

MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

T-33-05

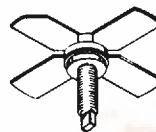
RF1031

The RF Line
UHF Power Transistor

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... 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 — 4.5 Watts
 - Power Gain — 7 dB Min, Class AB
- Gold Metallization for Improved Reliability

TO 1 GHz
4.5 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 (r _{Tc} = 25°C Derate above 25°C)	P _D	50 0.286	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}	3.5	°C/W

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage (I _C = 20 mA, I _B = 0)	V _{(BR)CEO}	30	—	—	Vdc
Collector-Emitter Breakdown Voltage (I _C = 20 mA, V _{BE} = 0)	V _{(BR)CES}	60	—	—	Vdc
Collector-Base Breakdown Voltage (I _C = 20 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}	—	—	2.5	mAdc

ON CHARACTERISTICS

DC Current Gain (I _C = 1 A, 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}	—	—	14	pF
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(continued)

RF1031

MOTOROLA SC (XSTRS/R F)

46E D

6367254 0095161 0

MOT6

T-33-05

ELECTRICAL CHARACTERISTICS — continued

Characteristic	Symbol	Min	Typ	Max	Unit
FUNCTIONAL TESTS					
Common-Emitter Amplifier Power Gain ($V_{CE} = 25 \text{ V}$, $P_{out} = 4.5 \text{ W}$, $f = 900 \text{ MHz}$, $I_C = 0.6 \text{ A}$)	GPE	7	8	—	dB
Load Mismatch ($V_{CE} = 25 \text{ V}$, $I_C = 0.6 \text{ A}$, $P_{out} = 4.5 \text{ W}$, $f = 900 \text{ MHz}$, Load VSWR = $\infty:1$, All Phase Angles)	ψ	No Degradation in Output Power			

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TYPICAL CHARACTERISTICS

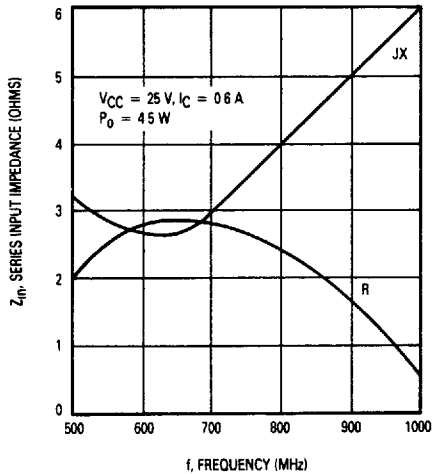


Figure 1. Input Impedance versus Frequency

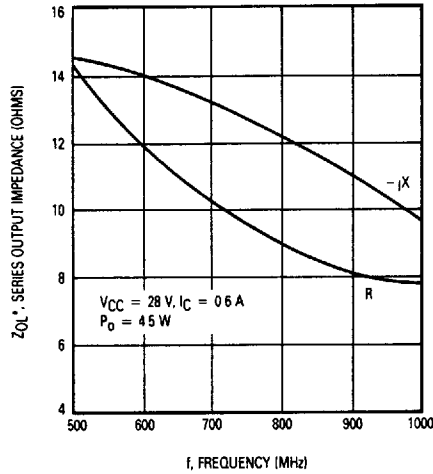


Figure 2. Output Impedance versus Frequency

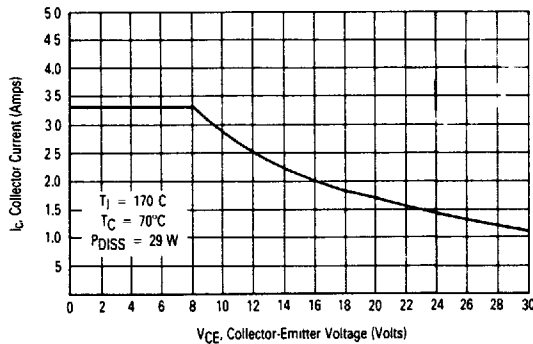


Figure 3. RF Safe Operating Area

VCE (Volts)	I _C (mA)	f (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
			Mag	∠φ	Mag	∠φ	Mag	∠φ	Mag	∠φ
25	500	0.4	0.95	178	1.54	81	0.02	62	0.67	-171
		0.45	0.96	178	1.35	79	0.03	62	0.68	-170
		0.5	0.95	177	1.24	77	0.03	64	0.69	-170
		0.55	0.95	177	1.12	75	0.03	67	0.69	-170
		0.6	0.96	176	1.04	72	0.03	68	0.69	-169
		0.65	0.95	176	0.97	72	0.04	72	0.7	-170
		0.7	0.95	175	0.88	69	0.04	72	0.7	-170
		0.75	0.95	175	0.84	68	0.04	74	0.7	-169
		0.8	0.95	174	0.79	66	0.04	77	0.71	-170
		0.85	0.95	174	0.73	64	0.05	78	0.71	-170
		0.9	0.95	173	0.72	62	0.05	77	0.72	-169
		0.95	0.95	172	0.67	62	0.05	81	0.72	-170
		1	0.95	172	0.65	59	0.05	79	0.72	-169

Figure 4. S-Parameters