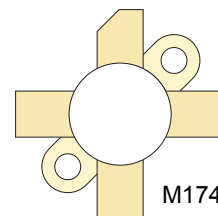


RF POWER VERTICAL MOSFET

The VRF150 is a gold-metallized silicon n-channel RF power transistor designed for broadband commercial and military applications requiring high power and gain without compromising reliability, ruggedness, or inter-modulation distortion.



FEATURES

- Improved Ruggedness $V_{(BR)DSS} = 170V$
- 150W with 11dB Typical Gain @ 150MHz, 50V
- 150W with 18dB Typical Gain @ 30MHz, 50V
- Excellent Stability & Low IMD
- Common Source Configuration
- Available in Matched Pairs
- 70:1 Load VSWR Capability at Specified Operating Conditions
- Nitride Passivated
- Refractory Gold Metallization
- High Voltage Replacement for MRF150
- RoHS Compliant

Maximum Ratings

All Ratings: $T_c = 25^\circ C$ unless otherwise specified

Symbol	Parameter	VRF150(MP)	Unit
V_{DSS}	Drain-Source Voltage	170	V
I_D	Continuous Drain Current @ $T_c = 25^\circ C$	16	A
V_{GS}	Gate-Source Voltage	± 40	V
P_D	Total Device dissipation @ $T_c = 25^\circ C$	300	W
T_{STG}	Storage Temperature Range	-65 to 150	$^\circ C$
T_J	Operating Junction Temperature	200	

Static Electrical Characteristics

Symbol	Parameter	Min	Typ	Max	Unit
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage ($V_{GS} = 0V, I_D = 100mA$)	170	180		V
$V_{DS(ON)}$	On State Drain Voltage ($I_{D(ON)} = 10A, V_{GS} = 10V$)		2.0	3.0	
I_{DSS}	Zero Gate Voltage Drain Current ($V_{DS} = 100V, V_{GS} = 0V$)			1.0	mA
I_{GSS}	Gate-Source Leakage Current ($V_{GS} = \pm 20V, V_{DS} = 0V$)			1.0	μA
g_{fs}	Forward Transconductance ($V_{DS} = 10V, I_D = 5A$)	4.5			mhos
$V_{GS(TH)}$	Gate Threshold Voltage ($V_{DS} = 10V, I_D = 100mA$)	2.9	3.6	4.4	V

Thermal Characteristics

Symbol	Characteristic	Min	Typ	Max	Unit
$R_{\theta JC}$	Junction to Case Thermal Resistance			0.60	$^\circ C/W$

 **CAUTION:** These Devices are Sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed.

Dynamic Characteristics

VRF150(MP)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
C_{iss}	Input Capacitance	$V_{GS} = 0V$		420		pF
C_{oss}	Output Capacitance	$V_{DS} = 50V$		210		
C_{rss}	Reverse Transfer Capacitance	$f = 1MHz$		35		

Functional Characteristics

Symbol	Parameter	Min	Typ	Max	Unit
G_{PS}	$f_1 = 30MHz, f_2 = 30.001MHz, V_{DD} = 50V, I_{DQ} = 250mA, P_{out} = 150W_{PEP}^1$		18		dB
G_{PS}	$f = 150MHz, V_{DD} = 50V, I_{DQ} = 250mA, P_{out} = 150W$		11		
η_D	$f_1 = 30MHz, f_2 = 30.001MHz, V_{DD} = 50V, I_{DQ} = 250mA, P_{out} = 150W_{PEP}^1$		50		%
IMD _(d3)	$f_1 = 30MHz, f_2 = 30.001MHz, V_{DD} = 50V, I_{DQ} = 250mA, P_{out} = 150W_{PEP}^1$		-32		dBc
ψ	$f_1 = 30MHz, V_{DD} = 50V, I_{DQ} = 250mA, P_{out} = 150W$ CW 70:1 VSWR - All Phase Angles, 0.2mSec X 20% Duty Factor	No Degradation in Output Power			

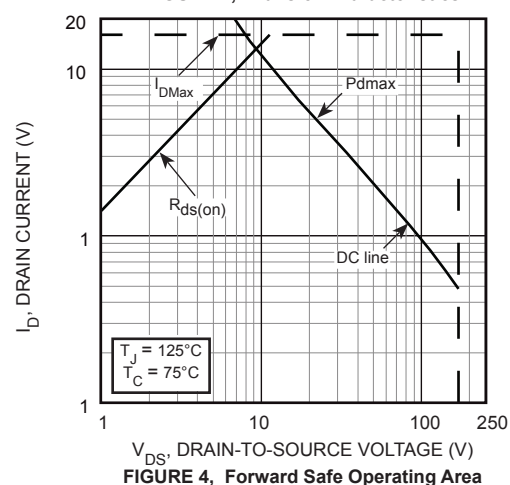
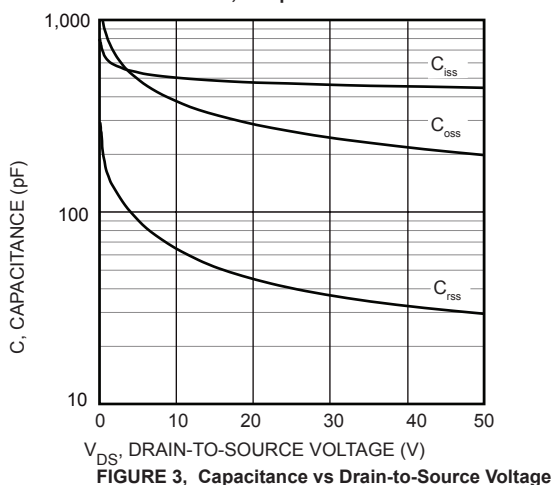
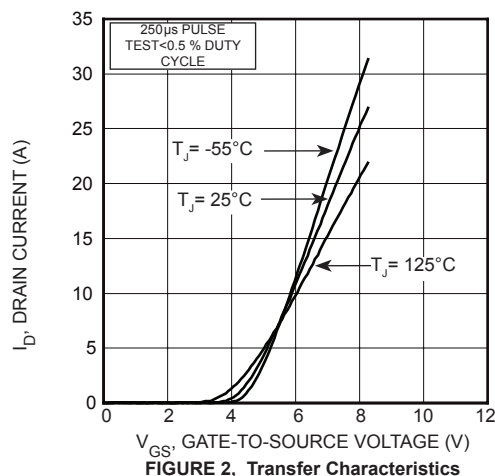
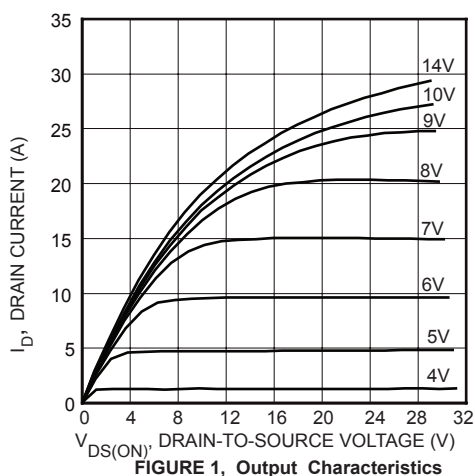
Class A Characteristics

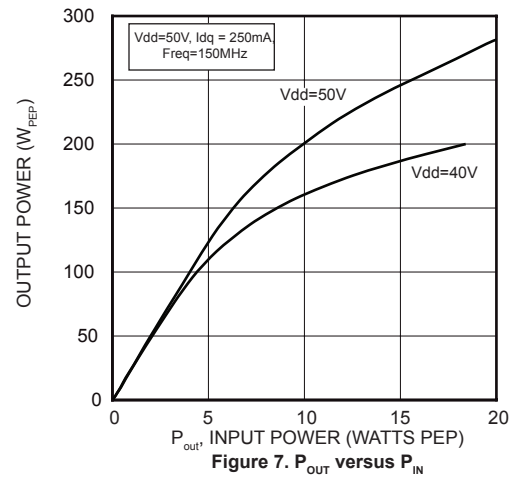
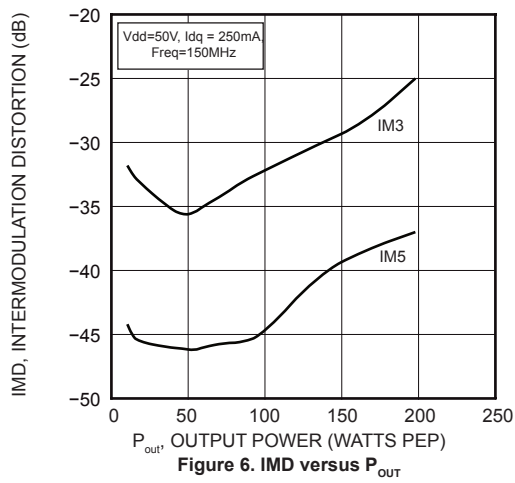
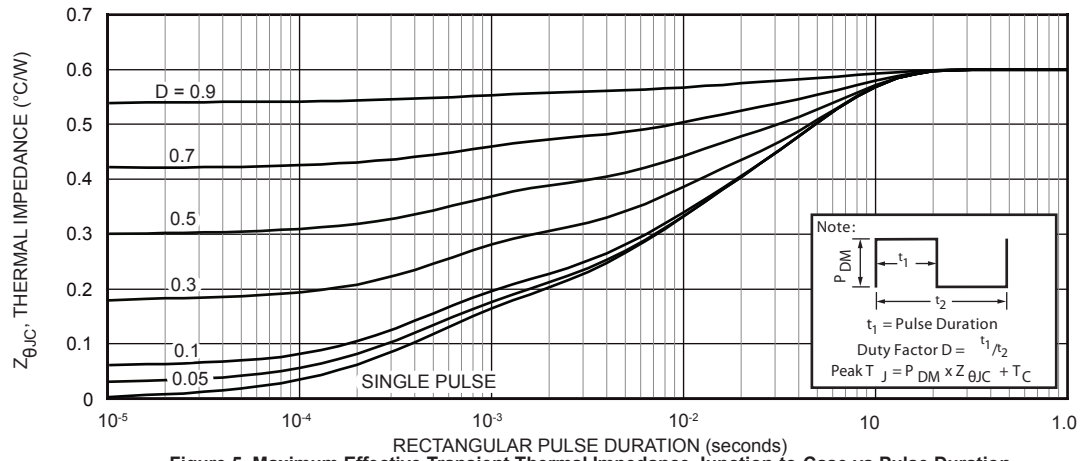
Symbol	Test Conditions	Min	Typ	Max	Unit
G_{PS}	$V_{DD} = 50V, I_{DQ} = 3A, P_{out} = 150W_{PEP}^1, f_1 = 30MHz, f_2 = 30.001MHz$		20		dB
IMD _(d3)			-50		
IMD _(d9-d13)			-75		

1. To MIL-STD-1311 Version A, test method 2204B, Two Tone, Reference Each Tone

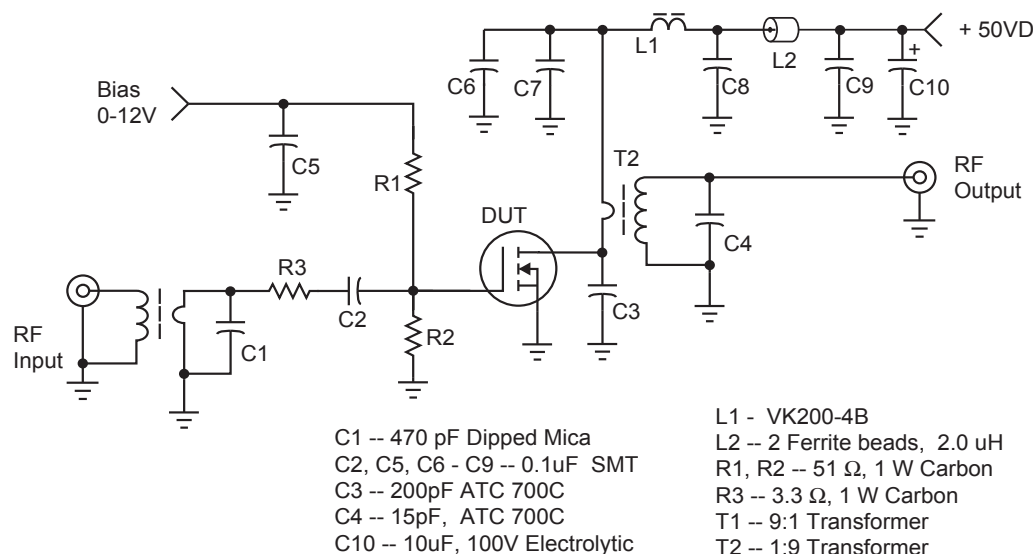
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Typical Performance Curves

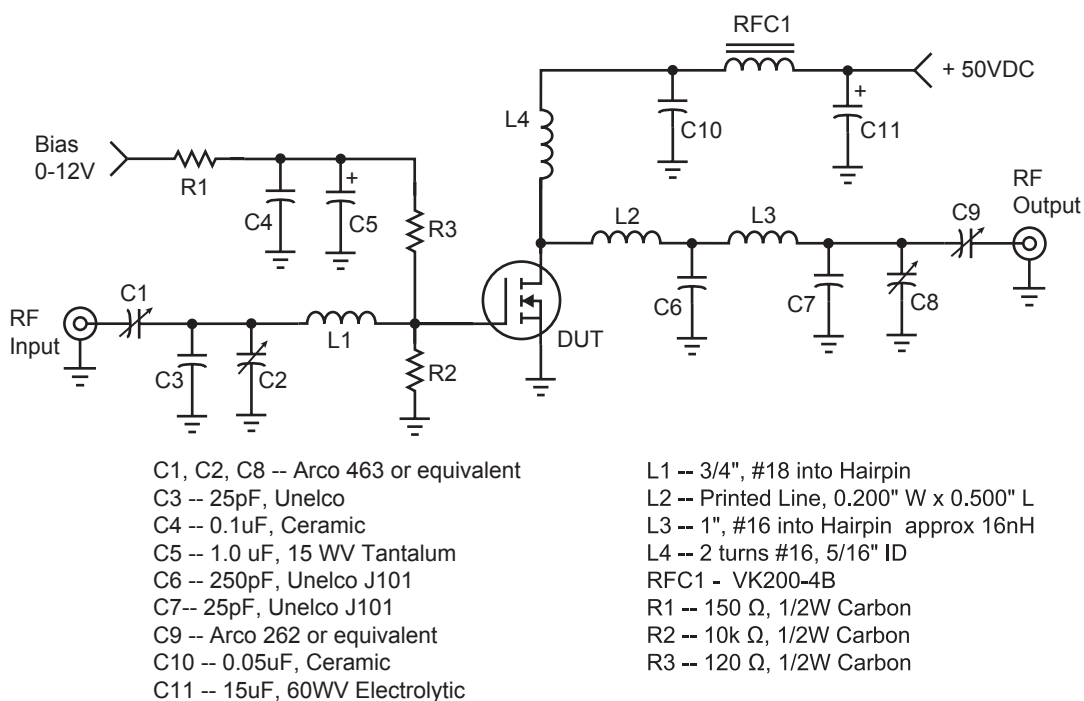




30 MHz test Circuit



150 MHz test Circuit

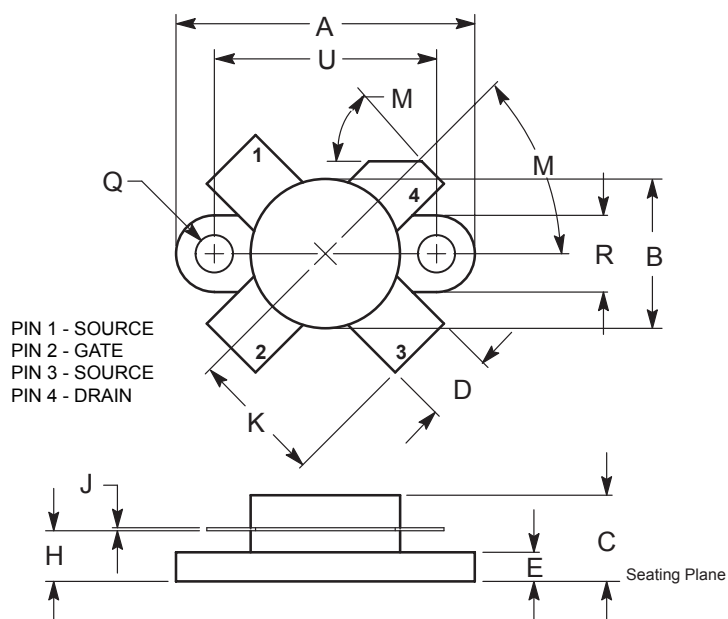


Adding MP at the end of P/N specifies a matched pair where $V_{GS(TH)}$ is matched between the two parts. V_{TH} values are marked on the devices per the following table.

Code	Vth Range	Code 2	Vth Range
A	2.900 - 2.975	M	3.650 - 3.725
B	2.975 - 3.050	N	3.725 - 3.800
C	3.050 - 3.125	P	3.800 - 3.875
D	3.125 - 3.200	R	3.875 - 3.950
E	3.200 - 3.275	S	3.950 - 4.025
F	3.275 - 3.350	T	4.025 - 4.100
G	3.350 - 3.425	W	4.100 - 4.175
H	3.425 - 3.500	X	4.175 - 4.250
J	3.500 - 3.575	Y	4.250 - 4.325
K	3.575 - 3.650	Z	4.325 - 4.400

V_{TH} values are based on Microsemi measurements at datasheet conditions with an accuracy of 1.0%.

.5" SOE Package Outline
All Dimensions are $\pm .005$



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.096	0.990	24.39	25.14
B	0.465	0.510	11.82	12.95
C	0.229	0.275	5.82	6.98
D	0.216	0.235	5.49	5.96
E	0.084	0.110	2.14	2.79
H	0.144	0.178	3.66	4.52
J	0.003	0.007	0.08	0.17
K	0.435		11.0	
M	45° NOM		45° NOM	
Q	0.115	0.130	2.93	3.30
R	0.246	0.255	6.25	6.47
U	0.720	0.730	18.29	18.54

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