CB
AMATEUR RADIO
ELECTRONIC DEVICES

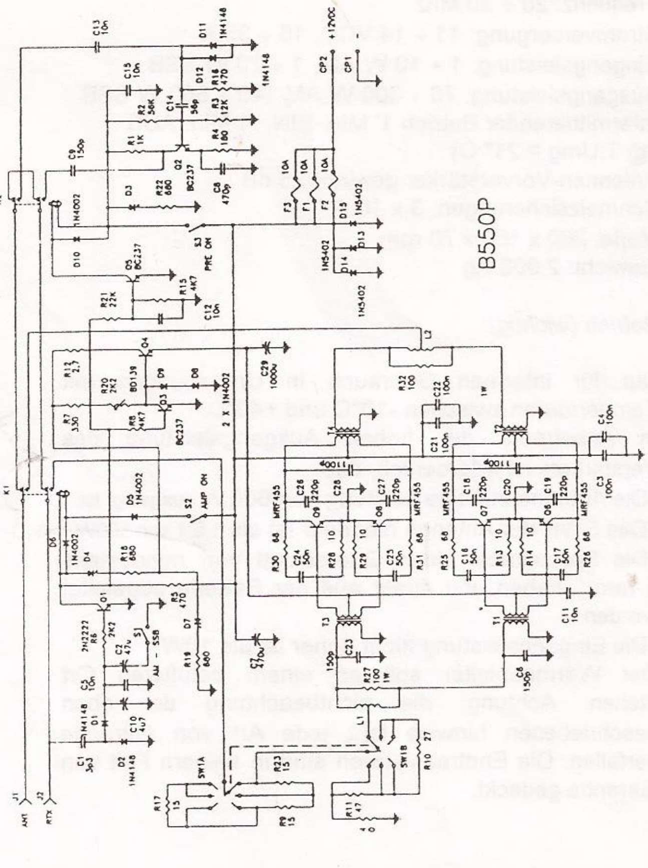
Alimentatori	*Power supply*
Riduttori di tensione	*Voltage reducer*
Caricabatterie	*Battery charger*
Convertitori 12VCC→220VCA	*Inverter 12VDC→220VAC*
Amplificatori RF di potenza	*RF Power amplifiers*
Carichi fittizi	*Dummy load*
Rosmetri e wattmetri RF	*SWR and RF power meter*
Adattatori di impedenza	*Transmatch*
Preamplificatori	*Preamplifier*
Demiscelatori	*Splitters*
Commutatori d'antenna	*Antenna switch*
Microfoni da tavolo	*Desk microphones*
Microfoni palmari	*Handheld microphones*
Frequenzimetri	*Frequency counter*

Richiedere il catalogo illustrato
Ask for illustrative catalogue

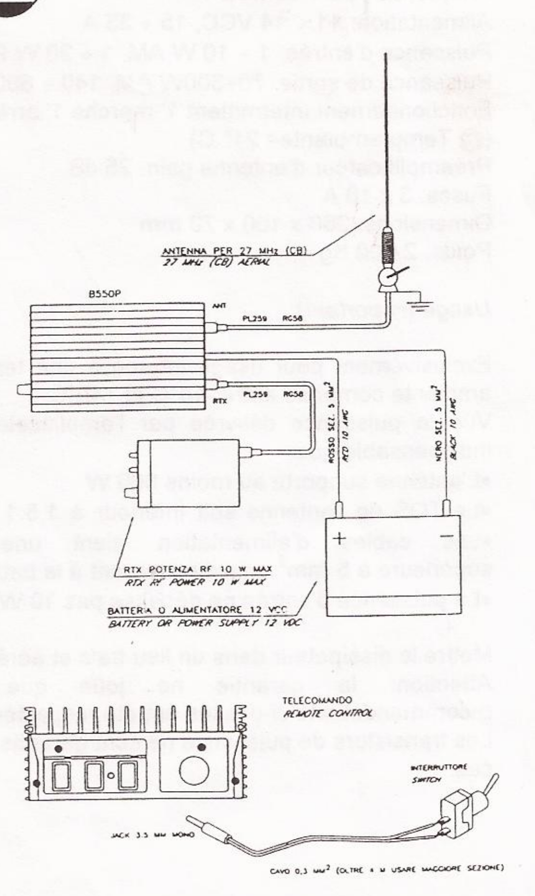
B550P

CE

ZETAGI S.p.A.
Via Ozanam, 29
20049 CONCOREZZO (MI) - Italy
Tel. + 39. 39.6049346 / 6041763
Fax + 39. 39.6041465



ZG_B550P_N2



AMPLIFICATORE LINEARE B550P

Caratteristiche:

Frequenza: 20 ÷ 30 Mhz
Alimentazione: 11 ÷ 14 VCC, 15 ÷ 35 A
Potenza d'ingresso: 1 ÷ 10 W AM, 1 ÷ 20 W SSB
Potenza d'uscita: 70 ÷ 300 W AM, 140 ÷ 600 W SSB
Funzionamento intermittente 1' ON 1' OFF
(@ Tamb.= 21° C)
Guadagno preamplificatore d'antenna: 25 dB
Fusibili: 3 x 10 A
Dimensioni: 260 x 160 x 70 mm
Peso: 2,600 Kg

Impiego (importante):

Solo per uso interno in ambienti con temperatura compresa da -10°C a +40°C.
Data l'alta potenza in uscita dell'amplificatore è necessario che:
•L'antenna sopporti una potenza pari a 600 W
•Il ROS d'antenna deve essere inferiore a 1,5:1 a 500 W
•I cavi d'alimentazione devono essere almeno da $5mm^2$ di sezione e devono partire direttamente dalla batteria
•La potenza d'ingresso non deve essere superiore a 10W

Posizionare il dissipatore in un luogo aerato.
Attenzione: si avverte che non osservando le suddette regole decade ogni forma di garanzia.
In ogni caso i transistor finali ne sono sempre esclusi

LINEAR AMPLIFIER B550P

Specifications:

Frequency: 20 ÷ 30 Mhz
Power Supply: 11 ÷ 14 VDC, 15 ÷ 35 A
Input power: 1 ÷ 10 W AM, 1 ÷ 20 W SSB
Output power: 70 ÷ 300 W AM, 140 ÷ 600 W SSB
Intermittent operation 1' ON 1' OFF
(@ R.Temp.= 21° C)
Antenna preamplifier gain: 25 dB
Fuses: 3 x 10 A
Size: 260 x 160 x 70 mm
Weight: 2.600 Kg

Application (important):

Only for internal use in rooms with a temperature of between -10°C and +40°C.
Given the amplifier's high output power it is important that:
•The aerial is able to carry effective power of 600 W
•The aerial SWR is less than 1.5:1 at 500 W
•The power cables must have a cross section of at least 5 mm^2 and must be connected directly to the battery
•Input power must not exceed 10W.

Install the heat sink in well-ventilated surroudings.
Notice: all guarantee rights are waived in the event of failure to comply with the above regulations.
The output transistors are not covered by the terms of the guarantee.

AMPLIFICATEUR LINEAIRE B550P

Caractéristiques:

Fréquence: 20 ÷ 30 Mhz
Alimentation: 11 ÷ 14 VCC, 15 ÷ 35 A
Puissance d'entrée: 1 ÷ 10 W AM, 1 ÷ 20 W BLU
Puissance de sortie: 70÷300W AM, 140 ÷ 600 W BLU
Fonctionnement intermittent 1' marche 1' arrêt
(@ Temp.ambiante= 21° C)
Préamplificateur d'antenne gain: 25 dB
Fuses: 3 x 10 A
Dimensions: 260 x 160 x 70 mm
Poids: 2,600 Kg

Usage (important):

Exclusivement pour usage interne à une température ambiante comprise entre -10°C et +40°C.
Vue la puissance délivrée par l'amplificateur, il est indispensable que:
•L'antenne supporte au moins 600 W
•Le TOS de l'antenne soit inférieur à 1,5:1 à 500 W
•Les cables d'alimentation aient une section supérieure à 5 mm^2 unis directement à la batterie
•La puissance d'entrée ne dépasse pas 10 W.

Mettre le dissipateur dans un lieu frais et aéré.
Attention: la garantie ne joue que si les recommandations ci-dessus ont été respectée.
Les transistors de puissance ne sont garantis en aucun cas.

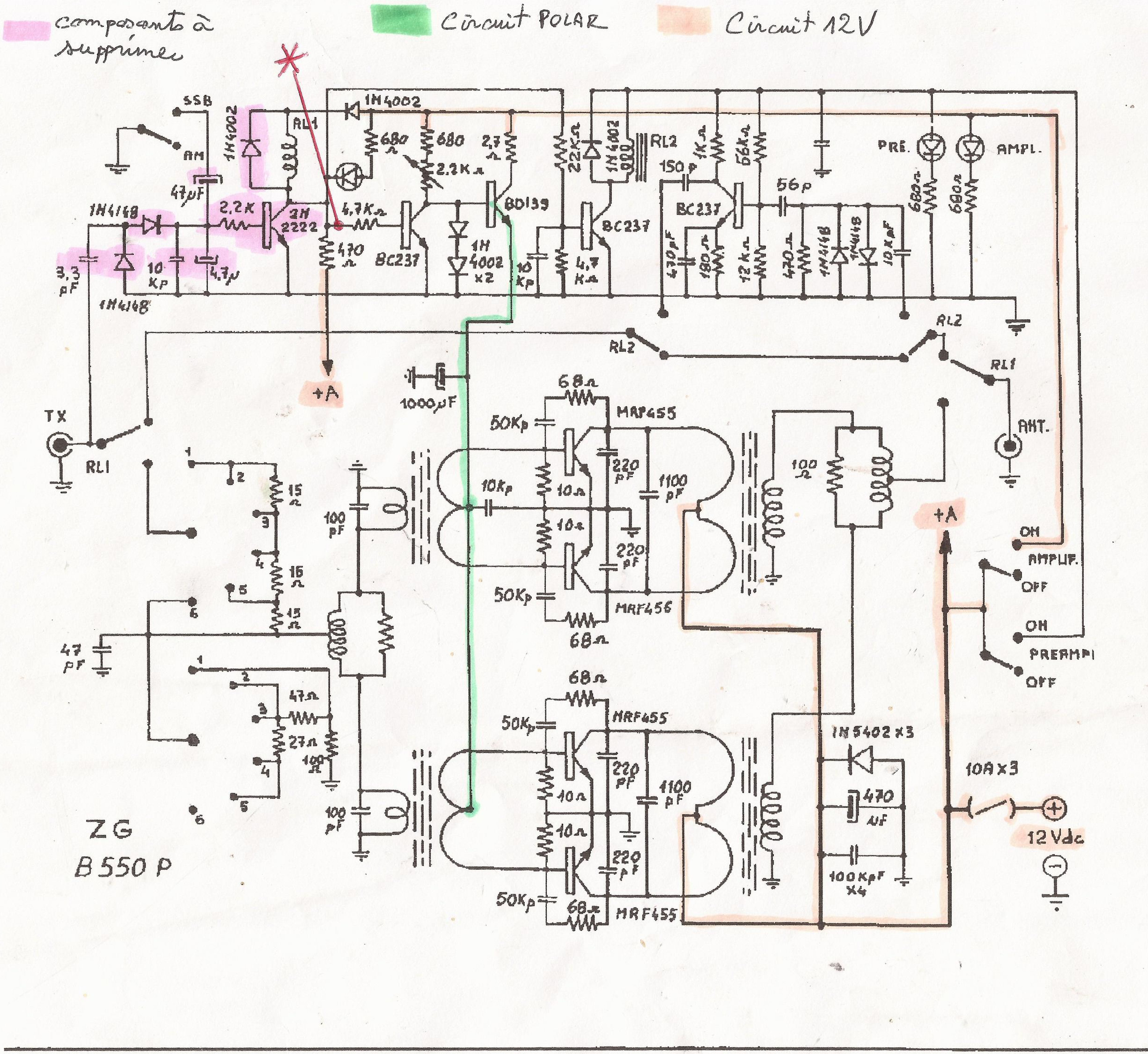
LINEARVERSTÄRKER B550P

Eigenschaften:

Frequenz: 20 ÷ 30 Mhz
Stromversorgung: 11 ÷ 14 VCC, 15 ÷ 35 A
Eingangsleistung: 1 ÷ 10 W AM, 1 ÷ 20 W SSB
Ausgangsleistung: 70 ÷ 300 W AM 140 ÷ 600 W SSB
Intermittierender Betrieb 1' Min. EIN, 1 Min. AUS
(@ T.Umg.= 21° C)
Antennen-Vorverstärker gewinn: 25 dB
Schmelzsicherungen: 3 x 10 A
Maβe: 260 x 160 x 70 mm
Gewicht: 2,600 Kg

Betrieb (wichtig):

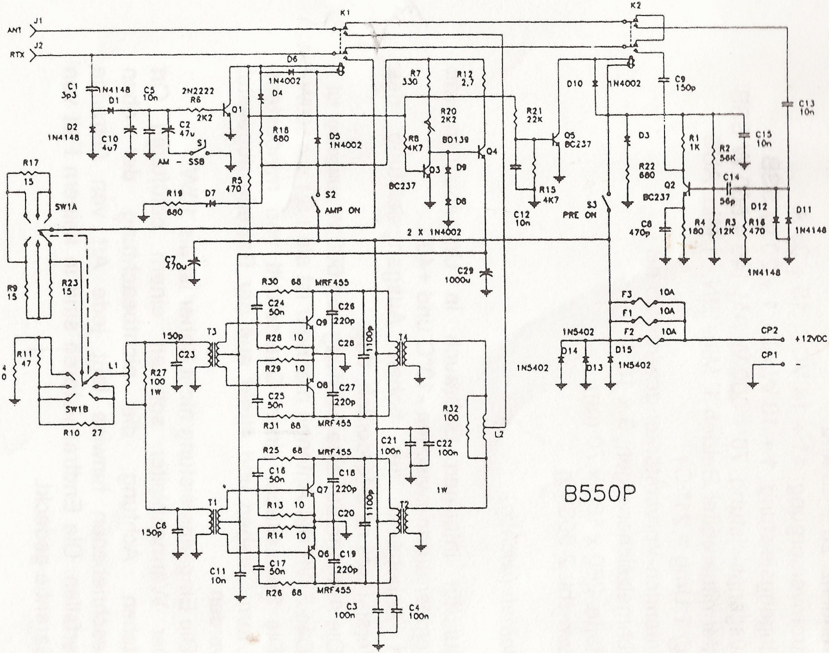
Nur für intermen Gebrauch in Umgebungen mit Temperaturen zwischen -10°C und +40°C.
In Anbetracht der hohen Ausgangsleistung des Verstärkers ist erforderlich, daβ:
•Die Antenne auf eine Leistung von 600 W ausgelegt ist
•Das SWR der Antenne niedriger ist als 1,5:1 von 500W
•Die Speisekabel einen Querschnitt von mindestens 5 mm^2 haben und direkt aus der Batterie abgeleitet werden
•Die Eingangsleistung nicht höher ist als 10W.
Der Wärmeableiter soll an einem belüfteten Ort stehen. Achtung: die nichtbeachtung der oben beschriebenen hinwise läβt jede Art von Garantie verfallen. Die Endtransistoren sind in keinem Fall von Garantie gedeckt.



B 550 P - AMPLIFICATEUR MOBILE

CARACTERISTIQUES :

Fréquence : 3 - 30 MHz
Alimentation : 13,8 V DC
Consommation : 15 - 35 A
Puissance d'entrée : 1 - 10 W AM, 1 - 20 W SSB
Puissance de sortie : 70 - 250 W AM, 140 - 400 W SSB
Préampli 25 dB gain
6 puissances de sortie
Dimensions : 260 x 160 x 70 mm



ANT
J1
RTX
J2
K1
K2
C1
3p3
1N4148
D1
C5
10n
2N2222
R6
2K2
Q1
D2
1N4148
C10
4u7
C2
47u
S1
AM - SSB
D6
1N4002
D4
R18
680
D5
1N4002
R5
470
R19
680
D7
S2
AMP ON
R7
330
R12
2,7
R20
2K2
R8
4K7
BD139
Q4
Q3
BC237
D9
D8
2 X 1N4002
R21
22K
Q5
BC237
C12
10n
R15
4K7
C29
1000u
D10
1N4002
C9
150p
D3
R1
1K
R2
56K
C15
10n
C13
10n
R22
680
Q2
BC237
C14
56p
S3
PRE ON
C8
470p
R4
180
R3
12K
R16
470
D12
D11
1N4148
1N4148
R17
15
SW1A
C7
470u
R9
15
R23
15
R11
47
40
SW1B
L1
R10
27
150p
C23
T3
R27
100
1W
R30
68
MRF455
C24
50n
Q9
C26
220p
R28
10
C28
1100p
T4
R29
10
C25
50n
Q8
C27
220p
R31
68
MRF455
R32
100
L2
C21
100n
C22
100n
1W
R25
68
MRF455
C16
50n
Q7
C18
220p
R13
10
C20
1100p
T1
T2
C6
150p
R14
10
Q6
C19
220p
C17
50n
C11
10n
R26
68
MRF455
C3
100n
C4
100n
F3
10A
F1
10A
F2
10A
1N5402
D14
D13
D15
1N5402
1N5402
CP2
+12VDC
CP1
-
B550P

ZG_B550P_N2

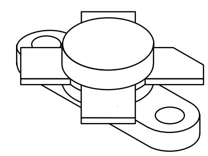
The RF Line
NPN Silicon RF Power Transistor

MRF455

. . . designed for power amplifier applications in industrial, commercial and amateur radio equipment to 30 MHz.

- Specified 12.5 Volt, 30 MHz Characteristics —
  Output Power = 60 Watts
  Minimum Gain = 13 dB
  Efficiency = 55%

60 W, 30 MHz
RF POWER
TRANSISTOR
NPN SILICON



CASE 211–07, STYLE 1

MATCHING PROCEDURE

In the push–pull circuit configuration it is preferred that the transistors are used as matched pairs to obtain optimum performance.

The matching procedure used by Motorola consists of measuring h_{FE} at the data sheet conditions and color coding the device to predetermined h_{FE} ranges within the normal h_{FE} limits. A color dot is added to the marking on top of the cap. Any two devices with the same color dot can be paired together to form a matched set of units.

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CEO}	18	Vdc
Collector–Emitter Voltage	V_{CES}	36	Vdc
Emitter–Base Voltage	V_{EBO}	4.0	Vdc
Collector Current — Continuous	I_C	15	Adc
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	175 1.0	Watts W/°C
Storage Temperature Range	T_{stg}	–65 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.0	°C/W

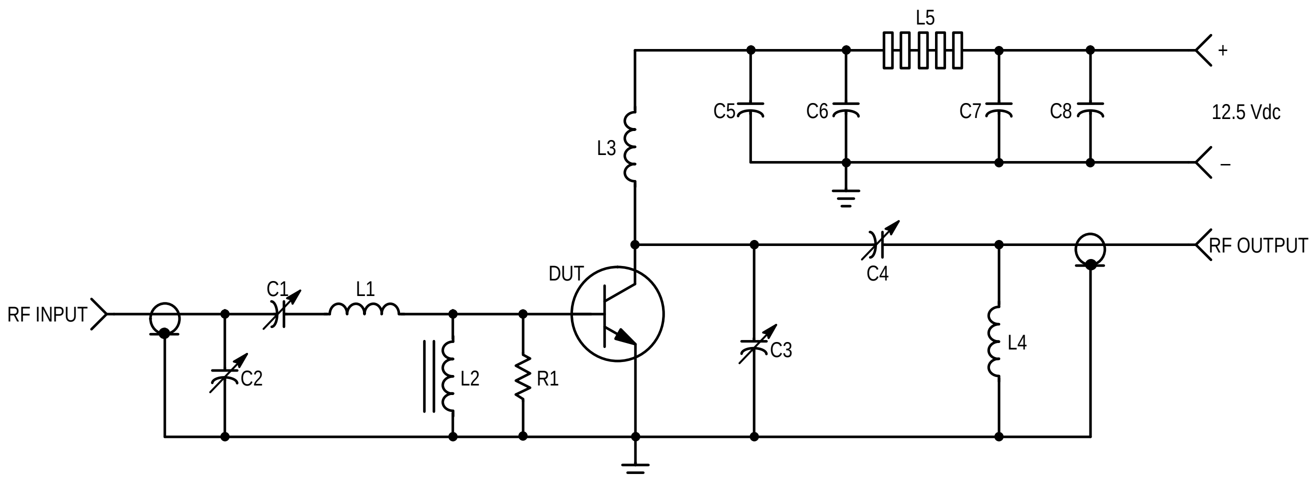
ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage (I_C = 100 mAdc, I_B = 0)	$V_{(BR)CEO}$	18	—	—	Vdc
Collector–Emitter Breakdown Voltage (I_C = 50 mAdc, V_{BE} = 0)	$V_{(BR)CES}$	36	—	—	Vdc
Emitter–Base Breakdown Voltage (I_E = 10 mAdc, I_C = 0)	$V_{(BR)EBO}$	4.0	—	—	Vdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 5.0 Adc, V_{CE} = 5.0 Vdc)	h_{FE}	10	—	150	—
DYNAMIC CHARACTERISTICS					
Output Capacitance (V_{CB} = 12.5 Vdc, I_E = 0, f = 1.0 MHz)	C_{ob}	—	—	250	pF

(continued)

ELECTRICAL CHARACTERISTICS — continued (T_C = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
FUNCTIONAL TESTS (Figure 1)					
Common–Emitter Amplifier Power Gain (V_{CC} = 12.5 Vdc, P_{out} = 60 W, f = 30 MHz)	G_{pe}	13	—	—	dB
Collector Efficiency (V_{CC} = 12.5 Vdc, P_{out} = 60 W, f = 30 MHz)	η	55	—	—	%
Series Equivalent Input Impedance (V_{CC} = 12.5 Vdc, P_{out} = 60 W, f = 30 MHz)	Z_{in}	—	1.66–j.844	—	Ohms
Series Equivalent Output Impedance (V_{CC} = 12.5 Vdc, P_{out} = 60 W, f = 30 MHz)	Z_{out}	—	1.73–j.188	—	Ohms
Parallel Equivalent Input Impedance (V_{CC} = 12.5 Vdc, P_{out} = 60 W, f = 30 MHz)	Z_{in}	—	2.09/1030	—	Ω/pF
Parallel Equivalent Output Impedance (V_{CC} = 12.5 Vdc, P_{out} = 60 W, f = 30 MHz)	Z_{out}	—	1.75/330	—	Ω/pF



C1, C2, C4 — ARCO 469
C3 — ARCO 466
C5 — 1000 pF, UNELCO
C6, C7 — 0.1 µF Disc Ceramic
C8 — 1000 µF/15 V Electrolytic
R1 — 10 Ohm/1.0 Watt, Carbon

L1 — 3 Turns, #18 AWG, 5/16″ I.D., 5/16″ Long
L2 — VK200–20/4B, FERROXCUBE
L3 — 12 Turns, #18 AWG Enameled Wire, 1/4″ I.D., Close Wound
L4 — 3 Turns 1/8″ O.D. Copper Tubing, 3/8″ I.D., 3/4″ Long
L5 — 7 FERRITE Beads, FERROXCUBE #56–590–65/3B

Figure 1. 30 MHz Test Circuit Schematic

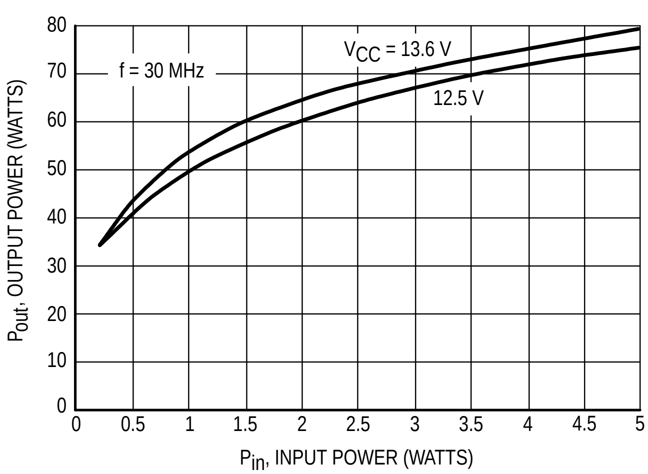


Figure 2. Output Power versus Input Power

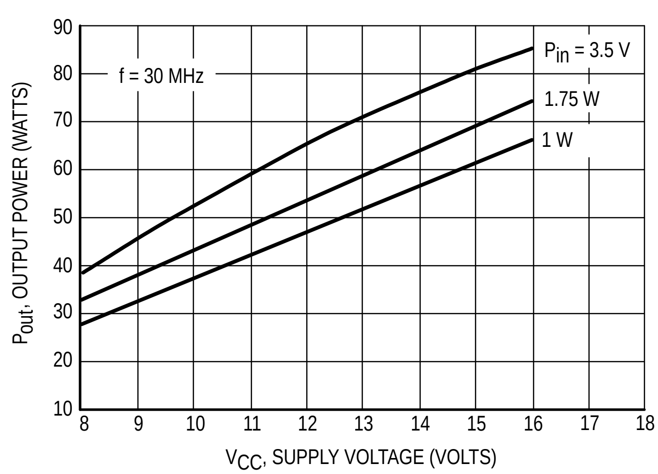
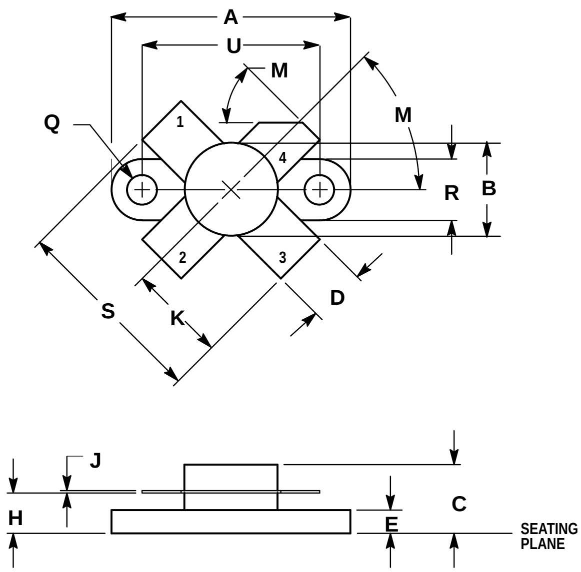


Figure 3. Output Power versus Supply Voltage

PACKAGE DIMENSIONS



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.960	0.990	24.39	25.14
B	0.370	0.390	9.40	9.90
C	0.229	0.281	5.82	7.13
D	0.215	0.235	5.47	5.96
E	0.085	0.105	2.16	2.66
H	0.150	0.108	3.81	4.57
J	0.004	0.006	0.11	0.15
K	0.395	0.405	10.04	10.28
M	40°	50°	40°	50°
Q	0.113	0.130	2.88	3.30
R	0.245	0.255	6.23	6.47
S	0.790	0.810	20.07	20.57
U	0.720	0.730	18.29	18.54

STYLE 1:
PIN 1. EMITTER
2. BASE
3. EMITTER
4. COLLECTOR

CASE 211–07
ISSUE N

Literature Distribution Centers:
USA: Motorola Literature Distribution; P.O. Box 20912; Phoenix, Arizona 85036.
EUROPE: Motorola Ltd.; European Literature Centre; 88 Tanners Drive, Blakelands, Milton Keynes, MK14 5BP, England.
JAPAN: Nippon Motorola Ltd.; 4-32-1, Nishi-Gotanda, Shinagawa-ku, Tokyo 141, Japan.
ASIA PACIFIC: Motorola Semiconductors H.K. Ltd.; Silicon Harbour Center, No. 2 Dai King Street, Tai Po Industrial Estate, Tai Po, N.T., Hong Kong.

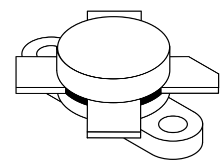
MRF421

The RF Line
NPN Silicon RF Power Transistor

Designed primarily for application as a high–power linear amplifier from 2.0 to 30 MHz.

- Specified 12.5 Volt, 30 MHz Characteristics —
  Output Power = 100 W (PEP)
  Minimum Gain = 10 dB
  Efficiency = 40%
- Intermodulation Distortion @ 100 W (PEP) —
  IMD = –30 dB (Min)
- 100% Tested for Load Mismatch at all Phase Angles with 30:1 VSWR

100 W (PEP), 30 MHz
RF POWER
TRANSISTORS
NPN SILICON



CASE 211–11, STYLE 1

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CEO}	20	Vdc
Collector–Base Voltage	V_{CBO}	45	Vdc
Emitter–Base Voltage	V_{EBO}	3.0	Vdc
Collector Current — Continuous	I_C	20	Adc
Withstand Current — 10 s	—	30	Adc
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	290 1.66	Watts W/°C
Storage Temperature Range	T_{stg}	–65 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.6	°C/W

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted.)

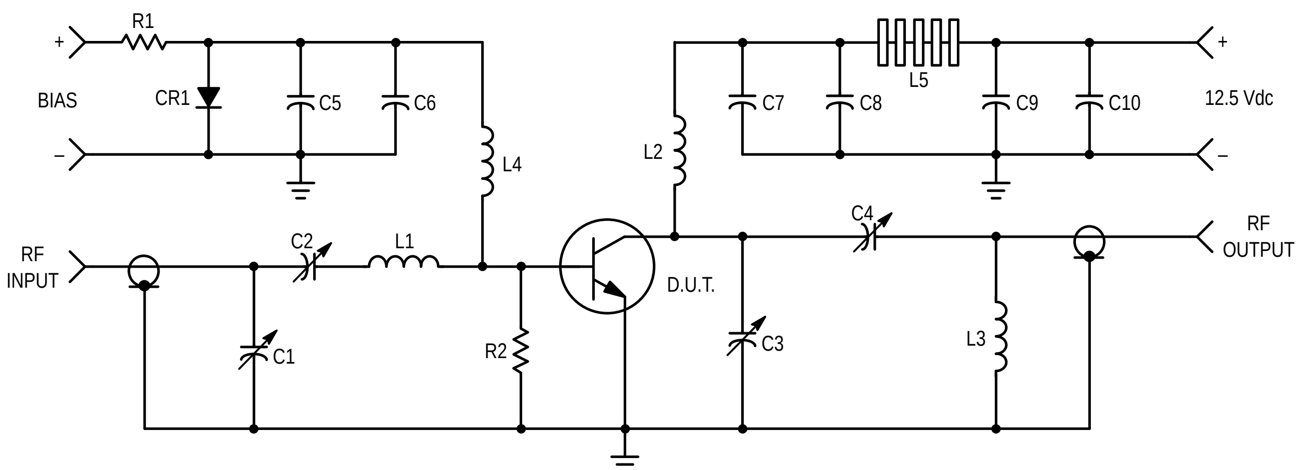
Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage (I_C = 50 mAdc, I_B = 0)	$V_{(BR)CEO}$	20	—	—	Vdc
Collector–Emitter Breakdown Voltage (I_C = 200 mAdc, V_{BE} = 0)	$V_{(BR)CES}$	45	—	—	Vdc
Collector–Base Breakdown Voltage (I_C = 200 mAdc, I_E = 0)	$V_{(BR)CBO}$	45	—	—	Vdc
Emitter–Base Breakdown Voltage (I_E = 10 mAdc, I_C = 0)	$V_{(BR)EBO}$	3.0	—	—	Vdc
Collector Cutoff Current (V_{CE} = 16 Vdc, V_{BE} = 0, T_C = 25°C)	I_{CES}	—	—	10	mAdc

(continued)

ELECTRICAL CHARACTERISTICS – continued (T_C = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS					
DC Current Gain (I_C = 5.0 Adc, V_{CE} = 5.0 Vdc)	h_{FE}	10	70	—	—
DYNAMIC CHARACTERISTICS					
Output Capacitance (V_{CB} = 12.5 Vdc, I_E = 0, f = 1.0 MHz)	C_{ob}	—	550	800	pF
FUNCTIONAL TESTS					
Common–Emitter Amplifier Power Gain (V_{CC} = 12.5 Vdc, P_{out} = 100 W, $I_{C(max)}$ = 10 Adc, I_{CQ} = 150 mAdc, f = 30, 30.001 MHz)	G_{PE}	10	12	—	dB
Collector Efficiency (V_{CC} = 12.5 Vdc, P_{out} = 100 W, $I_{C(max)}$ = 10 Adc, I_{CQ} = 150 mA, f = 30, 30.001 MHz)	η	40	—	—	%
Intermodulation Distortion (1) (V_{CE} = 12.5 Vdc, P_{out} = 100 W, I_C = 10 Adc, I_{CQ} = 150 mA, f = 30, 30.001 MHz)	IMD	—	–33	–30	dB

NOTE:
1. To proposed EIA method of measurement. Reference peak envelope power.



C1, C2, C4 — 170–780 pF, ARCO 469
C3 — 80–480 pF, ARCO 466
C5, C7, C10 — ERIE 0.1 µF, 100 V
C6 — MALLORY 500 µF @ 15 V Electrolytic
C9 — 100 µF, 15 V Electrolytic
C8 — 1000 pF, 350 V UNDERWOOD
R1 — 10 Ω, 25 Watt Wirewound

R2 — 10 Ω, 1.0 Watt Carbon
CR1 — 1N4997
L1 — 3 Turns, #16 Wire, 5/16″ I.D., 5/16″ Long
L2 — 12 Turns, #16 Enameled Wire Closewound, 1/4″ I.D.
L3 — 1–3/4 Turns, 1/8″ Tubing, 3/8″ I.D., 3/8″ Long
L4 — 10 µH Molded Choke
L5 — 10 Ferrite Beads — FERROXCUBE #56–590–65/3B

Figure 1. 30 MHz Test Circuit Schematic

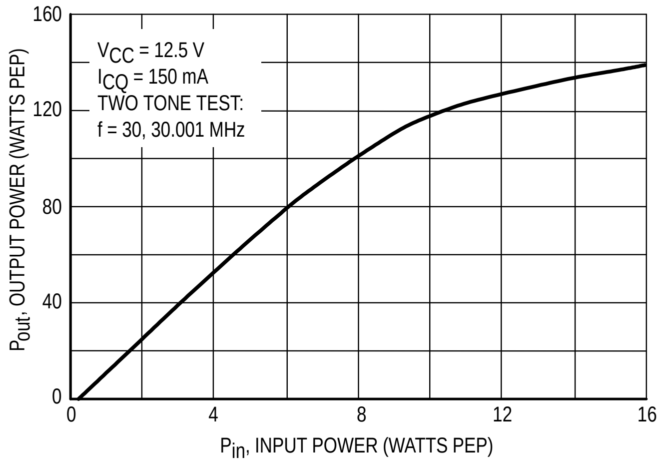


Figure 2. Output Power versus Input Power

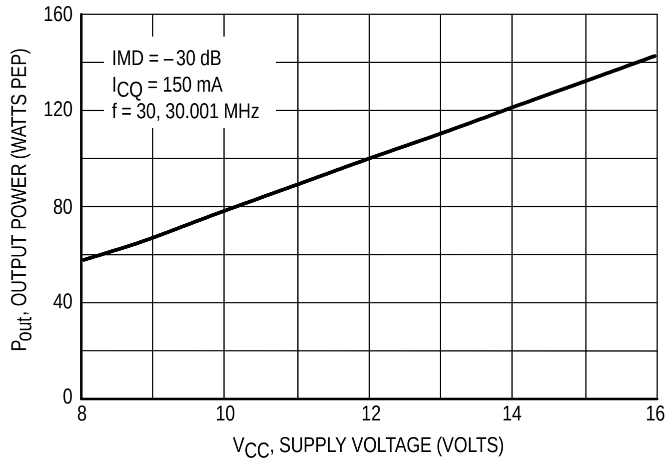


Figure 3. Output Power versus Supply Voltage

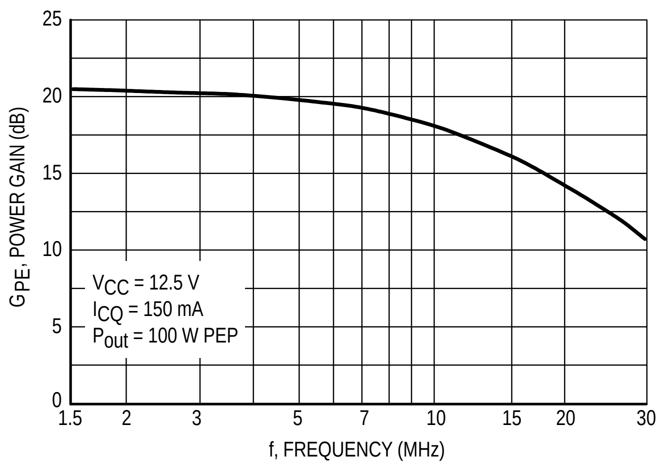


Figure 4. Power Gain versus Frequency

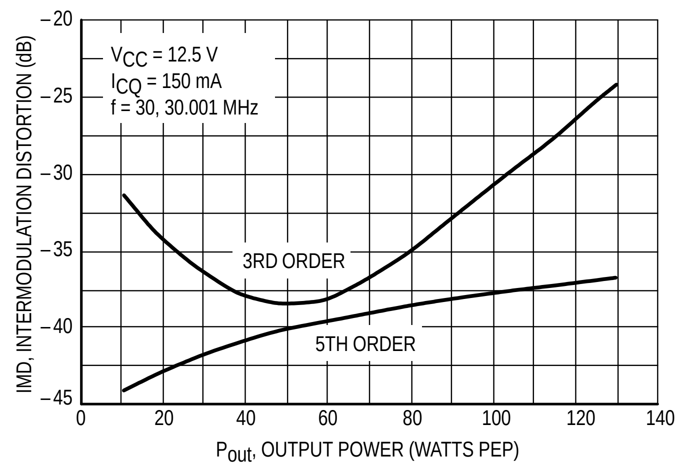


Figure 5. Intermodulation Distortion versus Output Power

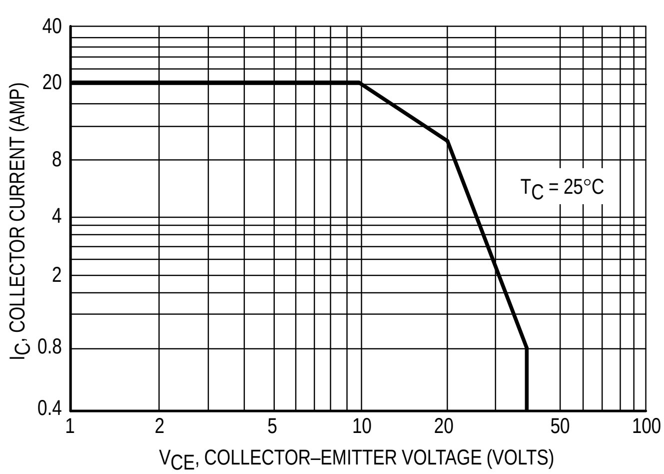
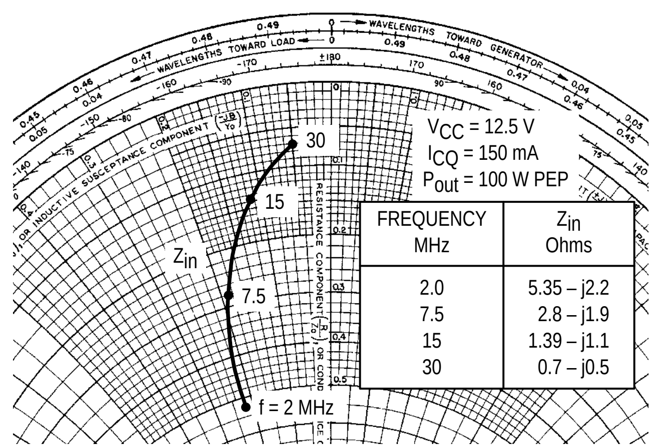


Figure 6. DC Safe Operating Area



FREQUENCY MHz	Zin Ohms
2.0	5.35 – j2.2
7.5	2.8 – j1.9
15	1.39 – j1.1
30	0.7 – j0.5

Figure 7. Series Equivalent Impedance

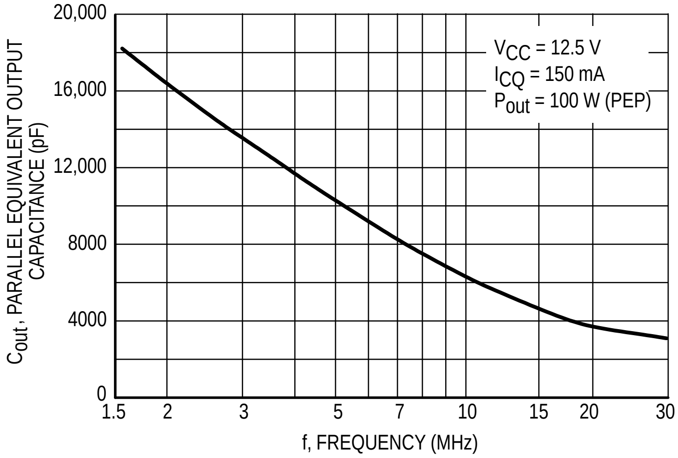


Figure 8. Output Capacitance versus Frequency

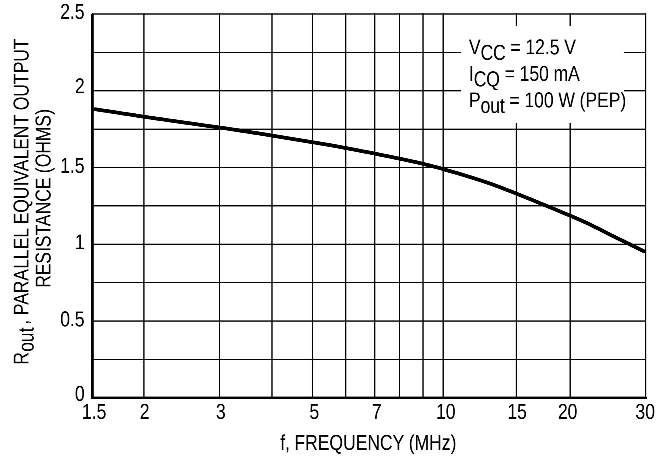
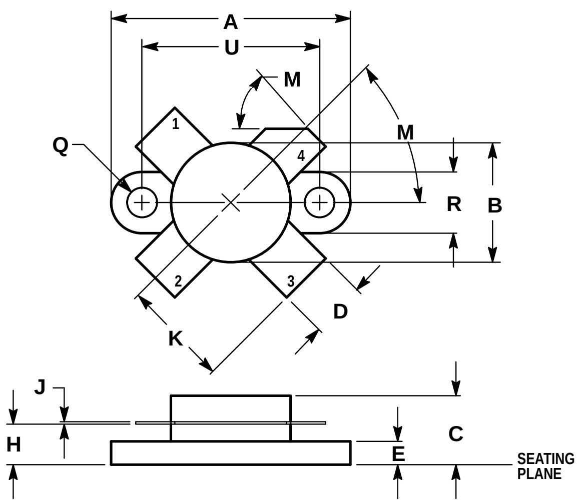


Figure 9. Output Resistance versus Frequency

PACKAGE DIMENSIONS



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.960	0.990	24.39	25.14
B	0.465	0.510	11.82	12.95
C	0.229	0.275	5.82	6.98
D	0.216	0.235	5.49	5.96
E	0.084	0.110	2.14	2.79
H	0.144	0.178	3.66	4.52
J	0.003	0.007	0.08	0.17
K	0.435	—	11.05	—
M	45 °NOM		45 °NOM	
Q	0.115	0.130	2.93	3.30
R	0.246	0.255	6.25	6.47
U	0.720	0.730	18.29	18.54

STYLE 1:
PIN 1. EMITTER
2. BASE
3. EMITTER
4. COLLECTOR

CASE 211–11
ISSUE N

How to reach us:
USA / EUROPE: Motorola Literature Distribution;
P.O. Box 20912; Phoenix, Arizona 85036. 1–800–441–2447

JAPAN: Nippon Motorola Ltd.; Tatsumi–SPD–JLDC, Toshikatsu Otsuki,
6F Seibu–Butsuryu–Center, 3–14–2 Tatsumi Koto–Ku, Tokyo 135, Japan. 03–3521–8315

MFAX: RMFAX0@email.sps.mot.com – TOUCHTONE (602) 244–6609
INTERNET: http://Design–NET.com

HONG KONG: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852–26629298

FL1 LOW PASS FILTERS

Broadband amplifiers, by definition, provide little, if any, suppression of harmonic energy. The output of the amplifier will contain harmonics of the input signal. Thus, if direct operation into an antenna is expected, filtering of the amplifier output is necessary to meet FCC regulations for spectral purity. A five element, low pass filter will provide more than sufficient harmonic attenuation. The low pass filter will attenuate signals above the desired output frequency.

Filter Design

The five element, low pass filter design is derived from information contained in the ARRL Handbook. The filter schematic is shown in Figure 1. The various filter parameters are shown in Table 1. The capacitance values derived for C1 and C2 are not standard values for some of the filters. In order to achieve the closest value for the filter, standard values are placed in parallel. Provision has been made on the PC board to accommodate the parallel values. When a capacitance value requires parallel values, the capacitors are identified as C1A and C1B for the parallel combination of C1. C2A and C2B are the parallel combination of C2. These combinations are shown in Table 2.

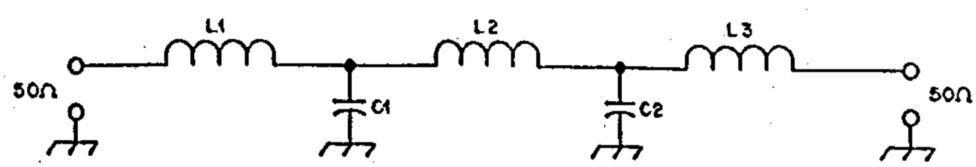


Figure 1 - FL1 Schematic Diagram

Table 1 – FL1 Filter Parameters

BAND	F_{cutoff}	L1,L3			L2			C1,C2
(meters)	(MHz)	(uH)	No. of Turns	Toroid	(uH)	No. of Turns	Toroid	(pf)
160	2.1	8.1	23	T-106-2	11.4	28	T-106-2	1653
80	4.1	4.1	16	T-106-2	5.8	20	T-106-2	847
40	7.4	2.3	12	T-106-2	3.2	14	T-106-2	470
20	14.450	1.18	9	T-106-6	1.65	11	T-106-6	240
15	21.550	0.79	7	T-106-6	1.11	8	T-106-6	161
10	29.8	0.57	6	T-106-6	0.80	7	T-106-6	117

Table 2 – Parallel Capacitance Values

	Desired Value	Parallel Values			
BAND	**C1, C2**	**C1A**	**C1B**	**C2A**	**C2B**
(meters)	**(pf)**	**(pf)**	**(pf)**	**(pf)**	**(pf)**
160	1653	1500	150	1500	150
80	847	820	27	820	27
40	470	470	--	470	--
20	240	240	--	240	--
15	161	110	51	110	51
10	117	100	18	100	18

Construction Hints

The effective inductance of a toroid coil depends in part on the distributed capacitance between the coil turns and between the ends of the winding. The distributed capacitance should be kept as low as possible. The pictorial illustration in Figure 2 show the inductor turns distributed uniformly around the toroid core, but a gap of approximately 30 degrees is maintained between the ends of the winding. This method is recommended to reduce the distributed capacitance of the winding. The closer the ends of the winding are to one another, the greater the unwanted capacitance. Also, in order to achieve the desired toroid inductance, the winding should be spread over the core as shown in Figure 2.

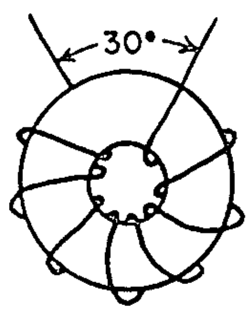


Figure 2 – Toroid Winding Pictorial

The proper method for counting the turns on a toroidal inductor is shown in Figure 3. The core is shown as it would appear when stood on its edge with the narrow dimension toward the viewer. In this example, a four-turn winding has been placed on the core.

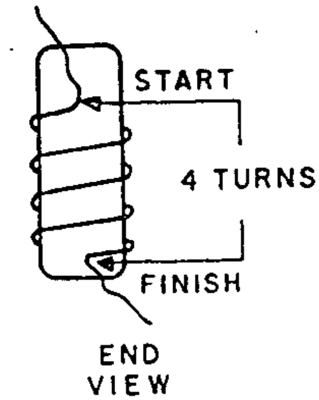


Figure 3 – Toroid Turns Counting Pictorial

Filter Construction

The construction of the filter is fairly simple but requires some care. A component layout pictorial is shown in Figure 4. For identification purposes, the foil side of the PC board is the bottom. The components are placed on the topside of the PC board and soldered on the bottom. The PC board is the same for all frequency bands. The toroid cores are identified by the color of the core. The T-106-2 is gray in color and the T-106-6 is yellow.

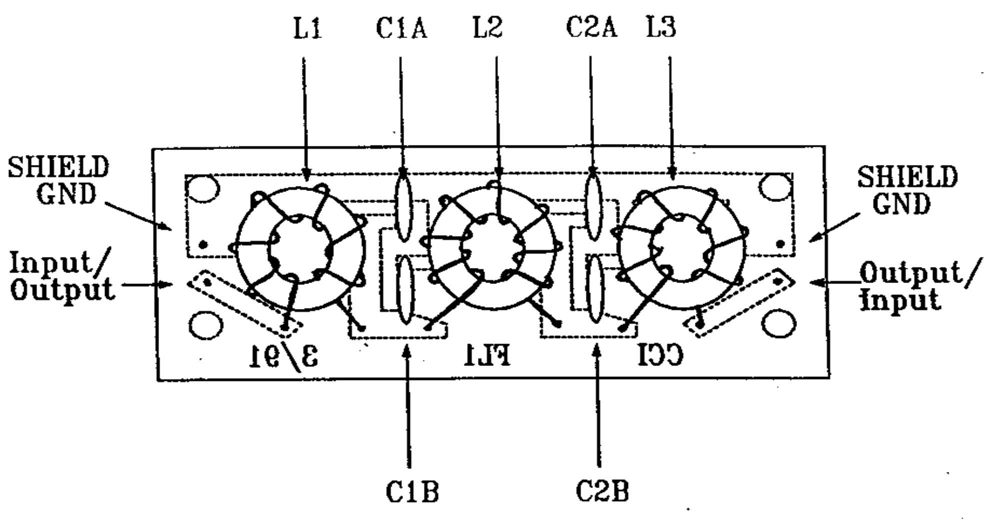


Figure 4 – Component Layout Pictorial

The capacitors C1 (or C1A and C1B) and C2 (or C2A and C2B) should be mounted on the PC board first. Refer to Table 2 for the proper values and the component layout pictorial in Figure 4 for proper placement. Next wind the toroid with the proper number of turns using the #18 AWG enameled wire included. The wire should follow the contour of the core and be snug. Refer to Figure 2 for the proper number of windings and the construction hints for the toroid winding procedures. After winding the toroids, scrape off enough of the enamel coating on the wire for soldering purposes. Then mount and solder the toroid to the PC board. The toroid is mounted to the PC board using a 4-40 x ¾ inch bolt and KEP nut with a large fiber washer. Refer to the toroid mounting pictorial in Figure 5.

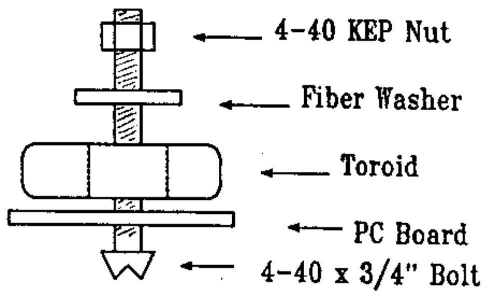


Figure 5 – Toroid Mounting Pictorial

Since the filter circuit is symmetrical, the input and output can be reversed. 50 ohm coax should be used for the connections as shown in the component layout pictorial in Figure 4. The shield of the coax should connect to the large ground foil on the PC board. The filter should be connected as close as possible to the output of the power amplifier. This distance should be 6 inches or less. Connect the filter between the output of the amplifier and the antenna as shown in Figure 6. No tuning of the filter is necessary if care is exercised in the construction.

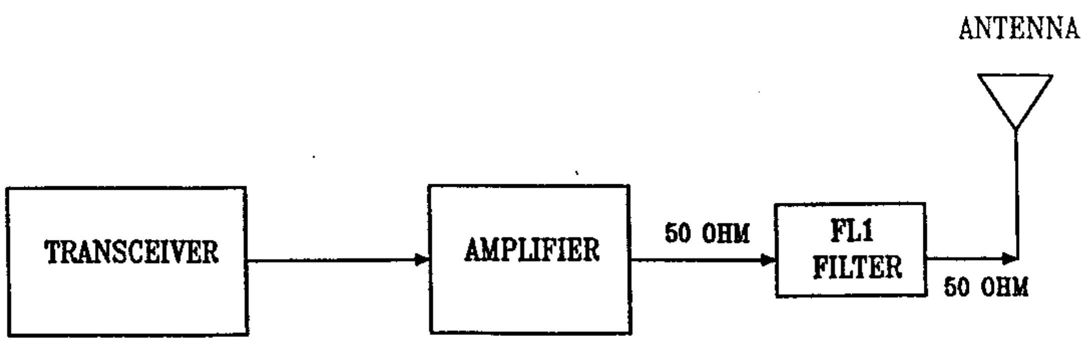


Figure 6 – Filter Installation

Filter Parts List

160 Meter Filter Board Part Number FL1-160	
3 each	T-106-2 Toroid Cores
2 each	1500 pf Silver Mica Capacitors 500 WVDC
2 each	150 pf Silver Mica Capacitors 500 WVDC
3 each	60 inches #18 AWB enameled wire
3 each	4-40 x ¾" bolt
3 each	4-40 Kep Nut
3 each	Fiber Washer
1 each	PC Board (FL1)

80 Meter Filter Board Part Number FL1-80	
3 each	T-106-2 Toroid Cores
2 each	820 pf Silver Mica Capacitors 500 WVDC
2 each	27 pf Silver Mica Capacitors 500 WVDC
3 each	40 inches #18 AWB enameled wire
3 each	4-40 x ¾" bolt
3 each	4-40 Kep Nut
3 each	Fiber Washer
1 each	PC Board (FL1)

40 Meter Filter Board Part Number FL1-40	
3 each	T-106-2 Toroid Cores
2 each	470 pf Silver Mica Capacitors 500 WVDC
3 each	28 inches #18 AWB enameled wire
3 each	4-40 x ¾" bolt
3 each	4-40 Kep Nut
3 each	Fiber Washer
1 each	PC Board (FL1)

20 Meter Filter Board Part Number FL1-20	
3 each	T-106-6 Toroid Cores
2 each	240 pf Silver Mica Capacitors 500 WVDC
3 each	22 inches #18 AWB enameled wire
3 each	4-40 x ¾" bolt
3 each	4-40 Kep Nut
3 each	Fiber Washer
1 each	PC Board (FL1)

15 Meter Filter Board Part Number FL1-15	
3 each	T-106-6 Toroid Cores
2 each	110 pf Silver Mica Capacitors 500 WVDC
2 each	51 pf Silver Mica Capacitors 500 WVDC
3 each	18 inches #18 AWB enameled wire
3 each	4-40 x ¾" bolt
3 each	4-40 Kep Nut
3 each	Fiber Washer
1 each	PC Board (FL1)

10 Meter Filter Board Part Number FL1-10	
3 each	T-106-6 Toroid Cores
2 each	100 pf Silver Mica Capacitors 500 WVDC
2 each	18 pf Silver Mica Capacitors 500 WVDC
3 each	15 inches #18 AWB enameled wire
3 each	4-40 x ¾" bolt
3 each	4-40 Kep Nut
3 each	Fiber Washer
1 each	PC Board (FL1)