2SB1202/2SD1802

Bipolar Transistor

(–)50 V, (–)3 A, Low V_{CE}(sat) (PNP)NPN Single TP/TP−FA

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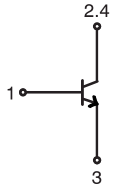
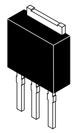
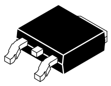


(For PNP, the polarity is reversed.)



IPAK / TP
CASE 369AJ



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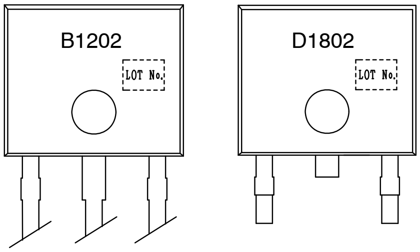
CASE 369AH

MARKING DIAGRAM



ORDERING INFORMATION

See detailed ordering and shipping information on page 8 of this data sheet.

Features

- Adoption of FBET and MBIT Processes
- Large Current Capacitance and Wide ASO
- Low Collector to Emitter Saturation Voltage
- Fast Switching Speed
- Small and Slim Package Making it Easy to Make 2SB1202/2SD1802−used Sets Smaller
- These Devices are Pb−Free and are RoHS Compliant

Applications

- Voltage Regulators, Relay Drivers, Lamp Drivers, Electrical Equipment

ABSOLUTE MAXIMUM RATINGS at T_A = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector to Base Voltage	V_{CBO}		(–)60	V
Collector to Emitter Voltage	V_{CEO}		(–)50	V
Emitter to Base Voltage	V_{EBO}		(–)6	V
Collector Current	I_C		(–)3	A
Collector Current (Pulse)	I_{CP}		(–)6	A
Collector Dissipation	P_C		1	W
		T_C = 25°C	15	W
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.

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March, 2019 − Rev. 0

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ELECTRICAL CHARACTERISTICS at $T_A = 25°C$

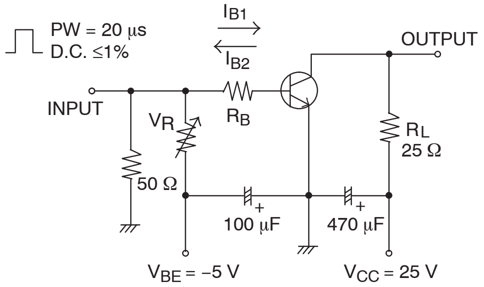
Parameter	Symbol	Conditions	Ratings			Unit
			Min	Typ	Max	
Collector Cutoff Current	I_{CBO}	V_{CB} = (-)40 V, I_E = 0 A			(-)1	µA
Emitter Cutoff Current	I_{EBO}	V_{EB} = (-)4V, I_C = 0 A			(-)1	µA
DC Current Gain	$h_{FE}1$	V_{CE} = (-)2 V, I_C = (-)100 mA	100*		560*	
	$h_{FE}2$	V_{CE} = (-)2 V, I_C = (-)3 A	35			
Gain−Bandwidth Product	f_T	V_{CE} = (-)10 V, I_C = (-)50 mA		150		MHz
Output Capacitance	Cob	V_{CB} = (-)10 V, f = 1 MHz		(39)25		pF
Collector to Emitter Saturation Voltage	V_{CE}(sat)	I_C = (-)2 A, I_B = (-)100 mA		(−0.35)0.19	(-0.7)0.5	V
Base to Emitter Saturation Voltage	V_{BE}(sat)	V_{CE} = (-)2 V, I_C = (-)100 mA		(-)0.94	(-)1.2	V
Collector to Base Breakdown Voltage	$V_{(BR)CBO}$	I_C = (-)10 µA, I_E = 0 A	(-)60			V
Collector to Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = (-)1 mA, R_{BE} = Ω	(-)50			V
Emitter to Base Breakdown Voltage	$V_{(BR)EBO}$	I_E = (-)10 µA, I_C = 0 A	(-)6			V
Turn−On Time	ton	See specified Test Circuit		70		ns
Storage Time	tstg			(450)650		ns
Fall Time	tf			35		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 2SB1202/2SD1802 are classified by 100 mA h_{FE} as follows :

Rank	R	S	T	U
h_{FE}	100 to 200	140 to 280	200 to 400	280 to 560

Switching Time Test Circuit



$I_C = 10\ I_{B1} = -10\ I_{B2} = 1$ A
For PNP, the polarity is reversed.

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TYPICAL CHARACTERISTICS

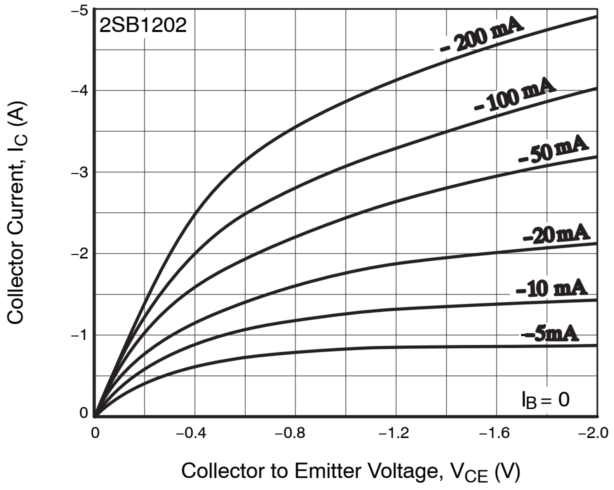

Figure 1. I_C – V_{CE}

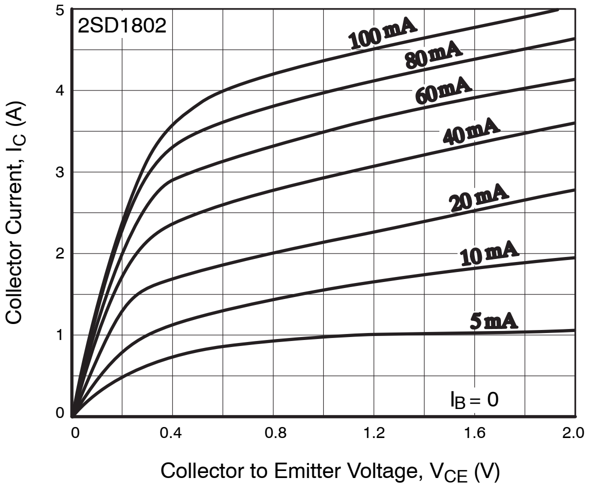

Figure 2. I_C – V_{CE}

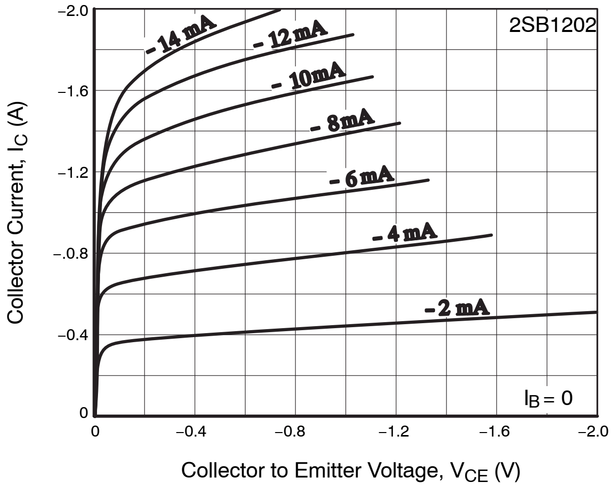

Figure 3. I_C – V_{CE}

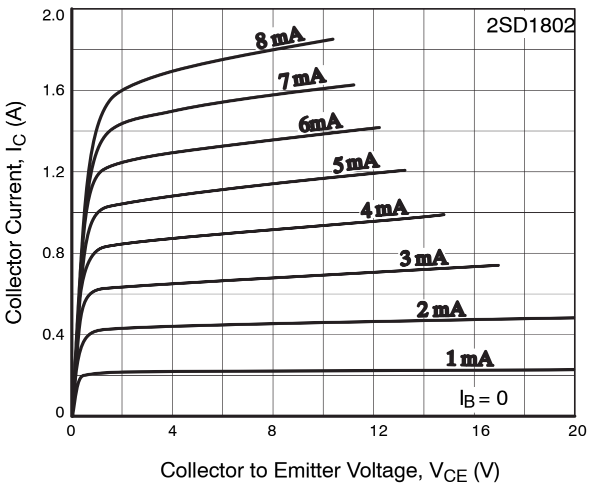

Figure 4. I_C – V_{CE}

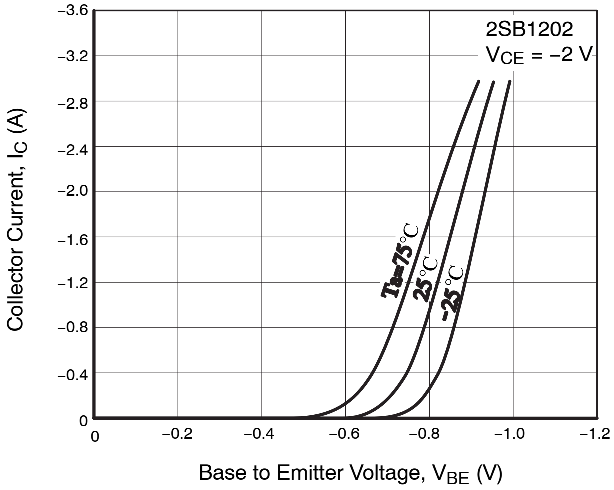

Figure 5. I_C – V_{BE}

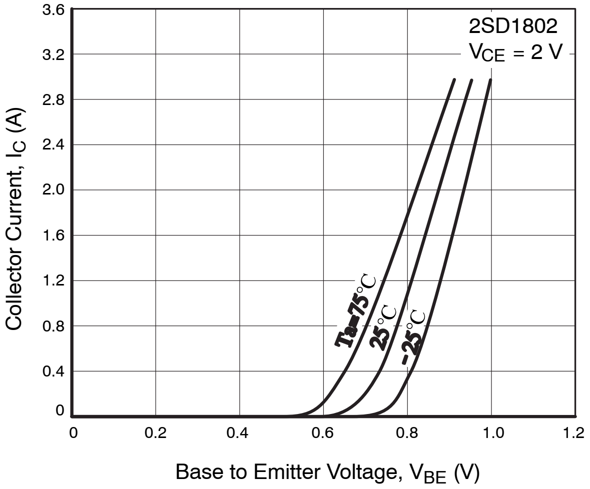

Figure 6. I_C – V_{BE}

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TYPICAL CHARACTERISTICS (continued)

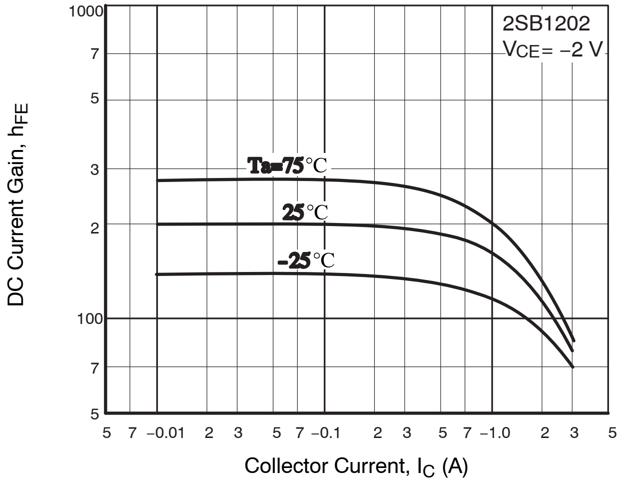

Figure 7. h_{FE} – I_C

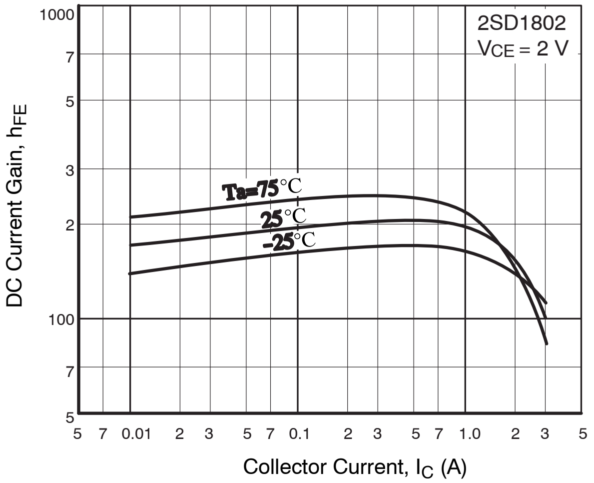

Figure 8. h_{FE} – I_C

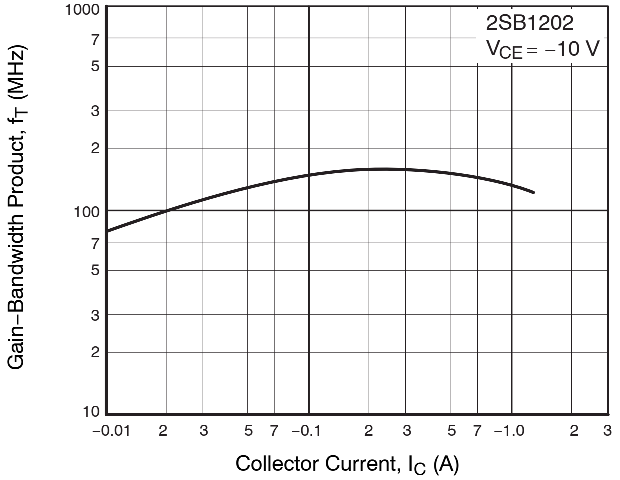

Figure 9. f_T – I_C

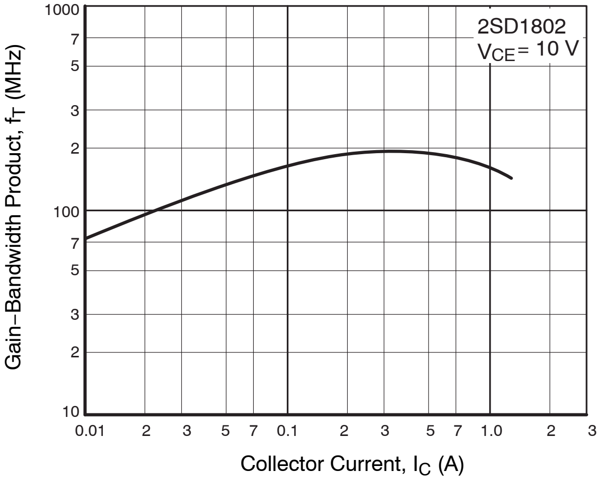

Figure 10. f_T – I_C

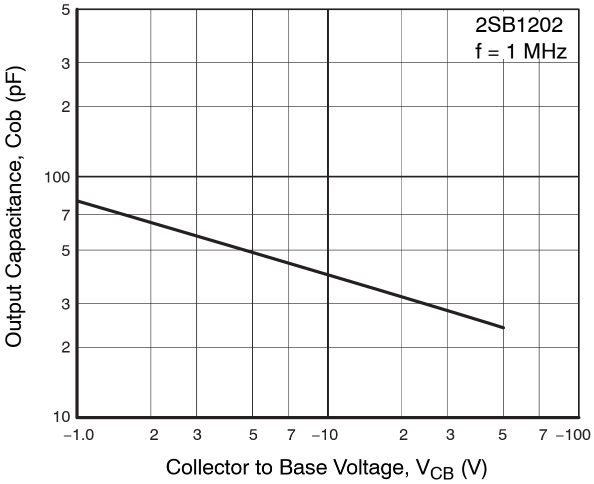

Figure 11. Cob – V_{CB}

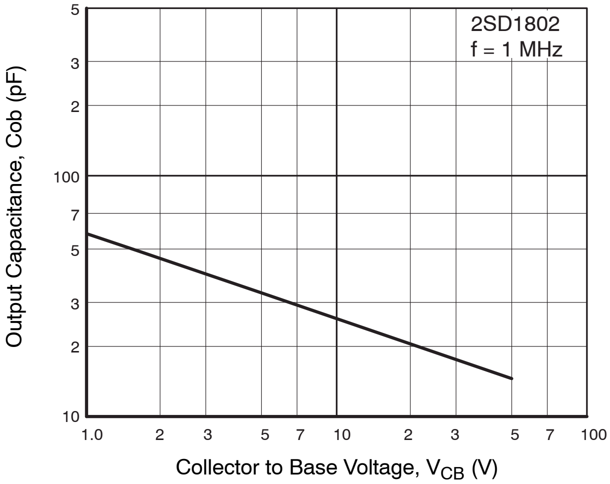

Figure 12. Cob – V_{CB}

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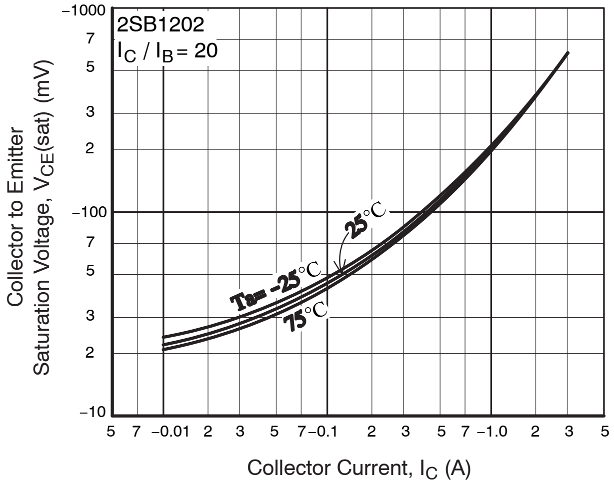

Figure 13. V_{CE}(sat) – I_C

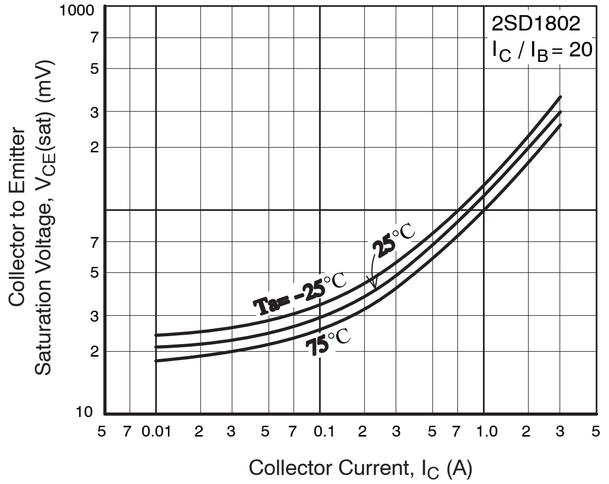

Figure 14. V_{CE}(sat) – I_C

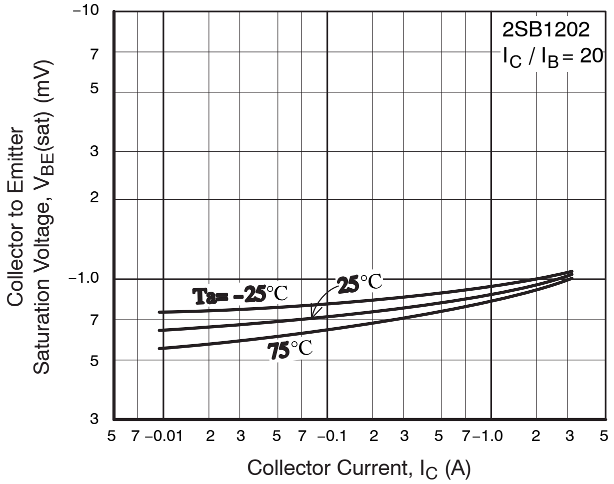

Figure 15. V_{BE}(sat) – I_C

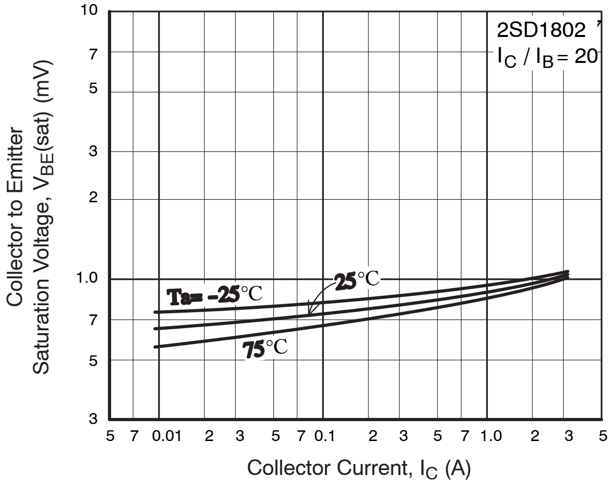

Figure 16. V_{BE}(sat) – I_C

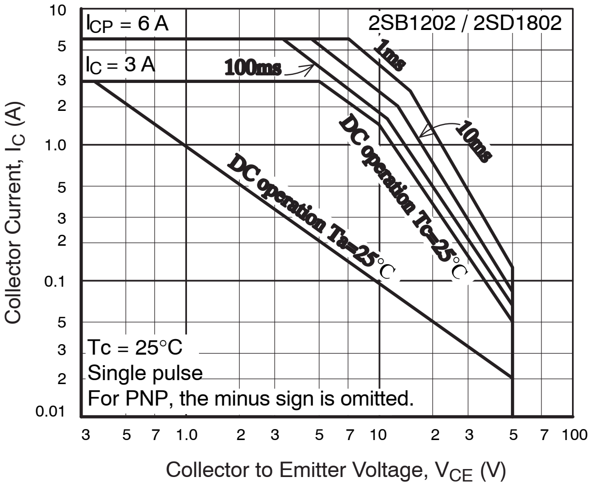

Figure 17. ASO

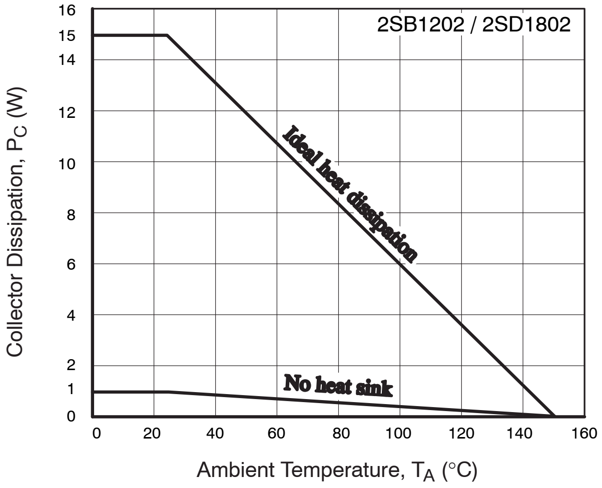

Figure 18. P_C – T_A

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ORDERING INFORMATION

Device	Package	Shipping†	memo
2SB1202S−E	TP	500pcs./bag	Pb−Free
2SB1202T−E	TP	500pcs./bag	
2SD1802S−E	TP	500pcs./bag	
2SD1802T−E	TP	500pcs./bag	
2SB1202S−TL−E	TP−FA	700pcs./reel	
2SB1202T−TL−E	TP−FA	700pcs./reel	
2SD1802S−TL−E	TP−FA	700pcs./reel	
2SD1802T−TL−E	TP−FA	700pcs./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.

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MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

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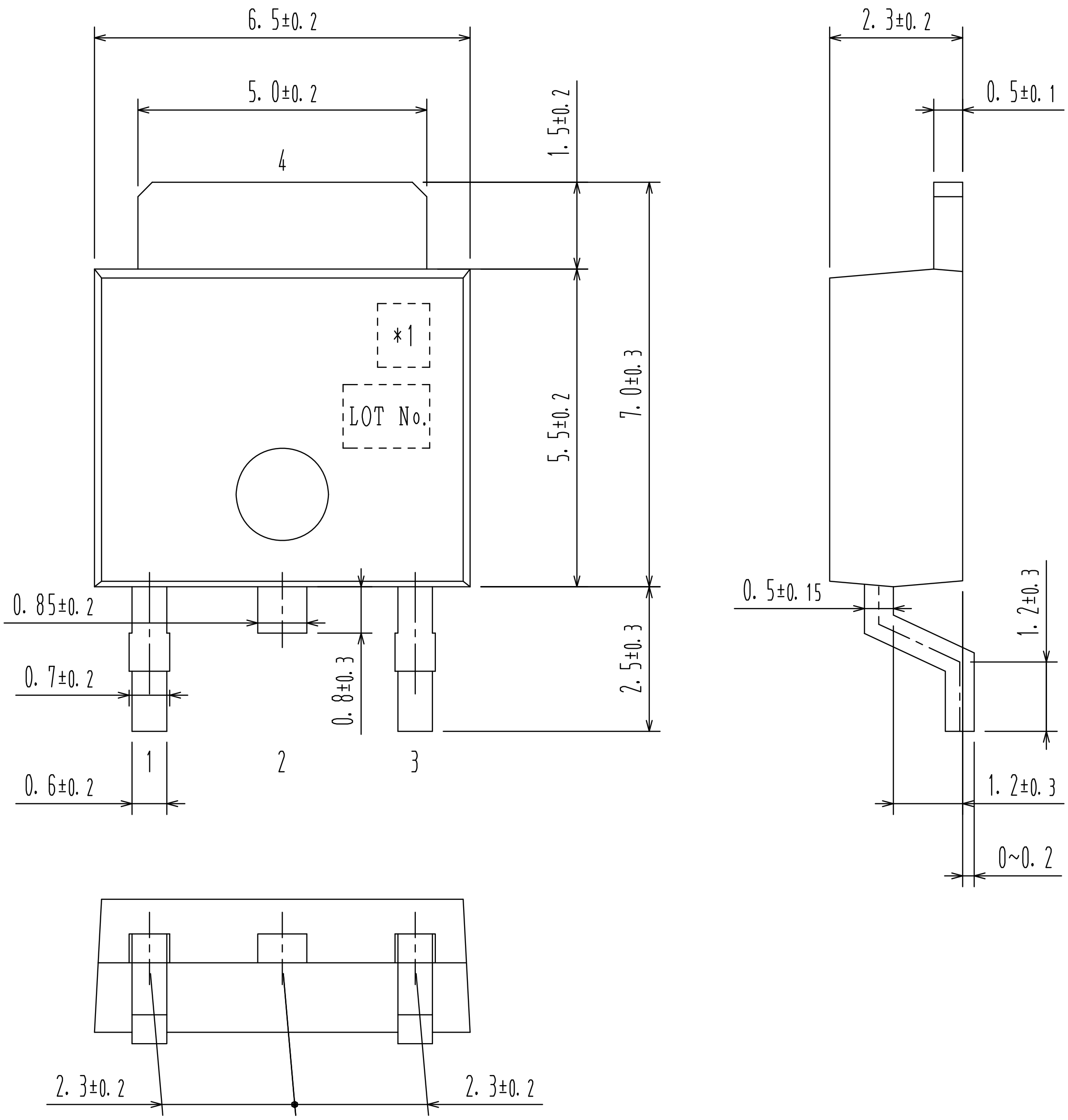

1:
2:
3:
4:

Pin 2 is idle pin with electrical designation only carried.

*1:Lot indication

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MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

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CASE 369AJ
ISSUE O

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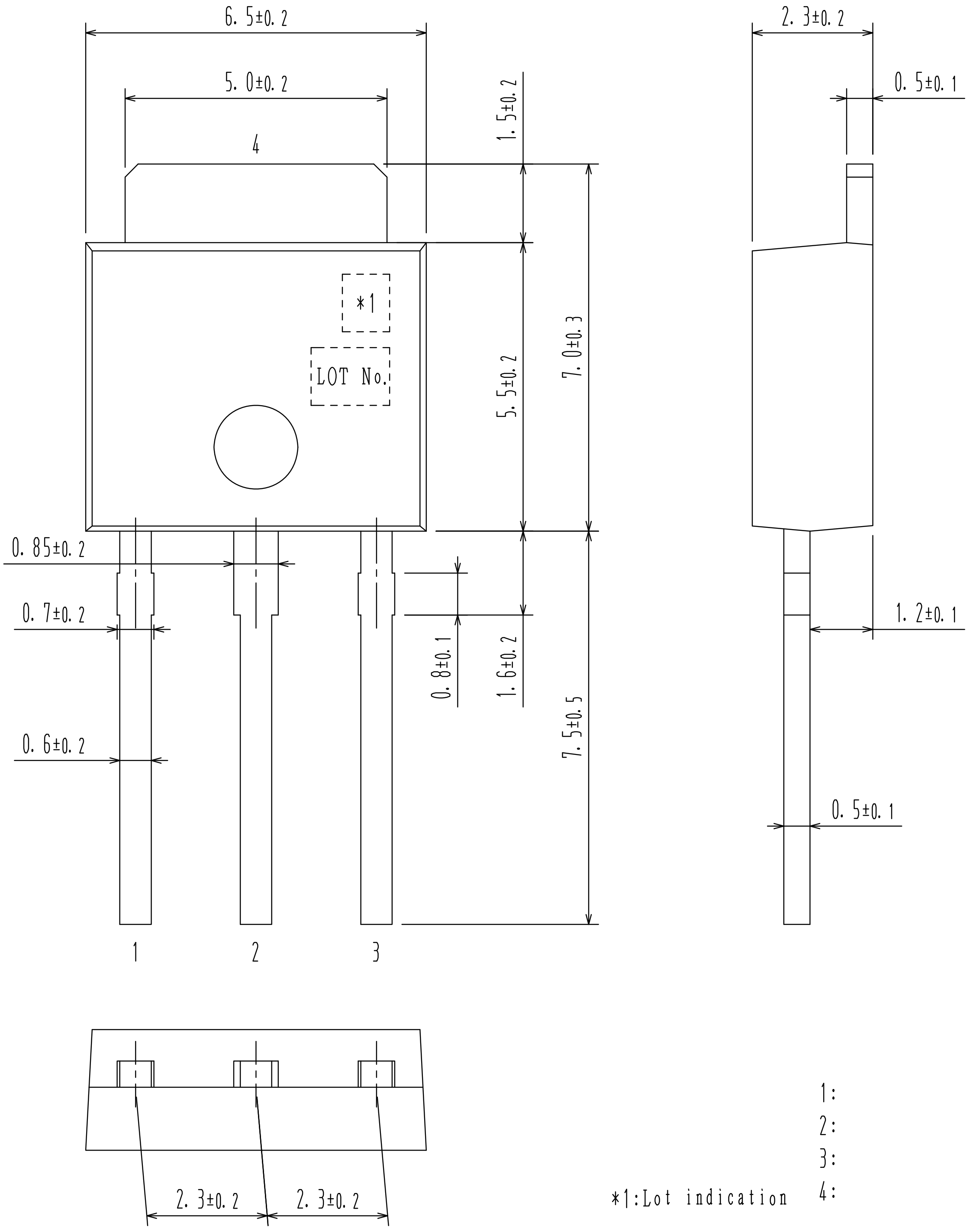

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