PNP Epitaxial Planar Silicon Transistor

2SA2180 — 50V / 5A High-Speed Switching Applications

Applications

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

Features

- Adoption of MBIT processes.
- 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}		–50	V
Collector-to-Emitter Voltage	V_{CEO}		–50	V
Emitter-to-Base Voltage	V_{EBO}		–6	V
Collector Current	I_C		–5	A
Collector Current (Pulse)	I_{CP}		–8	A
Base Current	I_B		–1	A
Collector Dissipation	P_C		2	W
		Tc=25°C	20	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=–125mA	200		500	
	$h_{FE}2$	V_{CE}=–2V, I_C=–3.75A	50			
Gain-Bandwidth Product	f_T	V_{CE}=–10V, I_C=–300mA		130		MHz
Output Capacitance	Cob	V_{CB}=–10V, f=1MHz		55		pF

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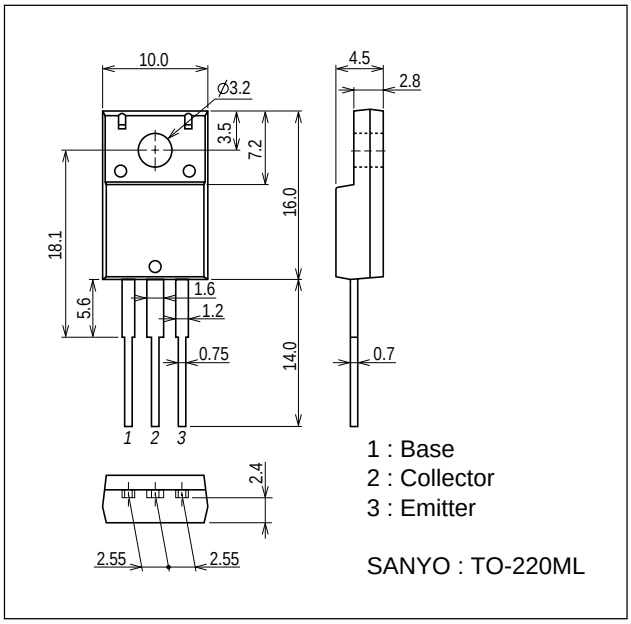
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE}(sat)$	I_C=–2.5A, I_B=–125mA		–250	–500	mV
Base-to-Emitter Saturation Voltage	$V_{BE}(sat)$	I_C=–2.5A, I_B=–125mA			–1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=–100μA, I_E=0A	–50			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.		75		ns
Storage Time	t_{stg}	See specified Test Circuit.		100		ns
Fall Time	t_f	See specified Test Circuit.		40		ns

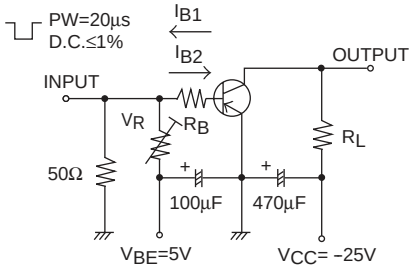
Package Dimensions

unit : mm

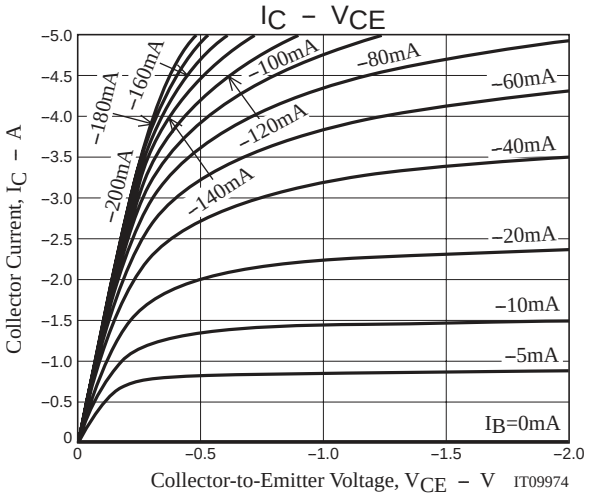
7508-002

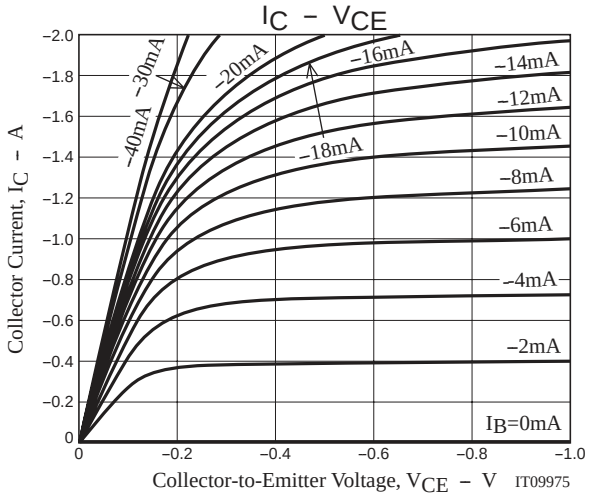


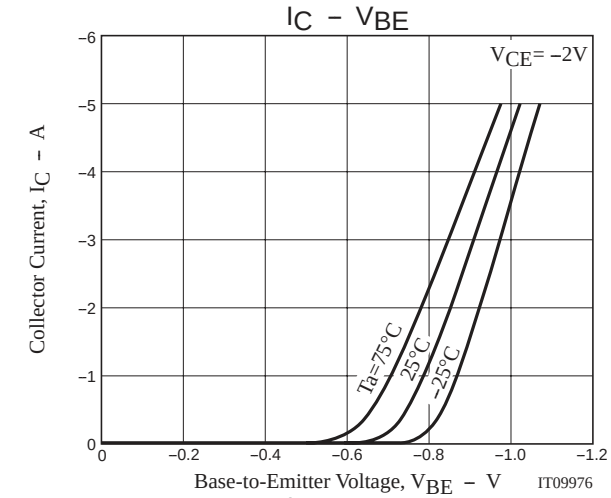
Switching Time Test Circuit

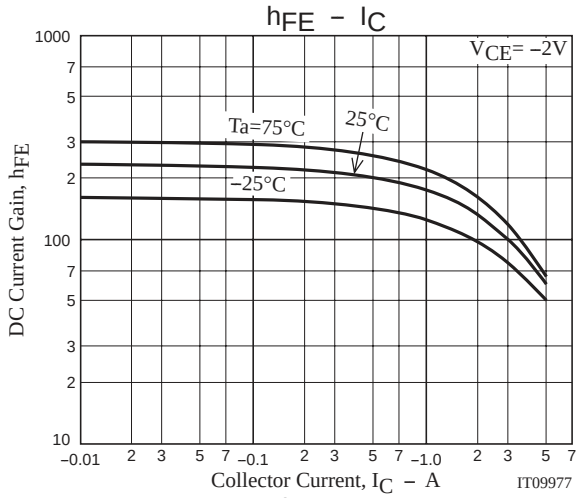


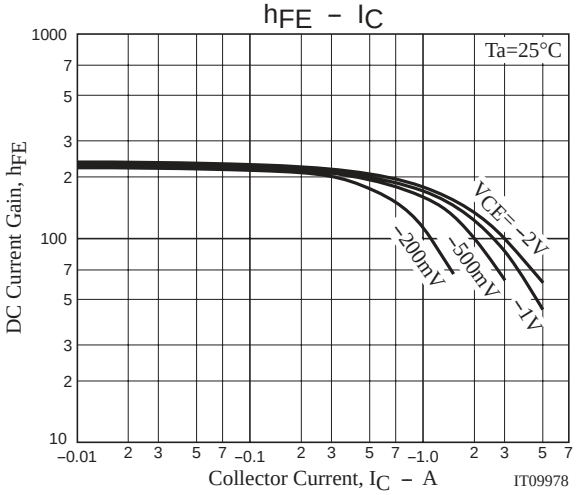
I_C=20I_{B1}= –20I_{B2}= –5A

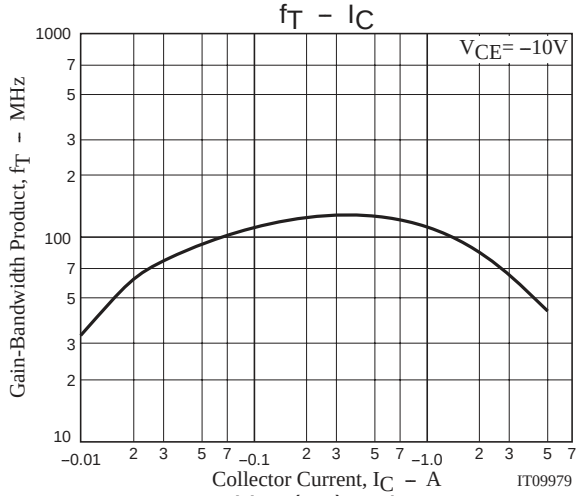


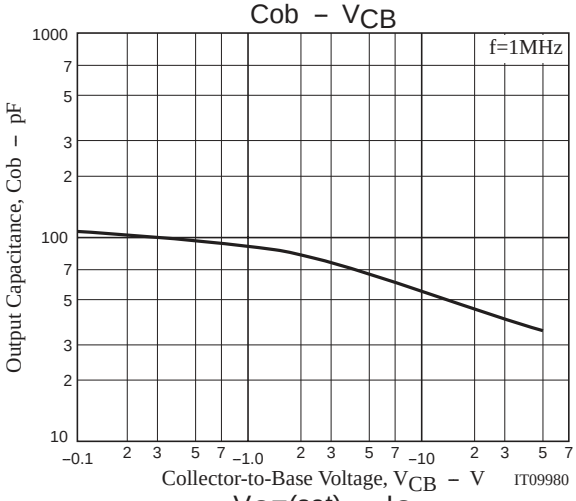


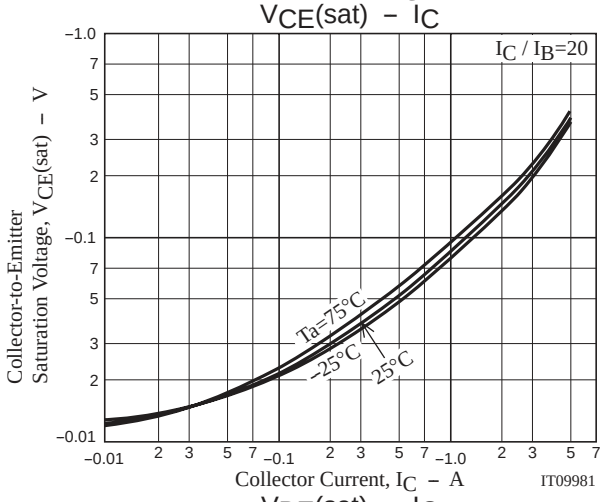

IC – VBE
VCE= –2V
Ta=75°C
25°C
–25°C
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
IT09976

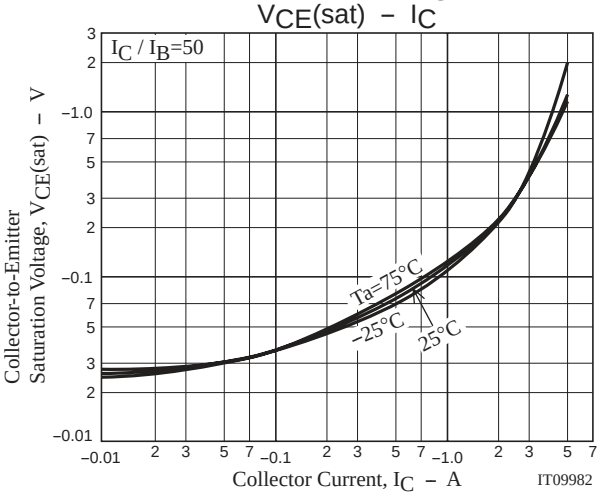

hFE – IC
VCE= –2V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
IT09977

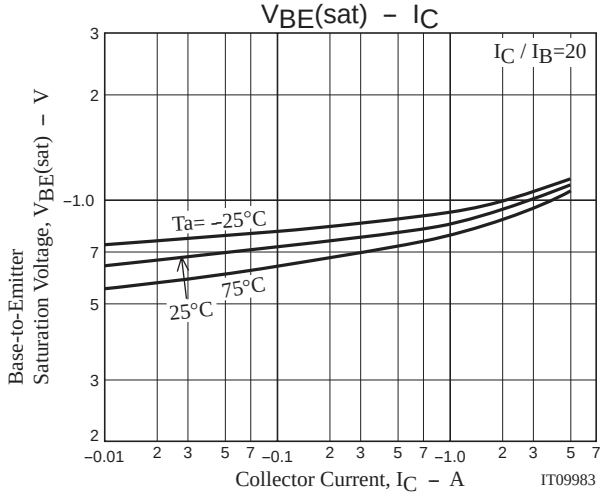

hFE – IC
Ta=25°C
VCE= –2V
–200mV
–500mV
–1V
DC Current Gain, hFE
Collector Current, IC – A
IT09978


fT – IC
VCE= –10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT09979


Cob – VCB
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT09980


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
IT09981


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
IT09982


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
IT09983