Ordering number : ENA0277

SANYO Semiconductors

DATA SHEET

NPN Epitaxial Planar Silicon Transistor

2SC6080 — 50V / 13A High-Speed Switching Applications

Applications

- High-speed switching applications (switching regulator, driver circuit).

Features

- Adoption of MBIT process.
- Large current capacitance.
- Low collector-to-emitter saturation voltage.
- High-speed switching.

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		60	V
Collector-to-Emitter Voltage	V_{CES}		60	V
Collector-to-Emitter Voltage	V_{CEO}		50	V
Emitter-to-Base Voltage	V_{EBO}		6	V
Collector Current	I_C		13	A
Collector Current (Pulse)	I_{CP}	PW≤10μs, duty cycle≤10%	15	A
Base Current	I_B		2	A
Collector Dissipation	P_C		2	W
		Tc=25°C	25	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=0A			10	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=4V, I_C=0A			10	μA
DC Current Gain	$h_{FE}1$	V_{CE}=2V, I_C=270mA	200		560	
	$h_{FE}2$	V_{CE}=2V, I_C=8.1A	50			

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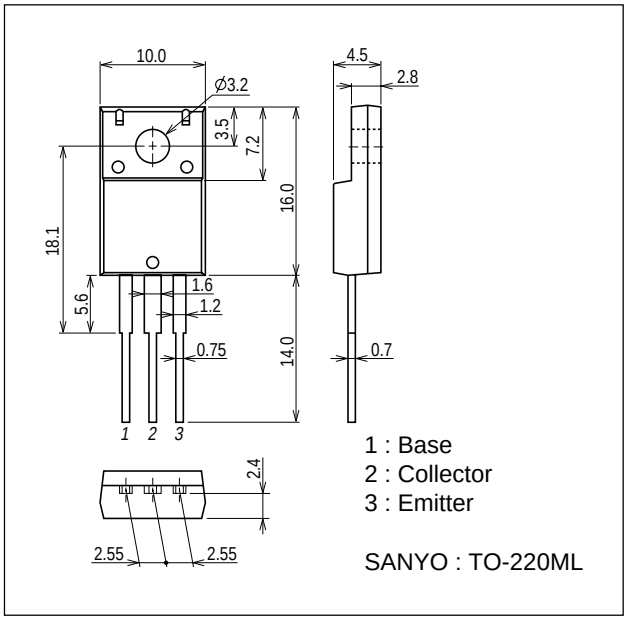
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Gain-Bandwidth Product	f_T	V_{CE}=5V, I_C=1A		180		MHz
Output Capacitance	Cob	V_{CB}=10V, f=1MHz		73		pF
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)	I_C=6A, I_B=300mA		200	400	mV
Base-to-Emitter Saturation Voltage	V_{BE}(sat)	I_C=6A, I_B=300mA			1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=100μA, I_E=0A	60			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CES}$	I_C=100μA, R_{BE}=0Ω	60			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=100μA, I_C=0A	6			V
Turn-ON Time	t_{on}	See specified Test Circuit.		46		ns
Storage Time	t_{stg}	See specified Test Circuit.		450		ns
Fall Time	t_f	See specified Test Circuit.		35		ns

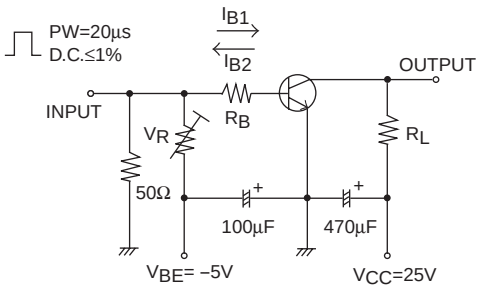
Package Dimensions

unit : mm

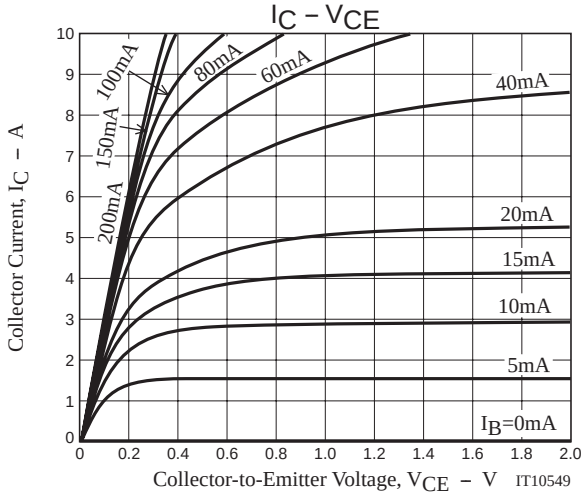
7508-002

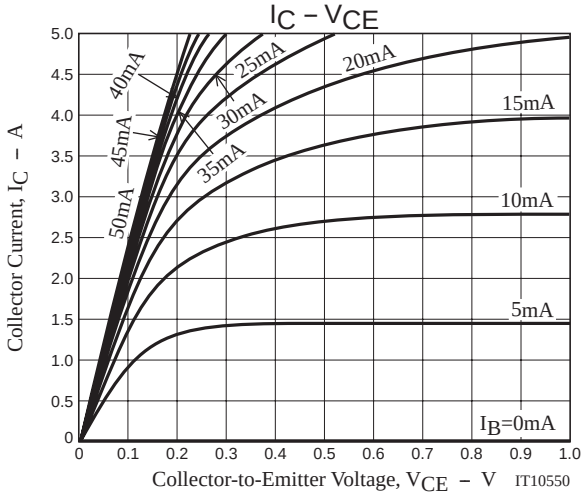


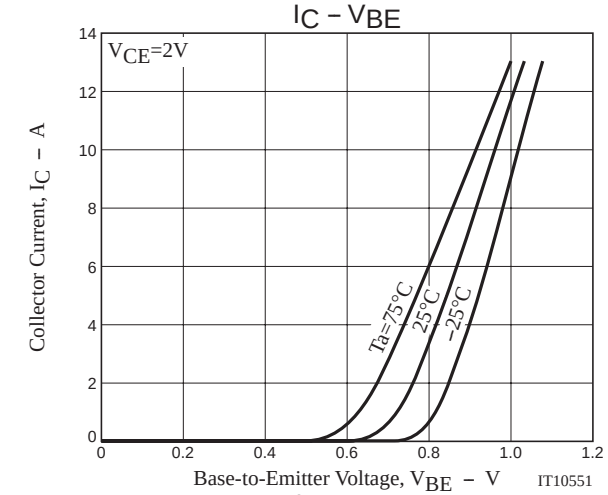
Switching Time Test Circuit

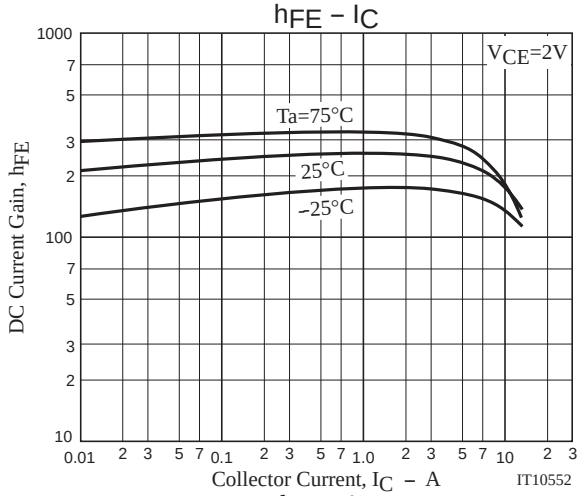


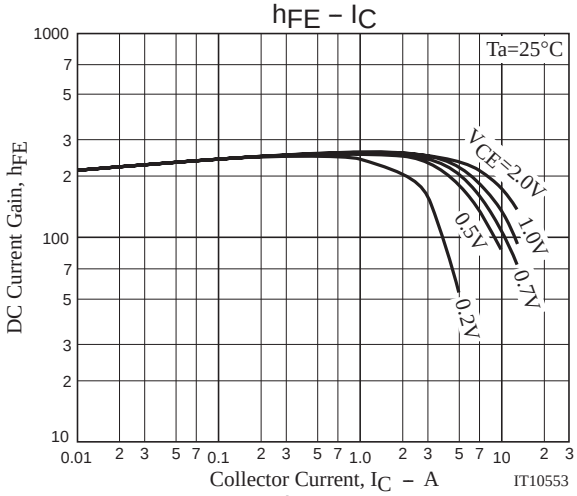
I_C=20I_{B1}= −20I_{B2}=5A

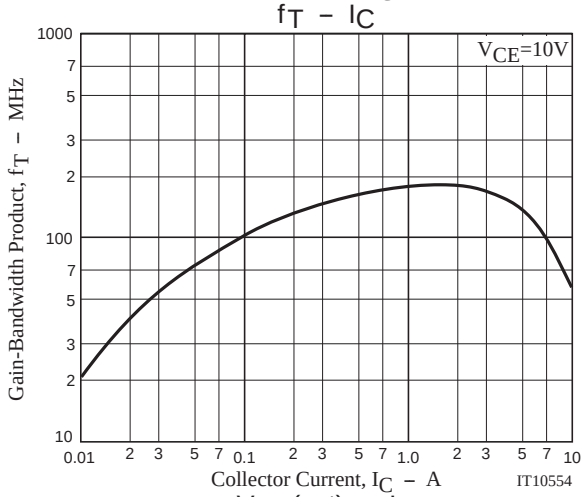


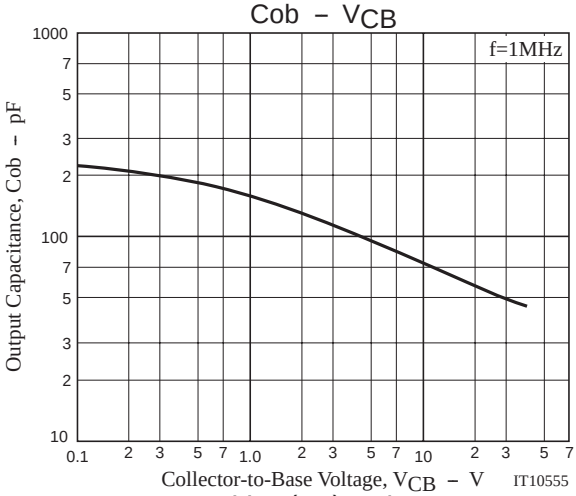


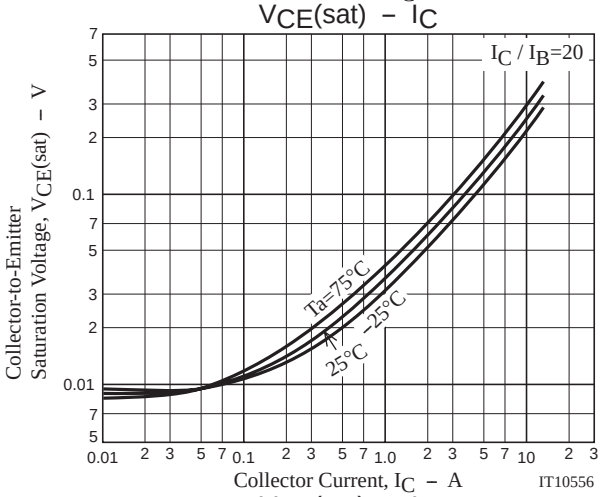

IC – VBE
VCE=2V
Ta=75°C
25°C
–25°C
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
IT10551

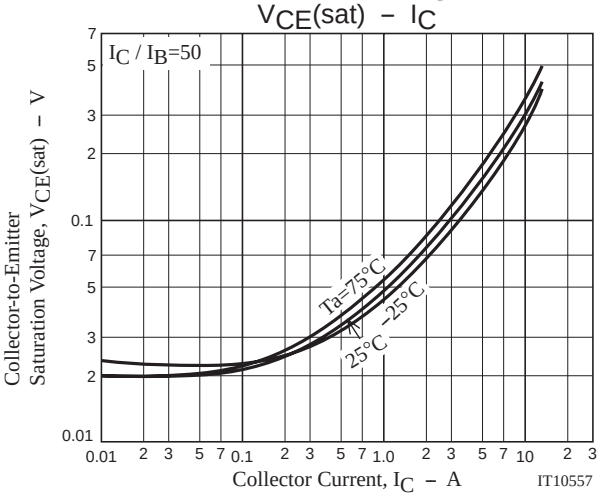

hFE – IC
VCE=2V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
IT10552

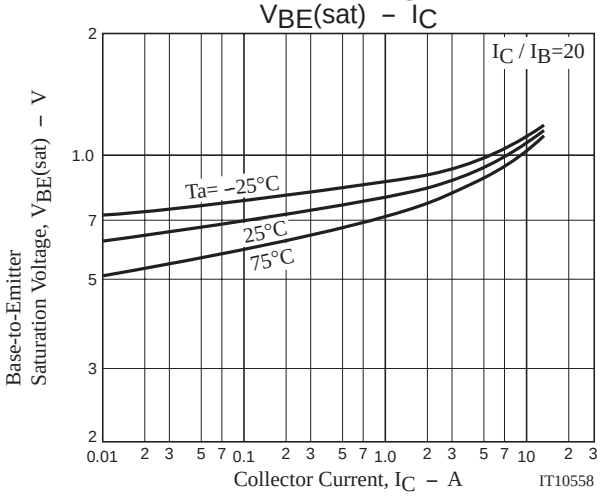

hFE – IC
Ta=25°C
VCE=2.0V
1.0V
0.7V
0.5V
0.2V
DC Current Gain, hFE
Collector Current, IC – A
IT10553


fT – IC
VCE=10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT10554


Cob – VCB
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT10555


VCE(sat) – IC
IC / IB=20
Ta=75°C
25°C
–25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
IT10556


VCE(sat) – IC
IC / IB=50
Ta=75°C
25°C
–25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
IT10557


VBE(sat) – IC
IC / IB=20
Ta= –25°C
25°C
75°C
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – A
IT10558