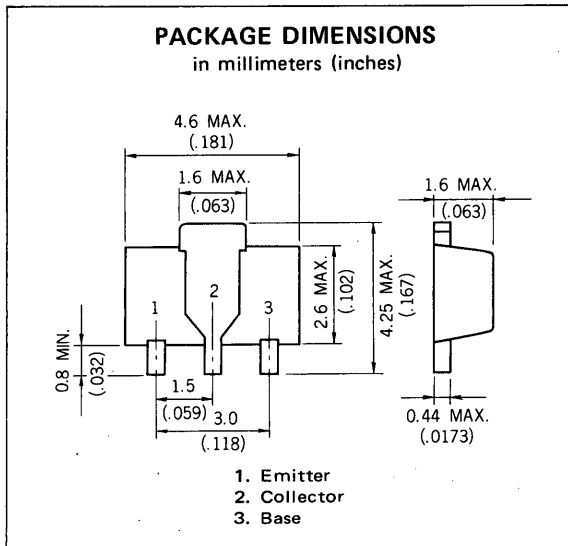


NPN SILICON EPITAXIAL TRANSISTOR  
POWER MINI MOLD

DESCRIPTION

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



FEATURES

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

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

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

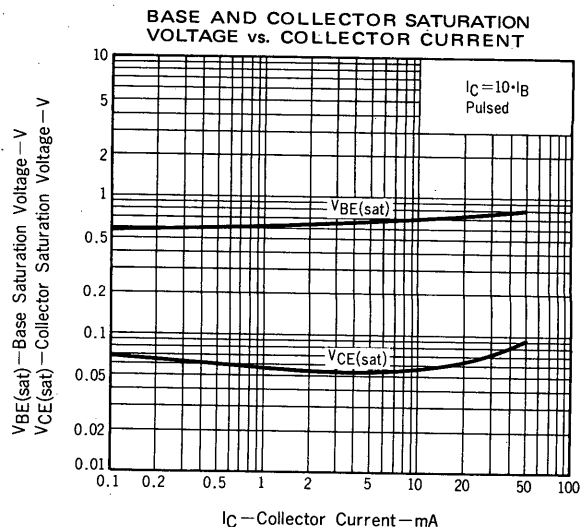
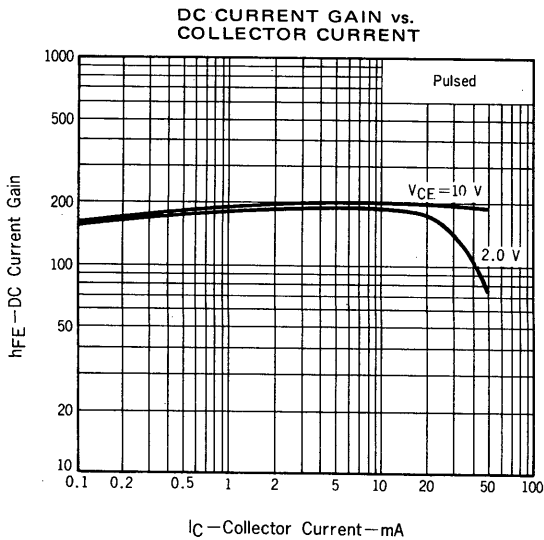
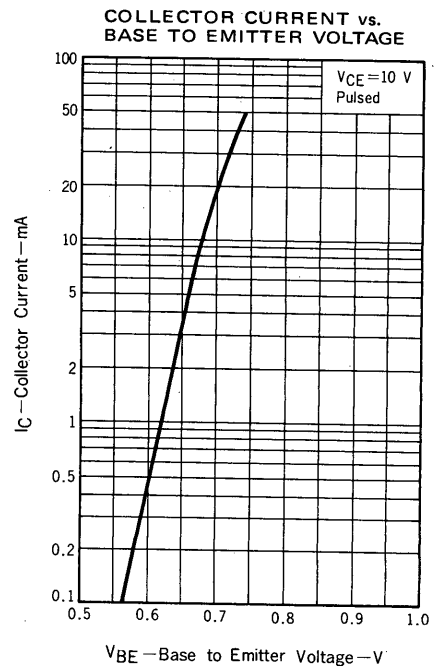
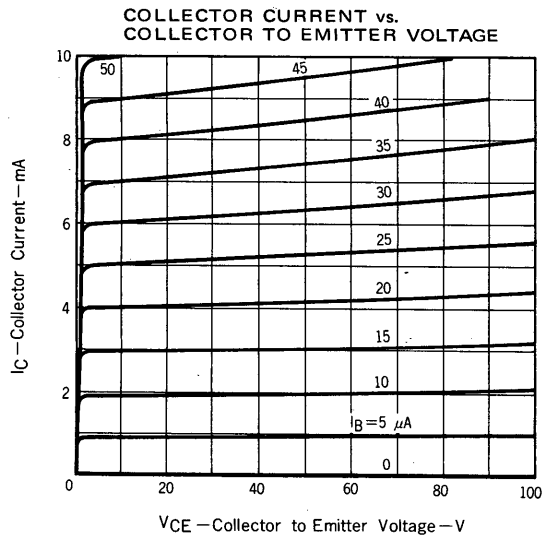
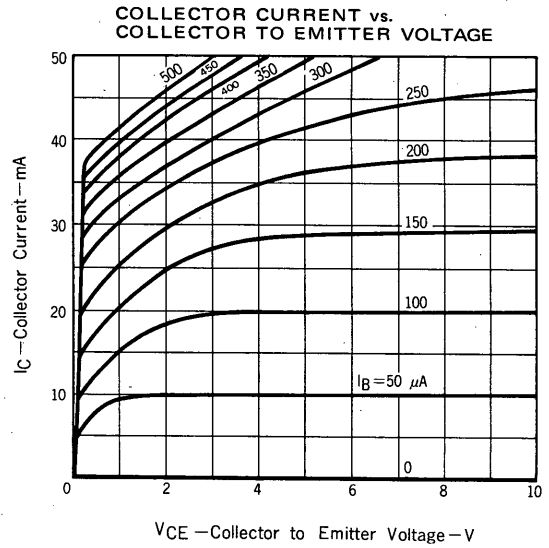
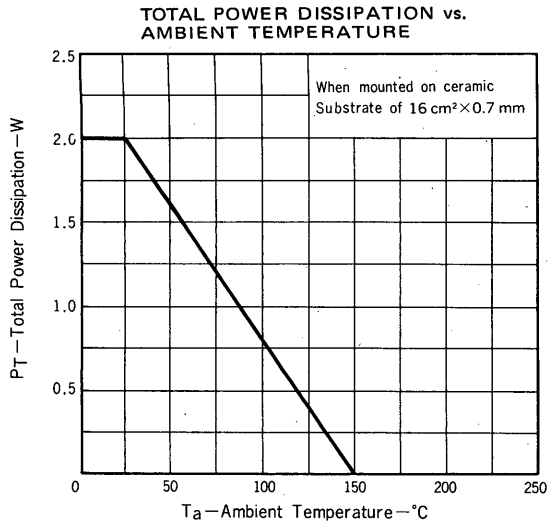
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	$I_{CBO}$			100	nA	$V_{CB} = 140\text{ V}, I_E = 0$
Emitter Cutoff Current	$I_{EBO}$			100	nA	$V_{EB} = 5.0\text{ V}, I_C = 0$
DC Current Gain	$h_{FE1}$	50	180			$V_{CE} = 10\text{ V}, I_C = 1.0\text{ mA}$ ***
DC Current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

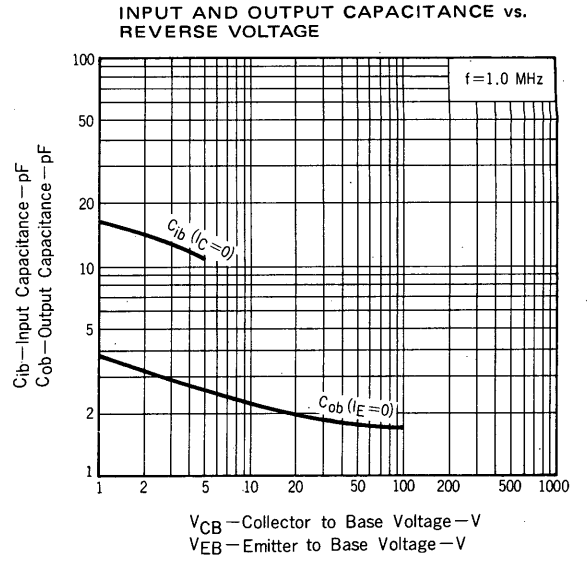
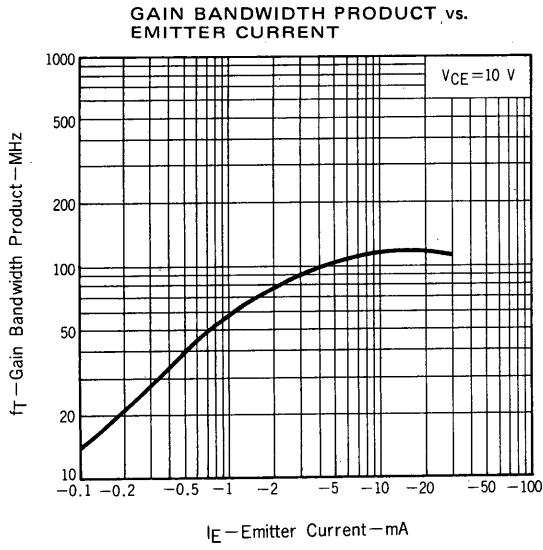
\*\*\*Pulsed: PW  $\leq$  350  $\mu\text{s}$ , duty cycle  $\leq$  2 %

$h_{FE}$  Classification

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

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





**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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