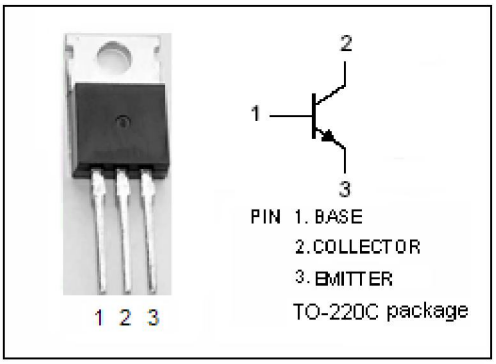
isc Silicon NPN Power Transistor 2SC3457

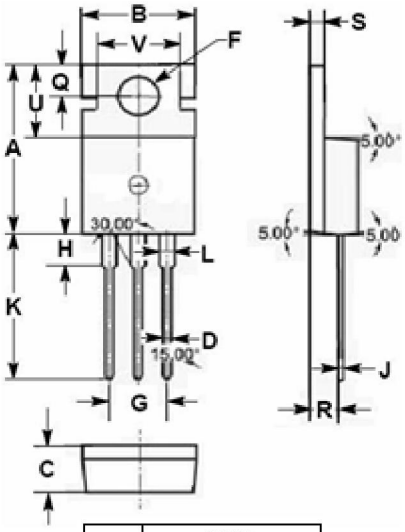


DESCRIPTION

- High Breakdown Voltage-
  : $V_{(BR)CBO}$= 1100V(Min)
- Fast Switching Speed
- Wide Area of Safe Operation

APPLICATIONS

- Designed for switching regulator Applications



DIM	mm MIN	MAX
A	15.70	15.90
B	9.90	10.10
C	4.20	4.40
D	0.70	0.90
F	3.40	3.60
G	4.98	5.18
H	2.70	2.90
J	0.44	0.46
K	13.20	13.40
L	1.10	1.30
Q	2.70	2.90
R	2.50	2.70
S	1.29	1.31
U	6.45	6.65
V	8.66	8.86

ABSOLUTE MAXIMUM RATINGS(T_a=25℃)

SYMBOL	PARAMETER	VALUE	UNIT
V_{CBO}	Collector-Base Voltage	1100	V
V_{CEO}	Collector-Emitter Voltage	800	V
V_{EBO}	Emitter-Base Voltage	7	V
I_C	Collector Current-Continuous	3	A
I_{CM}	Collector Current-Peak	10	A
I_B	Base Current-Continuous	1.5	A
P_C	Collector Power Dissipation @ T_C=25℃	50	W
T_J	Junction Temperature	150	℃
T_{stg}	Storage Temperature Range	-55~150	℃

isc Silicon NPN Power Transistor 2SC3457

ELECTRICAL CHARACTERISTICS

T_C=25℃ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	I_C= 5mA; R_{BE}= ∞	800			V
$V_{CEO(SUS)}$	Collector-Emitter Sustaining Voltage	I_C= 1.5A; I_{B1}= -I_{B2}= 0.3A; L= 2mH; clamped	800			V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	I_C= 1mA; I_E= 0	1100			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	I_E= 1mA; I_C= 0	7			V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C= 1.5A; I_B= 0.3A			2.0	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	I_C= 1.5A; I_B= 0.3A			1.5	V
I_{CBO}	Collector Cutoff Current	V_{CB}= 800V; I_E=0			10	μA
I_{EBO}	Emitter Cutoff Current	V_{EB}= 5V; I_C=0			10	μA
h_{FE-1}	DC Current Gain	I_C= 0.2A; V_{CE}= 5V	10		40	
h_{FE-2}	DC Current Gain	I_C= 1A; V_{CE}= 5V	8			
C_{OB}	Output Capacitance	I_E= 0; V_{CB}= 10V; f_{test}=1.0MHz		60		pF
f_T	Current-Gain—Bandwidth Product	I_C= 0.2A; V_{CE}= 10V		15		MHz

Switching times

t_{on}	Turn-on Time	I_C= 2A , I_{B1}= 0.4A; I_{B2}= -0.8A R_L= 200Ω ; V_{CC}=400V			0.5	μs
t_{stg}	Storage Time				3.0	μs
t_f	Fall Time				0.3	μs

◆ **h_{FE-1} Classifications**

K	L	M
10-20	15-30	20-40

Ordering number:EN1580C

NPN Triple Diffused Planar Type Silicon Transistor

2SC3457

800V/3A Switching Regulator Applications

Features

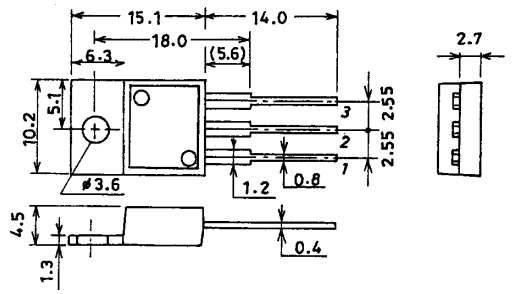
- High breakdown voltage and high reliability.
- Fast switching speed (t_f : 0.1μs typ).
- Wide ASO.
- Adoption of MBIT process.

Package Dimensions

unit:mm

2010C

[2SC3457]



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}		1100	V
Collector-to-Emitter Voltage	V_{CEO}		800	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%	10	A
Base Current	I_B		1.5	A
Collector Dissipation	P_C	Tc=25˚C	50	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=0.2A	10*		40*	
	$h_{FE}2$	V_{CE}=5V, I_C=1A	8			
Gain-Bandwidth Product	f_T	V_{CE}=10V, I_C=0.2A		15		MHz
Output Capacitance	C_{ob}	V_{CB}=10V, f=1MHz		60		pF

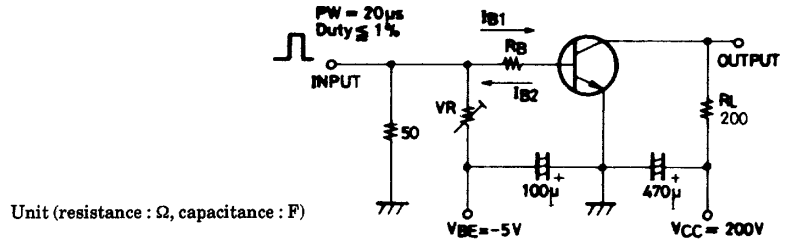
* : The $h_{FE}1$ of the 2SC3457 is classified as follows. When specifying the $h_{FE}1$ rank, specify two ranks or more in principle.

10 K 20	15 L 30	20 M 40

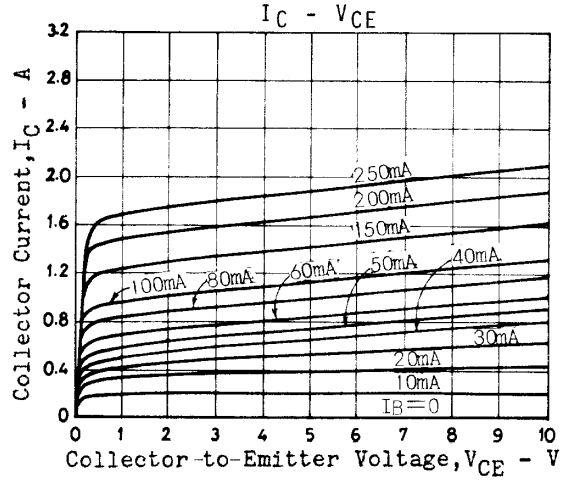
SANYO Electric Co.,Ltd. Semiconductor Bussiness Headquaters
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

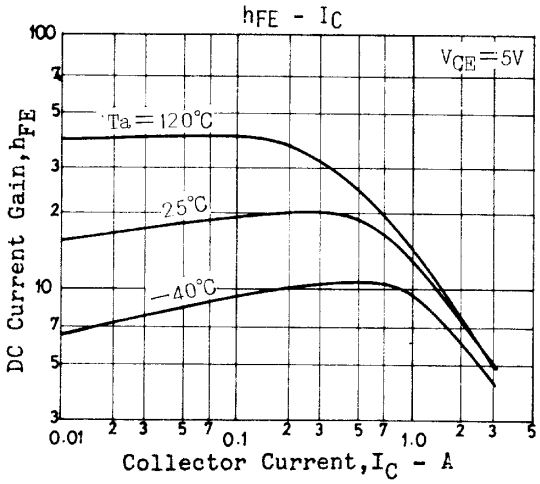
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=1.5A, I_B=0.3A			2.0	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=1.5A, I_B=0.3A			1.5	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=1mA, I_E=0	1100			V
Collector-to-Emitter 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	$V_{CEX(sus)}$	I_C=1.5A, I_{B1}=–I_{B2}=0.3A, L=2mH, clamped	800			V
Turn-ON Time	t_{on}	V_{CC}=400V, 5I_{B1}=–2.5I_{B2}=I_C=2A, R_L=200Ω			0.5	μs
Storage Time	t_{stg}	V_{CC}=400V, 5I_{B1}=–2.5I_{B2}=I_C=2A, R_L=200Ω			3.0	μs
Fall Time	t_f	V_{CC}=400V, 5I_{B1}=–2.5I_{B2}=I_C=2A, R_L=200Ω			0.3	μs

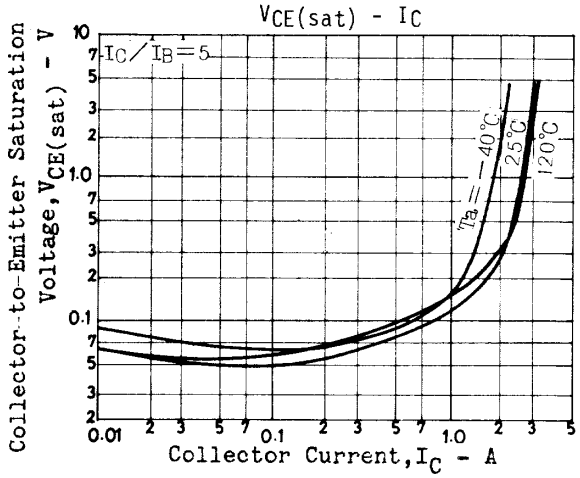
Switching Time Test Circuit

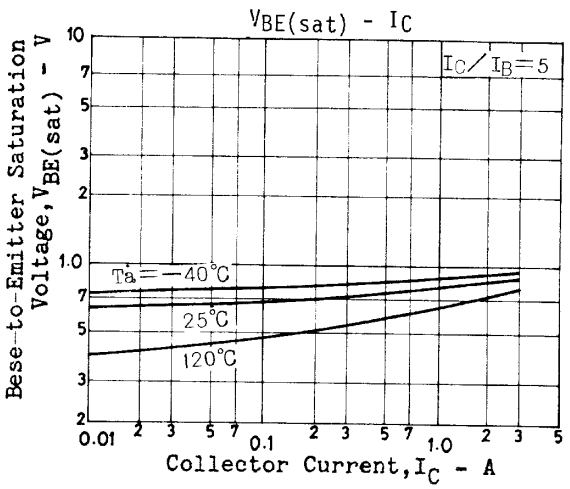


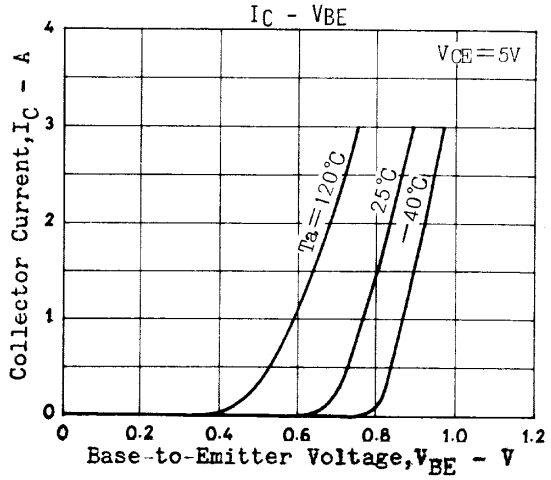
Unit (resistance : Ω, capacitance : F)

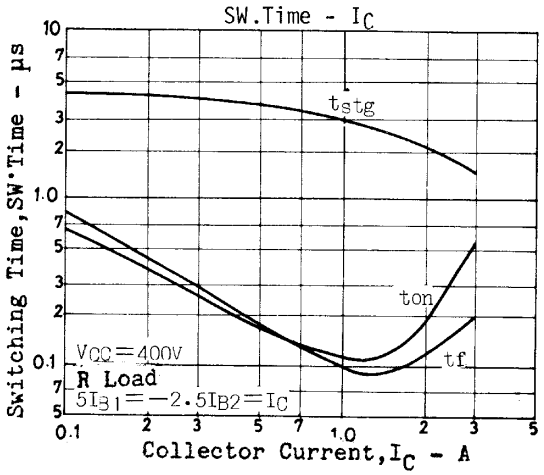


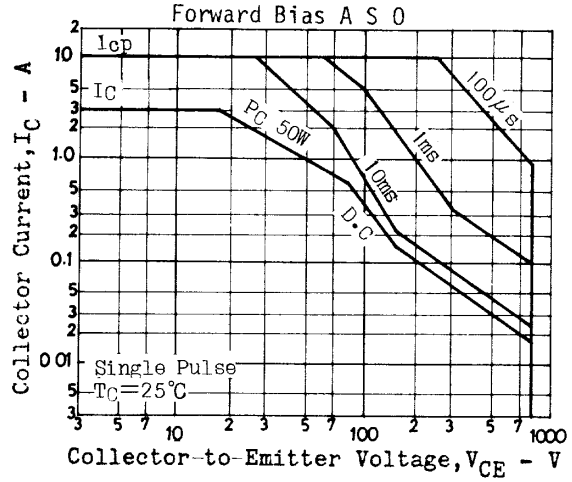


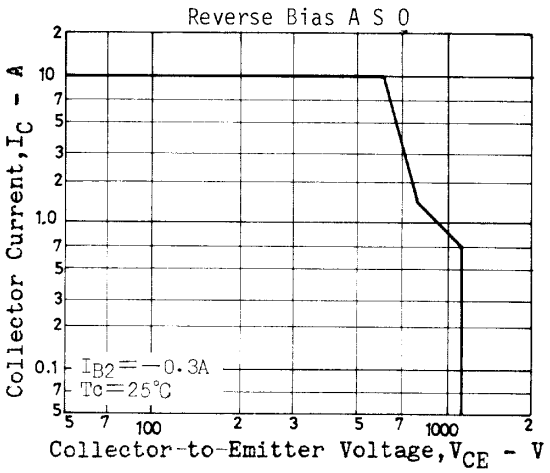


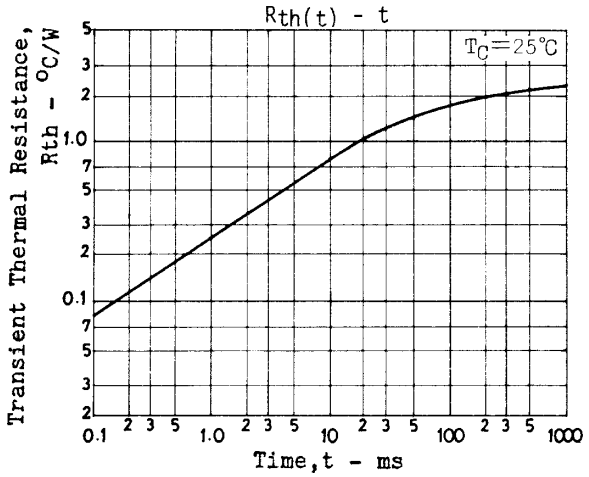


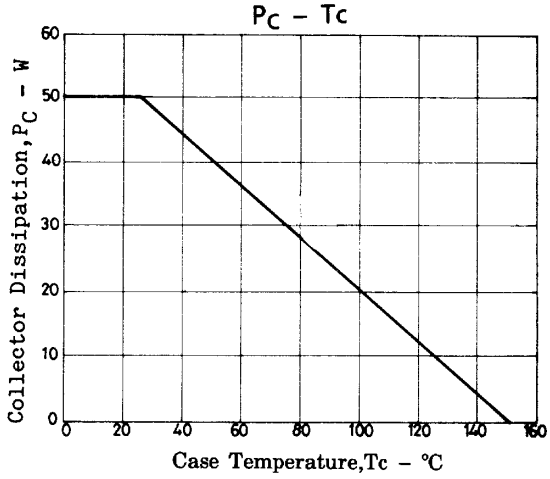

IC - VBE
VCE=5V
Ta=120°C
25°C
−40°C
Collector Current, IC - A
Base-to-Emitter Voltage, VBE - V


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


Forward Bias A S O
Icp
IC
PC 50W
100μs
1ms
10ms
D.C
Single Pulse
TC=25°C
Collector Current, IC - A
Collector-to-Emitter Voltage, VCE - V


Reverse Bias A S O
IB2=−0.3A
Tc=25°C
Collector Current, IC - A
Collector-to-Emitter Voltage, VCE - V


Rth(t) - t
TC=25°C
Transient Thermal Resistance, Rth - °C/W
Time, t - ms


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