UHF FM TRANSCEIVER / UHF FM 手持机

TK-378G

SERVICE MANUAL / 维修手册

M VERSIONS

KENWOOD

B51-8640-00 (S) 607

SUPPLEMENT/追补版

This service manual is aimed to revise and update the information on the PC Board that is used in the TK-378G transceiver having the serial number 4700201 and the later serial numbers. Refer to the original TK-378G (M,M4) service manual (B51-8517-00) for any information which are not contained in this manual.

此维修手册的目的是修改和更新印刷电路板的资料，它用于序号 4700201 以后的 TK-378G 对讲机。关于未包含于此手册的资料请参照 TK-378G (M,M4) 初版维修手册 (B51-8517-00)。

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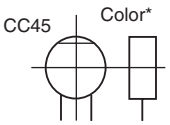
CAPACITORS

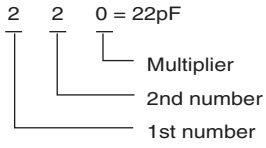
CC 45 TH 1H 220 J
1 2 3 4 5 6

1 = Type ... ceramic, electrolytic, etc.
2 = Shape ... round, square, ect.
3 = Temp. coefficient
4 = Voltage rating
5 = Value
6 = Tolerance



· Capacitor value

010 = 1pF
100 = 10pF
101 = 100pF
102 = 1000pF = 0.001μF
103 = 0.01μF



· Temperature coefficient

1st Word	C	L	P	R	S	T	U
Color*	Black	Red	Orange	Yellow	Green	Blue	Violet
ppm/℃	0	-80	-150	-220	-330	-470	-750

2nd Word	G	H	J	K	L
ppm/℃	±30	±60	±120	±250	±500

Example : CC45TH = -470 ± 60ppm/℃

· Tolerance (More than 10pF)

Code	C	D	G	J	K	M	X	Z	P	No code
(%)	±0.25	±0.5	±2	±5	±10	±20	+ 40	+ 80	+ 100	More than 10μF -10 ~ +50
							- 40	- 20	-0	Less than 4.7μF -10 ~ +75

(Less than 10pF)

Gode	B	C	D	F	G
(pF)	±0.1	±0.25	±0.5	±1	±2

· Voltage rating

2nd word / 1st word	A	B	C	D	E	F	G	H	J	K	V
0	1.0	1.25	1.6	2.0	2.5	3.15	4.0	5.0	6.3	8.0	-
1	1	12.5	16	20	25	31.5	40	50	63	80	35
2	100	125	160	200	250	315	400	500	630	800	-
3	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	-

· Chip capacitors

(EX) C C 7 3 F S L 1 H 0 0 0 J
1 2 3 4 5 6 7
(Chip)(CH,RH<UJ,SL)

(EX) C K 7 3 F F 1 H 0 0 0 Z
1 2 3 4 5 6 7
(Chip)(B,F)

Refer to the table above.
1 = Type
2 = Shape
3 = Dimension
4 = Temp. coefficient
5 = Voltage rating
6 = Value
7 = Tolerance

Dimension (Chip capacitors)

Dimension code	L	W	T
Empty	5.6 ±0.5	5.0 ±0.5	Less than 2.0
A	4.5 ±0.5	3.2 ±0.4	Less than 2.0
B	4.5 ±0.5	2.0 ±0.3	Less than 2.0
C	4.5 ±0.5	1.25 ±0.2	Less than 1.25
D	3.2 ±0.4	2.5 ±0.3	Less than 1.5
E	3.0 ±0.2	1.6 ±0.2	Less than 1.25
F	2.0 ±0.3	1.25 ±0.2	Less than 1.25
G	1.6 ±0.2	0.8 ±0.2	Less than 1.0
H	1.0 ±0.05	0.5 ±0.05	0.5 ±0.05

RESISTORS

· Chip resistor (Carbon)

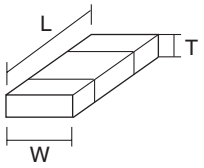
(EX) R K 7 3 E B 2 B 0 0 0 J
1 2 3 4 5 6 7
(Chip)(B,F)

· Carbon resistor (Nomal type)

(EX) R D 1 4 B B 2 C 0 0 0 J
1 2 3 4 5 6 7

1 = Type
2 = Shape
3 = Dimension
4 = Temp. coefficient
5 = Rating wattage
6 = Value
7 = Tolerance

Dimension



Dimension (Chip resistor)

Dimension code	L	W	T
E	3.2 ±0.2	1.6 ±0.2	1.0
F	2.0 ±0.3	1.25 ±0.2	1.0
G	1.6 ±0.2	0.8 ±0.2	0.5 ±0.1
H	1.0 ±0.05	0.5 ±0.05	0.35 ±0.05

Rating wattage

Code	Wattage	Code	Wattage	Code	Wattage
1J	1/16W	2C	1/16W	3A	1W
2A	1/10W	2E	1/4W	3D	2W
2B	1/8W	2H	1/2W		

PARTS LIST / 零件表

* New Parts. ⚠ indicates safety critical components.
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

L: Scandinavia **K**: USA **P**: Canada
Y: PX (Far East, Hawaii) **T**: England **E**: Europe
Y: AAFES (Europe) **X**: Australia **M**: Other Areas

TK-378G (Y50-5390-XX)
TX-RX UNIT (X57-6170-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination
TK-378G					
1	1A	*	A02-3508-33	CABINET ASSY	
2	3B		A82-0036-02	REAR PANEL	
3	2C		B09-0351-03	CAP(SP/MIC)	
4	2D		B62-1288-10	INSTRUCTION MANUAL	
5	3A	*	B72-1752-14	MODEL NAME PLATE	M
5	3A	*	B72-1753-14	MODEL NAME PLATE	M4
6	3B		E04-0413-05	RF COAXIAL RECEPTACLE(SMA)	
7	3A		E23-1183-04	RELAY TERMINAL(BATT -)	
8	2B		E23-1184-04	RELAY TERMINAL(BATT +)	
9	2B		E37-0829-05	SPEAKER LEAD ASSY	
10	3A		E37-0830-05	FLAT CABLE(PTT)	
11	2A		F10-2302-04	SHIELDING COVER(POWER MODULE)	
12	2A		F10-2304-03	SHIELDING COVER(TX-RX UNIT)	
13	1A		G01-0881-04	COIL SPRING(BATT RELEASE)	
14	1B		G10-1254-04	FIBROUS SHEET(SP)	
15	1B	*	G10-1276-04	FIBROUS SHEET(MIC)	
16	1A	*	G11-4028-04	SHEET(MONI/LAMP)	
17	3A	*	G11-4252-14	SHEET(PTT)	
18	2A		G13-1783-04	CUSHION(POWER MODULE COVER)	
19	3B	*	G13-1865-04	CUSHION(CHASSIS-BATT)	
20	2B	*	G13-1866-04	CUSHION(SP)	
21	2B,3A	*	G13-1867-14	CUSHION(BATT TERMINAL)	
22	1B		G53-0882-03	PACKING(SP)	
23	3B		G53-0883-04	PACKING(BATT TERMINAL +)	
24	3B	*	G53-1528-04	PACKING(SMA)	
25	1B	*	G53-1529-04	PACKING(VOL/CH)	
26	3B		G53-1530-02	PACKING(SIDE)	
27	2B		G53-1531-03	PACKING(SP/MIC)	
28	1A		G53-1537-04	PACKING(PTT KNOB)	
29	1C,2D		H12-1487-02	PACKING FIXTURE	
30	1D		H25-0085-04	PROTECTION BAG (100/200/0.07)	
31	2C		H25-2012-04	PROTECTION BAG (75/100/0.08)	
32	3D		H52-1557-02	ITEM CARTON CASE	
33	1A		J19-1572-04	HOLDER(BATT RELEASE)	
34	2B	*	J19-5353-24	HOLDER(BATT TERMINAL +)	
35	2B		J19-5388-03	HOLDER(VOL/CH)	
36	2C		J21-4493-04	HARDWARE FIXTURE(SP/MIC)	
37	2B		J21-8378-04	HARDWARE FIXTURE(SP)	
38	2C		J21-8393-04	HARDWARE FIXTURE(HAND STRAP)	
39	2C		J21-8399-04	HARDWARE FIXTURE ASSY(HAND STRAP)	
40	2C		J29-0658-05	BELT HOOK	
41	2A		J32-0925-04	HEXAGON BOSS	
42	2C		J69-0339-05	HAND STRAP	
43	2C		J69-0349-04	RING(HAND STRAP)	
44	1B		K29-5332-03	KNOB(VOLUME)	
45	1A		K29-5333-13	BUTTON KNOB(MONI/LAMP)	
46	1A	*	K29-5334-23	BUTTON KNOB(PTT)	
47	1A		K29-5337-03	LEVER KNOB(BATT RELEASE)	
48	1B		K29-5434-03	KNOB(16CH)	
A	3B		N09-2319-05	BINDING HEAD SCREW(SMA)	
B	2A,3A		N09-2331-05	SPECIAL SCREW(BATT TERMINAL +)	
C	1B		N14-0582-14	CIRCULAR NUT(SMA)	
D	1B	*	N14-0591-04	CIRCULAR NUT(VOL/CH)	
E	3A		N30-2606-46	PAN HEAD MACHINE SCREW(CHASSIS)	
G	2A		N67-2005-46	PAN HEAD SEMS SCREW W(POWER MODULE)	
H	2A,3A,3B		N78-2045-46	PAN HEAD TAPTITE SCREW(TX-RX B/2)	
I	3A		N79-2030-46	PAN HEAD TAPTITE SCREW(BATT TERMINAL -)	
J	2B		N83-2005-46	PAN HEAD TAPTITE SCREW(TX-RX A/2)	
49	2C		N99-2012-05	SCREW SET	
VR2			R31-0628-15	VARIABLE RESISTOR(VOLUME)	
S1			S60-0416-15	ROTARY SWITCH(16CH)	
50	2B		T07-0326-05	SPEAKER	
51	2D		T90-0743-05	HELICAL ANTENNA	M
51	2D		T90-0744-05	HELICAL ANTENNA	M4
TX-RX UNIT (X57-6170-XX) -20:M, -21:M4					
D18			B30-2019-05	LED(RED/GREEN)	
C1			CK73GB1H471K	CHIP C 470PF K	
C2			CC73GCH1H020C	CHIP C 2.0PF C	
C3			CC73GCH1H010B	CHIP C 1.0PF B	M4
C4			CC73GCH1H0R5B	CHIP C 0.5PF B	M4
C4,5			CC73GCH1H010B	CHIP C 1.0PF B	M
C5			CC73GCH1H020B	CHIP C 2.0PF B	M4
C6			CK73GB1C104K	CHIP C 0.10UF K	
C8			CC73GCH1H030B	CHIP C 3.0PF B	
C9			CK73GB1H471K	CHIP C 470PF K	
C10			CC73GCH1H080B	CHIP C 8.0PF B	M
C10			CC73GCH1H270G	CHIP C 27PF G	M4
C11			CC73GCH1H080D	CHIP C 8.0PF D	M
C11			CC73GCH1H120J	CHIP C 12PF J	M4
C12			CC73GCH1H070D	CHIP C 7.0PF D	M
C12			CC73GCH1H110J	CHIP C 11PF J	M4
C13			CK73GB1H471K	CHIP C 470PF K	
C14			CC73GCH1H0R5B	CHIP C 0.5PF B	
C16			CC73GCH1H060B	CHIP C 6.0PF B	M
C16,17			CC73GCH1H040B	CHIP C 4.0PF B	M4
C17			CC73GCH1H040B	CHIP C 4.0PF B	M
C18			CC73GCH1H060B	CHIP C 6.0PF B	M
C18			CC73GCH1H270J	CHIP C 27PF J	M4
C20			CC73GCH1H030B	CHIP C 3.0PF B	M
C20			CC73GCH1H040B	CHIP C 4.0PF B	M4
C21			CC73GCH1H0R5B	CHIP C 0.5PF B	M4
C22			CC73GCH1H101J	CHIP C 100PF J	
C23			CC73GCH1H020B	CHIP C 2.0PF B	M
C23			CC73GCH1H050B	CHIP C 5.0PF B	M4
C24			CC73GCH1H030B	CHIP C 3.0PF B	M
C24,25			CC73GCH1H080B	CHIP C 8.0PF B	M4
C25			CC73GCH1H040B	CHIP C 4.0PF B	M
C26			CC73GCH1H020B	CHIP C 2.0PF B	M4
C26			CC73GCH1H1R5B	CHIP C 1.5PF B	M
C27			CC73GCH1H0R5B	CHIP C 0.5PF B	
C28			CC73GCH1H060D	CHIP C 6.0PF D	M
C28			CC73GCH1H070D	CHIP C 7.0PF D	M4
C29			CC73GCH1H220J	CHIP C 22PF J	
C30			CC73GCH1H060D	CHIP C 6.0PF D	M

PARTS LIST / 零件表

TX-RX UNIT (X57-6170-XX)

Ref. No.	Address	New parts	Parts No.	Description			Destination
C30			CC73GCH1H080D	CHIP C	8.0PF	D	M4
C31			C92-0507-05	CHIP-TAN	4.7UF	6.3WV	
C32			CK73GB1C104K	CHIP C	0.10UF	K	
C33			CC73GCH1H060B	CHIP C	6.0PF	B	M
C33			CC73GCH1H080B	CHIP C	8.0PF	B	M4
C35-41			CK73GB1H471K	CHIP C	470PF	K	
C42-44			CC73GCH1H101J	CHIP C	100PF	J	
C45			CK73GB1H471K	CHIP C	470PF	K	
C48,49			C92-0001-05	CHIP-C	0.1UF	35WV	
C51			C92-0004-05	CHIP-TAN	1.0UF	16WV	M
C51			C92-0585-05	CHIP-TAN	4.7UF	16WV	M4
C52			CC73GCH1H030B	CHIP C	3.0PF	B	M4
C52			CC73GCH1H040B	CHIP C	4.0PF	B	M
C53			CK73GB1H471K	CHIP C	470PF	K	
C54			CK73FB1C474K	CHIP C	0.47UF	K	
C55			CK73GB1H471K	CHIP C	470PF	K	
C57			CK73FB1C474K	CHIP C	0.47UF	K	
C58			CK73GB1H103K	CHIP C	0.010UF	K	
C60			CK73GB1H103K	CHIP C	0.010UF	K	
C62			CC73GCH1H560J	CHIP C	56PF	J	
C63			CC73GCH1H070B	CHIP C	7.0PF	B	
C64			CC73GCH1H010B	CHIP C	1.0PF	B	
C68			C92-0565-05	CHIP-TAN	6.8UF	10WV	
C70			CK73GB1H103K	CHIP C	0.010UF	K	
C71			CC73GCH1H101J	CHIP C	100PF	J	
C72			CC73GCH1H180J	CHIP C	18PF	J	M4
C72			CC73GCH1H330G	CHIP C	33PF	G	M
C73			CK73GB1H471K	CHIP C	470PF	K	
C74			CK73FB1E104K	CHIP C	0.10UF	K	
C75			CK73GB1H471K	CHIP C	470PF	K	
C76			CK73GB1H102K	CHIP C	1000PF	K	
C77			CC73GCH1H010B	CHIP C	1.0PF	B	M4
C77			CC73GCH1H030B	CHIP C	3.0PF	B	M
C78			CC73GCH1H470J	CHIP C	47PF	J	
C81			CC73GCH1H010C	CHIP C	1.0PF	C	
C82			CK73GB1H102K	CHIP C	1000PF	K	M
C84,85			CK73GB1H471K	CHIP C	470PF	K	
C86,87			CC73GCH1H100D	CHIP C	10PF	D	
C88			CC73GCH1H040B	CHIP C	4.0PF	B	
C89			CC73GCH1H070B	CHIP C	7.0PF	B	
C90			C92-0560-05	CHIP-TAN	10UF	6.3WV	
C94			C92-0560-05	CHIP-TAN	10UF	6.3WV	
C95,96			CK73GB1H471K	CHIP C	470PF	K	
C98			C92-0560-05	CHIP-TAN	10UF	6.3WV	
C99			CK73GB1C104K	CHIP C	0.10UF	K	
C100			C92-0507-05	CHIP-TAN	4.7UF	6.3WV	
C101			CK73GB1H471K	CHIP C	470PF	K	
C104			CK73GB1H471K	CHIP C	470PF	K	
C107,108			CK73GB1C104K	CHIP C	0.10UF	K	
C109			C92-0560-05	CHIP-TAN	10UF	6.3WV	
C110			CK73GB1H103K	CHIP C	0.010UF	K	
C111			CK73GB1H471K	CHIP C	470PF	K	
C112			CC73GCH1H050B	CHIP C	5.0PF	B	
C113			CK73GB1H471K	CHIP C	470PF	K	
C114			CK73GB1H391K	CHIP C	390PF	K	
C115			CK73GB1C104K	CHIP C	0.10UF	K	
C116			CK73GB1H471K	CHIP C	470PF	K	M4
C118			CK73GB1H471K	CHIP C	470PF	K	
C119			CK73FB1A105K	CHIP C	1.0UF	K	
C120,121			CK73GB1H471K	CHIP C	470PF	K	

Ref. No.	Address	New parts	Parts No.	Description			Destination
C122			CK73FB1A105K	CHIP C	1.0UF	K	
C123			CK73GB1H391K	CHIP C	390PF	K	
C124			CC73GCH1H390J	CHIP C	39PF	J	
C125,126			CK73GB1H103K	CHIP C	0.010UF	K	
C128			CC73GCH1H040C	CHIP C	4.0PF	C	
C130			CK73GB1H471K	CHIP C	470PF	K	
C131			CC73GCH1H100D	CHIP C	10PF	D	
C132			CK73GB1H103K	CHIP C	0.010UF	K	
C133			CC73GCH1H820J	CHIP C	82PF	J	
C135			CK73GB1H103K	CHIP C	0.010UF	K	
C136			CC73GCH1H060B	CHIP C	6.0PF	B	M4
C136			CC73GCH1H080B	CHIP C	8.0PF	B	M
C137			CK73GB1H471K	CHIP C	470PF	K	
C138			CK73GB1C104K	CHIP C	0.10UF	K	
C139			CC73GCH1H181J	CHIP C	180PF	J	
C140			CK73GB1H103K	CHIP C	0.010UF	K	
C141			CK73GB1C104K	CHIP C	0.10UF	K	
C142			CK73FB1A105K	CHIP C	1.0UF	K	
C143,144			CK73GB1H471K	CHIP C	470PF	K	
C146,147			CK73GB1C104K	CHIP C	0.10UF	K	
C148			CK73GB1H103K	CHIP C	0.010UF	K	
C150			CK73GB1H102K	CHIP C	1000PF	K	
C151-153			CK73GB1H471K	CHIP C	470PF	K	
C155			C92-0662-05	CHIP-TAN	15UF	6.3WV	
C156,157			CK73GB1H471K	CHIP C	470PF	K	
C158			CK73FB1A105K	CHIP C	1.0UF	K	
C159			CK73GB1H471K	CHIP C	470PF	K	
C161			CK73GB1H471K	CHIP C	470PF	K	
C162			CK73GB1H103K	CHIP C	0.010UF	K	
C163,164			CK73GB1H471K	CHIP C	470PF	K	
C165			CK73GB1H103K	CHIP C	0.010UF	K	
C166			CK73FF1E104Z	CHIP C	0.10UF	Z	
C167			CK73GB1H471K	CHIP C	470PF	K	
C170,171			CK73GB1H471K	CHIP C	470PF	K	
C173			C92-0567-05	CHIP-TAN	68UF	6.3WV	
C174			CK73GB1H471K	CHIP C	470PF	K	
C176			CC73GCH1H101J	CHIP C	100PF	J	
C177			CK73GB1C473K	CHIP C	0.047UF	K	
C178			C92-0560-05	CHIP-TAN	10UF	6.3WV	
C179			CK73GB1C104K	CHIP C	0.10UF	K	
C180			CK73GB1H103K	CHIP C	0.010UF	K	
C181			CK73GB1C393K	CHIP C	0.039UF	K	
C182			CK73GB1H102K	CHIP C	1000PF	K	
C183,184			CK73GB1C104K	CHIP C	0.10UF	K	
C185			CC73GCH1H180J	CHIP C	18PF	J	
C189			CK73GB1H103K	CHIP C	0.010UF	K	
C190,191			CK73GB1C104K	CHIP C	0.10UF	K	
C192,193			CC73GCH1H300J	CHIP C	30PF	J	
C194			C92-0507-05	CHIP-TAN	4.7UF	6.3WV	
C196			CC73GCH1H101J	CHIP C	100PF	J	
C198,199			CK73GB1H103K	CHIP C	0.010UF	K	
C200			CK73GB1A224K	CHIP C	0.22UF	K	
C201			CK73GB1H103K	CHIP C	0.010UF	K	
C202,203			CK73GB1C104K	CHIP C	0.10UF	K	
C204			CK73FB1C474K	CHIP C	0.47UF	K	
C205			CK73GB1H103K	CHIP C	0.010UF	K	
C206-208			CK73GB1C104K	CHIP C	0.10UF	K	
C209			CK73GB1H392K	CHIP C	3900PF	K	
C210			CK73GB1H102K	CHIP C	1000PF	K	
C211			C92-0507-05	CHIP-TAN	4.7UF	6.3WV	

PARTS LIST / 零件表

TX-RX UNIT (X57-6170-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination
C212			CK73GB1H122K	CHIP C 1200PF K	
C213			CK73GB1H103K	CHIP C 0.010UF K	
C215			CK73GB1C104K	CHIP C 0.10UF K	
C216			CK73GB1H392K	CHIP C 3900PF K	
C217			CK73GB1E153K	CHIP C 0.015UF K	
C218			CK73FB1H563K	CHIP C 0.056UF K	
C219,220			CK73GB1C104K	CHIP C 0.10UF K	
C221			CK73GB1H471K	CHIP C 470PF K	
C222			CK73GB1H103K	CHIP C 0.010UF K	
C223			C92-0560-05	CHIP-TAN 10UF 6.3WV	
C224			CK73GB1H122K	CHIP C 1200PF K	
C225			CC73GCH1H101J	CHIP C 100PF J	
C226,227			CK73GB1H562J	CHIP C 5600PF J	
C229			CK73FB1H471K	CHIP C 470PF K	
C230			CK73GB1H562J	CHIP C 5600PF J	
C231			C92-0521-05	CHIP-TAN 0.47UF 20WV	
C232			CK73GB1H471K	CHIP C 470PF K	
C233			CC73GCH1H151J	CHIP C 150PF J	
C234,235			CK73GB1H272J	CHIP C 2700PF J	
C236			CK73GB1C104K	CHIP C 0.10UF K	
C238			CK73GB1H392K	CHIP C 3900PF K	
C239			CK73GB1C683K	CHIP C 0.068UF K	
C240			CK73GB1H272J	CHIP C 2700PF J	
C241			CK73GB1H471K	CHIP C 470PF K	
C242			C92-0560-05	CHIP-TAN 10UF 6.3WV	
C243			CK73FB1A105K	CHIP C 1.0UF K	
C244			C92-0560-05	CHIP-TAN 10UF 6.3WV	
C245			CK73GB1H471K	CHIP C 470PF K	
C246			CK73FB1A105K	CHIP C 1.0UF K	
C247			CK73GB1E123K	CHIP C 0.012UF K	
C248			CK73GB1H103K	CHIP C 0.010UF K	
C249			CK73GB1H222K	CHIP C 2200PF K	
C250			CK73GB1C683K	CHIP C 0.068UF K	
C251			CK73GB1C104K	CHIP C 0.10UF K	
C252			CK73GB1C473K	CHIP C 0.047UF K	
C253,254			CK73GB1H103K	CHIP C 0.010UF K	
C255			CK73GB1H183K	CHIP C 0.018UF K	
C257			CK73GB1E153K	CHIP C 0.015UF K	
C258			CK73GB1C333K	CHIP C 0.033UF K	
C259			CC73GCH1H121J	CHIP C 120PF J	
C260			CK73GB1H183K	CHIP C 0.018UF K	
C261			CK73GB1E153K	CHIP C 0.015UF K	
C262			CK73GB1H102K	CHIP C 1000PF K	
C263			CK73GB1C104K	CHIP C 0.10UF K	
C265,266			CK73GB1C104K	CHIP C 0.10UF K	
C268			CK73GB1H102K	CHIP C 1000PF K	
C269			CK73GB1H152K	CHIP C 1500PF K	
C270			CK73GB1H222K	CHIP C 2200PF K	
C271			CK73GB1H102K	CHIP C 1000PF K	
C302			CC73GCH1H010B	CHIP C 1.0PF B	M
C302			CC73GCH1H020B	CHIP C 2.0PF B	M4
C303			CC73GCH1H020B	CHIP C 2.0PF B	M
C303			CC73GCH1H220G	CHIP C 22PF G	M4
C304			CC73GCH1H150G	CHIP C 15PF G	M
C304			CK73GB1H471K	CHIP C 470PF K	M4
C305,306			CC73GCH1HR75B	CHIP C 0.75PF B	M4
C305,306			CC73GCH1H0R5B	CHIP C 0.5PF B	M
C307			CC73GCH1H220J	CHIP C 22PF J	
C309			CK73GB1H471K	CHIP C 470PF K	
C311			CC73GCH1H020B	CHIP C 2.0PF B	M

Ref. No.	Address	New parts	Parts No.	Description	Destination
C311			CC73GCH1H030B	CHIP C 3.0PF B	M4
C312			CC73GCH1H010B	CHIP C 1.0PF B	M4
C312			CC73GCH1H040B	CHIP C 4.0PF B	M
C314			CC73GCH1H030B	CHIP C 3.0PF B	M
C316,317			CK73GB1H471K	CHIP C 470PF K	
C319			CK73GB1H471K	CHIP C 470PF K	M4
C320			CC73GCH1H030B	CHIP C 3.0PF B	M4
C325,326			CK73GB1H471K	CHIP C 470PF K	
C327			CC73GCH1H080B	CHIP C 8.0PF B	M
C327			CC73GCH1H120G	CHIP C 12PF G	M4
C328,329			CK73GB1H471K	CHIP C 470PF K	M4
C330,331			CC73GCH1H050B	CHIP C 5.0PF B	M4
C332			CC73GCH1H040B	CHIP C 4.0PF B	M4
TC1,2			C05-0384-05	CERAMIC TRIMMER CAP(10PF)	
TC301-303			C05-0383-05	CERAMIC TRIMMER CAP(6PF)	M
TC301,302			C05-0383-05	CERAMIC TRIMMER CAP(6PF)	M4
TC303			C05-0382-05	CERAMIC TRIMMER CAP(3PF)	M4
CN1			E40-6067-05	PIN ASSY SOCKET	
CN3			E40-5662-05	PIN ASSY SOCKET	
CN5			E40-5932-05	PIN ASSY SOCKET	
CN6			E23-0342-05	TEST TERMINAL	
J1			E11-0457-05	PHONE JACK(2.5/3.5)	
F1			F53-0130-05	FUSE(3A)	
F1			F53-0217-05	FUSE(3A)	
CD1			L79-1474-05	TUNING COIL	
CF1			L72-0968-05	CERAMIC FILTER	
CF2			L72-0969-05	CERAMIC FILTER	
L1			L40-1875-92	SMALL FIXED INDUCTOR(18NH)	M
L1			L40-2275-92	SMALL FIXED INDUCTOR(22NH)	M4
L2			L92-0138-05	FERRITE CHIP	
L3			L40-3391-86	SMALL FIXED INDUCTOR(3.3UH)	
L4			L33-0744-05	SMALL FIXED INDUCTOR	
L5-7			L34-4547-05	AIR-CORE COIL	M
L5,6			L34-4547-05	AIR-CORE COIL	M4
L7			L34-4546-05	AIR-CORE COIL	M4
L8			L40-1575-92	SMALL FIXED INDUCTOR(15NH)	
L9			L40-1075-92	SMALL FIXED INDUCTOR(10NH)	M
L9			L40-1275-92	SMALL FIXED INDUCTOR(12NH)	M4
L10			L40-1095-34	SMALL FIXED INDUCTOR(1UH)	
L11			L40-1092-81	SMALL FIXED INDUCTOR	
L12			L40-2702-86	SMALL FIXED INDUCTOR(27UH)	M4
L12			L40-3391-86	SMALL FIXED INDUCTOR(3.3UH)	M
L14			L40-1875-92	SMALL FIXED INDUCTOR(18NH)	
L15			L40-2275-92	SMALL FIXED INDUCTOR(22NH)	M
L15			L40-2775-92	SMALL FIXED INDUCTOR(27NH)	M4
L17			L34-4547-05	AIR-CORE COIL	
L18-20			L92-0138-05	FERRITE CHIP	
L21			L40-1875-92	SMALL FIXED INDUCTOR(18NH)	
L22			L40-1085-92	SMALL FIXED INDUCTOR(100NH)	M
L22			L40-1885-92	SMALL FIXED INDUCTOR(180NH)	M4
L23			L92-0138-05	FERRITE CHIP	
L24			L40-5681-86	SMALL FIXED INDUCTOR(0.56UH)	
L25			L40-1085-92	SMALL FIXED INDUCTOR(100NH)	M
L25			L40-1885-92	SMALL FIXED INDUCTOR(180NH)	M4
L26			L33-0744-05	SMALL FIXED INDUCTOR	M
L26			L33-0745-05	SMALL FIXED INDUCTOR	M4
L27			L92-0149-05	FERRITE CHIP	
L30			L40-2702-86	SMALL FIXED INDUCTOR(27UH)	
L31			L40-1085-92	SMALL FIXED INDUCTOR(100NH)	M

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PARTS LIST / 零件表

TX-RX UNIT (X57-6170-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination
L31			L40-1885-92	SMALL FIXED INDUCTOR(180NH)	M4
L32			L40-1005-85	SMALL FIXED INDUCTOR(10UH)	
L35			L40-1275-92	SMALL FIXED INDUCTOR(12NH)	M
L35			L40-2775-92	SMALL FIXED INDUCTOR(27NH)	M4
L36			L40-1085-85	SMALL FIXED INDUCTOR(0.10UH)	
L37			L40-6885-85	SMALL FIXED INDUCTOR(0.68UH)	
L38			L92-0138-05	FERRITE CHIP	
L39			L92-0149-05	FERRITE CHIP	
L40,41			L92-0138-05	FERRITE CHIP	
L42			L92-0131-05	FERRITE CHIP	
L43,44			L92-0138-05	FERRITE CHIP	
L301			L40-4775-92	SMALL FIXED INDUCTOR(47NH)	M
L301			L40-5675-92	SMALL FIXED INDUCTOR(56NH)	M4
L302			L34-4546-05	AIR-CORE COIL	
L303			L40-2275-92	SMALL FIXED INDUCTOR(22NH)	M4
L303			L40-5675-92	SMALL FIXED INDUCTOR(56NH)	M
L304-306			L34-4546-05	AIR-CORE COIL	M
L304,305			L34-4546-05	AIR-CORE COIL	M4
L307			L40-4785-85	SMALL FIXED INDUCTOR(0.47UH)	
L308-310			L34-4546-05	AIR-CORE COIL	M
L308,309			L34-4546-05	AIR-CORE COIL	M4
L311			L40-8268-53	SMALL FIXED INDUCTOR(8.2NH)	M4
L312			L40-2775-92	SMALL FIXED INDUCTOR(27NH)	M
X1			L77-1833-05	TCXO(16.8MHZ)	
X2			L78-0479-05	RESONATOR(3.58MHZ)	
X3			L77-1810-05	CRYSTAL RESONATOR(9.8304MHZ)	
X3			L77-1835-05	CRYSTAL RESONATOR(9.8304MHZ)	
XF1			L71-0546-05	CRYSTAL FILTER(49.95MHZ)	
CP1			R90-0724-05	MULTI-COMP 1K X4	
CP2-9			R90-0741-05	MULTIPLE RESISTOR	
CP10			R90-0724-05	MULTI-COMP 1K X4	
CP11-18			R90-0741-05	MULTIPLE RESISTOR	
CP19			R90-0718-05	MULTI-COMP 4.7K X4	
CP20			RK75HA1J472J	CHIP-COM 4.7K J 1/16W	
R1			RK73GB1J124J	CHIP R 120K J 1/16W	M
R1			RK73GB1J394J	CHIP R 390K J 1/16W	M4
R2			RK73GB1J104J	CHIP R 100K J 1/16W	
R3			RK73GB1J392J	CHIP R 3.9K J 1/16W	M
R3			RK73GB1J472J	CHIP R 4.7K J 1/16W	M4
R4			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R5			RK73GB1J152J	CHIP R 1.5K J 1/16W	
R6			R92-1252-05	CHIP R 0 OHM J 1/16W	
R7			RK73GB1J100J	CHIP R 10 J 1/16W	
R8			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R9			RK73GB1J332J	CHIP R 3.3K J 1/16W	
R10			RK73GB1J331J	CHIP R 330 J 1/16W	
R13			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R14			RK73GB1J332J	CHIP R 3.3K J 1/16W	
R16			RK73GB1J391J	CHIP R 390 J 1/16W	
R17			RK73GB1J103J	CHIP R 10K J 1/16W	
R18			RK73GB1J124J	CHIP R 120K J 1/16W	
R19			RK73GB1J332J	CHIP R 3.3K J 1/16W	
R20			RK73GB1J122J	CHIP R 1.2K J 1/16W	
R21			RK73GB1J331J	CHIP R 330 J 1/16W	
R22			RK73GB1J561J	CHIP R 560 J 1/16W	
R23			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R24			RK73GB1J682J	CHIP R 6.8K J 1/16W	
R25			RK73GB1J470J	CHIP R 47 J 1/16W	
R26			RK73GB1J561J	CHIP R 560 J 1/16W	

Ref. No.	Address	New parts	Parts No.	Description	Destination
R27			RK73GB1J390J	CHIP R 39 J 1/16W	
R28,29			RK73GB1J271J	CHIP R 270 J 1/16W	
R30			RK73GB1J152J	CHIP R 1.5K J 1/16W	M4
R30			RK73GB1J472J	CHIP R 4.7K J 1/16W	M
R31			RK73GB1J101J	CHIP R 100 J 1/16W	
R33			RK73GB1J101J	CHIP R 100 J 1/16W	
R34			RK73GB1J473J	CHIP R 47K J 1/16W	
R35			RK73GB1J104J	CHIP R 100K J 1/16W	
R36			RK73GB1J473J	CHIP R 47K J 1/16W	
R37			RK73GB1J392J	CHIP R 3.9K J 1/16W	
R38			RK73GB1J101J	CHIP R 100 J 1/16W	
R39			RK73GB1J220J	CHIP R 22 J 1/16W	
R41			RK73GB1J100J	CHIP R 10 J 1/16W	
R42			RK73GB1J220J	CHIP R 22 J 1/16W	
R43			RK73GB1J101J	CHIP R 100 J 1/16W	
R44			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R45			RK73GB1J222J	CHIP R 2.2K J 1/16W	M
R45			RK73GB1J562J	CHIP R 5.6K J 1/16W	M4
R46			RN73GH1J154D	CHIP R 150K D 1/16W	
R47			RK73GB1J104J	CHIP R 100K J 1/16W	
R48			RK73GB1J334J	CHIP R 330K J 1/16W	
R49			RK73GB1J103J	CHIP R 10K J 1/16W	
R50			RN73GH1J154D	CHIP R 150K D 1/16W	
R51			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R52			RK73GB1J181J	CHIP R 180 J 1/16W	
R53			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R54			RN73GH1J154D	CHIP R 150K D 1/16W	
R55			RK73GB1J105J	CHIP R 1.0M J 1/16W	
R56-58			RK73EB2ER39K	CHIP R 0.39 K 1/4W	
R59			RN73GH1J154D	CHIP R 150K D 1/16W	
R60			R92-1252-05	CHIP R 0 OHM J 1/16W	
R61			RK73GB1J104J	CHIP R 100K J 1/16W	
R62			RN73GH1J154D	CHIP R 150K D 1/16W	
R64,65			RK73GB1J104J	CHIP R 100K J 1/16W	
R67			RK73GB1J273J	CHIP R 27K J 1/16W	
R68			RN73GH1J154D	CHIP R 150K D 1/16W	
R69			RK73GB1J220J	CHIP R 22 J 1/16W	
R70			RK73GB1J104J	CHIP R 100K J 1/16W	M
R71			RK73GB1J124J	CHIP R 120K J 1/16W	
R72			RK73GB1J103J	CHIP R 10K J 1/16W	
R73			RK73GB1J273J	CHIP R 27K J 1/16W	
R74,75			RK73GB1J223J	CHIP R 22K J 1/16W	
R76			R92-0670-05	CHIP R 0 OHM	
R77			R92-1252-05	CHIP R 0 OHM J 1/16W	
R78,79			RK73GB1J153J	CHIP R 15K J 1/16W	
R80,81			RK73GB1J223J	CHIP R 22K J 1/16W	
R82			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R83			RK73GB1J104J	CHIP R 100K J 1/16W	M4
R84			RK73GB1J394J	CHIP R 390K J 1/16W	M4
R84			RK73GB1J474J	CHIP R 470K J 1/16W	M
R85			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R86			RK73GB1J334J	CHIP R 330K J 1/16W	
R87			R92-1252-05	CHIP R 0 OHM J 1/16W	
R88			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R89			RK73GB1J821J	CHIP R 820 J 1/16W	
R90,91			RK73GB1J332J	CHIP R 3.3K J 1/16W	
R92			RK73GB1J100J	CHIP R 10 J 1/16W	
R93			RK73GB1J332J	CHIP R 3.3K J 1/16W	
R94			RK73GB1J221J	CHIP R 220 J 1/16W	
R95			RK73GB1J222J	CHIP R 2.2K J 1/16W	M

PARTS LIST / 零件表

TX-RX UNIT (X57-6170-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination
R95			RK73GB1J561J	CHIP R 560 J 1/16W	M4
R96			RK73GB1J181J	CHIP R 180 J 1/16W	
R97			RK73GB1J183J	CHIP R 18K J 1/16W	
R98			RK73GB1J473J	CHIP R 47K J 1/16W	
R99			RK73GB1J684J	CHIP R 680K J 1/16W	
R100			RK73GB1J473J	CHIP R 47K J 1/16W	
R101			RK73GB1J104J	CHIP R 100K J 1/16W	
R102,103			RK73GB1J272J	CHIP R 2.7K J 1/16W	
R104			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R105			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R106			RK73GB1J272J	CHIP R 2.7K J 1/16W	
R107			RK73GB1J470J	CHIP R 47 J 1/16W	
R108			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R109			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R110,111			RK73GB1J103J	CHIP R 10K J 1/16W	
R112			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R113			RK73GB1J391J	CHIP R 390 J 1/16W	
R114,115			RK73GB1J103J	CHIP R 10K J 1/16W	
R116,117			RK73GB1J153J	CHIP R 15K J 1/16W	
R118			RK73GB1J473J	CHIP R 47K J 1/16W	
R119			R92-1252-05	CHIP R 0 OHM J 1/16W	
R120,121			RK73GB1J473J	CHIP R 47K J 1/16W	
R122			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R123			RK73GB1J104J	CHIP R 100K J 1/16W	
R124			RK73GB1J334J	CHIP R 330K J 1/16W	
R126			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R127			RK73GB1J333J	CHIP R 33K J 1/16W	
R128			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R129			RK73GB1J224J	CHIP R 220K J 1/16W	
R130			R92-1252-05	CHIP R 0 OHM J 1/16W	
R131			RK73GB1J101J	CHIP R 100 J 1/16W	
R132			RK73GB1J104J	CHIP R 100K J 1/16W	
R133			R92-1252-05	CHIP R 0 OHM J 1/16W	
R135			RK73GB1J100J	CHIP R 10 J 1/16W	
R137			RK73GB1J101J	CHIP R 100 J 1/16W	
R138			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R139			RK73GB1J151J	CHIP R 150 J 1/16W	
R140			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R142			R92-1252-05	CHIP R 0 OHM J 1/16W	
R143			RK73GB1J184J	CHIP R 180K J 1/16W	
R144			R92-1252-05	CHIP R 0 OHM J 1/16W	
R145			RK73GB1J474J	CHIP R 470K J 1/16W	
R146			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R147			RK73GB1J470J	CHIP R 47 J 1/16W	
R148			RK73GB1J220J	CHIP R 22 J 1/16W	
R149			RK73GB1J104J	CHIP R 100K J 1/16W	
R150			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R151			RK73GB1J473J	CHIP R 47K J 1/16W	
R152			RK73GB1J823J	CHIP R 82K J 1/16W	
R153			RK73GB1J104J	CHIP R 100K J 1/16W	
R154			RK73GB1J564J	CHIP R 560K J 1/16W	
R155			RK73GB1J473J	CHIP R 47K J 1/16W	
R156			RN73GH1J683D	CHIP R 68K D 1/16W	
R157			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R158			R92-1252-05	CHIP R 0 OHM J 1/16W	
R159			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R160			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R161			RK73GB1J563J	CHIP R 56K J 1/16W	
R162			RN73GH1J333D	CHIP R 33K D 1/16W	
R163			RN73GH1J274D	CHIP R 270K D 1/16W	

Ref. No.	Address	New parts	Parts No.	Description	Destination
R164			RK73GB1J184J	CHIP R 180K J 1/16W	
R165			RK73GB1J473J	CHIP R 47K J 1/16W	
R166			RK73GB1J103J	CHIP R 10K J 1/16W	
R167			RK73GB1J564J	CHIP R 560K J 1/16W	
R168			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R169			RK73GB1J473J	CHIP R 47K J 1/16W	
R170			RK73GB1J394J	CHIP R 390K J 1/16W	
R171			RK73GB1J474J	CHIP R 470K J 1/16W	
R172			RK73GB1J473J	CHIP R 47K J 1/16W	
R173			RK73GB1J104J	CHIP R 100K J 1/16W	
R174			R92-1252-05	CHIP R 0 OHM J 1/16W	
R175			RK73GB1J103J	CHIP R 10K J 1/16W	
R177			RK73GB1J473J	CHIP R 47K J 1/16W	
R178,179			RK73GB1J104J	CHIP R 100K J 1/16W	
R180			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R181			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R182,183			R92-1252-05	CHIP R 0 OHM J 1/16W	
R184			RK73GB1J333J	CHIP R 33K J 1/16W	
R185			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R186			RK73GB1J155J	CHIP R 1.5M J 1/16W	
R198			RK73GB1J154J	CHIP R 150K J 1/16W	
R199			RK73GB1J103J	CHIP R 10K J 1/16W	
R200			RK73GB1J101J	CHIP R 100 J 1/16W	
R201			R92-1252-05	CHIP R 0 OHM J 1/16W	
R202			RK73GB1J474J	CHIP R 470K J 1/16W	
R203			R92-1252-05	CHIP R 0 OHM J 1/16W	
R204			RK73GB1J104J	CHIP R 100K J 1/16W	
R205			RK73GB1J182J	CHIP R 1.8K J 1/16W	
R206			RK73GB1J471J	CHIP R 470 J 1/16W	
R207			RK73GB1J101J	CHIP R 100 J 1/16W	
R208			RN73GH1J682D	CHIP R 6.8K D 1/16W	
R209			RK73GB1J224J	CHIP R 220K J 1/16W	
R210			RK73GB1J474J	CHIP R 470K J 1/16W	
R211			RK73GB1J103J	CHIP R 10K J 1/16W	
R212			RN73GH1J683D	CHIP R 68K D 1/16W	
R213			RN73GH1J682D	CHIP R 6.8K D 1/16W	
R214			RK73GB1J184J	CHIP R 180K J 1/16W	
R215			RK73GB1J474J	CHIP R 470K J 1/16W	
R218			R92-1252-05	CHIP R 0 OHM J 1/16W	
R219			RK73GB1J273J	CHIP R 27K J 1/16W	
R220,221			RK73GB1J184J	CHIP R 180K J 1/16W	
R222			RK73GB1J153J	CHIP R 15K J 1/16W	
R223			RK73GB1J223J	CHIP R 22K J 1/16W	
R224			RK73GB1J103J	CHIP R 10K J 1/16W	
R225			RK73GB1J153J	CHIP R 15K J 1/16W	
R226			R92-1252-05	CHIP R 0 OHM J 1/16W	
R230			RK73GB1J223J	CHIP R 22K J 1/16W	
R231			RK73GB1J104J	CHIP R 100K J 1/16W	
R232			RK73GB1J182J	CHIP R 1.8K J 1/16W	M
R232,233			R92-1252-05	CHIP R 0 OHM J 1/16W	M4
R233			R92-1252-05	CHIP R 0 OHM J 1/16W	M
R234			RK73GB1J124J	CHIP R 120K J 1/16W	
R235			RK73GB1J334J	CHIP R 330K J 1/16W	
R237			R92-1252-05	CHIP R 0 OHM J 1/16W	
R239			RK73GB1J153J	CHIP R 15K J 1/16W	
R240			RK73GB1J223J	CHIP R 22K J 1/16W	
R241			RK73GB1J334J	CHIP R 330K J 1/16W	
R242			R92-1252-05	CHIP R 0 OHM J 1/16W	
R244			RK73GB1J391J	CHIP R 390 J 1/16W	M4
R244			RK73GB1J561J	CHIP R 560 J 1/16W	M

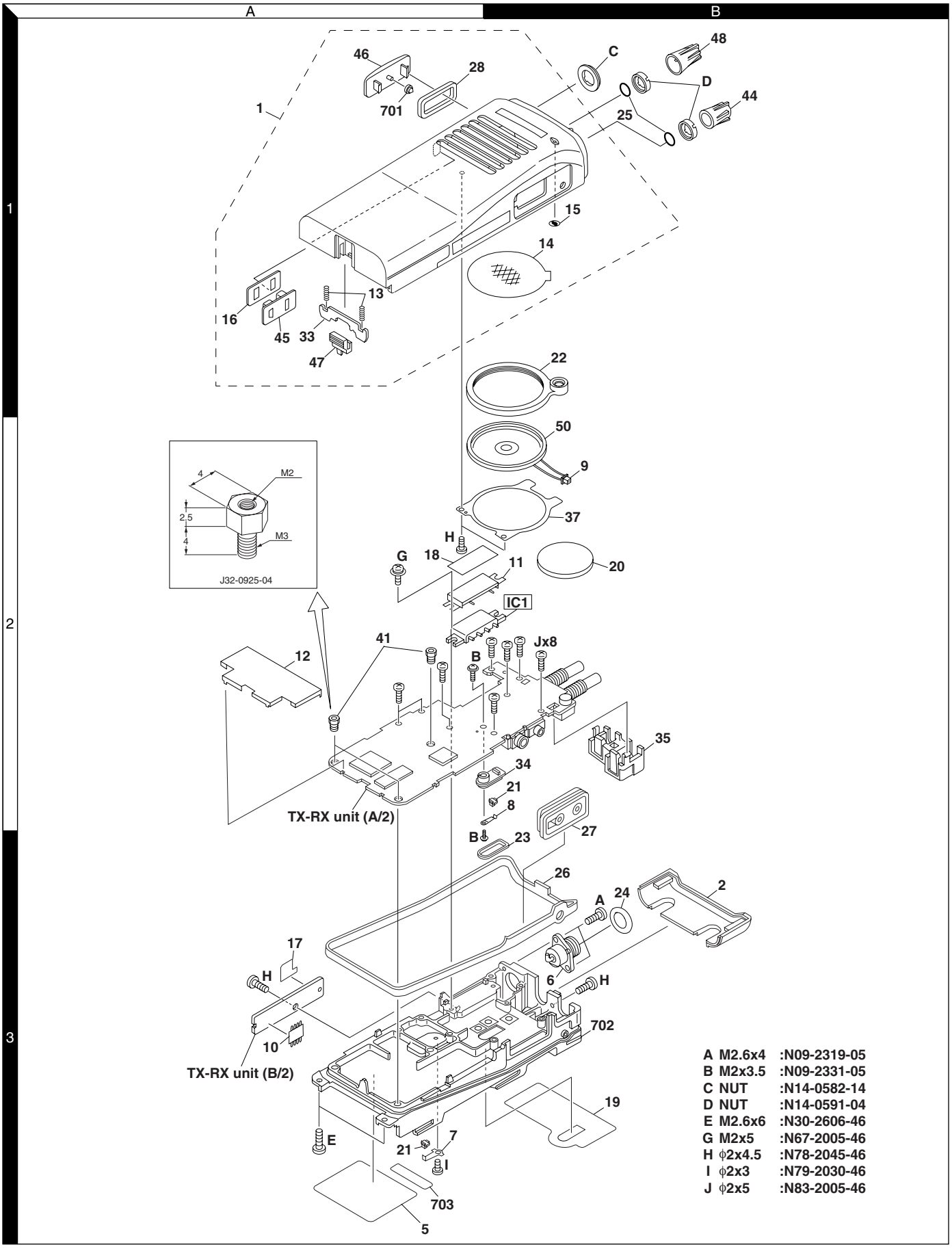
PARTS LIST / 零件表

TX-RX UNIT (X57-6170-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination
R249			R92-1252-05	CHIP R 0 OHM J 1/16W	
R250			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R251			RK73GB1J474J	CHIP R 470K J 1/16W	
R252,253			R92-1252-05	CHIP R 0 OHM J 1/16W	
R254			RK73GB1J184J	CHIP R 180K J 1/16W	
R255			RK73GB1J474J	CHIP R 470K J 1/16W	
R256			R92-1252-05	CHIP R 0 OHM J 1/16W	
R258			R92-1252-05	CHIP R 0 OHM J 1/16W	
R259			RK73GB1J473J	CHIP R 47K J 1/16W	
R260,261			RK73GB1J224J	CHIP R 220K J 1/16W	
R262			RK73GB1J183J	CHIP R 18K J 1/16W	M4
R262			RK73GB1J223J	CHIP R 22K J 1/16W	M
R263-265			RK73GB1J473J	CHIP R 47K J 1/16W	
R266			R92-1252-05	CHIP R 0 OHM J 1/16W	
R267,268			RK73GB1J473J	CHIP R 47K J 1/16W	
R301			R92-0679-05	CHIP R 0 OHM	
R303			RK73GB1J470J	CHIP R 47 J 1/16W	
R304			R92-1252-05	CHIP R 0 OHM J 1/16W	
R305			RK73GB1J102J	CHIP R 1.0K J 1/16W	M
R305			RK73GB1J222J	CHIP R 2.2K J 1/16W	M4
R306			RK73GB1J332J	CHIP R 3.3K J 1/16W	M
R306			RK73GB1J472J	CHIP R 4.7K J 1/16W	M4
R308			R92-1252-05	CHIP R 0 OHM J 1/16W	M4
R309			RK73GB1J101J	CHIP R 100 J 1/16W	
R310			RK73GB1J221J	CHIP R 220 J 1/16W	M4
R310			RK73GB1J331J	CHIP R 330 J 1/16W	M
R311			RK73GB1J104J	CHIP R 100K J 1/16W	M4
R314			RK73GB1J224J	CHIP R 220K J 1/16W	
R315-318			RK73GB1J104J	CHIP R 100K J 1/16W	M4
R318			RK73GB1J104J	CHIP R 100K J 1/16W	M
R326			R92-1252-05	CHIP R 0 OHM J 1/16W	
R600			R92-1252-05	CHIP R 0 OHM J 1/16W	M4
VR1			R12-7491-05	TRIMMING POT.(68K)	
VR3			R12-7491-05	TRIMMING POT.(68K)	
S401			S70-0457-05	TACT SWITCH	
S402,403			S70-0424-05	TACT SWITCH	
MIC1			T91-0627-05	MIC ELEMENT	
D1			MA2S111	DIODE	
D2			MA2S376	VARIABLE CAPACITANCE DIODE	
D3			HVU131	DIODE	
D4			MA2S376	VARIABLE CAPACITANCE DIODE	
D5			HSC277	DIODE	
D6			MA360	VARIABLE CAPACITANCE DIODE	
D7			HSC277	DIODE	M
D7			HVC131	DIODE	M4
D8			HZU5ALL	DIODE	
D9			MA2S376	VARIABLE CAPACITANCE DIODE	
D10			HSC277	DIODE	
D11			MA2S376	VARIABLE CAPACITANCE DIODE	
D12			MA2S111	DIODE	
D13,14			DAN235E	DIODE	
D15			HSC277	DIODE	
D16			MA2S111	DIODE	
D19			MA2S111	DIODE	
D21			1SS373	DIODE	
D22			1SR154-400	DIODE	
D23			RB706F-40	DIODE	
D302			HVC350B	VARIABLE CAPACITANCE DIODE	M4

Ref. No.	Address	New parts	Parts No.	Description	Destination
D305-307			HVC350B	VARIABLE CAPACITANCE DIODE	M4
IC1			M68732H	IC(RF POWER AMP)	M
IC1			M68732L	IC(RF POWER AMP)	M4
IC2			MB15A02	MOS IC	
IC3			NJM2904V	MOS IC	
IC4			TA31136FN	MOS IC	
IC5,6			BU4094BCFV	MOS IC	
IC7			S-81350HG-KD	MOS IC	
IC8			PST9140NR	MOS IC	
IC9			RN5VL45C	MOS IC	
IC10			AT2408N10SI2.5	ROM IC	
IC10			24LC08BT-ISN	ROM IC	
IC11			TA7368F	MOS IC	
IC12			AT29C020-90TI	ROM IC	
IC12			W29C020C90	SRAM IC	
IC13			30622M4A-439GP	MPU	
IC14			TC35453F	MOS IC	
IC15			TA75W01FU	MOS IC	
IC16			TC75W51FU	MOS IC	
IC17			X9C103SI	ANALOG IC	
IC18			LC73872M	MOS IC	
IC19			TA75W01FU	MOS IC	
Q1			2SC5108(Y)	TRANSISTOR	
Q2			2SC4226(R24)	TRANSISTOR	
Q3-5			2SC5108(Y)	TRANSISTOR	
Q6			2SC4988	TRANSISTOR	
Q7			2SJ243	FET	
Q8			UMC4N	TRANSISTOR	
Q9			DTC144EE	DIGITAL TRANSISTOR	
Q10			2SK508NV(K52)	FET	
Q11			2SC4617(S)	TRANSISTOR	
Q12			2SC4649(N,P)	TRANSISTOR	
Q13,14			DTA144EE	DIGITAL TRANSISTOR	
Q15			DTC114EE	DIGITAL TRANSISTOR	
Q16			DTA114YE	DIGITAL TRANSISTOR	
Q17			DTC144EE	DIGITAL TRANSISTOR	
Q18			FP210	TRANSISTOR	
Q19			3SK228	FET	
Q20,21			UMG3N	TRANSISTOR	
Q22			2SC4619	TRANSISTOR	
Q23			UMC4N	TRANSISTOR	
Q24,25			DTC114EE	DIGITAL TRANSISTOR	
Q26			DTA114EE	DIGITAL TRANSISTOR	
Q27			UPA572T	FET	
Q28			DTA114YE	DIGITAL TRANSISTOR	
Q30			2SK1588	FET	
Q31			2SC4619	TRANSISTOR	
Q32			2SA1362(GR)	TRANSISTOR	
Q33,34			DTC144EE	DIGITAL TRANSISTOR	
Q35			UPA672T	FET	
Q36			2SK1824	FET	
Q301			3SK228	FET	

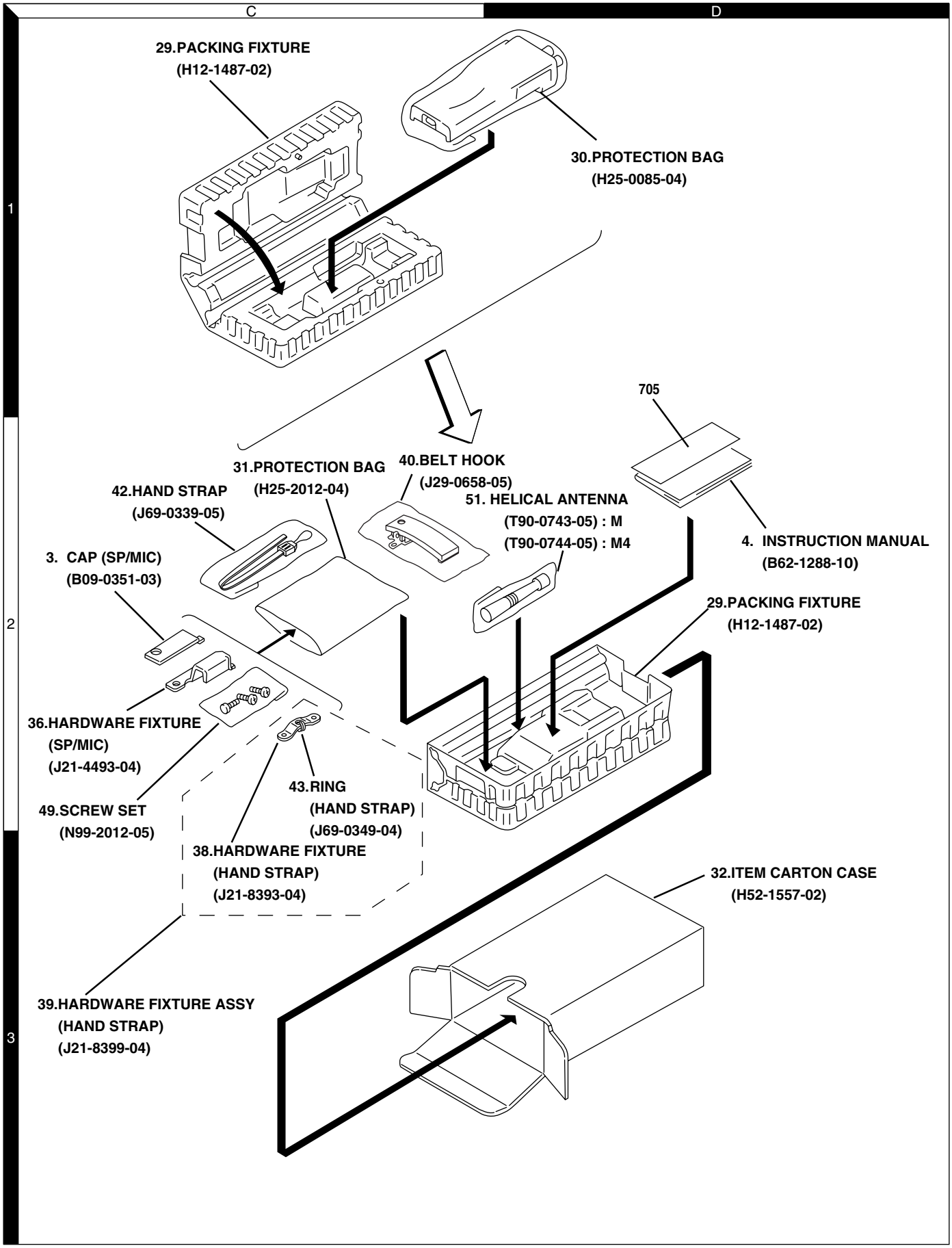
EXPLODED VIEW / 部件分解图



A	M2.6x4	:N09-2319-05
B	M2x3.5	:N09-2331-05
C	NUT	:N14-0582-14
D	NUT	:N14-0591-04
E	M2.6x6	:N30-2606-46
G	M2x5	:N67-2005-46
H	ϕ2x4.5	:N78-2045-46
I	ϕ2x3	:N79-2030-46
J	ϕ2x5	:N83-2005-46

Parts with the exploded numbers larger than 700 are not supplied.

PACKING / 包装


C
D
1
2
3
29.PACKING FIXTURE
(H12-1487-02)
30.PROTECTION BAG
(H25-0085-04)
705
31.PROTECTION BAG
(H25-2012-04)
40.BELT HOOK
(J29-0658-05)
42.HAND STRAP
(J69-0339-05)
51. HELICAL ANTENNA
(T90-0743-05) : M
(T90-0744-05) : M4
4. INSTRUCTION MANUAL
(B62-1288-10)
3. CAP (SP/MIC)
(B09-0351-03)
29.PACKING FIXTURE
(H12-1487-02)
36.HARDWARE FIXTURE
(SP/MIC)
(J21-4493-04)
49.SCREW SET
(N99-2012-05)
43.RING
(HAND STRAP)
(J69-0349-04)
38.HARDWARE FIXTURE
(HAND STRAP)
(J21-8393-04)
32.ITEM CARTON CASE
(H52-1557-02)
39.HARDWARE FIXTURE ASSY
(HAND STRAP)
(J21-8399-04)

ADJUSTMENT / 调整

Test Equipment Required for Alignment

Test Equipment	Major Specifications	
1. Standard Signal Generator (SSG)	Frequency Range	400 to 470MHz
	Modulation	Frequency modulation and external modulation.
	Output	-127dBm/0.1μV to greater than -47dBm/1mV
2. Power Meter	Input Impedance	50Ω.
	Operation Frequency	400 to 470MHz or more.
	Measurement Range	Vicinity of 10W
3. Deviation Meter	Frequency Range	400 to 470MHz.
4. Digital Volt Meter (DVM)	Measuring Range	10mV to 10V DC
	Input Impedance	High input impedance for minimum circuit loading.
5. Oscilloscope		DC through 30MHz.
6. High Sensitivity Frequency Counter	Frequency Range	10Hz to 1000MHz.
	Frequency Stability	0.2ppm or less.
7. Ammeter		5A.
8. AF Volt Meter (AF VTVM)	Frequency Range	50Hz to 10kHz.
	Voltage Range	1mV to 10V.
9. Audio Generator (AG)	Frequency Range	50Hz to 5kHz or more.
	Output	0 to 1V.
10. Distortion Meter	Capability	3% or less at 1kHz.
	Input Level	50mV to 10Vrms.
11. Spectrum Analyzer	Measuring Range	DC to 1GHz or more
12. Tracking Generator	Center frequency	50kHz to 600MHz
	Output Voltage	100mV or more
13. 8W Dummy Load		Approx. 8Ω, 3W.
14. Regulated Power Supply		5V to 10V, approx. 3A
		Useful if ammeter equipped.

所需的用于调整的测试设备

测试设备	主要特性	
1. 标准信号发生器 (SSG)	频率范围	400 到 470MHz
	调制	调频和外部调制
	输出	-127dBm/0.1 μ V 到大于 -47dBm/1mV
2. 功率计	输入阻抗	50 Ω
	操作频率	400 到 470MHz 或更高
	测量范围	10W 左右
3. 偏差仪	频率范围	400 到 470MHz
4. 数字电压表（DVM）	测量范围	直流 10mV 到 10V
	输入阻抗	为最小电路负载高输入阻抗
5. 示波器		直流到 30MHz
6. 高灵敏度频率计数器	频率范围	10Hz 到 1000MHz
	频率稳定性	0.2ppm 或更低
7. 电流表		5A.
8. 音频电压表（AF VTVM）	频率范围	50Hz 到 10kHz
	电压范围	1mV 到 10V
9. 音频发生器（AG）	频率范围	50Hz 到 5kHz 或更高
	输出	0 到 1V
10. 失真测试仪	容量	在 1kHz 时 3 % 或更低
	输入电平	50mV 到 10Vrms
11. 频谱分析仪	测量范围	直流到 1GHz 或更高
12. 轨迹发生器	中心频率	50kHz 到 600MHz
	输出电压	100mV 或更高
13. 8 Ω假负载		大约 8 Ω，3W
14. 可调电源		5V 到 10V，大约 3A
		配备了电流表时有用

ADJUSTMENT / 调整

■ The following parts are required for adjustment

1. Antenna connector adapter

The antenna connector of this radio uses an SMA terminal.

Use an antenna connector adapter [SMA(f) – BNC(f) or SMA(f) – N(f)] for adjustment. (The adapter is not provided as an option, so buy a commercially-available one.)

Note

When the antenna connector adapter touches the knob, draw out the knob to mount the connector.

Repair Jig (Chassis)

1. Jig (chassis : Part No. A10-4009-03) for adjustment.
2. Use the jig as follows.
   ① Place the TX-RX unit on the jig and fix it with thirteen screws ❶.
   ② Solder the antenna terminal of the TX-RX unit.
3. Supply power from an external power supply.
   Relay terminal : + (7.5V)
   Jig (Chassis) : -

■ 下面是调整时所需的部件

1. 天线接口转换头

此手持机的天线接口使用 SMA 终端。

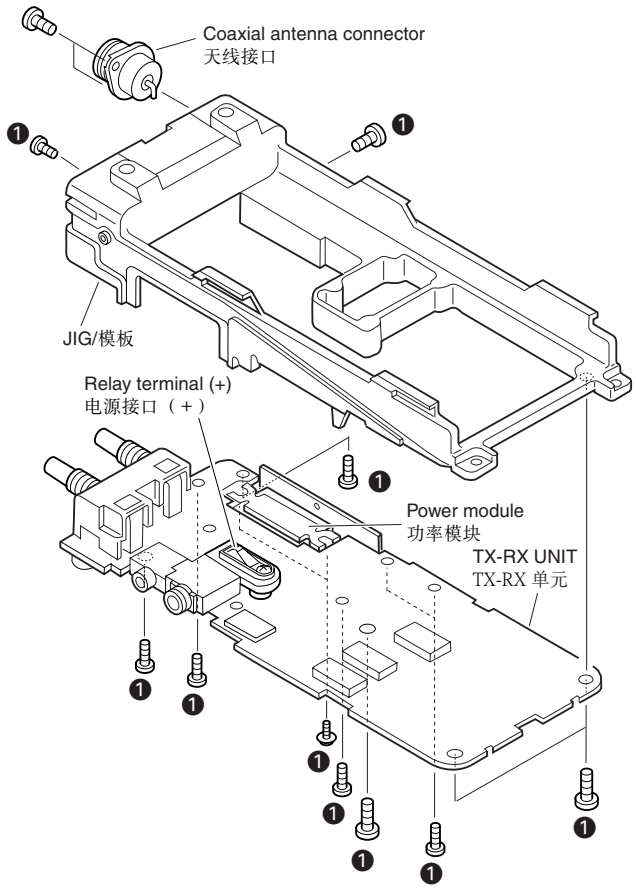
使用天线接口转换头[SMA（f）-BNC（f）或 SMA（f）-N（f）]进行调整。（转换头不作为可选件提供，因此请购买商用转换头。）

注释

当天线接口转换头接触到其他旋钮时 · 拔出该旋钮并安装转换头。

维修模板（机架）

1. 用于调整的模板（机架：部件号码 A10-4009-03）
2. 按下述方法使用模板。
   ①将 TX-RX 单元放置在模板上并使用 13 颗螺钉拧紧 ❶。
   ②将 TX-RX 单元的天线焊点焊好。
3. 供电来自于外部稳压电源。
   电源接口 : +（7.5V）
   模板（机架）: -



ADJUSTMENT / 调整

■ Frequency and signalling

The set has been adjusted for the frequencies shown in the following table. When required, re-adjust them following the adjustment procedure to obtain the frequencies you want in actual operation.

Frequency (MHz)

	M		M4	
Channel No.	RX	TX	RX	TX
1	460. 05000	460. 00000	410.05000	410.00000
2	450. 05000	450. 00000	400.05000	400.00000
3	469. 95000	470. 00000	419.95000	420.00000
4	460. 00000	460. 00000	410.00000	410.00000
5	460. 20000	460. 20000	410.20000	410.20000
6	460. 40000	460. 40000	410.40000	410.40000

Signalling

Signalling No.	RX	TX
1	None	None
2	None	100Hz square wave
3	QT 67.0Hz	QT 67.0Hz
4	QT 151.4Hz	QT 151.4Hz
5	QT 210.7Hz	QT 210.7Hz
6	QT 250.3Hz	QT 250.3Hz
7	DQT D023N	DQT D023N
8	DQT D754I	DQT D754I
9	DTMF DEC, (159D)	DTMF ENC, (159D)
10	None	DTMF tone 9
11	2 tone 321.7/928.1Hz	None
12	Single tone 1200Hz	Single tone 1200Hz

- **Preparations for tuning the transceiver**

Before attempting to tune the transceiver, connect the unit to a suitable power supply.

Whenever the transmitter is tuned, the unit must be connected to a suitable dummy load (i.e. power meter).

The speaker output connector must be terminated with a 8Ω dummy load and connected to an AC voltmeter and an audio distortion meter or a SINAD measurement meter at all times during tuning.

Adjustment Frequency (M)

	450-470(MHz)	
TEST Ch	RX frequency (MHz)	TX frequency (MHz)
Low	450.05000	450.00000
Low'	455.05000	455.00000
Center	460.05000	460.00000
High'	465.05000	465.00000
High	469.95000	470.00000

Adjustment Frequency (M4)

	400-420(MHz)	
TEST Ch	RX frequency (MHz)	TX frequency (MHz)
Low	400.05000	400.00000
Low'	405.05000	405.00000
Center	410.05000	410.00000
High'	415.05000	415.00000
High	419.95000	420.00000

Adjustment Frequency for EXT CTCSS input

M	458.00000MHz
M4	410.00000MHz

■ 频率和信令

为下表所列的频率调整设定。需要时，按照调整步骤重新调整以获得用户在实际操作中想要的频率。

频率（MHz）

	M		M4	
信道号码	RX	TX	RX	TX
1	460. 05000	460. 00000	410.05000	410.00000
2	450. 05000	450. 00000	400.05000	400.00000
3	469. 95000	470. 00000	419.95000	420.00000
4	460. 00000	460. 00000	410.00000	410.00000
5	460. 20000	460. 20000	410.20000	410.20000
6	460. 40000	460. 40000	410.40000	410.40000

信令

信令号码	接收	发射
1	无	无
2	无	100Hz 方波
3	QT 67.0Hz	QT 67.0Hz
4	QT 151.4Hz	QT 151.4Hz
5	QT 210.7Hz	QT 210.7Hz
6	QT 250.3Hz	QT 250.3Hz
7	DQT D023N	DQT D023N
8	DQT D754I	DQT D754I
9	DTMF DEC,(159D)	DTMF ENC,(159D)
10	无	DTMF 音频 9
11	双音信令 321.7/928.1Hz	无
12	单音信令 1200Hz	单音信令 1200Hz

- **调整手持机的准备**

在进行调整手持机之前，将主机与电源连接。

无论何时调整发射部分，主机必须连接到合适的假负载（或功率仪）。

在整个调整过程中，扬声器输出必须经过 8 Ω假负载并被连接到一个交流电压表和一个音频失真测试仪或一个SINAD测量仪。

面板调谐模式 (M)

	450-470(MHz)	
测试信道	接收频率（MHz）	发射频率（MHz）
Low	450.05000	450.00000
Low'	455.05000	455.00000
Center	460.05000	460.00000
High'	465.05000	465.00000
High	469.95000	470.00000

面板调谐模式 (M4)

	400-420(MHz)	
测试信道	接收频率（MHz）	发射频率（MHz）
Low	400.05000	400.00000
Low'	405.05000	405.00000
Center	410.05000	410.00000
High'	415.05000	415.00000
High	419.95000	420.00000

EXT CTCSS 输入的调谐频率

M	458.00000MHz
M4	410.00000MHz

ADJUSTMENT

Common Section

Item	Condition	Measurement		Adjustment		Specifications/ Remark
		Test equipment	Terminal	Parts	Method	
1. Setting	1) BATT terminal voltage:7.5V 2) SSG Standard modulation [Wide] MOD:1kHz, DEV:3kHz [Narrow] MOD:1kHz, DEV:1.5kHz					
2. VCO lock voltage RX	1) CH:RX High	Power meter DVM	ANT CV(LV)	TC2	ADJ	4.0V ± 0.1V
	2) CH:RX Low				Check	0.8V or more
TX	3) CH:TX High PTT:ON			TC1	ADJ	4.0V ± 0.1V
	4) CH:TX Low PTT:ON				Check	0.8V or more

Transmitter Section

Item	Condition	Measurement		Adjustment		Specifications/ Remark
		Test equipment	Terminal	Parts	Method	
1. Frequency Adjust	1) TEST CH:TX Center PTT:ON	Freq. Counter	ANT	VR1	Center frequency ± 100 Hz	
2. High Power Check Adjust (PC MODE)	TEST CH: TX Low TX Low' TX Center TX High' TX High Battery terminal voltage:7.5V PTT:ON	Power meter Am meter		PC key		4.2W ± 0.1W 2.2A or less
3. Low Power Adjust (PC MODE)	TEST CH: TX Low TX Low' TX Center TX High' TX High Battery terminal voltage:7.5V PTT:ON					1.0W ± 0.1W 1.0A or less
4. Max DEV Adjust (PC MODE) [Wide]	TEST CH: TX Low TX Center TX High AG:1kHz / 120mV Deviation meter filter LPF:15kHz HPF:OFF PTT:ON	Deviation meter Oscilloscope AG AF VTVM	ANT SP/MIC connector		4.2kHz (According to the larger +,-)	±50Hz
[Narrow]	TEST CH:TX Center PTT:ON				2.1kHz (According to the larger+,-)	
5. External CTCSS Input Balance Adjust	AG:20MHz (Square waves) /600mVpp Deviation meter filter LPF:15kHz HPF:OFF M)151.0MHz M4)143.0MHz PTT:ON	Deviation meter Oscilloscope AG	ANT CN6(CT IN)	VR3	Make the demodulation waves into square waves.	
6. QT TCXO Balance (PC MODE)	TEST CH: TX Low TX Center TX High [240] (Wide/Narrow) PTT:ON	Deviation meter Oscilloscope AG AF VTVM	ANT SP/MIC connector	PC key		

调整

公用部分

项目	条件	测量		调整		规格 / 备注
		测试设备	终端	部件	方法	
1. 设定	1) 电池终端 电压：7.5V 2)SSG 标准 调制 [宽带]MOD:1kHz DEV:3kHz [窄带]MOD:1kHz DEV:1.5kHz					
2. 压控振荡器电压接收	1) 信道:RX High	功率仪 数字电压表	天线 CV（LV）	TC2	调整	4.0V ± 0.1V
	2) 信道:RX Low				检查	0.8V 或更高
发射	3) 信道:TX High PTT:开启			TC1	调整	4.0V ± 0.1V
	4) 信道:TX Low PTT:开启				检查	0.8V 或更高

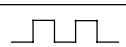
发射部分

项目	条件	测量		调整		规格 / 备注
		测试设备	终端	部件	方法	
1. 频率调整	1) 测试信道:TX Center PTT:开启	频率计数器	天线	VR1	中心频率 ± 100Hz	
2. 高功率调整 (计算机模式)	测试信道: TX Low TX Low' TX Center TX High' TX High 电池终端 电压：7.5V PTT:开启	功率仪 电流表		计算机键		4.2W ± 0.1W 2.2A 或更低
3. 低功率调整 (计算机模式)	测试信道: TX Low TX Low' TX Center TX High' TX High 电池终端 电压：7.5V PTT:开启					1.0W ± 0.1W 1.0A 或更低
4. 最大 DEV 调整 (计算机模式) [宽]	测试信道: TX Low TX Center TX High AG:1kHz/120mV 频偏仪滤波器 LPF:15kHz HPF:关闭 PTT:开启	频偏仪 示波器 音频发生器 音频电压表	天线 扬声器 / 话筒接口		4.2kHz (按照较大 +,-)	± 50Hz
[窄]	测试信道: TX Center PTT:开启				2.1kHz (按照较大 +,-)	
5. 外部CTCSS输入平衡调整	AG=20MHz(方形波)/600mVpp 频偏仪滤波器 LPF:15kHz M)151.0MHz M4)143.0MHz PTT:开启	频偏仪 示波器 音频发生器	天线 CN6(CT IN)	VR3	使调整波形为方形波。	
6. QT TCXO 平衡	测试信道: TX Low TX Center TX High [240] (宽 / 窄) PTT:开启	频偏仪 示波器 音频发生器 音频电压表	天线 扬声器 / 话筒接口	计算机键		

ADJUSTMENT

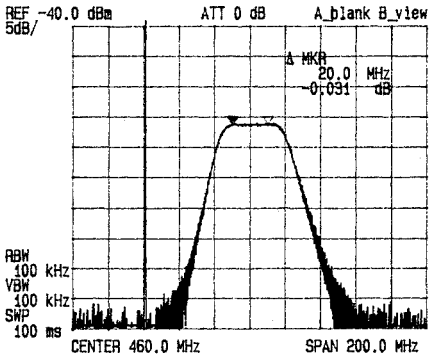
Item	Condition	Measurement		Adjustment		Specifications/ Remark
		Test equipment	Terminal	Parts	Method	
7. DQT TCXO Balance (PC MODE)	TEST CH: TX Low TX Center TX High [180] (Wide/Narrow) PTT:ON	Deviation meter Oscilloscope AG AF VTVM	ANT SP/MIC connector	PC key		
8. DQT VCO Balance Adjust (PC MODE) [Wide]	TEST CH: TX Low TX Center TX High LPF:3kHz HPF:OFF PTT:ON				Make the demodulation waves into square waves.	
[Narrow]	TEST CH: TX Center PTT:ON					
9. QT VCO Balance (PC MODE)	TEST CH: TX Low TX Center TX High $[VQT]=[VDQT] \times \frac{240}{180}$ PTT:ON					
10. QT Deviation Adjust (PC MODE) [Wide]	TEST CH: TX Low TX Center TX High LPF:3kHz HPF:OFF PTT:ON				0.90kHz(M) 0.80kHz(M4)	±40Hz (M) ±20Hz (M4)
[Narrow]	TEST CH: TX Center PTT:ON				0.42kHz	±40Hz
11. DQT Devition Adjust (PC MODE) [Wide]	TEST CH: TX Low TX Center TX High LPF:3kHz HPF:OFF PTT:ON	Power meter Deviation meter Oscilloscope			0.75kHz	±50Hz
[Narrow]	TEST CH: TX Center PTT:ON				0.35kHz	
12. DTMF Deviation Adjust (PC MODE) [Wide]	TEST CH: TX Center LPF:15kHz HPF:OFF PTT:ON				2.5kHz	±0.1kHz
[Narrow]	TEST CH: TX Center PTT:ON				1.25kHz	
13. TONE Deviation Adjust (PC MODE) [Wide]	TEST CH: TX Center LPF:15kHz HPF:OFF PTT:ON				3.0kHz	±0.1kHz
[Narrow]	TEST CH: TX Center PTT:ON				1.5kHz	
14. BATT Detection Writing (PC MODE)	BATT terminal voltage:5.9V	Power meter DVM	ANT BATT terminal	PC key		BATT terminal voltage:5.9V
15. BATT Detection Check (PC MODE)	1) BATT terminal voltage:6.5V PTT:ON				Check	No blinking of LED
	2) BATT terminal voltage:5.7V PTT:ON					Blinking of LED

调整

项目	条件	测量		调整		规格 / 备注
		测试设备	终端	部件	方法	
7. QT TCXO 平衡 (计算机模式)	测试信道: TX Low TX Center TX High [180] (宽 / 窄) PTT:开启	频偏仪 示波器 音频发生器 音频电压表	天线 扬声器 / 话筒接口	计算机键		
8. DQT 压控振荡器 平衡 调整 (计算机模式) [宽]	测试信道: TX Low TX Center TX High LPF:3kHz HPF:关闭 PTT:开启				使调整波形为方形波。	
[窄]	测试信道: TX Center PTT:开启					
9. QT 压控振荡器 平衡 (计算机模式)	测试信道: TX Low TX Center TX High [VDQT] x $\frac{240}{180}$ =[VQT] PTT:开启					
10. QT 偏差 调整 (计算机模式) [宽]	测试信道: TX Low TX Center TX High LPF:3kHz HPF:关闭 PTT:开启				0.90kHz (M) 0.80kHz (M4)	± 40Hz (M) ± 20Hz (M4)
[窄]	测试信道: TX Center PTT:开启				0.42kHz	± 40Hz
11. DQT 频偏 调整 (计算机模式) [宽]	测试信道: TX Low TX Center TX High PTT:开启 LPF:3kHz HPF:关闭	功率仪 频偏仪 示波器			0.75kHz	± 50Hz
[窄]	测试信道: TX Center PTT:开启				0.35kHz	
12. DTMF 频偏 调整 (计算机模式) [宽]	测试信道: TX Center LPF:15kHz HPF:关闭 PTT:开启				2.5kHz	± 0.1kHz
[窄]	测试信道: TX Center PTT:开启				1.25kHz	
13. TONE 频偏 调整 (计算机模式) [宽]	测试信道: TX Center LPF:15kHz HPF:关闭 PTT:开启				3.0kHz	± 0.1kHz
[窄]	测试信道: TX Center PTT:开启				1.5kHz	
14. 电池 检测 写入 (计算机模式)	电池终端电压：5.9V	功率仪 数字电压表	天线 电池终端	计算机键		电池终端 电压：5.9V
15. 电池 检测 检查 (计算机模式)	电池终端电压：6.5V PTT：开启				检查	LED 不闪烁
	电池终端电压：5.7V PTT：开启					LED 闪烁

ADJUSTMENT

Receiver Section

Item	Condition	Measurement		Adjustment		Specifications/ Remark
		Test equipment	Terminal	Parts	Method	
M type						
1. BPF Adjustment	TEST CH : RX Center Tra-G setting -40dBm	Tracking generator Spectrum analyzer	ANT BPF	TC301, TC302, TC303	Adjust wave form to figure 1.	
						
		Fig. 1 BPF-WAVE				
2. Sensitivity Check	1) TEST CH : RX Center SSG OUT AF VTVM Wide:-118dBm (0.28µV) (MOD:1kHz / ±3kHz) Narrow:-117dBm (0.316µV) (MOD:1kHz / ±1.5kHz)	SSG Oscilloscope	ANT		Check	12dB SINAD or more
3. Squelch (Open) Adjust (PC MODE) [Wide]	1) TEST CH : RX Center SSG OUT: -123dBm (0.158µV)			PC key	Adjust to the squelch threshold point	
[Narrow]	2) TEST CH : RX Center SSG OUT: -122dBm (0.178µV)					
4. Squelch(Tight) Adjust (PC MODE) [Wide]	1) TEST CH : RX Center SSG OUT:-116dBm (0.35µV)				Adjust to the squelch threshold point	
[Narrow]	2) TEST CH : RX Center SSG OUT:-115dBm (0.398µV)					
5. Squelch Check (PC MODE)	1) TEST CH : RX Center SQ Level : [SQL5] SSG OUT: -118dBm (0.28µV)				Check	Squelch must be opened.
	2) SSG OUT:OFF					Squelch must be closed.

调整

接收部分

项目	条件	测量		调整		规格 / 备注
		测试设备	终端	部件	方法	
M type						
1. BPF 调整	测试信道：RX Center Tra-G 设定 -40dBm	轨迹发生器 频谱分析仪	天线 BPF	TC301，TC302， TC303	按图 1 调整波形。	
2. 灵敏度 检查	1）测试信道：RX Center 标准信号发生器输出 宽：-118dBm（0.28μV） （MOD：1kHz/(± 3kHz） 窄：-117dBm（0.316μV） （MOD：1kHz/(± 1.5kHz）	标准信号发生器 音频电压表 示波器	天线		检查	12dB SINAD 或更高
3. 静噪抑制电路（打开）调整 (计算机模式) [宽]	1）测试信道：RX Center 标准信号发生器输出： -123dBm （0.158μV）			计算机键	调整到噪音抑制电路临限点	
[窄]	2）测试信道：RX Center 标准信号发生器输出： -122dBm （0.178μV）					
4. 静噪抑制电路（密闭）调整 (计算机模式) [宽]	1）测试信道：RX Center 标准信号发生器输出： -116dBm（0.35μV）				调整到静噪临限点	
[窄]	2）测试信道：RX Center 标准信号发生器输出： -115dBm（0.398μV）					
5. 静噪抑制电路检查 (计算机模式)	1）测试信道：RX Center SQ 电平 :[SQL5] 标准信号发生器输出： -118dBm（0.28μV）				检查	静噪必须被打开。
	2）标准信号发生器输出：关闭					静噪必须被关闭。

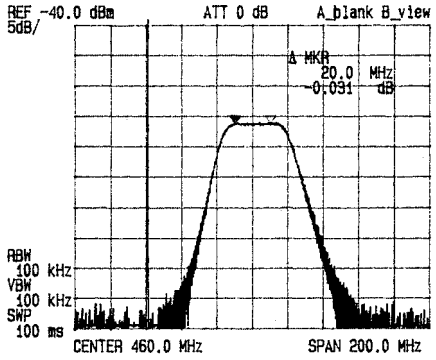
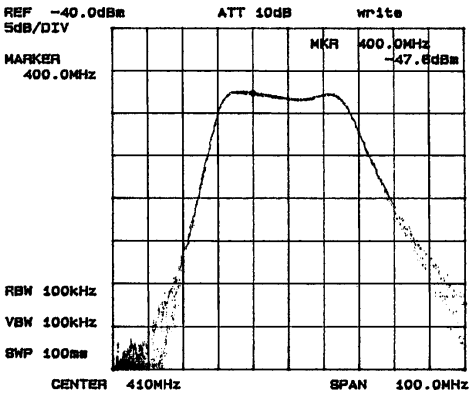
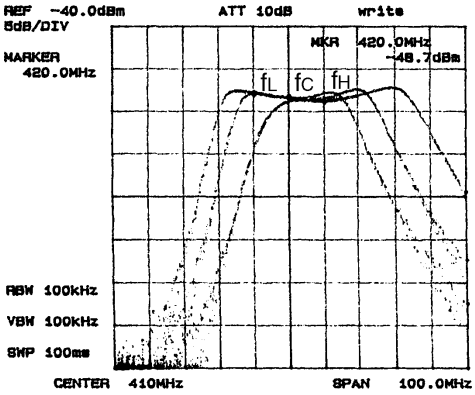


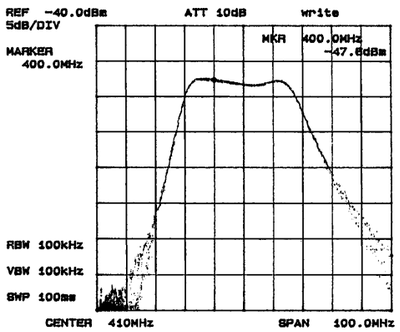
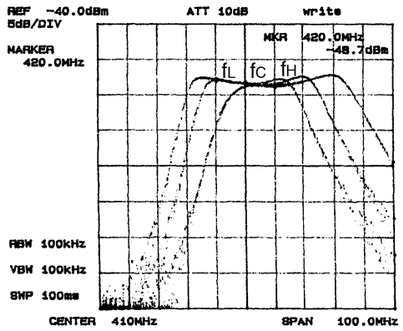
图 1 BPF 波形

ADJUSTMENT

Item	Condition	Measurement		Adjustment		Specifications/ Remark
		Test equipment	Terminal	Parts	Method	
M4 type						
1. Sensitivity Adjustment (PC MODE)	f_L : Low f_C : Center f_H : High	DVM		PC key	f_L : [55] f_C : [100] f_H : [160]	
2. BPF	TEST CH : Low Tra-G setting -40dBm	Tracking generator spectrum analyzer	ANT BPF	TC301, TC302, TC303	Adjust wave form to figure 1.(f_L)	
	TEST CH : Center				Check wave form to figure 2.(f_C)	
	TEST CH : High				Check wave form to figure 2.(f_H)	
	 Fig. 1 BPF-WAVE  Fig. 2					
3. Sensitivity Check	1) TEST CH : Center SSG OUT AF VTVM Wide:-118dBm (0.28µV) (MOD:1kHz / ±3kHz) Narrow:-117dBm (0.316µV) (MOD:1kHz / ±1.5kHz)	SSG Oscilloscope	ANT		Check more	12dB SINAD or
4. Squelch (Open) Adjust (PC MODE) [Wide]	1) TEST CH : Center SSG OUT: -123dBm (0.158µV)			PC key	Adjust to the squelch threshold point	
[Narrow]	2) TEST CH : Center SSG OUT: -122dBm (0.178µV)					
5. Squelch(Tight) Adjust (PC MODE) [Wide]	1) TEST CH : Center SSG OUT:-116dBm (0.35µV)				Adjust to the squelch threshold point	
[Narrow]	2) TEST CH : Center SSG OUT:-115dBm (0.398µV)					
6. Squelch Check (PC MODE)	1) TEST CH : Center SQ Level : [SQL5] SSG OUT: -118dBm (0.28µV)				Check	Squelch must be opened.
	2) SSG OUT:OFF					Squelch must be closed.

TK-378G

调整

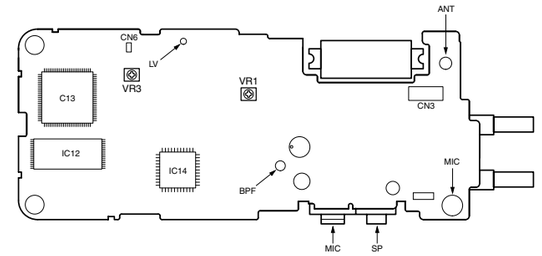
项目	条件	测量		调整		规格 / 备注
		测试设备	终端	部件	方法	
M4 type						
1. BPF 调整 (计算机模式)	fL : Low fc : Center fH : High	数字电压表		计算机键	fL : [55] fc : [100] fH : [160]	
2. BPF	测试信道：Low Tra-G setting -40dBm	轨迹发生器 频谱分析仪	天线 BPF	TC301, TC302, TC303	按图 1 调整波形。(fL)	
	测试信道：Center				按图 2 调整波形。(fc)	
	测试信道：High				按图 2 调整波形。(fH)	
	 图 1 BPF 波形				 图 2	
3. 灵敏度 检查	1）测试信道：Center 标准信号发生器输出 宽：-118dBm（0.28μV） （MOD：1kHz/(± 3kHz） 窄：-117dBm（0.316μV） （MOD：1kHz/(± 1.5kHz）	标准信号发生器 音频电压表 示波器	天线		检查	12dB SINAD 或更高
4. 静噪抑制电路（打开）调整 (计算机模式) [宽]	1）测试信道：Center 标准信号发生器输出： -123dBm （0.158μV）			计算机键	调整到噪音抑制电路临限点	
[窄]	2）测试信道：Center 标准信号发生器输出： -122dBm （0.178μV）					
5. 静噪抑制电路（密闭）调整 (计算机模式) [宽]	1）测试信道：Center 标准信号发生器输出： -116dBm（0.35μV）				调整到静噪临限点	
[窄]	2）测试信道：Center 标准信号发生器输出： -115dBm（0.398μV）					
6. 静噪抑制电路检查 (计算机模式)	1）测试信道：Center SQ 电平 :[SQL5] 标准信号发生器输出： -118dBm（0.28μV）				检查	静噪必须被打开。
	2）标准信号发生器输出：关闭					静噪必须被关闭。

ADJUSTMENT / 调整

Adjustment points
TX-RX unit (X57-617X-XX)
调整点
TX-RX 单元（X57-617X-XX）

Component side view

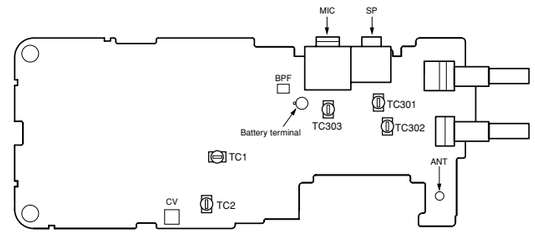
元件侧视图



VR1 : Frequency adjustment
VR1：频率调整
VR3 : External CTCSS Input Balance adjustment
VR3：外部 CTCSS 输入平衡调整

Foil Side View

锡箔面侧视图



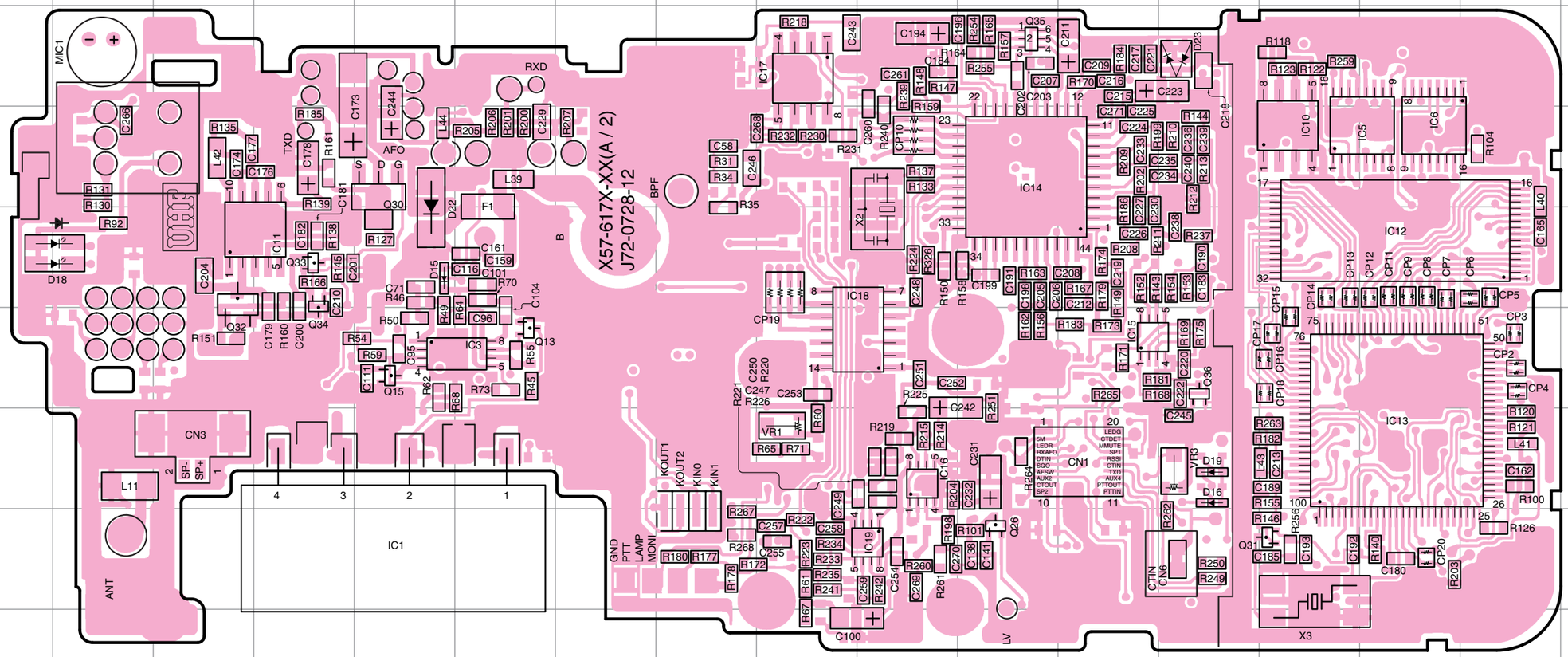
TC1 : Transmit lock voltage adjustment
TC2 : Receive lock voltage adjustment
TC301 :
TC302 : } Band-pass filter waveform adjustment
TC303 :
BPF : Band-pass filter test point
CV(LV) : Lock voltage adjustment terminal.

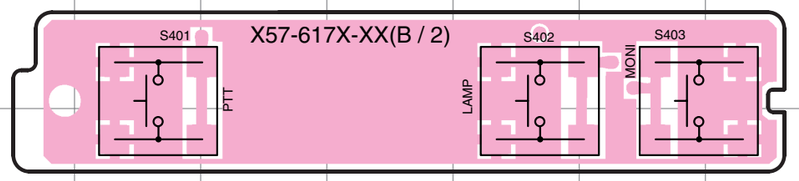
TC1：发射锁定电压调整
TC2：接收锁定电压调整
TC301：
TC302： } 带通滤波器波形调整
TC303：
BPF：带通滤波器测试点
CV（LV）：锁定电压调整终端。

Fig. 3 Adjustment points / 图 3 调整点

TK-378G **PC BOARD** / PC 板视图

Serial No.4700201 -
TX-RX UNIT (X57-617X-XX) Component Side View (J72-0728-12)
0-20 : M, 0-21 : M4



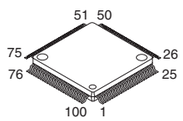


TX-RX UNIT
(X57-617X-XX)

Ref. No.	Address
IC1	8E
IC3	6F
IC5	4O
IC6	4O
IC10	4N
IC11	5D
IC12	5O
IC13	7O
IC14	4K
IC15	6L
IC16	7J
IC17	3I
IC18	6J
IC19	8J
Q13	6F
Q15	6E
Q26	8K
Q30	4E
Q31	8N
Q32	5C
Q33	5D
Q34	5D
Q35	3K
Q36	6M
D15	5E
D16	7M
D19	7M
D22	4E
D23	3M

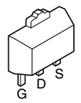
Component side
Layer 1
Layer 2
Layer 3
Layer 4
Foil side

30622M4A-439GP

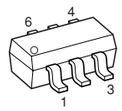


DTA114EE
DTA144EE
DTC114EE
DTC144EE
2SA1362
2SC4619

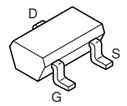
2SK1588



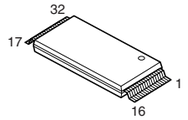
UPA672T



2SK1824



AT29C020-90TI



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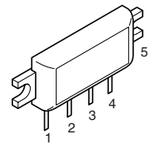

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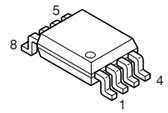
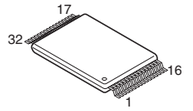


W29C020-90TI



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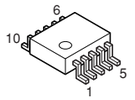
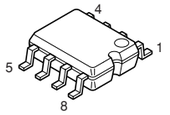


AT2408N10SI2.5



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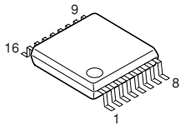

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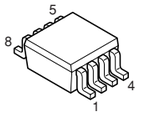
TC75W51FU



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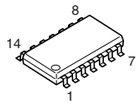

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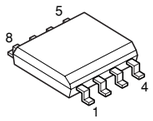

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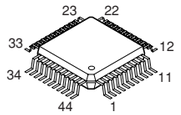

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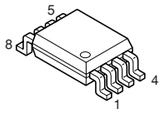
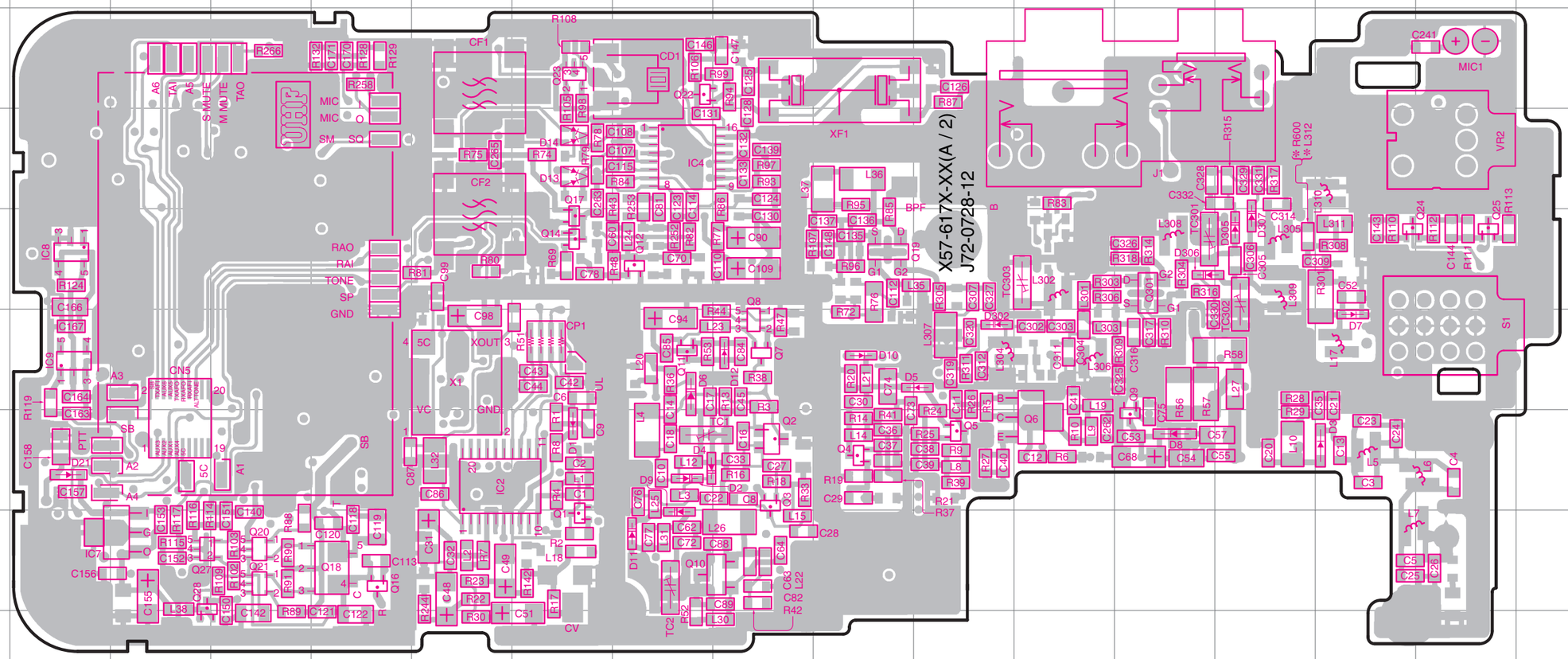
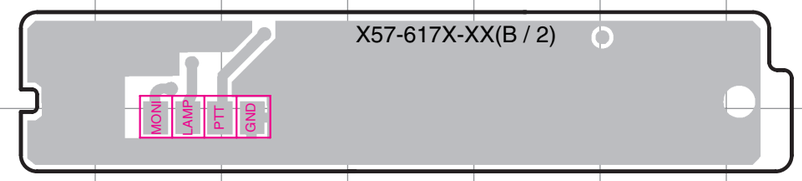


TX-RX UNIT
(X57-617X-XX)

Ref. No.	Address
IC2	7H
IC4	4J
IC7	8E
IC8	6D
IC9	5D
Q1	8I
Q2	7K
Q3	7K
Q4	7L
Q5	7M
Q6	7N
Q7	6K
Q8	6K
Q9	7O
Q10	8K
Q11	6J
Q12	5J
Q14	5I
Q16	8G
Q17	5I
Q18	8G
Q19	5L
Q20	8F
Q21	8F
Q22	3J
Q23	3I
Q24	5Q
Q25	5R
Q27	8E
Q28	8E
Q301	5O
D1	7I
D2	7J
D3	7Q
D4	7J
D5	6M
D6	6J
D7	6Q
D8	7O
D9	8J
D10	6L
D11	8J
D12	6K
D13	4I
D14	4I
D21	7D
D302	6M
D305	5O
D306	5P
D307	5P

Serial No.4700201 -
TX-RX UNIT (X57-617X-XX) Foil Side View (J72-0728-12)
0-20 : M, 0-21 : M4





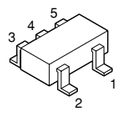
Component side

Layer 1
Layer 2
Layer 3
Layer 4

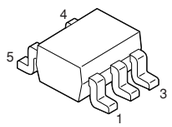
Foil side

DTA114YE
DTA144EE
DTC114EE
DTC144EE
2SC4226
2SC4617
2SC4619
2SC5108

UMC4N



UMG3N



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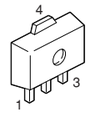

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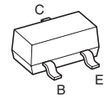
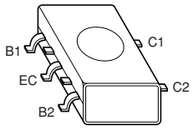
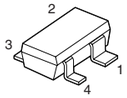


FP210



2SK508NV

3SK228



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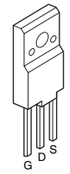

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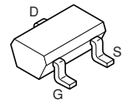
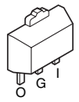


S-81350HG-KD



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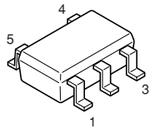
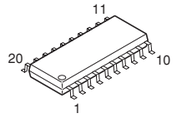
RN5VL45C



MB15A02



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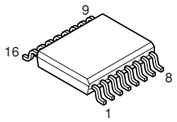
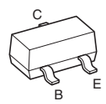


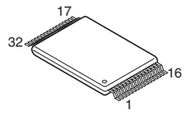
TK-378G **PC BOARD** / PC 板视图

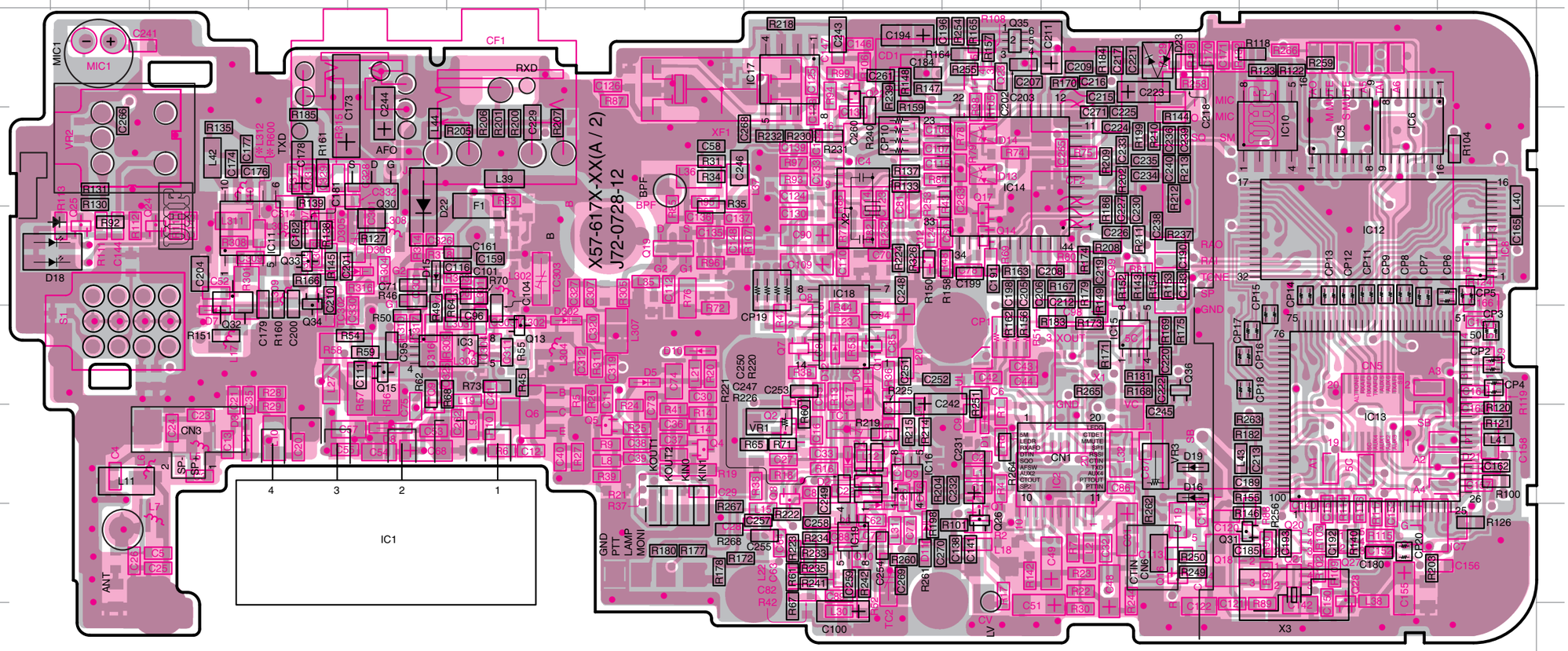
Serial No.4700201 -
TX-RX UNIT (X57-617X-XX) Component Side View + Foil Side View (J72-0728-12)
0-20 : M, 0-21 : M4

2SC4649



W29C020C90





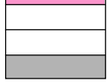
TX-RX UNIT
(X57-617X-XX)

Ref. No.	Address
IC1	8E
IC2	7L
IC3	6F
IC4	4J
IC5	4O
IC6	4O
IC7	8O
IC8	6P
IC9	5D
IC10	4N
IC11	5D
IC12	5O
IC13	7O
IC14	4K
IC15	6L
IC16	7J
IC17	3I
IC18	6J
IC19	8J
Q1	8K
Q2	7I
Q3	7I
Q4	7H
Q5	7G
Q6	7F
Q7	6I
Q8	6I
Q9	7O
Q10	8I
Q11	6J
Q12	5J
Q13	6F
Q14	5K
Q15	6E
Q16	8M
Q17	5K
Q18	8M
Q19	5H
Q20	8N
Q21	8N
Q22	3J

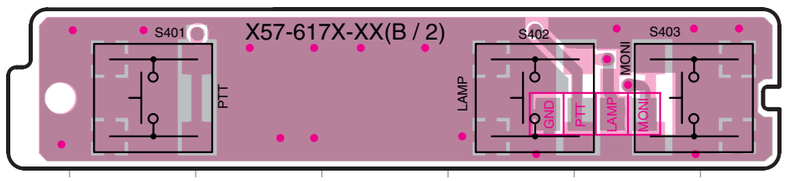
Ref. No.	Address
Q23	3K
Q24	5C
Q25	5B
Q26	8K
Q27	8O
Q28	8O
Q30	4E
Q31	8N
Q32	5C
Q33	5D
Q34	5D
Q35	3K
Q36	6M
D1	7K
D2	7J
D3	7C
D4	7J
D5	6G
D6	6J
D7	6C
D8	7E
D9	8J
D10	6H
D11	8J
D12	6I
D13	4K
D14	4K
D15	5E
D16	7M
D19	7M
D21	7P
D22	4E
D23	3M
D302	6G
D305	5E
D306	5D
D307	5D

● Connect 1 and 4.
Component side

Layer 1
Layer 2
Layer 3
Layer 4

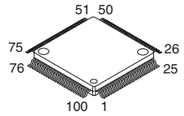


Foil side

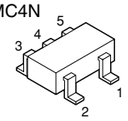


DTA114EE
DTA114YE
DTA144EE
DTC114EE
DTC144EE
2SA1362
2SC4226
2SC4617
2SC4619
2SC5108

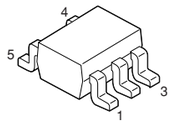
30622M4A-439GP



UMC4N



UMG3N



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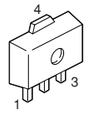
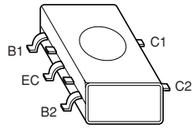


FP210



2SK508NV

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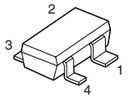

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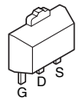

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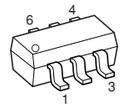

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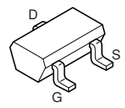
2SK1824



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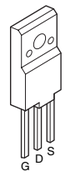

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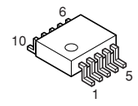
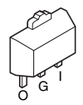


S-81350HG-KD



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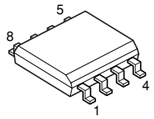
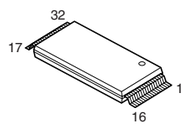
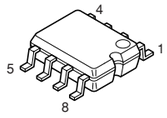


AT29C020-90TI



AT2408N10SI2.5



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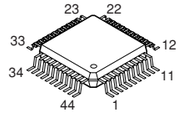

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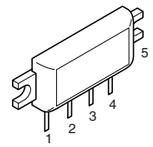
M68732L



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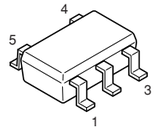

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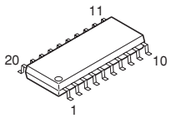

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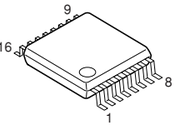

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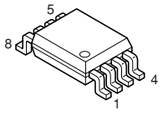

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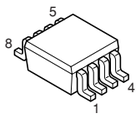

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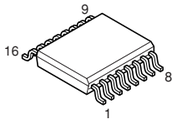

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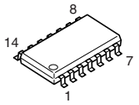

SCHEMATIC DIAGRAM / 原理图

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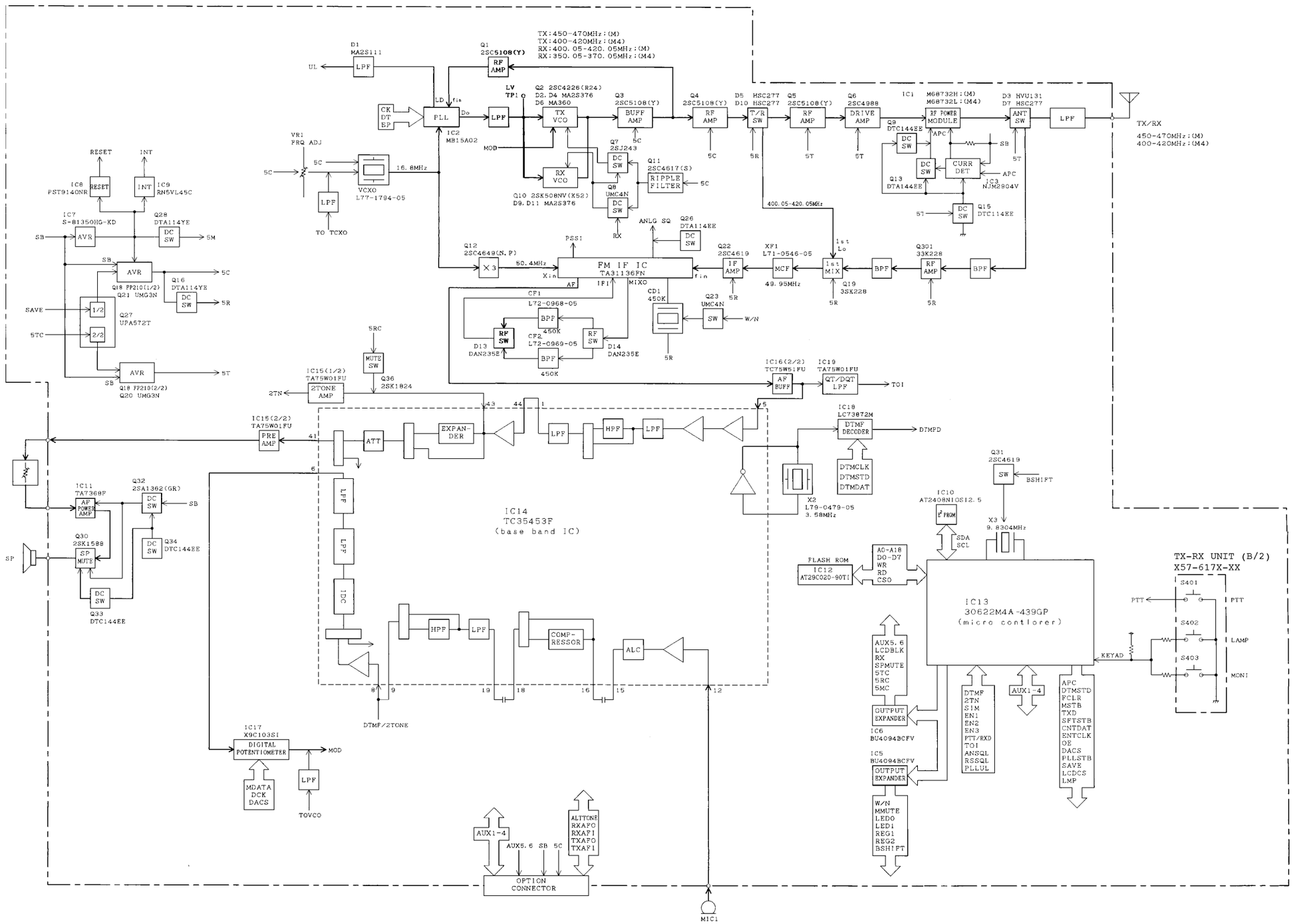
X57-617*-**		IC1	D7	D302	D305	D306	D307	L1	L7	L9	L12	L15	L22	L25	L26	L31	L35	L301	L303	L306	L310	L311	L312	TC303
0-20	M	M68732H	HSC277	NO	NO	NO	NO	18n	4.5T	10n	3.3u	22u	100n	100n	23n	100n	12n	47n	56n	3.5T	3.5T	NO	27n	6p
0-21	M4	M68732L	HVC131	HVC350B	HVC350B	HVC350B	HVC350B	22n	3.5T	12n	27u	27u	180n	180n	33n	180n	27n	56n	22n	NO	NO	8.2n(-53)	NO	3p

X57-617*-**		C3	C4	C5	C10	C11	C12	C16	C18	C20	C21	C23	C24	C25	C26	C28	C30	C33	C51	C52	C72	C77	C82	C116	C136	C302	C303	C304	C305
0-20	M	NO	1p(B)	1p(B)	8p(B)	8p	7p	6p(B)	6p(B)	3p(B)	NO	2p(B)	3p(B)	4p(B)	1.5p(B)	6p	6p	6p(B)	1u	4p(B)	33p(G)	3p(B)	1000p	NO	8p(B)	1p(B)	2p(B)	15p(G)	0.5p(B)
0-21	M4	1p(B)	0.5p(B)	2p(B)	27p(G)	12p	11p	4p(B)	27p	4p(B)	0.5p(B)	5p(B)	8p(B)	8p(B)	2p(B)	7p	8p	8p(B)	4.7u	3p(B)	18p	1p(B)	NO	470p	6p(B)	2p(B)	22p(G)	470p	0.75p(B)

X57-617*-**		C306	C311	C312	C314	C319	C320	C327	C328	C329	C330	C331	C332	R1	R3	R30	R45	R70	R83	R84	R95	R232	R244	R262	R305	R306	R308	R310	R311	R315	R316	R317	R600
0-20	M	0.5p(B)	2p(B)	4p(B)	3p(B)	NO	NO	8p(B)	NO	NO	NO	NO	NO	120k	3.9k	4.7k	2.2k	100k	NO	470k	2.2k	1.8k	560	22k	1.0k	3.3k	NO	330	NO	NO	NO	NO	NO
0-21	M4	0.75p(B)	3p(B)	1p(B)	NO	470p	3p(B)	12p(G)	470p	470p	5p(B)	5p(B)	4p(B)	390k	4.7k	1.5k	5.6k	NO	100k	390k	560	0	390	18k	2.2k	4.7k	0	220	100k	100k	100k	100k	0

Note) Component marked with a dot (●) are Parts of layer 1.

BLOCK DIAGRAM / 方块图



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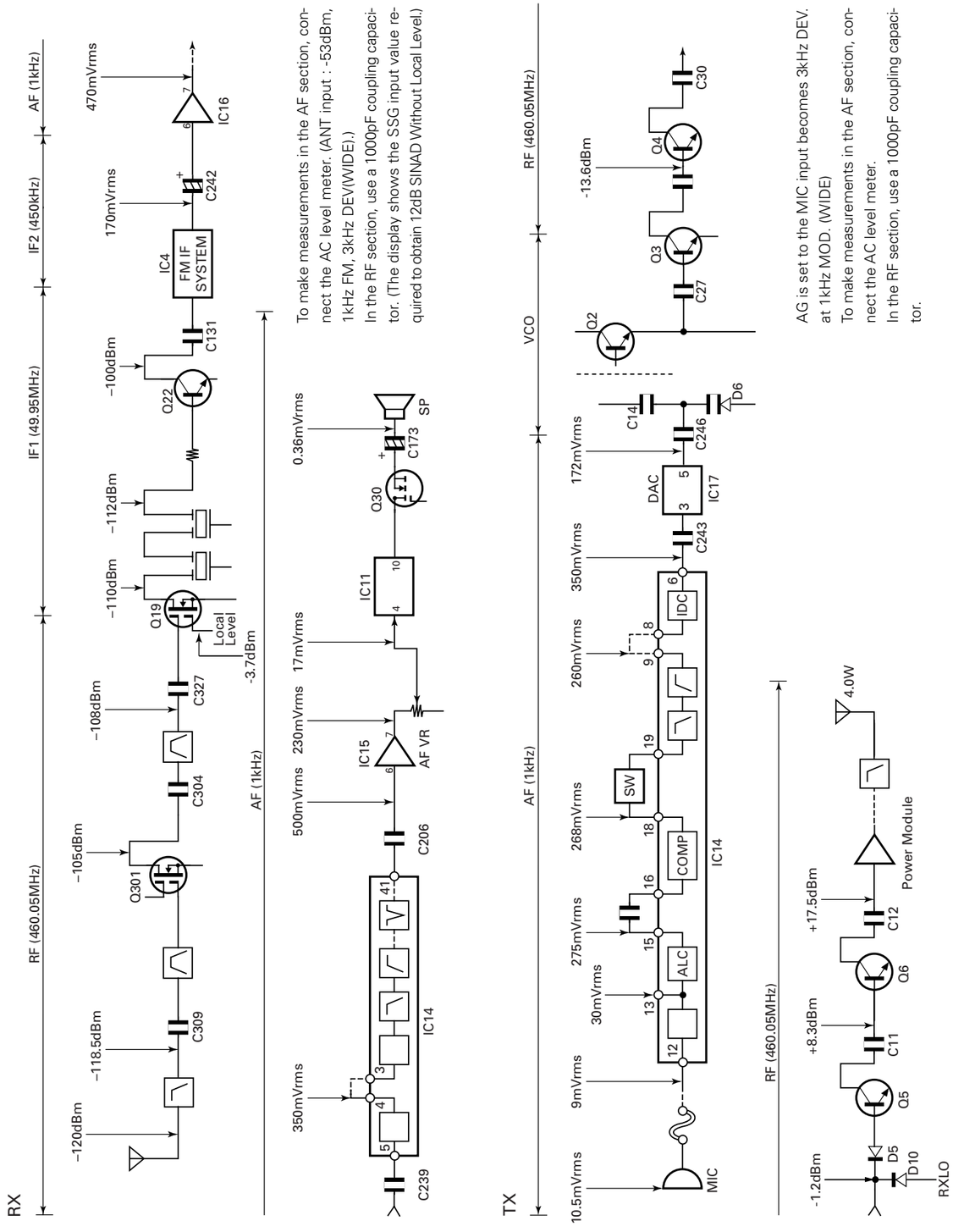
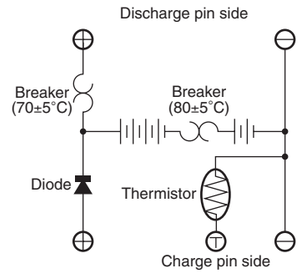
LEVEL DIAGRAM / 电平图



KNB-14/KNB-15A (Ni-Cd BATTERY)

KNB-14

CIRCUIT DIAGRAM

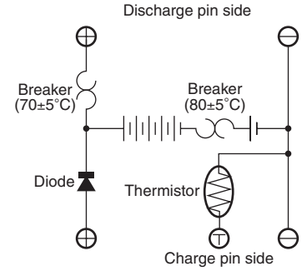


SPECIFICATIONS

Voltage : 7.2V (1.2V x 6)
Charging current : 600mAh
Dimensions : 60.8W x 110.8H x 17.3D (mm) (projections included)
Charger and charging time:
KSC-15 (normal charger), approximately 8 hours
KSC-16 (rapid charger), approximately 1 hour
Weight : 165g

KNB-15A

CIRCUIT DIAGRAM



SPECIFICATIONS

Voltage : 7.2V (1.2V x 6)
Charging current : 1100mAh
Dimensions : 60.8W x 110.8H x 20.3D (mm) (projections included)
Charger and charging time:
KSC-15 (normal charger), approximately 8 hours
KSC-16 (rapid charger), approximately 2 hours
Weight : 210g

KMC-17/KMC-21(SPEAKER MICROPHONE)

KMC-17 (Speaker microphone)

KMC-17 Parts List

Ref. No.	New parts	Parts No.	Description	Re-marks
		A02-0907-08	Case (Front)	
		A02-0908-08	Case (Rear)	
		B09-0316-08	Cap	
		D10-0606-08	Lever (PTT)	
		E11-0421-05	Phone jack	
		E30-3138-18	Curl cord	
		F07-0889-08	Silicon rubber (PTT)	
		G53-0569-08	Packing (MIC case)	
		J29-0440-08	Clip assy	
		J39-0601-08	Packing (MIC)	
		N46-2605-60	Screw (Clip assy)	
		N46-3016-60	Screw (Case)	
		N80-2005-41	Screw (MIC unit)	
		S50-1415-05	Tact switch (PTT)	
		T07-0290-05	Loudspeaker (1W, 8W)	
		T91-0534-08	Condenser MIC	

KMC-21 (Speaker microphone)

KMC-21 Parts List

Ref. No.	New parts	Parts No.	Description	Re-marks
		A02-1979-08	Case (Front)	
		A02-0980-18	Case (Rear)	
		E11-0453-08	Phone jack	
		E30-3239-08	Curl cord	
		F07-1414-08	Cover	
		K29-5077-08	Lever (PTT)	
		S70-0444-08	Tact switch (PTT)	
		T07-0335-05	Loudspeaker	
		T91-0564-08	Condenser MIC	

MEMO

规格

概述

频率范围	450～470MHz (M), 400～420MHz (M4)
信道数量	最多 16 个
组数量	最多 16 个
信道间隔	25kHz（宽） 12.5kHz（窄）
PLL 步进值	5kHz，6.25kHz
工作电压	7.5V 直流 ± 20 %
电池寿命	4W 时长于 4 个小时（使用 KNB-14 电池 5-5-90 工作周期）
	4W 时长于 8 个小时（使用 KNB-15A 电池 5-5-90 工作周期）
工作温度范围	-30℃到 + 60℃（-22° F 到 + 140° F）
尺寸和重量	
带有 KNB-14（7.2V 600mAh 电池）	58（2-5/16）宽 × 135（5-5/16）高 × 32（1-1/4）长毫米（英寸）
	400g（0.88lbs）
带有 KNB-15A（7.2V 1100mAh 电池）	58（2-5/16）宽 × 135（5-5/16）高 × 35（1-3/8）长毫米（英寸）
	440g（0.97lbs）

接收部（以每 EIA 标准 EIA-RS316B 进行测量）

灵敏度	
EIA 12dB SINAD	0.25μV（宽）/0.28μV（窄）
选择性	70dB（宽）/65dB（窄）
互调	65dB（宽）/60dB（窄）
假信号响应	60dB
音频功率输出	500mW
频率稳定性	± 2.5ppm
信道频率扩展	20MHz（M, M4）

发射部（以每 EIA 标准 EIA-316B 进行测量）

射频功率输出	4W/1W
寄生和谐波	70dB
调制	16KφF3E（宽）/11KφF3E（窄）
频率调制噪音	45dB（宽）/40dB（窄）
音频失真	低于 5 %
频率稳定性	± 2.5ppm
信道频率扩展	20MHz（M, M4）

TK-378G

SPECIFICATIONS

General

Frequency Range	450~470MHz (M), 400~420MHz (M4)
Number of channels	Max. 16
Number of groups	Max. 16
Channel Spacing	25kHz (Wide) 12.5kHz (Narrow)
PLL channel stepping	5kHz, 6.25kHz
Operating Voltage	7.5 VDC±20%
Battery Life	More than 4 hours at 4 watts (5-5-90 duty cycle with KNB-14 battery) More than 8 hours at 4 watts (5-5-90 duty cycle with KNB-15A battery)
Operating Temperature renge	-30˚C to +60˚C (-22 ˚F to +140 ˚F)
Dimensions and Weight	
With KNB-14 (7.2V 600mAh battery)	58 (2-5/16) W x 135 (5-5/16) H x 32 (1-1/4) D mm (in) 400g (0.88lbs)
With KNB-15A (7.2V 1100mAh battery)	58 (2-5/16) W x 135 (5-5/16) H x 35 (1-3/8) D mm (in) 440g (0.97lbs)

Receiver (Measurements made per EIA standard EIA-RS316B)

Sensitivity	
EIA 12dB SINAD	0.25μV (Wide)/0.28μV (Narrow)
Selectivity	70dB (Wide)/65dB (Narrow)
Intermodulation	65dB (Wide)/60dB (Narrow)
Spurious response	60dB
Audio Power Output	500mW
Frequency Stability	±2.5ppm
Channel Frequency Spread	20MHz (M, M4)

Transmitter (Measurements made per EIA standard EIA 316B)

RF Power output	4W/1W
Spurious and Harmonics	70dB
Modulation	16KϕF3E (Wide)/11KϕF3E (Narrow)
FM Noise	45dB (Wide)/40dB (Narrow)
Audio Distortion	Less than 5%
Frequency Stability	±2.5ppm
Channel Frequency Spread	20MHz (M, M4)

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