

## NPN SILICON POWER TRANSISTOR 2SC2333

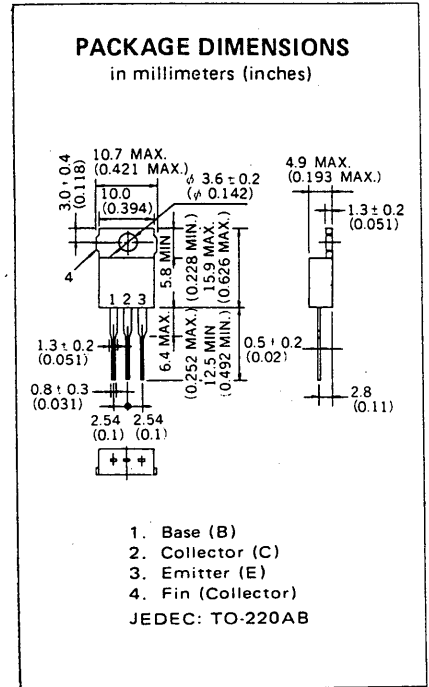
**DESCRIPTION** The 2SC2333 is NPN silicon triple diffused transistor designed for switching regulator, DC-DC converter and ultrasonic appliance applications.

- 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 <sub>c</sub> = 25 °C)	
Total Power Dissipation	15 W
Maximum Voltages and Currents (T <sub>a</sub> = 25 °C)	
V <sub>CBO</sub> Collector to Base Voltage	500 V
V <sub>CEO</sub> Collector to Emitter Voltage	400 V
V <sub>EBO</sub> Emitter to Base Voltage	7.0 V
I <sub>C(DC)</sub> Collector Current (DC)	2.0 A
I <sub>C(pulse)</sub> Collector Current (pulse)*	4.0 A
I <sub>B(DC)</sub> Base Current (DC)	1.0 A

\* PW ≤ 350 μs, Duty Cycle ≤ 10 %



**ELECTRICAL CHARACTERISTICS (T<sub>a</sub> = 25 °C)**

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
t <sub>on</sub>	Turn On Time			1.0	μs	I <sub>C</sub> = 0.5 A, I <sub>B1</sub> = -I <sub>B2</sub> = 0.1 A R <sub>L</sub> = 300 Ω, V <sub>CC</sub> = 150 V See Test Circuit.
t <sub>stg</sub>	Storage Time			2.5	μs	
t <sub>f</sub>	Fall Time			1.0	μs	
h <sub>FE1</sub>	DC Current Gain**	20		80	-	V <sub>CE</sub> = 5.0 V, I <sub>C</sub> = 0.1 A
h <sub>FE2</sub>	DC Current Gain**	10			-	V <sub>CE</sub> = 5.0 V, I <sub>C</sub> = 0.5 A
V <sub>CE(sat)</sub>	Collector Saturation Voltage**			1.0	V	I <sub>C</sub> = 0.5 A, I <sub>B</sub> = 0.1 A
V <sub>BE(sat)</sub>	Base Saturation Voltage**			1.2	V	I <sub>C</sub> = 0.5 A, I <sub>B</sub> = 0.1 A
V <sub>CEO(SUS)</sub>	Collector to Emitter Sustaining Voltage	400			V	I <sub>C</sub> = 0.5 A, I <sub>B</sub> = 0.1 A, L = 1 mH
V <sub>CES(SUS)1</sub>	Collector to Emitter Sustaining Voltage	450			V	I <sub>C</sub> = 0.5 A, I <sub>B1</sub> = -I <sub>B2</sub> = 0.1 A, T <sub>a</sub> = 125 °C, L = 180 μH, Clamped
V <sub>CES(SUS)2</sub>	Collector to Emitter Sustaining Voltage	400			V	I <sub>C</sub> = 1.0 A, I <sub>B1</sub> = 0.2 A, -I <sub>B2</sub> = 0.2 A, T <sub>a</sub> = 125 °C, L = 180 μH, Clamped
I <sub>CBO</sub>	Collector Cutoff Current			10	μA	V <sub>CB</sub> = 400 V, I <sub>E</sub> = 0
I <sub>CER</sub>	Collector Cutoff Current			1.0	mA	V <sub>CE</sub> = 400 V, R <sub>BE</sub> = 51 Ω, T <sub>a</sub> = 125 °C
I <sub>CES1</sub>	Collector Cutoff Current			10	μA	V <sub>CE</sub> = 400 V, V <sub>BE(OFF)</sub> = -5.0 V
I <sub>CES2</sub>	Collector Cutoff Current			1.0	mA	V <sub>CE</sub> = 400 V, V <sub>BE(OFF)</sub> = -5.0 V, T <sub>a</sub> = 125 °C
I <sub>EBO</sub>	Emitter Cutoff Current			10	μA	V <sub>EB</sub> = 5.0 V, I <sub>C</sub> = 0

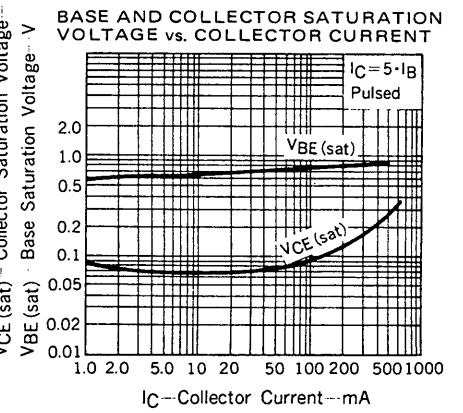
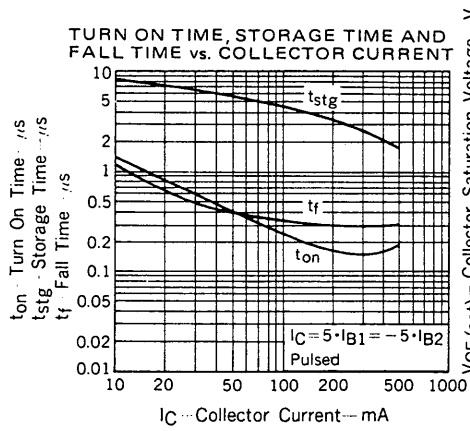
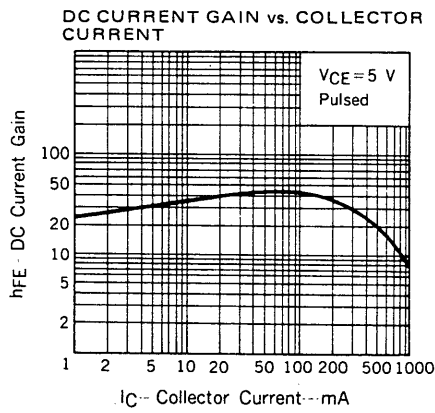
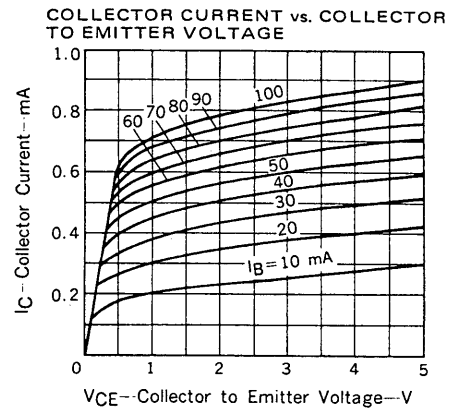
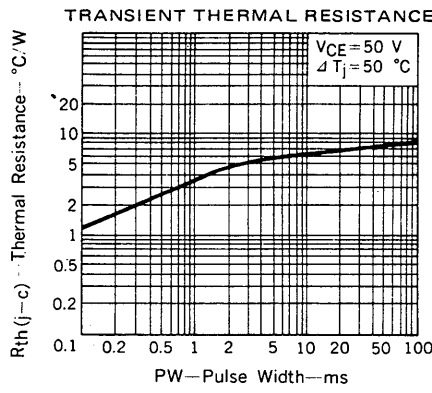
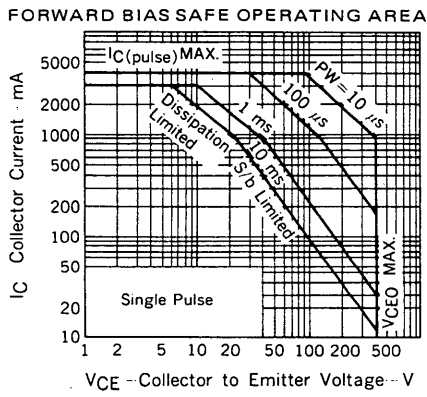
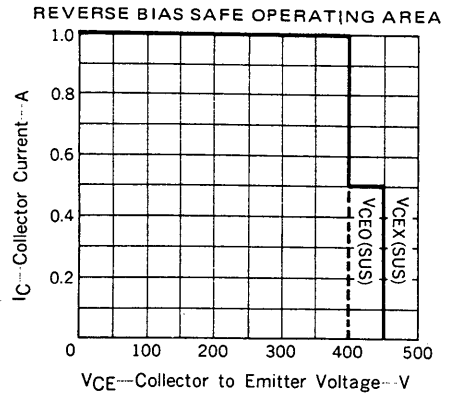
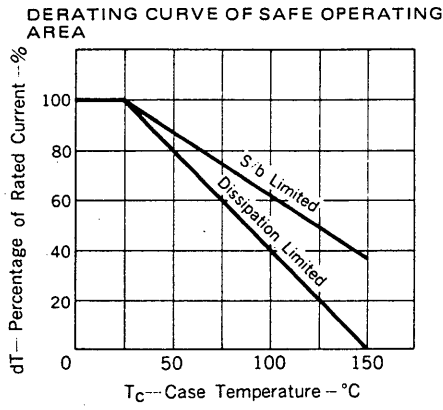
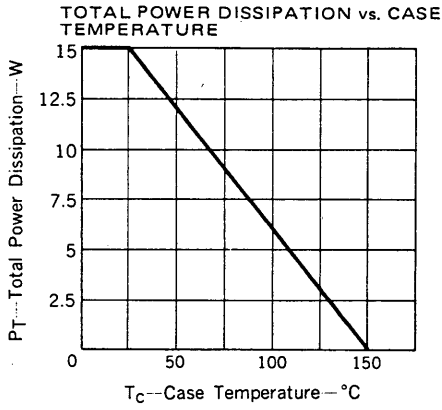
\*\*Pulse Test : PW ≤ 350 μs, Duty Cycle ≤ 2 %/Pulsed

**Classification of h<sub>FE1</sub>**

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

Test Conditions : V<sub>CE</sub> = 5.0 V, I<sub>C</sub> = 0.1 A

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



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

