

# ***Service Manual***

**MODEL: DIGAN2.30**

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# 1. Introduction

DIGAN 2.30 is the biggest unit in the DIGAN range. It is 2×30 bands stereo equalizer and it the most versatile processor of this kind. The unit is only 1U and also includes an internal power supply. It is therefore particularly space-efficient.

The unit makes use of a power 24 bit DSP and 100dB codecs and it comes with USB interface for easy connection with a remote PC. Did you ever try to operate one of the 2×30 bands digital equalizers made by other Brands? It would take you at least 30minutes to run a complete curve. But with the down loadable Windows Editor, you can simply connect DIGAN 2.30 to a PC via the resident USB interface and will take minutes do adjust the curve and store it into one of the many memory cells available in the DIGAN 2.3. Not only! We have created 30 Factory presets for your benefit and there are easily recallable through buttons of the front panel. And if you are leaving in the digital domain, DIGAN 2.30 is provided with a 24-bit/192 kHz digital interface and external clock via BNC connector.

If you are working in studio or busy is balancing a mix at mix at Live DIGAN 2.30 is your only choice at a price that is truly affordable.

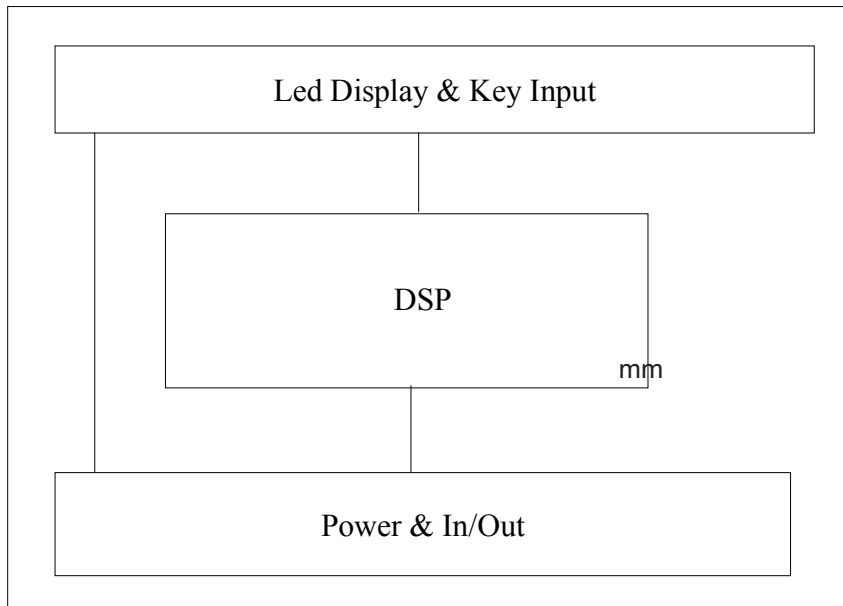
## Key features and benefits

- Stereo 1/3-octave, 2×30 bands digital equalizer
- 24 bit DSP, 100 dB codecs
- Large LED matrix as intuitive User Interface and real time control
- Locking mode to prevent unwanted changes
- Balanced input and output
- 30 Factory presets and 60 User presets
- Internal power supply
- USB interface
- Possibility to update the Firmware from Alto Web Site
- Free windows, PC Editor
- 24/192 Digital output

## 2. SPECIFICATION

|                                     |                       |   |
|-------------------------------------|-----------------------|---|
| <b>System parametric</b>            | Band                  | 2x30 bands,1/3 octave                       |
|                                     | Bandwidth             | 20Hz-20kHz                                  |
|                                     | THD+N%                | <0.015%, Analog In to Analog Out            |
|                                     | Signal to noise ratio | >90dB A-Weighted, Analog In to Analog Out   |
|                                     | Input gain            | +/-12dB                                     |
|                                     | Output gain           | +/-6dB                                      |
|                                     | Delay line            | 255ms                                       |
|                                     | Preset                | Factory preset: 30 , User preset: 50        |
| <b>Filter</b>                       | High pass filter      | Freq: 25Hz-25kHz step 1/3 oct               |
|                                     |                       | Slope: bypass , -6dB/oct, 12dB/oct          |
|                                     | Low pass filter       | Freq: 20Hz-20kHz step 1/3 oct               |
|                                     |                       | Slope: bypass, -6dB/oct, 12dB/oct           |
| <b>Input section</b>                | Inputs                | Balanced XLR and 1/4" TRS connectors        |
|                                     | Input impedance       | Balanced > 50Kohm, Unbalanced > 25Kohm      |
| <b>Output section</b>               | Outputs               | Balanced XLR, 1/4" TRS and SPDIF connectors |
|                                     | Output impedance      | Balanced 120ohm, Unbalanced > 60ohm         |
| <b>USB serial port</b>              |                       |   |
| <b>Power supply (AC/AC adapter)</b> | Input voltage         | 9 Volt AC Power Transformer                 |
|                                     | Power consumption     | 8W  |
| <b>physical</b>                     | Dimension (WxDxH)     | 483x150x44mm                                |
|                                     | Net weight            | 4.8 lbs(2.15kg)                             |

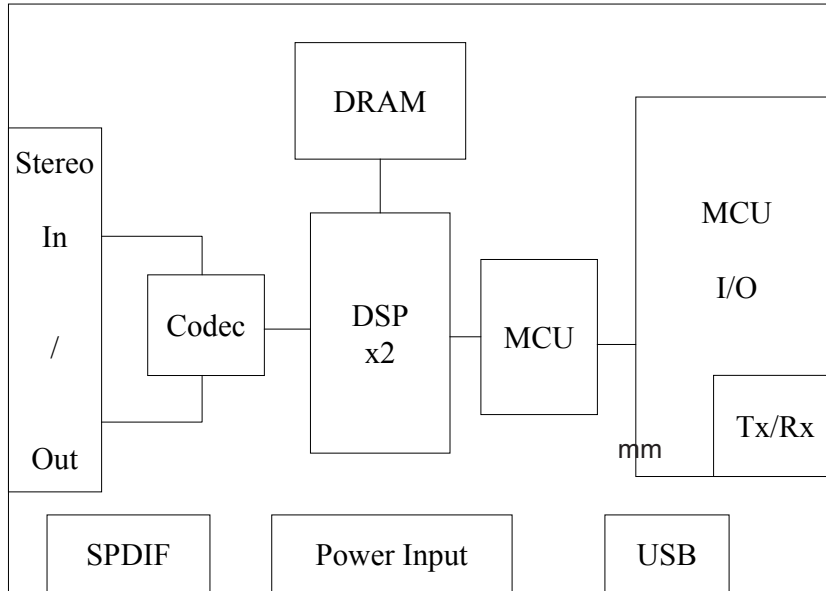
### 3. Block Diagram



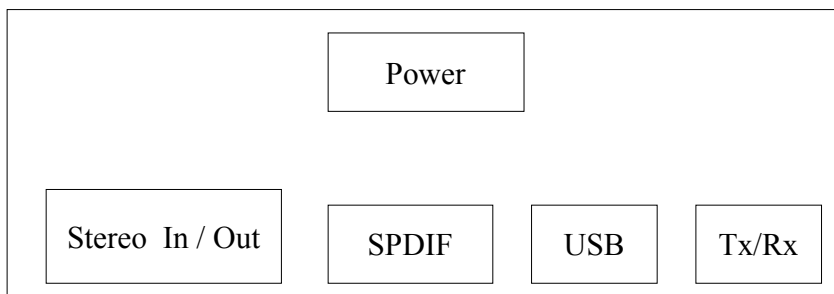
**Display:** 732 yellow LED 62 green LED red LED  
66 buttons 66 diodes 76 transistors 74HC154



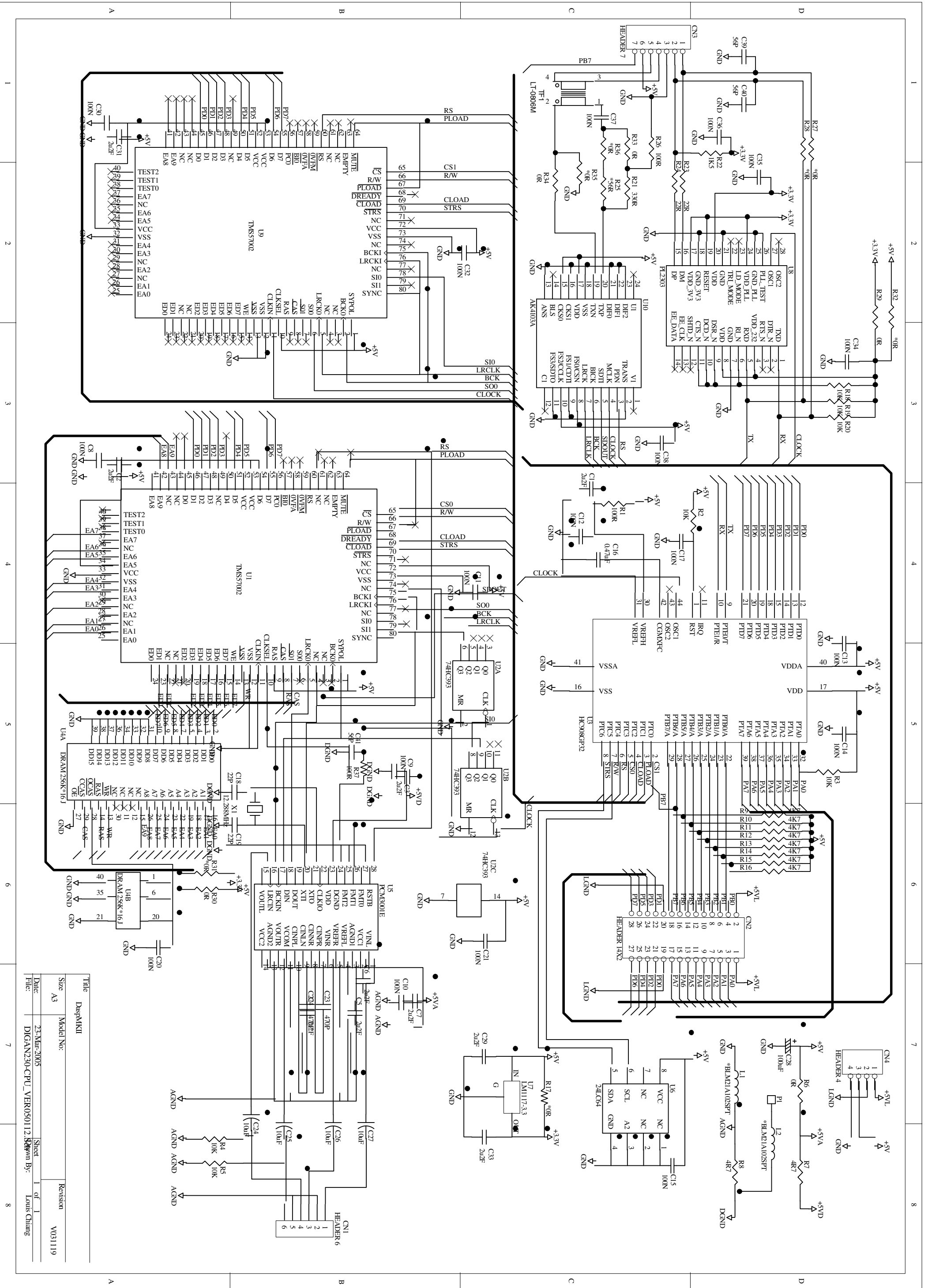
**DSP** TMS57002 Motorola MCU GP32 ICSI DRAM  
 IC41LV16256 256Kx16(GLINK GLT4116 64Kx16)PCM3001  
 74HC04 24LC64.If use SPDIF output, please add AK1403;if use USB  
 please add PL2303X

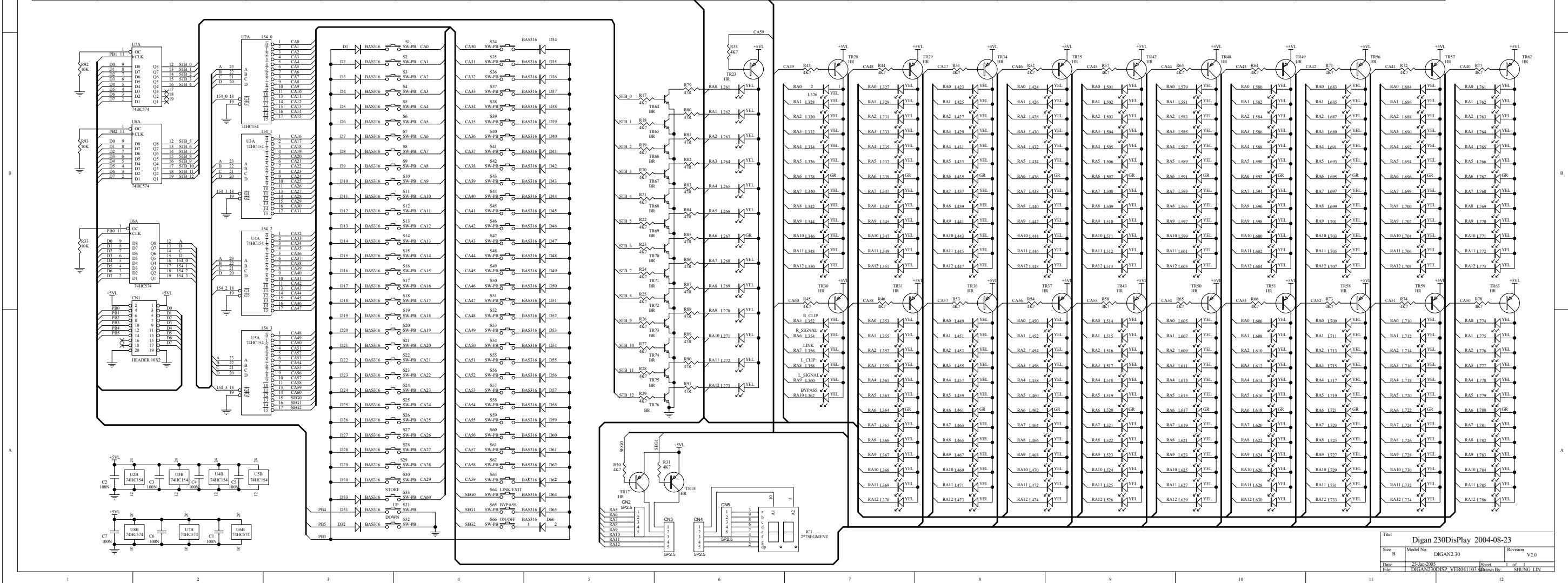
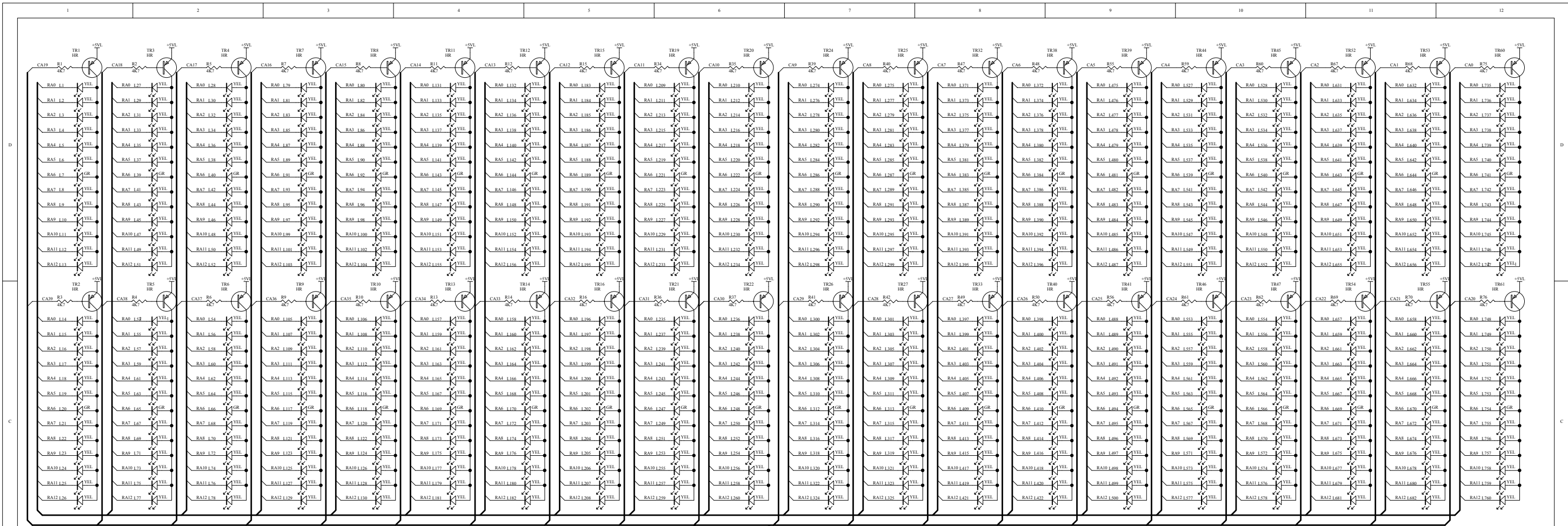


**Power In/Out:** USB connector RS232 DB9 MAX232 SPDIF  
 RCA connector Stereo Input & Output AC to DC



# 4. Schematic Diagram



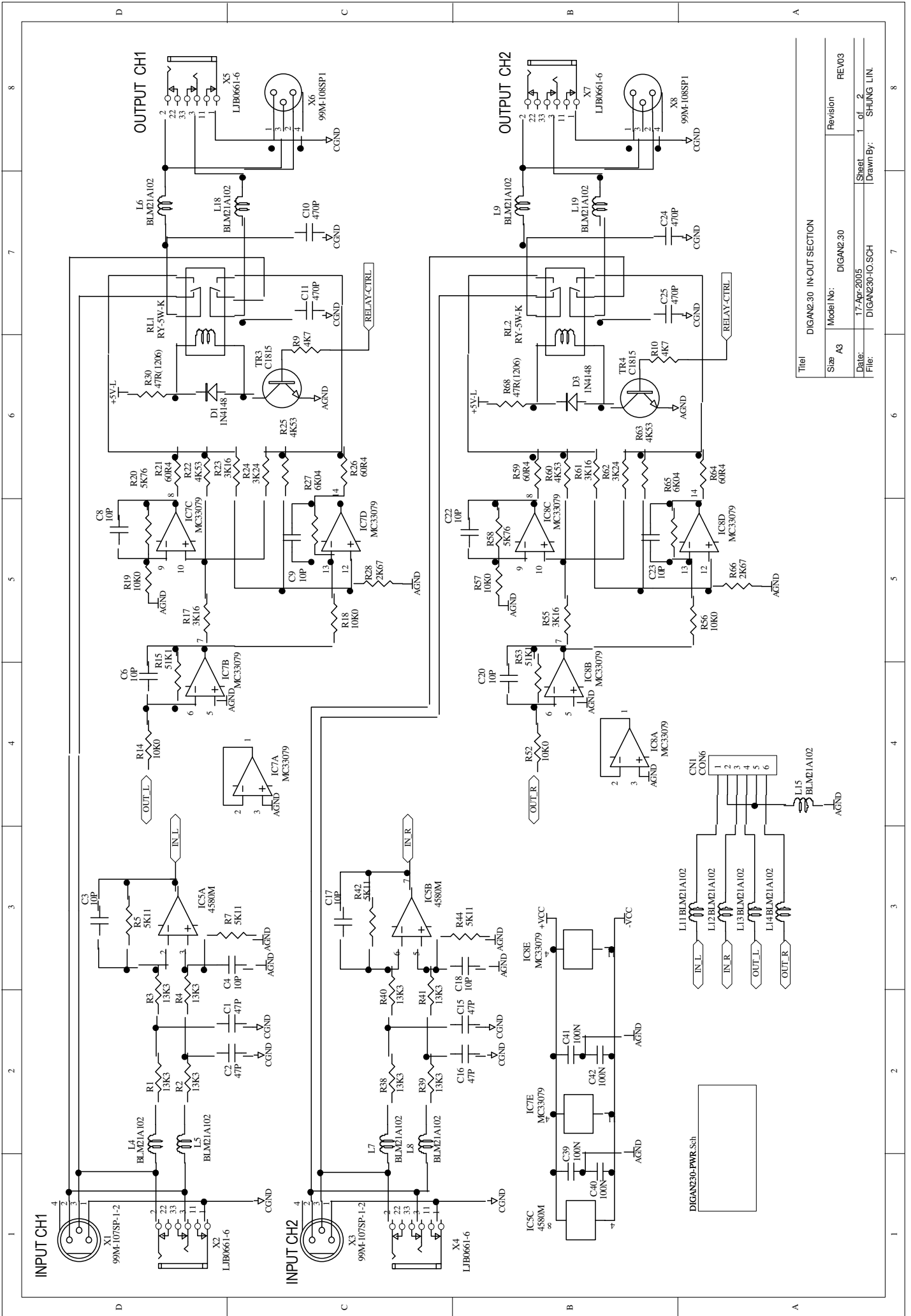


| Rev | Model No  | Revision |
|-----|-----------|----------|
| 01  | DIGIAN230 | V2.0     |

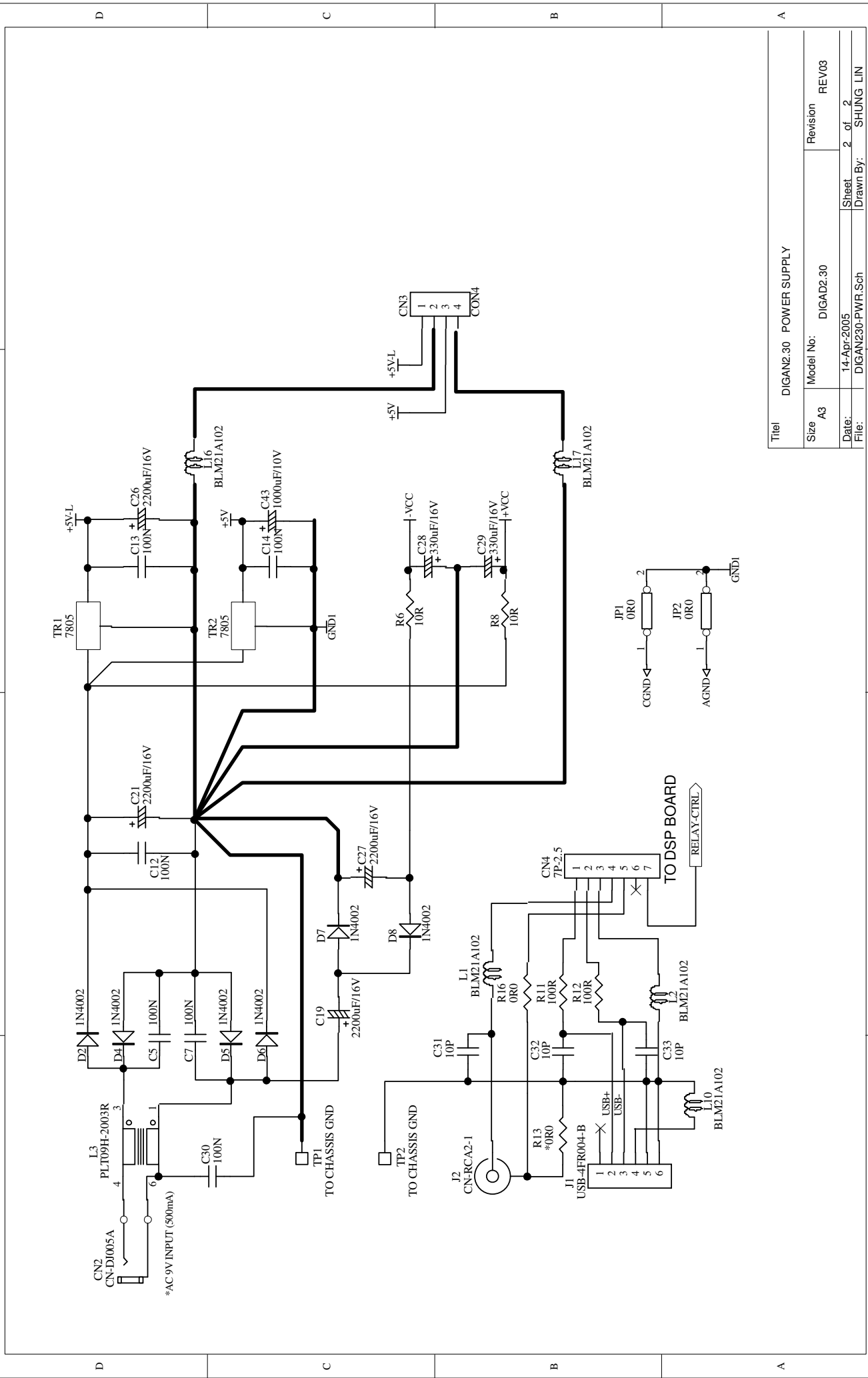
Digian 230DiSPlay 004-08-23  
 Date: 25-Jan-2005  
 File: DIGIAN230DiSPlay\_VER011.DWG





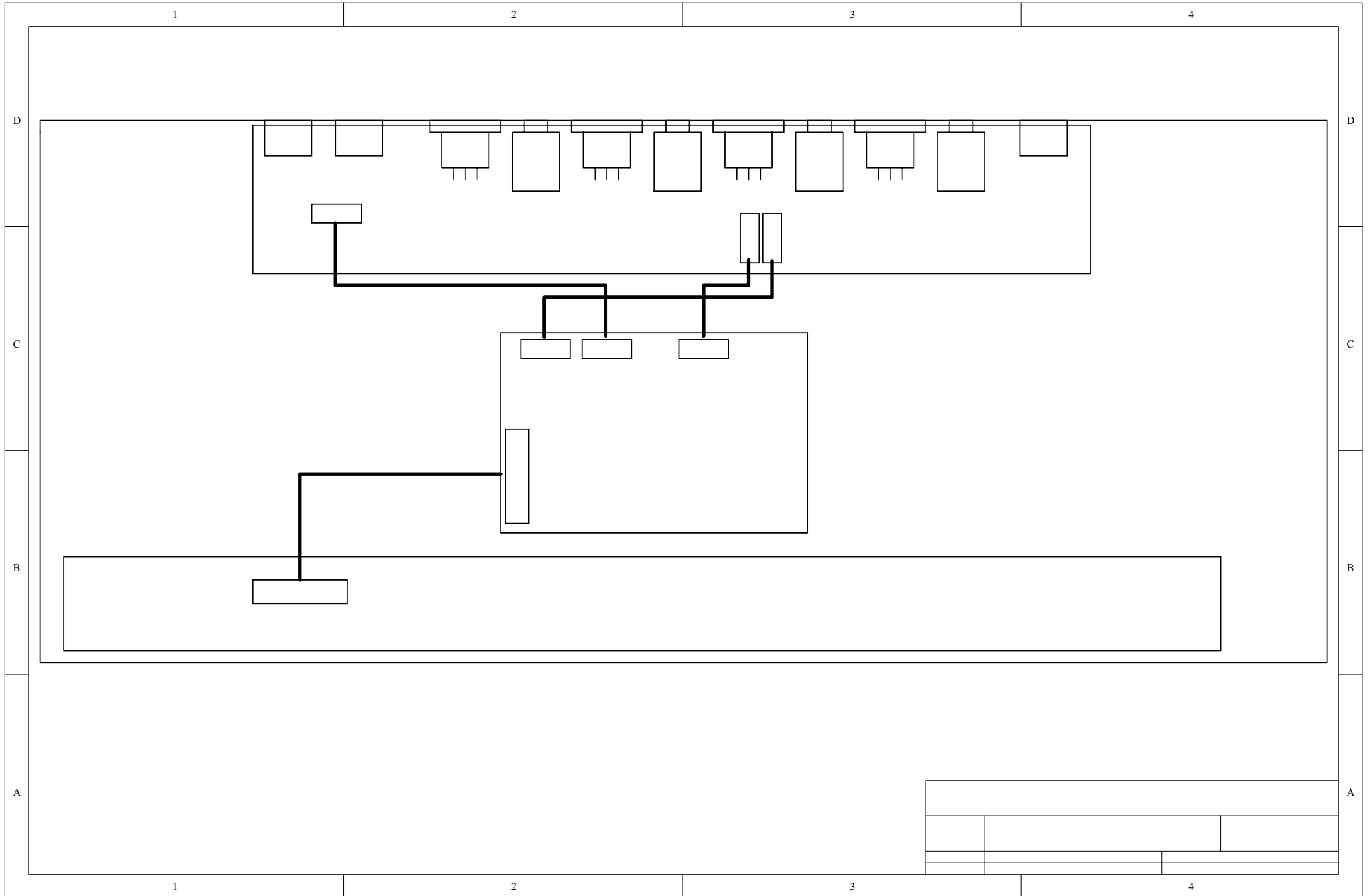


|                                 |                      |
|---------------------------------|----------------------|
| Title: DIGAN2.30 IN-OUT SECTION |                      |
| Size: A3                        | Model No.: DIGAN2.30 |
| Date: 17-Apr-2005               | Revision: REV03      |
| File: DIGAN230-IO.SCH           | Sheet: 1 of 2        |
|                                 | Drawn By: SHUNG LIN  |

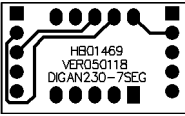


|       |                  |                        |           |
|-------|------------------|------------------------|-----------|
| Title |                  | DIGAN2.30 POWER SUPPLY |           |
| Size  | A3               | Model No:              | DIGAD2.30 |
| Date: | 14-Apr-2005      | Revision               | REV.03    |
| File: | DIGAN230-PWR.Sch | Sheet                  | 2 of 2    |
|       |                  | Drawn By:              | SHUNG LIN |

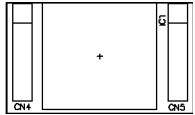
# 5. Wiring Diagram



VER050118



PCB : DIGAN230-72EG Bottom Layer



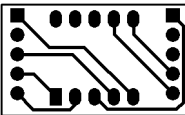
PCB : DIGAN230-72EG Top Overlay



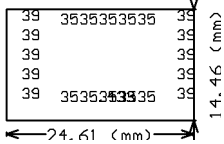
PCB : DIGAN230-72EG Bottom Solder Mask



PCB : DIGAN230-72EG Top Solder Mask

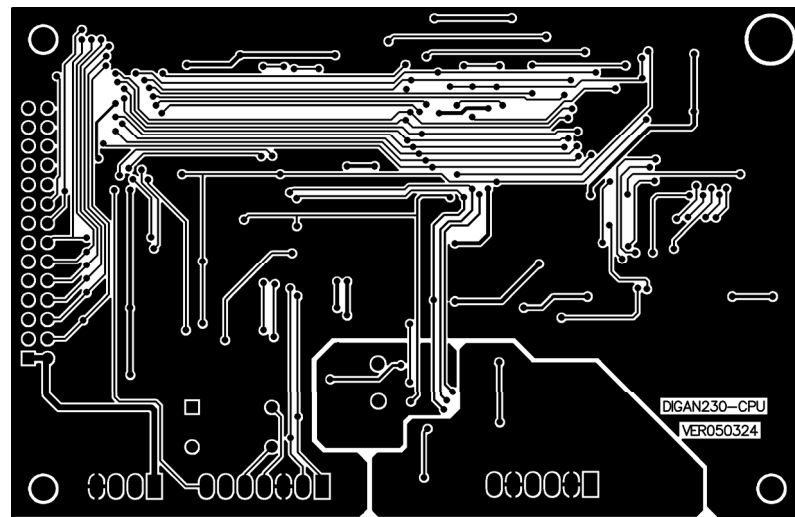


PCB : DIGAN230-72EG Top Layer

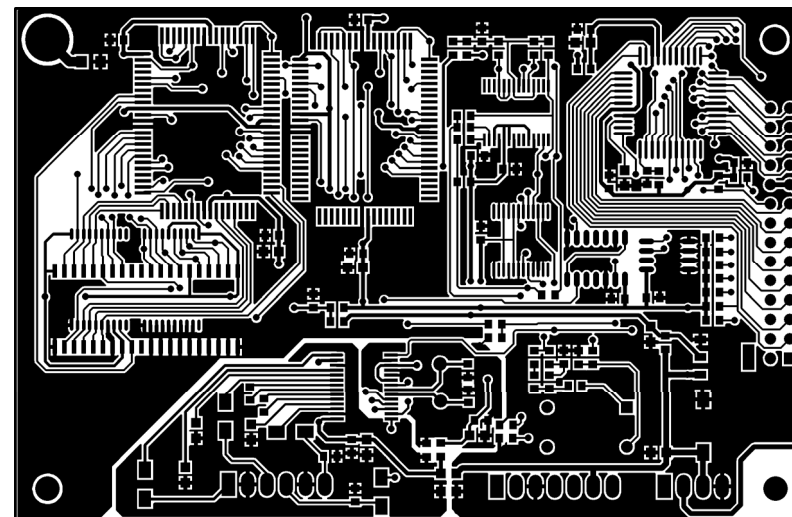


PCB : DIGAN230-72EG Drill Drawing

| Tool   | Hole Size        | Hole Count Plated |
|--------|------------------|-------------------|
| T1     | 35mil (0.889mm)  | 10                |
| T2     | 39mil (0.9906mm) | 10                |
| Totals |                  | 20                |

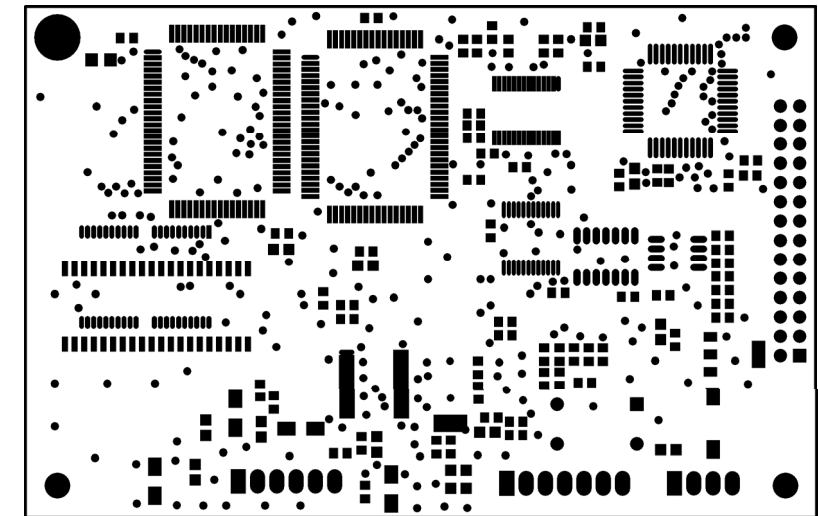


PCB : DIGAN230-CPU Bottom Layer

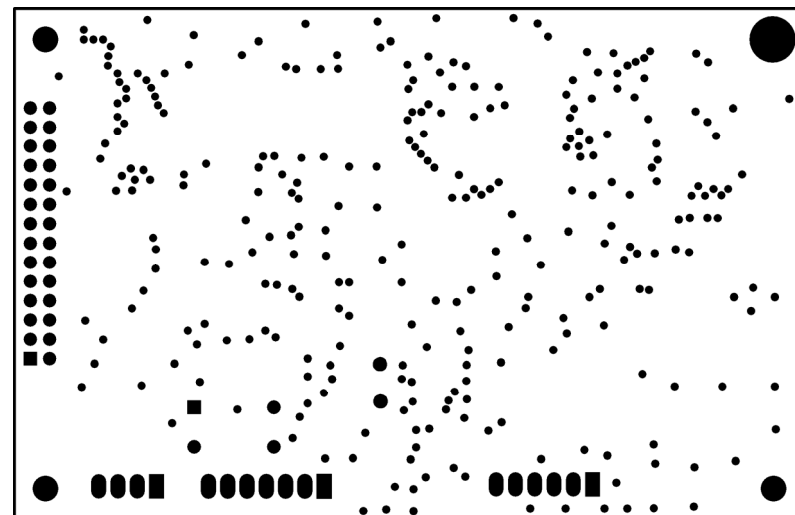


PCB : DIGAN230-CPU Top Layer

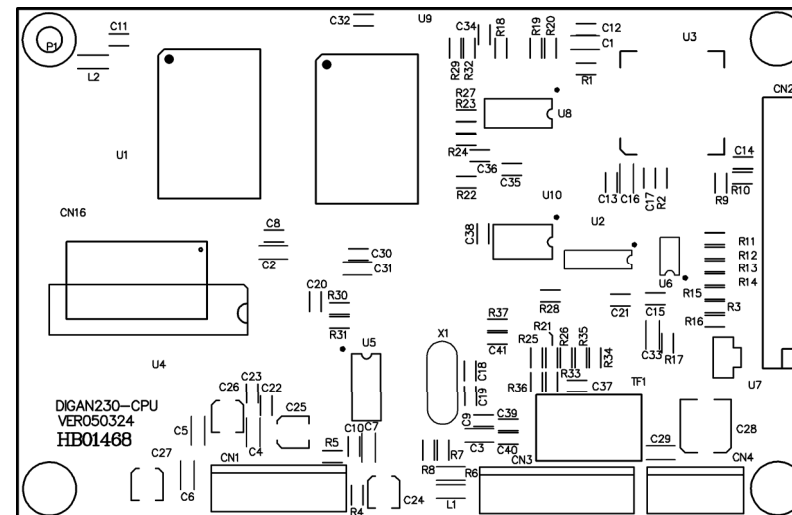
VER050324



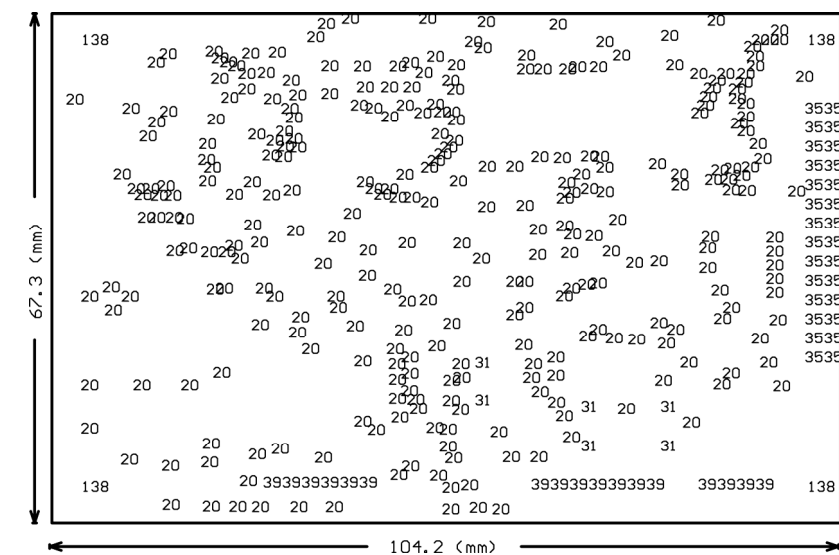
PCB : DIGAN230-CPU Top Solder Mask



PCB : DIGAN230-CPU Bottom Solder Mask

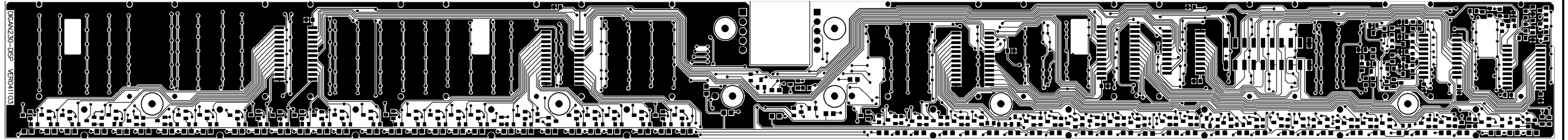


PCB : DIGAN230-CPU Top Overlay

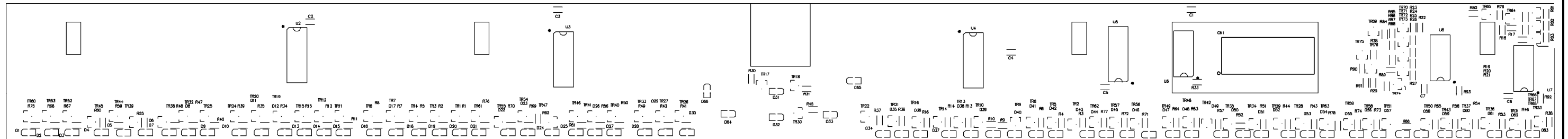


PCB : DIGAN230-CPU Drill Drawing

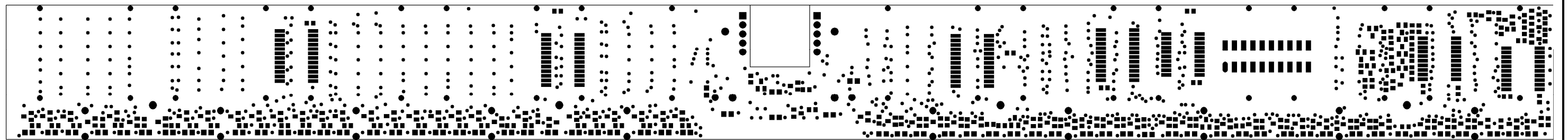
| Tool   | Hole Size        | Hole Count | Plated |                   |     |
|--------|------------------|------------|--------|-------------------|-----|
| T1     | 20mil (0.508mm)  | 305        | T4     | 39mil (0.9906mm)  | 17  |
| T2     | 31mil (0.7874mm) | 6          | T5     | 138mil (3.5052mm) | 1   |
| T3     | 35mil (0.889mm)  | 28         | T6     | 138mil (3.5052mm) | 3   |
| -----  |                  |            |        |                   |     |
| Totals |                  |            |        |                   | 360 |



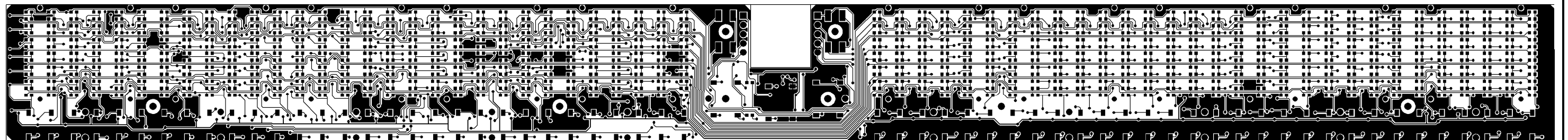
PCB : DIGAN230-DISP Bottom Layer



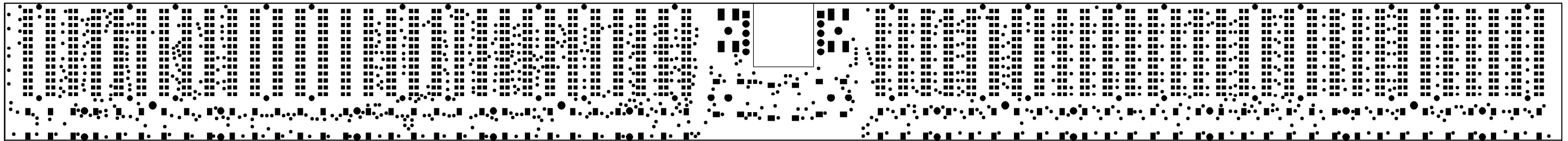
PCB : DIGAN230-DISP Bottom Overlay



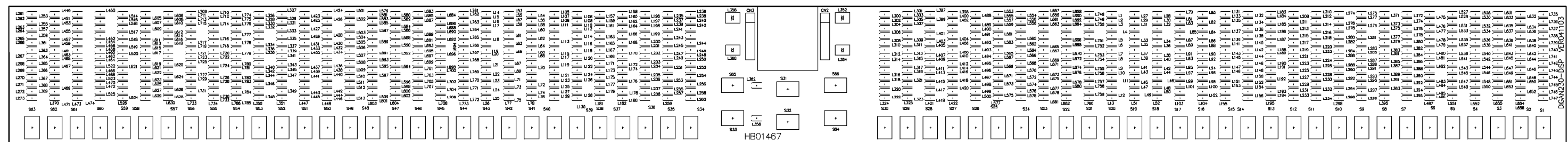
PCB : DIGAN230-DISP Bottom Solder Mask



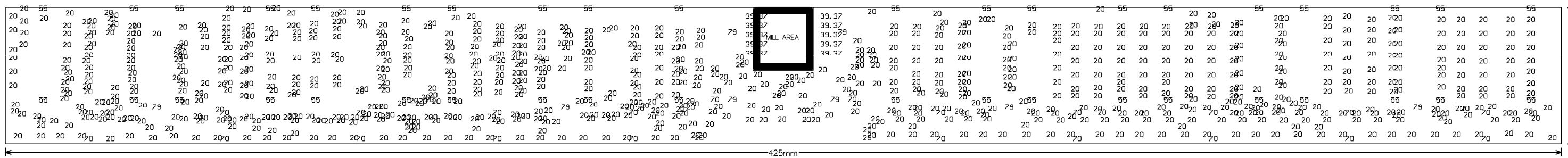
PCB : DIGAN230-CPU Top Layer



PCB : DIGAN230-CPU Top Solder Mask



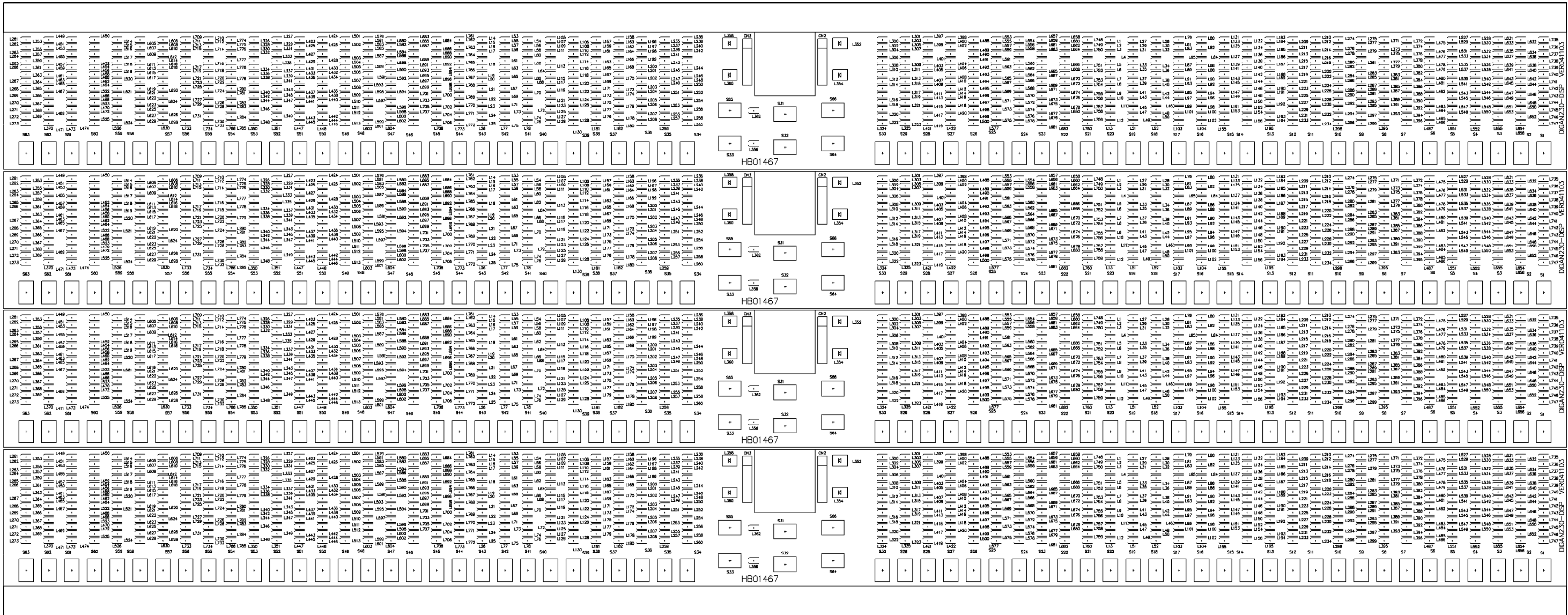
PCB : DIGAN230-DISP Top Overlay



PCB : DIGAN230-DISP Drill Drawing

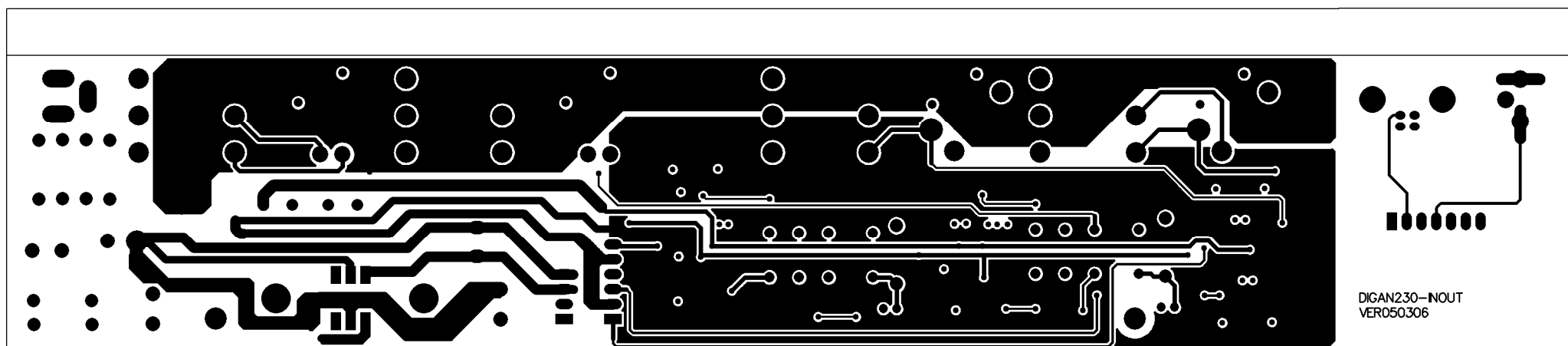
| Tool   | Hole Size       | Hole Count | Plated |                  |     |
|--------|-----------------|------------|--------|------------------|-----|
| T1     | 20mil (0.508mm) | 879        | T2     | 39mil (0.9906mm) | 10  |
| T3     | 70mil (1.778mm) | 5          | T4     | 55mil (1.397mm)  | 40  |
| T5     | 70mil (1.778mm) | 17         | T6     | 79mil (2.0066mm) | 8   |
| Totals |                 |            |        |                  | 959 |



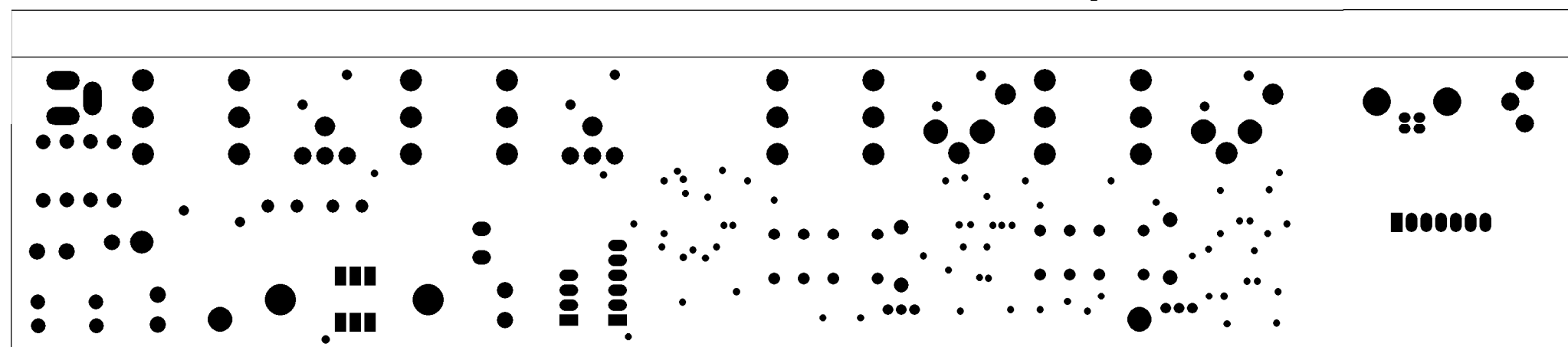


3. Block Diagram

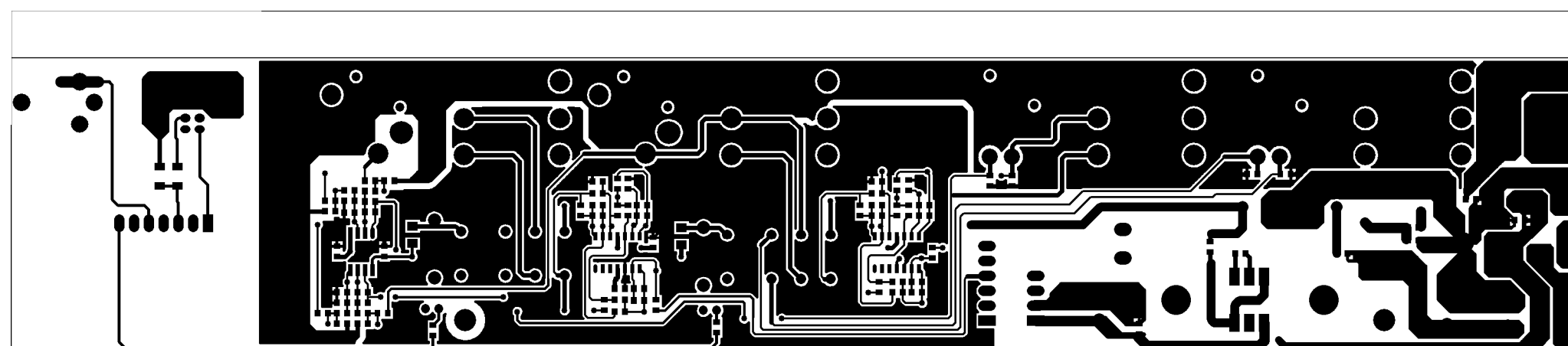
VER050306



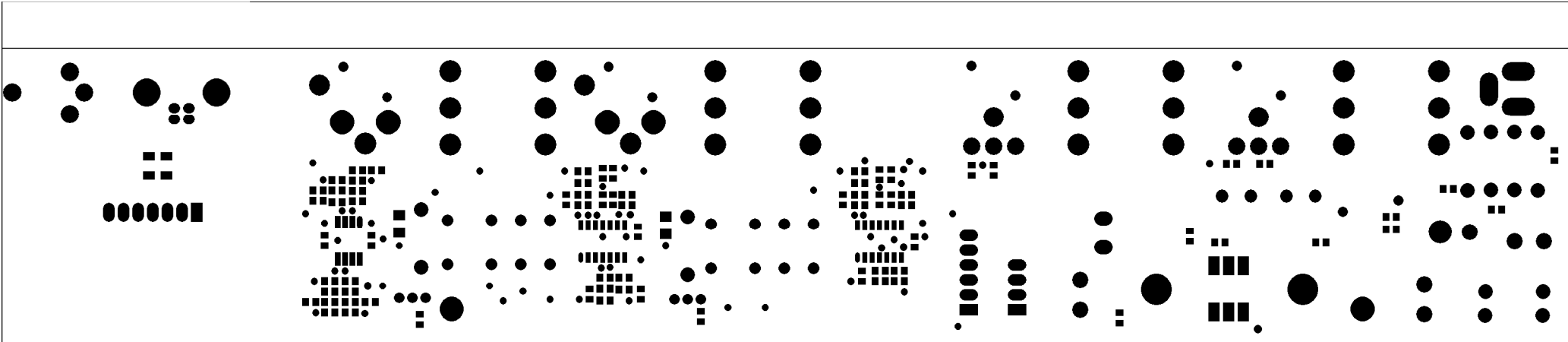
PCB : DIGAN230-INPUT Bottom Layer



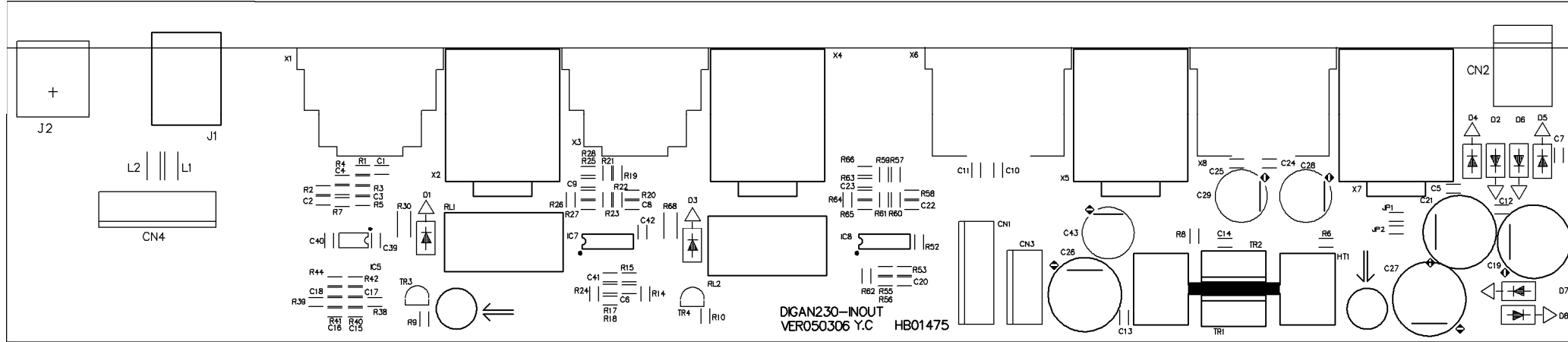
PCB : DIGAN230-INPUT Bottom Solder Mask



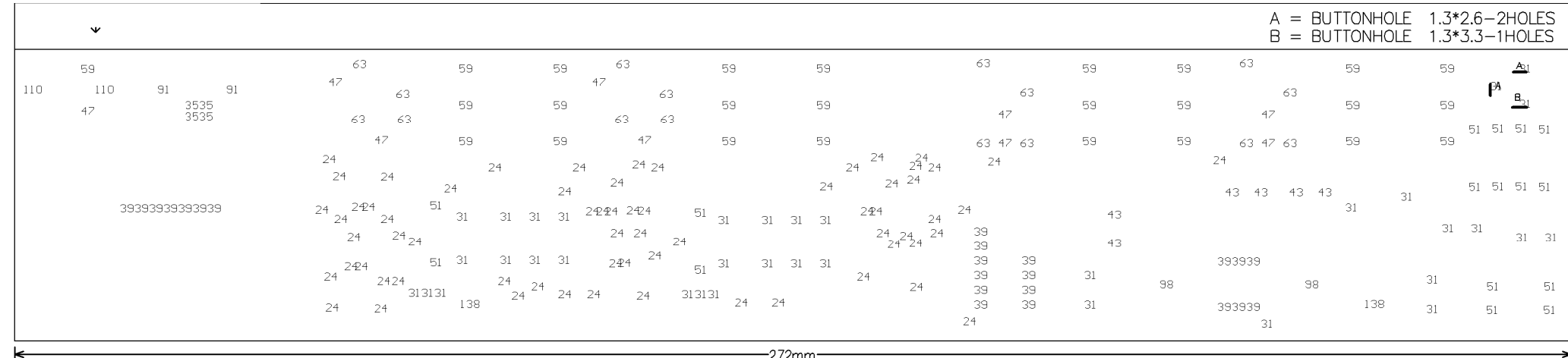
PCB : DIGAN230-INPUT Top Layer



PCB : DIGAN230-INPUT Top Solder Mask



PCB : DIGAN230-INPUT Top Overlay



PCB : DIGAN230-INPUT Drill Drawing

| Tool   | Hole Size         | Hole Count Plated | Tool Travel                 |
|--------|-------------------|-------------------|-----------------------------|
| T1     | 24mil (0.6096mm)  | 66                | 27.88 Inch (708.21 mm)      |
| T2     | 31mil (0.7874mm)  | 36                | 31.06 Inch (788.90 mm)      |
| T3     | 35mil (0.889mm)   | 4                 | 4.01 Inch (101.80 mm)       |
| T4     | 39mil (0.9906mm)  | 23                | 17.81 Inch (452.44 mm)      |
| T5     | 43mil (1.0922mm)  | 6                 | 11.32 Inch (287.55 mm)      |
| T6     | 47mil (1.1938mm)  | 9                 | 13.15 Inch (334.05 mm)      |
| T7     | 51mil (1.2954mm)  | 16                | 28.17 Inch (715.47 mm)      |
| T8     | 59mil (1.4986mm)  | 25                | 17.22 Inch (437.44 mm)      |
| T9     | 63mil (1.6002mm)  | 12                | 12.14 Inch (308.27 mm)      |
| T10    | 91mil (2.3114mm)  | 2                 | 4.34 Inch (110.17 mm)       |
| T11    | 98mil (2.4892mm)  | 2                 | 9.41 Inch (239.05 mm)       |
| T12    | 63mil (1.6002mm)  | 4                 | NPTH 10.08 Inch (256.01 mm) |
| T13    | 110mil (2.794mm)  | 2                 | NPTH 4.18 Inch (106.14 mm)  |
| T14    | 138mil (3.5052mm) | 2                 | NPTH 15.96 Inch (405.42 mm) |
| -----  |                   |                   |                             |
| Totals |                   | 209               | 206.73 Inch (5250.92 mm)    |

## 7. TEST PROCEDURE

### Test instruments

1. AP instrument
2. Dual track oscillograph

### Instrument Setting and Connection

1. Connect AP output to INPUT1 and INPUT2. Set AP 1 kHz, 0dBu, Load 600Ω UNBAL & BAL.
2. Connect output1 and output2 to AP input terminal. Connect its monitor signal to oscillograph. Set UNBAL & BAL Load 100KΩ, BW: 22HZ~22KHZ

### Part 1 Functional Switch Test

1. Connect AC9V/300mA voltage adapter to DIGAN 2.30. When the power switch is in the ON position, LED indicates "DIGAN 230". Press POWER (S20) button, now it is in the standby mode. It is 0dBu input and 0dBu output of the AP instrument.
2. Press the button of POWER, BYPASS and LINK in turn quickly. The left LED shows TEST. After flashing 2 seconds, the Seven bands LCD shows "00".
  - 2-1. Press the '▲' button, the yellow LED of CLIP and SIGNAL on the right will light up.
  - 2-2. Press the '▼' button, the yellow LED of CLIP and SIGNAL on the right will light up.
  - 2-3. Press the 'STORE' button, both 'SIGNAL' will light up simultaneously.
  - 2-4. Press the 'BYPASS' button, and the yellow LED beside will light up.
  - 2-5. Press the 'LINK' button, and the yellow LED beside will light up.
  - 2-6. Press the '25' button of the left channel, EQ LED will light up from left to right in turn. (The one in the middle is green, others are yellow).
  - 2-7. Press '31.5' button of the left channel, the LED of L/R channel EQ will light up in turn.
  - 2-8. Press '40' button of the left channel, the corresponding EQ LED will light up.
  - 2-9. Press the buttons of other frequency, the corresponding EQ LED will light up.

### Part 2 Electric performance test

1. Set the AP instrument 0dBu output, BW: 22Hz~22 kHz (Input Signal Level=0dBu, at model 00).

Test the unbalance input/output of DIGAN 2.30 is 0dBu±1dBu. THD+ N value <0.05%.  
 Test the balance input/output of DIGAN 2.30 is 0dBu 1± dBu. THD+ N value <0.05%.  
 The Frequency Response is as Figure 1 and 2

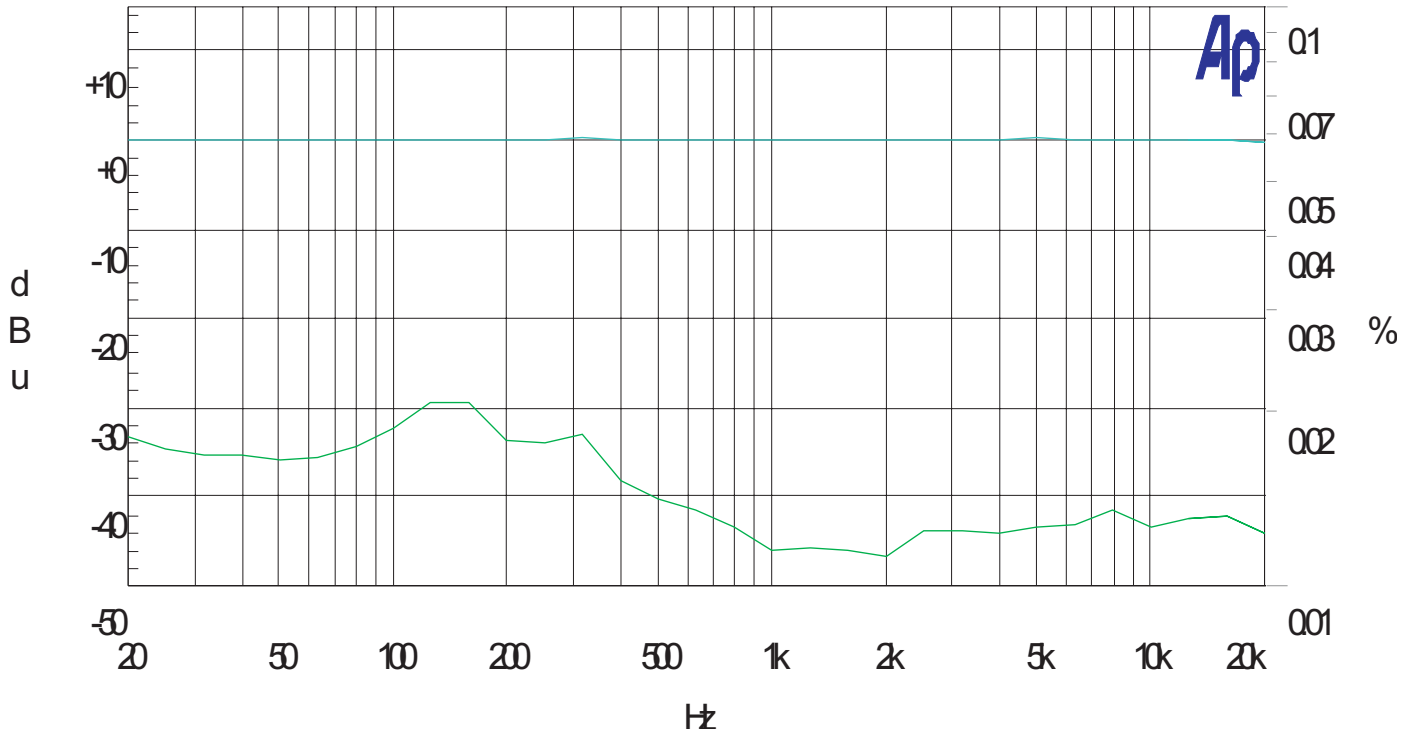
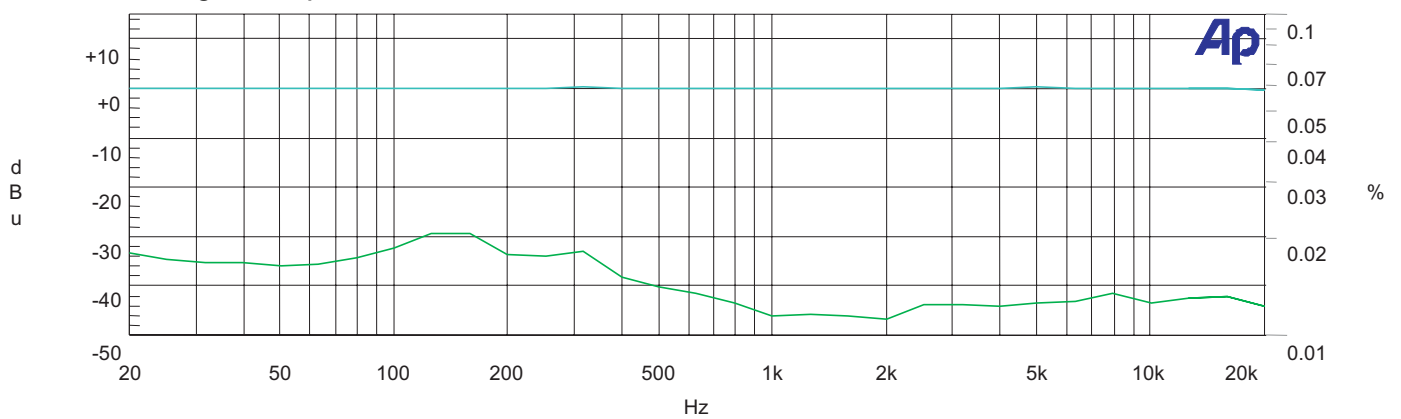


Figure 1

Audio Precision  
 24/192 Digital output

05/03/00 09:59:44



| Sweep | Trace | Color | Line Style | Thick | Data                   | Axis  | Comment |
|-------|-------|-------|------------|-------|------------------------|-------|---------|
| 1     | 1     | Cyan  | Solid      | 1     | Analyzer.Level A       | Left  |         |
| 1     | 2     | Green | Solid      | 1     | Analyzer.THd+N Ratio A | Right |         |

keke ats?

Figure 2

- Test the Bandpass value of the L/R channel in DIGAN 2.30. It is less than -73 dBu. At the same time scan the Bandpass as figure3.

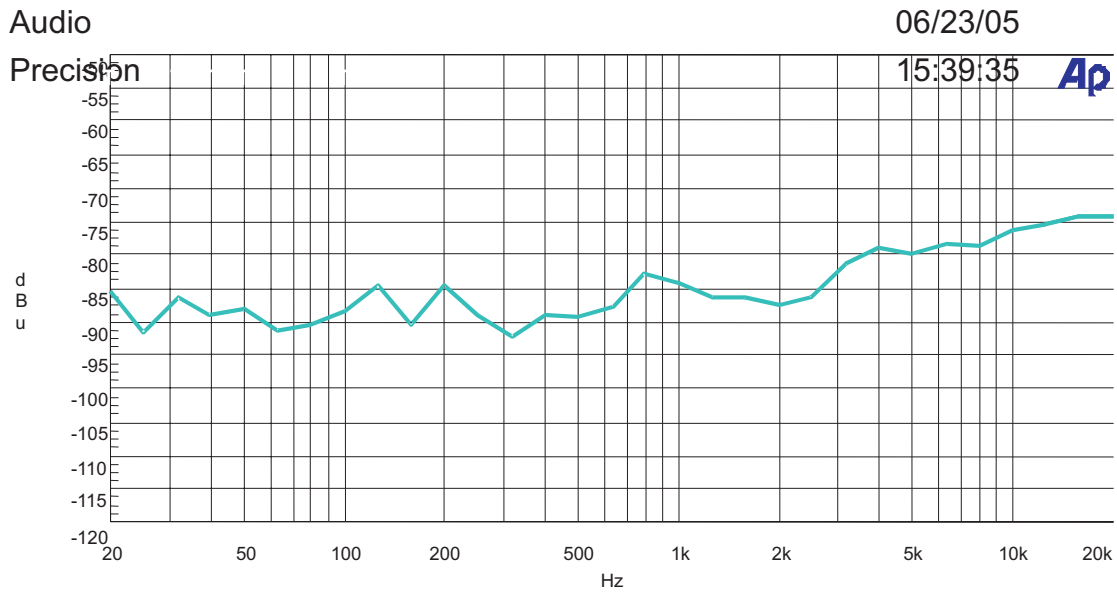
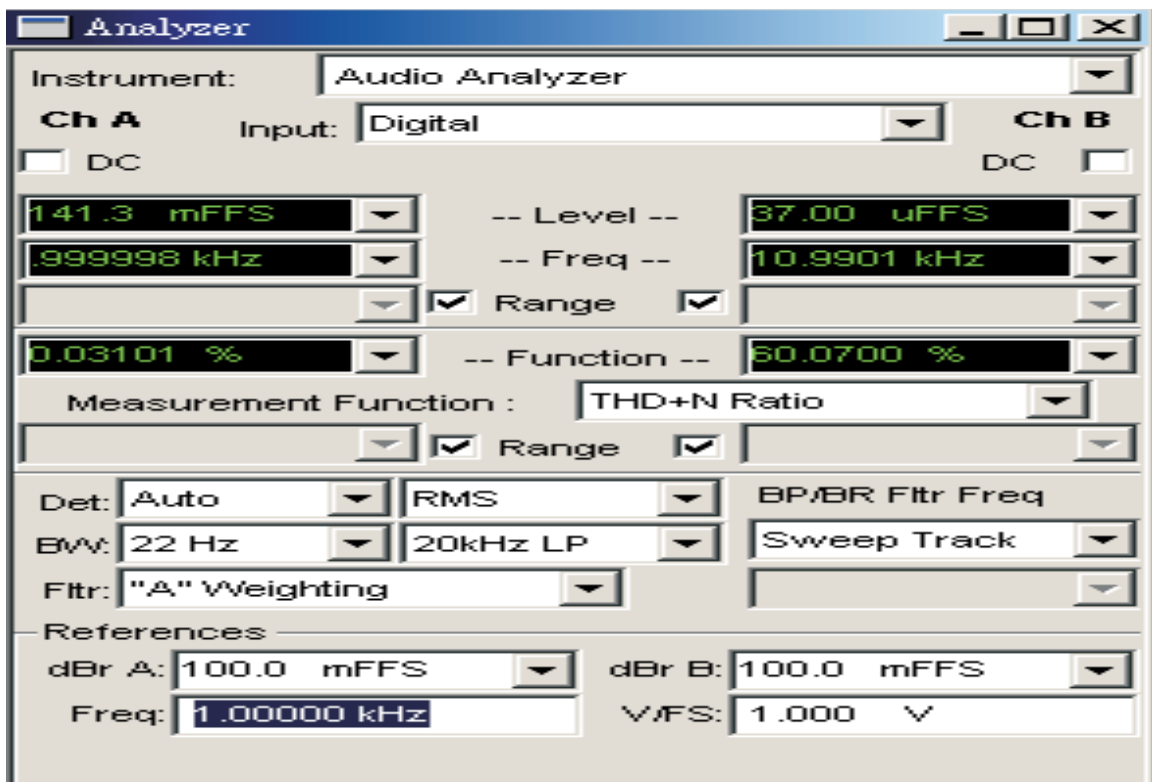


Figure 3

- Test the S/N value of L/R channel in DIGAN 2.30. It is more than 88dB.

### Part 3 Test if the SPDIF digital output terminal works in order

- The setting of the input signal is same to other test. Connect DIGITAL INPUT of AP to DIGITAL OUTPUT port of DIGAN 2.30.
- The input setting (as figure 4)
  - \* Make sure the content in Input column is "Digital".



### 3. Digital I/O of AP setting (as figure5)

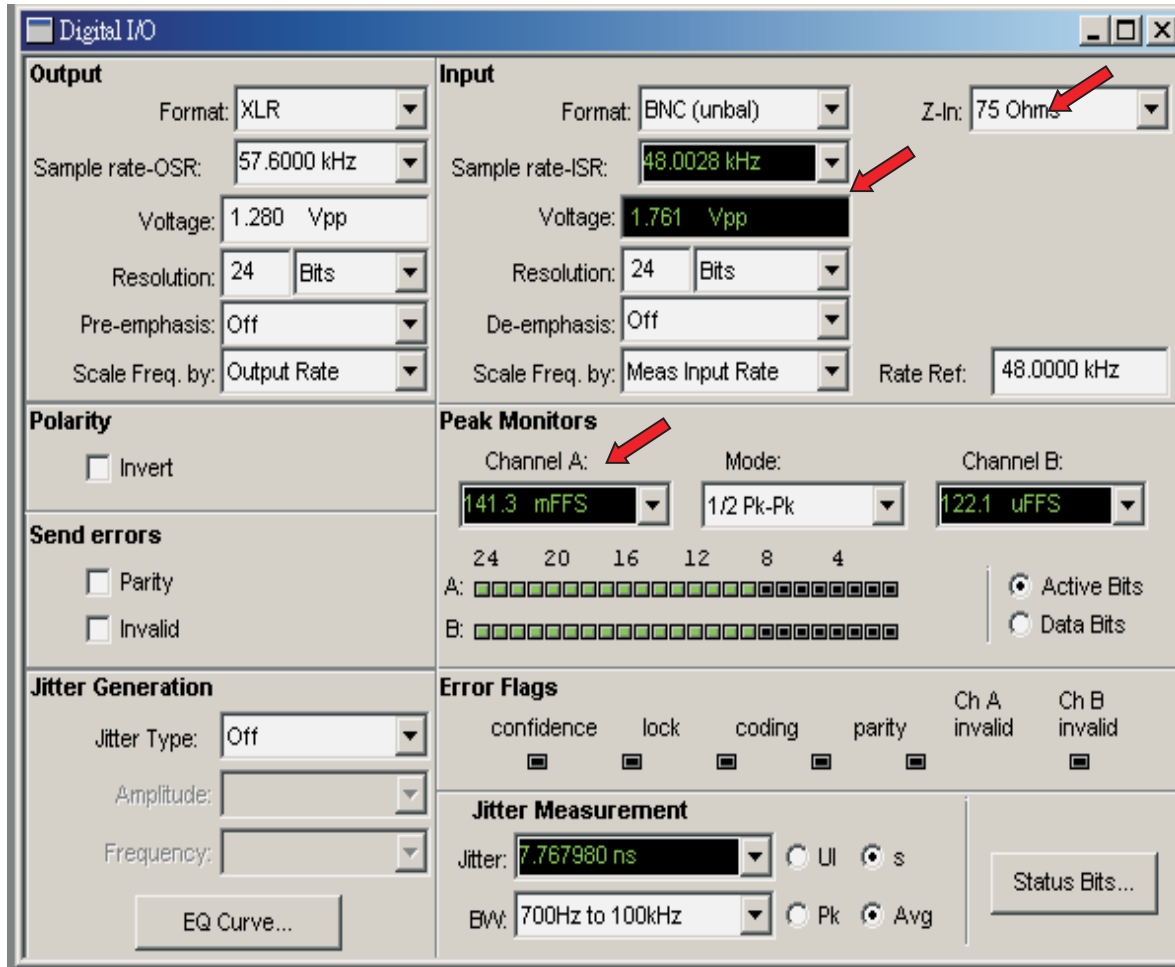


Figure 5

4. Check the Oscillograph outputs the wave or not, if it does, that means DIGITAL output works in order.

### Part 4 Test if it can be connected to the computer.

1. Open DIGAN control program in the computer (as figure1), then click the new icon (As the arrow indicating).
2. Select the corresponding program. If it is the DIGAN 2.30 select the third one (as the arrow indicating).
3. After opening the program, click the external instrument connection icon (as the arrow indicating in figure 3).
4. If the connection succeeds, the bottom of the window shows red (as the arrow indicating in figure 4).

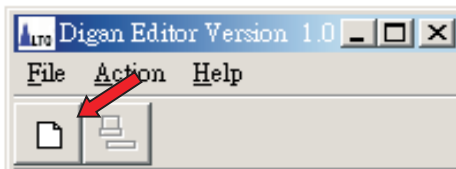


Figure 1



Figure 2

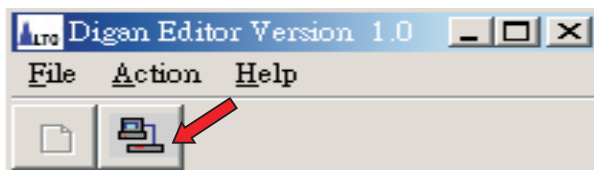


Figure 3

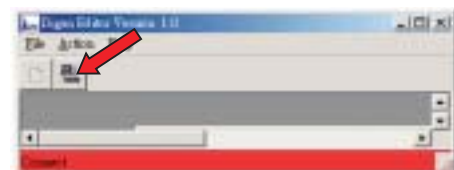
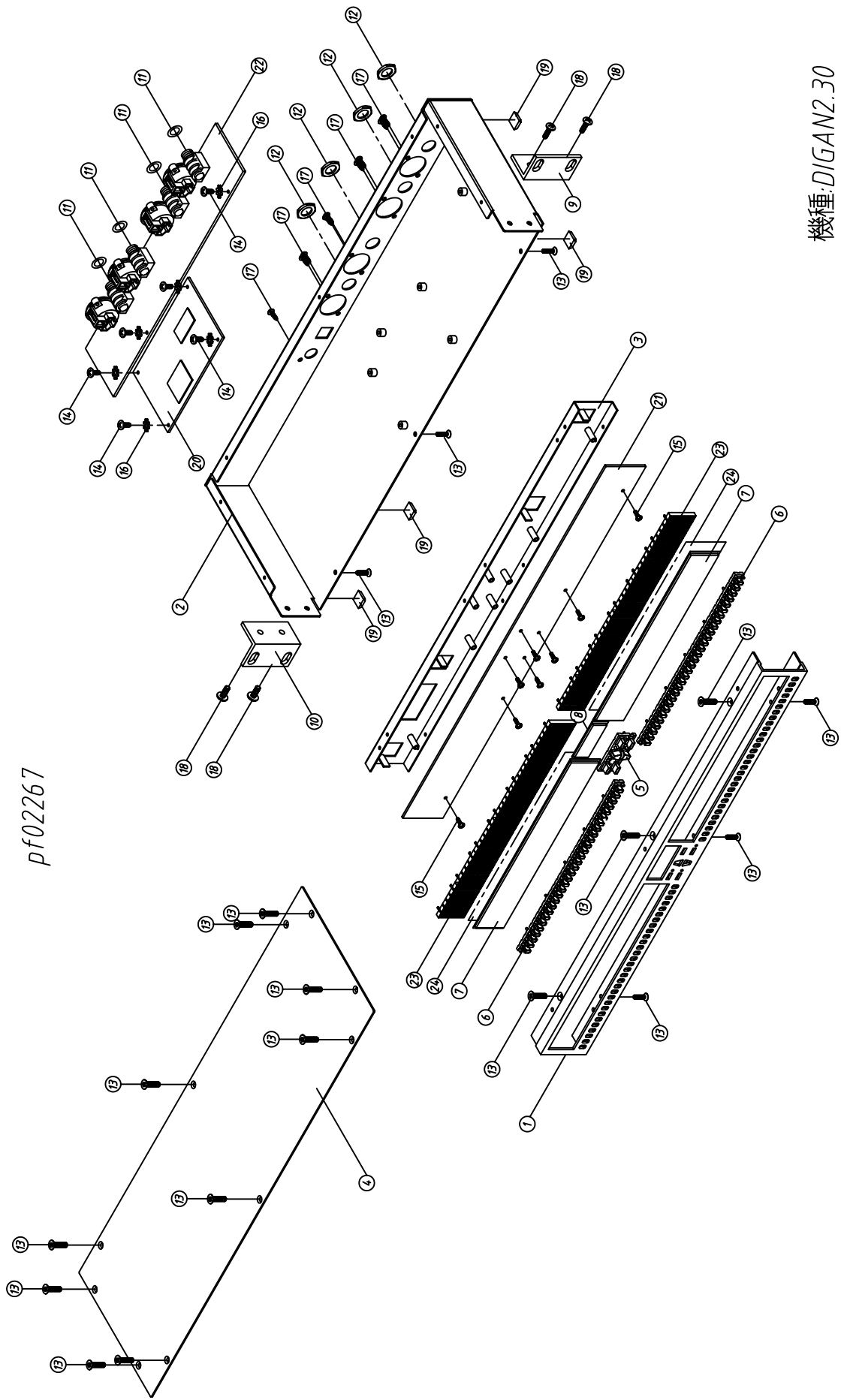


Figure 4

### Part 5 Done



8. Exploded Views & Mechanical Parts List



pf02267

機種: DIGAN2.30  
 圖號: DIGAN2.30-00  
 日期: 2005/02/05

SEIKAKU

## 9. BOM

| No. | Part No. | Description        | Specification                   | Remark |
|-----|----------|--------------------|---------------------------------|--------|
| 1   | MA00203  | panel              | DIGAN2.30_V1.1                  |        |
| 2   | MA00224  | panel              | DIGAN 2.30                      |        |
| 3   | MA00223  | panel              | DIGAN 2.30_V1.0                 |        |
| 4   | MI02544  | panel              | 2.1*21.5*44*433_V1.0            |        |
| 5   | MB03743  | chassis            | DIGAN2.30_V1.2                  |        |
| 6   | MB03739  | chassis            | DIGAN 2.30                      |        |
| 7   | MB03738  | chassis            | DIGAN 2.30_V1.2                 |        |
| 8   | MJ00059  | single light board | 1.2*2135*1220 24.54kg           |        |
| 9   | ME00041  | iron pillar        | hexagon6.35*M3*6                |        |
| 10  | MI02546  | front board        | DIGAN 2.30 10*38*405_V1.0       |        |
| 11  | MJ00061  | iron board         | 1*2135*1220 20.45kg             |        |
| 12  | ME00183  | iron pillar        | DIGAN 2.30 (5)*M2*0.4PH*13_V1.0 |        |
| 13  | MC00663  | top cover          | DIGAN 2.30_V1.0                 |        |
| 14  | MC00662  | top cover          | DIGAN 2.30_V1.0                 |        |
| 15  | MJ00059  | single light board | 1.2*2135*1220 24.54kg           |        |
| 16  | NI03283  | bole               | 36*26.6*6.3 black_V1.0          |        |
| 17  | NI03358  | silicone sleeve    | DIGAN2.30 40*11.5_V1.0          |        |
| 18  | NI03359  | silicone sleeve    | DIGAN2.30 188.8*8.6_V1.0        |        |
| 19  | NI03363  | acrylic panel      | DIGAN2.30 left right_V1.1       |        |
| 20  | NI03356  | acrylic panel      | DIGAN 2.30 2.1*24.6*185.6_V1.0  |        |
| 21  | NI03364  | acrylic panel      | DIGAN2.30 middle_V1.0           |        |
| 22  | NI03357  | acrylic panel      | DIGAN 2.30 2.1*14.8*37.8_V1.1   |        |
| 23  | NH00348  | cone               | DIGAN2.30_V1.0                  |        |
| 24  | NI03290  | LED lens           | 2*4*13*5.4_V1.0                 |        |
| 25  | MI02548  | fixed bracket      | DIGAN2.30 left L type ALTO_V1.0 |        |
| 26  | MI03128  | fixed bracket      | RKB-2 L type                    |        |
| 27  | AE00046  | solvent            | solvent                         |        |
| 28  | AE00284  | .                  | .                               |        |
| 29  | MI00597  | fixed bracket      | RKB-2 L type_V1.0               |        |
| 30  | MI02550  | fixed bracket      | DIGAN2.30 right Ltype_V1.0      |        |
| 31  | MI03128  | fixed bracket      | RKB-2 L type                    |        |
| 32  | AE00046  | solvent            | solvent                         |        |
| 33  | AE00284  | .                  | .                               |        |
| 34  | MI00597  | fixed bracket      | RKB-2 L type_V1.0               |        |
| 35  | NC00131  | washer             | 1* 11.3* 15.3 red               |        |
| 36  | NI00002  | plastic nut        | 7/16"*G20/15*4.8(hexagon)       |        |
| 37  | MG00025  | screw              | M3*6                            |        |
| 38  | MG00041  | screw              | M3*6                            |        |
| 39  | MG00153  | screw              | M2*8                            |        |
| 40  | MF00037  | washer             | 3.2* 5.5*1t                     |        |
| 41  | MG00061  | screw              | M3*10                           |        |
| 42  | MG00021  | screw              | M4*6                            |        |

| No. | Part No. | Description                   | Specification                         | Remark  |
|-----|----------|-------------------------------|---------------------------------------|---|
| 43  | NI00218  | cable tie                     | ALT-102SB                             |   |
| 44  | NF00061  | assurance card                | ALTO                                  |   |
| 45  | NE05004  | label                         | ALTO                                  |   |
| 46  | NH00334  | cone paper                    | 0.040*1m                              |   |
| 47  | NE13917  | label                         | DIGAN2.30_V1.0                        |   |
| 48  | NH00334  | cone paper                    | 0.040*1m                              |   |
| 49  | NB03664  | gift carton                   | DIGAN2.30 ALTO_V1.0                   |   |
| 50  | NA00380  | silk wadding                  | DIGAN2.30 right_V1.0                  |   |
| 51  | NA00381  | silk wadding                  | DIGAN2.30 left_V1.0                   |   |
| 52  | NB03707  | carton                        | DIGAN2.30 ALTO_V1.0                   |   |
| 53  | NF02070  | instruction                   | DIGAN2.30 ALTO_V1.1                   |   |
| 54  | NH00149  | paper                         | 889*640mm                             |   |
| 55  | TG00161  | adapter                       | 230V/50~60Hz_AC9V/500mA_EI-41         |   |
| 56  | HJ00006  | desiccant                     | 30g                                   |   |
| 57  | NI00501  | self-adhere foot cushion      | 12.7*9*3t(SF-004)                     |   |
| 58  | NA00137  | clip-chain bag                | 5*7                                   |   |
| 59  | NA00123  | PE bag                        | 0.04t*580*300mm                       |   |
| 60  | NA00279  | clip-chain bag                | 0.04t*100*150mm_V1.0                  |   |
| 61  | AD00012  | twin adhesive                 | 90*120mm_V1.0                         |   |
| 62  | HA01959  | row-wire connecting wiring    | 4P-4P 180                             |   |
| 63  | HA01502  | header wiring                 | 6P-6P 120                             |   |
| 64  | HA03817  | wire                          | 20P-20P 165mm UL2651 28AWG gray red   |   |
| 65  | NI01594  | MOUNT                         | TH-1                                  |   |
| 66  | MG00518  | screw                         | M3*7*0.5PH                            |   |
| 67  | HK04837  | PC board                      | P-DIGAN230CPU-DIP                     |   |
| 68  | SC00319  | crystal oscillator            | 12.288MHZ                             | X1  |
| 69  | NI01906  | cushion                       | QW-3(HC-49U)                          | X1  |
| 70  | HC00154  | connector                     | 2.54 180° 2*10P(gold-plated) 6/11.6mm |   |
| 71  | HC00078  | connector(male)               | 4P 2.5mm 180°                         | CN4   |
| 72  | HC00080  | connector(male)               | 6P 2.5mm 180°                         | CN1   |
| 73  | HC00081  | connector(male)               | 7P 2.5mm 180°                         | CN3   |
| 74  | TB00018  | transformer                   | LT-0806M(D/A Data Transmission        | TF1   |
| 75  | AC00002  | solder wire                   | 63/37%                                |   |
| 76  | HK04838  | PC board                      | P-DIGAN230CPU-SMD                     |   |
| 77  | HB01468  | PCB                           | DIGAN230CPU(1*4)_VER050518            |   |
| 78  | CI00114  | SMD ceramic capacitor 0805    | 0.47uF/25V                            | C16   |
| 79  | RD00059  | SMD fixed resistor 1/10W      | 0.0 ±5% 0603                          | R29,R30,R33,R34   |
| 80  | CI00075  | SMD ceramic capacitor 0603    | 0.1uF/50V Y5V +80,-20%                | C8,C9,C10,C11,C12,C13,C14,C15,C17,C20,C21,C30,C32,C34,C35,C36,C37,C38 |
| 81  | RD00068  | SMD fixed resistor 1/10W      | 100 ±5% 0603                          | R1,R26,R37  |
| 82  | CJ00007  | SMD AL electrolytic capacitor | 100uF/6.3V CASE6.3                    | C28   |
| 83  | RD00101  | SMD fixed resistor 1/10W      | 10K ±5% 0603                          | R2,R3,R4,R5,R18,R19,R20   |
| 84  | CJ00005  | SMD AL electrolytic capacitor | 10uF/16V CASE4                        | C24,C25,C26,C27   |

| No. | Part No. | Description                   | Specification                        | Remark   |
|-----|----------|-------------------------------|--------------------------------------|--|
| 85  | RD00085  | SMD fixed resistor 1/10W      | 1.5K ±5% 0603                        | R22  |
| 86  | CI00051  | SMD ceramic capacitor 0603    | 22PF/50V COG±5%(C1608C0G1H220JT)/TDK | C18,C19  |
| 87  | RD00063  | SMD fixed resistor 1/10W      | 22 ±5% 0603                          | R23,R24  |
| 88  | CI00031  | SMD ceramic capacitor 0805    | 2.2uF/16V Y5V-0805(2012)             | C1,C2,C3,C4,C5,C6,C7,C29,C31,C33   |
| 89  | RD00076  | SMD fixed resistor 1/10W      | 330 ±5% 0603                         | R21  |
| 90  | CI00063  | SMD ceramic capacitor 0603    | 470PF/50V NPO ±5                     | C22,C23  |
| 91  | RD00093  | SMD fixed resistor 1/10W      | 4.7K ±5% 0603                        | R9,R10,R11,R12,R13,R14,R15,R16   |
| 92  | RD00355  | SMD fixed resistor 1/10W      | 4.7 ±5% 0603                         | R7,R8  |
| 93  | RD00002  | SMD fixed resistor 1/8W       | 0.0 ±5% 0805                         | R6   |
| 94  | CI00056  | SMD ceramic capacitor 0603    | 56PF/50V NPO ±5%                     | C39,C40,C41  |
| 95  | SG00070  | SMD integrated circuit        | 74HC393DT                            | U2   |
| 96  | SG00326  | SMD integrated circuit        | AK4103AVF(VSOP24)/(AKM)              | U10  |
| 97  | CO00006  | SMD chip inductance           | BLM21A102SPT/(MURATA)                | L2   |
| 98  | SG00025  | SMD integrated circuit        | 24LC64I/SN                           | U6   |
| 99  | SG00309  | SMD integrated circuit        | GLT41116-40J                         | U4   |
| 100 | SG00229  | SMD integrated circuit        | MC68HC908GP32CFB(QFP-44)/(MOT)       | U3   |
| 101 | SF00009  | voltage stabilized transistor | LM1117MP-3.3 (3.3V, SOT223)          | U7   |
| 102 | SG00036  | SMD integrated circuit        | PCM3001E                             | U5   |
| 103 | SG00327  | SMD integrated circuit        | PL-2303HX(SSOP28)/Prolific           | U8   |
| 104 | SG00114  | SMD integrated circuit        | TMS57002DPHA                         | U1,U9  |
| 105 | AE00221  | tin soldering paste           | SJ-617                               |  |
| 106 | HK04839  | PC board                      | P-DIGAN230DISP-DIP                   |  |
| 107 | HB01469  | PCB                           | DIGAN230-7SEG(1*25)_VER050118        |  |
| 108 | HC00435  | connector                     | 2.54 180° 5P6/11.6mm                 | CN2,CN3  |
| 109 | HH00051  | seven display                 | LDD3265-10                           |  |
| 110 | AC00002  | solder wire                   | 63/37%                               |  |
| 111 | HK04840  | PC board                      | P-DIGAN230DISP-SMD                   |  |
| 112 | HB01467  | PCB                           | DIGAN230DISP_VER041103               |  |
| 113 | RD00065  | SMD fixed resistor 1/10W      | 47 ±5% 0603                          | R79,R80,R81,R82,R83,R84,R85,R86,R87,R88,R89,R90,R91  |
| 114 | CI00075  | SMD ceramic capacitor 0603    | 0.1uF/50V Y5V +80,-20%               | C1,C2,C3,C4,C5,C6,C7   |
| 115 | RD00101  | SMD fixed resistor 1/10W      | 10K ±5% 0603                         | R33,R92,R93  |
| 116 | RD00093  | SMD fixed resistor 1/10W      | 4.7K ±5% 0603                        | R1,R2,R3,R4,R5,R6,R7,R8,R9,R10,R11,R12,R13,R14,R15,R16,R17,R18,R19,R20,R21,R22,R23,R24,R25,R26,R27,R28,R29,R30,R31,R34,R35,R36,R37,R38,R39,R40,R41,R42,R43,R44,R45,R46,R47,R48,R49,R50,R51,R52,R53,R54,R55,R56,R57,R58,R59,R60,R61,R62,R63,R64,R65,R66,R67,R68,R69,R70,R71,R72,R73,R74,R75,R76,R77,R78 |
| 117 | SG00308  | SMD integrated circuit        | 74HC154DT(PHI)                       | U2,U3,U4,U5  |
| 118 | SG00078  | SMD integrated circuit        | SN74HC574DW                          | U6,U7,U8   |
| 119 | HC00718  | connector                     | 2.54 180° 2*10P 6/11.6mm             | CN1  |
| 120 | AE00221  | tin soldering paste           | SJ-617                               |  |
| 121 | HK04841  | PC board                      | P-DIGAN230-INOUT-DIP                 |  |

| No. | Part No. | Description            | Specification               | Remark  |
|-----|----------|------------------------|-----------------------------|---|
| 122 | SA00094  | rectifier diode        | 1N4002/100V                 | D2,D4,D5,D6,D7,D8   |
| 123 | SA00093  | rectifier diode        | 1N4148 0.5A                 | D1,D3   |
| 124 | CB00075  | electrolytic capacitor | 2200uF/16V 13*20mm          | C19,C21,C26,C27   |
| 125 | SE00028  | SMD rectifier diode    | BAS316,115                  | D1,D2,D3,D4,D5,D6,D7,D8,D9,D10,D11,D12,D13,D14,D15,D16,D17,D18,D19,D20,D21,D22,D23,D24,D25,D26,D27,D28,D29,D30,D31,D32,D33,D34,D35,D36,D37,D38,D39,D40,D41,D42,D43,D44,D45,D46,D47,D48,D49,D50,D51,D52,D53,D54,D55,D56,D57,D58,D59,D60,D61,D62,D63,D64,D65,D66  |
| 126 | SE00055  | SMD L.E.D              | green 19-21SYGC/S530-E3/TR8 | L7,L20,L39,L40,L65,L66,L91,L92,L117,L118,L143,L144,L169,L170,L189,L202,L221,L222,L247,L248,L267,L286,L287,L312,L313,L338,L339,L364,L384,L383,L409,L410,L435,L436,L461,L462,L481,L494,L507,L520,L539,L540,L565,L566,L591,L592,L617,L618,L643,L644,L669,L670,L695,L696,L721,L722,L741,L754,L767,L780                |
| 127 | SF00010  | SMD transistor         | 2SC2412K(SOT-23)/(R)        | TR64,TR65,TR66,TR67,TR68,TR69,TR70,TR71,TR72,TR73,TR74,TR75,TR76  |
| 128 | SF00004  | SMD transistor         | 2SA1036K(SOT-23)/(R)        | TR1,TR2,TR3,TR4,TR5,TR6,TR7,TR8,TR9,TR10,TR11,TR12,TR13,TR14,TR15,TR16,TR17,TR18,TR19,TR20,TR21,TR22,TR23,TR24,TR25,TR26,TR27,TR28,TR29,TR30,TR31,TR32,TR33,TR34,TR35,TR36,TR37,TR38,TR39,TR40,TR41,TR42,TR43,TR44,TR45,TR46,TR47,TR48,TR49,TR50,TR51,TR52,TR53,TR54,TR55,TR56,TR57,TR58,TR59,TR60,TR61,TR62,TR63 |
| 129 | HL00004  | push button switch-RS  | 6*3.8*2.5mm TRAVEL=0.25     | S1,S2,S3,S4,S5,S6,S7,S8,S9,S10,S11,S12,S13,S14,S15,S16,S17,S18,S19,S20,S21,S22,S23,S24,S25,S26,S27,S28,S29,S30,S31,S32,S33,S34,S35,S36,S37,S38,S39,S40,S41,S42,S43,S44,S45,S46,S47,S48,S49,S50,S51,S52,S53,S54,S55,S56,S57,S58,S59,S60,S61,S62,S63,S64,S65,S66  |
| 132 | CB00063  | electrolytic capacitor | 330uF/16V 8*11mm            | C28,C29   |
| 133 | CB00255  | electrolytic capacitor | 1000uF/10V 8*11mm 5mm       | C43   |
| 134 | SD00074  | integrated circuit     | L7805CV(TO-220)(ST)         | TR1,TR2   |
| 135 | HC00081  | connector(male)        | 7P 2.5mm 180°               | CN4   |
| 136 | SB00034  | transistor             | 2SC1815GR                   | TR3,TR4   |
| 137 | HC00183  | DC jack                | KJ-36-S 3.5                 | CN2   |
| 138 | HC00241  | RCA jack               | RJ-1081-01-0500A            | J2  |
| 139 | HC00078  | connector(male)        | 4P 2.5mm 180°               | CN3   |
| 140 | HC00080  | connector(male)        | 6P 2.5mm 180°               | CN1   |
| 141 | MI00257  | heat-sink              | 25*34.6*12*1.5 DX26         | HT1   |
| 142 | HC00111  | balance MIC jack       | 99M-108SP1                  | X6,X8   |
| 143 | HC00108  | stereo MIC jack        | 6.3 stereo LJB0661-6        | X2,X4,X5,X7   |
| 144 | HC00112  | balance MIC jack       | 99M-107SP-1-2 90° PUSH      | X1,X3   |
| 145 | HI00161  | Relay                  | RY-5W-K,5V                  | RL1,RL2   |
| 146 | HC00556  | USB socket             | UCB-4FR004-B 90°            | J1  |
| 147 | CG00024  | filter-EMI FILTER      | PLT09H-2003R                | L3  |
| 148 | NC00005  | silicone insulator     | TO-220 square type          |   |
| 149 | NI02249  | plastic washer         | TW-1(TO-220)                |   |
| 150 | ME00015  | color nut              | 3m/m                        |   |

| No. | Part No. | Description | Specification                    | Remark   |
|-----|----------|-------------|----------------------------------|--|
| 130 | SE00004  | SMD L.E.D   | yellow 67-21UYC/S530-A2/TR8 1210 | L352,L354,L358,L360  |
| 131 | SE00054  | SMD L.E.D   | yellow 19-21UYC/S530-A2/TR8      | L1,L2,L3,L4,L5,L6,L8,L9,L10,L11,L12,L13,L14,L15,L16,L17,L18,L19,L21,L22,L23,L24,L25,L26,L27,L28,L29,L30,L31,L32,L33,L34,L35,L36,L37,L38,L41,L42,L43,L44,L45,L46,L47,L48,L49,L50,L51,L52,L53,L54,L55,L56,L57,L58,L59,L60,L61,L62,L63,L64,L67,L68,L69,L70,L71,L72,L73,L74,L75,L76,L77,L78,L79,L80,L81,L82,L83,L84,L85,L86,L87,L88,L89,L90,L93,L94,L95,L96,L97,L98,L99,L100,L101,L102,L103,L104,L105,L106,L107,L108,L109,L110,L111,L112,L113,L114,L115,L116,L119,L120,L121,L122,L123,L124,L125,L126,L127,L128,L129,L130,L131,L132,L133,L134,L135,L136,L137,L138,L139,L140,L141,L142,L145,L146,L147,L148,L149,L150,L151,L152,L153,L154,L155,L156,L157,L158,L159,L160,L161,L162,L163,L164,L165,L166,L167,L168,L171,L172,L173,L174,L175,L176,L177,L199,L200,L201,L203,L204,L205,L206,L207,L208,L209,L178,L179,L180,L181,L182,L183,L184,L185,L186,L187,L188,L190,L191,L192,L193,L194,L195,L196,L197,L198,L210,L211,L212,L213,L214,L215,L216,L217,L218,L219,L220,L223,L224,L225,L226,L227,L228,L229,L230,L231,L232,L233,L234,L235,L236,L237,L238,L239,L240,L241,L242,L243,L244,L245,L246,L249,L250,L251,L252,L253,L254,L255,L256,L257,L258,L259,L260,L261,L262,L263,L264,L265,L266,L268,L269,L270,L271,L272,L273,L274,L275,L276,L277,L278,L279,L280,L281,L282,L283,L284,L285,L288,L289,L290,L291,L292,L293,L294,L295,L296,L297,L298,L299,L300,L301,L302,L303,L304,L305,L306,L307,L308,L309,L310,L311,L314,L315,L316,L317,L318,L319,L320,L321,L322,L323,L324,L325,L326,L327,L328,L329,L330,L331,L332,L333,L334,L335,L336,L337,L340,L341,L342,L343,L344,L345,L346,L347,L348,L349,L350,L351,L353,L355,L356,L357,L359,L361,L362,L363,L365,L366,L367,L368,L369,L370,L371,L372,L373,L374,L375,L376,L377,L378,L379,L380,L381,L382,L385,L386,L387,L388,L389,L390,L391,L392,L393,L394,L395,L396,L397,L398,L399,L400,L401,L402,L403,L404,L405,L406,L407,L408,L411,L412,L413,L414,L415,L416,L417,L418,L419,L420,L421,L422,L423,L424,L425,L426,L427,L428,L429,L430,L431,L432,L433,L434,L437,L438,L439,L440,L441,L442,L443,L444,L445,L446,L447,L448,L449,L450,L451,L452,L453,L454,L455,L456,L457,L458,L459,L460,L463,L464,L465,L466,L467,L468,L469,L470,L471,L472,L473,L474,L475,L476,L477,L478,L479,L480,L482,L483,L484,L485,L486,L487,L488,L489,L490,L491,L492,L493,L495,L496,L497,L498,L499,L500,L501,L502,L503,L504,L505,L506,L508,L509,L510,L511,L512,L513,L514,L515,L516,L517,L518,L519,L521,L522,L523,L524,L525,L526,L527,L528,L529,L530,L531,L532,L533,L534,L535,L536,L537,L538,L541,L542,L543,L544,L545,L546,L547,L548,L549,L550,L551,L552,L553,L554,L555,L556,L557,L558,L559,L560,L561,L562,L563,L564,L567,L568,L569,L570,L571,L572,L573,L594,L595,L596,L597,L598,L599,L600,L603,L604,L605,L606,L607,L608,L609,L610,L611,L612,L613,1,L602,L603,L574,L575,L576,L577,L578,L579,L580,L581,L582,L583,L584,L585,L586,L587,L588,L589,L590,L593,L614,L615,L616,L619,L620,L621,L622,L623,L624,L625,L626,L627,L628,L629,L630,L631,L632,L633,L634,L635,L636,L637,L638,L639,L640,L641,L642,L645,L646,L647,L648,L649,L650,L651,L652,L653,L654,L655,L656,L657,L658,L659,L660,L661,L662,L663,L664,L665,L666,L667,L668,L671,L672,L673,L674,L675,L676,L677,L678,L679,L680,L681,L682,L683,L684,L685,L686,L687,L688,L689,L690,L691,L692,L693,L694,L697,L698,L699,L700,L701,L702,L703,L704,L705,L706,L707,L708,L709,L710,L711,L712,L713,L714,L715,L716,L717,L718,L719,L720,L723,L724,L725,L726,L727,L728,L729,L730,L731,L732,L733,L734,L735,L736,L737,L738,L739,L740,L742,L743,L744,L745,L746,L747,L748,L749,L750,L751,L752,L753,L755,L756,L757,L758,L759,L760,L761,L762,L763,L764,L765,L766,L768,L769,L770,L771,L772,L773,L774,L775,L776,L777,L778,L779,L781,L782,L783,L784,L785,L786 |

| No. | Part No. | Description                     | Specification                        | Remark   |
|-----|----------|---------------------------------|--------------------------------------|--|
| 151 | MF00037  | washer                          | 3.2* 5.5*1t                          |  |
| 152 | MG00171  | screw                           | M3*14                                |  |
| 153 | AC00002  | solder wire                     | 63/37%                               |  |
| 154 | HK04842  | PC board                        | P-DIGAN230-INOUT-SMD                 |  |
| 155 | HB01475  | PCB                             | DIGAN230-INOUT(1*4)_VER050306        |  |
| 156 | RD00059  | SMD fixed resistor 1/10W        | 0.0 ±5% 0603                         | JP1,JP2,R16,R13  |
| 157 | RD00002  | SMD fixed resistor 1/8W         | 0.0 ±5% 0805                         | L2   |
| 158 | CI00075  | SMD ceramic capacitor 0603      | 0.1uF/50V Y5V +80,-20%               | C5,C7,C12,C13,C14,C39,C40,C41,C42,C30                        |
| 159 | RD00068  | SMD fixed resistor 1/10W        | 100 ±5% 0603                         | R11,R12  |
| 160 | RD00214  | SMD precise resistor 1/10W      | 10.0K ±1% 0603                       | R18,R19,R56,R57,R14,R52                                      |
| 161 | RD00210  | SMD precise resistor 1/10W      | 5.11K ±1% 0603                       | R5,R7,R42,R44  |
| 162 | CI00047  | SMD ceramic capacitor 0603      | 10PF/50V C0G±0.25PFG1H100CT)TDK      | C3,C4,C6,C8,C9,C17,C18,C20,C22,C23,C31,C32,C33               |
| 163 | RD00061  | SMD fixed resistor 1/10W        | 10 ±5% 0603                          | R6,R8  |
| 164 | RD00216  | SMD precise resistor 1/10W      | 13.3K ±1% 0603                       | R1,R2,R3,R4,R38,R39,R40,R41                                  |
| 165 | RD00371  | SMD precise resistor 1/10W      | 51.1K ±1% 0603                       | R15,R53  |
| 166 | RD00271  | SMD precise resistor 1/10W      | 2.67K ±1% 0603                       | R28,R66  |
| 167 | RD00363  | SMD precise resistor 1/10W      | 3.16K ±1% 0603                       | R17,R23,R55,R61  |
| 168 | RD00285  | SMD precise resistor 1/10W      | 3.24K ±1% 0603                       | R24,R62  |
| 169 | SG00122  | SMD integrated circuit          | NJM4580M-TE3                         | IC5  |
| 170 | CI00063  | SMD ceramic capacitor 0603      | 470PF/50V NPO ±5                     | C10,C11,C24,C25  |
| 171 | CI00055  | SMD ceramic capacitor 0603      | 47PF/50V C0G±5%(C1608C0G1H470JT)/TDK | C1,C2,C15,C16  |
| 172 | RD00132  | SMD fixed resistor 1/4W         | 47 ±5% 1206                          | R30,R68  |
| 173 | RD00286  | SMD precise resistor 1/10W      | 4.53K ±1% 0603                       | R22,R25,R60,R63  |
| 174 | RD00093  | SMD fixed resistor 1/10W        | 4.7K ±5% 0603                        | R9,R10   |
| 175 | RD00299  | SMD precise resistor 1/10W      | 5.76K ±1% 0603                       | R20,R58  |
| 176 | RD00297  | SMD precise resistor 1/10W      | 60.4 ±1% 0603                        | R21,R26,R59,R64  |
| 177 | RD00300  | SMD precise resistor 1/10W      | 6.04K ±1% 0603                       | R27,R65  |
| 178 | CO00006  | SMD chip inductance             | BLM21A102SPT/(MURATA)                | L1,L4,L5,L6,L7,L8,L9,L10,L11,L12,L13,L14,L15,L16,L17,L18,L19 |
| 179 | SG00118  | SMD integrated circuit          | MC33079DT(ST)MC33079D(ON)            | IC7,IC8  |
| 180 | AE00221  | tin soldering paste             | SJ-617                               |  |
| 181 | HA04024  | header wiring                   | 7P-7P 125mm 24AWG UL1007 black/white |  |
| 182 | HA04018  | row-stand connector wiring      | 7P-7P 125mm 24AWG UL1007 black/white |  |
| 183 | CN00152  | high frequency magnetism enrich | M192515150AFX                        |  |