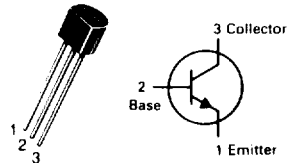


# MPSH07A

CASE 29-04, STYLE 1  
TO-92 (TO-226AA)



FM/VHF TRANSISTOR

NPN SILICON

## MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CEO}$	30	Vdc
Collector-Base Voltage	$V_{CBO}$	30	Vdc
Emitter-Base Voltage	$V_{EBO}$	3.0	Vdc
Total Device Dissipation (@ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$ )	$P_D$	350 2.81	mW mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-55 to +150	$^\circ\text{C}$

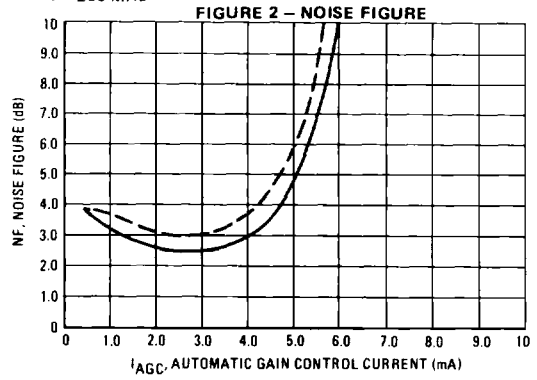
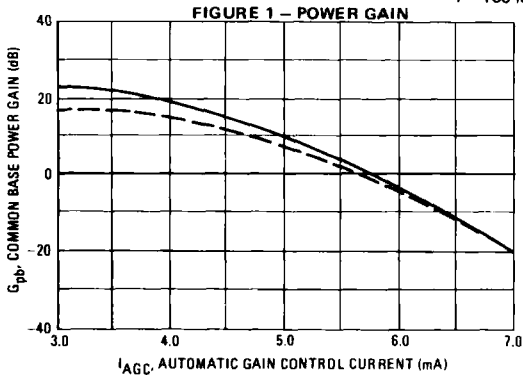
## THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	125	$^\circ\text{C/W}$

## ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted.)

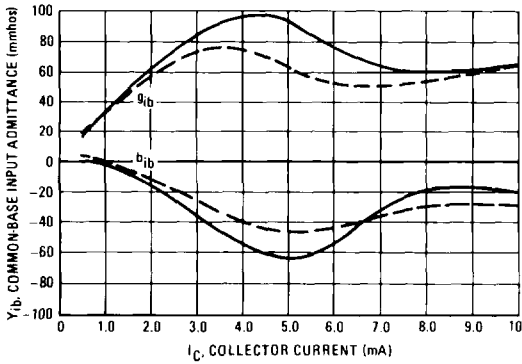
Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector-Emitter Breakdown Voltage ( $I_C = 1.0 \text{ mA}$ , $I_B = 0$ )	$V_{(BR)CEO}$	30	—	Vdc
Collector-Base Breakdown Voltage ( $I_C = 100 \mu\text{A}$ , $I_E = 0$ )	$V_{(BR)CBO}$	30	—	Vdc
Emitter-Base Breakdown Voltage ( $I_E = 100 \mu\text{A}$ , $I_C = 0$ )	$V_{(BR)EBO}$	3.0	—	Vdc
Collector Cutoff Current ( $V_{CB} = 15 \text{ Vdc}$ , $I_E = 0$ )	$I_{CBO}$	—	50	nA
<b>ON CHARACTERISTICS</b>				
DC Current Gain ( $I_C = 3.0 \text{ mA}$ , $V_{CE} = 10 \text{ Vdc}$ )	$h_{FE}$	20	—	—
Base-Emitter On Voltage ( $I_C = 3.0 \text{ mA}$ , $V_{CE} = 10 \text{ Vdc}$ )	$V_{BE(on)}$	—	0.9	Vdc
<b>SMALL-SIGNAL CHARACTERISTICS</b>				
Current-Gain — Bandwidth Product ( $I_C = 3.0 \text{ mA}$ , $V_{CE} = 10 \text{ Vdc}$ , $f = 100 \text{ MHz}$ )	$f_T$	400	—	MHz
Collector-Emitter Capacitance ( $V_{CE} = 10 \text{ Vdc}$ , $I_B = 0$ , $f = 1.0 \text{ MHz}$ , base guarded)	$C_{ce}$ ( $C_{rb}$ )	—	0.3	pF
Noise Figure ( $I_C = 3.0 \text{ mA}$ , $V_{CB} = 10 \text{ Vdc}$ , $R_S = 50 \text{ Ohms}$ , $f = 100 \text{ MHz}$ )	NF	—	3.2	dB
<b>FUNCTIONAL TEST</b>				
Common-Emitter Amplifier Power Gain ( $I_C = 3.0 \text{ mA}$ , $V_{CB} = 10 \text{ Vdc}$ , $R_S = 50 \text{ Ohms}$ , $f = 100 \text{ MHz}$ ) ( $I_C = 3.0 \text{ mA}$ , $V_{CB} = 10 \text{ Vdc}$ , $R_S = 50 \text{ Ohms}$ , $f = 200 \text{ MHz}$ )	$G_{pb}$	18 14	—	dB
Forward AGC Current (Gain Reduction = 30 dB, $R_S = 50 \text{ Ohms}$ , $f = 100 \text{ MHz}$ )	$I_{AGC}$	5.0	8.0	mA

**AGC CHARACTERISTICS**  
 $V_{CC} = 10 \text{ Vdc}$ ,  $R_S = 50 \text{ Ohms}$ , See Figure 9  
 —  $f = 100 \text{ MHz}$     - - -  $f = 200 \text{ MHz}$

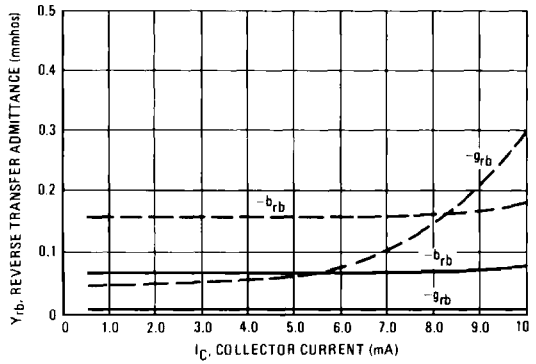


**COMMON-BASE  $y$  PARAMETERS**  
 $V_{CB} = 10 \text{ Vdc}$ ,  $T_A = 25^\circ\text{C}$   
 —  $f = 100 \text{ MHz}$     - - -  $f = 200 \text{ MHz}$

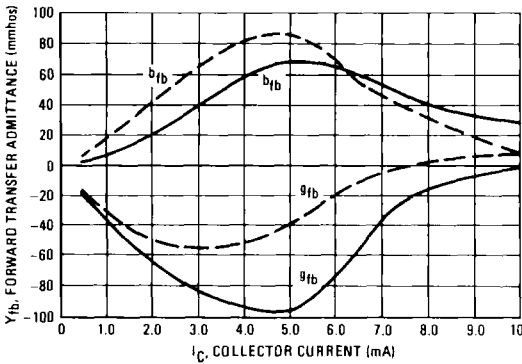
**FIGURE 3 - INPUT ADMITTANCE**



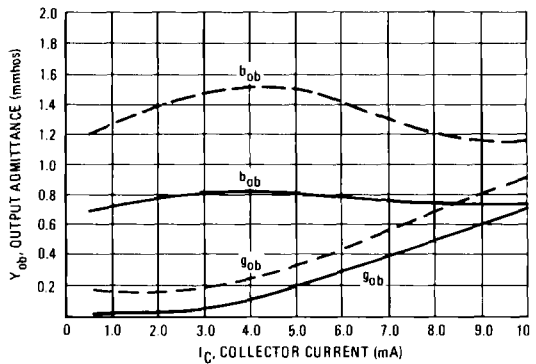
**FIGURE 4 - REVERSE TRANSFER ADMITTANCE**



**FIGURE 5 - FORWARD TRANSFER ADMITTANCE**

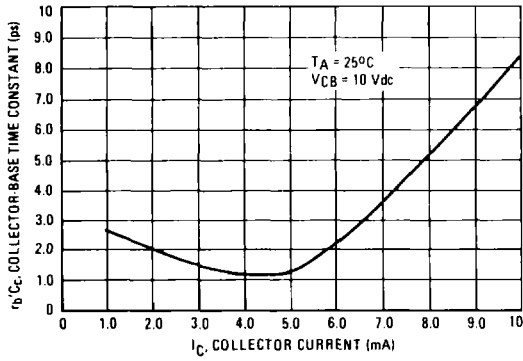


**FIGURE 6 - OUTPUT ADMITTANCE**

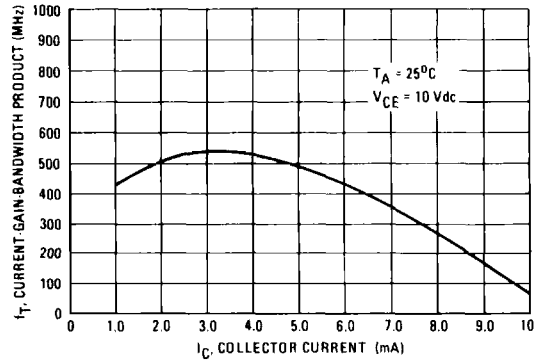


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**FIGURE 7 – COLLECTOR-BASE TIME CONSTANT**



**FIGURE 8 – CURRENT-GAIN BANDWIDTH PRODUCT**



**FIGURE 9 – 100-MHz AND 200-MHz COMMON-BASE AMPLIFIER**

