

MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

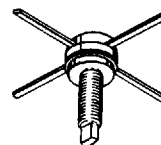
T-33-05

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The RF Line
NPN Silicon
High Frequency Transistor

... designed for broadband class A applications requiring high output, low distortion and low noise. Primarily used in intermediate or output stages of MATV or CATV amplifiers.

- Low Noise — 2.3 dB Typ @ $f = 300$ MHz
- High Output — P_{o1} dB = 27 dBm Typ @ $f = 500$ MHz
- Low Distortion — ITO = 45 dBm Typ @ $f = 500$ MHz

PT4572A
 $I_C = 200$ mA
HIGH FREQUENCY
TRANSISTOR
NPN SILICON

CASE 244D-01, STYLE 1
(TO-117A)
MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	25	Vdc
Collector-Base Voltage	V_{CBO}	40	Vdc
Emitter-Base Voltage	V_{EBO}	3	Vdc
Collector Current — Continuous	I_C	200	mA
Operating Junction Temperature	T_J	200	°C
Storage Temperature Range	T_{stg}	-65 to +200	°C

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ($I_C = 5$ mA, $I_B = 0$)	$V_{(BR)CEO}$	25	—	—	Vdc
Collector-Base Breakdown Voltage ($I_C = 1$ mA, $I_E = 0$)	$V_{(BR)CBO}$	40	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 0.1$ mA, $I_C = 0$)	$V_{(BR)EBO}$	3	—	—	Vdc
Collector Cutoff Current ($V_{CB} = 10$ V, $I_E = 0$)	I_{CBO}	—	—	200	μA

ON CHARACTERISTICS

DC Current Gain ($I_C = 50$ mA, $V_{CE} = 5$ V)	h_{FE}	50	130	300	—
Collector-Emitter Saturation Voltage ($I_C = 100$ mA, $I_C/I_B = 2$)	$V_{CE(sat)}$	—	400	—	mV

DYNAMIC CHARACTERISTICS

Collector-Base Capacitance ($V_{CB} = 8$ V, $I_E = 0$, $f = 1$ MHz)	C_{cb}	—	2.2	—	pF
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FUNCTIONAL TESTS

Noise Figure, Minimum ($V_{CE} = 8$ V, $I_C = 50$ mA, $f = 300$ MHz)	NFMIN	—	2.3	—	dB
Cutoff Frequency ($V_{CE} = 14$ V, $I_C = 90$ mA)	f_T	—	2.5	—	GHz
Maximum Unilateral Gain ($V_{CE} = 14$ V, $I_C = 90$ mA, $f = 300$ MHz)	G_{UMAX}	—	16	—	dB
Insertion Gain ($V_{CE} = 14$ V, $I_C = 90$ mA, $f = 300$ MHz)	$ S_{21} ^2$	—	14	—	dB
Output Power @ 1 dB Compression ($V_{CE} = 14$ V, $I_C = 90$ mA, $f = 500$ MHz)	P_{o1} dB	—	27	—	dBm
Third Order Intercept ($V_{CE} = 14$ V, $I_C = 90$ mA, $f = 500$ MHz)	ITO	—	45	—	dBm

MOTOROLA RF DEVICE DATA

2-1110

TYPICAL CHARACTERISTICS

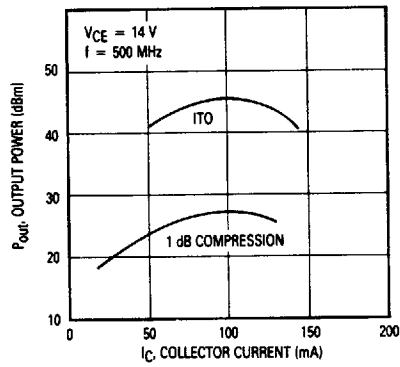


Figure 1. Third Order Intercept and 1 dB Compression

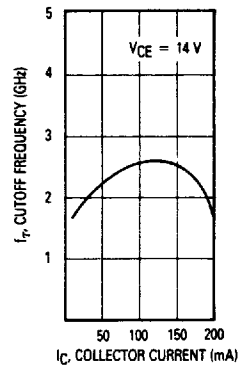


Figure 2. Gain-Bandwidth Product versus Collector Current

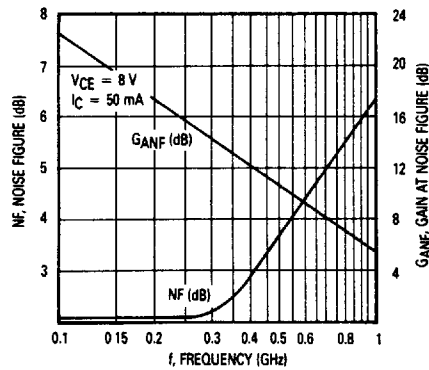
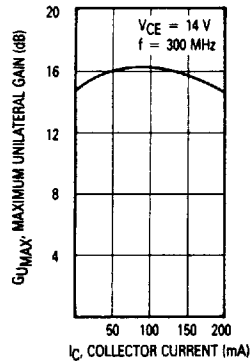


Figure 3. Noise Figure and Associated Gain versus Frequency

Figure 4. G_{UMAX} versus Collector Current

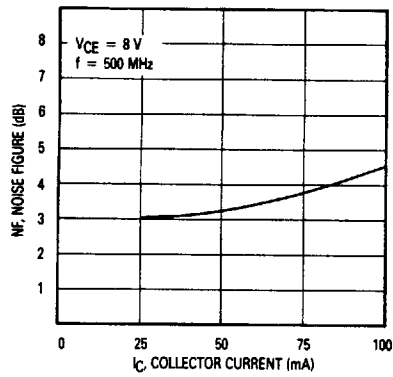


Figure 5. Noise Figure versus Collector Current

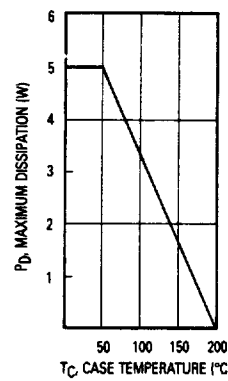


Figure 6. Dissipation versus Temperature

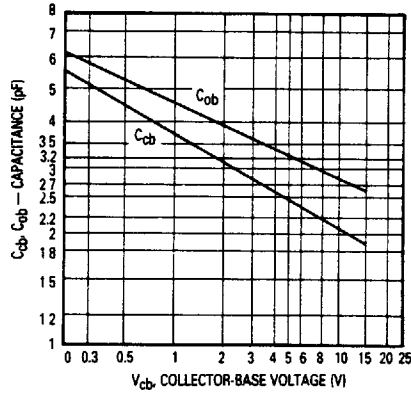


Figure 7. Junction Capacitance versus Voltage

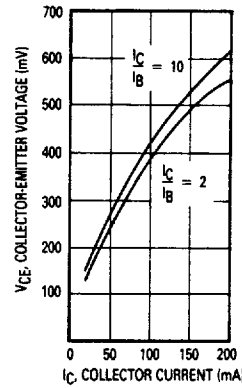


Figure 8. Collector Saturation Characteristics

VCE (Volts)	IC (mA)	f (GHz)	S11		S21		S12		S22	
			Mag	∠φ	Mag	∠φ	Mag	∠φ	Mag	∠φ
8	50	0.1	0.59	-173	12.69	96	0.03	61	0.15	-108
		0.2	0.6	170	7.19	85	0.05	67	0.1	-124
		0.3	0.61	156	4.89	74	0.07	67	0.13	-132
		0.4	0.61	147	3.72	65	0.09	66	0.12	-129
		0.5	0.61	137	2.96	58	0.11	64	0.16	-129
		0.6	0.63	128	2.48	50	0.13	60	0.16	-143
		0.7	0.62	121	2.11	44	0.15	58	0.18	-142
		0.8	0.62	113	1.83	37	0.16	56	0.24	-158
		0.9	0.63	106	1.6	31	0.18	53	0.24	-166
		1	0.62	100	1.42	26	0.2	51	0.25	-170
14	90	0.1	0.6	-177	17.1	84	0.02	66	0.15	-87
		0.2	0.59	167	7.89	76	0.05	71	0.1	-93
		0.3	0.6	157	5.19	69	0.07	71	0.1	-100
		0.4	0.61	148	3.88	63	0.09	70	0.12	-110
		0.5	0.62	138	3.08	57	0.11	68	0.14	-118
		0.6	0.63	130	2.55	50	0.13	66	0.16	-127
		0.7	0.63	124	2.19	45	0.14	63	0.19	-138
		0.8	0.63	115	1.87	39	0.16	61	0.22	-146
		0.9	0.63	108	1.63	34	0.18	59	0.24	-153
		1	0.62	102	1.44	31	0.19	57	0.26	-161

Figure 9. Common Emitter S-Parameters