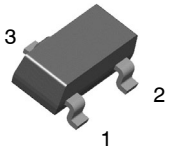
PNP Epitaxial Silicon Transistor

BSR16



SOT−23
CASE 318

PNP General Purpose Amplifier

- This Device Designed for Use as General Purpose Amplifier and Switches Requiring Collector Currents to 500 mA
- Sourced from Process 63
- See BCW68G for Characteristics

ABSOLUTE MAXIMUM RATINGS

(T_A = 25°C, unless otherwise specified.)

Symbol	Parameter	Value	Unit
V_{CEO}	Collector−Emitter Voltage	−60	V
V_{CBO}	Collector−Base Voltage	−60	V
V_{EBO}	Emitter−Base Voltage	−5.0	V
I_C	Collector Current − Continuous	−800	mA
T_J, T_{ST}	Operating and Storage Junction Temperature Range	−55 ~ +150	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. These ratings are based on a maximum junction temperature of 150°C.
2. These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

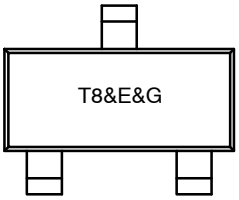
THERMAL CHARACTERISTICS

(T_A = 25°C, unless otherwise specified)

Symbol	Parameter	Max.	Unit
P_D	Total Device Dissipation Derate above 25°C	350 2.8	mW mW/°C
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	357	°C/W

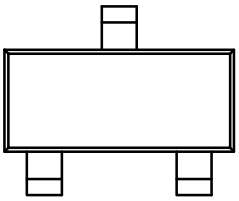
3. Device mounted on FR−4 PCB 40 mm × 40 mm × 1.5 mm.

MARKING DIAGRAM



T8	Specific Device Code
&E	Designates Space
&G	Date Code (Week)

PIN ASSIGNMENT



ORDERING INFORMATION

Device	Package	Shipping†
BSR16	SOT−23 (Pb−Free)	3,000 / Tape & Reel

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

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ELECTRICAL CHARACTERISTICS (T_A = 25°C, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
$BV_{(BR)CEO}$	Collector−Emitter Breakdown Voltage	I_C = −10 mA, I_B = 0	−60			V
$BV_{(BR)CBO}$	Collector−Base Breakdown Voltage	I_C = −100 μA, I_E = 0	−60			V
$BV_{(BR)EBO}$	Emitter−Base Breakdown Voltage	I_E = −10 μA, I_C = 0	−5.0			V
I_{CBO}	Collector Cut−off Current	V_{CB} = −50 V V_{CB} = −50 V, T_A = 150°C			−10 −10	nA μA
I_{CEX}	Collector Cut−off Current	V_{CE} = −30 V, V_{EB} = −0.5 V			−50	nA
I_{BEX}	Reverse Base Current	V_{CE} = −30 V, V_{EB} = −3.0 V			−50	nA
ON CHARACTERISTICS						
h_{FE}	DC Current Gain	I_C = −0.1 mA, V_{CE} = −10 V I_C = −1.0 mA, V_{CE} = −10 V I_C = −10 mA, V_{CE} = −10 V I_C = −150 mA, V_{CE} = −10 V I_C = −500 mA, V_{CE} = −10 V	75 100 100 100 50	300		
V_{CE}(sat)	Collector−Emitter Saturation Voltage	I_C = −150 mA, I_B = −15 mA I_C = −500 mA, I_B = −50 mA			−0.4 −1.6	V
V_{BE}(sat)	Base−Emitter Saturation Voltage	I_C = −150 mA, I_B = −15 mA I_C = −500 mA, I_B = −50 mA			−1.3 −2.6	V
SMALL SIGNAL CHARACTERISTICS						
f_T	Current Gain Bandwidth Product	I_C = −50 mA, V_{CE} = −20 V, f = 100 MHz, T_A = 25°C	200			MHz
C_{cb}	Output Capacitance	V_{CB} = −10 V, I_E = 0, f = 1.0 MHz			8.0	pF
C_{eb}	Emitter−Base Capacitance	V_{CB} = −2.0 V, I_E = 0, f = 1.0 MHz			30	pF
SWITCHING CHARACTERISTICS						
t_{on}	Turn−On Time	V_{CC} = −30 V, I_C = −150 mA, I_{B1} = −15 mA			45	ns
t_d	Delay Time				10	ns
t_r	Rise Time				40	ns
t_{off}	Turn−Off Time	V_{CC} = −6 V, I_C = −150 mA, I_{B1} = I_{B2} = −15 mA			100	ns
t_s	Storage Time				80	ns
t_f	Fall Time				30	ns

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

Share Feedback
Your Opinion Matters

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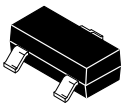
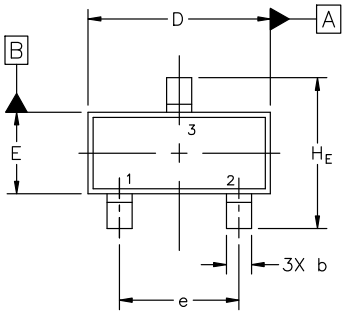


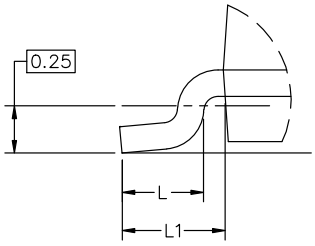
SCALE 4:1

SOT−23 (TO−236) 2.90x1.30x1.00 1.90P
CASE 318
ISSUE AU

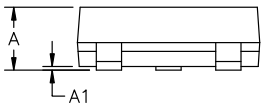
DATE 14 AUG 2024



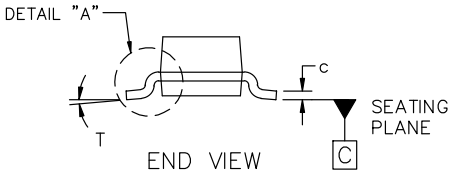
TOP VIEW



DETAIL "A"
Scale 3:1



SIDE VIEW

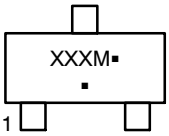


END VIEW

MILLIMETERS			
DIM	MIN	NOM	MAX
A	0.89	1.00	1.11
A1	0.01	0.06	0.10
b	0.37	0.44	0.50
c	0.08	0.14	0.20
D	2.80	2.90	3.04
E	1.20	1.30	1.40
e	1.78	1.90	2.04
L	0.30	0.43	0.55
L1	0.35	0.54	0.69
H_E	2.10	2.40	2.64
T	0°	−−−	10°

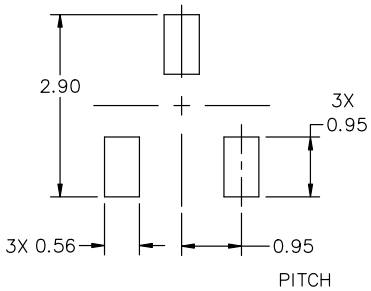
NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
2. CONTROLLING DIMENSIONS: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

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 onsemi Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

STYLES ON PAGE 2

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DESCRIPTION:	**SOT−23 (TO−236) 2.90x1.30x1.00 1.90P**	**PAGE 1 OF 2**

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CASE 318
ISSUE AU

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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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