MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

RF1029

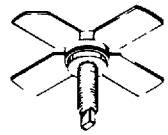
TO 1 GHz
1.5 WATTS
LINEAR
UHF POWER
TRANSISTOR
NPN SILICON

2

The RF Line
UHF Power Transistor

. . . 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 — 1.5 Watts
  Power Gain — 8 dB Min, Class AB
- Gold Metallization for Improved Reliability



.280 SOE
CASE 244C-01, STYLE 1

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	14.5 0.084	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)	$R_{\theta JC}$	12	°C/W

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I_C = 10 mA, I_B = 0)	$V_{(BR)CEO}$	30	—	—	Vdc
Collector-Emitter Breakdown Voltage (I_C = 10 mA, V_{BE} = 0)	$V_{(BR)CES}$	60	—	—	Vdc
Collector-Base Breakdown Voltage (I_C = 10 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}	—	—	1	mAdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 250 mA, V_{CE} = 5 V)	h_{FE}	20	—	80	—
DYNAMIC CHARACTERISTICS					
Output Capacitance (V_{CB} = 28 V, I_E = 0, f = 1 MHz)	C_{ob}	—	—	4.75	pF

(continued)

ELECTRICAL CHARACTERISTICS — continued

Characteristic	Symbol	Min	Typ	Max	Unit
FUNCTIONAL TESTS					
Common Emitter Amplifier Power Gain (V_{CE} = 25 V, P_{out} = 1.5 W, f = 900 MHz, I_C = 0.2 A)	G_{PE}	8	9.3	—	dB
Load Mismatch (V_{CE} = 25 V, I_C = 0.2 A, P_{out} = 1.5 W, f = 900 MHz, Load VSWR = ∞:1, All Phase Angles)	ψ	No Degradation in Output Power			—

TYPICAL CHARACTERISTICS

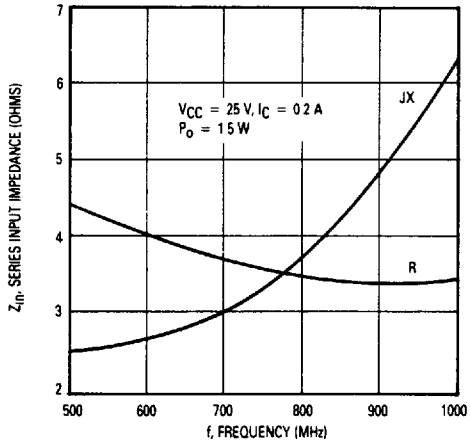


Figure 1. Input Impedance versus Frequency

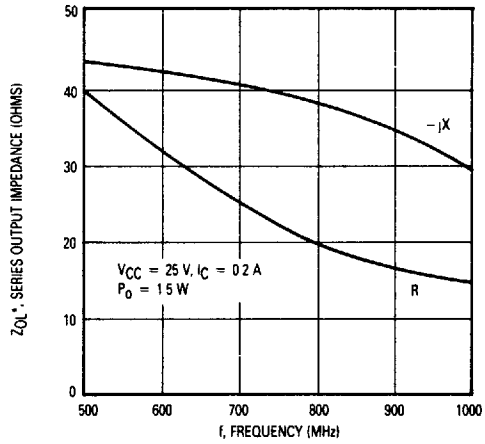


Figure 2. Output Impedance versus Frequency

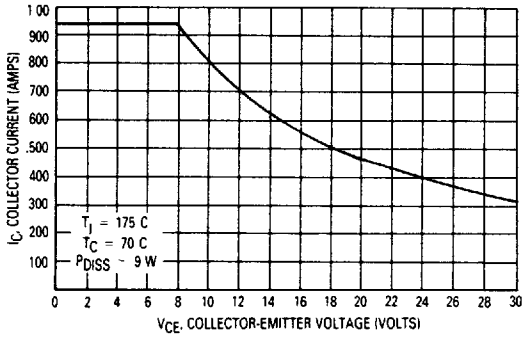


Figure 3. RF Safe Operating Area

V_{CE} (Volts)	I_C (mA)	f (GHz)	S_{11}		S_{21}		S_{12}		S_{22}	
			Mag	∠φ	Mag	∠φ	Mag	φ	Mag	φ
25	200	0.4	0.86	178	10.43	74	0.04	35	0.43	-143
		0.45	0.86	177	9.7	80	0.04	32	0.41	149
		0.5	0.86	175	9.03	78	0.04	35	0.41	151
		0.55	0.86	174	8.11	76	0.05	37	0.42	150
		0.6	0.86	172	7.46	72	0.05	38	0.43	149
		0.65	0.86	171	6.9	71	0.05	41	0.43	151
		0.7	0.86	170	6.04	69	0.05	41	0.43	150
		0.75	0.85	168	5.71	66	0.05	43	0.45	149
		0.8	0.85	167	5.16	64	0.05	46	0.45	150
		0.85	0.85	165	4.48	61	0.06	47	0.46	149
		0.9	0.85	164	4.36	59	0.06	49	0.47	148
		0.95	0.85	162	3.64	56	0.06	51	0.47	149
		1	0.84	160	3.48	54	0.06	51	0.48	148

Figure 4. S-Parameters