BSP52T1

Preferred Device

NPN Small-Signal Darlington Transistor

This NPN small signal Darlington transistor is designed for use in switching applications, such as print hammer, relay, solenoid and lamp drivers. The device is housed in the SOT-223 package, which is designed for medium power surface mount applications.

Features

- Pb−Free Package is Available
- The SOT-223 Package can be soldered using wave or reflow. The formed leads absorb thermal stress during soldering, eliminating the possibility of damage to the die
- Available in 12 mm Tape and Reel
  Use BSP52T1 to order the 7 inch/1000 unit reel
- PNP Complement is BSP62T1

MAXIMUM RATINGS (T_C = 25°C unless otherwise noted)

Rating	Symbol	Max	Unit
Collector-Emitter Voltage	V_{CES}	80	Vdc
Collector-Base Voltage	V_{CBO}	90	Vdc
Emitter-Base Voltage	V_{EBO}	5.0	Vdc
Collector Current	I_C	1.0	Adc
Total Power Dissipation (Note 1) @ T_A = 25°C Derate above 25°C	P_D	 0.8 6.4	 W mW/°C
Total Power Dissipation (Note 2) @ T_A = 25°C Derate above 25°C	P_D	 1.25 10	 W mW/°C
Operating and Storage Temperature Range	T_J, T_{stg}	−65 to 150	°C

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Value	Unit
Thermal Resistance (Note 1) Junction-to-Ambient	$R_{\theta JA}$	156	°C/W
Thermal Resistance (Note 2) Junction-to-Ambient	$R_{\theta JA}$	100	°C/W
Maximum Temperature for Soldering Purposes Time in Solder Bath	T_L	260 10	°C Sec

1. Device mounted on a FR-4 glass epoxy printed circuit board using minimum recommended footprint.
2. Device mounted on a FR-4 glass epoxy printed circuit board using 1 cm^2 pad.

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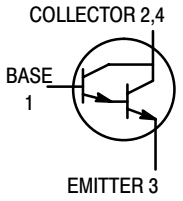
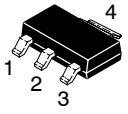
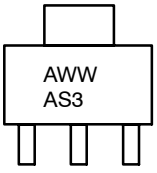
MEDIUM POWER NPN SILICON SURFACE MOUNT DARLINGTON TRANSISTOR



MARKING DIAGRAM



SOT−223
CASE 318E
STYLE 1



A = Assembly Location
WW = Date Code
AS3 = Specific Device Code

ORDERING INFORMATION

Device	Package	Shipping†
BSP52T1	SOT−223	1000/Tape & Reel
BSP52T1G	SOT−223 (Pb−Free)	1000/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.

Preferred devices are recommended choices for future use and best overall value.

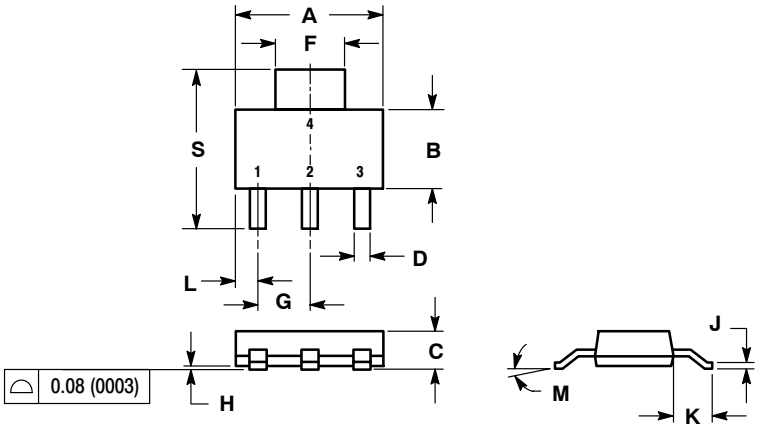
ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristics	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Base Breakdown Voltage (I_C = 100 μAdc, I_E = 0)	$V_{(BR)CBO}$	90	–	Vdc
Emitter-Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)	$V_{(BR)EBO}$	5.0	–	Vdc
Collector-Emitter Cutoff Current (V_{CE} = 80 Vdc, V_{BE} = 0)	I_{CES}	–	10	μAdc
Emitter-Base Cutoff Current (V_{EB} = 4.0 Vdc, I_C = 0)	I_{EBO}	–	10	μAdc
ON CHARACTERISTICS (Note 3)				
DC Current Gain (I_C = 150 mAdc, V_{CE} = 10 Vdc) (I_C = 500 mAdc, V_{CE} = 10 Vdc)	h_{FE}	 1000 2000	 – –	–
Collector-Emitter Saturation Voltage (I_C = 500 mAdc, I_B = 0.5 mAdc)	$V_{CE(sat)}$	–	1.3	Vdc
Base-Emitter Saturation Voltage (I_C = 500 mAdc, I_B = 0.5 mAdc)	$V_{BE(sat)}$	–	1.9	Vdc

3. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%

PACKAGE DIMENSIONS

SOT−223
CASE 318E−04
ISSUE K

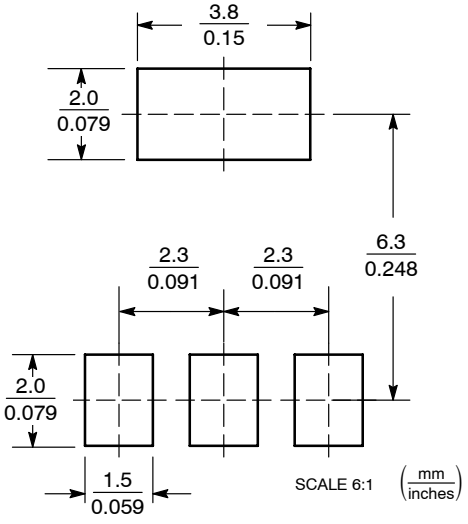


NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.249	0.263	6.30	6.70
B	0.130	0.145	3.30	3.70
C	0.060	0.068	1.50	1.75
D	0.024	0.035	0.60	0.89
F	0.115	0.126	2.90	3.20
G	0.087	0.094	2.20	2.40
H	0.0008	0.0040	0.020	0.100
J	0.009	0.014	0.24	0.35
K	0.060	0.078	1.50	2.00
L	0.033	0.041	0.85	1.05
M	0 °	10 °	0 °	10 °
S	0.264	0.287	6.70	7.30

STYLE 1:
PIN 1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

SOLDERING 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.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 61312, Phoenix, Arizona 85082−1312 USA
Phone: 480−829−7710 or 800−344−3860 Toll Free USA/Canada
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BSP52T1/D

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