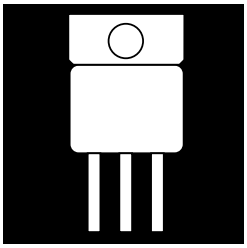
POWER MOSFET IN HERMETIC ISOLATED JEDEC TO-258AA PACKAGE



100V Thru 500V, Up To 35 Amp, N-Channel MOSFET With Or Without Zener Gate Clamp Protection

FEATURES

- Isolated Hermetic Metal Package
- Bi-Lateral Zener Gate Protection (Optional)
- Fast Switching, Low Drive Current
- Ease Of Paralleling For Added Power
- 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. The MOSFET gates are protected using bi-lateral zener clamps in the OM6105SC series.

MAXIMUM RATINGS

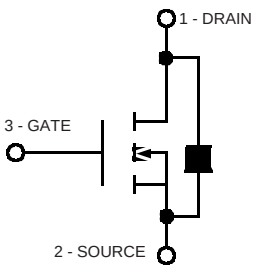
PART NUMBER	V_{DS}	$R_{DS(on)}$	I_D
OM6005SC/OM6105SC	100 V	.065	35 A
OM6006SC/OM6106SC	200 V	.095	30 A
OM6007SC/OM6107SC	400 V	0.3	15 A
OM6008SC/OM6108SC	500 V	0.4	13 A

Note: OM6105SC thru OM6108SC is supplied with zener gate protection.
OM6005SC thru OM6008SC is supplied without zener gate protection.

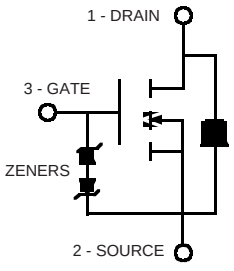
3.1

SCHEMATIC

WITHOUT ZENER CLAMPS
OM6005SC - 6008SC



WITH ZENER CLAMPS
OM6105SC - 6108SC



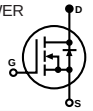
ELECTRICAL CHARACTERISTICS: (T_C = 25°C unless otherwise noted)
STATIC P/N OM6105SC/OM6005SC (100V)

Parameter		Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage	100			V	V_{GS} = 0, I_D = 250 mA
$V_{GS(th)}$	Gate-Threshold Voltage	2.0		4.0	V	$V_{DS} = V_{GS}$, I_D = 250 mA
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]		0.55	0.65		V_{GS} = 10 V, I_D = 20 A
$R_{DS(on)}$	Static Drain-Source On-State Resistance[1]		.09	0.11		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_G = 10V
$t_{d(off)}$	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/ms

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

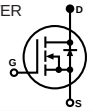
ELECTRICAL CHARACTERISTICS: (T_C = 25°C unless otherwise noted)
STATIC P/N OM6106SC/OM6006SC (200V)

Parameter		Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage	200			V	V_{GS} = 0, I_D = 250 mA
$V_{GS(th)}$	Gate-Threshold Voltage	2.0		4.0	V	$V_{DS} = V_{GS}$, I_D = 250 mA
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		V_{GS} = 10 V, I_D = 16 A
$R_{DS(on)}$	Static Drain-Source On-State Resistance[1]		0.14	0.17		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} = 10V
$t_{d(off)}$	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/ms

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

ELECTRICAL CHARACTERISTICS: (T_C = 25°C unless otherwise noted)
STATIC P/N OM6107SC/OM6007SC (400V)

Parameter		Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage	400			V	V_{GS} = 0, I_D = 250 mA
$V_{GS(th)}$	Gate-Threshold Voltage	2.0		4.0	V	V_{DS} = V_{GS}, I_D = 250 mA
I_{GSS}	Gate-Body Leakage (OM6107)			± 500	nA	V_{GS} = ± 12.8 V
I_{GSS}	Gate-Body Leakage (OM6007)			± 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]	15			A	V_{DS} 2 $V_{DS(on)}$, V_{GS} = 10 V
$V_{DS(on)}$	Static Drain-Source On-State Voltage[1]		2.0	2.4	V	V_{GS} = 10 V, I_D = 8.0 A
$R_{DS(on)}$	Static Drain-Source On-State Resistance[1]		0.25	0.3		V_{GS} = 10 V, I_D = 8.0 A
$R_{DS(on)}$	Static Drain-Source On-State Resistance[1]		0.50	0.60		V_{GS} = 10 V, I_D = 8.0 A, T_C = 125 C

DYNAMIC

g_{fs}	Forward Transductance[1]	6.0	9.6		S(M)	V_{DS} 2 $V_{DS(on)}$, I_D = 8.0 A
C_{iss}	Input Capacitance		2900		pF	V_{GS} = 0
C_{oss}	Output Capacitance		450		pF	V_{DS} = 25 V
C_{rss}	Reverse Transfer Capacitance		150		pF	f = 1 MHz
$t_{d(on)}$	Turn-On Delay Time		30		ns	V_{DD} = 200 V, I_D @8.0 A
t_r	Rise Time		40		ns	R_g =5.0 W, V_{GS} =10V
$t_{d(off)}$	Turn-Off Delay Time		80		ns	
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 C, I_S = -15 A, V_{GS} = 0
t_{rr}	Reverse Recovery Time		600		ns	T_J = 100 C, I_F = I_S, dI_F/ds = 100 A/ms

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

ELECTRICAL CHARACTERISTICS: (T_C = 25°C unless otherwise noted)
STATIC P/N OM6108SC/OM6008SC (500V)

Parameter		Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage	500			V	V_{GS} = 0, I_D = 250 mA
$V_{GS(th)}$	Gate-Threshold Voltage	2.0		4.0	V	V_{DS} = V_{GS}, I_D = 250 mA
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} 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		V_{GS} = 10 V, I_D = 7.0 A
$R_{DS(on)}$	Static Drain-Source On-State Resistance[1]		0.66	0.88		V_{GS} = 10 V, I_D = 7.0 A, T_C = 125 C

DYNAMIC

g_{fs}	Forward Transductance[1]	5.0	7.2		S(M)	V_{DS} 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 @7.0 A
t_r	Rise Time		46		ns	R_g = 5.0 W, 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/ms

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

OM6005SC - OM6108SC

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

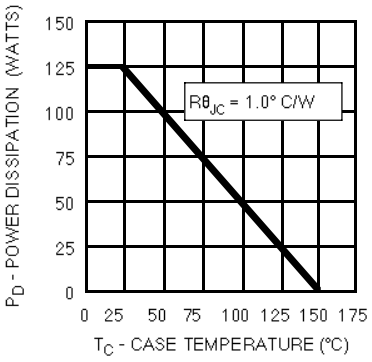
	Parameter	OM6005SC OM6105SC	OM6006SC OM6106SC	OM6007SC OM6107SC	OM6008SC OM6108SC	Units
V_{DS}	Drain-Source Voltage	100	200	400	500	V
V_{DGR}	Drain-Gate Voltage (R_{GS} = 1 M)	100	200	400	500	V
I_D @ T_C = 25°C	Continuous Drain Current[2]	±35	±30	±15	±13	A
I_D @ T_C = 100°C	Continuous Drain Current[2]	± 25	±19	±9	±8	A
I_D	Pulsed Drain Current[1]	±160	±120	±60	±52	A
P_D @ T_C = 25°C	Maximum Power Dissipation	125	125	125	125	W
P_D @ T_C = 100°C	Maximum Power Dissipation	50	50	50	50	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					
T_{stg}	Storage Temperature Range	-55 to 150	-55 to 150	-55 to 150	-55 to 150	°C
Lead Temperature	(1/16" from case for 10 secs.)	300	300	300	300	°C

1 Pulse Test: Pulse width 300 µsec. Duty Cycle 2%.
2 Package Pin Limitation = 35 Amps

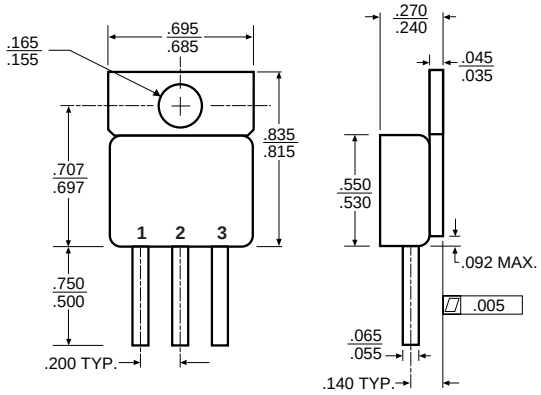
THERMAL RESISTANCE (MAXIMUM) at T_A = 25°C

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

POWER DERATING

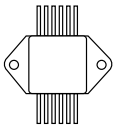


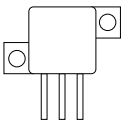
MECHANICAL OUTLINE WITH PIN CONNECTION

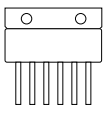


Pin 1: Drain
Pin 2: Source
Pin 3: Gate

PACKAGE OPTIONS


MOD PAK


Z-TAB


6 PIN SIP

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

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