NEC

NPN SILICON POWER TRANSISTOR

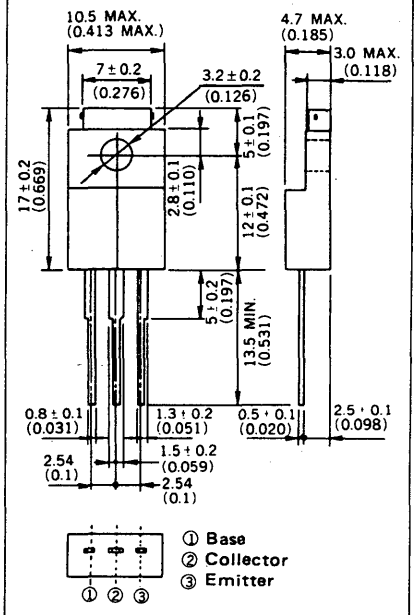
2SC3571

DESCRIPTION The 2SC3571 is NPN silicon epitaxial transistor designed for switching regulator, DC-DC converter and high frequency power amplifier application.

FEATURES

- Easy mount by eliminating Insulation Sheet and Bushing.
- Low Collector Saturation Voltage.
- High Switching Speed.

PACKAGE DIMENSIONS
in millimeters (inches)



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 . . . . . 30 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	7.0	V
$I_{C(DC)}$	Collector Current (DC)	7.0	A
$I_{C(pulse)}$	Collector Current (pulse)*	15	A
$I_{B(DC)}$	Base Current (DC)	3.5	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 = 3.0 A, I_{B1} = $-I_{B2}$ = 0.6 A R_L = 50 Ω, V_{CC} ≒ 150 V
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 V, I_C = 0.1 A
h_{FE2}*	DC Current Gain	20		80	–	V_{CE} = 5.0 V, I_C = 1.0 A
h_{FE3}*	DC Current Gain	10			–	V_{CE} = 5.0 V, I_C = 3.0 A
$V_{CE(sat)}$*	Collector Saturation Voltage			1.0	V	I_C = 3.0 A, I_B = 0.6 A
$V_{BE(sat)}$*	Base Saturation Voltage			1.2	V	I_C = 3.0 A, I_B = 0.6 A
$V_{CEO(SUS)}$	Collector to Emitter Sustaining Voltage	400			V	I_C = 3.0 A, I_B = 0.6 A, L = 1 mH
$V_{CEX(SUS)1}$	Collector to Emitter Sustaining Voltage	450			V	I_C = 3.0 A, I_{B1} = $-I_{B2}$ = 0.6 A, L = 180 μH, Clamped
$V_{CEX(SUS)2}$	Collector to Emitter Sustaining Voltage	400			V	I_C = 6.0 A, I_{B1} = 2.0 A, $-I_{B2}$ = 0.6 A, 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

* PW ≦ 350 μs, Duty Cycle ≦ 2 %

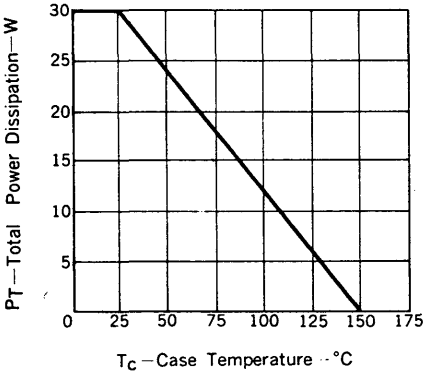
Classification of h_{FE2}

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

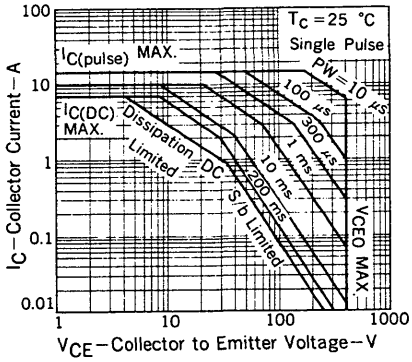
Test Conditions: V_{CE} = 5.0 V, I_C = 1.0 A

TYPICAL CHARACTERISTICS (T_a = 25 °C)

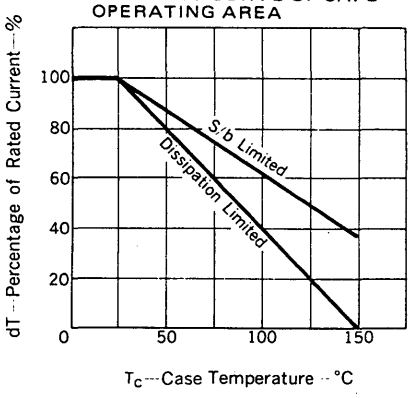
TOTAL POWER DISSIPATION vs. CASE TEMPERATURE



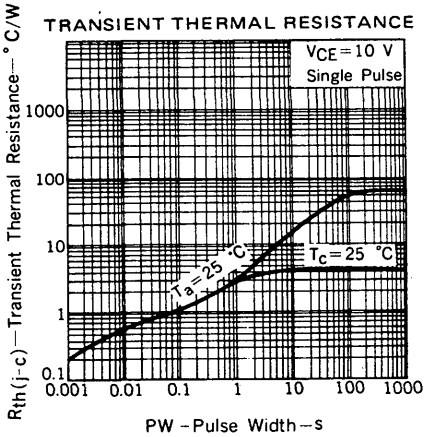
FORWARD BIAS SAFE OPERATING AREA



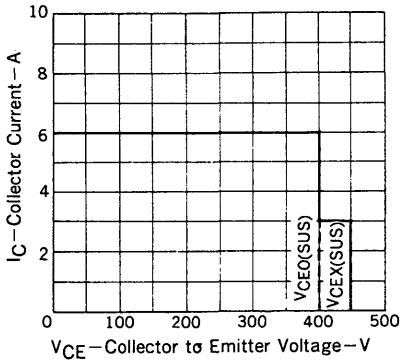
DERATING CURVE OF SAFE OPERATING AREA



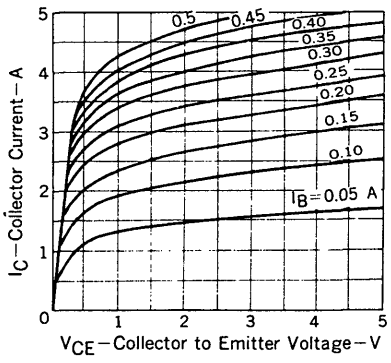
TRANSIENT THERMAL RESISTANCE



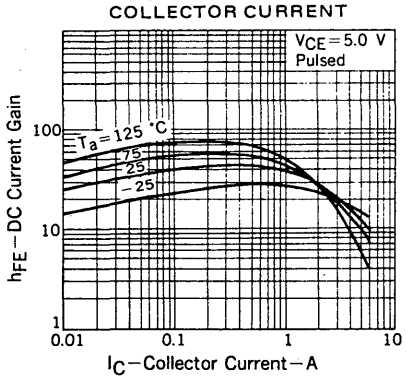
REVERSE BIAS SAFE OPERATING AREA



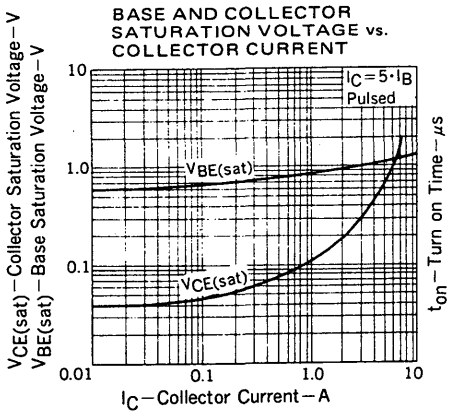
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



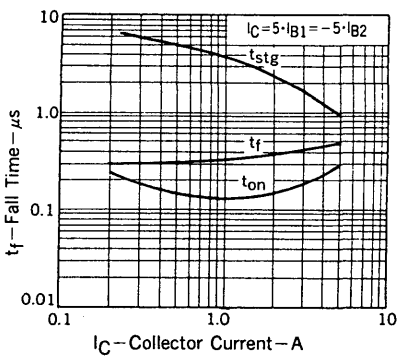
DC CURRENT GAIN vs. COLLECTOR CURRENT



BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



TURN ON TIME, STORAGE AND FALL TIME vs. COLLECTOR CURRENT



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