

MCH5541

PNP/NPN Bipolar Transistor (-)30V, (-)700mA, $V_{CE(sat)}$; (-220)190mV (max)



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Overview

MCH5541 is (-)30V, (-)700mA, $V_{CE(sat)}$; (-220)190mV (max), PNP/NPN 2 in 1 type MCPH5, Bipolar Transistor.

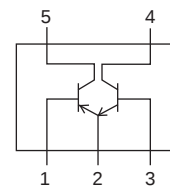
Features

- Composite type with a PNP / NPN transistor contained in one package, facilitating high-density mounting
- Ultrasmall package permitting applied sets to be small and slim.
Package : SC-88AFL / MCPH5 (2.0 × 1.6 × 0.85 mm)

Typical Applications

- MOSFET gate drivers
- Lamp drivers
- Relay drivers
- Motor drivers

Electrical Connection



- 1 : Base1
2 : Emitter Common
3 : Base2
4 : Collector2
5 : Collector1
Top view

ORDERING INFORMATION

See detailed ordering and shipping information on page 6 of this data sheet.

SPECIFICATIONS () : PNP

ABSOLUTE MAXIMUM RATINGS at $T_a = 25^\circ\text{C}$ (Note 1)

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		(-30) 40	V
Collector-to-Emitter Voltage	V_{CEO}		(-30) 30	V
Emitter-to Base Voltage	V_{EBO}		(-) 5	V
Collector Current	I_C		(-) 700	mA
Collector Current (Pulse)	I_{CP}	$PW \leq 10\mu s$	(-) 3	A
Collector Dissipation	P_C	Mounted on a ceramic board (600mm ² x 0.8m)	0.5	W
Junction Temperature	T_j		150	$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to +150	$^\circ\text{C}$

Note 1 : Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

ELECTRICAL CHARACTERISTICS at $T_a = 25^\circ\text{C}$ (Note 2)

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	$V_{CB}=(-)30V, I_E=0$			(-) 100	nA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=(-)4V, I_C=0$			(-) 100	nA
DC Current Gain	h_{FE}	$V_{CE}=(-)2V, I_C=(-)50mA$	(200) 300		(500) 800	
Gain-Bandwidth Product	f_T	$V_{CE}=(-)2V, I_C=(-)50mA$		(520) 540		MHz
Output Capacitance	C_{ob}	$V_{CB}=(-)10V, f=1MHz$		(4.7) 3.3		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)200mA, I_B=(-)10mA$		(-110) 85	(-220) 190	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=(-)200mA, I_B=(-)10mA$		(-) 0.9	(-) 1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-)10\mu A, I_E=0$	(-30) 40			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=(-)1mA, R_{BE}=\infty$	(-) 30			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=(-)10\mu A, I_C=0$	(-) 5			V

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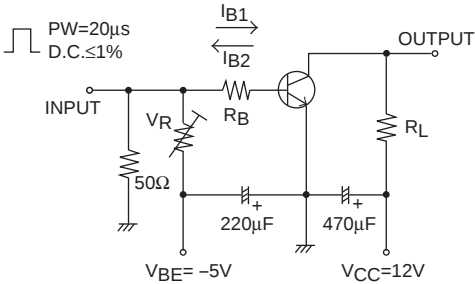
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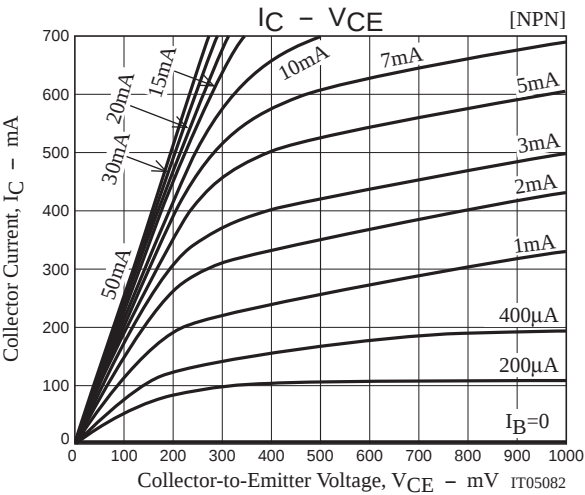
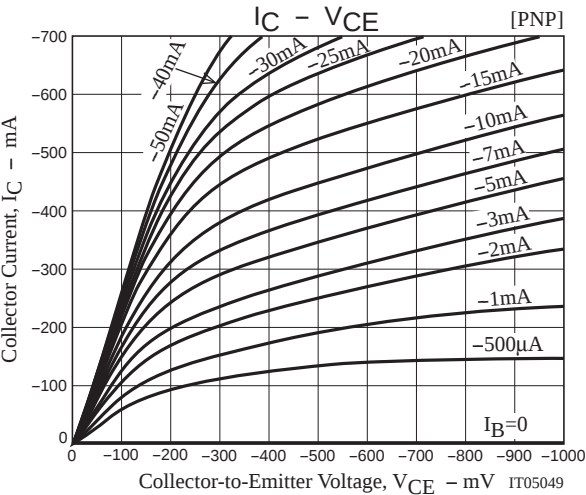
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Turn-ON Time	t_{on}	See specified Test Circuit.		35		ns
Storage Time	t_{stg}	See specified Test Circuit.		(125) 255		ns
Fall Time	t_f	See specified Test Circuit.		(25) 40		ns

Note 2 : Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

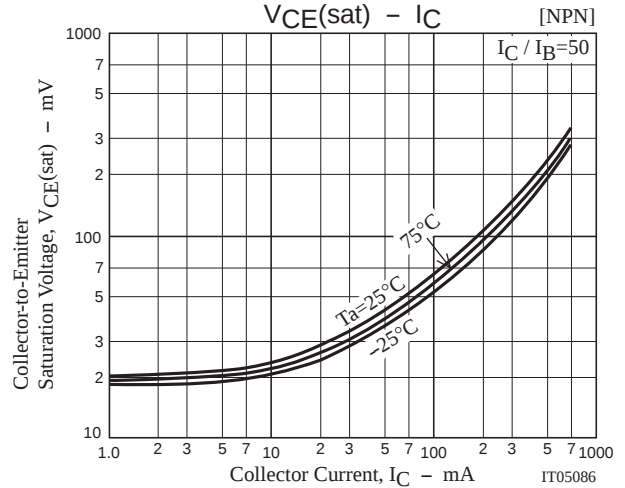
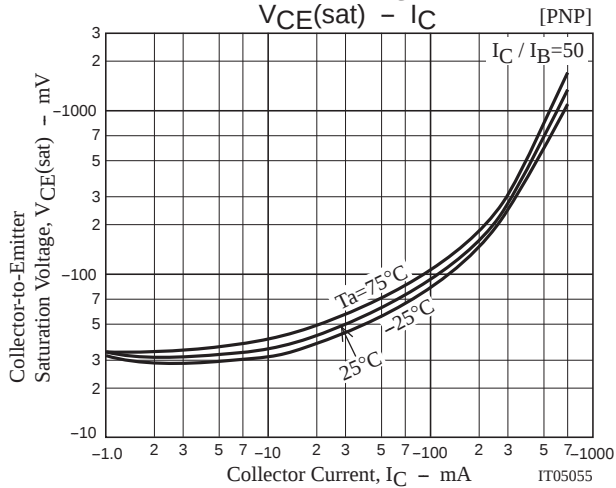
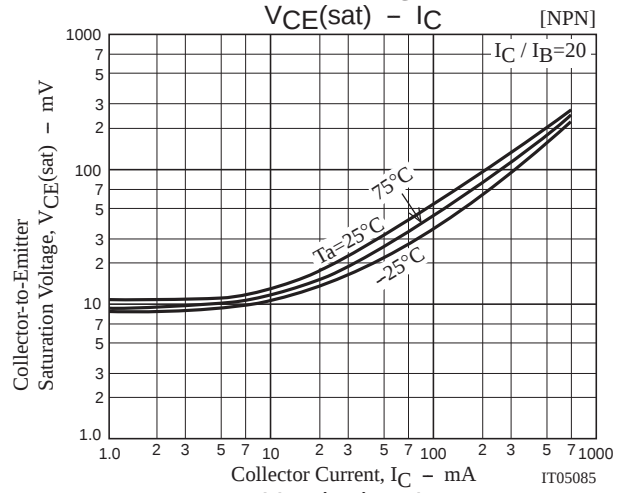
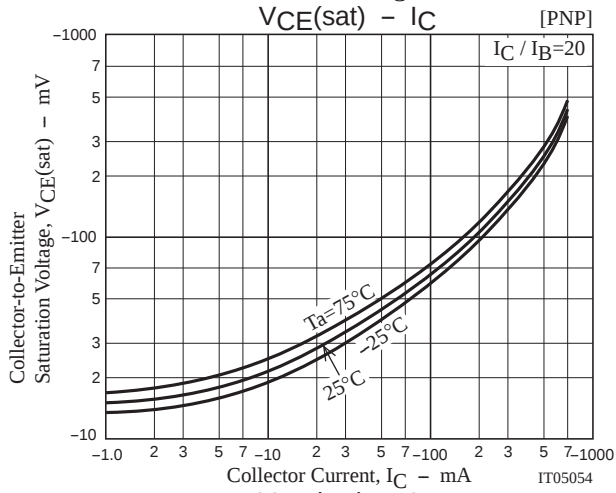
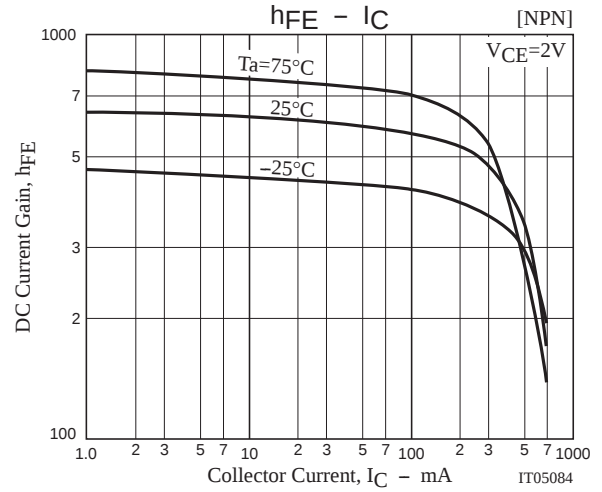
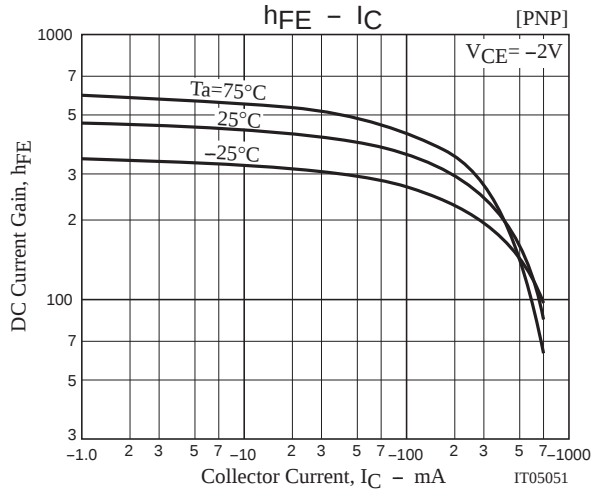
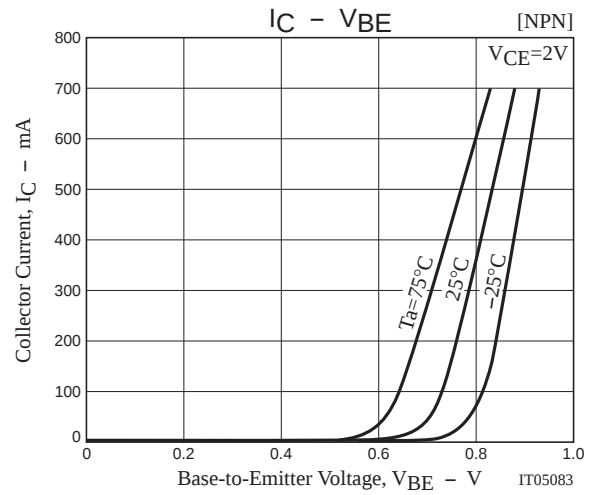
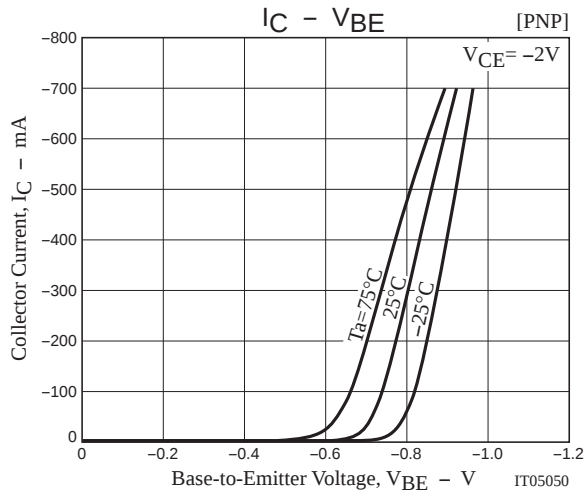
Switching Time Test Circuit



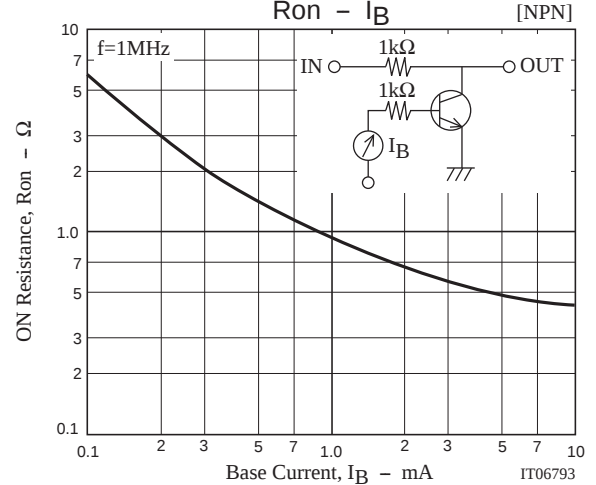
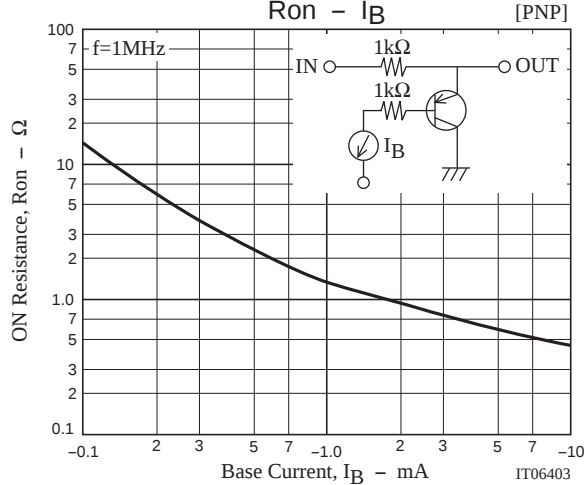
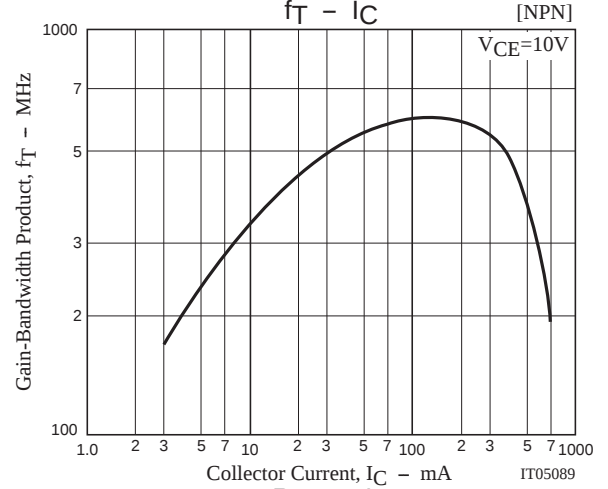
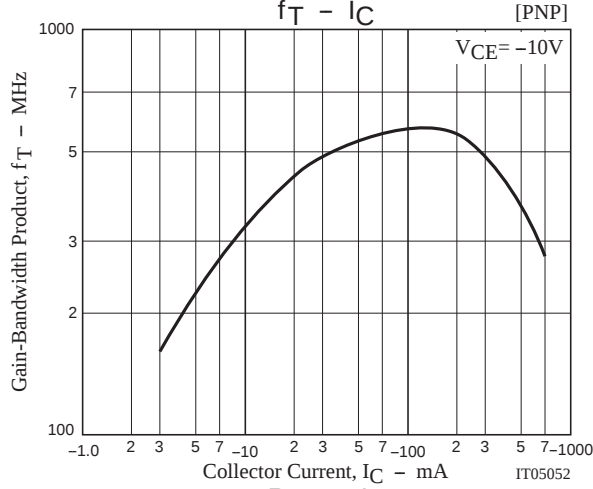
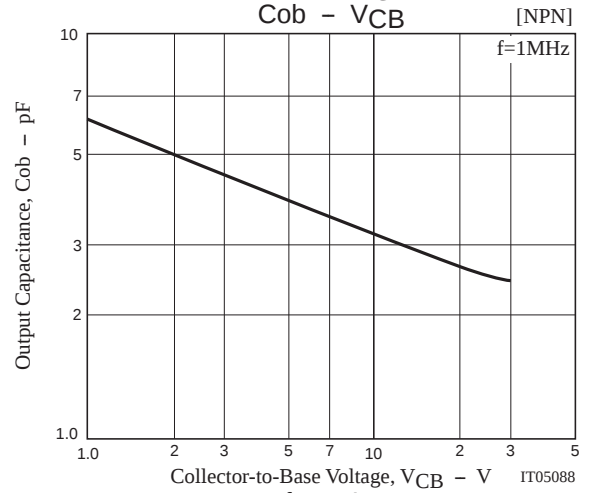
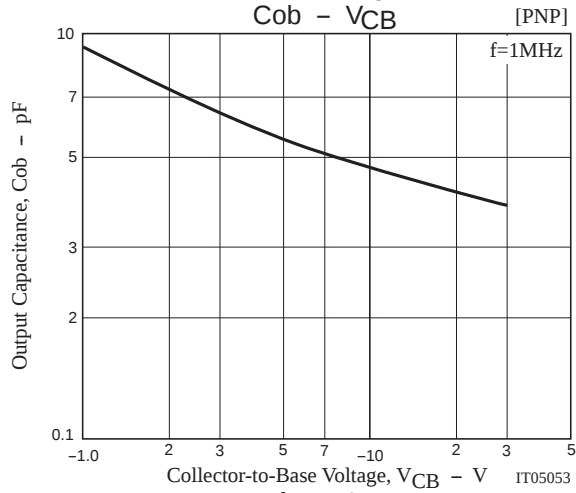
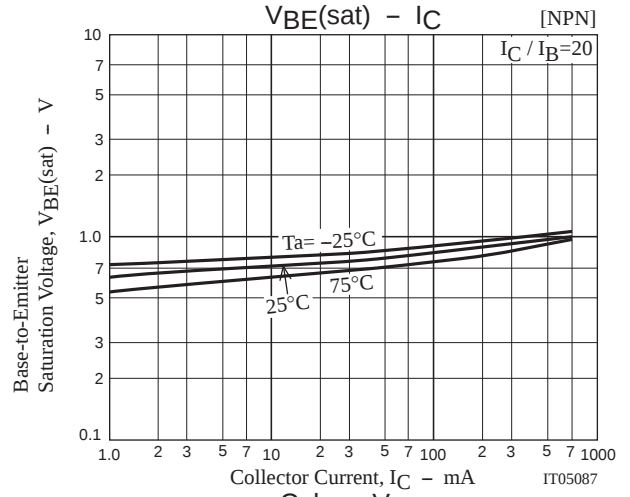
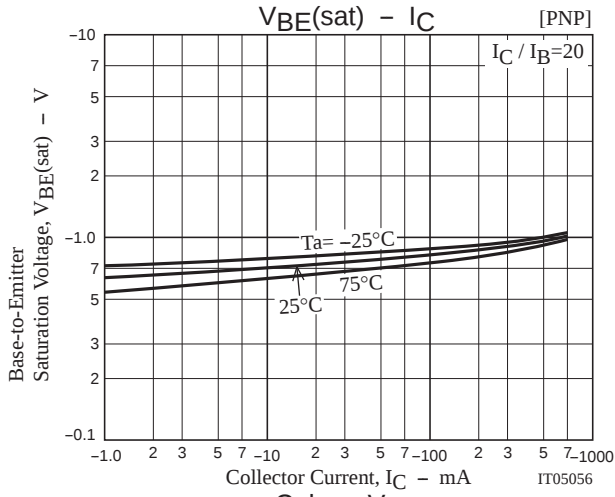
$20I_{B1} = -20I_{B2} = I_C = 300\text{mA}$
For PNP, minus sign is omitted.



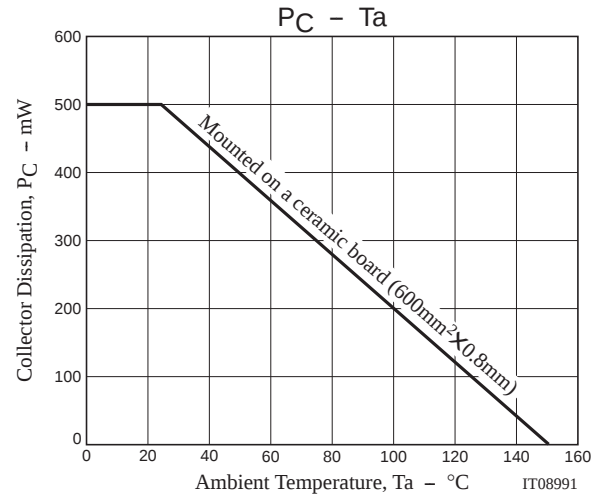
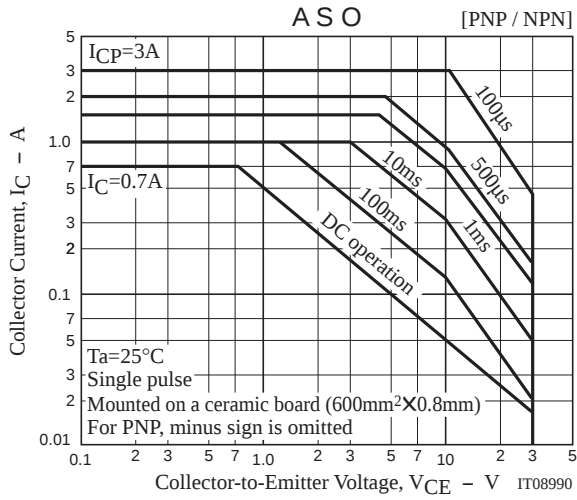
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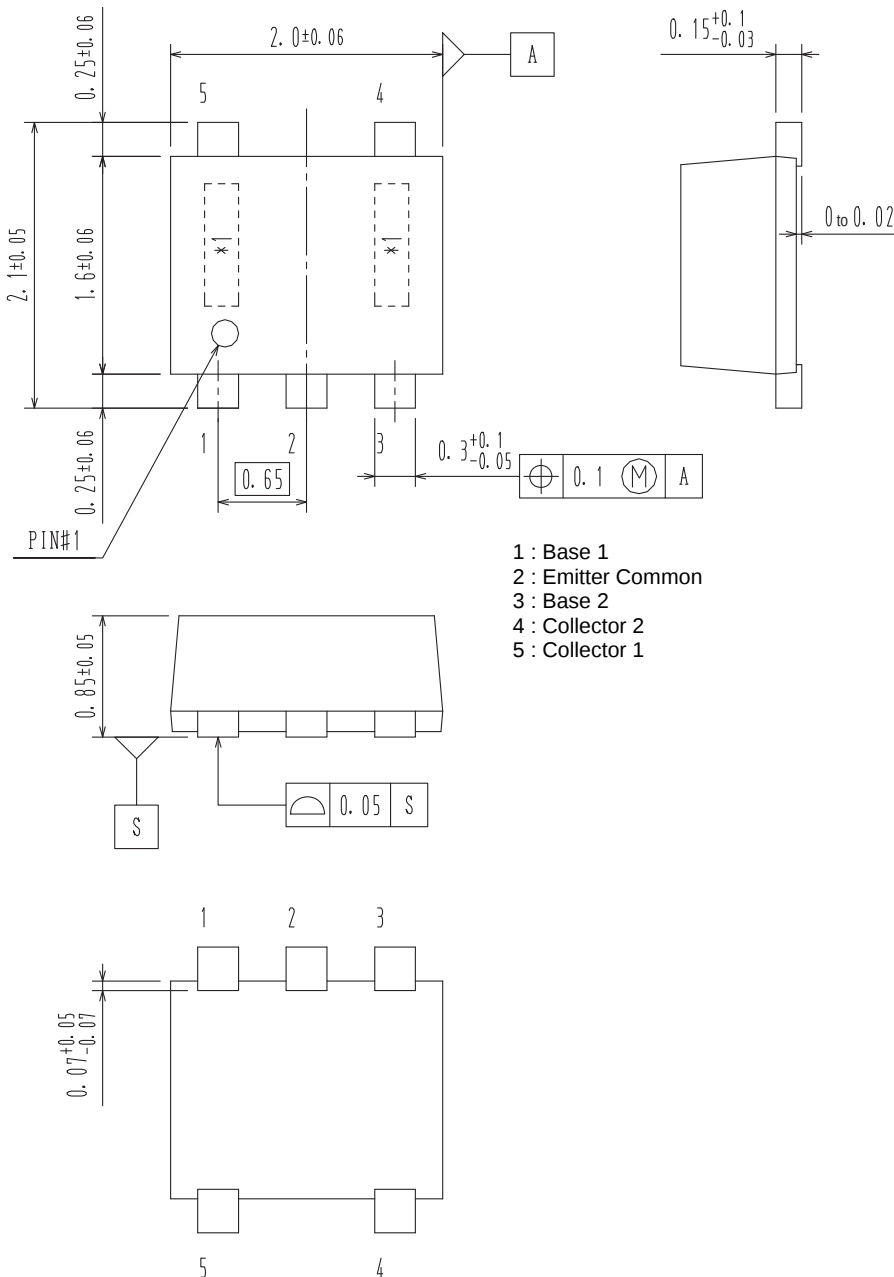
PACKAGE DIMENSIONS

unit : mm

SC-88AFL / MCPH5

CASE 419AP

ISSUE 0



MCH5541

ORDERING INFORMATION

Device	Marking	Package	Shipping (Qty / Packing)
MCH5541-TL-E	E1	SC-88AFL / MCPH5 (Pb-Free)	3000 / Tape & Reel

† For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D. http://www.onsemi.com/pub_link/Collateral/BRD8011-D.PDF

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