

BCX71JLT1G

General Purpose Transistor

PNP Silicon

Features

- Moisture Sensitivity Level: 1
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector – Emitter Voltage	V_{CEO}	-45	Vdc
Collector – Base Voltage	V_{CBO}	-45	Vdc
Emitter – Base Voltage	V_{EBO}	-5.0	Vdc
Collector Current – Continuous	I_C	-100	mAdc

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation (Note 1) $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	350 2.8	mW mW/ $^\circ\text{C}$
Storage Temperature	T_{stg}	150	$^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient (Note 1)	$R_{\theta JA}$	357	$^\circ\text{C/W}$

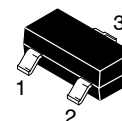
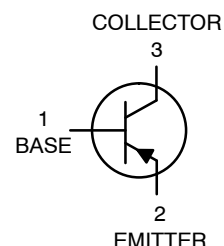
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. Package mounted on 99.5% alumina 10 X 8 X 0.6 mm.



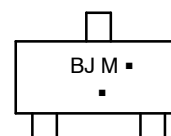
ON Semiconductor®

<http://onsemi.com>



SOT-23
CASE 318
STYLE 6

MARKING DIAGRAM



BJ = Device Code
M = Date Code*
▪ = Pb-Free Package

(Note: Microdot may be in either location)

*Date Code orientation and/or overbar may vary depending upon manufacturing location.

ORDERING INFORMATION

Device	Package	Shipping†
BCX71JLT1G	SOT-23 (Pb-free)	3000/Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

BCX71JLT1G

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector–Emitter Breakdown Voltage (I _C = 2.0 mA _{dc} , I _B = 0)	V _{(BR)CEO}	–45	–	V _{dc}
Collector–Base Breakdown Voltage (I _E = 1.0 μA _{dc} , I _E = 0)	V _{(BR)EBO}	–5.0	–	V _{dc}
Collector Cutoff Current (V _{CE} = 32 V _{dc}) (V _{CE} = 32 V _{dc} , T _A = 150°C)	I _{CES}	–	–20	nA _{dc} μA _{dc}

ON CHARACTERISTICS

DC Current Gain (I _C = 10 μA _{dc} , V _{CE} = 5.0 V _{dc}) (I _C = 2.0 mA _{dc} , V _{CE} = 5.0 V _{dc}) (I _C = 50 mA _{dc} , V _{CE} = 1.0 V _{dc}) (I _C = 2.0 mA _{dc} , V _{CE} = 5.0 V _{dc} , f = 1.0 kHz)	h _{FE}	40 250 100 250	– 460 – 500	–
Collector–Emitter Saturation Voltage (I _C = 10 mA _{dc} , I _B = 0.25 mA _{dc}) (I _C = 50 mA _{dc} , I _B = 1.25 mA _{dc})	V _{CE(sat)}	– –	–0.25 –0.55	V _{dc}
Base–Emitter Saturation Voltage (I _C = 1.0 mA _{dc} , V _{CE} = 5.0 V _{dc}) (I _C = 10 mA _{dc} , V _{CE} = 5.0 V _{dc})	V _{BE(sat)}	–0.6 –0.68	–0.85 –1.05	V _{dc}
Base–Emitter On Voltage (I _C = 2.0 mA _{dc} , V _{CE} = 5.0 V _{dc})	V _{BE(on)}	–0.6	–0.75	V _{dc}
Output Capacitance (V _{CE} = 10 V _{dc} , I _C = 0, f = 1.0 MHz)	C _{obo}	–	6.0	pF
Noise Figure (I _C = 0.2 mA _{dc} , V _{CE} = 5.0 V _{dc} , R _S = 2.0 kΩ, f = 1.0 kHz, BW = 200 Hz)	NF	–	6.0	dB

SWITCHING CHARACTERISTICS

Turn-On Time (I _C = 10 mA _{dc} , I _{B1} = 1.0 mA _{dc})	t _{on}	–	150	ns
Turn-Off Time (I _{B2} = 1.0 mA _{dc} , V _{BB} = 3.6 V _{dc} , R1 = R2 = 5.0 kΩ, R _L = 990 Ω)	t _{off}	–	800	ns

TYPICAL NOISE CHARACTERISTICS

(V_{CE} = –5.0 V_{dc}, T_A = 25°C)

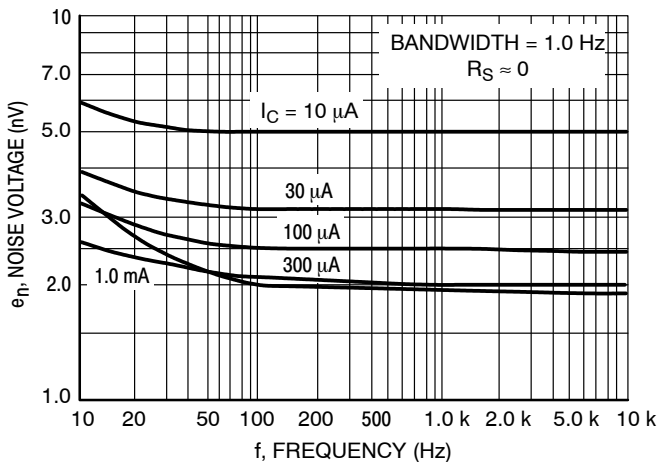


Figure 1. Noise Voltage

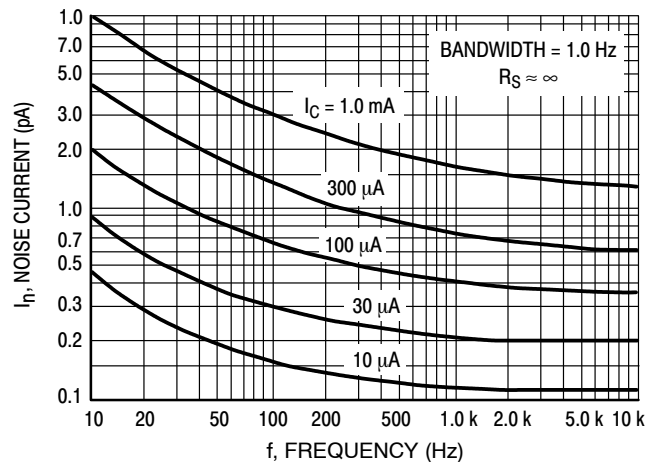


Figure 2. Noise Current

BCX71JLT1G

NOISE FIGURE CONTOURS

($V_{CE} = -5.0 \text{ Vdc}$, $T_A = 25^\circ\text{C}$)

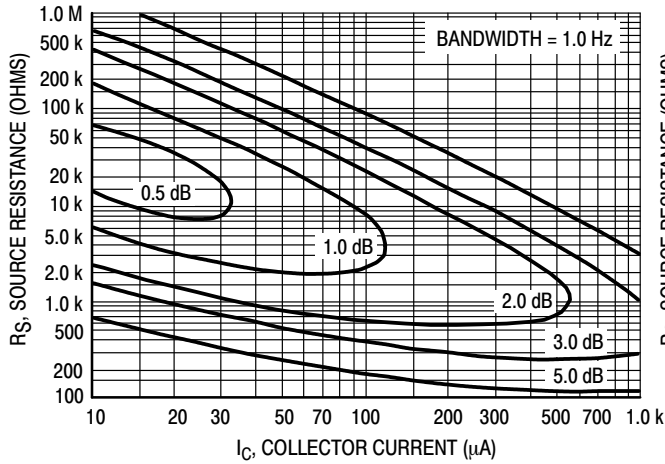


Figure 3. Narrow Band, 100 Hz

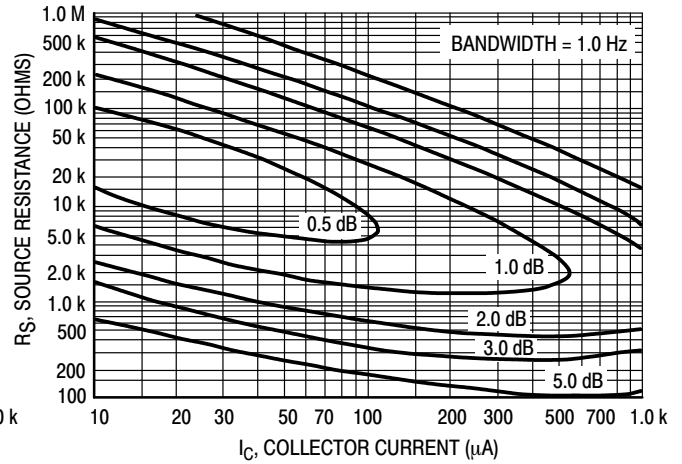


Figure 4. Narrow Band, 1.0 kHz

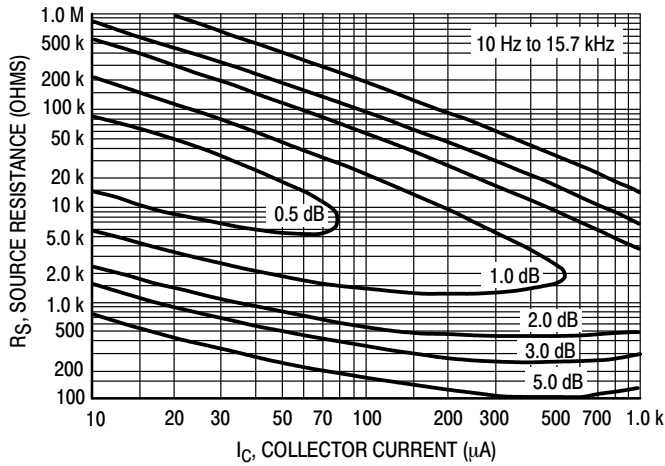


Figure 5. Wideband

Noise Figure is Defined as:

$$NF = 20 \log_{10} \left[\frac{e_n^2 + 4KTR_S + I_n^2 R_S^2}{4KTR_S} \right]^{1/2}$$

e_n = Noise Voltage of the Transistor referred to the input. (Figure 3)
 I_n = Noise Current of the Transistor referred to the input. (Figure 4)
 K = Boltzman's Constant ($1.38 \times 10^{-23} \text{ J/}^\circ\text{K}$)
 T = Temperature of the Source Resistance ($^\circ\text{K}$)
 R_S = Source Resistance (Ohms)

TYPICAL STATIC CHARACTERISTICS

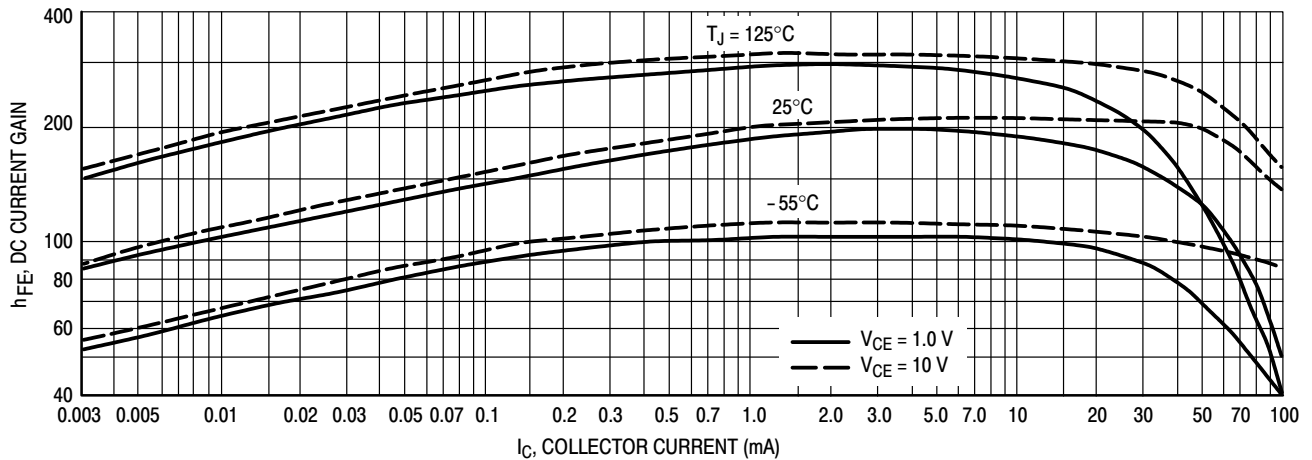


Figure 6. DC Current Gain

TYPICAL STATIC CHARACTERISTICS

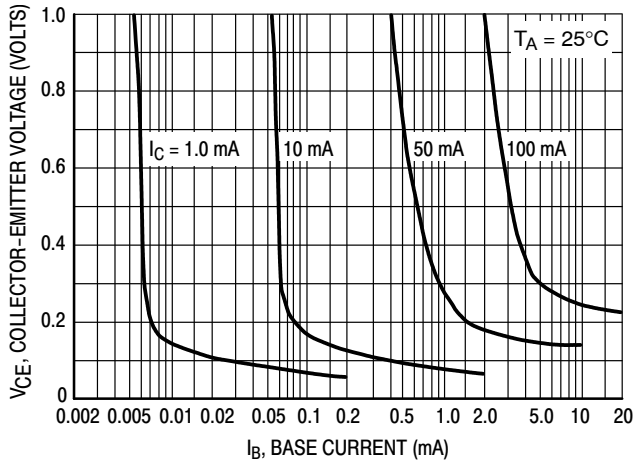


Figure 7. Collector Saturation Region

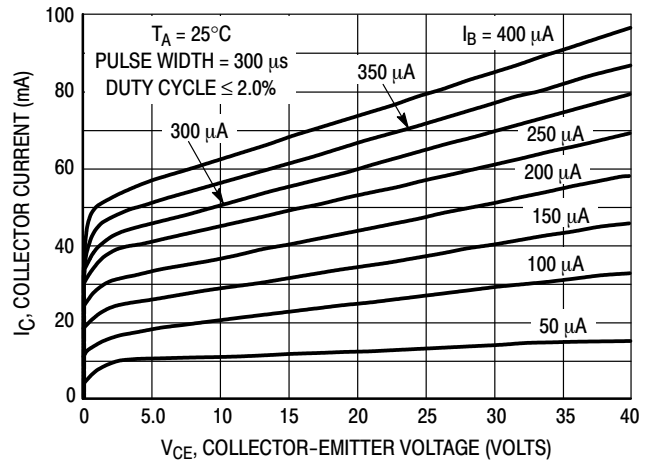


Figure 8. Collector Characteristics

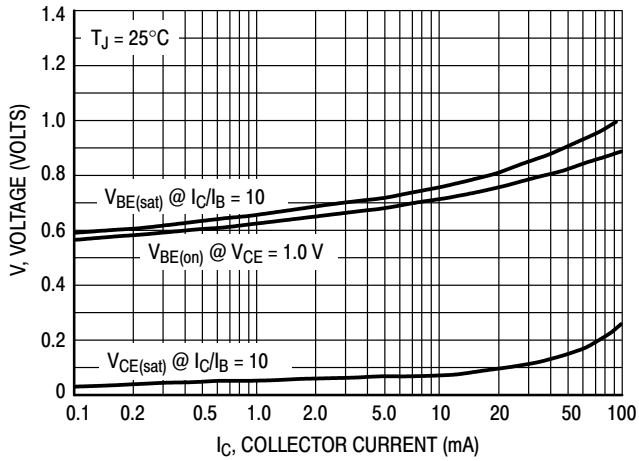


Figure 9. "On" Voltages

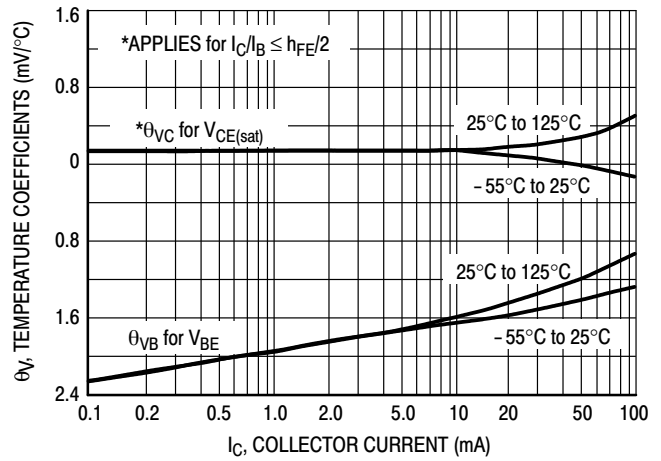


Figure 10. Temperature Coefficients

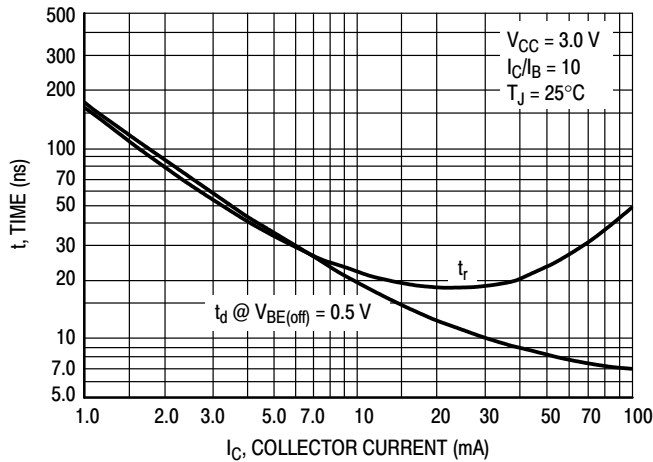


Figure 11. Turn-On Time

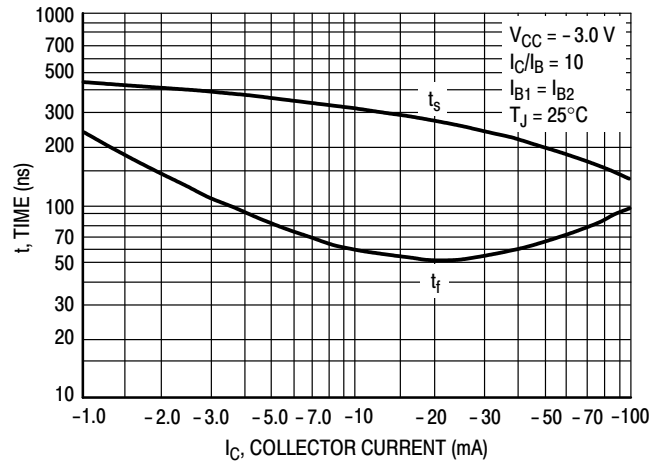


Figure 12. Turn-Off Time

BCX71JLT1G

TYPICAL DYNAMIC CHARACTERISTICS

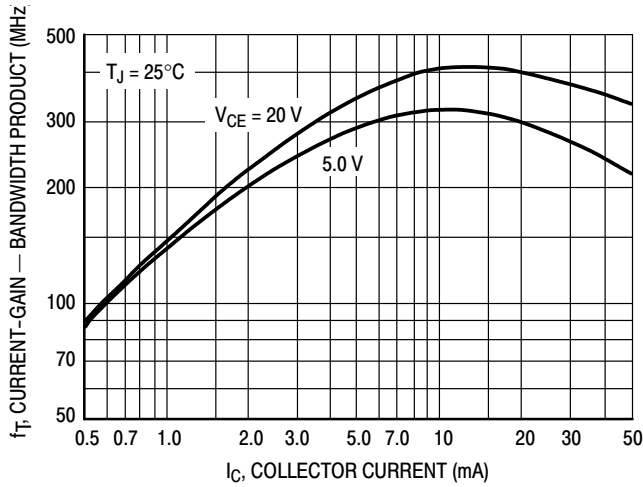


Figure 13. Current-Gain — Bandwidth Product

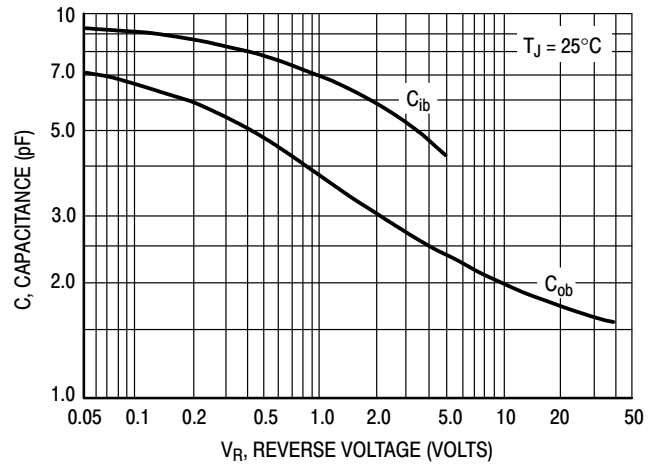


Figure 14. Capacitance

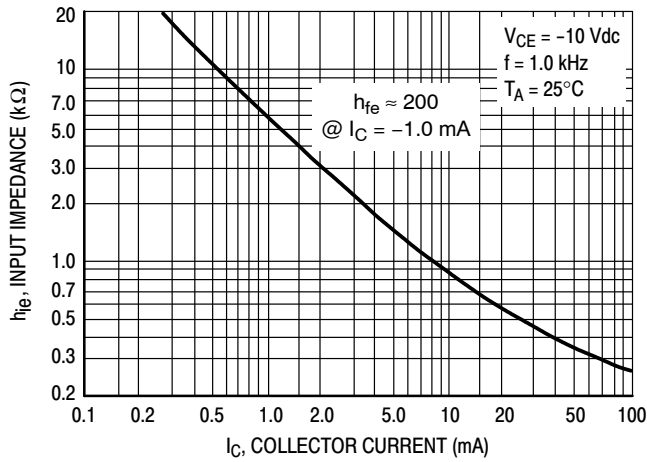


Figure 15. Input Impedance

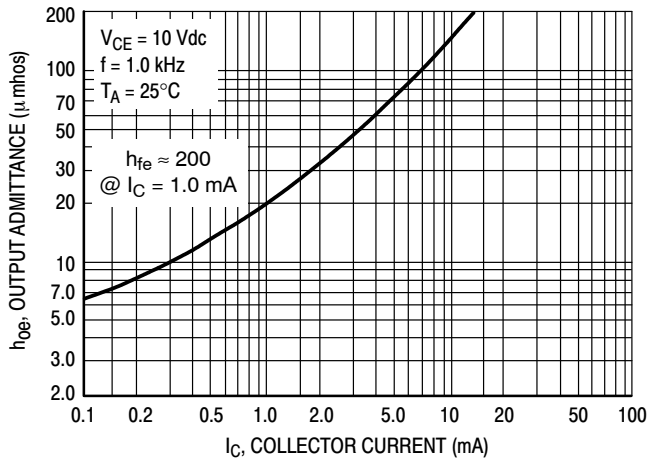


Figure 16. Output Admittance

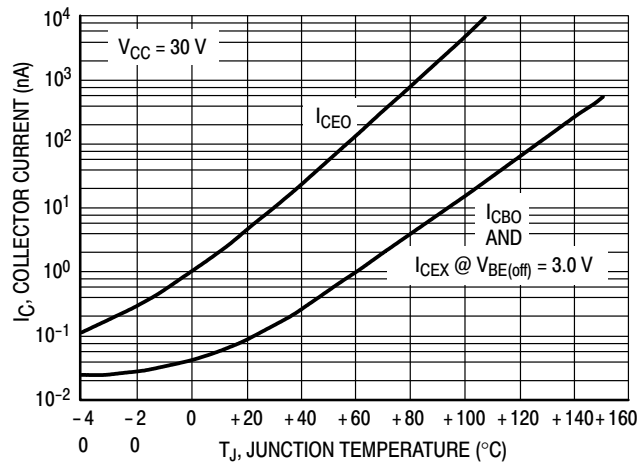
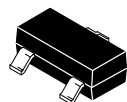


Figure 17. Typical Collector Leakage Current

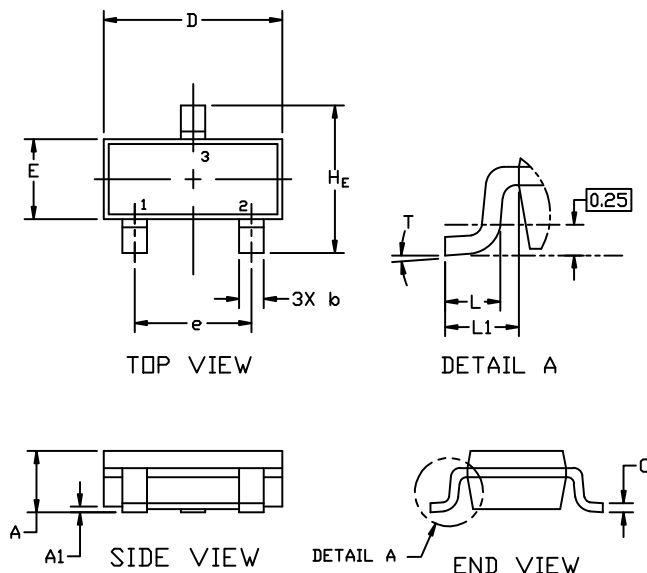
MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS



SCALE 4:1

SOT-23 (TO-236)
CASE 318
ISSUE AT

DATE 01 MAR 2023

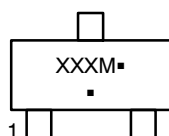


NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M,1994.
2. CONTROLLING DIMENSION: MILLIMETERS
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

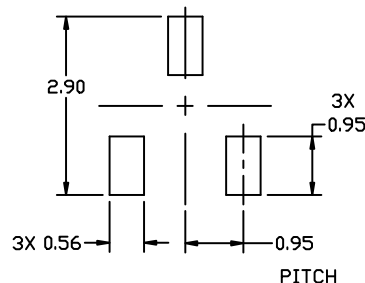
DIM	MILLIMETERS			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.89	1.00	1.11	0.035	0.039	0.044
A1	0.01	0.06	0.10	0.000	0.002	0.004
b	0.37	0.44	0.50	0.015	0.017	0.020
c	0.08	0.14	0.20	0.003	0.006	0.008
D	2.80	2.90	3.04	0.110	0.114	0.120
E	1.20	1.30	1.40	0.047	0.051	0.055
e	1.78	1.90	2.04	0.070	0.075	0.080
L	0.30	0.43	0.55	0.012	0.017	0.022
L1	0.35	0.54	0.69	0.014	0.021	0.027
H _E	2.10	2.40	2.64	0.083	0.094	0.104
T	0°	---	10°	0°	---	10°

GENERIC MARKING DIAGRAM*



XXX = Specific Device Code
M = Date Code
▪ = Pb-Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.



RECOMMENDED MOUNTING FOOTPRINT

* For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

STYLES ON PAGE 2

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MECHANICAL CASE OUTLINE

PACKAGE DIMENSIONS



SOT-23 (TO-236) CASE 318 ISSUE AT

DATE 01 MAR 2023

STYLE 1 THRU 5: CANCELLED	STYLE 6: PIN 1. BASE 2. EMITTER 3. COLLECTOR	STYLE 7: PIN 1. EMITTER 2. BASE 3. COLLECTOR	STYLE 8: PIN 1. ANODE 2. NO CONNECTION 3. CATHODE		
STYLE 9: PIN 1. ANODE 2. ANODE 3. CATHODE	STYLE 10: PIN 1. DRAIN 2. SOURCE 3. GATE	STYLE 11: PIN 1. ANODE 2. CATHODE 3. CATHODE-ANODE	STYLE 12: PIN 1. CATHODE 2. CATHODE 3. ANODE	STYLE 13: PIN 1. SOURCE 2. DRAIN 3. GATE	STYLE 14: PIN 1. CATHODE 2. GATE 3. ANODE
STYLE 15: PIN 1. GATE 2. CATHODE 3. ANODE	STYLE 16: PIN 1. ANODE 2. CATHODE 3. CATHODE	STYLE 17: PIN 1. NO CONNECTION 2. ANODE 3. CATHODE	STYLE 18: PIN 1. NO CONNECTION 2. CATHODE 3. ANODE	STYLE 19: PIN 1. CATHODE 2. ANODE 3. CATHODE-ANODE	STYLE 20: PIN 1. CATHODE 2. ANODE 3. GATE
STYLE 21: PIN 1. GATE 2. SOURCE 3. DRAIN	STYLE 22: PIN 1. RETURN 2. OUTPUT 3. INPUT	STYLE 23: PIN 1. ANODE 2. ANODE 3. CATHODE	STYLE 24: PIN 1. GATE 2. DRAIN 3. SOURCE	STYLE 25: PIN 1. ANODE 2. CATHODE 3. GATE	STYLE 26: PIN 1. CATHODE 2. ANODE 3. NO CONNECTION
STYLE 27: PIN 1. CATHODE 2. CATHODE 3. CATHODE	STYLE 28: PIN 1. ANODE 2. ANODE 3. ANODE				

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