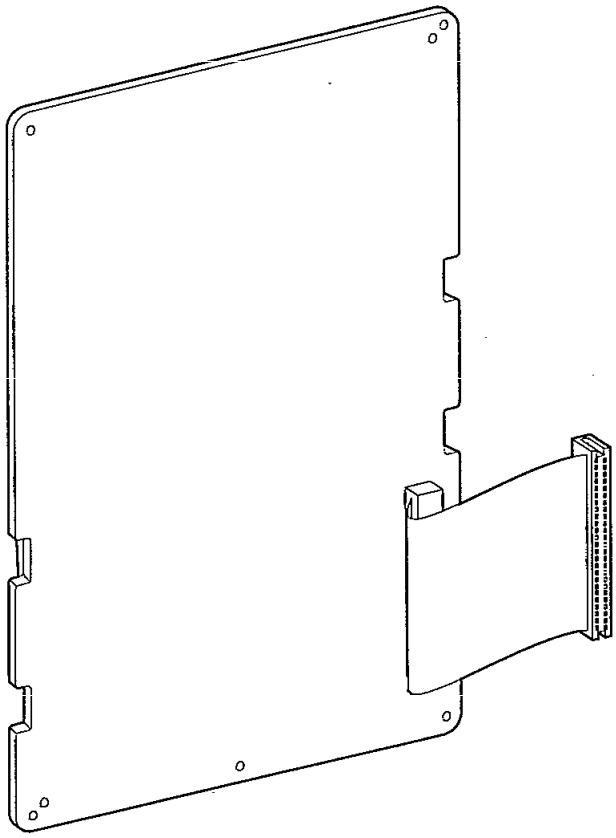
ORDER NO. KMS9609166C2

Service Manual

4-CO LINE CARD

KX-TD182E

(for United Kingdom)



⚠ 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.

Panasonic

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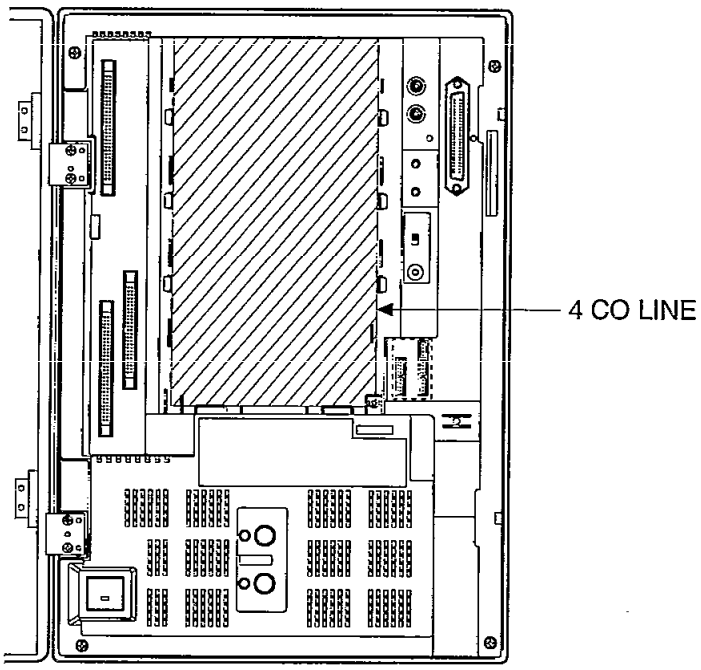
LOCATION OF THE CARD

The location of the 4 CO line expansion card shown below.
Precaution: Do not touch parts on the card.



Notes: System Programming is required for card location identification. For details, refer to the Installation Manual.

CIRCUIT OPERATIONS

1. FUNCTION

EXPANSION CO CARD (KX-TD182E) is an optional card for extending the CO lines from 1 up to 4 lines.

2. EXPLANATION OF CIRCUIT OPERATION

KX-TD182E consists of the following:
Call Interface Circuit
Parallel I/O Circuit
Timing Signal Generation Circuit

■ Call Interface Circuit

Call Interface Circuit is a circuit which works as the interface between the call line and the PCM highway, and consists of the following circuits.

Composition:

(a) Bell Signal Detection Circuit
(b) DC loop formation Circuit
(c) Pulse Dial Transmission Circuit
(d) 2 W~ 4 W Lines Conversion Circuit
(e) A/D, D/A Conversion Circuit
(f) Diagnostic Circuit

Call Interface Circuit consists of eight lines corresponding to each call line.
(Transfer Circuit at Power Failure are four lines)

Circuit Operation:

(a) Bell signal Detection Circuit

When there is no bell signal, the EXRLY pin of IC111 is low, photocoupler PC103 is OFF, and the BELL pin of IC111 is high. When there is an incoming bell signal, the signal passes through C102 and R101 and photocoupler PC103 turns ON. IC103 detects the signal and changes the BELL pin of IC111 from high to low, thereby receiving the bell signal.

Call Signal Path:

Tip–L101–(RLY102)–L103–L104–RLY101–C102–R101–RLY105(4-6)–D101–PC103–R103–RD1–RLY101–L106–L105–(RLY102)–L102–Ring

(b) DC Loop Formation Circuit

In the off-hook mode, EXRLY of IC111 is low, and RLY101 is OFF.

DC Loop Path:

Tip–L101–(RLY102)–L103–L104–RLY101–C103–D112(~–+)–RLY104–R134–Q101–R137–D112(– – ~)–RD1A–RLY101–L106–L105–(RLY102)–L102–Ring.

(c) Pulse Dial Transmission Circuit

When off-hook, pulse dial transmission is executed by alternating on-hook and off-hook.
On-hook and off-hook is controlled by RLY104. During the make position, dial pin of IC111 is High level and RLY104 is ON. During the break position, dial pin of IC111 is Low level and RLY104 is OFF.
At this time, DS is ON and the shunt relay turns ON. The voice signal is transmitted into the system via the transformer T101.

(d) 2 W-4 W Lines Conversion Circuit

This circuit converts 2-line analogue signals from CO line to 4-line signals. The voice analogue signal from the line is outputted from T101 to the 2-4 Line Conversion Circuit, and the circuit flow is
T101 (4–6) –R116–5 pin of IC102
IC102 is a CODEC. The voice analogue signal is converted to PCM signal by this CODEC. PCM signal from TSW is converted to voice analogue signal by the CODEC. And the circuit flow is as following.
2 pin of IC102–C108/R112–6 pin of IC101–R107–R141/C112–T101

(e) A/D, D/A Conversion Circuit

This circuit is for conversion between 4-line analogue signals and the PCM digital signals. CODEC (IC102) has power down function at no operation and a μ/A law switching over function, and are controlled through the parallel I/O port.

(f) Diagnostic Circuit

This circuit is a circuit which checks the function of CO cards. This circuit is composed of the relays (RLY101) which connect the path for the interface circuit of #1 (or #9) line in EXT card. The function check of the DTMF receiver circuit on EXT card. The function check of the DTMF receiver circuit on EXT card can be done by presenting the DTMF signals from CO card.
When EXRLY pin of IC111 becomes high, RLY101 turn ON and make the path.

■ Parallel I/O Circuit

Composition:

Gate Array
IC114, 116, 117, 121, 123

Circuit Operation:

Parallel I/O Circuit is a I/O port for controlling the Call Interface Circuit, and is composed of one gate array (IC111).

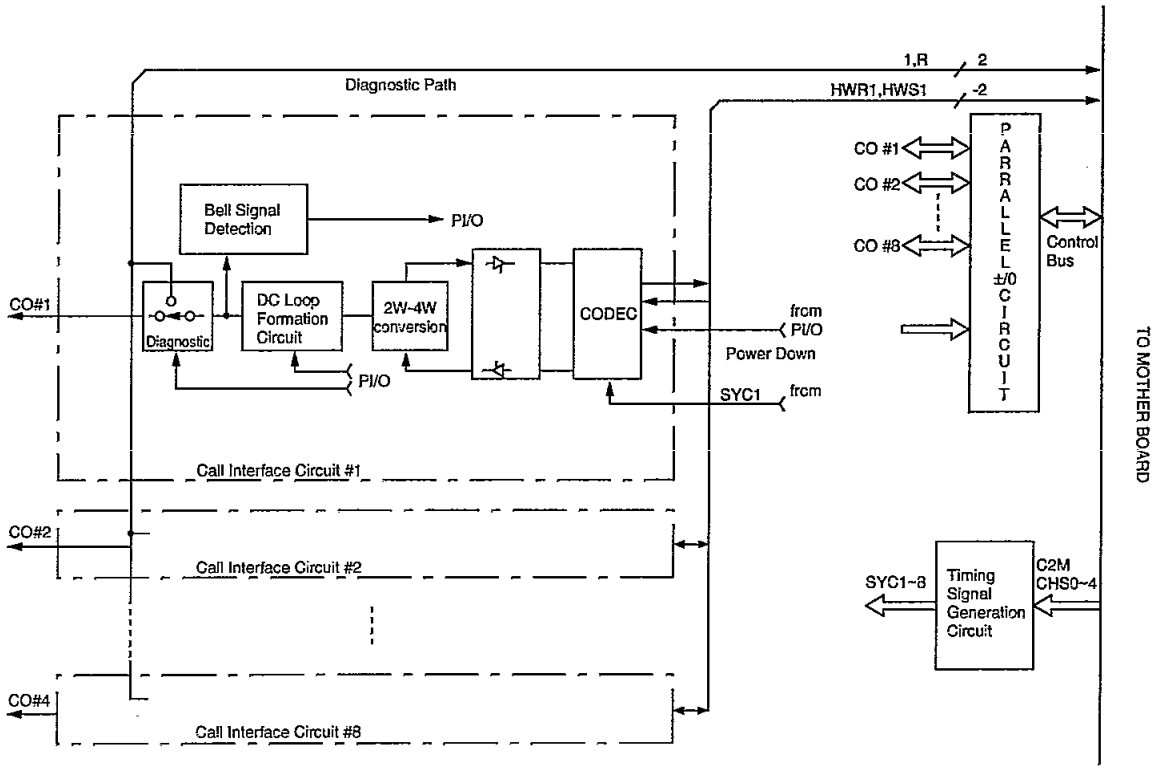
■ Timing Signal Generation Circuit

Composition:

IC112, 120, 121, 122

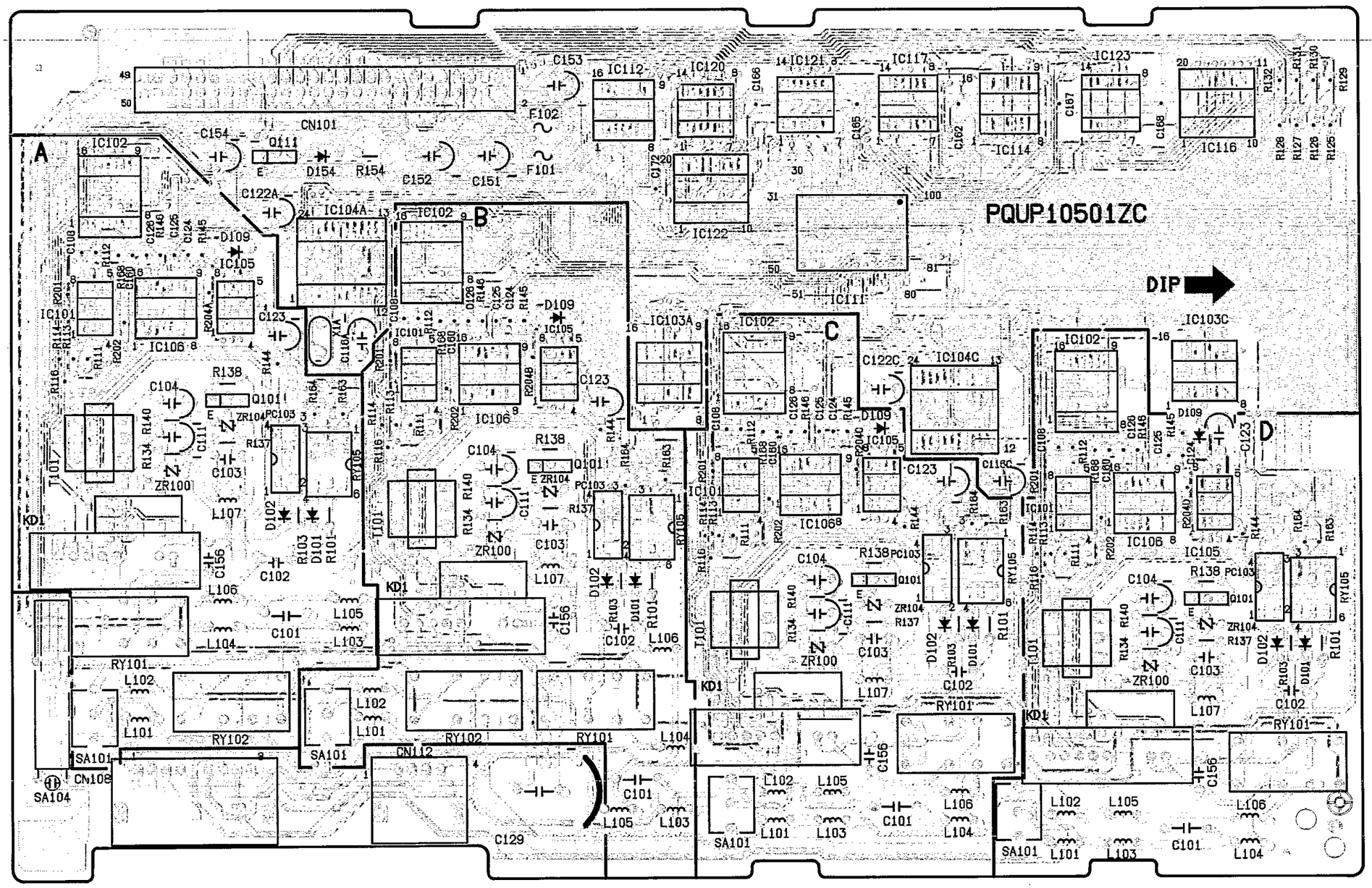
Circuit Operation:

Timing Signal Generation Circuit is a circuit which generates the synchronous signals for CODEC. It generates eight kinds of signals from the channel select signals (CH0-4) presented by the CPU CARD and from the highway clock (C2M).



PRINTED CIRCUIT BOARD

(COMPONENT VIEW)



Notes:

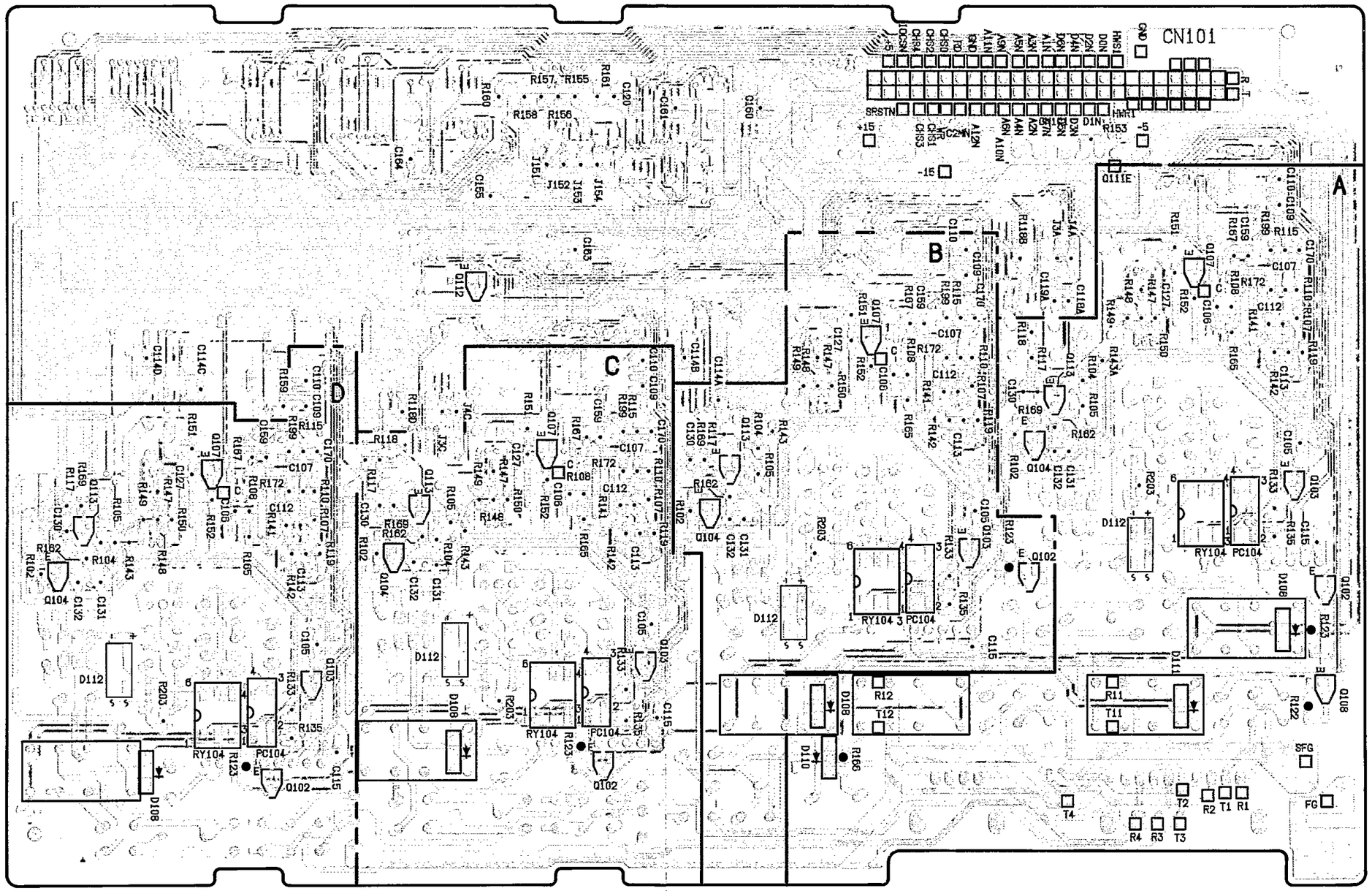
1. The circuit shown in ▭ on the conductor indicates printed circuit on the back side of the printed circuit board.

Notes:

2. The circuit shown in ▭ on the conductor indicates printed circuit on the front side of the printed circuit board.

PRINTED CIRCUIT BOARD

(BOTTOM VIEW)



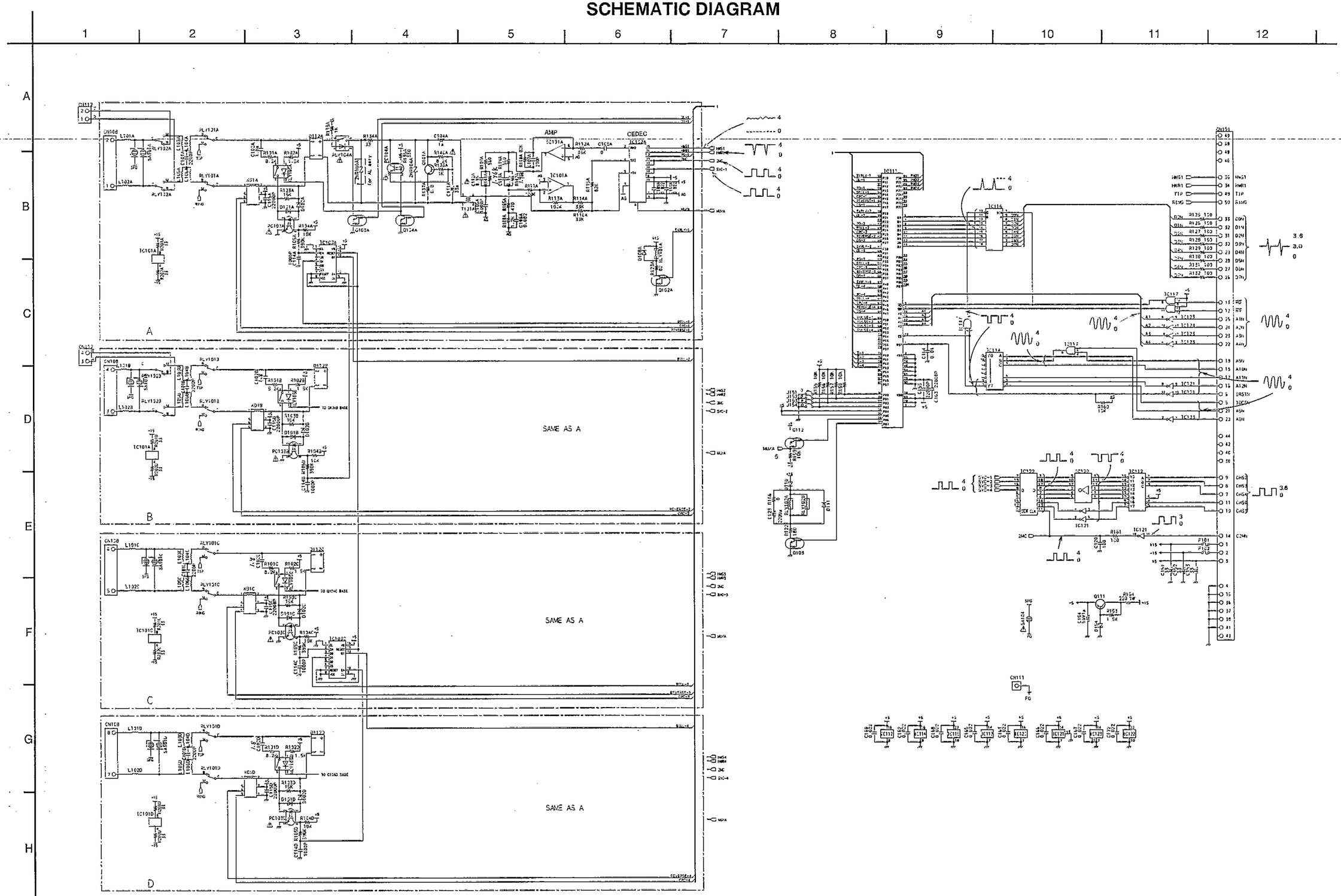
Notes:

1. The circuit shown in ▭ on the conductor indicates printed circuit on the back side of the printed circuit board.

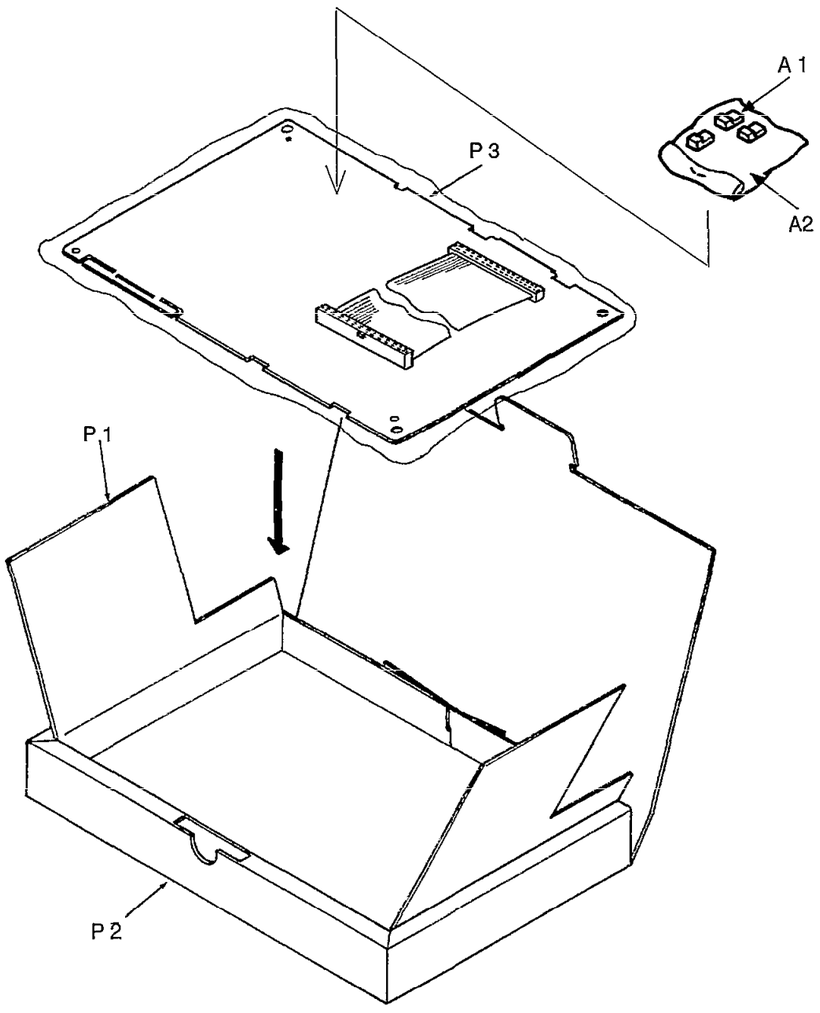
Notes:

2. The circuit shown in ▭ on the conductor indicates printed circuit on the front side of the printed circuit board.

SCHEMATIC DIAGRAM



ACCESSORIES AND PACKING MATERIALS



This replacement parts list is for KX-TD182EUK only. Refer to the simplified manual (cover) for other areas.

REPLACEMENT PARTS LIST

Model KX-TD182EUK

Note:
1. RTL (Retention Time Limited)
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 depends on the type of assembly and the laws govering parts and product retention. At the end of this period, the assembly will no longer be available.
2. Important safety notice
Components identified by the ⚠ mark indicates special characteristics important for safety. When replacing any of these components, only use specified manufacturer's parts.
3. The S mark indicates service standard parts and may differ from production parts.
4. RESISTORS & CAPACITORS
Unless otherwise specified;
All resistors are in ohms (Ω) K=1000Ω, M=1000KΩ
All capacitors are in MICRO FARADS (μF) P=μμF
*Type & Wattage of Resistor
Type

ERC:Solid	ERX:Metal Film	PQRD:Carbon
ERD:Carbon	ERG:Metal Oxide	PQRQ:Fuse
PQ4R:Chip	ERO:Metal Film	ERF:Wire Wound

Wattage

10,16,18:1/8W	14,25,S2:1/4W	12,50,S1:1/2W	1:1W	2:2W	5:5W

*Type & Voltage of Capacitor
Type

ECFD:Semi-Conductor	ECCD,ECKD,PQCBC,PQVP : Ceramic
ECQS:Styrol	ECQM,ECQV,ECQE,ECQU,ECQB : Polyester
PQCBX,ECUV:Chip	ECEA,ECSZ,ECOS : Electrolytic
ECMS:Mica	ECQP : Polypropylene

Voltage

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

Ref. No.	Part No.	Part Name & Description	Pcs
		ACCESSORIES AND PACKING MATERIALS	
A1	PQJS04S08Z	PROTECTION COVER	3
A2	XTB05X08A03	PROTECTION COVER (FOR ACCESSORY)	1
P1	PQPD10240Z	COVER FOR SET	1
P2	PQPK11149Z	GIFT BOX	1
P3	PQPP145Z	PROTECTION COVER (FOR SET)	1
		MAIN BOARD PARTS	
		(ICs)	
IC101A~D	PQVINJM4558M	IC	4
IC102A~D	PQVIMC45503W	IC	4
IC103A	PQVIMC14520F	IC	1
IC103C	PQVIMC14520F	IC	1

Ref. No.	Part No.	Value, Part Name & Description		Pcs
IC111	PQVI92018554	IC		1
IC112	PQVISN7L138M	IC		1
IC114	PQVISN7L138M	IC		1
IC116	PQVISN7L640M	IC		1
IC117	PQVISN7L08S	IC	S	1
IC120	PQVISN7L04S	IC	S	1
IC121	PQVISN7L14S	IC		1
IC122	PQVISN7L273M	IC		1
IC123	PQVISN7L14S	IC		1
KD1A~D	PQVIHFS113F1	IC		4
		(TRANSISTORS)		
Q101A~D	2SC2590	TRANSISTOR(SI)		4
Q102A~D	UN521	TRANSISTOR(SI)	S	4
Q103A~D	UN521	TRANSISTOR(SI)	S	4
Q104A~D	UN521	TRANSISTOR(SI)	S	4
Q108	UN521	TRANSISTOR(SI)	S	1
		(DIODES)		
D101A~D	1SS131	DIODE(SI)		4
D102A~D	MA4120	DIODE(SI)		4
D108A~D	RLS71	DIODE(SI)		4
D109A~D	RLS71	DIODE(SI)		4
D110	RLS71	DIODE(SI)		1
D111	RLS71	DIODE(SI)		1
D112A~D	PQVDS1ZB40F1	DIODE(SI)		4
D154	MA4056	DIODE(SI)		1
		(RESISTORS)		
J151	PQ4R10XJ000	0		1
J152	PQ4R10XJ000	0		1
J153	PQ4R10XJ000	0		1
J154	PQ4R10XJ000	0		1
R101A~D	PQRD12VJ822	8.2K		4
R102A~D	PQ4R10XJ152	1.5K		4
R103A~D	ERDS2TJ153	15K		4
R104A~D	PQ4R10XJ103	10K		4
R105A~D	PQ4R10XJ394	390K		4
R107A~D	PQ4R10XJ561	560	⚠	4
R108A~D	PQ4R10XF1201	1.2K		4
R110A~D	PQ4R10XJ823	82K		4
R111A~D	PQ4R10XF1003	100K		4
R112A~D	PQ4R10XJ393	39K		4
R113A~D	PQ4R10XF1003	100K		4
R114A~D	PQ4R10XF3302	33K		4
R115A~D	PQ4R10XJ823	82K		4
R116A~D	PQ4R10XF3302	33K		4
R119A~D	PQ4R10XJ561	560		4
R122	PQ4R18XJ181	180		4
R123A~D	PQ4R18XJ820	82		4
R125	PQ4R10XJ101	100		1
R126	PQ4R10XJ101	100		1
R127	PQ4R10XJ101	100		1
R128	PQ4R10XJ101	100		1
R129	PQ4R10XJ101	100		1
R130	PQ4R10XJ101	100		1
R131	PQ4R10XJ101	100		1
R132	PQ4R10XJ101	100		1

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Ref. No.	Part No.	Value, Part Name & Description		Pcs
R133A~D	PQ4R10XJ102	1K		4
R134A~D	ERDS2TJ330	33		4
R135A~D	PQ4R10XJ331	330		4
R137A~D	ERDS2TJ6R8	6.8		4
R138A~D	ERDS2TJ102	1K		4
R140A~D	ERDS2TJ822	8.2K		4
R141A~D	PQ4R10XF1961	1.96K	⚠	4
R142A~D	PQ4R10XF1961	1.96K		4
R153	PQ4R10XJ152	1.5K		1
R154	PQRD1VJ221	220		1
R155	PQ4R10XJ103	10K		1
R156	PQ4R10XJ103	10K		1
R157	PQ4R10XJ103	10K		1
R158	PQ4R10XJ103	10K		1
R159	PQ4R10XJ103	10K		1
R160	PQ4R10XJ103	10K		1
R161	PQ4R10XJ101	100		1
R165A~D	PQ4R10XF4700	470		4
R166	PQ4R18XJ000	0		1
R172A~D	PQ4R10XJ000	0		4
R199A~D	PQ4R10XJ000	0		4
R201A~D	PQ4R10XJ330	33		4
R202A~D	PQ4R10XJ330	33		4
R204A~D	PQ4R10XJ330	33		4
C108A~D	PQ4R10XJ000	0		4
L107A~D	ERDS2TJ0T	0		4
		(CAPASITORS)		
C101A~D	ECKDKC222KB	0.0022	S	4
C102A~D	ECQE2185KS	1.8	S	4
C103A~D				
C104A~D	ECEA1HKS010	1	S	4
C105A~D	PQCUV1H102J	0.001	S	4
C106A~D	PQCUV1E823KB	0.082		4
C107A~D	PQCUV1H271JC	270P		4
C109A~D	PQCUV1H223KB	0.022	S	4
C110A~D	PQCUV1H223KB	0.022	S	4
C111A~D	ECEA1VU330	33		4
C112A~D	PQCUV1C154KB	0.15	⚠	4
C113A~D	PQCUV1C154KB	0.15	S	4
C114A~D	PQCUV1H102J	0.001	S	4
C115A~D	PQCUV1H223KB	0.022	S	4
C120	PQCUV1H101JC	100P		1
C129	ECEA1CSS222	2200		1
C151	ECEA1HU330	33		1
C152	ECEA1HU330	33		1
C153	ECEA1HU330	33		1
C154	ECEA1HKS010	1	S	1
C155	PQCUV1H223KB	0.022	S	1
C160	PQCUV1H223KB	0.022	S	1
C161	PQCUV1H223KB	0.022	S	1
C162	PQCUV1H223KB	0.022	S	1
C163	PQCUV1H223KB	0.022	S	1
C164	PQCUV1H103KB	0.01		1

Ref. No.	Part No.	Value, Part Name & Description		Pcs
C165	PQCUV1H223KB	0.022	S	1
C166	PQCUV1H223KB	0.022	S	1
C167	PQCUV1H223KB	0.022	S	1
C168	PQCUV1H223KB	0.022	S	1
C172	PQCUV1H223KB	0.022	S	1
		(FUSES)		
F101	PQBA1N15NMAL	FUSE		1
F102	PQBA1N15NMAL	FUSE		1
		(FILTER)		
X101	PQVBFC3584A1	CERAMIC FILTER		1
L105	PQVFTU50MT	CERAMIC FILTER		1
		(PHOTO ELECTRIC TRANSDUCERS)		
PC103A~D	PQVITLP521	PHOTO ELECTRIC TRANSDUCER	⚠	4
PC104A~D	PQVITLP521	PHOTO ELECTRIC TRANSDUCER	⚠	4
		(RELAYS)		
RY101A~D	PQSL120Z	RELAY		4
RY102A	PQSL120Z	RELAY		1
RY102B	PQSL120Z	RELAY		1
RY104A~D	AQV214SX	RELAY	⚠	4
RY105A~D	AQV414S	RELAY		4
		(VARISTORS)		
ZR104A~D	ERZC07DK820	VARISTOR	S	4
		(SURGE ABSORBER)		
SA101A~D	PQVDT83A350X	DIODE(SI)	⚠	4
SA104	PQVDDSA102MA	DIODE(SI)	⚠	1
		(TRANSFORMERS)		
T101A~D	PQLT8E1A	TRANSFORMER	⚠	4
		(CONECTORS)		
CN101	PQJS50Q73Z	JACK/SOCKET		1
CN108	PQJP08A56Y	CONNECTOR		1
CN112	PQJP04A56Y	CONNECTOR		1
		(COMPONENTS COMBINATIONS)		
MDL100	PQXDZW32415	MODULE		1
MDL101	PQXDZW32415	MODULE		1
		(COILS)		
L101A~D	PQLE106	COIL	S	4
L102A~D	PQLE106	COIL	S	4
L103A~D	PQLE106	COIL	S	4
L104A~D	PQLE106	COIL	S	4
L105A~D	PQLE106	COIL	S	4
L106A~D	PQLE106	COIL	S	4

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