

Ordering number : ENN7076

TR : NPN Epitaxial Planar Silicon Transistor  
SBD : Schottky Barrier Diode



# MCH5702

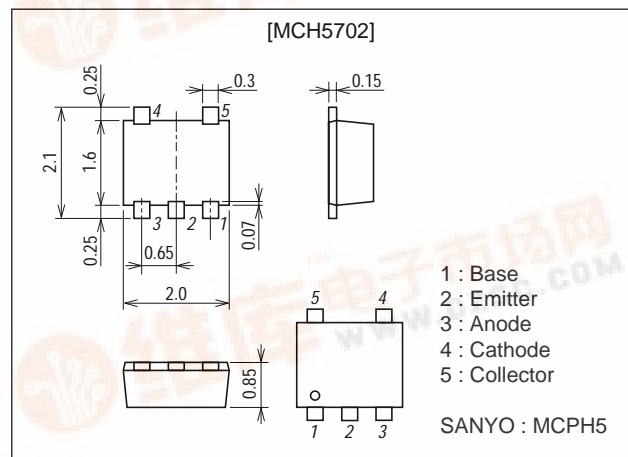
## DC / DC Converter Applications

### Features

- Composite type with an NPN transistor and a Schottky barrier diode contained in one package facilitating high-density mounting.
- The MCH5702 consists of two chips which are equivalent to the MCH6201 and the SBS006, respectively.
- Ultrasmall package (0.85mm high when mounted) facilitates miniaturization in end products.

### Package Dimensions

unit : mm  
2200



### Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
[TR]				
Collector-to-Base Voltage	V <sub>CB0</sub>		15	V
Collector-to-Emitter Voltage	V <sub>CE0</sub>		15	V
Emitter-to-Base Voltage	V <sub>EB0</sub>		5	V
Collector Current	I <sub>C</sub>		1.5	A
Collector Current (Pulse)	I <sub>CP</sub>		3	A
Base Current	I <sub>B</sub>		300	mA
Collector Dissipation	P <sub>C</sub>	Mounted on a ceramic board (600mm <sup>2</sup> X0.8mm)	0.7	W
Junction Temperature	T <sub>J</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +125	°C
[SBD]				
Repetitive Peak Reverse Voltage	V <sub>RRM</sub>		30	V
Non-repetitive Peak Reverse Surge Voltage	V <sub>RSM</sub>		30	V
Average Rectified Current	I <sub>O</sub>		0.7	A
Surge Current	I <sub>FSM</sub>	50Hz sine wave, 1cycle	10	A
Junction Temperature	T <sub>J</sub>		-55 to +125	°C
Storage Temperature	T <sub>stg</sub>		-55 to +125	°C

Marking : PC

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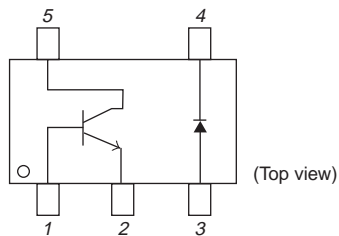


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## Electrical Characteristics at Ta=25°C

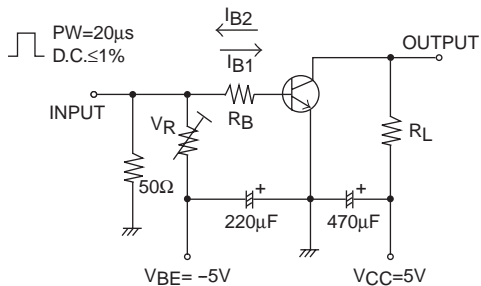
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[TR]						
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=12V, I_E=0$			0.1	$\mu A$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=4V, I_C=0$			0.1	$\mu A$
DC Current Gain	$h_{FE}$	$V_{CE}=2V, I_C=100mA$	200		560	
Gain-Bandwidth Product	$f_T$	$V_{CE}=2V, I_C=300mA$		450		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=10V, f=1MHz$		9		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=750mA, I_B=15mA$		130	200	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=750mA, I_B=15mA$		0.85	1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=10\mu A, I_E=0$	15			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=1mA, R_{BE}=\infty$	15			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.		40		ns
Storage Time	$t_{stg}$	See specified Test Circuit.		180		ns
Fall Time	$t_f$	See specified Test Circuit.		20		ns
[SBD]						
Reverse Voltage	$V_R$	$I_R=0.5mA$	30			V
Forward Voltage	$V_{F1}$	$I_F=0.3A$		0.35	0.40	V
	$V_{F2}$	$I_F=0.5A$		0.42	0.47	V
	$V_{F3}$	$I_F=0.7A$		0.5	0.55	V
Reverse Current	$I_R$	$V_R=10V$			200	$\mu A$
Interterminal Capacitance	$C$	$V_R=10V, f=1MHz$		20		pF
Reverse Recovery Time	$t_{rr}$	$I_F=I_R=100mA$ , See specified Test Circuit			10	ns

## Electrical Connection



## Switching Time Test Circuit

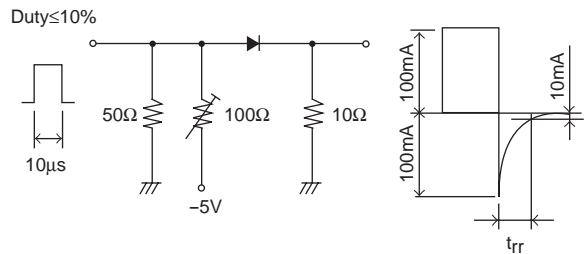
[TR]



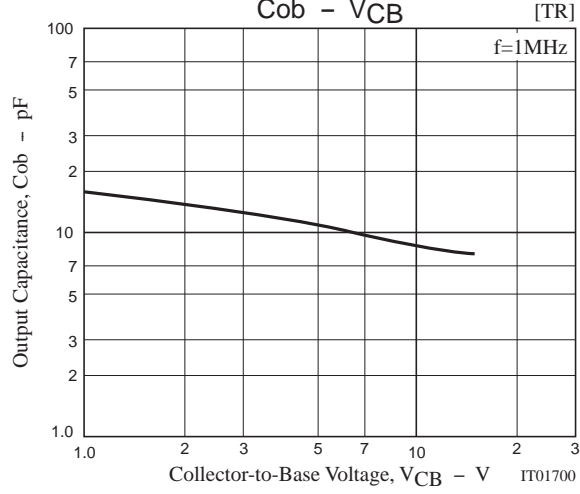
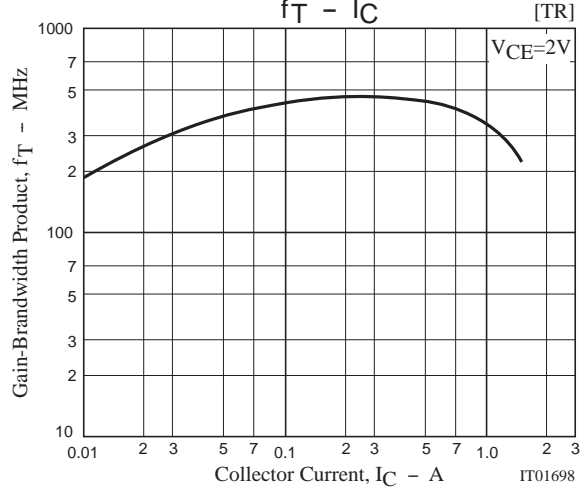
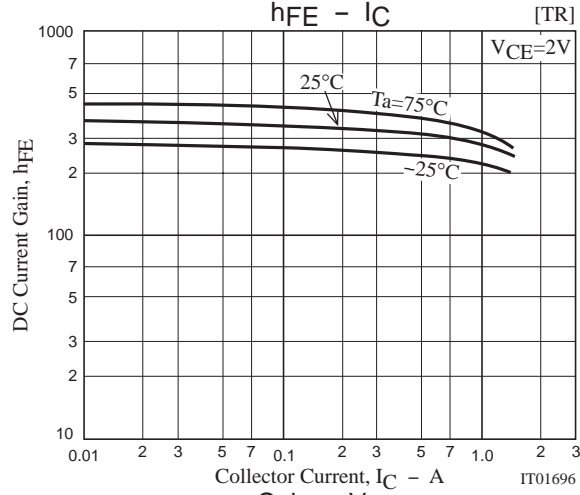
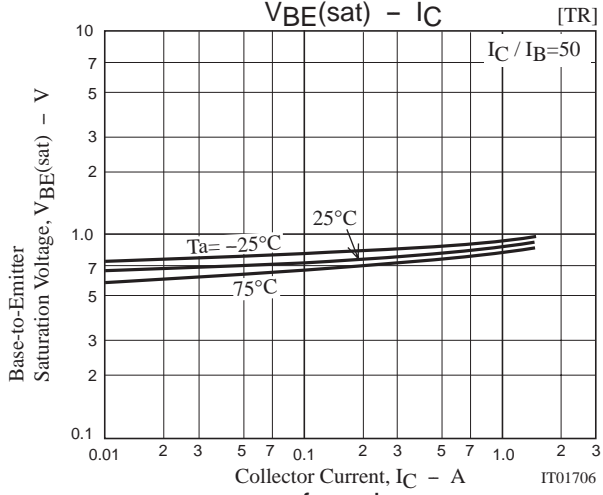
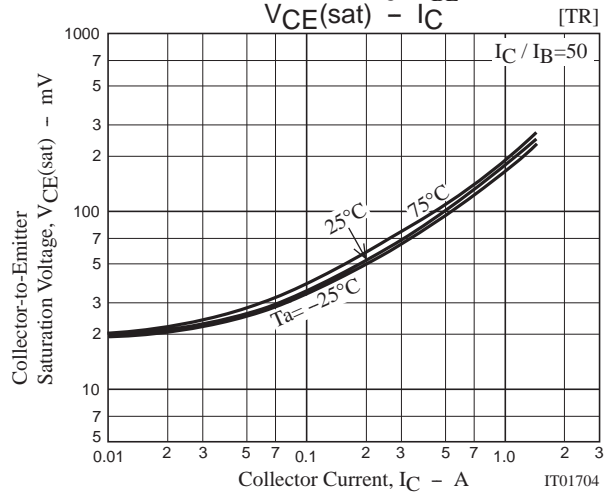
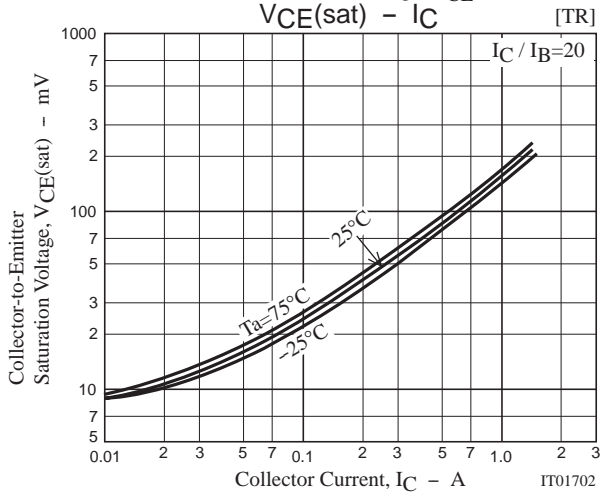
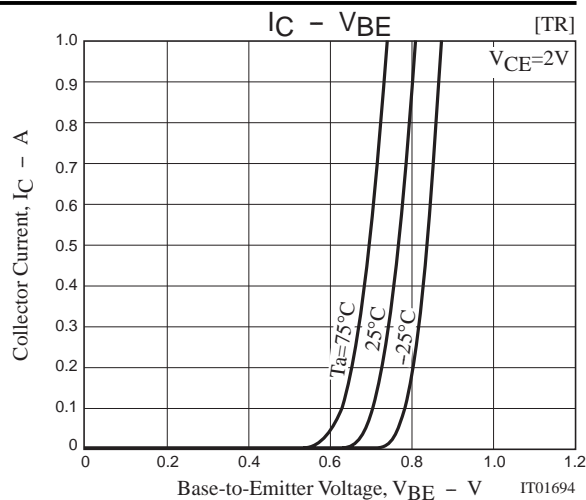
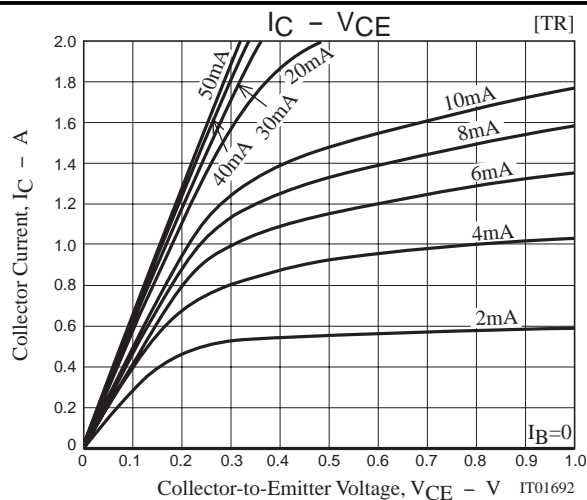
$$I_C=20I_{B1} = -20I_{B2}=750mA$$

## $t_{rr}$ Test Circuit

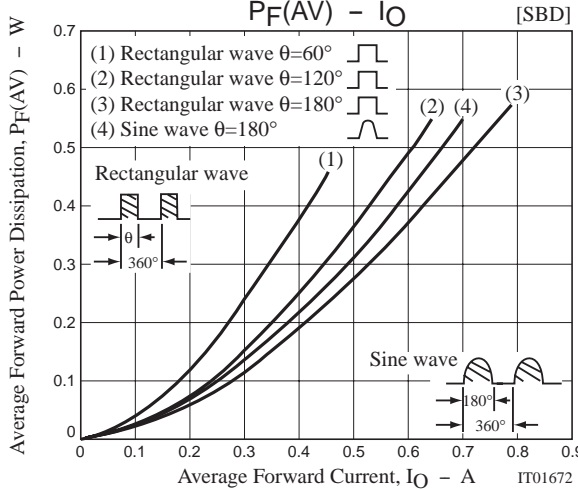
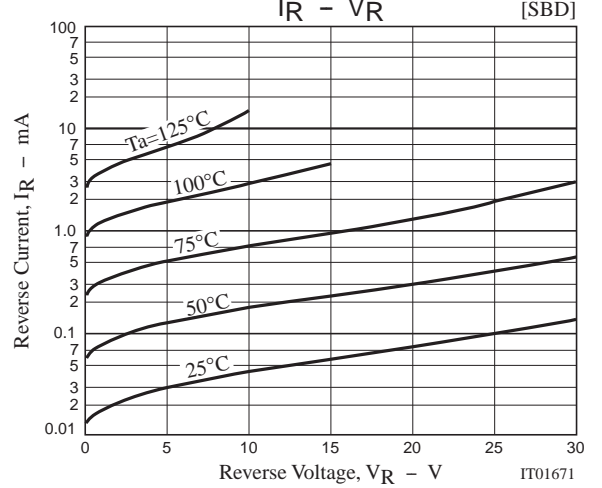
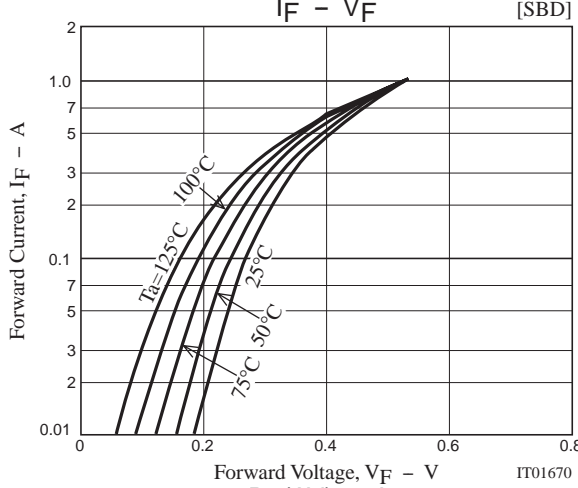
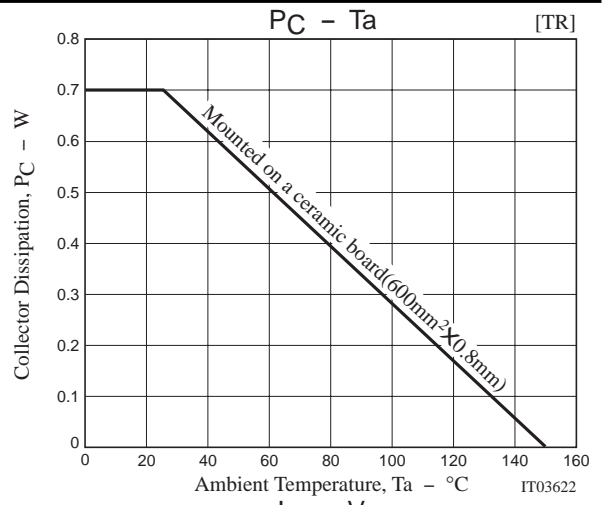
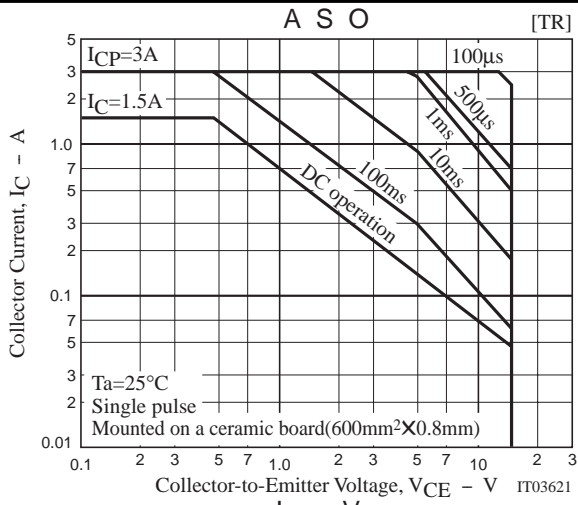
[SBD]



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