

Service Manual

PR-D12BT

FM / AM Digital Receiver With Bluetooth Playback

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Specification

FM. ELECTRICAL PERFORMANCE

Model : PR-D12BT		Brand : SANGEAN			Date : 2019/8/6	
Temp : 25° C		R.H : 75%				
Test Item	Condition			Value		Unit
	Input	Output	freq	Nom.	Lim.	
Tuning Range		S/N=6dB	Min	87.5		MHz
			Max	108		
Max. Sensitivity		S/N=6dB	90MHz	12	18	dBu
			98MHz	12	18	
			106MHz	12	18	
Usable Sensitivity		S/N=30dB	90MHz	18	24	dBu
			98MHz	18	24	
			106MHz	18	24	
-3db Limiting	80dBu			18	24	dBu
Min. output				1.5	3	mV
Auto Scan				22	28	dBu
S/N (1mV)		with 20KHz LPF		46	40	dB
Am. Suppression (1mV)				32	26	dB
Current Consumption (Battery:6V & backlight=off) (75KHz dev.)		60dBu	Vol.=max	450	550	mA
			R. O	300	350	mA
			Spk 10mW	200	250	mA
			Ear 0.6125mW	100	130	mA
			Earphone 32 Ohm 1mW	32	26	dB
Stereo separation 1KHz				100	200	Hz
Audio fidelity 75kHz/or 50kHz (-3dB W/pre emphasis)				10K	8K	Hz
Output Power (75KHz dev.)	Speaker 8 Ohm		10%T.H.D.	1	0.8	W
	Earphone 32 Ohm		Volume max	1	3	mW
T. H. D. (75KHz dev.)				1	3	%
Over load capacity			10%T. H.D.	100	90	dBu
Lowest Batt. Volt.	60dBu			4.0	4.3	V
Standby current consumption				300	500	µA
Charge current (Adaptor Input)	Power off, charging			550	±80	mA
Supply Voltage : DC 9 V Batt 6V		R.O : 50mW			Load : 8 Ohm EP : 32Ω	
Modulation : 1KHz Mod./22.5KHz Dev.						
Remark :		Approved by :			Released / Tested by :	

Specification

MW ELECTRICAL PERFORMANCE

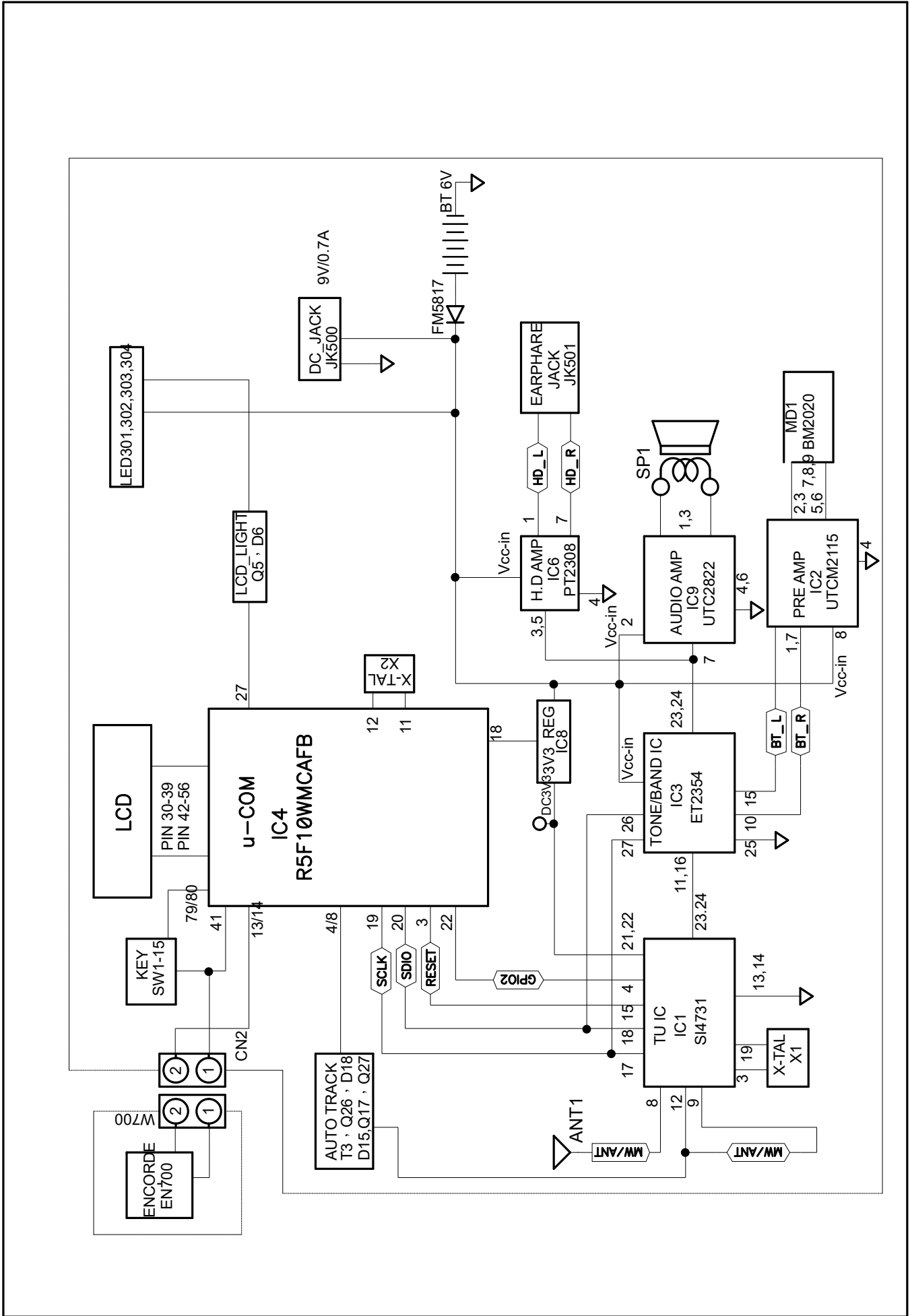
Model : PR-D12BT	Brand : SANGEAN			Date : 2019/8/6		
Temp : 25° C	R.H : 75%					
Test Item	Condition			Value		Unit
	Input	Output	freq	Nom.	Lim.	
Tuning Range			Min	522		KHz
			Max	1710		
Max. Sensitivity		S/N=6dB	603KHz	46	56	dBu/m
			999KHz	42	54	
			1404KHz	42	54	
Usable Sensitivity		S/N=20dB	603KHz	54	60	dBu/m
			999KHz	52	58	
			1404KHz	52	58	
T. H. D.	74dBu/m		999KHz	2	4	%
Lowest Batt. Volt.	74dBu/m			4.0	4.3	V
Auto. Scan. Stop. Sens.				56	62	dBu/m
Freq. Response (-6dB)	74dBu/m			100	200	Hz
				2500	1800	Hz
Output Power 80% Mod.		10%T.H.D.		1	0.8	W
Over load capacity	80%mod.	10%T. H.D.		100	90	dBu/m
A. G. C. F. O. M.	100dBu/m			46	40	dB
S/N Ration	74dBu/m			40	34	dB
Current Consumption (Battery:6V& backlight=off)	74dBu/m	R.O		300	350	mA
Supply Voltage : DC 9 V Batt 6V	R.O : 50mW			Load : 8 Ohm EP : 32Ω		
Modulation : 1KHz/30% Mod						
Remark :	Approved by :			Released / Tested by :		

Specification

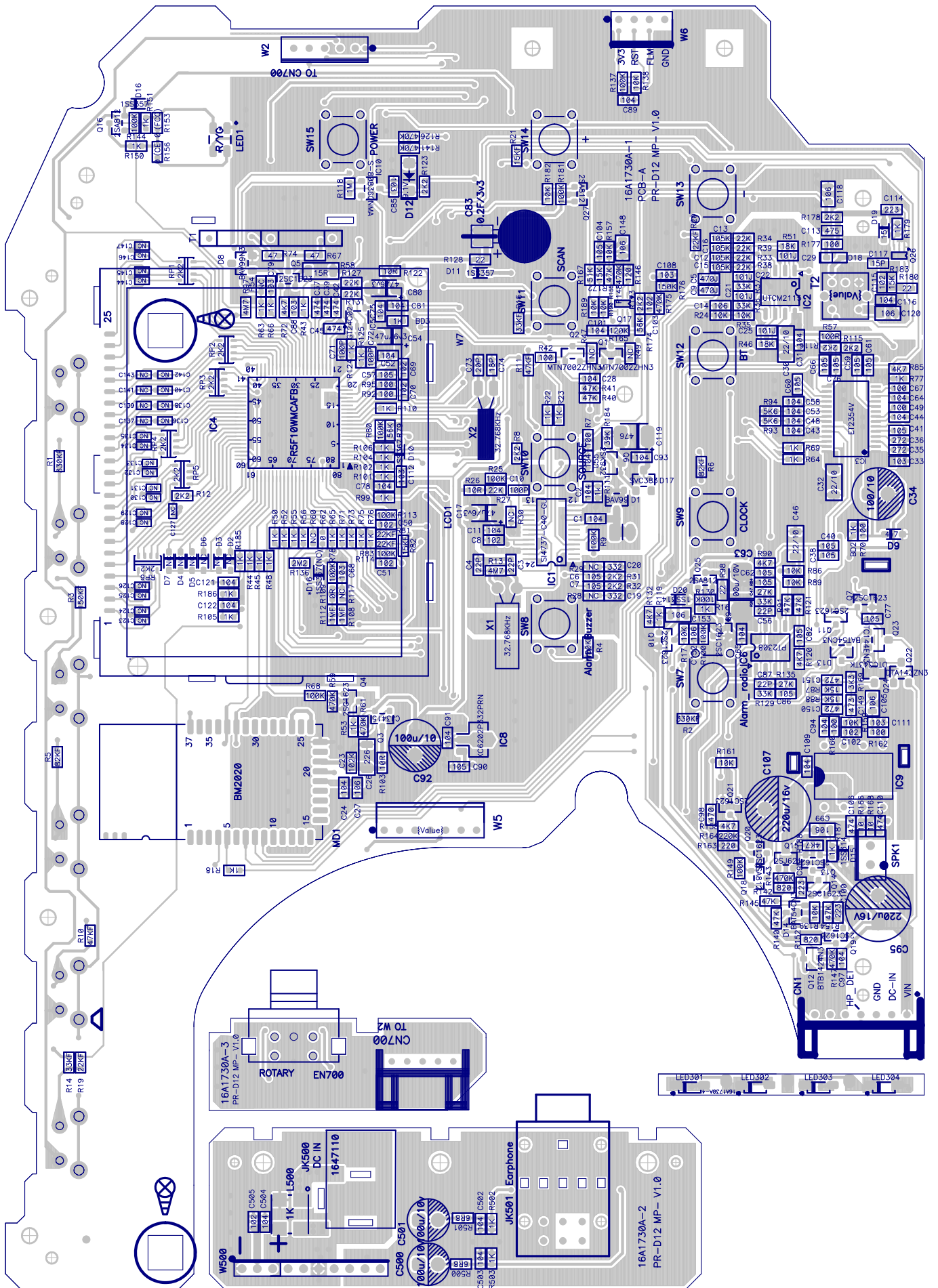
BLUETOOTH ELECTRICAL PERFORMANCE

Model : PR-D12BT		Brand : SANGEAN		Date : 2019/8/6	
Temp : 25° C		R.H : 75%			
Test Item	Condition	Value		Unit	
		Nom.	Lim.		
Transferring distance	Directive distance		>10	m	
access time for link			<15	Sec	
Playing Frequency Response	MP3 1KHz 0dB 128kbps@1W	100Hz	4	+3	dB
		10KHz	5	+3	dB
S/N Ratio	MP3 1KHz 0dB 128kbps @R.O	52	46	dB	
THD Of Playing	MP3 1KHz 0dB 128kbps @ R.O		<3	%	
Output power	MP3 1kHz -10dB 128kbps T.H.D. = 10%	1	>0.8	W	
Current Consumption (Battery:6V & backlight=off)	R. O	300	350	mA	
Supply Voltage : DC 9 V Batt 6V	R.O : 50mW	Load : 8 Ohm EP : 32Ω			
Modulation : With 20KHz LPF					
Remark :	Approved by :	Released / Tested by :			

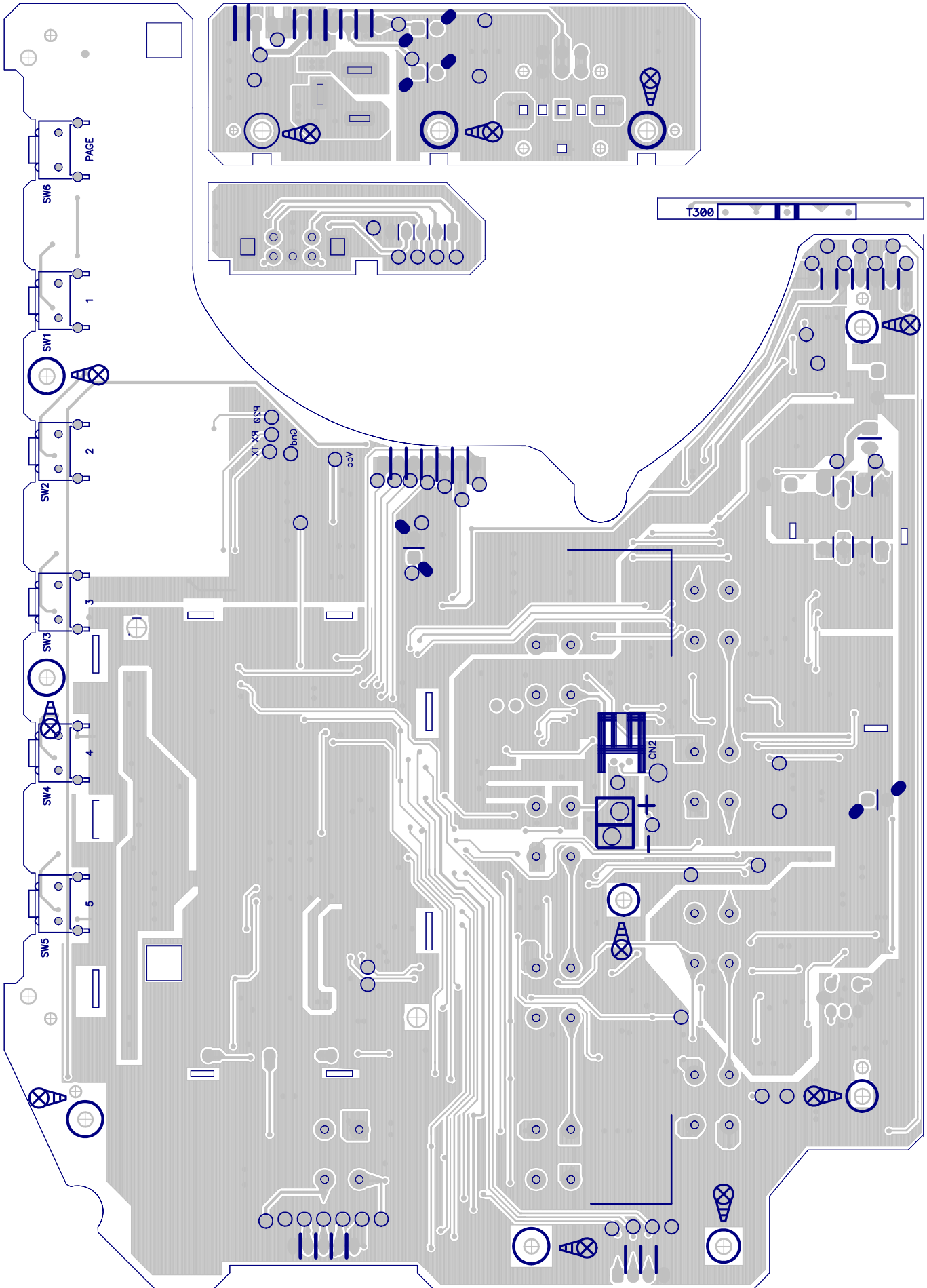
BLOCK DIAGRAM



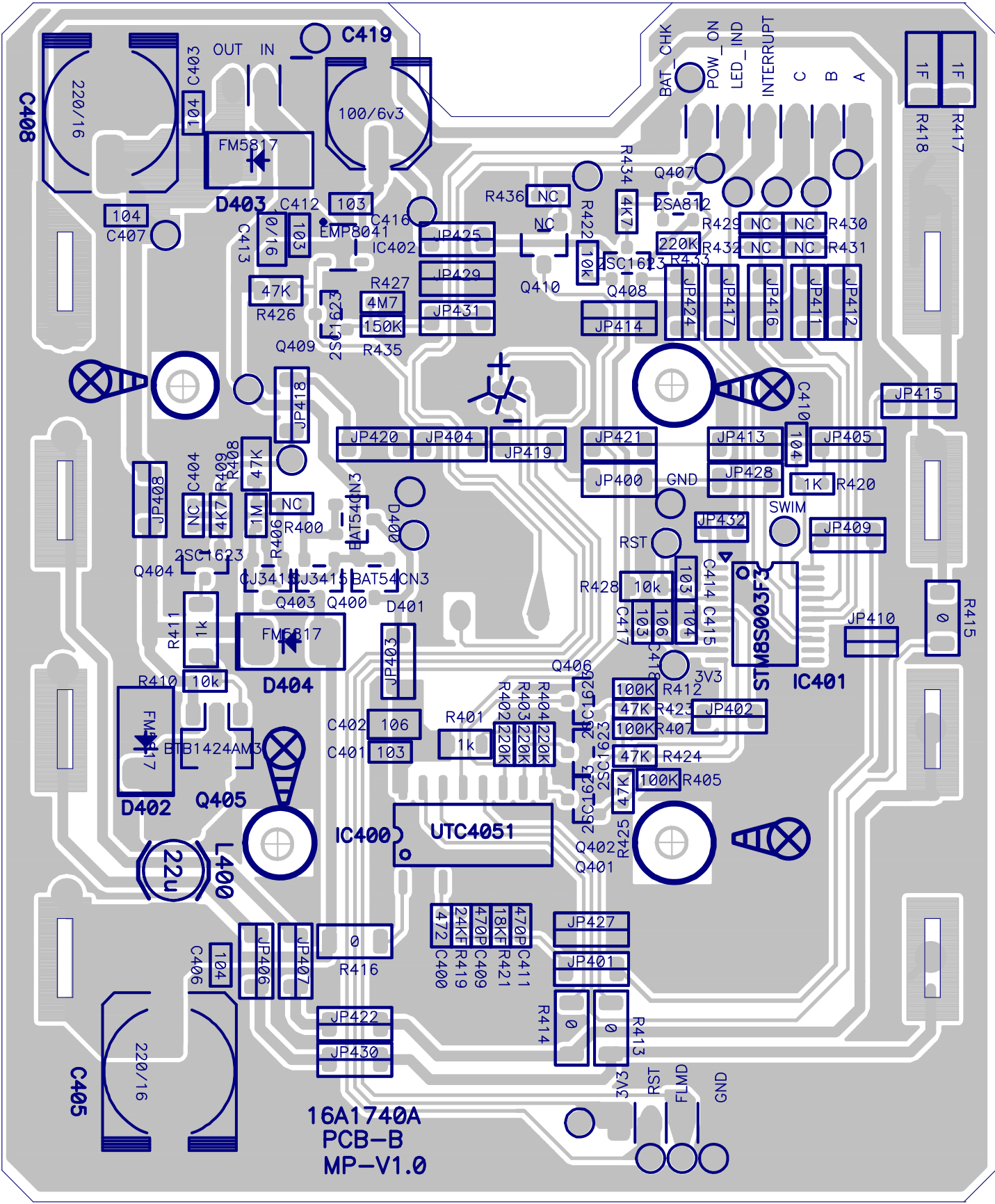
PCB-A TOP VIEW



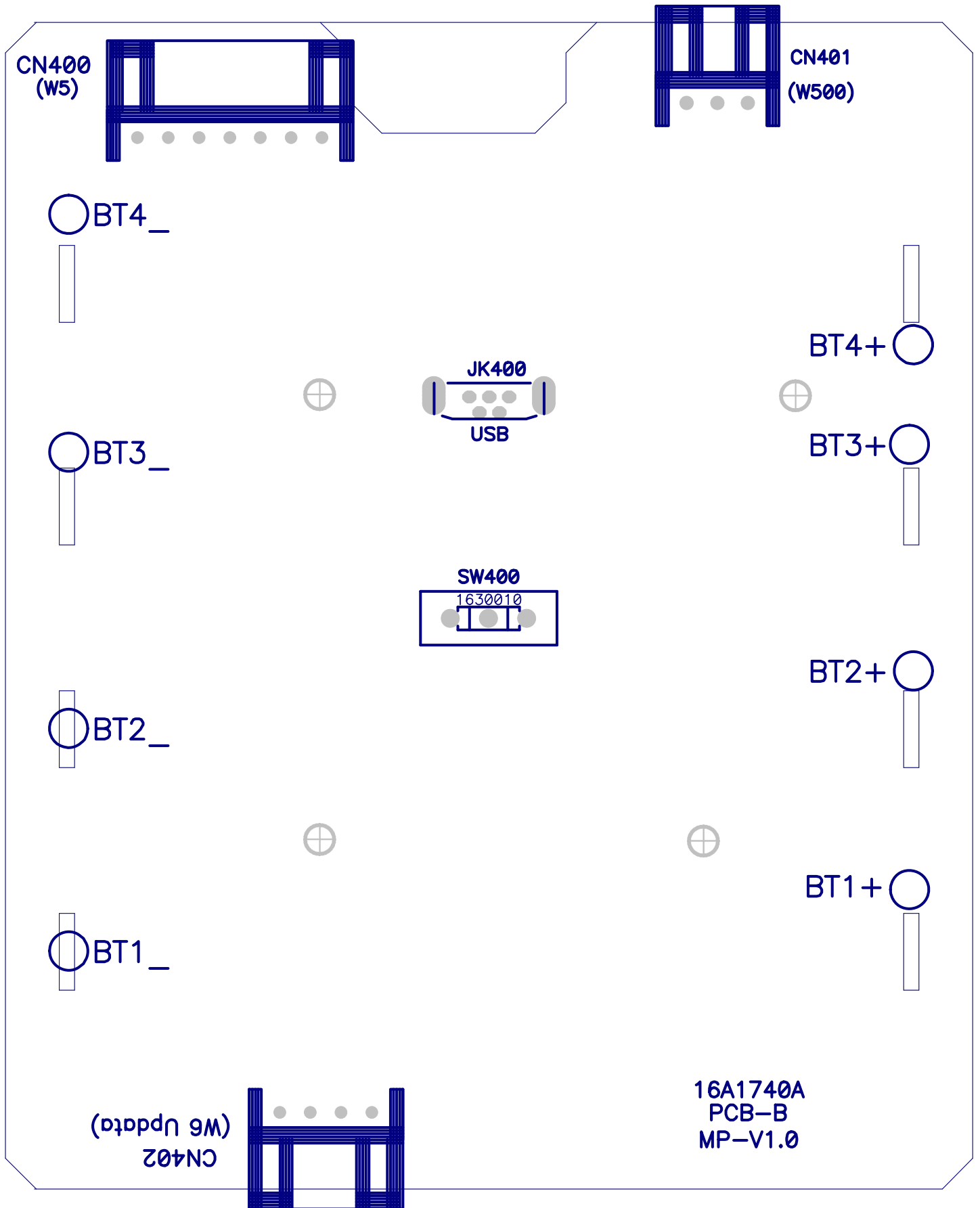
PCB-A BOTTOM VIEW



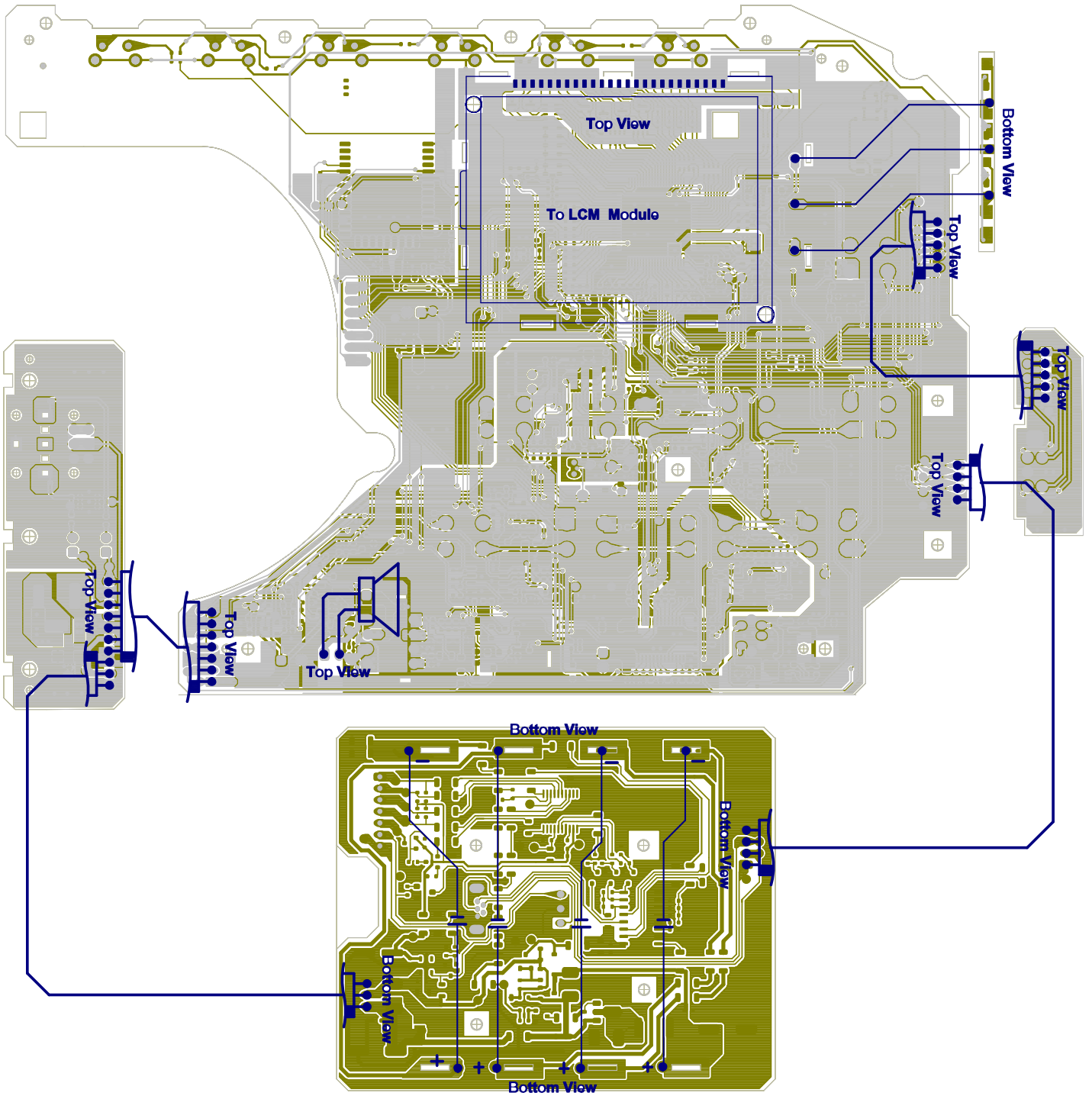
PCB-B TOP VIEW



PCB-B BOTTOM VIEW

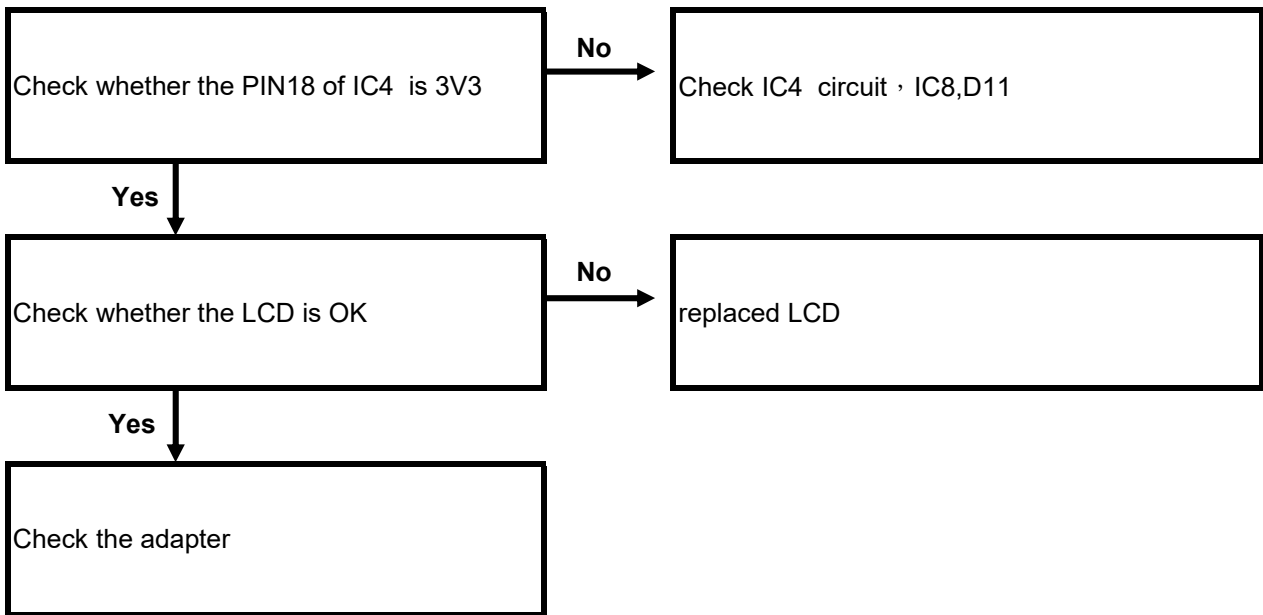


WIRING DIAGRAM

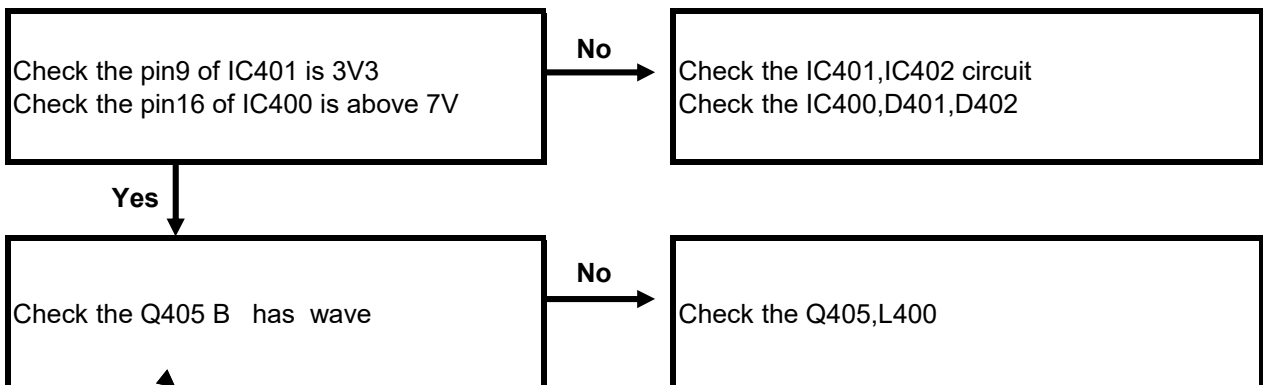


TROUBLESHOOTING FLOW CHART

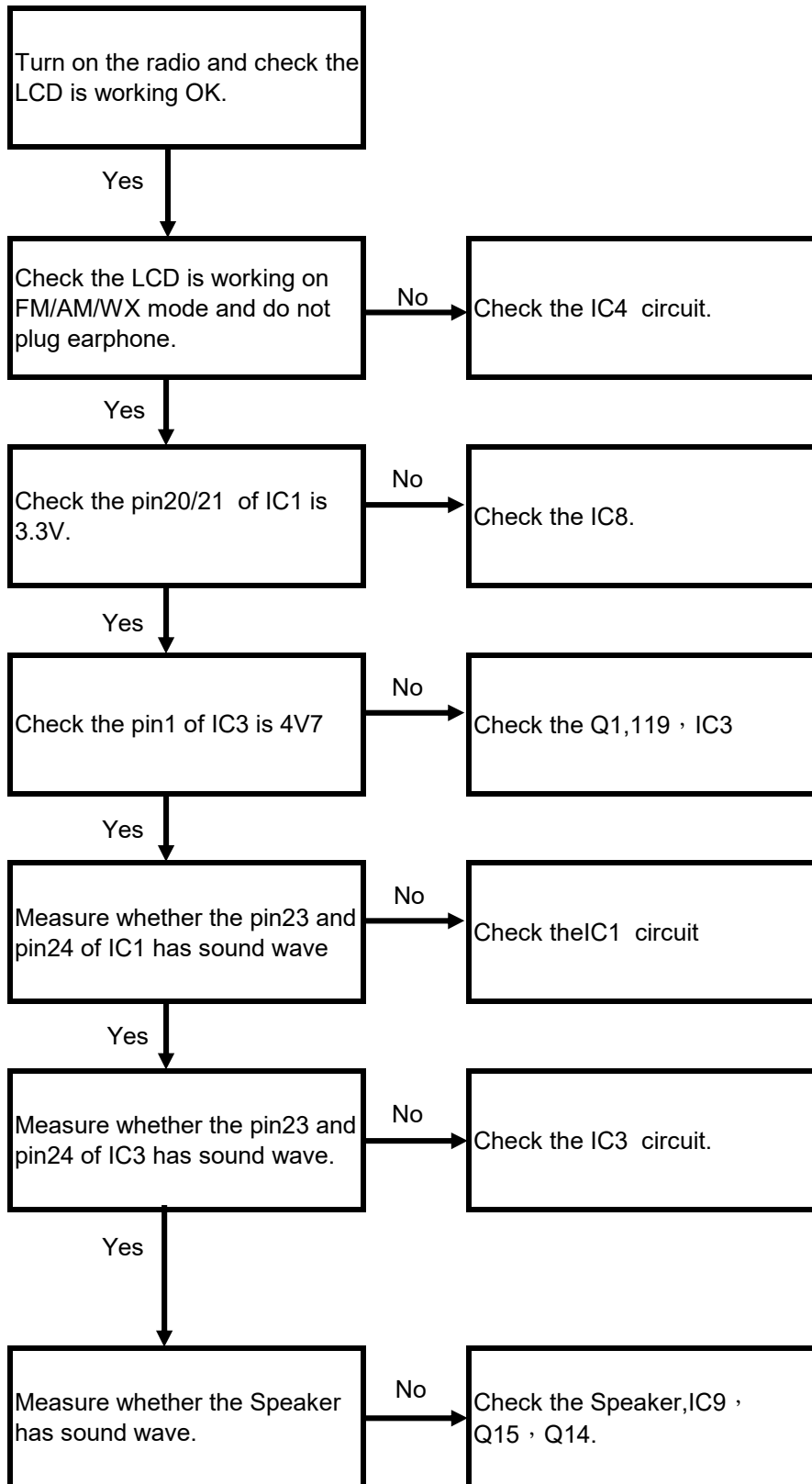
Power can not be turn on



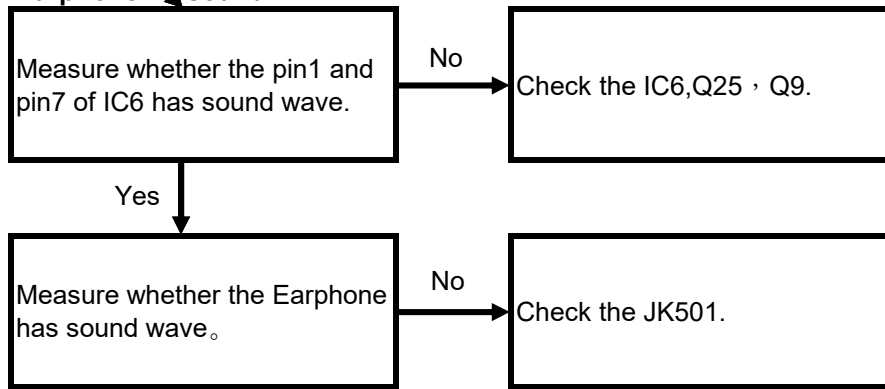
BATTERY no Charge



Speaker no sound



Earphone no sound



ELECTRICAL PARTS LIST

000d8100C

PR-D12BT

Date : 2019/06/07

PART NO.	DESCRIPTION	Q'TY	REMARK
1001490	CH LSI R5F10WMCAFB LQFP-80	1	IC4,
1001810	CH LSI STM8S003F3P6 TSSOP-20	1	IC401,
1013360	IC UTC TDA2822-DIP8	1	IC9,
1013890	CH IC PT2308 8PIN SO-P	1	IC6,
1014880	CH IC 6202P332PRN	1	IC8,
1016612	CH IC M2115G-S08-R SOP-8	1	IC2,
1016932	CH IC Si4731-D60-GU/R SSOP24	1	IC1,
1017310	CH IC S-80836CNMA-B8VT1G	1	IC10,
1017560	CH IC EMP8041-33VF05NRR	1	IC402,
1017841	CH IC 4051G-S16-R SOP-16	1	IC400,
1018380	CH IC ET2354V TSSOP28	1	IC3,
1019270	CH IC GT24C02-2TLI-TR TSOT23-5	1	IC5,
1020530	CH TR 2SA812-M6 SOT-23	5	Q16,Q18,Q27,Q25,Q407,
1021110	CH TR BTB1424N3-R SOT23	1	Q12,
1021140	CH TR BTB1424AM3-R SOT-89	1	Q405,
1022131T	CH TR 2SC DTC343TKT146-T	3	Q24,Q7,Q11,
1022560	CH TR 2SC1623-L6 SOT-23	8	Q4,Q5,Q9,Q14,Q19,Q20,Q21,Q10,
1022561	CH TR 2SC1623-L7 SOT-23	6	Q401,Q402,Q404,Q406,Q408,Q409,
1026001	CH TR HN2C01FU-GR hFE=200	2	Q17,Q26,
1026140	CH TR DTC144EN3 SO-T23	1	Q23,
1026143	CH TR DTC115EN3 SO-T23	1	Q13,
1026151	CH TR DTA143ZN3 SOT23	1	Q22,
1030170	CH FET 2SK932-23-TB-E	1	Q6,
1030381	CH FET CJ3415 SOT-23	4	Q15,Q3,Q400,Q403,
1030510	CH FET MTN7002ZHN3 SOT-23	2	Q1,Q2,
1041221	CH SCHOTTKY 1SS367 SOD-323	1	D10,
1041403	CH SCHOTTKY SS12 DO-214AC	2	D402,D403,
1042360	CH DIODE 1N4148WS-FL SOD-323FL	2	D15,D20,
1043141	CH VARICAP SVC383 SOT-23-3L	1	D17,
1045360	CH ZENER UDZSTE-17 15B	1	D19,
104547E	CH ZENER BZV55B9V1	1	D12,
1045583	CH ZENER UDZV 4.7B SOD-323	1	D9,
1046182	CH DIODE BAV99N3	2	D1,D8,
1046240	CH DIODE CDSU4148-(0603)	1	D18,
1046252	CH SCHOTTKY 1SS357 SOD-323	3	D2,D11,D16,
1046300	CH SCHOTTKY BAT54CN3 SOT-23	4	D13,D14,D400,D401,
1062211	CH LED YEL SS0335YCN-001	4	LED301,LED302,LED303,LED304,
1062960	CH LED RED/BLUE B3528RBSCN-402	1	LED1,
1112070	BAR ANT & COIL 2070 AM	1	AM_ANT1,
1124401	ADJ. COIL 4401	1	T2,
113223M081F	CH WOUND 22uHM-4235	1	L400,
1150311	CH BEAD 1K-1608	2	BD2,BD3,
1150660	CH Common Mode 1K 2A CM0502F-102	1	L500,

ELECTRICAL PARTS LIST

000d8100C

PR-D12BT

Date : 2019/06/07

PART NO.	DESCRIPTION	Q'TY	REMARK
1601470	LCD GHC4978SB01 PR-D12BT	1	LCD1,
1622341	SPK 3" 8Ω 3W	1	
1630680	TACT SW 100±50gf 7mm	9	SW7,SW8,SW9,SW10,SW11,SW12, SW13,SW14,SW15,
1631012	TACT SW 100±50gf 3.85mm	6	SW1,SW2,SW3,SW4,SW5,SW6,
1631351	SLIDE SW 1P2C	1	SW400,
1640230	JACK HP MSJ-035-08D PBT	1	JK501,
1647110	JACK DC HTJ-020-04AZ	1	JK500,
1649730	JACK USB 5P B-TYPE	1	JK400,
1650150	X'TAL 32.768KHZ±10Ppm 2×6	1	X1,
1650910	X'TAL 32.768K±20Ppm 2×6	1	X2,
16A1730A	PCB A PR-D12BT 1.6T/2	1	PCB1,
16A1740A	PCB B PR-D12BT 1T/1	1	
1701H2002H063	HOUSING 2x2P-H	1	CN2,
1701H2003H063	HOUSING 2x3P-H	1	CN401,
1701H2004H063	HOUSING 2x4P-H	1	CN402,
1701H2005H063	HOUSING 2x5P-H	1	CN700,
1701H2007H063	HOUSING 2x7P-H	2	CN1,CN400,
170310102010	CNT/W-A 100(SPK+2P)	1	SPK1,
17031114A030	CNT/W-A 110(10P+10P)P=2	1	W500,
170312147030	CNT/W-A 120(7P+7P)P=2	1	W5,
170314142050	CNT/W-A 140(2+1P) BLK	1	FM_ANT1,
170360045040	CNT/W-A 60(2+5P)	1	W2,
170390044010	CNT/W-A 90(4P+4P)P=2	1	W6,
1730470	EN/SW RE111F-21B1-10F-20P	1	EN700,
17S1T2003V033	TIP 2x3P-V	1	T1,
1908250	BT/M BM2020 PR-D12BT	1	MD1,
1A0510115M20	W-A/1 115(3+6) BLK	1	W7,
1Sd80100	PR-D12BT	1	
3A8D097132B00	ADA/SW2 9V/0.7A V CE-B	1	
44107257T0H0	EL 107M 10V 5x7-T 105	2	C500,C501,
44107265T0H0	EL 107M 10V 6.3x5-T 105	2	C34,C92,
4922410	CH SUPERCAP DMS3R3224R	1	C83,
4A10733	CH EL 107M 16V 6.3×5.3	3	C408,C419,C405,
4B107K2215	CH TA 107K 10V-6032	1	C63,
4B476K1015	CH TA 476K 6.3V-3216	3	C17,C54,C80,
4B476K2115	CH TA 476K 10V-3528	1	C119,
4L227387T0H0	EL 227M 16V 8x7-T 105	2	C95,C107,
5410001	CH CC 100J 50V NPO-C	2	C73,C74,
5410101	CH CC 101J 50V NPO-C	9	C10,C21,C22,C25,C29,C71,C72,C49,C67,
5410201	CH CC 102J 50V NPO-C	10	C102,C103,C115,C23,C50,C51, C69,C70,C8,C505,
5410361	CH CC 103K 50V X7R-C	13	C33,C68,C85,C108,C111,C79,C88,C112,

ELECTRICAL PARTS LIST

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PART NO.	DESCRIPTION	Q'TY	REMARK
5410361	CH CC 103K 50V X7R-C		C401,C412,C414,C416,C417,
5410461	CH CC 104K 50V X7R-C	37	C1,C11,C24,C28,C31,C43,C44, C78,C48,C81,C2,C89,C52,C91, C53,C97,C58,C109,C64,C116,C65, C121,C122,C75,C502,C503,C504, C55,C93,C101,C104,C94, C403,C406,C407,C410,C415,
5410551	CH CC 105K 16V X5R-C	20	C6,C7,C12,C13,C15,C16,C38,C40, C41,C47,C57,C59,C60,C61,C62, C66,C76,C82,C86,C90,
5410688	CH CC 106M 6.3V X5R-C	5	C14,C77,C27,C152,C418,
5415001	CH CC 150J 50V NPO-C	1	C117,
5422001	CH CC 220J 50V NPO-C	4	C3,C4,C56,C87,
5422361	CH CC 223K 50V X7R-C	3	C96,C100,C114,
5427261	CH CC 272K 50V X7R-C	2	C35,C36,
5433261	CH CC 332K 50V X7R-C	2	C19,C20,
5447101	CH CC 471J 50V NPO-C	5	C5,C9,C98,C409,C411,
5447261	CH CC 472K 50V X7R-C	3	C150,C151,C400,
5447351	CH CC 473K 16V X5R-C	1	C149,
5447466	CH CC 474K 16V X7R-C	4	C37,C39,C42,C45,
5447467	CH CC 474K 25V X7R-C	2	C106,C110,
5447589	CH CC 475K 6.3V X5R-C	1	C113,
5510651	CH CC 106K 16V X5R-A	8	C99,C118,C148,C120,C105,C153,C402,C413,
5622673	CH CC 226Z 10V Y5V-B	4	C26,C30,C32,C46,
61301000	CH RD 0J-0603	3	R109,R156,R62,
61301100	CH RD 10J-0603	5	R26,R122,R166,R168,R103,
61301101	CH RD 100J-0603	9	R7,R42,R57,R70,R92,R95,R177,R160,R162,
61301102	CH RD 1KJ-0603	43	R106,R18,R22,R23,R44,R45,R48, R50,R52,R53,R56,R63,R64,R65, R66,R69,R71,R73,R75,R76,R99, R101,R104,R105,R110,R111,R124, R125,R150,R151,R179,R185,R186, R187,R502,R503,R43,R77,R102, R16,R55,R119,R420,
61301103	CH RD 10KJ-0603	15	R24,R35,R159,R189,R190,R86,R17,R422, R89,R138,R139,R157,R161,R182,R410,
61301104	CH RD 100KJ-0603	16	R9,R25,R68,R78,R80,R113,R114, R137,R144,R149,R181,R130,R100, R407,R412,R405,
61301105	CH RD 1MJ-0603	5	R108,R112,R118,R406,R427,
61301121	CH RD 120J-0603	1	R146,
61301124	CH RD 120KJ-0603	1	R165,
61301153	CH RD 15KJ-0603	1	R172,

ELECTRICAL PARTS LIST

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PR-D12BT

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PART NO.	DESCRIPTION	Q'TY	REMARK
61301154	CH RD 150KJ-0603	1	R435,
61301183	CH RD 18KJ-0603	2	R46,R51,
61301220	CH RD 22J-0603	3	R128,R180,R98,
61301221	CH RD 220J-0603	1	R163,
61301222	CH RD 2K2J-0603	9	R8,R31,R32,R115,R116,R123,R173,R178,R12,
61301223	CH RD 22KJ-0603	7	R27,R33,R34,R38,R39,R127,R131,
61301224	CH RD 220KJ-0603	5	R164,R402,R403,R404,R433,
61301225	CH RD 2M2J-0603	1	R136,
61301273	CH RD 27KJ-0603	2	R84,R135,
61301332	CH RD 3K3J-0603	1	R169,
61301333	CH RD 33KJ-0603	4	R36,R37,R96,R129,
61301393	CH RD 39KJ-0603	1	R184,
61301470	CH RD 47J-0603	2	R67,R74,
61301472	CH RD 4K7J-0603	8	R90,R120,R158,R188,R72,R85,R132,R409,
61301473	CH RD 47KJ-0603	12	R40,R41,R91,R121,R140,R145, R154,R155,R423,R424,R425,R434,
61301474	CH RD 470KJ-0603	8	R59,R61,R126,R141,R143,R147,R148,R175,
61301475	CH RD 4M7J-0603	2	R13,R97,
61301513	CH RD 51KJ-0603	1	R167,
61301562	CH RD 5K6J-0603	2	R93,R94,
61301563	CH RD 56KJ-0603	2	R79,R174,
613016R8	CH RD 6R8J-0603	2	R500,R501,
61301821	CH RD 820J-0603	2	R142,R152,
61321153	CH RD 15KF-0603	5	R21,R82,R183,R87,R88,
61321154	CH RD 150KF-0603	3	R3,R4,R176,
61321183	CH RD 18KF-0603	1	R421,
61321223	CH RD 22KF-0603	4	R19,R20,R81,R83,
61321243	CH RD 24KF-0603	1	R419,
61321333	CH RD 33KF-0603	2	R14,R15,
61321334	CH RD 330KF-0603	2	R1,R2,
61321473	CH RD 47KF-0603	2	R10,R11,
61321823	CH RD 82KF-0603	2	R5,R6,
61501000	CH RD 0J-1206	33	JP400,JP401,JP402,JP403,JP404, JP405,JP406,JP407,JP408,JP409, JP411,JP412,JP413,JP414,JP415, JP416,JP417,JP418,JP419,JP420, JP421,JP422,JP424,JP425,JP427, JP428,JP429,JP430,JP431,R413, R414,R415,R416,
61501102	CH RD 1KJ-1206	1	R411,
61501150	CH RD 15J-1206	1	R58,
615211R0	CH RD 1RF-1206	2	R417,R418,
61801000	CH RD 0J-0805	2	JP410,JP432,
61801102	CH RD 1KJ-0805	1	R401,
61801103	CH RD 10KJ-0805	1	R428,
61801473	CH RD 47KJ-0805	2	R408,R426,
65304222	CH RP 2K2Jx4-0603	6	RP2,RP1,RP3,RP4,RP5,RP6,

MECHANICAL PARTS LIST

000d8100C

PR-D12BT

Date:2019/5/20

Ref no	PART NO.	DESCRIPTION	Q'TY	DWG NO.	REMARK
1	2000cT00100	TOP KEY HOLDER	1	A3-cT-05	
2	2000cT00200	RUBBER KEY HOLDER	1	A3-cT-07	
3	2100b600700	BATTERY CONTACT ASS'Y-	4	A4-b6-31	REAR CABINETx4
4	2100cT00100	ROD ANT LUG	1	A4-cT-16	
5	2000d800300	LCD LENS HOLOER	1	A4-d8-03	
6	2100J900800	ROTARY KNOB RING φ8.7	1	A4-ATR1-44	REVOLVE KNOB
7	2100YV00300	BATTERY CONTACT ASS'Y+	4	A4-YV-05	REAR CABINETx4
8	2200d800110	HEMELON A (黑色)	1	A4-d8-10	FRONT CABINET
9	2200cT00500	HEMELON B(BLACK)	1	A4-cT-25	TOP KEY ASS'Y
10	2200cT00600	HEMELON	2	A4-cT-26	BATTERY COVERx2
11	2100d800100	LCD HOLDER	1	A4-d8-04	
12	2200L400200	HEMELON	2	A4-523-40	REAR CABINETx2
13	2300cT00200	TAPE	1	A4-cT-19	JACK PANEL
14	2100d800200	COPPER FOIL	1	A4-d8-07	PCB A
15	2300d800400	EVA 54x1.5x0.5	2	A4-d8-09	LCD HOLDERx2
16	2300d800300	EVA 39x1.5x0.5	2	A4-d8-08	LCD HOLDERx2
17	2500cT00010	SPEAKER WASHER	3	KY WS10-4.3-4	
18	2000d800200	LCD LENS	1	A4-d8-02	
19	29S00208002	SCREW JMP 2.6x8(NI)	1		ROD ANT
20	29S09990034	SCREW PTPW 2x6(NI)	3	A4-TQ-07	SPKx3
21	29S09990045	SCREW PTPW 2.6x6(NI)	2	A4-XT-45	SPK FRAMEx2
22	29S10110002	SCREW PTP 2x10(NI)	2		REAR FRAMEx2
23	29S10312002	SCREW PTP 3x12(NI)	5		REAR CABINETx5
24	29S15105002	SCREW PTPW 2x5(NI)	7		TOP KEY HOLDERx3/BATTERY PCBx4
25	29S15108002	SCREW PTPW 2x8(NI)	11		PCB Ax8/JACK PCBx3
26	3010cT1000020	FRONT CABINET (BLK)	1	A2-cT-01	
27	3030cT0000050	REAR CABINET(BLK)	1	A2-cT-10	
28	3050cD0000010	DISPLAY WINDOW(TRN)	1	A4-cD-05	
29	3070cT0000040	FRONT FRAME(BLK)	1	A2-cT-02	
30	3071cT0000040	REAR FRAME(BLK)	1	A2-cT-11	
31	3072cT0000010	SPEAKER FRAME(BLK)	1	A3-cT-03	
32	3080cT0000060	JACK PANEL(BLK)	1	A4-cT-09	
33	3100cT00A0060	RUBBER KEY ASS'Y(BLK)	1	A3-cT-06	
34	3101cT0000040	TOP KEY ASS'Y (BLK)	1	A3-cT-04	
35	3102cT0000040	REVOLVE KNOB(BLK)	1	A4-cT-08	
36	3120cT0000040	BATTERY COVER(BLK)	1	A3-cT-12	
37	3121cT0000020	BATTERY CASE COVER(BLK)	1	A4-cT-14	
38	3230cT0000020	SPEAKER GRILL(BLK)	1	A3-cT-15	
39	3240cT0000040	FOOT RUBBER(BLK)	2	A4-cT-13	
40	3270M3000001A	ROD ANT	1	A1-RD15-12	
41	3291aJ0000010	LED LENS	1	A4-aJ-09	
42	2000Q5A0400	BAR ANT HOLDER L	1	A4-Q5-34	
43	2000Q5A0300	BAR ANT HOLDER R	1	A4-Q5-33	
44	2300d800100	LCD CONDUCT RUBBER	1	A4-d8-05	
45	2300d800200	LCD SYNTHETIC PAPER	1	A4-d8-06	
46	22005600000	P.C.B. HEMELON	4	A4-066-1313	WIREx3/LCD HOLDERx1
47	2100d800300	HEAT SINK	1	A4-d8-14	PCB A
48	2300d800500	SPONGE (65X25X3)	1	A4-d8-11	CABLE
49	2300d800600	SPONGE (90X30X3)	1	A4-d8-12	CABLE

MECHANICAL PARTS LIST

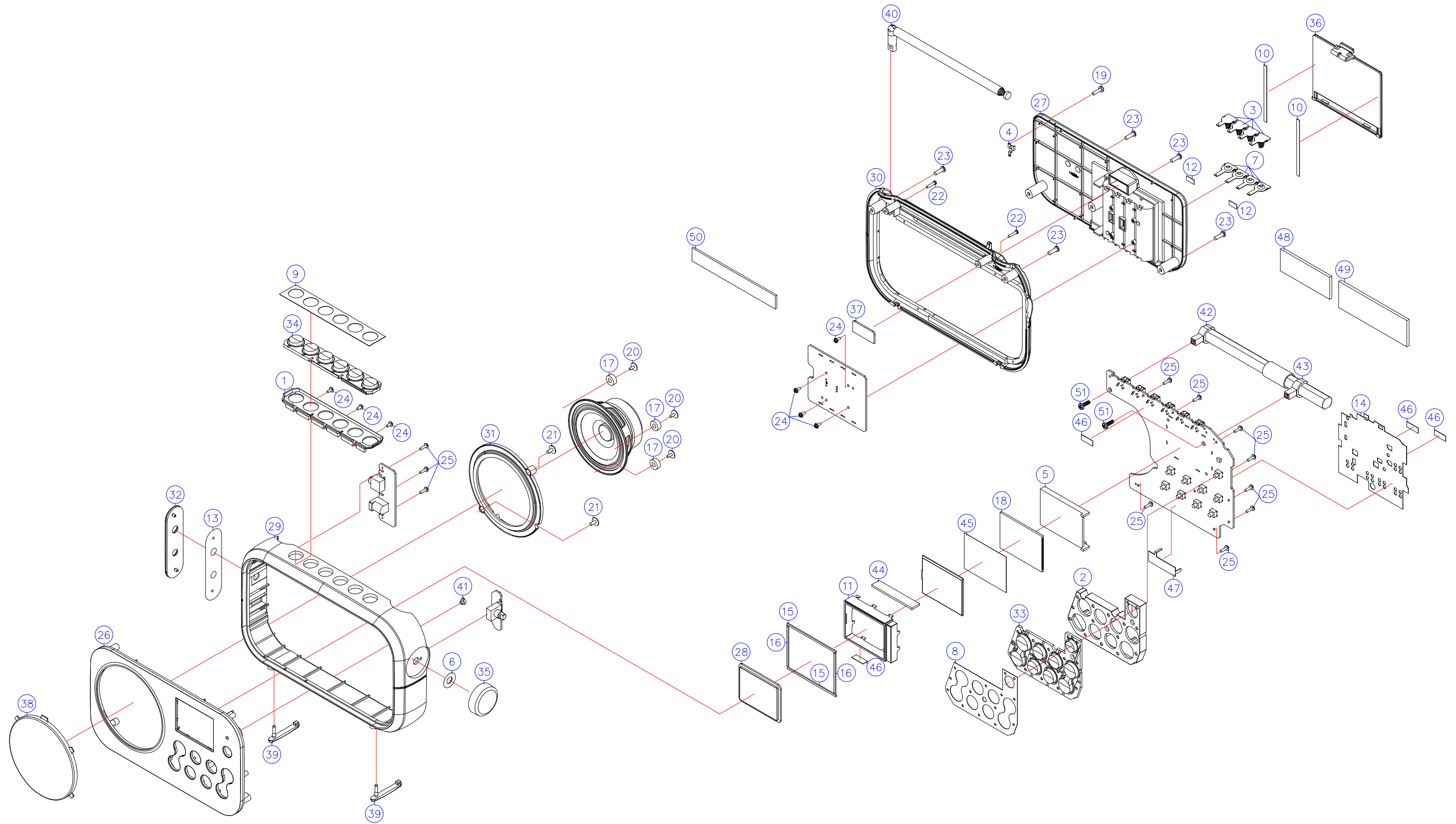
000d8100C

PR-D12BT

Date:2019/5/20

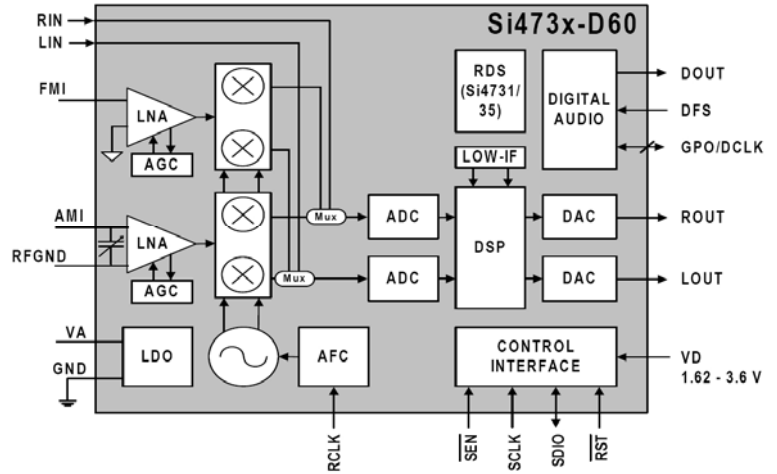
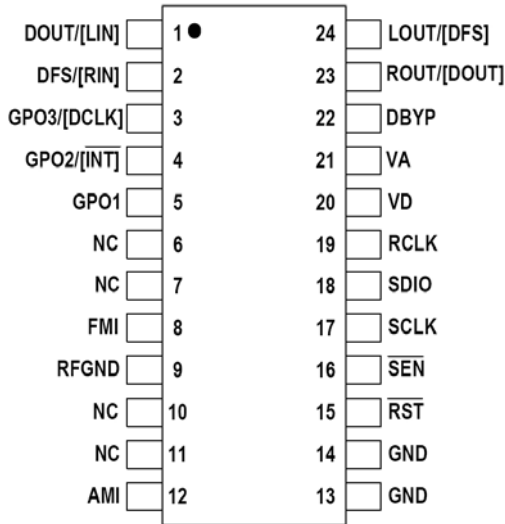
Ref no	PART NO.	DESCRIPTION	Q'TY	DWG NO.	REMARK
50	2300d800700	SPONGE (110X15X2)	1	A4-d8-13	WIRE
51	29S16310001	SCREW PTB 3×10(ZK)	2		PCB A&BAR ANT HOLDERx2

EXPLODED VIEWS

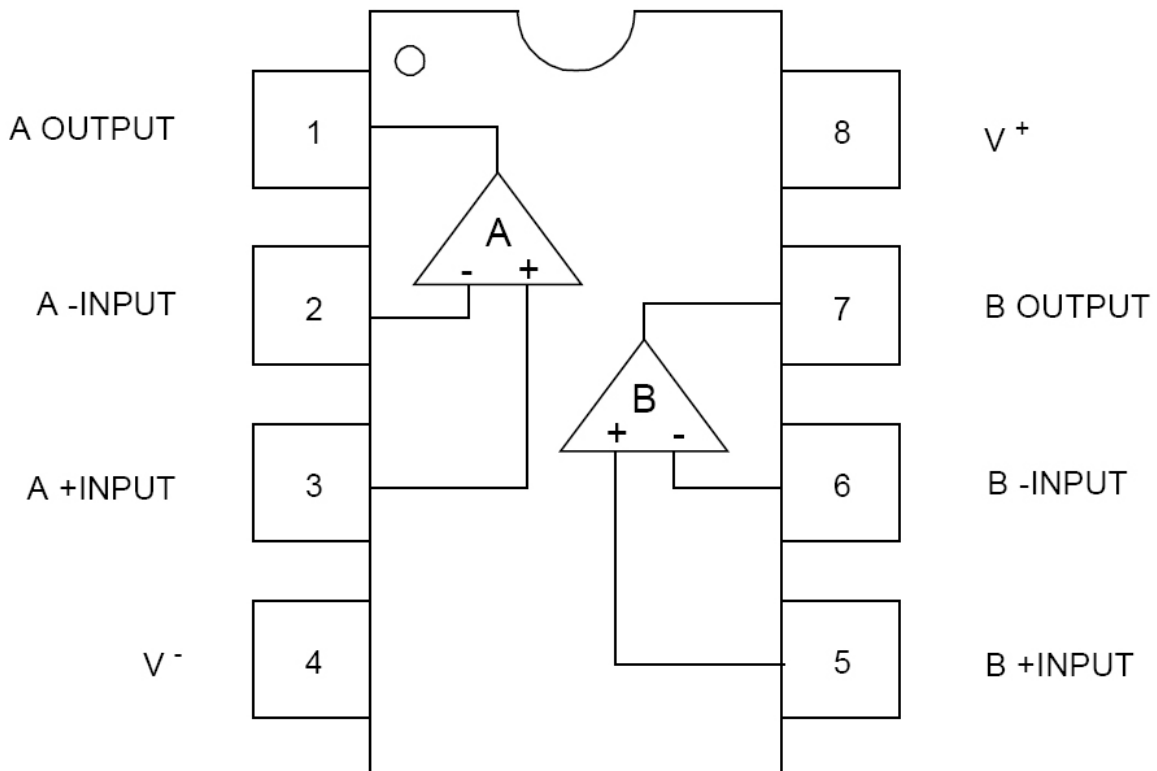


IC CIRCUIT BLOCK DIAGRAM

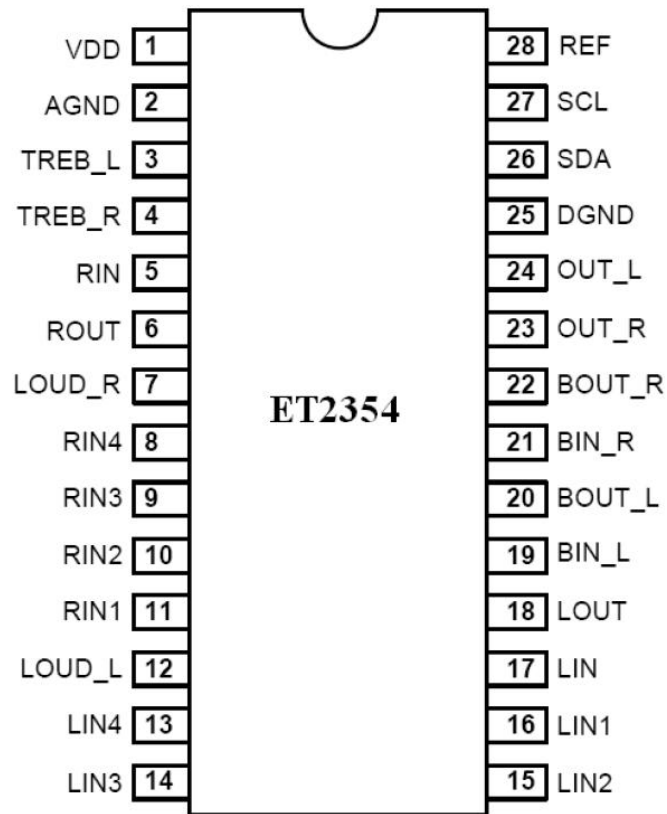
1. IC— Si4731-D60-GU/R



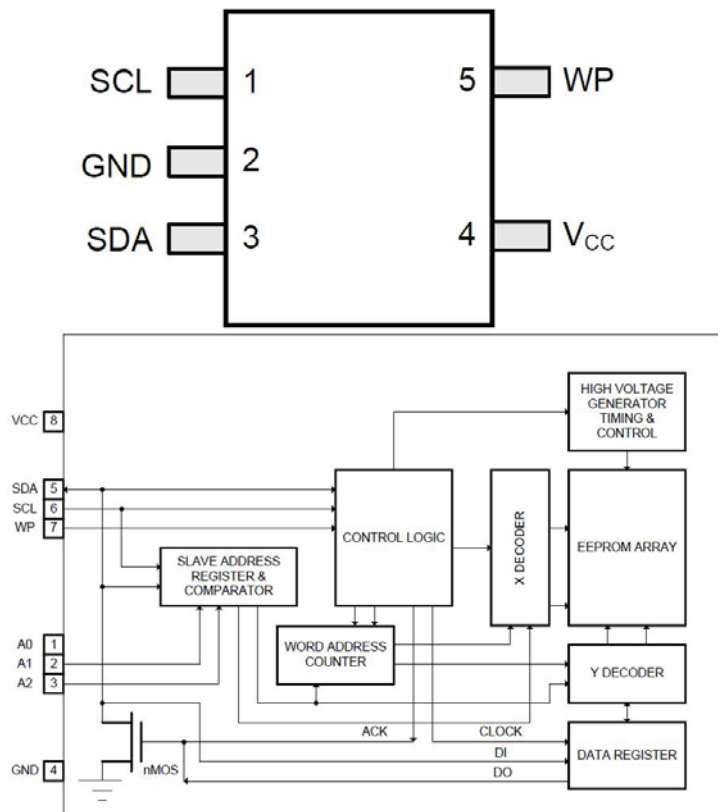
2. IC2 — M2115G-S08-R



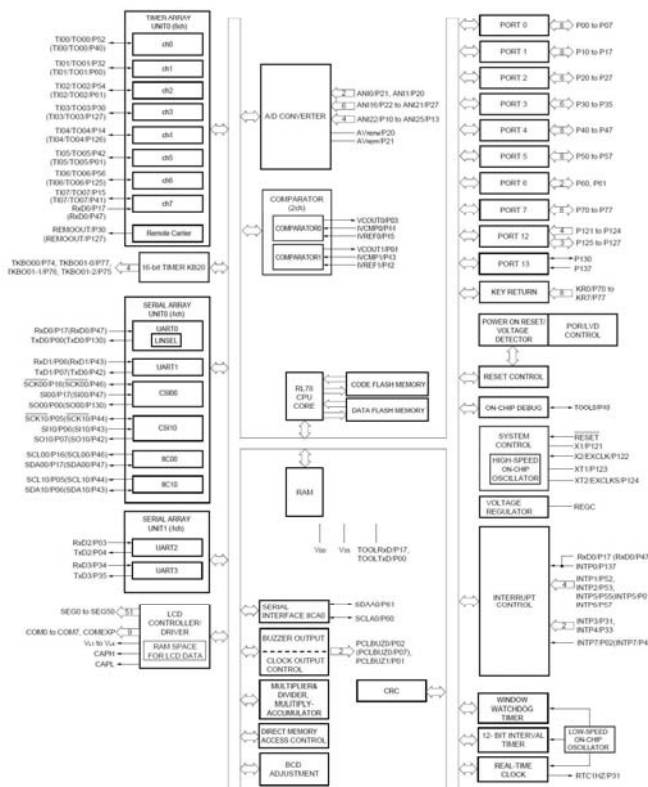
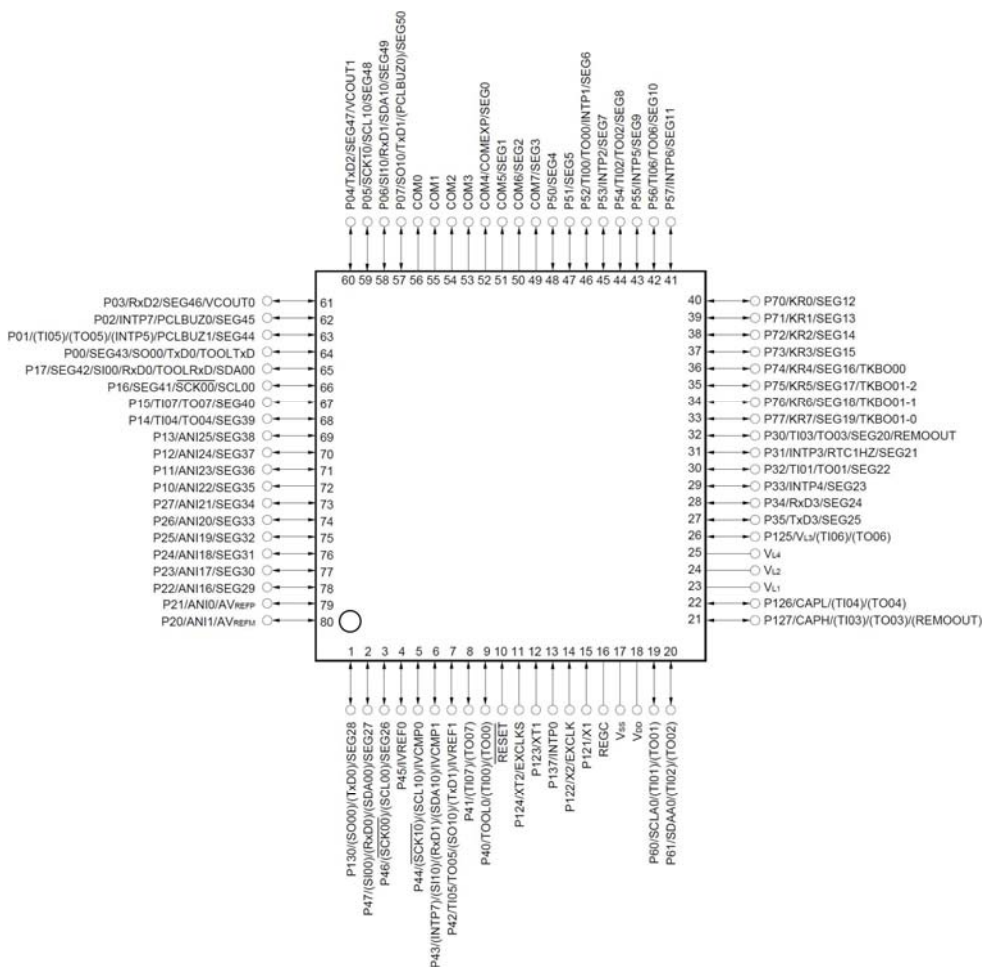
3. IC3 — ET2354V



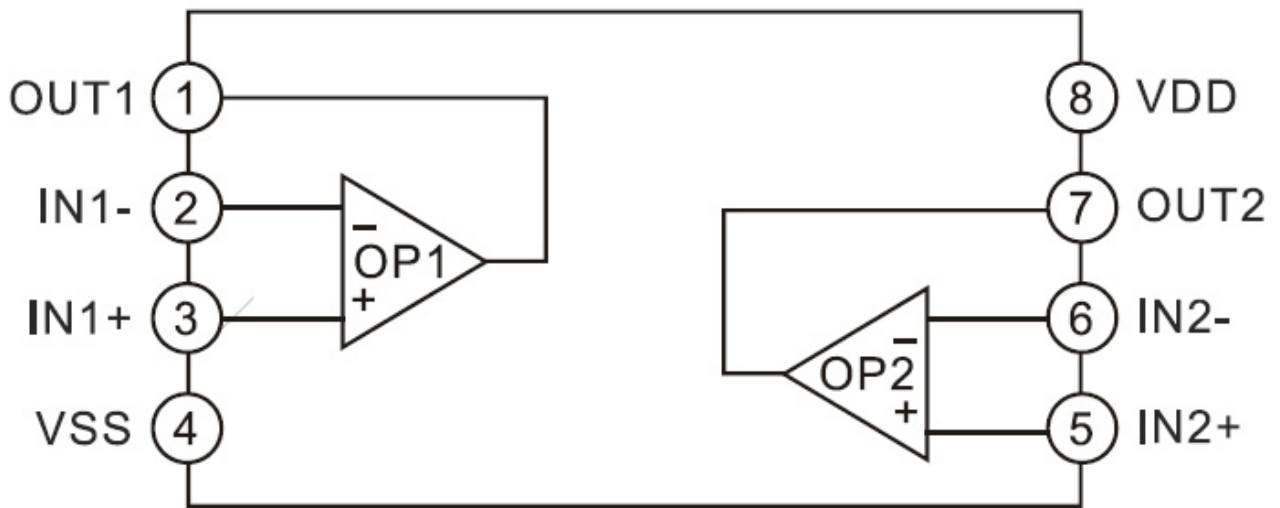
4. IC5 — GT24C02-2TLI-TR



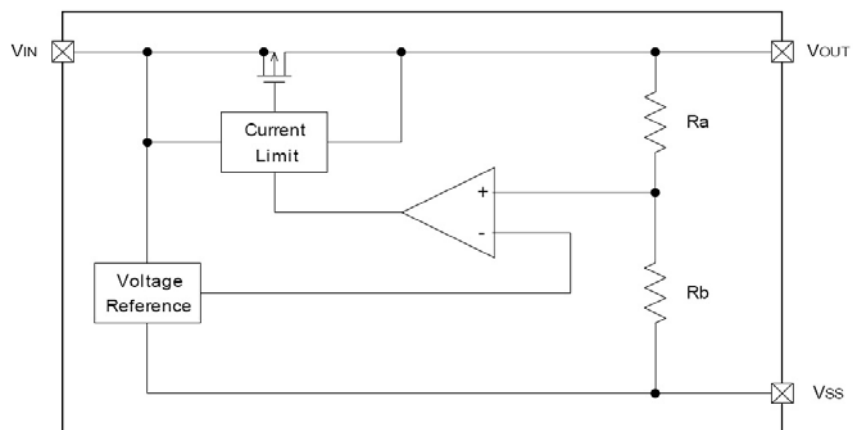
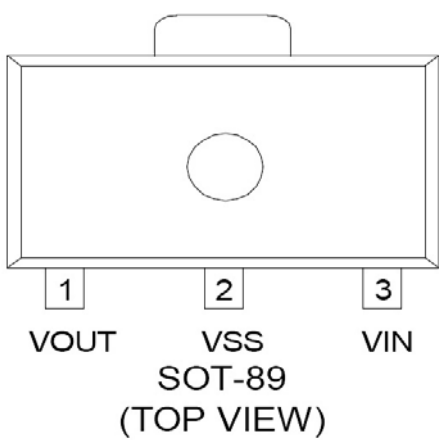
5. IC4 — R5F10WMCAFB



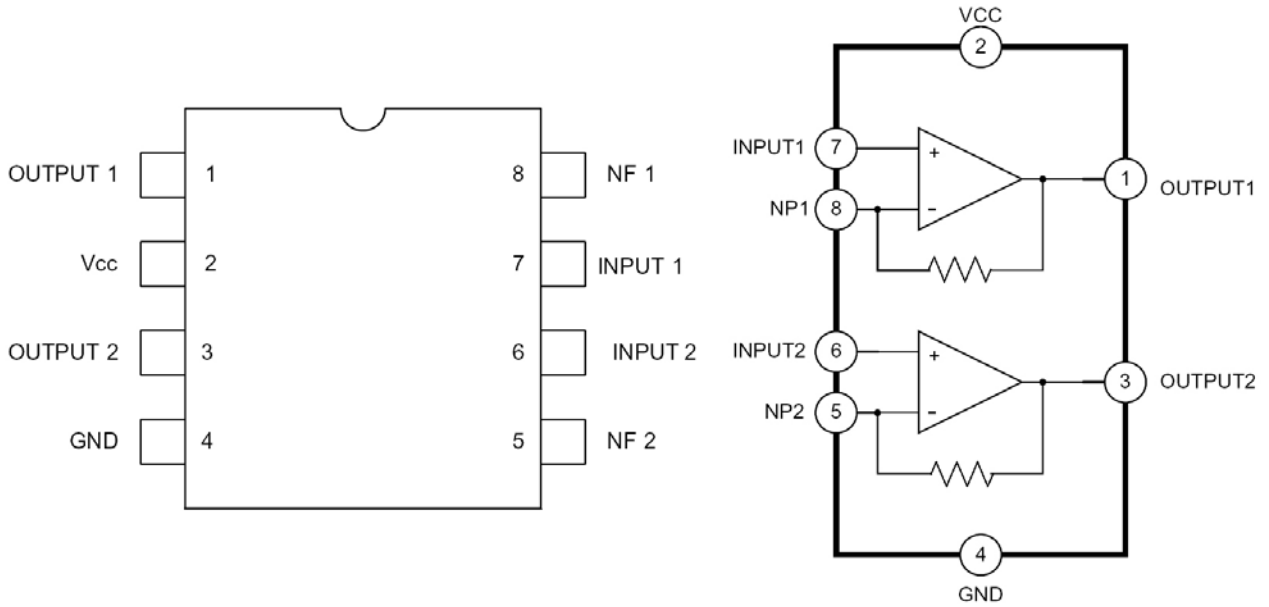
6. IC6 — PT2308



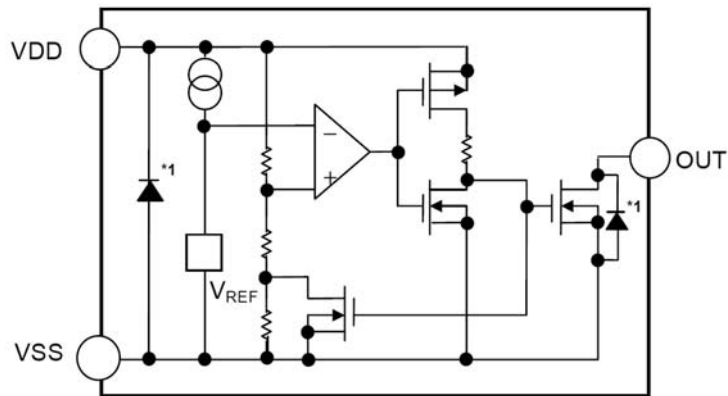
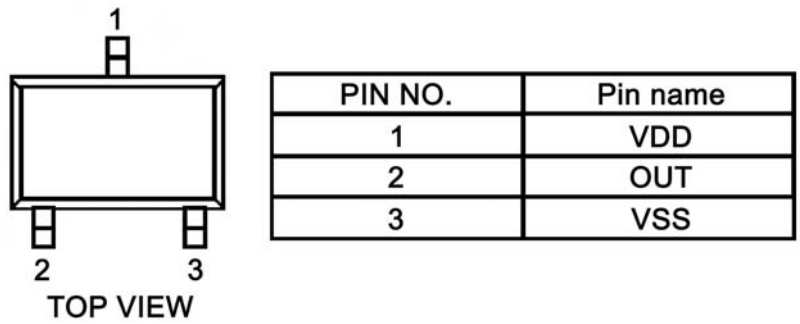
7. IC8 —XC 6202P332PRN



8. IC9 — TDA2822

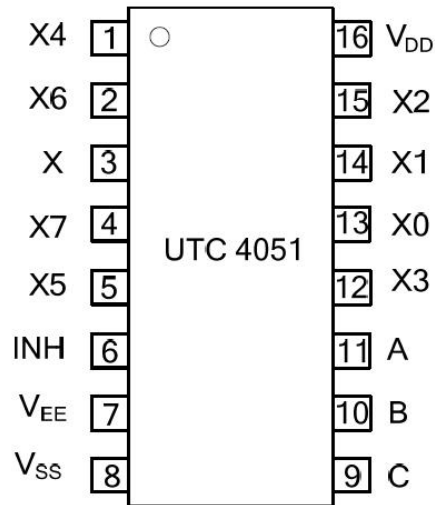
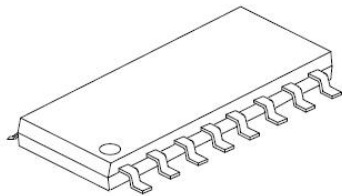


9. IC10 — S-80836CNMA



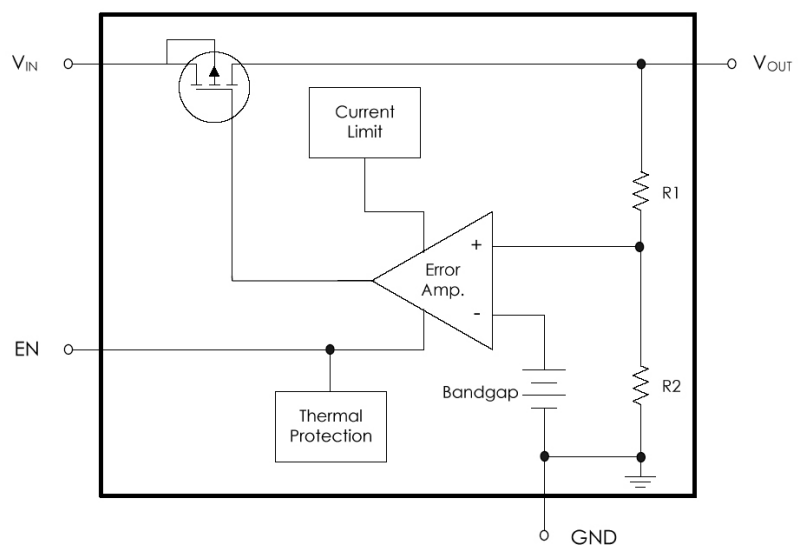
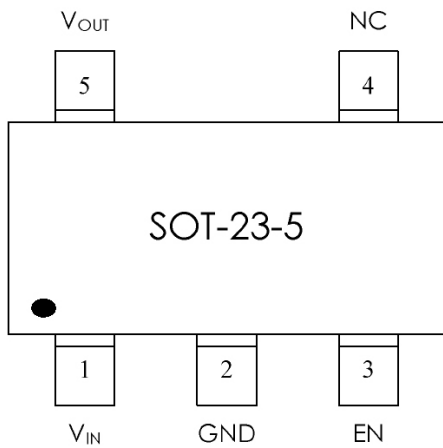
*1. Parasitic diode

10. IC400 — UTC4051G-S16-R

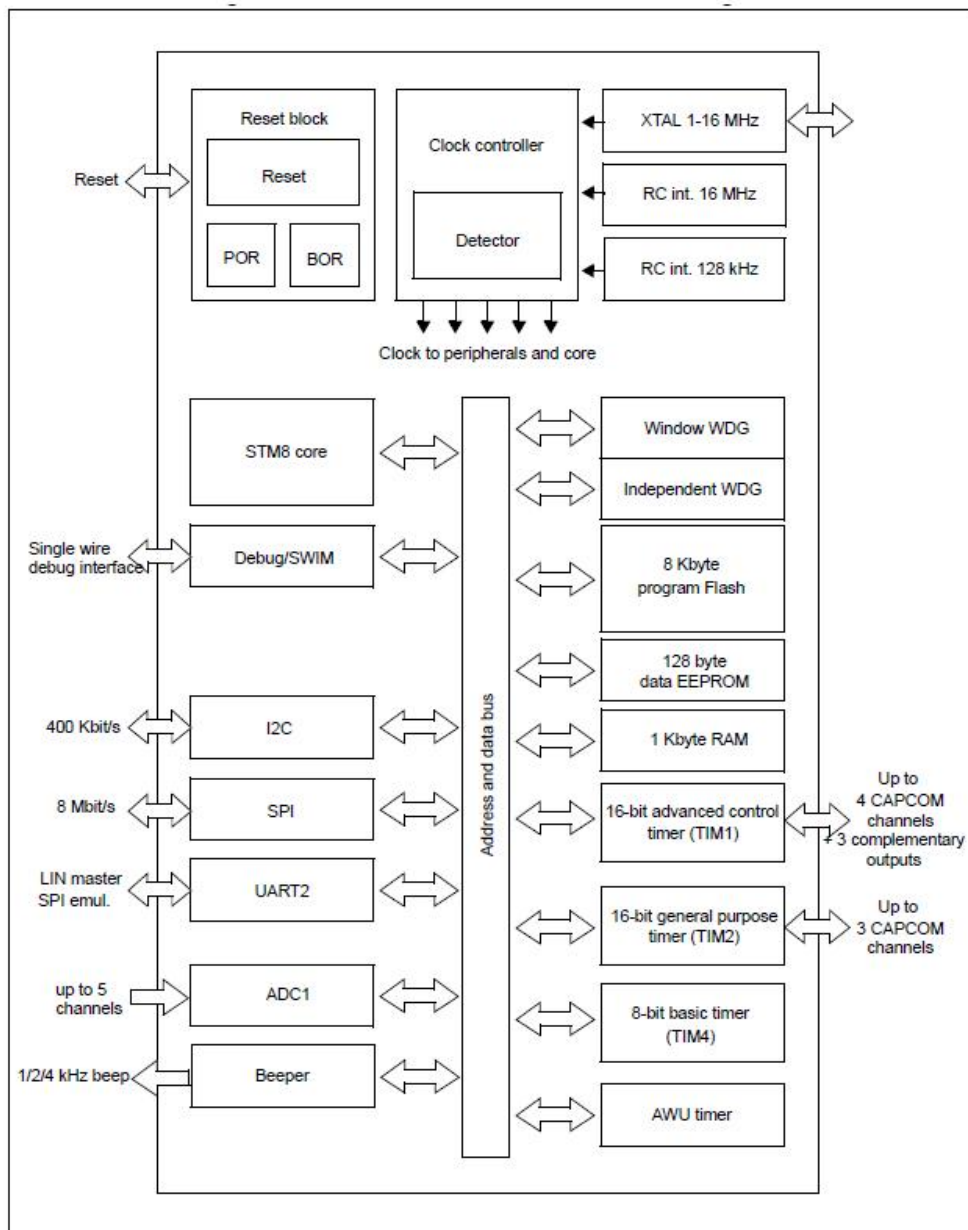
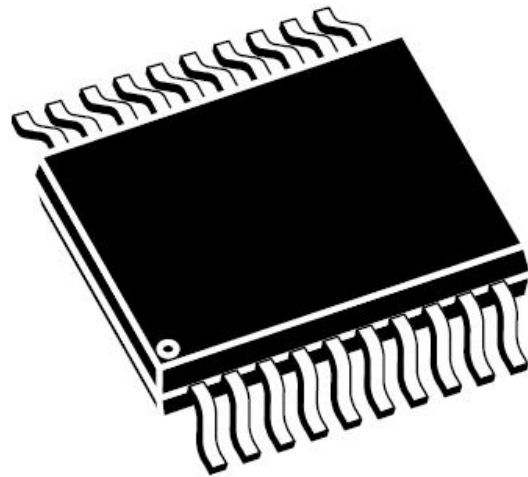


PIN No.	SYMBOL	I/O	NAME AND FUNCTION
3	X	I/O	Common Input/Output
6	INH	I	Inhibit Inputs
7	V_{EE}		Supply Voltage
8	V_{SS}		Ground
11,10,9	A,B,C	I	Binary Control Inputs
13,14,15,12,1,5,2,4	X0~X7	I/O	Independent Inputs/Outputs
16	V_{DD}		Positive Supply Voltage

11. IC402 — EMP8041-33VF05NRR

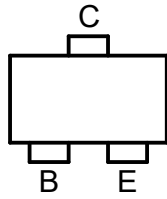


12. IC401 — STM8S003F3P6



SEMICONDUCTOR LEAD IDENTIFICATIONS

Transistors



2SA812

BTB1424N3

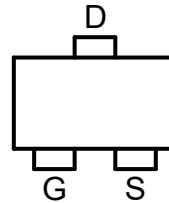
DTC343TK

DTA143ZN3

2SC1623

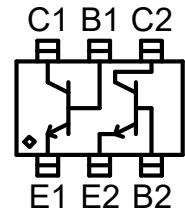
DTC144EN3

DTC115EN3

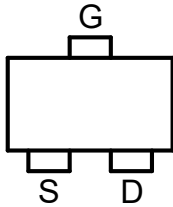


CJ3415

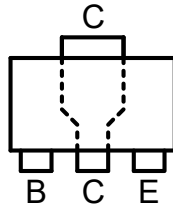
MTN7002ZHN3



HN2C01FU



2SK932



BTB1424AM3

(E: Emitter C: Collector B: Base S: Source G: Gate D: Drain)

Diodes



1SS367

CDSU4148

1N4148

1SS357

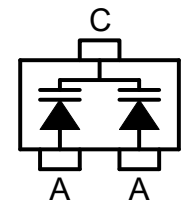


SS12 DO-214AC



UDZSTE -17 15B

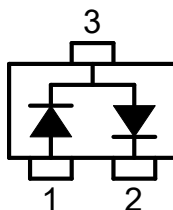
UDZV 4.7B



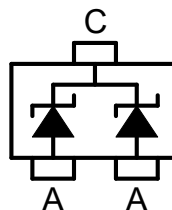
SVC383



BZV55B9V1



BAV99N3



BAT54CN3

(A: Anode C: Cathode)

IC AND TRANSISTOR VOLTAGE CHART

IC1— Si4731-D60-GU/R

PIN	FM	AM	BT	PIN	FM	AM	BT	PIN	FM	AM	BT
1	-	-	-	9	0	0	0	17	2.98	3.0	3.0
2	-	-	-	10	0	0	0	18	2.98	3.0	3.0
3	0.45	0.5	0.5	11	0	0	0	19	0.89	0.9	0.9
4	3.09	3.1	3.1	12	0	0	0	20	3.09	3.1	3.1
5	3.07	3.1	3.1	13	0	0	0	21	3.1	3.1	3.1
6	-	-	-	14	0	0	0	22	0	0	0
7	-	-	-	15	3.0	3.0	3.0	23	0.79	0.8	0.8
8	0	0	0	16	3.09	3.1	3.1	24	0.79	0.8	0.8

IC2 — M2115G-S08-R

PIN	FM	AM	BT
1	4.5	4.5	4.5
2	4.5	4.5	4.5
3	4.5	4.5	4.5
4	0	0	0
5	4.5	4.5	4.5
6	4.5	4.5	4.5
7	4.5	4.5	4.5
8	8.92	8.92	8.9

IC5 — GT24C02-2TLI-TR

PIN	FM	AM	BT
1	2.95	2.95	2.95
2	0	0	0
3	2.95	2.95	2.95
4	3.1	3.1	3.1
5	0	0	0

IC6 — PT2308

PIN	FM	AM	BT
1	2.5	2.5	2.5
2	2.5	2.5	2.5
3	2.5	2.5	2.5
4	0	0	0
5	2.5	2.5	2.5
6	2.5	2.5	2.5
7	2.5	2.5	2.5
8	5	5	5

IC3 — ET2354V

PIN	FM	AM	BT	PIN	FM	AM	BT	PIN	FM	AM	BT
1	4.86	4.86	4.86	10	2.4	2.41	2.41	19	2.42	2.42	2.42
2	0	0	0	11	2.42	2.42	2.42	20	2.43	2.43	2.43
3	2.42	2.42	2.42	12	2.42	2.42	2.42	21	2.42	2.42	2.42
4	2.43	2.42	2.42	13	2.41	2.41	2.41	22	2.43	2.43	2.43
5	2.41	2.41	2.41	14	-	-	-	23	2.43	2.43	2.43
6	2.43	2.43	2.43	15	2.41	2.41	2.41	24	2.43	2.43	2.43
7	2.42	2.42	2.42	16	2.41	2.41	2.41	25	0	0	0
8	2.41	2.41	2.41	17	2.41	2.41	2.41	26	2.66	2.65	2.66
9	-	-	-	18	2.43	2.43	2.43	27	2.66	2.65	2.65
								28	2.42	2.42	2.42

IC4 — R5F10WMCAFB

PIN	FM	AM	BT	PIN	FM	AM	BT	PIN	FM	AM	BT
1	2.96	2.96	2.96	27	0	0	0	54	1.5	1.5	1.5
2	-	-	-	28	3.0	3.0	3.0	55	1.5	1.5	1.5
3	2.5	2.95	2.95	29	0	0	0	56	3.0	3.0	3.0
4	2.97	0	2.97	30	1.50	1.50	1.50	57	3.0	3.0	3.0
5	-	-	-	31	1.50	1.50	1.50	58	3.0	3.0	3.0
6	3.08	3.08	3.08	32	1.50	1.50	1.50	59	3.0	3.0	3.0
7	0	0	0	33	1.50	1.50	1.50	60	3.0	3.0	3.0
8	3.0	3.0	3.0	34	1.50	1.50	1.50	61	3.0	3.0	3.0
9	2.97	2.97	2.97	35	1.50	1.50	1.50	62	3.0	3.0	3.0
10	2.94	2.94	2.94	36	1.50	1.50	1.50	63	0	0	0
11	0.63	0.63	0.63	37	1.50	1.50	1.50	64	0	0	0
12	0.5	0.5	0.5	38	1.50	1.50	1.50	65	3.0	3.0	3.0
13	2.85	2.85	2.85	39	1.50	1.50	1.50	66	0	0	3.1
14	2.85	2.85	2.85	40	0	0	0	67	0	0	0
15	-	-	-	41	0	0	0	68	2.35	2.35	2.35
16	1.8	1.8	1.8	42	1.50	1.50	1.50	69	3.0	3.0	3.0
17	0	0	0	43	1.50	1.50	1.50	70	0.4	0.4	0.4
18	2.97	2.97	2.97	44	1.50	1.50	1.50	71	3.0	3.0	3.0
19	2.95	2.95	2.95	45	1.50	1.50	1.50	72	3.0	3.0	3.0
20	2.95	2.95	2.95	46	1.50	1.50	1.50	73	0	0	0
21	1.98	1.98	1.98	47	1.50	1.50	1.50	74	0.3	0.3	0.3
22	1	1	1	48	1.50	1.50	1.50	75	0.3	0.3	0.3
23	1	1	1	49	1.50	1.50	1.50	76	0.3	0.3	0.3
24	2.0	2.0	2.0	50	1.50	1.50	1.50	77	0.2	0.2	0.2
25	3.0	3.0	3.0	51	1.50	1.50	1.50	78	3.44	3.44	3.44
26	0	0	0	52	1.50	1.50	1.50	79	3.0	3.0	3.0
				53	1.50	1.50	1.50	80	3.0	3.0	3.0

IC8 — 6202P332PRN

PIN	FM	AM	BT
1	8.97	8.97	8.97
2	0	0	0
3	3.29	3.29	3.29

IC9 — TDA2822

PIN	FM	AM	BT	PIN	FM	AM	BT
1	4.5	4.5	4.5	5	0.52	0.51	0.52
2	8.96	8.95	8.96	6	0	0	0
3	4.49	4.48	4.49	7	0	0	0
4	0	0	0	8	0.52	0.51	0.52

IC10 — S-80836CNMA

PIN	FM	AM	BT
1	3.1	3.1	3.1
2	0	0	0
3	9	9	9

IC400 — UTC4051G-S16-R

PIN	FM	AM	BT	PIN	FM	AM	BT
1	0	0	0	9	8.4	8.4	8.4
2	0	0	0	10	8.4	8.4	8.4
3	0	0	0	11	8.4	8.4	8.4
4	0	0	0	12	0	0	0
5	0	0	0	13	0	0	0
6	0	0	0	14	0	0	0
7	0	0	0	15	0	0	0
8	0	0	0	16	8.4	8.4	8.4

IC402 — EMP8041-33VF05NRR

PIN	FM	AM	BT
1	9.0	9.0	9.0
2	0	0	0
3	0	0	0
4	-	-	-
5	0	0	0

MD1 BM2020

PIN	FM	AM	BT	PIN	FM	AM	BT
1	-	-	-	13	-	-	-
2	-	-	-	14	-	-	-
3	-	-	-	15	-	-	-
4	0	0	3.3	16	-	-	-
5	0	0	0	17	-	-	-
6	-	-	-	18	-	-	-
7	0	0	1.6	19	0	0	0.4
8	0	0	1.6	20	0	0	3.3
9	0	0	1.6	21	0	0	3.3
10	-	-	-	22	-	-	-
11	-	-	-	23	0	0	0
12	-	-	-	24	0	0	3.3
				25	-	-	-
				26	0	0	3.3
				27	-	-	-
				28	-	-	-
				29	-	-	-
				30	-	-	-
				31	-	-	-
				32	0	0	2.5
				33	0	0	0
				34	-	-	-
				35	-	-	-
				36	-	-	-
				37	0	0	0
				38	-	-	-
				39	-	-	-
				40	-	-	-

IC401 — STM8S003F3P6

PIN	FM	AM	BT	PIN	FM	AM	BT	PIN	FM	AM	BT
1	0	0	0	8	0	0	0	15	0	0	0
2	0	0	0	9	0	0	0	16	0	0	0
3	0	0	0	10	0	0	0	17	0	0	0
4	0	0	0	11	0	0	0	18	0	0	0
5	0	0	0	12	0	0	0	19	0	0	0
6	0	0	0	13	0	0	0	20	0	0	0
7	0	0	0	14	0	0	0				

Transistor

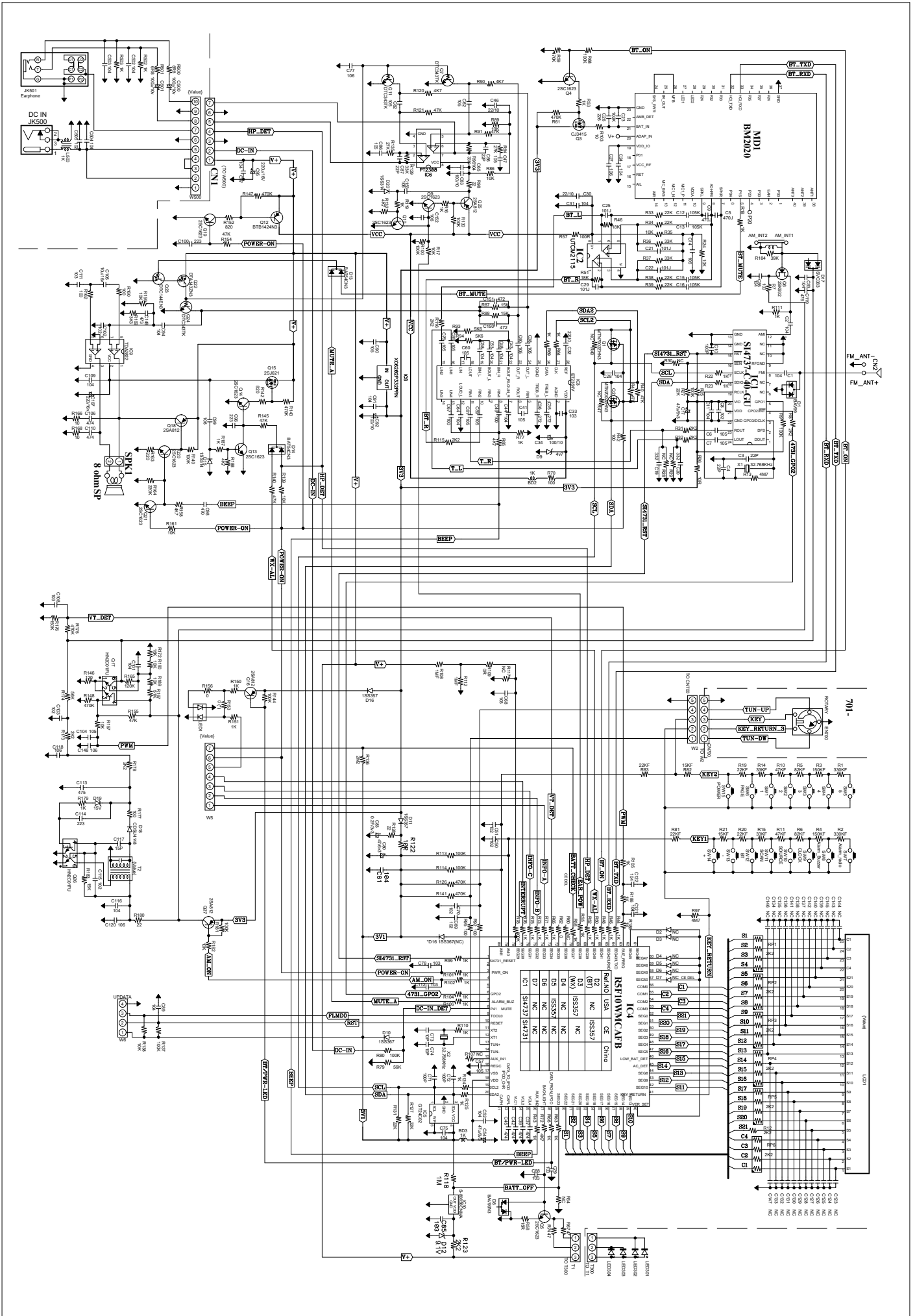
	PIN	FM	AM	BT
Q1	G	0.3	0.3	0.3
	S	2.9	2.9	2.9
	D	2.9	2.9	2.9
Q2	G	3.3	3.3	3.3
	S	2.9	2.9	2.9
	D	2.9	2.9	2.9
Q3	G	3.3	3.3	0
	S	3.3	3.3	3.3
	D	0	0	3.3
Q4	B	0	0	0.6
	C	3.3	3.3	0
	E	0	0	0
Q5	B	1.2	1.2	1.2
	C	0.6	0.6	0.6
	E	0.6	0.6	0.6
Q6	B	0	0	0
	C	0	0.47	0
	E	0	3.2	0
Q7	B	0	0	0
	C	0	0	0
	E	0	0	0
Q9	B	0	0	0
	C	8.9	8.9	8.9
	E	0	0	0
Q10	B	0	0	0
	C	0	0	0
	E	0	0	0
Q11	B	0	0	0
	C	0	0	0
	E	0	0	0
Q12	B	8.5	8.5	8.5
	C	9	9	9
	E	9	9	9

	PIN	FM	AM	BT
Q13	B	0	0	0
	C	0.6	0.6	0.6
	E	0	0	0
Q14	B	0.6	0.6	0.6
	C	0	0	0
	E	0	0	0
Q15	G	0	0	0
	S	9	9	9
	D	9	9	9
Q16	B	3.0	3.0	3.0
	C	0	0	0
	E	3.3	3.3	3.3
Q17	1	0	0.38	0
	2	0	0.38	0
	3	0	1.0	0
	4	0	3.3	0
	5	0	1.0	0
	6	0	1.3	0
Q18	B	9	9	9
	C	4.5	4.5	4.5
	E	9	9	9
Q19	B	0.6	0.6	0.6
	C	0	0	0
	E	0	0	0
Q20	B	0	0	0
	C	9	9	9
	E	0	0	0
Q21	B	0	0	0
	C	0	0	0
	E	0	0	0
Q22	B	9	9	9
	C	0	0	0
	E	9	9	9

	PIN	FM	AM	BT
Q23	B	0	0	0
	C	9.0	9.0	9.0
	E	0	0	0
Q24	B	0.3	0.3	0.3
	C	0	0	0
	E	0	0	0
Q25	B	8.9	8.9	8.9
	C	0	0	0
	E	8.9	8.9	8.9
Q26	1	0	0	0
	2	0	0	0
	3	0	0.6	0
	4	0	0.6	0
	5	0	0.6	0
	6	0	3.1	0
Q27	B	3.3	0	3.3
	C	0	3.3	0
	E	3.3	3.3	3.3
Q400	G	9.0	9.0	9.0
	S	0	0	0
	D	6.0	6.0	6.0
Q401	B	0	0	0
	C	8.4	8.4	8.4
	E	0	0	0

	PIN	FM	AM	BT
Q402	B	0	0	0
	C	8.4	8.4	8.4
	E	0	0	0
Q403	G	8.7	8.7	8.7
	S	9.0	9.0	9.0
	D	6.0	6.0	6.0
Q404	B	0	0	0
	C	8.7	8.7	8.7
	E	0	0	0
Q405	B	8.7	8.7	8.7
	C	6.0	6.0	6.0
	E	8.7	8.7	8.7
Q406	B	0	0	0
	C	8.4	8.4	8.4
	E	0	0	0
Q407	B	3.3	3.3	3.3
	C	0	0	0
	E	3.3	3.3	3.3
Q408	B	3.3	3.3	3.3
	C	3.3	3.3	3.3
	E	3.3	3.3	3.3
Q409	B	0.6	0.6	0.6
	C	0	0	0
	E	0	0	0

PCB-A SCHEMATIC DIAGRAM



PCB-B SCHEMATIC DIAGRAM

