DATA SHEET

NEC

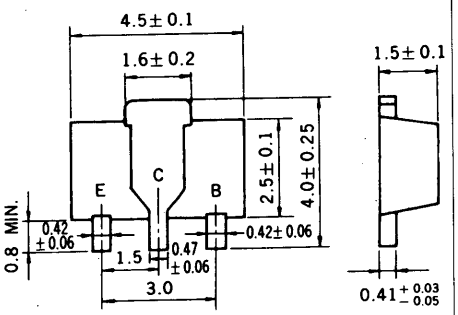
SILICON TRANSISTOR
2SD1950

NPN SILICON EPITAXIAL TRANSISTOR
POWER MINI MOLD

DESCRIPTION

The 2SD1950 is designed for general-purpose applications requiring High DC Current Gain.
This is suitable for all kind of driving or muting.

PACKAGE DIMENSIONS
in millimeters



1. Emitter
2. Collector
3. Base

FEATURES

- High DC Current Gain and good h_{FE} linearity.
  h_{FE} = 800 to 3 200 (@V_{CE} = 5.0 V, I_C = 1.0 A)
- Low Collector Saturation Voltage.
  $V_{CE(sat)}$ = 0.18 V TYP. (@I_C = 1.0 A, I_B = 10 mA)
- High V_{EBO} : V_{EBO} = 15 V

ABSOLUTE MAXIMUM RATINGS

Maximum Voltages and Currents (T_a = 25 °C)			
Collector to Base Voltage	V_{CBO}	30	V
Collector to Emitter Voltage	V_{CEO}	25	V
Emitter to Base Voltage	V_{EBO}	15	V
Collector Current (DC)	I_C	2	A
Collector Current (Pulse)*	I_C	3	A
Maximum Power Dissipation			
Total Power Dissipation at 25°C Ambient Temperature**	P_T	2.0	W
Maximum Temperatures			
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_{stg}	−55 to +150	°C

* PW ≦ 10 ms, Duty Cycle ≦ 50 %
** When mounted on ceramic substrate of 16 cm² x 0.7 mm

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDICTIONS
Collector Cutoff Current	I_{CBO}			100	nA	V_{CB} = 30 V, I_E = 0
Emitter Cutoff Current	I_{EBO}			100	nA	V_{EB} = 10 V, I_C = 0
DC Current Gain	h_{FE1}***	800	1500	3200		V_{CE} = 5.0 V, I_C = 1.0 A
DC Current Gain	h_{FE2}***	400				V_{CE} = 5.0 V, I_C = 2.0 A
Collector Saturation Voltage	$V_{CE(sat)}$***		0.18	0.3	V	I_C = 1.0 A, I_B = 10 mA
Base Saturation Voltage	$V_{BE(sat)}$***		0.83	1.2	V	I_C = 1.0 A, I_B = 10 mA
Base to Emitter Voltage	V_{BE}***	600	660	700	mV	V_{CE} = 5.0 V, I_C = 300 mA
Gain Bandwidth Product	f_T	150	350		MHz	V_{CE} = 10 V, I_E = −500 mA
Output Capacitance	C_{ob}		26	35	pF	V_{CB} = 10 V, I_E = 0, f = 1.0 MHz

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

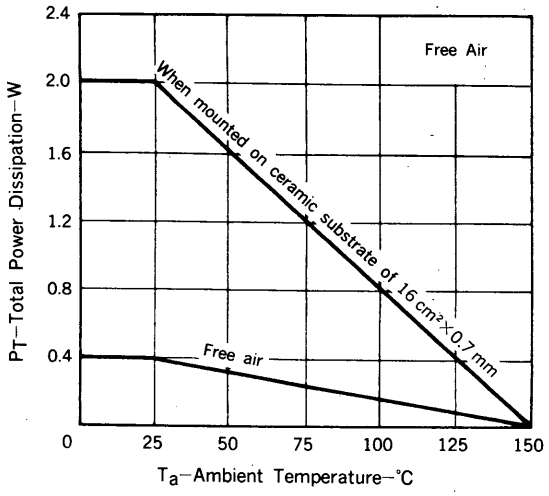
h_{FE} Classification

MARKING	VM	VL	VK
h_{FE}	800 to 1600	1200 to 2400	2000 to 3200

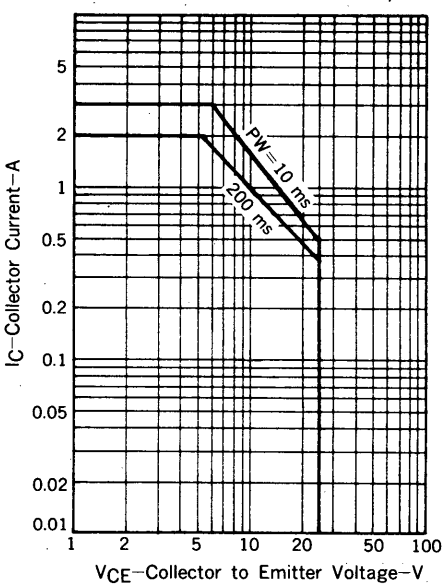
Document No. TC−1894A
(O.D.No. TC−6129A)
Date Published November 1994 M
Printed in Japan

TYPICAL CHARACTERISTICS (T_a = 25 °C)

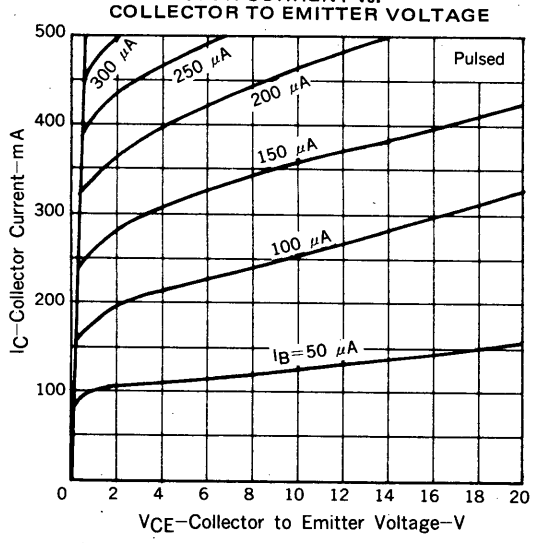
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



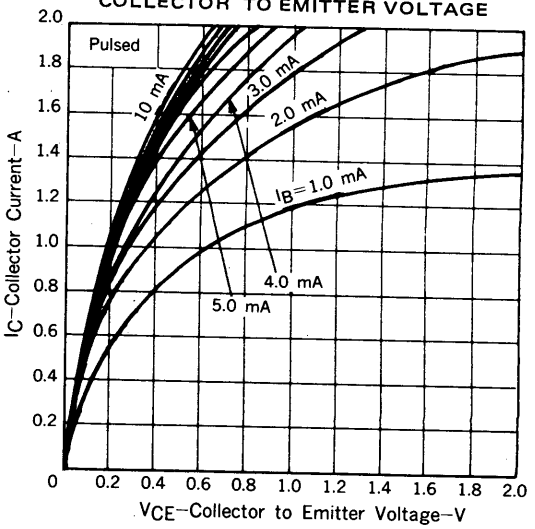
SAFE OPERATING AREAS (TRANSIENT THERMAL RESISTANCE METHOD)



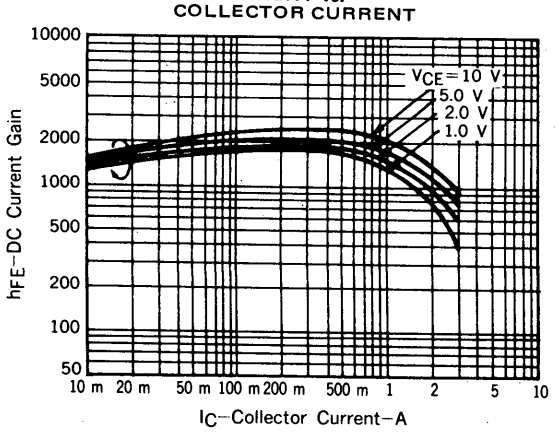
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



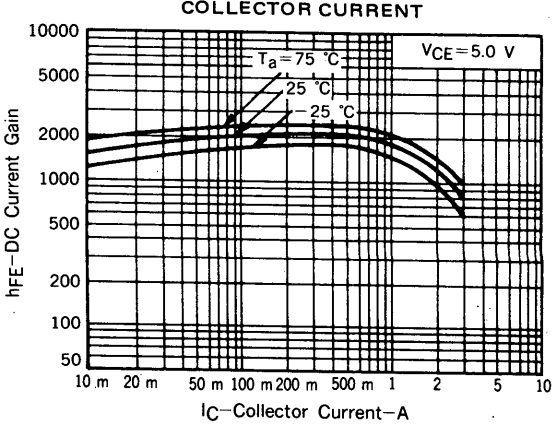
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



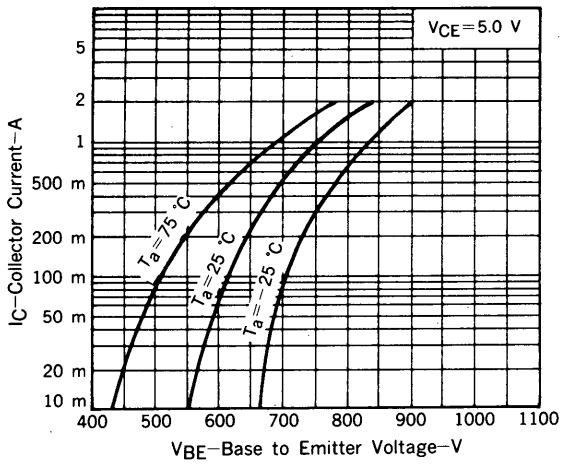
DC CURRENT vs. COLLECTOR CURRENT



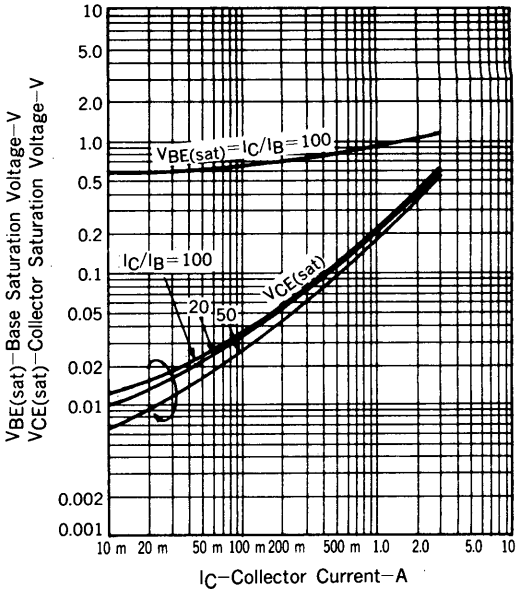
DC CURRENT GAIN vs. COLLECTOR CURRENT



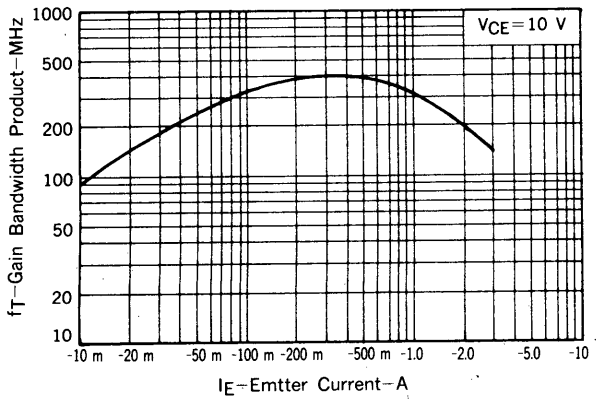
COLLECTOR CURRENT vs.
BASE TO EMITTER VOLTAGE



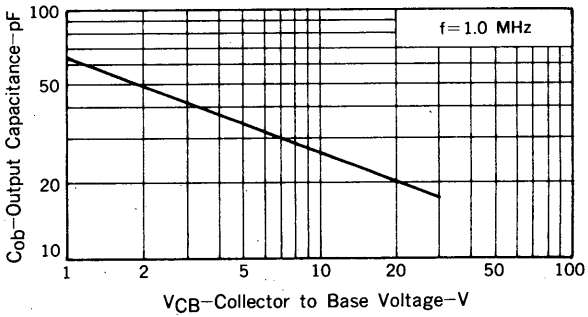
COLLECTOR AND BASE SATURATION
VOLTAGE vs. COLLECTOR CURRENT



GAIN BANDWIDTH PRODUCT vs.
EMITTER CURRENT



OUTPUT CAPACITANCE vs.
COLLECTOR TO BASE VOLTAGE



REFERENCE

Document Name	Document No.
NEC semiconductor device reliability/quality control system.	TEI-1202
Quality grade on NEC semiconductor devices.	IEI-1209
Semiconductor device mounting technology manual.	IEI-1207
Semiconductor device package manual.	IEI-1213
Guide to quality assurance for semiconductor devices.	MEI-1202
Semiconductor selection guide.	MF-1134

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