MRF571
MRF572
MRF573

MRF571
CASE 317-01, STYLE 2

MRF572
CASE 303-01, STYLE 1

MRF573
CASE 358-01, STYLE 1

HIGH FREQUENCY TRANSISTOR

NPN SILICON

MAXIMUM RATINGS

Rating	Symbol	MRF571	MRF572	MRF573	Unit
Collector-Emitter Voltage	V_{CEO}	10	10	10	Vdc
Collector-Base Voltage	V_{CBO}	20	20	20	Vdc
Emitter-Base Voltage	V_{EBO}	3.0	3.0	3.0	Vdc
Collector Current — Continuous	I_C	70	70	70	mAdc
Total Device Dissipation @ T_C = 100°C(1)	P_D	0.5	0.75	0.75	Watts
Derate above 100°C		5.0	7.5	7.5	mW/°C
Storage Temperature	T_{stg}	−65 to +150	−65 to +200	−65 to +200	°C

(1) Case temperature measured on collector lead immediately adjacent to body of package.

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

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector-Emitter Breakdown Voltage (I_C = 0.1 mAdc, I_B = 0)		$V_{(BR)CEO}$	10	12	—	Vdc
Collector-Base Breakdown Voltage (I_C = 1.0 mAdc, I_E = 0)		$V_{(BR)CBO}$	20	—	—	Vdc
Emitter-Base Breakdown Voltage (I_E = 50 μAdc, I_C = 0)		$V_{(BR)EBO}$	2.5	—	—	Vdc
Collector Cutoff Current (V_{CB} = 8.0 Vdc, I_E = 0)		I_{CBO}	—	—	10	μAdc
ON CHARACTERISTICS						
DC Current Gain (I_C = 30 mAdc, V_{CE} = 5.0 Vdc)		h_{FE}	50	—	300	—
SMALL SIGNAL CHARACTERISTICS						
Current-Gain — Bandwidth Product (V_{CE} = 8.0 V_{DC}, I_C = 50 mA, f = 1.0 GHz)		f_T	—	8.0	—	GHz
Collector-Base Capacitance (V_{CB} = 6.0 Vdc, I_E = 0, f = 1.0 MHz)		C_{cb}	—	.7	1.0	pF
FUNCTIONAL TEST						
Noise Figure		NF				dB
(I_C = 5.0 mAdc, V_{CE} = 6.0 Vdc, f = .50 GHz)			—	1.0	—	
(I_C = 5.0 mAdc, V_{CE} = 6.0 Vdc, f = 1.0 GHz)			—	1.5	2.0	
(I_C = 5.0 mAdc, V_{CE} = 6.0 Vdc, f = 2.0 GHz)	MRF571		—	2.8	—	
(I_C = 5.0 mAdc, V_{CE} = 6.0 Vdc, f = 2.0 GHz)	MRF572,573		—	2.5	—	
Gain @ Noise Figure		G_{NF}				dB
(V_{CE} = 6.0 Vdc, I_C = 5.0 mAdc, f = .50 GHz)			—	16.5	—	
(V_{CE} = 6.0 Vdc, I_C = 5.0 mAdc, f = 1.0 GHz)			10	12	—	

FIGURE 1 — C_{cb}, COLLECTOR-BASE CAPACITANCE versus VOLTAGE

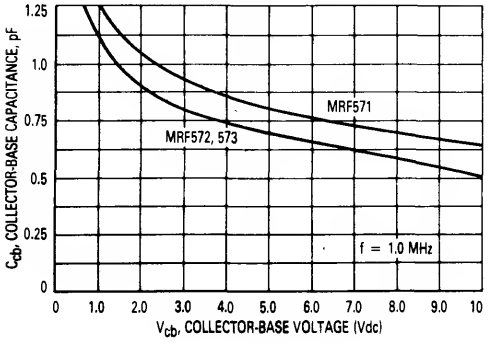


FIGURE 2 — C_{ib}, INPUT CAPACITANCE versus EMITTER BASE VOLTAGE

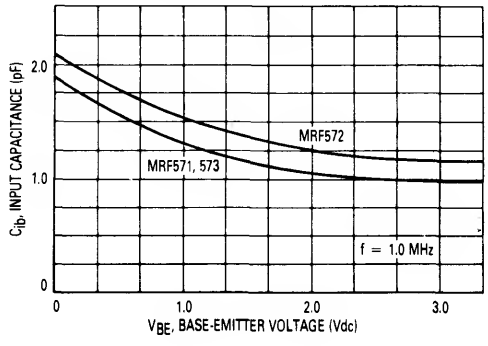


FIGURE 3 — MRF571 — GAIN AT NOISE FIGURE AND NOISE FIGURE versus FREQUENCY

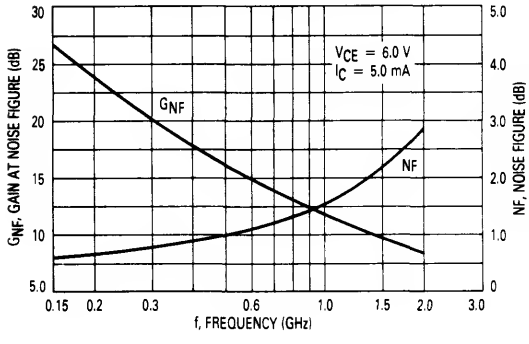


FIGURE 4 — MRF572, MRF573 — GAIN AT NOISE FIGURE AND NOISE FIGURE versus FREQUENCY

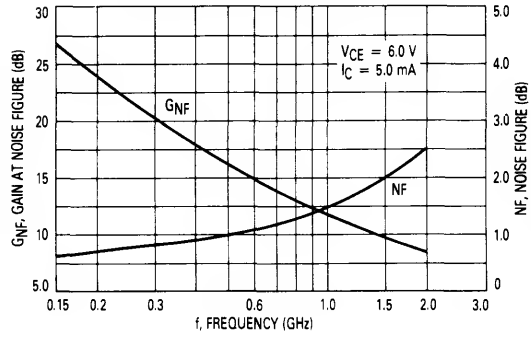


FIGURE 5 — MRF571, MRF572 and MRF573 — GAIN AT NOISE FIGURE AND NOISE FIGURE versus COLLECTOR CURRENT

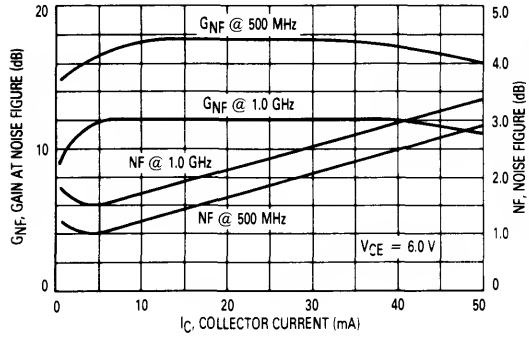


FIGURE 6 — f_γ, CURRENT GAIN-BANDWIDTH PRODUCT versus COLLECTOR CURRENT

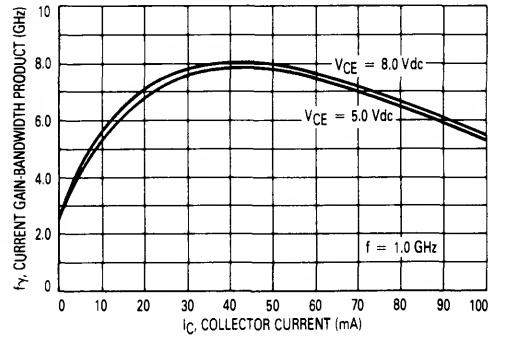


FIGURE 7 — G_A MAX, MAXIMUM AVAILABLE GAIN versus FREQUENCY

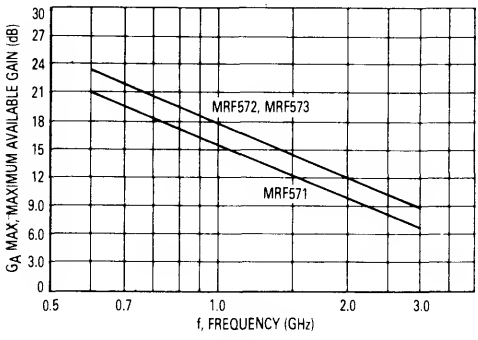


FIGURE 8 — 1.0 dB COMPRESSION PT. AND THIRD ORDER INTERCEPT

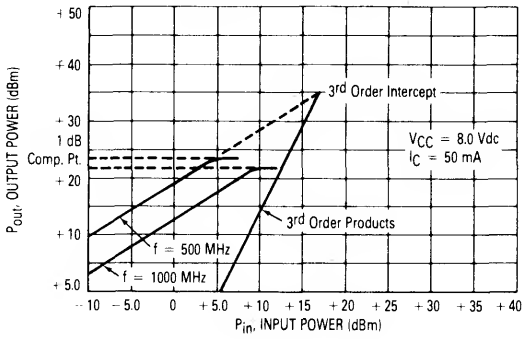


FIGURE 9 — MRF571 — $G_{U}max$ and $|S_{21}|^2$ versus FREQUENCY

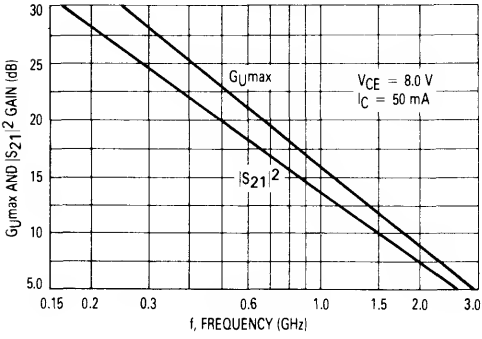
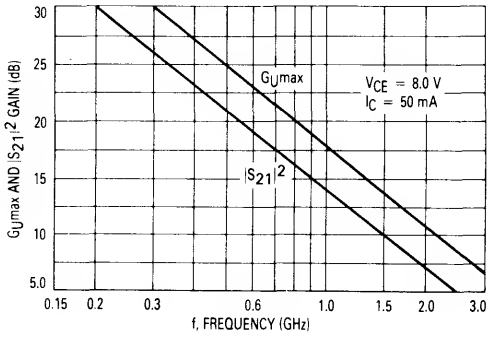
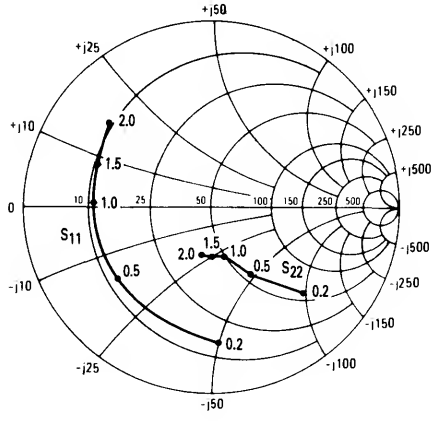


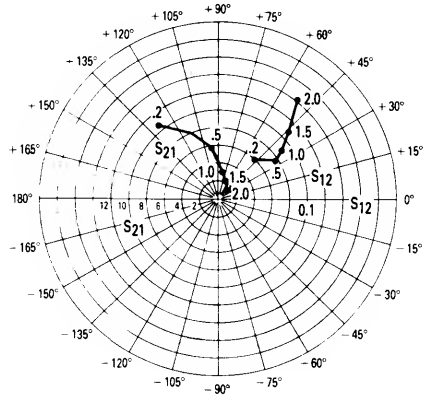
FIGURE 10 — MRF572, MRF573 — $G_{U}max$ and $|S_{21}|^2$ versus FREQUENCY



MRF571
INPUT/OUTPUT REFLECTION COEFFICIENTS versus FREQUENCY (GHz)
V_{CE} = 6.0 V, I_C = 5.0 mA



MRF571
FORWARD/REVERSE TRANSMISSION COEFFICIENTS versus FREQUENCY (GHz)
V_{CE} = 6.0 V, I_C = 5.0 mA



MRF571 COMMON EMITTER S-PARAMETERS

V_{CE} (Volts)	I_C (mA)	f (MHz)	S_{11}		S_{21}		S_{12}		S_{22}	
			$\|S_{11}\|$	$\angle\phi$	$\|S_{21}\|$	$\angle\phi$	$\|S_{12}\|$	$\angle\phi$	$\|S_{22}\|$	$\angle\phi$
6.0	5.0	200	0.74	−86	10.5	129	0.06	48	0.69	−42
		500	0.62	−143	5.5	97	0.08	33	0.41	−59
		1000	0.61	178	3.0	78	0.09	37	0.28	−69
		1500	0.65	158	2.0	62	0.11	44	0.26	−88
		2000	0.70	140	1.6	51	0.14	51	0.27	−99
	10	200	0.64	−111	15	118	0.04	44	0.53	−59
		500	0.58	−160	6.9	93	0.06	42	0.27	−77
		1000	0.59	168	3.7	77	0.09	52	0.16	−91
		1500	0.63	151	2.5	64	0.12	56	0.16	−113
		2000	0.67	134	2.0	53	0.16	57	0.16	−118
	50	200	0.56	−160	20.4	102	0.02	57	0.27	−98
		500	0.57	176	8.4	86	0.05	67	0.14	−130
		1000	0.60	156	4.4	75	0.09	70	0.11	−164
		1500	0.62	152	2.9	64	0.13	68	0.13	−175
		2000	0.66	127	2.4	53	0.18	62	0.11	−178
8.0	5.0	200	0.75	−83	10.7	129	0.06	49	0.71	−39
		500	0.62	−140	5.1	98	0.08	34	0.43	−54
		1000	0.60	−179	3.7	78	0.09	38	0.31	−62
		1500	0.64	159	2.1	62	0.10	45	0.29	−80
		2000	0.69	141	1.7	52	0.13	52	0.29	−91
	10	200	0.64	−99	15.1	120	0.05	46	0.54	−60
		500	0.52	−152	7.1	94	0.07	45	0.32	−75
		1000	0.52	170	3.7	76	0.10	54	0.15	−82
		1500	0.52	150	2.5	62	0.13	56	0.16	−108
		2000	0.57	133	2.0	51	0.18	55	0.16	−107
	50	200	0.52	−153	19.6	102	0.03	56	0.28	−92
		500	0.52	178	8.1	86	0.05	67	0.16	−98
		1000	0.56	157	4.1	73	0.10	70	0.06	−130
		1500	0.54	139	2.8	62	0.13	68	0.11	−146
		2000	0.59	126	2.2	52	0.19	63	0.10	−137

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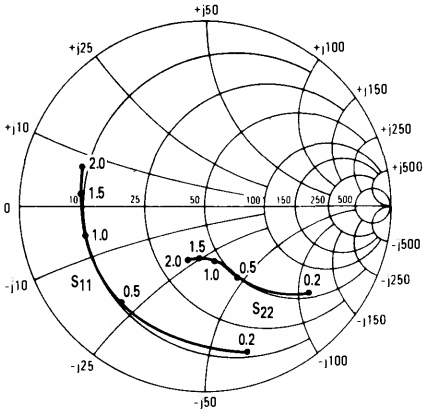
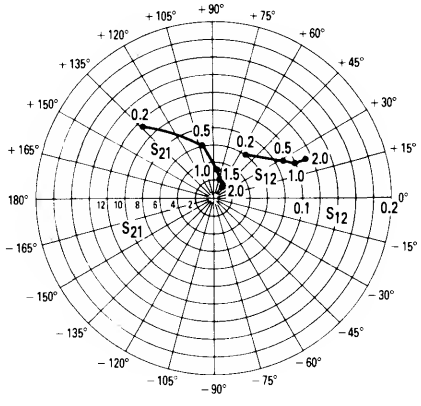
MRF572
INPUT/OUTPUT REFLECTION COEFFICIENTS versus FREQUENCY (GHz)
V_{CE} = 6.0 V, I_C = 5.0 mA



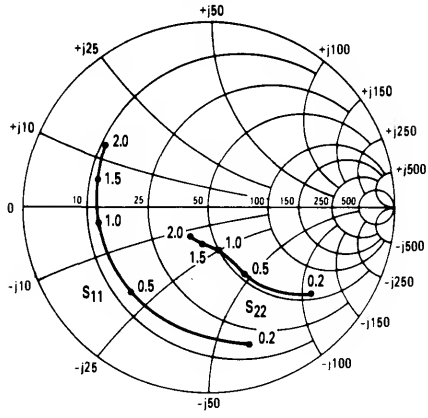
MRF572
FORWARD/REVERSE COEFFICIENTS versus FREQUENCY (GHz)
V_{CE} = 6.0 V, I_C = 5.0 mA



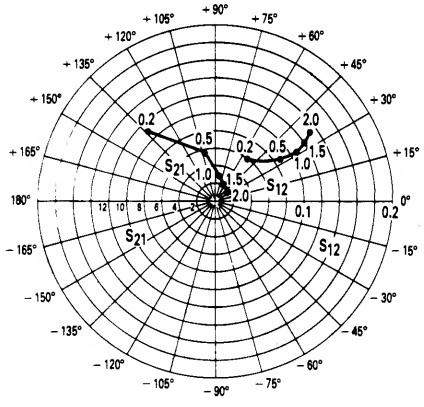
MRF572 COMMON EMITTER S-PARAMETERS

V_{CE} (Volts)	I_C (mA)	f (MHz)	S_{11}		S_{21}		S_{12}		S_{22}	
			$\|S_{11}\|$	$\angle\phi$	$\|S_{21}\|$	$\angle\phi$	$\|S_{12}\|$	$\angle\phi$	$\|S_{22}\|$	$\angle\phi$
6.0	5.0	200	0.81	−73	10.9	134	0.06	50	0.74	−40
		500	0.68	−130	6.1	102	0.09	29	0.43	−64
		1000	0.66	−167	3.3	79	0.10	22	0.29	−77
		1500	0.66	174	2.3	63	0.10	22	0.27	−94
		2000	0.68	161	1.8	49	0.11	23	0.29	−104
	10	200	0.72	−101	15.9	123	0.05	43	0.57	−58
		500	0.66	−150	7.7	95	0.06	30	0.29	−86
		1000	0.66	−178	4.0	77	0.08	33	0.19	−103
		1500	0.67	166	2.7	63	0.09	36	0.19	−122
		2000	0.69	155	2.1	51	0.10	37	0.20	−129
	50	200	0.67	−154	21.8	104	0.02	43	0.30	−94
		500	0.68	−177	9.0	87	0.03	52	0.17	−129
		1000	0.70	167	4.5	74	0.06	58	0.14	−151
		1500	0.71	157	3.0	62	0.08	59	0.16	−160
		2000	0.73	148	2.3	51	0.10	55	0.17	−161
8.0	5.0	200	0.83	−69	10.9	136	0.06	52	0.75	−36
		500	0.71	−125	6.3	103	0.08	30	0.46	−57
		1000	0.64	−164	3.5	80	0.09	24	0.31	−68
		1500	0.65	176	2.4	63	0.10	23	0.29	−84
		2000	0.66	163	1.8	49	0.11	24	0.30	−94
	10	200	0.74	−94	16.2	125	0.05	45	0.60	−51
		500	0.65	−146	7.9	96	0.06	32	0.31	−74
		1000	0.64	−176	4.2	77	0.07	33	0.20	−87
		1500	0.65	168	2.8	63	0.09	36	0.19	−104
		2000	0.67	156	2.2	50	0.10	37	0.20	−111
	50	200	0.62	−150	22.7	104	0.02	43	0.30	−81
		500	0.64	−174	9.4	86	0.03	51	0.15	−107
		1000	0.68	167	4.8	74	0.05	58	0.10	−126
		1500	0.69	160	3.2	61	0.07	58	0.13	−140
		2000	0.70	147	2.4	50	0.09	55	0.15	−140

MRF573
INPUT/OUTPUT REFLECTION COEFFICIENTS versus FREQUENCY (GHz)
V_{CE} = 6.0 V, I_C = 5.0 mA



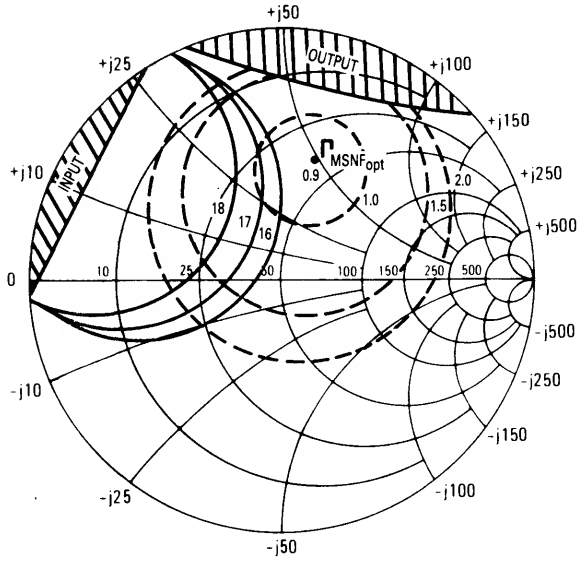
MRF573
FORWARD/REVERSE COEFFICIENTS versus FREQUENCY (GHz)
V_{CE} = 6.0 V, I_C = 5.0 mA



MRF573 COMMON EMITTER S-PARAMETERS

V_{CE} (Volts)	I_C (mA)	f (MHz)	S_{11}		S_{21}		S_{12}		S_{22}	
			$\|S_{11}\|$	$\angle\phi$	$\|S_{21}\|$	$\angle\phi$	$\|S_{12}\|$	$\angle\phi$	$\|S_{22}\|$	$\angle\phi$
6.0	5.0	200	0.76	−73	10.6	134	0.06	52	0.72	−40
		500	0.61	−132	6.0	100	0.09	35	0.41	−63
		1000	0.59	−173	3.2	77	0.11	33	0.24	−76
		1500	0.61	165	2.2	59	0.12	35	.0.19	−99
		2000	0.64	149	1.8	45	0.13	36	0.18	−117
	10	200	0.64	−99	15.1	122	0.05	48	0.56	−55
		500	0.58	−152	7.2	94	0.07	41	0.27	−81
		1000	0.58	175	3.8	74	0.09	45	0.14	−102
		1500	0.60	158	2.6	60	0.12	47	0.13	−135
		2000	0.64	144	2.0	46	0.13	45	0.13	−155
	50	200	0.54	−153	19.6	104	0.03	55	0.29	−83
		500	0.56	−179	8.1	85	0.05	62	0.13	−115
		1000	0.59	162	4.1	71	0.09	63	0.08	−157
		1500	0.61	150	2.8	58	0.12	60	0.12	179
		2000	0.65	138	2.1	46	0.13	54	0.14	165
8.0	5.0	200	0.78	−67	10.6	136	0.06	54	0.75	−36
		500	0.61	−125	6.1	102	0.09	36	0.44	−56
		1000	0.57	−169	3.4	78	0.10	33	0.27	−66
		1500	0.59	168	2.3	60	0.12	35	0.21	−84
		2000	0.62	151	1.8	46	0.14	36	0.19	−100
	10	200	0.66	−92	15.3	125	0.05	49	0.60	−49
		500	0.55	−147	7.5	95	0.07	41	0.30	−70
		1000	0.55	178	3.9	75	0.09	45	0.16	−81
		1500	0.57	160	2.7	60	0.12	47	0.12	−109
		2000	0.62	146	2.1	47	0.13	45	0.11	−130
	50	200	0.53	−147	20.8	105	0.02	47	0.31	−73
		500	0.53	−176	9.0	87	0.04	57	0.16	−90
		1000	0.57	166	4.5	72	0.07	61	0.06	−110
		1500	0.59	151	3.1	61	0.11	59	0.07	−154
		2000	0.63	143	2.3	49	0.13	55	0.09	−172

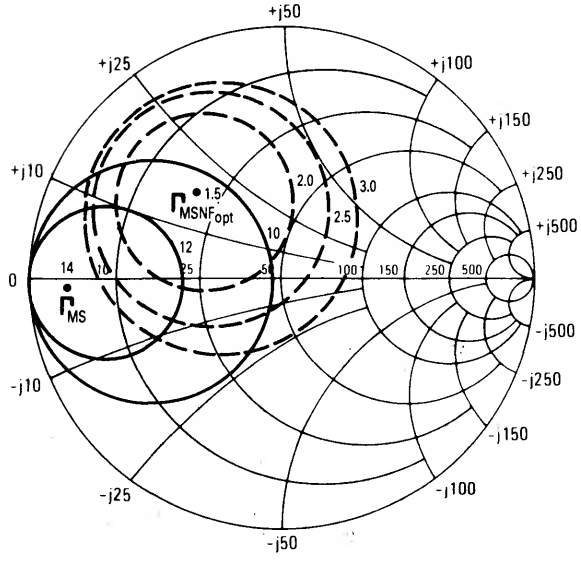
MRF571 — CONSTANT GAIN and NOISE FIGURE CONTOURS



V_{CE} = 6.0 V, I_C = 5.0 mA
f = 500 MHz
▨ — REGION OF INSTABILITY

f(GHz)	NF_{OPT}(dB)	Rn (Ω)	NF50 Ω (dB)
0.5	0.9	9.3	1.3

$\Gamma msNF_{OPT}$	K
0.49 ∠74°	0.58

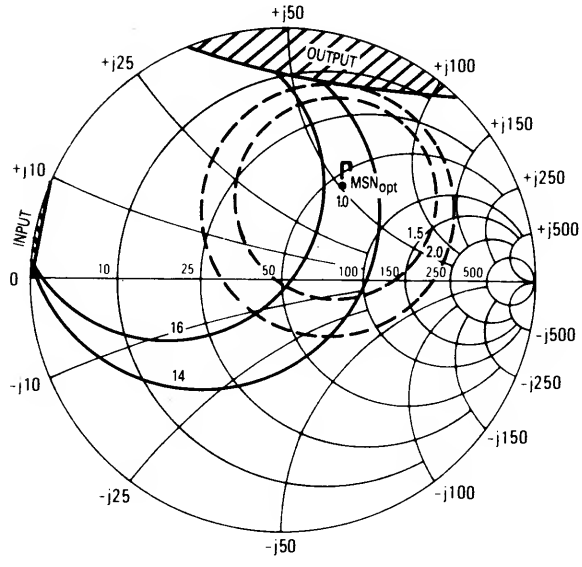


V_{CE} = 6.0 V, I_C = 5.0 mA
f = 1.0 GHz

f(GHz)	NF_{OPT}(dB)	Rn (Ω)	NF50 Ω (dB)	$\Gamma msNF_{OPT}$
1.0	1.5	7.5	2.2	0.48 ∠134°

Γms	ΓmL
0.89 ∠ − 179°	0.81 ∠66°

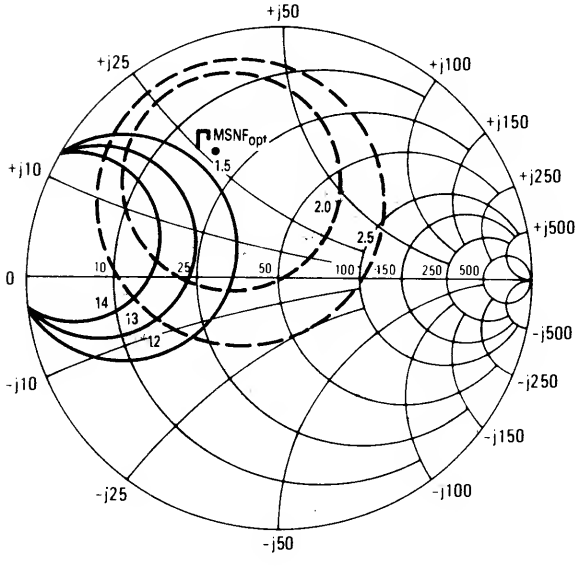
MRF572, MRF573 — CONSTANT GAIN and NOISE FIGURE CONTOURS



V_{CE} = 6.0 V, I = 5.0 mA
f = 500 MHz
▨ — REGION OF INSTABILITY

f(GHz)	Rn (Ω)	NF (50Ω)	$\Gamma_{msNF_{OPT}}$
0.5	17.1	1.5	0.43 ∠ 57°

K	NF_{OPT}
0.55	1.0

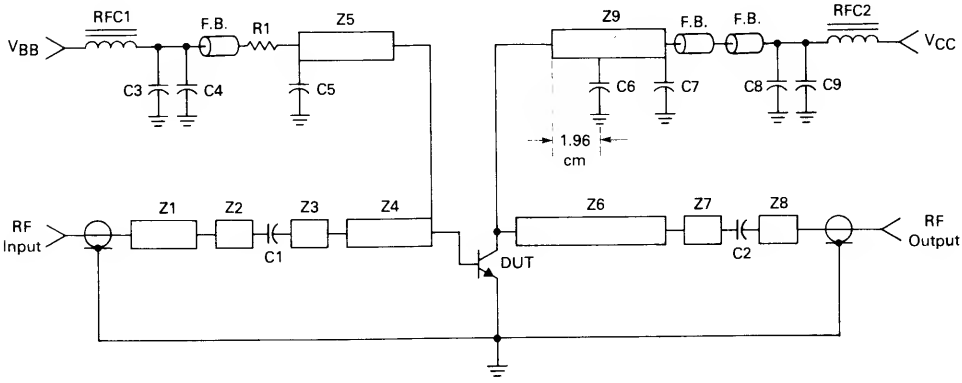


V_{CE} = 6.0 V, I_C = 5.0 mA
f = 1.0 GHz

f(GHz)	NF_{OPT}	Rn (Ω)	NF50 (Ω) (dB)
1.0	1.5	6.0	2.0

$\Gamma_{msNF_{OPT}}$	K
0.56 ∠ 116°	0.93

MRF571 1.0 GHz TEST CIRCUIT



C1, C2, C6	560 pF Chip Capacitor	RFC1, RFC2	VK-200, Ferroxcube
C5, C7	0.018 μF Chip Capacitor	Z1–Z9	Microstrip, See Photomaster
C3, C8	0.1 μF Mylar Capacitor	Bead	Ferrite Bead, Ferroxcube 56-590-65/3B
C4, C9	1.0 μF Electrolytic Capacitor	Board Material	0.0625" Teflon Fiberglass ϵ_r = 2.5 ± 0.05
R1	2.7 kΩ		

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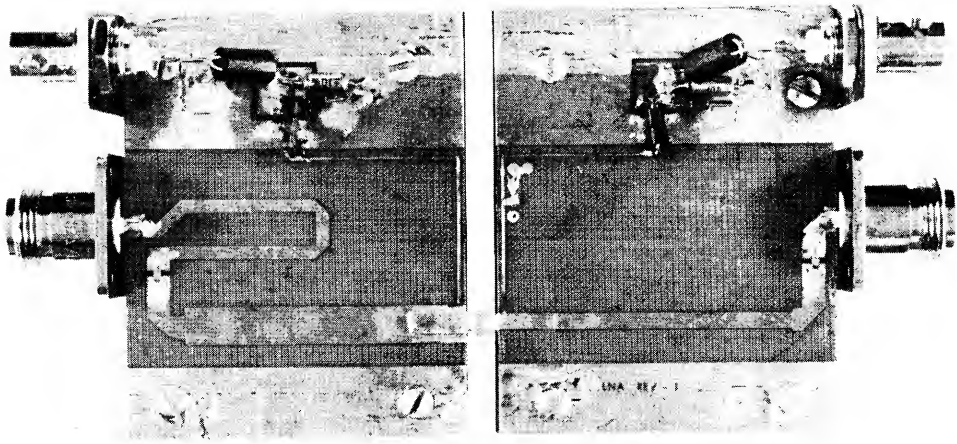
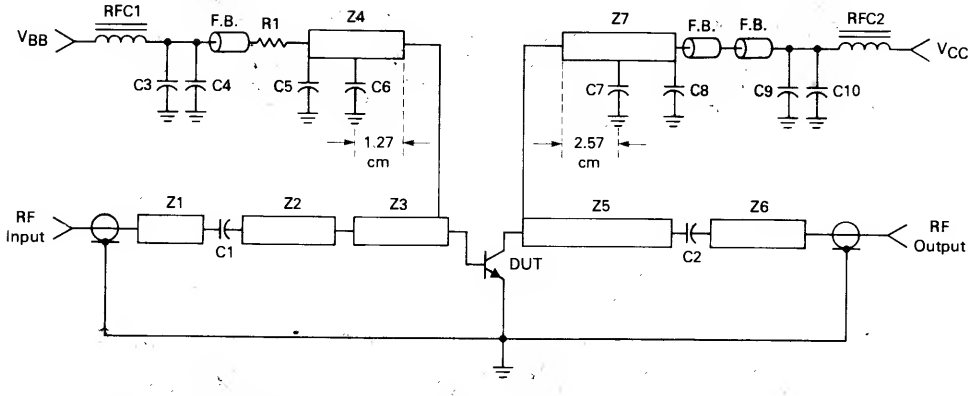
MRF571 TEST CIRCUIT

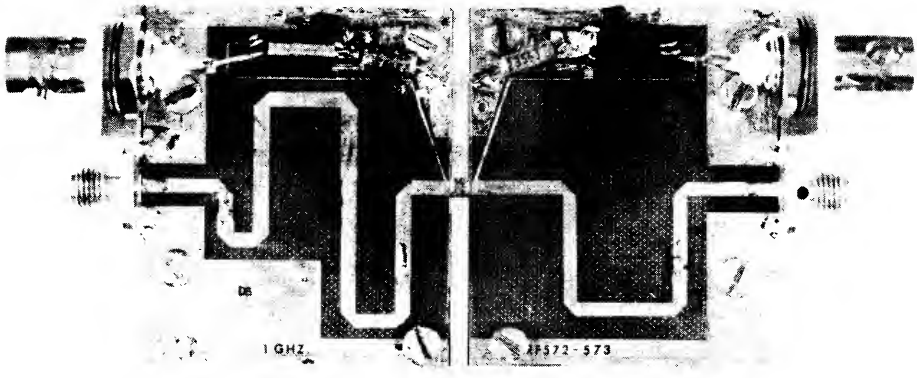


MRF572, 573 1.0 GHz TEST FIXTURE

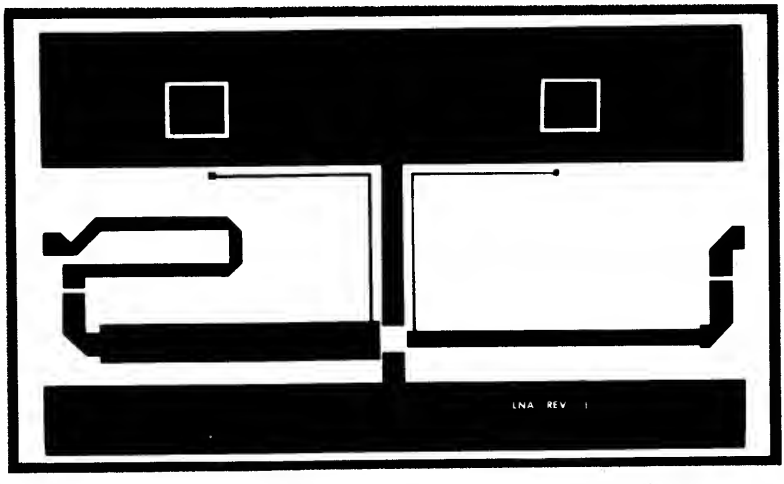


C1, C2, C6, C7	560 pF Chip Capacitor	RFC1, RFC2	VK-200, Ferroxcube
C5, C8	0.018 μF Chip Capacitor	Z1–Z7	Microstrip, See Photomaster
C3, C9	0.1 μF Mylar Capacitor	Bead	Ferrite Bead, Ferroxcube 56-590-65/3B
C4, C10	1.0 μF Electrolytic Capacitor	Board Material	0.031″ Teflon Fiberglass ϵ_r = 2.5 ± 0.05
R1	2.7 kΩ		

MRF572, 573 TEST CIRCUIT



PHOTOMASTER OF MRF571 CIRCUIT LAYOUT



PHOTOMASTER OF MRF572, 573 CIRCUIT LAYOUT