

DESCRIPTION The 2SC2333 is NPN silicon triple diffused transistor designed for switching regulator, DC-DC converter and ultrasonic appliance applications.

- FEATURES**
- High speed switching.
 - Low collector saturation voltage.
 - Specified of reverse biased SOA with inductive loads.

ABSOLUTE MAXIMUM RATINGS

Maximum Temperatures

Storage Temperature -55 to +150 °C

Junction Temperature 150 °C Maximum

Maximum Power Dissipation ($T_c = 25\text{ °C}$)

Total Power Dissipation 15 W

Maximum Voltages and Currents ($T_a = 25\text{ °C}$)

V_{CBO} Collector to Base Voltage 500 V

V_{CEO} Collector to Emitter Voltage 400 V

V_{EBO} Emitter to Base Voltage 7.0 V

$I_C(DC)$ Collector Current (DC) 2.0 A

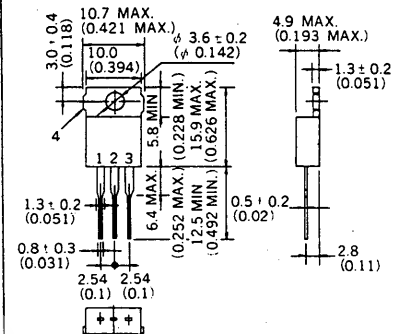
$I_C(pulse)$ Collector Current (pulse)* 4.0 A

$I_B(DC)$ Base Current (DC) 1.0 A

* $PW \leq 350\text{ }\mu s$, Duty Cycle $\leq 10\%$

PACKAGE DIMENSIONS

in millimeters (inches)



1. Base (B)
 2. Collector (C)
 3. Emitter (E)
 4. Fin (Collector)
- JEDEC: TO-220AB

ELECTRICAL CHARACTERISTICS ($T_a = 25\text{ °C}$)

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
t_{on}	Turn On Time			1.0	μs	$I_C = 0.5\text{ A}$, $I_{B1} = -I_{B2} = 0.1\text{ A}$ $R_L = 300\text{ }\Omega$, $V_{CC} \approx 150\text{ V}$ See Test Circuit.
t_{stg}	Storage Time			2.5	μs	
t_f	Fall Time			1.0	μs	
h_{FE1}	DC Current Gain**	20		80	—	$V_{CE} = 5.0\text{ V}$, $I_C = 0.1\text{ A}$
h_{FE2}	DC Current Gain**	10			—	$V_{CE} = 5.0\text{ V}$, $I_C = 0.5\text{ A}$
$V_{CE(sat)}$	Collector Saturation Voltage**			1.0	V	$I_C = 0.5\text{ A}$, $I_B = 0.1\text{ A}$
$V_{BE(sat)}$	Base Saturation Voltage**			1.2	V	$I_C = 0.5\text{ A}$, $I_B = 0.1\text{ A}$
$V_{CEO(SUS)}$	Collector to Emitter Sustaining Voltage	400			V	$I_C = 0.5\text{ A}$, $I_B = 0.1\text{ A}$, $L = 1\text{ mH}$
$V_{CEX(SUS)1}$	Collector to Emitter Sustaining Voltage	450			V	$I_C = 0.5\text{ A}$, $I_{B1} = -I_{B2} = 0.1\text{ A}$, $T_a = 125\text{ °C}$, $L = 180\text{ }\mu H$, Clamped
$V_{CEX(SUS)2}$	Collector to Emitter Sustaining Voltage	400			V	$I_C = 1.0\text{ A}$, $I_{B1} = 0.2\text{ A}$, $-I_{B2} = 0.2\text{ A}$, $T_a = 125\text{ °C}$, $L = 180\text{ }\mu H$, Clamped
I_{CBO}	Collector Cutoff Current			10	μA	$V_{CB} = 400\text{ V}$, $I_E = 0$
I_{CER}	Collector Cutoff Current			1.0	mA	$V_{CE} = 400\text{ V}$, $R_{BE} = 51\text{ }\Omega$, $T_a = 125\text{ °C}$
I_{CEX1}	Collector Cutoff Current			10	μA	$V_{CE} = 400\text{ V}$, $V_{BE(OFF)} = -5.0\text{ V}$
I_{CEX2}	Collector Cutoff Current			1.0	mA	$V_{CE} = 400\text{ V}$, $V_{BE(OFF)} = -5.0\text{ V}$, $T_a = 125\text{ °C}$
I_{EBO}	Emitter Cutoff Current			10	μA	$V_{EB} = 5.0\text{ V}$, $I_C = 0$

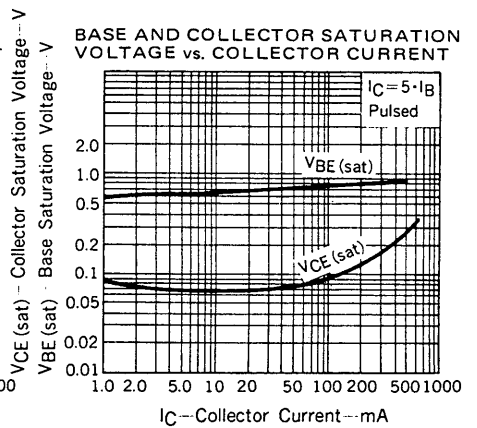
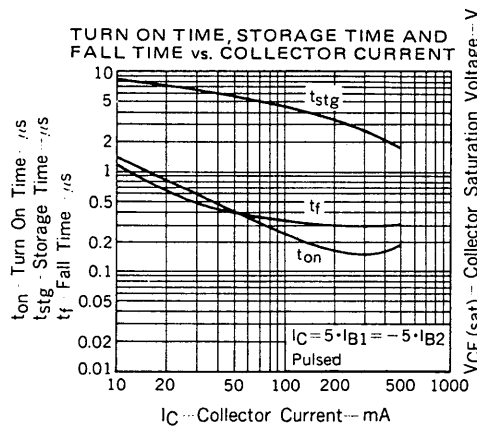
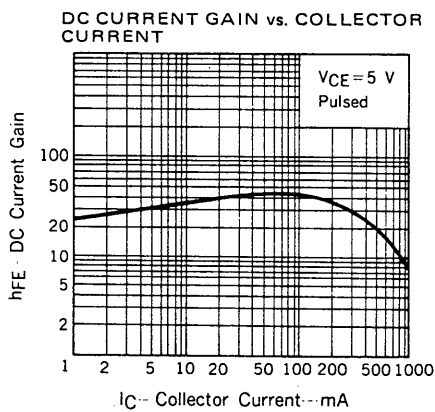
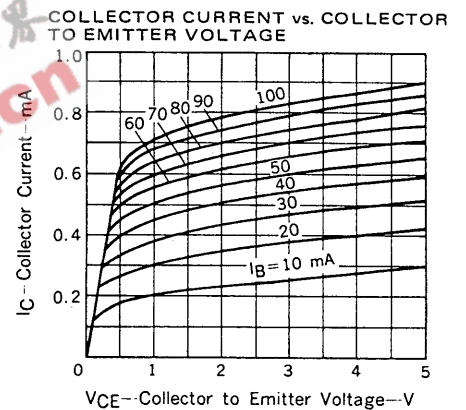
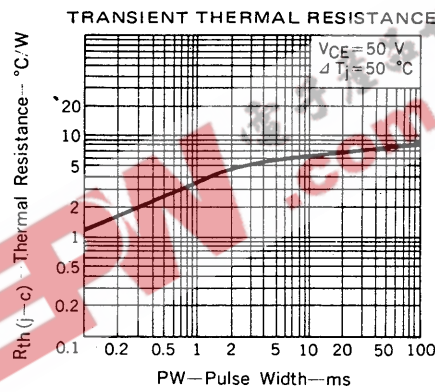
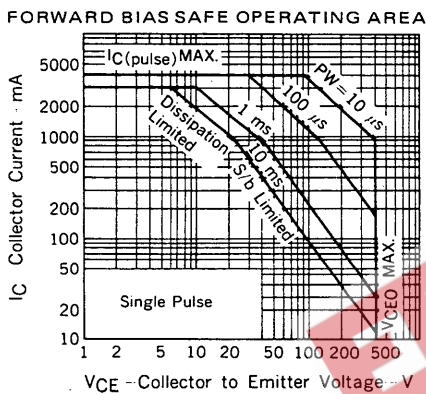
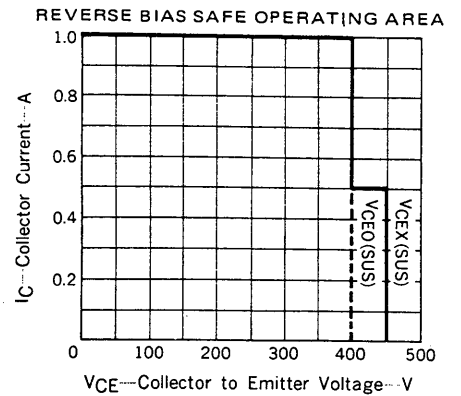
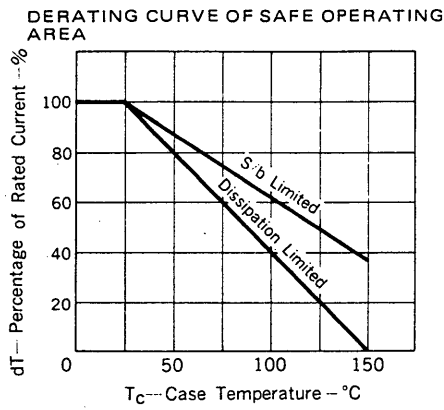
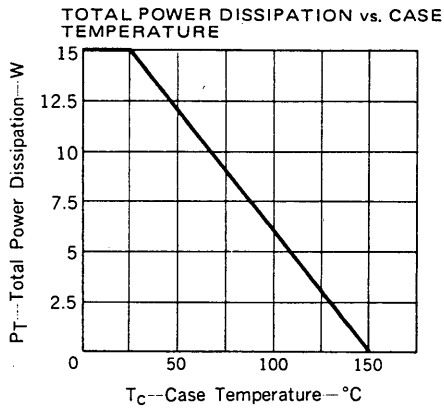
**Pulse Test : $PW \leq 350\text{ }\mu s$, Duty Cycle $\leq 2\%$ /Pulsed

Classification of h_{FE1}

Rank	M	L	K
Range	20 to 40	30 to 60	40 to 80

Test Conditions : $V_{CE} = 5.0\text{ V}$, $I_C = 0.1\text{ A}$

TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)



SWITCHING TIME (t_{on} , t_{stg} , t_f) TEST CIRCUIT