onsemi™

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
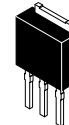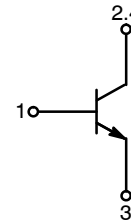
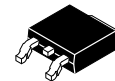### SPECIFICATIONS
ABSOLUTE MAXIMUM RATINGS at Ta = 25°C

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°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.
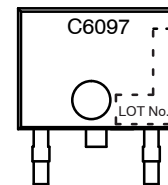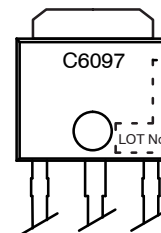
ELECTRICAL CONNECTION

IPAK / TP
CASE 369AJ

DPAK / TP−FA
CASE 369AH

MARKING DIAGRAM

C6097
LOT No.

C6097
LOT No.

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 Ta = 25°C)

Parameter	Symbol	Conditions	Ratings			Unit
			Min	Typ	Max	
Collector Cutoff Current	I_{CBO}	V_{CB} = 50 V, I_E = 0 A	–	–	1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB} = 4 V, I_C = 0 A	–	–	1	μA
DC Current Gain	h_{FE}	V_{CE} = 2 V, I_C = 100 mA	300	–	600	
Gain−Bandwidth Product	f_T	V_{CE} = 10 V, I_C = 500 mA	–	390	–	MHz
Output Capacitance	Cob	V_{CB} = 10 V, f = 1MHz	–	18	–	pF
Collector to Emitter Saturation Voltage	$V_{CE}(sat)1$	I_C = 1 A, I_B = 50 mA	–	100	150	mV
	$V_{CE}(sat)2$	I_C = 1 A, I_B = 100 mA	–	90	135	mV
Base to Emitter Saturation Voltage	$V_{BE}(sat)$	I_C = 1 A, I_B = 100 mA	–	0.84	1.2	V
Collector to Base Breakdown Voltage	$V_{(BR)CBO}$	I_C = 10 μA, I_E = 0 A	100	–	–	V
Collector to Emitter Breakdown Voltage	$V_{(BR)CES}$	I_C = 100 μA, R_{BE} = 0 Ω	100	–	–	V
Collector to Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 1 mA, R_{BE} = ∞	60	–	–	V
Emittert o Base Breakdown Voltage	$V_{(BR)EBO}$	I_E = 10 μA, I_C = 0 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

PW = 20 μs
D.C. 1%

I_C = 10 I_{B1}= −10 I_{B2} = 0.5 A

2SC6097
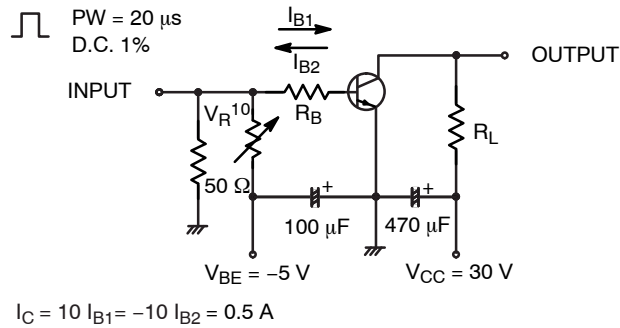
TYPICAL CHARACTERISTICS
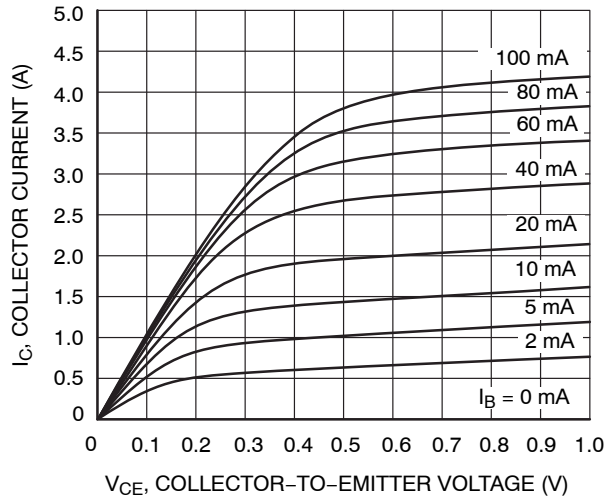
Figure 1. $I_C - V_{CE}$
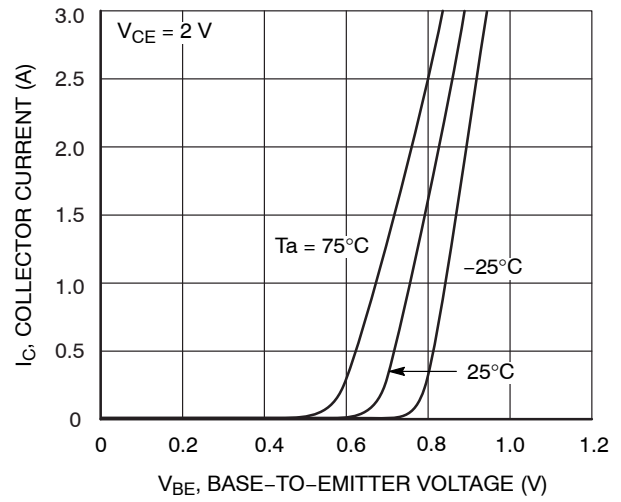
Figure 2. $I_C - V_{BE}$
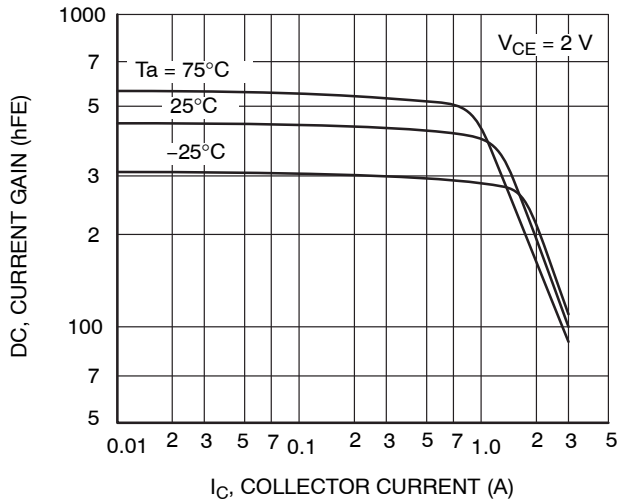
Figure 3. $H_{FE} - I_C$
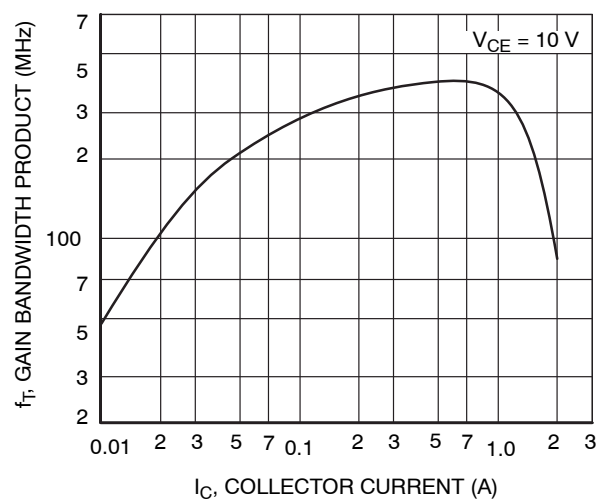
Figure 4. $f_T - I_C$
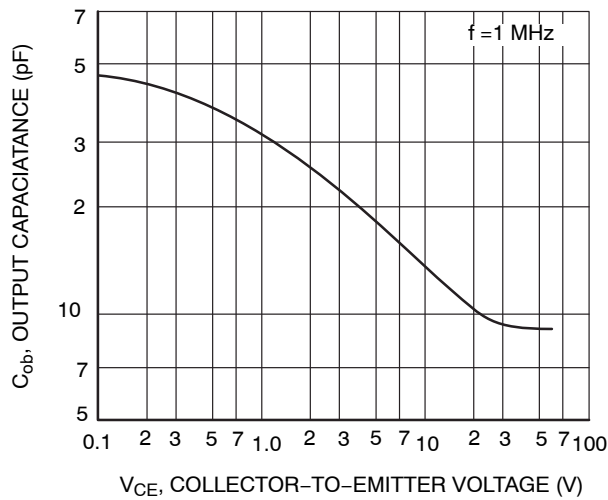
Figure 5. $C_{ob} - V_{CB}$
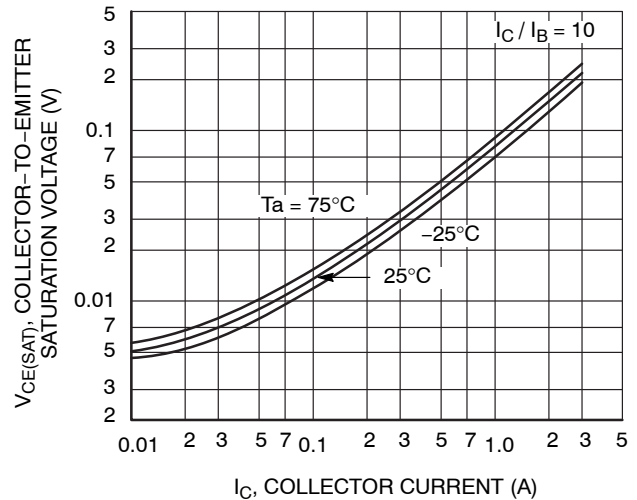
Figure 6. $V_{CE}(sat) - I_C$
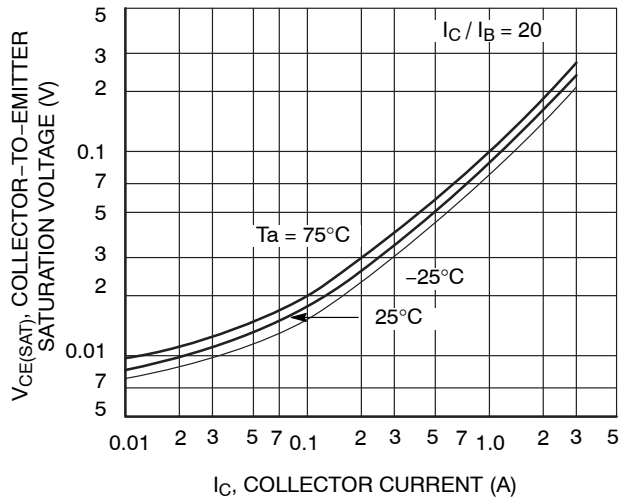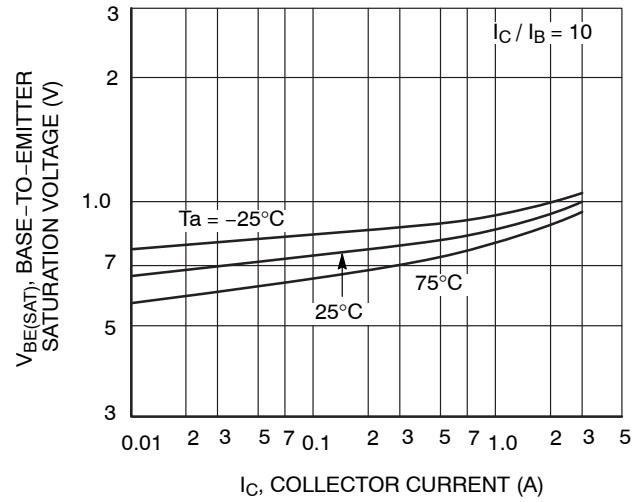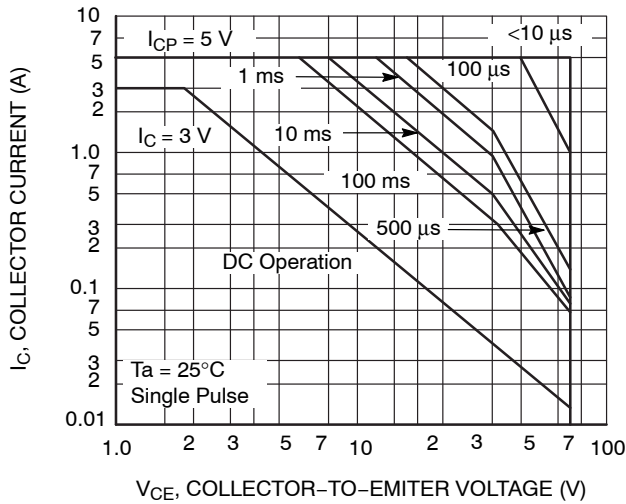
TYPICAL CHARACTERISTICS (continued)

Figure 7. V$_{CE}$(sat) – I$_C$

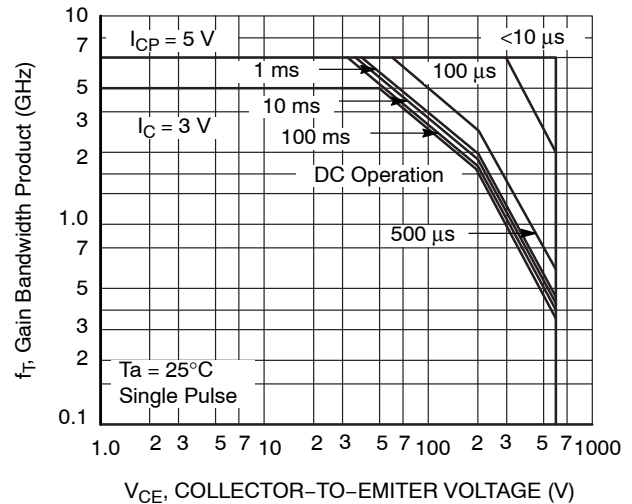Figure 8. V$_{BE}$(sat) – I$_C$

Figure 9. ASO

Figure 10. ASO
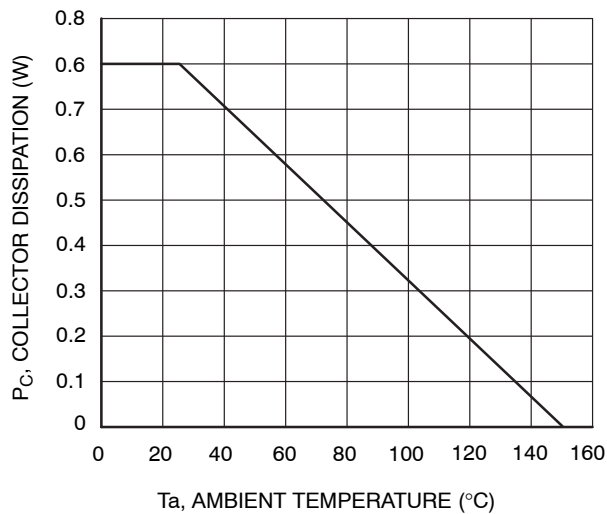
Figure 11. P$_C$ – Ta
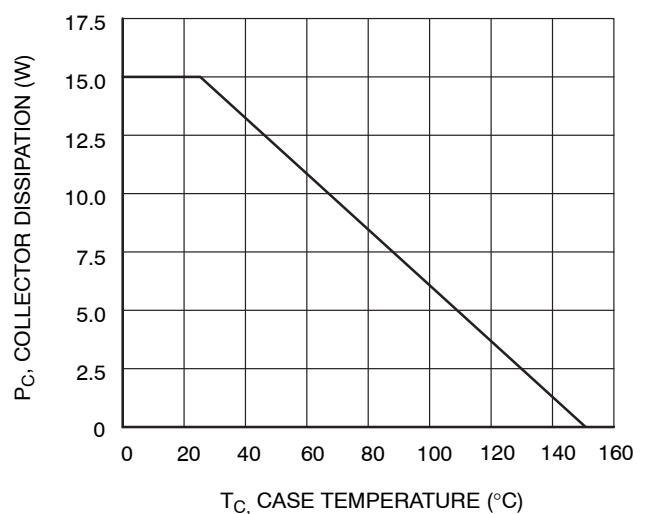
Figure 12. P$_C$ – T$_C$

DPAK / TP–FA
CASE 369AH
ISSUE O

DATE 30 JAN 2012

6. 5±0. 2

5. 0±0. 2

4

1. 5±0. 2

2. 3±0. 2

0. 5±0. 1

*1

LOT No.

7. 0±0. 3

5. 5±0. 2

0. 85±0. 2

0. 7±0. 2

0. 8±0. 3

2. 5±0. 3

0. 6±0. 2

1   2   3

0. 5±0. 15

1. 2±0. 3

1. 2±0. 3

0~0. 2

2. 3±0. 2

2. 3±0. 2
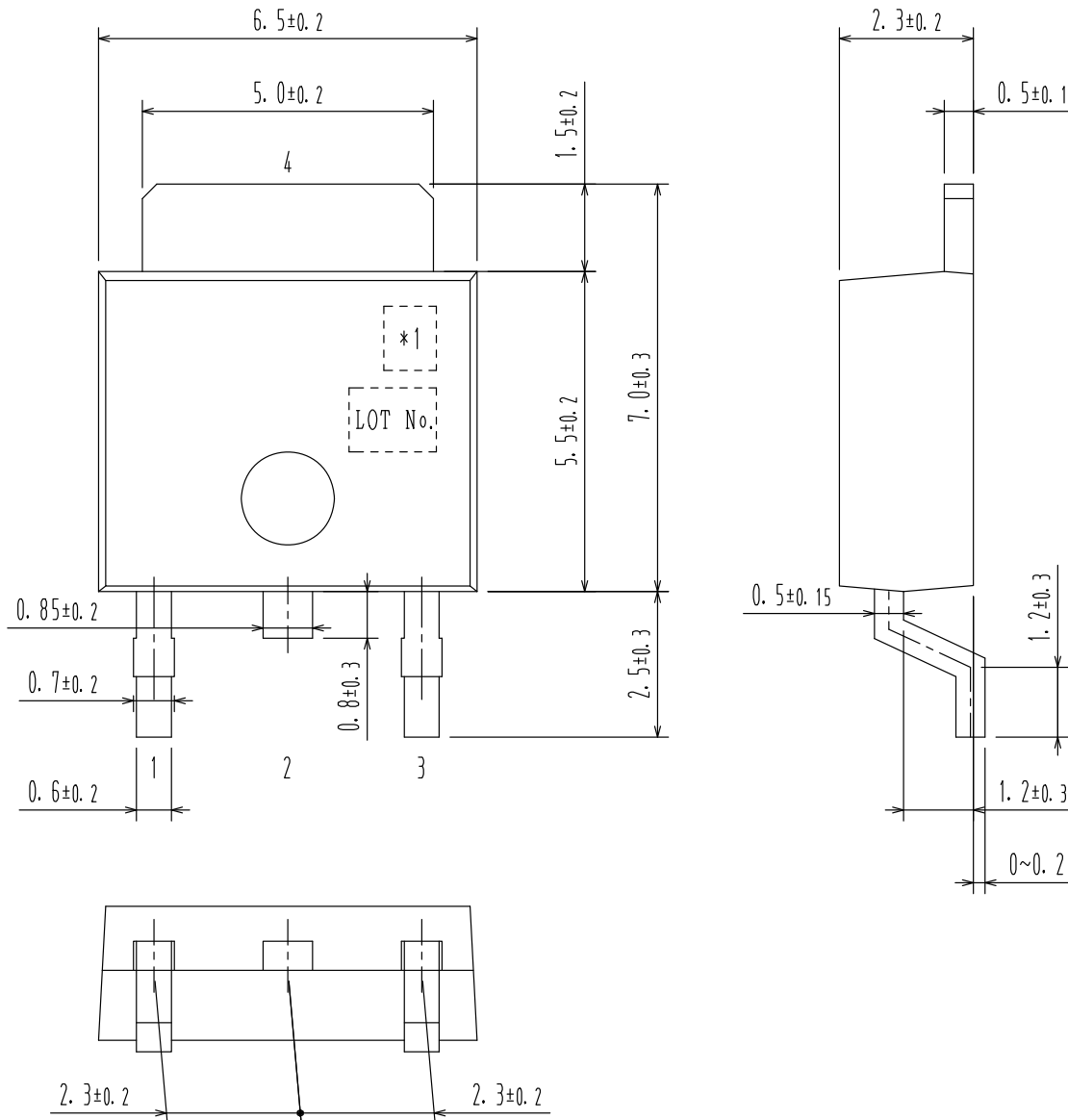
Pin 2 is idle pin with electrical
designation only carried.

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

DOCUMENT NUMBER:	98AON66236E	
DESCRIPTION:	DPAK / TP–FA	PAGE 1 OF 1

IPAK / TP
CASE 369AJ
ISSUE O

DATE 30 JAN 2012
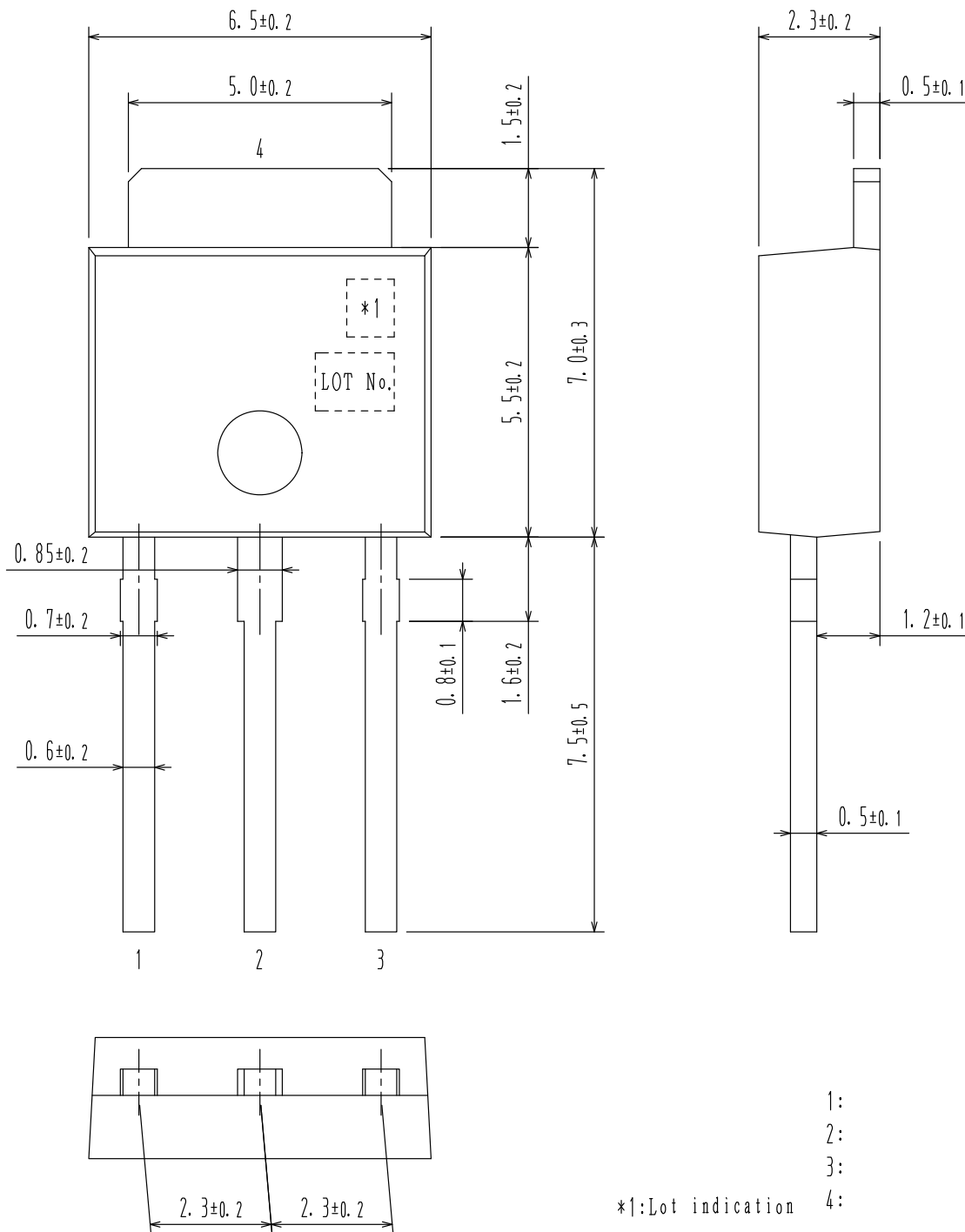
6. 5±0. 2

5. 0±0. 2

4

1. 5±0. 2

2. 3±0. 2

0. 5±0. 1

*1

LOT No.

7. 0±0. 3

5. 5±0. 2

0. 85±0. 2

0. 7±0. 2

0. 8±0. 1

1. 6±0. 2

1. 2±0. 1

0. 6±0. 2

7. 5±0. 5

1

2

3

0. 5±0. 1

2. 3±0. 2   2. 3±0. 2

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

DOCUMENT NUMBER:	98AON66237E		
DESCRIPTION:	IPAK / TP		PAGE 1 OF 1

ADDITIONAL INFORMATION

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