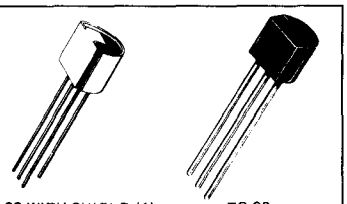
MPS6568, A (SILICON)
thru
MPS6570, A

NPN SILICON ANNULAR TRANSISTORS

. . . designed for VHF-RF and video IF stages in TV receivers.

- Guaranteed Noise Figure
  NF = 3.3 dB(Max) @ 200 MHz—MPS6568,A
  6.0 dB(Max) @ 45 MHz—MPS6569,A, MPS6570,A
- Guaranteed AGC Characteristics
- External Shielding for Optimum RF Circuit Performance
- Complete y-Parameter Curves at Both 45 MHz and 200 MHz
- Guaranteed Power Gain
  G_{pe} = 20 dB(Min) @ 200 MHz—MPS6568,A
  22.5 dB(Min) (Unneutralized) @ 45 MHz—MPS6529,A, MPS6570,A

NPN SILICON VHF TRANSISTORS



TO-92 WITH SHIELD (1)
MPS6568
MPS6569
MPS6570

TO-92
MPS6568A
MPS6569A
MPS6570A

MAXIMUM RATINGS

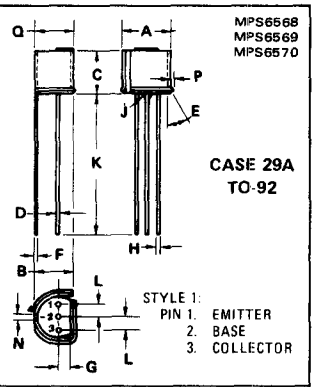
Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	20	Vdc
Collector-Base Voltage	V_{CB}	20	Vdc
Emitter-Base Voltage	V_{EB}	3.0	Vdc
Collector Current - Continuous	I_C	50	mAdc
Total Power Dissipation T_A = 25°C Derate above 25°C	P_D	350 2.8	mW mW/°C
Total Power Dissipation @ T_C = 25°C Derate above 25°C	P_D	1.0 8.0	Watt mW/°C
Operating and Storage Junction Temperature Range	T_J,T_{stg}	-55 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case (2)	$R_{\theta JC}$	125	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	357	°C/W

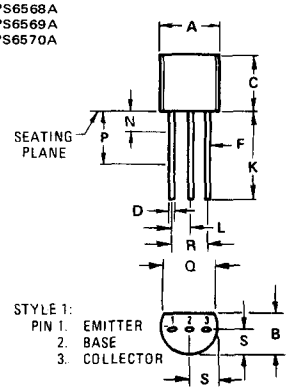
(1) Device and shield supplied without shield being attached.
(2) $R_{\theta JA}$ is measured with the device soldered into a typical printed circuit board.

DIM	MILLIMETERS MIN	MAX	INCHES MIN	MAX
A	5.03	5.18	0.198	0.204
B	4.01	4.27	0.158	0.168
C	4.45	4.70	0.175	0.185
D	0.254	0.381	0.010	0.015
E	30° TYP		30° TYP	
F	0.229	0.279	0.009	0.011
G	1.14	1.40	0.045	0.055
H	0.406	0.483	0.016	0.019
J	0.787 RAD		0.031 RAD	
K	12.70	–	0.500	–
L	1.27 T.P		0.050 T.P	
N	0.330	0.331	0.013	0.015
P	0.254 TYP		0.010 TYP	
Q	4.01	4.27	0.158	0.168



CASE 29A
TO-92

MPS6568A
MPS6569A
MPS6570A



DIM	MILLIMETERS MIN	MAX	INCHES MIN	MAX
A	4.450	5.200	0.175	0.205
B	3.180	4.190	0.125	0.165
C	4.320	5.330	0.170	0.210
D	0.407	0.533	0.016	0.021
F	0.407	0.482	0.016	0.019
K	12.700	–	0.500	–
L	1.150	1.390	0.045	0.055
N	–	1.270	–	0.050
P	6.350	–	0.250	–
Q	3.430	–	0.135	–
R	2.410	2.670	0.095	0.105
S	2.030	2.670	0.080	0.105

CASE 29-02
TO-92

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage (I_C = 1.0 mAdc, I_B = 0)	BV_{CEO}	20	–	Vdc
Collector-Base Breakdown Voltage (I_C = 100 μAdc, I_E = 0)	BV_{CBO}	20	–	Vdc
Emitter-Base Breakdown Voltage (I_E = 100 μAdc, I_C = 0)	BV_{EBO}	3.0	–	Vdc
Collector Cutoff Current (V_{CB} = 10 Vdc, I_C = 0)	I_{CBO}	–	50	nAdc
ON CHARACTERISTICS				
DC Current Gain (I_C = 4.0 mAdc, V_{CE} = 5.0 Vdc)	h_{FE}	20	200	–
Collector-Emitter Saturation Voltage (I_C = 10 mAdc, I_B = 5.0 mAdc)	$V_{CE(sat)}$	0.1	0.3	Vdc
Base-Emitter Saturation Voltage (I_C = 10 mAdc, I_B = 5.0 mAdc)	$V_{BE(sat)}$	–	0.96	Vdc
SMALL-SIGNAL CHARACTERISTICS				
Current-Gain–Bandwidth Product (I_C = 4.0 mAdc, V_{CE} = 10 Vdc, f = 100 MHz) MPS6568A	f_T	375	800	MHz
MPS6569A, MPS6570A		300	800	
Collector-Base Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 1.0 MHz, emitter guarded, with shield) MPS6568/6570	C_{cb}	0.25	0.5	pF
(V_{CB} = 10 Vdc, I_E = 0, f = 1.0 MHz, emitter guarded) MPS6568A/6570A		–	0.65	
Noise Figure (V_{AGC} = 1.4 Vdc, R_S = 50 ohms, f = 200 MHz, Figure 9) MPS6568,A	NF	–	3.3	dB
(V_{AGC} = 2.75 Vdc, R_S = 50 ohms, f = 45 MHz, Figure 10) MPS6569A, MPS6570A		–	6.0	
FUNCTIONAL TEST				
Power Gain (V_{AGC} = 1.4 Vdc, R_S = 50 ohms, f = 200 MHz, Figure 9) MPS6568,A	G_{pe}	20	27	dB
(V_{AGC} = 2.75 Vdc, R_S = 50 ohms, f = 45 MHz, Figure 10) MPS6569,A, MPS6570,A		22.5	28.5	
Forward AGC Voltage (Gain Reduction = 30 dB, R_S = 50 ohms, f = 200 MHz, Figure 9) MPS6568,A	V_{AGC}	4.0	5.0	Vdc
(Gain Reduction = 30 dB, R_S = 50 ohms, f = 45 MHz, Figure 10) MPS6569,A		4.4	5.4	
MPS6570,A		5.2	6.2	

AGC CHARACTERISTICS

V_{CC} = 12 Vdc, R_S = 50 OHMS, SEE FIGURES 9 AND 10

—— f = 45 MHz — — f = 200 MHz

FIGURE 1 — POWER GAIN

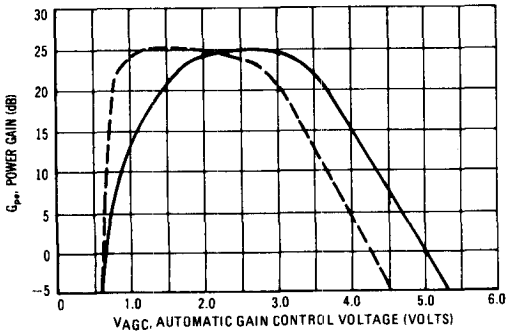
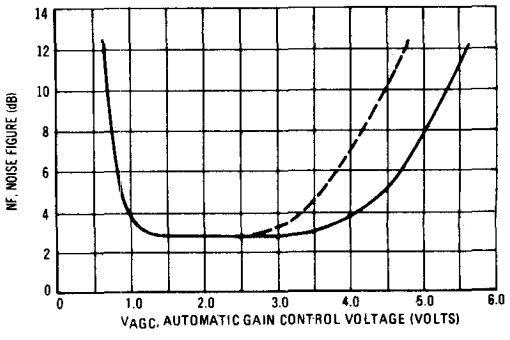


FIGURE 2 — NOISE FIGURE



COMMON-EMITTER y PARAMETERS

V_{CE} = 12 Vdc, T_A = 25°C

— f = 45 MHz - - f = 200 MHz

FIGURE 3 — INPUT ADMITTANCE

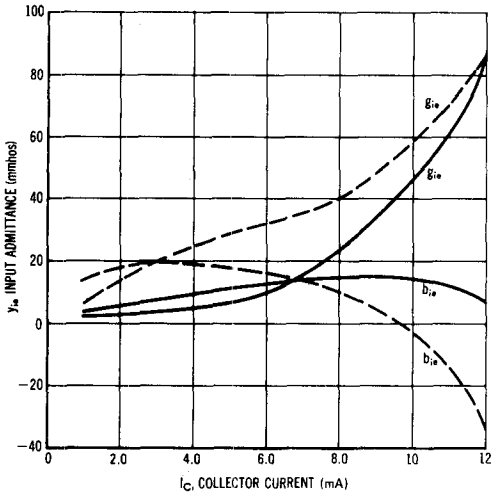


FIGURE 4 — REVERSE TRANSFER ADMITTANCE

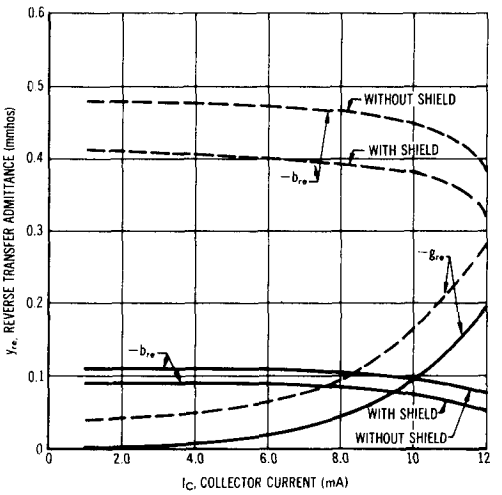


FIGURE 5 — FORWARD TRANSFER ADMITTANCE

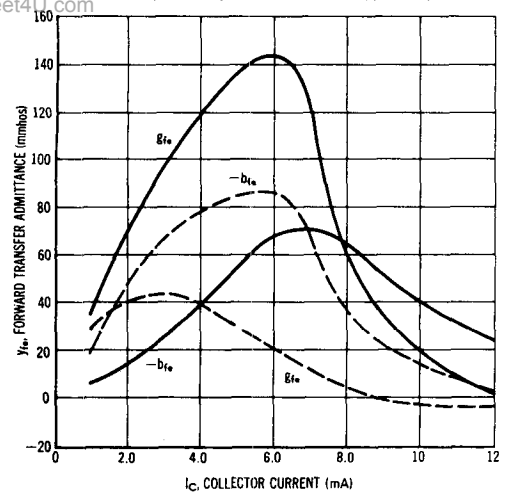


FIGURE 6 — OUTPUT ADMITTANCE

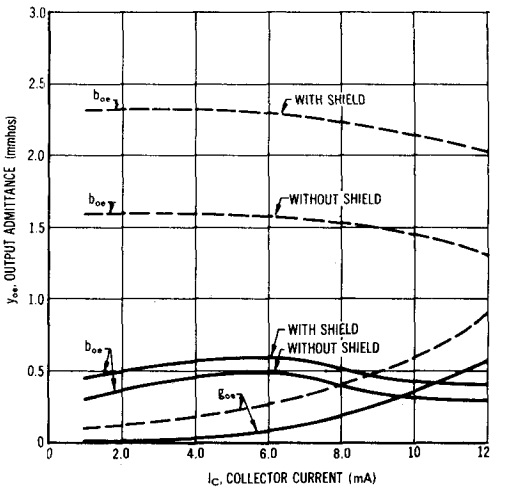


FIGURE 7 – DC CURRENT GAIN

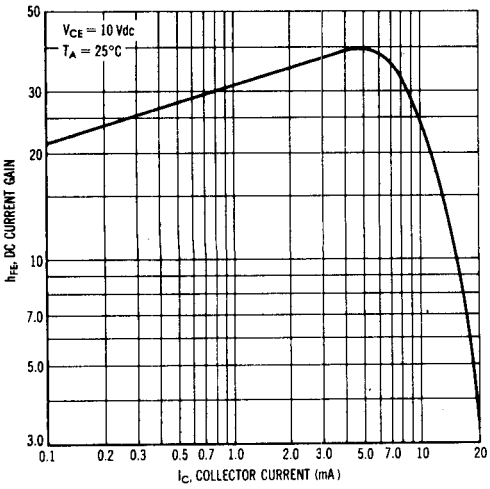


FIGURE 8 – COLLECTOR-BASE CAPACITANCE

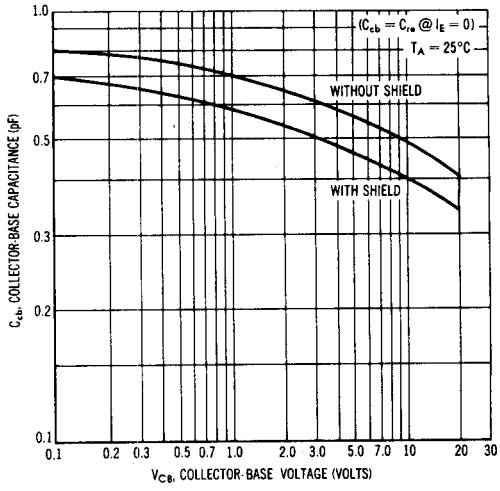
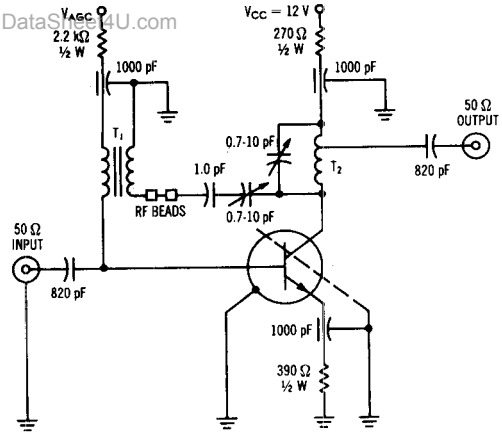
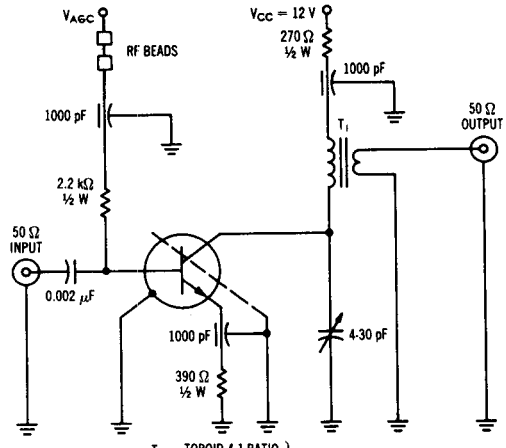


FIGURE 9 – 200 MHz FUNCTIONAL TEST CIRCUIT (NEUTRALIZED)



T_1 = FERRITE CORE INDIANA GEN. CORP. F-684
T_2 = 6 TURNS #16 BUSS WIRE, ID = ¼", L = ¾".

FIGURE 10 – 45 MHz FUNCTIONAL TEST CIRCUIT (UNNEUTRALIZED)



T_1 = TOROID 4:1 RATIO, 8T-PRI 2T-SEC } #22 WIRE