Ordering number : ENA0463

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DATA SHEET

2SA2197 / 2SC6102 — PNP / NPN Epitaxial Planar Silicon Transistors
DC / DC Converter Applications

Applications

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

Features

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

Specifications ( ) : 2SA2197

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		(-30)40	V
Collector-to-Emitter Voltage	V_{CEO}		(-)30	V
Emitter-to-Base Voltage	V_{EBO}		(-)6	V
Collector Current	I_C		(-)7	A
Collector Current (Pulse)	I_{CP}		(-)9	A
Base Current	I_B		(-)1.2	A
Collector Dissipation	P_C		1	W
		Tc=25°C	10	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}=(-)30V, I_E=0A			(-)0.1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(-)4V, I_C=0A			(-)0.1	μA
DC Current Gain	h_{FE}	V_{CE}=(-)2V, I_C=(-)500mA	200		560	
Gain-Bandwidth Product	f_T	V_{CE}=(-)10V, I_C=(-)500mA		(250)290		MHz
Output Capacitance	Cob	V_{CB}=(-)10V, f=1MHz		(52)40		pF

Continued on next page.

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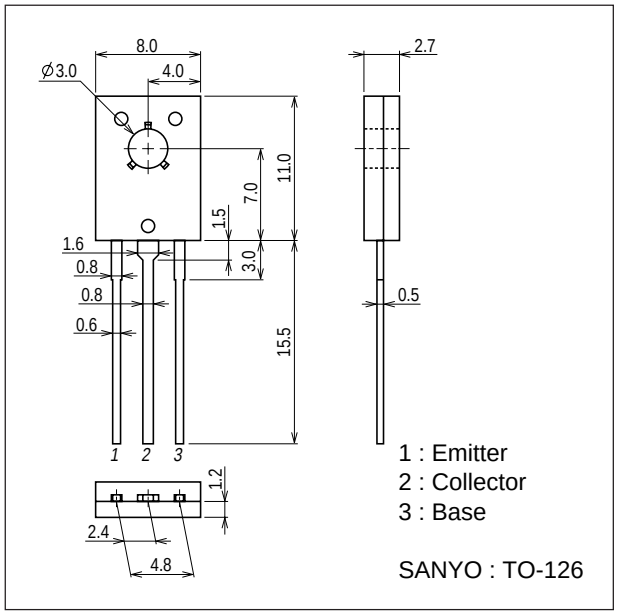
Continued from preceding page.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)	I_C=(–)2.5A, I_B=(–)50mA		(–160)125	(–240)185	mV
Base-to-Emitterr Saturation Voltage	V_{BE}(sat)	V_{CE}=(–)2.5V, I_B=(–)50mA		(–)0.84	(–)1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(–)10μA, I_E=0A	(–30)40			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=(–)1mA, R_{BE}=∞	(–)30			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=(–)10μA, I_C=0A	(–)6			V
Turn-On Time	t_{on}	See specified Test Circuit.		(30)30		ns
Storage Time	t_{stg}	See specified Test Circuit.		(190)320		ns
Fall Time	t_f	See specified Test Circuit.		(17)14		ns

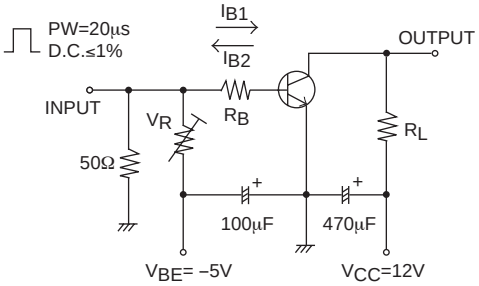
Package Dimensions

unit : mm (typ)

7515-002

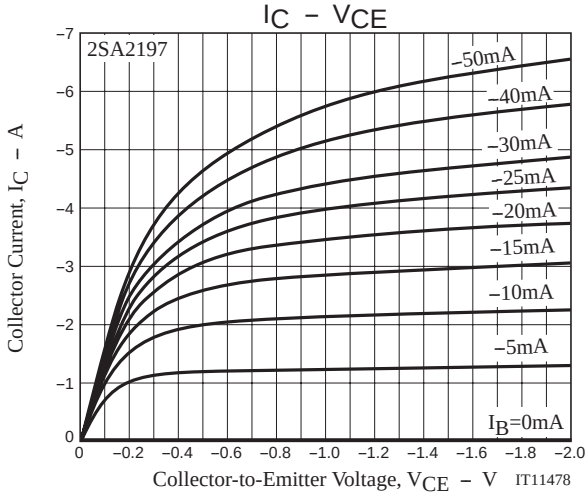


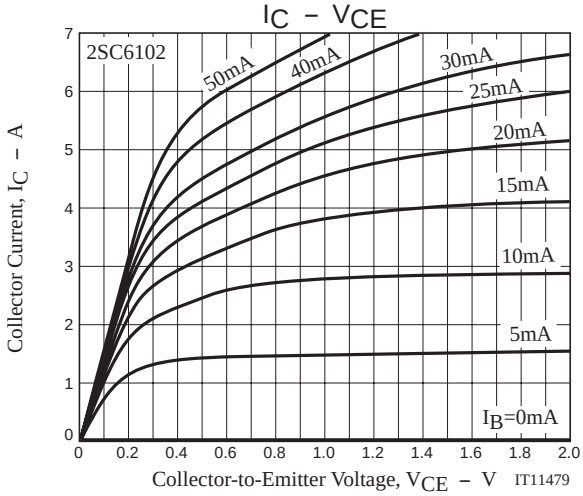
Switching Time Test Circuit

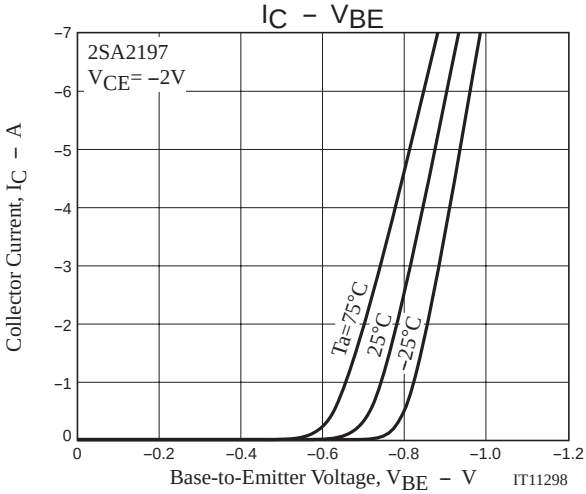


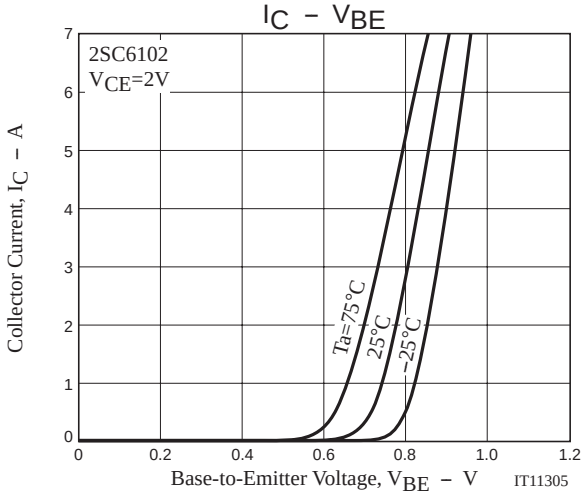
$20I_{B1}$= –$20I_{B2}$=I_C=2.5A

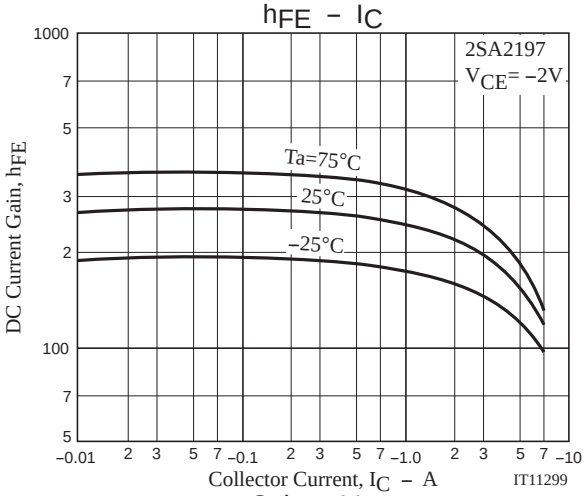
For PNP, the polarity is reversed.

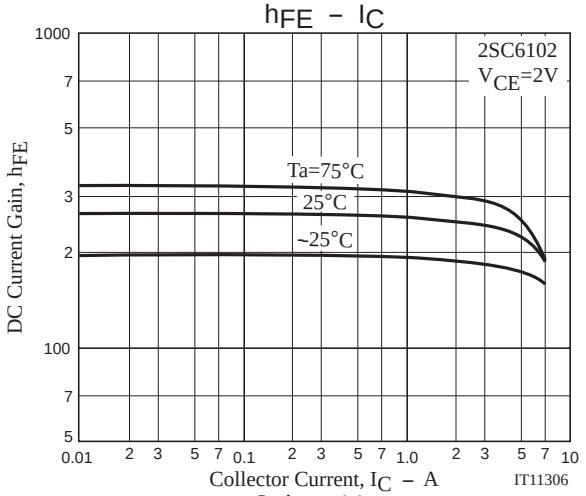


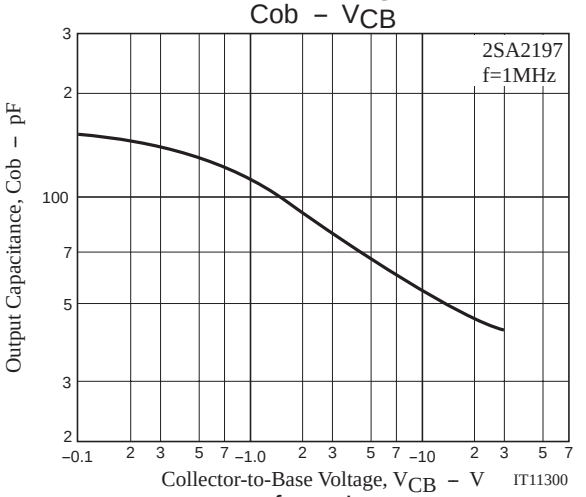


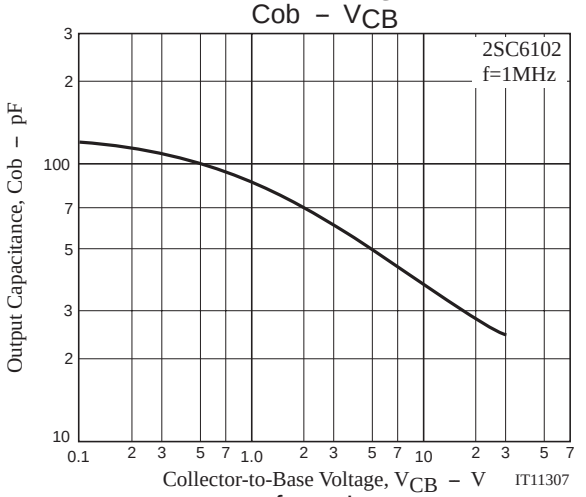

IC – VBE
2SA2197
VCE= –2V
Ta=75°C
25°C
–25°C
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
IT11298

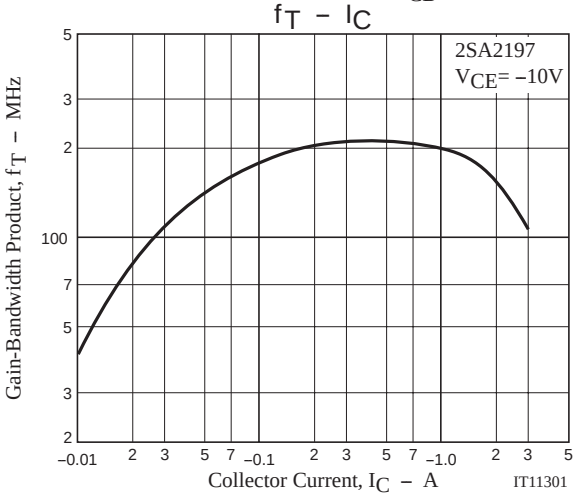

IC – VBE
2SC6102
VCE=2V
Ta=75°C
25°C
–25°C
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
IT11305

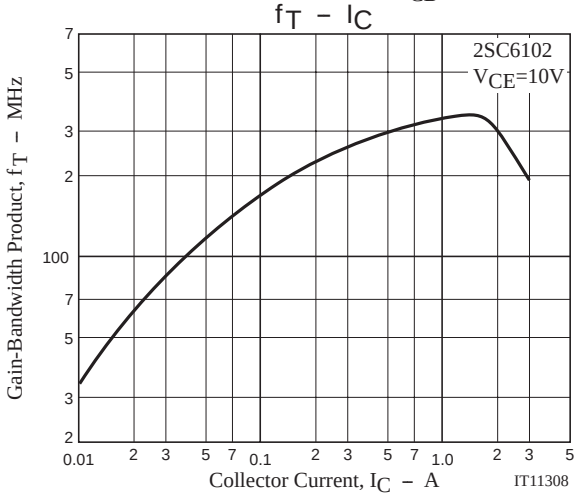

hFE – IC
2SA2197
VCE= –2V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
IT11299

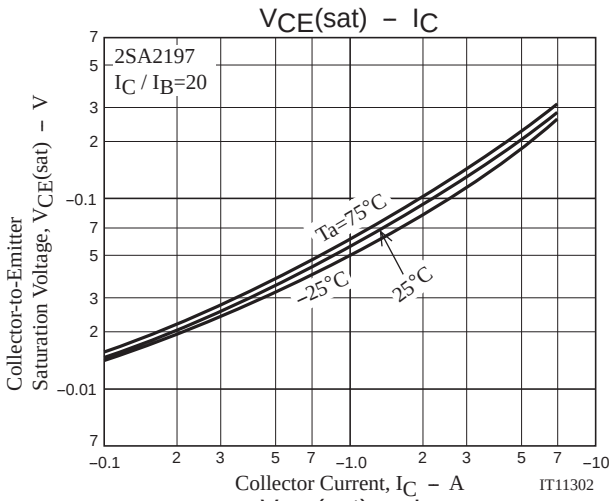

hFE – IC
2SC6102
VCE=2V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
IT11306

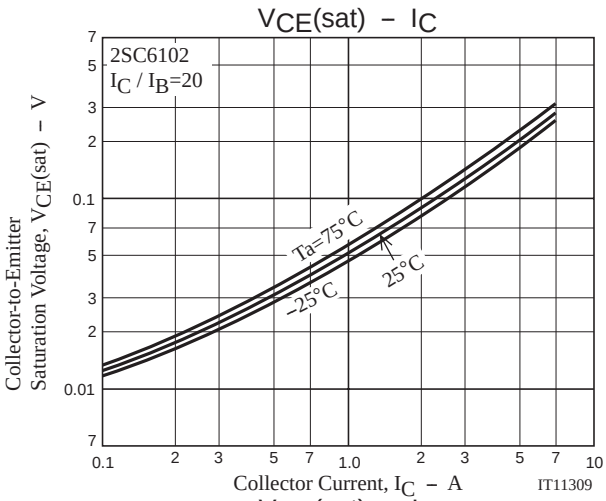

Cob – VCB
2SA2197
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT11300

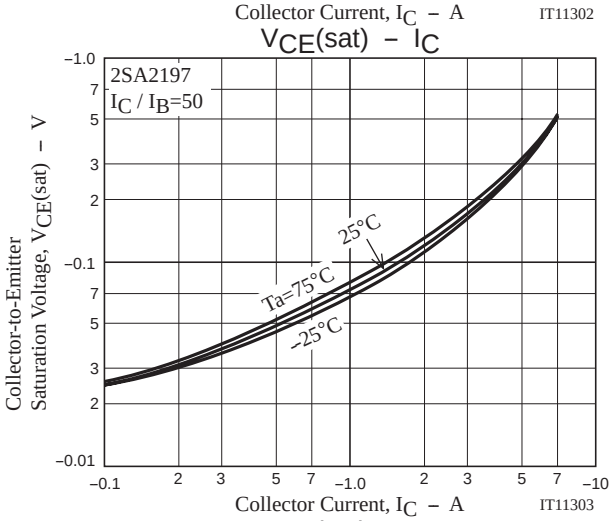

Cob – VCB
2SC6102
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT11307

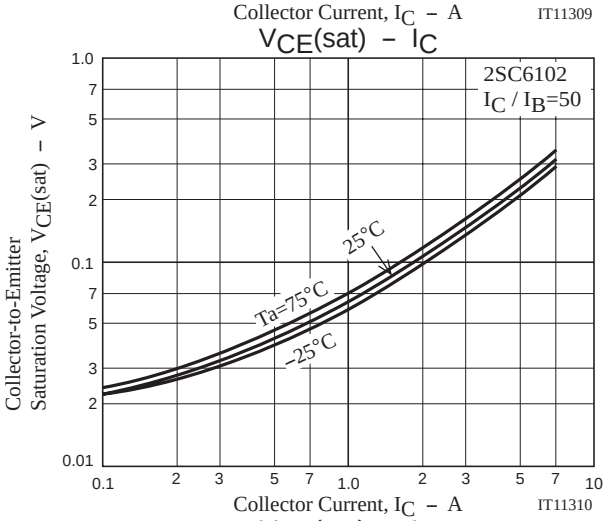

fT – IC
2SA2197
VCE= –10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT11301

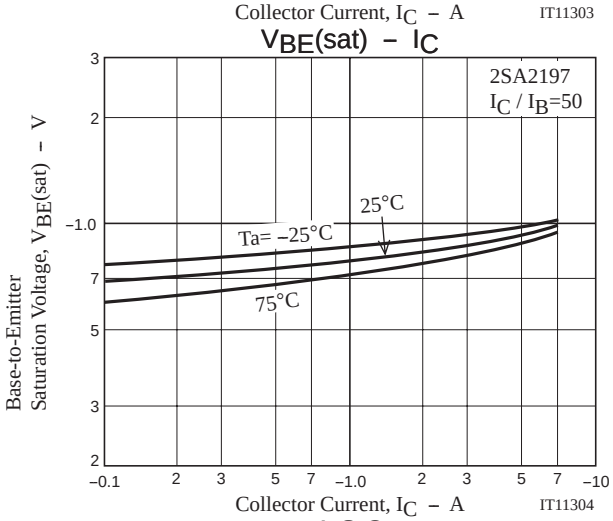

fT – IC
2SC6102
VCE=10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT11308

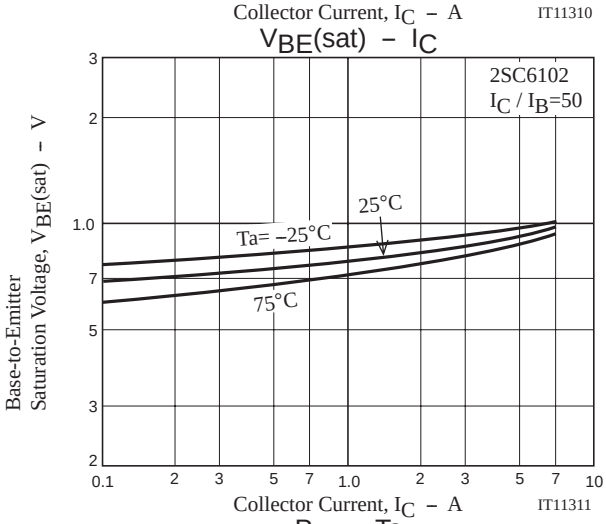

VCE(sat) – IC
2SA2197
IC / IB=20
Ta=75°C
25°C
–25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
IT11302

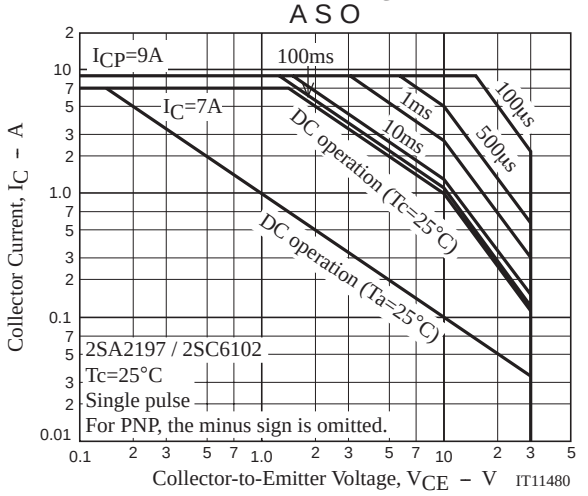

VCE(sat) – IC
2SC6102
IC / IB=20
Ta=75°C
25°C
–25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
IT11309

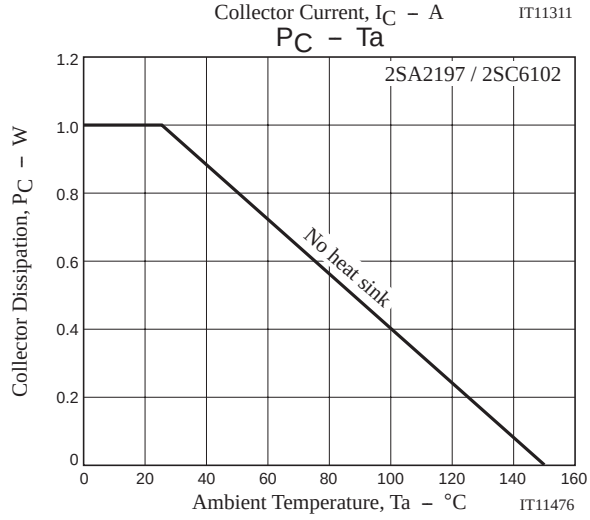

VCE(sat) – IC
2SA2197
IC / IB=50
25°C
Ta=75°C
–25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
IT11303

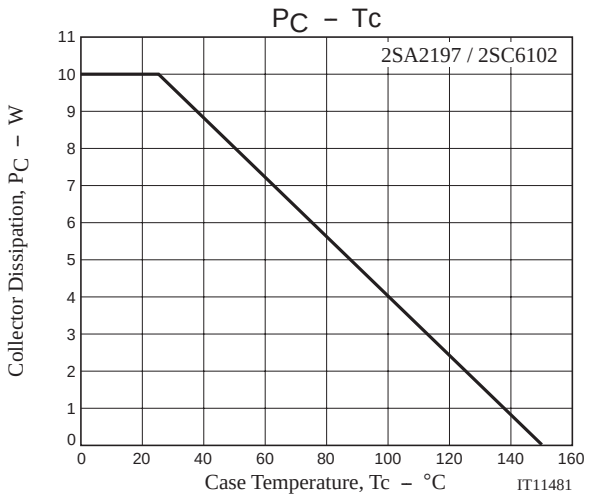

VCE(sat) – IC
2SC6102
IC / IB=50
25°C
Ta=75°C
–25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
IT11310


VBE(sat) – IC
2SA2197
IC / IB=50
Ta= –25°C
25°C
75°C
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – A
IT11304


VBE(sat) – IC
2SC6102
IC / IB=50
Ta= –25°C
25°C
75°C
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – A
IT11311


A S O
ICP=9A
100ms
IC=7A
1ms
10ms
100µs
500µs
DC operation (Tc=25°C)
DC operation (Ta=25°C)
2SA2197 / 2SC6102
Tc=25°C
Single pulse
For PNP, the minus sign is omitted.
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT11480


PC – Ta
2SA2197 / 2SC6102
No heat sink
Collector Dissipation, PC – W
Ambient Temperature, Ta – °C
IT11476



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