

RGO ONE HF transceiver

Technical supplement



RGO ONE schematics and boards layout

Main Board – MB

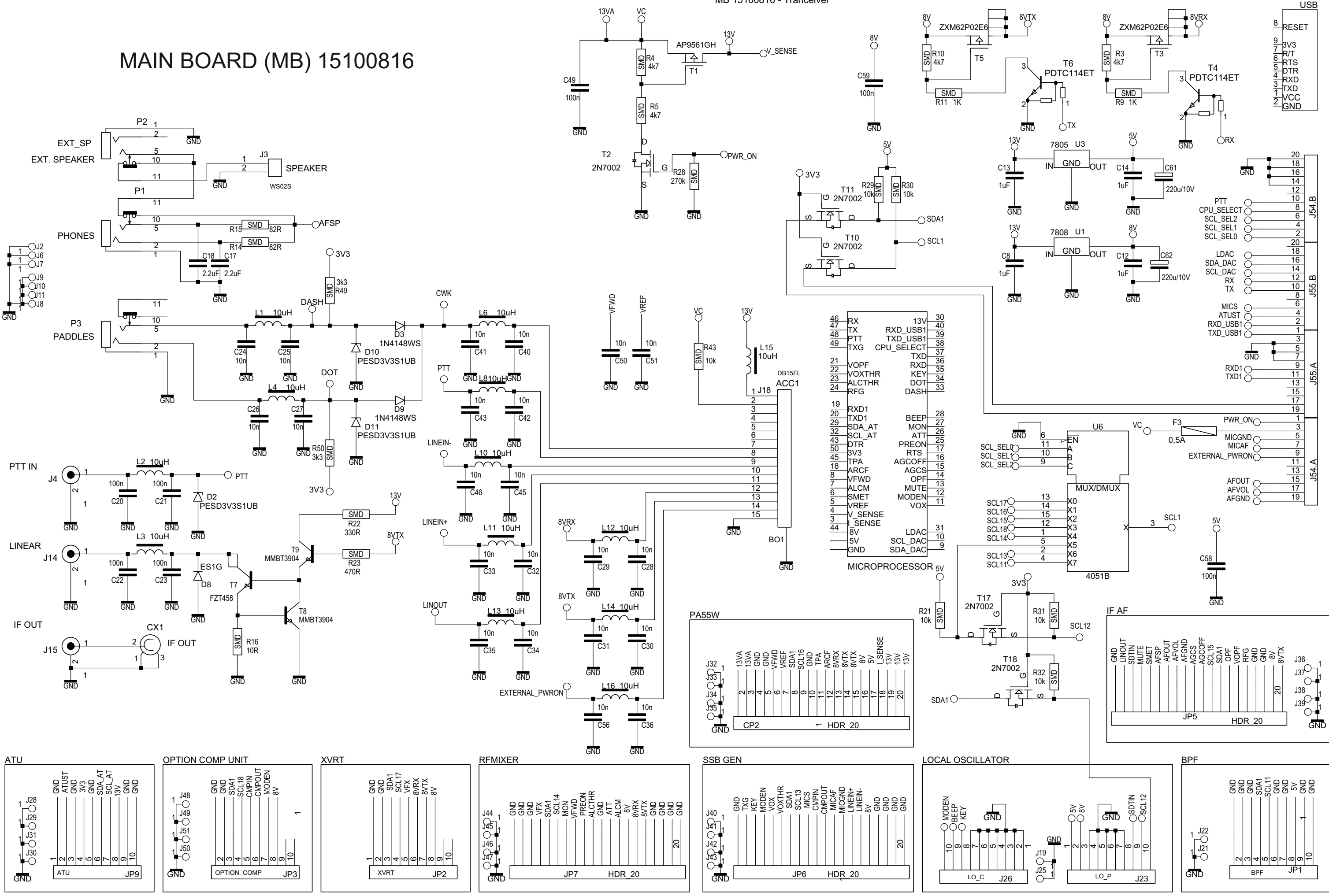
RGO ONE Main Board (MB) or so called mother board fits all connectors on the rear panel, power supply, I/O microcontroller (second CPU). MB is also intended to be a chassis for all RF boards and options, as long as “cable harness” and board interconnections.

The board has the following components on it:

- I/O micro controller U5, DAC U7, external fan control – U8, T12, signal multiplexer U9, 3.3V LDO regulator chip U4.
- USB FTDI chip F1
- I/O connectors at the back side, daughter board connectors, power on/off switch, level converters, 5V,8V LDO regulators.

MAIN BOARD (MB) 15100816

MB 15100816 - Transceiver



D

C

B

A

D

C

B

A

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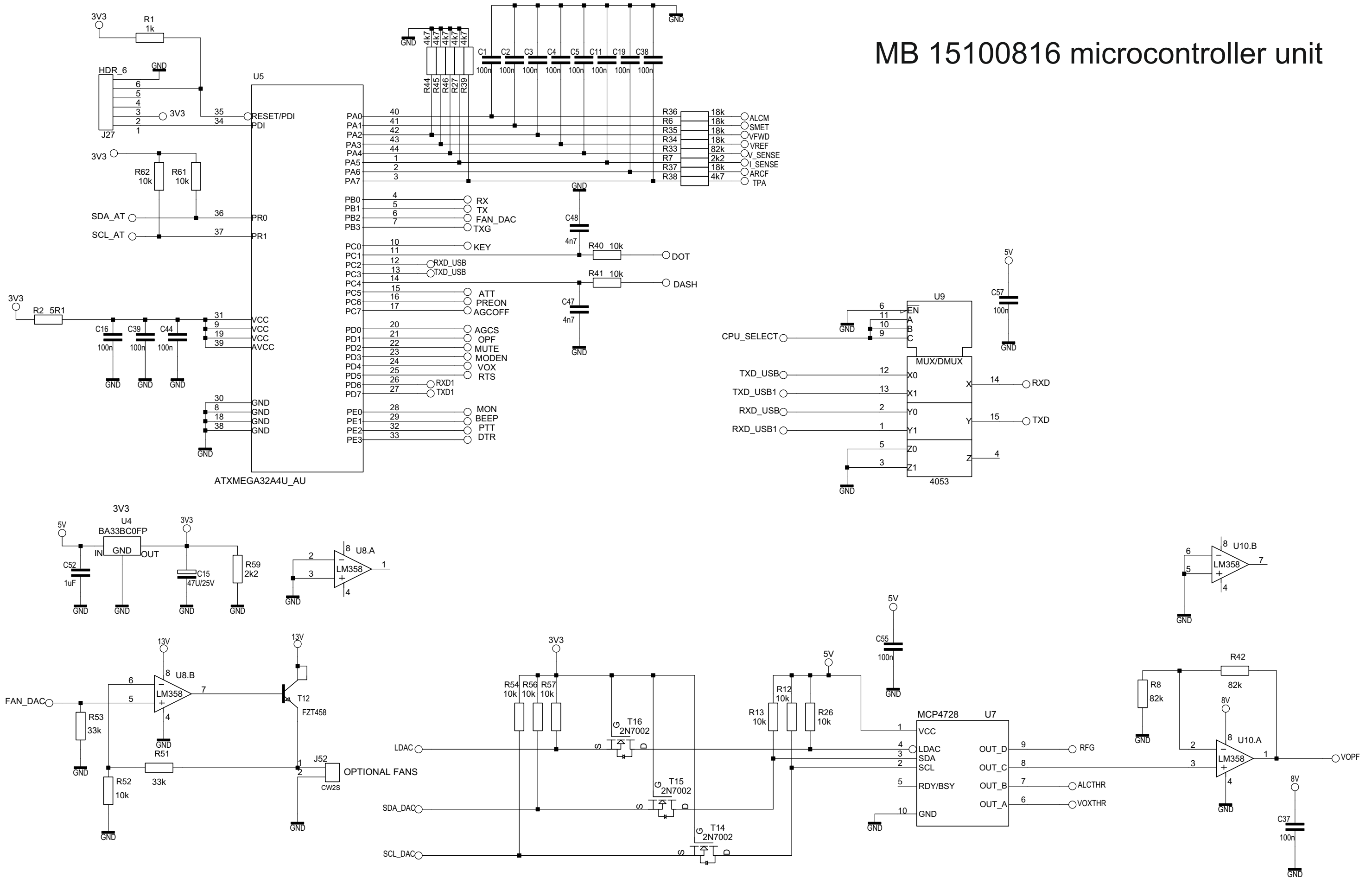
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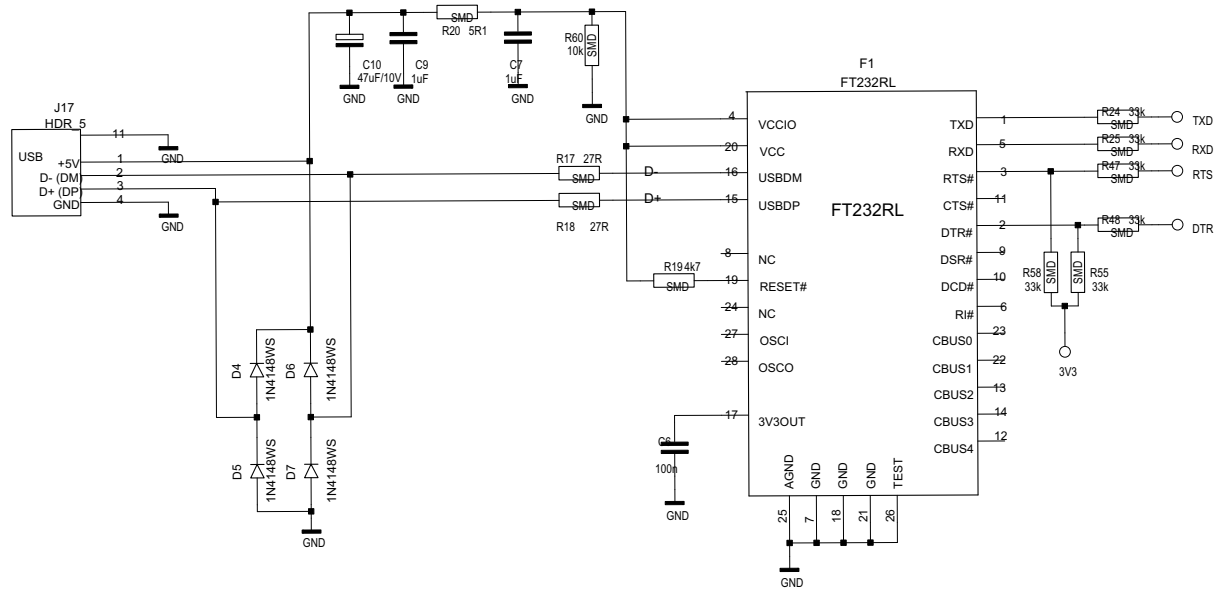
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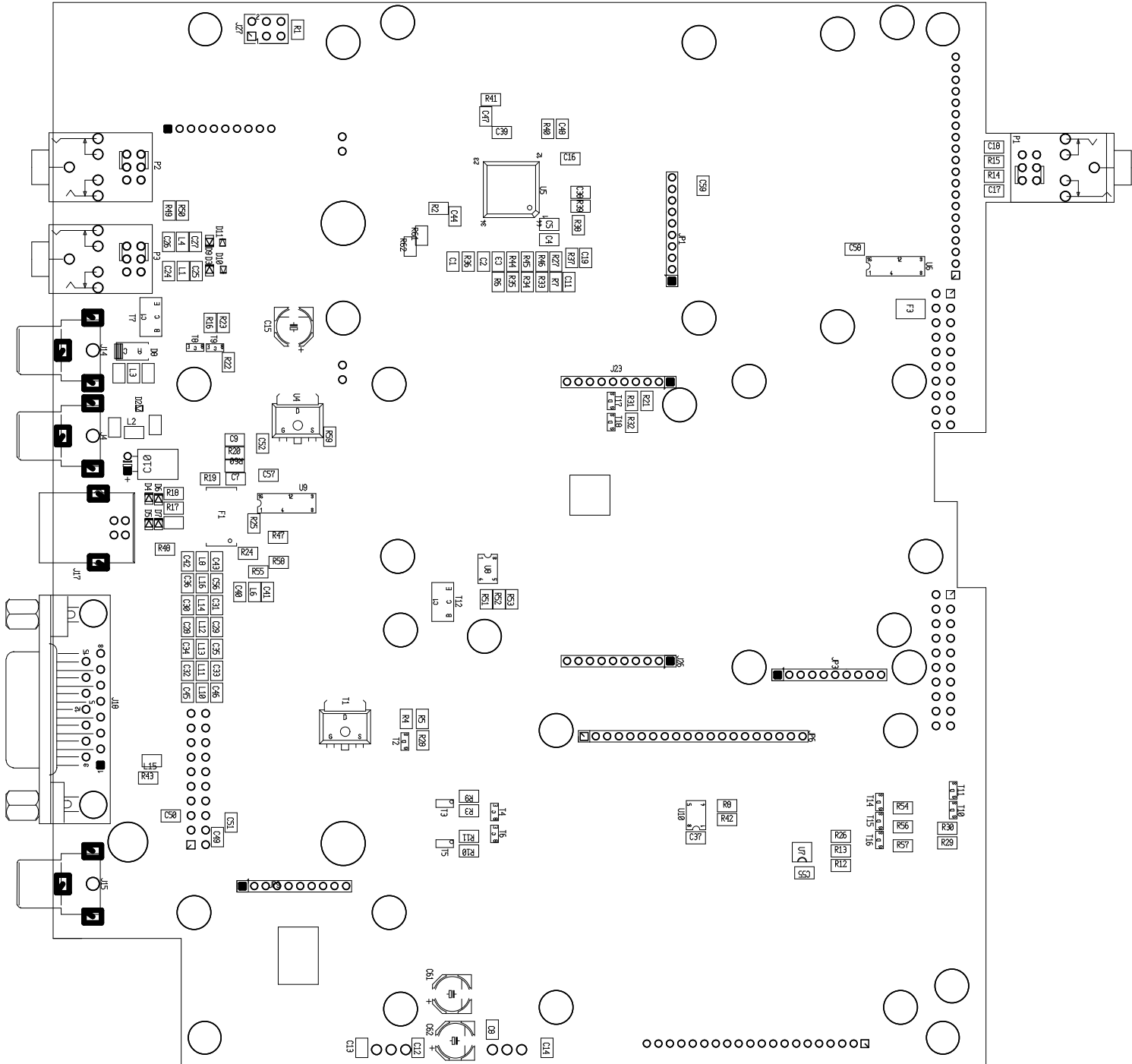
MB 15100816 microcontroller unit



MB 15100816 USB interface



Main Board (MB) BOTTOM view



Parts specification:

Name	Alias	Shape	Part
C1	100N	SC0805	C0805 100nF 50V X7R SAMSUNG
C2	100N	SC0805	C0805 100nF 50V X7R SAMSUNG
C3	100N	SC0805	C0805 100nF 50V X7R SAMSUNG
C4	100N	SC0805	C0805 100nF 50V X7R SAMSUNG
C5	100N	SC0805	C0805 100nF 50V X7R SAMSUNG
C6	100N	SC0805	C0805 100nF 50V X7R SAMSUNG
C7	1UF	SR0805	C0805 1.0uF 50V X7R SAMSUNG
C8	1UF	SR0805	C0805 1.0uF 50V X7R SAMSUNG
C9	1UF	SR0805	C0805 1.0uF 50V X7R SAMSUNG
C10	47UF/10V	ELKO5R2_51	CE 47uF 10V 105C mini Fujicon
C11	100N	SC0805	C0805 100nF 50V X7R SAMSUNG
C12	1UF	SR0805	C0805 1.0uF 50V X7R SAMSUNG
C13	1UF	SR0805	C0805 1.0uF 50V X7R SAMSUNG
C14	1UF	SR0805	C0805 1.0uF 50V X7R SAMSUNG
C15	47U/25V	SP_ELKO_D	CE 47uF 25V SMD Fujicon
C16	100N	SC0805	C0805 100nF 50V X7R SAMSUNG
C17	2.2UF	SR0805	C0805 2.2uF 16V X7R SAMSUNG
C18	2.2UF	SR0805	C0805 2.2uF 16V X7R SAMSUNG
C19	100N	SC0805	C0805 100nF 50V X7R SAMSUNG
C20	100N	SC0805	C0805 100nF 50V X7R SAMSUNG
C21	100N	SC0805	C0805 100nF 50V X7R SAMSUNG
C22	100N	SC0805	C0805 100nF 50V X7R SAMSUNG
C23	100N	SC0805	C0805 100nF 50V X7R SAMSUNG
C24	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C25	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C26	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C27	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C28	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C29	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C30	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C31	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C32	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C33	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C34	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C35	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C36	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C37	100N	SC0805	C0805 100nF 50V X7R SAMSUNG
C38	100N	SC0805	C0805 100nF 50V X7R SAMSUNG
C39	100N	SC0805	C0805 100nF 50V X7R SAMSUNG
C40	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C41	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C42	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C43	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C44	100N	SC0805	C0805 100nF 50V X7R SAMSUNG
C45	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C46	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C47	4N7	SC0805	C0805 4.7nF 50V X7R SAMSUNG
C48	4N7	SC0805	C0805 4.7nF 50V X7R SAMSUNG
C49	100N	SC0805	C0805 100nF 50V X7R SAMSUNG

Name	Alias	Shape	Part
C50	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C51	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C52	1UF	\$R0805	C0805 1.0uF 50V X7R SAMSUNG
C55	100N	\$C0805	C0805 100nF 50V X7R SAMSUNG
C56	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C57	100N	\$C0805	C0805 100nF 50V X7R SAMSUNG
C58	100N	\$C0805	C0805 100nF 50V X7R SAMSUNG
C59	100N	\$C0805	C0805 100nF 50V X7R SAMSUNG
C61	220U/10V	\$P_ELKO_D	CE 220uF 10V SMD Fujicon
C62	220U/10V	\$P_ELKO_D	CE 220uF 10V SMD Fujicon
CP1+trans	HDR_20	HDR2X10HA	HR2X40 1/4 cut; transfer PCB
CP2	PA55W	HDR2X10	HN2X20 1/2 cut
CX1	IF_OUT	IPX	IPX U.FL coax connector
D2	PESD3V3S	\$SOD523	PESD3V3S1UB
D3	1N4148WS	\$SOD_323	1N4148WS
D4	1N4148WS	\$SOD_323	1N4148WS
D5	1N4148WS	\$SOD_323	1N4148WS
D6	1N4148WS	\$SOD_323	1N4148WS
D7	1N4148WS	\$SOD_323	1N4148WS
D8	ES1G	\$SMA	ES1G SMD TK
D9	1N4148WS	\$SOD_323	1N4148WS
D10	PESD3V3S	\$SOD523	PESD3V3S1UB
D11	PESD3V3S	\$SOD523	PESD3V3S1UB
F1	FT232RL	SSOP28	FT232RL Rev C
F3	0.5A	\$R1210	LQH32CN220K23L
J3	WS02S	JMP8X7R2_5	WS02S
J4	PTT_IN	RCA_JACK	white
J6	HDR_1	GAJKA	M3x6, lockwasher 3mm
J7	HDR_1	GAJKA	M3x6, lockwasher 3mm
J8	HDR_1	HOLE	screw 2,9x6
J9	HDR_1	HOLE	screw 2,9x6
J10	HDR_1	HOLE	screw 2,9x6
J11	HDR_1	HOLE	screw 2,9x6
J14	LINEAR	RCA_JACK	red
J15	IF_OUT	RCA_JACK	yellow
J17	HDR_4	USB_B	USB B-PCB-R
J18	DB15FL	DB15FL	DB15BFR
J19	HDR_1	swage stndf	Amatom #19833B-B0350-0
J21	HDR_1	swage stndf	Amatom #19833B-B0350-0
J22	HDR_1	swage stndf	Amatom #19833B-B0350-0
J23	LO_P	HDR1X10_2MM	PN1X10-2.0
J25	HDR_1	swage stndf	Amatom #19833B-B0350-0
J26	LO_C	HDR1X10_2MM	PN1X10-2.0
J27	HDR_6	HDR2X3	HN2X20 3/20 cut
J28	HDR_1	swage stndf	Amatom #19833B-B0350-0
J29	HDR_1	swage stndf	Amatom #19833B-B0350-0
J30	HDR_1	swage stndf	Amatom #19833B-B0350-0
J31	HDR_1	swage stndf	Amatom #19833B-B0350-0
J32	HDR_1	swage stndf	Amatom #19833B-B0350-0
J33	HDR_1	swage stndf	Amatom #19833B-B0350-0

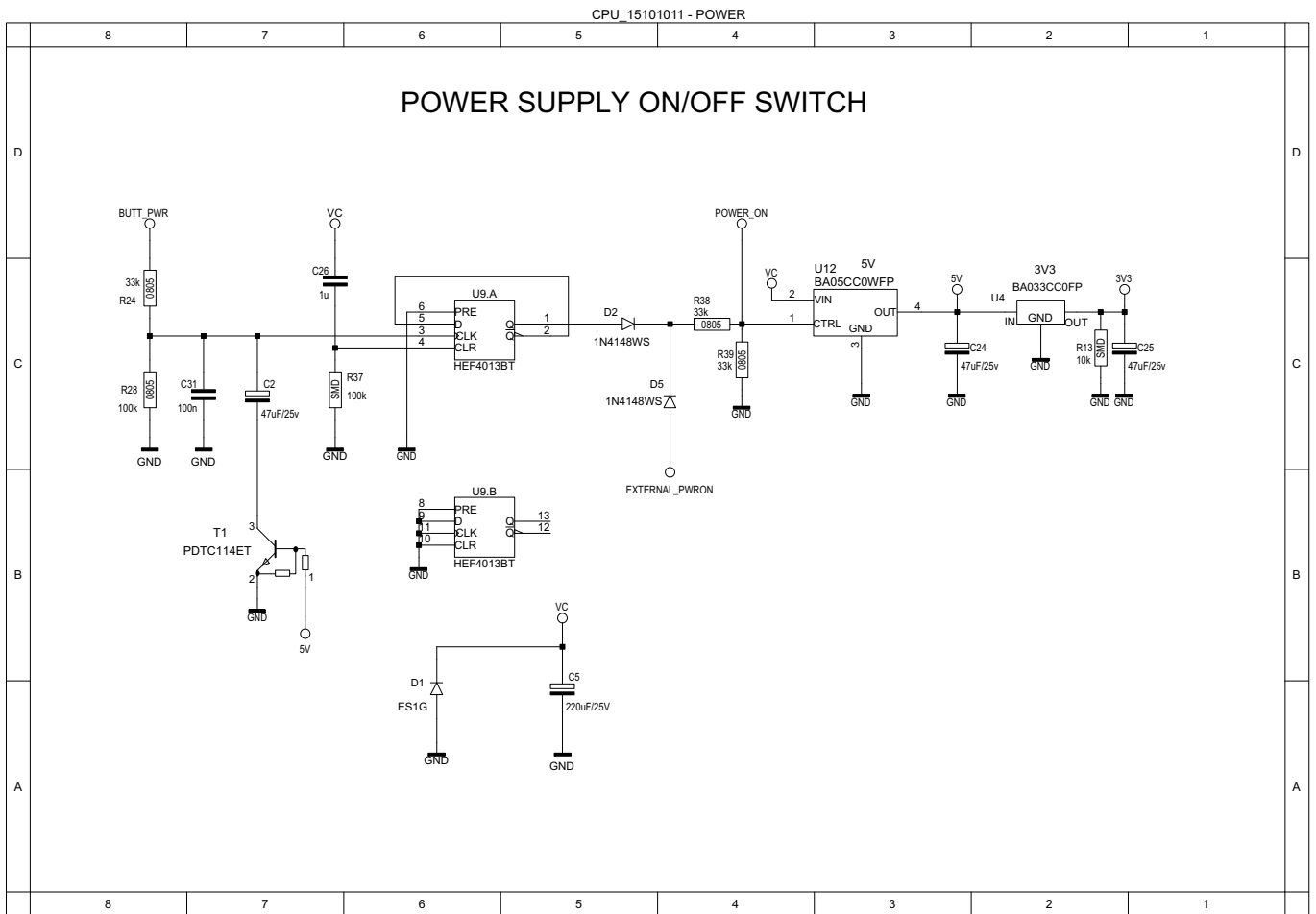
Name	Alias	Shape	Part
R7	2K2	\$R0805	R0805 2.2K 1%
R8	82K	\$R0805	R0805 82K 1%
R9	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R10	4K7	\$R0805	R0805 4.7K 1%
R11	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R12	10K	\$R0805	R0805 10K 1%
R13	10K	\$R0805	R0805 10K 1%
R14	82R	\$R0805	R0805 82R 1% YAG/ASJ
R15	82R	\$R0805	R0805 82R 1% YAG/ASJ
R16	10R	\$R0805	R0805 10R 1%
R17	27R	\$R0805	R0805 27R 1% YAG/ASJ
R18	27R	\$R0805	R0805 27R 1% YAG/ASJ
R19	4K7	\$R0805	R0805 4.7K 1%
R20	5R1	\$R0805	R0805 5.1R 5%
R21	10K	\$R0805	R0805 10K 1%
R22	330R	\$R0805	R0805 330R 1%
R23	470R	\$R0805	R0805 470R 1%
R24	33K	\$R0805	R0805 33K 1%
R25	33K	\$R0805	R0805 33K 1%
R26	10K	\$R0805	R0805 10K 1%
R27	4K7	\$R0805	R0805 4.7K 1%
R28	270K	\$R0805	R0805 270K 1%
R29	10K	\$R0805	R0805 10K 1%
R30	10K	\$R0805	R0805 10K 1%
R31	10K	\$R0805	R0805 10K 1%
R32	10K	\$R0805	R0805 10K 1%
R33	82K	\$R0805	R0805 82K 1%
R34	18K	\$R0805	R0805 18K 1%
R35	18K	\$R0805	R0805 18K 1%
R36	18K	\$R0805	R0805 18K 1%
R37	18K	\$R0805	R0805 18K 1%
R38	4K7	\$R0805	R0805 4.7K 1%
R39	4K7	\$R0805	R0805 4.7K 1%
R40	10K	\$R0805	R0805 10K 1%
R41	10K	\$R0805	R0805 10K 1%
R42	82K	\$R0805	R0805 82K 1%
R43	10K	\$R0805	R0805 10K 1%
R44	4K7	\$R0805	R0805 4.7K 1%
R45	4K7	\$R0805	R0805 4.7K 1%
R46	4K7	\$R0805	R0805 4.7K 1%
R47	33K	\$R0805	R0805 33K 1%
R48	33K	\$R0805	R0805 33K 1%
R49	3K3	\$R0805	R0805 3.3K 1%
R50	3K3	\$R0805	R0805 3.3K 1%
R51	33K	\$R0805	R0805 33K 1%
R52	10K	\$R0805	R0805 10K 1%
R53	33K	\$R0805	R0805 33K 1%
R54	10K	\$R0805	R0805 10K 1%
R55	33K	\$R0805	R0805 33K 1%
R56	10K	\$R0805	R0805 10K 1%
R57	10K	\$R0805	R0805 10K 1%

Name	Alias	Shape	Part
J34	HDR_1	swage stndf	Amatom #19833B-B0350-0
J35	HDR_1	swage stndf	Amatom #19833B-B0350-0
J36	HDR_1	swage stndf	Amatom #19833B-B0350-0
J37	HDR_1	swage stndf	Amatom #19833B-B0350-0
J38	HDR_1	swage stndf	Amatom #19833B-B0350-0
J39	HDR_1	swage stndf	Amatom #19833B-B0350-0
J40	HDR_1	swage stndf	Amatom #19833B-B0350-0
J41	HDR_1	swage stndf	Amatom #19833B-B0350-0
J42	HDR_1	swage stndf	Amatom #19833B-B0350-0
J43	HDR_1	swage stndf	Amatom #19833B-B0350-0
J44	HDR_1	swage stndf	Amatom #19833B-B0350-0
J45	HDR_1	swage stndf	Amatom #19833B-B0350-0
J46	HDR_1	swage stndf	Amatom #19833B-B0350-0
J47	HDR_1	swage stndf	Amatom #19833B-B0350-0
J48	HDR_1	swage stndf	Amatom #19833B-B0350-0
J49	HDR_1	swage stndf	Amatom #19833B-B0350-0
J50	HDR_1	swage stndf	Amatom #19833B-B0350-0
J51	HDR_1	swage stndf	Amatom #19833B-B0350-0
J52	CW2S	JMP8X7R2_5	CW2S
J54	-	HDR2X10HA	PR2X10
J55	-	HDR2X10HA	PR2X10
JP1	BPF	HDR1X10_2MM	PN1X10-2.0
JP2	XVRT	HDR1X10_2MM	PN1X10-2.0
JP3	OPTION_C	HDR1X10_2MM	PN1X10-2.0
JP5	IF_AF	HDR1X20_2MM	PN1X20-2.0
JP6	SSBGEN	HDR1X20_2MM	PN1X20-2.0
JP7	RFMIXER	HDR1X20_2MM	PN1X20-2.0
JP9	ATU	HDR1X10_2MM	PN1X10-2.0
L1	10UH	\$R0805	CL0805 10uH MLT
L2	10UH	\$R0805	CL0805 10uH MLT
L3	10UH	\$R0805	CL0805 10uH MLT
L4	10UH	\$R0805	CL0805 10uH MLT
L6	10UH	\$R0805	CL0805 10uH MLT
L8	10UH	\$R0805	CL0805 10uH MLT
L10	10UH	\$R0805	CL0805 10uH MLT
L11	10UH	\$R0805	CL0805 10uH MLT
L12	10UH	\$R0805	CL0805 10uH MLT
L13	10UH	\$R0805	CL0805 10uH MLT
L14	10UH	\$R0805	CL0805 10uH MLT
L15	10UH	\$R0805	CL0805 10uH MLT
L16	10UH	\$R0805	CL0805 10uH MLT
P1	PHONES	PHONE_JAK_PJ30	PJ306BM
P2	EXT_SP	PHONE_JAK_PJ30	PJ306BM
P3	PADDLES	PHONE_JAK_PJ30	PJ306BM
R1	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R2	5R1	\$R0805	R0805 5.1R 5%
R3	4K7	\$R0805	R0805 4.7K 1%
R4	4K7	\$R0805	R0805 4.7K 1%
R5	4K7	\$R0805	R0805 4.7K 1%
R6	18K	\$R0805	R0805 18K 1%

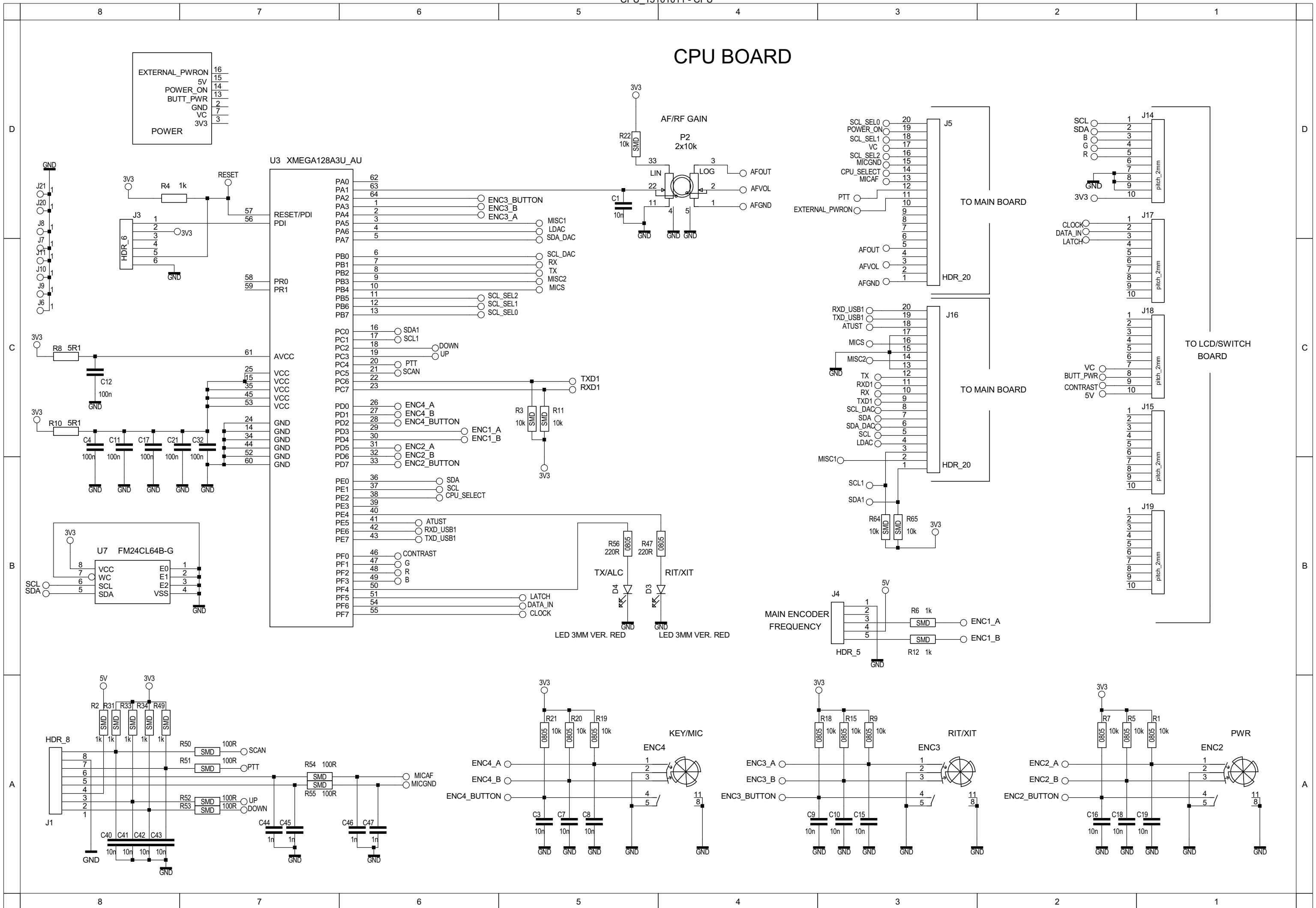
Name	Alias	Shape	Part
R58	33K	\$R0805	R0805 33K 1%
R59	2K2	\$R0805	R0805 2.2K 1%
R60	10K	\$R0805	R0805 10K 1%
R61	10K	\$R0805	R0805 10K 1%
R62	10K	\$R0805	R0805 10K 1%
T1	AP9561GH	\$FET_TO252	AP9561GH
T2	2N7002	\$FET_2N7002	2N7002K
T3	ZXM62P02	\$TRA_SOT23_6	ZXM62P02E6
T4	PDTC114E	DIGITRA	PDTC114ET
T5	ZXM62P02	\$TRA_SOT23_6	ZXM62P02E6
T6	PDTC114E	DIGITRA	PDTC114ET
T7	FZT458	\$TRA_SOT223	FZT458
T8	MMBT390	\$TRA_SOT23	MMBT3904 SMD
T9	MMBT390	\$TRA_SOT23	MMBT3904 SMD
T10	2N7002	\$FET_2N7002	2N7002K
T11	2N7002	\$FET_2N7002	2N7002K
T12	FZT458	\$TRA_SOT223	FZT458
T14	2N7002	\$FET_2N7002	2N7002K
T15	2N7002	\$FET_2N7002	2N7002K
T16	2N7002	\$FET_2N7002	2N7002K
T17	2N7002	\$FET_2N7002	2N7002K
T18	2N7002	\$FET_2N7002	2N7002K
U1	7808	78XXV	7808
U3	7805	78XXV	7805
U4	BA33BC0F	\$REG_TO252	BA033CC0FP
U5	ATXMEGA3	\$QFP44P081	ATXMEGA32A4U-AU
U6	4051B	\$SO16	HEF4051BT
U7	MCP4728	MSOP_10	MCP4728-E/UN
U8	LM358	\$SO8	LM358D SMD
U9	4053B	\$SO16	HEF4053BT
U10	LM358	\$SO8	LM358D SMD

Front panel CPU Board

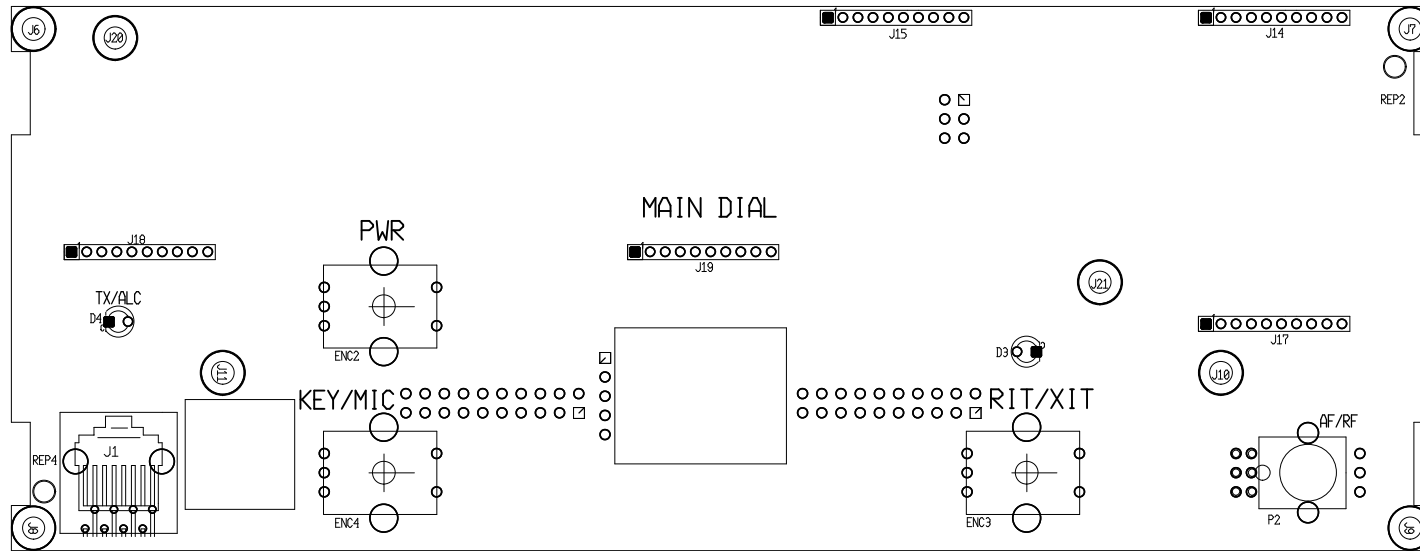
Front panel consist of two boards. One of them is CPU board with main microcontroller AtXMEGA128A3U-AU, main dial optical encoder BOURNS, mechanical encoders, dual concentric potentiometer AF/RF. This board holds LCD&switch PCB.



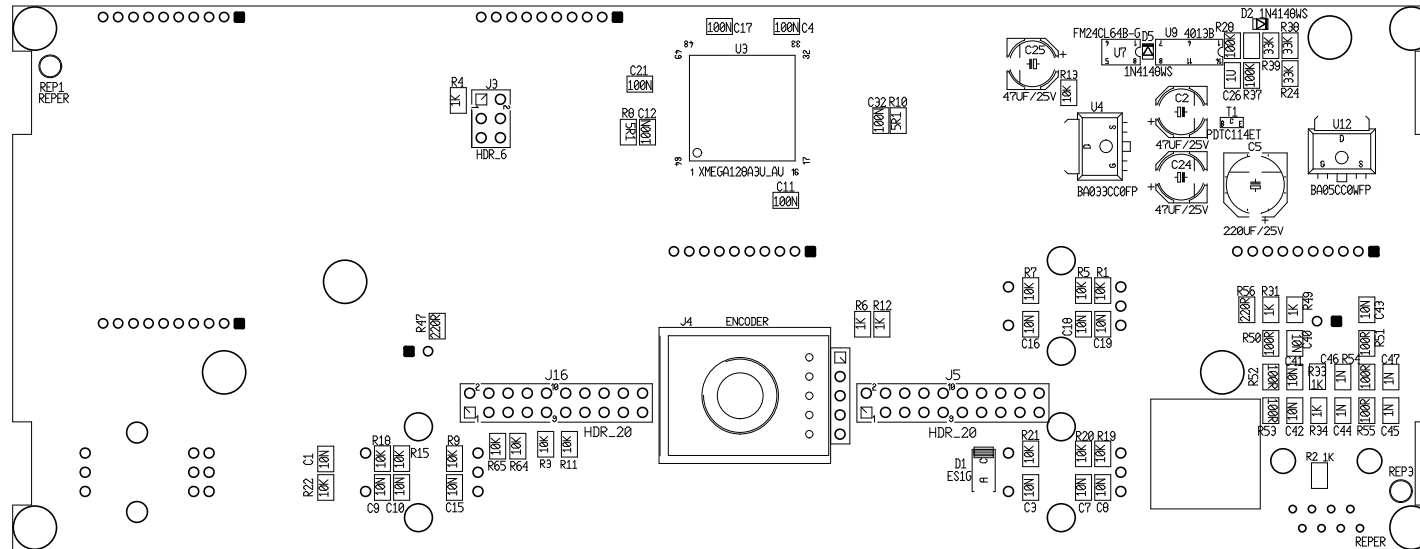
CPU BOARD



CPU board TOP view



CPU board BOTTOM view

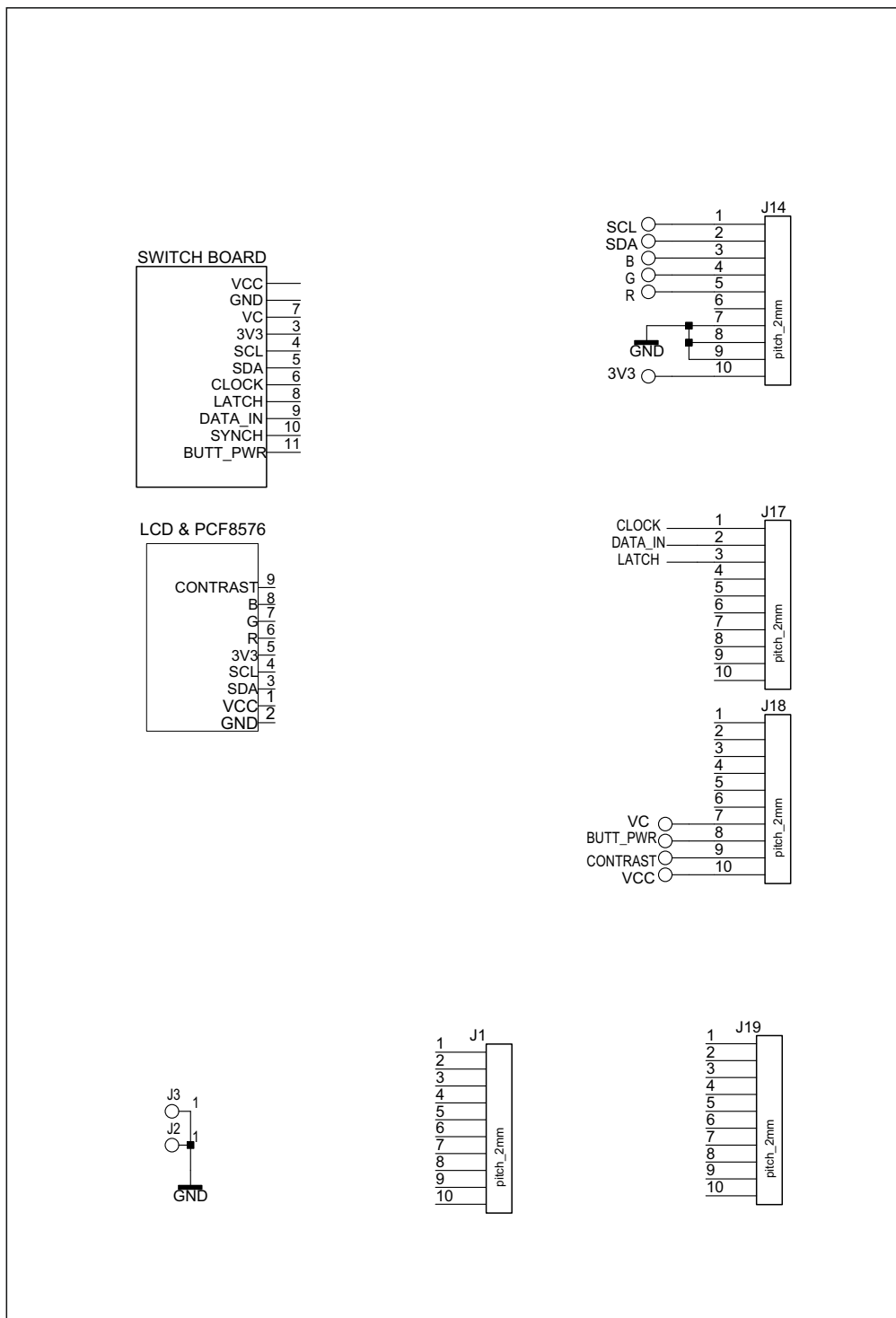


Parts specification:

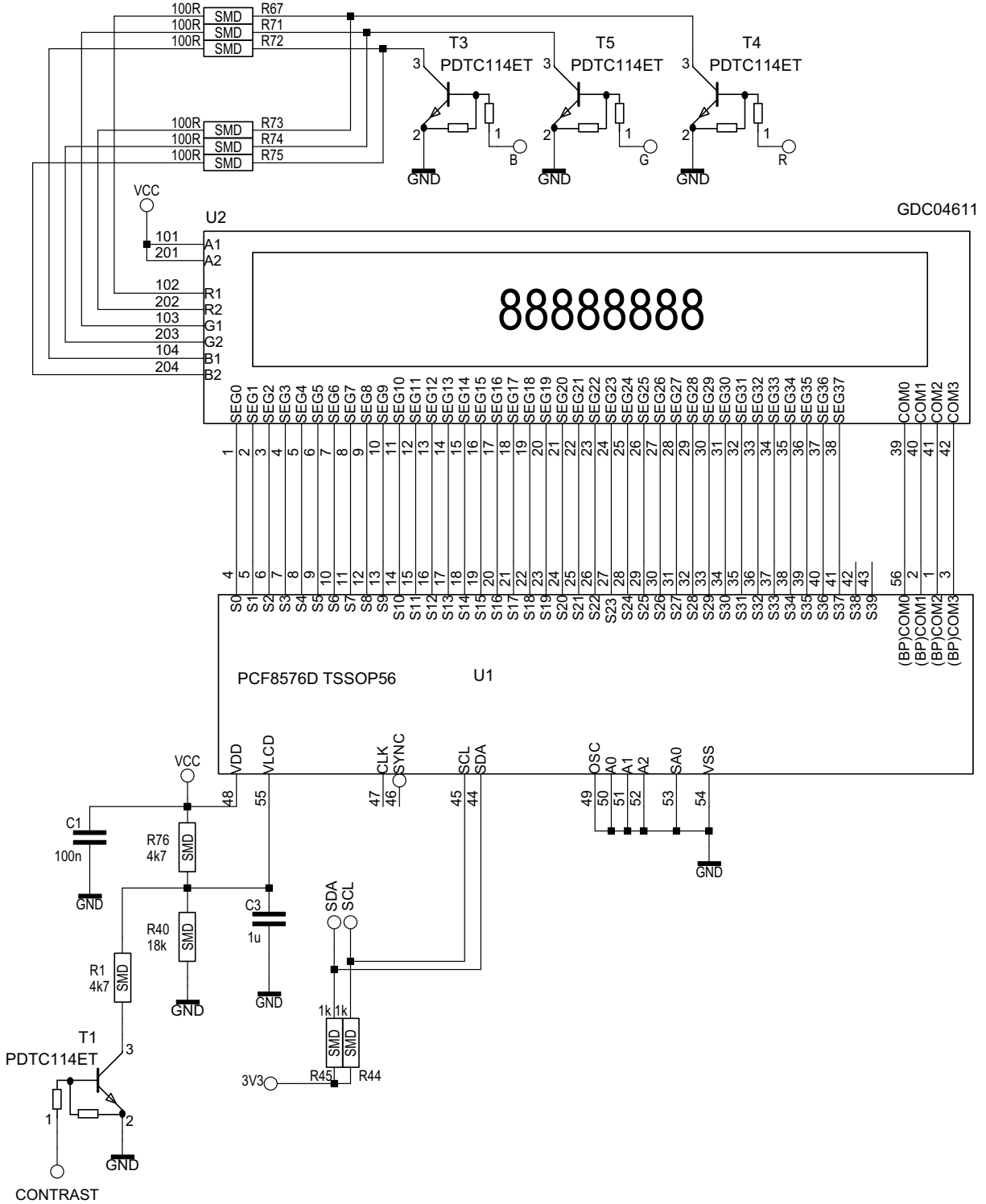
Name	Alias	Shape	Part
C1	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C2	47UF/25V	\$P_ELKO_D	CE 47uF 25V SMD Fujicon
C3	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C4	100N	\$C0805	C0805 100nF 50V X7R SAMSUNG
C5	220UF/25V	\$P_ELKO_E	CE 220uF 25V SMD 105C Fujicon
C7	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C8	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C9	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C10	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C11	100N	\$C0805	C0805 100nF 50V X7R SAMSUNG
C12	100N	\$C0805	C0805 100nF 50V X7R SAMSUNG
C15	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C16	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C17	100N	\$C0805	C0805 100nF 50V X7R SAMSUNG
C18	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C19	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C21	100N	\$C0805	C0805 100nF 50V X7R SAMSUNG
C24	47UF/25V	\$P_ELKO_D	CE 47uF 25V SMD Fujicon
C25	47UF/25V	\$P_ELKO_D	CE 47uF 25V SMD Fujicon
C26	1U	\$R0805	C0805 1.0uF 50V X7R SAMSUNG
C31	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C32	100N	\$C0805	C0805 100nF 50V X7R SAMSUNG
C40	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C41	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C42	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C43	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C44	1N	\$R0805	C0805 1.0nF 50V COG SAMSUNG
C45	1N	\$R0805	C0805 1.0nF 50V COG SAMSUNG
C46	1N	\$R0805	C0805 1.0nF 50V COG SAMSUNG
C47	1N	\$R0805	C0805 1.0nF 50V COG SAMSUNG
D1	ES1G	\$SMA	ES1G SMD TK
D2	1N4148WS	\$SOD_323	1N4148WS
D3	LED_3MM_VER._RED	LED3R2_5V	OSR6NU3134E
D4	LED_3MM_VER._RED	LED3R2_5V	OSR6NU3134E
D5	1N4148WS	\$SOD_323	1N4148WS
ENC2	LJV ENCODER	ENC_5_2	RE1203CC1-H01-0351
ENC3	LJV ENCODER	ENC_5_2	RE1203CC1-H01-0351
ENC4	LJV ENCODER	ENC_5_2	RE1203CC1-H01-0351
J1	TS8P8_PCB_E	RJ45!0	TS8P8C-PCB-S
J3	HDR_6	HDR2X3	HN2X40 cut
J4	ENCODER	KK	ENA1J-B28L00128L
J5	HDR_20	HDR2X10	HN2X40 cut
J6	HDR_1	HOLE	screw 2,9x6
J7	HDR_1	HOLE	screw 2,9x6
J8	HDR_1	HOLE	screw 2,9x6
J9	HDR_1	HOLE	screw 2,9x6
J10	HDR_1	HOLE	screw 2,9x6
J11	HDR_1	HOLE	screw 2,9x6
J14	PITCH_2MM	HDR1X10_2mm	PN1X10-2.0
J15	PITCH_2MM	HDR1X10_2mm	PN1X10-2.0
J16	HDR_20	HDR2X10	HN2X40 cut

Name	Alias	Shape	Part
J17	PITCH_2MM	HDR1X10_2mm	PN1X10-2.0
J18	PITCH_2MM	HDR1X10_2mm	PN1X10-2.0
J19	PITCH_2MM	HDR1X10_2mm	PN1X10-2.0
J20	HDR_1	Swage stdoff	19833B-B0350-0
J21	HDR_1	Swage stdoff	19833B-B0350-0
P2	2X10K	Dual con.Pot.	RP09211GOXX-H03
R1	10K	\$R0805	R0805 10K 1% YAG/ASJ
R2	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R3	10K	\$R0805	R0805 10K 1%
R4	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R5	10K	\$R0805	R0805 10K 1% YAG/ASJ
R6	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R7	10K	\$R0805	R0805 10K 1% YAG/ASJ
R8	5R1	\$R0805	R0805 5.1R 5%
R9	10K	\$R0805	R0805 10K 1% YAG/ASJ
R10	5R1	\$R0805	R0805 5.1R 5%
R11	10K	\$R0805	R0805 10K 1%
R12	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R13	10K	\$R0805	R0805 10K 1%
R15	10K	\$R0805	R0805 10K 1% YAG/ASJ
R18	10K	\$R0805	R0805 10K 1% YAG/ASJ
R19	10K	\$R0805	R0805 10K 1% YAG/ASJ
R20	10K	\$R0805	R0805 10K 1% YAG/ASJ
R21	10K	\$R0805	R0805 10K 1% YAG/ASJ
R22	10K	\$R0805	R0805 10K 1%
R24	33K	\$R0805	R0805 33K 1%
R28	100K	\$R0805	R0805 100K 1%
R31	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R33	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R34	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R37	100K	\$R0805	R0805 100K 1%
R38	33K	\$R0805	R0805 33K 1%
R39	33K	\$R0805	R0805 33K 1%
R47	220R	\$R0805	R0805 220R 1%
R49	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R50	100R	\$R0805	R0805 100R 1%
R51	100R	\$R0805	R0805 100R 1%
R52	100R	\$R0805	R0805 100R 1%
R53	100R	\$R0805	R0805 100R 1%
R54	100R	\$R0805	R0805 100R 1%
R55	100R	\$R0805	R0805 100R 1%
R56	220R	\$R0805	R0805 220R 1%
R64	10K	\$R0805	R0805 10K 1%
R65	10K	\$R0805	R0805 10K 1%
T1	PDTC114ET	DIGITRA	PDTC114ET
U3	XMEGA128A3U_AU	\$QFP64S0_8	ATXMEGA128A3U-AU
U4	BA033CC0FP	\$FET_TO252	BA033CC0FP
U7	FM24CL64B-G	\$SO8	2768016
U9	4013B	\$SO14	HEF4013BT
U12	BA05CC0WFP	\$FET_TO252_5	BA05CC0WFP ROHM

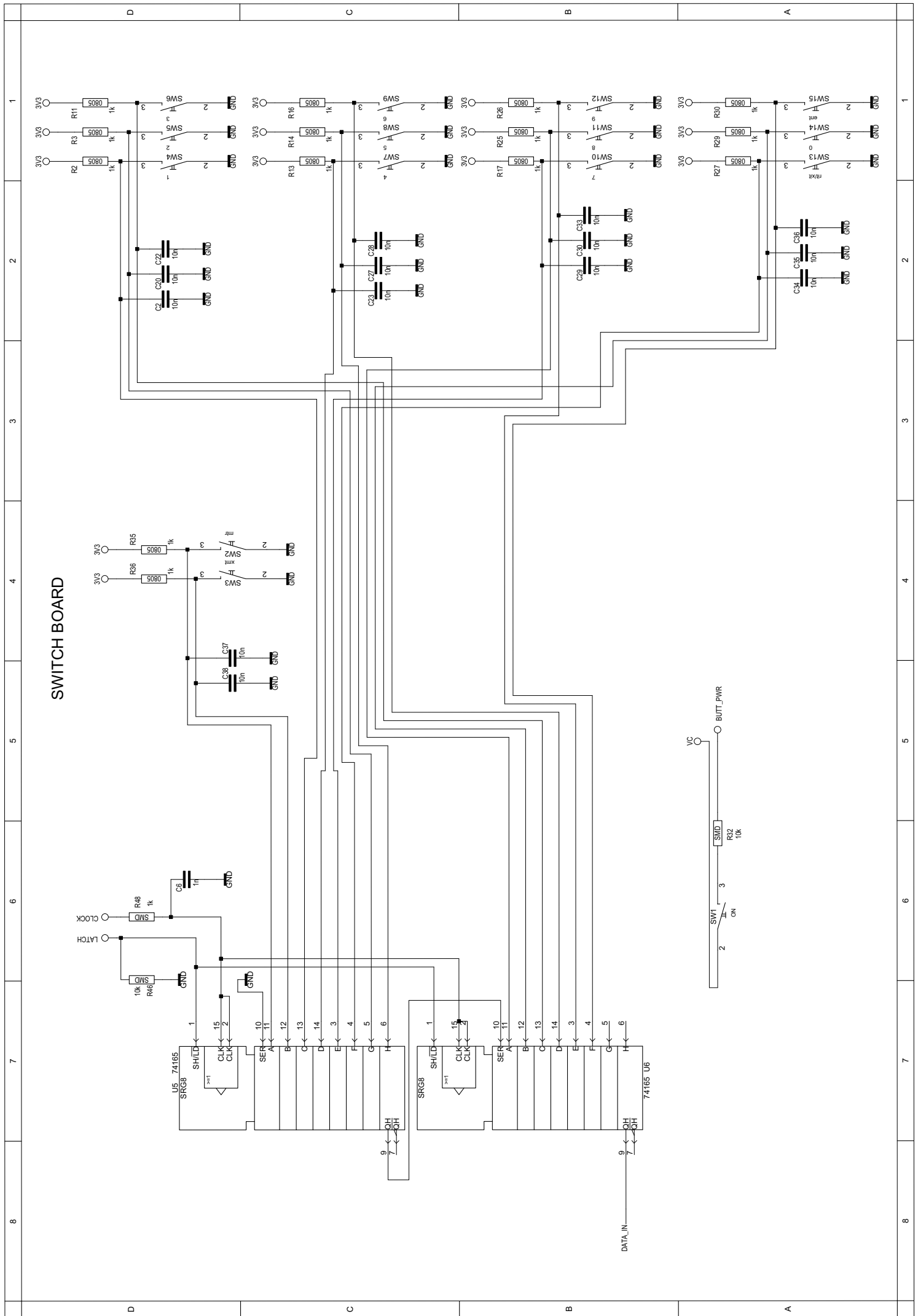
LCD&SWITCH BOARD 15100401



LCD & PCF8576



SWITCH BOARD



Parts specification:

Name	Alias	Shape	Part
C1	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C2	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C3	1U	\$R0805	C0805 1.0uF 50V X7R SAMSUNG
C6	1N	\$C0805	C0805 1.0nF 50V C0G SAMSUNG
C20	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C22	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C23	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C27	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C28	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C29	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C30	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C33	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C34	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C35	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C36	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C37	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C38	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
J1	PITCH_2MM	HDR1X10_2MM	2289781
J2	HDR_1	HOLE	M3x6, lockwasher 3mm
J3	HDR_1	HOLE	M3x6, lockwasher 3mm
J14	PITCH_2MM	HDR1X10_2MM	2289781
J17	PITCH_2MM	HDR1X10_2MM	2289781
J18	PITCH_2MM	HDR1X10_2MM	2289781
J19	PITCH_2MM	HDR1X10_2MM	2289781
R1	4K7	\$R0805	R0805 4.7K 1%
R2	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R3	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R11	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R13	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R14	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R16	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R17	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R25	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R26	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R27	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R29	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R30	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R32	10K	\$R0805	R0805 10K 1%
R35	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R36	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R40	18K	\$R0805	R0805 18K 1%
R44	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R45	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R46	10K	\$R0805	R0805 10K 1%
R48	1K	\$R0805	R0805 1.0K 1% YAG/ASJ

Name	Alias	Shape	Part
R67	100R	\$R0805	R0805 100R 1%
R71	100R	\$R0805	R0805 100R 1%
R72	100R	\$R0805	R0805 100R 1%
R73	100R	\$R0805	R0805 100R 1%
R74	100R	\$R0805	R0805 100R 1%
R75	100R	\$R0805	R0805 100R 1%
R76	4K7	\$R0805	R0805 4.7K 1%
SW1	ON	SKHH_1	TL1105SPF100Q
SW2	MTR	SKHH_1	TL1105SPF100Q
SW3	XMT	SKHH_1	TL1105SPF100Q
SW4	1	SKHH_1	TL1105SPF100Q
SW5	2	SKHH_1	TL1105SPF100Q
SW6	3	SKHH_1	TL1105SPF100Q
SW7	4	SKHH_1	TL1105SPF100Q
SW8	5	SKHH_1	TL1105SPF100Q
SW9	6	SKHH_1	TL1105SPF100Q
SW10	7	SKHH_1	TL1105SPF100Q
SW11	8	SKHH_1	TL1105SPF100Q
SW12	9	SKHH_1	TL1105SPF100Q
SW13	RIT/XIT	SKHH_1	TL1105SPF100Q
SW14	0	SKHH_1	TL1105SPF100Q
SW15	ENT	SKHH_1	TL1105SPF100Q
T1	PDTC114ET	DIGITRA	PDTC114ET
T3	PDTC114ET	DIGITRA	PDTC114ET
T4	PDTC114ET	DIGITRA	PDTC114ET
T5	PDTC114ET	DIGITRA	PDTC114ET
U1	PCF8576D_TSS	\$TSSOP56	771-PCF8576DT/2-T
U2	GDC04611	DA_42	GDC04611
U5	74HCT165	\$SO16	74HCT165D
U6	74HCT165	\$SO16	74HCT165D

MOSFET LINEAR POWER AMPLIFIER 50 WATTS

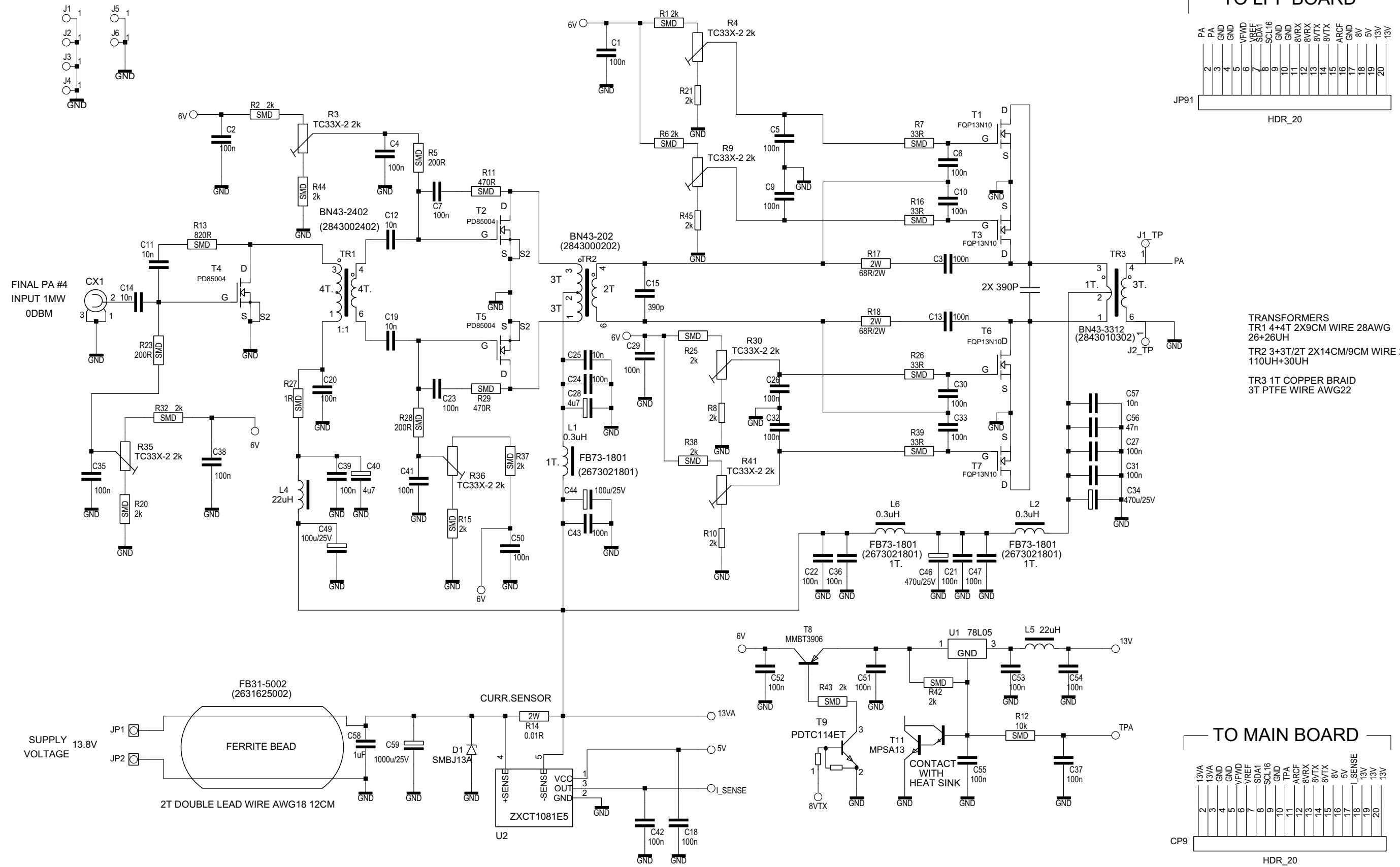
Final 50W amplifier is designed using 4pcs. QFET N-MOS [FAIRCHILD FQP13N10](#) transistor. The module consist of three stages: predriver with STMicroelectronics PD85004, driver in push-pull configuration (2xPD85004) and final unit utilizing 4pcs. (2 by 2 push-pull in parallel) FQP13N10 transistors in easy to mount TO-220 case.

Input matching and especially Ciss (~400pF) compensation is performed by input transformer Tr2 and swamp resistors R7, R16, R26, R39. This group of components increases input drive level but helps to compensate input capacitance on higher frequencies.

Each stage uses broadband ferrite transformer (Tr1, Tr2, Tr3).

Device input voltage 13.8V supplies directly power amplifier module via input balun transformer and current sensor U2 (ZXCT1081E5)

POWER AMPLIFIER MODULE 55W



Parts specification:

Name	Alias	Shape	Part
C1	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C2	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C3	100N	\$R1206	C1206 100nF 200V X7R
C4	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C5	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C6	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C7	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C9	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C10	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C11	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C12	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C13	100N	\$R1206	C1206 100nF 200V X7R
C14	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C15	390P	SM_CAP2	cornell dubilier
C18	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C19	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C20	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C21	100N	\$R1206	C1206 100nF 200V X7R
C22	100N	\$R1206	C1206 100nF 200V X7R
C23	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C24	100N	\$R1206	C1206 100nF 200V X7R
C25	10N	\$R1206	C1206 10nF 200V X7R
C26	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C27	100N	\$R1206	C1206 100nF 200V X7R
C28	4U7	\$TANT1206	C1206 4.7uF 25V X7R SAMSUNG
C29	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C30	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C31	100N	\$R1206	C1206 100nF 200V X7R
C32	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C33	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C34	470U/25V	ELKO8R3_5	CE 470uF 16V 105C Fujicon
C35	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C36	100N	\$R1206	C1206 100nF 200V X7R
C37	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C38	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C39	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C40	4U7	\$TANT1206	C1206 4.7uF 25V X7R SAMSUNG
C41	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C42	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C43	100N	\$R1206	C1206 100nF 200V X7R
C44	100U/25V	ELKO5R2_5	CE 100uF 25V 105C Fujicon
C46	470U/25V	ELKO8R3_5	CE 470uF 16V 105C Fujicon
C47	100N	\$R1206	C1206 100nF 200V X7R
C49	100U/25V	ELKO5R2_5	CE 100uF 25V 105C Fujicon
C50	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C51	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C52	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C53	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C54	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG

Name	Alias	Shape	Part
C55	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C56	47N	\$R1206	C1206 47nF 100V X7R SAMSUNG
C57	10N	\$R1206	C1206 10nF 200V X7R
C58	1UF	\$R0805	C0805 1.0uF 50V X7R SAMSUNG
C59	1000U/25V	ELKO10R5H	CE 1000uF 25V 105C Fujicon
CP9	HDR_20	HDR2X10	PN2X10
CX1	IPX	IPX	ebay
D1	SMBJ13A	\$SMB	SMBJ13A
JP1	L	HOLE_2MM2	Anderson connector RED
JP2	L	HOLE_2MM2	Anderson connector BLACK
13.8v	input balun		2631625002 Ferite bead
13.8v	input balun		2t. Double lead wire AWG18 12cm
JP91	HDR_20	HDR2X10	elevated from the board!
L1	0.3UH	FB43-1801	2673021801 1t. Fair-rite
L2	0.3UH	FB43-1801	2673021801 1t. Fair-rite
L4	22UH	\$R1210	LQH32CN220K23L
L5	22UH	\$R1210	LQH32CN220K23L
L6	0.3UH	FB43-1801	2673021801 1t. Fair-rite
R1	2K	\$R0805	R0805 2.0K 1%
R2	2K	\$R0805	R0805 2.0K 1%
R3	TC33X-2_2K	\$POTTC33X	TC33X-2 2K
R4	TC33X-2_2K	\$POTTC33X	TC33X-2 2K
R5	200R	\$R0805	R0805 200R 1%
R6	2K	\$R0805	R0805 2.0K 1%
R7	33R	\$R1206	R1206 33R 1%
R8	2K	\$R0805	R0805 2.0K 1%
R9	TC33X-2_2K	\$POTTC33X	TC33X-2 2K
R10	2K	\$R0805	R0805 2.0K 1%
R11	470R	\$R1206	R1206 470R 1% YAG/ASJ
R12	10K	\$R0805	R0805 10K 1%
R13	820R	\$R0805	R0805 820R 1%
R14	0.01R	\$R_WSC1	R2512 0.01R 1% 2W
R15	2K	\$R0805	R0805 2.0K 1%
R16	33R	\$R1206	R1206 33R 1%
R17	68R/2W	R0617R20	R2WCF 68R
R18	68R/2W	R0617R20	R2WCF 68R
R20	2K	\$R0805	R0805 2.0K 1%
R21	2K	\$R0805	R0805 2.0K 1%
R23	200R	\$R0805	R0805 200R 1%
R25	2K	\$R0805	R0805 2.0K 1%
R26	33R	\$R1206	R1206 33R 1%
R27	1R	\$R0805	R0805 1.1R 5%
R28	200R	\$R0805	R0805 200R 1%
R29	470R	\$R1206	R1206 470R 1% YAG/ASJ
R30	TC33X-2_2K	\$POTTC33X	TC33X-2 2K
R32	2K	\$R0805	R0805 2.0K 1%
R35	TC33X-2_2K	\$POTTC33X	TC33X-2 2K
R36	TC33X-2_2K	\$POTTC33X	TC33X-2 2K

Name	Alias	Shape	Part
R37	2K	\$R0805	R0805 2.0K 1%
R38	2K	\$R0805	R0805 2.0K 1%
R39	33R	\$R1206	R1206 33R 1%
R41	TC33X-2_2K	\$POTTC33X	TC33X-2 2K
R42	2K	\$R0805	R0805 2.0K 1%
R43	2K	\$R0805	R0805 2.0K 1%
R44	2K	\$R0805	R0805 2.0K 1%
R45	2K	\$R0805	R0805 2.0K 1%
T1	FQP13N10	FET_TO220H	FQP13N10
T2	PD85004	\$FET_SOT89	PD85004
T3	FQP13N10	FET_TO220H	FQP13N10
T4	PD85004	\$FET_SOT89	PD85004
T5	PD85004	\$FET_SOT89	PD85004
T6	FQP13N10	FET_TO220H	FQP13N10
T7	FQP13N10	FET_TO220H	FQP13N10
T8	MMBT3906	\$TRA_SOT23	MMBT3906 SMD
T9	PDTC114ET	DIGITRA	PDTC114ET
T11	MPSA13	TRA_TO92B	MPSA13
TR1	1:01	BN43-2402	2843002402
TR2	TRAFO_4_2	BN43_2020	2843000202
TR3	BN43-3312	BN61-4852	2843010302
U1	78L05	\$78L05_SOT8	78L05 SMD SOT89
U2	ZXCT1081E5	\$TRA_SOT23	ZXCT1081E5

LOW PASS FILTER BLOCK 1.8 - 30MHz

This board consist of the following modules:

High voltage (210V) scheme (voltage tripler)

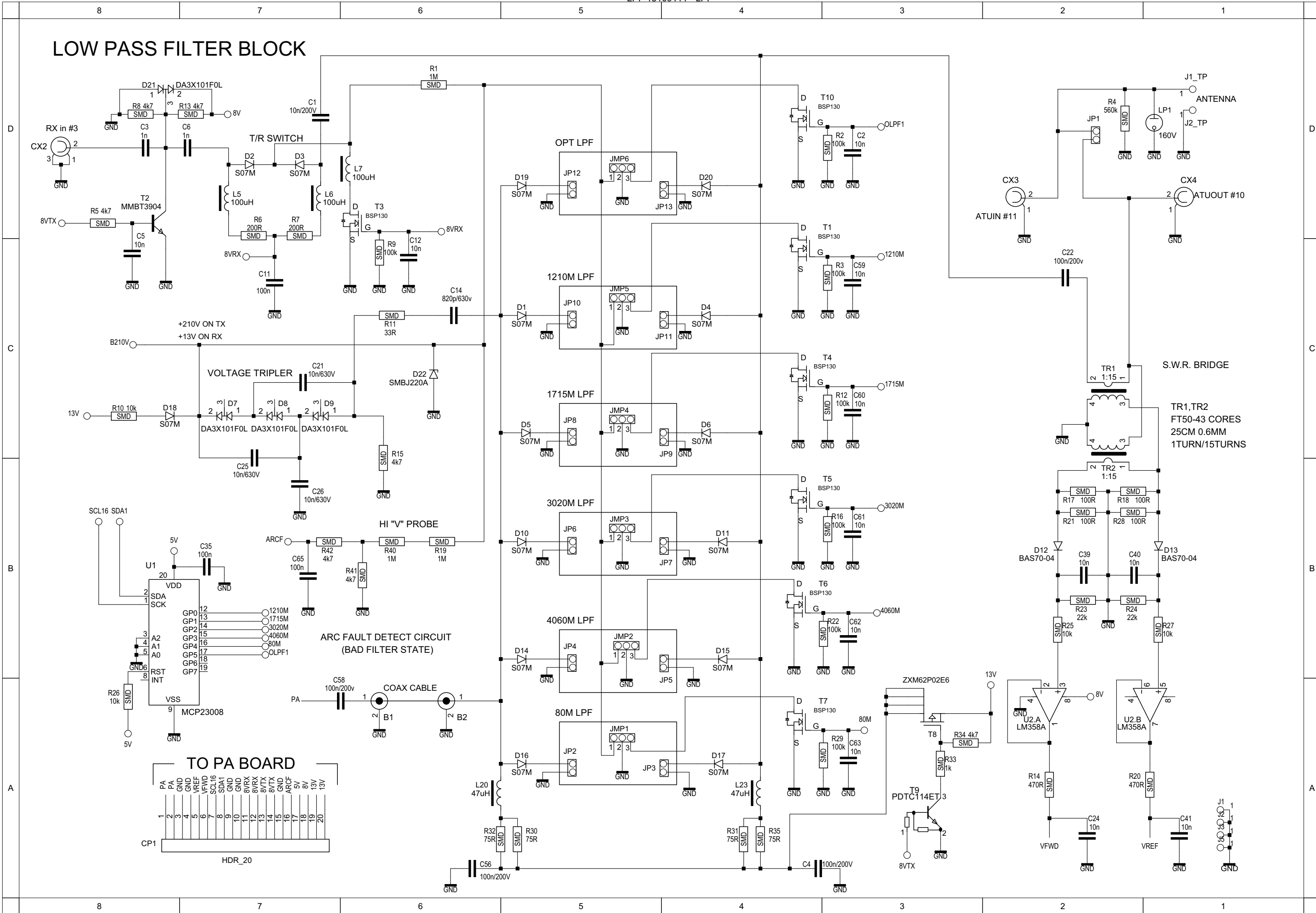
Antenna RX/TX switching

SWR directional coupler and measurement of V_{fwd}/V_{ref}

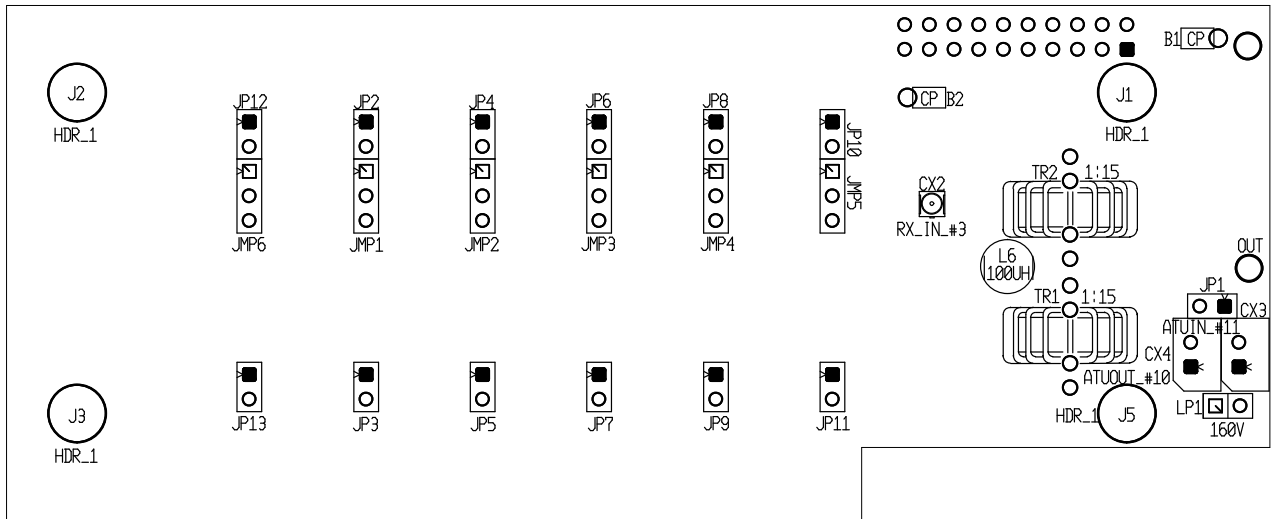
Optional LPF (160m) connector

This module ensures clear harmonic output of the linear amplifier, also fits the components for antenna RX/TX switching. Following the “click-less” concept, there are no mechanical relays in the circuit. After long searching for suitable power switching component a VISHAY high voltage rectifier diode [S07J](#) (S07M) that met all the requirements for reverse voltage capacity, reverse recovery time, forward current and reverse voltage was found. So S07J were used in the project to ensure good switching of TX power to the antenna via proper LPF and also reliable isolation between each other low pass filters not selected for this band portion.

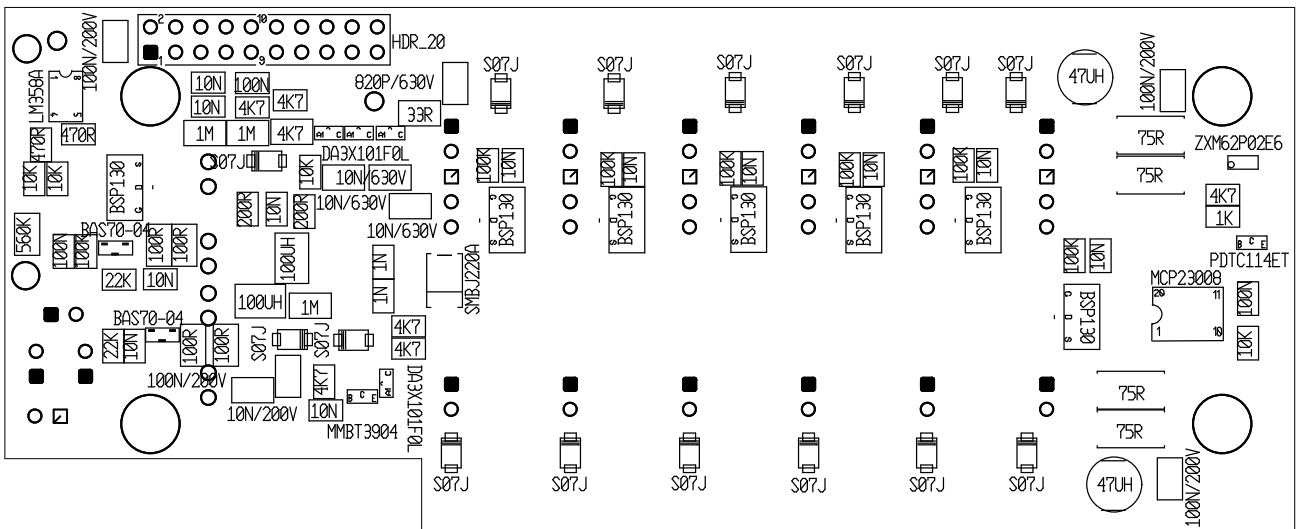
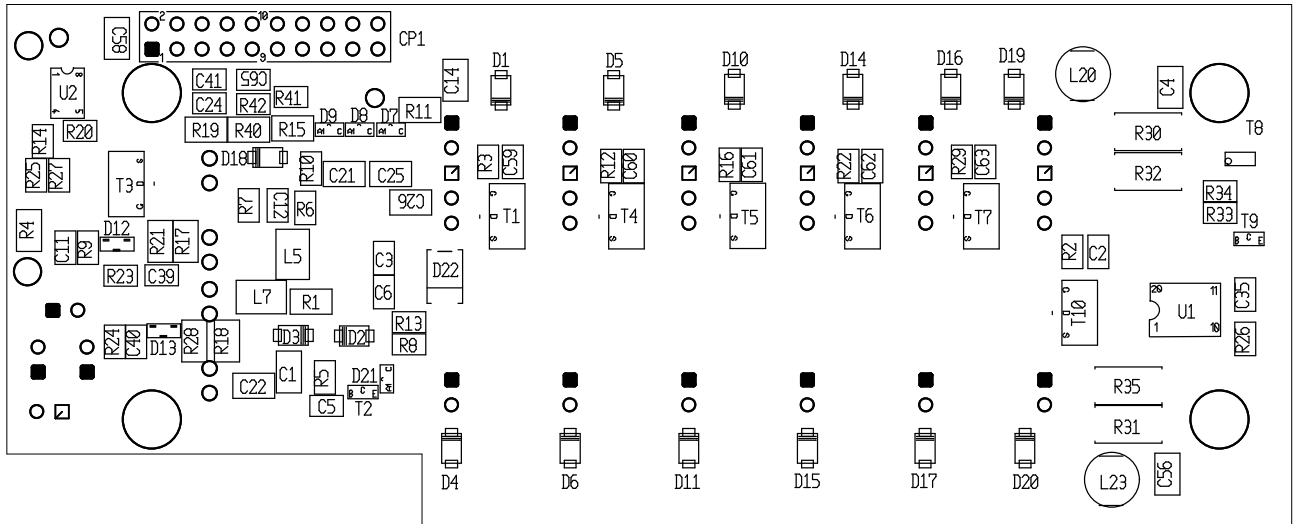
LOW PASS FILTER BLOCK



LPF TOP view



LPF BOTTOM view



Parts specification:

Name	Alias	Shape	Order number
B1,B2	CP	COAX_PADS	5cm rg-404
C1	10N/200V	SR1206	C1206 10nF 200V X7R
C2	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C3	1N	SR0805	C0805 1.0nF 50V COG SAMSUNG
C4	100N/200V	SR1206	C1206 100nF 200V X7R
C5	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C6	1N	SR0805	C0805 1.0nF 50V COG SAMSUNG
C11	100N	SR0805	C0805 100nF 50V X7R SAMSUNG
C12	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C14	820P/630V	SR1206	GRM31B5C2J821FW01L
C21	10N/630V	SR1206	C1206 10nF 630V X7R
C22	100N/200V	SR1206	C1206 100nF 200V X7R
C24	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C25	10N/630V	SR1206	C1206 10nF 630V X7R
C26	10N/630V	SR1206	C1206 10nF 630V X7R
C35	100N	SR0805	C0805 100nF 50V X7R SAMSUNG
C39	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C40	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C41	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C41	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C56	100N/200V	SR1206	C1206 100nF 200V X7R
C58	100N/200V	SR1206	C1206 100nF 200V X7R
C59	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C60	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C61	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C62	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C63	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C65	100N	SR0805	C0805 100nF 50V X7R SAMSUNG
CP1	HDR_20	HDR2X10	HN2X20 1/2 cut
CX2	RX_IN_#3	IPX	IPX/U.FL coax connector
CX3	ATUIN_#11	HDR2ATU	CW2S
CX4	ATUOUT_#10	HDR2ATU	CW2S
D1	S07M	SSMF	S07M-GS18
D2	S07M	SSMF	S07M-GS18
D3	S07M	SSMF	S07M-GS18
D4	S07M	SSMF	S07M-GS18
D5	S07M	SSMF	S07M-GS18
D6	S07M	SSMF	S07M-GS18
D7	DA3X101F0L	SSOT23DA3	2284127
D8	DA3X101F0L	SSOT23DA3	2284127
D9	DA3X101F0L	SSOT23DA3	2284127
D10	S07M	SSMF	S07M-GS18
D11	S07M	SSMF	S07M-GS18
D12	BAS70-04	SSOT23BAS	1797835
D13	BAS70-04	SSOT23BAS	1797835
D14	S07M	SSMF	S07M-GS18
D15	S07M	SSMF	S07M-GS18
D16	S07M	SSMF	S07M-GS18
D17	S07M	SSMF	S07M-GS18
D18	S07M	SSMF	S07M-GS18
D19	S07M	SSMF	S07M-GS18
D20	S07M	SSMF	S07M-GS18
D21	DA3X101F0L	SSOT23DA3	2284127
D22	SMBJ220A	SSMB	2749199
J1	HDR_1	HOLE	M3x6, lockwasher 3mm
J2	HDR_1	HOLE	M3x6, lockwasher 3mm
J3	HDR_1	HOLE	M3x6, lockwasher 3mm
J5	HDR_1	HOLE	M3x6, lockwasher 3mm
L5	100UH	SR1210	CL100uH FDA32

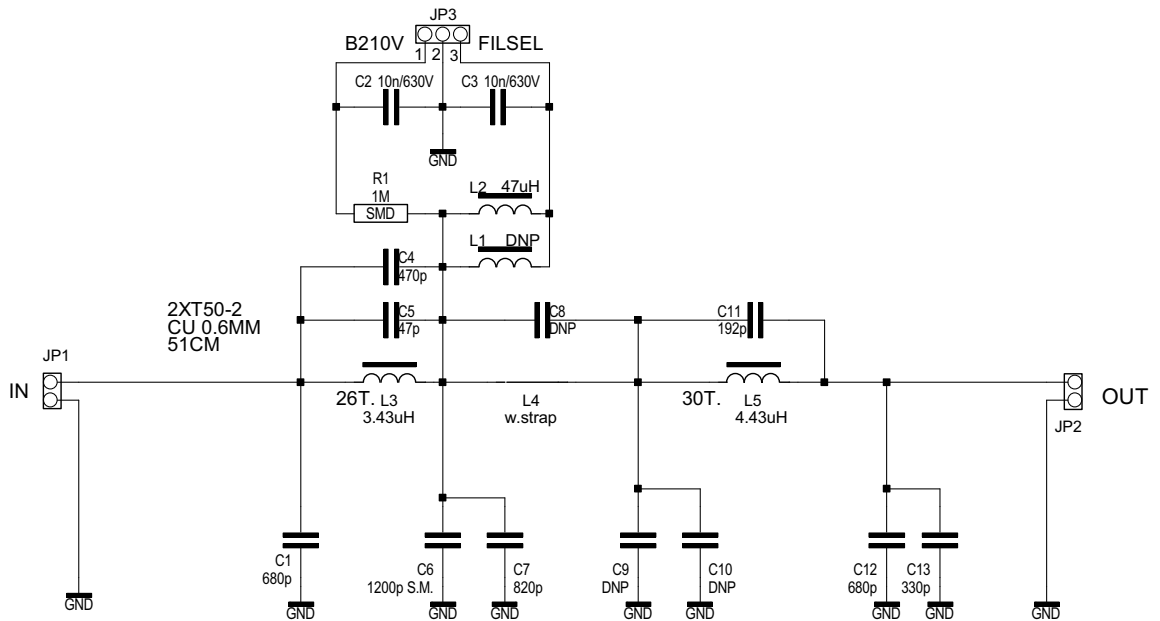
Name	Alias	Shape	Order number
L6	100UH	DA54	CL100uH FPI0504 (DA54)
L7	100UH	\$R1210	CL100uH FDA32
L20	47UH	DA54	CL47uH FPI0504 (DA54)
L23	47UH	DA54	CL47uH FPI0504 (DA54)
LP1	160V	SIL2	
R1	1M	\$R1206	R1206 1.0M 1% YAG/ASJ
R2	100K	\$R0805	R0805 100K 1%
R3	100K	\$R0805	R0805 100K 1%
R4	560K	\$R1206	R1206 560K 1% YAG/ASJ
R5	4K7	\$R0805	R0805 4.7K 1%
R6	200R	\$R0805	R0805 200R 1%
R7	200R	\$R0805	R0805 200R 1%
R8	4K7	\$R0805	R0805 4.7K 1%
R9	100K	\$R0805	R0805 100K 1%
R10	10K	\$R0805	R0805 10K 1%
R11	33R	\$R1206	R1206 33R 1%
R12	100K	\$R0805	R0805 100K 1%
R13	4K7	\$R0805	R0805 4.7K 1%
R14	470R	\$R0805	R0805 470R 1%
R15	4K7	\$R1206	R1206 4.7K 1% YAG/ASJ
R16	100K	\$R0805	R0805 100K 1%
R17	100R	\$R1206	R1206 100R 1% YAG/ASJ
R18	100R	\$R1206	R1206 100R 1% YAG/ASJ
R19	1M	\$R1206	R1206 1.0M 1% YAG/ASJ
R20	470R	\$R0805	R0805 470R 1%
R21	100R	\$R1206	R1206 100R 1% YAG/ASJ
R22	100K	\$R0805	R0805 100K 1%
R23	22K	\$R0805	R0805 22K 1%
R24	22K	\$R0805	R0805 22K 1%
R25	10K	\$R0805	R0805 10K 1%
R26	10K	\$R0805	R0805 10K 1%
R27	10K	\$R0805	R0805 10K 1%
R28	100R	\$R1206	R1206 100R 1% YAG/ASJ
R29	100K	\$R0805	R0805 100K 1%
R30	75R	\$R_WSC1	R2512 150R 1% YAG/ASJ po 2br
R31	75R	\$R_WSC1	R2512 150R 1% YAG/ASJ po 2br
R32	75R	\$R_WSC1	R2512 150R 1% YAG/ASJ po 2br
R33	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R34	4K7	\$R0805	R0805 4.7K 1%
R35	75R	\$R_WSC1	R2512 150R 1% YAG/ASJ po 2br
R40	1M	\$R1206	R1206 1.0M 1% YAG/ASJ
R41	4K7	\$R0805	R0805 4.7K 1%
R42	4K7	\$R0805	R0805 4.7K 1%
T1	BSP130	\$FET_SOT223	BSP130,115
T2	MMBT3904	\$TRA_SOT23	MMBT3904 SMD
T3	BSP130	\$FET_SOT223	BSP130,115
T4	BSP130	\$FET_SOT223	BSP130,115
T5	BSP130	\$FET_SOT223	BSP130,115
T6	BSP130	\$FET_SOT223	BSP130,115
T7	BSP130	\$FET_SOT223	BSP130,115
T8	ZXM62P02E6	\$TRA_SOT23_6	ZXM62P02E6
T9	PDTC114ET	DIGITRA	PDTC114ET
T10	BSP130	\$FET_SOT223	BSP130,115
TR1	1:15	TR1_16	FT50-43
TR2	1:15	TR1_16	FT50-43
U1	MCP23008	\$SSOP20	1605564
U2	LM358A	\$SO8	LM358D SMD

LOW PASS FILTER subboards 160 - 10m

LPF subboards are situated on small PCB that should be soldered directly on main LPF board. There are 6 sub PCBs with low pass filters chebyshev type for all HF bands. There is place where to be nested optional LPF subboard (for 160m). Bands and frequencies are as following:

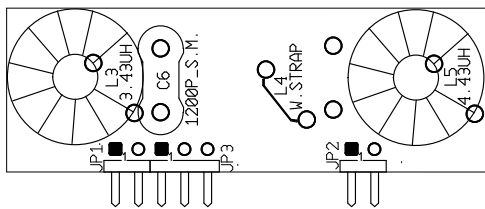
160m (optional)	1.8 - 2.0MHz
80m	3.5 - 4.0MHz
40/60m	5.2 - 7,3MHz
30/20m	10 - 14.3MHz
17/15m	18 - 21.5MHz
12/10m	24.5 - 29.7MHz

LOW PASS FILTER SUB BOARD 160M/15109201

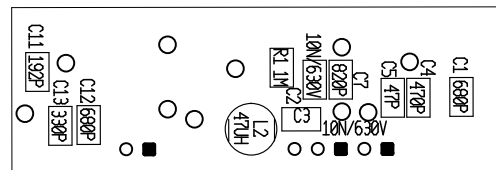


ALL CAPACITORS IF NOT OTHER SPECIFIED ARE 1000V COG RADIO FREQUENCY CERAMICS OR SILVER MICA 500V

160m TOP view



160m BOTTOM view



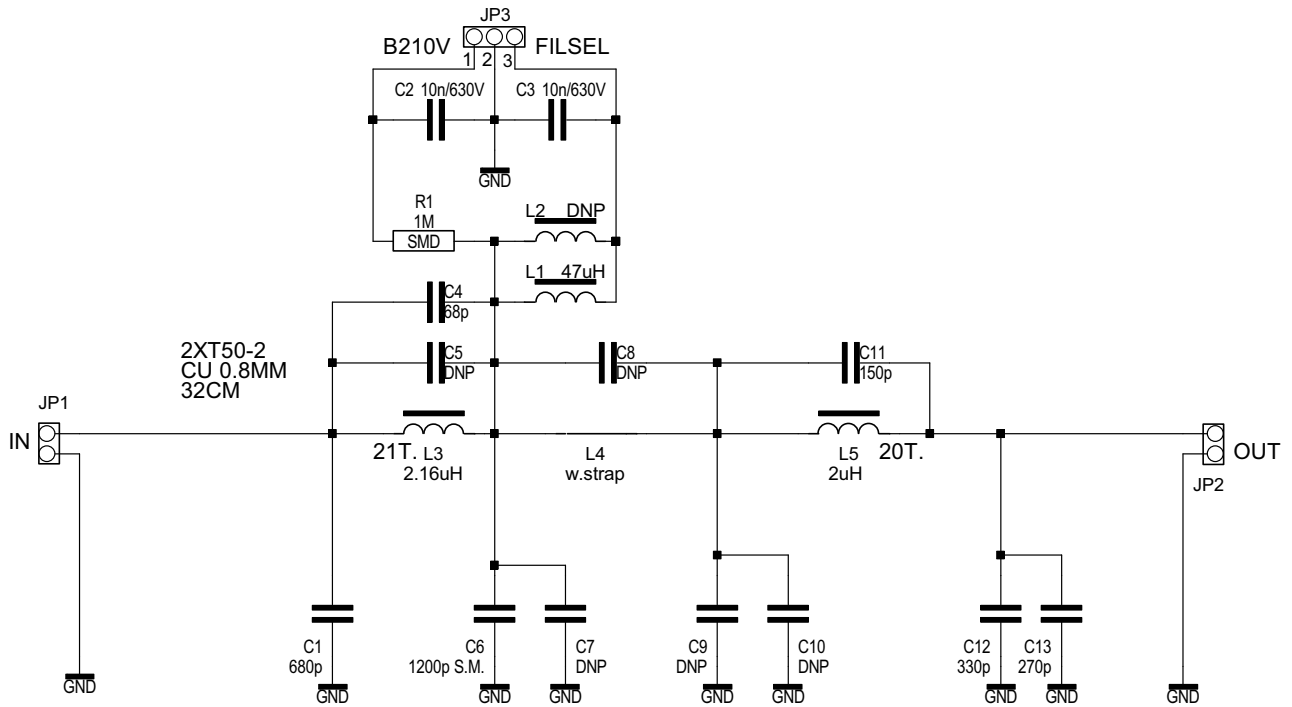
Parts specification:

Name	Alias	Shape	Part
C1	680P	SR1206	630-1000V COG
C2	10N/630V	SR1206	C1206 10nF 630V X7R
C3	10N/630V	SR1206	C1206 10nF 630V X7R
C4	470P	SR1206	630-1000V COG
C5	47P	SR1206	630-1000V COG
C6	1200P_S.M.	SM_CAP	Cornell Dubilier
C7	820P	SR1206	630-1000V COG
C8	DNP		
C9	DNP		
C10	DNP		
C11	192P	SR1206	630-1000V COG

Name	Alias	Shape	Part
C12	680P	SR1206	630-1000V COG
C13	330P	SR1206	630-1000V COG
JP1	.	HDR1X2HA	HR1X20 1/10cut
JP2	.	HDR1X2HA	HR1X20 1/10cut
JP3	.	HDR1X3HA	HR1X20 3/20cut
L1	DNP		
L2	47UH	DA54	CL47uH FPI0504 (DA54)
L3	3.43UH	T50-2	26t./51cm Cu 0.6mm
L4	0UH	wire strap	wire strap
L5	4.43UH	T50-2	30t./51cm Cu 0.6mm
R1	1M	SR1206	R1206 1.0M 1% YAG/ASJ

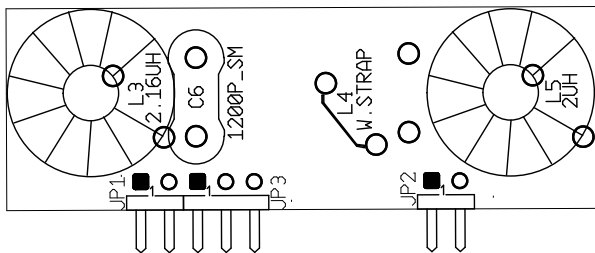
LOW PASS FILTER SUB BOARD

80M/15109206

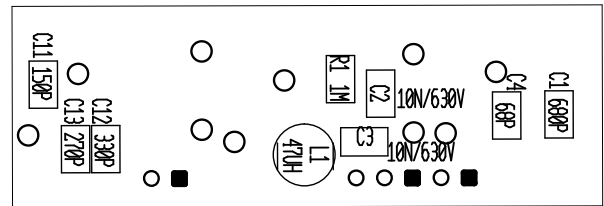


ALL CAPACITORS IF NOT OTHER
SPECIFIED ARE 1000V COG
RADIO FREQUENCY CERAMICS
OR SILVER MICA 500V

80m TOP VIEW



80m BOTTOM VIEW



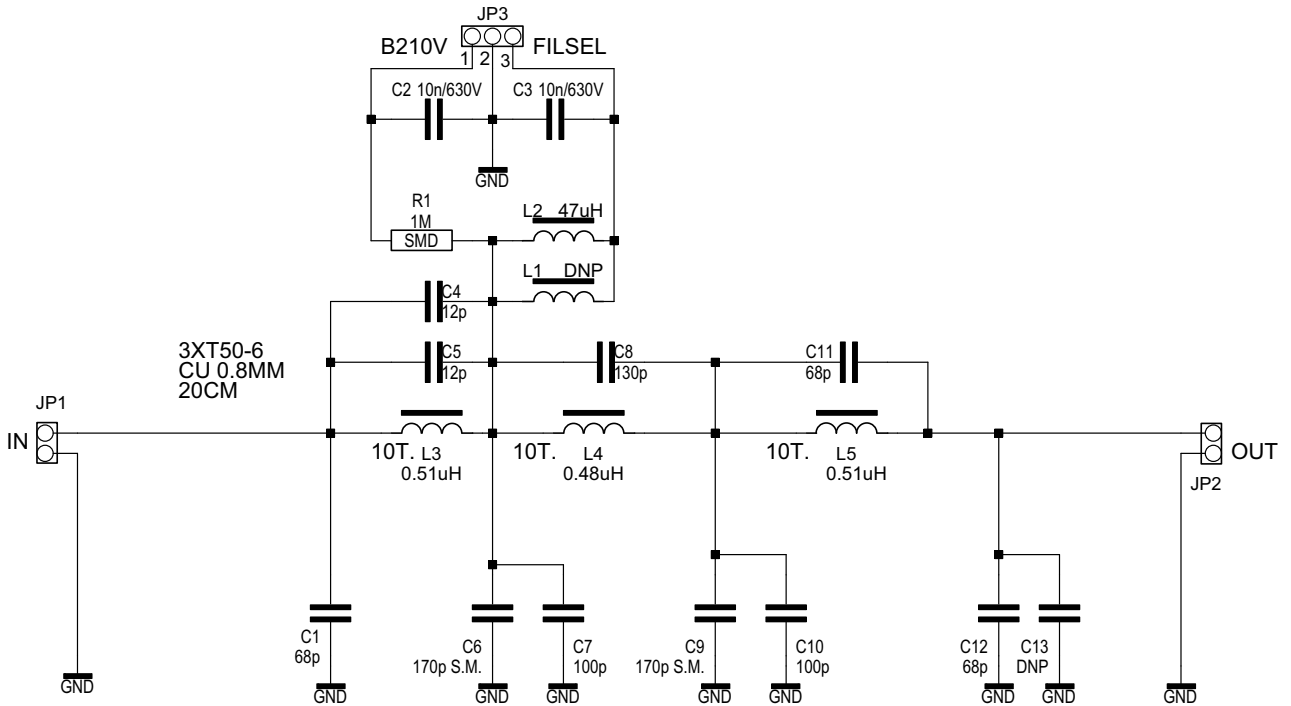
Parts specification:

Name	Alias	Shape	part
C1	680P	SR1206	630-1000V COG
C2	10N/630V	SR1206	C1206 10nF 630V X7R
C3	10N/630V	SR1206	C1206 10nF 630V X7R
C4	68P	SR1206	630-1000V COG
C5	DNP	SR1206	
C6	1200P_S.M.	SM_CAP	Cornell Dubilier
C7	DNP	SR1206	
C8	DNP	SR1206	
C9	DNP	SM_CAP	
C10	DNP	SR1206	
C11	150P	SR1206	630-1000V COG

Name	Alias	Shape	part
C12	330P	SR1206	630-1000V COG
C13	270P	SR1206	630-1000V COG
JP1	.	HDR1X2HA	HR1X20 1/10cut
JP2	.	HDR1X2HA	HR1X20 1/10cut
JP3	.	HDR1X3HA	HR1X20 3/20cut
L1	47UH	DA54	CL47uH FPI0504 (DA54)
L2	DNP	DA54	
L3	2.16UH	T50-2	21t./Cu 0.8mm/32cm
L4	0UH		wire strap 20mm
L5	2UH	T50-2	20t./Cu 0.8mm/32cm
R1	1M	SR1206	R1206 1.0M 1% YAG/ASJ

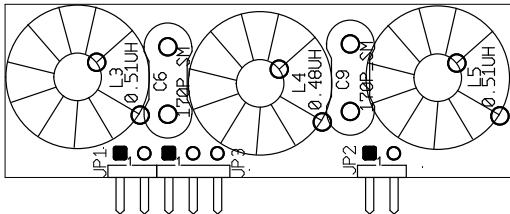
LOW PASS FILTER SUB BOARD

3020M/15109202

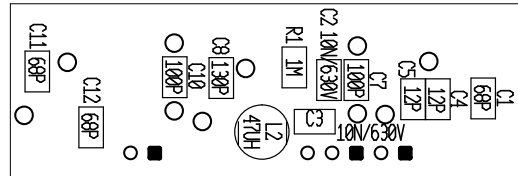


ALL CAPACITORS IF NOT OTHER SPECIFIED ARE 1000V C0G RADIO FREQUENCY CERAMICS OR SILVER MICA 500V

30/20m TOP VIEW



30/20m BOTTOM VIEW



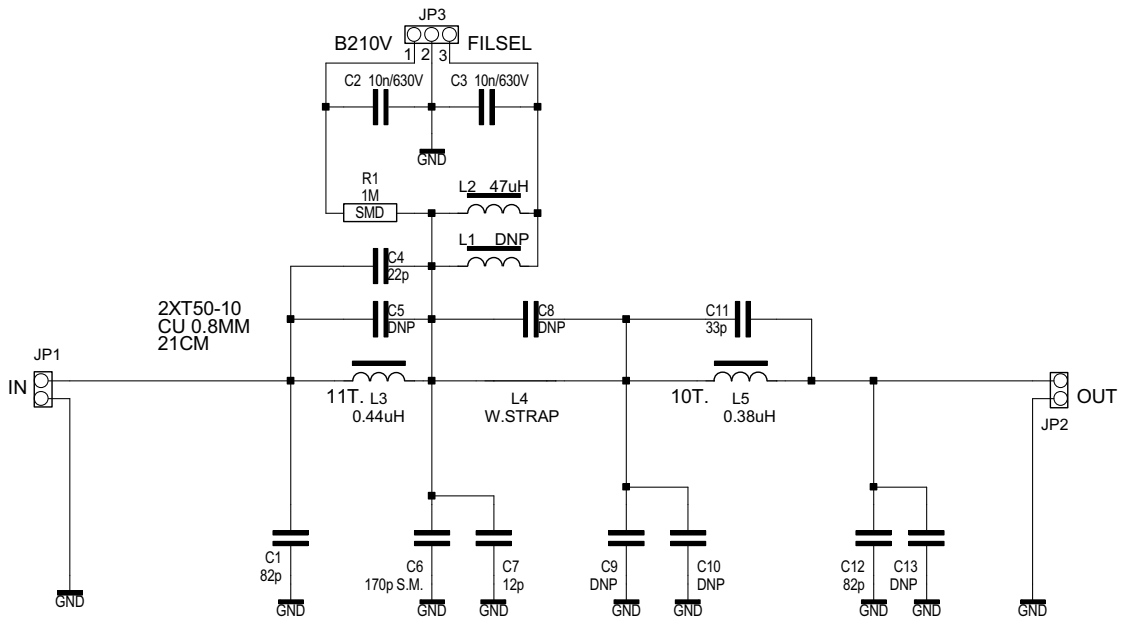
Parts specification:

Name	Alias	Shape	Part
C1	68P	SR1206	630-1000V C0G
C2	10N/630V	SR1206	C1206 10nF 630V X7R
C3	10N/630V	SR1206	C1206 10nF 630V X7R
C4	12P	SR1206	630-1000V C0G
C5	12P	SR1206	630-1000V C0G
C6	170P_S.M.	SM_CAP	Cornell Dubilier
C7	100P	SR1206	630-1000V C0G
C8	130P	SR1206	630-1000V C0G
C9	170P_S.M.	SM_CAP	Cornell Dubilier
C10	100P	SR1206	630-1000V C0G
C11	68P	SR1206	630-1000V C0G

Name	Alias	Shape	Part
C12	68P	SR1206	630-1000V C0G
C13	DNP	SR1206	
JP1	.	HDR1X2HA	HR1X20 1/10cut
JP2	.	HDR1X2HA	HR1X20 1/10cut
JP3	.	HDR1X3HA	HR1X20 3/20cut
L1	DNP	DA54	
L2	47UH	DA54	CL47uH FPI0504 (DA54)
L3	0.51UH	T50_6	10t./20cm Cu 0.8mm
L4	0.48UH	T50_6	10t./20cm Cu 0.8mm
L5	0.51UH	T50_6	10t./20cm Cu 0.8mm
R1	1M	SR1206	R1206 1.0M 1% YAG/ASJ

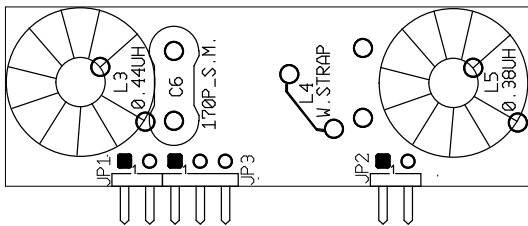
LOW PASS FILTER SUB BOARD

1715M/15109203

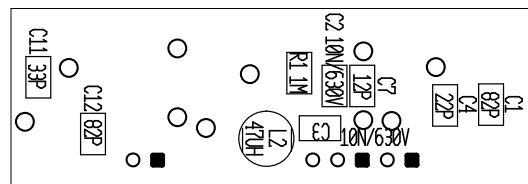


ALL CAPACITORS IF NOT OTHER SPECIFIED ARE 1000V C0G RADIO FREQUENCY CERAMICS OR SILVER MICA 500V

17/15m TOP VIEW



17/15m TOP VIEW



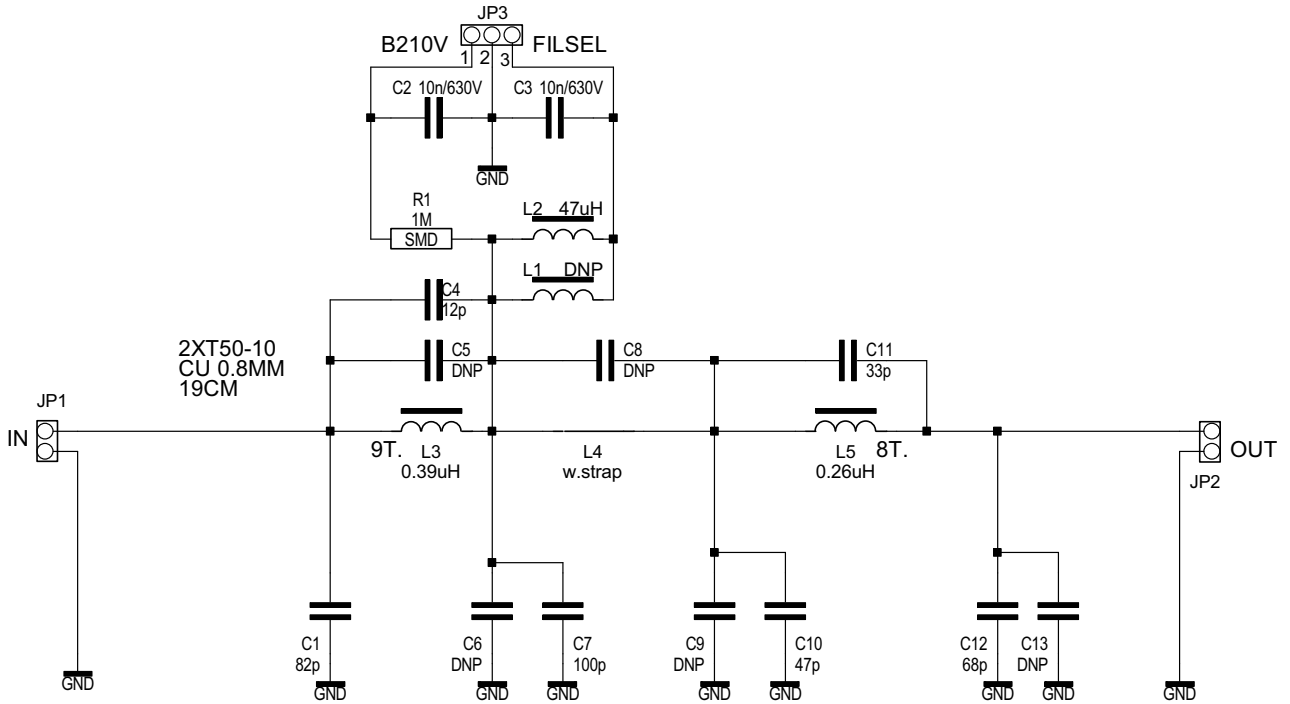
Parts specification:

Name	Alias	Shape	Order number
C1	82P	\$R1206	630-1000V C0G
C2	10N/630V	\$R1206	C1206 10nF 630V X7R
C3	10N/630V	\$R1206	C1206 10nF 630V X7R
C4	22P	\$R1206	630-1000V C0G
C5	DNP		
C6	170P_S.M.	SM_CAP	Cornell Dubilier
C7	12P	\$R1206	630-1000V C0G
C8	DNP		
C9	DNP		
C10	DNP		
C11	33P	\$R1206	630-1000V C0G

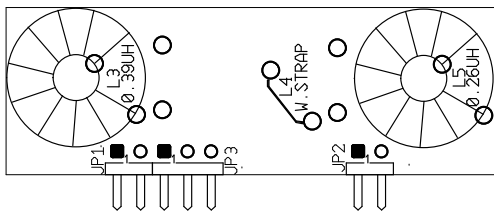
Name	Alias	Shape	Order number
C12	82P	\$R1206	630-1000V C0G
C13	DNP		
JP1	.	HDR1X2HA	HR1X20 1/10cut
JP2	.	HDR1X2HA	HR1X20 1/10cut
JP3	.	HDR1X3HA	HR1X20 3/20cut
L1	DNP		
L2	47UH	DA54	CL47uH FPI0504 (DA54)
L3	0.44UH	T50-10	11t./21cm Cu 0.8mm
L4	0UH	wire strap	wire strap
L5	0.38UH	T50-10	10t./21cm Cu 0.8mm
R1	1M	\$R1206	R1206 1.0M 1% YAG/ASJ

LOW PASS FILTER SUB BOARD

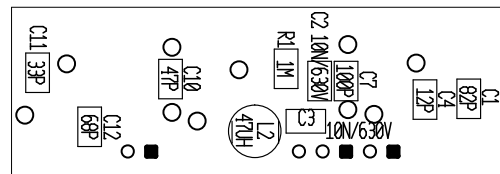
1210M/15109204



12/10m TOP VIEW



12/10m BOTTOM VIEW



Parts specification:

Name	Alias	Shape	part
C1	82P	\$R1206	630-1000V COG
C2	10N/630V	\$R1206	C1206 10nF 630V X7R
C3	10N/630V	\$R1206	C1206 10nF 630V X7R
C4	12P	\$R1206	630-1000V COG
C5	DNP		
C6	DNP		
C7	100P	\$R1206	630-1000V COG
C8	DNP		
C9	DNP		
C10	47P	\$R1206	630-1000V COG
C11	33P	\$R1206	630-1000V COG

Name	Alias	Shape	part
C12	68P	\$R1206	630-1000V COG
C13	DNP		
JP1	.	HDR1X2HA	HR1X20 1/10cut
JP2	.	HDR1X2HA	HR1X20 1/10cut
JP3	.	HDR1X3HA	HR1X20 3/20cut
L1	DNP		
L2	47UH	DA54	CL47uH FPI0504 (DA54)
L3	0.39UH	T50-10	9t./19cm Cu 0.8mm
L4	0UH	wire strap	wire strap
L5	0.26UH	T50-10	8t./19cm Cu 0.8mm
R1	1M	\$R1206	R1206 1.0M 1% YAG/ASJ

SSBGEN - mic amplifier, DSB, CW modulator unit

SSBGEN board forms DSB/CW modulation on TX.

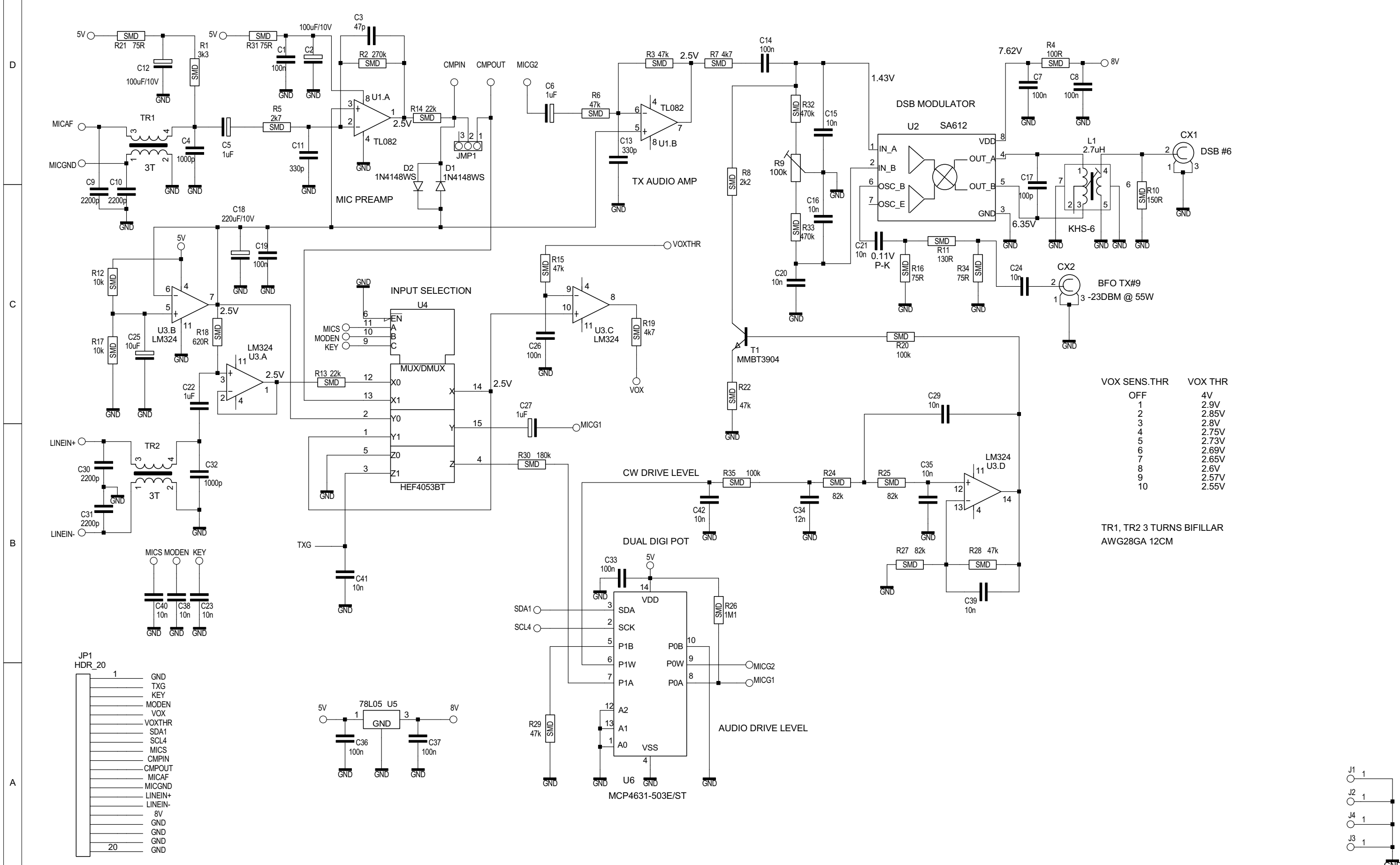
It consists of the following parts:

- Microphone preamplifier and TX audio amplifier – TL082
- Switched input: LINE IN or MIC (MUX 4053)
- DSB modulator – SA612
- CW drive level and form circuit – $\frac{1}{2}$ of MCP4631 dual digi pot
- SSB drive level (mic level) – $\frac{1}{2}$ of MCP4631 dual digi pot

Input audio frequency signal comes either from mic input from RJ-45 front panel connector or line input (DB15 ACC1 connector on rear panel). Tr1 and Tr2 eliminates any existing stray RF currents caused by mismatched and/or not balanced antenna load. TX gain line controls the signal level on CW so it could be near assigned power levels and ALC level is within proper range.

Pseudo-gaussian CW pulses are formed by LP filter U3.D and R35,R24,R25, R27, R28, C42, C34, C35, C29 and C39. Then the signal comes on T1 which leads to de-balance of DSB modulator U2.

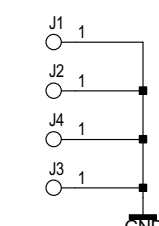
SSB GENERATOR BOARD



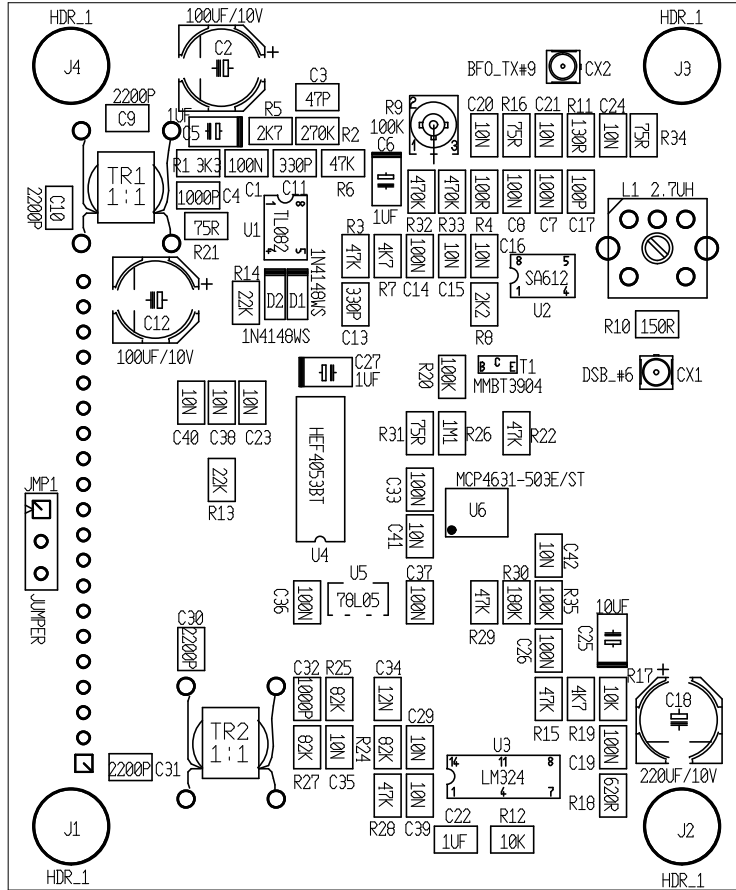
VOX SENS. THR	VOX THR
OFF	4V
1	2.9V
2	2.85V
3	2.8V
4	2.75V
5	2.73V
6	2.69V
7	2.65V
8	2.6V
9	2.57V
10	2.55V

TR1, TR2 3 TURNS BIFILAR
AWG28GA 12CM

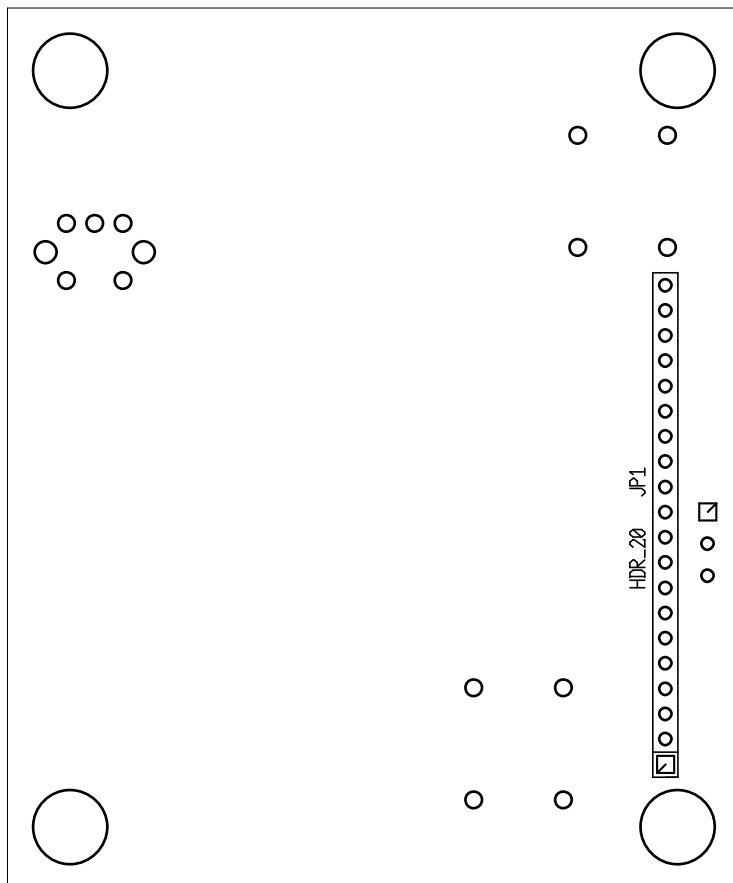
- JP1 HDR_20
- 1 GND
 - 2 TXG
 - 3 KEY
 - 4 MODEN
 - 5 VOX
 - 6 VOXTHR
 - 7 SDA1
 - 8 SCL4
 - 9 MICS
 - 10 CMPIN
 - 11 CMPOUT
 - 12 MICAF
 - 13 MICGND
 - 14 LINEIN+
 - 15 LINEIN-
 - 16 8V
 - 17 GND
 - 18 GND
 - 19 GND
 - 20 GND



SSB GEN TOP view



SSB GEN BOTTOM view



Parts specification:

Name	Alias	Shape	Part
C1	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C2	100UF/10V	\$P_ELKO_D	CE 100uF 25V SMD Fujicon
C3	47P	\$R0805	C0805 47pF 50V C0G SAMSUNG
C4	1000P	\$R0805	C0805 1.0nF 50V C0G SAMSUNG
C5	1UF	\$TANT1206	C1206 1.0uF 50V X7R SAMSUNG
C6	1UF	\$TANT1206	C1206 1.0uF 50V X7R SAMSUNG
C7	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C8	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C9	2200P	\$R0805	C0805 2.2nF 50V C0G SAMSUNG
C10	2200P	\$R0805	C0805 2.2nF 50V C0G SAMSUNG
C11	330P	\$R0805	C0805 330pF 50V C0G SAMSUNG
C12	100UF/10V	\$P_ELKO_D	CE 100uF 25V SMD Fujicon
C13	330P	\$R0805	C0805 330pF 50V C0G SAMSUNG
C14	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C15	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C16	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C17	100P	\$R0805	C0805 100pF 50V C0G SAMSUNG
C18	220UF/10V	\$P_ELKO_D	CE 220uF 16V SMD Fujicon
C19	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C20	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C21	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C22	1UF	\$R0805	C0805 1.0uF 50V X7R SAMSUNG
C23	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C24	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C25	10UF	\$TANT1206	TANT A SMD 10uF 16V
C26	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C27	1UF	\$TANT1206	C1206 1.0uF 50V X7R SAMSUNG
C29	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C30	2200P	\$R0805	C0805 2.2nF 50V C0G SAMSUNG
C31	2200P	\$R0805	C0805 2.2nF 50V C0G SAMSUNG
C32	1000P	\$R0805	C0805 1.0nF 50V C0G SAMSUNG
C33	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C34	12N	\$R0805	C0805 12nF 50V X7R SAMSUNG
C35	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C36	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C37	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C38	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C39	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C40	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C41	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C42	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
CX1	DSB_#6	IPX	coax connector
CX2	BFO_TX#9	IPX	coax connector
D1	1N4148WS	\$SOD123	1N4148WS
D2	1N4148WS	\$SOD123	1N4148WS
J1	HDR_1	HOLE	M3x6; lock washer 3mm
J2	HDR_1	HOLE	M3x6; lock washer 3mm
J3	HDR_1	HOLE	M3x6; lock washer 3mm
J4	HDR_1	HOLE	M3x6; lock washer 3mm

Name	Alias	Shape	Part
JMP1	JUMPER	JMP	wire strap
JP1	HDR_20	HDR1X20_2MM	2289781
L1	2.7UH	KHS-6 (3turns)	KHS-6 2.7uH A71108006
R1	3K3	\$R0805	R0805 3.3K 1%
R2	270K	\$R0805	R0805 270K 1%
R3	47K	\$R0805	R0805 47K 1% YAG/ASJ
R4	100R	\$R0805	R0805 100R 1%
R5	2K7	\$R0805	R0805 2.7K 1%
R6	47K	\$R0805	R0805 47K 1% YAG/ASJ
R7	4K7	\$R0805	R0805 4.7K 1%
R8	2K2	\$R0805	R0805 2.2K 5% YAG/ASJ
R9	100K	\$POTTC33X	TC33X-2 100K
R10	150R	\$R0805	R0805 150R 1% YAG/ASJ
R11	130R	\$R0805	R0805 130R 1% YAG/ASJ
R12	10K	\$R0805	R0805 10K 1%
R13	22K	\$R0805	R0805 22K 1%
R14	22K	\$R0805	R0805 22K 1%
R15	47K	\$R0805	R0805 47K 1% YAG/ASJ
R16	75R	\$R0805	R0805 75R 1%
R17	10K	\$R0805	R0805 10K 1%
R18	620R	\$R0805	R0805 620R 1% YAG/ASJ
R19	4K7	\$R0805	R0805 4.7K 1%
R20	100K	\$R0805	R0805 100K 1%
R21	75R	\$R0805	R0805 75R 1%
R22	47K	\$R0805	R0805 47K 1% YAG/ASJ
R24	82K	\$R0805	R0805 82K 1%
R25	82K	\$R0805	R0805 82K 1%
R26	1M1	\$R0805	R0805 1.1M 1% YAG/ASJ
R27	82K	\$R0805	R0805 82K 1%
R28	47K	\$R0805	R0805 47K 1% YAG/ASJ
R29	47K	\$R0805	R0805 47K 1% YAG/ASJ
R30	180K	\$R0805	R0805 180K 5% YAG/ASJ
R31	75R	\$R0805	R0805 75R 1%
R32	470K	\$R0805	R0805 470K 1%
R33	470K	\$R0805	R0805 470K 1%
R34	75R	\$R0805	R0805 75R 1%
R35	100K	\$R0805	R0805 100K 1%
T1	MMBT3904	\$TRA_SOT23	MMBT3904 SMD
TR1	1:1	inp.balun	5943000201
TR2	1:1	inp.balun	5943000201
U1	TL082	\$SO8	TL082CD SMD
U2	SA612	\$SO8	2212081
U3	LM324	\$SO14-1	LM324D SMD
U4	HEF4053BT	SO16	HEF4053BT
U5	78L05	\$78L05_SOT89	78L05 SMD SOT89 DIV
U6	MCP4631-503E/S	\$TSSOP14	MCP4631-503E/ST

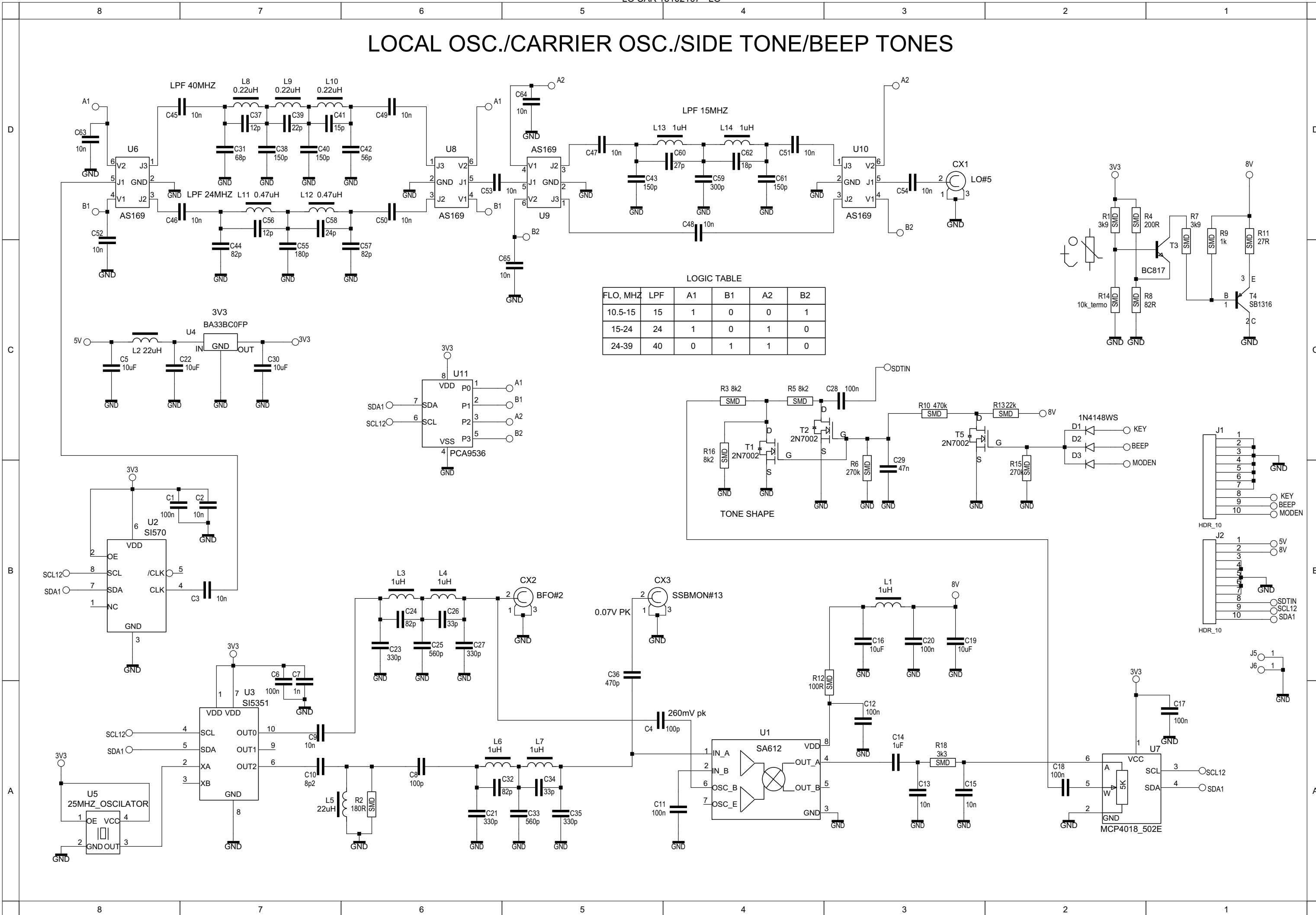
LO (Local oscillator)/BFO/BEEP/SIDETONES/SSB monitor

LO board provides all oscillator signals needed for signal conversion and mixing. The board consists of the following components:

- LO first oscillator realized by U2 – SI570 (570CAC000141DG), 3 switchable low pass filters: 10.8-15MHz; 15-24MHz; 24-39MHz. Filter switching is performed by I2C chip PCA9536
- 9MHz generators – U3 (SI5351) BFO, CW sidetone, beeps, U1 (SA-612) balanced mixer which acts as CW/SSB monitor product detector, digital potentiometer – U7 (MCP4018-502E)
- Tone shaping, (tones on/off) circuitry – T1,T2,T5
- Temperature compensation oven made by thermo resistor R14 and T3,T4

LO pure sine form is of essential importance for further signal mixing/processing and lack of spurs and higher harmonic content in output signal.

LOCAL OSC./CARRIER OSC./SIDE TONE/BEEP TONES



LOGIC TABLE

FLO, MHZ	LPF	A1	B1	A2	B2
10.5-15	15	1	0	0	1
15-24	24	1	0	1	0
24-39	40	0	1	1	0

0.07V PK
260mV pk

Parts specification:

Name	Alias	Shape	Part
C1	100N	ꯀC0805	C0805 100nF 50V X7R SAMSUNG
C2	10N	ꯀC0805	C0805 10nF 50V X7R SAMSUNG
C3	10N	ꯀC0805	C0805 10nF 50V X7R SAMSUNG
C4	100P	ꯀC0805	C0805 100pF 50V C0G SAMSUNG
C5	10UF	ꯀC0805	C0805 10uF 16V X5R SAMSUNG
C6	100N	ꯀC0805	C0805 100nF 50V X7R SAMSUNG
C7	1N	ꯀC0805	C0805 1.0nF 50V C0G SAMSUNG
C8	100P	ꯀC0805	C0805 100pF 50V C0G SAMSUNG
C9	10N	ꯀC0805	C0805 10nF 50V X7R SAMSUNG
C10	8P2	ꯀC0805	C0805 8.2pF 50V C0G SAMSUNG
C11	100N	ꯀC0805	C0805 100nF 50V X7R SAMSUNG
C12	100N	ꯀC0805	C0805 100nF 50V X7R SAMSUNG
C13	10N	ꯀC0805	C0805 10nF 50V X7R SAMSUNG
C14	1UF	ꯀC0805	C0805 1.0uF 50V X7R SAMSUNG
C15	10N	ꯀC0805	C0805 10nF 50V X7R SAMSUNG
C16	10UF	ꯀC0805	C0805 10uF 16V X5R SAMSUNG
C17	100N	ꯀC0805	C0805 100nF 50V X7R SAMSUNG
C18	100N	ꯀC0805	C0805 100nF 50V X7R SAMSUNG
C19	10UF	ꯀC0805	C0805 10uF 16V X5R SAMSUNG
C20	100N	ꯀC0805	C0805 100nF 50V X7R SAMSUNG
C21	330P	ꯀC0805	C0805 330pF 50V C0G SAMSUNG
C22	10UF	ꯀC0805	C0805 10uF 16V X5R SAMSUNG
C23	330P	ꯀC0805	C0805 330pF 50V C0G SAMSUNG
C24	82P	ꯀC0805	C0805 82pF 50V C0G SAMSUNG
C25	560P	ꯀC0805	C0805 560pF 50V C0G SAMSUNG
C26	33P	ꯀC0805	C0805 33pF 50V C0G SAMSUNG
C27	330P	ꯀC0805	C0805 330pF 50V C0G SAMSUNG
C28	100N	ꯀC0805	C0805 100nF 50V X7R SAMSUNG
C29	47N	ꯀC0805	C0805 47nF 50V X7R SAMSUNG
C30	10UF	ꯀC0805	C0805 10uF 16V X5R SAMSUNG
C31	68P	ꯀC0805	C0805 68pF 50V C0G SAMSUNG
C32	82P	ꯀC0805	C0805 82pF 50V C0G SAMSUNG
C33	560P	ꯀC0805	C0805 560pF 50V C0G SAMSUNG
C34	33P	ꯀC0805	C0805 33pF 50V C0G SAMSUNG
C35	330P	ꯀC0805	C0805 330pF 50V C0G SAMSUNG
C36	470P	ꯀC0805	C0805 470pF 50V C0G SAMSUNG
C37	12P	ꯀC0805	C0805 12pF 50V C0G
C38	150P	ꯀC0805	C0805 150pF 50V C0G
C39	22P	ꯀC0805	C0805 22pF 50V C0G
C40	150P	ꯀC0805	C0805 150pF 50V C0G
C41	15P	ꯀC0805	C0805 15pF 50V C0G SAMSUNG
C42	56P	ꯀC0805	C0805 56pF 50V C0G SAMSUNG
C43	150P	ꯀC0805	C0805 150pF 50V C0G
C44	82P	ꯀC0805	C0805 82pF 50V C0G SAMSUNG
C45	10N	ꯀC0805	C0805 10nF 50V X7R SAMSUNG
C46	10N	ꯀC0805	C0805 10nF 50V X7R SAMSUNG
C47	10N	ꯀC0805	C0805 10nF 50V X7R SAMSUNG
C48	10N	ꯀC0805	C0805 10nF 50V X7R SAMSUNG
C49	10N	ꯀC0805	C0805 10nF 50V X7R SAMSUNG

Name	Alias	Shape	Part
C50	10N	§C0805	C0805 10nF 50V X7R SAMSUNG
C51	10N	§C0805	C0805 10nF 50V X7R SAMSUNG
C52	10N	§C0805	C0805 10nF 50V X7R SAMSUNG
C53	10N	§C0805	C0805 10nF 50V X7R SAMSUNG
C54	10N	§C0805	C0805 10nF 50V X7R SAMSUNG
C55	180P	§C0805	C0805 180pF 50V C0G SAMSUNG
C56	12P	§C0805	C0805 12pF 50V C0G
C57	82P	§C0805	C0805 82pF 50V C0G SAMSUNG
C58	24P	§C0805	C0805 24pF 50V C0G SAMSUNG
C59	300P	§C0805	81-GRM215C1H301JA01D
C60	27P	§C0805	C0805 27pF 50V C0G
C61	150P	§C0805	C0805 150pF 50V C0G
C62	18P	§C0805	C0805 18pF 50V C0G SAMSUNG
C63	10N	§C0805	C0805 10nF 50V X7R SAMSUNG
C64	10N	§C0805	C0805 10nF 50V X7R SAMSUNG
C65	10N	§C0805	C0805 10nF 50V X7R SAMSUNG
CX1	LO#5	IPX	IPX/U.FL coax connector
CX2	BFO#2	IPX	IPX/U.FL coax connector
CX3	SSBMON#13	IPX	IPX/U.FL coax connector
D1	1N4148WS	§SOD_323	1N4148WS
D2	1N4148WS	§SOD_323	1N4148WS
D3	1N4148WS	§SOD_323	1N4148WS
J1	HDR_10	HDR1X10	2289781
J2	HDR_10	HDR1X10	2289781
J5	HDR_1	HOLE	M3x6, lockwasher 3mm
J6	HDR_1	HOLE	M3x6, lockwasher 3mm
L1	1UH	§R0805	CL0805 1.0uH CCFH
L2	22UH	§R1210	LQH32CN220K23L
L3	1UH	§R0805	CL0805 1.0uH CCFH
L4	1UH	§R0805	CL0805 1.0uH CCFH
L5	22UH	§R1210	LQH32CN220K23L
L6	1UH	§R0805	CL0805 1.0uH CCFH
L7	1UH	§R0805	CL0805 1.0uH CCFH
L8	0.22UH	§R0805	2309226
L9	0.22UH	§R0805	2309226
L10	0.22UH	§R0805	2309226
L11	0.47UH	§R1210	CL1210 470nH WWT
L12	0.47UH	§R1210	CL1210 470nH WWT
L13	1UH	§R0805	CL0805 1.0uH CCFH
L14	1UH	§R0805	CL0805 1.0uH CCFH
R1	3K9	§R0805	R0805 3.9K 1%
R2	180R	§R0805	R0805 180R 5% YAG/ASJ
R3	8K2	§R0805	R0805 8.2K 1%
R4	200R	§R0805	R0805 200R 1%
R5	8K2	§R0805	R0805 8.2K 1%
R6	270K	§R0805	R0805 270K 1%
R7	3K9	§R0805	R0805 3.9K 1%
R8	82R	§R0805	R0805 82R 1% YAG/ASJ
R9	1K	§R0805	R0805 1.0K 1% YAG/ASJ

Name	Alias	Shape	Part
R10	470K	\$R0805	R0805 470K 1%
R11	27R	\$R0805	R0805 27R 1% YAG/ASJ
R12	100R	\$R0805	R0805 100R 1%
R13	22K	\$R0805	R0805 22K 1%
R14	10K_TERM0	\$R0603	NCP21XV103J03RA
R15	270K	\$R0805	R0805 270K 1%
R16	8K2	\$R0805	R0805 8.2K 1%
R18	3K3	\$R0805	R0805 3.3K 1%
T1	2N7002	\$FET_2N7002	2N7002K
T2	2N7002	\$FET_2N7002	2N7002K
T3	BC817	\$TRA_SOT23	BC817-40 SMD
T4	SB1316	\$FET_TO252	2SB1316TL ROHM SMD
T5	2N7002	\$FET_2N7002	2N7002K
U1	SA612	\$SO8	2212081
U2	SI570	570CAC001	336-2518-ND
U3	SI5351	MSOP_10	
U4	BA33BC0FP	\$FET_TO252	BA033CC0FP
U5	25MHZ_OSC	25MHZ_OSC	QO-6NC2-25MHz SMD
U6	AS169	\$SOT6	863-1002-1-ND
U7	MCP4018_502E	\$SC70	MCP4018T-502E/LT
U8	AS169	\$SOT6	863-1002-1-ND
U9	AS169	\$SOT6	863-1002-1-ND
U10	AS169	\$SOT6	863-1002-1-ND
U11	PCA9536	TSSOP8	2212093

RF MIXER

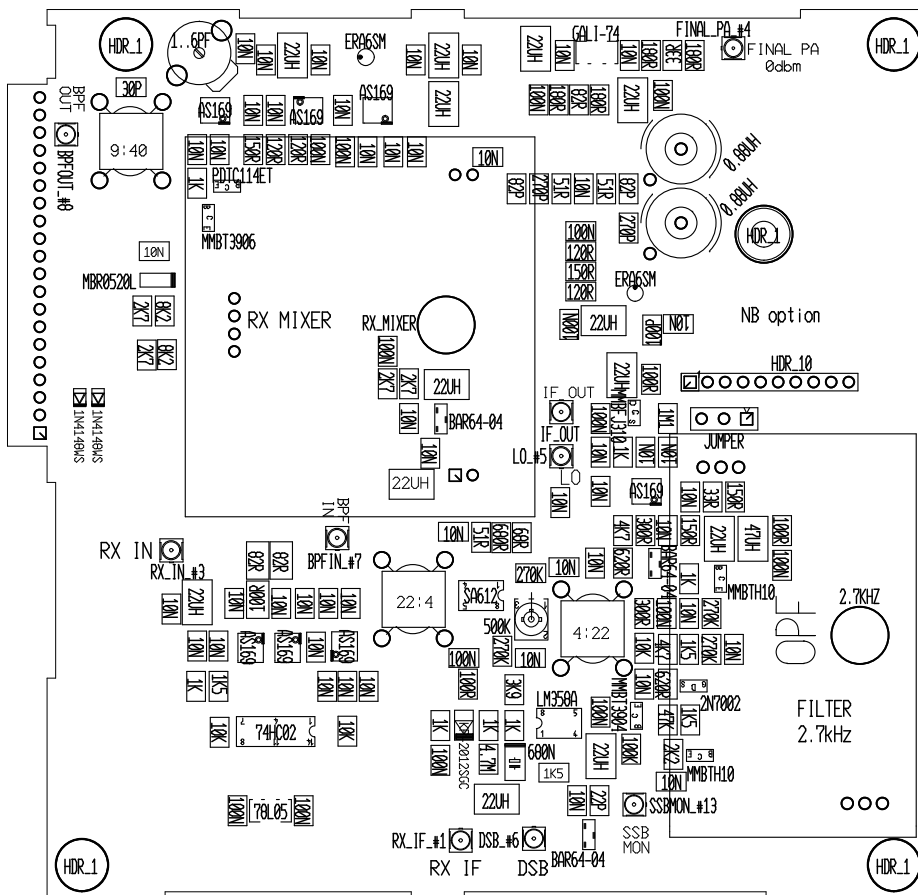
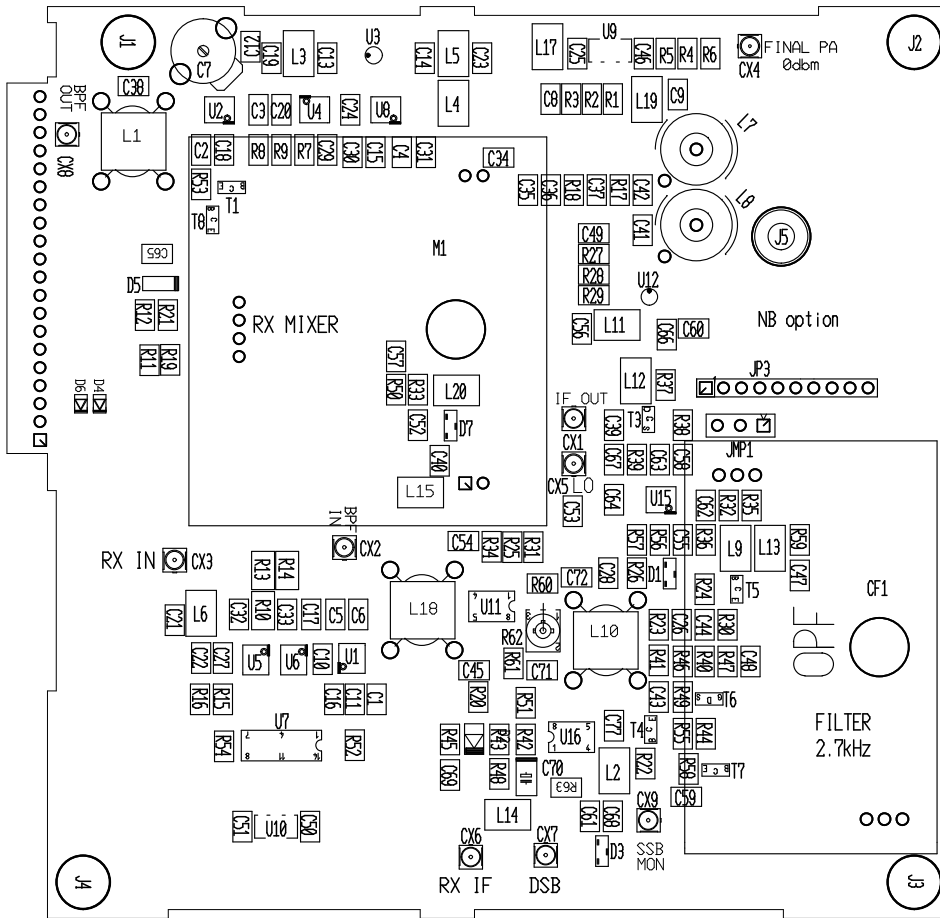
RF MIXER board does all RX/TX signals on IF and operation frequencies. On receive the signal comes on CX3 coaxial connector, then passes (or not) through input attenuator R10,R13,R14, then via switches come to BPF board. IF TRAP circuitry consists of L1, C7, C38. Then signal passes through U3 (ERA6SM) RX preamplifier (operator switchable). RX MIXER is on additional subboard and sits over RF MIXER board. 9MHz diplexer follows and then IF amplifier – U12 (ERA6SM). After some switching and attenuation signal comes to the first crystal filter – 2.7kHz then to CX6 coaxial connector and IF/AF board.

On transmit the signal from SSB GEN board through CX7 connector passes through crystal filter and after TX/RX switch to a pin diode D1 attenuator. It is driven by ALC circuitry performed by U16 and T4.

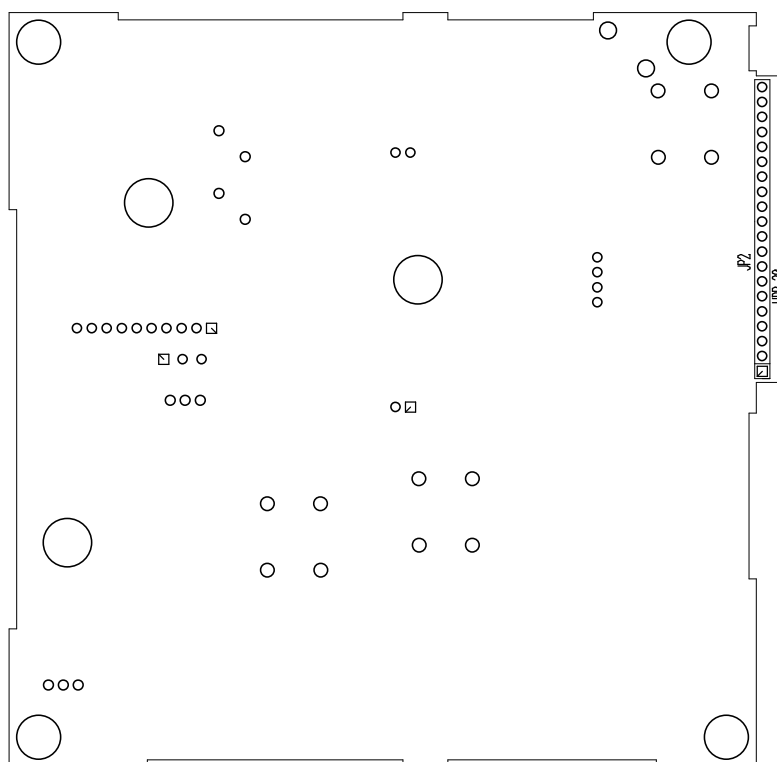
U11 is TX mixer which is fine balanced by R62 and impedance matched by L10,L18 wide band transformers. Output mixed signals are further filtered by BPF board and amplified by U3 and U9. Output attenuator R4,R5,R6 is following then via CX4 signal goes to linear amplifier PA55W board.

ALC circuitry consist of U16 and T4. ALC can be controlled either from Vfwd signal from PA or from XVRTR output signal - VFX. T4 directly controls D1 pin diode bias voltage which affects IF 9MHz signal level. ALCTHR line sets power level for both CW and side band modes.

RF MIXER TOP view



RF MIXER BOTTOM view



Parts specification:

Name	Alias	Shape	Order number
C1	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C2	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C3	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C4	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C5	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C6	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C7	1..6PF	TRIM-CON7.5	CVN610 10pF WHITE
C8	100N	SR0805	C0805 100nF 50V X7R SAMSUNG
C9	100N	SR0805	C0805 100nF 50V X7R SAMSUNG
C10	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C11	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C12	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C13	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C14	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C15	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C16	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C17	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C18	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C19	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C20	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C21	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C22	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C23	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C24	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C25	10N	SR0805	C0805 10nF 50V X7R SAMSUNG
C26	100N	SR0805	C0805 100nF 50V X7R SAMSUNG

C27	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C28	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C29	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C30	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C31	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C32	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C33	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C34	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C35	82P	\$R0805	C0805 82pF 50V COG SAMSUNG
C36	270P	\$R0805	C0805 270pF 50V COG SAMSUNG
C37	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C38	30P	\$R0805	C0805 30pF 50V COG SAMSUNG
C39	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C40	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C41	270P	\$R0805	C0805 270pF 50V COG SAMSUNG
C42	82P	\$R0805	C0805 82pF 50V COG SAMSUNG
C43	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C44	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C45	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C46	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C47	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C48	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C49	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C50	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C51	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C52	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C53	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C54	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C55	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C56	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C57	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C58	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C59	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C60	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C61	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C62	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C63	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C64	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C65	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C66	100P	\$R0805	C0805 100pF 50V COG SAMSUNG
C67	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C68	22P	\$R0805	C0805 22pF 50V COG
C69	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C70	680N	\$TANT1206	C1206 680nF 50V X7R SAMSUNG
C71	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C72	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C77	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
CF1	2.7KHZ	XTALFIL	XTAL filter 8 pole #15106104
CX1	IF_OUT	IPX	micro coax receptacle
CX2	BPFIN_#7	IPX	micro coax receptacle

CX3	RX_IN_#3	IPX	micro coax receptacle
CX4	FINAL_PA	IPX	micro coax receptacle
CX5	LO_#5	IPX	micro coax receptacle
CX6	RX_IF_#1	IPX	micro coax receptacle
CX7	DSB_#6	IPX	micro coax receptacle
CX8	BPFOUT_#	IPX	micro coax receptacle
CX9	SSBMON_#	IPX	micro coax receptacle
D1	BAR64-04	\$SOT23BAR	farnel 2480900
D2	KP-2012SG	\$D0805	KP-2012SGC
D3	BAR64-04	\$SOT23BAR	farnel 2480900
D4	1N4148WS	\$SOD123	1N4148WS
D5	MBR0520L	\$SOD123	MBR0520L
D6	1N4148WS	\$SOD123	1N4148WS
D7	BAR64-04	\$SOT23BAR	farnel 2480900
J5	HDR_1	Swage stndf	Amatom #19833B-B0350-0
JMP1	JUMPER	JMP	wire strap
JP2	HDR_20	HDR1X20_2MM	2289781
JP3	HDR_10	HDR1X10_2MM	PN1X10-2.0
L1	9:40	TRANSF_1:4!5	T50-2 40t./9t. AWG28
L2	22UH	\$R1210	LQH32CN220K23L
L3	22UH	\$R1210	LQH32CN220K23L
L4	22UH	\$R1210	LQH32CN220K23L
L5	22UH	\$R1210	LQH32CN220K23L
L6	22UH	\$R1210	LQH32CN220K23L
L7	0.88UH	T30-2	T30-2 15t. AWG28
L8	0.88UH	T30-2	T30-2 15t. AWG28
L9	22UH	\$R1210	LQH32CN220K23L
L10	4:22	TRANSF_1:4!7	5943000201
L11	22UH	\$R1210	LQH32CN220K23L
L12	22UH	\$R1210	LQH32CN220K23L
L13	47UH	\$R1210	LQH32CN470K23L
L14	22UH	\$R1210	LQH32CN220K23L
L15	22UH	\$R1210	LQH32CN220K23L
L17	22UH	\$R1210	LQH32CN220K23L
L18	22:04	TRANSF_1:4!6	5943000201
L19	22UH	\$R1210	LQH32CN220K23L
L20	22UH	\$R1210	LQH32CN220K23L
M1	RX_MIXER	RX_MIXER	RX mixer optional board
R1	180R	\$R0805	R0805 180R 5% YAG/ASJ
R2	82R	\$R0805	R0805 82R 1% YAG/ASJ
R3	180R	\$R0805	R0805 180R 5% YAG/ASJ
R4	33R	\$R0805	R0805 33R 1%
R5	180R	\$R0805	R0805 180R 5% YAG/ASJ
R6	180R	\$R0805	R0805 180R 5% YAG/ASJ
R7	120R	\$R0805	R0805 120R 1% YAG/ASJ
R8	150R	\$R0805	R0805 150R 1% YAG/ASJ
R9	120R	\$R0805	R0805 120R 1% YAG/ASJ
R10	100R	\$R1206	R1206 100R 1% YAG/ASJ
R11	2K7	\$R0805	R0805 2.7K 1%
R12	2K7	\$R0805	R0805 2.7K 1%

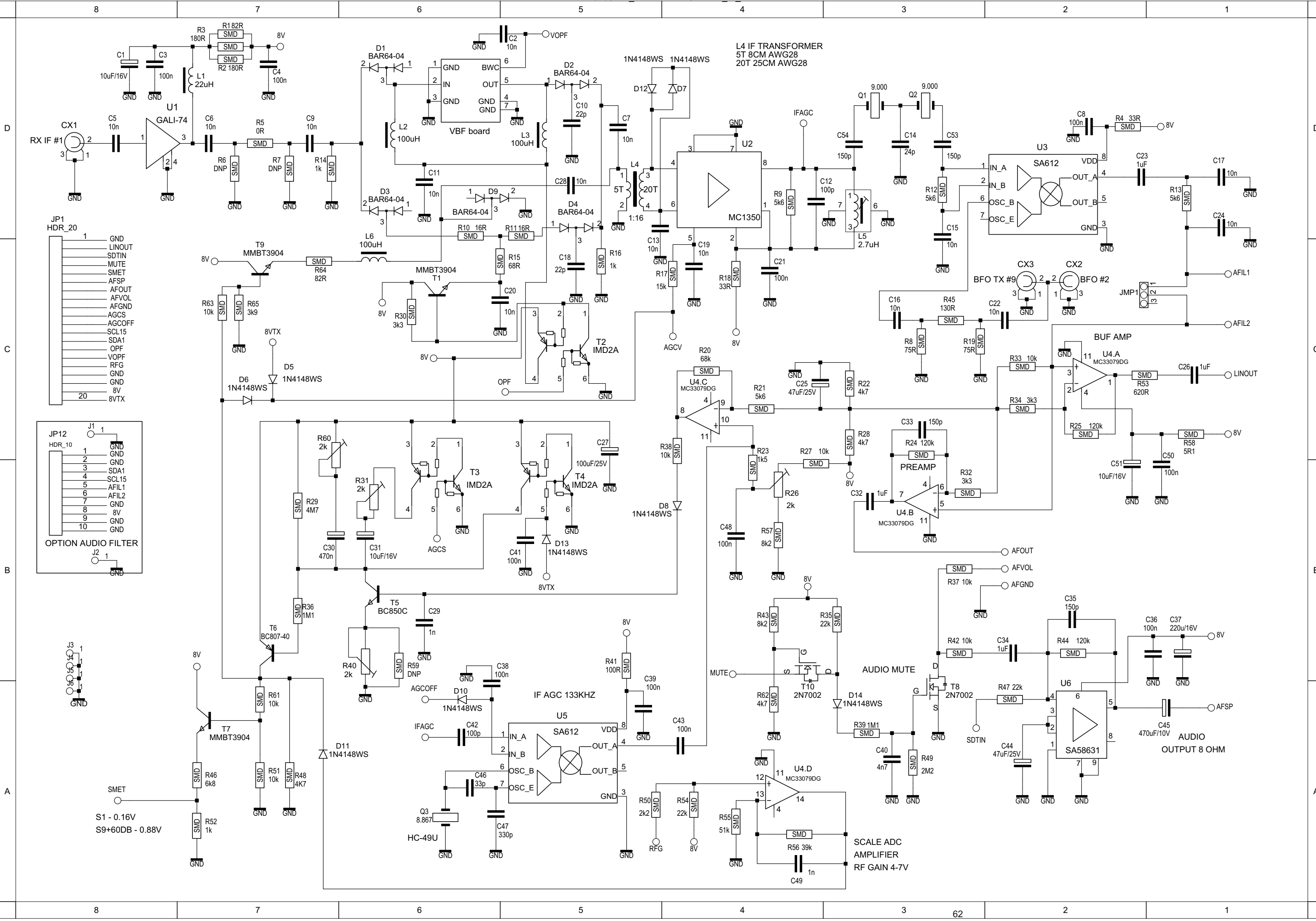
R13	82R	\$R1206	R1206 82R 1% YAG/ASJ
R14	82R	\$R1206	R1206 82R 1% YAG/ASJ
R15	1K5	\$R0805	R0805 1.5K 1%
R16	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R17	51R	\$R0805	R0805 51R 1% YAG/ASJ
R18	51R	\$R0805	R0805 51R 1% YAG/ASJ
R19	8K2	\$R0805	R0805 8.2K 1%
R20	100R	\$R0805	R0805 100R 1% YAG/ASJ
R21	8K2	\$R0805	R0805 8.2K 1%
R22	100K	\$R0805	R0805 100K 1%
R23	300R	\$R0805	R0805 300R 1% YAG/ASJ
R24	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R25	680R	\$R0805	R0805 680R 1%
R26	620R	\$R0805	R0805 620R 1% YAG/ASJ
R27	120R	\$R0805	R0805 120R 1% YAG/ASJ
R28	150R	\$R0805	R0805 150R 1% YAG/ASJ
R29	120R	\$R0805	R0805 120R 1% YAG/ASJ
R30	270K	\$R0805	R0805 270K 1%
R31	68R	\$R0805	R0805 68R 1%
R32	33R	\$R0805	R0805 33R 1%
R33	2K7	\$R0805	R0805 2.7K 1%
R34	51R	\$R0805	R0805 51R 1% YAG/ASJ
R35	150R	\$R0805	R0805 150R 1% YAG/ASJ
R36	150R	\$R0805	R0805 150R 1% YAG/ASJ
R37	100R	\$R0805	R0805 100R 1%
R38	1M1	\$R0805	R0805 1.1M 5%
R39	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R40	1K5	\$R0805	R0805 1.5K 1%
R41	10K	\$R0805	R0805 10K 1%
R42	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R43	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R44	1K5	\$R0805	R0805 1.5K 1%
R45	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R46	4K7	\$R0805	R0805 4.7K 1%
R47	270K	\$R0805	R0805 270K 1%
R48	4.7M	\$R0805	R0805 4.7M 5%
R49	620R	\$R0805	R0805 620R 1% YAG/ASJ
R50	2K7	\$R0805	R0805 2.7K 1%
R51	3K9	\$R0805	R0805 3.9K 1%
R52	10K	\$R0805	R0805 10K 1%
R53	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R54	10K	\$R0805	R0805 10K 1%
R55	47K	\$R0805	R0805 47K 1% YAG/ASJ
R56	300R	\$R0805	R0805 300R 1% YAG/ASJ
R57	4K7	\$R0805	R0805 4.7K 1%
R58	2K2	\$R0805	R0805 2.2K 5% YAG/ASJ
R59	100R	\$R0805	R0805 100R 1%
R60	270K	\$R0805	R0805 270K 1%
R61	270K	\$R0805	R0805 270K 1%
R62	470K	\$POTTC33X	TC33X-2 500K
R63	1K5	\$R0805	R0805 1.5K 1%

T1	PDTC114E	DIGITRA	PDTC114ET
T3	MMBFJ310	\$FET_SOT23	1095137
T4	MMBT390	\$TRA_SOT23	MMBT3904 SMD
T5	MMBTH10	\$TRA_SOT23	MMBTH10
T6	2N7002	\$FET_2N7002	2N7002K
T7	MMBTH10	\$TRA_SOT23	MMBTH10
T8	MMBT390	\$TRA_SOT23	MMBT3906 SMD
U1	AS169	\$SOT6	SKYWORK SOLUTION AS169
U2	AS169	\$SOT6	SKYWORK SOLUTION AS169
U3	ERA6SM	WW-107	era6sm
U4	AS169	\$SOT6	SKYWORK SOLUTION AS169
U5	AS169	\$SOT6	SKYWORK SOLUTION AS169
U6	AS169	\$SOT6	SKYWORK SOLUTION AS169
U7	74HC02	\$SO14	74HC02 SMD
U8	AS169	\$SOT6	digikey as169
U9	GALI-74	DF782	gali-74
U10	78L05	\$78L05_SOT89	78L05 SMD SOT89 DIV
U11	SA612	\$SO8	farnel 2212081
U12	ERA6SM	WW-107	era6sm
U15	AS169	\$SOT6	SKYWORK SOLUTION AS169
U16	LM358A	\$SO8	LM358D SMD

IF/AF board

This unit includes the following:

- intermediate frequency IF amplification – MC1350
- optional crystal filter (4 pole variable crystal Johnson type filter)
- RX product detector – SA612
- AF preamplifier – MC33079DG
- RX MUTE and sidetone input circuitry
- AF final amplifier – SA58631
- Fast IF 134kHz Automatic Gain Control scheme – SA612,MC33079DG
- Optional AF filter board



JP1 HDR_20

1	GND
2	LINOUT
3	SdTIN
4	MUTE
5	SMET
6	AFSP
7	AFOUT
8	AFVOL
9	AFGND
10	AGCS
11	AGCOFF
12	SCL15
13	SDA1
14	OPF
15	VOPF
16	RFG
17	GND
18	GND
19	8V
20	8VTX

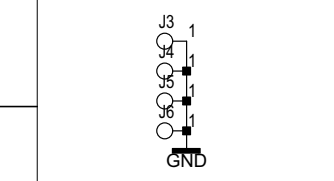
JP12 HDR_10

1	GND
2	GND
3	GND
4	SDA1
5	SCL15
6	AFIL1
7	AFIL2
8	GND
9	8V
10	GND

OPTION AUDIO FILTER

J2 1

1	GND
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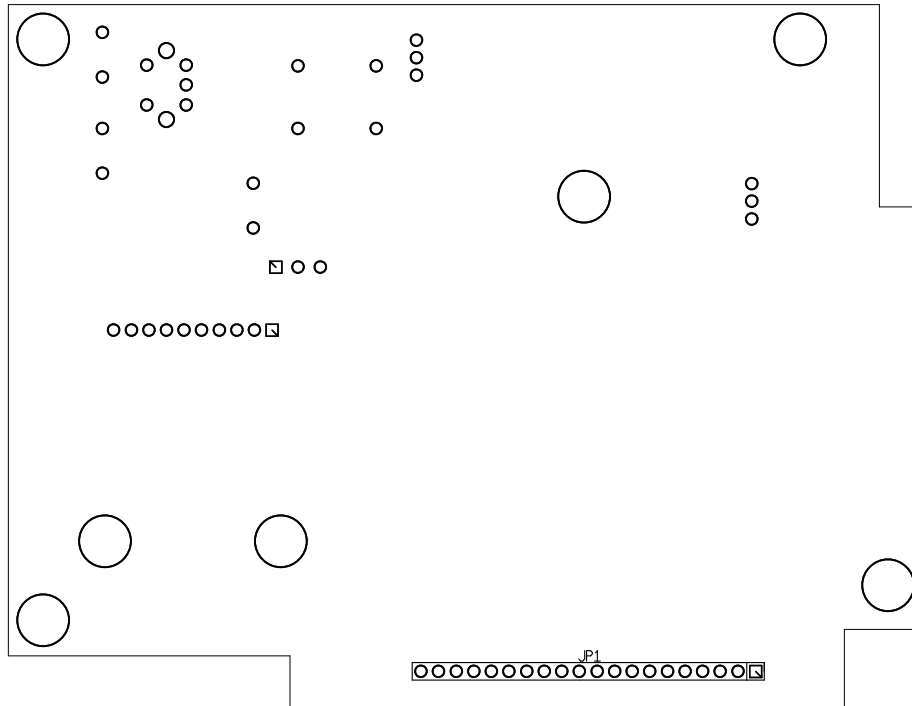


SMET

S1 - 0.16V

S9+60DB - 0.88V

IF/AF board BOTTOM view



Parts specification:

Name	Alias	Shape	part
C1	10UF/16V	\$TANT1206	TANT A SMD 10uF 16V
C2	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C3	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C4	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C5	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C6	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C7	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C8	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C9	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C10	22P	\$R0805	C0805 22pF 50V C0G
C11	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C12	100P	\$R0805	C0805 100pF 50V C0G SAMSUNG
C13	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C14	24P	\$R0805	C0805 24pF 50V C0G SAMSUNG
C15	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C16	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C17	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C18	22P	\$R0805	C0805 22pF 50V C0G
C19	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C20	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C21	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C22	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C23	1UF	\$R0805	C0805 1.0uF 50V X7R SAMSUNG
C24	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C25	47UF/16V	\$P_ELKO_D	CE 47uF 25V SMD Fujicon
C26	1UF	\$R0805	C0805 1.0uF 50V X7R SAMSUNG
C27	100UF/16V	\$P_ELKO_D	CE 100uF 25V SMD Fujicon
C28	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C29	1N	\$R0805	C0805 1.0nF 50V C0G SAMSUNG

Name	Alias	Shape	part
C30	470N	\$TANT1206	TANT A SMD 470nF 25V
C31	10UF/16V	\$TANT1206	TANT A SMD 10uF 16V
C32	1UF	\$R0805	C0805 1.0uF 50V X7R SAMSUNG
C33	150P	\$R0805	C0805 150pF 50V COG
C34	1UF	\$R0805	C0805 1.0uF 50V X7R SAMSUNG
C35	150P	\$R0805	C0805 150pF 50V COG
C36	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C37	220U/16V	\$P_ELKO_D	CE 220uF 16V SMD Fujicon
C38	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C39	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C40	4N7	\$R0805	C0805 4.7nF 50V X7R SAMSUNG
C41	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C42	100P	\$R0805	C0805 100pF 50V COG SAMSUNG
C43	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C44	47UF/16V	\$P_ELKO_D	CE 47uF 25V SMD Fujicon
C45	470UF/16V	\$P_ELKO_E	CE 470uF 10V SMD Fujicon
C46	33P	\$R0805	C0805 33pF 50V COG SAMSUNG
C47	330P	\$R0805	C0805 330pF 50V COG SAMSUNG
C48	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C49	1N	\$R0805	C0805 1.0nF 50V COG SAMSUNG
C50	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C51	10UF/16V	\$TANT1206	TANT A SMD 10uF 16V
C53	150P	\$R0805	C0805 150pF 50V COG SAMSUNG
C54	150P	\$R0805	C0805 150pF 50V COG SAMSUNG
CX1	RX_IF_#1	IPX	coax. Receptacle
CX2	BFO_#2	IPX	coax. Receptacle
CX3	BFO_TX_#9	IPX	coax. Receptacle
D1	BAR64-04	\$SOT23BAR	2480900
D2	BAR64-04	\$SOT23BAR	2480900
D3	BAR64-04	\$SOT23BAR	2480900
D4	BAR64-04	\$SOT23BAR	2480900
D5	1N4148WS	\$SOD_323	1N4148WS
D6	1N4148WS	\$SOD_323	1N4148WS
D7	1N4148WS	\$SOD_323	1N4148WS
D8	1N4148WS	\$SOD_323	1N4148WS
D9	BAR64-04	\$SOT23BAR	2480900
D10	1N4148WS	\$SOD_323	1N4148WS
D11	1N4148WS	\$SOD_323	1N4148WS
D12	1N4148WS	\$SOD_323	1N4148WS
D13	1N4148WS	\$SOD_323	1N4148WS
D14	1N4148WS	\$SOD_323	1N4148WS
J1	HDR_1	swage stndf	19833B-B0350-0
J2	HDR_1	swage stndf	19833B-B0350-0
J3	HDR_1	HOLE	M3x6, lockwasher 3mm
J4	HDR_1	HOLE	M3x6, lockwasher 3mm
J5	HDR_1	HOLE	M3x6, lockwasher 3mm
J6	HDR_1	HOLE	M3x6, lockwasher 3mm
JMP1	JUMPER	JMP	
JP1	HDR_20	HDR1X20_2MN	2289781
JP12	HDR_10	HDR1X10_2MN	PN1X10-2.0
L1	22UH	\$R1210	LQH32CN220K23L
L2	100UH	\$R1210	LQH32CN101K23L
L3	100UH	\$R1210	LQH32CN101K23L
L4	1:16	TRANSF_1:4	5943000201
L5	2.7UH	KHS-6	KHS-6 2.7uH A71108006

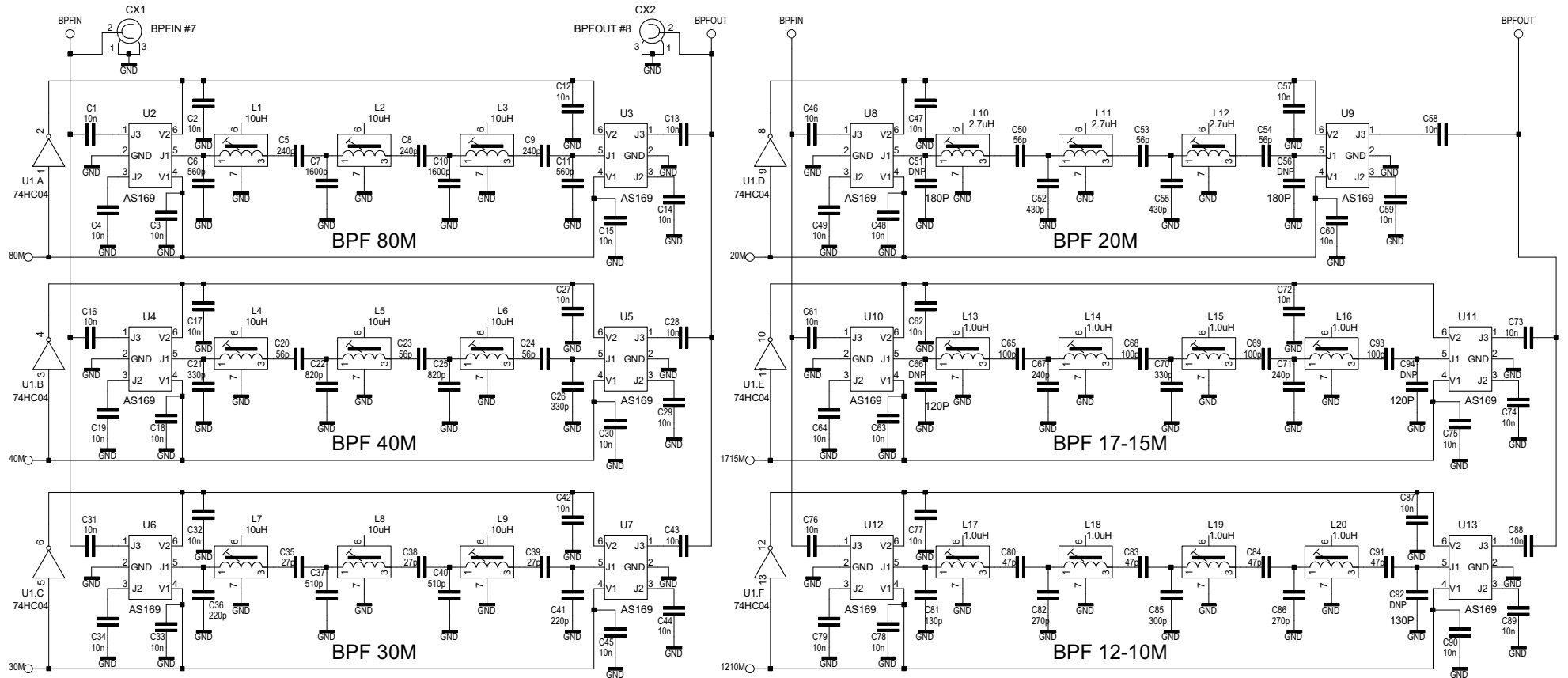
Name	Alias	Shape	part
L6	100UH	\$R1210	LQH32CN101K23L
Q1	9.000	RESO10X5R5	
Q2	9.000	RESO10X5R5	
Q3	8.867	RESO10X5R5	8,867238 MHz
R1	82R	\$R0805	R0805 82R 1% YAG/ASJ
R2	180R	\$R0805	R0805 180R 5% YAG/ASJ
R3	180R	\$R0805	R0805 180R 5% YAG/ASJ
R4	33R	\$R0805	R0805 33R 1%
R5	0R	\$R0805	R0805 0R 5%
R6	DNP	\$R0805	
R7	DNP	\$R0805	
R8	75R	\$R0805	R0805 75R 1%
R9	5K6	\$R0805	R0805 5.6K 1%
R10	16R	\$R0805	R0805 16R 1%
R11	16R	\$R0805	R0805 16R 1%
R12	5K6	\$R0805	R0805 5.6K 1%
R13	5K6	\$R0805	R0805 5.6K 1%
R14	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R15	68R	\$R0805	R0805 68R 1%
R16	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R17	15K	\$R0805	R0805 15K 1%
R18	33R	\$R0805	R0805 33R 1%
R19	75R	\$R0805	R0805 75R 1%
R20	68K	\$R0805	R0805 68K 1%
R21	5K6	\$R0805	R0805 5.6K 1%
R22	4K7	\$R0805	R0805 4.7K 1%
R23	1K5	\$R0805	R0805 1.5K 1%
R24	120K	\$R0805	R0805 120K 5%
R25	120K	\$R0805	R0805 120K 5%
R26	2K	\$POTTC33X	TC33X-2 2K
R27	10K	\$R0805	R0805 10K 1%
R28	4K7	\$R0805	R0805 4.7K 1%
R29	4M7	\$R0805	R0805 4.7M 5%
R30	3K3	\$R0805	R0805 3.3K 1%
R31	2K	\$POTTC33X	TC33X-2 2K
R32	3K3	\$R0805	R0805 3.3K 1%
R33	10K	\$R0805	R0805 10K 1%
R34	3K3	\$R0805	R0805 3.3K 1%
R35	22K	\$R0805	R0805 22K 1%
R36	1M1	\$R0805	R0805 1.1M 5%
R37	10K	\$R0805	R0805 10K 1%
R38	10K	\$R0805	R0805 10K 1%
R39	1M1	\$R0805	R0805 1.1M 5%
R40	2K	\$POTTC33X	TC33X-2 2K
R41	100R	\$R0805	R0805 100R 1%
R42	10K	\$R0805	R0805 10K 1%
R43	8K2	\$R0805	R0805 8.2K 1%
R44	120K	\$R0805	R0805 120K 1% YAG/ASJ
R45	130R	\$R0805	R0805 130R 1%
R46	6K8	\$R0805	R0805 6.8K 1%

Name	Alias	Shape	part
R47	22K	\$R0805	R0805 22K 1%
R48	4K7	\$R0805	R0805 4.7K 1%
R49	2M2	\$R0805	R0805 2.2M 1%
R50	2K2	\$R0805	R0805 2.2K 1%
R51	10K	\$R0805	R0805 10K 1%
R52	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R53	620R	\$R0805	R0805 620R 1% YAG/ASJ
R54	22K	\$R0805	R0805 22K 1%
R55	51K	\$R0805	R0805 51K 1%
R56	39K	\$R0805	R0805 39K 1% YAG/ASJ
R57	8K2	\$R0805	R0805 8.2K 1%
R58	5R1	\$R0805	R0805 5.1R 5%
R59	DNP	\$R0805	
R60	2K	\$POTTC33X	TC33X-2 2K
R61	10K	\$R0805	R0805 10K 1%
R62	4K7	\$R0805	R0805 4.7K 1%
R63	10K	\$R0805	R0805 10K 1%
R64	82R	\$R0805	R0805 82R 1% YAG/ASJ
R65	3K9	\$R0805	R0805 3.9K 1%
T1	MMBT3904	\$TRA_SOT23	MMBT3904 SMD
T2	IMD2A	\$SOT457	IMD2AT108 SMD
T3	IMD2A	\$SOT457	IMD2AT108 SMD
T4	IMD2A	\$SOT457	IMD2AT108 SMD
T5	BC850C	\$TRA_SOT23	BC850C SMD
T6	BC807-40	\$TRA_SOT23	BC807-40 SMD
T7	MMBT3904	\$TRA_SOT23	MMBT3904 SMD
T8	2N7002	\$FET_2N7002	2N7002K
T9	MMBT3904	\$TRA_SOT23	MMBT3904 SMD
T10	2N7002	\$FET_2N7002	2N7002K
U1	GALI-74	DF782	
U2	MC1350	\$SO8	
U3	SA612	\$SO8	2212081
U4	MC33079DG	\$SO14	863-MC33079DR2G
U5	SA612	\$SO8	2212081
U6	SA58631	\$SOT909-1	

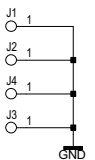
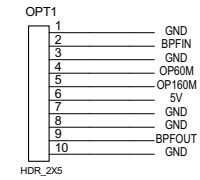
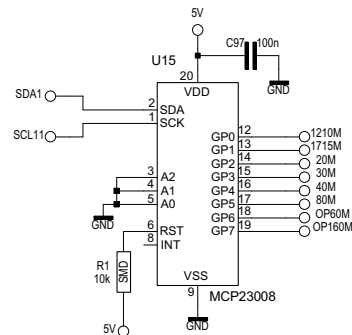
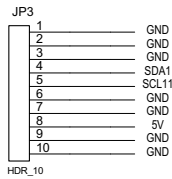
Receiver BAND PASS FILTERS (BPF) board

Six band pass filters were built to cover 10-80m bands on RX. Schematic utilizes Skywork solutions AS169 PHEMT GaAs SPDT switches, used in modern wireless equipments. In order to perform individually “fine tune” a variable coil inductors are used. The module fully meets project CLICKLESS concept as there aren't any mechanical switching components. MCP23008 serial controlled I/O expander is used to engage needed filter. The board has a provision for two optional filters (Optional filter 160/60m).

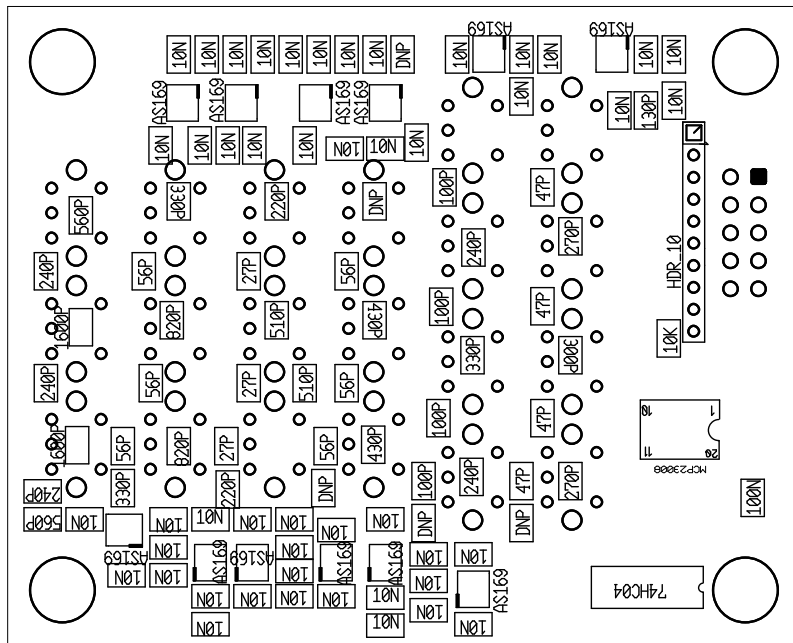
BAND PASS FILTER BOARD



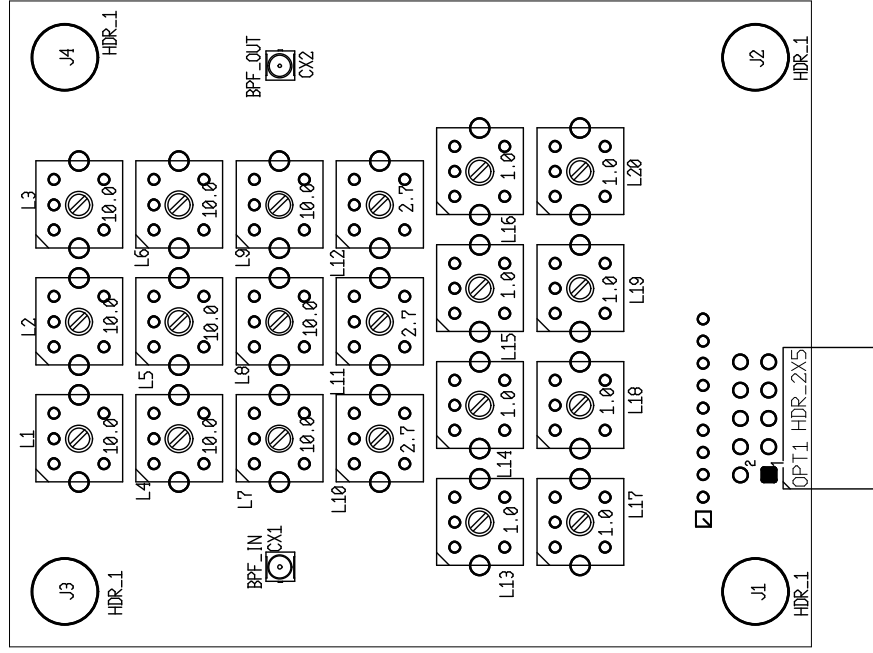
L1-L20 VARIABLE INDUCTOR COILS TYPE KHS-6
ALL CAPACITORS RATED AT 50V NPO/COG



BPF board BOTTOM view



BPF board TOP view



Name	Alias	Shape	part
C1	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C2	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C3	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C4	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C5	240P	\$R0805	C0805 240pF 50V COG SAMSUNG
C6	560P	\$R0805	C0805 560pF 50V COG SAMSUNG
C7	1600P	\$R0805	1865488
C8	240P	\$R0805	C0805 240pF 50V COG SAMSUNG
C9	240P	\$R0805	C0805 240pF 50V COG SAMSUNG
C10	1600P	\$R0805	1865488
C11	560P	\$R0805	C0805 560pF 50V COG SAMSUNG
C12	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C13	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C14	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C15	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C16	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C17	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C18	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C19	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C20	56P	\$R0805	C0805 56pF 50V COG SAMSUNG
C21	330P	\$R0805	C0805 330pF 50V COG SAMSUNG
C22	820P	\$R0805	C0805 820pF 50V COG SAMSUNG
C23	56P	\$R0805	C0805 56pF 50V COG SAMSUNG
C24	56P	\$R0805	C0805 56pF 50V COG SAMSUNG
C25	820P	\$R0805	C0805 820pF 50V COG SAMSUNG
C26	330P	\$R0805	C0805 330pF 50V COG SAMSUNG
C27	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C28	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C29	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C30	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C31	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C32	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C33	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C34	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C35	27P	\$R0805	C0805 27pF 50V COG SAMSUNG
C36	220P	\$R0805	C0805 220pF 50V COG SAMSUNG
C37	510P	\$R0805	NMC0805NPO511J50TRPF
C38	27P	\$R0805	C0805 27pF 50V COG SAMSUNG
C39	27P	\$R0805	C0805 27pF 50V COG SAMSUNG
C40	510P	\$R0805	NMC0805NPO511J50TRPF
C41	220P	\$R0805	C0805 220pF 50V COG SAMSUNG
C42	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C43	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C44	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C45	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C46	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C47	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C48	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C49	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C50	56P	\$R0805	C0805 56pF 50V COG SAMSUNG
C51	DNP	\$R0805	

Parts specification:

Name	Alias	Shape	part
C53	56P	\$R0805	C0805 56pF 50V COG SAMSUNG
C54	56P	\$R0805	C0805 56pF 50V COG SAMSUNG
C55	430P	\$R0805	CL21C431JBANNNC
C56	DNP	\$R0805	
C57	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C58	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C59	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C60	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C61	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C62	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C63	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C64	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C65	100P	\$R0805	C0805 100pF 50V COG SAMSUNG
C66	DNP	\$R0805	
C67	240P	\$R0805	C0805 240pF 50V COG SAMSUNG
C68	100P	\$R0805	C0805 100pF 50V COG SAMSUNG
C69	100P	\$R0805	C0805 100pF 50V COG SAMSUNG
C70	330P	\$R0805	C0805 330pF 50V COG SAMSUNG
C71	240P	\$R0805	C0805 240pF 50V COG SAMSUNG
C72	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C73	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C74	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C75	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C76	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C77	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C78	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C79	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C80	47P	\$R0805	C0805 47pF 50V COG SAMSUNG
C81	130P	\$R0805	C0805 130pF 50V COG SAMSUNG
C82	270P	\$R0805	C0805 270pF 50V COG SAMSUNG
C83	47P	\$R0805	C0805 47pF 50V COG SAMSUNG
C84	47P	\$R0805	C0805 47pF 50V COG SAMSUNG
C85	300P	\$R0805	CL21C301JBANNNC
C86	270P	\$R0805	C0805 270pF 50V COG SAMSUNG
C87	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C88	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C89	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C90	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C91	47P	\$R0805	C0805 47pF 50V COG SAMSUNG
C92	DNP	\$R0805	
C93	100P	\$R0805	C0805 100pF 50V COG SAMSUNG
C94	DNP	\$R0805	
C97	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
CX1	BPF_IN	IPX	
CX2	BPF_OUT	IPX	
J1	HDR_1	HOLE	M3x6, lockwasher 3mm
J2	HDR_1	HOLE	M3x6, lockwasher 3mm
J3	HDR_1	HOLE	M3x6, lockwasher 3mm
J4	HDR_1	HOLE	M3x6, lockwasher 3mm
JP3	HDR_10	HDR1X10_2MM	2289781

Name	Alias	Shape	part
L1	10.0	KHS-6	KHS-6 10 uH A71108002
L2	10.0	KHS-6	KHS-6 10 uH A71108002
L3	10.0	KHS-6	KHS-6 10 uH A71108002
L4	10.0	KHS-6	KHS-6 10 uH A71108002
L5	10.0	KHS-6	KHS-6 10 uH A71108002
L6	10.0	KHS-6	KHS-6 10 uH A71108002
L7	10.0	KHS-6	KHS-6 10 uH A71108002
L8	10.0	KHS-6	KHS-6 10 uH A71108002
L9	10.0	KHS-6	KHS-6 10 uH A71108002
L10	2.7uH	KHS-6	KHS-6 2.7uH A71108006
L11	2.7uH	KHS-6	KHS-6 2.7uH A71108006
L12	2.7uH	KHS-6	KHS-6 2.7uH A71108006
L13	1.0	KHS-6	KHS-6 1.0 uH 2593
L14	1.0	KHS-6	KHS-6 1.0 uH 2593
L15	1.0	KHS-6	KHS-6 1.0 uH 2593
L16	10.0	KHS-6	KHS-6 10 uH A71108002
L17	1.0	KHS-6	KHS-6 1.0 uH 2593
L18	1.0	KHS-6	KHS-6 1.0 uH 2593
L19	1.0	KHS-6	KHS-6 1.0 uH 2593
L20	1.0	KHS-6	KHS-6 1.0 uH 2593
OPT1	HDR_2X5	HDR2X5HA	PR2X5
R1	10K	\$R0805	R0805 10K 1%
U1	74HC04	SO14	74HC04D
U2	AS169	\$SOT6	863-1002-1-ND
U3	AS169	\$SOT6	863-1002-1-ND
U4	AS169	\$SOT6	863-1002-1-ND
U5	AS169	\$SOT6	863-1002-1-ND
U6	AS169	\$SOT6	863-1002-1-ND
U7	AS169	\$SOT6	863-1002-1-ND
U8	AS169	\$SOT6	863-1002-1-ND
U9	AS169	\$SOT6	863-1002-1-ND
U10	AS169	\$SOT6	863-1002-1-ND
U11	AS169	\$SOT6	863-1002-1-ND
U12	AS169	\$SOT6	863-1002-1-ND
U13	AS169	\$SOT6	863-1002-1-ND
U15	MCP23008	\$SSOP20	1605564

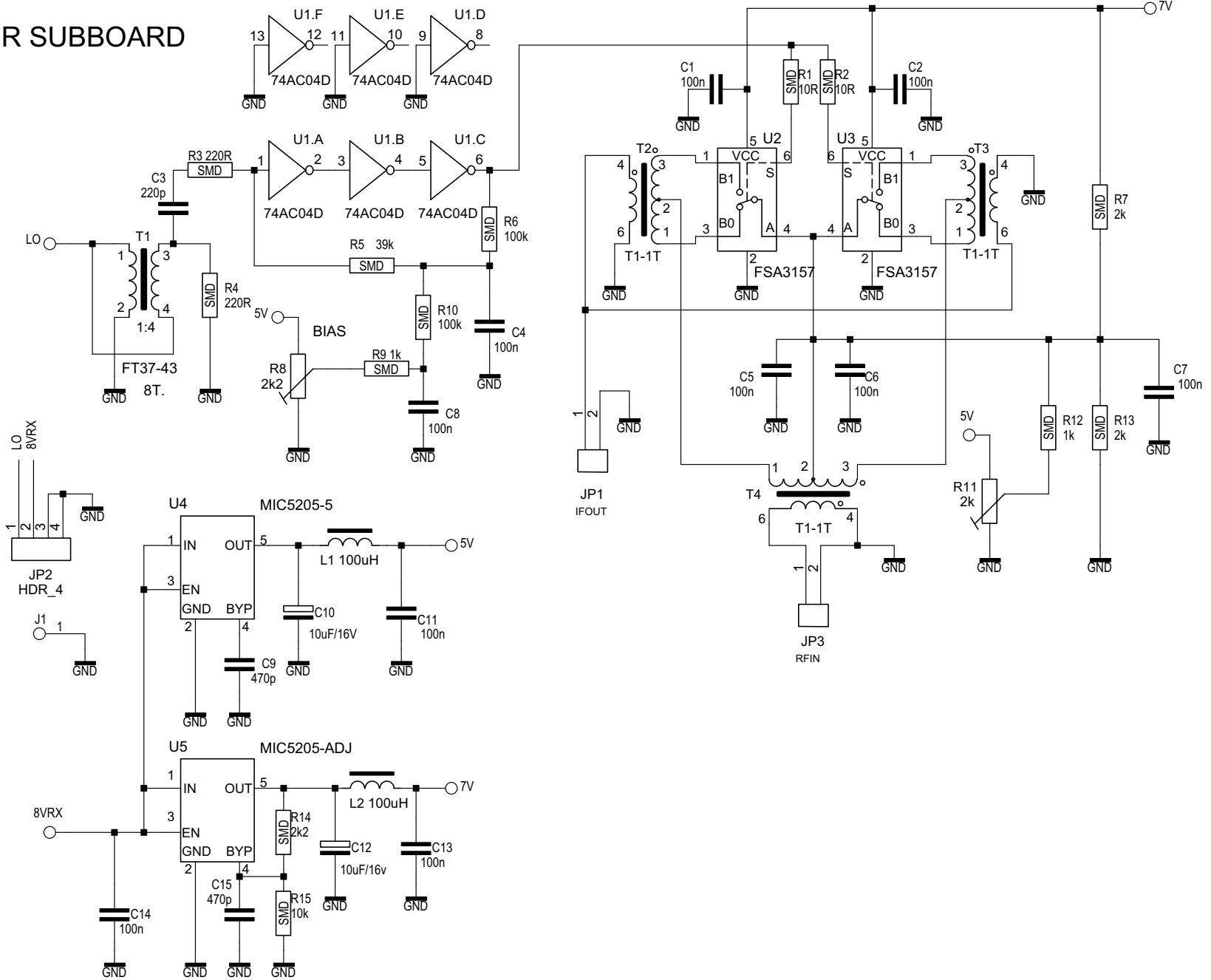
RX MIXER

High dynamic range H-MODE receiver mixer (Option)

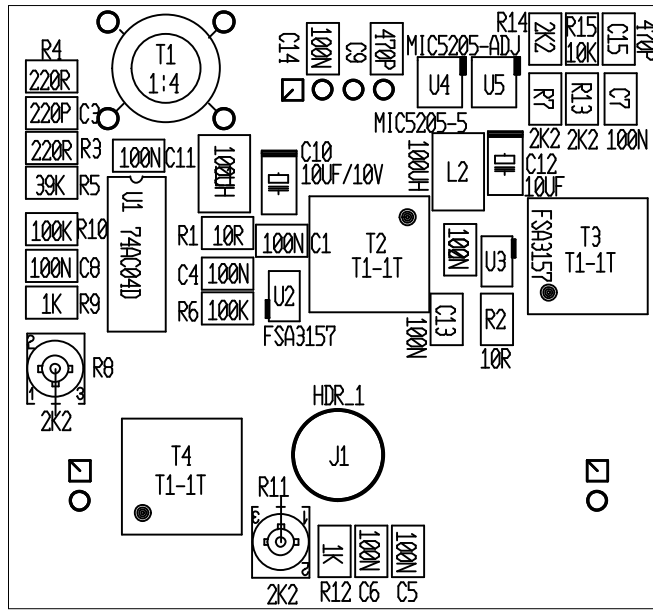
Parts specification:

Name	Alias	Shape	Part
C1	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C2	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C3	220P	\$R0805	C0805 220pF 50V COG SAMSUNG
C4	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C5	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C6	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C7	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C8	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C9	470P	\$R0805	C0805 470pF 50V COG SAMSUNG
C10	10UF/10V	\$TANT1206	TANT A SMD 10uF 16V
C11	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C12	10UF	\$TANT1206	TANT A SMD 10uF 16V
C13	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C14	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
C15	470P	\$R0805	C0805 470pF 50V COG SAMSUNG
J1	HDR_1	HOLE	M3x6, lockwasher 3mm
JP1	IFOUT	HDR1X2_2MM	2289781 1/10 cut
JP2	HDR_4	HDR1X4_2MM	2289781 1/5 cut
JP3	RFIN	HDR1X2_2MM	2289781 1/10 cut
L1	100UH	\$R1210	LQH32CN101K23L
L2	100UH	\$R1210	LQH32CN101K23L
R1	10R	\$R0805	R0805 10R 1%
R2	10R	\$R0805	R0805 10R 1%
R3	220R	\$R0805	R0805 220R 1%
R4	220R	\$R0805	R0805 220R 1%
R5	39K	\$R0805	R0805 39K 1% YAG/ASJ
R6	100K	\$R0805	R0805 100K 1%
R7	2K2	\$R0805	R0805 2.2K 1%
R8	2K	\$POTTC33X	TC33X-2 2K
R9	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R10	100K	\$R0805	R0805 100K 1%
R11	2K	\$POTTC33X	TC33X-2 2K
R12	1K	\$R0805	R0805 1.0K 1% YAG/ASJ
R13	2K2	\$R0805	R0805 2.2K 1%
R14	2K2	\$R0805	R0805 2.2K 1%
R15	10K	\$R0805	R0805 10K 1%
T1	1:04	TRANSF_1:4	mouser 5943000201
T2	T1-1T	\$KK81	ebay
T3	T1-1T	\$KK81	ebay
T4	T1-1T	\$KK81	ebay
U1	74AC04D	SO14	farnel 2534673
U2	FSA3157	\$SC70	farnel 1564487
U3	FSA3157	\$SC70	farnel 1564487
U4	MIC5205-5	\$SOT23-5	MIC5205 5.0 YM5-TR
U5	MIC5205-ADJ	\$SOT23-5	MIC5205YM5-TR

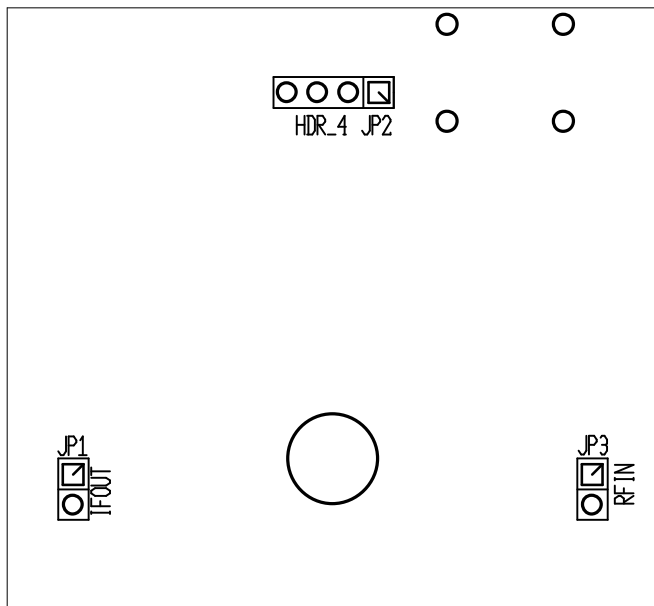
RX MIXER SUBBOARD



RX MIXER TOP view



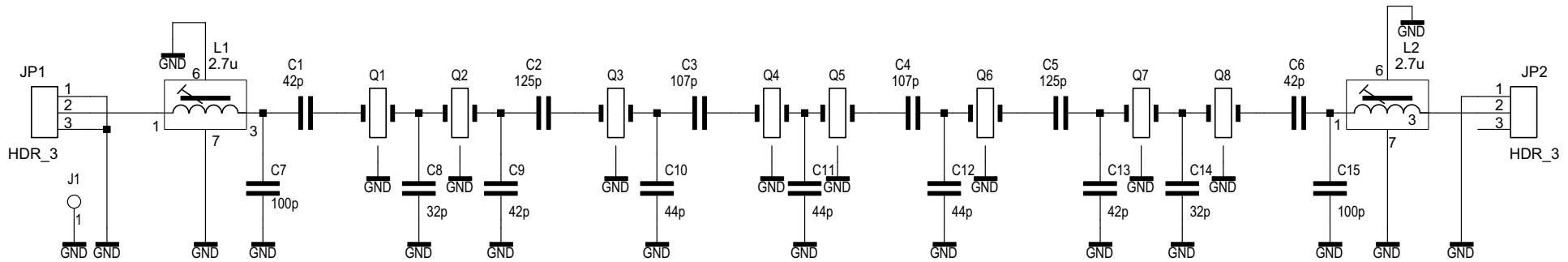
RX MIXER BOTTOM view



VBF part list

Name	Alias	Shape	part
C1	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C2	68P	\$R0805	C0805 68pF 50V COG SAMSUNG
C3	68P	\$R0805	C0805 68pF 50V COG SAMSUNG
C4	10N	\$R0805	C0805 10nF 50V X7R SAMSUNG
C5	100N	\$R0805	C0805 100nF 50V X7R SAMSUNG
D1	SVC321	TO92	SVC321 VARACTOR DIODE
D2	SVC321	TO92	SVC321 VARACTOR DIODE
D3	SVC321	TO92	SVC321 VARACTOR DIODE
D4	SVC321	TO92	SVC321 VARACTOR DIODE
D5	SVC321	TO92	SVC321 VARACTOR DIODE
J1	HDR_1	HOLE	M3x6; lockwasher 3mm
JP1	HDR_3	HDR1X4_2MM	2289781 3/20 cut
JP2	HDR_3	HDR1X4_2MM	2289781 3/20 cut
L1	4.7UH	\$R1210	LQH32CN4R7M23L
L2	4.7UH	\$R1210	LQH32CN4R7M23L
Q1	9.000	RESO10X5R5	CRYSTAL RESONATOR HC-49S
Q2	9.000	RESO10X5R5	CRYSTAL RESONATOR HC-49S
Q3	9.000	RESO10X5R5	CRYSTAL RESONATOR HC-49S
Q4	9.000	RESO10X5R5	CRYSTAL RESONATOR HC-49S
R1	100K	\$R0805	R0805 100K 1%
R2	100K	\$R0805	R0805 100K 1%
R3	100K	\$R0805	R0805 100K 1%
R4	100K	\$R0805	R0805 100K 1%
R5	100K	\$R0805	R0805 100K 1%
R6	100K	\$POTTC33X	TC33X-2 100K

8 POLE CHEBISHEV CRYSTAL LADDER FILTER 9MHZ BW 2.7KHZ



C.FREQ. 9.000 MHZ
 OFFSET 0HZ
 BW@-6 2.7KHZ
 PASSBAND RIPPLE 0.2DB
 STOPBAND ATTN >100DB
 SHAPE FACTOR 1.66

INDIVIDUAL XTAL MOTIONAL PARAMETERS:
 FS=8998.240KHZ
 Q=116000
 LM=35.3MH
 CM=8.85FF
 R=17.5
 CO=2.75PF

ALL CAPACITORS ARE NPO, COG 50V
 CRYSTAL TYPE HC-49S
 ALL CRYSTAL ARE MATCHED TO 30HZ
 ZIN/OUT = 50 OHM
 CRYSTAL CASES MUST BE SOLDERED
 TO GROUND

D

D

C

C

B

B

A

A

8

7

6

5

4

3

2

1

8

7

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5

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1

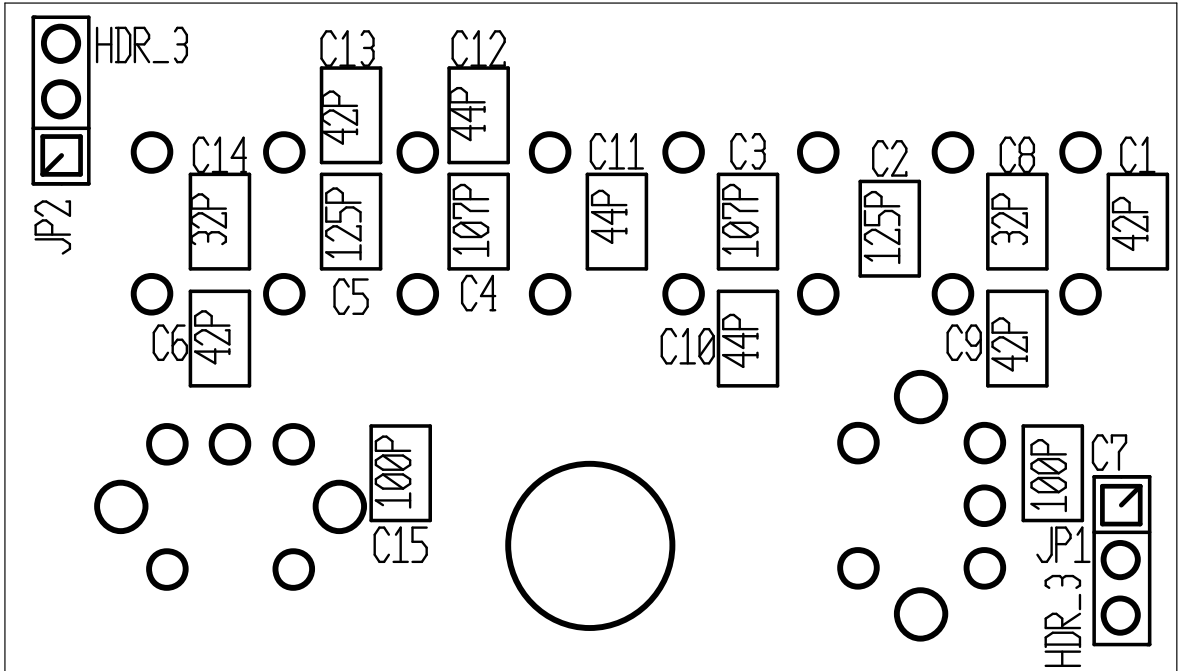
Crystal filter 9MHz 2.7kHz

Crystal filter is made of individual quartz crystals with matched parameters – Fser. (+/- 15Hz), Lm and Q factor > 100 000. A large quantity of 9MHz oscillator crystals were purchased to extract only few to fit those requirements. Three type of quartz filters are used in RGO ONE – main (roofing) filter, VBF 4 pole Johnson type filter for SSB and CW modes and noise filter. All the filters are internally impedance matched to 50 ohm input/output circuitry and individually aligned.

Roofing first (standard) wide 2.7kHz SSB filter:

Filter type	Chebyshev 8-pole
Center frequency	9MHz
Bandwidth at -3db	2.7kHz
Shape factor -6/-60db	1.75
IN/OUT impedance	50ohm
Band pass ripple	<1db
Stop band attenuation	>80db

XTAL Filter BOTTOM view



XTAL Filter TOP view

