

# IZ8016

## 3.5 DIGIT THERMOMETER

### DESCRIPTION

The IZ8016 is a CMOS circuit provided with digital thermometer function. Temperature reading from  $-50^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$  is detected

by use of a thermistor as a sensor and temperature is displayed on a LCD by  $0.2^{\circ}\text{C}$  step. High accuracy is obtained in wide range of

$-50^{\circ}\text{C} \sim +50^{\circ}\text{C}$  by providing non-linear correction circuit on the chip.

### FEATURES

- Measurement accuracy:  $\pm 1^{\circ}\text{C}$
- Resolution :  $0.2^{\circ}\text{C}$  ( $^{\circ}\text{F}$ )
- $3\frac{1}{2} + 7$  Indicators,  $3\frac{1}{2}$  duty LCD
- Low power consumption
- Few external components
- Easiness in adjustment
- Single 1.5V battery operation
- Package Type: Bare chip

### FUNCTIONS

- Measurable temperature range  $-49^{\circ}\text{C} \sim +49.8^{\circ}\text{C}$   
 $-57^{\circ}\text{F} \sim +121.8^{\circ}\text{F}$
- Suitable Thermistor  $R_T=10\text{K}\Omega \pm 1\%$  (at  $25^{\circ}\text{C}$ )
- Sampling Cycle 1 seconds, 3 seconds, 5 seconds,  
10 seconds (Default 10 sec)
- Oscillation Frequency 32.768 kHz
- Temperature adjustment: Adjustment of temperature is made by adjusting fundamental resistance against dispersion in resistance values of thermistors

### ABSOLUTE MAXIMUM RATINGS

Characteristic	Symbol	Value	Unit
Supply Voltage ( $V_{CC}$ )	$V_{CC}$	- 0.1 ~ + 3.0	V
Operating Temperature Range	$T_{opr}$	- 50 ~ + 50	$^{\circ}\text{C}$
Storage Temperature Range	$T_{stg}$	- 50 ~ + 125	$^{\circ}\text{C}$

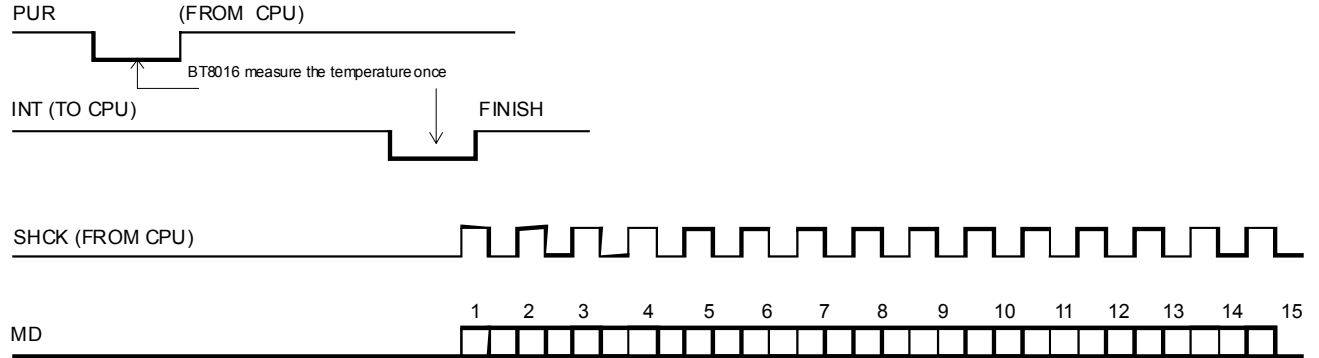
### ELECTRICAL CHARACTERISTICS

( $T_a = 25^{\circ}\text{C}$ ,  $V_{SS} = 0\text{V}$ ,  $V_{CC} = 1.5\text{V}$  unless otherwise specified)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Operating Voltage	$V_{CC}$		1.20	1.50	2.00	V
LCD Voltage	$V_{DD}$			3.00		V
Supply Current	$I_{CC}$	Operating		50	80	$\mu\text{A}$
	$I_{STD}$	Standby		5	10	$\mu\text{A}$

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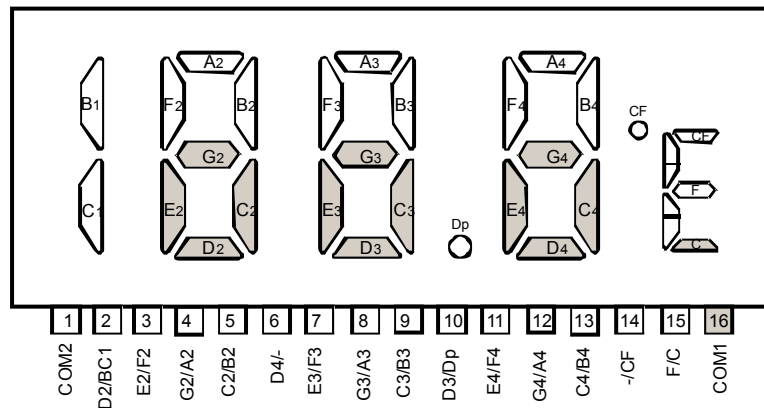
## SERIAL OUTPUT



Temperature data converted serially by MD, SHCK INT, PUR terminals.  
Temperature data is output a total 15-bits data.

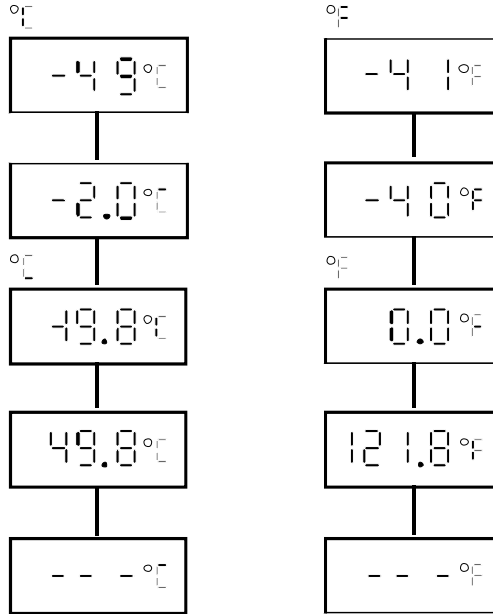
Bit No.	Function	Remark
01	Polarity	Polarity (1= Minus; 0 = Plus)
02		(Hundred digit) ( $^{\circ}\text{C}$ no use)
03	80	
04	40	
05	20	
06	10	
07	8	
08	4	
09	2	
10	1	
11	0.8	
12	0.4	
13	0.2	
14	0.1	
15	( $^{\circ}\text{C}/^{\circ}\text{F}$ )	(0 = $^{\circ}\text{C}$ ; 1 = $^{\circ}\text{F}$ )

## LCD FORMAT

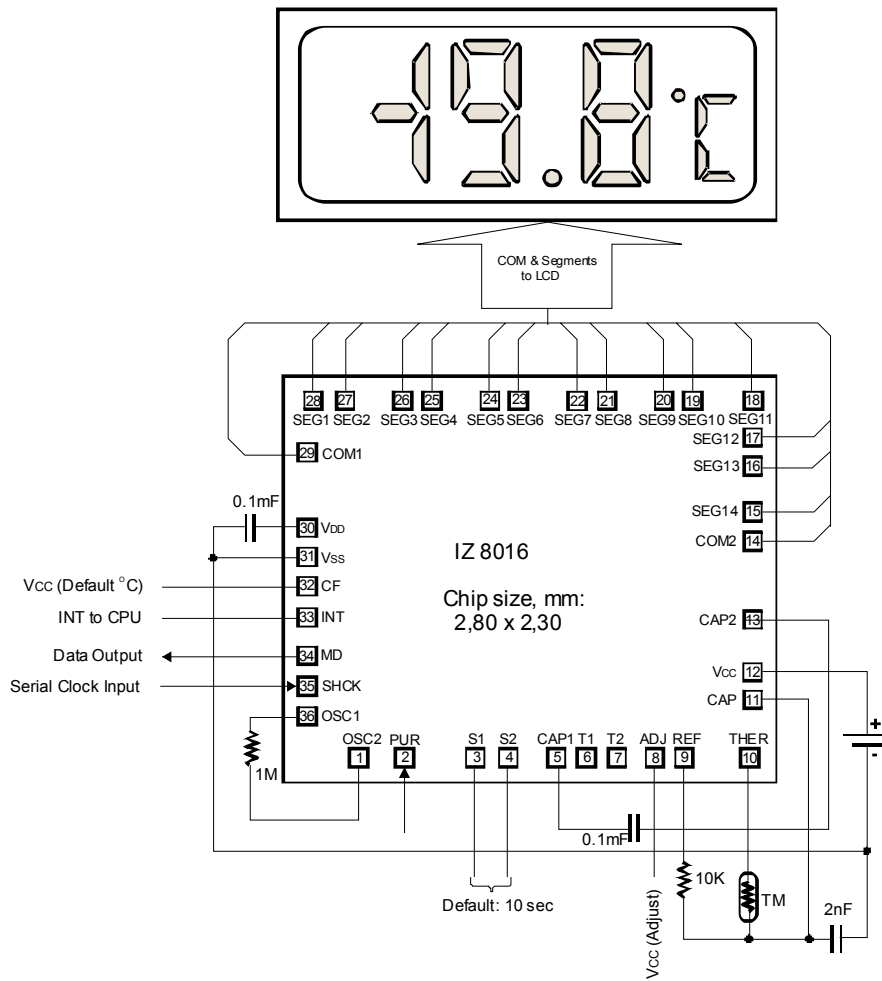


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## DISPLAY FORMAT



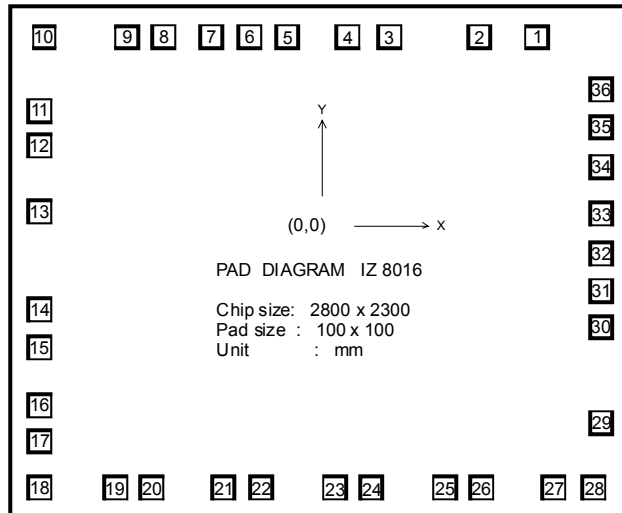
## APPLICATION CIRCUIT



TM – Thermistor CN36-2H103FB

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## PAD DIAGRAM



**NOTE:** Substrate is connected to  $V_{SS}$

## PAD ASSIGNMENT

Pad No.	Signal	Description	X	Y	Pad No.	Signal	Description	X	Y
1	OSC2	Oscillator circuit	969	1014	19	SEG10	LCD segment drive	-923	-1016
2	PUR		713	1014	20	SEG9	LCD segment drive	-763	-1016
3	S1	Pin option, select the thermistor sampling cycle (default 10 seconds)	314	1014	21	SEG8	LCD segment drive	-434	-1016
4	S2		80	1014	22	SEG7	LCD segment drive	-269	-1016
			S1	S2	SAMPLING CYCLE, sec				
			$V_{SS}$	$V_{SS}$	10				
			$V_{SS}$	$V_{CC}$	1				
			$V_{CC}$	$V_{SS}$	2				
		$V_{CC}$	$V_{CC}$	5					
5	CAP1	Booster capacitor	-148	1014	23	SEG6	LCD segment drive	59	-1016
6	T1	Test input	-318	1014	24	SEG5	LCD segment drive	224	-1016
7	T2	Test input	-517	1014	25	SEG4	LCD segment drive	552	-1016
8	ADJ	Adjust the fixed temperature (active high)	-714	1014	26	SEG3	LCD segment drive	718	-1016
9	REF	Terminal for temperature detection	-876	1014	27	SEG2	LCD segment drive	1046	-1016
10	THER	Terminal for temperature detection	-1244	1014	28	SEG1	LCD segment drive	1229	-1016
11	CAP	Terminal for temperature detection	-1266	685	29	COM1	LCD common drive	1261	-723
12	$V_{CC}$	Supply voltage	-1266	525	30	$V_{DD}$	LCD supply voltage	1261	-295
13	CAP2	Booster capacitor	-1266	223	31	$V_{SS}$	GND	1261	-127
14	COM2	LCD common drive	-1266	-213	32	CF	$^{\circ}$ C/ $^{\circ}$ F Terminal, default ( $V_{SS}$ ) select $^{\circ}$ C	1261	40
15	SEG14	LCD segment drive	-1266	-383	33	INT	Signal to interrupt the MPU	1261	218
16	SEG13	LCD segment drive	-1266	-646	34	MD	Serial Data	1261	431
17	SEG12	LCD segment drive	-1266	-808	35	SHCK	Serial shift Clock Input	1261	606
18	SEG11	LCD segment drive	-1266	-1016	36	OSC1	Oscillator circuit	1261	772