

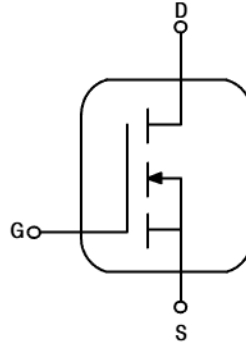
Replaced by MRF1517NT1. There are no form, fit or function changes with this part replacement. N suffix added to part number to indicate transition to lead-free terminations.

## RF Power Field Effect Transistor

### N-Channel Enhancement-Mode Lateral MOSFET

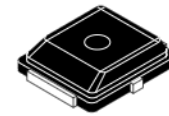
The MRF1517 is designed for broadband commercial and industrial applications at frequencies to 520 MHz. The high gain and broadband performance of this device makes it ideal for large-signal, common source amplifier applications in 7.5 volt portable FM equipment.

- Specified Performance @ 520 MHz, 7.5 Volts  
 Output Power — 8 Watts  
 Power Gain — 11 dB  
 Efficiency — 55%
- Characterized with Series Equivalent Large-Signal Impedance Parameters
- Excellent Thermal Stability
- Capable of Handling 20:1 VSWR, @ 9.5 Vdc, 520 MHz, 2 dB Overdrive
- Broadband UHF/VHF Demonstration Amplifier Information Available Upon Request
- Available in Tape and Reel.  
 T1 Suffix = 1,000 Units per 12 mm, 7 Inch Reel.



**MRF1517T1**

**520 MHz, 8 W, 7.5 V  
 LATERAL N-CHANNEL  
 BROADBAND  
 RF POWER MOSFET**



**CASE 466-03, STYLE 1  
 PLD-1.5  
 PLASTIC**

ARCHIVE INFORMATION

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**Table 1. Maximum Ratings**

Rating	Symbol	Value	Unit
Drain-Source Voltage (1)	V <sub>DSS</sub>	-0.5, +25	Vdc
Gate-Source Voltage	V <sub>GS</sub>	±20	Vdc
Drain Current — Continuous	I <sub>D</sub>	4	Adc
Total Device Dissipation @ T <sub>C</sub> = 25°C (2) Derate above 25°C	P <sub>D</sub>	62.5 0.50	W W/°C
Storage Temperature Range	T <sub>stg</sub>	- 65 to +150	°C
Operating Junction Temperature	T <sub>J</sub>	150	°C

**Table 2. Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case	R <sub>θJC</sub>	2	°C/W

**Table 3. Moisture Sensitivity Level**

Test Methodology	Rating	Package Peak Temperature	Unit
Per JESD 22-A113, IPC/JEDEC J-STD-020	1	260	°C

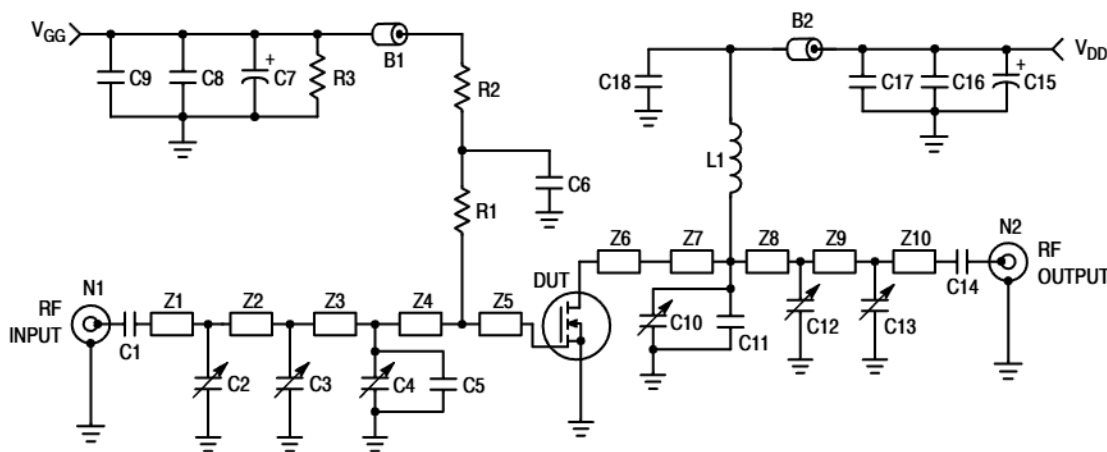
1. Not designed for 12.5 volt applications.

2. Calculated based on the formula  $P_D = \frac{T_J - T_C}{R_{\theta JC}}$

**NOTE - CAUTION** - MOS devices are susceptible to damage from electrostatic charge. Reasonable precautions in handling and packaging MOS devices should be observed.

**Table 4. Electrical Characteristics** ( $T_C = 25^\circ\text{C}$  unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>Off Characteristics</b>					
Zero Gate Voltage Drain Current ( $V_{DS} = 35\text{ Vdc}$ , $V_{GS} = 0$ )	$I_{DSS}$	—	—	1	$\mu\text{Adc}$
Gate-Source Leakage Current ( $V_{GS} = 10\text{ Vdc}$ , $V_{DS} = 0$ )	$I_{GSS}$	—	—	1	$\mu\text{Adc}$
<b>On Characteristics</b>					
Gate Threshold Voltage ( $V_{DS} = 7.5\text{ Vdc}$ , $I_D = 120\ \mu\text{Adc}$ )	$V_{GS(th)}$	1.0	1.7	2.1	Vdc
Drain-Source On-Voltage ( $V_{GS} = 10\text{ Vdc}$ , $I_D = 1\text{ Adc}$ )	$V_{DS(on)}$	—	0.5	—	Vdc
Forward Transconductance ( $V_{DS} = 10\text{ Vdc}$ , $I_D = 2\text{ Adc}$ )	$g_{fs}$	0.9	—	—	S
<b>Dynamic Characteristics</b>					
Input Capacitance ( $V_{DS} = 7.5\text{ Vdc}$ , $V_{GS} = 0$ , $f = 1\text{ MHz}$ )	$C_{iss}$	—	66	—	pF
Output Capacitance ( $V_{DS} = 7.5\text{ Vdc}$ , $V_{GS} = 0$ , $f = 1\text{ MHz}$ )	$C_{oss}$	—	38	—	pF
Reverse Transfer Capacitance ( $V_{DS} = 7.5\text{ Vdc}$ , $V_{GS} = 0$ , $f = 1\text{ MHz}$ )	$C_{rss}$	—	6	—	pF
<b>Functional Tests</b> (In Freescale Test Fixture)					
Common-Source Amplifier Power Gain ( $V_{DD} = 7.5\text{ Vdc}$ , $P_{out} = 8\text{ Watts}$ , $I_{DQ} = 150\text{ mA}$ , $f = 520\text{ MHz}$ )	$G_{ps}$	10	11	—	dB
Drain Efficiency ( $V_{DD} = 7.5\text{ Vdc}$ , $P_{out} = 8\text{ Watts}$ , $I_{DQ} = 150\text{ mA}$ , $f = 520\text{ MHz}$ )	$\eta$	50	55	—	%



B1, B2	Short Ferrite Bead, Fair Rite Products (2743021446)	R1	15 $\Omega$ , 0805 Chip Resistor
C1	300 pF, 100 mil Chip Capacitor	R2	1.0 k $\Omega$ , 1/8 W Resistor
C2, C3, C4, C10,	0 to 20 pF, Trimmer Capacitor	R3	33 k $\Omega$ , 1/2 W Resistor
C12, C13	43 pF, 100 mil Chip Capacitor	Z1	0.315" x 0.080" Microstrip
C5, C11	120 pF, 100 mil Chip Capacitor	Z2	1.415" x 0.080" Microstrip
C6, C18	10 $\mu\text{F}$ , 50 V Electrolytic Capacitor	Z3	0.322" x 0.080" Microstrip
C7, C15	0.1 $\mu\text{F}$ , 100 mil Chip Capacitor	Z4	0.022" x 0.080" Microstrip
C8, C16	1,000 pF, 100 mil Chip Capacitor	Z5, Z6	0.260" x 0.223" Microstrip
C9, C17	330 pF, 100 mil Chip Capacitor	Z7	0.050" x 0.080" Microstrip
C14	55.5 nH, 5 Turn, Coilcraft	Z8	0.625" x 0.080" Microstrip
L1	Type N Flange Mount	Z9	0.800" x 0.080" Microstrip
N1, N2		Z10	0.589" x 0.080" Microstrip
		Board	Glass Teflon <sup>®</sup> , 31 mils, 2 oz. Copper

**Figure 1. 480 - 520 MHz Broadband Test Circuit**