



# MCH6541

## Bipolar Transistor (-30V, (-)3A, Low VCE(sat) Complementary Dual MCPH6

ON Semiconductor®

<http://onsemi.com>

### Applications

- MOSFET gate drivers, relay drivers, lamp drivers, motor drivers

### Features

- Composite type with a PNP transistor and an NPN transistor contained in one package facilitating high-density mounting
- Ultrasmall package permitting applied sets to be small and slim

### Specifications ( ) : PNP

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

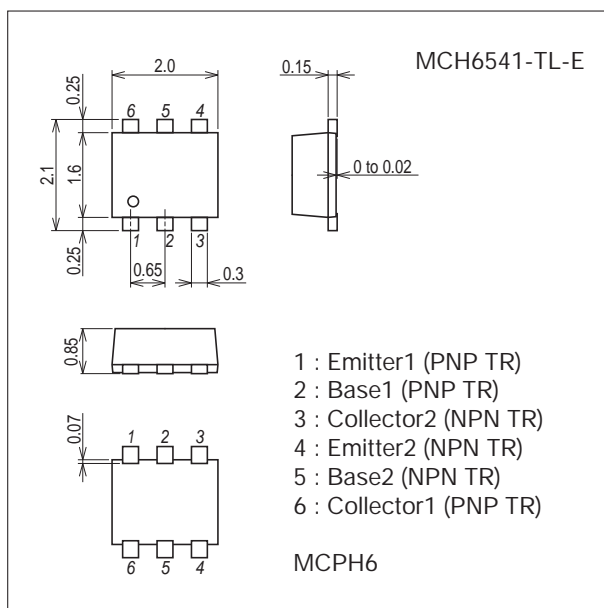
Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V <sub>CB0</sub>		(-30)40	V
Collector-to-Emitter Voltage	V <sub>CEO</sub>		(-)30	V
Emitter-to-Base Voltage	V <sub>EB0</sub>		(-)5	V
Collector Current	I <sub>C</sub>		(-)700	mA
Collector Current (Pulse)	I <sub>CP</sub>		(-)3	A
Collector Dissipation	P <sub>C</sub>	When mounted on ceramic substrate (600mm <sup>2</sup> ×0.8mm) 1unit	0.5	W
Total Power Dissipation	P <sub>T</sub>	When mounted on ceramic substrate (600mm <sup>2</sup> ×0.8mm)	0.55	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)

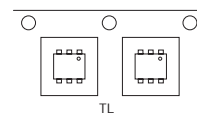
7022A-012



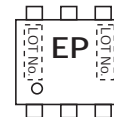
### Product & Package Information

- Package : MCPH6
- JEITA, JEDEC : SC-88, SC-70-6, SOT-363
- Minimum Packing Quantity : 3,000 pcs./reel

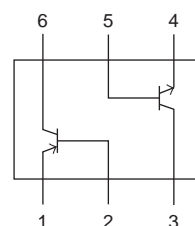
### Packing Type : TL



### Marking



### Electrical Connection

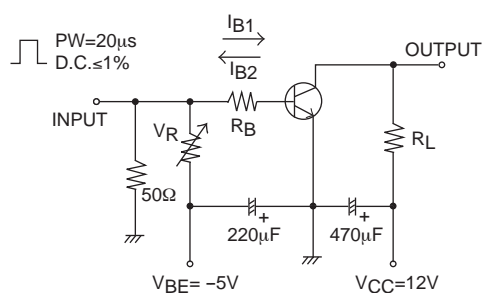


# MCH6541

## Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	ICBO	V <sub>CB</sub> =(-)30V, I <sub>E</sub> =0A			(-)100	nA
Emitter Cutoff Current	IEBO	V <sub>EB</sub> =(-)4V, I <sub>C</sub> =0A			(-)100	nA
DC Current Gain	h <sub>FE</sub>	V <sub>CE</sub> =(-)2V, I <sub>C</sub> =(-)50mA	(200)300		(500)800	
Gain-Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> =(-)2V, I <sub>C</sub> =(-)50mA		(520)540		MHz
Output Capacitance	Cob	V <sub>CB</sub> =(-)10V, f=1MHz		(4.7)3.3		pF
Collector-to-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =(-)200mA, I <sub>B</sub> =(-)10mA		(-110)85	(-220)190	mV
Base-to-Emitter Saturation Voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =(-)200mA, I <sub>B</sub> =(-)10mA		(-)0.9	(-)1.2	V
Collector-to-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> =(-)10μA, I <sub>E</sub> =0A	(-30)40			V
Collector-to-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> =(-)1mA, R <sub>BE</sub> =∞	(-)30			V
Emitter-to-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	I <sub>E</sub> =(-)10μA, I <sub>C</sub> =0A	(-)5			V
Turn-On Time	t <sub>on</sub>	See specified Test Circuit.		35		ns
Storage Time	t <sub>stg</sub>			(125)255		ns
Fall Time	t <sub>f</sub>			(25)40		ns

## Switching Time Test Circuit



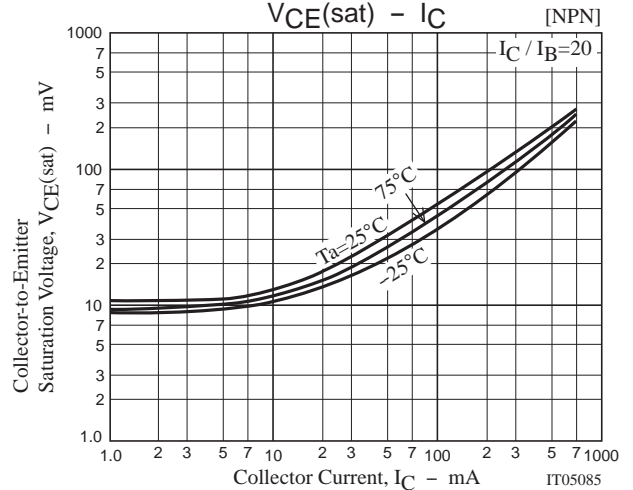
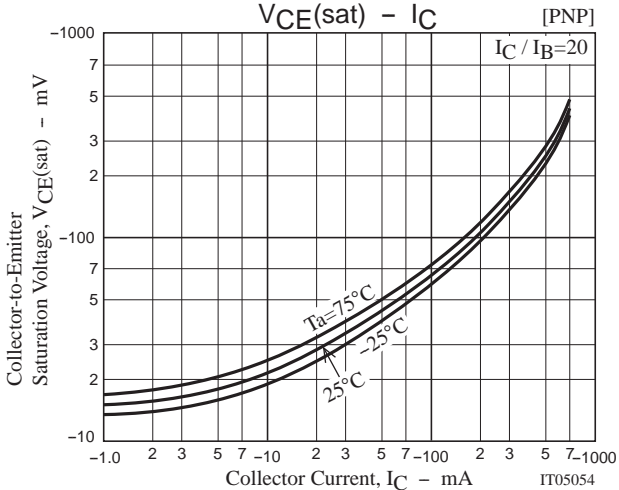
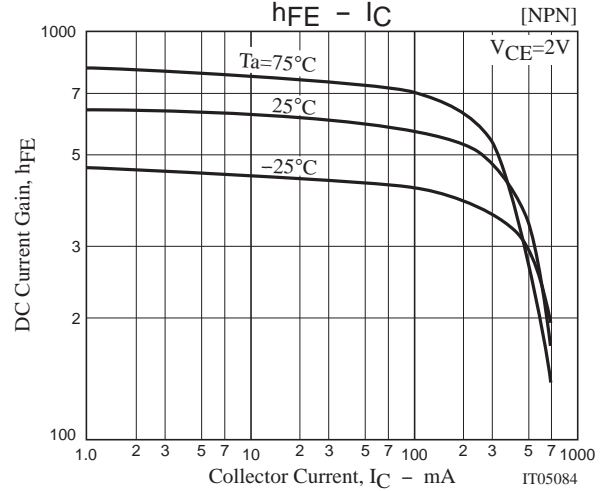
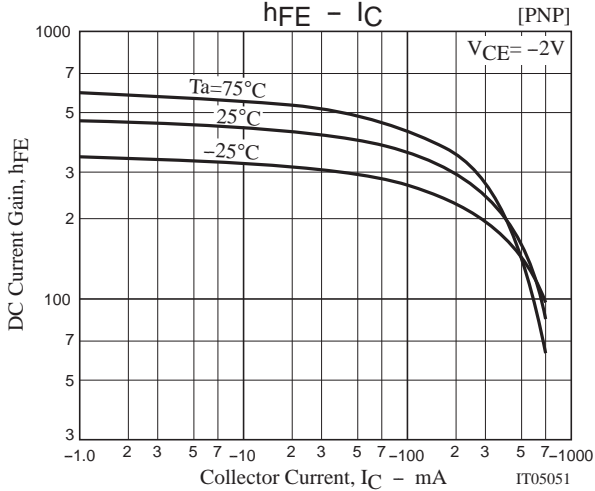
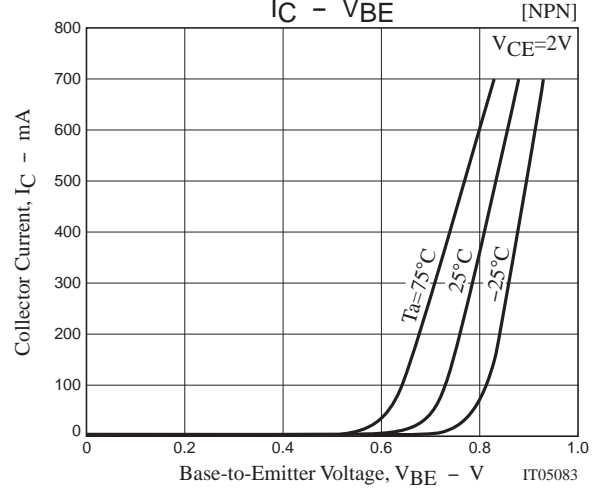
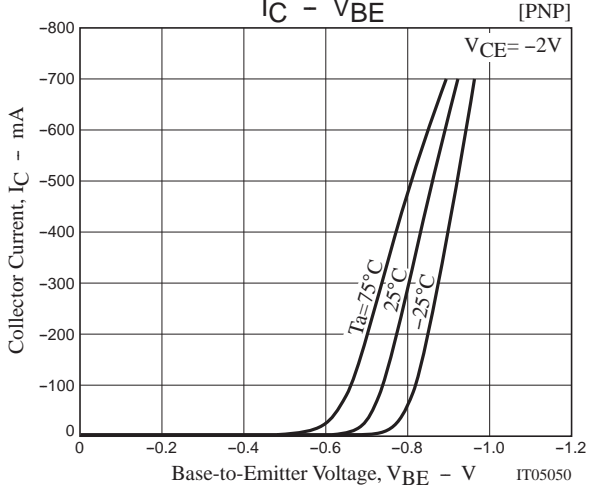
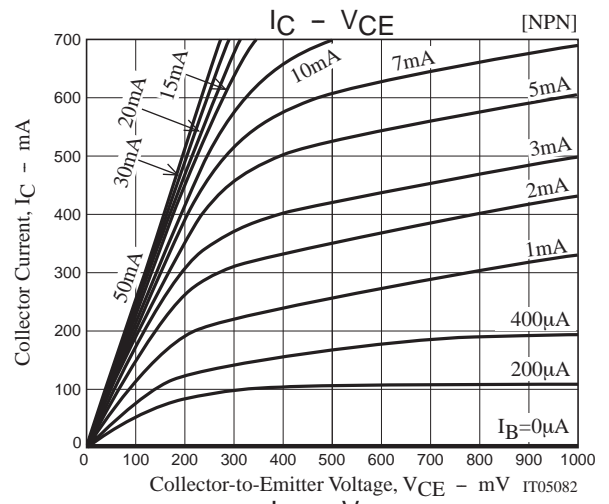
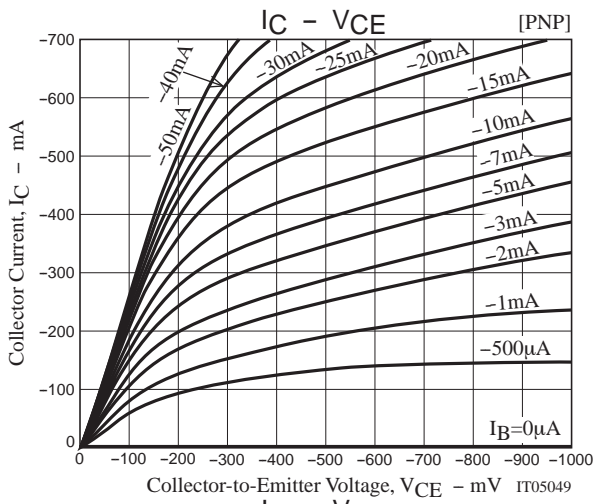
$$I_C = 20I_{B1} = -20I_{B2} = 300\text{mA}$$

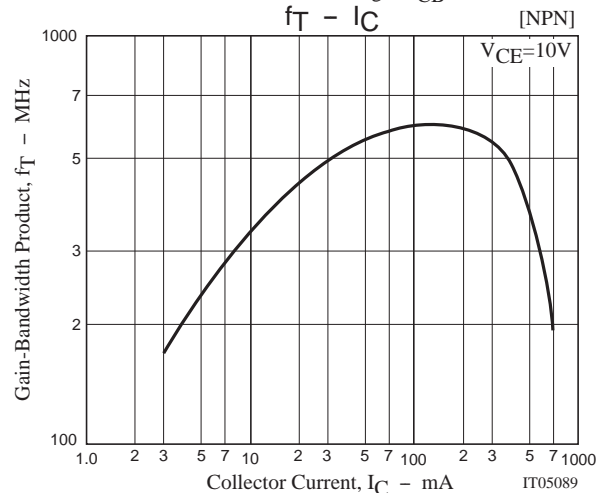
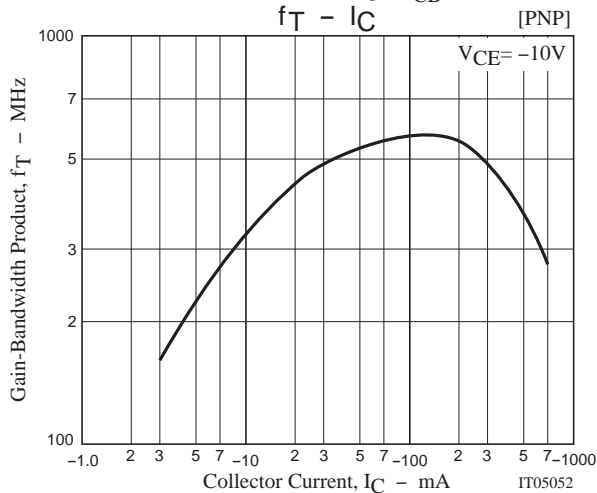
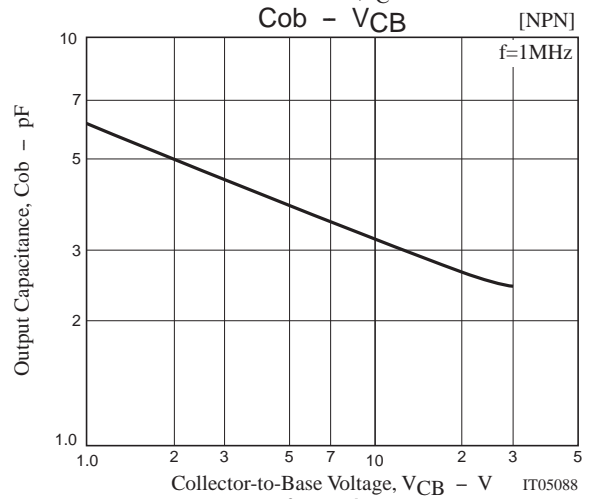
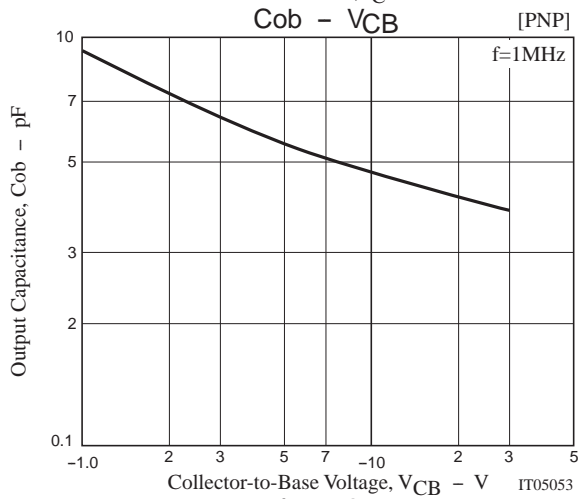
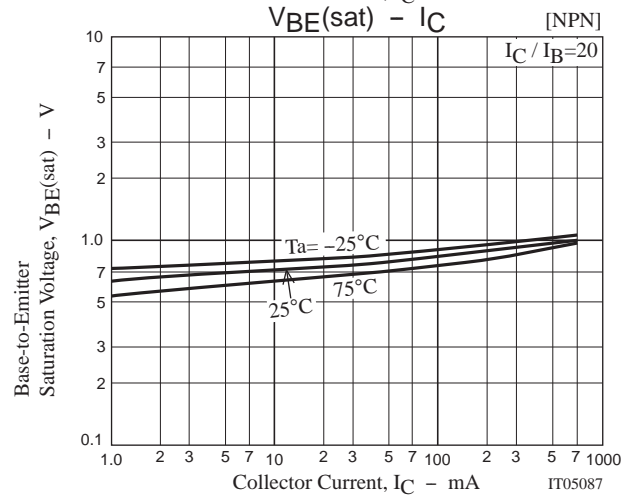
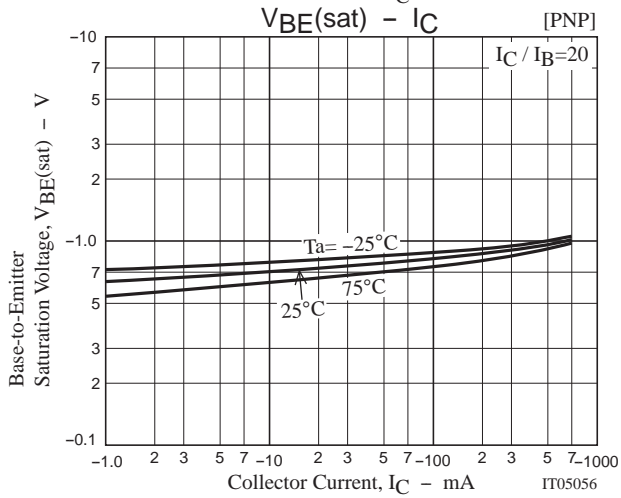
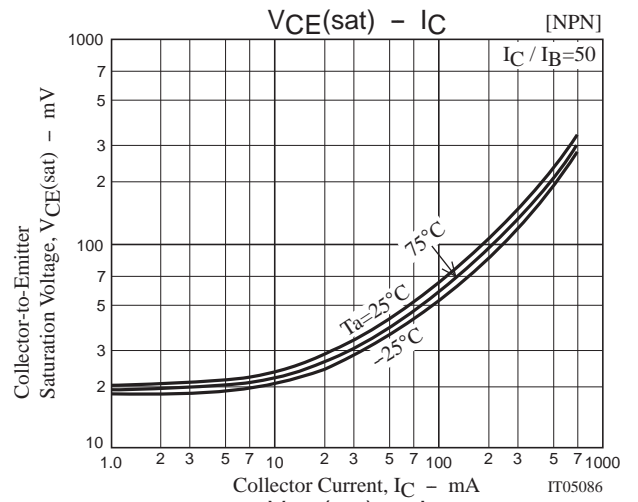
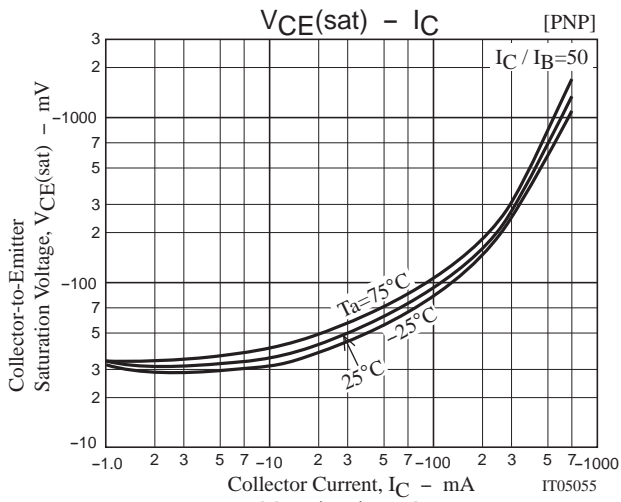
For PNP, the polarity is reversed.

## Ordering Information

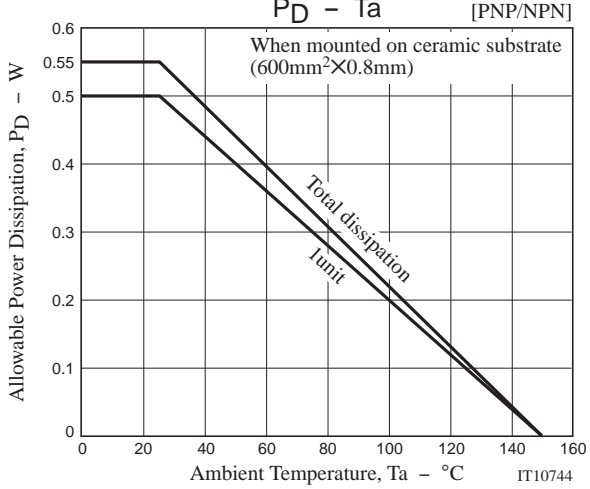
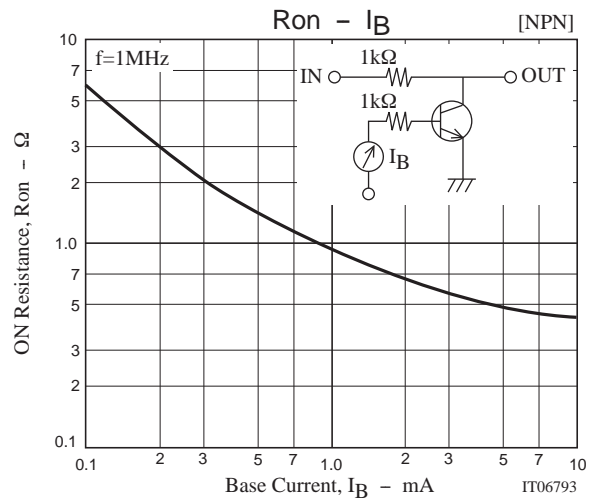
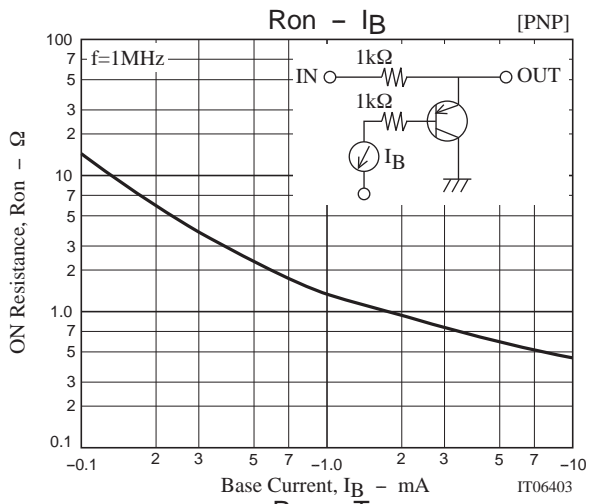
Device	Package	Shipping	memo
MCH6541-TL-E	MCPH6	3,000pcs./reel	Pb Free

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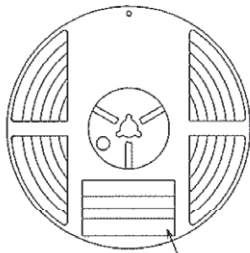
Embossed Taping Specification

MCH6541-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)
MCPH6	MCP4	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

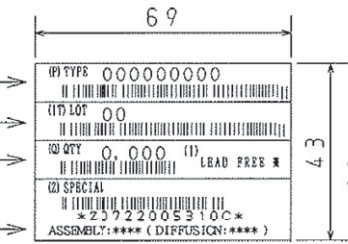
Packing method



Type No.  
LOT No.  
Quantity  
Origin

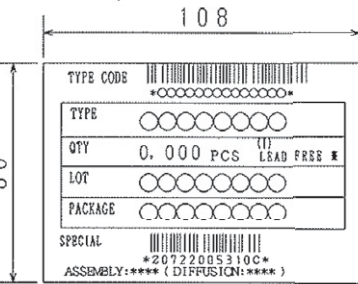
Reel label

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.



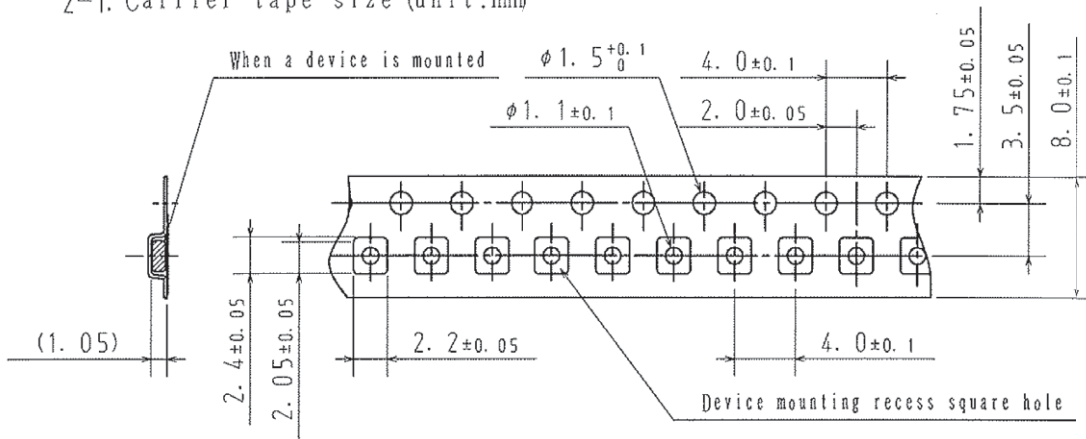
NOTE (1)

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

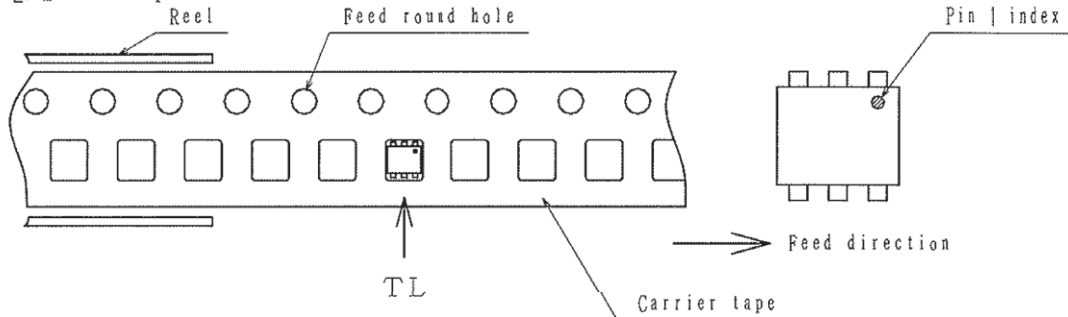
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



2-2. Device placement direction

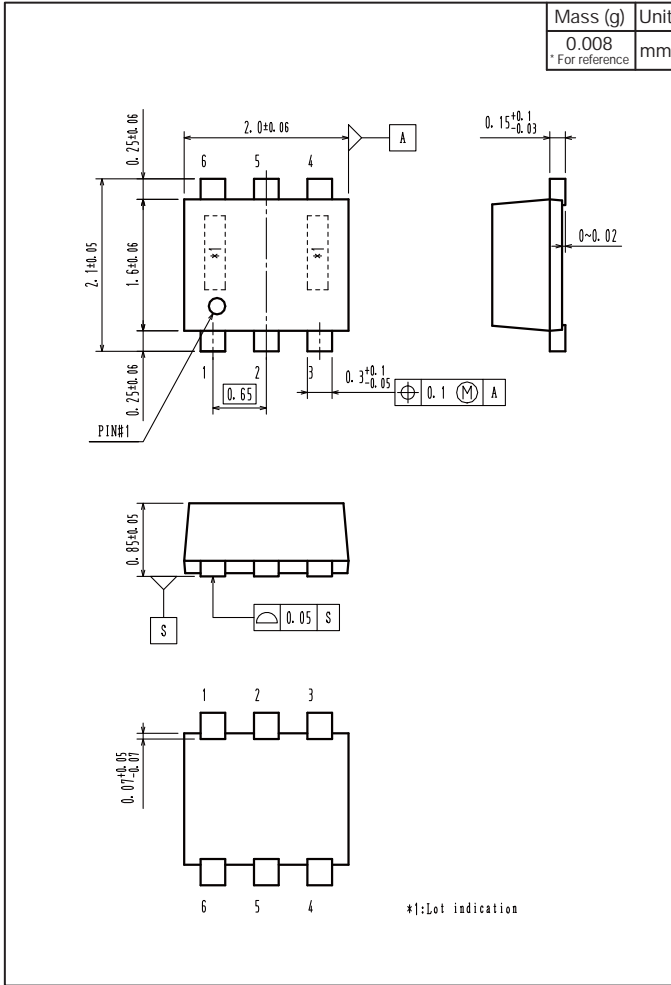


Those with pin | index on the feed hole side.....TL

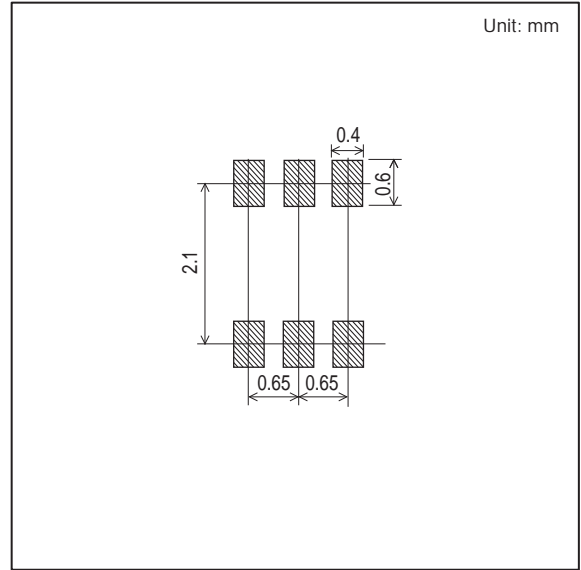
# MCH6541

## Outline Drawing

MCH6541-TL-E



## Land Pattern Example



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