

# NPN SILICON TRANSISTOR

## 2SC2785

**DESCRIPTION** The 2SC2785 is designed for use in driver stage of AF amplifier and low speed switching.

- FEATURES**
- High Voltage ( $V_{CE0} > 50$  V)
  - Excellent  $h_{FE}$  Linearity  
 $h_{FE1}$  (0.1 mA)/ $h_{FE2}$  (1.0 mA) : 0.92 TYP.
  - Complementary to the NEC 2SA1175 PNP Transistor.

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

Maximum Temperatures

Storage Temperature .....  $-55$  to  $+125^\circ\text{C}$   
 Junction Temperature .....  $+125^\circ\text{C}$  Maximum

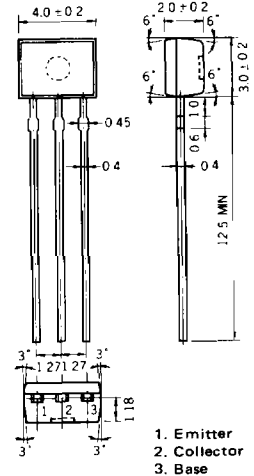
Maximum Power Dissipation ( $T_a = 25^\circ\text{C}$ )

Total Power Dissipation ..... 300 mW

Maximum Voltages and Currents

$V_{CB0}$  Collector to Base Voltage ..... 60 V  
 $V_{CE0}$  Collector to Emitter Voltage ..... 50 V  
 $V_{EB0}$  Emitter to Base Voltage ..... 5.0 V  
 $I_C$  Collector Current ..... 100 mA  
 $I_B$  Base Current ..... 20 mA

**PACKAGE DIMENSIONS**  
in millimeters



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

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
$h_{FE1}$	DC Current Gain	50	185			$V_{CE}=6.0$ V, $I_C=0.1$ mA
$h_{FE2}$	DC Current Gain	90	200	600		$V_{CE}=6.0$ V, $I_C=1.0$ mA
NF	Noise Figure		0.8	15	dB	$V_{CE}=6.0$ V, $I_C=0.1$ mA, $R_G=2.0$ k $\Omega$ , $f=1.0$ kHz
$f_T$	Gain Bandwidth Product	150	250	450	MHz	$V_{CE}=6.0$ V, $I_E=-10$ mA
$C_{ob}$	Collector to Base Capacitance		3.0	4.0	pF	$V_{CB}=6.0$ V, $I_E=0$ , $f=1.0$ MHz
$I_{CBO}$	Collector Cutoff Current			100	nA	$V_{CB}=60$ V, $I_E=0$
$I_{CEO}$	Collector Cutoff Current		1.0		$\mu$ A	$V_{CE}=40$ V, $I_B=0$
$I_{EBO}$	Emitter Cutoff Current		100		nA	$V_{EB}=5.0$ V, $I_C=0$
$V_{BE}$	Base to Emitter Voltage	0.55	0.62	0.65	V	$V_{CE}=6.0$ V, $I_C=1.0$ mA
$V_{CE(sat)}$	Collector Saturation Voltage		0.15	0.3	V	$I_C=100$ mA, $I_B=10$ mA
$V_{BE(sat)}$	Base Saturation Voltage		0.86	1.0	V	$I_C=100$ mA, $I_B=10$ mA

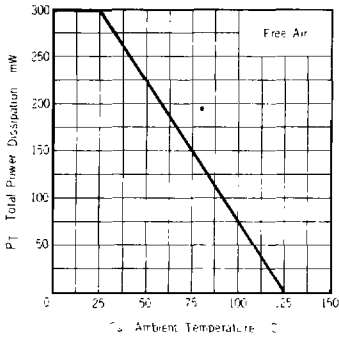
Classification of  $h_{FE2}$

Rank	R	J	H	F	E	K
Range	110 - 180	135 - 220	170 - 270	200 - 320	250 - 400	300 - 600

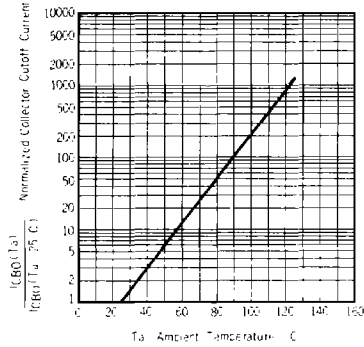
$h_{FE2}$  Test Conditions :  $V_{CE}=6.0$  V,  $I_C=1.0$  mA

TYPICAL CHARACTERISTICS (Ta = 25°C unless otherwise noted)

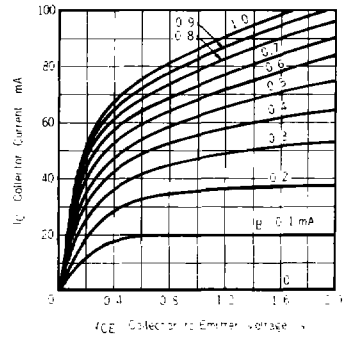
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



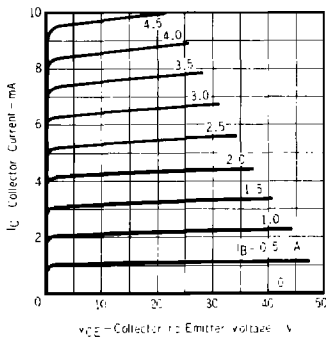
NORMALIZED COLLECTOR CUTOFF CURRENT vs. AMBIENT TEMPERATURE



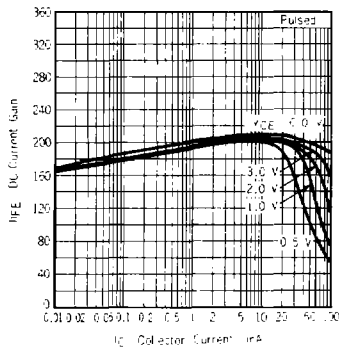
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



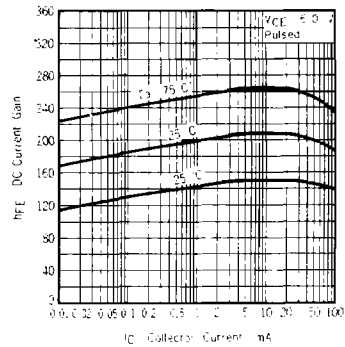
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



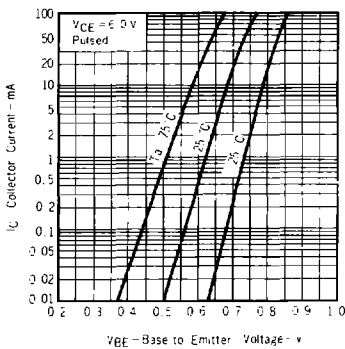
DC CURRENT GAIN vs. COLLECTOR CURRENT



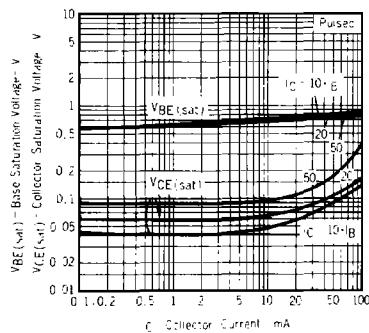
DC CURRENT GAIN vs. COLLECTOR CURRENT



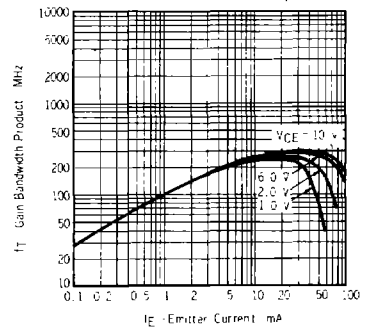
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



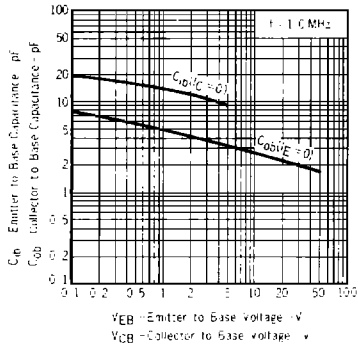
COLLECTOR AND BASE SATURATION VOLTAGE vs. COLLECTOR CURRENT



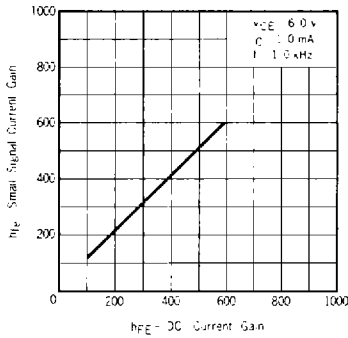
GAIN BANDWIDTH PRODUCT vs. EMITTER CURRENT



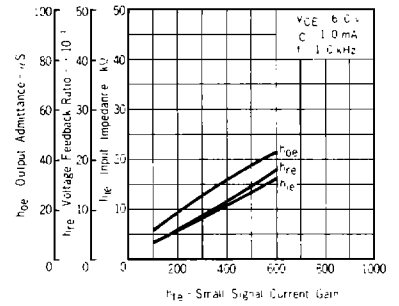
EMITTER TO BASE AND COLLECTOR TO BASE CAPACITANCE vs. COLLECTOR VOLTAGE



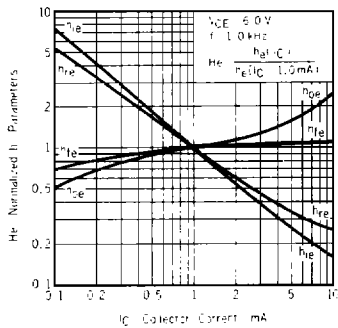
SMALL SIGNAL CURRENT GAIN vs. DC CURRENT GAIN



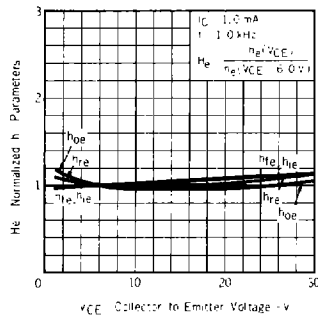
INPUT IMPEDANCE, VOLTAGE FEEDBACK RATIO AND OUTPUT ADMITTANCE vs. SMALL SIGNAL CURRENT GAIN



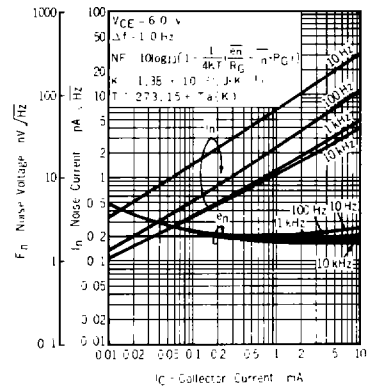
NORMALIZED h-PARAMETERS vs. COLLECTOR CURRENT



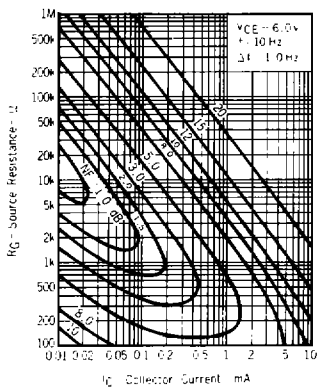
NORMALIZED h-PARAMETERS vs. COLLECTOR TO EMITTER VOLTAGE



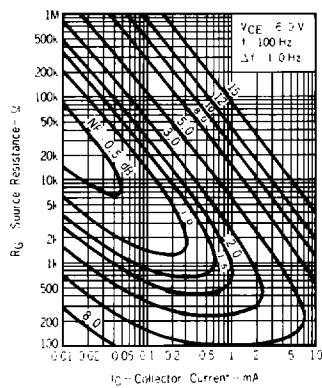
En AND In vs. COLLECTOR CURRENT



NOISE FIGURE MAP 1



NOISE FIGURE MAP 2



NOISE FIGURE MAP 3

