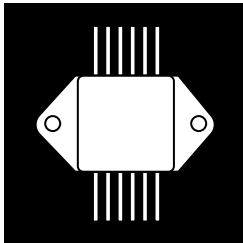


FOUR N-CANNEL MOSFETS IN HERMETIC POWER PACKAGE



100V Thru 500V, Up To 25 Amp, N-Channel MOSFET In Hermetic Metal Package

FEATURES

- Isolated Hermetic Metal Package
- Fast Switching
- Low $R_{DS(on)}$
- Available Screened To MIL-S-19500, TX, TXV and S Levels

DESCRIPTION

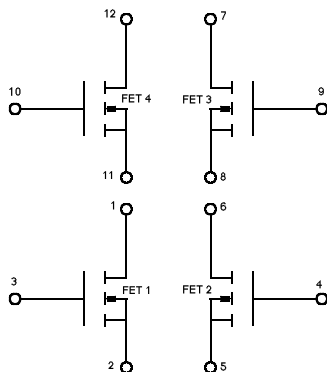
This series of hermetically packaged products feature the latest advanced MOSFET and packaging technology. They are ideally suited for Military requirements where small size, high performance and high reliability are required, and in applications such as switching power supplies, motor controls, inverters, choppers, audio amplifiers and high energy pulse circuits.

MAXIMUM RATINGS PER TRANSISTOR @ 25°C

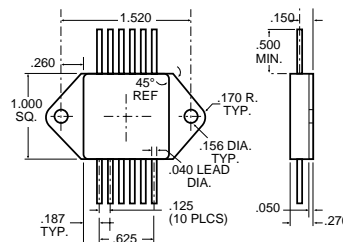
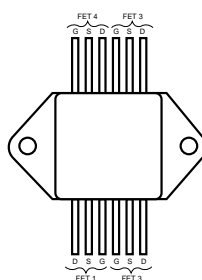
| PART NUMBER | V_{DS} | $R_{DS(on)}$ | I_D |
|-------------|----------|--------------|-------|
| OMD100 | 100V | .08 | 25A |
| OMD200 | 200V | .11 | 25A |
| OMD400 | 400V | .35 | 13A |
| OMD500 | 500V | .43 | 11A |

3.1

SCHEMATIC



CONNECTION DIAGRAM



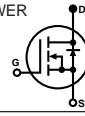
ELECTRICAL CHARACTERISTICS: ($T_C = 25^\circ\text{C}$ unless otherwise noted)
STATIC P/N OMD100 (100V)

| Parameter | Min. | Typ. | Max. | Units | Test Conditions |
|---|------|------|------|-------|--|
| BV_{DSS} Drain-Source Breakdown Voltage | 100 | | | V | $V_{GS} = 0$, $I_D = 250\text{ mA}$ |
| $V_{GS(th)}$ Gate-Threshold Voltage | 2.0 | | 4.0 | V | $V_{DS} = V_{GS}$, $I_D = 250\text{ mA}$ |
| I_{GSSF} Gate-Body Leakage Forward | | | 100 | nA | $V_{GS} = +20\text{ V}$ |
| I_{GSSR} Gate-Body Leakage Reverse | | | -100 | nA | $V_{GS} = -20\text{ V}$ |
| I_{DSS} Zero Gate Voltage Drain Current | | 0.1 | 0.25 | mA | $V_{DS} = \text{Max. Rat.}$, $V_{GS} = 0$ |
| | | 0.2 | 1.0 | | $V_{DS} = 0.8\text{ Max. Rat.}$, $V_{GS} = 0$, $T_C = 125^\circ\text{ C}$ |
| $I_{D(on)}$ On-State Drain Current ¹ | 35 | | | A | $V_{DS} = 2 V_{DS(on)}$, $V_{GS} = 10\text{ V}$ |
| $V_{DS(on)}$ Static Drain-Source On-State Voltage ¹ | | 1.1 | 1.60 | V | $V_{GS} = 10\text{ V}$, $I_D = 20\text{ A}$ |
| $R_{DS(on)}$ Static Drain-Source On-State Resistance ¹ | | .065 | .080 | | $V_{GS} = 10\text{ V}$, $I_D = 20\text{ A}$ |
| $R_{DS(on)}$ Static Drain-Source On-State Resistance ¹ | | .10 | .160 | | $V_{GS} = 10\text{ V}$, $I_D = 20\text{ A}$, $T_C = 125\text{ C}$ |

DYNAMIC

| | | | | | |
|--|-----|------|--|-------|--|
| g_{fs} Forward Transconductance ¹ | 9.0 | 10 | | S (M) | $V_{DS} = 2 V_{DS(on)}$, $I_D = 20\text{ A}$ |
| C_{iss} Input Capacitance | | 2700 | | pF | $V_{GS} = 0$ |
| C_{oss} Output Capacitance | | 1300 | | pF | $V_{DS} = 25\text{ V}$ |
| C_{riss} Reverse Transfer Capacitance | | 470 | | pF | $f = 1\text{ MHz}$ |
| $t_{d(on)}$ Turn-On Delay Time | | 28 | | ns | $V_{DD} = 30\text{ V}$, $I_D @ 20\text{ A}$ |
| t_r Rise Time | | 45 | | ns | $R_g = 5.0\text{ }\Omega$, $V_G = 10\text{ V}$ |
| $t_{d(off)}$ Turn-Off Delay Time | | 100 | | ns | (MOSFET switching times are essentially independent of operating temperature.) |
| t_f Fall Time | | 50 | | ns | |

BODY-DRAIN DIODE RATINGS AND CHARACTERISTICS

| | | | | | |
|---|--|-----|------|----|--|
| I_S Continuous Source Current (Body Diode) | | | -40 | A | Modified MOSPOWER symbol showing the integral P-N Junction rectifier.  |
| I_{SM} Source Current ¹ (Body Diode) | | | -160 | A | |
| V_{SD} Diode Forward Voltage ¹ | | | -2.5 | V | $T_C = 25\text{ C}$, $I_S = -40\text{ A}$, $V_{GS} = 0$ |
| t_{rr} Reverse Recovery Time | | 400 | | ns | $T_J = 150\text{ C}$, $I_F = I_S$, $dl_F/ds = 100\text{ A/ms}$ |

1 Pulse Test: Pulse Width 300msec, Duty Cycle 2%.

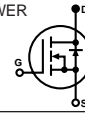
ELECTRICAL CHARACTERISTICS: ($T_C = 25^\circ\text{C}$ unless otherwise noted)
STATIC P/N OMD200 (200V)

| Parameter | Min. | Typ. | Max. | Units | Test Conditions |
|---|------|------|------|-------|--|
| BV_{DSS} Drain-Source Breakdown Voltage | 200 | | | V | $V_{GS} = 0$, $I_D = 250\text{ mA}$ |
| $V_{GS(th)}$ Gate-Threshold Voltage | 2.0 | | 4.0 | V | $V_{DS} = V_{GS}$, $I_D = 250\text{ mA}$ |
| I_{GSSF} Gate-Body Leakage Forward | | | 100 | nA | $V_{GS} = +20\text{ V}$ |
| I_{GSSR} Gate-Body Leakage Reverse | | | -100 | nA | $V_{GS} = -20\text{ V}$ |
| I_{DSS} Zero Gate Voltage Drain Current | | 0.1 | 0.25 | mA | $V_{DS} = \text{Max. Rat.}$, $V_{GS} = 0$ |
| | | 0.2 | 1.0 | | $V_{DS} = 0.8\text{ Max. Rat.}$, $V_{GS} = 0$, $T_C = 125^\circ\text{ C}$ |
| $I_{D(on)}$ On-State Drain Current ¹ | 30 | | | A | $V_{DS} = 2 V_{DS(on)}$, $V_{GS} = 10\text{ V}$ |
| $V_{DS(on)}$ Static Drain-Source On-State Voltage ¹ | | 1.36 | 1.76 | V | $V_{GS} = 10\text{ V}$, $I_D = 16\text{ A}$ |
| $R_{DS(on)}$ Static Drain-Source On-State Resistance ¹ | | .085 | .110 | | $V_{GS} = 10\text{ V}$, $I_D = 16\text{ A}$ |
| $R_{DS(on)}$ Static Drain-Source On-State Resistance ¹ | | 0.14 | .200 | | $V_{GS} = 10\text{ V}$, $I_D = 16\text{ A}$, $T_C = 125\text{ C}$ |

DYNAMIC

| | | | | | |
|--|------|------|--|-------|--|
| g_{fs} Forward Transconductance ¹ | 10.0 | 12.5 | | S (M) | $V_{DS} = 2 V_{DS(on)}$, $I_D = 16\text{ A}$ |
| C_{iss} Input Capacitance | | 2400 | | pF | $V_{GS} = 0$ |
| C_{oss} Output Capacitance | | 600 | | pF | $V_{DS} = 25\text{ V}$ |
| C_{riss} Reverse Transfer Capacitance | | 250 | | pF | $f = 1\text{ MHz}$ |
| $t_{d(on)}$ Turn-On Delay Time | | 25 | | ns | $V_{DD} = 75\text{ V}$, $I_D @ 16\text{ A}$ |
| t_r Rise Time | | 60 | | ns | $R_g = 5.0\text{ }\Omega$, $V_{GS} = 10\text{ V}$ |
| $t_{d(off)}$ Turn-Off Delay Time | | 85 | | ns | (MOSFET switching times are essentially independent of operating temperature.) |
| t_f Fall Time | | 38 | | ns | |

BODY-DRAIN DIODE RATINGS AND CHARACTERISTICS

| | | | | | |
|---|--|-----|------|----|--|
| I_S Continuous Source Current (Body Diode) | | | -30 | A | Modified MOSPOWER symbol showing the integral P-N Junction rectifier.  |
| I_{SM} Source Current ¹ (Body Diode) | | | -120 | A | |
| V_{SD} Diode Forward Voltage ¹ | | | -2 | V | $T_C = 25\text{ C}$, $I_S = -30\text{ A}$, $V_{GS} = 0$ |
| t_{rr} Reverse Recovery Time | | 350 | | ns | $T_J = 150\text{ C}$, $I_F = I_S$, $dl_F/ds = 100\text{ A/ms}$ |

1 Pulse Test: Pulse Width 300msec, Duty Cycle 2%.

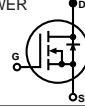
ELECTRICAL CHARACTERISTICS: ($T_C = 25^\circ\text{C}$ unless otherwise noted)
STATIC P/N OMD400 (400V)

| Parameter | Min. | Typ. | Max. | Units | Test Conditions |
|---|------|------|-------|-------|--|
| BV_{DSS} Drain-Source Breakdown Voltage | 400 | | | V | $V_{GS} = 0$, $I_D = 250\text{ mA}$ |
| $V_{GS(th)}$ Gate-Threshold Voltage | 2.0 | | 4.0 | V | $V_{DS} = V_{GS}$, $I_D = 250\text{ mA}$ |
| I_{GSSF} Gate-Body Leakage Forward | | | 100 | nA | $V_{GS} = +20\text{ V}$ |
| I_{GSSR} Gate-Body Leakage Reverse | | | - 100 | nA | $V_{GS} = -20\text{ V}$ |
| I_{DSS} Zero Gate Voltage Drain Current | | 0.1 | 0.25 | mA | $V_{DS} = \text{Max. Rat.}$, $V_{GS} = 0$ |
| | | 0.2 | 1.0 | mA | $V_{DS} = 0.8\text{ Max. Rat.}$, $V_{GS} = 0$, $T_C = 125^\circ\text{ C}$ |
| $I_{D(on)}$ On-State Drain Current ¹ | 15 | | | A | $V_{DS} = 2 V_{DS(on)}$, $V_{GS} = 10\text{ V}$ |
| $V_{DS(on)}$ Static Drain-Source On-State Voltage ¹ | | 2.0 | 2.8 | V | $V_{GS} = 10\text{ V}$, $I_D = 8.0\text{ A}$ |
| $R_{DS(on)}$ Static Drain-Source On-State Resistance ¹ | | 0.30 | .35 | | $V_{GS} = 10\text{ V}$, $I_D = 8.0\text{ A}$ |
| $R_{DS(on)}$ Static Drain-Source On-State Resistance ¹ | | .60 | .70 | | $V_{GS} = 10\text{ V}$, $I_D = 8.0\text{ A}$, $T_C = 125\text{ C}$ |

DYNAMIC

| | | | | | |
|--|-----|------|--|-------|--|
| g_{fs} Forward Transconductance ¹ | 6.0 | 9.6 | | S (M) | $V_{DS} = 2 V_{DS(on)}$, $I_D = 8.0\text{ A}$ |
| C_{iss} Input Capacitance | | 2900 | | pF | $V_{GS} = 0$ |
| C_{oss} Output Capacitance | | 450 | | pF | $V_{DS} = 25\text{ V}$ |
| C_{riss} Reverse Transfer Capacitance | | 150 | | pF | $f = 1\text{ MHz}$ |
| $t_{d(on)}$ Turn-On Delay Time | | 30 | | ns | $V_{DD} = 200\text{ V}$, $I_D @ 8.0\text{ A}$ |
| t_r Rise Time | | 40 | | ns | $R_{\theta} = 5.0\text{ W}$, $V_{GS} = 10\text{ V}$ |
| $t_{d(off)}$ Turn-Off Delay Time | | 80 | | ns | (MOSFET switching times are essentially independent of operating temperature.) |
| t_f Fall Time | | 30 | | ns | |

BODY-DRAIN DIODE RATINGS AND CHARACTERISTICS

| | | | | | |
|---|--|-----|-------|----|---|
| I_S Continuous Source Current (Body Diode) | | | - 15 | A | Modified MOSPOWER symbol showing the integral P-N Junction rectifier.  |
| I_{SM} Source Current ¹ (Body Diode) | | | - 60 | A | |
| V_{SD} Diode Forward Voltage ¹ | | | - 1.6 | V | $T_C = 25\text{ C}$, $I_S = -15\text{ A}$, $V_{GS} = 0$ |
| t_{rr} Reverse Recovery Time | | 600 | | ns | $T_J = 100\text{ C}$, $I_F = I_S$, $di_F/ds = 100\text{ A}/\mu\text{s}$ |

1 Pulse Test: Pulse Width 300msec, Duty Cycle 2%.

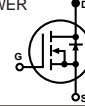
ELECTRICAL CHARACTERISTICS: ($T_C = 25^\circ\text{C}$ unless otherwise noted)
STATIC P/N OMD500 (500V)

| Parameter | Min. | Typ. | Max. | Units | Test Conditions |
|---|------|------|-------|-------|--|
| BV_{DSS} Drain-Source Breakdown Voltage | 500 | | | V | $V_{GS} = 0$, $I_D = 250\text{ mA}$ |
| $V_{GS(th)}$ Gate-Threshold Voltage | 2.0 | | 4.0 | V | $V_{DS} = V_{GS}$, $I_D = 250\text{ mA}$ |
| I_{GSSF} Gate-Body Leakage Forward | | | 100 | nA | $V_{GS} = +20\text{ V}$ |
| I_{GSSR} Gate-Body Leakage Reverse | | | - 100 | nA | $V_{GS} = -20\text{ V}$ |
| I_{DSS} Zero Gate Voltage Drain Current | | 0.1 | 0.25 | mA | $V_{DS} = \text{Max. Rat.}$, $V_{GS} = 0$ |
| | | 0.2 | 1.0 | mA | $V_{DS} = 0.8\text{ Max. Rat.}$, $V_{GS} = 0$, $T_C = 125^\circ\text{ C}$ |
| $I_{D(on)}$ On-State Drain Current ¹ | 13 | | | A | $V_{DS} = 2 V_{DS(on)}$, $V_{GS} = 10\text{ V}$ |
| $V_{DS(on)}$ Static Drain-Source On-State Voltage ¹ | | 2.1 | 3.0 | V | $V_{GS} = 10\text{ V}$, $I_D = 7.0\text{ A}$ |
| $R_{DS(on)}$ Static Drain-Source On-State Resistance ¹ | | 0.35 | 0.43 | | $V_{GS} = 10\text{ V}$, $I_D = 7.0\text{ A}$ |
| $R_{DS(on)}$ Static Drain-Source On-State Resistance ¹ | | 0.66 | 0.88 | | $V_{GS} = 10\text{ V}$, $I_D = 7.0\text{ A}$, $T_C = 125\text{ C}$ |

DYNAMIC

| | | | | | |
|--|-----|------|--|-------|--|
| g_{fs} Forward Transconductance ¹ | 6.0 | 7.2 | | S (M) | $V_{DS} = 2 V_{DS(on)}$, $I_D = 7.0\text{ A}$ |
| C_{iss} Input Capacitance | | 2600 | | pF | $V_{GS} = 0$ |
| C_{oss} Output Capacitance | | 280 | | pF | $V_{DS} = 25\text{ V}$ |
| C_{riss} Reverse Transfer Capacitance | | 40 | | pF | $f = 1\text{ MHz}$ |
| $t_{d(on)}$ Turn-On Delay Time | | 30 | | ns | $V_{DD} = 210\text{ V}$, $I_D @ 7.0\text{ A}$ |
| t_r Rise Time | | 46 | | ns | $R_{\theta} = 5.0\text{ W}$, $V_{GS} = 10\text{ V}$ |
| $t_{d(off)}$ Turn-Off Delay Time | | 75 | | ns | (MOSFET switching times are essentially independent of operating temperature.) |
| t_f Fall Time | | 31 | | ns | |

BODY-DRAIN DIODE RATINGS AND CHARACTERISTICS

| | | | | | |
|---|--|-----|-------|----|---|
| I_S Continuous Source Current (Body Diode) | | | - 13 | A | Modified MOSPOWER symbol showing the integral P-N Junction rectifier.  |
| I_{SM} Source Current ¹ (Body Diode) | | | - 52 | A | |
| V_{SD} Diode Forward Voltage ¹ | | | - 1.4 | V | $T_C = 25\text{ C}$, $I_S = -13\text{ A}$, $V_{GS} = 0$ |
| t_{rr} Reverse Recovery Time | | 700 | | ns | $T_J = 150\text{ C}$, $I_F = I_S$, $di_F/ds = 100\text{ A}/\mu\text{s}$ |

1 Pulse Test: Pulse Width 300msec, Duty Cycle 2%.

OMD100 - OMD500

ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

| Parameter | OMD100 | OMD200 | OMD400 | OMD500 | Units |
|---|------------|------------|------------|------------|---------------------|
| V_{DS} Drain-Source Voltage | 100 | 200 | 400 | 500 | V |
| V_{DGR} Drain-Gate Voltage ($R_{GS} = 1\text{ M}$) | 100 | 200 | 400 | 500 | V |
| $I_D @ T_C = 25^\circ\text{C}$ Continuous Drain Current ² | ± 25 | ± 25 | ± 13 | ± 11 | A |
| $I_D @ T_C = 100^\circ\text{C}$ Continuous Drain Current ² | ± 16 | ± 16 | ± 8 | ± 7 | A |
| I_{DM} Pulsed Drain Current ¹ | ± 100 | ± 80 | ± 54 | ± 40 | A |
| V_{GS} Gate-Source Voltage | ± 20 | ± 20 | ± 20 | ± 20 | V |
| $P_D @ T_C = 25^\circ\text{C}$ Maximum Power Dissipation | 125 | 125 | 125 | 125 | W |
| $P_D @ T_C = 100^\circ\text{C}$ Maximum Power Dissipation | 50 | 50 | 50 | 50 | W |
| Junction To Case Linear Derating Factor | 1.0 | 1.0 | 1.0 | 1.0 | W/ $^\circ\text{C}$ |
| Junction To Ambient Linear Derating Factor | .033 | .033 | .033 | .033 | W/ $^\circ\text{C}$ |
| T_J Operating and T_{stg} Storage Temperature Range | -55 to 150 | -55 to 150 | -55 to 150 | -55 to 150 | $^\circ\text{C}$ |
| Lead Temperature (1/16" from case for 10 secs.) | 300 | 300 | 300 | 300 | $^\circ\text{C}$ |

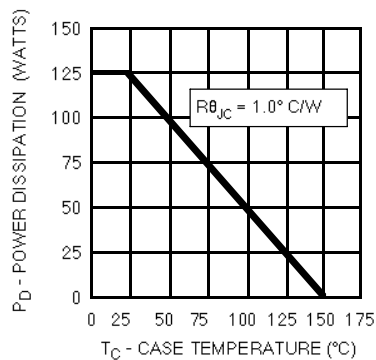
1 Pulse Test: Pulse width 300 μsec . Duty Cycle 2%.

2 Package pin limitation = 10 Amps

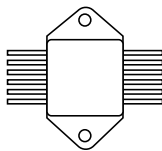
THERMAL RESISTANCE

| | | | |
|--------------------------------|-----|---------------------------|--------------------|
| R_{thJC} Junction-to-Case | 1.0 | $^\circ\text{C}/\text{W}$ | |
| R_{thJA} Junction-to-Ambient | 30 | $^\circ\text{C}/\text{W}$ | Free Air Operation |

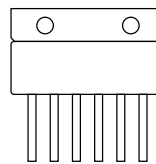
POWER DERATING



PACKAGE OPTIONS



MOD PAK



6 PIN SIP

Note: MOSFETs are also available in Z-Tab, dual and quad pak styles. Please call the factory for more information.