

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

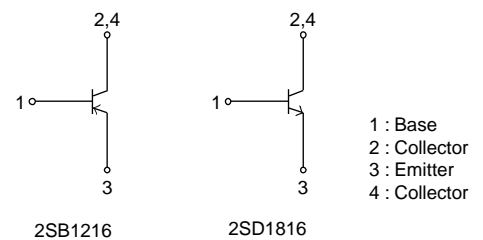
SPECIFICATIONS () : 2SB1216

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

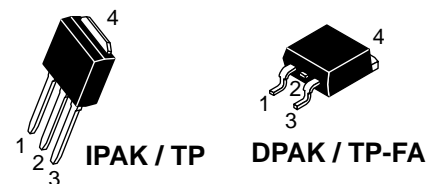
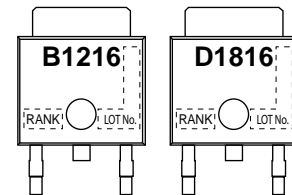
| Parameter | Symbol | Value | Unit |
|------------------------------|-----------|------------------------|------------------|
| Collector to Base Voltage | V_{CBO} | (-) 120 | V |
| Collector to Emitter Voltage | V_{CEO} | (-) 100 | V |
| Emitter to Base Voltage | V_{EBO} | (-) 6 | V |
| Collector Current | 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)

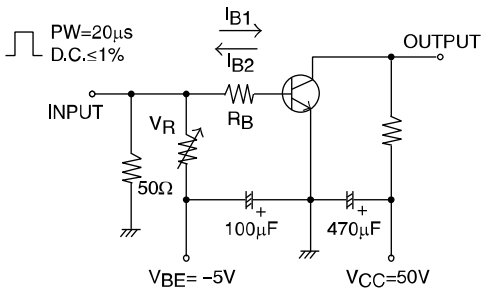
| Parameter | Symbol | Conditions | Value | | | Unit |
|---|----------------------|--|--------|------------|------------|------|
| | | | min | typ | max | |
| Collector Cutoff Current | ICBO | V _{CB} =(-)100V, I _E =0A | | | (-) 1 | μA |
| Emitter Cutoff Current | IEBO | V _{EB} =(-)4V, I _C =0A | |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

| Rank | S | T |
|-----------------|------------|------------|
| h _{FE} | 140 to 280 | 200 to 400 |

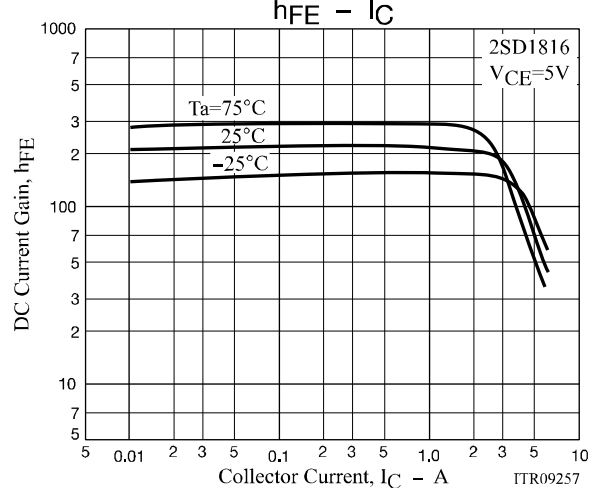
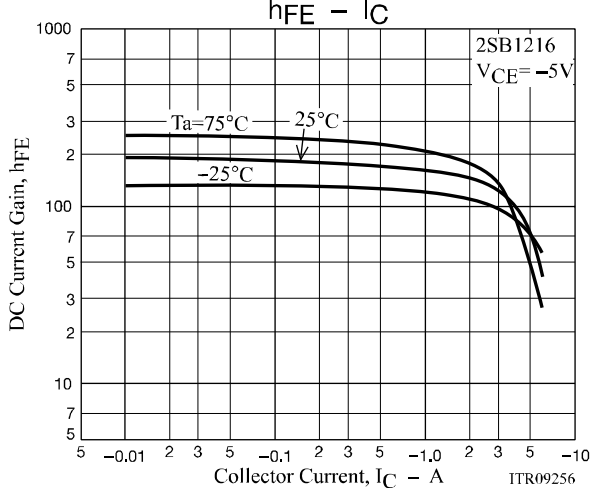
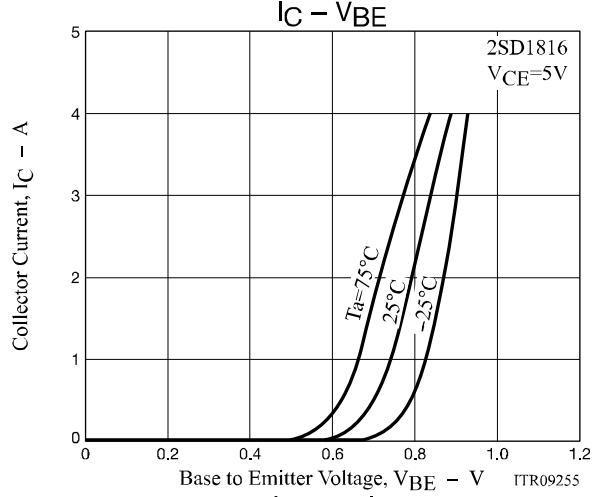
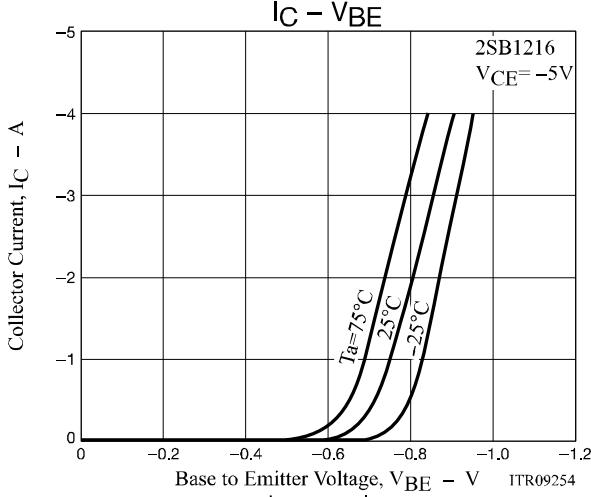
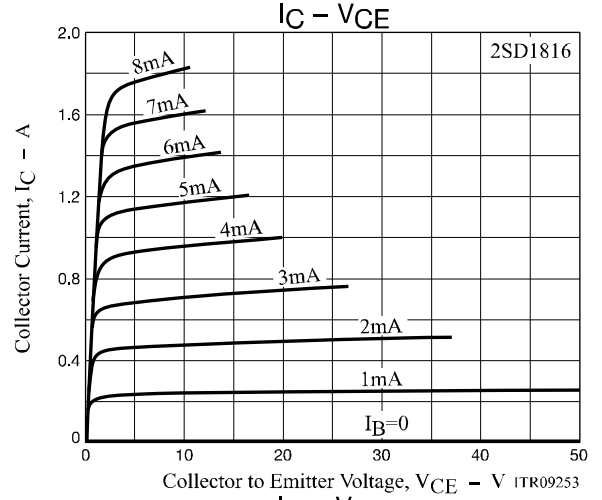
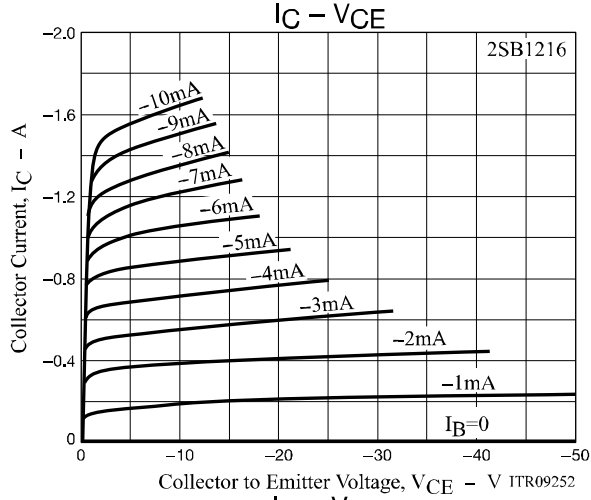
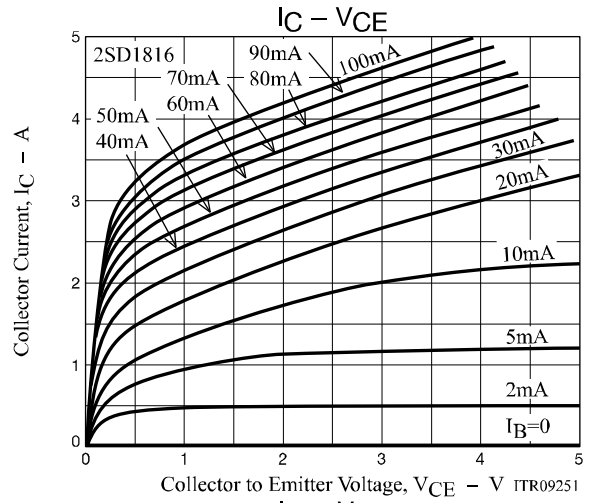
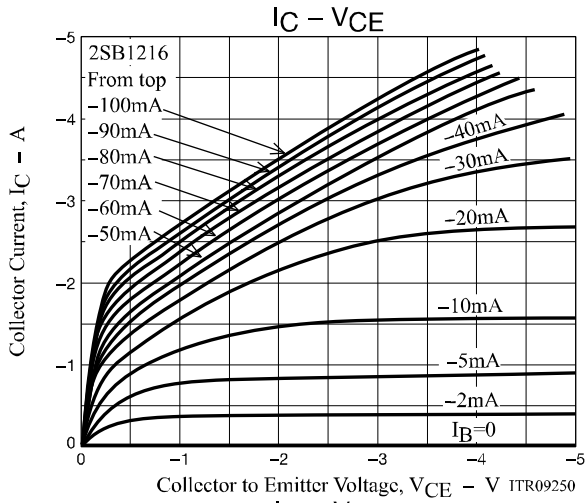
Fig.1 Switching Time Test Circuit



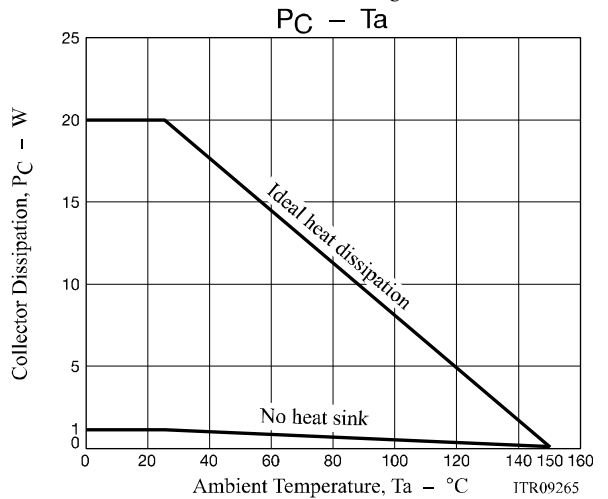
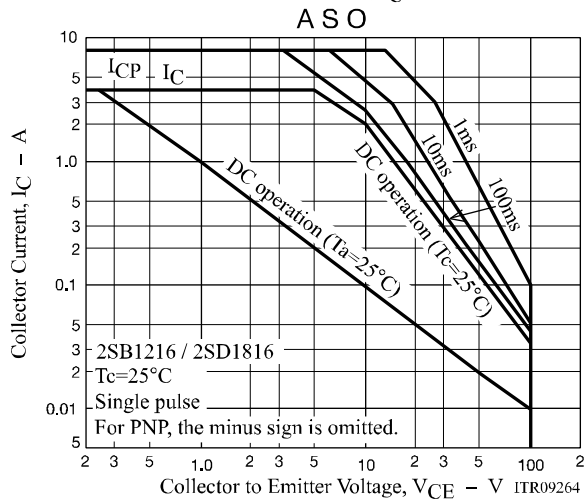
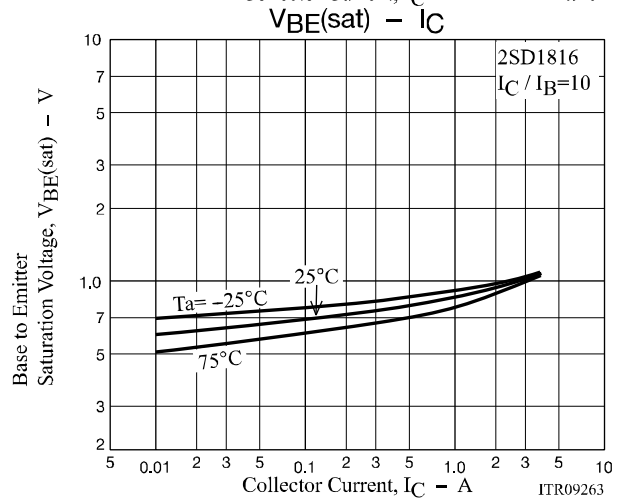
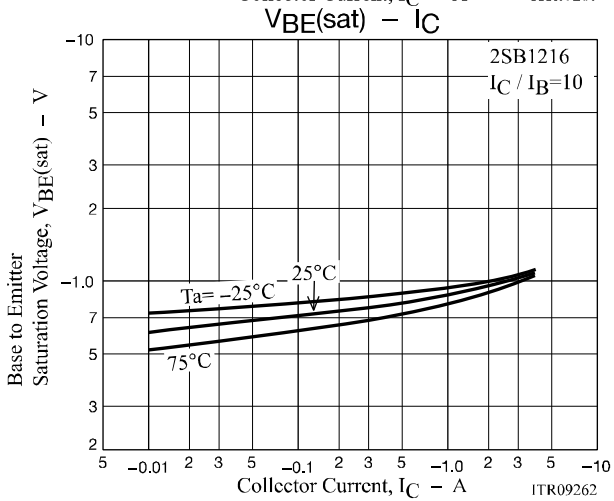
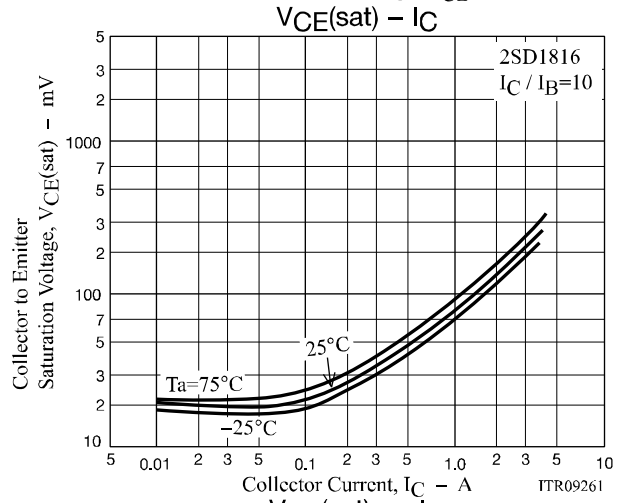
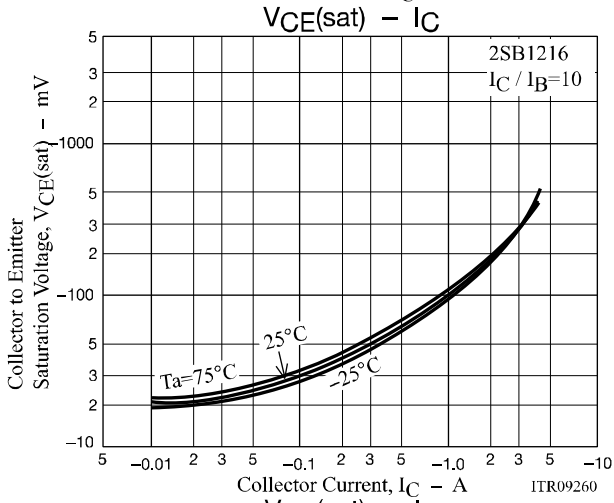
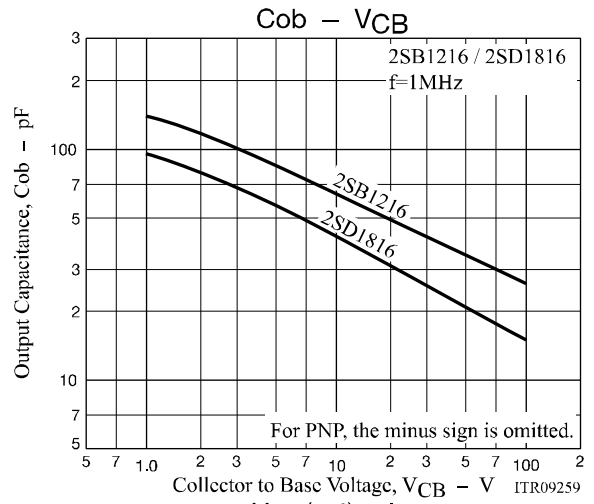
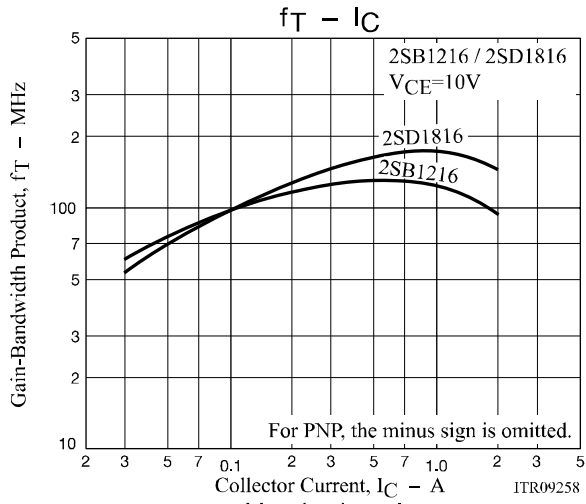
$$I_C = 10I_{B1} = -10I_{B2} = 2A$$

For PNP, the polarity is reversed.

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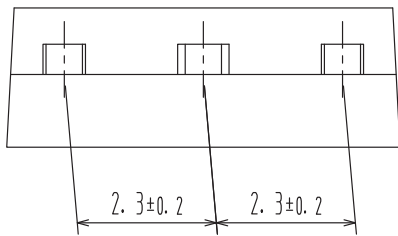
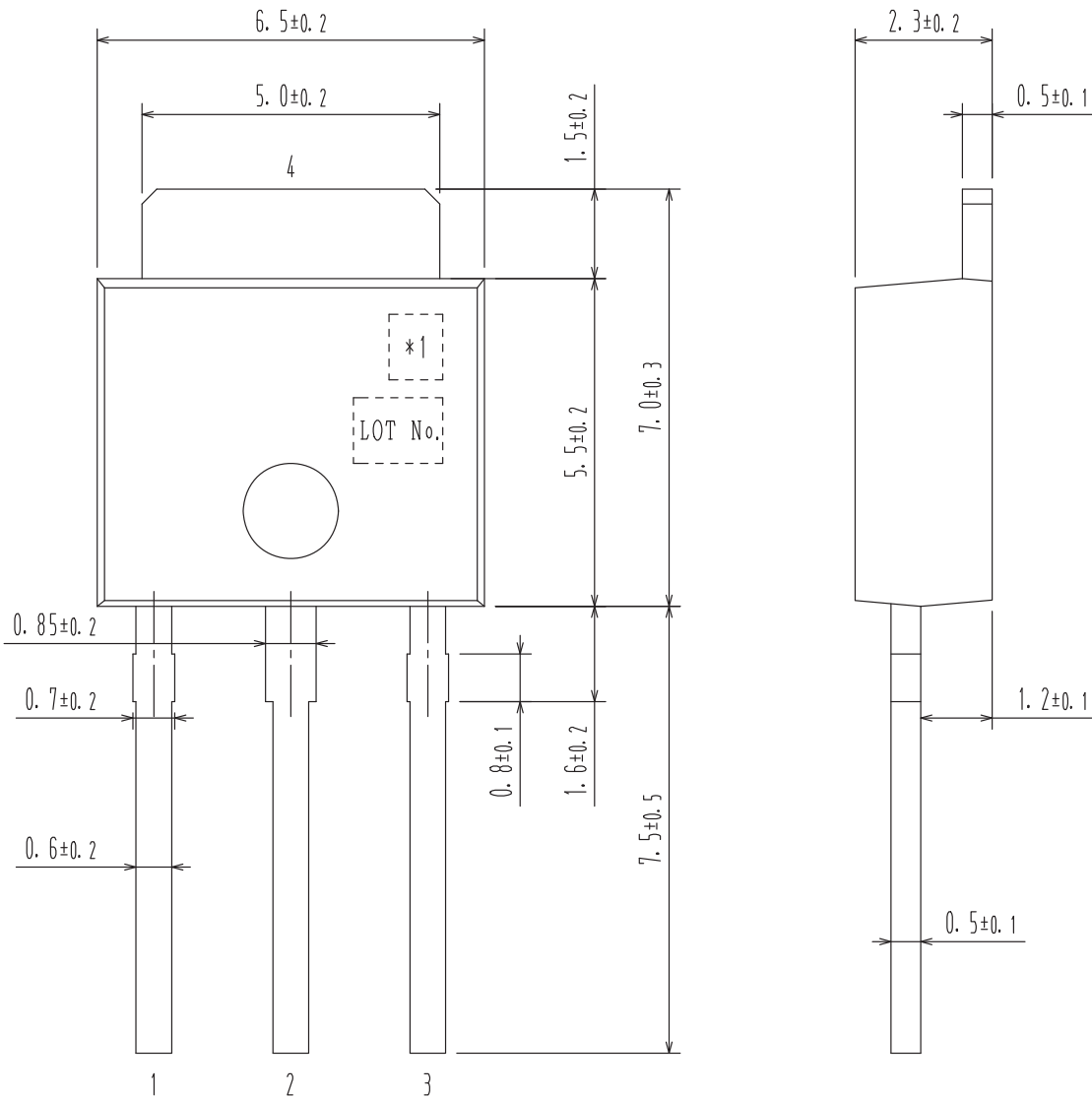


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PACKAGE DIMENSIONS

unit : mm

IPAK / TP
CASE 369AJ
ISSUE O



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

*1: Lot indication

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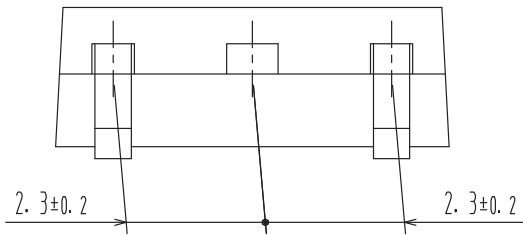
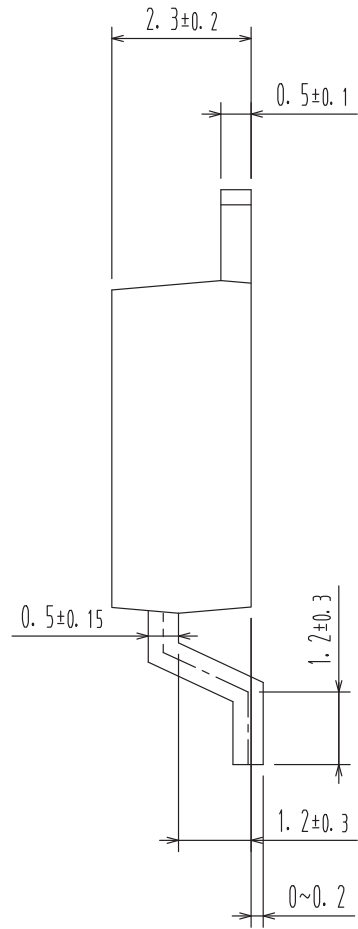
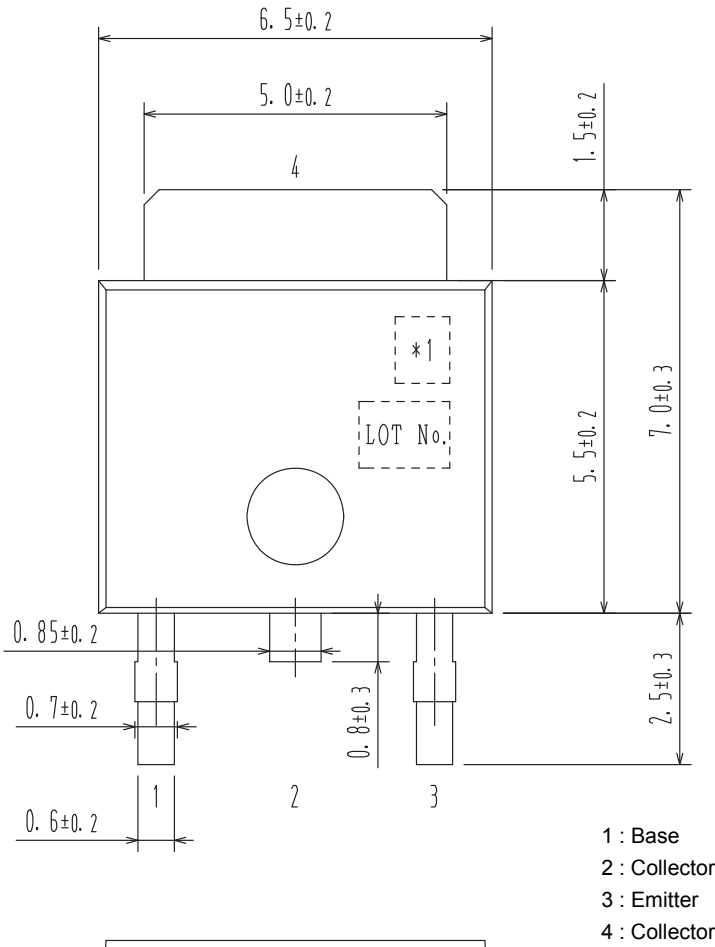
PACKAGE DIMENSIONS

unit : mm

DPAK / TP-FA

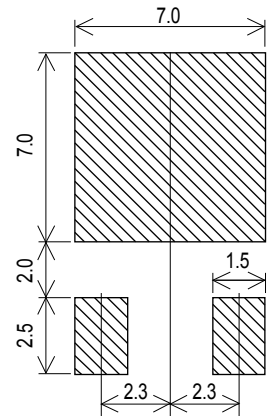
CASE 369AH

ISSUE 0



Pin 2 is idle pin with electrical designation only carried.

Recommended Soldering Footprint



*1: Lot indication

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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

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