Ordering number:EN1544B

NPN Triple Diffused Planar Silicon Transistor

2SC3446

500V/3A Switching Regulator Applications

Features

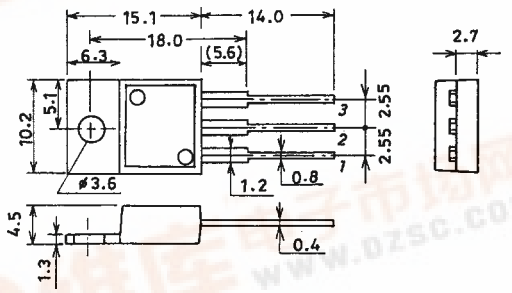
- High breakdown voltage and high reliability.
- Fast switching speed (t_f : 0.1μs typ).
- Wide ASO.
- Adoption of MBIT process.

Package Dimensions

unit:mm

2010C

[2SC3446]



JEDEC : TO-220AB
EIAJ : SC-46

1 : Base
2 : Collector
3 : Emitter

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		3	A
Collector Current (Pulse)	I_{CP}	PW≤300μs, Duty Cycle≤10%	6	A
Base Current	I_B		1	A
Collector Dissipation	P_C	Tc=25˚C	40	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=0.3A	15*			
	$h_{FE}2$	V_{CE}=5V, I_C=1.5A	8			
Gain-Bandwidth Product	f_T	V_{CE}=10V, I_C=0.3A		18		MHz
Output Capacitance	C_{ob}	V_{CB}=10V, f=1MHz		50		pF

* : The $h_{FE}1$ of the 2SC3446 is classified as follows. When specifying the $h_{FE}1$ rank, specify two ranks or more in principle.

15	L	30	20	M	40	30	N	50

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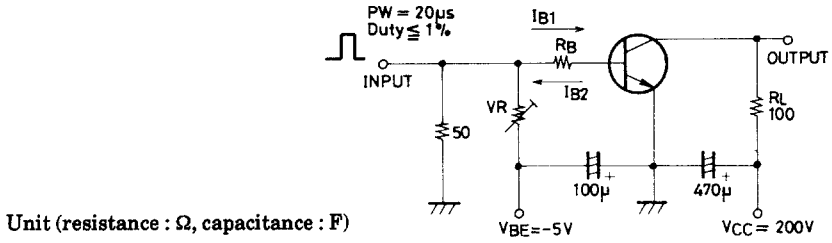
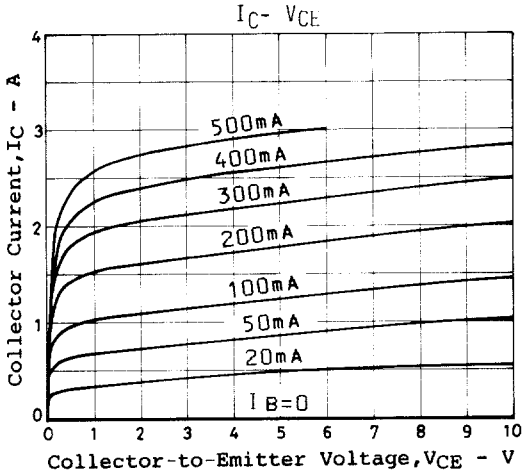
2SC3446

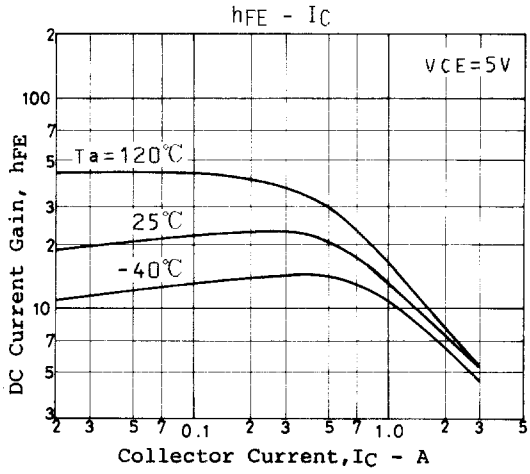
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=1.5A, I_B=0.3A			1.0	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=1.5A, I_B=0.3A			1.5	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=1mA, I_E=0	800			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=5mA, R_{BE}=∞	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=1.5A, I_{B1}=–I_{B2}=0.6A, L=2mH, clamped	500			V
Turn-ON Time	t_{on}	V_{CC}=200V, 5I_{B1}=–2.5I_{B2}=I_C=2A, R_L=100Ω			0.5	μs
Storage Time	t_{stg}	V_{CC}=200V, 5I_{B1}=–2.5I_{B2}=I_C=2A, R_L=100Ω			3.0	μs
Fall Time	t_f	V_{CC}=200V, 5I_{B1}=–2.5I_{B2}=I_C=2A, R_L=100Ω			0.3	μs

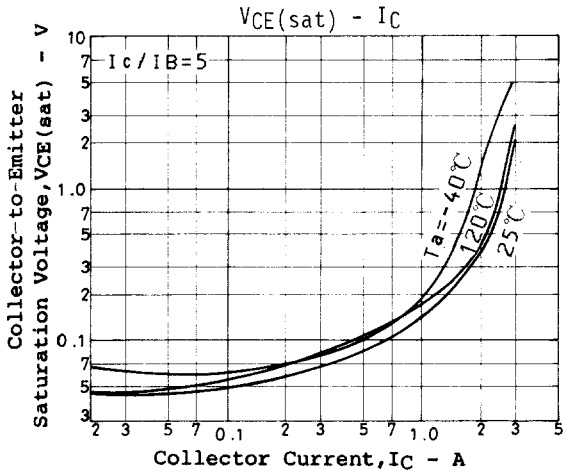
Switching Time Test Circuit

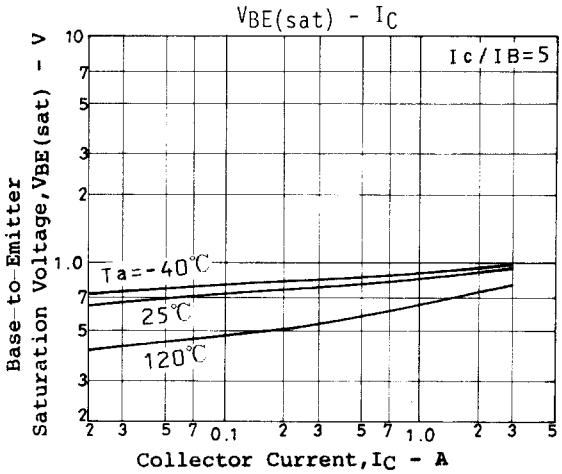


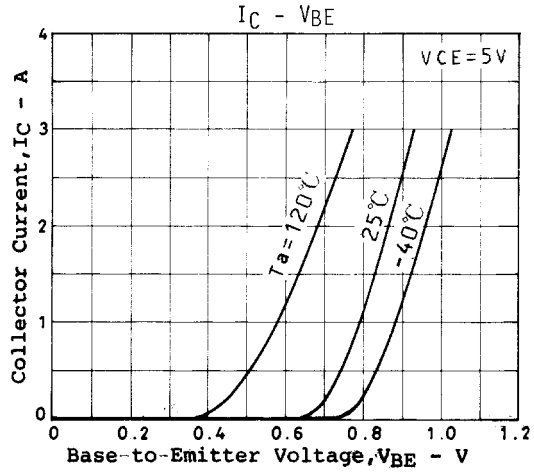
Unit (resistance : Ω, capacitance : F)

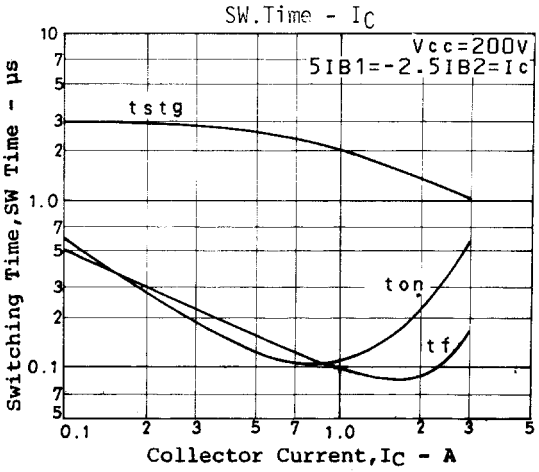


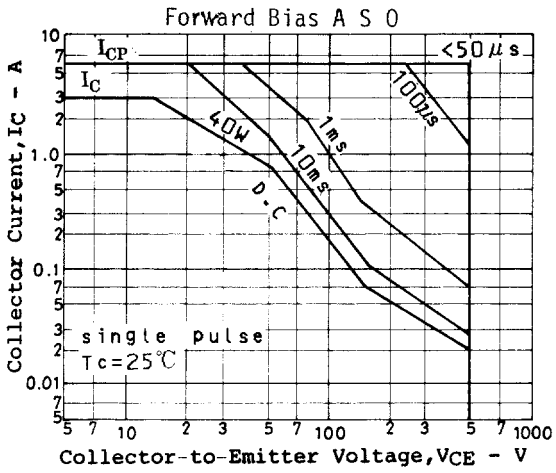


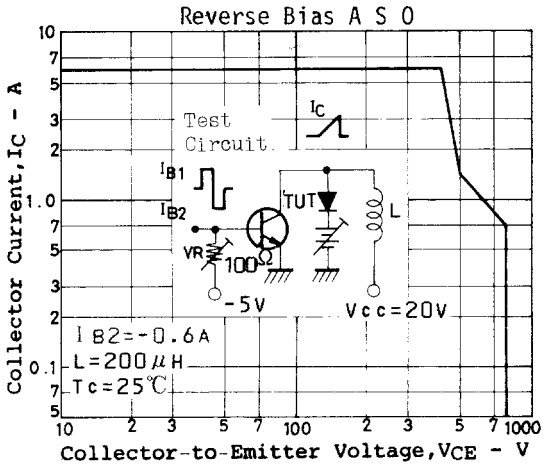


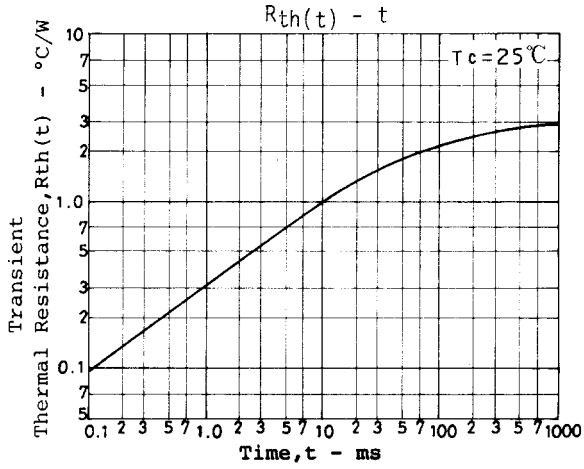


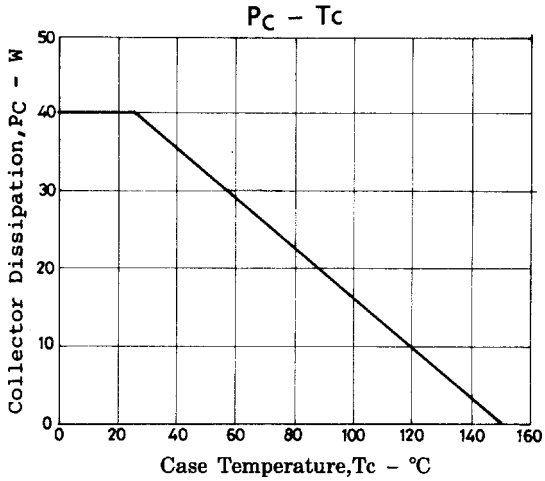

IC - VBE
VCE=5V
Ta=120℃
25℃
-40℃
Collector Current,IC - A
Base-to-Emitter Voltage,VBE - V


SW.Time - IC
Vcc=200V
5IB1=-2.5IB2=Ic
tstg
ton
tf
Switching Time,SW Time - μs
Collector Current,IC - A


Forward Bias A S O
ICP
IC
<50μs
100μs
1ms
10ms
D.C
40W
single pulse
Tc=25℃
Collector Current,IC - A
Collector-to-Emitter Voltage,VCE - V


Reverse Bias A S O
Test Circuit
IC
IB1
IB2
TUT
L
VR
100Ω
-5V
Vcc=20V
IB2=-0.6A
L=200μH
Tc=25℃
Collector Current,IC - A
Collector-to-Emitter Voltage,VCE - V


Rth(t) - t
Tc=25℃
Transient Thermal Resistance,Rth(t) - ℃/W
Time,t - ms


PC - Tc
Collector Dissipation,PC - W
Case Temperature,Tc - ℃