Ordering number:EN1070C

NPN Triple Diffused Planar Silicon Transistor

2SC3151

800V/1.5A Switching Regulator Applications

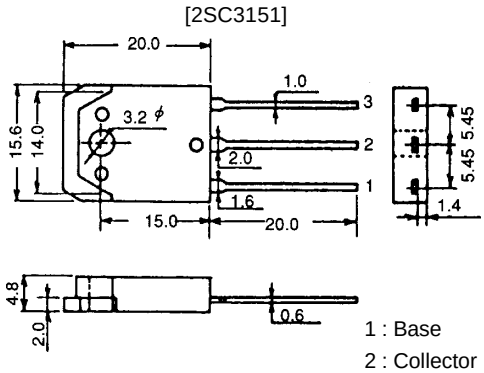
Features

- High breakdown voltage (V_{CBO}≥900V).
- Fast switching speed.
- Wide ASO.

Package Dimensions

unit:mm

2022A



Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		900	V
Collector-to-Emitter Voltage	V_{CEO}		800	V
Emitter-to-Base Voltage	V_{EBO}		7	V
Collector Current	I_C		1.5	A
Collector Current (Pulse)	I_{CP}	PW≤300μs, Duty Cycle≤10%	5	A
Base Current	I_B		0.8	A
Collector Dissipation	P_C	Tc=25˚C	60	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}=800V, I_E=0			10	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=5V, I_C=0			10	μA
DC Current Gain	$h_{FE}1$	V_{CE}=5V, I_C=0.1A	10*		40*	
	$h_{FE}2$	V_{CE}=5V, I_C=0.5A	8			
Gain-Bandwidth Product	f_T	V_{CE}=10V, I_C=0.1A		15		MHz
Output Capacitance	C_{ob}	V_{CB}=10V, f=1MHz		30		pF

* : The $h_{FE}1$ of the 2SC3151 is classified as follows. When specifying the $h_{FE}1$ rank, specify two ranks or more in principle.

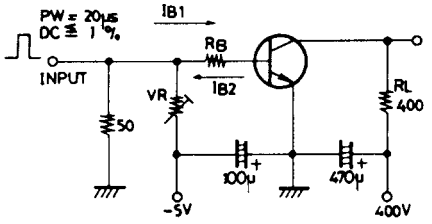
10 K 20	15 L 30	20 M 40

SANYO Electric Co.,Ltd. Semiconductor Bussiness Headquaters

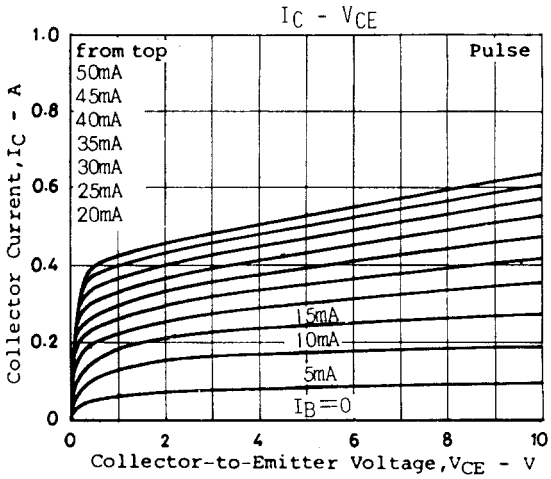
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

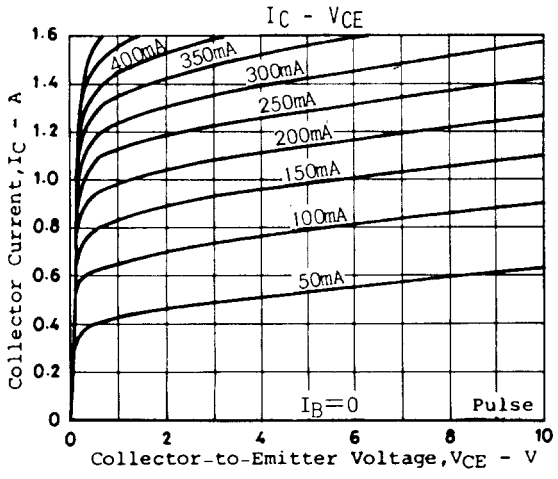
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=0.75A, I_B=0.15A			2.0	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=0.75A, I_B=0.15A			1.5	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=1mA, I_E=0	900			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=5mA, R_{BE}=∞	800			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=1mA, I_C=0	7			V
Collector-to-Emitter Sustain Voltage	$V_{CEO(sus)}$	I_C=1.5A, L=1mH, I_B=0.5A	800			V
Collector-to-Emitter Sustain Voltage	$V_{CEX(sus)1}$	I_C=0.5A, I_{B1}=0.1A, I_{B2}=–0.1A, L=5mH, clamped	800			V
	$V_{CEX(sus)2}$	I_C=0.25A, I_{B1}=0.05A, I_{B2}=–0.05A, L=10mH, clamped	900			V
Turn-ON Time	t_{on}	I_C=1A, I_{B1}=0.2A, I_{B2}=–0.4A, R_L=400Ω, V_{CC}=400V			1.0	μs
Storage Time	t_{stg}	I_C=1A, I_{B1}=0.2A, I_{B2}=–0.4A, R_L=400Ω, V_{CC}=400V			3.0	μs
Fall Time	t_f	I_C=1A, I_{B1}=0.2A, I_{B2}=–0.4A, R_L=400Ω, V_{CC}=400V			0.7	μs

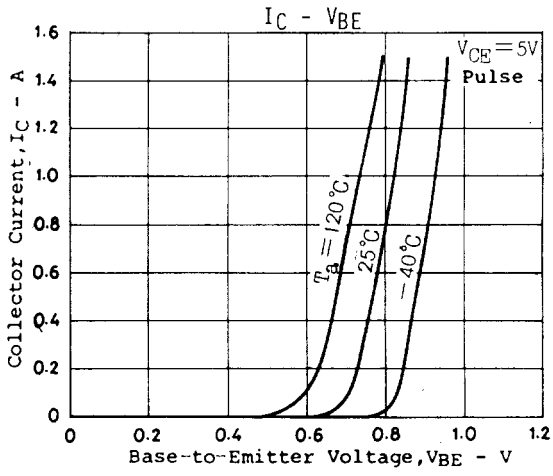
Switching Time Test Circuit

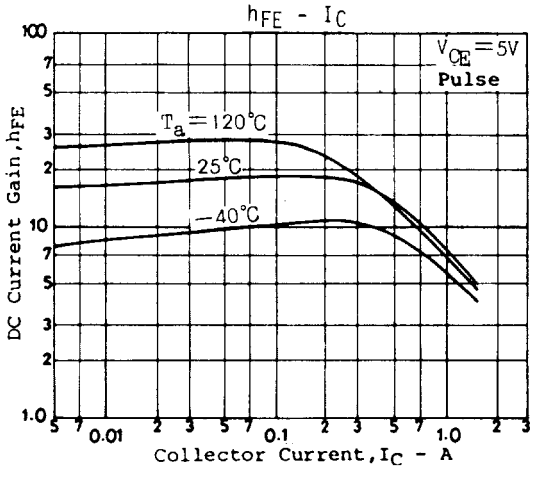


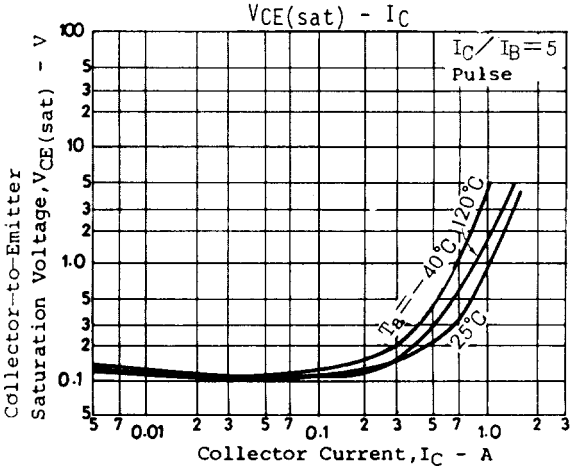
Unit (resistance : Ω, capacitance : F)

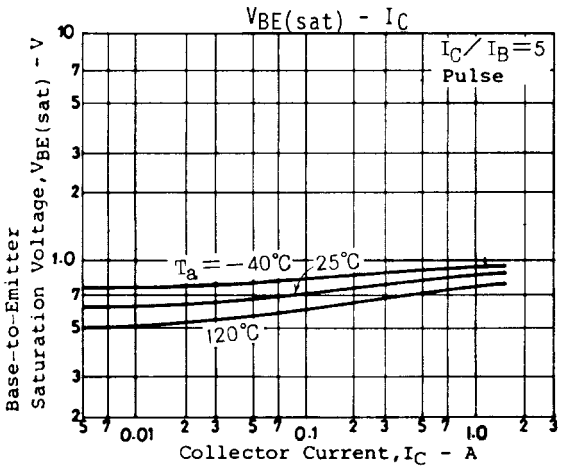


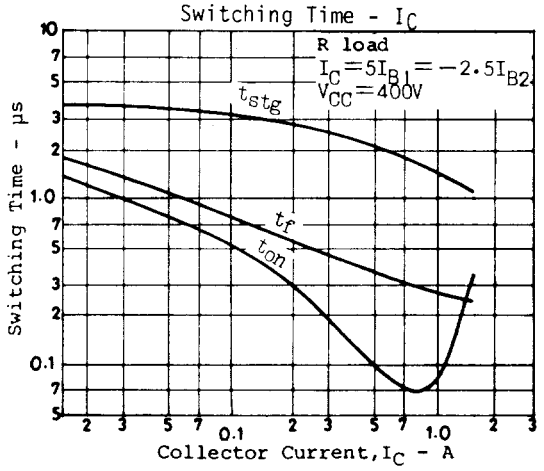


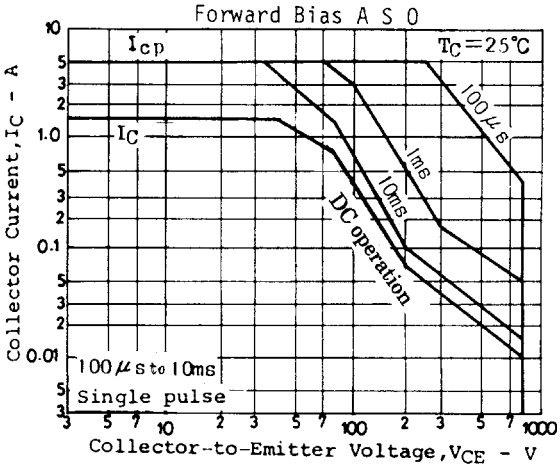


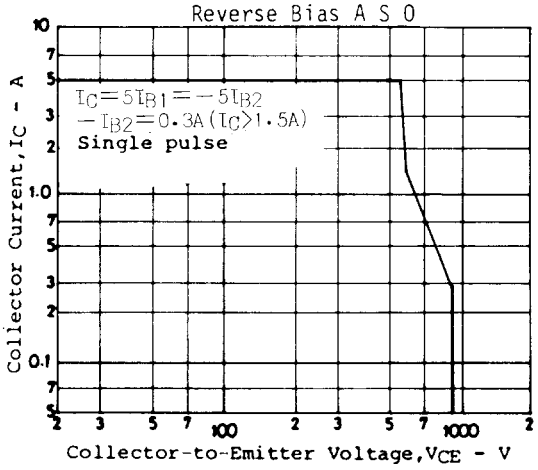


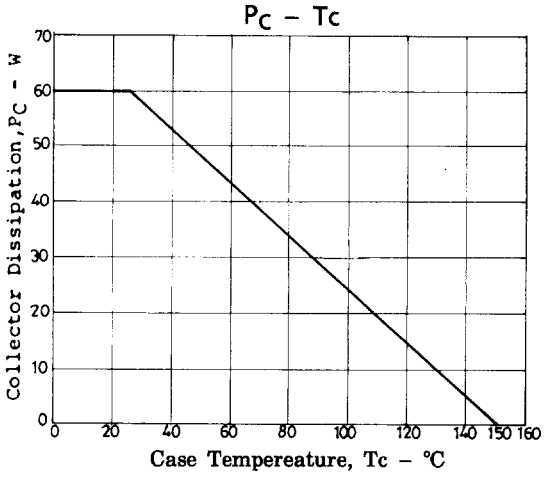

VCE(sat) - IC
IC / IB = 5
Pulse
Ta = −40°C
120°C
25°C
Collector-to-Emitter Saturation Voltage, VCE(sat) - V
Collector Current, IC - A


VBE(sat) - IC
IC / IB = 5
Pulse
Ta = −40°C
25°C
120°C
Base-to-Emitter Saturation Voltage, VBE(sat) - V
Collector Current, IC - A


Switching Time - IC
R load
IC = 5IB1 = −2.5IB2
VCC = 400V
tstg
tf
ton
Switching Time - µs
Collector Current, IC - A


Forward Bias A S O
Icp
IC
TC = 25°C
100µs
1ms
10ms
DC operation
100µs to 10ms
Single pulse
Collector Current, IC - A
Collector-to-Emitter Voltage, VCE - V


Reverse Bias A S O
IC = 5IB1 = −5IB2
−IB2 = 0.3A (IC > 1.5A)
Single pulse
Collector Current, IC - A
Collector-to-Emitter Voltage, VCE - V


PC - Tc
Collector Dissipation, PC - W
Case Tempereature, Tc - °C