1. DESCRIPTION

The XL285-1.2,XT285-1.2,XL385-1.2,XT385-1.2,XB385M3-1.2 are micropower 2-terminal band-gap voltage regulator diodes. Operating over a 10μA to 20mA current range, they feature exceptionally low dynamic impedance and good temperature stability. On-chip trimming is used to provide tight voltage tolerance.

2. FEATURES

- ±1% and 2% Initial Tolerance
- Operating Current of 10 μ A to 20mA
- 1 Ω Dynamic Impedance
- Low Temperature Coefficient
- Low Voltage Reference—1.235V

3. CONNECTION DIAGRAM

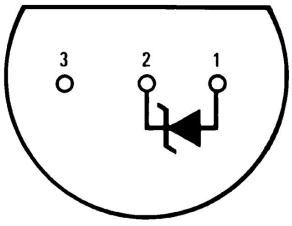


Figure 1.T0-92

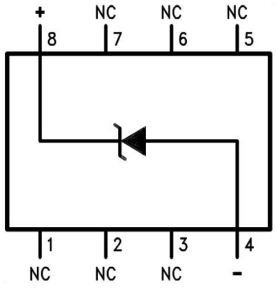
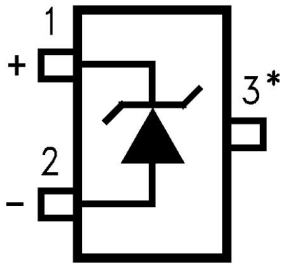


Figure 3. SOP8



* Pin 3 is attached to the Die Attach Pad (DAP) and should be connected to Pin 2 or left floating.

Figure 2. SOT23-3

4. ELECTRICAL CHARACTERISTICS

Parameter	Conditions	Typ	XL385-1.2		XL385-1.2		XL385-1.2		Units (Limit)
			Tested Limit (2) (3)	Design Limit (4)	Tested Limit (2)	Design Limit (4)	Tested Limit (2)	Design Limit (4)	
Reverse Breakdown Voltage	T_A = 25°C, 10µA ≤ I_R ≤ 20mA	1.235	1.223 1.247		1.223 1.247		1.205 1.260		V(Min) V(Max)
Minimum Operating Current		8	10	**20**	15	**20**	15	**20**	µA
	XL385-1.2						10	**15**	(Max)
Reverse Breakdown Voltage Change with Current	10µA ≤ I_R ≤ 1mA		1	**1.5**	1	**1.5**	1	**1.5**	mV (Max)
	1mA ≤ I_R ≤ 20mA		10	**20**	20	**25**	20	**25**	mV (Max)
Reverse Dynamic Impedance	I_R = 100µA, f = 20Hz	1							Ω
Wideband Noise (rms)	I_R = 100µA, 10Hz ≤ f ≤ 10kHz	60							µV
Long Term Stability	I_R = 100µA, T = 1000 Hr, T_A = 25°C ±0.1°C	20							ppm
Average Temperature Coefficient (5)	I_R = 100µA X Suffix Y Suffix All Others		**30** **50**	 **150**	**30** **50**	 **150**		 **150**	ppm/°C ppm/°C ppm/°C (Max)

(1) Parameters identified with boldface type apply at temperature extremes. All other numbers apply at $T_A = T_J$ = 25°C.
(2) Production tested.
(3) Specified by design. Not production tested. These limits are not used to calculate average outgoing quality levels.
(4) The average temperature coefficient is defined as the maximum deviation of reference voltage at all measured temperatures between the operating T_{MAX} and T_{MIN}, divided by $T_{MAX} - T_{MIN}$. The measured temperatures are −55°C, −40°C, 0°C, 25°C, 70°C, 85°C, 125°C.

5. THERMAL CHARACTERISTICS

Thermal Resistance	TO-92	SOP	SOT-23
θ_{JA} (junction to ambient)	180°C/W (0.4" leads) 170°C/W (0.125" leads)	165°C/W	283°C/W
θ_{JC} (junction to case)	N/A	N/A	N/A

6. TYPICAL PERFORMANCE CHARACTERISTICS

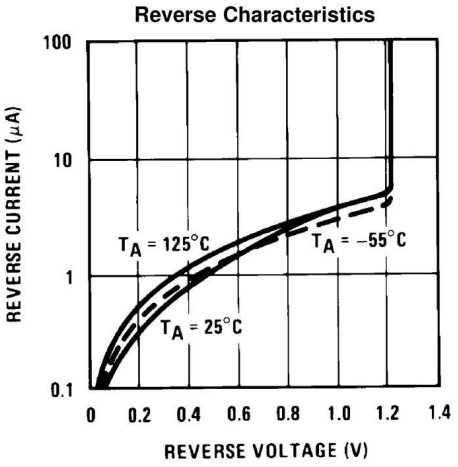


Figure 4.

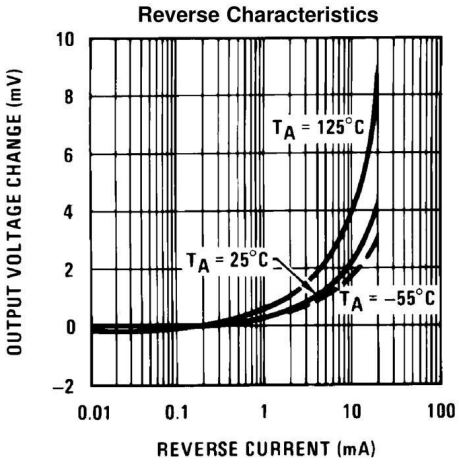


Figure 5.

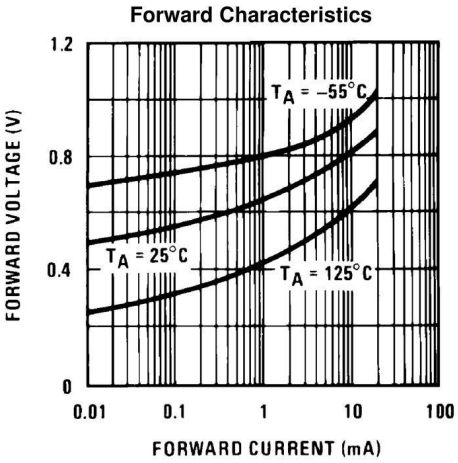


Figure 6.

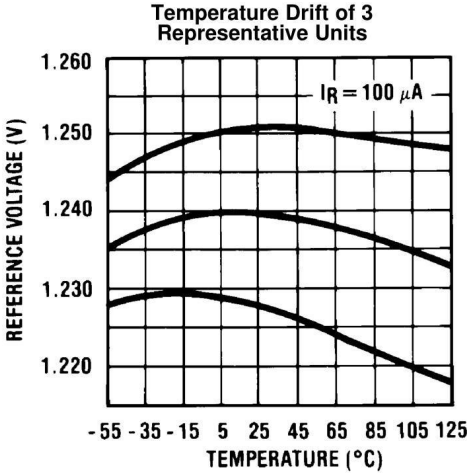


Figure 7.

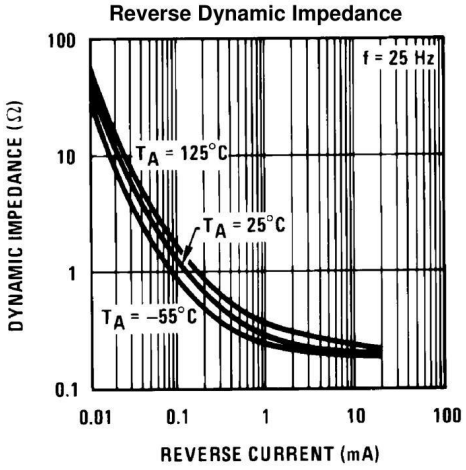


Figure 8.

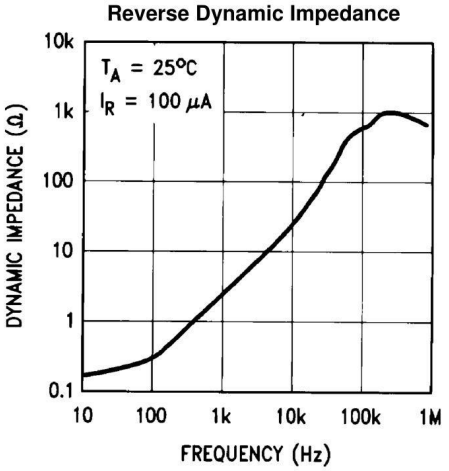


Figure 9.

TYPICAL PERFORMANCE CHARACTERISTICS(continued)

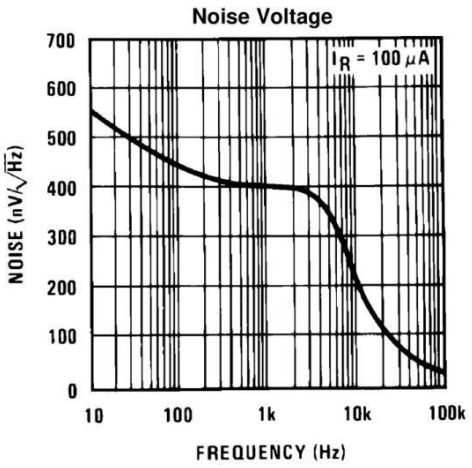


Figure 10.

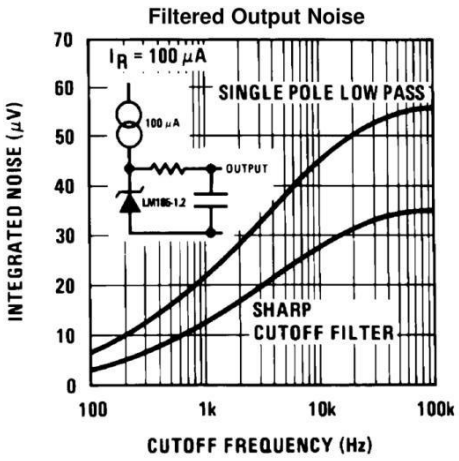


Figure 11.

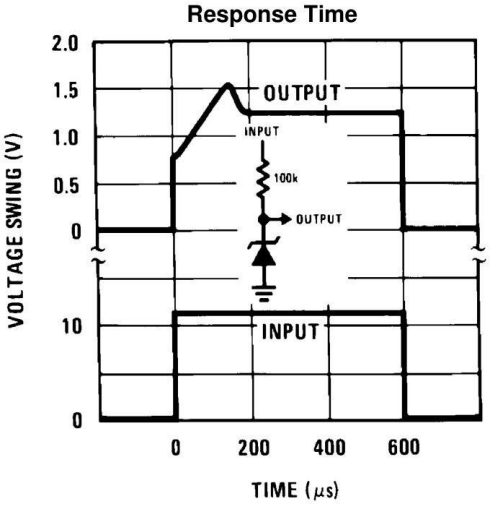
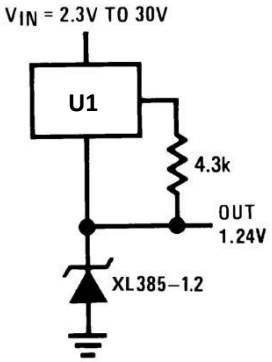


Figure 12.

7. TYPICAL PERFORMANCE CHARACTERISTICS



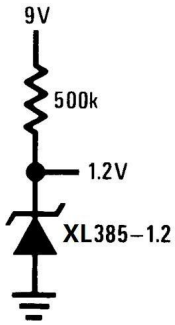


Figure 13.Wide Input Range Reference **Figure 14.Micropower Reference from 9V Battery**

Note 1: U1 uses a constant current source IC, such as an LM334 or equivalent.

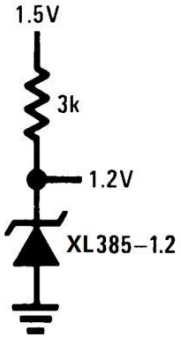
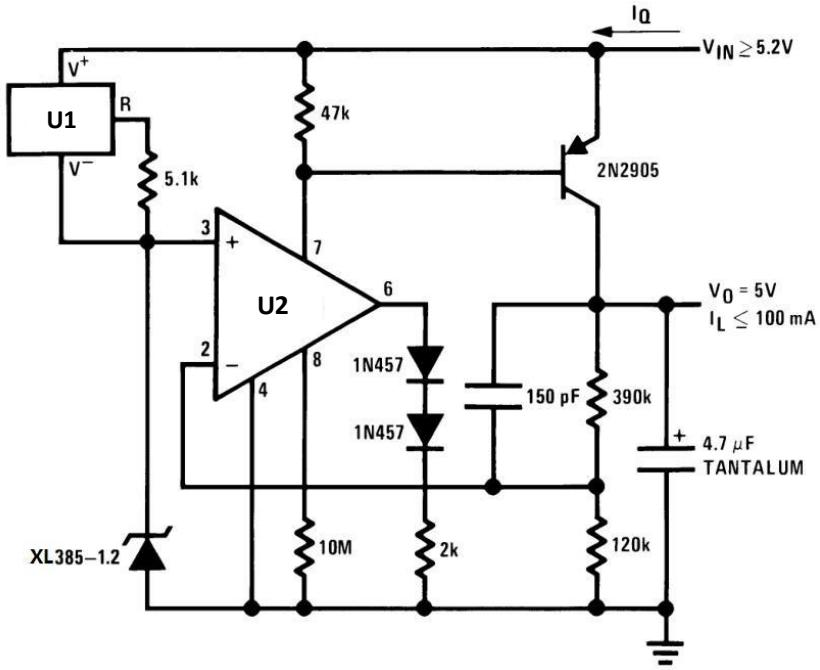


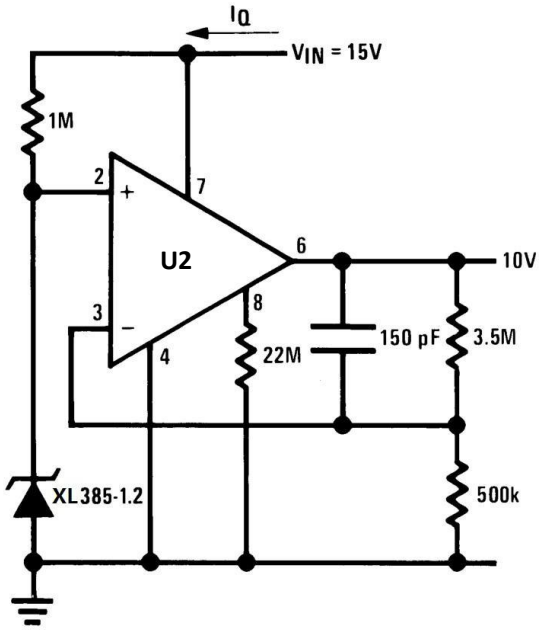
Figure 15.Reference from 1.5V Battery



*I_Q ≈ 30μA

Note 2: U2 uses a constant current source IC, such as an LM4250C or equivalent.

Figure 16.Micropower*5V Regulator



*I_Q ≈20µA standby current

Figure 17.Micropower* 10V Reference

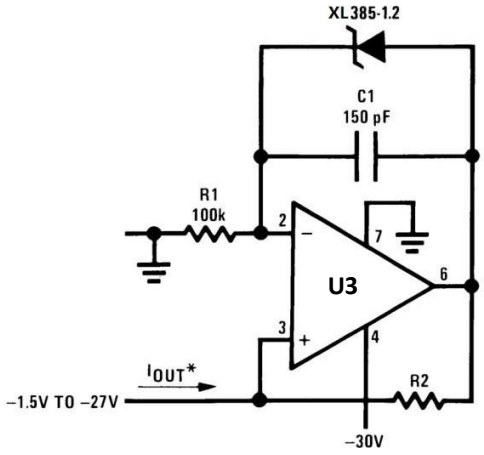


Figure 18.

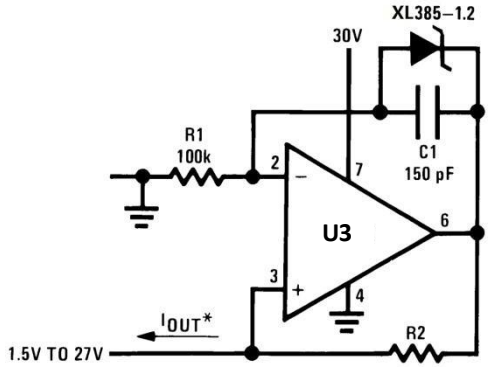


Figure 19.Precision 1µA to 1mA Current Sources

Note 3: U3 uses a constant current source IC, such as an LM312 or equivalent.

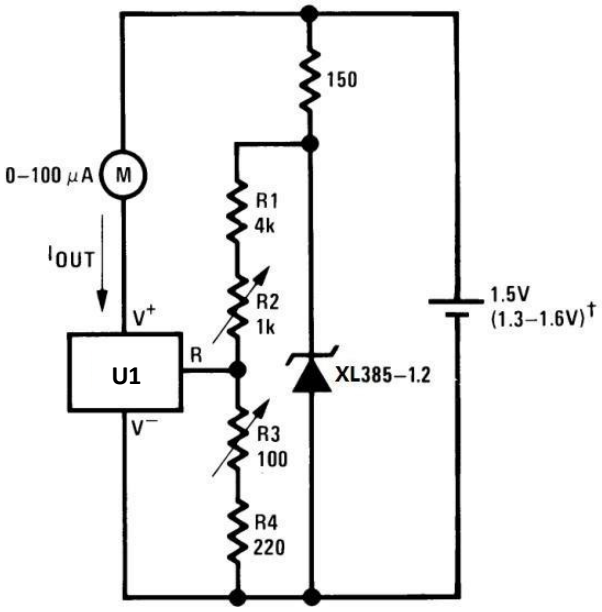


Figure 20.0℃-100℃ Thermometer

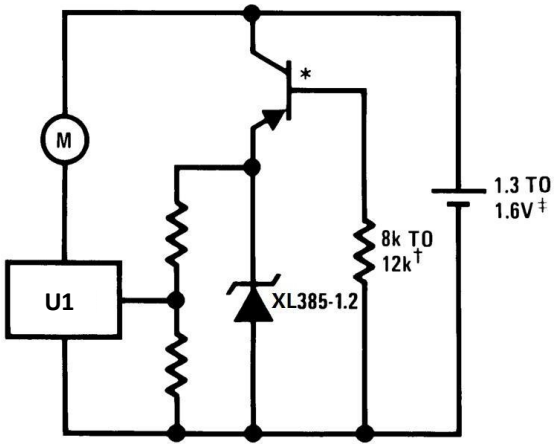


Figure 21. Lower Power Thermometer

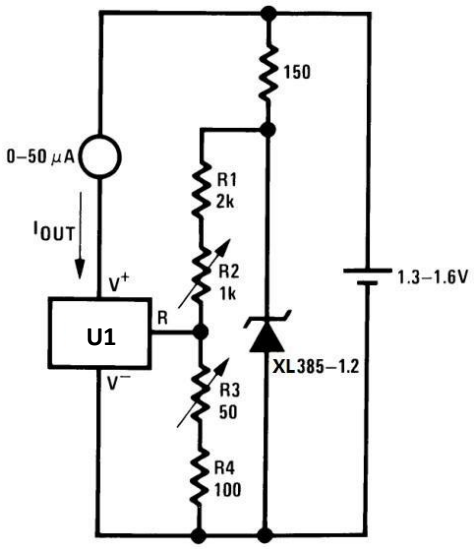


Figure 22. 0°F–50°F Thermometer

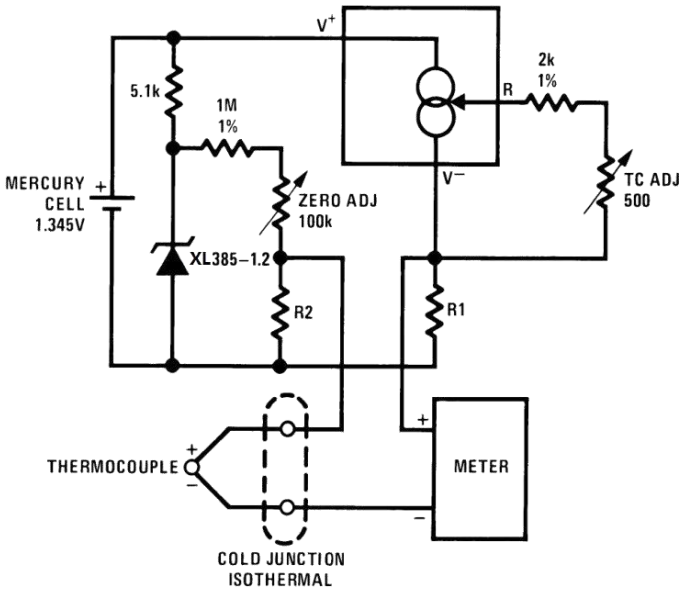


Figure 23. Micropower Thermocouple Cold Junction Compensator

Thermocouple Type	Seebeck Coefficient (μV/°C)	R1 (Ω)	R2 (Ω)	Voltage Across R1 @ 25°C (mV)	Voltage Across R2 (mV)
J	52.3	523	1.24k	15.60	14.32
T	42.8	432	1k	12.77	11.78
K	40.8	412	953Ω	12.17	11.17
S	6.4	63.4	150Ω	1.908	1.766

Typical supply current 50μA

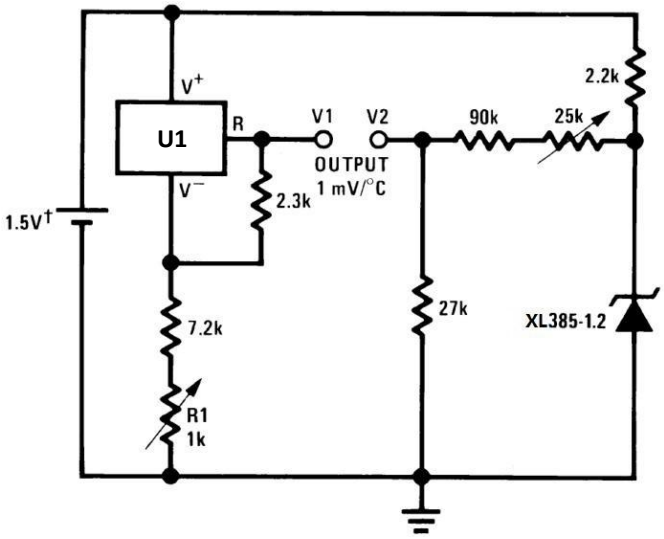
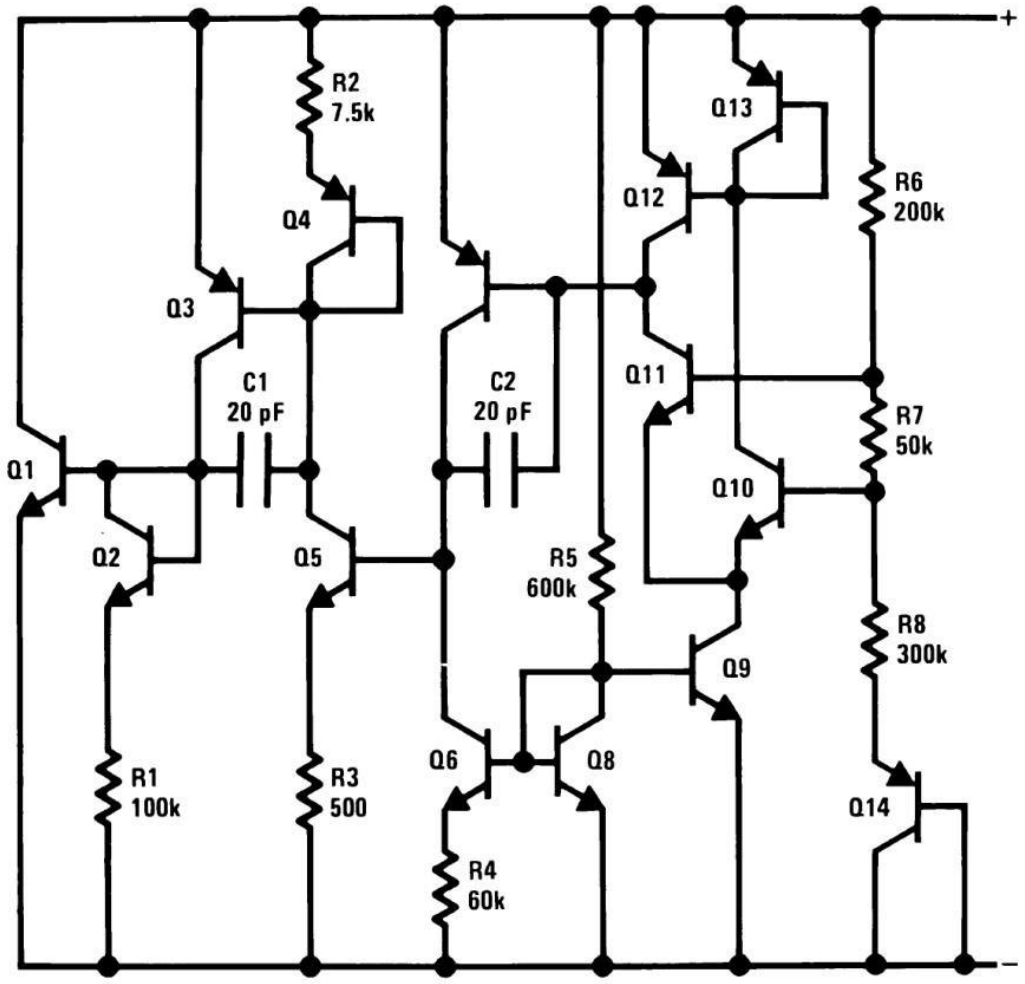


Figure 24. Centigrade Thermometer

8. SCHEMATIC DIAGRAM



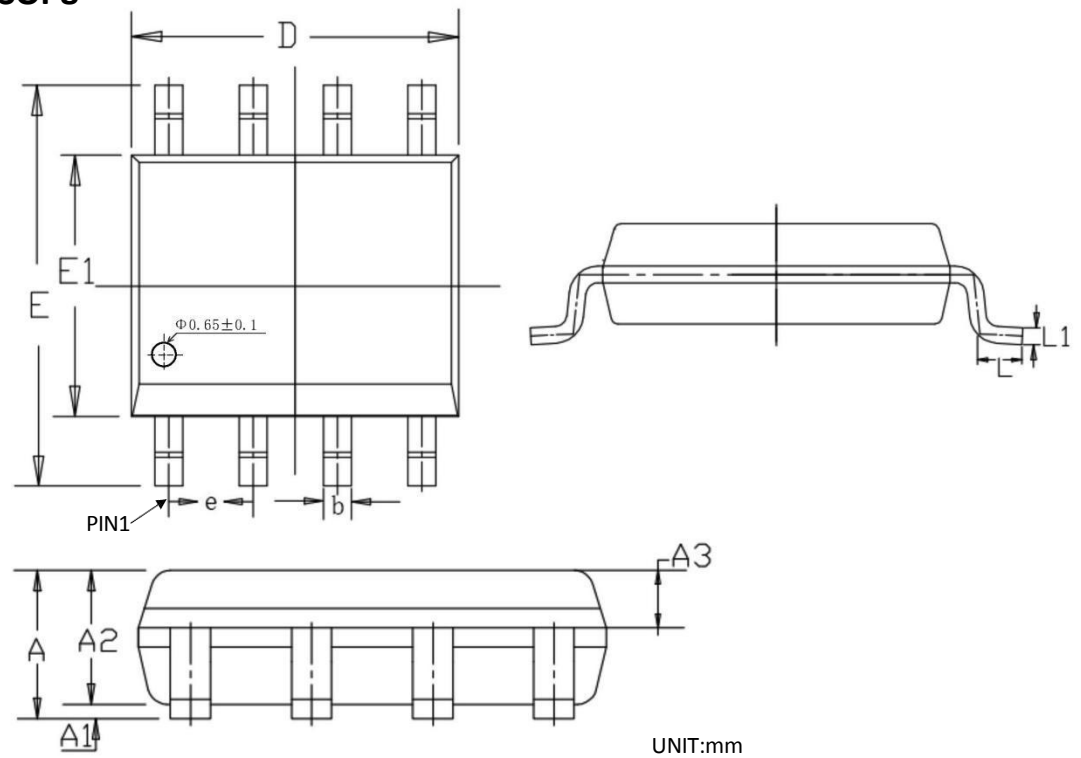
9. ORDERING INFORMATION

Ordering Information

Part Number	Device Marking	Package Type	Body size (mm)	Temperature (°C)	MSL	Transport Media	Package Quantity
XL285-1.2	XL285-1.2	SOP8	4.90 * 3.90	- 40 to 85	MSL3	T&R	2500
XT285-1.2	XT285-1.2	TO-92	4.58 * 4.58	- 40 to 85	MSL3	T&R	1000
XL385-1.2	XL385-1.2	SOP8	4.90 * 3.90	- 40 to 85	MSL3	T&R	2500
XT385-1.2	XT385-1.2	TO-92	4.58 * 4.58	- 40 to 85	MSL3	T&R	1000
XB385M3-1.2	XB385M3-1.2	SOT23-3	4.58 * 4.58	- 40 to 85	MSL3	T&R	3000

10. DIMENSIONAL DRAWINGS

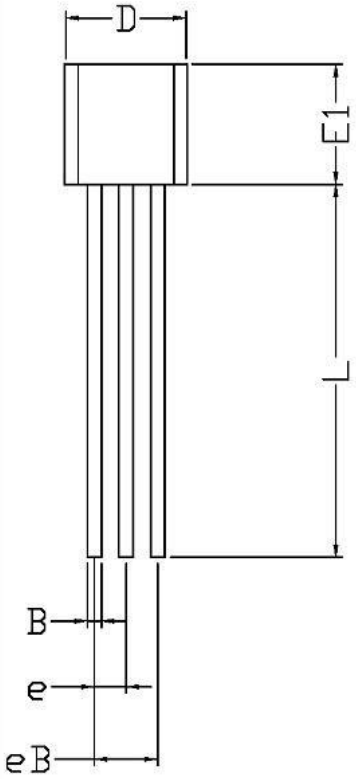
SOP8



UNIT:mm

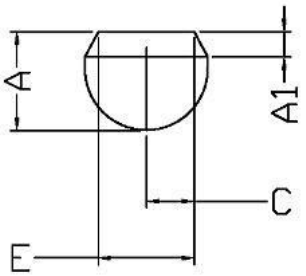
	MIN	NOM	MAX
A	1.450	1.550	1.650
A1	0.100	0.150	0.200
A2	1.300	1.400	1.500
A3	0.600	0.650	0.700
b	0.380	–	0.510
e	1.240	1.270	1.300
D	4.800	4.900	5.000
E	5.800	6.000	6.200
E1	3.800	3.900	4.000
L	0.450	0.600	0.750
L1	—	0.25BSC	—

TO-92

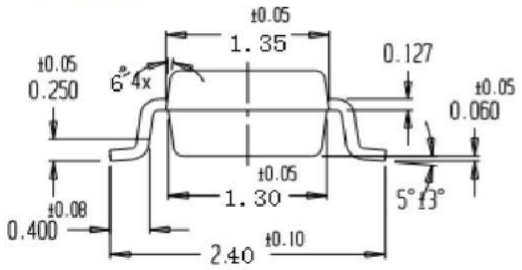


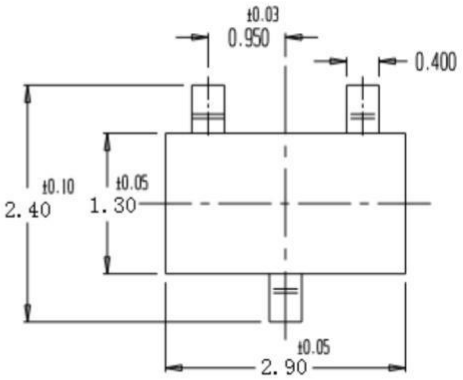
SYMBOL	MIN	MAX
A	3.46	3.96
A1	1.02 TYP	
B	0.36	0.56
C	1.80 TYP	
D	4.33	4.83
E1	4.33	4.83
E	3.35	3.85
eB	2.54 TYP	
e	1.27 TYP	
L	13.97	14.97

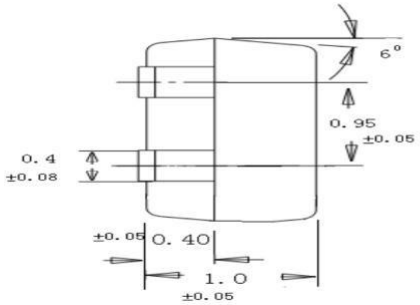
UNIT : mm



SOT23-3







[if you need helpcontact us. Xinluda reserves the right to changethe above information withoutpriornotice]