



SANYO Semiconductors

# DATA SHEET

An ON Semiconductor Company

PNP / NPN Epitaxial Planar Silicon Transistors

## MCH3105/MCH3205 — High-Current Switching Applications

### Applicaitions

- DC / DC converters, relay drivers, lamp drivers, motor drivers, flash

### Features

- Adoption of FBET, MBIT processes
- Low collector-to-emitter saturation voltage
- Ultrasmall package facilitates miniaturization in end products (mounting height : 0.85mm)
- High allowable power dissipation
- Large current capacity
- High-speed switching

### Specifications ( ) : MCH3105

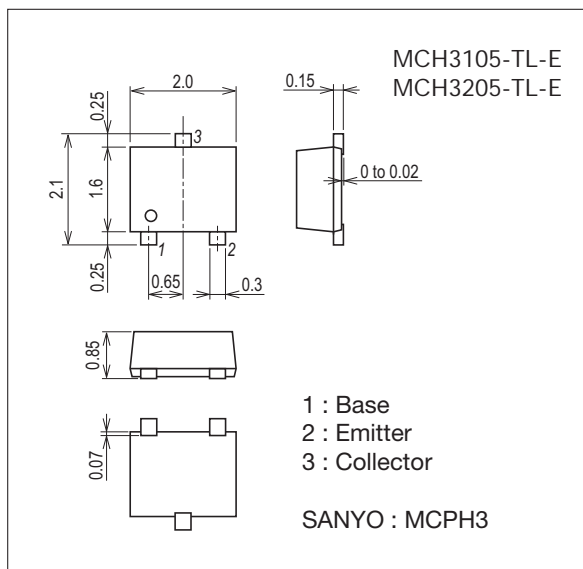
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V <sub>CBO</sub>		(-50)80	V
Collector-to-Emitter Voltage	V <sub>CES</sub>		(-50)80	V
	V <sub>CEO</sub>		(-)50	V
Emitter-to-Base Voltage	V <sub>EBO</sub>		(-)6	V
Collector Current	I <sub>C</sub>		(-)3	A
Collector Current (Pulse)	I <sub>CP</sub>		(-)6	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)	0.8	W
Junction Temperature	T <sub>J</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +150	°C

### Package Dimensions

unit : mm (typ)

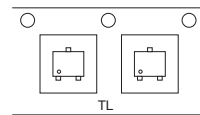
7019A-004



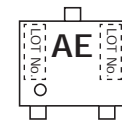
### Product & Package Information

- Package : MCPH3
- JEITA, JEDEC : SC-70, SOT-323
- Minimum Packing Quantity : 3,000 pcs./reel

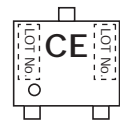
### Packing Type : TL



### Marking

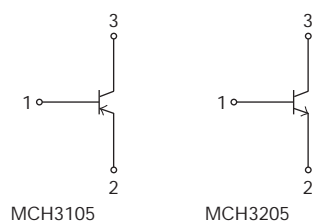


MCH3105



MCH3205

### Electrical Connection

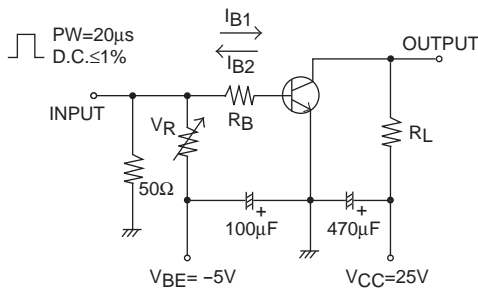


# MCH3105/MCH3205

## Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=(-)40V, I_E=0A$			(-) $1$	$\mu A$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=(-)4V, I_C=0A$			(-) $1$	$\mu A$
DC Current Gain	$h_{FE}$	$V_{CE}=(-)2V, I_C=(-)100mA$	200		560	
Gain-Bandwidth Product	$f_T$	$V_{CE}=(-)10V, I_C=(-)500mA$		(360)380		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=(-)10V, f=1MHz$		(24)13		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)1}$	$I_C=(-)1A, I_B=(-)50mA$		(-100)80	(-200)120	mV
	$V_{CE(sat)2}$	$I_C=(-)2A, I_B=(-)100mA$		(-185)140	(-500)210	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=(-)2A, I_B=(-)100mA$		(-) $0.88$	(-) $1.2$	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-)10\mu A, I_E=0A$	(-) $50$	80		V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CES}$	$I_C=(-)100\mu A, R_{BE}=0\Omega$	(-) $50$	80		V
	$V_{(BR)CEO}$	$I_C=(-)1mA, R_{BE}=\infty$	(-) $50$			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=(-)10\mu A, I_C=0A$	(-) $6$			V
Turn-On Time	$t_{on}$	See specified Test Circuit.		(30)35		ns
Storage Time	$t_{stg}$			(230)300		ns
Fall Time	$t_f$			(15)22		ns

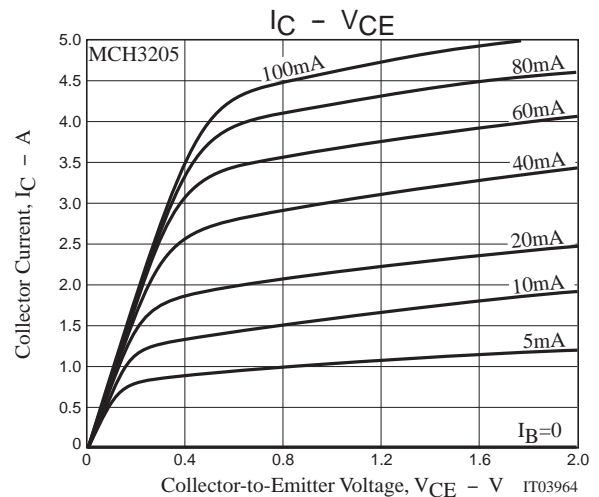
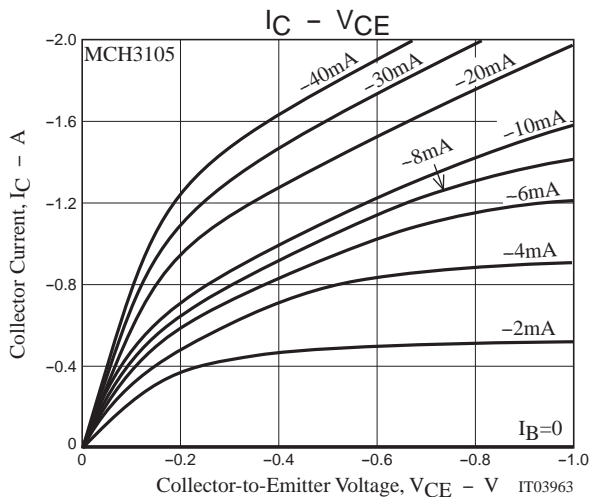
## Switching Time Test Circuit



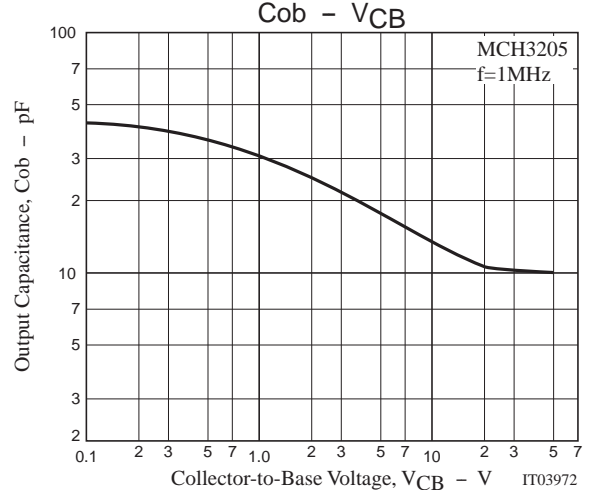
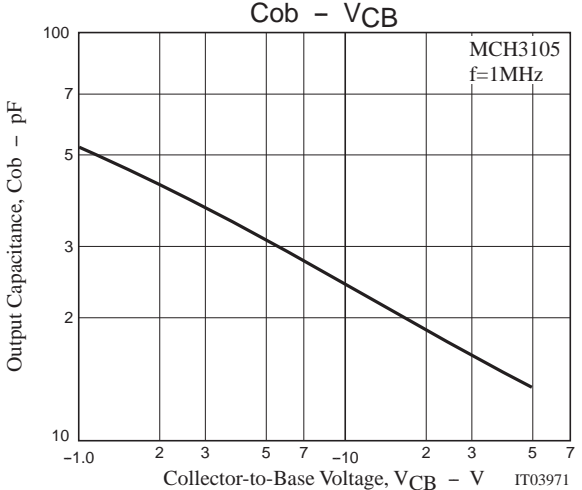
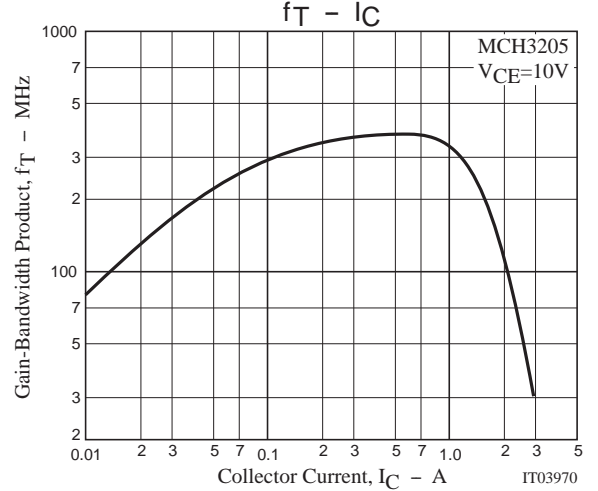
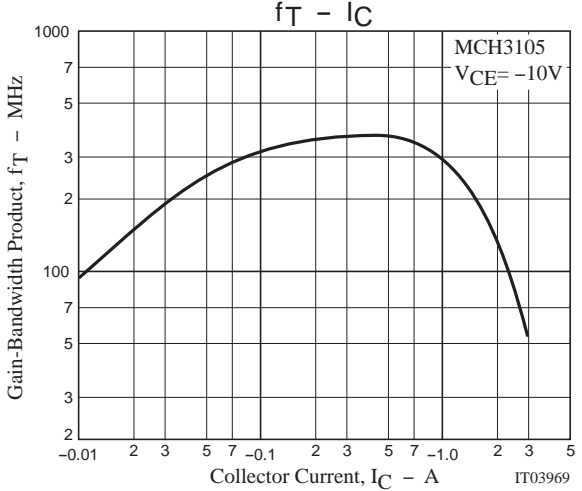
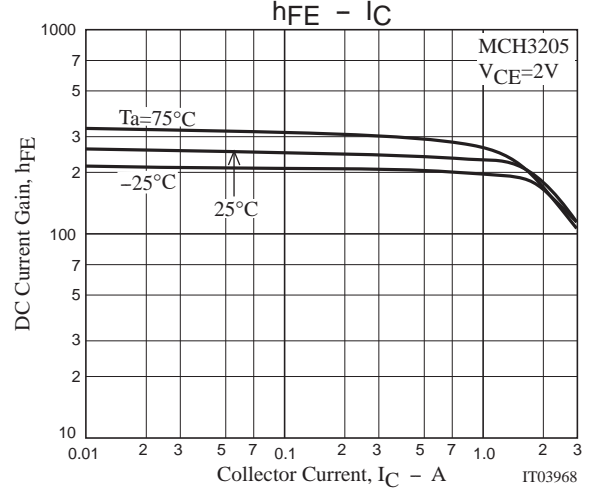
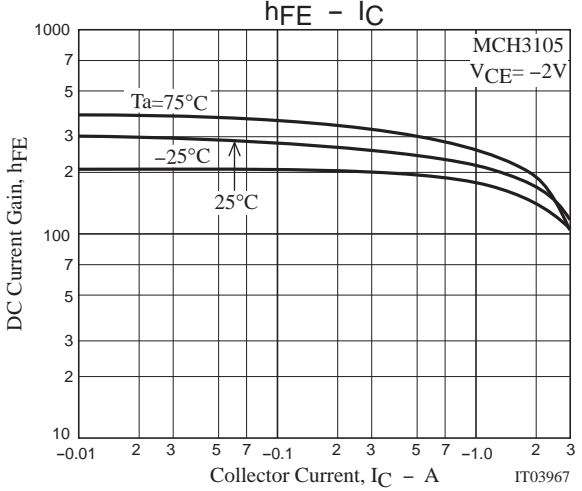
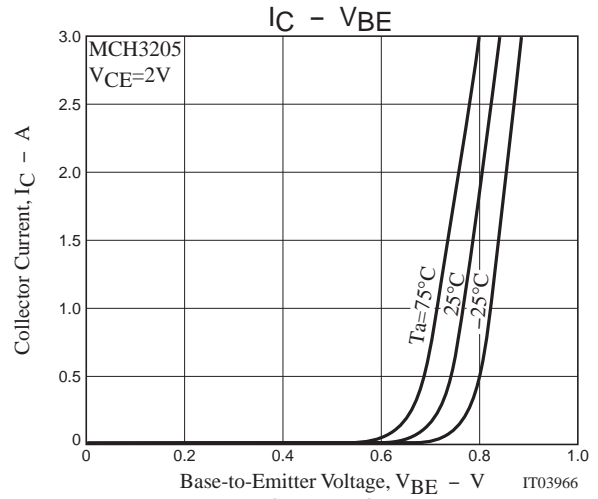
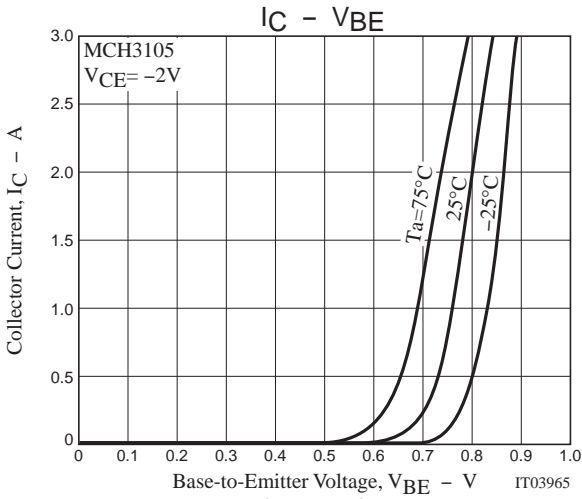
$I_C = 10I_{B1} = -10I_{B2} = 1A$   
 (For PNP, the polarity is reversed.)

## Ordering Information

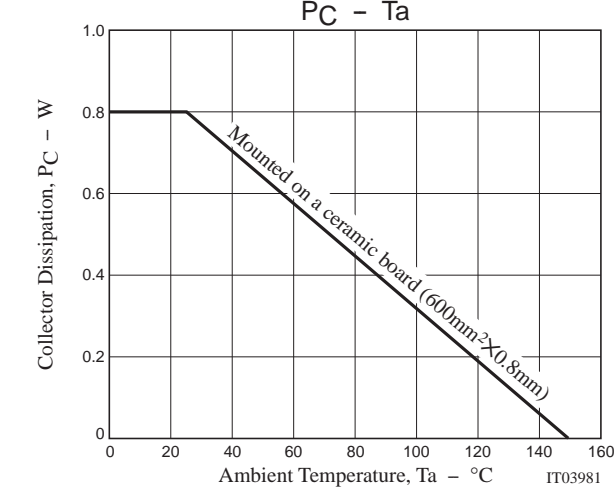
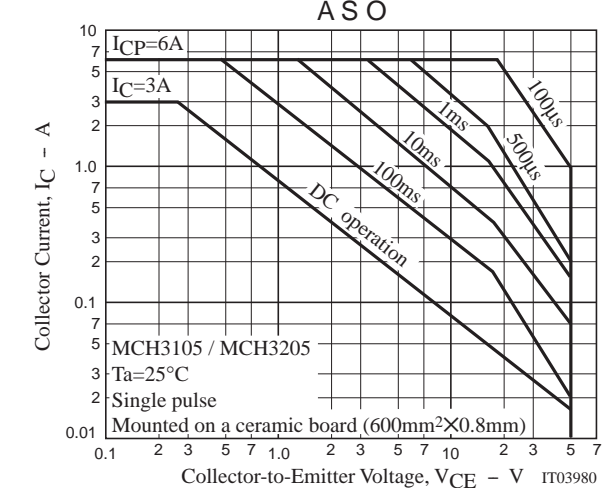
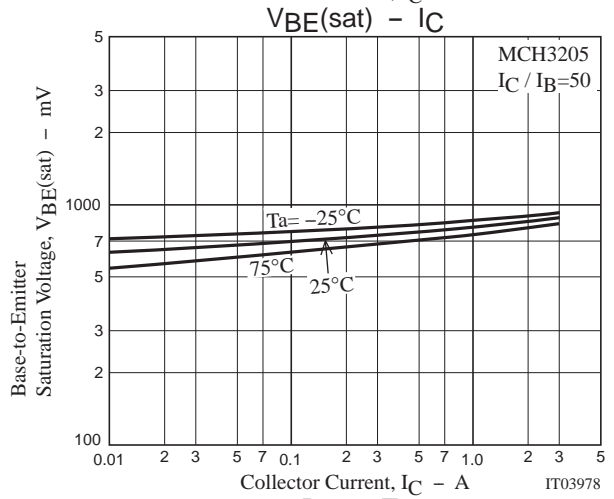
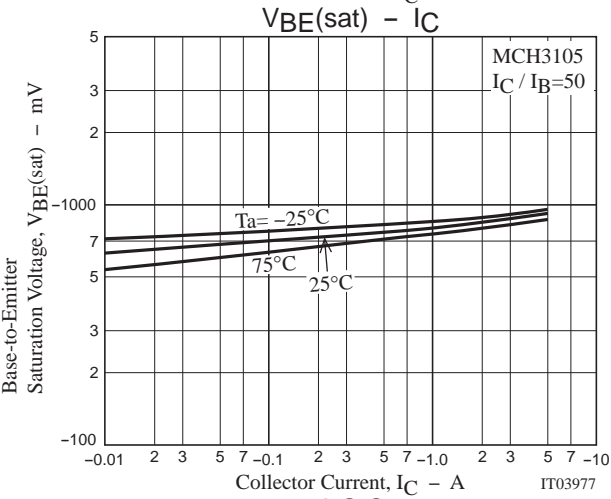
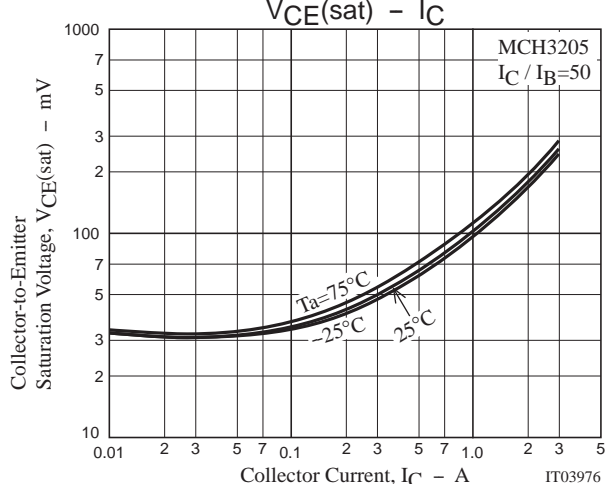
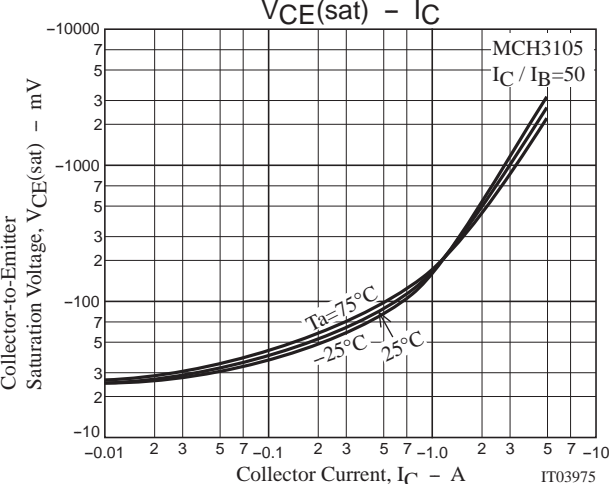
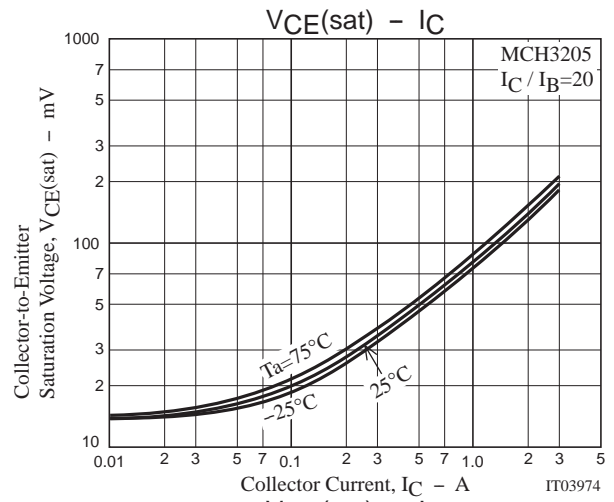
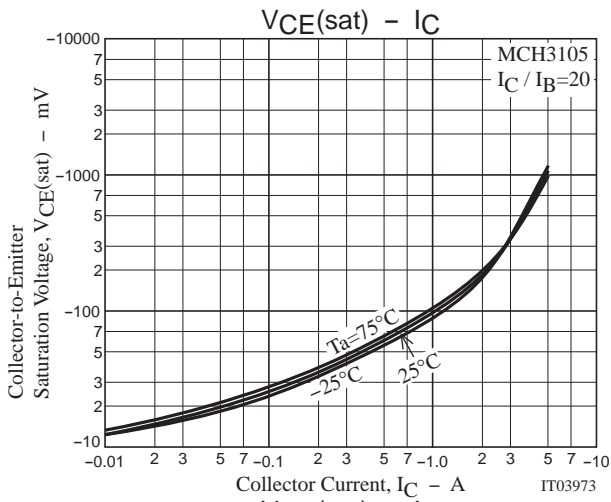
Device	Package	Shipping	memo
MCH3105-TL-E	MCPH3	3,000pcs./reel	Pb Free
MCH3205-TL-E	MCPH3	3,000pcs./reel	



# MCH3105/MCH3205



# MCH3105/MCH3205



# MCH3105/MCH3205

## Taping Specification

MCH3105-TL-E, MCH3205-TL-E

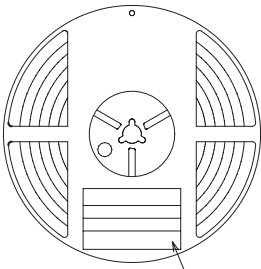
### 1. Packing Format

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)
MCPH3	MCPH3	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)

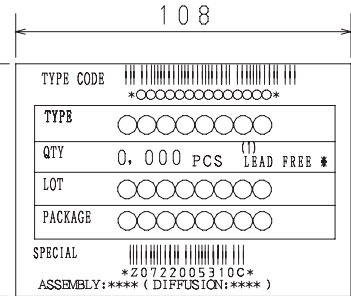
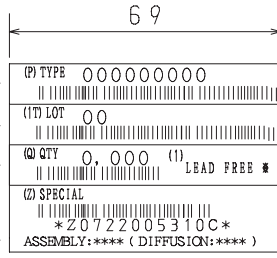
Outer box label  
It is a label at the time of factory shipments.  
The form of a label may change in physical distribution process.

#### Packing method



Reel label

Type No.  
LOT No.  
Quantity  
Origin



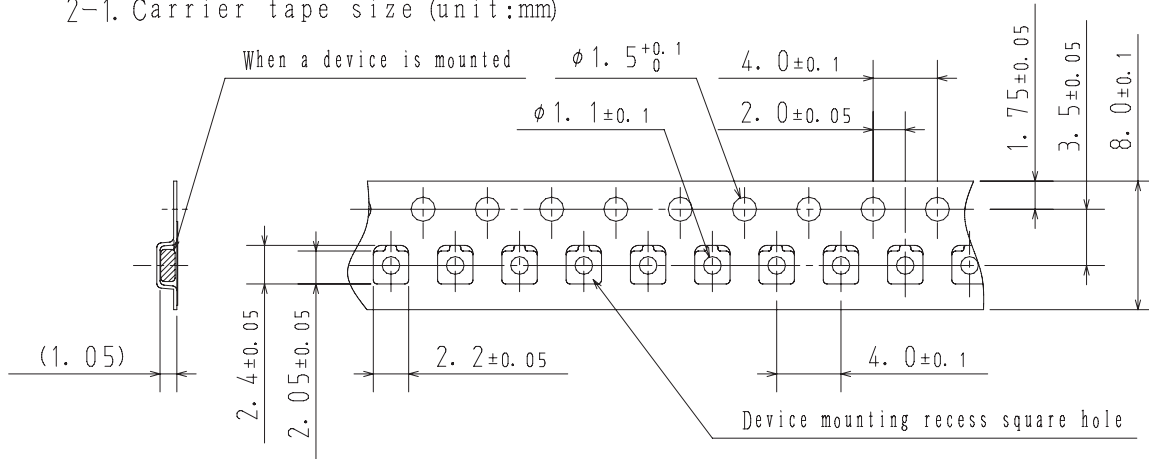
#### NOTE (1)

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

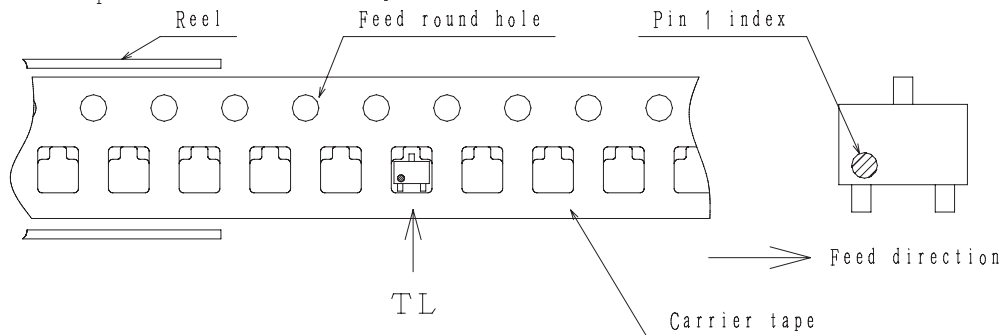
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

### 2. Taping configuration

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



#### 2-2. Device placement direction

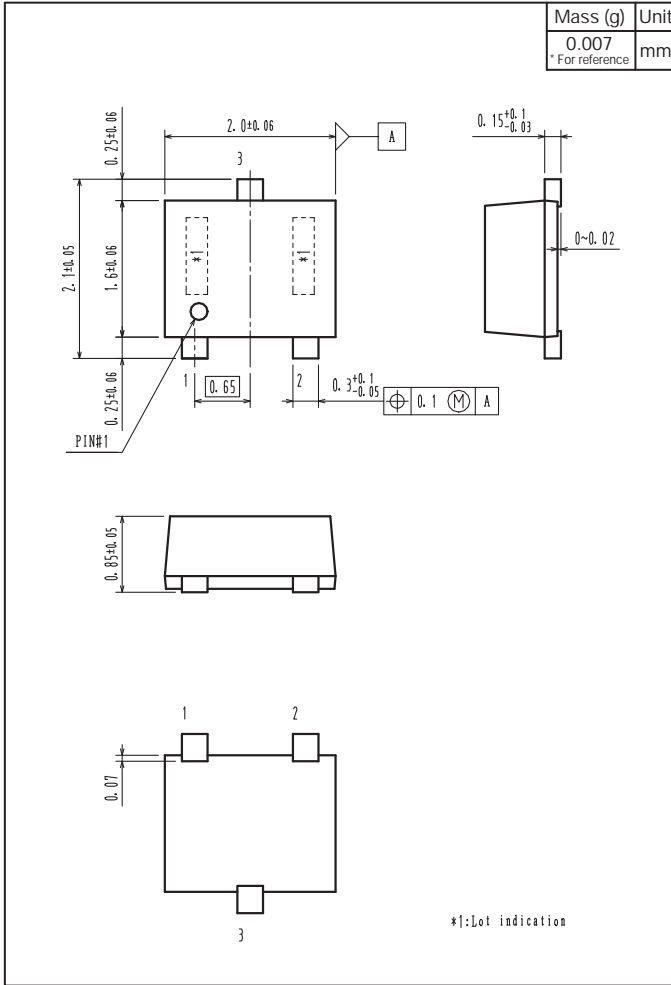


Those with pin 1 index on the feed hole side.....TL

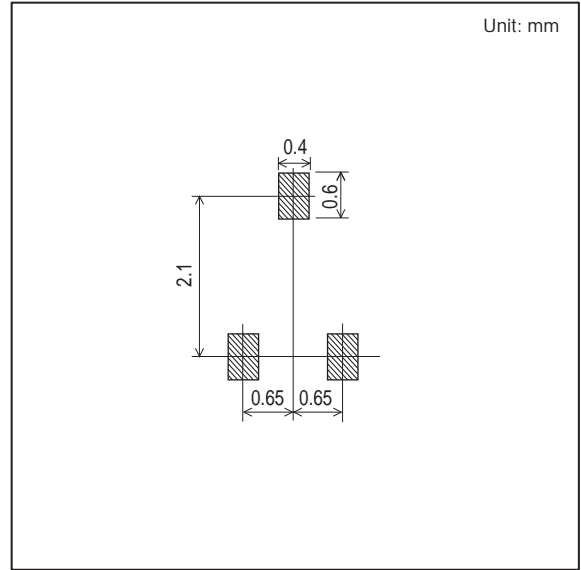
# MCH3105/MCH3205

## Outline Drawing

MCH3105-TL-E, MCH3205-TL-E



## Land Pattern Example



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