



# CPH6538 — NPN Epitaxial Planar Silicon Transistor

## DC / DC Converter Applications

### Features

- Small-sized package with two NPN transistors (30C02CH equivalency) contained in one package
- $V_{CE0}=30V, I_C=0.7A$
- Low Collector-to-Emitter Saturation Voltage  $V_{CE(sat)}=85mV(\text{typ.})@I_C=0.2A$
- High-speed switching  $t_f=40ns(\text{typ.})@I_C=0.3A$
- Halogen free Compliance

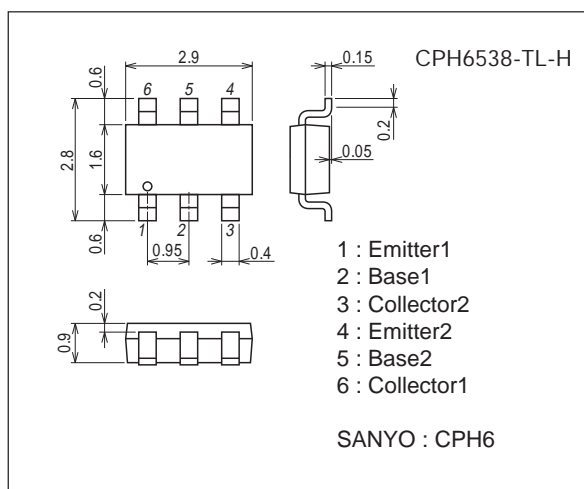
### Specifications

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

| 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            | $I_C$     |   | 700         | mA   |
| Collector Current (Pulse)    | $I_{CP}$  |   | 1.4         | A    |
| Collector Dissipation        | $P_C$     | When mounted on ceramic substrate (600mm <sup>2</sup> ×0.8mm) 1unit | 0.6         | W    |
| Junction Temperature         | $T_j$     |   | 150         | °C   |
| Storage Temperature          | $T_{stg}$ |   | -55 to +150 | °C   |

### Package Dimensions

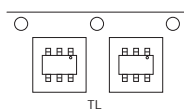
unit : mm (typ)  
7018A-006



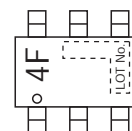
### Product & Package Information

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

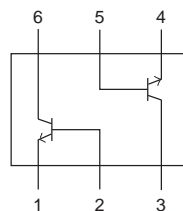
### Packing Type: TL



### Marking



### Electrical Connection

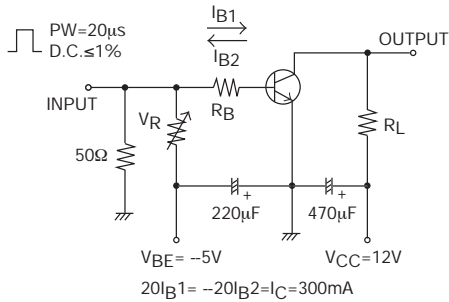


# CPH6538

## Electrical Characteristics at $T_a=25^\circ\text{C}$

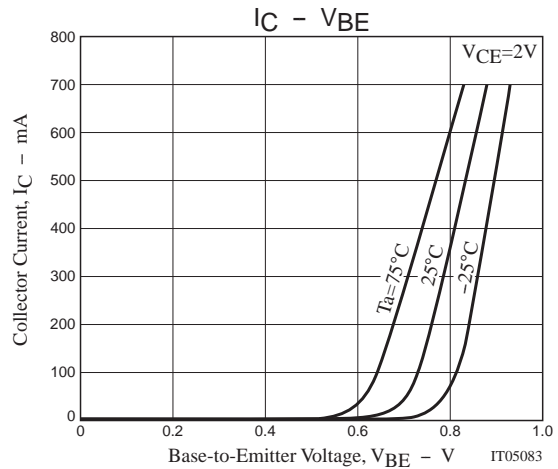
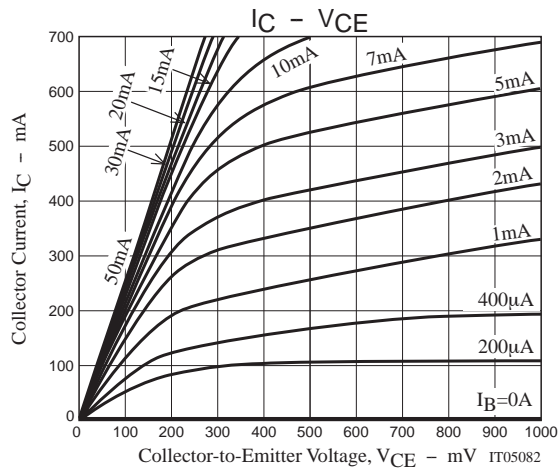
| Parameter                               | Symbol        | Conditions                          | Ratings |     |     | Unit |
|---|---------------|-------------------------------------|---------|-----|-----|------|
|   |               |                                     | min     | typ | max |      |
| Collector Cutoff Current                | $I_{CBO}$     | $V_{CB}=30\text{V}, I_E=0\text{A}$  |         |     | 100 | nA   |
| Emitter Cutoff Current                  | $I_{EBO}$     | $V_{EB}=4\text{V}, I_C=0\text{A}$   |         |     | 100 | nA   |
| DC Current Gain                         | $h_{FE}$      | $V_{CE}=2\text{V}, I_C=50\text{mA}$ | 300     |     | 800 |      |
| Gain-Bandwidth Product                  | $f_T$         | $V_{CE}=2\text{V}, I_C=50\text{mA}$ |         | 540 |     | MHz  |
| Output Capacitance                      | $C_{ob}$      | $V_{CB}=10\text{V}, f=1\text{MHz}$  |         | 3.3 |     | pF   |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=200\text{mA}, I_B=10\text{mA}$ |         | 85  | 190 | mV   |
| Base-to-Emitter Saturation Voltage      | $V_{BE(sat)}$ | $I_C=200\text{mA}, I_B=10\text{mA}$ |         | 0.9 | 1.2 | V    |
| Collector-to-Base Breakdown Voltage     | $V_{(BR)CBO}$ | $I_C=10\mu\text{A}, I_E=0\text{A}$  | 40      |     |     | V    |
| Collector-to-Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | $I_C=1\text{mA}, R_{BE}=\infty$     | 30      |     |     | V    |
| Emitter-to-Base Breakdown Voltage       | $V_{(BR)EBO}$ | $I_E=10\mu\text{A}, I_C=0\text{A}$  | 5       |     |     | V    |
| Turn-On Time                            | $t_{on}$      | See specified Test Circuit.         |         | 35  |     | ns   |
| Storage Time                            | $t_{stg}$     |                                     |         | 255 |     | ns   |
| Fall Time                               | $t_f$         |                                     |         | 40  |     | ns   |

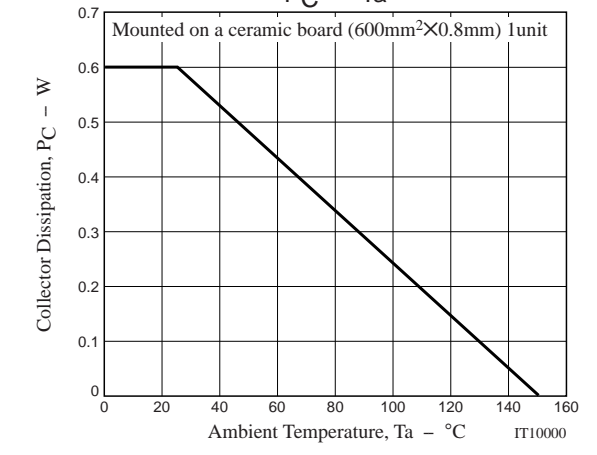
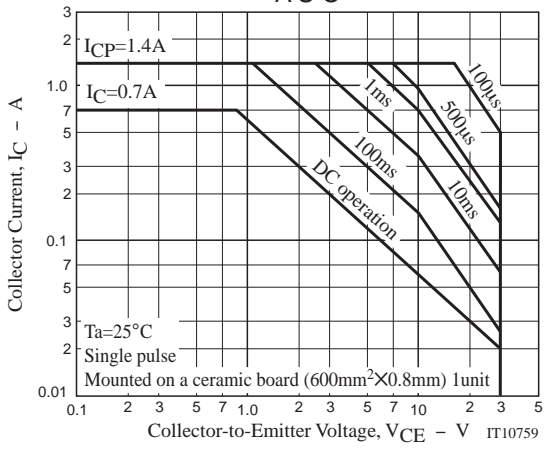
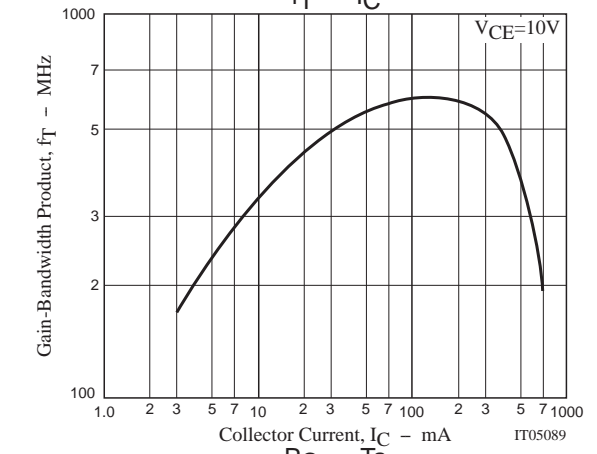
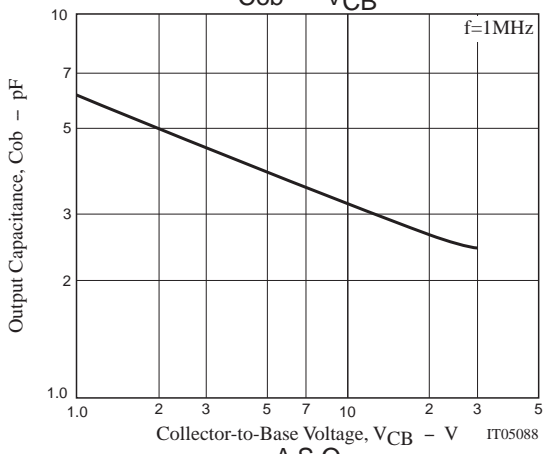
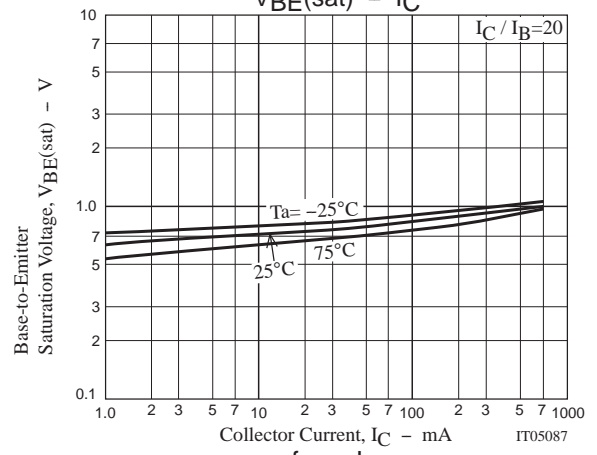
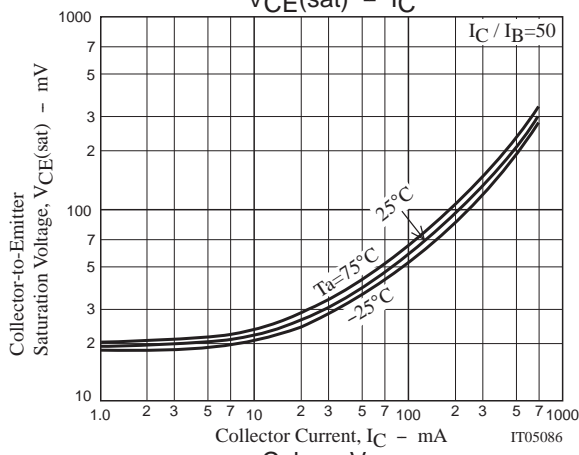
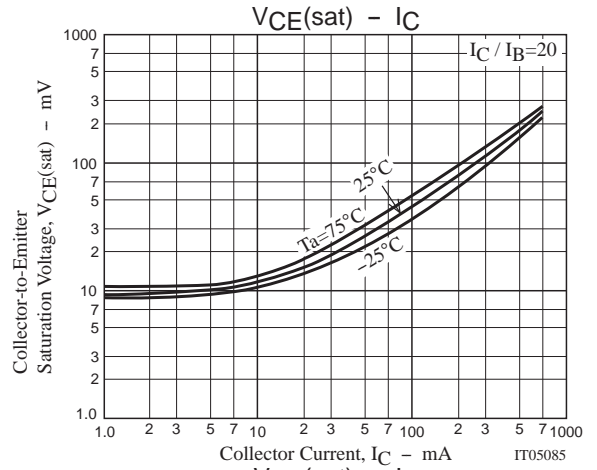
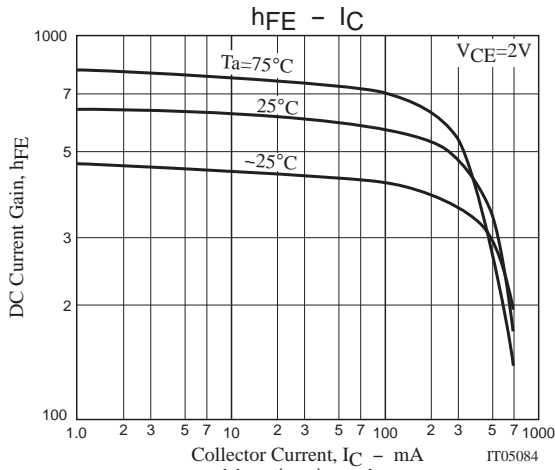
## Switching Time Test Circuit



## Ordering Information

| Device       | Package | Shipping       | memo                     |
|--------------|---------|----------------|--------------------------|
| CPH6538-TL-H | CPH6    | 3,000pcs./reel | Pb Free and Halogen Free |



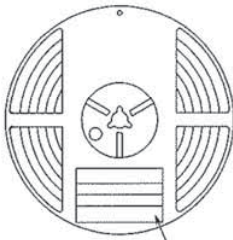


Embossed Taping Specification  
CPH6538-TL-H

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

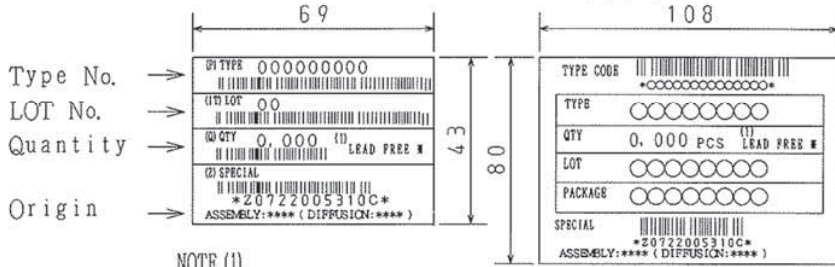


Reel label

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.



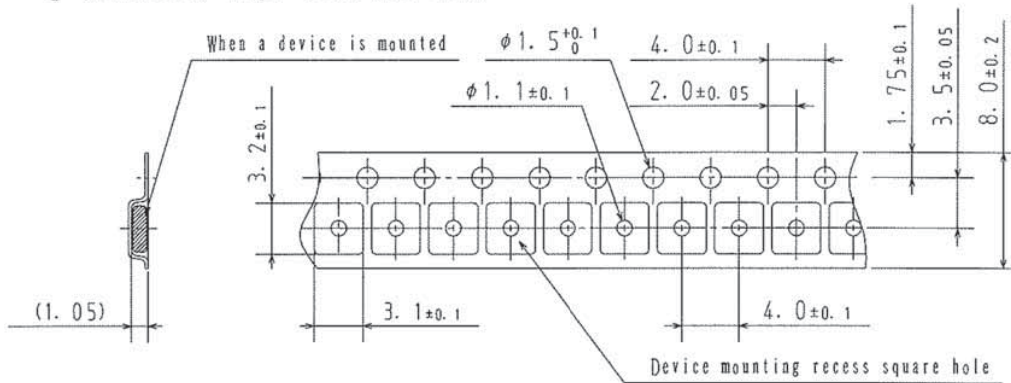
NOTE (1)

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

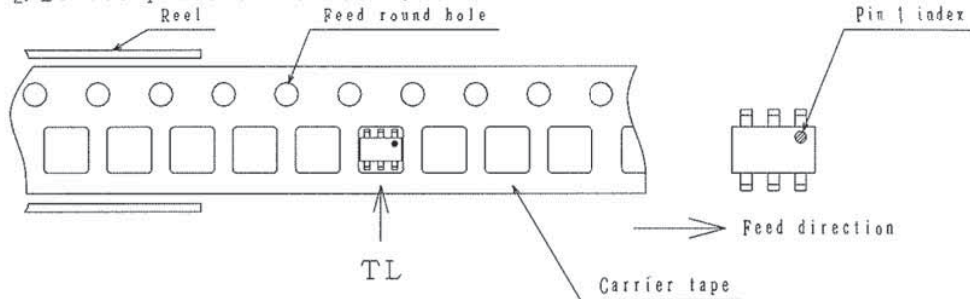
| Label       | JEITA Phase    |
|-------------|----------------|
| LEAD FREE 3 | JEITA Phase 3A |
| LEAD FREE 4 | JEITA Phase 3  |

2. Taping configuration

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



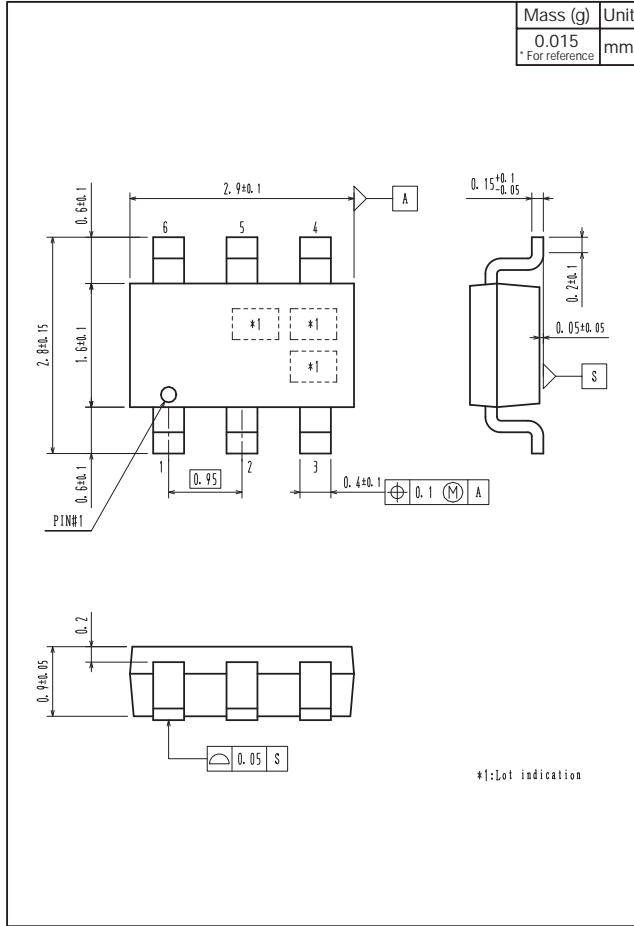
2-2. Device placement direction



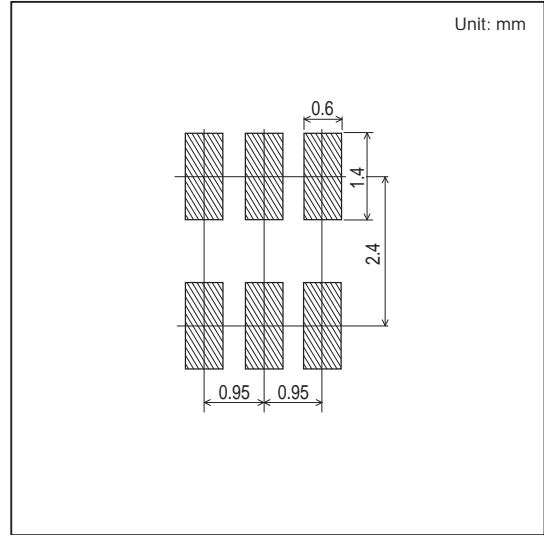
Those with pin 1 index on the feed hole side.....TL

# CPH6538

## Outline Drawing CPH6538-TL-H



## Land Pattern Example



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