

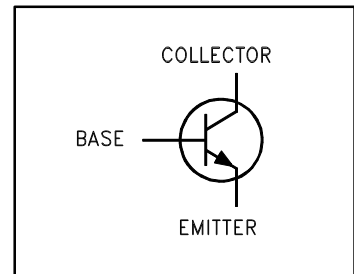
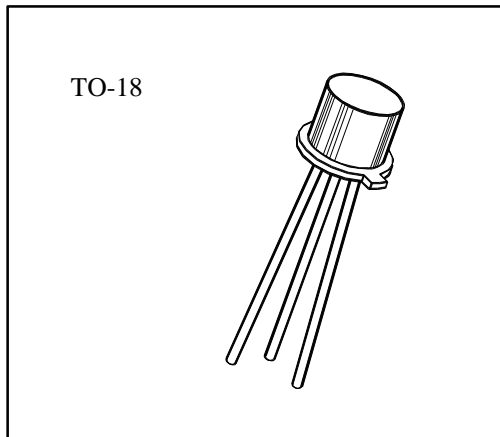
**2N2484**

## Features

- Meets MIL 19500 /376
- Collector - Base Voltage 60 V
- Collector - Current 50 mA
- High Speed, Low Power Bipolar Transistor

**SWITCHING  
 TRANSISTOR  
 JAN, JANTX, JANTXV**

**SMALL SIGNAL  
 BIPOLAR  
 NPN SILICON**



## Maximum Ratings

RATING	SYMBOL	VALUE	UNIT
Collector - Emitter Voltage	$V_{CEO}$	60	Vdc
Collector - Base Voltage	$V_{CB0}$	60	Vdc
Emitter - Base Voltage	$V_{EBO}$	6	Vdc
Collector Current - Continuous	$I_C$	50	mAdc
Total Device Dissipation @ $T_A = 25\text{ }^\circ\text{C}$	$P_D$	360	mW
Derate above 25 $^\circ\text{C}$		2.06	mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25\text{ }^\circ\text{C}$	$P_D$	1.2	WATTS
Derate above 25 $^\circ\text{C}$		6.85	mW/ $^\circ\text{C}$
Operating Junction&Storage Temperature Range	$T_J, T_{stg}$	-65 to +200	$^\circ\text{C}$

## Thermal Characteristics

CHARACTERISTIC	SYMBOL	MAX	UNIT
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	485	$^\circ\text{C/W}$

Electrical Characteristics ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

OFF CHARACTERISTIC	SYMBOL	MIN	MAX	UNIT
Collector - Emitter Breakdown Voltage (1)	$V(BR)_{CEO}$			
( $I_C = 10 \text{ mAdc}$ , $I_B = 0$ )		60		Vdc
Collector - Base Breakdown Voltage	$V(BR)_{CBO}$			
( $I_C = 10 \text{ mAdc}$ , $I_E = 0$ )		60		Vdc
Emitter - Base Breakdown Voltage	$V(BR)_{EBO}$			
( $I_E = 10 \text{ mAdc}$ , $I_C = 0$ )		6		Vdc
Collector - Base Cutoff Current	$I_{CBO}$			
( $V_{CB} = 45 \text{ Vdc}$ , $I_E = 0$ )			5	nAdc
( $V_{CB} = 45 \text{ Vdc}$ , $I_E = 0$ , $T_A = 150^\circ\text{C}$ )			10	mAdc
Collector - Emitter Cutoff Current	$I_{CEO}$			
( $V_{CE} = 5 \text{ Vdc}$ , $I_B = 0$ )			2	nAdc
Collector - Emitter Cutoff Current	$I_{CES}$			
( $V_{CE} = 45 \text{ Vdc}$ , $V_{BE} = 0$ )			5	nAdc
Emitter - Base Cutoff Current	$I_{EBO}$			
( $V_{EB} = 5 \text{ Vdc}$ )			2	nAdc

ON CHARACTERISTIC	SYMBOL	MIN	MAX	UNIT
DC Current Gain	$h_{FE}$			
( $I_C = 1 \text{ mAdc}$ , $V_{CE} = 5 \text{ Vdc}$ )		45		
( $I_C = 10 \text{ mAdc}$ , $V_{CE} = 5 \text{ Vdc}$ )		200	500	
( $I_C = 100 \text{ mAdc}$ , $V_{CE} = 5 \text{ Vdc}$ )		225	675	
( $I_C = 500 \text{ mAdc}$ , $V_{CE} = 5 \text{ Vdc}$ )		250	800	
( $I_C = 1 \text{ mAdc}$ , $V_{CE} = 5 \text{ Vdc}$ )		250	800	
( $I_C = 10 \text{ mAdc}$ , $V_{CE} = 5 \text{ Vdc}$ )		225	800	
( $I_C = 10 \text{ mAdc}$ , $V_{CE} = 5 \text{ Vdc}$ , $T_J = -55^\circ\text{C}$ )		35		
Collector- Emitter Saturation Voltage	$V_{CE(sat)}$			
( $I_C = 1 \text{ mAdc}$ , $I_B = 100 \text{ mAdc}$ )			0.3	Vdc
Base - Emitter Non-Saturated Voltage	$V_{BE(on)}$			
( $I_C = 100 \text{ mAdc}$ , $V_{CE} = 5 \text{ Vdc}$ )		0.5	0.7	Vdc

1. Pulse Test: Pulse Width  $\leq 300 \mu\text{s}$ , Duty Cycle  $\leq 2\%$

Electrical Characteristics ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

SMALL - SIGNAL CHARACTERISTICS	SYMBOL	MIN	MAX	UNIT
Output Capacitance ( $V_{CB} = 5 \text{ Vdc}$ , $I_E = 0$ , 100kHz $\times$ f $\leq$ 1 MHz)	$C_{obo}$		5	pF
Input Capacitance ( $V_{EB} = 0.5 \text{ Vdc}$ , $I_C = 0$ , 100kHz $\times$ f $\leq$ 1 MHz)	$C_{ibo}$		6	pF

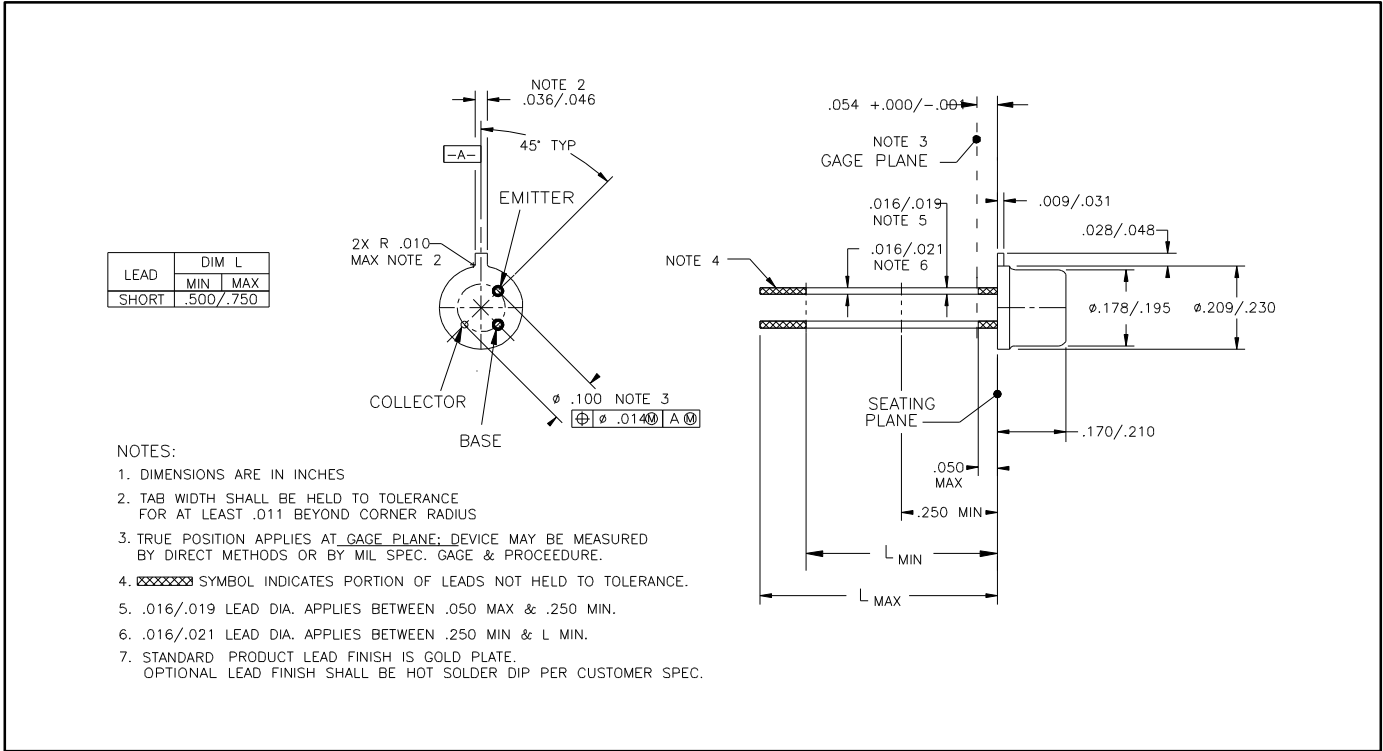
Small - Signal AC Characteristics ( $T_A = 25^\circ\text{C}$ )

LOW FREQUENCY	SYMBOL	MIN	MAX	UNIT
Common - Emitter Forward Current Transfer Ratio ( $I_C = 1 \text{ mA}$ , $V_{CE} = 5 \text{ V}$ , $f = 1 \text{ kHz}$ )	$h_{fe}$	250	900	
Common - Emitter Short Circuit Input Impedance ( $I_C = 1 \text{ mA}$ , $V_{CE} = 5 \text{ V}$ , $f = 1 \text{ kHz}$ )	$h_{ie}$	3.5	24	k $\Omega$
Common - Emitter Open Circuit Output Admittance ( $I_C = 1 \text{ mA}$ , $V_{CE} = 5 \text{ V}$ , $f = 1 \text{ kHz}$ )	$h_{oe}$		40	mhos
Common-Emitter Open Circuit Reverse Voltage Transfer Ratio ( $I_C = 1 \text{ mA}$ , $V_{CE} = 5 \text{ V}$ , $f = 1 \text{ kHz}$ )	$h_{re}$		$8.0 \times 10^{-4}$	
<b>HIGH FREQUENCY AND NOISE</b>				
<b>Magnitude of Common Emitter</b>				
Short Circuit Forward Current Transfer Ratio ( $I_C = 50 \text{ mA}$ , $V_{CE} = 5 \text{ V}$ , $f = 5 \text{ MHz}$ )	$ \hat{h}_{fe} $	3.0		
( $I_C = 500 \text{ mA}$ , $V_{CE} = 5 \text{ V}$ , $f = 30 \text{ MHz}$ )		2.0	7.0	
Noise Figure ( $I_C = 10 \text{ mA}$ , $V_{CE} = 5 \text{ Vdc}$ , $R_G = 10 \text{ k}\Omega$ , $f = 100 \text{ Hz}$ )	$F_1$		7.5	dB
Noise Figure ( $I_C = 10 \text{ mA}$ , $V_{CE} = 5 \text{ Vdc}$ , $R_G = 10 \text{ k}\Omega$ , $f = 1 \text{ kHz}$ )	$F_2$		3.0	dB
Noise Figure ( $I_C = 10 \text{ mA}$ , $V_{CE} = 5 \text{ Vdc}$ , $R_G = 10 \text{ k}\Omega$ , $f = 10 \text{ kHz}$ )	$F_3$		2.0	dB
Wide Band Noise Figure ( $I_C = 10 \text{ mA}$ , $V_{CE} = 5 \text{ Vdc}$ , $R_G = 10 \text{ k}\Omega$ , $f = 10 \text{ Hz to } 15.7 \text{ kHz}$ )	$F_4$		3.0	dB

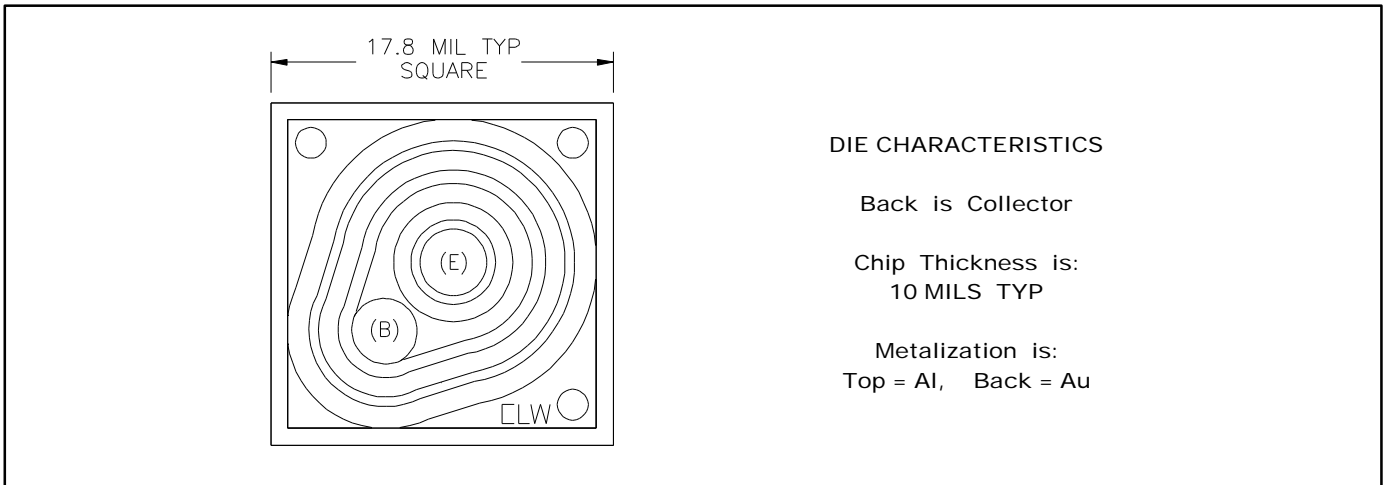
Spice Model (based upon typical device characteristics) \*1

Q2N2484 NPN (IS = 66.4p XTI = 2.0m EG = 1.11 VAF = 73.1 BF = 660.0 ISE = 48.8n  
 + NE = 46.13 IKF = 8.98m NK = 0.123 XTB = 1.5 BR = 1.0 ISC = 66.4p  
 + NC = 2.51 IKR = 1.23 RC = 0.738 CJC = 4.74p VJC = 0.933 MJC = 0.35  
 + FC = 0.5 CJE = 6.0p VJE = 0.6 MJE = 0.34 TR = 25.96n TF = 1.918n  
 + ITF = 1.0 XTF = 0 VTF = 10.0)

\*1. Microsemi Corp. claims no responsibility for misapplication of Spice Model information. Spice modeling should be used as a precursor guide to in-circuit performance. Actual performance is the responsibility of the user / designer.



**TO 18 CASE OUTLINE**



**DIE OUTLINE**

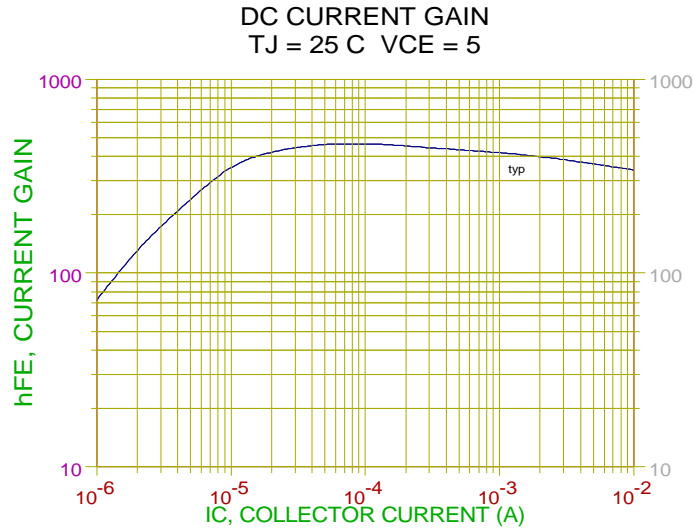


FIGURE 1

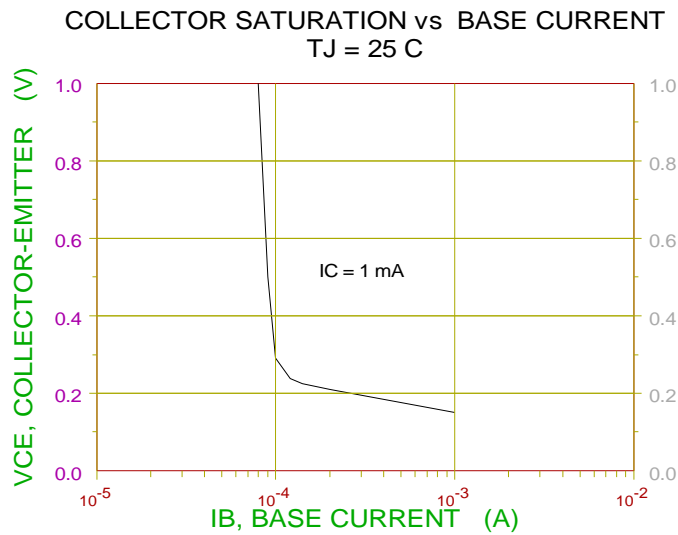
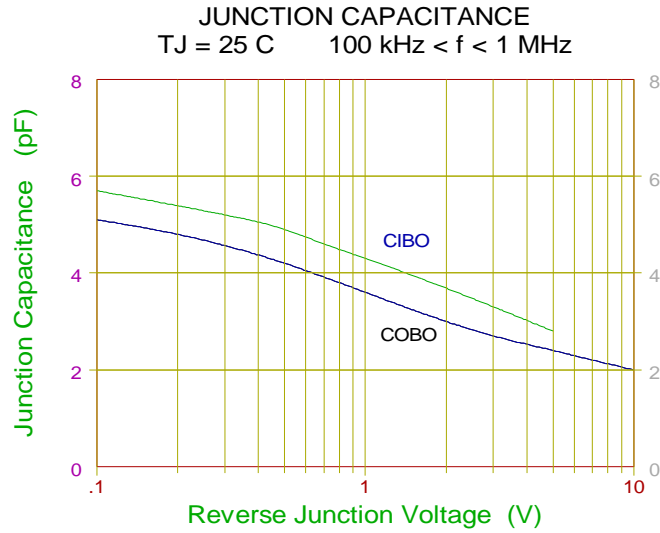
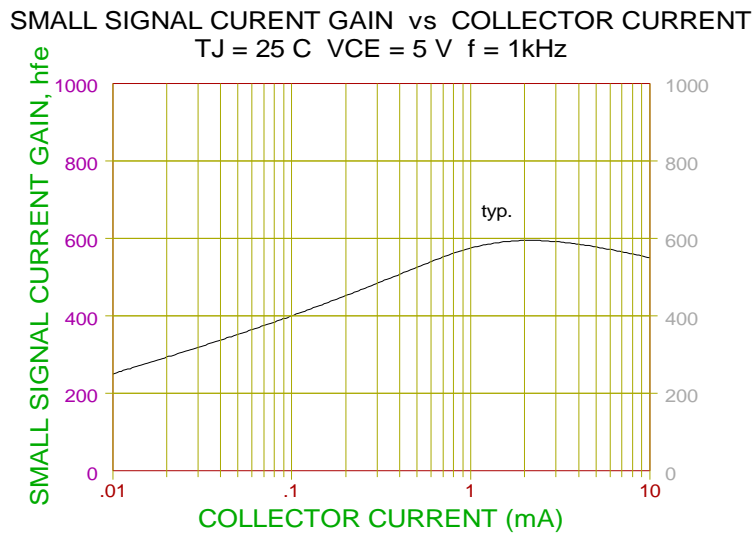


FIGURE 2



**FIGURE 3**



**FIGURE 4**

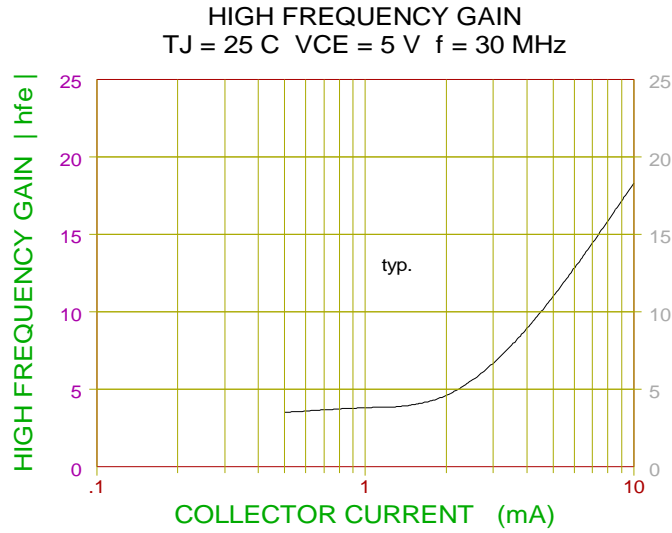


FIGURE 5

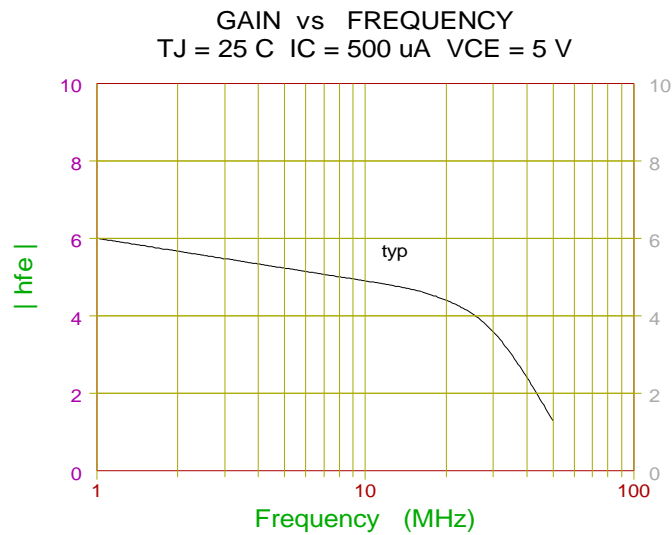
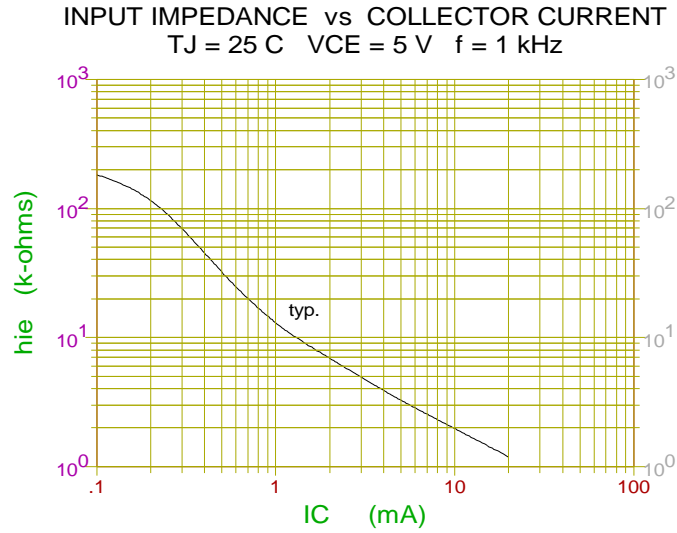
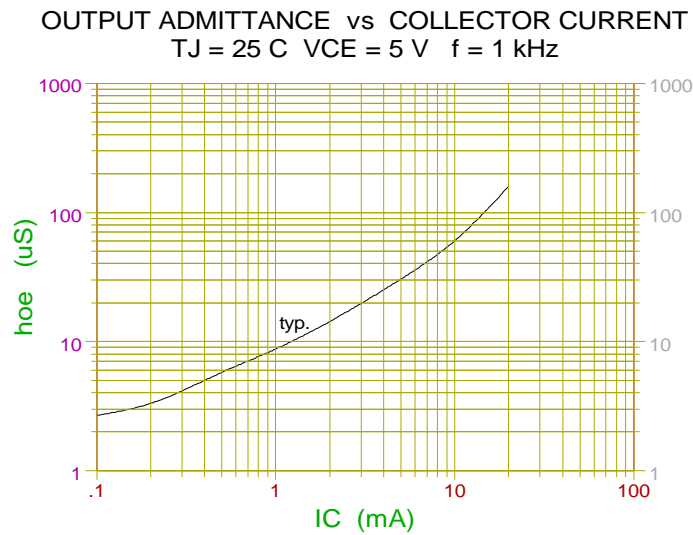


FIGURE 6



**FIGURE 7**



**FIGURE 8**

VOLTAGE FEEDBACK RATIO vs COLLECTOR CURRENT  
 T<sub>J</sub> = 25 C V<sub>CE</sub> = 5 V f = 1kHz

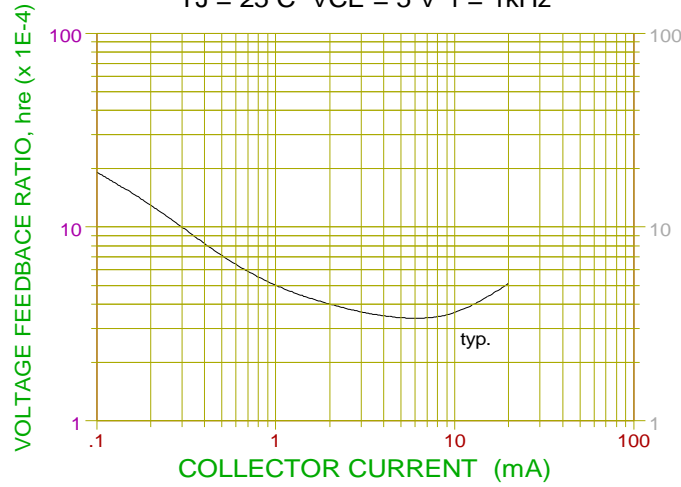


FIGURE 9

NOISE FIGURE (db) VS COLLECTOR CURRENT  
 T<sub>J</sub> = 25 C V<sub>CE</sub> = 5 V R<sub>G</sub> = 10 k f = 1 kHz

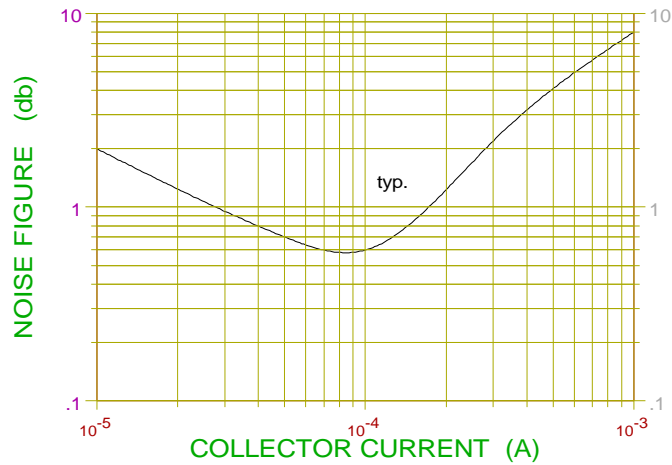
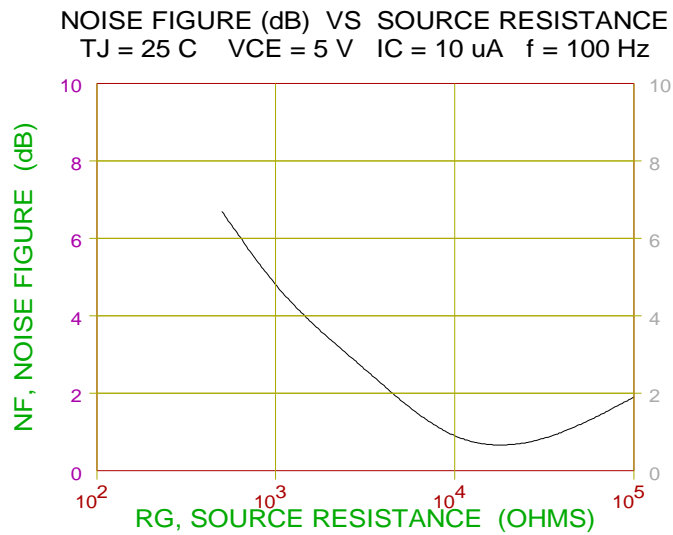


FIGURE 10



**FIGURE 11**



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