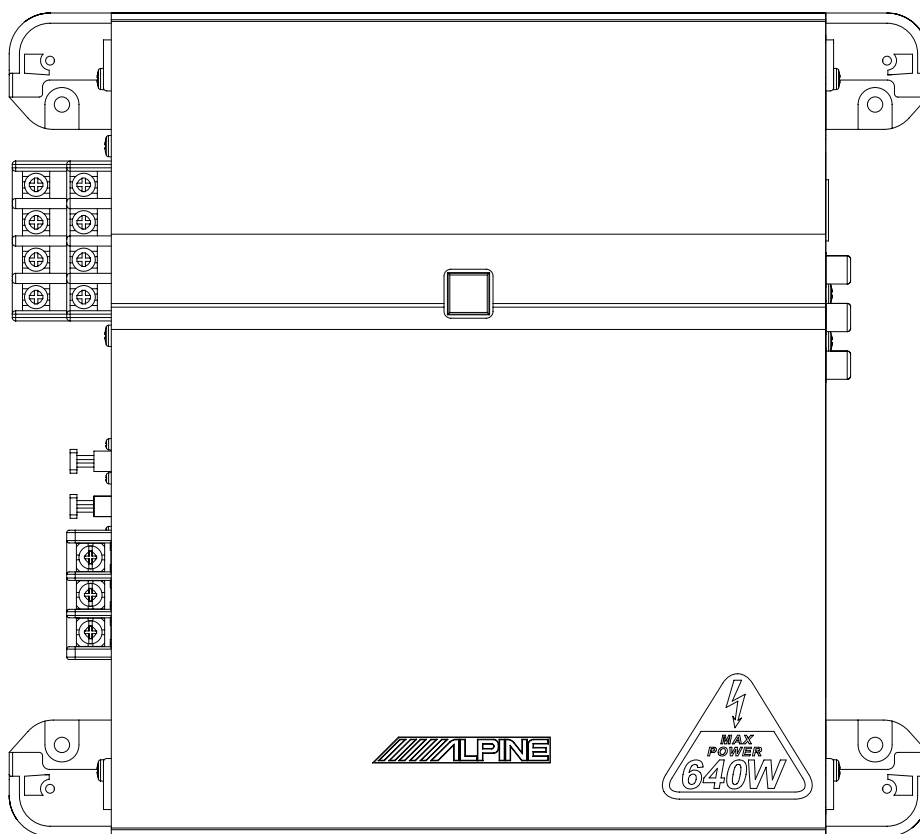


////ALPINE

SERVICE MANUAL

4 CHANNEL POWER AMPLIFIER



12 / 08-A
T0110800124



PMX-F640

<Cautions for Safe Repair Work>



The following cautions will prevent accidents in the workplace and will ensure safe products.

*The symbols indicate caution is needed to prevent injuries and damage to property.



The symbols and their meanings follow.

 Warning	If you ignore this symbol and handle the product incorrectly or unsafely, serious injury or death may result.
 Caution	If you ignore this symbol and handle the product incorrectly or unsafely, injury or only material damage may result.









*The following symbols indicate two levels of cautions.

 When you see this symbol, you have to be very careful.	
 When you see this symbol, you have to follow the instructions there.	

Warning

 Do not look squarely into the laser light coming from the pickup. You may lose your sight.	 Fuse Caution Always use a designated fuse. Use of an incorrect fuse may result in a fire.
--	--

Caution

 Do not allow wiring to be caught in the screw/chassis. If wiring is caught in the screw/chassis, it may cause a short circuit, resulting in a fire.	 Battery Caution Use the designated battery. Confirm the correct polarity and seat of the battery. An incorrect battery or an improperly connected or seated battery may result in a fire.
 High Temperature Caution Touching the heat sink may cause severe burns.	 Designated Parts Caution Look up the part list and ensure that only designated parts are used to prevent problems or accidents.
 Reverse Power Supply Connections or Misconnections Caution Reverse power supply connections or misconnections may cause ignition problems and smoke may result.	 Wiring Caution Ensure that the wiring is correct when rewiring to prevent problems with ignition/breakdown.
 Soldering Caution Hot solder from solder splash may cause severe burns.	 Wear Gloves Wear gloves to prevent electrical shocks or injury from the end face of the metal.

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Parts Layout on P.W.Boards and Wiring Diagram	7
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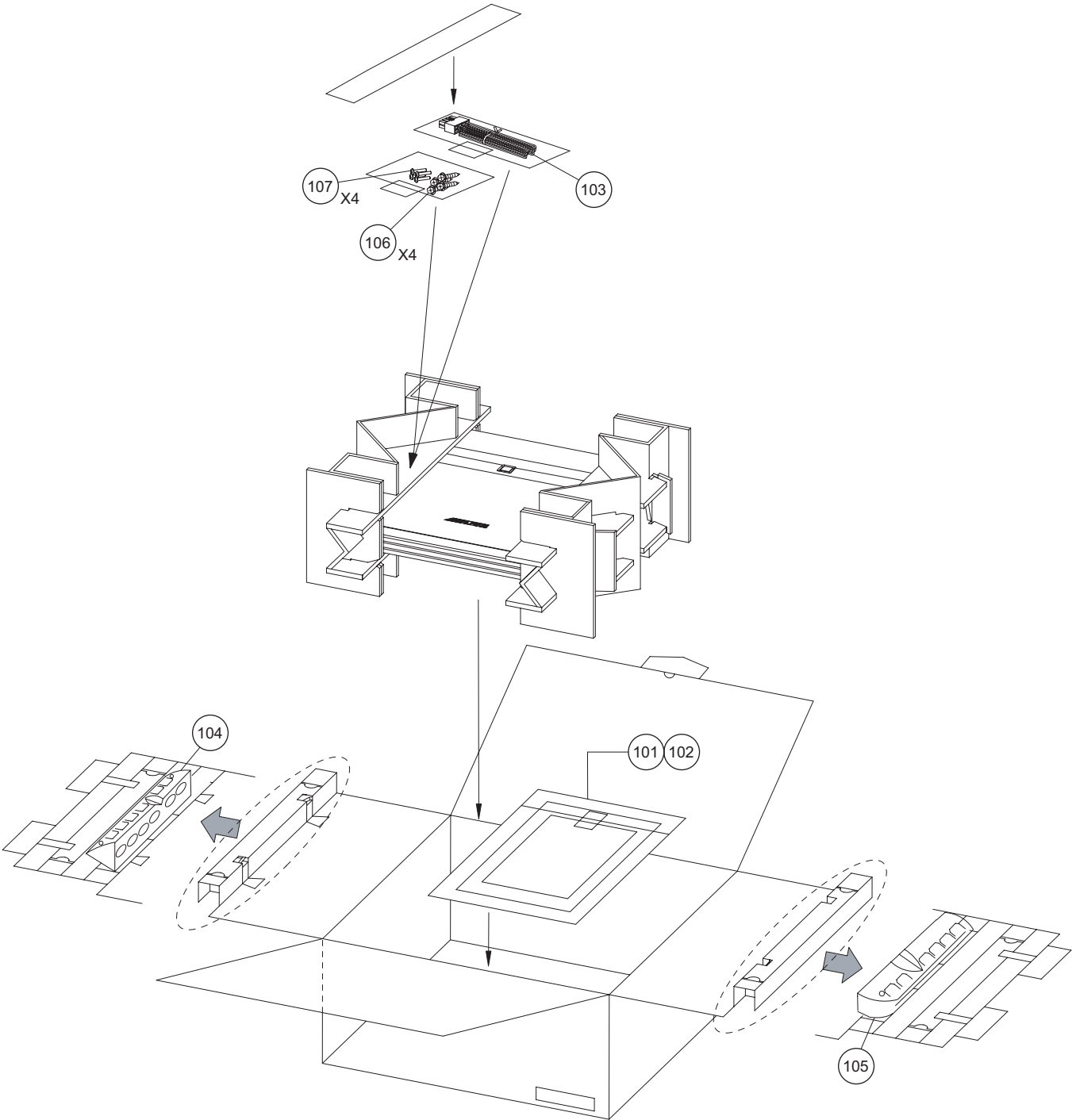
NOTE : Due to continuing product improvement, specifications and designs are subject to change without notice.

Packing Assembly Parts List

Symbol No.	Part No.	Description	Symbol No.	Part No.	Description
#1 101	68-10872Z46	MANUAL,OWNER'S	104	15E40954S01	COVER,PLATE L
\$1 101	68-10872Z46	MANUAL,OWNER'S	105	15E40955S01	COVER,PLATE R
%1 101	68-14470Z34	MANUAL,OWNER'S(AOCH)	106	03E40419S01	SCR,M4X20(BLK)
#1 102	68-10872Z52	MANUAL,OWNER'S(IGS)	107	03E39167S01	SCR,M3X12(P)(BLK)
103	01E23875S01	ASSY,CONN 8P			

NOTE : #1 : For European Model Only, \$1 : For General Foreign Model Only, %1 : For Chinese Model Only, Others : Common.

Packing Method View



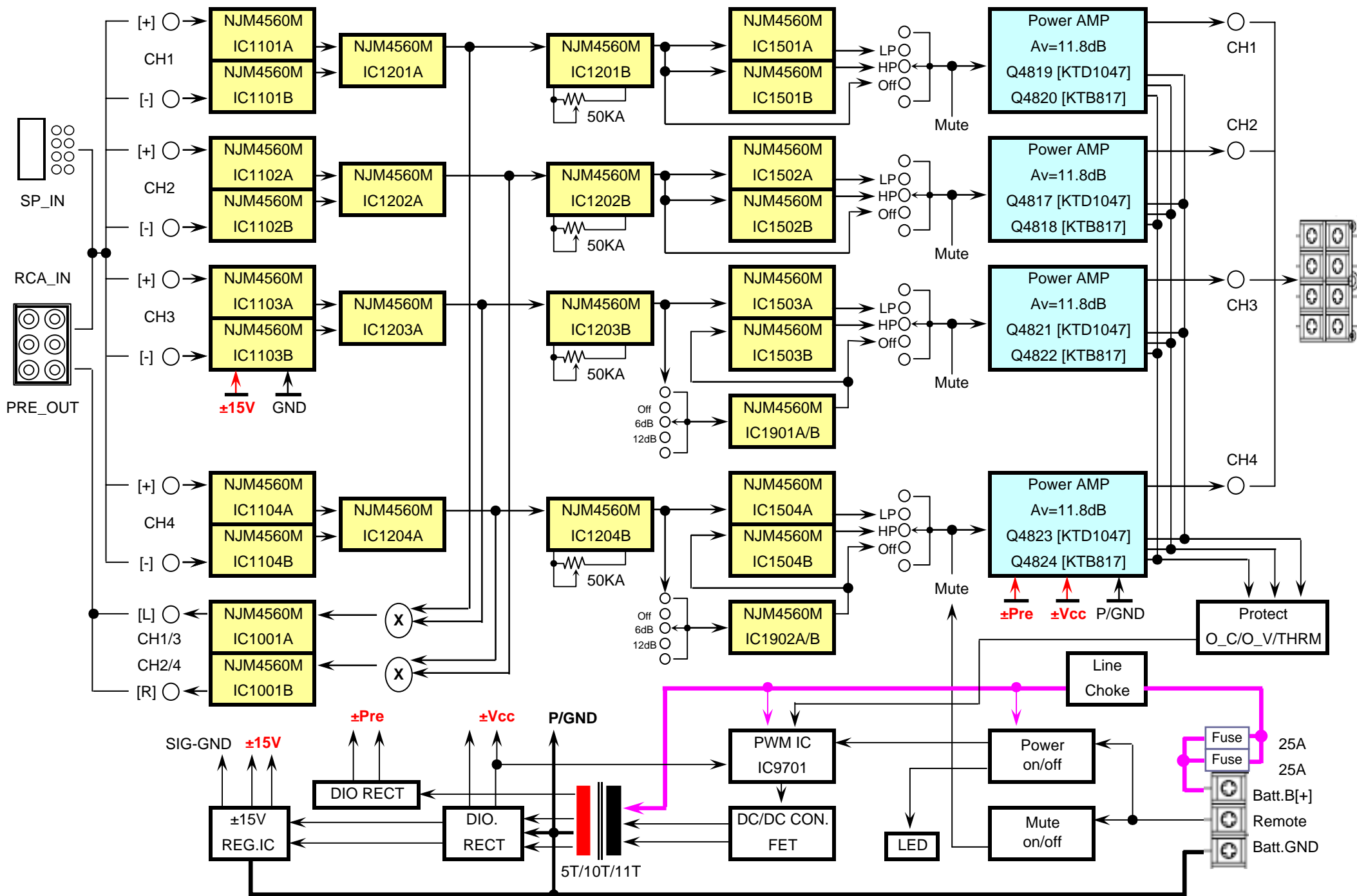
Specifications

Power Output	(20Hz to 20kHz, 4ohm x 4ch, 1.0% T.H.D. (14.4V))	45W
	(20Hz to 20kHz, 2ohm x 4ch, 1.0% T.H.D. (14.4V))	67.5W
	(20Hz to 20kHz, 4ohm(BTL) x 2ch, 1.0% T.H.D. (14.4V))	135W
Input Sensitivity	(Ref.Output 50W/4ohm, Speaker Input)	Gain VR MAX : 0.4V±4dB Gain VR MIN : 8.0V±3dB
	(Ref.Output 50W/4ohm, RCA Input)	Gain VR MAX : 0.2V±4dB Gain VR MIN : 4.0V±3dB
Pre Out Level	(Ref.1kHz, 10Kohm Load, Input 0.5Vrms)	0.5±0.1V
Frequency Response	(Ref.Output 1W, Ref.Frequency : 1kHz 0dB)	10Hz : -1.0~0dB
		50kHz : -1.0~0dB
Channel Separation	(1kHz, 4ohm x 4ch, 50W, Input shorted)	55dB
S/N Ratio	(1kHz, 4ohm x 4ch, 50W, Input shorted)	85dB
Residual Noise	(Input shorted, 4ohm Load)	3.0mV
Output Offset Voltage	(No Signal)	0V±50mV
Remote On Voltage	(1W Output)	6.2±1V
Current Drain	(No Signal)	1.5A
	(50W x 4, 4ohm Load)	23±5A
	(Remote Current Drain)	1.1±0.3mA
	(Back up Current Drain)	0.1mA
Input Impedance	(Reference)	RCA Input : 15Kohm±10%
		Speaker Input : 14.7Kohm±10%
Fuse Requirement		25A(Peak) x 2 (For Battery Line)
Power Source		DC14.4V (11 to 16V)
Dimensions (W x H x D)		270 x 60 x 242mm
Weight		2.5kg

NOTE : Due to Continuing product improvement, specifications and designs are subject to change without notice.

Block Diagram

PMX-F640



Parts Layout on P.W.Boards and Wiring Diagram

PMX-F640

MAIN P.W.Board (Component Side View)

1

2

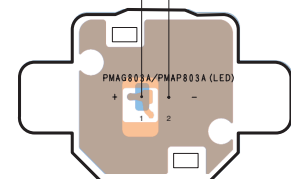
3

4

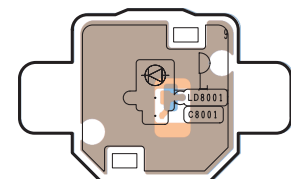
5

RED
BLK
1 2
To CB8001

CON8001
ASSY, CONN 2P



LED P.W.Board
(Foil Side View)



LED P.W.Board
(Component Side View)

PMAG803A/PMAP803A (MAIN)-E300100462

Orange Color Pattern:Component Side Pattern
Blue Color Pattern:Foil Side Pattern

A

B

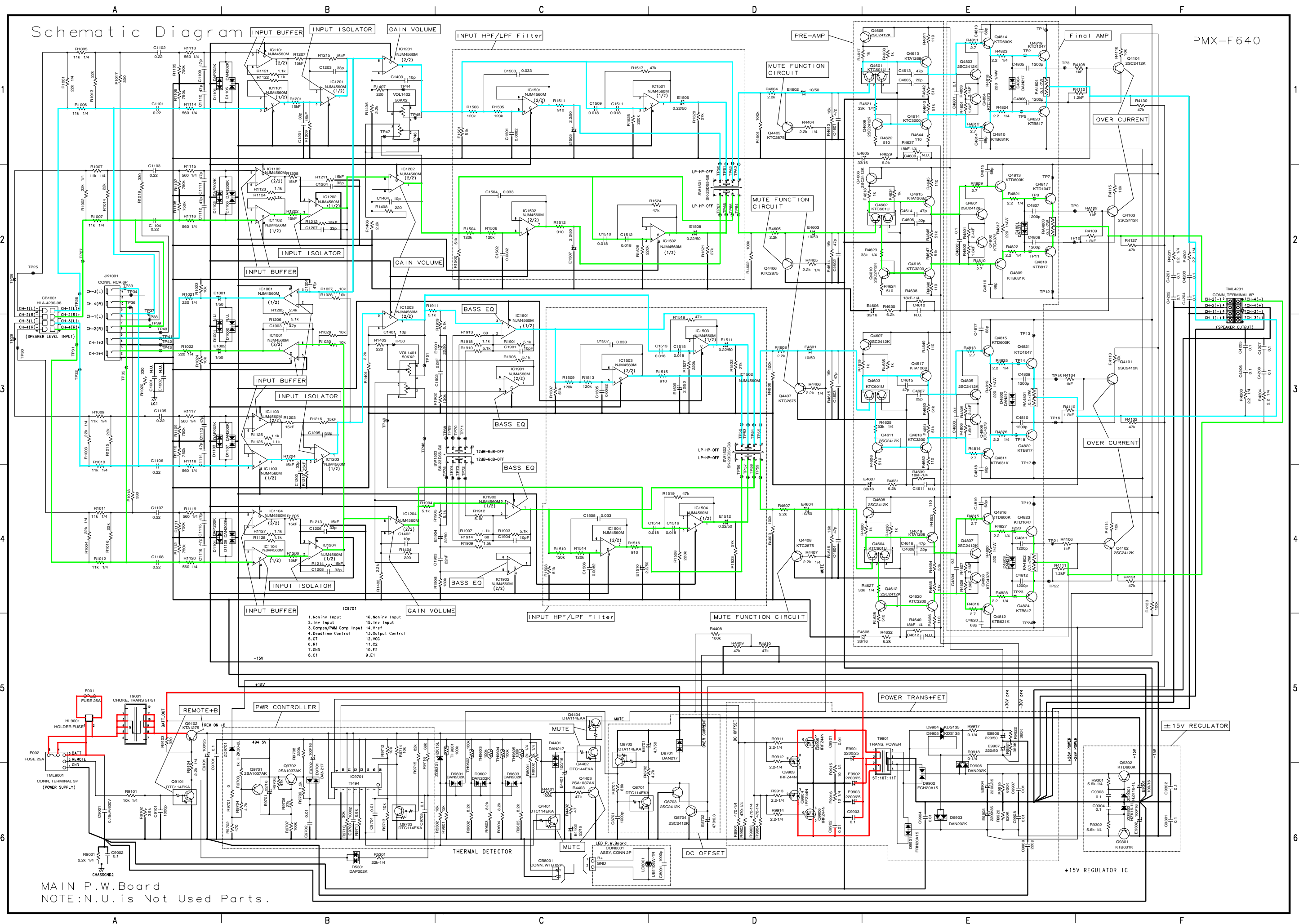
C

D

E

F

G



Schematic Diagram

PMX-F640

MAIN P.W. Board
NOTE: N.U. is Not Used Parts.

Terminal Voltage of IC/TR

[Unit : V]

IC1001	
1	0.00
2	0.00
3	0.00
4	-14.75
5	0.00
6	0.00
7	0.00
8	14.83

IC1101	
1	0.03
2	0.03
3	0.03
4	-14.74
5	0.03
6	0.03
7	0.03
8	14.82

IC1102	
1	0.03
2	0.03
3	0.03
4	-14.74
5	0.03
6	0.03
7	0.03
8	14.82

IC1103	
1	0.03
2	0.03
3	0.03
4	-14.75
5	0.03
6	0.03
7	0.03
8	14.82

IC1104	
1	0.03
2	0.03
3	0.03
4	-14.75
5	0.03
6	0.03
7	0.03
8	14.82

IC1201	
1	0.00
2	0.02
3	0.02
4	-14.75
5	0.00
6	0.00
7	0.01
8	14.83

IC1202	
1	0.00
2	0.02
3	0.02
4	-14.75
5	0.00
6	0.00
7	0.01
8	14.83

IC1203	
1	0.00
2	0.02
3	0.02
4	-14.76
5	0.00
6	0.00
7	0.01
8	14.83

IC1204	
1	0.00
2	0.02
3	0.02
4	-14.75
5	0.00
6	0.00
7	0.01
8	14.83

IC1501	
1	0.01
2	0.01
3	0.01
4	-14.75
5	0.02
6	0.02
7	0.02
8	14.83

IC1502	
1	0.01
2	0.01
3	0.01
4	-14.76
5	0.02
6	0.02
7	0.02
8	14.83

IC1503	
1	0.01
2	0.01
3	0.01
4	-14.76
5	0.02
6	0.02
7	0.02
8	14.83

IC1504	
1	0.01
2	0.01
3	0.01
4	-14.76
5	0.02
6	0.02
7	0.02
8	14.83

IC1901	
1	0.01
2	0.01
3	0.01
4	-14.75
5	0.01
6	0.01
7	0.01
8	14.83

IC1902	
1	0.01
2	0.01
3	0.01
4	-14.75
5	0.01
6	0.01
7	0.01
8	14.83

IC9701			
1	1.57	9	5.57
2	2.47	10	5.56
3	0.07	11	14.30
4	0.15	12	14.30
5	1.46	13	4.93
6	3.75	14	4.93
7	0.00	15	2.47
8	14.30	16	0.04

TR	E	B	C	TR	E	B	C
Q4101	0.02	0.02	15.34	Q4805	0.45	1.11	1.10
Q4102	0.02	0.02	15.31	Q4806	-1.04	-0.46	0.44
Q4103	0.02	0.02	15.32	Q4807	0.45	1.10	1.11
Q4104	0.02	0.02	15.33	Q4808	-1.04	-0.45	0.45
Q4401	0.01	0.08	4.9	Q4809	-0.46	-1.06	-28.25
Q4402	4.72	4.7	14.33	Q4810	-0.45	-1.06	-28.24
Q4403	4.7	4.97	0.01	Q4811	-0.46	-1.06	-28.23
Q4404	14.37	14.34	-7.38	Q4812	-0.45	-1.06	-28.24
Q4405	0.01	-7.39	0.01	Q4813	0.53	1.12	28.34
Q4406	0.01	-7.40	0.01	Q4814	0.53	1.11	28.33
Q4407	0.01	-7.39	0.01	Q4815	0.54	1.12	28.34
Q4408	0.01	-7.40	0.01	Q4816	0.52	1.11	28.33
Q4605	30.13	30.74	30.74	Q4817	0.01	0.51	28.40
Q4606	30.13	30.75	30.74	Q4818	0.01	-0.49	-28.40
Q4607	30.12	30.71	30.74	Q4819	0.00	0.51	28.40
Q4608	30.13	30.73	30.72	Q4820	0.00	-0.50	-28.40
Q4609	-30.22	-29.59	-29.59	Q4821	0.00	0.52	28.40
Q4610	-30.22	-29.58	-29.59	Q4822	0.00	-0.50	-28.40
Q4611	-30.21	-29.58	-29.58	Q4823	0.01	0.52	28.40
Q4612	-30.22	-29.59	-29.59	Q4824	0.01	-0.49	-28.40
Q4613	30.26	29.66	1.10	Q8701	0.03	0.03	14.82
Q4614	-30.18	-29.57	-1.05	Q8702	14.86	14.83	0.03
Q4615	30.25	29.67	1.11	Q8703	0.02	0.03	14.82
Q4616	-30.18	-29.57	-1.05	Q8704	0.03	0.02	14.82
Q4517	30.26	29.67	1.11	Q9101	0.03	3.23	0.08
Q4618	-30.16	-29.56	-1.04	Q9102	14.4	13.7	14.31
Q4619	30.26	29.67	1.10	Q9301	-14.74	-15.40	-28.40
Q4620	-30.15	-29.56	-1.05	Q9302	14.82	15.47	28.40
Q4801	0.45	1.11	1.11	Q9701	4.93	4.36	4.96
Q4802	-1.04	-0.46	0.45	Q9702	4.97	4.95	0.29
Q4803	0.44	1.10	1.11	Q9703	0.03	1.96	0.07
Q4804	-1.03	-0.45	0.45				

TR	1	2	3	4	5
Q4601	0.00	0.00	0.00	29.71	29.92
Q4602	0.00	0.00	0.00	29.70	29.91
Q4603	0.00	0.00	0.00	29.72	29.92
Q4604	0.00	0.00	0.00	29.70	29.90

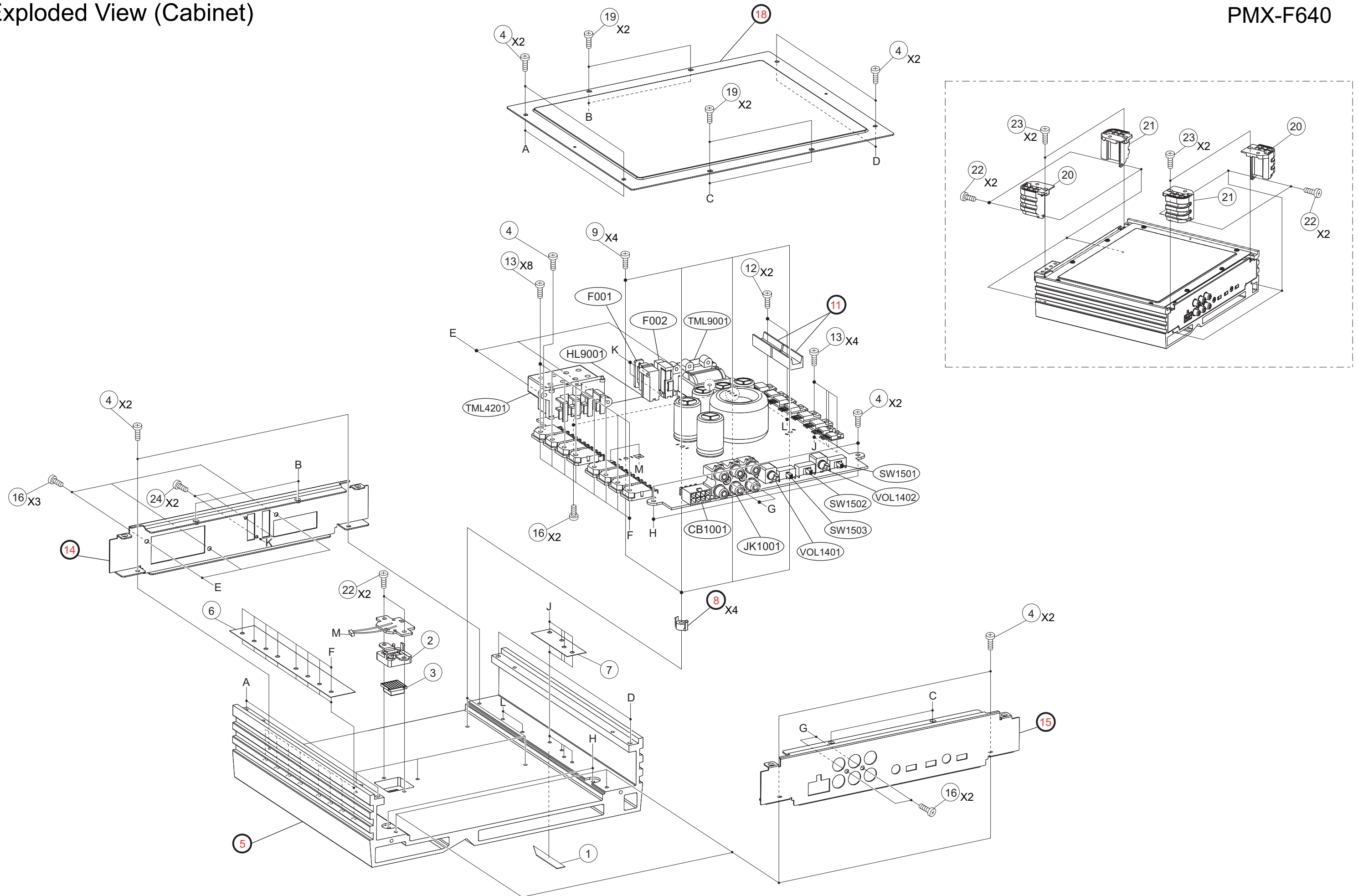
FET	G	D	S
Q9903	5.56	14.30	0.00
Q9904	5.57	14.30	0.00
Q9905	5.56	14.30	0.00
Q9906	5.57	14.30	0.00

[Measuring Conditions]

1. Power Supply Voltage : DC 14.4V
2. Measuring Meter : Digital Multi Voltmeter
3. Measuring Point Reference : Between GND
4. Measuring Condition : No Signal Input

Exploded View (Cabinet)

PMX-F640



Cabinet Assembly Parts List

NOTE : The part that has not PART NUMBER will not be supplied.

1	33E39157S01	PLATE,NAME
2	09E39162S01	HOLDER,INDICATOR
3	34E39161S01	INDICATOR,LENS
4	03E38671S01	SCR,M3X6(B)
5	-----	HEAT,SINK MAIN
6	14E40562S01	INSULATOR,SILPAD-8H
7	14E40951S01	INSULATOR,SILPAD-2H
8	-----	SUPPORT,PWB
9	03E39165S01	SCR,M3X11(WP)(WHT)
11	-----	HEAT,SINK BAR
12	03E38094S01	SCR,M3X15.5(WS)
13	03E40148S01	SCR,M3X11(WS)(YEL)
14	-----	CHAS,FRONT
15	-----	CHAS,REAR
16	03E38698S01	SCR,M3X8(P)(BLK)
18	-----	CHAS,BOTTOM
19	03E39163S01	SCR,M3X6(B)(WHT)
20	29E40953S01	LEG,MTG-B
21	29E40952S01	LEG,MTG-A
22	03E39166S01	SCR,M3X8(B)
23	03E38668S01	SCR,M3X10(B)(BLK)
24	03E39164S01	SCR,M2X6(P)(BLK)

Electrical Parts List

* Each parts on P.W.Board are described in order of the reference number.

=====MAIN P.W.Board

C1003	08E36676S01	CAP,CER. 47pF/50V
C1004	08E36676S01	CAP,CER. 47pF/50V
C1101	08E40235S01	CAP,CER. 0.22uF/25V
C1102	08E40235S01	CAP,CER. 0.22uF/25V
C1103	08E40235S01	CAP,CER. 0.22uF/25V
C1104	08E40235S01	CAP,CER. 0.22uF/25V
C1105	08E40235S01	CAP,CER. 0.22uF/25V
C1106	08E40235S01	CAP,CER. 0.22uF/25V
C1107	08E40235S01	CAP,CER. 0.22uF/25V
C1108	08E40235S01	CAP,CER. 0.22uF/25V
C1109	08E36676S01	CAP,CER. 47pF/50V
C1110	08E36676S01	CAP,CER. 47pF/50V
C1111	08E36676S01	CAP,CER. 47pF/50V
C1112	08E36676S01	CAP,CER. 47pF/50V
C1113	08E36676S01	CAP,CER. 47pF/50V
C1114	08E36676S01	CAP,CER. 47pF/50V
C1115	08E36676S01	CAP,CER. 47pF/50V
C1116	08E36676S01	CAP,CER. 47pF/50V
C1201	08E36675S01	CAP,CER. 33pF/50V
C1202	08E36675S01	CAP,CER. 33pF/50V
C1203	08E36675S01	CAP,CER. 33pF/50V
C1204	08E36675S01	CAP,CER. 33pF/50V
C1205	08E36675S01	CAP,CER. 33pF/50V
C1206	08E36675S01	CAP,CER. 33pF/50V
C1207	08E36675S01	CAP,CER. 33pF/50V
C1208	08E36675S01	CAP,CER. 33pF/50V
C1401	08E40234S01	CAP,CER. 10pF/50V
C1402	08E40234S01	CAP,CER. 10pF/50V
C1403	08E40234S01	CAP,CER. 10pF/50V
C1404	08E40234S01	CAP,CER. 10pF/50V
C1501	08E33355S01	CAP,FILM 8200pF/50V
C1502	08E33355S01	CAP,FILM 8200pF/50V
C1503	08E38436S01	CAP,FILM 0.033uF/50V
C1504	08E38436S01	CAP,FILM 0.033uF/50V
C1505	08E33355S01	CAP,FILM 8200pF/50V
C1506	08E33355S01	CAP,FILM 8200pF/50V
C1507	08E38436S01	CAP,FILM 0.033uF/50V
C1508	08E38436S01	CAP,FILM 0.033uF/50V
C1509	08E40961S01	CAP,FILM 0.018uF/100V
C1510	08E40961S01	CAP,FILM 0.018uF/100V
C1511	08E40961S01	CAP,FILM 0.018uF/100V
C1512	08E40961S01	CAP,FILM 0.018uF/100V
C1513	08E40961S01	CAP,FILM 0.018uF/100V
C1514	08E40961S01	CAP,FILM 0.018uF/100V
C1515	08E40961S01	CAP,FILM 0.018uF/100V
C1516	08E40961S01	CAP,FILM 0.018uF/100V
C1901	08E40234S01	CAP,CER. 10pF/50V
C1902	08E36627S01	CAP,CER. 0.022uF/50V
C1903	08E36627S01	CAP,CER. 0.022uF/50V
C1904	08E40234S01	CAP,CER. 10pF/50V
C4201	08E36593S01	CAP,CER. 0.1uF/50V

C4202	08E36593S01	CAP,CER. 0.1uF/50V
C4203	08E36593S01	CAP,CER. 0.1uF/50V
C4204	08E36593S01	CAP,CER. 0.1uF/50V
C4205	08E36593S01	CAP,CER. 0.1uF/50V
C4206	08E36593S01	CAP,CER. 0.1uF/50V
C4207	08E36593S01	CAP,CER. 0.1uF/50V
C4208	08E36593S01	CAP,CER. 0.1uF/50V
C4601	08E36676S01	CAP,CER. 47pF/50V
C4602	08E36676S01	CAP,CER. 47pF/50V
C4603	08E36676S01	CAP,CER. 47pF/50V
C4604	08E36676S01	CAP,CER. 47pF/50V
C4605	08E38421S01	CAP,CER. 22pF/50V
C4606	08E38421S01	CAP,CER. 22pF/50V
C4607	08E38421S01	CAP,CER. 22pF/50V
C4608	08E38421S01	CAP,CER. 22pF/50V
C4613	08E36676S01	CAP,CER. 47pF/50V
C4614	08E36676S01	CAP,CER. 47pF/50V
C4615	08E36676S01	CAP,CER. 47pF/50V
C4616	08E36676S01	CAP,CER. 47pF/50V
C4801	08E36593S01	CAP,CER. 0.1uF/50V
C4802	08E36593S01	CAP,CER. 0.1uF/50V
C4803	08E36593S01	CAP,CER. 0.1uF/50V
C4804	08E36593S01	CAP,CER. 0.1uF/50V
C4805	08E38109S01	CAP,CER. 1200pF/50V
C4806	08E38109S01	CAP,CER. 1200pF/50V
C4807	08E38109S01	CAP,CER. 1200pF/50V
C4808	08E38109S01	CAP,CER. 1200pF/50V
C4809	08E38109S01	CAP,CER. 1200pF/50V
C4810	08E38109S01	CAP,CER. 1200pF/50V
C4811	08E38109S01	CAP,CER. 1200pF/50V
C4812	08E38109S01	CAP,CER. 1200pF/50V
C4813	08E38599S01	CAP,CER. 68pF/50V
C4814	08E38599S01	CAP,CER. 68pF/50V
C4815	08E38599S01	CAP,CER. 68pF/50V
C4816	08E38599S01	CAP,CER. 68pF/50V
C4817	08E38599S01	CAP,CER. 68pF/50V
C4818	08E38599S01	CAP,CER. 68pF/50V
C4819	08E38599S01	CAP,CER. 68pF/50V
C4820	08E38599S01	CAP,CER. 68pF/50V
C8701	08E36596S01	CAP,CER. 1000pF/50V
C9001	08E40555S01	CAP,CER. 0.15uF/630V
C9002	08E36593S01	CAP,CER. 0.1uF/50V
C9101	08E36596S01	CAP,CER. 1000pF/50V
C9301	08E36593S01	CAP,CER. 0.1uF/50V
C9302	08E36593S01	CAP,CER. 0.1uF/50V
C9303	08E36593S01	CAP,CER. 0.1uF/50V
C9304	08E36593S01	CAP,CER. 0.1uF/50V
C9701	08E36593S01	CAP,CER. 0.1uF/50V
C9702	08E37120S01	CAP,CER. 0.01uF/50V
C9703	08E36596S01	CAP,CER. 1000pF/50V
C9704	08E37120S01	CAP,CER. 0.01uF/50V
C9705	08E36593S01	CAP,CER. 0.1uF/50V
C9901	08E37120S01	CAP,CER. 0.01uF/50V
C9902	08E37120S01	CAP,CER. 0.01uF/50V
C9903	08E36593S01	CAP,CER. 0.1uF/50V
C9904	08E37120S01	CAP,CER. 0.01uF/50V
C9907	08E37120S01	CAP,CER. 0.01uF/50V

C9908	08E37120S01	CAP,CER. 0.01uF/50V
C9909	08E37118S01	CAP,CER. 220pF/50V
D1101	48E36633S01	DIODE,DAP202K
D1102	48E36633S01	DIODE,DAP202K
D1103	48E36633S01	DIODE,DAP202K
D1104	48E36633S01	DIODE,DAP202K
D1105	48E36568S01	DIODE,DAN202K
D1106	48E36568S01	DIODE,DAN202K
D1107	48E36568S01	DIODE,DAN202K
D1108	48E36568S01	DIODE,DAN202K
D4401	48E34197S01	DIODE,DAN217
D4801	48E34197S01	DIODE,DAN217
D4802	48E34197S01	DIODE,DAN217
D4803	48E34197S01	DIODE,DAN217
D4804	48E34197S01	DIODE,DAN217
D5301	48E36633S01	DIODE,DAP202K
D8701	48E34197S01	DIODE,DAN217
D9601	48E36568S01	DIODE,DAN202K
D9602	48E36568S01	DIODE,DAN202K
D9603	48E36568S01	DIODE,DAN202K
D9701	48E34197S01	DIODE,DAN217
D9901	48E38098S01	DIODE,FRH20A15G
D9902	48E39706S01	DIODE,FCH20A15
D9903	48E36568S01	DIODE,DAN202K
D9904	48E40242S01	DIO,SWITCHING KDS135
D9905	48E40242S01	DIO,SWITCHING KDS135
D9906	48E36568S01	DIODE,DAN202K
CB8001	09E27780S01	CONN,WTB 02P
E1001	23E38000S01	CAP,ELY. 1uF/50V
E1002	23E38000S01	CAP,ELY. 1uF/50V
E1505	23E38001S01	CAP,ELY. 2.2uF/50V
E1506	23E38016S01	CAP,ELY. 0.22uF/50V
E1507	23E38001S01	CAP,ELY. 2.2uF/50V
E1508	23E38016S01	CAP,ELY. 0.22uF/50V
E1509	23E38001S01	CAP,ELY. 2.2uF/50V
E1510	23E38001S01	CAP,ELY. 2.2uF/50V
E1511	23E38016S01	CAP,ELY. 0.22uF/50V
E1512	23E38016S01	CAP,ELY. 0.22uF/50V
E1901	23E38001S01	CAP,ELY. 2.2uF/50V
E1904	23E38001S01	CAP,ELY. 2.2uF/50V
E4401	23E38014S01	CAP,ELY. 100uF/16V
E4402	23E38006S01	CAP,ELY. 22uF/16V
E4601	23E39860S01	CAP,ELY. 10uF/50V
E4602	23E39860S01	CAP,ELY. 10uF/50V
E4603	23E39860S01	CAP,ELY. 10uF/50V
E4604	23E39860S01	CAP,ELY. 10uF/50V
E4605	23E40237S01	CAP,ELY. 33uF/16V
E4606	23E40237S01	CAP,ELY. 33uF/16V
E4607	23E40237S01	CAP,ELY. 33uF/16V
E4608	23E40237S01	CAP,ELY. 33uF/16V
E8701	23E38002S01	CAP,ELY. 4.7uF/50V
E8702	23E40236S01	CAP,ELY. 470uF/6.3V
E9101	23E38018S01	CAP,ELY. 100uF/25V
E9301	23E38014S01	CAP,ELY. 100uF/16V
E9302	23E38014S01	CAP,ELY. 100uF/16V
E9701	23E38006S01	CAP,ELY. 22uF/16V
E9702	23E38014S01	CAP,ELY. 100uF/16V

E9901	23E40240S01	CAP,ELY. 2200uF/25V
E9902	23E40240S01	CAP,ELY. 2200uF/25V
E9903	23E40240S01	CAP,ELY. 2200uF/25V
E9904	23E40416S01	CAP,ELY. 2200uF/35V
E9905	23E40416S01	CAP,ELY. 2200uF/35V
E9906	23E40238S01	CAP,ELY. 220uF/50V
E9907	23E40238S01	CAP,ELY. 220uF/50V
IC1001	51E38085S01	IC,NJM4560M
IC1101	51E38085S01	IC,NJM4560M
IC1102	51E38085S01	IC,NJM4560M
IC1103	51E38085S01	IC,NJM4560M
IC1104	51E38085S01	IC,NJM4560M
IC1201	51E38085S01	IC,NJM4560M
IC1202	51E38085S01	IC,NJM4560M
IC1203	51E38085S01	IC,NJM4560M
IC1204	51E38085S01	IC,NJM4560M
IC1501	51E38085S01	IC,NJM4560M
IC1502	51E38085S01	IC,NJM4560M
IC1503	51E38085S01	IC,NJM4560M
IC1504	51E38085S01	IC,NJM4560M
IC1901	51E38085S01	IC,NJM4560M
IC1902	51E38085S01	IC,NJM4560M
IC9701	51E40529S01	IC,TL494ID
Q4101	48E36571S01	TR,2SC2412K
Q4102	48E36571S01	TR,2SC2412K
Q4103	48E36571S01	TR,2SC2412K
Q4104	48E36571S01	TR,2SC2412K
Q4401	48E37234S01	TR,DTC114EKA
Q4402	48E36573S01	TR,DTC144EK
Q4403	48E38440S01	TR,2SA1037AK
Q4404	48E38062S01	TR,DTA114EK
Q4405	48E39389S01	TR,KTC2875
Q4406	48E39389S01	TR,KTC2875
Q4407	48E39389S01	TR,KTC2875
Q4408	48E39389S01	TR,KTC2875
Q4517	48E38630S01	TR,KTA1268-GR
Q4601	48E40245S01	TR,KTC601U
Q4602	48E40245S01	TR,KTC601U
Q4603	48E40245S01	TR,KTC601U
Q4604	48E40245S01	TR,KTC601U
Q4605	48E36571S01	TR,2SC2412K
Q4606	48E36571S01	TR,2SC2412K
Q4607	48E36571S01	TR,2SC2412K
Q4608	48E36571S01	TR,2SC2412K
Q4609	48E36571S01	TR,2SC2412K
Q4610	48E36571S01	TR,2SC2412K
Q4611	48E36571S01	TR,2SC2412K
Q4612	48E36571S01	TR,2SC2412K
Q4613	48E38630S01	TR,KTA1268-GR
Q4614	48E38631S01	TR,KTC3200-GR
Q4615	48E38630S01	TR,KTA1268-GR
Q4616	48E38631S01	TR,KTC3200-GR
Q4618	48E38631S01	TR,KTC3200-GR
Q4619	48E38630S01	TR,KTA1268-GR
Q4620	48E38631S01	TR,KTC3200-GR
Q4801	48E36571S01	TR,2SC2412K
Q4802	48E40556S01	TR,KTC4373

Q4803	48E36571S01	TR,2SC2412K
Q4804	48E40556S01	TR,KTC4373
Q4805	48E36571S01	TR,2SC2412K
Q4806	48E40556S01	TR,KTC4373
Q4807	48E36571S01	TR,2SC2412K
Q4808	48E40556S01	TR,KTC4373
Q4809	48E39129S01	TR,KTB631K
Q4810	48E39129S01	TR,KTB631K
Q4811	48E39129S01	TR,KTB631K
Q4812	48E39129S01	TR,KTB631K
Q4813	48E39128S01	TR,KTD600K
Q4814	48E39128S01	TR,KTD600K
Q4815	48E39128S01	TR,KTD600K
Q4816	48E39128S01	TR,KTD600K
Q4817	48E39390S01	TR,KTD1047
Q4818	48E39393S01	TR,KTB817
Q4819	48E39390S01	TR,KTD1047
Q4820	48E39393S01	TR,KTB817
Q4821	48E39390S01	TR,KTD1047
Q4822	48E39393S01	TR,KTB817
Q4823	48E39390S01	TR,KTD1047
Q4824	48E39393S01	TR,KTB817
Q8701	48E37234S01	TR,DTC114EKA
Q8702	48E38062S01	TR,DTA114EK
Q8703	48E36571S01	TR,2SC2412K
Q8704	48E36571S01	TR,2SC2412K
Q9101	48E37234S01	TR,DTC114EKA
Q9102	48E23700S01	TR,KTA12750
Q9301	48E39129S01	TR,KTB631K
Q9302	48E39128S01	TR,KTD600K
Q9701	48E38440S01	TR,2SA1037AK
Q9702	48E38440S01	TR,2SA1037AK
Q9703	48E37234S01	TR,DTC114EKA
Q9903	48E39190S01	FET,IRFZ44N
Q9904	48E39190S01	FET,IRFZ44N
Q9905	48E39190S01	FET,IRFZ44N
Q9906	48E39190S01	FET,IRFZ44N
R1001	06E31183S01	RES,CF. 22K-1/4W
R1002	06E31183S01	RES,CF. 22K-1/4W
R1003	06E31183S01	RES,CF. 22K-1/4W
R1004	06E31183S01	RES,CF. 22K-1/4W
R1005	06E32200S01	RES,CF. 11K-1/4W
R1006	06E32200S01	RES,CF. 11K-1/4W
R1007	06E32200S01	RES,CF. 11K-1/4W
R1008	06E32200S01	RES,CF. 11K-1/4W
R1009	06E32200S01	RES,CF. 11K-1/4W
R1010	06E32200S01	RES,CF. 11K-1/4W
R1011	06E32200S01	RES,CF. 11K-1/4W
R1012	06E32200S01	RES,CF. 11K-1/4W
R1013	06E36586S01	RES,CF. 22K-1/16W
R1014	06E36586S01	RES,CF. 22K-1/16W
R1015	06E36586S01	RES,CF. 22K-1/16W
R1016	06E36586S01	RES,CF. 22K-1/16W
R1017	06E28786S01	RES,CF. 330-1/16W
R1018	06E28786S01	RES,CF. 330-1/16W
R1019	06E28786S01	RES,CF. 330-1/16W
R1020	06E28786S01	RES,CF. 330-1/16W

R1021	06E36484S01	RES,CF. 220-1/4W
R1022	06E36484S01	RES,CF. 220-1/4W
R1023	06E36463S01	RES,CF. 10K-1/16W
R1024	06E36463S01	RES,CF. 10K-1/16W
R1025	06E32311S01	RES,CF. 2.4K-1/16W
R1026	06E31156S01	RES,CF. 5.1K-1/16W
R1027	06E36463S01	RES,CF. 10K-1/16W
R1028	06E36463S01	RES,CF. 10K-1/16W
R1029	06E36463S01	RES,CF. 10K-1/16W
R1030	06E36463S01	RES,CF. 10K-1/16W
R1105	06E32317S01	RES,CF. 750K-1/16W
R1106	06E32317S01	RES,CF. 750K-1/16W
R1107	06E32317S01	RES,CF. 750K-1/16W
R1108	06E32317S01	RES,CF. 750K-1/16W
R1109	06E32317S01	RES,CF. 750K-1/16W
R1110	06E32317S01	RES,CF. 750K-1/16W
R1111	06E32317S01	RES,CF. 750K-1/16W
R1112	06E32317S01	RES,CF. 750K-1/16W
R1113	06E36650S01	RES,CF. 560-1/4W
R1114	06E36650S01	RES,CF. 560-1/4W
R1115	06E36650S01	RES,CF. 560-1/4W
R1116	06E36650S01	RES,CF. 560-1/4W
R1117	06E36650S01	RES,CF. 560-1/4W
R1118	06E36650S01	RES,CF. 560-1/4W
R1119	06E36650S01	RES,CF. 560-1/4W
R1120	06E36650S01	RES,CF. 560-1/4W
R1121	06E31150S01	RES,CF. 1.1K-1/16W
R1122	06E31150S01	RES,CF. 1.1K-1/16W
R1123	06E31150S01	RES,CF. 1.1K-1/16W
R1124	06E31150S01	RES,CF. 1.1K-1/16W
R1125	06E31150S01	RES,CF. 1.1K-1/16W
R1126	06E31150S01	RES,CF. 1.1K-1/16W
R1127	06E31150S01	RES,CF. 1.1K-1/16W
R1128	06E31150S01	RES,CF. 1.1K-1/16W
R1201	06E33657S01	RES,CF. 15K-1/16W
R1202	06E33657S01	RES,CF. 15K-1/16W
R1203	06E33657S01	RES,CF. 15K-1/16W
R1204	06E33657S01	RES,CF. 15K-1/16W
R1205	06E33657S01	RES,CF. 15K-1/16W
R1206	06E33657S01	RES,CF. 15K-1/16W
R1207	06E33657S01	RES,CF. 15K-1/16W
R1208	06E33657S01	RES,CF. 15K-1/16W
R1209	06E33657S01	RES,CF. 15K-1/16W
R1210	06E33657S01	RES,CF. 15K-1/16W
R1211	06E33657S01	RES,CF. 15K-1/16W
R1212	06E33657S01	RES,CF. 15K-1/16W
R1213	06E33657S01	RES,CF. 15K-1/16W
R1214	06E33657S01	RES,CF. 15K-1/16W
R1215	06E33657S01	RES,CF. 15K-1/16W
R1216	06E33657S01	RES,CF. 15K-1/16W
R1401	06E36585S01	RES,CF. 2.2K-1/16W
R1402	06E36585S01	RES,CF. 2.2K-1/16W
R1403	06E31149S01	RES,CF. 220-1/16W
R1404	06E31149S01	RES,CF. 220-1/16W
R1405	06E36585S01	RES,CF. 2.2K-1/16W
R1406	06E36585S01	RES,CF. 2.2K-1/16W
R1407	06E31149S01	RES,CF. 220-1/16W

R1408	06E31149S01	RES,CF. 220-1/16W
R1501	06E31803S01	RES,CF. 51K-1/16W
R1502	06E31803S01	RES,CF. 51K-1/16W
R1503	06E32037S01	RES,CF. 120K-1/16W
R1504	06E32037S01	RES,CF. 120K-1/16W
R1505	06E32037S01	RES,CF. 120K-1/16W
R1506	06E32037S01	RES,CF. 120K-1/16W
R1507	06E31803S01	RES,CF. 51K-1/16W
R1508	06E31803S01	RES,CF. 51K-1/16W
R1509	06E32037S01	RES,CF. 120K-1/16W
R1510	06E32037S01	RES,CF. 120K-1/16W
R1511	06E32033S01	RES,CF. 910-1/16W
R1512	06E32033S01	RES,CF. 910-1/16W
R1513	06E32037S01	RES,CF. 120K-1/16W
R1514	06E32037S01	RES,CF. 120K-1/16W
R1515	06E32033S01	RES,CF. 910-1/16W
R1516	06E32033S01	RES,CF. 910-1/16W
R1517	06E36559S01	RES,CF. 47K-1/16W
R1518	06E36559S01	RES,CF. 47K-1/16W
R1519	06E36559S01	RES,CF. 47K-1/16W
R1520	06E37246S01	RES,CF. 27K-1/16W
R1521	06E37246S01	RES,CF. 27K-1/16W
R1522	06E37246S01	RES,CF. 27K-1/16W
R1523	06E37246S01	RES,CF. 27K-1/16W
R1524	06E36559S01	RES,CF. 47K-1/16W
R1525	06E31163S01	RES,CF. 220K-1/16W
R1526	06E31163S01	RES,CF. 220K-1/16W
R1527	06E31163S01	RES,CF. 220K-1/16W
R1528	06E31163S01	RES,CF. 220K-1/16W
R1901	06E31156S01	RES,CF. 5.1K-1/16W
R1902	06E40962S01	RES,CF. 130K-1/16W
R1903	06E31156S01	RES,CF. 5.1K-1/16W
R1904	06E31156S01	RES,CF. 5.1K-1/16W
R1905	06E31156S01	RES,CF. 5.1K-1/16W
R1906	06E31152S01	RES,CF. 1.5K-1/16W
R1907	06E31150S01	RES,CF. 1.1K-1/16W
R1908	06E40962S01	RES,CF. 130K-1/16W
R1909	06E31152S01	RES,CF. 1.5K-1/16W
R1910	06E31156S01	RES,CF. 5.1K-1/16W
R1911	06E31156S01	RES,CF. 5.1K-1/16W
R1912	06E31156S01	RES,CF. 5.1K-1/16W
R1913	06E31173S01	RES,CF. 68-1/16W
R1914	06E31173S01	RES,CF. 68-1/16W
R1918	06E31150S01	RES,CF. 1.1K-1/16W
R1919	06E31156S01	RES,CF. 5.1K-1/16W
R4102	06E36665S01	RES,CF. 1K-1/16W
R4104	06E36665S01	RES,CF. 1K-1/16W
R4106	06E36665S01	RES,CF. 1K-1/16W
R4108	06E36665S01	RES,CF. 1K-1/16W
R4109	06E36465S01	RES,CF. 1.2K-1/16W
R4110	06E36465S01	RES,CF. 1.2K-1/16W
R4111	06E36465S01	RES,CF. 1.2K-1/16W
R4112	06E36465S01	RES,CF. 1.2K-1/16W
R4113	06E36463S01	RES,CF. 10K-1/16W
R4114	06E36463S01	RES,CF. 10K-1/16W
R4115	06E36463S01	RES,CF. 10K-1/16W
R4116	06E36463S01	RES,CF. 10K-1/16W

R4127	06E36559S01	RES,CF. 47K-1/16W
R4130	06E36559S01	RES,CF. 47K-1/16W
R4131	06E36559S01	RES,CF. 47K-1/16W
R4132	06E36559S01	RES,CF. 47K-1/16W
R4133	06E36622S01	RES,CF. 100K-1/16W
R4201	06E37129S01	RES,CF. 2.2-1/4W
R4202	06E37129S01	RES,CF. 2.2-1/4W
R4203	06E37129S01	RES,CF. 2.2-1/4W
R4204	06E37129S01	RES,CF. 2.2-1/4W
R4401	06E36622S01	RES,CF. 100K-1/16W
R4402	06E31172S01	RES,CF. 47-1/16W
R4403	06E36559S01	RES,CF. 47K-1/16W
R4404	06E36580S01	RES,CF. 2.2K-1/4W
R4405	06E36580S01	RES,CF. 2.2K-1/4W
R4406	06E36580S01	RES,CF. 2.2K-1/4W
R4407	06E36580S01	RES,CF. 2.2K-1/4W
R4408	06E36622S01	RES,CF. 100K-1/16W
R4409	06E36559S01	RES,CF. 47K-1/16W
R4410	06E36559S01	RES,CF. 47K-1/16W
R4601	06E36622S01	RES,CF. 100K-1/16W
R4602	06E36622S01	RES,CF. 100K-1/16W
R4603	06E36622S01	RES,CF. 100K-1/16W
R4604	06E36585S01	RES,CF. 2.2K-1/16W
R4605	06E36585S01	RES,CF. 2.2K-1/16W
R4606	06E36622S01	RES,CF. 100K-1/16W
R4607	06E36585S01	RES,CF. 2.2K-1/16W
R4608	06E36585S01	RES,CF. 2.2K-1/16W
R4613	06E34947S01	RES,CF. 16K-1/16W
R4614	06E34947S01	RES,CF. 16K-1/16W
R4615	06E34947S01	RES,CF. 16K-1/16W
R4616	06E34947S01	RES,CF. 16K-1/16W
R4617	06E36618S01	RES,CF. 1K-1/16W
R4618	06E36618S01	RES,CF. 1K-1/16W
R4619	06E36618S01	RES,CF. 1K-1/16W
R4620	06E36618S01	RES,CF. 1K-1/16W
R4621	06E32296S01	RES,CF. 33K-1/4W
R4622	06E36461S01	RES,CF. 510-1/16W
R4623	06E32296S01	RES,CF. 33K-1/4W
R4624	06E36461S01	RES,CF. 510-1/16W
R4625	06E32296S01	RES,CF. 33K-1/4W
R4626	06E36461S01	RES,CF. 510-1/16W
R4627	06E32296S01	RES,CF. 33K-1/4W
R4628	06E36461S01	RES,CF. 510-1/16W
R4629	06E33865S01	RES,CF. 6.2K-1/16W
R4630	06E33865S01	RES,CF. 6.2K-1/16W
R4631	06E33865S01	RES,CF. 6.2K-1/16W
R4632	06E33865S01	RES,CF. 6.2K-1/16W
R4633	06E36618S01	RES,CF. 1K-1/16W
R4634	06E36618S01	RES,CF. 1K-1/16W
R4635	06E36618S01	RES,CF. 1K-1/16W
R4636	06E36618S01	RES,CF. 1K-1/16W
R4637	06E39633S01	RES,CF. 18K-1/4W
R4638	06E39633S01	RES,CF. 18K-1/4W
R4639	06E39633S01	RES,CF. 18K-1/4W
R4640	06E39633S01	RES,CF. 18K-1/4W
R4641	06E32032S01	RES,CF. 110-1/16W
R4642	06E31803S01	RES,CF. 51K-1/16W

R4643	06E31803S01	RES,CF. 51K-1/16W
R4644	06E32032S01	RES,CF. 110-1/16W
R4645	06E32032S01	RES,CF. 110-1/16W
R4646	06E31803S01	RES,CF. 51K-1/16W
R4647	06E31803S01	RES,CF. 51K-1/16W
R4648	06E32032S01	RES,CF. 110-1/16W
R4649	06E32032S01	RES,CF. 110-1/16W
R4650	06E31803S01	RES,CF. 51K-1/16W
R4651	06E31803S01	RES,CF. 51K-1/16W
R4652	06E32032S01	RES,CF. 110-1/16W
R4653	06E32032S01	RES,CF. 110-1/16W
R4654	06E31803S01	RES,CF. 51K-1/16W
R4655	06E31803S01	RES,CF. 51K-1/16W
R4656	06E32032S01	RES,CF. 110-1/16W
R4801	06E34536S01	RES,CF. 2.4K-1/16W
R4802	06E38589S01	RES,CF. 1.6K-1/16W
R4803	06E34536S01	RES,CF. 2.4K-1/16W
R4804	06E38589S01	RES,CF. 1.6K-1/16W
R4805	06E34536S01	RES,CF. 2.4K-1/16W
R4806	06E38589S01	RES,CF. 1.6K-1/16W
R4807	06E34536S01	RES,CF. 2.4K-1/16W
R4808	06E38589S01	RES,CF. 1.6K-1/16W
R4809	06E40227S01	RES,CF. 2.7-1/10W
R4810	06E40227S01	RES,CF. 2.7-1/10W
R4811	06E40227S01	RES,CF. 2.7-1/10W
R4812	06E40227S01	RES,CF. 2.7-1/10W
R4813	06E40227S01	RES,CF. 2.7-1/10W
R4814	06E40227S01	RES,CF. 2.7-1/10W
R4815	06E40227S01	RES,CF. 2.7-1/10W
R4816	06E40227S01	RES,CF. 2.7-1/10W
R4817	06E36484S01	RES,CF. 220-1/4W
R4818	06E36484S01	RES,CF. 220-1/4W
R4819	06E36484S01	RES,CF. 220-1/4W
R4820	06E36484S01	RES,CF. 220-1/4W
R4821	06E37129S01	RES,CF. 2.2-1/4W
R4822	06E37129S01	RES,CF. 2.2-1/4W
R4823	06E37129S01	RES,CF. 2.2-1/4W
R4824	06E37129S01	RES,CF. 2.2-1/4W
R4825	06E37129S01	RES,CF. 2.2-1/4W
R4826	06E37129S01	RES,CF. 2.2-1/4W
R4827	06E37129S01	RES,CF. 2.2-1/4W
R4828	06E37129S01	RES,CF. 2.2-1/4W
R5301	06E31183S01	RES,CF. 22K-1/4W
R5302	06E28793S01	RES,CF. 18K-1/16W
R8001	06E38508S01	RES,CF. 2K-1/4W
R8002	06E38508S01	RES,CF. 2K-1/4W
R8701	06E31804S01	RES,CF. 68K-1/16W
R8702	06E36462S01	RES,CF. 4.7K-1/16W
R9001	06E36580S01	RES,CF. 2.2K-1/4W
R9101	06E36556S01	RES,CF. 10K-1/4W
R9102	06E37276S01	RES,CF. 3.9K-1/16W
R9103	06E28786S01	RES,CF. 330-1/16W
R9104	06E36580S01	RES,CF. 2.2K-1/4W
R9301	06E36615S01	RES,CF. 5.6K-1/4W
R9302	06E36615S01	RES,CF. 5.6K-1/4W
R9601	06E38389S01	RES,CF. 12K-1/16W
R9602	06E36658S01	RES,CF. 8.2K-1/16W

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R9603	06E36658S01	RES,CF. 8.2K-1/16W
R9604	06E36658S01	RES,CF. 8.2K-1/16W
R9605	06E36658S01	RES,CF. 8.2K-1/16W
R9701	06E36464S01	RES,CF. 0-1/16W
R9702	06E36657S01	RES,CF. 470-1/16W
R9703	06E36618S01	RES,CF. 1K-1/16W
R9704	06E36462S01	RES,CF. 4.7K-1/16W
R9705	06E36559S01	RES,CF. 47K-1/16W
R9706	06E37246S01	RES,CF. 27K-1/16W
R9707	06E36622S01	RES,CF. 100K-1/16W
R9708	06E31163S01	RES,CF. 220K-1/16W
R9709	06E31152S01	RES,CF. 1.5K-1/16W
R9710	06E36588S01	RES,CF. 30K-1/16W
R9711	06E36621S01	RES,CF. 6.8K-1/16W
R9712	06E36463S01	RES,CF. 10K-1/16W
R9713	06E36463S01	RES,CF. 10K-1/16W
R9714	06E36463S01	RES,CF. 10K-1/16W
R9715	06E28536S01	RES,CF. 82K-1/16W
R9716	06E31804S01	RES,CF. 68K-1/16W
R9901	06E36485S01	RES,CF. 470-1/4W
R9902	06E36485S01	RES,CF. 470-1/4W
R9903	06E36485S01	RES,CF. 470-1/4W
R9904	06E36485S01	RES,CF. 470-1/4W
R9911	06E37129S01	RES,CF. 2.2-1/4W
R9912	06E37129S01	RES,CF. 2.2-1/4W
R9913	06E37129S01	RES,CF. 2.2-1/4W
R9914	06E37129S01	RES,CF. 2.2-1/4W
R9915	06E36578S01	RES,CF. 10-1/4W
R9916	06E36578S01	RES,CF. 10-1/4W
R9917	06E36583S01	RES,CF. 0-1/4W
R9918	06E36583S01	RES,CF. 0-1/4W
R9919	06E32213S01	RES,CF. 620K-1/16W
R9920	06E32213S01	RES,CF. 620K-1/16W
R9921	06E31808S01	RES,CF. 360K-1/16W
R9922	06E31808S01	RES,CF. 360K-1/16W
RA4801	06E40554S01	RES,CEMENT 0.1-7W
RA4802	06E40554S01	RES,CEMENT 0.1-7W
RA4803	06E40554S01	RES,CEMENT 0.1-7W
RA4804	06E40554S01	RES,CEMENT 0.1-7W
T9001	24E40560S01	CHOKE,TRANS 5T/5T
T9901	25E40957S01	TRANS,POWER PMAG803A
TH9601	48E40530S01	THERMISTOR,100K
TH9602	48E40530S01	THERMISTOR,100K
TH9603	48E40530S01	THERMISTOR,100K
TH9604	48E40530S01	THERMISTOR,100K
TH9605	48E40530S01	THERMISTOR,100K
ZD5301	48E39118S01	DIODE,ZENER HZK15-2L
ZD9301	48E39119S01	DIODE,ZENER HZK16-1L
ZD9302	48E39119S01	DIODE,ZENER HZK16-1L
ZD9701	48E40243S01	DIODE,ZENER HZK30-2L
=====LED P.W.Board		
C8001	08E36596S01	CAP,CER. 1000pF/50V
CON8001	09E33654S01	ASSY,CONN 2P
LD8001	48E39343S01	LED,BLU UB1106W
=====Miscellaneous		

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CB1001	09E40252S01	CONN,HLA-4200-08 8P
F001	65E27881S01	FUSE,25A
F002	65E27881S01	FUSE,25A
HL9001	09E39154S01	HOLDER,FUSE
JK1001	09E40960S01	CONN,RCA 6P
SW1501	40E40956S01	SW,SLIDE SK-23D55-G6
SW1502	40E40956S01	SW,SLIDE SK-23D55-G6
SW1503	40E40956S01	SW,SLIDE SK-23D55-G6
TML4201	09E40959S01	CONN,TERMINAL 8P
TML9001	09E39148S01	CONN,TERMINAL 3P
VOL1401	18E40958S01	VOL,ROTARY 50KX2
VOL1402	18E40958S01	VOL,ROTARY 50KX2