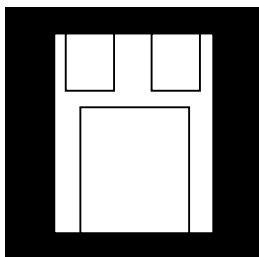


# POWER MOSFET IN HERMETIC SURFACE MOUNT PACKAGE



**100V Thru 1000V, Up To 30 Amp, N-Channel MOSFET In A Surface Mount Package**

## FEATURES

- Surface Mount Hermetic Package
- High Current/Low  $R_{DS(on)}$
- Fast Switching, Low Drive Current
- Ease of Paralleling For Added Power
- Small Size
- Available Screened to MIL-S-19500, TX, TXV, S Levels

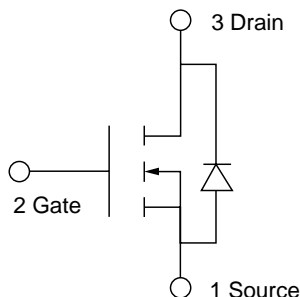
## DESCRIPTION

This series of hermetic surface mount product features the latest advanced MOSFET and packaging technology. They are ideally suited for Military surface mount 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 AT $T_C = 25^\circ C$

PART NUMBER	$V_{DS}$	$R_{DS(on)}$	$I_D$
OM6034NM	100V	.065	35A
OM6035NM	200V	.095	30A
OM6036NM	500V	0.4	15A
OM6037NM	1000V	3	5A

## SCHEMATIC



3.5

**ELECTRICAL CHARACTERISTICS: (T<sub>c</sub> = 25°C unless otherwise noted)**  
**STATIC P/N OM6034NM (100V)**

Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV <sub>DSS</sub> Drain-Source Breakdown Voltage	100			V	V <sub>GS</sub> = 0, I <sub>b</sub> = 250 μA
V <sub>GS(th)</sub> Gate-Threshold Voltage	2.0	4.0		V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>b</sub> = 250 μA
I <sub>GSS</sub> Gate-Body Leakage (OM6105)		± 500		nA	V <sub>GS</sub> = ± 12.8 V
I <sub>GSS</sub> Gate-Body Leakage (OM6005)		± 100		nA	V <sub>GS</sub> = ± 20 V
I <sub>BSS</sub> Zero Gate Voltage Drain Current		0.1	0.25	mA	V <sub>DS</sub> = Max. Rat., V <sub>GS</sub> = 0
Current		0.2	1.0	mA	V <sub>DS</sub> = 0.8 Max. Rat., V <sub>GS</sub> = 0, T <sub>c</sub> = 125°C
I <sub>b(on)</sub> On-State Drain Current <sup>1</sup>	35			A	V <sub>DS</sub> 2 V <sub>DS(on)</sub> , V <sub>GS</sub> = 10 V
V <sub>GS(on)</sub> Static Drain-Source On-State Voltage <sup>1</sup>		1.1	1.3	V	V <sub>GS</sub> = 10 V, I <sub>b</sub> = 20 A
R <sub>DS(on)</sub> Static Drain-Source On-State Resistance <sup>1</sup>		.055	.065		V <sub>GS</sub> = 10 V, I <sub>b</sub> = 20 A
R <sub>DS(on)</sub> Static Drain-Source On-State Resistance <sup>1</sup>		.09	0.11		V <sub>GS</sub> = 10 V, I <sub>b</sub> = 20 A, T <sub>c</sub> = 125°C

**DYNAMIC**

Parameter	Min.	Typ.	Max.	Units	Test Conditions
g <sub>fs</sub> Forward Transductance <sup>1</sup>	9.0	10		S(Ω)	V <sub>DS</sub> 2 V <sub>DS(on)</sub> , I <sub>b</sub> = 20 A
C <sub>iss</sub> Input Capacitance		2700		pF	V <sub>GS</sub> = 0
C <sub>oss</sub> Output Capacitance		1300		pF	V <sub>DS</sub> = 25 V
C <sub>rss</sub> Reverse Transfer Capacitance		470		pF	f = 1 MHz
t <sub>turn(on)</sub> Turn-On Delay Time		28		ns	V <sub>DD</sub> = 30 V, I <sub>b</sub> ≅ 20 A
t <sub>r</sub> Rise Time		45		ns	R <sub>g</sub> = 5.0 Ω, V <sub>GS</sub> = 10 V
t <sub>turn(off)</sub> Turn-Off Delay Time		100		ns	
t <sub>f</sub> Fall Time		50		ns	

**BODY-DRAIN DIODE RATINGS AND CHARACTERISTICS**

Parameter	Min.	Typ.	Max.	Units	Test Conditions
I <sub>S</sub> Continuous Source Current (Body Diode)			- 40	A	Modified MOSPOWER symbol showing the integral P-N Junction rectifier.
I <sub>SM</sub> Source Current <sup>1</sup> (Body Diode)			- 160	A	T <sub>c</sub> = 25°C, I <sub>S</sub> = -40 A, V <sub>GS</sub> = 0
V <sub>SD</sub> Diode Forward Voltage <sup>1</sup>			- 2.5	V	T <sub>J</sub> = 150°C, I <sub>r</sub> = I <sub>S</sub> , dI <sub>r</sub> /ds = 100 A/μs
t <sub>rr</sub> Reverse Recovery Time		400		ns	

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

**ELECTRICAL CHARACTERISTICS: (T<sub>c</sub> = 25°C unless otherwise noted)**  
**STATIC P/N OM6035NM (200V)**

Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV <sub>DSS</sub> Drain-Source Breakdown Voltage	200			V	V <sub>GS</sub> = 0, I <sub>b</sub> = 250 μA
V <sub>GS(th)</sub> Gate-Threshold Voltage	2.0	4.0		V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>b</sub> = 250 μA
I <sub>GSS</sub> Gate-Body Leakage (OM6106)		± 500		nA	V <sub>GS</sub> = ± 12.8 V
I <sub>GSS</sub> Gate-Body Leakage (OM6006)		± 100		nA	V <sub>GS</sub> = ± 20 V
I <sub>BSS</sub> Zero Gate Voltage Drain Current		0.1	0.25	mA	V <sub>DS</sub> = Max. Rat., V <sub>GS</sub> = 0
Current		0.2	1.0	mA	V <sub>DS</sub> = 0.8 Max. Rat., V <sub>GS</sub> = 0, T <sub>c</sub> = 125°C
I <sub>b(on)</sub> On-State Drain Current <sup>1</sup>	30			A	V <sub>DS</sub> 2 V <sub>DS(on)</sub> , V <sub>GS</sub> = 10 V
V <sub>GS(on)</sub> Static Drain-Source On-State Voltage <sup>1</sup>		1.36	1.52	V	V <sub>GS</sub> = 10 V, I <sub>b</sub> = 16 A
R <sub>DS(on)</sub> Static Drain-Source On-State Resistance <sup>1</sup>		.085	.095		V <sub>GS</sub> = 10 V, I <sub>b</sub> = 16 A
R <sub>DS(on)</sub> Static Drain-Source On-State Resistance <sup>1</sup>		0.14	0.17		V <sub>GS</sub> = 10 V, I <sub>b</sub> = 16 A, T <sub>c</sub> = 125°C

**DYNAMIC**

Parameter	Min.	Typ.	Max.	Units	Test Conditions
g <sub>fs</sub> Forward Transductance <sup>1</sup>	10.0	12.5		S(Ω)	V <sub>DS</sub> 2 V <sub>DS(on)</sub> , I <sub>b</sub> = 16 A
C <sub>iss</sub> Input Capacitance		2400		pF	V <sub>GS</sub> = 0
C <sub>oss</sub> Output Capacitance		600		pF	V <sub>DS</sub> = 25 V
C <sub>rss</sub> Reverse Transfer Capacitance		250		pF	f = 1 MHz
t <sub>turn(on)</sub> Turn-On Delay Time		25		ns	V <sub>DD</sub> = 75 V, I <sub>b</sub> ≅ 16 A
t <sub>r</sub> Rise Time		60		ns	R <sub>g</sub> = 5.0 Ω, V <sub>GS</sub> = 10 V
t <sub>turn(off)</sub> Turn-Off Delay Time		85		ns	
t <sub>f</sub> Fall Time		38		ns	

**BODY-DRAIN DIODE RATINGS AND CHARACTERISTICS**

Parameter	Min.	Typ.	Max.	Units	Test Conditions
I <sub>S</sub> Continuous Source Current (Body Diode)			- 30	A	Modified MOSPOWER symbol showing the integral P-N Junction rectifier.
I <sub>SM</sub> Source Current <sup>1</sup> (Body Diode)			- 120	A	T <sub>c</sub> = 25°C, I <sub>S</sub> = -30 A, V <sub>GS</sub> = 0
V <sub>SD</sub> Diode Forward Voltage <sup>1</sup>			- 2	V	T <sub>J</sub> = 150°C, I <sub>r</sub> = I <sub>S</sub> , dI <sub>r</sub> /ds = 100 A/μs
t <sub>rr</sub> Reverse Recovery Time		350		ns	

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

**ELECTRICAL CHARACTERISTICS: (T<sub>C</sub> = 25°C unless otherwise noted)  
STATIC P/N OM6036NM (500V)**

Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV <sub>DSS</sub> Drain-Source Breakdown Voltage	500			V	V <sub>GS</sub> = 0, I <sub>b</sub> = 250 μA
V <sub>GS(th)</sub> Gate-Threshold Voltage	2.0	4.0	4.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>b</sub> = 250 μA
I <sub>GSSF</sub> Gate-Body Leakage (OM6108)		± 500		nA	V <sub>GS</sub> = ± 12.8 V
I <sub>GSSR</sub> Gate-Body Leakage (OM6008)		± 100		nA	V <sub>GS</sub> = ± 20 V
I <sub>DSS</sub> Zero Gate Voltage Drain Current		0.1	0.25	mA	V <sub>DS</sub> = Max. Rat., V <sub>GS</sub> = 0
		0.2	1.0	mA	V <sub>DS</sub> = 0.8 Max. Rat., V <sub>GS</sub> = 0, T <sub>C</sub> = 125°C
I <sub>D(on)</sub> On-State Drain Current <sup>1</sup>	13			A	V <sub>DS</sub> = 2 V <sub>DSS(on)</sub> , V <sub>GS</sub> = 10 V
V <sub>DS(on)</sub> Static Drain-Source On-State Voltage <sup>1</sup>		2.1	2.8	V	V <sub>GS</sub> = 10 V, I <sub>b</sub> = 7.0 A
R <sub>DS(on)</sub> Static Drain-Source On-State Resistance <sup>1</sup>		0.3	0.4	Ω	V <sub>GS</sub> = 10 V, I <sub>b</sub> = 7.0 A
R <sub>DS(on)</sub> Static Drain-Source On-State Resistance <sup>1</sup>		0.66	0.88	Ω	V <sub>GS</sub> = 10 V, I <sub>b</sub> = 7.0 A, T <sub>C</sub> = 125°C

**DYNAMIC**

g <sub>fs</sub> Forward Transconductance <sup>1</sup>	5.0	7.2		S (Ω)	V <sub>DS</sub> = 2 V <sub>DSS(on)</sub> , I <sub>b</sub> = 7.0 A
C <sub>iss</sub> Input Capacitance		2600		pF	V <sub>GS</sub> = 0
C <sub>oss</sub> Output Capacitance		280		pF	V <sub>DS</sub> = 25 V
C <sub>rss</sub> Reverse Transfer Capacitance		40		pF	f = 1 MHz
t <sub>d(on)</sub> Turn-On Delay Time		30		ns	V <sub>DS</sub> = 210 V, I <sub>b</sub> = 7.0 A
t <sub>r</sub> Rise Time		46		ns	R <sub>g</sub> = 5.0 Ω, V <sub>GS</sub> = 10 V
t <sub>d(off)</sub> Turn-Off Delay Time		75		ns	
t <sub>f</sub> Fall Time		31		ns	

**BODY-DRAIN DIODE RATINGS AND CHARACTERISTICS**

I <sub>S</sub> Continuous Source Current (Body Diode)	Modified MOSPOWER symbol showing the integral P-N Junction rectifier.	
	A	Symbol showing the integral P-N Junction rectifier.
I <sub>SM</sub> Source Current <sup>1</sup> (Body Diode)	-13	-52
V <sub>SD</sub> Diode Forward Voltage <sup>1</sup>	-1.4	V
t <sub>rr</sub> Reverse Recovery Time	700	ns

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

**ELECTRICAL CHARACTERISTICS: T<sub>C</sub> = 25° unless otherwise noted  
STATIC P/N OM6037NM (1000V)**

Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV <sub>DSS</sub> Drain-Source Breakdown Voltage	1000			V	V <sub>GS</sub> = 0, I <sub>b</sub> = 250 μA
V <sub>GS(th)</sub> Gate-Threshold Voltage	2.0	4.0	4.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>b</sub> = 250 μA
I <sub>GSSF</sub> Gate-Body Leakage Forward		100		nA	V <sub>GS</sub> = 20 V, V <sub>DS</sub> = 0
I <sub>GSSR</sub> Gate-Body Leakage Reverse		-100		nA	V <sub>GS</sub> = -20 V, V <sub>DS</sub> = 0
I <sub>DSS</sub> Zero Gate Voltage		0.25		mA	V <sub>DS</sub> = Max. Rat., V <sub>GS</sub> = 0
I <sub>D(on)</sub> Drain Current		1.0		mA	V <sub>DS</sub> = 0.8 x Max. Rat., T <sub>C</sub> = 125°C
I <sub>D(on)</sub> On-State Drain Current	5.0			A	V <sub>DS</sub> > I <sub>D(on)</sub> x R <sub>DS(on)</sub> Max., V <sub>GS</sub> = 10 V
R <sub>DS(on)</sub> Static Drain-Source On-State Resistance <sup>1</sup>		3.0		Ω	V <sub>GS</sub> = 10 V, I <sub>b</sub> = 2.5 A
R <sub>DS(on)</sub> Static Drain-Source On-State Resistance <sup>1</sup>		6.0		Ω	V <sub>GS</sub> = 10 V, I <sub>b</sub> = 2.5 A, T <sub>C</sub> = 100°C

**DYNAMIC**

g <sub>fs</sub> Forward Transconductance <sup>1</sup>	4.0			S (Ω)	V <sub>DS</sub> = 25 V <sub>DSS(on)</sub> , I <sub>b</sub> = 2.5 A
C <sub>iss</sub> Input Capacitance		2600		pF	V <sub>GS</sub> = 0
C <sub>oss</sub> Output Capacitance		350		pF	V <sub>DS</sub> = 25 V
C <sub>rss</sub> Reverse Transfer Capacitance		150		pF	f = 1 MHz
t <sub>d(on)</sub> Turn-On Delay Time		65		ns	
t <sub>r</sub> Rise Time		55		ns	
T <sub>r</sub> V <sub>off</sub> Off-Voltage Rise Time		62		ns	
t <sub>f</sub> Fall Time		25		ns	

**BODY-DRAIN DIODE RATINGS AND CHARACTERISTICS**

I <sub>S</sub> Continuous Source Current (Body Diode)	Modified MOSPOWER symbol showing the integral P-N Junction rectifier.	
	A	Symbol showing the integral P-N Junction rectifier.
I <sub>SM</sub> Source Current <sup>2</sup> (Body Diode)	24	A
V <sub>SD</sub> Diode Forward Voltage <sup>1</sup>	2.5	V
t <sub>rr</sub> Reverse Recovery Time	1100	ns

**1 Pulse Test:** Pulse Width 300 μsec, Duty Cycle 1.5%.



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

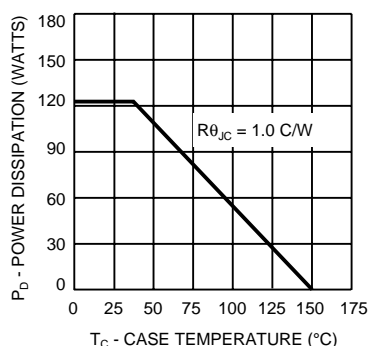
Parameter	OM6034	OM6035	OM6036	OM6037	Units
$V_{DS}$ Drain-Source Voltage	100	200	500	1000	V
$V_{DGR}$ Drain-Gate Voltage ( $R_{GS} = 1M$ )	100	200	500	1000	V
$I_D @ T_C = 25^\circ\text{C}$ Continuous Drain Current	30	25	11	4	A
$V_{GS}$ Continuous Gate-Source Voltage	$\pm 20$	$\pm 20$	$\pm 20$	$\pm 20$	V
$V_{GSM}$ Gate-Source Voltage Non-Repetitive ( $t_p = 50 \mu s$ )	$\pm 40$	$\pm 40$	$\pm 40$	$\pm 40$	V
$I_{DM}$ Pulsed Drain Current <sup>1</sup>	105	60	65	17	A
$P_D @ T_C = 25^\circ\text{C}$ Max. Power Dissipation	100	100	100	100	W
$P_D @ T_C = 100^\circ\text{C}$ Max. Power Dissipation	35	35	35	35	W
Junction to Case Linear Derating Factor <sup>1</sup>	1.0	1.0	1.0	1.0	W/ $^\circ\text{C}$
Junction to Ambient Linear Derating Factor	.025	.025	.025	.025	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 (At case for 5 seconds)	225	225	225	225	$^\circ\text{C}$

<sup>1</sup> Pulse Test: Pulse Width 300  $\mu\text{sec}$ , Duty Cycle 2%.

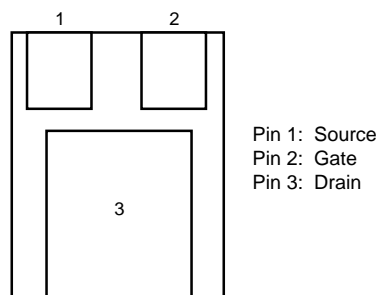
**THERMAL RESISTANCE (MAXIMUM) at  $T_A = 25^\circ\text{C}$**

$R_{\theta JC}$ Junction-to-Case	1.0	$^\circ\text{C/W}$
$R_{\theta JA}$ Junction-to-Ambient	40	$^\circ\text{C/W}$ Free Air Operation

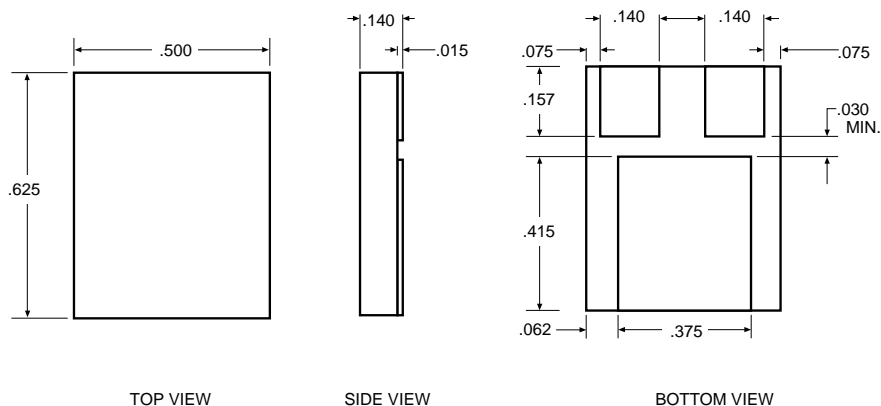
**POWER DERATING**



**PIN CONNECTION**



**MECHANICAL OUTLINE**



3.5

