ORDER NO. KMS0308816C1

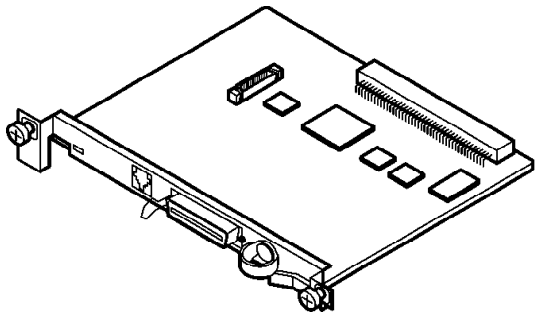
F19

Service Manual

8Port Digital Hybrid Extension Card

KX-TDA0170

(for U.S.A.)



⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

When you note the serial number, write down all of the 11 digits. The serial number may be found on the unit.

Panasonic

IMPORTANT INFORMATION ABOUT LEAD FREE, (PbF), SOLDERING
If lead free solder was used in the manufacture of this product the printed circuit boards will be marked PbF.
Standard leaded, (Pb), solder can be used as usual on boards without the PbF mark.
When this mark does appear please read and follow the special instructions described in this manual on the use of PbF and how it might be permissible to use Pb solder during service and repair work.

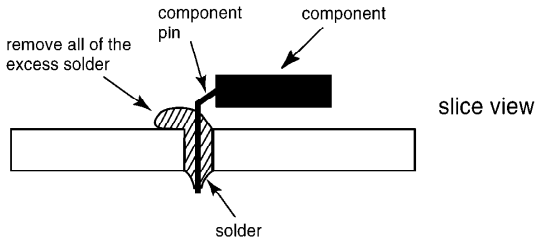
1. ABOUT LEAD FREE SOLDER (PbF: Pb free)

Note:
In the information below, Pb, the symbol for lead in the periodic table of elements, will refer to

standard solder or solder that contains lead.
We will use PbF solder when discussing the lead free solder used in our manufacturing process which is made from Tin, (Sn), Silver, (Ag), and Copper, (Cu).
This model, and others like it, manufactured using lead free solder will have PbF stamped on the PCB. For service and repair work we suggest using the same type of solder although, with some precautions, standard Pb solder can also be used.

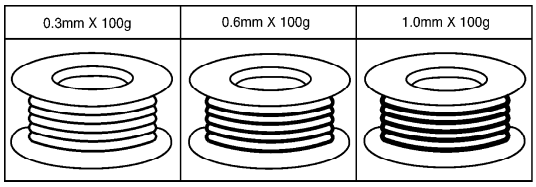
Caution

- **PbF solder has a melting point that is 50° ~ 70° F, (30° ~ 40°C) higher than Pb solder. Please use a soldering iron with temperature control and adjust it to 700° ± 20° F, (370° ± 10°C). In case of using high temperature soldering iron, please be careful not to heat too long.**
- **PbF solder will tend to splash if it is heated much higher than its melting point, approximately 1100°F, (600°C).**
- **If you must use Pb solder on a PCB manufactured using PbF solder, remove as much of the original PbF solder as possible and be sure that any remaining is melted prior to applying the Pb solder.**
- **When applying PbF solder to double layered boards, please check the component side for excess which may flow onto the opposite side (See figure, below).**



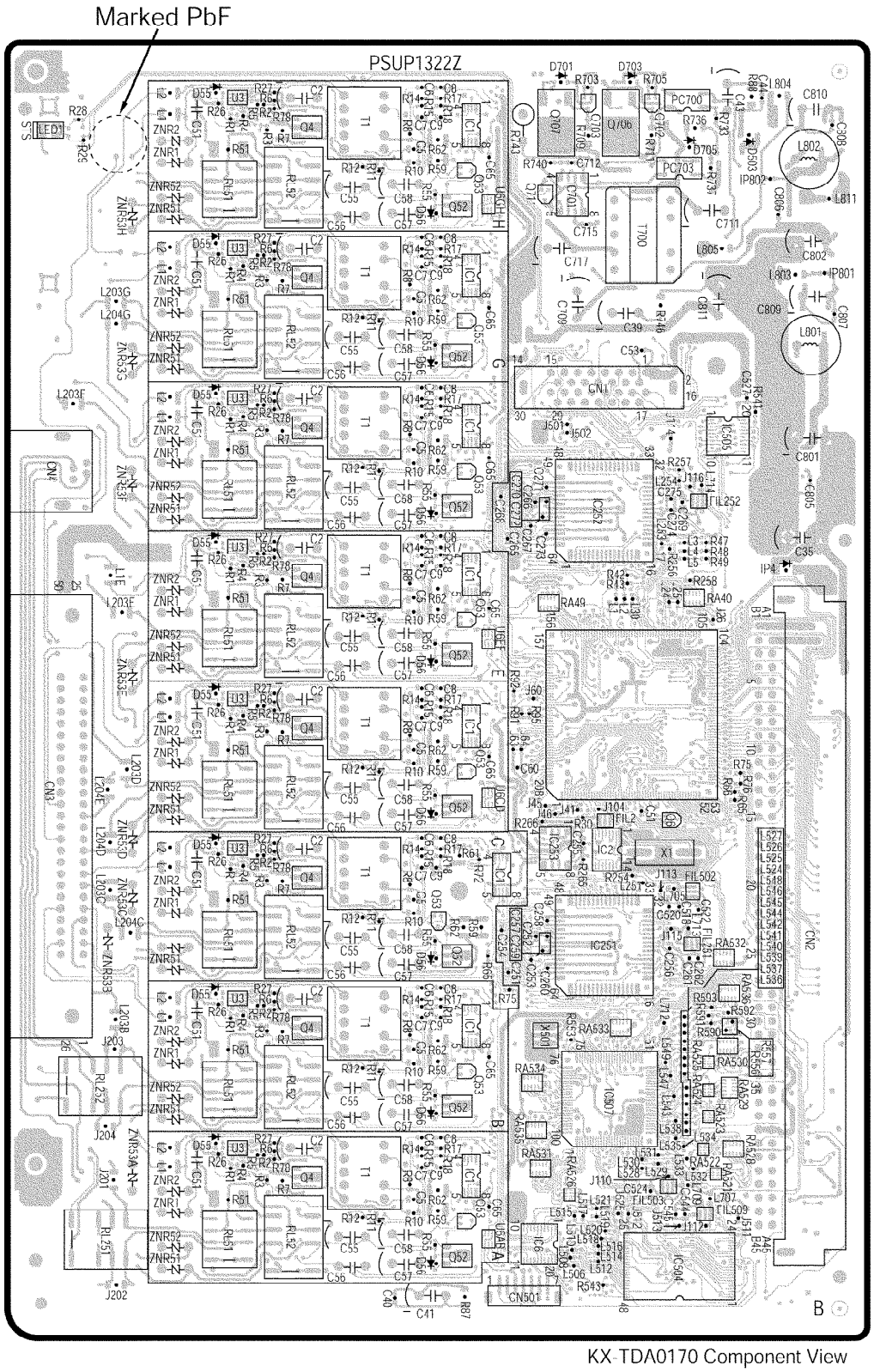
1.1. SUGGESTED PbF SOLDER

There are several types of PbF solder available commercially. While this product is manufactured using Tin, Silver, and Copper,(Sn+Ag+Cu), you can also use Tin and Copper, (Sn+Cu), or Tin, Zinc, and Bismuth, (Sn+Zn+Bi). Please check the manufacturer's specific instructions for the melting points of their products and any precautions for using their product with other materials. The following lead free (PbF) solder wire gauge are recommended for service of this product: 0.3mm, 0.6mm and 1.0mm.



1.2. HOW TO RECOGNIZE THAT Pb FREE SOLDER IS USED

“PbF” is marked on the PCB to show that Pb free solder is used.(See the figure below.)



KX-TDA0170 Component View

2. FOR SERVICE TECHNICIANS

ICs and LSIs are vulnerable to static electricity.

When repairing, the following precautions will help prevent recurring malfunctions.

1. Cover the plastic parts boxes with aluminum foil.

2. Ground the soldering irons.

3. Use a conductive mat on the worktable.

4. Do not touch IC or LSI pins with bare fingers.

3. GENERAL DESCRIPTION

This card, which is used in the free slot of the TDA system, can randomly connect eight of SLT, DPT, and APT. In DPT connection, the XDP function allows SLT to be connected to each port in parallel.It is comprised of CPU that is SH-1 (SH7020), 8Mbit flash ROM, and 2Mbit SRAM. The software updates can be downloaded.

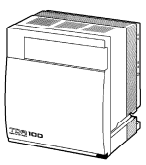
4. SPECIFICATION

Functional Block	Functional contents	
Extension Interface	Number of Ports	8 ports
	PT Interface	+40V/+15V Overcurrent protective function, Volta switching function Inter-APT communications D (Upward: 0.25kbps, Downward: 0.69kbps) 2W Ping-pong transmission system (31.25kbps) Inter-DPT communications, Inter-CS (TDA0141) communications (from ver.1.1) 2B+D (144kbps) 2W Ping-pong transmission syst (512kbps) Dch-control HDLC embeds eight channels in ASI Surge protective function
	SLT Interface	+30V 30mA Feeding function Dial-pulse signal detecting function DTMF signal detecting function Bell signal issuing function Hook detecting function Ringtrip detecting function 2W/4W converting function Surge protective function Infineon-manufactured 4ch codec function CODEC function μ /A law switching function Test function (Loop back, Tone generation) Programmable digital filtering function Serial interface function PIO function

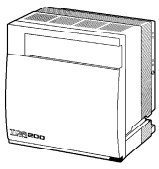
Functional Block	Functional contents	
DTMF Receiver	Eight lines for each port	
On-board Ringer	20/25Hz 75Vrms Phase control (Three-phase / Four-phase)	
On-board DC/DC Power Supply	Input +15V Output +15V, +5V, +3.3V	
Power Failure Forwarding Function	Two lines supported	
Self-Diagnostic Function	Carried out with outsire-line interface in a pair (DHLC8 card has only Speech path test, Dial pulse test, DTMF test	
ASIC	EC bus interface function CT bus interface function, Digital PLL function Local bus interface function Time switch function, Gain controlling function, DPRAM function Private telephone controlling interface function Parallel IO function	
Controller	CPU	SH-1/SH7020 (12.288MHz)
	Flash ROM	1 Mbyte
	SRAM	256 kbyte
LED Display Circuit	Card status indicating LED: Two colors (Red/Green)	
External Interface Connector	Extension interface	50pin Amphenol connector: 1
	Power failure forwarding	4pin modular jack: 1

5. NAMES AND LOCATIONS

Overview

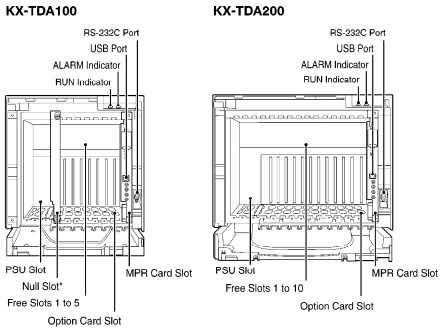


KX-TDA100



KX-TDA200

Inside View



Note:
***Null slot is not available for any optional service cards.**

5.1. INSTALLING/REMOVING THE OPTIONAL SERVICE CARDS

Slot Condition

Card Type	Slot Type		
	KX-TDA100: Free Slots 1 to 5 KX-TDA200: Free Slots 1 to 10	Option Slot	MPR Slot
MPR Card	No	No	Yes
CO Line Cards	Yes	No	No
Extension Cards	Yes	No	No
OPB3 Card	Yes	Yes	No
CTI-LINK Card	Yes	Yes	No

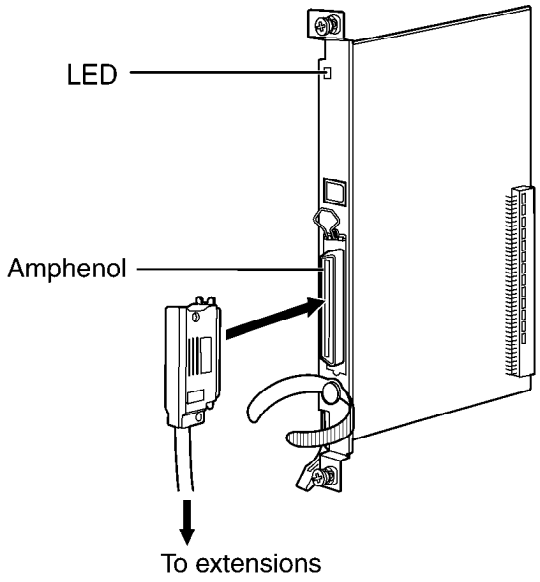
Caution:

To protect the back board from static electricity, do not touch parts on the back board in the main unit and on the optional service cards.To discharge static, touch ground or wear an earthing strap.

DHLC8 Card

Function

8-port digital hybrid extension card for DPT, APT, SLT, and digital DSS consoles with 2 power failure transfer ports.



Notes

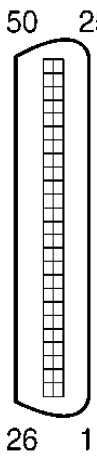
- To connect the amphenol connector, refer to "Fastening Amphenol Type Connector".

- For details about power failure transfer, refer to "Auxiary Connection for Power Failure Transfer".

Accessory and User-supplied Items
Accessory: screws x 2
User-supplied: amphenol connector

Pin Assignments

Amphenol Connector



No.	Signal Name	Function	No.	Signal Name	Function
1	RA	SLT Ring port 1	26	TA	SLT Tip port 1
2	D2A	PT Data port 1 (Low Volt)	27	D1A	PT Data port 1 (Hig Volt)
3	Reserved	-	28	Reserved	-
4	RB	SLT Ring port 2	29	TB	SLT Tip port 2
5	D2B	PT Data port 2 (Low Volt)	30	D1B	PT Data port 2 (Hig Volt)
6	Reserved	-	31	Reserved	-
7	RC	SLT Ring port 3	32	TC	SLT Tip port 3
8	D2C	PT Data port 3 (Low Volt)	33	D1C	PT Data port 3 (Hig Volt)
9	Reserved	-	34	Reserved	-
10	RD	SLT Ring port 4	35	TD	SLT Tip port 4
11	D2D	PT Data port 4 (Low Volt)	36	D1D	PT Data port 4 (Hig Volt)
12	Reserved	-	37	Reserved	-
13	RE	SLT Ring port 5	38	TE	SLT Tip port 5
14	D2E	PT Data port 5 (Low Volt)	39	D1E	PT Data port 5 (Hig Volt)
15	Reserved	-	40	Reserved	-
16	RF	SLT Ring port 6	41	TF	SLT Tip port 6
17	D2F	PT Data port 6 (Low Volt)	42	D1F	PT Data port 6 (Hig Volt)
18	Reserved	-	43	Reserved	-
19	RG	SLT Ring port 7	44	TG	SLT Tip port 7
20	D2G	PT Data port 7 (Low Volt)	45	D1G	PT Data port 7 (Hig Volt)
21	Reserved	-	46	Reserved	-
22	RH	SLT Ring port 8	47	TH	SLT Tip port 8
23	D2H	PT Data port 8 (Low Volt)	48	D1H	PT Data port 8 (Hig Volt)
24-25	Reserved	-	49-50	Reserved	-

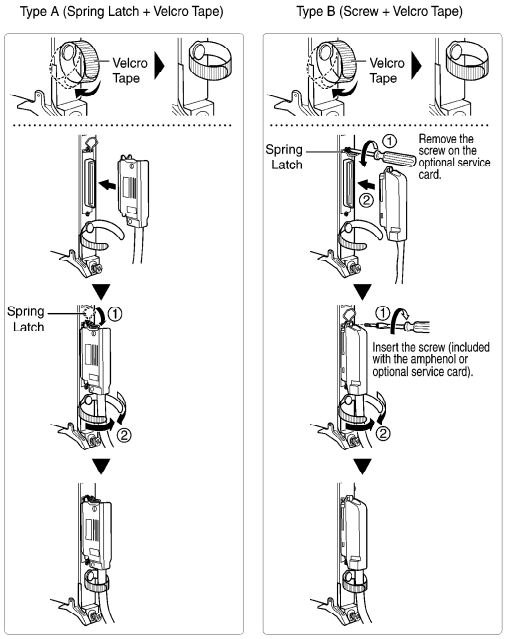
LED Indications

Indication	Color	Description
CARD STATUS	Green/Red	OFF: Power Off Green ON: Normal (all ports are idle) Green Flash (60 times per minute): Normal (a port is in use) Red ON: Fault (includes reset) Red Flash (60 times per minute): Out of Service

Fastening Amphenol Type Connector

An amphenol 57JE type connector is used on some of the optional sevice cards.

To connect an amphenol connector, use the spring latch or screw to fix the upper part and use Velcro® tape to fix the lower part of the connector.



Auxiliary Connection for Power Failure Transfer

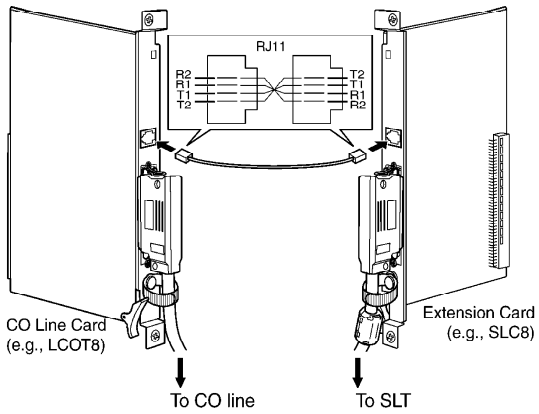
When the power supply to the Hybrid IP-PBX fails, power failure transfer (PFT) switches the current connection to the Auxiliary Connection automatically. A specific SLT (determined by System Programming) will be connected to selected CO lines in the event of system power failure. Auxiliary Connection is required to implement this feature.

Connection

The following CO line and extension cards can be used for Auxiliary Connections:

- **Analog CO line cards: LCOT16 (4 PFT ports), and LCOT8 (2 PFT port)**
- **Extension cards: MSLC16 (4 PFT ports), SLC16 (4PFT ports),**

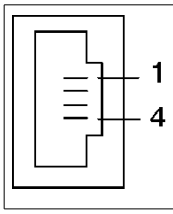
DHLC8 (2 PFT port) and SLC8 (2 PFT port)



Note
Pin assignments for ports 3 and 4 are the same as those of ports 1 and 2.

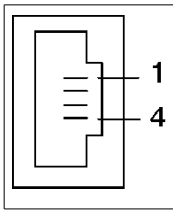
Accessory and User-supplied Items
Accessory: none
User-supplied: RJ11 connectors

RJ11 Connector Pin Assignments for CO line Crad



No.	Signal Name	Function
1	R2	Ring port 2
2	R1	Ring port 1
3	T1	Tip port 1
4	T2	Tip port 2

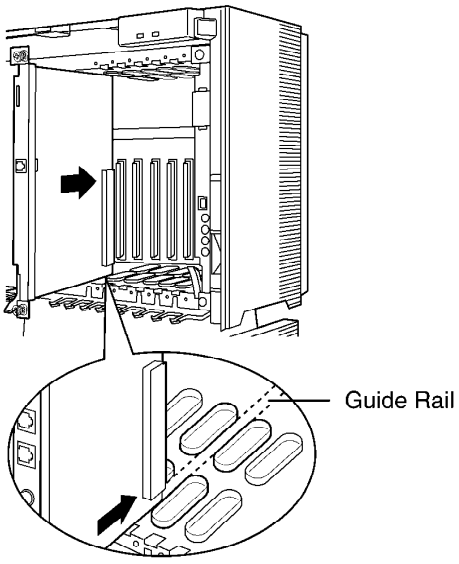
RJ11 Connector Pin Assignments for Extension Card



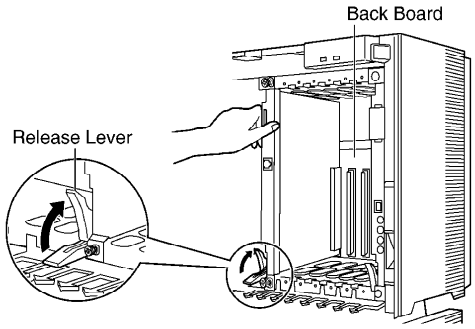
No.	Signal Name	Function
1	T2	Tip port 2
2	T1	Tip port 1
3	R1	Ring port 1
4	R2	Ring port 2

Installing Optional Service Cards

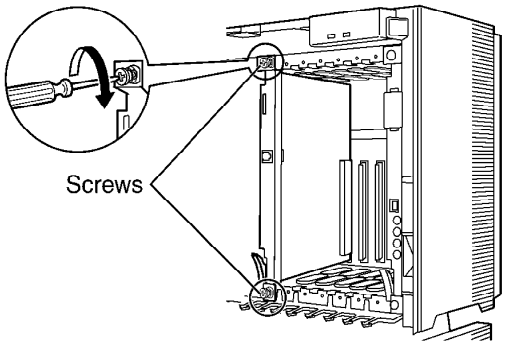
1. Insert the card along the guide rails.



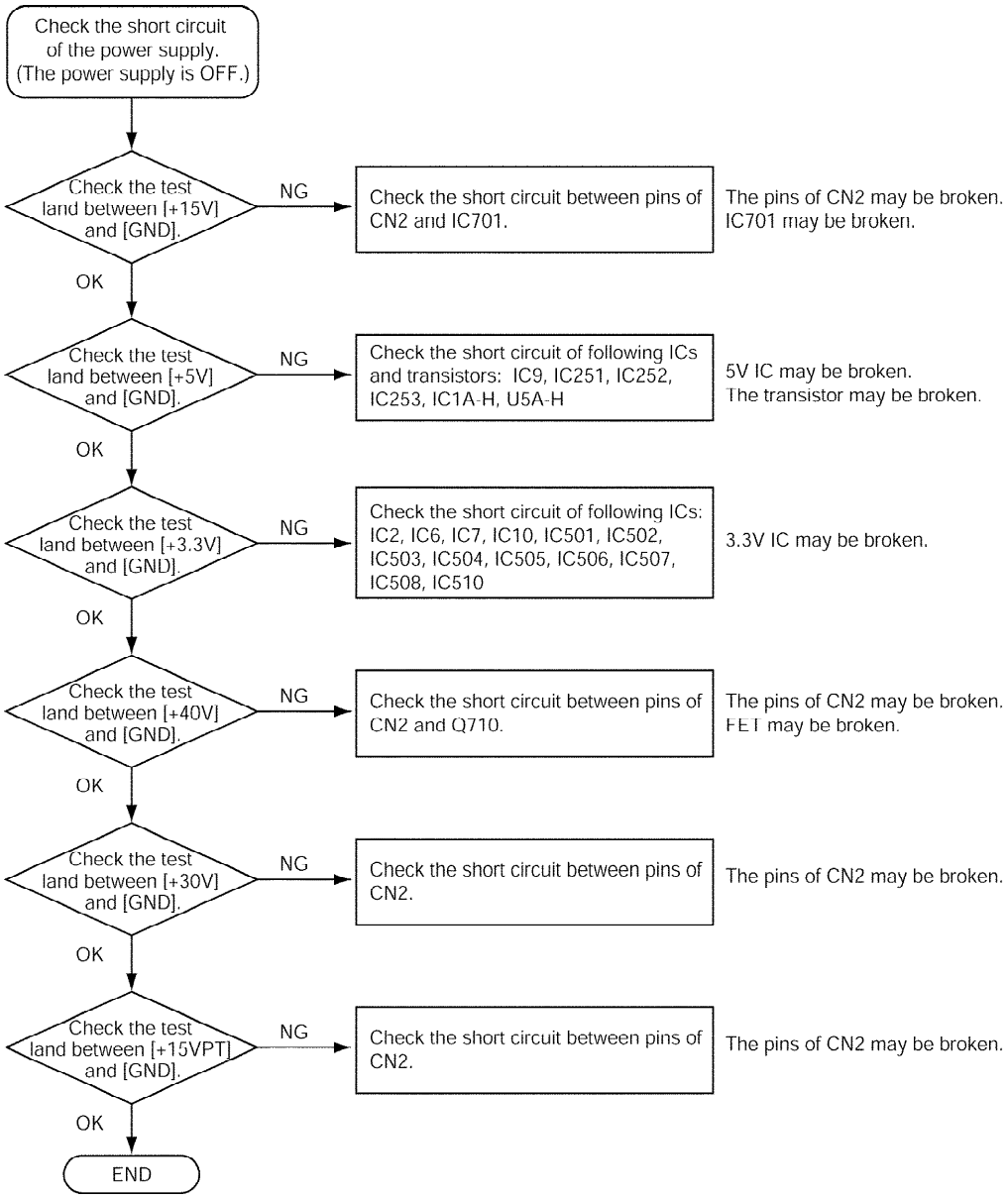
2. Holding the card as follows, push the release lever in the direction of the arrow so that the card is made to engage with the connector on the back board securely.

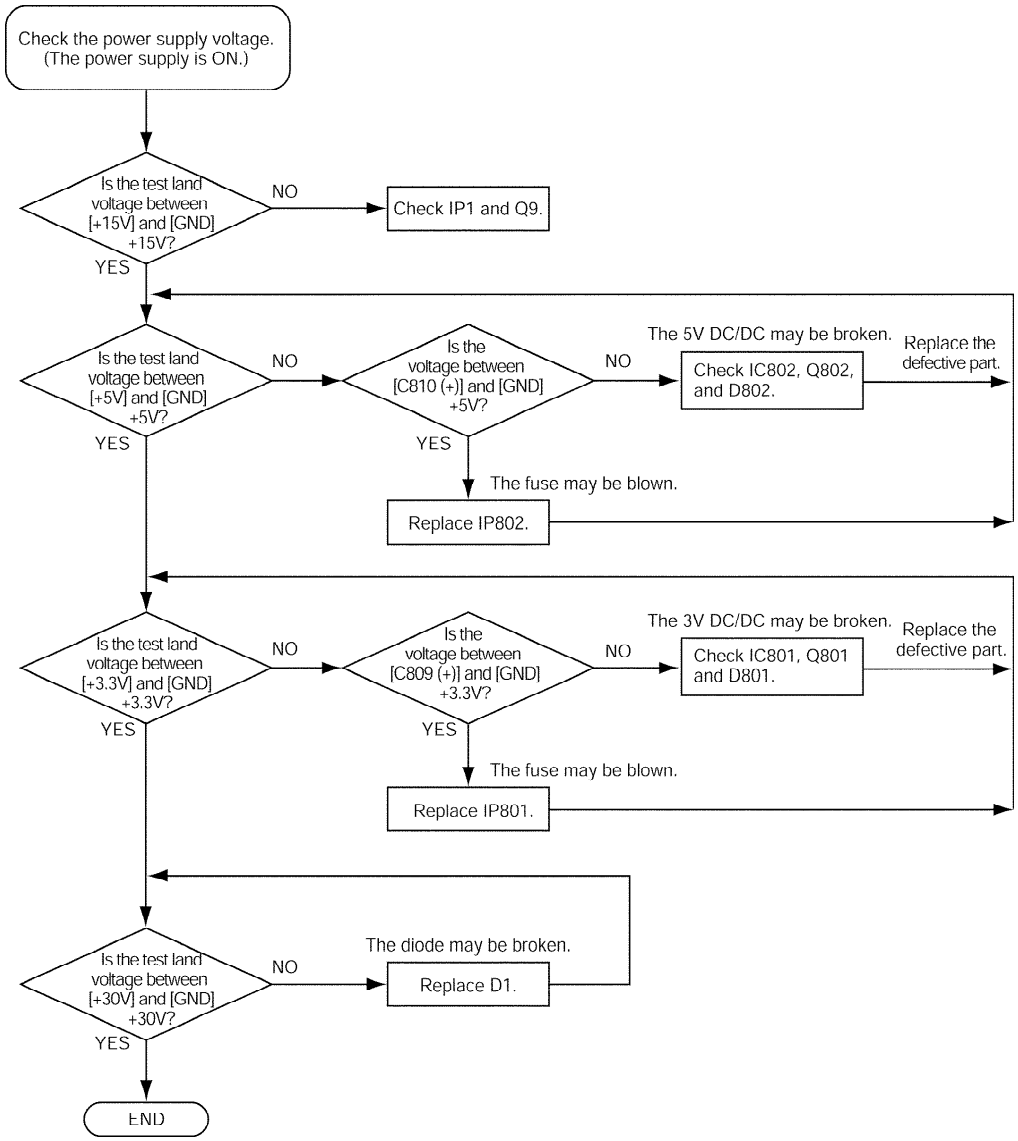


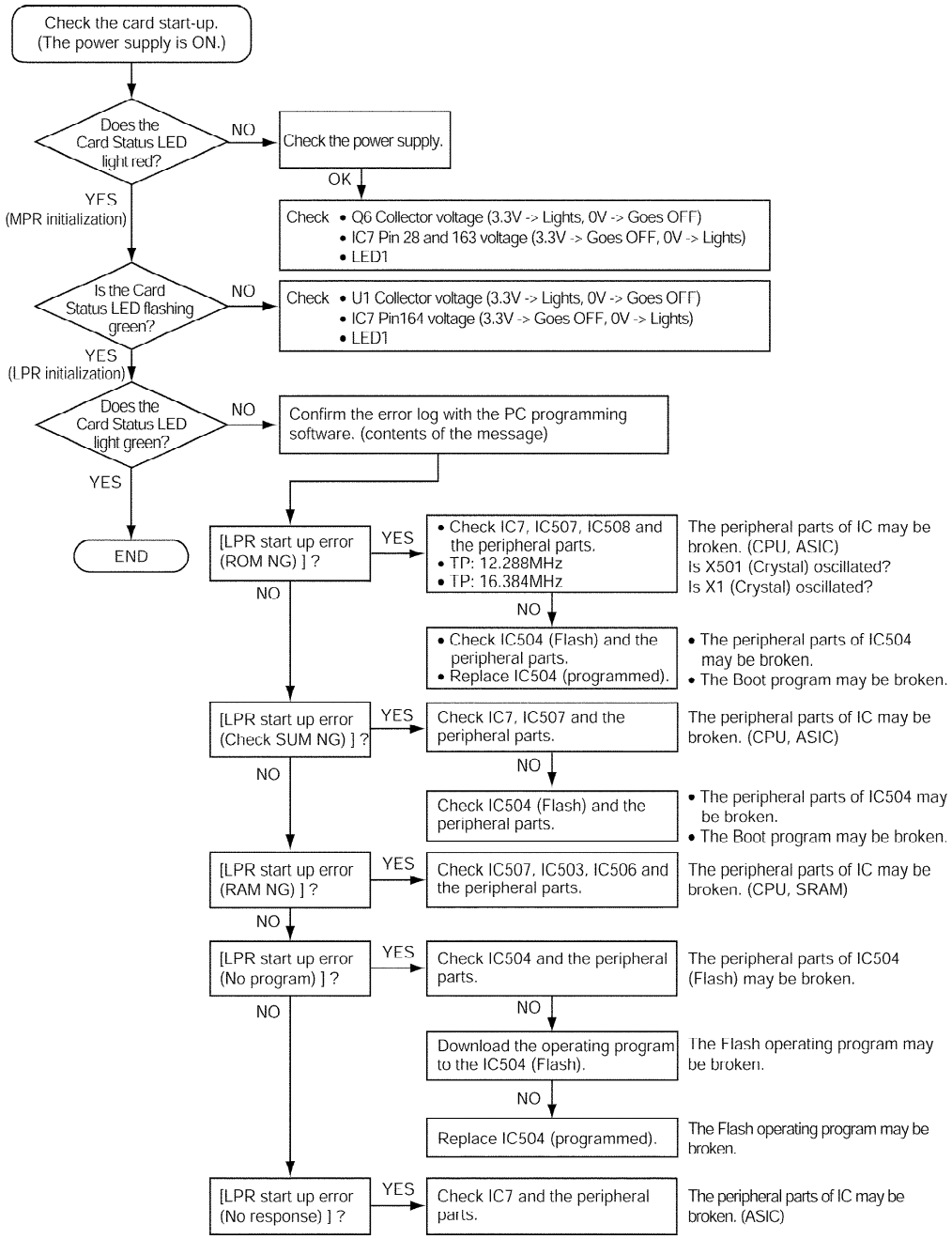
3. Turn the 2 screws clockwise to fix the card.

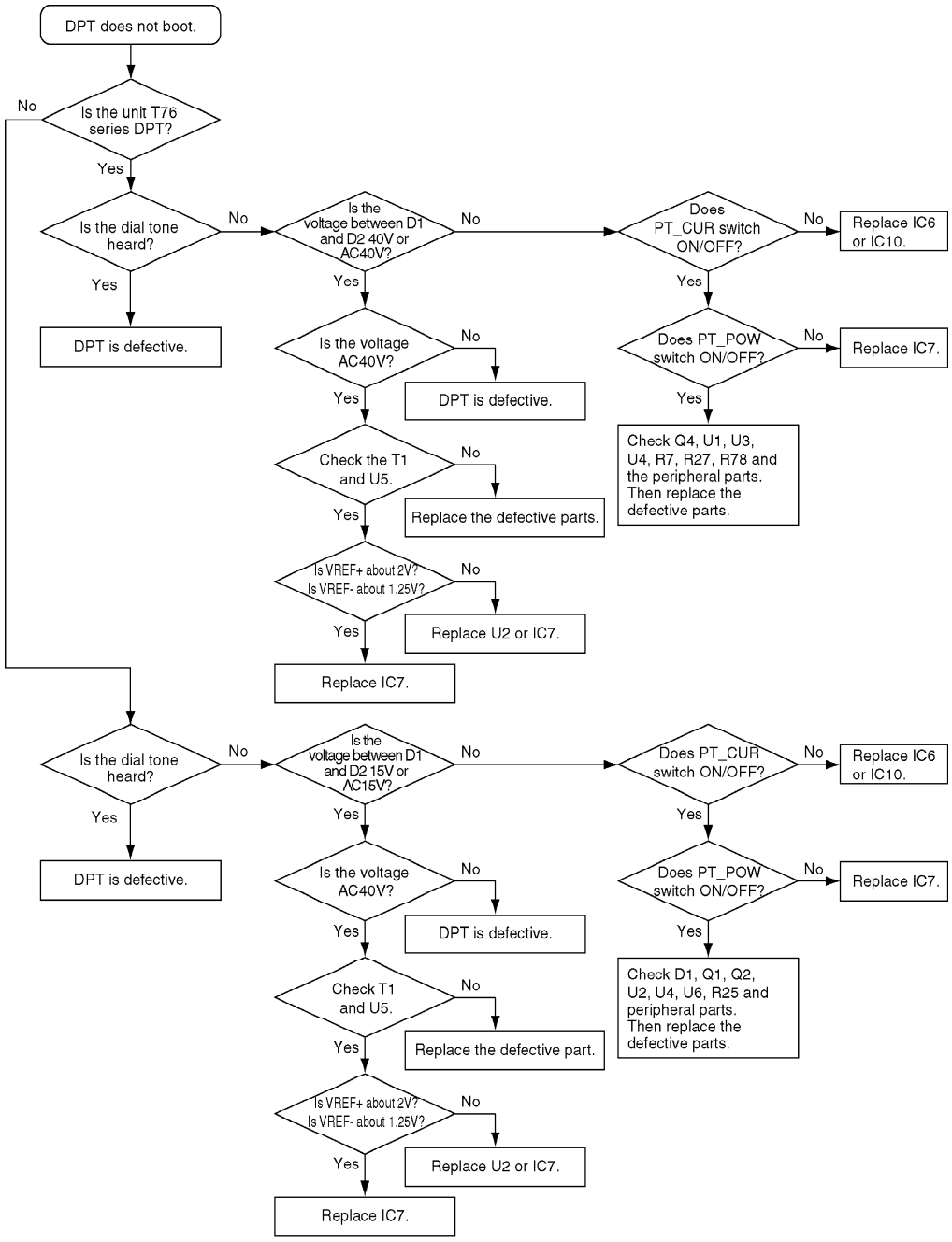


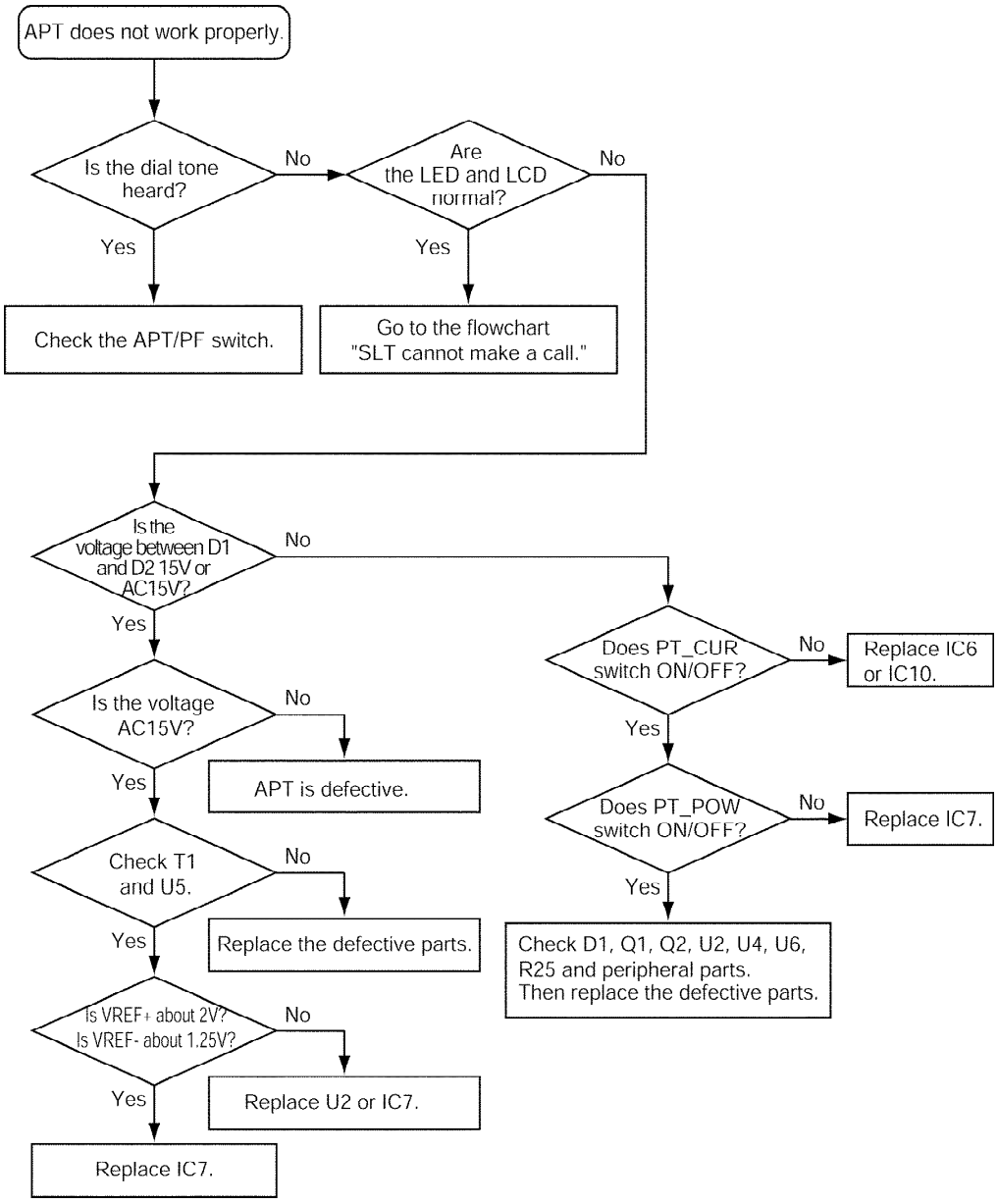
6. TROUBLESHOOTING GUIDE

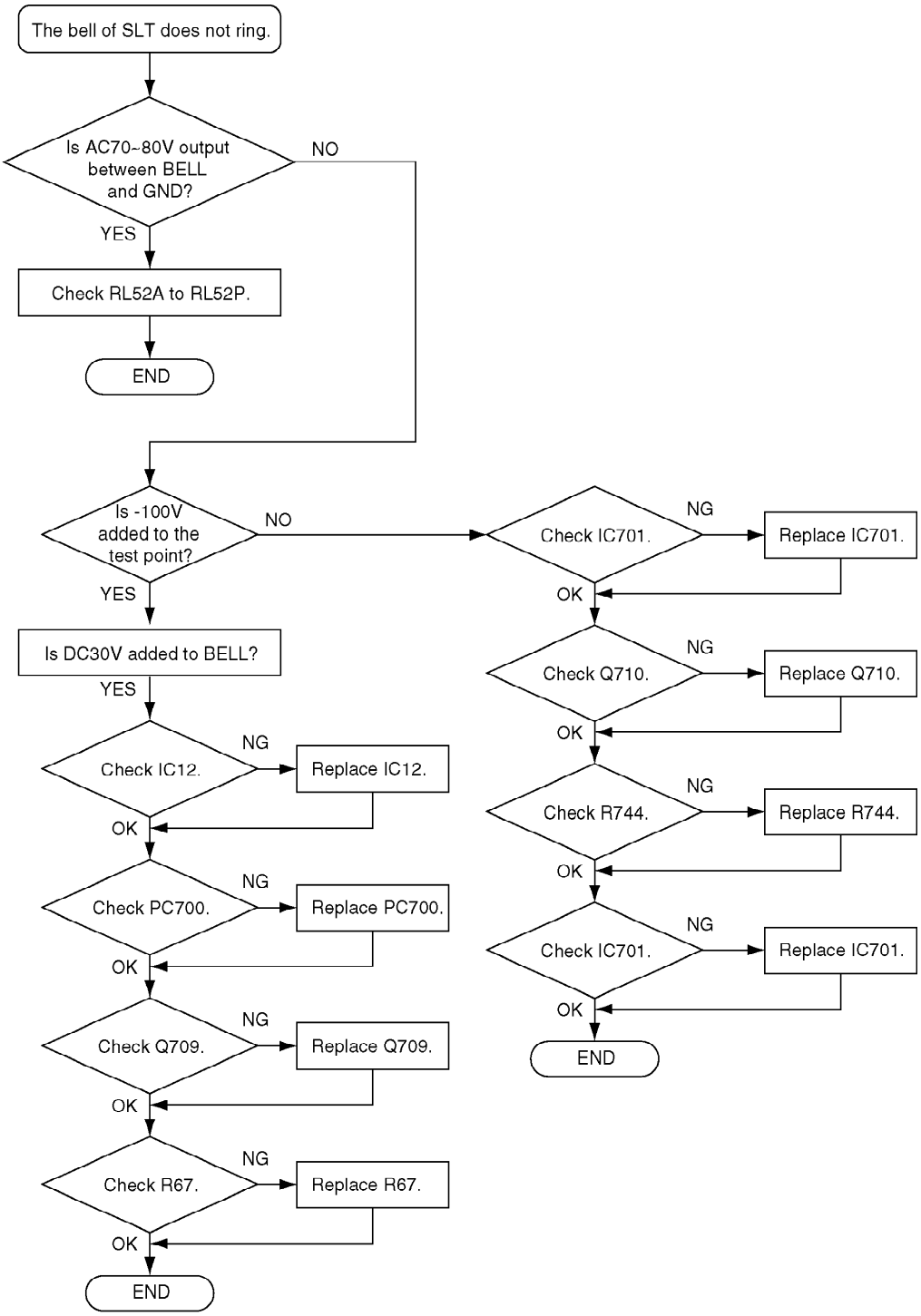

Check the short circuit of the power supply. (The power supply is OFF.)
Check the test land between [+15V] and [GND].
NG
Check the short circuit between pins of CN2 and IC701.
The pins of CN2 may be broken. IC701 may be broken.
OK
Check the test land between [+5V] and [GND].
NG
Check the short circuit of following ICs and transistors: IC9, IC251, IC252, IC253, IC1A-H, U5A-H
5V IC may be broken. The transistor may be broken.
OK
Check the test land between [+3.3V] and [GND].
NG
Check the short circuit of following ICs: IC2, IC6, IC7, IC10, IC501, IC502, IC503, IC504, IC505, IC506, IC507, IC508, IC510
3.3V IC may be broken.
OK
Check the test land between [+40V] and [GND].
NG
Check the short circuit between pins of CN2 and Q710.
The pins of CN2 may be broken. FET may be broken.
OK
Check the test land between [+30V] and [GND].
NG
Check the short circuit between pins of CN2.
The pins of CN2 may be broken.
OK
Check the test land between [+15VPT] and [GND].
NG
Check the short circuit between pins of CN2.
The pins of CN2 may be broken.
OK
END

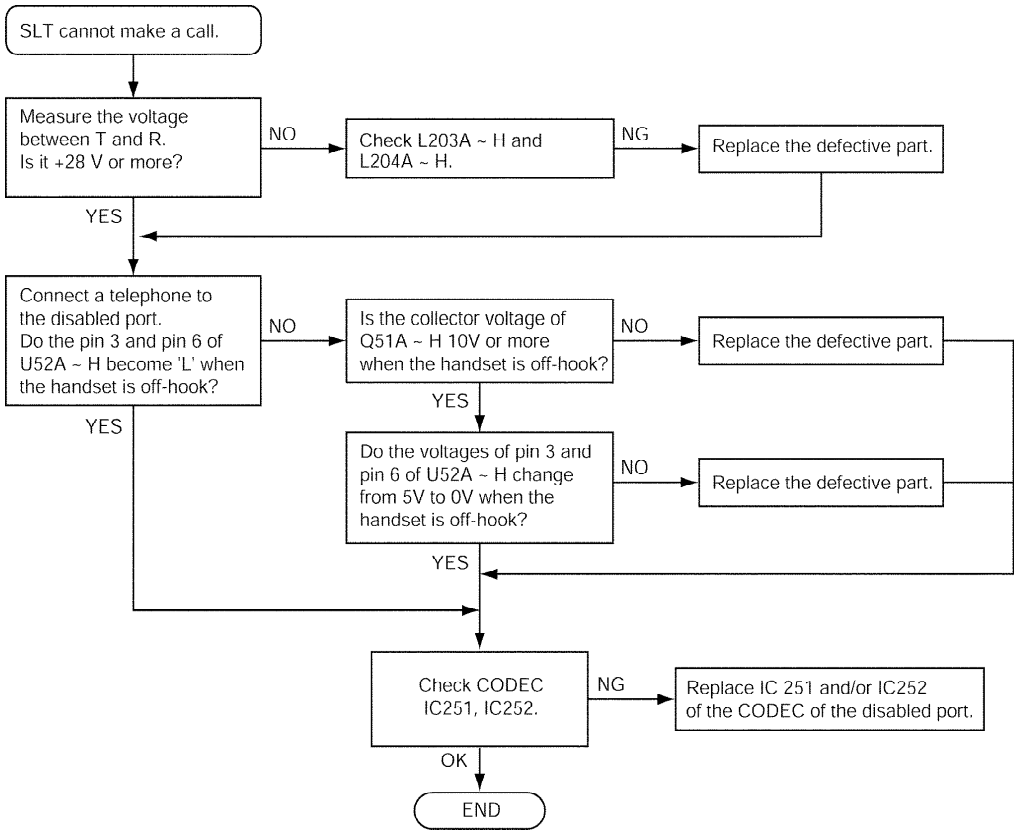

Check the power supply voltage.
(The power supply is ON.)
Is the test land voltage between [+15V] and [GND] +15V?
NO
Check IP1 and Q9.
YES
Is the test land voltage between [+5V] and [GND] +5V?
NO
Is the voltage between [C810 (+)] and [GND] +5V?
NO
The 5V DC/DC may be broken.
Check IC802, Q802, and D802.
Replace the defective part.
YES
YES
The fuse may be blown.
Replace IP802.
Is the test land voltage between [+3.3V] and [GND] +3.3V?
NO
Is the voltage between [C809 (+)] and [GND] +3.3V?
NO
The 3V DC/DC may be broken.
Check IC801, Q801 and D801.
Replace the defective part.
YES
YES
The fuse may be blown.
Replace IP801.
Is the test land voltage between [+30V] and [GND] +30V?
NO
The diode may be broken.
Replace D1.
YES
END

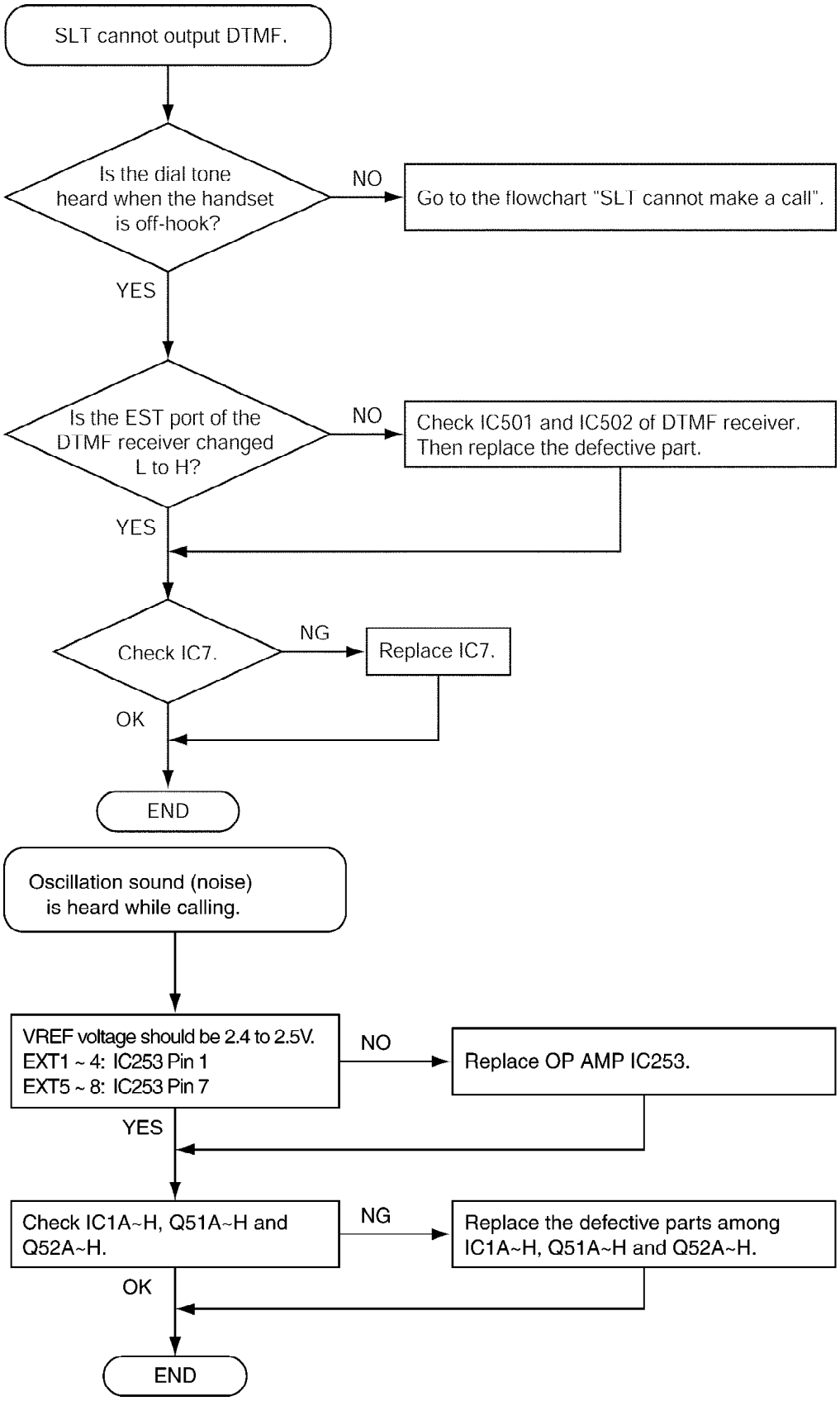

Check the card start-up.
(The power supply is ON.)
Does the Card Status LED light red?
NO
Check the power supply.
OK
YES
(MPR initialization)
Check • Q6 Collector voltage (3.3V -> Lights, 0V -> Goes OFF)
• IC7 Pin 28 and 163 voltage (3.3V -> Goes OFF, 0V -> Lights)
• LED1
Is the Card Status LED flashing green?
NO
Check • U1 Collector voltage (3.3V -> Lights, 0V -> Goes OFF)
• IC7 Pin164 voltage (3.3V -> Goes OFF, 0V -> Lights)
• LED1
YES
(LPR initialization)
Does the Card Status LED light green?
NO
Confirm the error log with the PC programming software. (contents of the message)
YES
END
[LPR start up error (ROM NG)] ?
YES
• Check IC7, IC507, IC508 and the peripheral parts.
• TP: 12.288MHz
• TP: 16.384MHz
The peripheral parts of IC may be broken. (CPU, ASIC)
Is X501 (Crystal) oscillated?
Is X1 (Crystal) oscillated?
NO
• Check IC504 (Flash) and the peripheral parts.
• Replace IC504 (programmed).
• The peripheral parts of IC504 may be broken.
• The Boot program may be broken.
[LPR start up error (Check SUM NG)] ?
YES
Check IC7, IC507 and the peripheral parts.
The peripheral parts of IC may be broken. (CPU, ASIC)
NO
Check IC504 (Flash) and the peripheral parts.
• The peripheral parts of IC504 may be broken.
• The Boot program may be broken.
[LPR start up error (RAM NG)] ?
YES
Check IC507, IC503, IC506 and the peripheral parts.
The peripheral parts of IC may be broken. (CPU, SRAM)
NO
[LPR start up error (No program)] ?
YES
Check IC504 and the peripheral parts.
The peripheral parts of IC504 (Flash) may be broken.
NO
Download the operating program to the IC504 (Flash).
The Flash operating program may be broken.
NO
Replace IC504 (programmed).
The Flash operating program may be broken.
[LPR start up error (No response)] ?
YES
Check IC7 and the peripheral parts.
The peripheral parts of IC may be broken. (ASIC)


DPT does not boot.
Is the unit T76 series DPT?
No
Yes
Is the dial tone heard?
No
Yes
DPT is defective.
Is the voltage between D1 and D2 40V or AC40V?
No
Yes
Is the voltage AC40V?
No
DPT is defective.
Yes
Check the T1 and U5.
No
Replace the defective parts.
Yes
Is VREF+ about 2V? Is VREF- about 1.25V?
No
Replace U2 or IC7.
Yes
Replace IC7.
Does PT_CUR switch ON/OFF?
No
Replace IC6 or IC10.
Yes
Does PT_POW switch ON/OFF?
No
Replace IC7.
Yes
Check Q4, U1, U3, U4, R7, R27, R78 and the peripheral parts. Then replace the defective parts.
Is the dial tone heard?
No
Yes
DPT is defective.
Is the voltage between D1 and D2 15V or AC15V?
No
Yes
Is the voltage AC40V?
No
DPT is defective.
Yes
Check T1 and U5.
No
Replace the defective part.
Yes
Is VREF+ about 2V? Is VREF- about 1.25V?
No
Replace U2 or IC7.
Yes
Replace IC7.
Does PT_CUR switch ON/OFF?
No
Replace IC6 or IC10.
Yes
Does PT_POW switch ON/OFF?
No
Replace IC7.
Yes
Check D1, Q1, Q2, U2, U4, U6, R25 and peripheral parts. Then replace the defective parts.


APT does not work properly.
Is the dial tone heard?
No
Are the LED and LCD normal?
No
Yes
Yes
Check the APT/PF switch.
Go to the flowchart "SLT cannot make a call."
Is the voltage between D1 and D2 15V or AC15V?
No
Yes
Is the voltage AC15V?
No
APT is defective.
Yes
Check T1 and U5.
No
Replace the defective parts.
Yes
Is VREF+ about 2V? Is VREF- about 1.25V?
No
Replace U2 or IC7.
Yes
Replace IC7.
Does PT_CUR switch ON/OFF?
No
Replace IC6 or IC10.
Yes
Does PT_POW switch ON/OFF?
No
Replace IC7.
Yes
Check D1, Q1, Q2, U2, U4, U6, R25 and peripheral parts. Then replace the defective parts.


The bell of SLT does not ring.
Is AC70~80V output between BELL and GND?
NO
YES
Check RL52A to RL52P.
END
Is -100V added to the test point?
NO
YES
Is DC30V added to BELL?
YES
Check IC12.
NG
Replace IC12.
OK
Check PC700.
NG
Replace PC700.
OK
Check Q709.
NG
Replace Q709.
OK
Check R67.
NG
Replace R67.
OK
END
Check IC701.
NG
Replace IC701.
OK
Check Q710.
NG
Replace Q710.
OK
Check R744.
NG
Replace R744.
OK
Check IC701.
NG
Replace IC701.
OK
END


SLT cannot make a call.
Measure the voltage between T and R. Is it +28 V or more?
NO
Check L203A ~ H and L204A ~ H.
NG
Replace the defective part.
YES
Connect a telephone to the disabled port. Do the pin 3 and pin 6 of U52A ~ H become 'L' when the handset is off-hook?
NO
Is the collector voltage of Q51A ~ H 10V or more when the handset is off-hook?
NO
Replace the defective part.
YES
YES
Do the voltages of pin 3 and pin 6 of U52A ~ H change from 5V to 0V when the handset is off-hook?
NO
Replace the defective part.
YES
Check CODEC IC251, IC252.
NG
Replace IC 251 and/or IC252 of the CODEC of the disabled port.
OK
END



7. BLOCK DIAGRAM

8. CIRCUIT OPERATION

8.1. Control-System Circuit

8.1.1. CPU Peripherals

- CPU (System clock: 12.288 MHz).....IC507

Data bus: 16bit, Address bus: 23bit

- Flash ROM (8Mbit).....IC504

Flash memory consists of two areas: boot space and administration space.

administration program can be rewritten through downloading.

0	Sector 0 16KB	Boot (128KB)
4000	Sector 1 8KB	
6000	Sector 2 8KB	
8000	Sector 3 32KB	
10000	Sector 4 64KB	
20000	Sector 5 64KB	Administration (896KB)
30000	Sector 6 64KB	
40000	...	
F0000	Sector 18 64KB	

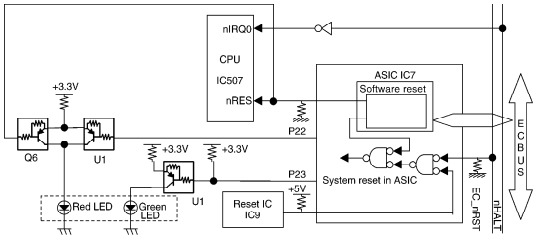
- SRAM (2Mbit).....IC503, IC506

Used for the data buffer for CPU work area, and PT communication.

- Dual port RAM (128byte).....Uses a part of the functions of IC7.

Used for the buffer for the communications with MPR.

- Reset



On boot-up, ASIC reset release is carried out by EC_nRST from MPR. After the ASIC reset release, CPU reset is released by the soft reset release from MPR; then, LPR program starts up.

- Operation in instantaneous interruption

When instantaneous power interruption is 300msec or less, reset operation is not carried out because the voltage is retained by the capacitor in the power supply. However for the purpose of reducing the power consumption during instantaneous interruption, if it is detected (nHALT=L), power down mode is established and CPU itself goes into sleep mode. CPU sleep is

recovered from by the edge detection of nIRQ0 →L.

- LED Operation status indicating LED (Two colors)

Red ON: Fault (RESET included)

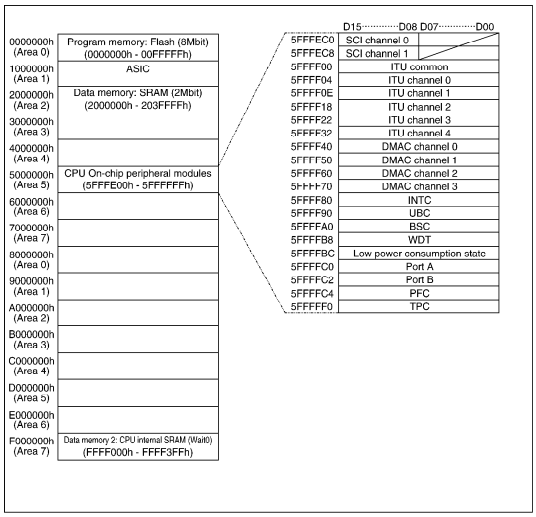
Green ON: INS (Line not in use)

Green Flash (60/minute): INS (Line in use)

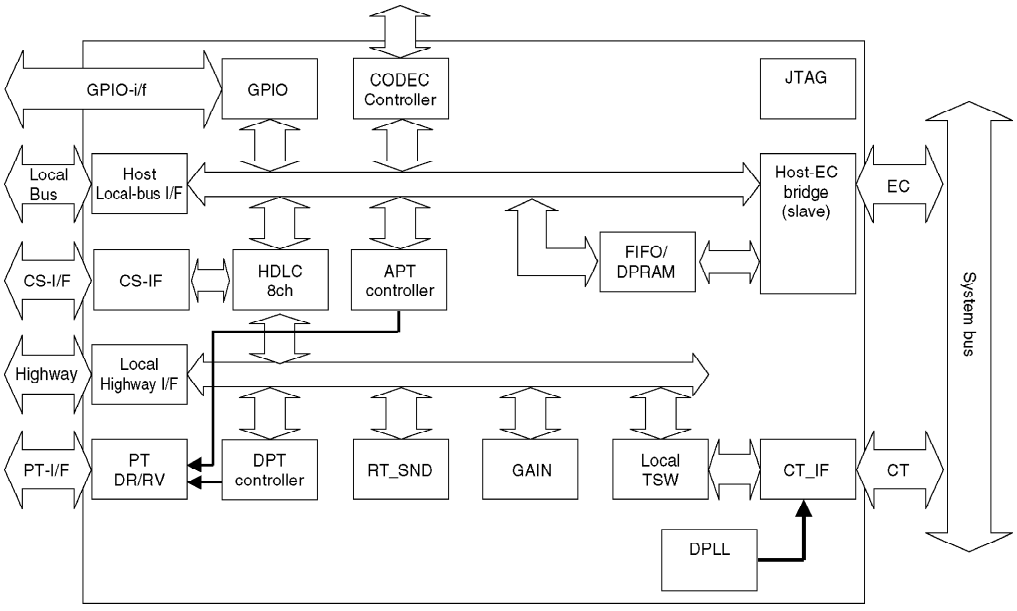
Red blinking: OUS

OFF: Power supply failure

- Address map



8.1.2. IC7 (ASIC)



- EC bus interface

Independent bus for 16bit/8MHz two-way address data multiplex.

- CT bus interface

Supports eight 8.192MHz highways (128 time slots).

- Local bus interface

HITACHI-manufactured (Data 8bit, Address 13bit) SH-1CPU-compatible bus.

- Local highway interface

Accommodates 2.048, 4.096, and 8.192MHz highways (Up to 64 time slots).

- Local TSW

Exchanges the time slots between CT bus (1024ch) and local highway (64ch).

- Local gain control

Controls the gain of the local highway up-and-down 64ch in 1db step arbitrarily.

- PT interface

Allows APT/DPT interface to be selected for each port.

- CODEC interface

Can connect up to four Infineon-manufactured PEB2466, and is intended for enabling the line control.

- GPIO interface

Parallel interface that is arbitrarily and bidirectionally programmable .

- Time slot structure

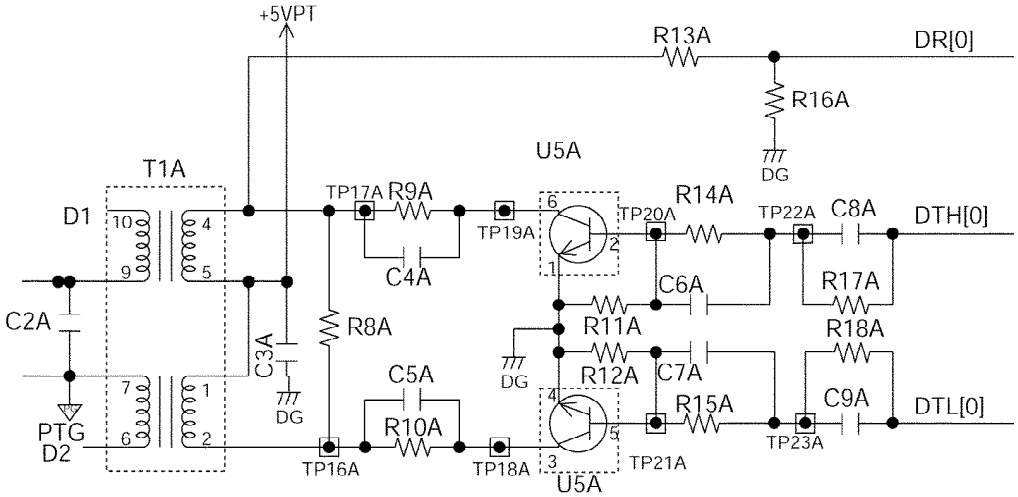
The following is the time slot structure of the local highway on TDA0170.

Slot	PCM data
0	DPT#0 B1
1	DPT#0 B2
2	DPT#1 B1
3	DPT#1 B2
4	DPT#2 B1
5	DPT#2 B2
6	DPT#3 B1
7	DPT#3 B2
8	DPT#4 B1
9	DPT#4 B2
10	DPT#5 B1
11	DPT#5 B2
12	DPT#6 B1
13	DPT#6 B2
14	DPT#7 B1
15	DPT#7 B2

Slot	PCM data
16	SLT#0
17	SLT#1
18	SLT#2
19	SLT#3
20	SLT#4
21	SLT#5
22	SLT#6
23	SLT#7
25 ~ 26	Not used
63	Reserved

8.2. Line-System Circuit

8.2.1. PT Interface



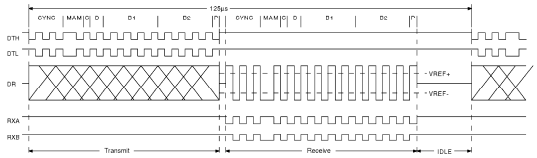
- APT data communications

Control data is transmitted from the DTL terminal of ASIC, then is output to APT (between D1 and D2) by way of the driver U5 and the pulse transformer T1.

The control data transmitted from APT is input to the DR terminal of ASIC by way of the pulse transformer T1 and R13. ASIC compares VREF+ with the input waveform, and receives a valid pulse.

- DPT data communications

Bch/Dch/Cch data is transmitted from the DTL/DTH terminal of ASIC, and the AMI-converted pulse signal is output to DPT (between D1 and D2) by way of the driver U5 and the pulse transformer T1. The Bch/Dch/Cch data transmitted from APT is input to the DR terminal of ASIC by way of the pulse transformer T1 and R13. ASIC compares VREF+ and VREF- with the input waveform, and receives a valid pulse.



- Bch communications

Communicated by the PCM data (64kbps × 2) connected from the local highway by ASIC.

Used mainly for the audio signal of DPT.

- Dch communications

Communicated by the data (16kbps) protocol-converted by the HDLC controller in ASIC.

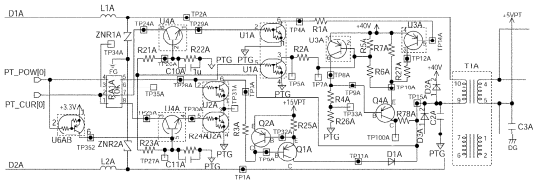
Used mainly for the control signal of DPT.

- Cch communications

Communicated by the data (8kbps) converted by the serial/parallel-converting circuit in ASIC.

Used mainly for recognizing the terminal model.

- PT current-supply circuit

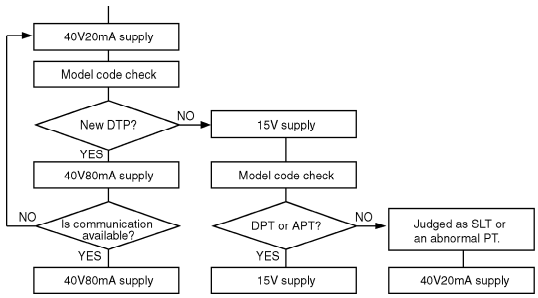


+15V/+40V is superimposed on the transmit/receive data line (D1, D2), and fed to PT. Supply voltage is +15V for old DPT and APT, and +40V for new DPT. It will be switched after the connected PT is judged through communications. I/O control is as follows.

PT_POW	PT_CUR	
H	H	15V
H	L	0V
L	H	40V80mA
L	L	40V20mA

For protection against risks such as an overcurrent due to +15V short in wiring, 300mA constant-current circuit by Q1, Q2, and R25 is used. In case of +40V, 20mA and 80mA constant-current circuits by Q4, U3, R7, and R27 are used.

The following is the flow chart of telephone switching at boot-up.



8.2.2. SLT interface

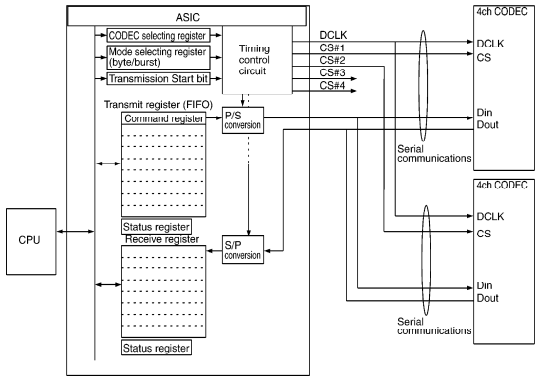
- CODEC control.....IC251, IC252

Infineon-manufactured PEB2466 is used. The analog characteristics, such as BN, frequency characteristic, level, and sidetone, are set by the CODEC interface DCLK, CS, DOUT, and DIN. The built-in I/O port is used for HOOK detection, DTMF

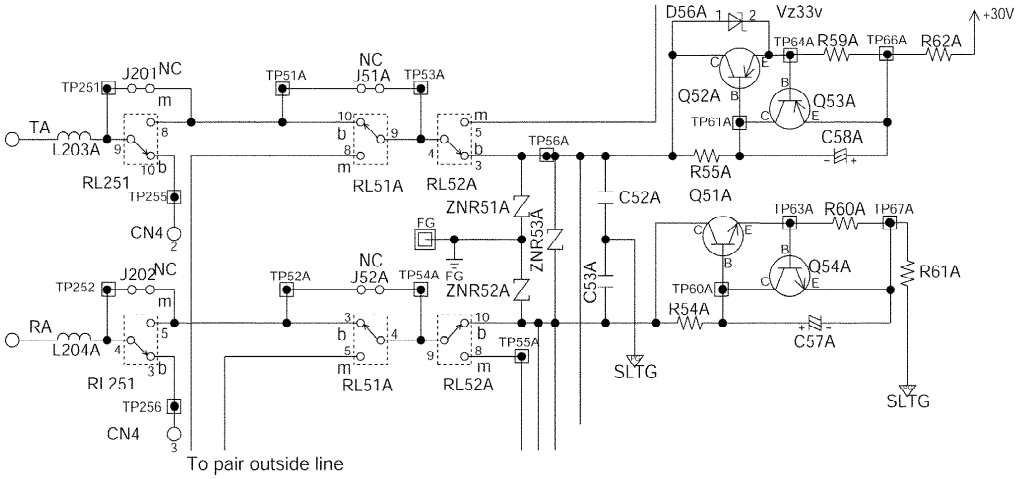
detection, BELL relay control, and DIAG relay control.

- A/D, D/A conversion

The conversion of 4-line analog signal and G.711 format PCM code (μ /A) is carried out.



- SLT current-supply circuit



The current-supply circuit feeds current at the constant-current circuit (TIP +30V, RING 0V). When the telephone is taken off the hook, DC loop is formed.

The feeding current is limited to 30mA by the circuit configurations of R59, Q53, R60, and Q54.

+30 V → R62 → R61 → Q52 → RL52(b → c) → RL51(c → b) → RL251(m → c) → L203 → Telephone → L204 → RL251(c → m) → RL51(b → c) → RL52(c → b) → Q51 → R60 → R62 → SLTG(0 V)

- Power failure switching relays

Switching relays RL251 and RL252 are on board in order that two lines out of eight can be directly connected to the outside line in case of power failure. They will be directly connected to the line that is connected with the outside-line card connected by CN4 on

the front of the board and 4-conductor TEL cord. In normal operation, the switching relays are in ‘make’ state. In case of power supply down, they will be in ‘break’ state, and the power-failure direct-dial mode will be established.

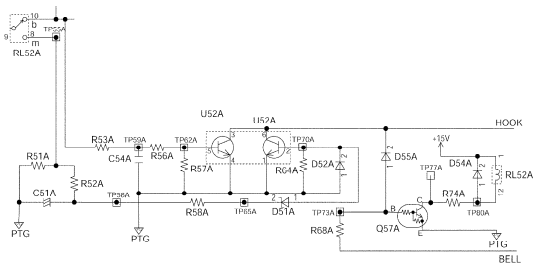
- Self-diagnostic relay

A port has a self-diagnostic relay. In normal operation, the self-diagnostic relay is in ‘break’ state. In self-diagnostic operation, it will be in ‘make’ state. In self-diagnostic mode, Tip-Ring will be connected to Tip-Ring of another outside-line card by way of the backboard, and the self-diagnosis of the outside-line card can be carried out.

The self-diagnosis of the outside-line card includes outside line acquisition, dial pulse issue, DTMF issue, BELL reception, and CPC detection.

- Bell signal issuing circuit

When feeding and speech paths are connected, BELL relay will be in ‘break’ state. When the bell signal is issued, BELL relay will be in ‘Make’ state.



- HOOK detecting circuit

When BELL signal is not output or when dial pulse is received, this circuit distinguishes whether SLT is off hook or on hook. When SLT is off hook, DC loop is formed and current flows into U52. At this time, the collector of U52 (3, 4, and 5 pin), namely, HOOK signal changes from H to L and is detected by CPU by way of CODEC → ASIC. When SLT is on hook, DC loop is interrupted and the current flow into U52 (3, 4, and 5 pin) ceases; the collector of U52, namely, HOOK signal changes from L to H and is detected by CPU in a similar manner.

- Ring trip circuit

While BELL signal is output, this circuit detects SLT off-hook by the hardware, and makes BELL relay in ‘break’ state.

While BELL signal is issued, when SLT is on hook, U52 (1, 2, and 6 pin) is off. When SLT is taken off the hook, DC loop is formed because 30V is superimposed on BELL signal; then, current flows into R52 → R58 → D51 → U52, and U52 (1, 2, and 6 pin) becomes on.

When U52 (1, 2, and 6 pin) has become on, because the base of Q57 that is the driver of BELL relay becomes L, BELL relay will be in 'break' state and SLT current-supply circuit feeds current to SLT.

- DTMF signal detecting circuit

Each port has its DTMF receiver.

Ports A to D carry out detection at IC501, and ports E to H do that at IC502.

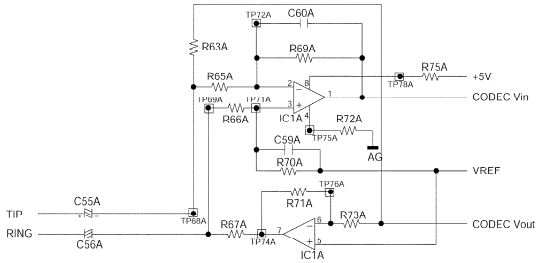
That DTMF data has become valid at EST terminal = H is detected by CPU by way of CODEC → ASIC, and then CPU reads and detects the data of DTMF receiver.

- 2W-4W converting circuit

This circuit converts between the 2-line audio signal of APT or SLT and the 4-line audio signal on CODEC.

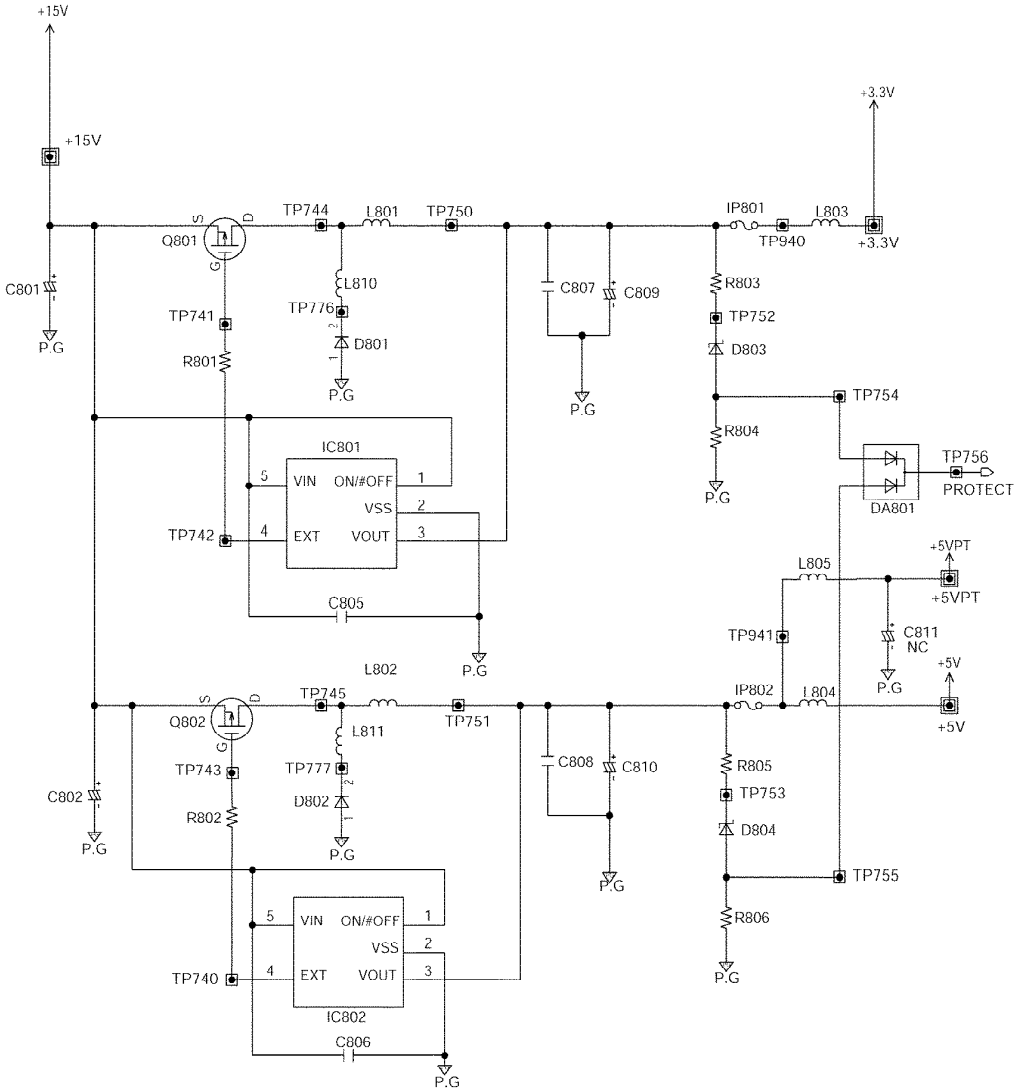
The audio signal from SLT is input to the differential amplifying circuit of IC1 (1, 2, and 3 pin) by way of C55 and C56, and its output is input to CODEC.

CODEC output is issued to SLT in the form of the synthesis of the signal that is output by way of R63 and the one that is reversely output by IC1 (5, 6, and 7 pin). Programmable frequency characteristic adjusting filter, sidetone removing filter, and return loss compensating filter are included in CODEC.



8.3. Power Supply Circuit

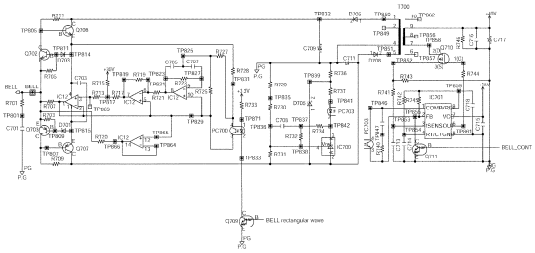
8.3.1. DC/DC Converting Circuit



This circuit generates +3.3V, +5V from the input +15V.
It is comprised of the circuit that steps +15V down to +3.3V by the switching power supply of IC801, Q801, and L810 and the one that steps +15V down to +5V by the switching power supply of IC802, Q802, and L811.
It has three protection circuits: IP801 against +3.3V short, IP802 against +5V short, and the overvoltage protection that detects the voltage buildup of +3.3V/+5V, turns FET of Q9 on, and then interrupts IP1.

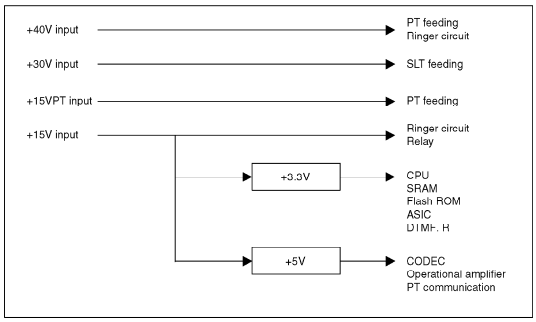
8.3.2. Ringer Generating Circuit

The bell signal forms a sine wave out of the rectangular wave of 20/25Hz transmitted from ASIC of MPR, amplifies it up to AC75Vrms, and generates it.
+40V is stepped up to +180V and -100V by SW power circuit that oscillates at 200KHz, and the voltage between these is amplified with a focus on +30V to generate the bell signal of AC75Vrms.



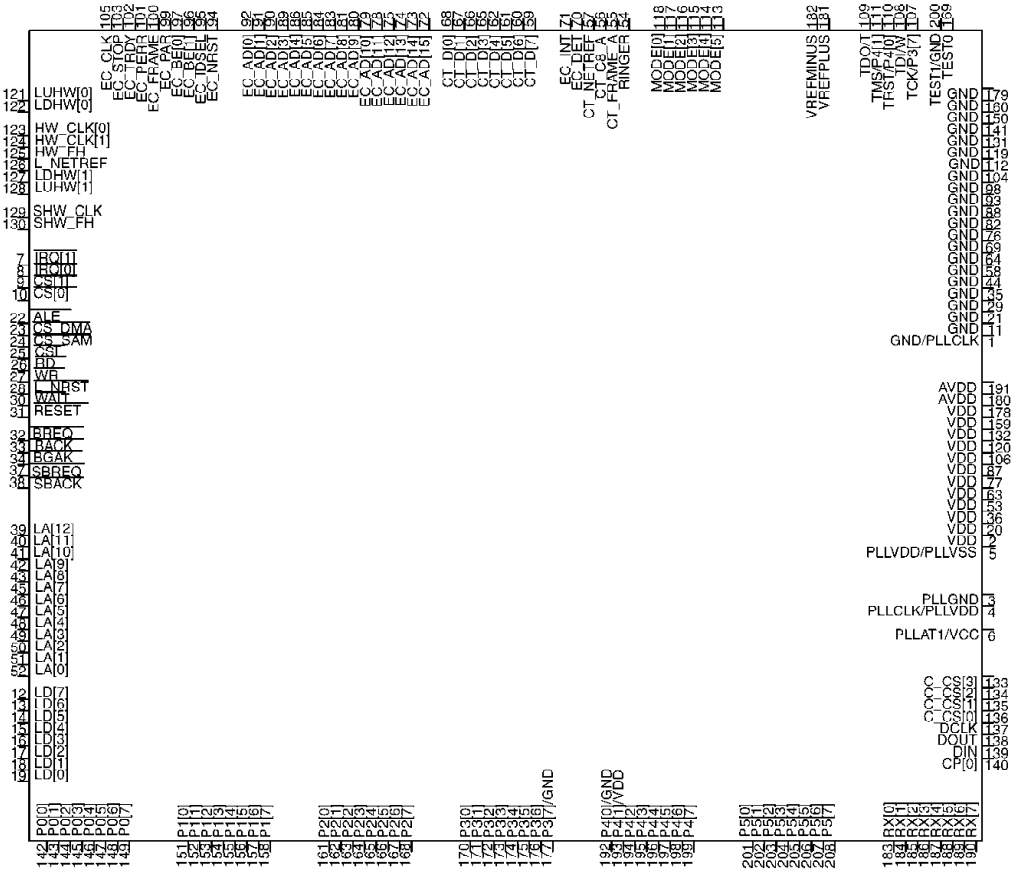
8.3.3. Power Supply System

Power-supply input includes four systems: +15V, +15VPT, +40V, and +30V; the output includes + 15V, +5V, +3.3V, +40V.



9. IC DATA

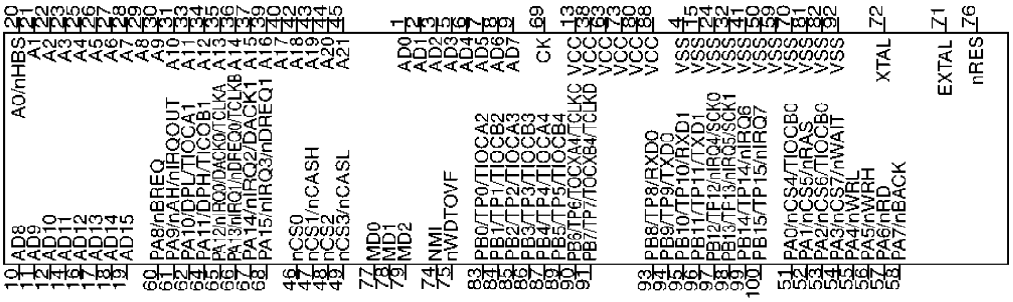
9.1. IC7 (ASIC)



Pin No.	Pin name	Signal name	I/O	ACT	Description	Re
149	P07	VER5	I	H	RAM (H: 2Mbit, L: 1Mbit)	
148	P06	VER4	I	L	Card distinguishing reserve	
147	P05	VER3	I	L		
146	P04	VER2	I	L	For hard version management	
145	P03	VER1	I	L	For the first time, 0	
144	P02	VER0	I	L		
143	P01	PORT1	I	H	Number of ports: 8	
142	P00	PORT0	I	L		
158	P17	DTH7	O	H/L	Port 7 PT transmit pulse	Used
157	P16	DTH6	O	H/L	Port 6 PT transmit pulse	Used
156	P15	DTH5	O	H/L	Port 5 PT transmit pulse	Used
155	P14	DTH4	O	H/L	Port 4 PT transmit pulse	Used
154	P13	DTH3	O	H/L	Port 3 PT transmit pulse	Used
153	P12	DTH2	O	H/L	Port 2 PT transmit pulse	Used
152	P11	DTH1	O	H/L	Port 1 PT transmit pulse	Used
151	P10	DTH0	O	H/L	Port 0 PT transmit pulse	Used
168	P27	ACALM	O	H	AC interruption detection	
167	P26	PFRLY	O	L	Power-failure direct-dial switching	
166	P25	VREF1	O	H/L	PT I/F setting	
165	P24	VREF0	O	H/L	01...Manufacture diagnosis, 10...Normal	

Pin No.	Pin name	Signal name	I/O	ACT	Description	Re
164	P23	LED_G	O	L	Green LED lit / CS_DELAY output	
163	P22	LED_R	O	L	Red LED lit	
162	P21	BELL CNT	O	H	Bell circuit stop	
161	P20	OPTION 0	I	L	Option board 0 detection	
107	P37	DTL7	O	H/L	Port 7 PT transmit pulse	Used
176	P36	DTL6	O	H/L	Port 6 PT transmit pulse	Used
175	P35	DTL5	O	H/L	Port 5 PT transmit pulse	Used
174	P34	DTL4	O	H/L	Port 4 PT transmit pulse	Used
173	P33	DTL3	O	H/L	Port 3 PT transmit pulse	Used
172	P32	DTL2	O	H/L	Port 2 PT transmit pulse	Used
171	P31	DTL1	O	H/L	Port 1 PT transmit pulse	Used
170	P30	DTL0	O	H/L	Port 0 PT transmit pulse	Used
199	P47	TOE7	O	H	Port 7 DTMF R. Output enable	Used
198	P46	TOE6	O	H	Port 6 DTMF R. Output enable	Used
197	P45	TOE5	O	H	Port 5 DTMF R. Output enable	Used
196	P44	TOE4	O	H	Port 4 DTMF R. Output enable	Used
195	P43	TOE3	O	H	Port 3 DTMF R. Output enable	Used
194	P42	TOE2	O	H	Port 2 DTMF R. Output enable	Used
111	P41	TOE1	O	H	Port 1 DTMF R. Output enable	Used
110	P40	TOE0	O	H	Port 0 DTMF R. Output enable	Used
208	P57	PT_POW7	O	H/L	PT supplying power switching	
207	P56	PT_POW6	O	H/L	PT_POWn, PT_CURn	
206	P55	PT_POW5	O	H/L	H H 15V feeding	
205	P54	PT_POW4	O	H/L	H L Feeding OFF	
204	P53	PT_POW3	O	H/L	L H 40V80mA	
203	P52	PT_POW2	O	H/L	L L 40V20mA	
202	P51	PT_POW1	O	H/L		
201	P50	PT_POW0	O	H/L		
190	RX7	DR7	I	H/L	Port 7 PT receive pulse	
189	RX6	DR6	I	H/L	Port 6 PT receive pulse	
188	RX5	DR5	I	H/L	Port 5 PT receive pulse	
187	RX4	DR4	I	H/L	Port 4 PT receive pulse	
186	RX3	DR3	I	H/L	Port 3 PT receive pulse	
185	RX2	DR2	I	H/L	Port 2 PT receive pulse	
184	RX1	DR1	I	H/L	Port 1 PT receive pulse	
183	RX0	DR0	I	H/L	Port 0 PT receive pulse	

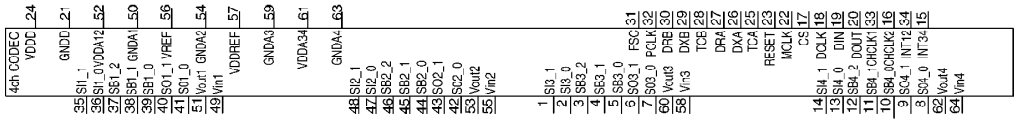
9.2. IC507 (CPU)



Pin No.	Pin name	Signal name	I/O	ACT	Description	Re
68	PA15	FH	I	L ↓	Frame head detection	Used nIRQ
67	PA14	BELL_SYNC	I	L ↓	BELL phase detection	Used nIRQ
66	PA13	nIRQ1	I	L	MPR interrupt	Used nIRQ
65	PA12	HALT	I	H	DC power down recovery detection	Used nIRQ
64	PA11	nRTS	O	L	Serial I/F for debug	
62	PA10	nCTS	I	L	Serial I/F for debug	
61	PA9		O	H	Not used	
60	PA8	nBREQ	I	L	Bus request from MPR	Used nBRE
58	PA7	nBACK	O	L	Response to bus request from MPR	Used nBA(
57	PA6	nRD	O	L	Read signal	Used
56	PA5		O	H	Not used	
55	PA4	nWR	O	L	Write signal	Used
54	PA3	nWAIT	I	L	Wait signal	Used nWA
53	PA2		O		Not used	
52	PA1		O		Not used	
51	PA0		O		Not used	
100	PB15	ACALM	I	H	AC interruption detection	
99	PB14		O		Not used	
98	PB13		O		Not used	
97	PB12	P23	I	L	CS transmission delay signal detection	Used nIRQ
96	PB11		O		Not used	
95	PB10		O		Not used	
94	PB9	TX			Serial I/F for debug	Used
93	PB8	RX			Serial I/F for debug	Used RXD(
91	PB7	BID2	I	L	Board classification judgment (Use undecided)	

Pin No.	Pin name	Signal name	I/O	ACT	Description	Re
90	PB6	BID1	I	L	Board classification judgment (Use undecided)	
89	PB5	BID0	I	L	Board classification judgment (Use undecided)	
87	PB4	PB4	I	H	H: Operation, L: Debug	
86	PB3	P23	I	L	CS transmission delay signal detection	Used TIOC
85	PB2	FH	I	L	Frame head detection	Used TIOC
84	PB1		O		Not used	
83	PB0		O		Not used	

9.3. IC251, IC252 (CODEC)



IC No.	Pin No.	Pin name	Signal name	I/O	ACT	Description	
IC251	40	SO1_1		O	-	EXT0	Not used
	41	SO1_0	BELL0	O	H		Bell signal issue
	37	SB1_2		I	H		Not used
	38	SB1_1	DIAG0	O	H		Self-diagnosis switching
	39	SB1_0		O	H		Not used
	35	SI1_1	HOOK0	I	L		Off-hook detection
	36	SI1_0	EST0	I	H		DTMF detection
	43	SO2_1		O	-	EXT1	Not used
	42	SO2_0	BELL1	O	H		Bell signal issue
	46	SB2_2		I	H		Not used
	45	SB2_1		O	H		Not used
	44	SB2_0		O	H		Not used
	48	SI2_1	HOOK1	I	L		Off-hook detection
	47	SI2_0	EST1	I	H		DTMF detection
	6	SO3_1		O	-	EXT2	Not used
	7	SO3_0	BELL2	O	H		Bell signal issue
	3	SB3_2		I	H		Not used
	4	SB3_1		O	H		Not used
	5	SB3_0		O	H		Not used
	1	SI3_1	HOOK2	I	L		Off-hook detection
	2	SI3_0	EST2	I	H		DTMF detection
	9	SO4_1		O	-	EXT3	Not used
	8	SO4_0	BELL3	O	H		Bell signal issue
	12	SB4_2		I	H		Not used
	11	SB4_1		O	H		Not used
	10	SB4_0		O	H		Not used
	14	SI4_1	HOOK3	I	L		Off-hook detection
	13	SI4_0	EST3	I	H		DTMF detection

IC No.	Pin No.	Pin name	Signal name	I/O	ACT	Description	
IC252	40	SO1_1		O	-	EXT4	Not used
	41	SO1_0	BELL4	O	H		Bell signal issue
	37	SB1_2		I	H		Not used
	38	SB1_1		O	H		Not used
	39	SB1_0		O	H		Not used
	35	SI1_1	HOOK4	I	L		Off-hook detection
	36	SI1_0	EST4	I	H		DTMF detection
	43	SO2_1		O	-	EXT5	Not used
	42	SO2_0	BELL5	O	H		Bell signal issue
	46	SB2_2		I	H		Not used
	45	SB2_1		O	H		Not used
	44	SB2_0		O	H		Not used
	48	SI2_1	HOOK5	I	L		Off-hook detection
	47	SI2_0	EST5	I	H		DTMF detection
	6	SO3_1		O	-	EXT6	Not used
	7	SO3_0	BELL6	O	H		Bell signal issue
	3	SB3_2		I	H		Not used
	4	SB3_1		O	H		Not used
	5	SB3_0		O	H		Not used
	1	SI3_1	HOOK6	I	L		Off-hook detection
	2	SI3_0	EST6	I	H		DTMF detection
	9	SO4_1		O	-	EXT7	Not used
	8	SO4_0	BELL7	O	H		Bell signal issue
	12	SB4_2		I	H		Not used
	11	SB4_1		O	H		Not used
	10	SB4_0		O	H		Not used
	14	SI4_1	HOOK7	I	L		Off-hook detection
	13	SI4_0	EST7	I	H		DTMF detection

10. HOW TO REPLACE A FLAT PACKAGE IC

10.1. PREPARATION

- PbF (: Pb free) Solder

- Soldering Iron

Tip Temperature of 700°F ± 20°F (370°C ± 10°C)

Note: We recommend a 30 to 40 Watt soldering iron. An expert may be able to use a 60 to 80 Watt iron where someone with less experience could overheat and damage the PCB foil.

- Flux

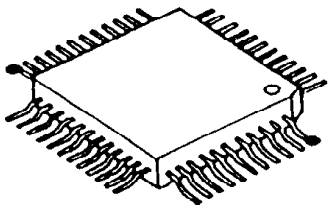
Recommended Flux: Specific Gravity →0.82.

Type →RMA (lower residue, non-cleaning type)

Note: See ABOUT LEAD FREE SOLDER (PbF: Pb free) ().

10.2. PROCEDURE

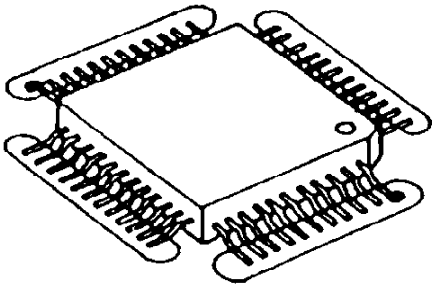
1. Tack the flat pack IC to the PCB by temporarily soldering two diagonally opposite pins in the correct positions on the PCB.

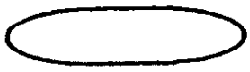


●- - - - - -Temporary soldering point.

Be certain each pin is located over the correct pad on the PCB.

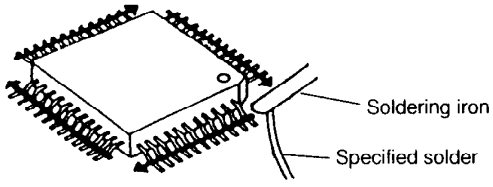
2. Apply flux to all of the pins on the IC.





- - - - - - Flux

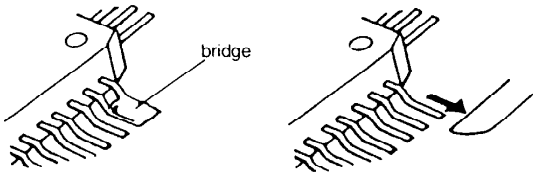
3. Being careful to not unsolder the tack points, slide the soldering iron along the tips of the pins while feeding enough solder to the tip so that it flows under the pins as they are heated.



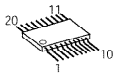
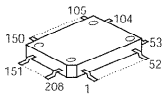
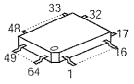
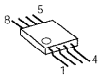
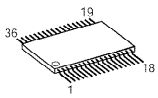
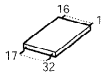
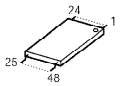
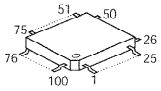
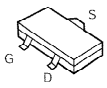
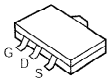
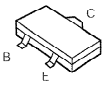
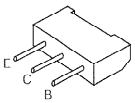
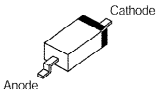
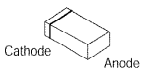
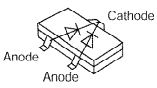
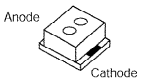
10.3. REMOVING SOLDER FROM BETWEEN PINS

1. Add a small amount of solder to the bridged pins.

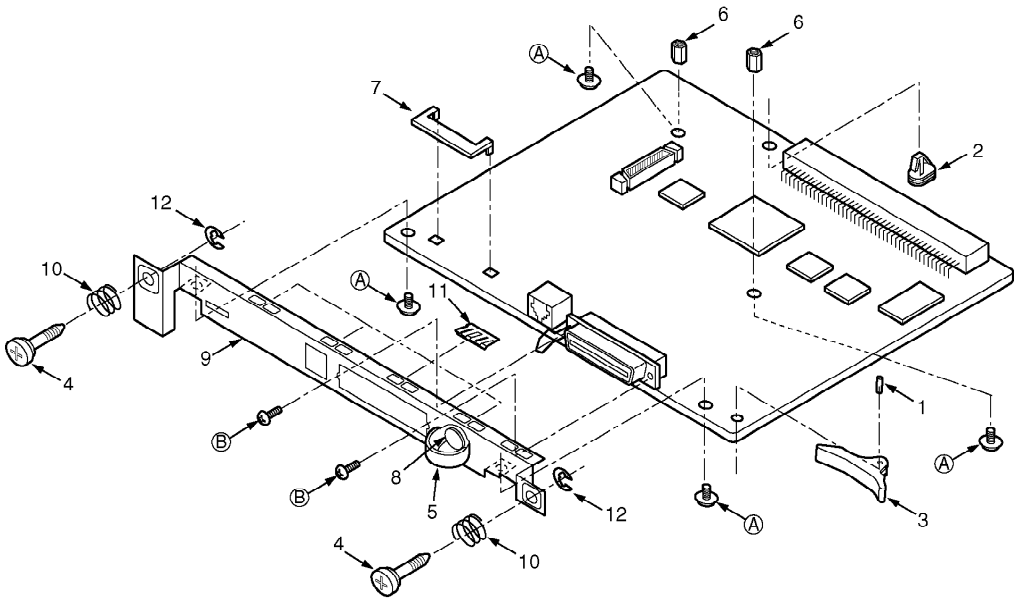
2. With a hot iron, use a sweeping motion along the flat part of the pin to draw the solder from between the adjacent pads.



11. TERMINAL GUIDE OF ICS, TRANSISTORS AND DIODES

 C0JBAB000507 C0JBAE000253 C0JBAB000504 C0ABCB000050	 C0JBAZ001852 PSVISNLV273A	 C1CB00001396	 PSVIPST596CN PQVIS8520F33 C0DBAHA00011	 C1CB00001432
 PQVINJM4558M C1CB00001497 C0AABA000029	 C1CB00001314	 PQVIBS2L1ST	 PSWIDA0170XJ	 PFVI7020VX12
 C0DBZZB00005	 C0DBAJD00002	 PQVTDTA114YU	 B1DHCD000018 B1DFDC000002 B1DFBL000002	 UN5213 2SD1819A 2SB1218A PQVTDTC143E
 B1BBAP000002 B1BDAP000010	 2SB766ARTX 2SD874A	 B1GHCFJJ0007	 XP4401 B1GHCFNN0004 PSVTUMX1NTN B1GFAFNN0001	 PFVDDGD1FP3T B0HCMR000002 B0JCJG000002
 MA8330, MA8240 MA8150, MA8075 MA2J11100L MAZ80390HL B0BC5R000009	 MA142WKTX	 PQVDBRPY1204		

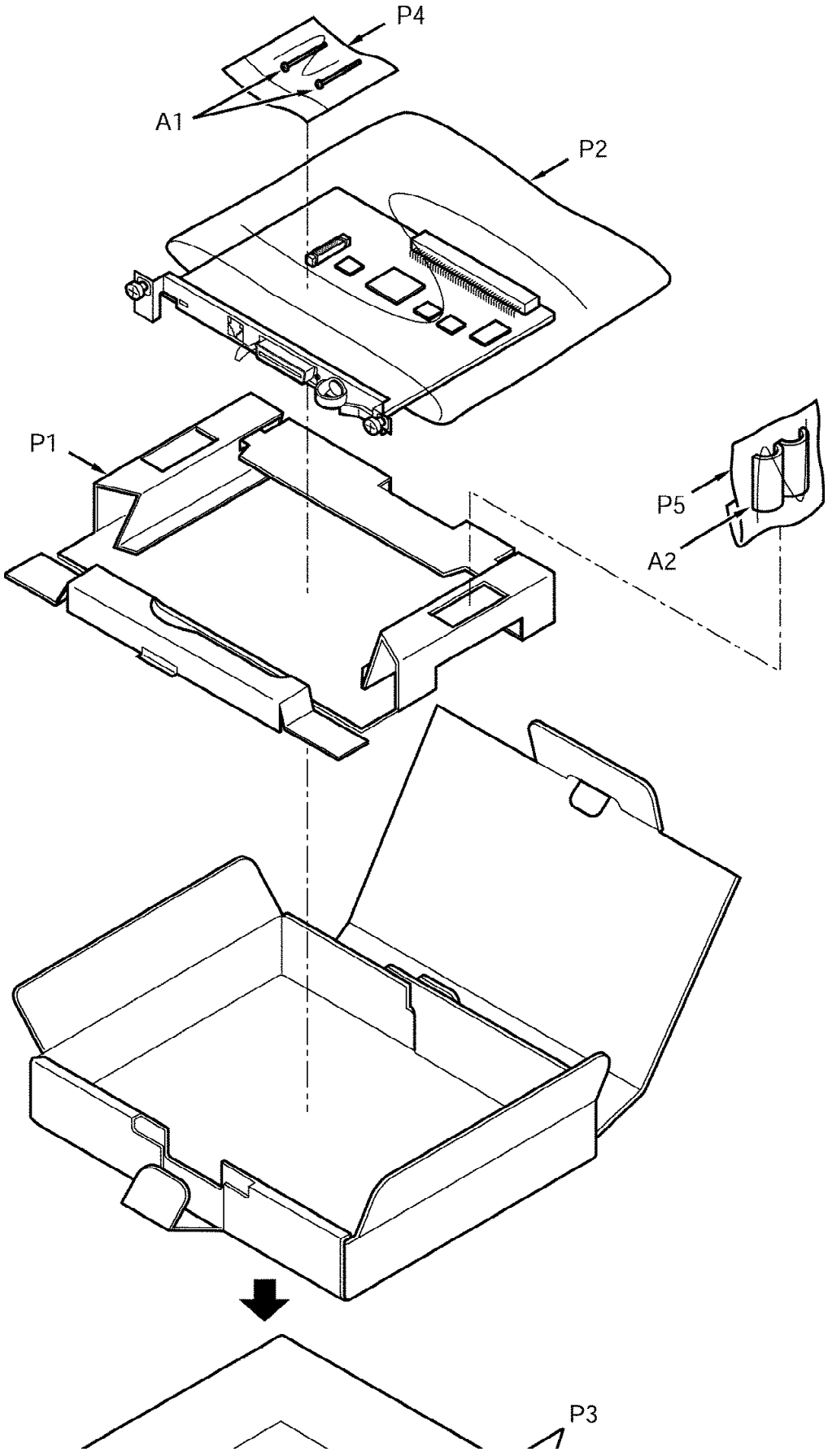
12. CABINET AND ELECTRICAL PARTS LOCATION

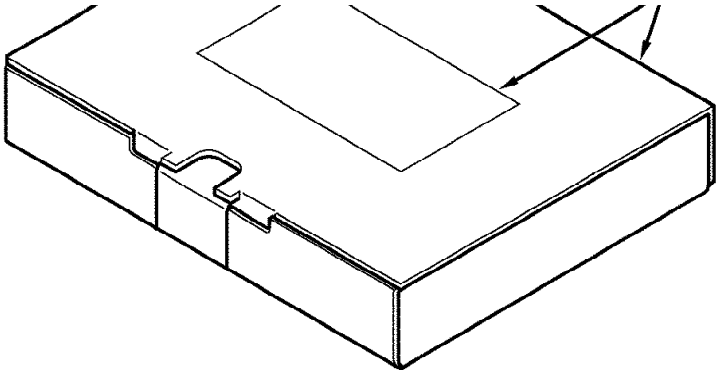


SCREW

Ref. No.	Part No.	Screw
A	XYN3+F6	Φ 3 x 6 mm
B	XSN4X40+6FN	Φ 2.8 x 6 mm

13. ACCESSORIES AND PACKING MATERIALS


P4
A1
P2
P1
P5
A2
P3



14. REPLACEMENT PARTS LIST

1. **RTL (Retention Time Limited)**
   Note: The marking (RTL) indicates that the Retention Time is limited for this item.
   After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is depends on the type of assembly, and in accordance with the laws governing parts and product retention.
   After end of this period, the assembly will no longer be available.
2. **Important safety notice**
   Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacture's specified parts.
3. **The S mark means the part is one of some identical parts. For that reason, it may be different from the installed part.**
4. **ISO code (Example: ABS-94HB) of the remarks column shows quality of the material and a flame resisting grade about plastics.**
5. **RESISTORS & CAPACITORS**
   Unless otherwise specified;
   All resistors are in ohms (Ω) K=1000 Ω , M=1000k Ω
   All capacitors are in MICRO FARADS (μ F) P= μ μ F
   ***Type & Wattage of Resistor**

Type

ERC:Solid ERD:Carbon PQRD:Carbon	ERX:Metal Film ERG:Metal Oxide ER0:Metal Film	PQ4R:Carbon ERS:Fusible Resistor ERF:Cement Resistor

Wattage

10,16:1/8W	14,25:1/4W	12:1/2W	1:1W	2:2W	3:3W

*Type & Voltage of Capacitor

Type

ECFD:Semi-Conductor ECQS:Styrol PQCUV:Chip ECQMS:Mica	ECCD,ECKD,ECBT,PQCBC:Ceramic ECQE,ECQV,ECQG:Polyester ECEA,ECSZ:Electrolytic ECQP:Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others	
1H:50V 2A:100V 2E:250V 2H:500V	05:50V 1:100V 2:200V	0F:3.15V 1A:10V 1V:35V 0J:6.3V	0J :6.3V 1A :10V 1C :16V 1E,25:25V	1V :35V 50,1H:50V 1J :63V 2A :100V

14.1. CABINET AND ELECTRICAL PARTS LOCATION

Ref. No.	Part No.	Part Name & Description	Remarks
1	PQDF996Z	SHAFT	
2	PQHR10005Z	SPACER	
3	PQUB14Z2	LEVER	
4	PSHD1088Z	SCREW	
5	PSHE1106Z	TAPE	
6	PSHE1123Z	SPACER	
7	PSHR1238Z	SPACER	
8	PSHR1272Z	REVET	
9	PSMH1213Y	ANGLE	
10	PSUS1020Z	SPRING	
11	PSUS1021Y	SPRING	
12	XUC25VW	RETAINING RING	

14.2. ACCESSORIES AND PACKING MATERIALS

Ref. No.	Part No.	Part Name & Description	Remarks
A1	XSN4X40+28FY	SCREW	
A2	J0KG00000019	CORE	
P1	PSPD1188Y	CUSHION	
P2	PSPP1069Z	PROTECTION COVER	
P3	PSZKTDA0170M	GIFT BOX	
P4	XZB05X08A03	PROTECTION COVER	
P5	PSPP1077Z	PROTECTION COVER	

14.3. MAIN BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
		(ICS)	
IC1A	C0AABA000029	IC	
IC1B	C0AABA000029	IC	
IC1C	C0AABA000029	IC	
IC1D	C0AABA000029	IC	
IC1E	C0AABA000029	IC	
IC1F	C0AABA000029	IC	
IC1G	C0AABA000029	IC	
IC1H	C0AABA000029	IC	
IC2	C0JBAB000504	IC	
IC6	PSVISNLV273A	IC	S
IC7	C1CB00001396	IC	
IC9	PSVIPST596CN	IC	
IC10	C0JBAE000253	IC	
IC12	C0ABCB000050	IC	
IC251	C1CB00001432	IC	
IC252	C1CB00001432	IC	
IC253	PQVINJM4558M	IC	S
IC501	C1CB00001314	IC	
IC502	C1CB00001314	IC	
IC503	PQVIBS2L1ST	IC	S
IC504	PSWIDA0170XJ	IC	
IC505	C0JBAZ001852	IC	
IC506	PQVIBS2L1ST	IC	S
IC507	PFVI7020VX12	IC	
IC508	C1CB00001497	IC	
IC510	C0JBAB000507	IC	
IC700	C0DBZZB00005	IC	
IC701	C0DBAJD00002	IC	
IC801	PQVIS8520F33	IC	S
IC802	C0DBAHA00011	IC	
		(TRANSISTORS)	
Q1A	2SB766ARTX	TRANSISTOR(SI)	
Q1B	2SB766ARTX	TRANSISTOR(SI)	
Q1C	2SB766ARTX	TRANSISTOR(SI)	
Q1D	2SB766ARTX	TRANSISTOR(SI)	
Q1E	2SB766ARTX	TRANSISTOR(SI)	
Q1F	2SB766ARTX	TRANSISTOR(SI)	
Q1G	2SB766ARTX	TRANSISTOR(SI)	
Q1H	2SB766ARTX	TRANSISTOR(SI)	
Q2A	2SB1218A	TRANSISTOR(SI)	S
Q2B	2SB1218A	TRANSISTOR(SI)	S
Q2C	2SB1218A	TRANSISTOR(SI)	S
Q2D	2SB1218A	TRANSISTOR(SI)	S
Q2E	2SB1218A	TRANSISTOR(SI)	S
Q2F	2SB1218A	TRANSISTOR(SI)	S
Q2G	2SB1218A	TRANSISTOR(SI)	S
Q2H	2SB1218A	TRANSISTOR(SI)	S
Q4A	2SB766ARTX	TRANSISTOR(SI)	
Q4B	2SB766ARTX	TRANSISTOR(SI)	
Q4C	2SB766ARTX	TRANSISTOR(SI)	
Q4D	2SB766ARTX	TRANSISTOR(SI)	
Q4E	2SB766ARTX	TRANSISTOR(SI)	
Q4F	2SB766ARTX	TRANSISTOR(SI)	

Ref. No.	Part No.	Part Name & Description	Remarks
Q4G	2SB766ARTX	TRANSISTOR(SI)	
Q4H	2SB766ARTX	TRANSISTOR(SI)	
Q6	PQVTDTA114YU	TRANSISTOR(SI)	S
Q9	B1DFDC000002	TRANSISTOR(SI)	
Q51A	2SD874A	TRANSISTOR(SI)	
Q51B	2SD874A	TRANSISTOR(SI)	
Q51C	2SD874A	TRANSISTOR(SI)	
Q51D	2SD874A	TRANSISTOR(SI)	
Q51E	2SD874A	TRANSISTOR(SI)	
Q51F	2SD874A	TRANSISTOR(SI)	
Q51G	2SD874A	TRANSISTOR(SI)	
Q51H	2SD874A	TRANSISTOR(SI)	
Q52A	2SB766ARTX	TRANSISTOR(SI)	
Q52B	2SB766ARTX	TRANSISTOR(SI)	
Q52C	2SB766ARTX	TRANSISTOR(SI)	
Q52D	2SB766ARTX	TRANSISTOR(SI)	
Q52E	2SB766ARTX	TRANSISTOR(SI)	
Q52F	2SB766ARTX	TRANSISTOR(SI)	
Q52G	2SB766ARTX	TRANSISTOR(SI)	
Q52H	2SB766ARTX	TRANSISTOR(SI)	
Q53A	2SB1218A	TRANSISTOR(SI)	S
Q53B	2SB1218A	TRANSISTOR(SI)	S
Q53C	2SB1218A	TRANSISTOR(SI)	S
Q53D	2SB1218A	TRANSISTOR(SI)	S
Q53E	2SB1218A	TRANSISTOR(SI)	S
Q53F	2SB1218A	TRANSISTOR(SI)	S
Q53G	2SB1218A	TRANSISTOR(SI)	S
Q53H	2SB1218A	TRANSISTOR(SI)	S
Q54A	2SD1819A	TRANSISTOR(SI)	S
Q54B	2SD1819A	TRANSISTOR(SI)	S
Q54C	2SD1819A	TRANSISTOR(SI)	S
Q54D	2SD1819A	TRANSISTOR(SI)	S
Q54E	2SD1819A	TRANSISTOR(SI)	S
Q54F	2SD1819A	TRANSISTOR(SI)	S
Q54G	2SD1819A	TRANSISTOR(SI)	S
Q54H	2SD1819A	TRANSISTOR(SI)	S
Q57A	PQVTDTC143E	TRANSISTOR(SI)	S
Q57B	PQVTDTC143E	TRANSISTOR(SI)	S
Q57C	PQVTDTC143E	TRANSISTOR(SI)	S
Q57D	PQVTDTC143E	TRANSISTOR(SI)	S
Q57E	PQVTDTC143E	TRANSISTOR(SI)	S
Q57F	PQVTDTC143E	TRANSISTOR(SI)	S
Q57G	PQVTDTC143E	TRANSISTOR(SI)	S
Q57H	PQVTDTC143E	TRANSISTOR(SI)	S
Q58A	PQVTDTC143E	TRANSISTOR(SI)	S
Q251	PQVTDTC143E	TRANSISTOR(SI)	S
Q702	2SD1819A	TRANSISTOR(SI)	S
Q703	2SB1218A	TRANSISTOR(SI)	S
Q706	B1BBAP000002	TRANSISTOR(SI)	
Q707	B1BDAP000010	TRANSISTOR(SI)	
Q709	UN5213	TRANSISTOR(SI)	S
Q710	B1DFBL000002	TRANSISTOR(SI)	
Q711	PQVTDTC143E	TRANSISTOR(SI)	S
Q801	B1DHCD000018	TRANSISTOR(SI)	

Ref. No.	Part No.	Part Name & Description	Remarks
Q802	B1DHCD000018	TRANSISTOR(SI)	
U1	B1GHCFJJ0007	TRANSISTOR(SI)	
U1A	B1GFAFNN0001	TRANSISTOR(SI)	
U1B	B1GFAFNN0001	TRANSISTOR(SI)	
U1C	B1GFAFNN0001	TRANSISTOR(SI)	
U1D	B1GFAFNN0001	TRANSISTOR(SI)	
U1E	B1GFAFNN0001	TRANSISTOR(SI)	
U1F	B1GFAFNN0001	TRANSISTOR(SI)	
U1G	B1GFAFNN0001	TRANSISTOR(SI)	
U1H	B1GFAFNN0001	TRANSISTOR(SI)	
U2	B1GFAFNN0001	TRANSISTOR(SI)	
U2A	B1GFAFNN0001	TRANSISTOR(SI)	
U2B	B1GFAFNN0001	TRANSISTOR(SI)	
U2C	B1GFAFNN0001	TRANSISTOR(SI)	
U2D	B1GFAFNN0001	TRANSISTOR(SI)	
U2E	B1GFAFNN0001	TRANSISTOR(SI)	
U2F	B1GFAFNN0001	TRANSISTOR(SI)	
U2G	B1GFAFNN0001	TRANSISTOR(SI)	
U2H	B1GFAFNN0001	TRANSISTOR(SI)	
U3A	XP4401	TRANSISTOR(SI)	
U3B	XP4401	TRANSISTOR(SI)	
U3C	XP4401	TRANSISTOR(SI)	
U3D	XP4401	TRANSISTOR(SI)	
U3E	XP4401	TRANSISTOR(SI)	
U3F	XP4401	TRANSISTOR(SI)	
U3G	XP4401	TRANSISTOR(SI)	
U3H	XP4401	TRANSISTOR(SI)	
U4A	PSVTUMX1NTN	TRANSISTOR(SI)	
U4B	PSVTUMX1NTN	TRANSISTOR(SI)	
U4C	PSVTUMX1NTN	TRANSISTOR(SI)	
U4D	PSVTUMX1NTN	TRANSISTOR(SI)	
U4E	PSVTUMX1NTN	TRANSISTOR(SI)	
U4F	PSVTUMX1NTN	TRANSISTOR(SI)	
U4G	PSVTUMX1NTN	TRANSISTOR(SI)	
U4H	PSVTUMX1NTN	TRANSISTOR(SI)	
U5A	PSVTUMX1NTN	TRANSISTOR(SI)	
U5B	PSVTUMX1NTN	TRANSISTOR(SI)	
U5C	PSVTUMX1NTN	TRANSISTOR(SI)	
U5D	PSVTUMX1NTN	TRANSISTOR(SI)	
U5E	PSVTUMX1NTN	TRANSISTOR(SI)	
U5F	PSVTUMX1NTN	TRANSISTOR(SI)	
U5G	PSVTUMX1NTN	TRANSISTOR(SI)	
U5H	PSVTUMX1NTN	TRANSISTOR(SI)	
U6AB	B1GHCFNN0004	TRANSISTOR(SI)	
U6CD	B1GHCFNN0004	TRANSISTOR(SI)	
U6EF	B1GHCFNN0004	TRANSISTOR(SI)	
U6GH	B1GHCFNN0004	TRANSISTOR(SI)	
U52A	PSVTUMX1NTN	TRANSISTOR(SI)	
U52B	PSVTUMX1NTN	TRANSISTOR(SI)	
U52C	PSVTUMX1NTN	TRANSISTOR(SI)	
U52D	PSVTUMX1NTN	TRANSISTOR(SI)	
U52E	PSVTUMX1NTN	TRANSISTOR(SI)	
U52F	PSVTUMX1NTN	TRANSISTOR(SI)	
U52G	PSVTUMX1NTN	TRANSISTOR(SI)	

Ref. No.	Part No.	Part Name & Description	Remarks
U52H	PSVTUMX1NTN	TRANSISTOR(SI)	
		(DIODES)	
D1	B0JCJG000002	DIODE(SI)	
D1A	B0JCJG000002	DIODE(SI)	
D1B	B0JCJG000002	DIODE(SI)	
D1C	B0JCJG000002	DIODE(SI)	
D1D	B0JCJG000002	DIODE(SI)	
D1E	B0JCJG000002	DIODE(SI)	
D1F	B0JCJG000002	DIODE(SI)	
D1G	B0JCJG000002	DIODE(SI)	
D1H	B0JCJG000002	DIODE(SI)	
D2A	MA2J11100L	DIODE(SI)	
D2B	MA2J11100L	DIODE(SI)	
D2C	MA2J11100L	DIODE(SI)	
D2D	MA2J11100L	DIODE(SI)	
D2E	MA2J11100L	DIODE(SI)	
D2F	MA2J11100L	DIODE(SI)	
D2G	MA2J11100L	DIODE(SI)	
D2H	MA2J11100L	DIODE(SI)	
D3A	MA2J11100L	DIODE(SI)	
D3B	MA2J11100L	DIODE(SI)	
D3C	MA2J11100L	DIODE(SI)	
D3D	MA2J11100L	DIODE(SI)	
D3E	MA2J11100L	DIODE(SI)	
D3F	MA2J11100L	DIODE(SI)	
D3G	MA2J11100L	DIODE(SI)	
D3H	MA2J11100L	DIODE(SI)	
D51A	MAZ80390HL	DIODE(SI)	
D51B	MAZ80390HL	DIODE(SI)	
D51C	MAZ80390HL	DIODE(SI)	
D51D	MAZ80390HL	DIODE(SI)	
D51E	MAZ80390HL	DIODE(SI)	
D51F	MAZ80390HL	DIODE(SI)	
D51G	MAZ80390HL	DIODE(SI)	
D51H	MAZ80390HL	DIODE(SI)	
D52A	MA2J11100L	DIODE(SI)	
D52B	MA2J11100L	DIODE(SI)	
D52C	MA2J11100L	DIODE(SI)	
D52D	MA2J11100L	DIODE(SI)	
D52E	MA2J11100L	DIODE(SI)	
D52F	MA2J11100L	DIODE(SI)	
D52G	MA2J11100L	DIODE(SI)	
D52H	MA2J11100L	DIODE(SI)	
D53A	MA2J11100L	DIODE(SI)	
D54A	MA2J11100L	DIODE(SI)	
D54B	MA2J11100L	DIODE(SI)	
D54C	MA2J11100L	DIODE(SI)	
D54D	MA2J11100L	DIODE(SI)	
D54E	MA2J11100L	DIODE(SI)	
D54F	MA2J11100L	DIODE(SI)	
D54G	MA2J11100L	DIODE(SI)	
D54H	MA2J11100L	DIODE(SI)	
D55A	MA2J11100L	DIODE(SI)	
D55B	MA2J11100L	DIODE(SI)	

Ref. No.	Part No.	Part Name & Description	Remarks
D55C	MA2J11100L	DIODE(SI)	
D55D	MA2J11100L	DIODE(SI)	
D55E	MA2J11100L	DIODE(SI)	
D55F	MA2J11100L	DIODE(SI)	
D55G	MA2J11100L	DIODE(SI)	
D55H	MA2J11100L	DIODE(SI)	
D56A	MA8330	DIODE(SI)	
D56B	MA8330	DIODE(SI)	
D56C	MA8330	DIODE(SI)	
D56D	MA8330	DIODE(SI)	
D56E	MA8330	DIODE(SI)	
D56F	MA8330	DIODE(SI)	
D56G	MA8330	DIODE(SI)	
D56H	MA8330	DIODE(SI)	
D251	MA2J11100L	DIODE(SI)	
D701	MA8150	DIODE(SI)	
D703	MA8150	DIODE(SI)	
D705	MA8240	DIODE(SI)	
D706	B0HCMR000002	DIODE(SI)	
D708	B0HCMR000002	DIODE(SI)	
D801	PFVDDGD1FP3T	DIODE(SI)	S
D802	PFVDDGD1FP3T	DIODE(SI)	S
D803	B0BC5R000009	DIODE(SI)	
D804	MA8075	DIODE(SI)	S
DA801	MA142WKTX	DIODE(SI)	S
LED1	PQVDBRPY1204	LED	S
		(CERAMIC FILTERS)	
FIL1	J0HAAH000003	IC FILTER	
FIL2	J0HAAB000020	IC FILTER	
FIL3	J0HAAH000003	IC FILTER	
FIL4	J0HAAH000003	IC FILTER	
FIL8	J0HAAH000003	IC FILTER	
FIL251	J0HAAH000003	IC FILTER	
FIL252	J0HAAH000003	IC FILTER	
FIL501	J0HAAH000003	IC FILTER	
FIL502	J0HAAH000003	IC FILTER	
FIL503	J0HAAH000003	IC FILTER	
FIL504	J0HAAH000003	IC FILTER	
FIL505	J0HAAH000003	IC FILTER	
FIL506	J0HAAB000020	IC FILTER	
FIL507	J0HAAH000003	IC FILTER	
FIL508	J0HAAH000003	IC FILTER	
FIL509	J0HAAH000003	IC FILTER	
FIL510	J0HAAB000020	IC FILTER	
L1	PFVF1B221SB	CERAMIC FILTER	
L2	PFVF1B221SB	CERAMIC FILTER	
L3	PFVF1B221SB	CERAMIC FILTER	
L4	PFVF1B221SB	CERAMIC FILTER	
L5	PFVF1B221SB	CERAMIC FILTER	
L6	PFVF1B221SB	CERAMIC FILTER	
L7	PFVF1B221SB	CERAMIC FILTER	
L8	PFVF1B221SB	CERAMIC FILTER	
L9	PFVF1B221SB	CERAMIC FILTER	
L10	PFVF1B221SB	CERAMIC FILTER	

Ref. No.	Part No.	Part Name & Description	Remarks
L11	PFVF1B221SB	CERAMIC FILTER	
L12	PFVF1B221SB	CERAMIC FILTER	
L13	PFVF1B221SB	CERAMIC FILTER	
L14	PFVF1B221SB	CERAMIC FILTER	
L15	PFVF1B221SB	CERAMIC FILTER	
L16	PFVF1B221SB	CERAMIC FILTER	S
L17	PFVF1B221SB	CERAMIC FILTER	S
L18	PFVF1B221SB	CERAMIC FILTER	S
L19	PFVF1B221SB	CERAMIC FILTER	S
L20	PFVF1B221SB	CERAMIC FILTER	S
L21	PFVF1B221SB	CERAMIC FILTER	S
L22	PFVF1B221SB	CERAMIC FILTER	S
L23	PFVF1B221SB	CERAMIC FILTER	S
L24	PFVF1B221SB	CERAMIC FILTER	S
L25	PFVF1B221SB	CERAMIC FILTER	S
L26	PFVF1B221SB	CERAMIC FILTER	S
L27	PFVF1B221SB	CERAMIC FILTER	S
L28	PFVF1B221SB	CERAMIC FILTER	S
L29	PFVF1B221SB	CERAMIC FILTER	
L30	PFVF1B221SB	CERAMIC FILTER	
L251	PFVF1B221SB	CERAMIC FILTER	
L252	PFVF1B221SB	CERAMIC FILTER	S
L253	PFVF1B221SB	CERAMIC FILTER	S
L254	PFVF1B221SB	CERAMIC FILTER	
L506	PFVF1B221SB	CERAMIC FILTER	
L507	PFVF1B221SB	CERAMIC FILTER	
L508	PFVF1B221SB	CERAMIC FILTER	
L509	PFVF1B221SB	CERAMIC FILTER	
L510	PFVF1B221SB	CERAMIC FILTER	
L511	PFVF1B221SB	CERAMIC FILTER	
L512	PFVF1B221SB	CERAMIC FILTER	
L513	PFVF1B221SB	CERAMIC FILTER	
L514	PFVF1B221SB	CERAMIC FILTER	
L515	PFVF1B221SB	CERAMIC FILTER	
L516	PFVF1B221SB	CERAMIC FILTER	
L517	PFVF1B221SB	CERAMIC FILTER	
L518	PFVF1B221SB	CERAMIC FILTER	
L519	PFVF1B221SB	CERAMIC FILTER	
L520	PFVF1B221SB	CERAMIC FILTER	
L521	PFVF1B221SB	CERAMIC FILTER	
L522	PFVF1B221SB	CERAMIC FILTER	
L523	PFVF1B221SB	CERAMIC FILTER	
L524	PFVF1B221SB	CERAMIC FILTER	
L525	PFVF1B221SB	CERAMIC FILTER	
L526	PFVF1B221SB	CERAMIC FILTER	
L527	PFVF1B221SB	CERAMIC FILTER	
L528	PFVF1B221SB	CERAMIC FILTER	
L529	PFVF1B221SB	CERAMIC FILTER	
L530	PFVF1B221SB	CERAMIC FILTER	
L531	PFVF1B221SB	CERAMIC FILTER	
L532	PFVF1B221SB	CERAMIC FILTER	
L533	PFVF1B221SB	CERAMIC FILTER	
L534	PFVF1B221SB	CERAMIC FILTER	
L535	PFVF1B221SB	CERAMIC FILTER	

Ref. No.	Part No.	Part Name & Description	Remarks
L536	PFVF1B221SB	CERAMIC FILTER	
L537	PFVF1B221SB	CERAMIC FILTER	
L538	PFVF1B221SB	CERAMIC FILTER	
L539	PFVF1B221SB	CERAMIC FILTER	
L540	PFVF1B221SB	CERAMIC FILTER	
L541	PFVF1B221SB	CERAMIC FILTER	
L542	PFVF1B221SB	CERAMIC FILTER	
L543	PFVF1B221SB	CERAMIC FILTER	
L544	PFVF1B221SB	CERAMIC FILTER	
L545	PFVF1B221SB	CERAMIC FILTER	
L546	PFVF1B221SB	CERAMIC FILTER	
L547	PFVF1B221SB	CERAMIC FILTER	
L548	PFVF1B221SB	CERAMIC FILTER	
L549	PFVF1B221SB	CERAMIC FILTER	
L810	PFVF2P600SG	CERAMIC FILTER	
L811	PFVF2P600SG	CERAMIC FILTER	
X501	H2D122500003	CERAMIC FILTER	
		(COILS)	
L1A	PSLQR1K102MT	COIL	
L1B	PSLQR1K102MT	COIL	
L1C	PSLQR1K102MT	COIL	
L1D	PSLQR1K102MT	COIL	
L1E	PSLQR1K102MT	COIL	
L1F	PSLQR1K102MT	COIL	
L1G	PSLQR1K102MT	COIL	
L1H	PSLQR1K102MT	COIL	
L2A	PSLQR1K102MT	COIL	
L2B	PSLQR1K102MT	COIL	
L2C	PSLQR1K102MT	COIL	
L2D	PSLQR1K102MT	COIL	
L2E	PSLQR1K102MT	COIL	
L2F	PSLQR1K102MT	COIL	
L2G	PSLQR1K102MT	COIL	
L2H	PSLQR1K102MT	COIL	
L203A	PSLQR1K102MT	COIL	
L203B	PSLQR1K102MT	COIL	
L203C	PSLQR1K102MT	COIL	
L203D	PSLQR1K102MT	COIL	
L203E	PSLQR1K102MT	COIL	
L203F	PSLQR1K102MT	COIL	
L203G	PSLQR1K102MT	COIL	
L203H	PSLQR1K102MT	COIL	
L204A	PSLQR1K102MT	COIL	
L204B	PSLQR1K102MT	COIL	
L204C	PSLQR1K102MT	COIL	
L204D	PSLQR1K102MT	COIL	
L204E	PSLQR1K102MT	COIL	
L204F	PSLQR1K102MT	COIL	
L204G	PSLQR1K102MT	COIL	
L204H	PSLQR1K102MT	COIL	
L801	G0C680KA0052	COIL	
L802	G0C680KA0052	COIL	
		(CONNECTORS)	
CN1	K1KB30A00056	CONNECTOR	

Ref. No.	Part No.	Part Name & Description	Remarks
CN2	K1KA90B00008	CONNECTOR	
CN3	K1FB150B0039	CONNECTOR	
CN501	PSJP07A44Z	CONNECTOR	
		(CRYSTAL OSCILLATOR)	
X1	PSVCC0025GT	CRYSTAL OSCILLATOR	S
		(FUSES)	
IP1	K5H502Z00003	FUSE	
IP801	K5H751Z00003	FUSE	
IP802	K5H751Z00003	FUSE	
		(JACKS)	
CN4	PQJJ1T011Y	JACK	S
		(PHOTO ELECTRIC TRANSDUCERS)	
PC700	PQVIPC357CN	PHOTO COUPLER	⚠S
PC703	PQVIPC357CN	PHOTO COUPLER	⚠S
		(TRANSFORMERS)	
T1A	G4B1A0000030	TRANSFORMER	S
T1B	G4B1A0000030	TRANSFORMER	S
T1C	G4B1A0000030	TRANSFORMER	S
T1D	G4B1A0000030	TRANSFORMER	S
T1E	G4B1A0000030	TRANSFORMER	S
T1F	G4B1A0000030	TRANSFORMER	S
T1G	G4B1A0000030	TRANSFORMER	S
T1H	G4B1A0000030	TRANSFORMER	S
T700	G4D1A0000048	TRANSFORMER	
		(VARISTORS)	
ZNR1A	D4EAB560A005	VARISTOR	
ZNR1B	D4EAB560A005	VARISTOR	
ZNR1C	D4EAB560A005	VARISTOR	
ZNR1D	D4EAB560A005	VARISTOR	
ZNR1E	D4EAB560A005	VARISTOR	
ZNR1F	D4EAB560A005	VARISTOR	
ZNR1G	D4EAB560A005	VARISTOR	
ZNR1H	D4EAB560A005	VARISTOR	
ZNR2A	D4EAB180A005	VARISTOR	
ZNR2B	D4EAB180A005	VARISTOR	
ZNR2C	D4EAB180A005	VARISTOR	
ZNR2D	D4EAB180A005	VARISTOR	
ZNR2E	D4EAB180A005	VARISTOR	
ZNR2F	D4EAB180A005	VARISTOR	
ZNR2G	D4EAB180A005	VARISTOR	
ZNR2H	D4EAB180A005	VARISTOR	
ZNR51A	D4EAB470A005	VARISTOR	
ZNR51B	D4EAB470A005	VARISTOR	
ZNR51C	D4EAB470A005	VARISTOR	
ZNR51D	D4EAB470A005	VARISTOR	
ZNR51E	D4EAB470A005	VARISTOR	
ZNR51F	D4EAB470A005	VARISTOR	
ZNR51G	D4EAB470A005	VARISTOR	
ZNR51H	D4EAB470A005	VARISTOR	
ZNR52A	D4EAB220A005	VARISTOR	
ZNR52B	D4EAB220A005	VARISTOR	
ZNR52C	D4EAB220A005	VARISTOR	
ZNR52D	D4EAB220A005	VARISTOR	
ZNR52E	D4EAB220A005	VARISTOR	

[illegible]	[illegible]	VARISTOR	

Ref. No.	Part No.	Part Name & Description	Remarks
ZNR52F	D4EAB220A005	VARISTOR	
ZNR52G	D4EAB220A005	VARISTOR	
ZNR52H	D4EAB220A005	VARISTOR	
ZNR53A	D4EAB470A005	VARISTOR	
ZNR53B	D4EAB470A005	VARISTOR	
ZNR53C	D4EAB470A005	VARISTOR	
ZNR53D	D4EAB470A005	VARISTOR	
ZNR53E	D4EAB470A005	VARISTOR	
ZNR53F	D4EAB470A005	VARISTOR	
ZNR53G	D4EAB470A005	VARISTOR	
ZNR53H	D4EAB470A005	VARISTOR	
		(RELAYS)	
RL51A	K6B2CGA00094	RELAY	⚠
RL52A	K6B2CGA00095	RELAY	⚠
RL52B	K6B2CGA00095	RELAY	⚠
RL52C	K6B2CGA00095	RELAY	⚠
RL52D	K6B2CGA00095	RELAY	⚠
RL52E	K6B2CGA00095	RELAY	⚠
RL52F	K6B2CGA00095	RELAY	⚠
RL52G	K6B2CGA00095	RELAY	⚠
RL52H	K6B2CGA00095	RELAY	⚠
RL251	K6B2CGA00095	RELAY	⚠
RL252	K6B2CGA00095	RELAY	⚠
		(COMPONENTS PARTS)	
RA1A	D1H81034A024	RESISTOR ARRAY, 10K	
RA1B	D1H81034A024	RESISTOR ARRAY, 10K	
RA1C	D1H81034A024	RESISTOR ARRAY, 10K	
RA1D	D1H81034A024	RESISTOR ARRAY, 10K	
RA1E	D1H81034A024	RESISTOR ARRAY, 10K	
RA1F	D1H81034A024	RESISTOR ARRAY, 10K	
RA1G	D1H81034A024	RESISTOR ARRAY, 10K	
RA1H	D1H81034A024	RESISTOR ARRAY, 10K	
RA5	D1H81024A024	RESISTOR ARRAY, 1K	
RA16	D1H84704A024	RESISTOR ARRAY, 47	
RA17	D1H84704A024	RESISTOR ARRAY, 47	
RA18	D1H84704A024	RESISTOR ARRAY, 47	
RA19	D1H84704A024	RESISTOR ARRAY, 47	
RA20	D1H84704A024	RESISTOR ARRAY, 47	
RA21	D1H84704A024	RESISTOR ARRAY, 47	
RA40	D1HA1038A005	RESISTOR ARRAY, 10K	
RA41	D1HA1038A005	RESISTOR ARRAY, 10K	
RA42	D1HA1038A005	RESISTOR ARRAY, 10K	
RA43	D1HA1038A005	RESISTOR ARRAY, 10K	
RA44	D1HA1038A005	RESISTOR ARRAY, 10K	
RA260	D1HA1038A005	RESISTOR ARRAY, 10K	
RA261	D1HA1038A005	RESISTOR ARRAY, 10K	
RA262	D1HA1038A005	RESISTOR ARRAY, 10K	
RA263	D1HA1038A005	RESISTOR ARRAY, 10K	
RA519	D1H86804A024	RESISTOR ARRAY, 68	
RA520	D1H86804A024	RESISTOR ARRAY, 68	
RA521	D1H86804A024	RESISTOR ARRAY, 68	
RA522	D1H86804A024	RESISTOR ARRAY, 68	

Ref. No.	Part No.	Part Name & Description	Remarks
RA523	D1H86804A024	RESISTOR ARRAY, 68	
RA524	D1H86804A024	RESISTOR ARRAY, 68	
RA525	D1H86804A024	RESISTOR ARRAY, 68	
RA526	D1H86804A024	RESISTOR ARRAY, 68	
RA527	D1H86804A024	RESISTOR ARRAY, 68	
RA528	D1HA1038A005	RESISTOR ARRAY, 10K	
RA529	D1HA1038A005	RESISTOR ARRAY, 10K	
RA530	D1HA1038A005	RESISTOR ARRAY, 10K	
RA531	D1HA1028A005	RESISTOR ARRAY, 1K	
RA532	D1HA1028A005	RESISTOR ARRAY, 1K	
RA533	D1HA1038A005	RESISTOR ARRAY, 10K	
RA534	D1HA1038A005	RESISTOR ARRAY, 10K	
RA535	D1HA1038A005	RESISTOR ARRAY, 10K	
RA536	D1HA1038A005	RESISTOR ARRAY, 10K	
		(RESISTORS)	
R1A	ERJ3GEYJ223	22K	S
R1B	ERJ3GEYJ223	22K	S
R1C	ERJ3GEYJ223	22K	S
R1D	ERJ3GEYJ223	22K	S
R1E	ERJ3GEYJ223	22K	S
R1F	ERJ3GEYJ223	22K	S
R1G	ERJ3GEYJ223	22K	S
R1H	ERJ3GEYJ223	22K	S
R2A	ERJ3GEYJ104	100K	
R2B	ERJ3GEYJ104	100K	
R2C	ERJ3GEYJ104	100K	
R2D	ERJ3GEYJ104	100K	
R2E	ERJ3GEYJ104	100K	
R2F	ERJ3GEYJ104	100K	
R2G	ERJ3GEYJ104	100K	
R2H	ERJ3GEYJ104	100K	
R3A	ERJ3GEYJ472	4.7K	
R3B	ERJ3GEYJ472	4.7K	
R3C	ERJ3GEYJ472	4.7K	
R3D	ERJ3GEYJ472	4.7K	
R3E	ERJ3GEYJ472	4.7K	
R3F	ERJ3GEYJ472	4.7K	
R3G	ERJ3GEYJ472	4.7K	
R3H	ERJ3GEYJ472	4.7K	
R4A	ERJ3GEYJ223	22K	
R4B	ERJ3GEYJ223	22K	
R4C	ERJ3GEYJ223	22K	
R4D	ERJ3GEYJ223	22K	
R4E	ERJ3GEYJ223	22K	
R4F	ERJ3GEYJ223	22K	
R4G	ERJ3GEYJ223	22K	
R4H	ERJ3GEYJ223	22K	
R5A	ERJ3GEYJ103	10K	
R5B	ERJ3GEYJ103	10K	
R5C	ERJ3GEYJ103	10K	
R5D	ERJ3GEYJ103	10K	
R5E	ERJ3GEYJ103	10K	
R5F	ERJ3GEYJ103	10K	
R5G	ERJ3GEYJ103	10K	

Ref. No.	Part No.	Part Name & Description	Remarks
R5H	ERJ3GEYJ103	10K	
R6A	ERJ3GEYJ103	10K	
R6B	ERJ3GEYJ103	10K	
R6C	ERJ3GEYJ103	10K	
R6D	ERJ3GEYJ103	10K	
R6E	ERJ3GEYJ103	10K	
R6F	ERJ3GEYJ103	10K	
R6G	ERJ3GEYJ103	10K	
R6H	ERJ3GEYJ103	10K	
R7A	ERJ3GEYJ560	56	
R7B	ERJ3GEYJ560	56	
R7C	ERJ3GEYJ560	56	
R7D	ERJ3GEYJ560	56	
R7E	ERJ3GEYJ560	56	
R7F	ERJ3GEYJ560	56	
R7G	ERJ3GEYJ560	56	
R7H	ERJ3GEYJ560	56	
R8A	PQ4R10XJ561	560	S
R8B	PQ4R10XJ561	560	S
R8C	PQ4R10XJ561	560	S
R8D	PQ4R10XJ561	560	S
R8E	PQ4R10XJ561	560	S
R8F	PQ4R10XJ561	560	S
R8G	PQ4R10XJ561	560	S
R8H	PQ4R10XJ561	560	S
R9A	PQ4R10XJ390	39	S
R9B	PQ4R10XJ390	39	S
R9C	PQ4R10XJ390	39	S
R9D	PQ4R10XJ390	39	S
R9E	PQ4R10XJ390	39	S
R9F	PQ4R10XJ390	39	S
R9G	PQ4R10XJ390	39	S
R9H	PQ4R10XJ390	39	S
R10A	PQ4R10XJ390	39	S
R10B	PQ4R10XJ390	39	S
R10C	PQ4R10XJ390	39	S
R10D	PQ4R10XJ390	39	S
R10E	PQ4R10XJ390	39	S
R10F	PQ4R10XJ390	39	S
R10G	PQ4R10XJ390	39	S
R10H	PQ4R10XJ390	39	S
R11A	ERJ3GEYJ681	680	
R11B	ERJ3GEYJ681	680	
R11C	ERJ3GEYJ681	680	
R11D	ERJ3GEYJ681	680	
R11E	ERJ3GEYJ681	680	
R11F	ERJ3GEYJ681	680	
R11G	ERJ3GEYJ681	680	
R11H	ERJ3GEYJ681	680	
R12A	ERJ3GEYJ681	680	
R12B	ERJ3GEYJ681	680	
R12C	ERJ3GEYJ681	680	
R12D	ERJ3GEYJ681	680	
R12E	ERJ3GEYJ681	680	

Ref. No.	Part No.	Part Name & Description	Remarks
R12F	ERJ3GEYJ681	680	
R12G	ERJ3GEYJ681	680	
R12H	ERJ3GEYJ681	680	
R13B	ERJ3GEYF472	4.7K	
R13C	ERJ3GEYF472	4.7K	
R13D	ERJ3GEYF472	4.7K	
R13E	ERJ3GEYF472	4.7K	
R13F	ERJ3GEYF472	0	
R13G	ERJ3GEYF472	4.7K	
R13H	ERJ3GEYF472	4.7K	
R14A	ERJ3GEYJ152	1.5K	
R14B	ERJ3GEYJ152	1.5K	
R14C	ERJ3GEYJ152	1.5K	
R14D	ERJ3GEYJ152	1.5K	
R14E	ERJ3GEYJ152	1.5K	
R14F	ERJ3GEYJ152	1.5K	
R14G	ERJ3GEYJ152	1.5K	
R14H	ERJ3GEYJ152	1.5K	
R15A	ERJ3GEYJ152	1.5K	
R15B	ERJ3GEYJ152	1.5K	
R15C	ERJ3GEYJ152	1.5K	
R15D	ERJ3GEYJ152	1.5K	
R15E	ERJ3GEYJ152	1.5K	
R15F	ERJ3GEYJ152	1.5K	
R15G	ERJ3GEYJ152	1.5K	
R15H	ERJ3GEYJ152	1.5K	
R16A	ERJ3GEYF222	2.2K	
R16B	ERJ3GEYF222	2.2K	
R16C	ERJ3GEYF222	2.2K	
R16D	ERJ3GEYF222	2.2K	
R16E	ERJ3GEYF222	2.2K	
R16F	ERJ3GEYF222	2.2K	
R16G	ERJ3GEYF222	2.2K	
R16H	ERJ3GEYF222	2.2K	
R17A	ERJ3GEYJ102	1K	
R17B	ERJ3GEYJ102	1K	
R17C	ERJ3GEYJ102	1K	
R17D	ERJ3GEYJ102	1K	
R17E	ERJ3GEYJ102	1K	
R17F	ERJ3GEYJ102	1K	
R17G	ERJ3GEYJ102	1K	
R17H	ERJ3GEYJ102	1K	
R18A	ERJ3GEYJ102	1K	
R18B	ERJ3GEYJ102	1K	
R18C	ERJ3GEYJ102	1K	
R18D	ERJ3GEYJ102	1K	
R18E	ERJ3GEYJ102	1K	
R18F	ERJ3GEYJ102	1K	
R18G	ERJ3GEYJ102	1K	
R18H	ERJ3GEYJ102	1K	
R19	ERJ3GEYJ105	1M	
R20	ERJ3GEYJ152	1.5K	
R21A	ERJ3GEYJ105	1M	
R21B	ERJ3GEYJ105	1M	

Ref. No.	Part No.	Part Name & Description	Remarks
R21C	ERJ3GEYJ105	1M	
R21D	ERJ3GEYJ105	1M	
R21E	ERJ3GEYJ105	1M	
R21F	ERJ3GEYJ105	1M	
R21G	ERJ3GEYJ105	1M	
R21H	ERJ3GEYJ105	1M	
R22A	ERJ3GEYJ154	150K	
R22B	ERJ3GEYJ154	150K	
R22C	ERJ3GEYJ154	150K	
R22D	ERJ3GEYJ154	150K	
R22E	ERJ3GEYJ154	150K	
R22F	ERJ3GEYJ154	150K	
R22G	ERJ3GEYJ154	150K	
R22H	ERJ3GEYJ154	150K	
R23A	ERJ3GEYJ475	4.7M	
R23B	ERJ3GEYJ475	4.7M	
R23C	ERJ3GEYJ475	4.7M	
R23D	ERJ3GEYJ475	4.7M	
R23E	ERJ3GEYJ475	4.7M	
R23F	ERJ3GEYJ475	4.7M	
R23G	ERJ3GEYJ475	4.7M	
R23H	ERJ3GEYJ475	4.7M	
R24A	ERJ3GEYJ105	1M	
R24B	ERJ3GEYJ105	1M	
R24C	ERJ3GEYJ105	1M	
R24D	ERJ3GEYJ105	1M	
R24E	ERJ3GEYJ105	1M	
R24F	ERJ3GEYJ105	1M	
R24G	ERJ3GEYJ105	1M	
R24H	ERJ3GEYJ105	1M	
R51A	ERJ1WYJ102	1K	S
R51B	ERJ1WYJ102	1K	S
R51C	ERJ1WYJ102	1K	S
R51D	ERJ1WYJ102	1K	S
R51E	ERJ1WYJ102	1K	S
R51F	ERJ1WYJ102	1K	S
R51G	ERJ1WYJ102	1K	S
R51H	ERJ1WYJ102	1K	S
R251	ERJ3GEYJ101	100	
R255	ERJ3GEYJ101	100	
R25A	PSRD14XG1R5	1.5	
R25B	PSRD14XG1R5	1.5	
R25C	PSRD14XG1R5	1.5	
R25D	PSRD14XG1R5	1.5	
R25E	PSRD14XG1R5	1.5	
R25F	PSRD14XG1R5	1.5	
R25G	PSRD14XG1R5	1.5	
R25H	PSRD14XG1R5	1.5	
R26A	ERJ3GEYJ223	22K	
R26B	ERJ3GEYJ223	22K	
R26C	ERJ3GEYJ223	22K	
R26D	ERJ3GEYJ223	22K	
R26E	ERJ3GEYJ223	22K	
R26F	ERJ3GEYJ223	22K	

Ref. No.	Part No.	Part Name & Description	Remarks
R26G	ERJ3GEYJ223	22K	
R26H	ERJ3GEYJ223	22K	
R27A	ERJ3GEYJ8R2	8.2	
R27B	ERJ3GEYJ8R2	8.2	
R27C	ERJ3GEYJ8R2	8.2	
R27D	ERJ3GEYJ8R2	8.2	
R27E	ERJ3GEYJ8R2	8.2	
R27F	ERJ3GEYJ8R2	8.2	
R27G	ERJ3GEYJ8R2	8.2	
R27H	ERJ3GEYJ8R2	8.2	
R28	ERJ3GEYJ151	150	
R29	ERJ3GEYJ151	150	
R30	ERJ3GEYJ391	390	
R37	ERJ3GEYJ103	10K	
R42	ERJ3GEYJ221	220	
R43	ERJ3GEYJ221	220	
R44	ERJ3GEY0R00	0	
R47	ERJ3GEYJ101	100	
R48	ERJ3GEYJ101	100	
R49	ERJ3GEYJ101	100	
R52A	ERJ3GEYJ333	33K	
R52B	ERJ3GEYJ333	33K	
R52C	ERJ3GEYJ333	33K	
R52D	ERJ3GEYJ333	33K	
R52E	ERJ3GEYJ333	33K	
R52F	ERJ3GEYJ333	33K	
R52G	ERJ3GEYJ333	33K	
R52H	ERJ3GEYJ333	33K	
R53A	ERJ3GEYJ563	56K	
R53B	ERJ3GEYJ563	56K	
R53C	ERJ3GEYJ563	56K	
R53D	ERJ3GEYJ563	56K	
R53E	ERJ3GEYJ563	56K	
R53F	ERJ3GEYJ563	56K	
R53G	ERJ3GEYJ563	56K	
R53H	ERJ3GEYJ563	56K	
R54A	ERJ3GEYJ682	6.8K	
R54B	ERJ3GEYJ682	6.8K	
R54C	ERJ3GEYJ682	6.8K	
R54D	ERJ3GEYJ682	6.8K	
R54E	ERJ3GEYJ682	6.8K	
R54F	ERJ3GEYJ682	6.8K	
R54G	ERJ3GEYJ682	6.8K	
R54H	ERJ3GEYJ682	6.8K	
R55A	ERJ3GEYJ682	6.8K	
R55B	ERJ3GEYJ682	6.8K	
R55C	ERJ3GEYJ682	6.8K	
R55D	ERJ3GEYJ682	6.8K	
R55E	ERJ3GEYJ682	6.8K	
R55F	ERJ3GEYJ682	6.8K	
R55G	ERJ3GEYJ682	6.8K	
R55H	ERJ3GEYJ682	6.8K	
R56	ERJ3GEYJ470	47	
R56A	ERJ3GEYJ153	15K	

Ref. No.	Part No.	Part Name & Description	Remarks
R56B	ERJ3GEYJ153	15K	
R56C	ERJ3GEYJ153	15K	
R56D	ERJ3GEYJ153	15K	
R56E	ERJ3GEYJ153	15K	
R56F	ERJ3GEYJ153	15K	
R56G	ERJ3GEYJ153	15K	
R56H	ERJ3GEYJ153	15K	
R57	ERJ3GEYJ470	47	
R57A	ERJ3GEYJ333	33K	
R57B	ERJ3GEYJ333	33K	
R57C	ERJ3GEYJ333	33K	
R57D	ERJ3GEYJ333	33K	
R57E	ERJ3GEYJ333	33K	
R57F	ERJ3GEYJ333	33K	
R57G	ERJ3GEYJ333	33K	
R57H	ERJ3GEYJ333	33K	
R58	ERJ3GEYJ470	47	
R58A	ERJ3GEYJ123	12K	
R58B	ERJ3GEYJ123	12K	
R58C	ERJ3GEYJ123	12K	
R58D	ERJ3GEYJ123	12K	
R58E	ERJ3GEYJ123	12K	
R58F	ERJ3GEYJ123	12K	
R58G	ERJ3GEYJ123	12K	
R58H	ERJ3GEYJ123	12K	
R59	ERJ3GEYJ470	47	
R59A	ERJ14YJ220	22	S
R59B	ERJ14YJ220	22	S
R59C	ERJ14YJ220	22	S
R59D	ERJ14YJ220	22	S
R59E	ERJ14YJ220	22	S
R59F	ERJ14YJ220	22	S
R59G	ERJ14YJ220	22	S
R59H	ERJ14YJ220	22	S
R60	ERJ3GEYJ103	10K	
R60A	ERJ14YJ220	22	S
R60B	ERJ14YJ220	22	S
R60C	ERJ14YJ220	22	S
R60D	ERJ14YJ220	22	S
R60E	ERJ14YJ220	22	S
R60F	ERJ14YJ220	22	S
R60G	ERJ14YJ220	22	S
R60H	ERJ14YJ220	22	S
R61A	ERJ14YJ680	68	
R61B	ERJ14YJ680	68	
R61C	ERJ14YJ680	68	
R61D	ERJ14YJ680	68	
R61E	ERJ14YJ680	68	
R61F	ERJ14YJ680	68	
R61G	ERJ14YJ680	68	
R61H	ERJ14YJ680	68	
R62A	ERJ14YJ680	68	
R62B	ERJ14YJ680	68	
R62C	ERJ14YJ680	68	

Ref. No.	Part No.	Part Name & Description	Remarks
R62D	ERJ14YJ680	68	
R62E	ERJ14YJ680	68	
R62F	ERJ14YJ680	68	
R62G	ERJ14YJ680	68	
R62H	ERJ14YJ680	68	
R63	ERJ3GEYJ470	47	
R63A	D0GB301ZA002	300	
R63B	D0GB301ZA002	300	
R63C	D0GB301ZA002	300	
R63D	D0GB301ZA002	300	
R63E	D0GB301ZA002	300	
R63F	D0GB301ZA002	300	
R63G	D0GB301ZA002	300	
R63H	D0GB301ZA002	300	
R64	ERJ3GEYJ470	47	
R64A	ERJ3GEYJ473	47K	
R64B	ERJ3GEYJ473	47K	
R64C	ERJ3GEYJ473	47K	
R64D	ERJ3GEYJ473	47K	
R64E	ERJ3GEYJ473	47K	
R64F	ERJ3GEYJ473	47K	
R64G	ERJ3GEYJ473	47K	
R64H	ERJ3GEYJ473	47K	
R65A	ERJ3GEYF104	100K	S
R65B	ERJ3GEYF104	100K	S
R65C	ERJ3GEYF104	100K	S
R65D	ERJ3GEYF104	100K	S
R65E	ERJ3GEYF104	100K	S
R65F	ERJ3GEYF104	100K	S
R65G	ERJ3GEYF104	100K	S
R65H	ERJ3GEYF104	100K	S
R66A	ERJ3GEYF104	100K	S
R66B	ERJ3GEYF104	100K	S
R66C	ERJ3GEYF104	100K	S
R66D	ERJ3GEYF104	100K	S
R66E	ERJ3GEYF104	100K	S
R66F	ERJ3GEYF104	100K	S
R66G	ERJ3GEYF104	100K	S
R66H	ERJ3GEYF104	100K	S
R67	ERJ3GEYJ220	22	
R67A	D0GB301ZA002	300	
R67B	D0GB301ZA002	300	
R67C	D0GB301ZA002	300	
R67D	D0GB301ZA002	300	
R67E	D0GB301ZA002	300	
R67F	D0GB301ZA002	300	
R67G	D0GB301ZA002	300	
R67H	D0GB301ZA002	300	
R68	ERJ3GEYJ220	22	
R68A	ERJ3GEYJ103	10K	
R68B	ERJ3GEYJ103	10K	
R68C	ERJ3GEYJ103	10K	
R68D	ERJ3GEYJ103	10K	
R68E	ERJ3GEYJ103	10K	

Ref. No.	Part No.	Part Name & Description	Remarks
R68F	ERJ3GEYJ103	10K	
R68G	ERJ3GEYJ103	10K	
R68H	ERJ3GEYJ103	10K	
R69	ERJ3GEYJ220	22	S
R69A	ERJ3GEYF563	56K	S
R69B	ERJ3GEYF563	56K	S
R69C	ERJ3GEYF563	56K	S
R69D	ERJ3GEYF563	56K	S
R69E	ERJ3GEYF563	56K	S
R69F	ERJ3GEYF563	56K	S
R69G	ERJ3GEYF563	56K	S
R69H	ERJ3GEYF563	56K	S
R70	ERJ3GEYJ220	22	
R70A	ERJ3GEYF563	56K	S
R70B	ERJ3GEYF563	56K	S
R70C	ERJ3GEYF563	56K	S
R70D	ERJ3GEYF563	56K	S
R70E	ERJ3GEYF563	56K	S
R70F	ERJ3GEYF563	56K	S
R70G	ERJ3GEYF563	56K	S
R70H	ERJ3GEYF563	56K	S
R71	ERJ3GEYJ220	22	
R71A	ERJ3GEYF104	100K	S
R71B	ERJ3GEYF104	100K	S
R71C	ERJ3GEYF104	100K	S
R71D	ERJ3GEYF104	100K	S
R71E	ERJ3GEYF104	100K	S
R71F	ERJ3GEYF104	100K	S
R71G	ERJ3GEYF104	100K	S
R71H	ERJ3GEYF104	100K	S
R72	ERJ3GEYJ220	22	S
R72A	ERJ3GEYJ220	22	
R72B	ERJ3GEYJ220	22	
R72C	ERJ3GEYJ220	22	
R72D	ERJ3GEYJ220	22	
R72E	ERJ3GEYJ220	22	
R72F	ERJ3GEYJ220	22	
R72G	ERJ3GEYJ220	22	
R72H	ERJ3GEYJ220	22	
R73	ERJ3GEYJ221	220	
R73A	ERJ3GEYF104	100K	S
R73B	ERJ3GEYF104	100K	S
R73C	ERJ3GEYF104	100K	S
R73D	ERJ3GEYF104	100K	S
R73E	ERJ3GEYF104	100K	S
R73F	ERJ3GEYF104	100K	S
R73G	ERJ3GEYF104	100K	S
R73H	ERJ3GEYF104	100K	S
R74	ERJ3GEYJ102	1K	
R74A	ERJ3GEYJ221	220	
R74B	ERJ3GEYJ221	220	
R74C	ERJ3GEYJ221	220	
R74D	ERJ3GEYJ221	220	
R74E	ERJ3GEYJ221	220	

Ref. No.	Part No.	Part Name & Description	Remarks
R74F	ERJ3GEYJ221	220	
R74G	ERJ3GEYJ221	220	
R74H	ERJ3GEYJ221	220	
R75	ERJ3GEYJ220	22	
R75A	ERJ3GEYJ220	22	
R75B	ERJ3GEYJ220	22	
R75C	ERJ3GEYJ220	22	
R75D	ERJ3GEYJ220	22	
R75E	ERJ3GEYJ220	22	
R75F	ERJ3GEYJ220	22	
R75G	ERJ3GEYJ220	22	
R75H	ERJ3GEYJ220	22	
R76	ERJ3GEYJ220	22	
R76A	ERJ3GEYJ221	220	
R77	ERJ3GEYJ102	1K	
R77A	ERJ3GEYJ472	4.7K	
R77B	ERJ3GEYJ472	4.7K	
R77C	ERJ3GEYJ472	4.7K	
R77D	ERJ3GEYJ472	4.7K	
R77E	ERJ3GEYJ472	4.7K	
R77F	ERJ3GEYJ472	4.7K	
R77G	ERJ3GEYJ472	4.7K	
R77H	ERJ3GEYJ472	4.7K	
R78A	ERJ14YJ220	22	S
R78B	ERJ14YJ220	22	S
R78C	ERJ14YJ220	22	S
R78D	ERJ14YJ220	22	S
R78E	ERJ14YJ220	22	S
R78F	ERJ14YJ220	22	S
R78G	ERJ14YJ220	22	S
R78H	ERJ14YJ220	22	S
R80	ERJ3GEYJ101	100	
R85	ERJ3GEYJ103	10K	
R86	ERJ3GEYJ103	10K	
R87	PQ4R18XJ223	22K	S
R88	PQ4R18XJ223	22K	S
R91	ERJ3GEYF122	1.2K	
R92	ERJ3GEYF392	3.9K	
R93	ERJ3GEYF182	1.8K	S
R94	ERJ3EKF9100	910	
R95	ERJ3GEYF362	3.6K	
R96	ERJ3GEYF362	3.6K	
R97	ERJ3EKF1001	1K	
R98	ERJ3GEYF201	200	
R99	ERJ3GEYJ102	1K	
R100	ERJ3GEYJ102	1K	
R101	ERJ3GEYJ103	10K	
R266	ERJ3GEY0R00	0	
R254	ERJ3GEYJ101	100	
R256	ERJ3GEYJ101	100	
R257	ERJ3GEYJ101	100	
R258	ERJ3GEYJ103	10K	
R261	ERJ3GEYF104	100K	S
R264	ERJ3GEYF104	100K	S

Ref. No.	Part No.	Part Name & Description	Remarks
R265	ERJ3GEY0R00	0	
R501	ERJ3GEYJ104	100K	
R502	ERJ3GEYJ104	100K	
R503	ERJ3GEYJ104	100K	
R504	ERJ3GEYJ104	100K	
R505	ERJ3GEYJ104	100K	
R506	ERJ3GEYJ104	100K	
R507	ERJ3GEYJ104	100K	
R508	ERJ3GEYJ104	100K	
R509	ERJ3GEYJ104	100K	
R510	ERJ3GEYJ104	100K	
R511	ERJ3GEYJ104	100K	
R512	ERJ3GEYJ104	100K	
R513	ERJ3GEYJ104	100K	
R514	ERJ3GEYJ104	100K	
R515	ERJ3GEYJ104	100K	
R516	ERJ3GEYJ104	100K	
R518	ERJ3GEYJ104	100K	
R519	ERJ3GEYJ104	100K	
R520	ERJ3GEYJ104	100K	
R521	ERJ3GEYJ104	100K	
R522	ERJ3GEYJ104	100K	
R523	ERJ3GEYJ104	100K	
R524	ERJ3GEYJ104	100K	
R525	ERJ3GEYJ104	100K	
R526	ERJ3GEYJ104	100K	
R527	ERJ3GEYJ104	100K	
R528	ERJ3GEYJ104	100K	
R529	ERJ3GEYJ104	100K	
R530	ERJ3GEYJ104	100K	
R531	ERJ3GEYJ104	100K	
R532	ERJ3GEYJ104	100K	
R533	ERJ3GEYJ104	100K	
R535	ERJ3GEYJ103	10K	
R541	ERJ3GEYJ103	10K	
R543	ERJ3GEYJ103	10K	
R546	ERJ3GEYJ220	22	
R547	ERJ3GEYJ220	22	
R548	ERJ3GEYJ103	10K	
R549	ERJ3GEYJ680	68	
R550	ERJ3GEYJ680	68	
R551	ERJ3GEYJ220	22	
R552	ERJ3GEYJ220	22	
R553	ERJ3GEYJ220	22	
R554	ERJ3GEYJ393	39K	
R555	ERJ3GEYJ220	22	
R556	ERJ3GEYJ680	68	
R557	ERJ3GEYJ680	68	
R589	ERJ3GEYJ103	10K	
R590	ERJ3GEYJ151	150	
R591	ERJ3GEYJ151	150	
R592	ERJ3GEYJ680	68	
R593	ERJ3GEY0R00	0	
R594	ERJ3GEYJ331	330	

Ref. No.	Part No.	Part Name & Description	Remarks
R701	ERJ3GEYJ151	150	
R703	ERJ3GEYJ681	680	S
R705	ERJ3GEYJ681	680	S
R707	PQ4R10XJ101	100	S
R709	PQ4R18XJ104	100K	S
R711	PQ4R18XJ104	100K	S
R713	ERJ3GEYJ103	10K	
R715	ERJ3GEYJ105	1M	
R717	ERJ3GEYJ103	10K	
R719	ERJ3GEYJ752	7.5K	
R720	PQ4R10XJ101	100	S
R721	ERJ3GEYJ473	47K	
R723	ERJ3EKF3903	390K	
R725	ERJ3EKF2002	20K	
R727	ERJ3EKF1803	180K	
R728	PQ4R10XJ472	4.7K	S
R729	ERJ3EKF2002	20K	
R730	ERJ3GEYF393	39K	S
R731	ERJ3EKF1501	1.5K	
R732	ERJ3GEYJ125	1.2M	
R733	ERJ3GEYJ102	1K	
R734	ERJ3GEYJ223	22K	
R736	PQ4R18XJ473	47K	S
R737	ERJ3GEYJ103	10K	
R740	ERJ3GEYJ222	2.2K	
R741	ERJ3GEYJ220	22	
R742	ERJ3GEYJ223	22K	
R743	ERX1SJ2R7	2.7	
R744	ERJ3GEYJ220	22	
R745	ERJ3GEYJ103	10K	
R746	PQ4R18XJ223	22K	S
R801	ERJ3GEYJ560	56	
R802	ERJ3GEYJ560	56	
R803	ERJ3GEYJ681	680	
R804	ERJ3GEYJ681	680	
R805	ERJ3GEYJ681	680	
R806	ERJ3GEYJ681	680	
L701	PQ4R10XJ000	0	S
L702	PQ4R10XJ000	0	S
L703	PQ4R10XJ000	0	S
L704	PQ4R10XJ000	0	S
L705	PQ4R10XJ000	0	S
L706	PQ4R10XJ000	0	S
L707	PQ4R10XJ000	0	S
L708	PQ4R10XJ000	0	S
L709	PQ4R10XJ000	0	S
L710	PQ4R10XJ000	0	S
L711	PQ4R10XJ000	0	S
L712	PQ4R10XJ000	0	S
L713	PQ4R10XJ000	0	S
L714	PQ4R10XJ000	0	S
L715	PQ4R10XJ000	0	S
L716	PQ4R10XJ000	0	S
L803	PQ4R18XJ000	0	S

Ref. No.	Part No.	Part Name & Description	Remarks
L804	PQ4R18XJ000	0	S
L805	PQ4R18XJ000	0	S
IP3	PQ4R18XJ000	0	S
J1	ERJ3GEY0R00	0	
J3	ERJ3GEY0R00	0	
J4	ERJ3GEY0R00	0	
J5	ERJ3GEY0R00	0	S
J6	ERJ3GEY0R00	0	
J7	ERJ3GEY0R00	0	
J21	ERJ3GEY0R00	0	
J22	ERJ3GEY0R00	0	S
J23	ERJ3GEY0R00	0	S
J24	ERJ3GEY0R00	0	
J25	ERJ3GEY0R00	0	
J26	ERJ3GEY0R00	0	
J40	ERJ3GEY0R00	0	
J41	ERJ3GEY0R00	0	
J42	ERJ3GEY0R00	0	
J45	ERJ3GEY0R00	0	
J47	ERJ3GEY0R00	0	
J48	ERJ3GEY0R00	0	
J49	ERJ3GEY0R00	0	
J51B	PQ4R18XJ000	0	S
J51C	PQ4R18XJ000	0	S
J51D	PQ4R18XJ000	0	S
J51E	PQ4R18XJ000	0	S
J51F	PQ4R18XJ000	0	S
J51G	PQ4R18XJ000	0	S
J51H	PQ4R18XJ000	0	S
J52B	PQ4R18XJ000	0	S
J52C	PQ4R18XJ000	0	S
J52D	PQ4R18XJ000	0	S
J52E	PQ4R18XJ000	0	S
J52F	PQ4R18XJ000	0	S
J52G	PQ4R18XJ000	0	S
J52H	PQ4R18XJ000	0	S
J63	ERJ3GEY0R00	0	
J64	ERJ3GEY0R00	0	
J65	ERJ3GEY0R00	0	
J501	ERJ3GEY0R00	0	
J502	ERJ3GEY0R00	0	
J506	ERJ3GEY0R00	0	
J507	ERJ3GEY0R00	0	
J508	ERJ3GEY0R00	0	
J515	ERJ3GEY0R00	0	
J517	ERJ3GEY0R00	0	
		(CAPACITORS)	
C2A	ECEA1HU2R2	2.2	S
C2B	ECEA1HU2R2	2.2	S
C2C	ECEA1HU2R2	2.2	S
C2D	ECEA1HU2R2	2.2	S
C2E	ECEA1HU2R2	2.2	S
C2F	ECEA1HU2R2	2.2	S
C2G	ECEA1HU2R2	2.2	S

Ref. No.	Part No.	Part Name & Description	Remarks
C2H	ECEA1HU2R2	2.2	S
C3A	ECUV1A105ZFV	1	
C3B	ECUV1A105ZFV	1	
C3C	ECUV1A105ZFV	1	
C3D	ECUV1A105ZFV	1	
C3E	ECUV1A105ZFV	1	
C3F	ECUV1A105ZFV	1	
C3G	ECUV1A105ZFV	1	
C3H	ECUV1A105ZFV	1	
C4	PQCUV1A225ZF	2.2	S
C4A	PQCUV1H105JC	1	S
C4B	PQCUV1H105JC	1	S
C4C	PQCUV1H105JC	1	S
C4D	PQCUV1H105JC	1	S
C4E	PQCUV1H105JC	1	S
C4F	PQCUV1H105JC	1	S
C4G	PQCUV1H105JC	1	S
C4H	PQCUV1H105JC	1	S
C5	ECUV1A105ZFV	1	
C5A	PQCUV1H105JC	1	S
C5B	PQCUV1H105JC	1	S
C5C	PQCUV1H105JC	1	S
C5D	PQCUV1H105JC	1	S
C5E	PQCUV1H105JC	1	S
C5F	PQCUV1H105JC	1	S
C5G	PQCUV1H105JC	1	S
C5H	PQCUV1H105JC	1	S
C6A	ECUV1H680JCV	68P	
C6B	ECUV1H680JCV	68P	
C6C	ECUV1H680JCV	68P	
C6D	ECUV1H680JCV	68P	
C6E	ECUV1H680JCV	68P	
C6F	ECUV1H680JCV	68P	
C6G	ECUV1H680JCV	68P	
C6H	ECUV1H680JCV	68P	
C7	ECUV1C104ZFV	0.1	
C7A	ECUV1H680JCV	68P	
C7B	ECUV1H680JCV	68P	
C7C	ECUV1H680JCV	68P	
C7D	ECUV1H680JCV	68P	
C7E	ECUV1H680JCV	68P	
C7F	ECUV1H680JCV	68P	
C7G	ECUV1H680JCV	68P	
C7H	ECUV1H680JCV	68P	
C8A	ECUV1C104KBV	0.1	
C8B	ECUV1C104KBV	0.1	
C8C	ECUV1C104KBV	0.1	
C8D	ECUV1C104KBV	0.1	
C8E	ECUV1C104KBV	0.1	
C8F	ECUV1C104KBV	0.1	
C8G	ECUV1C104KBV	0.1	
C8H	ECUV1C104KBV	0.1	
C9	ECUV1H150JCV	15P	
C9A	ECUV1C104KBV	0.1	

Ref. No.	Part No.	Part Name & Description	Remarks
C9B	ECUV1C104KBV	0.1	
C9C	ECUV1C104KBV	0.1	
C9D	ECUV1C104KBV	0.1	
C9E	ECUV1C104KBV	0.1	
C9F	ECUV1C104KBV	0.1	
C9G	ECUV1C104KBV	0.1	
C9H	ECUV1C104KBV	0.1	
C10	ECUV1H180JCV	18P	
C10A	ECUV1C104KBV	0.1	
C10B	ECUV1C104KBV	0.1	
C10C	ECUV1C104KBV	0.1	
C10D	ECUV1C104KBV	0.1	
C10E	ECUV1C104KBV	0.1	
C10F	ECUV1C104KBV	0.1	
C10G	ECUV1C104KBV	0.1	
C10H	ECUV1C104KBV	0.1	
C11A	ECUV1A105ZFV	1	
C11B	ECUV1A105ZFV	1	
C11C	ECUV1A105ZFV	1	
C11D	ECUV1A105ZFV	1	
C11E	ECUV1A105ZFV	1	
C11F	ECUV1A105ZFV	1	
C11G	ECUV1A105ZFV	1	
C11H	ECUV1A105ZFV	1	
C19	ECUV1C104ZFV	0.1	
C21	PQCUV1A225ZF	2.2	S
C22	ECUV1A105ZFV	1	
C23	ECUV1C104ZFV	0.1	
C24	PQCUV1A225ZF	2.2	S
C25	ECUV1A105ZFV	1	
C26	ECUV1C104ZFV	0.1	
C27	ECUV1C104ZFV	0.1	
C28	ECUV1C104ZFV	0.1	
C29	ECUV1C104ZFV	0.1	
C30	ECUV1C104ZFV	0.1	
C31	ECUV1C104ZFV	0.1	
C32	ECUV1C104ZFV	0.1	
C34	ECUV1E104ZFV	0.1	S
C35	ECA1EHG470	47P	
C36	ECUV1C104ZFV	0.1	
C37	ECUV1C104ZFV	0.1	
C38	ECUV1H104ZFV	0.1	S
C39	ECA1HHG100	10P	
C40	ECUV1E104ZFV	0.1	S
C41	ECA1EHG470	47P	
C42	ECUV1C104ZFV	0.1	
C43	ECA1HHG100	10P	
C44	ECUV1H104ZFV	0.1	S
C48	PQCUV1A225ZF	2.2	S
C49	ECUV1A105ZFV	1	
C50	ECUV1C104ZFV	0.1	
C51	ECUV1H103KBV	0.01	S
C51A	PSCEA1HN4R7	4.7	
C51B	PSCEA1HN4R7	4.7	

Ref. No.	Part No.	Part Name & Description	Remarks
C51C	PSCEA1HN4R7	4.7	
C51D	PSCEA1HN4R7	4.7	
C51E	PSCEA1HN4R7	4.7	
C51F	PSCEA1HN4R7	4.7	
C51G	PSCEA1HN4R7	4.7	
C51H	PSCEA1HN4R7	4.7	
C52	ECUV1C104ZFV	0.1	
C52A	ECUV1H103KBV	0.01	
C52B	ECUV1H103KBV	0.01	
C52C	ECUV1H103KBV	0.01	
C52D	ECUV1H103KBV	0.01	
C52E	ECUV1H103KBV	0.01	
C52F	ECUV1H103KBV	0.01	
C52G	ECUV1H103KBV	0.01	
C52H	ECUV1H103KBV	0.01	
C53	ECUV1C104ZFV	0.1	
C53A	ECUV1H103KBV	0.01	
C53B	ECUV1H103KBV	0.01	
C53C	ECUV1H103KBV	0.01	
C53D	ECUV1H103KBV	0.01	
C53E	ECUV1H103KBV	0.01	
C53F	ECUV1H103KBV	0.01	
C53G	ECUV1H103KBV	0.01	
C53H	ECUV1H103KBV	0.01	
C54	ECUV1C104ZFV	0.1	
C54A	ECUV1C393KBV	0.039	S
C54B	ECUV1C393KBV	0.039	S
C54C	ECUV1C393KBV	0.039	S
C54D	ECUV1C393KBV	0.039	S
C54E	ECUV1C393KBV	0.039	S
C54F	ECUV1C393KBV	0.039	S
C54G	ECUV1C393KBV	0.039	S
C54H	ECUV1C393KBV	0.039	S
C55	ECUV1H332KBV	0.0033	
C55A	ECEA1HU100	10	S
C55B	ECEA1HU100	10	S
C55C	ECEA1HU100	10	S
C55D	ECEA1HU100	10	S
C55E	ECEA1HU100	10	S
C55F	ECEA1HU100	10	S
C55G	ECEA1HU100	10	S
C55H	ECEA1HU100	10	S
C56A	PSCEA1HN100	10P	
C56B	PSCEA1HN100	10P	
C56C	PSCEA1HN100	10P	
C56D	PSCEA1HN100	10P	
C56E	PSCEA1HN100	10P	
C56F	PSCEA1HN100	10P	
C56G	PSCEA1HN100	10P	
C56H	PSCEA1HN100	10P	
C57A	ECEA1HU100	10	S
C57B	ECEA1HU100	10	S
C57C	ECEA1HU100	10	S
C57D	ECEA1HU100	10	S

Ref. No.	Part No.	Part Name & Description	Remarks
C57E	ECEA1HU100	10	S
C57F	ECEA1HU100	10	S
C57G	ECEA1HU100	10	S
C57H	ECEA1HU100	10	S
C58A	ECEA1HU100	10	S
C58B	ECEA1HU100	10	S
C58C	ECEA1HU100	10	S
C58D	ECEA1HU100	10	S
C58E	ECEA1HU100	10	S
C58F	ECEA1HU100	10	S
C58G	ECEA1HU100	10	S
C58H	ECEA1HU100	10	S
C59A	ECUV1H680JCV	68P	
C59B	ECUV1H680JCV	68P	
C59C	ECUV1H680JCV	68P	
C59D	ECUV1H680JCV	68P	
C59E	ECUV1H680JCV	68P	
C59F	ECUV1H680JCV	68P	
C59G	ECUV1H680JCV	68P	
C59H	ECUV1H680JCV	68P	
C60	ECUV1C104ZFV	0.1	
C60A	ECUV1H680JCV	68P	
C60B	ECUV1H680JCV	68P	
C60C	ECUV1H680JCV	68P	
C60D	ECUV1H680JCV	68P	
C60E	ECUV1H680JCV	68P	
C60F	ECUV1H680JCV	68P	
C60G	ECUV1H680JCV	68P	
C60H	ECUV1H680JCV	68P	
C61	ECUV1C104ZFV	0.1	
C62	ECUV1C104ZFV	0.1	
C63	ECUV1C104ZFV	0.1	
C64	ECUV1C104ZFV	0.1	
C65	ECUV1C104ZFV	0.1	
C66	ECUV1C104ZFV	0.1	
C251	ECUV1C104KBV	0.1	
C252	ECUV1C104KBV	0.1	
C253	ECUV1C104KBV	0.1	
C254	ECUV1C104KBV	0.1	
C256	PQCUV1A225ZF	2.2	S
C257	ECUV1C224ZFV	0.22	
C258	ECUV1C104ZFV	0.1	
C259	ECUV1C104ZFV	0.1	
C260	ECUV1C104ZFV	0.1	
C261	ECUV1A105ZFV	1	
C262	ECUV1C104ZFV	0.1	
C263	PQCUV1H105JC	1	S
C265	ECUV1C104KBV	0.1	
C266	ECUV1C104KBV	0.1	
C267	ECUV1C104KBV	0.1	
C268	ECUV1C104KBV	0.1	
C269	PQCUV1A225ZF	2.2	S
C270	ECUV1C224ZFV	0.22	
C271	ECUV1C104ZFV	0.1	

Ref. No.	Part No.	Part Name & Description	Remarks
C272	ECUV1C104ZFV	0.1	
C273	ECUV1C104ZFV	0.1	
C274	ECUV1A105ZFV	1	
C275	ECUV1C104ZFV	0.1	
C276	PQCUV1H105JC	1	S
C277	ECUV1C104ZFV	0.1	
C278	ECUV1C104ZFV	0.1	
C501	ECUV1C104KBV	0.1	
C502	ECUV1C104KBV	0.1	
C503	ECUV1C104KBV	0.1	
C504	ECUV1C104KBV	0.1	
C505	ECUV1C104KBV	0.1	
C506	ECUV1C104KBV	0.1	
C507	ECUV1C104KBV	0.1	
C508	ECUV1C104KBV	0.1	
C509	ECUV1C104KBV	0.1	
C510	ECUV1C104KBV	0.1	
C511	ECUV1C104KBV	0.1	
C512	ECUV1C104KBV	0.1	
C513	ECUV1C104KBV	0.1	
C514	ECUV1C104KBV	0.1	
C515	ECUV1C104KBV	0.1	
C516	ECUV1C104KBV	0.1	
C517	ECUV1C104ZFV	0.1	
C518	ECUV1C104ZFV	0.1	
C519	ECUV1A105ZFV	1	
C520	ECUV1A105ZFV	1	
C521	PQCUV1A225ZF	2.2	S
C522	PQCUV1A225ZF	2.2	S
C524	PQCUV1A225ZF	2.2	S
C525	ECUV1A105ZFV	1	
C527	ECUV1C104ZFV	0.1	
C529	ECUV1A105ZFV	1	
C530	PQCUV1A225ZF	2.2	S
C531	PQCUV1A225ZF	2.2	S
C532	ECUV1A105ZFV	1	
C533	ECUV1C104ZFV	0.1	
C534	ECUV1C104ZFV	0.1	
C535	ECUV1A105ZFV	1	
C540	PQCUV1A225ZF	2.2	S
C541	PQCUV1A225ZF	2.2	S
C542	ECUV1A105ZFV	1	
C543	ECUV1C104ZFV	0.1	
C544	PQCUV1A225ZF	2.2	
C545	ECUV1A105ZFV	1	
C550	ECUV1C104ZFV	0.1	
C551	ECUV1C104ZFV	0.1	
C552	ECUV1C104ZFV	0.1	
C553	ECUV1C104ZFV	0.1	
C554	ECUV1C104ZFV	0.1	
C701	PSCUV2EY104K	0.1	S
C703	ECUV1E104ZFV	0.1	S
C705	PQCUV1E823KB	0.082	S
C707	PQCUV1E823KB	0.082	S

Ref. No.	Part No.	Part Name & Description	Remarks
C708	ECUV1E104ZFV	0.1	S
C709	ECA2EHG100	10P	
C711	ECA2EHG100	10P	
C712	ECUV1C473KBV	0.047	S
C713	ECUV1E104ZFV	0.1	S
C714	ECUV1H471JCV	470P	S
C715	ECUV1E104ZFV	0.1	S
C716	ECUV1H104ZFV	0.1	S
C717	ECA1HHG101	100P	
C718	ECUV1E104ZFV	0.1	S
C801	EEUFC1E101S	100	
C802	EEUFC1E121	120	
C805	ECUV1E104ZFV	0.1	S
C806	ECUV1E104ZFV	0.1	S
C807	ECUV1C104ZFV	0.1	
C808	ECUV1C104ZFV	0.1	
C809	EEUFC0J221	220	
C810	EEUFC1A151	150	

15. FOR SCHEMATIC DIAGRAM

Note:

1. DC voltage measurements are taken with voltmeter from the negative voltage line.

Important Safety Notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

2. This schematic diagram may be modified at any time with the development of new technology.

16. SCHEMATIC DIAGRAM

16.1. NO.1

16.2. NO.2

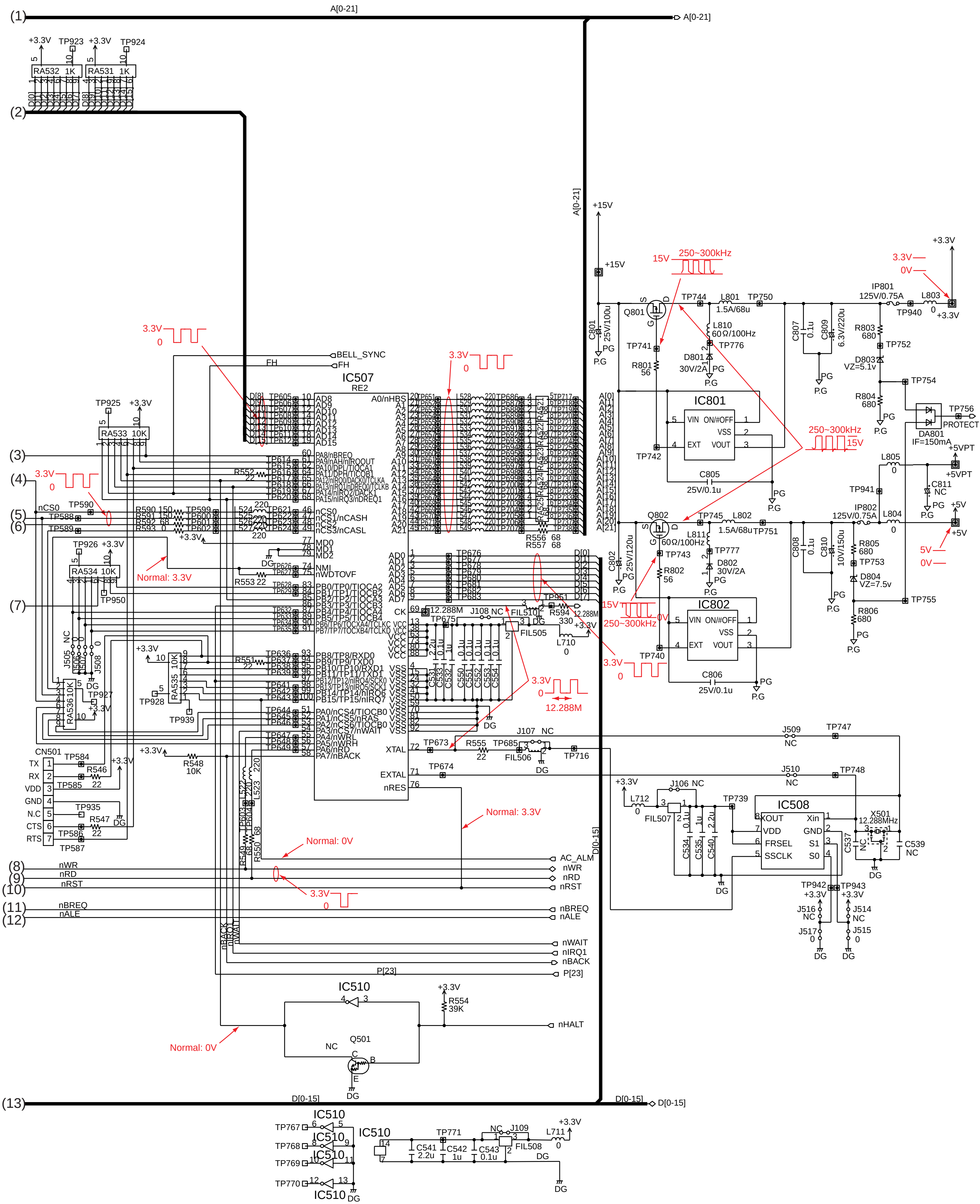
16.3. NO.3

17. PRINTED CIRCUIT BOARD

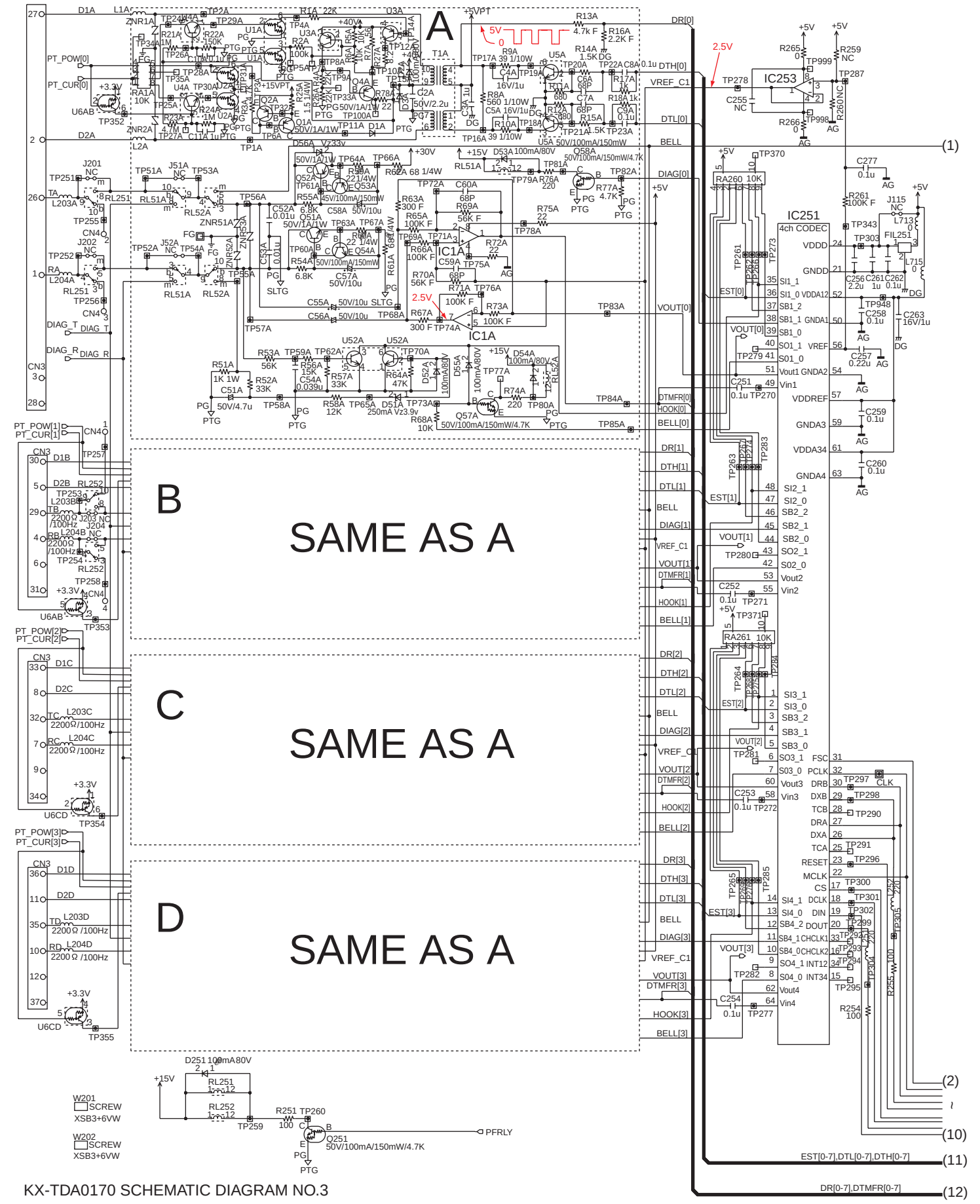
17.1. Component View

17.2. Bottom View

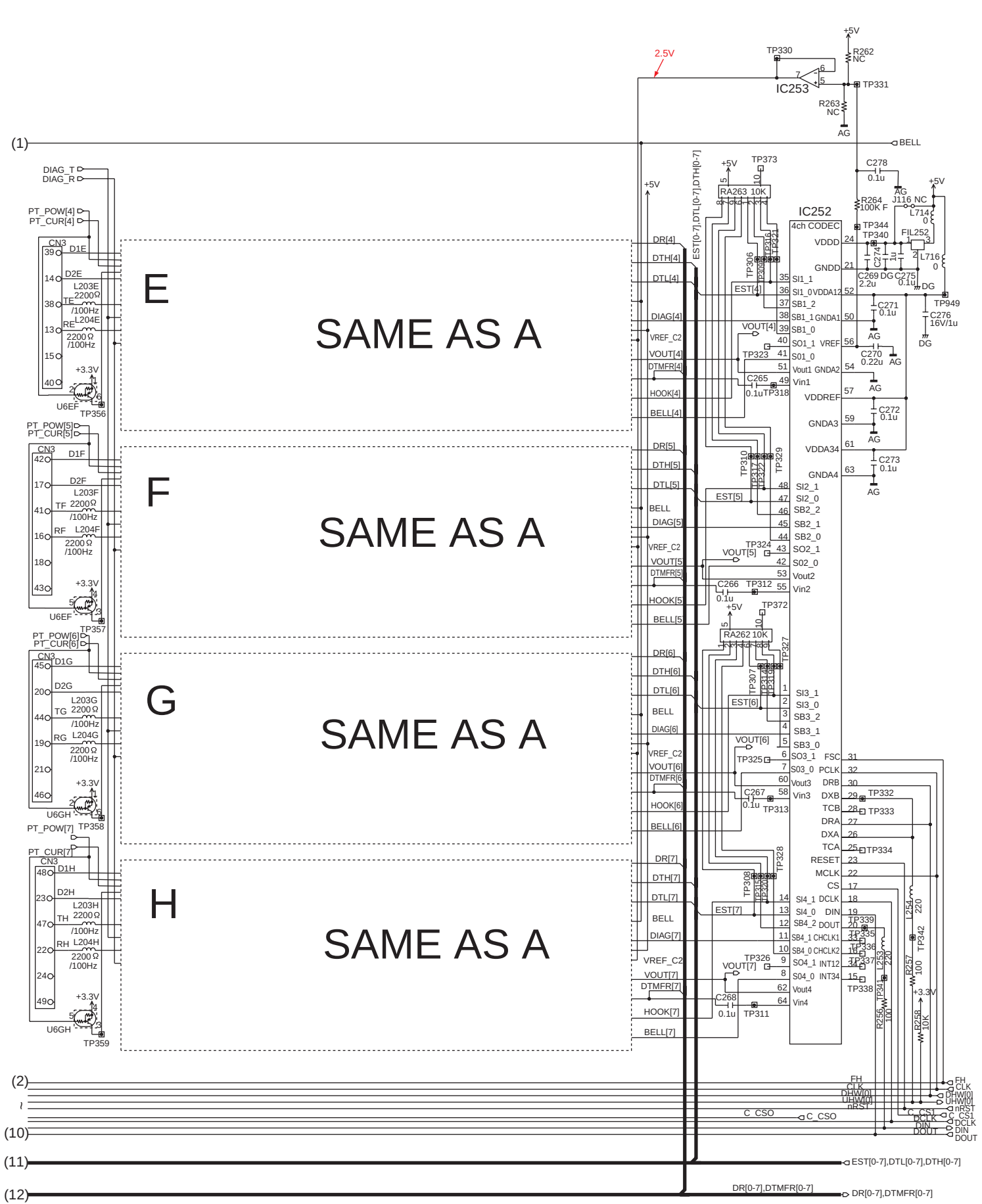
H / KXTDA0170

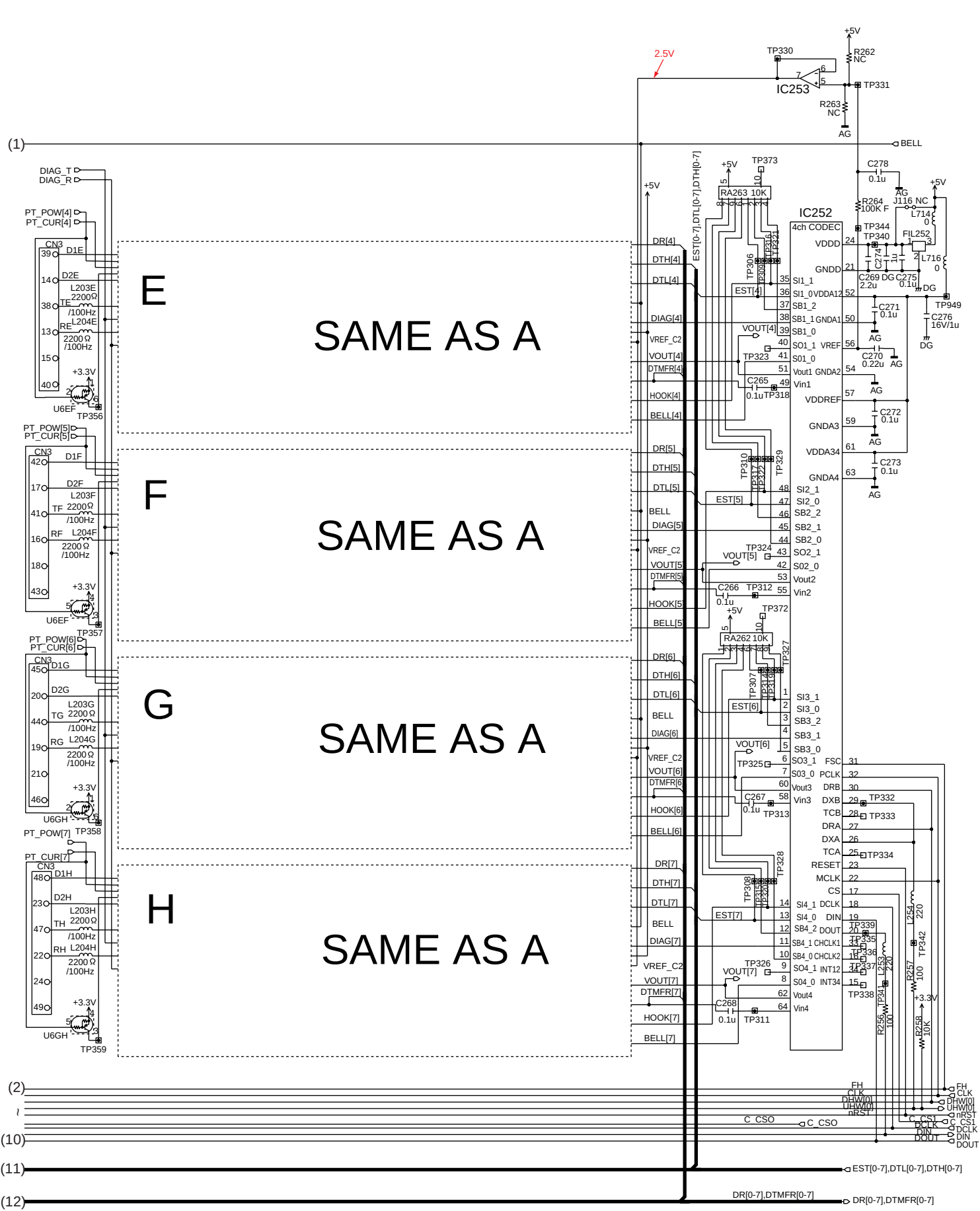


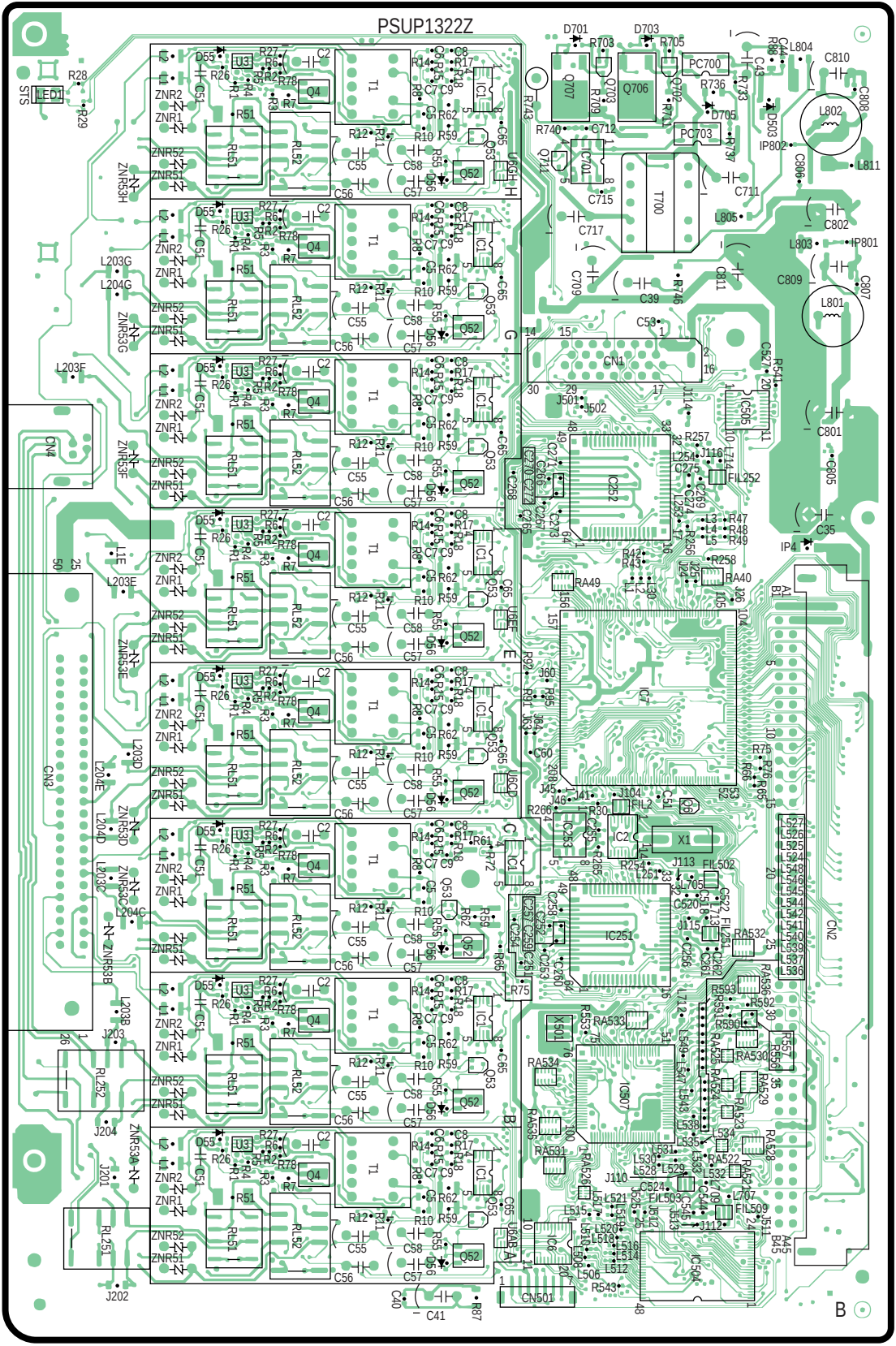
A[0-21]
D[0-15]
IC507
RE2
IC801
IC802
IC508
IC510
Q801
Q802
Q501
RA532 1K
RA531 1K
RA533 10K
RA534 10K
RA535 10K
RA536 10K
CN501
TX
RX
VDD
GND
N.C
CTS
RTS
BELL_SYNC
FH
AC_ALM
nWR
nRD
nRST
nBREQ
nALE
nWAIT
nIRQ1
nBACK
P[23]
nHALT
+3.3V
+15V
+5V
+5VPT
PROTECT
DA801
IF=150mA
IP801
125V/0.75A
IP802
125V/0.75A
L801
1.5A/68u
L802
1.5A/68u
L810
60Ω/100Hz
L811
60Ω/100Hz
D801
30V/2A
D802
30V/2A
D803
VZ=5.1V
D804
VZ=7.5V
C801
25V/100u
C802
25V/120u
C805
25V/0.1u
C806
25V/0.1u
C809
6.3V/220u
C810
10V/150u
X501
12.288MHz
15V
250~300kHz
3.3V
0
0V
5V
Normal: 3.3V
Normal: 0V
12.288M
VIN ON/#OFF
VSS
EXT VOUT
XOUT Xin
VDD GND
FRSEL S1
SSCLK S0
DG
PG
P.G
NC

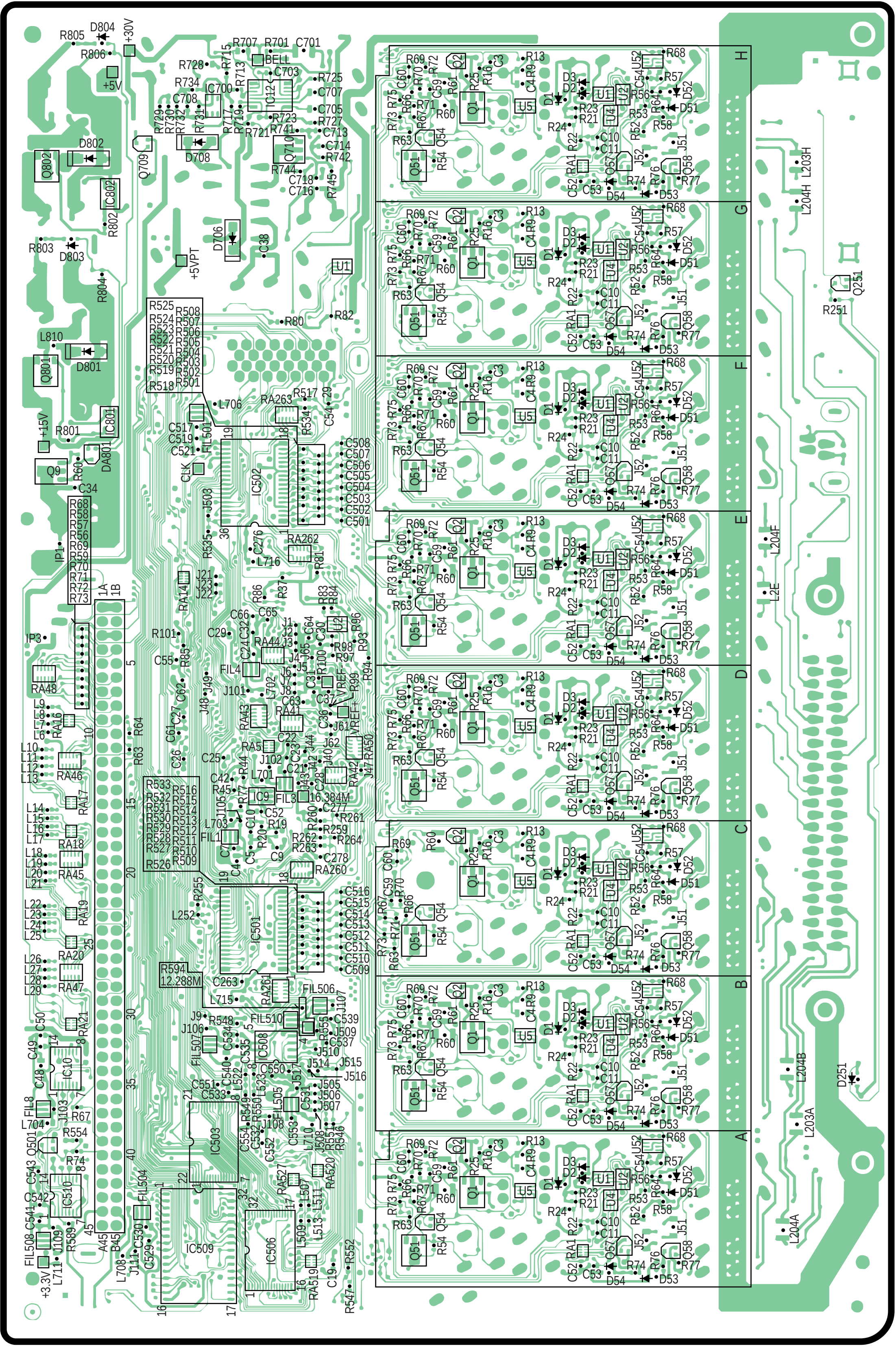


KX-TDA0170 SCHEMATIC DIAGRAM NO.3

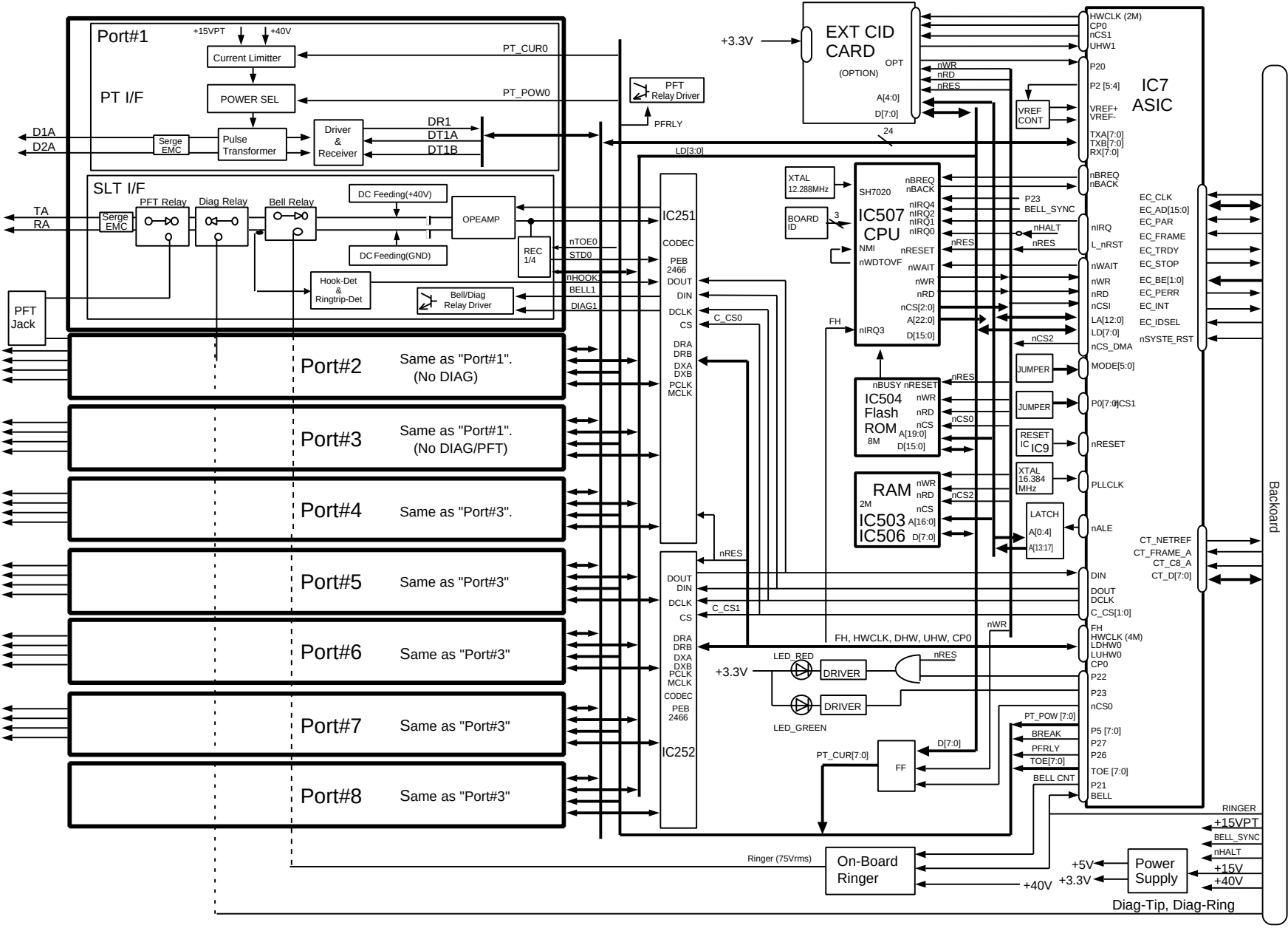

E
SAME AS A
F
SAME AS A
G
SAME AS A
H
SAME AS A
IC253
IC252
4ch CODEC
2.5V
+5V
BELL
DIAG_T
DIAG_R
PT_POW[4]
PT_CUR[4]
PT_POW[5]
PT_CUR[5]
PT_POW[6]
PT_CUR[6]
PT_POW[7]
PT_CUR[7]
CN3
U6EF
U6GH
TP356
TP357
TP358
TP359
EST[0-7],DTL[0-7],DTH[0-7]
DR[0-7],DTMFR[0-7]
C_CSO
(1)
(2)
(10)
(11)
(12)


E
SAME AS A
F
SAME AS A
G
SAME AS A
H
SAME AS A
IC252
4ch CODEC
IC253
2.5V
+5V
BELL
DIAG_T
DIAG_R
PT_POW[4]
PT_CUR[4]
PT_POW[5]
PT_CUR[5]
PT_POW[6]
PT_CUR[6]
PT_POW[7]
PT_CUR[7]
CN3
U6EF
U6GH
TP356
TP357
TP358
TP359
RA263 10K
RA262 10K
DR[4]
DTH[4]
DTL[4]
DIAG[4]
VREF_C2
VOUT[4]
DTMFR[4]
HOOK[4]
BELL[4]
DR[5]
DTH[5]
DTL[5]
BELL
DIAG[5]
VREF_C2
VOUT[5]
DTMFR[5]
HOOK[5]
BELL[5]
DR[6]
DTH[6]
DTL[6]
BELL
DIAG[6]
VREF_C2
VOUT[6]
DTMFR[6]
HOOK[6]
BELL[6]
DR[7]
DTH[7]
DTL[7]
BELL
DIAG[7]
VREF_C2
VOUT[7]
DTMFR[7]
HOOK[7]
BELL[7]
EST[0-7],DTL[0-7],DTH[0-7]
EST[4]
EST[5]
EST[6]
EST[7]
VOUT[4]
VOUT[5]
VOUT[6]
VOUT[7]
TP323
TP324
TP325
TP326
C265
C266
C267
C268
TP318
TP312
TP313
TP311
TP306
TP309
TP316
TP319
TP317
TP322
TP310
TP329
TP307
TP314
TP315
TP327
TP308
TP311
TP328
TP330
TP331
TP373
TP372
R262
NC
R263
NC
AG
C278
0.1u
R264
100K F
J116 NC
L714
0
TP344
TP340
FIL252
C274
1u
L716
0
C269 DG
2.2u
C275
0.1u
DG
TP949
C271
0.1u
C276
16V/1u
C270
0.22u
C272
0.1u
C273
0.1u
SI1_1
SI1_0
SB1_2
SB1_1
SB1_0
SO1_1
SO1_0
Vout1
Vin1
VDDA12
GNDA1
VREF
GNDA2
VDDREF
GNDA3
VDDA34
GNDA4
SI2_1
SI2_0
SB2_2
SB2_1
SB2_0
SO2_1
SO2_0
Vout2
Vin2
SI3_1
SI3_0
SB3_2
SB3_1
SB3_0
SO3_1
Vout3
Vin3
SI4_1
SI4_0
SB4_2
SB4_1
SB4_0
SO4_1
SO4_0
Vout4
Vin4
VDD
GND
FSC
PCLK
DRB
DXB
TCB
DRA
DXA
TCA
RESET
MCLK
CS
DCLK
DIN
DOUT
CHCLK1
CHCLK2
INT12
INT34
TP332
TP333
TP334
TP335
TP336
TP337
TP338
TP339
TP342
L254
220
L253
220
R257
100
R256
100
R258
10K
TP341
+3.3V
FH
CLK
DHW[0]
UHW[0]
nRST
C_CS1
C_CSO
(1)
(2)
(10)
(11)
(12)
DR[0-7],DTMFR[0-7]

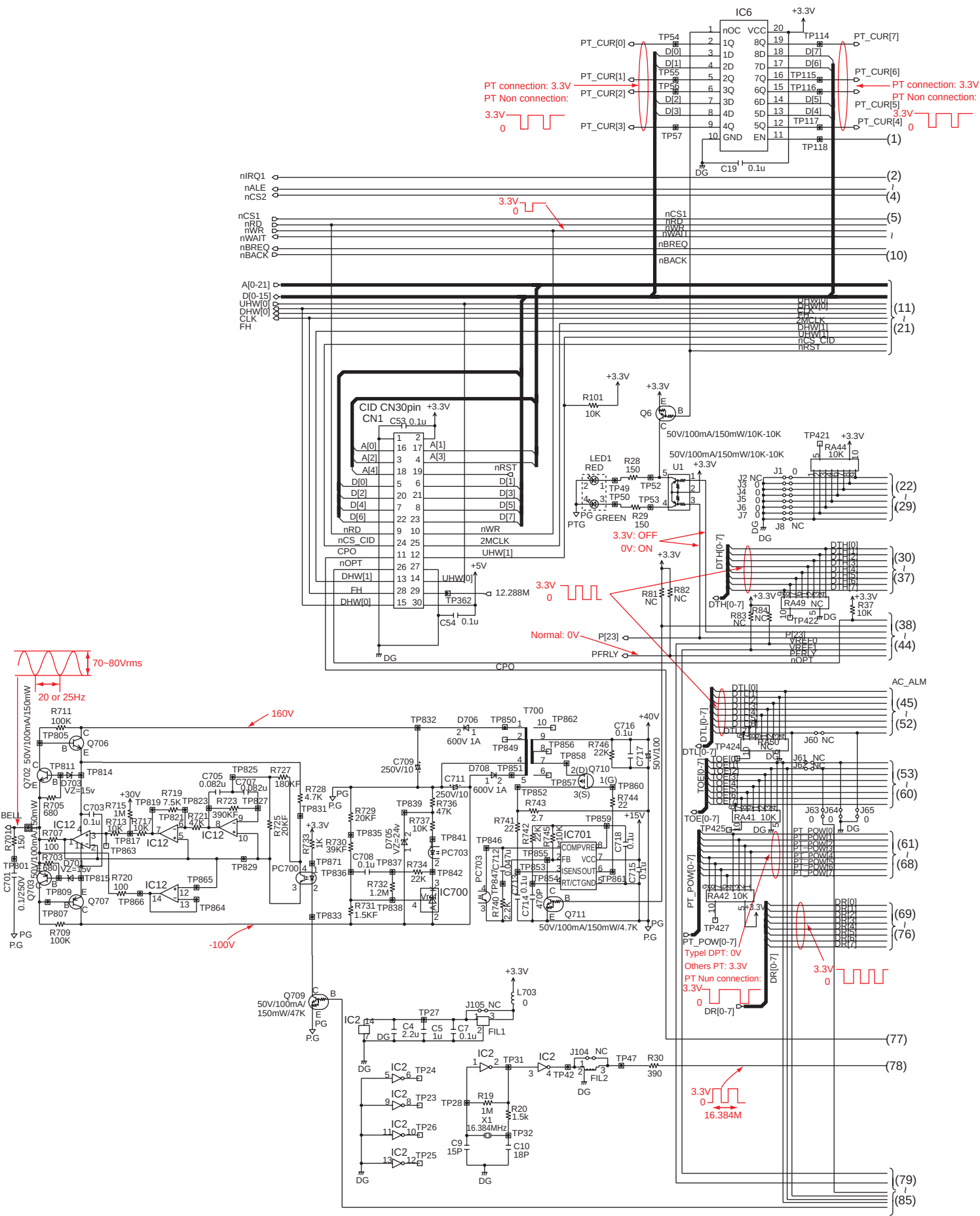

PSUP1322Z
KX-TDA0170 Component View

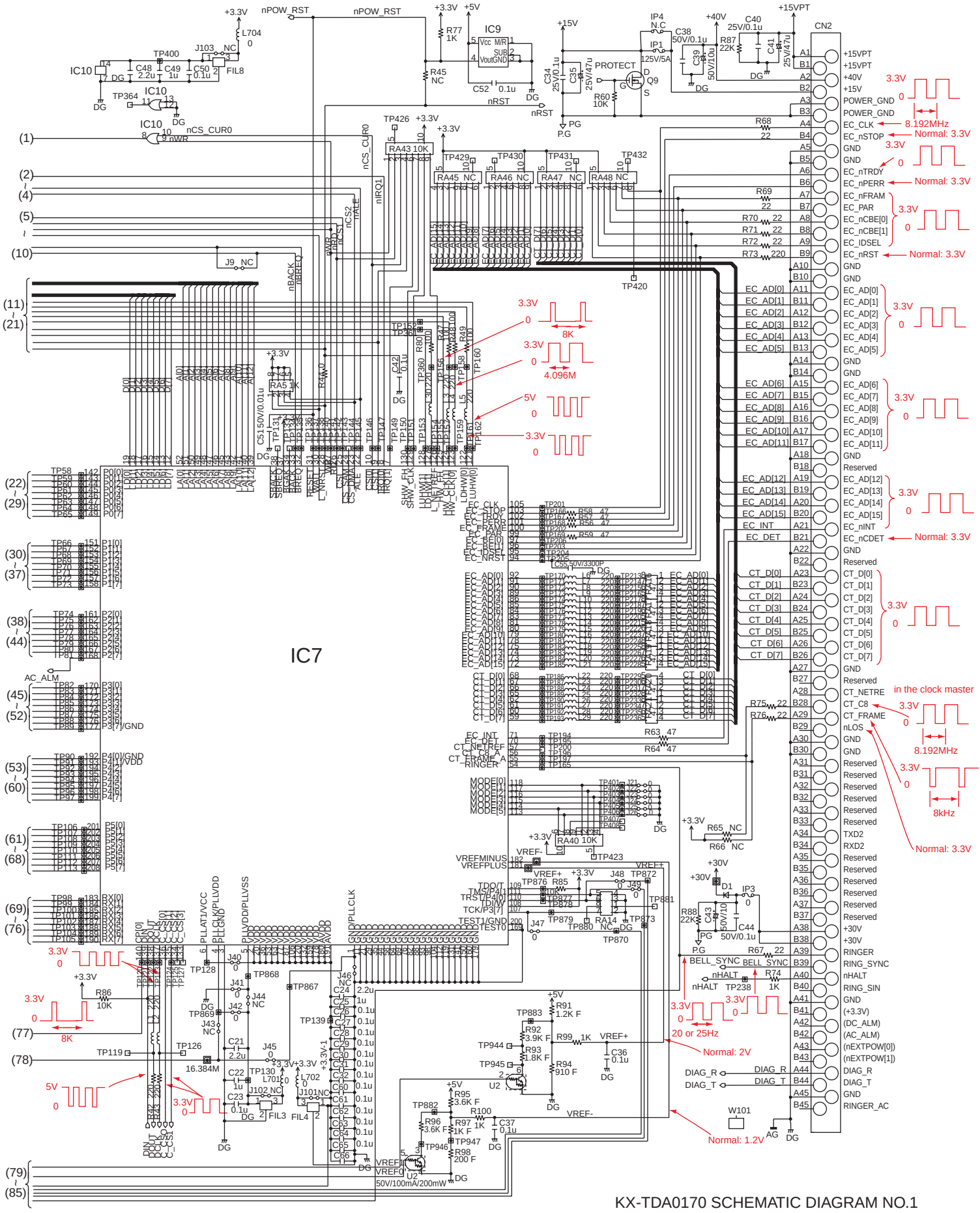


KX-TDA0170 Bottom View

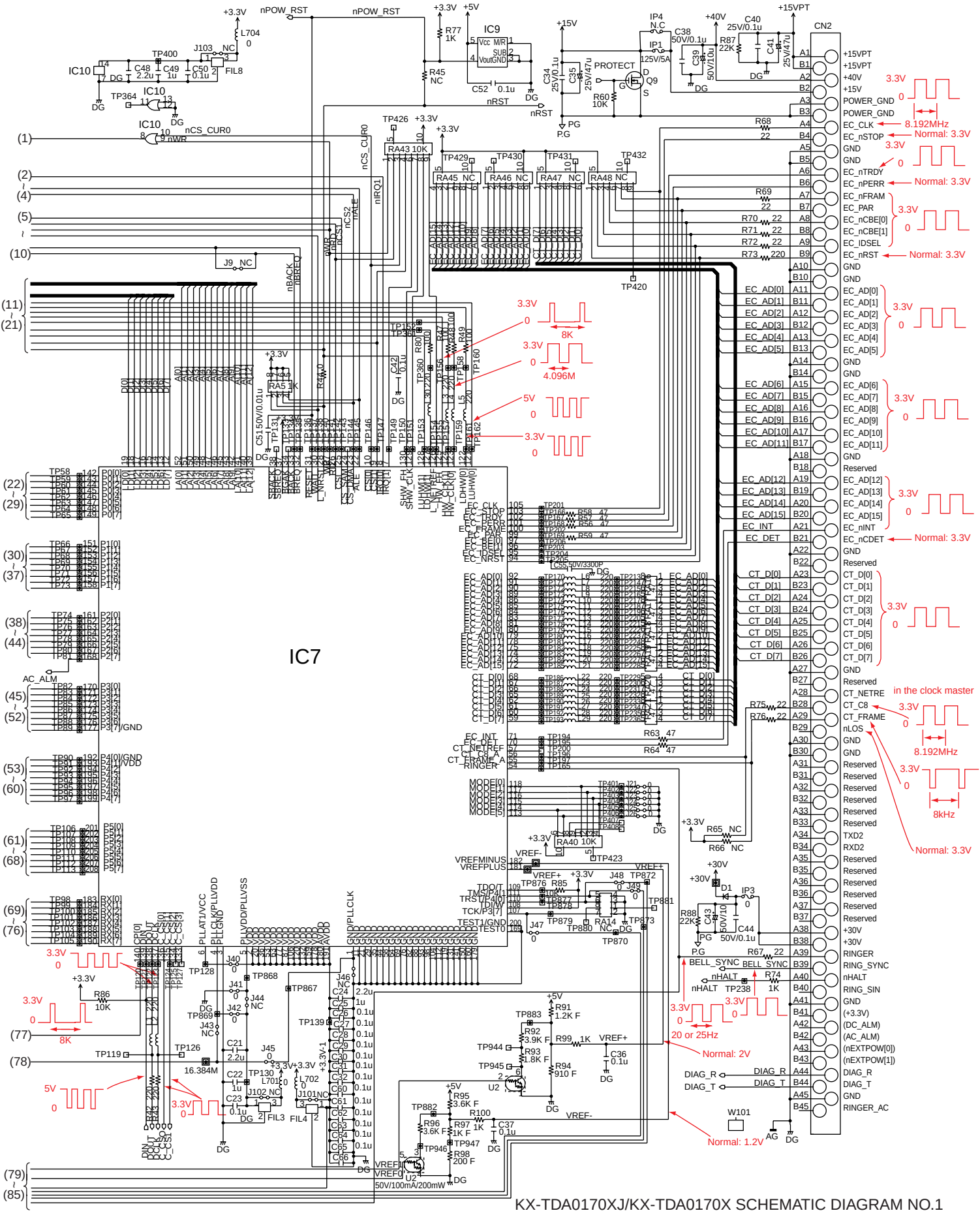


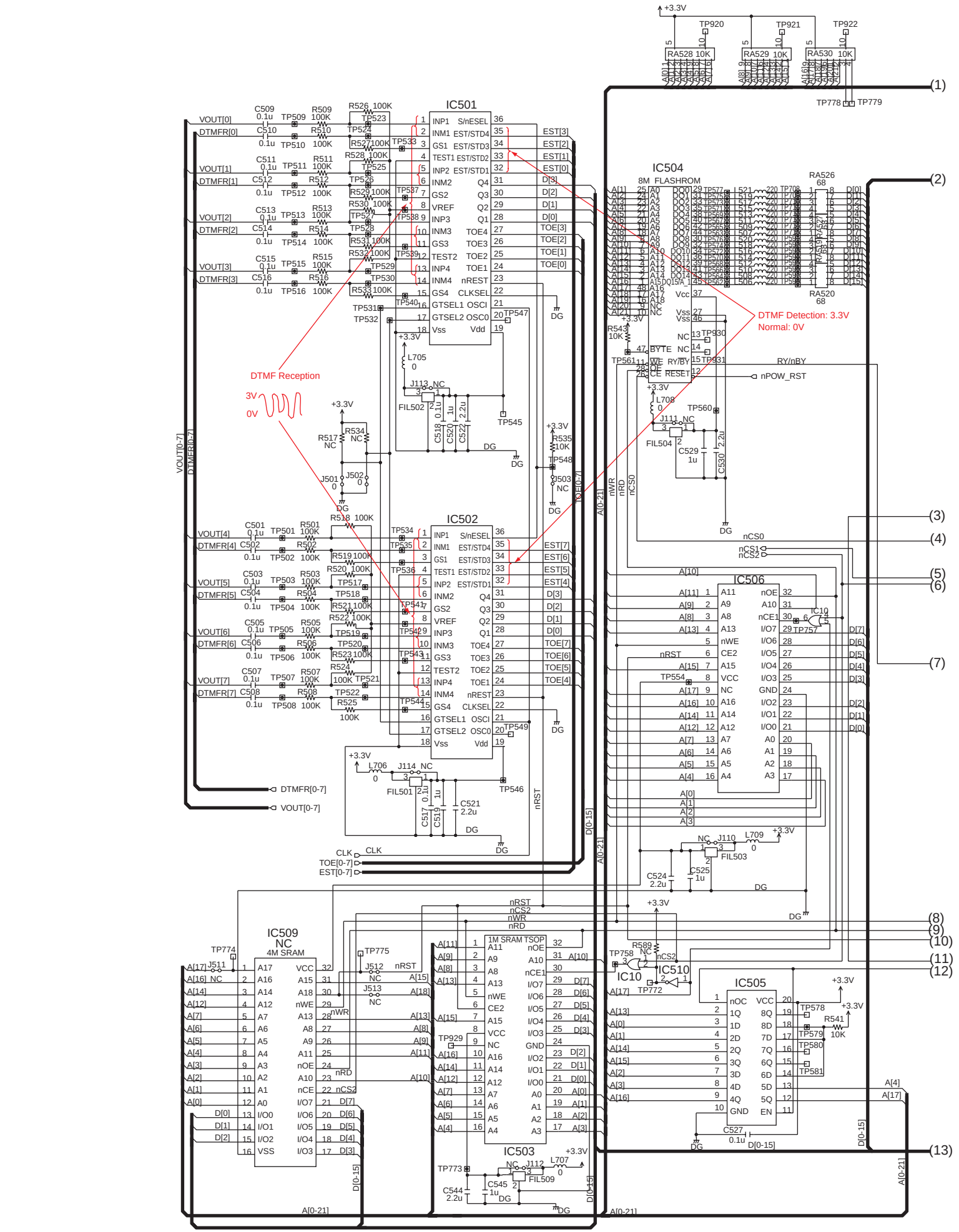
KX-TDA0170 BLOCK DIAGRAM


IC6
PT_CUR[0]
PT_CUR[1]
PT_CUR[2]
PT_CUR[3]
PT_CUR[4]
PT_CUR[5]
PT_CUR[6]
PT_CUR[7]
PT connection: 3.3V
PT Non connection:
3.3V
0
nIRQ1
nALE
nCS2
nCS1
nRD
nWR
nWAIT
nBREQ
nBACK
A[0-21]
D[0-15]
UHW[0]
DHW[0]
CLK
FH
CID CN30pin
CN1
12.288M
nRST
2MCLK
UHW[1]
DHW[1]
nCS_CID
CPO
nOPT
P[23]
PFRLY
Normal: 0V
3.3V: OFF
0V: ON
70~80Vrms
20 or 25Hz
160V
-100V
Typel DPT: 0V
Others PT: 3.3V
PT Nun connection:
16.384M
AC_ALM
BELL

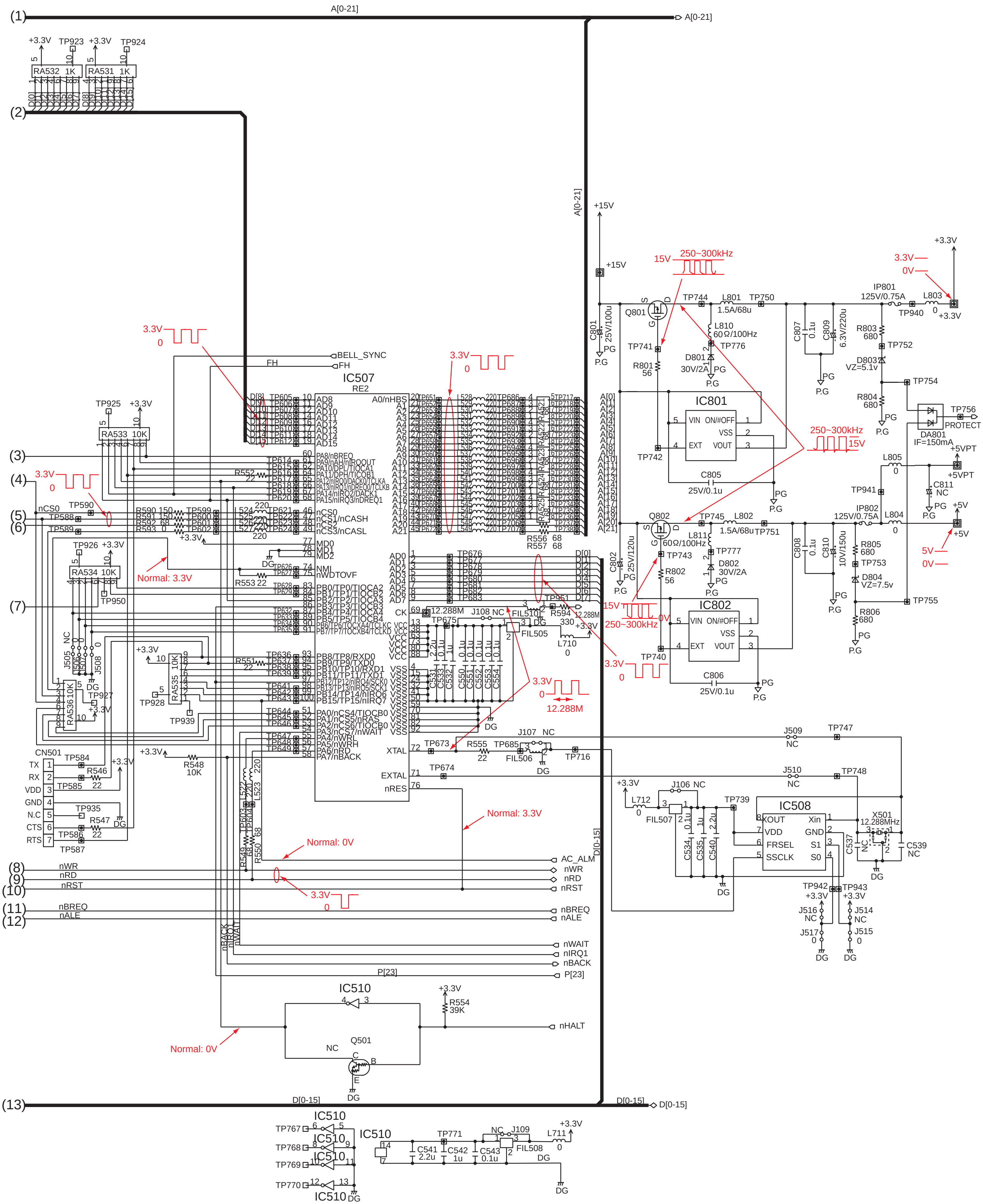


KX-TDA0170 SCHEMATIC DIAGRAM NO.1


IC7
CN2
+15VPT
+15VPT
+40V
+15V
POWER_GND
POWER_GND
EC_CLK
EC_nSTOP
GND
GND
EC_nTRDY
EC_nPERR
EC_nFRAM
EC_PAR
EC_nCBE[0]
EC_nCBE[1]
EC_IDSEL
EC_nRST
GND
GND
EC_AD[0]
EC_AD[1]
EC_AD[2]
EC_AD[3]
EC_AD[4]
EC_AD[5]
GND
GND
EC_AD[6]
EC_AD[7]
EC_AD[8]
EC_AD[9]
EC_AD[10]
EC_AD[11]
GND
Reserved
EC_AD[12]
EC_AD[13]
EC_AD[14]
EC_AD[15]
EC_nINT
EC_nCDET
GND
Reserved
CT_D[0]
CT_D[1]
CT_D[2]
CT_D[3]
CT_D[4]
CT_D[5]
CT_D[6]
CT_D[7]
GND
Reserved
CT_NETRE
CT_C8
CT_FRAME
nLOS
GND
GND
Reserved
Reserved
Reserved
Reserved
Reserved
Reserved
TXD2
RXD2
Reserved
Reserved
Reserved
Reserved
Reserved
Reserved
+30V
+30V
RINGER
RING_SYNC
nHALT
RING_SIN
GND
(+3.3V)
(DC_ALM)
(AC_ALM)
(nEXTPOW[0])
(nEXTPOW[1])
DIAG_R
DIAG_T
GND
RINGER_AC
3.3V
8.192MHz
Normal: 3.3V
8K
4.096M
5V
in the clock master
8kHz
20 or 25Hz
Normal: 2V
Normal: 1.2V
nPOW_RST
nCS_CUR0
nWR
nIRQ1
nRST
PROTECT
PG
BELL_SYNC
DIAG_R
DIAG_T
W101
AC_ALM
KX-TDA0170XJ/KX-TDA0170X SCHEMATIC DIAGRAM NO.1



KX-TDA0170 SCHEMATIC DIAGRAM NO.2



IC507
RE2
IC801
IC802
IC508
IC510
Q801
Q802
Q501
X501
12.288MHz
CN501
A[0-21]
D[0-15]
BELL_SYNC
FH
AC_ALM
nWR
nRD
nRST
nBREQ
nALE
nWAIT
nIRQ1
nBACK
P[23]
nHALT
+15V
+3.3V
+5V
+5VPT
PROTECT
DA801
IF=150mA
15V
250~300kHz
3.3V
0V
Normal: 3.3V
Normal: 0V
12.288M
5V
TX
RX
VDD
GND
N.C
CTS
RTS
XOUT
Xin
FRSEL
SSCLK
GND
S1
S0
VIN ON/#OFF
VSS
EXT
VOUT
L801 1.5A/68u
L802 1.5A/68u
L810 60Ω/100Hz
L811 60Ω/100Hz
D801 30V/2A
D802 30V/2A
D803 VZ=5.1V
D804 VZ=7.5V
IP801 125V/0.75A
IP802 125V/0.75A
C801 25V/100u
C802 25V/120u
C809 6.3V/220u
C810 10V/150u
C805 25V/0.1u
C806 25V/0.1u
RA532 1K
RA531 1K
RA533 10K
RA534 10K
RA535 10K
RA536 10K
(1)
(2)
(3)
(4)
(5)
(6)
(7)
(8)
(9)
(10)
(11)
(12)
(13)