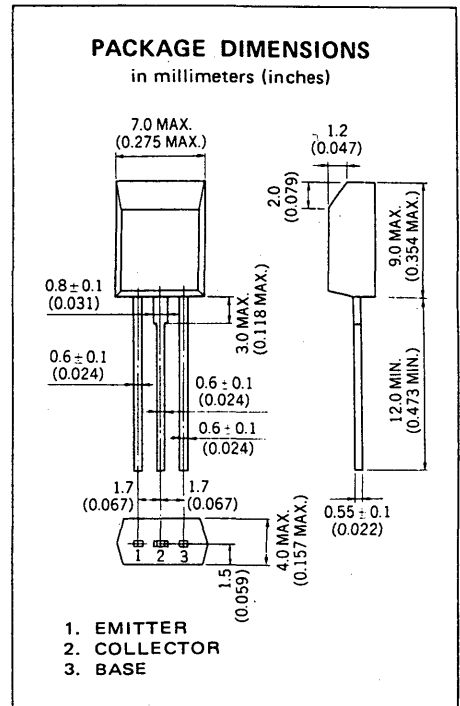


**DESCRIPTION** The 2SD1312 is designed for use in driver and output stages of audio frequency amplifiers.

- FEATURES**
- High total power dissipation and high breakdown voltage:  
1.0 W at 25 °C ambient temperature /  $V_{CE0} = 80$  V
  - Complementary to the NEC 2SB984 PNP transistor.

**ABSOLUTE MAXIMUM RATINGS**

- Maximum Temperatures
- Storage Temperature . . . . . -55 to +150 °C
  - Junction Temperature . . . . . +150 °C Maximum
- Maximum Power Dissipation ( $T_a = 25$  °C)
- Total Power Dissipation . . . . . 1.0 W
- Maximum Voltages and Currents ( $T_a = 25$  °C)
- $V_{CBO}$  Collector to Base Voltage . . . . . 120 V
  - $V_{CEO}$  Collector to Emitter Voltage . . . . . 80 V
  - $V_{EBO}$  Emitter to Base Voltage . . . . . 5.0 V
  - $I_C(DC)$  Collector Current . . . . . 1.0 A
  - $I_C(pulse)^*$  Collector Current . . . . . 2.0 A
- \*  $PW \leq 10$  ms, duty cycle  $\leq 50$  %



**ELECTRICAL CHARACTERISTICS ( $T_a = 25$  °C)**

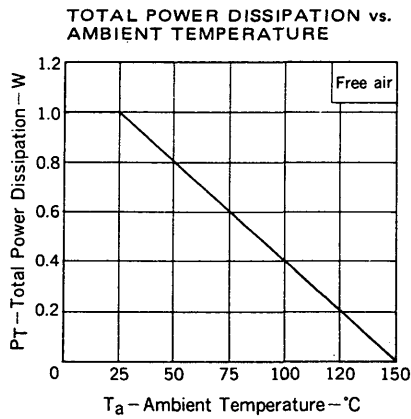
SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
$h_{FE1}$	DC Current Gain	135		600		$V_{CE} = 1.0$ V, $I_C = 200$ mA
$h_{FE2}$	DC Current Gain	75				$V_{CE} = 1.0$ V, $I_C = 500$ mA
$f_T$	Gain Bandwidth Product	50	120		MHz	$V_{CE} = 6.0$ V, $I_E = -200$ mA
$C_{ob}$	Output Capacitance		13	30	pF	$V_{CB} = 10$ V, $I_E = 0$ , $f = 1.0$ MHz
$I_{CBO}$	Collector Cutoff Current			100	nA	$V_{CB} = 100$ V, $I_E = 0$
$I_{EBO}$	Emitter Cutoff Current			100	nA	$V_{EB} = 5.0$ V, $I_C = 0$
$V_{BE}$	Base to Emitter Voltage	550	610	650	mV	$V_{CE} = 6.0$ V, $I_C = 10$ mA
$V_{CE(sat)}$	Collector Saturation Voltage		0.25	0.5	V	$I_C = 1.0$ A, $I_B = 100$ mA
$V_{BE(sat)}$	Base Saturation Voltage		1.0	1.2	V	$I_C = 1.0$ A, $I_B = 100$ mA

Classification of  $h_{FE1}$

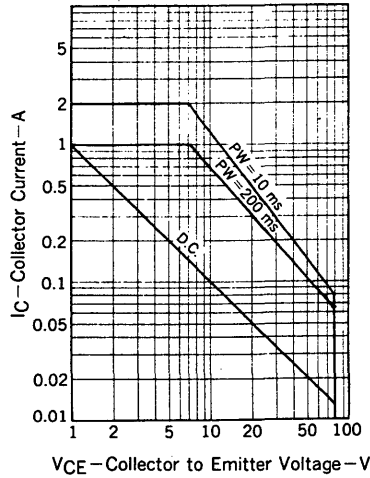
Rank	L	K	U
Range	135-270	200-400	300-600

Test Conditions:  $V_{CE} = 1.0$  V,  $I_C = 200$  mA.

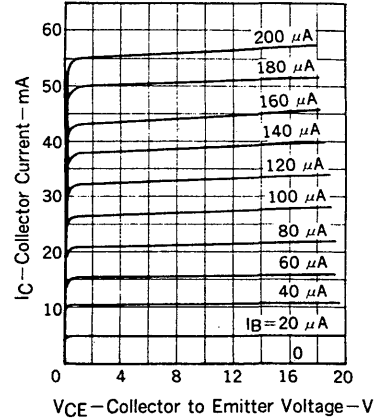
TYPICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )



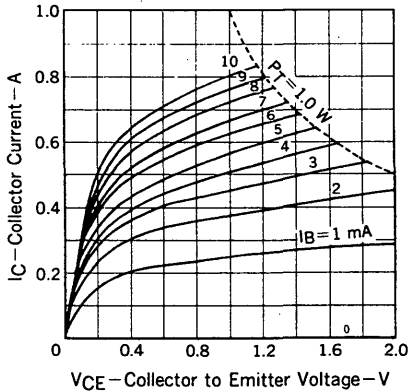
**SAFE OPERATING AREAS (TRANSIENT THERMAL RESISTANCE METHOD)**



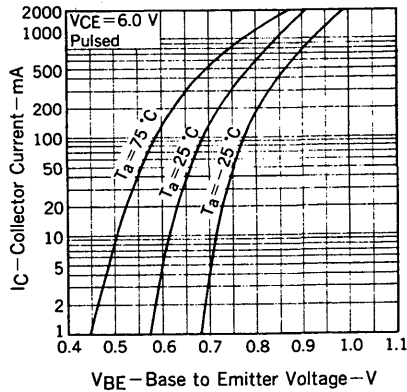
**COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE**



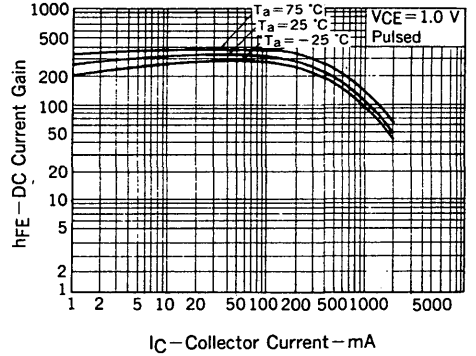
**COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE**



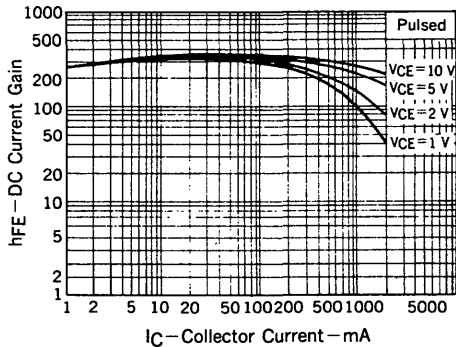
**COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE**



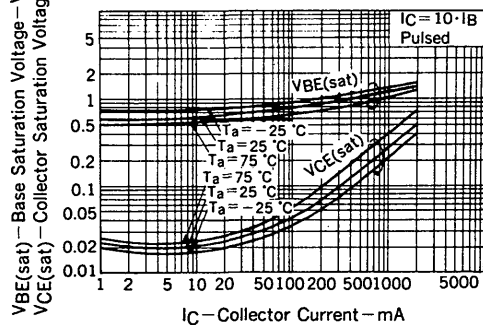
**DC CURRENT GAIN vs. COLLECTOR CURRENT**



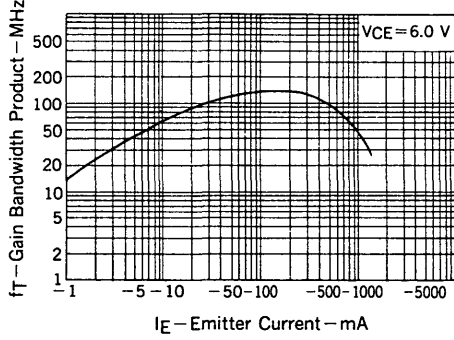
**DC CURRENT GAIN vs. COLLECTOR CURRENT**



**BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT**



GAIN BANDWIDTH PRODUCT vs. EMITTER CURRENT



OUTPUT CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE

