



SANYO Semiconductors

# DATA SHEET

## MCH3109 / MCH3209 — PNP / NPN Epitaxial Planar Silicon Transistors DC / DC Converter Applications

### Applications

- Relay drivers, lamp drivers, motor drivers, flash.

### Features

- Adoption of MBIT processes.
- High 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 ( ) : MCH3109

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>CE0</sub>		(-30)	V
Emitter-to-Base Voltage	V <sub>EB0</sub>		(-5)	V
Collector Current	I <sub>C</sub>		(-3)	A
Collector Current (Pulse)	I <sub>CP</sub>		(-5)	A
Base Current	I <sub>B</sub>		(-600)	mA
Collector Dissipation	P <sub>C</sub>	Mounted on a ceramic board (600mm <sup>2</sup> X0.8mm)	0.8	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>CB0</sub>	V <sub>CB</sub> =(-)30V, I <sub>E</sub> =0A			(-)0.1	μA
Emitter Cutoff Current	I <sub>EB0</sub>	V <sub>EB</sub> =(-)4V, I <sub>C</sub> =0A			(-)0.1	μA
DC Current Gain	h <sub>FE</sub>	V <sub>CE</sub> =(-)2V, I <sub>C</sub> =(-)500mA	200		560	
Gain-Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> =(-)10V, I <sub>C</sub> =(-)500mA		(380)450		MHz
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> =(-)10V, f=1MHz		(25)20		pF

Marking : MCH3109 : AJ / MCH3209 : CJ

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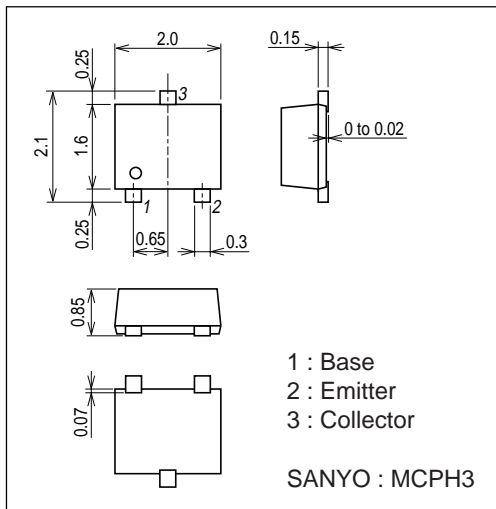
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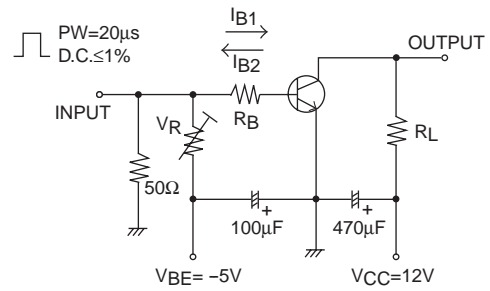
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)1}$	$I_C = (-)1.5A, I_B = (-)30mA$		(-155)	(-230)	mV
	$V_{CE(sat)2}$	$I_C = (-)1.5A, I_B = (-)75mA$		120	180	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = (-)1.5A, I_B = (-)30mA$		(-)105	(-)155	mV
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = (-)10\mu A, I_E = 0A$	(-30)40			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = (-)1mA, R_{BE} = \infty$	(-)30			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = (-)10\mu A, I_C = 0A$	(-)5			V
Turn-ON Time	$t_{on}$	See specified Test Circuit.		(50)30		ns
Storage Time	$t_{stg}$	See specified Test Circuit.		(270)300		ns
Fall Time	$t_f$	See specified Test Circuit.		(25)15		ns

## Package Dimensions

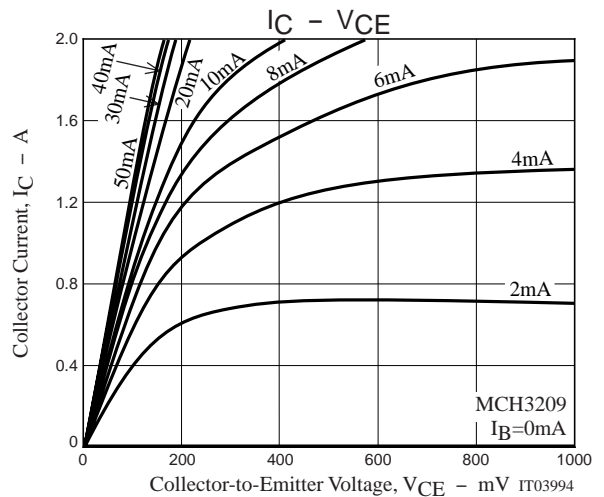
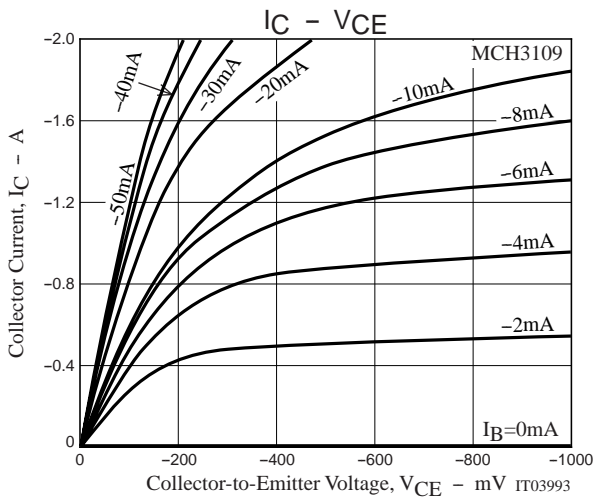
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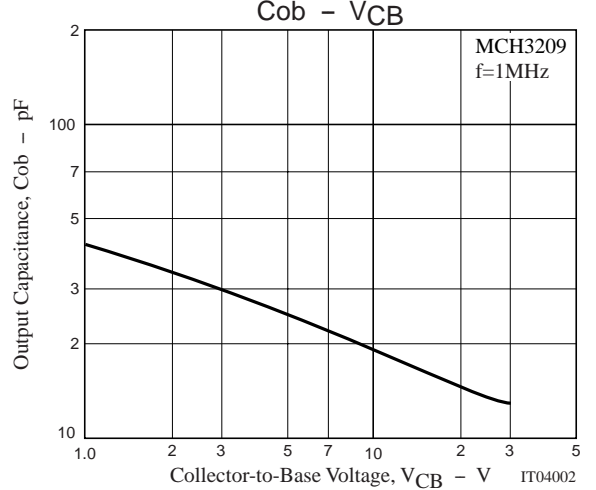
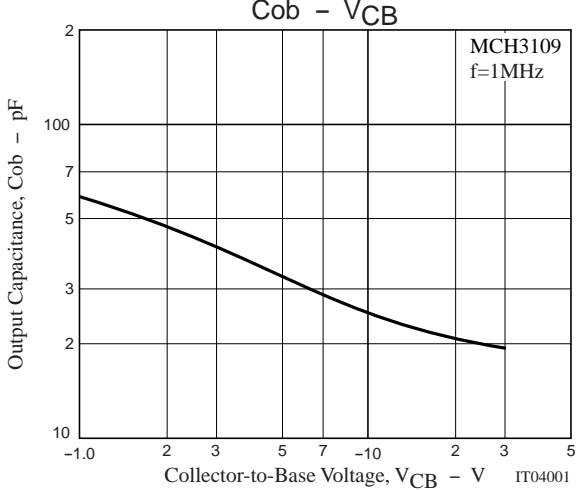
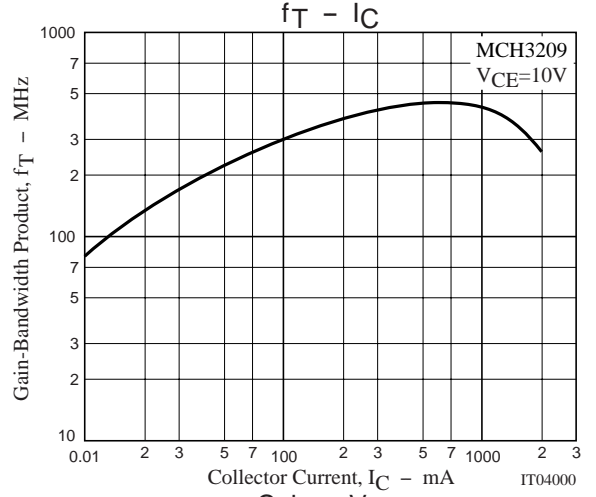
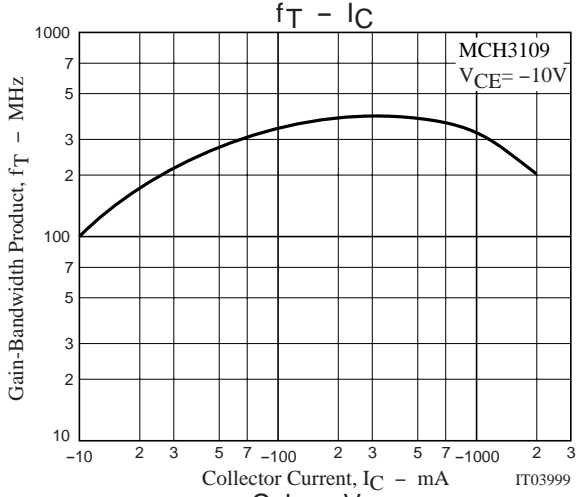
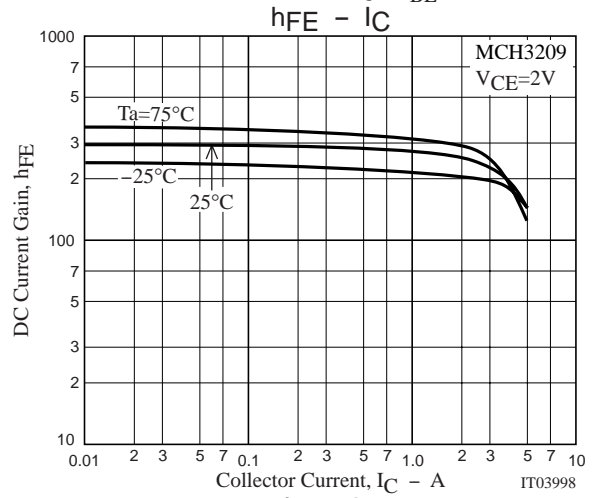
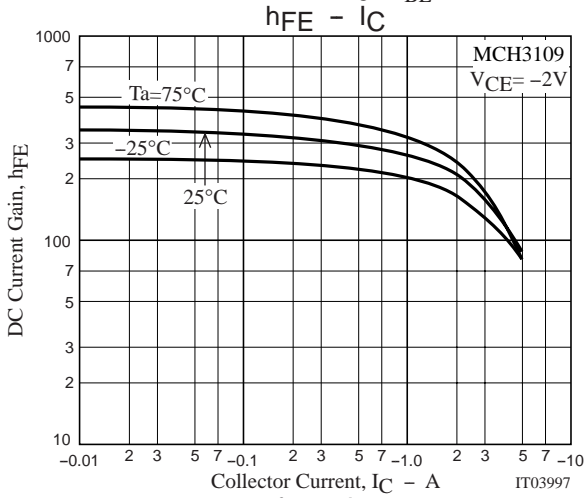
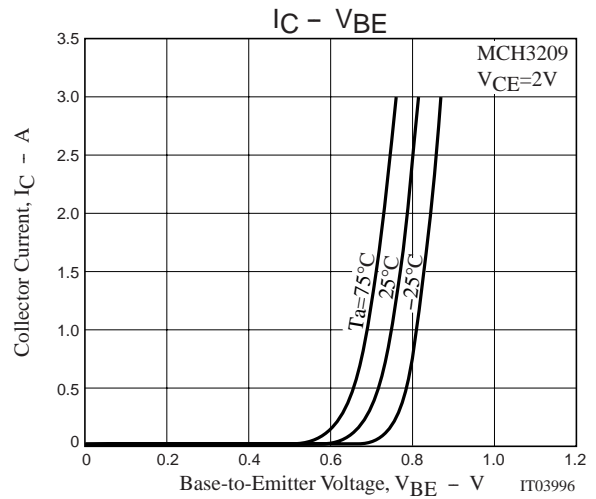
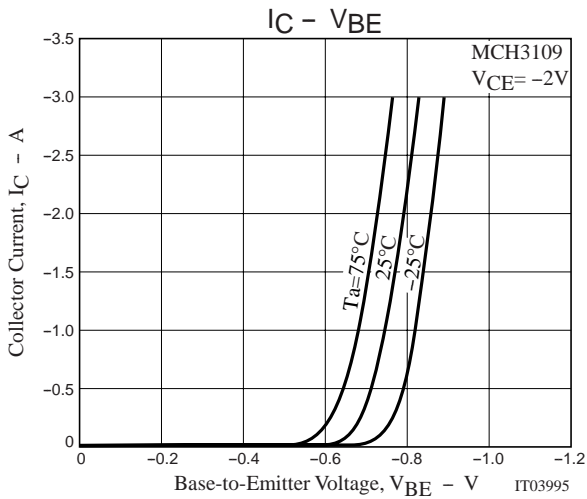
## Switching Time Test Circuit



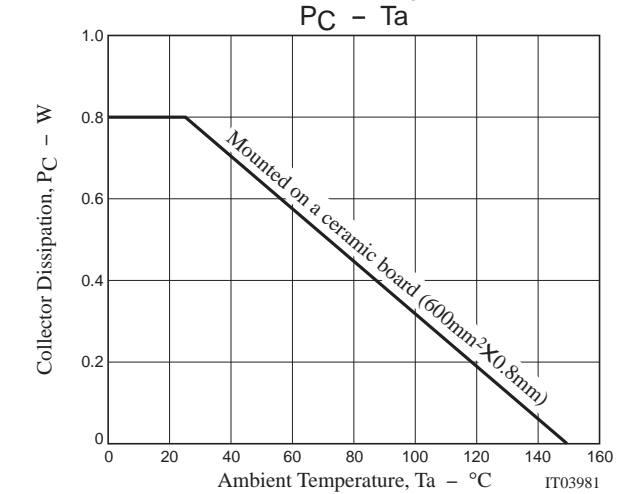
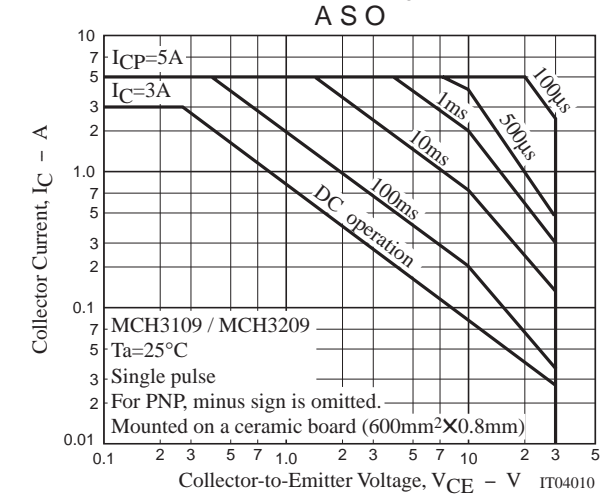
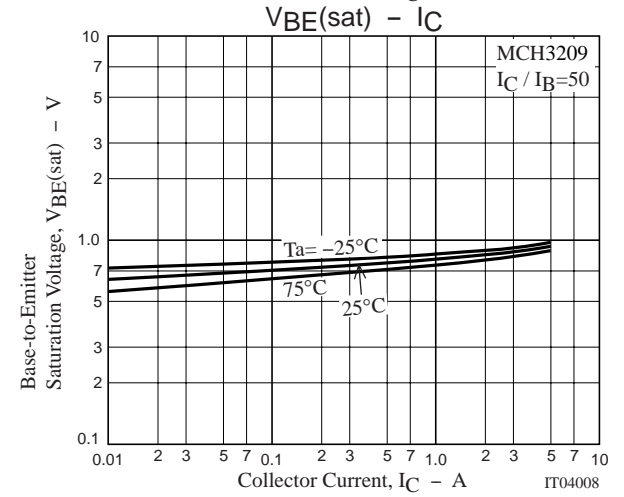
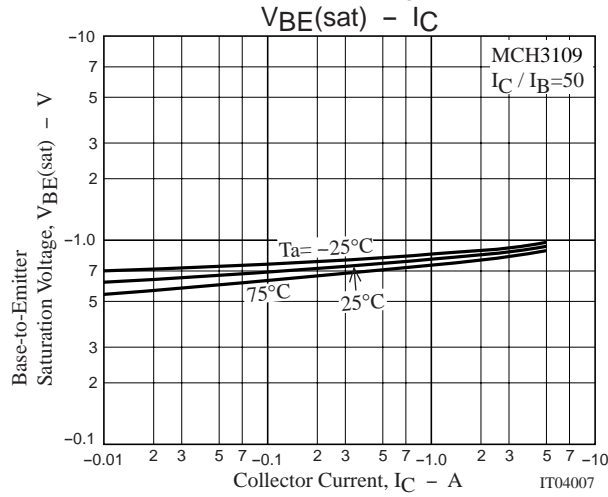
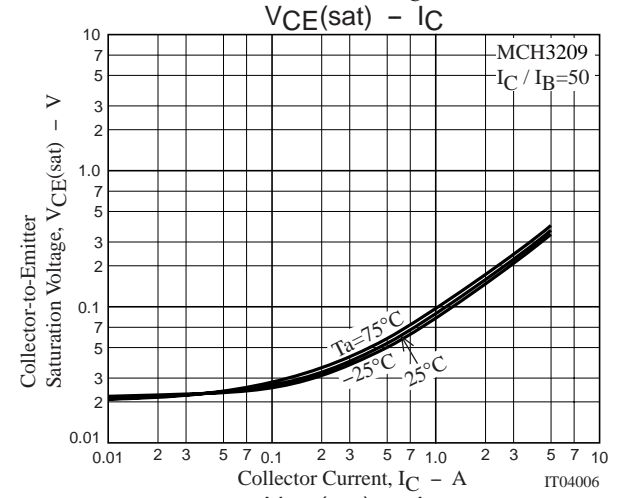
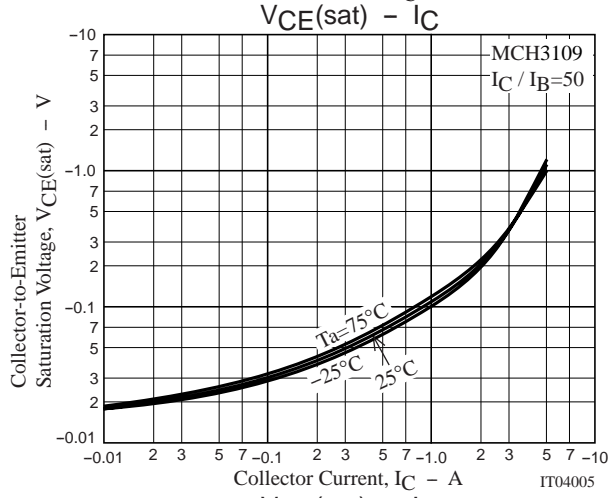
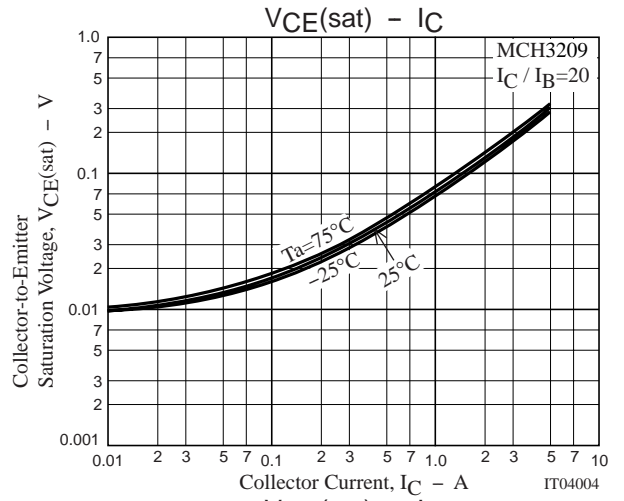
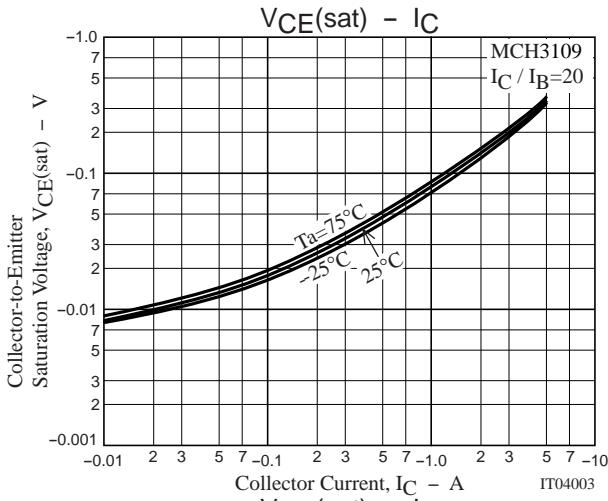
$I_C = 20I_{B1} = -20I_{B2} = 500mA$   
 (For PNP, the polarity is reversed.)



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