Ordering number : ENN8071

SANYO Semiconductors
DATA SHEET

2SC5991 — NPN Epitaxial Planar Silicon Transistor
DC / DC Converter Applications

Applications

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

Features

- Adoption of FBET, MBIT process.
- High current capacitance.
- Low collector-to-emitter saturation voltage.
- High-speed switching.
- Narrow h_{FE} width.
- High allowable power dissipation.

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		100	V
Collector-to-Emitter Voltage	V_{CES}		100	V
Collector-to-Emitter Voltage	V_{CEO}		50	V
Emitter-to-Base Voltage	V_{EBO}		6	V
Collector Current	I_C		7	A
Collector Current (Pulse)	I_{CP}		10	A
Base Current	I_B		1.2	A
Collector Dissipation	P_C	Mounted on a ceramic board (250mm²×0.8mm)	1.3	W
		Tc=25°C	3.5	W
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		-55 to +150	°C

Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=40V, 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=500mA	250		400	

Marking : FI

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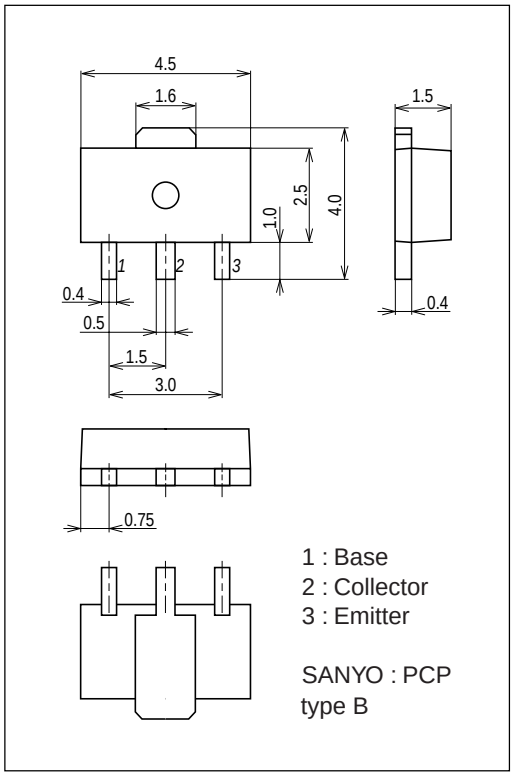
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Gain-Bandwidth Product	f_T	V_{CE}=10V, I_C=500mA		330		MHz
Output Capacitance	Cob	V_{CB}=10V, f=1MHz		28		pF
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)	I_C=3.5A, I_B=175mA		105	160	mV
		I_C=2A, I_B=40mA		90	135	mV
Base-to-Emitter Saturation Voltage	V_{BE}(sat)	I_C=2A, I_B=40mA		0.81	1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=10μA, I_E=0	100			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CES}$	I_C=100μA, R_{BE}=0	100			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=1mA, R_{BE}=∞	50			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=10μA, I_C=0	6			V
Turn-ON Time	t_{on}	See specified Test Circuit.		30		ns
Storage Time	t_{stg}	See specified Test Circuit.		420		ns
Fall Time	t_f	See specified Test Circuit.		25		ns

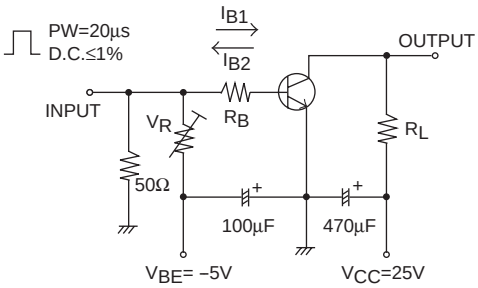
Package Dimensions

unit : mm

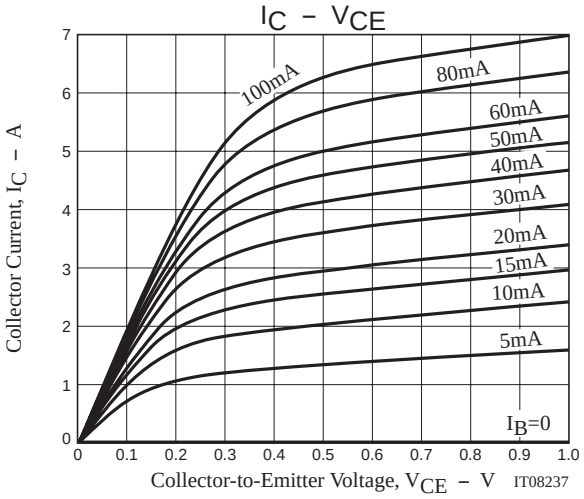
2163A

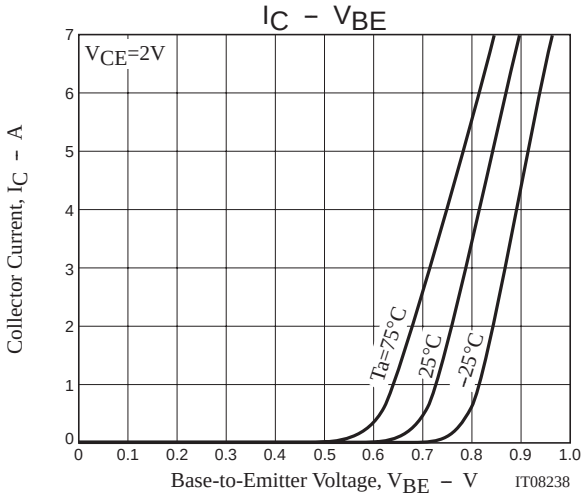


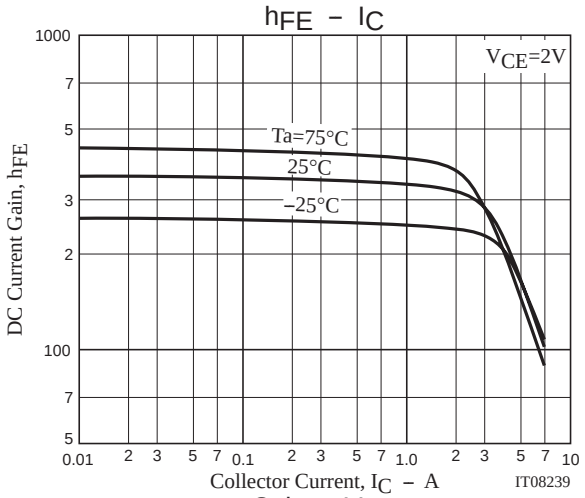
Switching Time Test Circuit

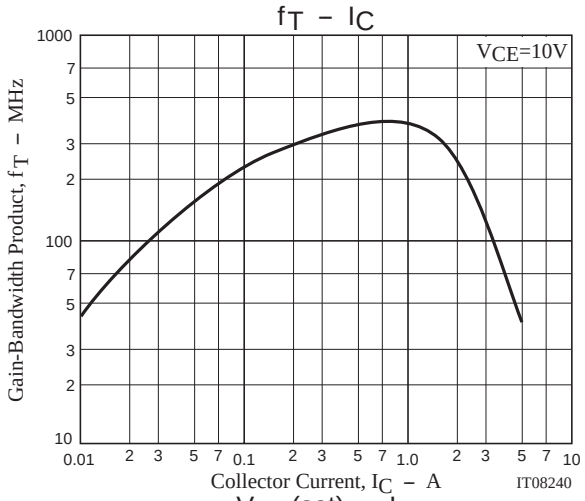


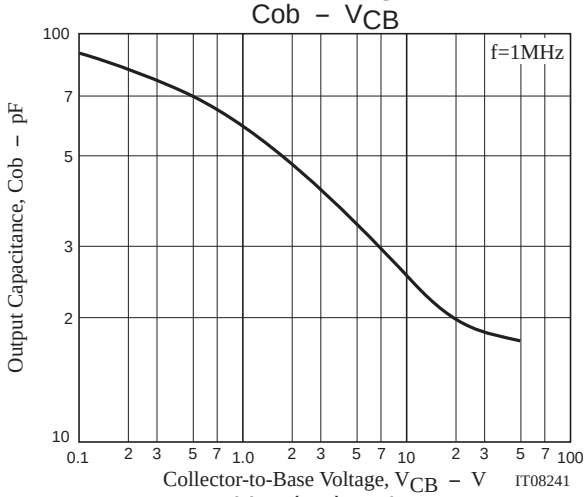
$I_C=20I_{B1}=-20I_{B2}=2.5A$

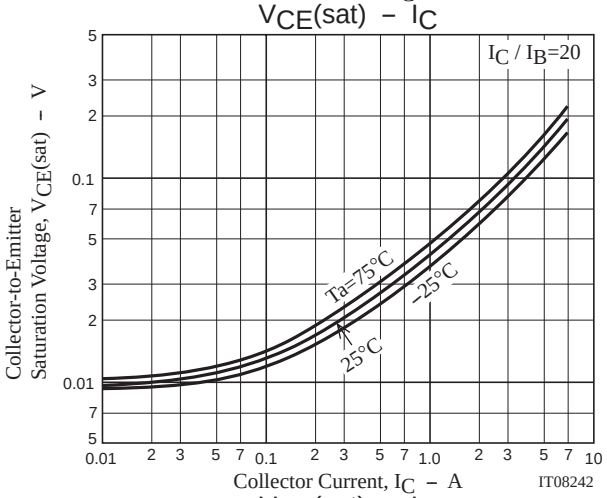


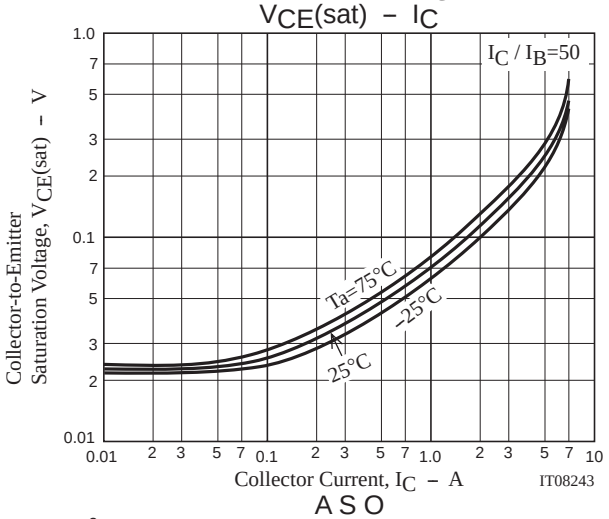


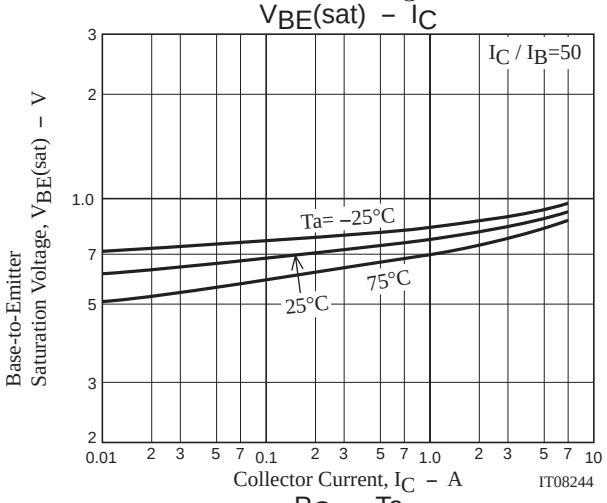

hFE – IC
VCE=2V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
IT08239

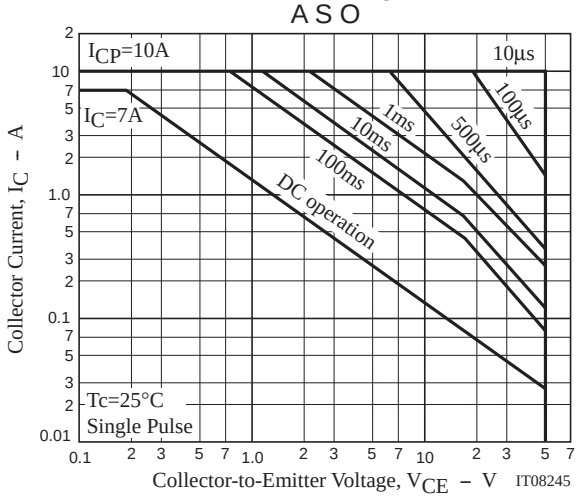

fT – IC
VCE=10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT08240

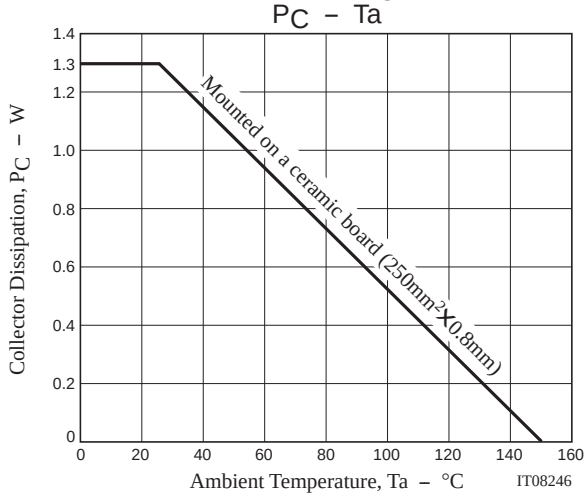

Cob – VCB
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT08241


VCE(sat) – IC
IC / IB=20
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Ta=75°C
–25°C
25°C
Collector Current, IC – A
IT08242


VCE(sat) – IC
IC / IB=50
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Ta=75°C
–25°C
25°C
Collector Current, IC – A
IT08243


VBE(sat) – IC
IC / IB=50
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Ta= –25°C
25°C
75°C
Collector Current, IC – A
IT08244


A S O
ICP=10A
10µs
IC=7A
100µs
1ms
10ms
500µs
100ms
DC operation
Tc=25°C
Single Pulse
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT08245


PC – Ta
Mounted on a ceramic board (250mm2×0.8mm)
Collector Dissipation, PC – W
Ambient Temperature, Ta – °C
IT08246