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Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
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Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

Ordering number : EN6611B

MCH6103/MCH6203

Bipolar Transistor
(–)50V, (–)1A, Low V_{CE}(sat), (PNP)NPN Single MCPH6

ON Semiconductor®
http://onsemi.com

Applicaitons
- Relay drivers, lamp drivers, motor drivers, flash

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

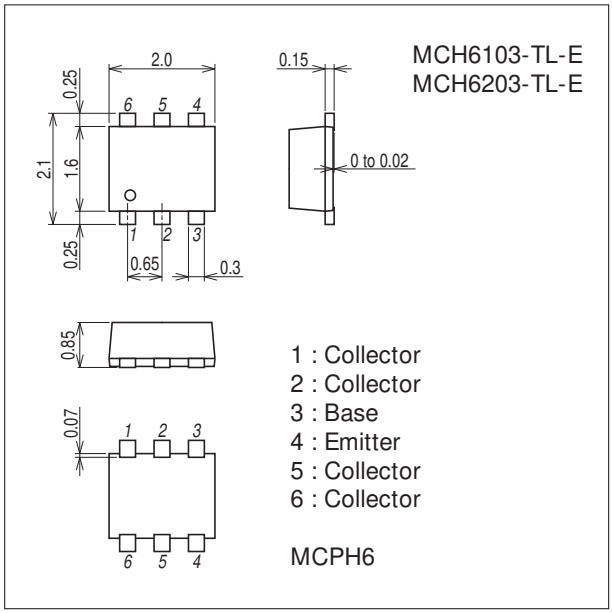
Specifications ( ) : MCH6103

Absolute Maximum Ratings at Ta=25°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}		(–)5	V

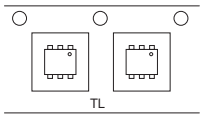
Continued on next page.

Package Dimensions
unit : mm (typ)
7022A-007

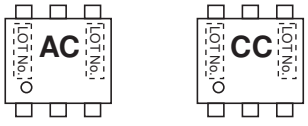


Product & Package Information
- Package : MCPH6
- JEITA, JEDEC : SC-88, SC-70-6, SOT-363
- Minimum Packing Quantity : 3,000 pcs./reel

Packing Type: TL

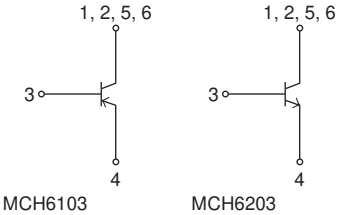


Marking



MCH6103 MCH6203

Electrical Connection



MCH6103 MCH6203

Continued from preceding page.

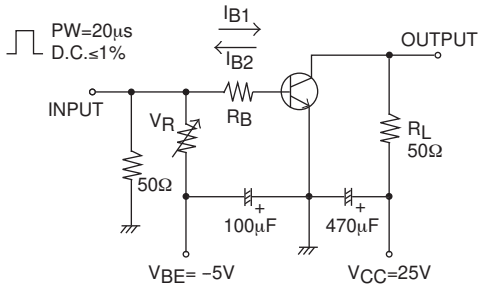
Parameter	Symbol	Conditions	Ratings	Unit
Collector Current	I_C		(–)1.0	A
Collector Current (Pulse)	I_{CP}		(–)3	A
Base Current	I_B		200	mA
Collector Dissipation	P_C	When mounted on ceramic substrate (600mm^2×0.8mm)	1.0	W
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		–55 to +150	°C

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.

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			(–)0.1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(–)4V, I_C=0A			(–)0.1	μA
DC Current Gain	h_{FE}	V_{CE}=(–)2V, I_C=(–)100mA	200		560	
Gain-Bandwidth Product	f_T	V_{CE}=(–)10V, I_C=(–)300mA		420		MHz
Output Capacitance	Cob	V_{CB}=(–)10V, f=1MHz		(9)6		pF
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)1	I_C=(–)500mA, I_B=(–)10mA		(–280)130	(–430)190	mV
	V_{CE}(sat)2	I_C=(–)300mA, I_B=(–)6mA		(–145)90	(–220)135	mV
Base-to-Emitter Saturation Voltage	V_{BE}(sat)	I_C=(–)500mA, I_B=(–)10mA		(–)0.81	(–)1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(–)10μA, I_E=0A	(–50)80			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CES}$	I_C=(–)100μA, R_{BE}=0Ω	(–50)80			V
	$V_{(BR)CEO}$	I_C=(–)1mA, R_{BE}=∞	(–)50			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=(–)10μA, I_C=0A	(–)5			V
Turn-On Time	t_{on}	See specified Test Circuit.		(36)38		ns
Storage Time	t_{stg}			(173)332		ns
Fall Time	t_f			(28)40		ns

Switching Time Test Circuit

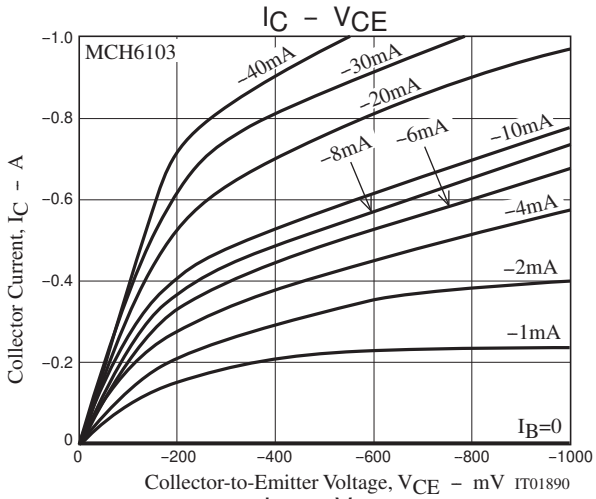


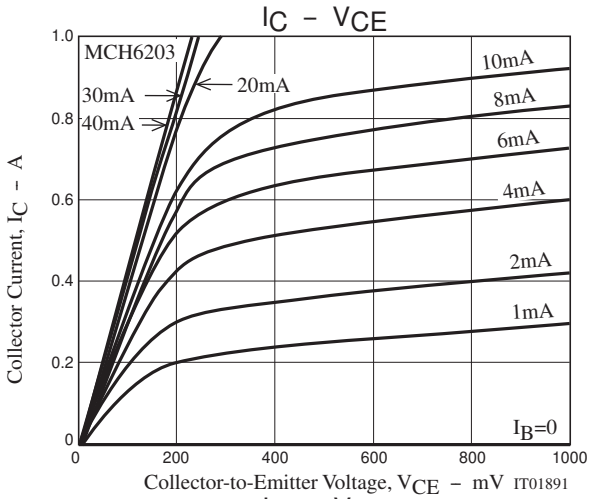
I_C=20I_{B1}= –20I_{B2}=500mA

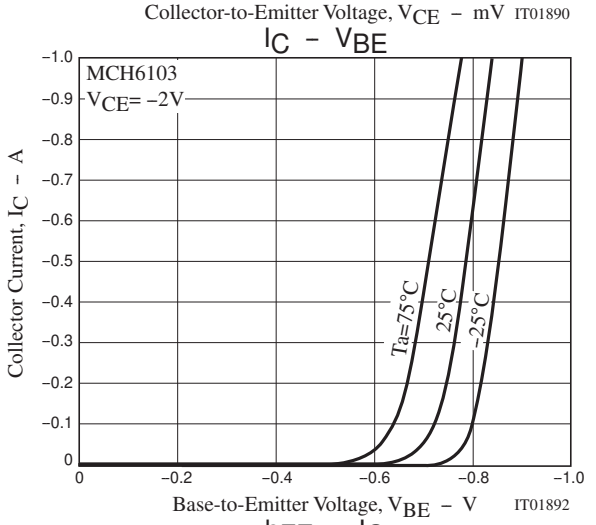
For PNP, the polarity is reversed.

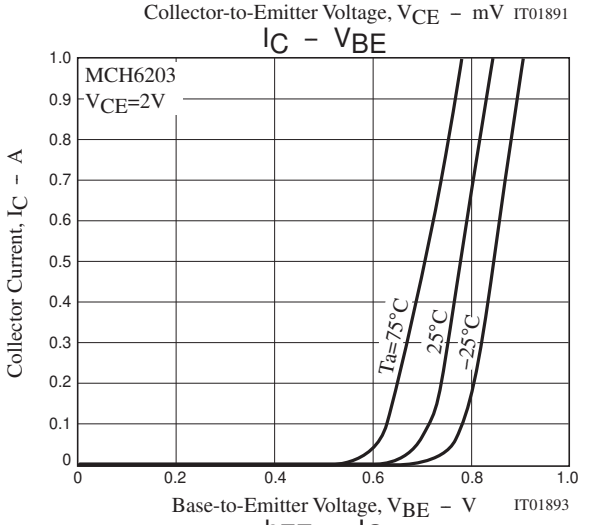
Ordering Information

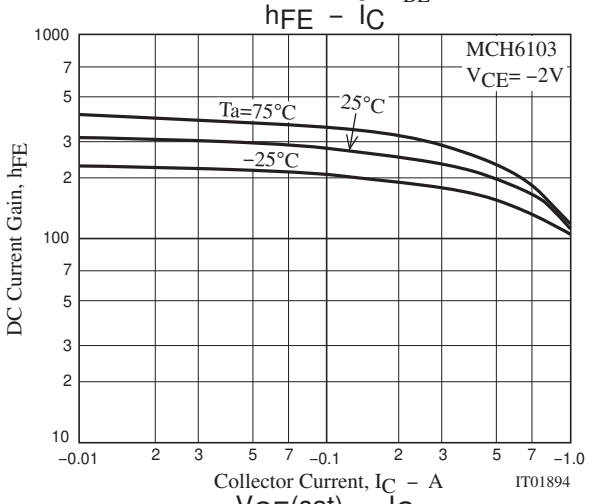
Device	Package	Shipping	memo
MCH6103-TL-E	MCPH6	3,000pcs./reel	Pb Free
MCH6203-TL-E	MCPH6	3,000pcs./reel	

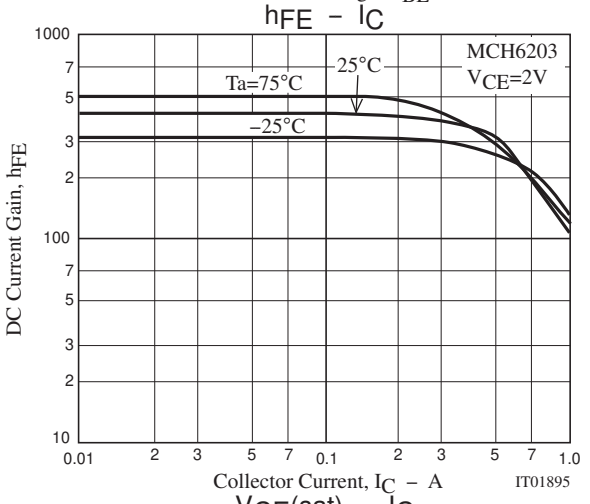

IC – VCE
MCH6103
–40mA
–30mA
–20mA
–8mA
–6mA
–10mA
–4mA
–2mA
–1mA
IB=0
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – mV
IT01890

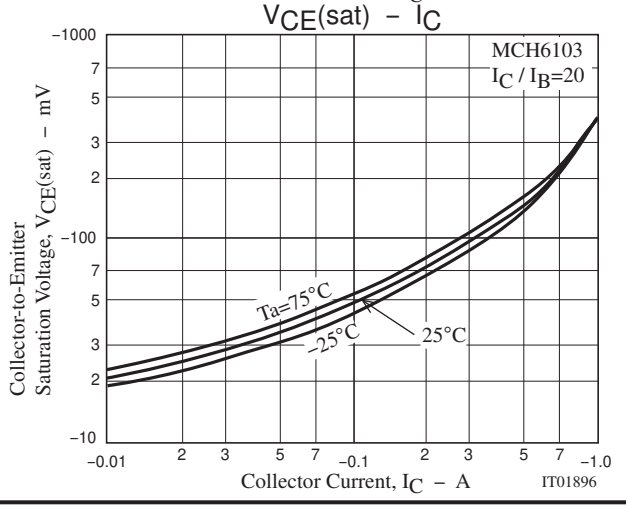

IC – VCE
MCH6203
30mA
40mA
20mA
10mA
8mA
6mA
4mA
2mA
1mA
IB=0
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – mV
IT01891

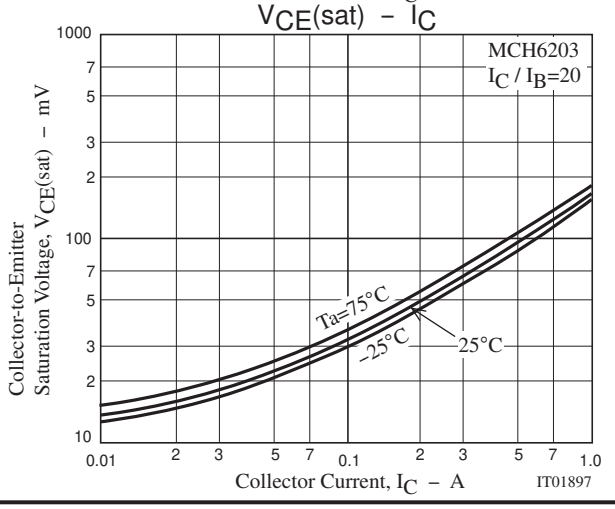

IC – VBE
MCH6103
VCE= –2V
Ta=75°C
25°C
–25°C
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
IT01892

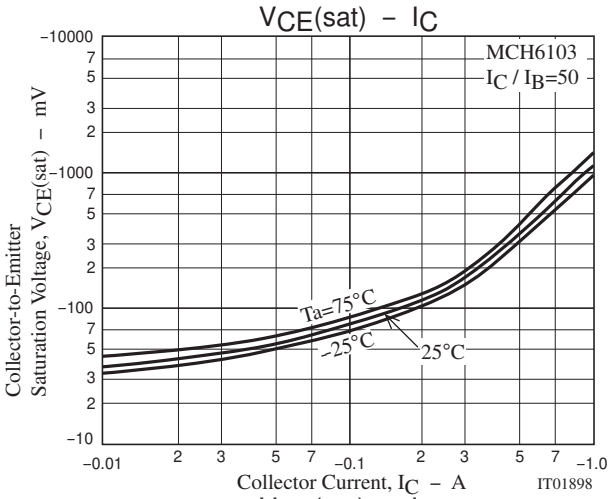

IC – VBE
MCH6203
VCE=2V
Ta=75°C
25°C
–25°C
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
IT01893

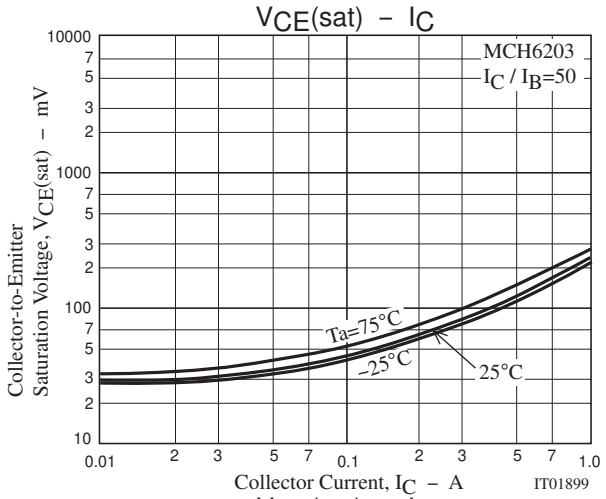

hFE – IC
MCH6103
VCE= –2V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
IT01894

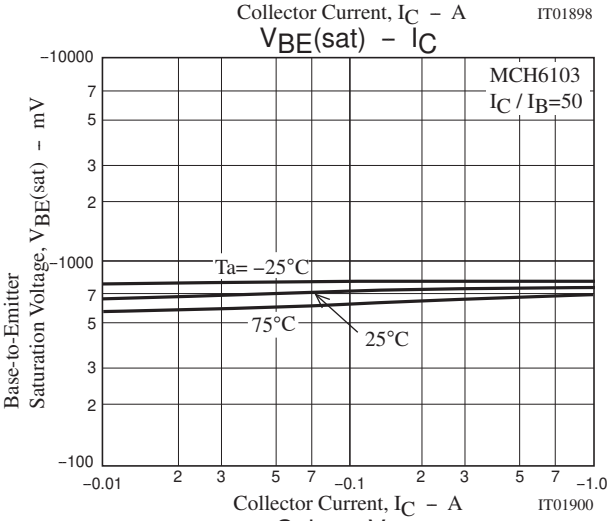

hFE – IC
MCH6203
VCE=2V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
IT01895

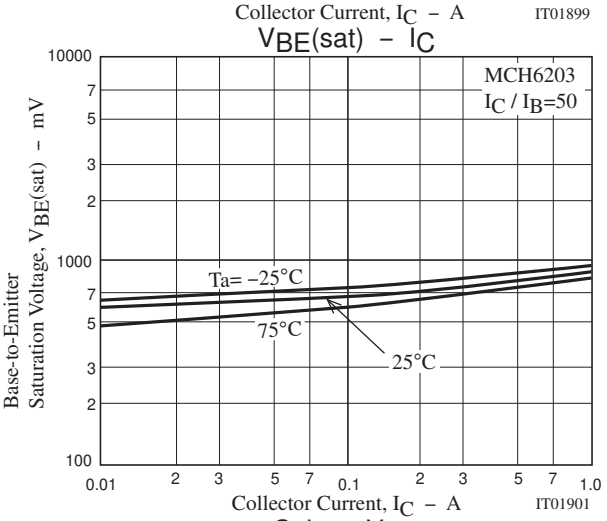

VCE(sat) – IC
MCH6103
IC / IB=20
Ta=75°C
–25°C
25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
IT01896

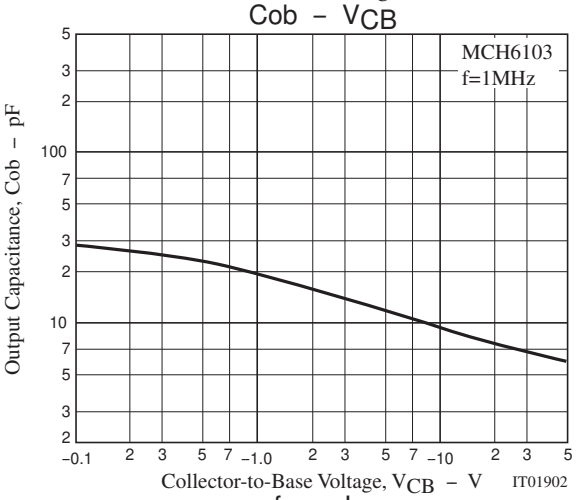

VCE(sat) – IC
MCH6203
IC / IB=20
Ta=75°C
–25°C
25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
IT01897

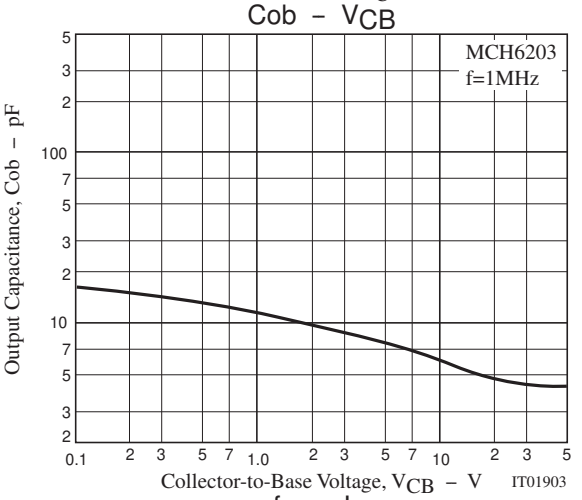

VCE(sat) – IC
MCH6103
IC / IB=50
Ta=75°C
–25°C
25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
IT01898

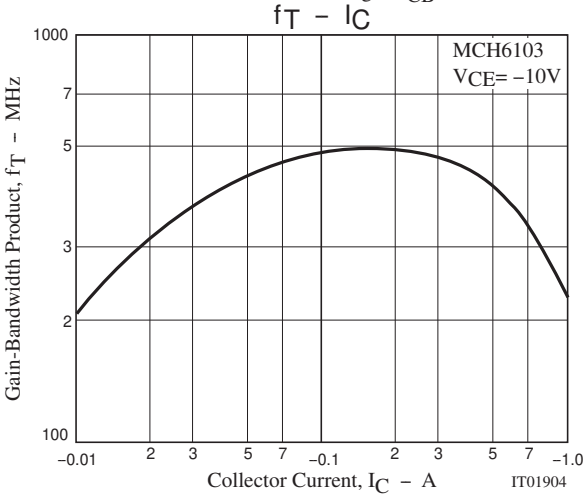

VCE(sat) – IC
MCH6203
IC / IB=50
Ta=75°C
–25°C
25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
IT01899

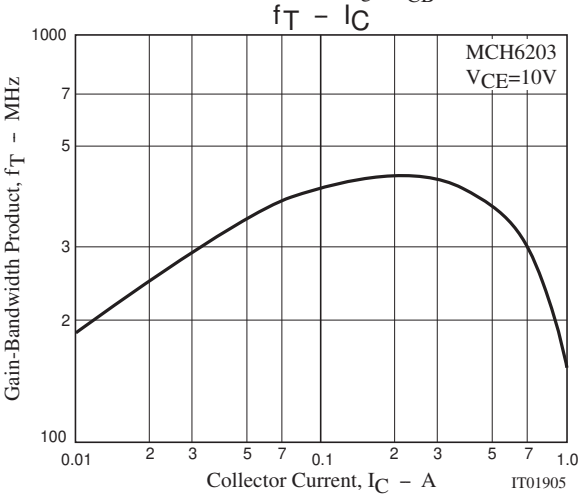

VBE(sat) – IC
MCH6103
IC / IB=50
Ta= –25°C
75°C
25°C
Base-to-Emitter Saturation Voltage, VBE(sat) – mV
Collector Current, IC – A
IT01900

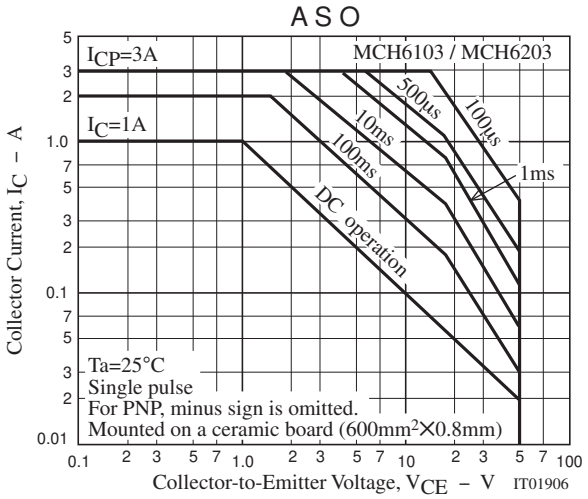

VBE(sat) – IC
MCH6203
IC / IB=50
Ta= –25°C
75°C
25°C
Base-to-Emitter Saturation Voltage, VBE(sat) – mV
Collector Current, IC – A
IT01901

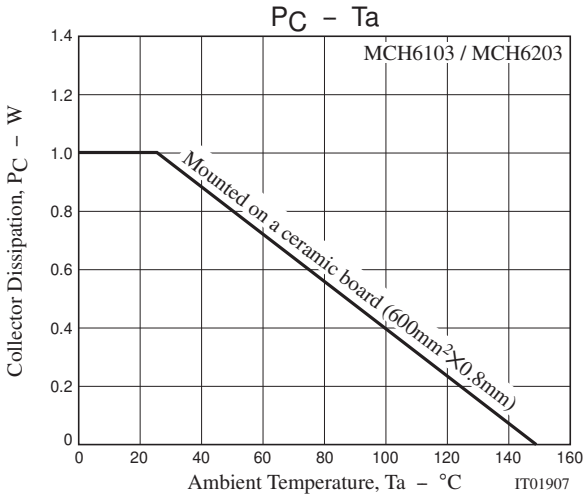

Cob – VCB
MCH6103
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT01902


Cob – VCB
MCH6203
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT01903


fT – IC
MCH6103
VCE= –10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT01904


fT – IC
MCH6203
VCE=10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT01905


ASO
MCH6103 / MCH6203
I_{CP}=3A
I_C=1A
500µs
100µs
10ms
100ms
1ms
DC operation
Ta=25°C
Single pulse
For PNP, minus sign is omitted.
Mounted on a ceramic board (600mm²×0.8mm)
Collector Current, I_C – A
Collector-to-Emitter Voltage, V_{CE} – V
IT01906


P_C – Ta
MCH6103 / MCH6203
Mounted on a ceramic board (600mm²×0.8mm)
Collector Dissipation, P_C – W
Ambient Temperature, Ta – °C
IT01907

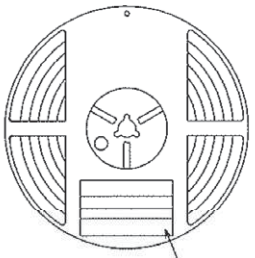
Embossed Taping Specification

MCH6103-TL-E, MCH6203-TL-E

1. Packing Format

Package Name	Carrier Tape Type	Maximun 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

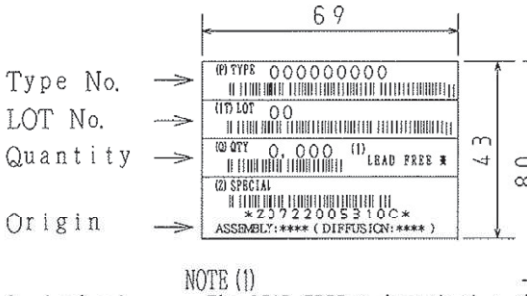
Packing method



Reel label

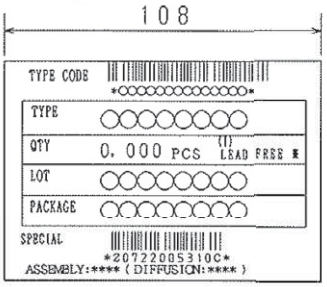
Reel label, Inner box label

(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.



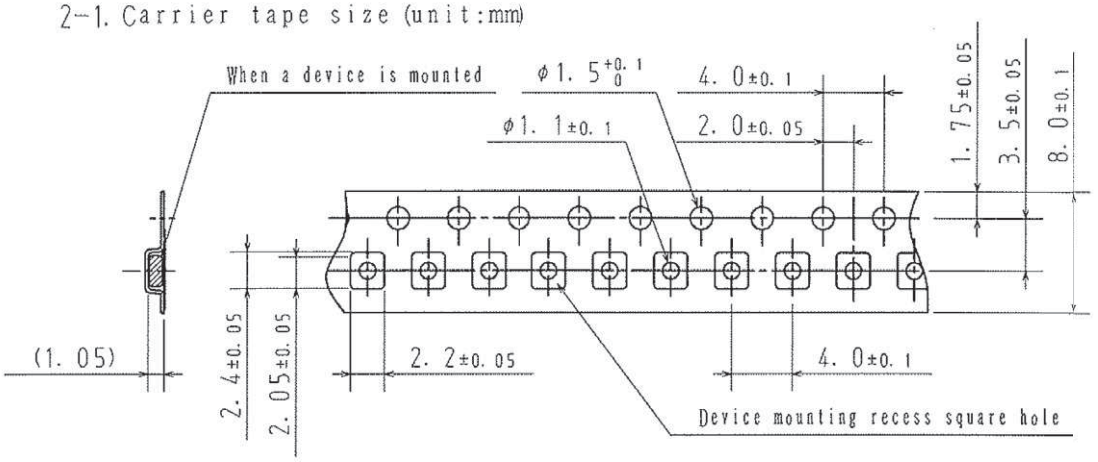
NOTE (1)

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

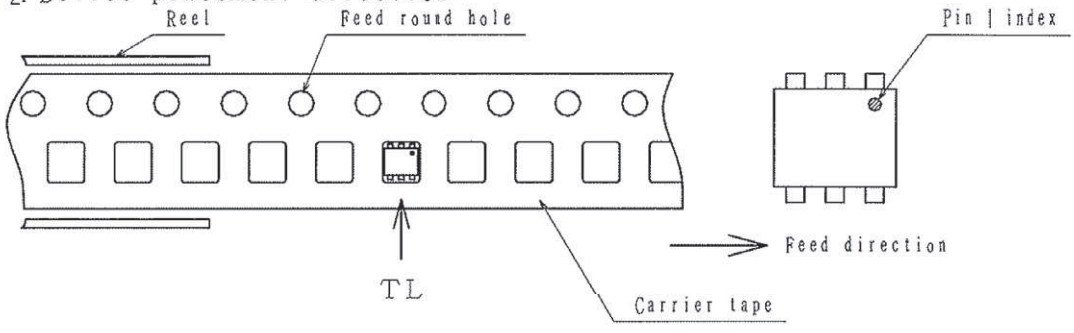
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



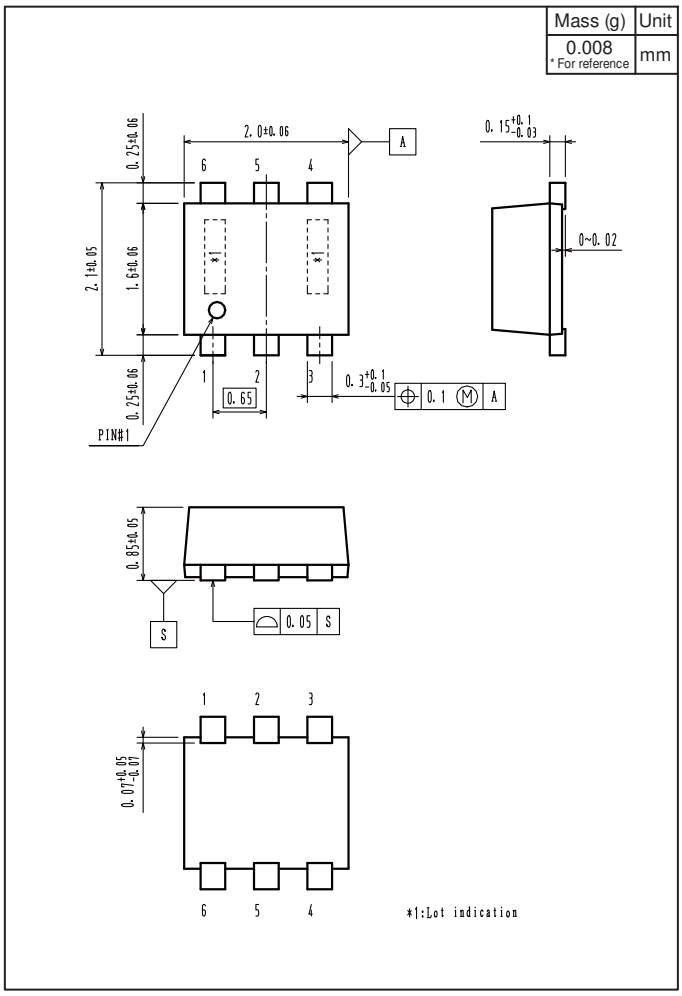
2-2. Device placement direction



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

Outline Drawing

MCH6103-TL-E, MCH6203-TL-E



Land Pattern Example