NEC

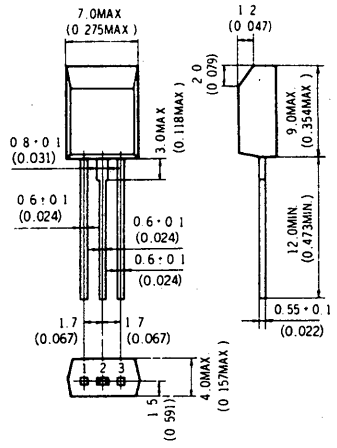
NPN SILICON TRANSISTOR
2SC3733

DESCRIPTION The 2SC3733 is designed for power amplifier and high speed switching applications.

FEATURES

- High speed, high voltage switching.
- Low Collector Saturation Voltage.
- Complementary to the NEC 2SA1460 PNP transistor.

PACKAGE DIMENSIONS
in millimeters (inches)



1. Emitter
2. Collector
3. Base

ABSOLUTE MAXIMUM RATINGS

Maximum Temperatures

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

Junction Temperature . . . . . 150 °C Maximum

Maximum Power Dissipation (T_a = 25 °C)

Total Power Dissipation . . . . . 1.0 W

Maximum Voltages and Currents (T_a = 25 °C)

V_{CBO}	Collector to Base Voltage . . .	80	V
V_{CEO}	Collector to Emitter Voltage .	45	V
V_{EBO}	Emitter to Base Voltage	5.0	V
$I_{C(DC)}$	Collector Current (DC)	1.0	A
$I_{C(pulse)}$	Collector Current (pulse)* . .	2.0	A

* PW ≦ 10 ms, Duty Cycle ≦ 50 %

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
t_{on}	Turn-on Time		20	40	ns	V_{CC} = 10 V, I_C = 500 mA, $I_{B1} = -I_{B2} \fallingdotseq$ 50 mA
t_{off}	Turn-off Time		72	110	ns	
t_{stg}	Storage Time		55	80	ns	
f_T	Gain Bandwidth Product	300	380		MHz	V_{CE} = 10 V, I_E = −100 mA
C_{ob}	Output Capacitance		1.8	10	pF	V_{CB} = 10 V, I_E = 0, f = 1 MHz
h_{FE1}**	DC Current Gain	60	120	200	—	V_{CE} = 10 V, I_C = 50 mA
h_{FE2}**	DC Current Gain	60	150		—	V_{CE} = 10 V, I_C = 500 mA
$V_{CE(sat)}$**	Collector Saturation Voltage		0.17	0.40	V	I_C = 500 mA, I_B = 50 mA
$V_{BE(sat)}$**	Base Saturation Voltage		0.90	1.20	V	I_C = 500 mA, I_B = 50 mA
I_{CES}	Collector Cutoff Current			0.1	μA	V_{CE} = 45 V, R_{BE} = 0
I_{EBO}	Emitter Cutoff Current			0.1	μA	V_{EB} = 4.0 V, I_C = 0

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

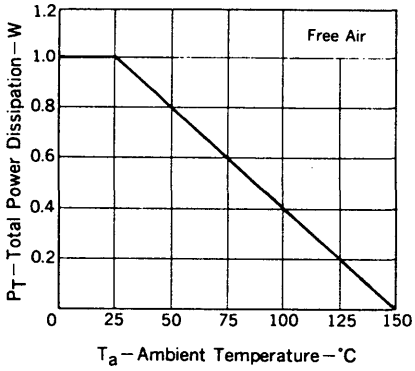
Classification of h_{FE1}

Rank	L	K
Range	60 to 120	100 to 200

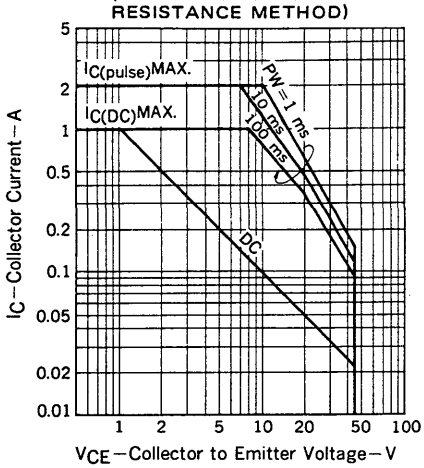
Test Conditions : V_{CE} = 10 V, I_C = 50 mA

TYPICAL CHARACTERISTICS (T_a = 25 °C)

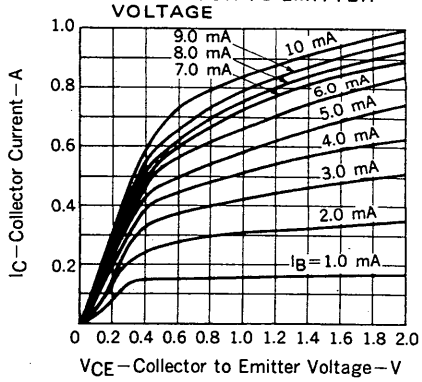
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



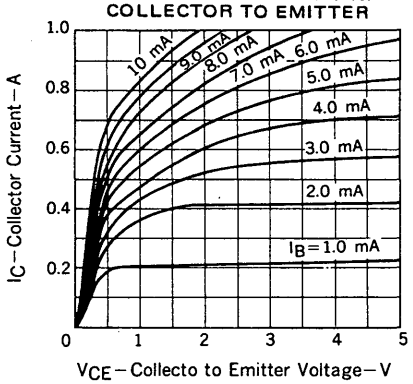
SAFE OPERATING AREA (TRANSIENT THERMAL RESISTANCE METHOD)



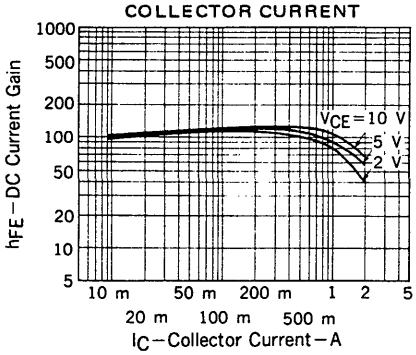
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



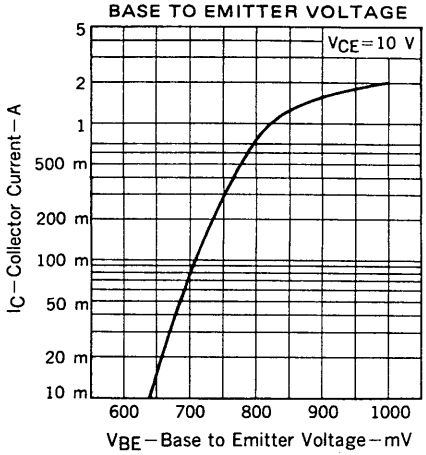
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER



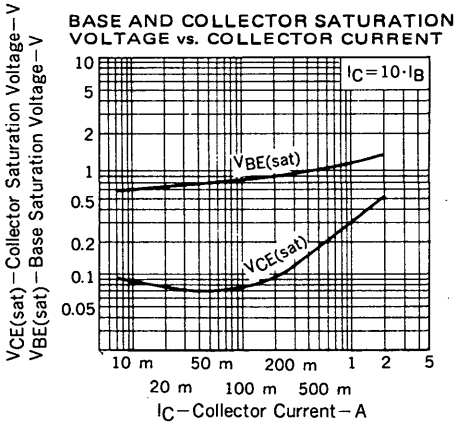
DC CURRENT GAIN vs. COLLECTOR CURRENT



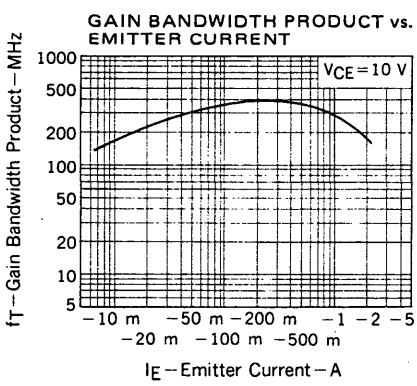
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



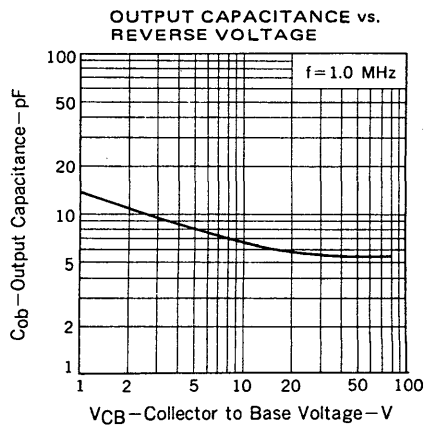
BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



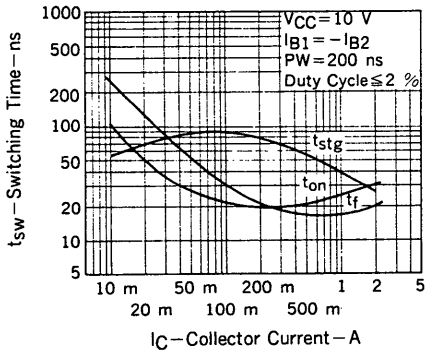
GAIN BANDWIDTH PRODUCT vs. EMITTER CURRENT



OUTPUT CAPACITANCE vs. REVERSE VOLTAGE



SWITCHING TIME vs. COLLECTOR CURRENT



SWITCHING TIME TEST CIRCUIT