

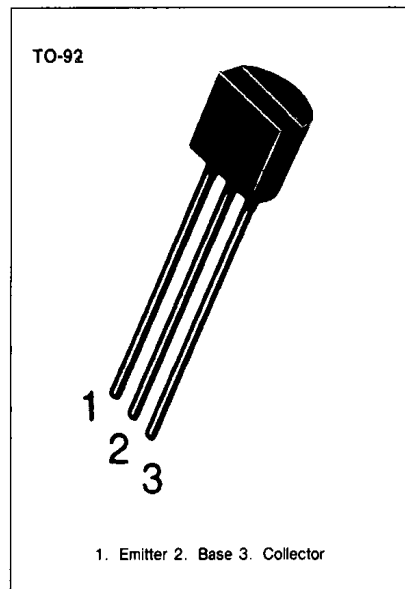
# Transistors

## 2SA9015

**LOW FREQUENCY, LOW NOISE AMPLIFIER**

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

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	$V_{CB0}$	-50	V
Collector-Emitter Voltage	$V_{CE0}$	-45	V
Emitter-Base Voltage	$V_{EB0}$	-5	V
Collector Current	$I_c$	-100	mA
Collector Dissipation	$P_c$	450	mW
Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-55~150	$^\circ\text{C}$



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

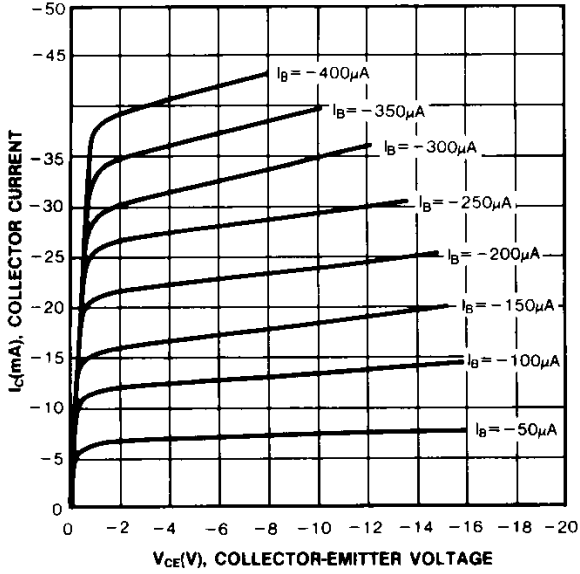
Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector-Base Breakdown Voltage	$BV_{CB0}$	$I_c = -100\mu\text{A}, I_E = 0$	-50			V
Collector-Emitter Breakdown Voltage	$BV_{CE0}$	$I_c = -1\text{mA}, I_B = 0$	-45			V
Emitter-Base Breakdown Voltage	$BV_{EB0}$	$I_E = -100\mu\text{A}, I_C = 0$	-5			V
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = -50\text{V}, I_E = 0$			-50	nA
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = -5\text{V}, I_C = 0$			-50	nA
DC Current Gain	$h_{FE}$	$V_{CE} = -5\text{V}, I_C = -1\text{mA}$	60	200	600	
Collector-Base Saturation Voltage	$V_{CE(sat)}$	$I_c = -100\text{mA}, I_B = -5\text{mA}$		-0.2	-0.7	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_c = -100\text{mA}, I_B = -5\text{mA}$		-0.82	-1.0	V
Base-Emitter On Voltage	$V_{BE(on)}$	$V_{CE} = -5\text{V}, I_C = -2\text{mA}$	-0.6	-0.65	-0.75	V
Output Capacitance	$C_{ob}$	$V_{CB} = -10\text{V}, I_E = 0$ $f = 1\text{MHz}$		4.5	7.0	pF
Current Gain-Bandwidth Product	$f_T$	$V_{CE} = -5\text{V}, I_C = -10\text{mA}$	100	190		MHz
Noise Figure	NF	$V_{CE} = -5\text{V}, I_C = -0.2\text{mA}$ $f = 1\text{KHz}, R_s = 1\text{K}\Omega$		0.7	10	dB

**$h_{FE}$  CLASSIFICATION**

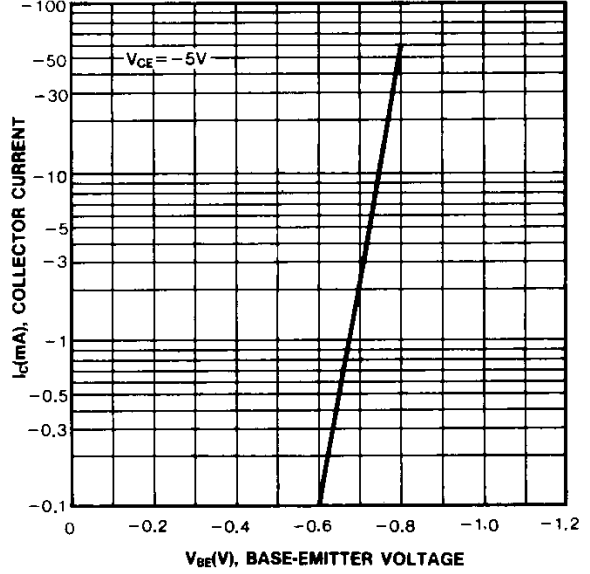
Classification	A	B	C
$h_{FE}$	60-150	100-300	200-600



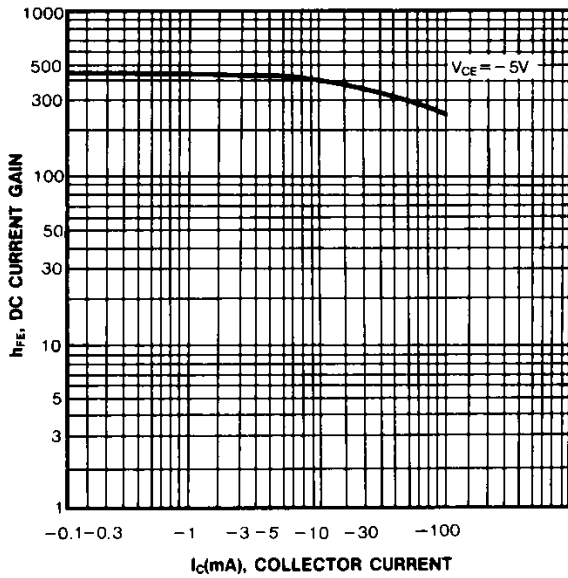
**STATIC CHARACTERISTIC**



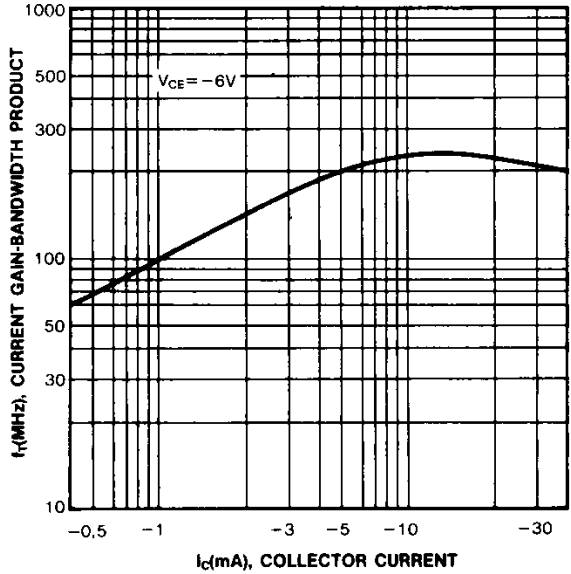
**BASE-EMITTER ON VOLTAGE**



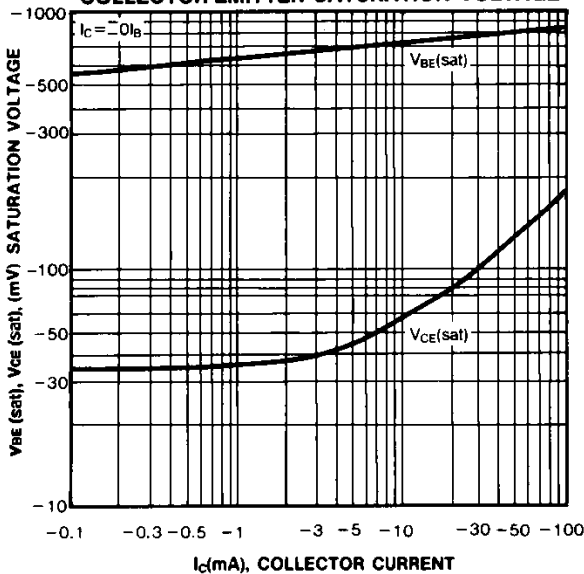
**DC CURRENT GAIN**



**CURRENT GAIN-BANDWIDTH PRODUCT**



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



**COLLECTOR OUTPUT CAPACITANCE**

