

T-33-05

MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

RF1030

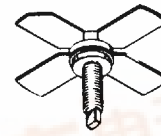
The RF Line
UHF Power Transistor

2

... designed primarily for wideband, large-signal output and driver amplifier stages to 1 GHz.

- Designed for Class A Linear Power Amplifiers
- Specified 25 Volt, 900 MHz Characteristics:
Output Power — 3 Watts
Power Gain — 7.5 dB Min, Class AB
- Gold Metallization for Improved Reliability

TO 1 GHz
3 WATTS
LINEAR
UHF POWER
TRANSISTOR
NPN SILICON



CASE 244C-01, STYLE 1
(.280 SOE)

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V _{CEO}	30	Vdc
Collector-Base Voltage	V _{CBO}	60	Vdc
Emitter-Base Voltage	V _{EBO}	4	Vdc
Total Device Dissipation @ T _C = 25°C Derate above 25°C	P _D	29 0.167	Watts W/°C
Operating Junction Temperature	T _J	200	°C
Storage Temperature Range	T _{stg}	-65 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case (T _C = 70°C)	R _{θJC}	6	°C/W

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage (I _C = 15 mA, I _B = 0)	V _{(BR)CEO}	30	—	—	Vdc
Collector-Emitter Breakdown Voltage (I _C = 15 mA, V _{BE} = 0)	V _{(BR)CES}	60	—	—	Vdc
Collector-Base Breakdown Voltage (I _C = 15 mA, I _E = 0)	V _{(BR)CBO}	60	—	—	Vdc
Emitter-Base Breakdown Voltage (I _E = 5 mA, I _C = 0)	V _{(BR)EBO}	4	—	—	Vdc
Collector Cutoff Current (V _{CB} = 25 V, I _E = 0)	I _{CBO}	—	—	2	mA _{dc}

ON CHARACTERISTICS

DC Current Gain (I _C = 500 mA, V _{CE} = 5 V)	h _{FE}	20	—	80	—
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DYNAMIC CHARACTERISTICS

Output Capacitance (V _{CB} = 28 V, I _E = 0, f = 1 MHz)	C _{ob}	—	—	9.8	pF
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(continued)



ELECTRICAL CHARACTERISTICS — continued

Characteristic	Symbol	Min	Typ	Max	Unit
FUNCTIONAL TESTS					
Common-Emitter Amplifier Power Gain ($V_{CE} = 25\text{ V}$, $P_{out} = 3\text{ W}$, $f = 900\text{ MHz}$, $I_C = 0.4\text{ A}$)	GPE	7.5	8.5	—	dB
Load Mismatch ($V_{CE} = 25\text{ V}$, $I_C = 0.4\text{ A}$, $P_{out} = 3\text{ W}$, $f = 900\text{ MHz}$, Load VSWR = $\infty:1$, All Phase Angles)	ψ	No Degradation in Output Power			

TYPICAL CHARACTERISTICS

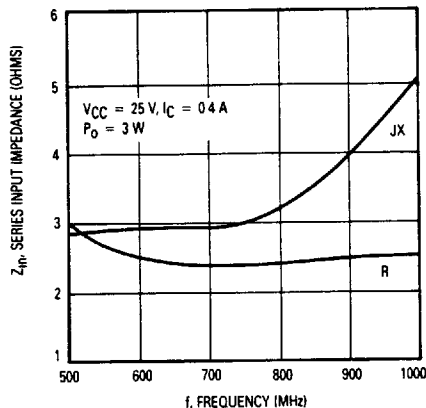


Figure 1. Input Impedance versus Frequency

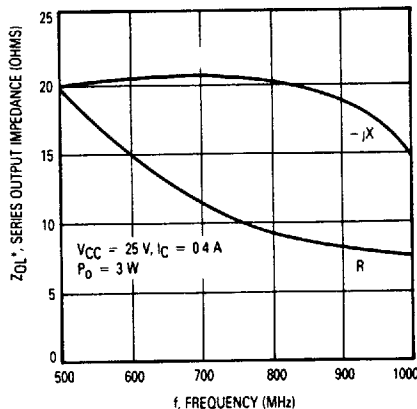


Figure 2. Output Impedance versus Frequency

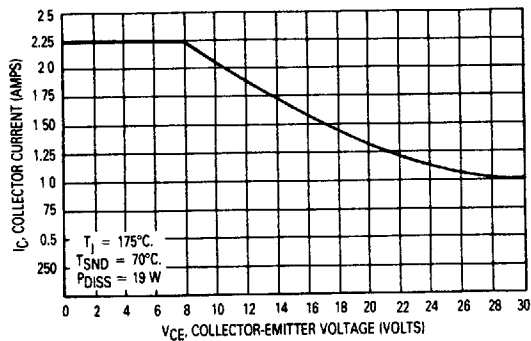


Figure 3. RF Safe Operating Area

VCE (Volts)	Ic (mA)	f (GHz)	S11		S21		S12		S22	
			Mag	$\angle \phi$	Mag	$\angle \phi$	Mag	$\angle \phi$	Mag	$\angle \phi$
25	400	0.4	0.92	178	2.05	73	0.03	48	0.62	-171
		0.45	0.92	177	1.9	81	0.03	46	0.63	-169
		0.5	0.92	176	1.75	80	0.03	48	0.63	170
		0.55	0.92	175	1.57	79	0.04	51	0.63	170
		0.6	0.92	175	1.47	75	0.04	53	0.63	169
		0.65	0.92	174	1.38	74	0.04	57	0.64	170
		0.7	0.92	173	1.25	72	0.04	57	0.64	170
		0.75	0.92	172	1.2	70	0.05	59	0.64	169
		0.8	0.92	172	1.13	68	0.05	62	0.64	170
		0.85	0.91	171	1.05	66	0.05	63	0.64	169
		0.9	0.91	170	1.04	64	0.06	64	0.64	169
0.95	0.91	169	0.96	64	0.06	67	0.65	-169		
1	0.91	168	0.95	61	0.06	66	0.65	-169		

Figure 4. S-Parameters