Ordering number : EN7331A

SANYO Semiconductors
DATA SHEET

2SA2099 / 2SC5888 — PNP / NPN Epitaxial Planar Silicon Transistors
High-Current Switching Applications

Applications

- Relay drivers, lamp drivers, motor drivers.

Features

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

Specifications ( ) : 2SA2099

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		(–50)60	V
Collector-to-Emitter Voltage	V_{CEO}		(–)50	V
Emitter-to-Base Voltage	V_{EBO}		(–)6	V
Collector Current	I_C		(–)10	A
Collector Current (Pulse)	I_{CP}		(–)13	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

SANYO Semiconductor Co., Ltd.
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

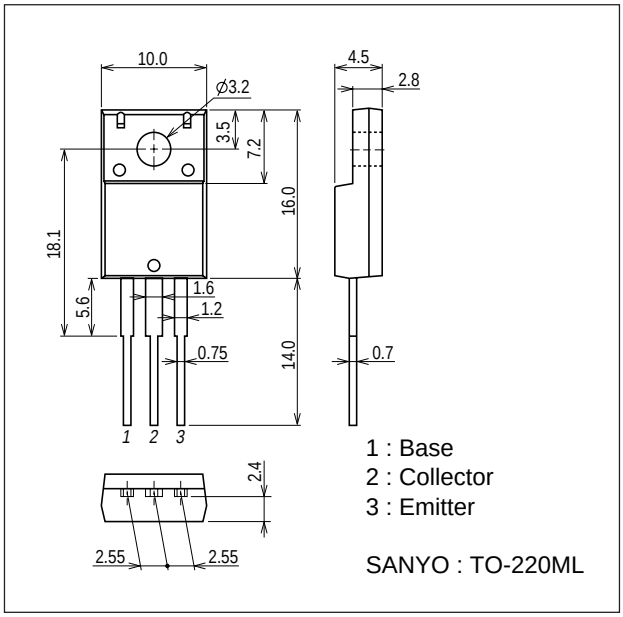
Electrical Characteristics at Ta=25°C

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}	V_{CE}=(-)2V, I_C=(-)1A	200		(560)700	
Gain-Bandwidth Product	f_T	V_{CE}=(-)5V, I_C=(-)1A		(130)200		MHz
Output Capacitance	Cob	V_{CB}=(-)10V, f=1MHz		(90)60		pF
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)	I_C=(-)5A, I_B=(-)250mA		(-250)180	(-500)360	mV
Base-to-Emitter Saturation Voltage	V_{BE}(sat)	I_C=(-)5A, I_B=(-)250mA		(-)0.93	(-)1.4	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(-)100μA, I_E=0A	(-50)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.		(70)40		ns
Storage Time	t_{stg}	See specified Test Circuit.		(650)1000		ns
Fall Time	t_f	See specified Test Circuit.		(60)80		ns

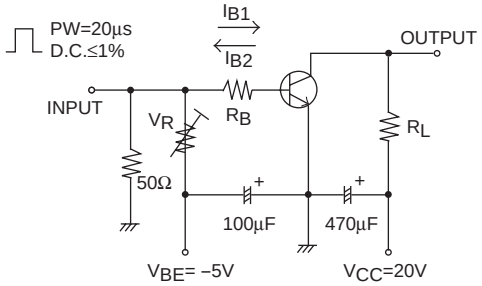
Package Dimensions

unit : mm (typ)

7508-002

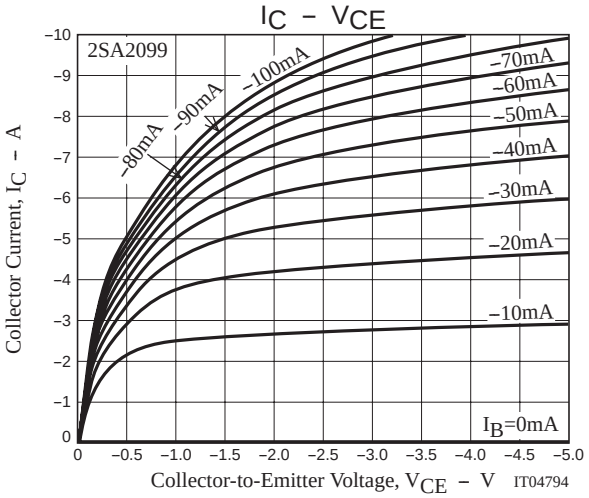


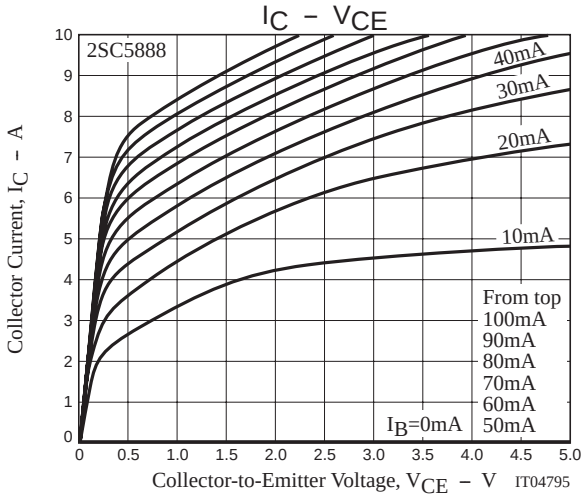
Switching Time Test Circuit

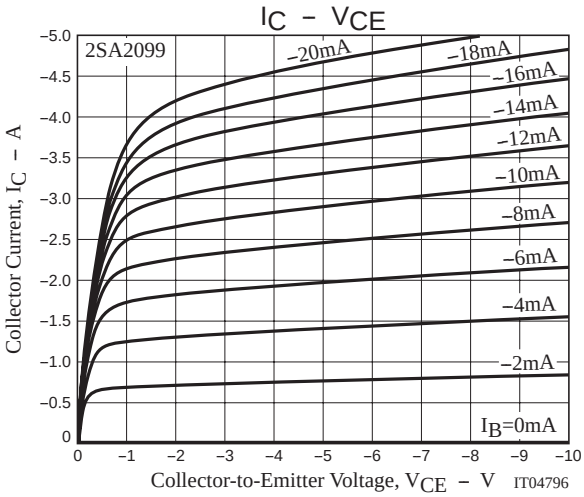


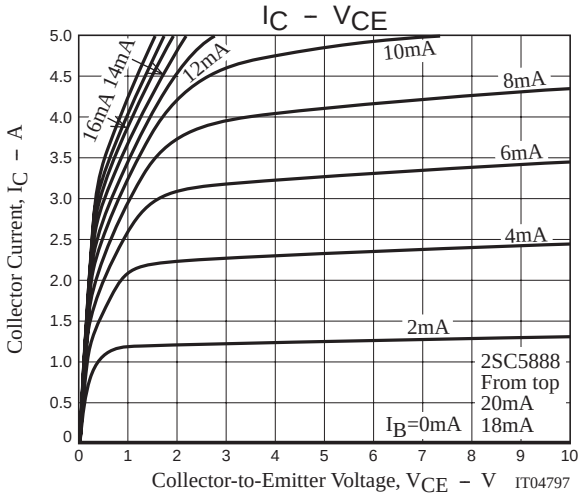
I_C=20I_{B1}= −20I_{B2}=3A

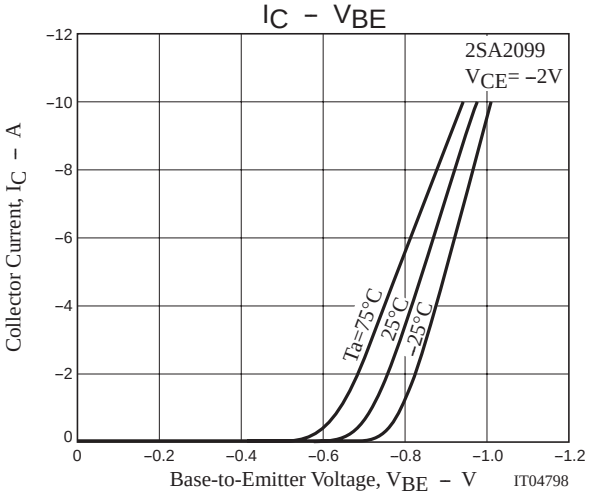
(For PNP, the polarity is reversed.)

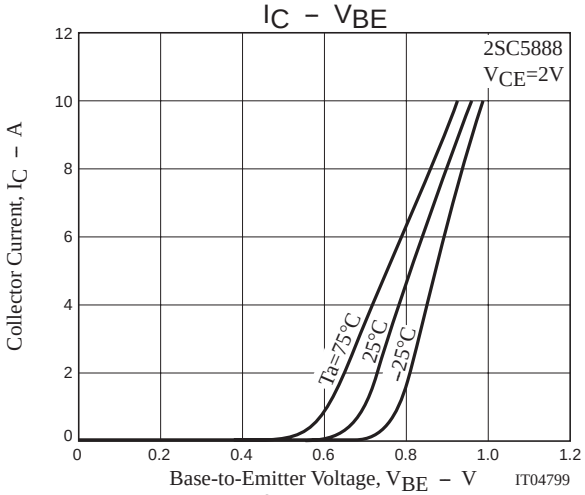


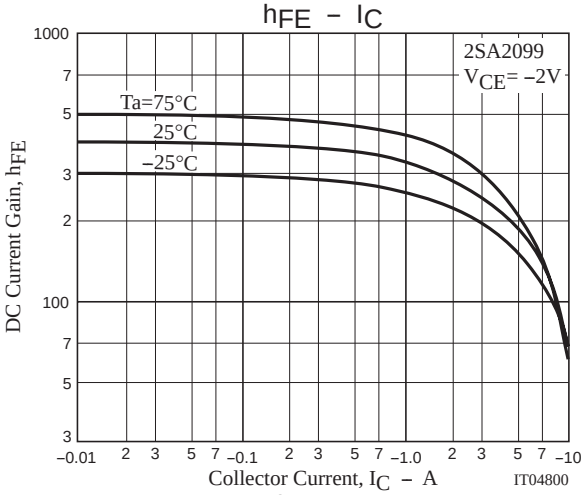


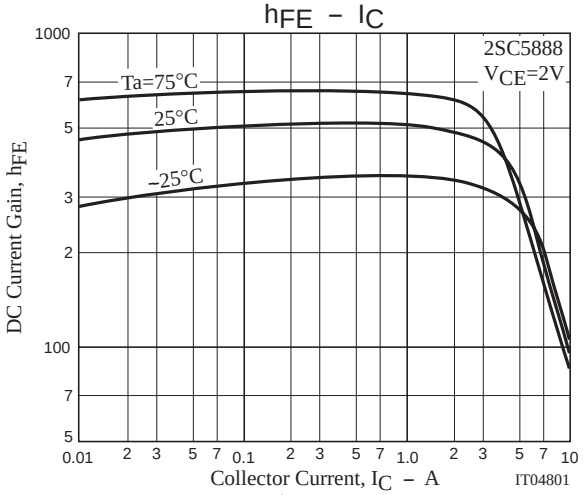

IC – VCE
2SA2099
–20mA
–18mA
–16mA
–14mA
–12mA
–10mA
–8mA
–6mA
–4mA
–2mA
IB=0mA
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT04796

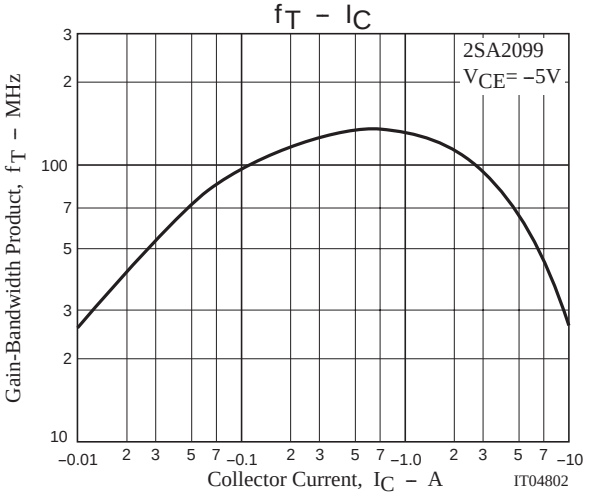

IC – VCE
16mA
14mA
12mA
10mA
8mA
6mA
4mA
2mA
2SC5888
From top
20mA
18mA
IB=0mA
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT04797

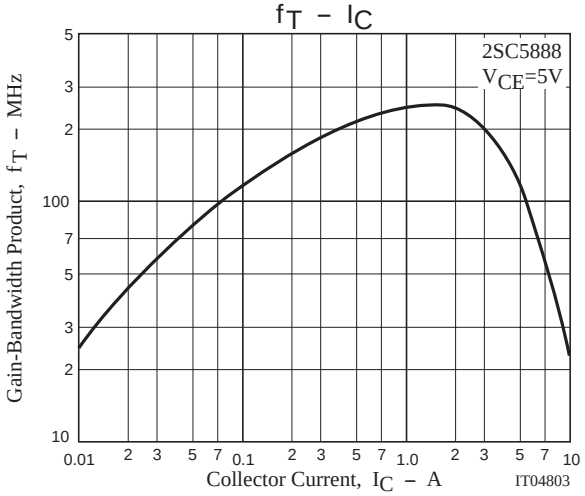

IC – VBE
2SA2099
VCE= –2V
Ta=75°C
25°C
–25°C
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
IT04798

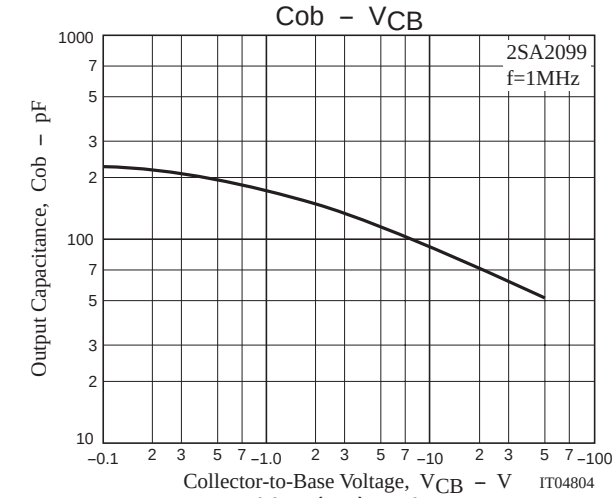

IC – VBE
2SC5888
VCE=2V
Ta=75°C
25°C
–25°C
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
IT04799

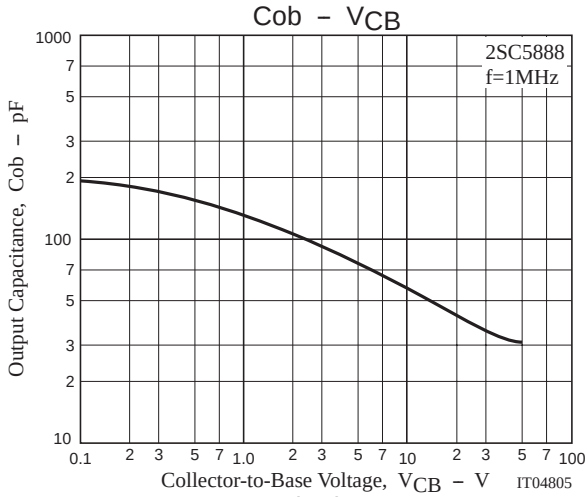

hFE – IC
2SA2099
VCE= –2V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
IT04800

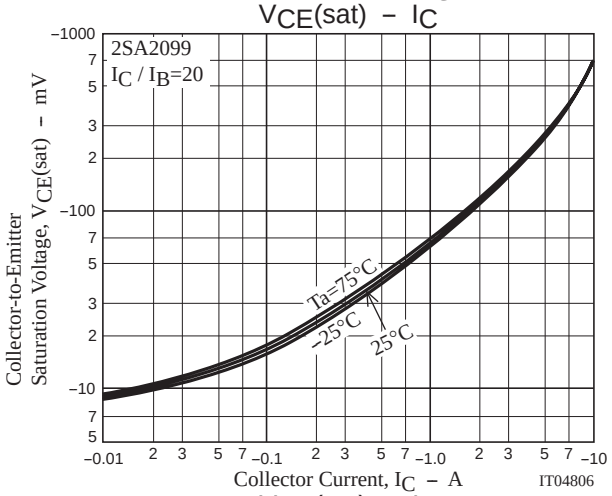

hFE – IC
2SC5888
VCE=2V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
IT04801

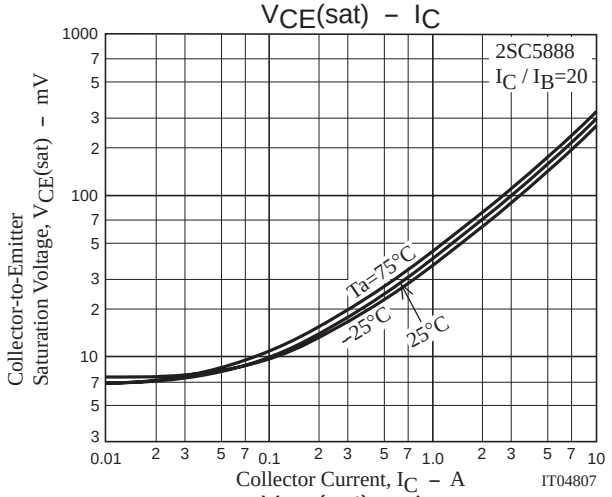

fT – IC
2SA2099
VCE= –5V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT04802

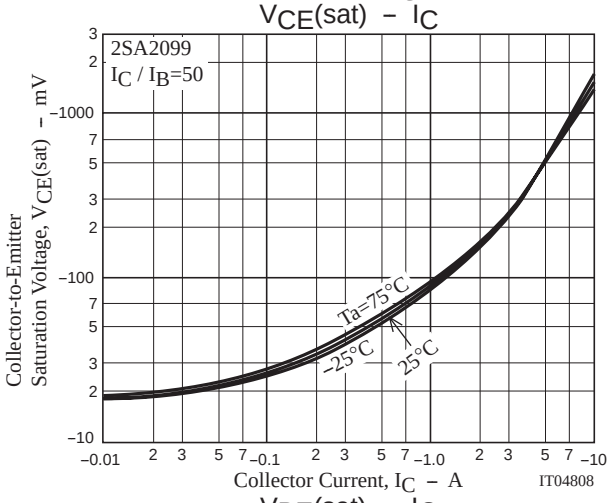

fT – IC
2SC5888
VCE=5V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT04803

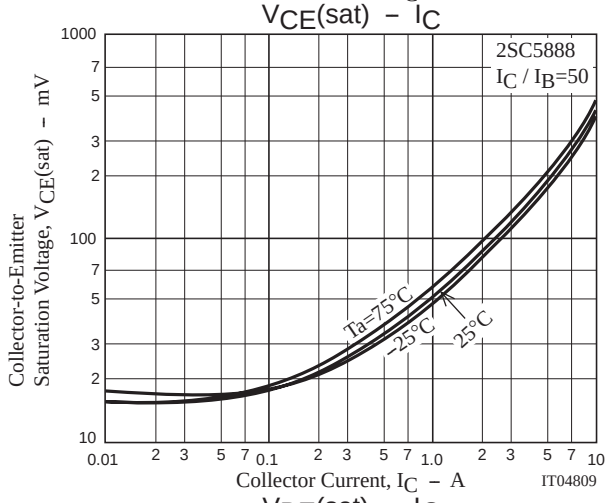

Cob – VCB
2SA2099
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT04804

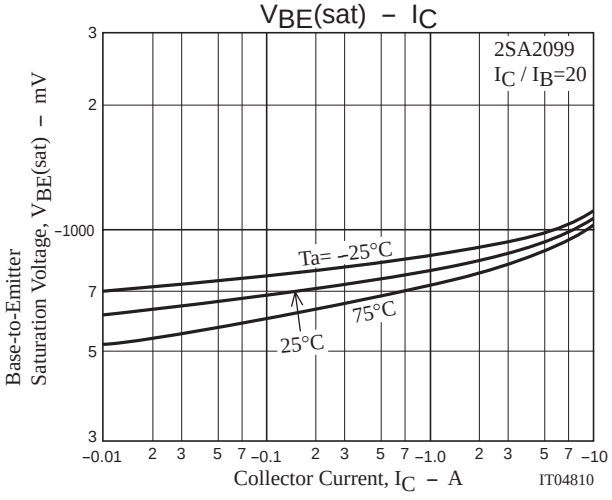

Cob – VCB
2SC5888
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT04805

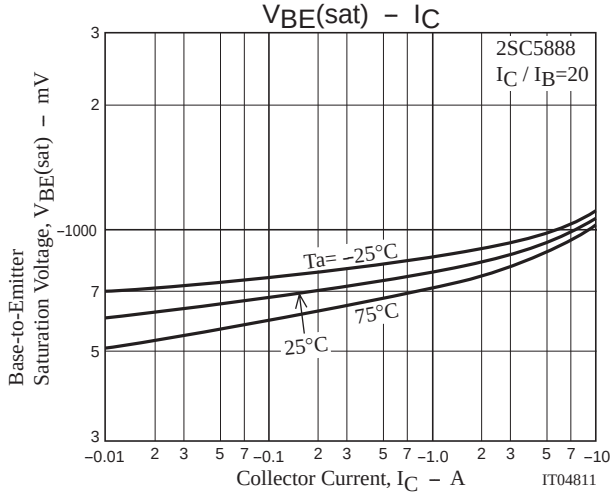

VCE(sat) – IC
2SA2099
IC / IB=20
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Ta=75°C
–25°C
25°C
Collector Current, IC – A
IT04806

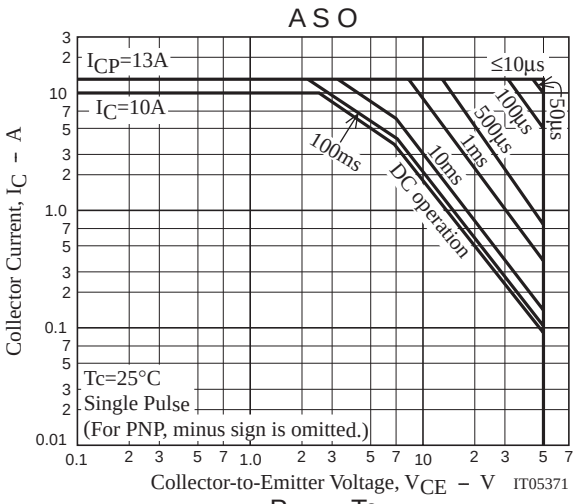

VCE(sat) – IC
2SC5888
IC / IB=20
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Ta=75°C
–25°C
25°C
Collector Current, IC – A
IT04807

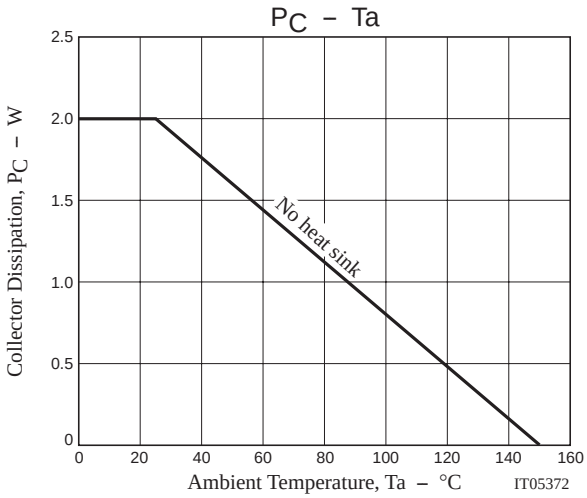

VCE(sat) – IC
2SA2099
IC / IB=50
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Ta=75°C
–25°C
25°C
Collector Current, IC – A
IT04808

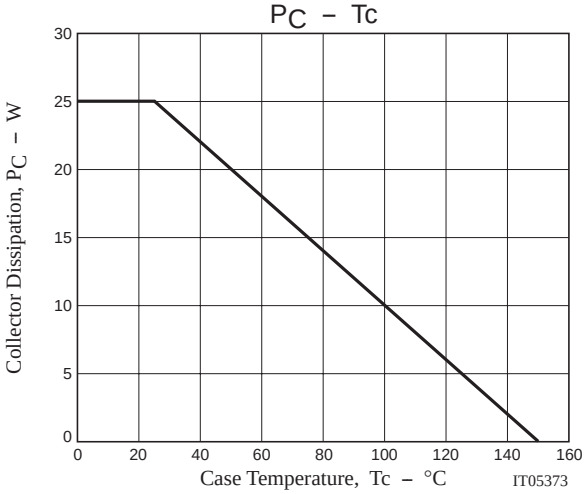

VCE(sat) – IC
2SC5888
IC / IB=50
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Ta=75°C
–25°C
25°C
Collector Current, IC – A
IT04809


VBE(sat) – IC
2SA2099
IC / IB=20
Base-to-Emitter Saturation Voltage, VBE(sat) – mV
Ta= –25°C
75°C
25°C
Collector Current, IC – A
IT04810


VBE(sat) – IC
2SC5888
IC / IB=20
Base-to-Emitter Saturation Voltage, VBE(sat) – mV
Ta= –25°C
75°C
25°C
Collector Current, IC – A
IT04811







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