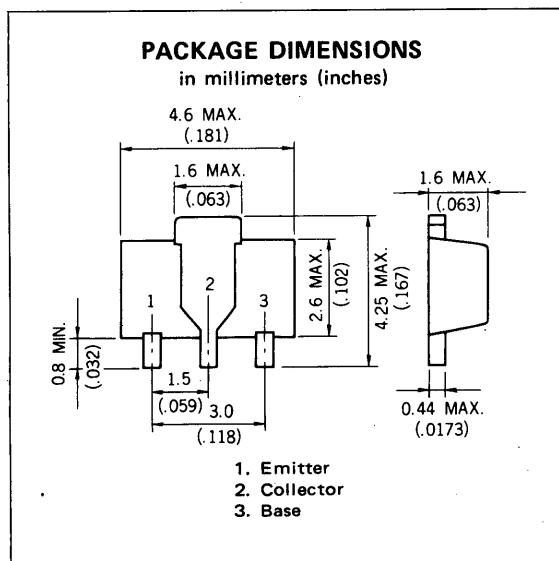


NPN SILICON EPITAXIAL TRANSISTOR
POWER MINI MOLD

DESCRIPTION

The 2SD1001 is designed for audio frequency power amplifier application, especially in Hybrid Integrated Circuits.



FEATURES

- World Standard Miniature Package : SOT-89
- High Collector to Emitter Voltage : $V_{CEO} > 80$ V
- Complements to PNP type 2SB800

ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

Maximum Voltages and Currents

Collector to Base Voltage	V_{CBO}	80	V
Collector to Emitter Voltage	V_{CEO}	80	V
Emitter to Base Voltage	V_{EBO}	5.0	V
Collector Current (DC)	I_C	300	mA
Collector Current (Pulse)*	I_C	500	mA

Maximum Power Dissipation

Total Power Dissipation at 25°C Ambient Temperature**	P_T	2.0	W
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Maximum Temperatures

Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to +150	$^\circ\text{C}$

* $PW \leq 10$ ms, duty cycle $\leq 50\%$

**When mounted on ceramic substrate of $16\text{ cm}^2 \times 0.7\text{ mm}$

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I_{CBO}			100	nA	$V_{CB} = 80\text{ V}, I_E = 0$
Emitter Cutoff Current	I_{EBO}			100	nA	$V_{EB} = 5.0\text{ V}, I_C = 0$
DC Current Gain	h_{FE1}	90	200	400		$V_{CE} = 1.0\text{ V}, I_C = 50\text{ mA}$ ***
DC Current Gain	h_{FE2}	30	80			$V_{CE} = 2.0\text{ V}, I_C = 300\text{ mA}$ ***
Collector Saturation Voltage	$V_{CE(sat)}$		0.15	0.60	V	$I_C = 300\text{ mA}, I_B = 30\text{ mA}$ ***
Base Saturation Voltage	$V_{BE(sat)}$		0.86	1.2	V	$I_C = 300\text{ mA}, I_B = 30\text{ mA}$ ***
Base to Emitter Voltage	V_{BE}	600	645	700	mV	$V_{CE} = 6.0\text{ V}, I_C = 10\text{ mA}$ ***
Gain Bandwidth Product	f_T		140		MHz	$V_{CE} = 6.0\text{ V}, I_E = -10\text{ mA}$
Output Capacitance	C_{ob}		7.0		pF	$V_{CB} = 6.0\text{ V}, I_E = 0, f = 1.0\text{ MHz}$

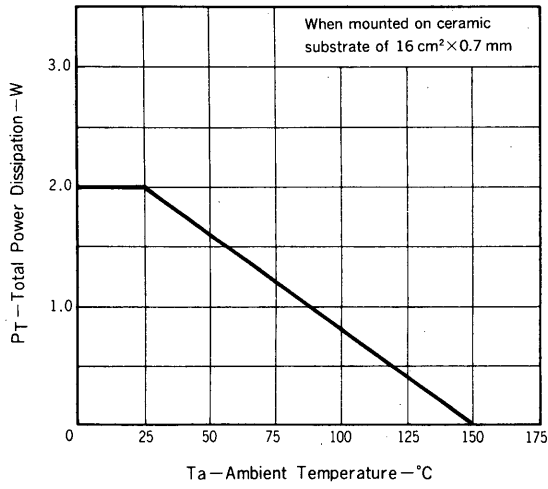
***Pulsed: $PW \leq 350\ \mu\text{s}$, duty cycle $\leq 2\%$

h_{FE} Classification

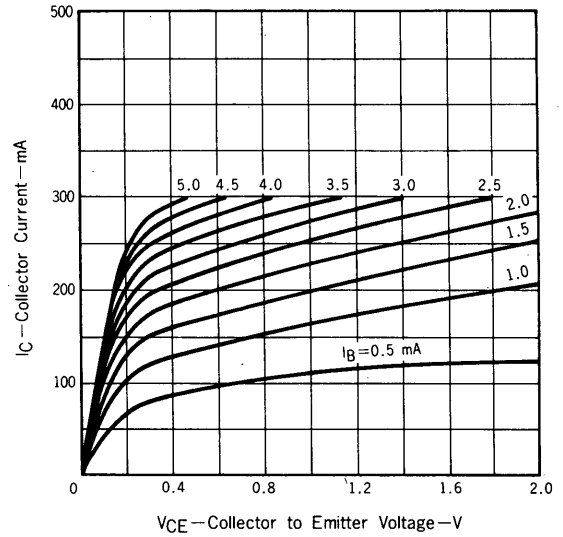
MARKING	EM	EL	EK
h_{FE1}	90 - 180	135 - 270	200 - 400

TYPICAL CHARACTERISTICS (Ta=25 °C)

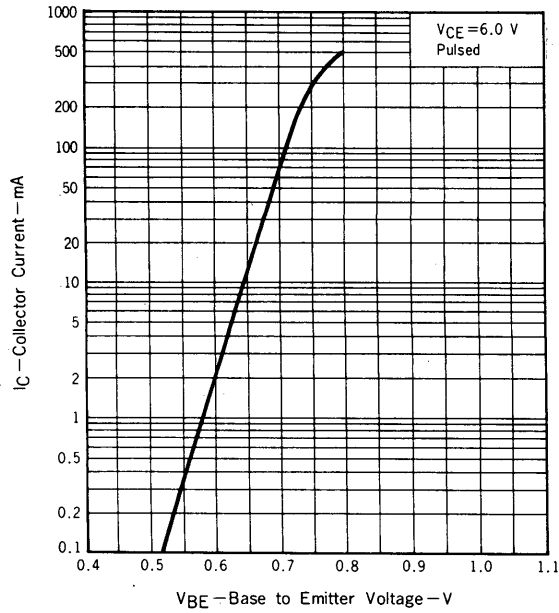
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



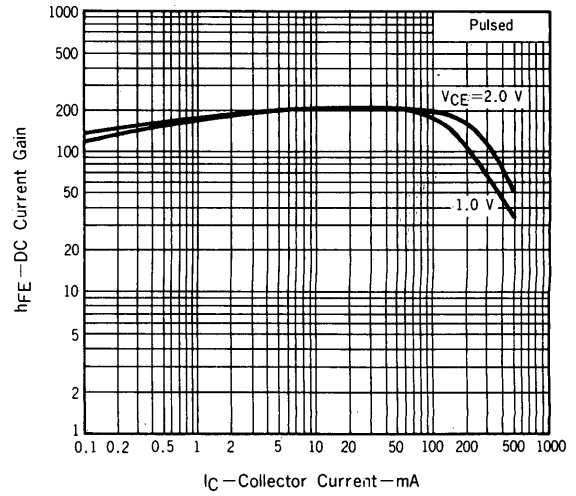
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



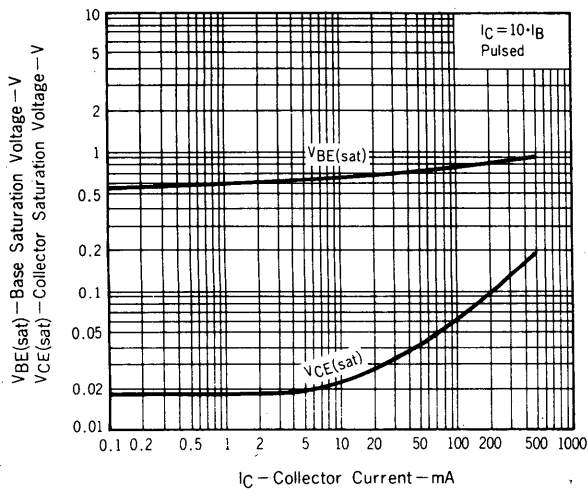
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



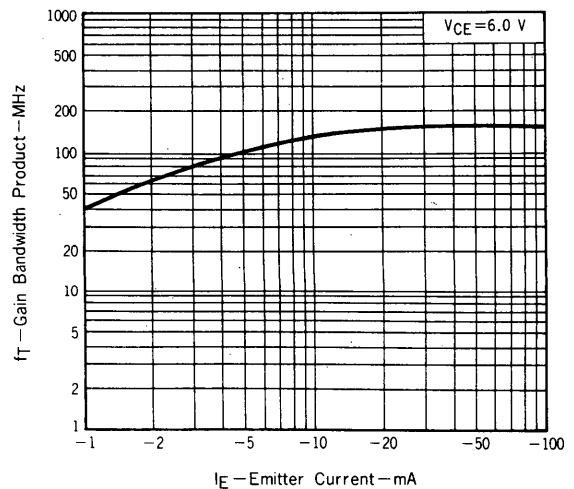
DC CURRENT GAIN vs. COLLECTOR CURRENT



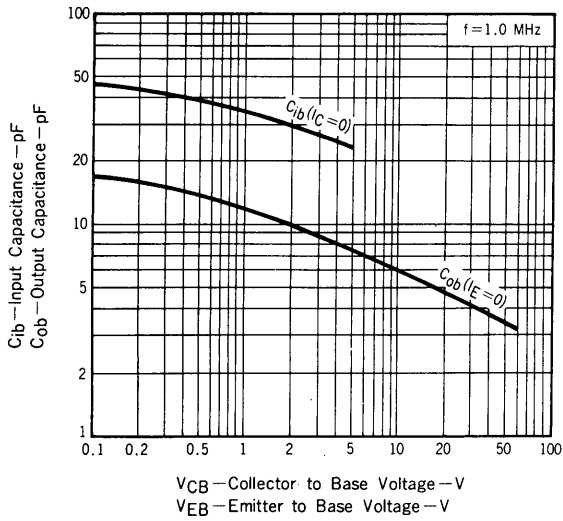
BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



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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