



# SILICON TRANSISTORS

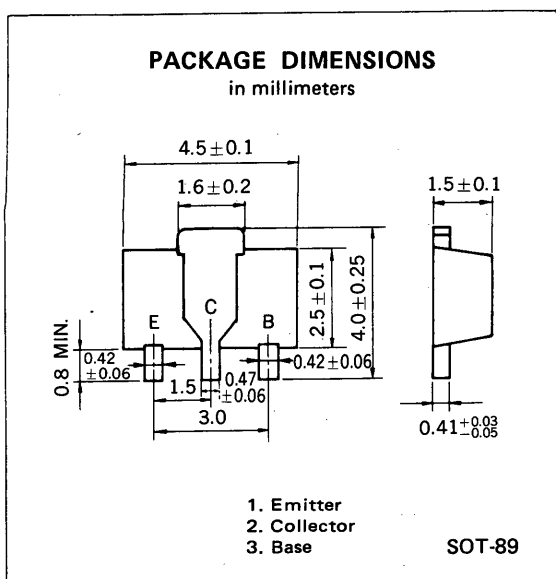
## 2SD1006, 2SD1007

### 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.



#### FEATURES

- World Standard Miniature Package : SOT-89
- High Collector to Emitter Voltage :  $V_{CE0} > 120$  V (2SD1007)  
:  $V_{CE0} > 100$  V (2SD1006)
- Complement to PNP type 2SB805 and 2SB806 respectively.

#### ABSOLUTE MAXIMUM RATINGS

Maximum Voltages and Currents ( $T_a = 25^\circ\text{C}$ )		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 $25^\circ\text{C}$ Ambient Temperature **	$P_T$	2.0		W
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  $16\text{ cm}^2 \times 0.7\text{ mm}$

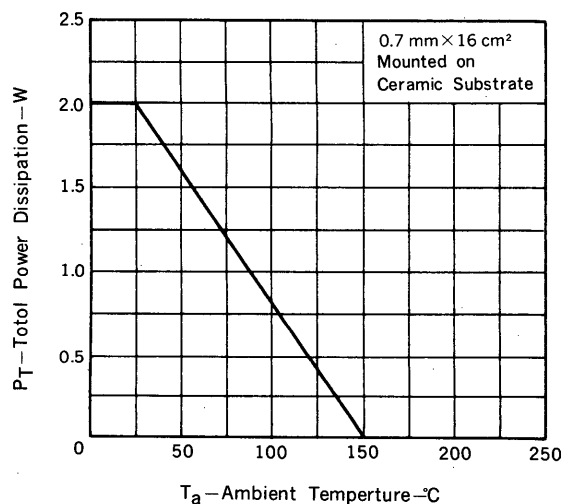
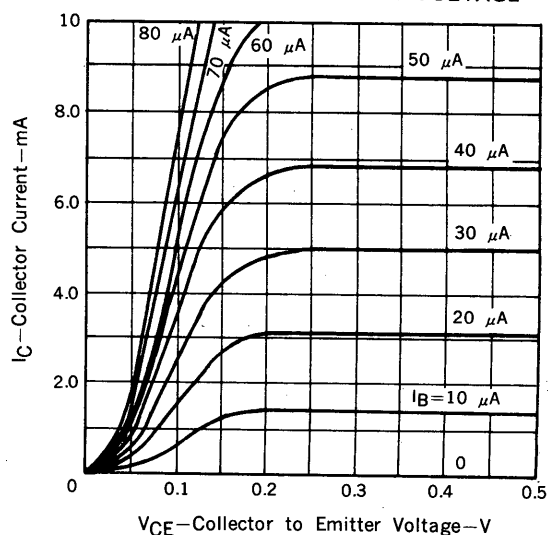
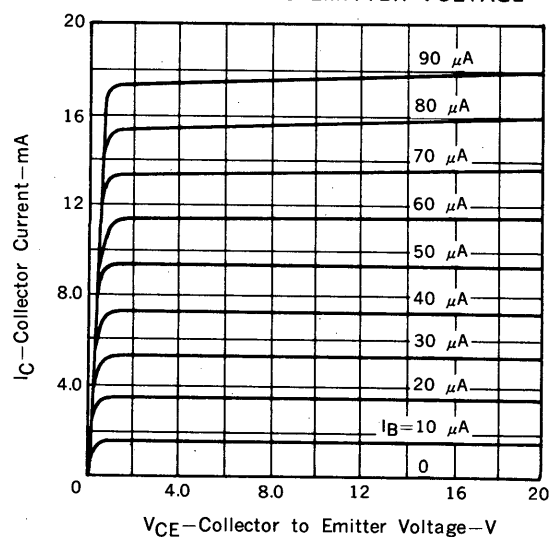
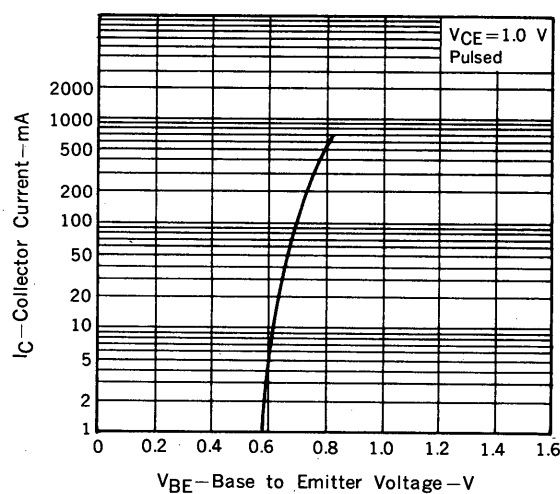
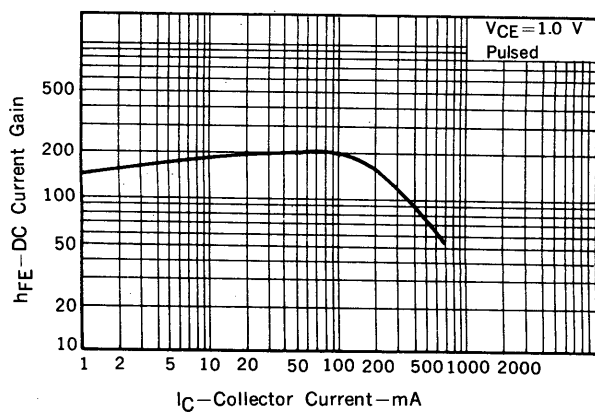
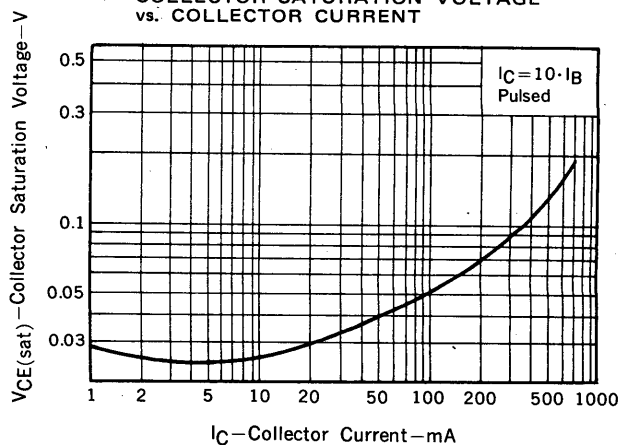
#### ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS	
Collector Cutoff Current	$I_{CBO}$			100	nA	2SD1006	$V_{CB}=100\text{ V}, I_E=0$
				100	nA	2SD1007	$V_{CB}=120\text{ V}, I_E=0$
Emitter Cutoff Current	$I_{EBO}$			100	nA	$V_{EB}=5.0\text{ V}, I_C=0$	
DC Current Gain	$h_{FE1}$	45	200			$V_{CE}=1.0\text{ V}, I_C=5.0\text{ mA}$	
DC Current Gain	$h_{FE2}$	90	200	400		$V_{CE}=1.0\text{ V}, I_C=100\text{ mA}$	
Collector Saturation Voltage	$V_{CE(sat)}$		0.3	0.6	V	$I_C=500\text{ mA}, I_B=50\text{ mA}$	
Base Saturation Voltage	$V_{BE(sat)}$		0.9	1.5	V	$I_C=500\text{ mA}, I_B=50\text{ mA}$	
Base to Emitter Voltage	$V_{BE}$	550	620	650	mV	$V_{CE}=10\text{ V}, I_C=10\text{ mA}$	
Gain Bandwidth Product	$f_T$		90		MHz	$V_{CE}=10\text{ V}, I_E=-10\text{ mA}$	
Output Capacitance	$C_{ob}$		10		pF	$V_{CB}=10\text{ V}, I_E=0, f=1.0\text{ MHz}$	

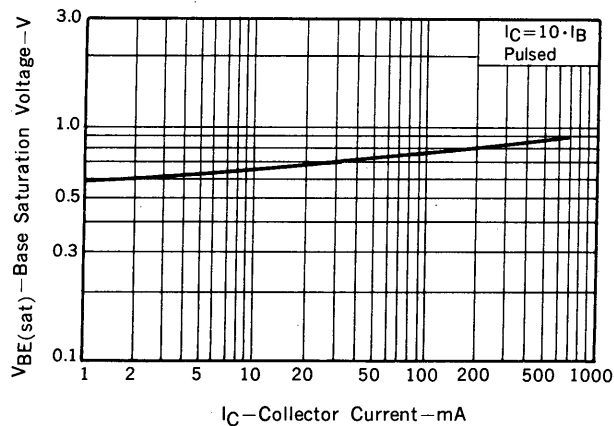
\*\*\* Pulsed:  $PW \leq 350\text{ }\mu\text{s}$ , duty cycle  $\leq 2$  %

#### $h_{FE}$ Classification

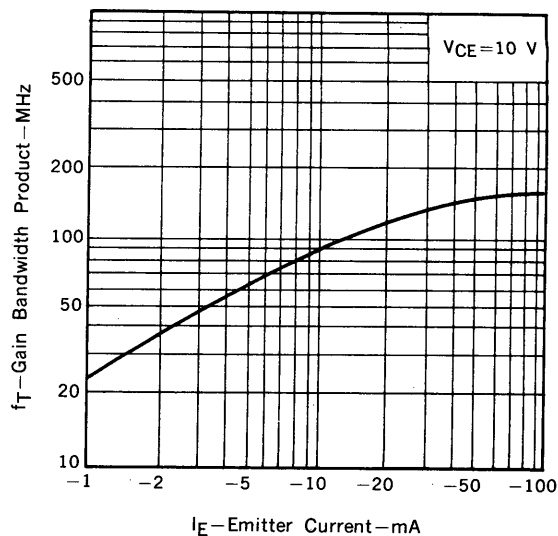
MARKING	2SD1006	HM	HL	HK
	2SD1007	HR	HQ	HP
$h_{FE}$		90 - 180	135 - 270	200 - 400

TYPICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )TOTAL POWER DISSIPATION vs.  
AMBIENT TEMPERATURECOLLECTOR CURRENT vs.  
COLLECTOR TO EMITTER VOLTAGECOLLECTOR CURRENT vs.  
COLLECTOR TO EMITTER VOLTAGECOLLECTOR CURRENT vs.  
BASE TO EMITTER VOLTAGEDC CURRENT GAIN vs.  
COLLECTOR CURRENTCOLLECTOR SATURATION VOLTAGE  
vs. COLLECTOR CURRENT

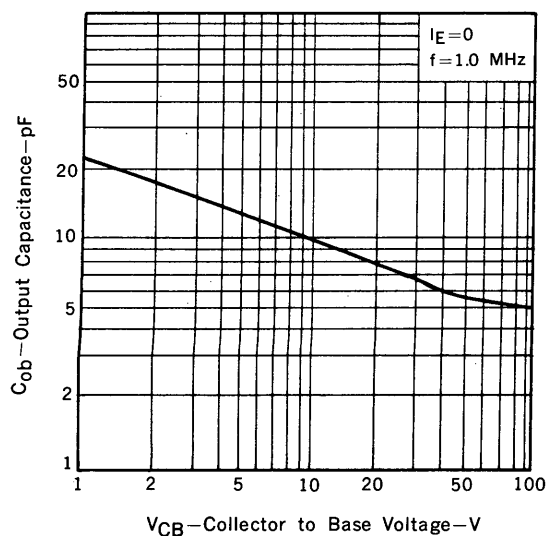
BASE SATURATION VOLTAGE vs.  
COLLECTOR CURRENT



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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