Ordering number : ENN7076

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

MCH5702

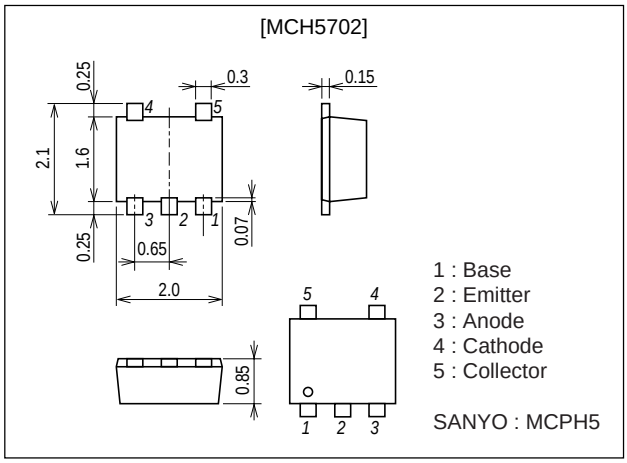
DC / DC Converter Applications

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_{CBO}		15	V
Collector-to-Emitter Voltage	V_{CEO}		15	V
Emitter-to-Base Voltage	V_{EBO}		5	V
Collector Current	I_C		1.5	A
Collector Current (Pulse)	I_{CP}		3	A
Base Current	I_B		300	mA
Collector Dissipation	P_C	Mounted on a ceramic board (600mm²×0.8mm)	0.7	W
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		-55 to +125	°C
[SBD]				
Repetitive Peak Reverse Voltage	V_{RRM}		30	V
Non-repetitive Peak Reverse Surge Voltage	V_{RSM}		30	V
Average Recified Current	I_O		0.7	A
Surge Current	I_{FSM}	50Hz sine wave, 1cycle	10	A
Junction Temperature	Tj		-55 to +125	°C
Storage Temperature	Tstg		-55 to +125	°C

Marking : PC

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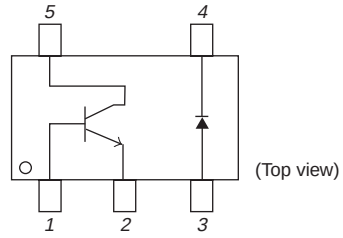
Electrical Characteristics at Ta=25°C

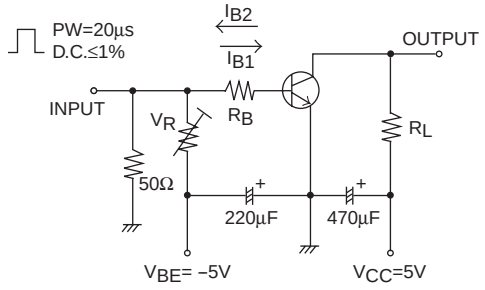
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[TR]						
Collector Cutoff Current	I_{CBO}	V_{CB}=12V, I_E=0			0.1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=4V, I_C=0			0.1	μA
DC Current Gain	h_{FE}	V_{CE}=2V, I_C=100mA	200		560	
Gain-Bandwidth Product	f_T	V_{CE}=2V, I_C=300mA		450		MHz
Output Capacitance	Cob	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=10μA, I_E=0	15			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=1mA, R_{BE}=∞	15			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=10μA, 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	μA
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

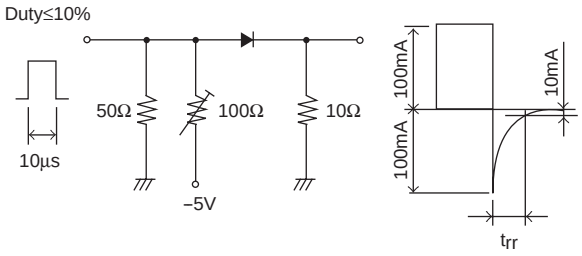
[TR]



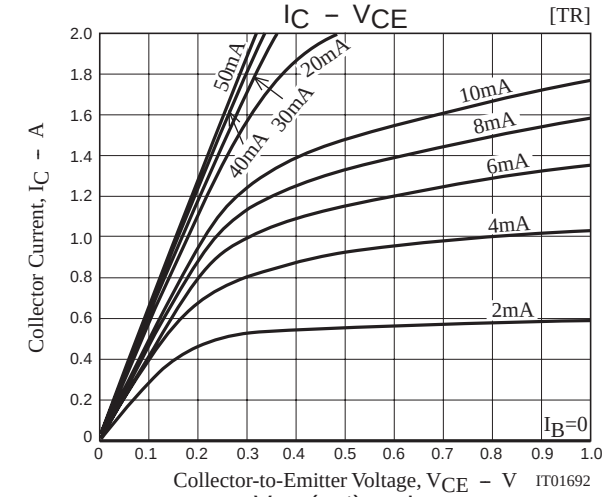
I_C=20I_{B1}= −20I_{B2}=750mA

t_{rr} Test Circuit

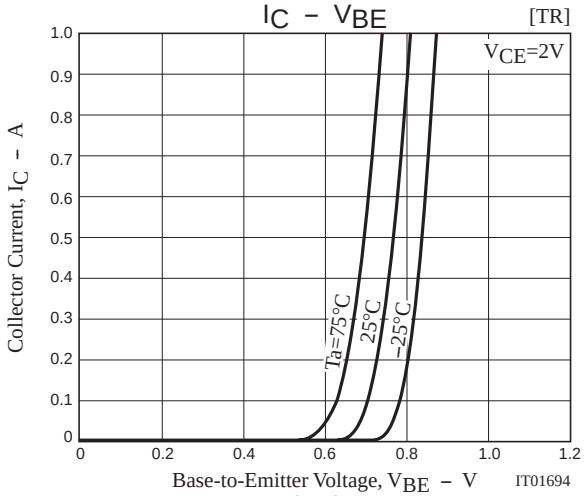
[SBD]



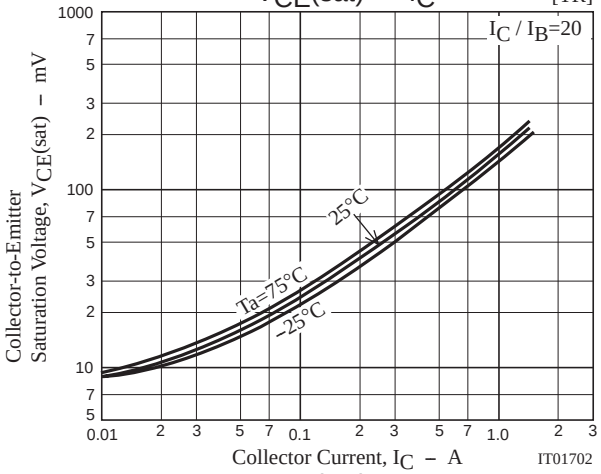
I_C – V_{CE} [TR]



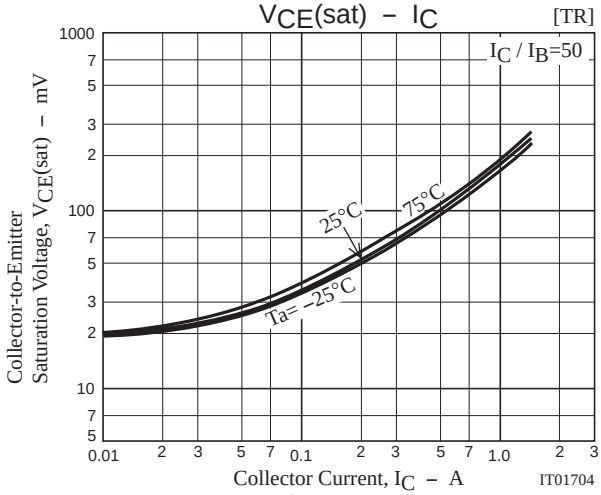
I_C – V_{BE} [TR]



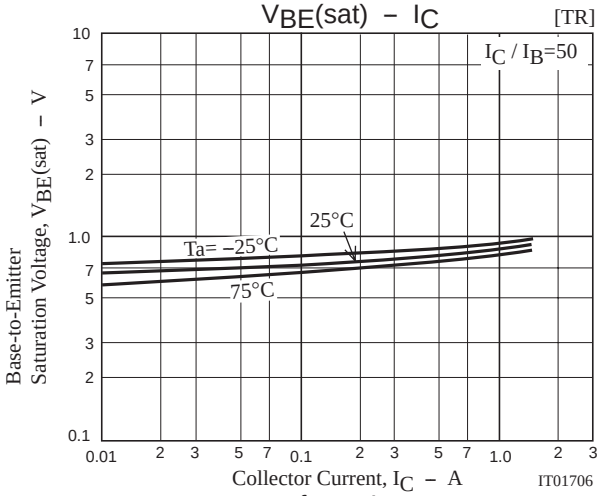
V_{CE}(sat) – I_C [TR]



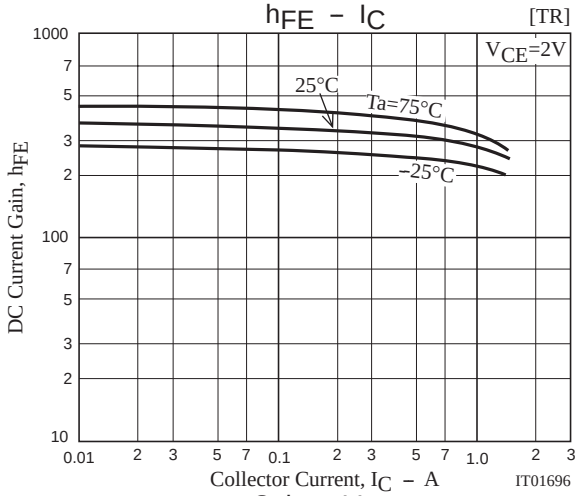
V_{CE}(sat) – I_C [TR]



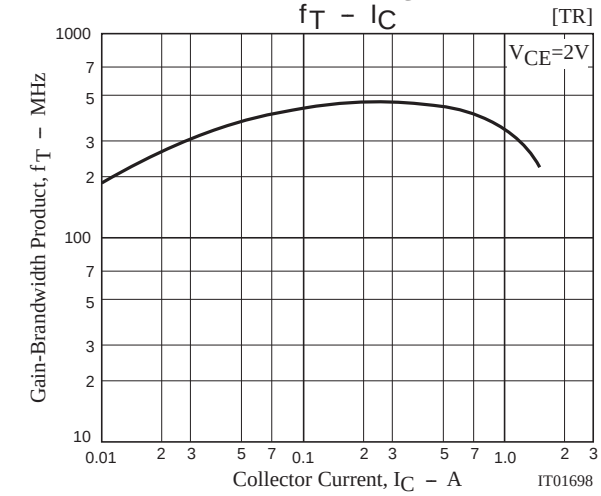
V_{BE}(sat) – I_C [TR]



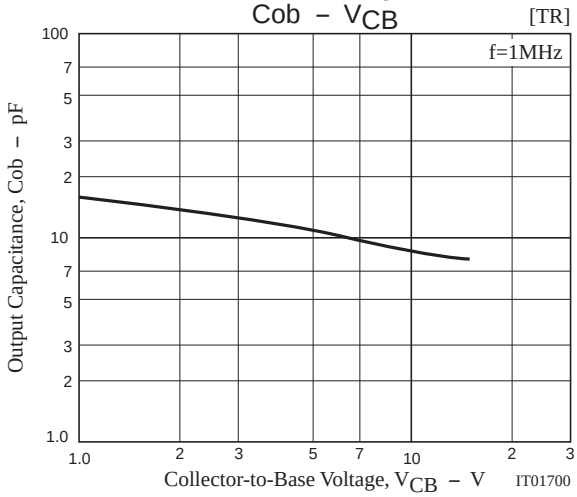
h_{FE} – I_C [TR]



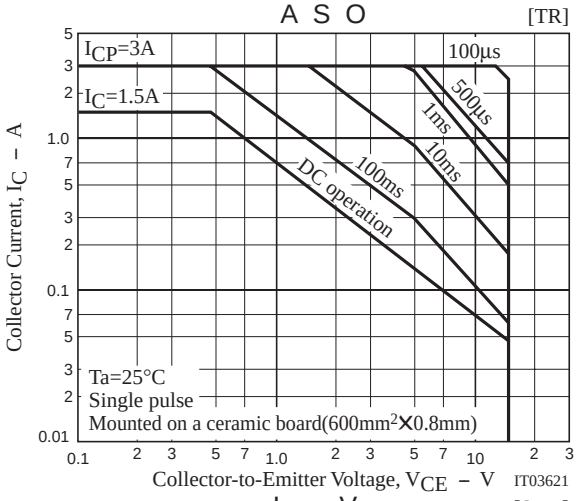
f_T – I_C [TR]



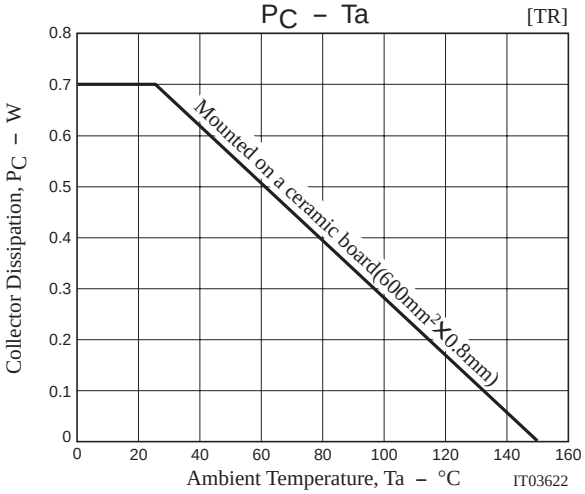
Cob – V_{CB} [TR]



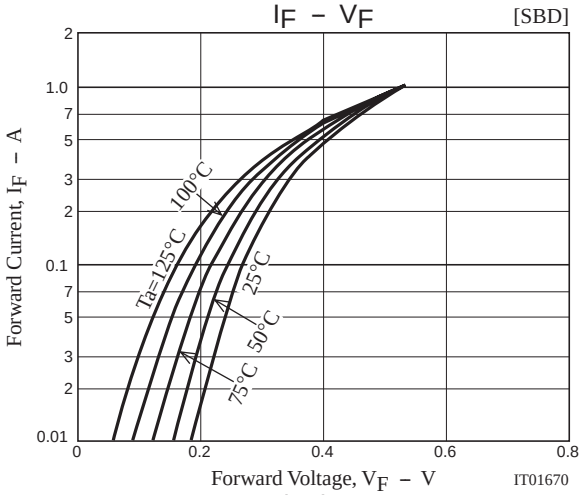
A S O [TR]



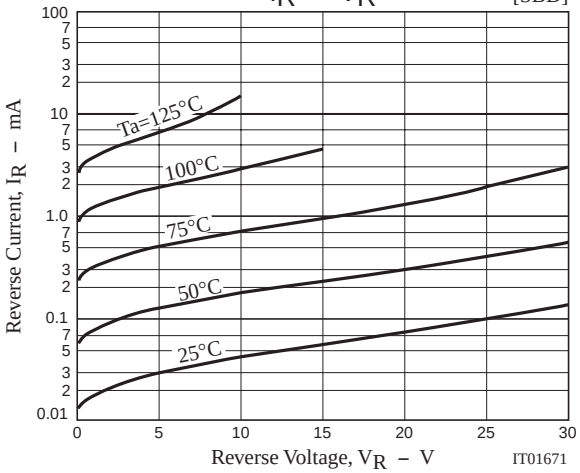
P_C – Ta [TR]



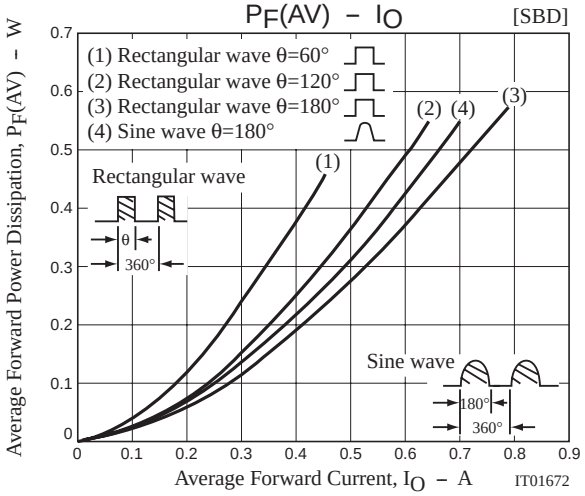
I_F – V_F [SBD]



I_R – V_R [SBD]



$P_{F(AV)}$ – I_O [SBD]



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