

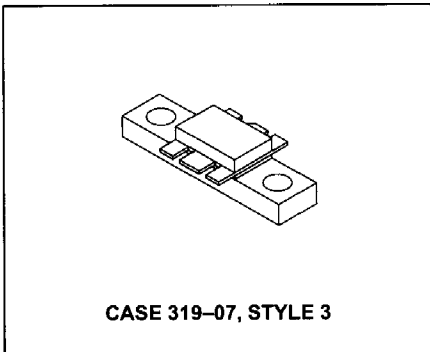
The RF MOSFET Line
RF Power Field Effect Transistor
N-Channel Enhancement-Mode

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 _{DSS}	36	Vdc
Drain-Gate Voltage (RGS = 1 MΩ)	V _{DGR}	36	Vdc
Gate-Source Voltage	V _{GS}	± 20	Vdc
Drain Current — Continuous	I _D	6	Adc
Total Device Dissipation @ T _C = 25°C Derate above 25°C	P _D	50 0.29	Watts W/°C
Storage Temperature Range	T _{stg}	- 65 to +150	°C
Operating Junction Temperature	T _J	200	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	R _{θJC}	3.5	°C/W

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Drain-Source Breakdown Voltage (V _{GS} = 0, I _D = 5 mAdc)	V _{(BR)DSS}	36	—	—	Vdc
Zero Gate Voltage Drain Current (V _{DS} = 15 Vdc, V _{GS} = 0)	I _{DSS}	—	—	5	mAdc
Gate-Source Leakage Current (V _{GS} = 20 Vdc, V _{DS} = 0)	I _{GSS}	—	—	2	μAdc

(continued)



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

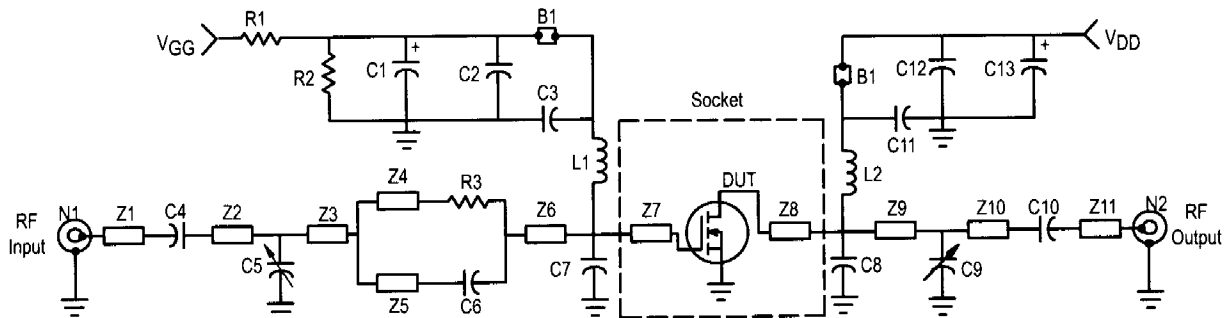
Characteristic	Symbol	Min	Typ	Max	Unit
Gate Threshold Voltage ($V_{DS} = 10\text{ Vdc}$, $I_D = 10\text{ mAdc}$)	$V_{GS(th)}$	1.25	2.3	3.5	Vdc
Drain-Source On-Voltage ($V_{GS} = 10\text{ Vdc}$, $I_D = 1\text{ Adc}$)	$V_{DS(on)}$	—	—	0.375	Vdc
Forward Transconductance ($V_{DS} = 10\text{ Vdc}$, $I_D = 1\text{ Adc}$)	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 ($V_{DD} = 12.5\text{ Vdc}$, $P_{out} = 15\text{ W}$, $I_{DQ} = 100\text{ mA}$)	$f = 512\text{ MHz}$ $f = 175\text{ MHz}$	η	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)		ψ	No Degradation in Output Power			



B1, B2	Ferrite Bead, Fair Rite Products	R3	160 Ω , 0.1 W Chip
C1, C13	10 μF , 50 V, Electrolytic	Z1, Z11	Transmission Line*
C2, C12	0.1 μF , 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 Ω , 1/4 W, Carbon	Board	Glass Teflon® 0.060"
R2	470 k Ω , 1/4 W, Carbon		+ Part of Capacitor Mount Socket
			*See Photomaster

Figure 1. 512 MHz Narrowband Test Circuit Electrical Schematic