

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

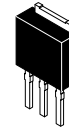
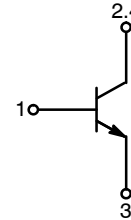
SPECIFICATIONS

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

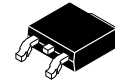
| Parameter | Symbol | Conditions | Ratings | Unit |
|------------------------------|-----------|--------------------------|--------------|------------------|
| Collector to Base Voltage | V_{CBO} | - | 100 | V |
| Collector to Emitter Voltage | V_{CES} | - | 100 | V |
| Collector to Emitter Voltage | 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

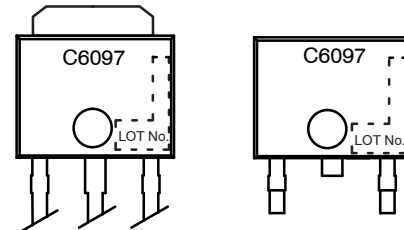


IPAK / TP
CASE 369AJ



DPAK / TP-FA
CASE 369AH

MARKING DIAGRAM



ORDERING INFORMATION

| Device | Package | Shipping [†] |
|--------------|------------------|-----------------------|
| 2SC6097-E | SC-64, TO-251 | 500 / Bulk Bag |
| 2SC6097-TL-E | SC-63, TO-252 | 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](#).

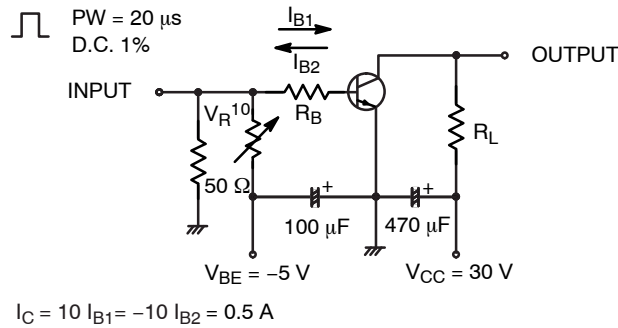
2SC6097

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 | μA |
| Emitter Cutoff Current | I_{EBO} | $V_{EB} = 4\text{ V}, I_C = 0\text{ A}$ | - | - | 1 | μA |
| 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



TYPICAL CHARACTERISTICS

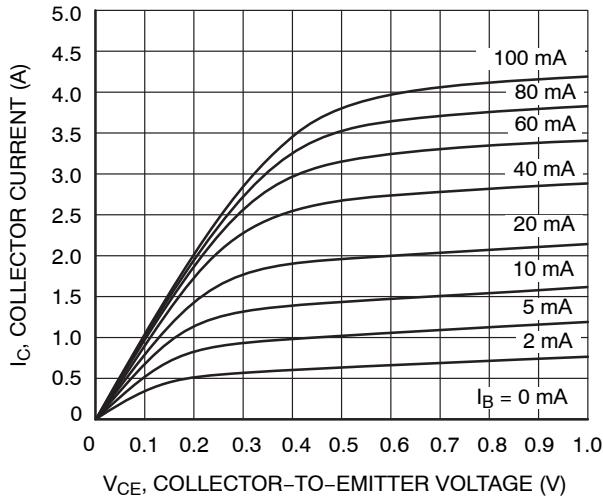


Figure 1. $I_C - V_{CE}$

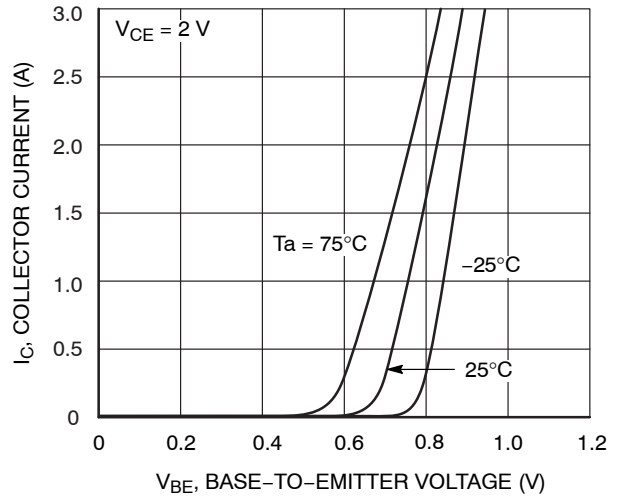


Figure 2. $I_C - V_{BE}$

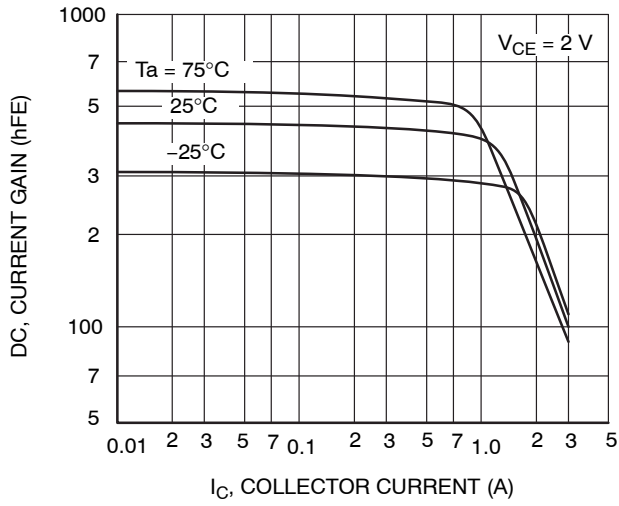


Figure 3. $H_{FE} - I_C$

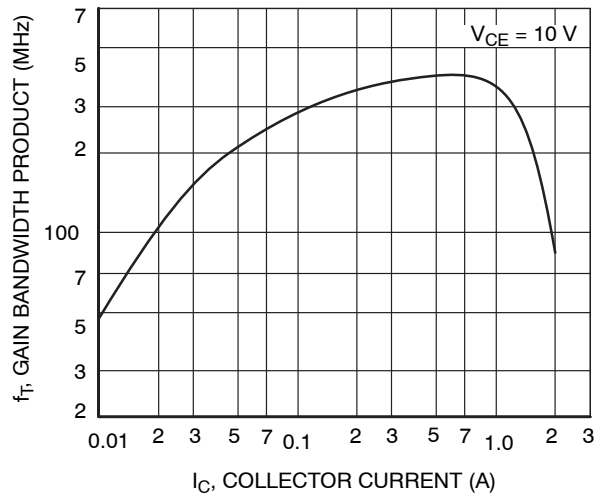


Figure 4. $f_T - I_C$

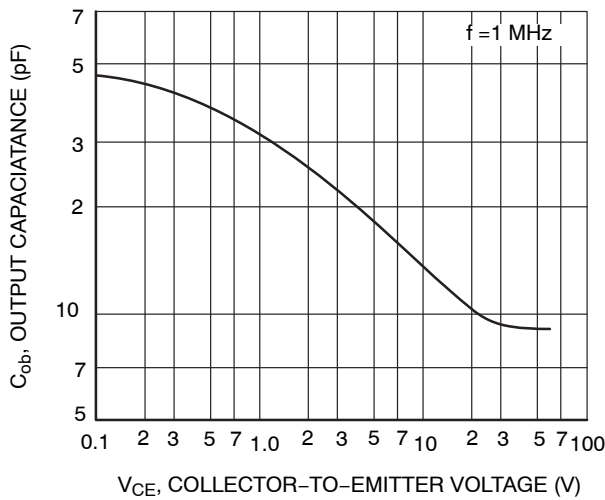


Figure 5. $C_{ob} - V_{CB}$

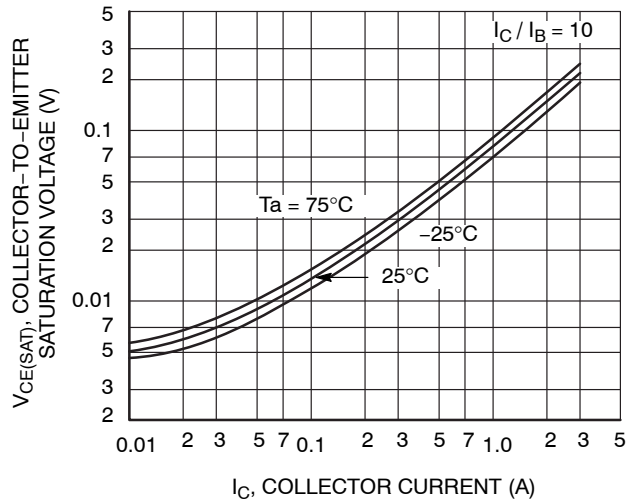


Figure 6. $V_{CE(sat)} - I_C$

TYPICAL CHARACTERISTICS (continued)

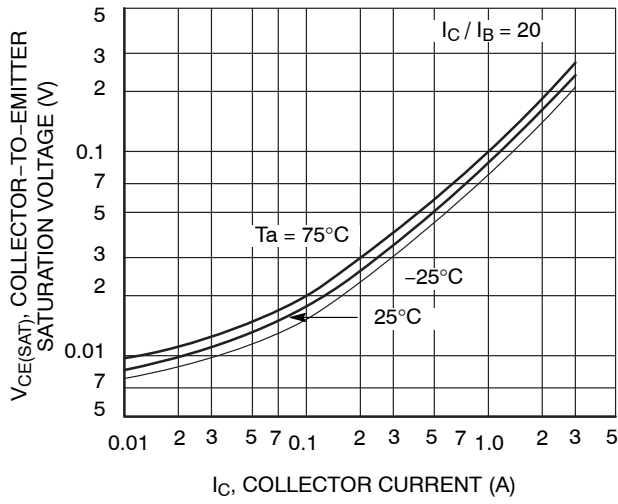


Figure 7. $V_{CE(sat)} - I_C$

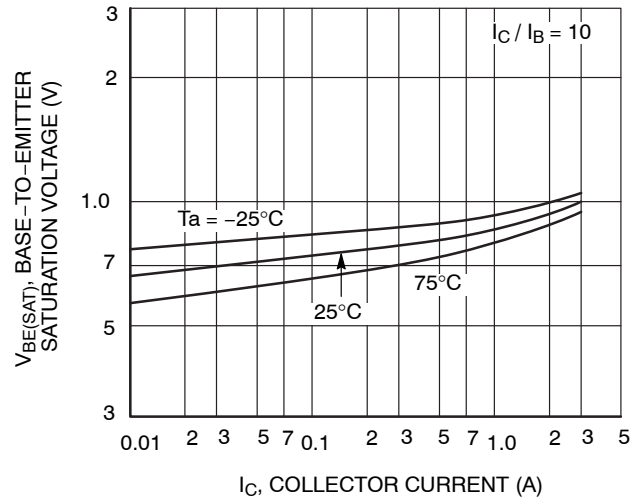


Figure 8. $V_{BE(sat)} - I_C$

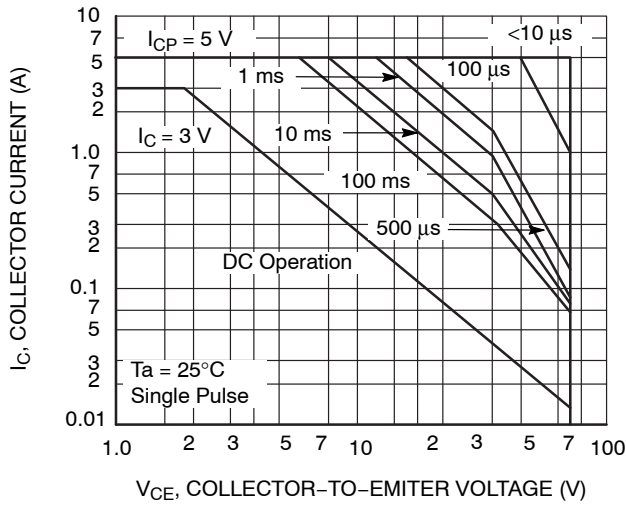


Figure 9. ASO

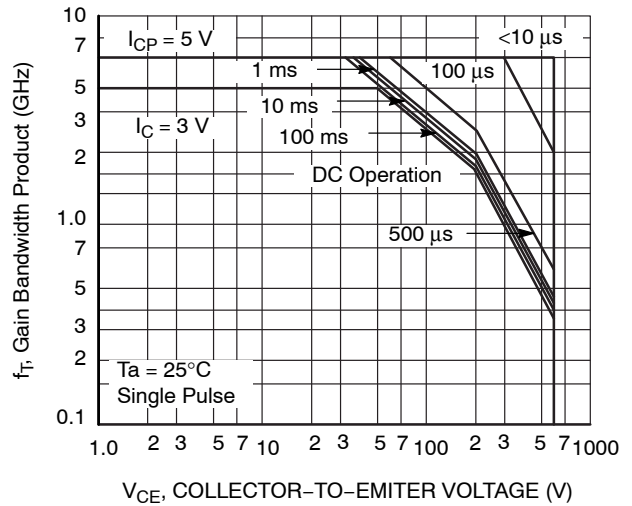


Figure 10. ASO

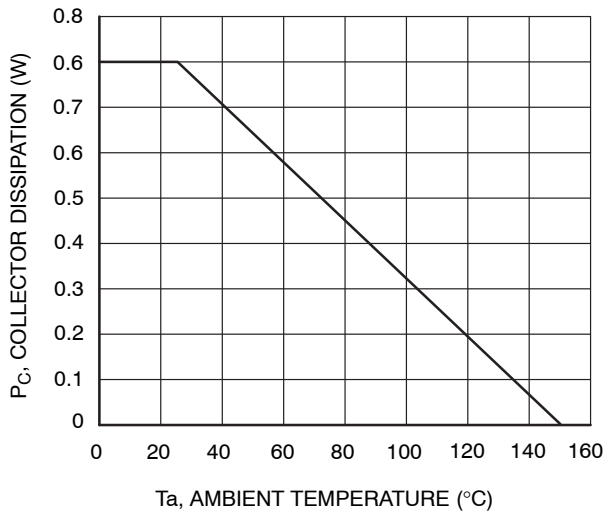


Figure 11. $P_C - T_a$

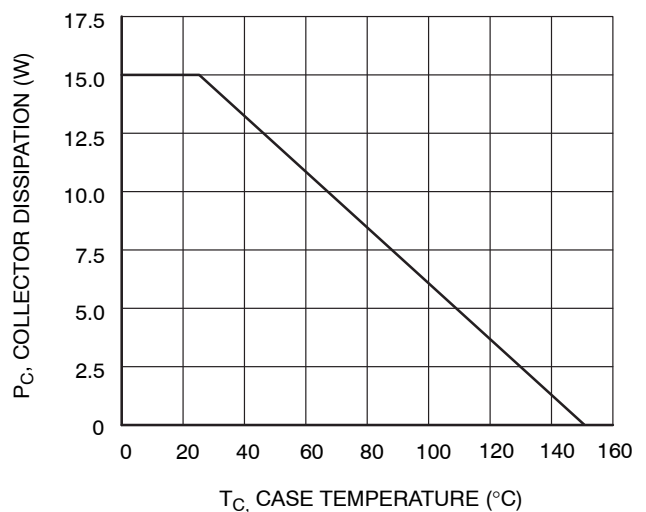
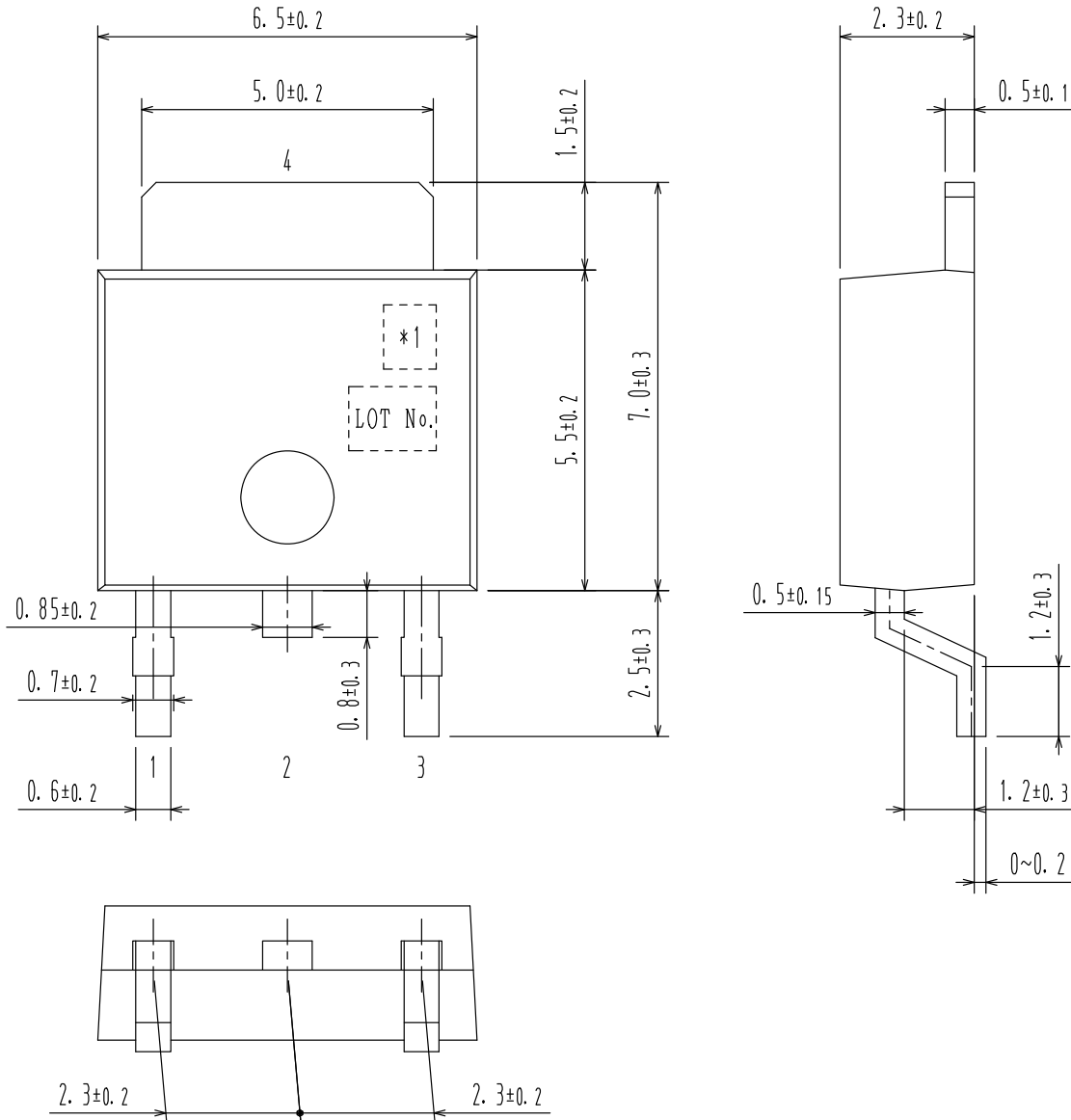


Figure 12. $P_C - T_C$

MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

DPAK / TP-FA
CASE 369AH
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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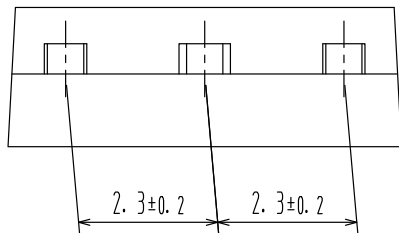
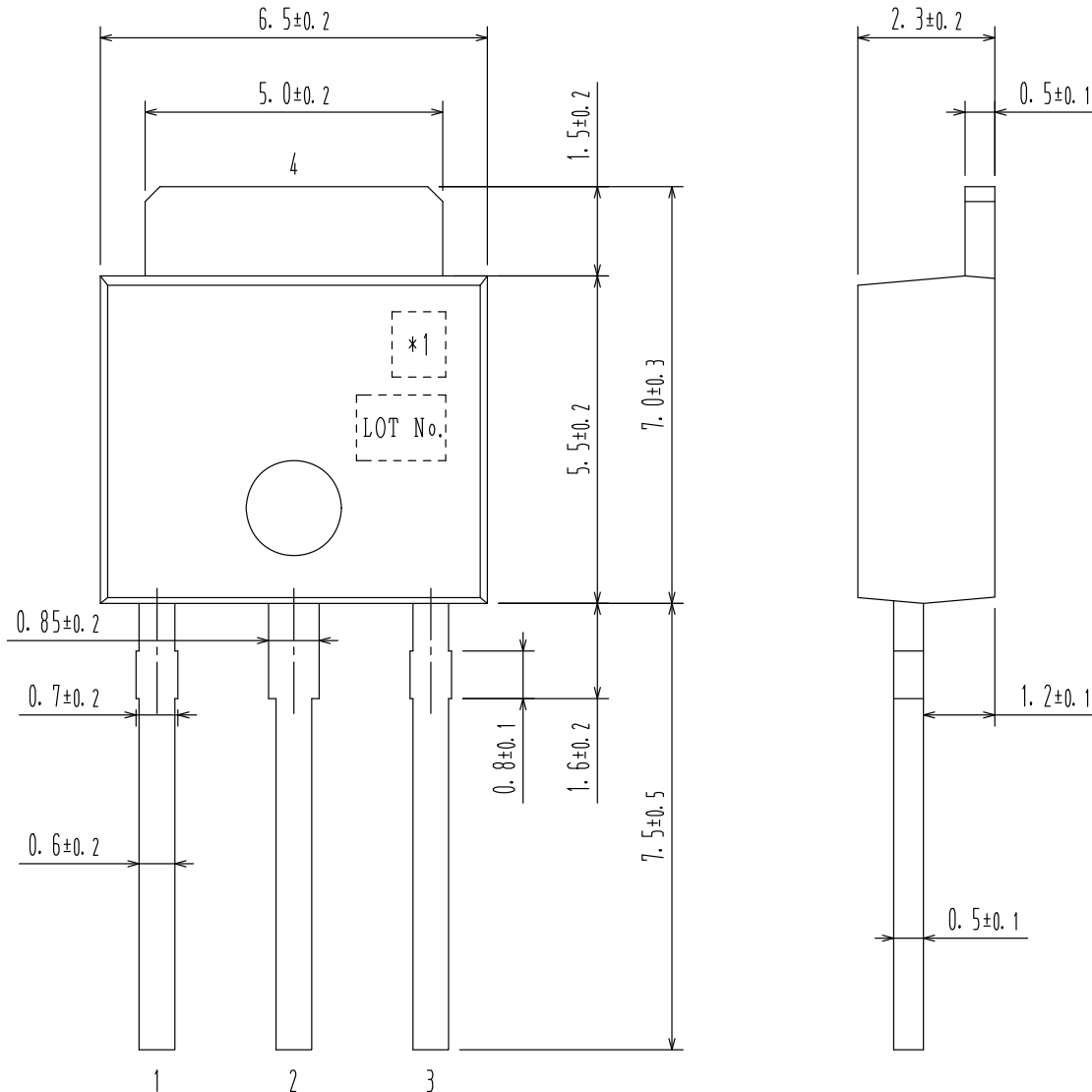
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MECHANICAL CASE OUTLINE

PACKAGE DIMENSIONS

IPAK / TP
CASE 369AJ
ISSUE O


DATE 30 JAN 2012



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

*1: Lot indication

| | | |
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