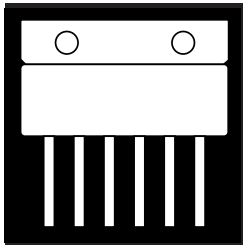


# TWO POWER MOSFETS IN HERMETIC ISOLATED SIP PACKAGE



**100V Thru 500V, Dual High Current, N-Channel MOSFETs**

## FEATURES

- Two Isolated MOSFETs In A Hermetic Metal Package
- 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

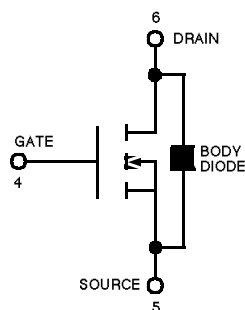
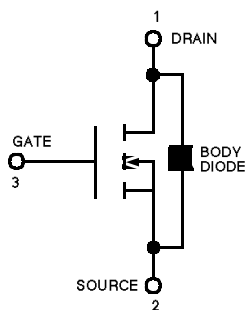
This series of hermetically packaged products feature the latest advanced MOSFET and packaging technology. They are ideally suited for Military requirements where small size, high performance and high reliability are required, and in applications such as switching power supplies, motor controls, inverters,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

## MAXIMUM RATINGS

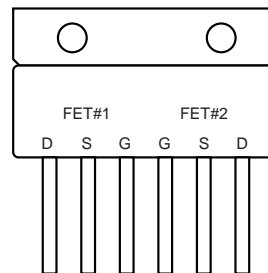
PART NUMBER	$V_{DS}$	$R_{DS(ON)}$	$I_{D(MAX)}$
OM6214SS	100V	.065	30A
OM6215SS	200V	.095	25A
OM6216SS	400V	.3	15A
OM6217SS	500V	.4	13A

3.1

## SCHEMATIC



## CONNECTION DIAGRAM




**ELECTRICAL CHARACTERISTICS:  $T_C = 25^\circ$  unless otherwise noted  
STATIC P/N OM6214SS (Per FET) (100 Volt)**

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			$\pm 100$	nA	$V_{GS} = \pm 20 \text{ V}$
$I_{DSS}$ 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 <sup>1</sup>	30			A	$V_{DS} = 2 V_{DS(on)}$ , $V_{GS} = 10 \text{ V}$
$V_{DS(on)}$ Static Drain-Source On-State Voltage <sup>1</sup>		1.1	1.3	V	$V_{GS} = 10 \text{ V}$ , $I_D = 20 \text{ A}$
$R_{DS(on)}$ Static Drain-Source On-State Resistance <sup>1</sup>		.055	.065		$V_{GS} = 10 \text{ V}$ , $I_D = 20 \text{ A}$
$R_{DS(on)}$ Static Drain-Source On-State Resistance <sup>1</sup>		.09	0.11		$V_{GS} = 10 \text{ V}$ , $I_D = 20 \text{ A}$ , $T_C = 125 \text{ C}$

**DYNAMIC**

$g_{fs}$ Forward Transconductance <sup>1</sup>	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	$V_{DS} = 25 \text{ V}$
$C_{rss}$ 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	$R_g = 5.0 \Omega$ , $V_G = 10 \text{ V}$
$t_{d(off)}$ Turn-Off Delay Time		100		ns	(MOSFET) switching times are essentially independent of operating temperature.
$t_f$ Fall Time		50		ns	(MOSFET) switching times are essentially independent of operating temperature.

**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 <sup>1</sup> (Body Diode)			- 140	A	
$V_{SD}$ Diode Forward Voltage <sup>1</sup>			- 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:  $T_C = 25^\circ$  unless otherwise noted  
STATIC P/N OM6215SS (Per FET) (200 Volt)**

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			$\pm 100$	nA	$V_{GS} = \pm 20 \text{ V}$
$I_{DSS}$ 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 <sup>1</sup>	25			A	$V_{DS} = 2 V_{DS(on)}$ , $V_{GS} = 10 \text{ V}$
$V_{DS(on)}$ Static Drain-Source On-State Voltage <sup>1</sup>		1.36	1.52	V	$V_{GS} = 10 \text{ V}$ , $I_D = 16 \text{ A}$
$R_{DS(on)}$ Static Drain-Source On-State Resistance <sup>1</sup>		.085	.095		$V_{GS} = 10 \text{ V}$ , $I_D = 16 \text{ A}$
$R_{DS(on)}$ Static Drain-Source On-State Resistance <sup>1</sup>		0.14	0.17		$V_{GS} = 10 \text{ V}$ , $I_D = 16 \text{ A}$ , $T_C = 125 \text{ C}$

**DYNAMIC**

$g_{fs}$ Forward Transconductance <sup>1</sup>	8.0	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	$V_{DS} = 25 \text{ V}$
$C_{rss}$ 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	$R_g = 5.0 \Omega$ , $V_G = 10 \text{ V}$
$t_{d(off)}$ Turn-Off Delay Time		85		ns	(MOSFET) switching times are essentially independent of operating temperature.
$t_f$ Fall Time		38		ns	(MOSFET) switching times are essentially independent of operating temperature.

**BODY-DRAIN DIODE RATINGS AND CHARACTERISTICS**

$I_S$ Continuous Source Current (Body Diode)			- 25	A	Modified MOSPOWER symbol showing the integral P-N Junction rectifier. 
$I_{SM}$ Source Current <sup>1</sup> (Body Diode)			- 100	A	
$V_{SD}$ Diode Forward Voltage <sup>1</sup>			- 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%.

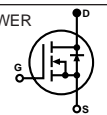
**ELECTRICAL CHARACTERISTICS:  $T_C = 25^\circ$  unless otherwise noted  
STATIC P/N OM6216SS (Per FET) (400 Volt)**

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
$I_{GSSF}$ Gate-Body Leakage			$\pm 100$	nA	$V_{GS} = \pm 20$ 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	$V_{DS} = 0.8$ Max. Rat., $V_{GS} = 0$ , $T_C = 125^\circ$ C
$I_{D(on)}$ On-State Drain Current <sup>1</sup>	15			A	$V_{DS} = 2 V_{DS(on)}$ , $V_{GS} = 10$ V
$V_{DS(on)}$ Static Drain-Source On-State Voltage <sup>1</sup>		2.0	2.4	V	$V_{GS} = 10$ V, $I_D = 8$ A
$R_{DS(on)}$ Static Drain-Source On-State Resistance <sup>1</sup>		0.25	0.3		$V_{GS} = 10$ V, $I_D = 8$ A
$R_{DS(on)}$ Static Drain-Source On-State Resistance <sup>1</sup>		0.50	0.60		$V_{GS} = 10$ V, $I_D = 8$ A, $T_C = 125$ C

**DYNAMIC**

$g_{fs}$ Forward Transconductance <sup>1</sup>	8.0	9.6		S (M)	$V_{DS} = 2 V_{DS(on)}$ , $I_D = 58$ 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	$R_{\theta} = 5.0$ W, $V_{GS} = 10$ 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 <sup>1</sup> (Body Diode)			- 60	A	
$V_{SD}$ Diode Forward Voltage <sup>1</sup>			- 1.6	V	$T_C = 25$ C, $I_S = -15$ 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%.

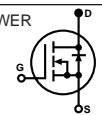
**ELECTRICAL CHARACTERISTICS:  $T_C = 25^\circ$  unless otherwise noted  
STATIC P/N OM6217SS (Per FET) (500 Volt)**

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
$I_{GSSF}$ Gate-Body Leakage			$\pm 100$	nA	$V_{GS} = \pm 20$ 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	$V_{DS} = 0.8$ Max. Rat., $V_{GS} = 0$ , $T_C = 125^\circ$ C
$I_{D(on)}$ On-State Drain Current <sup>1</sup>	13			A	$V_{DS} = 2 V_{DS(on)}$ , $V_{GS} = 10$ V
$V_{DS(on)}$ Static Drain-Source On-State Voltage <sup>1</sup>		2.1	2.8	V	$V_{GS} = 10$ V, $I_D = 7$ A
$R_{DS(on)}$ Static Drain-Source On-State Resistance <sup>1</sup>		0.3	0.4		$V_{GS} = 10$ V, $I_D = 7$ A
$R_{DS(on)}$ Static Drain-Source On-State Resistance <sup>1</sup>		0.66	0.88		$V_{GS} = 10$ V, $I_D = 7$ A, $T_C = 125$ C

**DYNAMIC**

$g_{fs}$ Forward Transconductance <sup>1</sup>	6.0	7.2		S (M)	$V_{DS} = 2 V_{DS(on)}$ , $I_D = 7$ 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	$R_{\theta} = 5.0$ W, $V_{GS} = 10$ 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 <sup>1</sup> (Body Diode)			- 52	A	
$V_{SD}$ Diode Forward Voltage <sup>1</sup>			- 1.4	V	$T_C = 25$ C, $I_S = -13$ 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%.

## OM6214SS - OM6217SS

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

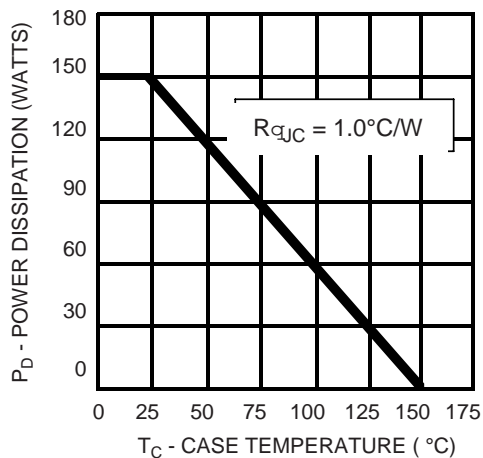
Parameter	OM6214SS	OM6215SS	OM6216SS	OM6217SS	Units
$V_{DS}$	100	200	400	500	V
$V_{DGR}$	100	200	400	500	V
$I_D @ T_C = 25^\circ\text{C}$	$\pm 30$	$\pm 25$	$\pm 15$	$\pm 13$	A
$I_D @ T_C = 100^\circ\text{C}$	$\pm 20$	$\pm 16$	$\pm 9$	$\pm 8$	A
$I_{DM}$	$\pm 140$	$\pm 100$	$\pm 60$	$\pm 52$	A
$P_D @ T_C = 25^\circ\text{C}$	125	125	125	125	W
$P_D @ T_C = 100^\circ\text{C}$	50	50	50	50	W
Junction To Case	1.0	1.0	1.0	1.0	$W/^\circ\text{C}$
Junction To Ambient	.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	(1/16" from case for 10 secs.)				
	300	300	300	300	$^\circ\text{C}$

**1 Pulse Test:** Pulse width 300  $\mu\text{sec}$ . Duty Cycle 2%.

### THERMAL RESISTANCE (Per FET at $T_A = 25^\circ\text{C}$ )

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

### POWER DERATING (Per Device)



### MECHANICAL OUTLINE

