DATA SHEET

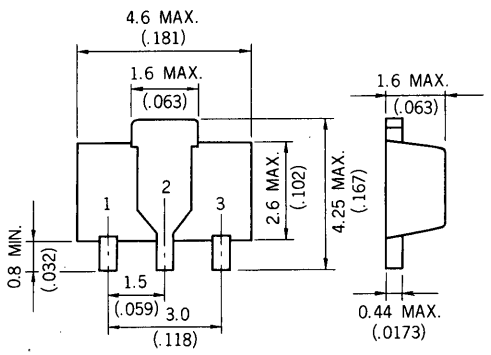
NEC

SILICON TRANSISTOR
2SC2780

NPN SILICON EPITAXIAL TRANSISTOR
POWER MINI MOLD

DESCRIPTION
The 2SC2780 is designed for audio frequency preamplifier application, especially in Hybrid Integrated Circuits.

PACKAGE DIMENSIONS
in millimeters (inches)



1. Emitter
2. Collector
3. Base

FEATURES
- World Standard Miniature Package
  : SOT−89
- High Collector to Emitter Voltage
  : $V_{CEO} > 140$ V
- Complements to PNP type 2SA1173

ABSOLUTE MAXIMUM RATINGS (Ta = 25 °C)

Maximum Voltages and Currents			
Collector to Base Voltage	V_{CBO}	140	V
Collector to Emitter Voltage	V_{CEO}	140	V
Emitter to Base Voltage	V_{EBO}	5.0	V
Collector Current (DC)	I_C	50	mA
Collector Current (Pulse)*	I_C	100	mA
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 (Ta = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I_{CBO}			100	nA	V_{CB}=140 V, I_E=0
Emitter Cutoff Current	I_{EBO}			100	nA	V_{EB}=5.0 V, I_C=0
DC Current Gain	h_{FE1}	50	180			V_{CE}=10 V, I_C=1.0 mA ***
DC Current Gain	h_{FE2}	90	200	400		V_{CE}=10 V, I_C=10 mA ***
Collector Saturation Voltage	$V_{CE(sat)}$		0.07	0.60	V	I_C=20 mA, I_B=2.0 mA ***
Base Saturation Voltage	$V_{BE(sat)}$		0.75	1.0	V	I_C=20 mA, I_B=2.0 mA ***
Base to Emitter Voltage	V_{BE}	650	685	750	mV	V_{CE}=10 V, I_C=10 mA ***
Gain Bandwidth Product	f_T		120		MHz	V_{CE}=10 V, I_E=−10 mA
Output Capacitance	C_{ob}		2.3		pF	V_{CB}=10 V, I_E=0, f=1.0 MHz

***Pulsed: PW ≦ 350 μs, duty cycle ≦ 2 %

h_{FE} Classification

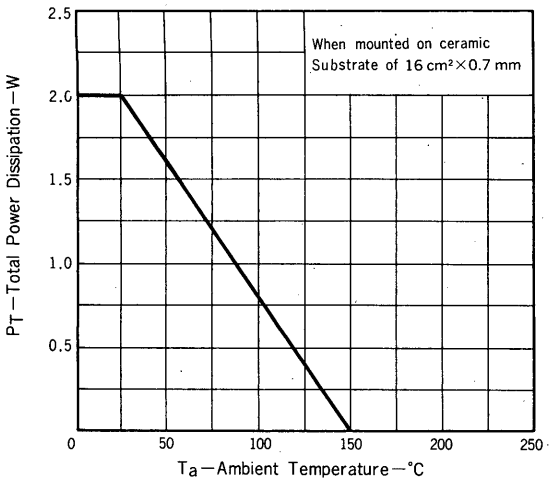
MARKING	NM	NL	NK
h_{FE2}	90 − 180	135 − 270	200 − 400

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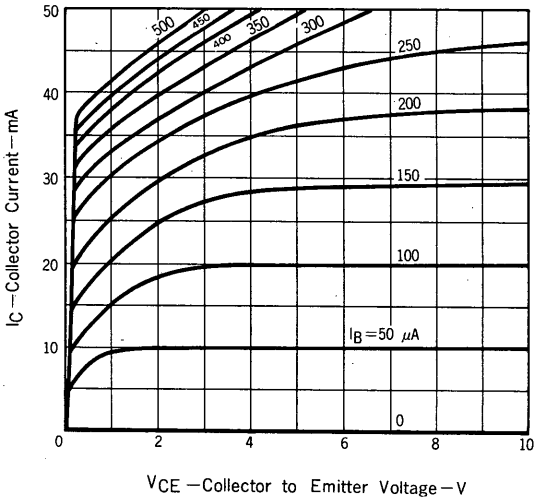
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TYPICAL CHARACTERISTICS (T_a = 25 °C)

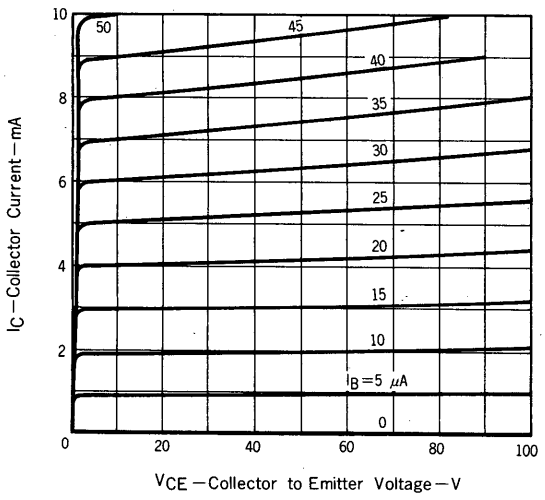
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



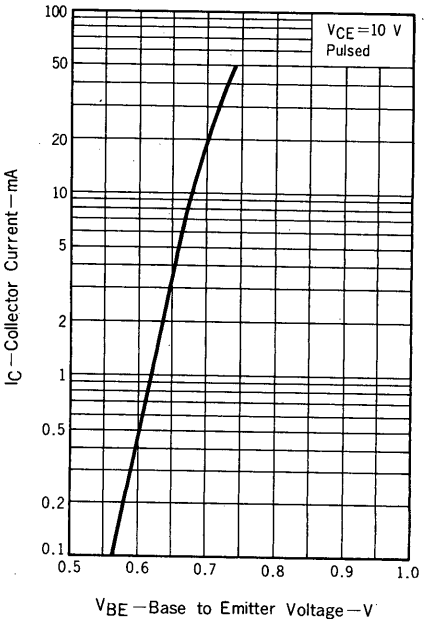
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



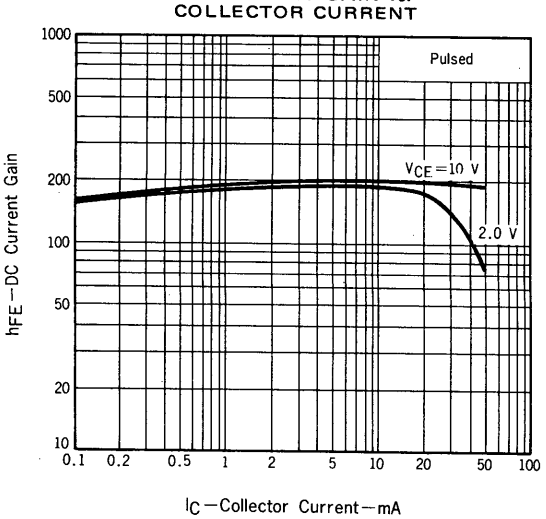
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



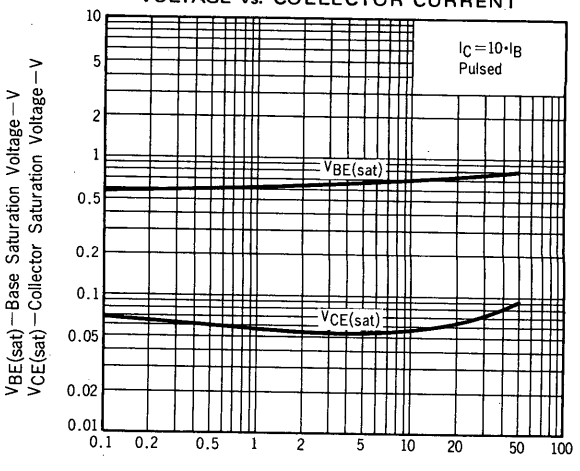
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



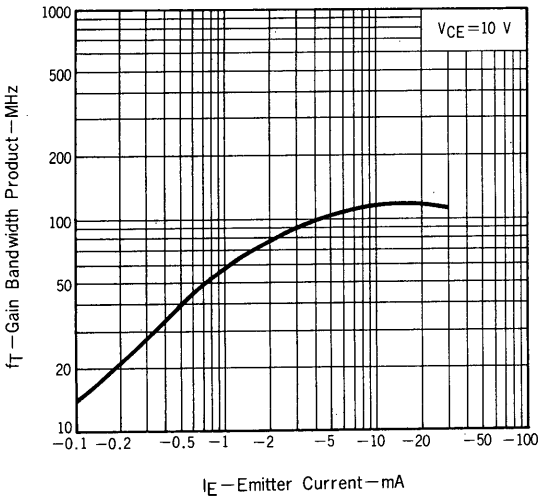
DC CURRENT GAIN vs. COLLECTOR CURRENT



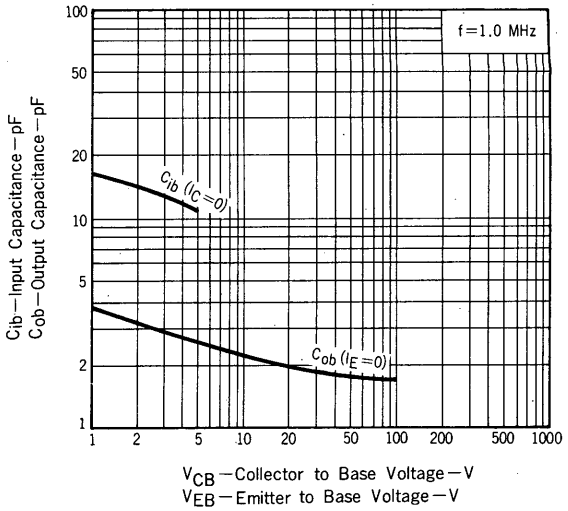
BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



GAIN BANDWIDTH PRODUCT vs.
EMITTER CURRENT



INPUT AND OUTPUT CAPACITANCE vs.
REVERSE 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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