



CPH5901

N-Channel JFET and NPN Bipolar Transistor 15V, 6 to 20mA, 50V, 150mA, Composite type CPH5

ON Semiconductor®
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Features

- Composite type with J-FET and NPN transistors contained in the CPH5 package, improving the mounting efficiency greatly
- The CPH5901 is formed with two chips, being equivalent to the 2SK932 and the other the 2SC4639, placed in one package
- Common drain and emitter

Specifications

Absolute Maximum Ratings at Ta=25°C

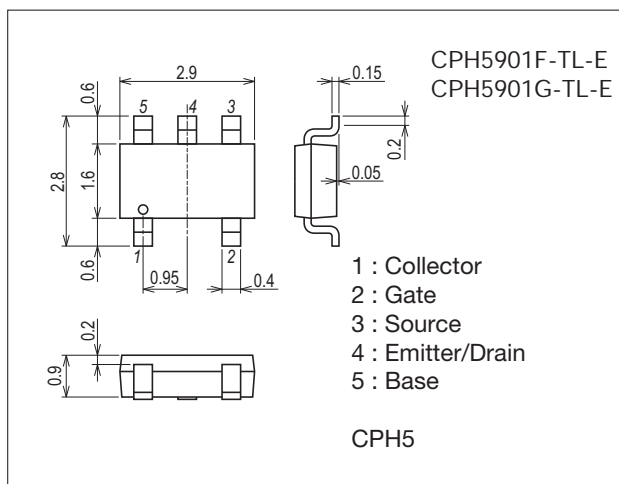
| Parameter | Symbol | Conditions | Ratings | Unit |
|------------------------------|------------------|--|-------------|------|
| [FET] | | | | |
| Drain-to-Source Voltage | V _{DSX} | | 15 | V |
| Gate-to-Drain Voltage | V _{GD} | | -15 | V |
| Gate Current | I _G | | 10 | mA |
| Drain Current | I _D | | 50 | mA |
| Allowable Power Dissipation | P _D | Mounted on a ceramic board (600mm ² ×0.8mm) | 350 | mW |
| [TR] | | | | |
| Collector-to-Base Voltage | V _{CB} | | 55 | V |
| Collector-to-Emitter Voltage | V _{CE} | | 50 | V |
| Emitter-to-Base Voltage | V _{EB} | | 6 | V |
| Collector Current | I _C | | 150 | mA |
| Collector Current (Pulse) | I _{CP} | | 300 | mA |
| Base Current | I _B | | 30 | mA |
| Collector Dissipation | P _C | Mounted on a ceramic board (600mm ² ×0.8mm) | 350 | mW |
| [TR] | | | | |
| Total Power Dissipation | P _T | Mounted on a ceramic board (600mm ² ×0.8mm) | 500 | mW |
| 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)

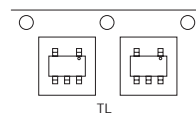
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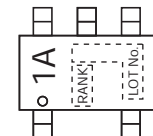
Product & Package Information

- Package : CPH5
- JEITA, JEDEC : SC-74A, SOT-25
- Minimum Packing Quantity : 3,000 pcs./reel

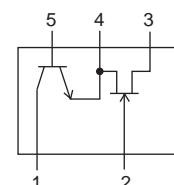
Packing Type : TL



Marking



Electrical Connection



CPH5901

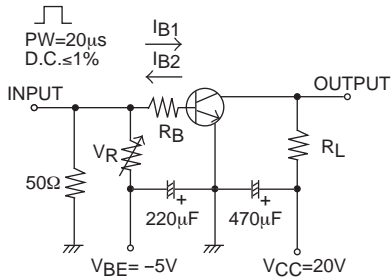
Electrical Characteristics at Ta=25°C

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|----------------------|---|---------|------|-------|------|
| | | | min | typ | max | |
| [FET] | | | | | | |
| Gate-to-Drain Breakdown Voltage | V(BR)GDS | I _G =-10μA, V _{GS} =0V | -15 | | | V |
| Gate Cutoff Current | I _{GSS} | V _{GS} =-10V, V _{DS} =0V | | | -1.0 | nA |
| Cutoff Voltage | V _{GS(off)} | V _{DS} =5V, I _D =100μA | -0.2 | -0.6 | -1.4 | V |
| Drain Current | I _{DSS} | V _{DS} =5V, V _{GS} =0V | 6.0* | | 20.0* | mA |
| Forward Transfer Admittance | y _{fs} | V _{DS} =5V, V _{GS} =0V, f=1kHz | 25 | 50 | | mS |
| Input Capacitance | C _{iss} | V _{DS} =5V, V _{GS} =0V, f=1kHz | | 10 | | pF |
| Reverse Transfer Capacitance | C _{rss} | V _{DS} =5V, V _{GS} =0V, f=1kHz | | 3.0 | | pF |
| Noise Figure | NF | V _{DS} =5V, R _g =1kΩ, I _D =1mA, f=1kHz | | 1.5 | | dB |
| [TR] | | | | | | |
| Collector Cutoff Current | I _{CBO} | V _{CB} =35V, 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} =6V, I _C =1mA | 135 | | 400 | |
| Gain-Bandwidth Product | f _T | V _{CE} =6V, I _C =10mA | | 200 | | MHz |
| Output Capacitance | C _{ob} | V _{CB} =6V, f=1MHz | | 1.7 | | pF |
| Collector-to-Emitter Saturation Voltage | V _{CE(sat)} | I _C =50mA, I _B =5mA | | 0.08 | 0.4 | mV |
| Base-to-Emitter Saturation Voltage | V _{BE(sat)} | I _C =50mA, I _B =5mA | | 0.8 | 1.0 | V |
| Collector-to-Base Breakdown Voltage | V(BR)CBO | I _C =10μA, I _E =0A | 55 | | | V |
| Collector-to-Emitter Breakdown Voltage | V(BR)CEO | I _C =1mA, R _{BE} =∞ | 50 | | | V |
| Emitter-to-Base Breakdown Voltage | V(BR)EBO | I _E =10μA, I _C =0A | 6 | | | V |
| Turn-On Time | t _{on} | See specified Test Circuit. | | 0.15 | | ns |
| Storage Time | t _{stg} | | | 0.75 | | ns |
| Fall Time | t _f | | | 0.20 | | ns |

* : The CPH5901 is classified by I_{DSS} as follows : (unit : mA)

| Rank | F | G |
|------------------|-------------|--------------|
| I _{DSS} | 6.0 to 12.0 | 10.0 to 20.0 |

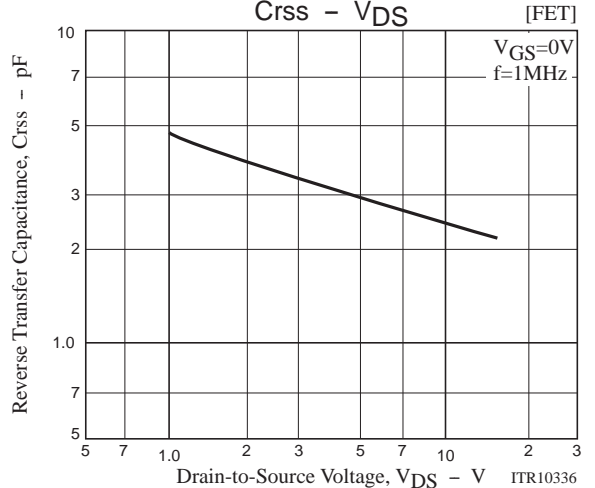
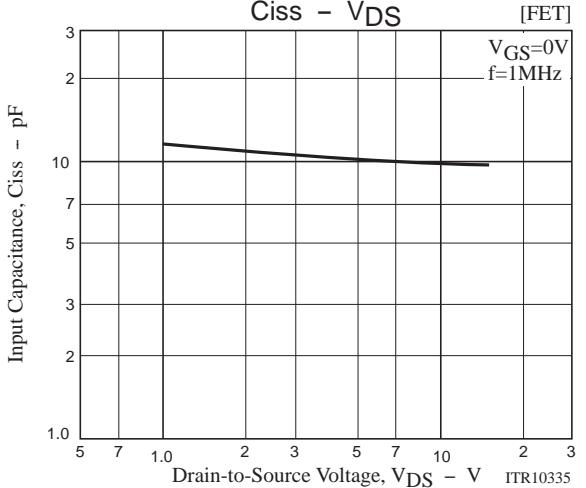
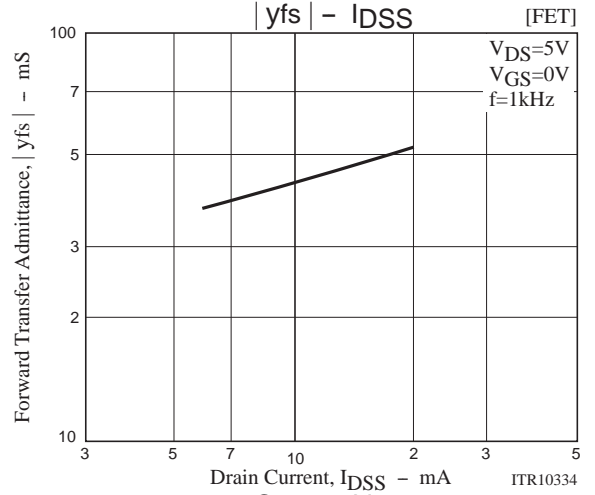
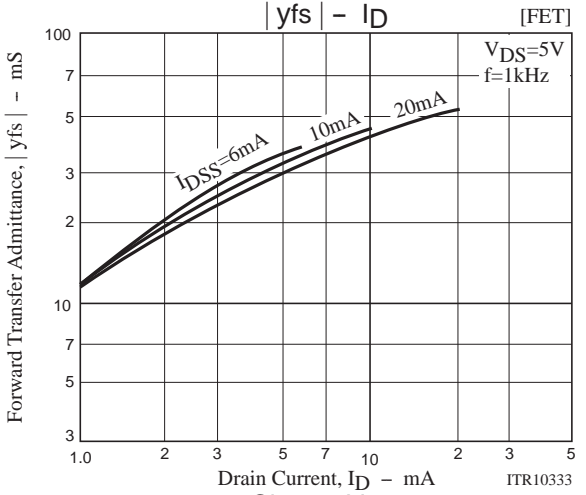
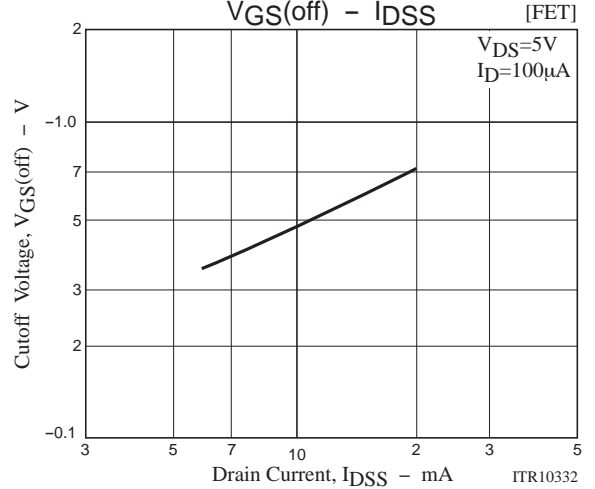
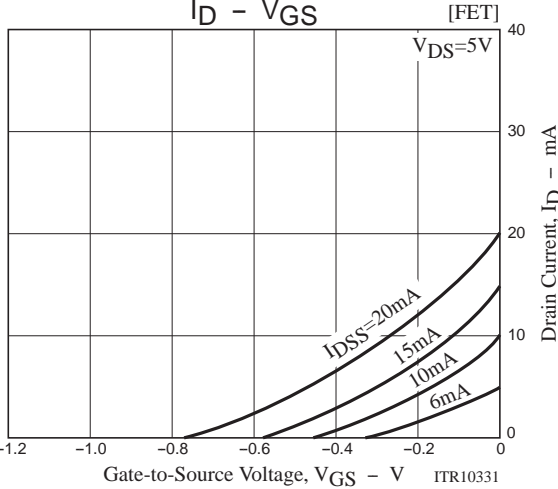
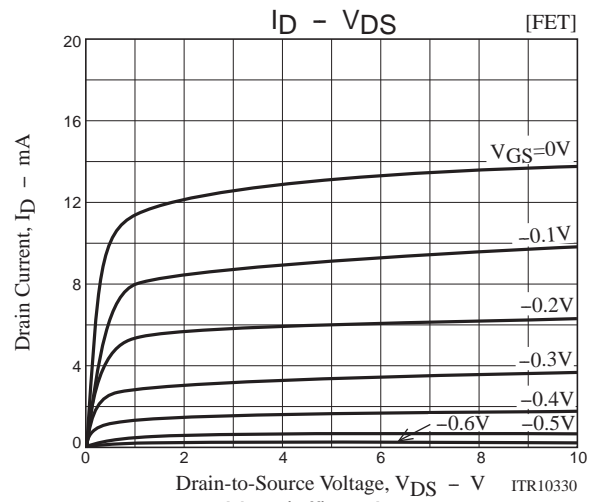
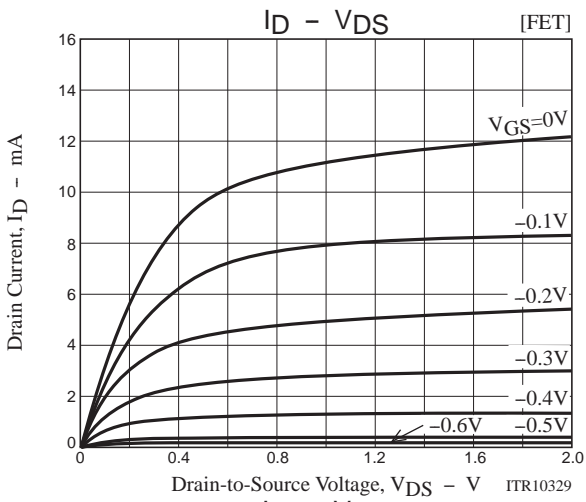
Switching Time Test Circuit

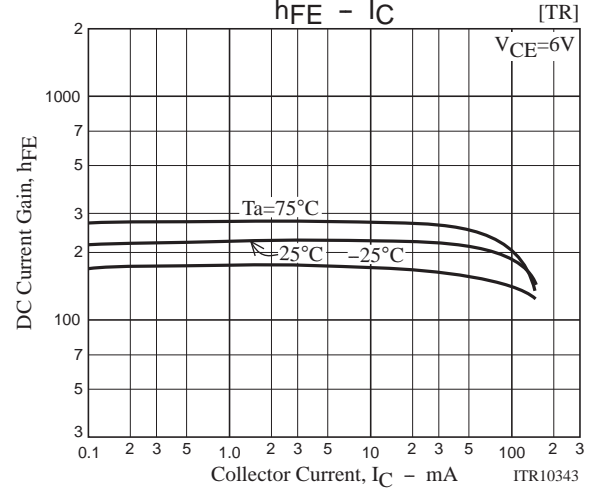
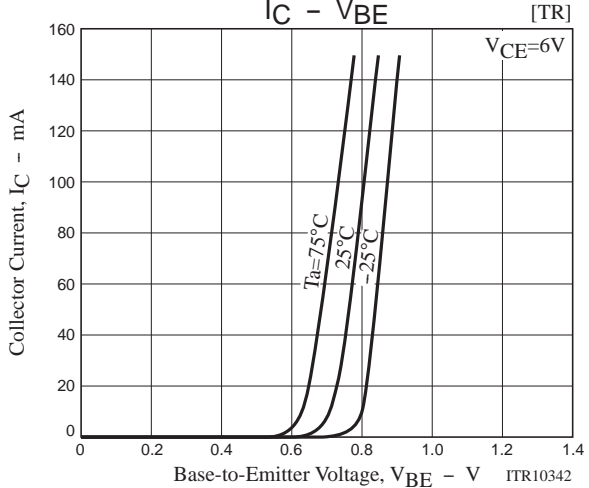
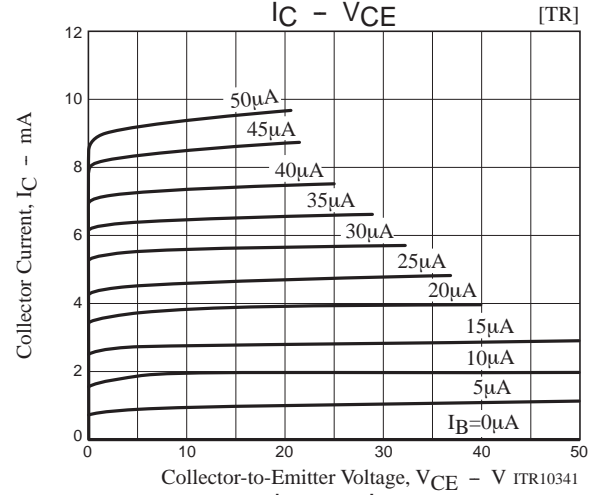
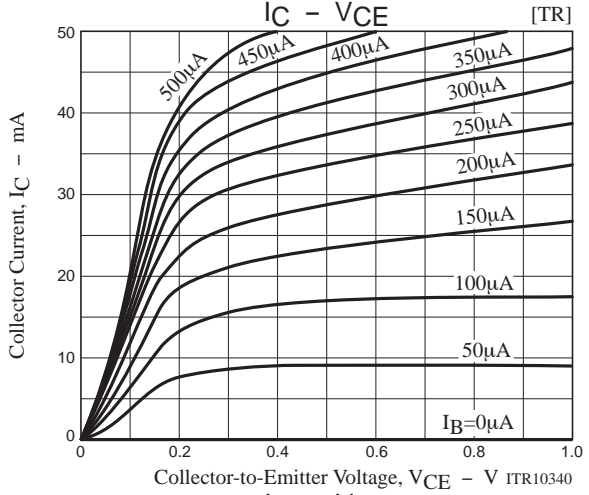
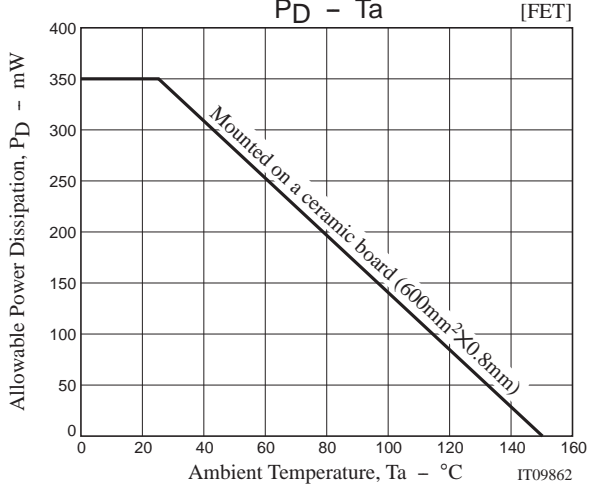
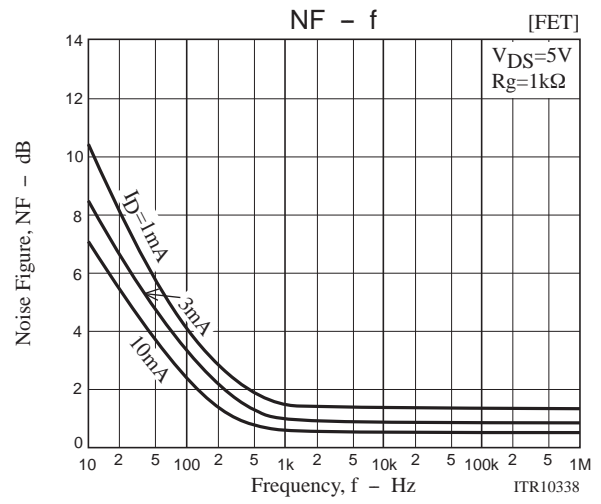
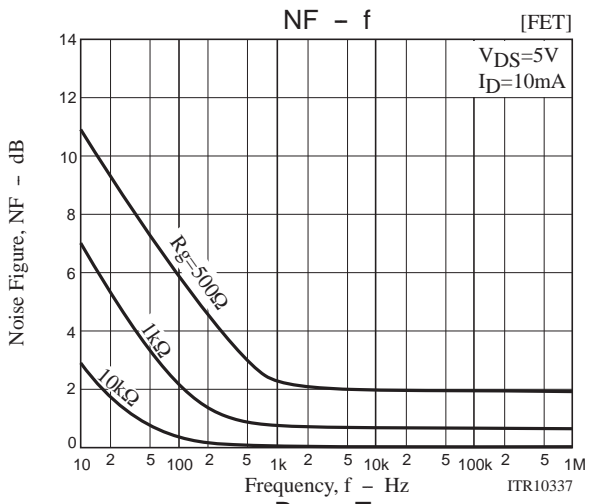


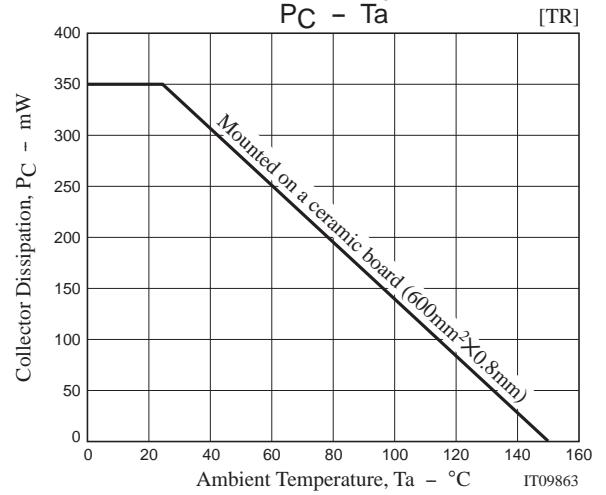
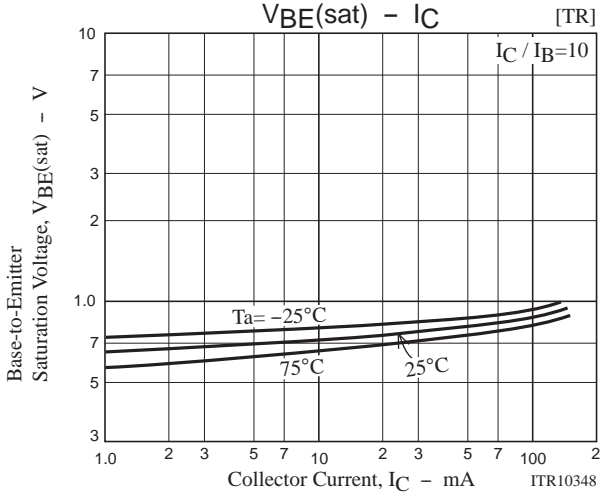
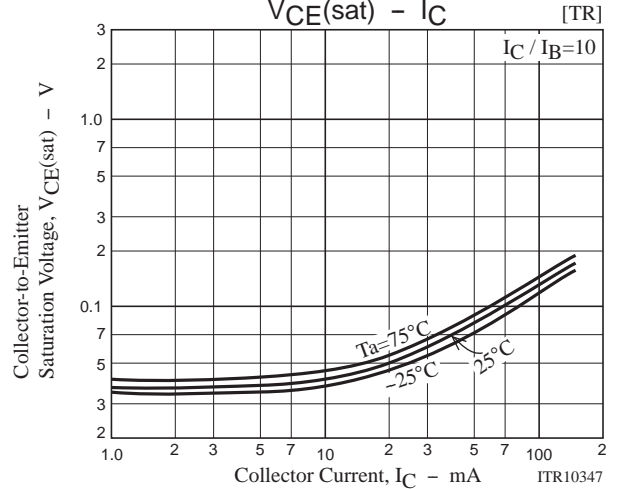
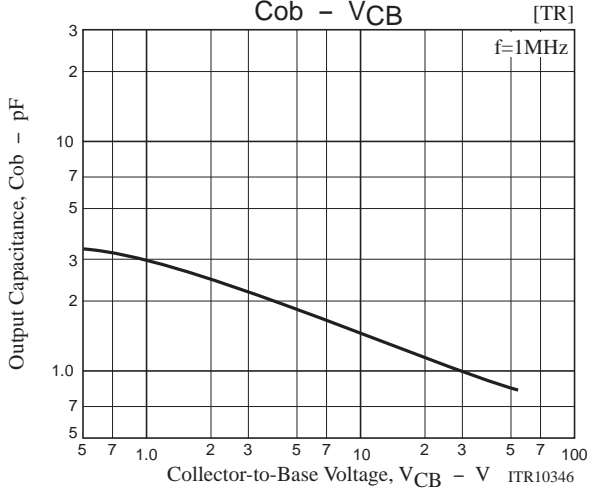
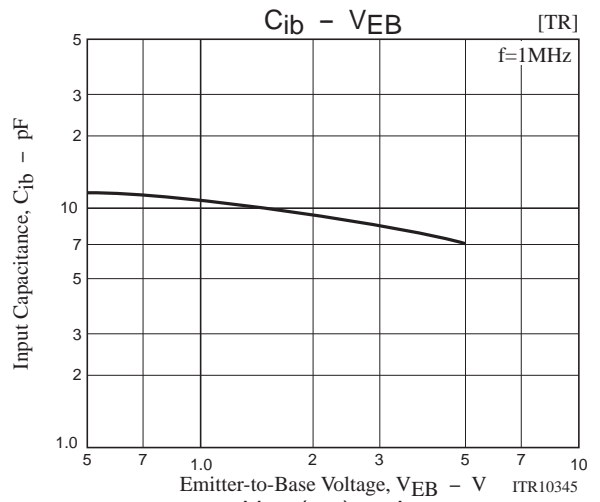
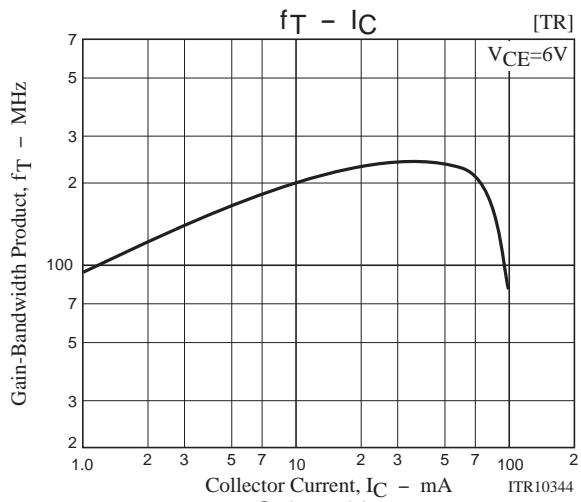
$$10I_{B1} = -10I_{B2} = I_C = 10\text{mA}$$

Ordering Information

| Device | Package | Shipping | memo |
|---------------|---------|----------------|---------|
| CPH5901F-TL-E | CPH5 | 3,000pcs./reel | Pb Free |
| CPH5901G-TL-E | CPH5 | 3,000pcs./reel | |







Embossed Taping Specification

CPH5901F-TL-E, CPH5901G-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) |
| CPH5 | CPH6 | 3,000 | 15,000 | 90,000 | 5 reels contained Dimensions:mm (external) 183×72×185 | 6 inner boxes contained Dimensions:mm (external) 440×195×210 |

Reel label, Inner box label
(unit:mm)

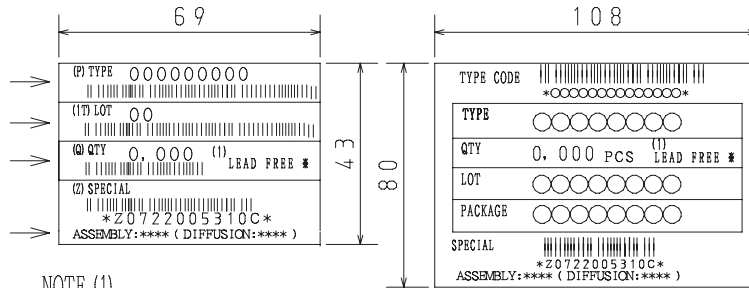
Outer box label
It is a label at the time of factory shipments.
The form of a label may change in physical distribution process.

Packing method



Reel label

Type No.
LOT No.
Quantity
Origin



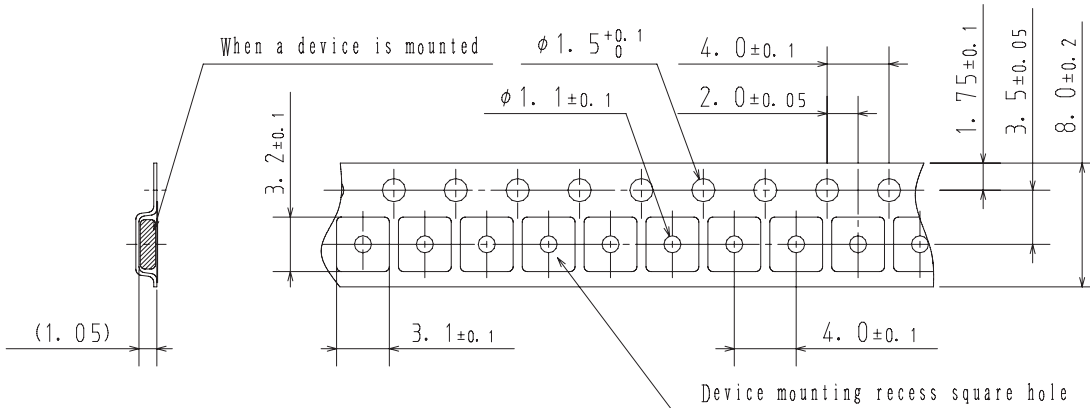
NOTE (1)

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

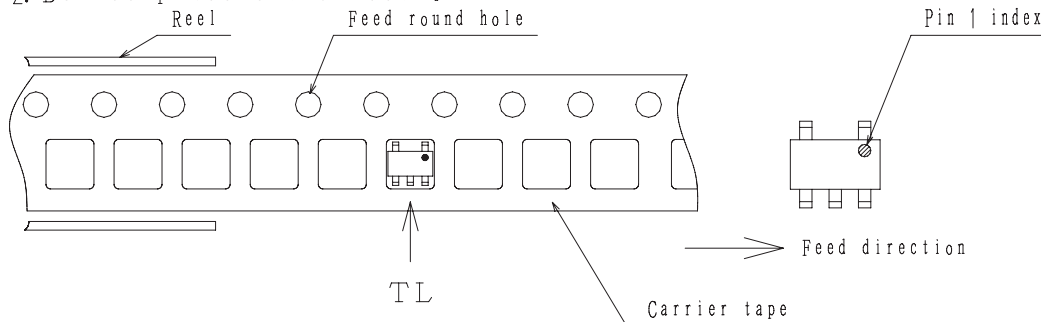
| Label | JEITA Phase |
|-------------|----------------|
| LEAD FREE 3 | JEITA Phase 3A |
| LEAD FREE 4 | JEITA Phase 3 |

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

CPH5901

Outline Drawing

CPH5901F-TL-E, CPH5901G-TL-E



Land Pattern Example



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