

SS0404

THERMOMETER SPECIFICATION

<1> Power SW: Push switch can turn on or turn off the thermometer.

<2> At Power On:

- A. LCD display 188.88°M (or 188.88°M) 2 sec at first.
- B. Following A: If push switch more than 2 sec, LCD will display the stable-temperature of last measured until release switch and memory mark "M" also display.
- C. Following B: Display 36.50°C (or 97.70°F) 1 sec, if sensor circuit is detected abnormal status, LCD will only display "Err".
- D. When measuring, the mark $^{\circ}\text{C}$ (or $^{\circ}\text{F}$) flash by 1Hz until temperature is stabilization.
- E. After push switch or memory display finish, there are 8 sec to be ignore for counter of stable-temperature time.
- F. If measuring temperature $< 32.00^{\circ}\text{C}$ (89.60°F), LCD display $\text{Lo } ^{\circ}\text{C}$ ($^{\circ}\text{F}$).
- G. If measuring temperature $\geq 43.00^{\circ}\text{C}$ (109.40°F), LCD display $\text{Hi } ^{\circ}\text{C}$ ($^{\circ}\text{F}$).
- H. When measuring, the LCD will always display the highest temperature.
- I. If the measuring temperature is no changed more than 16 sec (or 8 sec), it means stable-temperature is over and $^{\circ}\text{C}$ ($^{\circ}\text{F}$) mark flash stop. The time 16 sec or 8 sec is selected by Pad option (Default time is 16 sec).
- J. Two stable-temperature time 16 sec (or 8 sec) and 4 sec (or 8 sec) are selected by Metal option.
- K. When measuring over and fever alarm enable, if temperature $\geq 37.50^{\circ}\text{C}$ (99.50°F), Then Buzzer alarm "Bi-Bi-Bi--- Bi-Bi-Bi---" about 4 sec as below:
Bi-----Bi-----Bi-----
0.0625S/0.0625S/0.0625S/0.0625S/0.0625S/0.1875S (period cycle=0.5S)
If temperature $< 37.50^{\circ}\text{C}$ (99.50°F), or fever alarm disable, then Buzzer alarm "Bi-" about 4 sec as below:
Bi—
0.5S/ 0.5S
- L. Fever alarm is selected by Pad option (Default: fever alarm enable)
- M. It will auto power off when measurement is over than 10 minutes.

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N. when measurement is over within 10 minutes, if temperature rises again the °C (°F) mark no blink and remeasure the temperature.but the buzzer will not alarm again when measurement is over and 10 minutes is recount.

- <3> After(2-B), If detect Low-voltage ($1.35 \pm 0.05V$), LCD only display battery mark " ", means thermometer must be changed battery.
- <4> When sensor circuit is open or short, LCD only display "Err" until sensor circuit recorver normal.
- <5> When push switch, the Buzzer will alarm "Bi" about 0.078 sec.
- <6> The Stand-By current $\leq 0.5 \mu A$ at power off status.
- <7> The frequency of Buzzer is 5.3KHz.
- <8> When LCD display "Lo",if temperature rise and stable-temperature time will count again with following item (I) description.
- <9> Test2 Pin connect to Vss, LCD display is real-time temperature, not the highest temperature in order to adjust Reference Resistor.
- <10> °C or °F be selected by Pad option (Default is °C) °
- <11> LCD display which is one number after point or two numbers after point is selected by Pad option (Default is two numbers after point LCD display).
- <12> Thermometer others character is below:

Temperature range	32.00°C ~ 43.00°C	89.60°F ~ 109.40°F
Accuracy	± 0.1 °C	± 0.2 °F
Resolution	0.01 °C	0.01 °F

- <13> Pad option table

Pad name	Default	Connect to Vss
TEST2	Highest Temperature	Real Temperature
SLCD	Two numbers after point	one number after point
SFC	°C	°F
ALARM	Fever alarm	No Fever alarm
M16T	16 sec (or 4 sec)	8 sec

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Pad Description

Pad Name	Description

1	VSS Power Pad.
2	SC Reference and sensor frequency input Pad. the reference and sensor frequency generator consists of Pad 2,3,4,5.
3	SC1 Inner resistor about 470 ohm connect to SC Pad.
4	RF PMOS open drain, connect to the reference resistor.
5	RS PMOS open drain, connect to the sensor resistor.
6	BZ1 Output Pad, the buffer of buzzer.
7	BZ2 Output Pad, the buffer of buzzer.
8	COM1 Output Pad, connect to LCD pin 1.
9	COM2 Output Pad, connect to LCD pin 2.
10	COM3 Output Pad, connect to LCD pin 3.
11	S1 Output Pad, connect to LCD pin 4.
12	S2 Output Pad, connect to LCD pin 5.
13	S3 Output Pad, connect to LCD pin 6.
14	S4 Output Pad, connect to LCD pin 7.
15	S5 Output Pad, connect to LCD pin 8.
16	S6 Output Pad, connect to LCD pin 9.
17	S7 Output Pad, connect to LCD pin 10.
18	S8 Output Pad, connect to LCD pin 11.
19	S9 Output Pad, connect to LCD pin 12.
20	S10 Output Pad, connect to LCD pin 13.
21	S11 Output Pad, connect to LCD pin 14.
22	S12 Output Pad, connect to LCD pin 15.
23	S13 Output Pad, connect to LCD pin 16.
24	C512 The Pad 24,25 is doubler voltage 3V capacitor connect.
25	CAP
26	Vdd Power Pad.
27	Vee Voltage 3v.
28	PSW Pull high input Pad. push switch to power on/off.

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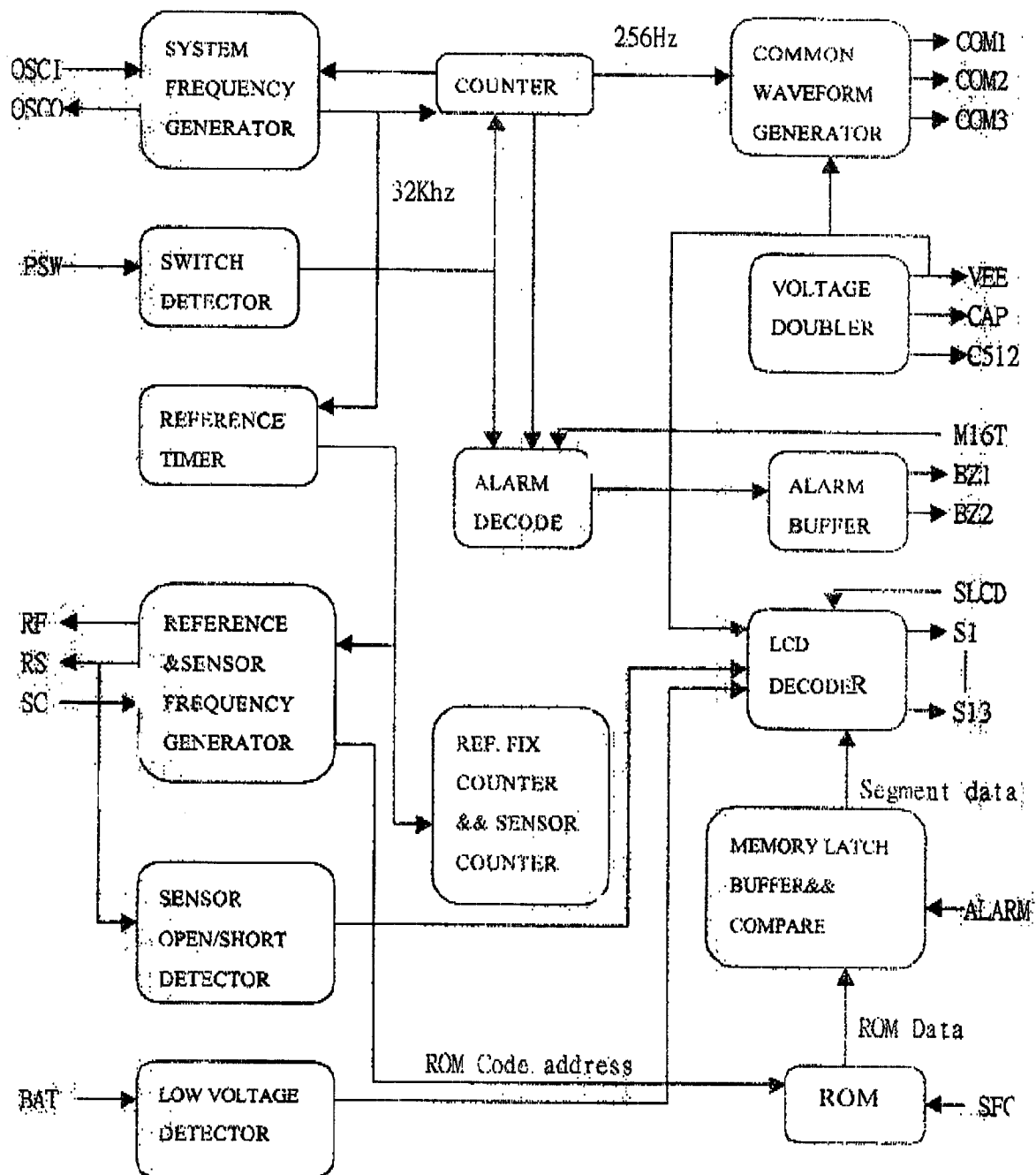
- 29 OSC0 System frequency output Pad.
- 30 OSC1 System frequency input Pad.
- 31 TEST1 Test Pad ,for IC test only, normal connect to Vss.
- 32 BAT For the low voltage detecting.
- 33 TEST2 Pull high test Pad. when this pin connect to Vdd on production, the LCD is always display realtime value (not the highest value)
- 34 SLCD Select LCD display Pad.
 Pad no connect → show 188.88
 Pad connect Vss → show 188.8
- 35 SF Select the temperature is show °C or °F.
 Pad no connect → show °C
 Pad connect Vss → show °F
- 36 ARM Select fever alarm
 Pad no connect → fever alarm
 Pad connect Vss → no fever alarm
- 37 M16T Select holding time
 Pad no connect → holding time 16 sec
 Pad connect Vss → holding time 8 sec

Operating Parameter:(Vdd=1.5V)

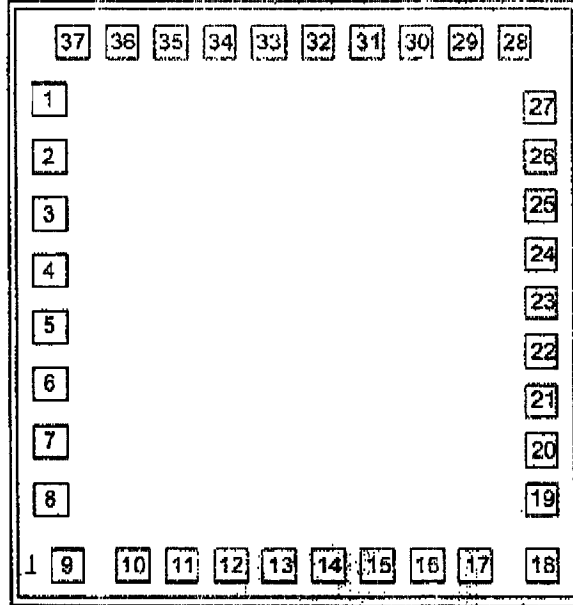
Description	Max.	Typical	Min.
1 Operating Voltage:	1.6V	1.5V	1.3V
2 Operating Average Current:	30uA		
3.Input Voltage.	V _{IL} Vss+0.3V		
4. Input Voltage:	V _{OH} VDD-0.1V		
	V _{OH}		Vdd-0.1V
5. Pull-up Resistor:		10KΩ	1
	TEST2 Pad	10KΩ	
8 Pull-low Resistor:	TEST1 Pad	25KΩ	

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BLOCK DIAGRAM :



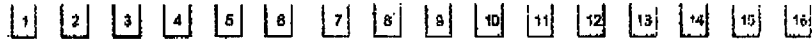
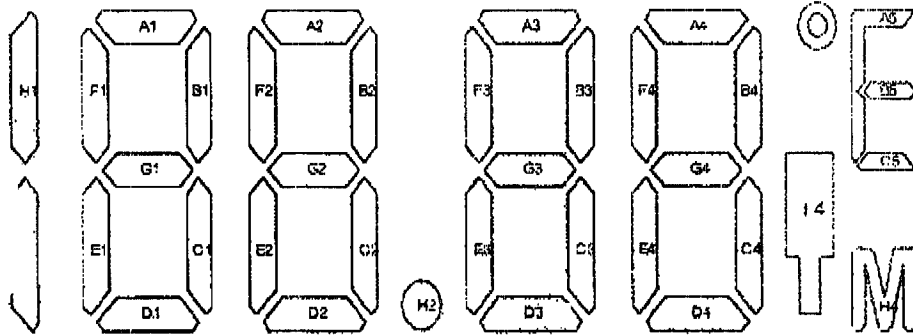
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CHIP SIZE : X= 1440 um.
Y= 1610 um

PAD NAME	PAD No.	COORDINATE (X,Y)	PAD NAME	PAD No.	COORDINATE (X,Y)
VSS	1	(-600.00, 559.80)	S10	20	(600.00, 404.20)
SC	2	(-600.00, 414.10)	S11	21	(600.00, -279.20)
SC1	3	(-600.00, 234.10)	S12	22	(600.00, 154.20)
RF	4	(-600.00, 76.10)	S13	23	(600.00, -29.20)
RS	5	(-600.00, -81.90)	C512	24	(600.00, 95.80)
BZ1	6	(-600.00, -249.00)	CAP	25	(600.00, 220.80)
BZ2	7	(-600.00, -410.90)	VDD	26	(600.00, 355.80)
COM1	8	(-600.00, -548.80)	VEE	27	(600.00, 490.80)
COM2	9	(-531.90, -685.00)	PSW	28	(555.20, 685.00)
COM3	10	(-360.40, -685.00)	OSCO	29	(438.20, 685.00)
S1	11	(-243.60, -685.00)	OSCI	30	(321.20, 685.00)
S2	12	(-126.60, -685.00)	TEST1	31	(204.20, 685.00)
S3	13	(-9.50, -685.00)	BAT	32	(73.00, 685.00)
S4	14	(107.40, -685.00)	TEST2	33	(-58.50, 685.00)
S5	15	(224.40, -685.00)	SLCD	34	(-175.50, 685.00)
S6	16	(341.40, -685.00)	SFC	35	(-292.50, 685.00)
S7	17	(458.40, -685.00)	ALARM	36	(-409.50, 685.00)
S8	18	(600.00, -685.00)	MI6T	37	(-526.50, 685.00)
S9	19	(600.00, -529.30)			

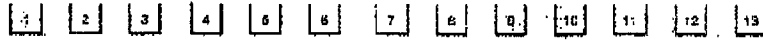
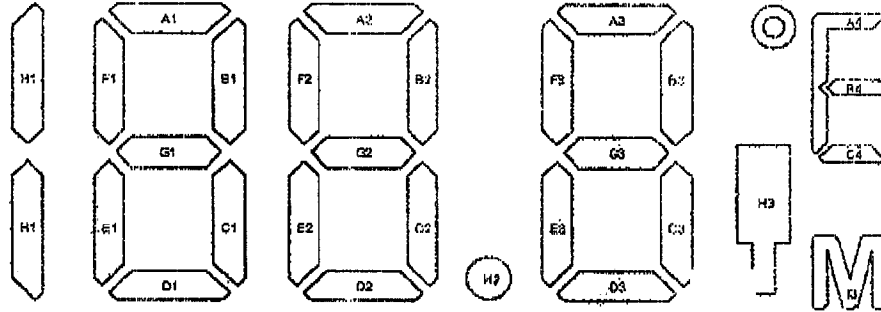
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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
COM1	COM1			F1	A1	B1	F2	A2	B2	F3	A3	B3	F4	A4	B4	A5
COM2		COM2		E1	G1	C1	F2	G2	C2	E3	G3	C3	E4	G4	C4	B5
COM3			COM3	H1	D1			D2	H2		D3		14	D4	H4	C5

SPEC A. 1/3DUTY 1/2 BIAS (LCD USES 3V)
 B. $V_{TH} = 1.5V$

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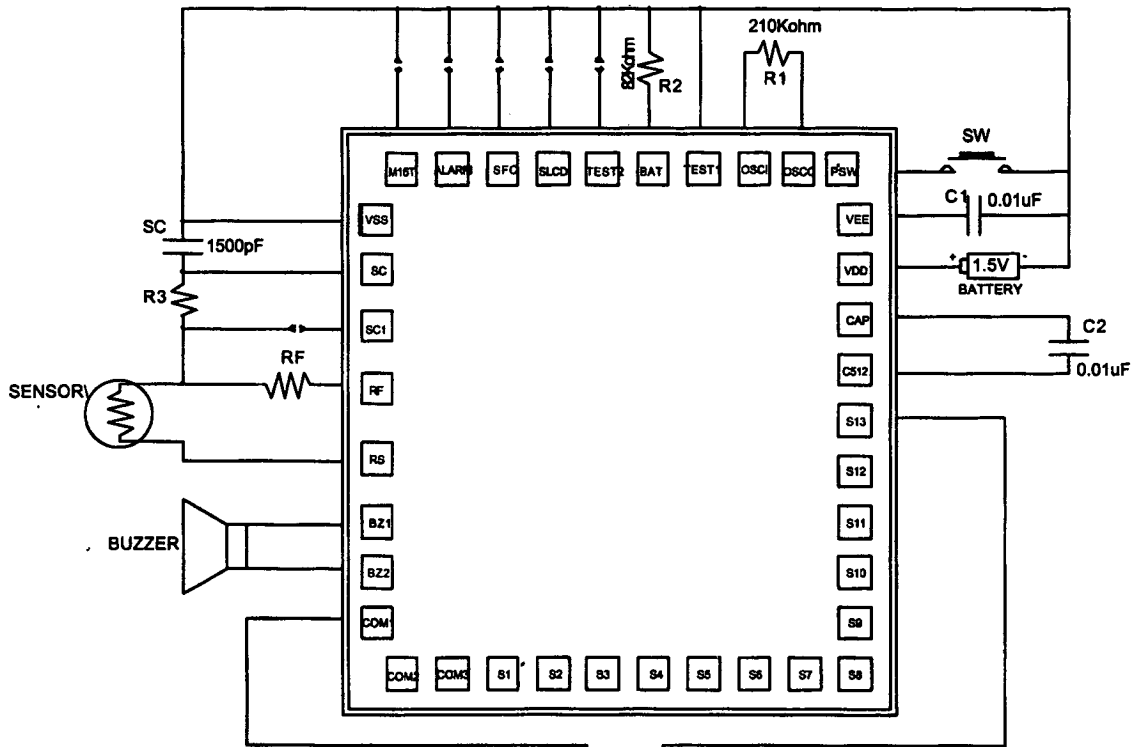


	1	2	3	4	5	6	7	8	9	10	11	12	13
COM1	COM1			F1	A1	B1	F2	A2	B2	F3	A3	B3	A4
COM2		COM2		E1	G1	C1	E2	G2	C2	E3	G3	C3	B4
COM3			COM3	H1	D1			D2	H2	D3	H3	C4	

SPEC A. 1/3 DUTY, 1/2 BIAS (LCD USES 3 V)
 B. $V_{TH} = 1.5 V$

SS0404 Application

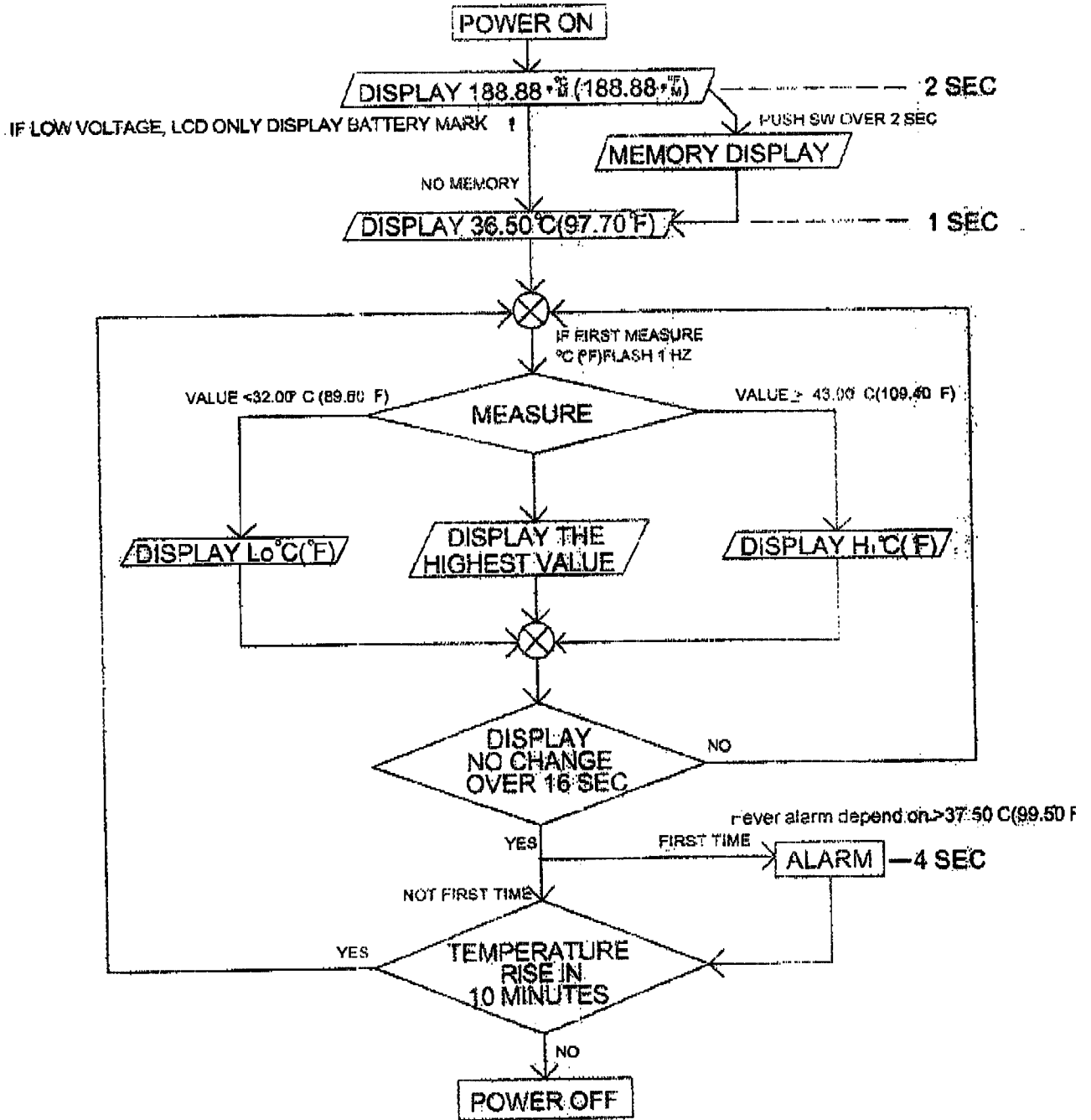
REFERENCE ONLY
DATE : 2000/01/03
VER : 1.0



- Note:
1. R3 is about 470 ohm for improve ESD.
 2. If SC1 pad is bonding ,the R3 must open.
 3. If LCD is one number after point ,Pad S10,S11,S12 is NC pad.
 4. Sensor is use ET-503 sensor.
 5. RF is selected according to sensor type.

LCD

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