



SANYO Semiconductors

## DATA SHEET

An ON Semiconductor Company

PNP / NPN Epitaxial Planar Silicon Transistors

# MCH3105/MCH3205 — High-Current Switching Applications

## Applications

- DC / DC converters, relay drivers, lamp drivers, motor drivers, flash

## Features

- Adoption of FBET, MBIT processes
- Low collector-to-emitter saturation voltage
- Ultrasmall package facilitates miniaturization in end products (mounting height : 0.85mm)
- High allowable power dissipation
- Large current capacity
- High-speed switching

## Specifications ( ) : MCH3105

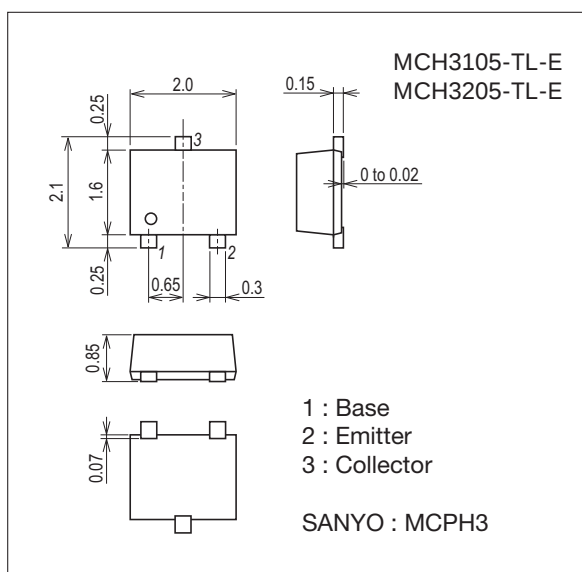
Absolute Maximum Ratings at Ta=25°C

| Parameter                    | Symbol           | Conditions                                                    | Ratings     | Unit |
|------------------------------|------------------|---------------------------------------------------------------|-------------|------|
| Collector-to-Base Voltage    | V <sub>CBO</sub> |                                                               | (-50)80     | V    |
| Collector-to-Emitter Voltage | V <sub>CES</sub> |                                                               | (-50)80     | V    |
|                              | V <sub>CEO</sub> |                                                               | (-)50       | V    |
| Emitter-to-Base Voltage      | V <sub>EBO</sub> |                                                               | (-)6        | V    |
| Collector Current            | I <sub>C</sub>   |                                                               | (-)3        | A    |
| Collector Current (Pulse)    | I <sub>CP</sub>  |                                                               | (-)6        | A    |
| Base Current                 | I <sub>B</sub>   |                                                               | (-)600      | mA   |
| Collector Dissipation        | P <sub>C</sub>   | When mounted on ceramic substrate (600mm <sup>2</sup> ×0.8mm) | 0.8         | W    |
| Junction Temperature         | T <sub>j</sub>   |                                                               | 150         | °C   |
| Storage Temperature          | T <sub>stg</sub> |                                                               | -55 to +150 | °C   |

## Package Dimensions

unit : mm (typ)

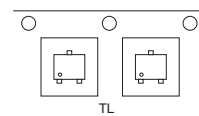
7019A-004



## Product & Package Information

- Package : MCPH3
- JEITA, JEDEC : SC-70, SOT-323
- Minimum Packing Quantity : 3,000 pcs./reel

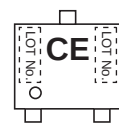
## Packing Type : TL



## Marking

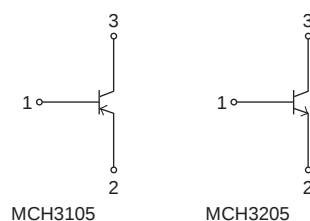


MCH3105



MCH3205

## Electrical Connection



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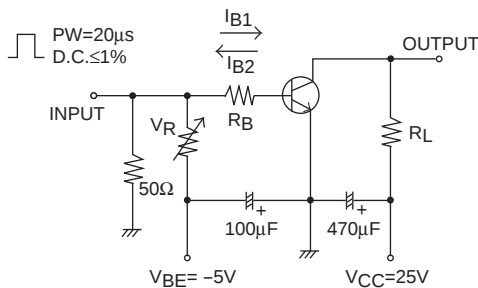
<http://www.sanyosemi.com/en/network/>

MCH3105/MCH3205

Electrical Characteristics at Ta=25°C

| Parameter                               | Symbol    | Conditions                  | Ratings |           |           | Unit |
|-----------------------------------------|-----------|-----------------------------|---------|-----------|-----------|------|
|                                         |           |                             | min     | typ       | max       |      |
| Collector Cutoff Current                | ICBO      | VCE=(-)40V, IE=0A           |         |           | (-)1      | μA   |
| Emitter Cutoff Current                  | IEBO      | VEB=(-)4V, IC=0A            |         |           | (-)1      | μA   |
| DC Current Gain                         | hFE       | VCE=(-)2V, IC=(-)100mA      | 200     |           | 560       |      |
| Gain-Bandwidth Product                  | fT        | VCE=(-)10V, IC=(-)500mA     |         | (360)380  |           | MHz  |
| Output Capacitance                      | Cob       | VCE=(-)10V, f=1MHz          |         | (24)13    |           | pF   |
| Collector-to-Emitter Saturation Voltage | VCE(sat)1 | IC=(-)1A, IB=(-)50mA        |         | (-100)80  | (-200)120 | mV   |
|                                         | VCE(sat)2 | IC=(-)2A, IB=(-)100mA       |         | (-185)140 | (-500)210 | mV   |
| Base-to-Emitter Saturation Voltage      | VBE(sat)  | IC=(-)2A, IB=(-)100mA       |         | (-)0.88   | (-)1.2    | V    |
| Collector-to-Base Breakdown Voltage     | V(BR)CBO  | IC=(-)10μA, IE=0A           | (-50)80 |           |           | V    |
| Collector-to-Emitter Breakdown Voltage  | V(BR)CES  | IC=(-)100μA, RBE=0Ω         | (-50)80 |           |           | V    |
|                                         | V(BR)CEO  | IC=(-)1mA, RBE=∞            | (-)50   |           |           | V    |
| Emitter-to-Base Breakdown Voltage       | V(BR)EBO  | IE=(-)10μA, IC=0A           | (-)6    |           |           | V    |
| Turn-On Time                            | ton       | See specified Test Circuit. |         | (30)35    |           | ns   |
| Storage Time                            | tstg      |                             |         | (230)300  |           | ns   |
| Fall Time                               | tf        |                             |         | (15)22    |           | ns   |

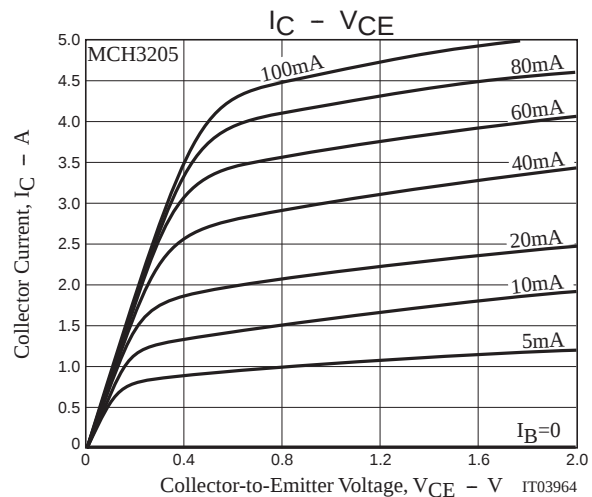
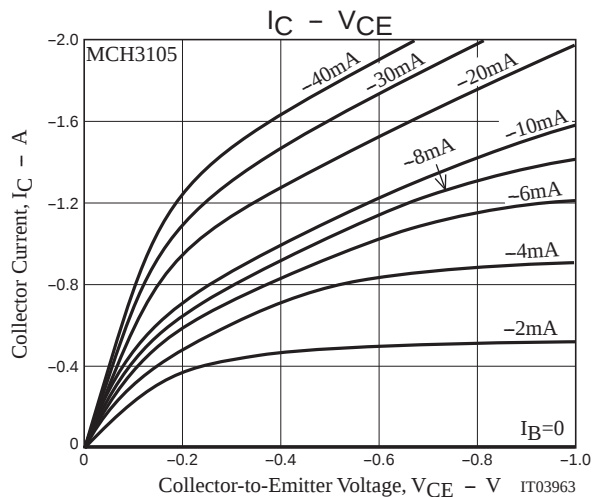
Switching Time Test Circuit



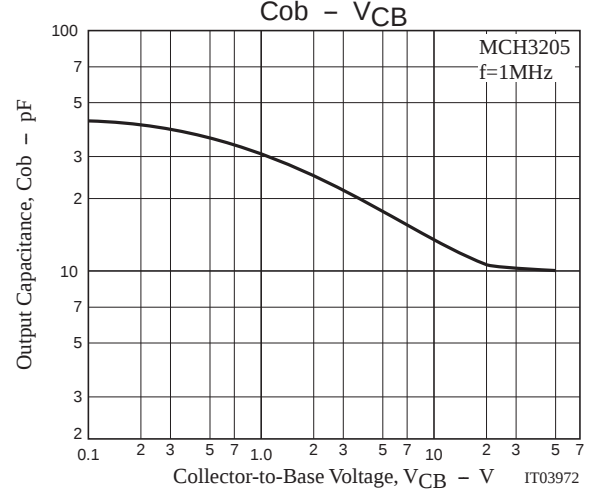
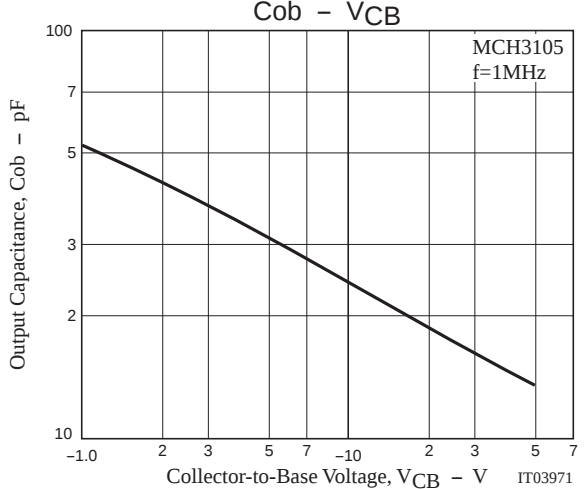
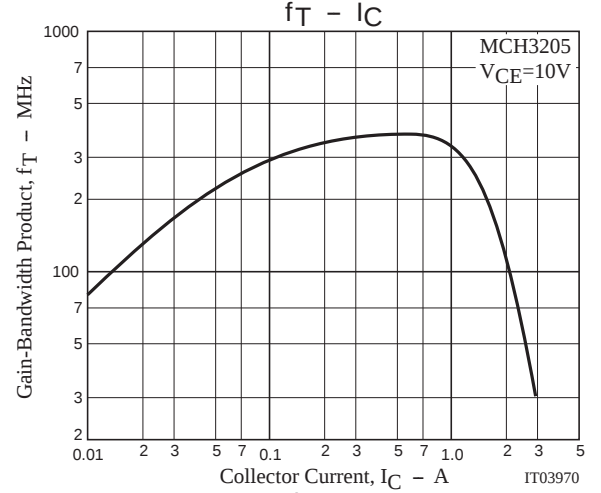
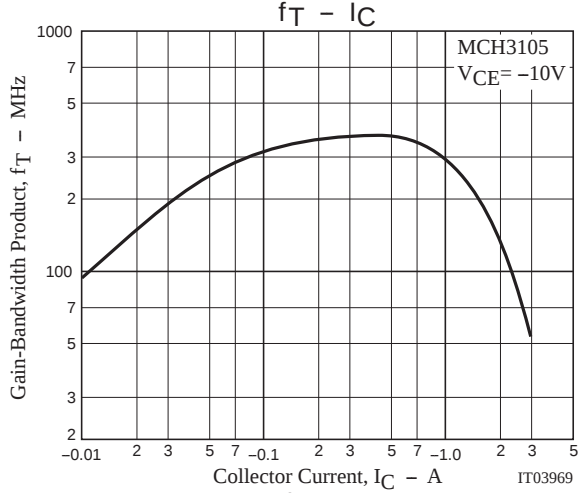
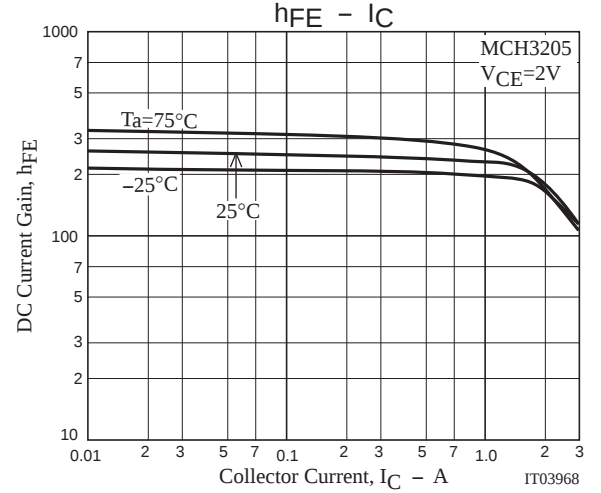
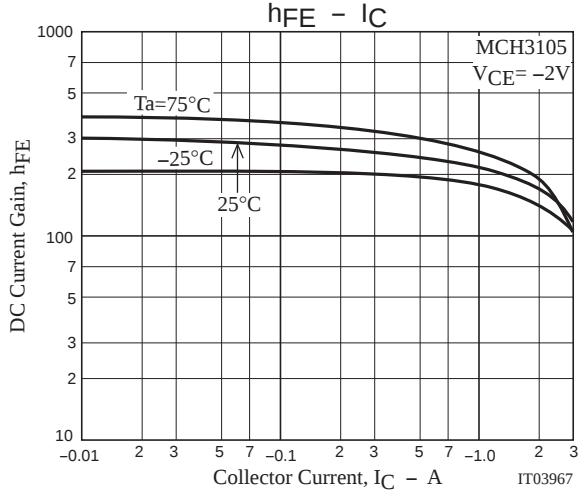
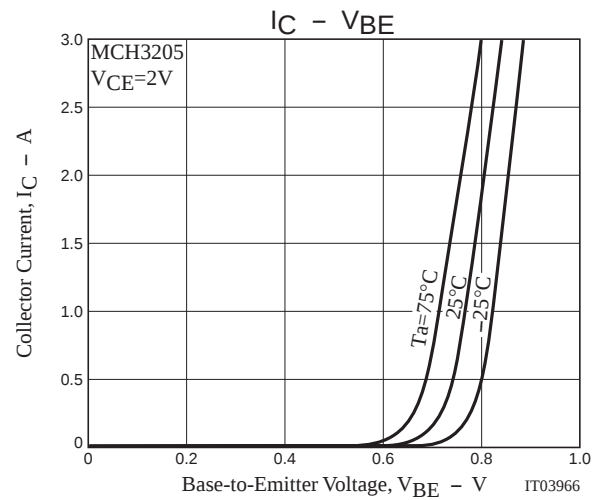
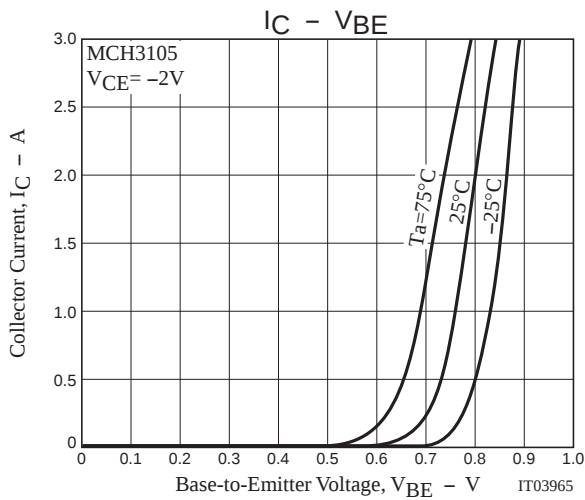
IC=10IB1= -10IB2=1A  
(For PNP, the polarity is reversed.)

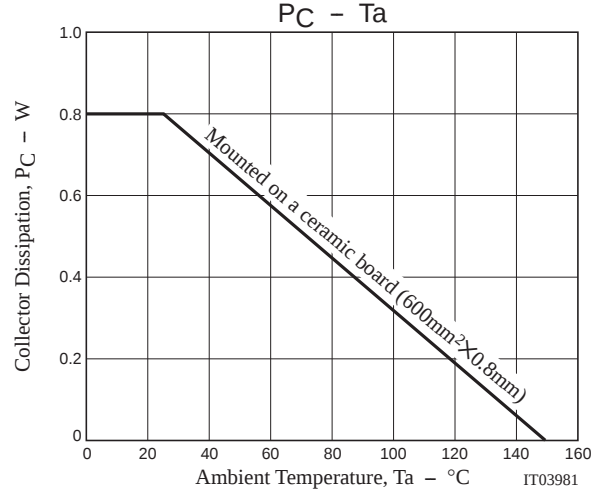
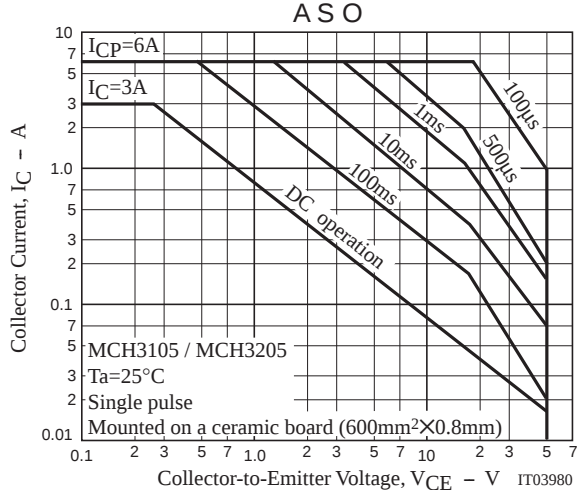
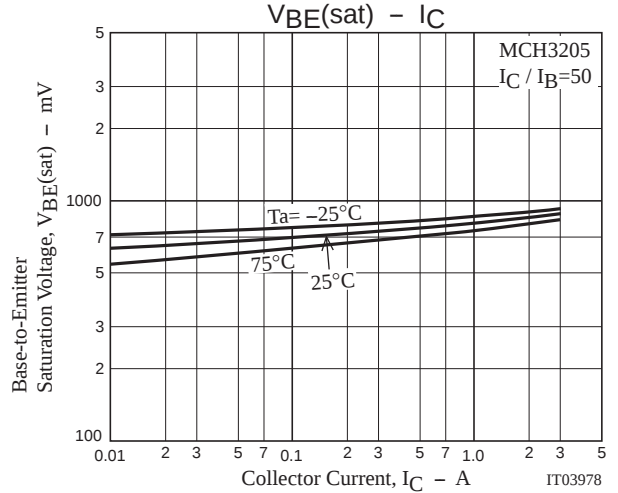
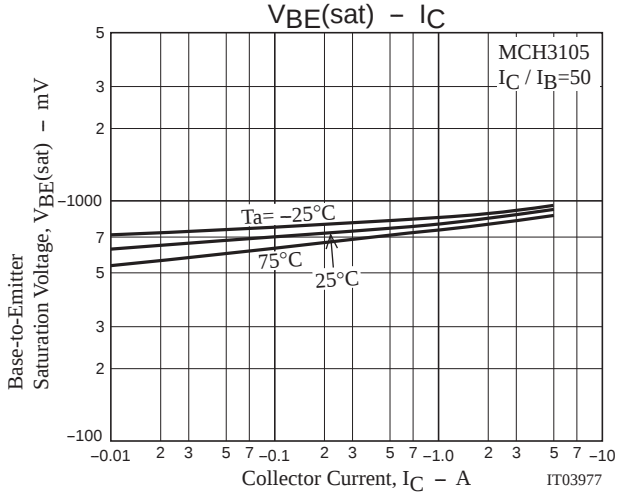
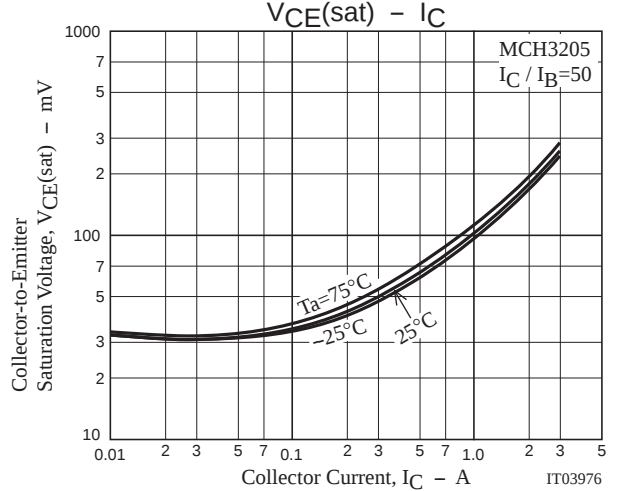
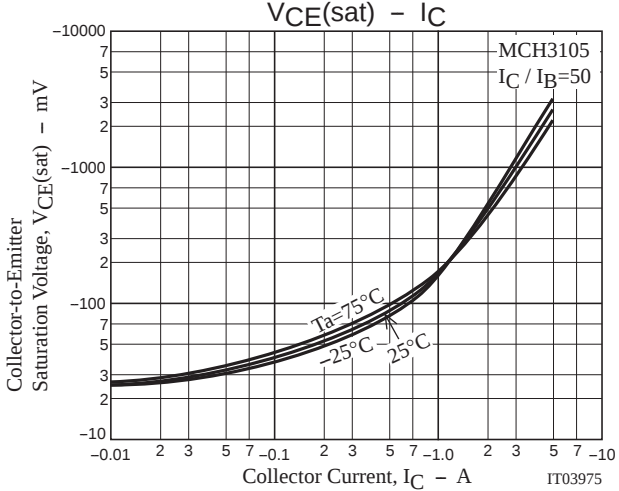
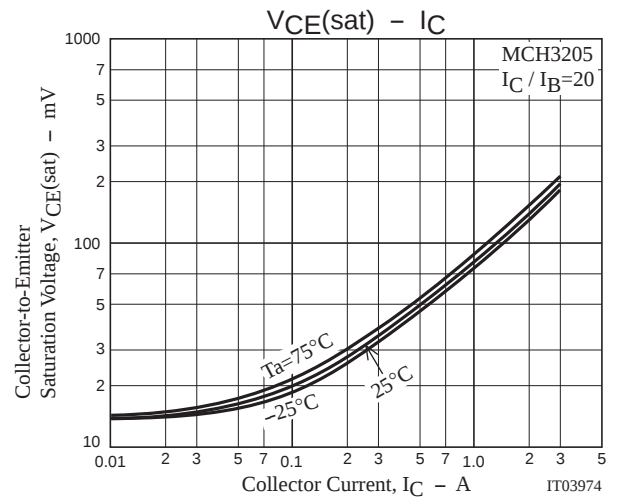
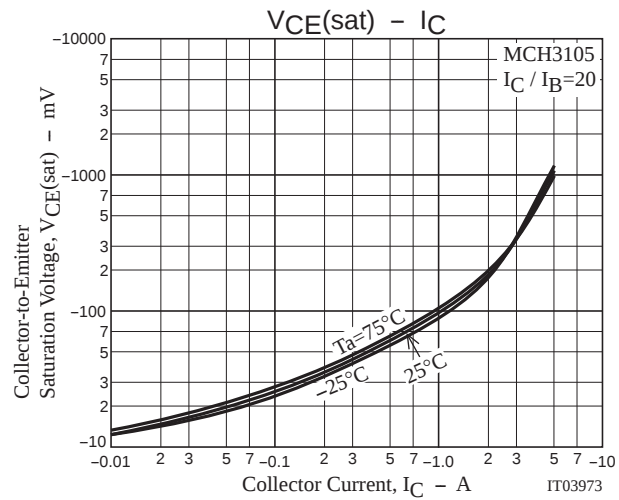
Ordering Information

| Device       | Package | Shipping       | memo    |
|--------------|---------|----------------|---------|
| MCH3105-TL-E | MCPH3   | 3,000pcs./reel | Pb Free |
| MCH3205-TL-E | MCPH3   | 3,000pcs./reel |         |



# MCH3105/MCH3205





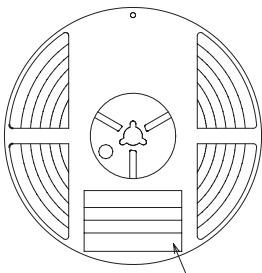
## Taping Specification

MCH3105-TL-E, MCH3205-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)                                                    |
| MCPH3        | MCPH3             | 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 |

#### Packing method



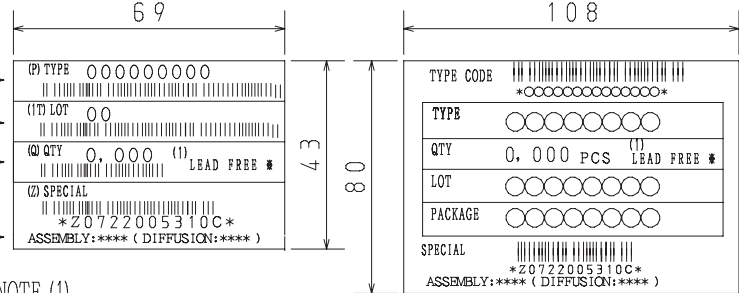
Type No.  
LOT No.  
Quantity  
Origin

Reel label

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.



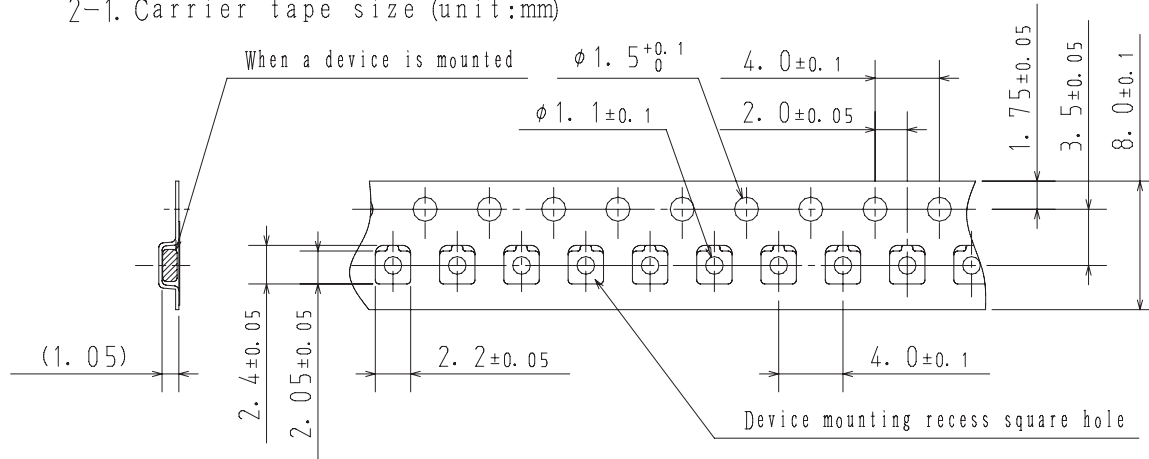
NOTE (1)

The LEAD FREE \* description shows that the surface treatment of the terminal is lead free.

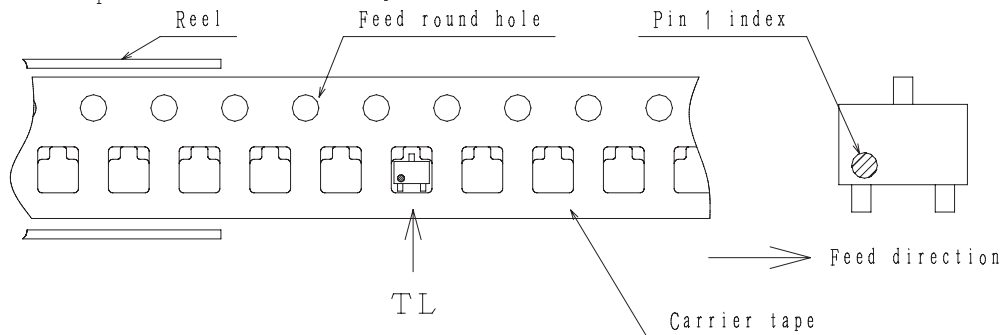
| Label       | JEITA Phase    |
|-------------|----------------|
| LEAD FREE 3 | JEITA Phase 3A |
| LEAD FREE 4 | JEITA Phase 3  |

### 2. Taping configuration

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



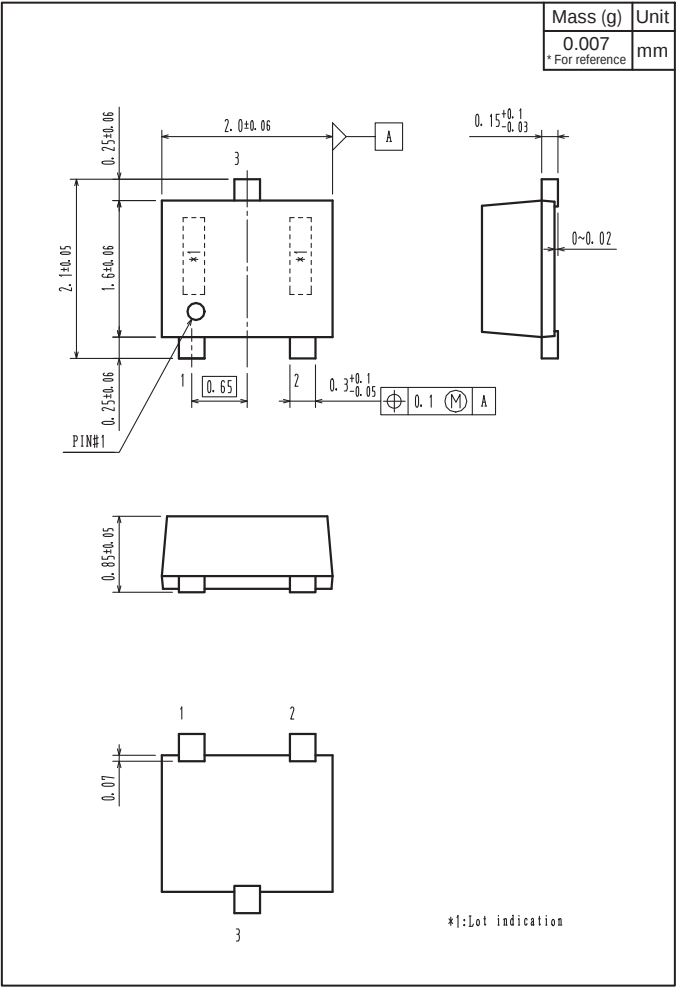
#### 2-2. Device placement direction



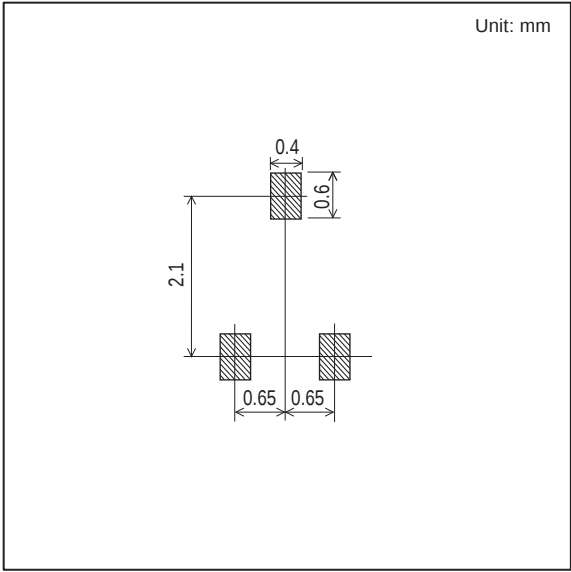
Those with pin 1 index on the feed hole side.....TL

Outline Drawing

MCH3105-TL-E, MCH3205-TL-E



Land Pattern Example



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**Факс:** 8 (812) 320-02-42

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