

Service Manual

Model: MINI-TUBE

NONO TUBE PREAMP



www.altoproaudio.com

Version: 1.1

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1. Specification

MINI-TUBE TECHNICAL SPECIFICATIONS :

Preamp Bandwidth : 20Hz~50KHz/±2dB

Number of Channels : One

Performance :

THD+Noise : 0.05% @ GAIN +0dBu (A-Weighting)

OUTPUT LEVEL(MAX) : +22dBu

Noise Floor : -88dBu(±2 dBu)

Signal to Noise : >108dBu

Input :

Connectors : XLR and 1/4"

Input Impedance, XLR : 1.3K Ohms

Input Impedance, High Z 1/4 : 1Meg Ohms

Output :

Output Impedance, XLR Balanced : 51Ohms

Output Impedance, High Z 1/4"TRS Unbalanced : 51Ohms

Panel Controls :

Tube Drive : 0dB~+40dB

Gain : 0dB~+30dB

Phase Reversal

-20dB Pad

+48V Phantom Power

Metering :

VU Meter : -20dBu~+5dBu

Clip LED : +20dBu

Power Supply :

Input : 18VAC/1000mA

Power : 12 WATT

Physical :

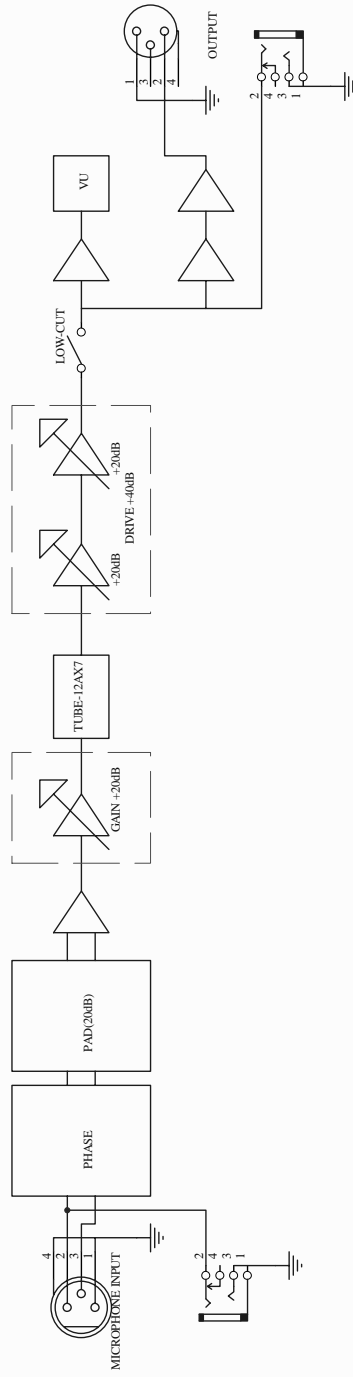
Weight : 0.7Kg

Size : 1U Rack

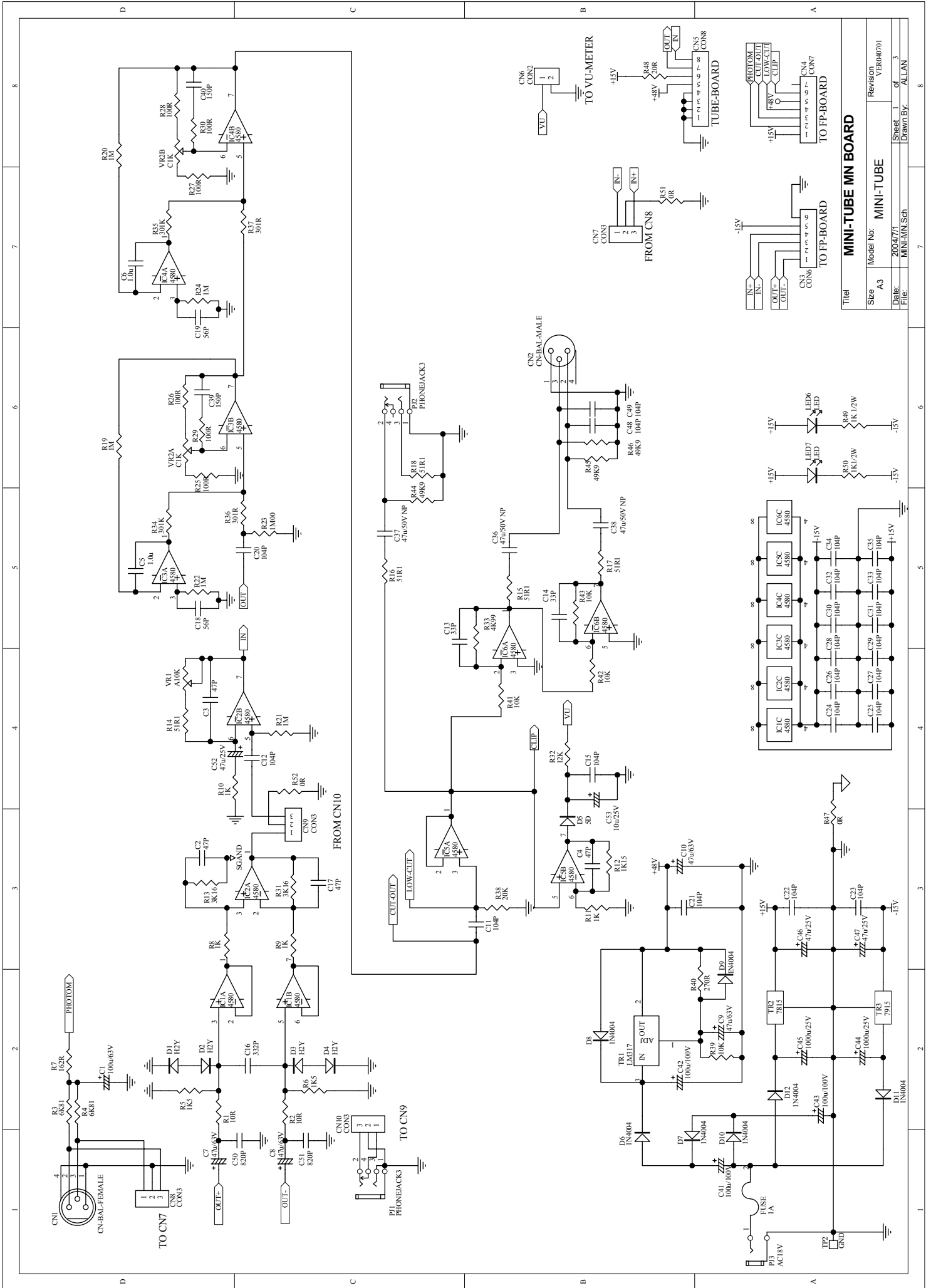
Dimension : W*D*H 210*93*44

2.Black Diagram

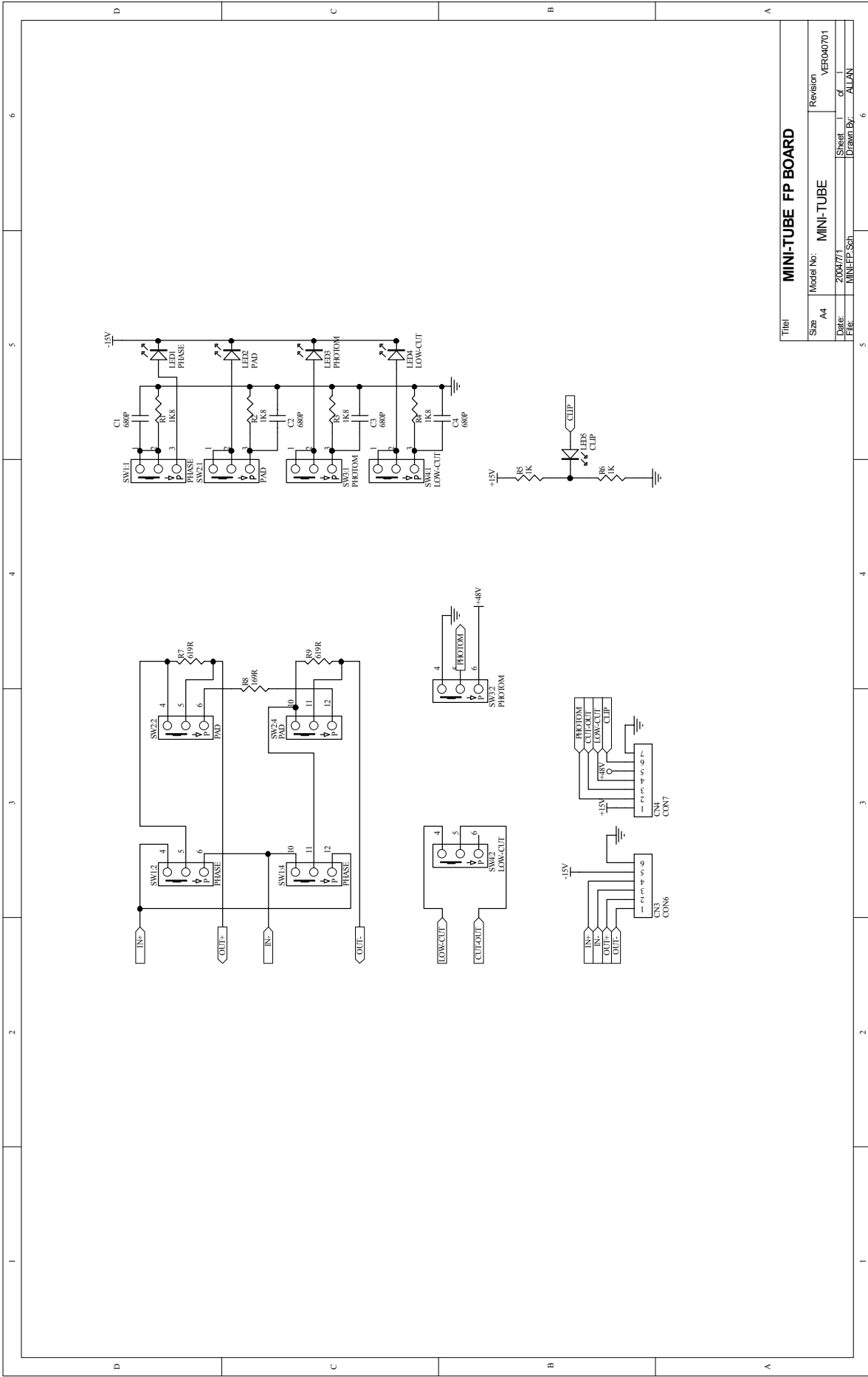
BLOAK DIAGRAM



3. Schematic Diagram



MINI-TUBE MN BOARD			
Title	Model No:	Revision	Sheet
A3	MINI-TUBE	VER040701	1 of 3
Date:	2004/7/1	File:	MINI-MN.Sch
		Drawn By:	ALLAN



Title		MINI-TUBE FP BOARD	
Size	A4	Model No.	MINI-TUBE
Date	2008/7/1	Revision	VER040701
File	MINI-FP.Sch	Sheet	of
		Drawn By:	JALAN

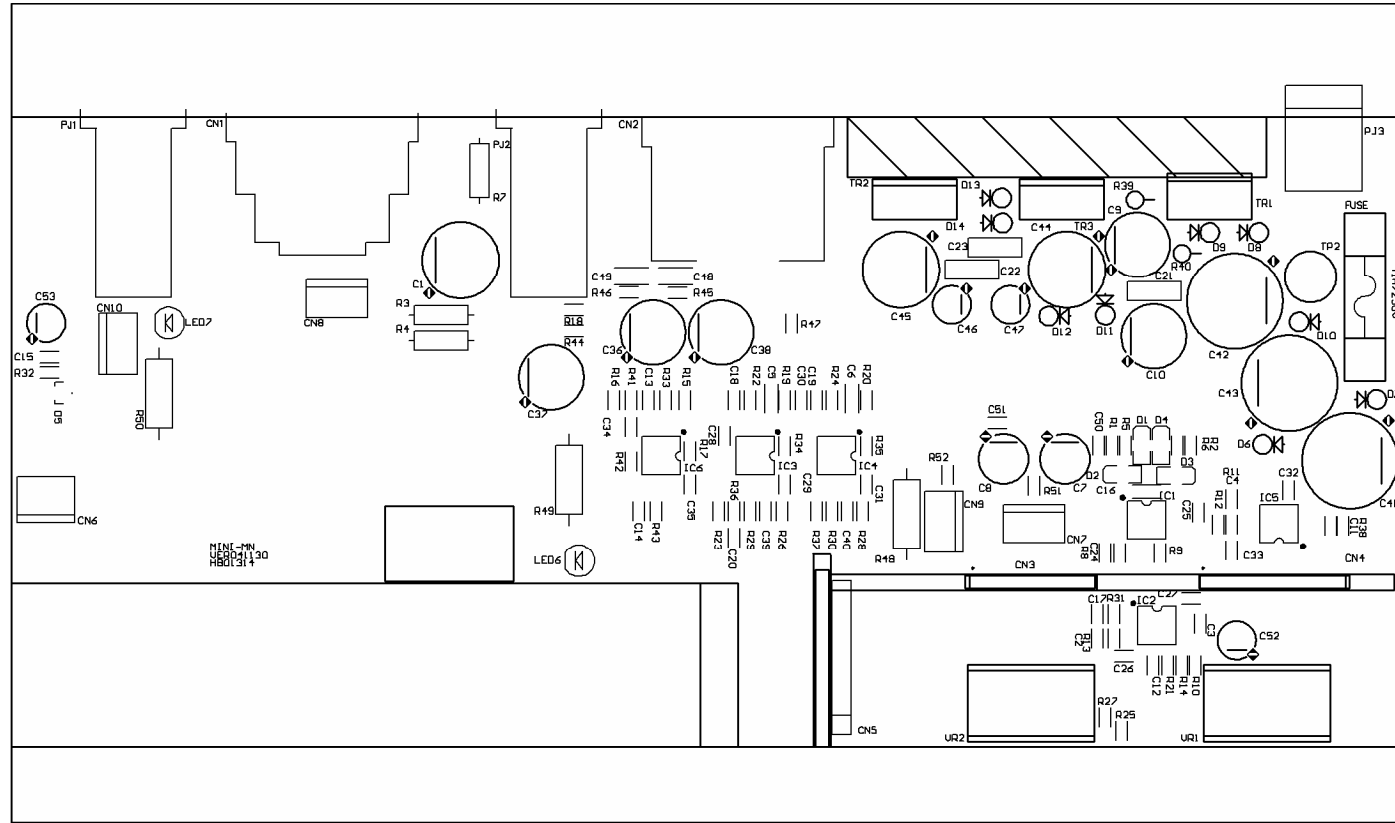
1 2 3 4 5 6

1 2 3 4 5 6

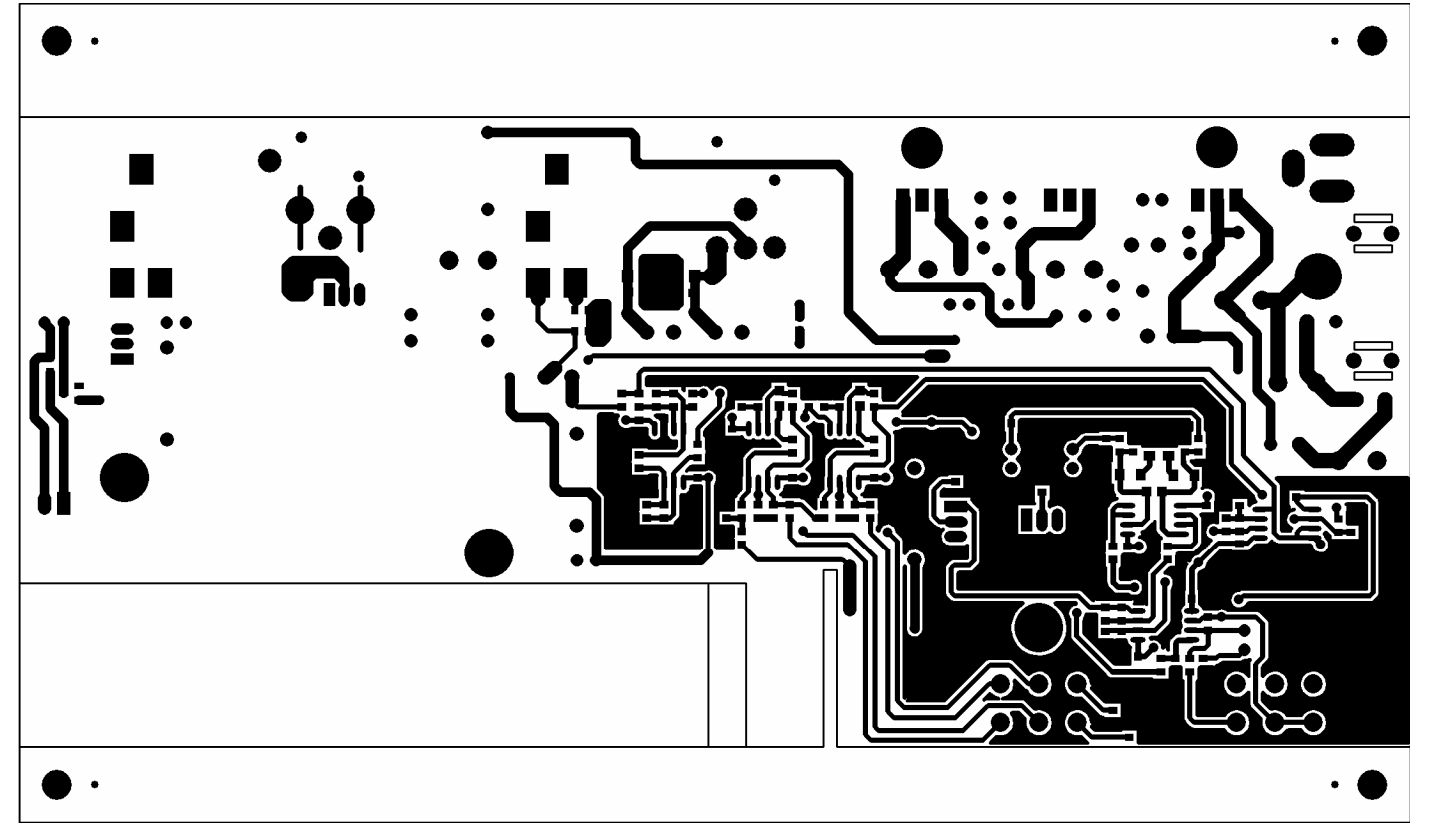
D C B A

D C B A

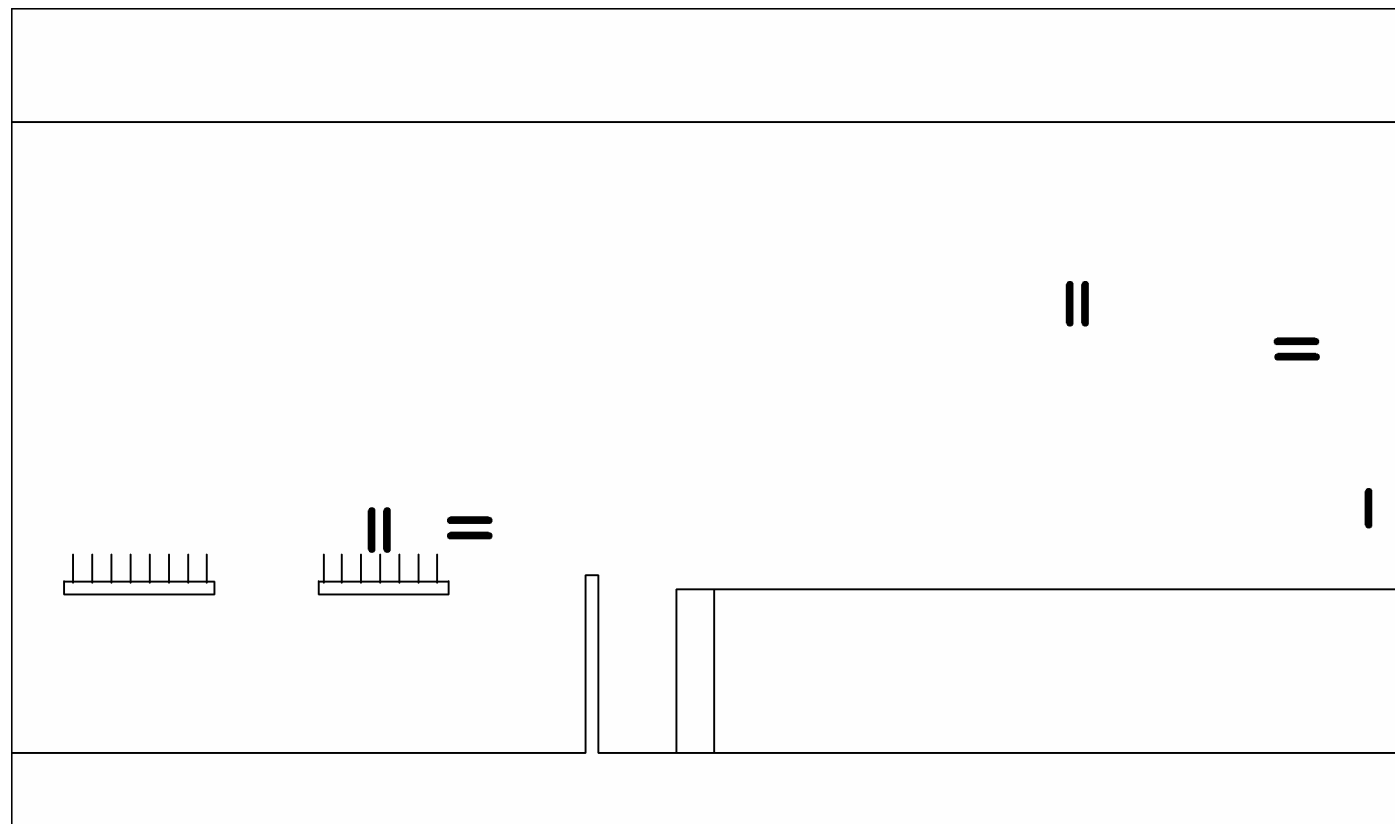
4.PRINTED CIRCUIT BOARD



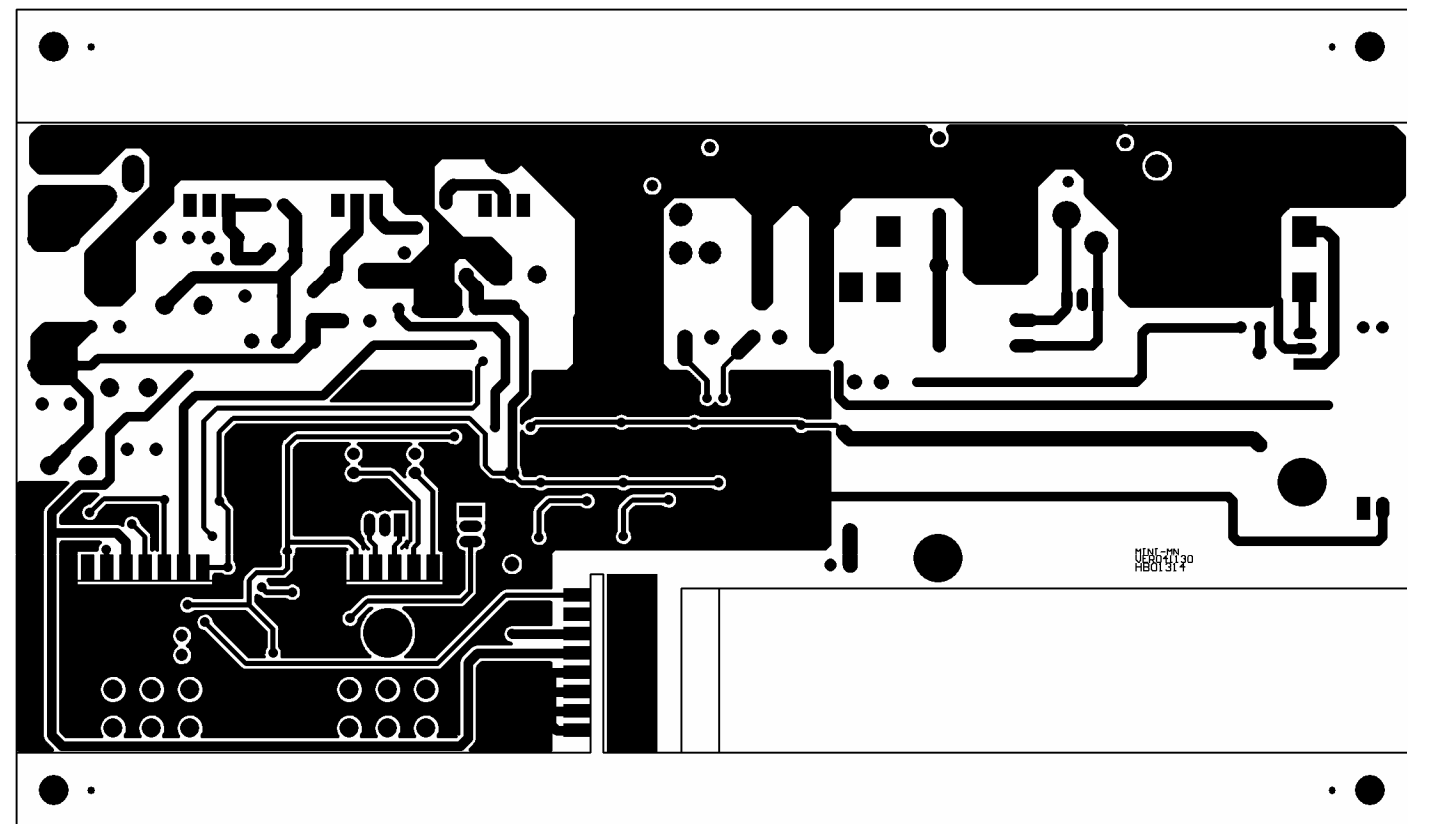
MINI-MN Top overlay



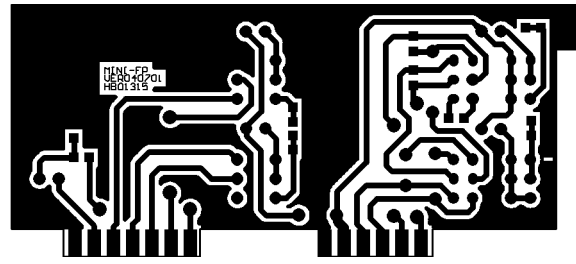
MINI-MN Top Layer



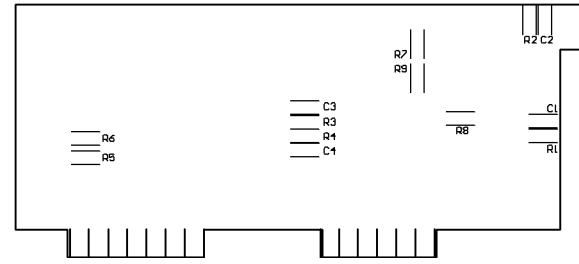
MINI-MN Bottom overlay



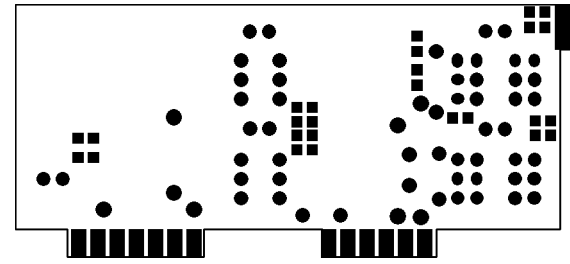
MINI-MN Bottom Layer



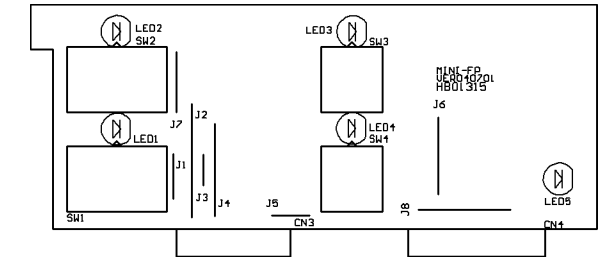
MINI-FP Bottom Layer



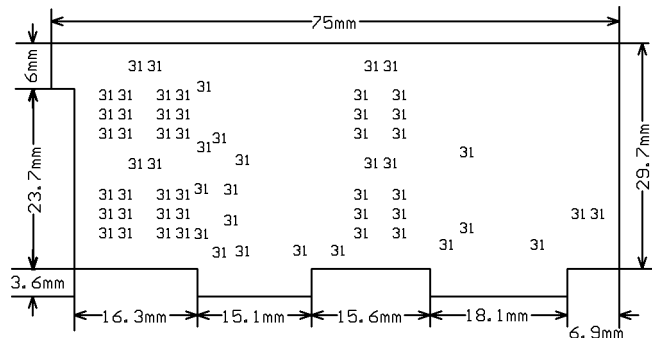
MINI-FP Bottom overlay



MINI-FP Bottom Solder Mask

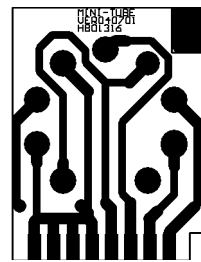


MINI-FP Top overlay

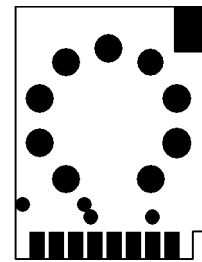


MINI-FP Drill Drawing

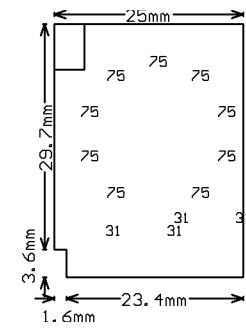
Tool	Hole Size	Hole Count Plated
T1	31mil (0.7874mm)	62
Totals		62



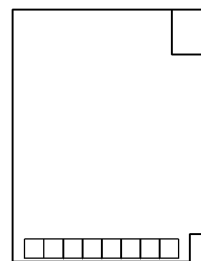
MINI-TUBE Bottom Layer



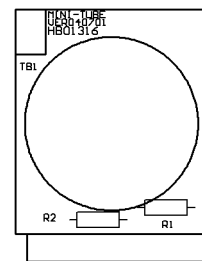
MINI-TUBE Bottom Solder Mask



MINI-TUBE Drill Drawing



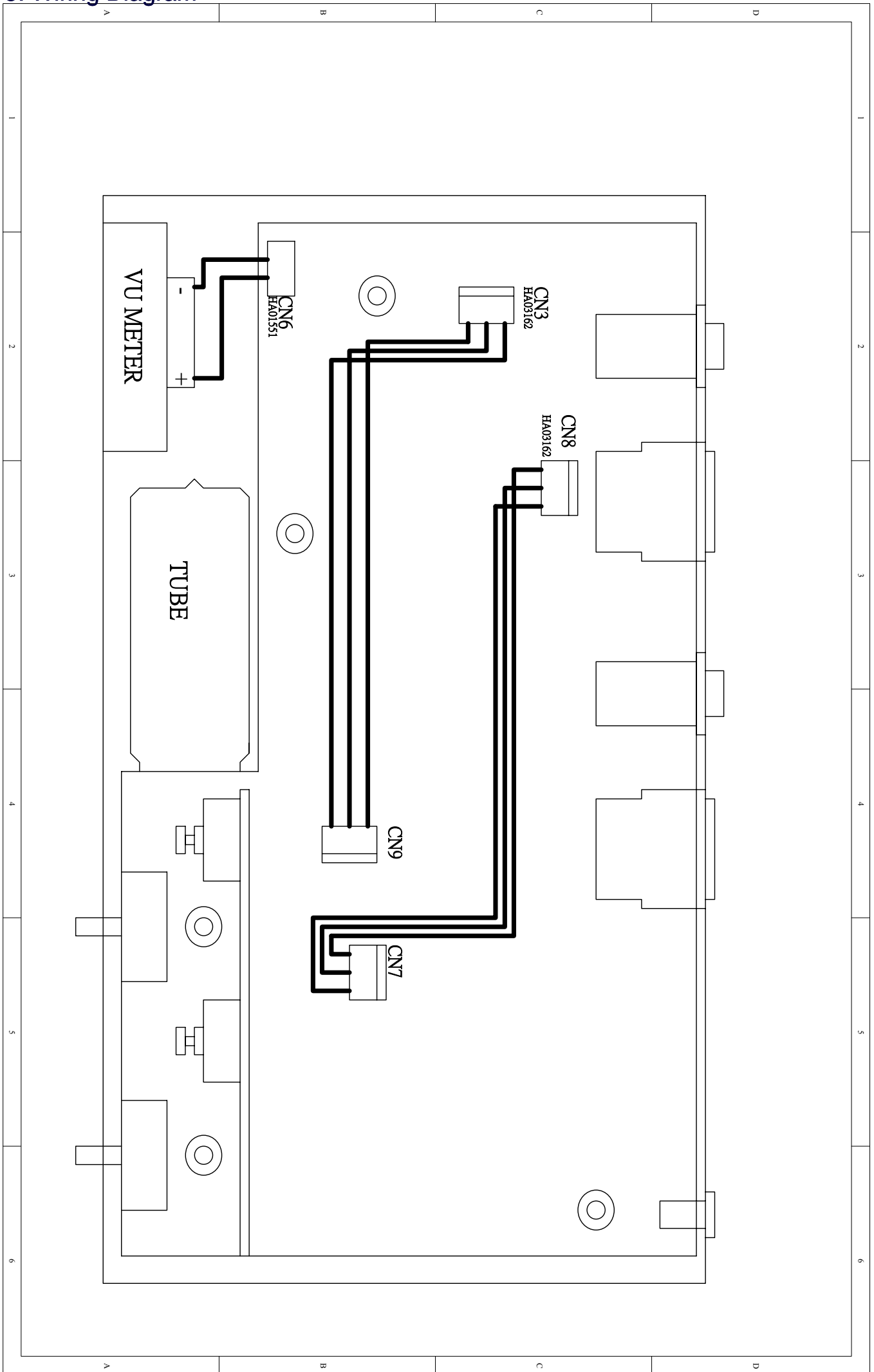
MINI-TUBE Bottom overlay



MINI-TUBE Top overlay

Tool	Hole Size	Hole Count Plated
T1	31mil (0.7874mm)	4
T2	75mil (1.905mm)	9
Totals		13

5. Wiring Diagram



7. Electrical Parts List

SEKAKU ELECTRON INDUSTRY (H.K.) CO.,LTD

Multi-Level BOM Structure Listing

Report No.: IEBO_P02
Prepared by 030002[陳建勳]

Date 2004/12/14
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Item No. PF01709 Version
DESCRIPTION: MINI-TUBE UNIT: PCS
MINI-TUBE ALTO_230V Date: 2004/09/01

Version	Item No	Loss %	Ver.	Unit	Cardinal	Effective Date
Component Remark	Item Descri				Usage Rate	@:Phantom Layer
					Attrition	Rate
-0001-----	MA05232 panel			PCS	1.0000	2004/09/01
	MINI-TUBE ALTO_V1.1				1	N
					0.00	%
-0001-----	MA05233 panel			PCS	1.0000	2004/06/26
	MINI-TUBE				1	N
					0.00	%
-0001-----	MA05234 panel			PCS	1.0000	2004/06/26
	MINI-TUBE_V1.1				1	N
					0.00	%
-0001-----	MI01294 panel			PCS	1.0000	2004/06/26
	2*44*12*210				1	N
					0.00	%
-0002-----	MB03462 rear board			PCS	1.0000	2004/09/01
	MINI-TUBE_V1.1				1	N
					0.00	%
-0001-----	MB03463 bottom board			PCS	1.0000	2004/06/22
	MINI-TUBE				1	N
					0.00	%
-0001-----	MB03464 bottom board			PCS	1.0000	2004/06/22
	MINI-TUBE_V1.0				1	N
					0.00	%
-0001-----	ME00142 iron pillar			PCS	4.0000	2004/09/16
	M3*7.2*0.5PH				1	N
					0.00	%
-0002-----	MJ00058 iron board			PCS	1.0000	2004/06/22
	1*2135*1220 20.45kg			KG	63	N
					0.00	%
-0003-----	MC00603 top cover			PCS	1.0000	2004/09/01
	MINI-TUBE_V1.0				1	N
					0.00	%
-0001-----	MC00604 top cover			PCS	1.0000	2004/06/22
	MINI-TUBE_V1.0				1	N
					0.00	%
-0001-----	MJ00058 iron board			PCS	1.0000	2004/06/22
	1*2135*1220 20.45kg			KG	84	N
					0.00	%
-0004-----	MI02541 bracket			PCS	1.0000	2004/11/20
	MINI-TUBE 59.5*33*21.4 Ltype_V1.0				1	N
					0.00	%
-0001-----	MI02237 fixed bracket			PCS	1.0000	2004/11/18
	MINI-TUBE L type_V1.1				1	N
					0.00	%
-0001-----	MJ00058 iron board			PCS	1.0000	2004/11/18
	1*2135*1220 20.45kg			KG	660	N
					0.00	%
-0005-----	MG00061 screw			PCS	4.0000	2004/09/01
	M3*10				1	N
					0.00	%
-0006-----	MG00021 screw			PCS	2.0000	2004/09/01
	M4*6				1	N
					0.00	%
-0007-----	ME00056 nut			PCS	2.0000	2004/09/01
	LJ-648				1	N
					0.00	%
-0008-----	MG00036 screw			PCS	5.0000	2004/09/01
	M3*4				1	N
					0.00	%
-0009-----	MG00041 screw			PCS	4.0000	2004/09/01
	M3*6				1	N
					0.00	%
-0010-----	NI00451 rubber tube			PCS	1.0000	2004/09/01
	φ 5*10				1	N
					0.00	%
-0011-----	NI01156 button			PCS	4.0000	2004/09/01
	φ 3*W6*18.3				1	N
					0.00	%

Multi-Level BOM Structure Listing

Report No.: IEBO_P02
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Date 2004/12/14
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Item No. PF01709 Version
 DESCRIPTION: MINI-TUBE UNIT: PCS
 MINI-TUBE ALTO_230V Date: 2004/09/01

Version	Item No	Loss %	Ver.	Unit	Cardinal	Effective Date
Component Remark	Item Descri				Usage Rate	@:Phantom Layer
					Attrition	Rate
-0012-----	NI02386 konb φ 14*13mm			PCS	2.0000 1 0.00 %	2004/09/01 N
-0013-----	HH00046 voltage meter 700Ω/150UA P-210SI-xxx ALTO			PCS	1.0000 1 0.00 %	2004/09/01 N
-0014-----	HA01551 header wiring AF:W320 2P 80			PCS	1.0000 1 0.00 %	2004/09/01 N
-0015-----	NA00137 clip-chain bag 5*7			PCS	1.0000 1 0.00 %	2004/09/01 N
-0016-----	NI00218 cable tie-black ALT-102SB			PCS	2.0000 1 0.00 %	2004/09/01 N
-0017-----	NA00123 PE bag 0.04t*580*300mm			PCS KG	1.0000 1 0.00 %	2004/09/01 N
-0018-----	HJ00006 desiccant 30g			PCS	1.0000 1 0.00 %	2004/09/01 N
-0019-----	@NI00240 sleeve φ 2.5*10mm			PCS	2.0000 1 0.00 %	2004/09/01 N
-0001-----	NI00239 sleeve φ 2.5*1000mm			M	10.0000 1000 0.00 %	2002/06/04 N
-0020-----	NF01861 instruction MINI-TUBE ALTO_V1.0			PCS	1.0000 1 0.00 %	2004/09/01 N
-0001-----	NH00149 paper 889*640mm			張 令	0.5000 1 0.00 %	2004/07/29 Y
-0021-----	NF00061 assurance card ALTO			PCS	1.0000 1 0.00 %	2004/09/01 N
-0022-----	NE05004 label ALTO			PCS	4.0000 1 0.00 %	2004/09/01 N
-0001-----	NH00334 cone paper 0.040*1m			M	1.0000 76 0.00 %	2004/11/29 N
-0023-----	NE13268 label MINI-TUBE_V1.0			PCS	4.0000 1 0.00 %	2004/09/01 N
-0001-----	NH00012 bond paper 0.04*1M			M	1.0000 80 0.00 %	2004/07/14 N
-0002-----	NI00014 membrane 0.035*1M			M	1.0000 80 0.00 %	2004/07/14 N
-0024-----	NB03066 box MINI-TUBE ALTO_V1.0			PCS	1.0000 1 0.00 %	2004/09/01 N
-0025-----	NB02141 box a VERB;a COMP;a MICTUBE ALTO			PCS	1.0000 8 0.00 %	2004/09/01 N
-0026-----	TG00040 adaptor 230V/50Hz_AC18V/1000mA_EI-48			PCS	1.0000 1 0.00 %	2004/09/01 N
-0027-----	HK04354 PC board P-MINI-MN-DIP			PCS	1.0000 1 0.00 %	2004/09/01 N
-0001-----	MI02235 heat-sink 55.5*24*8 MINI-TUBE_V1.0			PCS	1.0000 1 0.00 %	2004/09/01 N

Multi-Level BOM Structure Listing

Report No.: IEBO_P02
 Prepared by 030002[陳建勳]

Date 2004/12/14
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Item No. PF01709 Version
 DESCRIPTION: MINI-TUBE
 MINI-TUBE ALTO_230V

UNIT: PCS
 Date: 2004/09/01

Version	Item No Item Descri	Loss %	Ver.	Unit	Cardinal Usage Rate Attrition Rate	Effective Date @:Phantom Layer Rate
0002-----	MG00048 screw M3*15			PCS	3.0000 1 0.00 %	2004/09/01 N
0003-----	NI00863 insulate bean TO220B			PCS	3.0000 1 0.00 %	2004/09/01 N
0004-----	ME00021 nut 1/8			PCS	3.0000 1 0.00 %	2004/09/01 N
0005-----	NC00005 silicone insulator TO-220 square type			PCS	3.0000 1 0.00 %	2004/09/01 N
0006-----	MG00041 screw M3*6			PCS	2.0000 1 0.00 %	2004/09/01 N
0007-----	MF00037 washer φ 3* φ 5*1t			PCS	5.0000 1 0.00 %	2004/09/01 N
0008-----	NI01781 LED spacer support LEDS-8 8mm LED7			PCS	1.0000 1 0.00 %	2004/09/01 N
0009-----	NI01765 LED spacer support LEDS-10 10mm LED6			PCS	1.0000 1 0.00 %	2004/09/01 N
0010-----	SA00073 L.E.D φ 3 yellow LVY2340/A LED6			PCS	1.0000 1 0.00 %	2004/09/01 N
0011-----	SA00194 L.E.D φ 3 LED7			PCS	1.0000 1 0.00 %	2004/09/01 N
0012-----	RA00195 fixed resistor 1/4W 270Ω F type R40			PCS	1.0000 1 0.00 %	2004/09/01 N
0013-----	RA00241 fixed resistor 1/4W 10KΩ F type R39			PCS	1.0000 1 0.00 %	2004/09/01 N
0014-----	RA00455 precise resistor 1/4W 162Ω M type R7			PCS	1.0000 1 0.00 %	2004/09/01 N
0015-----	RA00505 precise resistor 1/4W 6.81KΩ M type R3,R4			PCS	2.0000 1 0.00 %	2004/09/01 N
0016-----	RA00103 fixed resistor 1/2W 22Ω M type R48			PCS	1.0000 1 0.00 %	2004/09/01 N

Multi-Level BOM Structure Listing

Report No.: IEBO_P02
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Date 2004/12/14
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Item No. PF01709 Version
 DESCRIPTION: MINI-TUBE
 MINI-TUBE ALTO_230V

UNIT: PCS
 Date: 2004/09/01

Version	Item No Item Descri	Loss %	Ver.	Unit	Cardinal Usage Rate Attrition Rate	Effective Date @:Phantom Layer Rate
0017-----	RA00133 fixed resistor 1/2W 1.0KΩ M type R49,R50			PCS	2.0000 1 0.00 %	2004/09/01 N
0018-----	SA00098 rectifier diode 1A/400V IN4004 D6,D7,D8,D9,D10,D11,D12,D13,D14			PCS	9.0000 1 0.00 %	2004/09/01 N
0019-----	CH00017 multilayer ceramic capacitor 0.1uF/50V Y5V PH5 C21,C22,C23			PCS	3.0000 1 0.00 %	2004/09/01 N
0020-----	CB00039 electrolytic capacitor 47uF/25V φ5*11mm C46,C47,C52			PCS	3.0000 1 0.00 %	2004/09/01 N
0021-----	CB00035 electrolytic capacitor 47uF/50V NP φ8*11mm C36,C37,C38			PCS	3.0000 1 0.00 %	2004/09/01 N
0022-----	CB00042 electrolytic capacitor 47uF/63V 105°C LZ φ8*11mm C9,C10			PCS	2.0000 1 0.00 %	2004/09/01 N
0023-----	CB00127 electrolytic capacitor 47uF/63V φ6*11mm C7,C8			PCS	2.0000 1 0.00 %	2004/09/01 N
0024-----	CB00052 electrolytic capacitor 100uF/100V φ13*21mm C41,C42,C43			PCS	3.0000 1 0.00 %	2004/09/01 N
0025-----	CB00072 electrolytic capacitor 1000uF/25V φ10*20mm C44,C45			PCS	2.0000 1 0.00 %	2004/09/01 N
0026-----	SD00077 integrated circuit L7815CV(TO-220)(ST) TR2			PCS	1.0000 1 0.00 %	2004/09/01 N
0027-----	SD00079 integrated circuit L7915CV(TO-220)(ST) TR3			PCS	1.0000 1 0.00 %	2004/09/01 N
0028-----	SD00032 integrated circuit LM317T TR1			PCS	1.0000 1 0.00 %	2004/09/01 N
0029-----	HC00183 DC power jack KJ-36-S φ3.5			PCS	1.0000 1 0.00 %	2004/09/01 N

Multi-Level BOM Structure Listing

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Date 2004/12/14
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Item No. PF01709 Version
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 MINI-TUBE ALTO_230V

UNIT: PCS
 Date: 2004/09/01

Version	Item No Item Descri	Loss %	Ver.	Unit	Cardinal Usage Rate @: Attrition Rate	Effective Date Phantom Layer Rate
	PJ3					
0030	HC00112 XLR MIC jack 99M-107SP-1-2 90° PUSH CN1			PCS	1.0000 1 0.00 %	2004/09/01 N
0031	HC00111 XLR MIC jack 99M-108SP1 CN2			PCS	1.0000 1 0.00 %	2004/09/01 N
0032	HC00110 MIC jack JY-6314-02-340 PJ1,PJ2			PCS	2.0000 1 0.00 %	2004/09/01 N
0033	HC00254 row-wire header(male) 3P 2.0mm 180° CN7,CN8,CN9,CN10			PCS	4.0000 1 0.00 %	2004/09/01 N
0034	HC00076 row-wire header(male) 2P 2.5mm 180° CN6			PCS	1.0000 1 0.00 %	2004/09/01 N
0035	RC00082 potentiometer A10KΩ*2 RV16A01-20-15F-A14-301 VR1			PCS	1.0000 1 0.00 %	2004/09/01 N
0036	RC00454 potentiometer C1KΩ RV16A01-20-15F-C1K-3 VR2			PCS	1.0000 1 0.00 %	2004/09/01 N
0037	HC00064 FUSE holder JEF-503B (5.2mm) FUSE			PCS	2.0000 1 0.00 %	2004/09/01 N
0038	HK04356 PC board P-MINI-MN-SMD			PCS	1.0000 1 0.00 %	2004/09/01 N
0001	HB01314 PCB MINI-MN_VER041130			PCS	1.0000 1 0.00 %	2004/09/01 N
0002	RD00059 SMD fixed resistor 1/10W 0.0Ω ±5% 0603 R47,R51,R52			PCS	3.0000 1 0.00 %	2004/09/01 N
0003	RD00272 SMD precise resistor 1/10W 10.0Ω ±1% 0603 R1,R2			PCS	2.0000 1 0.00 %	2004/09/01 N
0004	RD00273 SMD precise resistor 1/10W 51.1Ω ±1% 0603 R14,R15,R16,R17,R18			PCS	5.0000 1 0.00 %	2004/09/01 N

Multi-Level BOM Structure Listing

Report No.: IEBO_P02
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 Date: 2004/09/01

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Component Remark	Item Descri				Usage Rate	@:Phantom Layer
					Attrition	Rate
-0005-----	RD00274 SMD precise resistor 1/10W 100Ω ±1% 0603 R25,R26,R27,R28,R29,R30			PCS	6.0000 1 0.00	2004/09/01 N %
-0006-----	RD00278 SMD precise resistor 1/10W 301Ω ±1% 0603 R36,R37			PCS	2.0000 1 0.00	2004/09/01 N %
-0007-----	RD00102 SMD fixed resistor 1/10W 12KΩ ±5% 0603 R32			PCS	1.0000 1 0.00	2004/12/03 N %
-0008-----	RD00282 SMD precise resistor 1/10W 1.00KΩ ±1% 0603 R8,R9,R10,R11			PCS	4.0000 1 0.00	2004/09/01 N %
-0009-----	RD00396 SMD precise resistor 1/10W 1.15KΩ ±1% 0603 R12			PCS	1.0000 1 0.00	2004/09/01 N %
-0010-----	RD00201 SMD precise resistor 1/10W 1.50KΩ ±1% 0603 R5,R6			PCS	2.0000 1 0.00	2004/09/01 N %
-0011-----	RD00363 SMD precise resistor 1/10W 3.16KΩ ±1% 0603 R13,R31			PCS	2.0000 1 0.00	2004/09/01 N %
-0012-----	RD00209 SMD precise resistor 1/10W 4.99KΩ ±1% 0603 R33			PCS	1.0000 1 0.00	2004/09/01 N %
-0013-----	RD00223 SMD precise resistor 1/10W 49.9KΩ ±1% 0603 R44,R45,R46			PCS	3.0000 1 0.00	2004/09/01 N %
-0014-----	RD00214 SMD precise resistor 1/10W 10.0KΩ ±1% 0603 R41,R42,R43			PCS	3.0000 1 0.00	2004/09/01 N %
-0015-----	RD00219 SMD precise resistor 1/10W 20.0KΩ ±1% 0603 R38			PCS	1.0000 1 0.00	2004/09/01 N %
-0016-----	RD00291 SMD precise resistor 1/10W 301KΩ ±1% 0603 R34,R35			PCS	2.0000 1 0.00	2004/09/01 N %
-0017-----	RD00292 SMD precise resistor 1/10W 1.00MΩ ±1% 0603			PCS	6.0000 1 0.00	2004/09/01 N %

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UNIT: PCS
 Date: 2004/09/01

Version	Item No Item Descri	Loss %	Ver.	Unit	Cardinal Usage Rate Attrition	Effective Date @:Phantom Layer Rate
R19,R20,R21,R22,R23,R24						
0018-----	CI00053 SMD ceramic capacitor 0603 33PF/50V NPO ±5% C13,C14			PCS	2.0000 1 0.00 %	2004/09/01 N
0019-----	CI00055 SMD ceramic capacitor 0603 47PF/50V NPO ±5% C2,C3,C4,C17			PCS	4.0000 1 0.00 %	2004/09/01 N
0020-----	CI00056 SMD ceramic capacitor 0603 56PF/50V NPO ±5% C18,C19			PCS	2.0000 1 0.00 %	2004/09/01 N
0021-----	CI00075 SMD ceramic capacitor 0603 0.1uF/50V Y5V +80,-20% C11,C12,C15,C20,C24,C25,C26,C27,C28,C29,C30,C31,C32, C33,C34,C35			PCS	16.0000 1 0.00 %	2004/09/01 N
0022-----	CI00060 SMD ceramic capacitor 0603 150PF/50V NPO ±5% C39,C40			PCS	2.0000 1 0.00 %	2004/09/01 N
0023-----	CI00026 SMD ceramic capacitor 0805 0.0033uF/50V X7R ±10% C16			PCS	1.0000 1 0.00 %	2004/09/01 N
0024-----	CI00121 SMD ceramic capacitor 0603 820PF/-50V NPO ±5% C50,C51			PCS	2.0000 1 0.00 %	2004/09/01 N
0025-----	CI00030 SMD ceramic capacitor 0805 1uF/16V Y5V-0805(2012) C5,C6			PCS	2.0000 1 0.00 %	2004/09/01 N
0026-----	SG00122 SMD integrated circuit NJM4580M-TE3 IC1,IC2,IC3,IC4,IC5,IC6			PCS	6.0000 1 0.00 %	2004/09/01 N
0027-----	SE00010 SMD rectifier diode BAS16(SOT-23) D5			PCS	1.0000 1 0.00 %	2004/09/01 N
0028-----	SE00031 diode 1/2W 12V(MMSZ5242BT1) (ISOD123) D1,D2,D3,D4			PCS	4.0000 1 0.00 %	2004/09/01 N
0039-----	HD00008 glass tube fuse 1A 250V φ5.2*20mm CSA/S/UL/VDE			PCS	1.0000 1 0.00 %	2004/09/01 N

Multi-Level BOM Structure Listing

Report No.: IEBO_P02
 Prepared by 030002[陳建勳]

Date 2004/12/14
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Item No. PF01709 Version
 DESCRIPTION: MINI-TUBE
 MINI-TUBE ALTO_230V

UNIT: PCS
 Date: 2004/09/01

Version	Item No	Loss %	Ver.	Unit	Cardinal	Effective Date
Component Remark	Item Descri				Usage Rate	@:Phantom Layer
					Attrition Rate	Rate
0040	HA03162 wire 3P-3P 150mm UL2547 28AWG			PCS	2.0000 1 0.00 %	2004/09/11
0041	HK04353 PC board P-MINI-FP-DIP			PCS	1.0000 1 0.00 %	2004/09/21
0001	HI00163 push-button switch 2 stage 12P PS-42E85 SW1,SW2			PCS	2.0000 1 0.00 %	2004/09/01 N
0002	HI00162 push-button switch 2 paragraphs 6p PS-22E8552L SW3,SW4			PCS	2.0000 1 0.00 %	2004/09/01 N
0003	SA00072 L.E.D φ3 red LI2340/A LED3,LED5			PCS	2.0000 1 0.00 %	2004/09/01 N
0004	SA00071 L.E.D φ3 green LVG2340/A LED1,LED4			PCS	2.0000 1 0.00 %	2004/09/01 N
0005	SA00073 L.E.D φ3 yellow LUY2340/A LED2			PCS	1.0000 1 0.00 %	2004/09/01 N
0006	NI02532 led LEDS-22 22mm LED5			PCS	1.0000 1 0.00 %	2004/09/01 N
0007	NI01772 LED spacer support LEDS-7 7mm LED2,LED3			PCS	2.0000 1 0.00 %	2004/11/20 N
0008	NI01831 separating 8.5*4*17 black LED1,LED4			PCS	2.0000 1 0.00 %	2004/09/01 N
0009	HK04460 PC board P-MINI-FP-AI			PCS	1.0000 1 0.00 %	2004/09/01 N
0001	HA01919 jumper wire 5mm J5			PCS	1.0000 1 0.00 %	2004/09/01 N
0001	HA02249 wire φ0.6			M KG	0.0150 1 0.00 %	2003/03/31 N
0002	HA01920 jumper wire 6mm J1			PCS	1.0000 1 0.00 %	2004/09/01 N

Multi-Level BOM Structure Listing

Report No.: IEBO_P02
 Prepared by 030002[陳建勳]

Date 2004/12/14
 Page No.: 9 / 10

Item No. PF01709 Version
 DESCRIPTION: MINI-TUBE
 MINI-TUBE ALTO_230V

UNIT: PCS
 Date: 2004/09/01

Version	Item No	Loss %	Ver.	Unit	Cardinal	Effective Date
Component Remark	Item Descri				Usage Rate	@:Phantom Layer
					Attrition	Rate
0001	HA02249 wire φ0.6			M KG	0.0160 430	2002/09/19 N
0003	HA01922 jumper wire 8mm J7			PCS	1.0000 1 0.00 %	2004/09/01 N
0001	HA02249 wire φ0.6			M KG	0.0180 1	2004/08/05 N
0004	HA01925 jumper wire 10mm J6			PCS	1.0000 1 0.00 %	2004/09/01 N
0001	HA02249 wire φ0.6			M KG	0.0200 1	2004/08/05 N
0005	HA01928 jumper wire 12mm J4,J8			PCS	2.0000 1 0.00 %	2004/09/01 N
0001	HA02249 wire φ0.6			M KG	0.0220 1	2002/09/19 N
0006	HA01930 jumper wire 15mm J2			PCS	1.0000 1 0.00 %	2004/09/01 N
0001	HA02249 wire φ0.6			M KG	0.0250 1	2004/08/05 N
0007	HK04355 PC board P-MINI-FP-SMD			PCS	1.0000 1	2004/09/01 N
0001	HB01315 PCB MINI-FP(1*3)_VER040726			PCS	1.0000 1	2004/09/01 N
0002	RD00504 SMD precise resistor 1/10W 169Ω ±1% 0805 R8			PCS	1.0000 1 0.00 %	2004/09/01 N
0003	RD00505 SMD precise resistor 1/10W 619Ω ±1% 0805 R7,R9			PCS	2.0000 1 0.00 %	2004/09/01 N
0004	RD00378 SMD precise resistor 1/10W 1.00KΩ ±1% 0805 R5,R6			PCS	2.0000 1 0.00 %	2004/09/01 N
0005	RD00021 SMD fixed resistor 1/10W 1.8KΩ ±5% 0805 R1,R2,R3,R4			PCS	4.0000 1 0.00 %	2004/09/01 N
0006	CI00020 SMD ceramic capacitor 0805 680PF/50V NPO			PCS	4.0000 1 0.00 %	2004/09/01 N

Multi-Level BOM Structure Listing

Report No.: IEBO_P02
 Prepared by 030002[陳建勳]

Date 2004/12/14
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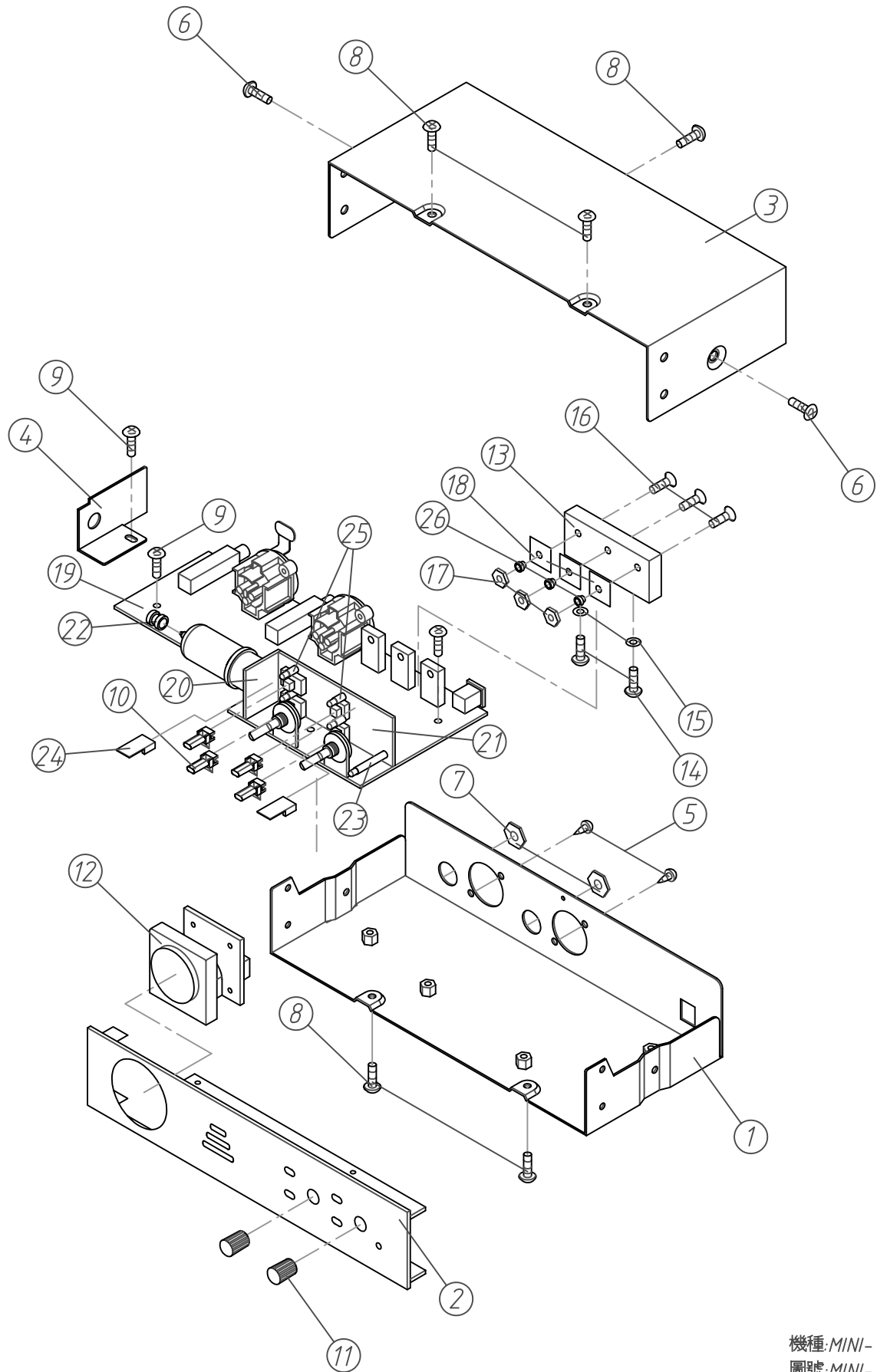
Item No. PF01709 Version
 DESCRIPTION: MINI-TUBE
 MINI-TUBE ALTO_230V

UNIT: PCS
 Date: 2004/09/01

Version	Item No	Loss %	Ver.	Unit	Cardinal	Effective Date
Component Remark	Item Descri				Usage Rate	@:Phantom Layer
					Attrition	Rate
	C1,C2,C3,C4					
0010	HA01918 jumper wire 4mm J3			PCS	1.0000 1 0.00 %	2004/09/01 N
0042	HK04357 PC board P-MINI-TUBE			PCS	1.0000 1 0.00 %	2004/09/21
0001	HB01316 PCB			PCS	1.0000 1 0.00 %	2004/09/01 N
0002	MINI-Tube(3*3)_VER040830 RA00761 precise resistor 1/8W 10.0KΩ M type 8mm R1,R2			PCS	2.0000 1 0.00 %	2004/09/01 N
0003	HC00225 vacuum tube holder 9PIN PCB type TB1			PCS	1.0000 1 0.00 %	2004/09/01 N
0004	HD00063 vacuum tube 12AX7WA TB1			PCS	1.0000 1 0.00 %	2004/09/01 N
0043	CB00263 electrolytic capacitor 10uF /25V φ4*7mm C53			PCS	1.0000 1 0.00 %	2004/12/13
0028	NA00279 clip-chain bag 0.04t*100*150mm_V1.0			PCS	1.0000 1 0.00 %	2004/09/07
0029	AD00012 twin adhesive 90*120mm_V1.0			M 圈	0.0024 1 0.00 %	2004/11/03
0030	NI00501 foot cushion 12.7*9*3t(SF-004)			PCS	4.0000 1 0.00 %	2004/11/22

8.Exploded Views

SEIKAKU



機種:MINI-TUBE
圖號:MINI-TUBE-00
日期:2004/09/07

SEKAKU ELECTRON INDUSTRY CO., LTD.

Model : MINI-TUBE Part List 2004/12/14 No : MINI-TUBE-00

NO	Material No	Item Name	Specific	quantity	material	remark	NO	Material No	Item Name	Specific	quantity	material	remark
1	MB03462	rear board	MINI-TUBE_V1.1	1			29						
2	MA05232	panel	MINI-TUBE ALTO_V1.1	1			30						
3	MC00603	MC00603	top cover	1			31						
4	MI02237	fixed bracket	MINI-TUBE L type_V1.1	1			32						
5	MG00061	screw	M3*10	4			33						
6	MG00021	screw	M4*6	2			34						
7	ME00056	nut	LJ-648	2			35						
8	MG00036	screw	M3*4	5			36						
9	MG00041	screw	M3*6	4			37						
10	NI01156	button	φ3*W6*18.3	4			38						
11	NI02386	konb	φ14*13mm	2			39						
12	HH00046	voltage meter	700Ω/1500A P-210SI-xxx ALTO	1			40						
13	MI02235	heat-sink	55.5*24*8 MINI-TUBE_V1.0	1			41						
14	MG00041	screw	M3*6	2			42						
15	MF00037	washer	φ3* φ5*1t	5			43						
16	MG00048	screw	M3*15	3			44						
17	ME00021	nut	1/8	3			45						
18	NC00005	silicone insulator	T0-220 square type	1			46						
19	HK04354	PC board	P-MINI-MN-DIP	1			47						
20	HK04357	PC board	P-MINI-TUBE	1			48						
21	HK04353	PC board	P-MINI-FP-DIP	1			49						
22	NI00451	rubber tube	φ5*10	1			50						
23	NI02532	1ed	LEDS-22 22mm	1			51						
24	NI01831	1ed	LEDS-22 22mm	1			52						
25	NI01781	1ed	LEDS-8 8mm	4			53						
26	NI00863	insulate bean	T0220B	3			54						
27							55						
28							56						