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# MCH6542

PNP / NPN Epitaxial Planar Silicon Transistors  
**Push-Pull Circuit Applications**

## 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>CBO</sub>		(-30)40	V
Collector-to-Emitter Voltage	V <sub>CEO</sub>		(-)30	V
Emitter-to-Base Voltage	V <sub>EBO</sub>		(-)5	V
Collector Current	I <sub>C</sub>		(-)300	mA
Collector Current (Pulse)	I <sub>CP</sub>		(-)900	mA
Collector Dissipation	P <sub>C</sub>	Mounted on a ceramic board (600mm <sup>2</sup> ×0.8m) 1unit	0.5	W
Total Power Dissipation	P <sub>T</sub>	Mounted on a ceramic board (600mm <sup>2</sup> ×0.8m)	0.55	W
Junction Temperature	T <sub>J</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +150	°C

### Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I <sub>CBO</sub>	V <sub>CB</sub> =(-)30V, I <sub>E</sub> =0A			(-)100	nA
Emitter Cutoff Current	I <sub>EBO</sub>	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> =(-)10mA	(200)300		(500)800	
Gain-Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> =(-)10V, I <sub>C</sub> =(-)50mA		(520)380		MHz
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> =(-)10V, f=1MHz		(3)2.4		pF

Marking : EQ

Continued on next page.

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# MCH6542

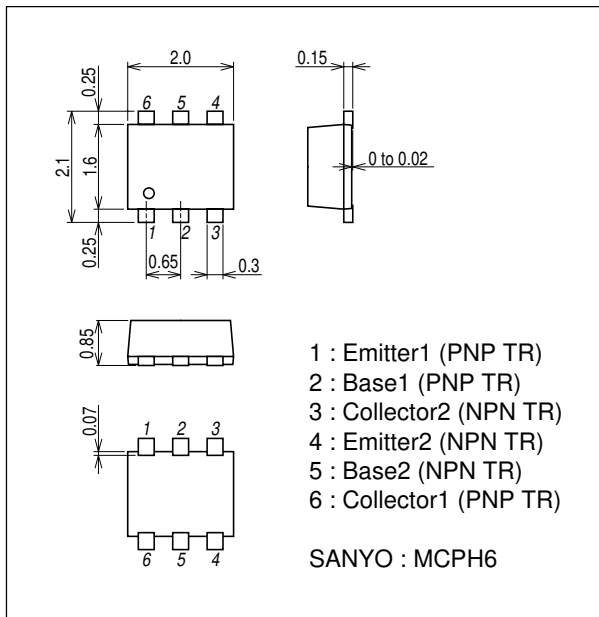
Continued from preceding page.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)100\text{mA}$ , $I_B=(-)5\text{mA}$		(-110)100	(-220)200	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=(-)100\text{mA}$ , $I_B=(-)5\text{mA}$		(-)0.9	(-)1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-)10\mu\text{A}$ , $I_E=0\text{A}$	(-30)40			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=(-)1\text{mA}$ , $R_{BE}=\infty$	(-)30			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=(-)10\mu\text{A}$ , $I_C=0\text{A}$	(-)5			V
Turn-On Time	$t_{on}$	See specified Test Circuit.		(39)42		ns
Storage Time	$t_{stg}$	See specified Test Circuit.		(200)135		ns
Fall Time	$t_f$	See specified Test Circuit.		(48)90		ns

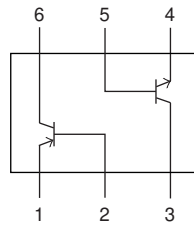
## Package Dimensions

unit : mm (typ)

7022A-012



## Electrical Connection

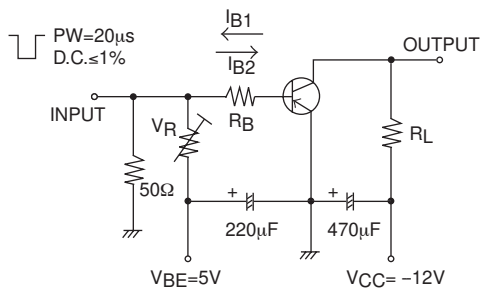


- 1 : Emitter1 (PNP TR)
- 2 : Base1 (PNP TR)
- 3 : Collector2 (NPN TR)
- 4 : Emitter2 (NPN TR)
- 5 : Base2 (NPN TR)
- 6 : Collector1 (PNP TR)

Top view

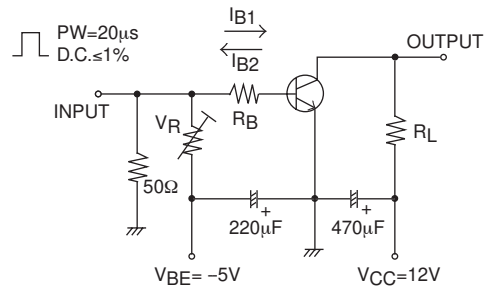
## Switching Time Test Circuit

[PNP]



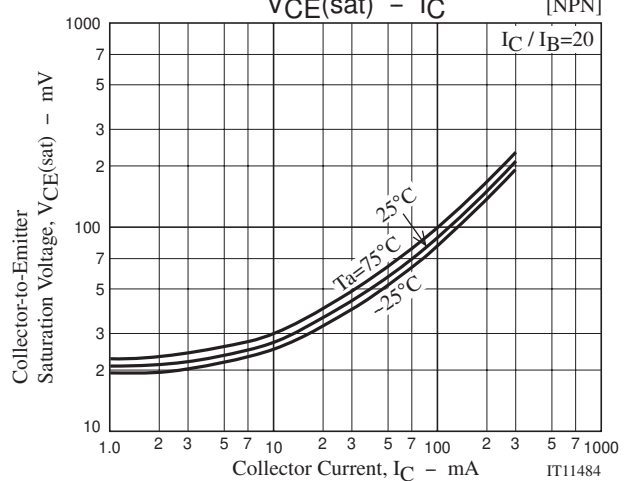
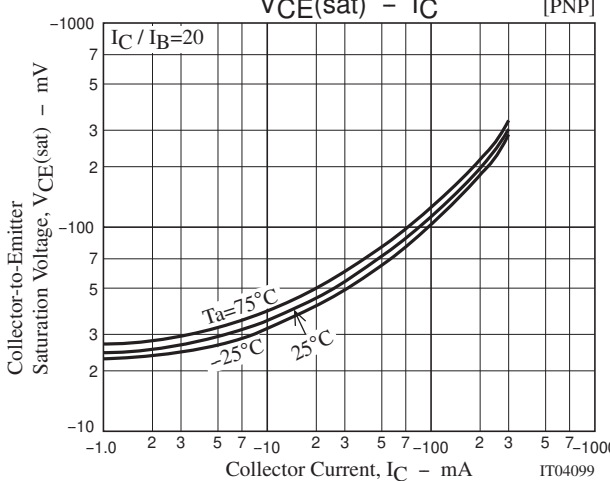
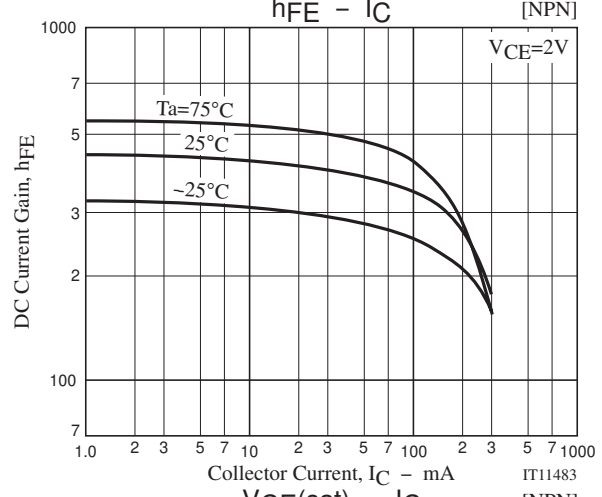
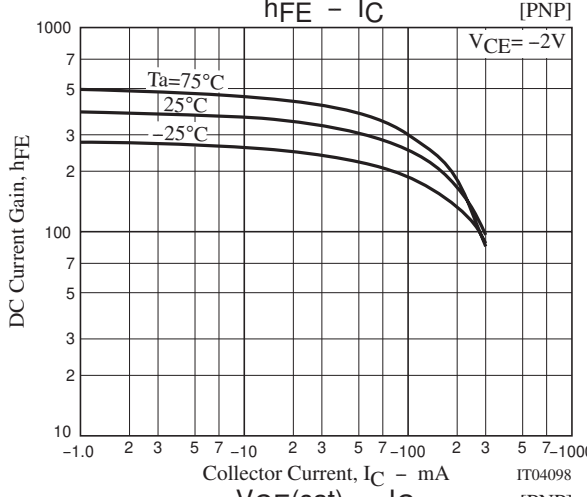
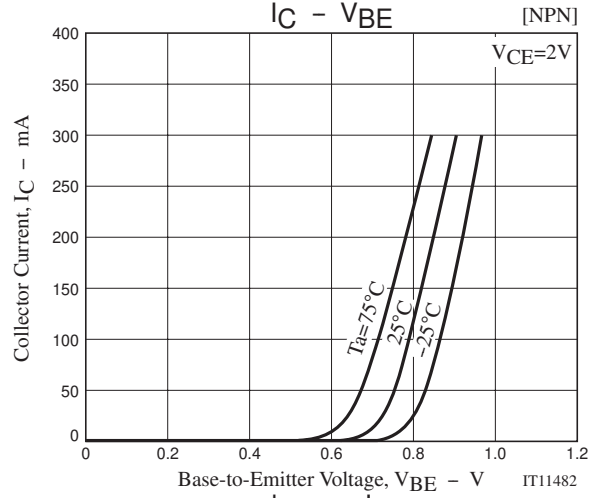
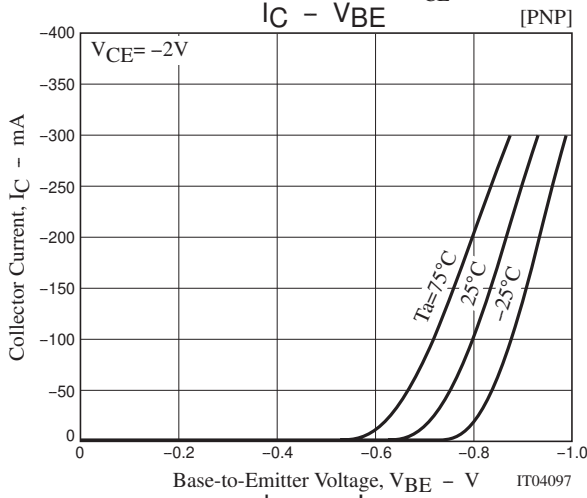
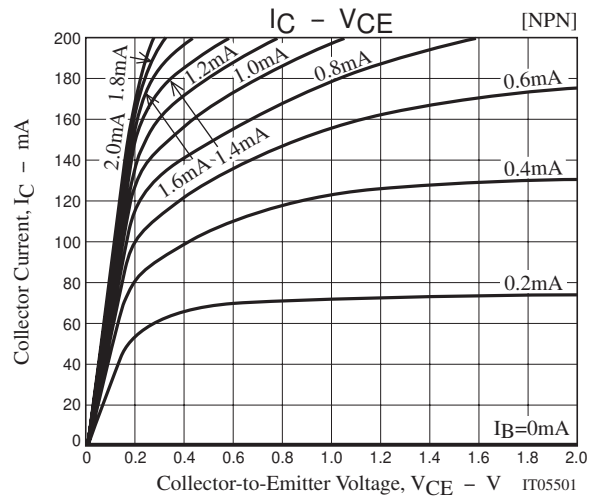
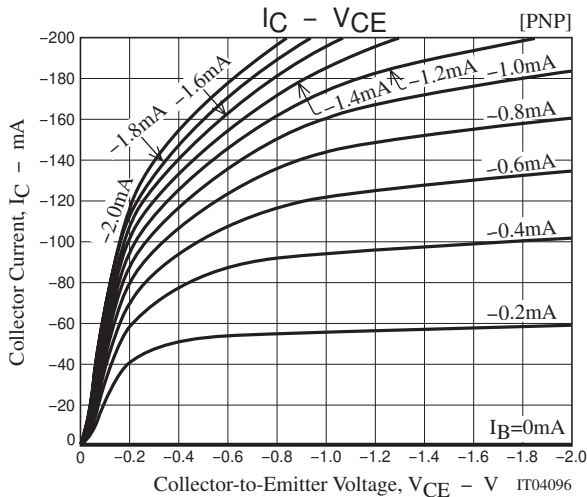
$$I_C=20I_{B1} = -20I_{B2} = -100\text{mA}$$

[NPN]

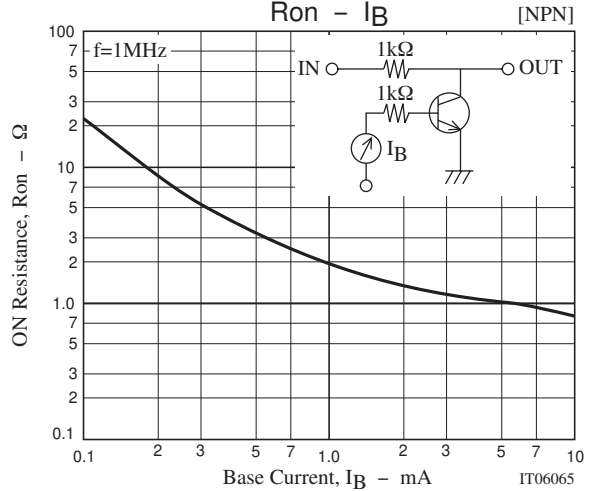
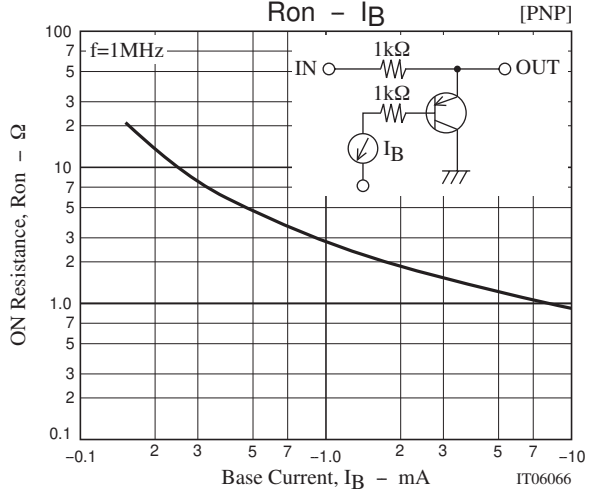
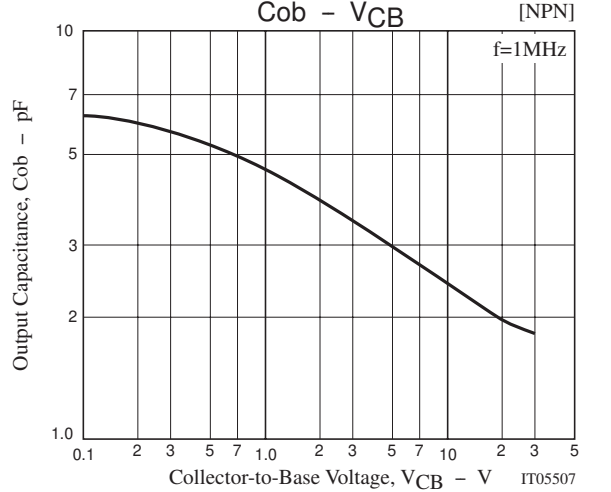
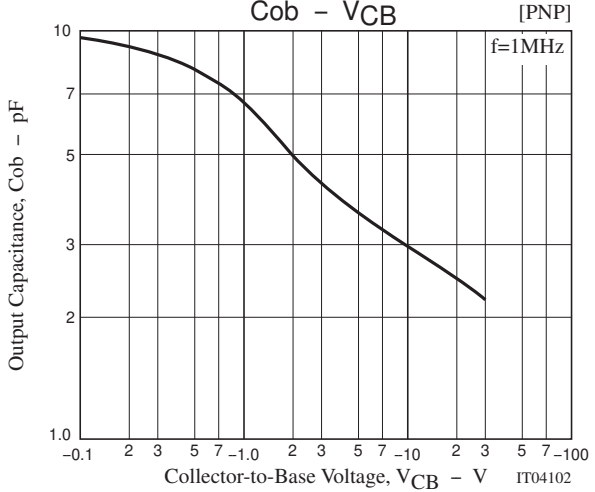
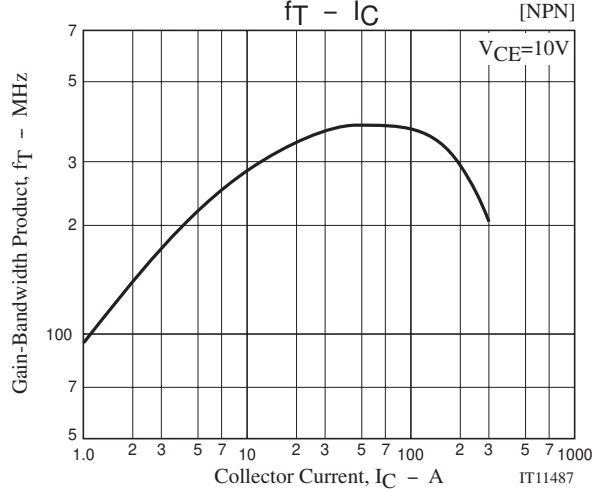
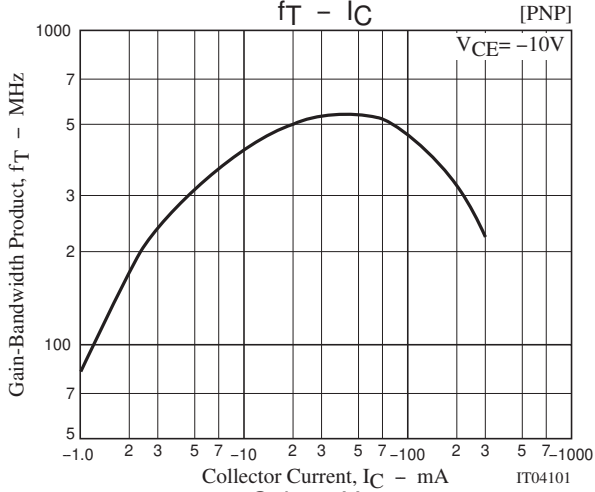
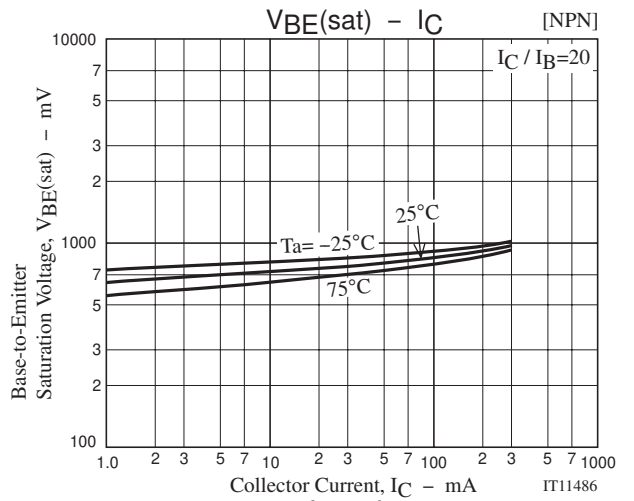
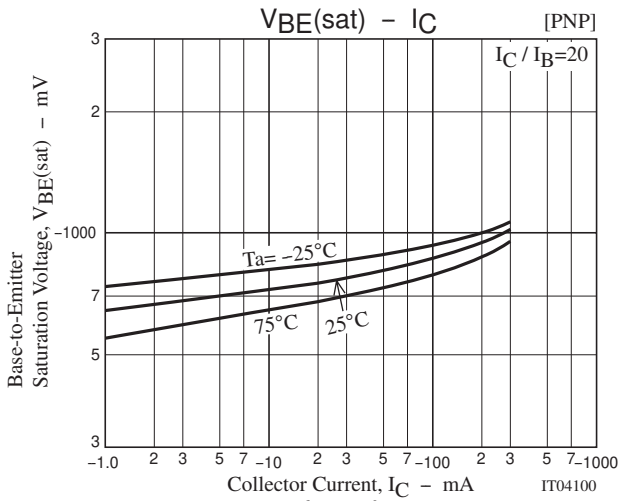


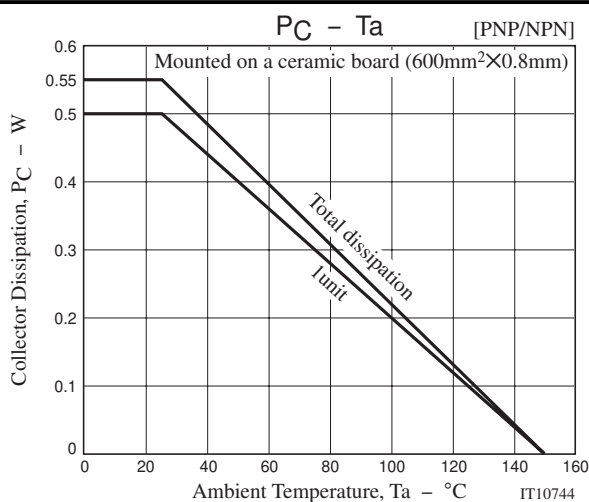
$$I_C=20I_{B1} = -20I_{B2} = 300\text{mA}$$

# MCH6542



# MCH6542





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