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Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

Ordering number : EN6592A

# CPH6501

## Bipolar Transistor
## 30V, 1.5A, Low $V_{CE}$(sat) NPN Dual CPH6

ON Semiconductor®
http://onsemi.com

### Applications

- Relay drivers, lamp drivers, motor drivers

### Features

- Composite type with two NPN transistors contained in one package, facilitating high-density mounting
- The CPH6501 consists of with two chips which are equivalent to the CPH3215.
- Ultrasmall-sized package permitting facilitates miniaturization in end products (0.9mm)

### Specifications

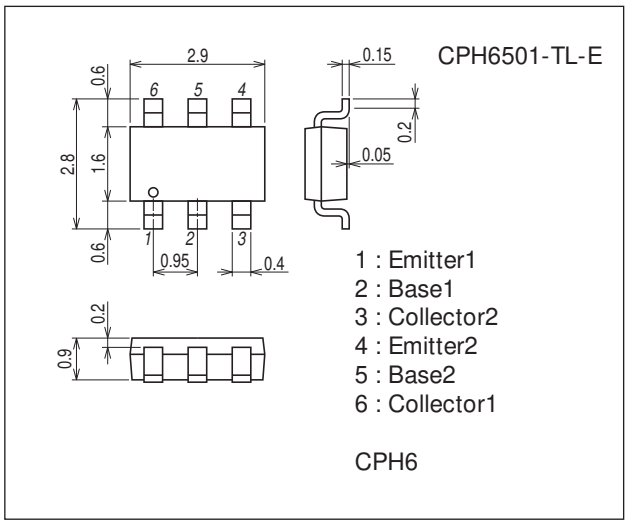
**Absolute Maximum Ratings** at Ta=25°C

| Parameter | Symbol | Conditions | Ratings | Unit |
|---|---|---|---|---|
| Collector-to-Base Voltage | $V_{CBO}$ | | 40 | V |
| Collector-to-Emitter Voltage | $V_{CEO}$ | | 30 | V |
| Emitter-to-Base Voltage | $V_{EBO}$ | | 5 | V |
| Collector Current | $I_C$ | | 1.5 | A |
| Collector Current (Pulse) | $I_{CP}$ | | 3 | A |
| Base Current | $I_B$ | | 300 | mA |
| Collector Dissipation | $P_C$ | When mounted on ceramic substrate (600mm$^2$×0.8mm) | 0.9 | W |
| Total Power Dissipation | $P_T$ | When mounted on ceramic substrate (600mm$^2$×0.8mm) | 1.2 | W |
| Junction Temperature | Tj | | 150 | °C |
| Storage Temperature | Tstg | | -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

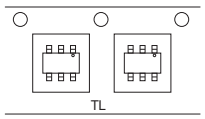
unit : mm (typ)
7018A-006



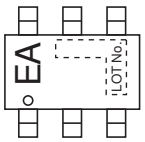

### Product & Package Information

- Package : CPH6
- JEITA, JEDEC : SC-74, SOT-26, SOT-457
- Minimum Packing Quantity : 3,000 pcs./reel

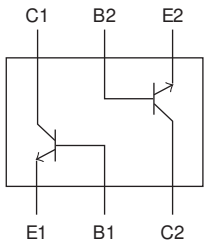
### Packing Type: TL




### Marking



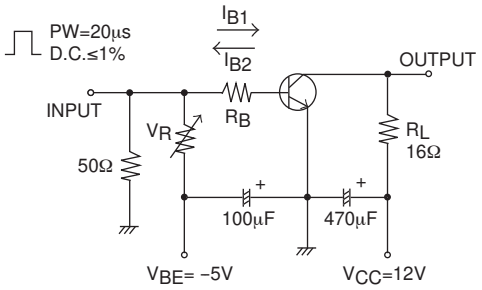

### Electrical Connection



## Electrical Characteristics at Ta=25°C

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---|---|---|---|---|---|
| | | | min | typ | max | |
| Collector Cutoff Current | $I_{CBO}$ | $V_{CB}$=30V, $I_E$=0A | | | 0.1 | μA |
| Emitter Cutoff Current | $I_{EBO}$ | $V_{EB}$=4V, $I_C$=0A | | | 0.1 | μA |
| DC Current Gain | $h_{FE}$ | $V_{CE}$=2V, $I_C$=100mA | 200 | | 560 | |
| Gain-Bandwidth Product | $f_T$ | $V_{CE}$=10V, $I_C$=300mA | | 500 | | MHz |
| Output Capacitance | Cob | $V_{CB}$=10V, f=1MHz | | 8 | | pF |
| Collector-to-Emitter Saturation Voltage | $V_{CE}$(sat) | $I_C$=750mA, $I_B$=15mA | | 150 | 225 | mV |
| Base-to-Emitter Saturation Voltage | $V_{BE}$(sat) | $I_C$=750mA, $I_B$=15mA | | 0.85 | 1.2 | V |
| Collector-to-Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C$=10μA, $I_E$=0A | 40 | | | V |
| Collector-to-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C$=1mA, $R_{BE}$=∞ | 30 | | | V |
| Emitter-to-Base Breakdown Voltage | $V_{(BR)EBO}$ | $I_E$=10μA, $I_C$=0A | 5 | | | V |
| Turn-On Time | $t_{on}$ | See specified Test Circuit. | | 35 | | ns |
| Storage Time | $t_{stg}$ | | | 205 | | ns |
| Fall Time | $t_f$ | | | 30 | | ns |

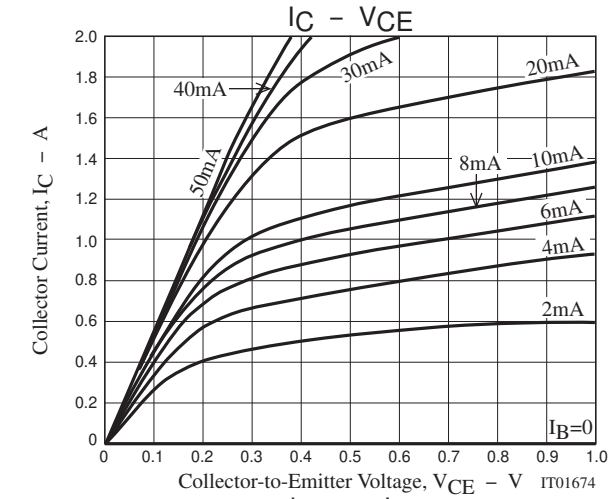
## Switching Time Test Circuit

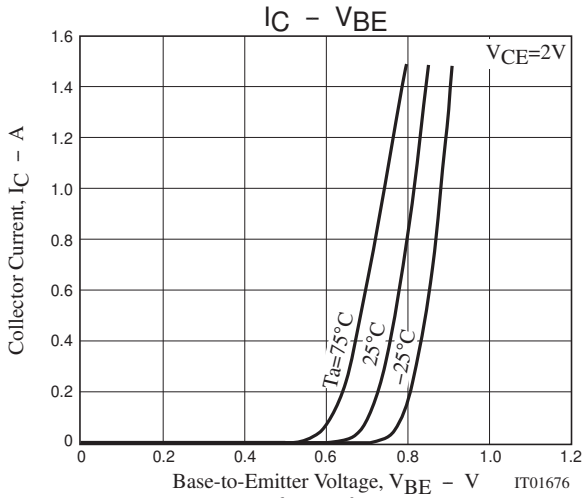


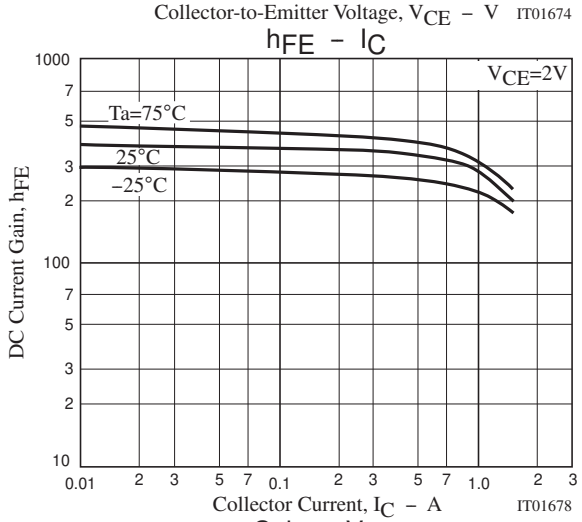

$20I_{B1}$= $-20I_{B2}$=$I_C$=750mA

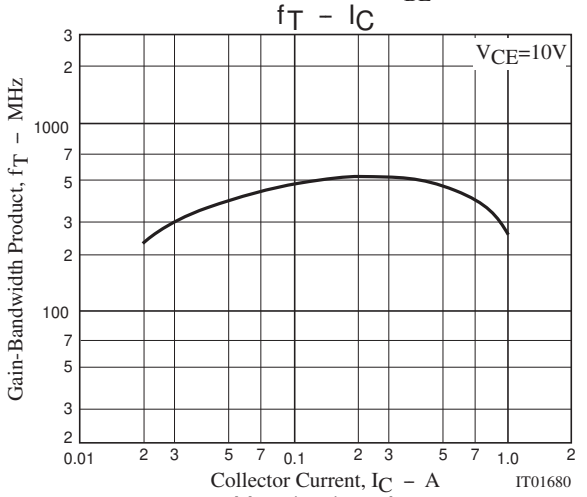
## Ordering Information

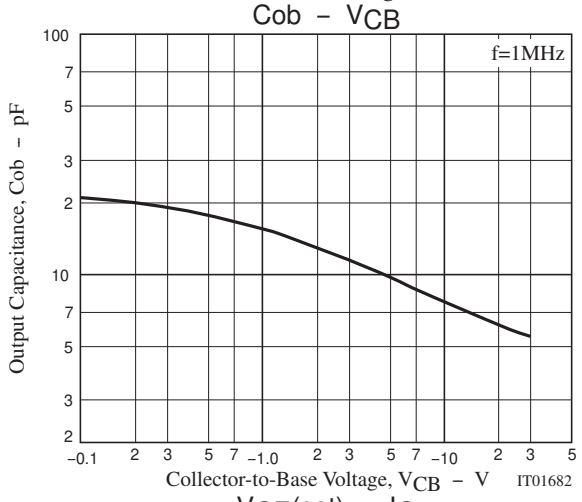
| Device | Package | Shipping | memo |
|---|---|---|---|
| CPH6501-TL-E | CPH6 | 3,000pcs./reel | Pb Free |

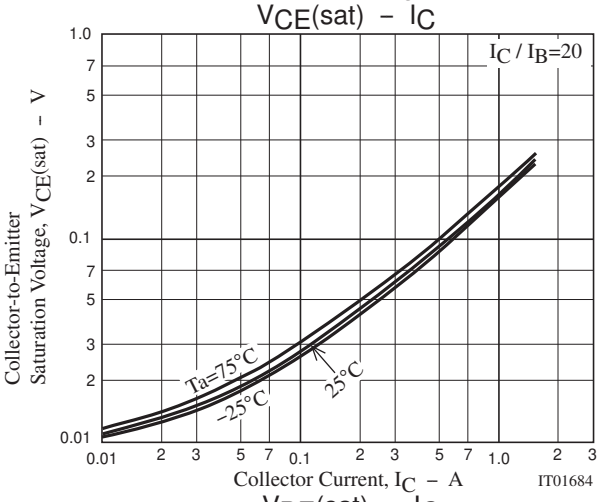

IC – VCE
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT01674
40mA
30mA
20mA
50mA
8mA
10mA
6mA
4mA
2mA
IB=0

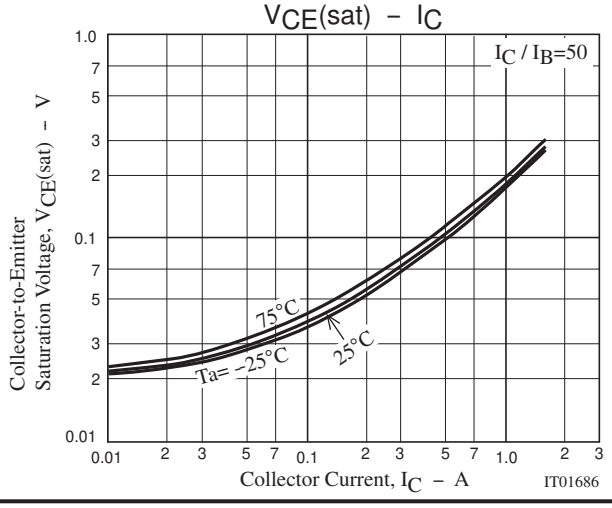

IC – VBE
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
IT01676
VCE=2V
Ta=75°C
25°C
–25°C

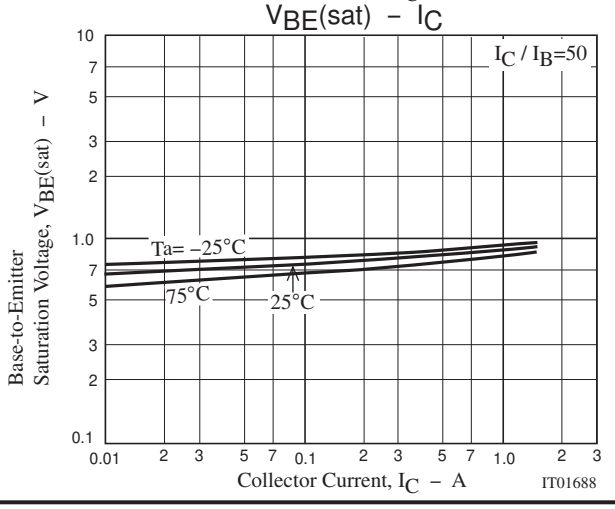

hFE – IC
DC Current Gain, hFE
Collector Current, IC – A
IT01678
VCE=2V
Ta=75°C
25°C
–25°C

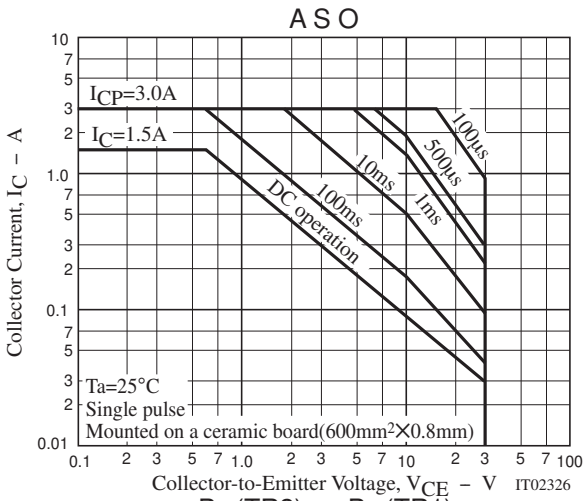

fT – IC
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT01680
VCE=10V

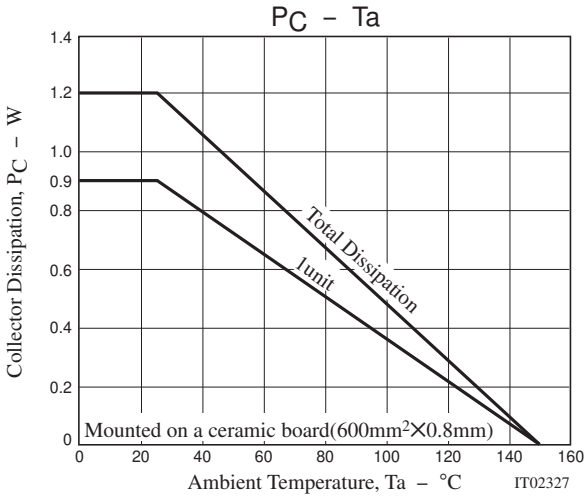

Cob – VCB
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT01682
f=1MHz

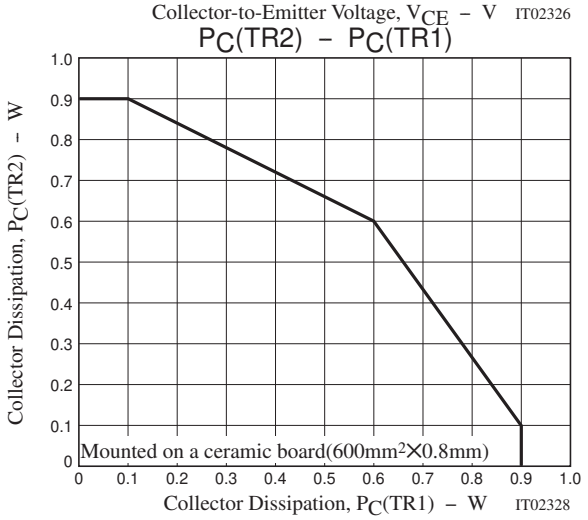

VCE(sat) – IC
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
IT01684
IC / IB=20
Ta=75°C
25°C
–25°C


VCE(sat) – IC
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
IT01686
IC / IB=50
75°C
Ta= –25°C
25°C


VBE(sat) – IC
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – A
IT01688
IC / IB=50
Ta= –25°C
75°C
25°C


A S O
Collector Current, $I_C$ – A
$I_{CP}$=3.0A
$I_C$=1.5A
100μs
500μs
10ms
1ms
100ms
DC operation
Ta=25°C
Single pulse
Mounted on a ceramic board(600mm²×0.8mm)
Collector-to-Emitter Voltage, $V_{CE}$ – V
IT02326


$P_C$ – Ta
Collector Dissipation, $P_C$ – W
Total Dissipation
1unit
Mounted on a ceramic board(600mm²×0.8mm)
Ambient Temperature, Ta – °C
IT02327


$P_C$(TR2) – $P_C$(TR1)
Collector Dissipation, $P_C$(TR2) – W
Mounted on a ceramic board(600mm²×0.8mm)
Collector Dissipation, $P_C$(TR1) – W
IT02328

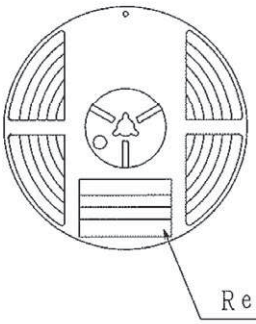
**Embossed Taping Specification**

CPH6501-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) |
| CPH6 | CPH6 | 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 |

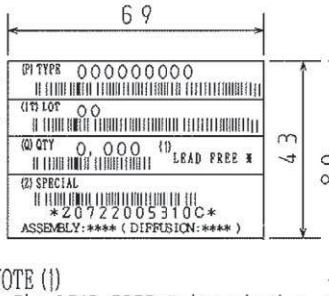
Packing method



Reel label

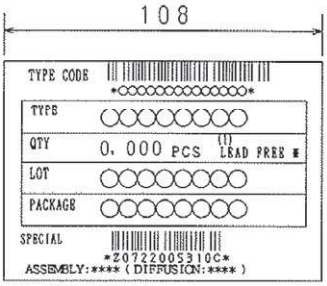
Reel label, Inner box label

(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.



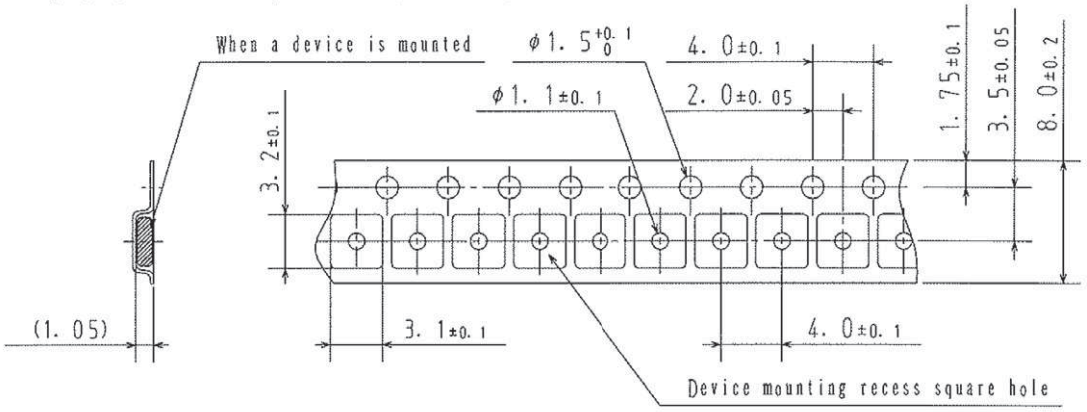

NOTE (1)

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

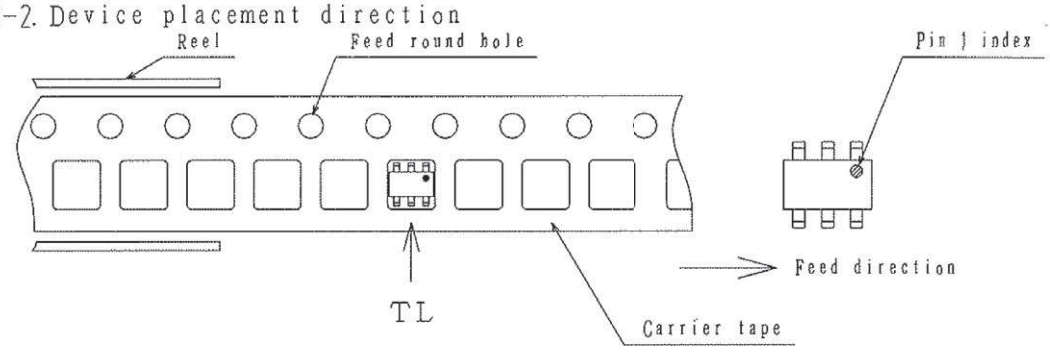
| Label | JEITA Phase |
|---|---|
| LEAD FREE 3 | JEITA Phase 3A |
| LEAD FREE 4 | JEITA Phase 3 |

## 2. Taping configuration

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



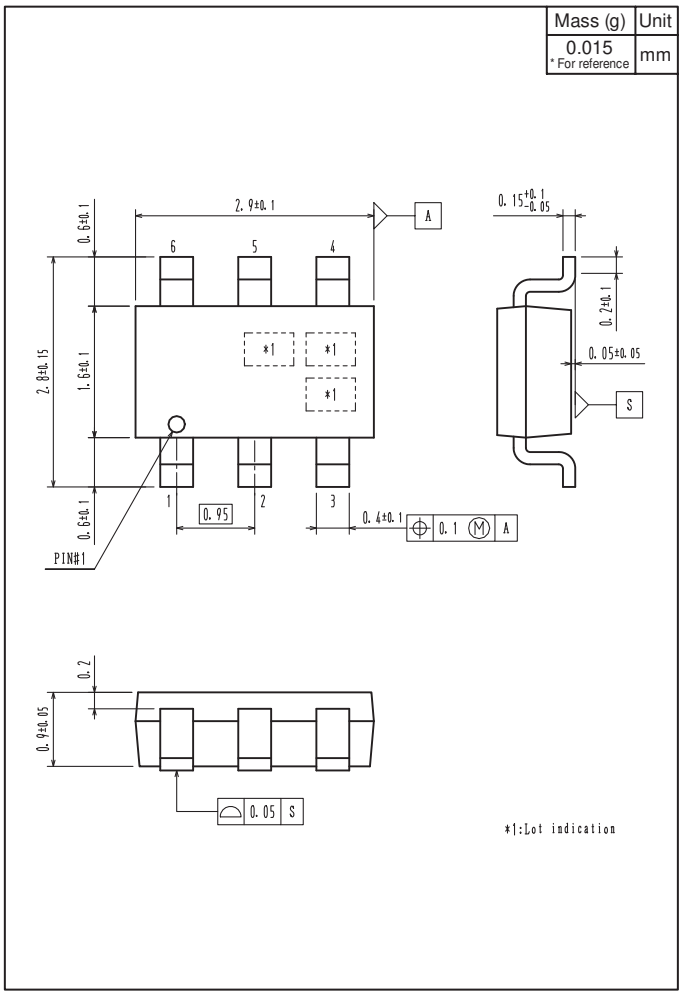

### 2-2. Device placement direction




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

## Outline Drawing

CPH6501-TL-E




## Land Pattern Example