Ordering number : ENA1800

SANYO Semiconductors

DATA SHEET

2SC6144SG — NPN Epitaxial Planar Silicon Transistor

High-Current Switching Applications

Applications

- Relay drivers, lamp drivers, motor drivers

Features

- Adoption of MBIT process
- Large current capacitance (I_C=10A)
- Low collector-to-emitter saturation voltage (V_{CE}(sat)=180mV(typ.))
- High-speed switching (t_f=25ns(typ.))

Specifications

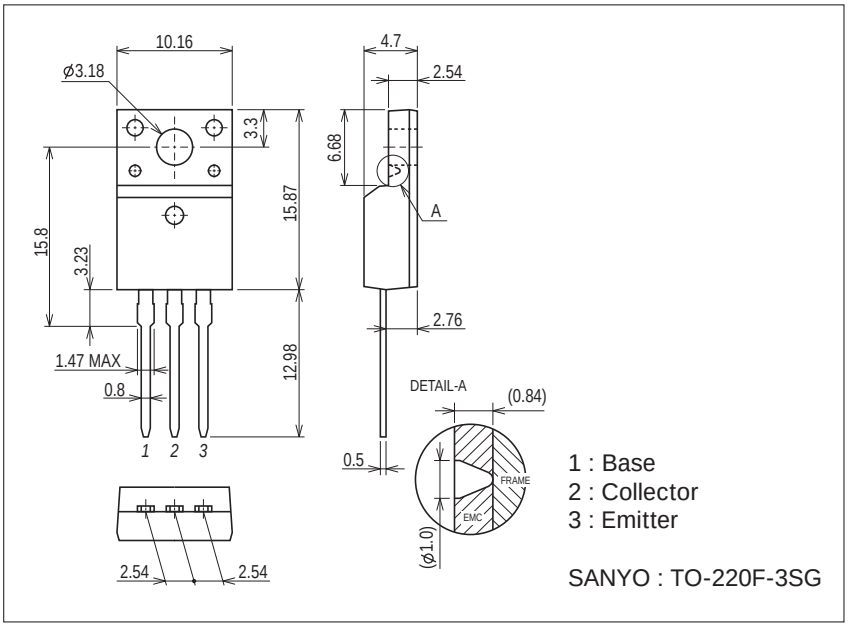
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		60	V
Collector-to-Emitter Voltage	V_{CEO}		50	V
Emitter-to-Base Voltage	V_{EBO}		5	V
Collector Current	I_C		10	A
Collector Current (Pulse)	I_{CP}		13	A
Base Current	I_B		2	A
Collector Dissipation	P_C	Tc=25°C, P_T≤1s	25	W
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		−55 to +150	°C

Package Dimensions

unit : mm (typ)

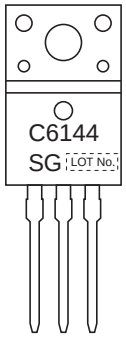
7529-002



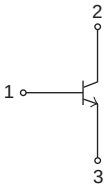
Product & Package Information

- Package : TO-220F-3SG
- JEITA, JEDEC : SC-67
- Minimum Packing Quantity : 50 pcs./magazine

Marking



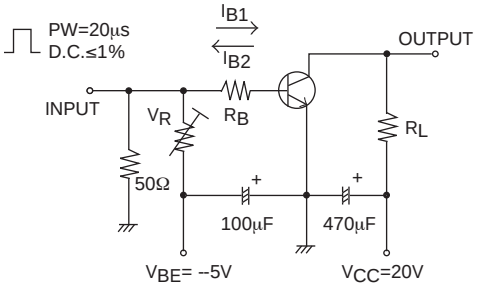
Electrical Connection



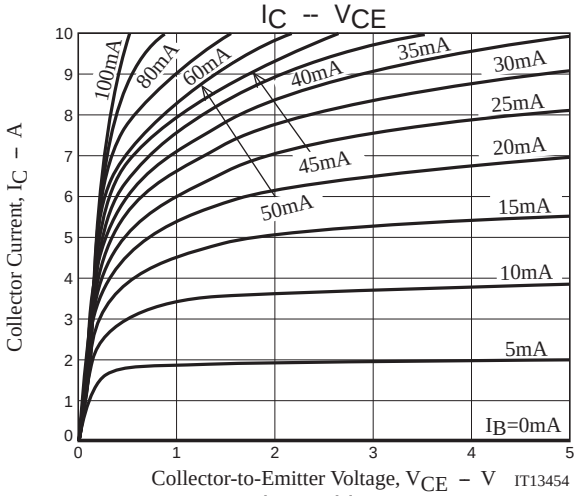
Electrical Characteristics at Ta=25°C

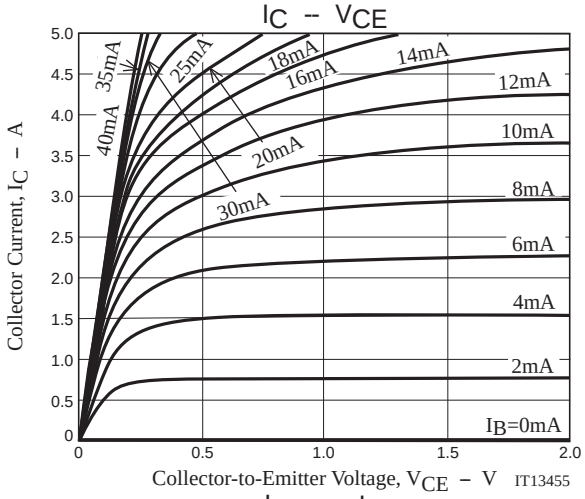
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=40V, I_E=0A			10	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=4V, I_C=0A			10	μA
DC Current Gain	h_{FE}	V_{CE}=2V, I_C=270mA	200		560	
Gain-Bandwidth Product	f_T	V_{CE}=10V, I_C=3A		330		MHz
Output Capacitance	Cob	V_{CB}=10V, f=1MHz		60		pF
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)	I_C=6A, I_B=300mA		180	360	mV
Base-to-Emitter Saturation Voltage	V_{BE}(sat)	I_C=6A, I_B=300mA			1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=100μA, I_E=0A	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	5			V
Turn-On Time	t_{on}	See specified Test Circuit.		62		ns
Storage Time	t_{stg}	See specified Test Circuit.		350		ns
Fall Time	t_f	See specified Test Circuit.		25		ns

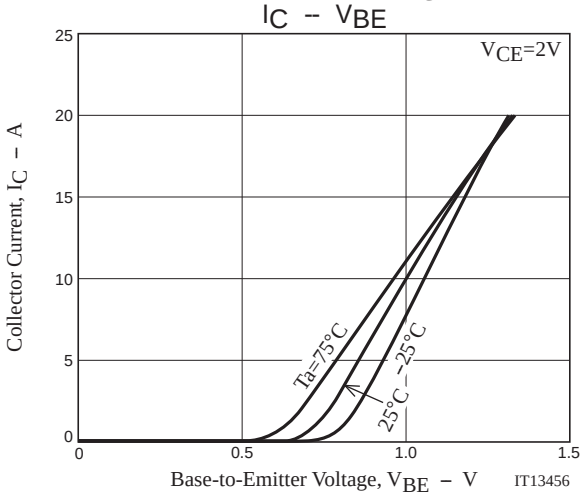
Switching Time Test Circuit

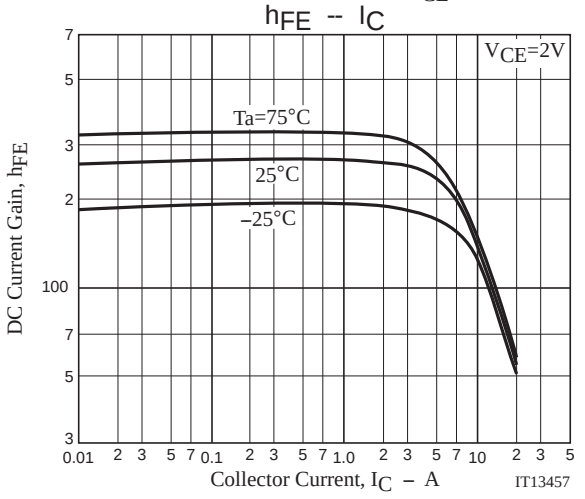


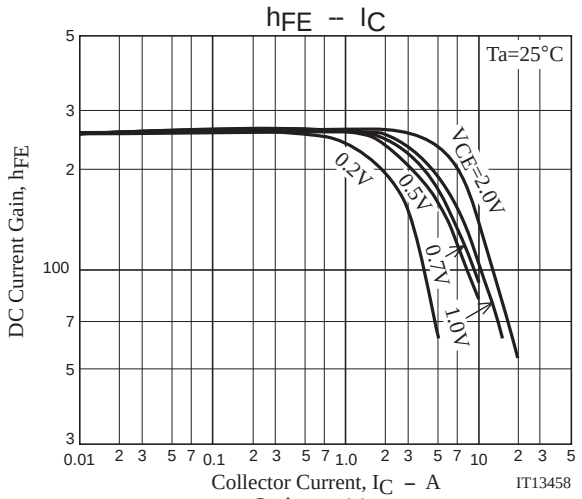
I_C=20I_{B1}= –20I_{B2}=5A

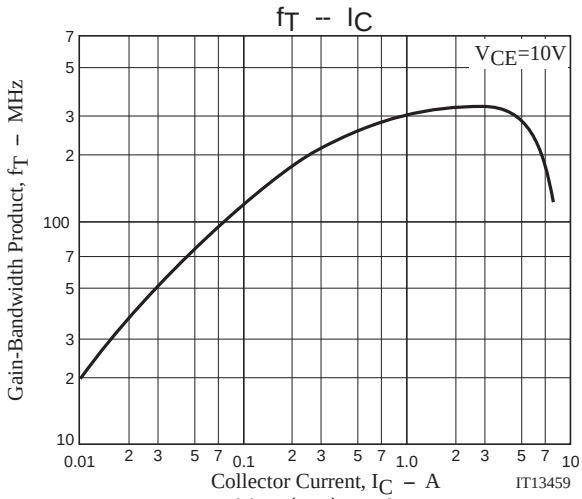


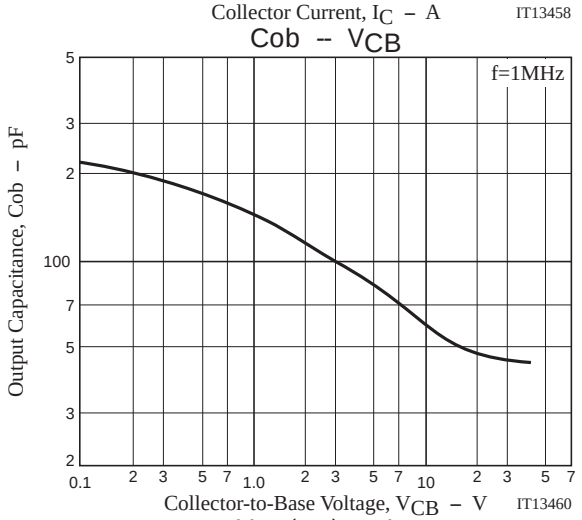


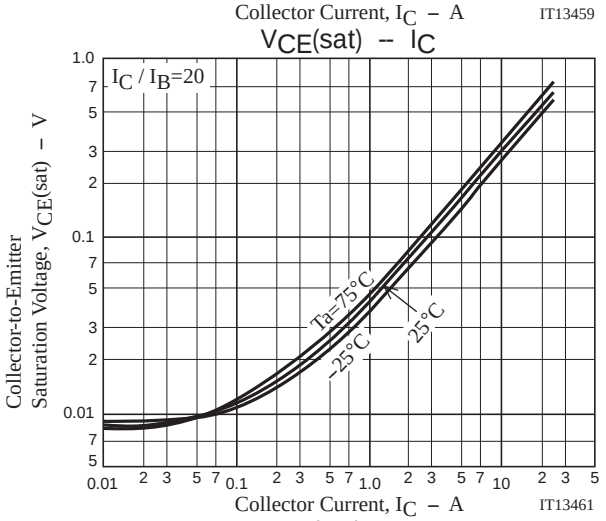


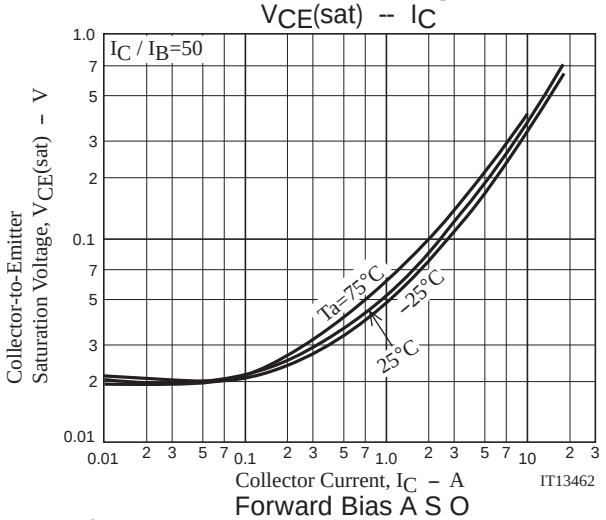


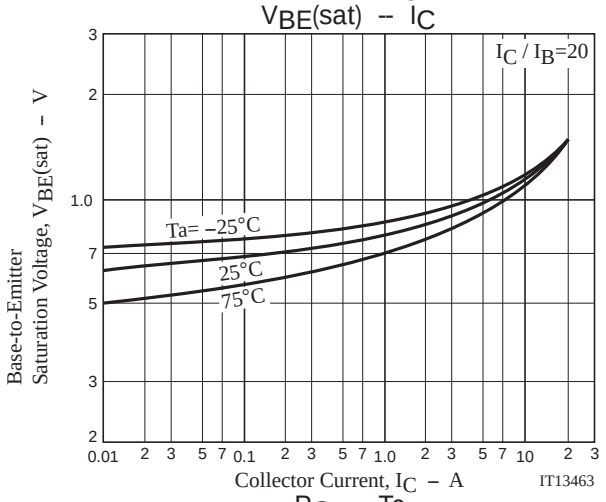

hFE -- IC
Ta=25°C
VCE=2.0V
0.2V
0.5V
0.7V
1.0V
DC Current Gain, hFE
Collector Current, IC – A
IT13458

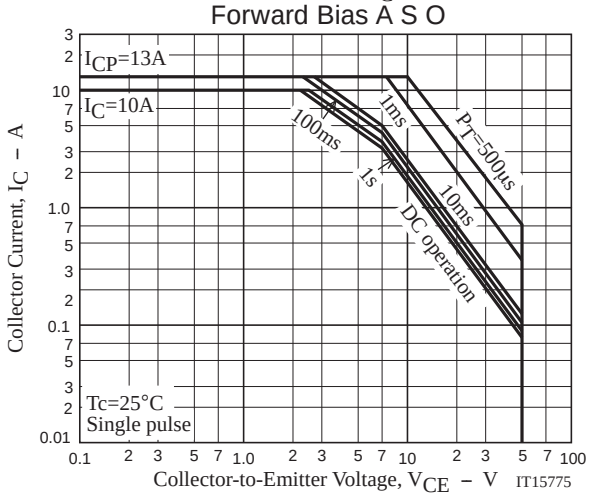

fT -- IC
VCE=10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT13459

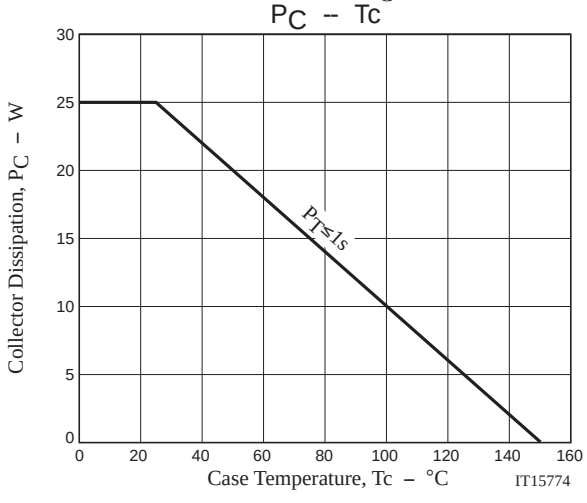

Cob -- VCB
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT13460


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
IT13461


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
IT13462


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
IT13463


Forward Bias A S O
ICP=13A
IC=10A
100ms
1ms
1s
PT=500µs
10ms
DC operation
Tc=25°C
Single pulse
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT15775


PC -- Tc
PT=1s
Collector Dissipation, PC – W
Case Temperature, Tc – °C
IT15774

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