



# CPH3106

## Bipolar Transistor -12V, -3A, Low $V_{CE(sat)}$ , PNP Single CPH3

ON Semiconductor®

<http://onsemi.com>

### Applications

- Relay drivers, lamp drivers, motor drivers, flash

### Features

- Adoption of MBIT processes
- High current capacitance
- 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

Absolute Maximum Ratings at  $T_a=25^\circ\text{C}$ 

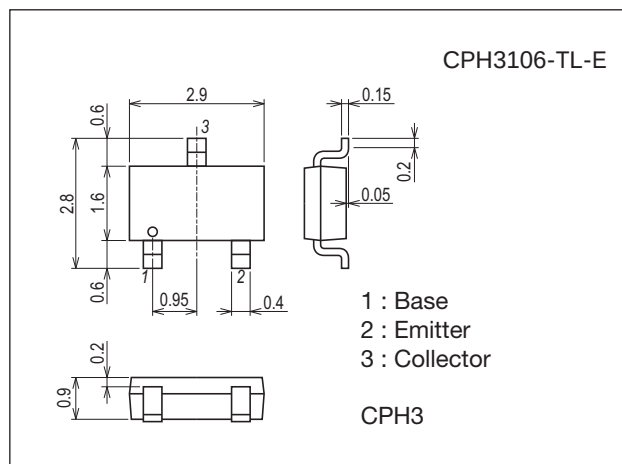
| Parameter                    | Symbol    | Conditions                                             | Ratings     | Unit |
|------------------------------|-----------|--------------------------------------------------------|-------------|------|
| Collector-to-Base Voltage    | $V_{CBO}$ |                                                        | -15         | V    |
| Collector-to-Emitter Voltage | $V_{CEO}$ |                                                        | -12         | V    |
| Emitter-to-Base Voltage      | $V_{EBO}$ |                                                        | -5          | V    |
| Collector Current            | $I_C$     |                                                        | -3          | A    |
| Collector Current (Pulse)    | $I_{CP}$  |                                                        | -5          | A    |
| Base Current                 | $I_B$     |                                                        | -600        | mA   |
| Collector Dissipation        | $P_C$     | Mounted on a ceramic board (600mm <sup>2</sup> ×0.8mm) | 0.9         | W    |
| Junction Temperature         | $T_j$     |                                                        | 150         | °C   |
| Storage Temperature          | $T_{stg}$ |                                                        | -55 to +150 | °C   |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

### Package Dimensions

unit : mm (typ)

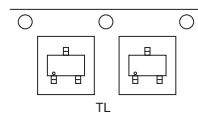
7015A-003



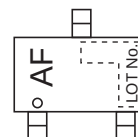
### Product & Package Information

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

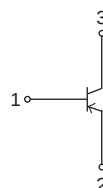
### Packing Type: TL



### Marking



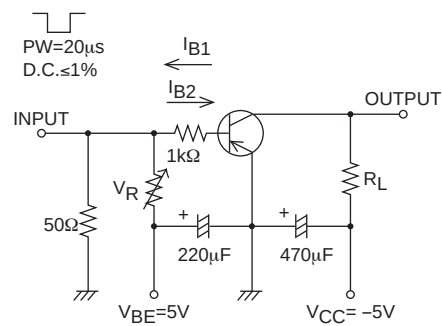
### Electrical Connection



Electrical Characteristics at Ta=25°C

| Parameter                               | Symbol               | Conditions                                     | Ratings |       |      | Unit |
|-----------------------------------------|----------------------|------------------------------------------------|---------|-------|------|------|
|                                         |                      |                                                | min     | typ   | max  |      |
| Collector Cutoff Current                | ICBO                 | V <sub>CB</sub> = -12V, I <sub>E</sub> =0A     |         |       | -0.1 | μA   |
| Emitter Cutoff Current                  | IEBO                 | V <sub>EB</sub> = -4V, I <sub>C</sub> =0A      |         |       | -0.1 | μA   |
| DC Current Gain                         | h <sub>FE</sub>      | V <sub>CE</sub> = -2V, I <sub>C</sub> = -500mA | 200     |       | 560  |      |
| Gain-Bandwidth Product                  | f <sub>T</sub>       | V <sub>CE</sub> = -2V, I <sub>C</sub> = -500mA |         | 280   |      | MHz  |
| Output Capacitance                      | Cob                  | V <sub>CB</sub> = -10V, f=1MHz                 |         | 36    |      | pF   |
| Collector-to-Emitter Saturation Voltage | V <sub>CE(sat)</sub> | I <sub>C</sub> = -1.5A, I <sub>B</sub> = -30mA |         | -110  | -165 | mV   |
| Base-to-Emitter Saturation Voltage      | V <sub>BE(sat)</sub> | I <sub>C</sub> = -1.5A, I <sub>B</sub> = -30mA |         | -0.85 | -1.2 | mV   |
| Collector-to-Base Breakdown Voltage     | V <sub>(BR)CBO</sub> | I <sub>C</sub> = -10μA, I <sub>E</sub> =0A     | -15     |       |      | V    |
| Collector-to-Emitter Breakdown Voltage  | V <sub>(BR)CEO</sub> | I <sub>C</sub> = -1mA, R <sub>BE</sub> =∞      | -12     |       |      | V    |
| Emitter-to-Base Breakdown Voltage       | V <sub>(BR)EBO</sub> | I <sub>E</sub> = -10μA, I <sub>C</sub> =0A     | -5      |       |      | V    |
| Turn-On Time                            | t <sub>on</sub>      | See specified Test Circuit.                    |         | 30    |      | ns   |
| Storage Time                            | t <sub>stg</sub>     |                                                |         | 90    |      | ns   |
| Fall Time                               | t <sub>f</sub>       |                                                |         | 10    |      | ns   |

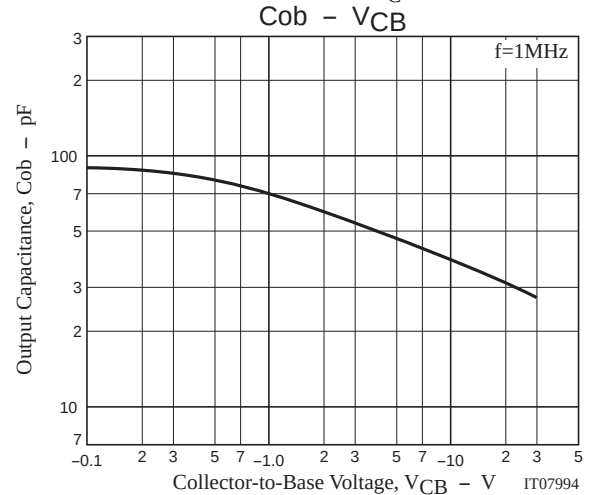
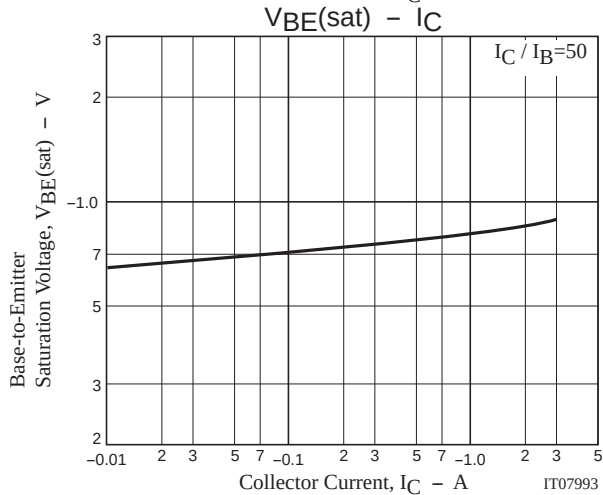
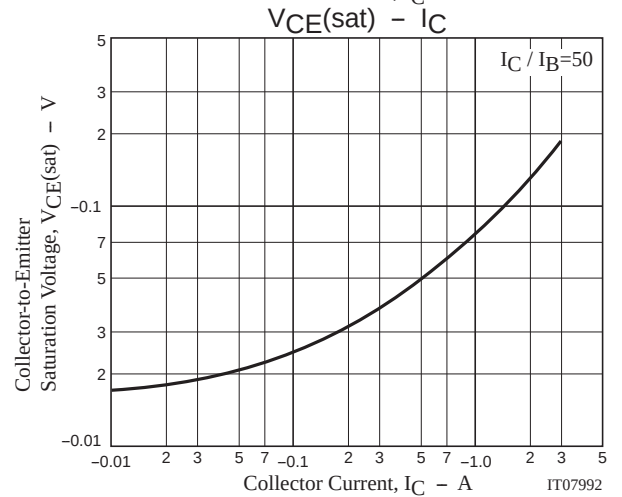
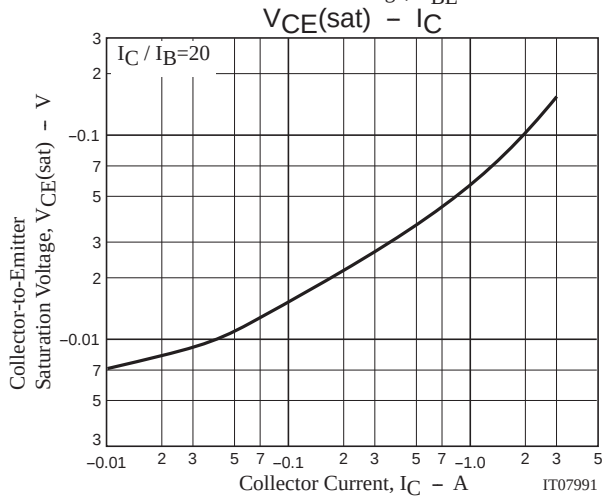
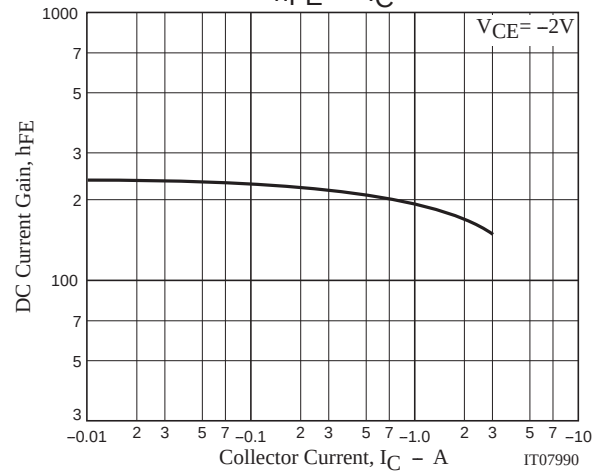
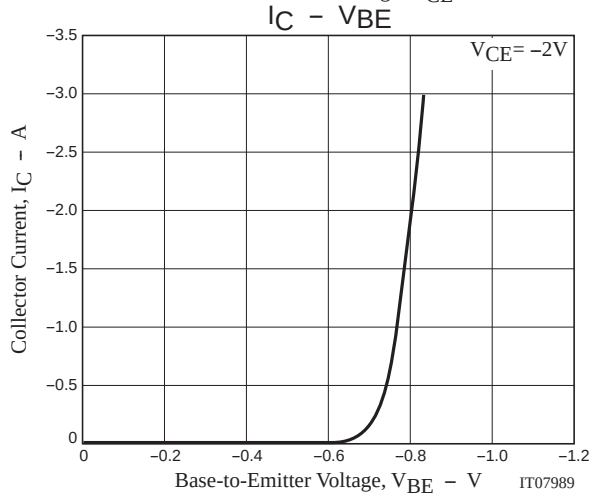
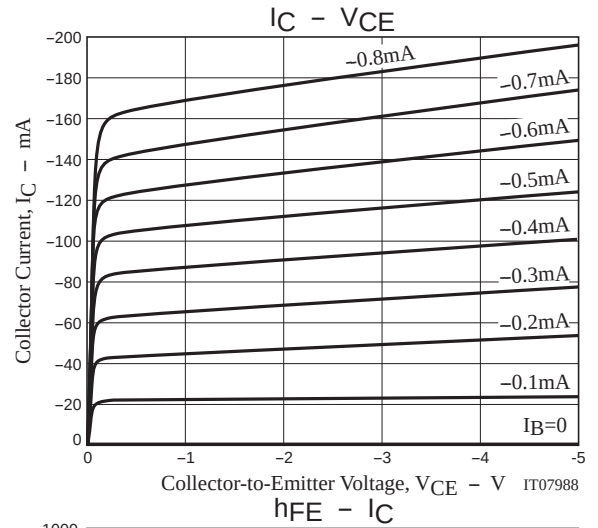
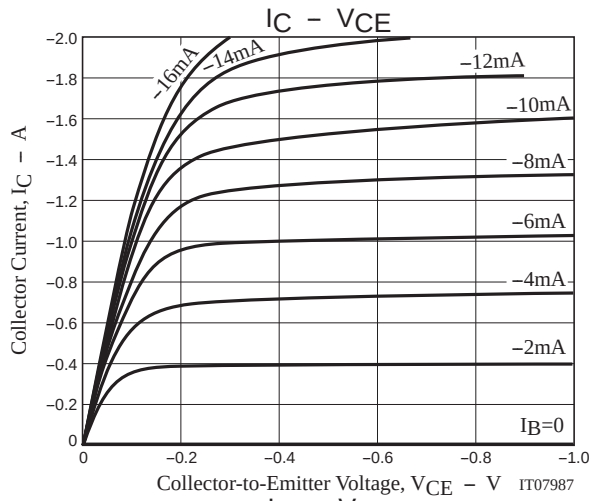
Switching Time Test Circuit

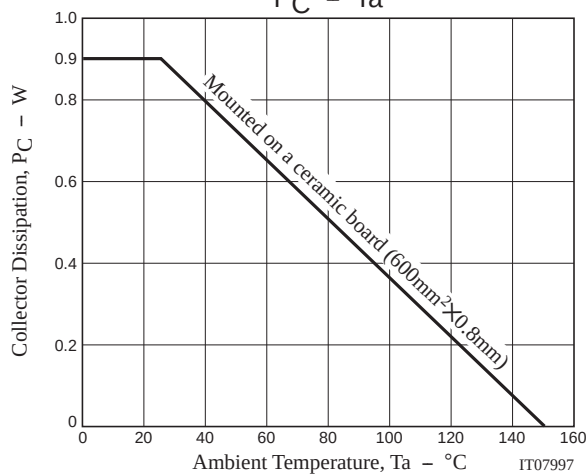
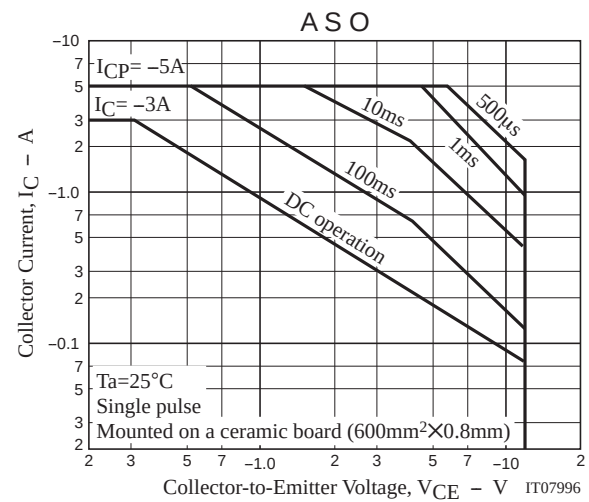
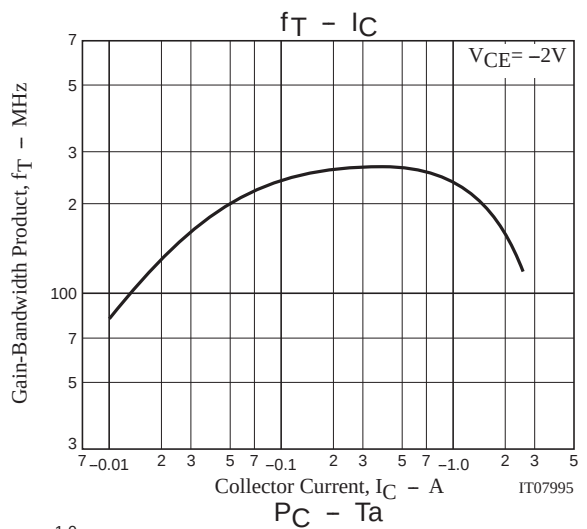


$-20I_{B1}=20I_{B2}=I_C = -1.5A$

Ordering Information

| Device       | Package | Shipping       | memo    |
|--------------|---------|----------------|---------|
| CPH3106-TL-E | CPH3    | 3,000pcs./reel | Pb Free |





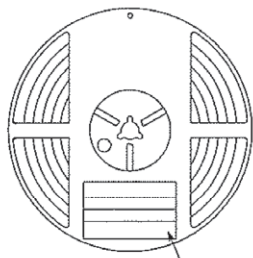
## Embossed Taping Specification

CPH3106-TL-E

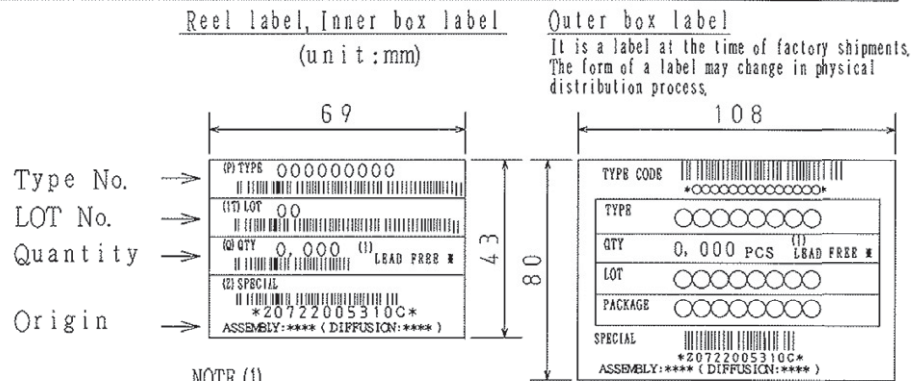
## 1. Packing Format

| 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 |

## Packing method

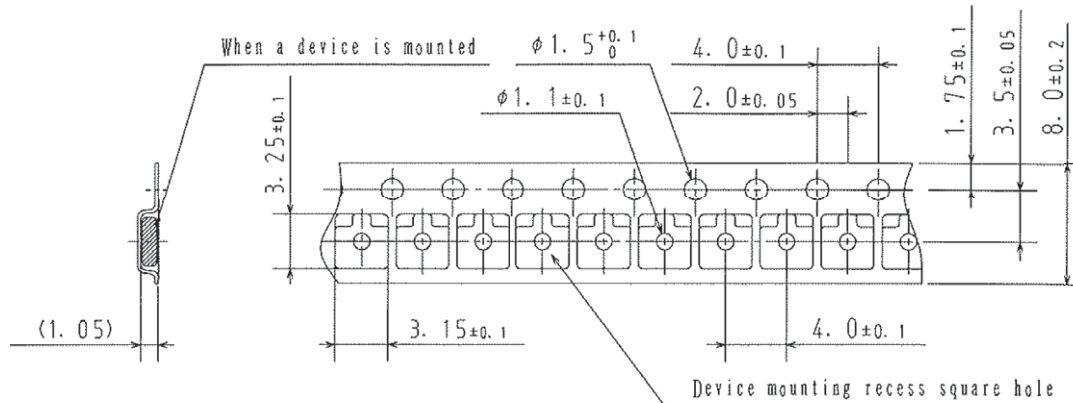


Reel label

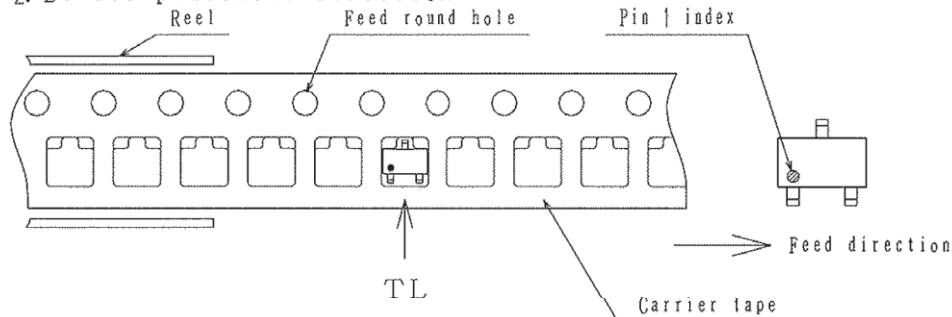


## 2. Taping configuration

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

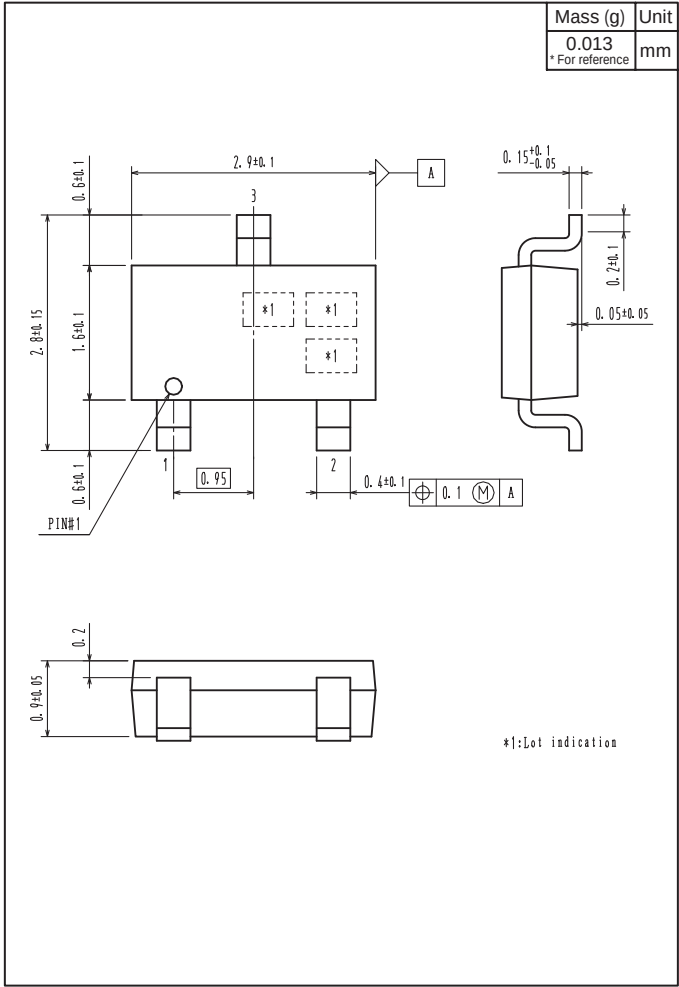


## 2-2. Device placement direction

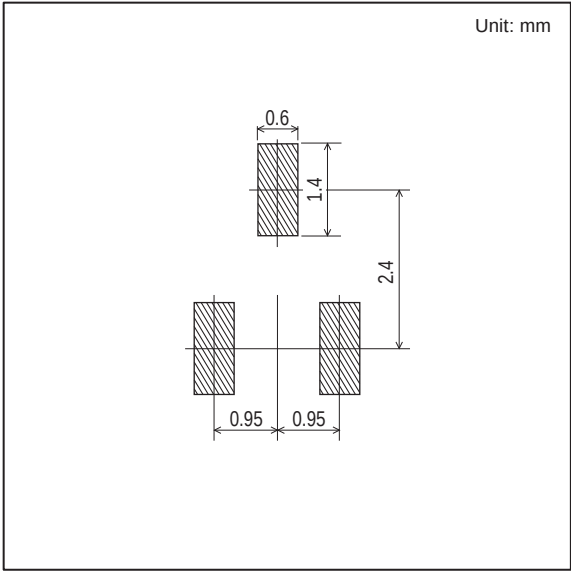


Those with one electrode terminal on the feed hole side.....TL

Outline Drawing  
CPH3106-TL-E



Land Pattern Example



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