Ordering number:ENN6305

PNP/NPN Epitaxial Planar Silicon Transistors

2SA2011/2SC5564

DC/DC Converter Applications

Applications

· Relay drivers, lamp drivers, motor drivers, strobes.

Features

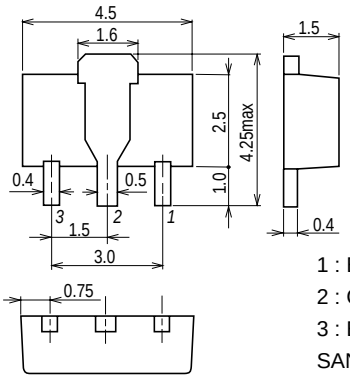
· Adoption of MBIT processes.
· Large current capacitance.
· Low collector-to-emitter saturation voltage.
· High-speed switching.
· Ultrasmall-sized package permitting applied sets to be made small and slim.
· High allowable power dissipation.

Package Dimensions

unit:mm

2038A

[2SA2011/2SC5564]



1 : Base
2 : Collector
3 : Emitter
SANYO : PCP
(Bottom view)

Specifications

( ) : 2SA2011

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		(–)15	V
Collector-to-Emitter Voltage	V_{CEO}		(–12)15	V
Emitter-to-Base Voltage	V_{EBO}		(–)5	V
Collector Current	I_C		(–)6	A
Collector Current (Pulse)	I_{CP}		(–)9	A
Base Current	I_B		(–)600	mA
Collector Dissipation	P_C	Mounted on a ceramic board (250mm^2×0.8mm)	1.3	W
		Tc=25˚C	3.5	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}=(–)12V, I_E=0			(–)0.1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(–)4V, I_C=0			(–)0.1	μA
DC Current Gain	h_{FE}	V_{CE}=(–)2V, I_C=(–)500mA	200		560	
Gain-Bandwidth Product	f_T	V_{CE}=(–)2V, I_C=(–)500mA		(350)		MHz
				380		MHz
Output Capacitance	Cob	V_{CB}=(–)10V, f=1MHz		(41)23		pF

Continued on next page.

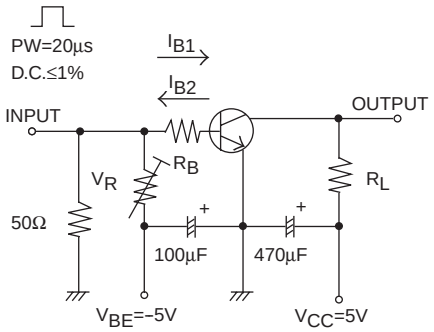
Marking : 2SA2011 : AR 2SC5564 : FA

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

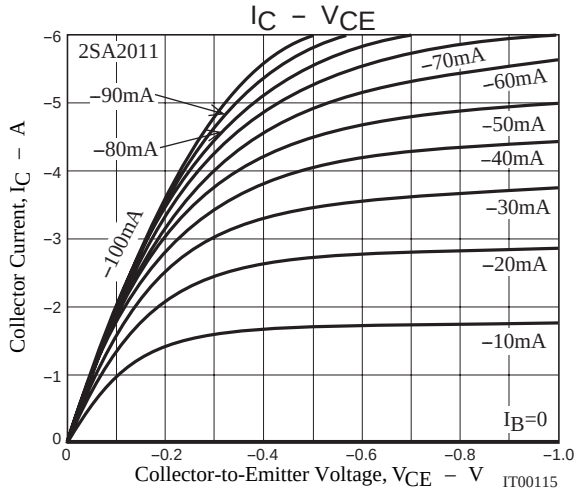
Continued on preceding page.

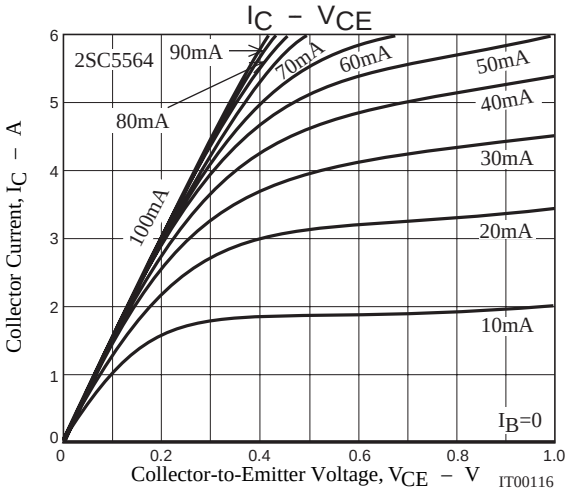
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)	I_C=(–)1.5A, I_B=(–)30mA		(–)120	(–)180	mV
		I_C=(–)3A, I_B=(–)60mA		(–190)	(–290)	mV
				200	300	mV
Base-to-Emitter Saturation Voltage	V_{BE}(sat)	I_C=(–)1.5A, I_B=(–)30mA		(–)0.85	(–)1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(–)10μA, I_E=0	(–)15			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=(–)1mA, R_{BE}=∞	(–12)			V
			15			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=(–)10μA, I_C=0	(–)5			V
Turn-ON Time	t_{on}	See specified Test Circuit		(35)30		ns
Storage Time	t_{stg}	See specified Test Circuit		(110)		ns
				190		ns
Fall Time	t_f	See specified Test Circuit		15		ns

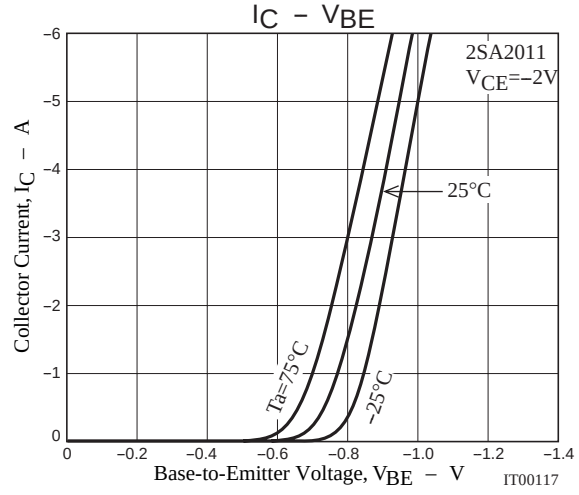
Switching Time Test Circuit

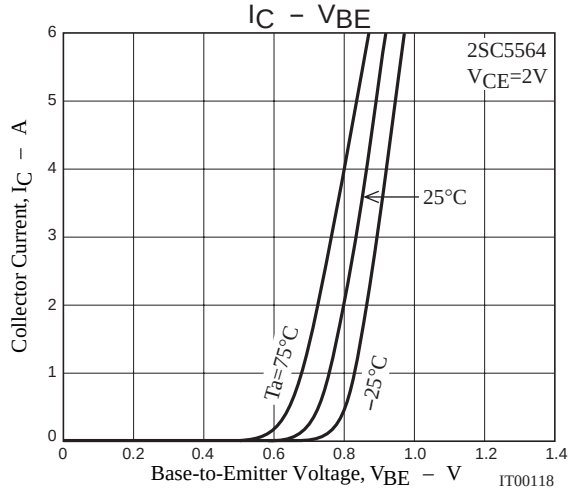


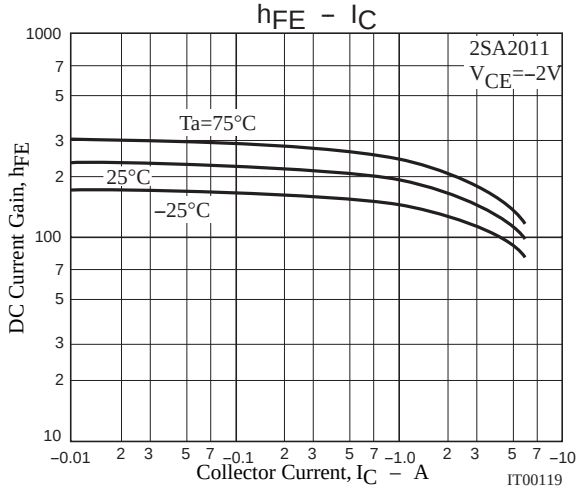
$20I_{B1}$= $-20I_{B2}$= I_C=1.5A
(For PNP, the polarity is reversed.)

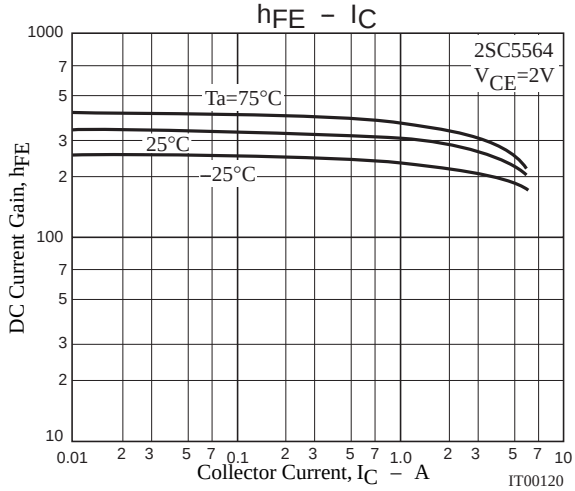


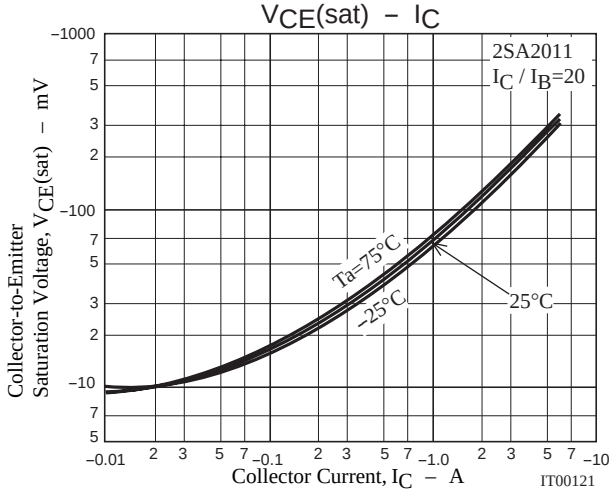


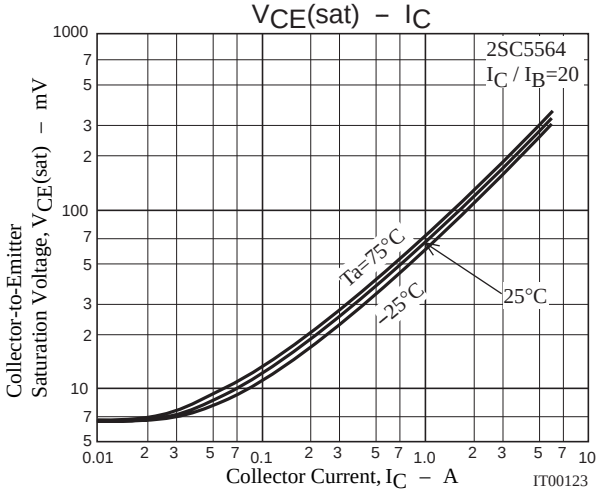


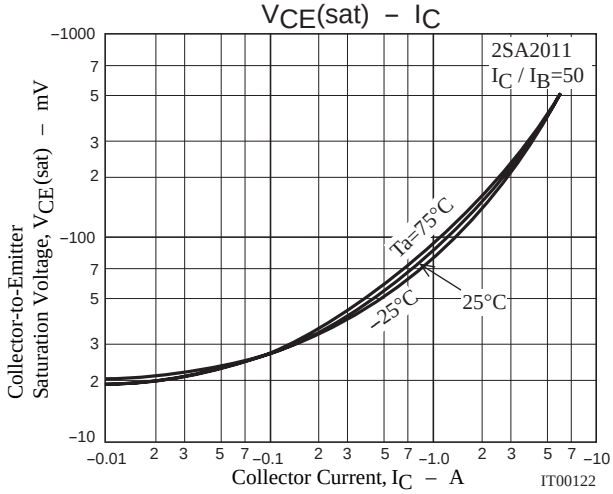


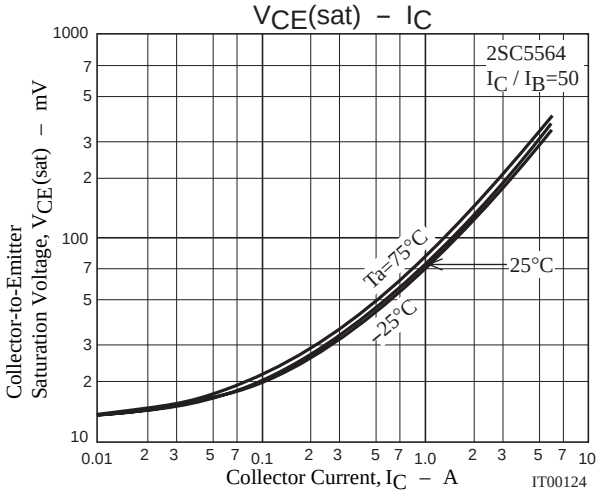

hFE – IC
2SA2011
VCE=–2V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
IT00119

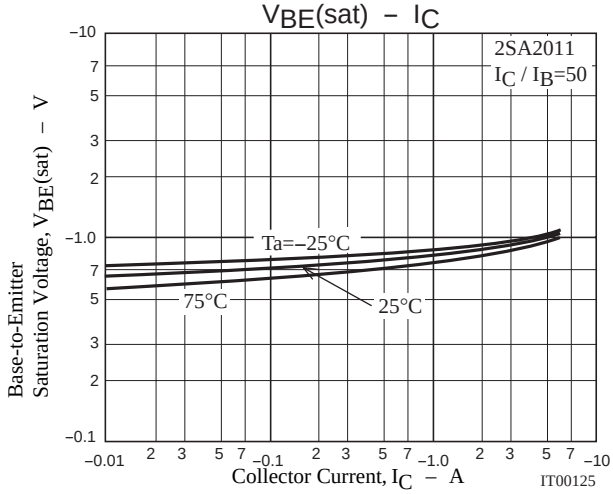

hFE – IC
2SC5564
VCE=2V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A
IT00120

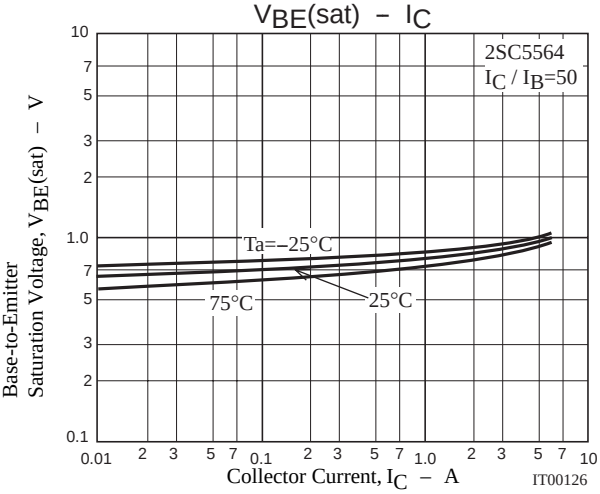

VCE(sat) – IC
2SA2011
IC / IB=20
Ta=75°C
–25°C
25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
IT00121


VCE(sat) – IC
2SC5564
IC / IB=20
Ta=75°C
–25°C
25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
IT00123

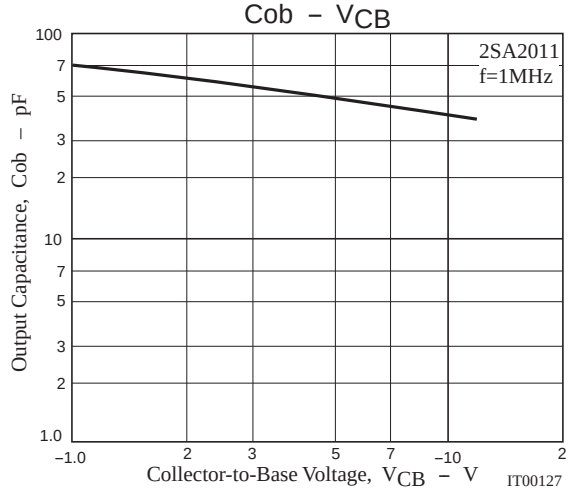

VCE(sat) – IC
2SA2011
IC / IB=50
Ta=75°C
–25°C
25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
IT00122


VCE(sat) – IC
2SC5564
IC / IB=50
Ta=75°C
–25°C
25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A
IT00124

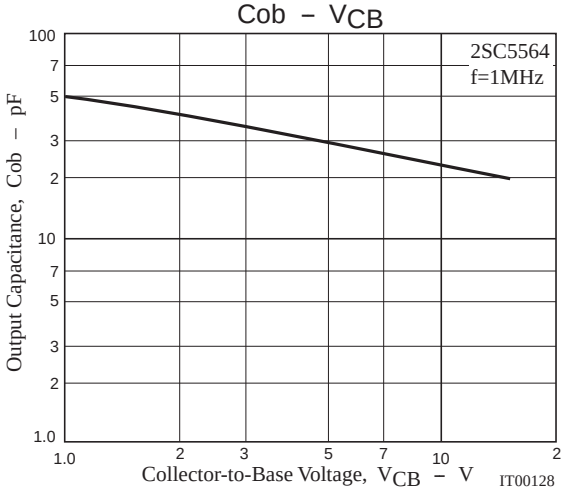

VBE(sat) – IC
2SA2011
IC / IB=50
Ta=–25°C
75°C
25°C
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – A
IT00125


VBE(sat) – IC
2SC5564
IC / IB=50
Ta=–25°C
75°C
25°C
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – A
IT00126

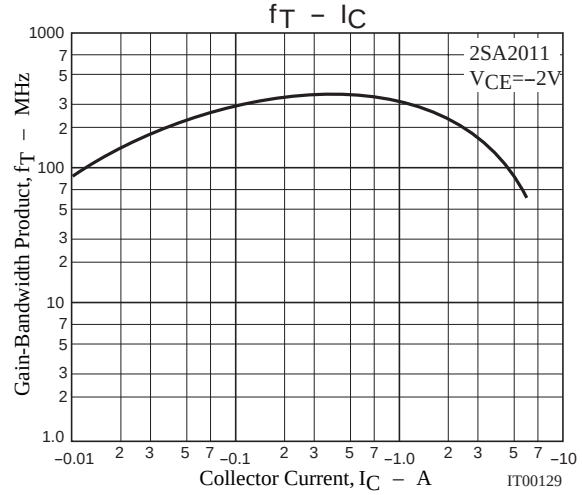
Cob – V_{CB}



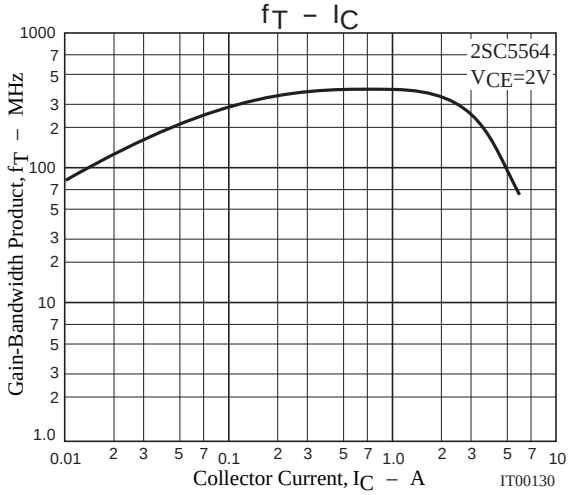
Cob – V_{CB}



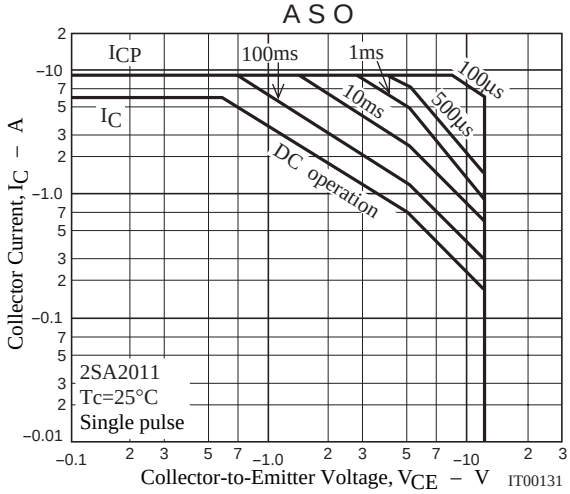
f_T – I_C



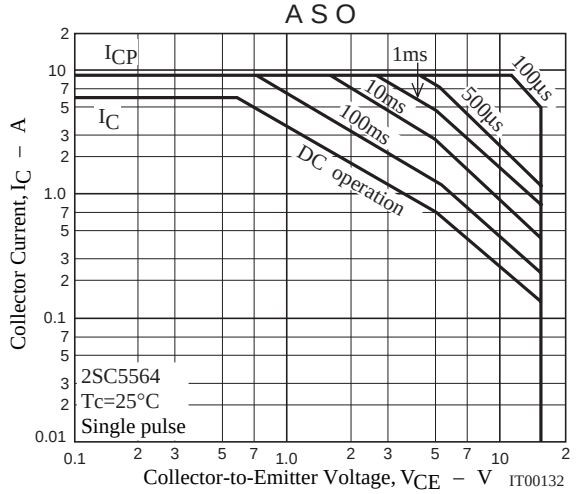
f_T – I_C



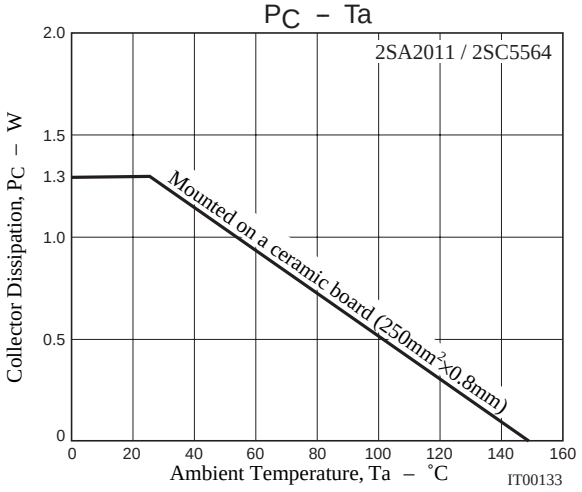
A S O



A S O



P_C – Ta



P_C – Tc