

# CPH3145/CPH3245

## Low VCE (sat) Bipolar Transistor (PNP)NPN, (–)50V, (–)2A

### Features

- Adoption of MBIT Process
- Large Current Capacity
- Low Collector to Emitter Saturation Voltage
- High Speed Switching
- Ultrasmall Package Facilitates Miniaturization in End Products (mounting height : 0.9mm)
- High Allowable Power Dissipation

### Typical Applications

- Relay Drivers
- Lamp Drivers
- Motor Drivers
- Flash

### SPECIFICATIONS ( ) : CPH3145

**ABSOLUTE MAXIMUM RATING** at Ta = 25°C (Note 1)

| Parameter  | Symbol | Value       | Unit |
|--|--------|-------------|------|
| Collector to Base Voltage  | VCBO   | (–50)80     | V    |
| Collector to Emitter Voltage   | VCES   | (–50)80     | V    |
| Collector to Emitter Voltage   | VCEO   | (–)50       | V    |
| Emitter to Base Voltage  | VEBO   | (–)6        | V    |
| Collector Current  | IC     | (–)2        | A    |
| Collector Current (Pulse)  | ICP    | (–)4        | A    |
| Base Current   | IB     | (–)400      | mA   |
| Collector Dissipation<br>When mounted on ceramic substrate<br>(600mm <sup>2</sup> × 0.8mm) | PC     | 0.9         | W    |
| Junction Temperature   | Tj     | 150         | °C   |
| Storage Temperature  | Tstg   | –55 to +150 | °C   |

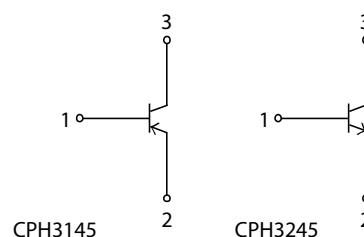
Note 1 : Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.



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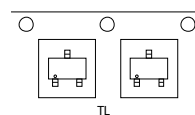
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### ELECTRICAL CONNECTION

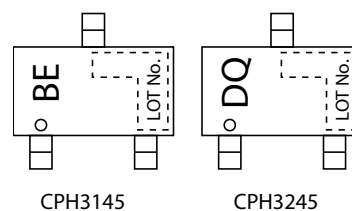


1 : Base  
2 : Emitter  
3 : Collector

### PACKING TYPE : TL



### MARKING



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### ORDERING INFORMATION

See detailed ordering and shipping information on page 5 of this data sheet.

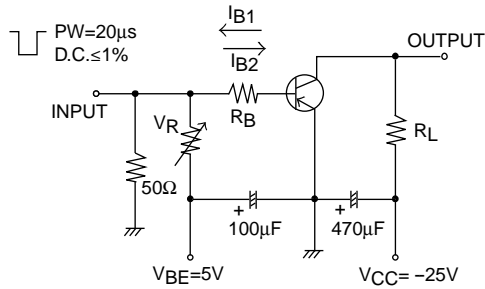
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## ELECTRICAL CHARACTERISTICS at Ta = 25°C (Note 2)

| Parameter                               | Symbol               | Conditions  | Value   |           |           | Unit |
|---|----------------------|---|---------|-----------|-----------|------|
|   |                      |   | min     | typ       | max       |      |
| Collector Cutoff Current                | ICBO                 | V <sub>CB</sub> =(-)40V, I <sub>E</sub> =0A       |         |           | (-)1      | μA   |
| Emitter Cutoff Current                  | IEBO                 | V <sub>EB</sub> =(-)4V, I <sub>C</sub> =0A        |         |           | (-)1      | μA   |
| DC Current Gain                         | h <sub>FE</sub>      | V <sub>CE</sub> =(-)2V, I <sub>C</sub> =(-)100mA  | 200     |           | 560       |      |
| Gain-Bandwidth Product                  | f <sub>T</sub>       | V <sub>CE</sub> =(-)10V, I <sub>C</sub> =(-)300mA |         | 420       |           | MHz  |
| Output Capacitance                      | C <sub>ob</sub>      | V <sub>CB</sub> =(-)10V, f=1MHz                   |         | (16)8     |           | pF   |
| Collector to Emitter Saturation Voltage | V <sub>CE(sat)</sub> | I <sub>C</sub> =(-)1A, I <sub>B</sub> =(-)50mA    |         | (-165)130 | (-330)260 | mV   |
| Base to Emitter Saturation Voltage      | V <sub>BE(sat)</sub> |   |         | (-)0.9    | (-)1.2    | V    |
| Collector to Base Breakdown Voltage     | V <sub>(BR)CBO</sub> | I <sub>C</sub> =(-)10μA, I <sub>E</sub> =0A       | (-50)80 |           |           | V    |
| Collector to Emitter Breakdown Voltage  | V <sub>(BR)CES</sub> | I <sub>C</sub> =(-)100μA, R <sub>BE</sub> =0Ω     | (-50)80 |           |           | V    |
| Collector to Emitter Breakdown Voltage  | V <sub>(BR)CEO</sub> | I <sub>C</sub> =(-)1mA, R <sub>BE</sub> =∞        | (-)50   |           |           | V    |
| Emitter to Base Breakdown Voltage       | V <sub>(BR)EBO</sub> | I <sub>E</sub> =(-)10μA, I <sub>C</sub> =0A       | (-)6    |           |           | V    |
| Turn-ON Time                            | t <sub>on</sub>      | See specified Test Circuit                        |         | (35)35    |           | ns   |
| Storage Time                            | t <sub>stg</sub>     |   |         | (200)330  |           | ns   |
| Fall Time                               | t <sub>f</sub>       |   |         | (24)40    |           | ns   |

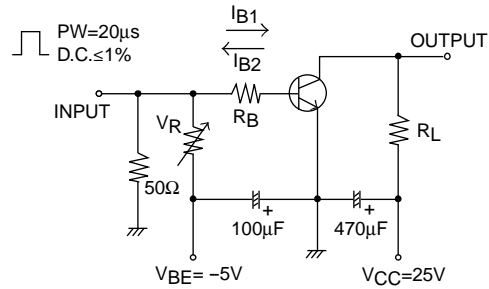
Note 2 : Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

## Switching Time Test Circuit



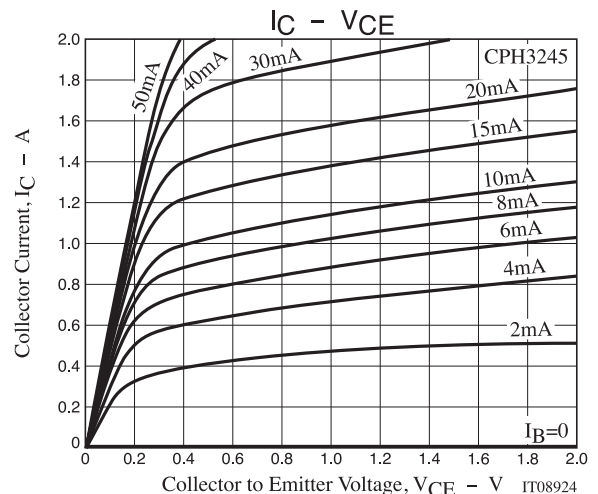
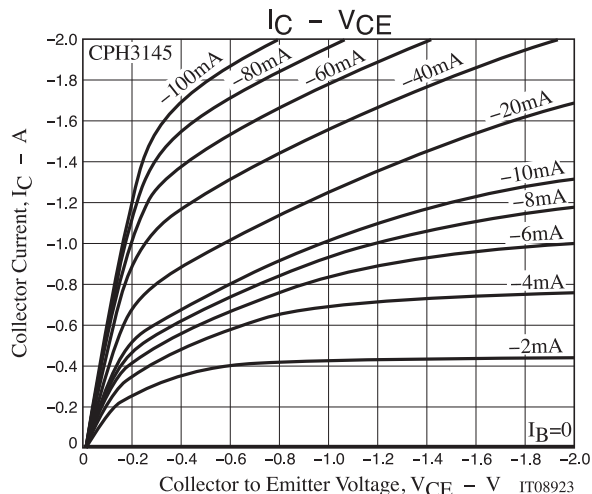
$$I_C = -10I_{B1} = 10I_{B2} = -0.7A$$

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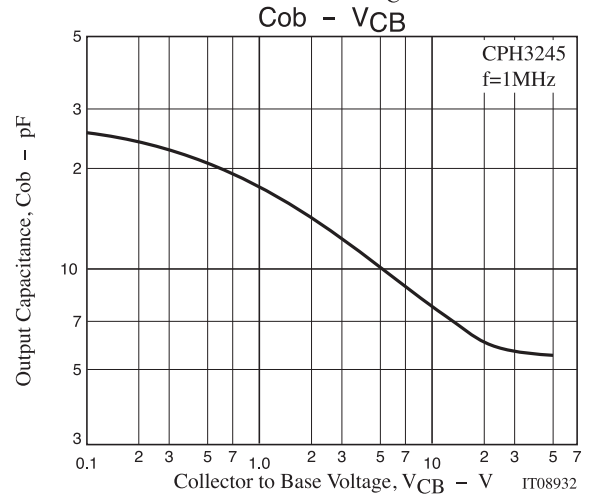
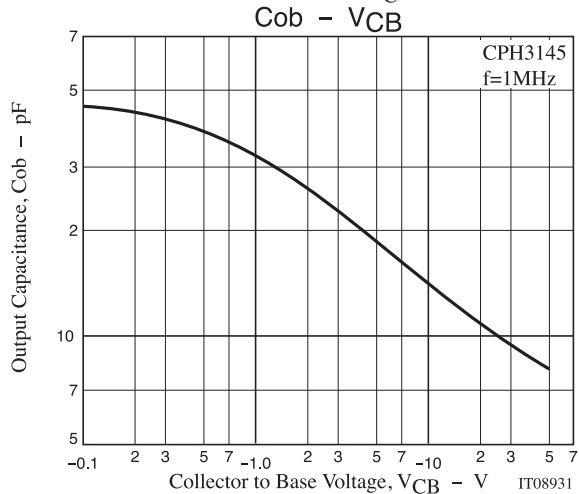
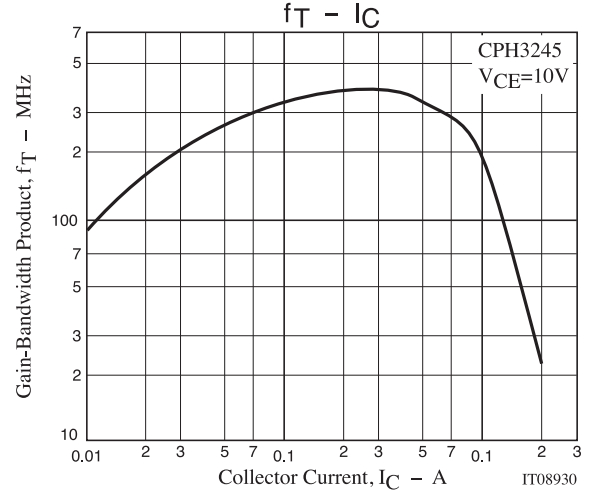
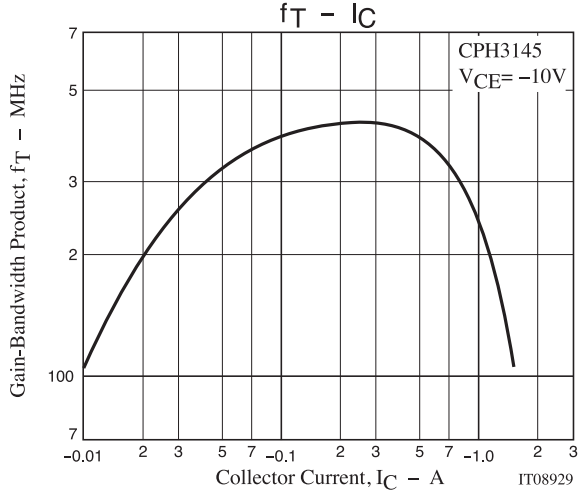
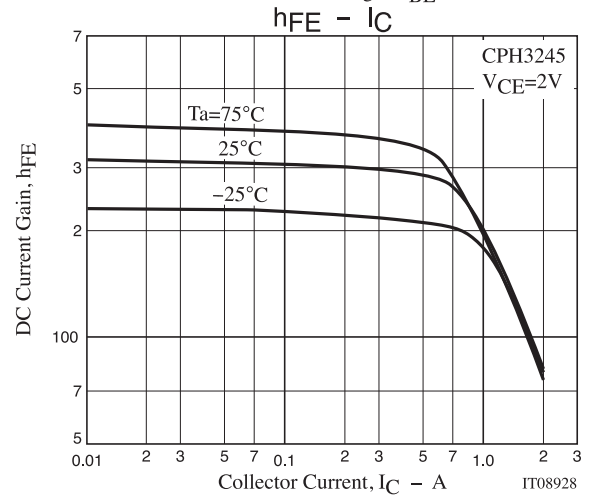
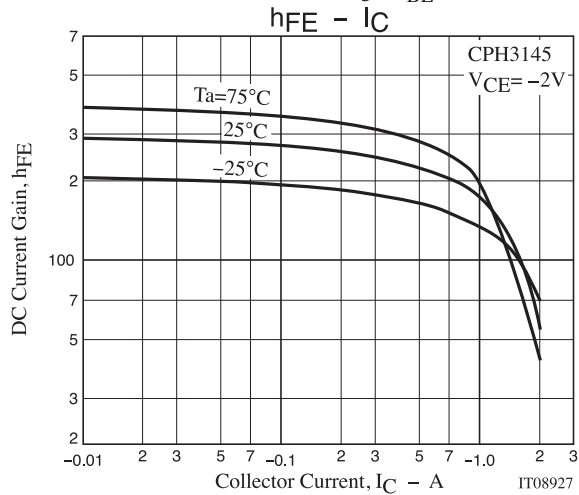
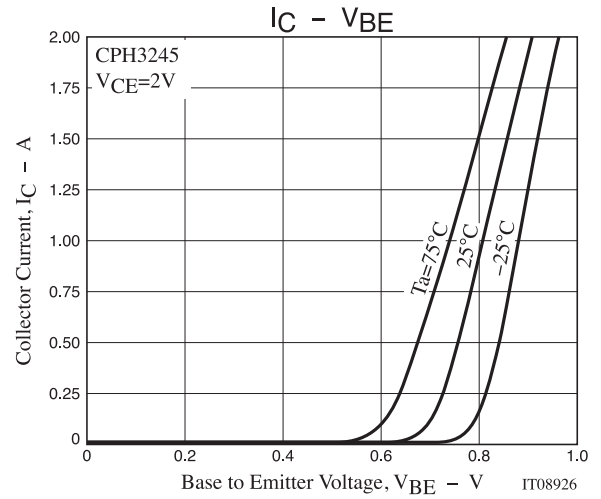
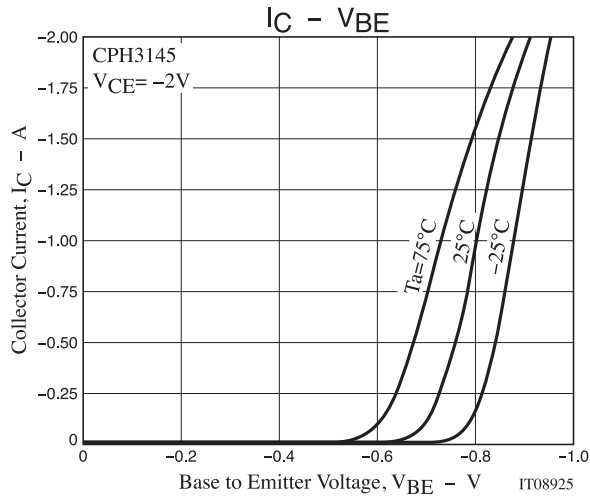


$$I_C = 10I_{B1} = -10I_{B2} = 0.7A$$

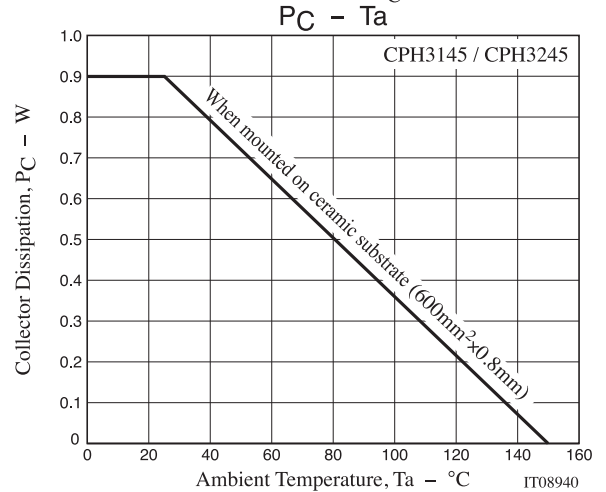
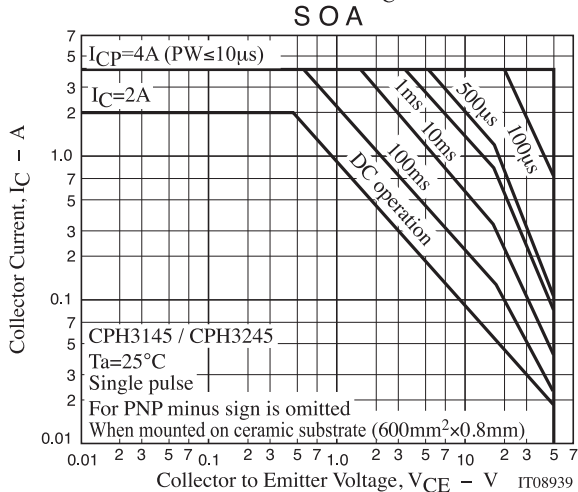
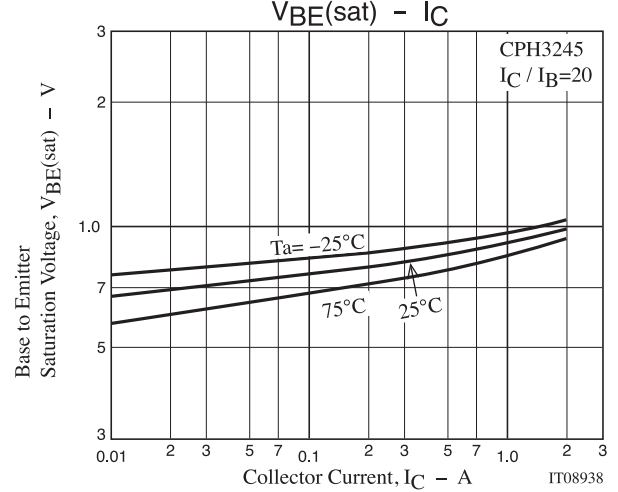
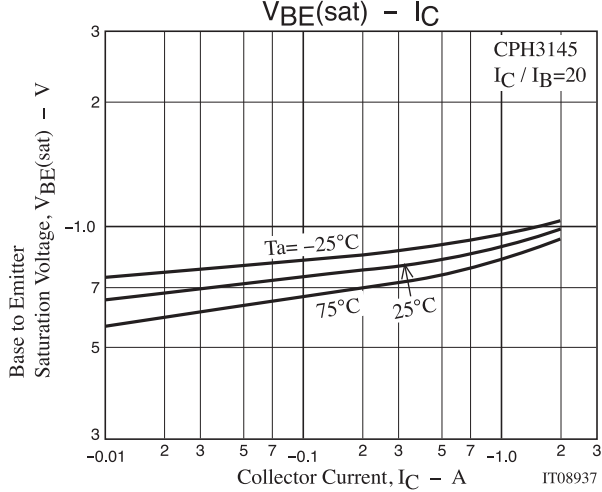
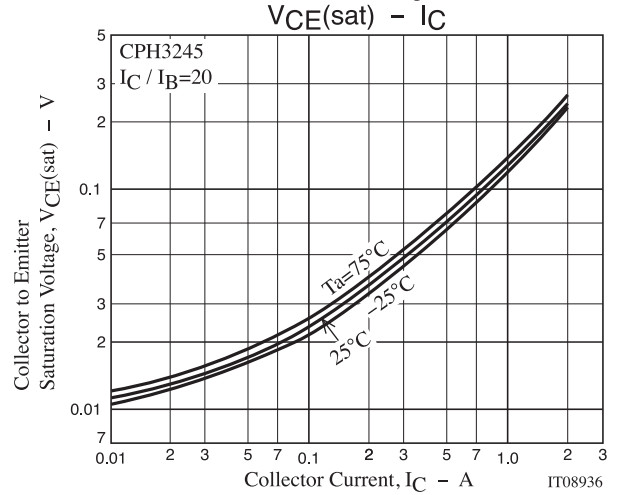
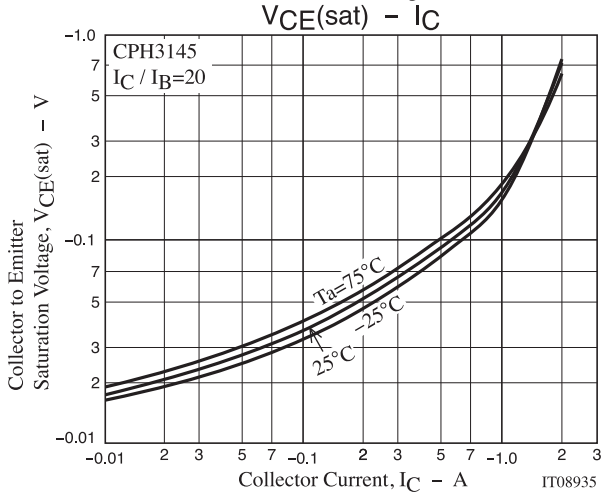
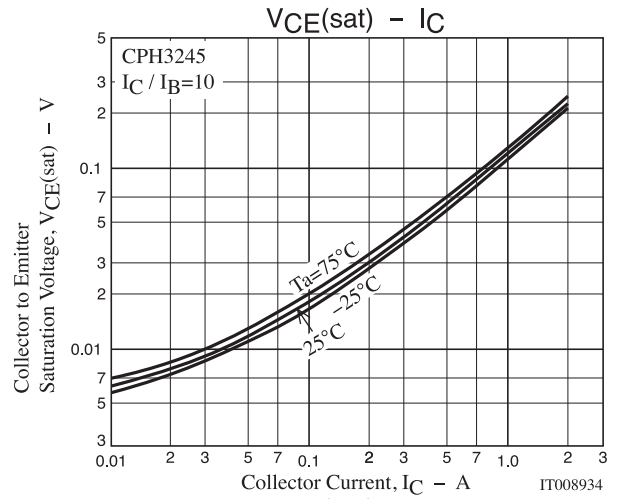
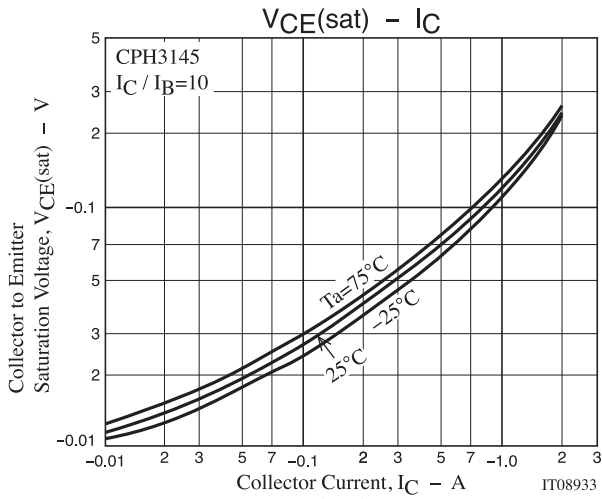
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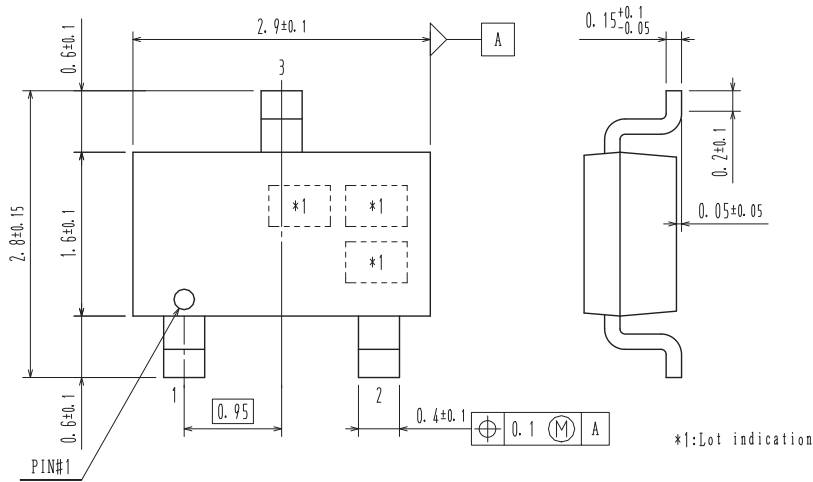


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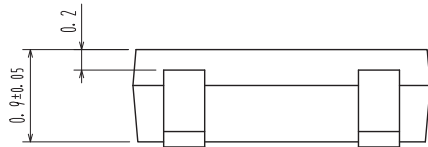
## PACKAGE DIMENSIONS

unit : mm

CPH3  
CASE 318BA  
ISSUE 0

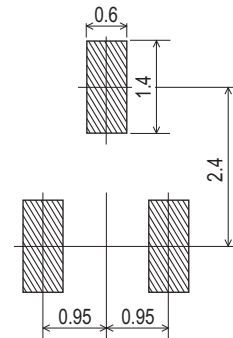


\*1: Lot indication



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

## Recommended Soldering Footprint



## ORDERING INFORMATION

| Device       | Marking | Package                                    | Shipping (Qty / Packing) |
|--------------|---------|--|--------------------------|
| CPH3145-TL-E | BE      | CPH3<br>SC-59, SOT-23, TO-236<br>(Pb-Free) | 3,000 / Tape & Reel      |
| CPH3245-TL-E | DQ      |  |                          |

† 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://www.onsemi.com/pub\\_link/Collateral/BRD8011-D.PDF](http://www.onsemi.com/pub_link/Collateral/BRD8011-D.PDF)

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