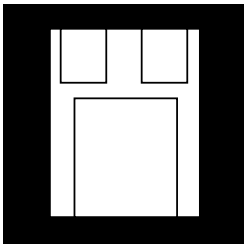
POWER MOSFET IN HERMETIC SURFACE MOUNT PACKAGE



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

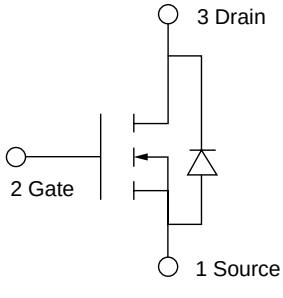
DESCRIPTION

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°C

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

SCHEMATIC



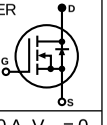
ELECTRICAL CHARACTERISTICS: (T_C = 25°C unless otherwise noted)
STATIC P/N OM6034NM (100V)

Parameter		Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage	100			V	V_{GS} = 0, I_D = 250 µA
$V_{GS(th)}$	Gate-Threshold Voltage	2.0		4.0	V	V_{DS} = V_{GS}, I_D = 250 µA
I_{GSS}	Gate-Body Leakage (OM6105)			± 500	nA	V_{GS} = ± 12.8 V
I_{GSS}	Gate-Body Leakage (OM6005)			± 100	nA	V_{GS} = ± 20 V
I_{DSS}	Zero Gate Voltage Drain Current		0.1	0.25	mA	V_{DS} = Max. Rat., V_{GS} = 0
			0.2	1.0	mA	V_{DS} = 0.8 Max. Rat., V_{GS} = 0, T_C = 125° C
$I_{D(on)}$	On-State Drain Current[1]	35			A	V_{DS} ≥ 2 $V_{DS(on)}$, V_{GS} = 10 V
$V_{DS(on)}$	Static Drain-Source On-State Voltage[1]		1.1	1.3	V	V_{GS} = 10 V, I_D = 20 A
$R_{DS(on)}$	Static Drain-Source On-State Resistance[1]		.055	.065	Ω	V_{GS} = 10 V, I_D = 20 A
$R_{DS(on)}$	Static Drain-Source On-State Resistance[1]		.09	0.11	Ω	V_{GS} = 10 V, I_D = 20 A, T_C = 125°C

DYNAMIC

g_{fs}	Forward Transductance[1]	9.0	10		S(℧)	V_{DS} ≥ 2 $V_{DS(on)}$, I_D = 20 A
C_{iss}	Input Capacitance		2700		pF	V_{GS} = 0
C_{oss}	Output Capacitance		1300		pF	V_{DS} = 25 V
C_{rss}	Reverse Transfer Capacitance		470		pF	f = 1 MHz
$t_{d(on)}$	Turn-On Delay Time		28		ns	V_{DD} = 30 V, I_D ≅ 20 A
t_r	Rise Time		45		ns	R_g = 5.0 Ω, V_{GS} = 10 V
$t_{d(off)}$	Turn-Off Delay Time		100		ns	
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°C, I_S = -40 A, V_{GS} = 0
t_{rr}	Reverse Recovery Time		400		ns	T_J = 150°C, I_F = I_S, dI_F/ds = 100 A/µs

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

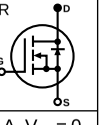
ELECTRICAL CHARACTERISTICS: (T_C = 25°C unless otherwise noted)
STATIC P/N OM6035NM (200V)

Parameter		Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage	200			V	V_{GS} = 0, I_D = 250 µA
$V_{GS(th)}$	Gate-Threshold Voltage	2.0		4.0	V	V_{DS} = V_{GS}, I_D = 250 µA
I_{GSS}	Gate-Body Leakage (OM6106)			± 500	nA	V_{GS} = ± 12.8 V
I_{GSS}	Gate-Body Leakage (OM6006)			± 100	nA	V_{GS} = ± 20 V
I_{DSS}	Zero Gate Voltage Drain Current		0.1	0.25	mA	V_{DS} = Max. Rat., V_{GS} = 0
			0.2	1.0	mA	V_{DS} = 0.8 Max. Rat., V_{GS} = 0, T_C = 125° C
$I_{D(on)}$	On-State Drain Current[1]	30			A	V_{DS} ≥ 2 $V_{DS(on)}$, V_{GS} = 10 V
$V_{DS(on)}$	Static Drain-Source On-State Voltage[1]		1.36	1.52	V	V_{GS} = 10 V, I_D = 16 A
$R_{DS(on)}$	Static Drain-Source On-State Resistance[1]		.085	.095	Ω	V_{GS} = 10 V, I_D = 16 A
$R_{DS(on)}$	Static Drain-Source On-State Resistance[1]		0.14	0.17	Ω	V_{GS} = 10 V, I_D = 16 A, T_C = 125°C

DYNAMIC

g_{fs}	Forward Transductance[1]	10.0	12.5		S(℧)	V_{DS} ≥ 2 $V_{DS(on)}$, I_D = 16 A
C_{iss}	Input Capacitance		2400		pF	V_{GS} = 0
C_{oss}	Output Capacitance		600		pF	V_{DS} = 25 V
C_{rss}	Reverse Transfer Capacitance		250		pF	f = 1 MHz
$t_{d(on)}$	Turn-On Delay Time		25		ns	V_{DD} = 75 V, I_D ≅ 16 A
t_r	Rise Time		60		ns	R_g = 5.0 Ω, V_{GS} = 10 V
$t_{d(off)}$	Turn-Off Delay Time		85		ns	
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°C, I_S = -30 A, V_{GS} = 0
t_{rr}	Reverse Recovery Time		350		ns	T_J = 150°C, I_F = I_S, dI_F/ds = 100 A/µs

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

ELECTRICAL CHARACTERISTICS: (T_C = 25°C unless otherwise noted)
STATIC P/N OM6036NM (500V)

Parameter		Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage	500			V	V_{GS} = 0, I_D = 250 µA
$V_{GS(th)}$	Gate-Threshold Voltage	2.0		4.0	V	$V_{DS} = V_{GS}$, I_D = 250 µA
I_{GSS}	Gate-Body Leakage (OM6108)			± 500	nA	V_{GS} = ± 12.8 V
I_{GSS}	Gate-Body Leakage (OM6008)			± 100	nA	V_{GS} = ± 20 V
I_{DSS}	Zero Gate Voltage Drain Current		0.1	0.25	mA	V_{DS} = Max. Rat., V_{GS} = 0
			0.2	1.0	mA	V_{DS} = 0.8 Max. Rat., V_{GS} = 0, T_C = 125° C
$I_{D(on)}$	On-State Drain Current[1]	13			A	$V_{DS} \geq 2\ V_{DS(on)}$, V_{GS} = 10 V
$V_{DS(on)}$	Static Drain-Source On-State Voltage[1]		2.1	2.8	V	V_{GS} = 10 V, I_D = 7.0 A
$R_{DS(on)}$	Static Drain-Source On-State Resistance[1]		0.3	0.4	Ω	V_{GS} = 10 V, I_D = 7.0 A
$R_{DS(on)}$	Static Drain-Source On-State Resistance[1]		0.66	0.88	Ω	V_{GS} = 10 V, I_D = 7.0 A, T_C = 125°C

DYNAMIC

g_{fs}	Forward Transductance[1]	5.0	7.2		S (℧)	$V_{DS} \geq 2\ V_{DS(on)}$, I_D = 7.0 A
C_{iss}	Input Capacitance		2600		pF	V_{GS} = 0
C_{oss}	Output Capacitance		280		pF	V_{DS} = 25 V
C_{rss}	Reverse Transfer Capacitance		40		pF	f = 1 MHz
$t_{d(on)}$	Turn-On Delay Time		30		ns	V_{DD} = 210 V, $I_D \cong$ 7.0 A
t_r	Rise Time		46		ns	R_g = 5.0 Ω, = V_{GS} = 10 V
$t_{d(off)}$	Turn-Off Delay Time		75		ns	
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°C, I_S = -13 A, V_{GS} = 0
t_{rr}	Reverse Recovery Time		700		ns	T_J = 150°C, $I_F = I_S$, dI_F/ds = 100 A/µs

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

ELECTRICAL CHARACTERISTICS: T_C = 25° unless otherwise noted
STATIC P/N OM6037NM (1000V)

Parameter		Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage	1000			V	V_{GS} = 0, I_D = 250 µA
$V_{GS(th)}$	Gate-Threshold Voltage	2.0		4.0	V	$V_{DS} = V_{GS}$, I_D = 250 µA
I_{GSSF}	Gate-Body Leakage Forward			100	nA	V_{GS} = 20 V, V_{DS} = 0
I_{GSSR}	Gate-Body Leakage Reverse			-100	nA	V_{GS} = - 20 V, V_{DS} = 0
I_{DSS}	Zero Gate Voltage Drain Current			0.25	mA	V_{DS} = Max. Rat., V_{GS} = 0
				1.0	mA	V_{DS} = 0.8 x Max. Rat.,
						T_C = 125° C
$I_{D(on)}$	On-State Drain Current	5.0			A	$V_{DS} > I_{D(on)}$ x $R_{DS(on)}$Max., V_{GS} = 10 V
$R_{DS(on)}$	Static Drain-Source On-State Resisitance[1]			3.0	Ω	V_{GS} = 10 V, I_D = 2.5 A
$R_{DS(on)}$	Static Drain-Source On-State Resistance[1]			6.0	Ω	V_{GS} = 10 V, I_D = 2.5 A T_C = 100°C

DYNAMIC

g_{fs}	Forward Transductance[1]	4.0			S (℧)	V_{DS} = 25 $V_{DS(on)}$, I_D = 2.5 A
C_{iss}	Input Capacitance			2600	pF	V_{GS} = 0
C_{oss}	Output Capacitance			350	pF	V_{DS} = 25 V
C_{rss}	Reverse Transfer Capacitance			150	pF	f = 1 MHz
$T_{d(on)}$	Turn-On Delay Time			65	ns	
t_r	Rise Time			55	ns	
$T_{r(V_{off})}$	Off-Voltage Rise Time			62	ns	
t_f	Fall Time			25	ns	

BODY-DRAIN DIODE RATINGS AND CHARACTERISTICS

I_S	Continuous Source Current (Body Diode)			6	A	Modified MOSPOWER symbol showing the integral P-N Junction rectifier.
I_{SM}	Source Current[2] (Body Diode)			24	A	
V_{SD}	Diode Forward Voltage[1]			2.5	V	T_C = 25°C, I_S = 6 A, V_{GS} = 0
t_{rr}	Reverse Recovery Time		1100		ns	$I_F = I_S$, V_{DD} = 100 V dI_F/ds = 100 A/µs

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

ABSOLUTE MAXIMUM RATINGS: (T_C = 25°C unless otherwise noted)

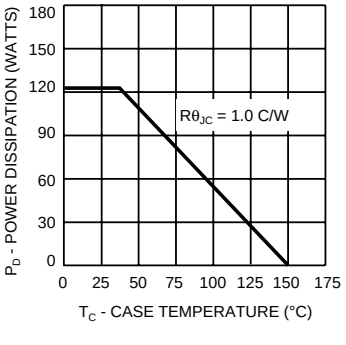
	Parameter	OM6034	OM6035	OM6036	OM6037	Units
V_{DS}	Drain-Source Voltage	100	200	500	1000	V
V_{DGR}	Drain-Gate Voltage (R_{GS} = 1MΩ)	100	200	500	1000	V
I_D @ T_C = 25°C	Continuous Drain Current	30	25	11	4	A
V_{GS}	Continuous Gate-Source Voltage	±20	±20	±20	±20	V
V_{GSM}	Gate-Source Voltage Non-Repetitive ($t_p \leq 50\mu s$)	±40	±40	±40	±40	V
I_{DM}	Pulsed Drain Current[1]	105	60	65	17	A
P_D @ T_C = 25°C	Max. Power Dissipation	100	100	100	100	W
P_D @ T_C = 100°C	Max. Power Dissipation	35	35	35	35	W
Junction to Case	Linear Derating Factor[1]	1.0	1.0	1.0	1.0	W/°C
Junction to Ambient	Linear Derating Factor	.025	.025	.025	.025	W/°C
T_J T_{stg}	Operating and Storage Temperature Range	-55 to 150	-55 to 150	-55 to 150	-55 to 150	°C
Lead Temperature	(At case for 5 seconds)	225	225	225	225	°C

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

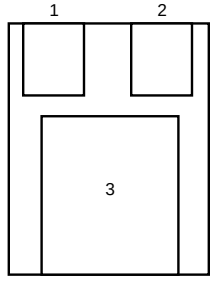
THERMAL RESISTANCE (MAXIMUM) at T_A = 25°C

R_{thJC}	Junction-to-Case	1.0	°C/W
R_{thJA}	Junction-to-Ambient	40	°C/W Free Air Operation

POWER DERATING



PIN CONNECTION



Pin 1: Source
Pin 2: Gate
Pin 3: Drain

MECHANICAL OUTLINE