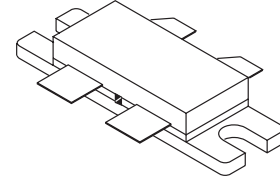



## RF POWER VERTICAL MOSFET

The VRF152G is designed for broadband commercial and military applications at frequencies to 175MHz. The high power, high gain, and broadband performance of this device make possible solid state transmitters for FM broadcast or TV channel frequency bands.



### FEATURES

- Improved Ruggedness  $V_{(BR)DSS} = 130V$
- 300W with 16dB Typical Gain @ 175MHz, 50V
- Excellent Stability & Low IMD
- Common Source Configuration
- RoHS Compliant 
- 5:1 Load VSWR Capability at Specified Operating Conditions
- Nitride Passivated
- Refractory Gold Metallization
- High Efficiency Replacement for MRF151G

### Maximum Ratings

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

| Symbol    | Parameter                                     | VRF152G    | Unit |
|-----------|---|------------|------|
| $V_{DSS}$ | Drain-Source Voltage                          | 130        | V    |
| $I_D$     | Continuous Drain Current @ $T_c = 25^\circ C$ | 40         | A    |
| $V_{GS}$  | Gate-Source Voltage                           | $\pm 40$   | V    |
| $P_D$     | Total Device dissipation @ $T_c = 25^\circ C$ | 500        | W    |
| $T_{STG}$ | Storage Temperature Range                     | -65 to 150 | °C   |
| $T_J$     | Operating Junction Temperature                | 200        |      |

### Static Electrical Characteristics

| Symbol        | Parameter  | Min | Typ | Max | Unit    |
|---------------|--|-----|-----|-----|---------|
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage ( $V_{GS} = 0V, I_D = 100mA$ )        | 130 |     |     | V       |
| $R_{DS(ON)}$  | Drain-Source On-State Resistance ( $I_{D(ON)} = 10A, V_{GS} = 10V$ ) |     | .13 | .20 |         |
| $I_{DSS}$     | Zero Gate Voltage Drain Current ( $V_{DS} = 50V, V_{GS} = 0V$ )      |     |     | 50  | $\mu A$ |
| $I_{GSS}$     | Gate-Source Leakage Current ( $V_{DS} = \pm 20V, V_{GS} = 0V$ )      |     |     | 1.0 | $\mu A$ |
| $g_{fs}$      | Forward Transconductance ( $V_{DS} = 10V, I_D = 10A$ )               | 5.0 | 6.2 |     | 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 |     |     | 0.35 | °C/W |

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

## Dynamic Characteristics

VRF152G

| Symbol    | Parameter                    | Test Conditions | Min | Typ | Max | Unit |
|-----------|------------------------------|-----------------|-----|-----|-----|------|
| $C_{iss}$ | Input Capacitance            | $V_{GS} = 0V$   |     | 383 |     | pF   |
| $C_{oss}$ | Output Capacitance           | $V_{DS} = 50V$  |     | 215 |     |      |
| $C_{rss}$ | Reverse Transfer Capacitance | $f = 1MHz$      |     | 18  |     |      |

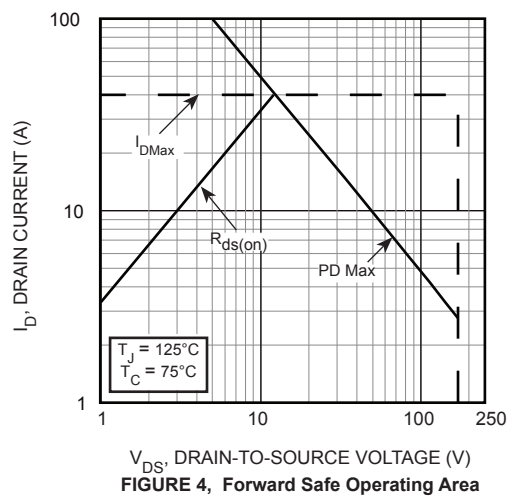
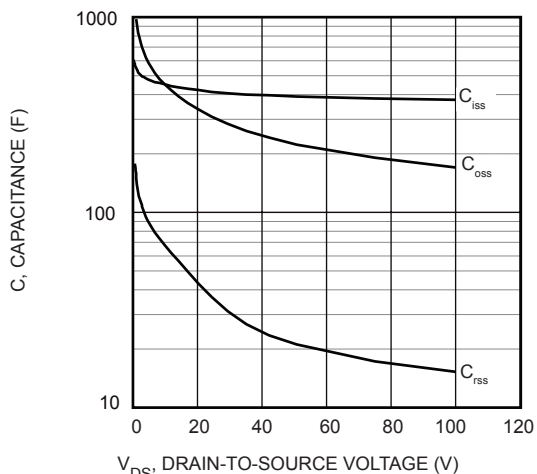
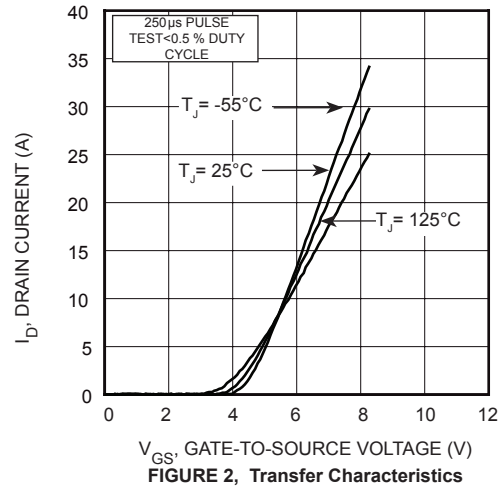
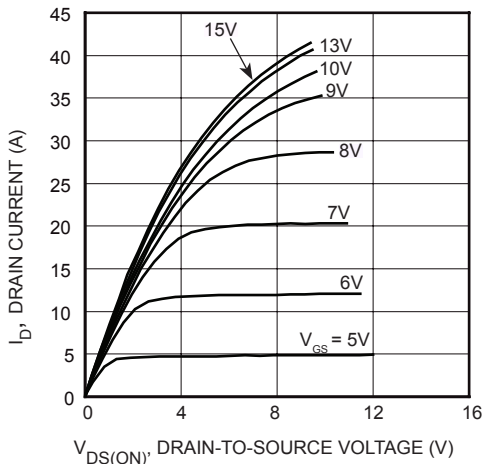
## Functional Characteristics

| Symbol   | Parameter   | Min                            | Typ | Max | Unit |
|----------|---|--------------------------------|-----|-----|------|
| $G_{PS}$ | $f = 175MHz, V_{DD} = 50V, I_{DQ} = 500mA, P_{out} = 300W$                            | 14                             | 16  |     | dB   |
| $\eta_D$ | $f = 175MHz, V_{DD} = 50V, I_{DQ} = 500mA, P_{out} = 300W$                            | 50                             | 55  |     | %    |
| $\Psi$   | $f = 175MHz, V_{DD} = 50V, I_{DQ} = 500mA, P_{out} = 300W$ 5:1VSWR - All Phase Angles | No Degradation in Output Power |     |     |      |

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

Microsemi reserves the right to change, without notice, the specifications and information contained herein.

## Typical Performance Curves



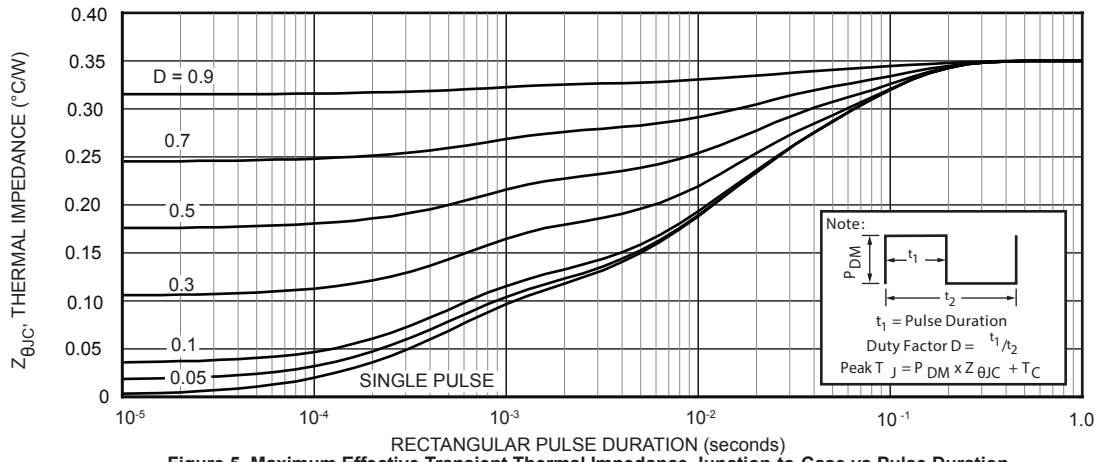


Figure 5. Maximum Effective Transient Thermal Impedance Junction-to-Case vs Pulse Duration