NPN Small-Signal Darlington Transistor

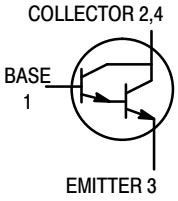
BSP52T1G, BSP52T3G, SBSP52T1G

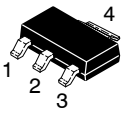
MEDIUM POWER NPN SILICON SURFACE MOUNT DARLINGTON TRANSISTOR

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

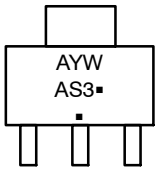
- The SOT-223 Package can be soldered using wave or reflow. The formed leads absorb thermal stress during soldering, eliminating the possibility of damage to the die
- Available in 12 mm Tape and Reel
  Use BSP52T1 to Order the 7 Inch/1000 Unit Reel
- PNP Complement is BSP62T1
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant
- S Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC−Q101 Qualified and PPAP Capable





SOT−223
CASE 318E
STYLE 1

MARKING DIAGRAM



A	= Assembly Location
Y	= Year
W	= Work Week
AS3	= Specific Device Code
▪	= Pb−Free Package

(Note: Microdot may be in either location)

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

Rating	Symbol	Max	Unit
Collector-Emitter Voltage	V_{CES}	80	V
Collector-Base Voltage	V_{CBO}	90	V
Emitter-Base Voltage	V_{EBO}	5.0	V
Collector Current	I_C	1.0	A
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

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

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. 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.

ORDERING INFORMATION

Device	Package	Shipping†
BSP52T1G, SBSP52T1G	SOT−223 (Pb−Free)	1000 / Tape & Reel
BSP52T3G	SOT−223 (Pb−Free)	4000 / 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.

© Semiconductor Components Industries, LLC, 2012

Downloaded from Arrow.com.

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

Characteristics	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Base Breakdown Voltage (I_C = 100 μA, I_E = 0)	$V_{(BR)CBO}$	90	–	–	V
Emitter-Base Breakdown Voltage (I_E = 10 μA, I_C = 0)	$V_{(BR)EBO}$	5.0	–	–	V
Collector-Emitter Cutoff Current (V_{CE} = 80 V, V_{BE} = 0)	I_{CES}	–	–	10	μA
Emitter-Base Cutoff Current (V_{EB} = 4.0 V, I_C = 0)	I_{EBO}	–	–	10	μA
ON CHARACTERISTICS (Note 3)					
DC Current Gain (I_C = 150 mA, V_{CE} = 10 V) (I_C = 500 mA, V_{CE} = 10 V)	h_{FE}	1000 2000	– –	– –	–
Collector-Emitter Saturation Voltage (I_C = 500 mA, I_B = 0.5 mA)	$V_{CE(sat)}$	–	–	1.3	V
Base-Emitter Saturation Voltage (I_C = 500 mA, I_B = 0.5 mA)	$V_{BE(sat)}$	–	–	1.9	V
SWITCHING CHARACTERISTICS					
Rise Time (V_{CC} = 10 V, I_C = 150 mA, I_{B1} = 0.15 mA)	t_r	–	155	–	ns
Delay Time (V_{CC} = 10 V, I_C = 150 mA, I_{B1} = 0.15 mA)	t_d	–	205	–	ns
Storage Time (V_{CC} = 10 V, I_C = 150 mA, I_{B1} = 0.15 mA, I_{B2} = 0.15 mA)	t_s	–	420	–	ns
Fall Time (V_{CC} = 10 V, I_C = 150 mA, I_{B1} = 0.15 mA, I_{B2} = 0.15 mA)	t_f	–	365	–	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.

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

Share Feedback
Your Opinion Matters

Downloaded from Arrow.com.

TYPICAL CHARACTERISTICS (T_J = 25°C unless otherwise noted)

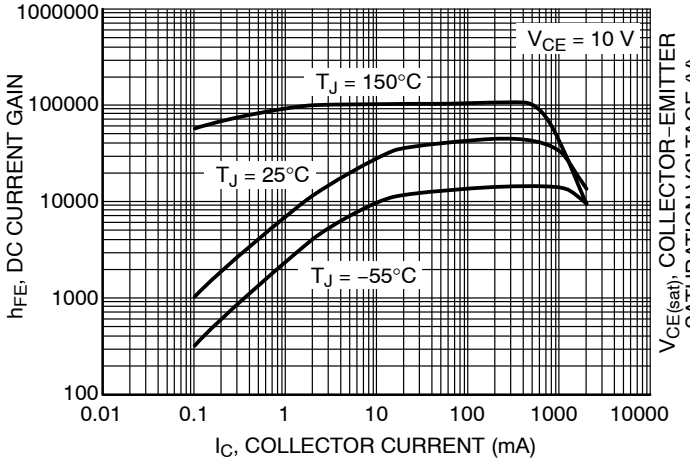


Figure 1. DC Current Gain

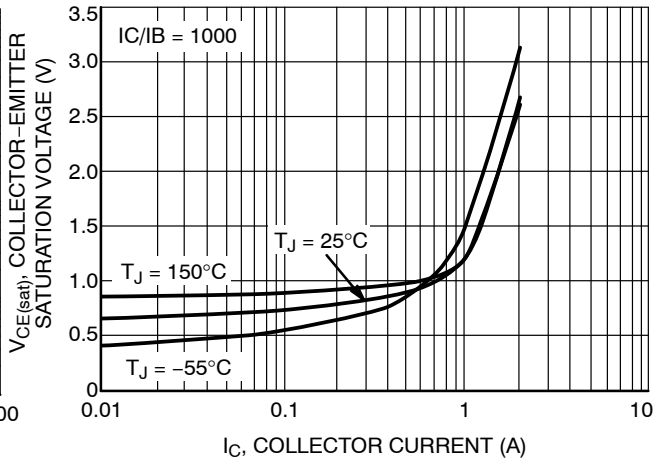


Figure 2. Collector−Emitter Saturation Voltage

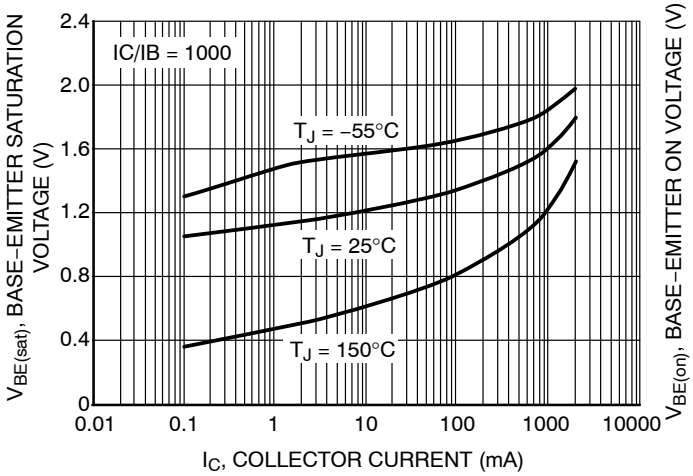


Figure 3. Base−Emitter Saturation Voltage

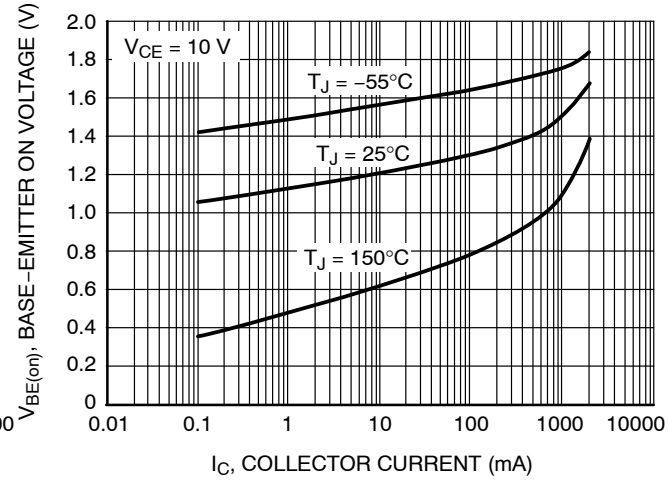


Figure 4. Base−Emitter ON Voltage

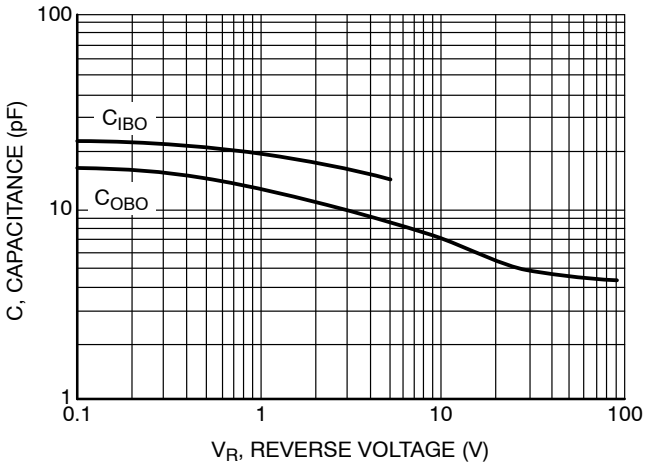


Figure 5. Capacitance

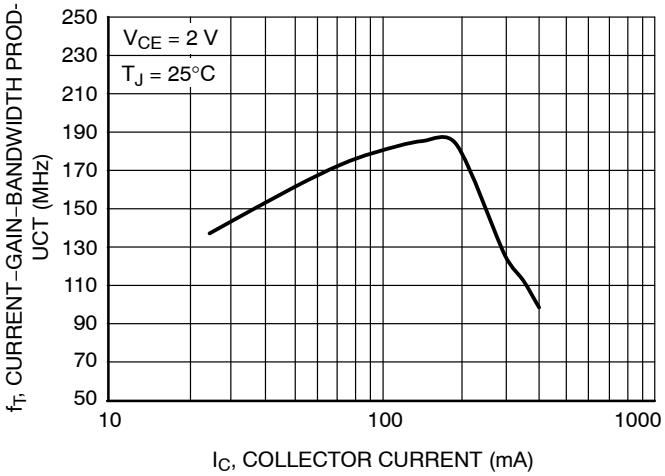


Figure 6. Current Gain Bandwidth Product vs. Collector Current

Share Feedback
Your Opinion Matters

Downloaded from Arrow.com.

onsemi, ONSEMI , and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent−Marking.pdf. **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as−is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:
Technical Library: www.onsemi.com/design/resources/technical−documentation
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support
For additional information, please contact your local Sales Representative at www.onsemi.com/support/sales

◊

Downloaded from Arrow.com.