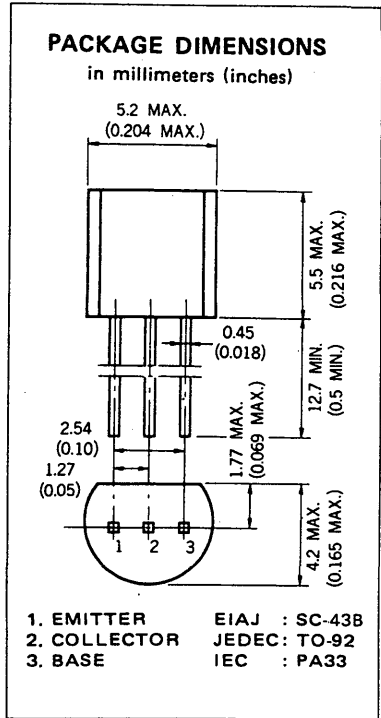


**DESCRIPTION** The 2SA953 is designed for use in driver stage of high voltage audio equipment.

- FEATURES**
- High total power dissipation.  
 $P_T = 600 \text{ mW}$
  - High  $h_{FE}$  and high voltage.  
 $h_{FE} (I_C = -50 \text{ mA}) : 200 \text{ TYP.}$   
 $V_{CEO} : -60 \text{ V}$

**ABSOLUTE MAXIMUM RATINGS**

- Maximum Temperatures
- Storage Temperature .....  $-55 \text{ to } +150 \text{ }^\circ\text{C}$
  - Junction Temperature .....  $+150 \text{ }^\circ\text{C}$  Maximum
- Maximum Power Dissipation ( $T_a = 25 \text{ }^\circ\text{C}$ )
- Total Power Dissipation .....  $600 \text{ mW}$
- Maximum Voltages and Currents ( $T_a = 25 \text{ }^\circ\text{C}$ )
- $V_{CBO}$  Collector to Base Voltage .....  $-60 \text{ V}$
  - $V_{CEO}$  Collector to Emitter Voltage .....  $-60 \text{ V}$
  - $V_{EBO}$  Emitter to Base Voltage .....  $-5.0 \text{ V}$
  - $I_C$  Collector Current .....  $-300 \text{ mA}$
  - $I_B$  Base Current .....  $-60 \text{ mA}$



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

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
$h_{FE1}^*$	DC Current Gain	90	200	400	—	$V_{CE} = -1.0 \text{ V}, I_C = -50 \text{ mA}$
$h_{FE2}^*$	DC Current Gain	30	80		—	$V_{CE} = -1.0 \text{ V}, I_C = -300 \text{ mA}$
$C_{ob}$	Collector to Base Capacitance		13	25	pF	$V_{CB} = -6.0 \text{ V}, I_E = 0,$ $f = 1.0 \text{ MHz}$
$f_T$	Gain Bandwidth Product	50	100		MHz	$V_{CE} = -6.0 \text{ V}, I_E = 10 \text{ mA}$
$V_{BE}^*$	Base to Emitter Voltage	-600	-660	-700	mV	$V_{CE} = -6.0 \text{ V}, I_C = -10 \text{ mA}$
$V_{CE(sat)}^*$	Collector Saturation Voltage		-0.15	-0.6	V	$I_C = -300 \text{ mA}, I_B = -30 \text{ mA}$
$V_{BE(sat)}^*$	Base Saturation Voltage		-0.85	-1.2	V	$I_C = -300 \text{ mA}, I_B = -30 \text{ mA}$
$I_{CBO}$	Collector Cutoff Current			-100	nA	$V_{CB} = -60 \text{ V}, I_E = 0$
$I_{EBO}$	Emitter Cutoff Current			-100	nA	$V_{EB} = -5.0 \text{ V}, I_C = 0$

\* Pulsed  $PW \leq 350 \mu\text{s}$ , duty cycle  $\leq 2.0 \%$

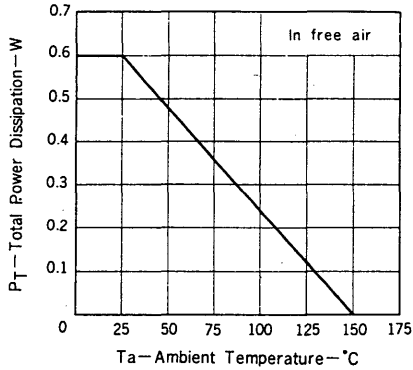
**Classification of  $h_{FE1}$**

Rank	M	L	K
Range	90 - 180	135 - 270	200 - 400

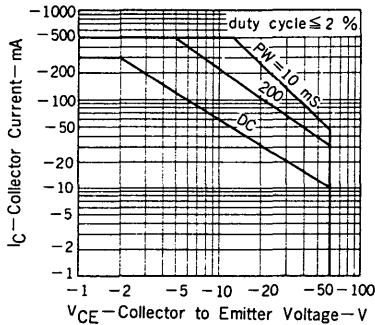
$h_{FE}$  Test Conditions :  $V_{CE} = -1.0 \text{ V}, I_C = -50 \text{ mA}$

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

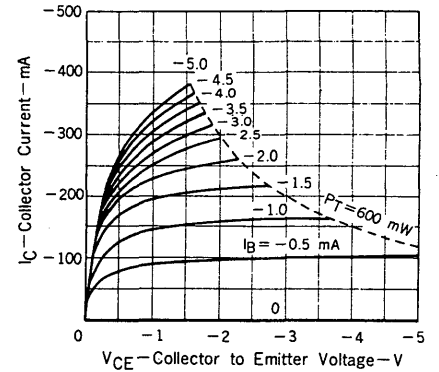
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



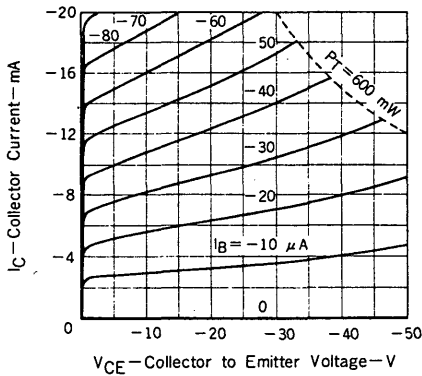
SAFE OPERATING AREAS (TRANSIENT THERMAL RESISTANCE)



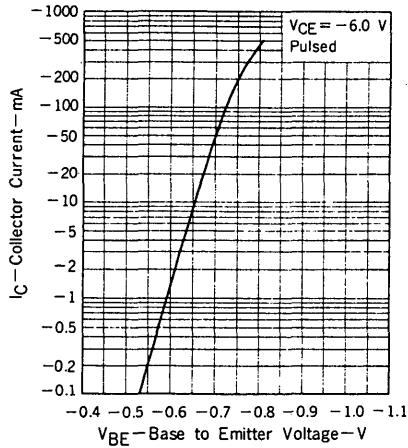
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



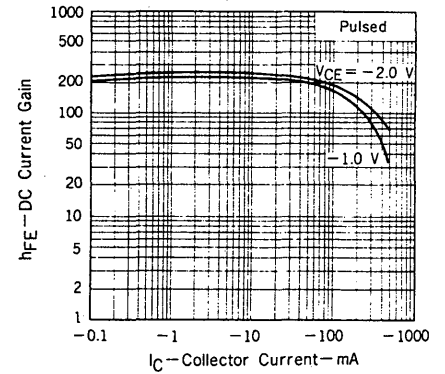
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



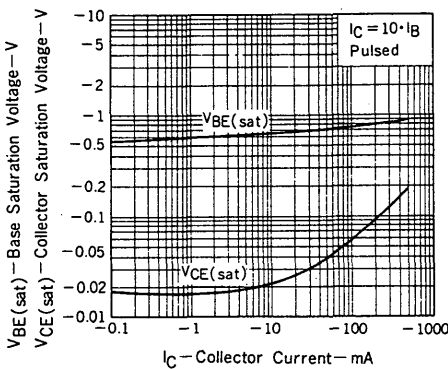
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



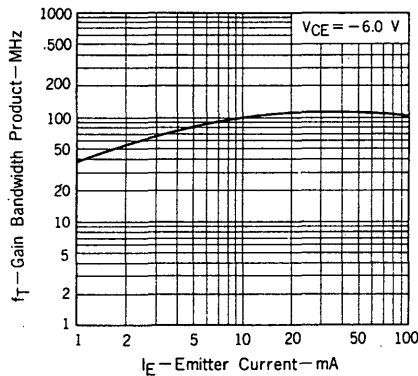
DC CURRENT GAIN vs. COLLECTOR CURRENT



BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



GAIN BANDWIDTH PRODUCT vs. EMITTER CURRENT



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

