



SANYO Semiconductors

# DATA SHEET

An ON Semiconductor Company

## CPH5902

TR : NPN Epitaxial Planar Silicon Transistor

FET : N-Channel Silicon Junction FET

### High-Frequency Amplifier. AM Amplifier. Low-Frequency Amplifier Applications

#### Features

- Composite type with J-FET and NPN transistors contained in the CPH5 package, improving the mounting efficiency greatly
- The CPH5902 contains a 2SK2394-equivalent chip and a 2SC4639-equivalent chip in one package
- Drain and emitter are shared

#### Specifications

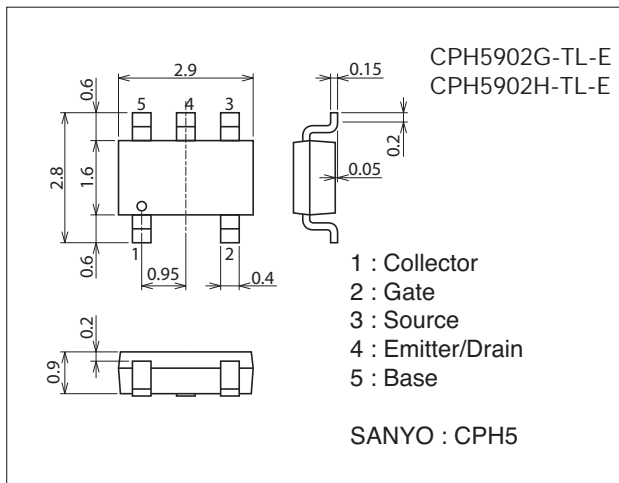
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
[FET]				
Drain-to-Source Voltage	VDSX		15	V
Gate-to-Drain Voltage	VGDS		-15	V
Gate Current	IG		10	mA
Drain Current	ID		50	mA
Allowable Power Dissipation	PD	Mounted on a ceramic board (600mm <sup>2</sup> ×0.8mm)	350	mW
[TR]				
Collector-to-Base Voltage	VCBO		55	V
Collector-to-Emitter Voltage	VCEO		50	V
Emitter-to-Base Voltage	VEBO		6	V
Collector Current	IC		150	mA
Collector Current (Pulse)	ICP		300	mA
Base Current	IB		30	mA
Collector Dissipation	PC	Mounted on a ceramic board (600mm <sup>2</sup> ×0.8mm)	350	mW
[TR]				
Total Power Dissipation	PT	Mounted on a ceramic board (600mm <sup>2</sup> ×0.8mm)	500	mW
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		-55 to +150	°C

#### Package Dimensions

unit : mm (typ)

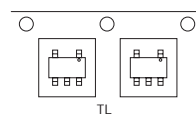
7017A-007



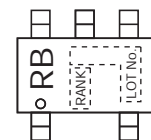
#### Product & Package Information

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

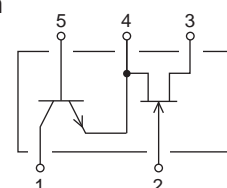
#### Packing Type : TL



#### Marking



#### Electrical Connection



SANYO Semiconductor Co., Ltd.

<http://semicon.sanyo.com/en/network>

# CPH5902

## Electrical Characteristics at Ta=25°C

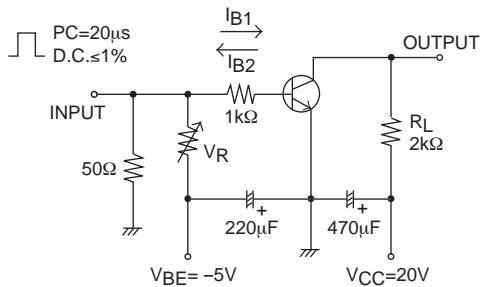
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[FET]						
Gate-to-Drain Breakdown Voltage	V(BR)GDS	I <sub>G</sub> =-10μA, V <sub>GS</sub> =0V	-15			V
Gate Cutoff Current	I <sub>GSS</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =0V			-1.0	nA
Cutoff Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =100μA	-0.4	-0.7	-1.5	V
Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =5V, V <sub>GS</sub> =0V	10.0*		32.0*	mA
Forward Transfer Admittance	y <sub>fs</sub>	V <sub>DS</sub> =5V, V <sub>GS</sub> =0V, f=1kHz	24	38		mS
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =5V, V <sub>GS</sub> =0V, f=1kHz		10.0		pF
Reverse Transfer Capacitance	C <sub>rss</sub>	V <sub>DS</sub> =5V, V <sub>GS</sub> =0V, f=1kHz		2.9		pF
Noise Figure	NF	V <sub>DS</sub> =5V, R <sub>g</sub> =1kΩ, I <sub>D</sub> =1mA, f=1kHz		1.0		dB
[TR]						
Collector Cutoff Current	I <sub>CBO</sub>	V <sub>CB</sub> =35V, I <sub>E</sub> =0A			0.1	μA
Emitter Cutoff Current	I <sub>EBO</sub>	V <sub>EB</sub> =4V, I <sub>C</sub> =0A			0.1	μA
DC Current Gain	h <sub>FE</sub>	V <sub>CE</sub> =6V, I <sub>C</sub> =1mA	135		400	
Gain-Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> =6V, I <sub>C</sub> =10mA		200		MHz
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> =6V, f=1MHz		1.7		pF
Collector-to-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =50mA, I <sub>B</sub> =5mA		0.08	0.4	mV
Base-to-Emitter Saturation Voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =50mA, I <sub>B</sub> =5mA		0.8	1.0	V
Collector-to-Base Breakdown Voltage	V(BR)CBO	I <sub>C</sub> =10μA, I <sub>E</sub> =0A	55			V
Collector-to-Emitter Breakdown Voltage	V(BR)CEO	I <sub>C</sub> =1mA, R <sub>BE</sub> =∞	50			V
Emitter-to-Base Breakdown Voltage	V(BR)EBO	I <sub>E</sub> =10μA, I <sub>C</sub> =0A	6			V
Turn-On Time	t <sub>on</sub>	See specified Test Circuit.		0.15		ns
Storage Time	t <sub>stg</sub>			0.75		ns
Fall Time	t <sub>f</sub>			0.20		ns

\* : The CPH5902 is classified by I<sub>DSS</sub> as follows : (unit : mA)

Rank	G	H
I <sub>DSS</sub>	10.0 to 20.0	16.0 to 32.0

The specifications shown above are for each individual FET or transistor.

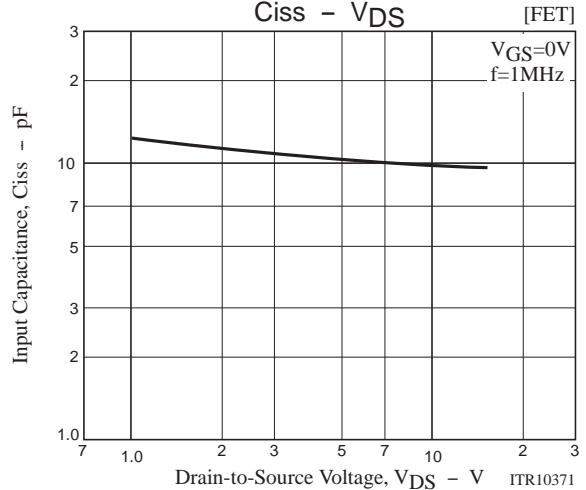
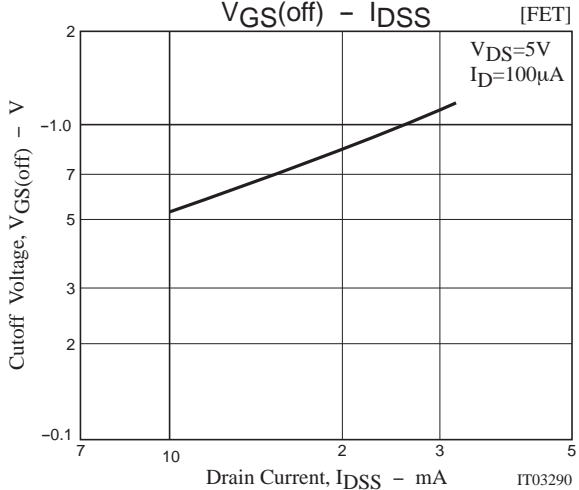
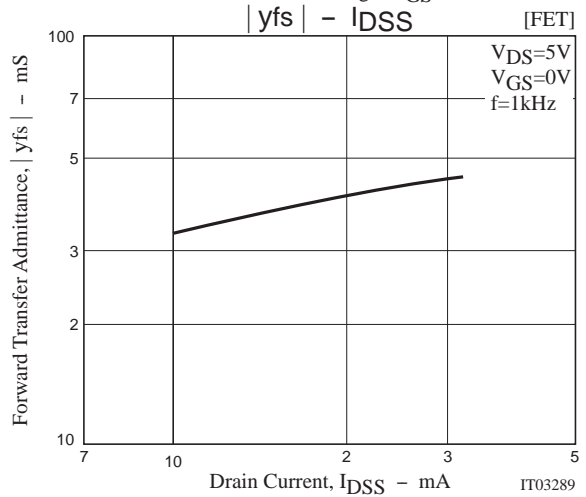
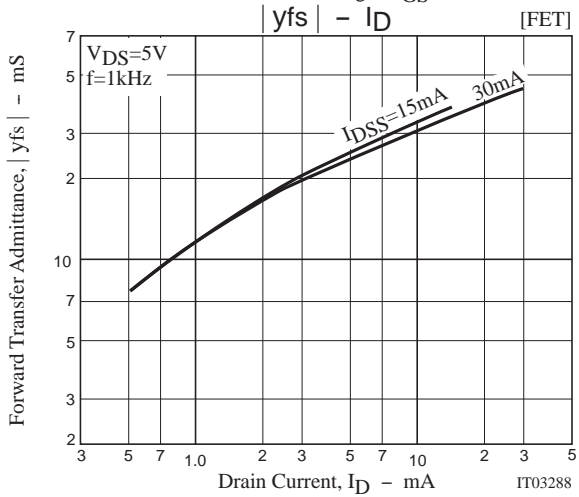
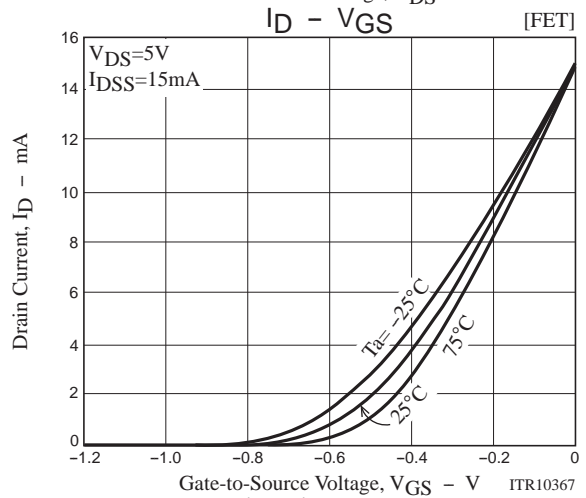
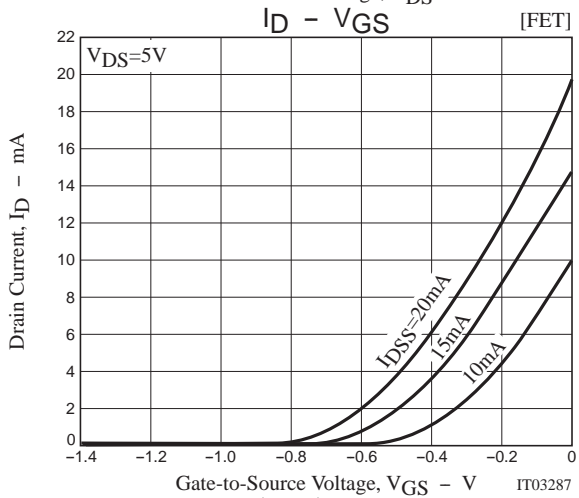
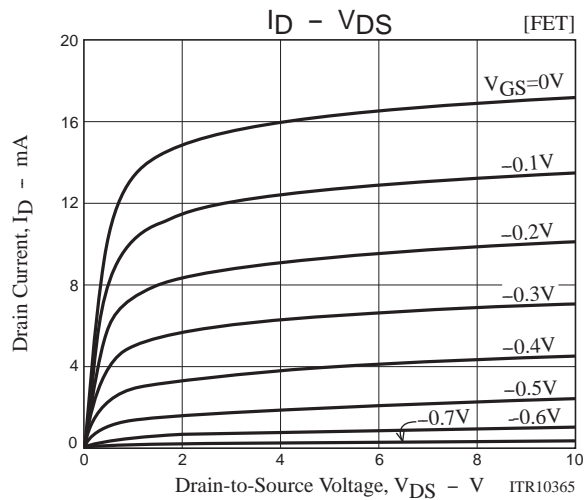
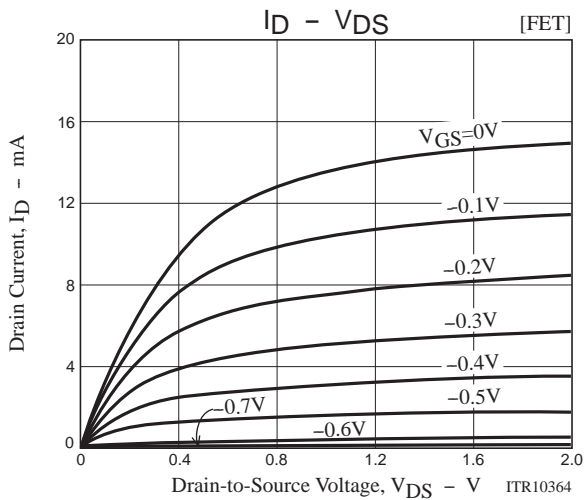
### Switching Time Test Circuit

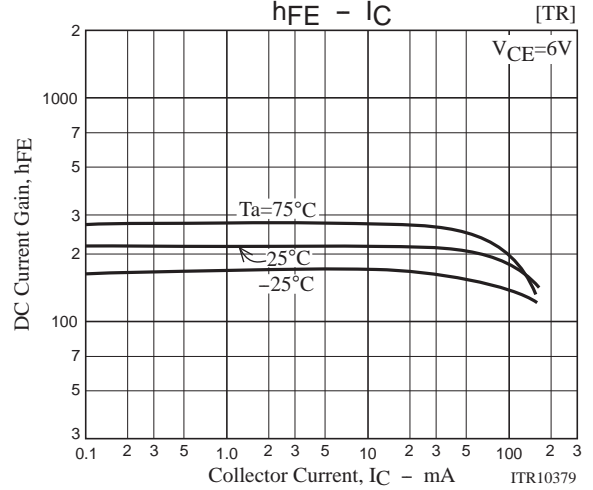
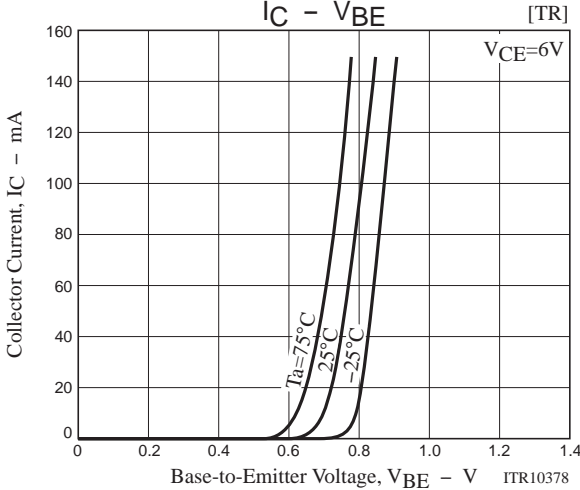
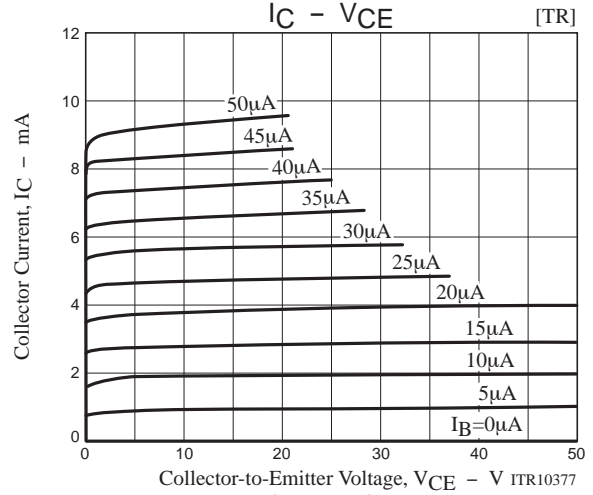
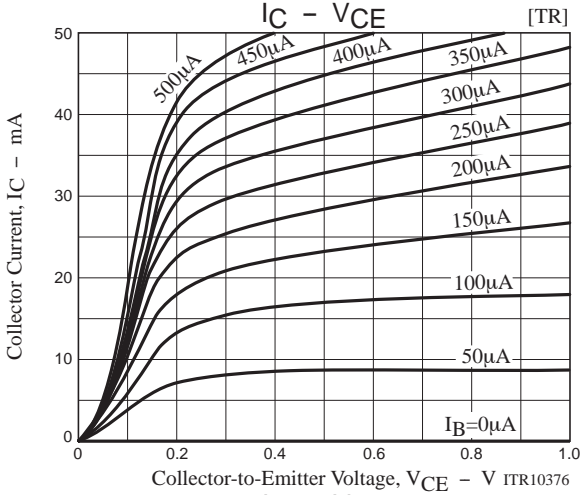
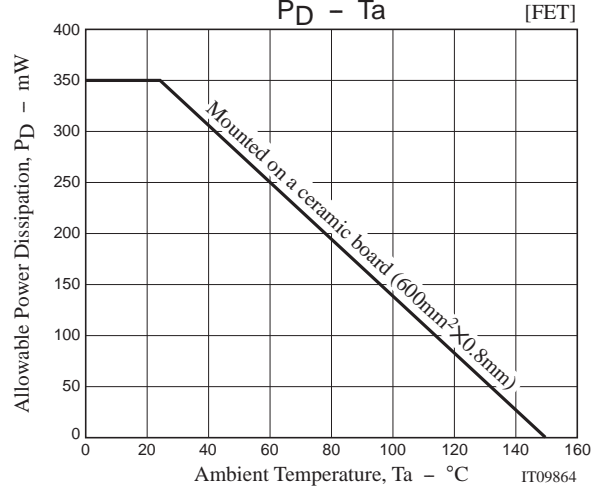
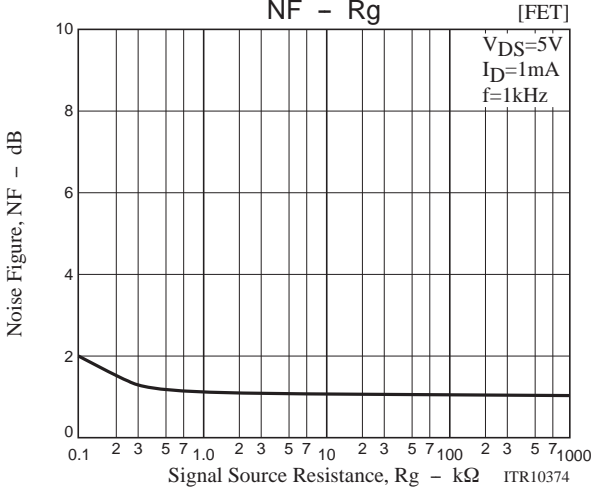
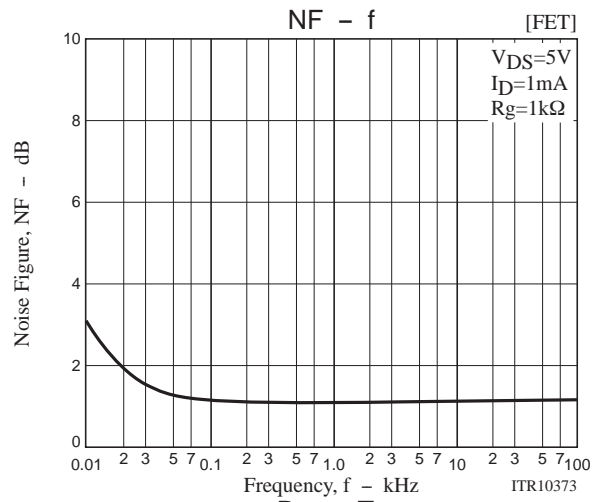
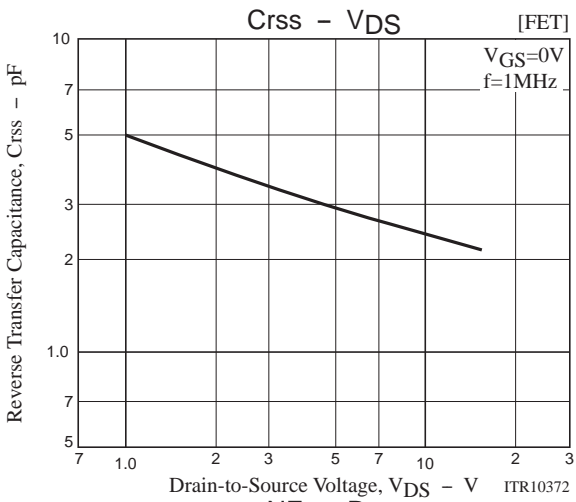


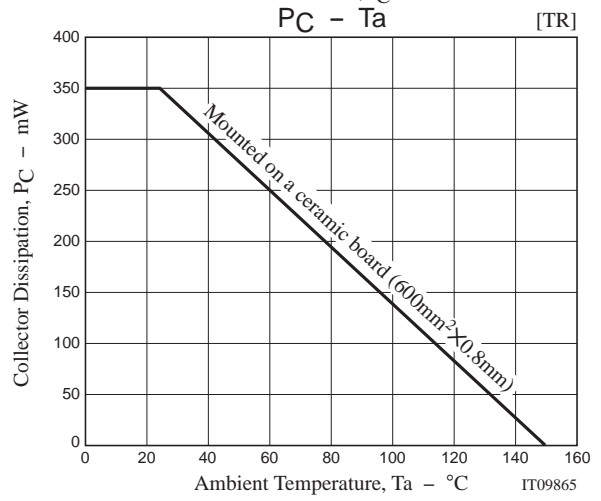
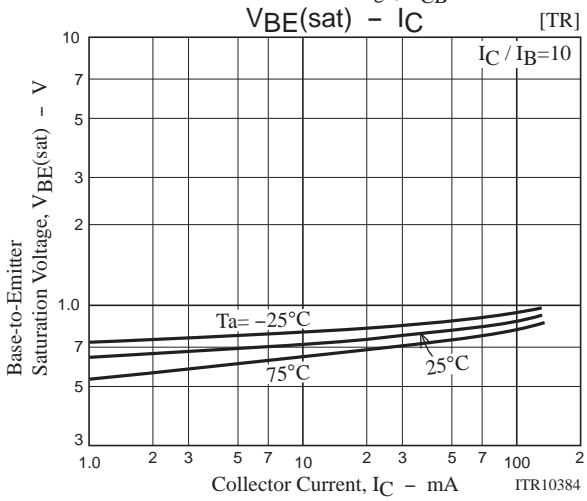
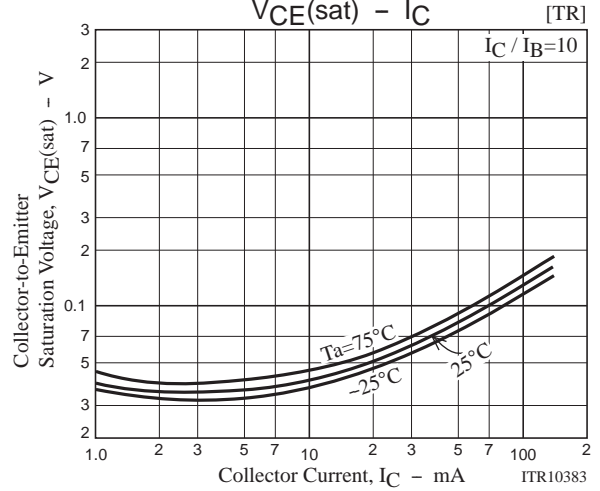
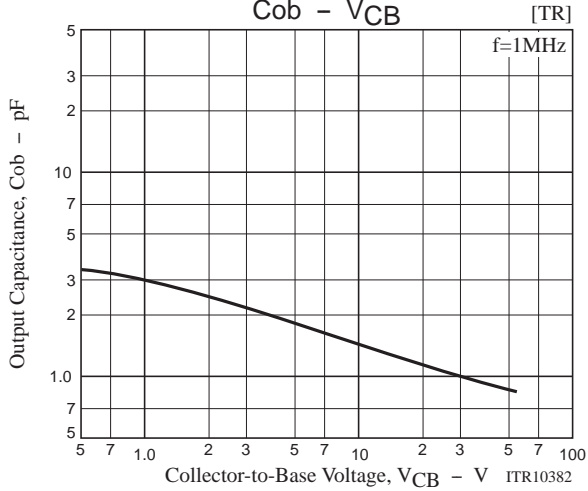
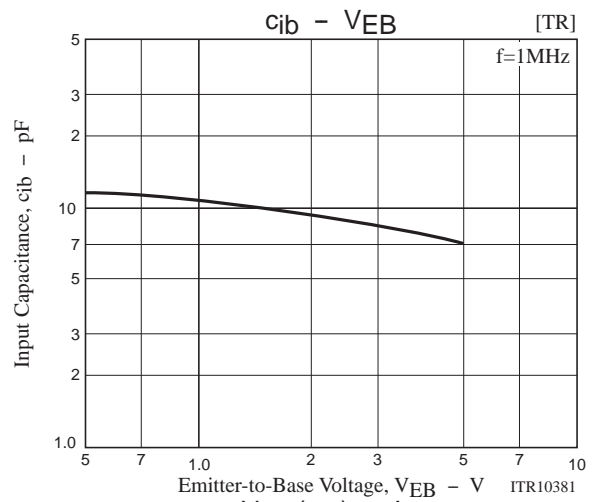
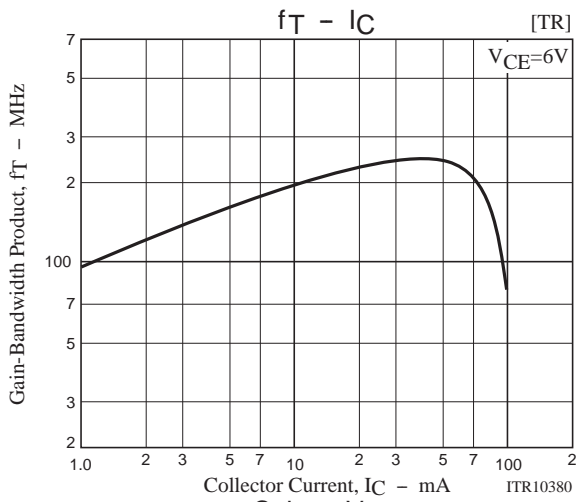
$$10I_{B1} = -10I_{B2} = I_C = 10\text{mA}$$

### Ordering Information

Device	Package	Shipping	memo
CPH5902G-TL-E	CPH5	3,000pcs./reel	Pb Free
CPH5902H-TL-E	CPH5	3,000pcs./reel	







Embossed Taping Specification

CPH5902G-TL-E, CPH5902H-TL-E

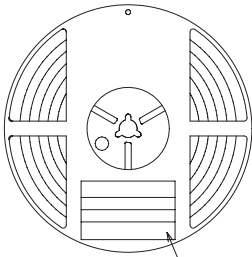
1. Packing Format

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)

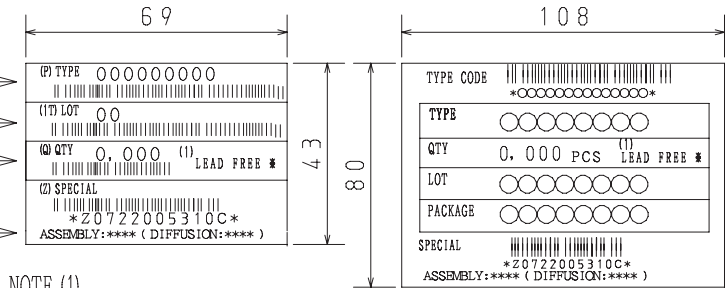
Outer box label  
It is a label at the time of factory shipments.  
The form of a label may change in physical distribution process.

Packing method



Reel label

Type No.  
LOT No.  
Quantity  
Origin



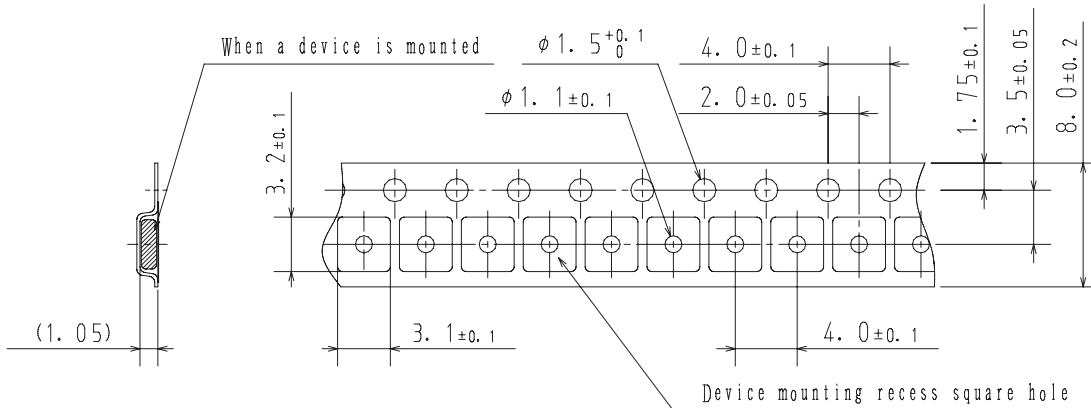
NOTE (1)

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

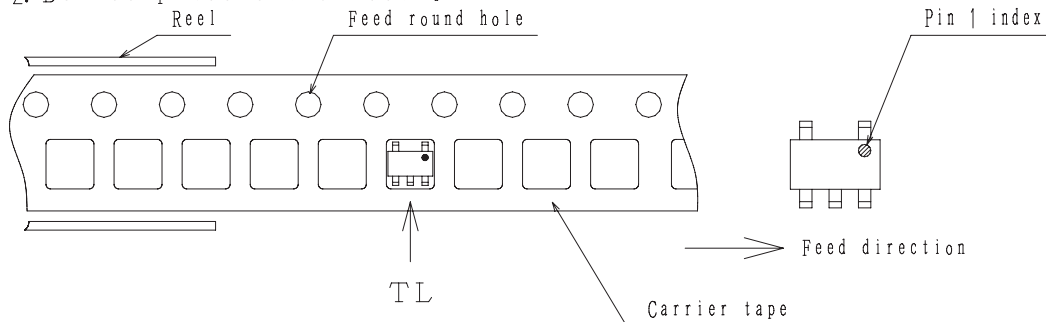
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



2-2. Device placement direction

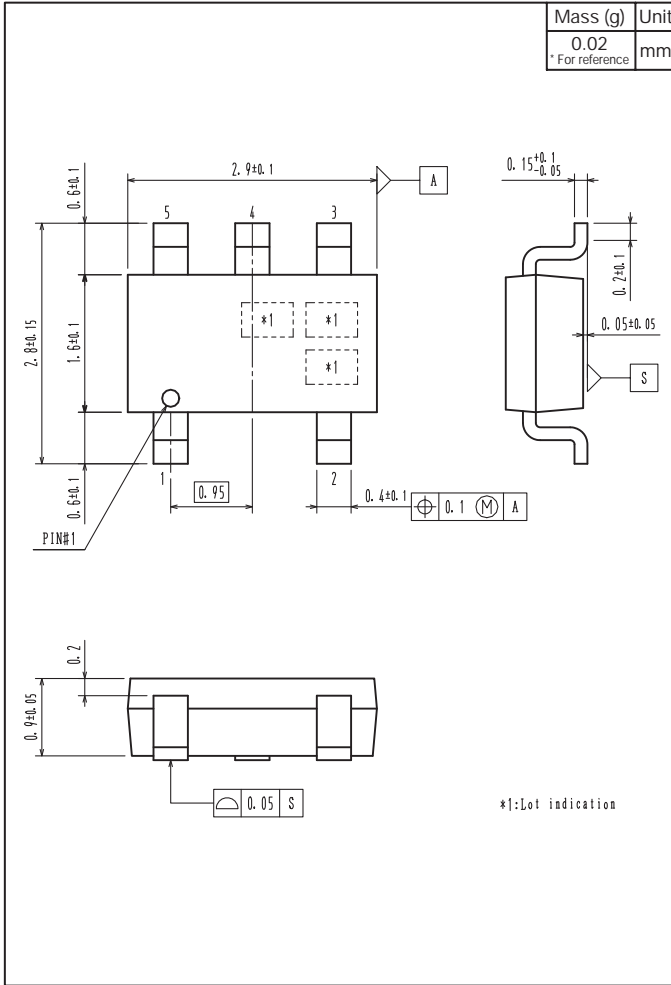


Those with pin 1 index on the feed hole side.....TL

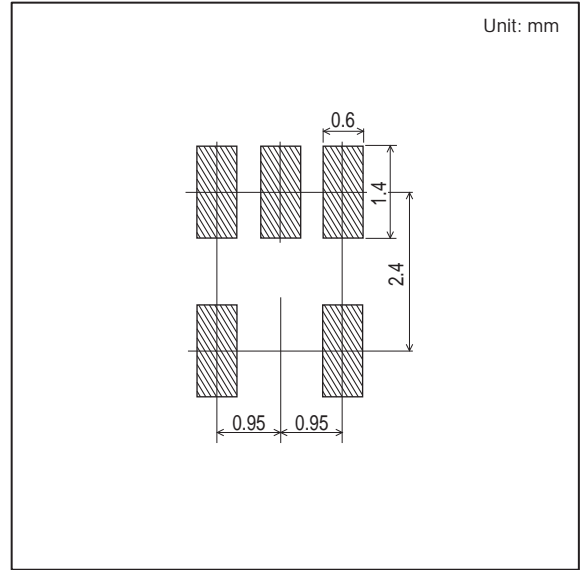
# CPH5902

## Outline Drawing

CPH5902G-TL-E, CPH5902H-TL-E



## Land Pattern Example



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