

POWER MOSFET IN HERMETIC 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

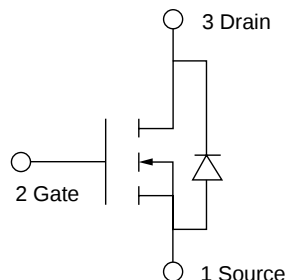
DESCRIPTION

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 $T_C = 25^\circ\text{C}$

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

SCHEMATIC



3.5

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 _{SS} Gate-Body Leakage (OM6105)			± 500	nA	V _{GS} = ± 12.8 V
I _{SS} 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
I _{DSS} Current		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 _{DSS(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(Ω)	V _{DS} ≥ 2 V _{DSS(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 _{don} Turn-On Delay Time		28		ns	V _{DS} = 30 V, I _D ≅ 20 A
t _r Rise Time		45		ns	R _θ = 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 _r Reverse Recovery Time		400		ns	T _J = 150°C, I _F = I _S , dI _F /dI _S = 100 A/I _S

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 _{SS} Gate-Body Leakage (OM6106)			± 500	nA	V _{GS} = ± 12.8 V
I _{SS} 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
I _{DSS} Current		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 _{DSS(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(Ω)	V _{DS} ≥ 2 V _{DSS(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 _{don} Turn-On Delay Time		25		ns	V _{DS} = 75 V, I _D ≅ 16 A
t _r Rise Time		60		ns	R _θ = 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 _r Reverse Recovery Time		350		ns	T _J = 150°C, I _F = I _S , dI _F /dI _S = 100 A/I _S

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}	500			V	V _{GS} = 0, I _b = 250 μA
V _{GS(th)}	2.0		4.0	V	V _{DS} = V _{GS} , I _b = 250 μA
I _{GSS}			± 500	nA	V _{GS} = ± 12.8 V
I _{GSSR}			± 100	nA	V _{GS} = ± 20 V
I _{DSS}		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 _{b(on)}	13			A	V _{DS} ≥ 2 V _{DSS(on)} , V _{GS} = 10 V
V _{DS(on)}		2.1	2.8	V	V _{GS} = 10 V, I _b = 7.0 A
R _{DS(on)}		0.3	0.4	Ω	V _{GS} = 10 V, I _b = 7.0 A
R _{DS(on)}		0.66	0.88	Ω	V _{GS} = 10 V, I _b = 7.0 A, T _C = 125° C

DYNAMIC

g _{fs}	5.0	7.2	S(τ)	V _{DS} ≥ 2 V _{DSS(on)} , I _b = 7.0 A
C _{iss}		2600	pF	V _{GS} = 0
C _{oss}		280	pF	V _{DS} = 25 V
C _{rss}		40	pF	f = 1 MHz
t _{d(on)}		30	ns	V _{DS} = 210 V, I _b ≅ 7.0 A
t _r		46	ns	R _g = 5.0 Ω, V _{GS} = 10 V
t _{d(off)}		75	ns	
t _f		31	ns	

BODY-DRAIN DIODE RATINGS AND CHARACTERISTICS

I _S		-13	A	Modified MOSPOWER symbol showing the integral P-N junction rectifier.
I _{SM}		-52	A	T _C = 25°C, I _S = -13 A, V _{GS} = 0
V _{SD}		-1.4	V	T _J = 150°C, I _F = I _S
t _r		700	ns	dl _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}	1000			V	V _{GS} = 0, I _b = 250 μA
V _{GS(th)}	2.0		4.0	V	V _{DS} = V _{GS} , I _b = 250 μA
I _{GSS}			100	nA	V _{GS} = 20 V, V _{DS} = 0
I _{GSSR}			-100	nA	V _{GS} = - 20 V, V _{DS} = 0
I _{DSS}			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 _{b(on)}	5.0			A	V _{DS} > I _{b(on)} x R _{DS(on)} Max., V _{GS} = 10 V
R _{DS(on)}			3.0	Ω	V _{GS} = 10 V, I _b = 2.5 A
R _{DS(on)}			6.0	Ω	V _{GS} = 10 V, I _b = 2.5 A, T _C = 100° C

DYNAMIC

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

BODY-DRAIN DIODE RATINGS AND CHARACTERISTICS

I _S			6	A	Modified MOSPOWER symbol showing the integral P-N junction rectifier.
I _{SM}			24	A	T _C = 25°C, I _S = 6 A, V _{GS} = 0
V _{SD}			2.5	V	I _F = I _S , V _{DO} = 100 V
t _r		1100		ns	dl _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)

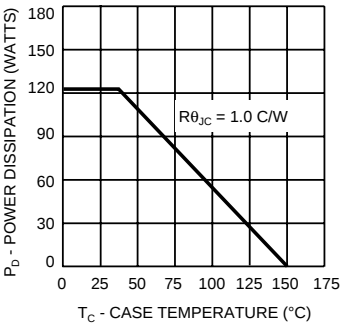
	Parameter	OM6034	OM6035	OM6036	OM6037	Units
V _{DS}	Drain-Source Voltage	100	200	500	1000	V
V _{DGR}	Drain-Gate Voltage (R _{GS} = 1MΩ)	100	200	500	1000	V
I _D @ T _C = 25°C	Continuous Drain Current	30	25	11	4	A
V _{GS}	Continuous Gate-Source Voltage	±20	±20	±20	±20	V
V _{GSM}	Gate-Source Voltage Non-Repetitive (t _p ≤ 50μs)	±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	Operating and	-55 to	-55 to	-55 to	-55 to	
T _{stg}	Storage Temperature Range	150	150	150	150	°C
Lead Temperature	(At case for 5 seconds)	225	225	225	225	°C

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

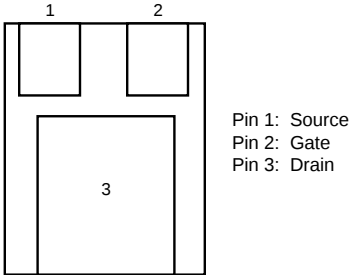
THERMAL RESISTANCE (MAXIMUM) at T_A = 25°C

R _{θJC}	Junction-to-Case	1.0	°C/W
R _{θJA}	Junction-to-Ambient	40	°C/W Free Air Operation

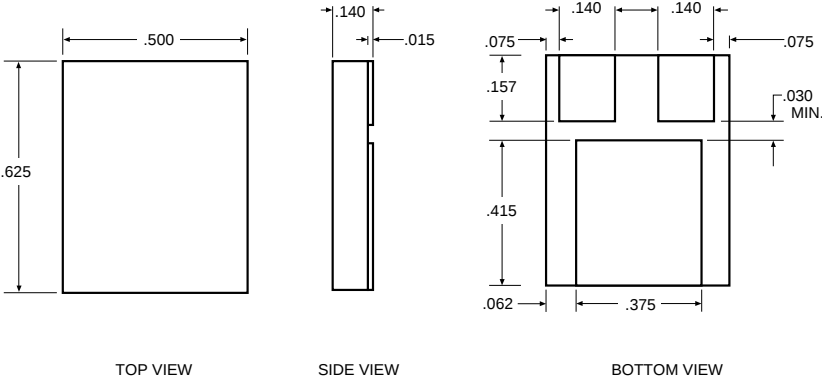
POWER DERATING



PIN CONNECTION



MECHANICAL OUTLINE



3.5