Ordering number : ENN7331

PNP / NPN Epitaxial Planar Silicon Transistors

2SA2099 / 2SC5888

High-Current Switching Applications

Applications

- Relay drivers, lamp drivers, motor drivers.

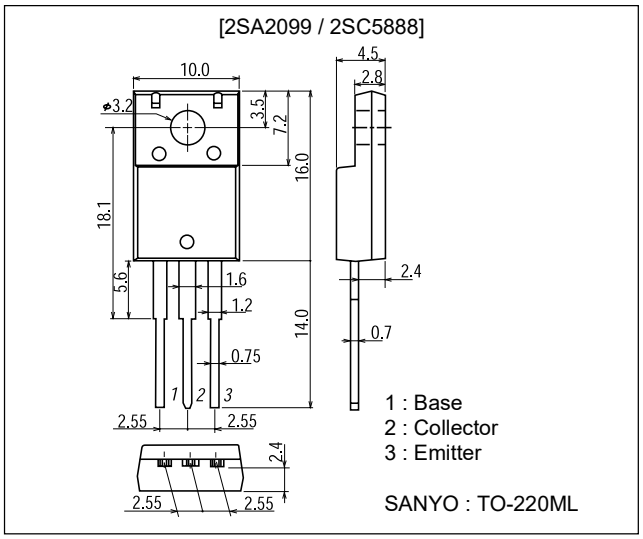
Features

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

Package Dimensions

unit : mm

2041A



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

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			(-)10	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(-)4V, I_C=0			(-)10	μA

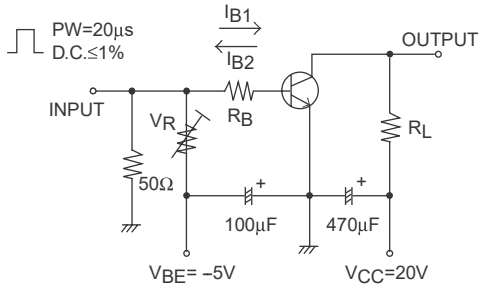
Continued on next page.

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

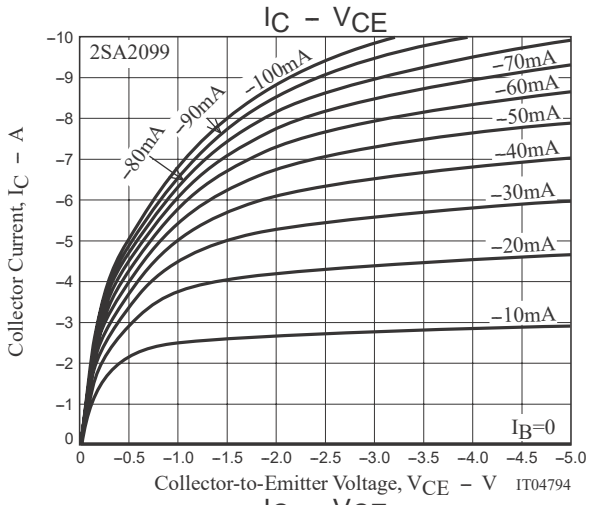
Continued from preceding page.

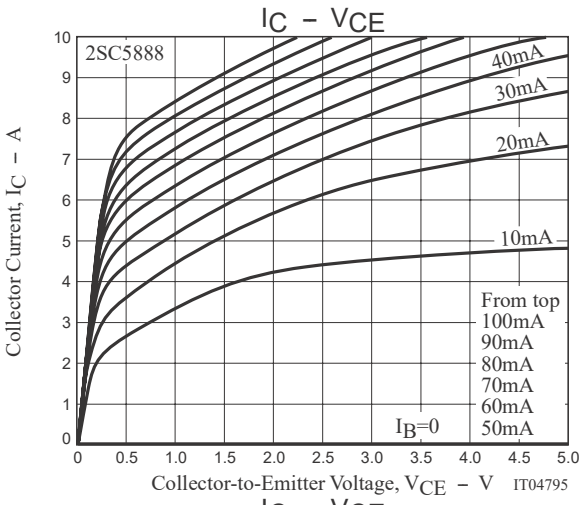
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
DC Current Gain	h_{FE}	V_{CE}=(–)2V, I_C=(–)1A	200		(560)700	
Gain-Bandwidth Product	f_T	V_{CE}=(–)5V, I_C=(–)1A		(130)200		MHz
Output Capacitance	Cob	V_{CB}=(–)10V, f=1MHz		90(60)		pF
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)	I_C=(–)5A, 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=0	(–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=0	(–)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

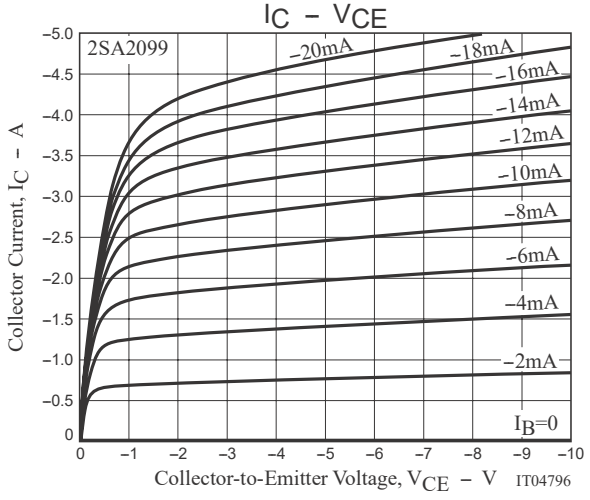
Switching Time Test Circuit

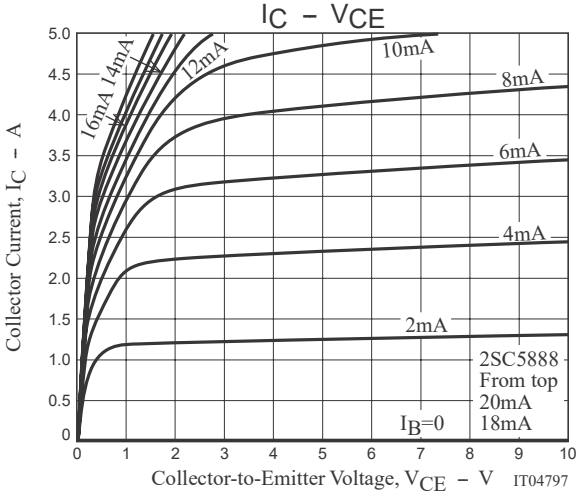


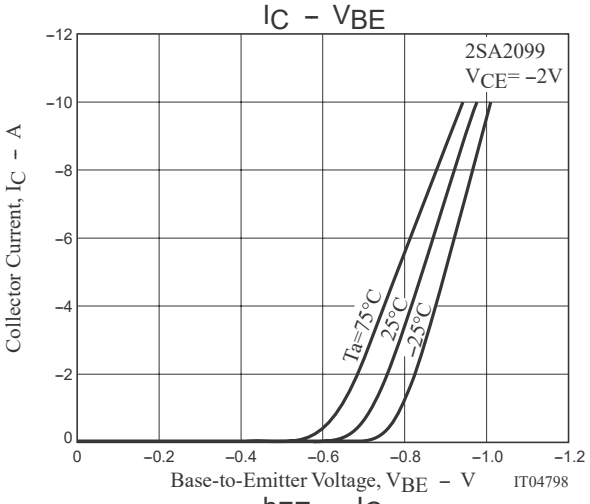
I_C=20I_{B1}= –20I_{B2}=3A
(For PNP, the polarity is reversed.)

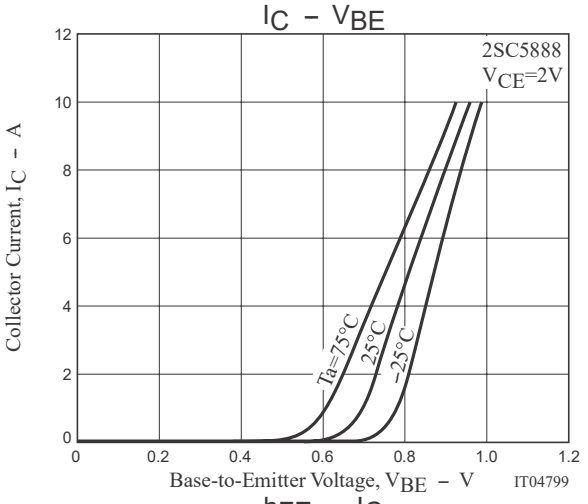


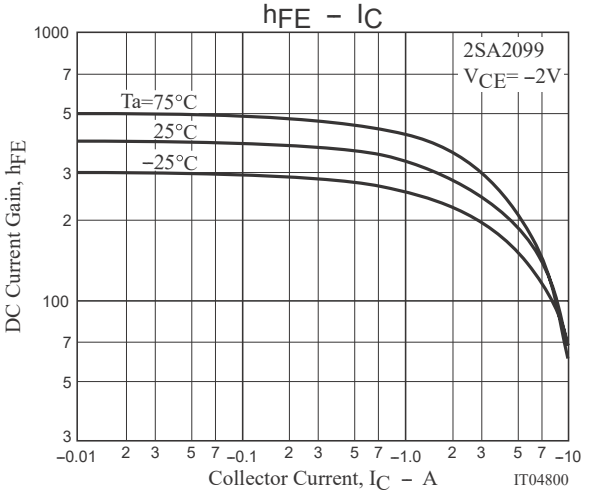


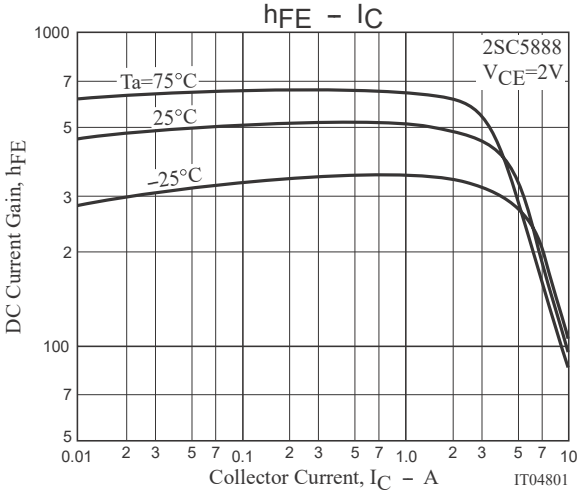


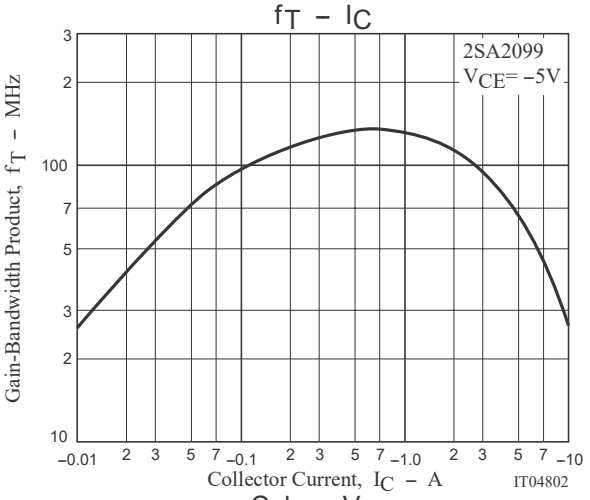


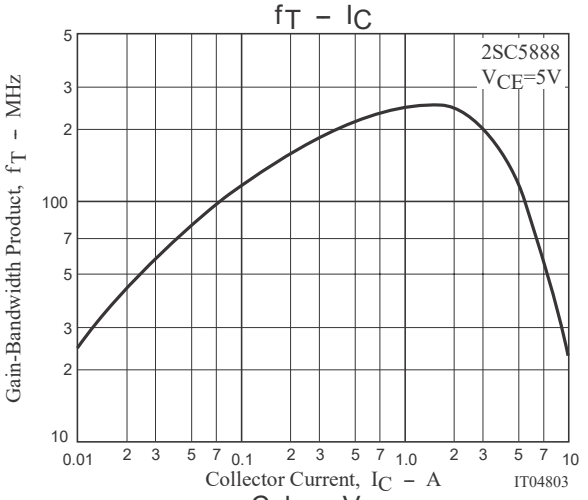

IC – VBE
2SA2099
VCE= –2V
Ta=75°C
25°C
–25°C
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
IT04798

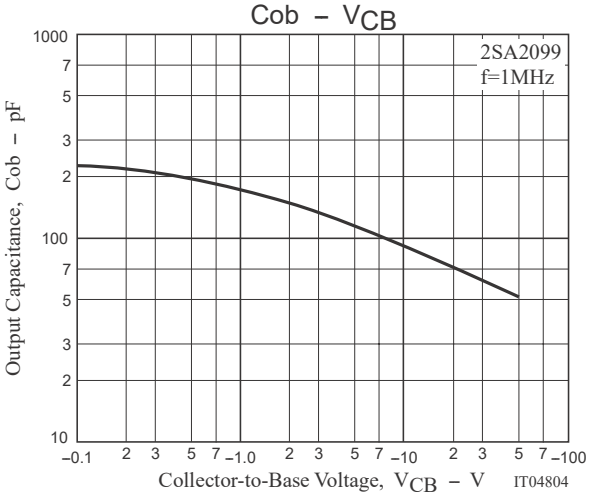

IC – VBE
2SC5888
VCE=2V
Ta=75°C
25°C
–25°C
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V
IT04799

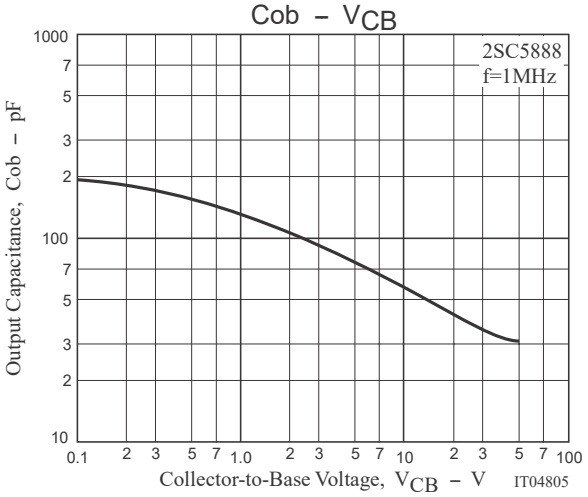

hFE – IC
2SA2099
VCE= –2V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
IT04800

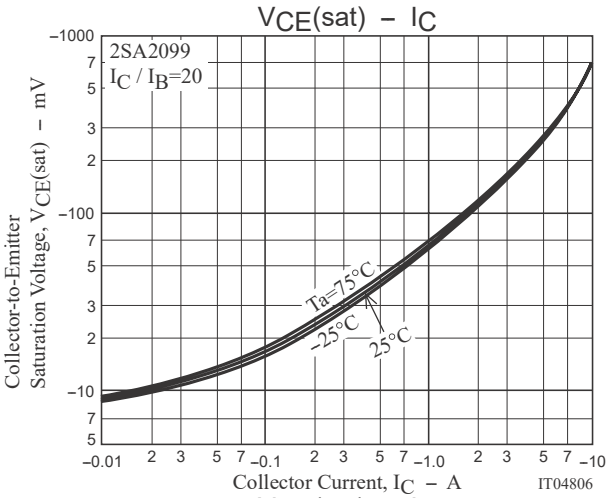

hFE – IC
2SC5888
VCE=2V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
IT04801

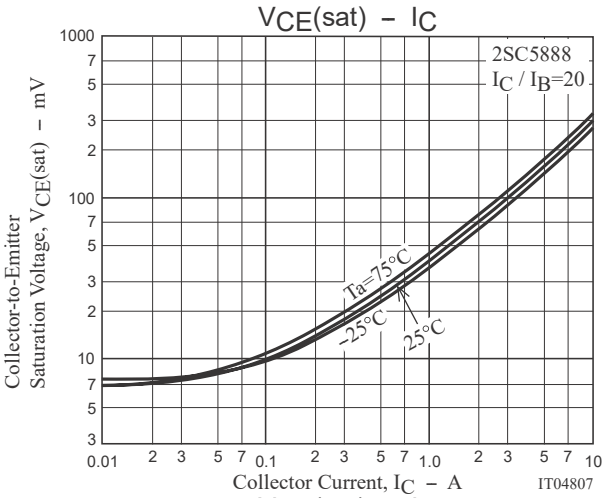

fT – IC
2SA2099
VCE= –5V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT04802

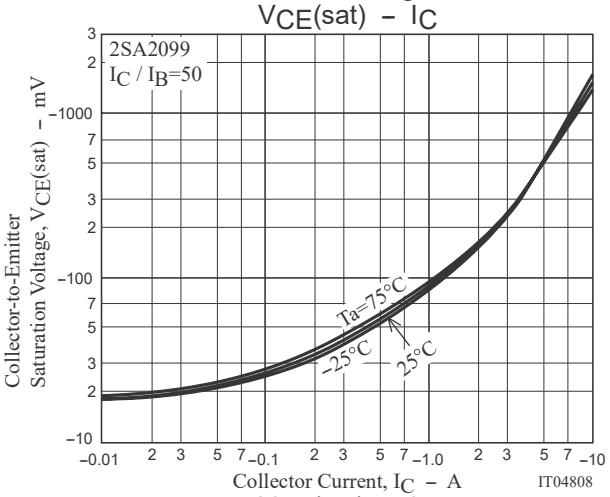

fT – IC
2SC5888
VCE=5V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT04803

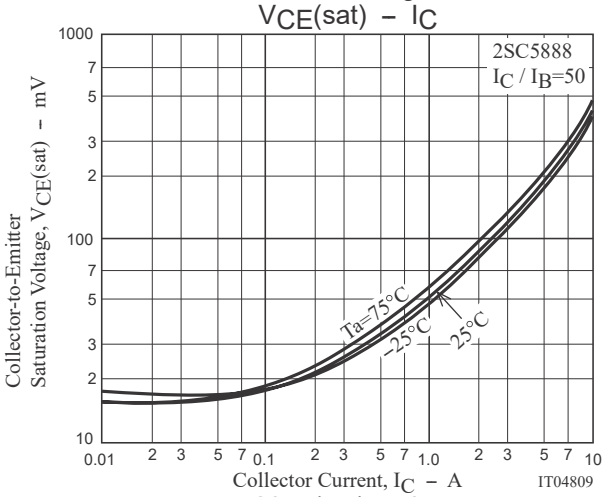

Cob – VCB
2SA2099
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT04804

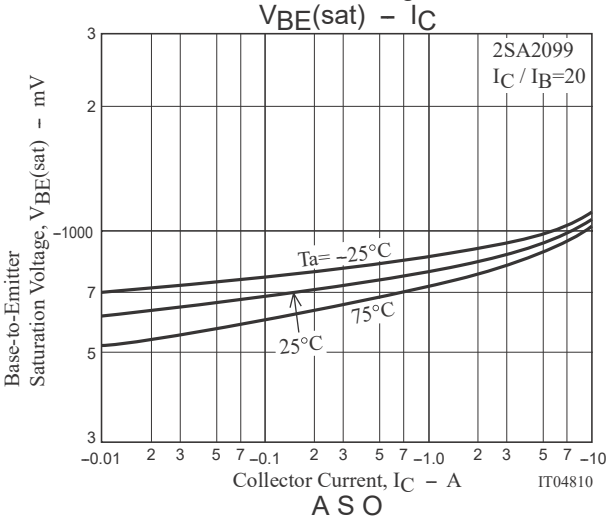

Cob – VCB
2SC5888
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT04805

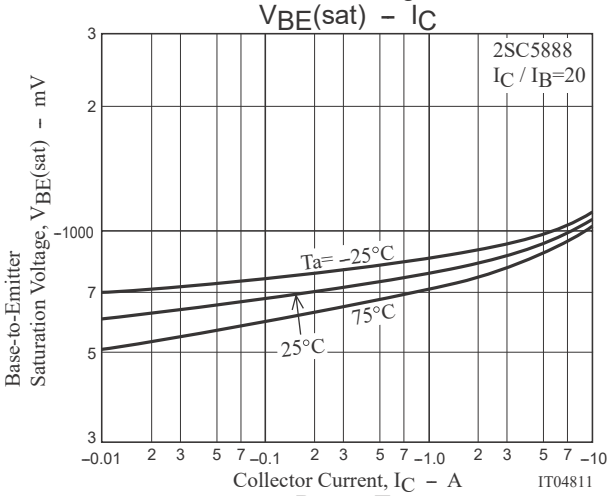

VCE(sat) – IC
2SA2099
IC / IB=20
Ta=75°C
–25°C
25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
IT04806

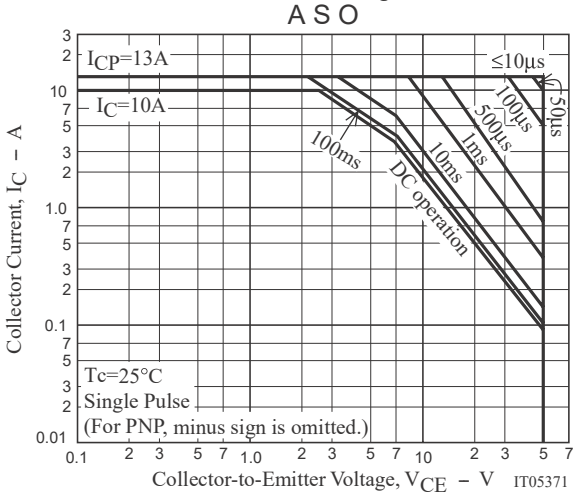

VCE(sat) – IC
2SC5888
IC / IB=20
Ta=75°C
–25°C
25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
IT04807

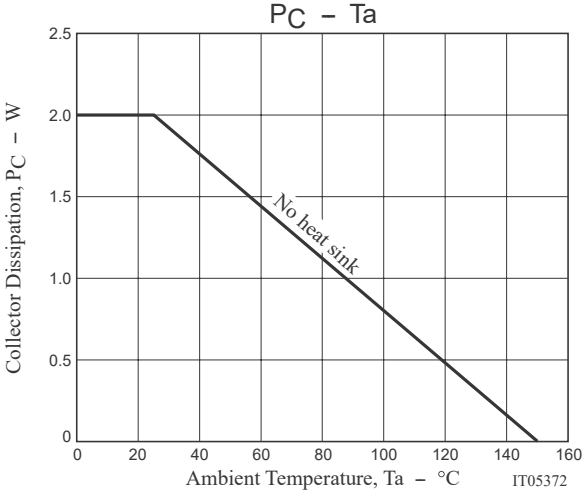

VCE(sat) – IC
2SA2099
IC / IB=50
Ta=75°C
–25°C
25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
IT04808


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


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


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


A S O
ICP=13A
IC=10A
≤10µs
50µs
100µs
500µs
1ms
10ms
DC operation
100ms
Tc=25°C
Single Pulse
(For PNP, minus sign is omitted.)
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT05371


PC – Ta
No heat sink
Collector Dissipation, PC – W
Ambient Temperature, Ta – °C
IT05372