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Amateur Radio Products
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Low Noise Amplifiers

Low Noise Amplifiers for 9 MHz to 2400 MHz

Type	Frequency Range (MHz)	Noise Figure (dB) ¹⁾		Gain (dB)	Power Supply		Connectors		Case Type waterproof	Remarks
		typical	maximum		DC Voltage (V)	Current (mA)	Input	Output		
MKU LNA 10 IFA	9 ... 11	4		typ. 14	12 ... 15	35	BNC, female	BNC, female	milled alu, no	High IP3, 4), 5)
MKU LNA 144 A	144 ... 146	0.35	0.4	min. 25	12 ... 14	60	N, male	N, female	milled alu, no	High IP3, 4), 5)
MKU LNA 432 A	430 ... 440	0.4	0.45	typ. 20	12 ... 14	60	N, male	N, female	milled alu, no	High IP3, 4), 5)
MKU LNA 132 A	1265 ... 1285	0.7		min. 35	9 ... 18	30	N, male	N, female	German Silver, no	Including helical filter, 4)
MKU LNA 132 A2	1265 ... 1285	0.7		min. 35	9 ... 18	30	N, female	F, female	German Silver, no	Including helical filter, 2350 MHz notch
MKU LNA 132 A2 TM	1265 ... 1285	0.7		min. 35	9 ... 18	30	N, female	F, female	German Silver, yes	Including helical filter, 2350 MHz notch
MKU LNA 131 AH	1246 ... 1346	0.4	0.45	typ. 20	9 ... 15	15	N, male	N, female	milled alu, no	Super low noise HEMT
MKU LNA 132 AH	1246 ... 1346	0.4	0.45	typ. 33	9 ... 15	80	N, male	N, female	milled alu, no	Super low noise HEMT, high IP3
MKU LNA 232 A2	2320 ... 2380	0.7		min. 35	9 ... 18	30	N, male	N, female	German Silver, no	Including ceramic filter, 1250 MHz notch 4)
MKU LNA 232 A2 TM	2320 ... 2380	0.7		min. 35	9 ... 18	30	N, female	N, female	German Silver, yes	Including ceramic filter, 1250 MHz notch
MKU LNA 231 AH	2304 ... 2320	0.4	0.5	typ. 16	9 ... 15	15	N, male	N, female	milled alu, no	Super low noise HEMT, 4)
MKU LNA 232 AH	2304 ... 2320	0.5	0.6	typ. 30	9 ... 15	80	N, male	N, female	milled alu, no	Super low noise HEMT, high IP3, 4)

- 1) Noise figure values at +18 °C.
Only for narrowband preamplifiers:
noise figure is specified at center frequency.
- 2) Also see waveguide table.
- 3) N connectors available
- 4) SMA connectors available
- 5) Input connector 7/16

Waveguide table

R 100	WG 16	WR 90
R 120	WG 17	WR 75
R 220	WG 20	WR 42
R 500	WG 24	WR 19

Important notes

- Low noise amplifiers are static sensitive devices. Handle with care!
- Maximum input power 1 mW (unless otherwise specified).
- The modules do not contain built-in coaxial relays!
- In case of outdoor installation, protection against water and moisture is required!
- Other connectors or cases are available on request.

Low Noise Amplifiers for 3 GHz to 47 GHz											
Type	Frequency Range (MHz)	Noise Figure (dB) ¹⁾		Gain typ. (dB)	Power Supply		Connectors		Case Type waterproof	Remarks	
		typical	maximum		DC Voltage (V)	Current (mA)	Input	Output			
MKU LNA 341 AH	3400 ... 3460	0.5		min. 14	9 ... 15	15	N, male	N, female	milled alu, no		
MKU LNA 342 AH	3400 ... 3460	0.5		typ. 28	9 ... 15	90	N, male	N, female	milled alu, no		
MKU LNA 571 A	5760 (+/- 50)		0.7	min. 12	9 ... 15	15	SMA, male	SMA, female	milled alu, no		
MKU LNA 571 B	5760 (+/- 50)		0.7	min. 12	9 ... 15	15	SMA, female	SMA, female	milled alu, no		
MKU LNA 572 A	5760 (+/- 50)		0.7	min. 25	9 ... 15	30	SMA, male	SMA, female	milled alu, no		
MKU LNA 572 AF	5760 (+/- 50)		0.7	min. 25	9 ... 15	30	SMA, male	SMA, female	milled alu, no	Including band pass filter	
MKU LNA 572 B	5760 (+/- 50)		0.7	min. 25	9 ... 15	30	SMA, female	SMA, female	milled alu, no		
MKU LNA 572 BF	5760 (+/- 50)		0.7	min. 25	9 ... 15	30	SMA, female	SMA, female	milled alu, no	Including band pass filter	
MKU LNA 101 AS	10368 (+/- 50)	0.8		min. 12	9 ... 15	15	SMA, male	SMA, female	milled alu, no		
MKU LNA 101 BS	10368 (+/- 50)	0.8		min. 12	9 ... 15	15	SMA, female	SMA, female	milled alu, no		
MKU LNA 102 A	10368 (+/- 50)	0.8		min. 22	9 ... 15	30	SMA, male	SMA, female	milled alu, no		
MKU LNA 102 B	10368 (+/- 50)	0.8		min. 22	9 ... 15	30	SMA, female	SMA, female	milled alu, no		
MKU LNA 102 S-EME	10368 (+/- 50)	0.7		min. 23	9 ... 15	30	R 100 (2)	SMA, female	milled alu, no	Input waveguide R100 / WG16 / WR90	
MKU LNA 243 CS2	24000 ... 24250	2.0	2.3	min. 24	9 ... 15	60	SMA, male	SMA, female	milled alu, no	Output power typ. 10 mW	
MKU LNA 243 WS2	24000 ... 24250	1.5	1.8	min. 26	9 ... 15	60	R 220 (2)	R 220 (2)	milled alu, no	Output power typ. 10 mW	
MKU LNA 243 RX2	24000 ... 24250	1.5	1.8	min. 26	9 ... 15	60	R 220 (2)	SMA, female	milled alu, no	Output power typ. 10 mW	
MKU LNA 472 B	47000 ... 47250		5.0	min. 27	10 ... 14	110	R 500 (2)	R 500 (2)	milled alu, no	Saturation output power 30 mW	
MKU LNA 473 A	47000 ... 47250		5.0	min. 25	9 ... 13	400	R 500 (2)	R 500 (2)	milled alu, no	Saturation output power 150 mW	

- Noise figure values at +18 °C.
Only for narrowband preamplifiers:
noise figure is specified at center frequency.
- Also see waveguide table.
- N connectors available
- SMA connectors available

Waveguide table

R 100	WG 16	WR 90
R 120	WG 17	WR 75
R 220	WG 20	WR 42
R 500	WG 24	WR 19

Important notes

- Low noise amplifiers are static sensitive devices. Handle with care!
- Maximum input power 1 mW (unless otherwise specified).
- The low noise amplifiers do not contain coaxial relays!
- In case of outdoor installation, protection against water and moisture is required!
- Other connectors or cases are available on request.

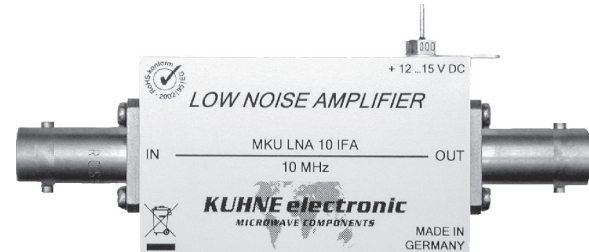
Reference Frequency Amplifier for 9 ... 11 MHz

MKU LNA 10 IFA

Our reference frequency amplifier MKU LNA 10 IFA was designed for buffering and amplifying of a 10 MHz reference frequency signal. The HF-transceivers IC-7700 and IC-7800 are using a good reference frequency oscillator. This reference frequency can be used to lock the oscillators of the TR and G3 transverter series. With the reference frequency of the HF-transceivers a good frequency stability of the transverters can be achieved. A concrete application is amplifying the 10 MHz reference frequency signal of the HF-transceivers IC-7700 or IC-7800. With the MKU LNA 10 IFA the reference frequency level is compatible to the input power range of the reference frequency input of the TR und G3 transverter series.

Specifications

Type	MKU LNA 10 IFA
Frequency range	9 ... 11 MHz
Noise figure @ 18 °C	typ. 4.0 dB, max. 4.5 dB
Gain	14 ... 16 dB
Input power	max. 1 mW
Output power P1dB	typ. 8 mW, min. 5 mW
Saturation power	typ. 100 mW
Output IP3	typ. +24 dBm, min. +22 dBm
Max. case temperature	+55 °C
Supply voltage	+12 ... 15 V DC
Current consumption	typ. 35 mA
Input connector / impedance	BNC-female, 50 ohms
Output connector / impedance	BNC-female, 50 ohms
Case	milled aluminium
Dimensions (mm)	50 x 30 x 22
Weight	typ. 80 g



Features

- Built-in bias tee for remote power supply via coaxial cable
- Good return loss (S11/S22)
- Solder pin for direct power supply
- Reverse polarity protection
- Small mechanical dimensions

Applications

- 10 MHz reference distribution
- Measurement and laboratory equipment

Important note

- Maximum input power 1 mW

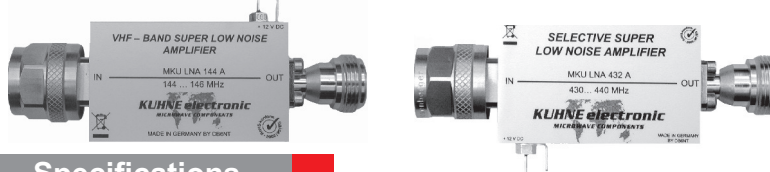
Other frequencies on request.

Selective Super Low Noise PHEMT Amplifiers for 144 MHz and 432 MHz

MKU LNA 144 A - MKU LNA 432 A

These selective super low noise amplifiers use the latest PHEMT transistor technology from Agilent. Due to high technical performance - low noise figure, high gain and very high IP3 - they are ideal for contest operation as well as EME, Meteorscatter, Aurora and tropo DX.

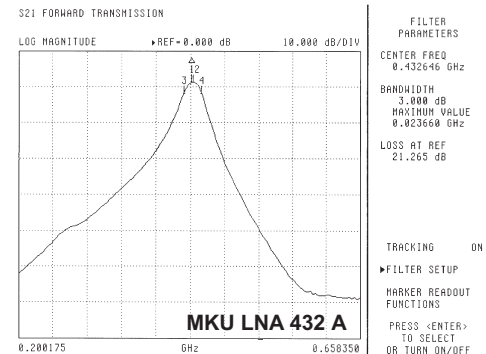
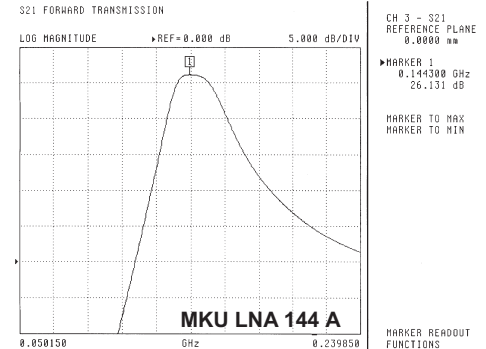
- Low noise figure and high gain
- LC filter (144 MHz) / Helical filter (432 MHz) for good selectivity
- High IP3 - ideal for contest operation
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Milled aluminium case
- Important note: The modules do not contain built-in coaxial relays!



Specifications

Type	MKU LNA 144 A	MKU LNA 432 A
Frequency range	144 ... 146 MHz	430 ... 440 MHz +/-
Noise figure @ 18 °C	0.35 dB +/- 0.05	0.4 dB +/- 0.05
Gain	min. 25 dB	typ. 20 dB
Input return loss	min. 3 dB	typ. 5 dB
Output return loss	typ. 15 dB	min. 15 dB
Output IP3	typ. +24 dBm	typ. +27 dBm
Supply voltage	+12 ... 14 V DC	+12 ... 14 V DC
Current consumption	typ. 60 mA	typ. 60 mA
Input connector	N-male / 50 ohms	N-male / 50 ohms
Output connector	N-female / 50 ohms	N-female / 50 ohms
Case	milled aluminium	milled aluminium
Dimensions (mm)	50 x 30 x 24	50 x 30 x 24
Weight	typ. 100 g	typ. 100 g
Options	7/16	7/16

Option 7/16:
Input connector 7/16,
Impedance 50 ohms



Other frequencies on request.

Super Low Noise Amplifiers with Helical Filter / Ceramic Filter (23 cm, 13 cm)

LNAs with helical filter and notch filter:

MKU LNA 132 A2 - MKU LNA 132 A2 TM

- Notch filter for 2350 MHz at input - for duplex operation on 1.3 GHz (RX) and 2.3 GHz (TX)
- Helical filter for good selectivity
- Low noise figure
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Built-in bias tee for remote power supply via coaxial cable
- Output connector F-female for direct connection to a TV satellite receiver
- Important note: The modules do not contain built-in coaxial relays!

LNAs with ceramic filter and notch filter:

MKU LNA 232 A2 - MKU LNA 232 A2 TM

- Notch filter for 1250 MHz at input - for duplex operation on 1.3 GHz (TX) and 2.3 GHz (RX)
- Multilayer ceramic for good selectivity
- Low noise figure
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Built-in bias tee for remote power supply via coaxial cable
- **MKU LNA 232 A2:** additional solder pin for direct DC power supply
- Important note: The modules do not contain built-in coaxial relays!

LNAs with helical filter:

MKU LNA 132 A

- Helical filter for good selectivity
- Low noise figure
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Solder pin for direct DC power supply (feed-through capacitor)
- Built-in bias tee for remote power supply via coaxial cable
- Important note: The modules do not contain built-in coaxial relays!

Specifications

Type	MKU LNA 132 A	MKU LNA 132 A2	MKU LNA 132 A2 TM	MKU LNA 232 A2	MKU LNA 232 A2 TM
Center frequency	1265 ... 1285 MHz	1265 ... 1285 MHz	Installed into a water resistant case	2320 ... 2380 MHz	Installed into a water resistant case
Noise figure @ 18 °C	typ. 0.7 dB	typ. 0.7 dB		typ. 0.7 dB	
Gain	min. 35 dB	min. 35 dB		min. 35 dB	
Supply voltage	+9 ... 18 V DC	+9 ... 18 V DC		+9 ... 18 V DC	
Current consumption	30 mA	30 mA		30 mA	
Input connector	N-male / 50 ohms	N-female / 50 ohms		N-male / 50 ohms	
Output connector	N-female / 50 ohms	F-female / 50 ohms		N-female / 50 ohms	
Case	German silver	German silver		German silver	
Dimensions (mm)	74 x 38 x 30	74 x 38 x 30	109 x 85 x 60	74 x 38 x 30	109 x 85 x 60
Weight	typ. 130 g	typ. 100 g	typ. 390 g	typ. 130 g	typ. 390 g

Other frequencies on request.

Super Low Noise HEMT Preamplifiers for DX and EME (23 cm, 13 cm)

MKU LNA 131 AH - MKU LNA 132 AH - MKU LNA 231 AH - MKU LNA 232 AH

For many years, our super low noise microwave preamplifiers have been used very successful. Many results of Ham Radio Contests proof that! Due to an extremely low noise figure the preamplifiers are ideal for tropo DX, EME (earth moon earth operation) and for receiving satellites.

Features

- Extremely low noise figure
- Good input return loss (low VSWR)
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Professional milled aluminium case
- Small mechanical dimensions
- Male connector at the input for direct connection to antenna or coaxial relay
- MKU LNA 132 AH and MKU LNA 232 AH: high IP3 for good large signal performance
- MKU LNA 132 AH: Remote power supply via RF output connector

Options

- Other connectors on request

Important notes

- The modules do not contain built-in coaxial relays!



Specifications

Type	MKU LNA 131 AH	MKU LNA 132 AH	MKU LNA 231 AH	MKU LNA 232 AH
Frequency range	1246 ... 1346 MHz	1246 ... 1346 MHz	2304 ... 2320 MHz	2304 ... 2320 MHz
Noise figure @ 18 °C	0.4 dB +/- 0.05	0.4 dB +/- 0.05	typ. 0.4 dB	typ. 0.5 dB
Gain	typ. 20 dB	typ. 33 dB	typ. 16 dB	typ. 30 dB
Output IP3	-	typ. 27 dBm	-	typ. 27 dBm
Supply voltage	+9 ... 15 V DC	+9 ... 15 V DC	+9 ... 15 V DC	+9 ... 15 V DC
Current consumption	typ. 15 mA	typ. 80 mA	typ. 15 mA	typ. 80 mA
Input connector	N-male / 50 ohms	N-male / 50 ohms	N-male / 50 ohms	N-male / 50 ohms
Output connector	N-female / 50 ohms	N-female / 50 ohms	N-female / 50 ohms	N-female / 50 ohms
Case	milled aluminium	milled aluminium	milled aluminium	milled aluminium
Dimensions (mm)	50 x 30 x 22	73 x 30 x 22	50 x 30 x 22	73 x 30 x 22
Weight	typ. 100 g	typ. 140 g	typ. 110 g	typ. 140 g

Other frequencies on request.

Super Low Noise HEMT Preamplifiers for DX and EME

MKU LNA 341 AH - MKU LNA 342 AH

Features

- Extremely low noise figure
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Male connector at the input for direct connection to antenna or coaxial relay
- Reverse polarity protection
- Professional design in milled aluminium case
- Small mechanical dimensions
- Solder pin for direct power supply
- High IP3 for good large signal performance (MKU LNA 342 AH)

Applications

- Amateur radio
- Satellite reception, EME, Tropo DX
- Analog and digital operation modes (SSB, CW, WSJT)

Options

- Remote power supply via output connector (Bias Tee) (MKU LNA 342 AH)
- Other connectors are available on request

Important note

- The modules do not contain built-in coaxial relays!



Specifications

	MKU LNA 341 AH	MKU LNA 342 AH
Type	MKU LNA 341 AH	MKU LNA 342 AH
Frequency range	3400 ... 3460 MHz	3400 ... 3460 MHz
Noise figure @ 18 °C	0.5 dB +/- 0.05 dB	0.5 dB +/- 0.05 dB
Input power	max. 1 mW	max. 1 mW
Gain	min. 14 dB	typ. 28 dB
Output IP3		typ. +28 dBm
Supply voltage	+9 ... 15 V DC	+9 ... 15 V DC
Current consumption	typ. 15 mA	typ. 90 mA
Maximum case temperature	+55 °C	+55 °C
Input connector, impedance	N-male, 50 ohms	N-male, 50 ohms
Output connector, impedance	N-female, 50 ohms	N-female, 50 ohms
Case	milled aluminium	milled aluminium
Dimensions (mm)	50 x 30 x 22	73 x 30 x 22
Weight	typ. 110 g	typ. 140 g

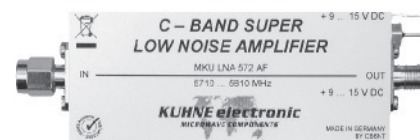
Other frequencies on request.

Super Low Noise HEMT Preamplifiers for the 6 cm Band

MKU LNA 571 A - MKU LNA 571 B - MKU LNA 572 A - MKU LNA 572 B

With band pass filter: MKU LNA 572 AF - MKU LNA 572 BF

- Low noise figure
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Milled aluminium case
- Small mechanical dimensions
- Important note: The modules do not contain built-in coaxial relays!
- The preamplifiers MKU LNA 572 AF and MKU LNA 572 BF contain an internal band pass filter with good wideband selectivity
- Other connectors on request



Specifications

Type	MKU LNA 571 A	MKU LNA 571 B	MKU LNA 572 A	MKU LNA 572 B	MKU LNA 572 AF	MKU LNA 572 BF
Center frequency	5760 MHz +/- 50	5760 MHz +/- 50	5760 MHz +/- 50	5760 MHz +/- 50	5760 MHz +/- 50	5760 MHz +/- 50
Noise figure @ 18 °C	max. 0.7 dB	max. 0.7 dB	max. 0.7 dB	max. 0.7 dB	max. 0.7 dB	max. 0.7 dB
Gain	min. 12 dB	min. 12 dB	min. 25 dB	min. 25 dB	min. 25 dB	min. 25 dB
Supply voltage	+9 ... 15 V DC	+9 ... 15 V DC	+9 ... 15 V DC	+9 ... 15 V DC	+9 ... 15 V DC	+9 ... 15 V DC
Current consumption	typ. 15 mA	typ. 15 mA	typ. 30 mA	typ. 30 mA	typ. 30 mA	typ. 30 mA
Input connector	SMA-male	SMA-female	SMA-male	SMA-female	SMA-male	SMA-female
Output connector	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female
Case	milled aluminium	milled aluminium	milled aluminium	milled aluminium	milled aluminium	milled aluminium
Dimensions (mm)	50 x 30 x 17	50 x 30 x 17	74 x 30 x 20	74 x 30 x 20	74 x 30 x 20	74 x 30 x 20
Weight	typ. 50 g	typ. 50 g	typ. 75 g	typ. 75 g	typ. 75 g	typ. 75 g
Incl. band pass filter	no	no	no	no	yes	yes

Other frequencies on request.

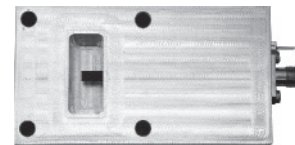
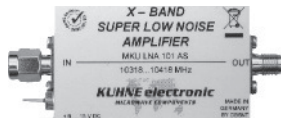
Super Low Noise HEMT Preamplifiers for the 3 cm Band

One-stage preamplifiers: MKU LNA 101 AS - MKU LNA 101 BS

Two-stage preamplifiers: MKU LNA 102 A - MKU LNA 102 B

Two-stage preamplifiers with waveguide-input: MKU LNA 102 S-EME

- Low noise figure
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Milled aluminium case
- Small mechanical dimensions
- Important note: The modules do not contain built-in coaxial relays!



Specifications

	MKU LNA 101 AS	MKU LNA 101 BS	MKU LNA 102 A	MKU LNA 102 B	MKU LNA 102 S-EME
Type	MKU LNA 101 AS	MKU LNA 101 BS	MKU LNA 102 A	MKU LNA 102 B	MKU LNA 102 S-EME
Center frequency	10368 MHz +/- 50	10368 MHz +/- 50	10368 MHz +/- 50	10368 MHz +/- 50	10368 MHz +/- 50
Noise figure @ 18 °C	typ. 0.8 dB	typ. 0.8 dB	max. 0.8 dB	max. 0.8 dB	typ. 0.7 dB
Gain	min. 12 dB	min. 12 dB	min. 22 dB	min. 22 dB	min. 23 dB
Supply voltage	+9 ... 15 V DC	+9 ... 15 V DC	+9 ... 15 V DC	+9 ... 15 V DC	+9 ... 15 V DC
Current consumption	typ. 15 mA	typ. 15 mA	typ. 30 mA	typ. 30 mA	typ. 30 mA
Input connector	SMA-male	SMA-female	SMA-male	SMA-female	Waveguide R100 / WG16 / WR90
Output connector	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female
Case	milled aluminium	milled aluminium	milled aluminium	milled aluminium	milled aluminium
Dimensions (mm)	50 x 30 x 17	50 x 30 x 17	50 x 30 x 17	50 x 30 x 17	73 x 40 x 20
Weight	typ. 50 g	typ. 50 g	typ. 50 g	typ. 50 g	typ. 130 g

Other frequencies on request.

Super Low Noise HEMT Amplifiers for 24 GHz

MKU LNA 243 WS2 - MKU LNA 243 CS2

The HEMT amplifiers for 24 GHz feature low noise figures and high output power. They can be used as preamplifiers and as driver or power amplifiers. The amplifiers are available with SMA or waveguide connectors.

- Low noise figure
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Milled aluminium case
- Small mechanical dimensions
- Important note: The modules do not contain built-in coaxial relays!



Specifications

Type	MKU LNA 243 WS2	MKU LNA 243 CS2
Frequency range	24000 ... 24250 MHz	24000 ... 24250 MHz
Noise figure @ 18 °C	typ. 1.5 dB (max. 1.8 dB)	typ. 2.0 dB (max. 2.3 dB)
Gain	min. 26 dB	min. 24 dB
Saturation output power	typ. 10 mW	typ. 10 mW
Supply voltage	+9 ... 15 V DC	+9 ... 15 V DC
Current consumption	typ. 60 mA	typ. 60 mA
Input connector	Waveguide R220 / WR42 / WG20	SMA-male / 50 ohms
Output connector	Waveguide R220 / WR42 / WG20	SMA-female / 50 ohms
Case	milled aluminium case	milled aluminium case
Dimensions (mm)	55 x 30 x 27	50 x 30 x 17
Weight	typ. 85 g	typ. 40 g

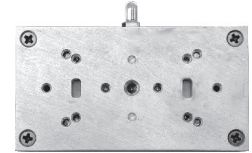
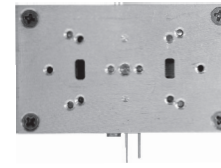
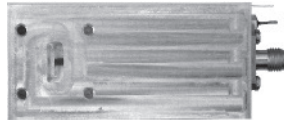
Other frequencies on request.

Super Low Noise HEMT Amplifiers for 24 GHz and 47 GHz

MKU LNA 243 RX2 - MKU LNA 472 B - MKU LNA 473 A

Our amplifiers for 24 GHz and 47 GHz use the latest semiconductor technologies. They achieve low noise figures and a high output power. The waveguide input is directly coupled to the internal PCB for minimum losses. Due to small mechanical dimensions, the modules can be used for building very compact receive or transmit systems.

- Low noise figure
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Milled aluminium case
- Small mechanical dimensions
- Important note: The modules do not contain built-in coaxial relays!



Specifications

Type	MKU LNA 243 RX2	MKU LNA 472 B	MKU LNA 473 A
Center frequency	24048 MHz (24.0 ... 24.25 GHz)	47088 MHz (47.0 ... 47.25 GHz)	47088 MHz (47.0 ... 47.25 GHz)
Noise figure @ 18 °C	typ. 1.5 dB (max. 1.8 dB)	max. 5.0 dB	max. 5.0 dB
Gain	min. 26 dB	min. 27 dB	min. 25 dB
Saturation output power	typ. 10 mW	typ. 30 mW	typ. 150 mW
Supply voltage	+9 ... 15 V DC	+10 ... 14 V DC	+9 ... 13 V DC
Current consumption	typ. 60 mA	typ. 110 mA	typ. 400 ... 900 mA
Input connector	Waveguide R220 / WR42 / WG20	Waveguide R500 / WR19 / WG24	Waveguide R500 / WR19 / WG24 with M2 thread
Output connector	SMA-female / 50 ohms	Waveguide R500 / WR19 / WG24	Waveguide R500 / WR19 / WG24 with M2 thread
Case	milled aluminium	milled aluminium / brass	milled aluminium / brass
Dimensions (mm)	63 x 30 x 20	50 x 30 x 20	56 x 30 x 20
Weight	typ. 75 g	typ. 100 g	typ. 110 g

Other frequencies on request.

Low Noise Amplifiers for Avionics, Radio Astronomy and Satellite Reception

Low Noise Amplifiers for Avionics, Radio Astronomy and Satellite Reception										
Type	Frequency Range (MHz)	Noise Figure (dB) ¹⁾		Gain (dB)	Power Supply		Connectors		Case Type waterproof	Remarks
		typical	maximum		DC Voltage (V)	Current (mA)	Input	Output		
KU LNA 1090 A	1070 ... 1110	0.5	0.6	min. 30	8 ... 15	130	N, female	BNC, female	German silver, no	Including band pass filter
KU LNA 1090 A TM	1070 ... 1110	0.5	0.6	min. 30	8 ... 15	130	N, female	N, female	German silver, yes	Including band pass filter
KU LNA 142 AH	1350 ... 1450	0.35	0.45	typ. 33	9 ... 15	80	N, male	N, female	milled alu, no	Super low noise HEMT
KU LNA 1575/4 SMA	1565 ... 1585	0.7		typ. 47	8 ... 15	300	SMA, female	4 x SMA, female	German Silver, no	Including helical filter, for GPS
KU LNA 1575-50	1565 ... 1585		0.5	typ. 55	9 ... 18	100	N, female	N, female	milled alu, no	Including helical filter, for GPS
KU LNA 172 A	1685 ... 1705	0.7		min. 35	9 ... 18	30	N, male	N, female	German Silver, no	Including helical filter
KU LNA 8000 A	8000 ... 8450	0.7		min. 24	12 ... 15	30	R 100 (2)	SMA, female	milled alu, no	Input waveguide R100 / WG16 / WR90
KU LNA 8000 A-SMA	8000 ... 8450	0.7		min. 24	12 ... 15	30	SMA, female	SMA, female	milled alu, no	

- 1) Noise figure values at +18 °C.
Only for narrowband preamplifiers:
noise figure is specified at center frequency.
- 2) Also see waveguide table.
- 3) N connectors available
- 4) SMA connectors available

Waveguide table

R 100	WG 16	WR 90
R 120	WG 17	WR 75
R 220	WG 20	WR 42
R 500	WG 24	WR 19

Important notes

- Low noise amplifiers are static sensitive devices. Handle with care!
- Maximum input power 1 mW (unless otherwise specified).
- The modules do not contain built-in coaxial relays!
- In case of outdoor installation, protection against water and moisture is required!
- Other connectors or cases are available on request.

Super Low Noise Amplifiers for Avionics

KU LNA 1090 A - KU LNA 1090 A TM

This high linear preamplifier was developed for applications in the IFF frequency range (Identification Friend or Foe) at 1090 MHz. The preamplifier has a two-pole band pass filter between the two amplifier stages for high suppression of out-of-band signals. This preamplifier features excellent large signal performance and a low noise figure.

Features

- High IP3 for excellent large signal performance
- Low noise figure
- ESD protection at preamplifier input
- Built-in bias tee for remote power supply via coaxial cable
- Built-in band pass filter

Accessories

- Bias-T KU BT 271 N (for remote power supply)

Important note

- The modules do not contain built-in coaxial relays!

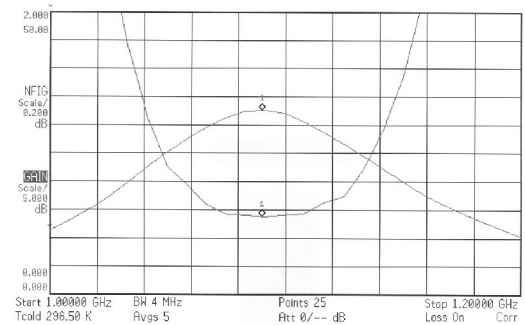


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Mkr1 1.09 GHz

0.552 dB

32.659 dB



Specifications

Type	KU LNA 1090 A	KU LNA 1090 A TM
Frequency range	1070 ... 1110 MHz	1070 ... 1110 MHz
Noise figure @ 18 °C	typ. 0.5 dB; max. 0.6 dB	typ. 0.5 dB; max. 0.6 dB
Gain	min. 30 dB	min. 30 dB
RF input power	max. 1 mW	max. 1 mW
Supply voltage	+8 ... 15 V DC	+8 ... 15 V DC
Current consumption	130 mA	130 mA
Input connector	N-female / 50 ohms	N-female / 50 ohms
Output connector	BNC-female / 50 ohms	N-female / 50 ohms
Case	German silver	German silver, installed into a water resistant case
Dimensions (mm)	74 x 37 x 30	109 x 85 x 60
Weight	typ. 90 g	typ. 330 g

Other frequencies on request.

Super Low Noise Amplifiers for Radio Astronomy

KU LNA 142 AH

Our radio astronomy preamplifier for the 1400 MHz band provide an extremely low noise figure. It is excellent for receiving weak signals from space. The preamplifier can be added to the receiving system without additional adaptors because of the male input connector and female output connector.

Features

- Extremely low noise figure
- Good input return loss (low VSWR)
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Milled aluminium case
- Small mechanical dimensions
- Remote power supply via output connector

Important notes

- The modules do not contain built-in coaxial relays!
- Maximum input power 1 mW
- Options: Other connectors on request!

Specifications

Type	KU LNA 142 AH
Frequency range	1350 ... 1450 MHz
Noise figure @ 18° C	0.4 dB +/- 0.05
Gain	typ. 33 dB
Supply voltage	+9 ... 15 V DC
Current consumption	typ. 80 mA
Input connector	N-male / 50 ohms
Output connector	N-female / 50 ohms
Case	milled aluminium
Dimensions (mm)	73 x 30 x 22
Weight	typ. 140 g



Amplifiers for other frequencies available on request.

Super Low Noise Amplifiers for Satellite Reception

Preamplifier with helical filter KU LNA 172 A - METEOSAT and weather satellites 1.7 GHz

Features

- Helical filter for good selectivity
- Low noise figure
- Unconditionally stable - no parasitic oscillators in case of poor antenna match
- Solder pin for direct power supply (feed-through capacitor)
- Built-in bias-T for remote power supply via coaxial cable

Important note

- The module does not contain built-in coaxial relays!



Specifications

Type	KU LNA 172 A
Frequency range	1685 ... 1705 MHz
Noise figure @ 18 °C	typ. 0.7 dB
Gain	min. 35 dB
Supply voltage	+9 ... 18 V DC
Current consumption	30 mA
Input connector	N-male / 50 ohms
Output connector	N-female / 50 ohms
Case	German silver
Dimensions (mm)	74 x 38 x 30
Weight	typ. 130 g

Deep Space Communications KU LNA 8000 A KU LNA 8000 A-SMA

Features

- Preamplifier for reception of space probes
- Super low noise figure due to the use of the latest HEMT FETs
- Unconditionally stable. No parasitic oscillations in case of poor antenna match.
- Input either waveguide R100 or SMA-female connector
- Milled aluminium case

Important note

- The modules do not contain built-in coaxial relays!



Specifications

Type	KU LNA 8000 A	KU LNA 8000 A-SMA
Frequency range	8000 ... 8450 MHz	8000 ... 8450 MHz
Noise figure @ 18 °C	typ. 0.7 dB	typ. 0.7 dB
Gain	min. 24 dB	min. 24 dB
Supply voltage	+12 ... 15 V DC	+12 ... 15 V DC
Current consumption	typ. 30 mA	typ. 30 mA
Input connector	Waveguide R100 / WG16 / WR90	SMA-female / 50 ohms
Output connector	SMA-female / 50 ohms	SMA-female / 50 ohms
Case	milled aluminium	milled aluminium
Dimensions (mm)	73 x 40 x 20	50 x 30 x 17
Weight	typ. 110 g	typ. 45 g

Other frequencies on request.

Super Low Noise Amplifiers for GPS Reception

KU LNA 1575/4 SMA

- Power supply (12 V) of an active antenna via the preamplifier's input connector is possible
- 4 separate output stages and output connectors
- Internal helical filter
- Low noise figure
- Unconditionally stable - no parasitic oscillations in case of poor antenna match



KU LNA 1575-50

- Very low noise figure
- High gain
- Internal helical filter
- Unconditionally stable - no parasitic oscillations in case of poor antenna match

Power Splitter for GPS

KU DIV 1575

The KU DIV 1575 is a passive power splitter with one DC-coupled path for power supply of active antennas. Two receivers can be connected to one common antenna. The receiver in the DC-coupled path can be used to supply an active antenna.



Specifications

Type	KU LNA 1575/4 SMA	KU LNA 1575-50
Center frequency	1565 ... 1585 MHz	1565 ... 1585 MHz
Noise figure @ 18 °C	typ. 0.7 dB	max. 0.5 dB
Gain	typ. 47 dB	typ. 55 dB
Output power		min. +10 dBm (10 mW)
Output IP3		min. +20 dBm
Supply voltage	+8 ... 15 V DC	+9 ... 18 V DC
Current consumption	typ. 300 mA	typ. 100 mA
Input connector	SMA-female / 50 ohms	N-female / 50 ohms
Output connector	4 x SMA-female / 50 ohms	N-female / 50 ohms
Case	German silver	milled aluminium
Dimensions (mm)	111 x 55 x 30	102 x 45 x 29
Weight	typ. 150 g	typ. 220 g

Specifications

Type	KU DIV 1575
Center frequency	1565 ... 1585 MHz
Insertion loss	typ. 3 dB
Isolation	typ. 25 dB
Impedance	50 ohms
DC path	+0 ... 24 V DC / max. 0.5 A
Input connector	N-female / 50 ohms
Output connector A	N-female / 50 ohms
Output connector B	N-female / 50 ohms
Case	tinplate
Dimensions (mm)	37 x 37 x 30
Weight	typ. 95 g

Other frequencies on request.

Power Combiner (Splitter) for 1266 ... 1326 MHz

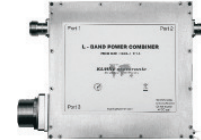
MKU DIV 1300-1-SMA - MKU DIV 1300-1-N - MKU DIV 1300-1-7/16 - MKU DIV 1300-4-7/16

Features

- Passive Power Combiner / quadrature hybrid
- Internal 100 W load resistor with detector for error power detection

Applications

- Can be used to combine two power amplifiers to achieve double output power



Specifications

	MKU DIV 1300-1-SMA	MKU DIV 1300-1-N	MKU DIV 1300-1-7/16	MKU DIV 1300-4-7/16
Type	MKU DIV 1300-1-SMA	MKU DIV 1300-1-N	MKU DIV 1300-1-7/16	MKU DIV 1300-4-7/16
Center frequency	1266 ... 1326 MHz	1266 ... 1326 MHz	1266 ... 1326 MHz	1266 ... 1326 MHz
Insertion loss	typ. 3.1 dB	typ. 3.1 dB	typ. 3.1 dB	typ. 3.1 dB
Isolation	typ. 25 dB, min. 20 dB	typ. 25 dB, min. 20 dB	typ. 25 dB, min. 20 dB	typ. 20 dB
Input power	2 x 25 W	2 x 300 W	2 x 600 W	max. 2 x 1000 W
Output power	50 W	600 W	1200 W	max. 2000 W
Input connector, impedance	SMA-female, 50 ohms	N-female, 50 ohms	N-female, 50 ohms	7/16-female / 50 ohms
Output connector, impedance	SMA-female, 50 ohms	SMA-female, 50 ohms	N-female, 50 ohms	7/16-female / 50 ohms
Load resistor 50 ohms	max. 100 W	max. 100 W	max. 100 W	
Monitor (MON)	DC voltage output for monitoring the detected error power (in case of reflected power or asymmetry)	DC voltage output for monitoring the detected error power (in case of reflected power or asymmetry)	DC voltage output for monitoring the detected error power (in case of reflected power or asymmetry)	
Typical MON values	2.2 V @ 20 W (error power at the load resistor) 4.0 V @ 80 W (error power at the load resistor)	2.2 V @ 20 W (error power at the load resistor) 4.0 V @ 80 W (error power at the load resistor)	2.2 V @ 20 W (error power at the load resistor) 4.0 V @ 80 W (error power at the load resistor)	
Case	milled aluminium	milled aluminium	milled aluminium	milled aluminium
Dimensions (mm)	147 x 140 x 26.5	147 x 140 x 26.5	147 x 140 x 26.5	147 x 140 x 26.5
Weight	typ. 495 g	typ. 520 g	typ. 740 g	typ. 1100 g

Power Combiner (Splitter) for 2300 ... 2330 MHz

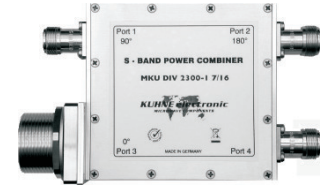
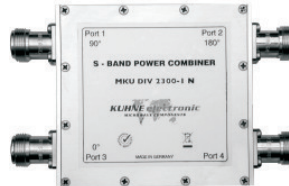
MKU DIV 2300-1-SMA - MKU DIV 2300-1-N - MKU DIV 2300-1-7/16

Features

- Passive Power Combiner / quadrature hybrid

Applications

- Can be used to combine two power amplifiers to achieve double output power



Specifications

Type	MKU DIV 2300-1-SMA	MKU DIV 2300-1-N	MKU DIV 2300-1-7/16
Frequency range	2300 ... 2330 MHz	2300 ... 2330 MHz	2300 ... 2330 MHz
Insertion loss	typ. 3.1 dB	typ. 3.1 dB	typ. 3.1 dB
Isolation	typ. 25 dB, min. 20 dB	typ. 25 dB, min. 20 dB	typ. 25 dB, min. 20 dB
Input power	2 x 25 W	2 x 300 W	2 x 600 W
Output power	50 W	600 W	1200 W
Input connector, impedance	SMA-female, 50 ohms	N-female, 50 ohms	N-female, 50 ohms
Output connector, impedance	SMA-female, 50 ohms	N-female, 50 ohms	7/16-female, 50 ohms
Case	milled aluminium	milled aluminium	milled aluminium
Dimensions (mm)	82 x 89 x 18	82 x 89 x 18	82 x 89 x 18
Weight	typ. 215 g	typ. 270 g	typ. 415 g

Power Amplifiers

Type	Frequency	Input Power	Output power	DC Voltage	Current
MKU PA 4M-35W HY	68 ... 75 MHz	20 mW	40 W	+13.5 V	6.5 A
MKU PA 2M-60W HY	144 ... 146 MHz	50 mW	60 W	+12 ... 14 V	12 A
MKU PA 2M-120W HY	144 ... 146 MHz	100 mW	120 W	+12 ... 14 V	21 A
MKU PA 70CM-60W HY	430 ... 440 MHz	50 mW	60 W	+12 ... 14 V	10 A
MKU PA 23CM-1W A	1240 ... 1300 MHz	50 mW	1 W	+12 ... 14 V	0.45 A
MKU PA 23CM-30W HY	1260 ... 1300 MHz	100 mW	35 W	+12.8 V	11 A
MKU PA 23CM-30W A	1240 ... 1300 MHz	1 W	40 W	+26 V	3.5 A
MKU PA 23CM-50W A	1240 ... 1300 MHz	3 W	60 W	+26 V	6 A
MKU PA 23CM-100W A	1240 ... 1300 MHz	300 mW	120 W	+26 V	14 A
MKU PA 23CM-100W B	1240 ... 1300 MHz	5 W	120 W	+26 V	14 A
MKU PA 23CM-200W A	1240 ... 1300 MHz	0.5 W	230 W	+26 V	24 A
MKU PA 23CM-200W B	1240 ... 1300 MHz	15 W	230 W	+26 V	24 A
MKU PA 23CM-250W CU	1270 ... 1300 MHz	4 W	300 W	+50 V	12 A
MKU PA 23CM-1000W CU	1296 (1280 ... 1300) MHz	20 W	1000 W	+50 V	40 A
MKU PA 13CM-08W A	2300 ... 2400 MHz	5 mW	0.8 W	+12 ... 14 V	0.26 A
MKU PA 13CM-5W A	2300 ... 2400 MHz	0.7 W	5 W	+12 ... 14 V	0.8 A
MKU PA 13CM-10W A	2300 ... 2400 MHz	1 W	10 W	+12 ... 14 V	25 A
MKU PA 13CM-20W A	2300 ... 2400 MHz	1 W	27 W	+12 ... 14 V	5 A
MKU PA 13CM-400W CU	2300 ... 2400 MHz	1,2 W	450 W	+28 V	50 A

*) Waveguide output connector

Type	Frequency	Input Power	Output Power	DC Voltage	Current
MKU PA 9CM-9W A	3400 ... 3460 MHz	200 mW	14 W	+28 V	1.4 A
MKU PA 9CM-25W A	3400 ... 3460 MHz	900 mW	20 W	+12 ... 14 V	5 A
MKU PA 9CM-30W A	3400 ... 3460 MHz	500 mW	30 W	+28 V	3.8 A
MKU PA 9CM-28W A	3400 ... 3460 MHz	2 W	40 W	+28 V	5 A
MKU PA 9CM-75W A	3400 ... 3460 MHz	8 W	100 W	+28 V	10 A
MKU PA 9CM-300W CU	3400 ... 3460 MHz	1 W	350 W	+28 V	42 A
MKU PA 9CM-4W A	3400 ... 3460 MHz	250 mW	4 W	+12 ... 14 V	1.2 A
MKU PA 6CM-4W A	5740 ... 5780 MHz	100 mW	4 W	+12 ... 14 V	1.6 A
MKU PA 6CM-8W A	5740 ... 5780 MHz	200 mW	8 W	+12 ... 14 V	2.5 A
MKU PA 6CM-15W A	5740 ... 5780 MHz	300 mW	15 W	+12 ... 14 V	6 A
MKU PA 6CM-50W A	5740 ... 5780 MHz	200 mW	50 W	+12 V	13 A
MKU PA 6CM-100W A	5740 ... 5780 MHz	200 mW	100 W	+12 V	28 A
MKU PA 3CM-2W A	10300 ... 10400 MHz	200 mW	2 W	+12 ... 14 V	1.1 A
MKU PA 3CM-02W A	10300 ... 10400 MHz	10 mW	250 mW	+12 ... 14 V	250 mA
MKU PA 3CM-8W B	10300 ... 10400 MHz	1.5 W	10 W	+12 ... 14 V	4 A
MKU PA 3CM-4W A	10300 ... 10400 MHz	200 mW	5 W	+12 ... 14 V	2 A
MKU PA 3CM-8W A	10300 ... 10400 MHz	200 mW	10 W	+12 ... 14 V	4 A
MKU PA 3CM-25W A	10300 ... 10400 MHz	200 mW	25 W	+12 ... 14 V	8 A
MKU PA 3CM-45W B	10300 ... 10400 MHz	250 mW	50 W	+12 ... 14 V	20 A
MKU PA 3CM-45W B WG	10300 ... 10400 MHz	250 mW	50 W	+12 ... 14 V	20 A
MKU PA 3CM-45W A	10300 ... 10400 MHz	10 mW	50 W	+12 ... 14 V	20 A
MKU PA 3CM-45W A WG	10300 ... 10400 MHz	10 mW	50 W	+12 ... 14 V	20 A
MKU PA 1.2CM-002W A	24000 ... 24250 MHz	0.1 mW	30 mW	+10 ... 15 V	70 mA
MKU PA 1.2CM-008W A	24000 ... 24250 MHz	8 mW	90 mW	+12 ... 15 V	300 mA
MKU PA 1.2CM-009W WG	24000 ... 24250 MHz	8 mW	90 mW *	+10 ... 15 V	300 mA
MKU PA 1.2CM-1W A	24000 ... 24250 MHz	10 mW	1.2 W	+7 ... 14 V	max. 1.1 A
MKU PA 1.2CM-3W A	24000 ... 24250 MHz	20 mW	3 W	+10 ... 12 V	3 A
MKU PA 1.2CM-10 W WG	24000 ... 24250 MHz	20 mW	10 W *	+9 ... 10 V	15 A
KIT MKU PA 1360	1240 ... 1300 MHz	3 W	60 W	+27 V	max. 5 A

*) Waveguide output connector

VHF MOSFET Power Amplifiers

MKU PA 4M-35W HY



Specifications

Type	MKU PA 4M-35W HY
Frequency range	68 ... 75 MHz
Input power	typ. 20 mW, max. 40 mW
Output power Psat	min. 40 W @ 13.5 V
Harmonic rejection	min. 60 dB
ON voltage (PTT)	+12 ... 13.8 V
VSWR of load	max. 1.8:1
Maximum case temperature	+55 °C
Monitor output	yes
Supply voltage	+13.5 V DC
Current consumption	max. 6.5 A
Quiescent current	typ. 2.7 A
Input connector	SMA-female, 50 ohms
Output connector	SMA-female, 50 ohms
Case	milled aluminium
Dimensions (mm)	130 x 60 x 20
Weight	typ. 270 g
Recommended heat sink	SK 150-62
Recommended power supply	SP 150 W 13.5
Recommended fan	FAN 60x60 12 V

Features

- Good linearity
- Built-in low pass filter for good harmonic rejection
- Over voltage protection and reverse polarity protection
- Monitor outputs for forward and reverse power detection
- ON / OFF control with DC voltage (+12 V DC)

Applications

- Analog and digital transmission systems
- Power amplifier for radio amateur applications (SSB, CW)

Options

- Amplifier mounted on heat sink with fans

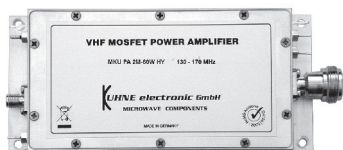
Important notes

- Recommended output power for radio amateur applications:
Modulation type: CW/FM up to 40 W, SSB up to 20 ... 25 W
- The module does not contain built-in coaxial relays!

Other frequencies on request.

VHF MOSFET Power Amplifiers

MKU PA 2M-60W HY - MKU PA 2M-120W HY



Specifications

Type	MKU PA 2M-60W HY	MKU PA 2M-120W HY
Frequency range	144 ... 146 MHz	144 ... 146 MHz
Input power	typ. 50 mW	typ. 100 mW
Output power Psat	typ. 60 W (CW)	typ. 120 W (CW)
Harmonic rejection	min. 60 dB	min. 60 dB
VSWR of load	max. 1.8:1	max. 1.8:1
Maximum case temperature	+55 °C	+55 °C
Supply voltage	+12 ... 14 V DC	+12 ... 14 V DC
Current consumption	max. 12 A	max. 21 A
Quiescent current	typ. 4 A	typ. 8 A
Input connector	SMA-female, 50 ohms	SMA-female, 50 ohms
Output connector	N-female, 50 ohms	N-female, 50 ohms
Case	milled aluminium	milled aluminium
Dimensions (mm)	130 x 60 x 20	124 x 80 x 22
Weight	typ. 270 g	typ. 400 g
Recommended power supply	SP 150 W 12	SP 320 W 12
Recommended heat sink	SK 150-62	SK 200-125
Recommended fan	FAN 60x60 HP 12 V	2 x FAN 60x60 12 V

Features

- Good linearity
- Built-in low pass filter for good harmonic rejection
- Over voltage protection and reverse polarity protection
- Monitor outputs for forward and reverse power detection

Applications

- Analog and digital transmission systems
- Power amplifier for radio amateur applications (SSB, CW)

Options

- Amplifier mounted on heat sink with fans

Important notes

- The modules do not contain built-in coaxial relays!
- Recommended output power for radio amateur applications:

Modulation type MKU PA 2M-60W HY:

CW/FM up to 60 W, SSB up to 20 W

Modulation type MKU PA 2M-120W HY:

CW/FM up to 120 W, SSB up to 40 W

Other frequencies on request.

UHF MOSFET Power Amplifier

MKU PA 70CM-60W HY



Specifications

Type	MKU PA 70CM-60W HY
Frequency range	430 ... 440 MHz
Input power	typ. 50 mW
Output power Psat	typ. 60 W (CW)
Gain (small signal)	typ. 43 dB
Harmonic rejection	min. 60 dB
VSWR of load	max. 1.8:1
Maximum case temperature	+55 °C
Supply voltage	+12 ... 14 V DC
Current consumption	max. 10 A
Quiescent current	typ. 4 A
Input connector	SMA-female, 50 ohms
Output connector	N-female, 50 ohms
Case	milled aluminium
Dimensions (mm)	130 x 60 x 20
Weight	typ. 270 g
Recommended power supply	SP 150 W 12
Recommended heat sink	SK 150-62
Recommended fan	FAN 60x60 12 V

Features

- Good linearity
- Built-in low pass filter for good harmonic rejection
- Over voltage protection and reverse polarity protection
- Monitor outputs for forward and reverse power detection

Applications

- Analog and digital transmission systems
- Power amplifier for radio amateur applications (SSB, CW)

Options

- Amplifier mounted on heat sink with fans

Important notes

- Recommended output power for radio amateur applications:
Modulation type: CW/FM up to 60 W, SSB up to 20 W
- The module does not contain built-in coaxial relays!

Other frequencies on request.

Linear Power Amplifiers for the 23 cm Band

Power Amplifier with GaAs FET: MKU PA 23CM-1W A

This amplifier with an output power of 1 watt is suitable as driver amplifier or for low power applications. Because of the small mechanical dimensions of the milled aluminium case, it is easy to integrate into compact systems.

Power Amplifiers with MOSFET Modules: MKU PA 23CM-30W HY

This series of power amplifiers for the 23 cm band uses LD MOSFET Modules. Due to their linearity and thermal stability the amplifiers are excellent for all analog and digital modes in amateur radio. Typical examples are SSB, CW and ATV.

Important note: The modules do not contain built-in coaxial relays!

Specifications		
Type	MKU PA 23CM-1W A	MKU PA 23CM-30W HY
Frequency range	1240 ... 1300 MHz	1260 ... 1300 MHz
Input power	max. 50 mW	max. 0.2 W
Output power Psat	1 W	typ. 30 W (1260 ... 1280 MHz) min. 20 W (1281 ... 1300 MHz)
Harmonic rejection		50 dB
ON voltage (PTT)		+13.8 V DC
VSWR of load	max. 1.8:1	max. 1.8:1
Maximum case temperature	+55 °C	+55 °C
Monitor output	no	yes
Supply voltage	+12 ... 14 V DC	+12 ... 13.8 V DC
Current consumption	max. 0.45 A	max. 11 A
Quiescent current	typ. 0.3 A	typ. 4 A
Input connector	SMA-female, 50 ohms	SMA-female, 50 ohms
Output connector	SMA-female, 50 ohms	SMA-female, 50 ohms
Dimensions (mm)	50 x 30 x 22	130 x 60 x 20
Case	milled aluminium	milled aluminium
Weight	typ. 65 g	typ. 270 g
Recommended power supply	-	SP 150 W 12
Recommended heat sink	SK 120-75	SK 150-62
Recommended fan	-	FAN 60x60 12 V



Other frequencies on request.

Linear High Power Amplifiers up to 100 W for the 23 cm Band

MKU PA 23CM-30W A - 30 Watts

MKU PA 23CM-50W A - 50 Watts

MKU PA 23CM-100W A - 100 Watts

MKU PA 23CM-100W B - 100 Watts

Our high power amplifiers for the 23 cm band are based on LDMOS technology. They provide high linearity, high efficiency and offer a wide range of analog and digital applications.

Important note: The modules do not contain built-in coaxial relays!



Specifications

	MKU PA 23CM-30W A	MKU PA 23CM-50W A	MKU PA 23CM-100W A	MKU PA 23CM-100W B
Type	MKU PA 23CM-30W A	MKU PA 23CM-50W A	MKU PA 23CM-100W A	MKU PA 23CM-100W B
Frequency range	1240 ... 1300 MHz	1240 ... 1300 MHz	1240 ... 1300 MHz	1240 ... 1300 MHz
RF input power	typ. 1 W	3 W	0.3 W	5 W
Maximum RF input power	1.5 W	4 W	0.5 W	10 W
Output power Psat	typ. 40 W	min. 60 W	typ. 120 W	min. 120 W
Gain	typ. 14 dB	typ. 11 dB		
Harmonic rejection	typ. 37 dB @ 30 W	typ. 45 dB @ 50 W	typ. 39 dB @ 100 W	typ. 39 dB @ 100 W
ON voltage (PTT)	+12 ... 14 V DC	+12 ... 14 V DC	+12 ... 14 V DC	+12 ... 14 V DC
VSWR of load	max. 1.8:1	max. 1.8:1	max. 1.8:1	max. 1.8:1
Maximum case temperature	+55 °C	+55 °C	+55 °C	+55 °C
Monitor output	yes	yes	yes	yes
Supply voltage	+26 V DC	+26 V DC	+26 V DC	+26 V DC
Current consumption	max. 3.5 A	max. 6 A	max. 14 A	max. 14 A
Quiescent current	typ. 0.5 A	typ. 0.45 A	typ. 2 A	typ. 2 A
Input connector	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms
Output connector	SMA-female / 50 ohms	SMA-female / 50 ohms	N-female / 50 ohms	N-female / 50 ohms
Dimensions (mm)	130 x 60 x 20	130 x 60 x 20	192 x 80 x 22	124 x 80 x 22
Case	milled aluminium	milled aluminium	milled aluminium	milled aluminium
Weight	typ. 240 g	typ. 240 g	typ. 570 g	typ. 370 g
Recommended power supply	SP 150 W 24	SP 150 W 24	SP 320 W 24	SP 320 W 24
Recommended heat sink	SK 150-62	SK 200-80	SK 200-160	SK 200-160
Recommended fan	FAN 60x60 24 V	FAN 80x80 24 V	2x FAN 80x80 HP 24 V	2x FAN 80x80 HP 24 V

Other frequencies on request.

Linear High Power Amplifiers up to 200 W for the 23 cm Band

MKU PA 23CM-200W A - MKU PA 23CM-200W B

High power, high efficiency and best linearity are achieved by our high power amplifiers for the 23 cm band. In comparison to tube power amplifiers, the new LDMOS transistors need a supply of only +26 V. High voltage transformers, waiting for the tube warm-up and retuning of the tube are the past! Safe operation is guaranteed by the internal overheat protection. The built-in sequencer can be used to control other devices like preamplifiers or coaxial relays.

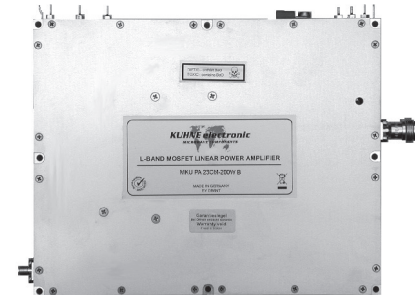
Specifications		
Type	MKU PA 23CM-200W A	MKU PA 23CM-200W B
Frequency range	1240 ... 1300 MHz	1240 ... 1300 MHz
RF input power	0.5 W	15 W
Maximum RF input power	1.0 W	20 W
Output power Psat	typ. 230 W	typ. 230 W
ON voltage (PTT)	switched to ground	switched to ground
VSWR of load	max. 1.8:1	max. 1.8:1
Maximum case temperature	+55° C	+55° C
Monitor output	yes	yes
Supply voltage	+ 26 V DC	+ 26 V DC
Current consumption	max. 24 A	max. 24 A
Quiescent current	typ. 4 A	typ. 4 A
Input connector	SMA-female / 50 ohms	SMA-female / 50 ohms
Output connector	N-female / 50 ohms	N-female / 50 ohms
Dimensions (mm)	190 x 152 x 26	190 x 152 x 26
Case	milled aluminium	milled aluminium
Weight	typ. 1300 g	typ. 1300 g
Recommended power supply	SP 500 W 24	SP 500 W 24
Recommended heat sink	SK 200-160	SK 200-160
Recommended fan	2x FAN 80x80 HP 24 V	2x FAN 80x80 HP 24 V
Recommended circulator	VAM 1081	VAM 1081
as a protection in case of bad antenna matching		

Features

- LD MOSFET technology
- Overheat protection
- Over voltage protection and reverse polarity protection
- Monitor output for forward power detection (DC voltage)

Important note

- The modules do not contain built-in coaxial relays!



Other frequencies on request.

Linear High Power Amplifiers up to 1 kW for the 23 cm Band

MKU PA 23CM-250W CU - MKU PA 23CM-1000W CU

These linear high power amplifiers were developed for producing high frequency energy for accelerator applications. High power, high efficiency and best linearity are achieved by our high power amplifiers for the 23 cm amateur radio band. In comparison to tube power amplifiers, the used LDMOS transistors operate with a supply voltage of only +50 V DC. High voltage transformers, waiting for tube warm-up and retuning of the tube are the past! Safe operation is guaranteed by the internal overheat protection. The built-in sequencer can be used to control other devices like preamplifiers or coaxial relays. An output power of 2 kW is achieved by combining two MKU PA23CM-1000W CU amplifiers. This is ideal for EME (earth-moon-earth operation)!

Specifications

	MKU PA 23CM-250W CU	MKU PA 23CM-1000W CU
Type	MKU PA 23CM-250W CU	MKU PA 23CM-1000W CU
Frequency range	1270 ... 1300 MHz	1296 MHz (1280 ... 1300 MHz)
RF input power	4 ... 6 W	20 ... 30 W
Maximum RF input power	6 W	30 W
Output power Psat	typ. 300 W	1000 W
Gain	min. 17 dB	
ON voltage (PTT)	+9 ... 14 V DC (ON)	switched to ground
Harmonic rejections	min. 35 dB @ 250 W	typ. 37 dB @ 1000 W
VSWR of load	max. 1.8:1	max. 1.8:1
Maximum case temperature	+65° C	+65° C
Monitor output	yes	yes
Supply voltage	+50 V DC	+50 V DC
Current consumption	max. 12 A @ 300 W (CW)	max. 40 A
Quiescent current	typ. 0,25 A	typ. 1 A
Input connector	SMA-female / 50 ohms	SMA-female / 50 ohms
Output connector	N-female / 50 ohms	7/16-female / 50 ohms
Dimensions (mm)	130 x 59 x 20	190 x 152 x 38.5
Case	milled copper, silver-plated	milled copper, silver- / nickel-plated
Weight	typ. 730 g	typ. 4850 g
Recommended power supply	SP 500 W 48	RSP 2400-48
Recommended heat sink	SK 200-160	SK 320-240
Recommended fan	2x FAN 80x80 HP 24 V	3x FAN 80x80 HP 24 V
Recommended Circulator	VAM 1081	VAN 1053 A

as a protection in case of bad antenna matching

Features

- 50 V LD-MOSFET-Technology
 - High linearity
 - High efficiency
 - Built in a copper case
- ### Important note
- The modules do not contain built-in coaxial relays!

1kW
at 1,3 GHz !!!



Other frequencies on request.

Linear Power Amplifiers up to 20 W for the 13 cm Band

MKU PA 13CM-08W A - MKU PA 13CM-5W A - MKU PA 13CM-10W A - MKU PA 13CM-20W A

This series of power amplifiers for the 13 cm band use GaAs FETs. Due to the linearity the amplifiers are usable for all analog and digital modes in amateur radio. Typical examples are SSB, CW, ATV and DATV (digital amateur television).

- Detector output (DC voltage) for monitoring forward output power
- Over voltage protection and reverse polarity protection
- Suitable for all analog and digital modes (SSB, CW, ATV, DATV)
- Important notes: The modules do not contain built-in coaxial relays!



Specifications	MKU PA 13CM-08W A	MKU PA 13CM-5W A	MKU PA 13CM-10W A	MKU PA 13CM-20W A
Type	MKU PA 13CM-08W A	MKU PA 13CM-5W A	MKU PA 13CM-10W A	MKU PA 13CM-20W A
Frequency range	2300 ... 2400 MHz	2300 ... 2400 MHz	2300 ... 2400 MHz	2300 ... 2400 MHz
Input power	typ. 5 mW	typ. 700 mW	typ. 1 W, max. 1.5 W	typ. 1 W, max. 2 W
Output power Psat	typ. 0.8 ... 1 W	typ. 5 W	typ. 10 W	min. 27 W
Gain	typ. 27 dB	-	typ. 10 dB	typ. 13 dB
Harmonic rejection	typ. 30 dB	-	typ. 30 dB	min. 40 dB
Supply voltage	+12 ... 14 V DC	+12 ... 14 V DC	+12 ... 14 V DC	+12 ... 14 V DC
Current consumption	typ. 0.26 A	typ. 0.8 A	typ. 2.5 A	typ. 5 A
Maximum case temperature	+55 °C	+55 °C	+55 °C	+55 °C
Input connector	SMA-female, 50 ohms	SMA-female, 50 ohms	SMA-female, 50 ohms	SMA-female, 50 ohms
Output connector	SMA-female, 50 ohms	SMA-female, 50 ohms	SMA-female, 50 ohms	SMA-female, 50 ohms
Case	German silver	milled aluminium	milled aluminium	milled aluminium
Dimensions (mm)	75 x 38 x 30	80 x 60 x 20	80 x 60 x 20	80 x 60 x 20
Weight	typ. 80 g	typ. 140 g	typ. 140 g	typ. 150 g
Recommended power supply	-	-	-	SP 150 W 12
Recommended heat sink	-	-	SK 120-75	SK 150-62
Recommended fan	-	-	-	FAN 60x60 12V

Other frequencies on request.

Linear High Power Amplifier 400 W for the 13 cm Band

MKU PA 13CM-400W CU

This power amplifier, which is based on LD MOSFET technology, is characterized by high linearity and best performance. The amplifier module is thermally very stable. Due to the high linearity, it can be used for all operating modes, like SSB, CW or DATV (digital amateur television) or other digital modes. In contrast to conventional tube amplifiers, no high voltage transformers and other dangerous components are needed. The output power can be increased to 800 watts by using two power amplifier modules MKU PA 13CM-400W CU and 90° hybrid couplers. The power amplifier can also be used within professional applications like digital video broadcast (DVB) or other communication systems using COFDM and digital modulation.

Specifications

Type	MKU PA 13CM-400W CU
Frequency range	2300 ... 2400 MHz
Input power	typ. 1.2 W, max. 3 W
Output power Psat	450 W
Gain (small signal)	min. 28 dB
Spurious and harmonic rejection	35 dB @ 400 W
VSWR of load	max. 1.8:1
Maximum case temperature	+55 °C
Monitor output	yes
Supply voltage	+28 V DC
Current consumption	max. 50 A
Quiescent current	typ. 6.5 A
Input connector	SMA-female, 50 ohms
Output connector	N-female, 50 ohms
Case	milled copper, silver- / nickel-plated
Dimensions (mm)	190 x 152 x 38.5
Weight	typ. 4500 g
Recommended power supply	RSP 1500 W 27
Recommended heat sink	SK 320-240
Recommended fan	3x FAN 80x80 HP 24 V



Important note

- The module does not contain built-in coaxial relays!

Other frequencies on request.

Linear Power Amplifiers up to 20 W for the 9 cm Band

MKU PA 9CM-4W A - MKU PA 9CM-25W A



Specifications

	MKU PA 9CM-4W A	MKU PA 9CM-25W A
Type		
Frequency range	3400 ... 3460 MHz	3400 ... 3460 MHz
Maximum input power	250 mW	typ. 900 mW
Output power Psat	typ. 4 W	typ. 20 W (CW)
Gain	typ. 11 dB	typ. 11 dB
Monitor output	-	DC voltage, uncalibrated
Harmonic rejection	typ. 47 dB @ 4 W	min. 25 dB @ 10 W
ON voltage (ON)	-	+5 ... 14 V DC
Supply voltage	+12 ... 14 V DC	+12 ... 14 V DC
Maximum load VSWR	1.8:1	1.8:1
Maximum case temperature	+55 °C	+55 °C
Quiescent current	-	typ. 900 mA
Current consumption	typ. 1.2 A	max. 5 A
Input connector	SMA-female, 50 ohms	SMA-female, 50 ohms
Output connector	SMA-female, 50 ohms	SMA-female, 50 ohms
Case	milled aluminium	milled aluminium
Dimensions (mm)	76 x 40 x 22	80 x 59 x 20
Weight	typ. 110 g	typ. 140 g
Recommended power supply	-	SP 150 W 12
Recommended heat sink	SK 120-75	SK 150-62
Recommended fan	-	FAN 60x60 12 V

Features

- Over voltage and reverse polarity protection
- Monitor output for forward power detection (DC voltage)
- Milled aluminium case

Applications MKU PA 9CM-4W A

- Analog and digital transmission systems

Applications MKU PA 9CM-25W A

- Mobile communication
- COFDM – systems with modulation QPSK, QAM
- Analog transmission systems
- Measurement equipment

Important note

- The modules do not contain built-in coaxial relays!

Other frequencies on request.

Linear Power Amplifier up to 30 W for the 9 cm Band

MKU PA 9CM-9W A - MKU PA 9CM-30W A

Features

- LD-MOSFET-technology
- Over voltage and reverse polarity protection
- Monitor output for forward power detection (DC voltage)
- Milled aluminium case

Applications

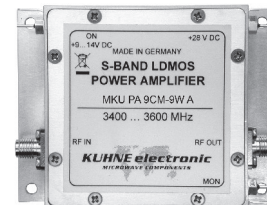
- COFDM – systems with modulation QPSK, QAM
- Analog transmission systems
- Amateur radio

Important notes

- The modules do not contain built-in coaxial relays!

Specifications

Type	MKU PA 9CM-9W A	MKU PA 9CM-30W A
Frequency range	3400 ... 3460 MHz	3400 ... 3460 MHz
Input power	typ. 200 mW	500 mW
Output power Psat	typ. 14 W (CW)	min. 30 W (CW)
Gain (Small signal)	typ. 18 dB	min. 23 dB
Monitor output	DC voltage, uncalibrated	DC voltage, uncalibrated
Harmonic rejection	min. 37 dB @ 10 W	min. 30 dB @ 30 W
Supply voltage	+28 V DC	+28 V DC
ON voltage	+9 ... 14 V DC	+9 ... 14 V DC
Maximum load VSWR	1.8:1	1.8:1
Maximum case temperature	+55 °C	+55 °C
Quiescent consumption	typ. 160 mA	typ. 380 mA
Current consumption	max. 1.4 A	max. 3.8 A
Input connector	SMA-female, 50 ohms	SMA-female, 50 ohms
Output connector	SMA-female, 50 ohms	SMA-female, 50 ohms
Case	milled aluminium	milled aluminium
Dimensions (mm)	80 x 59 x 20	80 x 59 x 20
Weight	typ. 140 g	typ. 140 g
Recommended power supply	SP 150 W 27	SP 150 W 27
Recommended heat sink	SK 150-62	SK 150-62
Recommended fan	FAN 60x60 24 V	FAN 60x60 24 V



Other frequencies on request.

Linear Power Amplifiers up to 300 W for the 9 cm Band

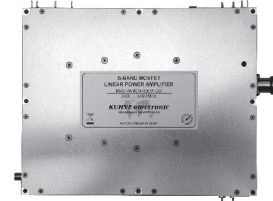
MKU PA 9CM-28W A - MKU PA 9CM-75W A - MKU PA 9CM-300W CU

Applications

- Analog and digital transmission systems

Important note

- The modules do not contain built-in coaxial relays!



Specifications

Type	MKU PA 9CM-28W A	MKU PA 9CM-75W A	MKU PA 9CM-300W CU
Frequency range	3400 ... 3460 MHz	3400 ... 3460 MHz	3400 ... 3460 MHz
Input power	max. 2 W	typ. 8 W, max. 12 W	typ. 1.0 W, max 1.2 W
Output power Psat	typ. 40 W (CW)	typ. 100 W (CW)	min. 350 W (CW), typ. 370 W (CW)
Gain (small signal)	min. 13 dB, typ. 14 dB	min. 10 dB	min. 28 dB
Harmonic rejection	47 dB @ 40 W	typ. 27 dB @ 100 W	40 dB @ 350 W
Maximum VSWR of load	1.8:1	1.8:1	1.8:1
Maximum case temperature	+55 °C	+55°C	+55°C
Monitor output	-	yes	yes
Supply voltage	+28 V DC	+28 V DC	+28 V DC
Current consumption	typ. 5 A	max. 10 A	max. 42 A
PTT	-	-	switched to ground
ON voltage	-	+9 ... 14 V DC	-
Quiescent current	typ. 450 mA	typ. 1.0 A	typ. 4,5 A
Input connector	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms
Output connector	SMA-female / 50 ohms	N-female / 50 ohms	N-female / 50 ohms
Dimensions (mm)	130 x 60 x 20	130 x 60 x 20	190 x 152 x 38,5
Case	milled aluminium	milled aluminium	milled aluminium, silver-plated
Weight	typ. 255 g	typ. 255 g	typ. 4800 g
Recommended power supply	SP 150 W 27	SP 150 W 27	RSP 1500-27
Recommended heat sink	SK 200-80	SK 200-80	SK 320-240
Recommended fan	FAN 80x80 24 V	FAN 80x80 24 V	3x FAN 80x80 HP 24 V
Recommended heat-conductive paste	-	-	Arctic Silver 5

For more information about the power amplifiers
please visit our website on
www.db6nt.com

Other frequencies on request.

Linear High Power Amplifiers up to 100 W for the 6 cm Band

Low and medium power:

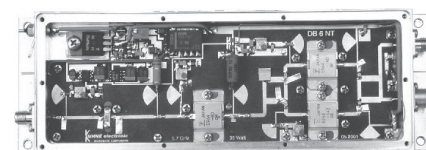
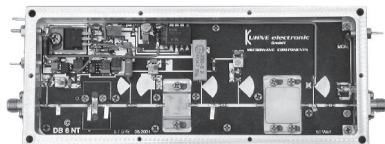
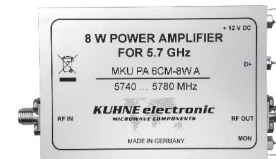
MKU PA 6CM-4W A - MKU PA 6CM-8W A - MKU PA 6CM-15W A

High power:

MKU PA 6CM-50W A - MKU PA 6CM-100W A

- Detector output (DC voltage) for monitoring forward output power
- Over voltage protection and reverse polarity protection
- Milled aluminium case
- Suitable for all analog and digital modes (SSB, CW, ATV, DATV)
- Important notes: The modules do not contain built-in coaxial relays!

**100 W
at 5,7 GHz !!!**



Specifications

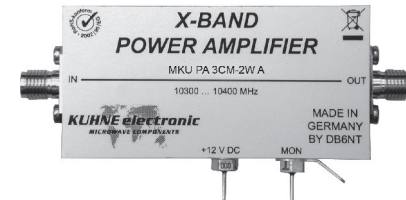
Type	MKU PA 6CM-4W A	MKU PA 6CM-8W A	MKU PA 6CM-15W A	MKU PA 6CM-50W A	MKU PA 6CM-100W A
Center frequency	5740 ... 5780 MHz	5740 ... 5780 MHz	5740 ... 5780 MHz	5740 ... 5780 MHz	5740 ... 5780 MHz
RF input power	max. 100 mW	typ. 200 mW	typ. 300 mW	max. 200 mW	typ. 200 mW
RF output power CW	min. 4 W	min. 8 W	min. 15 W	typ. 50 W	typ. 100 W
Gain	-	typ. 19 dB	-	-	-
Supply voltage	+12 ... 14 V DC	+12 ... 14 V DC	+12 ... 14 V DC	+12 V DC	+12 V DC
Current consumption	max. 1.6 A	max. 2.5 A	max. 6 A	typ. 13 A	typ. 28 A
Dimensions (mm)	80 x 55 x 22	80 x 55 x 22	80 x 55 x 22	158 x 64 x 22	158 x 64 x 22
Case	milled aluminium	milled aluminium	milled aluminium	milled aluminium	milled aluminium
Input connector	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms
Output connector	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms	N-female / 50 ohms
Weight	typ. 160 g	typ. 160 g	typ. 180 g	typ. 390 g	typ. 380 g
Max. case temperature	+55 °C	+55 °C	+55 °C	+55 °C	+55 °C
On / Off control	-	-	-	+12 V @ TX	+12 V @ TX
Recommended power su.	-	-	-	SP 200 W 12	SP 500 W 12
Recommended heat sink	SK 120-75	SK 120-75	SK 150-62	SK 200-125	SK 200-125
Recommended fan	-	-	FAN 60x60 12 V	2x FAN 60x60 12 V	2x FAN 60x60 HP 12 V

Other frequencies on request.

Linear Power Amplifiers for 10 GHz

MKU PA 3CM-02W A - MKU PA 3CM-2W A - MKU PA 3CM-8W B

- Detector output (DC voltage) for monitoring forward output power
- Over voltage protection and reverse polarity protection
- Small mechanical dimensions
- Suitable for all analog and digital modes (SSB, CW, ATV, DATV)
- Important notes: The modules do not contain built-in coaxial relays!



Specifications

	MKU PA 3CM-02W A	MKU PA 3CM-2W A	MKU PA 3CM-8W B
Type	MKU PA 3CM-02W A	MKU PA 3CM-2W A	MKU PA 3CM-8W B
Frequency range	10300 ... 10400 MHz	10300 ... 10400 MHz	10300 ... 10400 MHz
Input power	max. 10 mW	typ. 200 mW	1.5 ... 2 W
Output power Psat	min. 250 mW	min. 2 W	min. 10 W
Gain	-	typ. 12 dB	-
Harmonic rejection	-	typ. 47 dB	-
Supply voltage	+12 ... 14 V DC	+12 ... 14 V DC	+12 ... 14 V DC
Current consumption	typ. 250 mA	typ. 1.1 A	max. 4 A
Input connector	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms
Output connector	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms
Case	German Silver	milled aluminium	milled aluminium
Dimensions (mm)	75 x 30 x 38	60 x 30 x 20	80 x 60 x 20
Weight	typ. 80 g	typ. 70 g	typ. 150 g
Max. case temperature	+55 °C	+55 °C	+55 °C
Overheat protection	-	-	-
Recommended power supply	-	-	-
Recommended heatsink	-	SK 120-75	SK 150-62
Recommended fan	-	-	FAN 60x60 12 V

Other frequencies on request.

Linear High Power Amplifiers up to 50 W for 10 GHz

MKU PA 3CM-4W A - MKU PA 3CM-8W A - MKU PA 3CM-25W A

- Suitable for all analog and digital modes (SSB, CW, ATV, DATV)
- Detector output (DC voltage) for monitoring forward output power
- Over voltage protection and reverse polarity protection
- Small mechanical dimensions
- Important notes: The modules do not contain built-in coaxial relays!



Specifications

	MKU PA 3CM-4W A	MKU PA 3CM-8W A	MKU PA 3CM-25W A
Type			
Frequency range	10300 ... 10400 MHz	10300 ... 10400 MHz	10300 ... 10400 MHz
Input power	min. 200 mW, max. 300 mW	min. 200 mW, max. 300 mW	typ. 200 mW, max. 250 mW
Output power Psat	typ. 5 W	typ. 10 W	min. 25 W
Gain	typ. 14 dB	typ. 17 dB	typ. 21 dB
Harmonic rejection	typ. 50 dB	-	typ. 35 dB
Supply voltage	+12 ... 14 V DC	+12 ... 14 V DC	+12 ... 14 V DC
Current consumption	typ. 2 A	typ. 4 A	typ. 8 A
Input connector	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms
Output connector	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms
Case	milled aluminium	milled aluminium	milled aluminium
Dimensions (mm)	70 x 45 x 22	130 x 60 x 20	158 x 64 x 22
Weight	typ. 120 g	typ. 250 g	typ. 380 g
Max. case temperature	+55 °C	+55 °C	+55 °C
Overheat protection	-	-	yes
Recommended power supply	-	-	SP 150 W 12
Recommended heat sink	SK 120-75	SK 150-62	SK 200-80
Recommended fan	-	FAN 60x60 12 V	FAN 80x80 12 V

Other frequencies on request.

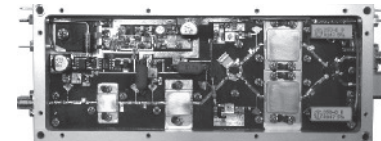
Linear Power Amplifiers up to 50 W for 10 GHz

MKU PA 3CM-45W B - MKU PA 3CM-45W B WG

MKU PA 3CM-45W A - MKU PA 3CM-45W A WG

- Suitable for all analog and digital modes (SSB, CW, ATV, DATV)
- Reverse polarity protection
- High linearity (class A operation)
- Detector output (DC voltage) for monitoring forward output power
- Milled aluminium case
- Small mechanical dimensions
- Important notes: The modules do not contain built-in coaxial relays!

50 W
at 10 GHz !!!



Specifications

Specifications	MKU PA 3CM-45W B	MKU PA 3CM-45W B WG	MKU PA 3CM-45W A	MKU PA 3CM-45W A WG
Type	MKU PA 3CM-45W B	MKU PA 3CM-45W B WG	MKU PA 3CM-45W A	MKU PA 3CM-45W A WG
Frequency range	10300 ... 10400 MHz	10300 ... 10400 MHz	10300 ... 10400 MHz	10300 ... 10400 MHz
Input power	max. 250 mW	max. 250 mW	max. 10 mW	max. 10 mW
Output power Psat	typ. 50 W	typ. 50 W	typ. 50 W	typ. 50 W
Supply voltage	+12 ... 14 V DC	+12 ... 14 V DC	+12 ... 14 V DC	+12 ... 14 V DC
Current consumption	typ. 20 A	typ. 20 A	typ. 20 A	typ. 20 A
Input connector	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms
Output connector	SMA-female / 50 ohms	Waveguide R100 / WG16 / WR90	SMA-female / 50 ohms	Waveguide R100 / WG16 / WR90
Case	milled aluminium	milled aluminium	milled aluminium	milled aluminium
Dimensions (mm)	158 x 64 x 22	158 x 64 x 22	158 x 64 x 22	158 x 64 x 22
Weight	typ. 400 g	typ. 400 g	typ. 400 g	typ. 400 g
Max. case temperature	+55 °C	+55 °C	+55 °C	+55 °C
Overheat protection	yes	yes	yes	yes
Recommended power supply	SP 320 W 12	SP 320 W 12	SP 320 W 12	SP 320 W 12
Recommended heat sink	SK 200-125	SK 200-125	SK 200-125	SK 200-125
Recommended fan	2x FAN 60x60 HP 12 V	2x FAN 60x60 HP 12 V	2x FAN 60x60 HP 12 V	2x FAN 60x60 HP 12 V

Other frequencies on request.

Linear Power Amplifiers for 24 GHz / SMA

MKU PA 1.2CM-002W A - MKU PA 1.2CM-008W A - MKU PA 1.2CM-1W A - MKU PA 1.2CM-3W A

- Detector output (DC voltage) for monitoring forward output power
- Reverse polarity protection
- Milled aluminium case
- Small mechanical dimensions
- Suitable for all analog and digital modes (SSB, CW, ATV, DATV)
- Important notes: The modules do not contain built-in coaxial relays!



Specifications

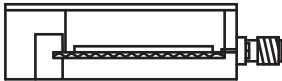
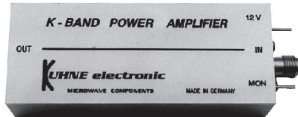
	MKU PA 1.2CM-002W A	MKU PA 1.2CM-008W A	MKU PA 1.2CM-1W A	MKU PA 1.2CM-3W A
Type	MKU PA 1.2CM-002W A	MKU PA 1.2CM-008W A	MKU PA 1.2CM-1W A	MKU PA 1.2CM-3W A
Frequency range	24000 ... 24250 MHz	24000 ... 24250 MHz	24000 ... 24250 MHz	24000 ... 24250 MHz
Input power	typ. 0.1 mW	typ. 8 mW	typ. 10 mW, max. 20 mW	typ. 20 mW, max. 50 mW
Output power Psat	min. 30 mW	min. 90 mW	typ. 1.2 W	typ. 3 W
Gain (Small signal)	-	-	typ. 25 dB	-
Supply voltage	+10 ... 15 V DC	+12 ... 15 V DC	+7 ... 14 V DC	+10 ... 12 V DC
Current consumption	typ. 70 mA	typ. 300 mA	max. 1.1 A @ 7 V	typ. 3 A
Input connector	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms
Output connector	SMA-female / 50 ohms	SMA-male / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms
Case	milled aluminium	milled aluminium	milled aluminium	milled aluminium
Dimensions (mm)	50 x 30 x 18	60 x 30 x 18	50 x 30 x 17	50 x 30 x 17
Weight	typ. 50 g	typ. 100 g	typ. 50 g	typ. 60 g
Recommended heat sink	-	SK 120-75	SK 120-75	SK 150-62
Recommended fan	-	-	-	FAN 60x60 12 V

Other frequencies on request.

Linear Power Amplifiers for 24 GHz / Waveguide

MKU PA 1.2CM-009W WG - MKU PA 1.2CM-10W WG

- Detector output (DC voltage) for monitoring forward output power
- Reverse polarity protection
- Milled aluminium case
- Small mechanical dimensions
- Suitable for all analog and digital modes (SSB, CW, ATV, DATV)
- Important note: The modules do not contain built-in coaxial relays!



Power Amplifiers

Specifications

Type	MKU PA 1.2CM-009W WG	MKU PA 1.2CM-10W WG
Frequency range	24000 ... 24250 MHz	24000 ... 24250 MHz
Input power	typ. 8 mW	20 mW, max. 50 mW
Output power Psat	typ. 100 mW	min. 10 W
Supply voltage	+10 ... 15 V DC	+9 ... 10 V DC
Current consumption	typ. 300 mA	typ. 15 A
Input connector	SMA-female / 50 ohms	SMA-female / 50 ohms
Output connector	Waveguide R220 / WG20 / WR42	Waveguide R220 / WG20 / WR42
Case	milled aluminium	milled aluminium
Dimensions (mm)	73 x 30 x 20	119 x 63 x 22
Weight	typ. 90 g	typ. 310 g
Recommended heat sink	-	SK 150-62
Recommended fan	-	FAN 60x60 HP 12 V

10 W
at 24 GHz !!!

Other frequencies on request.

Transverters

Transverters

Type	Frequency Range RF	Frequency Range IF	Output Power	Frequency Options
TR 70 H	69.9 ... 72 MHz	27.9 ... 30 MHz	20 W	
TR 144 H +40	144 ... 146 MHz	28 ... 30 MHz	25 W	Opt. 05: IF = 14 ... 16 MHz
TR 432 H	432 ... 434 MHz	28 ... 30 MHz	20 W	
TR 1296 H-144	1296 ... 1298 MHz 1268 ... 1270 MHz	144 ... 146 MHz	18 W	
TR 1296 H-28	1296 ... 1298 MHz 1268 ... 1270 MHz	28 ... 30 MHz	18 W	
TR 2320 H-2320	2320 ... 2322 MHz	144 ... 146 MHz	15 W	
TR 2320 H-2304	2304 ... 2306 MHz	144 ... 146 MHz	15 W	
TR 2320 H-2400	2400 ... 2402 MHz	144 ... 146 MHz	15 W	



Transverter-Switch Unit

Type	Frequency range	Remarks
TR 6 SW	DC ... 146 MHz	link together up to 6 transverters



Transverter Modules

Type	Frequency Range RF	Frequency Range IF	Output Power	Frequency Options
MKU 70 G2	69.9 ... 72 MHz	27.9 ... 30 MHz	100 mW	
MKU 144 G2	144 ... 146 MHz	28 ... 30 MHz	100 mW	
MKU 432 G2	432 ... 434 MHz	28 ... 30 MHz	70 mW	
MKU 13 G3	1296 ... 1298 MHz	144 ... 146 MHz	2.5 W	
MKU 13 G3 28	1296 ... 1298 MHz	28 ... 30 MHz	2.5 W	
MKU 23 G3	2320 ... 2322 MHz	144 ... 146 MHz	1.0 W	Opt. USA: RF = 2304 ... 2306 MHz
MKU 34 G3	3400 ... 3402 MHz	144 ... 146 MHz	400 mW	Opt. USA: RF = 3456 ... 3458 MHz
MKU 34 G3 432	3400 ... 3402 MHz	432 ... 434 MHz	400 mW	Opt. USA: RF = 3456 ... 3458 MHz
MKU 57 G3	5760 ... 5762 MHz	144 ... 146 MHz	250 mW	
MKU 57 G3 432	5760 ... 5762 MHz	432 ... 434 MHz	250 mW	
MKU 10 G3	10368 ... 10370 MHz	144 ... 146 MHz	200 mW	Option: JAPAN: Frequency: 10450 ... 10452 MHz
MKU 10 G3 432	10368 ... 10370 MHz	432 ... 434 MHz	200 mW	Option: JAPAN: Frequency: 10450 ... 10452 MHz
MKU 24 G2 144	24048 ... 24050 MHz	432 ... 434 MHz	20 mW	
MKU 24 G2 432	24048 ... 24050 MHz	432 ... 434 MHz	20 mW	
MKU 24 GA	24000 ... 24250 MHz	144 MHz (broadband)	0.2 mW	
MKU 24 GC	24000 ... 24250 MHz	144 MHz (broadband)	0.2 mW	
MKU 47 G	47088 MHz	144 MHz (broadband)	0.15 mW	



Transverter - TR 70 H

This high performance transverter is designed for the 4m amateur radio band around 70 MHz. It is based on Kuhne electronic's famous TR 144 H for the 2m band. The TR 70 H features excellent technical characteristics like low noise figure, high linearity and best large signal performance. It is ideal for narrow band operation modes (SSB and CW). The TR 70 H can be modified for professional use. Please contact us for more information!

Oscillator

A temperature compensated low noise butler oscillator generates the local oscillator (LO) signal at 42 MHz. The ambient temperature for the thermostat crystal is stabilized by a 40 °C precision crystal heater. The phase noise of the 42 MHz output signal is -156 dBc/Hz @ 10 kHz. This value is much better than that of the HF transceivers. The oscillator's output power is 100 mW.

Receiver

In the frontend of the transverter, there is only one super low noise amplifier stage with a noise figure of 0.7 dB and an output IP3 of +25 dBm. This provides excellent large signal performance. A first selection of the input signal is done with a low loss bandpass filter in front of the input stage. The first stage is followed by a helical band pass filter and a matching network. A high level schottky diode ring mixer converts the signal to the intermediate frequency (IF) at 28 ... 30 MHz. The total gain of the receive path is limited to 25 dB to avoid overdriving of the HF transceiver.

Transmitter

In the transmit path of the transverter a second 17 dBm ring mixer is used. The TX IF input power ranges (0.06 ... 1 mW and 1 ... 50 mW) can be set with an internal switch.

The TX gain of the transverter can be adjusted with the potentiometer on the front panel. For further power adjustments the HF transceiver can be used. At the mixer output there is a matching network and a helical band pass filter. The following stages are a MMIC amplifier stage, another helical band pass filter, a driver amplifier and the final power amplifier. The available output power is 35 watts. To achieve optimum intermodulation performance, the output power is limited to 20 watts. Overdriving is prevented by an ALC circuit. The output power is indicated on a calibrated meter. A final low pass filter guarantees spurious and harmonic rejection of more than 60 dB.

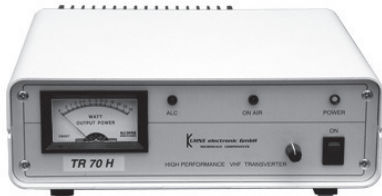
The transmit unit of the transverter contains a VSWR protection circuit. If the antenna VSWR is bad, the power amplifier switches off for 3 seconds. This is indicated by a red light in the power meter scale.

Sequence Controller

The built-in sequence controller allows time-controlled operation of an additional high power amplifier, a coaxial relay and a preamplifier, which can be placed directly at the antenna. The required connectors are on the back panel of the transverter.

Transverter

TR 70 H



Specifications

Type
Frequency range VHF
Frequency range IF
IF input power

LO accuracy @ 18 °C
LO frequency stability (0 ... +40 °C)
PTT control
Output power
IM 3

Supply voltage
Current consumption
RX Gain
RX Output IP3
Noise figure
Dimensions (mm)
Case
IF connectors

RF connectors
DC supply and control connector

TR 70 H
69.9 ... 72 MHz
27.9 ... 30 MHz
1 ... 50 mW adjustable / internally switchable to range 60 ... 1000 μ W (-12 ... 0 dBm)
typ. +/- 2 ppm, max. +/- 3 ppm
typ. +/- 2 ppm, max. +/- 3 ppm
Contact closure to ground
20 W
- 28 dBc @ 20 W PEP
Power amplifier with built-in VSWR protection
+13.8 V DC (+12 ... 14 V)
typ. 6 A (TX)
typ. 25 dB
typ. +26 dBm
typ. 1.5 dB
270 x 260 x 80
aluminium
BNC - female / 50 ohms // There are two separate IF connectors. They can be switched to one common IF connector
N - female / 50 ohms
SUB-D 9-pole

Features

- Receive path with low noise figure and excellent large signal performance
- Phase noise of the local oscillator better than -156 dBc/Hz @ 10 kHz
- Spurious and harmonic rejection better than 60 dB
- Power amplifier with built-in VSWR protection
- Built-in directional coupler for calibrated power output reading
- Antenna relay with isolation of 70 dB
- Built-in sequence controller
- Big aluminium case with heat sink, additional filters or components can be added
- Two separate IF connectors. They can be switched (internally) to one common IF connector.
- Cable for control and DC supply included
- Handbook included

Accessories

- RX-cable
- TX-cable
- IF-cable



RX-cable



TX-cable



IF-cable

**For more information about the transverters
please visit our website on
www.db6nt.com**

Transverter for the 2 m Band - TR 144 H +40

Several decades of engineering and production of Transverters result in this designed TR144 H +40 high performance Transverter. Its outstanding technical data makes it usable for many applications. The 2m-transverter was originally designed for VHF amateur radio applications, for example high performance contest stations. The receive path of the transverter provides very good large-signal performance.

The new design of our 2m-transverter features better performance and many new functions.

Now an external 10 MHz reference frequency can be connected to achieve highest frequency accuracy. This is necessary for EME and WSJT. The frequency of 10 MHz can be supplied by a highly stable OCXO, a reference oscillator of a frequency counter, a rubidium frequency standard or a GPS controlled frequency source.

The new design includes the "old" options 02 (TX IF input power 60...1000 μ W / 0...-12 dBm) and 06 (common IF-connector for RX/TX). So the Transverter is compatible to most of the used HF transceivers with transverter output. The TX IF input ranges and the IF connector configuration can be done with the internal switches of the transverter. The "old" option 04 (drive gain control on the front panel) is standard now.

Oscillator

A temperature-compensated low noise butler oscillator generates the 116 MHz LO signal. A thermostat crystal with a 40 °C precision crystal heater is used. The phase noise of the output signal is -156 dBc/Hz @ 10 kHz. This value is better than that of the HF transceivers. The oscillator output power is 100 mW.

Receiver

In the receiver frontend there is only one balanced super low noise stage with two Power GaAs-FETs. A noise figure (NF) of 0.9 dB and an output IP3 of >40 dBm are achieved. To prevent interference in case of multi-band operation, there is a notch filter for the 70cm band at the input. The prestage is followed by a high-Q helical filter and a matching network. A high-level triple-balanced GaAs-FET ring mixer with an IP3 of >35 dBm converts the signal to the intermediate frequency (IF) at 28...30 MHz. The total gain of the receiver path is limited to 25 dB to avoid overdriving of the HF transceiver. An internal low noise amplifier of the HF transceiver has to be switched off. The transverter provides excellent large-signal performance. Gain and sensitivity are ideal for contesting and DXing. For EME operation the use of the low noise amplifier LNA 144 A is recommended. This drops the total noise figure to 0.35 dB. A second N-connector permits the use of a separate cable for the low noise amplifier.

Transmitter

In the transmit path of the transverter a second 17 dBm ring mixer is used. The TX IF input power ranges (0.06 ... 1 mW and 1 ... 50 mW) can be set with an internal switch.

The TX gain of the transverter can be adjusted with the potentiometer on the front panel. For further power adjustments the HF transceiver can be used. At the mixer output there is a matching network and a helical band pass filter. It is followed by an MMIC amplifier stage, another helical band pass filter, driver amplifier and power amplifier. LD-MOSFETs are used in driver amplifier and power amplifier. The available output power is 60 W. To achieve optimum intermodulation performance, the output power is limited to 25 W. Overdriving is prevented by an ALC circuit. The transmit unit of the transverter has a protection circuit. If the antenna SWR is bad, the power amplifier switches off for 3 seconds. This is indicated by a LED. A final low pass filter guarantees spurious and harmonic rejection of more than 60 dB. The output power is indicated on a calibrated meter.

Sequence Controller

The built-in sequence controller allows time-controlled operation of a high-quality power amplifier, a coaxial relay and a low noise amplifier, which is placed directly at the antenna. The required connectors are on the rear panel of the transverter.

SUPER
large signal proof!
RX OIP3
+40 dBm

Transverter for the 2 m Band

TR 144 H +40



Specifications

Type	TR 144 H +40
Frequency range VHF	144 ... 146 MHz
Frequency range IF	28 ... 30 MHz
IF input power	1 ... 50 mW adjustable / switchable to range 60 ... 1000 µW
PTT control	Contact closure to ground
Output power	25 W
IM3	-32 dBc @ 20 W PEP
Supply voltage	+13.8 V DC (+12 ... 14 V DC)
Current consumption	typ. 6 A (TX)
Noise figure @ 18 °C	typ. 1.2 dB
External reference input	10 MHz / 2 ... 10 mW
RX Gain	typ. 25 dB
IP3 out	typ. +40 dBm, min. +37 dBm
Blocking	min. -106 dBc @ 3 kHz BW
IM-Dynamic	min. 102.5 dB SFDR @ 3 kHz BW
Image rejection	typ. 90 dB
Dimensions (mm)	270 x 260 x 80
Case	Aluminium
IF connectors	BNC-female / 50 ohms There are two separate IF connectors. They can be switched to one common IF connector
RF connectors	N-female / 50 ohms
DC supply and control connector	SUB-D 9-pole
Possible options	05: IF frequency 14 ... 16 MHz

Some technical characteristics:

- Additional input for 10 MHz reference frequency
- Automatic activation of PLL if external 10 MHz signal is supplied
- Switchable IF input power range
- There are two separate IF connectors. They can be switched to one common IF connector.
- Aluminium case with a big heat sink
- Inside wiring with silver plated Teflon coaxial cable
- Antenna relay with 70 dB cross-talk attenuation
- Converter can process large signals
- Extension with additional filters and other components
- Built-in directional coupler for calibrated power output control
- 5-pole low-pass filter for harmonic wave suppression
- Spurious and harmonic wave suppression better 60dBc
- Phase noise of the oscillator better -156 dBc/Hz @ 10 kHz
- Built-in sequence control
- Including dc-power and control cable
- Handbook

Accessories to order



RX-cable



TX-cable



IF-cable

For more information about the transverters
please visit our website on
www.db6nt.com

Transverter for the 70 cm Band - TR 432 H

The new design of our 70cm transverter for 432 MHz features better performance and new functions.

An external 10 MHz reference frequency can be connected to achieve highest frequency accuracy now. This is necessary for EME and WSJT. The frequency of 10 MHz can be supplied by a highly stable OCXO, a reference oscillator of a frequency counter, a rubidium frequency standard or a GPS controlled frequency source.

The new version of the 70cm transverter TR 432 H also includes the switches to configure the IF connectors of the transverter. The TX IF input ranges and the IF connector configuration can be done with the internal switches of the transverter. So the transverter is compatible to most of the used HF transceivers with transverter output. The drive gain control on the front panel is standard now.

Oscillator

A temperature-compensated low noise butler oscillator generates the 101 MHz LO signal. A thermostat crystal with a 40 °C precision crystal heater is used. The phase noise of the multiplied oscillator signal with a frequency of 404 MHz is -140 dBc/Hz @ 10 kHz. This value is better than that of the HF transceivers. The oscillator output power is more than 50 mW.

Receiver

In the receiver frontend there is only one balanced super low noise stage. A noise figure (NF) of 0.8 dB and an output IP3 of 37 dBm are achieved. To prevent interference in case of multi-band operation, there is a bandpass for the 70cm band at the input. The prestage is followed by a high-Q helical filter and a matching network. A high-level double-balanced ring mixer with an IP3 of 30 dBm converts the signal to the intermediate frequency (IF) at 28 ... 30 MHz. The total gain of the receiver path is limited to 20 dB to avoid overdriving of the HF transceiver. An internal low noise amplifier of the HF transceiver has to be switched off. The transverter provides excellent large-signal performance. Gain and sensitivity are ideal for contesting and DXing. For EME operation the use of the low noise amplifier MKU LNA 432 A is recommended. This drops the total noise figure to 0.5 dB. A second N-connector permits the use of a separate cable for the low noise amplifier.

Transmitter

In the transmit path of the transverter a second 17 dBm ring mixer is used. The TX IF input power ranges (0.06 ... 1 mW and 1 ... 50 mW) can be set with an internal switch.

The TX gain of the transverter can be adjusted with the potentiometer on the front panel. For further power adjustments the HF transceiver can be used. At the mixer output there is a matching network. Two helical band pass filter ensure best spurious rejection. The mixer output signal will be amplified with two MMIC amplifier stage. LD-MOSFETs are used in the driver amplifier and the power amplifier. To achieve optimum intermodulation performance, the output power of the oversized power amplifier is limited to 20 W. Overdriving is prevented by an ALC circuit. The transmit unit of the transverter has a protection circuit. If the antenna SWR is bad, the power amplifier switches off for 3 seconds. This is indicated by a LED. A final low pass filter guarantees spurious and harmonic rejection of more than 60 dB. The output power is indicated on a calibrated meter.

Sequence Controller

The built-in sequence controller allows time-controlled operation of a high-quality power amplifier and a coaxial relay with a low noise amplifier, which is placed directly at the antenna. The required connectors are on the rear panel of the transverter.

Transverter for the 70 cm Band

TR 432 H



Specifications

Type	TR 432 H
Frequency range UHF	432 ... 434 MHz
Frequency range IF	28 ... 30 MHz
IF input power	1 ... 50 mW, adjustable / internally switchable to range 60 ... 1000 μ W
LO accuracy @ 18 °C	typ. +/- 2 ppm, max. +/- 3 ppm (without 10 MHz reference frequency)
LO frequency stability (0 ... +40 °C)	typ. +/- 2 ppm, max. +/- 3 ppm (without 10 MHz reference frequency)
PTT control	contact closure to ground
Output power	20 W
Supply voltage	+13.8 V DC (+12 ... 14 V DC)
Current consumption	typ. 6 A (TX)
Noise figure @ 18 °C	typ. 1.8 dB
External reference input	10 MHz / 2 ... 10 mW
RX Gain	typ. 20 dB
IP3 out	typ. +30 dBm, min. +27 dBm
IM-Dynamic	typ. 98 dB HPSFCR @ 3 kHz BW
Dimensions (mm)	270 x 260 x 80
Case	aluminium
IF connectors	BNC-female / 50 ohms There are two separate IF connectors. They can be switched to one common IF connector
RF connectors	N-female / 50 ohms
DC supply and control connector	SUB-D 9-pole

Features

- Additional input for 10 MHz reference frequency
- Automatic activation of PLL if external 10 MHz signal is supplied
- Switchable IF input power range
- There are two separate IF connectors. They can be switched to one common IF connector
- Aluminium case with a big heat sink
- Inside wiring with silver plated teflon coaxial cable
- Antenna relay with 60 dB cross-talk attenuation
- Converter can process large signals
- Extension with additional filters and other components
- Built-in directional coupler for calibrated power output control
- 5-pole low-pass filter for harmonic wave suppression
- Spurious and harmonic wave suppression better 60 dBc
- Phase noise of the oscillator better -140 dBc/Hz @ 10 kHz
- Built-in sequence control
- Including dc-power and control cable
- Handbook

Accessories

- RX-Cable
- TX-Cable
- IF-Cable



RX-Cable



TX-Cable



IF-Cable

For more information about the transverters
please visit our website on
www.db6nt.com

Transverter for the 23 cm Band

TR 1296 H - 144 / TR 1296 H - 28

For more information about the transverters
please visit our website on
www.db6nt.com



Specifications

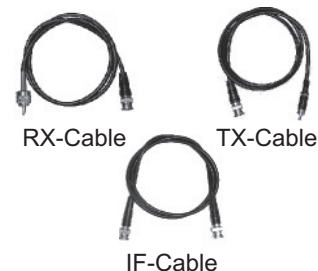
	TR 1296 H - 144	TR 1296 H - 28
Type	TR 1296 H - 144	TR 1296 H - 28
Frequency range RF	1296 ... 1298 MHz, 1268 ... 1270 MHz	1296 ... 1298 MHz, 1268 ... 1270 MHz
Frequency range IF	144 ... 146 MHz	28 ... 30 MHz
IF input power	0.5 ... 5 W, adjustable	1 ... 50 mW, adjustable / switchable to range 60 ... 1000 µW
LO accuracy @ 18 °C	typ. +/- 0.1 ppm (without 10 MHz reference frequency)	typ. +/- 0.1 ppm (without 10 MHz reference frequency)
LO frequency stability (0 ... +40 °C)	typ. +/- 0.1 ppm (without 10 MHz reference frequency)	typ. +/- 0.1 ppm (without 10 MHz reference frequency)
PTT-control	Contact closure to ground	Contact closure to ground
Output power @ 13.8 V	18 W	18 W
Supply voltage	13.8 V DC (12 ... 14 V DC)	13.8 V DC (12 ... 14 V DC)
Current consumption	typ. 8 A (TX)	typ. 8 A (TX)
Noise figure @ 18 °C	typ. 1.2 dB	typ. 1.2 dB
External reference input	10 MHz / 2 ... 10 mW	10 MHz / 2 ... 10 mW
RX gain	min. 20 dB	min. 20 dB
Dimensions (mm)	270 x 260 x 80	270 x 260 x 80
Case	Aluminium	Aluminium
IF connectors	BNC-female / 50 ohms	BNC-female / 50 ohms There are two separate IF connectors. They can be switched to one common IF connector
UHF connectors	N-female / 50 ohms	N-female / 50 ohms
Reference input connector	BNC-female / 50 ohms	BNC-female / 50 ohms
DC supply and control connector	SUB-D 9-pole	SUB-D 9-pole

Features

- Aluminium case with a big heat sink
- Internally wired with silver plated Teflon coaxial cable
- Antenna relay with 60 dB isolation
- Converter with excellent large-signal performance
- Big case for additional filters and other components
- Built-in directional coupler for calibrated power output control
- 5-pole low-pass filter for harmonic rejection
- Spurious and harmonic rejection better than 60 dBc
- Highly stable VCOCXO
- Built-in sequence control
- Cable for control and DC supply included
- Handbook included

Accessories

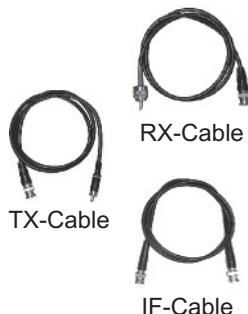
- RX-Cable
- TX-Cable
- IF-Cable



Transverter for the 13 cm Band

TR 2320 H - 2320 / TR 2320 H - 2304

TR 2320 H - 2400



Features

- Additional input for 10 MHz reference frequency
- Automatic activation of PLL if external 10 MHz signal is supplied
- Aluminium case with a big heat sink
- Inside wiring with silver plated teflon coaxial cable
- Antenna relay with 45 dB cross-talk attenuation
- Converter can process large signals
- Extension with additional filters and other components
- Built-in directional coupler for calibrated power output control
- 5-pole low-pass filter for harmonic wave suppression
- Spurious and harmonic wave suppression better 50 dBc
- Phase noise of the oscillator better -132 dBc/Hz @ 10 kHz
- Built-in sequence control
- Including dc-power, control cable and handbook

Accessories

- RX-Cable
- TX-Cable
- IF-Cable

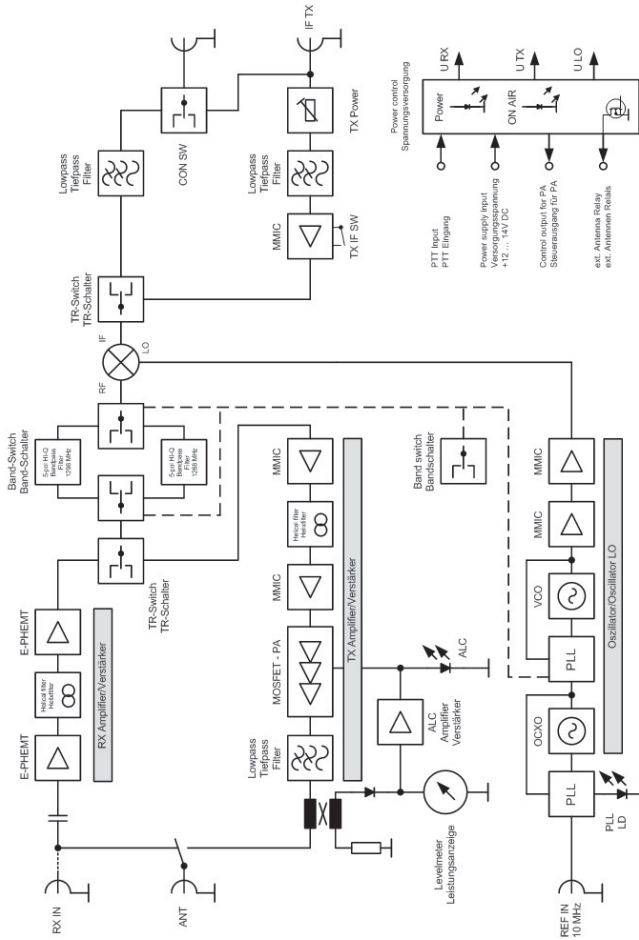
Specifications

	TR 2320 H - 2320	TR 2320 H - 2304	TR 2320 H - 2400
Type	2320 ... 2322 MHz (Standard)	2304 ... 2306 MHz (Standard)	2400 ... 2402 MHz (Standard)
Frequency range RF	144 ... 146 MHz	144 ... 146 MHz	144 ... 146 MHz
Frequency range IF	0.5 ... 5 W, adjustable	0.5 ... 5 W, adjustable	0.5 ... 5 W, adjustable
IF input power	contact closure to ground or +12 V on the IF-cable at TX	contact closure to ground or +12 V on the IF-cable at TX	contact closure to ground or +12 V on the IF-cable at TX
PTT-control	15 W	15 W	15 W
Output power	+13.8 V DC (+12 ... 14 V DC)	+13.8 V DC (+12 ... 14 V DC)	+13.8 V DC (+12 ... 14 V DC)
Supply voltage	typ. 6 A (TX)	typ. 6 A (TX)	typ. 6 A (TX)
Current consumption	min. 20 dB	min. 20 dB	min. 20 dB
RX gain	typ. 1.5 dB	typ. 1.5 dB	typ. 1.5 dB
Noise figure @ 18 °C	10 MHz / 2 ... 10 MHz	10 MHz / 2 ... 10 MHz	10 MHz / 2 ... 10 MHz
External reference input	270 x 260 x 80	270 x 260 x 80	270 x 260 x 80
Dimensions (mm)	Aluminium	Aluminium	Aluminium
Case	BNC-female, 50 ohms	BNC-female, 50 ohms	BNC-female, 50 ohms
IF connector	N-female, 50 ohms	N-female, 50 ohms	N-female, 50 ohms
RF connectors	BNC-female, 50 ohms	BNC-female, 50 ohms	BNC-female, 50 ohms
Input connector for 10 MHz	SUB-D 9-pole	SUB-D 9-pole	SUB-D 9-pole
DC supply voltage and control connector			

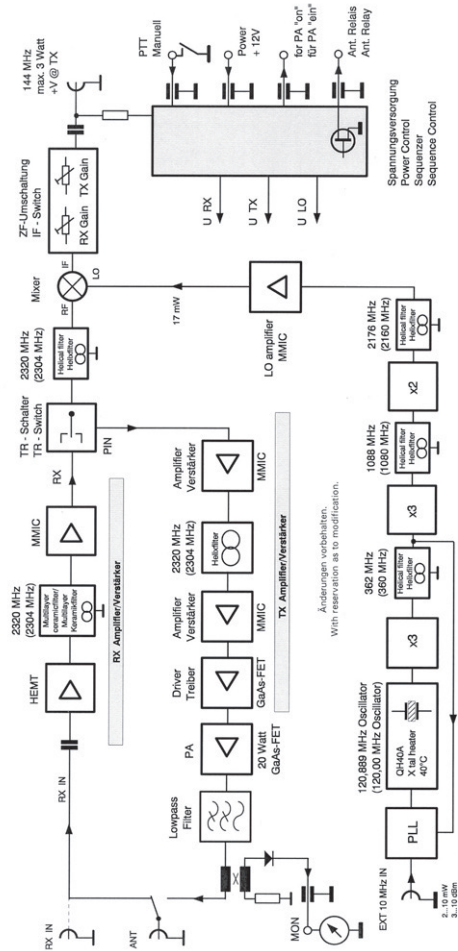
For more information about the transverters
please visit our website on
www.db6nt.com

Transverter block diagrams - TR 1296 H - TR 2320 H

TR 1296 H - 28 Transverter Blockdiagramm / block diagramm



TR 2320 H - 2320/2304 Transverter Blockdiagramm / block diagramm



DB 6 NT 07.2008

Transverter Switch Unit

TR 6 SW



The switch unit TR 6 SW is the gateway between your transceiver and the Kuhne electronic transverters of the TR Tranverter series or the Microwave Transverter modules. Up to 6 Transverters can be used with one HF – transceiver. The switch unit controls the IF signals and the PTT signals of the HF - transceiver. All connected transverters can be selected manually or via the remote control feature. The remote control connector is on the rear panel of the case.

Specifications

Type	TR 6 SW
Frequency range	DC ... 146 MHz
Insertion loss	
RX IN / RX TRV-(n)	typ. 0.1 dB @ 14 MHz typ. 0.1 dB @ 28 MHz max. 1.0 dB @ 144 MHz
Cross talk attenuation	
TX TRV-(n) / TX TRV-(n) DC ... 30 MHz	min. 50 dB
RX TRV-(n) / RX TRV-(n) DC ... 30 MHz	min. 50 dB
RX TRV-(n) / TX TRV-(n) DC ... 30 MHz	min. 50 dB
TX TRV-(n) / TX TRV-(n) 144 ... 146 MHz	min. 40 dB
RX TRV-(n) / RX TRV-(n) 144 ... 146 MHz	min. 40 dB
RX TRV-(n) / TX TRV-(n) 144 ... 146 MHz (n) = 1...6	min. 30 dB
PTT control	contact closure to ground
Remote input control levels	
Low level (0)	0 ... 1.5 V
High level (1)	3.5 ... 5 V
Supply voltage	+13.8 V DC (+12 ... 14 V DC)
Current consumption	typ. 60 mA
HF connectors	BNC-female / 50 Ohm
PTT connectors	RCA-female
DC supply	DC socket 2.1 mm
Control connector (Remote)	HD-SUB-D 15 pole
Dimensions (mm)	270 x 260 x 80
Case	Aluminium

Features

- Up to 6 IF channels useable
- Manually selectable channels
- Remote control via 15 pin HD-SUB-D connector
- Automatic activation of the remote control
- For separate and common IF systems
- IF signal up to 146 MHz possible
- Low insertion loss
- Controls PTT interface of the connected transverters
- All PTT outputs are protected against overvoltage, overcurrent (max. 500 mA) and reverse polarity

Accessories

- K3-cable: Remote cable for transceiver Elecraft K3

For more information about the transverter switch unit please visit our website on www.db6nt.com

Transverter for the 4 m Band

MKU 70 G2



Specifications

Type

Frequency range RF

Frequency range IF

IF input power

LO accuracy @ 18 °C

LO frequency stability (0 ... +40 °C)

Output power

IM3 of output signal

Spurious rejection

Harmonic rejection

RX gain

Noise figure @ 18 °C

RX output IP3

PTT control

Supply voltage

Current consumption

Dimensions (mm)

Case

Coaxial connectors IF

Coaxial connectors VHF

DC-supply and control connector

Weight

MKU 70 G2

69.9 ... 72 MHz

27.9 ... 30 MHz

2 ... 50 mW, adjustable / switchable to range 60 ... 2000 μ m

typ. +/- 2 ppm, max. +/- 3 ppm

typ. +/- 2 ppm, max. +/- 3 ppm

min. 100 mW

max. -40 dBc @ 200 mW PEP

min. 60 dB

typ. 40 dB

typ. 25 dB

typ. 1.5 dB

typ. +26 dBm

+12 V DC für TX

+12 ... 14 V DC

typ. 370 mA

150 x 55 x 30

German silver

SMA-female, 50 ohms

There are two separate IF connectors. They can be

switched to one common IF connector.

separate RX/TX connectors, SMA-female, 50 ohms

Feed-through capacitor with solder pin

typ. 200 g

Combinations of HF transceivers and transverters provide high input sensitivity, good large signal performance, excellent phase noise values and low intermodulation distortion. Usually, the performance is much better than that of modern VHF transceivers. The high performance transverter module MKU 70 G2 is based on several decades of development and production of transverters. Its outstanding technical data makes it usable for many applications.

Technically skilled customers can set up their own 70 MHz transverter system with the transverter module and one of Kuhne electronic's power amplifiers MKU PA 4M-35 W HY. The transverter module MKU 70 G2 will work with most HF transceivers, which have a transverter output port. Due to switchable input power range and connector configuration, the module is very flexible.

Features

- Low noise converter with excellent large-signal performance
- There are two separate IF connectors. They can be switched to one common IF connector.
- Switchable IF input power range
- Phase noise of the oscillator -156 dBc/Hz @ 10 kHz
- Internal temperature stabilized crystal oscillator with QH 40 A

Transverter for the 2 m Band

MKU 144 G2



Specifications

Type

Frequency range VHF

Frequency range IF

IF input power

LO accuracy @ 18 °C

LO frequency stability (0 ... +40 °C)

Output power

IM3 of output signal

Spurious rejection

Harmonic rejection

RX gain

Noise figure @ 18 °C

RX output IP3

PTT-control

Supply voltage

Current consumption

Dimensions (mm)

Case

Coaxial connectors IF

Coaxial connectors VHF

DC-supply and control

connector

Weight

MKU 144 G2

144 ... 146 MHz

28 ... 30 MHz

2 ... 50 mW, adjustable / switchable to range 60 ... 2000 μ W

typ. +/- 2 ppm, max. +/- 3 ppm

typ. +/- 2 ppm, max. +/- 3 ppm

min. 100 mW

max. -40 dBc @ 200 mW PEP

min. 60 dB

typ. 40 dB

typ. 25 dB

typ. 0.9 dB

typ. +23 dBm

+12 V DC for TX

+12 ... 14 V DC

typ. 370 mA

150 x 55 x 30

German silver

SMA-female, 50 ohms

There are two separate IF connectors. They can be

switched to one common IF connector

Separate RX/TX connectors, SMA-female, 50 ohms

Feed-through capacitor with solder pin

typ. 200 g

Combinations of HF transceivers and transverters provide high input sensitivity, good large signal performance, excellent phase noise values and low intermodulation distortion. Usually, the performance is much better than that of modern VHF transceivers. The high performance transverter module MKU 144 G2 is based on several decades of development and production of transverters. Its outstanding technical data makes it usable for many applications.

Technically skilled customers can set up their own 144 MHz transverter system with the transverter module and one of Kuhne electronic's power amplifier MKU PA 2M-60W HY or MKU PA 2M-120W HY. The transverter module MKU 144 G2 will work with most HF transceivers, which have a transverter output port. Due to switchable input power range and connector configuration, the module is very flexible.

Features

- Low noise converter with excellent large-signal performance
- There are two separate IF connectors. They can be switched to one common IF connector.
- Switchable IF input power range
- Phase noise of the oscillator -156 dBc/Hz @ 10 kHz
- Internal temperature stabilized crystal oscillator with QH 40 A

Transverter for the 70 cm Band

MKU 432 G2



Specifications

Type

Frequency range UHF

IF frequency range IF

IF input power

LO accuracy @ 18 °C

LO frequency stability (0 ... +40 °C)

Output power

IM3 of output signal

Spurious rejection

Harmonic rejection

RX gain

Noise figure @ 18 °C

RX output IP3

PTT control

Supply voltage

Current consumption

Dimensions (mm)

Case

Coaxial connectors IF

Coaxial connectors VHF

DC-supply and control connector

Weight

MKU 432 G2

432 ... 434 MHz

28 ... 30 MHz

2 ... 50 mW, adjustable / switchable to range 60 ... 2000 μ W

typ. +/- 2 ppm, max. +/- 3 ppm

typ. +/- 2 ppm, max. +/- 3 ppm

min. 70 mW

max. -30 dBc @ 50 mW PEP

min. 60 dB

typ. 25 dB

typ. 25 dB

typ. 1.1 dB

typ. +23 dBm

+12 V DC for TX

+12 ... 14 V DC

typ. 370 mA

150 x 55 x 30

German silver

SMA-female, 50 ohms

There are two separate IF connectors. They can be switched to one common IF connector.

separate RX/TX connectors, SMA-female, 50 ohms

Feed-through capacitor with solder pin

typ. 200 g

Combinations of HF transceivers and transverters provide high input sensitivity, good large signal performance, excellent phase noise values and low intermodulation distortion. Usually, the performance is much better than that of modern VHF transceivers. The high performance transverter module MKU 432 G2 is based on several decades of development and production of transverters. Its outstanding technical data makes it usable for many applications.

Technically skilled customers can set up their own 432 MHz transverter system with the transverter module and one of Kuhne electronic's power amplifier MKU PA 70 CM-60W HY. The transverter module MKU 432 G2 will work with most HF transceivers, which have a transverter output port. Due to switchable input power range and connector configuration, the module is very flexible.

Features

- Low noise converter with excellent large-signal performance
- There are two separate IF connectors. They can be switched to one common IF connector.
- Switchable IF input power range
- Phase noise of the oscillator -140 dBc/Hz @ 10 kHz
- Internal temperature stabilized crystal oscillator with QH 40 A

Transverter for the 23 cm Band

MKU 13 G3 (for 1.3 GHz)

Features

- Additional input for 10 MHz reference frequency
- Internal stabilized oscillator with precision crystal heater (can be used instead of 10 MHz reference frequency)
- High Level Ringmixer with an IP3 of +25 dBm
- Higher output power
- Bigger attenuator at the IF input for input power up to 5 watts
- Fuses are self-resettable (polyfuses)



Well-ried functions and features - based on MKU 13 G2

- Super low noise converter in the receive path
- Transmit gain and receive gain separately adjustable
- Control output for additional amplifier stages or a coaxial relay
- PTT can be switched by voltage on the IF connector or by connecting the PTT pin to ground
- Detector output (DC voltage) for monitoring the output power

Specifications

Type	MKU 13 G3
Frequency range RF	1296 ... 1298 MHz
Frequency range IF	144 ... 146 MHz
Output power	typ. 2.5 W
RF input power	max. 5 W, adjustable (0.5 ... 5 W)
Noise figure @ 18 °C	max. 0.8 dB
Receive gain	min. 20 dB, adjustable
Supply voltage	+12 ... 14 V DC
Current consumption	typ. 1 A (TX)
Ext. reference in	10 MHz / 2 ... 10 mW
PTT voltage (to the IF connector)	+3 ... 14 V DC
Coaxial connectors	SMA-female / 50 ohms
Case	German Silver, with heat sink
Dimensions (mm)	111 x 55 x 30 (without heat sink)
Weight	typ. 320 g

MKU 13 G3 28
Transverter with intermediate frequency (IF) = 28...30 MHz

Important note:

The transverter MKU 13 G3 28 needs an additional external band pass filter for 1296...1298 MHz to achieve sufficient image rejection.

Option

- Professional: Transverter available in milled aluminium case

Transverter for the 13 cm Band

MKU 23 G3 (for 2.3 GHz)

Features

- Additional input for 10 MHz reference frequency
- Internal stabilized oscillator with precision crystal heater (can be used instead of 10 MHz reference frequency)
- Bigger attenuator at the IF input for input power up to 5 watts
- Fuses are self-resettable (polyfuses)

Well-trying functions and features - based on MKU 23 G2

- Super low noise converter in the receive path
- Transmit gain and receive gain separately adjustable
- Control output for additional amplifier stages or a coaxial relay
- PTT can be switched by voltage on the IF connector or by connecting the PTT pin to ground
- Detector output (DC voltage) for monitoring the output power

Specifications

Type	MKU 23 G3
Frequency range RF	2320 ... 2322 MHz Option USA: 2304 ... 2306 MHz Option 2400 MHz: 2400 ... 2404 MHz
Frequency range IF	144 ... 146 MHz
Output power	typ. 1 W
RF input power	max. 5 W, adjustable (0.5 ... 5 W)
Noise figure @ 18 °C	max. 0.8 dB
Receive gain	min. 20 dB, adjustable
Supply voltage	+12 ... 14 V DC
Current consumption	typ. 0.6 A (TX)
Ext. reference in	10 MHz / 2 ... 10 mW
PTT voltage (to the IF connector)	+3 ... 14 V DC
Coaxial connectors	SMA-female / 50 ohms
Case	German Silver, with heat sink
Dimensions (mm)	150 x 55 x 30 (without heat sink)
Weight	typ. 300 g

Options

- USA: Frequency range RF 2304 ... 2306 MHz
- Professional: Transverter available in milled aluminium case
- 2400 MHz: Frequency range RF 2400 ... 2404 MHz, IF 144 ... 148 MHz



Transverter for the 9 cm Band

MKU 34 G3 (for 3.4 GHz)

- >> Advanced version of the popular transverter MKU 34 G2
- >> With new features and more power

Features of the transverter MKU 34 G3

- Additional input for 10 MHz reference frequency
- Internal stabilized oscillator with precision crystal heater (can be used instead of 10 MHz reference frequency)
- Higher output power
- Bigger attenuator at the IF input for input power up to 5 watts
- Fuses are self-resettable (polyfuses)



Well-trying functions and features - based on MKU 34 G2

- Super low noise converter in the receive path
- Transmit gain and receive gain separately adjustable
- Control output for additional amplifier stages or a coaxial relay
- PTT can be switched by voltage on the IF connector or by connecting the PTT pin to ground
- Detector output (DC voltage) for monitoring the output power

Specifications

	MKU 34 G3	MKU 34 G3 432
Type		
Frequency range RF	3400 ... 3402 MHz	3400 ... 3402 MHz
Frequency range IF	144 ... 146 MHz	432 ... 434 MHz
Output power	typ. 400 mW	typ. 400 mW
RF input power	max. 5 W, adjustable (0.5 ... 5 W)	max. 5 W, adjustable (0.5 ... 5 W)
Noise figure @ 18 °C	max. 0.9 dB	max. 0.9 dB
Receive gain	min. 20 dB, adjustable	min. 20 dB, adjustable
Supply voltage	+12 ... 14 V DC	+12 ... 14 V DC
Current consumption	typ. 0.4 A (TX)	typ. 0.4 A (TX)
Ext. reference in	10 MHz / 2 ... 10 mW	10 MHz / 2 ... 10 mW
PTT voltage (to the IF connector)	+3 ... 14 V DC	+3 ... 14 V DC
Coaxial connectors	SMA-female / 50 ohms	SMA-female / 50 ohms
Case	German Silver	German Silver
Dimensions (mm)	150 x 55 x 30	150 x 55 x 30
Weight	190 g	190 g

Options

- USA: Frequency range RF 3456 ... 3458 MHz
- Professional: Transverter available in milled aluminium case

Transverter for the 6 cm Band

MKU 57 G3 (for 5.7 GHz)

Features of the transverter MKU 57 G3

- Additional input for 10 MHz reference frequency
- Internal stabilized oscillator with precision crystal heater (can be used instead of 10 MHz reference frequency)
- Higher output power
- Bigger attenuator at the IF input for input power up to 5 watts
- Fuses are self-resettable (polyfuses)



Well-trying functions and features - based on MKU 57 G2

- Super low noise converter in the receive path
- Transmit gain and receive gain separately adjustable
- Control output for additional amplifier stages or a coaxial relay
- PTT can be switched by voltage on the IF connector or by connecting the PTT pin to ground
- Detector output (DC voltage) for monitoring the output power

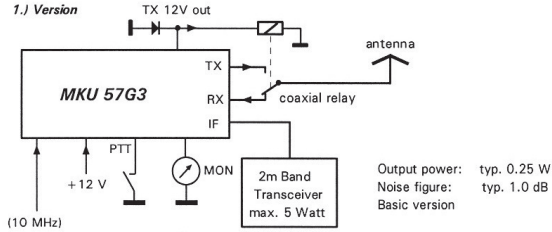
Specifications

	MKU 57 G3	MKU 57 G3 432
Type	MKU 57 G3	MKU 57 G3 432
Frequency range RF	5760 ... 5762 MHz	5760 ... 5762 MHz
Frequency range IF	144 ... 146 MHz	432 ... 434 MHz
Output power	typ. 250 mW	typ. 250 mW
RF input power	max. 5 W, adjustable (0.5 ... 5 W)	max. 5 W, adjustable (0.5 ... 5 W)
Noise figure @ 18 °C	max. 1 dB	max. 1 dB
Receive gain	min. 20 dB, adjustable	min. 20 dB, adjustable
Supply voltage	+12 ... 14 V DC	+12 ... 14 V DC
Current consumption	typ. 350 mA (TX)	typ. 350 mA (TX)
Ext. reference in	10 MHz / 2 ... 10 mW	10 MHz / 2 ... 10 mW
PTT voltage (to the IF connector)	+3 ... 14 V DC	+3 ... 14 V DC
Coaxial connectors	SMA-female / 50 ohms	SMA-female / 50 ohms
Case	German Silver	German Silver
Dimensions (mm)	150 x 55 x 30	150 x 55 x 30
Weight	typ. 220 g	typ. 220 g

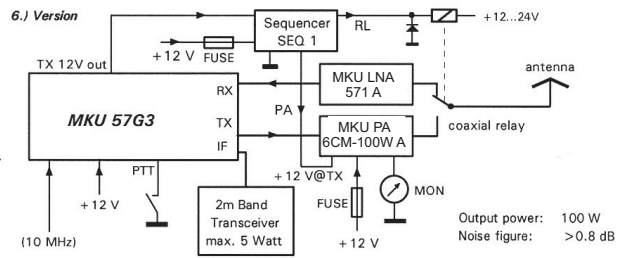
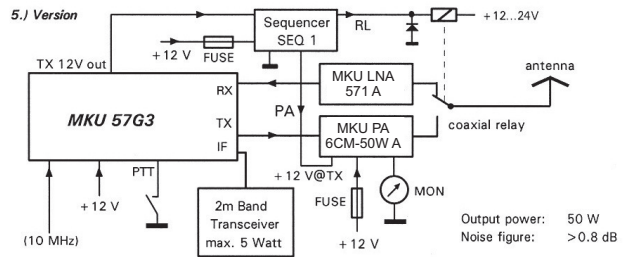
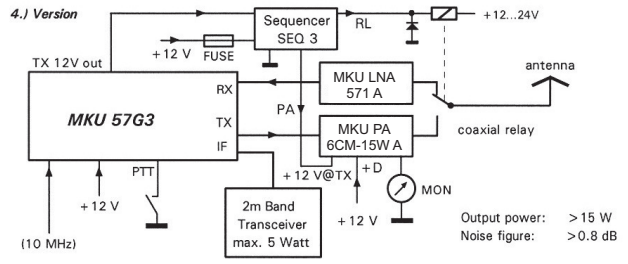
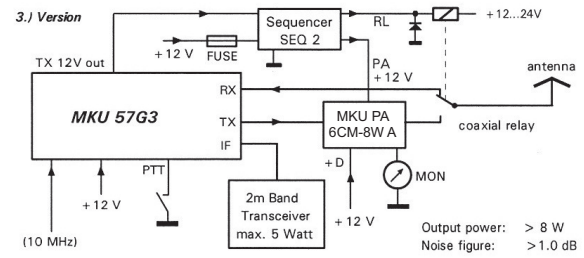
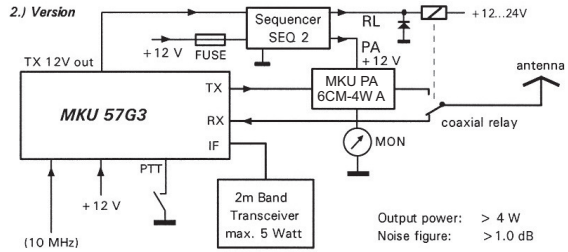
Option

- Professional: Transverter available in milled aluminium case

The 5.7 GHz Transverter



+D = permanent 12V



Transverter for 10 GHz

MKU 10 G3

The new design of our transverter for 10 GHz features better performance and many new functions.

Now, an external 10 MHz reference frequency can be connected to achieve highest frequency accuracy. This is necessary for EME, WSJT and Tropo DX. The frequency of 10 MHz can be supplied by a highly stable OCXO, a reference oscillator of a frequency counter, a rubidium frequency standard or a GPS controlled frequency source.

If a 10 MHz reference frequency is not available, the internal crystal oscillator of the transverter can be used. This crystal oscillator is frequency stabilized by our 40 °C precision crystal heater QH40A.

A bigger attenuator at the IF input port allows an input power of up to 5 watts. Self-resettable polyfuses prevent damages of the transverter module, especially if it is used in a portable station. Of course, all the well-tried functions of the old transverter version are kept in the new design!

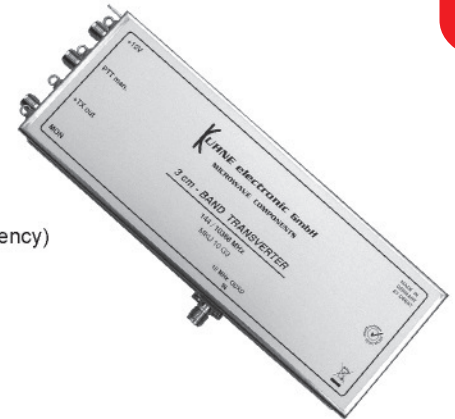
The small mechanical dimensions of the transverter, which is designed in SMD technology, allow the construction of a small portable station as well as a powerful home station.

Features of the transverter MKU 10 G3

- Additional input for 10 MHz reference frequency
- Internal stabilized oscillator with precision crystal heater (can be used instead of 10 MHz reference frequency)
- Bigger attenuator at the IF input for input power up to 5 watts
- Fuses are self-resettable (polyfuses)

Well-tried functions and features - based on MKU 10 G2

- Super low noise converter in the receive path
- Transmit gain and receive gain separately adjustable
- Control output for additional amplifier stages or a coaxial relay
- PTT can be switched by voltage on the IF connector or by connecting the PTT pin to ground
- Detector output (DC voltage) for monitoring the output power



Transverter for 10 GHz

MKU 10 G3

10368 MHz / 144 MHz

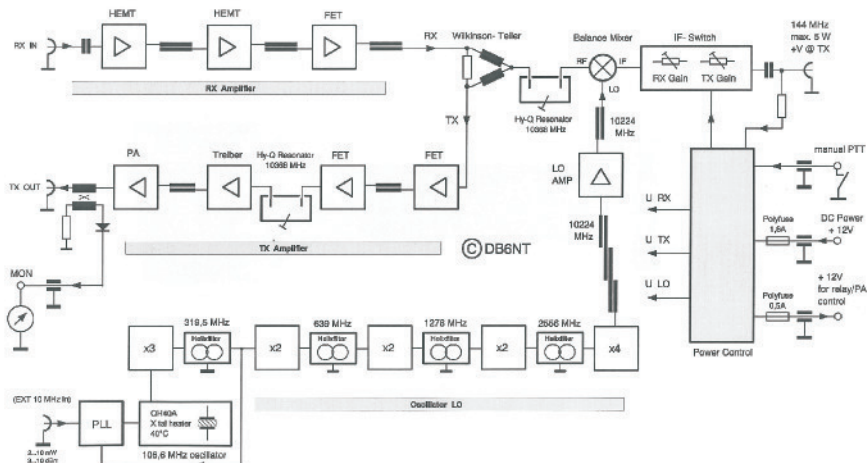
Optionen

- Professional: Transverter available in milled aluminium case
- Option JA: Transverter version for Japan Frequency: 10450 ... 10452 MHz
IF: 432 ... 434 MHz



10 GHz Transverter 10G3 DB 6 NT 12.2007

10368 / 144 MHz

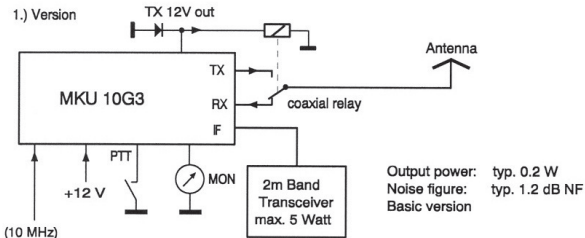


Specifications

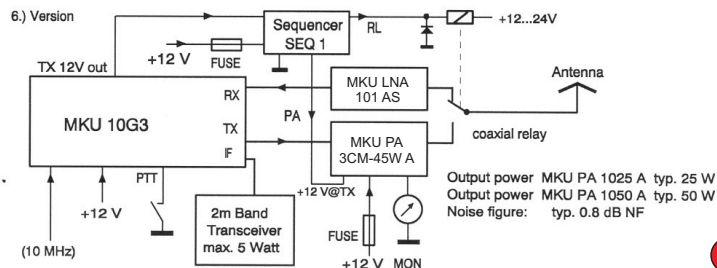
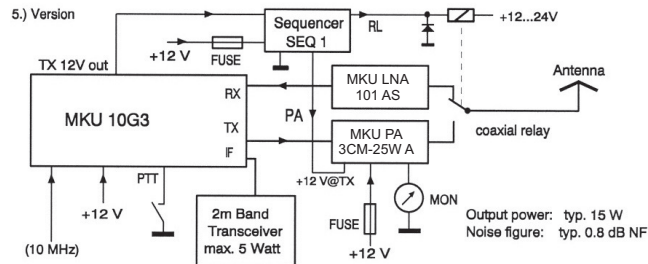
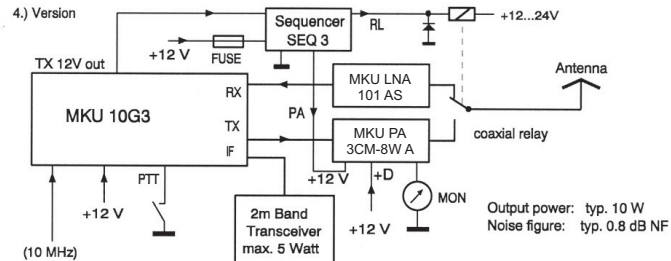
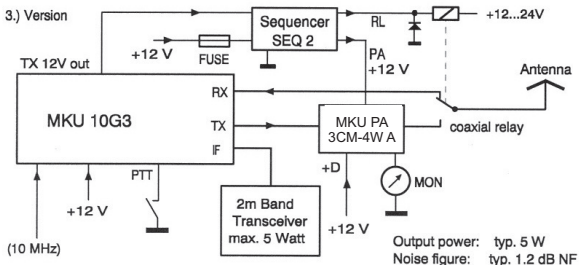
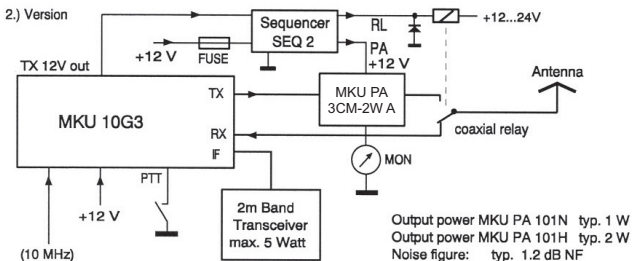
Type	MKU 10 G3
Frequency range RF	10368 ... 10370 MHz
Frequency range IF	144 ... 146 MHz
IF input power	max. 5 W, adjustable (0.5 ... 5 W)
RX gain	min. 20 dB, adjustable
Noise figure @ 18 °C	typ. 1.2 dB
TX output power	min. 200 mW
Spurious rejection	min. 40 dB, typ. 50 dB
Harmonic rejection	typ. 30 dB
Ext. reference in	10 MHz / 2 ... 10 mW
PTT input	via IF-cable or contact to ground
12 V - output	for antenna relay and PA, max. 0.6 A
Monitor output	output power monitoring typ. + 1.2 V out
Supply voltage	+12 ... 14 V DC / typ. 350 mA @ TX
Dimensions (mm)	150 x 55 x 30
Coaxial connectors	SMA-female / 50 ohms
Weight	typ. 220 g

MKU 10 G3 432	
Frequency range RF	10368 ... 10370 MHz
Frequency range IF	432 ... 434 MHz
IF input power	max. 5 W, adjustable (0.5 ... 5 W)
RX gain	min. 20 dB, adjustable
Noise figure @ 18 °C	typ. 1.2 dB
TX output power	min. 200 mW
Spurious rejection	min. 40 dB, typ. 50 dB
Harmonic rejection	typ. 30 dB
Ext. reference in	10 MHz / 2 ... 10 mW
PTT input	via IF-cable or contact to ground
12 V - output	for antenna relay and PA, max. 0.6 A
Monitor output	output power monitoring typ. + 1.2 V out
Supply voltage	+12 ... 14 V DC / typ. 350 mA @ TX
Dimensions (mm)	150 x 55 x 30
Coaxial connectors	SMA-female / 50 ohms
Weight	typ. 220 g

10 GHz Transverter Versions



+D = permanent 12V



24 GHz Transverter

Specifications

	MKU 24 GA	MKU 24 GC
Type	24000 ... 24250 MHz	24000 ... 24250 MHz
Frequency range	11952 MHz / 12024 MHz (144 MHz IF)	11952 MHz / 12024 MHz (144 MHz IF)
Oscillator input	25 ... 60 mW	25 ... 60 mW
LO power	max. 2 W	max. 2 W
2m input power	typ. 13 dB (144 MHz IF)	typ. 13 dB (144 MHz IF)
RX gain	typ. 8 dB DSB (144 MHz IF)	typ. 8 dB DSB (144 MHz IF)
Noise figure	typ. 0.2 mW SSB	typ. 0.2 mW SSB (144 MHz IF)
TX output power	typ. 30 mA	typ. 30 mA
Current consumption	+12 ... 14 V DC	+12 ... 14 V DC
Supply voltage	milled aluminium	SMC / 50 ohms
Case	R220 / WG20 / WR42	SMA-female / 50 ohms
24 GHz connector	SMC / 50 ohms	milled aluminium
IF connector	SMA-female / 50 ohms	SMA-female / 50 ohms
LO input	60 x 30 x 20	50 x 30 x 17
Dimensions (mm)	typ. 80 g	typ. 50 g
Weight		

MKU 24 GA Waveguide MKU 24 GC Coaxial

- Built-in wide band IF-amplifier 50...500 MHz
- Built-in IF transmit / receive switch
- Built-in 2 watt IF - attenuator for direct operation with a 2m transceiver

**KIT
available**

Specifications

	MKU 24 G2 144	MKU 24 G2 432
Type	24048 ... 24050 MHz	24048 ... 24050 MHz
Frequency range (RF)	144 ... 146 MHz	432 ... 434 MHz
Frequency range (IF)	11952 MHz	11808 MHz
LO frequency	10 ... 30 mW	10 ... 30 mW
LO input power	max. 5 W, adjustable (1 ... 5 W)	max. 5 W, adjustable (1 ... 5 W)
IF input power	min. 18 dB, typ. 20 dB, adjustable	min. 18 dB, typ. 20 dB, adjustable
RX gain	typ. 4.0 dB NF, max. 5.0 dB NF	typ. 4.0 dB NF, max. 4.5 dB NF
Noise figure @ 18 °C	min. 20 mW	min. 20 mW, typ. 30 mW
TX output power	typ. 30 dB	typ. 50 dB
Spurious rejection	via IF-cable or contact to ground	via IF-cable or contact to ground
PTT input	for antenna relay and PA, max. 0.5 A	for antenna relay and PA, max. 0.5 A
12 V - output	+12 ... 14 V DC	+12 ... 14 V DC
Supply voltage	typ. 260 mA	typ. 260 mA
Current consumption	130 x 59 x 18	130 x 59 x 18
Dimensions (mm)	SMA-female / 50 ohms	SMA-female / 50 ohms
Coaxial connectors	milled aluminium	milled aluminium
Case	typ. 220 g	typ. 220 g
Weight		

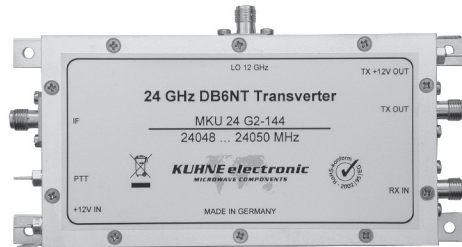


New features of the transverter MKU 24 G2

- IF input power up to 5 W
- Built-in 24 GHz amplifier for receiving and transmitting
- Built-in image rejection filter
- Usage of an image rejection mixers for better image rejection
- Fuses are self-resettable (polyfuses)

Well-tried functions and features - based on MKU 10 G2

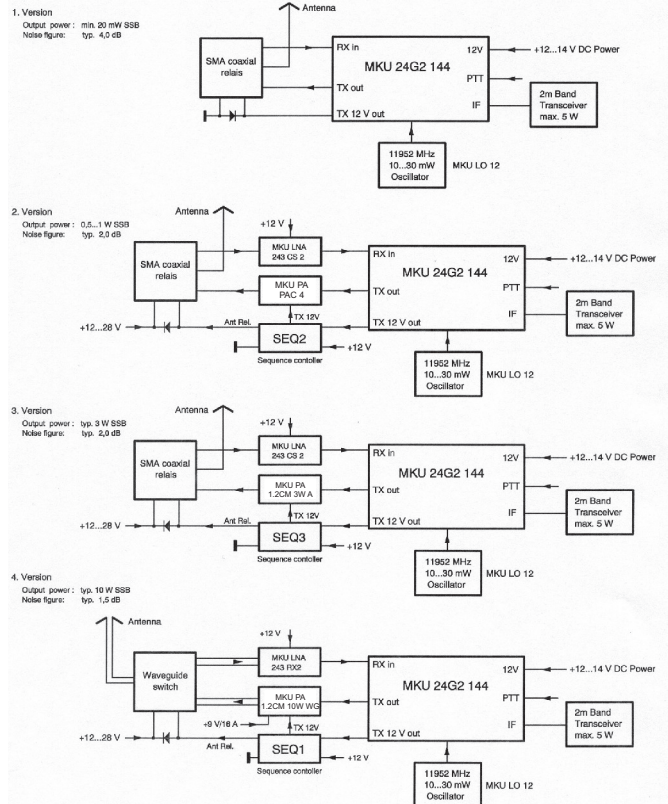
- Transmit gain and receive gain separately adjustable
- Control output for additional amplifier stages or a coaxial relay
- PTT can be switched by voltage on the IF connector or by connecting the PTT pin to ground



24 GHz Transverter Versions

24 GHz DB6NT Transverter MKU 24 G2-144

24 GHz Transverter Versions



For more information please visit our website on www.db6nt.com

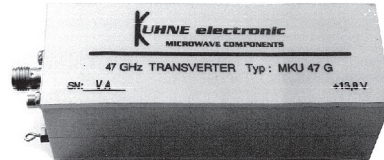
47 GHz Transverter

MKU 47 G

- Milled aluminium case
- Built-in wide band IF - amplifier 50 ... 500 MHz
- Built-in IF transmit / receive switch
- Built-in 2 Watt IF - attenuator for direct operation to a 2 m transceiver
- Control output for further stages



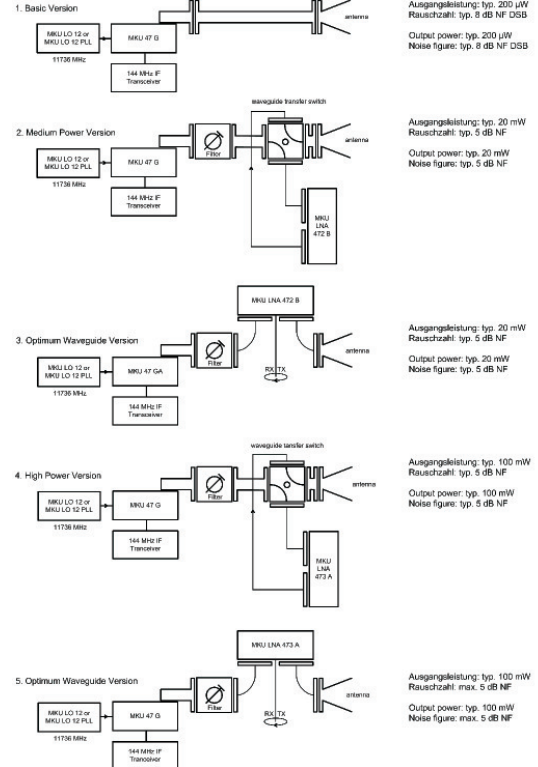
PROCOM waveguide flange available



Specifications

Type	MKU 47 G
Center frequency	47088 MHz
Oscillator input	11736 MHz 20 ... 40 mW (144 MHz IF)
2m input power	max. 3 W
RX gain	typ. 15 dB (144 MHz IF)
Noise figure @ 18 °C	typ. 8 dB DSB (144 MHz IF)
TX output power	typ. 0.15 mW SSB (144 MHz IF)
Current consumption	typ. 100 mA
Supply voltage	+12 ... 14 V DC
Dimensions (mm)	90 x 30 x 31
Weight	typ. 140 g
Coaxial connectors	SMA-female for LO, SMC for IF / 50 ohms
Waveguide	R500 / WG 24 / WR19

47 GHz Transverter Versions



Low Noise Converters

Type	Frequency Range RF	Frequency Range IF	Noise Figure	Gain	Remarks
MKU LNC 23 CON2	2320 ... 2322 MHz	144 ... 146 MHz	0.7 dB	26 dB	Option: ZF = 432 ... 434 MHz
MKU LNC 24 OSCAR2	2400 ... 2402 MHz	144 ... 146 MHz	0.7 dB	30 dB	Option: ZF = 432 ... 434 MHz or IF = 50 ... 52 MHz
MKU LNC 24 OSCAR 2 TM	2400 ... 2402 MHz	144 ... 146 MHz	0.7 dB	30 dB	Option: ZF = 432 ... 434 MHz or IF = 50 ... 52 MHz
MKU LNC 10 CON	10368 ... 10370 MHz	432 ... 434 MHz	1.2 dB	20 dB	
MKU LNC 10 OSCAR	10451 ... 10453 MHz	432 ... 434 MHz	1.2 dB	20 dB	
MKU LNC 23	2320 ... 2450 MHz	1404 ... 1534 MHz	0.7 dB	40 dB	Converter for digital/analogue TV
MKU LNC 23 TM	2320 ... 2450 MHz	1404 ... 1534 MHz	0.7 dB	40 dB	Converter for digital/analogue TV
MKU LNC 34	3400 ... 3475 MHz	1567 ... 1642 MHz	0.9 dB	38 dB	Converter for digital/analogue TV
MKU LNC 34 TM	3400 ... 3475 MHz	1567 ... 1642 MHz	0.9 dB	38 dB	Converter for digital/analogue TV
MKU LNC 57-3	5600 ... 5900 MHz	1400 ... 1700 MHz	1.0 dB	40 dB	Converter for ATV
MKU LNC 57-3 TM	5600 ... 5900 MHz	1400 ... 1700 MHz	1.0 dB	40 dB	Converter for ATV
KU LNC 8084 B PRO	8000 ... 8450 MHz	850 ... 1300 MHz	1.2 dB	28 dB	Case: milled aluminium

Super Low Noise Converters for the Amateur Radio Bands

MKU LNC 23 CON2 - MKU LNC 24 OSCAR2 - MKU LNC 24 OSCAR2 TM MKU LNC 10 CON - MKU LNC 10 OSCAR

- Converters for the microwave amateur radio bands from 1.3 GHz up to 10 GHz
- Super low noise figure due to the use of the latest HEMT FETs
- Remote power supply via the coaxial cable
- Protection against damages by accidentally transmitting into the IF output port (not in the converter for 10 GHz)
- **MKU LNC 24 OSCAR 2** and **MKU LNC 24 OSCAR 2 TM** with notch filter for 1268 MHz, for duplex operation on 1.3 GHz (transmit) and 2.4 GHz (receive)



Specifications

Type	MKU LNC 23 CON2	MKU LNC 24 OSCAR2	MKU LNC 24 OSCAR2 TM	MKU LNC 10 CON	MKU LNC 10 OSCAR
Frequency range RF (MHz)	2320 ... 2322	2400 ... 2402	2400 ... 2402	10368 ... 10370	10451 ... 10453
Frequency range IF (MHz)	144 ... 146	144 ... 146	144 ... 146	432 ... 434	432 ... 434
Option 70 cm	432 ... 434	432 ... 434	432 ... 434	-	-
Option 6 m	-	50 ... 52	50 ... 52	-	-
Noise figure @ 18 °C	typ. 0.7 dB	typ. 0.7 dB	typ. 0.7 dB	typ. 1.2 dB	typ. 1.2 dB
Gain	26 dB	30 dB	30 dB	20 dB	20 dB
Supply voltage	+12 ... 15 V DC	+12 ... 15 V DC	+12 ... 15 V DC	+12 ... 15 V DC	+12 ... 15 V DC
Current consumption	typ. 130 mA	typ. 130 mA	typ. 130 mA	typ. 220 mA	typ. 220 mA
Input / 50 ohms	N-female	N-female	N-female	SMA-female	SMA-female
Output / 50 ohms	N-female	N-female	N-female	N-female	N-female
Case	German Silver	German Silver	German Silver, mounted into water resistant case	German Silver	German Silver
Dimensions (mm)	74 x 56 x 35	74 x 56 x 35	109 x 85 x 60	74 x 56 x 30	74 x 56 x 30

Other frequencies on request.

Super Low Noise Converters for ATV

MKU LNC 23 - MKU LNC 34 - MKU LNC 57-3

Converters in Tower-Mount Case: MKU LNC 23 TM - MKU LNC 34 TM - MKU LNC 57-3 TM

- Amateur Television (ATV) converter for conversion of the microwave bands into the frequency range of TV Sat Receivers
- F connector at the output for direct connection to a TV satellite receiver
- Remote power supply via the coaxial cable
- Super low noise figure due to the use of the latest HEMT FETs
- High gain
- Converters are suitable for DATV (only MKU LNC 23 and MKU LNC 34)
- MKU LNC 23 and MKU LNC 23 TM with notch filter for 1.3 GHz for duplex operation on 1.3 GHz (transmit) and 2.3 GHz (receive)



Converters in water resistant tower mount case:
MKU LNC 23 TM
MKU LNC 34 TM
MKU LNC 57-3 TM

Specifications

Specifications	MKU LNC 23	MKU LNC 34	MKU LNC 57-3
Type	2320 ... 2450 MHz	3400 ... 3475 MHz	5600 ... 5900 MHz
Frequency range RF	1404 ... 1534 MHz	1567 ... 1642 MHz	1400 ... 1700 MHz
Frequency range IF	916.5 MHz SAW	1833 MHz SAW	4200 MHz
Local Oscillator (LO)	+/- 20 kHz	+/- 40 kHz	+/- 20 kHz
Frequency stability	typ. 0.7 dB	typ. 0.9 dB	typ. 1.0 dB
Noise figure @ 18 °C	typ. 40 dB	typ. 38 dB	typ. 40 dB, min. 38 dB
Gain	+9 ... 18 V DC	+9 ... 18 V DC	+9 ... 18 V DC
Supply voltage	typ. 70 mA	typ. 100 mA	typ. 180 mA
Current consumption	N-female / 50 ohms	N-female / 50 ohms	N-female / 50 ohms
Input connector	F-female / 75 ohms	F-female / 75 ohms	F-female / 75 ohms
Output connector	typ. 120 g	typ. 100 g	typ. 120 g
Weight	German silver	German silver	German silver
Case	74 x 56 x 30	74 x 56 x 30	82 x 64 x 22
Dimensions (mm)	MKU LNC 23 TM	MKU LNC 34 TM	MKU LNC 57-3 TM
Converter mounted into water resistant case			

Versions for other frequencies on request.

Super Low Noise Converters for Satellite Reception

KU LNC 8084 B PRO

The KU LNC 8084 B PRO is a low noise down converter for deep space communication applications.

A special feature is the 10 MHz reference frequency input at the output connector. This feature can be used to lock the internal local oscillator to an external reference frequency.

Recommended bias tee is the KU BT 3000 DIP. This module includes bias tee and a diplexer for the 10 MHz reference frequency in one case. It can be used to put the supply voltage and an external 10 MHz reference frequency on the IF cable.



Specifications

Type	KU LNC 8084 B PRO
Input Frequency (RF)	8000 ... 8450 MHz
RF Input Power	max. 1 mW (0 dBm)
Output Frequency (IF)	850 ... 1300 MHz
Output IP3	typ. +16 dBm
Gain	typ. 28 dB
Noise Figure @ 18 °C	typ. 1.2 dB, max. 1.5 dB
LO Frequency	7150 MHz
LO Accuracy @ 18°C	+/- 2 ppm
LO Frequency Stability	+/- 3 ppm (0 ... +40 °C)
Phase Noise	
@ 1 kHz	typ. -82 dBc/Hz
@ 10 kHz	typ. -82 dBc/Hz
@ 100 kHz	typ. -109 dBc/Hz
Maximum case temperature	+55 °C
Supply Voltage	+12 ... 14 V DC
Current Consumption	typ. 320 mA
Input connector, impedance	SMA-female, 50 ohms
Output connector, impedance	N-female, 50 ohms
Dimensions (mm)	82 x 64 x 22
Case	milled aluminium
Weight	typ. 220 g

Features

- Low noise figure
- Large bandwidth
- Low phase noise oscillator
- High frequency stability of the oscillator
- High linearity
- Over voltage protection and reverse polarity protection
- Remote power supply via output connector
- Solder pin for direct power supply, this pin can also be used to supply an external preamplifier via the remote power supply feature of the converter
- Input for 10 MHz reference frequency via output connector
- Automatic activation of PLL if external 10 MHz signal is supplied

Applications

- Deep space communications

Zubehör

- Bias Tee / Diplexer KU BT 3000 DIP
- Bias Tee KU BT 271 N
- Bias Tee KU BT 3000 N
- Preamplifier KU LNA 8000 A

Options

- Other connectors on request

Other frequencies on request.

Up-Converter

KU UP 107 A

The up converter KU UP 107 A converts the frequency range 2260 ... 2310 MHz up to 10 GHz. The output signal is a 50 MHz segment in the range between 10000 MHz and 10700 MHz. The customer specific output frequency is determined by the LO (local oscillator) frequency. The internal filters provide high spurious rejection and image rejection. Due to low phase noise and high frequency stability of the local oscillator, the up converter is suitable for analog and digital communication systems.

Typical applications are Multichannel Multipoint Distribution Systems (MMDS) using QPSK modulation and DVB-T or DVB-S systems. The output power for digital applications of about 200 mW can be increased to several watts by the use of an additional power amplifier.



Specifications

Type	KU UP 107 A
Input frequency range (IF)	2260 MHz ... 2310 MHz
Output frequency range	selectable in the range from 10000 MHz ... 10700 MHz with 50 MHz bandwidth in the range between 7740 MHz ... 8440 MHz
LO frequency	+/- 50 kHz
LO accuracy @ 18 °C	+/- 50 kHz
LO frequency stability (0...40 °C)	typ. 1 mW
IF input power	> 30 dBm
RF Output power CW	typ. 23 dBm
RF Output power (digital applications)	> 50 dB
Image rejection	typ. 30 dB
Gain	typ. -103 dBc/Hz @ 100 kHz
Phase noise	+12 ... 14 V DC
Supply Voltage	typ. 1.5 A
Current consumption	SMA-female / 50 ohms
Input connector	SMA-female / 50 ohms
Output connector	126 x 64 x 22
Dimensions (mm)	milled aluminium
Case	typ. 340 g
Weight	

Oscillators and Beacon Transmitters

Oscillators

Type	Frequency	Output Power	Input Frequency	Application
MKU LO 95	9486 MHz	35 mW	internal oscillator *	for 76 GHz transverter
MKU LO 95 PLL	9486 MHz	35 mW	10 MHz	for 76 GHz transverter
MKU LO 12	11736 MHz 11952 MHz 12024 MHz 12096.45 MHz	35 mW	internal oscillator *	11736 MHz: for 47 GHz transverter 11952 MHz: for 24 GHz transverter 12024 MHz: for 24 GHz transverter USA 12096.45 MHz: for beacon 24192.9 MHz
MKU LO 12 PLL	11736 MHz 11808 MHz 11952 MHz 12024 MHz 12648 MHz	35 mW	10 MHz	11736 MHz: for 47 GHz transverter 11952 MHz: for 24 GHz transverter 12024 MHz: for 24 GHz transverter USA 12648 MHz: for 76 GHz Transverter
MKU LO 13 Opt. 01	13567 MHz	20 mW	141.3264 MHz, 1 mW	for 122 GHz transverter
MKU LO 76	7631.625 MHz	20 mW	119.2441 MHz, 1 mW	for 122 GHz transverter
MKU LO 15	15263.25 MHz	20 mW	119.2441 MHz, 1 mW	for 122 GHz transverter
MKU XO 2 OSC	Band 1: 120.000 MHz Band 2: 120.889 MHz	1 mW	internal oscillator *	switchable dual crystal oscillator for 2.3 GHz transverter
MKU XO 1 PLL	different frequencies	1 mW	10 MHz	for G and G2 series of transverters



*) Option 01: connector for external oscillator (without internal oscillator)

Beacon Transmitters

Type	Standard Frequency	Output Power	Keying
MKU 13 BAKE	1296.9 MHz	0.8 W	A1, F1
MKU 10 BAKE	10368.9 MHz	200 mW	F1

Oscillators for stable frequency sources

MKU XO 1 PLL - MKU LO 95 PLL - MKU LO 12 PLL

Features

- Fixed frequency PLL-stabilized crystal oscillator
- Input for external 10 MHz reference frequency
- Automatic activation of PLL if external 10 MHz signal is supplied
- Over voltage and reverse polarity protection

Applications

- Highly stable frequency source for transverter modules
- Can be used instead of OCXO



Specifications

Type	MKU XO 1 PLL	MKU LO 95 PLL	MKU LO 12 PLL
Available output frequencies	96.000 MHz, 98.8125 MHz, 101.000 MHz, 103.500 MHz, 105.666 MHz, 106.500 MHz, 111.000 MHz, 116.000 MHz, 117.000 MHz, 120.000 MHz, 120.888 MHz, 122.250 MHz, 123.666 MHz, 124.500 MHz, 125.250 MHz, 126.000 MHz, 131.750 MHz, 135.666 MHz, 138.000 MHz, 141.32638 MHz, 141.4931 MHz	9486 MHz	11736 MHz 11808 MHz 11952 MHz 12024 MHz 12648 MHz
Output power	typ. 1 mW	min. 35 mW	min. 35 mW
Frequency stability (0 ... +40 °C)	typ. 2 ppm, max. 3 ppm (without 10 MHz reference frequency)	typ. 2 ppm, max. 3 ppm (without 10 MHz reference frequency)	typ. 2 ppm, max. 3 ppm (without 10 MHz reference frequency)
External reference frequency	10 MHz / 2 ... 10 mW	10 MHz / 2 ... 10 mW	10 MHz / 2 ... 10 mW
Supply voltage	+12 ... 14 V DC	+12 ... 14 V DC	+12 ... 14 V DC
Current consumption	60 mA (without PLL operation) 70 mA (PLL locked) max. 120 mA	350 mA	260 mA
Input connector for 10 MHz, impedance	SMA-female, 50 ohms	SMA-female, 50 ohms	SMA-female, 50 ohms
Output connector, impedance	SMA-female, 50 ohms	SMA-female, 50 ohms	SMA-female, 50 ohms
Case	German silver	German silver	German silver
Dimensions (mm)	74 x 37 x 30	111 x 55 x 30	111 x 55 x 30
Weight	typ. 75 g	typ. 140 g	typ. 140 g

Oscillators for KU-Band and K-Band

MKU LO 95 - MKU LO 12 - MKU LO 76 - MKU LO 13 - MKU LO 15

- German silver case, compact construction
- 'Clean' output signal by using helical filters and microstrip resonators
- High frequency stability provided by a compensated crystal oscillator
- External OCXO input is possible

Crystal oscillator - MKU XO 2 OSC

This is a switch-selectable dual crystal oscillator for operating with a 2.3 GHz transverter on 2304 and 2320 MHz. The crystals are temperature stabilized on 40.8°C with a precision crystal heater.

- German silver case, compact construction
- Dual crystal oscillator
- High frequency stability provided by a compensated crystal oscillator

Specifications

Type	MKU XO 2 OSC
Available output frequencies	Band 1: 120.000 MHz Band 2: 120.889 MHz
Output power	typ. 1 mW
Phase noise	max. -156 dBc @ 10 kHz
Frequency stability	typ. 1 ppm 0 ... 40 °C
Supply voltage	+12 ... 14 V DC
Current consumption	max. 180 mA
Coaxial connector	SMA-female / 50 ohms
Dimensions (mm)	74 x 55 x 30
Case	German silver

Specifications

	MKU LO 95	MKU LO 12	MKU LO 76	MKU LO 13 Opt. 01	MKU LO 15
Type	MKU LO 95	MKU LO 12	MKU LO 76	MKU LO 13 Opt. 01	MKU LO 15
Available output frequencies	9486 MHz (for 76 GHz Transverter)	11952 MHz (24 GHz) 12024 MHz (24 GHz USA) 11736 MHz (47 GHz) 12096.45 MHz (Bake 24192.9 MHz)	7631.625 MHz (for 122 GHz Transverter)	13567 MHz (for 122 GHz Transverter)	15263.25 MHz (for 122 GHz Transverter)
Output power	typ. 35 mW	typ. 35 mW	min. 20 mW, typ. 40 mW	min. 20 mW, typ. 40 mW	min. 20 mW, typ. 40 mW
Input frequency			119.2441 MHz	141.3263 MHz	119.2441 MHz
Input power			1 mW / 0 dBm	1 mW / 0 dBm	1 mW / 0 dBm
Supply voltage	+12 ... 14 V DC	+12 ... 14 V DC	+12 ... 14 V DC	+12 ... 14 V DC	+12 ... 14 V DC
Current consumption	typ. 250 mA	typ. 250 mA	typ. 250 mA	typ. 250 mA	typ. 250 mA
Input connector	-	-	SMA-female	SMA-female	SMA-female
Output connector	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female
Dimensions (mm)	111 x 55 x 30	111 x 55 x 30	111 x 55 x 30	111 x 55 x 30	111 x 55 x 30
Case	German silver	German silver	German silver	German silver	German silver
Weight	typ. 140 g	typ. 130 g	typ. 134 g	typ. 140 g	typ. 134 g
Options	Option 01 Option 02	Option 01 Option 02	Option 02	Option 02	Option 02
Option 01	SMA-female connector for external OCXO (without internal oscillator)				
Option 02	Aluminium case				

Versions for other frequencies on request.

Beacon Transmitters

MKU 13 BAKE **23 cm Band**

MKU 10 BAKE **1,2 cm Band**

Features

- Temperature stabilized crystal oscillator for high frequency stability
- Optional: connector for external source (e.g. OCXO) - please request!
- Helical filters and microstrip filters for high spurious and harmonic rejection
- Compact construction in a German Silver case
- Optional: milled aluminium case - please request!

Applications

- Beacon transmitters to explore radio propagation (amateur radio)
- Signal source for measurement equipment

Important Notes

- Please specify the required beacon frequency in your order. If the frequency is not specified, the standard frequency will be supplied (see table).
- At option 01 the frequency of the ext. oscillator is calculated as follows: Oscillator frequency = wanted output frequency : multiplication factor

Options

- Option 01: SMA-female connector for external oscillator (without internal oscillator)
- Option 02: milled aluminium case

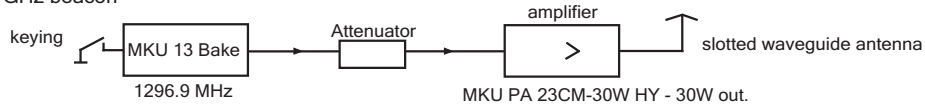
Specifications

	MKU 13 BAKE	MKU 10 BAKE
Type	MKU 13 BAKE	MKU 10 BAKE
Center frequency	1296.9 MHz	10368.9 MHz
Output power	typ. 800 mW	typ. 200 mW
Crystal frequency (standard)	108.075 MHz	108.009 MHz
Multiplication factor	12	96
CW keying (telegraphy)	A1, F1	F1
CW input connector	feed-through capacitor	Feed-through capacitor
Supply voltage	+12 ... 14 V DC	+12 ... 14 V DC
Current consumption	typ. 500 mA	typ. 280 mA
Output connector	SMA-female / 50 ohms	SMA-female / 50 ohms
Case	German Silver	German Silver
Dimensions (mm)	74 x 56 x 30	111 x 55 x 30
Weight	typ. 100 g	typ. 160 g
Possible Options	01	01; 02

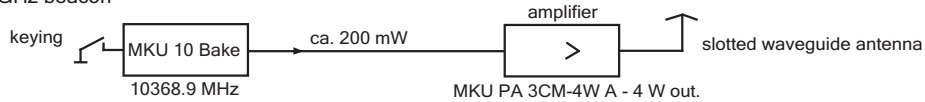


Beacon Transmitters - Block diagrams

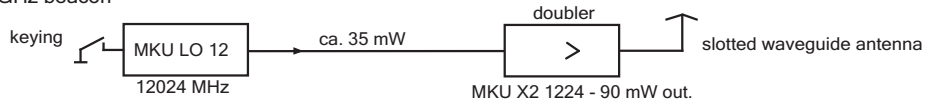
1.3 GHz beacon



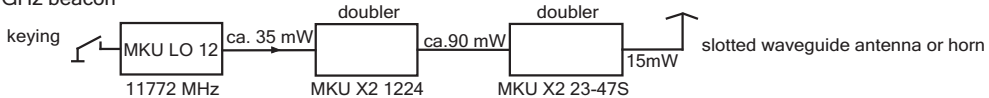
10 GHz beacon



24 GHz beacon



47 GHz beacon

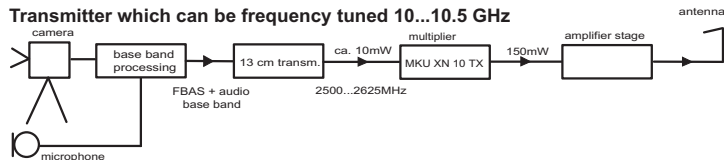


Transmitter Modules for Amateur Television (ATV)

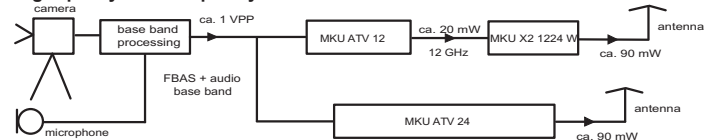
Type	Frequency Range RF	Tuning Range	Output Power	Remarks
MKU ATV 10 B	10000 ... 10500 MHz	+/- 50 MHz	200 mW	Please specify desired frequency in your order!
MKU ATV 10 H	10000 ... 10500 MHz	+/- 50 MHz	1 W	Please specify desired frequency in your order !
MKU ATV 12	12000 ... 12125 MHz	125 MHz	20 mW	Please specify desired frequency in your order!
MKU ATV 24	24000 ... 24250 MHz	250 MHz	100 mW	
MKU ATV 24-2	24000 ... 24250 MHz	250 MHz	300 mW	

ATV - TRANSMITTER

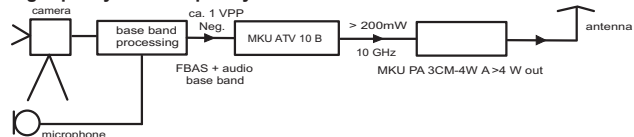
Transmitter which can be frequency tuned 10...10.5 GHz



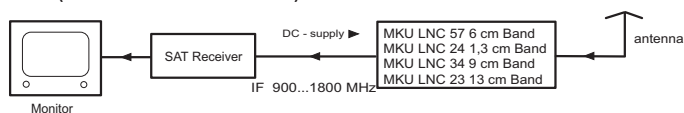
High-quality fixed frequency DRO - Transmitter for the 24 GHz band



High-quality fixed frequency DRO - Transmitter for the 10 GHz band



LNC (LOW NOISE CONVERTER) for the 6 and 1.3 cm Band



ATV Transmitter Modules for 10 GHz

MKU ATV 10 B - MKU ATV 10 H

The ATV transmitter module can be used to build a high quality ATV station for 10 GHz. In addition, a baseband processor unit (for video and audio signal) and a suitable antenna are needed. The output power can be increased with an additional power amplifier.

- Small size
- Milled aluminium case
- Direct base-band video input
- The module is adjusted to the desired center frequency optimised for best linearity.
- The frequency can be changed by tuning the gold plated precision screw - tuning range +/- 50 MHz
- Internal DRO (dielectric resonator oscillator)



Specifications

Type	MKU ATV 10 B	MKU ATV 10 H
Frequency range	10000 ... 10500 MHz please specify your desired frequency	10000 ... 10500 MHz please specify your desired frequency
Tuning range	+/- 50 MHz	+/- 50 MHz
Input	baseband max. 1 V _{ss}	baseband max. 1 V _{ss}
Output power	min. 200 mW	typ. 1 W
Supply voltage	+12 ... 14 V DC	+12 ... 14 V DC
Current consumption	typ. 200 mA	typ. 600 mA
Dimensions (mm)	76 x 30 x 20	100 x 30 x 20
Weight	typ. 80 g	typ. 100 g
Input connector	SMC-female (invert.neg) / 50 ohms	SMC-female (invert.neg) / 50 ohms
Output connector	SMA-female / 50 ohms	SMA-female / 50 ohms
Case	milled aluminium	milled aluminium
SMC-connector for 3.2 mm cable available		

Versions for other frequencies available on request.

ATV Transmitter Modules for 24 GHz

MKU ATV 24 100 mW - MKU ATV 24-2 300 mW

Using these modules together with a baseband processor unit and a suitable antenna, a high-quality 24 GHz ATV-Transmitter can be constructed. You only need the baseband signal and +12 V supply.

- Small size
- Milled aluminium case
- Direct base-band input
- Can be adjusted over the complete 24 GHz amateur radio band
- Will be adjusted according to frequency specification and optimized for high linearity
- Built-in directional coupler with detector for monitoring the output power - MON -



Specifications

	MKU ATV 24	MKU ATV 24-2
Type	MKU ATV 24	MKU ATV 24-2
Frequency range	24000 ... 24250 MHz	24000 ... 24250 MHz
Output power	typ. 100 mW	typ. 300 mW
Supply voltage	+12 ... 14 V DC	+12 ... 14 V DC
Current consumption	typ. 230 mA	typ. 300 mA
Dimensions (mm)	124 x 45 x 30 incl. heat sink	
Weight	typ. 220 g	
Case	milled aluminium	
Input	baseband <1 V _{ss} SMC-male (invert. neg.)	
Waveguide	R220 / WR 42 / WG 20	
	(SMA-out available on request)	

Versions for other frequencies on request.

12 GHz ATV

MKU ATV 12

ATV oscillator module for 12 GHz

- Small size
- Milled aluminium case, professional construction
- Direct base-band video input
- Frequency adjustment with tuning screw

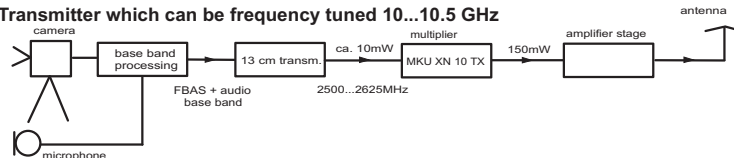


Specifications

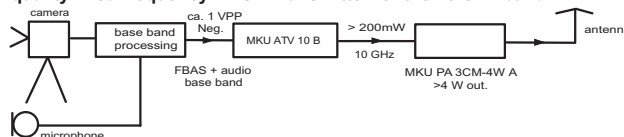
Type	MKU ATV 12
Frequency range	12000 ... 12125 MHz Please specify the desired center frequency in your order!
Input signal bandwidth	max. 20 MHz (baseband)
Output power	min. 20 mW
Input signal	baseband signal, inverted, max. 1 Vpp
Modulation type	frequency modulation (FM)
Supply voltage	+12 ... 14 V DC
Current consumption	typ. 80 mA
Input connector	SMC-female, 50 ohms
Output connector	SMA-female, 50 ohms
Case	milled aluminium
Dimensions (mm)	50 x 30 x 17 (20)
Weight	typ. 40 g

ATV - TRANSMITTER

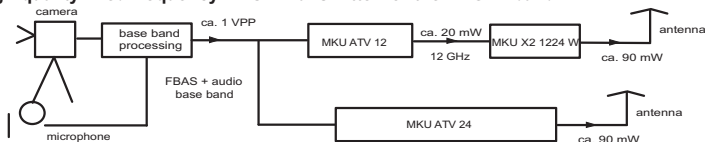
Transmitter which can be frequency tuned 10...10.5 GHz



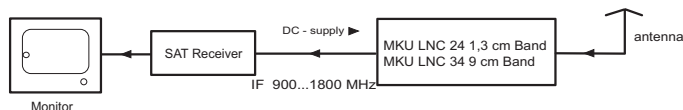
High-quality fixed frequency DRO - Transmitter for the 10 GHz band



High-quality fixed frequency DRO - Transmitter for the 24 GHz band



LNC (LOW NOISE CONVERTER) for the 6 and 1.3 cm Band

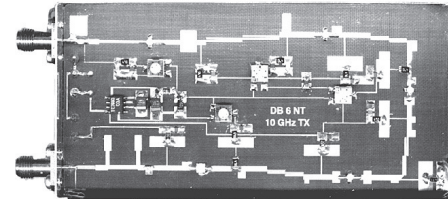


Versions for other frequencies on request.

Frequency multipliers

MKU XN 57 TX - MKU XN 10 TX

- Wide band frequency multiplier x 4 for generation of 5.7 or 10 GHz ATV signal



Specifications

	MKU XN 57 TX	MKU XN 10 TX
Type	MKU XN 57 TX	MKU XN 10 TX
Output frequency	5650 ... 5850 MHz	10000 ... 10500 MHz
Input frequency	1410 ... 1462 MHz	2500 ... 2625 MHz
Input power	typ. 3...10 mW	typ. 3...10 mW
Dimensions (mm)	111 x 56 x 30	111 x 56 x 30
Weight	typ. 120 g	typ. 120 g
Output power	typ. 200 mW	typ. 200 mW
Supply voltage	+12 ... 15 V DC	+12 ... 15 V DC
Current consumption	typ. 250 mA	typ. 250 mA
Case	German silver	German silver
Coaxial connectors	SMA-female / 50 ohms	SMA-female / 50 ohms

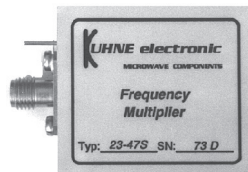
Frequency Doublers

MKU X2 1224 - MKU X2 23-47 S

Specifications

Type	MKU X2 1224
Input frequency	12 GHz Band; 20...40 MHz
Output frequency (GHz)	23.544 / 24.192 / 24.048 *
Output power	typ. 80...100 mW
Bandwidth	typ. 300 MHz
Supply voltage	+11 ... 14 V DC
Current consumption	typ. 0.4 A
Dimensions (mm)	116 x 30 x 24
Weight	typ. 130 g
Case	milled aluminium
In- and output connector	SMA-female / 50 ohms

*Please specify frequency!



Specifications

Type	MKU X2 23-47 S
Input frequency	23.544 GHz
Input power	100 mW
Output frequency	47.088 GHz
Output power	typ. 15 mW
Dimensions (mm)	33 x 30 x 17
Weight	typ. 40 g
Case	milled aluminium
Input connector	SMA-female / 50 ohms
Output connector	Waveguide R500 / WG24 / WR19

Low Pass Filter

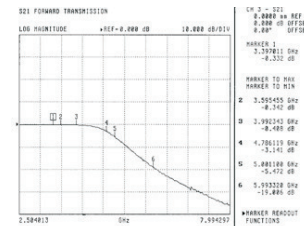
MKU LPF 40-SMA

Features

- 5-pole microstrip low pass filter

Applications

- Harmonic rejection improvement of transmitters and amplifiers

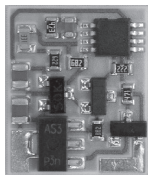


Specifications

Type	MKU LPF 40-SMA
Frequency range	3000 ... 4000 MHz
Insertion loss	typ. 0.4 dB
RF power	max. 60 W
Input connector	SMA-female, 50 ohms
Output connector	SMA-female, 50 ohms
Case	milled aluminium
Dimensions (mm)	50 x 30 x 22
Weight	typ. 60 g

Frequency multipliers for other frequencies on request.

Precision Crystal Heater



The precision crystal heater provides temperature stabilisation for crystals. The circuit, which is built on Al_2O_3 ceramic substrate, has to be mounted on the $40^\circ C$ thermostat crystal. Then, the crystal is heated to $40.8^\circ C$ with a regulation accuracy of better than $0.1^\circ C$. This provides high frequency stability.

The precision crystal heater is an inexpensive alternative to completely heated oven oscillators (OCXOs). However, the stability values of an OCXO can not be reached.

Specifications

Type	QH 40 A
Adjustment tolerance	$40.8^\circ C \pm 2.5^\circ C$
Regulation accuracy	better $0.1^\circ C$
Supply voltage	+8 ... 12 V DC
	used stabilized voltage
Inrush current	typ. 80 mA
Dimensions (mm)	10.5 x 14.0 x 3.5



Bias Tee

KU BT 271 N

Bias Tee for remote power supply of preamplifiers and converters via the coaxial cable. The Bias Tee contains a replaceable 1 Ampere fuse and it is protected against over voltage and reverse polarity.

Specifications

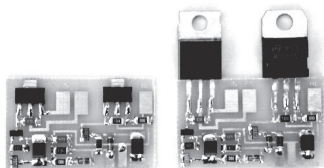
Type	KU BT 271 N
Frequency range	10 ... 3000 MHz
Insertion loss	typ. 0.1 dB @ 150 MHz typ. 0.5 dB @ 1300 MHz typ. 1.0 dB @ 3000 MHz
Voltage range	0 ... +15 V DC
Current	max. 1 A
DC connector	DC socket 2.1 mm
Input connector	N-female / 50 ohms
Output connector	N-female / 50 ohms
Case	German Silver
Dimensions (mm)	37 x 37 x 30
Weight	typ. 90 g

Sequence Controller

Many coaxial relays have a too low isolation between the ports during the change-over. If the power amplifier (in a transmit-receive system) is switched too early, this may lead to damage or destruction of the input transistor in the preamplifier or converter. With a sequence controller, this trouble can be avoided. The sequence controller provides a control signal for the coaxial relay and it switches the voltage supply for the power amplifier. There is a time delay between the two signals to guarantee safe switching.

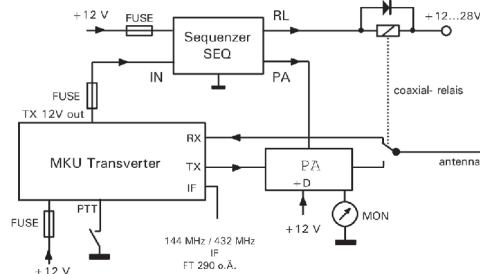
Specifications

Type	Load current	Voltage
SEQ 1	max. 1 A	+12 ... 15 V DC
SEQ 2	max. 4 A	+12 ... 15 V DC
SEQ 3	max. 18 A	+12 ... 15 V DC
SEQ 4	max. 18 A	+12 ... 32 V DC



SEQ 1

SEQ 2/3



Bias Tees

KU BT 3000 DIP

Bias Tee for remote power supply of preamplifiers and converters via the coaxial cable.

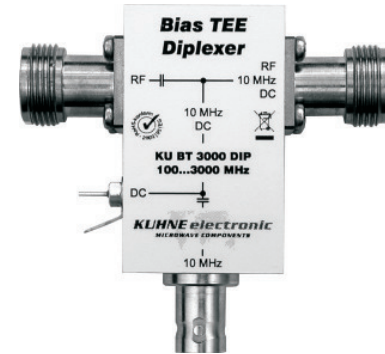
This module includes bias tee and a diplexer for the 10 MHz reference frequency in one case. It can be used to put the supply voltage and an external 10 MHz reference frequency on the IF cable.

Features

- Low insertion loss
- Large bandwidth

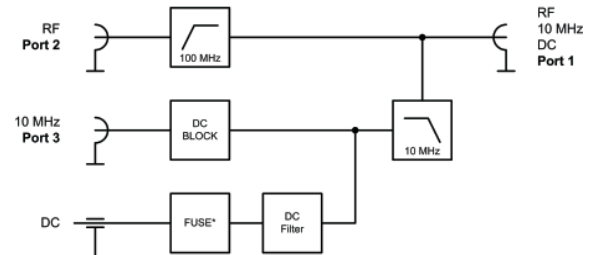
Applications

- Remote power supply of tower mounted low noise converters
- 10 MHz Reference frequency supply via IF cable



Specifications

Type	KU BT 3000 DIP
Frequency range	100 ... 3000 MHz
Insertion loss (Port 1 - Port 2)	typ. 0.5 dB, max 1.0 dB @ 100 MHz typ. 0.8 dB, max 1.3 dB @ 2000 MHz typ. 1.5 dB, max 2.0 dB @ 3000 MHz
RF Input Power (Port 1 - Port 2)	max. 1 W (+30 dBm)
Input Frequency (Port 3)	10 MHz
Voltage at DC Port	0 ... 30 V DC
Input current	max. 500 mA Protected with a 500 mA self resetting semiconductor fuse
Connector Port 1 / Impedance	N-female, 50 Ohms
Connector Port 2 / Impedance	N-female, 50 ohms
Connector Port 3 / Impedance	BNC-female, 50 Ohms
Case	milled aluminium
Dimensions (mm)	50 x 30 x 22
Weight	typ. 100 g



Bias Tee

KU BT 3001 N

Bias Tee for remote power supply of preamplifiers and converters via the coaxial cable.

Specifications	
Type	KU BT 3001 N
Frequency range	10 ... 3000 MHz
Insertion loss	typ. 0.3 dB, max. 0.5 dB @ 100 MHz typ. 0.8 dB, max. 1.0 dB @ 2000 MHz typ. 1.1 dB, max. 1.3 dB @ 3000 MHz max. 1 W (+30 dBm)
RF Input power	
Isolation (RF - DC)	typ. 30 dB
Voltage at DC port	0 ... +30 V DC
Input Current	max. 1 A Protected with a 1 A self resetting semiconductor fuse
Connector (RF) / impedance	N-female, 50 Ohm
Connector (RF + DC) / impedance	N-female, 50 Ohm
Connector (DC) / impedance	BNC-female
Case	milled aluminium
Dimensions (mm)	50 x 30 x 22
Weight	typ. 100 g

Features

- Low insertion loss
- Large bandwidth

Applications

- Remote power supply of tower mounted low noise converters



Mechanical Changeover Plate for mm-Wave Amplifiers

This item allows to turn the amplifier so that it can be used for the transmitting and receiving path alternatively.

- Built-in choke flanges to prevent couplings and oscillations

Specifications			
Type	WP472B	WP473A	WP761B
Material	brass (galvanically silver-coated)	brass (galvanically silver-coated)	brass (galvanically silver-coated)
Screw	M2 for flanges and mountings	M2 for flanges and mountings	M2 for flanges and mountings
Dimensions	50 x 30 x 4.9 mm (waveguide: R500 / WR19 / WG24)	56 x 30 x 4.9 mm (waveguide: R500 / WR19 / WG24)	50 x 30 x 4.9 mm (waveguide: R740 / WR12 / WG26)
Suitable for	MKU LNA 472 B	MKU LNA 473 A	MKU LNA 761 B

Two spring plungers with ball and slot and one central fixing screw are included.



Band Pass Filters

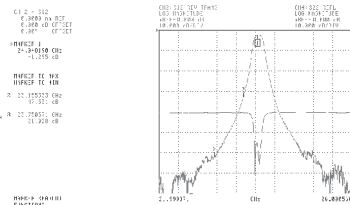
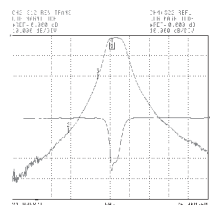
MKU BPF 24-1-SMA - MKU BPF 24-2-SMA - MKU BPF 24-3-WR42 - MKU BPF 47-WR19

Features

- 3-pole band pass filter in waveguide technology

Applications

- Image frequency rejection for 24 GHz transverter



Specifications

Type	MKU BPF 24-1-SMA	MKU BPF 24-2-SMA
Center frequency	24048 MHz	24048 MHz
3 dB bandwidth	typ. 300 MHz	typ. 190 MHz
Image frequency rejection @ IF = 144 MHz	typ. 18 dB	typ. 30 dB
Image frequency rejection @ IF = 432 MHz	typ. 48 dB	typ. 60 dB
Insertion loss	max. 2.0 dB	max. 3.0 dB
Input connector / impedance	SMA-female, 50 ohms	SMA-female, 50 ohms
Output connector / impedance	SMA-female, 50 ohms	SMA-female, 50 ohms
Case	milled aluminium	milled aluminium
Dimensions (mm)	59 x 18 x 11	59 x 18 x 11
Weight	typ. 22 g	typ. 22 g



Specifications

Type	MKU BPF 24-3-WR42	MKU BPF 47-WR19
Center frequency	24048 MHz (24192 MHz = Opt. USA)	47088 MHz
3 dB bandwidth	typ. 30 MHz	typ. 50 MHz
Image frequency rejection @ IF = 144 MHz	min. 70 dB	min. 50 dB
LO rejection	min. 50 dB	min. 37 dB, typ. 40 dB
Insertion loss	max. 1.5 dB	max. 3.0 dB
Connector	waveguide: R220 / WG20 / WR42	waveguide: R500 / WR19 / WG24
Case	milled brass / silver-plated	milled brass / silver-plated
Dimensions (mm)	25 x 43 x 26	25 x 20 x 20
Weight	typ. 175 g	typ. 75 g

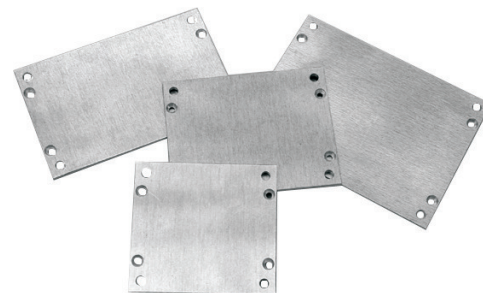


Mounting plates

This mounting plate allows power amplifiers having the mounting holes on the bottom side to be easily mounted on a heat sink

Specifications							
Type	MP 5030	MP 6030	MP 7330	MP 7640	MP 7630	MP 7045	MP 8055
Material	aluminium	aluminium	aluminium	aluminium	aluminium	aluminium	aluminium
Dimensions	50 x 46 x 2 mm, drilled	60 x 46 x 2 mm, drilled	73 x 46 x 2 mm, drilled	76 x 56 x 2 mm, drilled	76 x 46 x 3 mm,	70 x 61 x 3 mm,	80 x 71 x 3 mm,
	- 4 pieces suitable screws for mounting the amplifier are included				- 4 pieces suitable screws for mounting the amplifier are included		
					- holes for PA fixing are only marked		

Waveguide Transitions

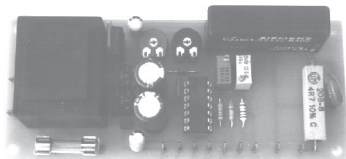


Specifications		
Type	MKU WGT 24-1-SMAF	MKU WGT 24-1-SMAM
Frequency range	23.5 ... 24.5 GHz	23.5 ... 24.5 GHz
Matching	min. 17 dB	min. 17 dB
Insertion loss	max. 0.25 dB	max. 0.25 dB
Connector	waveguide: R220 / WR42 / WG20	waveguide: R220 / WR42 / WG20
Connector / impedance	SMA-female, 50 ohms	SMA-male, 50 ohms
Case	milled brass / silver-plated	milled brass / silver-plated
Dimensions (mm)	23 x 23 x 23	23 x 23 x 23
Weight	typ. 42 g	typ. 42 g

More parts will you find on our website www.db6nt.com

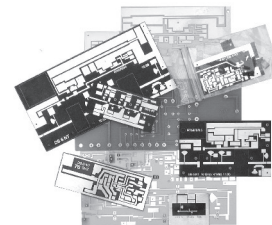
Printed Circuit Boards (PCBs)

01 - PCB broadband amplifier 0.5 ... 2.5 GHz typ. 1 W.....	UKW Ber.	2.97	
02 - PCB 12/24 GHz doubler.....	DUBUS	1-2.92	
03 - PCB 5.7GHz 8 W PA.....	DUBUS	3.92	
04 - PCB 10 GHz 4/8 W PA 2-stage.....	DUBUS	4.91	
05 - PCB 10 GHz 4 W PA 1-stage.....	-----	-----	
06 - PCB 10 GHz 4 W PA 2-stage for Mitsubshi FET's.....	DUBUS	12.98	
07 - PCB 10 GHz 8 W PA 2-stage.....	-----	-----	
08 - PCB 10 GHz HEMT-prestage DK.....	DUBUS	3.95	
09 - PCB 10 GHz beacon.....	-----	-----	
10 - PCB 12 GHz LO MK4.....	RO4003	plated-through	
11 - PCB 24 GHz HEMT ampl. coaxial.....	DUBUS	4.93	
12 - PCB 24 GHz HEMT ampl. waveguide.....	DUBUS	4.93	
13 - PCB 24 GHz PA ampl. coaxial.....	DUBUS	4.93	
14 - PCB 24 GHz PA ampl. waveguide.....	DUBUS	4.93	
15 - PCB 24 GHz HEMT amp. coax. only for NE32584C!.....	DUBUS	3.96	
16 - PCB 24 GHz HEMT amp. waveguide only for NE32584C.....	DUBUS	3.96	
17 - PCB 24 GHz PA Amp. wg in - coax out > beacon.....	DUBUS	3.96	
18 - PCB 24 GHz Amp. wg in - coax out.....	DUBUS	2.97	
19 - PCB 24 GHz HEPA 4-stage amplifier waveguide.....	Dorsten	2.97	
20 - PCB 24 GHz HEPA 4-stage amplifier coax.....	Dorsten	2.97	
21 - PCB 24 GHz MK2 transverter.....	DUBUS	1.93	
22 - PCB 24 GHz MK3 Transverter waveguide.....	DUBUS	2.98	
23 - PCB 24 GHz MK3 Transverter coaxial.....	DUBUS	2.98	
24 - PCB 24 GHz LO oscillator.....	DUBUS	2.98	
25 - PCB 47 GHz mixer.....	DUBUS	1.94	
26 - PCB 47 GHz IF.....	DUBUS	1.94	
27 - PCB 76 GHz mixer x 4.....	DUBUS	2.92	
28 - PCB 76 GHz IF.....	DUBUS	1.94	
29 - PCB 76 GHz mixer x 2.....	DUBUS	1.94	
30 - PCB 25.3-76 GHz tripler.....	DUBUS	1.94	
31 - PCB 120 GHz multiplier by 3.....	Dorsten	2005	
32 - PCB 120 GHz multiplier by 5.....	Dorsten	2005	
33 - PCB 23-47 GHz doubler.....	DUBUS	4.93	
34 - PCB 19-38 GHz doubler.....	DUBUS	1.94	
35 - PCB 120 GHz RX mixer.....	Dorsten	2005	
36 - PCB 145 GHz mixer.....	DUBUS	2.94	
37 - PCB 241 GHz mixer.....	DUBUS	2.94	
38 - PCB Speed control of KR400 Rotor series.....	UKW Berichte	2/99	
39 - PCB 30.5 - 61 GHz Multiplier.....	DL2AM DUBUS	4.2006	
40 - PCB 120 GHz SHM-Mixer.....	DL2AM DUBUS	4.2006	
41 - PCB 40 - 80 GHz multiplier.....	-----	-----	
42 - PCB 240 GHz, 80 GHz LO.....	DL2AM DUBUS	1.2009	
43 - PCB 40 - 240 GHz mixer/multiplier.....	DL2AM DUBUS	1.2009	
44 - PCB 40 - 80 Multiplier WG.....	-----	-----	
45 - PCB 76 GHz SHM, input WR 28.....	DL2AM CQDL	5.2008	
	waveguide, output 2.7 mm waveguide		
46 - PCB 40/80 GHz Doppler, input WR 28,.....	DL2AM DUBUS	1.2009	
	output 3 mm waveguide		
47 - PCB 40/120 GHz Tripler / Mixer, input WR.....	DL2AM CQDL	5.2008	
	28, output 1,8 mm waveguide		
48 - PCB 47 GHz Mixer LO-R220.....	DL2AM DUBUS	1.2010	
49 - PCB frequency doubler 23-47 GHz, output.....	-----	-----	
	rectangular waveguide R500 / WR19 /		
	WG24		
50 - PCB 23 cm band upconverter.....	-----	-----	
51 - PCB 3.4 GHz Beacon.....	-----	-----	
52 - PCB LNA 132 B2.....	-----	-----	
53 - PCB LNA 132 B TM.....	-----	-----	
54 - PCB LNA 232 A2.....	-----	-----	
55 - PCB 2.3 GHz beacon.....	-----	-----	



Speed control for KR400 Rotor series

Discribed in UKW Berichte magazine or on our homepage.
PCB available



Kits

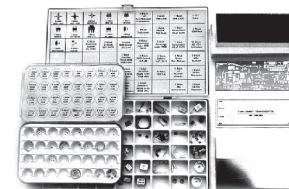
KIT 13 G2B
KIT 13 G2B-28

KIT 23 G2
KIT 23 G2 OSCAR
KIT 23 G2 USA
KIT 34 G2
KIT 34 G2 USA
KIT 57 G2

KIT 57 G2, ext. OCXO
KIT 10 G2

KIT 10 G2, ext. OCXO
100 - KIT 24 GHz HEMT, Amp. Coax
101 - KIT 24 GHz HEMT, Amp. Waveguide
102 - KIT 24 GHz MK2, Transverter
103 - KIT 24 GHz MK3, Transverter Waveguide
104 - KIT 24 GHz MK3, Transverter Coax

Transverter (all parts you need, description)
Transverter (all parts you need, description) with 28 MHz IF
addition filter necessary
Transverter (all parts you need, description)
2400 MHz, Transverter (all parts you need, description)
2304 MHz, Transverter (all parts you need, description)
Transverter (all parts you need, description)
3456 MHz, Transverter (all parts you need, description)
Transverter (all parts you need, description)
Option für extern. OCXO (all parts you need, description)
Transverter (all parts you need, description)
Option für extern. OCXO (all parts you need, description)
(3 x NE32584 C + 1 PCB + 1 x Drawing/circuit)
(3 x NE32584 C + 1 PCB + 1 x Drawing/circuit)
(1 x PCB + 2 x BAT 15-W3 + 1 pF)
(1 x PCB + 2 x BAT 15-W3 + 3 x BAR64-03W + 1 x BFP196)
(1 x PCB + 2 x BAT 15-W3 + 3 x BAR64-03W + 1 x BFP196)



• Important note:
The transverter KIT 1,3 GHz 13G28 needs an additional external band pass filter for 1296...1298 MHz, to achieve sufficient image rejection.

Specifications of the Transverters (KITS)

Type	KIT 1,3 GHz 13G2B	KIT 1,3 GHz 13G2B-28	KIT 2,3 GHz 23G2	KIT 3,4 GHz 34G2	KIT 5,7 GHz 57G2	KIT 10 GHz 10G2
Frequency range (RF) Options	1296 ... 1298 MHz	1296 ... 1298 MHz	2320 ... 2322 MHz USA: 2304...2306 MHz OSCAR: 2400...2402 MHz	3400 ... 3402 MHz USA: 3456 ... 3458 MHz	5760 ... 5762 MHz ext. OCXO	10368 ... 10370 MHz ext. OCXO
IF range	144 ... 146 MHz	28 ... 30 MHz	144 ... 146 MHz	144 ... 146 MHz	144 ... 146 MHz	144 ... 146 MHz
Output power	min. 0.4 W	min. 0.4 W	min. 1 W	min. 200 mW	min. 200 mW	min. 200 mW
IF input power	max. 3 W, adjustable	max. 3 W, adjustable	max. 3 W, adjustable	max. 3 W, adjustable	max. 3 W, adjustable	max. 3 W, adjustable
Noise figure @ 18 °C	typ. 0.8 dB	typ. 0.8 dB	typ. 0.8 dB	typ. 0.9 dB	typ. 1 dB	typ. 1.2 dB
Receive gain	min. 20 dB, adjustable	min. 20 dB, adjustable	min. 20 dB, adjustable	min. 20 dB, adjustable	min. 20 dB, adjustable	min. 20 dB, adjustable
Supply voltage	+12 ... 14 V DC	+12 ... 14 V DC	+12 ... 14 V DC	+12 ... 14 V DC	+12 ... 14 V DC	+12 ... 14 V DC
Current consumption	typ. 350 mA (TX)	typ. 350 mA (TX)	typ. 600 mA (TX)	typ. 400 mA (TX)	typ. 350 mA (TX)	typ. 350 mA (TX)
PTT voltage (to the IF connector)	+3 ... 14 V DC	+3 ... 14 V DC	+3 ... 14 V DC	+3 ... 14 V DC	+3 ... 14 V DC	+3 ... 14 V DC
Coaxial connectors	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female
Case	Tinplate	Tinplate	Tinplate	Tinplate	Tinplate	Tinplate

Kits

With the KIT MKU PA 1360 Kuhne electronic puts an power amplifier kit for the 23 cm band on the market. Because of it's high linearity this power amplifier is suitable for all amateur radio applications.

Important notes

- To achieve a successful construction of this Power Amplifier the builder has to have experiences in the use and handling of SMD-parts. Further more experiences with smaller projects in microwave circuits arevaluable. The construction of this Power Amplifier KIT is NOT a beginners' project! ESD sensitive devices (for example FETs) must be handled carefully.

Accessories

- Ready milled and drilled aluminium case
- Recommended power supply unit: SP 150 W 27
- Recommended heatsink: SK 300 - 62 1)
- Recommended fan: FAN 60x60 24 V 1)

For more information about the kit
please visit our website on
www.db6nt.com

Specifications

Type	KIT MKU PA 1360
Frequency range	1240 ... 1300 MHz adjustable
Input power	3.0 W
Maximum input power	4.0 W
Output power @ 50 Ohm	typ. 60 W
Input return loss (S11)	min. 10 dB
Maximum VSWR of load	1.8 : 1
Maximum case temperature	+55 °C
Monitor output	yes
Supply voltage	+ 27 V
Quiescent current	0.4 A
ON voltage	+12 ... 14 V DC
Current consumption	max. 5 A
Input connector	SMA-female / 50 ohms
Output connector	SMA-female / 50 ohms
Dimensions (mm)	130 x 60 x 20



Power Supply Units

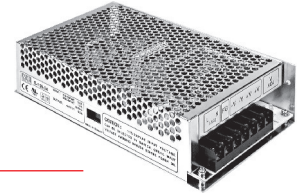
Power Supply Units

Type	Voltage (Output)	Current (Output)	Power	Voltage (Input)
SP 150 W 12	12 V DC	12.5 A	150 W	110 / 230 V AC, 50 ... 60 Hz
SP 150 W 13.5	13.5 V DC	11.2 A	150 W	110 / 230 V AC, 50 ... 60 Hz
S 150 W 24	24 V DC	6.5 A	150 W	110 / 230 V AC, 50 ... 60 Hz
SP 150 W 27	27 V DC	5.6 A	150 W	110 / 230 V AC, 50 ... 60 Hz
SP 200 W 12	12 V DC	16.7 A	200 W	110 / 230 V AC, 50 ... 60 Hz
SP 320 W 12	12 V DC	25 A	320 W	110 / 230 V AC, 50 ... 60 Hz
SP 320 W 13.5	13.5 V DC	22 A	320 W	110 / 230 V AC, 50 ... 60 Hz
SP 320 W 24	24 V DC	12.5 A	320 W	110 / 230 V AC, 50 ... 60 Hz
SP 320 W 27	27 V DC	11.7 A	320 W	110 / 230 V AC, 50 ... 60 Hz
SP 500 W 12	12 V DC	40 A	500 W	110 / 230 V AC, 50 ... 60 Hz
SP 500 W 24	24 V DC	20 A	500 W	110 / 230 V AC, 50 ... 60 Hz
SP 500 W 27	27 V DC	18 A	500 W	110 / 230 V AC, 50 ... 60 Hz
SP 500 W 48	48 V DC	10 A	500 W	110 / 230 V AC, 50 ... 60 Hz
RSP 1500 W 27	27 V DC	56 A	1500 W	110 / 230 V AC, 50 ... 60 Hz
RSP 2400 W 48	48 V DC	50 A	2400 W	180 / 264 V AC, 50 ... 60 Hz

Power Supply Units

SP 150 W 12 / SP 150 W 13.5 / SP 150 W 27

- AC input range selectable by switch
- Protections: Short circuit/Over load/Over voltage
- Cooling by free air convection
- 100% full load burn-in test
- Fixed switching frequency at 25KHz



Specifications

I/P = Input, O/P = Output, FG = Ground

Type	SP 150 W 12	SP 150 W 13.5	S 150 W 24
Input:			
AC input voltage range	85 ... 132 V AC 176 ... 264 V AC (47 - 63 Hz) 120 ... 370 VDC	85 ... 264 V AC (47 - 63 Hz) 120 ... 370 V DC	88 ... 132 V AC 176 ... 264 V AC (47 - 63 Hz) 248 ... 370 V DC
AC input current (at 230 V)	1.2 A	1.2 A	1.6 A
AC inrush current (at 230 V)	40 A	40 A	35 A
Efficiency	80 %	80 %	85 %
Output:			
DC voltage	12 V	13.5 V	24 V
Voltage adjust range	11.4 ... 13.2 V	12.8 ... 14.9 V	21 ... 28 V
Voltage tolerance	+/- 2.0 %	+/- 2.0 %	+/- 1.0 %
Ripple & noise	max. 100 mVpp	max. 100 mVpp	max. 240 mVpp
Rated current	12.5 A	11.2 A	6.5 A
Current range	0 ... 12.5 A	0 ... 11.2 A	0 ... 6.5 A
Rated power	150 W	151.2 W	156 W
Setup time, rise time	600 ms, 30 ms at full load (at 230 V AC)	600 ms, 30 ms at full load (at 230 V AC)	100 ms, 50 ms at full load (at 230 V AC)
Hold time (typ.)	20 ms at full load (at 230 V AC)	20 ms at full load (at 230 V AC)	28 ms at full load (at 230 V AC)
Protection:			
Over voltage	13.2 ... 16.2 V (Protection type: Shut down o/p voltage, repower on to recover)	14.85 ... 18.2 V (Protection type: Shut down o/p voltage, repower on to recover)	30 ... 34,8 V (Protection type: Shut down o/p voltage, re- power on to recover)
Withstand voltage	I/P-O/P: 3.0 kV AC I/P-FG: 1.5 kV AC O/P-FG: 0.5 kV AC	I/P-O/P: 3.0 kV AC I/P-FG: 1.5 kV AC O/P-FG: 0.5 kV AC	I/P-O/P: 3.0 kV AC I/P-FG: 1.5 kV AC O/P-FG: 0.5 kV AC
Dimensions in mm	199 x 99 x 50	199 x 99 x 50	199 x 110 x 50

Power Supply Unit

SP 150 W 27

- Universal AC input / Full range
- Built-in active PFC function, PF>0.95
- Built-in remote ON-OFF control
- Forced air cooling by built-in DC fan
- Protections: Short circuit/Over load/Over voltage/Over temperature
- Built-in cooling Fan ON-OFF control
- Built-in remote sense function
- Fixed switching frequency at 110KHz



Technische Daten

I/P = Input, O/P = Output, FG = Ground

Type	SP 150 W 27
Input:	
AC input voltage range	85 ... 264 V AC (47 - 63 Hz) 120 ... 370 V DC
AC input current (at 230 V)	1.2 A
AC inrush current (at 230 V)	40 A
Efficiency	80 %
Output:	
DC voltage	27 V
Voltage adjust range	25.7 ... 29.7 V
Voltage tolerance	+/- 1.0 %
Ripple & noise	max. 150 mVpp
Rated current	5.6 A
Current range	0 ... 5.6 A
Rated power	151.2 W
Setup time, rise time	600 ms, 30 ms ms at full load (at 230 V AC)
Hold time (typ.)	20 ms at full load (at 230 V AC)
Protection:	
Over voltage	29.7 ... 36.45 V (Protection type: Shut down o/p voltage, repower on to recover)
Withstand voltage	I/P-O/P: 3.0 kV AC I/P-F/G: 1.5 kV AC O/P-FG: 0.5 kV AC
Dimensions in mm	199 x 99 x 50

Power Supply Unit

SP 200 W 12

- Universal AC input / full range
- Built-in active PFC function, PF>0.95
- Built-in fan speed control
- Built-in cooling fan speed control
- Built-in constant current limiting circuit

- Protections: Short circuit/Over load/Over voltage/Over temperature
- Fixed switching frequency at PFC: 67KHz PWM: 134KHz
- LED indicator for power on
- 100% full load burn-in test
- Remote ON-OFF control (Optional)



I/P = Input, O/P = Output, FG = Ground

Specifications

Type	SP 200 W 12
Input:	
AC input voltage range	85 ... 264 V AC (47 - 63 Hz) 120 ... 370 V DC
AC input current (at 230 V)	1.7 A
AC inrush current (at 230 V)	40 A
Efficiency	79 %
Output:	
DC voltage	12 V
Voltage adjust range	11.4 ... 13.2 V
Voltage tolerance	+/- 2.0 %
Ripple & noise	max. 100 mVpp
Rated current	16.7 A
Current range	0 ... 16.7 A
Rated power	200.4 W
Setup time, rise time	600 ms, 30 ms at full load (at 230 V AC)
Hold time (typ.)	20 ms at full load (at 230 V AC)
Protection:	
Over voltage	14.85 ... 18.2 V (Protection type: Shut down o/p voltage, re-power on to recover)
Withstand voltage	I/P-O/P: 3.0 kV AC I/P-FG: 1.5 kV AC O/P-FG: 0.5 kV AC
Dimensions in mm	199 x 110 x 50

I/P = Eingang (Input), O/P = Ausgang (Output),
FG = Masseanschluss, I/P = Eingang (Input), O/P = Ausgang (Output),
FG = Masseanschluss (Ground)

Power Supply Units

SP 320 W 12 / SP 320 W 13.5 / SP 320 W 24 / SP 320 W 27

- Universal AC input / Full range
- Built-in active PFC function, PF>0.95
- Protections: Short circuit/Over load/Over voltage/Over temperature
- Forced air cooling by built-in DC Fan
- Built-in fan speed control
- Fixed switching frequency at 100KHz

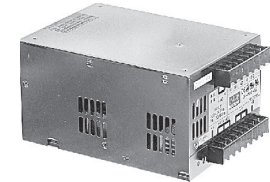


Specifications		I/P = Input, O/P = Output, FG = Ground			
Type	SP 320 W 12	SP 320 W 13.5	SP 320 W 24	SP 320 W 27	
Input:					
AC input voltage range	88 ... 264 V AC (47 - 63 Hz) 248 ... 370 V DC	88 ... 264 V AC (47 - 63 Hz) 124 ... 370 V DC	88 ... 264 V AC (47 - 63 Hz) 124 ... 370 V DC	88 ... 264 V AC (47 - 63 Hz) 124 ... 370 V DC	
AC input current (at 230 V)	2.5 A	2.5 A	2.5 A	2.5 A	
AC inrush current (at 230 V)	40 A	40 A	40 A	40 A	
Efficiency	86 %	86 %	87 %	88 %	
Output:					
DC voltage	12 V	13.5 V	24 V	27 V	
Voltage adjust range	10 ... 13.2 V	12 ... 15 V	20 ... 26.4 V	26 ... 31.5 V	
Voltage tolerance	+/- 1.0 %	+/- 1.0 %	+/- 1.0 %	+/- 1.0 %	
Ripple & noise	max. 150 mVpp	max. 150 mVpp	max. 150 mVpp	max. 200 mVpp	
Rated current	25 A	22 A	13 A	11.7 A	
Current range	0 ... 25 A	0 ... 22 A	0 ... 13 A	0 ... 11.7 A	
Rated power	300 W	297 W	312 W	315.9 W	
Setup time, rise time	800 ms, 50 ms at full load (at 230 V AC)	800 ms, 50 ms at full load (at 230 V AC)	800 ms, 50 ms at full load (at 230 V AC)	800 ms, 50 ms at full load (at 230 V AC)	
Hold time (typ.)	16 ms at full load (at 230 V AC)	16 ms at full load (at 230 V AC)	16 ms at full load (at 230 V AC)	16 ms at full load (at 230 V AC)	
Protection:					
Over voltage	13.8 ... 16.2 V (Protection type: Shut down o/p voltage, repower on to recover)	15.5 ... 18.2 V (Protection type: Shut down o/p voltage, repower on to recover)	27.6 ... 32.4 V (Protection type: Shut down o/p voltage, repower on to recover)	33.7 ... 39.2 V (Protection type: Shut down o/p voltage, repower on to recover)	
Withstand voltage	I/P-O/P: 3.0 kV AC I/P-FG: 1.5 kV AC O/P-FG: 0.5 kV AC	I/P-O/P: 3.0 kV AC I/P-FG: 1.5 kV AC O/P-FG: 0.5 kV AC	I/P-O/P: 3.0 kV AC I/P-FG: 1.5 kV AC O/P-FG: 0.5 kV AC	I/P-O/P: 3.0 kV AC I/P-FG: 1.5 kV AC O/P-FG: 0.5 kV AC	
Dimensions in mm	215 x 115 x 50	215 x 115 x 50	215 x 115 x 50	215 x 115 x 50	

Power Supply Units

SP 500 W 12 / SP 500 W 24 / SP 500 W 27 / SP 500 W 48

- Universal AC input / Full range
- Built-in active PFC function, PF>0.95
- Built-in remote ON-OFF control
- Forced air cooling by built-in DC fan
- Protections: Short circuit/Over load/Over voltage/Over temperature
- Built-in cooling Fan ON-OFF control
- Built-in remote sense function
- Fixed switching frequency at 110KHz



Specifications

I/P = Input, O/P = Output, FG = Ground

Type	SP 500 W 12	SP 500 W 24	SP 500 W 27	SP 500 W 48
Input:				
AC input voltage range	88 ... 264 V AC (47 - 63 Hz) 124 ... 370 V DC	88 ... 264 V AC (47 - 63 Hz) 124 ... 370 V DC	88 ... 264 V AC (47 - 63 Hz) 124 ... 370 V DC	88 ... 264 V AC (47 - 63 Hz) 124 ... 370 V DC
AC input current (at 230 V)	3.5 A	3.5 A	3.5 A	3.5 A
AC inrush current (at 230 V)	36 A	36 A	36 A	36 A
Efficiency	84 %	85.5 %	86.5 %	87 %
Output:				
DC voltage	12 V	24 V	27 V	48 V
Voltage adjust range	10 ... 13.2 V	20 ... 26.4 V	24 ... 30 V	41 ... 56 V
Voltage tolerance	+/- 1.0 %	+/- 1.0 %	+/- 1.0 %	+/- 1.0 %
Ripple & noise	max. 240 mVpp	max. 240 mVpp	max. 200 mVpp	max. 300 mVpp
Rated current	40 A	20 A	18 A	10 A
Current range	0 ... 40 A	0 ... 20 A	0 ... 18 A	0 ... 10 A
Rated power	480 W	480 W	486 W	480 W
Setup time, rise time	1500 ms, 50 ms at full load (at 230 V AC)	1500 ms, 50 ms at full load (at 230 V AC)	1500 ms, 50 ms at full load (at 230 V AC)	1500 ms, 50 ms at full load (at 230 V AC)
Hold time (typ.)	24 ms at full load (at 230 V AC)	24 ms at full load (at 230 V AC)	24 ms at full load (at 230 V AC)	24 ms at full load (at 230 V AC)
Protection:				
Over voltage	13.8 ... 16.2 V (Protection type: Hiccup mode, recovers automatically after fault condition is removed)	27.6 ... 32.4 V (Protection type: Hiccup mode, recovers automatically after fault condition is removed)	31 ... 36.5 V (Protection type: Hiccup mode, recovers automatically after fault condition is removed)	57.6 ... 67.2 V (Protection type: Hiccup mode, recovers automatically after fault condition is removed)
Withstand voltage	I/P-O/P: 3.0 kV AC I/P-FG: 1.5 kV AC O/P-FG: 0.5 kV AC	I/P-O/P: 3.0 kV AC I/P-FG: 1.5 kV AC O/P-FG: 0.5 kV AC	I/P-O/P: 3.0 kV AC I/P-FG: 1.5 kV AC O/P-FG: 0.5 kV AC	I/P-O/P: 3.0 kV AC I/P-FG: 1.5 kV AC O/P-FG: 0.5 kV AC
Dimensions in mm	170 x 120 x 93	170 x 120 x 93	170 x 120 x 93	170 x 120 x 93

Power Supply Units

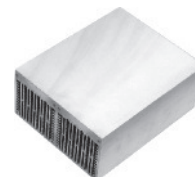
RSP 1500 W 27 / RSP 2400 W 48

- Universal AC input/Full range
- AC input active surge current limiting
- Built-in active PFC function, PF>0.95
- Forced air cooling by built-in DC ball bearing fan
- High efficiency
- Built-in remote sense function
- Built-in 12V/0.1A auxiliary output for remote control
- Built-in remote ON-OFF control
- Protections: Short circuit / Overload / Over voltage / Over temperature



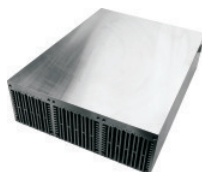
Specifications	I/P = Input, O/P = Output, FG = Ground	
	RSP 1500 W 27	RSP 2400 W 48
Type		
Input:		
AC input voltage range	90 ... 264 V AC (47 - 63 Hz) 127 ... 370 V DC	180 ... 264 V AC (47 - 63 Hz) 254 ... 370 V DC
AC input current (at 230 V)	8 A	12 A
AC inrush current (at 230 V)	60 A	60 A
Efficiency	90 %	91.5 %
Output:		
DC voltage	27 V	48 V
Voltage adjust range	24 ... 30 V	43 ... 56 V
Voltage tolerance	+/- 1.0 %	+/- 1.0 %
Ripple & noise	max. 150 mVpp	max. 200 mVpp
Rated current	56 A	50 A
Current range	0 ... 56 A	0 ... 50 A
Rated power	1512 W	2400 W
Setup time, rise time	1500 ms, 100 ms at full load (at 230 V AC)	1000 ms, 80 ms at full load (at 230 V AC)
Hold time (typ.)	10 ms at full load (at 230 V AC)	12 ms at full load
Protection:		
Over voltage	31 ... 36.5 V (Protection type: Shut down o/p voltage, re- power on to recover)	57.6 ... 67.2 V (Protection type: Shut down o/p voltage, re-power on to recover)
Withstand voltage	I/P-O/P: 3.0 kV AC I/P-FG: 1.5 kV AC O/P-FG: 0.5 kV AC	I/P-O/P: 3.0 kV AC I/P-FG: 1.5 kV AC O/P-FG: 0.5 kV AC
Dimensions in mm	278 x 127 x 83.5	278 x 177.8 x 63.5

Heat Sinks



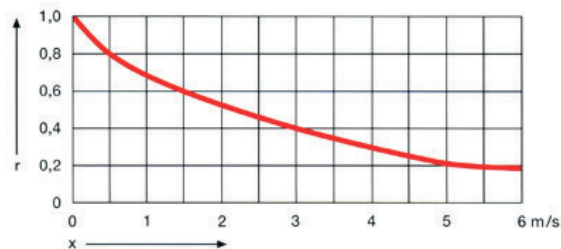
Specifications

Type	SK 120 - 75	SK 200 - 80	SK 150 - 62	SK 200 - 125	SK 200 - 160
Dimensions in (mm)	150 x 75 x 40 mm	200 x 80 x 85 mm	150 x 62 x 75 mm	200 x 125 x 75 mm	200 x 160 x 85 mm
Material	Aluminium, black anodized	Aluminium blank, flat milled base	Aluminium blank, flat milled base	Aluminium blank, flat milled base	Aluminium blank, flat milled base
K / W	1.25	0.13 at 5 m/s	0.21 at 5 m/s	0.09 at 5 m/s	0.065 at 5 m/s
Weight	typ. 470 g	typ. 1700 g	typ. 800 g	typ. 2200 g	typ. 3500 g



Specifications

Typ	SK 300 - 62	SK 320 - 240
Abmessungen	300 x 62 x 75 mm	320 x 240 x 85 mm
Material	Aluminium blank, flat milled base	Aluminium blank, flat milled base
K / W	0.15 at 5 m/s	0.03 at 5 m/s
Weight	typ. 1600 g	typ. 8000 g



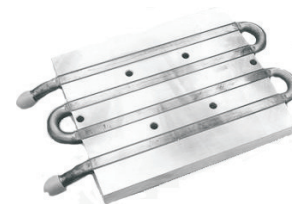
Reduction of thermal resistance with forced convection of airspeed 'x' in m/s

For more information how to dimension a heat sink please visit our website on www.db6nt.com

Heat Sink

WK 15 - 12

- Liquid cold plate for different cooling liquids



Specifications

Type	WK 15 - 12
K / W	0.012 °C/W at 15 l / min
Material	Plate: aluminium blank, Tube: Cu, flat milled base
Cooling Fluid	H ₂ O, Glycol/H ₂ O, De-ionized water, Oil, Dielectric Fluids, POA
Dimensions of mounting plate	152(X) x 127 x 15.2 mm
Cu Tube outer / inner diameter	9.5 mm / 7.0 mm
Weight	typ. 900 g

Circulators

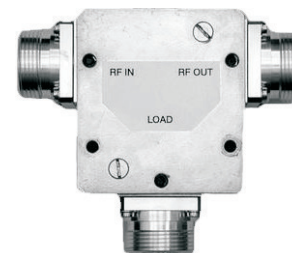
VAM 1081 - VAN 1053 A

Circulator as a protection in case of bad antenna matching

To protect a power amplifier in case of bad antenna matching the use of a circulator is recommended. This item conducts the reflected power into an external terminating resistor where it is absorbed. Therefore the power amplifier is protected well because the output stage is always matched correctly.

Specifications

Type	VAM 1081	VAN 1053 A
Frequency range	1250 ... 1300 MHz	1275 ... 1325 MHz
Isolation	min. 23 dB	min. 23 dB
Loss	max. 0.3 dB	max. 0.2 dB
VSWR	1:15	max. 1:15
Power	max. 500 W (CW)	max. 1000 W (CW)
Operating temperature	-20 ... +70 °C	0 ... +60 °C
Connectors	3x N-female	7/16" (3 x female)
Dimensions (mm)	52 x 49 x 27	65 x 74 x 38



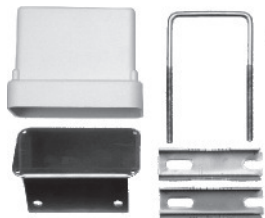
Fans incl. fan grills

Specifications				
Type	FAN 60x60 12 V	FAN 60x60 24 V	FAN 80x80 12 V	FAN 80x80 24 V
Dimensions in (mm)	60 x 60 x 25	60 x 60 x 25	80 x 80 x 25	80 x 80 x 25
Supply voltage	12 V	24 V	12 V	24 V
Current consumption	0.12 A	0.11 A	0.14 A	0,065 A
Airflow	40 m³/h	37.5 m³/h	70 m³/h	70 m³/h
Noise	33 dBA	34.3 dBA	35 dBA	35 dBA
Bearing system	ball	ball	ball	ball
Fan grill	60x60	60x60	80x80	80x80
Dimensions (mm)	60x60	60x60	80x80	80x80



Specifications				
Type	FAN 60x60 HP 12 V	FAN 60x60 HP 24 V	FAN 80x80 HP 12 V	FAN 80x80 HP 24 V
Dimensions in (mm)	60 x 60 x 25	60 x 60 x 25	80 x 80 x 25	80 x 80 x 25
Supply voltage	12 V	24 V	12 V	24 V
Current consumption	0.47 A	0.13 A	0.38 A	0.21 A
Airflow	63 m³/h	46.8 m³/h	90 m³/h	90 m³/h
Noise	44 dBA	39 dBA	40 dBA	40 dBA
Bearing system	ball	ball	ball	ball
Fan grill	60x60	60x60	80x80	80x80
Abmessungen	60x60	60x60	80x80	80x80

Tower Mount Case



TTTT Waterproof case for self mounting available

Dimension inside
max. 90 x 75 x 40 mm
incl. V2A - mounting clamp

Low Noise Amplifiers / Broadband Preamplifiers

Low Noise Amplifiers										
Type	Frequency Range (MHz)	Noise Figure (dB) ¹⁾		Gain typ. (dB)	Power Supply		Connectors		Case Type	Remarks
		typical	maximum		DC Voltage (V)	Current (mA)	Input	Output		
KU LNA 133 BH	1200 ... 1400	0.6		32	+12	100	SMA, female	SMA, female	milled aluminium	
KU LNA 163 BH	1500 ... 1700	0.6		31	+12	100	SMA, female	SMA, female	milled aluminium	
KU LNA 183 BH	1600 ... 1900	0.6		29	+12	100	SMA, female	SMA, female	milled aluminium	
KU LNA 222 AH	2200 ... 2400	0.5		30	9 ... 15	80	SMA, female	SMA, female	milled aluminium	Super low noise HEMT, high IP3
KU LNA 3436 A	3400 ... 3600	0.8	0.9	29 (+/- 2)	9 ... 15	80	SMA, male	SMA, female	milled aluminium	
KU LNA 3436 B	3400 ... 3600	0.8	0.9	29 (+/- 2)	9 ... 15	80	SMA, female	SMA, female	milled aluminium	
KU LNA 3446 C	3400 ... 3600	0.7	0.8	26 (+/- 2)	9 ... 15	80	SMA, female	SMA, female	milled aluminium	
KU LNA 4450 A	4400 ... 5000	0.8		24	8 ... 14	110	SMA, female	SMA, female	milled aluminium	
KU LNA 5059 A	5000 ... 5900	1.5		30	9 ... 14	130	SMA, female	SMA, female	milled aluminium	
KU LNA 6570 A	6500 ... 7000	0.8		23	8 ... 12	90	SMA, female	SMA, female	milled aluminium	
KU LNA 682 A	6800	1.0		26	9 ... 15	30	SMA, female	SMA, female	milled aluminium	
KU LNA 682 A-Bias	6800	1.0		26	9 ... 15	30	SMA, female	SMA, female	milled aluminium	
KU LNA 922 A	9200	0.8		25	9 ... 15	30	SMA, male	SMA, female	milled aluminium	
KU LNA 922 B	9200	0.8		25	9 ... 15	30	SMA, female	SMA, female	milled aluminium	

1) Noise figure values at +18 °C.

Only for narrowband preamplifiers:
noise figure is specified at center frequency.

Important notes

- Low noise amplifiers are static sensitive devices. Handle with care!
- Maximum input power 1 mW (unless otherwise specified).
- The low noise amplifiers do not contain coaxial relays!
- In case of outdoor installation, protection against water and moisture is required!
- Other connectors or cases are available on request.

Please contact us for more information or visit our website on www.db6nt.com

Products for professional applications

Low Noise Amplifiers / Broadband Preamplifiers

Broadband Preamplifiers										
Type	Frequency Range (MHz)	Noise Figure (dB) ¹⁾		Gain typ. (dB)	Power Supply		Connectors		Case Type	Remarks
		typical	maximum		DC Voltage (V)	Current (mA)	Input	Output		
KU LNA BB 1018 A	100 ... 180	1.0	1.3	20 (+/- 2)	12 ... 15	400	SMA, female	SMA, female	milled aluminium	High IP3: typ. 44 dBm @ 140 MHz
KU LNA BB 2240 A	225 ... 400	1.0	1.2	20 (+/- 2.5)	12 ... 15	400	SMA, female	SMA, female	milled aluminium	High IP3, output P1dB typ. 28 dBm
KU LNA BB 3050 A	350 ... 500	1.0	1.3	20 (+/- 3)	12 ... 15	400	SMA, female	SMA, female	milled aluminium	High IP3: typ. 40 dBm @ 400 MHz
KU LNA BB 0515 A-SMA	5 ... 1500	1.2	2.0	20	12 ... 14	120	SMA, female	SMA, female	milled aluminium	High IP3, bias-T optional
KU LNA BB 0515 B-N	5 ... 1500	1.2	2.0	20	12 ... 14	120	N, female	N, female	milled aluminium	High IP3, bias-T optional
KU LNA BB 0515 C-N	5 ... 1500	1.2	2.0	20	12 ... 14	120	N, female	N, male	milled aluminium	High IP3, bias-T optional
KU LNA BB 1020 A	1000 ... 2000	0.8	1.0	> 28	12 ... 15	350	SMA, female	SMA, female	milled aluminium	High IP3: typ. 37 dBm @ 1500 MHz
KU LNA BB 1522 A	1500 ... 2200	0.8	1.0	> 27	12 ... 15	250	SMA, female	SMA, female	milled aluminium	High IP3: typ. 36 dBm @ 1800 MHz
KU LNA BB 2227 A	2200 ... 2700	0.9	1.2	> 25	12 ... 15	250	SMA, female	SMA, female	milled aluminium	High IP3, built-in bias-T
KU LNA BB 3000 A	10 ... 3000	2.0	2.5	25 ... 30	12 ... 15	150	SMA, female	SMA, female	milled aluminium	High-IP3, typ. 30 dBm (min. 26 dBm)
KU LNA BB 3000 C-N	10 ... 3000	2.0	2.5	25 ... 30	12 ... 15	150	N, female	N, male	milled aluminium	High IP3, typ. 30 dBm (min. 26 dBm)
KU LNA BB 2533 A	2500 ... 3300	1.2	1.3	33	12 ... 15	120	SMA, female	SMA, female	milled aluminium	High IP3, built-in bias-T
KU LNA BB 0180 A-SMA	1 ... 7000	4.0		23 (+/- 3)	12 ... 15	90	SMA, female	SMA, female	milled aluminium	High IP3, bias-T optional
KU LNA BB 0180 B-N	1 ... 7000	4.0		23 (+/- 3)	12 ... 15	90	N, female	N, female	milled aluminium	High IP3, bias-T optional
KU LNA BB 0180 C-N	1 ... 7000	4.0		23 (+/- 3)	12 ... 15	90	N, female	N, male	milled aluminium	High IP3, bias-T optional
KU LNA BB 0112 A	100 ... 12000	6.0		20	12 ... 15	100	SMA, female	SMA, female	milled aluminium	
KU LNA BB 202 A	100 ... 20000	3.5		28	12 ... 14	190	SMA, female	SMA, female	milled aluminium	

1) Noise figure values at +18 °C.
Only for narrowband preamplifiers:
noise figure is specified at center frequency.

Important notes

- Low noise amplifiers are static sensitive devices. Handle with care!
- Maximum input power 1 mW (unless otherwise specified).
- The low noise amplifiers do not contain coaxial relays!
- In case of outdoor installation, protection against water and moisture is required!
- Other connectors or cases are available on request.

Please contact us for more information or visit our website on www.db6nt.com

Power Amplifiers

Products for professional applications

Type	Frequency Range	Input Power	Output Power CW	Output Power COFDM	Gain	DC Voltage	Current
KU PA 4550 A	450 ... 500 MHz	30 mW	35 W		30 dB	+12 V	max. 8.5 A
KU PA 0850 N	800 ... 900 MHz	30 ... 50 mW	1 W		15 dB	+12 ... 14 V	typ. 350 mA
KU PA 1401 A	1300 ... 1400 MHz	50 ... 80 mW	1 W		13 dB	+12 ... 14 V	max. 0.5 A
KU PA 1430 A	1300 ... 1400 MHz	1 W	30 W			+26 V	max. 3.5 A
KU PA 1430 B	1350 ... 1450 MHz	1 W	25 W			+26 V	max. 3.5 A
KU PA 1545 A	1400 ... 1600 MHz	1 W	45 W			+28 V	max. 5 A
KU PA 1505 A	1450 ... 1600 MHz	10 mW	4 W			+12 ... 14 V	max. 1.5 A
KU PA 15150 A	1450 ... 1500 MHz	4 W	120 W		16 dB	+28 V	max. 12 A
KU PA 1605 A	1600 ... 1680 MHz	10 mW	4 W		27 dB	+12 ... 14 V	max. 1.5 A
KU PA 16150 A	1620 ... 1670 MHz	4 W	140 W		18 dB	+28 V	max. 12 A
KU PA 1940 A	1700 ... 2200 MHz	80 mW	50 W		30 dB	+28 V	max. 4.5A
KU PA 1810 A	1800 ... 1900 MHz	50 mW	10 W		23 dB	+28 V	max. 0.9 A
KU PA 1845 A	1800 ... 2000 MHz	1.5 W	45 W		16 dB	+28 V	typ. 4.5 A
KU PA 2145 A	1900 ... 2200 MHz	60 mW	35 W		26 dB	+28 V	max. 5.2 A
KU PA 2045 A	2000 ... 2100 MHz	1.5 W	45 W		16 dB	+28 V	max. 4.5 A
KU PA 222 TX	2100 ... 2300 MHz	50 mW	> 4 W	0.5 ... 1 W	20 dB	+12 ... 14 V	max. 1.5 A
KU PA 242 TX	2300 ... 2500 MHz	50 mW	> 4 W	0.5 ... 1 W	20 dB	+12 ... 14 V	max. 1.5 A
KU PA 262 TX	2500 ... 2700 MHz	50 mW	> 4 W	0.5 ... 1 W	20 dB	+12 ... 14 V	max. 1.5 A
KU PA 223 BBA	2100 ... 2300 MHz	3 mW	> 4 W	0.5 ... 1 W	34 dB	+12 ... 14 V	max. 1.5 A
KU PA 243 BBA	2300 ... 2500 MHz	3 mW	> 4 W	0.5 ... 1 W	33 dB	+12 ... 14 V	max. 1.5 A
KU PA 263 BBA	2500 ... 2700 MHz	3 mW	> 4 W	0.5 ... 1 W	31 dB	+12 ... 14 V	max. 1.5 A
KU PA 2127 ALK	2100 ... 2700 MHz	1 mW	> 4 W	0.5 ... 1 W	39 dB	+11 ... 14 V	typ. 1.6 A
KU PA 2327 AL	2300 ... 2700 MHz	1 mW	> 4 W	0.5 ... 1 W	39 dB	+11 ... 14 V	typ. 1.6 A
KU PA 2027 BK	2000 ... 2700 MHz	5 mW	> 8 W	0.8 ... 2 W	37 dB	+11 ... 14 V	max. 3.5 A
KU PA 2327 BL	2300 ... 2700 MHz	5 mW	> 8 W	0.8 ... 2 W	37 dB	+11 ... 14 V	max. 3.5 A
KU PA 2327 LD-20	2300 ... 2700 MHz	0.5 mW	typ. 18 W	4 ... 7 W	44 dB	+11 ... 26 V	max. 8.7 A
KU PA 2123 A	2100 ... 2300 MHz	0.1 mW	> 20 W	2 ... 5 W	55 dB	+11 ... 14 V	typ. 8.0 A
KU PA 2325 A	2300 ... 2500 MHz	0.1 mW	> 20 W	2 ... 5 W	55 dB	+11 ... 14 V	typ. 8.0 A
KU PA 2527 A	2500 ... 2700 MHz	0.1 mW	> 20 W	2 ... 5 W	53 dB	+11 ... 14 V	typ. 8.0 A
KU PA 2123 B	2100 ... 2300 MHz	15 mW	> 20 W	2 ... 5 W	31 dB	+11 ... 14 V	typ. 7.5 A
KU PA 2325 B	2300 ... 2500 MHz	15 mW	> 20 W	2 ... 5 W	31 dB	+11 ... 14 V	typ. 7.5 A
KU PA 2527 B	2500 ... 2700 MHz	15 mW	> 20 W	2 ... 5 W	31 dB	+11 ... 14 V	typ. 7.5 A
KU PA 2123 C	2100 ... 2300 MHz	2 W	> 20 W	2 ... 5 W	10 dB	+11 ... 14 V	typ. 6.0 A
KU PA 2325 C	2300 ... 2500 MHz	2 W	> 20 W	2 ... 5 W	10 dB	+11 ... 14 V	typ. 6.0 A
KU PA 2527 C	2500 ... 2700 MHz	2 W	> 20 W	2 ... 5 W	10 dB	+11 ... 14 V	typ. 6.0 A
KU PA 2123 D	2100 ... 2300 MHz	5 W	> 50 W	5 ... 13 W	10 dB	+13 V	typ. 10 A
KU PA 2325 D	2300 ... 2500 MHz	5 W	> 50 W	5 ... 13 W	10 dB	+13 V	typ. 10 A
KU PA 2527 D	2500 ... 2700 MHz	5 W	> 50 W	5 ... 13 W	10 dB	+13 V	typ. 10 A

Type	Frequency Range	Input Power	Output Power CW	Output Power COFDM	Gain	DC Voltage	Current
KU PA 2123 E	2100 ... 2300 MHz	12 W	typ. 100 W	10 ... 25 W	10 dB	+13 V	typ. 22 A
KU PA 2325 E	2300 ... 2500 MHz	12 W	typ. 100 W	10 ... 25 W	10 dB	+13 V	typ. 22 A
KU PA 2527 E	2500 ... 2700 MHz	12 W	typ. 100 W	10 ... 25 W	10 dB	+13 V	typ. 22 A
KU PA 2325 F	2300 ... 2500 MHz	15 W	typ. 150 W	15 ... 38 W	10 dB	+13 V	typ. 30 A
KU PA 2527 F	2500 ... 2700 MHz	15 W	typ. 150 W	15 ... 38 W	10 dB	+13 V	typ. 30 A
KU PA 2021 LD 200	2000 ... 2100 MHz	15 W	200 W	20 ... 50 W	10 dB	+28 V	max. 22 A
KU PA 2122 LD 200	2100 ... 2200 MHz	15 W	200 W	20 ... 50 W	10 dB	+28 V	max. 22 A
KU PA 2223 LD 200	2200 ... 2300 MHz	15 W	200 W	20 ... 50 W	10 dB	+28 V	max. 22 A
KU PA 2323 LD 200	2250 ... 2350 MHz	15 W	200 W	20 ... 50 W	10 dB	+28 V	max. 22 A
KU PA 2345 A	2300 ... 2500 MHz	1.6 W	40 W	max. 10 W	13 dB	+28 V	typ. 4 A
MKU PA 3240 TX	3200 ... 4000 MHz	5 mW	3.3 W	max 0.6 W	27 dB	+12 ... 14 V	typ. 1.7 A
KU PA 3436 AL	3400 ... 3600 MHz	0.5 mW	4 W	0.4 ... 1.0 W	46 dB	+11 ... 14 V	max. 2.4 A
KU PA 3436 B	3400 ... 3600 MHz	0.2 mW	18 W	2 ... 4 W	45 dB	+11 ... 14 V	typ. 5.5 A
KU PA 3450 MM	3400 ... 5000 MHz	20 dBm	33 dBm		24 dB	+12 ... 14 V	max. 1.8 A
KU PA 4450 - 8 B	4400 ... 5000 MHz	10 mW	7 W	1 ... 2 W	36 dB	+12 ... 14 V	max. 4 A
KU PA 4450 - 30 A	4400 ... 5000 MHz	10 mW	14 W	5 W	46 dB	+12 ... 14 V	max. 12 A
KU PA 3337 TX	3300 ... 3700 MHz	5 mW	1.6 W	200 ... 500 mW	26 dB	+11 ... 14 V	typ. 1 A
KU PA 5060 TX	5000 ... 6000 MHz	8 mW	800 mW	100 ... 250 mW	21 dB	+10 ... 14 V	typ. 530 mA
KU PA 5358 AL	5300 ... 5800 MHz	2 mW	3.5 W		34 dB	+12 ... 14 V	max. 2.5 A
KU PA 5359 A	5300 ... 5900 MHz	5 mW	9 W	2 W	35 dB	+12 ... 14 V	max. 4.5 A
KU PA 6800 TR	6800 MHz	10 mW	500 mW		17 dB	+12 ... 14 V	typ. 350 mA
KU PA 6800 A	6800 MHz	10 mW	8 W		29 dB	+12 ... 14 V	typ. 3 A
KU PA 6800 B	6800 MHz	200 mW	8 W		16 dB	+12 ... 14 V	typ. 3 A
KU PA 6800 C	6800 MHz	400 mW	15 W		16 dB	+12 ... 14 V	typ. 6.5 A
KU PA 6834 TX	6834 MHz	10 mW	900 mW		20 dB	+12 ... 15 V	typ. 820 mA
KU PA 8183 TX	8100 ... 8300 MHz	10 mW	800 mW		19 dB	+12 ... 15 V	typ. 820 mA
KU PA 093 MM	8500 ... 10000 MHz	8 mW	1.5 W		23 dB	+12 ... 14 V	typ. 1.8 A
KU PA 092 X	9200 MHz (+/- 10 MHz)	200 mW	4 W		13 dB	+12 ... 14 V	typ. 2.0 A
KU PA 092 XLC	9200 MHz (+/- 10 MHz)	200 mW	15 W		18 dB	+12 ... 14 V	typ. 8.0 A
KU PA 103 MM	9500 ... 11000 MHz	8 mW	1.5 W		23 dB	+12 ... 14 V	typ. 1.8 A
KU PA 113 MM	11000 ... 12500 MHz	8 mW	1.5 W		23 dB	+12 ... 14 V	typ. 1.8 A
KU PA 142 AVS	14000 ... 14500 MHz	200 mW	3 W		13 dB	+12 ... 14 V	typ. 1.6 A
KU PA 14005 A-3	14000 ... 14500 MHz	20 mW	6 W		30 dB	+12 ... 14 V	typ. 4.0 A
KU PA 00305-100 A	30 ... 550 MHz	8 dBm	100 W		48 dB	+28 V	max. 8.5 A
KU PA BB 233 BBA	500 ... 2500 MHz	1 mW	1.0 ... 3 W		30 dB	+12 ... 14 V	typ. 1.7 A
KU PA BB 2025 A	50 ... 2500 MHz	1 mW	1.5 ... 3 W		33 dB	+24 ... 26 V	typ. 700 mA
KU PA BB 325 A	30 ... 2500 MHz	3 dBm	8 W		43 dB	+28 V	max. 1.5 A
KU PA BB 5030 A	50 ... 3000 MHz	3 mW	2 ... 4 W		32 dB	+24 ... 26 V	typ. 850 mA
KU PA BB 109 A	50 ... 900 MHz	23 dBm	35.5 ... 38 dBm		33 dB	+28 V	max. 1.1 A

Products for professional applications

Low Noise Converters

Type	Frequency Range RF	Frequency Range IF	Noise Figure	Gain	Remarks
KU LNC 2027 B PRO	2000 ... 2700 MHz	167 ... 867 MHz	1.0 dB	30 dB	Analog / Digital TV applications
KU LNC BB 2030 B	2020 ... 3000 MHz	20 ... 1000 MHz	2.0 dB	30 dB	Analog / Digital TV applications
KU LNC 23-3	2100 ... 2600 MHz	1184 ... 1684 MHz	1.0 dB	40 dB	Analog / Digital TV applications
KU LNC 23-3 TM	2100 ... 2600 MHz	1184 ... 1684 MHz	1.0 dB	40 dB	Analog / Digital TV applications
KU LNC 25	2350 ... 2550 MHz	1433.5 ... 1633.5 MHz	0.7 dB	40 dB	Analog / Digital TV applications
KU LNC 25 TM	2350 ... 2550 MHz	1433.5 ... 1633.5 MHz	0.7 dB	40 dB	Analog / Digital TV applications
KU LNC 2227 B PRO	2200 ... 2700 MHz	367 ... 867 MHz	1.0 dB	30 dB	
KU LNC 3436 A	3400 ... 3560 MHz	400 ... 560 MHz	1.0 dB	44 dB	
KU LNC 3136 A	3100 ... 3600 MHz	200 ... 700 MHz	2.0 dB	37 dB	
KU LNC 5257 A PRO	5100 ... 5700 MHz	1150 ... 1700 MHz	1.1 dB	35 dB	
KU LNC 5659 C PRO	5600 ... 5900 MHz	400 ... 700 MHz	1.0 dB	40 dB	
KU LNC 6772 A	6700 ... 7200 MHz	300 ... 800 MHz	1.5 dB	38 dB	
KU LNC 107 A	10000 ... 10700 MHz	1400 ... 2100 MHz	1.3 dB	36 dB	Preliminary data

PLL-stabilized Oscillators

Type	Frequency	Phase Noise @ 10 kHz	Output Power	Remarks
KU LO 2000 PLL	2000 MHz	typ. -90 dBc / Hz	up to 100 mW	Fixed frequency (not adjustable)
KU LO xxxx PLL	xxxx MHz	typ. -90 dBc / Hz	up to 100 mW	Fixed frequency in the range 100 ... 4000 MHz - please request

Oscillator for Microwave Transverters

Type	Frequency	Output Power	Input Frequency	Remarks
MKU LO 92	9200 MHz	typ. 200 mW	internal oscillator *	

*) Option 01: connector for external oscillator (without internal oscillator)

Please contact us for more information or visit our website on www.db6nt.com

Up Converters

Type	Frequency Range RF	Frequency Range IF	Bandwidth	Output Power	Remarks
KU UP 2123 A	2100 ... 2700 MHz	540 ... 740 MHz	200 MHz	50 mW	
KU UP 2325 A	2300 ... 3600 MHz	597 ... 797 MHz	200 MHz	50 mW	
KU UP 2527 A	2500 ... 2700 MHz	662 ... 862 MHz	200 MHz	100 mW	Analog / Digital TV applications
KU UP 3436 A	3400 ... 3600 MHz	400 ... 600 MHz	200 MHz	20 mW	Analog / Digital TV applications
KU UP 5457 A	5400 ... 5700 MHz	400 ... 700 MHz	300 MHz	100 mW	Analog / Digital TV applications
KU UP 5659 A	5600 ... 5900 MHz	400 ... 700 MHz	300 MHz	100 mW	Analog / Digital TV applications
KU UP 107 A	10000 ... 10700 MHz	2260 ... 2310 MHz	min. 50 MHz	1 W	Please specify desired frequency in your order!
KU UP 107 B	10000 ... 10700 MHz	960 ... 1660 MHz	700 MHz	250 mW	Preliminary data!
KU UP 112 A	10700 ... 11400 MHz	2240 ... 2470 MHz	min. 50 MHz	1 W	Please specify desired frequency in your order!
KU UP 1212 A	12200 ... 12700 MHz	950 ... 1450 MHz	min. 50 MHz	1 W	Preliminary data!
KU UP 114 B	13750 ... 14500 MHz	950 ... 1450 MHz	750 MHz	200 mW	Preliminary data!

Frequency Multipliers

Type	Input Frequency Range	Input Power	Output Frequency Range	Output Power	Fundamental Rejection
KU X2 1020 B	9 ... 11 GHz	typ. -2 dBm (max. +4 dBm)	18 ... 22 GHz	> +4 dBm (typ. +7 dBm)	> 30 dB
KU X2 2040 SHF	19.5 ... 22 GHz	-1 ... +3 dBm	39 ... 44 GHz	> +4 dBm	30 dB

Signal Generator

Type	Frequency	Frequency Tolerance	Phase Noise @ 100 kHz	Output Power	Fundamental Rejection
KU SG 2.45 – 30 A	2450 MHz	+/- 10 kHz	typ. -104 dBc / Hz	2 ... 30 W (adjustable)	> 50 dB
KU SG 2325 100	2300 ... 2500 MHz	+/- 10 kHz	typ. -104 dBc / Hz	1 ... 100 W (adjustable)	> 50 dB
KU SG 2325 200	2300 ... 2500 MHz	+/- 10 kHz	typ. -104 dBc / Hz	1 ... 200 W (adjustable)	> 50 dB

Products for professional applications

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Geschäftsführerin / Manager: Jutta Kuhne

General Terms and Conditions of Business with Private Customers (9.2012)

Note: This is a translation of a German document into English language.
As we do business only under German Law, in cases of dispute only the German wording of the GTCs will apply.

1. Scope

The following general terms and conditions (GTCs) apply for all contracts, shipments, and other services between Kuhne electronic GmbH and private customers. Private customers in the sense of this document are natural persons which do or intend to do business with Kuhne electronic GmbH not practising a commercial or self-employed business thereby.

Kuhne electronic GmbH does not accept any conditions which are opposite to or deviating from these GTCs conflicting terms and conditions of a customer do not become valid unless the terms and conditions are explicitly and individually recognized in writing by Kuhne electronic GmbH.

2. Conclusion of Contract

The presentation of the products in the catalogue does not constitute a legally binding offer of Kuhne electronic GmbH but an invitation to order. By sending an order, customer enters into a legally binding offer for a respective contract. The contract will be concluded with our confirmation of the order within two weeks after dispatch of the order or by delivery of goods ordered.

2.1. Force Majeure

1. The Parties are not responsible for the failure to perform its contractual obligations if the failure is due to circumstances beyond their control for the cause of the hindrance and in particular but not limited to if it is one of the following causes: Fire, natural disasters, act of war, confiscation, export regulations (prohibition of export), embargo or other acts of government, general shortage of materials, limitation of power consumption, industrial disputes or if there is a breach of contract by suppliers on any such circumstances. The impediment and its removal must be reported immediately to the other contractual Party.

2. Either Party may terminate the contract by written notice, if the fulfillment of the contract is prevented for more than six months according to clause No. 1.

3. Instruction on Right of Revocation:

Right of Revocation

You may declare the revocation of your contractual statement in text form (e.g. letter, fax, email) or by returning the merchandise within a period of two weeks. The revocation does not have to contain any grounds. The revocation period commences upon receipt of this declaration of revocation in text form but not before receipt of merchandise (in cases of recurrent deliveries of uniform goods not before receipt of first instalment) and also not before fulfilment of our information obligation upon Art. 246 § 2 in conj. with § 1 para 1 and 2 EGBGB as well as fulfilment of our obligations acc. To § 312 e para 1 BGB (German commercial Code) in conj. with Art. 246 § 3 EGBGB. The time-limit shall be deemed to be observed by the timely dispatch of the declaration of revocation or the return shipment.

The revocation is to be addressed to:
Kuhne electronic GmbH, Scheibenacker 3, D-95180 Berg
Telefax: + 49 (0)9293/800938
Email: info@kuhne-electronic.de

Consequences of revocation

In case of a valid revocation, all mutually received performances as well as emoluments (e.g.

interest) taken, if applicable, are to be restituted by either side. If you are unable or partially unable to restate the merchandise to us or can only restate it in a deteriorated condition, then you have to insofar compensate for its value. This does not apply if the deterioration is exclusively due to examining the merchandise as for instance in a retail store. For a deterioration exclusively due to intended use of merchandise no restitution has to be made.

Goods that can be shipped by parcel are to be returned on our risk. You are obliged to bear the costs of the return shipment if the merchandise delivered corresponds to the merchandise ordered, and if the price of merchandise to be sent back does not exceed an amount of 40 € or if, where the price is higher, you have at the date of the revocation not yet rendered consideration or given a part payment. In all other cases, the return shipment for you is free of charge. Things that cannot be shipped by parcel will be picked up.

All reimbursement obligations must be fulfilled within 30 days. For you, time limit starts with sending of the declaration of revocation or merchandise, for us with their receipt.
End of revocation instruction

4. Dispatch and Delivery

The delivery of goods ordered will be effected within one to three workdays. The compliance with our delivery obligation furthermore requires the due and orderly performance of the customer's obligations in due time. The defence of non-performance of the contract is reserved.

Delivery times for customized products and goods not in stock are not binding unless seller committed itself to a binding delivery date in written form.

In case we are not able to keep bidding delivery dates due to reasons we are not responsible for (impossibility of performance, e.g. because our suppliers fail to deliver) we shall inform the buyer without delay and determine a new delivery period which appears reasonable according to the circumstances.

If performance continues to be impossible also within the newly determined period, we shall be entitled to cancel the agreement completely or partly; we shall thereupon immediately reimburse any already provided counter-performance. Cases of impossibility of performance include cases of force majeure (e.g. strike, business interruptions/restraints, or transport difficulties).

5. Prices and Payment

The prices stated are EURO-prices (including VAT). Shipping cost are not included.

We offer delivery against payment in advance, against invoice, direct debit, or credit card. For delivery to new customers or customers from outside Germany, payment has to be effected in advance. In case of purchase on account (invoice), customer is obliged to settle invoice within 21 days after receipt of goods in full unless otherwise agreed. For payments with credit card or debit credit, collection takes place before the goods are dispatched.

Please note our New Conditions for Payment with Credit Card from August 2012 onwards:

For payment by credit card the following process has to be followed.

After you (the customer) has sent a request for quotation or a purchase order to Kuhne electronic, you will receive from Kuhne electronic an order confirmation or a proforma invoice with the delivery time(s) via email.

In the same email you will get from Kuhne electronic a link to a website in order to process the credit card payment.

General Terms and Conditions of Business with Private Customers (9.2012)

On this page you can enter your credit card data, the proforma invoice number or order confirmation number as well as your customer account number (if applicable) and you will be forwarded to a secure web page of the Kuhne electronic contract partner company "1 & 1" for the processing of electronic payment options (i-payment).

The credit card details are processed directly at our partner "1 & 1". You will receive a message whether the payment was successful, or why the card is not accepted (foreign customers sometimes need to contact the bank to have to release the payment to a foreign country). This message can be printed out by you.

After successful payment, Kuhne electronic will receive a message from "1 & 1" that the payment was made and that the order can be produced or delivered, depending on whether it is a custom product, a standard product, or whether the product is in stock.

The buyer shall not be entitled to offset payment against counterclaims unless such claims are undisputed or finally established by court. Further, buyer is only authorized to exercise the right of retention to the extent as his counter claim is based on the same contractual relationship.

If you use your right of revocation, you have to bear regular cost of return if the merchandise delivered corresponds to the merchandise ordered, and if the price of merchandise to be sent back does not exceed an amount of 40 € or if, where the price is higher, you have at the date of the revocation not yet rendered consideration or given a part payment. In all other cases, the return shipment for you is free of charge.

6. Warranty

Palpable defaults in material or production including transport damages should be notified to us in writing within two weeks upon receipt. Failure of timely complaint does not effect your legal claims.

Buyer has the choice if supplementary performance is to be executed by remedial action or substitute delivery. Whereas, we are authorized to refuse chosen alternative if this is only feasible under disproportional cost and the other alternative does not stay with any substantial disadvantages. During supplementary performance, a reduction of price or rescission of contract are excluded. Supplementary performance deems to be failed when performed twice without success if from the mod of article or failure any other result can be drawn. Already the opening or destroying of the seal on our modules leads to caveat emptor. The guarantee for semiconductors and the withdrawal of those is also disclaimed. Customized products and special developments may not be returned.

In addition, statutory provisions apply.

7. Retention of Title

We reserve title of all goods delivered until complete settlement of all contractual receivables. Also, extended reservation of title applies.

Upon any levy of execution or other respective third party actions we have to be immediately informed to execute our rights under § 771 BGB.

8. Final Provisions

All disputes resulting from this contractual relationship are solely governed by German law. If any regulation in these terms and conditions or within the scope of further agreements should become ineffective the effectiveness of all remaining regulations or agreements is not touched. The stipulation which is invalid in whole or in part shall be replaced by an arrangement which comes as closely as possible to the invalid stipulation in terms of its economic effect.

In case of any dispute of these GTCs, the German version of the GTCs will prevail over the English version.



We develop and manufacture professional devices for the frequency range 0.1 ... 50 GHz. This includes customer defined amplifiers, mixers, oscillators and systems.