

Service Manual

Model: HPA6

6-Channel HEADPHONE AMPLIFIER



www.altoproaudio.com

Version: 1.1

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1.Specifications

Input

MAIN input

Connectors	XLR and 1/4" jack
Type	RF filtered, servo balanced input
Impedance	50k Ohms balanced, 25k Ohms unbalanced
Max.Input level	+21 dBu balanced and unbalanced (unity gain)
CMRR	typ.40 dB,>55 dB @ 1kHz

AUX IN and DIRECT IN input

Connectors	1/4" jack (tip=left, ring=right, sleeve=ground)
Type	unbalanced
Impedance	25k Ohms unbalanced
Max.Input level	+21 dBu unbalanced (unity gain)
CMRR	typ.40 dB,>55 dB @ 1kHz

Output

Connectors	XLR and 1/4" jack
Type	balanced/unbalanced
Impedance	dependent on input balanced
Max.Input level	+21 dBu balanced and unbalanced

SYSTEM SPECIFICATIONS

Frequency response	10Hz to 50kHz,+/-3dB
Noise	>90dB,unweighted,22Hz to 22kHz
THD	<u>0.005%typ.@+4dBu</u> , 1kHz, Gain 1

POWER AMPLIFIER

Max.output power	+21dBm
Min.output impedance	100Ohms
Max.gain	+20dB

FUNCTION CONTROLS

Input level	variable
Balanced per channel	mix between aux and main signal
Output level per channel	variable

FUNCTION SWITCHES

Left mute	mutes the left signal of this channel
Right mute	mutes the right signal of this channel
Mode	switches channel to mono/stereo

INDICATORS

Input level	8-digit LED display:-24/-18/-12/- 6/0/+6/+12/+18dBu
Output level	4-digit LED display:-24/0/+12/CLIP

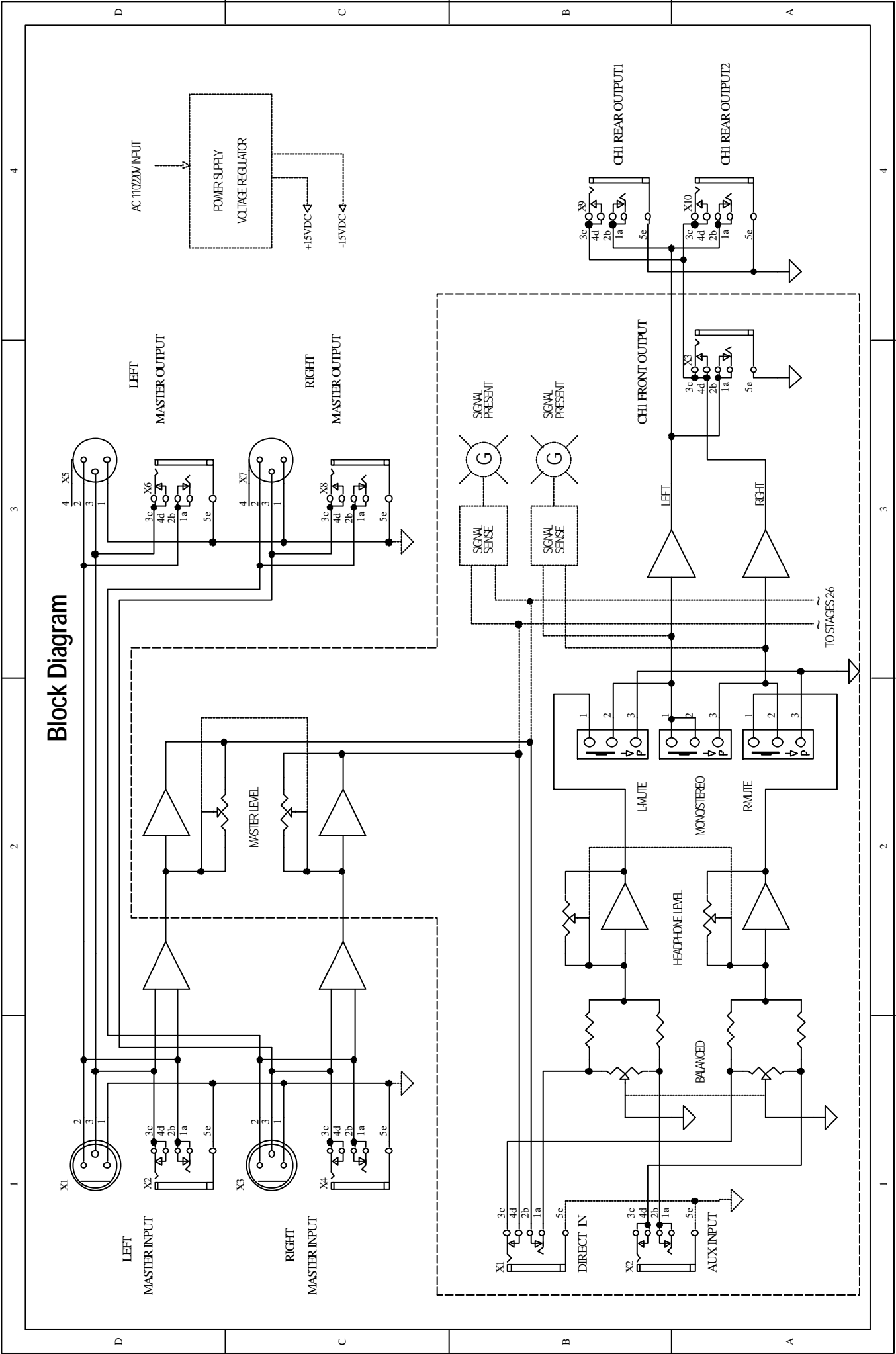
POWER SUPPLY

Mains voltages	USA/Canada	120V~,60Hz
	U.K./Australia	240V~,50Hz
	Europe	230V~,50Hz
	General exprot model 95-120~,210-240~,50-60Hz	
Power consumption	20 WATTS	
Fuse	100-120V~:T 315mAH	
	200-240V~:T 160mAH	
Mains connection	Standard IEC receptacle	

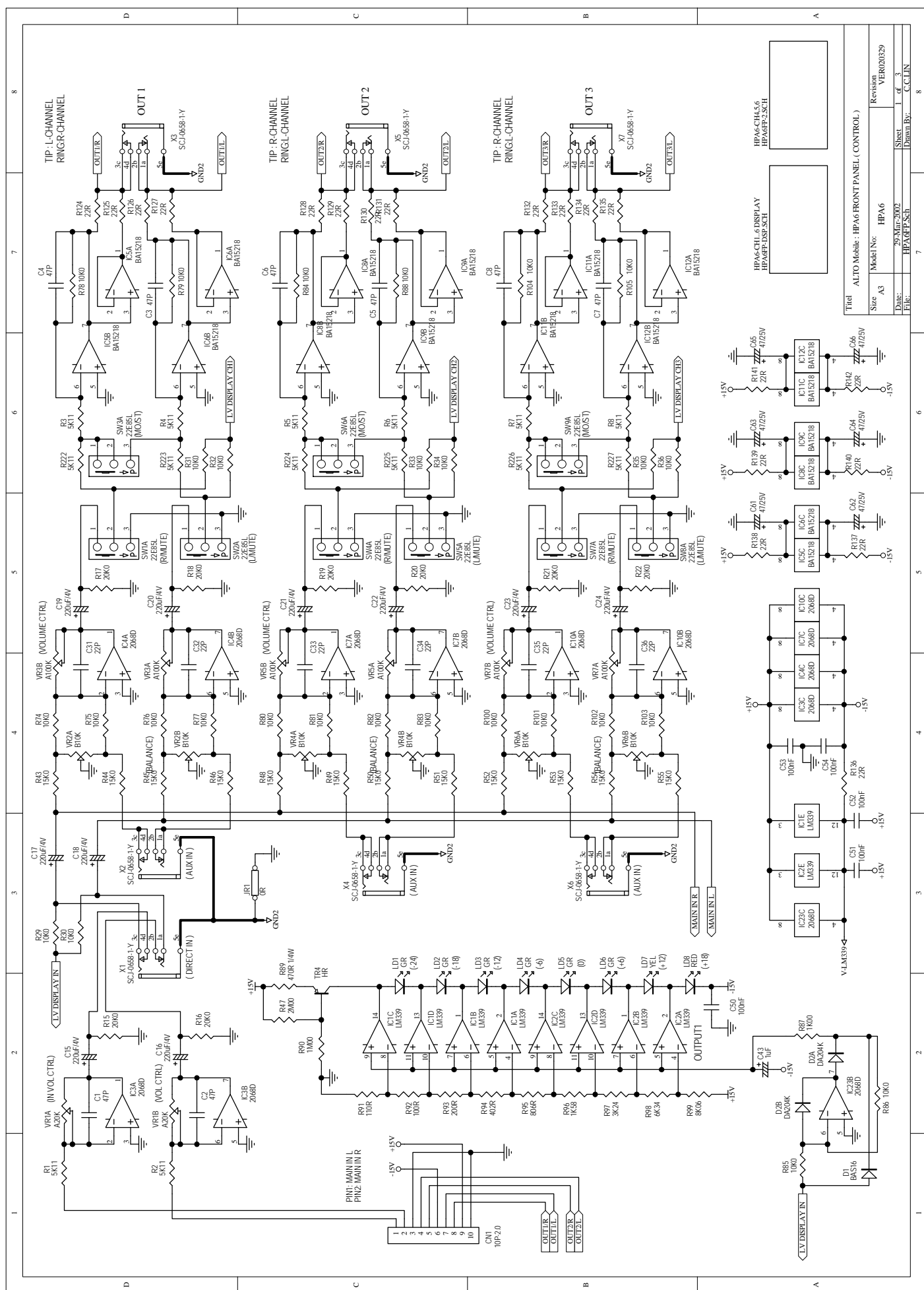
PHYSICAL

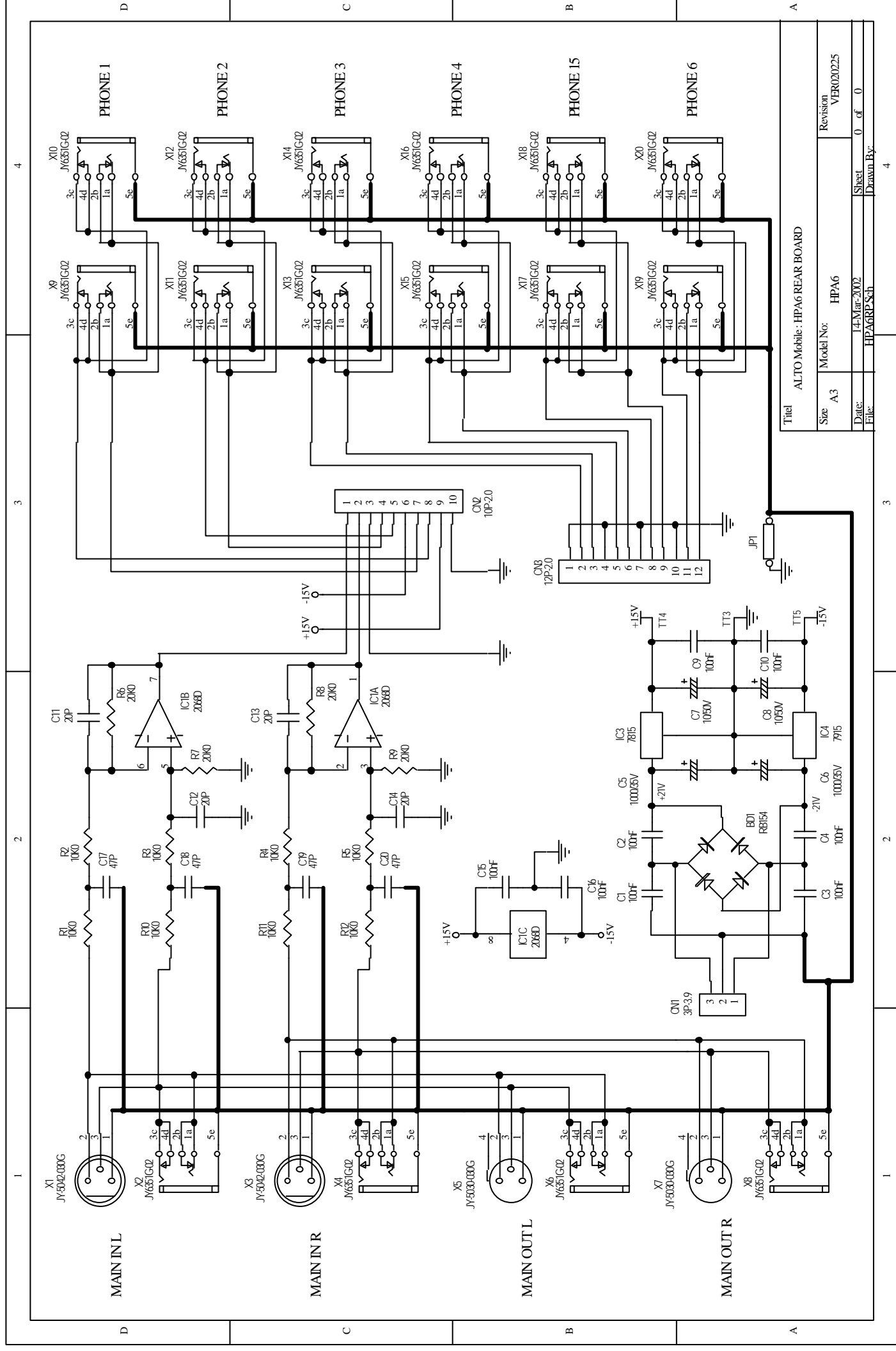
Dimension(W*H*D)	483*44*217mm
Net weight	approx.2.9kg

2.Block Diagram



3.Schematic Diagram

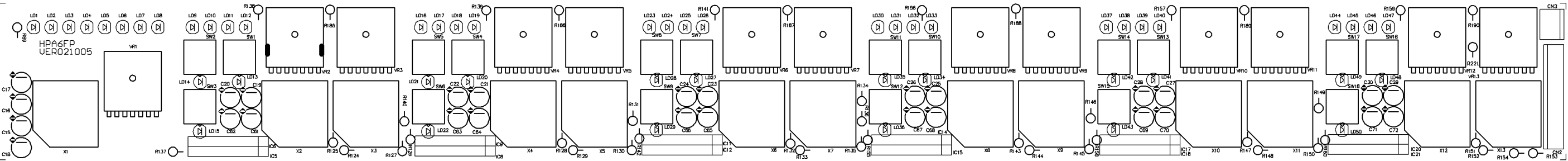




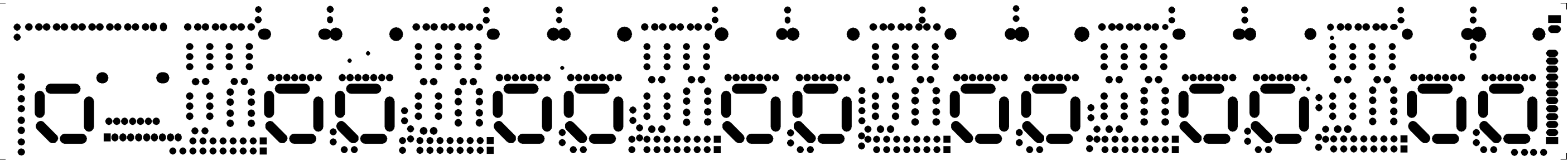
Titel ALTO Mobile : HPA6 REAR BOARD

Size	A3	Model No:	HPA6	Revision	VR020225
Date:	14 Mar 2002	Sheet	0	of	0
File:	HPA6RPSch	Drawn By:			

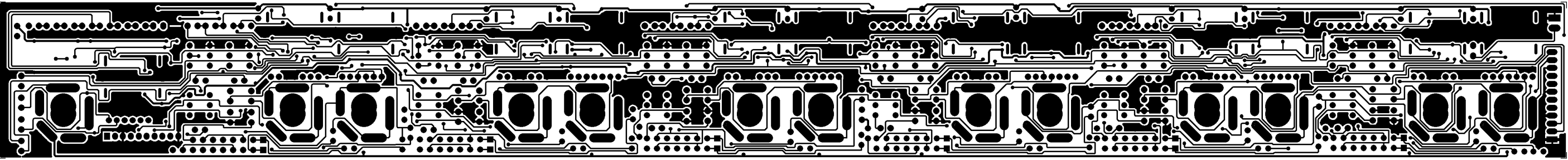
4.Printed Circuit Diagram



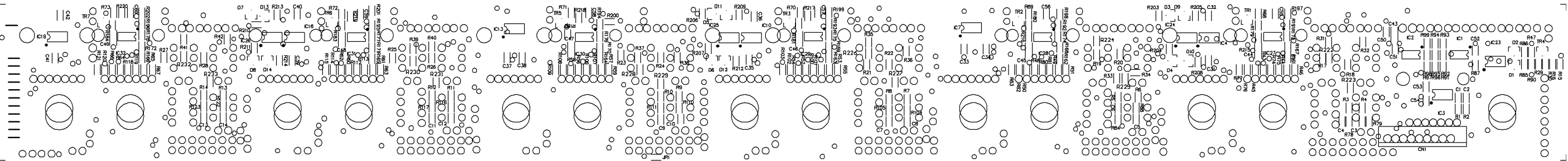
HPA6FP Top Scilkscreen



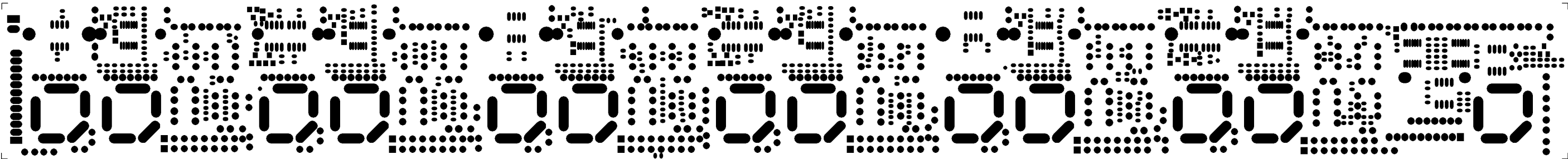
HPA6FP Top Solder Mask



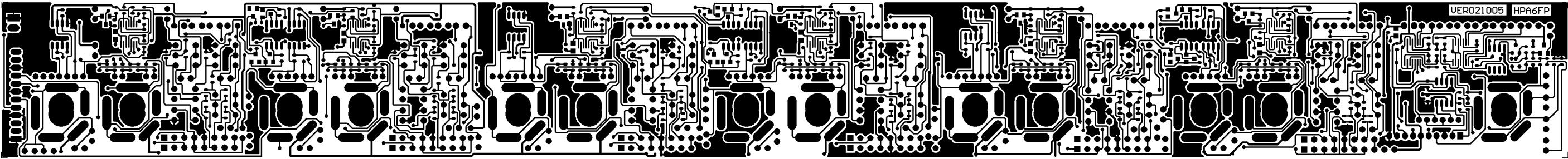
HPA6FP Top Layer



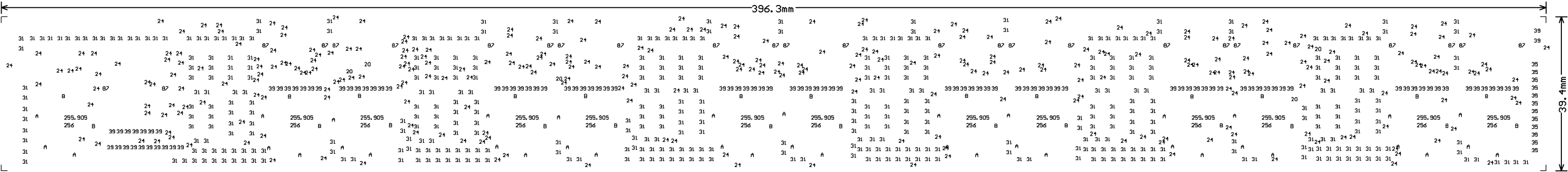
HPA6FP Bottom Scilkscreen



HPA6FP Bottom Solder Mask



HPA6FP Bottom Layer



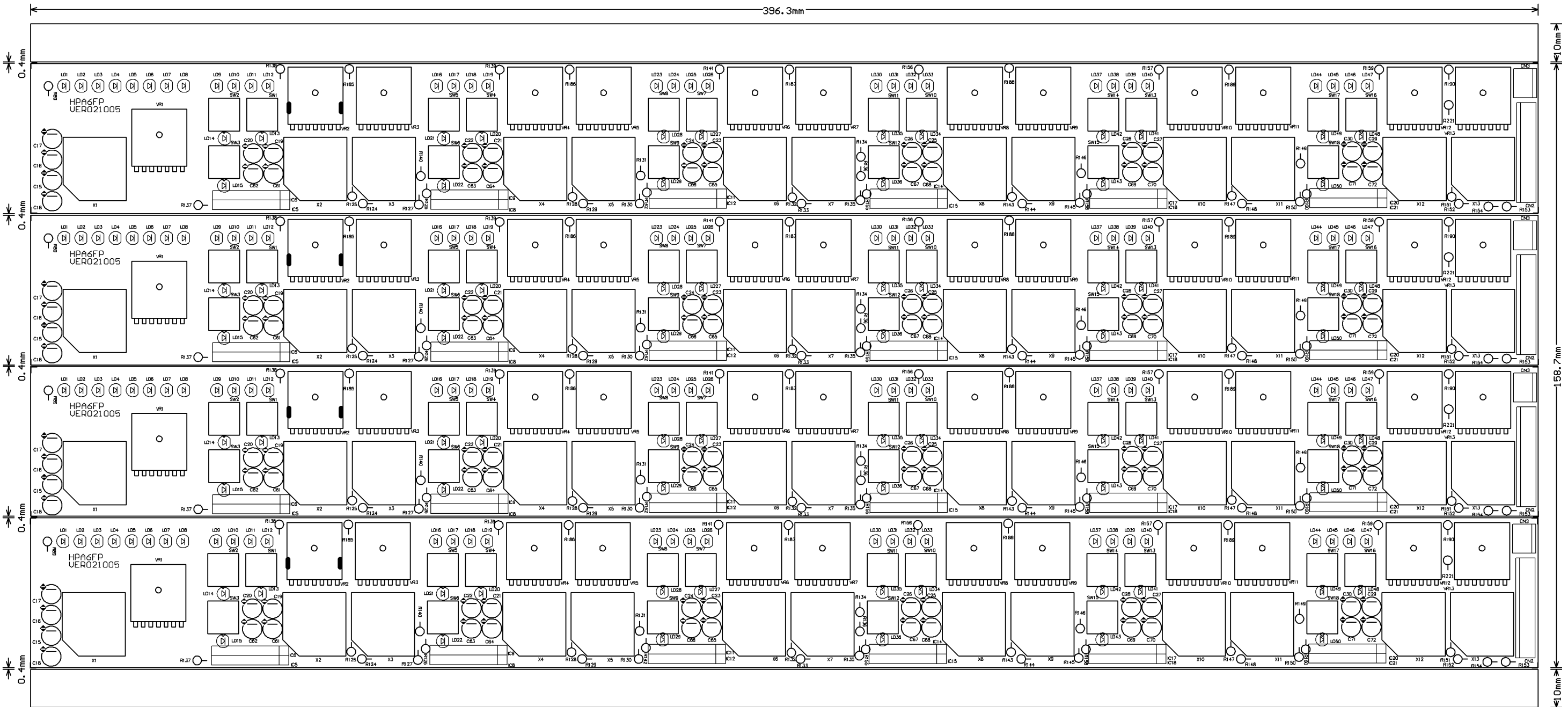
HPA6FP Drill Drawing

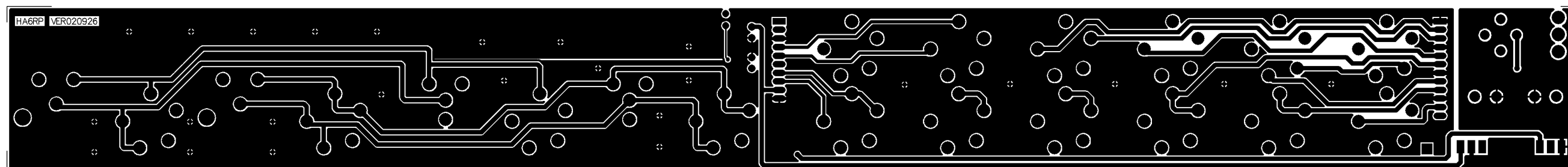
Tool	Hole Size	Hole Count Plated

T1	20mil (0.508mm)	5
T2	24mil (0.6096mm)	292
T3	31mil (0.7874mm)	450
T4	35mil (0.889mm)	12

T5	39mil (0.9906mm)	103	NPTH
T6	87mil (2.2098mm)	26	
T7	256mil (6.5024mm)	26	

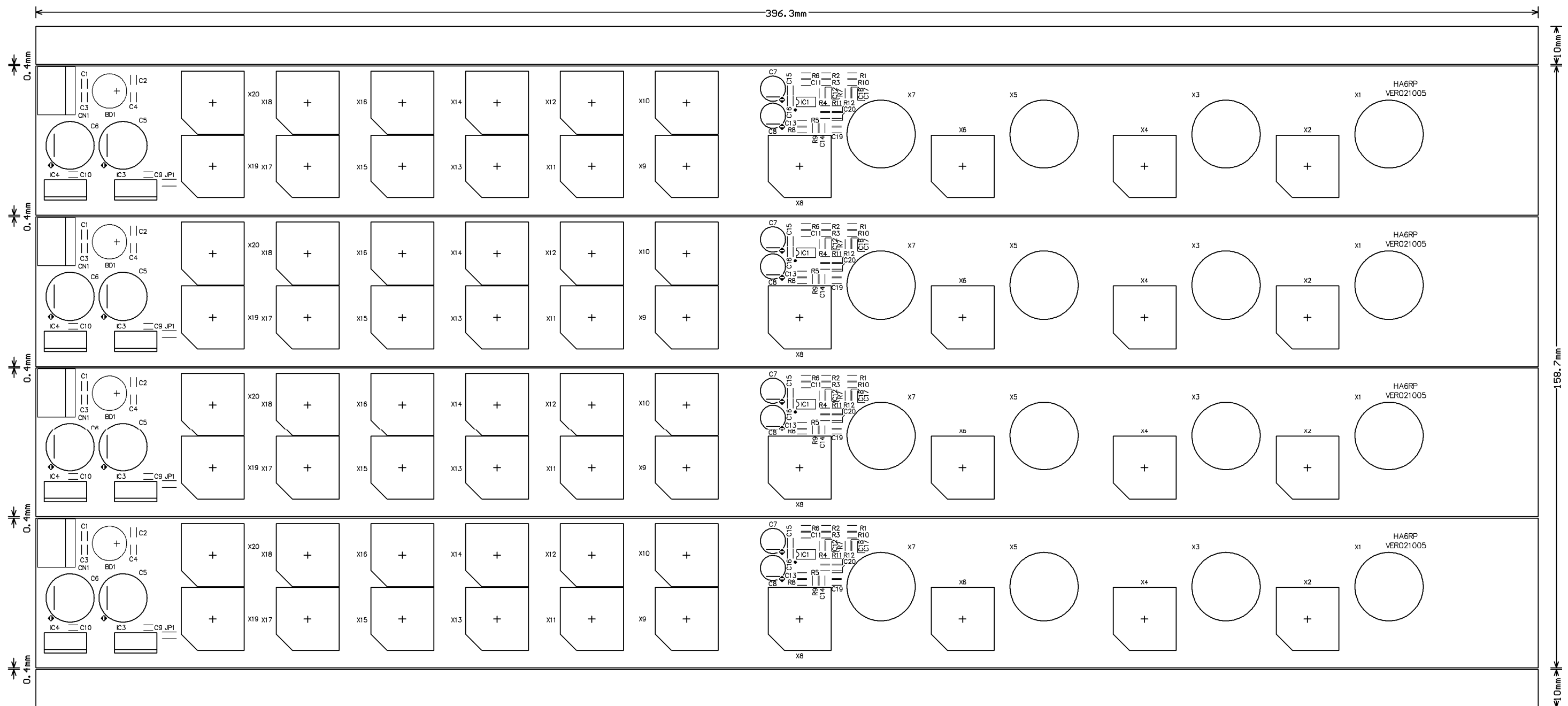
Totals		914	



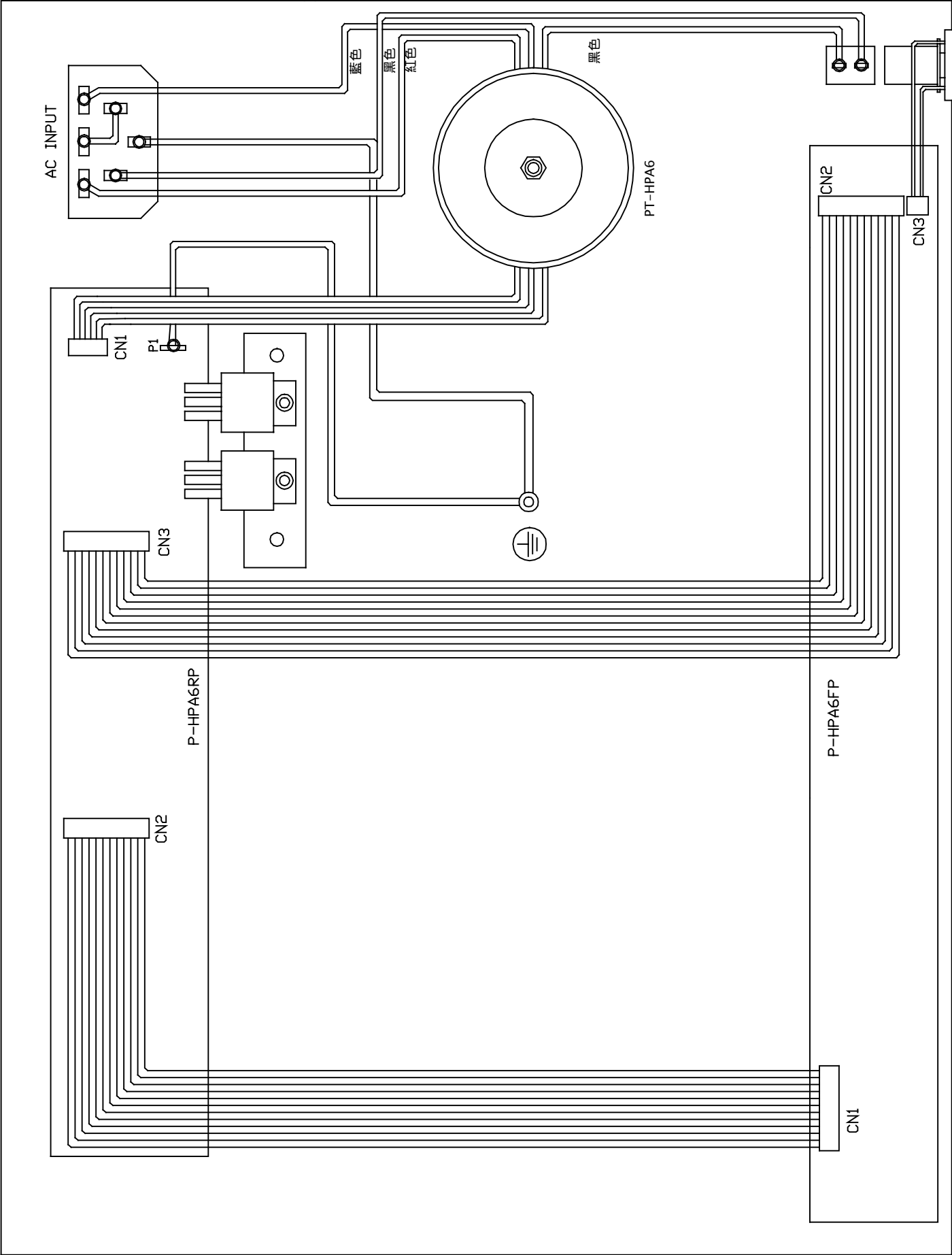


HPA6RP Drill Drawing

Tool	Hole Size	Hole Count Plated
T1	24mil (0.6096mm)	28
T2	31mil (0.7874mm)	10
T3	35mil (0.889mm)	22
T4	39mil (0.9906mm)	10
T5	47mil (1.1938mm)	2
T6	55mil (1.397mm)	6
T7	59mil (1.4986mm)	1
T8	63mil (1.6002mm)	9
T9	87mil (2.2098mm)	80
T10	110mil (2.794mm)	2
Totals		170



HPA6 全機配線圖



Test Procedures(HPA6)

Required Equipment

Audio Precision System 2 with APWin software

100MHz oscilloscope connected to APS2 Analyzer Signal Monitor output (Ch. A and Ch. B)

Connection Mode

Use Audio Precision System 2 analog unbalanced (XLR) inputs/output

Test Procedures for HPA6

Amplitude response test

On PC:

-Load file:amictube_amplitude(APWin File menu / Open / Test)

Test Connections:

- Output A of Audio Precision System Two \rightarrow LEFT input of the device under test.
- Output B of Audio Precision System Two \rightarrow RIGHT input of the device under test.
- LEFT output of the device under test \rightarrow A input of Audio Precision System Two.
- RIGHT output of the device under test \rightarrow B input of Audio Precision System Two.

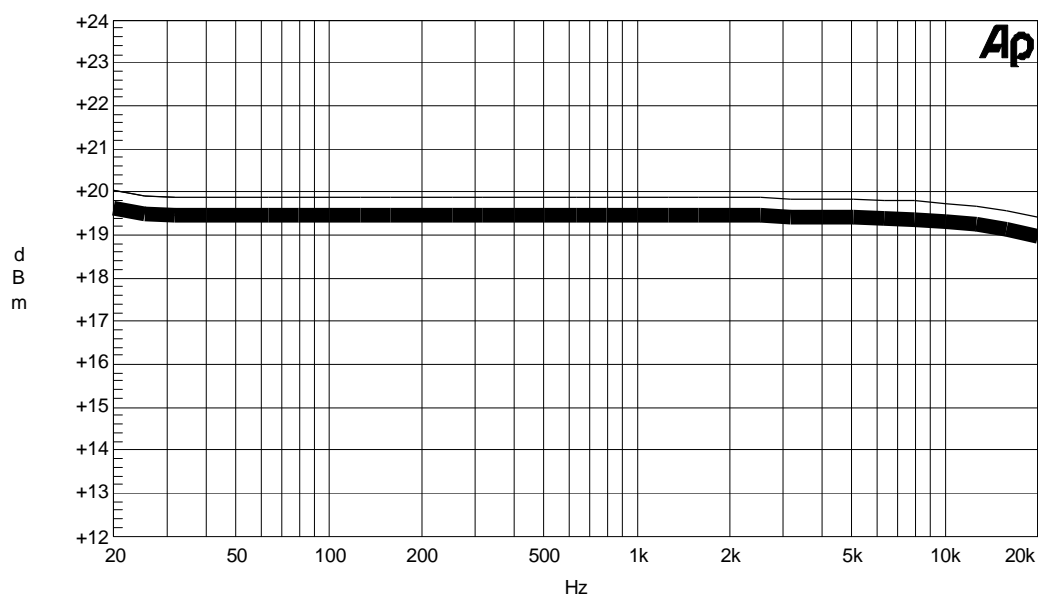
On the HPA6:

- Turn on the power switch.
- Set INPUT GAIN to maximum.
- Set OUTPUT GAIN to maximum.

Start the sweep (F9) and control the results (Page3 – Graph) in the following conditions:

SEKAKU

03/29/02 19:33:20



Color	Line Style	Thick	Data	Axis
Red	Solid	10	Anlr.Level A	Left
Magenta	Solid	1	Anlr.Level B	Left

Structure Needing Material Detail List

建檔日：2002/05/16 修正日：2002/09/26

<i>NO.</i>	<i>Midprod NO</i>	<i>Quantity</i>	<i>Unit</i>
1	A-HPA6-ALTO-230V-法國	1.000	PCS
2	A-HPA6底後板組合	1.000	PCS
3	P-HPA6FP-SMD	1.000	PCS
4	P-HPA6FP-DIP	1.000	PCS
5	P-HPA6RP-SMD	1.000	PCS
6	P-HPA6RP-DIP	1.000	PCS

Item No: HPA6

specify: AMP

Mid No: A-HPA6-ALTO-230V-法國 standard quantity: 1.000

NO	Material No	Item Name	Specific	Quantity	Unit	Ps
	1 MA03059	label	HPA6 ALTO	1.000	PCS	
MARK:						
	2 MC00385	toip cover	HPA6	1.000	PCS	
MARK:						
	3 NMBP64	plastic knob double	1C00L GRAY 8C	13.000	PCS	
MARK:						
	4 NPL272	cover	8.5*4 blue 072C	13.000	PCS	
MARK:						
	5 NMBA02	power push button	15*17	1.000	PCS	
MARK:						
	6 NPL285	switch cap	6*2.5 YELLOW C	1.000	PCS	
MARK:						
	7 DL43RG	L.E.D	LG2043 green	1.000	PCS	
MARK:						
	8 HSWA13	alimentation SW	SDDL B 1007U	1.000	PCS	
MARK:						
	9 HCSA16	AC outlett	(S)315-B (AC select)	1.000	PCS	
MARK:						
	10 HD00067	fuse	160mA 250V 5.2*20mm CS	1.000	PCS	
MARK:						
	11 MSCB28	black plated screw	flat self 3*4	6.000	PCS	
MARK:						
	12 MSCB34	black plated screw	pill 3*6	3.000	PCS	
MARK:						
	13 MSCB35	black plated screw	cross-head pan head 3*10	2.000	PCS	
MARK:						
	14 MSCB58	black plated screw	iron-board pill 3*10	8.000	PCS	
MARK:						
	15 MSCB03	black-plated screw	flat self 4*6	4.000	PCS	
MARK:						
	16 MSCN19	Ni screw	pill 3*8	2.000	PCS	穩壓晶體
MARK:						
	17 MFSS03	washer	3* 5*1t	4.000	PCS	
MARK:						
	18 MFSS04	washer	4* 7*1t	2.000	PCS	
MARK:						
	19 MSCC40	colour screw	pill 4*30	1.000	PCS	
MARK:						
	20 NLXC07	rubber coil	20* 60*2tB	1.000	PCS	
MARK:						
	21 MSTC04	colour nut	4m/m	2.000	PCS	
MARK:						
	22 MSTC03	colour nut	3m/m	2.000	PCS	
MARK:						
	23 ME00060	MIC stand nut	JY-6351G-02-250	29.000	PCS	
MARK:						
	24 MF00061	mic stand washer	JY-6351G-02-250	29.000	PCS	
MARK:						
	25 MFST01	washer	4* 8*0.5t	2.000	PCS	
MARK:						
	26 MFSC02	washer	4* 12*1t	1.000	PCS	
MARK:						
	27 HLSF126	row-wire connector wirir2P	100m/m	1.000	PCS	
MARK:						
	28 HLSP71	P.V.C single wave wired	UL1617 22AWG 80m/m brown	1.000	PCS	
MARK:						

Item No: HPA6

specify: AMP

Mid No: A-HPA6-ALTO-230V-法國 standard quantity: 1.000

NO	Material No	Item Name	Specific	Quantity	Unit	Ps
29	HLSP164	P.V.C wiring	UL1617 AWG22 250mm black	1.000	PCS	
MARK:						
30	HLSC76	single terminal wiring (green/yellow 150m/m		2.000	PCS	
MARK:						
31	HLSA31	power cord	Europe 3P LT-312+LT-501	1.000	PCS	
MARK:						
32	NI00839	power switch button	5*5*15(內3.3*3.3)black	18.000	PCS	
MARK:						
33	NMCT16WW0010	sleeving flame retardant	2.5 *10m/m	2.000	PCS	
MARK:						
34	NMCT19WW0020	sleeving flame retardant	4 *20m/m	8.000	PCS	
MARK:						
35	MHLB15ZZ	heat-sink	65*18*4 SCX-P234	1.000	PCS	
MARK:						
36	STR802-T2	silicone insulator	T0-220 square type	2.000		
MARK:						
37	NI02249	caushion	TW-1(T0-220)	2.000	PCS	
MARK:						
38	NLXM39	self-paste foot pad(SF-(12.7*9.0*3.0t		4.000	PCS	
MARK:						
39	NWCP04	lockable bag	5*7	1.000	PCS	
MARK:						
40	NWCP01WW0300*0580PE	bag	30*58cm	1.000	PCS	
MARK:						
41	HEM083	desiccant	30g	1.000		
MARK:						
42	NMLZ779	label	SCL-2020 black/white	1.000		
MARK:						
43	NMLB1680ZZ	label	HPA6 ALTO	2.000		
MARK:						
44	NE05004	label	ALTO	4.000		內箱,外箱,保
MARK:						
45	NF00989	instruction	HPA 6 ALTO	1.000		
MARK:						
46	NB01720	box	ALTO 19"系列	1.000	PCS	
MARK:						
47	PKMS153	sponge barrier	ALTO 19"	1.000	PCS	
MARK:						
48	PKMS156	barrier	ALTO19"	1.000	PCS	
MARK:						
49	POA182	paper outter case 4 hole	ALTO 19"	0.250	PCS	
MARK:						
50	NMCQ-073	assurance book	ALTO	1.000		
MARK:						
51	TD00118	transformer	PT-CLE40	1.000	PCS	
MARK:						
52	NE05205	label	HPA6	4.000		內箱,外箱,保
MARK:						
53	NA00154	box	ALTO	2.000	PCS	
MARK:						
54	SIC719	integrated circuit	7915	1.000	PCS	
MARK:						
55	SIC717	integrated circuit	7815	1.000	PCS	
MARK:						
56	NE05864	label	Amplificateur	2.000		
MARK:						

Item No: HPA6

specify: AMP

Mid No: A-HPA6-ALTO-230V-法國 standard quantity: 1.000

NO	Material No	Item Name	Specific	Quantity	Unit	Ps
57	NI02097	power switch	18.5*10 072C藍	1.000	PCS	

MARK:

Item No: HPA6

specify: AMP

Mid No: standard quantity:

NO	Material No	Item Name	Specific	Quantity	Unit	Ps
	1 MB01998	rear board	HPA6	1.000	PCS	
MARK:						
	2 MSC030		M3*10*0.5PH	2.000	PCS	
MARK:						
	3 MSC023	screw pillar	M4*10*0.7PH	1.000	PCS	
MARK:						
	4 MAPR80ZZ	L-shape fixed bracket	1.2*28*20*10(CLE2.0)	1.000	PCS	
MARK:						

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specify: AMP
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Mid No: standard quantity:

NO	Material No	Item Name	Specific	Quantity	Unit	Ps
1	HB00676	PCB	HPA6FP(1*4)_VER021005	1.000	PCS	
MARK:						
2	RFCF000	SMD 1/10W fixed resistor	0 ±5% 0603	1.000	PCS	
MARK:JR 1						
3	RPCA0100	SMD 1/10W precise resis	100 ±1% 0603	1.000	PCS	
MARK:R 92						
4	RPCA0110	SMD 1/10W precise resis	110 ±1% 0603	1.000	PCS	
MARK:R 91						
5	RPCA0200	SMD 1/10W precise resis	200 ±1% 0603	1.000	PCS	
MARK:R 93						
6	RPCA0402	SMD 1/10W precise resis	402 ±1% 0603	7.000	PCS	
MARK:R 161 162 163 164 165 166 94						
7	RPCA0806	SMD 1/10W precise resis	806 ±1% 0603	1.000	PCS	
MARK:R 95						
8	RPCA1100	SMD 1/10W precise resis	1.00K ±1% 0603	7.000	PCS	
MARK:R 215 216 217 218 219 220 87						
9	RPCA1158	SMD 1/10W precise resis	1.58K ±1% 0603	1.000	PCS	
MARK:R 96						
10	RD00285	resistor	3.24K ±1% 0603	1.000	PCS	
MARK:R 97						
11	RPCA1511	SMD 1/10W precise resis	5.11K ±1% 0603	26.000	PCS	
MARK:R 1 10 11 12 13 14 2 222 223 224 225 226 227 228 229 230 231 232 233 3 4 5 6 7 8 9						
12	RD00287	resistor	6.34K ±1% 0603	1.000	PCS	
MARK:R 98						
13	RPCA1806	SMD 1/10W precise resis	8.06K ±1% 0603	7.000	PCS	
MARK:R 167 168 169 170 171 172 99						
14	RPCA2100	SMD 1/10W precise resis	10.0K ±1% 0603	64.000	PCS	
MARK:R 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 203 204 205 206 207 208 209 210 211 212 213 214 29 30 31 32 33 34 35 36 37 38 39 40 41 42 74 75 76 77 78 79 80 81 82 83 84 85 86 88						
15	RPCA2110	SMD 1/10W precise resis	11.0K ±1% 0603	6.000	PCS	
MARK:R 173 174 175 176 177 178						
16	RPCA2150	SMD 1/10W precise resis	15.0K ±1% 0603	24.000	PCS	
MARK:R 43 44 45 46 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67						
17	RPCA2200	SMD 1/10W precise resis	20.0K ±1% 0603	14.000	PCS	
MARK:R 15 16 17 18 19 20 21 22 23 24 25 26 27 28						
18	RD00317	resistor	39.2K ±1% 0603	6.000	PCS	
MARK:R 191 192 193 194 195 196						
19	RPCA3200	SMD 1/10W precise resis	200K ±1% 0603	6.000	PCS	
MARK:R 197 198 199 200 201 202						
20	RPCA4100	SMD 1/10W precise resis	1.00M ±1% 0603	7.000	PCS	
MARK:R 179 180 181 182 183 184 90						
21	RPCA4200	SMD 1/10W precise resis	2.00M ±1% 0603	7.000	PCS	
MARK:R 47 68 69 70 71 72 73						
22	CCE022B	SMD0603 ceramic capacit	22PF NPO ±5% -5C	12.000	PCS	
MARK:C 31 32 33 34 35 36 37 38 39 40 41 42						
23	CCE047B	SMD0603 ceramic capacit	47PF NPO ±5% -5C	14.000	PCS	
MARK:C 1 10 11 12 13 14 2 3 4 5 6 7 8 9						
24	CI00128	capacitor	0.1uF/25V Y5V +80,-20%	11.000	PCS	
MARK:C 50 51 52 53 54 55 56 57 58 59 60						

Item No: HPA6

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specify: AMP
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Mid No: standard quantity:

NO	Material No	Item Name	Specific	Quantity	Unit	Ps
25	CCC510F	SMD0805 ceramic capacitor	1uF/16V Y5V-0805(201	7.000	PCS	
MARK:C 43 44 45 46 47 48 49						
26	STRS103	SMD transistor	2SA1036K(R)(MMBT3906LT1)	7.000	PCS	
MARK:TR 1 2 3 4 5 6 7						
27	DRS0004	SMD rectifier diode	BAS16(SOT-23)	7.000	PCS	
MARK:D 1 3 4 5 6 7 8						
28	DRS0002	SMD rectifier diode	DA204K/T-146	7.000	PCS	
MARK:D 10 11 12 13 14 2 9						
29	SICS202	SMD integrated circuit	NJM2068M-TE1(LM833D)	11.000	PCS	
MARK:IC 10 13 16 19 23 24 25 26 3 4 7						
30	SICS115	SMD integrated circuit	BA10339FV E2	8.000	PCS	
MARK:IC 1 2 27 28 29 30 31 32						

Item No: HPA6

specify: AMP

Mid No: standard quantity:

NO	Material No	Item Name	Specific	Quantity	Unit	Ps
1	RFB212F	1/4W fixed resistor	1.2K F type	1.000	PCS	
MARK:R 221						
2	RA00679	resistor	22 F	37.000	PCS	
MARK:R 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160						
3	RFB147F	1/4W fixed resistor	470 F type	7.000	PCS	
MARK:R 185 186 187 188 189 190 89						
4	CE722C-1	electrolytic capacitor	220uF/10V 5*11	16.000	PCS	
MARK:C 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30						
5	CE647E	electrotytic capacitor	47/25V	12.000	PCS	
MARK:C 61 62 63 64 65 66 67 68 69 70 71 72						
6	DL47CG	light emitting diode	circle*square green	24.000	PCS	
MARK:LD 1 10 15 16 17 2 22 23 24 29 3 30 31 36 37 38 4 43 44 45 5 50 6 9						
7	DL47CR	light emitting diode	circle*square red	7.000	PCS	
MARK:LD 12 19 26 33 40 47 8						
8	DL47CY	light emitting diode	circle*square yellow	19.000	PCS	
MARK:LD 11 13 14 18 20 21 25 27 28 32 34 35 39 41 42 46 48 49 7						
9	NI01793	LED spacer support	LEDS-17 17mm	44.000	PCS	
MARK:						
10	NI01765	LED separating pillar	LEDS-10 10mm	6.000	PCS	
MARK:						
11	SIC106	integrated circuit	BA15218N (M5218L substit	12.000	PCS	
MARK:IC 11 12 14 15 17 18 20 21 5 6 8 9						
12	RC00203	potentiometer	A100K L:35 R1411GOA-V1	6.000	PCS	
MARK:VR 11 13 3 5 7 9						
13	RC00204	potentiometer	A20K L:35 R1411GOA-V1A	1.000	PCS	
MARK:VR 1						
14	RC00205	potentiometer	B10K L:35 R1411GOA-V1E	6.000	PCS	
MARK:VR 10 12 2 4 6 8						
15	HI00162	sw	PS-22E8552L(3.3x3.3)	18.000	PCS	
MARK:SW 1 10 11 12 13 14 15 16 17 18 2 3 4 5 6 7 8 9						
16	HCSI0202	row-wire header	2P 2.5mm 180 °	1.000	PCS	
MARK:CN 3						
17	HA02084		10P-10P 220mm	1.000	PCS	
MARK:CN 1						
18	HA02078		12P-12P 220	1.000	PCS	
MARK:CN 2						
19	HC00371	MIC jack	SCJ-0658-1-Y	13.000	PCS	
MARK:X 1 10 11 12 13 2 3 4 5 6 7 8 9						

Item No: HPA6

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specify: AMP
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Mid No: standard quantity:

NO	Material No	Item Name	Specific	Quantity	Unit	Ps
1	HB00677	PCB	HPA6RP(1*4)_VER021005	1.000	PCS	
MARK:						
2	RPCA2100	SMD 1/10W precise resis	10.0K ±1% 0603	8.000	PCS	
MARK:R 1 10 11 12 2 3 4 5						
3	RPCA2200	SMD 1/10W precise resis	20.0K ±1% 0603	4.000	PCS	
MARK:R 6 7 8 9						
4	RFCE000	SMD 1/10W fixed resistor	0 ±5% 0805	1.000	PCS	
MARK:JP 1						
5	CCE020B	SMD0603 ceramic capacitc	20PF NPO ±5% -50V	4.000	PCS	
MARK:C 11 12 13 14						
6	CCE047B	SMD0603 ceramic capacitc	47PF NPO ±5% -50	4.000	PCS	
MARK:C 17 18 19 20						
7	CI00128	capacitor	0.1uF/25V Y5V +80,-20%	8.000	PCS	
MARK:C 1 10 15 16 2 3 4 9						
8	SICS202	SMD integrated circuit	NJM2068M-TE1(LM833D)	1.000	PCS	
MARK:IC 1						

Item No: HPA6

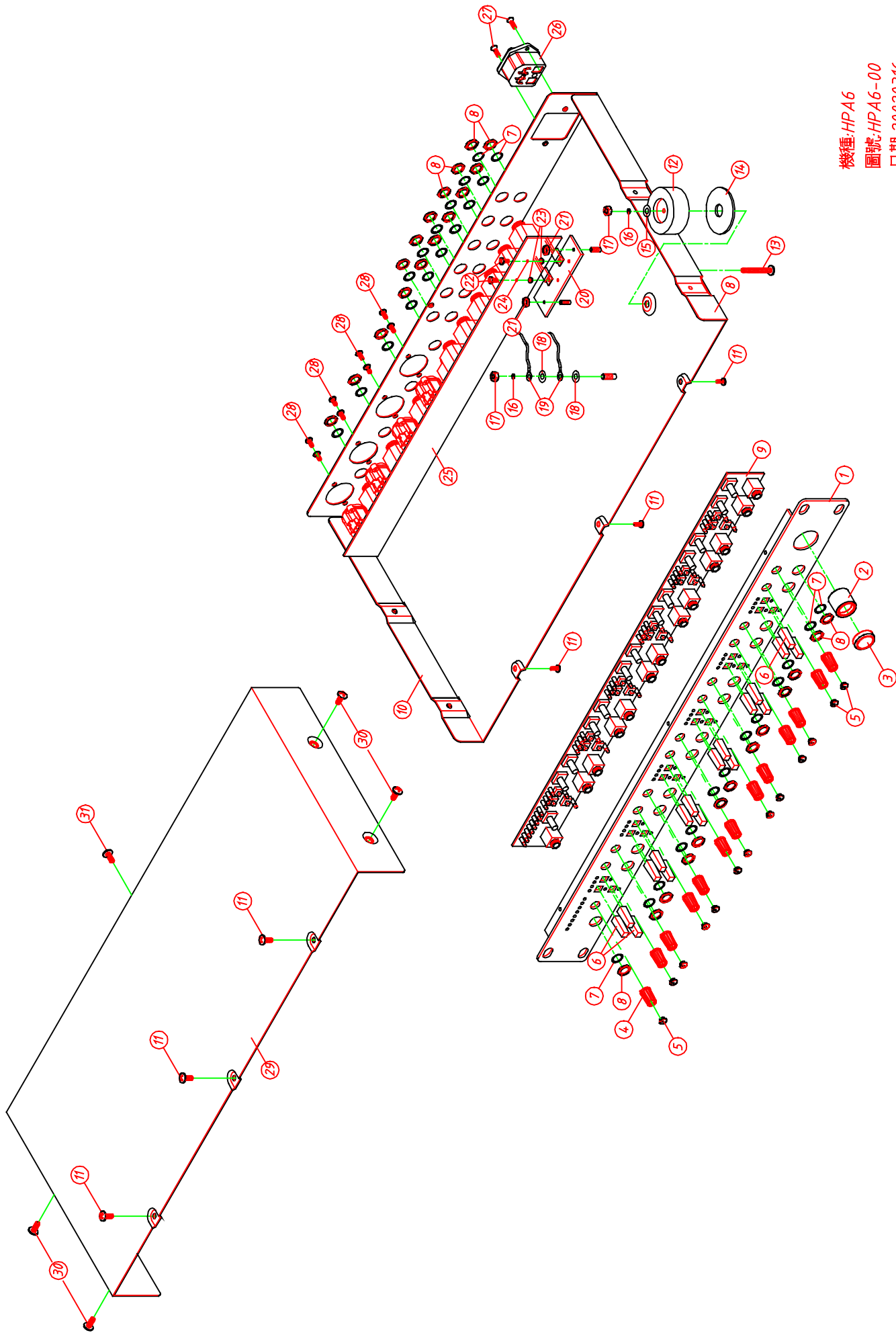
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specify: AMP
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Mid No: standard quantity:

NO	Material No	Item Name	Specific	Quantity	Unit	Ps
1	CE610S	electrolytic capacitor	10/50V 6.3*7	2.000	PCS	
MARK:C 7 8						
2	CE810F	electrolytic capacitor	1000/35V	2.000	PCS	
MARK:C 5 6						
3	DB001A	bridge rectifier	RB154 1A/400V	1.000	PCS	
MARK:BD 1						
4	HCSV0210	row wire header	10P 2.0mm 180 °	1.000	PCS	
MARK:CN 2						
5	HCSV0212	row-wire header	12P 2.0mm 180 °	1.000	PCS	
MARK:CN 3						
6	HCSJ0203	row-wire header	3P 3.9mm 180 °	1.000	PCS	
MARK:CN 1						
7	HC00392	balance mic socket	JY-5030-030G 公插插板式	2.000	PCS	
MARK:X 5 7						
8	HC00371	MIC jack	SCJ-0658-1-Y	16.000	PCS	
MARK:X 10 11 12 13 14 15 16 17 18 19 2 20 4 6 8 9						
9	HCSM61	MIC jack for balance	JY-5042-030G female plug	2.000	PCS	
MARK:X 1 3						

8.Exploded Views

SEIKAKU



機種:HPA6
圖號:HPA6-00
日期:20020316