

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

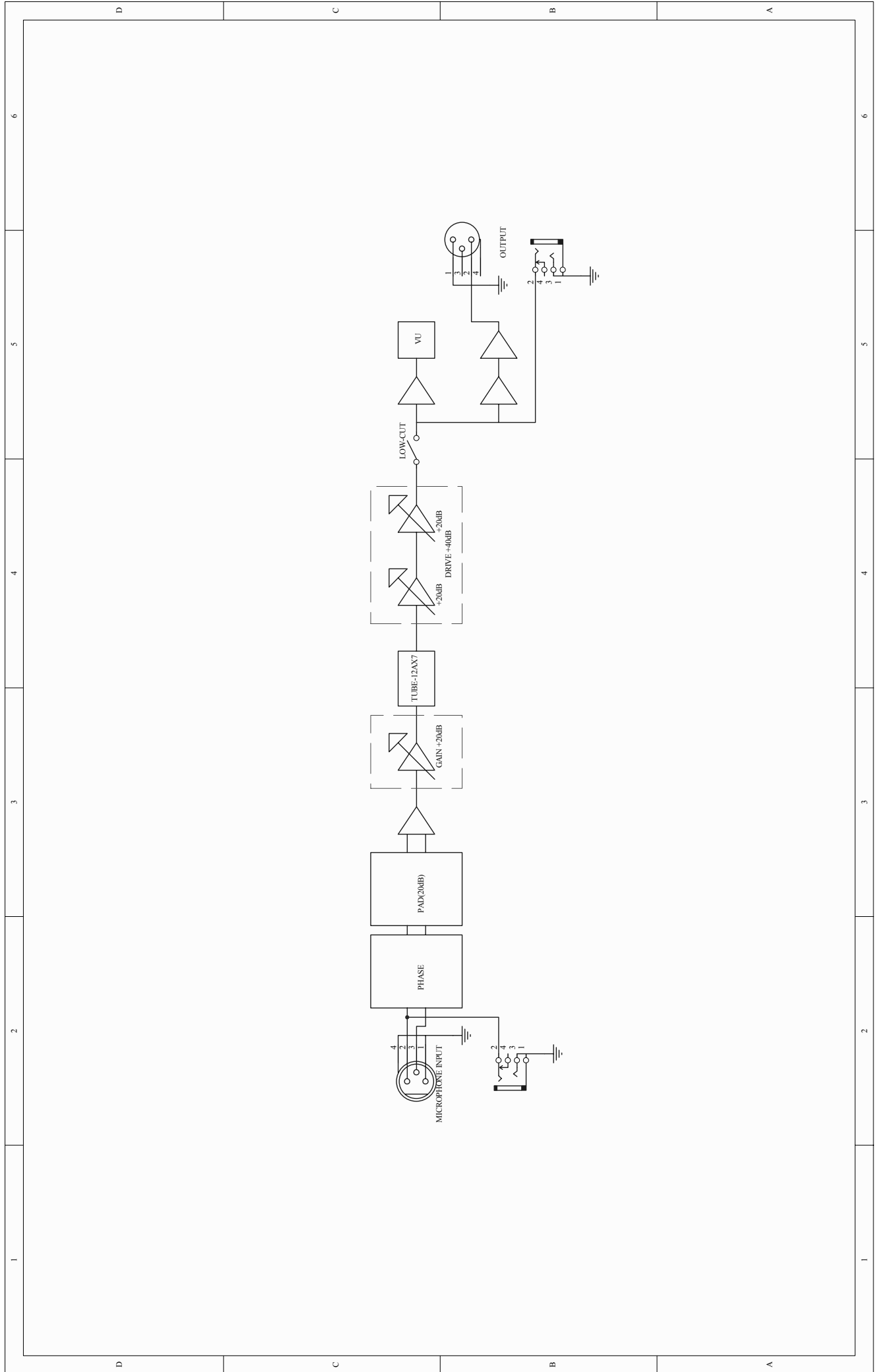
Physical :

Weight : 0.7Kg

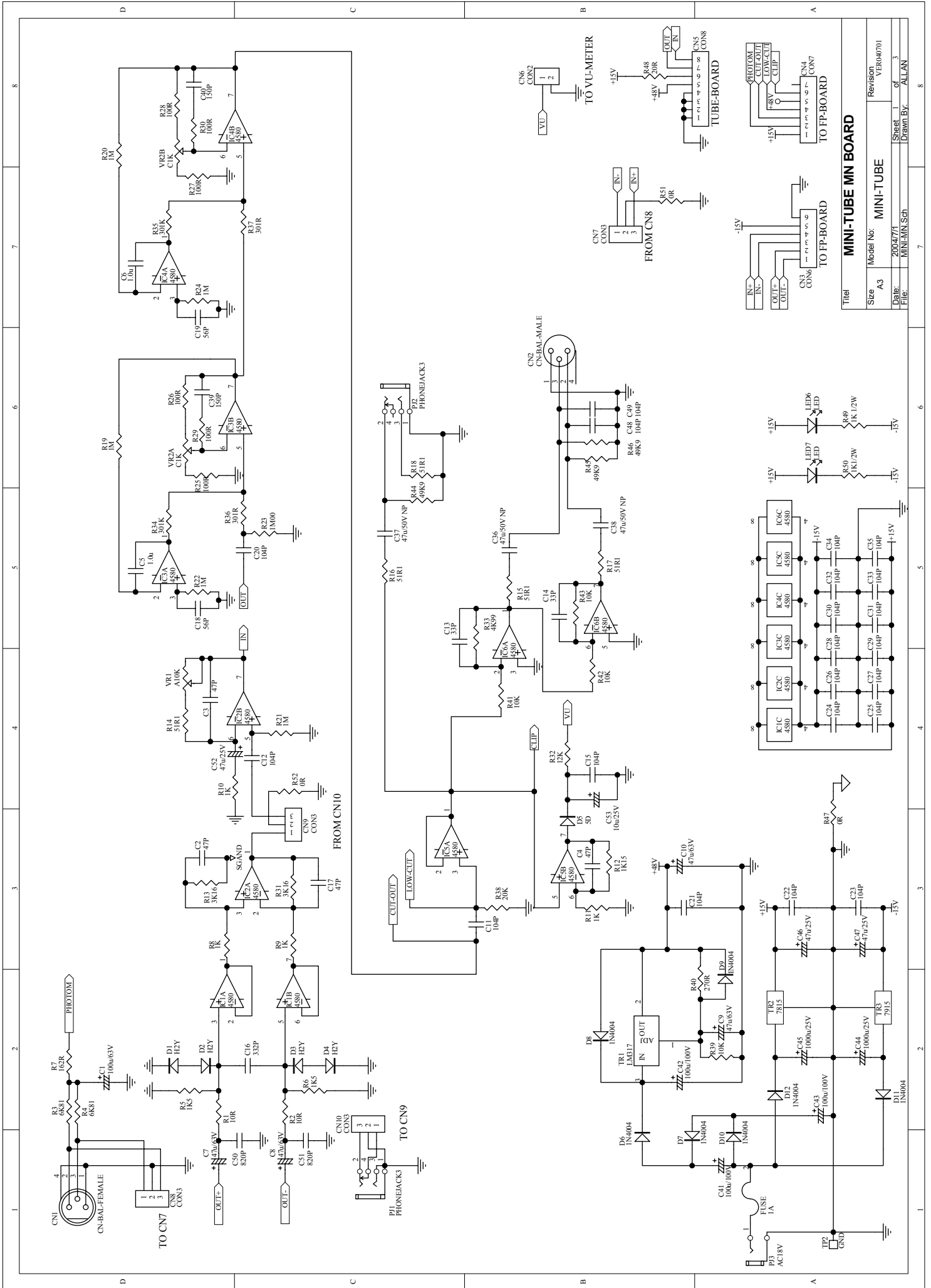
Size : 1U Rack

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

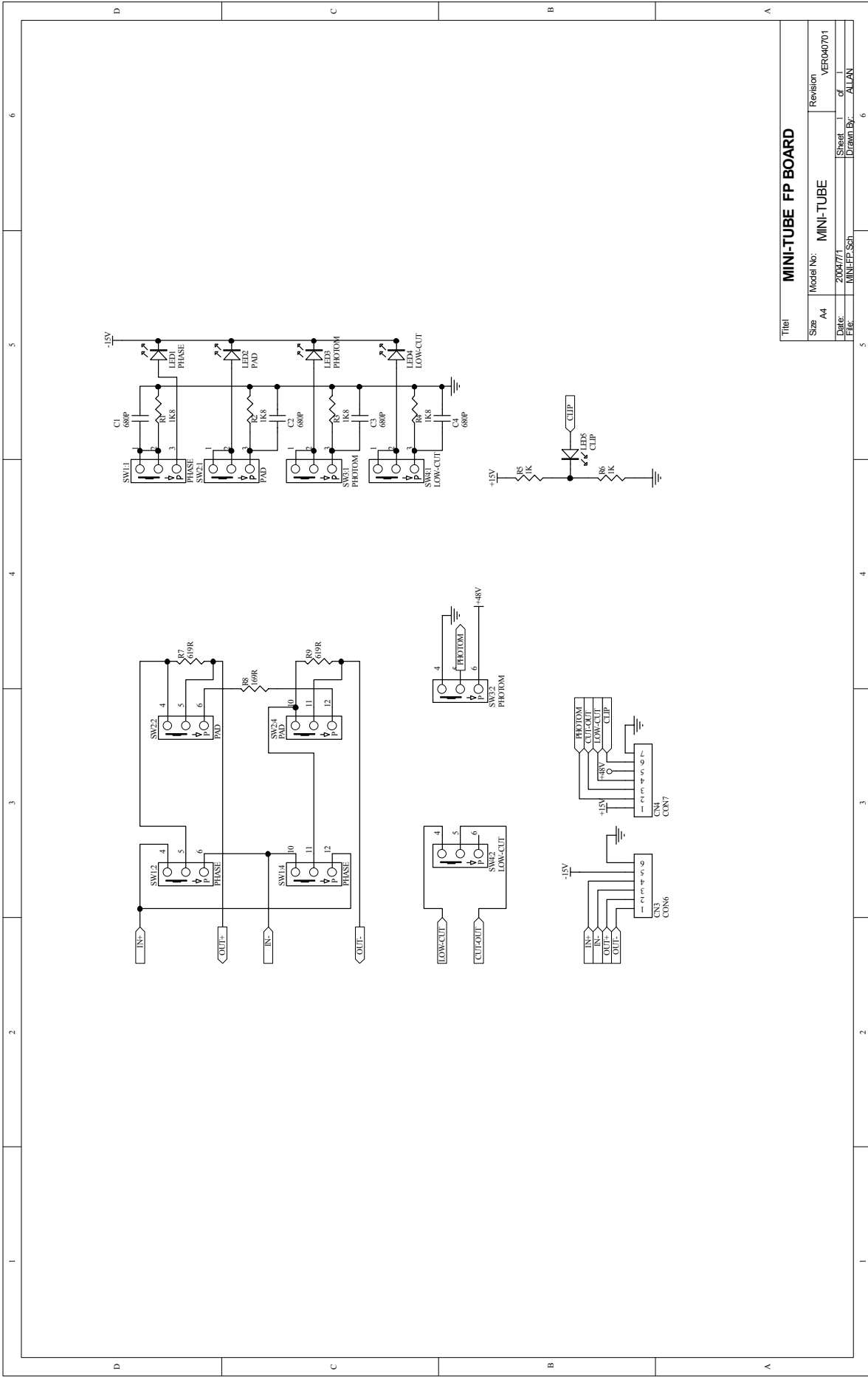
2.Black Diagram



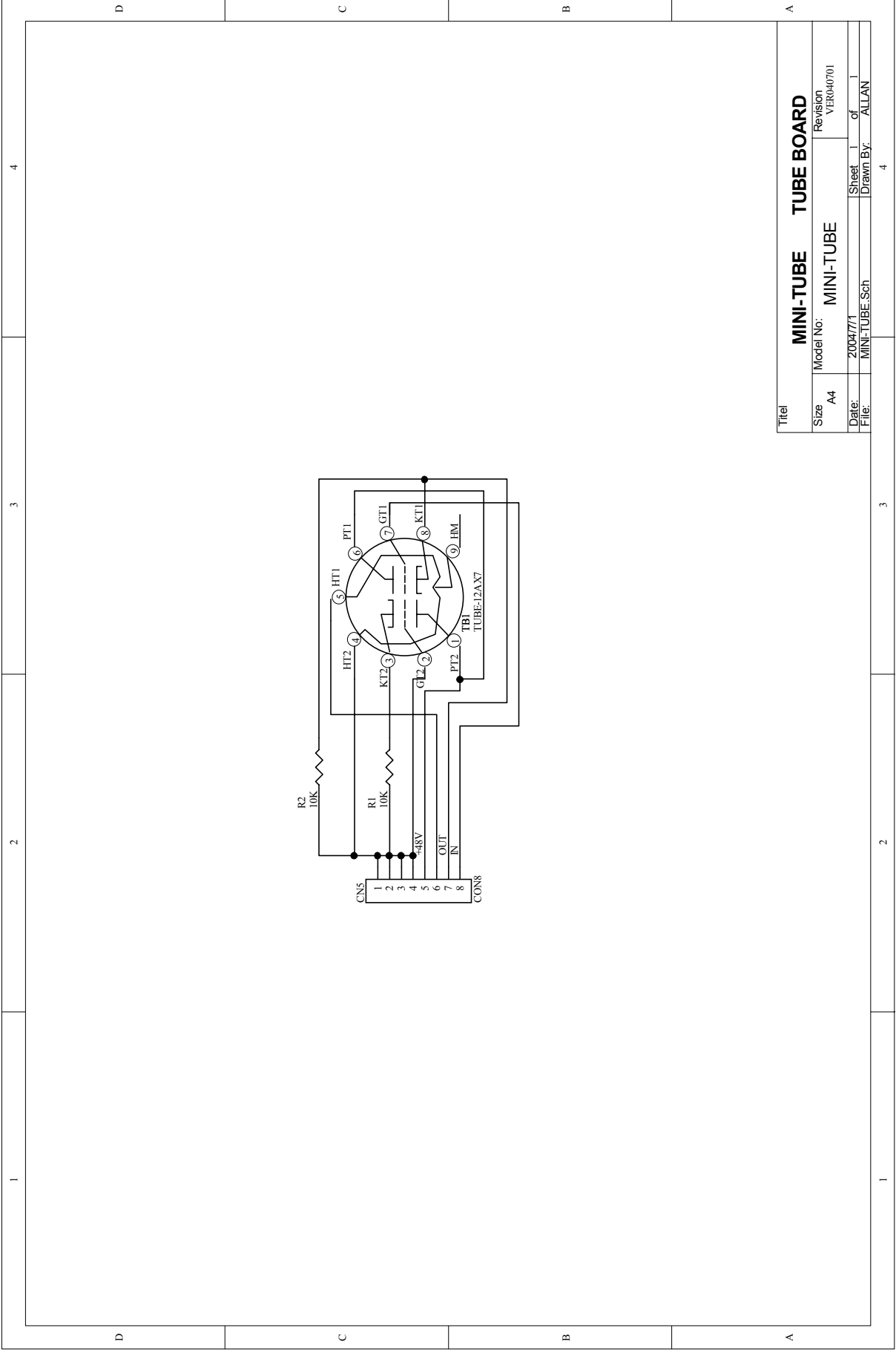
3. Schematic Diagram



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



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



Title		MINI-TUBE TUBE BOARD	
Size	A4	Model No:	MINI-TUBE
Date:	2004/7/1	Revision	VER040701
File:	MINI-TUBE.Sch	Sheet	1 of 1
		Drawn By:	ALLAN

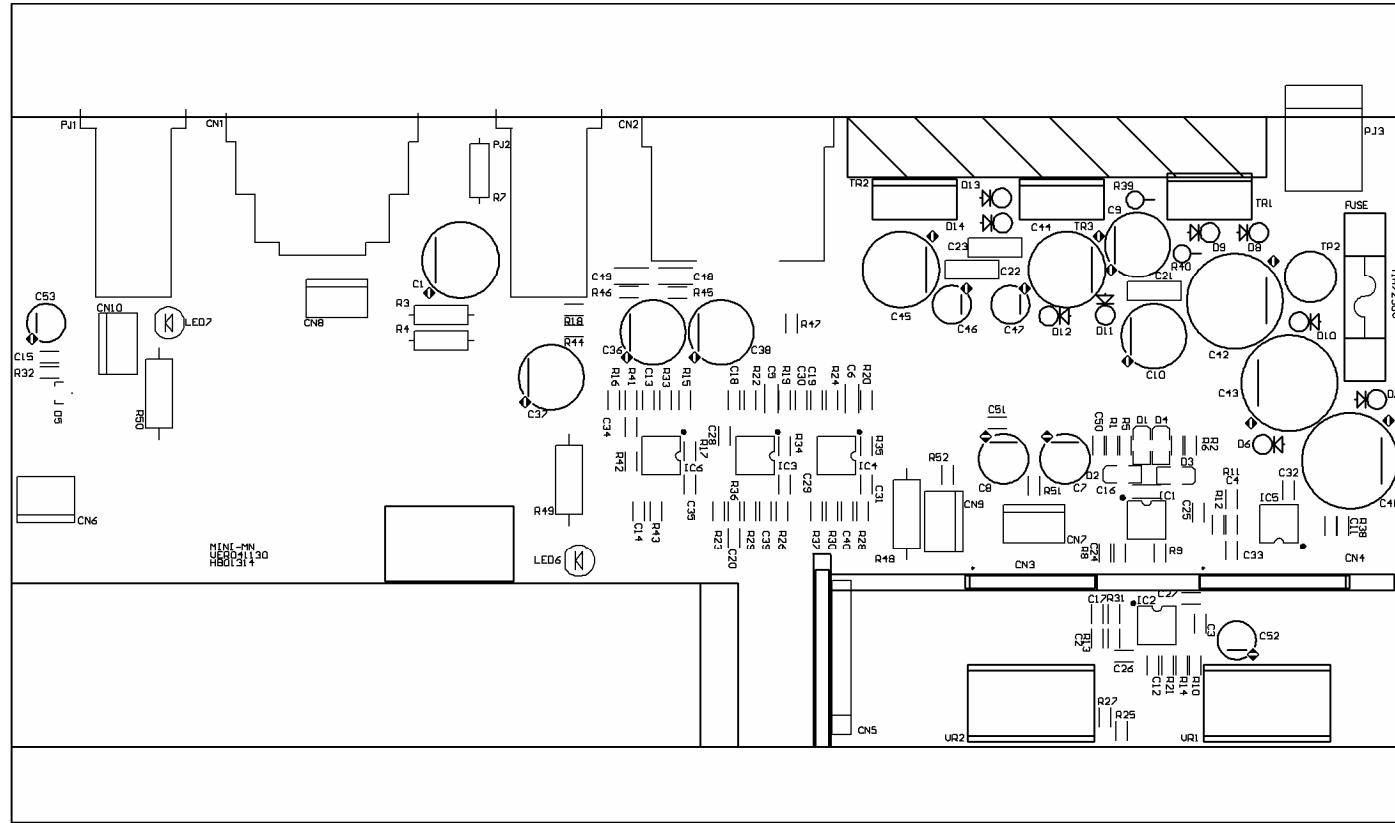
1 2 3 4

D C B A

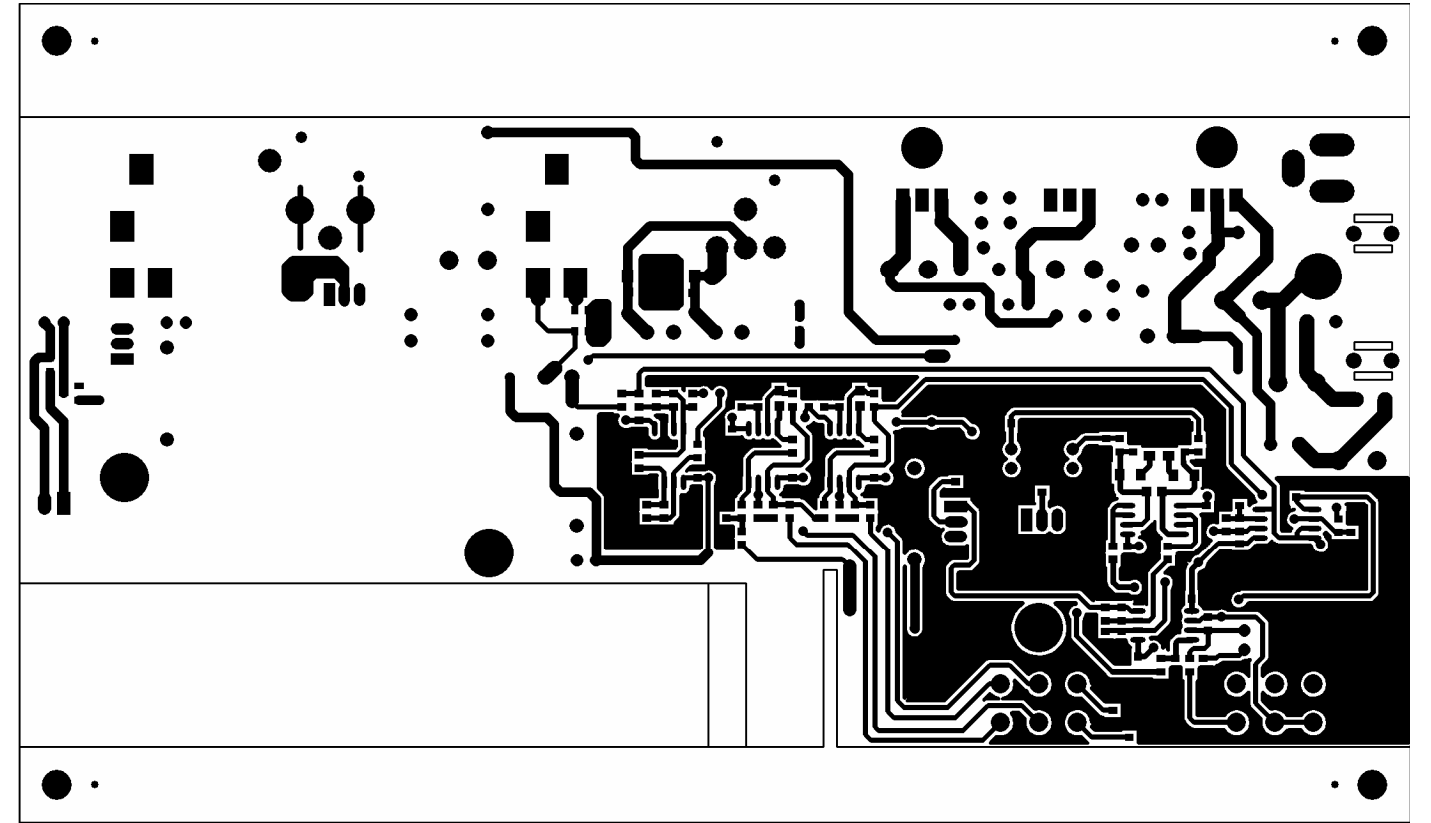
D C B A

1 2 3 4

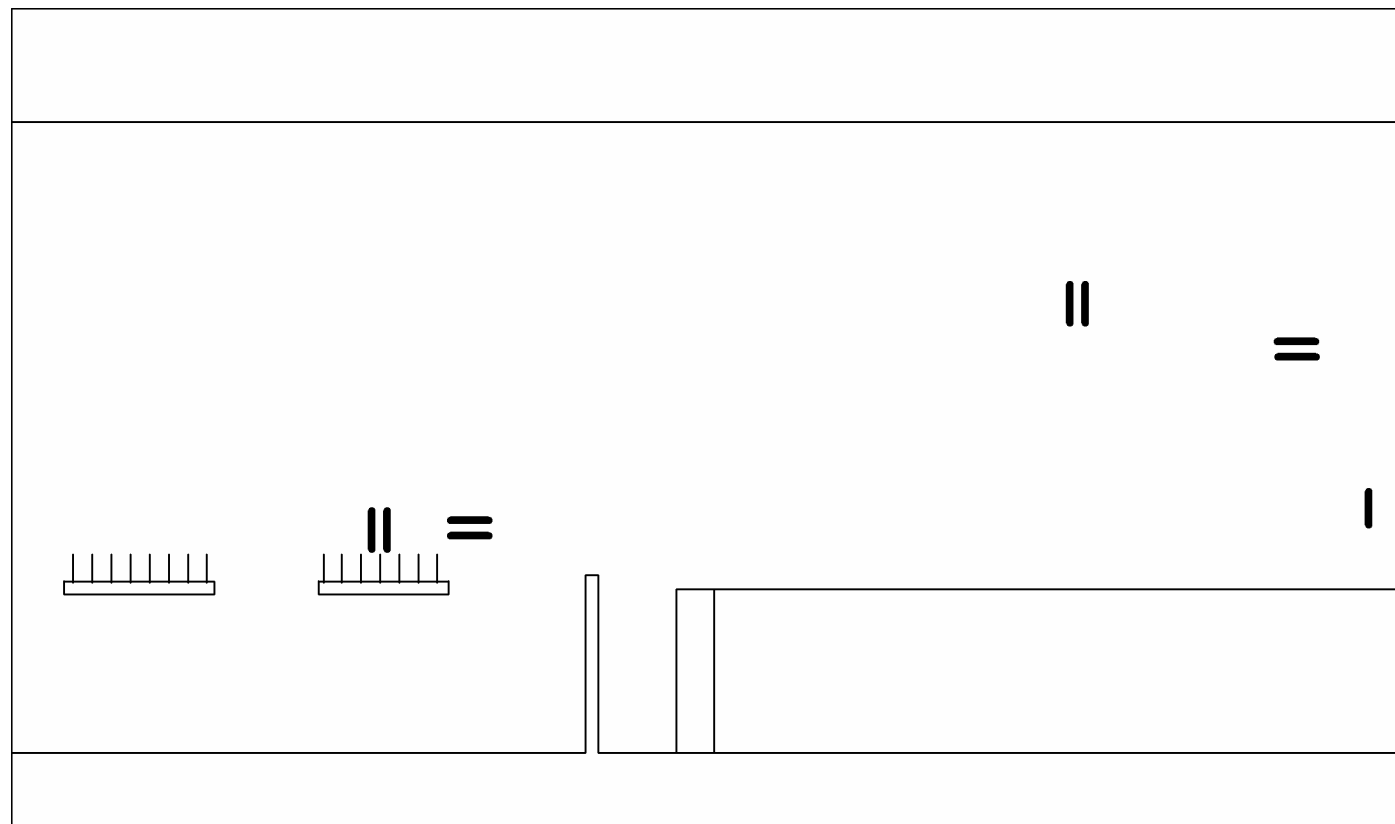
4.PRINTED CIRCUIT BOARD



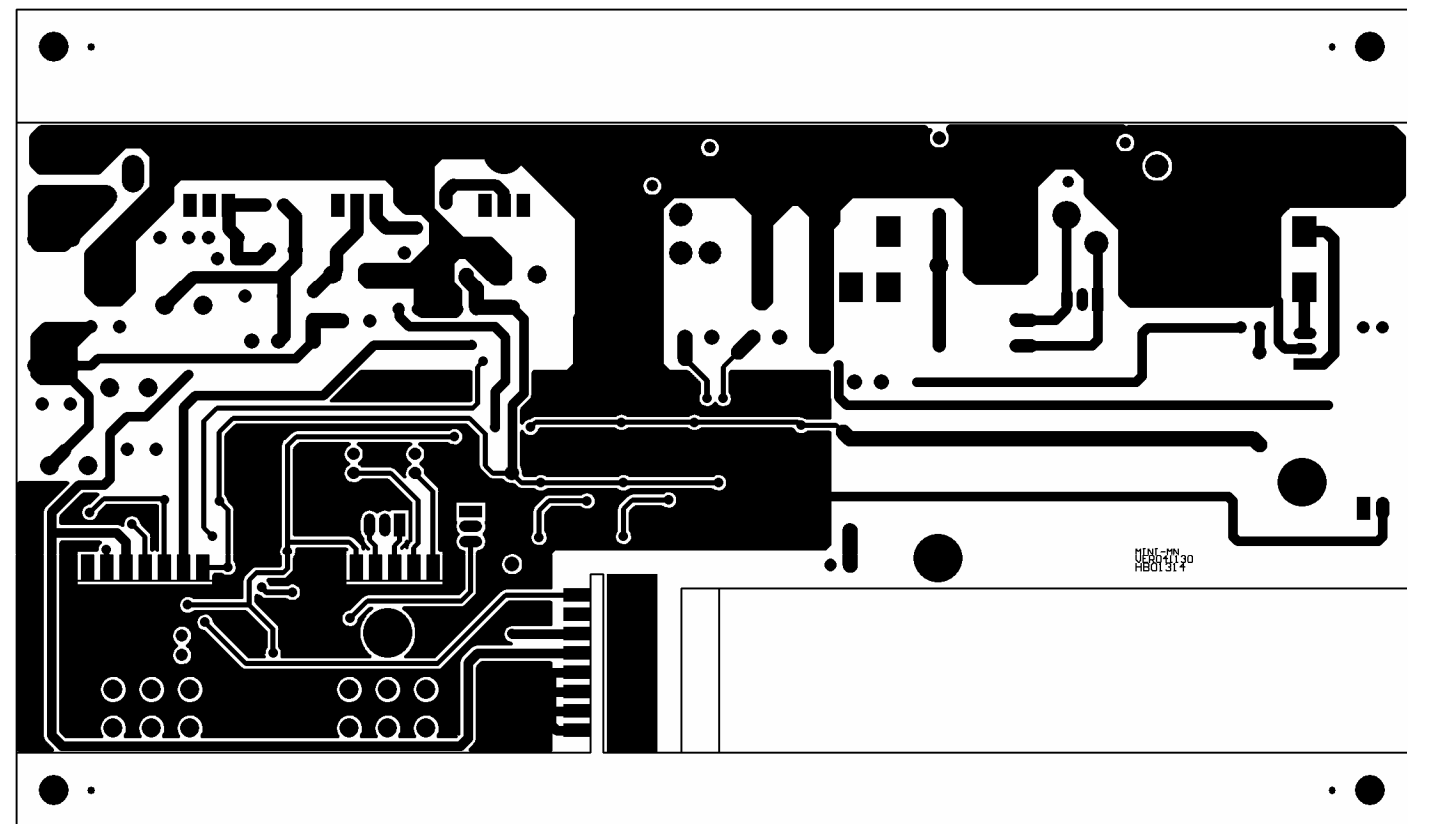
MINI-MN Top overlay



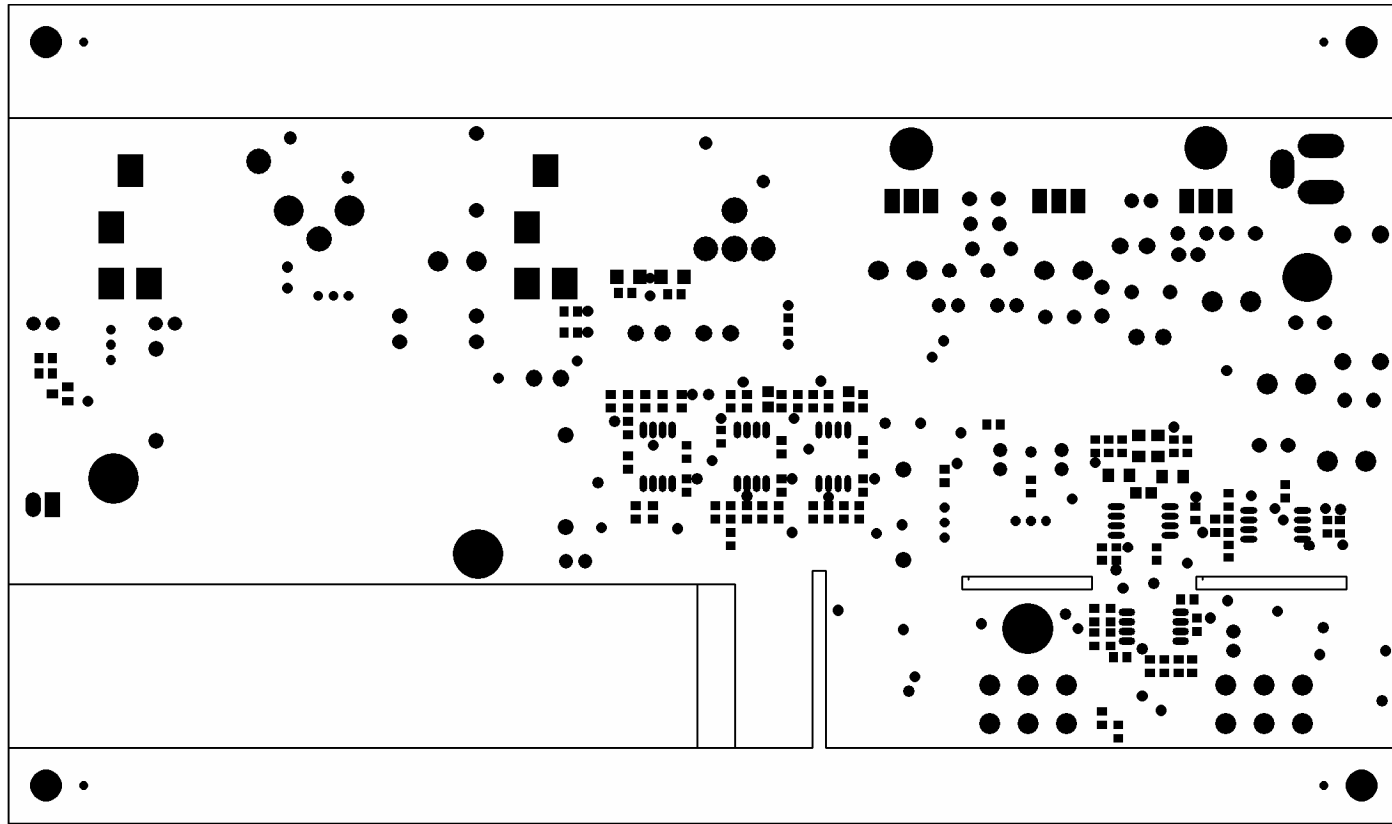
MINI-MN Top Layer



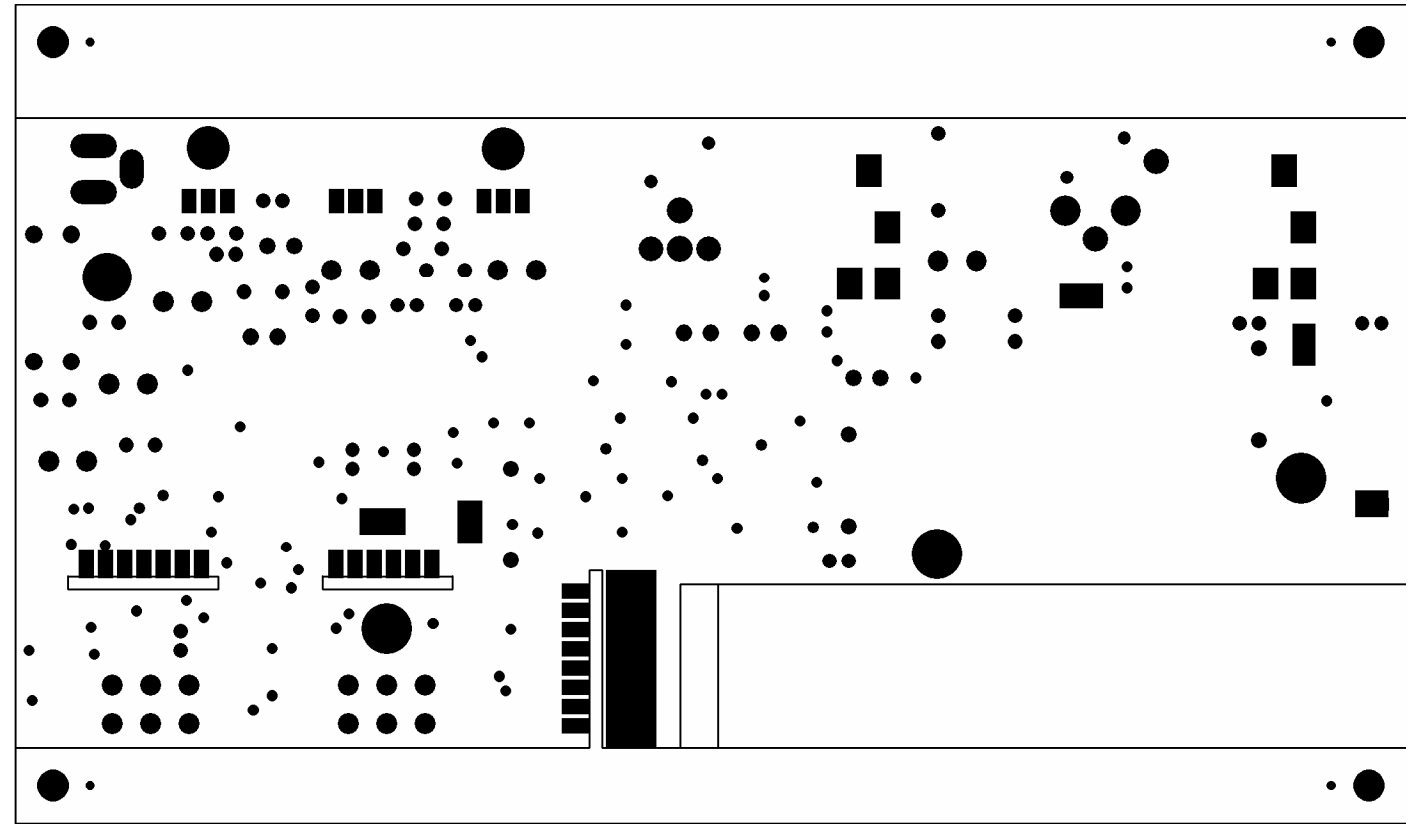
MINI-MN Bottom overlay



MINI-MN Bottom Layer

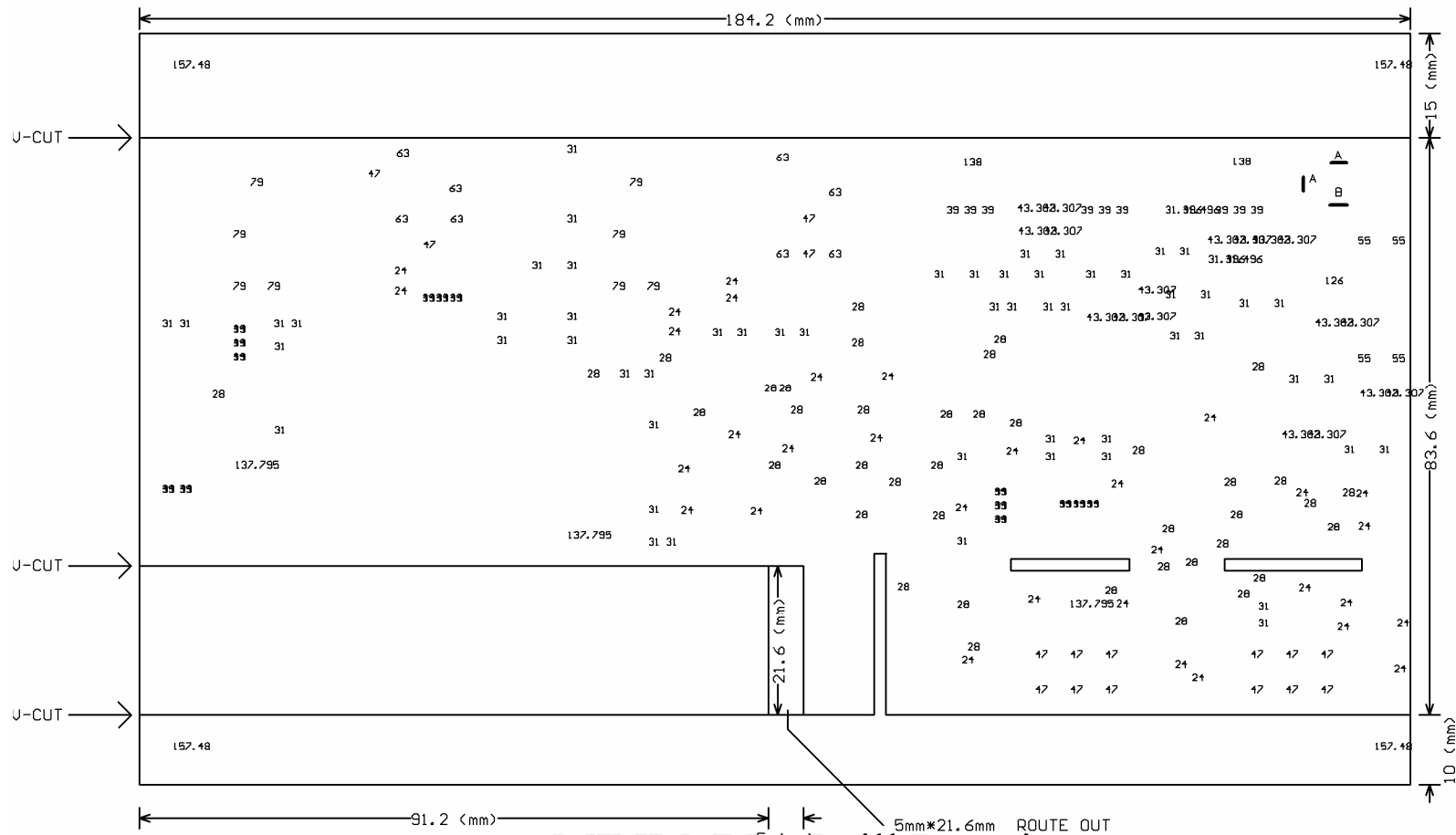


MINI-MN Top Solder Mask



MINI-MN Bottom Solder Mask

A = BUTTONHOLE 1.3*2.6--2HOLES
 B = BUTTONHOLE 1.3*3.3--1HOLES

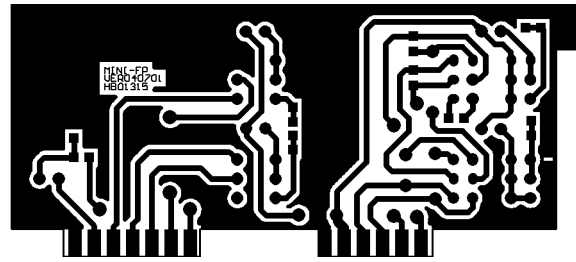


MINI-MN Drill Drawing

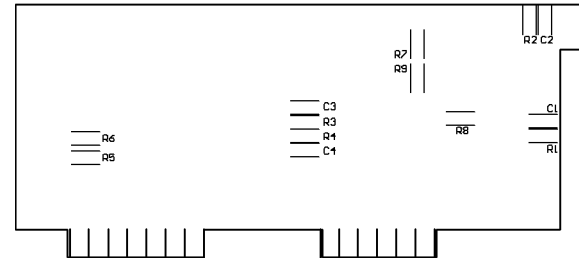
Tool Hole Size Hole Count Plated

Tool	Hole Size	Hole Count Plated
T1	24mil (0.6096mm)	33
T2	28mil (0.7112mm)	41
T3	31mil (0.7874mm)	60
T4	39mil (0.9906mm)	23
T5	43mil (1.0922mm)	18
T6	44mil (1.1176mm)	14
T7	47mil (1.1938mm)	16
T8	55mil (1.397mm)	4
T9	63mil (1.6002mm)	6
T10	79mil (2.0066mm)	8
T11	126mil (3.2004mm)	1
T12	138mil (3.5052mm)	2
T13	63mil (1.6002mm)	2
T14	138mil (3.5052mm)	3
T15	157mil (3.9878mm)	4

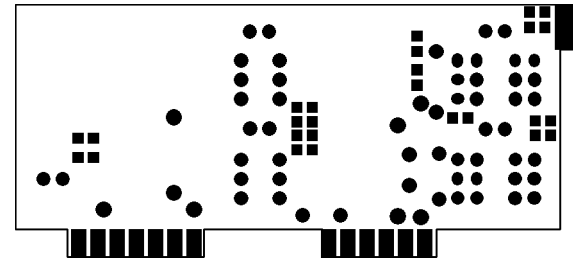
Totals 235



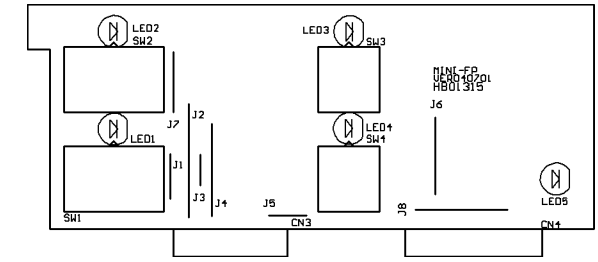
MINI-FP Bottom Layer



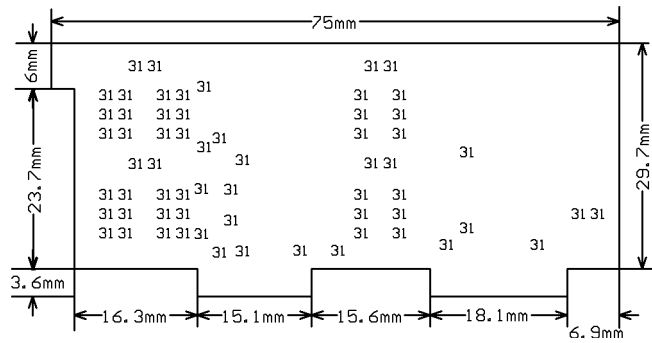
MINI-FP Bottom overlay



MINI-FP Bottom Solder Mask

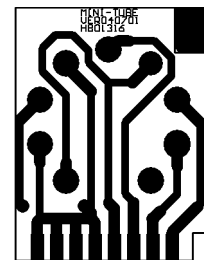


MINI-FP Top overlay

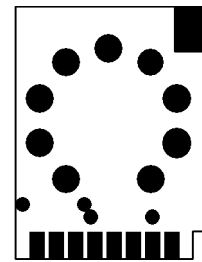


MINI-FP Drill Drawing

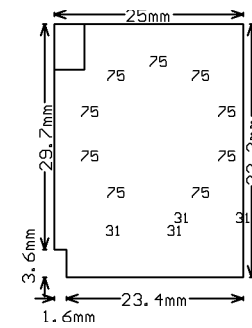
Tool	Hole Size	Hole Count Plated
T1	31mil (0.7874mm)	62
Totals		62



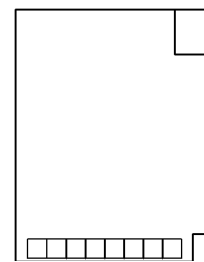
MINI-TUBE Bottom Layer



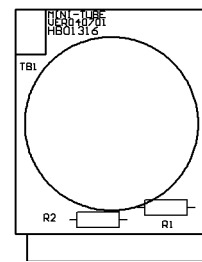
MINI-TUBE Bottom Solder Mask



MINI-TUBE Drill Drawing



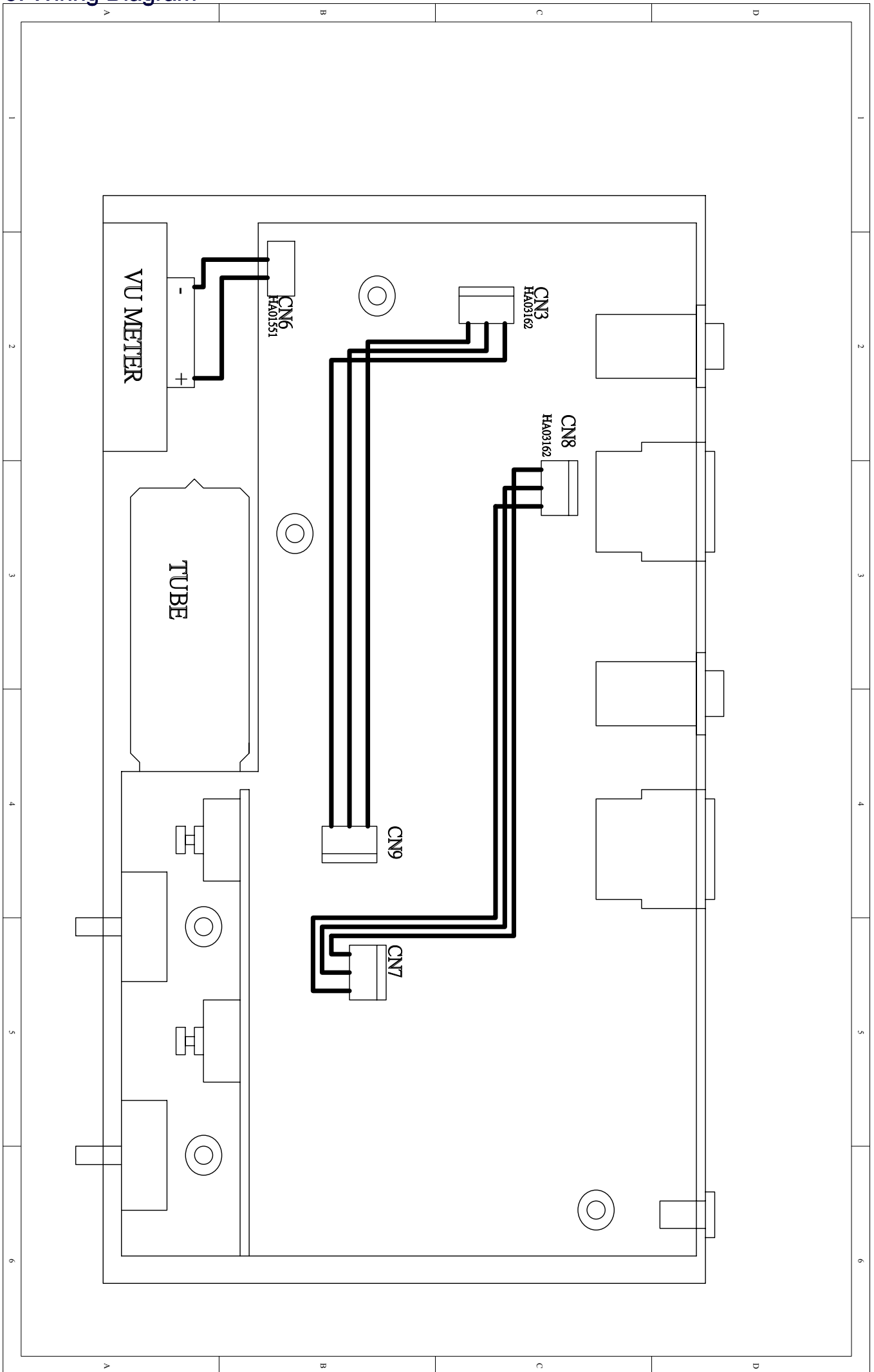
MINI-TUBE Bottom overlay



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
Page No.: 1 / 10

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

Version	Item No	Loss %	Ver.	Unit	Cardinal	Effective Date
Component Remark	Item Descri				Usage Rate	@:Phantom Layer
					Attrition Rate	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 LUY2340/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

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
	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 2004/12/14
 Page No.: 6 / 10

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
-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

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	Effective Date @:Phantom Layer Attrition 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
 Page No.: 8 / 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	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
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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
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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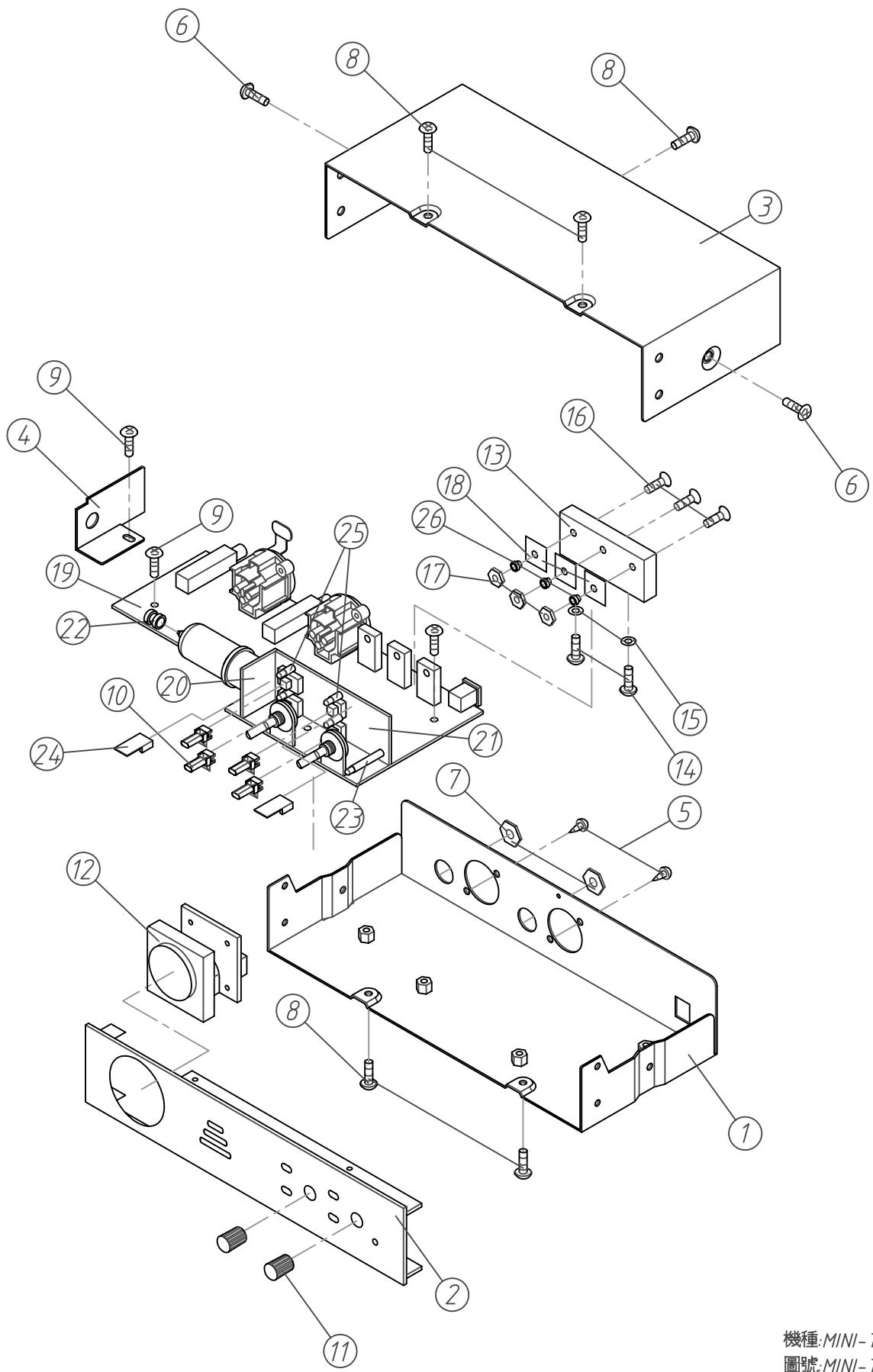
Item No. PF01709 Version
 DESCRIPTION: MINI-TUBE
 MINI-TUBE ALTO_230V

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 MINI-Tube(3*3)_VER040830			PCS	1.0000 1 0.00 %	2004/09/01 N
0002	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						