

# Service Manual

**Model: DI1**

DIRECT INJECT BOX



[www.altoproaudio.com](http://www.altoproaudio.com)

Version: 1.1

# **CONTENTS**

- 1. Specification**
- 2. Block Diagram**
- 3. Schematic Diagram**
- 4. Printed Circuit Board**
- 5. Wiring Diagram**
- 6. Test Procedure**
- 7. Electrical Parts List**
- 8. Exploded Views & Mechanical Parts List**
- 9. Notes**

## 1. SPECIFICATIONS (DI1)

Inputs	1/4" jack unbal. In/ Link Out XLR unbalanced In
Input Impedance	max 220 kOhm
Maximum Input level	+2/+22/+42 dBm

Output	XLR balanced Out
Load Impedance	>600 Ohm
Maximum Output Level	+6 dBm

### System specifications

Bandwidth(100kOhm)	10Hz to 200Khz( ± 3dbm)
Bandwidth(600Ohm)	10Hz to 45Khz( ± 3dbm)
Bandwidth(High Cut)	10Hz to 8Khz( ± 3dbm)

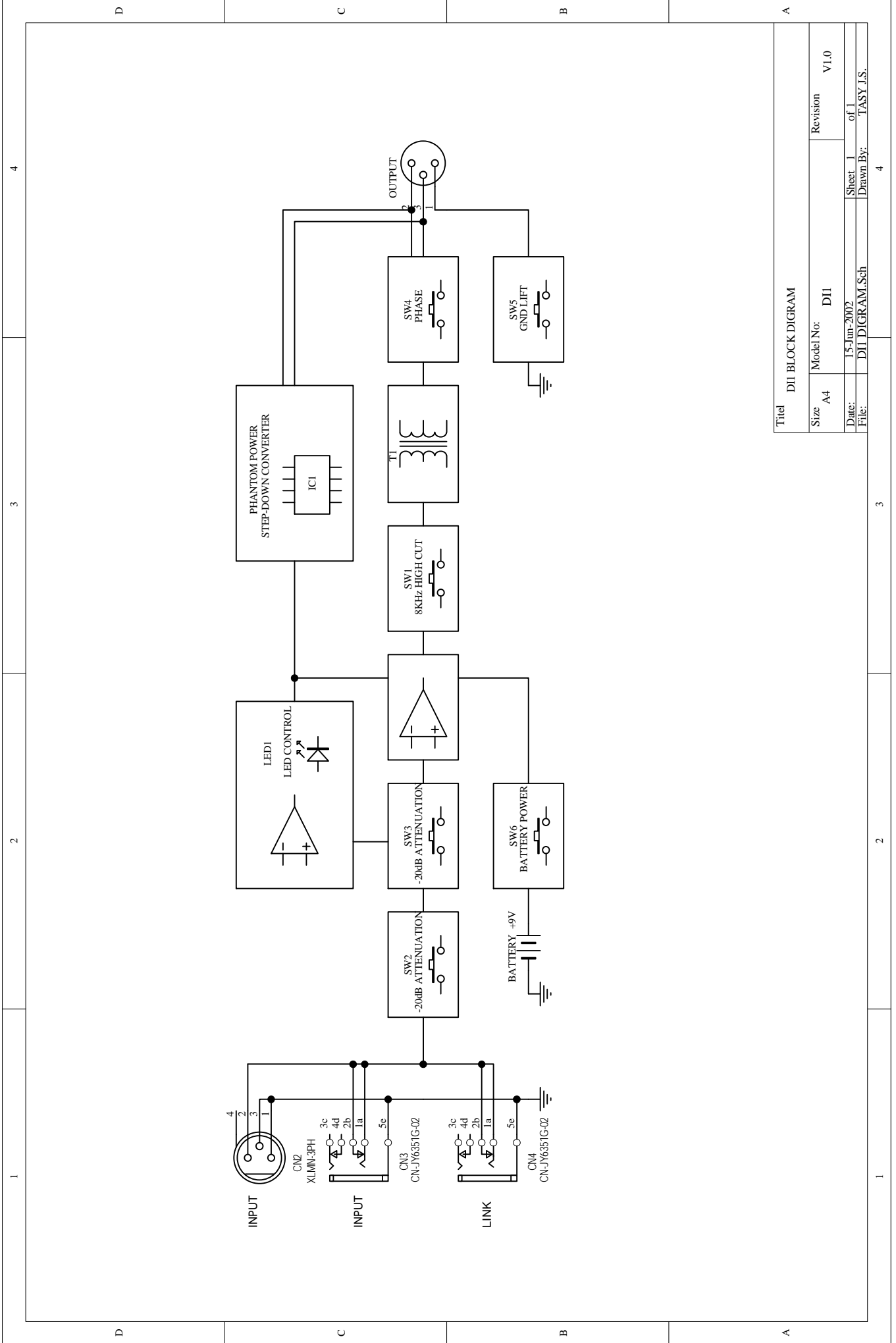
Noise Level	-105 dBm
THD+N @ 1 kHz / 1 dBm	< 0.01 %

### Power supply

Phantom power 18 V DC to 48 V DC  
Battery 9 V blockcell 6LR91

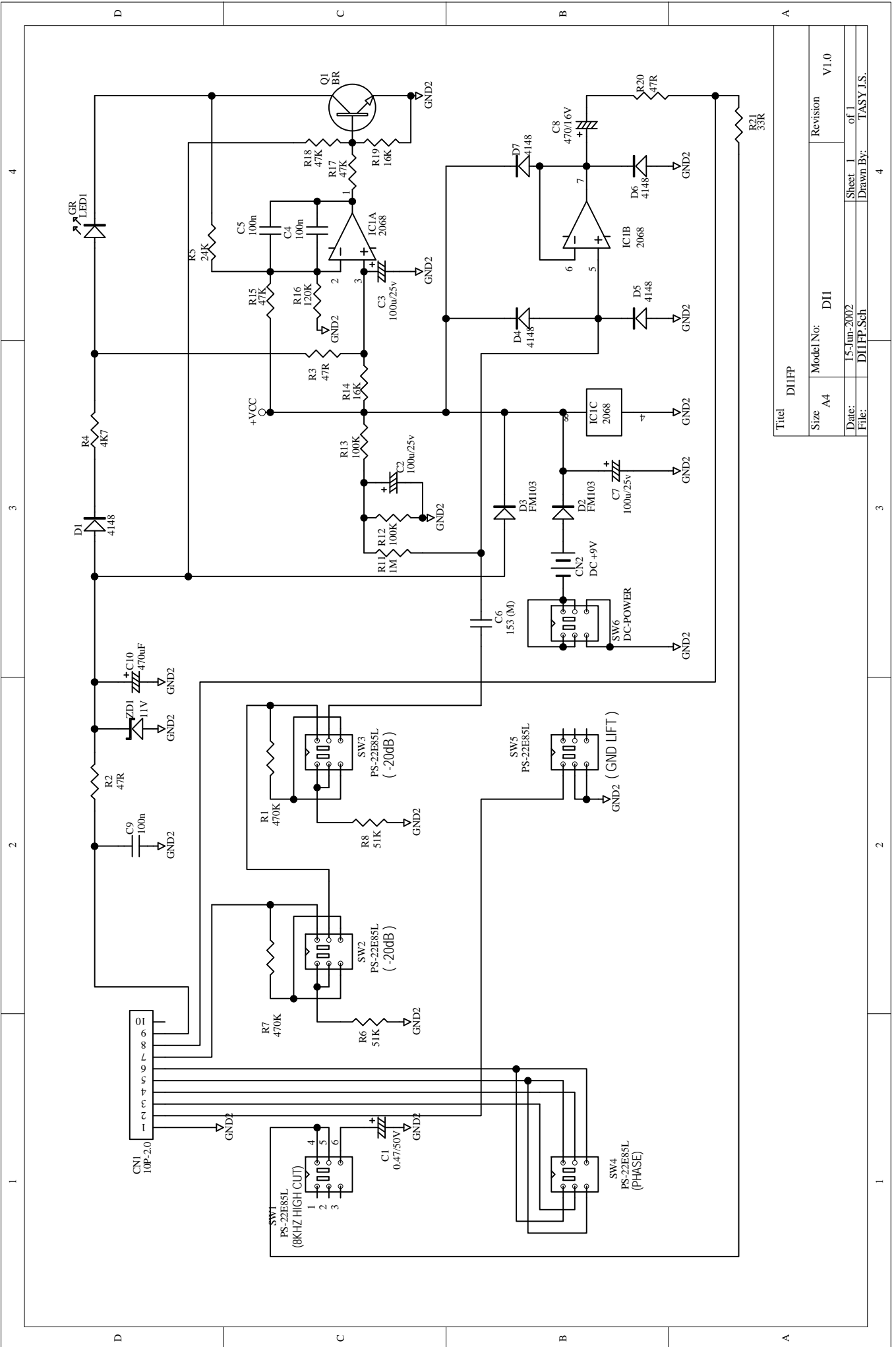
Dimensions 128 mm x 123.5 mm x 44.2 mm  
Weight ca. 0.8Kg

# 2.Block Diagram

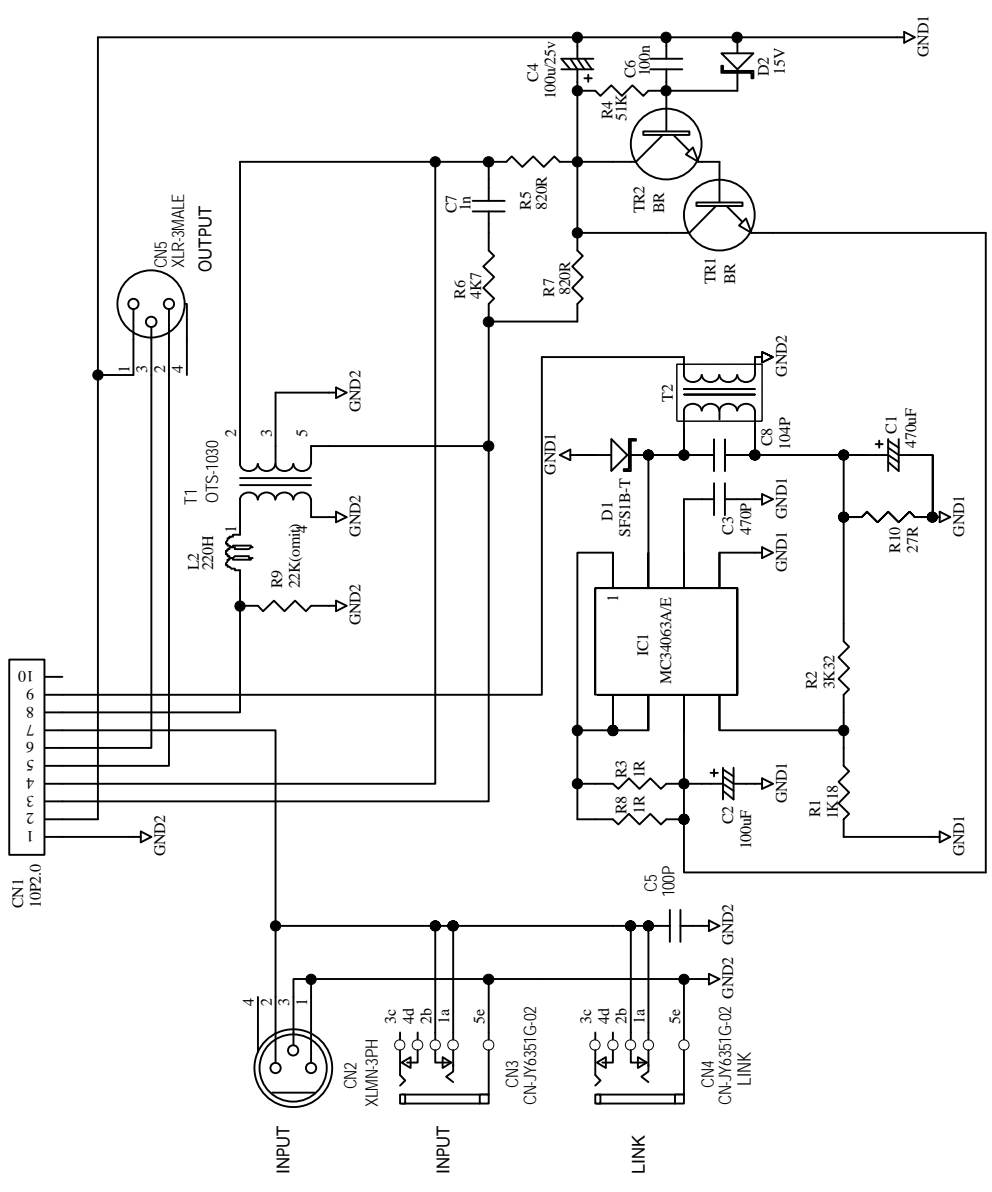


Titel		DII BLOCK DIGRAM	
Size	A4	Model No:	DII
Date:	15-Jun-2002	Revision	V1.0
File:	DII DIGRAM.Sch	Sheet 1 of 1	
		Drawn By:	TASY J.S.

### 3. Schematic Diagram



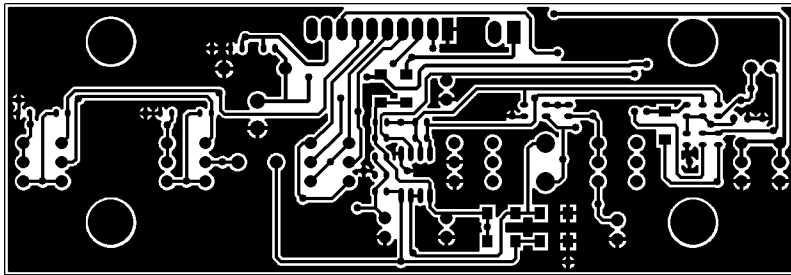
Titel		DII/FP	
Size	A4	Model No:	DII
Date:	15-Jun-2002	Sheet	1 of 1
File:	DII/FP.Sch	Drawn By:	TASY J.S.
		Revision	V1.0



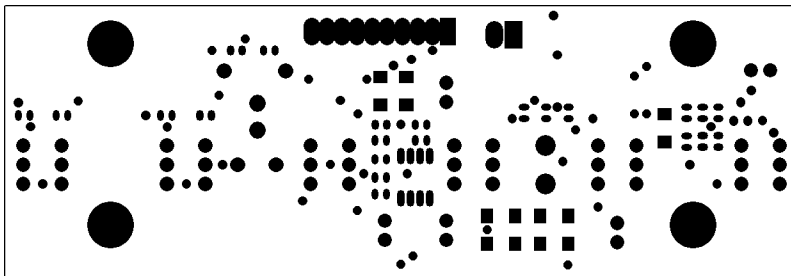
Titel		DI1PU	
Size	A4	Model No:	DI1
Date:	2-Jul-2002	Revision	V1.0
File:	DI1PU_Sch	Sheet 1	of 1
		Drawn By:	TASY J.S.

# 4. Printed Circuit Diagram

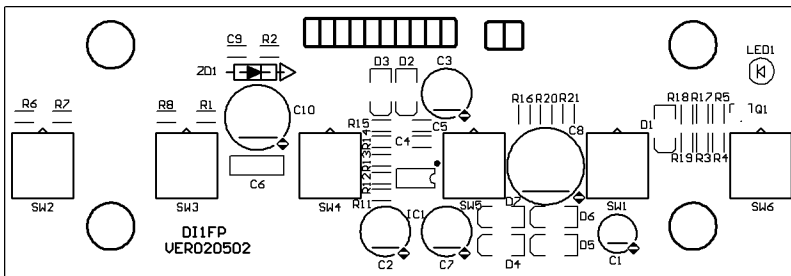
## DI1FP PCB LAYOUT



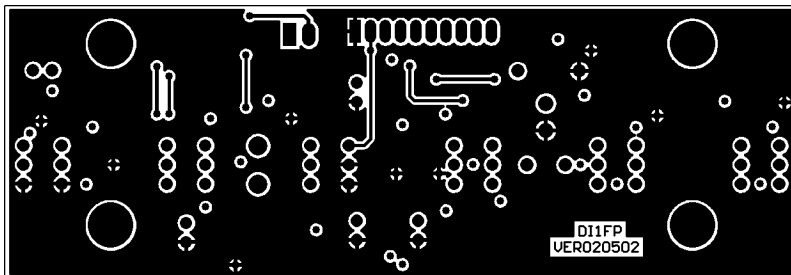
PCB : DI1FP Top Layer



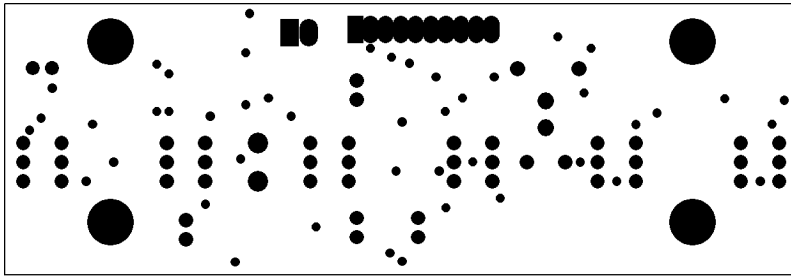
PCB : DI1FP Top Solder Mask



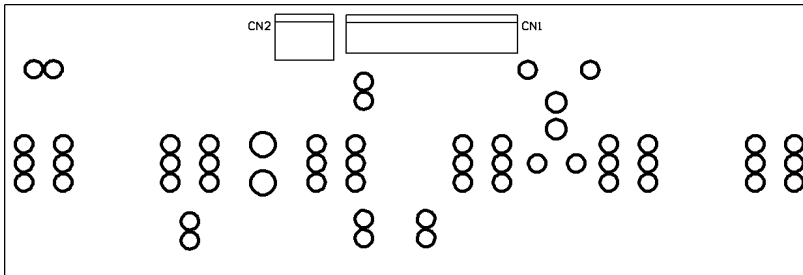
PCB : DI1FP Top Overlay



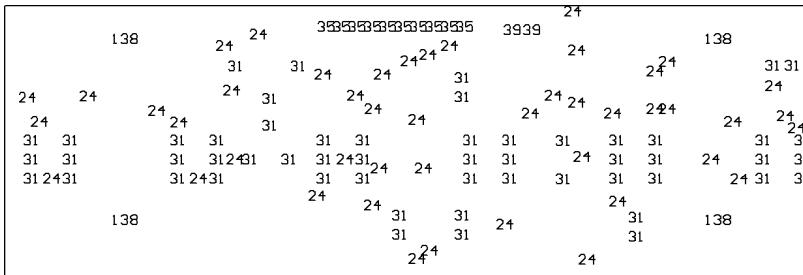
PCB : DI1FP Bottom Layer



PCB : DI1FP Bottom Solder Mask



PCB : DI1FP Bottom Overlay

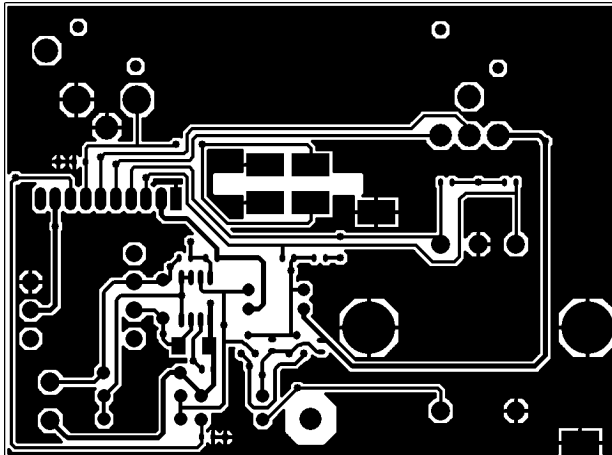


PCB : DI1FP Drill Drawing Plots

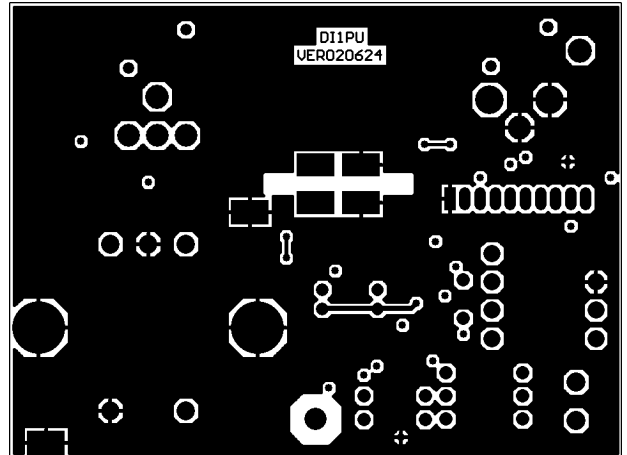
Hole Size	Hole Count
24mil (0.6mm)	46
31mil (0.8mm)	54
35mil (0.9mm)	10
39mil (1.0mm)	2
138mil (3.5mm)	4
Totals	116



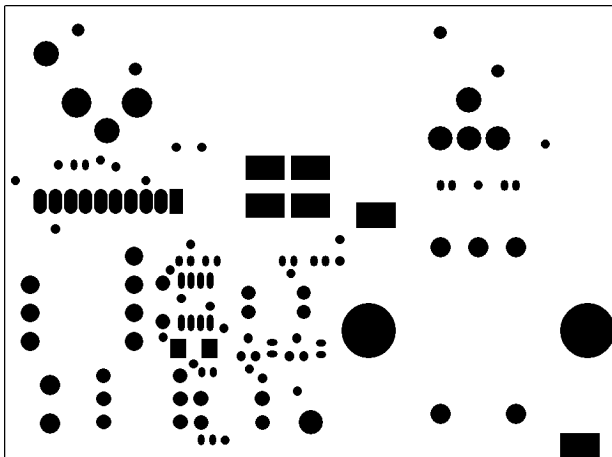
# DI1PU PCB LAYOUT



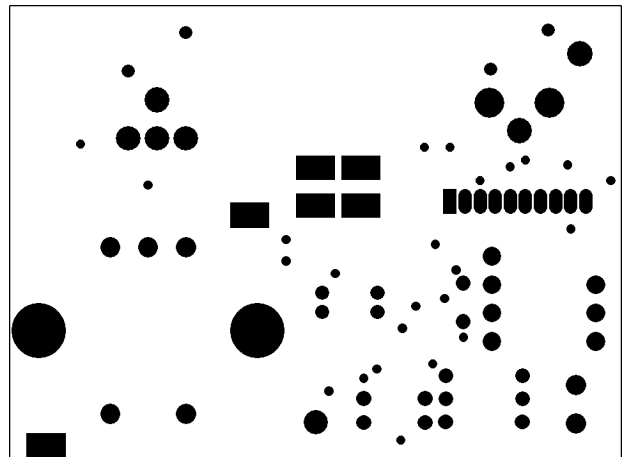
PCB : DI1PU Top Layer



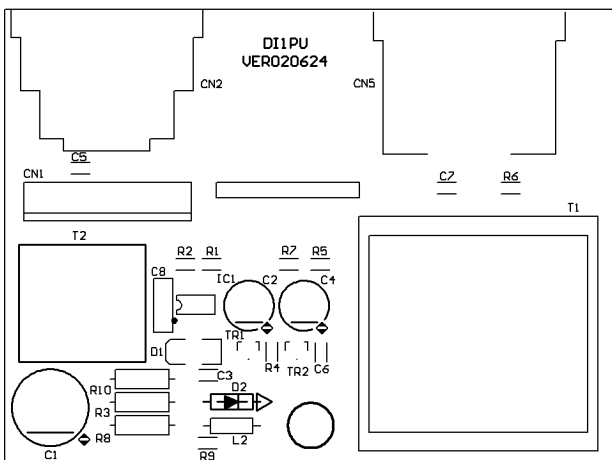
PCB : DI1PU Bottom Layer



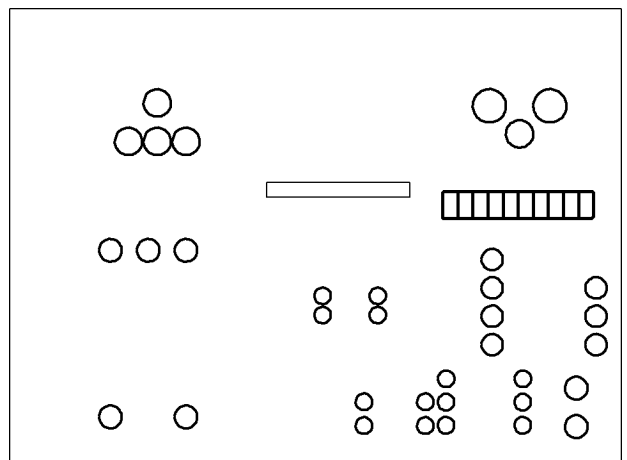
PCB : DI1PU Top Solder Mask



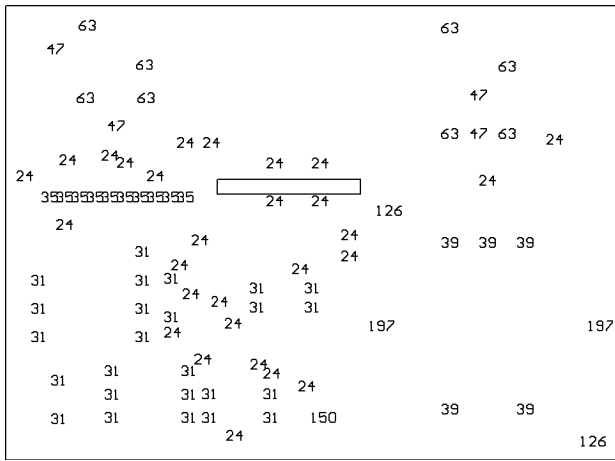
PCB : DI1PU Bottom Solder Mask



PCB : DI1PU Top Overlay



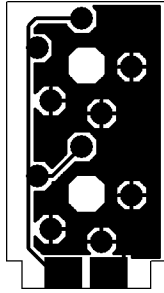
PCB : DI1PU Bottom Overlay



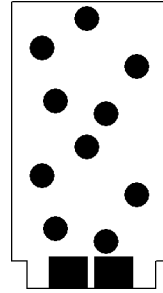
Hole Size	Hole Count
24mil (0.6mm)	28
31mil (0.8mm)	25
35mil (0.9mm)	10
39mil (1.0mm)	5
47mil (1.2mm)	4
63mil (1.6mm)	8
126mil (3.2mm)	2
150mil (3.8mm)	1
197mil (5.0mm)	2
<b>Totals</b>	<b>85</b>

PCB : DI1PU Drill Drawing Plots

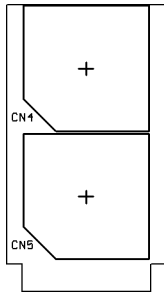
# DI4IN PCB LAYOUT



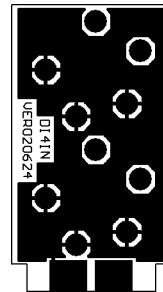
PCB : DI4IN Top Layer



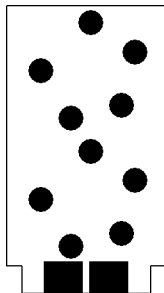
PCB : DI4IN Top Solder Mask



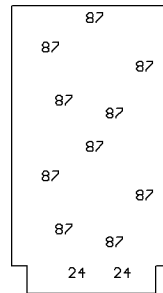
PCB : DI4IN Top Overlay



PCB : DI4IN Bottom Layer

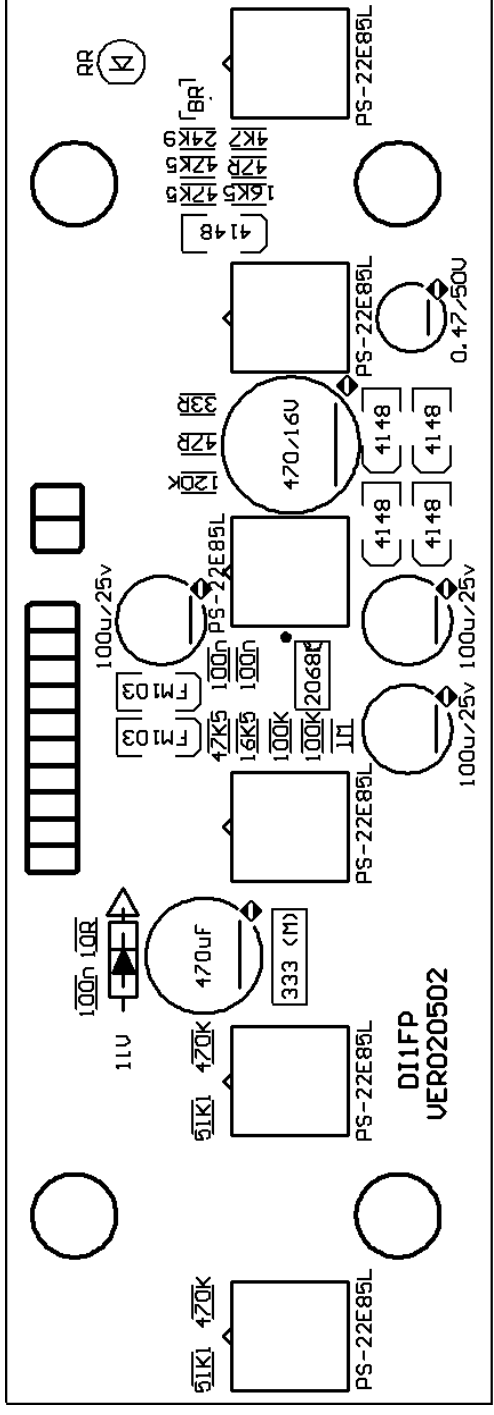


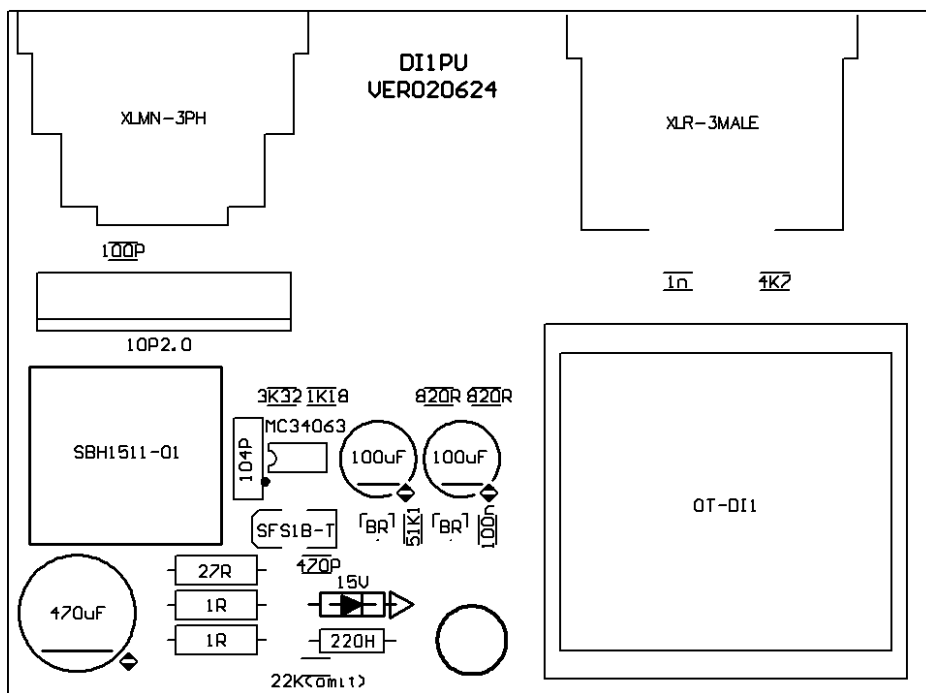
PCB : DI4IN Bottom Solder Mask



PCB : DI4IN Drill Drawing Plots

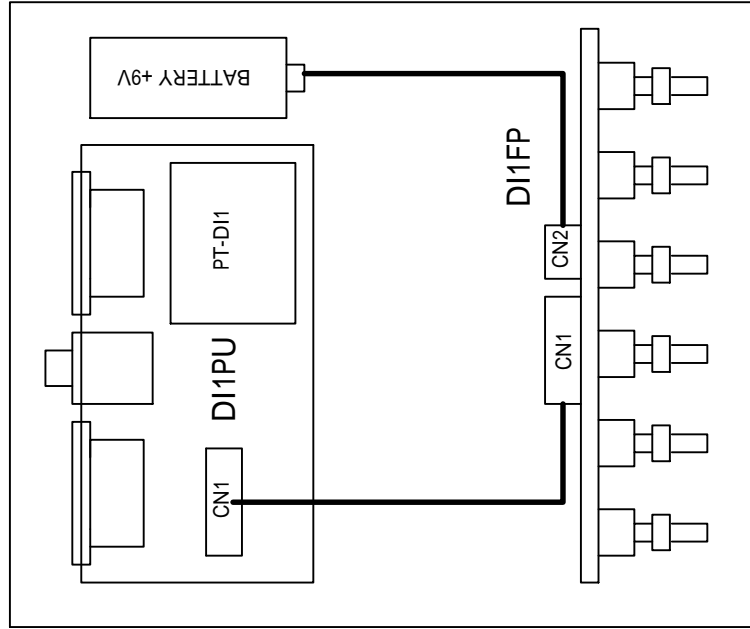
Hole Size	Hole Count
24mil (0.6mm)	2
87mil (2.2mm)	10
<b>Totals</b>	<b>12</b>





# 5. Wiring Diagram

## DI1 Wiring DIAGRAM



Titel DI1 Wiring DIAGRAM

Size	Model No:	Revision
A4	DI1	V1.0
Date:	26-Oct-2002	Sheet 1 of 1
File:	DI1(全).Sch	Drawn By: TASY J.S

4

3

2

1

D

C

B

A

D

C

B

A

3

2

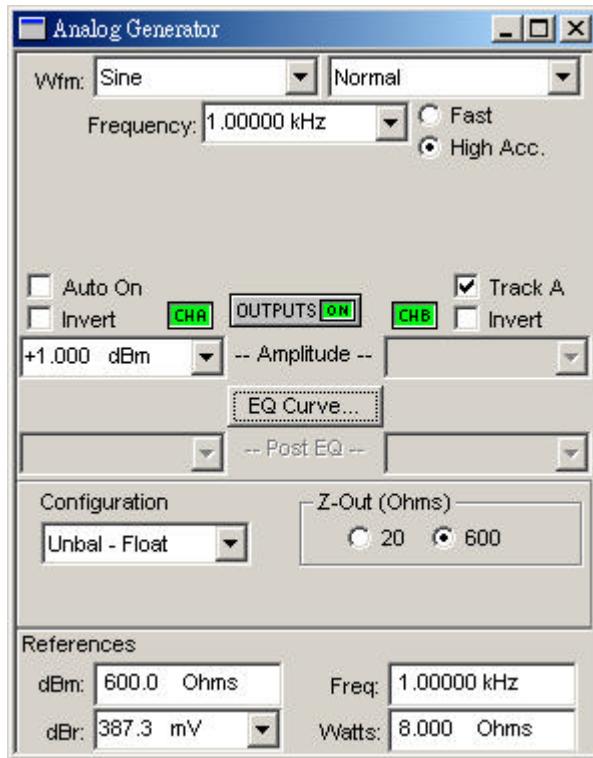
1

4

## 6. Test Procedure

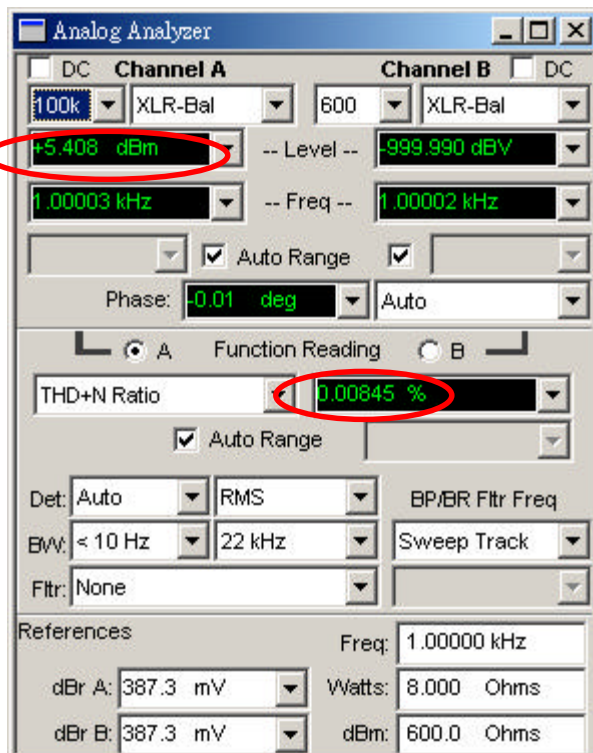
Adjustments (Please follow the instructions to test.)

### 1. Setting 1



Settings:

1.AP: set same as left features.

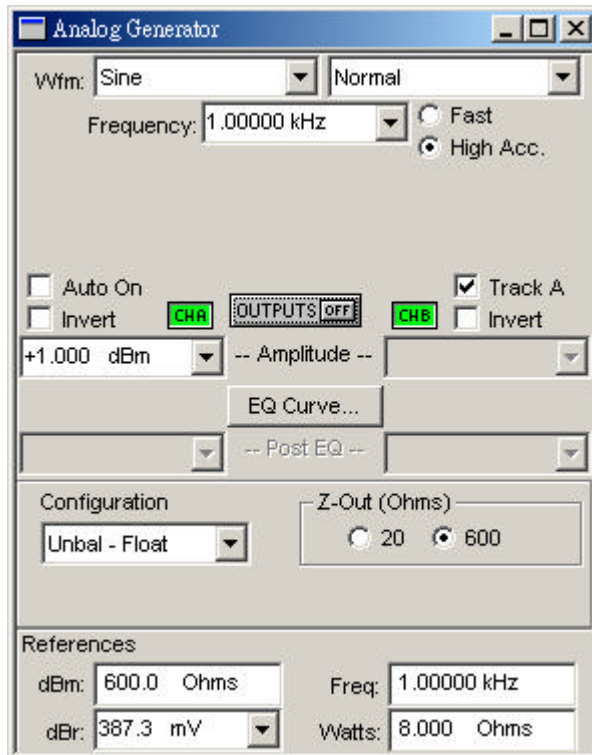


Test:

1.LEVEL: Keep it at the range of  $+5\text{dBm} \pm 1\text{dBm}$

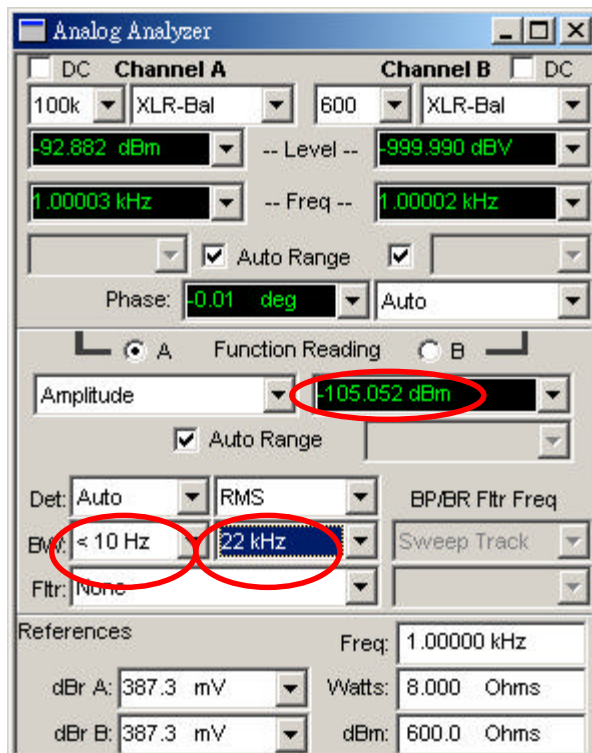
2.Distortion:  $0.01\% (+0.005\%)$ .

## 2. Setting 2.



Setting:

1. Set AP OUTPUT in OFF mode.

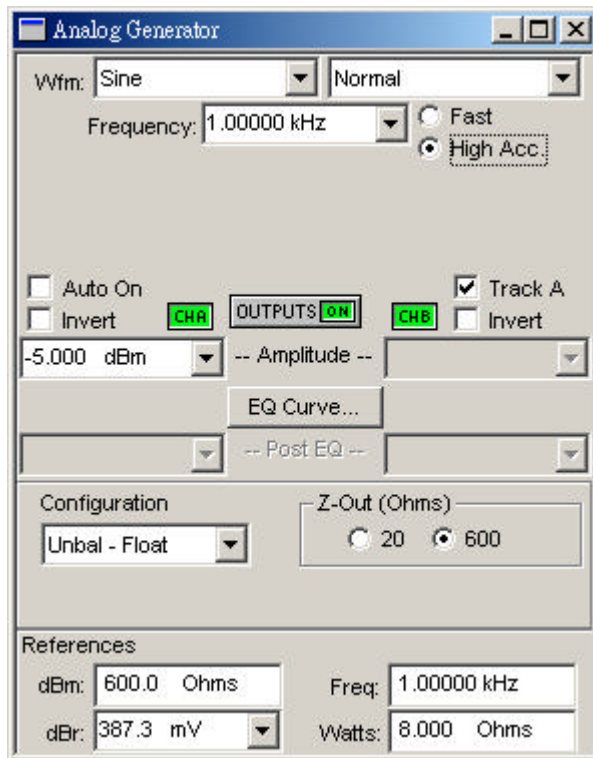


Test :

1. Noise Level -105 Bm( $\pm 3$ dBm)

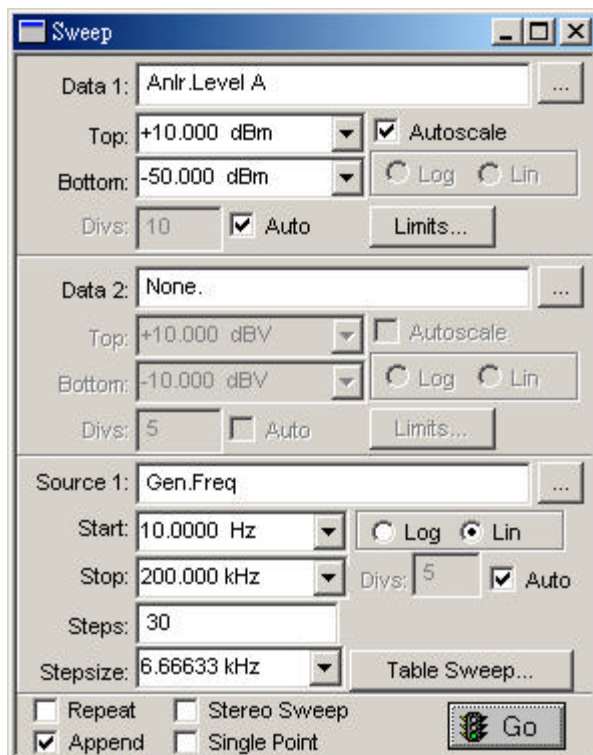


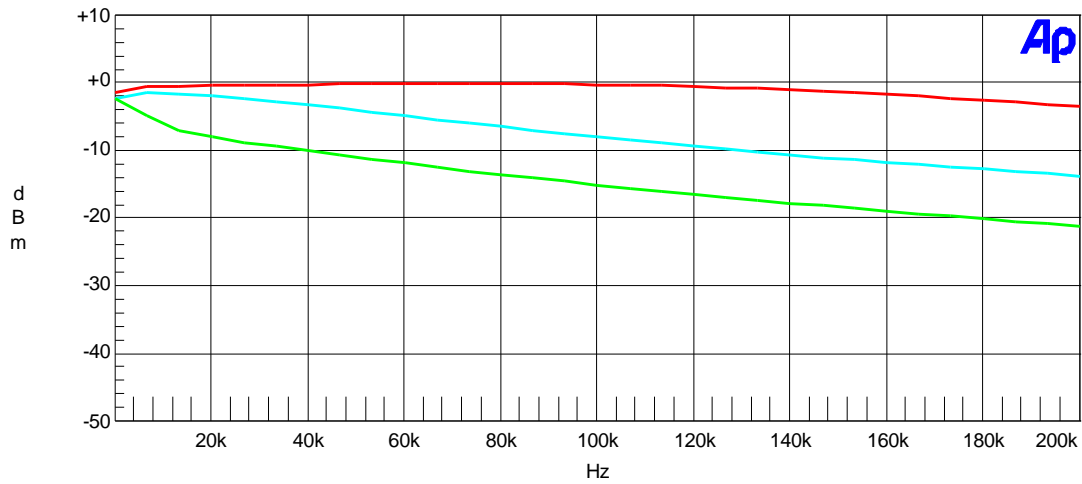
### 3. Test 3



#### Settings:

1. AP: Set as the left features.
2. RED Curve shows when all functions are at "OFF" mode, and the setting for AP output impedance is 100K
3. CYAN Curve shows when all functions are at "OFF" mode, and the setting for AP output impedance is 600
4. GREEN curve means only HIGH CUT(8KHZ) is ON, and AP output impedance is 600
5. Testing curve should be same as the curve in the pictures next page,  $\pm 2$ dBm





Color	Line Style	Thick	Data	Axis
Cyan	Solid	2	Anlr.Level A	Left
Green	Solid	2	Anlr.Level A	Left
Red	Solid	2	Anlr.Level A	Left

last.at2c

### Other hints :

1. All function switches (-20dBm, GND LIFT, PHASE) should be tested as well-functions

(1) When -20dBm is pushed down, LEVEL will be reduced to  $-20 \text{ dBm} \pm 2 \text{ dBm}$

(2) When both -20dBm buttons are pushed down, LEVEL will be reduced to  $-40 \text{ dBm} \pm 4 \text{ dBm}$

(3) GND (Ground) LIFT button is to separate output and input ground.

2. Phantom power test

(1) aMICTUBE (PHANTOM +48V) can be used to test that if the wire assemblies of DI1, PIN 9, pass through voltage on  $8.5 \text{ V} \pm 0.5 \text{ V}$  or not.

(2) When you use phantom power, the LED indicator for power is illuminated. However, if you use battery, then the indicator will flash.

Original settings for products:

1. All functions are in "OFF" mode.

2. Products should pass final test.

**Structure Needing Material Detail List**

建檔日: 2002/07/06      修正日: 2002/08/09

<u><b>NO.</b></u>	<u><b>Midprod NO</b></u>	<u><b>Quantity</b></u>	<u><b>Unit</b></u>
1	A-DI1-ALTO	1.000	PCS
2	A-DI1-底板組合	1.000	PCS
3	A-DI1-前板組合	1.000	PCS
4	P-DI1FP-SMD	1.000	PCS
5	P-DI1FP-DIP	1.000	PCS
6	P-DI1PU-SMD	1.000	PCS
7	P-DI1PU-DIP	1.000	PCS
8	P-DI4IN(DI1)	1.000	PCS

Item No: DI1

specify: AMP

Mid No:  standard quantity: 

NO	Material No	Item Name	Specific	Quantity	Unit	Ps
	1 MA03379	panel	DI1 ALTO	1.000	PCS	
<b>MARK:</b>						
	2 MC00424	top cover	DI1	1.000	PCS	
<b>MARK:</b>						
	3 MB02312	rear board	DI1	1.000	PCS	
<b>MARK:</b>						
	4 MI01412	battery cover	DI1	1.000	PCS	
<b>MARK:</b>						
	5 HLSF141	header wiring AF:W141	2P plus 9V battery clip	1.000	PCS	
<b>MARK:</b>						
	6 NPL287		3*W6*18.3 black ABS	6.000	PCS	
<b>MARK:</b>						
	7 MSCB28	black plated screw	flat self 3*4	5.000	PCS	DI1FP, DI1PU
<b>MARK:</b>						
	8 MSCB38	black plated screw	3*7	4.000	PCS	面板
<b>MARK:</b>						
	9 MSCB13	black-plated screw	cross-head pan head 3*6	10.000	PCS	上蓋,後板,前板
<b>MARK:</b>						
	10 MSCB58	black plated screw	iron-board pill 3*10	4.000	PCS	平衡座
<b>MARK:</b>						
	11 NLXM39	self-paste foot pad(SF-0	12.7*9.0*3.0t	4.000	PCS	
<b>MARK:</b>						
	12 NWCP01WW0200*0220	PE bag	20*22cm	1.000	PCS	
<b>MARK:</b>						
	13 NWCP04	lockable bag	5*7	1.000	PCS	
<b>MARK:</b>						
	14 HEM-002	desiccant	10g	1.000	PCS	
<b>MARK:</b>						
	15 ME00060	MIC stand nut	JY-6351G-02-250	2.000	PCS	
<b>MARK:</b>						
	16 MF00061	mic stand washer	JY-6351G-02-250	2.000	PCS	
<b>MARK:</b>						
	17 NB01832	box	DI1 ALTO	1.000	PCS	
<b>MARK:</b>						
	18 NF00968	instruction	DI1 ALTO	1.000	PCS	
<b>MARK:</b>						
	19 NMCQ-073	assurance book	ALTO	1.000		
<b>MARK:</b>						
	20 MSCB39	black plated screw	12*14	1.000	PCS	
<b>MARK:</b>						
	21 POA002	paper outter case 8hole	aVERB	0.125	PCS	
<b>MARK:</b>						
	22 ND00209	EV bubble sponge	40*15*5	1.000	PCS	
<b>MARK:</b>						
	23 NE04366	label	DI1 ALTO	2.000		
<b>MARK:</b>						
	24 NE05004	label	ALTO	4.000		
<b>MARK:</b>						
	25 NE07650	label	DI1 機種條碼	4.000	PCS	
<b>MARK:</b>						

Item No: DI1

specify: AMP

Mid No:  standard quantity: 

<b>NO</b>	<b>Material No</b>	<b>Item Name</b>	<b>Specific</b>	<b>Quantity</b>	<b>Unit</b>	<b>Ps</b>
1	MI01409	barrier	DI1	1.000	PCS	
<b>MARK:</b>						
2	MB02316	rear board	DI1	1.000	PCS	
<b>MARK:</b>						
3	MMC013	iron pillar	hexagon 6.35*M3*6	1.000	PCS	
<b>MARK:</b>						

Item No: DI1

specify: AMP

Mid No:  standard quantity: 

<b>NO</b>	<b>Material No</b>	<b>Item Name</b>	<b>Specific</b>	<b>Quantity</b>	<b>Unit</b>	<b>Ps</b>
1	MI01406	front board	DI1	1.000	PCS	
<b>MARK:</b>						
2	MMC013	iron pillar	hexagon 6.35*M3*6	4.000	PCS	
<b>MARK:</b>						

Item No: DI1

specify: AMP

Mid No:  standard quantity: 

NO	Material No	Item Name	Specific	Quantity	Unit	Ps
	1 HB00706	PC board	DI1FP(1*4)_VER020502	1.000	PCS	
<b>MARK:</b>						
	2 RD00368	resistor	16.5K ± 1% 0603	2.000	PCS	
<b>MARK:</b> R	14 19					
	3 RPCA2249	SMD 1/10W precise resis	24.9K ± 1% 0603	1.000	PCS	
<b>MARK:</b> R	5					
	4 RD00290	resistor	47.5K ± 1% 0603	3.000	PCS	
<b>MARK:</b> R	15 17 18					
	5 RD00371	resistor	51.1K ± 1% 0603	2.000	PCS	
<b>MARK:</b> R	6 8					
	6 RFCF010	SMD 1/10W fixed resistor	10 ± 5% 0603	1.000	PCS	
<b>MARK:</b> R	2					
	7 RFCF033	SMD 1/10W fixed resistor	33 ± 5% 0603	1.000	PCS	
<b>MARK:</b> R	21					
	8 RFCF047	SMD 1/10W fixed resistor	47 ± 5% 0603	2.000	PCS	
<b>MARK:</b> R	20 3					
	9 RFCF247	SMD 1/10W fixed resistor	4.7K ± 5% 0603	1.000	PCS	
<b>MARK:</b> R	4					
	10 RFCF410	SMD 1/10W fixed resistor	100K ± 5% 0603	2.000	PCS	
<b>MARK:</b> R	12 13					
	11 RFCF412	SMD 1/10W fixed resistor	120K ± 5% 0603	1.000	PCS	
<b>MARK:</b> R	16					
	12 RFCF447	SMD 1/10W fixed resistor	470K ± 5% 0603	2.000	PCS	
<b>MARK:</b> R	1 7					
	13 RFCF510	SMD 1/10W fixed resistor	1.0M ± 5% 0603	1.000	PCS	
<b>MARK:</b> R	11					
	14 SE00029	diode	FM103	2.000	PCS	
<b>MARK:</b> D	2 3					
	15 DRS0005	SMD rectifier diode	RLS4148 0.5A (LL-34)	5.000	PCS	
<b>MARK:</b> D	1 4 5 6 7					
	16 CCE410F	SMD0603 ceramic capacitc	0.1uF Y5V+80 -20%50V	3.000	PCS	
<b>MARK:</b> C	4 5 9					
	17 SICS202	SMD integraded circuit	NJM2068M-TE1(LM833D)	1.000	PCS	
<b>MARK:</b> IC	1					
	18 STRS201	SMD transistor	2SC2412K(R)(MMBT3904LT1)	1.000	PCS	
<b>MARK:</b> Q	1					

Item No: DI1

specify: AMP

Mid No:  standard quantity: 

NO	Material No	Item Name	Specific	Quantity	Unit	Ps
1	CE447G	electrotytic capacitor	0.47/50V 4*7	1.000	PCS	
<b>MARK:C</b>	1					
2	CE710E	electrotytic capacitor	100/25V	3.000	PCS	
<b>MARK:C</b>	2 3 7					
3	CE747D	electrolytic capacitor	470/16V	1.000	PCS	
<b>MARK:C</b>	8					
4	CL333G	mylar capacitor	0.033/50V	1.000	PCS	
<b>MARK:C</b>	6					
5	HI00162	sw	PS-22E8552L(3.3x3.3)	6.000	PCS	
<b>MARK:SW</b>	1 2 3 4 5 6					
6	DL37RR	L.E.D high intensity	3m/m round(red)long foot	1.000	PCS	
<b>MARK:SLE</b>	1					
7	HA02084		10P-10P 220mm	1.000	PCS	
<b>MARK:CN</b>	1					
8	HCSI0202	row-wire header	2P 2.5mm 180 °	1.000	PCS	
<b>MARK:CN</b>	2					
9	NI01766	LED separating pillar	LEDS-19 19mm	1.000	PCS	
<b>MARK:</b>						
10	DZA11V	zener diode	1/2W 11V 11B3	1.000	PCS	
<b>MARK:ZD</b>	1					
11	CB00129	capacitor	470uF/16V 85 低漏電	1.000	PCS	
<b>MARK:C</b>	10					



Item No: DI1

specify: AMP

Mid No:  standard quantity: 

NO	Material No	Item Name	Specific	Quantity	Unit	Ps
1	HB00707	PC board	DI1PU(1*4)_VER020624	1.000	PCS	
<b>MARK:</b>						
2	RPCA1118	SMD 1/10W precise resis	1.18K ± 1% 0603	1.000	PCS	
<b>MARK:R 1</b>						
3	RD00357	resistor	3.32K ± 1% 0603	1.000	PCS	
<b>MARK:R 2</b>						
4	RD00371	resistor	51.1K ± 1% 0603	1.000	PCS	
<b>MARK:R 4</b>						
5	RFCF247	SMD 1/10W fixed resistor	4.7K ± 5% 0603	1.000	PCS	
<b>MARK:R 6</b>						
6	CCE110B	SMD0603 ceramic capacitc	100PF NPO ± 5% -50	1.000	PCS	
<b>MARK:C 5</b>						
7	CCE147B	SMD0603 ceramic capacitc	470PF NPO ± 5% -50	1.000	PCS	
<b>MARK:C 3</b>						
8	CCE210I	SMD0603 ceramic capacitc	0.001uF X7R ± 10% -50	1.000	PCS	
<b>MARK:C 7</b>						
9	CCE410F	SMD0603 ceramic capacitc	0.1uF Y5V+80 -20%50V	1.000	PCS	
<b>MARK:C 6</b>						
10	STRS201	SMD transistor	2SC2412K(R) (MMBT3904LT1)	2.000	PCS	
<b>MARK:TR 1 2</b>						
11	SE00030	diode	SFS1B	1.000	PCS	
<b>MARK:D 1</b>						
12	SD00133	integratedcircuit	MC34063ACD	1.000	PCS	
<b>MARK:IC 1</b>						
13	RFCF182	SMD 1/10W fixed resistor	820 ± 5% 0603	2.000	PCS	
<b>MARK:R 5 7</b>						

Item No: DI1

specify: AMP

Mid No:  standard quantity: 

NO	Material No	Item Name	Specific	Quantity	Unit	Ps
	1 DZA15V	zener diode	1/2W 15V 15B3	1.000	PCS	
<b>MARK:D</b>	2					
	2 CN00038	inductance	220uH(LGA0307-221K)	1.000	PCS	
<b>MARK:L</b>	2					
	3 CE710E	electrotytic capacitor	100/25V	2.000	PCS	
<b>MARK:C</b>	2 4					
	4 RFBG10S	1/4W fixed resistor	1.0 S type	2.000	PCS	
<b>MARK:R</b>	3 8					
	5 CE747E-1	electrotytic capacitor	470uF/25V 105 10*16	1.000	PCS	
<b>MARK:C</b>	1					
	6 HCSV0210	row wire header	10P 2.0mm 180 °	1.000	PCS	
<b>MARK:CN</b>	1					
	7 TF00059	transformer	OT-DI1	1.000	PCS	
<b>MARK:T</b>	1					
	8 HC5M40	MIC jack for balance	99M-108SP1	1.000	PCS	
<b>MARK:CN</b>	5					
	9 HC00405	shape male	99M-107SP1L2 母插90 ° NO	1.000	PCS	
<b>MARK:CN</b>	2					
	10 TC00110	transformer	SBH1511-01	1.000	PCS	
<b>MARK:T</b>	2					
	11 MI01404	separting shade	DI4	1.000	PCS	
<b>MARK:T</b>	1					
	12 RFB027S	1/4W fixed resistor	27 S type	1.000	PCS	
<b>MARK:R</b>	10					
	13 CC410F-1	ceramic capacitor	0.1uF SL	1.000	PCS	
<b>MARK:C</b>	8					

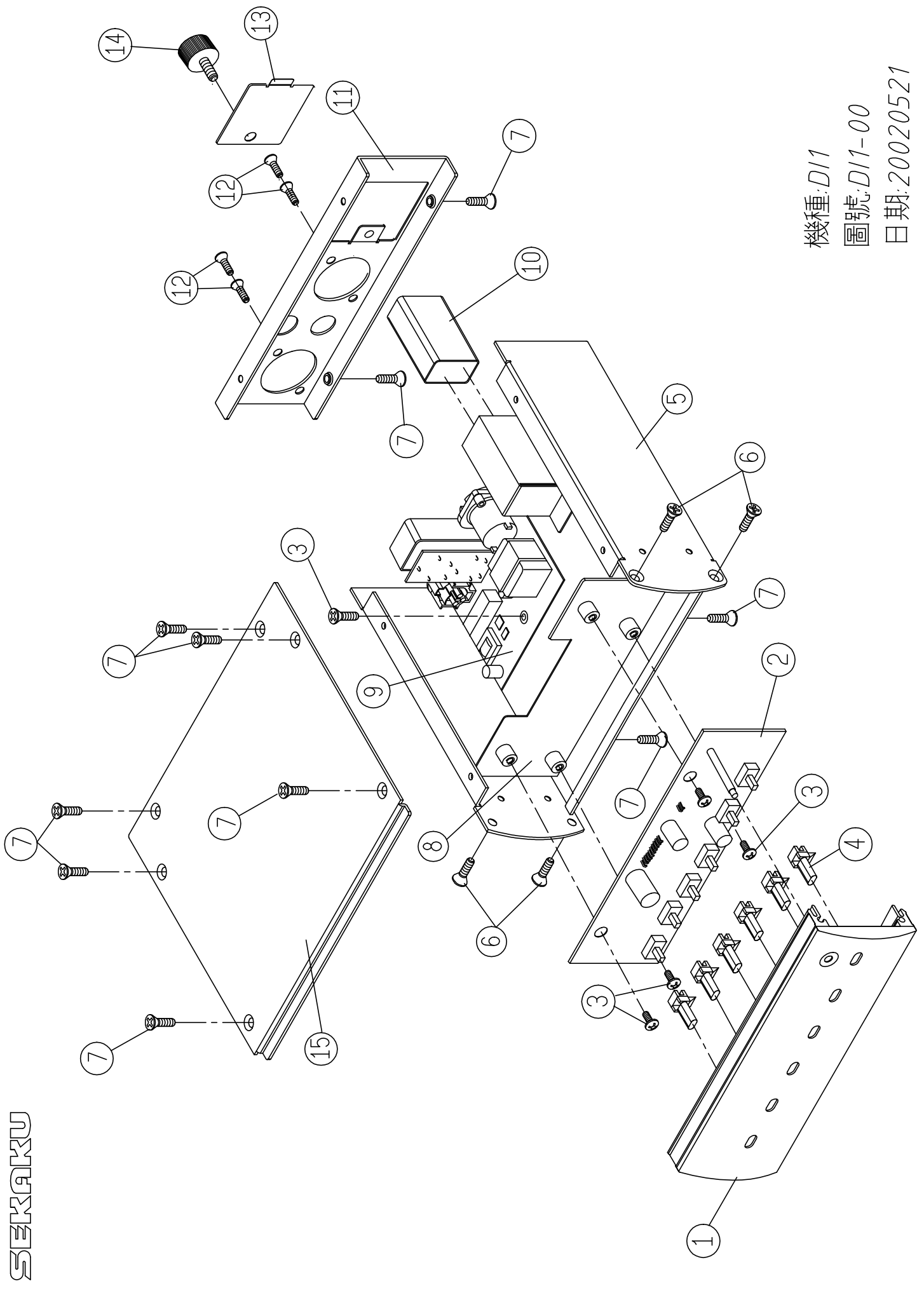
Item No: DI1

specify: AMP

Mid No:  standard quantity: 

<b>NO</b>	<b>Material No</b>	<b>Item Name</b>	<b>Specific</b>	<b>Quantity</b>	<b>Unit</b>	<b>Ps</b>
1	HB00712	PC board	DI4IN(1*24)_VER020624	1.000	PCS	
<b>MARK:</b>						
2	HC00125	MIC jack	JY-6351G-02-250	2.000	PCS	
<b>MARK:CN 4 5</b>						

# 8. Exploded Views



SEKAKU

機種: D11  
圖號: D11-00  
日期: 20020521