

# Bipolar Transistor

(-)160 V, (-)1.5 A, Low  $V_{CE(sat)}$ ,  
(PNP)NPN Single TP/TP-FA

## 2SA1552, 2SC4027

### Features

- Adoption of FBET and MBIT Processes
- High Voltage and Large Current Capacity
- Ultrahigh-speed Switching
- Small and Slim Package Permitting 2SA1552 / 2SC4027-Applied Sets to be Made More Compact

### Applications

- Converters, Inverters, Color TV Audio Output

### Specifications

( ): 2SA1552

#### ABSOLUTE MAXIMUM RATINGS (Ta = 25 °C)

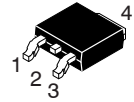
Parameter	Symbol	Conditions	Ratings	Unit
Collector to Base Voltage	$V_{CBO}$		(-)180	V
Collector to Emitter Voltage	$V_{CEO}$		(-)160	V
Emitter to Base Voltage	$V_{EBO}$		(-)6	V
Collector Current	$I_C$		(-)1.5	A
Collector Current (Pulse)	$I_{CP}$		(-)2.5	A
Collector Dissipation	$P_C$		1	W
		$T_c = 25\text{ °C}$	15	
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.



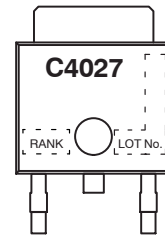
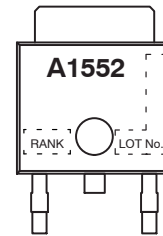
IPAK/TP  
CASE 369AJ

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

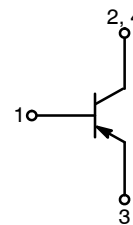


DPAK-3/TO-252-3  
CASE 369AH

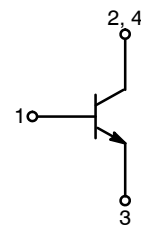
### MARKING DIAGRAMS



### ELECTRICAL CONNECTION



2SA1552



2SC4027

### ORDERING INFORMATION

See detailed ordering, marking and shipping information on page 6 of this data sheet.

NOTE: Some of the devices on this data sheet have been **DISCONTINUED**. Please refer to the table on page 6.

# 2SA1552, 2SC4027

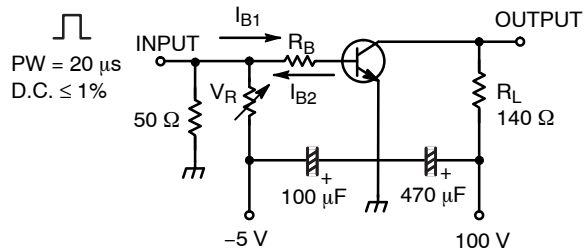
## ELECTRICAL CHARACTERISTICS (Ta = 25 °C)

Parameter	Symbol	Conditions	Ratings			Unit
			Min	Typ	Max	
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = (-)120 \text{ V}, I_E = 0 \text{ A}$	-	-	$(-)1.0$	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = (-)4 \text{ V}, I_C = 0 \text{ A}$	-	-	$(-)1.0$	$\mu\text{A}$
DC Current Gain	$h_{FE1}$	$V_{CE} = (-)5 \text{ V}, I_C = (-)100 \text{ mA}$	140 (Note 1)	-	400 (Note 1)	
	$h_{FE2}$	$V_{CE} = (-)5 \text{ V}, I_C = (-)10 \text{ mA}$	80	-	-	
Gain-Bandwidth Product	$f_T$	$V_{CE} = (-)10 \text{ V}, I_C = (-)50 \text{ mA}$	-	120	-	MHz
Output Capacitance	$C_{ob}$	$V_{CB} = (-)10 \text{ V}, f = 1 \text{ MHz}$	-	(22)12	-	pF
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = (-)500 \text{ mA}, I_B = (-)50 \text{ mA}$	-	$(-0.2)0.13$	$(-0.5)0.45$	V
Base to Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = (-)500 \text{ mA}, I_B = (-)50 \text{ mA}$		$(-0.85)$	$(-1.2)$	V
Collector to Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = (-)10 \mu\text{A}, I_E = 0 \text{ A}$	$(-)180$	-	-	V
Collector to Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = (-)1 \text{ mA}, R_{BE} = \infty$	$(-)160$	-	-	V
Emitter to Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = (-)10 \mu\text{A}, I_C = 0 \text{ A}$	$(-)6$	-	-	V
Turn-On Time	$t_{on}$	See specified Test Circuit	-	60	-	ns
Storage Time	$t_{stg}$		-	(0.7)1.2	-	$\mu\text{s}$
Fall Time	$t_f$		-	(50)80	-	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.

1. The 2SA1552 / 2SC4027 are classified by 100 mA  $h_{FE}$  as follows: (unit:  $\mu\text{A}$ )

Rank	S	T
$h_{FE}$	140 to 280	200 to 400



$10I_{B1} = -10I_{B2} = I_C = 0.7 \text{ A}$   
For PNP, the polarity is reversed.

**Figure 1. Switching Time Test Circuit**

# 2SA1552, 2SC4027

## TYPICAL CHARACTERISTICS

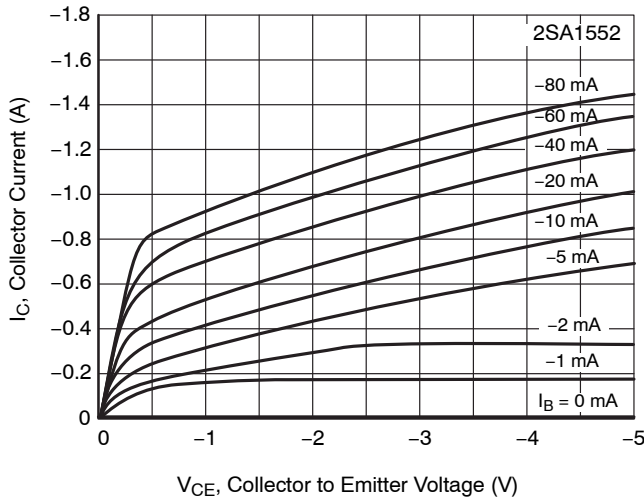


Figure 2.  $I_C - V_{CE}$

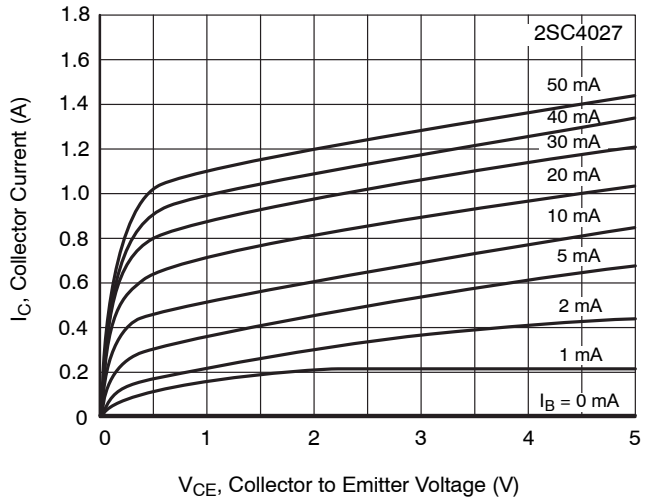


Figure 3.  $I_C - V_{CE}$

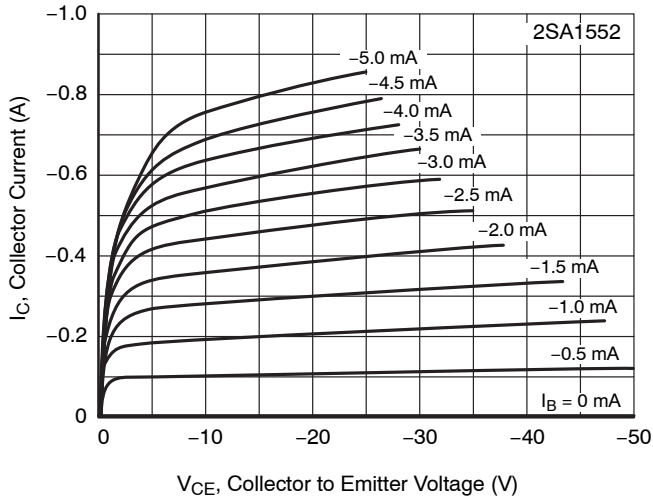


Figure 4.  $I_C - V_{CE}$

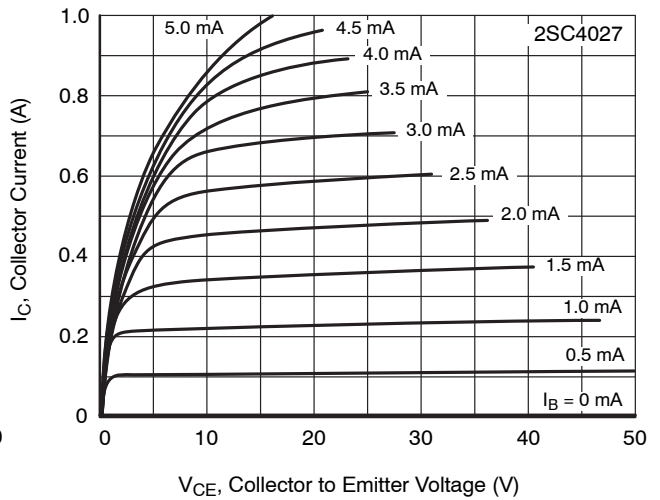


Figure 5.  $I_C - V_{CE}$

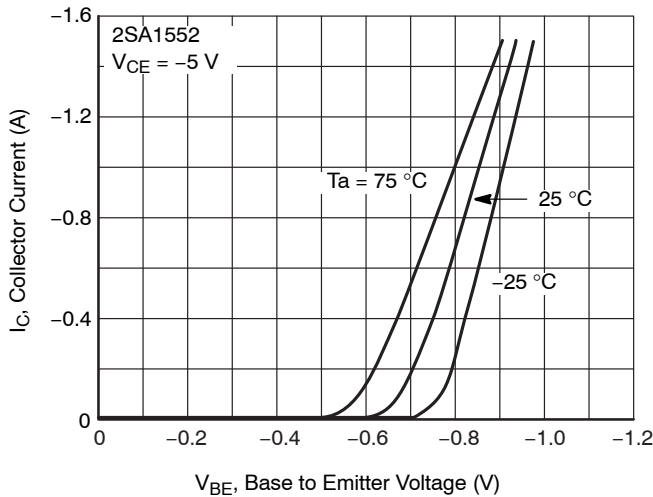


Figure 6.  $I_C - V_{BE}$

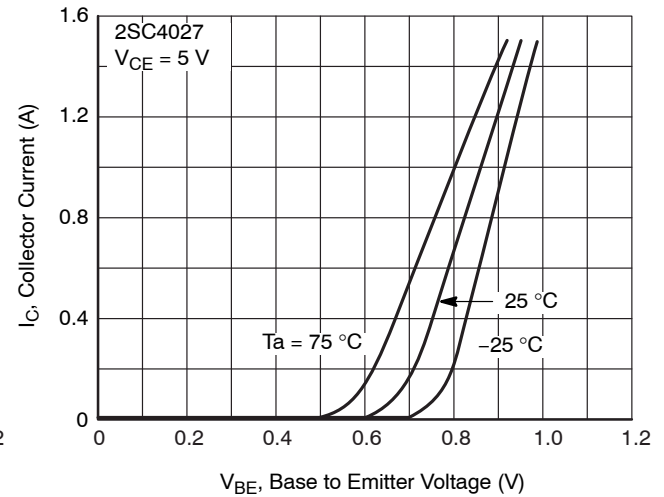


Figure 7.  $I_C - V_{BE}$

# 2SA1552, 2SC4027

## TYPICAL CHARACTERISTICS

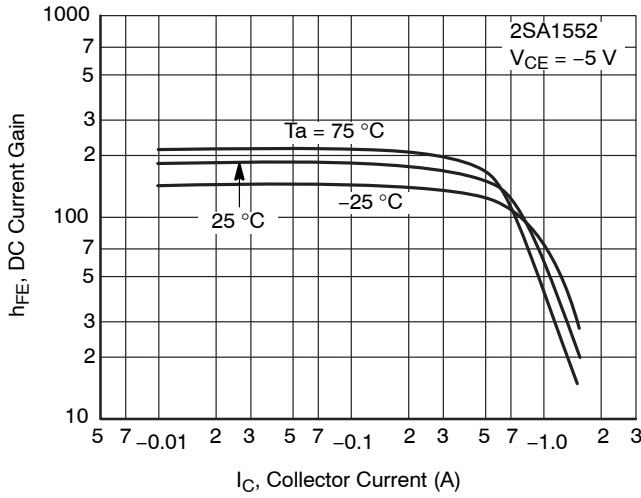


Figure 8.  $h_{FE} - I_C$

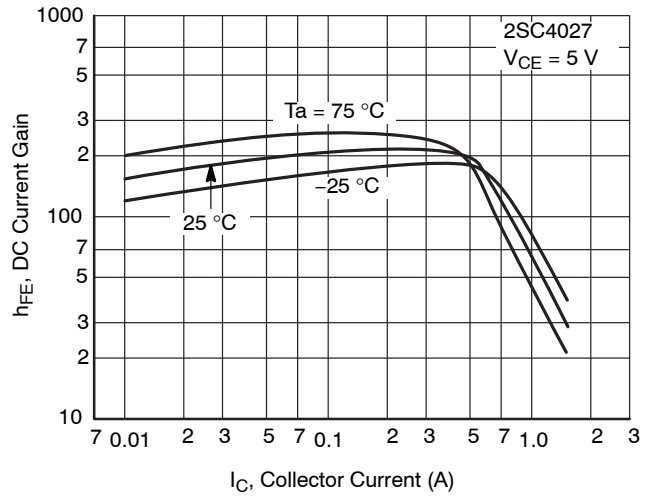


Figure 9.  $h_{FE} - I_C$

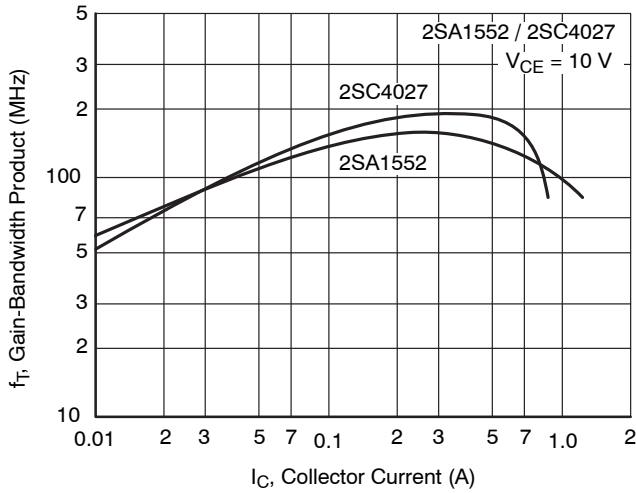


Figure 10.  $f_T - I_C$

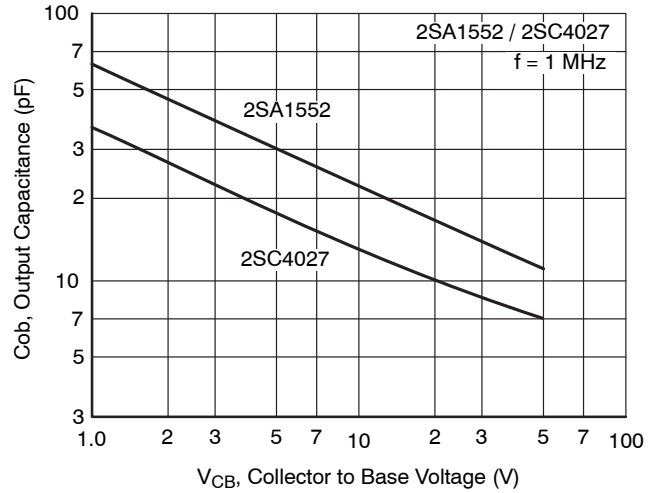


Figure 11.  $C_{ob} - V_{CB}$

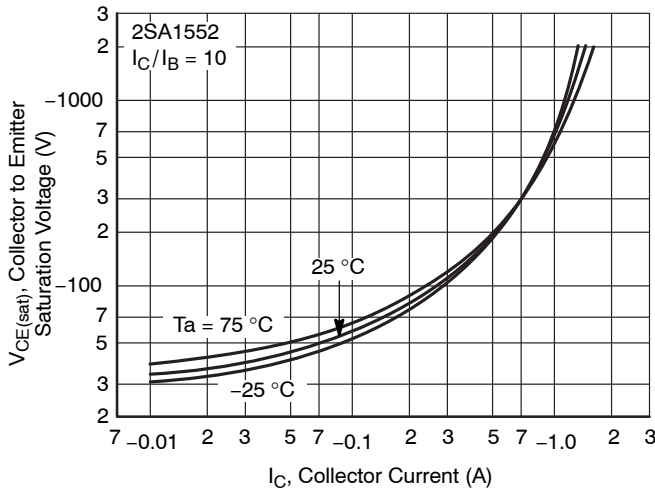


Figure 12.  $V_{CE(sat)} - I_C$

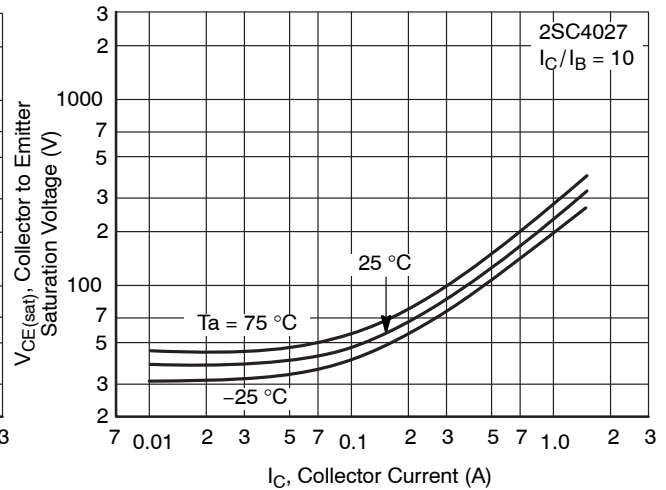


Figure 13.  $V_{CE(sat)} - I_C$

# 2SA1552, 2SC4027

## TYPICAL CHARACTERISTICS

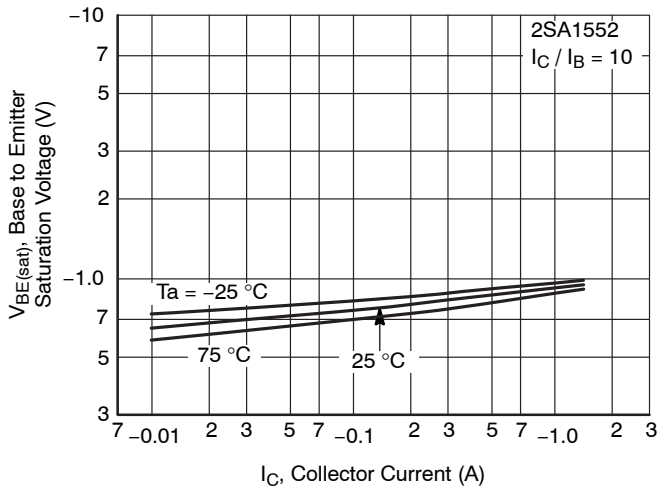


Figure 14.  $V_{BE(sat)} - I_C$

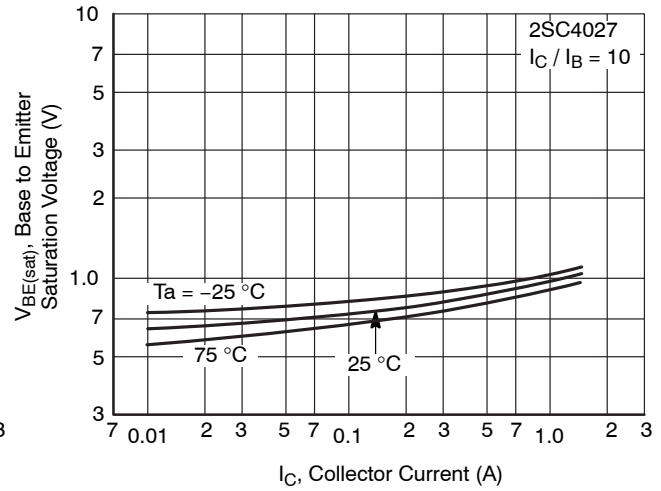


Figure 15.  $V_{BE(sat)} - I_C$

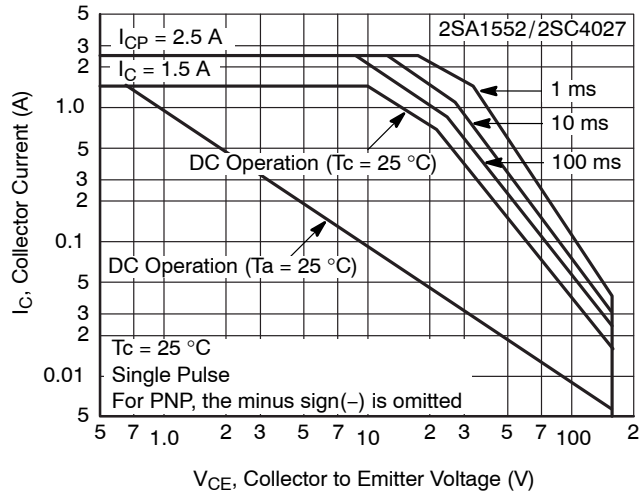


Figure 16. SOA

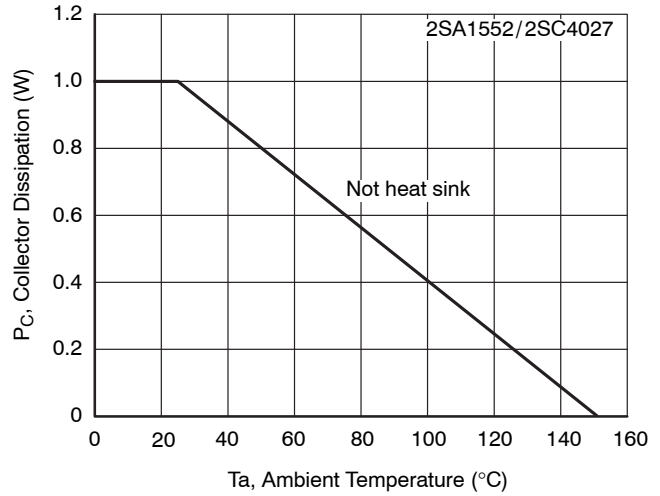


Figure 17.  $P_C - T_a$

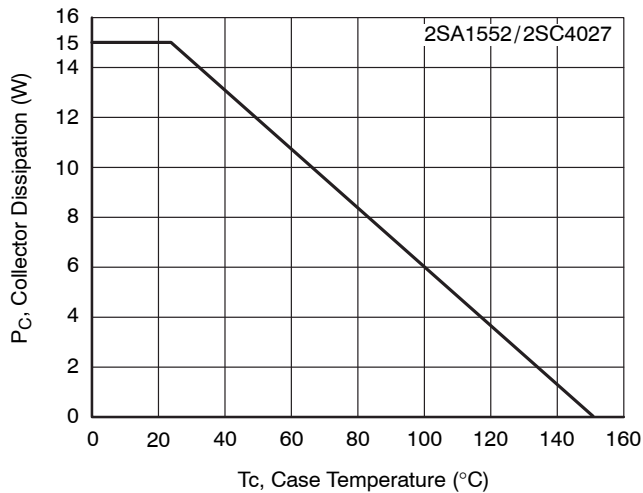


Figure 18.  $P_C - T_c$

## 2SA1552, 2SC4027

### ORDERING INFORMATION

Device	Package	Shipping†
2SA1552S-TL-E	DPAK-3 / TO-252-3 (Pb-Free)	700 / Tape & Reel
2SA1552S-TL-H	DPAK-3 / TO-252-3 (Pb-Free and Halogen Free)	700 / Tape & Reel
2SC4027S-TL-E	DPAK-3 / TO-252-3 (Pb-Free)	700 / Tape & Reel
2SC4027S-TL-H	DPAK-3 / TO-252-3 (Pb-Free and Halogen Free)	700 / Tape & Reel
2SC4027T-TL-E	DPAK-3 / TO-252-3 (Pb-Free)	700 / Tape & Reel

### DISCONTINUED (Note 2)

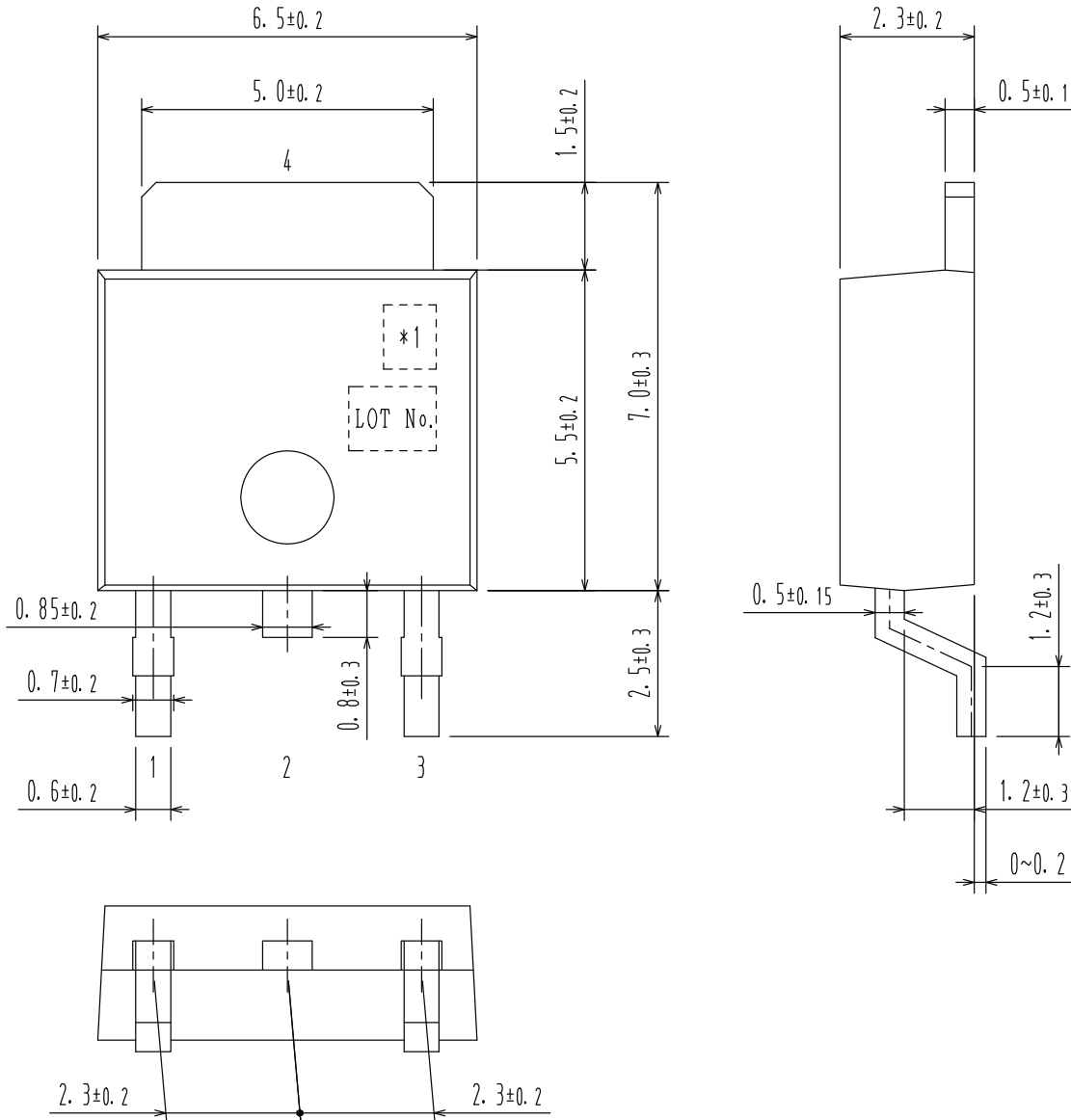
2SA1552S-E	IPAK / TP (Pb-Free)	500 Units / Bulk
2SA1552S-H	IPAK / TP (Pb-Free and Halogen Free)	500 Units / Bulk
2SA1552T-E	IPAK / TP (Pb-Free)	500 Units / Bulk
2SA1552T-H	IPAK / TP (Pb-Free and Halogen Free)	500 Units / Bulk
2SC4027S-E	IPAK / TP (Pb-Free)	500 Units / Bulk
2SC4027S-H	IPAK / TP (Pb-Free and Halogen Free)	500 Units / Bulk
2SC4027T-E	IPAK / TP (Pb-Free)	500 Units / Bulk
2SC4027T-H	IPAK / TP (Pb-Free and Halogen Free)	500 Units / Bulk
2SA1552T-TL-E	DPAK-3 / TO-252-3 (Pb-Free)	700 / Tape & Reel
2SA1552T-TL-H	DPAK-3 / TO-252-3 (Pb-Free and Halogen Free)	700 / Tape & Reel
2SC4027T-TL-H	DPAK-3 / TO-252-3 (Pb-Free and Halogen Free)	700 / 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.

2. **DISCONTINUED:** These devices are not recommended for new design. Please contact your **onsemi** representative for information. The most current information on these devices may be available on [www.onsemi.com](http://www.onsemi.com).

DPAK / TP-FA  
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ISSUE O

DATE 30 JAN 2012



Pin 2 is idle pin with electrical designation only carried.

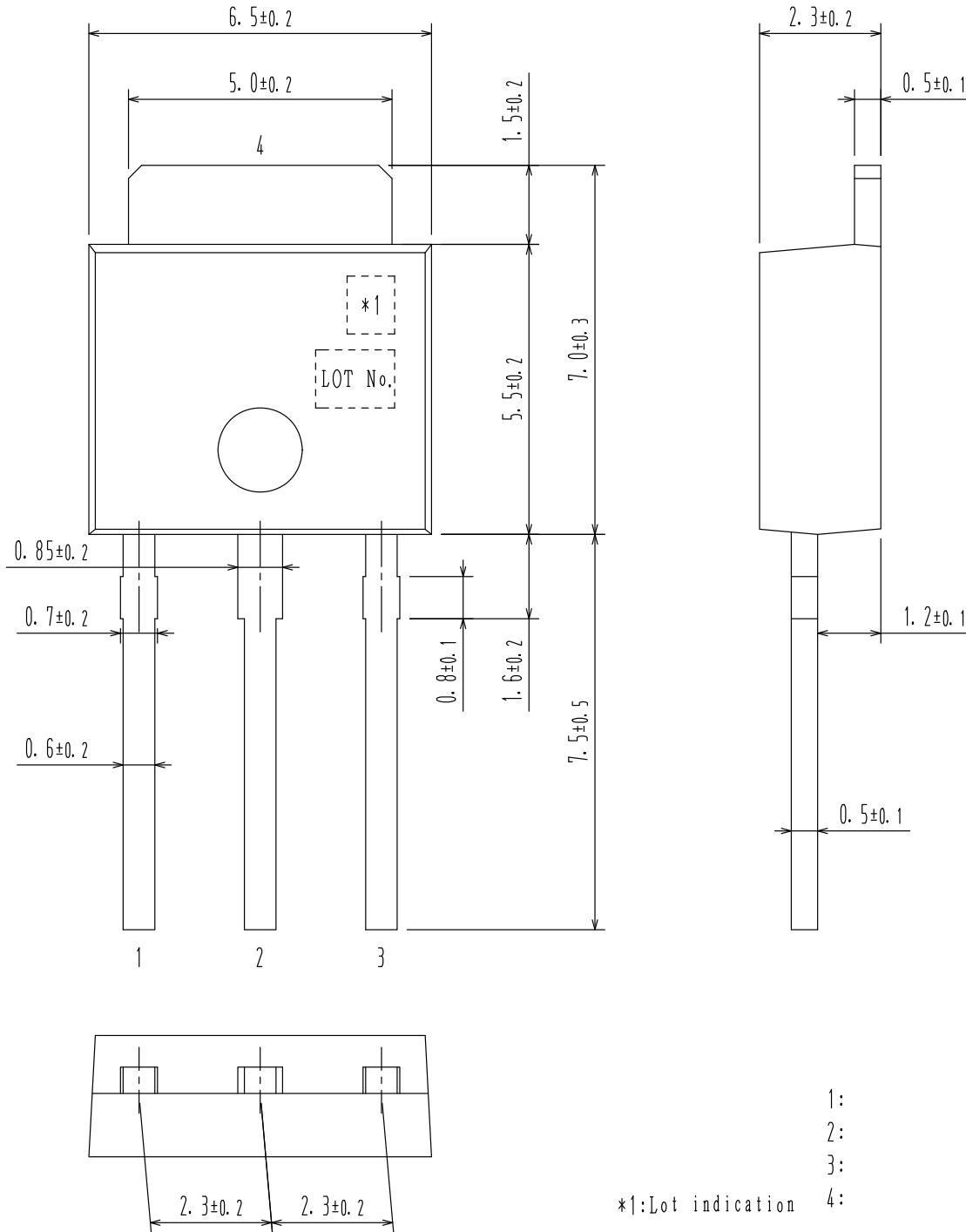
- 1:
- 2:
- 3:
- \*1: Lot indication 4:

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**IPAK / TP**  
**CASE 369AJ**  
**ISSUE 0**

DATE 30 JAN 2012



- 1:
- 2:
- 3:
- 4:

\*1: Lot indication

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