

Bipolar Transistor

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

2SD1620

Features

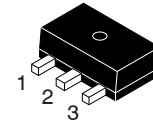
- Less Power Dissipation Because of Low $V_{CE(sat)}$, Permitting More Flashes of Light to be Emitted
- Large Current Capacity and Highly Resistant to Breakdown
- Excellent Linearity of h_{FE} in the Region from Low Current to High Current
- Ultrasmall Size Supports High-density, Ultrasmall-sized Hybrid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

Specifications

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

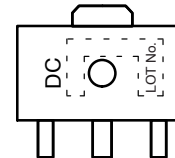
Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		30	V
Collector-to-Emitter Voltage	V_{CEX}		20	V
Collector-to-Emitter Voltage	V_{CEO}		10	V
Emitter-to-Base Voltage	V_{EBO}		6	V
Collector Current	I_C		3	A
Collector Current (Pulse)	I_{CP}		5	A
Collector Dissipation	P_C		500	mW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

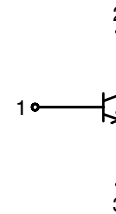


SOT-89 / PCP-1
CASE 419AU

MARKING DIAGRAM



ELECTRICAL CONNECTION



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](#).

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)

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

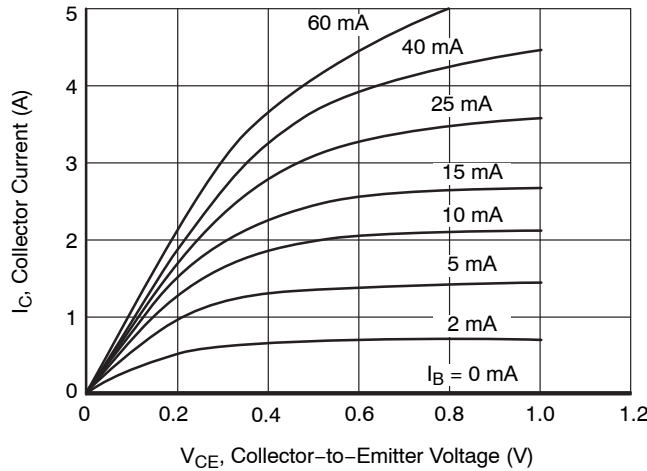


Figure 1. $I_C - V_{CE}$

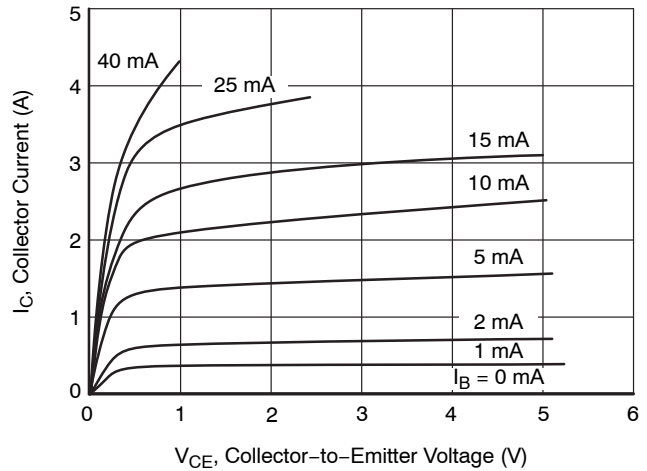


Figure 2. $I_C - V_{CE}$

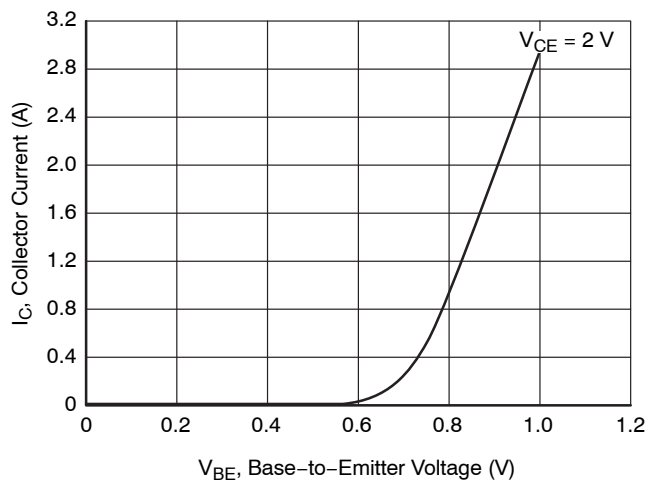


Figure 3. $I_C - V_{BE}$

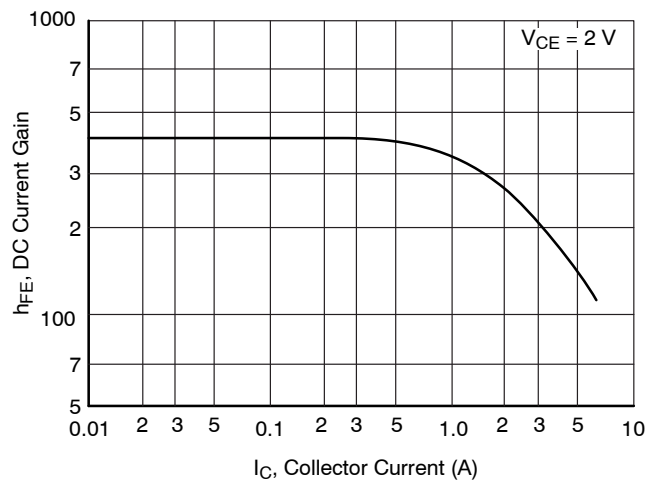


Figure 4. $h_{FE} - I_C$

2SD1620

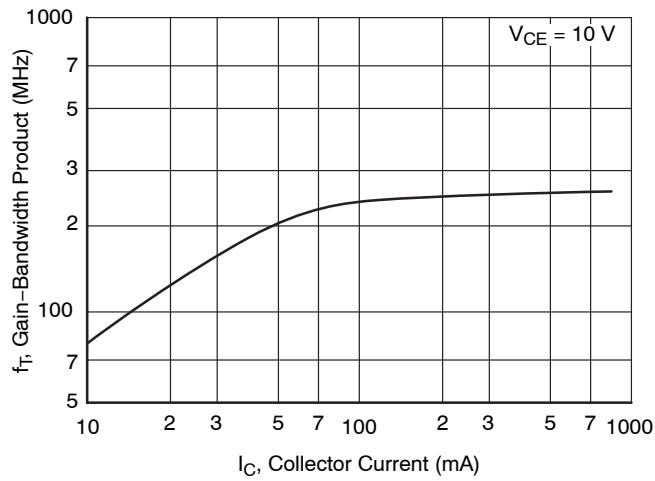


Figure 8. $f_T - I_C$

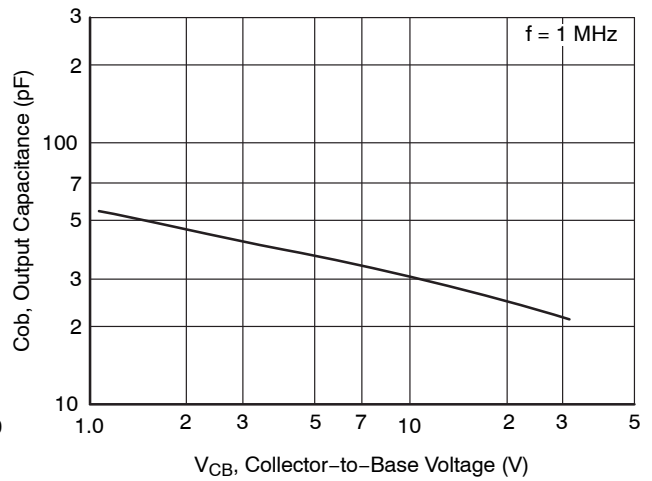


Figure 9. $C_{ob} - V_{CB}$

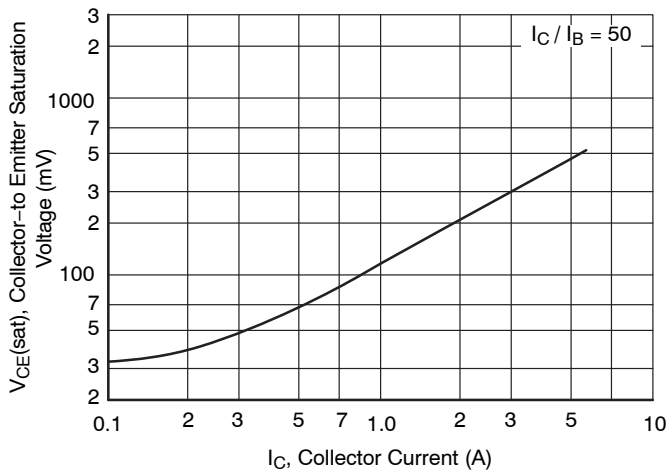


Figure 5. $V_{CE(sat)} - I_C$

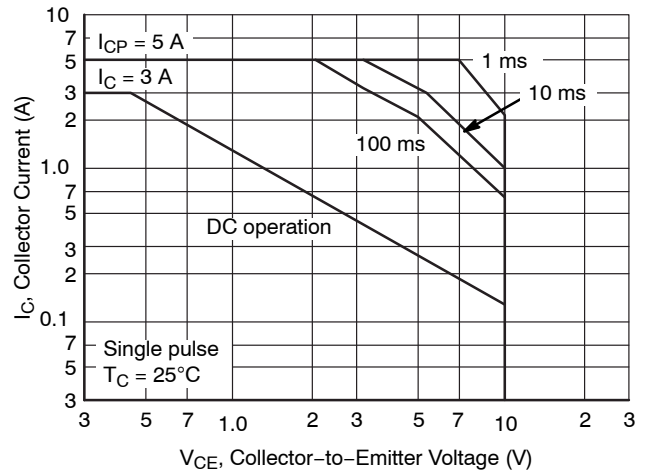


Figure 6. ASO

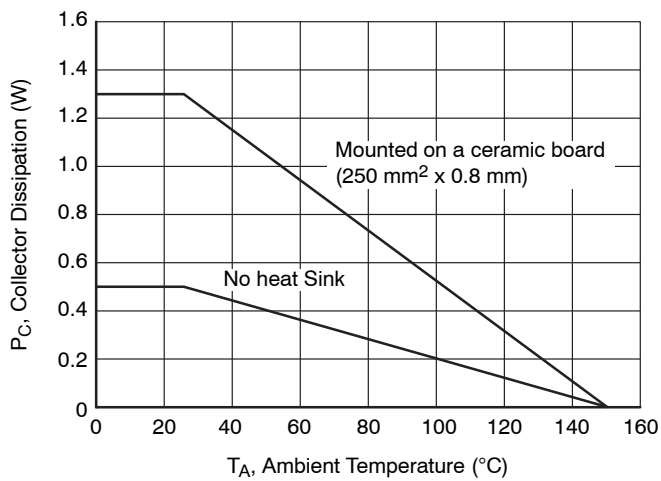
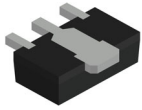
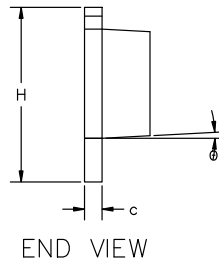
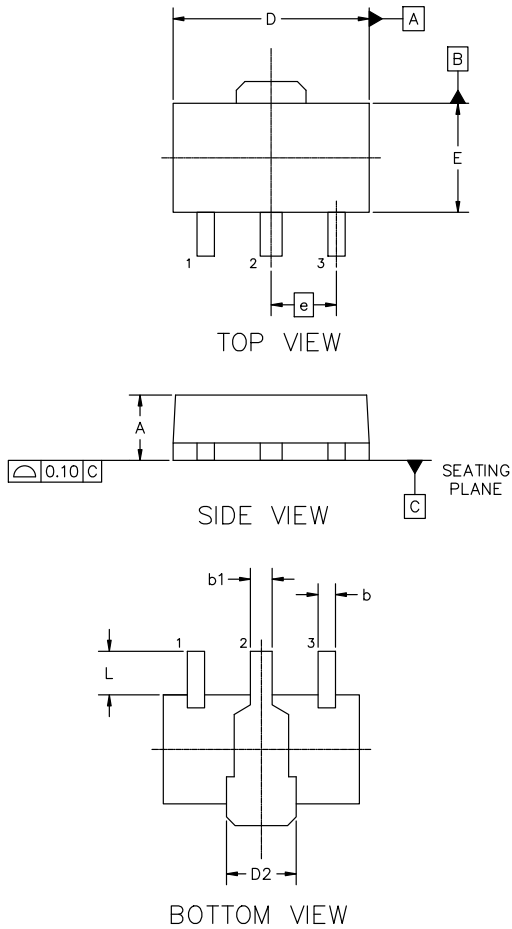


Figure 7. $P_C - T_A$



SOT-89 4.50x2.50x1.50 1.50P
CASE 419AU
ISSUE A

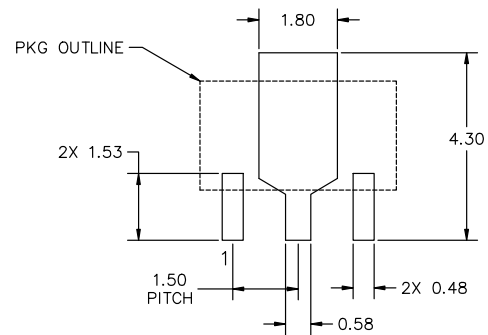
DATE 21 MAY 2025



NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. LEAD THICKNESS INCLUDES LEAD FINISH.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

MILLIMETERS			
DIM	MIN	NOM	MAX
A	1.40	1.50	1.60
b	0.35	0.40	0.48
b1	0.40	0.50	0.55
c	0.37	0.40	0.43
D	4.40	4.50	4.60
D2	1.40	1.60	1.80
E	2.40	2.50	2.60
e	1.50 BSC		
H	3.80	4.00	4.20
L	0.80	1.00	1.20
Ø	0°	---	3°



RECOMMENDED MOUNTING FOOTPRINT

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

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DESCRIPTION:	SOT-89 4.50x2.50x1.50 1.50P	PAGE 1 OF 1

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