



MCH3109/MCH3209

Bipolar Transistor

(-30V, (-)3A, Low $V_{CE(sat)}$, (PNP)NPN Single MCPH3

ON Semiconductor®

<http://onsemi.com>

Applicaitons

- Relay drivers, lamp drivers, motor drivers, flash

Features

- Adoption of 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 () : MCH3109

Absolute Maximum Ratings at $T_a=25^\circ\text{C}$

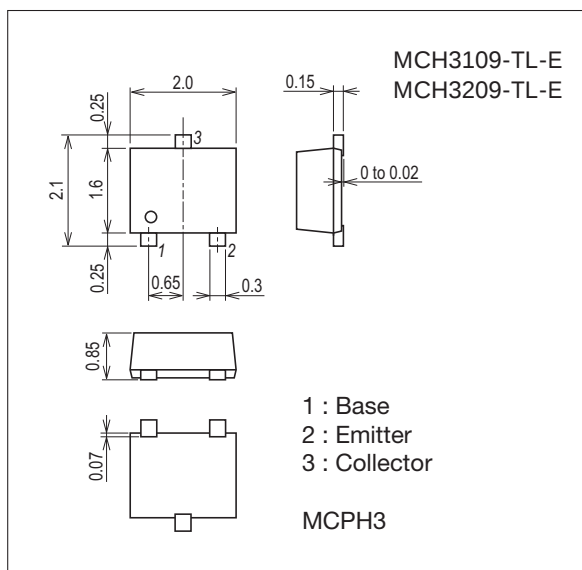
Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		(-30)40	V
Collector-to-Emitter Voltage	V_{CEO}		(-30)	V
Emitter-to-Base Voltage	V_{EBO}		(-5)	V
Collector Current	I_C		(-3)	A
Collector Current (Pulse)	I_{CP}		(-5)	A
Base Current	I_B		(-600)	mA
Collector Dissipation	P_C	When mounted on ceramic substrate (600mm ² ×0.8mm)	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)

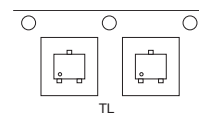
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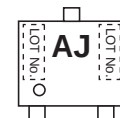
Product & Package Information

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

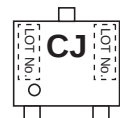
Packing Type : TL



Marking

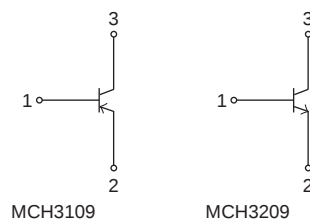


MCH3109



MCH3209

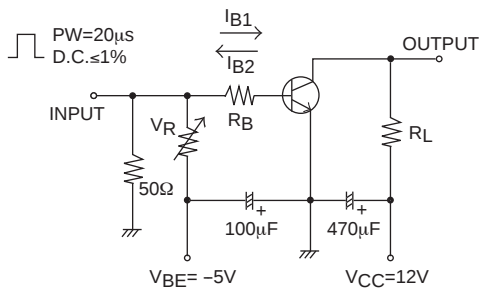
Electrical Connection



Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	ICBO	VCE=(-)30V, IE=0A			(-)0.1	μA
Emitter Cutoff Current	IEBO	VEB=(-)4V, IC=0A			(-)0.1	μA
DC Current Gain	hFE	VCE=(-)2V, IC=(-)500mA	200		560	
Gain-Bandwidth Product	fT	VCE=(-)10V, IC=(-)500mA		(380)450		MHz
Output Capacitance	Cob	VCE=(-)10V, f=1MHz		(25)20		pF
Collector-to-Emitter Saturation Voltage	VCE(sat)1	IC=(-)1.5A, IB=(-)30mA		(-155)120	(-230)180	mV
	VCE(sat)2	IC=(-)1.5A, IB=(-)75mA		(-)105	(-)155	mV
Base-to-Emitter Saturation Voltage	VBE(sat)	IC=(-)1.5A, IB=(-)30mA		(-)0.83	(-)1.2	V
Collector-to-Base Breakdown Voltage	V(BR)CBO	IC=(-)10μA, IE=0A	(-30)40			V
Collector-to-Emitter Breakdown Voltage	V(BR)CEO	IC=(-)1mA, RBE=∞	(-)30			V
Emitter-to-Base Breakdown Voltage	V(BR)EBO	IE=(-)10μA, IC=0A	(-)5			V
Turn-On Time	ton	See specified Test Circuit.		(50)30		ns
Storage Time	tstg			(270)300		ns
Fall Time	tf			(25)15		ns

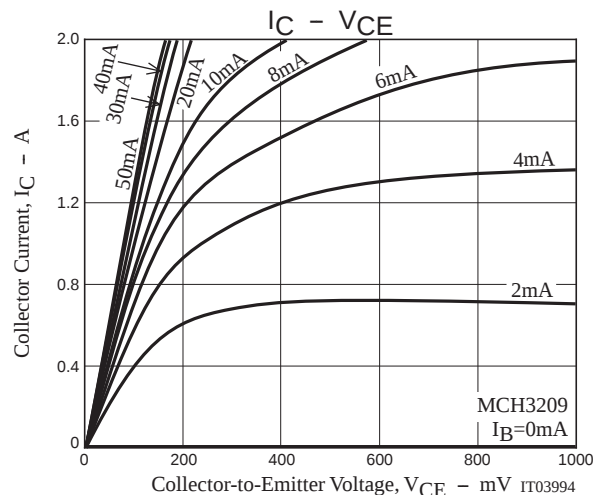
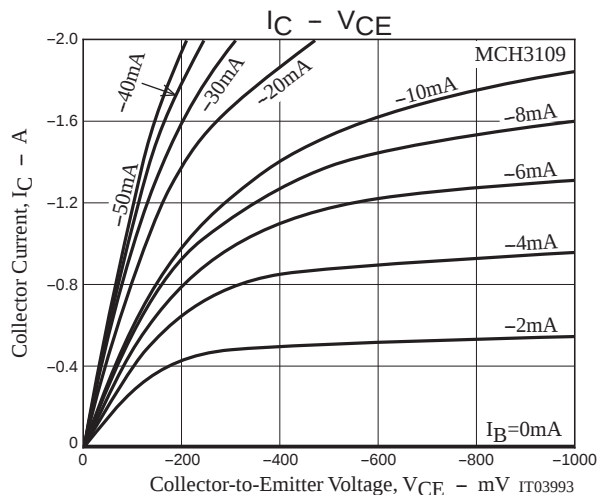
Switching Time Test Circuit

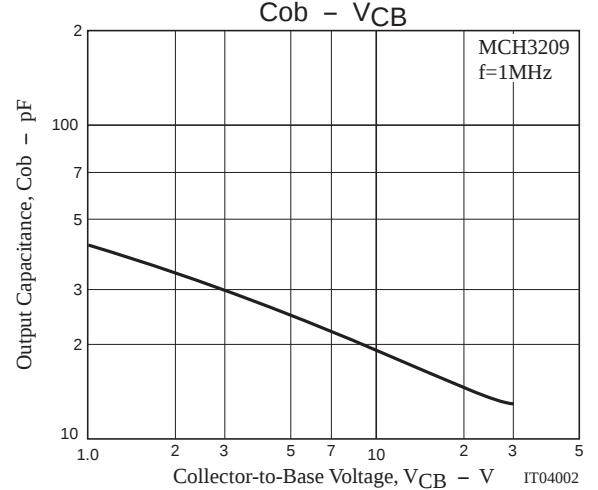
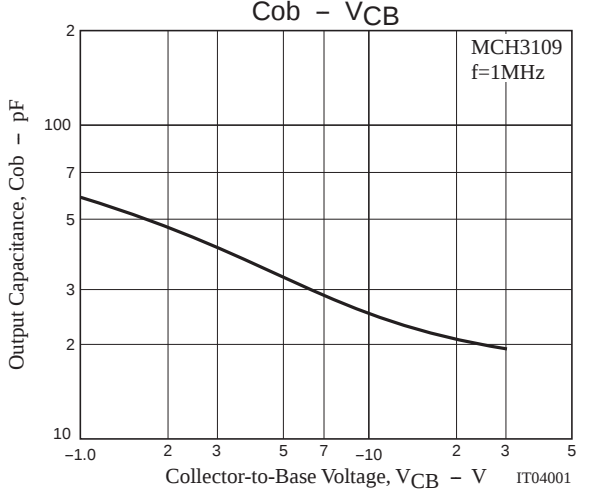
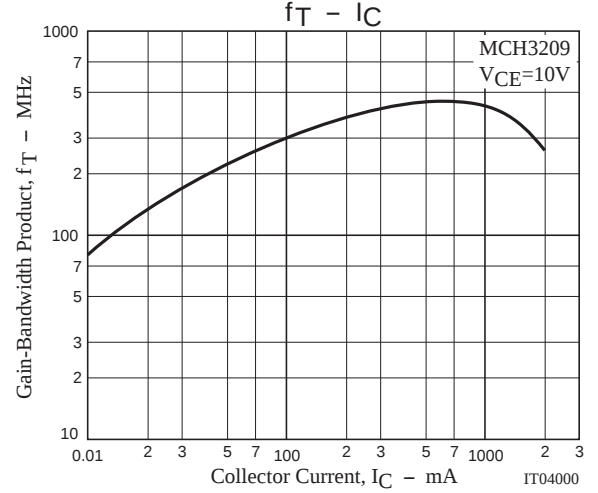
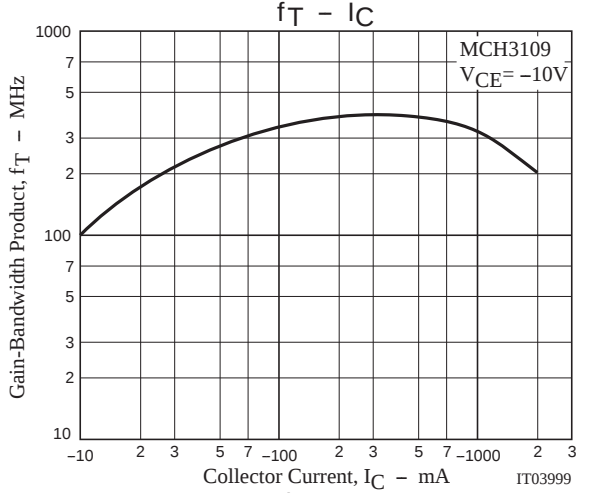
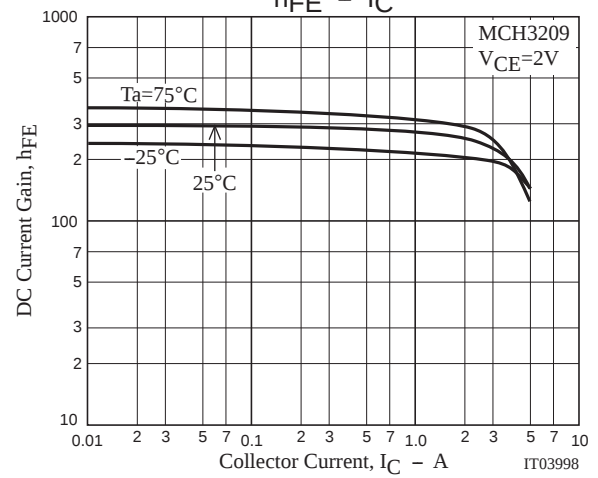
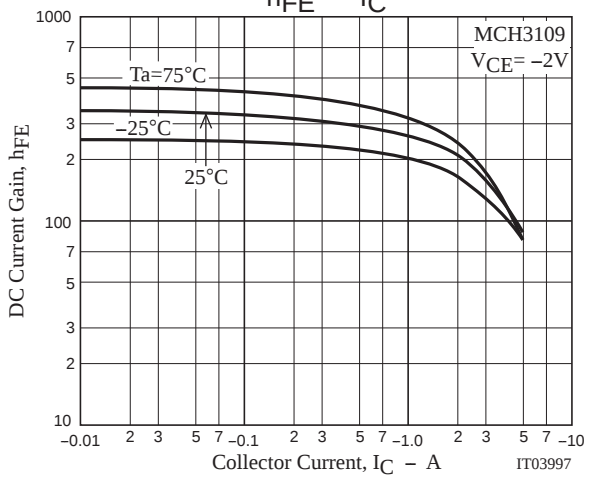
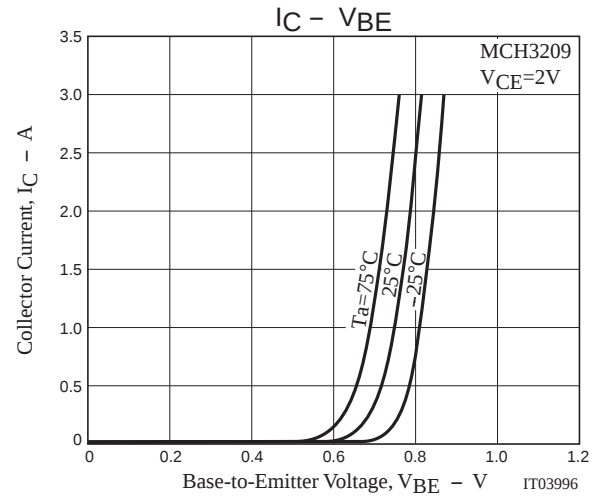
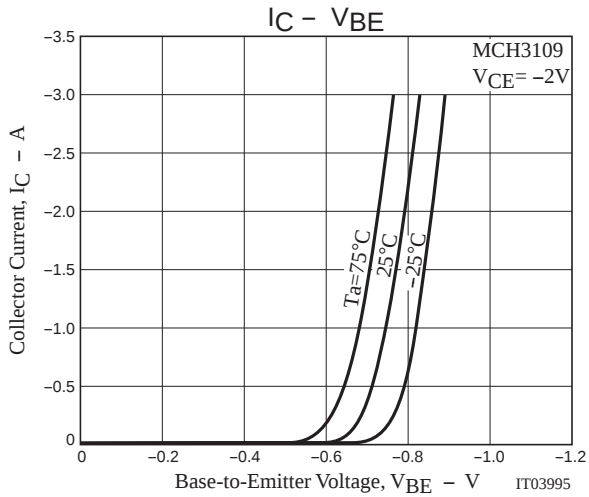


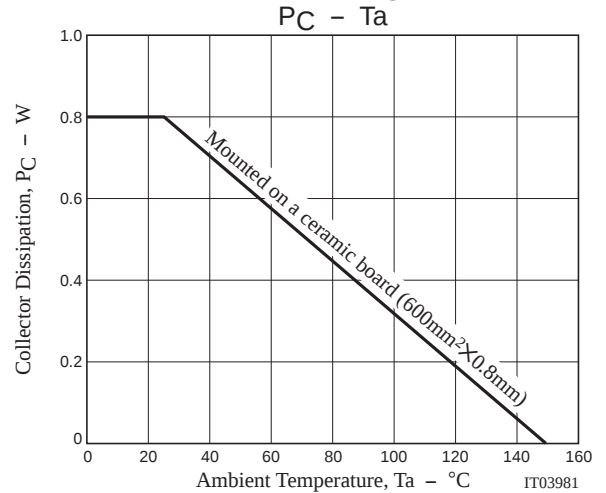
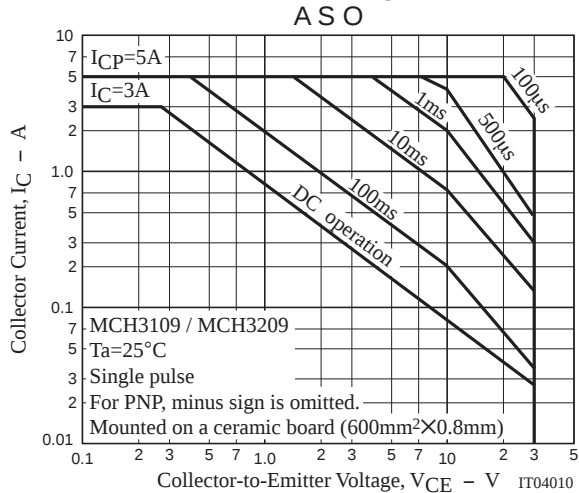
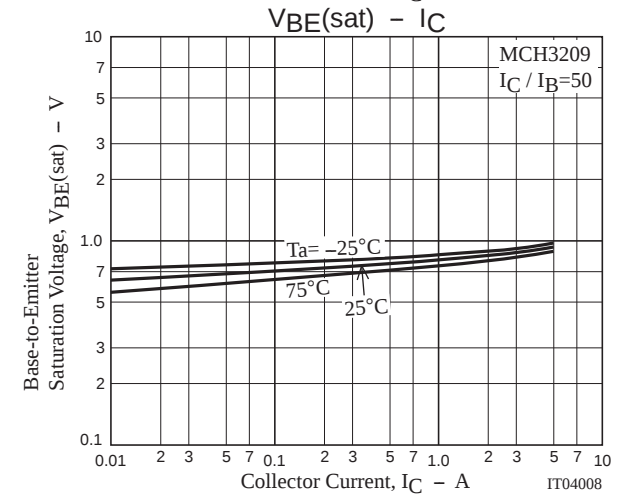
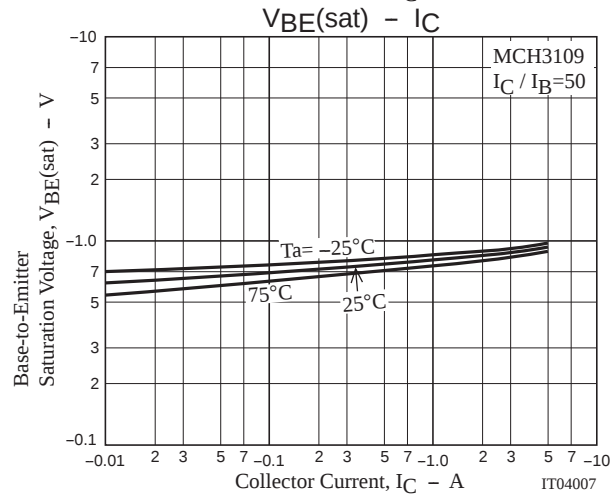
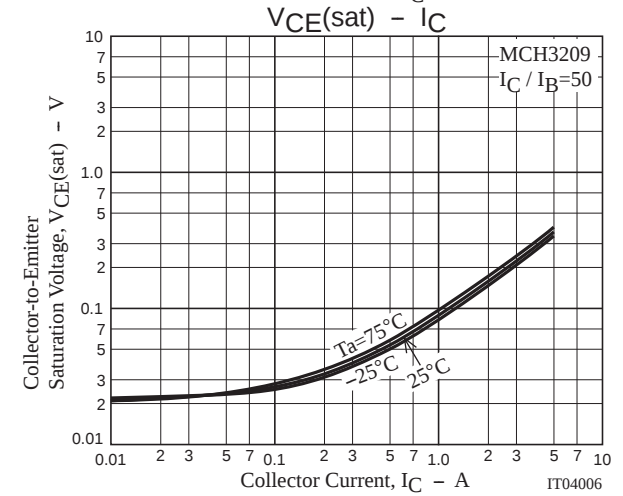
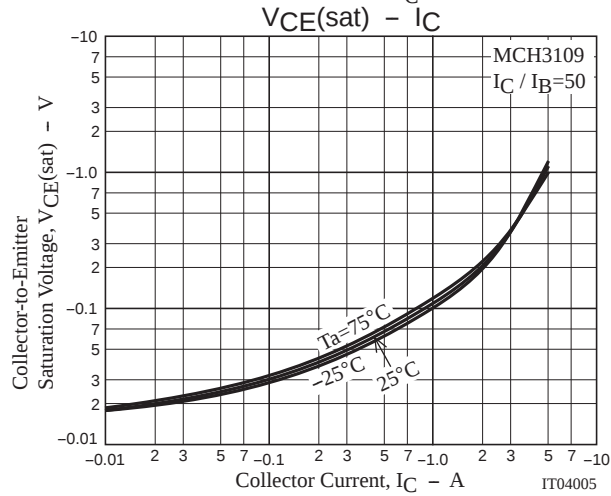
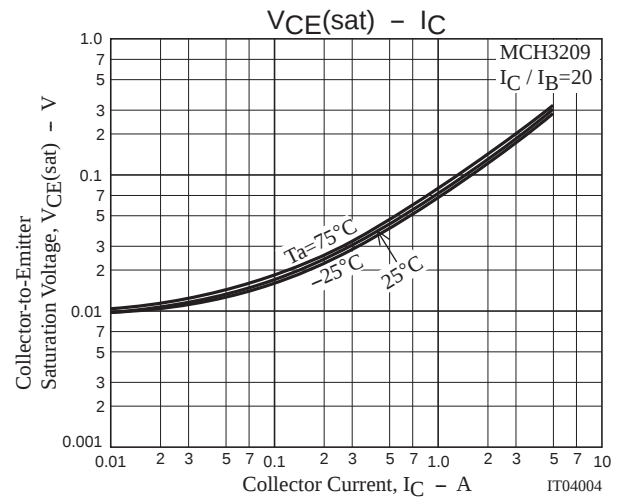
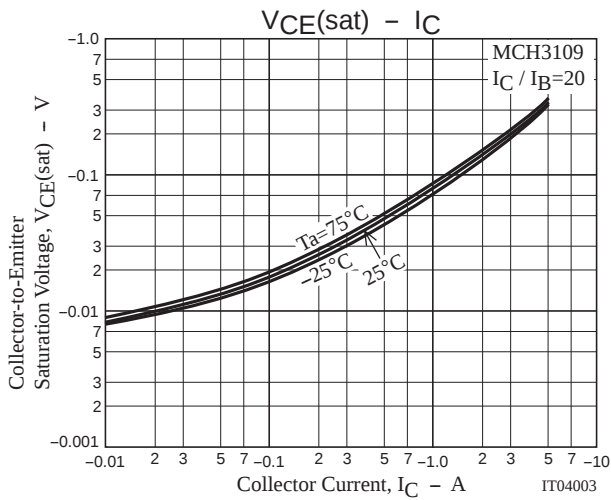
IC=20IB1= -20IB2=500mA
(For PNP, the polarity is reversed.)

Ordering Information

Device	Package	Shipping	memo
MCH3109-TL-E	MCPH3	3,000pcs./reel	Pb Free
MCH3209-TL-E	MCPH3	3,000pcs./reel	







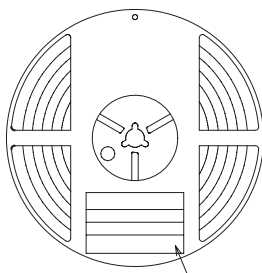
Taping Specification

MCH3109-TL-E, MCH3209-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



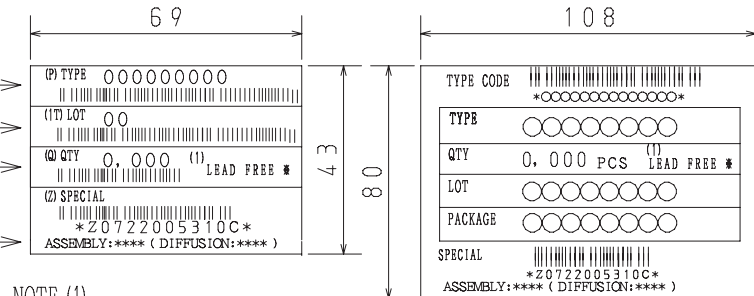
Reel label

Type No.
LOT No.
Quantity
Origin

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.



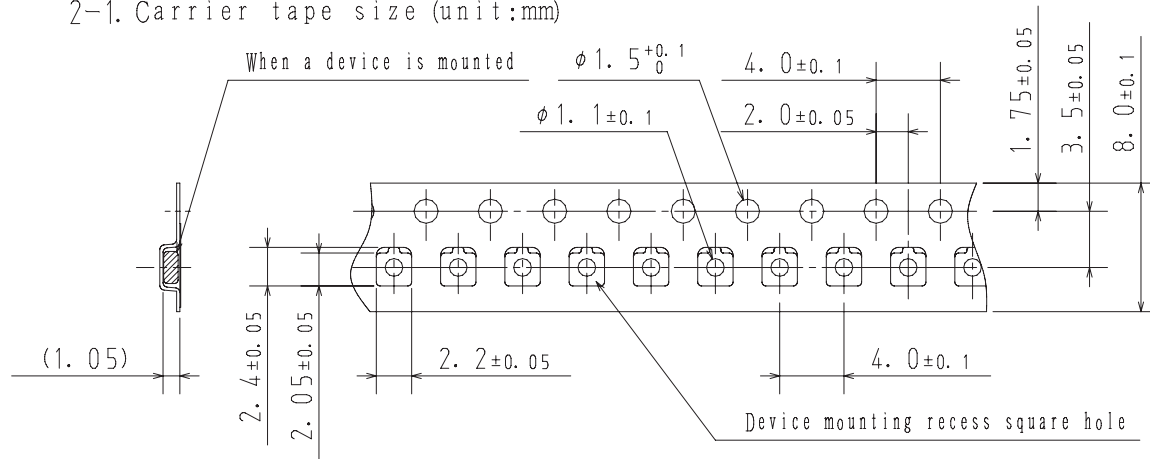
NOTE (1)

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

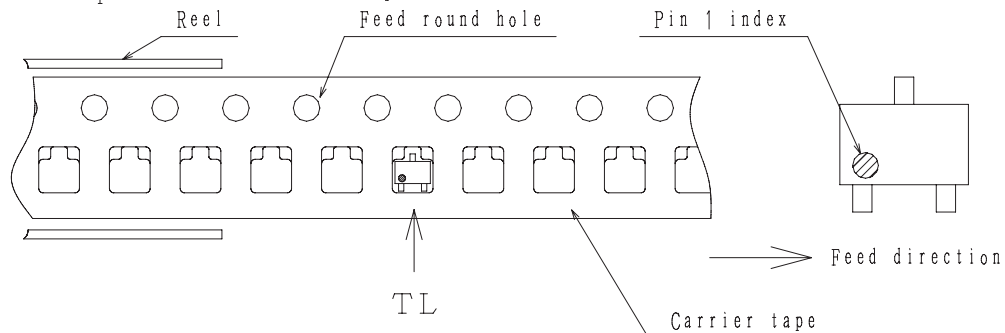
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



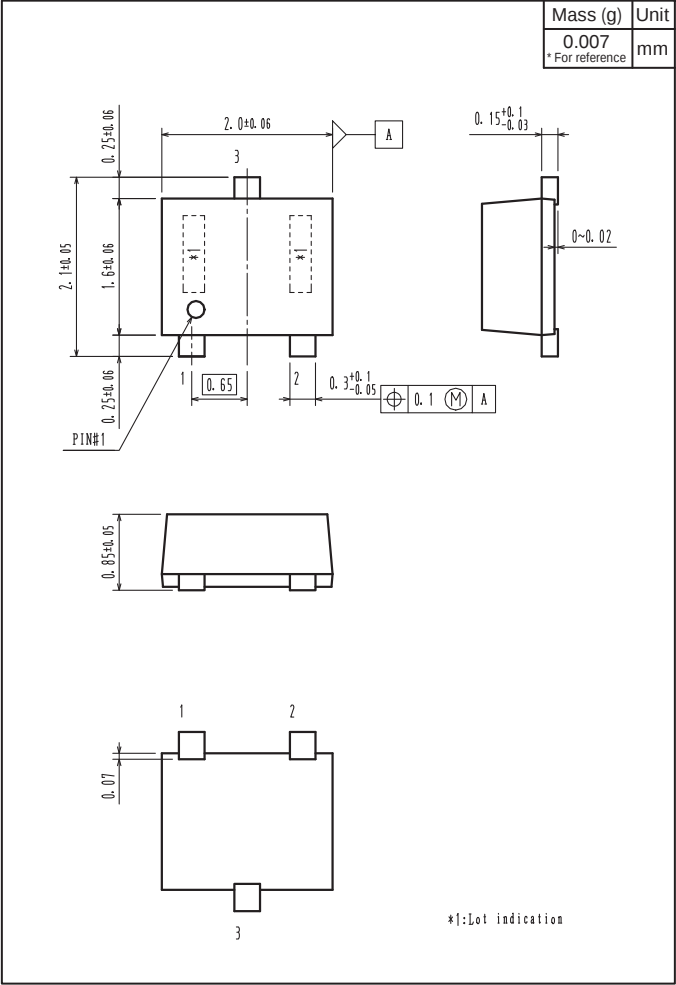
2-2. Device placement direction



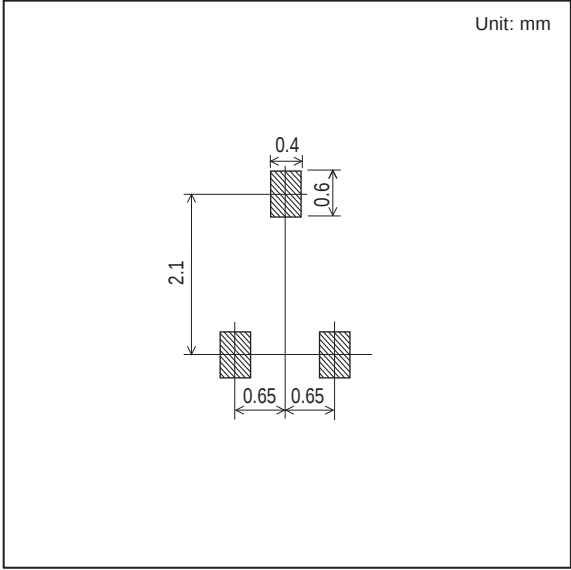
Those with pin 1 index on the feed hole side.....TL

Outline Drawing

MCH3109-TL-E, MCH3209-TL-E



Land Pattern Example



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