NEC

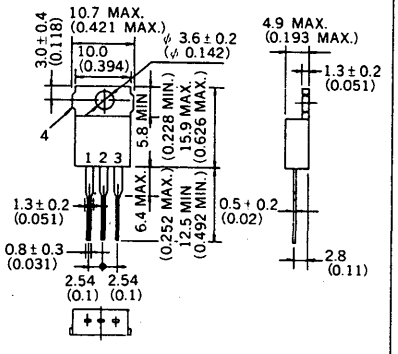
NPN SILICON POWER TRANSISTOR
2SC2518

DESCRIPTION The 2SC2518 is NPN triple diffused transistor designed for switching regulator, DC-DC converter and ultrasonic appliance applications.

FEATURES

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

PACKAGE DIMENSIONS
in millimeters (inches)



1. Base (B)
2. Collector (C)
3. Emitter (E)
4. Fin (Collector)

JEDEC: TO-220AB

ABSOLUTE MAXIMUM RATINGS

Maximum Temperatures

Storage Temperature . . . . . −55 to +150 °C

Junction Temperature . . . . . 150 °C Maximum

Maximum Power Dissipation (T_c = 25 °C)

Total Power Dissipation . . . . . 40 W

Maximum Voltages and Currents(T_a = 25 °C)

V_{CBO}	Collector to Base Voltage	500 V
V_{CEO}	Collector to Emitter Voltage	400 V
V_{EBO}	Emitter to Base Voltage	8.0 V
$I_{C(DC)}$	Collector Current (DC)	5.0 A
$I_{C(pulse)}$	Collector Current (pulse)*	10 A
$I_{B(DC)}$	Base Current (DC)	2.5 A

* PW ≦ 300 μs, Duty Cycle ≦ 10 %

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
t_{on}	Turn On Time			1.0	μs	I_C = 2.0 A, I_{B1} = −I_{B2} = 0.4 A
t_{stg}	Storage Time			2.5	μs	R_L = 75 Ω, V_{CC} ≒ 150 V
t_f	Fall Time			0.7	μs	See Test Circuit.
h_{FE1}	DC Current Gain**	20		80	—	V_{CE} = 5.0 V, I_C = 0.5 A
h_{FE2}	DC Current Gain**	10			—	V_{CE} = 5.0 V, I_C = 2.0 A
$V_{CE(sat)}$	Collector Saturation Voltage**			1.0	V	I_C = 2.0 A, I_B = 0.4 A
$V_{BE(sat)}$	Base Saturation Voltage**			1.5	V	I_C = 2.0 A, I_B = 0.4 A
$V_{CEO(SUS)}$	Collector to Emitter Sustaining Voltage	400			V	I_C = 2.0 A, I_B = 0.4 A, L = 1 mH
$V_{CEX(SUS)1}$	Collector to Emitter Sustaining Voltage	450			V	I_C = 2.0 A, I_{B1} = −I_{B2} = 0.4 A, T_a = 125 °C, L = 180 μH, Clamped
$V_{CEX(SUS)2}$	Collector to Emitter Sustaining Voltage	400			V	I_C = 4.0 A, I_{B1} = 0.8 A, −I_{B2} = 0.4 A, T_a = 125 °C, L = 180 μH, Clamped
I_{CBO}	Collector Cutoff Current			10	μA	V_{CB} = 400 V, I_E = 0
I_{CER}	Collector Cutoff Current			1.0	mA	V_{CE} = 400 V, R_{BE} = 51 Ω, T_a = 125 °C
I_{CEX1}	Collector Cutoff Current			10	μA	V_{CE} = 400 V, $V_{BE(OFF)}$ = −1.5 V
I_{CEX2}	Collector Cutoff Current			1.0	mA	V_{CE} = 400 V, $V_{BE(OFF)}$ = −1.5 V, T_a = 125 °C
I_{EBO}	Emitter Cutoff Current			10	μA	V_{EB} = 5.0 V, I_C = 0

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

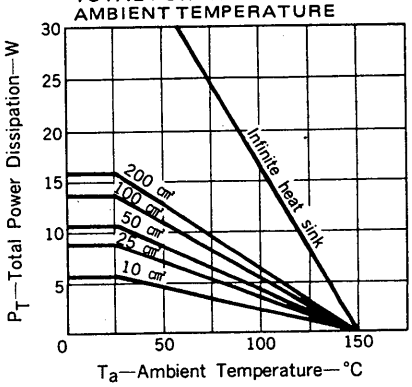
Classification of h_{FE1}

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

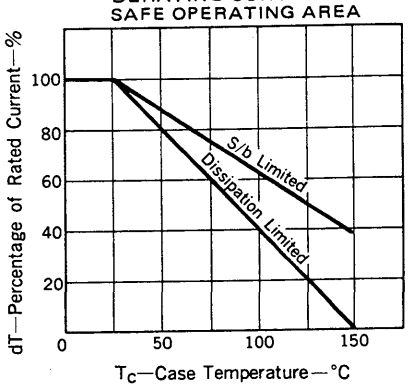
Test Conditions : V_{CE} = 5.0 V, I_C = 0.5 A

TYPICAL CHARACTERISTICS (T_a = 25 °C)

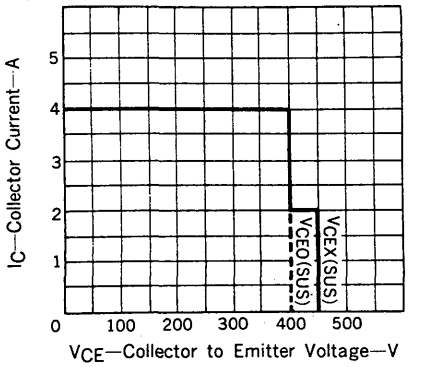
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



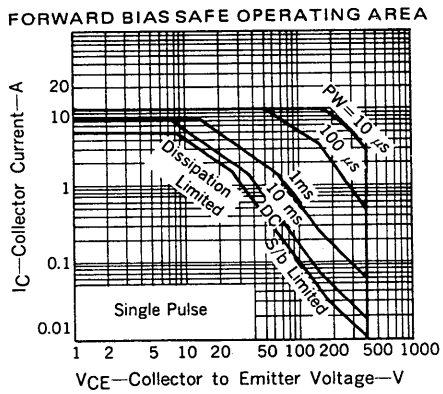
DERATING CURVE OF SAFE OPERATING AREA



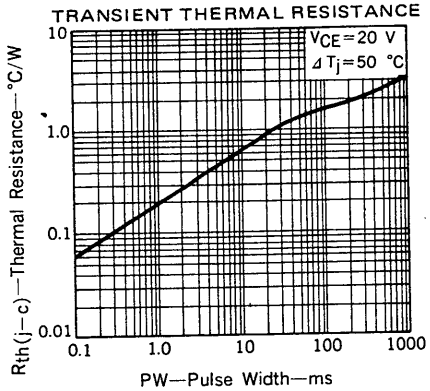
REVERSE BIAS SAFE OPERATING AREA



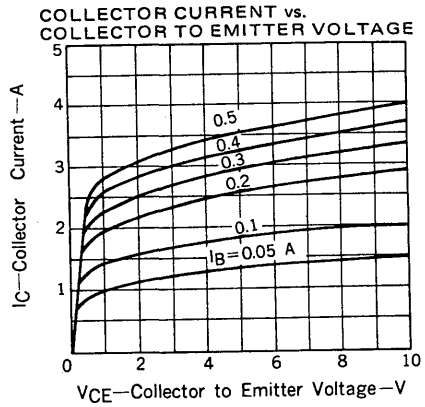
FORWARD BIAS SAFE OPERATING AREA



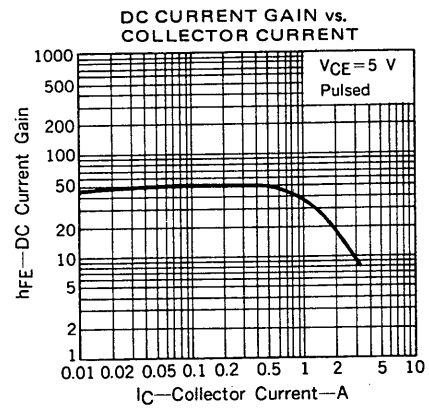
TRANSIENT THERMAL RESISTANCE



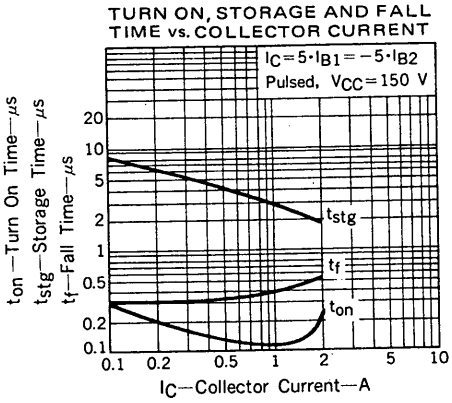
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



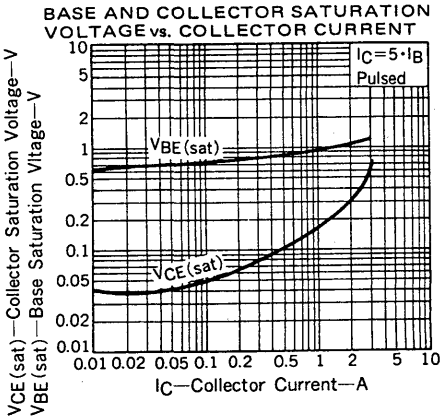
DC CURRENT GAIN vs. COLLECTOR CURRENT



TURN ON, STORAGE AND FALL TIME vs. COLLECTOR CURRENT



BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



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