

1. DESCRIPTION

The XL336-5.0/XT336-5.0 integrated circuits are precision 5.0V shunt regulator diodes. These monolithic IC voltage references operate as a low temperature coefficient 5.0V zener with 0.6Ω dynamic impedance.

2. FEATURES

- Adjustable 4V to 6V
- Low Temperature Coefficient
- Wide Operating Current of 600 μA to 10 mA
- 0.6Ω Dynamic Impedance
- ± 1% Initial Tolerance Available
- Specified Temperature Stability
- Easily Trimmed for Minimum Temperature Drift
- Fast Turn-on

3. CONNECTION DIAGRAM

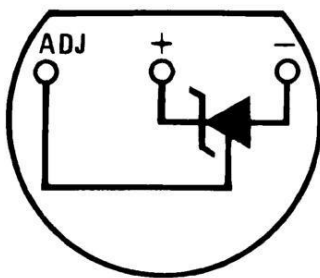


Figure 1. TO-92 Plastic Package
(Bottom View)

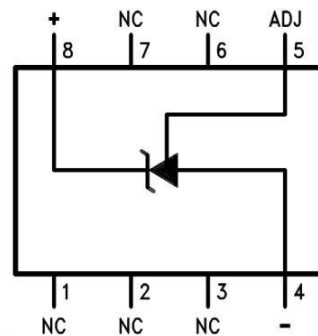
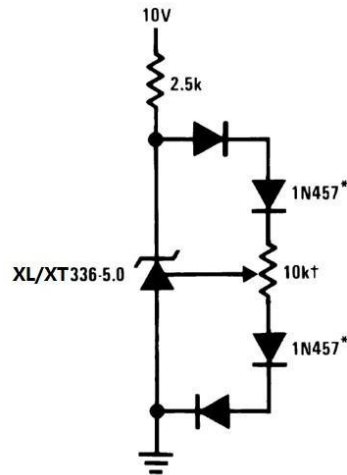


Figure 2. SOP 8 Package

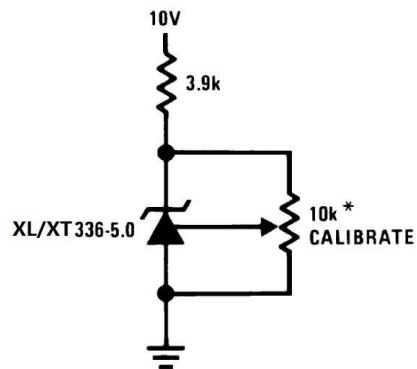
4. TYPICAL APPLICATIONS



† Adjust to 5.00V

* Any silicon signal diode

Figure 3. 5.0V Reference with Minimum Temperature Coefficient



* Does not affect temperature coefficient

Figure 4. Trimmed 4V to 6V Reference with Temperature Coefficient Independent of Breakdown Voltage

5. ABSOLUTE MAXIMUM RATINGS(1)

Reverse Current	15	mA
Forward Current	10	mA
Storage Temperature	-60 to +150	°C
Operating Temperature Range		
XL/XT336-5.0	-40 to +85	°C
Soldering Information		
TO-92 Package (10 sec.)	260	°C
SOP Package		
Vapor Phase (60 sec.)	215	°C
Infrared (15 sec.)	220	°C

- (1) Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. Electrical specifications do not apply when operating the device beyond its specified operating conditions.

6. THERMAL CHARACTERISTICS

over operating free-air temperature range (unless otherwise noted)

	XL/XT336	100°C	
Thermal Resistance	TO-92	TO	SOP-8
θ_{ja} (Junction to Ambient)	180°C/W (0.4" Leads)	440°C/W	165°C/W
	170°C/W (0.125" Leads)		
θ_{ja} (Junction to Case)	N/A	80°C/W	N/A

7. ELECTRICAL CHARACTERISTICS

Parameter	Conditions	XL/XT336-5.0			Units
		Min	Typ	Max	
Reverse Breakdown Voltage	$T_A=25^\circ\text{C}$, $I_R=1\text{ mA}$	4.8	5.00	5.2	V
	XL336-5.0,XT336-5.0	4.90	5.00	5.1	V
Reverse Breakdown Change With Current	$T_A=25^\circ\text{C}$, $600\text{ }\mu\text{A}\leq I_R\leq 10\text{ mA}$		6	20	mV
Reverse Dynamic Impedance	$T_A=25^\circ\text{C}$, $I_R=1\text{ mA}$, $f = 100\text{ Hz}$		0.6	2	Ω
Temperature Stability (2)	V_R Adjusted 5.00V $I_R=1\text{ A}$, $0^\circ\text{C}\leq T_A\leq 70^\circ\text{C}$ (XL/XT336-5.0)		4	12	mV

- (1) Unless otherwise specified, the XL/XT336-5.0 from $-40^\circ\text{C}\leq T_A\leq +85^\circ\text{C}$.
 (2) Temperature stability for the X L 336 and X L 236 family is specified by design. Design limits are specified (but not 100 % percent production tested) over the indicated temperature and supply voltage ranges. These limits are not used to calculate outgoing quality levels. Stability is defined as the maximum change in V_{REF} from 25°C to $T_A(\text{min})$ or $T_A(\text{max})$.

ELECTRICAL CHARACTERISTICS (continued)

Parameter	Conditions	XL/XT336-5.0			Units
		Min	Typ	Max	
Reverse Breakdown Change With Current	$600 \mu\text{A} \leq I_R \leq 10 \text{ mA}$		6	24	mV
Adjustment Range			± 1		V
Reverse Dynamic Impedance	$I_R = 1 \text{ mA}$		0.8	2.5	Ω
Long Term Stability	$T_A = 25^\circ\text{C} \pm 0.1^\circ\text{C}$, $I_R = 1 \text{ mA}$, $t = 1000 \text{ hrs}$		20		ppm

8. TYPICAL PERFORMANCE CHARACTERISTICS

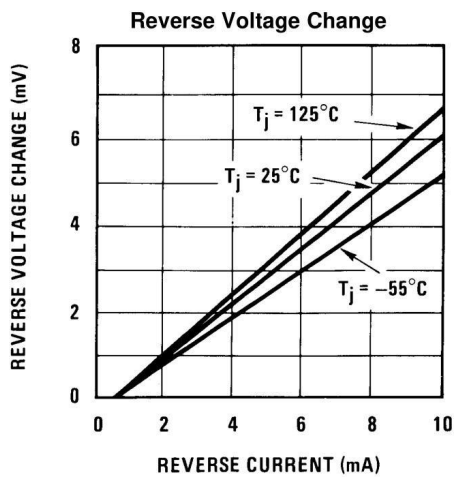


Figure 5.
Dynamic Impedance

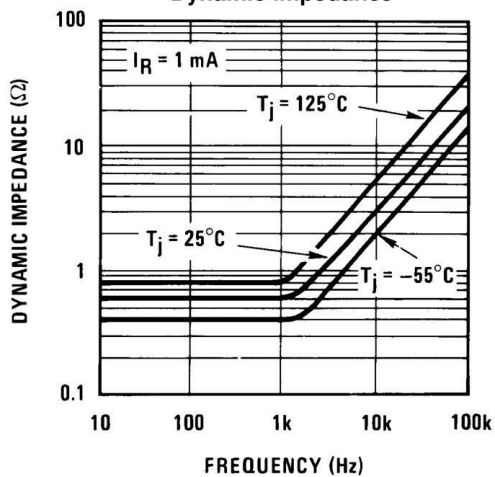


Figure 7.
Reverse Characteristics

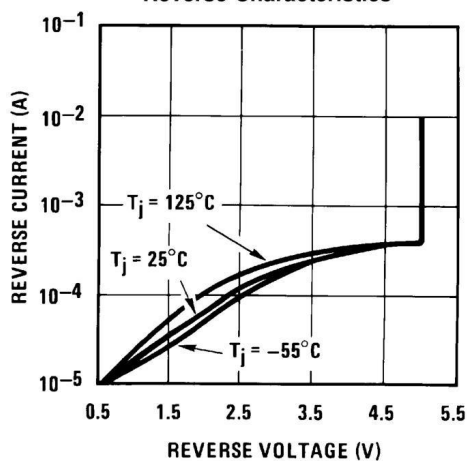


Figure 9.

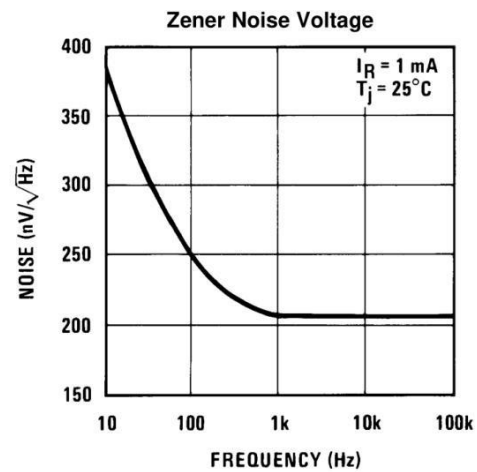


Figure 6.

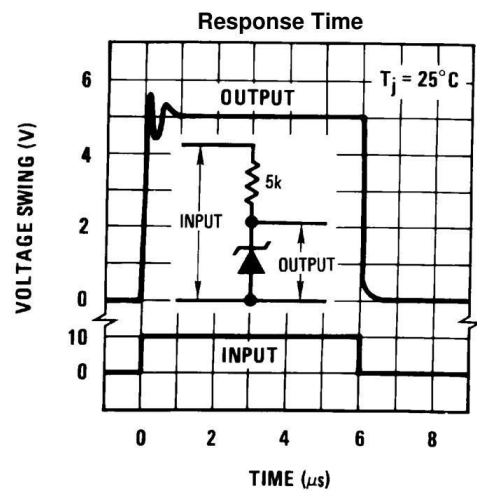


Figure 8.

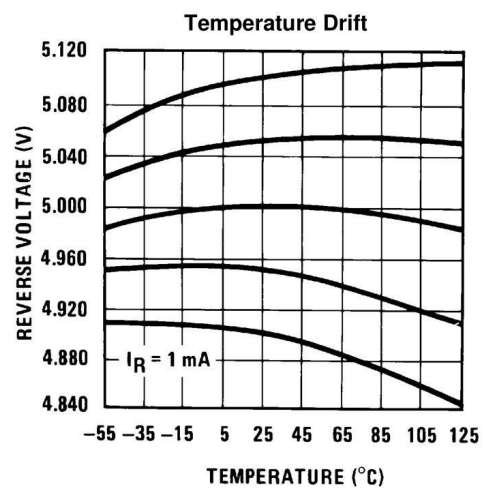


Figure 10.

TYPICAL PERFORMANCE CHARACTERISTICS(continued)

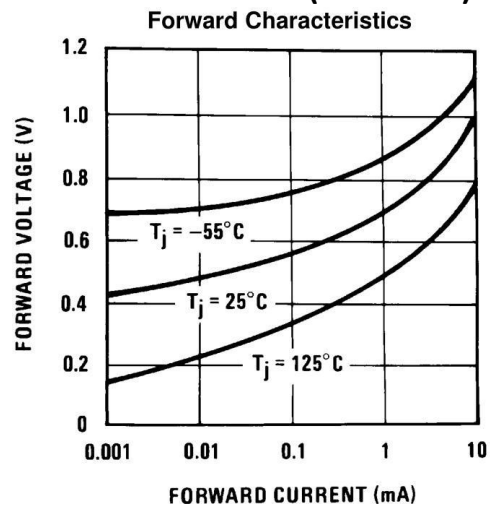
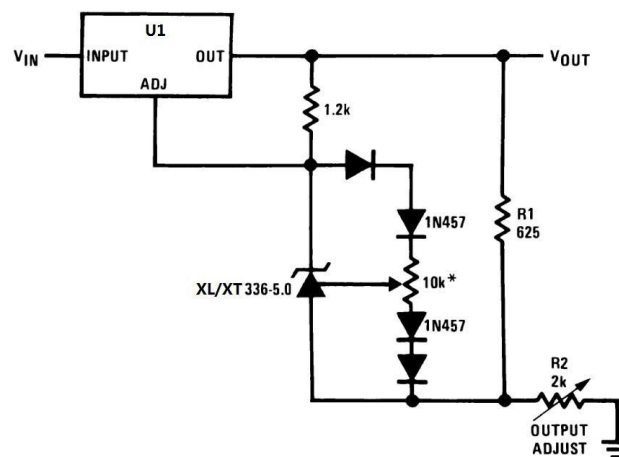


Figure 11.



* Adjust for 6.25V across R1

Note 1: U1 uses a constant current source IC, such as an XL317 or equivalent.

Figure 12. Precision Power Regulator with Low Temperature Coefficient

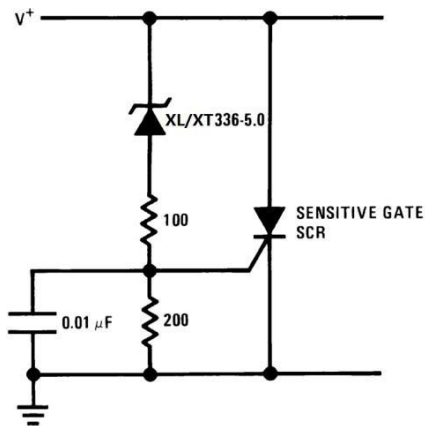


Figure 13.5V Crowbar

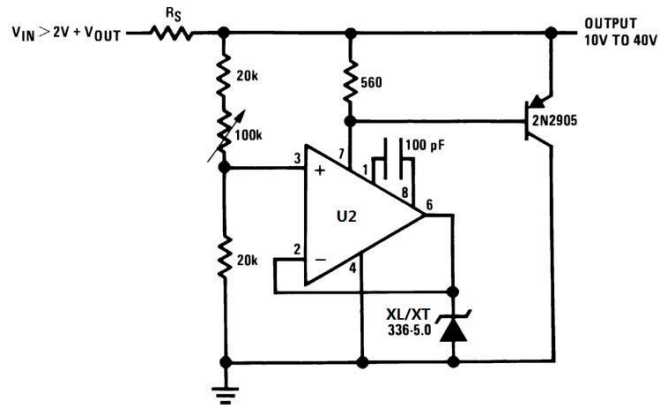


Figure 14. Adjustable Shunt Regulator

Note 2: U2 uses a constant current source IC, such as an LM308A or equivalent.

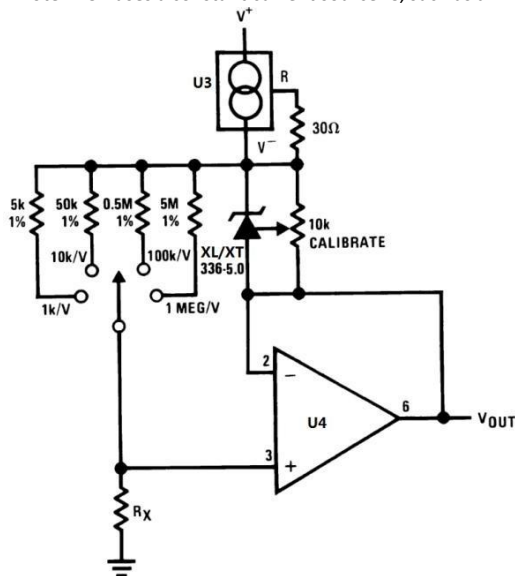


Figure 15. Linear Ohmmeter

Note 3: U3 uses a constant current source IC, such as an LM334 or equivalent.

Note 4: U4 uses a constant current source IC, such as an LM312 or equivalent.

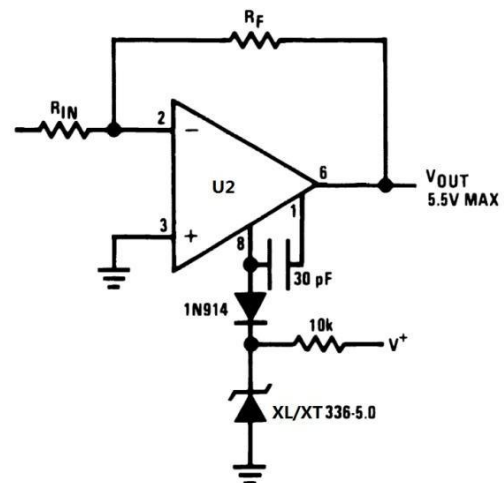


Figure 16. Linear Ohmmeter

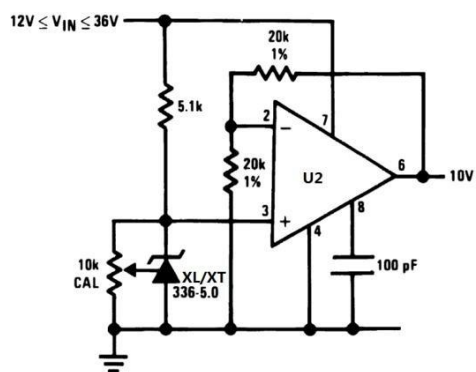


Figure 17.10V Buffered Reference

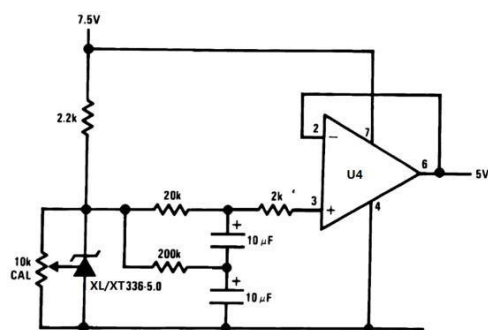


Figure 18.Low Noise Buffered Reference

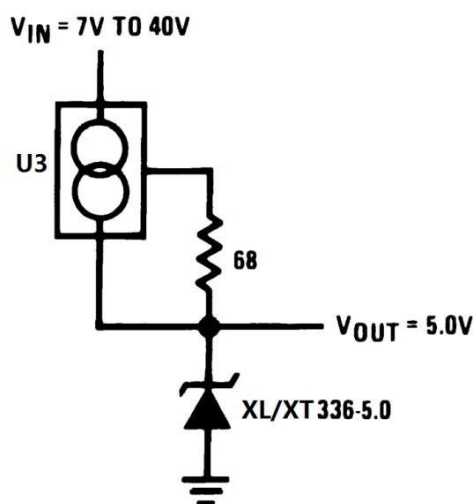
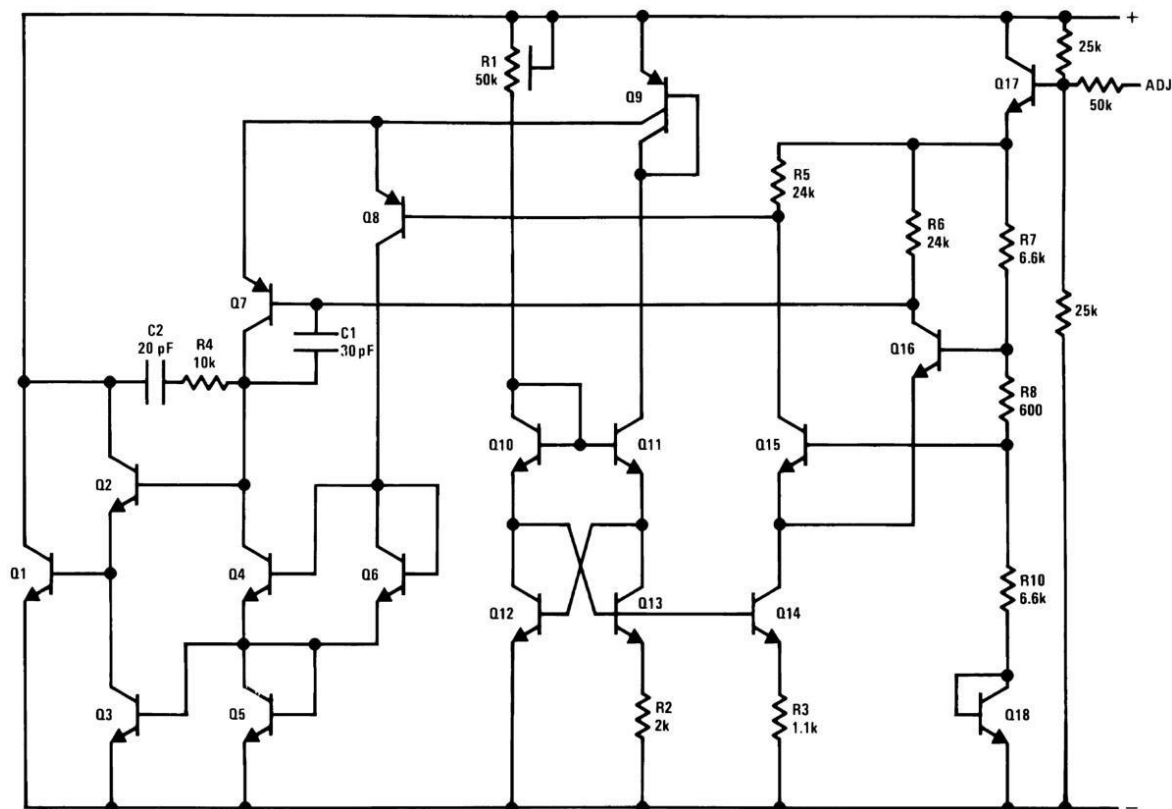


Figure 19.Wide Input Range Reference

9. SCHEMATIC DIAGRAM

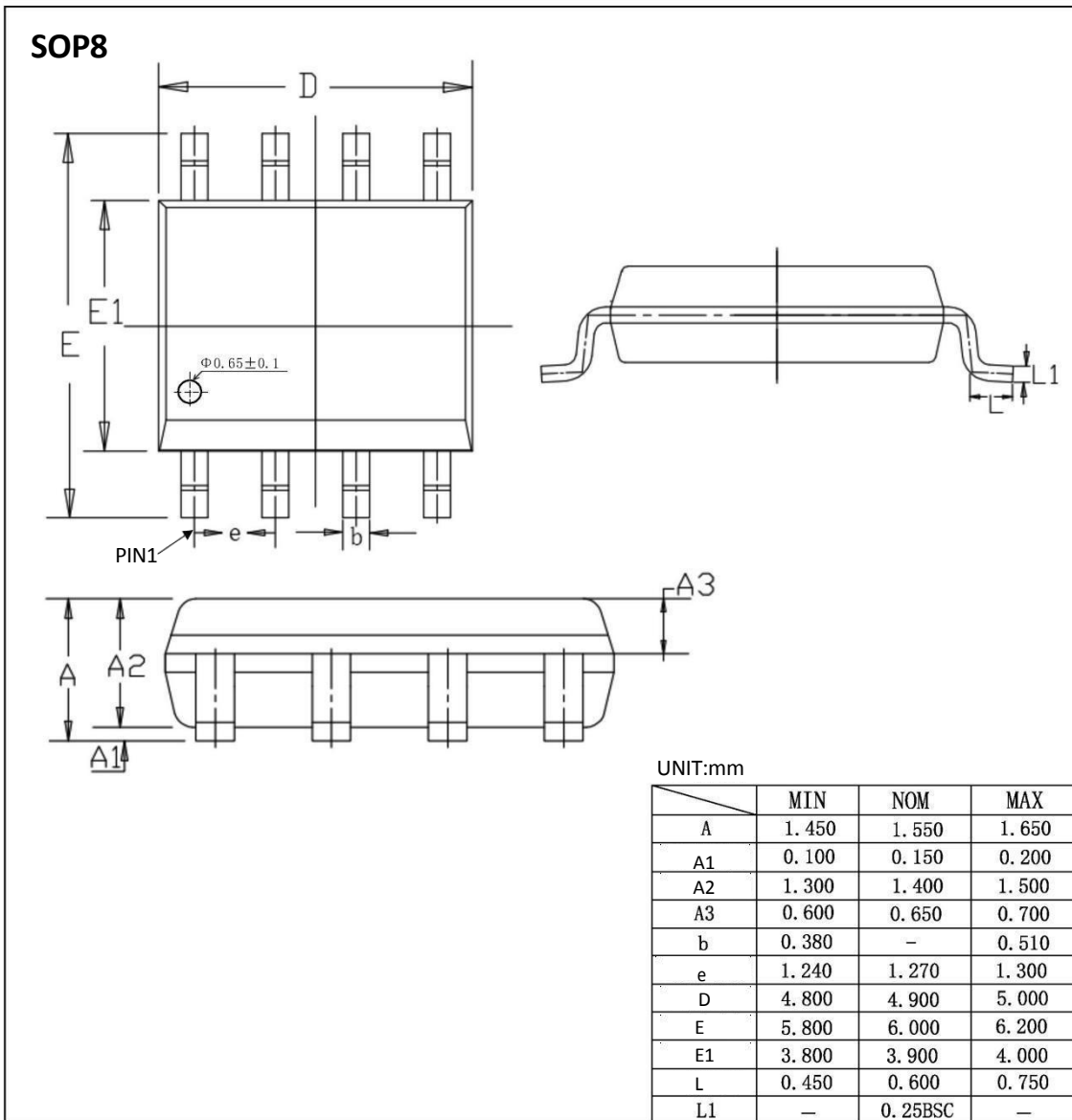


10. ORDERING INFORMATION

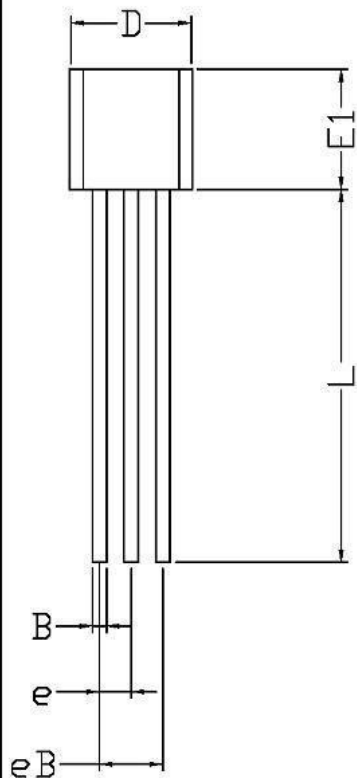
Ordering Information

Part Number	Device Marking	Package Type	Bodysize (mm)	Temperature (°C)	MSL	Transport Media	Package Quantity
XL336-5.0	XL336-5.0	SOP8	4.90 * 3.90	- 40 to 85	MSL3	T&R	2500
XT336-5.0	XT336-5.0	TO-92	4.58 * 4.58	- 40 to 85	MSL3	T&R	1000

11. DIMENSIONAL DRAWINGS



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

