

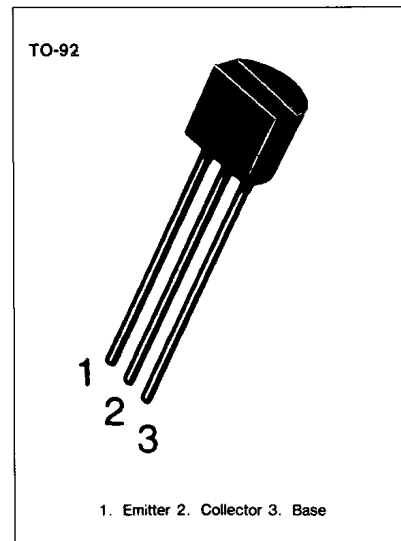
# Transistors

## 2SB1116A

**AUDIO FREQUENCY POWER AMPLIFIER  
MEDIUM SPEED SWITCHING**

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

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	$V_{CBO}$	-80	V
Collector-Emitter Voltage	$V_{CEO}$	-60	V
Emitter-Base Voltage	$V_{EBO}$	-6	V
Collector Current (DC)	$I_C$	-1	A
*Collector Current (Pulse)	$I_C$	-2	A
Collector Dissipation	$P_C$	0.75	W
Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-55~150	$^\circ\text{C}$



\*  $PW \leq 10\text{ms}$ , Duty Cycle  $\leq 50\%$

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

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = -60\text{V}$ , $I_E = 0$			-100	nA
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = -6\text{V}$ , $I_C = 0$			-100	nA
*DC Current Gain	$h_{FE1}$	$V_{CE} = -2\text{V}$ , $I_C = -100\text{mA}$			400	
	$h_{FE2}$	$V_{CE} = -2\text{V}$ , $I_C = -1\text{A}$	135			
			81			
* Base Emitter On Voltage	$V_{BE}(\text{on})$	$V_{CE} = -2\text{V}$ , $I_C = -50\text{mA}$	-600	-650	-700	mV
* Collector Emitter Saturation Voltage	$V_{CE}(\text{sat})$	$I_C = -1\text{A}$ , $I_B = -50\text{mA}$		-0.2	-0.3	V
* Base Emitter Saturation Voltage	$V_{BE}(\text{sat})$	$I_C = -1\text{A}$ , $I_B = -50\text{mA}$		-0.9	-1.2	V
Output Capacitance	$C_{ob}$	$V_{CB} = -10\text{V}$ , $I_E = 0$ $f = 1\text{MHz}$		25		pF
Current Gain Bandwidth Product	$f_T$	$V_{CE} = -2\text{V}$ , $I_C = -100\text{mA}$	70	120		MHz
Turn On Time	$t_{on}$	$V_{CC} = -10\text{V}$ , $I_C = -100\text{mA}$		0.07		$\mu\text{s}$
Storage Time	$t_s$	$I_{B1} = -I_{B2} = -10\text{mA}$		0.7		$\mu\text{s}$
Fall Time	$t_f$	$V_{BE}(\text{off}) = 2\sim 3\text{V}$		0.07		$\mu\text{s}$

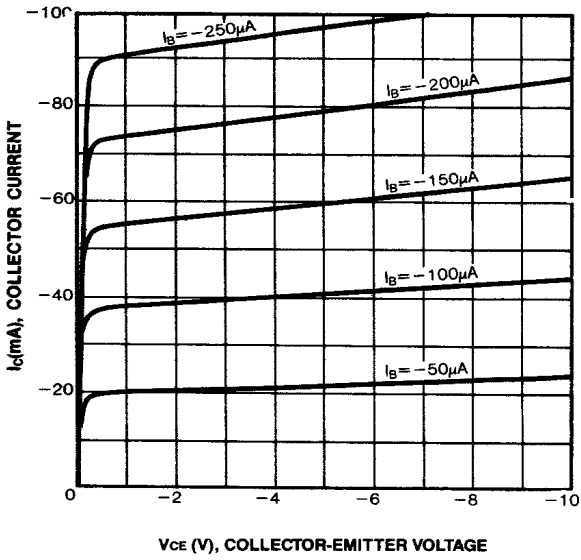
\* Pulse Test:  $PW \leq 350\mu\text{s}$ , Duty Cycle  $\leq 2\%$  Pulsed

### $h_{FE}(1)$ CLASSIFICATION

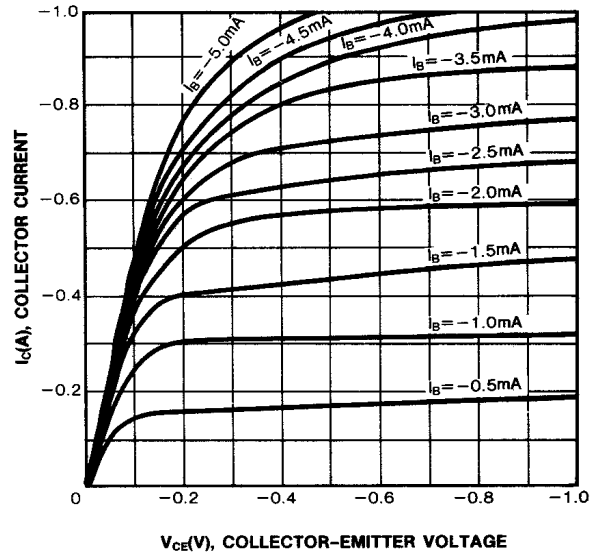
Classification	Y	G	L
$h_{FE}(1)$	135-270	200-400	300-600



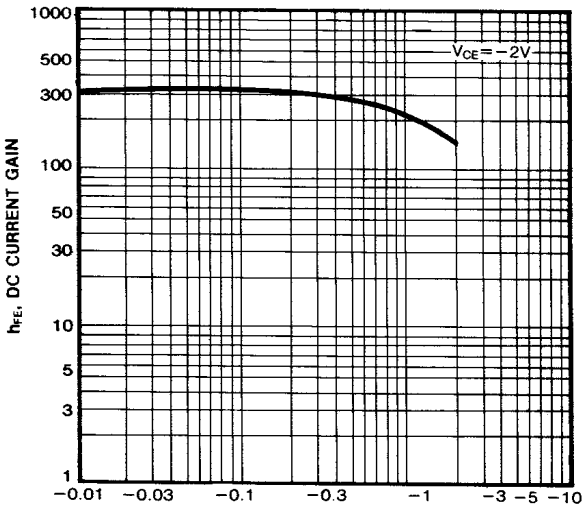
**STATIC CHARACTERISTIC**



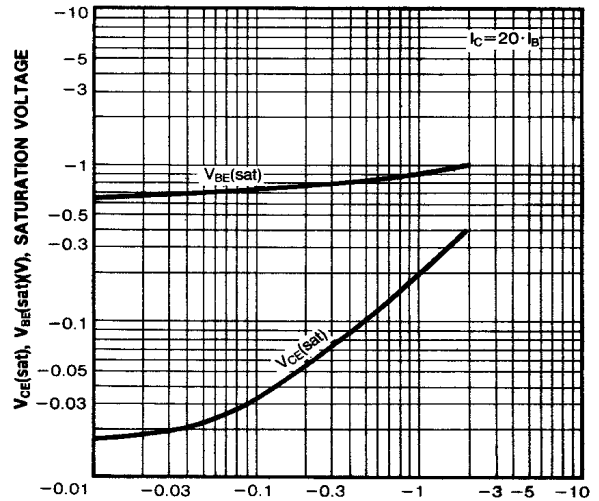
**STATIC CHARACTERISTIC**



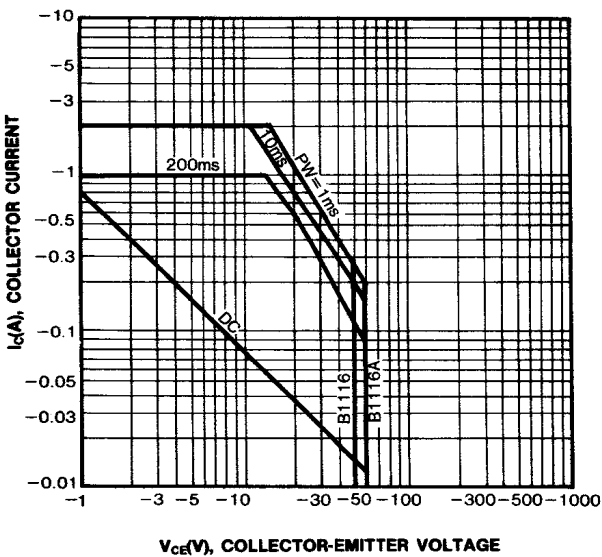
**DC CURRENT GAIN**



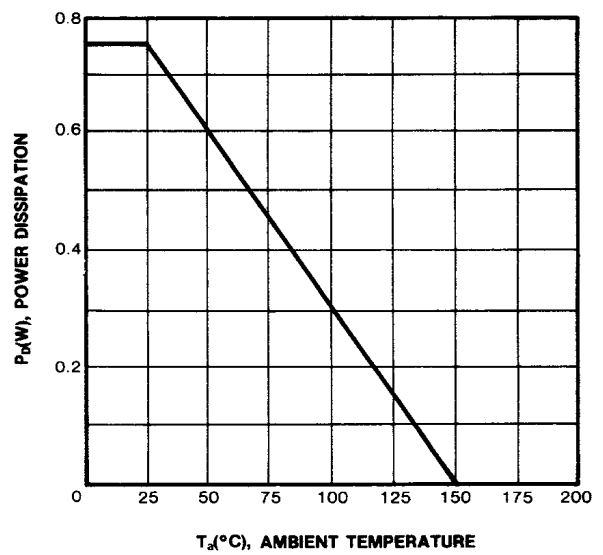
**BASE-EMITTER SATURATION VOLTAGE  
COLLECTOR-EMITTER SATURATION VOLTAGE**



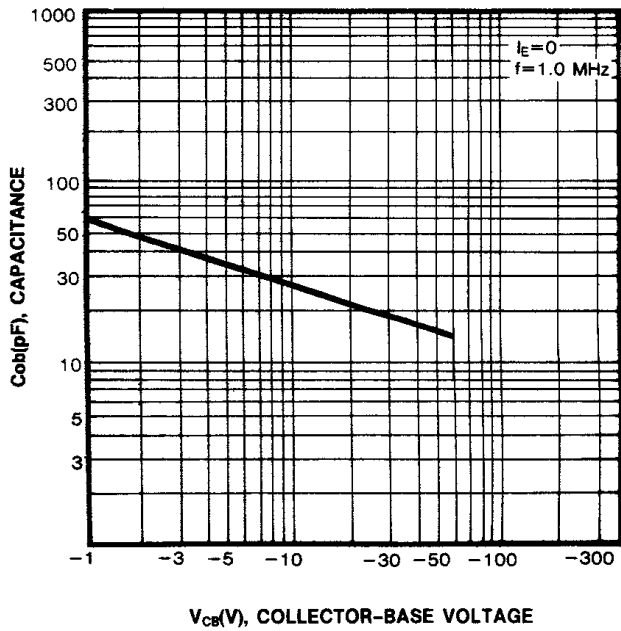
**SAFE OPERATING AREA**



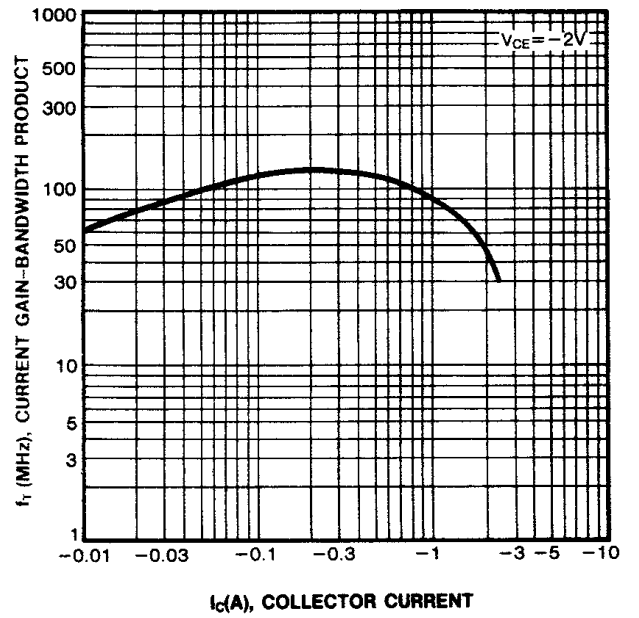
**POWER DERATING**



**COLLECTOR OUTPUT CAPACITANCE**



**CURRENT GAIN-BANDWIDTH PRODUCT**



**SWITCHING TIME**

