

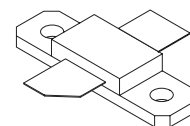
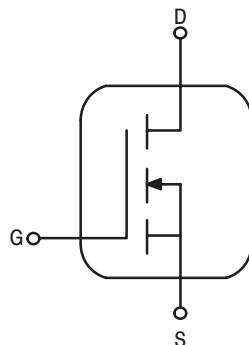
The RF MOSFET Line
RF Power Field Effect Transistors
N-Channel Enhancement-Mode Lateral MOSFETs

MRF373R1
MRF373SR1

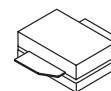
470 – 860 MHz, 60 W, 28 V
LATERAL N-CHANNEL
BROADBAND
RF POWER MOSFETS

Designed for broadband commercial and industrial applications with frequencies from 470 – 860 MHz. The high gain and broadband performance of these devices make them ideal for large-signal, common source amplifier applications in 28 volt transmitter equipment.

- Guaranteed CW Performance at 860 MHz, 28 Volts, Narrowband Fixture
Output Power – 60 Watts
Power Gain – 13 dB
Efficiency – 50%
- Typical Performance at 860 MHz, 28 Volts, Broadband Push-Pull Fixture
Output Power – 100 Watts (PEP)
Power Gain – 11.2 dB
Efficiency – 40%
IMD – -30 dBc
- Excellent Thermal Stability
- 100% Tested for Load Mismatch Stress at All Phase Angles with 5:1 VSWR @ 28 Vdc, 860 MHz, 60 Watts CW
- In Tape and Reel. R1 = 500 units per 32 mm, 13 inch Reel.



CASE 360B-05, STYLE 1
NI-360
MRF373R1



CASE 360C-05, STYLE 1
NI-360S
MRF373SR1

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	65	Vdc
Gate-Source Voltage	V _{GS}	±20	Vdc
Drain Current – Continuous	I _D	7	Adc
Total Device Dissipation @ T _C = 25°C Derate above 25°C	P _D	173 1.33	W 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}	0.75	°C/W
Thermal Resistance, Junction to Case	R _{θJC}	1	°C/W

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

ARCHIVED 2005

LIFETIME BUY

LAST SHIP 31JAN05
LAST ORDER 31JUL04

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

Characteristic	Symbol	Min	Typ	Max	Unit
----------------	--------	-----	-----	-----	------

OFF CHARACTERISTICS

Drain-Source Breakdown Voltage ($V_{GS} = 0 \text{ Vdc}, I_D = 1 \mu\text{A}$)	$V_{(BR)DSS}$	65	-	-	Vdc
Zero Gate Voltage Drain Current ($V_{DS} = 28 \text{ Vdc}, V_{GS} = 0 \text{ Vdc}$)	I_{DSS}	-	-	1	μAdc
Gate-Source Leakage Current ($V_{GS} = 20 \text{ Vdc}, V_{DS} = 0 \text{ Vdc}$)	I_{GSS}	-	-	1	μAdc

ON CHARACTERISTICS

Gate Threshold Voltage ($V_{DS} = 10 \text{ V}, I_D = 200 \mu\text{A}$)	$V_{GS(th)}$	2	3	4	Vdc
Gate Quiescent Voltage ($V_{DS} = 28 \text{ V}, I_D = 100 \text{ mA}$)	$V_{GS(Q)}$	3	4	5	Vdc
Drain-Source On-Voltage ($V_{GS} = 10 \text{ V}, I_D = 3 \text{ A}$)	$V_{DS(on)}$	-	0.6	0.8	Vdc
Forward Transconductance ($V_{DS} = 10 \text{ V}, I_D = 3 \text{ A}$)	g_{fs}	2.2	2.9	-	S

DYNAMIC CHARACTERISTICS

Input Capacitance ($V_{DS} = 28 \text{ V}, V_{GS} = 0, f = 1 \text{ MHz}$)	C_{iss}	-	79	-	pF
Output Capacitance ($V_{DS} = 28 \text{ V}, V_{GS} = 0, f = 1 \text{ MHz}$)	C_{oss}	-	46	-	pF
Reverse Transfer Capacitance ($V_{DS} = 28 \text{ V}, V_{GS} = 0, f = 1 \text{ MHz}$)	C_{rss}	-	4	-	pF

FUNCTIONAL CHARACTERISTICS, CW Operation

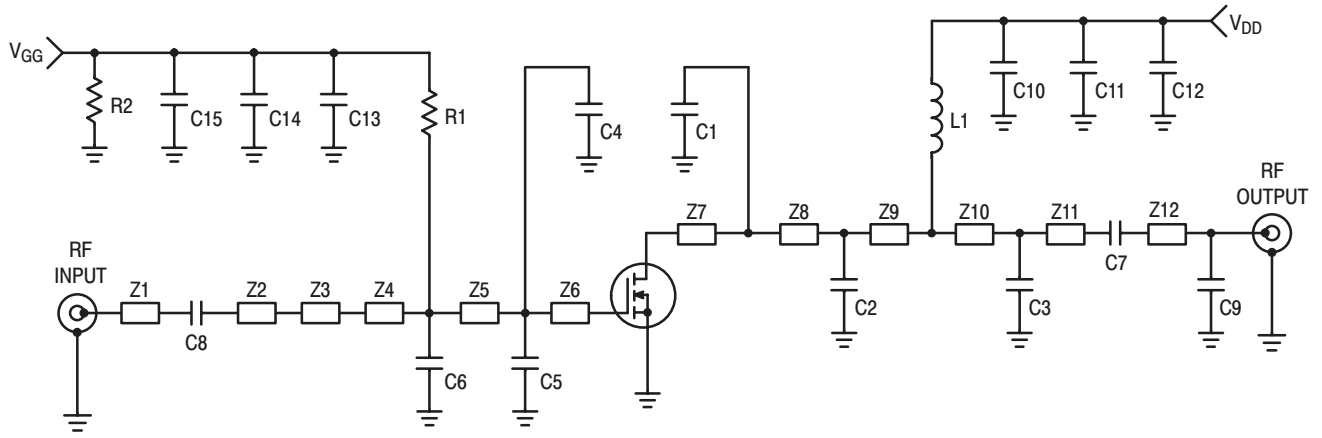
Common Source Power Gain ($V_{DD} = 28 \text{ V}, P_{out} = 60 \text{ W}, I_{DQ} = 200 \text{ mA}, f = 860 \text{ MHz}$)	G_{ps}	13	14.7	-	dB
Drain Efficiency ($V_{DD} = 28 \text{ V}, P_{out} = 60 \text{ W}, I_{DQ} = 200 \text{ mA}, f = 860 \text{ MHz}$)	η	50	54	-	%
Load Mismatch ($V_{DD} = 28 \text{ V}, P_{out} = 60 \text{ W}, I_{DQ} = 200 \text{ mA}, f = 860 \text{ MHz}$, Load VSWR at 5:1 at All Phase Angles)	ψ	No Degradation in Output Power			

TYPICAL CHARACTERISTICS, 2 Tone Operation, Push Pull Configuration (MRF373SR1), Broadband Fixture

Common Source Power Gain ($V_{DD} = 28 \text{ Vdc}, P_{out} = 100 \text{ W PEP}, I_{DQ} = 400 \text{ mA}$, $f_1 = 860.0 \text{ MHz}, f_2 = 866 \text{ MHz}$)	G_{ps}	-	11.2	-	dB
Drain Efficiency ($V_{DD} = 28 \text{ Vdc}, P_{out} = 100 \text{ W PEP}, I_{DQ} = 400 \text{ mA}$, $f_1 = 860.0 \text{ MHz}, f_2 = 866 \text{ MHz}$)	η	-	40	-	%
Third Order Intermodulation Distortion ($V_{DD} = 28 \text{ Vdc}, P_{out} = 100 \text{ W PEP}, I_{DQ} = 400 \text{ mA}$, $f_1 = 860.0 \text{ MHz}, f_2 = 866 \text{ MHz}$)	IMD	-	-30	-	dBc

ARCHIVED 2005
LIFETIME BUY

LAST SHIP 31JAN05
LAST ORDER 31JUL04



- | | | | |
|------------|---|---------------------|---|
| C1 | 4.7 pF, B Case Chip Capacitor, ATC | Connectors | N-Type (female), M/A Com P/N 3052-1648-10 |
| C2 | 15 pF, B Case Chip Capacitor, ATC | PCB | MRF373 Printed Circuit Board Rev 01, CuClad 250 (GX-0300-55), height 30 mils, $\epsilon_r = 2.55$ |
| C3 | 6.8 pF, B Case Chip Capacitor, ATC | Heatsink | Motorola P/N 95-11LDMOSKPS-1 |
| C4, C5, C6 | 10 pF, B Case Chip Capacitor, ATC | LDMOS | $\mu 250$ 3" x 5" Bedstead |
| C7, C8 | 47 pF, B Case Chip Capacitor, ATC | Insert | Motorola P/N 95-11LDMOSKPS-2 |
| C9 | 0.2 pF, B Case Chip Capacitor, ATC | Insert for LDMOS | $\mu 250$ 3" x 5" Bedstead |
| C10, C13 | 300 pF, B Case Chip Capacitor, ATC, Side Mounted | End Plates | 2) Motorola P/N 93-3MB-9, End Plate for Type-N Connector |
| C11 | 2) 2.2 μ F, 50 V, Kemet P/N C1825C225 | Banana Jack and Nut | |
| C12 | 22 μ F, 50 V, Kemet P/N T491D226K50AS | Brass Banana Jack | 2) Johnson P/N 108-0904-001 |
| C14 | 2) 1.0 μ F, 50 V, Kemet P/N C1825C105 | | |
| C15 | 10 μ F, 35 V, Kemet P/N T491D106K35AS | | |
| L1 | 22 nH, Coilcraft P/N B07T | | |
| R1 | 1.2 k Ω , Vishay Dale Chip Resistor (1206) | | |
| R2 | 12 k Ω , Vishay Dale Chip Resistor (1206) | | |

Figure 1. Single-Ended Narrowband Test Circuit Schematic (MRF373R1)

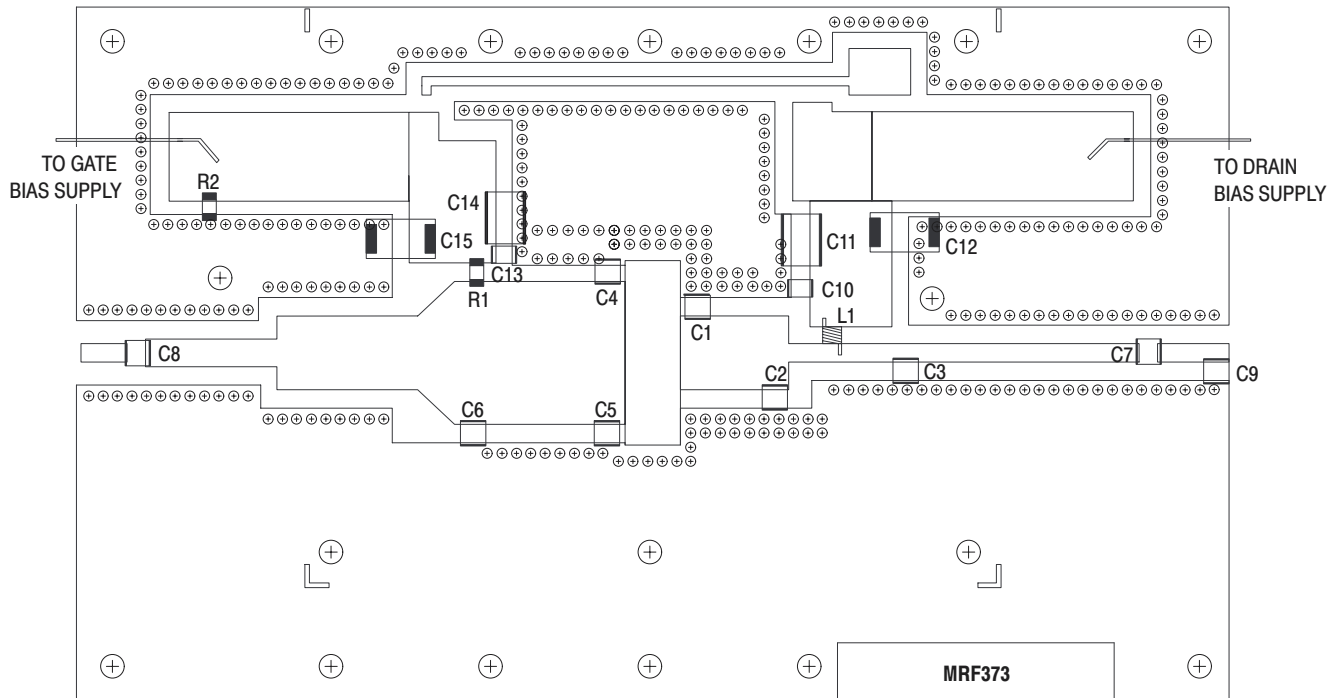


Figure 2. Single-Ended Narrowband Test Circuit Layout (Suitable for Use with MRF373R1)

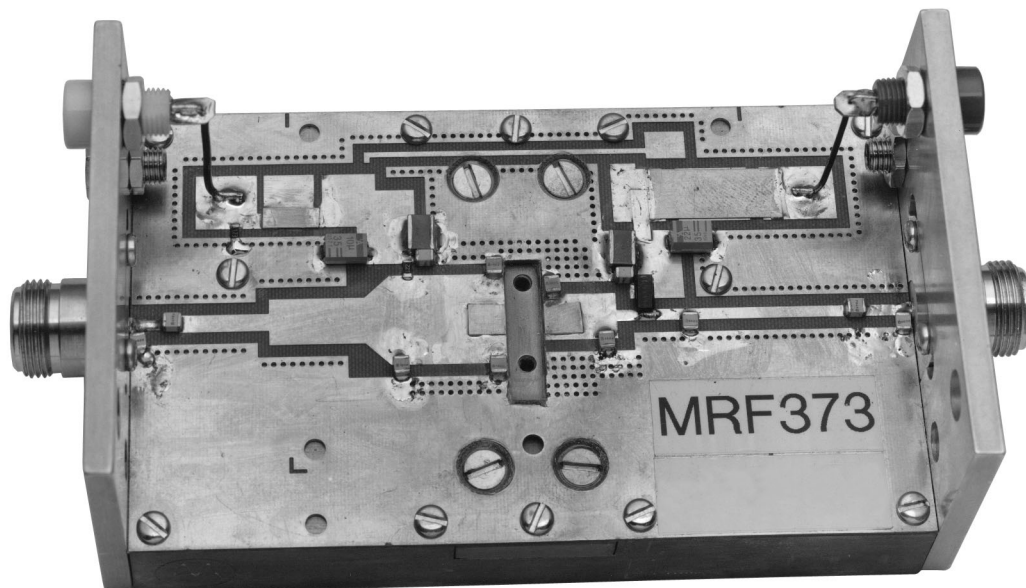
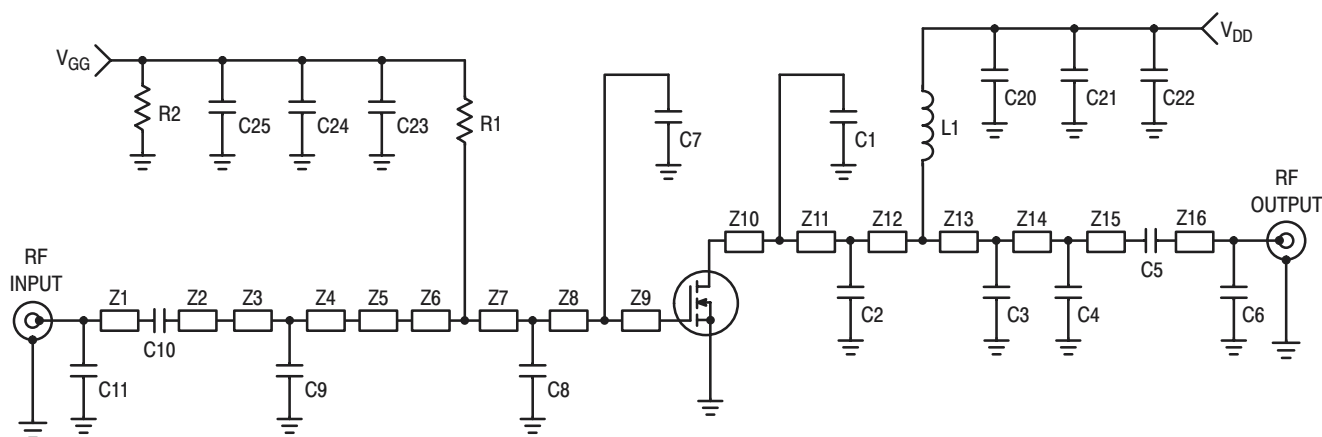


Figure 3. MRF373R1 Narrowband Test Fixture Photo



- C1, C2 18 pF, B Case Chip Capacitor, ATC
- C3 12 pF, B Case Chip Capacitor, ATC
- C4, C11 0.8 pF, B Case Chip Capacitor, ATC
- C5, C10 68 pF, B Case Chip Capacitor, ATC
- C6 0.3 pF, B Case Chip Capacitor, ATC
- C7 15 pF, B Case Chip Capacitor, ATC
- C8 10 pF, B Case Chip Capacitor, ATC
- C9 1.8 pF, B Case Chip Capacitor, ATC
- C20, C23 300 pF, B Case Chip Capacitor, ATC, Side Mounted
- C21 2) 2.2 μ F, 100 V, Vishay P/N VJ3640Y225KXBAT
- C24 2) 1.0 μ F, 50 V, Kemet P/N C1825C105
- C22 22 μ F, 35 V, Kemet P/N T491D226K35AS
- C25 10 μ F, 35 V, Kemet P/N T491D106K35AS
- L1 22 nH, Coilcraft P/N B07T
- R1 1.2 k Ω , Vishay Dale Chip Resistor (1206)
- R2 12 k Ω , Vishay Dale Chip Resistor (1206)

- Connectors N-Type (female), M/A Com P/N 3052-1648-10
- PCB MRF373 Printed Circuit Board Rev 01, CuClad 250 (GX-0300-55), height 30 mils, $\epsilon_r = 2.55$ (new PCB's available from CMR)
- Heatsink Motorola P/N 95-11LDMOSKPS-1 LDMOS μ 250 3" x 5" Bedstead
- Insert Motorola P/N 95-11LDMOSKPS-2S Insert for LDMOS μ 250S 3" x 5" Bedstead
- End Plates 2) Motorola P/N 93-3MB-9, End Plate for Type-N Connector
- Banana Jack and Nut 2) Johnson P/N 108-0904-001
- Brass Banana Jack 2) H.H. Smith P/N SM-101

Figure 4. Single-Ended Narrowband Test Circuit Schematic (MRF373SR1)

