DATA SHEET

NEC

SILICON TRANSISTORS

2SD1006,2SD1007

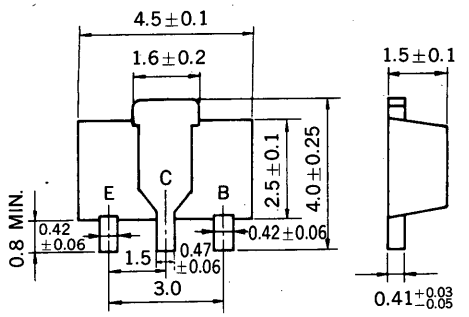
NPN SILICON EPITAXIAL TRANSISTOR

POWER MINI MOLD

DESCRIPTION

The 2SD1006 and 2SD1007 are designed for audio frequency power amplifier application, especially in Hybrid Integrated Circuits.

PACKAGE DIMENSIONS
in millimeters



1. Emitter
2. Collector
3. Base

SOT-89

FEATURES

- World Standard Miniature Package : SOT−89
- High Collector to Emitter Voltage : $V_{CEO} > 120$ V (2SD1007)
  : $V_{CEO} > 100$ V (2SD1006)
- Complement to PNP type 2SB805 and 2SB806 respectively.

ABSOLUTE MAXIMUM RATINGS

Maximum Voltages and Currents (T_a = 25 °C)		2SD1006	2SD1007	
Collector to Base Voltage	V_{CBO}	100	120	V
Collector to Emitter Voltage	V_{CEO}	100	120	V
Emitter to Base Voltage	V_{EBO}	5.0		V
Collector Current (DC)	I_C	0.7		A
Collector Current (Pulse)*	I_C	1.2		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 CONDITIONS	
Collector Cutoff Current	I_{CBO}			100	nA	2SD1006	V_{CB}=100 V, I_E=0
				100	nA	2SD1007	V_{CB}=120 V, I_E=0
Emitter Cutoff Current	I_{EBO}			100	nA	V_{EB}=5.0 V, I_C=0	
DC Current Gain	h_{FE1}	45	200			V_{CE}=1.0 V, I_C=5.0 mA	***
DC Current Gain	h_{FE2}	90	200	400		V_{CE}=1.0 V, I_C=100 mA	***
Collector Saturation Voltage	$V_{CE(sat)}$		0.3	0.6	V	I_C=500 mA, I_B=50 mA	***
Base Saturation Voltage	$V_{BE(sat)}$		0.9	1.5	V	I_C=500 mA, I_B=50 mA	***
Base to Emitter Voltage	V_{BE}	550	620	650	mV	V_{CE}=10 V, I_C=10 mA	***
Gain Bandwidth Product	f_T		90		MHz	V_{CE}=10 V, I_E=−10 mA	
Output Capacitance	C_{ob}		10		pF	V_{CB}=10 V, I_E=0, f=1.0 MHz	

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

h_{FE} Classification

MARKING	2SD1006	HM	HL	HK
	2SD1007	HR	HQ	HP
h_{FE}		90 − 180	135 − 270	200 − 400

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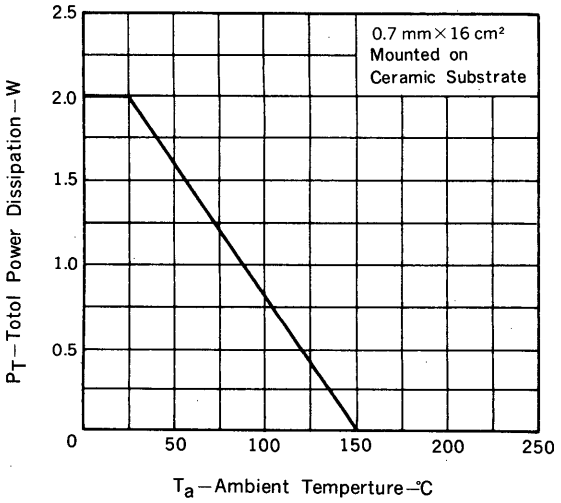
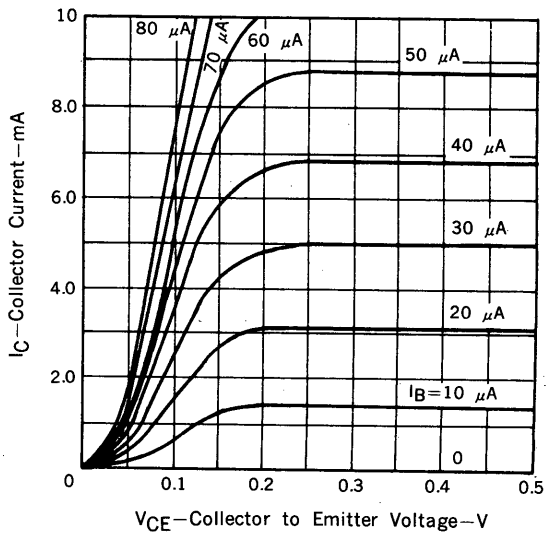
TYPICAL CHARACTERISTICS (T_a = 25 °C)

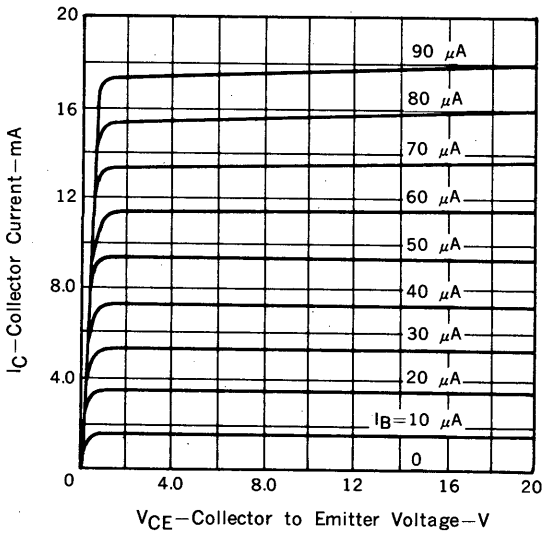
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



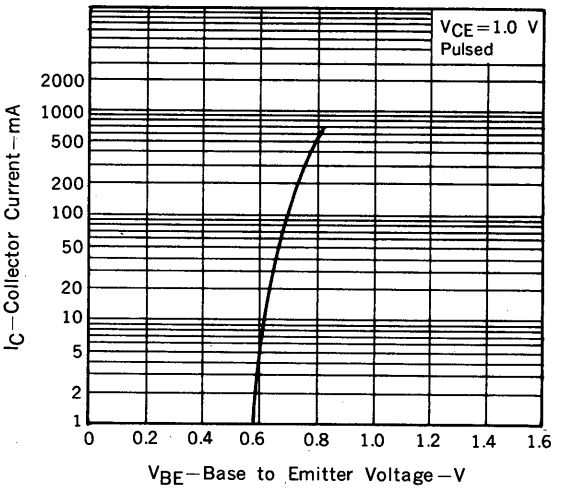
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



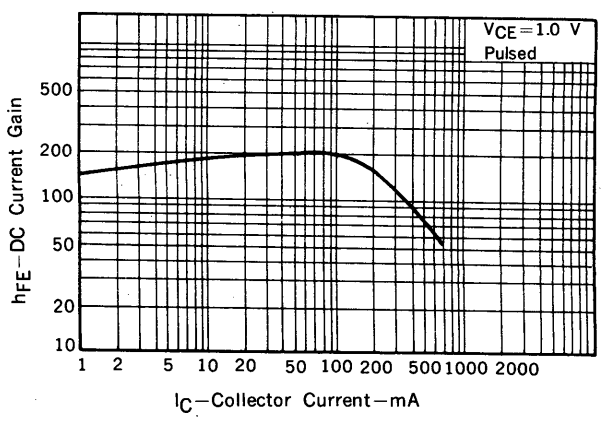
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



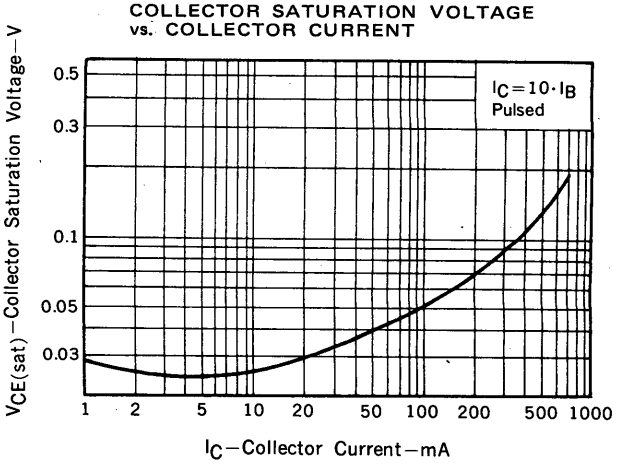
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



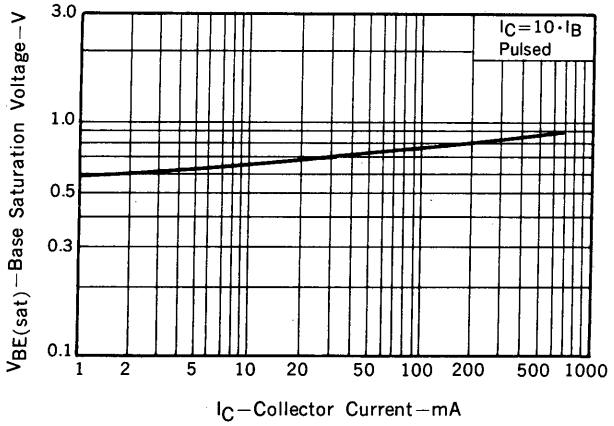
DC CURRENT GAIN vs. COLLECTOR CURRENT



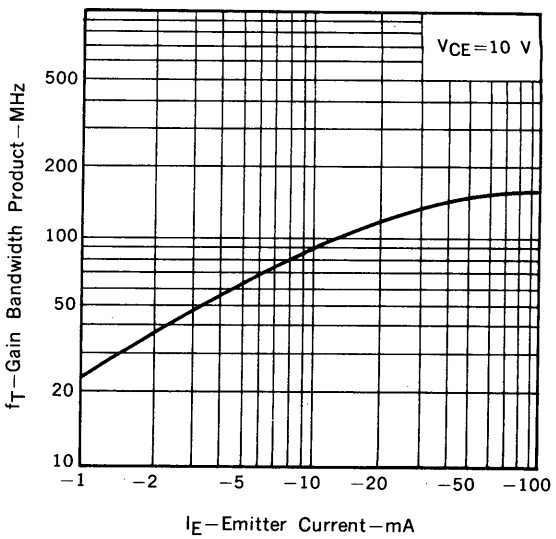
COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



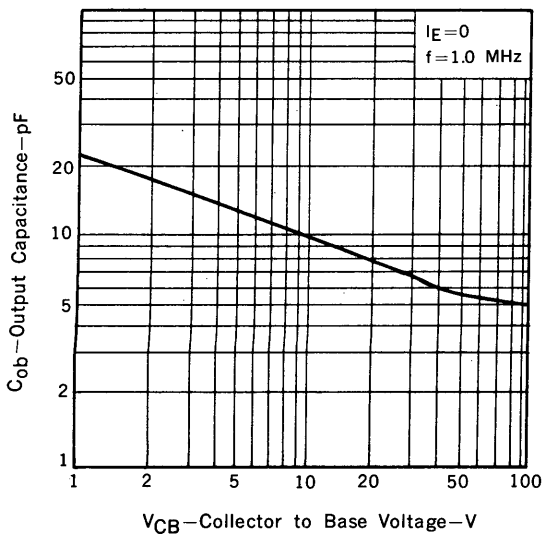
BASE SATURATION VOLTAGE vs.
COLLECTOR CURRENT



GAIN BANDWIDTH PRODUCT vs.
EMITTER CURRENT



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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