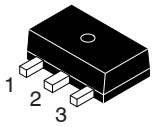
Bipolar Transistor

10 V, 3 A, Low V_{CE}(sat), NPN Single PCP

2SD1620

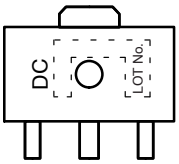


SOT−89 / PCP−1
CASE 419AU

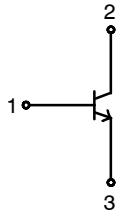
Features

- Less Power Dissipation Because of Low V_{CE}(sat), Permitting More Flashes of Light to be Emitted
- Large Current Capacity and Highly Resistant to Breakdown
- Excellent Linearity of h_{FE} in the Region from Low Current to High Current
- Ultrasmall Size Supports High−density, Ultrasmall−sized Hybrid IC Designs
- This is a Pb−Free Device

MARKING DIAGRAM



ELECTRICAL CONNECTION



Specifications

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Parameter	Symbol	Conditions	Ratings	Unit
Collector−to−Base Voltage	V_{CBO}		30	V
Collector−to−Emitter Voltage	V_{CEX}		20	V
Collector−to−Emitter Voltage	V_{CEO}		10	V
Emitter−to−Base Voltage	V_{EBO}		6	V
Collector Current	I_C		3	A
Collector Current (Pulse)	I_{CP}		5	A
Collector Dissipation	P_C		500	mW
		When mounted on ceramic substrate (250 mm^2 x 0.8 mm)	1.3	W
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		−55 to +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.

ORDERING INFORMATION

Device	Package	Shipping†
2SD1620−TD−E	PCP (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.

© Semiconductor Components Industries, LLC, 2013

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector Cutoff Current	I_{CBO}	V_{CB} = 20 V, I_E = 0 A	–	–	100	nA
Emitter Cutoff Current	I_{EBO}	V_{EB} = 4 V, I_C = 0 A	–	–	100	nA
DC Current Gain	h_{FE}	V_{CE} = 2 V, I_C = 3 A	140	210	–	
Gain−Bandwidth Product	f_T	V_{CE} = 10 V, I_C = 50 mA	–	200	–	MHz
Output Capacitance	Cob	V_{CB} = 10 V, f = 1 MHz	–	30	–	pF
Collector−to−Emitter Saturation Voltage	V_{CE}(sat)	I_C = 3 A, I_B = 60 mA	–	0.3	0.4	V
Collector−to−Base Breakdown Voltage	$V_{(BR)CBO}$	I_C = 10 μA, I_E = 0 A	30	–	–	V
Collector−to−Emitter Breakdown Voltage	$V_{(BR)CEX}$	I_C = 1 mA, R_{BE} = 3 V	20	–	–	V
Collector−to−Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 1 mA, R_{BE} = ∞	10	–	–	V
Emitter−to−Base Breakdown Voltage	$V_{(BR)EBO}$	I_E = 10 μA, I_C = 0 A	6	–	–	V

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.

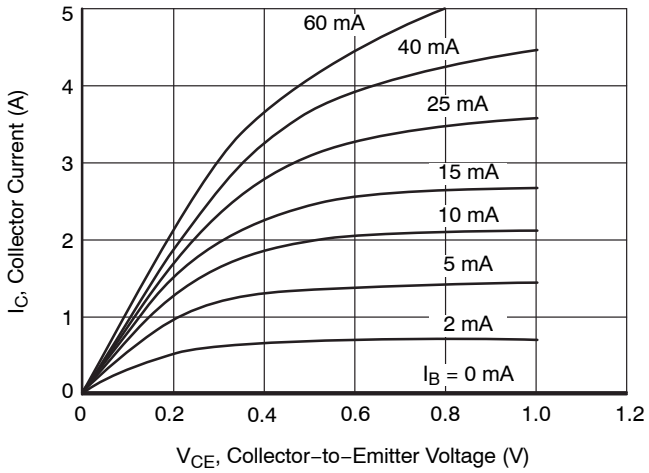


Figure 1. I_C – V_{CE}

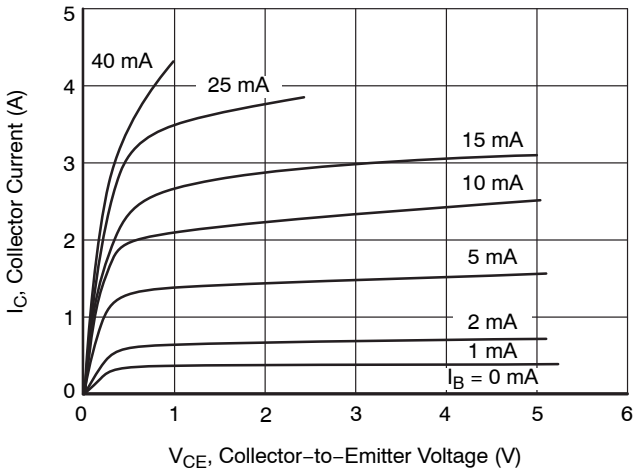


Figure 2. I_C – V_{CE}

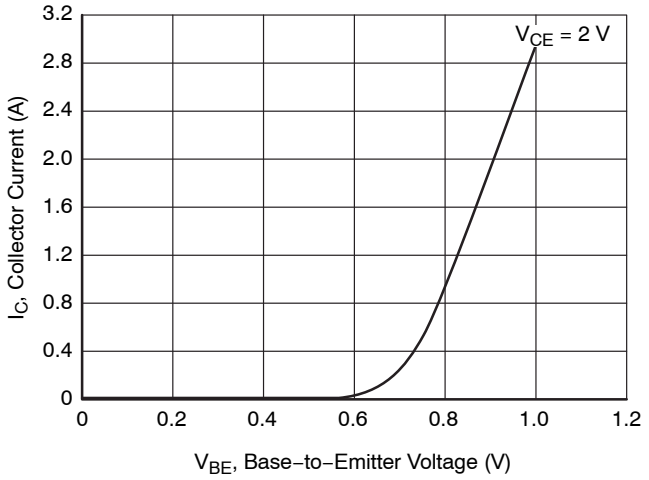


Figure 3. I_C – V_{BE}

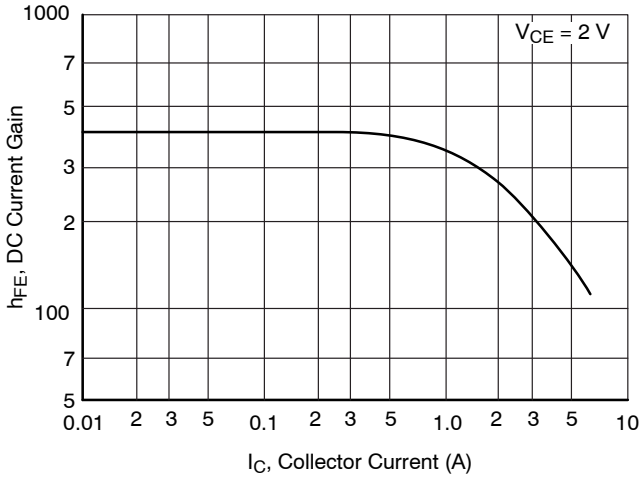


Figure 4. h_{FE} – I_C

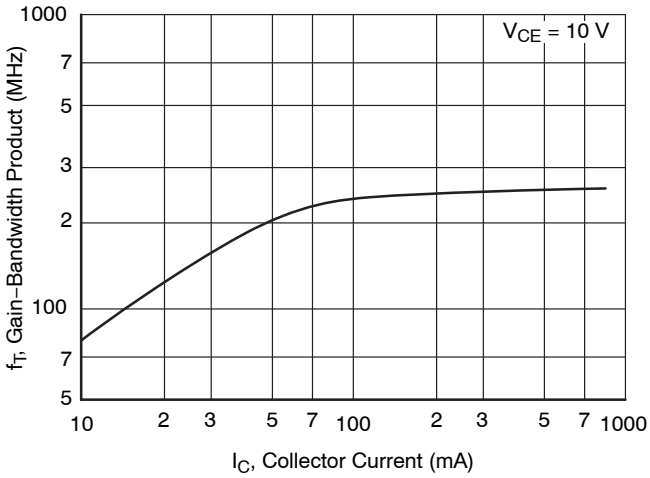


Figure 8. f_T – I_C

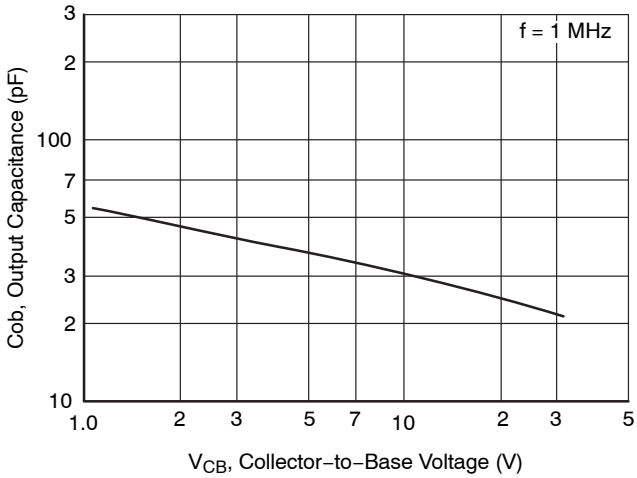


Figure 9. Cob – V_{CB}

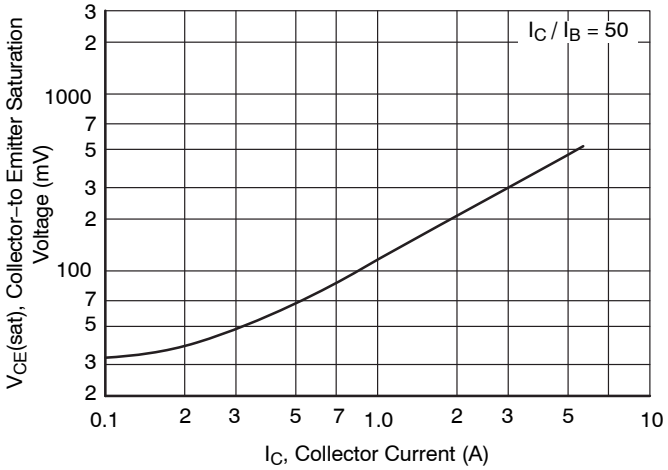


Figure 5. V_{CE}(sat) – I_C

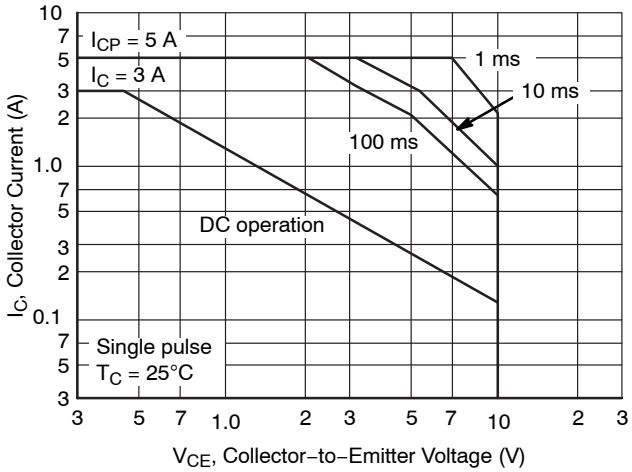


Figure 6. ASO

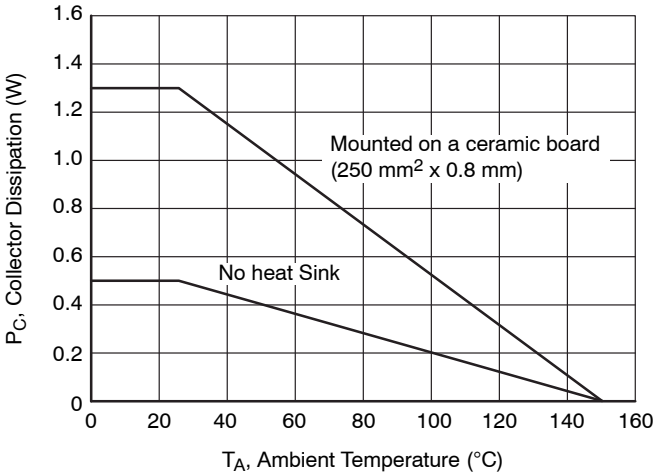
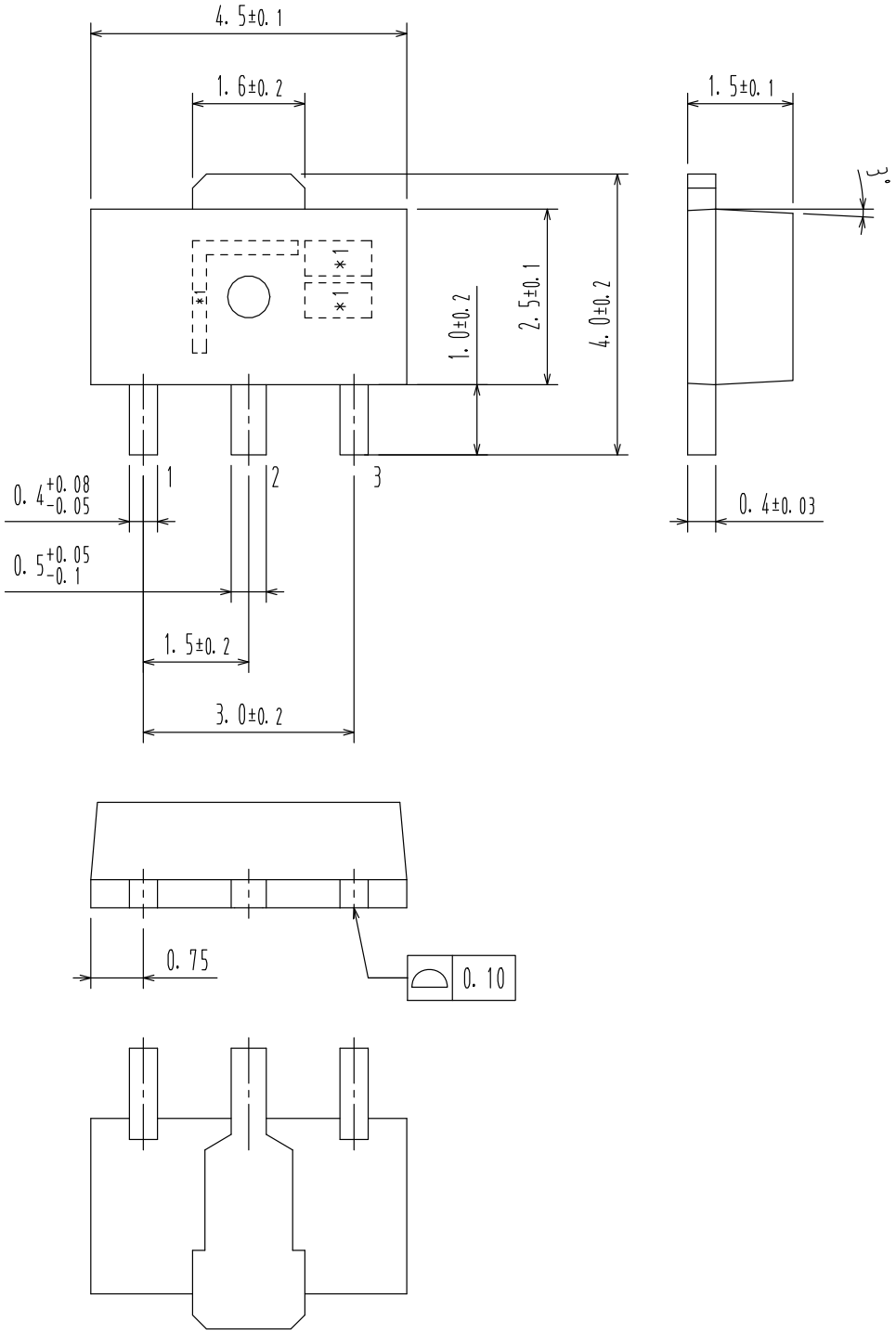


Figure 7. P_C – T_A

SOT−89 / PCP−1
CASE 419AU
ISSUE O

DATE 30 APR 2012



DOCUMENT NUMBER:	**98AON79746E**	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
DESCRIPTION:	**SOT−89 / PCP−1**	**PAGE 1 OF 1**

onsemi and onsemi are trademarks of Semiconductor Components Industries, LLC dba **onsemi** or its subsidiaries in the United States and/or other countries. **onsemi** reserves the right to make changes without further notice to any products herein. **onsemi** makes no warranty, representation or guarantee regarding the 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. **onsemi** does not convey any license under its patent rights nor the rights of others.

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