LP Series

Service Manual

Model : LP-1(ver1.6)

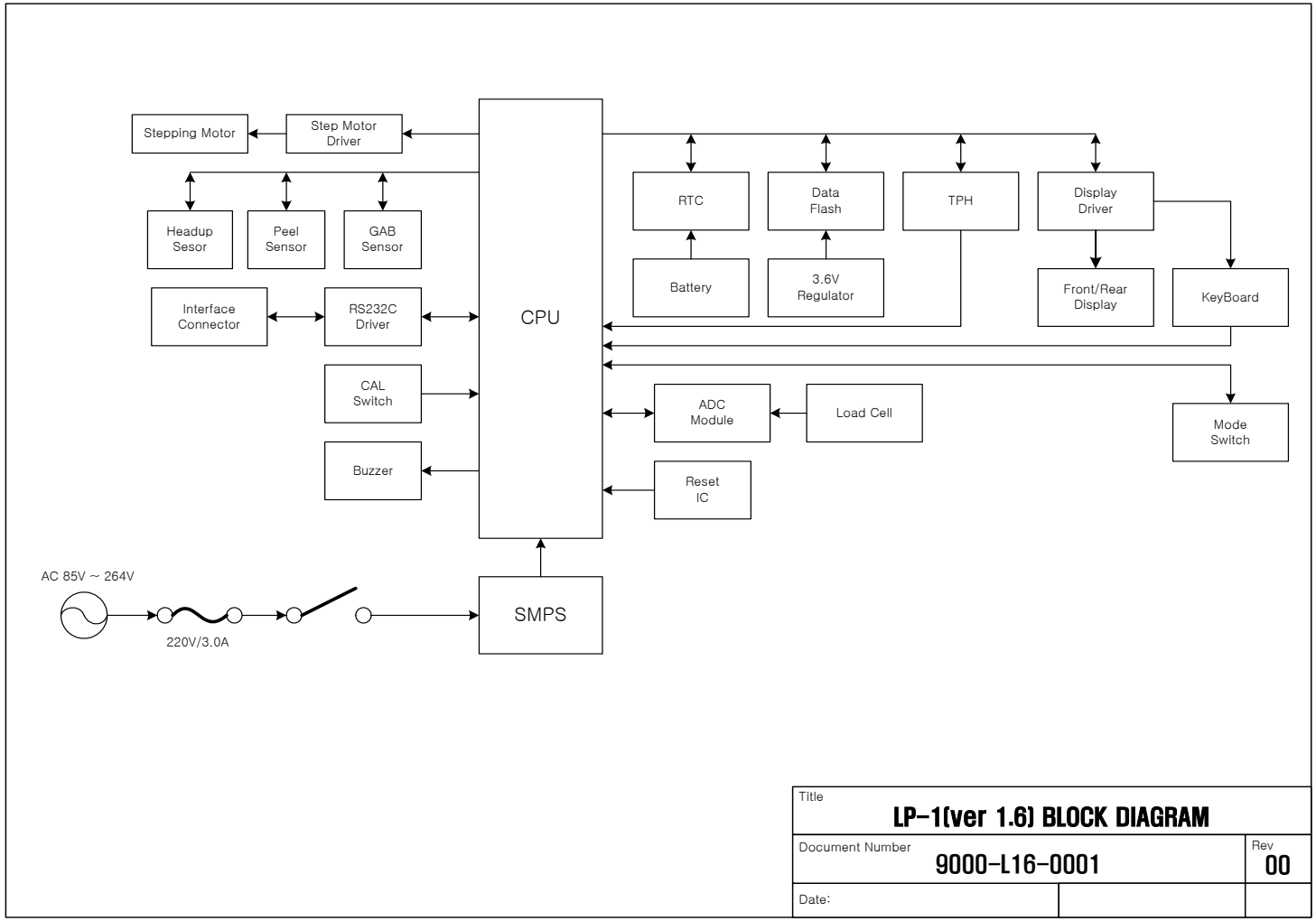
C A S

S·C·A·L·E

INDEX

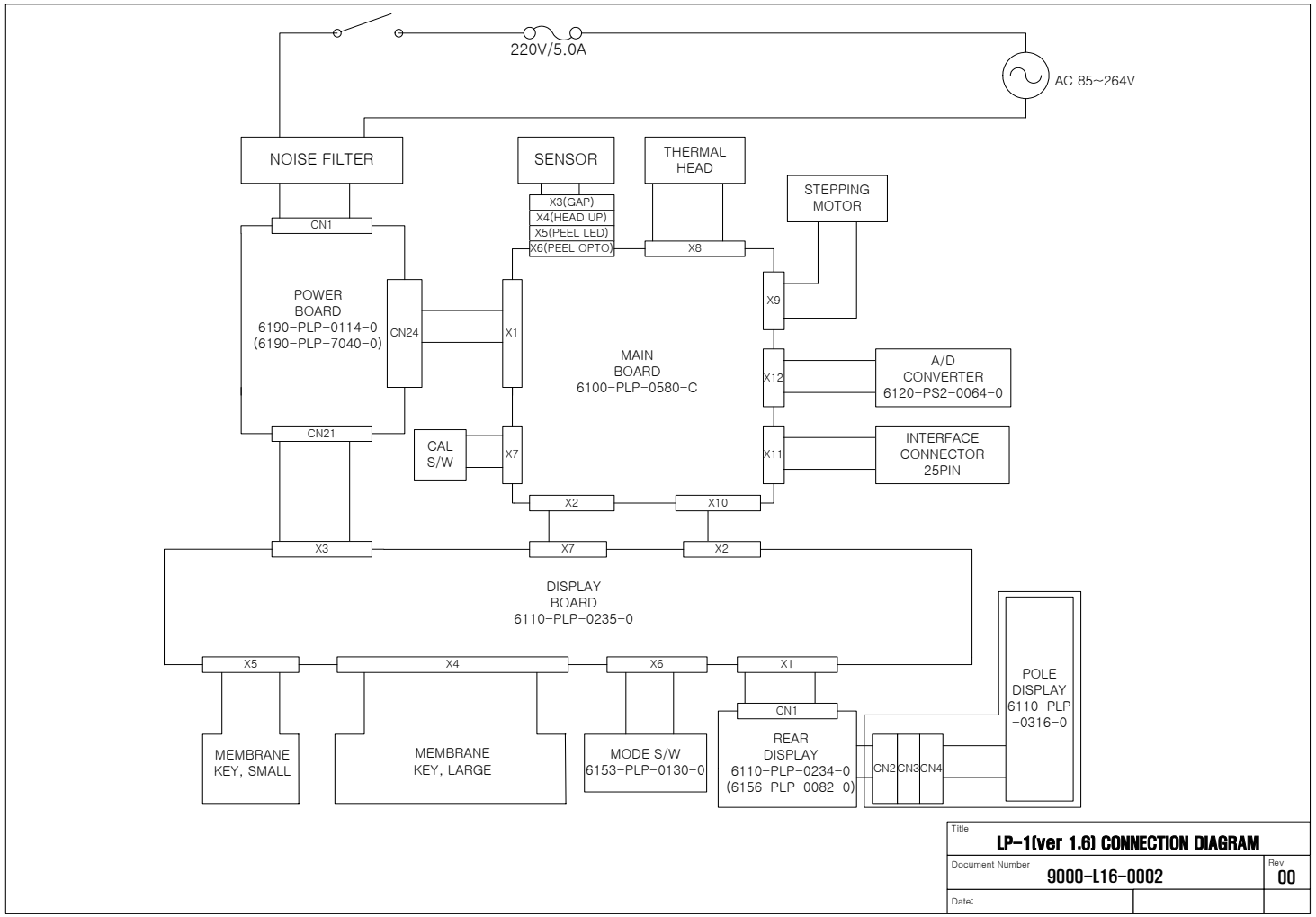
1. BLOCK DIAGRAM

Drawing No.: 9000-L16-0001-0



2. CONNECTION DAIGRAM

Drawing No.: 9000-L16-0002-0



3. OPENNING THE UNIT

A. Removing the Display PCB

i. Disconnect AC code.

ii. Put the scale where you can reach both the back and the front of it easily.

iii. Refer to “12. EXPLODED VIEW – UPPER CASE.”
Pull out the tray and the paper cover.

iv. On the front side of the upper case are the four screws holding the front cover on. Unscrew them and put them in a safe place

v. Unscrew a bolt that is on the left front side of the main body and put it in a safe place.

vi. Lift the front cover and pull it. Carefully remove the all cables including the FPC of the membrane key boards and unscrew the screws fastened to the main body with the ground wires.

vii. The five screws are holding the main PCB on the front cover. Remove them and place them in a safe place. Loosing the five hooks, pull out the board.

B. Removing the Main PCB

i. Follow the steps 1) ~ 5) listed in “1. Removing the Display PCB”.

ii. Remove the platform, side cover, upper case and rear cover. Refer to “12. EXPLODED VIEW – UPPER CASE.”

iii. Remove the all cables on Main board

iv. Refer to “13. EXPLODED VIEW – PRINTER MECHANISM.” Unscrew the three screws fixing the printer on the main body. Remove the sensor support from the main body.

v. Carefully pull out the printer.

vi. On the printer, the four screws holding the Main PCB. Unscrew them and put them in a safe place.

4. SCALE CALIBRATION

A. Description

i. CAL#1 : Shows the span – adusted ADC output.
ii. CAL#2 : Key test mode
iii. CAL#3 : Span calibration is carried in the mode
iv. CAL#4 : Scale Setting mode
v. CAL#5 : Pure ADC output
vi. CAL#6 : Printer sensor setting
vii. CAL#8 : Display test
viii. CAL#9 : Local gravity Setting

B. Calibration procedure

i. Turn the power switch off
ii. Remove the tray and slide the “CAL” switch toward the other side.
iii. Put the tray on the platform.
iv. Turn the power switch on.
v. CAL#4 Setting
vi. CAL#3 Span calibration
vii. CAL#1 Verification & Fine tuning

CAL 1

Press the [1] KEY

Relative factored AD

Raw factored AD

Relative factored AD
= Current raw factored AD − zero factored AD

Press [ZERO] Key and then

Relative factored AD is 0, zero factored AD is current factored AD. (cf. Zero factored AD is current raw factored AD when press "1" key)

Press the [C] KEY, Exit

Calibration fine tuning

	[SHIFT] Don't select	[SHIFT] Selelcted
↑	Span AD value + 1	Span AD value + 10
↓	Span AD value − 1	Span AD value − 10

CAL 2

Press the [2]

Press the [A]

Original Key code of "A" key
Press Other Key, Display original key code of each key.

Press the [C] Two times, Exit

First time:

CAL 3

Press the **3** → Press the **PRT/•** → Put weight on the platform of scale + **PRT/•**

At the stable condition, increase counter. However at the unstable, reset the counter of "1".

Press the **C**

at the any state of normal calibration, then exit. But when current state is the percent or weight calibration, it is former state after pressing "C" key.

PLU →

→ Input the percentage of weight for calibration

PAY →

→ Input the weight for calibration

→ **PRT/•**

CAL 4

Note: Before entering the CAL 4 settings, you must select the correct Country Code in CAL 7

Press the **4** KEY

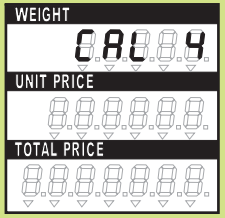


Table 1

CAPA	Kg (1)	Lb (2)	CAPA	Kg (1)	Lb (2)
1 (Single)	6	15	4 (Dual)	15	30
2 (Dual)	6	15	5 (Single)	30	60
3 (Single)	15	30	6 (Dual)	30	60

Press the **C**

at any time to clear the input field. For example, at the "KGLB" prompt, Input "3" in the input field, if you press the "C" key the "3" will change to "0".

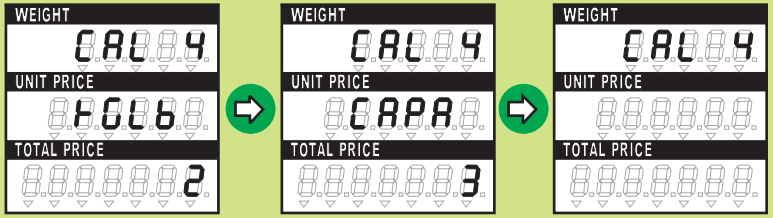
Press the **1** KEY

1 = Kg 2 = Lb

CAPA = 3

(Refer to Table 1)

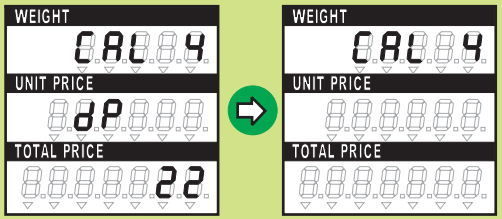
Input Digit, Press the PRT/*



Press the **4** KEY

dP = 22 for Lb
32 for Kg

Input Digit, Press the PRT/*

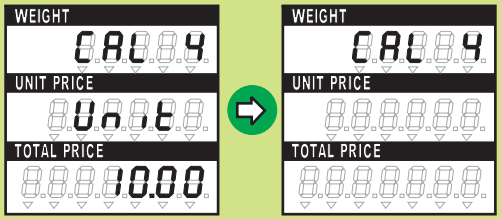


Press the **2** KEY

Unit = 10.00

Note: You must select the correct Country Code (2) in CAL 7 first.

Input Digit, Press the PRT/*



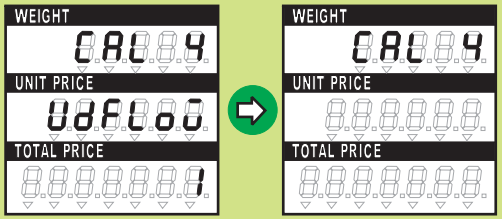
Press the **5** KEY

0 = Do not show -------

1 = Show ------- at 1.2% below ZERO

(Normal is 1)

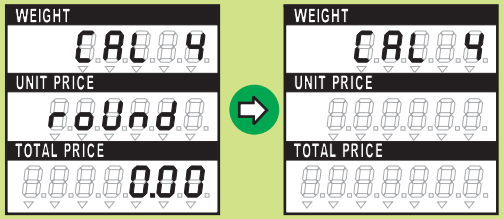
Input Digit, Press the PRT/*



Press the **3** KEY

Round = 0.00

Input Digit, Press the PRT/*

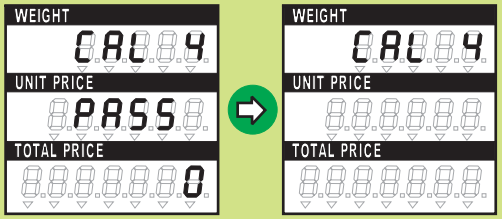


Press the **6** KEY

0 = Password Disabled

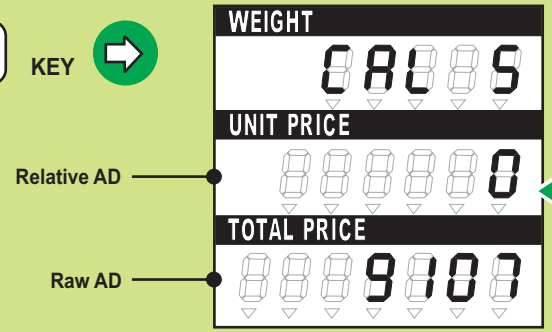
1 = Password Enabled

Input Digit, Press the PRT/*



CAL 5

Press the 5 KEY



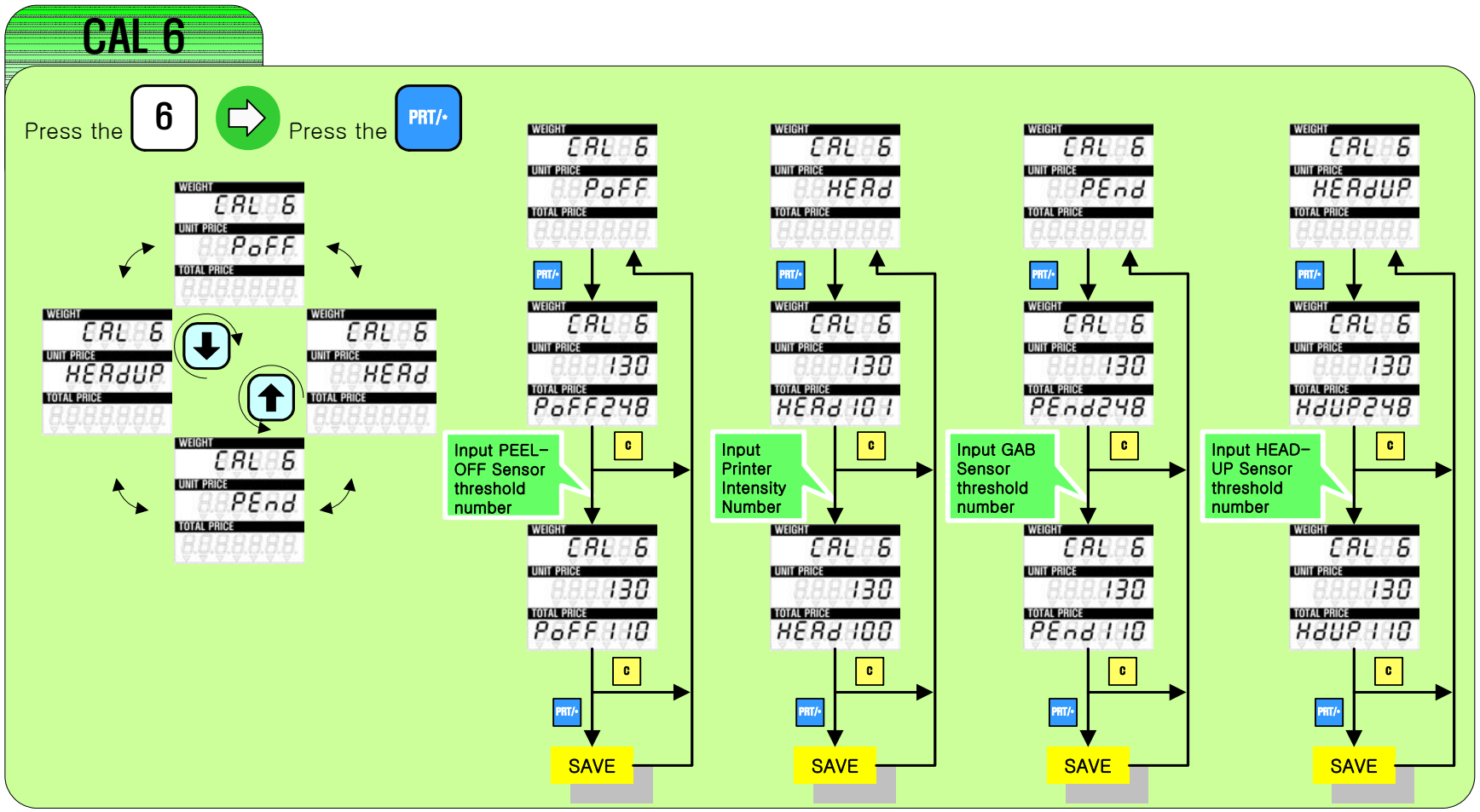
Relative AD
= Current raw AD - zero raw AD

Press ZERO Key and then

Relative AD is 0, zero raw AD is current raw AD, (Zero raw AD is current raw AD when press “5” key)

Press the C KEY, Exit

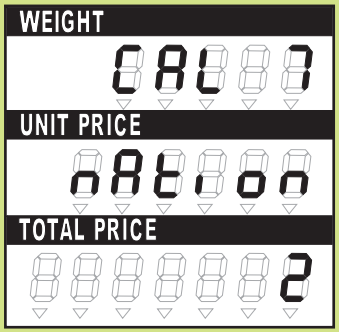
CAL 6


Press the
6
Press the
PRT/-
WEIGHT
CAL 6
UNIT PRICE
PoFF
TOTAL PRICE
HEAdUP
HEAd
PEnd
130
PoFF248
HEAd101
PEnd248
HdUP248
PoFF110
HEAd100
PEnd110
HdUP110
C
SAVE
Input PEEL-OFF Sensor threshold number
Input Printer Intensity Number
Input GAB Sensor threshold number
Input HEAD-UP Sensor threshold number

CAL 7

Press the 7 KEY

Enter a 2 for US



Press the C KEY, Exit

CAL 8

Press the **8** KEY

Press the **C** KEY, Exit

CAL 9

Press the **9** KEY

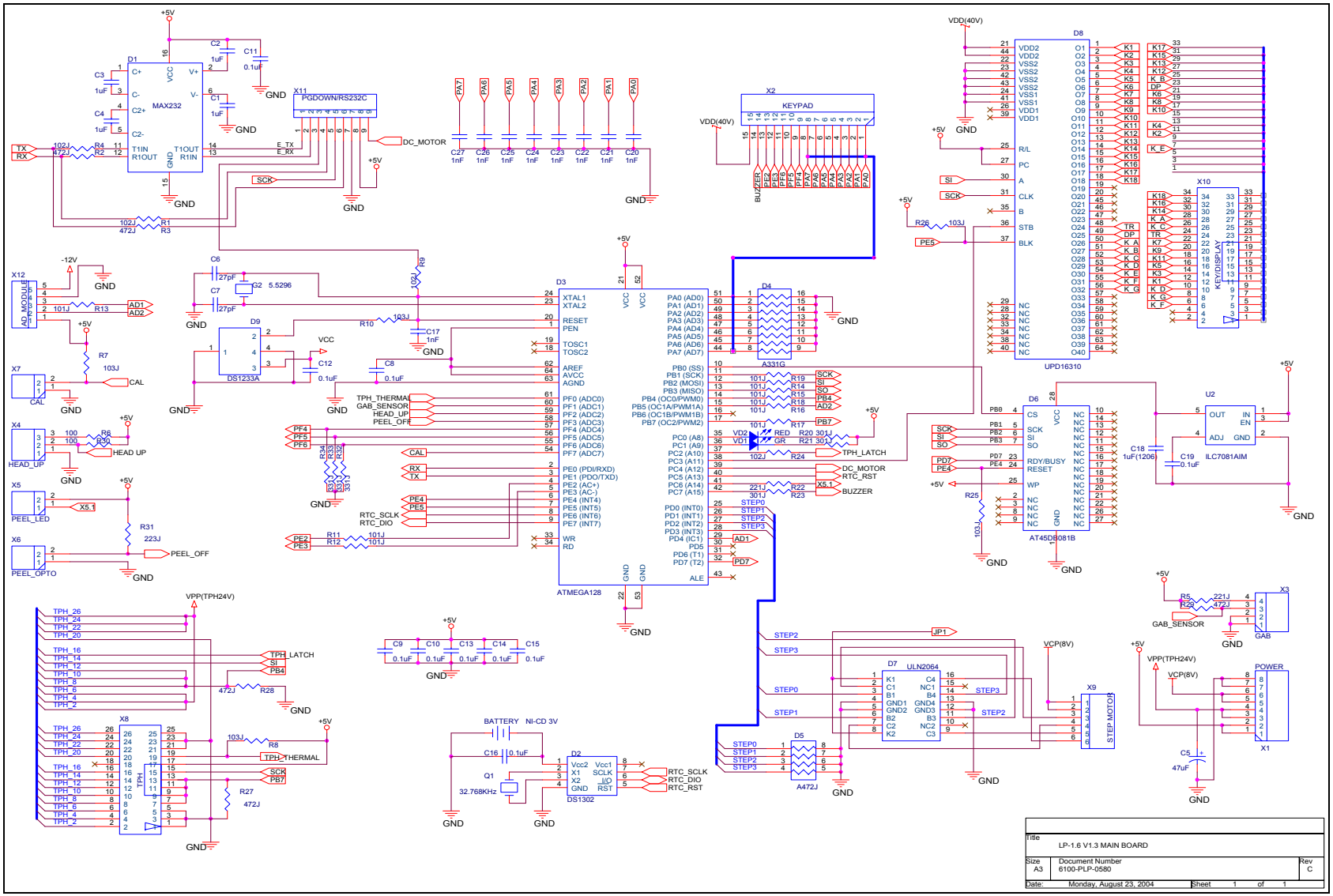
Press the **8** **1** **2** **3** KEY

Press the **PRT/•** KEY, Exit

5. SCHEMATIC DIAGRAM

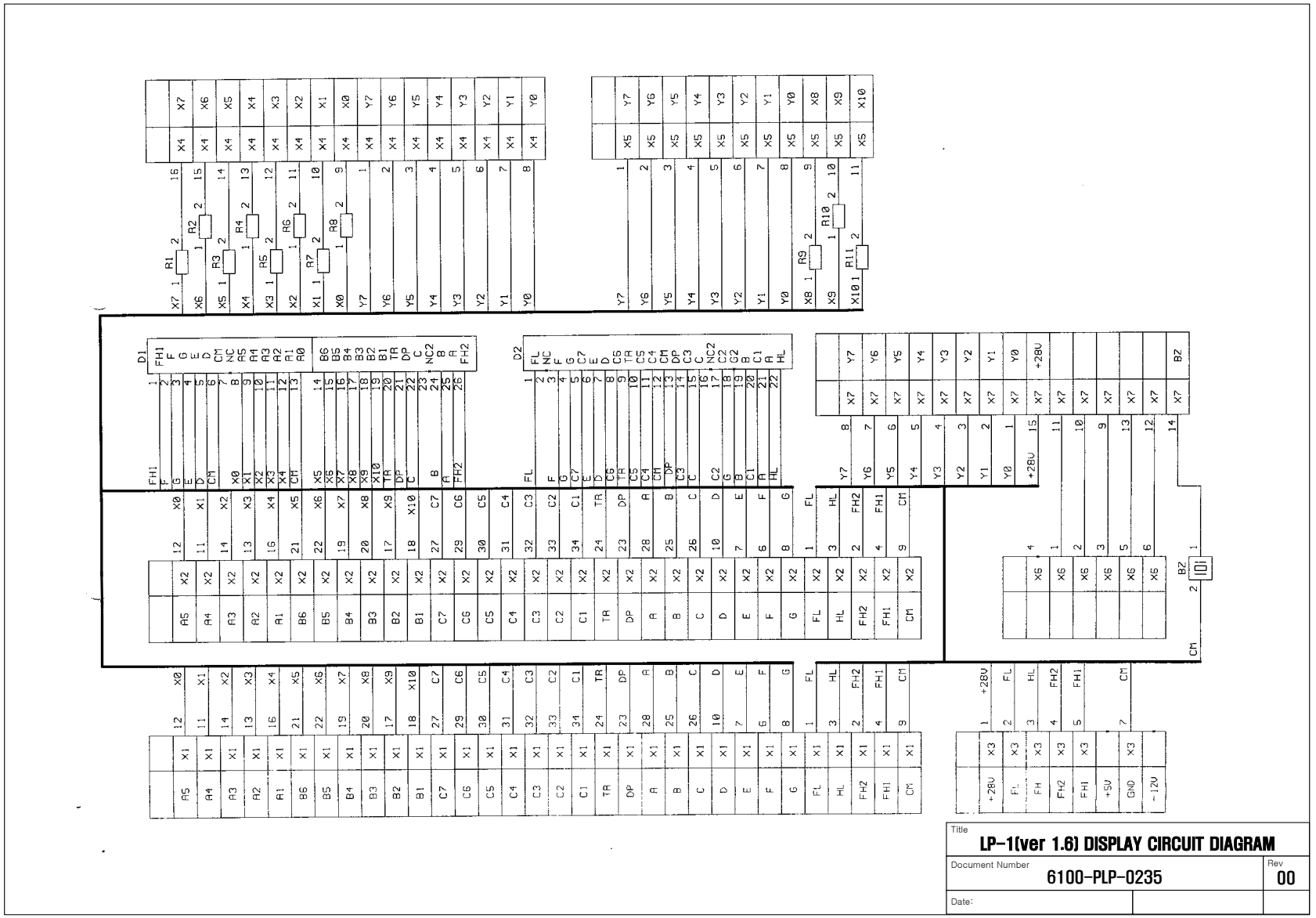
A. Main Board Schematic

Drawing No.: 6100-PLP-0580-C



B. Display Board Schematic

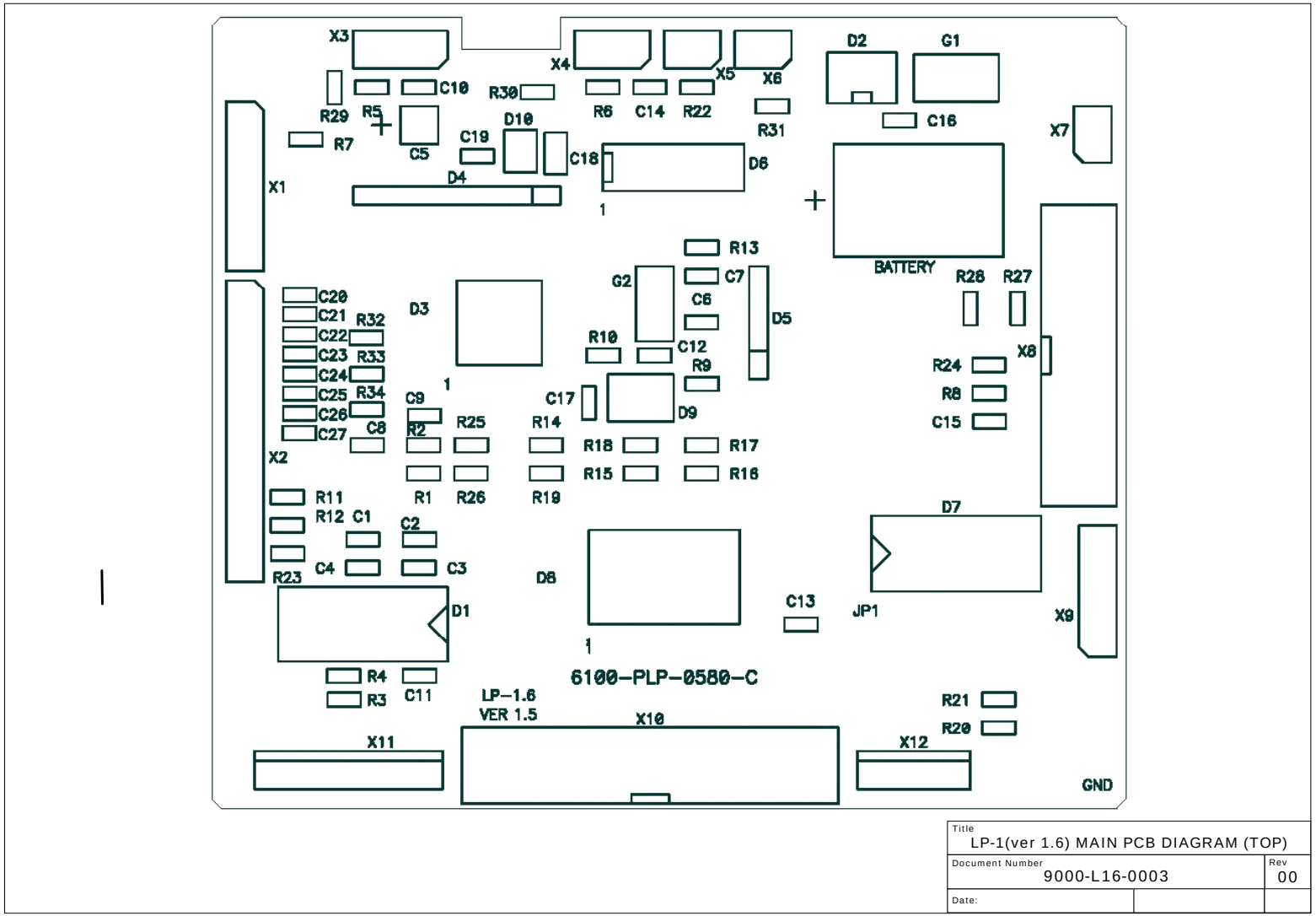
Drawing No.: 6110-PLP-0235-0



6. PCB DIAGRAM

A. Main PCB Diagram (top)

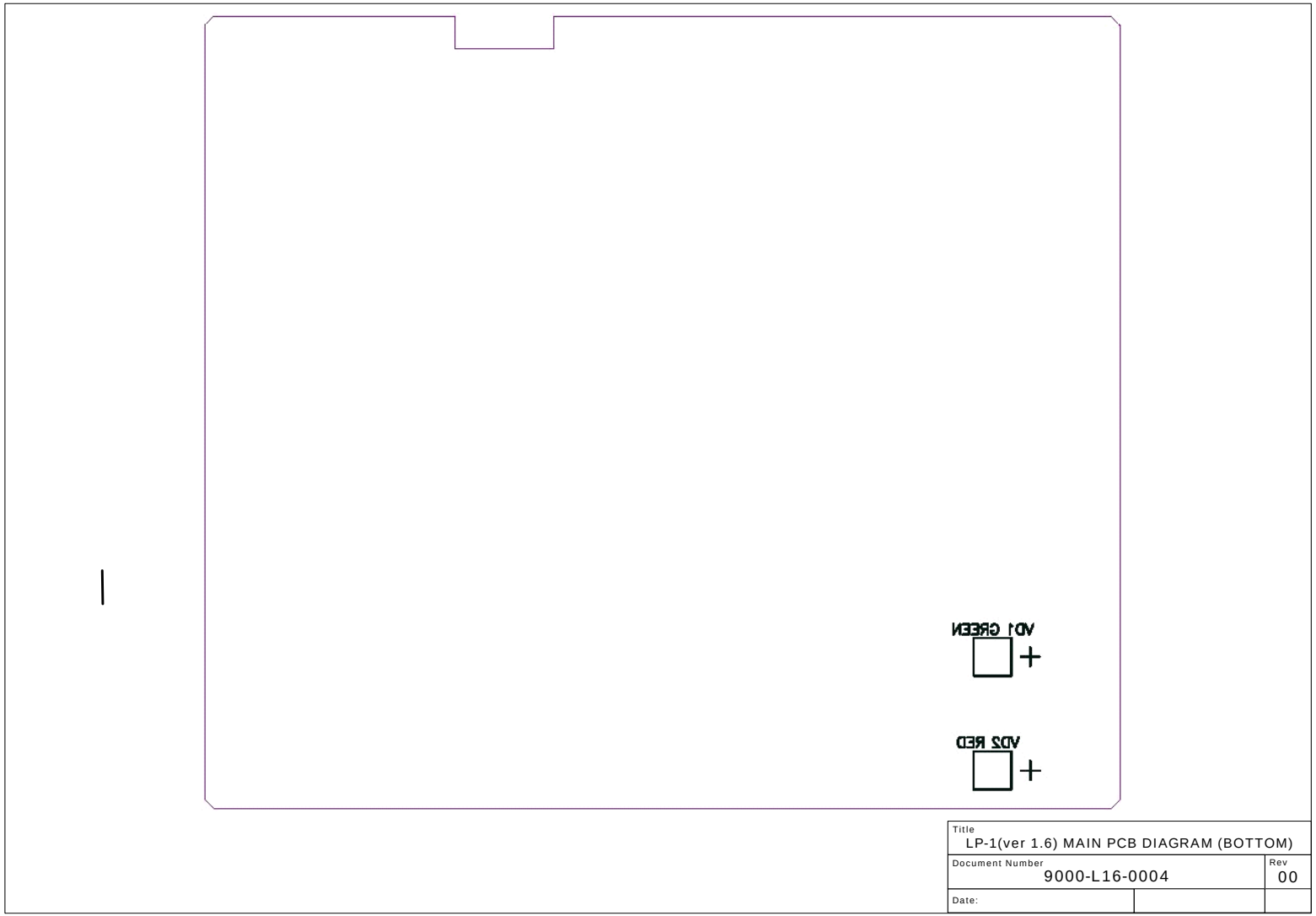
Drawing No.: 9000-L16-0003-0



Title	LP-1(ver 1.6) MAIN PCB DIAGRAM (TOP)
Document Number	9000-L16-0003
Rev	00
Date:	

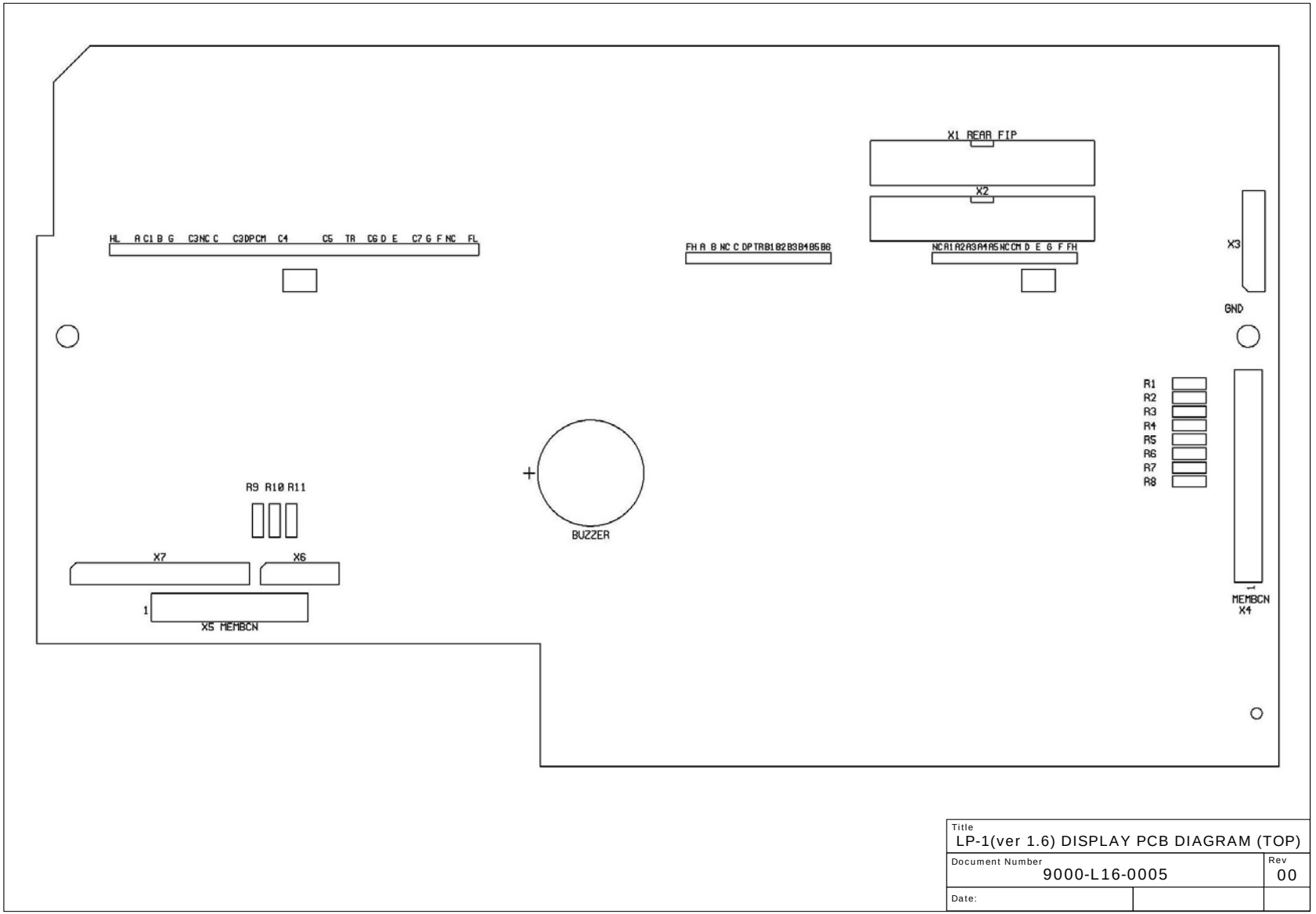
B. Main PCB Diagram(bottom)

Drawing No.: 9000-L16-0004-0



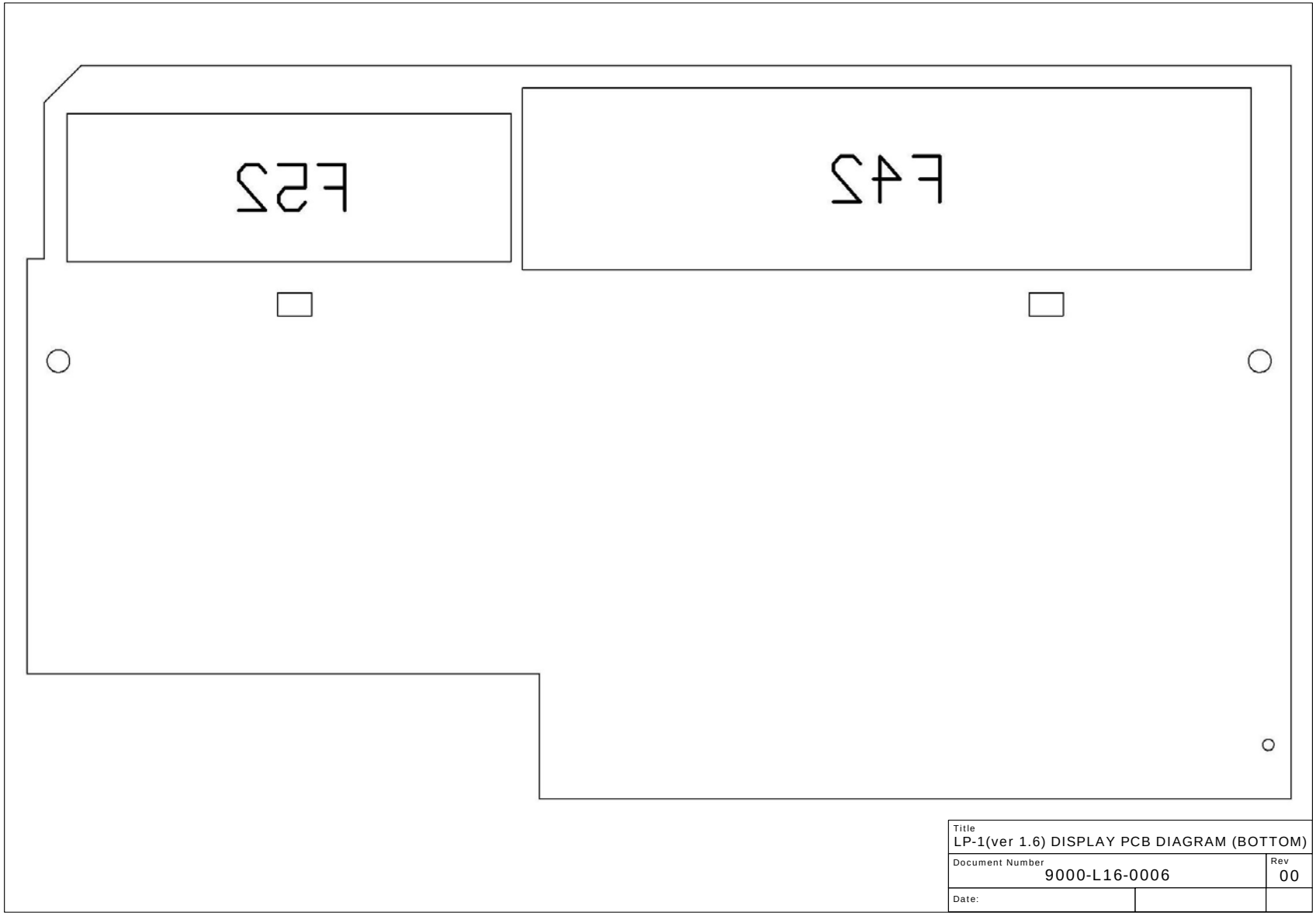
C. Display PCB Diagram(top)

Drawing No.: 9000-L16-0005-0



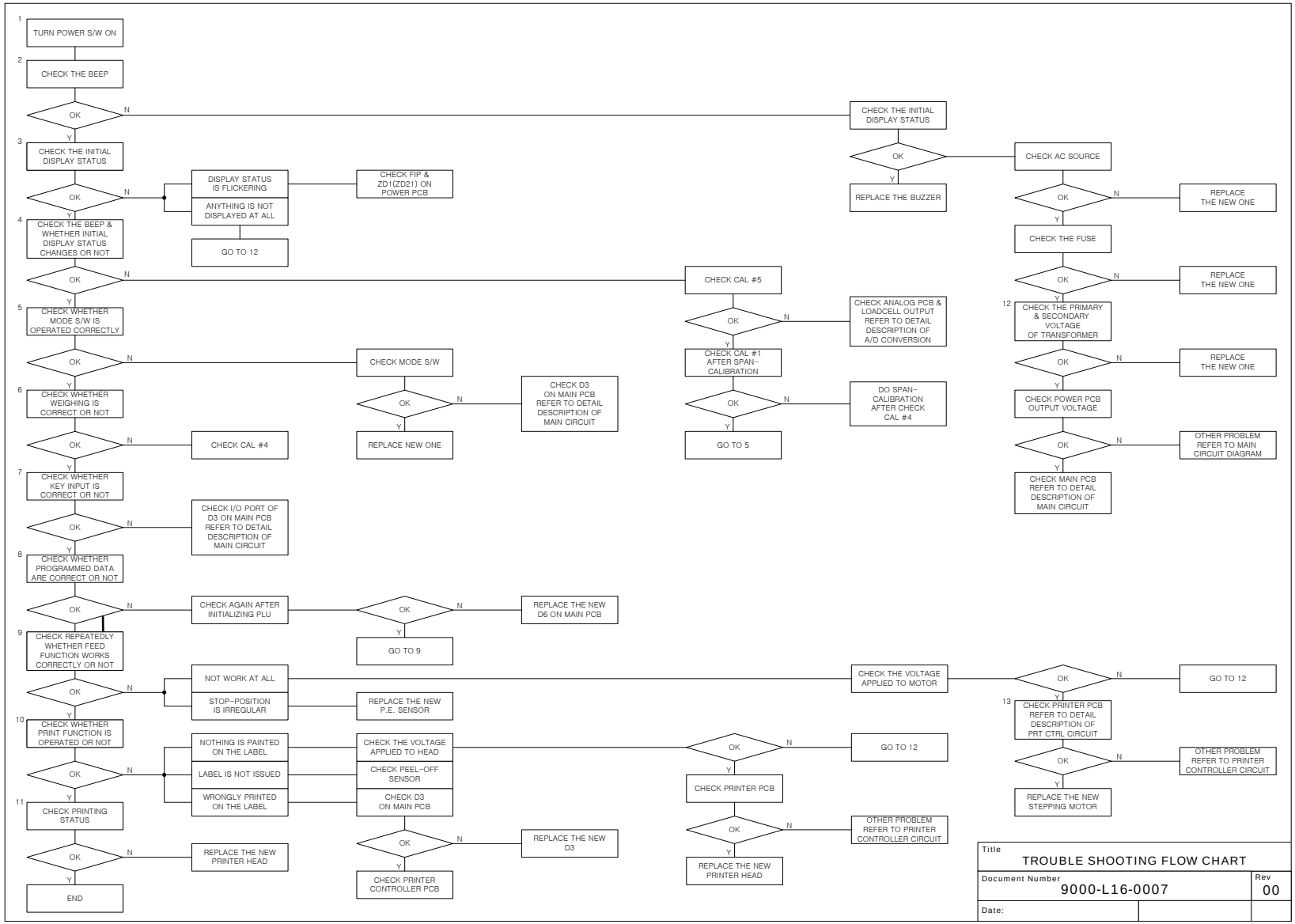
D. Display PCB Diagram(bot)

Drawing No.: 9000-L16-0006-0



7. TROUBLE SHOOTING FLOWCHART

Drawing No.: 9000-L16-0007-0



8. PARTS LIST

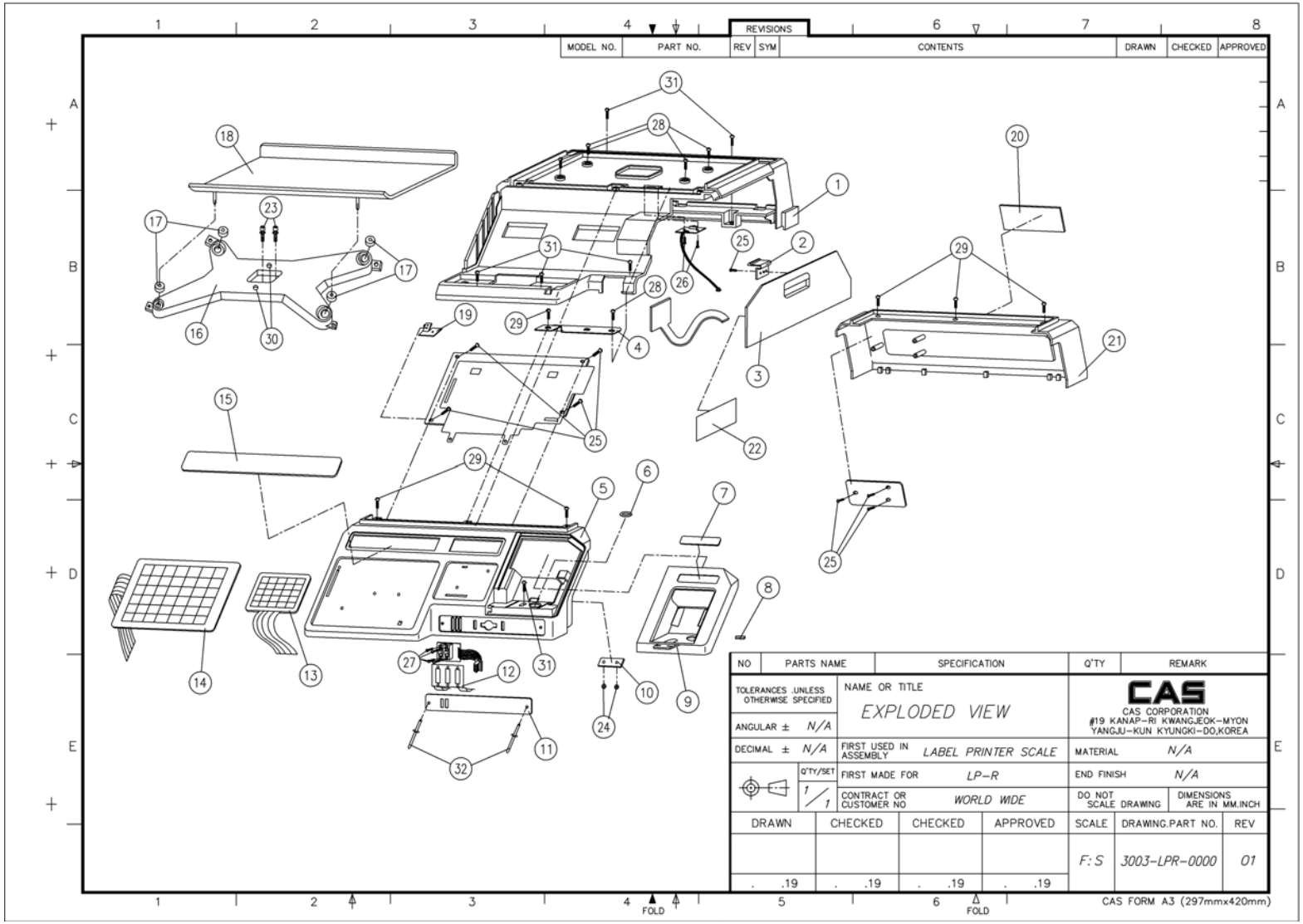
PART NO.	PART NAME	SPEC	Q'ty	LOCATION
6120PS20064B	ANALOG PCB	6120-PS2-0064-B	1	
6236I0040110	IC(C MOS)	14011	1	IC6
6236I0040660	IC(C MOS)	14066	1	IC4
6240I000077A	IC(OP AMP)	OP77	1	IC1
6240I0040810	IC(OP AMP)	4081	1	IC2
6240I0040820	IC(OP AMP)	4082	1	IC3
6280I0010150	TRANSISTOR	1015(1266)	3	TR1,TR2,TR3
6294ISW41480	SWITCHING-DIODE	1N4148P	1	D2
6505MB300100	RESISTOR 1/4W	1K	1	R8
6505MF010000	RESISTOR 1/4W	100Ω	2	R9,R10
6505MF310000	RESISTOR 1/4W	100KΩ	5	R5,R6,R7,R11,R12
6515CJ300220	RESISTOR 1/4W	2.2KΩ	4	R13,R17,R19,R21
6515CJ301000	RESISTOR 1/4W	10KΩ	3	R16,R18,R20
6540LA302250	PRECISION RESISTOR	22K5	2	R1,R2
6550RM00400A	NETWORK RESISTOR	ME16	1	R3
6700C1600100	TANTAL CONDENSER	10uF/16V	3	C01,C03,C04
6700C2500010	TANTAL CONDENSER	1UF/25V	1	C02
6710CAP01040	CERAMIC CONDENSER	0.1UF/25V(50V)	2	C1,C2
6714CAP01040	MONOLITHIC CONDESER	0.1UF/25V	6	C6,C7,C8,C9,C10,C13
6720CAP0105A	POLYESTER CONDENSER	1UF/63V-J(BOX)	1	C12
6720CAP0224A	POLYESTER CONDENSER	0.22UF/63V-J(BOX)	1	C11
6720CAP0474A	POLYESTER CONDENSER	0.47UF/63V-J(BOX)	2	C4,C5

6100PLP0580C	MAIN PCB	6100PLP0580C	1	
6200IPU0128A	IC(CPU)	128	1	D3
6200IS045810	IC(EP ROM)	45D081	1	D6
6210IS012330	IC(RESET)	1233(223)	1	D9
6220IS070810	IC(REGULATOR)	7081	1	D10
6224I0062640	IC	62064	1	D7
6224IS016310	IC(FIP DRIVER)	16310	1	D8
6228IS013020	IC(TIMER)	1302	1	D2
6232I0097150	IC	232	1	D1
6260I0000160	IC SOCKET	ZF16A	1	D1
6527ID010000	CHIP RESISTOR 1/10W	101	7	R13,R14,R15,R16,R17,R18,R19
6527ID022000	CHIP RESISTOR 1/10W	221	3	R5,R6,R22
6527ID300100	CHIP RESISTOR 1/10W	102	5	R1,R4,R11,R12,R24
6527ID300470	CHIP RESISTOR 1/10W	472	5	R2,R3,R9,R27,R28
6527ID301000	CHIP RESISTOR 1/10W	103	5	R7,R8,R10,R25,R26
6527IJ027000	CHIP RESISTOR 1/10W	271	3	R20,R21,R23
6527IJ300270	CHIP RESISTOR 1/10W	272	3	R32,R33,R34
6527IJ302200	CHIP RESISTOR 1/10W	223	3	R29,R30,R31
6550M0504720	NETWORK RESISTOR	472	1	D5
6550M0903310	NETWORK RESISTOR	331	1	D4
6704C2500470	ELECTRIC CONDENSER	47uF/25V	1	C5
6712CHP01040	CHIP CONDENSER	CL21F 104KBNC	10	C8,C9,C10,C11,C12,C13,C14,C15,C16,C19
6712CHP01050	CHIP CONDENSER	105(1uF-0805 TYPE)	4	C1,C2,C3,C4
6712CHP02000	CHIP CONDENSER	CL21C 200 JBNC(20PF)	2	C6,C7

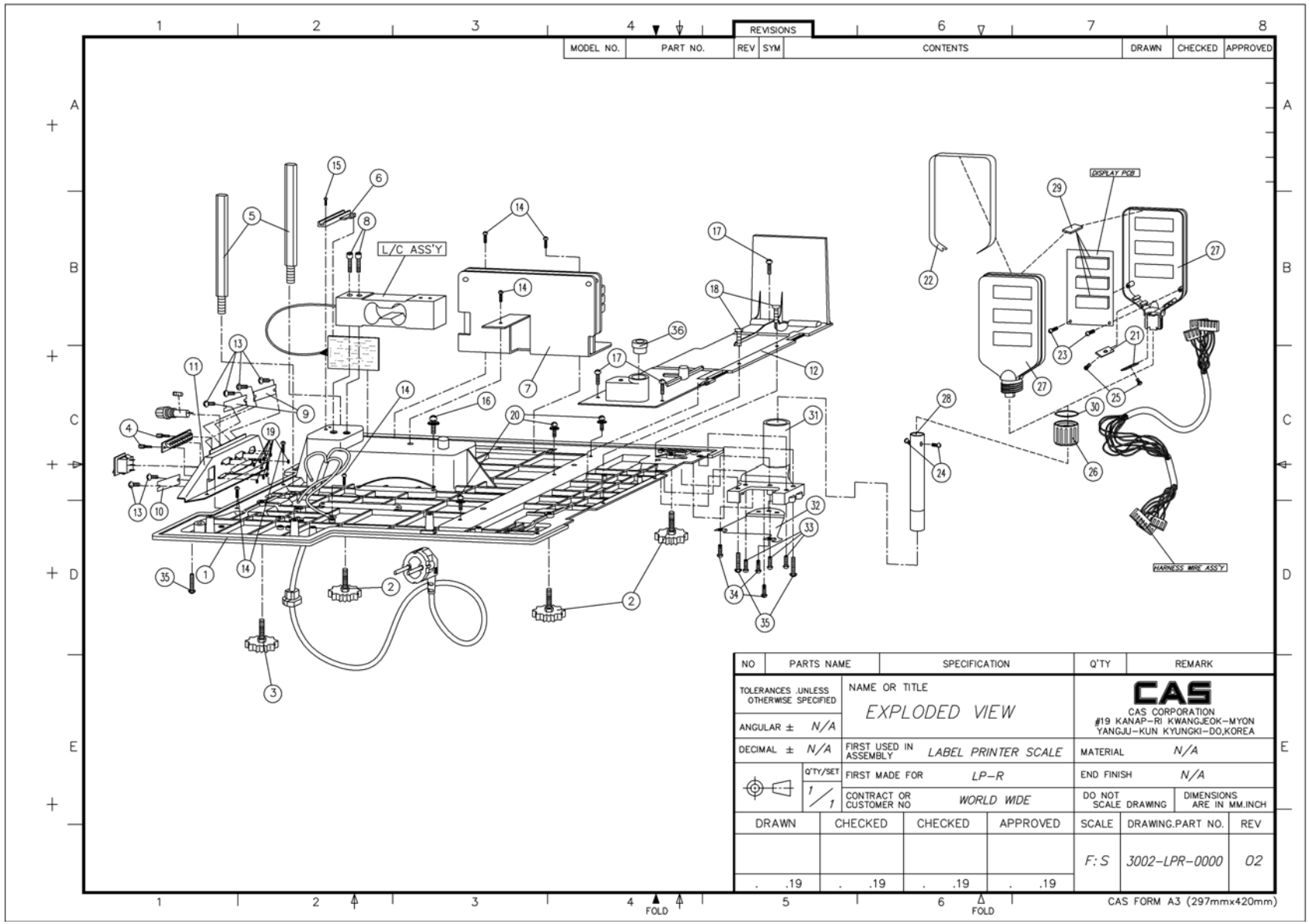
6712CHP01020	CHIP CONDENSER	CL21B 102KBNC	9	C17,C20,C21,C22,C23,C24,C25,C26,C27
6712CHPA1050	CHIP CONDENSER	105(1uF-1206 TYPE)	1	C18
7010ZK032760	CRYSTAL	32.768MHz	1	G1
7010ZM01105A	CRYSTAL	11.0592MHz	1	G2

9. EXPLODED VIEW

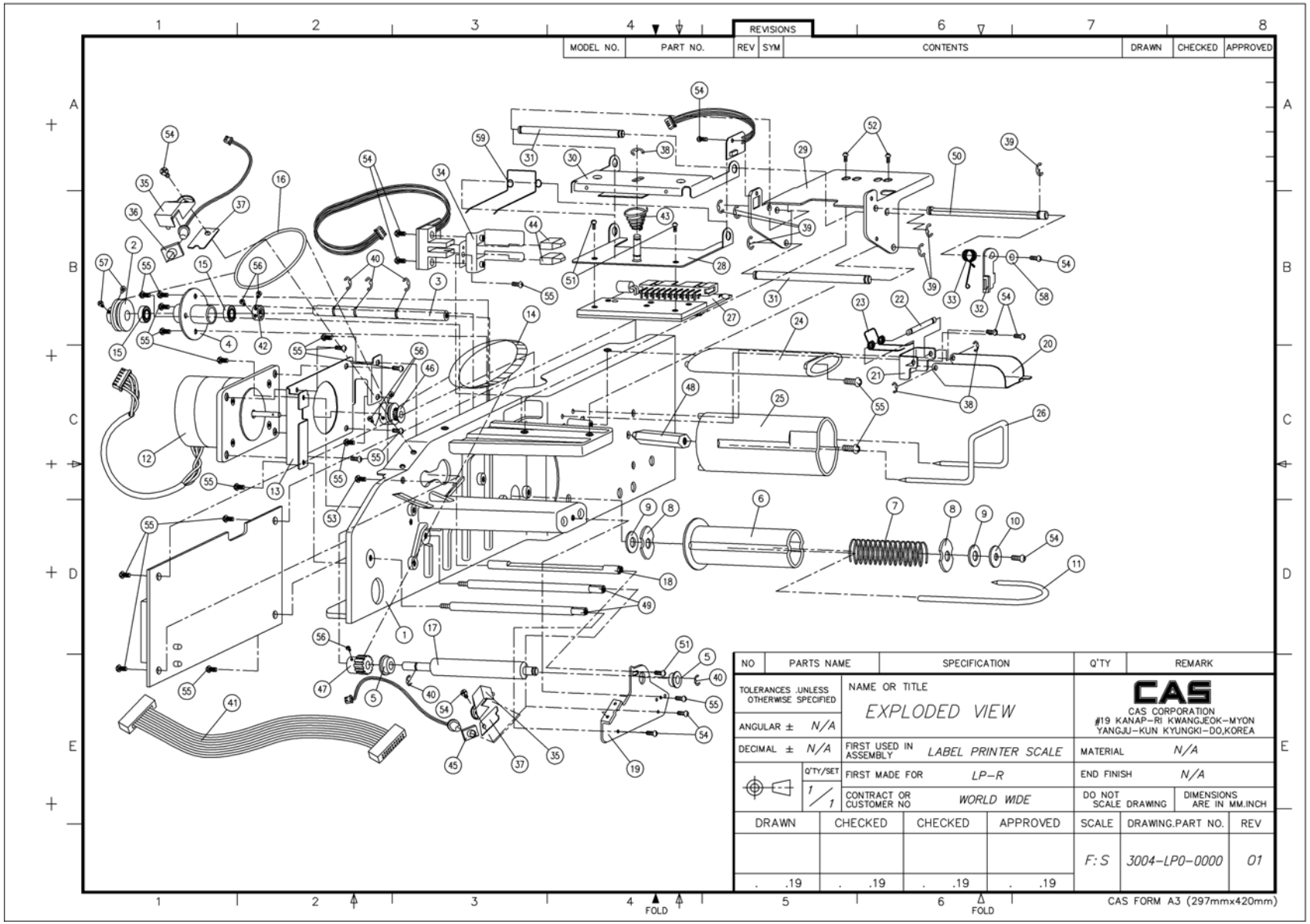
A. Upper Case (Drawing No.: 3003-LPR-0001-1)



B. Body(Drawing No.: 3002-LPR-0000-2)

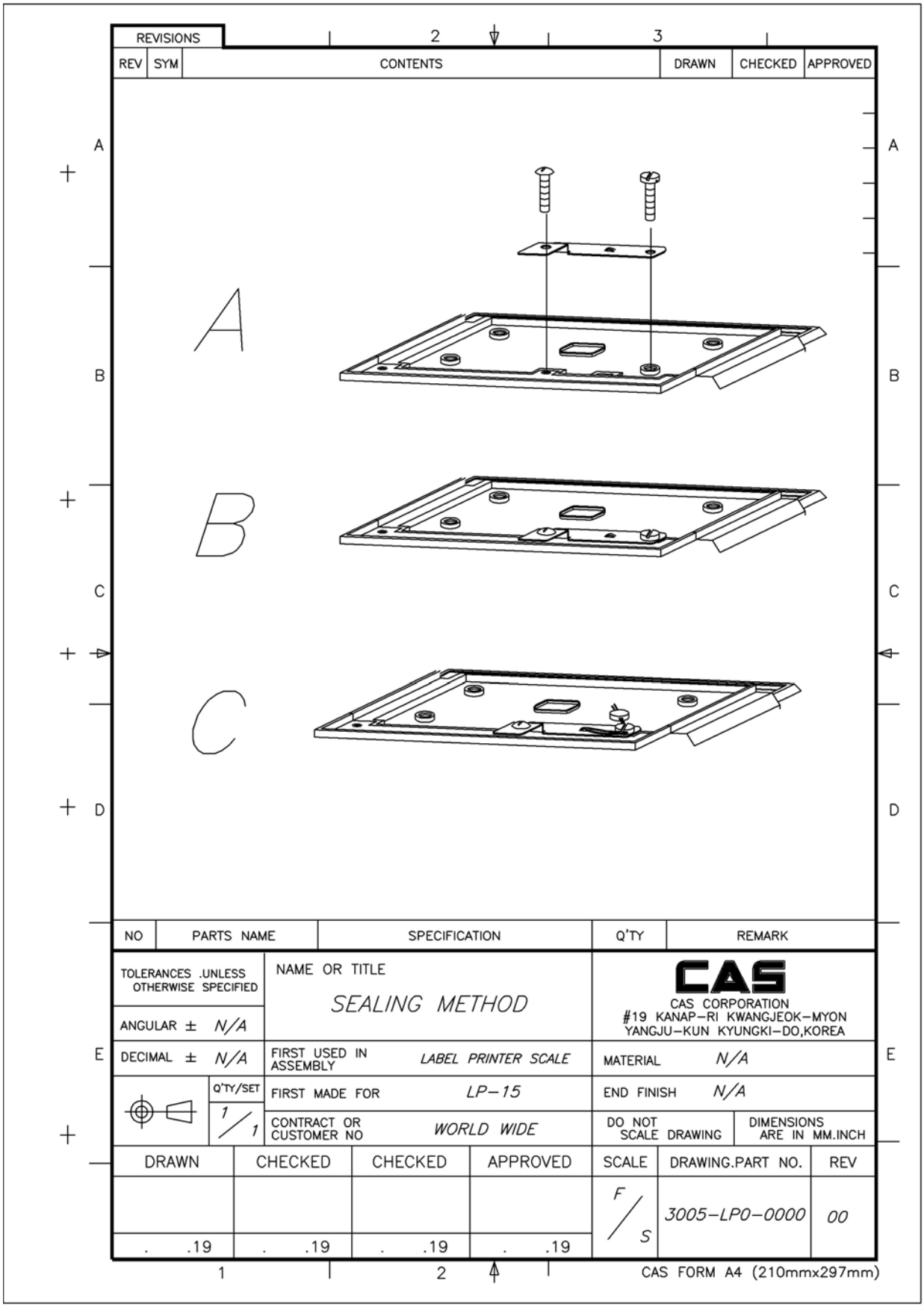


C. Printer Mechanism (Drawing No.: 3004-LPR-0000-1)

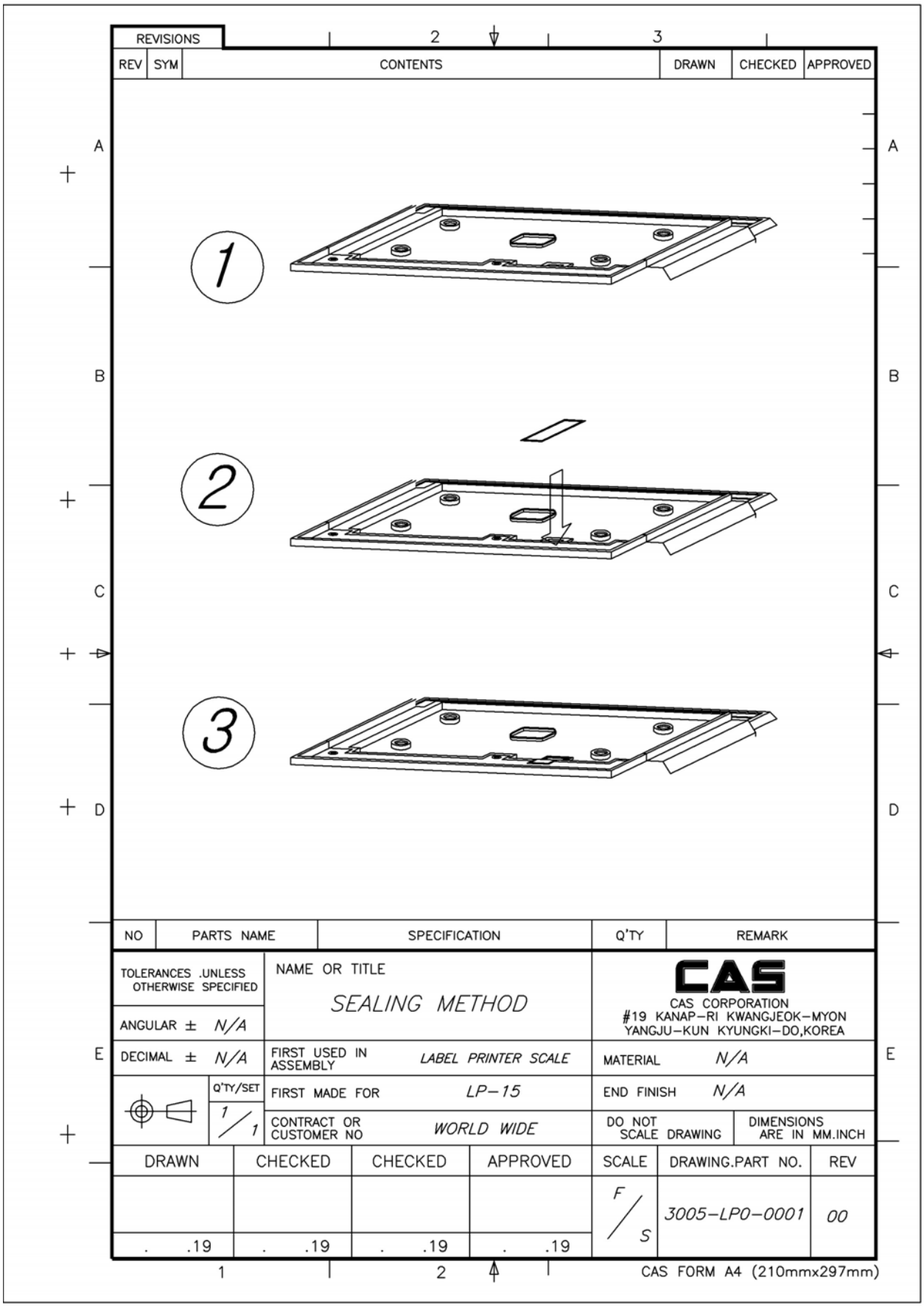


10. SEALING METHOD

A. Sealing #1 (Drawing No.: 3005-LP0-0000-0)

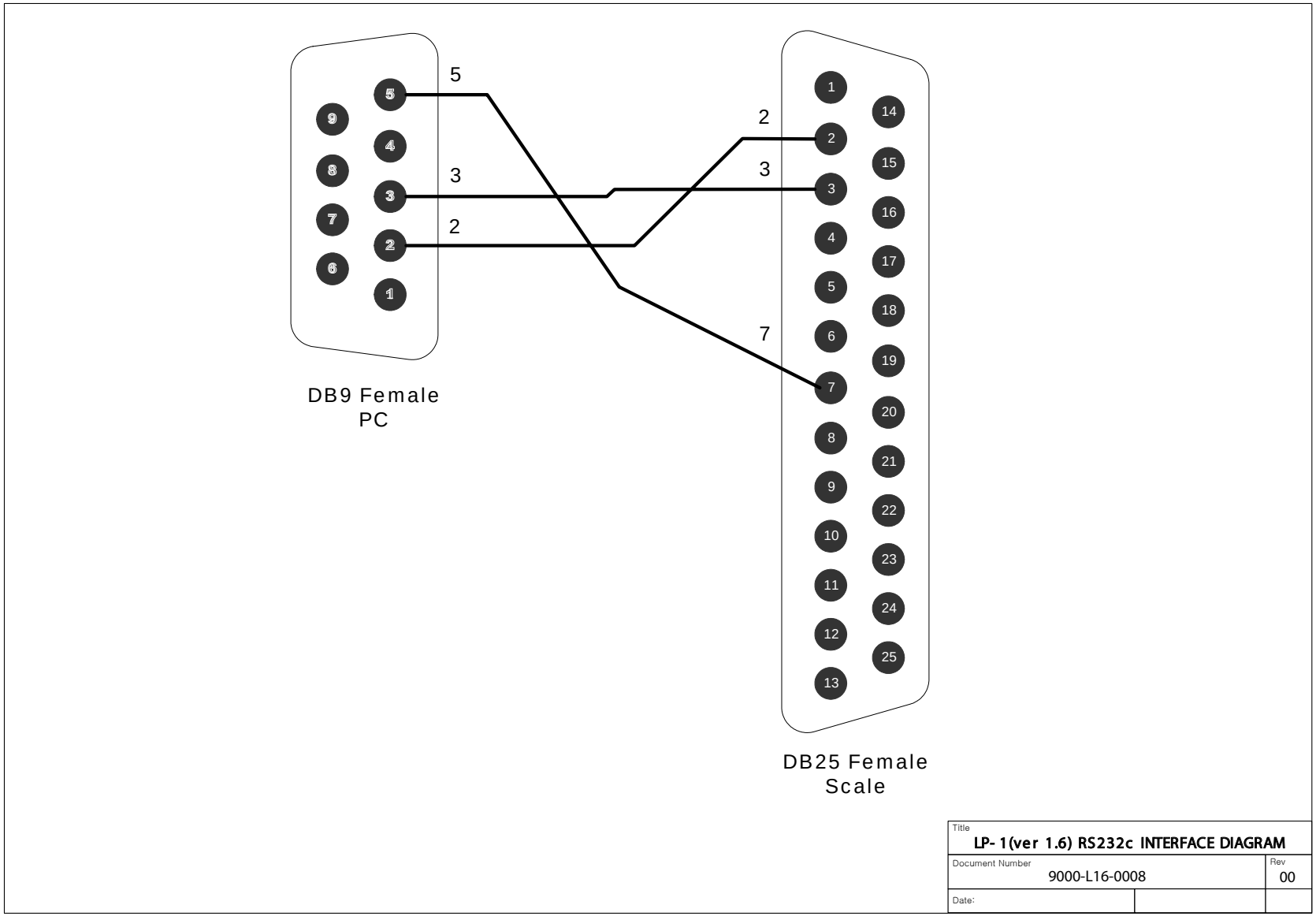


B. Sealing #2 (Drawing No.: 3005-LP0-0000-0)



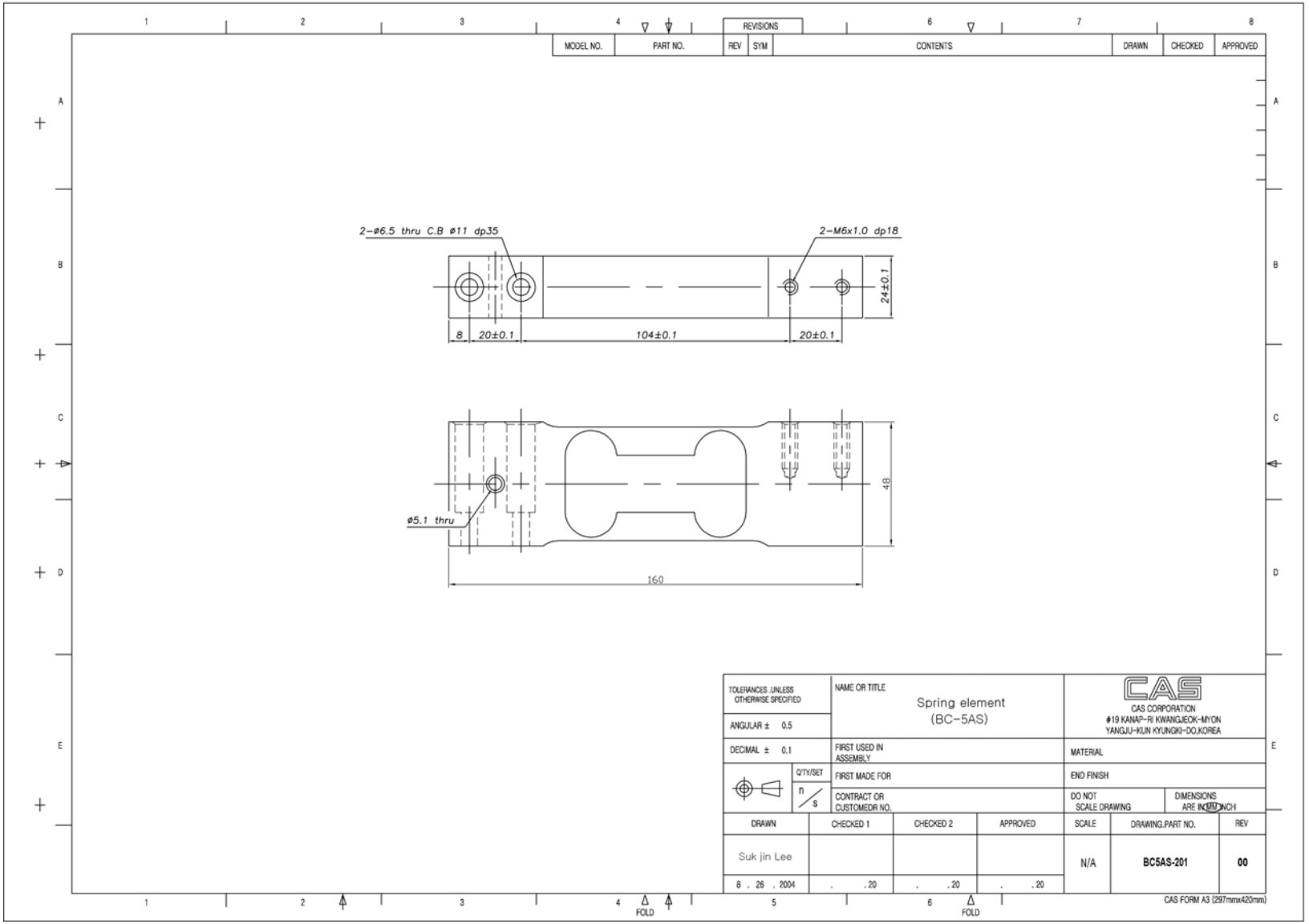
11. INTERFACE LIST

A. RS232c(Drawing No: 9000-L16-0008-0)



12. LOAD CELL DIAGRAM

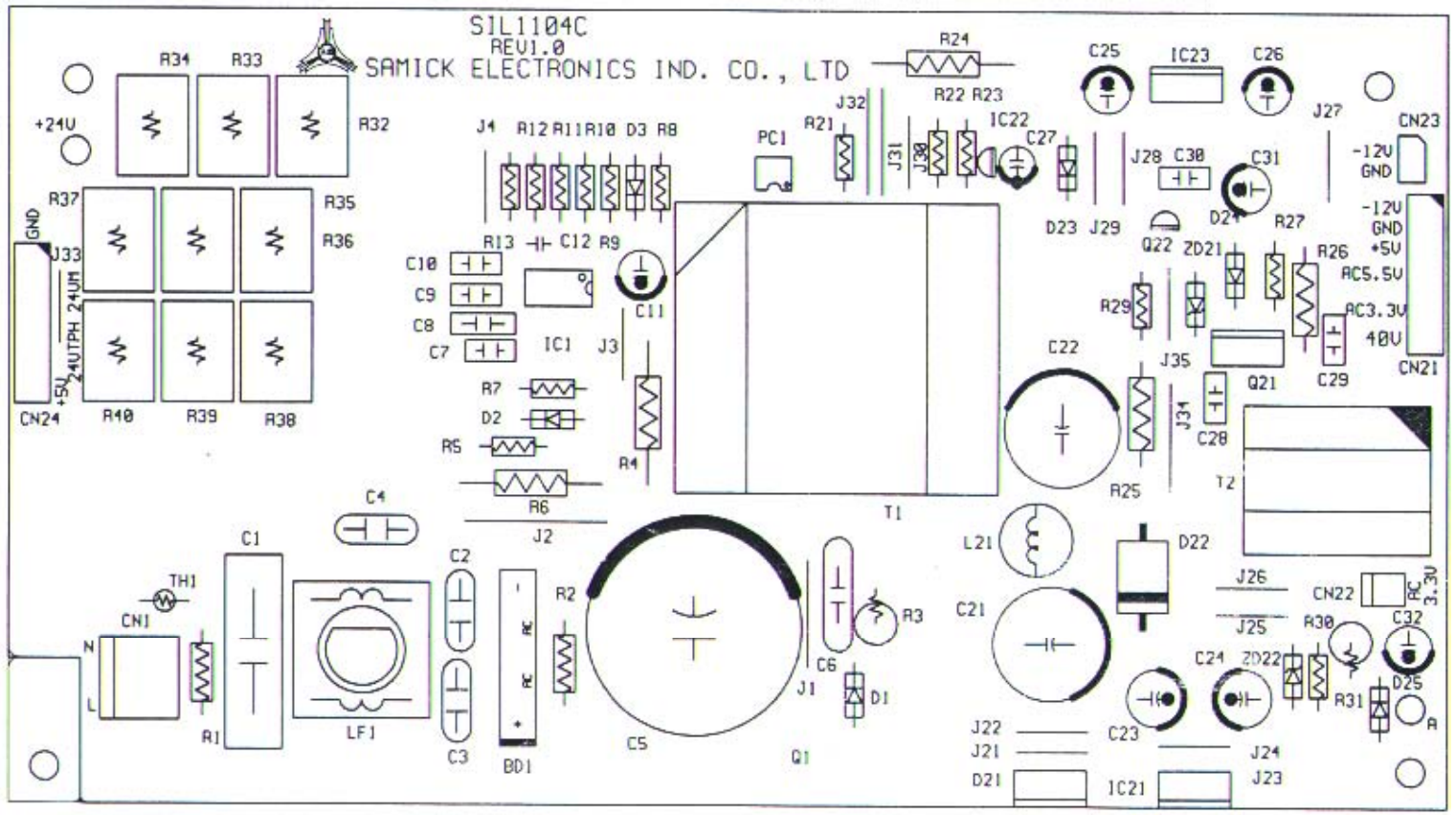
Drawing No: BC5AS-201-00



13. SMPS SPECIFICATION

A. SMPS(6190-PLP-0114-0)

i. PCB Diagram(Drawing No: 9000-L16-0009-0)



Title	SMPS PCB DIAGRAM(1104)	
Document Number	9000-L16-0009	Rev 00
Date:		

ii. Part List

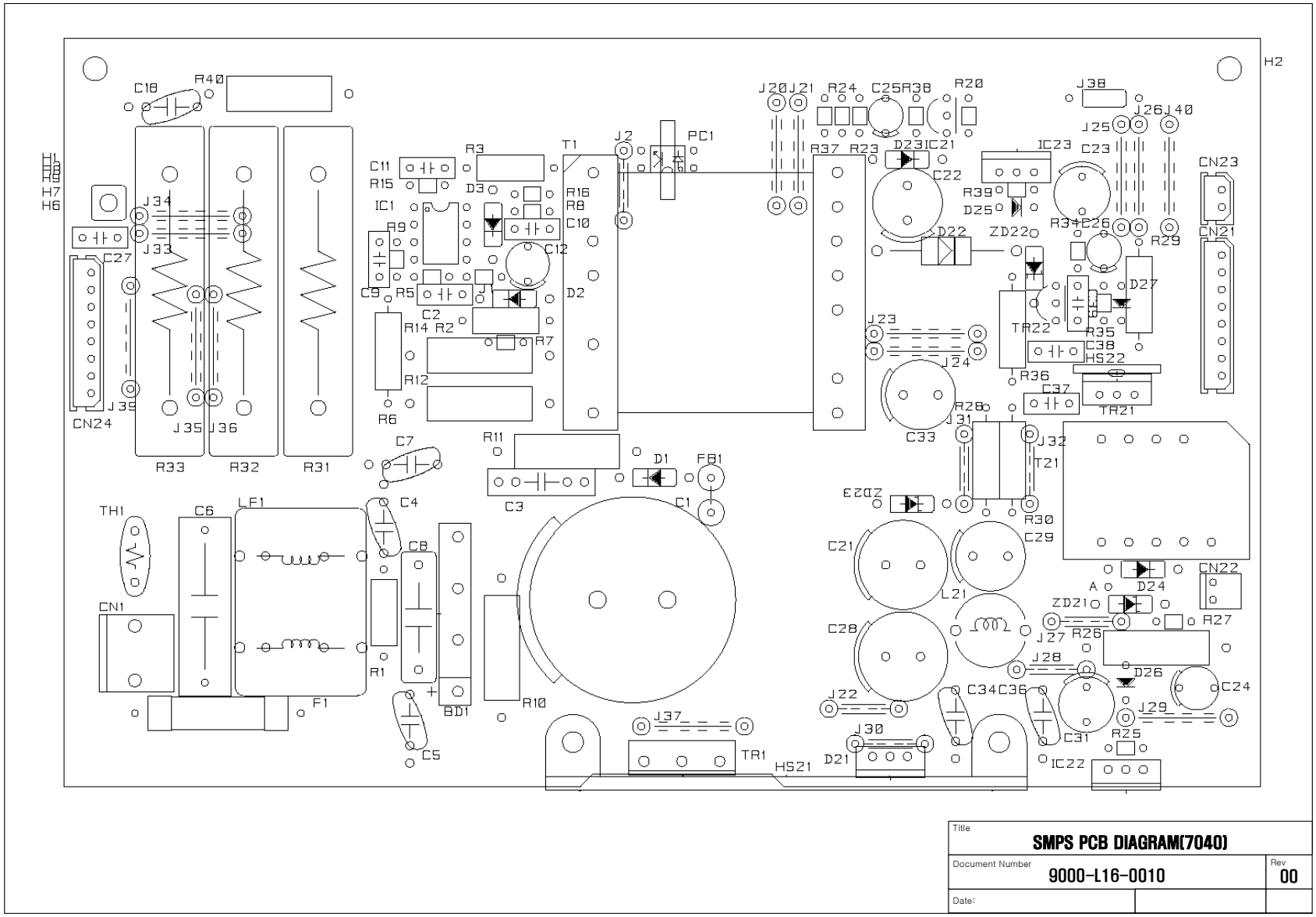
NO	PARTS NAME	SPECIFICATION	UNIT	Q'TY	REMARK
1	POWER PCB	6190-PLP-0114			
2	IC PWM	3844	EA	1	IC1
3	IC REGULATOR	7805	EA	1	IC21
4	IC REGULATOR	7912	EA	1	IC23
5	IC SHUNT	431	EA	1	IC22
6	PHOTO COUPLER	817 PC-17T1, KP1010A	EA	1	PC1
7	FET	2SK1537, STHV82, NTK9005, SSH6N80A(FQA6N80), SSH9N80A	EA	1	Q1
8	TR	TIP41C, 2SD613E	EA	1	Q21
9	TR	3203	EA	1	Q22
10	DIODE BRIDGE	D3SB(A)60, 406	EA	1	BD1
11	DIODE SCHOTTKY	RK39, 31DQ09	EA	1	D22
12	DIODE UFR	NDL020-10F, SF10LC20U, YG902C 2R, STPR1020CF	EA	1	D21
13	DIODE UFR	4007	EA	2	D1,D25
14	DIODE UFR	4004	EA	2	D3, D23
15	DIODE SWITCHING	4148	EA	2	D2,D24
16	DIODE ZENER	1N4731A 1W 4.3V	EA	1	ZD21
17	DIODE ZENER	1N4138A 1W 8.2V	EA	1	ZD22
18	CAPACITOR MP	PCX2 335M 250VAC 0.22uF, KNB1530 250VAC 0.22uF	EA	1	C1

19	CAPACITOR ELECT	400V 220uF M pi30(25)X30(35,40) (85DEGREE)	EA	1	C5
20	CAPACITOR ELECT	35V 2200uF M pi16X31.5 (85Degree)	EA	2	C21,C22
21	CAPACITOR ELECT	10V 470uF M pi8X11.5 (85Degree)	EA	2	C23,C24
22	CAPACITOR ELECT	50V 47uF M pi6.3X11 (85Degree)	EA	3	C11,C31,C32
23	CAPACITOR ELECT	25V 100uF M pi6.3X11 (85Degree)	EA	2	C25,C26
24	CAPACITOR ELECT	50V 0.33uF M pi5X11 (85Degree)	EA	1	C27
25	CAPACITOR CERAMIC	NU250VAC 222M Y2	EA	2	C2,C3
26	CAPACITOR CERAMIC	CKF103Z 1KV 0.01uF	EA	1	C6
27	CAPACITOR CERAMIC	DH222M 250VAC 0.0022uF, DE222M, AD222M, SC222M	EA	1	C4
28	CAPACITOR CERAMIC	CKB331K 50V 330pF	EA	1	C12
29	CAPACITOR MYLAR	TY104K 100V 0.1uF	EA	1	C8
30	CAPACITOR MYLAR	TY333K 100V 0.033uF	EA	2	C7,C29
31	CAPACITOR MYLAR	TY103K 100V 0.01uF	EA	1	C28
32	CAPACITOR MYLAR	TY102K 100V 0.001uF	EA	3	C9,C10,C30
33	THERMISTOR	DSC 5D-9, NTC 5D-9, TP 5D-9	EA	1	TH1
34	MAIN TRANS	3541 1102-T1	EA	1	T1
35	MAIN TRANS	2619 1102-T2	EA	1	T2

36	LINE FILTER	404060	EA	1	LF1
37	COHKE COIL	BAR 6X20 3uH	EA	1	L21
38	RESISTOR CEMENT	5W 100 Ohm J	EA	9	R32~R40
39	RESISTOR WW	2W 0.2 Ohm J	EA	1	R6
40	RESISTOR WW	1W 0.22 Ohm J	EA	1	R26
41	RESISTOR MOR	2W 47 kOhm J	EA	1	R3
42	RESISTOR MOR	2W 120 kOhm J	EA	1	R4
43	RESISTOR MOR	2W 1 kOhm J	EA	2	R24,R31
44	RESISTOR MOR	1W 20 kOhm J	EA	1	R25
45	RESISTOR CARBON	1/2W 470 kOhm J	EA	2	R1, R2
46	RESISTOR CARBON	1/4W 10 Ohm J	EA	2	R8, R29
47	RESISTOR CARBON	1/4W 10 kOhm J	EA	2	R9, R5
48	RESISTOR CARBON	1/4W 220 Ohm J	EA	1	R10
49	RESISTOR CARBON	1/4W 22 kOhm J	EA	1	R11
50	RESISTOR CARBON	1/4W 2.7 kOhm J	EA	1	R12
51	RESISTOR CARBON	1/4W 12 kOhm J	EA	1	R13
52	RESISTOR CARBON	1/4W 24 Ohm J	EA	1	R7
53	RESISTOR CARBON	1/4W 470 Ohm J	EA	1	R21
54	RESISTOR CARBON	1/4W 24 kOhm J	EA	1	R22
55	RESISTOR CARBON	1/4W 47 kOhm J	EA	1	R30
56	RESISTOR CARBON	1/4W 150 Ohm J	EA	1	R27
57	RESISTOR MF	1/4W 2.8 kOhm F	EA	1	R23

B. SMPS(6190-PLP-7040-0)

i. PCB Diagram(Drawing No: 9000-L16-0010-0)



Title	SMPS PCB DIAGRAM(7040)
Document Number	9000-L16-0010
Rev	00
Date:	

ii. Part List

NO	PARTS NAME	SPECIFICATION	UNIT	Q'TY	REMARK
1	PCB	6190PLP70400	EA	1	
2	I.C	3842	EA	1	IC1
3	I.C	431	EA	1	IC21
4	I.C	7805	EA	1	IC22
5	I.C	7812	EA	1	IC23
6	PHOTO COUPLER	621, 817	EA	1	PC1
7	TRANSISTOR	3203	EA	1	TR22
8	BRIDGE DIODE	D3SBA60, GBU4J	EA	1	BD1
9	DIODE / FRD	UF4007, UF1010	EA	1	D1
10	DIODE / FRD	UF4004, UF104	EA	3	D3, 23, 24
11	DIODE / FRD	S3L20U	EA	1	D22
12	DIODE / FRD	1N4531, 1S133	EA	3	D25, 26, 27
13	DIODE / FRD	1N4004	EA	1	
14	ZENER DIODE	1N4731	EA	1	ZD22
15	ZENER DIODE	1N4738	EA	1	ZD21
16	THERMISTOR	DSC 10D-9, NTC 10D-9	EA	1	TH1
17	RESISTOR	RQB, 10W, J 33, 5%	EA	3	R31, 32, 33
18	RESISTOR	JRW. 2N. J 0.47, 5%	EA	1	R10
19	RESISTOR	JRW. 1N. J 0.22, 5%	EA	1	R29
20	RESISTOR	CR, 1/6W, J	EA	1	R35

		150, 5%			
21	RESISTOR	CR, 1/6W, J 220, 5%	EA	1	R15
22	RESISTOR	CR, 1/6W, J 470, 5%	EA	1	R24,R31
23	RESISTOR	CR, 1/6W, J 1K, 5%	EA	2	R37, 38
24	RESISTOR	CR, 1/6W, J 4.7K, 5%	EA	1	R25
25	RESISTOR	CR, 1/6W, J 7.5K, 5%	EA	1	R8, R29
26	RESISTOR	CR, 1/6W, J 10K, 5%	EA	2	R7, 39
27	RESISTOR	CR, 1/6W, J 47K, 5%	EA	1	R27
28	RESISTOR	MR, 1/6W, F 360, 1%	EA	2	R9, R16
29	RESISTOR	MR, 1/6W, F 750, 1%	EA	1	R5
30	RESISTOR	MR, 1/6W, F 2.4K, 1%	EA	2	R20
31	RESISTOR	MR, 1/4W, J 360, 5%	EA	2	R22
32	RESISTOR	MR, 1/4W, F 24K, 1%	EA	2	R23

33	RESISTOR	CR, 0.5W, J 10, 5%	EA	1	R3
34	RESISTOR	CR, 0.5W, J 33, 5%	EA	1	R2
35	RESISTOR	CR, 0.5W, J 33K, 5%	EA	1	R28
36	RESISTOR	CR, 0.5W, J 1M, 5%	EA	1	R1
37	RESISTOR	MOR, 1W, J 10, 5%	EA	1	R36
38	RESISTOR	MOR, 1W, J 120K, 5%	EA	1	R6
39	RESISTOR	MOR, 2W, J 1K, 5%	EA	1	R40
40	RESISTOR	MOR, 2W, J 2.7K, 5%	EA	1	R26
41	RESISTOR	MOR, 2W, J 51K, 5%	EA	2	R12, 14
42	RESISTOR	MOR, 2W, J 68K, 5%	EA	1	R11
43	ELEC/CAP	KMG 50V 47uF, KME1H470MTD04R 50V/47uF 6.3 X 11	EA	3	C12, 23, 26
44	ELEC/CAP	KMG 63V 47uF, KME 63V 47uF 63V/47uF 6.3 X 11	EA	1	C24
45	ELEC/CAP	KMG 25V 100uF, KME1A101MTD04R 25V/100uF 6.3 X 11	EA	1	C22

46	ELEC/CAP	KMG 10V 470uF, KME1A471MTD04R 10V/470uF 10 X 16, 10V/470uF 8 X 11	EA	1	C31
47	ELEC/CAP	KXL 35V 470uF, SXE1V471MTD04R 35V/470uF 10 X 20	EA	1	C29
48	ELEC/CAP	KXL 16V 1000uF, SXE1C102MTD04R 16V/1000uF 10 X 20	EA	1	C33
49	ELEC/CAP	KXL 35V 1000uF, SXE1V102MTD04R 35V/1000uF 12.5 X 25, 35V/1000uF 12 X 30	EA	1	C21, 28
50	ELEC/CAP	SMH2GVN221M30A, HC450V 220uF 450V/220uF 30 X 40	EA	1	C1
51	CERAMIC/CAP	TS250V 222, SC250V 222, DS250V 222, SE250V 222, 250VAC/2200pF	EA	3	C4, 5, 7
52	CERAMIC/CAP	TS250V 103, DS250V 103, SE250V 103 250VAC/0.01uF	EA	3	C36
53	FILM/CAP	TY2A473KAN 100V/0.047uF, K	EA	1	C11
54	FILM/CAP	TY2A333KAN 100V/0.033uF, K	EA	1	C38
55	FILM/CAP	TY2A223JAN 100V/0.022uF, J	EA	2	C2
56	FILM/CAP	TY2A153KAN 100V/0.015uF, K	EA	3	C37
57	FILM/CAP	TY2A102KAN 100V/0.001uF, K	EA	2	C9, 39
58	FILM/CAP	TM2J103KAM 630V/0.01uF	EA	1	C3

59	FILM/CAP	ECQV1H104JL, PCMT36575104 0.1uF/50V, 0.1uF/63V	EA	2	C10, 27
60	FILM/CAP	ECQV1H224JL, PCMT36575224 0.22uF/50V, 0.22uF/63V	EA	1	C25
61	FILM/CAP	KNB1530-104M, PCX2335M1104 275VAC/0.1uF	EA	1	C8
62	FILM/CAP	KNB1530-224M, PCX2 335 M1224 275VAC/0.22uF	EA	1	C6
63	TRANSFORMER	CAST-70A EER35-41	EA	1	T1
64	TRANSFORMER	CAST-7040 EER26-19	EA	1	T21
65	CHOKE FILTER	12R5-1A	EA	1	L22
66	LINE FILTER	1980	EA	1	LF1
67	FERRITE BEAD	3550	EA	1	FB1
68	FUSE	S52 250V 5A, 218 005 XE, 52S 250V 5A 250V/T5A	EA	1	F1
69	FET	2SK2850, FS5SM-18A, 2SK2610 900V/5A	EA	1	Q1
70	DIODE/FRD	SF10LC20U, D10LC20U 200V/10A	EA	1	D21
71	TRANSISTOR	TIP41C 100V/6A	EA	1	TR21