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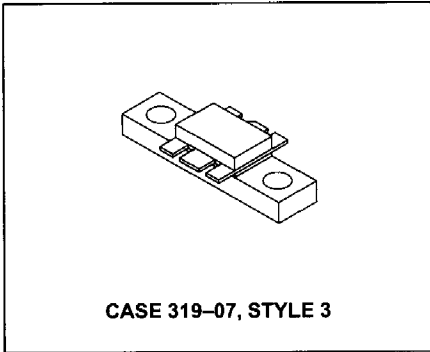
**The RF MOSFET Line**  
**RF Power Field Effect Transistor**  
**N-Channel Enhancement-Mode**

Designed for broadband commercial and industrial applications at frequencies to 520 MHz. The high gain and broadband performance of this device makes it ideal for large-signal, common source amplifier applications in 12.5 volt mobile, and base station FM equipment.

- Guaranteed Performance at 512 MHz, 12.5 Volts  
 Output Power — 15 Watts  
 Power Gain — 10 dB Min  
 Efficiency — 50% Min
- Characterized with Series Equivalent Large-Signal Impedance Parameters
- S-Parameter Characterization at High Bias Levels
- Excellent Thermal Stability
- All Gold Metal for Ultra Reliability
- Capable of Handling 20:1 VSWR, @ 15.5 Vdc, 512 MHz, 2 dB Overdrive
- Circuit board photomaster available upon request by contacting RF Tactical Marketing in Phoenix, AZ.



**15 W, 512 MHz, 12.5 VOLTS**  
**N-CHANNEL BROADBAND**  
**RF POWER FET**



**MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DSS</sub>	36	Vdc
Drain-Gate Voltage (RGS = 1 MΩ)	V <sub>DGR</sub>	36	Vdc
Gate-Source Voltage	V <sub>GS</sub>	± 20	Vdc
Drain Current — Continuous	I <sub>D</sub>	6	Adc
Total Device Dissipation @ T <sub>C</sub> = 25°C Derate above 25°C	P <sub>D</sub>	50 0.29	Watts W/°C
Storage Temperature Range	T <sub>stg</sub>	- 65 to +150	°C
Operating Junction Temperature	T <sub>J</sub>	200	°C

**THERMAL CHARACTERISTICS**

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	R <sub>θJC</sub>	3.5	°C/W

**ELECTRICAL CHARACTERISTICS** (T<sub>C</sub> = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
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**OFF CHARACTERISTICS**

Drain-Source Breakdown Voltage (V <sub>GS</sub> = 0, I <sub>D</sub> = 5 mAdc)	V <sub>(BR)DSS</sub>	36	—	—	Vdc
Zero Gate Voltage Drain Current (V <sub>DS</sub> = 15 Vdc, V <sub>GS</sub> = 0)	I <sub>DSS</sub>	—	—	5	mAdc
Gate-Source Leakage Current (V <sub>GS</sub> = 20 Vdc, V <sub>DS</sub> = 0)	I <sub>GSS</sub>	—	—	2	μAdc

(continued)



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

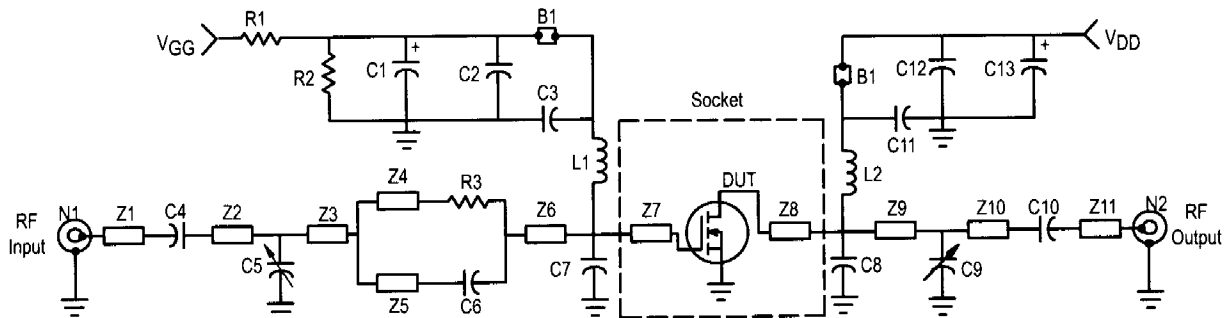
Characteristic	Symbol	Min	Typ	Max	Unit
Gate Threshold Voltage ( $V_{DS} = 10\text{ Vdc}$ , $I_D = 10\text{ mA}$ )	$V_{GS(th)}$	1.25	2.3	3.5	Vdc
Drain-Source On-Voltage ( $V_{GS} = 10\text{ Vdc}$ , $I_D = 1\text{ Adc}$ )	$V_{DS(on)}$	—	—	0.375	Vdc
Forward Transconductance ( $V_{DS} = 10\text{ Vdc}$ , $I_D = 1\text{ Adc}$ )	$g_{fs}$	1.2	—	—	S

**DYNAMIC CHARACTERISTICS**

Input Capacitance ( $V_{DS} = 12.5\text{ Vdc}$ , $V_{GS} = 0$ , $f = 1\text{ MHz}$ )	$C_{iss}$	—	33	—	pF
Output Capacitance ( $V_{DS} = 12.5\text{ Vdc}$ , $V_{GS} = 0$ , $f = 1\text{ MHz}$ )	$C_{oss}$	—	74	—	pF
Reverse Transfer Capacitance ( $V_{DS} = 12.5\text{ Vdc}$ , $V_{GS} = 0$ , $f = 1\text{ MHz}$ )	$C_{rss}$	7	8.8	10.8	pF

**FUNCTIONAL TESTS** (In Motorola Test Fixture)

Common-Source Amplifier Power Gain ( $V_{DD} = 12.5\text{ Vdc}$ , $P_{out} = 15\text{ W}$ , $I_{DQ} = 100\text{ mA}$ )	$f = 512\text{ MHz}$ $f = 175\text{ MHz}$	$G_{ps}$	10 —	11.5 15	— —	dB
Drain Efficiency ( $V_{DD} = 12.5\text{ Vdc}$ , $P_{out} = 15\text{ W}$ , $I_{DQ} = 100\text{ mA}$ )	$f = 512\text{ MHz}$ $f = 175\text{ MHz}$	$\eta$	50 —	55 55	— —	%
Load Mismatch ( $V_{DD} = 15.5\text{ Vdc}$ , 2 dB Overdrive, $f = 512\text{ MHz}$ , Load VSWR = 20:1, All Phase Angles at Frequency of Test)		$\psi$	No Degradation in Output Power			



B1, B2	Ferrite Bead, Fair Rite Products	R3	160 $\Omega$ , 0.1 W Chip
C1, C13	10 $\mu\text{F}$ , 50 V, Electrolytic	Z1, Z11	Transmission Line*
C2, C12	0.1 $\mu\text{F}$ , Chip Capacitor	Z2	Transmission Line*
C3, C4, C10, C11	120 pF, Chip Capacitor	Z3	Transmission Line*
C5, C9	0 to 20 pF, Trimmer Capacitor	Z4	Transmission Line*
C6	36 pF, Chip Capacitor	Z5	Transmission Line*
C7	43 pF, Chip Capacitor	Z6	Transmission Line*
C8	30 pF, Chip Capacitor	Z7, Z8	Transmission Line+
L1, L2	7 Turns, 24 AWG 0.116" ID	Z9	Transmission Line*
N1, N2	Type N Flange Mount	Z10	Transmission Line*
R1	1 k $\Omega$ , 1/4 W, Carbon	Board	Glass Teflon® 0.060"
R2	470 k $\Omega$ , 1/4 W, Carbon		+ Part of Capacitor Mount Socket
			*See Photomaster

**Figure 1. 512 MHz Narrowband Test Circuit Electrical Schematic**