

SS0911-1

**CLOCK ALARM CALENDAR
WITH THERMO-HYGROMETER****FEATURES**

- 1.5V battery operation with very low power consumption
- Real Time Clock with Alarm
- Day and Month display calendar
- Temperature reading and Humidity reading display
- C/F display format selectable
- Temperature - Measurement range ($-50^{\circ}\text{C} \sim 70^{\circ}\text{C}$, $-58^{\circ}\text{F} \sim 158^{\circ}\text{F}$)
 - Accuracy $\pm 1^{\circ}\text{C}$ ($0^{\circ}\text{C} - 50^{\circ}\text{C}$), $\pm 2^{\circ}\text{C}$ (otherwise)
 - 0.1°C resolution over the measuring range
- Humidity
 - Measurement range (20% - 90% R.H.)
 - Accuracy $\pm 5\%$ ($10^{\circ}\text{C} - 30^{\circ}\text{C}$), $\pm 7\%$ (otherwise)
 - 1% resolution over the measuring range
- Built in 32.768kHz crystal oscillation circuit
- De-bounce circuit on switch inputs
- Protection against static discharge

DESCRIPTIONS

The SS0911 is specially designed IC for the desktop calendar thermo-hygrometer application. It provides a real time clock alarm and monthly calendar which allows the good planning of life. The thermo-hygrometer allows the user to measure the temperature and relative humidity. Its measuring range is $-50^{\circ}\text{C} \sim 70^{\circ}\text{C}$ and 20% ~ 90% covering most of indoor and outdoor conditions.

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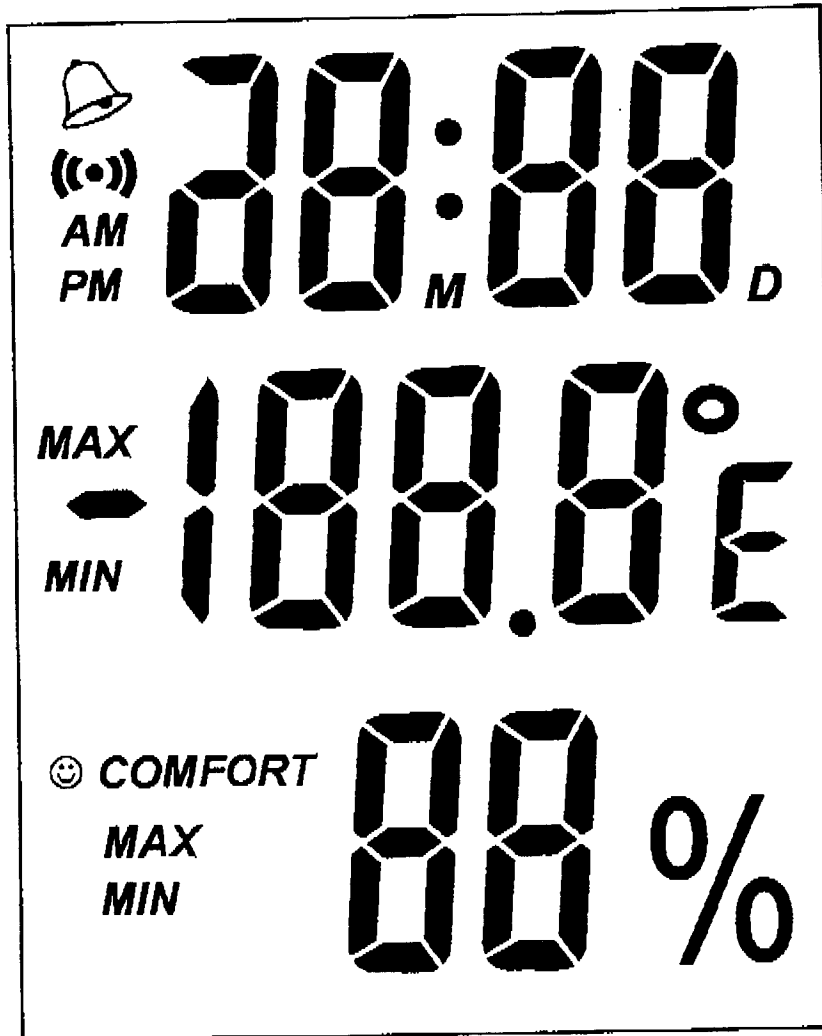
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LCD LAYOUT



LCD CHARACTERISTICS REQUIREMENT

Parameters	Symbol	Min	Typ.	Max	Unit
Operating Voltage	Vop		3.0		V
Duty			1/4		
Bias			1/2		

KEY OPERATIONS



Keys	Descriptions
MODE	Select CLOCK/ALARM/DATE display on the top digits
°C↔°F /SET	Toggle the temperature display between °C and °F or Hold for 1-2 seconds will enter into corresponding setting mode
MAX-MIN/MEMCLR	Select NORMAL/MAX/MIN temperature and relative humidity displays or Hold for 2 seconds will Clear the temperature and relative humidity memory
BK LIGHT	Turn on the back light

DISPLAY MODES

The LCD screen can be classified into 3 parts : The TOP set digits, the MIDDLE set digits and the BOTTOM set digits

- The TOP set digits

The TOP set digits is used to display the Clock / Date / Alarm. MODE key is used to select these modes

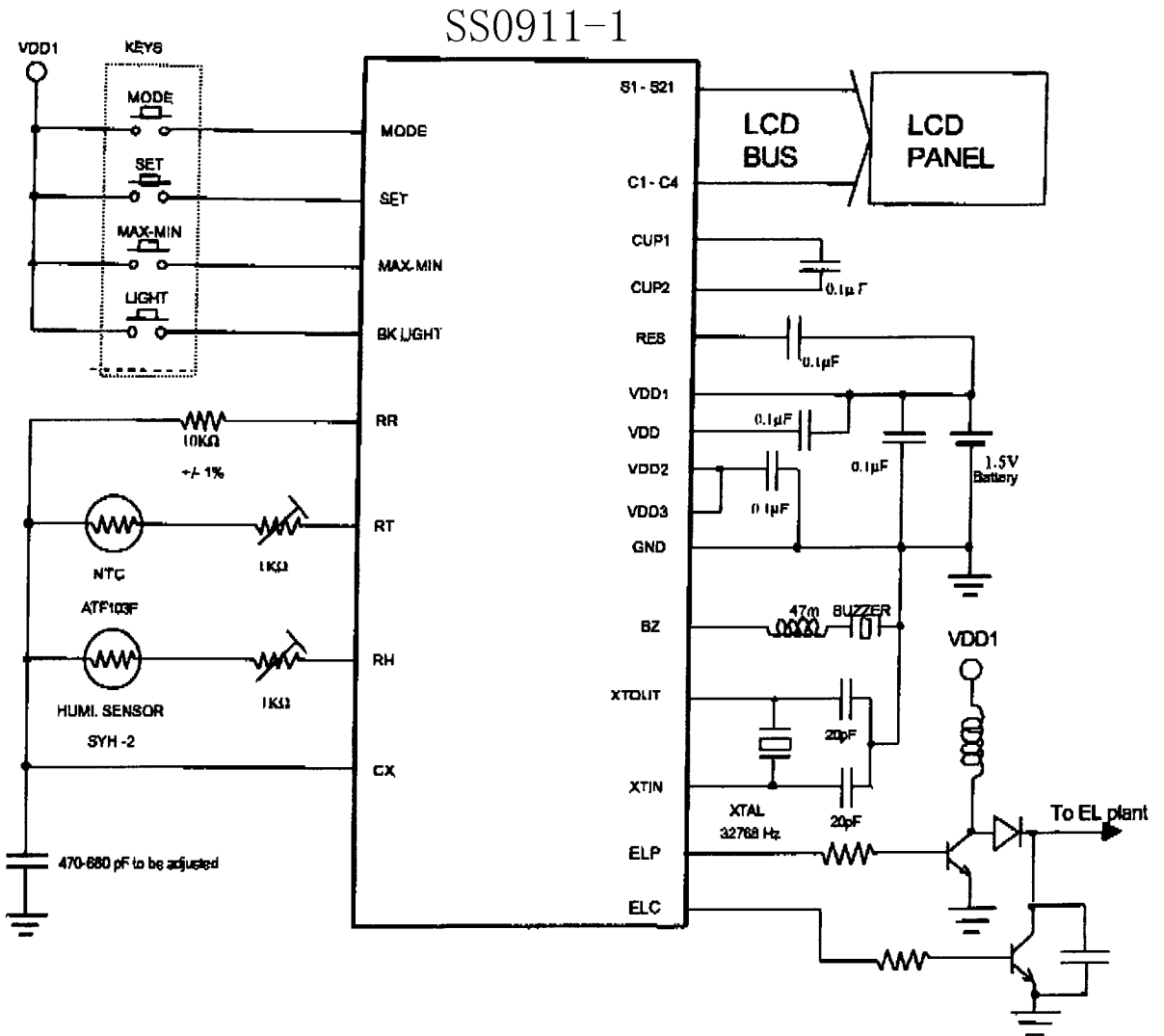
Modes	Descriptions
CLOCK	Real Time Clock; Display in 12/24 hrs format
DATE	Date, Day and Month will be shown with <i>M</i> and <i>D</i> icons indication
ALARM	Alarm Time Display in 12/24 hrs format as same as in CLOCK mode. symbol  indicate the ALARM mode and the  indicate the alarm in ON status.

- The MIDDLE and BOTTOM set digits

The MIDDLE and BOTTOM set digits is used to display CURRENT / MAX / MIN temperature and relative humidity readings. MAX-MIN key is used to select among these modes.

Modes	Descriptions
CURRENT	Show the current temperature and relative humidity readings.
MAX	Show the Maximum temperature and relative humidity readings recorded from last MEMCLR action. <i>MAX</i> icon will be displayed for indication.
MIN	Show the Minimum temperature and relative humidity readings recorded from last MEMCLR action. <i>MIN</i> icon will be displayed for indication.

APPLICATION CIRCUIT



ABSOLUTE RATINGS

Parameters	Symbol	Min	Max	Unit
Maximum Supply Voltage	V _{DD}	-0.3	+5.5	V
Maximum Input Voltage	V _{in}	-0.3	VDD+0.3	V
Maximum Output Voltage	V _{out}	-0.3	VDD+0.3	V
Maximum Operating Temperature	T _{opg}	0	70	°C
Maximum Storage Temperature	T _{stg}	-25	125	°C

ELECTRICAL CHARACTERISTICS

at Ta = 25°C, VDD = 3V

Parameters	Symbol	Min	Typ.	Max	Unit
Operating Voltage	VDD	1.2	1.5	1.8	V
Operating Current	I _d				μA
Standby Current	I _{st}				μA
LCD Supply Voltage	V _{lcd}		3		V
LCD Frame Frequency	F _{lcd}		32		Hz
Operating Frequency	F _{opg}		32.768		KHz

THERMISTER CHARACTERISTICS REQUIREMENTS

Parameters	Symbol	Min	Typ.	Max	Unit
Resistance at Ta= 25°C	R ₂₅		10		KΩ
B Constant	B		3,435		
R ₂₅ Tolerance	%err R		1	5	%
B Constant Tolerance	%err B		1	2	%
Operating Temperature Range	T _{ther}	-50		70	°C

HUMIDITY SENSOR CHARACTERISTICS REQUIREMENTS

Parameters	Symbol	Min	Typ.	Max	Unit
Resistance at R.H.=60%, Ta=25°C	R _{60%}		33		kΩ
Accuracy	%err R	-5		+5	%
Operating temperature range		0		50	°C
Operating relative humidity range		30		90	%

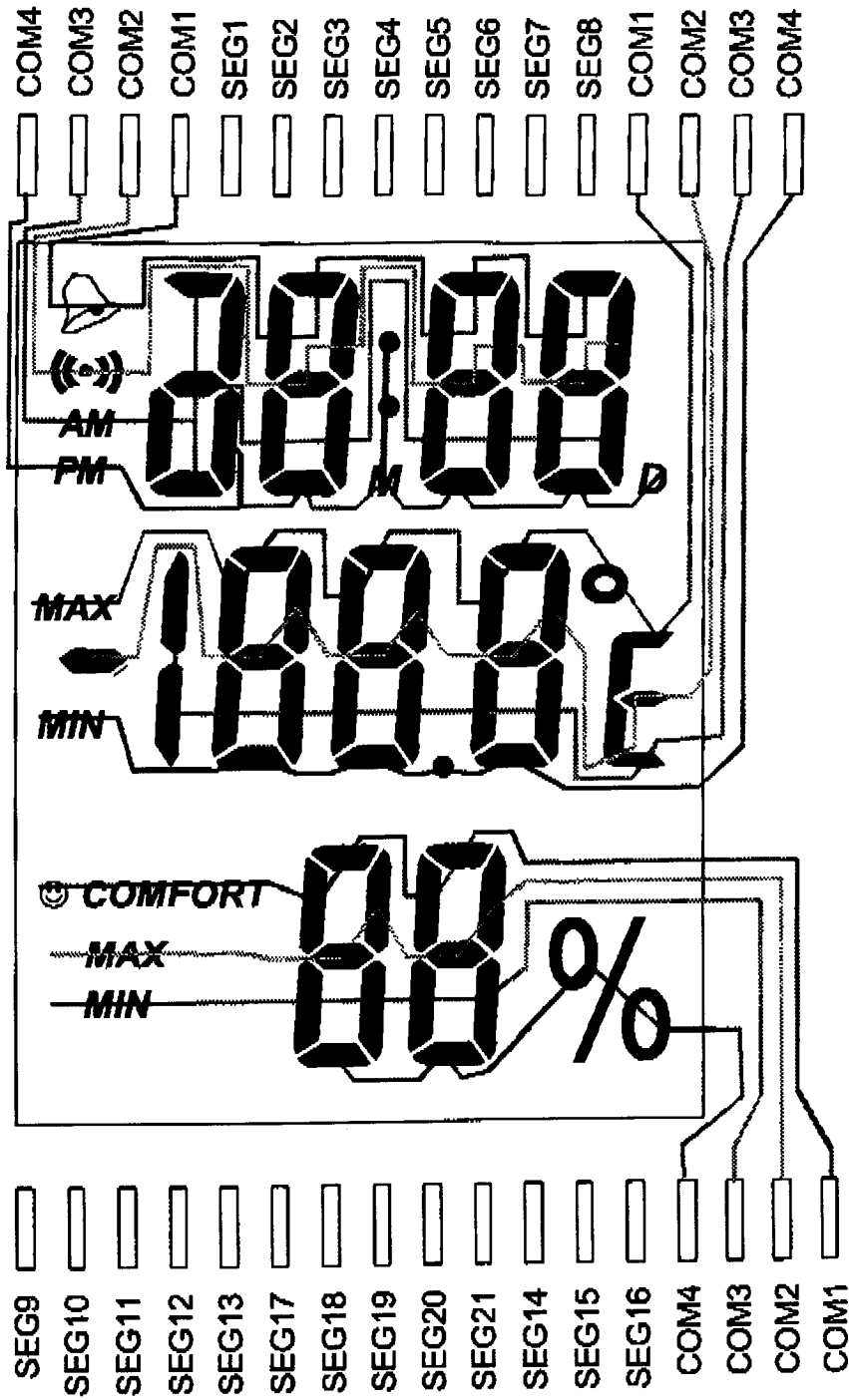
THERMOMETER CHARACTERISTICS

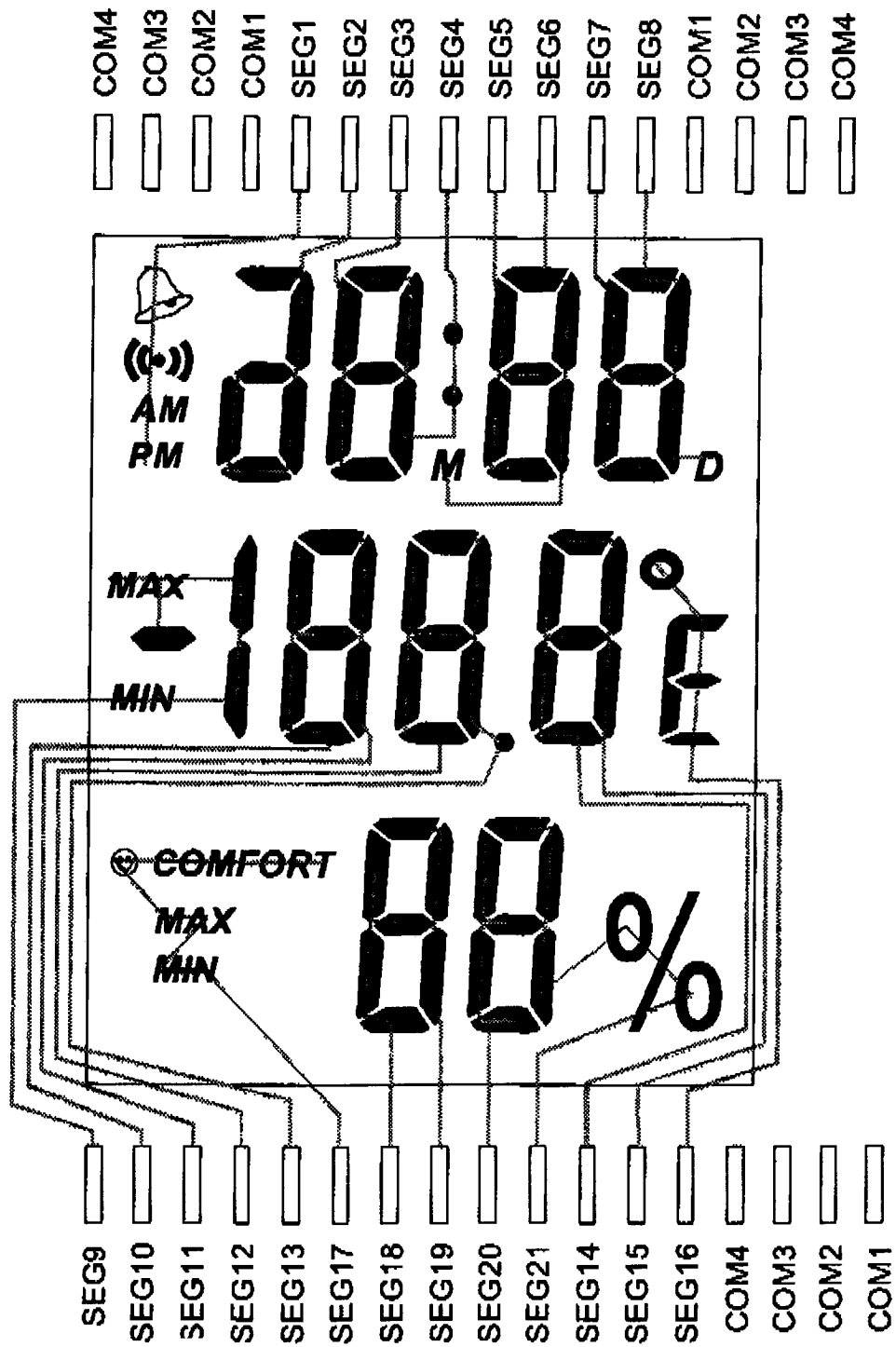
Parameters	Symbol	Condition	Min	Typ.	Max	Unit
Measurement Range	T _{in}	Ta = 25°C	-30		70	°C
Resolution	T _{dd}			0.1		°C
Accuracy	%err	0°C - 50°C	-1		+1	°C
		-30°C - 0 °C, 50-70°C	-2		+2	°C
Sample Frequency	F _s			10		secs

HYGROMETER CHARACTERISTICS

Parameters	Symbol	Condition	Min	Typ.	Max	Unit
Measurement Range	RH _{in}		20		90	%
Resolution	RH _{dd}			1		%
Accuracy	%err	10°C - 30°C	-1		+1	%
		Otherwise	-2		+2	%
Sample Frequency	F _s			10		secs

LCD Wiring

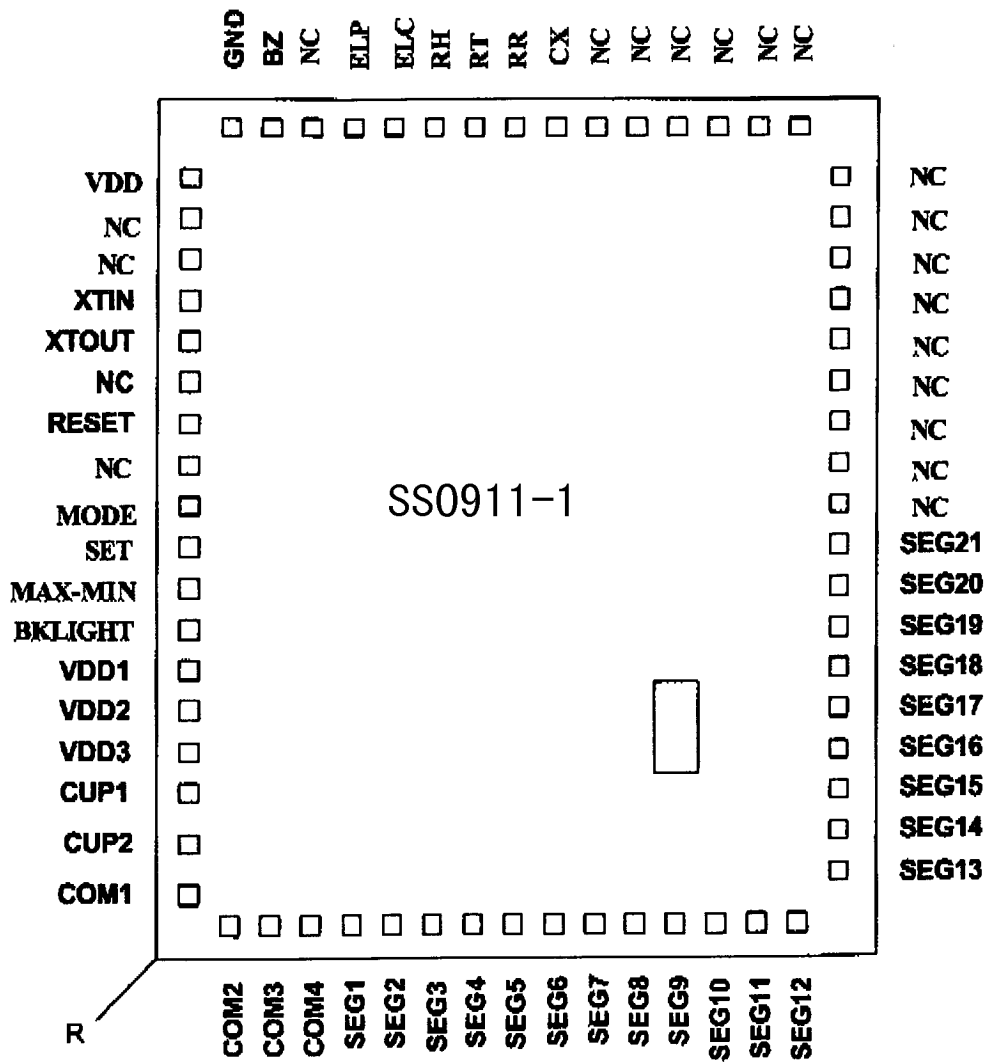




CHIP INFORMATION

Chip size: 2040 x 2335 (μm^2) or 84.65 x 96.45 (mil²)
 Pad size: 90 x 90 (μm^2)
 Pad pitch min.: 115 μm

PIN/PAD DIAGRAM



PIN/PAD ASSIGNMENT

Unit: μm

Pad No.	Pad Name	Coordinate		Pad No.	Pad Name	Coordinate	
		X	Y			X	Y
1	VDD	70.0	2175.0	34	SEG13	1970.0	160.0
2	NC	70.0	2045.0	35	SEG14	1970.0	290.0
3	NC	70.0	1915.0	36	SEG15	1970.0	420.0
4	XTIN	70.0	1800.0	37	SEG16	1970.0	535.0
5	XTOUT	70.0	1685.0	38	SEG17	1970.0	650.0
6	NC	70.0	1570.0	39	SEG18	1970.0	765.0
7	RESET	70.0	1455.0	40	SEG19	1970.0	880.0
8	NC	70.0	1340.0	41	SEG20	1970.0	995.0
9	MODE	70.0	1225.0	42	SEG21	1970.0	1110.0
10	SET	70.0	1110.0	43	NC	1970.0	1225.0
11	MAX-MIN	70.0	985.0	44	NC	1970.0	1340.0
12	BKLIGHT	70.0	880.0	45	NC	1970.0	1455.0
13	VDD1	70.0	765.0	46	NC	1970.0	1570.0
14	VDD2	70.0	650.0	47	NC	1970.0	1685.0
15	VDD3	70.0	535.0	48	NC	1970.0	1800.0
16	CUP1	70.0	420.0	49	NC	1970.0	1915.0
17	CUP2	70.0	290.0	50	NC	1970.0	2045.0
18	COM1	70.0	160.0	51	NC	1970.0	2175.0
19	COM2	200.0	70.0	52	NC	1840.0	2265.0
20	COM3	330.0	70.0	53	NC	1710.0	2265.0
21	COM4	445.0	70.0	54	NC	1595.0	2265.0
22	SEG1	560.0	70.0	55	NC	1480.0	2265.0
23	SEG2	675.0	70.0	56	NC	1365.0	2265.0
24	SEG3	790.0	70.0	57	NC	1250.0	2265.0
25	SEG4	905.0	70.0	58	CX	1135.0	2265.0
26	SEG5	1020.0	70.0	59	RR	1020.0	2265.0
27	SEG6	1135.0	70.0	60	RT	905.0	2265.0
28	SEG7	1250.0	70.0	61	RH	790.0	2265.0
29	SEG8	1365.0	70.0	62	ELC	675.0	2265.0
30	SEG9	1480.0	70.0	63	ELP	560.0	2265.0
31	SEG10	1595.0	70.0	64	NC	445.0	2265.0
32	SEG11	1710.0	70.0	65	BZ	330.0	2265.0
33	SEG12	1840.0	70.0	66	GND	200.0	2265.0

N.B: The Substrate must be connected to GND