



# MCH3105/MCH3205

## Bipolar Transistor (-50V, (-)3A, Low $V_{CE(sat)}$ , (PNP)NPN Single MCPH3

ON Semiconductor®

<http://onsemi.com>

### Applications

- 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 $T_a=25^\circ\text{C}$

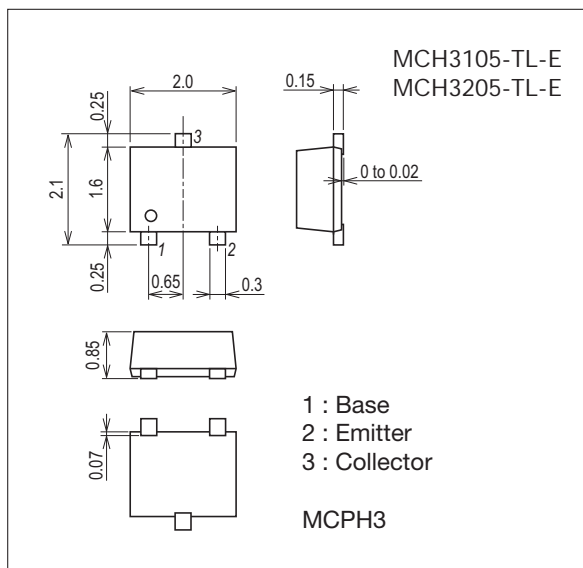
Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CBO}$		(-50)80	V
Collector-to-Emitter Voltage	$V_{CES}$		(-50)80	V
	$V_{CEO}$		(-50)	V
Emitter-to-Base Voltage	$V_{EBO}$		(-6)	V
Collector Current	$I_C$		(-3)	A
Collector Current (Pulse)	$I_{CP}$		(-6)	A
Base Current	$I_B$		(-600)	mA
Collector Dissipation	$P_C$	When mounted on ceramic substrate (600mm <sup>2</sup> x0.8mm)	0.8	W
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)

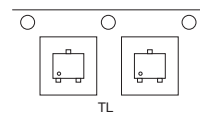
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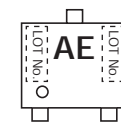
### Product & Package Information

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

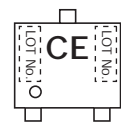
### Packing Type : TL



### Marking

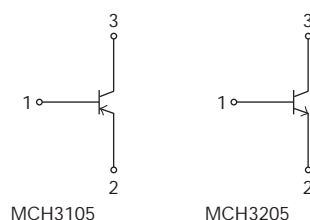


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### Electrical Connection

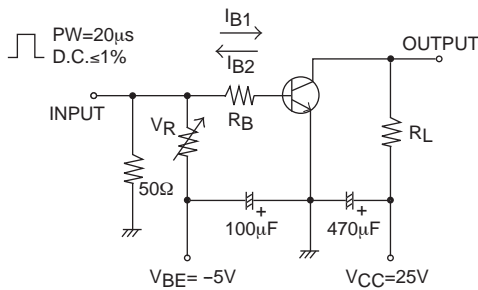


# MCH3105 / MCH3205

## 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

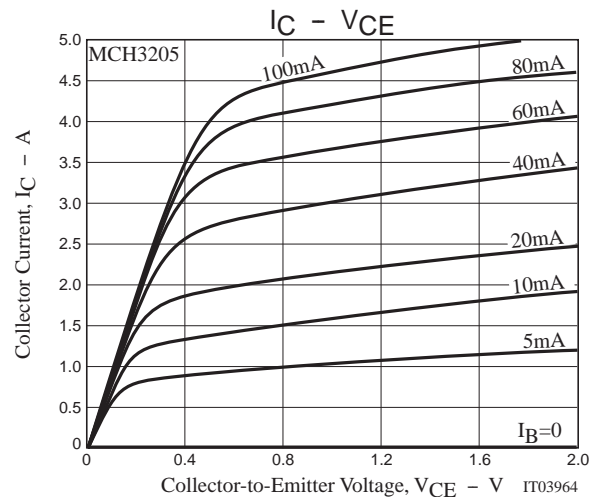
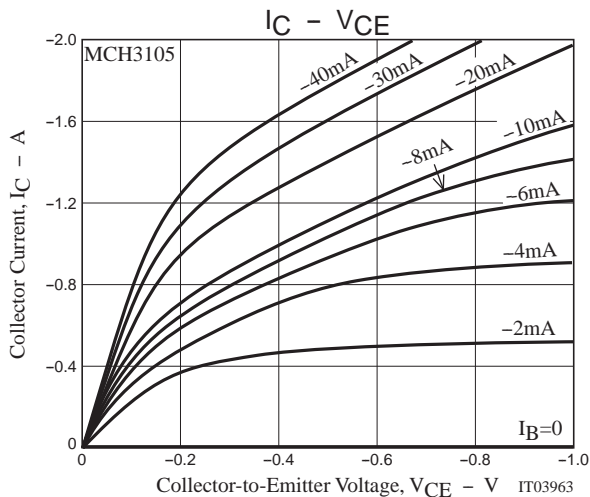
## Switching Time Test Circuit



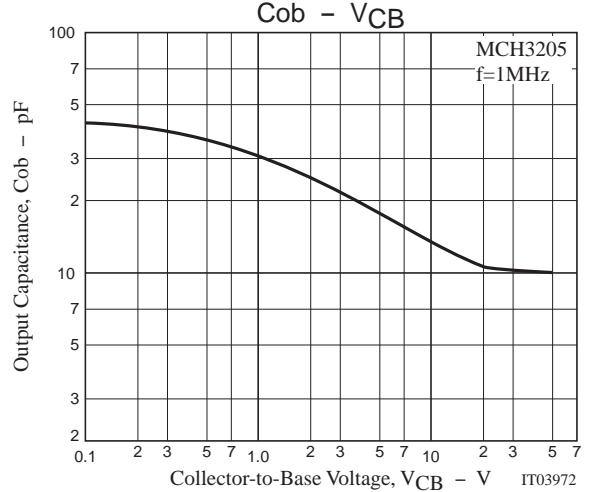
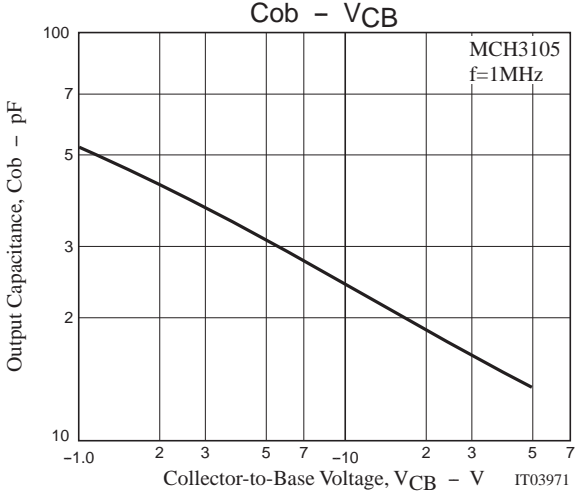
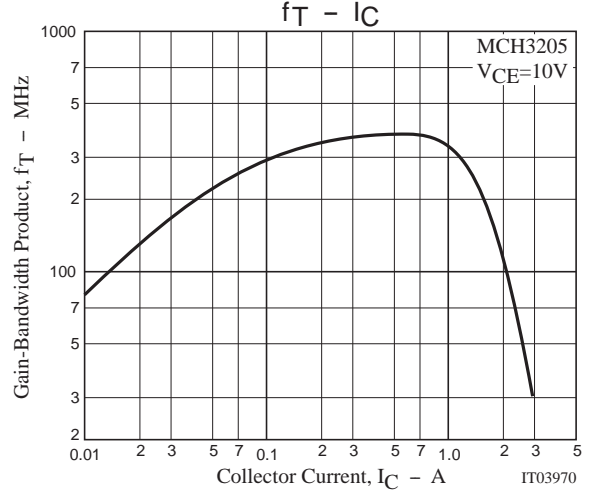
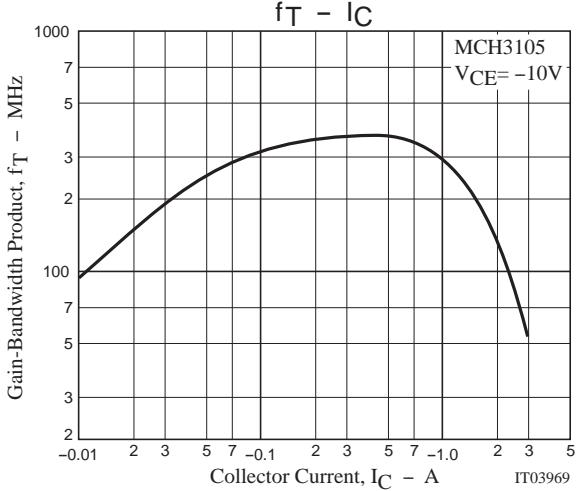
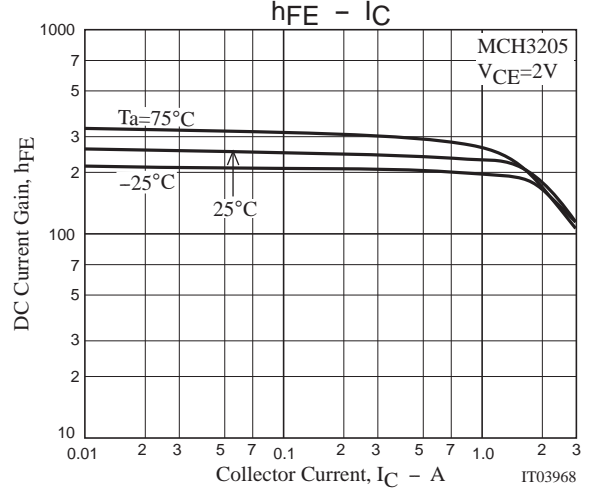
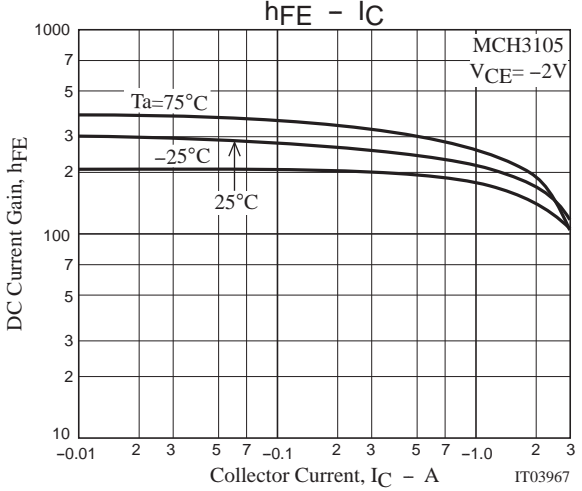
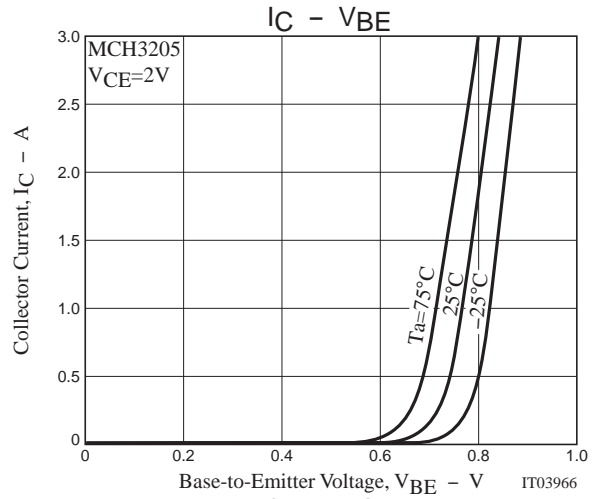
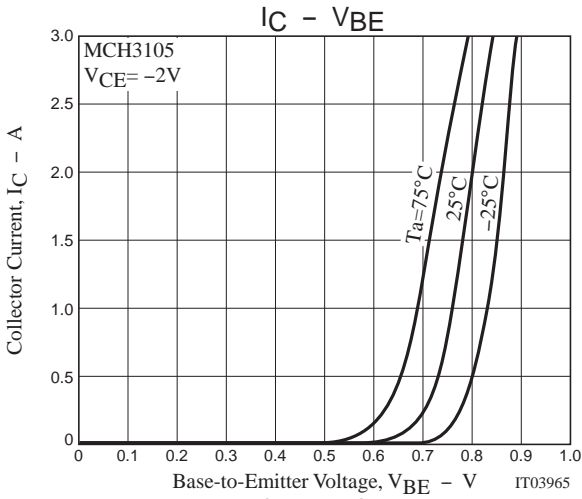
$I_C = 10I_{B1} = -10I_{B2} = 1A$   
 (For PNP, the polarity is reversed.)

## Ordering Information

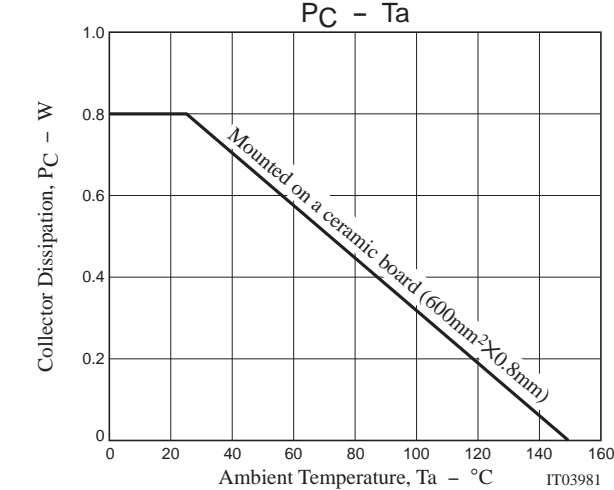
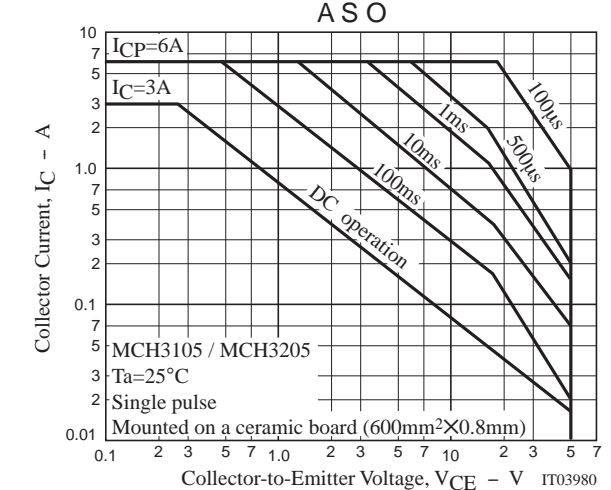
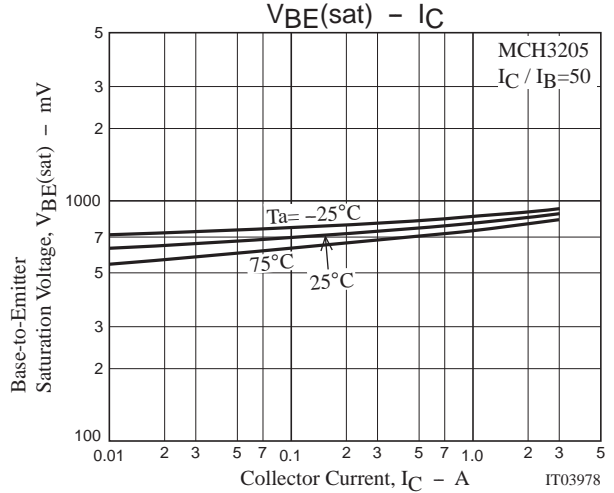
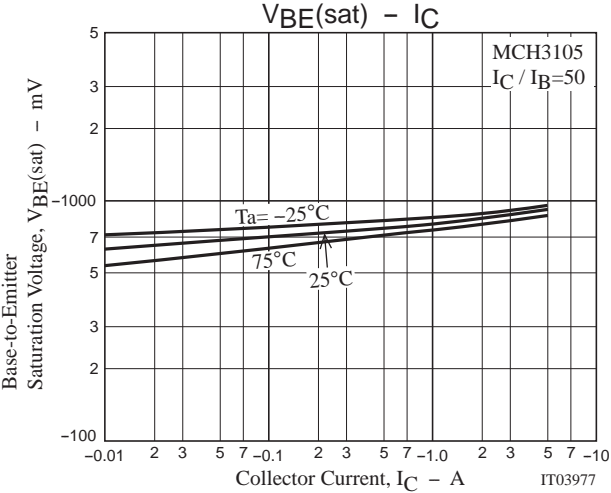
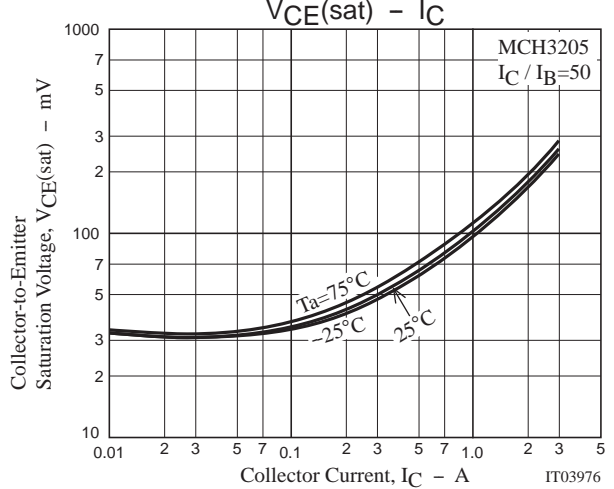
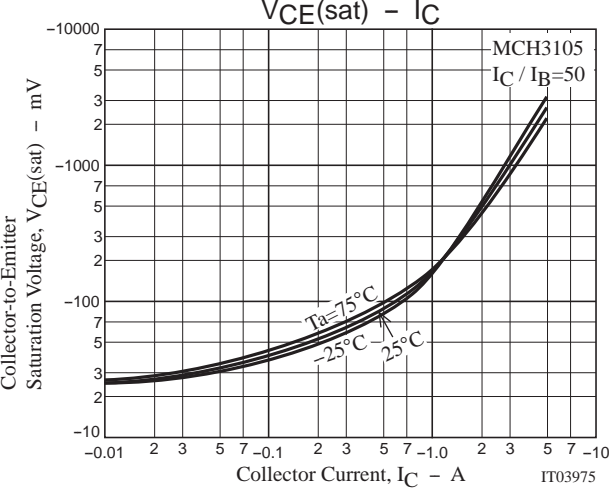
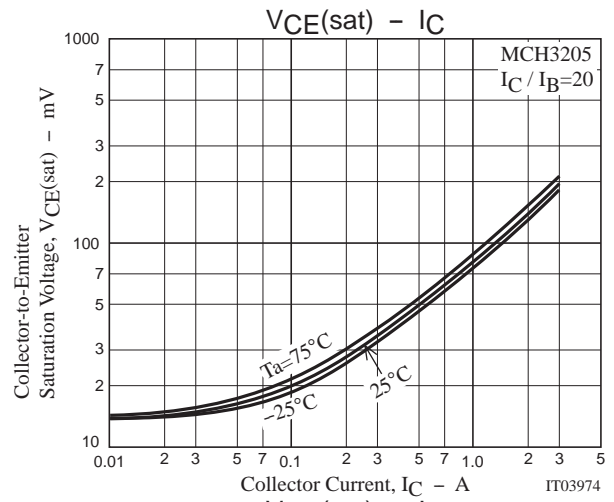
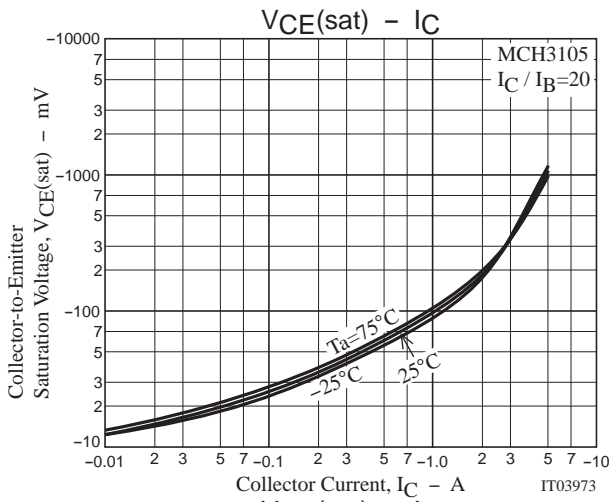
Device	Package	Shipping	memo
MCH3105-TL-E	MCPH3	3,000pcs./reel	Pb Free
MCH3205-TL-E	MCPH3	3,000pcs./reel	



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Taping Specification

MCH3105-TL-E, MCH3205-TL-E

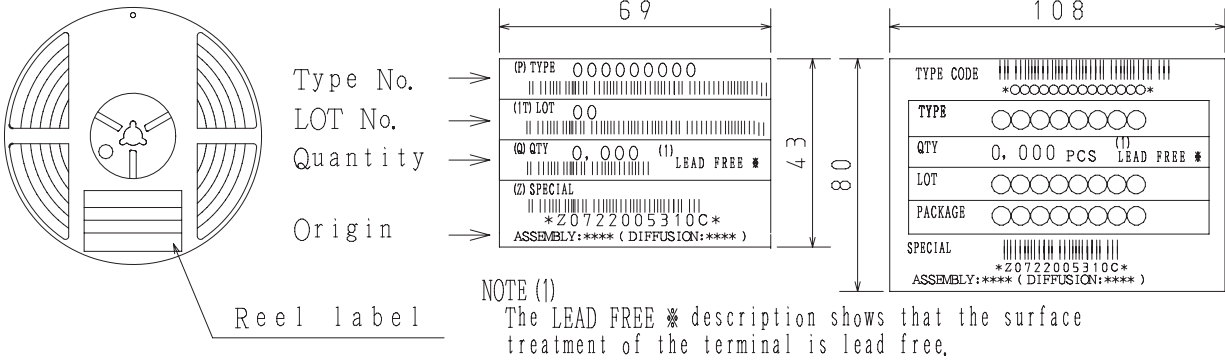
1. Packing Format

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

Packing method

Reel label, Inner box label (unit:mm)      Outer box label

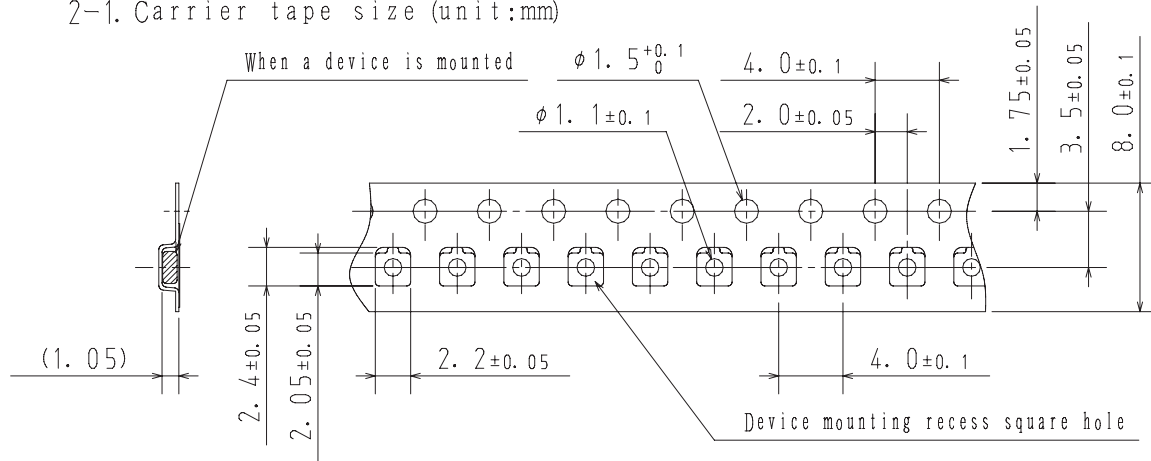
It is a label at the time of factory shipments. The form of a label may change in physical distribution process.



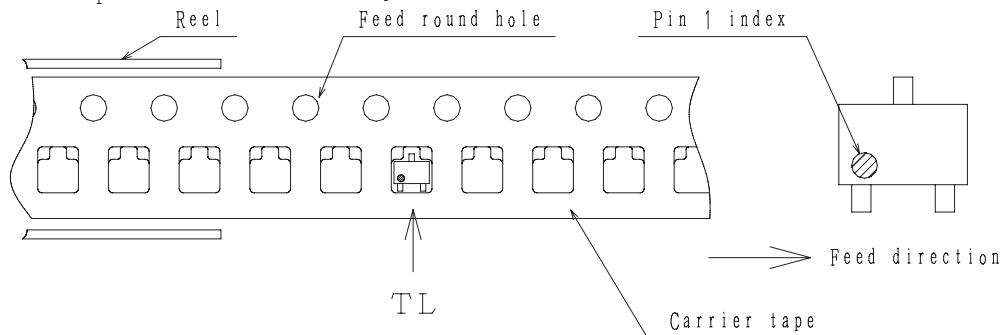
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



2-2. Device placement direction

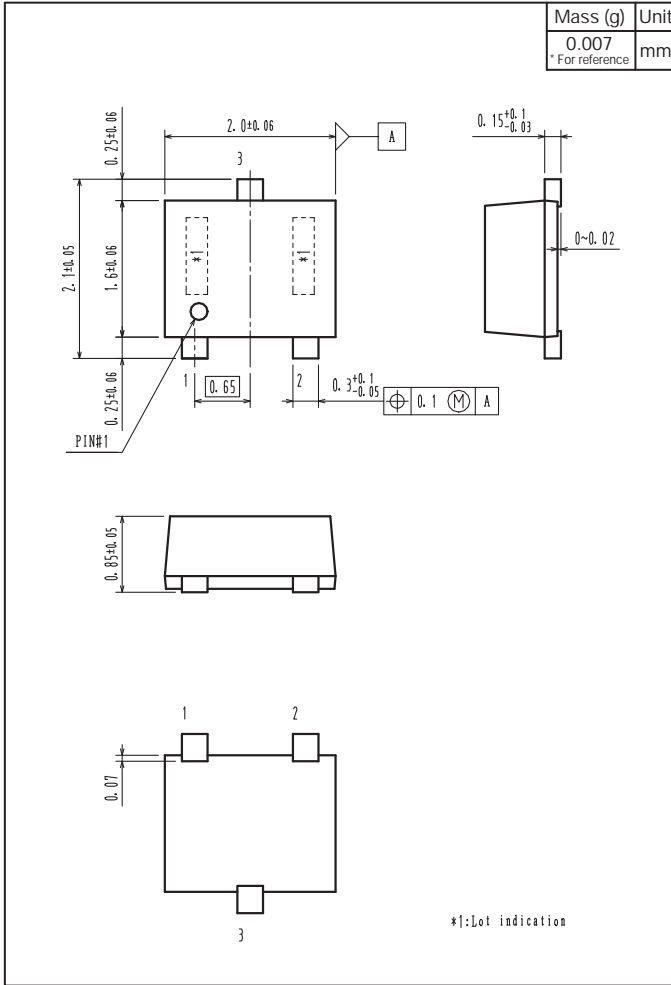


Those with pin 1 index on the feed hole side.....TL

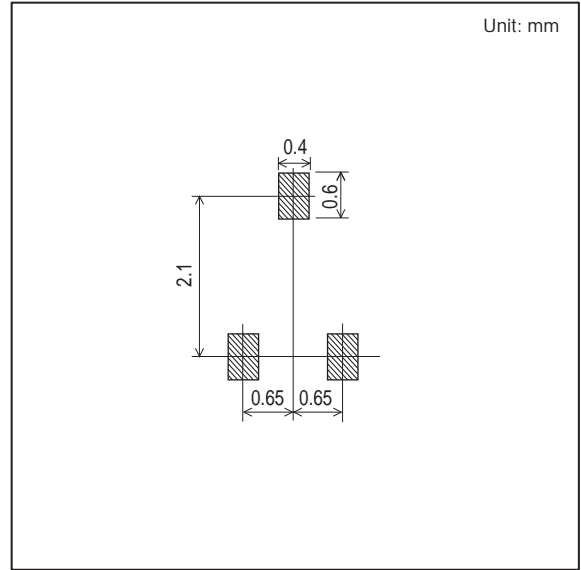
# MCH3105 / MCH3205

## Outline Drawing

MCH3105-TL-E, MCH3205-TL-E



## Land Pattern Example



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