



# CPH3109/CPH3209

## Bipolar Transistor (-30V, (-)3A, Low VCE(sat), (PNP)NPN Single CPH3

**ON Semiconductor®**
<http://onsemi.com>

### Applications

- Relay drivers, lamp drivers, motor drivers, strobes

### Features

- Adoption of MBIT processes
- Large current capacity
- 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 ( ) : CPH3109

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

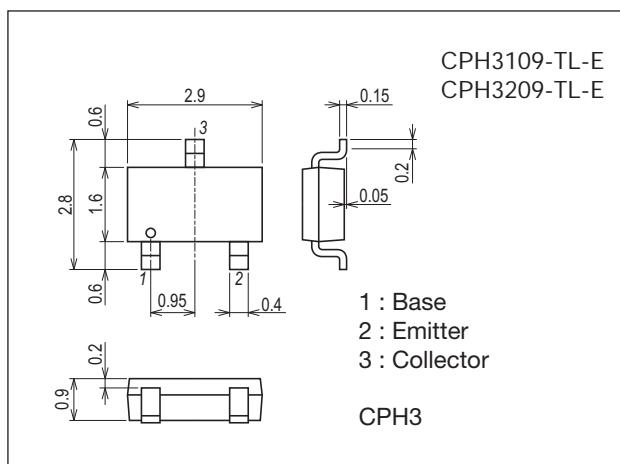
Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V <sub>CBO</sub>		(-30)40	V
Collector-to-Emitter Voltage	V <sub>CEO</sub>		(-30)	V
Emitter-to-Base Voltage	V <sub>EBO</sub>		(-5)	V
Collector Current	I <sub>C</sub>		(-3)	A
Collector Current (Pulse)	I <sub>CP</sub>		(-5)	A
Base Current	I <sub>B</sub>		(-600)	mA
Collector Dissipation	P <sub>C</sub>	When mounted on ceramic substrate (600mm <sup>2</sup> ×0.8mm)	0.9	W
Junction Temperature	T <sub>j</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-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)

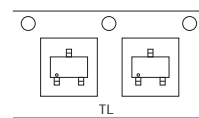
7015A-003



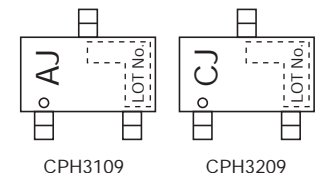
### Product & Package Information

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

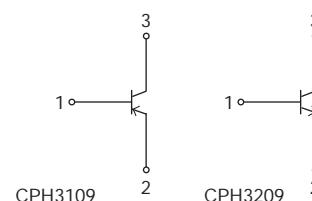
### Packing Type: TL



### Marking



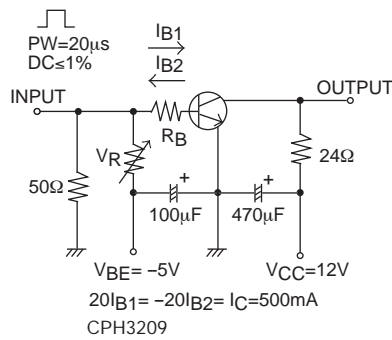
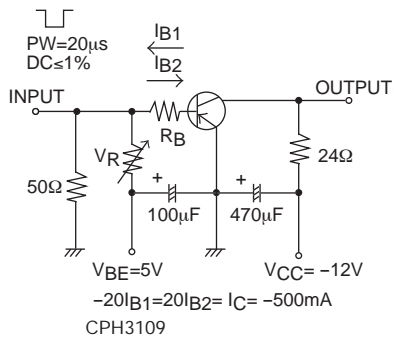
### Electrical Connection



Electrical Characteristics at Ta=25°C

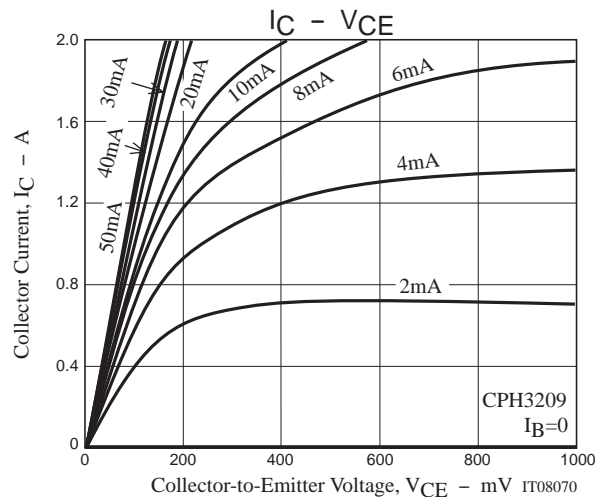
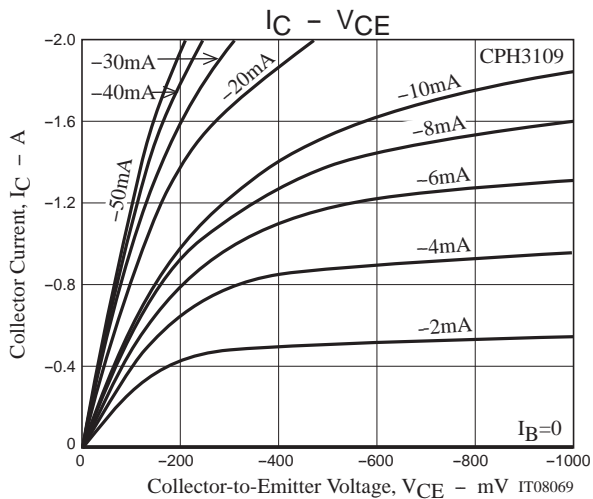
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = (-)30V, I_E = 0A$			(-)0.1	$\mu A$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = (-)4V, I_C = 0A$			(-)0.1	$\mu A$
DC Current Gain	$h_{FE}$	$V_{CE} = (-)2V, I_C = (-)500mA$	200		560	
Gain-Bandwidth Product	$f_T$	$V_{CE} = (-)10V, I_C = (-)500mA$		(380)450		MHz
Output Capacitance	$C_{ob}$	$V_{CB} = (-)10V, f = 1MHz$		(25)20		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)1}$	$I_C = (-)1.5A, I_B = (-)30mA$		(-155)120	(-230)180	mV
	$V_{CE(sat)2}$	$I_C = (-)1.5A, I_B = (-)75mA$		(-)105	(-)155	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = (-)1.5A, I_B = (-)30mA$		(-)0.83	(-)1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = (-)10\mu A, I_E = 0A$	(-30)40			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = (-)1mA, R_{BE} = \infty$	(-)30			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = (-)10\mu A, I_C = 0A$	(-)5			V
Turn-On Time	$t_{on}$	See specified Test Circuit.		(50)30		ns
Storage Time	$t_{stg}$			(270)300		ns
Fall Time	$t_f$			(25)15		ns

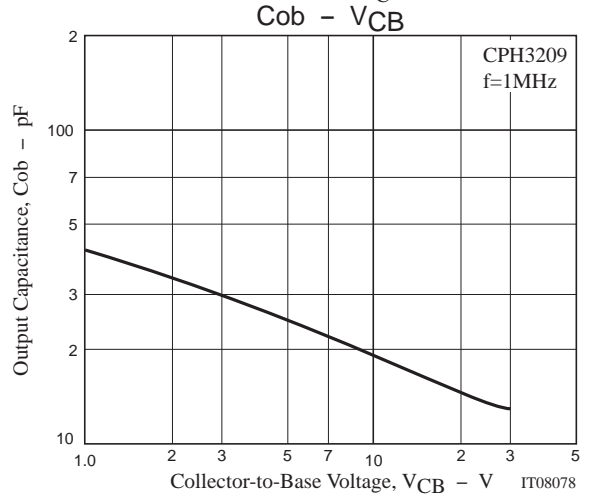
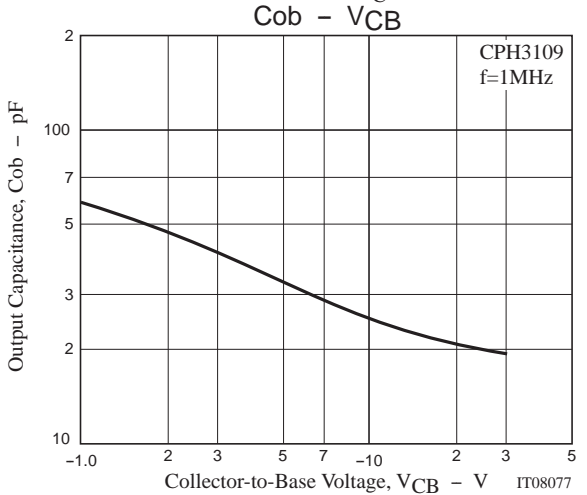
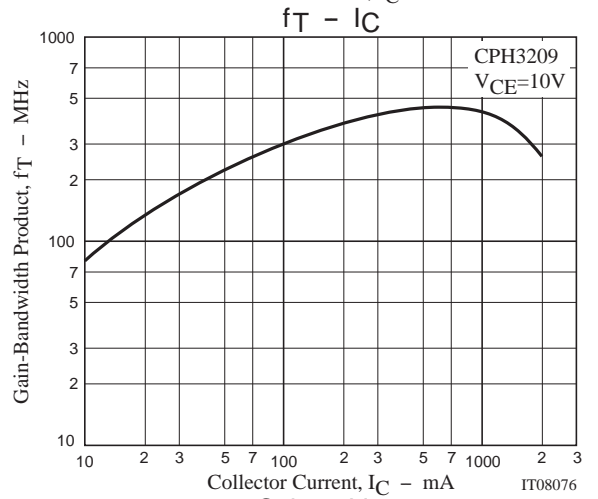
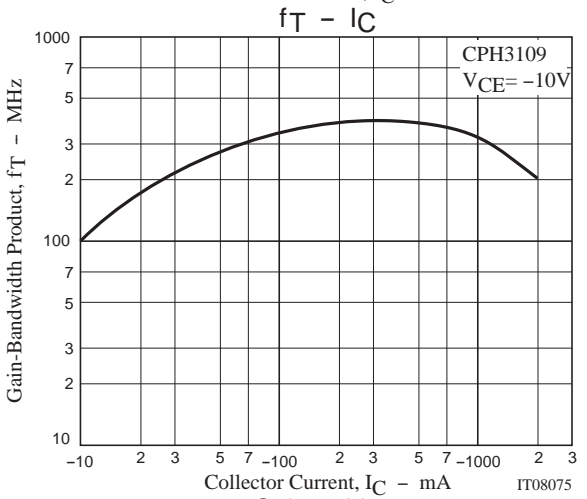
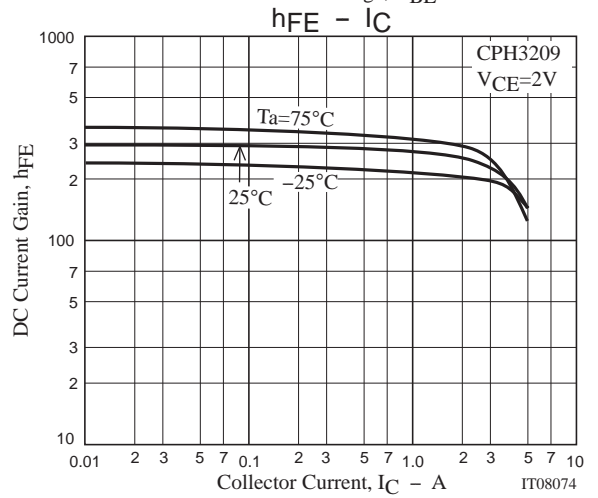
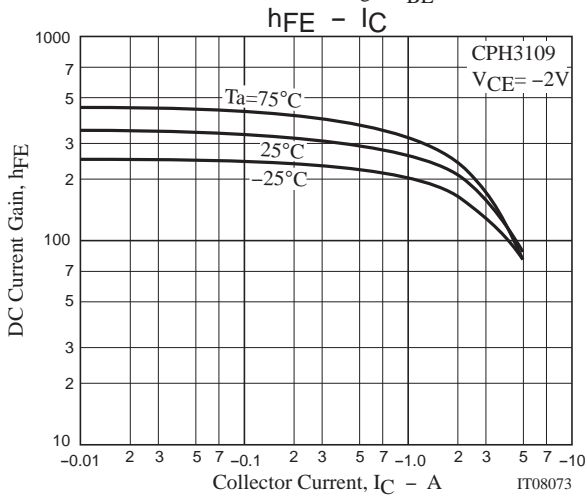
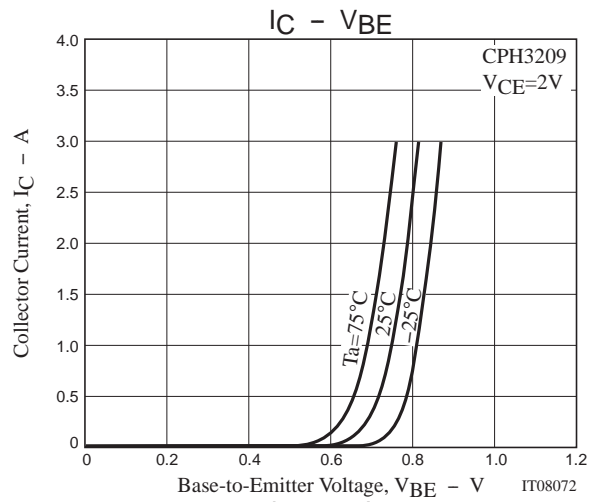
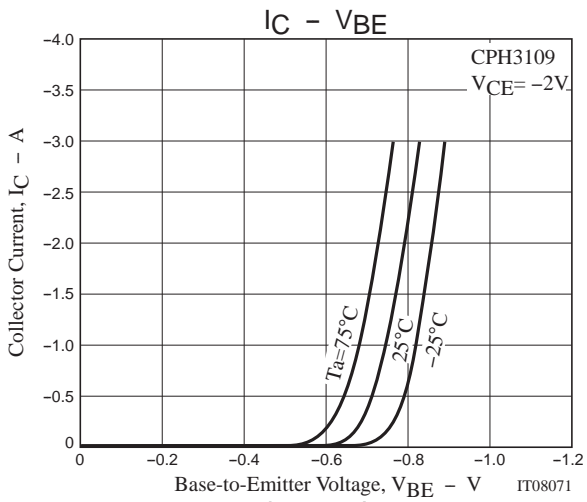
Switching Time Test Circuit

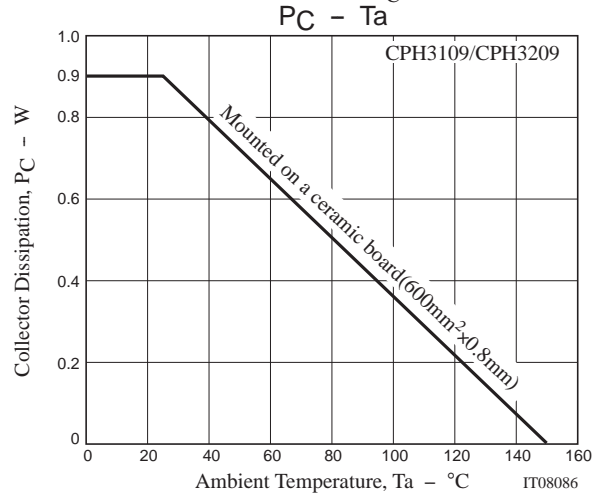
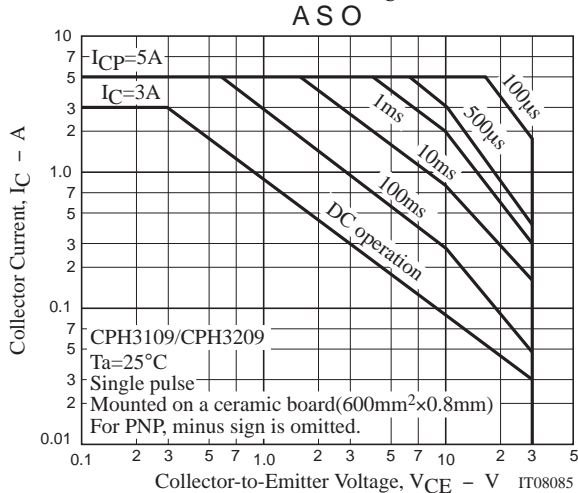
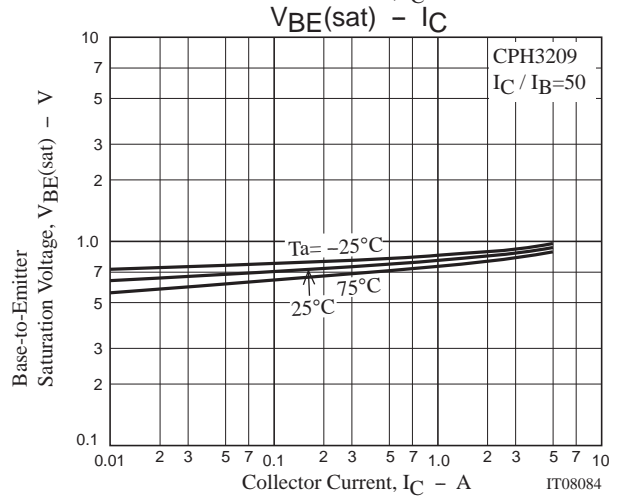
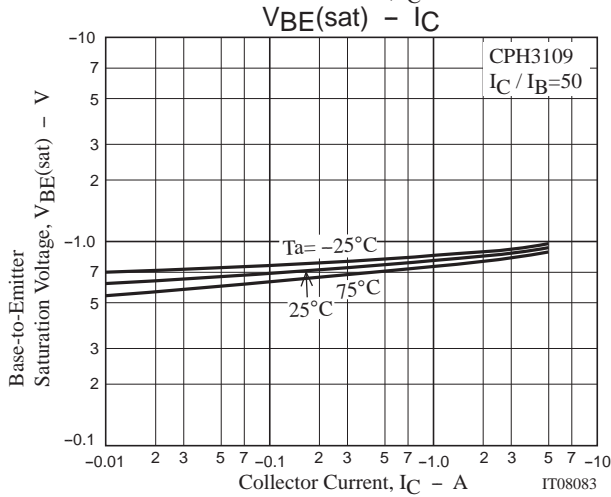
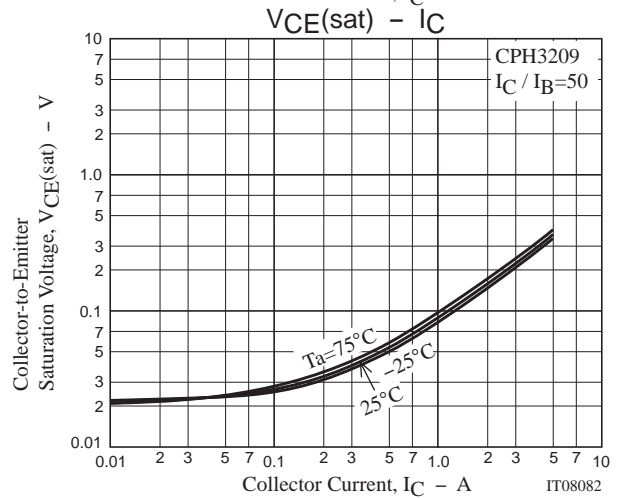
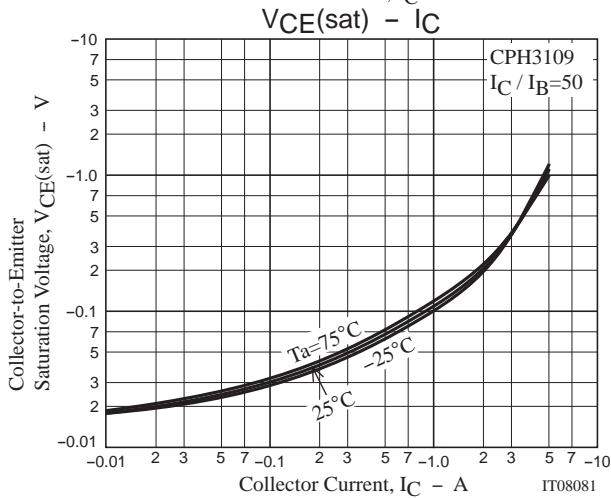
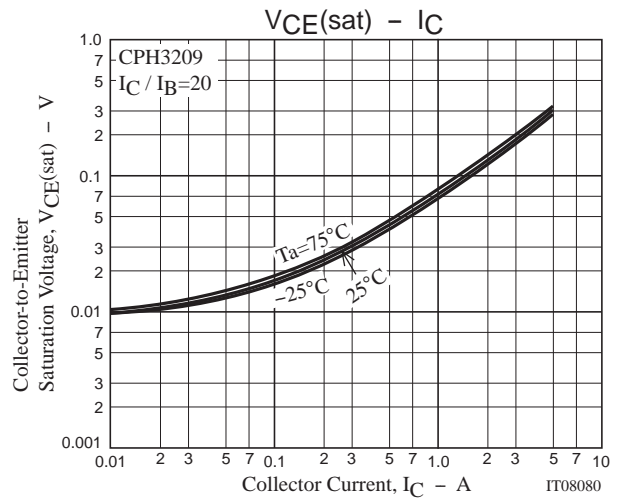
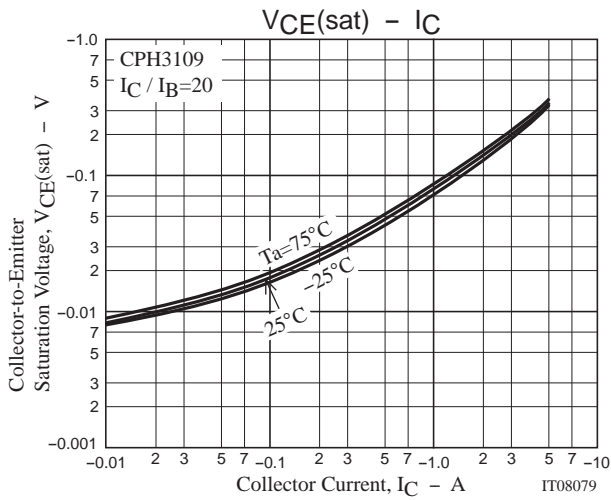


Ordering Information

Device	Package	Shipping	memo
CPH3109-TL-E	CPH3	3,000pcs./reel	Pb Free
CPH3209-TL-E	CPH3	3,000pcs./reel	Pb Free







Embossed Taping Specification  
CPH3109-TL-E, CPH3209-TL-E

1. Packing Format

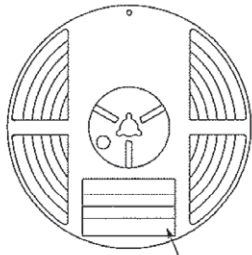
Package Name	Carrier Tape Type	Maximum Number of devices contained (pcs)			Packing format	
		Reel	Inner box	Outer box	Inner BOX (C-1)	Outer BOX (A-7)
CPH3	CPH3	3,000	15,000	90,000	5 reels contained Dimensions:mm (external) 183×72×185	6 inner boxes contained Dimensions:mm (external) 440×195×210

Reel label, Inner box label  
(unit:mm)

Outer box label

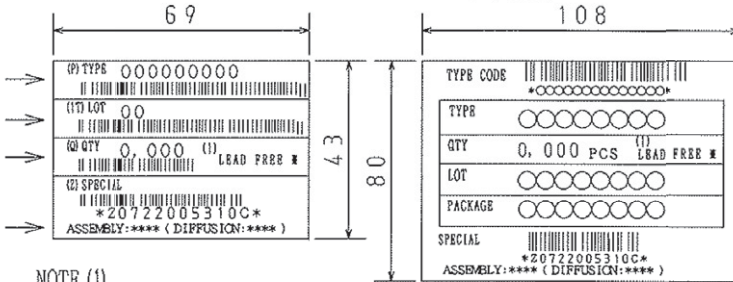
It is a label at the time of factory shipments.  
The form of a label may change in physical distribution process.

Packing method



Reel label

Type No.  
LOT No.  
Quantity  
Origin



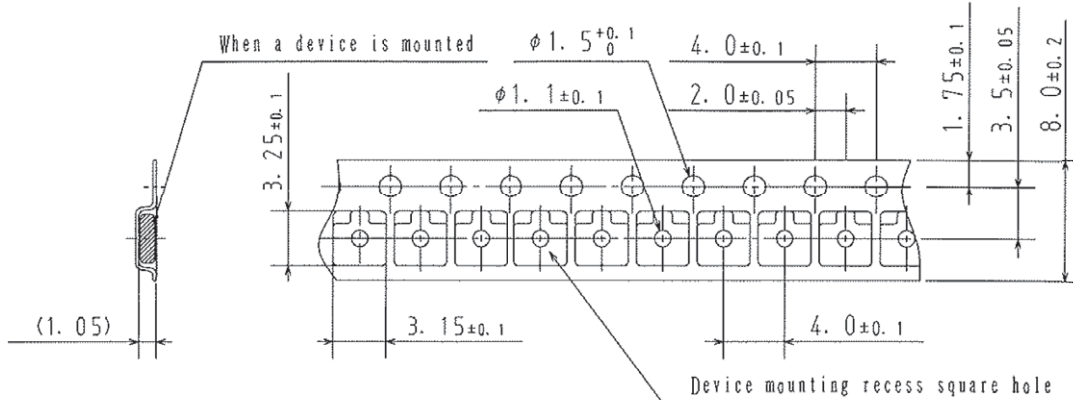
NOTE (1)

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

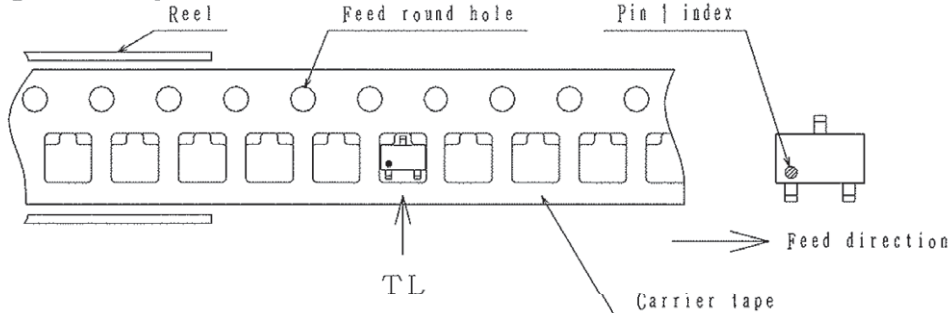
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



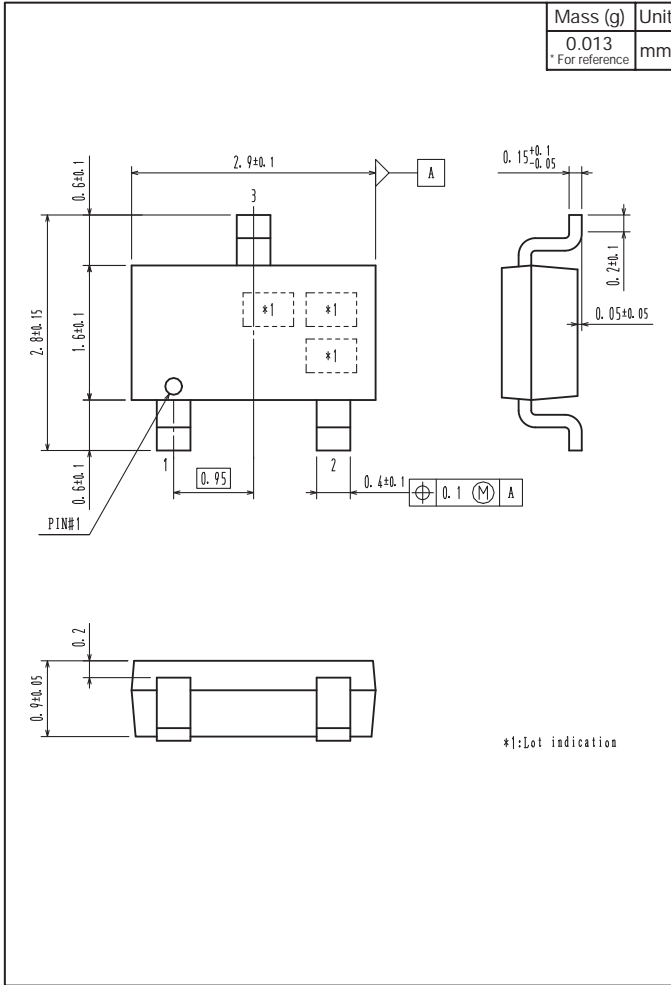
2-2. Device placement direction



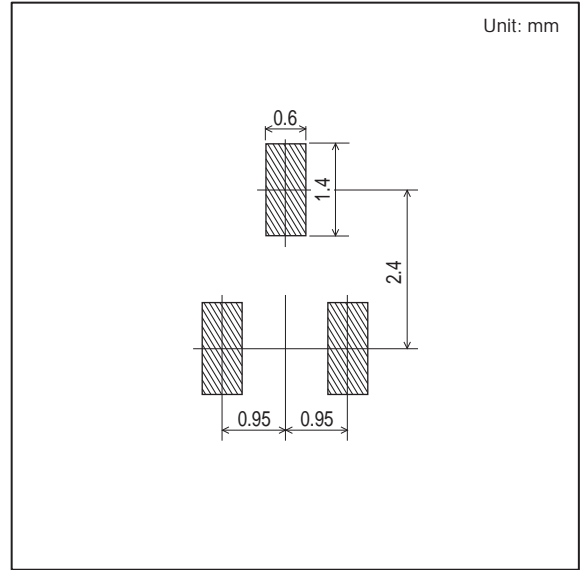
Those with one electrode terminal on the feed hole side.....TL

Outline Drawing

CPH3109-TL-E, CPH3209-TL-E



Land Pattern Example



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