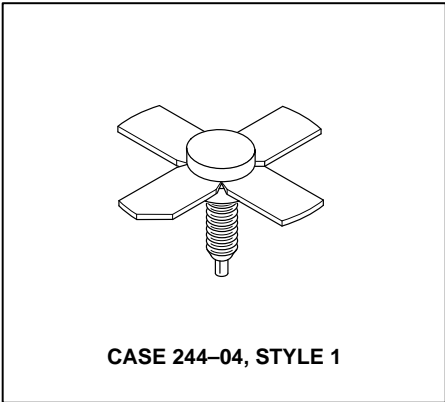


The RF Line NPN Silicon RF Power Transistor

... designed for 12.5 Volt UHF large-signal amplifier applications in industrial and commercial FM equipment operating to 512 MHz.

- Specified 12.5 Volt, 512 MHz Characteristics
 - Output Power = 15 W
 - Minimum Gain = 7.8 dB
 - Efficiency = 55%
- Built-In Matching Network for Broadband Operation
- Gold Metallized, Emitter Ballasted for Long Life and Reliability
- Capable of 20:1 VSWR Load Mismatch at 15.5 V Supply Voltage
- Circuit board photomaster available upon request by contacting RF Tactical Marketing in Phoenix, AZ.



MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	16	Vdc
Collector-Base Voltage	V_{CBO}	36	Vdc
Emitter-Base Voltage	V_{EBO}	4.0	Vdc
Collector Current — Continuous	I_C	4.0	Adc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	44 0.25	Watts W/ $^\circ\text{C}$
Storage Temperature Range	T_{stg}	-65 to +150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	4.0	$^\circ\text{C}/\text{W}$

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
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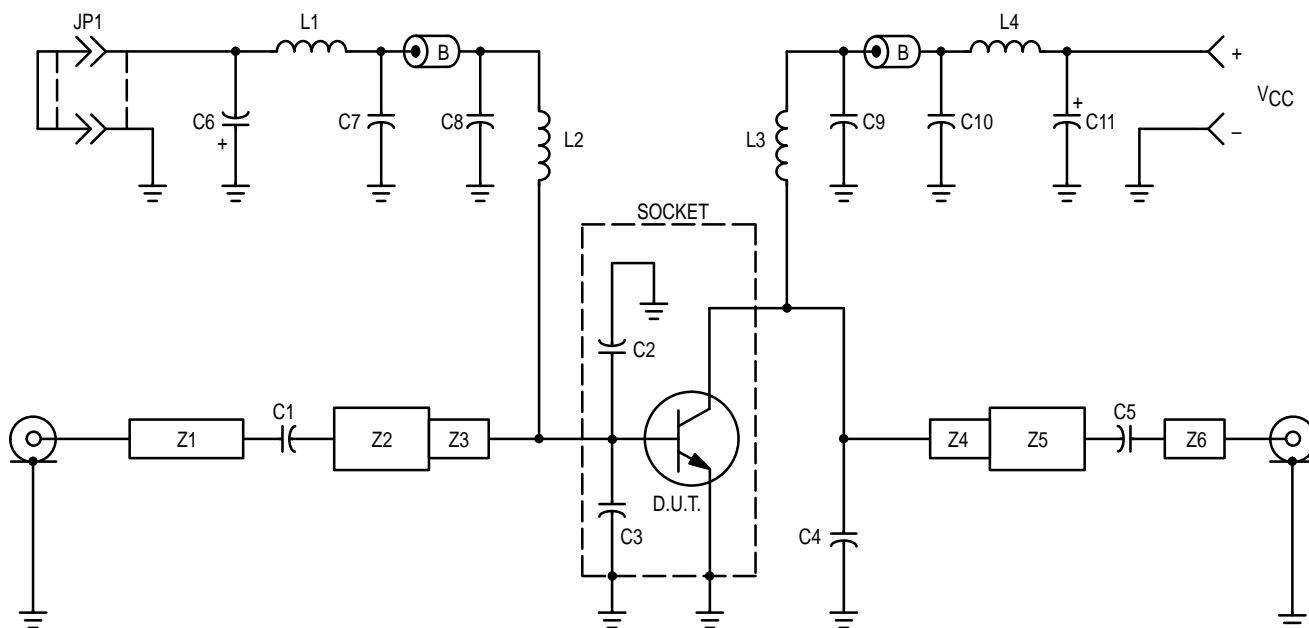
OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ($I_C = 25 \text{ mAdc}$, $I_B = 0$)	$V_{(BR)CEO}$	16	—	—	Vdc
Collector-Emitter Breakdown Voltage ($I_C = 25 \text{ mAdc}$, $V_{BE} = 0$)	$V_{(BR)CES}$	36	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 5.0 \text{ mAdc}$, $I_C = 0$)	$V_{(BR)EBO}$	4.0	—	—	Vdc
Collector-Cutoff Current ($V_{CE} = 15 \text{ Vdc}$, $V_{BE} = 0$)	I_{CES}	—	—	2.0	mAdc

(continued)

ELECTRICAL CHARACTERISTICS — continued ($T_C = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS					
DC Current Gain ($I_C = 1.0 \text{ Adc}$, $V_{CE} = 5.0 \text{ Vdc}$)	h_{FE}	20	—	120	—
DYNAMIC CHARACTERISTICS					
Output Capacitance ($V_{CB} = 15 \text{ Vdc}$, $I_E = 0$, $f = 1.0 \text{ MHz}$)	C_{ob}	—	31	45	pF
FUNCTIONAL TESTS					
Common-Emitter Amplifier Power Gain ($V_{CC} = 12.5 \text{ Vdc}$, $P_{out} = 15 \text{ W}$, $f = 512 \text{ MHz}$)	G_{pe}	7.8	8.8	—	dB
Collector Efficiency ($V_{CC} = 12.5 \text{ Vdc}$, $P_{out} = 15 \text{ W}$, $f = 512 \text{ MHz}$)	η	55	63	—	%
Load Mismatch Stress ($V_{CC} = 15.5 \text{ Vdc}$, $f = 512 \text{ MHz}$, $P_{in} = 3.0 \text{ W}$, $V_{SWR} = 20:1$, All Phase Angles)	ψ	No Degradation in Output Power			



- C1, C5 — 68 pF Mini-Unelco
- C2, C3 — 33 pF, Mini-Unelco
- C4 — 47 pF, Mini-Unelco
- C6, C11 — 10 μF , 25 V Tantalum
- C7, C10 — 0.1 μF , Ceramic
- C8, C9 — 91 pF, Mini-Unelco
- L1, L4 — 4-1/2 Turns, #18 AWG, Enamel Covered, 0.16" ID
- L2, L3 — 2 Turns, #18 AWG Enamel Covered, 0.16" ID
- B — Ferrite Bead, Ferroxcube 56-590-65-3B
- Z1-Z6 — See PCB Artwork
- PCB — 1/32" G-10, $\epsilon_r = 4.5$ @ UHF
- Socket — See Socket Drawings
- JP1 — Jumper, #14 AWG w/Banana Plugs

Figure 1. 440-512 MHz Broadband Test Circuit

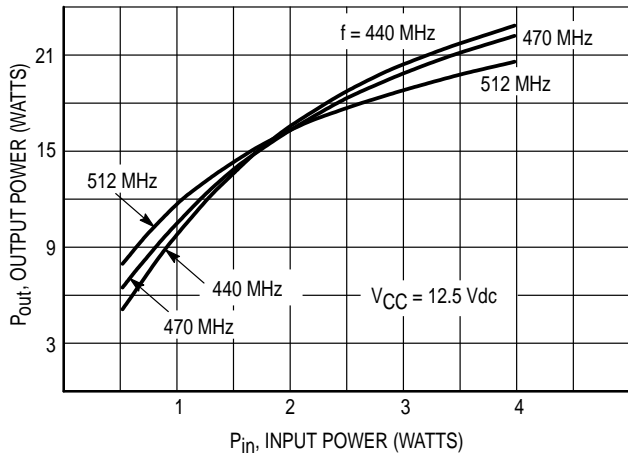


Figure 2. Output Power versus Input Power

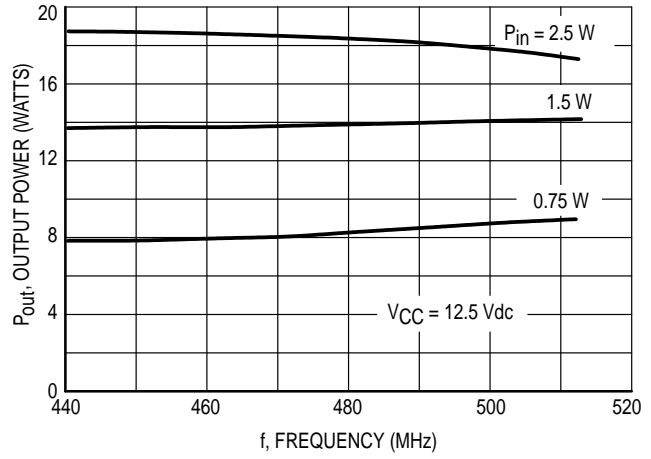


Figure 3. Output Power versus Frequency

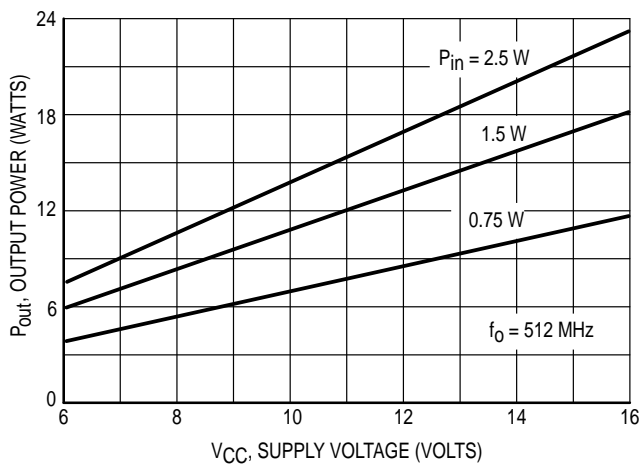


Figure 4. Power Output versus Supply Voltage

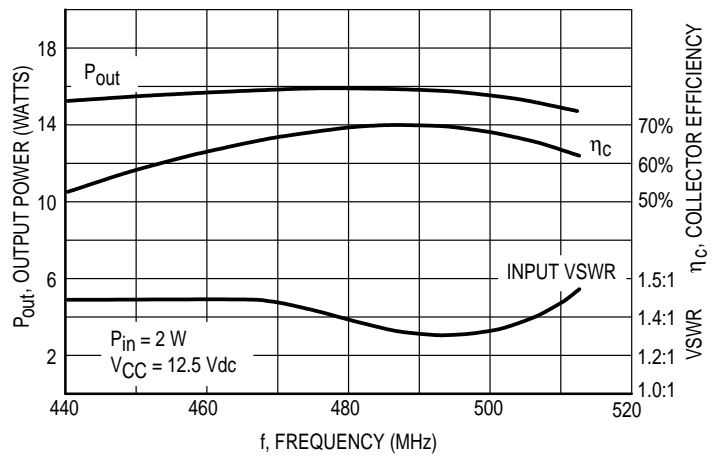


Figure 5. Typical Broadband Circuit Performance

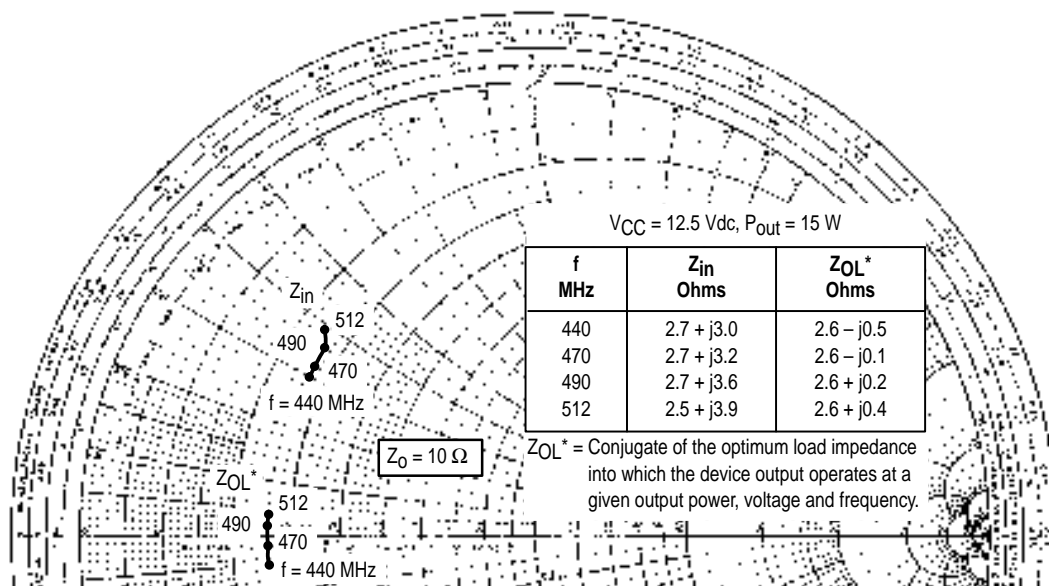
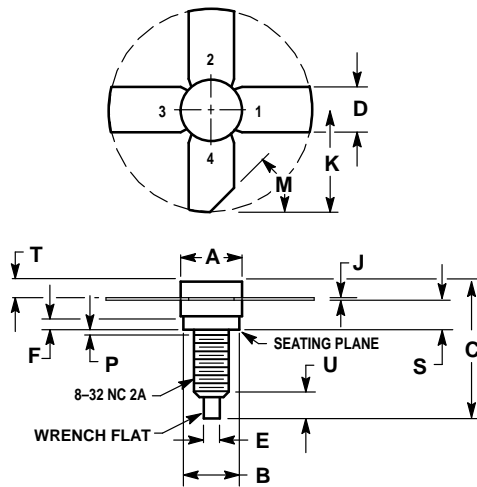


Figure 6. Series Equivalent Input and Output Impedance

PACKAGE DIMENSIONS



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	7.06	7.26	0.278	0.286
B	6.20	6.50	0.244	0.256
C	14.99	16.51	0.590	0.650
D	5.46	5.96	0.215	0.235
E	1.40	1.65	0.055	0.065
G	1.52	—	0.060	—
J	0.08	0.17	0.003	0.007
K	11.05	—	0.435	—
M	45° NOM		45° NOM	
P	—	1.27	—	0.050
S	3.00	3.25	0.118	0.128
T	1.40	1.77	0.055	0.070
U	2.92	3.68	0.115	0.145

STYLE 1:
 PIN 1. EMITTER
 2. BASE
 3. EMITTER
 4. COLLECTOR

CASE 244-04 ISSUE J

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