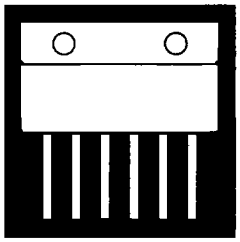
TWO POWER MOSFETS IN HERMETIC ISOLATED SIP PACKAGE



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

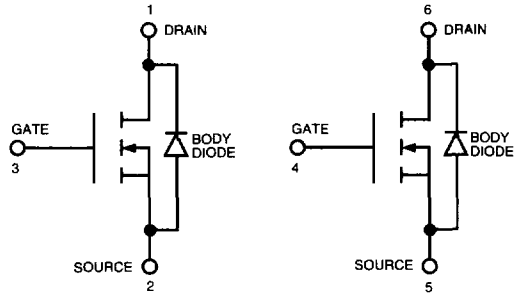
This series of hermetically packaged products feature the latest advanced MOSFET and packaging technology. They are ideally suited for Military requirements where small size, high performance and high reliability are required, and in applications such as switching power supplies, motor controls, inverters,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

MAXIMUM RATINGS

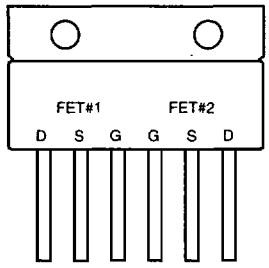
PART NUMBER	V_{DS}	$R_{DS(ON)}$	$I_{D(MAX)}$
OM6214SS	100V	.065Ω	30A
OM6215SS	200V	.095Ω	25A
OM6216SS	400V	.3Ω	15A
OM6217SS	500V	.4Ω	13A

2.1

SCHEMATIC



CONNECTION DIAGRAM



Omnirel

ELECTRICAL CHARACTERISTICS: T_C = 25° 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 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			±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	$V_{DS} \geq 2\ V_{DS(on)}$, 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 (℧)	$V_{DS} \geq 2\ V_{DS(on)}$, 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, $I_D \cong$ 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	(MOSFET) switching times are essentially independent of operating temperature.
t_f	Fall Time		50		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)			- 140	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° 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 µA
$V_{GS(th)}$	Gate-Threshold Voltage	2.0		4.0	V	$V_{DS} = V_{GS}$, I_D = 250 µ
I_{GSSF}	Gate-Body Leakage			±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]	25			A	$V_{DS} \geq 2\ V_{DS(on)}$, 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]	8.0	12.5		S (℧)	$V_{DS} \geq 2\ V_{DS(on)}$, 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, $I_D \cong$ 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	(MOSFET) switching times are essentially independent of operating temperature.
t_f	Fall Time		38		ns	

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[1] (Body Diode)			- 100	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° 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 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			±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	$V_{DS} \geq 2\ V_{DS(on)}$, 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 A
$R_{DS(on)}$	Static Drain-Source On-State Resistance[1]		0.25	0.3	Ω	V_{GS} = 10 V, I_D = 8 A
$R_{DS(on)}$	Static Drain-Source On-State Resistance[1]		0.50	0.60	Ω	V_{GS} = 10 V, I_D = 8 A, T_C = 125°C

DYNAMIC

g_{fs}	Forward Transductance[1]	8.0	9.6		S(℧)	$V_{DS} \geq 2\ V_{DS(on)}$, I_D = 58A
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, $I_D \cong$ 8.0 A
t_r	Rise Time		40		ns	R_g =5.0 Ω, V_{GS} =10V
$t_{d(off)}$	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[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		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° 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 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			±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 A
$R_{DS(on)}$	Static Drain-Source On-State Resistance[1]		0.3	0.4	Ω	V_{GS} = 10 V, I_D = 7 A
$R_{DS(on)}$	Static Drain-Source On-State Resistance[1]		0.66	0.88	Ω	V_{GS} = 10 V, I_D = 7 A, T_C = 125°C

DYNAMIC

g_{fs}	Forward Transductance[1]	6.0	7.2		S(℧)	$V_{DS} \geq 2\ V_{DS(on)}$, 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, $I_D \cong$ 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	(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[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		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%.

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

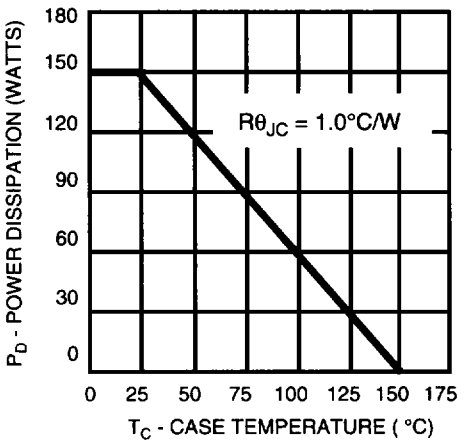
	Parameter	OM6214SS	OM6215SS	OM6216SS	OM6217SS	Units
V_{DS}	Drain-Source Voltage	100	200	400	500	V
V_{DGR}	Drain-Gate Voltage (R_{GS} = 1 MΩ)	100	200	400	500	V
I_D @ T_C = 25°C	Continuous Drain Current	± 30	± 25	± 15	± 13	A
I_D @ T_C = 100°C	Continuous Drain Current	± 20	± 16	± 9	± 8	A
I_{DM}	Pulsed Drain Current[1]	± 140	± 100	± 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%.

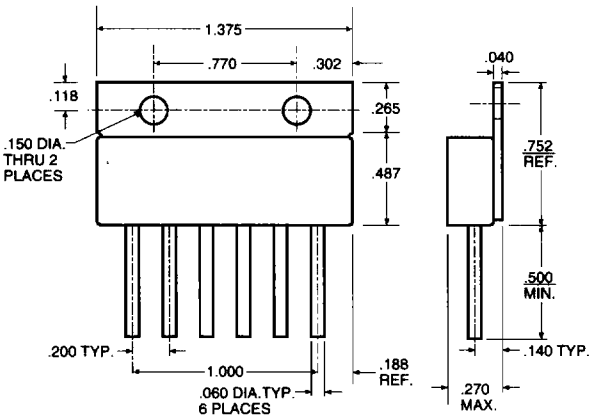
THERMAL RESISTANCE (Per FET at T_A = 25°C)

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

POWER DERATING (Per Device)



MECHANICAL OUTLINE



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