Ordering number:ENN1577B

NPN Triple Diffused Planar Silicon Transistor

2SC3451

SANYO

500V/15A Switching Regulator Applications

Features

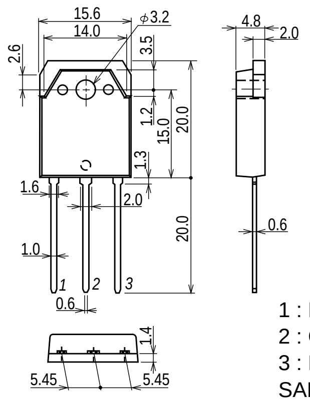
- · High breakdown voltage and high reliability.
- · High-speed switching (t_f : 0.1μs typ).
- · Wide ASO.
- · Adoption of MBIT process.

Package Dimensions

unit:mm

2022A

[2SC3451]



1 : Base
2 : Collector
3 : Emitter
SANYO : TO-3PB

Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		800	V
Collector-to-Emitter Voltage	V_{CEO}		500	V
Emitter-to-Base Voltage	V_{EBO}		7	V
Collector Current	I_C		15	A
Collector Current (Pulse)	I_{CP}	PW≤300μs, Duty Cycle≤10%	25	A
Base Current	I_B		4	A
Collector Dissipation	P_C	Tc=25˚C	100	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}=500V, 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=1.2A	15*		50*	
	$h_{FE}2$	V_{CE}=5V, I_C=6A	8			

Continued on next page.

* : The $h_{FE}1$ of the 2SC3451 is classified as follows. When specifying the $h_{FE}1$ rank, specify two ranks or more in principle.

Rank	L	M	N
h_{FE}	15 to 30	20 to 40	30 to 50

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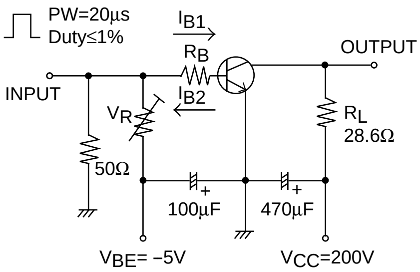
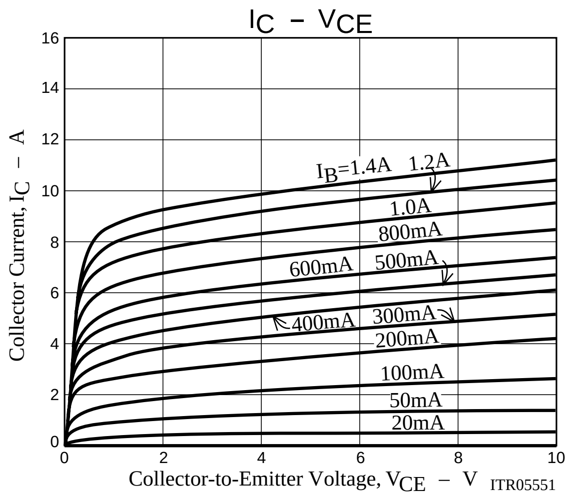
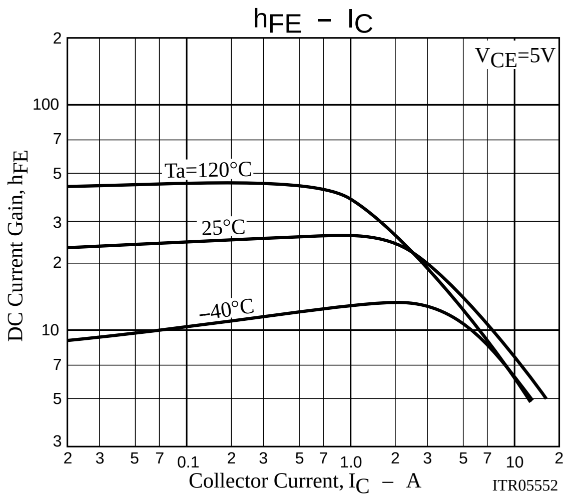
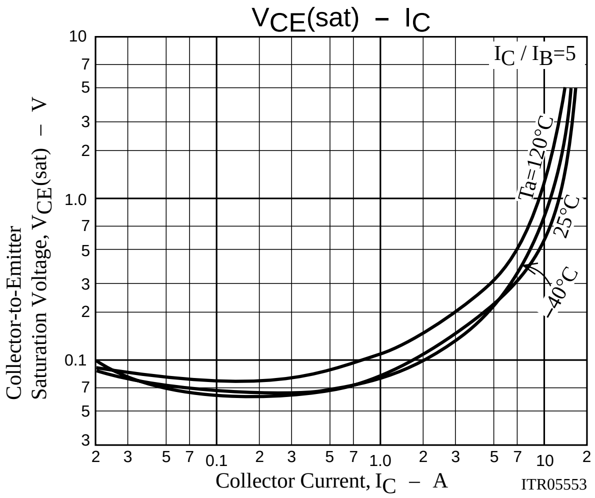
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Gain-Bandwidth Product	f_T	V_{CE}=10V, I_C=1.2A		18		MHz
Output Capacitance	C_{ob}	V_{CB}=10V, f=1MHz		160		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=6A, I_B=1.2A			1.0	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=6A, I_B=1.2A			1.5	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=1mA, I_E=0	800			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=5mA, $R_{BE}=\infty$	500			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=1mA, I_C=0	7			V
Collector-to-Emitter Sustain Voltage	$V_{CEX(sus)}$	I_C=5A, $I_{B1}=-I_{B2}$=2A, L=500µH, clamped	500			V
Turn-ON Time	t_{on}	V_{CC}=200V, $5I_{B1}=-2.5I_{B2}=I_C$=7A, R_L=28.6Ω			0.5	µs
Storage Time	t_{stg}	V_{CC}=200V, $5I_{B1}=-2.5I_{B2}=I_C$=7A, R_L=28.6Ω			3.0	µs
Fall Time	t_f	V_{CC}=200V, $5I_{B1}=-2.5I_{B2}=I_C$=7A, R_L=28.6Ω			0.3	µs

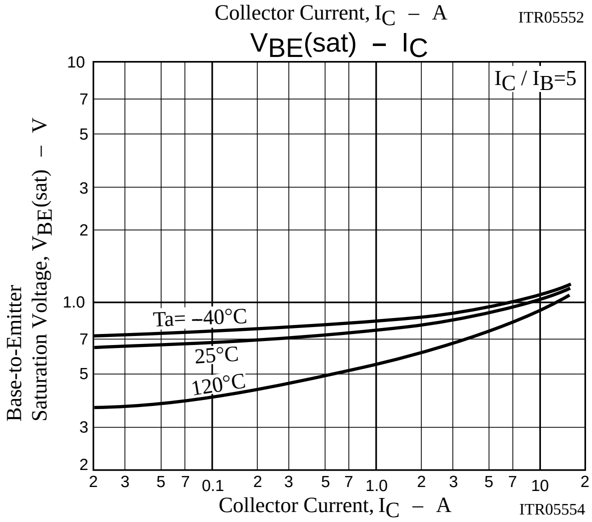
Switching Time Test Circuit



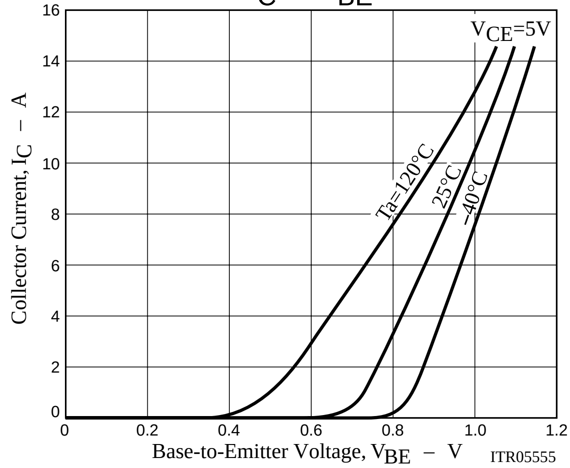




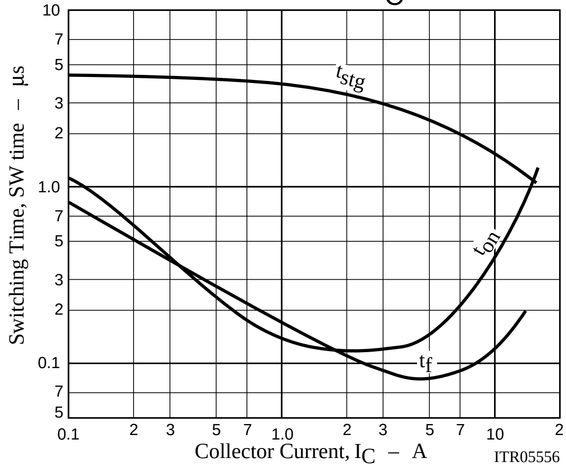




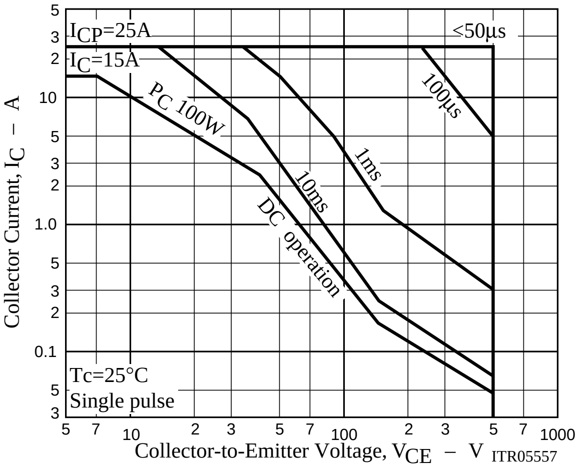
I_C – V_{BE}



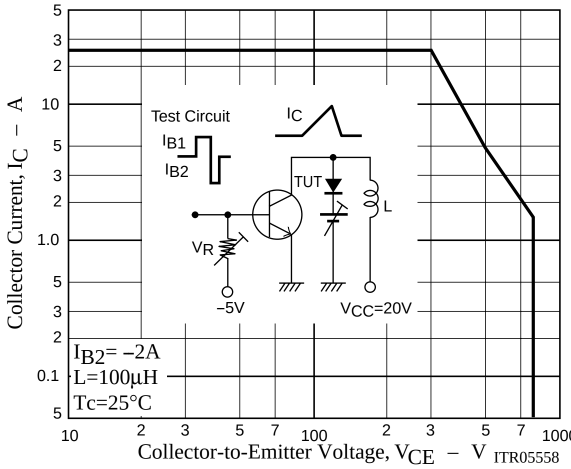
SW Time – I_C



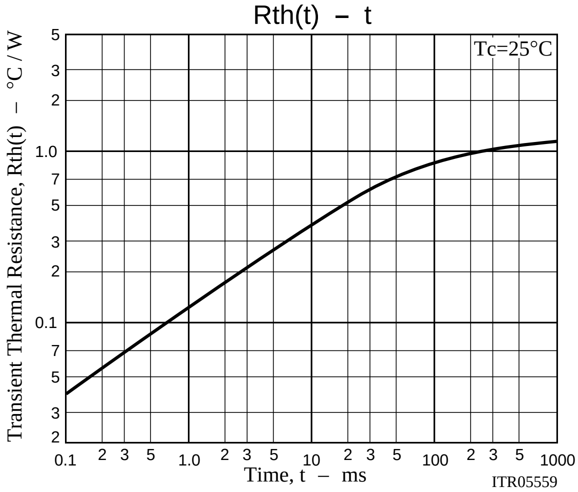
Forward Bias A S O



Reverse Bias A S O



Rth(t) – t



P_C – Ta