



1. EMITTER
2. COLLECTOR
3. BASE

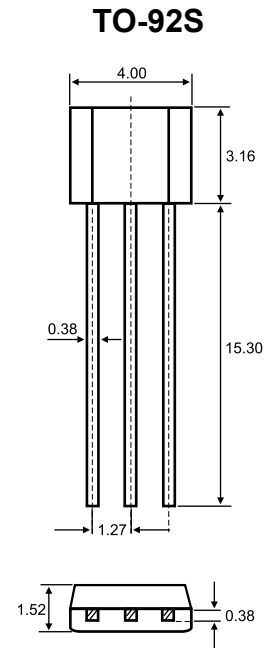
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### Features

- ✧ High voltage  $V_{CE0}$ :50V
- ✧ Excellent  $h_{FE}$  Linearity:0.92 TYP  $h_{FE1}$  (0.1mA)/  $h_{FE2}$  (1mA)
- ✧ Complementary to 2SA1175 PNP transistor

### MAXIMUM RATINGS ( $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Units
$V_{CBO}$	Collector-Base Voltage	60	V
$V_{CEO}$	Collector-Emitter Voltage	50	V
$V_{EBO}$	Emitter-Base Voltage	5	V
$I_C$	Collector Current -Continuous	0.1	A
$P_C$	Collector Power Dissipation	0.25	W
$T_J$	Junction Temperature	150	$^{\circ}\text{C}$
$T_{stg}$	Storage Temperature	-55-150	$^{\circ}\text{C}$



Dimensions in inches and (millimeters)

### ELECTRICAL CHARACTERISTICS ( $T_{amb}=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=100\mu\text{A}$ , $I_E=0$	60			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=1\text{mA}$ , $I_B=0$	50			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=100\mu\text{A}$ , $I_C=0$	5			V
Collector cut-off current	$I_{CBO}$	$V_{CB}=60\text{V}$ , $I_E=0$			0.1	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB}=5\text{V}$ , $I_C=0$			0.1	$\mu\text{A}$
DC current gain	$h_{FE(1)}$	$V_{CE}=6\text{V}$ , $I_C=1\text{mA}$	110		600	
	$h_{FE(2)}$	$V_{CE}=6\text{V}$ , $I_C=0.1\text{mA}$	50			
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=100\text{mA}$ , $I_B=10\text{mA}$			0.3	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C=100\text{mA}$ , $I_B=10\text{mA}$			1	V
Base-emitter voltage	$V_{BE}$	$V_{CE}=6\text{V}$ , $I_C=1\text{mA}$			0.65	V
Transition frequency	$f_T$	$V_{CE}=6\text{V}$ , $I_C=10\text{mA}$	150			MHz
Collector output capacitance	$C_{ob}$	$V_{CB}=6\text{V}$ , $I_E=0$ , $f=1\text{MHz}$			4	pF
Noise figure	NF	$V_{CE}=6\text{V}$ , $I_C=0.1\text{mA}$ , $f=1\text{KHZ}$ , $R_g=2\text{K}\Omega$			15	dB

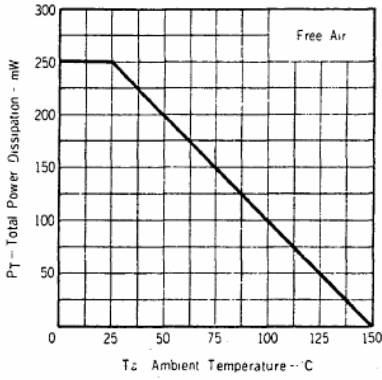
### CLASSIFICATION OF $h_{FE(1)}$

Rank	RF	JF	HF	FF	EF	KF
Range	110-180	135-220	170-270	200-320	250-400	300-600

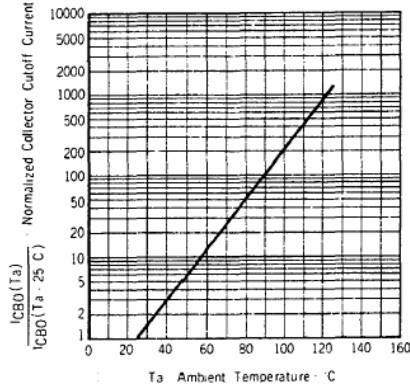


### Typical Characteristics

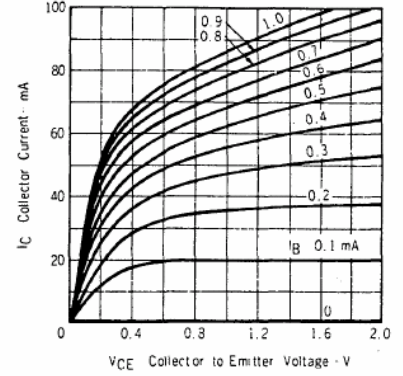
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



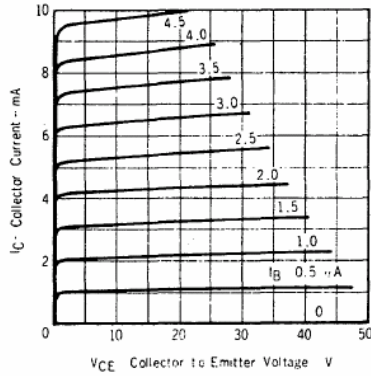
NORMALIZED COLLECTOR CUTOFF CURRENT vs. AMBIENT TEMPERATURE



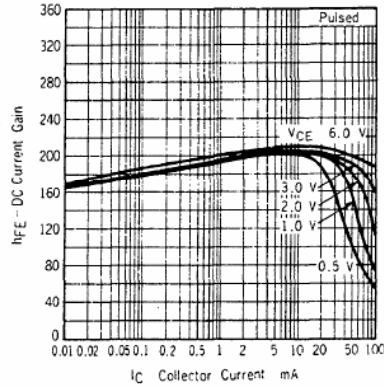
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



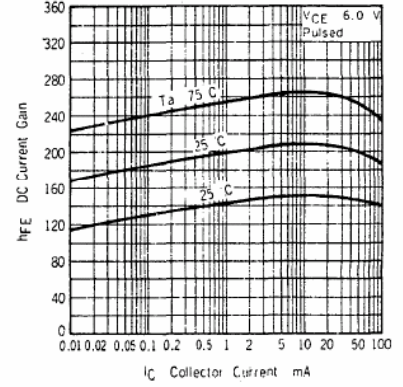
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



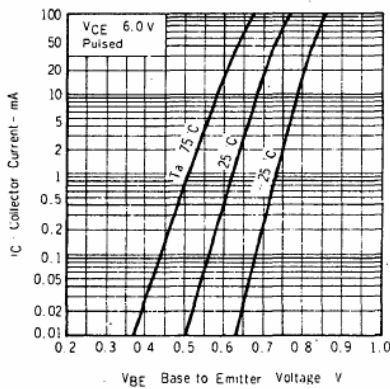
DC CURRENT GAIN vs. COLLECTOR CURRENT



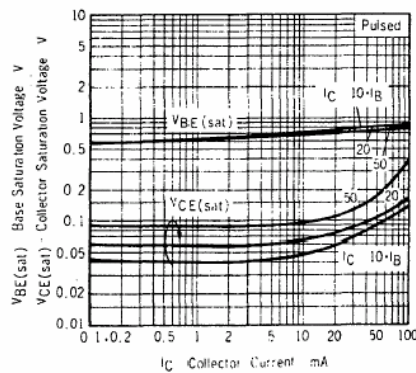
DC CURRENT GAIN vs. COLLECTOR CURRENT



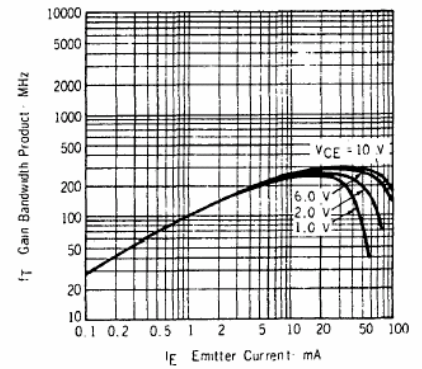
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



COLLECTOR AND BASE SATURATION VOLTAGE vs. COLLECTOR CURRENT



GAIN BANDWIDTH PRODUCT vs. EMITTER CURRENT

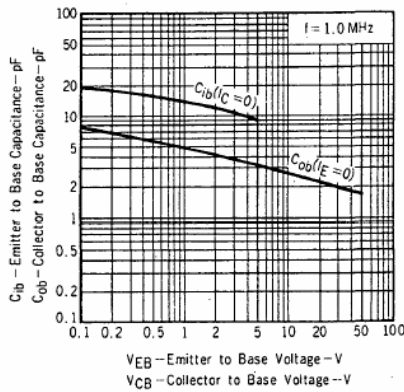


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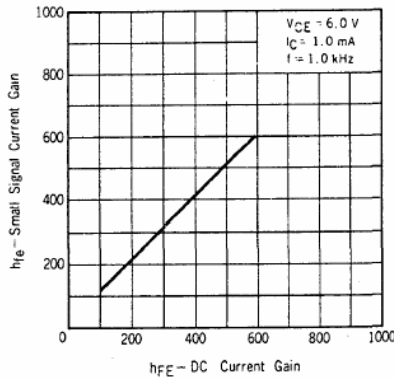
## TO-92S Bipolar Transistor (NPN)



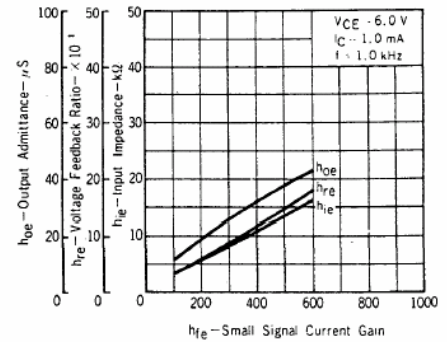
EMITTER TO BASE AND COLLECTOR TO BASE CAPACITANCE vs. REVERSE VOLTAGE



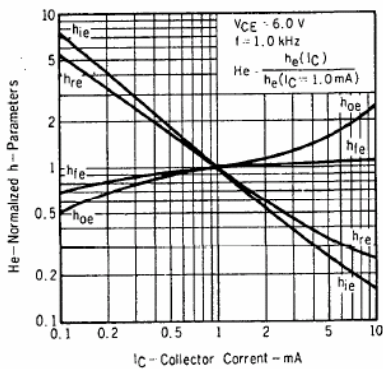
SMALL SIGNAL CURRENT GAIN vs. DC CURRENT GAIN



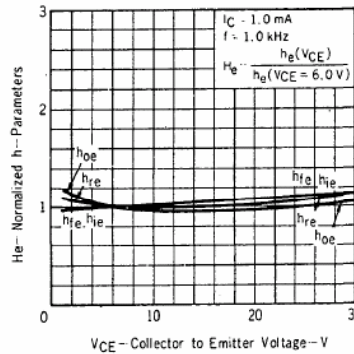
INPUT IMPEDANCE, VOLTAGE FEEDBACK RATIO AND OUTPUT ADMITTANCE vs. SMALL SIGNAL CURRENT GAIN



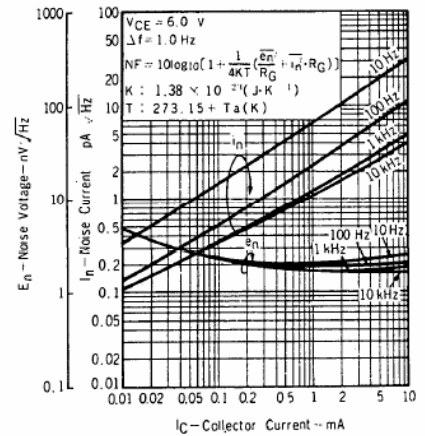
NORMALIZED h-PARAMETERS vs. COLLECTOR CURRENT



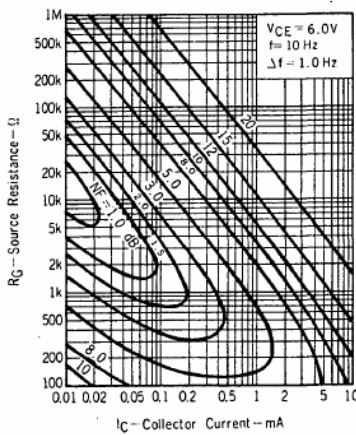
NORMALIZED h-PARAMETERS vs. COLLECTOR TO EMITTER VOLTAGE



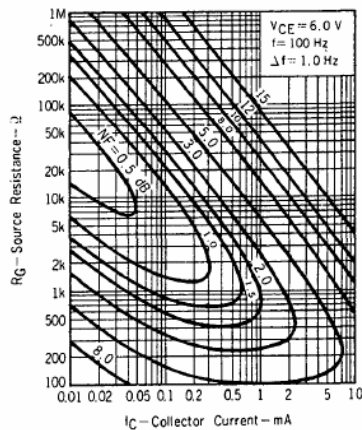
EN AND IN vs. COLLECTOR CURRENT



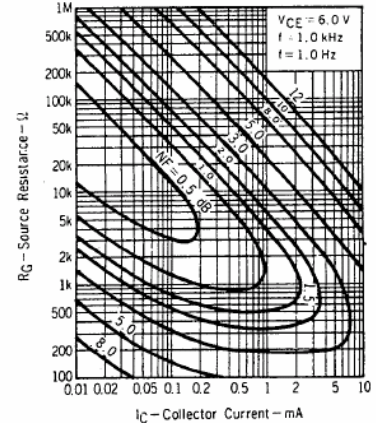
NOISE FIGURE MAP 1



NOISE FIGURE MAP 2



NOISE FIGURE MAP 3



Package	Packing	Quantity	Box	Box Size(mm)	Carton	Carton Size(mm)
TO-92S	Bulk	1000pcs/BP	10000pcs	245×170×100	100,000pcs	525×375×270
TO-92S	Tape	3000pcs/TP	3000pcs	333×162×43	30,000pcs	350×340×250