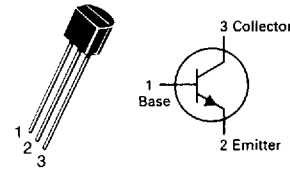
MPSH24

CASE 29-04, STYLE 2
TO-92 (TO-226AA)



VHF TRANSISTOR

NPN SILICON

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	30	Vdc
Collector-Base Voltage	V_{CBO}	40	Vdc
Emitter-Base Voltage	V_{EBO}	4.0	Vdc
Collector Current — Continuous	I_C	50	mAdc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	350 2.8	mW mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−55 to +135	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	357	°C/W

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I_C = 1.0 mAdc, I_B = 0)	$V_{(BR)CEO}$	30	—	—	Vdc
Collector-Base Breakdown Voltage (I_C = 100 μAdc, I_E = 0)	$V_{(BR)CBO}$	40	—	—	Vdc
Emitter-Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)	$V_{(BR)EBO}$	4.0	—	—	Vdc
Collector Cutoff Current (V_{CB} = 15 Vdc, I_E = 0)	I_{CBO}	—	—	50	nAdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 8.0 mAdc, V_{CE} = 10 Vdc)	h_{FE}	30	—	—	—
SMALL-SIGNAL CHARACTERISTICS					
Current-Gain — Bandwidth Product (I_C = 8.0 mAdc, V_{CE} = 10 Vdc, f = 100 MHz)	f_T	400	620	—	MHz
Collector-Base Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 1.0 MHz)	C_{cb}	—	0.25	0.36	pF
Conversion Gain (213 MHz to 45 MHz) (I_C = 8.0 mAdc, V_{CC} = 20 Vdc, Oscillator Injection = 150 mVrms) (60 MHz to 45 MHz) (I_C = 8.0 mAdc, V_{CC} = 20 Vdc, Oscillator Injection = 150 mVrms)	G_C	 19 24	 24 29	 — —	dB

CONVERSION GAIN CHARACTERISTICS

(TEST CIRCUIT FIGURE 7)

(V_{CC} = 20 Vdc, $R_S = R_L$ = 50 Ohms, f_{if} = 44 MHz, B.W. = 6.0 MHz)

FIGURE 1 – CONVERSION GAIN versus COLLECTOR CURRENT

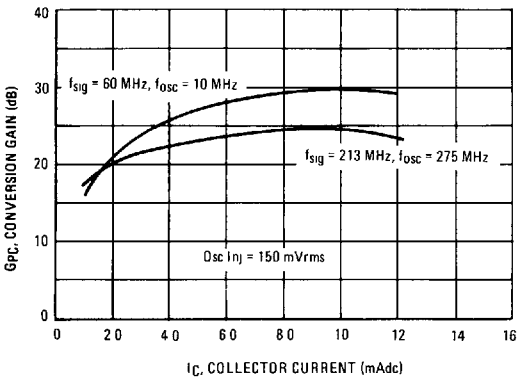
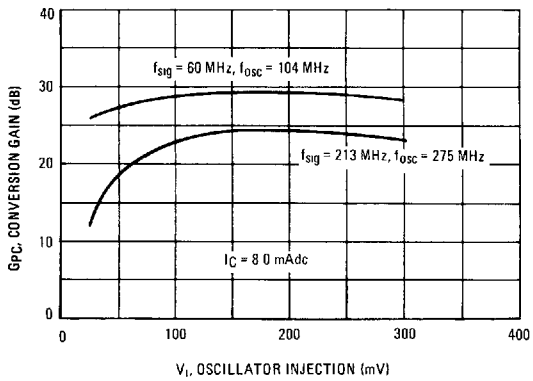


FIGURE 2 – CONVERSION GAIN versus INJECTION LEVEL



COMMON-EMITTER y PARAMETERS

(V_{CE} = 15 Vdc, T_A = 25°C)

FIGURE 3 – INPUT ADMITTANCE

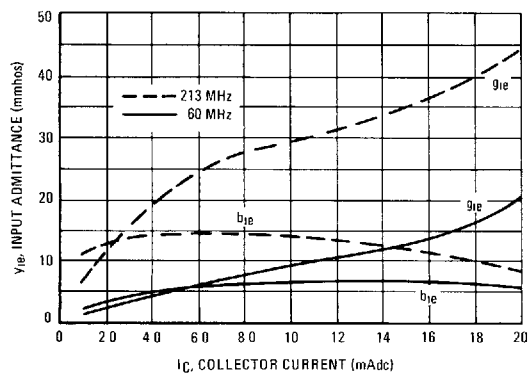


FIGURE 4 – REVERSE TRANSFER ADMITTANCE

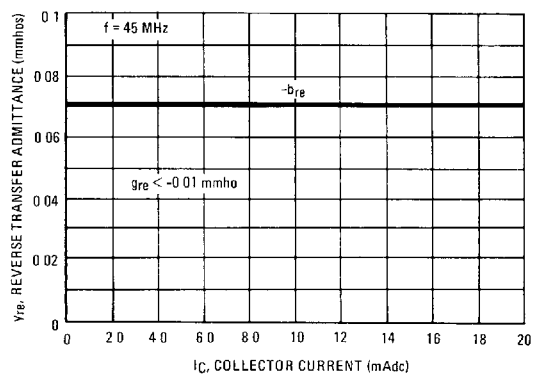


FIGURE 5 – FORWARD TRANSFER ADMITTANCE

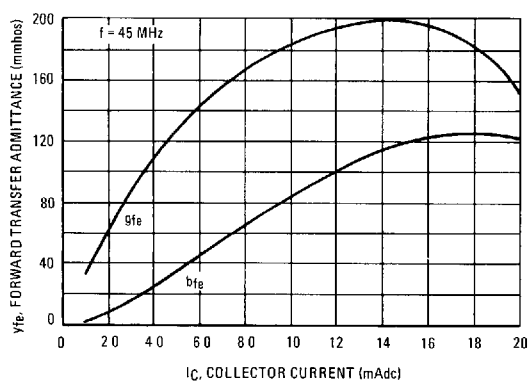


FIGURE 6 – OUTPUT ADMITTANCE

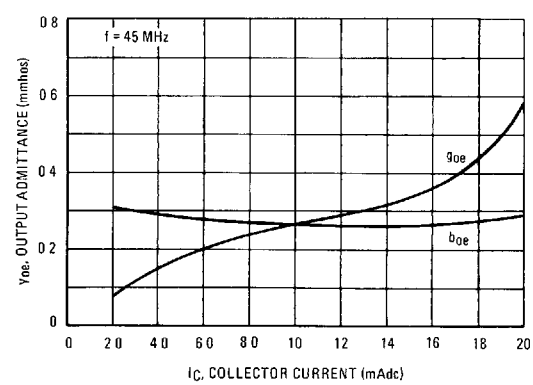


FIGURE 7 – VHF MIXER TEST CIRCUIT

(f_{if} = 44 MHz, B.W. = 6.0 MHz)

f_{sig}	60 MHz	213 MHz
f_{osc}	105 MHz	258 MHz
C1	1.5-20 pF	1.5-20 pF
C2	8.0-60 pF	6.0-12 pF
C3	8.0-60 pF	1.5-20 pF
C4	3.0-35 pF	–
C5	1.5-20 pF	–
L1	5 Turns #26 Air, Tap 1 Turn	3 Turns #16 Air, Tap ½ Turn
L2	10 Turns #26 Air	10 Turns #26 Arnold A1-10 Core
L3	Ohmite Z235	–