

# 2SC6097-TL-E Datasheet



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DiGi Electronics Part Number	2SC6097-TL-E-DG
Manufacturer	<a href="#">onsemi</a>
Manufacturer Product Number	2SC6097-TL-E
Description	TRANS NPN 60V 3A TP
Detailed Description	Bipolar (BJT) Transistor NPN 60 V 3 A 390MHz 800 mW Surface Mount TP-FA



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## Purchase and inquiry

Manufacturer Product Number:

2SC6097-TL-E

Series:

-

Transistor Type:

NPN

Voltage - Collector Emitter Breakdown (Max):

60 V

Current - Collector Cutoff (Max):

1 $\mu$ A (ICBO)

Power - Max:

800 mW

Operating Temperature:

150°C (TJ)

Package / Case:

TO-252-3, DPAK (2 Leads + Tab), SC-63

Base Product Number:

2SC6097

Manufacturer:

onsemi

Product Status:

Active

Current - Collector (Ic) (Max):

3 A

Vce Saturation (Max) @ Ib, Ic:

135mV @ 100mA, 1A

DC Current Gain (hFE) (Min) @ Ic, Vce:

300 @ 100mA, 2V

Frequency - Transition:

390MHz

Mounting Type:

Surface Mount

Supplier Device Package:

TP-FA

## Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.21.0075

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99

# Bipolar Transistor

60 V, 3 A, Low  $V_{CE(sat)}$ , NPN Single  
TP/TP-FA

## 2SC6097

### Features

- Adoption of FBET, MBIT Process
- Low Collector-to-Emitter Saturation Voltage
- High Allowable Power Dissipation
- Large Current Capacity
- High-Speed Switching

### Applications

- DC / DC Converter, Relay Drivers, Lamp Drivers, Motor Drivers, Inverter

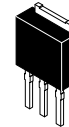
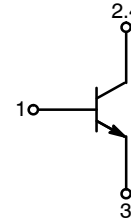
### SPECIFICATIONS

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector to Base Voltage	$V_{CBO}$	–	100	V
Collector to Emitter Voltage	$V_{CES}$	–	100	V
Collector to Emitter Voltage	$V_{CEO}$	–	60	V
Emitter to Base Voltage	$V_{EBO}$	–	6.5	V
Collector Current	$I_C$	–	3	A
Collector Current (Pulse)	$I_{CP}$	–	5	A
Collector Current	$I_B$	–	600	mA
Collector Dissipation	$P_C$	–	0.8	W
		$T_C = 25^\circ\text{C}$	15	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.

### ELECTRICAL CONNECTION

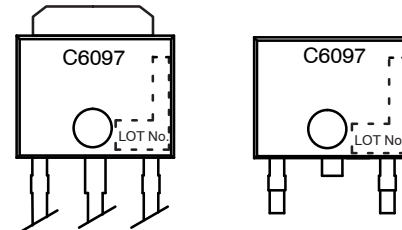


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CASE 369AJ



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CASE 369AH

### MARKING DIAGRAM



### ORDERING INFORMATION

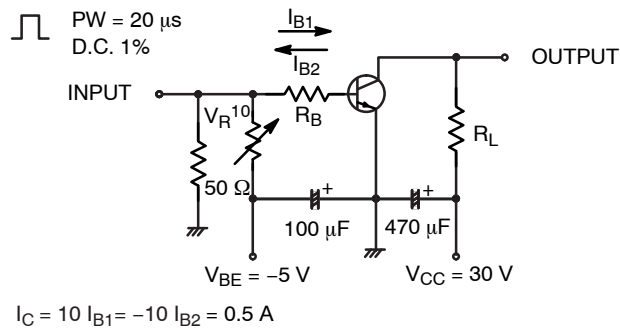
Device	Package	Shipping <sup>†</sup>
2SC6097-E	SC-64, TO-251	500 / Bulk Bag
2SC6097-TL-E	SC-63, TO-252	700 / Tape & Reel

<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).

**2SC6097****ELECTRICAL CHARACTERISTICS** (at  $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Conditions	Ratings			Unit
			Min	Typ	Max	
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = 50\text{ V}, I_E = 0\text{ A}$	-	-	1	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 4\text{ V}, I_C = 0\text{ A}$	-	-	1	$\mu\text{A}$
DC Current Gain	$h_{FE}$	$V_{CE} = 2\text{ V}, I_C = 100\text{ mA}$	300	-	600	
Gain-Bandwidth Product	$f_T$	$V_{CE} = 10\text{ V}, I_C = 500\text{ mA}$	-	390	-	MHz
Output Capacitance	$C_{ob}$	$V_{CB} = 10\text{ V}, f = 1\text{ MHz}$	-	18	-	pF
Collector to Emitter Saturation Voltage	$V_{CE(sat)1}$	$I_C = 1\text{ A}, I_B = 50\text{ mA}$	-	100	150	mV
	$V_{CE(sat)2}$	$I_C = 1\text{ A}, I_B = 100\text{ mA}$	-	90	135	mV
Base to Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 1\text{ A}, I_B = 100\text{ mA}$	-	0.84	1.2	V
Collector to Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 10\text{ }\mu\text{A}, I_E = 0\text{ A}$	100	-	-	V
Collector to Emitter Breakdown Voltage	$V_{(BR)CES}$	$I_C = 100\text{ }\mu\text{A}, R_{BE} = 0\text{ }\Omega$	100	-	-	V
Collector to Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1\text{ mA}, R_{BE} = \infty$	60	-	-	V
Emitter to Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 10\text{ }\mu\text{A}, I_C = 0\text{ A}$	6.5	-	-	V
Turn-On Time	$t_{on}$	See specified Test Circuit	-	35	-	ns
Storage Time	$t_{stg}$		-	680	-	ns
Fall Time	$t_f$		-	24	-	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.

**Switching Time Test Circuit**

## 2SC6097

### TYPICAL CHARACTERISTICS

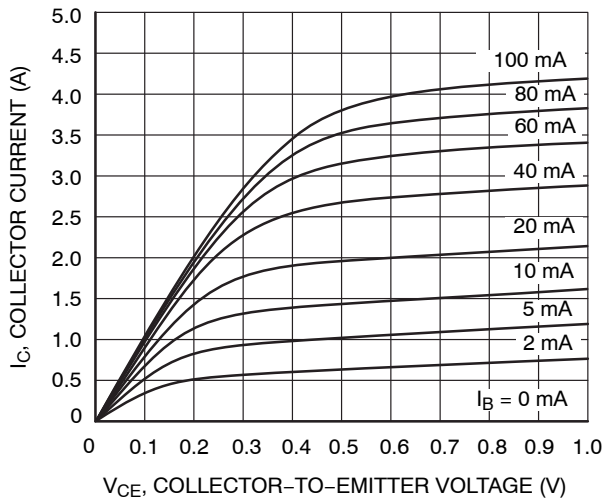


Figure 1.  $I_C - V_{CE}$

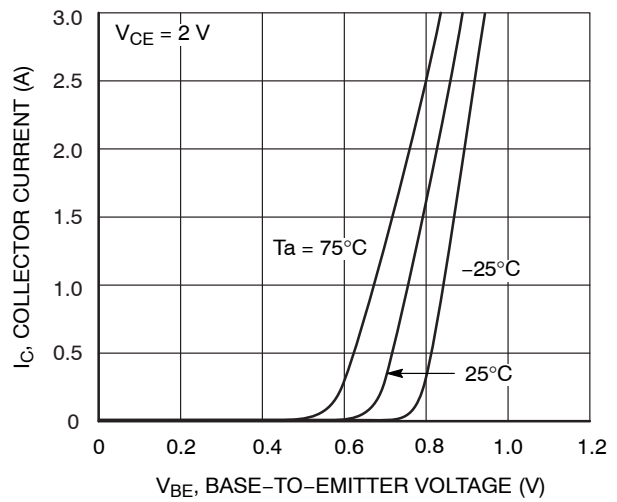


Figure 2.  $I_C - V_{BE}$

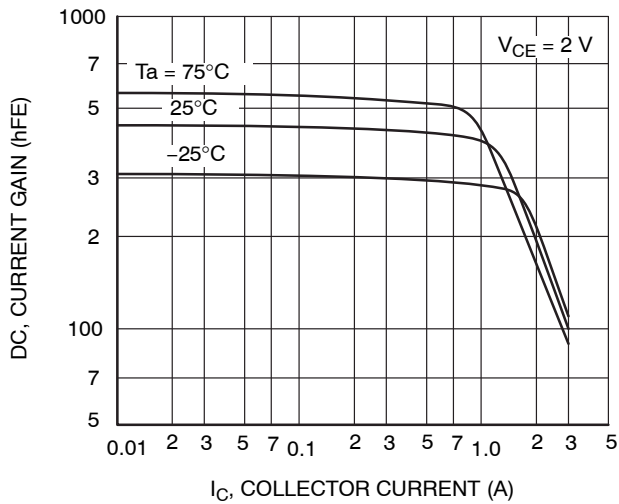


Figure 3.  $H_{FE} - I_C$

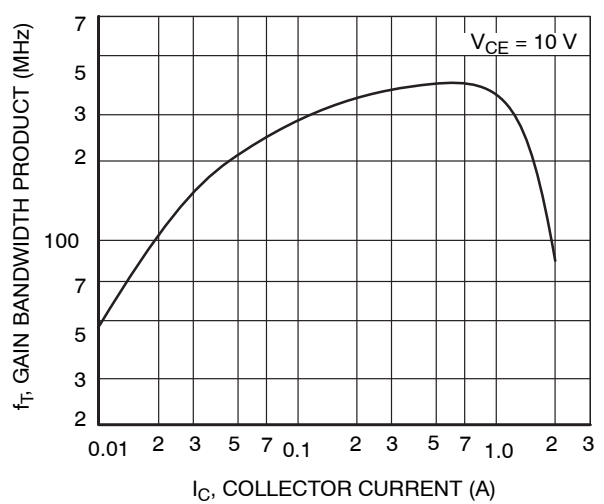


Figure 4.  $f_T - I_C$

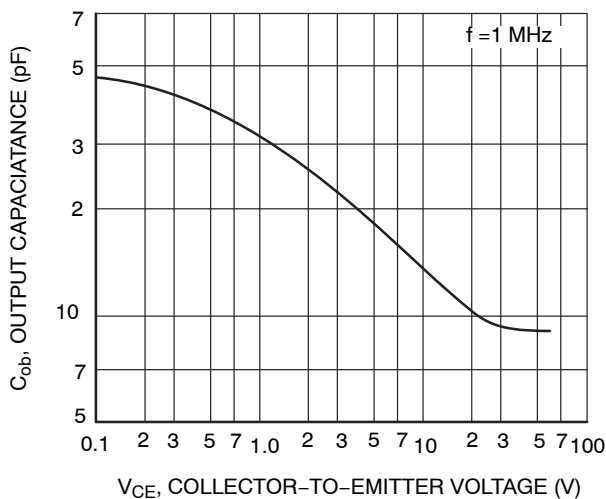


Figure 5.  $C_{ob} - V_{CB}$

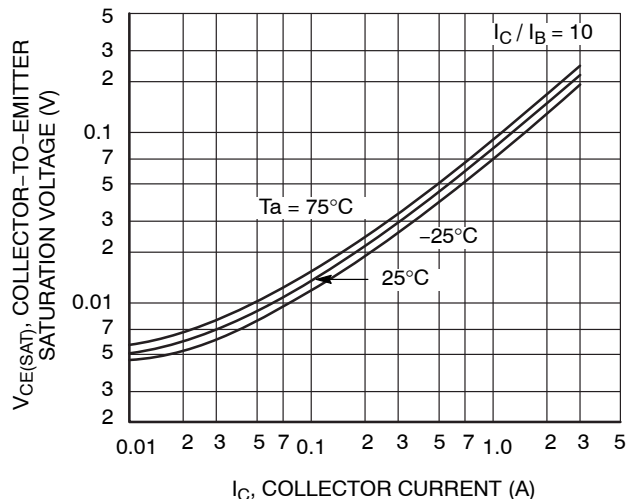


Figure 6.  $V_{CE(sat)} - I_C$

# 2SC6097

## TYPICAL CHARACTERISTICS (continued)

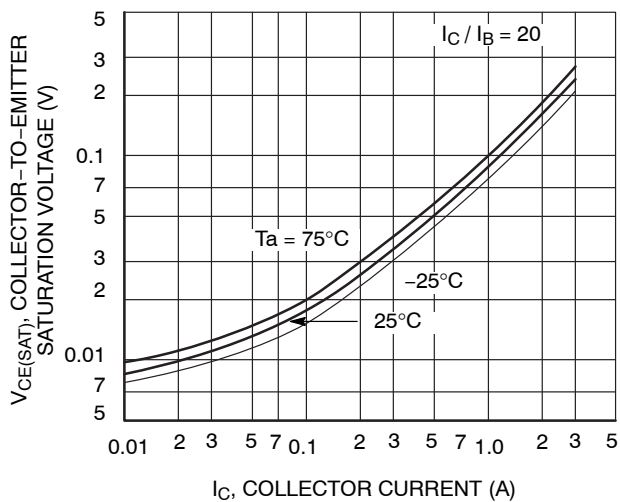


Figure 7.  $V_{CE(sat)} - I_C$

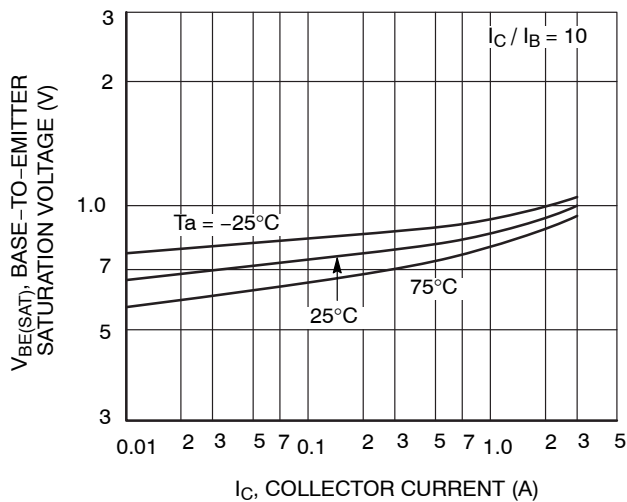


Figure 8.  $V_{BE(sat)} - I_C$

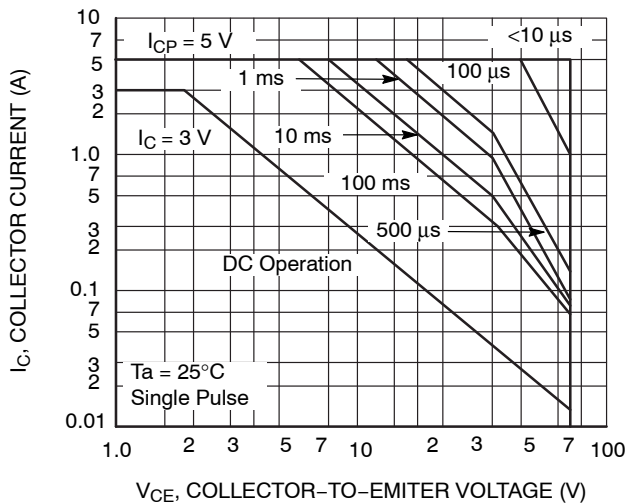


Figure 9. ASO

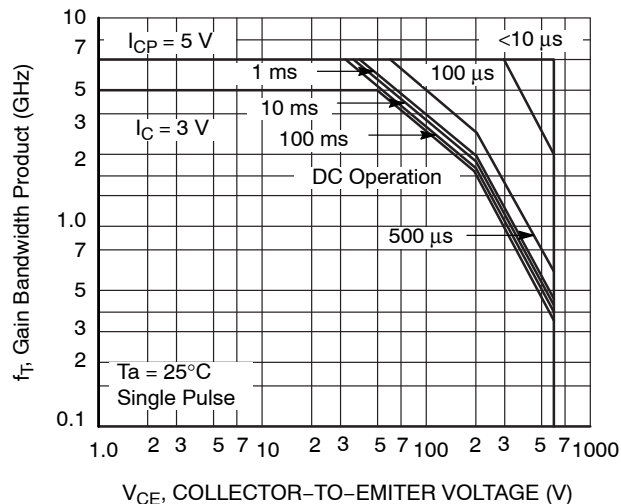


Figure 10. ASO

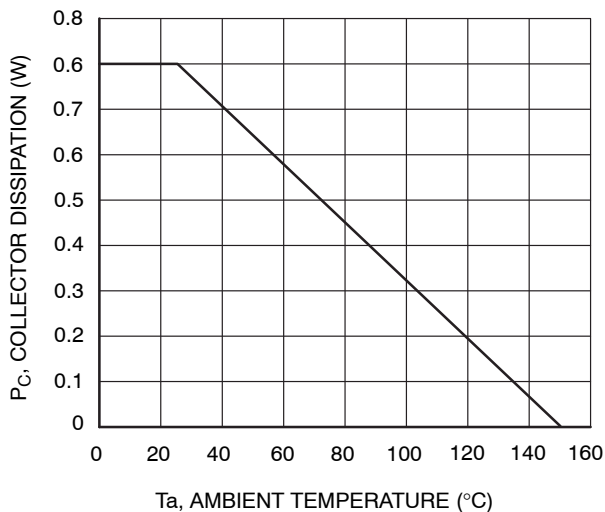


Figure 11.  $P_C - T_a$

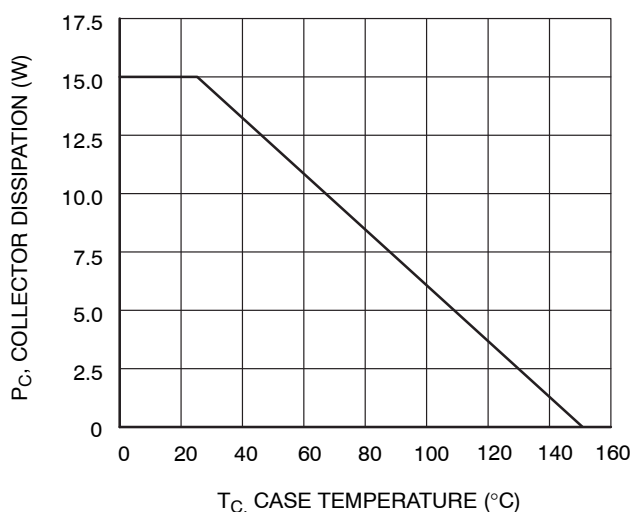
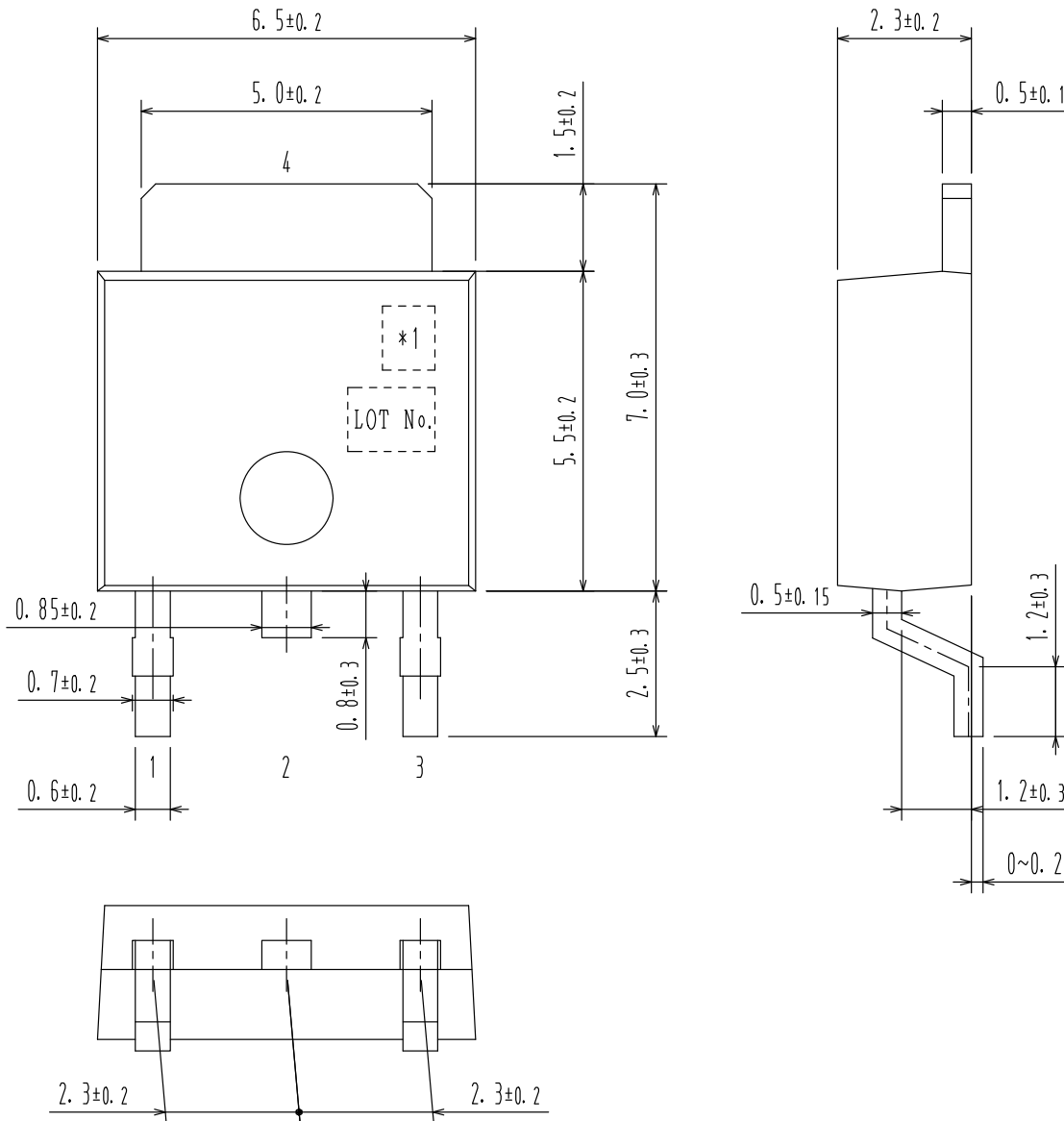


Figure 12.  $P_C - T_C$

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**ISSUE O**

DATE 30 JAN 2012



Pin 2 is idle pin with electrical designation only carried.

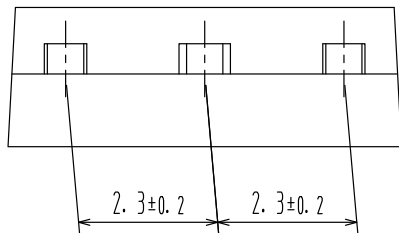
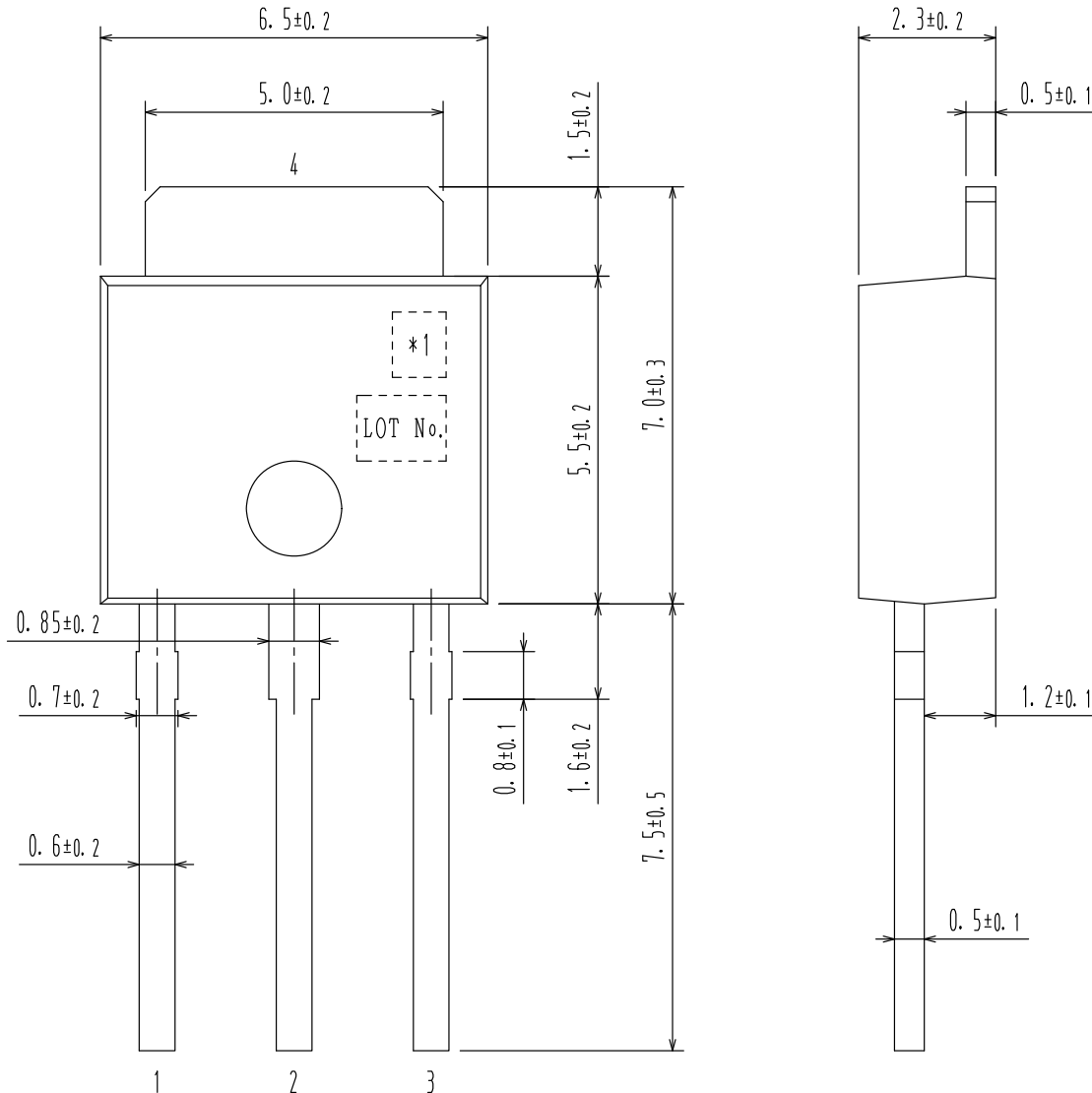
- 1:
- 2:
- 3:
- \*1: Lot indication 4:

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