

# Bipolar Transistor

20 V, 5 A, Low  $V_{CE(sat)}$ , NPN Single PCP

## 2SD1628

### Features

- Low Saturation Voltage
- High  $h_{FE}$
- Large Current Capacity
- Very Small Size Making it Easy to Provide High-Density Small-Sized Hybrid IC's
- These Devices are Pb-Free and are RoHS Compliant

### Applications

- Strobe DC-DC Converters, Relay Drivers, Hammer Drivers, Lamp Drivers, Motor Drivers

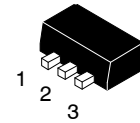
### SPECIFICATIONS

**ABSOLUTE MAXIMUM RATINGS** at  $T_a = 25^\circ\text{C}$

Parameter	Symbol	Value	Unit
Collector to Base Voltage	$V_{CBO}$	60	V
Collector to Emitter Voltage	$V_{CEO}$	20	V
Emitter to Base Voltage	$V_{EBO}$	6	V
Collector Current	$I_C$	5	A
Collector Current (Pulse)	$I_{CP}$	8	A
Collector Dissipation	$P_C$	500	mW
		1.5 (Note 1)	W
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55 to +150	$^\circ\text{C}$

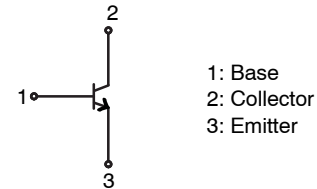
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. When mounted on ceramic substrate (250 mm<sup>2</sup> x 0.8 mm).

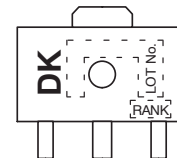


SOT-89 / PCP-1  
CASE 419AU

### ELECTRICAL CONNECTION



### MARKING DIAGRAM



### ORDERING INFORMATION

Device	Package	Shipping <sup>†</sup>
2SD1628G-TD-E	PCP (Pb-Free)	1000 / Tape & Reel

<sup>†</sup>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](http://BRD8011/D).

# 2SD1628

## ELECTRICAL CHARACTERISTICS at $T_A = 25^\circ\text{C}$

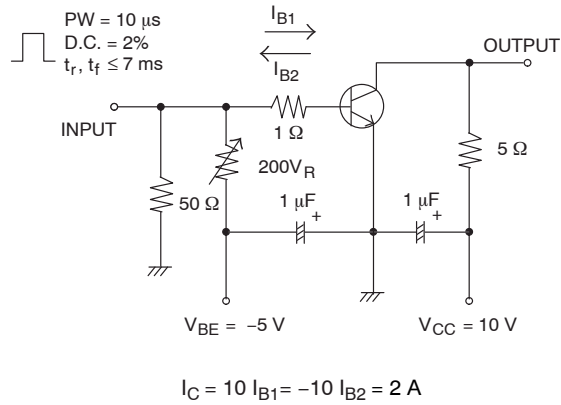
Parameter	Symbol	Conditions	Ratings			Unit
			Min	Typ	Max	
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = 50\text{ V}, I_E = 0\text{ A}$			100	nA
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 5\text{ V}, I_C = 0\text{ A}$			100	nA
DC Current Gain	$h_{FE1}$	$V_{CE} = 2\text{ V}, I_C = 0.5\text{ A}$	120*		560*	
	$h_{FE2}$	$V_{CE} = 2\text{ V}, I_C = 3\text{ A}$	95			
Gain-Bandwidth Product	$f_T$	$V_{CE} = 10\text{ V}, I_C = 50\text{ mA}$		120		MHz
Output Capacitance	$C_{ob}$	$V_{CB} = 10\text{ V}, f = 1\text{ MHz}$		45		pF
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 3\text{ A}, I_B = 60\text{ mA}$			500	mV
Base to Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 3\text{ A}, I_B = 60\text{ mA}$			1.5	V
Turn-On Time	$t_{on}$	See specified Test Circuit		30		ns
Storage Time	$t_{stg}$			300		ns
Fall Time	$t_f$			40		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.

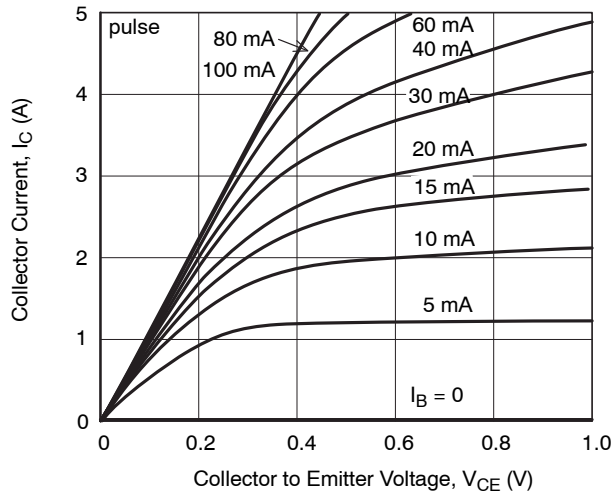
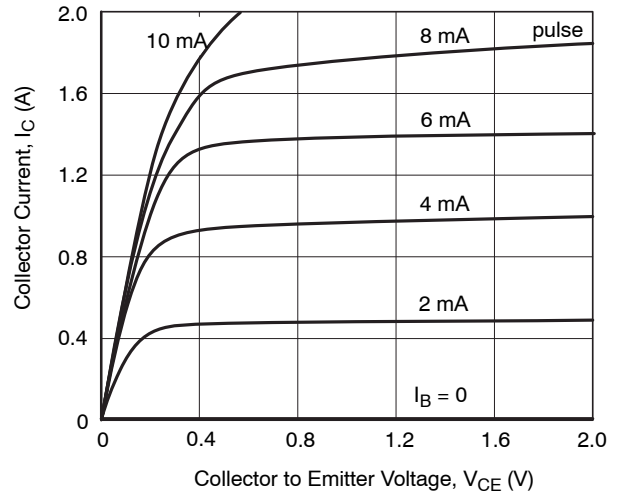
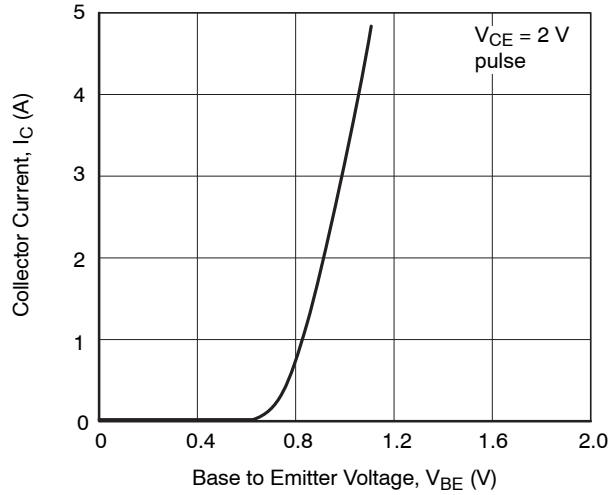
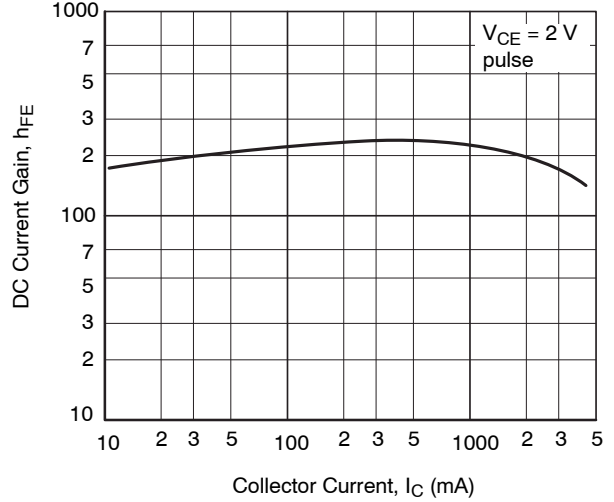
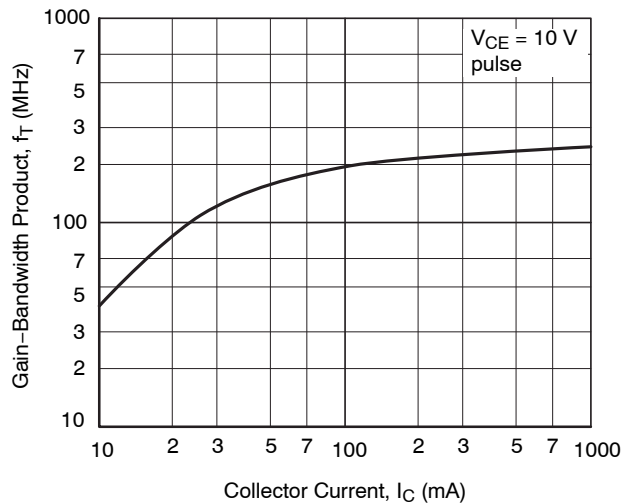
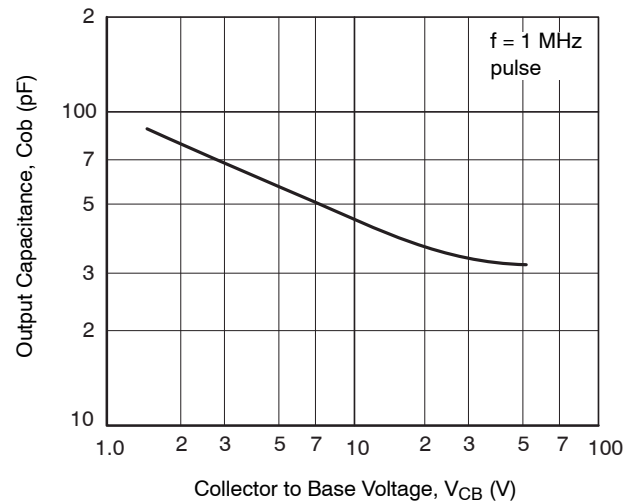
\*The 2SD1628 is classified by 0.5 A  $h_{FE}$  as follows :

Rank	E	F	G
$h_{FE}$	120 to 200	160 to 320	280 to 560

## Switching Time Test Circuit



## TYPICAL CHARACTERISTICS

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 5.  $f_T - I_C$ Figure 6.  $C_{ob} - V_{CB}$

TYPICAL CHARACTERISTICS (continued)

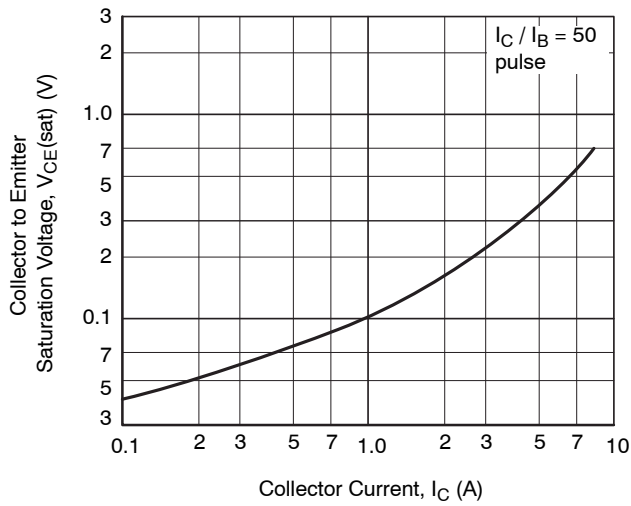


Figure 7.  $V_{CE(sat)} - I_C$

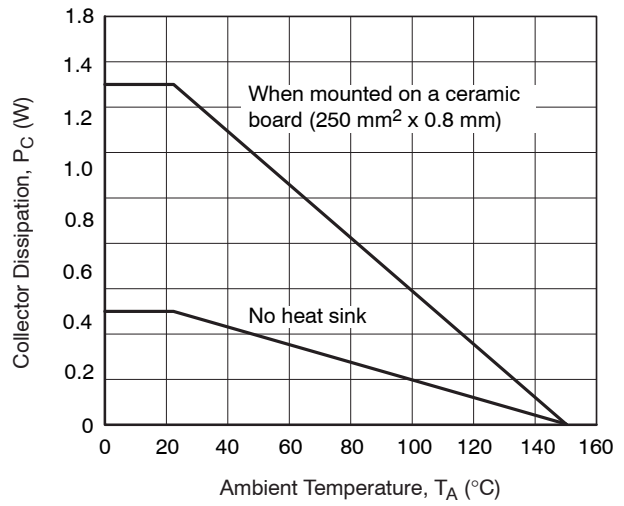


Figure 8.  $P_C - T_A$

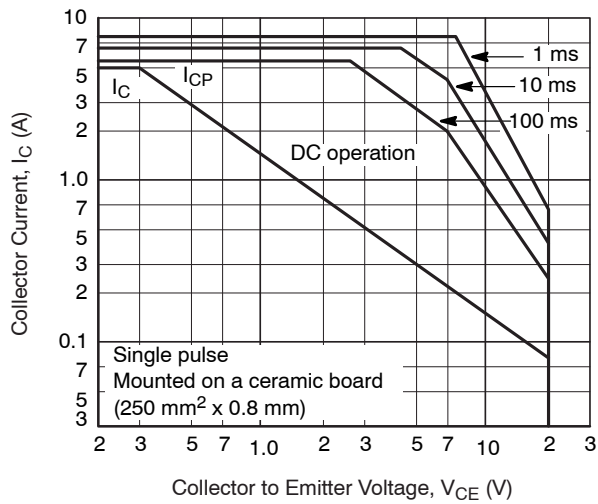


Figure 9. SOA

# MECHANICAL CASE OUTLINE

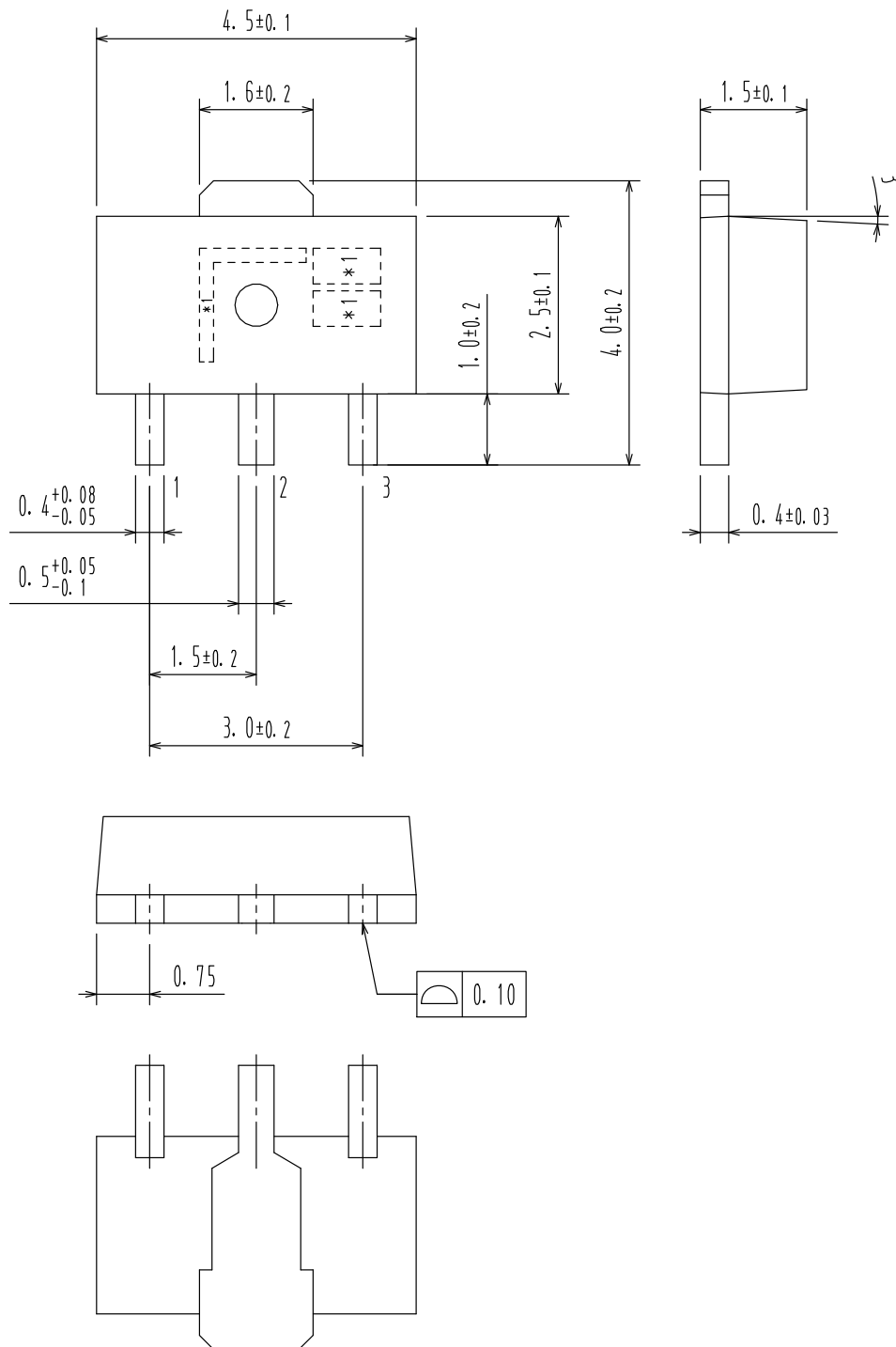
## PACKAGE DIMENSIONS

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DATE 30 APR 2012



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