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**harman/kardon**
**Service Manual**


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# TU 980/230

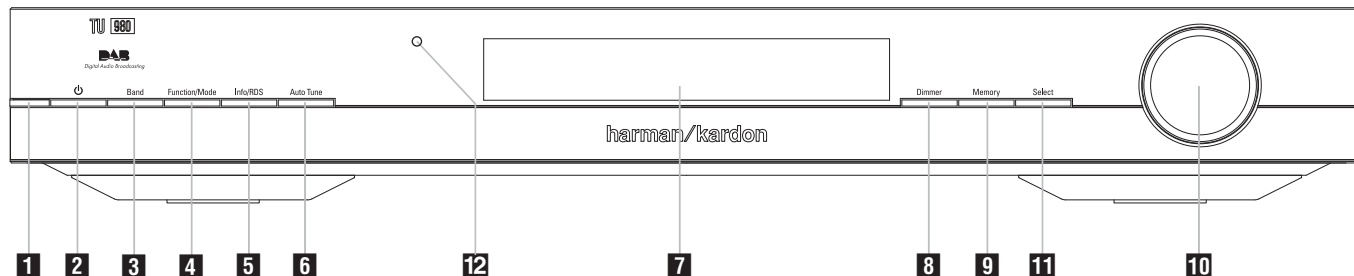
## FM/AM/Dual-band DAB Tuner with RDS



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## Front Panel Controls



- 1** Power Indicator
- 2** System Power Control
- 3** Band selector
- 4** Function/FM Mode Selector

- 5** Info/RDS Button
- 6** Auto Tune Button
- 7** Information Display
- 8** Dimmer

- 9** Memory
- 10** Control Ring
- 11** Select
- 12** Remote Control Sensor

**1 Power Indicator:** This LED will illuminate in amber when the unit is in the Standby mode to signal that the unit is ready to be turned on. When the unit is in operation, the indicator will turn blue.

**2 System Power Control:** Press this button to turn on the TU 980; press it again to turn the unit off (to Standby). Note that the **Power Indicator 1** next to the switch will turn blue when the unit is on.

**3 Band Selector:** Press this button to change between the DAB, FM and AM frequency bands.

**4 Function/FM Mode Selector:** In DAB mode, pressing this button will activate station order, preset tune, Dynamic Rate Control or manual tune features. In FM mode, press this button to select the stereo or mono mode for FM tuning. In the stereo mode, the word **STEREO** will be shown in the **Information Display 7**, and stereo reception will be provided when stations are transmitting stereo signals. In the mono mode, the left and right signals from stereo broadcasts will be mixed together and reproduced through all channels. Select **MONO** for better reception of weak signals.

**5 Info/RDS Button:** In DAB mode, pressing this button will change the content of the lower display line of the Information Display as shown on page 9, as well as signal error rate and software version. In RDS mode, it will change between the different RDS options.

**6 Auto Tune Button:** In DAB mode, press this button to automatically scan all available stations.

**7 Information Display:** This dual line display delivers messages and status indications to help you operate the tuner.

**8 Dimmer:** Press this button to dim the front panel display. The first press of the button will dim the displays to one-half normal brightness; the next press will turn off the display. Press the button again to turn the displays back to normal brightness.

The display will return to normal brightness the next time the unit is turned on.

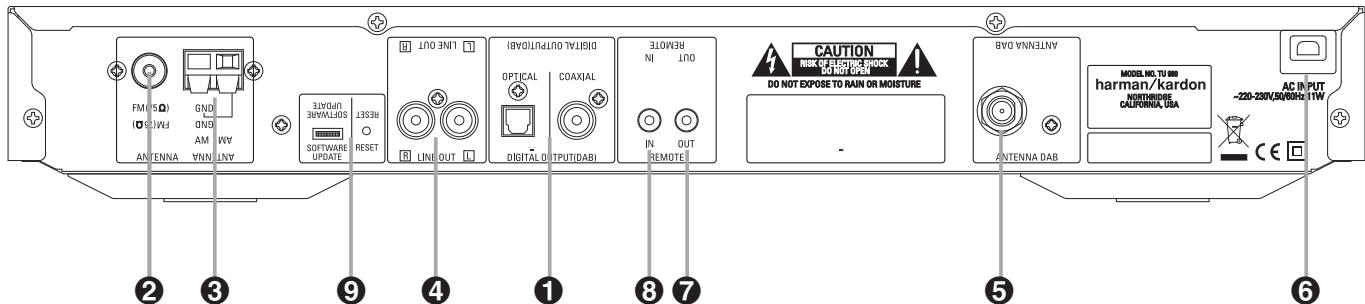
**9 Memory Button:** Press this button to open the memory position that stores a preset location in the tuner. 99 DAB presets can be stored, as well as 30 FM and 30 AM presets. (See page 9 for more information on tuner presets.)

**10 Control Ring:** Turn counterclockwise to tune lower frequency stations and clockwise to tune higher frequency stations. When a station with a strong signal is tuned, the **Information Display 7** will read **TUNED**. Turn again to tune to the next frequency increment in **Manual Tune Mode**, or automatically to the next station with a signal strong enough for acceptable reception in **Auto Tune Mode**. The ring also controls the parameters in the different menus.

**11 Select:** In FM or AM mode, press this button to select Auto Tune, Manual Tune or Preset Tune. In DAB mode, press this button to select the displayed station.

**12 Remote Sensor Window:** The sensor behind this window receives infrared signals from the remote control. Aim the remote at this area and do not block or cover it unless an external remote sensor is installed.

## Rear Panel Connections



- ❶ Optical and Coaxial Digital Outputs
- ❷ AC Power Cord
- ❸ FM Antenna
- ❹ Remote Control Output
- ❺ AM Antenna
- ❻ Remote Control Input
- ❻ Analog Audio Outputs
- ❼ Software Update and Reset Button
- ❼ DAB Antenna

**❶ Optical and Coaxial Digital Outputs:** Connect one of these jacks to the optical or coaxial digital input of your pre amplifier or integrated amplifier, if available.

Note that these digital outputs only contain the digital signal from the DAB stations. For FM/AM reception, you will have to connect the analog outputs at all times.

**❷ FM Antenna:** Connect an indoor or external FM antenna to this terminal.

**❸ AM Antenna:** Connect the AM loop antenna supplied with the receiver to these terminals. If an external AM antenna is used, make connections to the **AM** and **GND** terminals in accordance with the instructions supplied with the antenna.

**❹ Analog Audio Outputs:** Connect these jacks to the tuner input of your pre amplifier or integrated amplifier for analog audio playback. Be certain to observe proper channel connections using the color-coded cables and connectors so that red connects right channels and white connects left channels.

**NOTE:** Before making any audio connections, unplug all components of your audio system from their AC power outlets. To reduce the possibility of hum or noise in your system, place all audio interconnection cables away from both AC power cords and speaker wires.

**❼ DAB Antenna:** Connect a DAB antenna to this terminal.

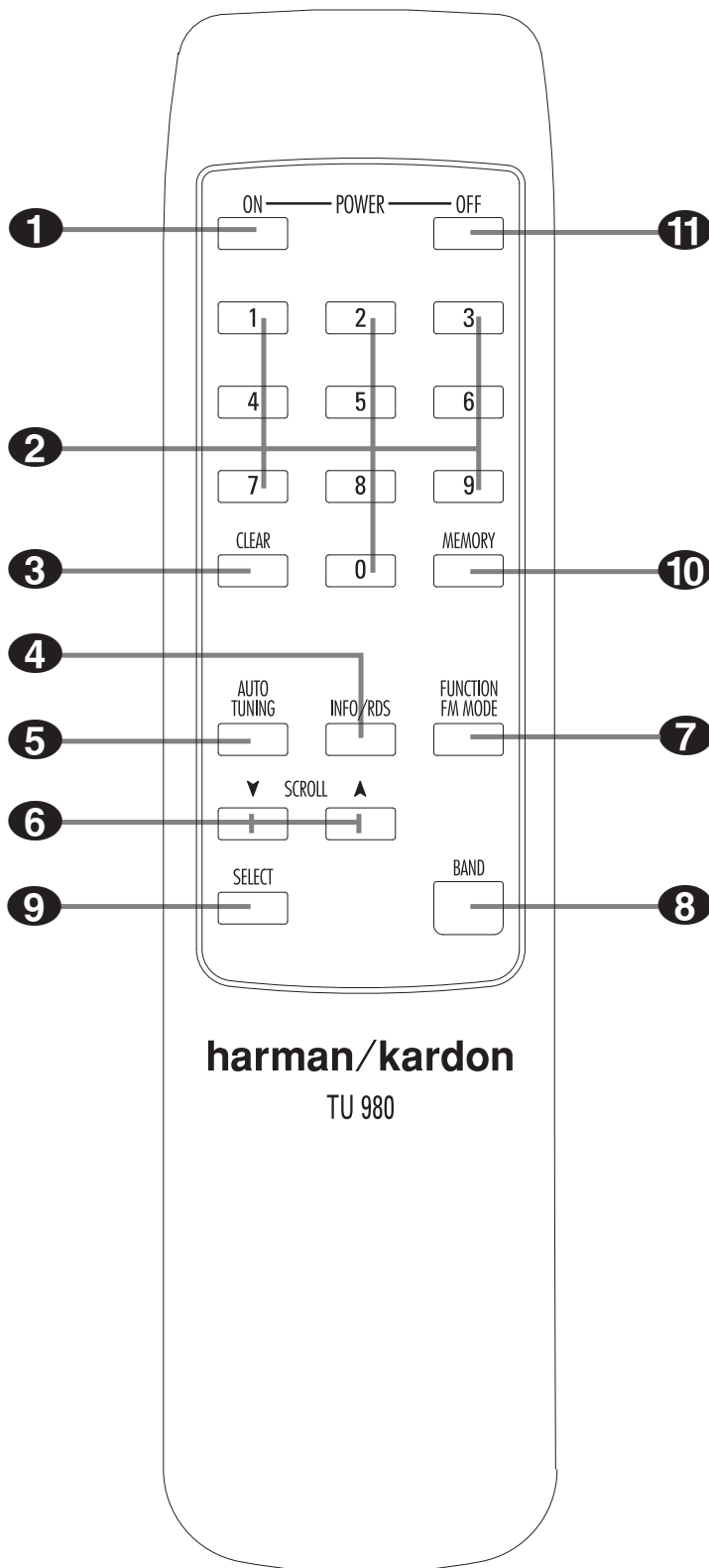
**❼ AC Power Cord:** Connect this plug to an AC outlet. If the outlet is controlled by a switch, make certain that it is in the ON position.

**❷ Remote Control Output:** Connect this jack to the infrared (IR) input jack of another compatible Harman Kardon remote controlled product to have the built-in Remote Sensor on the tuner provide IR signals to other compatible products.

**❸ Remote Control Input:** Connect the output of a remote infrared sensor, or the remote control output of another compatible Harman Kardon product, to this jack. This will enable the remote control to operate even when the front panel Remote Sensor on the tuner is blocked. This jack may also be used with compatible IR remote control-based automation systems.

**❼ Software Update and Reset Button (for Service Stations Only):** This specialized connector may be used with your personal computer in case Harman Kardon offers a software upgrade for the tuner at some time in the future. The Reset Button is only used during a software upgrade. A standard processor reset is performed by pressing and holding the front-panel Function/FM Mode Button.

## Remote Control Functions



- ➊ Standby/Power On
- ➋ Numeric Keys
- ➌ Clear Button
- ➍ Info/RDS Button
- ➎ Auto Tuning Button
- ➏ Scroll Button

- ➐ Function/FM Mode Selector
- ➑ Band Selector
- ➒ Select Button
- ➓ Memory Button
- ➔ Standby/Power Off

**➊ Standby/Power On:** Press this button to turn on the TU 980. Note that the **Power Indicator 1** next to the switch will turn blue when the unit is on.

**➋ Numeric Keys:** These buttons serve as a ten-button numeric keypad to enter tuner preset positions or to tune stations directly.

**➌ Clear Button:** Press this button to clear presets from your station list.

**➍ Info/RDS Button:** Pressing this button will change the content of the lower display line of the Information Display as well as signal error rate and software version. (See page 9 for more info).

**➎ Auto Tune Button:** In DAB mode, press this button to automatically scan all available stations.

**➏ Scroll Buttons:** Press ▼ to tune lower frequency stations and ▲ to tune higher frequency stations. When a station with a strong signal is tuned, the **Information Display 7** will read **TUNED**. Press again briefly to tune to the next frequency increment in Manual Tune Mode, or keep pressed for automatic search for the next station with a signal strong enough for acceptable reception in **Auto Tune Mode**. These buttons also control the parameters in the different menus, like the **Control Ring 10** on the front panel.

**➐ Function/FM Mode Selector:** In DAB mode, pressing this button will activate station order, preset tune, Dynamic Rate Control or manual tune features. In FM mode, press this button to select the stereo or mono mode for FM tuning. In the stereo mode, the word **STEREO** will be shown in the **Information Display 7**, and stereo reception will be provided when stations are transmitting stereo signals. In the mono mode, the left and right signals from stereo broadcasts will be mixed together and reproduced through all channels. Select **MONO** for better reception of weak signals.

**➑ Band Selector:** Press this button to change between the DAB, FM and AM frequency bands.

**➒ Select:** In FM or AM mode, press this button to select Auto Tune, Manual Tune or Preset Tune.

**➓ Memory Button:** Press this button to open the memory position that stores a preset location in the tuner. 99 DAB presets can be stored, as well as 30 FM and 30 AM presets. (See page 9 for more information on tuner presets.)

**➔ Standby/Power Off:** Press this button to turn the unit off (to Standby).

## Troubleshooting Guide

This unit is designed for trouble-free operation. Most problems users encounter are due to operating errors. If you have a problem, first check this list for a possible solution. If the problem persists, consult your authorized Harman Kardon Service Center.

If the problem is...	Make sure that the...
No lights appear when <b>System Power</b> button is pressed	Unit is plugged into a live outlet. Make sure the outlet is active.
No sound is heard	Tune to an active station. Check for correct amplifier settings. Check the connections and wires.
Sound distorts, particularly in stereo mode.	Use a more directional antenna.
Intermittent or continuous buzzing or hissing.	Place the unit farther away from these appliances. Install noise filters on the appliances.
Display says 'No stations Available'	Check that antenna is connected. Ensure that DAB coverage exists in your area.
Display has gone blank or says 'service off air'	This may occur if a broadcaster changes the label of a service or removes a label whilst you are listening to it. Try to retune to this station, using the Autotune procedure.

## Technical Specifications

### FM Section

Frequency Range	87.50 MHz to 108.00 MHz (50 kHz steps)
Signal-to-Noise Ratio	65 dB (Mono) 60 dB (Stereo)
Presets	30

### Section

Frequency Range	522 kHz to 1620 kHz (9 kHz steps)
Signal-to-Noise Ratio	35 dB
Presets	30

### DAB Section

RF Section	Band III, 174 MHz - 240 MHz Band L, 1452 MHz - 1492 MHz Input: 50 Ohm, nominal Max signal: -3 dBm typ Sensitivity: -96 dBm typ Adjacent Channel Rejection: 35dB typ
Display	2 line by 16 character DOT Matrix
Presets	99
Audio Output	Stereo, 2.5V P-P 48 kHz sample rate 16 bit sample resolution
Optical S/PDIF	IEC60958 Compliant 48 kHz sample rate 24 bit sample resolution

### General

Power Requirement	220-230 V AC, 50/60 Hz
Power Consumption	11 W 3 W (standby)

### Dimension (Max)

Width	442 mm
Height	63 mm
Depth	334 mm (350 mm with DAB antenna)
Weight	3.4 kg

Depth measurement includes knobs, buttons and terminal connections. Height measurement includes feet and chassis.

All features and specifications are subject to change without notice.

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## ELECTRICAL SPECIFICATION(BAND3 DAB)

MODEL : TU 980  
 DATE :  
 POWER SUPPLY : 230V~240V , 50Hz

SAMPLING RATE : 48kHz                      PAGE:1/4  
 STANDARD INPUT : -60dBm  
 AUDIO SIGNAL(L&R) :bit rate128kbit/s  
 AUDIO SIGNAL{L(R) only} :bit rate192kbit/s

NO	DESCRIPTION	CONDITION		UNIT	NOMINAL	LIMIT	L ch	R ch	
1	TUNING RANGE	LOW		MHz	174,928			-	
		HIGH		MHz	239,200			-	
2	INPUT SENSITIVITY (T.H.D : 0.5%)	5C	178.35MHz	dBm	-98	-90			
		11D	222.064MHz	dBm	-98	-90			
		13C	227.36MHz	dBm	-98	-90			
3	OUTPUT LEVEL	11D	222.064MHz	V	2	2±0.1			
4	S/N RATIO (IHF-A)	11D	222.064MHz	d B	95	80			
5	T.H.D (20 kHz L.P.F)	11D	222.064MHz	%	0,02	0,05			
6	STEREO SEPARATION ( 20kHz L.P.F)	11D	222.064MHz	100Hz	d B	80	70		
				1kHz	d B	80	70		
				10kHz	d B	80	70		
7	FREQUENCY RESPONSE STANDARD(1kHz) (20kHz L.P.F)	11D	222.064MHz	42Hz	d B	0	-3		
				16kHz	d B	0	-3		

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## ELECTRICAL SPECIFICATION(L BAND DAB)

MODEL : TU 980

DATE :

POWER SUPPLY : 230V~240V , 50Hz

SAMPLING RATE : 48kHz

PAGE:2/4

STANDARD INPUT : -60dBm

AUDIO SIGNAL(L&amp;R) :bit rate128kbit/s

AUDIO SIGNAL{L(R) only} :bit rate192kbit/s

NO	DESCRIPTION	CONDITION	UNIT	NOMINAL	LIMIT	L ch	R ch	
1	TUNING RANGE	LOW	MHz	1452,960				
		HIGH	MHz	1490,624				
2	INPUT SENSITIVITY (T.H.D : 0.5%)	LC 1459.808MHz	dBm	-95	-85			
		LN 1475.216MHz	dBm	-95	-85			
		LX 1490.624MHz	dBm	-95	-85			
3	OUTPUT LEVEL	LN 1475.216MHz	V	2	2±0.1			
4	S/N RATIO (IHF-A)	LN 1475.216MHz	d B	95	80			
5	T.H.D (20 kHz L.P.F)	LN 1475.216MHz	%	0,02	0,05			
6	STEREO SEPARATION ( 20kHz L.P.F)	LN 1475.216MHz	100Hz	d B	80	70		
			1kHz	d B	80	70		
			10kHz	d B	80	70		
7	FREQUENCY RESPONSE STANDARD(1kHz) (20kHz L.P.F)	LN 1475.216MHz	42Hz	d B	0	-3		
			16kHz	d B	0	-3		

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## ELECTRICAL SPECIFICATION(TUNER/FM)

PAGE:3/4

MODEL : TU 980

STANDARD INPUT : 60dB $\mu$ V 400Hz

DATE :

MOD : MONO 40kHz (DEV) --- 53.5%

POWER SUPPLY : 230V~240V , 50Hz

: STEREO Main 40kHz Pilot 7.5kHz

\* USE 20KHz L.P.F

NO	DESCRIPTION	REMARK		UNIT	NOMINAL	LIMIT	L ch	R ch
1	TUNING RANGE	LOW		MHz	87,50			
		HIGH		MHz	108,00			
2	USABLE SENSITIVITY ( S/N 30dB )	MONO 75 $\Omega$	90.10 MHz	d B ( EMF )	8	15		
			100.10 MHz		8	15		
			106.10 MHz		8	15		
3	50dB QUIETING SENSITIVITY	100.10 MHz	MONO	d B ( EMF )	21	28		
4	S/N RATIO	100.10 MHz ( L.P.F )	MONO STEREO		d B	70 60	60 50	
5	T.H.D ( 400Hz )	100.10MHz	MONO	%	0,3	1		
		( L.P.F )	STEREO		0,5	1,2		
7	IF REJECTION (10.7MHz)	100.10 MHz		d B	45	35		
8	IMAGE REJECTION	106.10 MHz		d B	40	30		
10	FREQUENCY RESPONSE 50 $\mu$ s (-3 dB)	100.10MHz	LOW	Hz	20	50		
			HIGH	kHz	15	12		
11	STEREO SEPARATION	100.10MHz	1kHz	d B	35	25		
12	ST. IND. LIGHT SENSI.	100.10MHz		d B	29	25~35		
13	TUNED IND. LIGHT SENS.	100.10MHz		d B	29	25~35		
14	AUTO STOP LEVEL	100.10MHz		d B	29	25~35		
15	OUTPUT LEVEL	100.10MHz	MONO	V	1	1 $\pm$ 0.2		
17	RDS IND. LIGHT SENS.	100.10MHz		d B	29	25~35		
18	STRONG SIGNAL (120dBuV)	100.10MHz	T.H.D	%	1,5	3		

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## ELECTRICAL SPECIFICATION(TUNER/AM)

MODEL : TU 980

PAGE:4/4

DATE :

STANDARD INPUT : 74dB $\mu$ V 400Hz

POWER SUPPLY : 230V~240V , 50Hz

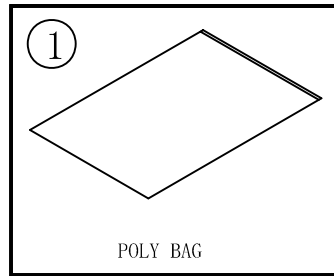
MOD : MONO 30 %

\*USE 20KHz L.P.F

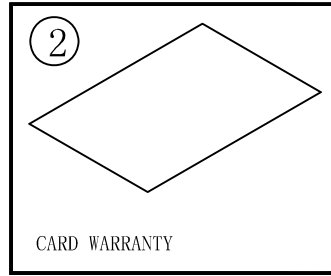
NO	DESCRIPTION	REMARK	UNIT	NOMINAL	LIMIT	L ch	R ch
1	TUNING RANGE	LOW	kHz	522			
		HIGH	kHz	1620			
2	USABLE SENSITIVITY ( S/N 20dB )	612 kHz	d B ( EMF )	60	70		
		990 kHz		60	70		
		1503 kHz		60	70		
3	S/N RATIO	990 kHz	MONO	d B	35	30	
4	T.H.D ( 400Hz )	990 kHz	MONO	%	1,5	3	
6	IF REJECTION (450kHz)	990 kHz		d B	35	30	
7	IMAGE REJECTION	990 kHz		d B	35	28	
8	OUTPUT LEVEL	990kHz		m V	360	60+80/-40	
9	TUNED IND. LIGHT SENS.	990 kHz		d B	60	50~70	
10	AUTO STOP LEVEL	990 kHz		d B	60	50~70	
11	FREQUENCY RESPONSE (-6dB)	990 kHz	LOW	Hz	60	100	
			HIGH	kHz	2,2	2	

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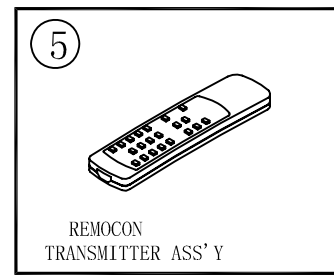
# 1. Instruction manual ass'y - Accessories



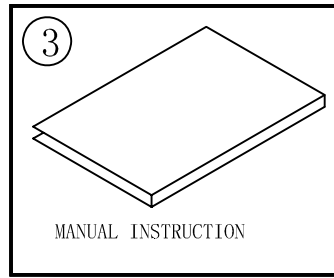
POLY BAG



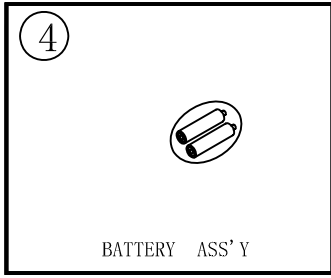
CARD WARRANTY



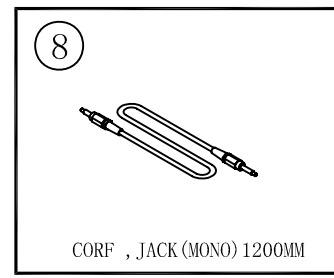
REMOCON TRANSMITTER ASS'Y



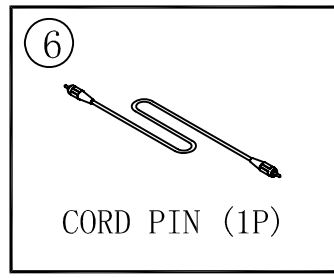
MANUAL INSTRUCTION



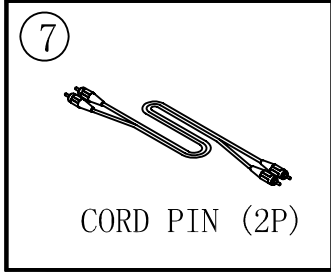
BATTERY ASS'Y



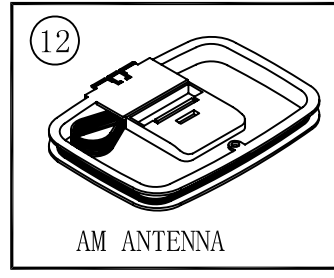
CORF, JACK (MONO) 1200MM



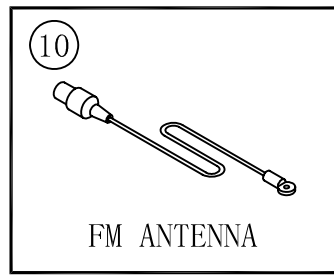
CORD PIN (1P)



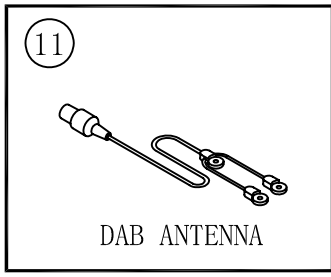
CORD PIN (2P)



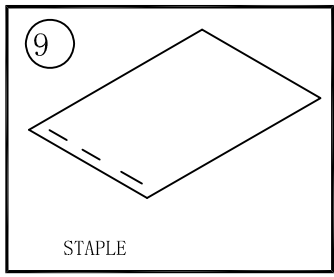
AM ANTENNA



FM ANTENNA



DAB ANTENNA

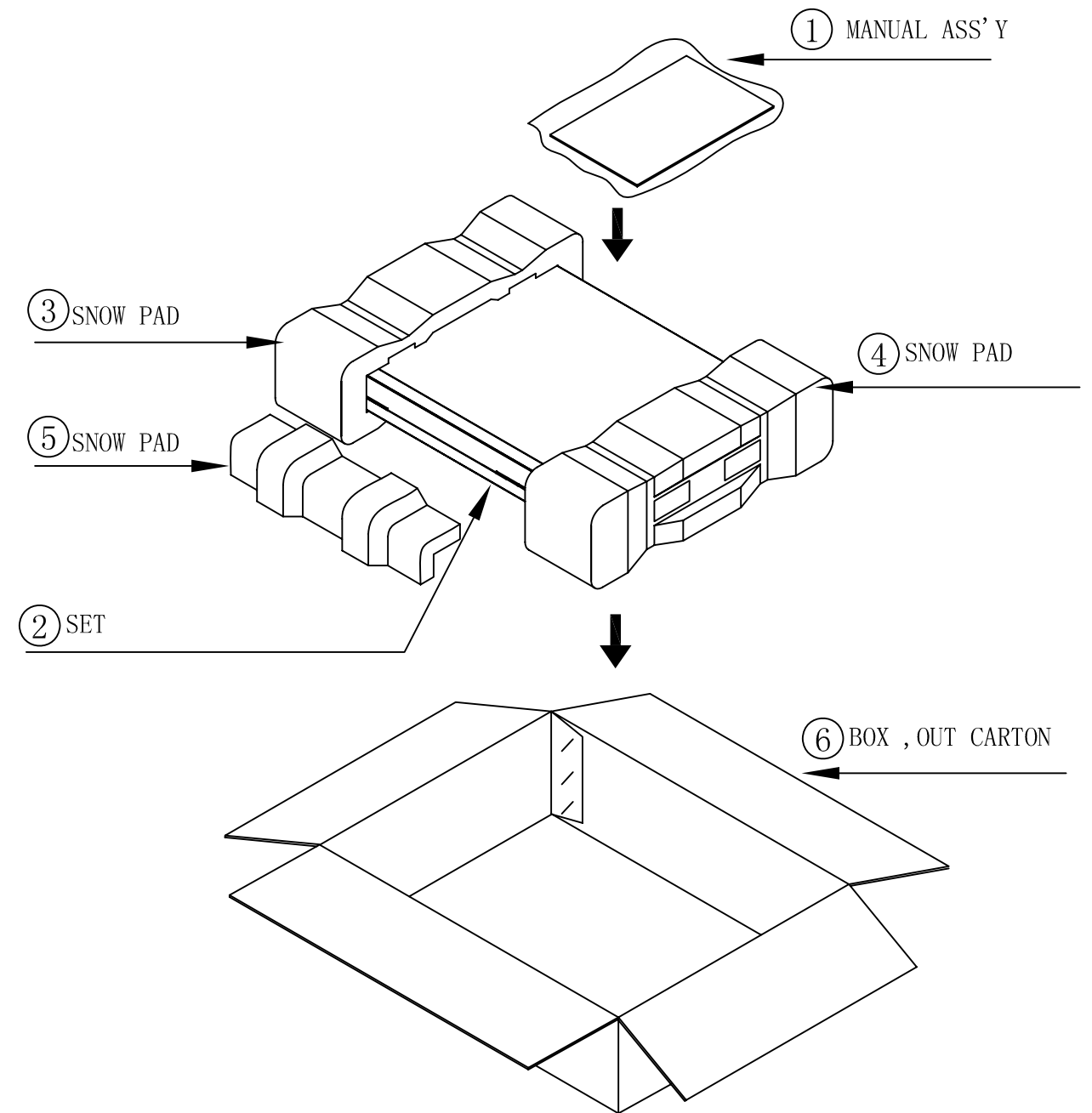


STAPLE

NO	DESCRIPTION	PARTS NO.	Q, ty
1	POLY BAG	CPB1061W	1
2	CARD WARRANTY	HQE1A273Z	1
3	INSTRUCTION MANUAL	CQX1A1324Z	1
4	BATTERY	CARB03P	2
5	REMOCON ASS'Y	CARTTU980/230	1
6	CORD, PIN (1P)	CJS4M009X	1
7	CORD, PIN (2P)	CJS4N015Z	1
8	CORD, JACK (MONO) 1200MM	CJS9D002Z	1
9	STAPLE	CPL0905	3
10	FM ANTENNA	CSA1A018Z	1
11	DAB ANTENNA	CSA272	1
12	AM ANTENNA	CSA1A020Z	1
13			

# 2. Package Drawing

TU980/230

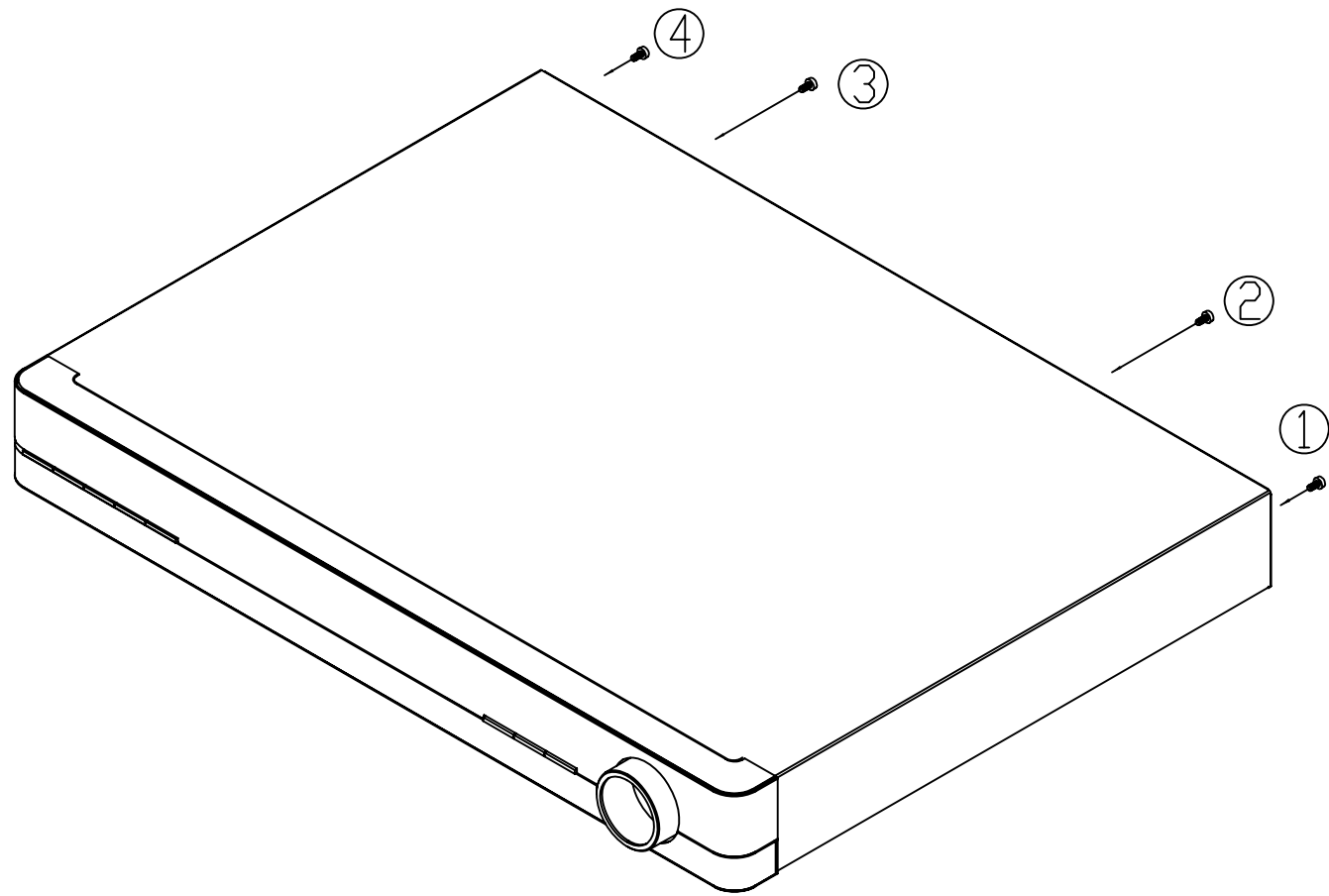


NO	DESCRIPTION	PARTS NO.	Q, ty
1	MANUAL ASS'Y	CQXTU980/230	1
2	SET	TU980/230SET	1
3	SNOW, PAD	CPS1A805	1
4	SNOW, PAD	CPS2A805	1
5	FRONT, PAD	CPS2A657	1
6	BOX, OUT CARTON	CPG1A856Z	1
7			

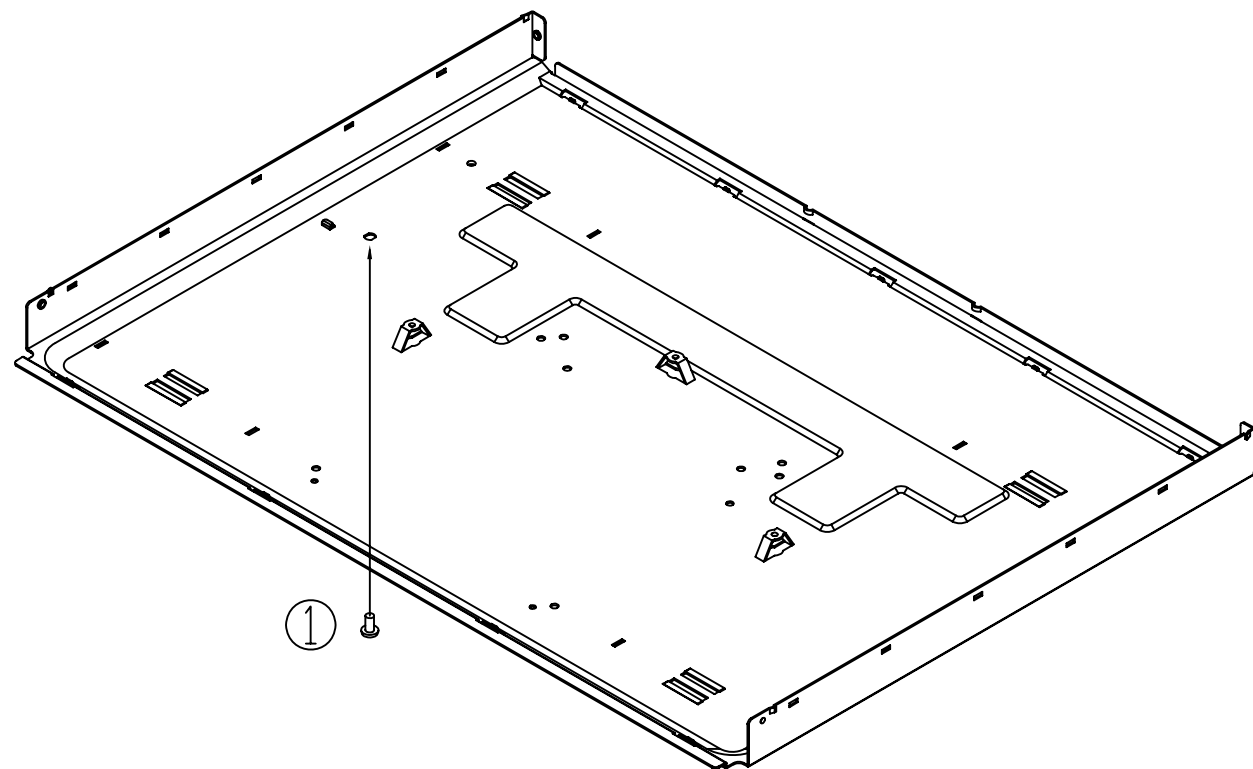
# DISASSEMBLY

# TU980/230

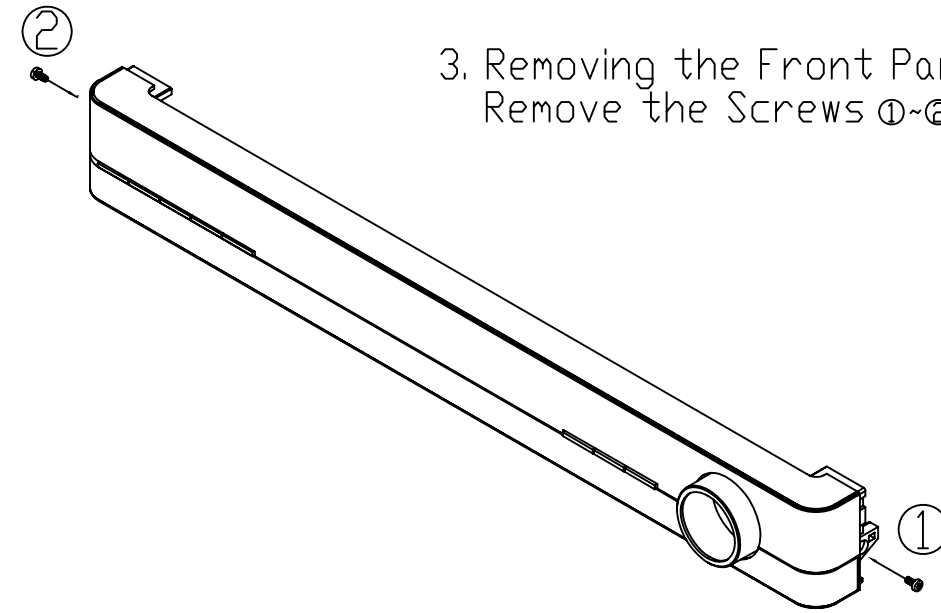
1. Removing the Top Cabinet  
Remove the Screws ①~④



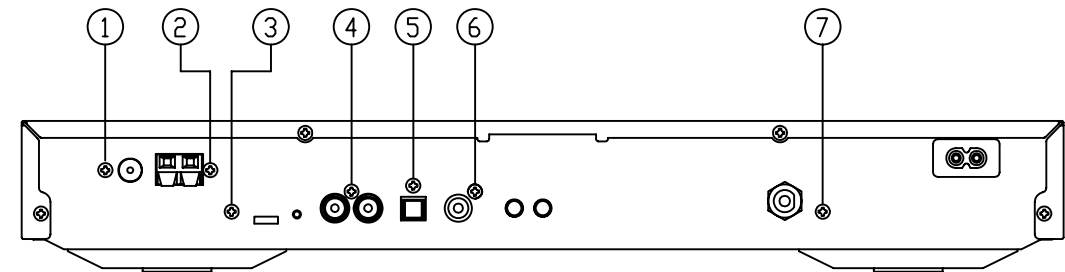
2. Removing the Bottom Chassis  
Remove the Screws ①



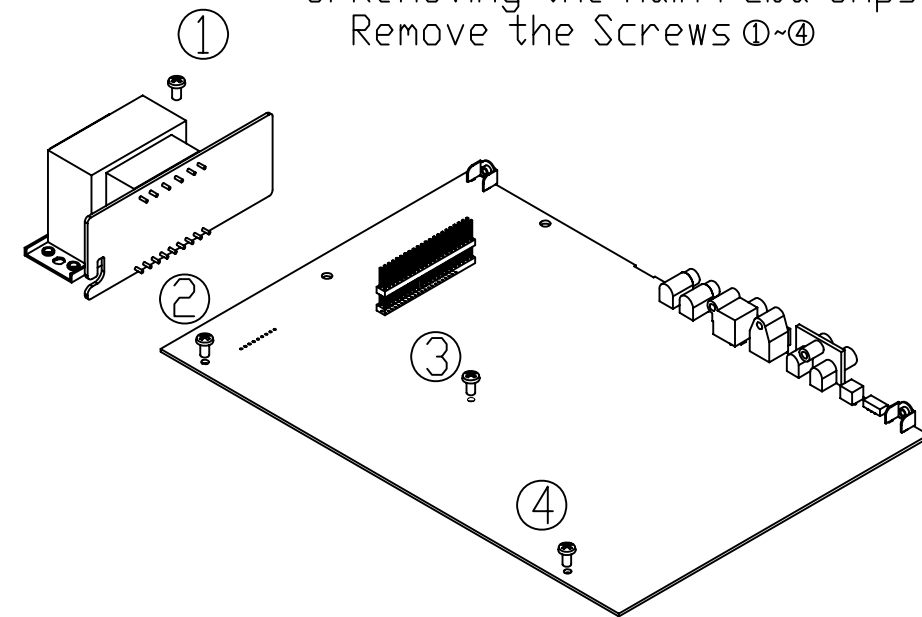
3. Removing the Front Panel  
Remove the Screws ①~②



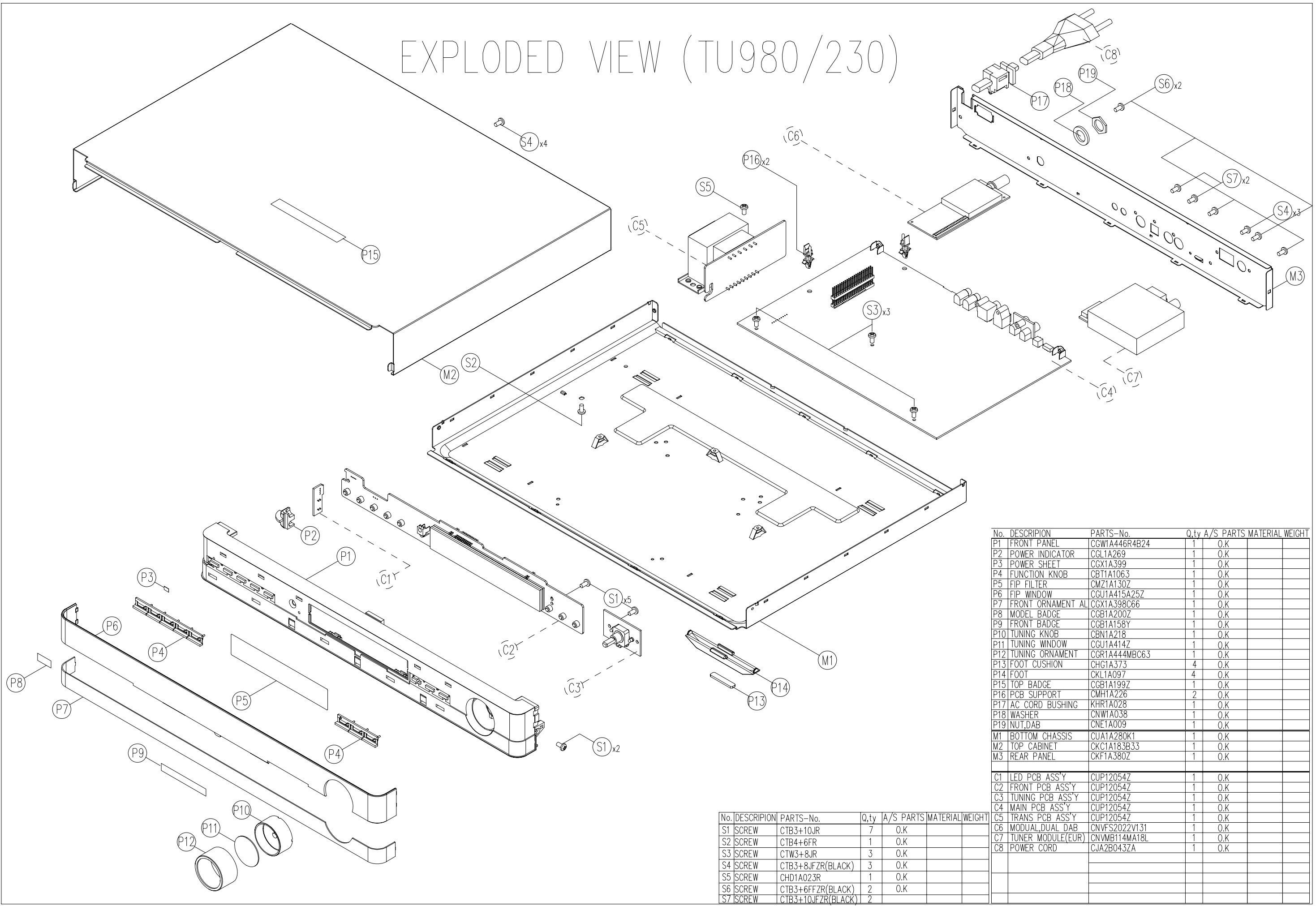
4. Removing the Rear Panel  
Remove the Screws ①~⑦



5. Removing the Main Pcb & Smpls Pcb  
Remove the Screws ①~④



# EXPLODED VIEW (TU980/230)



No.	DESCRIPTION	PARTS-No.	Q.ty	A/S	PARTS	MATERIAL	WEIGHT
P1	FRONT PANEL	CGW1A446R4B24	1		O.K		
P2	POWER INDICATOR	CGL1A269	1		O.K		
P3	POWER SHEET	CGX1A399	1		O.K		
P4	FUNCTION KNOB	CBT1A1063	1		O.K		
P5	FIP FILTER	CMZ1A130Z	1		O.K		
P6	FIP WINDOW	CGU1A415A25Z	1		O.K		
P7	FRONT ORNAMENT AL	CGX1A398C66	1		O.K		
P8	MODEL BADGE	CGB1A200Z	1		O.K		
P9	FRONT BADGE	CGB1A158Y	1		O.K		
P10	TUNING KNOB	CBN1A218	1		O.K		
P11	TUNING WINDOW	CGU1A414Z	1		O.K		
P12	TUNING ORNAMENT	CGR1A444MBC63	1		O.K		
P13	FOOT CUSHION	CHG1A373	4		O.K		
P14	FOOT	CKL1A097	4		O.K		
P15	TOP BADGE	CGB1A199Z	1		O.K		
P16	PCB SUPPORT	CMH1A226	2		O.K		
P17	AC CORD BUSHING	KHR1A028	1		O.K		
P18	WASHER	CNW1A038	1		O.K		
P19	NUT,DAB	CNE1A009	1		O.K		
M1	BOTTOM CHASSIS	CUA1A280K1	1		O.K		
M2	TOP CABINET	CKC1A183B33	1		O.K		
M3	REAR PANEL	CKF1A380Z	1		O.K		
C1	LED PCB ASS'Y	CUP12054Z	1		O.K		
C2	FRONT PCB ASS'Y	CUP12054Z	1		O.K		
C3	TUNING PCB ASS'Y	CUP12054Z	1		O.K		
C4	MAIN PCB ASS'Y	CUP12054Z	1		O.K		
C5	TRANS PCB ASS'Y	CUP12054Z	1		O.K		
C6	MODUAL,DUAL DAB	CNVFS2022V131	1		O.K		
C7	TUNER MODULE(EUR)	CNVMB114MA18L	1		O.K		
C8	POWER CORD	CJA2B043ZA	1		O.K		
S1	SCREW	CTB3+10JR	7		O.K		
S2	SCREW	CTB4+6FR	1		O.K		
S3	SCREW	CTW3+8JR	3		O.K		
S4	SCREW	CTB3+8JFZR(BLACK)	3		O.K		
S5	SCREW	CHD1A023R	1		O.K		
S6	SCREW	CTB3+6FFZR(BLACK)	2		O.K		
S7	SCREW	CTB3+10JFZR(BLACK)	2		O.K		

## TU 980 BOM LIST

Level	Ref#	Component	Description	Drawing No	REQ-Qty
1		CHE154	CLAMPER , ARM		0,12
1		CPG1A856Z	BOX , OUT CARTON TU980/230		1
1		CPS1A805	PAD , SNOW TU980/230		1
1		CPS2A657	PAD , SNOW FRONT TU980		1
1		CPS2A805	PAD , SNOW TU980		1
1		CQB1A549Y	LABEL , ATTENTION DVD48		1
1		CQB1A551Z	LABEL , BAR CODE		3
1		CQB1A622	LABEL , SERIAL NO		1
1		CQB1A644Z	LABEL , ORIGIN		1
1		CQB1A876Z	LABEL , COUNTRY DVD29/230		2
1		CQS1A001	RIBON , BAR CODE	SONY(TR-4070)	0,015
1		CQXTU980/230	INSTRUCTION MANUAL ASS'Y		1
0,2		CABR03P	BATTERY (SIZE 'AAA') 2PCS IN 1PACK		2
0,2		CARTTU980	REMOCON TRANSMITTER ASS'Y		1
0,2		CJS4M009X	CORD , PIN	CORD, PIN	1
0,2		CJS4N015Z	CORD , PIN		1
0,2		CJS9D002Z	CORD , JACK(MONO) 1200MM		1
0,2		CPB1061W	BAG , POLY(ENGLISH/FRANCH)	FRANCE LANGUAGE ADDED	1
0,2		CPL0905	STAPLE		3
0,2		CQX1A1324Z	MANUAL , INSTRUCTION TU980/230		1
0,2		CSA1A018Z	FM 1 POLE ANT		1
0,2		CSA1A020Z	ANT , AM LOOP		1
0,2		CSA272	ANT , DAB T	T17020N	1
0,2		HQE1A273Z	HARMAN IMAGE BROCHURES		1
0,2		CGB1A199Z	BADGE , TOP TU980/230		1
0,2		CGWTU980/230	FRONT PANEL ASS'Y		1
..3		CBN1A218ZA	TU980 TUNING KNOB ASS'Y		1
..4		CBN1A218	KNOB , TUNING TU980/230		
..4		CGR1A444MBC63	ORNAMENT , TUNING TU980/230		
..4		CGU1A414Z	WINDOW , TUNING TU980/230		
..3		CGW1A446ZA	TU980 FRONT PANEL ASS'Y		1
..4		CBT1A1063	KNOB , FUNCTION TU980/230		1
..4		CGB1A158Y	BADGE , FRONT HARMAN/KARDON		1
..4		CGB1A200Z	BADGE , MODEL TU980/230		1
..4		CGL1A269	INDICATOR , POWER TU980/230		1
..4		CGU1A415A25Z	WINDOW , FIP TU980/230		1
..4		CGW1A446R4B24	PANEL , FRONT TU980/230		1
..4		CGX1A398C66	ORNAMENT , AL PANEL TU980/230		1
..4		CGX1A399	SHEET , POWER TU980/230		1
..4		CMC1A341	PLATE , EARTH DMC250		2
..4		CMZ1A130Z	FILTER , FIP TU980/230		1
..3		CHS1A032	TAPE , HEMELON		2
..3		CTB3+10JR	SCREW		7
0,2		CHG1A305	CUSHION , SUPPORT		2
0,2		CKC1A183B33	CABINET , TOP TU980/230		1
0,2		CTB3+8JFZR	SCREW		4
0,2		CUATU980/230	BOTTOM CHASSIS ASS'Y		1
..3		CHD1A023R	SCREW , SPECIAL		1
..3		CHG1A104	CUSHION , EVA	H=9.5(15X20)	1
..3		CHG3A104	CUSHION , EVA		1
..3		CHR301	CLAMPER		4
..3		CJA2B043ZA	CORD , POWER(EUR)	QDR-7100CC	1
..3		CKC1A183ZA	TU980 TOP CABIET ASS'Y		1
..4		CGB1A199Z	BADGE , TOP TU980/230		
..4		CKC1A183B33	CABINET , TOP TU980/230		
..3		CKF1A380Z	PANEL , REAR TU980/230		1
..3		CKL1A097ZA	TU980 FOOT ASS'Y		4
..4		CHG1A373	CUSHION , FOOT AVR350		
..4		CKL1A097	FOOT , TU980/230		
..3		CMH1A226	SUPPORT , PCB		2
..3		CNE1A009	NUT, DAB	M3/8X32	1
..3		CNVFS2022V131C	MODULE , DUAL DAB	FS2022-0101-0005	1

Level	Ref#	Component	Description	Drawing No	REQ-Qty
.3		CNVMB114MA18L	TUNER MODULE(EUR)		1
.3		CNW1A038	WASHER	9.5X15	1
.3		COP12054B	TU980 PCB ASS'Y		1
....5		CUP12054Z	PCB , DAB TU980 (330X247, FR-1)		1
....5	C101	CCEA1CH471T	CAP , ELECT	470UF 16V	1
....5	C104	CGFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1
....5	C203	CCEA1AH471T	CAP , ELECT	470UF 10V	1
....5	C204	CCFT1H104ZF	CAP , SEMICONDUCTOR	0.1UF 50V Z	1
....5	C205	CCEA1HH4R7T	CAP , ELECT	4.7UF 50V	1
....5	C206	CCCT1H220JC	CAP , CERAMIC	22PF 50V J	1
....5	C207	CCFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1
....5	C208	CCEA1CH101T	CAP , ELECT	100UF 16V	1
....5	C209	CCEA1HH4R7T	CAP , ELECT	4.7UF 50V	1
....5	C210	CGFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1
....5	C211	CCEA1CH101T	CAP , ELECT	100UF 16V	1
....5	C212	CCEA1HH4R7T	CAP , ELECT	4.7UF 50V	1
....5	C213	CCCT1H220JC	CAP , CERAMIC	22PF 50V J	1
....5	C214	CCFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1
....5	C215	CCEA1CH101T	CAP , ELECT	100UF 16V	1
....5	C216	CCEA1HH4R7T	CAP , ELECT	4.7UF 50V	1
....5	C217	CCEA1CH101T	CAP , ELECT	100UF 16V	1
....5	C218	CCFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1
....5	C219	CCEA1HH4R7T	CAP , ELECT	4.7UF 50V	1
....5	C220	CCEA1HH4R7T	CAP , ELECT	4.7UF 50V	1
....5	C221	HCQI1H152JZT	CAP , MYLAR	1500PF 50V J	1
....5	C222	HCQI1H152JZT	CAP , MYLAR	1500PF 50V J	1
....5	C223	CCEA1HH4R7T	CAP , ELECT	4.7UF 50V	1
....5	C224	CCEA1HH4R7T	CAP , ELECT	4.7UF 50V	1
....5	C225	CGFT1H103ZF	CAP , CERAMIC	0.01UF 50V Z	1
....5	C228	CCEA1HH4R7T	CAP , ELECT	4.7UF 50V	1
....5	C229	CCEA1CH101T	CAP , ELECT	100UF 16V	1
....5	C230	CCEA1HH470T	CAP , ELECT	47UF 50V	1
....5	C231	CCFT1H104ZF	CAP , SEMICONDUCTOR	0.1UF 50V Z	1
....5	C234	CCCT1H330JC	CAP , CERAMIC	33PF 50V J	1
....5	C235	CCEA1CH101T	CAP , ELECT	100UF 16V	1
....5	C236	CGFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1
....5	C237	CCEA1CH101T	CAP , ELECT	100UF 16V	1
....5	C702	CCBS1H330JT	CAP , CERAMIC(33PF/50V)	CH UP025SL330J-A-B Z	1
....5	C703	CCBS1H330JT	CAP , CERAMIC(33PF/50V)	CH UP025SL330J-A-B Z	1
....5	C704	CGFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1
....5	C705	CCKT1H221KB	CAP , CERAMIC	220PF 50V K	1
....5	C706	CCKT1H221KB	CAP , CERAMIC	220PF 50V K	1
....5	C707	CCEA1CH101T	CAP , ELECT	100UF 16V	1
....5	C708	CGFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1
....5	C716	CCEA1AH471T	CAP , ELECT	470UF 10V	1
....5	C717	CCFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1
....5	C718	CCKT1H101KB	CAP , CERAMIC	100PF 50V K	1
....5	C719	CCKT1H101KB	CAP , CERAMIC	100PF 50V K	1
....5	C720	CCKT1H101KB	CAP , CERAMIC	100PF 50V K	1
....5	C722	CCKT1H101KB	CAP , CERAMIC	100PF 50V K	1
....5	C723	CCKT1H101KB	CAP , CERAMIC	100PF 50V K	1
....5	C727	CGFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1
....5	C728	CCFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1
....5	C729	CCEA1CH101T	CAP , ELECT	100UF 16V	1
....5	C730	CGFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1
....5	C731	CCEA1CH101T	CAP , ELECT	100UF 16V	1
....5	C732	CCKT1H101KB	CAP , CERAMIC	100PF 50V K	1
....5	C733	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1
....5	C734	CCBS1H102KBT	CAP , CERAMIC(1000PF/50V)	CH UP025 B102K-A-B Z	1
....5	C735	CCBS1H102KBT	CAP , CERAMIC(1000PF/50V)	CH UP025 B102K-A-B Z	1
....5	C736	HCBS1H222KBT	CAP , CERAMIC	2200PF 50V KB	1
....5	C737	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1
....5	C738	CCBS1H390JT	CAP , CERAMIC(39PF/50V)	CH UP025SL390J-A-B Z	1
....5	C739	CCBS1E103ZFT	CAP , CERAMIC(10000PF/25V)	CH TP025 F103Z-A-B J	1

Level	Ref#	Component	Description	Drawing No	REQ-Qty
....5	C740	CCBS1E103ZFT	CAP , CERAMIC(10000PF/25V)	CH TP025 F103Z-A-B J	1
....5	C741	CCBS1E103ZFT	CAP , CERAMIC(10000PF/25V)	CH TP025 F103Z-A-B J	1
....5	C742	CCBS1E103ZFT	CAP , CERAMIC(10000PF/25V)	CH TP025 F103Z-A-B J	1
....5	C743	CCBS1E103ZFT	CAP , CERAMIC(10000PF/25V)	CH TP025 F103Z-A-B J	1
....5	C744	CCFT1H103ZF	CAP , CERAMIC	0.01UF 50V Z	1
....5	C745	CCEA1HH220T	CAP , ELECT	22UF 50V	1
....5	C746	CCFT1H103ZF	CAP , CERAMIC	0.01UF 50V Z	1
....5	C747	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1
....5	C749	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1
....5	C751	CCEA1AKS221T	CAP , ELECT	220UF 10V	1
....5	C752	CCBS1E103ZFT	CAP , CERAMIC(10000PF/25V)	CH TP025 F103Z-A-B J	1
....5	C754	CCEA1HH470T	CAP , ELECT	47UF 50V	1
....5	C755	CCEA1CKS100T	CAP , ELECT	10UF 16V	1
....5	C901	CCFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1
....5	C902	CCFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1
....5	C903	CCFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1
....5	C904	CCFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1
....5	C905	CCEA1HH220T	CAP , ELECT	22UF 50V	1
....5	C906	CCFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1
....5	C908	CCEA1CH101T	CAP , ELECT	100UF 16V	1
....5	C909	CCFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1
....5	C910	CCEA1CH101T	CAP , ELECT	100UF 16V	1
....5	C911	CCFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1
....5	C914	CCEA1AH471T	CAP , ELECT	470UF 10V	1
....5	C915	CCFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1
....5	C916	CCEA1CH101T	CAP , ELECT	100UF 16V	1
....5	C917	CCFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1
....5	C918	CCEA1CH101T	CAP , ELECT	100UF 16V	1
....5	C919	CCFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1
....5	C920	CCEA1CH101T	CAP , ELECT	100UF 16V	1
....5	C921	CCFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1
....5	C922	CCEA1CH101T	CAP , ELECT	100UF 16V	1
....5	C923	CCFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1
....5	C924	CCEA1CH471T	CAP , ELECT	470UF 16V	1
....5	C925	CCFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1
....5	C926	CCEA1CH101T	CAP , ELECT	100UF 16V	1
....5	C927	CCFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1
....5	C928	CCEA1HH470T	CAP , ELECT	47UF 50V	1
....5	C929	CCFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1
....5	D201	CVD1SS133MT	DIODE	1SS133	1
....5	D202	CVD1SS133MT	DIODE	1SS133	1
....5	D221	CVD1N4003ST	DIODE , RECT	1N4003	1
....5	D702	CVD1SS133MT	DIODE	1SS133	1
....5	D704	CVD1SS133MT	DIODE	1SS133	1
....5	D706	CVD1SS133MT	DIODE	1SS133	1
....5	D708	CVD1SS133MT	DIODE	1SS133	1
....5	D712	CVDZJ4.3BT	DIODE , ZENER	ZJ4.3B 1/2W	1
....5	D713	CVDZJ4.3BT	DIODE , ZENER	ZJ4.3B 1/2W	1
....5	D715	CVDZJ20BT	DIODE , ZENER		1
....5	D716	CVDZJ22BT	DIODE , ZENER	ZJ22B 1/2W	1
....5	D717	CVD1SS133MT	DIODE	1SS133	1
....5	D719	CVD1SS133MT	DIODE	1SS133	1
....5	D720	CVD1SS133MT	DIODE	1SS133	1
....5	D901	CVD1N4003ST	DIODE , RECT	1N4003	1
....5	D902	CVD1N4003ST	DIODE , RECT	1N4003	1
....5	D903	CVD1N4003ST	DIODE , RECT	1N4003	1
....5	D904	CVD1N4003ST	DIODE , RECT	1N4003	1
....5	D905	CVD1N4003ST	DIODE , RECT	1N4003	1
....5	D906	CVD1SS133MT	DIODE	1SS133	1
....5	D907	CVDZJ4.7BT	DIODE , ZENER	ZJ4.7B 1/2W	1
....5	D908	CVD1N4003ST	DIODE , RECT	1N4003	1
....5	D909	CVD1N4003ST	DIODE , RECT	1N4003	1
....5	D910	CVDZJ6.2BT	DIODE , ZENER	ZJ6.2B 1/2W	1
....5	D911	CVDZJ6.2BT	DIODE , ZENER	ZJ6.2B 1/2W	1



Level	Ref#	Component	Description	Drawing No	REQ-Qty
....5	D912	CVD1N4003ST	DIODE , RECT	1N4003	1
....5	D913	CVD1SS133MT	DIODE	1SS133	1
....5	D914	CVD1SS133MT	DIODE	1SS133	1
....5	D915	CVD1SS133MT	DIODE	1SS133	1
....5	D916	CVD1SS133MT	DIODE	1SS133	1
....5	D917	CVD1SS133MT	DIODE	1SS133	1
....5	F901	KJCF5S	HOLDER , FUSE		2
....5	IC72	HVIRE5VL28CATZ	IC , RESET		1
....5	Q201	HVTKTC2874BT	T.R , MUTE	KTC2874B	1
....5	Q202	HVTKTC2874BT	T.R , MUTE	KTC2874B	1
....5	Q203	HVTKRA107MT	T.R	KRA107M	1
....5	Q701	HVTKRA107MT	T.R	KRA107M	1
....5	Q702	HVTKRA107MT	T.R	KRA107M	1
....5	Q703	HVTKRA107MT	T.R	KRA107M	1
....5	Q704	HVTKRA107MT	T.R	KRA107M	1
....5	Q705	HVTKRA107MT	T.R	KRA107M	1
....5	Q712	HVTKSA1175YT	T.R	KSA1175Y(DEAD)	1
....5	Q713	HVTKSC2785YT	T.R	KSC2785Y	1
....5	Q714	HVTKSC2316YT	T.R	KSC2316Y	1
....5	Q715	HVTKRA107MT	T.R	KRA107M	1
....5	Q716	HVTKRC107MT	T.R	KRC107M	1
....5	Q905	HVTKTC3198YT	T.R	KTC3198Y	1
....5	Q906	HVTKTA1266YT	T.R	TKTA1266YT	1
....5	R101	CRD25TJ4R7T	RES , CARBON		1
....5	R104	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
....5	R105	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
....5	R203	CRD20TJ473T	RES , CARBON	47K OHM 1/5W J	1
....5	R205	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1
....5	R208	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1
....5	R209	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1
....5	R210	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1
....5	R213	CRD20TJ473T	RES , CARBON	47K OHM 1/5W J	1
....5	R214	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1
....5	R215	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1
....5	R216	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1
....5	R217	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1
....5	R219	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
....5	R220	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
....5	R221	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1
....5	R222	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1
....5	R223	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
....5	R224	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
....5	R225	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
....5	R226	CRD20TJ105T	RES , CARBON	1M OHM 1/5W J	1
....5	R227	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1
....5	R228	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1
....5	R229	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1
....5	R230	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1
....5	R231	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1
....5	R232	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1
....5	R233	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1
....5	R235	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1
....5	R237	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1
....5	R238	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1
....5	R239	CRD20TJ241T	RES , CARBON	240OHM 1/5W J	1
....5	R240	CRD20TJ150T	RES , CARBON	15 OHM 1/5W J	1
....5	R241	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1
....5	R243	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1
....5	R244	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1
....5	R245	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1
....5	R246	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
....5	R247	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
....5	R248	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1
....5	R249	CRD20TJ101T	RES , CARBON	100 OHM 1/5W J	1

Level	Ref#	Component	Description	Drawing No	REQ-Qty
....5	R250	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
....5	R251	CRD20TJ332T	RES , CARBON	3.3K OHM 1/5W J	1
....5	R252	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
....5	R253	CRD20TJ470T	RES , CARBON	47 OHM 1/5W J	1
....5	R254	CRD20TJ271T	RES , CARBON	270 OHM 1/5W J	1
....5	R704	CRD20TJ470T	RES , CARBON	47 OHM 1/5W J	1
....5	R705	CRD20TJ332T	RES , CARBON	3.3K OHM 1/5W J	1
....5	R707	CRD20TJ470T	RES , CARBON	47 OHM 1/5W J	1
....5	R711	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1
....5	R712	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1
....5	R713	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1
....5	R714	CRD20TJ101T	RES , CARBON	100 OHM 1/5W J	1
....5	R715	CRD20TJ101T	RES , CARBON	100 OHM 1/5W J	1
....5	R716	CRD20TJ333T	RES , CARBON	33K OHM 1/5W J	1
....5	R718	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
....5	R719	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
....5	R721	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
....5	R722	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1
....5	R723	CRD20TJ182T	RES , CARBON	1.8K OHM 1/5W J	1
....5	R724	CRD20TJ272T	RES , CARBON	2.7K OHM 1/5W J	1
....5	R725	CRD20TJ332T	RES , CARBON	3.3K OHM 1/5W J	1
....5	R726	CRD20TJ562T	RES , CARBON	5.6K OHM 1/5W J	1
....5	R727	CRD20TJ752T	RES , CARBON	7.5K OHM 1/5W J	1
....5	R728	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
....5	R730	CRD20TJ101T	RES , CARBON	100 OHM 1/5W J	1
....5	R732	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
....5	R733	CRD20TJ105T	RES , CARBON	1M OHM 1/5W J	1
....5	R734	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
....5	R735	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
....5	R738	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
....5	R739	CRD20TJ822T	RES , CARBON	8.2K OHM 1/5W J	1
....5	R740	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1
....5	R741	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1
....5	R742	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
....5	R743	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
....5	R744	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
....5	R745	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
....5	R746	CRD20TJ330T	RES , CARBON	33 OHM 1/5W J	1
....5	R747	CRD20TJ330T	RES , CARBON	33 OHM 1/5W J	1
....5	R748	CRD20TJ330T	RES , CARBON	33 OHM 1/5W J	1
....5	R749	CRD20TJ272T	RES , CARBON	2.7K OHM 1/5W J	1
....5	R750	CRD20TJ272T	RES , CARBON	2.7K OHM 1/5W J	1
....5	R751	CRD20TJ473T	RES , CARBON	47K OHM 1/5W J	1
....5	R752	CRD20TJ121T	RES , CARBON	120 OHM 1/5W J	1
....5	R753	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
....5	R754	CRD25TJ4R7T	RES , CARBON		1
....5	R755	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
....5	R756	CRD25TJ560T	RES , CARBON		1
....5	R757	CRD25TJ560T	RES , CARBON		1
....5	R758	CRD20TJ681T	RES , CARBON	680 OHM 1/5W J	1
....5	R759	CRD20TJ181T	RES , CARBON	180 OHM 1/5W J	1
....5	R760	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1
....5	R761	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	1
....5	R762	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	1
....5	R763	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	1
....5	R764	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	1
....5	R901	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1
....5	R903	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1
....5	R904	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1
....5	R905	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1
....5	R906	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
....5	R907	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1
....5	R910	CRD20TJ105T	RES , CARBON	1M OHM 1/5W J	1
....5	R912	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1

Level	Ref#	Component	Description	Drawing No	REQ-Qty
....5	S701	HST1A020ZT	SW , TACT		1
....5	S702	HST1A020ZT	SW , TACT		1
....5	S703	HST1A020ZT	SW , TACT		1
....5	S704	HST1A020ZT	SW , TACT		1
....5	S705	HST1A020ZT	SW , TACT		1
....5	S706	HST1A020ZT	SW , TACT		1
....5	S707	HST1A020ZT	SW , TACT		1
....5	S709	HST1A020ZT	SW , TACT		1
...4	BAT1	CAB30H3A3H	BATTERY , RECHARGEABLE	30H3A3H	1
...4	BK21	CMD1A569	BRACKET , PCB		1
...4	BK22	CMD1A569	BRACKET , PCB		1
...4	BK71	CMD1A504	BRACKET , FIP		1
...4	BK72	CMD1A504	BRACKET , FIP		1
...4	BN21	CJP44TT212ZB	PIN , HEADER (2.00MM PITCH, DIP	44PIN, 2MM PITCH, DIP TYPE	1
...4	BN74	CWB1B905050EN	WIRE ASS'Y		1
...4	BN75	CWB1B003050NN	WIRE ASS'Y		1
...4	BN92	CWB1C909150BM	WIRE ASS'Y		1
...4	CN72	CJP15GA117ZY	WAFER , CARD CABLE		1
...4	CN73	CJP07GB113ZY	WAFER , CARD CABLE		1
...4	CN74	CJP05GA19ZY	WAFER , STRAIGHT		1
...4	CN91	CJP02KA060ZY	WAFER		1
...4	CN92	CJP09GA01ZY	CON WAFER YMW025-09R		1
...4	CN93	CJP03GB03ZY	WAFER		1
...4	C748	CCEA1JH471E	CAP , ELECT		1
...4	C900	HCQE2E104KDE	CAP , LINE ACROSS		1
...4	C912	CCEA1EH222E	CAP , ELECT	2200UF 25V	1
...4	C913	CCEA1CH102E	CAP , ELECT		1
...4	C930	CCEA1CH103E	CAP , ELECT		1
...4	C931	CCEA1CH682E	CAP , ELECT		1
...4	D701	CVD30ASOGCAA-S7	L.E.D , ORANGE	T0L-30ASOGCAA-S7	1
...4	D703	CVD1L0345W31BOCT2	L.E.D , WHITE	CVD1L0345W31BOCT201	1
...4	D705	CVD1L0345W31BOCT2	L.E.D , WHITE	CVD1L0345W31BOCT201	1
...4	D707	CVD1L0345W31BOCT2	L.E.D , WHITE	CVD1L0345W31BOCT201	1
...4	FIP1	CFLHCA17SM04T	V.F.D		1
...4	IC21	HVINJM2068MDTE1	I.C , OP AMP	NJM2068MD-TE1	1
...4	IC22	HVI74HC4066D	I.C , SWITCHING(QUAD)	74HC4066D	1
...4	IC23	HVI74HCU04AFNG	I.C , INVERTER	TC74HCU04AFNG(TOSHIBA)	1
...4	IC24	BVIKP1010B	IC, PHOTO COUPLER		1
...4	IC25	HVI74HC4066D	I.C , SWITCHING(QUAD)	74HC4066D	1
...4	IC71	HVIS3F84BB	I.C , FLASH U-COM	S3F84BB	1
...4	IC73	HVI74ACT04MTR	I.C , HEX		1
...4	IC74	HVI74LVC04ADT	I.C , HEX INVERTER	74LVC04AD-T	1
...4	IC91	HVIKA78R05ZA	I.C ASS'Y		1
....5		CMY2A048	HEAT SINK		1
....5		CTB3+8JR	SCREW		1
....5		HVIKA78R05	REGULATOR (5V OUTPUT LOW DRO	KA78R05TU	1
...4	IC92	HVIKA78R05ZA	I.C ASS'Y		1
....5		CMY2A048	HEAT SINK		1
....5		CTB3+8JR	SCREW		1
....5		HVIKA78R05	REGULATOR (5V OUTPUT LOW DRO	KA78R05TU	1
...4	IC93	HVIKA78R12	REGULATOR(12V OUTPUT LOW DRO	KA78R12TU	1
...4	IC94	CVKIA1117S33	I.C , REGULATOR(SOT-223)	KIA1117S/F33, SOT-223	1
...4	JK21	CJJ4N063Z	JACK , BOARD		1
...4	JK22	HJSTOTX177L	MODULE , OPTICAL(TX)	TOTX177L	1
...4	JK23	CJJ2D008Z	JACK , STEREO		1
...4	JK24	CJJ2D008Z	JACK , STEREO		1
...4	JK25	CJJ4M041Y	JACK , BOARD (COAX)		1
...4	RS71	CRVKSM603TH2E	SENSOR , REMOCON	KSM603TH2E	1
...4	S708	CST1A010Z	SW , TACT		1
...4	T901	CLT5M033ZE	TRANS , POWER TU980/230		1
...4	VE71	CSR2A037Z	ENCODER		1
...4	WF11	CJP17GA115ZY	WAFER , CARD CABLE		1
...4	WF72	CJP15GB113ZY	WAFER		1
...4	X701	HOX10000E220C	CRYSTAL		1

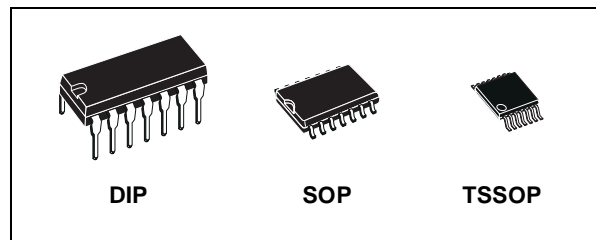
Level	Ref#	Component	Description	Drawing No	REQ-Qty
..3		CTB3+10JFZR	SCREW		2
..3		CTB3+6FFZR	SCREW		2
..3		CTB3+6JR	SCREW		2
..3		CTB3+8JFZR	SCREW		3
..3		CTB4+6FFZR	SCREW		1
..3		CTW3+8JR	SCREW		3
..3		CUA1A280K1	CHASSIS , BOTTOM TU980/230		1
..3		CWC4C4A17B070B	CABLE , CARD(17PIN, 70MM)		1
..3		CWC4F2A15A180B	CABLE , CARD (1mm PITCH, A-B T	DMC250	1
..3		C4FJ054	TAPE , BOTH SIDE	TESA #4970	0,02
..3		KHR1A028	BUSHING , AC CORD		1
..3		KMC1A264	CUSHION , SHIELD		2
..3	F901	KBA2C1000TLEZ	FUSE		1



# 74ACT04

## HEX INVERTER

- HIGH SPEED:  $t_{PD} = 5.0ns$  (TYP.) at  $V_{CC} = 5V$
- LOW POWER DISSIPATION:  
 $I_{CC} = 2\mu A$ (MAX.) at  $T_A=25^\circ C$
- COMPATIBLE WITH TTL OUTPUTS  
 $V_{IH} = 2V$  (MIN.),  $V_{IL} = 0.8V$  (MAX.)
- $50\Omega$  TRANSMISSION LINE DRIVING CAPABILITY
- SYMMETRICAL OUTPUT IMPEDANCE:  
 $|I_{OH}| = I_{OL} = 24mA$  (MIN)
- BALANCED PROPAGATION DELAYS:  
 $t_{PLH} \approx t_{PHL}$
- OPERATING VOLTAGE RANGE:  
 $V_{CC}$  (OPR) = 4.5V to 5.5V
- PIN AND FUNCTION COMPATIBLE WITH 74 SERIES 04
- IMPROVED LATCH-UP IMMUNITY



### ORDER CODES

PACKAGE	TUBE	T & R
DIP	74ACT04B	
SOP	74ACT04M	74ACT04MTR
TSSOP		74ACT04TTR

### DESCRIPTION

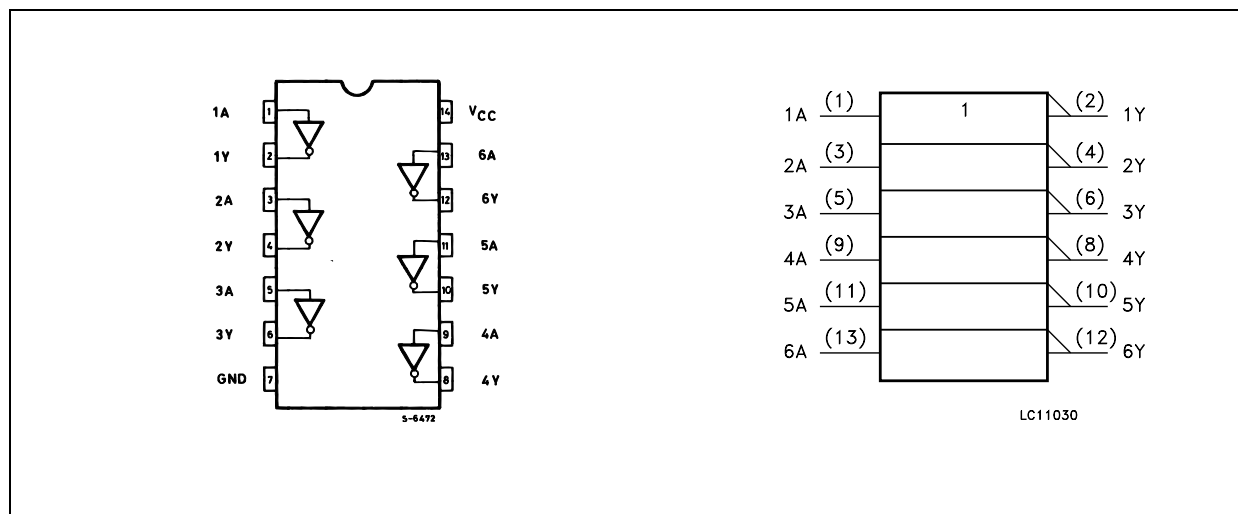
The 74ACT04 is an advanced high-speed CMOS HEX INVERTER fabricated with sub-micron silicon gate and double-layer metal wiring C<sup>2</sup>MOS technology.

The internal circuit is composed of 3 stages including buffer output, which enables high noise immunity and stable output.

The device is designed to interface directly High Speed CMOS systems with TTL, NMOS and CMOS output voltage levels.

All inputs and outputs are equipped with protection circuits against static discharge, giving them 2KV ESD immunity and transient excess voltage.

### PIN CONNECTION AND IEC LOGIC SYMBOLS



Quad bilateral switches

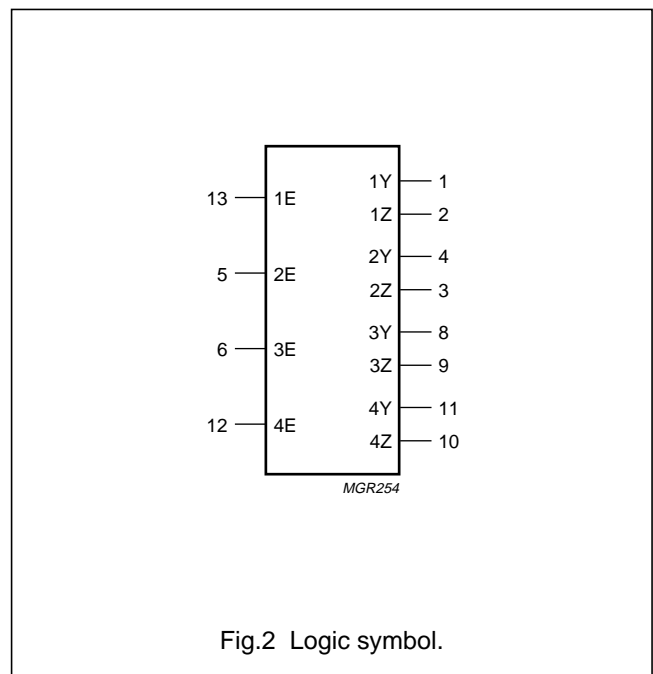
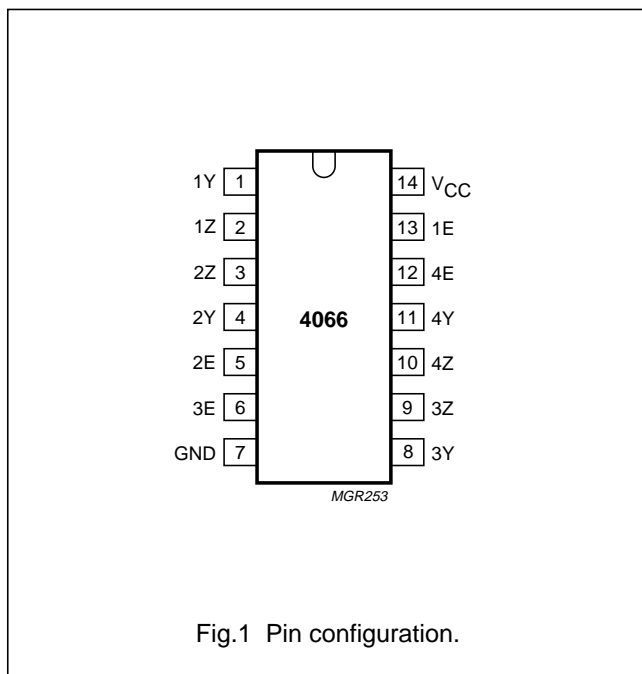
74HC/HCT4066

ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
74HC4066	DIP14	plastic dual in-line package; 14 leads (300 mil)	SOT27-1
74HC4066	SO14	plastic small outline package; 14 leads; body width 3.9 mm	SOT108-1
74HC4066	SSOP14	plastic shrink small outline package; 14 leads; body width 5.3 mm	SOT337-1
74HC4066	TSSOP14	plastic thin shrink small outline package; 14 leads; body width 4.4 mm	SOT402-1
74HCT4066	DIP14	plastic dual in-line package; 14 leads (300 mil)	SOT27-1
74HCT4066	SO14	plastic small outline package; 14 leads; body width 3.9 mm	SOT108-1
74HCT4066	SSOP14	plastic shrink small outline package; 14 leads; body width 5.3 mm	SOT337-1
74HCT4066	TSSOP14	plastic thin shrink small outline package; 14 leads; body width 4.4 mm	SOT402-1

PIN DESCRIPTION

PIN NO.	SYMBOL	NAME AND FUNCTION
1, 4, 8, 11	1Y to 4Y	independent inputs/outputs
2, 3, 9, 10	1Z to 4Z	independent inputs/outputs
7	GND	ground (0 V)
13, 5, 6, 12	1E to 4E	enable inputs (active HIGH)
14	V <sub>CC</sub>	positive supply voltage



TOSHIBA CMOS DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

**TC74HCU04AP, TC74HCU04AF, TC74HCU04AFN**

**HEX INVERTER**

The TC74HCU04A is a high speed CMOS INVERTER fabricated with silicon gate C<sup>2</sup>MOS technology.

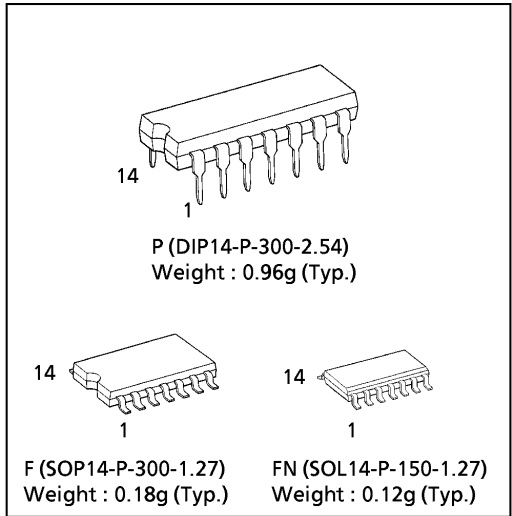
It achieves the high speed operation similar to equivalent LSTTL while maintaining the CMOS low power dissipation. Since the internal circuit is composed of a single stage inverter, it can be used in analog applications such as crystal oscillators.

All inputs are equipped with protection circuits against static discharge or transient excess voltage.

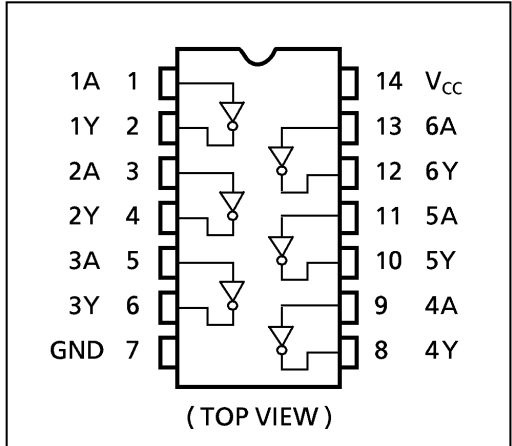
**FEATURES :**

- High Speed..... $t_{pd} = 4ns(typ.)$  at  $V_{CC} = 5V$
- Low Power Dissipation..... $I_{CC} = 1\mu A(Max.)$  at  $T_a = 25^\circ C$
- High Noise Immunity..... $V_{NIH} = V_{NIH} = 10\%V_{CC} (Min.)$
- Output Drive Capability..... 10 LSTTL Loads
- Symmetrical Output Impedance...  $|I_{OH}| = I_{OL} = 4mA(Min.)$
- Balanced Propagation Delays.....  $t_{pLH} \approx t_{pHL}$
- Wide Operating Voltage Range...  $V_{CC}(opr.) = 2V \sim 6V$
- Pin and Function Compatible with 74LS04

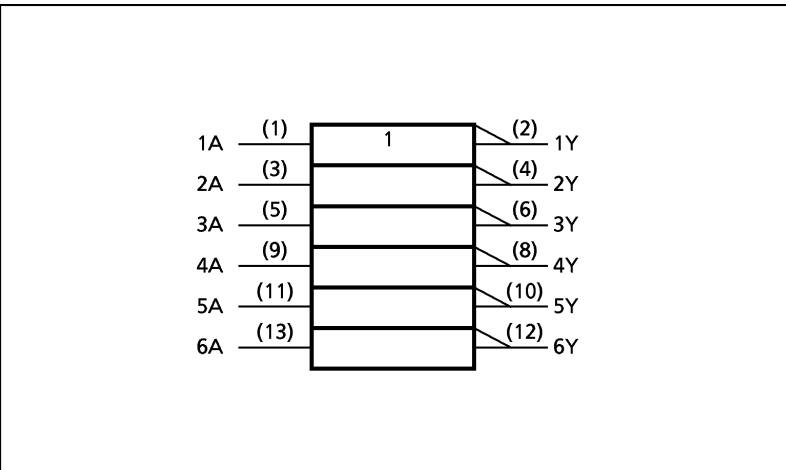
(Note) The JEDEC SOP (FN) is not available in Japan.



**PIN ASSIGNMENT**



**IEC LOGIC SYMBOL**



**TRUTH TABLE**

A	Y
L	H
H	L

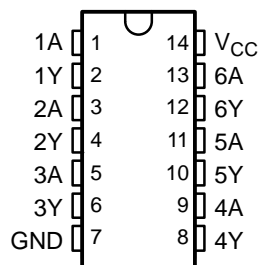
961001EBA2

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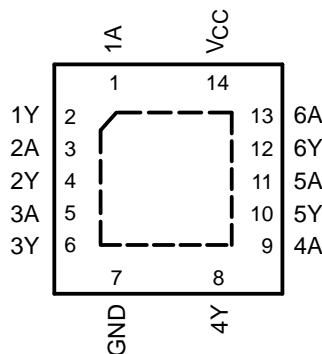
## FEATURES

- Operate From 1.65 V to 3.6 V
- Specified From  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$ ,  $-40^{\circ}\text{C}$  to  $125^{\circ}\text{C}$ , and  $-55^{\circ}\text{C}$  to  $125^{\circ}\text{C}$
- Inputs Accept Voltages to 5.5 V
- Max  $t_{pd}$  of 4.5 ns at 3.3 V
- Typical  $V_{OLP}$  (Output Ground Bounce)  $<0.8\text{ V}$  at  $V_{CC} = 3.3\text{ V}$ ,  $T_A = 25^{\circ}\text{C}$
- Typical  $V_{OHV}$  (Output  $V_{OH}$  Undershoot)  $>2\text{ V}$  at  $V_{CC} = 3.3\text{ V}$ ,  $T_A = 25^{\circ}\text{C}$
- Latch-Up Performance Exceeds 250 mA Per JESD 17
- ESD Protection Exceeds JESD 22
  - 2000-V Human-Body Model (A114-A)
  - 200-V Machine Model (A115-A)
  - 1000-V Charged-Device Model (C101)

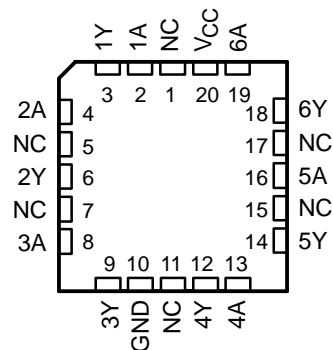
SN54LVC04A . . . J OR W PACKAGE  
SN74LVC04A . . . D, DB, DGV, NS,  
OR PW PACKAGE  
(TOP VIEW)



SN74LVC04A . . . RGY PACKAGE  
(TOP VIEW)



SN54LVC04A . . . FK PACKAGE  
(TOP VIEW)



NC - No internal connection

## DESCRIPTION/ORDERING INFORMATION

The SN54LVC04A hex inverter contains six independent inverters designed for 2.7-V to 3.6-V  $V_{CC}$  operation, and the SN74LVC04A hex inverter contains six independent inverters designed for 1.65-V to 3.6-V  $V_{CC}$  operation. The 'LVC04A devices perform the Boolean function  $Y = \bar{A}$ .

Inputs can be driven from either 3.3-V or 5-V devices. This feature allows the use of these devices as translators in a mixed 3.3-V/5-V system environment.



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.





# NJM2068

## LOW-NOISE DUAL OPERATIONAL AMPLIFIER

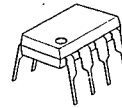
### ■ GENERAL DESCRIPTION

The NJM2068 is a high performance, low noise dual operational amplifier. This amplifier features popular pin-out, superior noise performance, and superior total harmonic distortion. This amplifier also features guaranteed noise performance with substantially higher gain-bandwidth product and slew rate which far exceeds that of the 4558 type amplifier. The specially designed low noise input transistors allow the NJM2068 to be used in very low noise signal processing applications such as audio preamplifiers and servo error amplifier.

### ■ FEATURES

- Operating Voltage (±4V ~ ±18V)
- Low Total Harmonic Distortion (0.001% typ.)
- Low Noise Voltage (FLAT+JISA, 0.56 μV typ.)
- High Slew Rate (6V/μs typ.)
- Unity Gain Bandwidth (27MHz @f=10kHz)
- Package Outline DIP8, DMP8, SIP8, SSOP8
- Bipolar Technology

### ■ PACKAGE OUTLINE



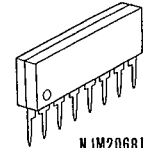
NJM2068D



NJM2068M

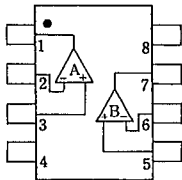


NJM2068V

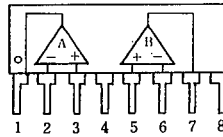


NJM2068L

### ■ PIN CONFIGURATION



NJM2068D  
NJM2068M  
NJM2068V

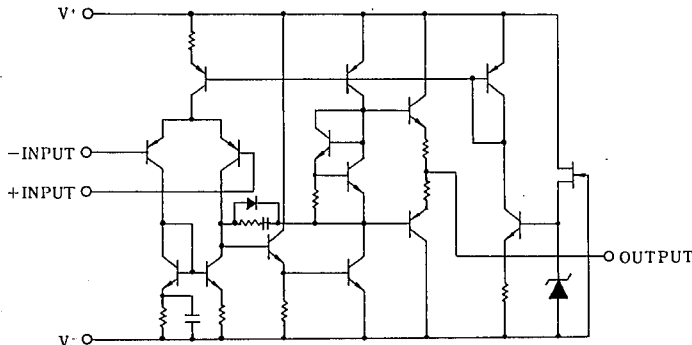


NJM2068L

#### PIN FUNCTION

1. A OUTPUT
2. A-INPUT
3. A+INPUT
4. V-
5. B+INPUT
6. B-INPUT
7. B OUTPUT
8. V+

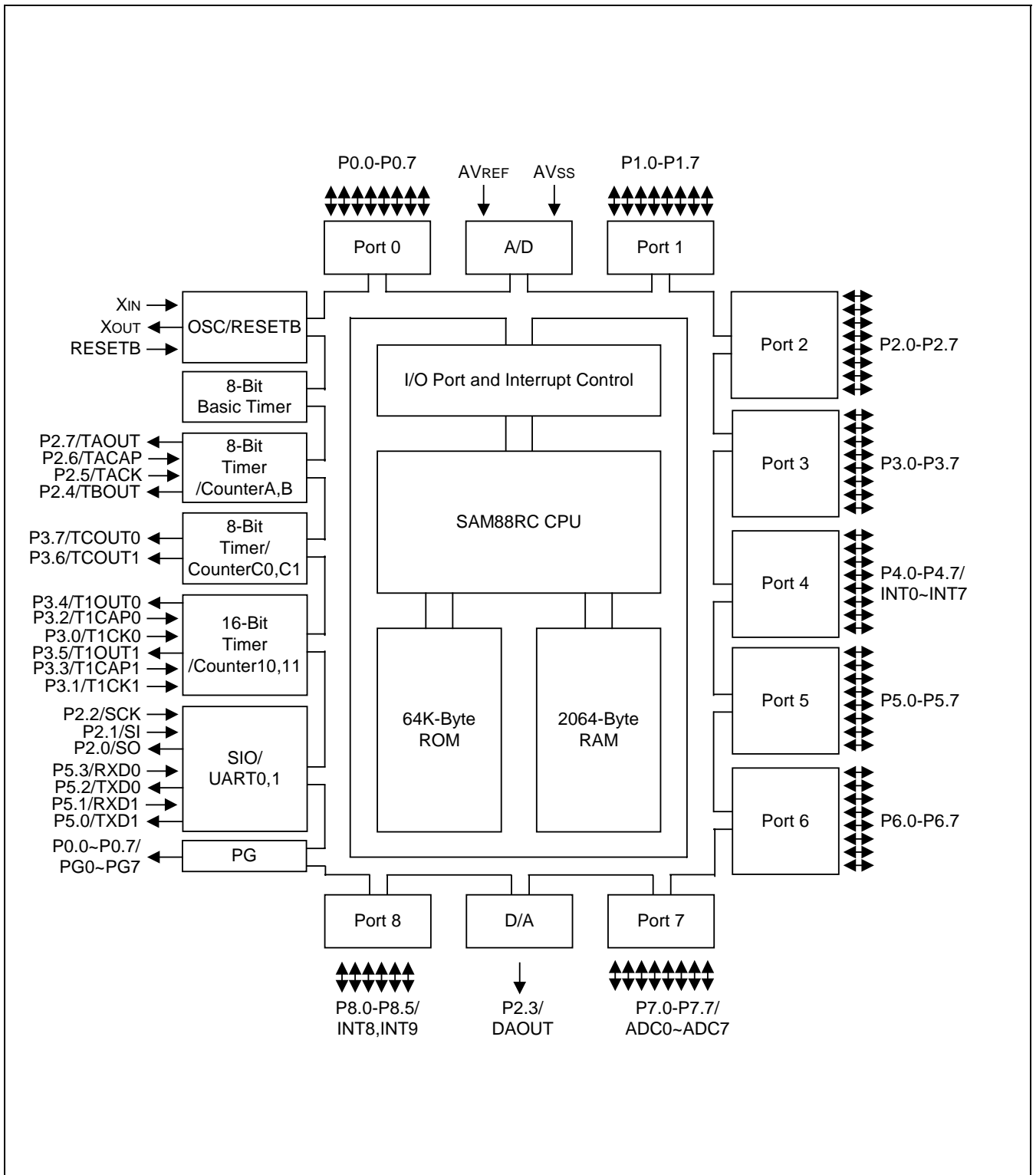
### ■ EQUIVALENT CIRCUIT (1/2 Shown)



## IC71 FUNCTION (MI-COM S3F84BB)

Pin No.	PIN NAME	I/O	DESCRIPTION
1~8	FIP-DA	O	FIP Data output port
9	N.C	-	Non connection
10	SINO	I	UART Data input port
11	SOTO	O	UART Data output port
12	VDD1	I	Power supply port(+5V)
13	VSS1	I	GND
14	XTOUT	O	10MHz crystal connection port
15	XIN	I	
16	TEST	I	Back-up Input
17,18	N.C	-	Non connection
19	RESET	I	Reset input port("L")
20	N.C	-	Non connection
21	DAB_DIN	I	DAB Data input port
22	DAB_DOUT	O	DAB Data output port
23	DAB_CLK	O	DAB Clock control port("L")
24	FM/AM_MUTE	O	FM/AM MUTE control port("L")
25	PLL_DATA	O	PLL Data output port
26	PLL_CE	O	PLL Enable control port
27	PLL_CLK	O	PLL Clock control port
28	STEREO	I	Tuner module stereo control port
29	TUNED	I	Tuner module tuned control port
30	PLL_DIN	I	PLL Data input port
31	RDS_CLK	O	RDS Clock control port
32	RDS_DATA	I	RDS Data input port
33	BACK_UP	I	BACK-UP mode control port("L")
34	REMOTE_IN	I	Remote unit data input port
35~38	N.C	-	Non connection
39,40	GND	I	GND
41	SCROLL_UP	I	Scroll up control port
42	SCROLL_DN	I	Scroll down control port
43	VREF	I	A/D converter reference voltage
44	AVSS	I	GND
45	GND	I	
46	KEY3	I	
47	KEY2	I	
48	KEY1	I	KEY 1 control port
49~51	N.C	-	Non connection
52	VSS2	I	GND
53	VDD2	I	Power supply port(+5V)
54	SYSTEM_MUTE	O	System MUTE control port("L")
55	STAND_BY	O	Standby on control port("L")
56	FM/AM_ON	O	FM/AM on control port("L")
57	N.C	-	Non connection
58	POWER_ON	O	Unit turn on control port("L")
59~64	N.C	-	Non connection
65~68	OPTION	I	GND or OPEN
69~70	N.C	-	Non connection
71	OPTION	I	GND or OPEN
72~74	N.C	-	Non connection
75	OPTION	I	GND or OPEN
76~77	N.C	-	Non connection
78	RS_P	O	Register selection port
79	WRITE	O	Write enable port
80	READ	O	Read enable port

**BLOCK DIAGRAM**



**Figure 1-1. S3C84BB/F84BB Block Diagram**



PIN ASSIGNMENT

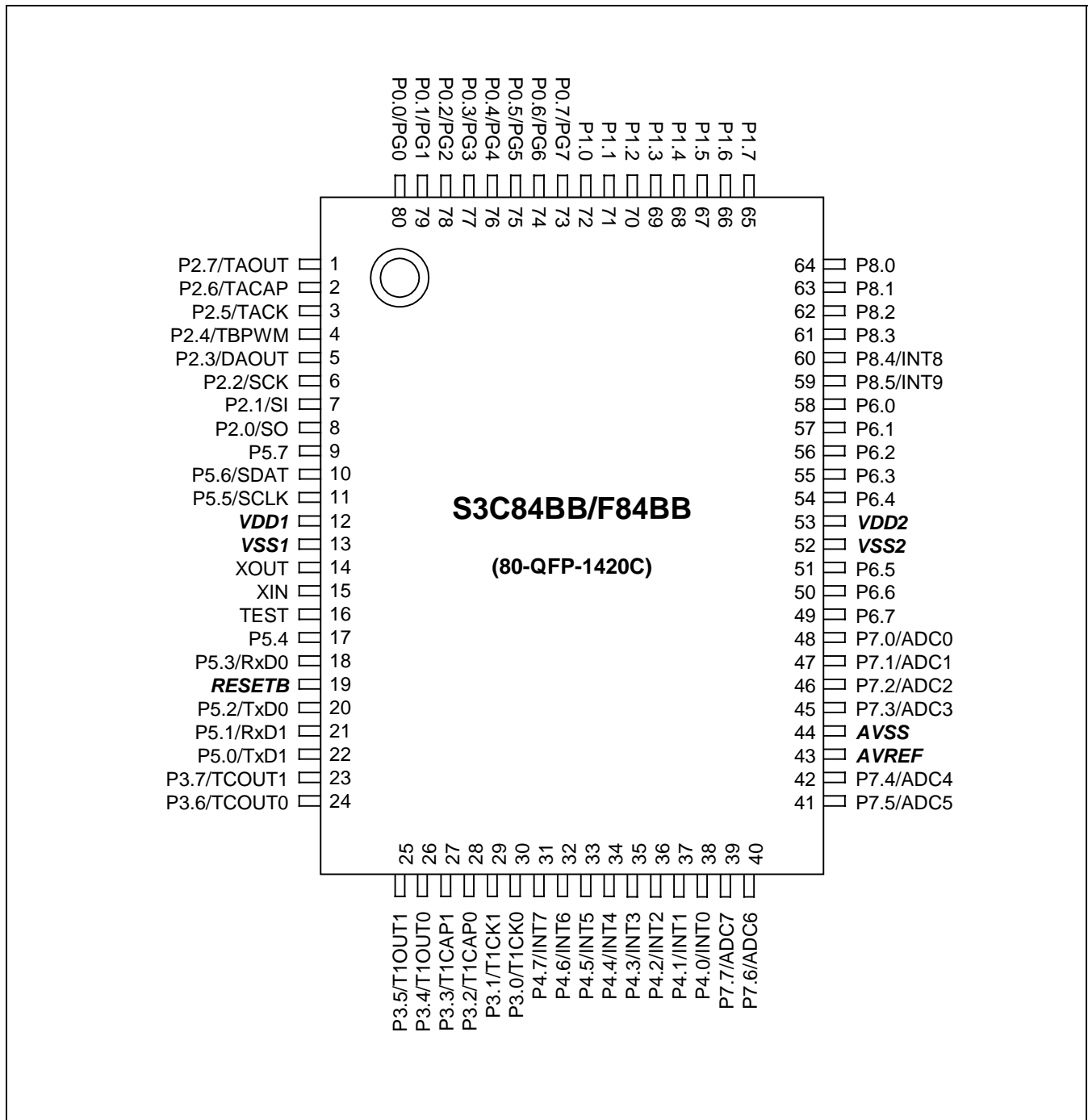
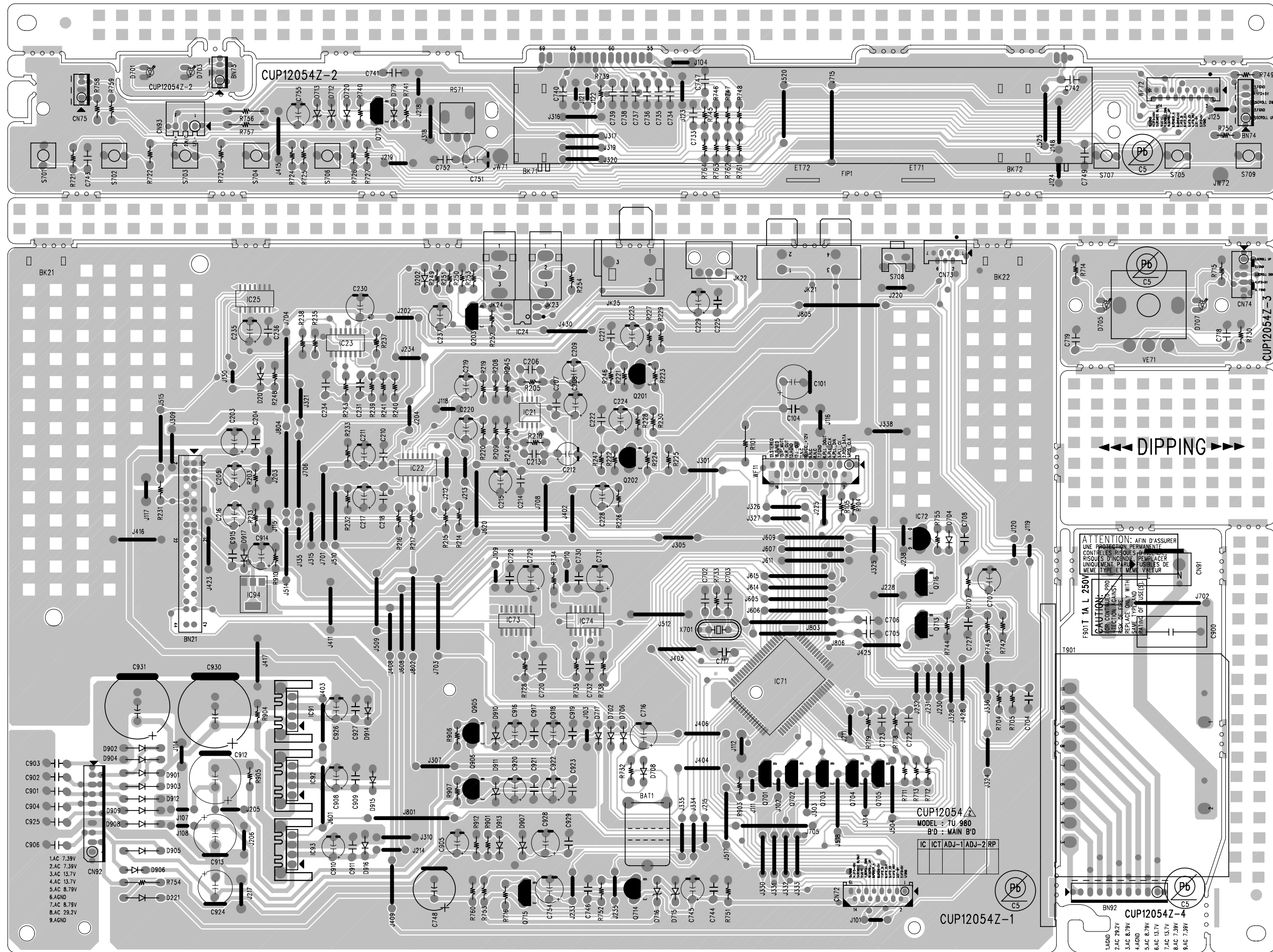
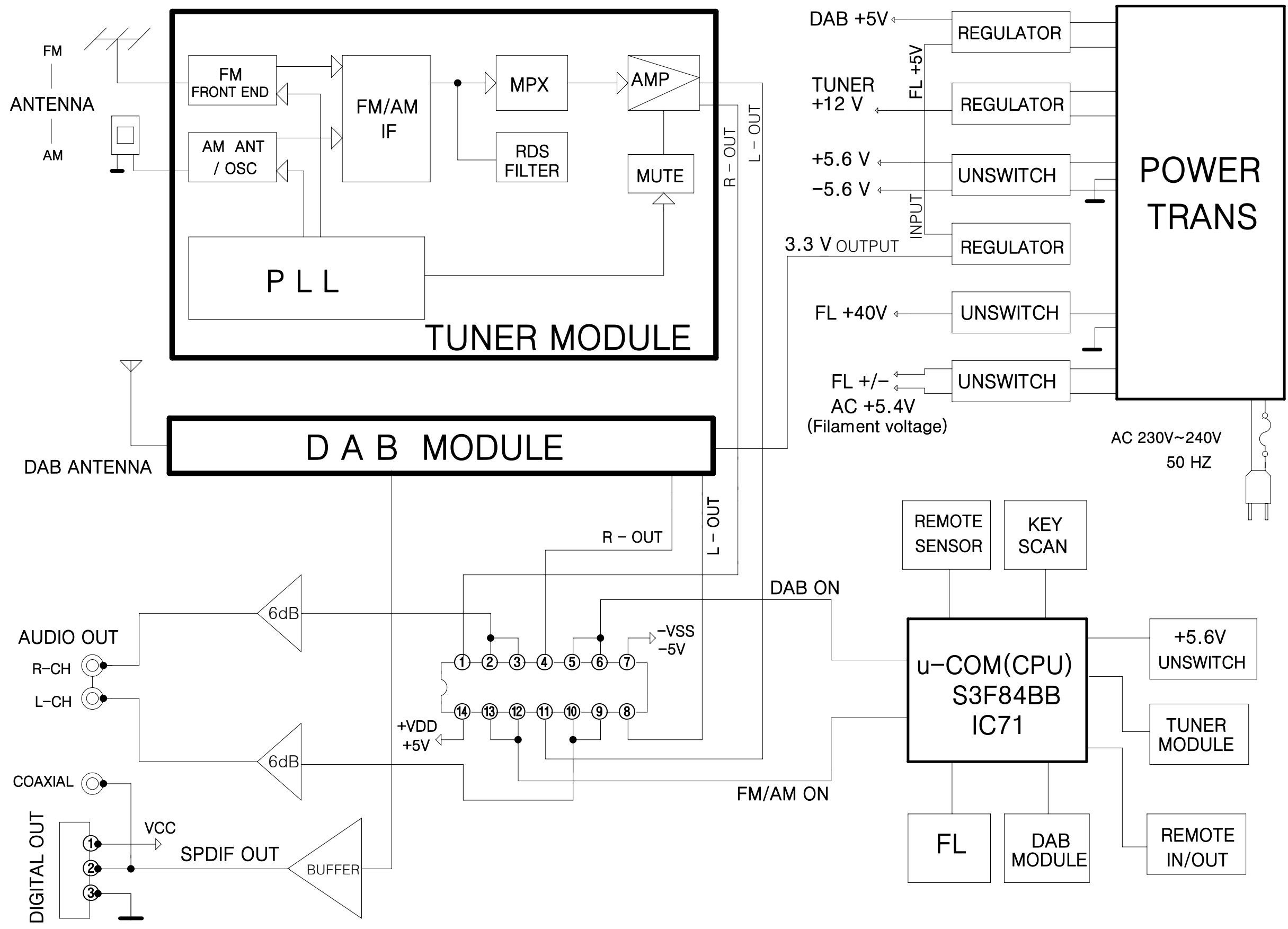


Figure 1-2. S3C84BB/F84BB Pin Assignment (80-QFP)

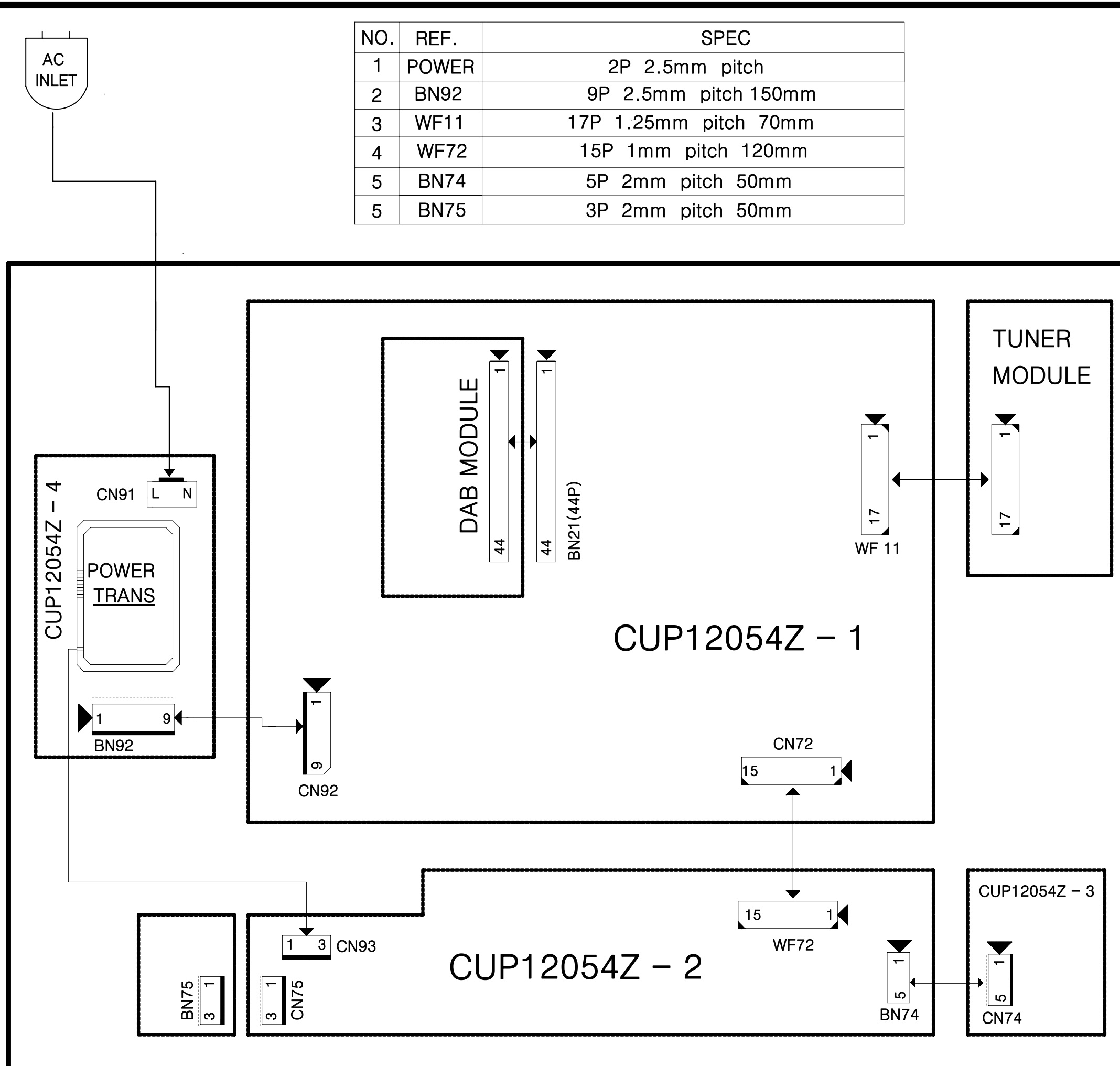
# PRINTED CIRCUIT BOARD



# BLOCK DIAGRAM



NO.	REF.	SPEC
1	POWER	2P 2.5mm pitch
2	BN92	9P 2.5mm pitch 150mm
3	WF11	17P 1.25mm pitch 70mm
4	WF72	15P 1mm pitch 120mm
5	BN74	5P 2mm pitch 50mm
5	BN75	3P 2mm pitch 50mm



# SCHEMATIC DIAGRAM

## DAB MODULE

### MODULE FM/AM

OPTION		
PIN 65	FM 50k STEP	ACTIVE L
PIN 66	AM 9k STEP	ACTIVE L
PIN 67	RDS ON	ACTIVE L
PIN 68	MW DISPLAY	ACTIVE L
PIN 75	L BAND ON	OPEN
	L/C/N/BAND ON	ACTIVE L

