



SANYO Semiconductors

# DATA SHEET

An ON Semiconductor Company

## CPH3145 / CPH3245 — PNP / NPN Epitaxial Planar Silicon Transistors DC / DC Converter Applications

### Applications

- Relay drivers, lamp drivers, motor drivers, flash

### 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

### Specifications ( ) : CPH3145

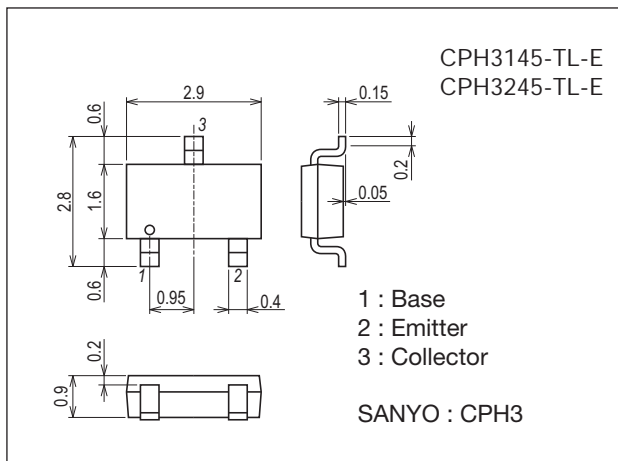
#### Absolute Maximum Ratings at Ta=25°C

| Parameter                    | Symbol | Conditions  | Ratings     | 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        | PC     | When mounted on ceramic substrate (600mm <sup>2</sup> ×0.8mm) | 0.9         | W    |
| Junction Temperature         | Tj     |   | 150         | °C   |
| Storage Temperature          | Tstg   |   | -55 to +150 | °C   |

### Package Dimensions

unit : mm (typ)

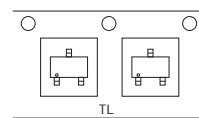
7015A-003



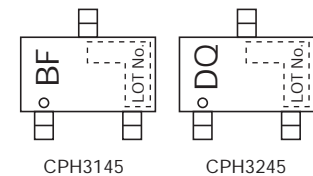
### Product & Package Information

- Package : CPH3
- JEITA, JEDEC : SC-59, TO-236, SOT-23
- Minimum Packing Quantity : 3,000 pcs./reel

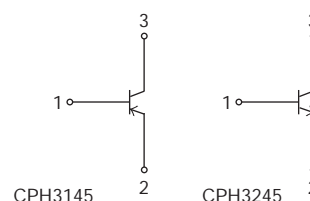
### Packing Type: TL



### Marking



### Electrical Connection



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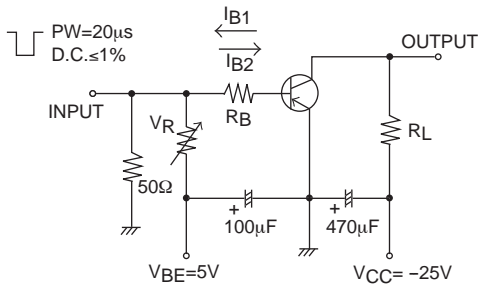
<http://semicon.sanyo.com/en/network>

# CPH3145 / CPH3245

## Electrical Characteristics at Ta=25°C

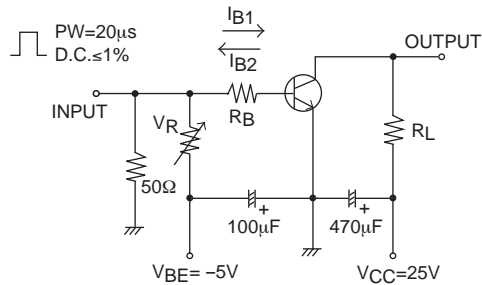
| Parameter                               | Symbol        | Conditions                        | Ratings     |           |           | Unit    |
|---|---------------|-----------------------------------|-------------|-----------|-----------|---------|
|   |               |                                   | min         | typ       | max       |         |
| Collector Cutoff Current                | $I_{CBO}$     | $V_{CB}=(-)40V, I_E=0A$           |             |           | (-) $1$   | $\mu A$ |
| Emitter Cutoff Current                  | $I_{EBO}$     | $V_{EB}=(-)4V, I_C=0A$            |             |           | (-) $1$   | $\mu A$ |
| DC Current Gain                         | $h_{FE}$      | $V_{CE}=(-)2V, I_C=(-)100mA$      | 200         |           | 560       |         |
| Gain-Bandwidth Product                  | $f_T$         | $V_{CE}=(-)10V, I_C=(-)300mA$     |             | 420       |           | MHz     |
| Output Capacitance                      | $C_{ob}$      | $V_{CB}=(-)10V, f=1MHz$           |             | (16)8     |           | pF      |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=(-)1A, I_B=(-)50mA$          |             | (-165)130 | (-330)260 | mV      |
| Base-to-Emitter Saturation Voltage      | $V_{BE(sat)}$ | $I_C=(-)1A, I_B=(-)50mA$          |             | (-) $0.9$ | (-) $1.2$ | V       |
| Collector-to-Base Breakdown Voltage     | $V_{(BR)CBO}$ | $I_C=(-)10\mu A, I_E=0A$          | (-) $50$ 80 |           |           | V       |
| Collector-to-Emitter Breakdown Voltage  | $V_{(BR)CES}$ | $I_C=(-)100\mu A, R_{BE}=0\Omega$ | (-) $50$ 80 |           |           | V       |
| Collector-to-Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | $I_C=(-)1mA, R_{BE}=\infty$       | (-) $50$    |           |           | V       |
| Emitter-to-Base Breakdown Voltage       | $V_{(BR)EBO}$ | $I_E=(-)10\mu A, I_C=0A$          | (-) $6$     |           |           | V       |
| Turn-On Time                            | $t_{on}$      | See specified Test Circuit.       |             | (35)35    |           | ns      |
| Storage Time                            | $t_{stg}$     |                                   |             | (200)330  |           | ns      |
| Fall Time                               | $t_f$         |                                   |             | (24)40    |           | ns      |

## Switching Time Test Circuit



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

CPH3145

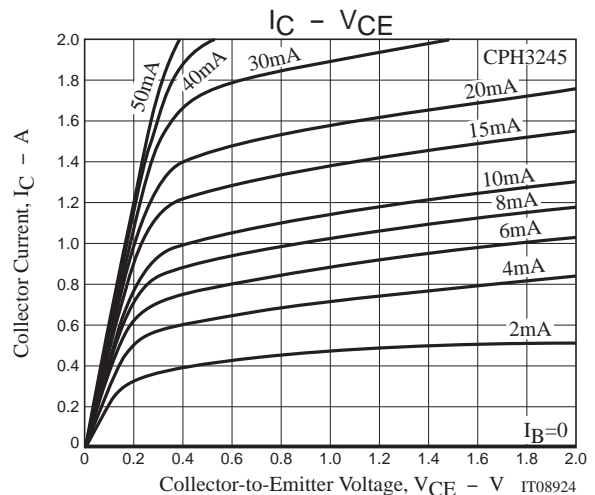
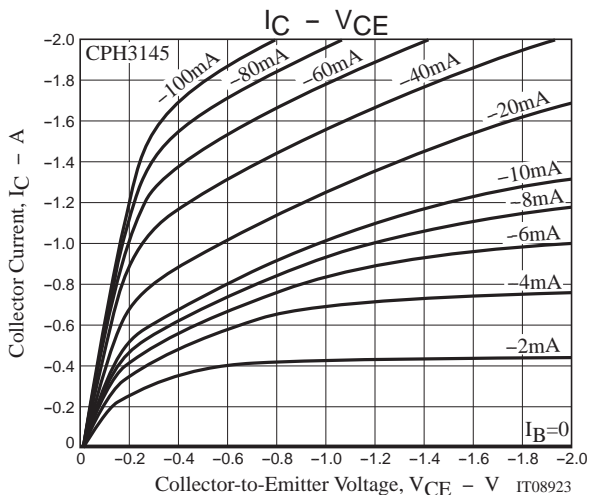


$$I_C = 10I_{B1} = -10I_{B2} = 0.7A$$

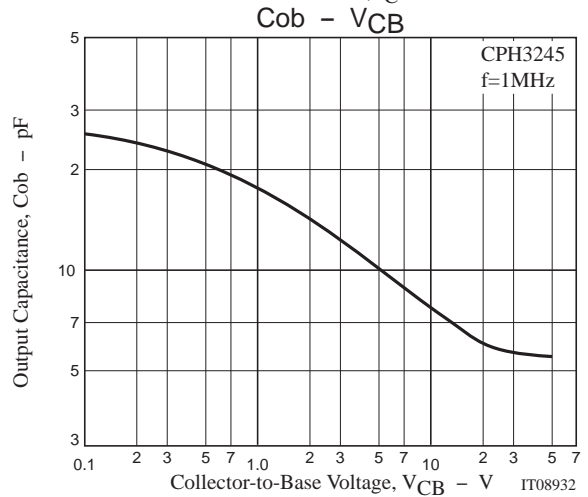
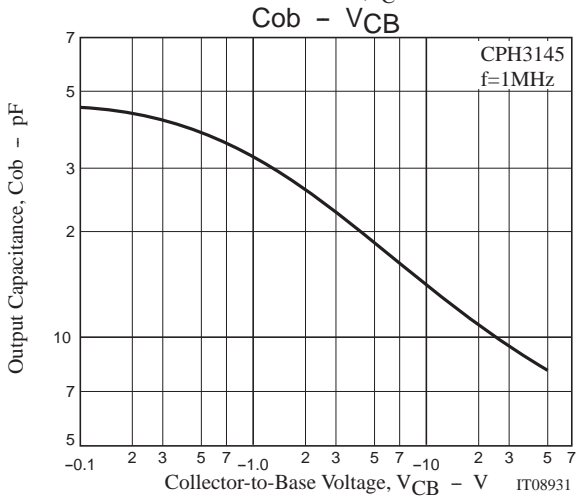
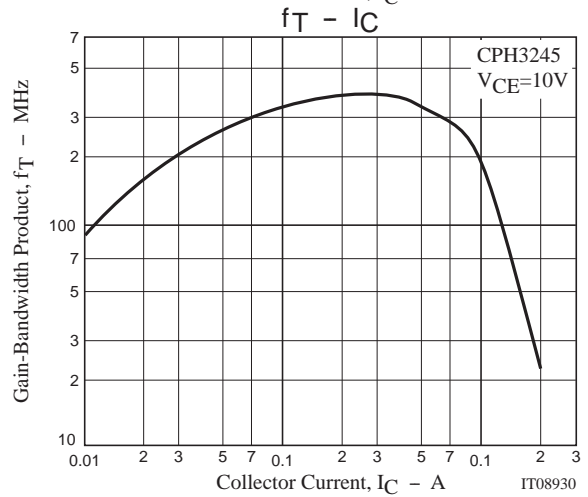
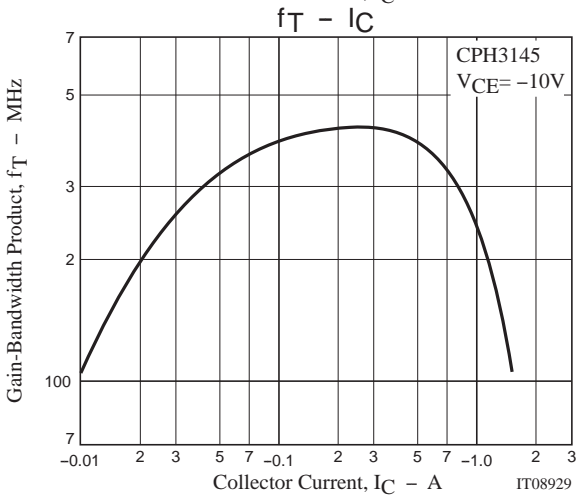
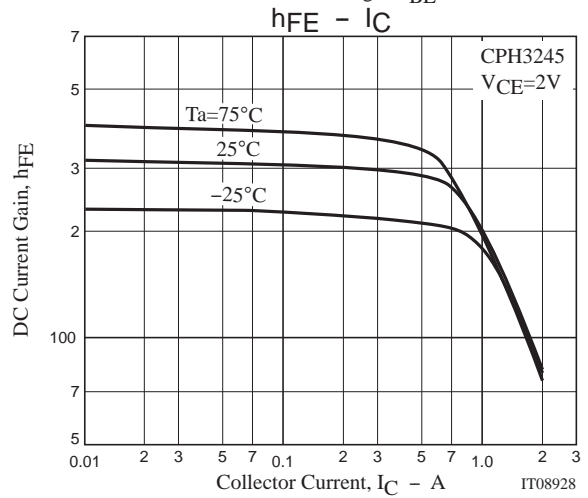
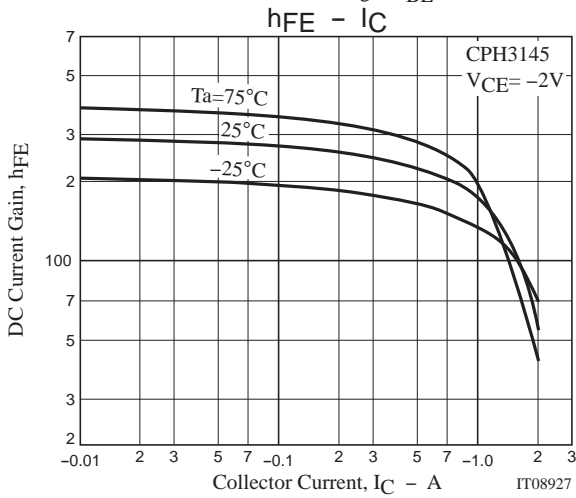
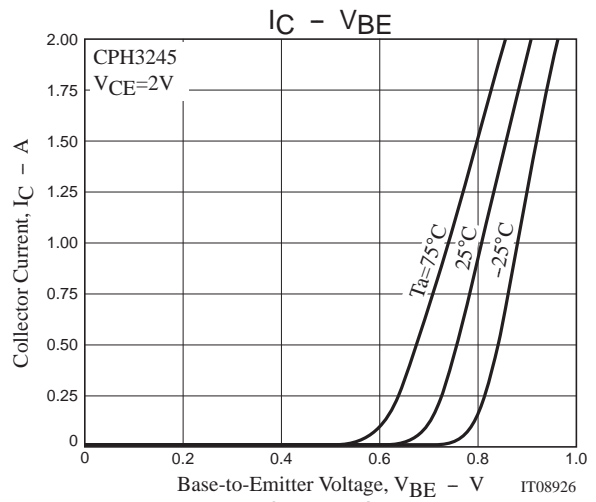
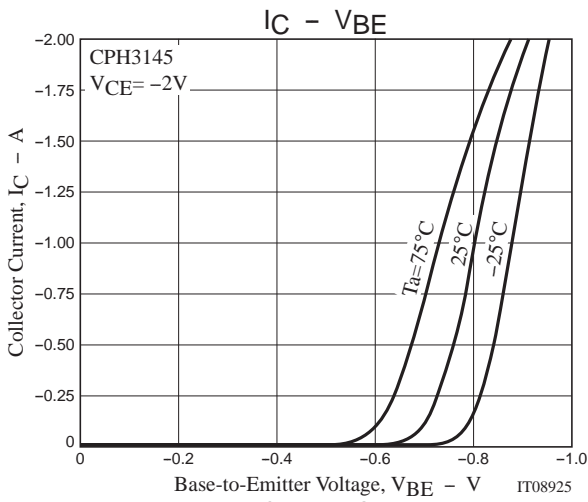
CPH3245

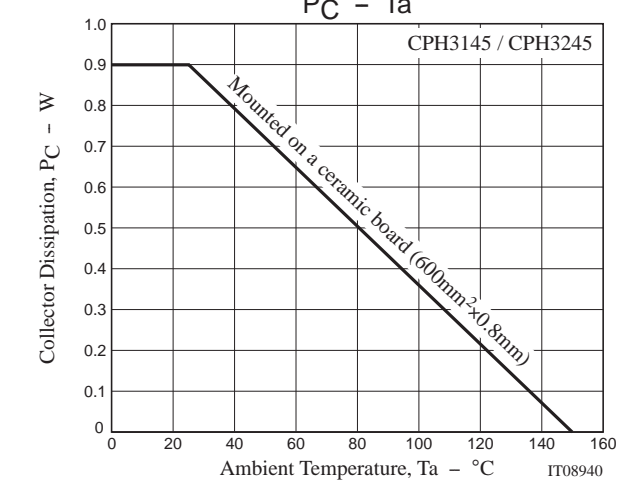
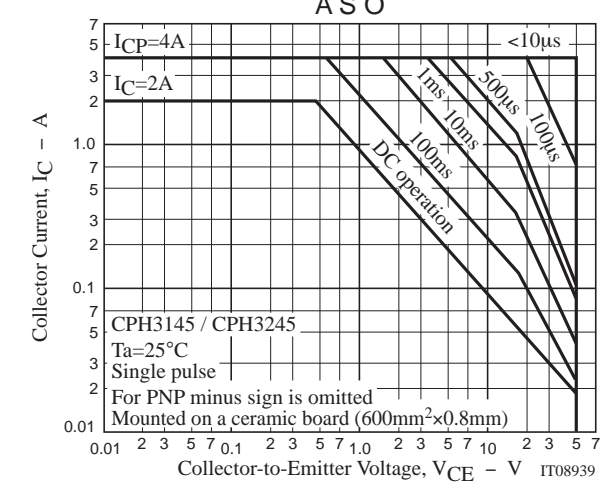
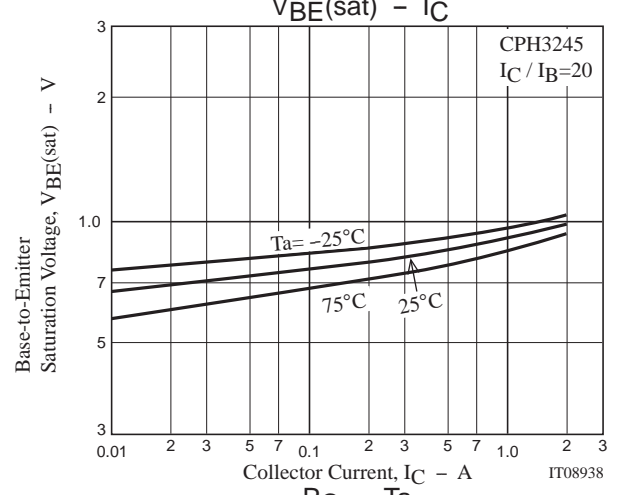
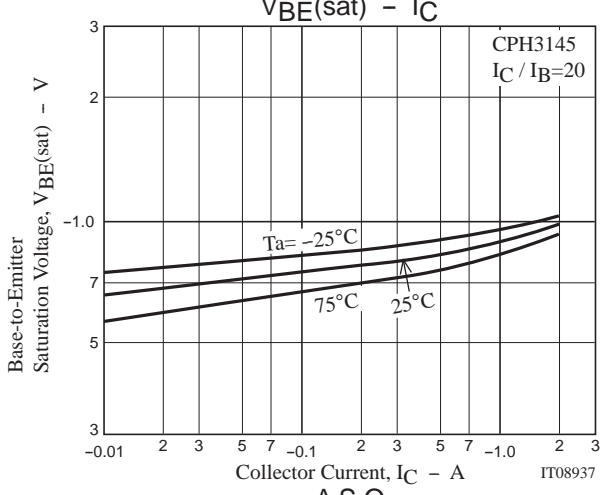
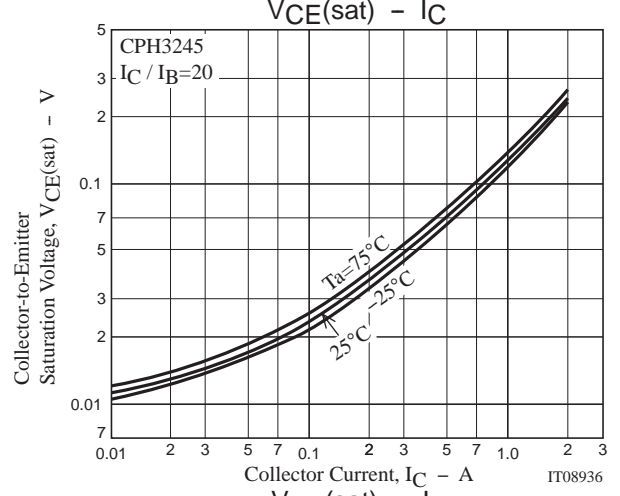
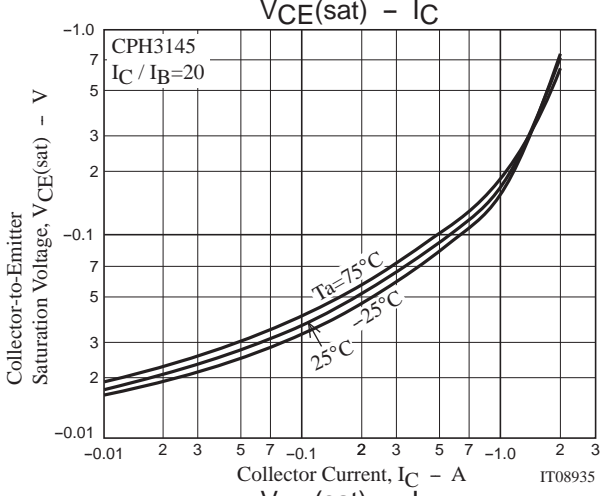
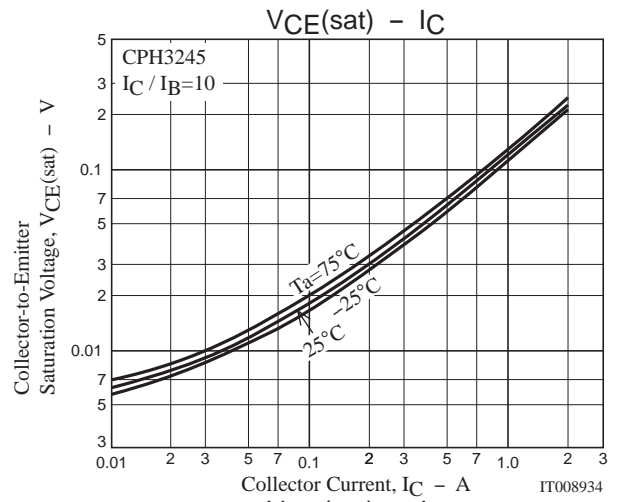
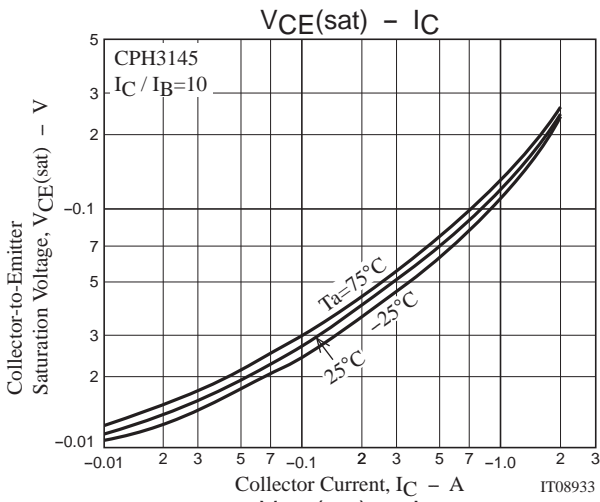
## Ordering Information

| Device       | Package | Shipping       | memo    |
|--------------|---------|----------------|---------|
| CPH3145-TL-E | CPH3    | 3,000pcs./reel | Pb Free |
| CPH3245-TL-E | CPH3    | 3,000pcs./reel | Pb Free |



CPH3145 / CPH3245





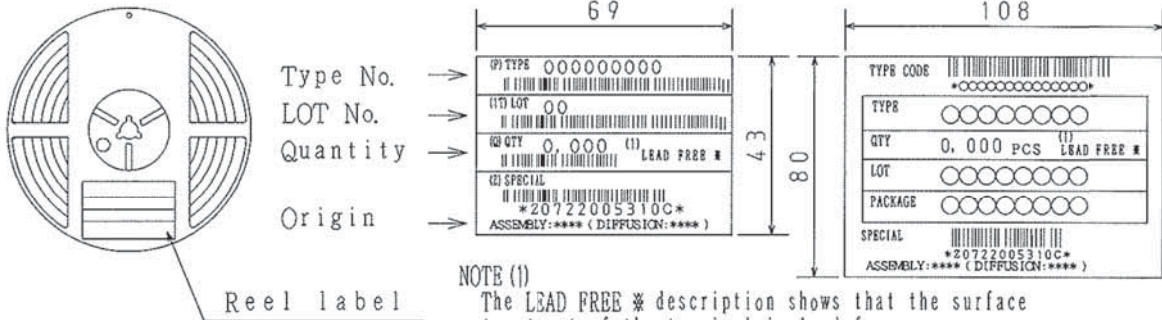
Embossed Taping Specification  
CPH3145-TL-E, CPH3245-TL-E

1. Packing Format

| Package Name | Carrier Tape Type | Maximum Number of devices contained (pcs) |           |           | Packing format  |  |
|--------------|-------------------|---|-----------|-----------|---|--|
|              |                   | Reel                                      | Inner box | Outer box | Inner BOX (C-1)   | Outer BOX (A-7)  |
| CPH3         | CPH3              | 3,000                                     | 15,000    | 90,000    | 5 reels contained<br>Dimensions:mm (external)<br>183×72×185 | 6 inner boxes contained<br>Dimensions:mm (external)<br>440×195×210 |

Reel label, Inner box label (unit:mm)      Outer box label  
It is a label at the time of factory shipments. The form of a label may change in physical distribution process.

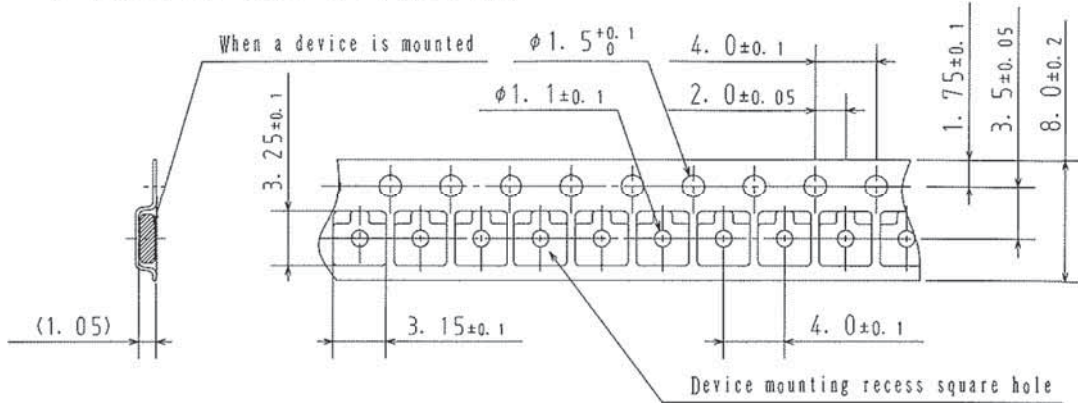
Packing method



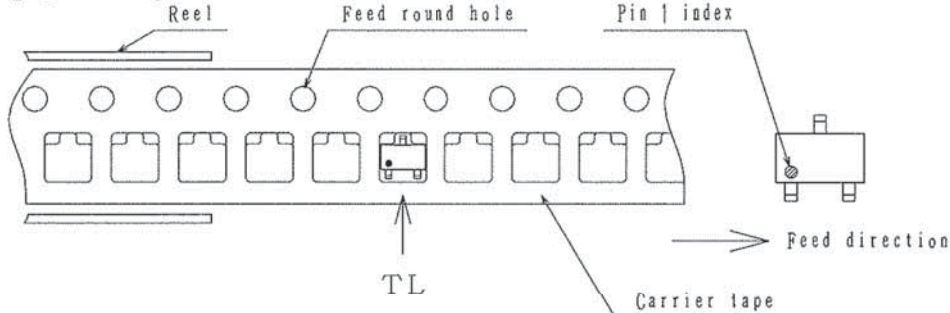
| Label       | JEITA Phase    |
|-------------|----------------|
| LEAD FREE 3 | JEITA Phase 3A |
| LEAD FREE 4 | JEITA Phase 3  |

2. Taping configuration

2-1. Carrier tape size (unit:mm)



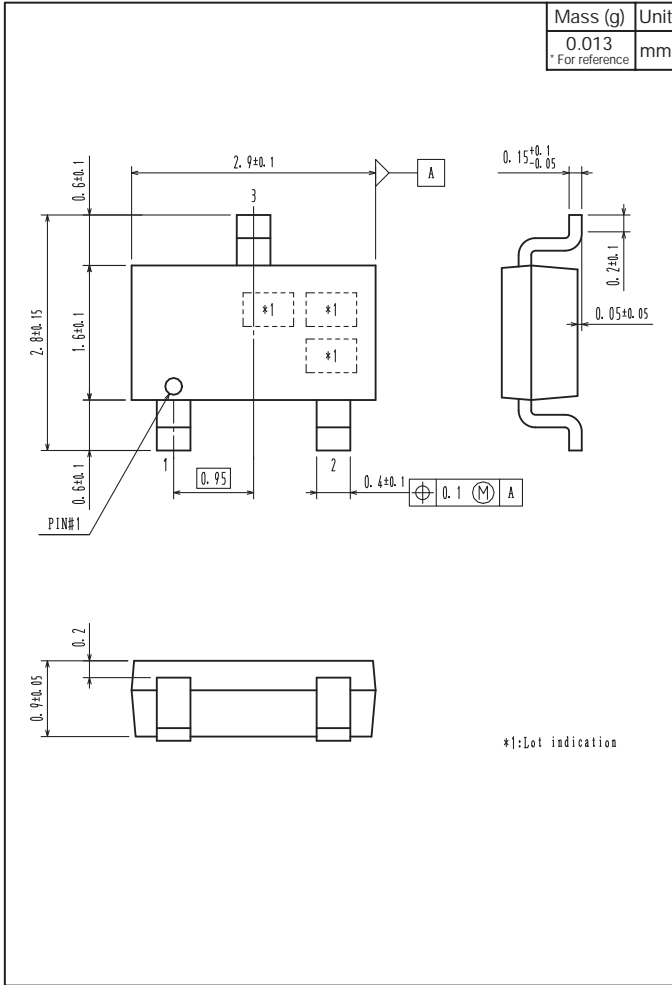
2-2. Device placement direction



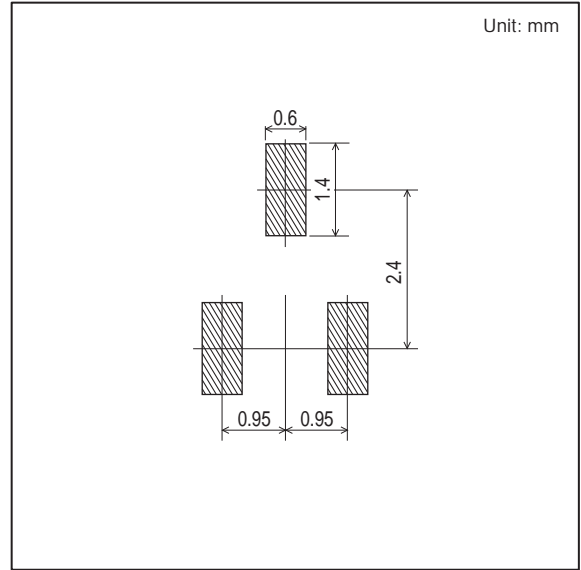
Those with one electrode terminal on the feed hole side.....TL

Outline Drawing

CPH3145-TL-E, CPH3245-TL-E



Land Pattern Example



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