

# 2SB1216, 2SD1816

## Bipolar Transistor (-)100V, (-)4A, Low VCE(sat), (PNP)NPN Single



**ON Semiconductor®**

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### Features

- Low Collector to Emitter Saturation Voltage
- Small and Slim Package Facilitating Compactness of Sets
- High  $f_T$
- Good Linearity of  $h_{FE}$
- Fast Switching Time

### Typical Applications

- Suitable for Relay Drivers
- High Speed Inverters
- Converters
- Other General High Current Switching Applications

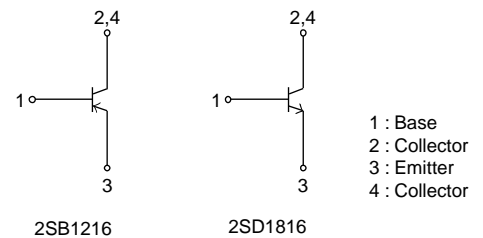
### SPECIFICATIONS ( ) : 2SB1216

#### ABSOLUTE MAXIMUM RATING at $T_a = 25^\circ\text{C}$ (Note 1)

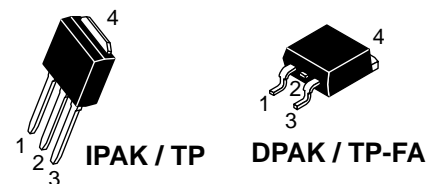
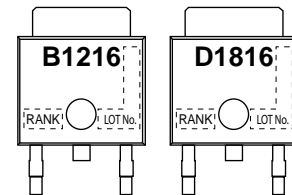
Parameter	Symbol	Value	Unit
Collector to Base Voltage	$V_{CBO}$	(-) 120	V
Collector to Emitter Voltage	$V_{CEO}$	(-) 100	V
Emitter to Base Voltage	$V_{EBO}$	(-) 6	V
Collector Current	$I_C$	(-) 4	A
Collector Current (Pulse)	$I_{CP}$	(-) 8	A
Collector Dissipation	PC	1	W
		$T_c=25^\circ\text{C}$	20
Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

Note 1 : 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.

### ELECTRICAL CONNECTION



### MARKING



### ORDERING INFORMATION

See detailed ordering and shipping information on page 7 of this data sheet.

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## ELECTRICAL CHARACTERISTICS at Ta = 25°C (Note 2)

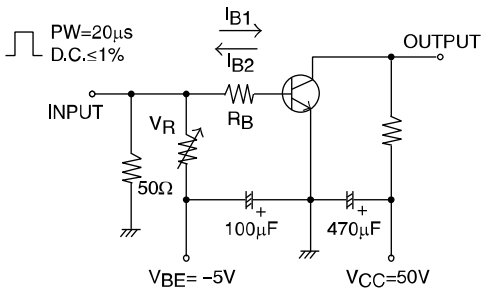
Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Collector Cutoff Current	ICBO	V <sub>CB</sub> =(-)100V, I <sub>E</sub> =0A			(-) 1	μA
Emitter Cutoff Current	IEBO	V <sub>EB</sub> =(-)4V, I <sub>C</sub> =0A			(-) 1	μA
DC Current Gain	hFE1	V <sub>CE</sub> =(-)5V, I <sub>C</sub> =(-)0.5A	140*		400*	
	hFE2	V <sub>CE</sub> =(-)5V, I <sub>C</sub> =(-)3A	40			
Gain-Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> =(-)10V, I <sub>C</sub> =(-)0.5A		(130) 180		MHz
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> =(-)10V, f=1MHz		(65) 40		pF
Collector to Emitter Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =(-)2A, I <sub>B</sub> =(-)0.2A		(-200) 150	(-500) 400	mV
Base to Emitter Saturation Voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =(-)2A, I <sub>B</sub> =(-)0.2A		(-) 0.9	(-) 1.2	V
Collector to Base Breakdown Voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> =(-)10μA, I <sub>E</sub> =0A	(-)120			V
Collector to Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> =(-)1mA, R <sub>BE</sub> =∞	(-)100			V
Emitter to Base Breakdown Voltage	V <sub>(BR)EBO</sub>	I <sub>E</sub> =(-)10μA, I <sub>C</sub> =0A	(-) 6			V
Turn-On Time	t <sub>on</sub>	See specified Test Circuit		100		ns
Storage Time	t <sub>stg</sub>			(800) 900		ns
Fall Time	t <sub>f</sub>			50		ns

Note 2 : 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 2SB1216/2SD1816 are classified by 0.5A h<sub>FE</sub> as follows:

Rank	S	T
h <sub>FE</sub>	140 to 280	200 to 400

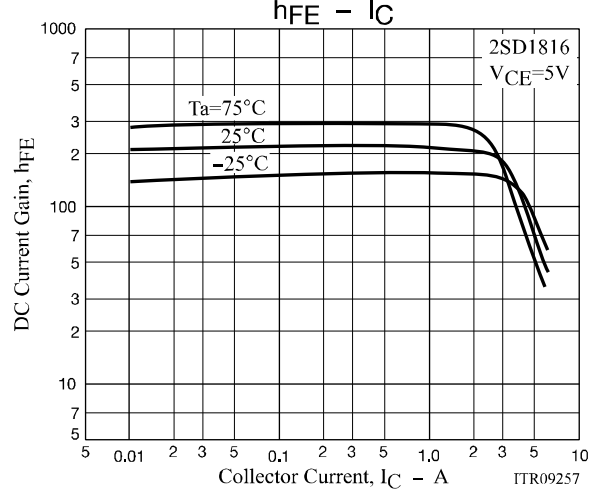
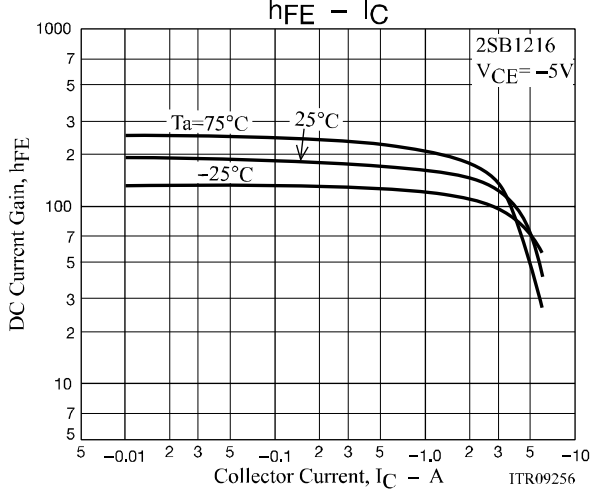
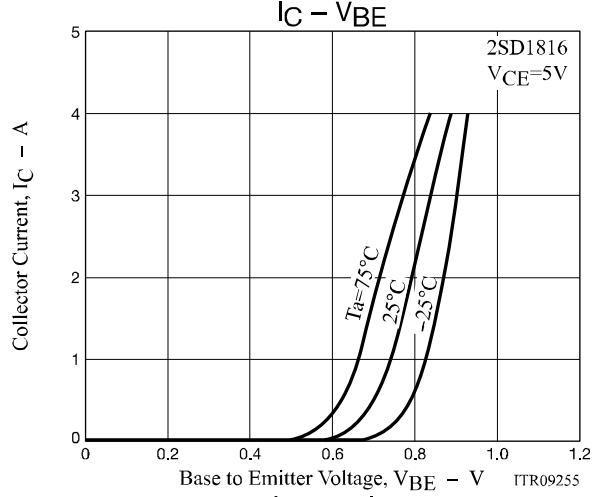
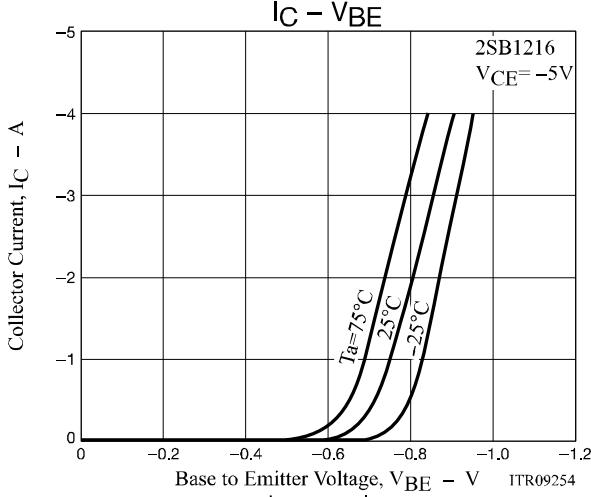
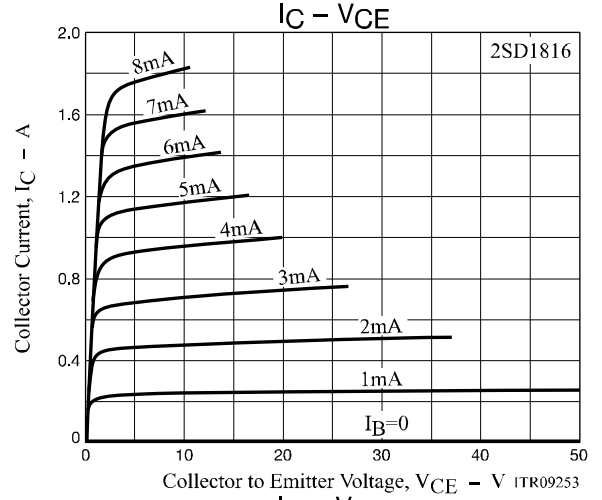
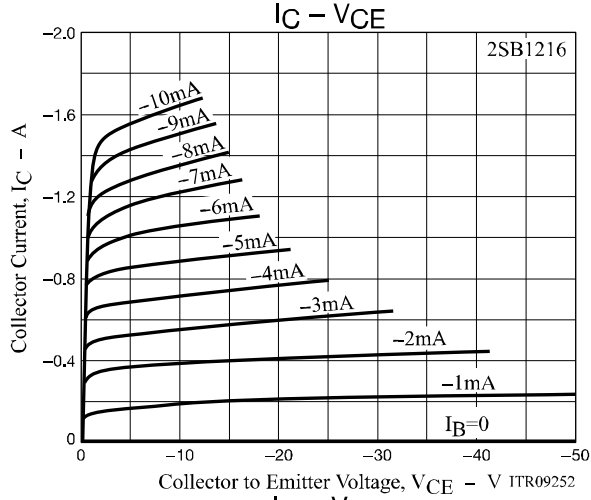
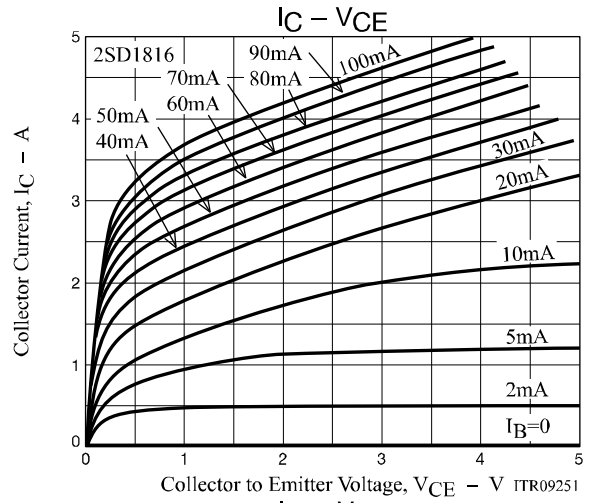
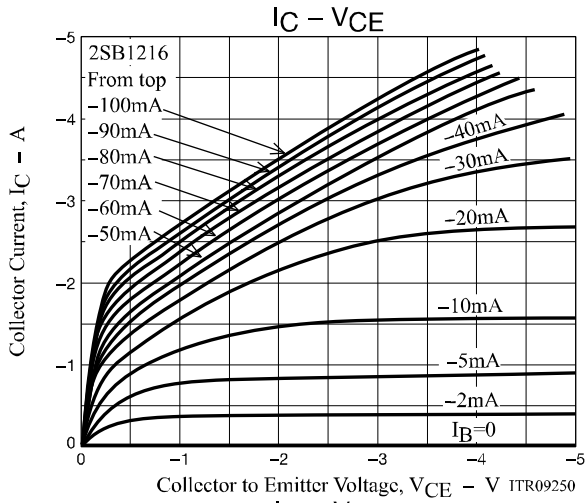
**Fig.1 Switching Time Test Circuit**



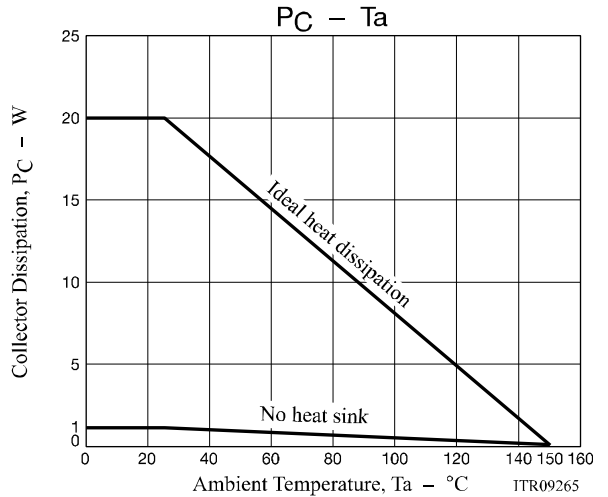
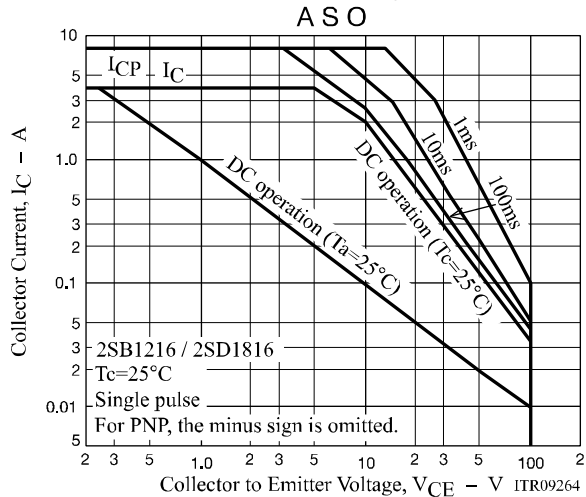
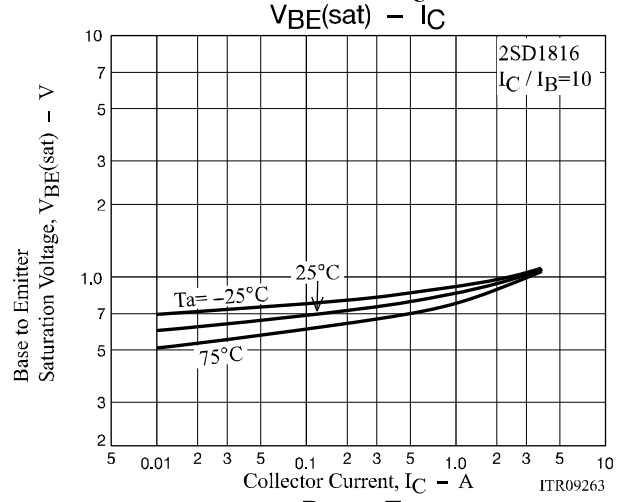
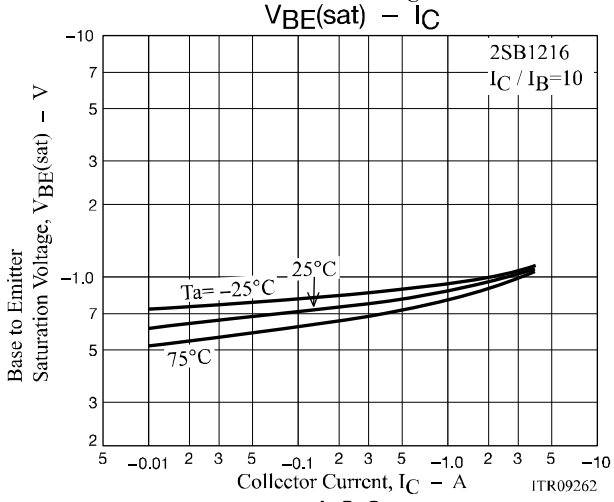
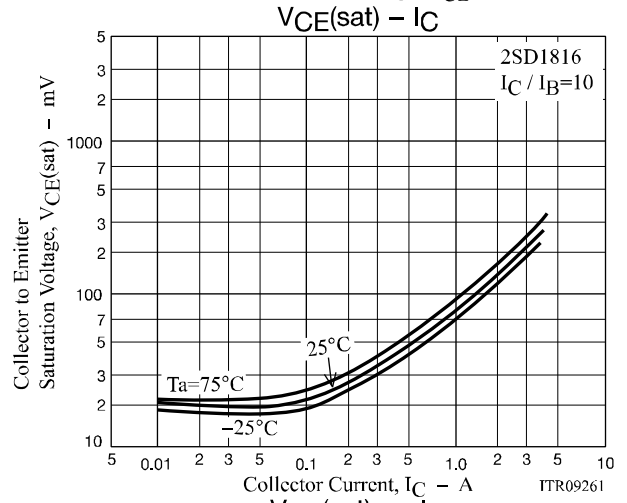
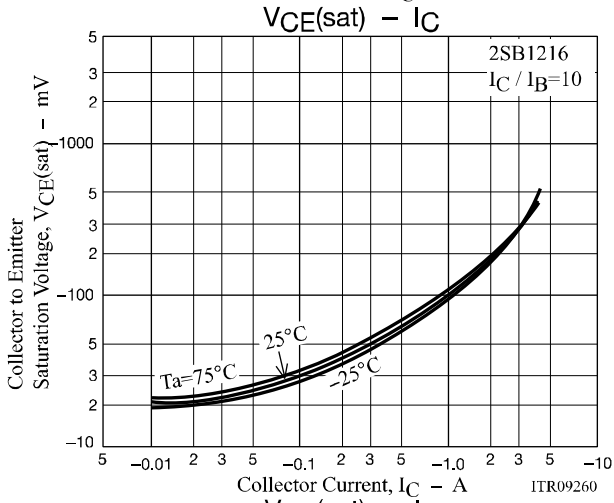
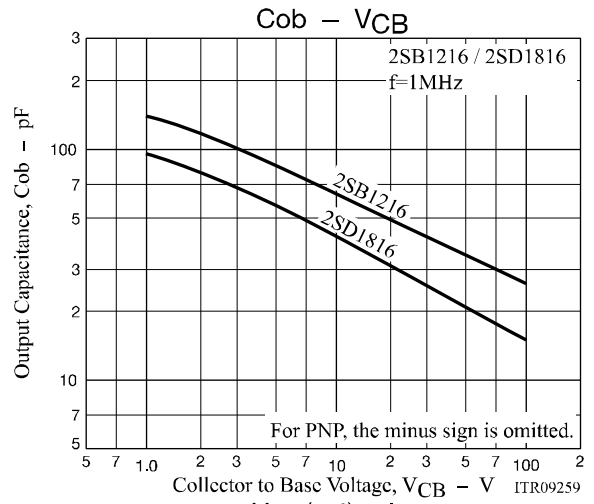
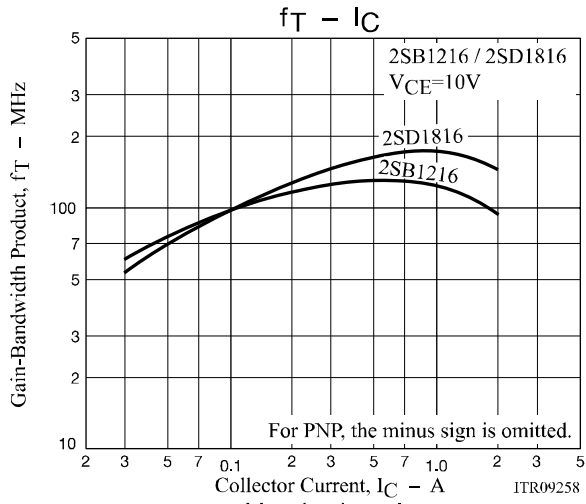
$$I_C = 10I_{B1} = -10I_{B2} = 2A$$

For PNP, the polarity is reversed.

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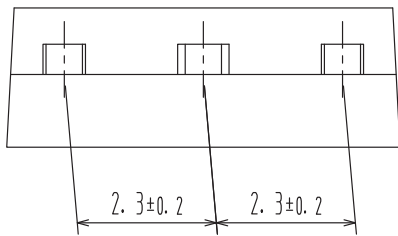
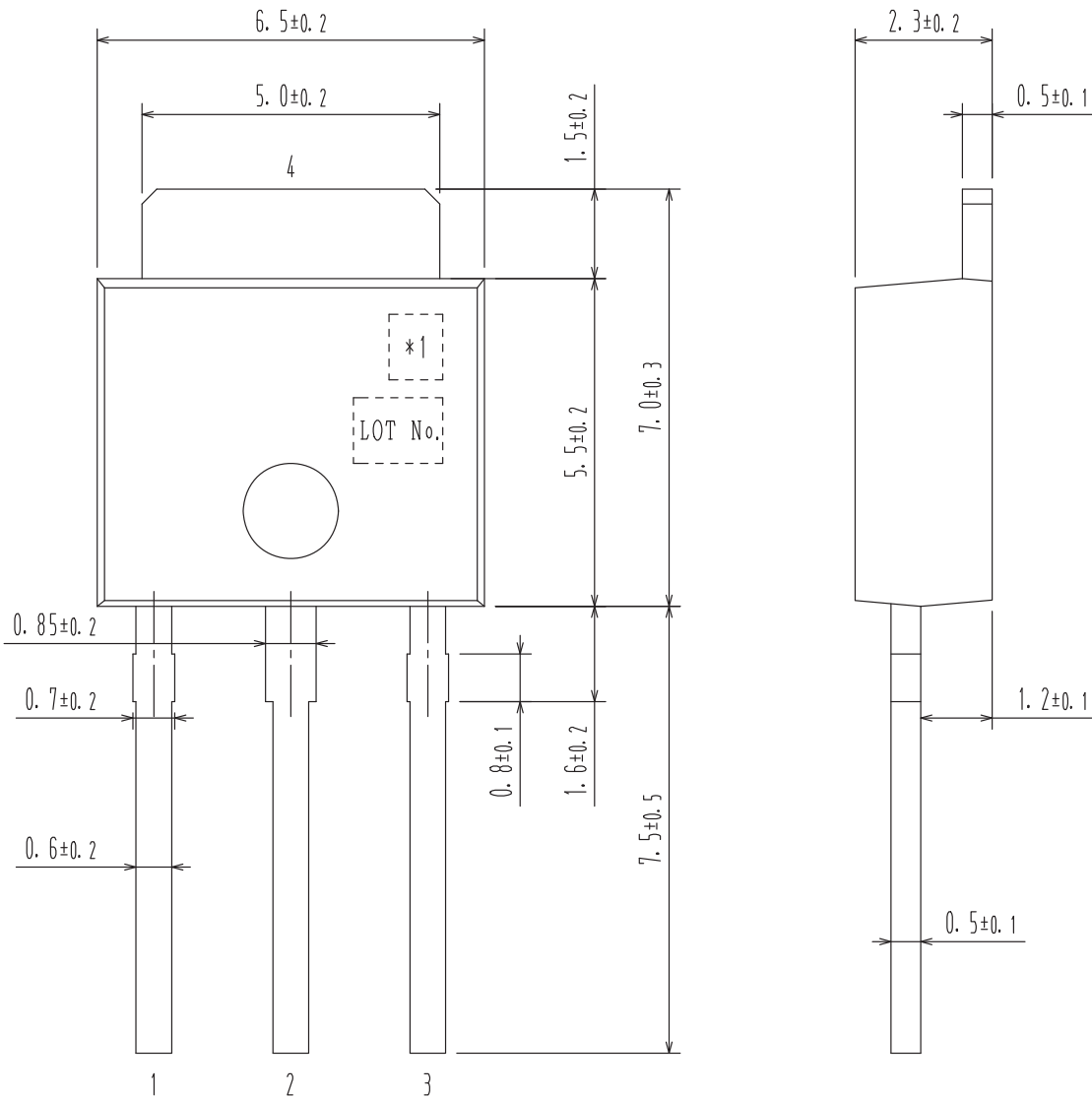


# 2SB1216, 2SD1816

## PACKAGE DIMENSIONS

unit : mm

IPAK / TP  
CASE 369AJ  
ISSUE O



- 1 : Base
- 2 : Collector
- 3 : Emitter
- 4 : Collector

\*1: Lot indication

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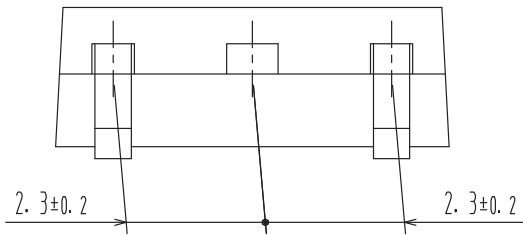
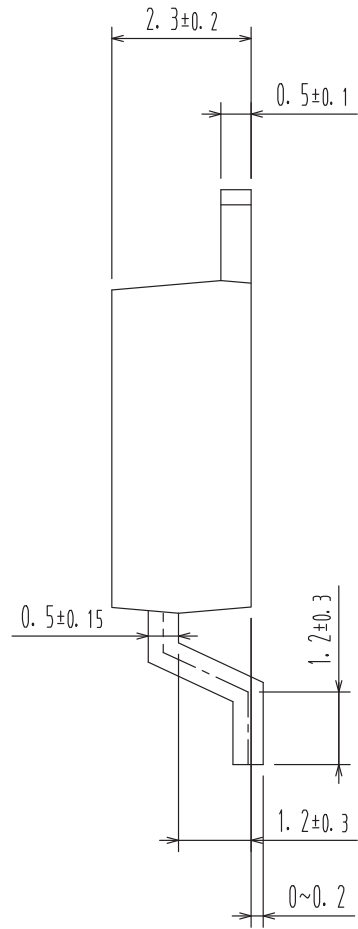
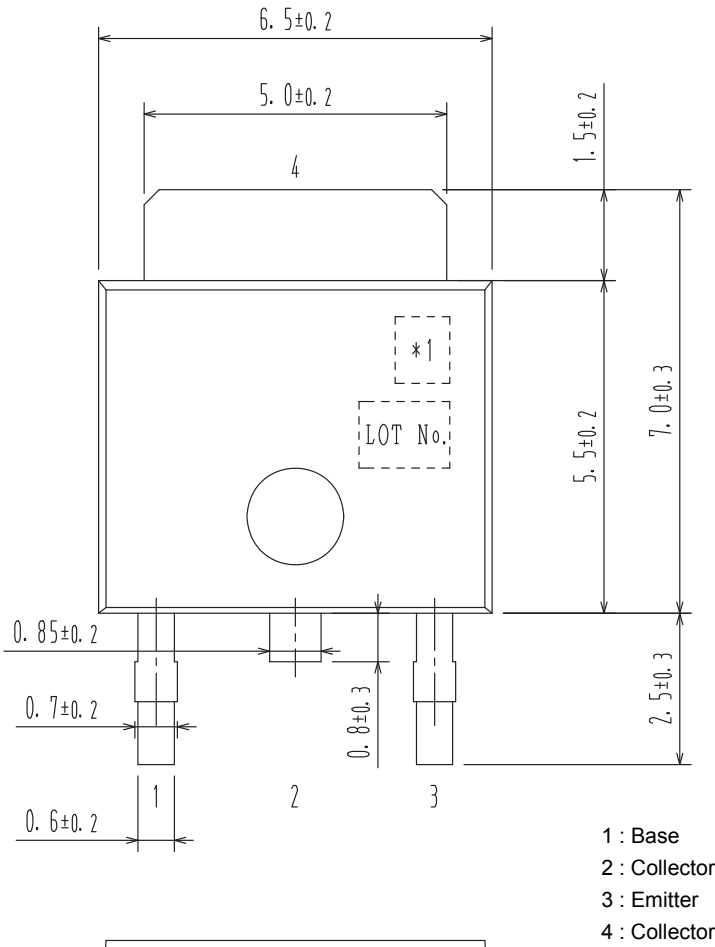
## PACKAGE DIMENSIONS

unit : mm

### DPAK / TP-FA

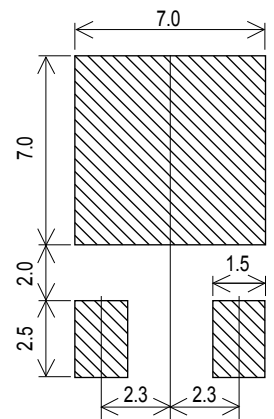
CASE 369AH

ISSUE 0



Pin 2 is idle pin with electrical designation only carried.

### Recommended Soldering Footprint



\*1: Lot indication

## 2SB1216, 2SD1816

### ORDERING INFORMATION

Device	Marking	Package	Shipping (Qty / Packing)
2SB1216S-E	B1216	IPAK / TP (Pb-Free)	500/ bag
2SB1216T-E	B1216		
2SD1816S-E	D1816		
2SD1816T-E	D1816		
2SB1216S-H	B1216	IPAK / TP (Pb-Free / Halogen Free)	
2SB1216T-H	B1216		
2SD1816S-H	D1816		
2SD1816T-H	D1816		
2SB1216S-TL-E	B1216	DPAK / TP-FA (Pb-Free)	700/ Tape & Reel
2SB1216T-TL-E	B1216		
2SD1816S-TL-E	D1816		
2SD1816T-TL-E	D1816		
2SB1216S-TL-H	B1216	DPAK / TP-FA (Pb-Free / Halogen Free)	
2SB1216T-TL-H	B1216		
2SD1816S-TL-H	D1816		
2SD1816T-TL-H	D1816		

† 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://www.onsemi.com/pub\\_link/Collateral/BRD8011-D.PDF](http://www.onsemi.com/pub_link/Collateral/BRD8011-D.PDF)

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