



# MCH6103/MCH6203

## DC/DC Converter Applications

### Applications

- Relay drivers, lamp drivers, motor drivers and strobos.

### Features

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

### Specifications

( ) : MCH6103

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

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
Collector Current	$I_C$		(-1.0)	A
Collector Current (Pulse)	$I_{CP}$		(-3)	A
Base Current	$I_B$		200	mA
Collector Dissipation	$P_C$	Mounted on a ceramic board (600mm <sup>2</sup> ×0.8mm)	1.0	W
Junction Temperature	$T_j$		150	°C
Storage Temperature	$T_{stg}$		-55 to +150	°C

#### Electrical Characteristics at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=(-)40\text{V}, I_E=0$			(-0.1)	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=(-)4\text{V}, I_C=0$			(-0.1)	$\mu\text{A}$
DC Current Gain	$h_{FE}$	$V_{CE}=(-)2\text{V}, I_C=(-)100\text{mA}$	200		560	
Gain-Bandwidth Product	$f_T$	$V_{CE}=(-)10\text{V}, I_C=(-)300\text{mA}$		420		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=(-)10\text{V}, f=1\text{MHz}$		(9)6		pF

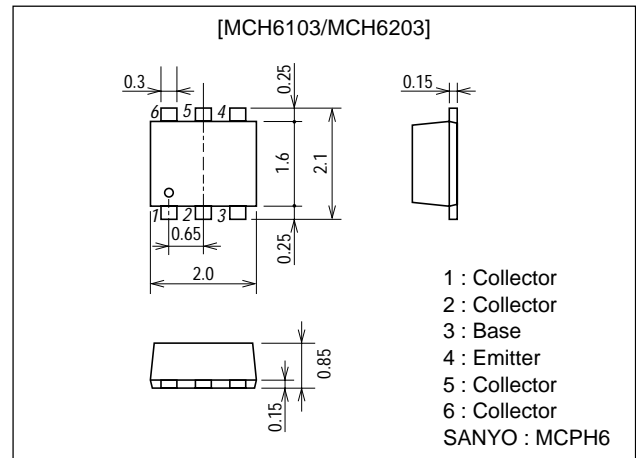
Marking : MCH6103 : AC, MCH6203 : CC

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### Package Dimensions

unit:mm

2177



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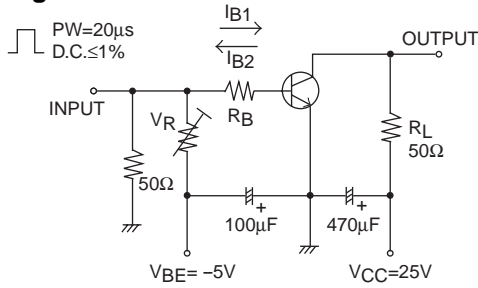
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# MCH6103/MCH6203

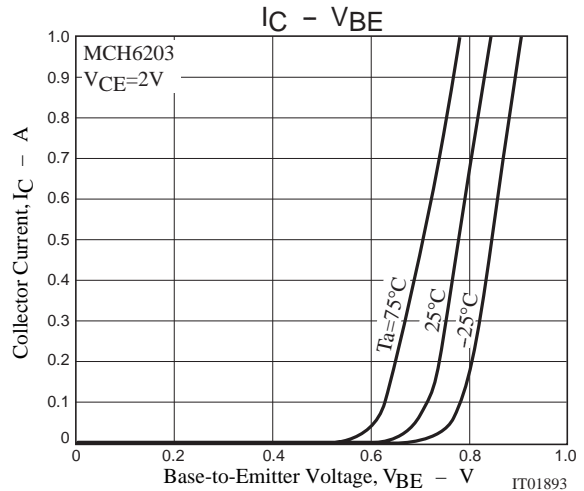
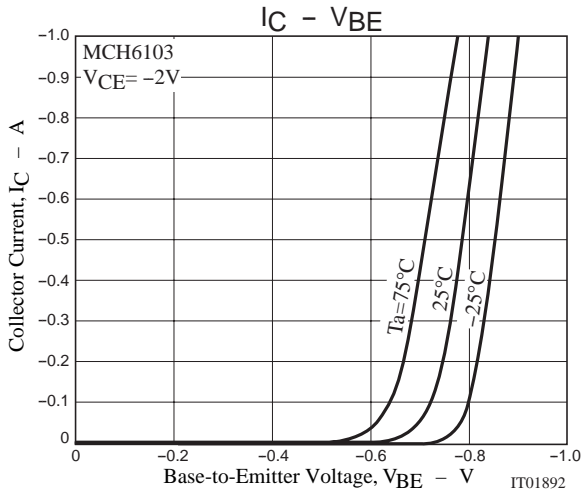
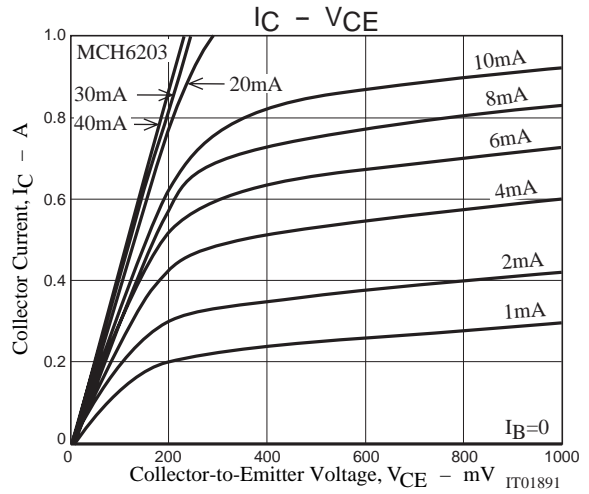
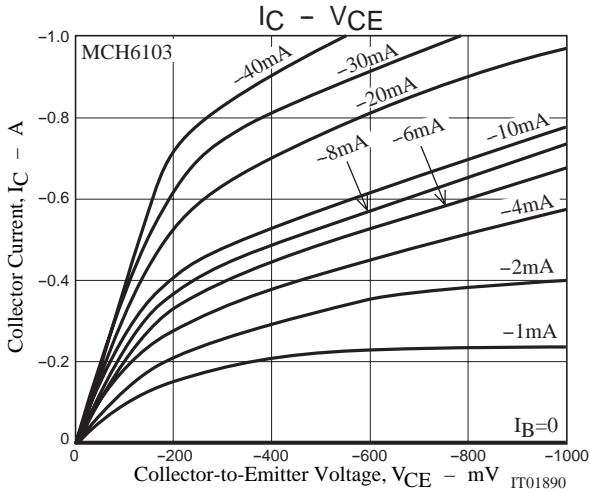
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)500mA, I_B=(-)10mA$		(-280)	(-430)	mV
				130	190	mV
				(-145)	(-220)	mV
		$I_C=(-)300mA, I_B=(-)6mA$		90	135	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=(-)500mA, I_B=(-)10mA$		(-0.81)	(-1.2)	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-)10\mu A, I_E=0$		(-50)		V
				80		V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CES}$	$I_C=(-)100\mu A, R_{BE}=0$		(-50)		V
				80		V
	$V_{(BR)CEO}$	$I_C=(-)1mA, R_{BE}=\infty$		(-50)		V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=(-)10\mu A, I_C=0$		(-5)		V
Turn-ON Time	$t_{on}$	See specified test circuit.		(36)38		ns
Storage Time	$t_{stg}$	See specified test circuit.		(173)		ns
				332		ns
Fall Time	$t_f$	See specified test circuit.		(28)40		ns

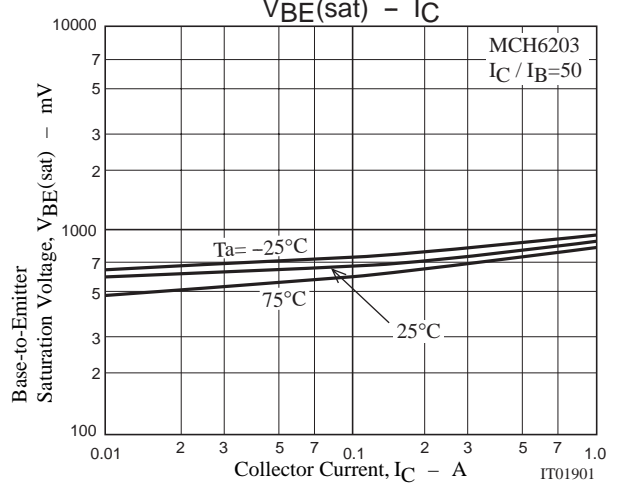
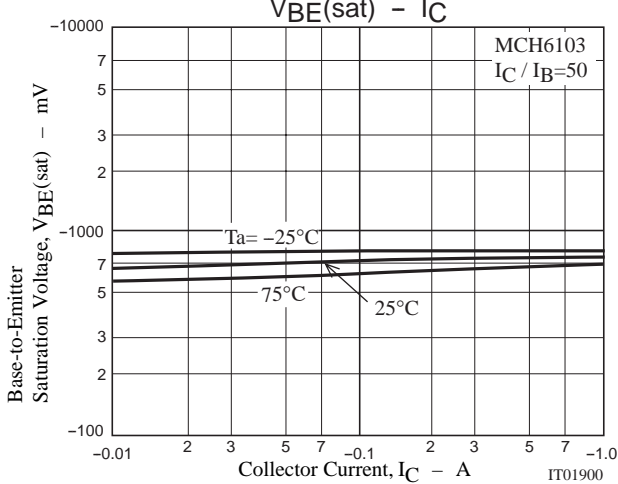
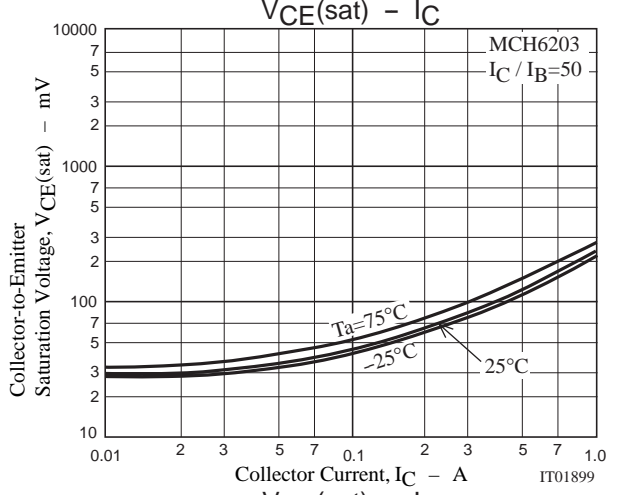
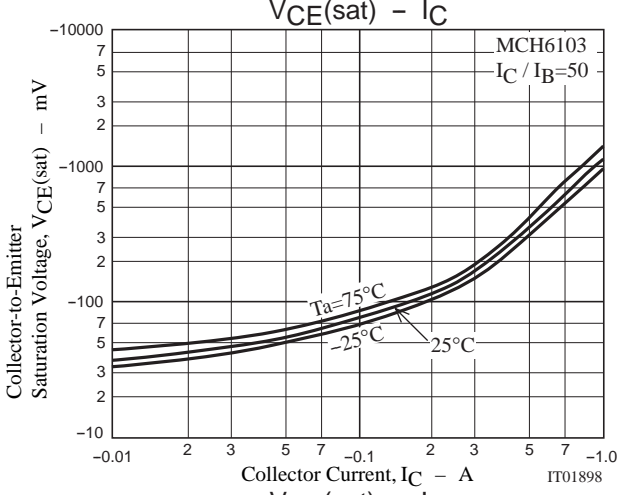
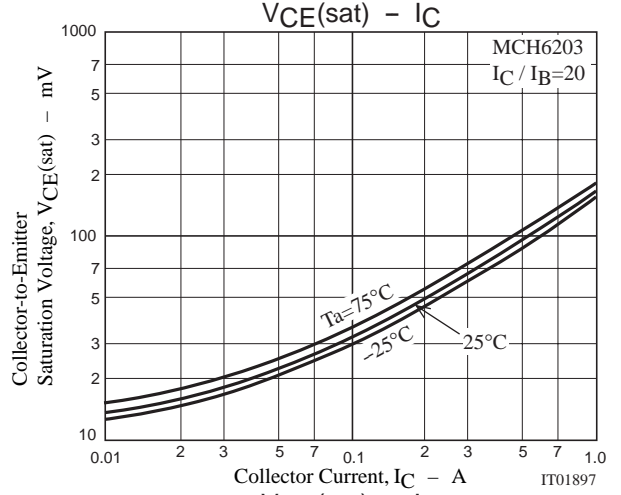
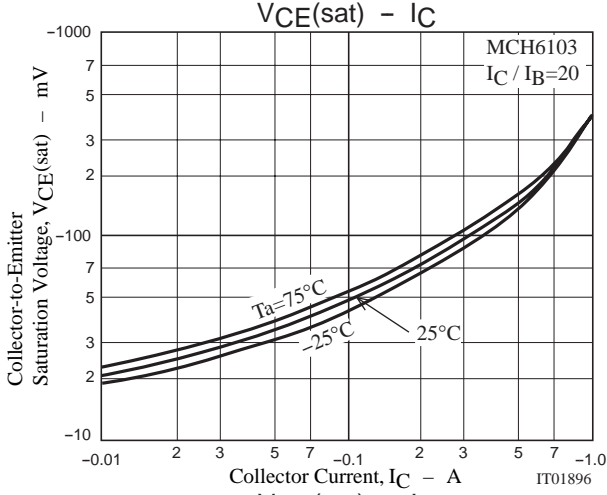
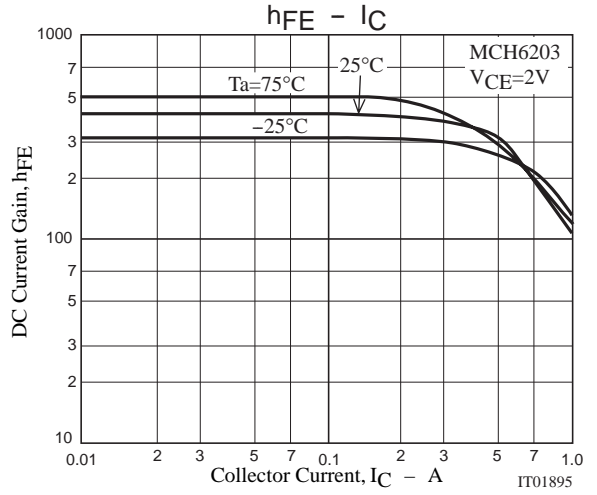
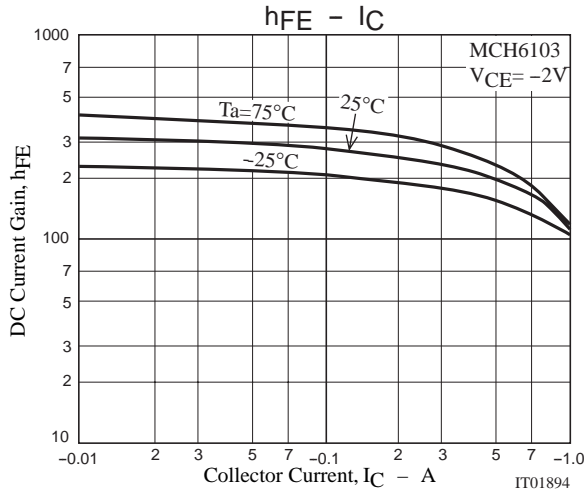
## Switching Time Test Circuit



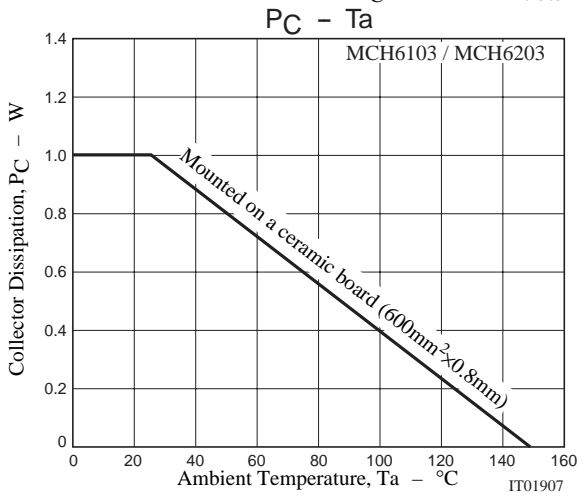
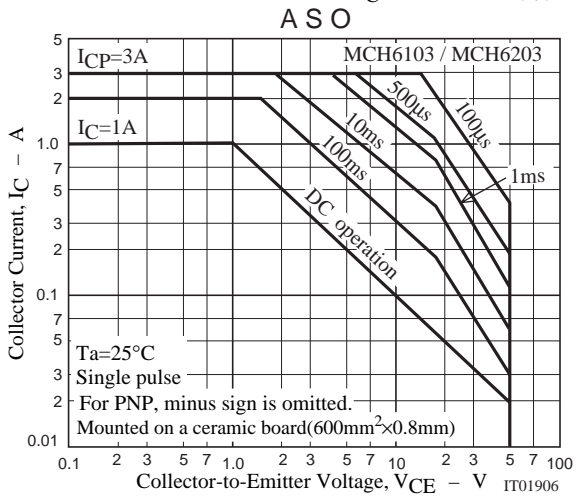
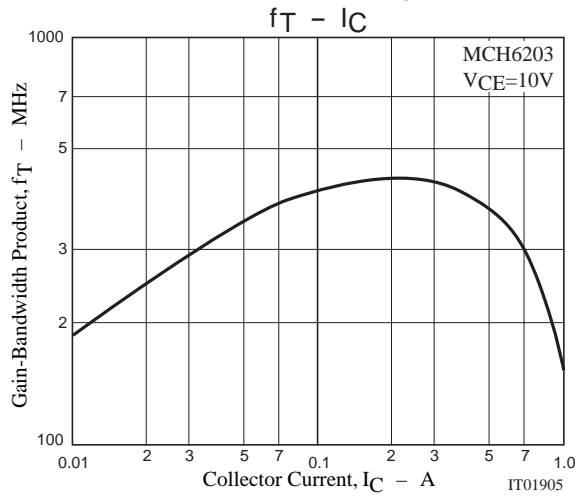
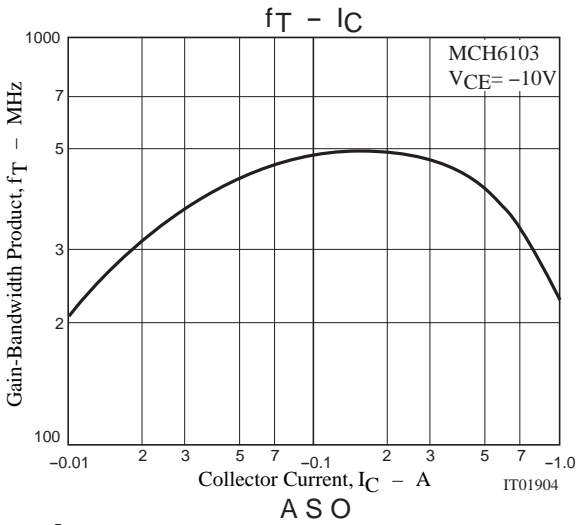
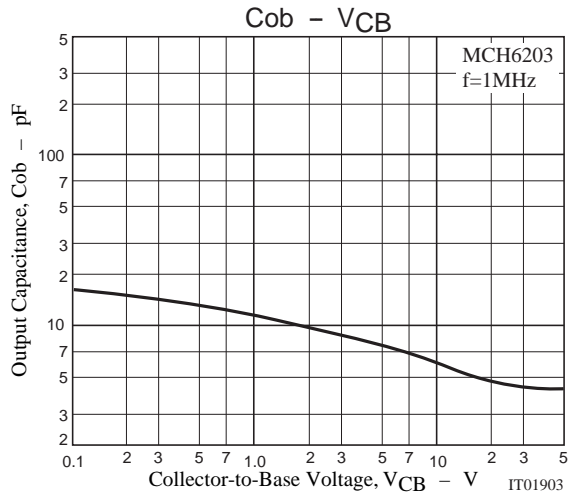
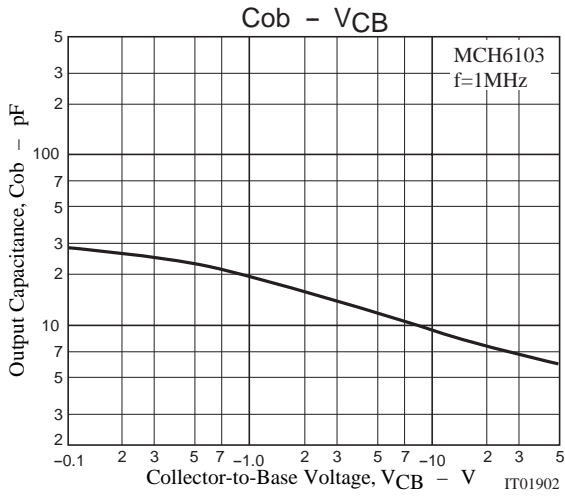
$I_C=20I_{B1} = -20I_{B2}=500mA$   
For PNP, the polarity is reversed.



# MCH6103/MCH6203



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