

通泰積體電路股份有限公司

TONTEK DESIGN TECHNOLOGY LTD.

TC7466A THERMOMETER SPECIFICATION

- <1> **Power SW:** Push switch can turn on or turn off the thermometer.
- <2> At Power On:
- A. LCD display 188.88°C (or 188.88°F) 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 also 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 the first measurement is over than 10 minutes. The 10 minutes is constant, it is not recount by the temperature raising again.
 - N. When measurement is over within 10 minutes, if temperature rises again the $^{\circ}\text{C} (^{\circ}\text{F})$ mark no blink and remeasure the temperature. But the buzzer will not alarm again when measurement is over and 10 minutes is not 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 recerver 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

Pad Description

Pad Name	Description

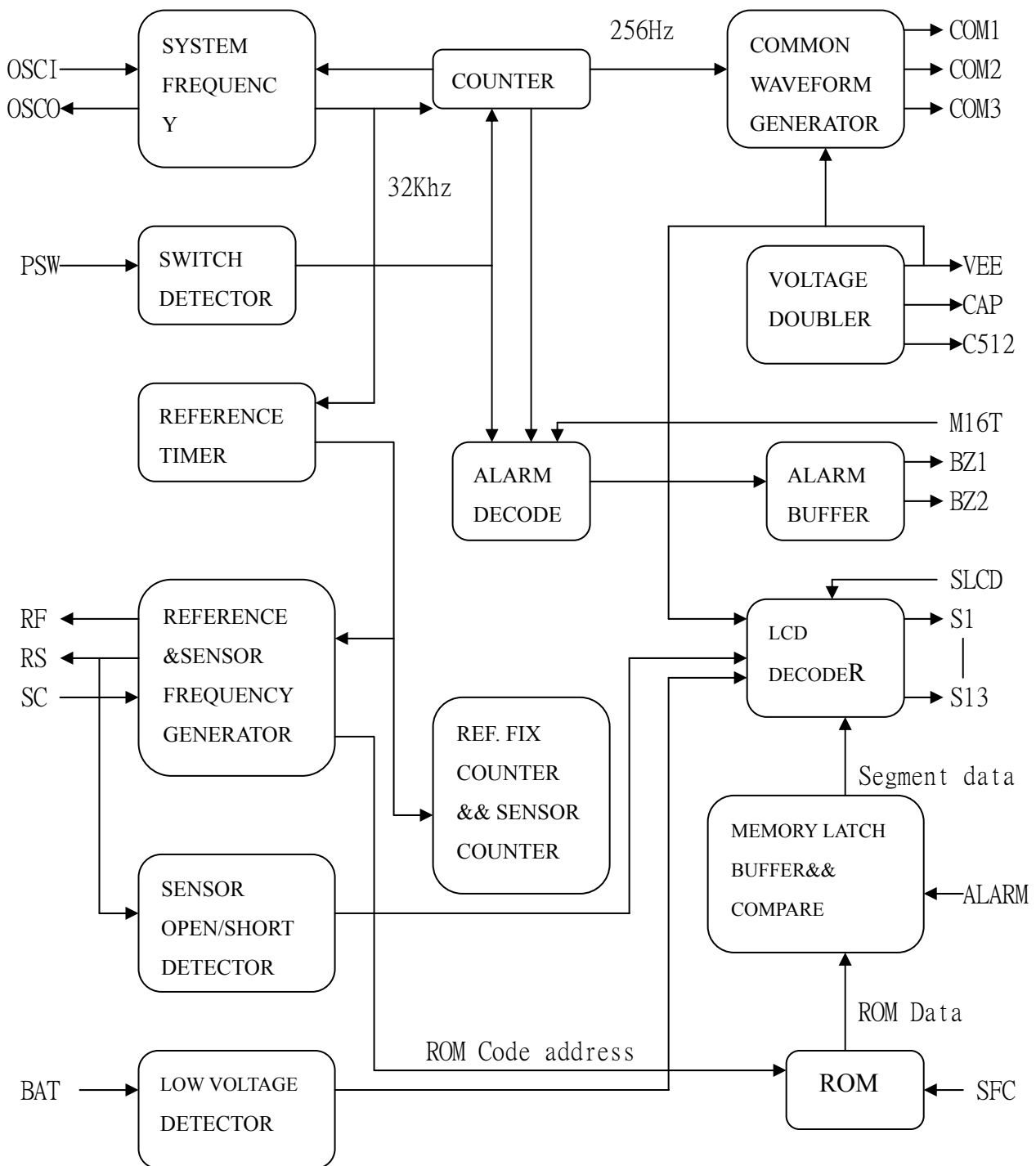
1 VSS	Power Pad.
2 SC	Reference and sensor frequency input Pad. the reference and sensor frequency generator consists of Pad 2,3,4,5.
3 SC1	Inner resistor about 470 ohm connect to SC Pad.
4 RF	PMOS open drain, connect to the reference resistor.
5 RS	PMOS open drain, connect to the sensor resistor.
6 BZ1	Output Pad, the buffer of buzzer.
7 BZ2	Output Pad, the buffer of buzzer.
8 COM1	Output Pad, connect to LCD.
9 COM2	Output Pad, connect to LCD.
10 COM3	Output Pad, connect to LCD.
11 S1	Output Pad, connect to LCD.
12 S2	Output Pad, connect to LCD.
13 S3	Output Pad, connect to LCD.
14 S4	Output Pad, connect to LCD.
15 S5	Output Pad, connect to LCD.
16 S6	Output Pad, connect to LCD.
17 S7	Output Pad, connect to LCD.
18 S8	Output Pad, connect to LCD.
19 S9	Output Pad, connect to LCD.
20 S10	Output Pad, connect to LCD.
21 S11	Output Pad, connect to LCD.
22 S12	Output Pad, connect to LCD.
23 S13	Output Pad, connect to LCD.
24 C512	The Pad 24,25 is doubler voltage 3V capacitor connect.
25 CAP	The Pad 24,25 is doubler voltage 3V capacitor connect.
26 Vdd	Power Pad.
27 Vee	Voltage 3v.
28 PSW	Pull high input Pad. push switch to power on/off.
29 OSC0	System frequency output Pad.
30 OSCI	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 Vss 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 SFC Select the temperature is show °C or °F.
Pad no connect → show °C
Pad connect Vss → show °F
- 36 ALARM 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

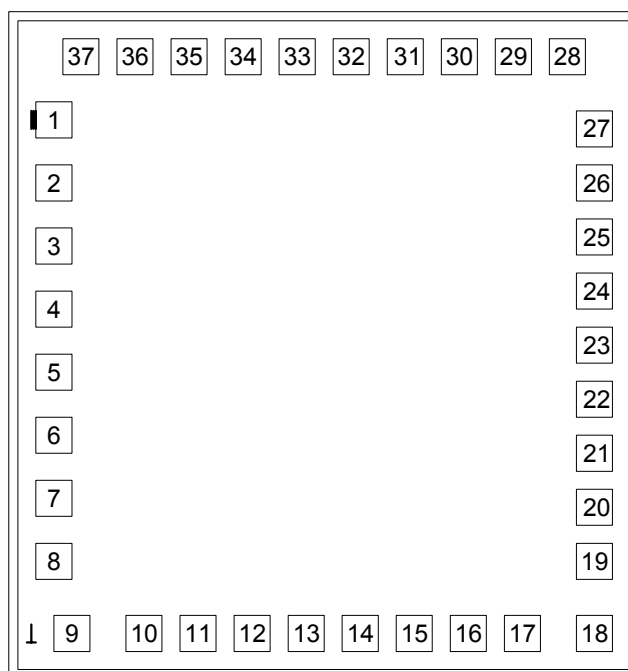
Operating Parameter:(Vdd=1.5V)

Description		Max.	Typical	Min.
1.Operating Voltage:		1.6V	1.5V	1.3V
2.Operating Average Current:		30uA		
3.Input Voltage:	V _{IL}	V _{SS} +0.3V		
	V _{IH}			V _{DD} -0.3V
4.Output Voltage:	V _{OL}	V _{SS} +0.1V		
	V _{OH}			V _{DD} -0.1V
5.Buzzer Driving Current:(V _{ds} =1/2 V _{DD}).				1mA
6,Buzzer Sinking Current:(V _{ds} =1/2 V _{DD})				1mA
7.Pull-high Resistor:	PSW Pad		500K Ω	
	TEST2 Pad		10K Ω	
8.Pull-low Resistor:	TEST1 Pad		25K Ω	

BLOCK DIAGRAM :



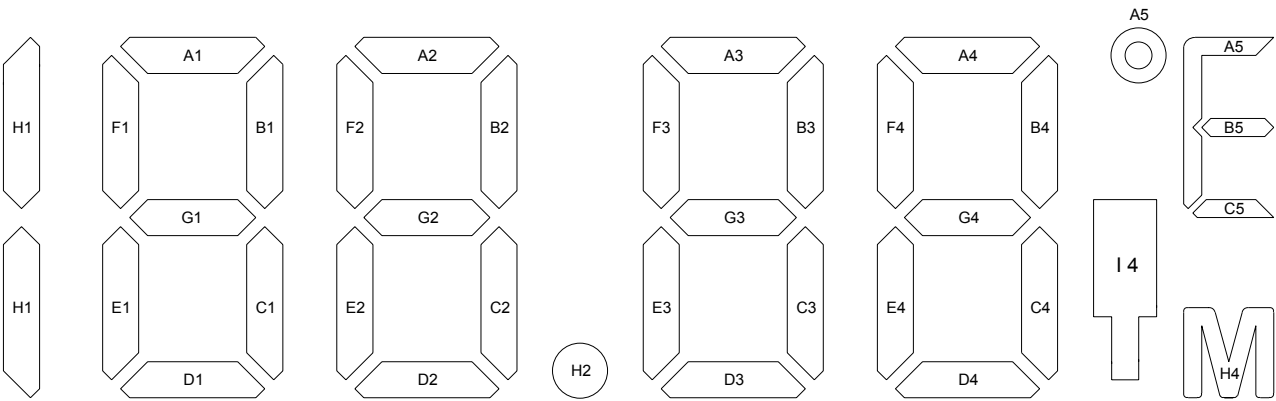
TC7466A PAD'S DIAGRAM



CHIP SIZE : X= 1500 um Y= 1660 um

PAD NAME	PAD No.	COORDINATE (X,Y)	PAD NAME	PAD No.	COORDINATE (X,Y)
VSS	1	(-630.00, 559.80)	S10	20	(630.00,-404.20)
SC	2	(-630.00, 410.20)	S11	21	(630.00,-279.20)
SC1	3	(-630.00, 205.00)	S12	22	(630.00,-154.20)
RF	4	(-630.00, 0.50)	S13	23	(630.00, -29.20)
RS	5	(-630.00,-171.10)	C512	24	(630.00, 95.80)
BZ1	6	(-630.00,-314.90)	CAP	25	(630.00, 220.80)
BZ2	7	(-630.00,-431.90)	VDD	26	(630.00, 355.80)
COM1	8	(-630.00,-548.90)	VEE	27	(630.00, 490.80)
COM2	9	(-501.90,-685.00)	PSW	28	(585.20, 685.00)
COM3	10	(-330.40,-685.00)	OSCO	29	(468.20, 685.00)
S1	11	(-213.60,-685.00)	OSCI	30	(351.20, 685.00)
S2	12	(-96.60,-685.00)	TEST1	31	(234.20, 685.00)
S3	13	(20.50,-685.00)	BAT	32	(103.00, 685.00)
S4	14	(137.40,-685.00)	TEST2	33	(-28.50, 685.00)
S5	15	(254.40,-685.00)	SLCD	34	(-145.50, 685.00)
S6	16	(371.40,-685.00)	SFC	35	(-262.50, 685.00)
S7	17	(488.40,-685.00)	ALARM	36	(-379.50, 685.00)
S8	18	(630.00,-685.00)	M16T	37	(-496.50, 685.00)
S9	19	(630.00,-529.30)			

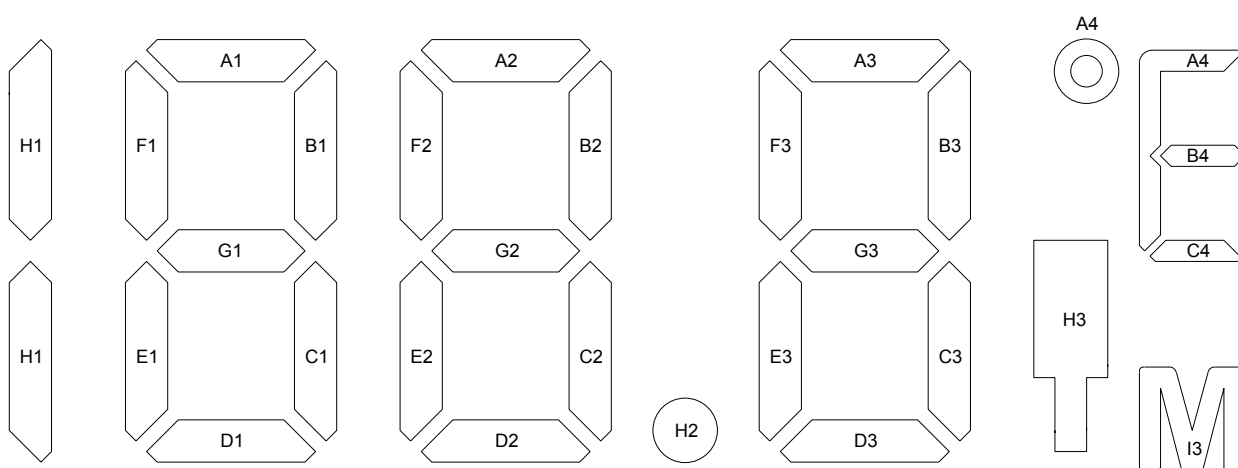
NOTICE: On PCB, IC Substrate should not connect directly with VDD or Vss.



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
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IC_PIN	COM1	COM2	COM3	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13
LCD_PIN	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	E2	G2	C2	E3	G3	C3	E4	G4	C4	B5
COM3			COM3	H1	D1			D2	H2		D3		I 4	D4	H4	C5

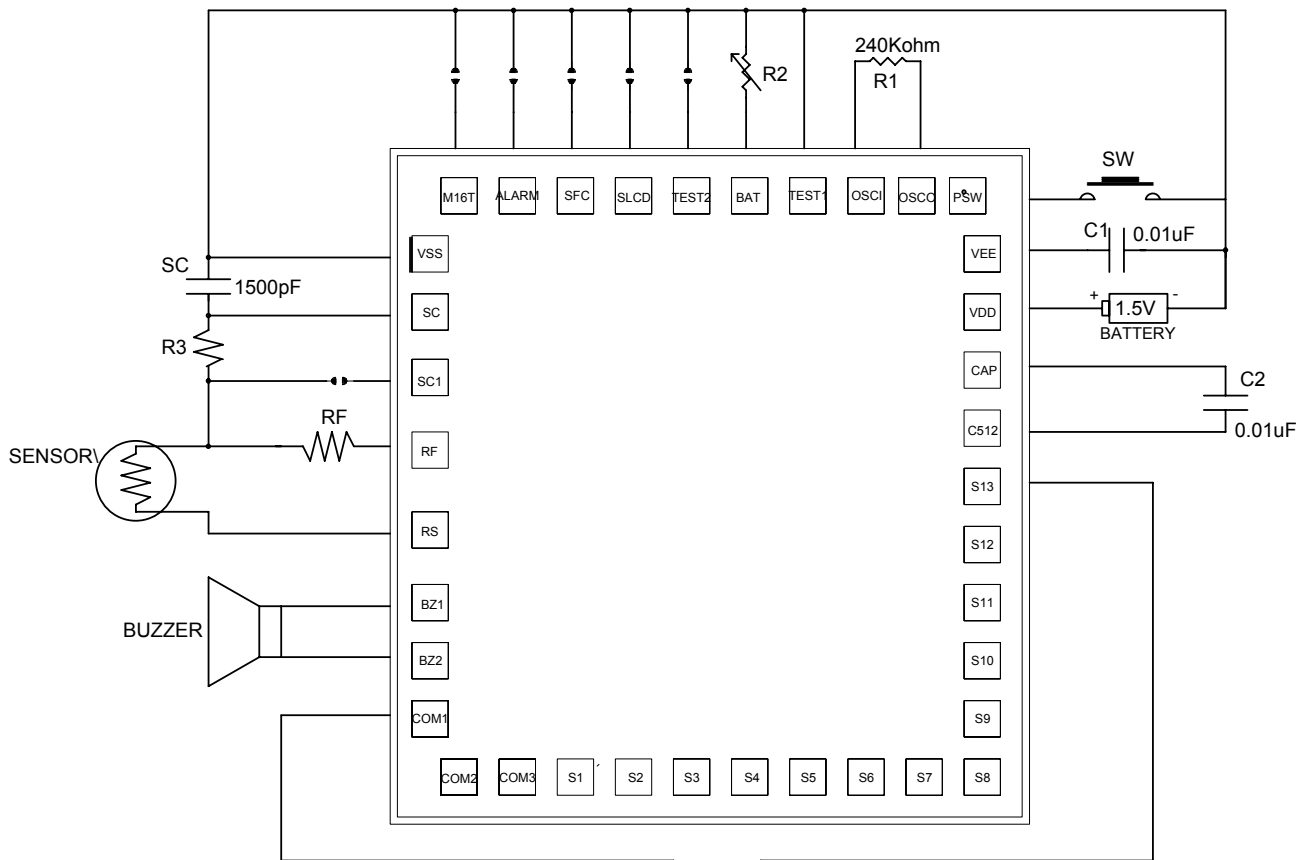
SPEC : A . 1/3 DUTY , 1/2 BIAS . (LCD USES 3 V)
B . $V_{TH} = 1.5 V$



IC_PIN	COM1	COM2	COM3	S1	S2	S3	S4	S5	S6	S7	S8	S9	S13
LCD_PIN	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	I 3	D3	H3	C4

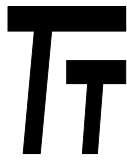
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B . $V_{TH} = 1.5 V$

TC7466A Application



- 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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TONTEK DESIGN TECHNOLOGY LTD.

TC7466A FUNCTION FLOW DIAGRAM :

