

A

B

C

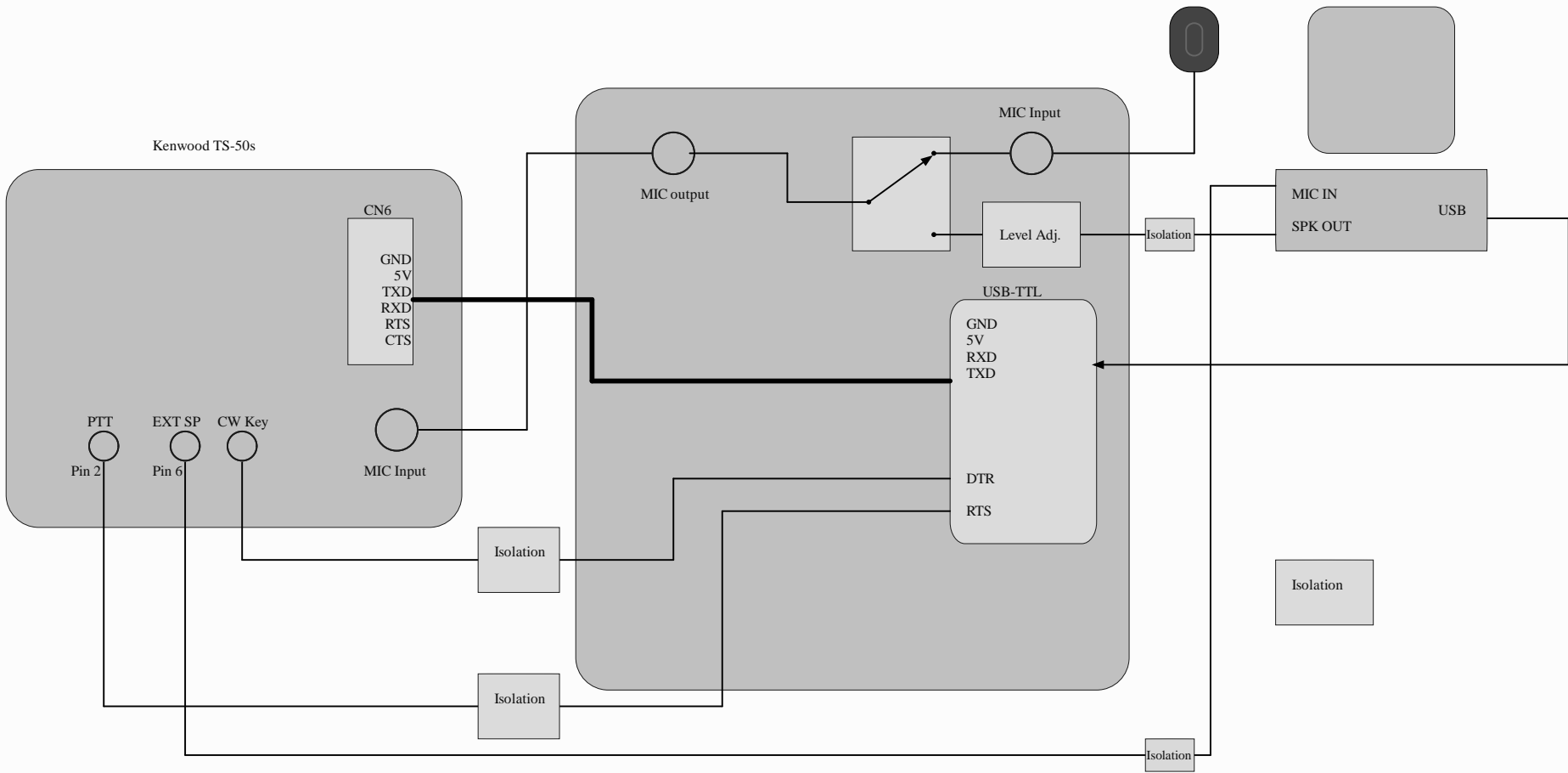
D

A

B

C

D



Title **Block Diagram**

Size: A4

Number: 1

Revision: 1

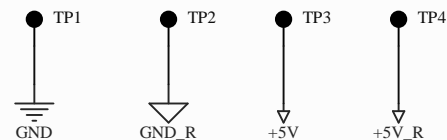
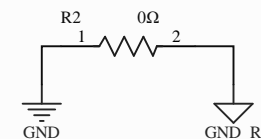
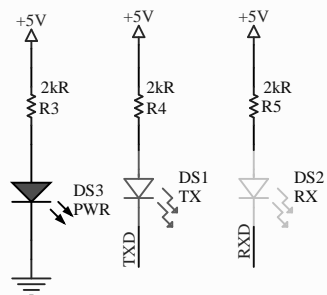
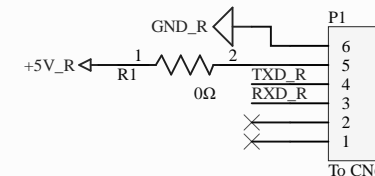
Date: 28/01/2022

Time: 16:40:08

Sheet 1 of 4

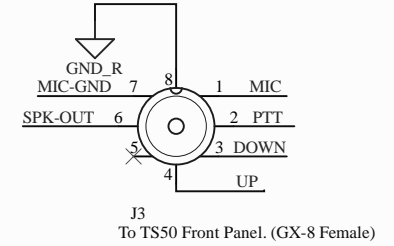
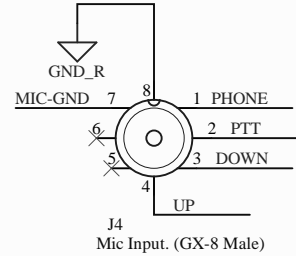
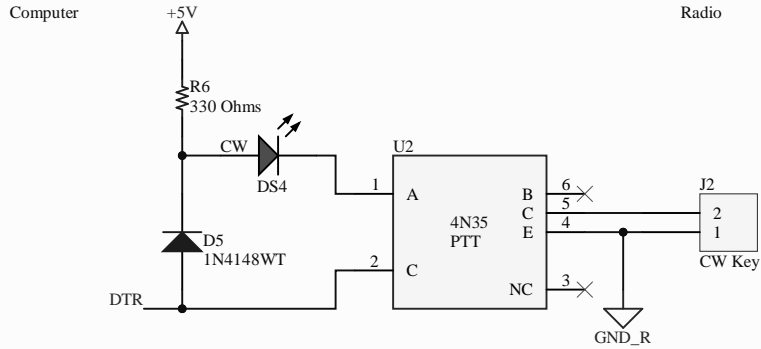
File: C:\Users\tmadu\Documents\Amateur Radio\Kenwood-TS50s-Digi-Interface\Kenwood-TS50s-Digi-Interface\Block Diagram.S

4S6TMP
www.4s6tmp.com

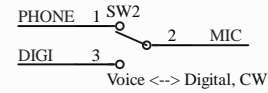
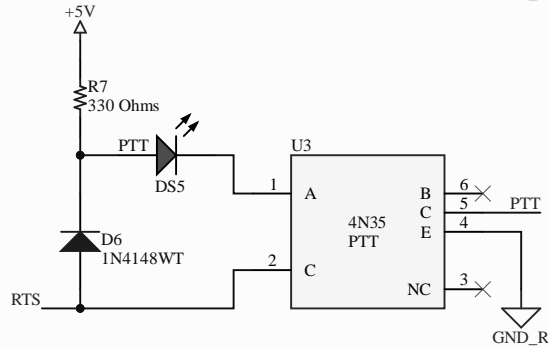


Check if TXD/RXD is Active low/high
Add POT for SPK OUT
Add Hardware & TPs

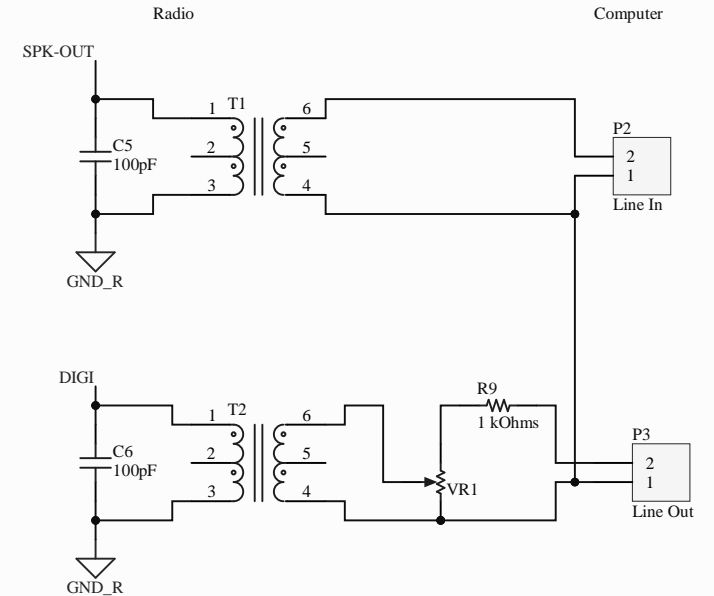
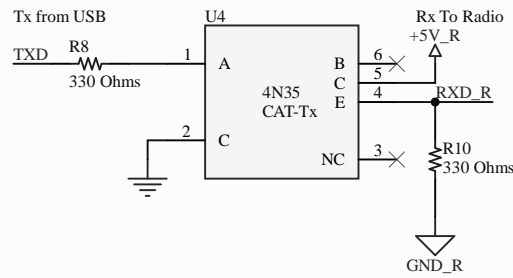
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Size: A4	Number: 2	Revision: 1	
Date: 28/01/2022	Time: 16:40:08	Sheet 2 of 4	
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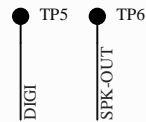
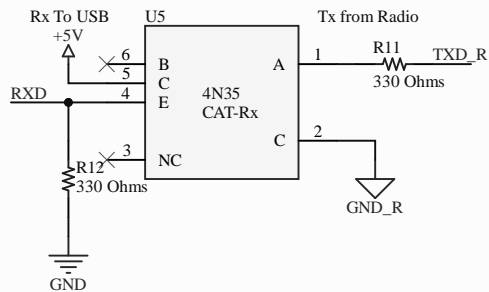
B



C



D



Title **Kenwood TS50s Digital Interface**

Size: A4

Number: 3

Revision: 1.0

Date: 28/01/2022

Time: 16:40:08

Sheet 3 of 4

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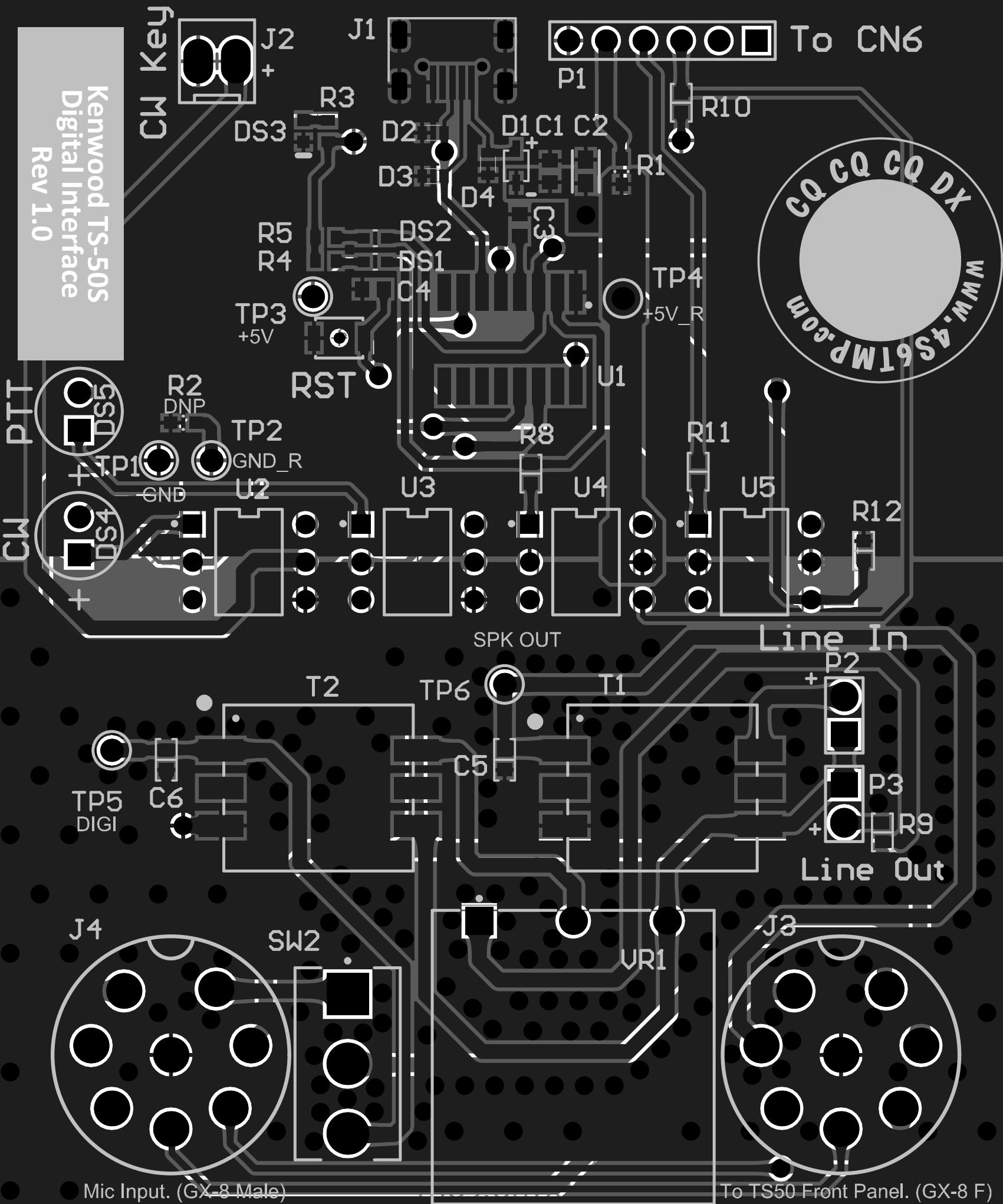
4S6TMP
Sri Lanka

4S6TMP
www.4s6tmp.com

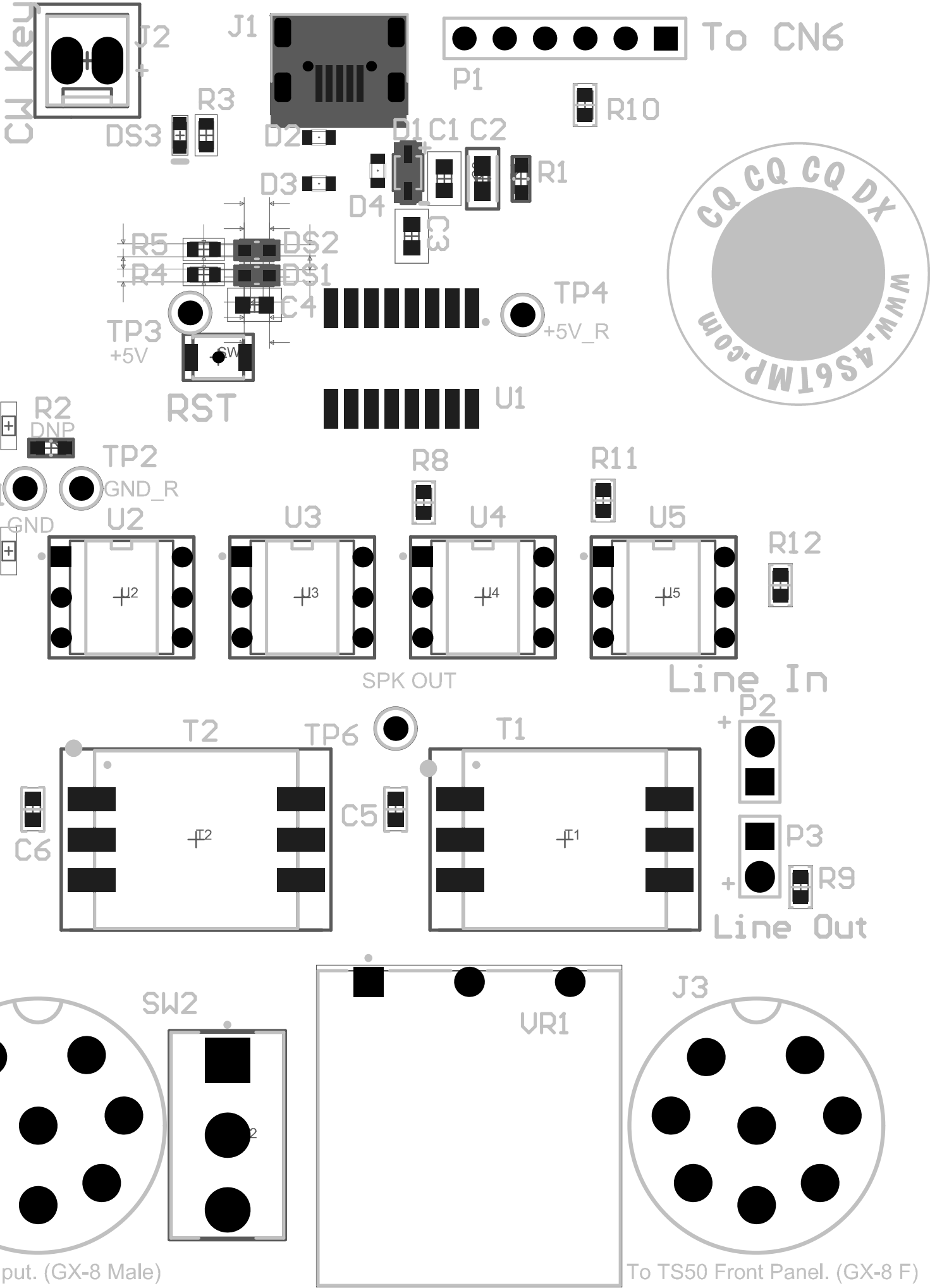
	1	2	3	4
A				
B				
C		Logo1 PCB Logo 4S6TMP		
D				
	1	2	3	4

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Size: A4	Number:4	Revision:1		
Date: 28/01/2022	Time: 16:40:08	Sheet4 of 4		
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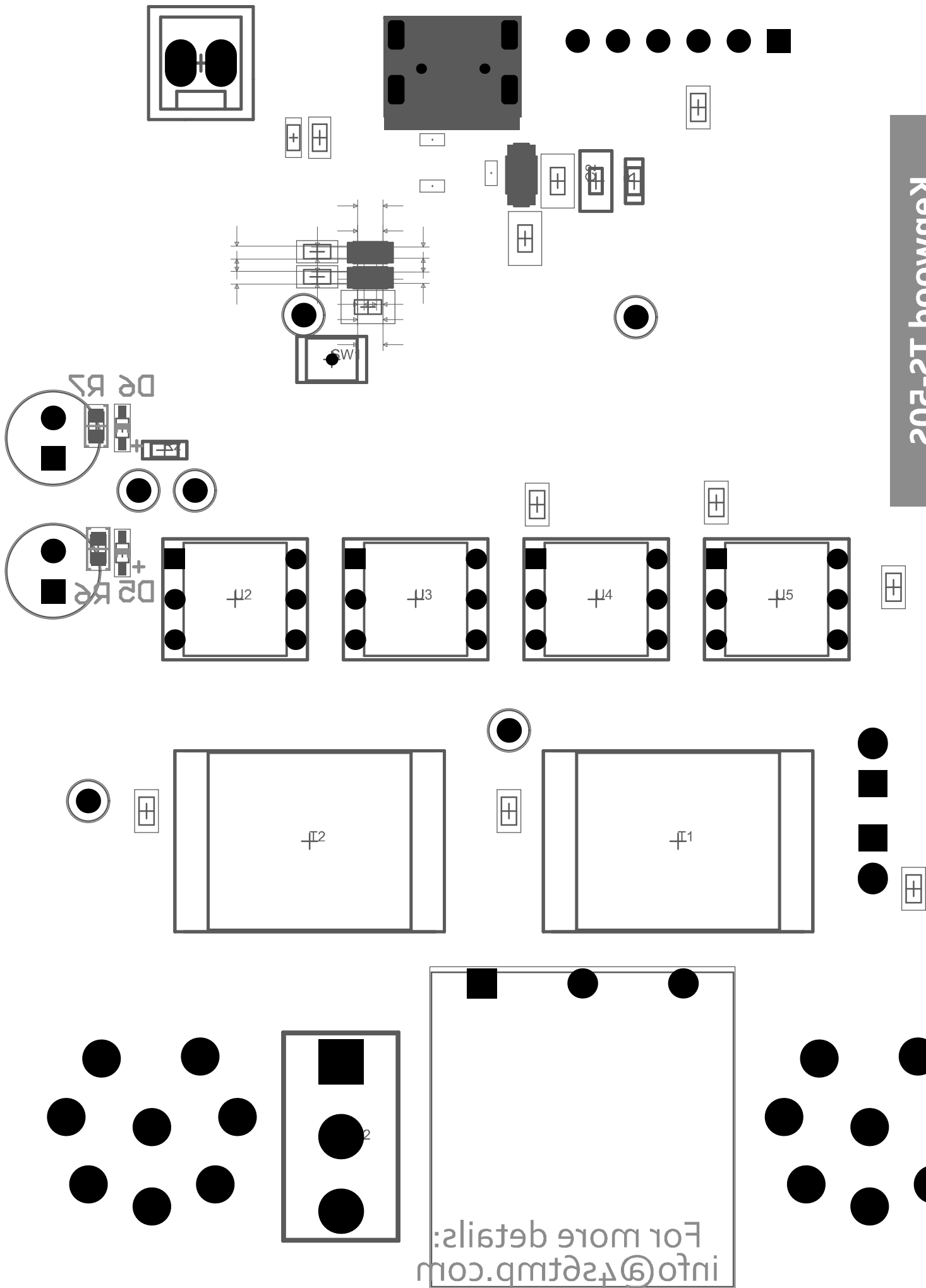
Kenwood TS-50S
Digital Interface
Rev 1.0



Kenwood TS-50S
Digital Interface
Rev 1.0



42e1Mb
Digital Interface pd
Kenwood T2-202



For more details:
info@42e1mb.com

Kenwood TS-50S
Digital Interface
Rev 1.0

CW Key

LLD
+
DS4
+
CM

J4

SW2

Mic Input. (GX-8 Male)



J2
+

R5
R4

TP3
+5V

RST

TP1
GND

DS1

U2

T2

TP5
DIGI

C6



J1

D2
D3

DS2

DS1

TP2
GND_R

U3

U4

U5

TP6

C5

T1

J3

SW2

SW2

SW2

SW2

D1
C1
C2

D4

C3

U1

R8

U3

U4

U5

TP6

C5

T1

J3

SW2

SW2

SW2

SW2

D1
C1
C2

D4

C3

U1

R8

U3

U4

U5

TP6

C5

T1

J3

SW2

SW2

SW2

SW2

D1
C1
C2

D4

C3

U1

R8

U3

U4

U5

TP6

C5

T1

J3

SW2

SW2

SW2

SW2

D1
C1
C2

D4

C3

U1

R8

U3

U4

U5

TP6

C5

T1

J3

SW2

SW2

SW2

SW2

D1
C1
C2

D4

C3

U1

R8

U3

U4

U5

TP6

C5

T1

J3

SW2

SW2

SW2

SW2

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C3

U1

R8

U3

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U5

TP6

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U3

U4

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TP6

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SW2

SW2

SW2

D1
C1
C2

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C3

U1

R8

U3

U4

U5

TP6

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SW2

SW2

D1
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C2

D4

C3

U1

R8

U3

U4

U5

TP6

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T1

J3

SW2

SW2

SW2

SW2

D1
C1
C2

D4

C3

U1

R8

U3

U4

U5

TP6

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T1

J3

SW2

SW2

SW2

SW2

D1
C1
C2

D4

C3

U1

R8

U3

U4

U5

TP6

C5

T1

J3

SW2

SW2

SW2

SW2

D1
C1
C2

D4

C3

U1

R8

U3

U4

U5

TP6

C5

T1

J3

SW2

SW2

SW2

SW2

D1
C1
C2

D4

C3

U1

R8

U3

U4

U5

TP6

C5

T1

J3

SW2

SW2

SW2

SW2

D1
C1
C2

D4

C3

U1

R8

U3

U4

U5

TP6

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J3

SW2

SW2

SW2

SW2

D1
C1
C2

D4

C3

U1

R8

U3

U4

U5

TP6

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T1

J3

SW2

SW2

SW2

SW2

D1
C1
C2

D4

C3

U1

R8

U3

U4

U5

TP6

C5

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SW2

SW2

SW2

SW2

D1
C1
C2

D4

C3

U1

R8

U3

U4

U5

TP6

C5

T1

J3

SW2

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SW2

SW2

D1
C1
C2

D4

C3

U1

R8

U3

U4

U5

TP6

C5

T1

J3

SW2

SW2

SW2

SW2

D1
C1
C2

D4

C3

U1

R8

U3

U4

U5

TP6

C5

T1

J3

SW2

SW2

SW2

SW2

D1
C1
C2

D4

C3

U1

R8

U3

U4

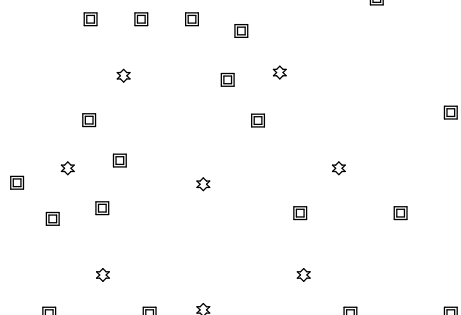
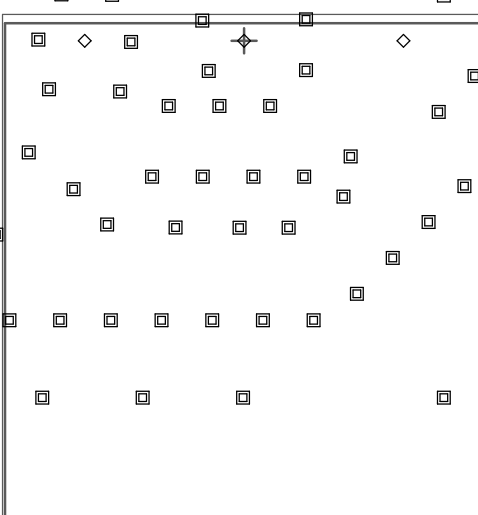
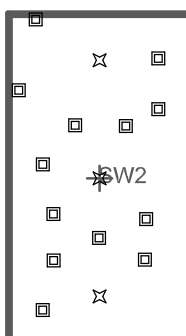
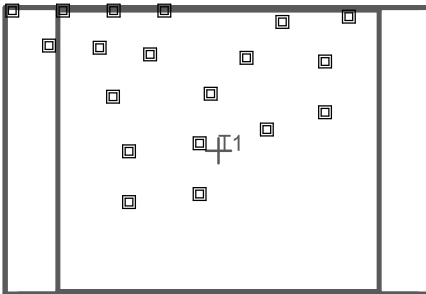
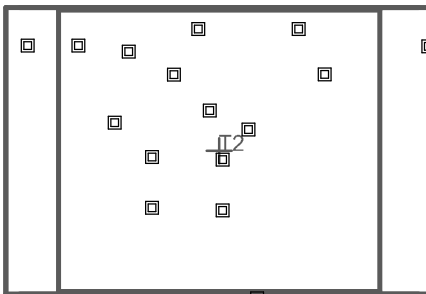
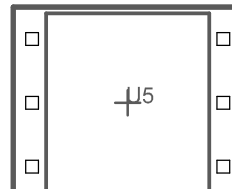
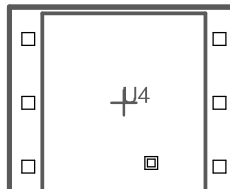
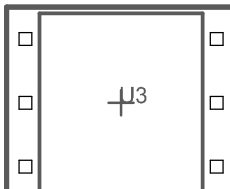
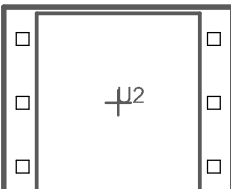
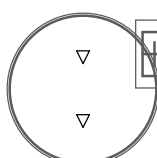
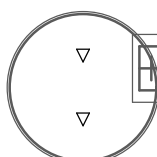
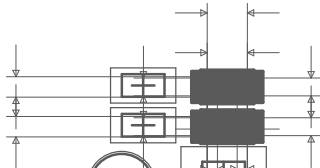
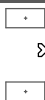
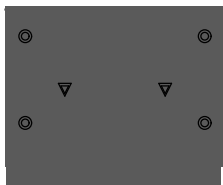
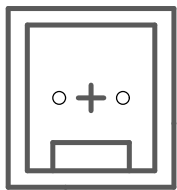
U5

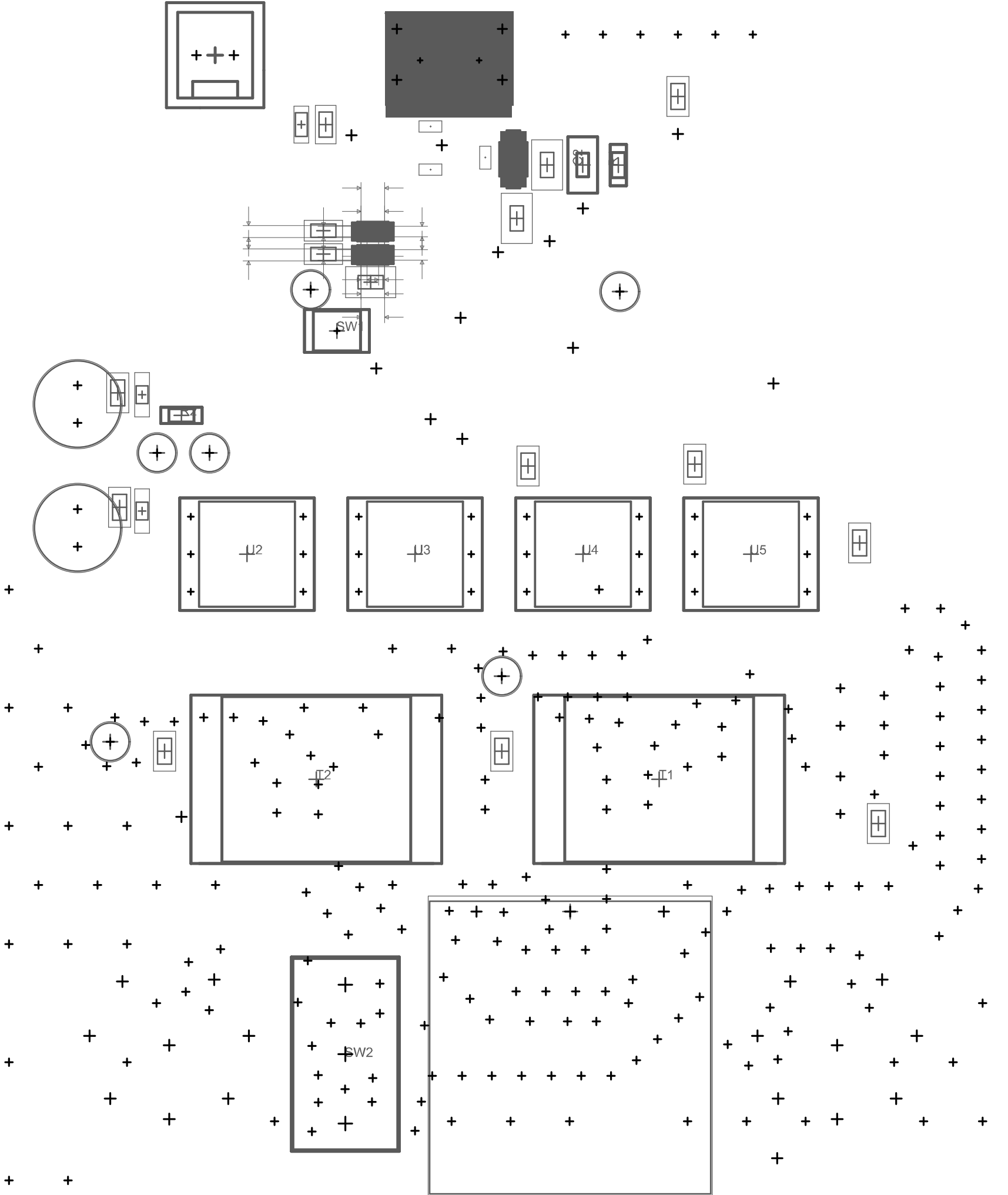
TP6

C5










T1

J3





Board Stack Report

Stack Up		Layer Stack			
Layer	Board Layer Stack	Name	Material	Thickness	Constant
1		Top Paste			
2		Top Overlay			
3		Top Solder	Solder Resist	0.40mil	3.5
4		Top Layer	Copper	1.40mil	
5		Dielectric 1	FR-4	12.60mil	4.8
6		Bottom Layer	Copper	1.40mil	
7		Bottom Solder	Solder Resist	0.40mil	3.5
8		Bottom Overlay			
9		Bottom Paste			
	Height : 16.20mil				

Design Rules Verification Report

Filename : C:\Users\lrmadu\Documents\Amateur Radio\Kenwood-TS50s-Digi-Interface\Kenwood-TS50s-Digi-Interface\ts-50s-digi-interface.PcbDoc

Warnings 0
Rule Violations 0

Warnings	
Total	0

Rule Violations	
Clearance Constraint (Gap=0.254mm) (All),(All)	0
Short-Circuit Constraint (Allowed=No) (All),(All)	0
Un-Routed Net Constraint (All)	0
Modified Polygon (Allow modified: No), (Allow shelved: No)	0
Width Constraint (Min=0.254mm) (Max=1mm) (Preferred=0.45mm) (All)	0
Power Plane Connect Rule(Relief Connect)(Expansion=0.508mm) (Conductor Width=0.254mm) (Air Gap=0.254mm)	0
Hole Size Constraint (Min=0.025mm) (Max=2.54mm) (All)	0
Hole To Hole Clearance (Gap=0.254mm) (All),(All)	0
Minimum Solder Mask Sliver (Gap=0.05mm) (Disabled)(All),(All)	0
Silk To Solder Mask (Clearance=0.01mm) (Disabled)(IsPad),(All)	0
Silk to Silk (Clearance=0.1mm) (Disabled)(All),(All)	0
Net Antennae (Tolerance=0mm) (All)	0
Room Hardware (Bounding Region = (166.497mm, 472.694mm, 222.885mm, 497.078mm)	0
Room ts-50s-digi-interface (Bounding Region = (38.735mm, 314.579mm, 108.077mm, 374.015mm)	0
Room CAT-PTT (Bounding Region = (39.141mm, 314.706mm, 108.61mm, 396.748mm)	0
Height Constraint (Min=0mm) (Max=25.4mm) (Preferred=12.7mm) (All)	0
Total	0

Electrical Rules Check Report

Class	Document	Message
Warning	CAT-PTT.SchDoc	Net RESET has no driving source (Pin C4-2, Pin SW1-2, Pin U1-7)
Warning	CAT-PTT.SchDoc	Net RXD has no driving source (Pin DS2-1, Pin R12-1, Pin U1-3, Pin U5-4)
Warning	ts-50s-digi-interface.SchDoc	Off grid J3 at 9723.071mil,6162.122mil
Warning	Hardware.SchDoc	Off grid Logo1 at 69.23mm,86.23mm
Warning	ts-50s-digi-interface.SchDoc	Off grid Net Label DOWN at 6722.047mil,5942.52mil
Warning	ts-50s-digi-interface.SchDoc	Off grid Net Label DOWN at 10023.859mil,6004.642mil
Warning	ts-50s-digi-interface.SchDoc	Off grid Net Label MIC at 10105.748mil,6319.602mil
Warning	ts-50s-digi-interface.SchDoc	Off grid Net Label MIC-GND at 5677.953mil,6257.48mil
Warning	ts-50s-digi-interface.SchDoc	Off grid Net Label MIC-GND at 9001.024mil,6319.602mil
Warning	ts-50s-digi-interface.SchDoc	Off grid Net Label PHONE at 6700mil,6257.48mil
Warning	ts-50s-digi-interface.SchDoc	Off grid Net Label PTT at 10123.071mil,6162.122mil
Warning	CAT-PTT.SchDoc	Off grid Net Label RESET at 6200mil,5673.677mil
Warning	ts-50s-digi-interface.SchDoc	Off grid Net Label SPK-OUT at 8923.071mil,6162.122mil
Warning	ts-50s-digi-interface.SchDoc	Off grid Net Label UP at 10038.032mil,5822.752mil
Warning	ts-50s-digi-interface.SchDoc	Off grid No ERC at 6177.953mil,5942.52mil
Warning	ts-50s-digi-interface.SchDoc	Off grid No ERC at 9501.024mil,6004.642mil
Warning	ts-50s-digi-interface.SchDoc	Off grid Pin J3-1 at 9945.118mil,6319.602mil
Warning	ts-50s-digi-interface.SchDoc	Off grid Pin J3-2 at 10023.071mil,6162.122mil
Warning	ts-50s-digi-interface.SchDoc	Off grid Pin J3-3 at 9945.118mil,6004.642mil
Warning	ts-50s-digi-interface.SchDoc	Off grid Pin J3-4 at 9723.071mil,5862.122mil
Warning	ts-50s-digi-interface.SchDoc	Off grid Pin J3-5 at 9501.024mil,6004.642mil
Warning	ts-50s-digi-interface.SchDoc	Off grid Pin J3-6 at 9423.071mil,6162.122mil
Warning	ts-50s-digi-interface.SchDoc	Off grid Pin J3-7 at 9501.024mil,6319.602mil
Warning	ts-50s-digi-interface.SchDoc	Off grid Pin J3-8 at 9723.071mil,6462.122mil
Warning	ts-50s-digi-interface.SchDoc	Off grid Pin J4-1 at 6622.047mil,6257.48mil
Warning	ts-50s-digi-interface.SchDoc	Off grid Pin J4-3 at 6622.047mil,5942.52mil
Warning	ts-50s-digi-interface.SchDoc	Off grid Pin J4-5 at 6177.953mil,5942.52mil
Warning	ts-50s-digi-interface.SchDoc	Off grid Pin J4-7 at 6177.953mil,6257.48mil
Warning	ts-50s-digi-interface.SchDoc	Off grid Power Object GND_R at 9300mil,6717.083mil

Comment	Description	Designator	Footprint	LibRef	Quantity	Capacitance	Resistance (Ohms)	Resistance	Value	Manufacturer Part Number	Manufacturer Part Number 1	Manufacturer Part Number 2	Part Number	PartNumber
100nF	Chip Capacitor, 100 nF, +/- 10%, 50 V, -55 to 125 degC, 0603 (1608 Metric), RoHS, Tape and Reel	C1, C3, C4	CAPC1608X90K35ML1 0T15	OMP-2006-02375-5		3 100nF				GCM188R71H104K A57D				
10uF	Chip Multilayer Ceramic Capacitors for General Purpose, 0603, 10uF, X5R, 15%, 20%, 6.3V	C2	FP-GRM188-0_1-e0_2_0_55-IPC_A	OMP-2006-02792-2		1 10uF								
100pF	CAP CER 100PF 50V COG/NPO 0603	C5, C6	CAP 0603_1608	500R14N101J4T		2 100pF			100pF				500R14N101J4T	
BAT760-7	30V 1A 500mV @ 1A SOD-323 Schottky Barrier Diodes (SBD) RoHS	D1	SOD323_DIO	BAT760-7		1			BAT760-7					
ESD Diode	Bidirectional - 50V - 5V 0603 ESD Protection Devices ROHS	D2, D3, D4	0603ESDA-05N	0603ESDA-05N		3								
1N4148WT	High Conductance Fast Switching Diode, 75 V, -55 to 150 degC, 2-Pin SOD523F, RoHS	D5, D6	FAIR-SOD-523F-2_V	OMP-0881-00001-1		2								1N4148WT
TX	No Description Available	DS1	LED_19-217/GHC-YR152/3T_EVE	19-217/GHC-YR152/3T		1								
RX	Yellow 590nm LED Indication - Discrete 2V 0603 (1608 Metric)	DS2	LED_19-217/GHC-YR152/3T_EVE	19-217/YSC-AP1Q2/3T		1								
PWR	Chip LED, Red, 5 V, 25 mA, -40 to 85 degC, 2-Pin SMD (0603), RoHS, Tape and Reel	DS3	EVRL-0603-2_V	OMP-2100-03578-1		1								
CW	T-1 3/4 (5 mm) Diffused LED Lamp, 1.9 V, -40 to 100 degC, 2-Pin THD, RoHS, Bulk	DS4	AVAG-HUMP-3301-2	OMP-2000-06411-1		1								
PTT	T-1 3/4 (5 mm) Diffused LED Lamp, 1.9 V, -40 to 100 degC, 2-Pin THD, RoHS, Bulk	DS5	AVAG-HUMP-3301-2	OMP-2000-06411-1		1								
U254-051N-4B4806	USB - Micro B Female USB 2.5 SMD USB Connectors RoHS	J1	CONN_10103594-00011F_AMP	U254-051N-4B4806		1								
CW Key	CONN HEADER VERT 2POS 2.54MM	J2	MOLEX KK 9022272021	0022272021		1							0022272021	
To TS50 Front Panel (GX-8 Female)	8 Position Circular Connector Receptacle, Male Pins Solder	J3	GX-8	GX-8		1								
Mic Input (GX-8 Male)	8 Position Circular Connector Receptacle, Male Pins Solder	J4	GX-8	GX-8		1								
To CN6	Header, 6-Pin	P1	HDR1X6	Header 6		1								
Line In	3.5mm Mono	P2	HDR1X2	Header 2		1								
Line Out	3.5mm Mono	P3	HDR1X2	Header 2		1								
00	RES SMD 0 OHM JUMPER 1/10W 0603, 0MP	R1, R2	FP-RC0603-MFG	OMP-2000-06925-2		2		00	00	RC0603FR-070RL				
2kR		R3, R4, R5	RES01608X55X25NLT0 T15	OMP-2000-04259-1		3		2kR		RC0603JR-072KL			RC0603JR-072KL	
330 Ohms	RES SMD 330 OHM 1%, 1/10W 0603	R6, R7, R8, R10, R11, R12	RES 0603_1608	AC0603FR-07330RL		6		330 Ohms	330 Ohms	AC0603FR-07330RL				
1 kOhms	RES SMD 1K OHM 1%, 1/10W 0603	R9	RES 0603_1608	AT0603FRE071KL		1		1 kOhms	1 kOhms	AT0603FRE071KL				
RST	SWITCH TACTILE SPST-NO 0.05A 12V	SW1	FP-B3U-1000P-B-MFG	OMP-08834-000005-1		1				B3U-1000P-B				
Voice <-> Digital, CW	SWITCH TOGGLE SPDT SA 120V	SW2	FP-A101SDC004-MFG	OMP-03408-000002-1		1								
SM-LP-3001	TRANSFORMER LINE MATCHING SMD	T1, T2	SM-LP-5001	OMP-07264-000002-1		2								
GND	Test Point, Black, 1-Pin THD, RoHS, Bulk	TP1	KSTN-5001	OMP-2000-05181-1		1								
GND_R	Test Point, Black, 1-Pin THD, RoHS, Bulk	TP2	KSTN-5001	OMP-2000-05181-1		1								
+5V	Test Point, Black, 1-Pin THD, RoHS, Bulk	TP3	KSTN-5001	OMP-2000-05181-1		1								
+5V_R	Test Point, Black, 1-Pin THD, RoHS, Bulk	TP4	KSTN-5001	OMP-2000-05181-1		1								
DIGI	Test Point, Black, 1-Pin THD, RoHS, Bulk	TP5	KSTN-5001	OMP-2000-05181-1		1								
SPK OUT	Test Point, Black, 1-Pin THD, RoHS, Bulk	TP6	KSTN-5001	OMP-2000-05181-1		1								
CH340B	Transceiver USB 2.0 2Mbps SOP-16, 150mil USB ICs RoHS	U1	SOIC-16	CH340B		1								
PTT	IC OPTOISO SKV TRANS W/BASE 6DIP	U2, U3	Vishay_4N35_0	IC_Vishay_4N35_eec		2							4N35	
CAT-Tx	IC OPTOISO SKV TRANS W/BASE 6DIP	U4	Vishay_4N35_0	IC_Vishay_4N35_eec		1							4N35	
CAT-Rx	IC OPTOISO SKV TRANS W/BASE 6DIP	U5	Vishay_4N35_0	IC_Vishay_4N35_eec		1							4N35	
3852A-282-103AL	Diameter Panel Control, 100 KOHM, +/- 10%, 2W, -1 to 125 degC, 3-Pin THD, RoHS, Bulk	VR1	BOUR-3852A-282-103AL-3_V	OMP-2000-05079-1		1		100k						