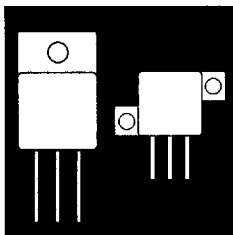


POWER MOSFET IN HERMETIC ISOLATED TO-254AA PACKAGE



100V Thru 500V, Up To 25 Amp, N-Channel
MOSFET In Hermetic Metal Package

FEATURES

- Isolated Hermetic Metal Package
- Fast Switching
- Low $R_{DS(on)}$
- Available Screened To MIL-S-19500, TX, TXV And S Levels
- Same as IRFM 150 - 450 Series
- Ceramic Feedthroughs Available

DESCRIPTION

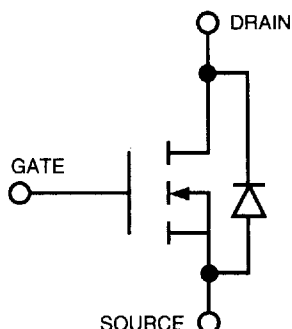
This series of hermetically packaged products feature the latest advanced MOSFET and packaging technology. They are ideally suited for Military requirements where small size, high performance and high reliability are required, and in applications such as switching power supplies, motor controls, inverters,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

MAXIMUM RATINGS @ 25°C

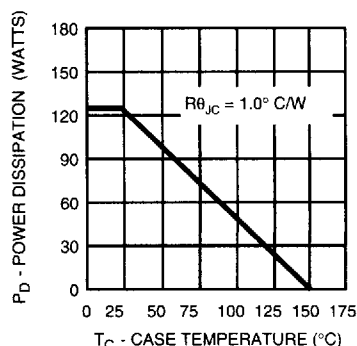
PART NUMBER	V_{DS}	$R_{DS(on)}$	I_D
OM6017SA	100 V	.065 Ω	25 A
OM6018SA	200 V	.100 Ω	25 A
OM6019SA	400 V	.33 Ω	13 A
OM6020SA	500 V	.42 Ω	11 A

3.1

SCHEMATIC



POWER RATING



ELECTRICAL CHARACTERISTICS: ($T_C = 25^\circ\text{C}$ unless otherwise noted)
STATIC P/N OM6017SA

Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS} Drain-Source Breakdown Voltage	100			V	$V_{GS} = 0$, $I_D = 250\ \mu\text{A}$
$V_{GS(th)}$ Gate-Threshold Voltage	2.0		4.0	V	$V_{DS} = V_{GS}$, $I_D = 250\ \mu\text{A}$
I_{SSR} Gate-Body Leakage Forward			100	nA	$V_{GS} = +20\ \text{V}$
I_{SSR} Gate-Body Leakage Reverse			-100	nA	$V_{GS} = -20\ \text{V}$
I_{SS} Zero Gate Voltage Drain Current		0.1	0.25	mA	$V_{DS} = \text{Max. Rat.}$, $V_{GS} = 0$ $V_{DS} = 0.8\ \text{Max. Rat.}$, $V_{GS} = 0$, $T_C = 125^\circ\text{C}$
I_{ON} On-State Drain Current ¹	35			A	$V_{DS} \geq 2 V_{DS(on)}$, $V_{GS} = 10\ \text{V}$
$V_{DS(on)}$ Static Drain-Source On-State Voltage ¹		1.1	1.3	V	$V_{GS} = 10\ \text{V}$, $I_D = 20\ \text{A}$
$R_{DS(on)}$ Static Drain-Source On-State Resistance ¹		0.55	0.65	Ω	$V_{GS} = 10\ \text{V}$, $I_D = 20\ \text{A}$
$R_{DS(on)}$ Static Drain-Source On-State Resistance ¹		.09	0.11	Ω	$V_{GS} = 10\ \text{V}$, $I_D = 20\ \text{A}$, $T_C = 125^\circ\text{C}$

DYNAMIC

g_{fs} Forward Transconductance ¹	9.0			S(Ω)	$V_{DS} \geq 2 V_{DS(on)}$, $I_D = 20\ \text{A}$
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_{don} Turn-On Delay Time		28		ns	$V_{DS} = 30\ \text{V}$, $I_D = 20\ \text{A}$
t_r Rise Time		45		ns	$R_{\theta} = 5.0\ \Omega$, $V_G = 10\ \text{V}$
t_{doff} 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)			-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	$T_C = 25^\circ\text{C}$, $I_S = -40\ \text{A}$, $V_{GS} = 0$
t_r Reverse Recovery Time		400		ns	$T_J = 150^\circ\text{C}$, $I_F = I_S$, $dI_F/dt = 100\ \text{A}/\mu\text{s}$

1 Pulse Test: Pulse Width $\leq 300\ \mu\text{sec}$, Duty Cycle $\leq 2\%$.ELECTRICAL CHARACTERISTICS: ($T_C = 25^\circ\text{C}$ unless otherwise noted)
STATIC P/N OM6018SA

Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS} Drain-Source Breakdown Voltage	200			V	$V_{GS} = 0$, $I_D = 250\ \mu\text{A}$
$V_{GS(th)}$ Gate-Threshold Voltage	2.0		4.0	V	$V_{DS} = V_{GS}$, $I_D = 250\ \mu\text{A}$
I_{SSR} Gate-Body Leakage Forward			100	nA	$V_{GS} = +20\ \text{V}$
I_{SSR} Gate-Body Leakage Reverse			-100	nA	$V_{GS} = -20\ \text{V}$
I_{SS} Zero Gate Voltage Drain Current		0.1	0.25	mA	$V_{DS} = \text{Max. Rat.}$, $V_{GS} = 0$ $V_{DS} = 0.8\ \text{Max. Rat.}$, $V_{GS} = 0$, $T_C = 125^\circ\text{C}$
I_{ON} On-State Drain Current ¹	30			A	$V_{DS} \geq 2 V_{DS(on)}$, $V_{GS} = 10\ \text{V}$
$V_{DS(on)}$ Static Drain-Source On-State Voltage ¹		1.36	1.60	V	$V_{GS} = 10\ \text{V}$, $I_D = 16\ \text{A}$
$R_{DS(on)}$ Static Drain-Source On-State Resistance ¹		.085	.100	Ω	$V_{GS} = 10\ \text{V}$, $I_D = 16\ \text{A}$
$R_{DS(on)}$ Static Drain-Source On-State Resistance ¹		0.14	0.17	Ω	$V_{GS} = 10\ \text{V}$, $I_D = 16\ \text{A}$, $T_C = 125^\circ\text{C}$

DYNAMIC

g_{fs} Forward Transconductance ¹	10.0			S(Ω)	$V_{DS} \geq 2 V_{DS(on)}$, $I_D = 16\ \text{A}$
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_{don} Turn-On Delay Time		25		ns	$V_{DS} = 75\ \text{V}$, $I_D = 16\ \text{A}$
t_r Rise Time		60		ns	$R_{\theta} = 5.0\ \Omega$, $V_{GS} = 10\ \text{V}$
t_{doff} 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)			-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	$T_C = 25^\circ\text{C}$, $I_S = -30\ \text{A}$, $V_{GS} = 0$
t_r Reverse Recovery Time		350		ns	$T_J = 150^\circ\text{C}$, $I_F = I_S$, $dI_F/dt = 100\ \text{A}/\mu\text{s}$

1 Pulse Test: Pulse Width $\leq 300\ \mu\text{sec}$, Duty Cycle $\leq 2\%$.

ELECTRICAL CHARACTERISTICS: ($T_C = 25^\circ\text{C}$ unless otherwise noted)
STATIC P/N OM6019SA

Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV_{DS} Drain-Source Breakdown Voltage	400			V	$V_{GS} = 0$, $I_D = 250\ \mu\text{A}$
$V_{GS(th)}$ Gate-Threshold Voltage	2.0		4.0	V	$V_{DS} = V_{GS}$, $I_D = 250\ \mu\text{A}$
I_{GSSF} Gate-Body Leakage Forward			100	nA	$V_{GS} = +20\ \text{V}$
I_{GSSR} Gate-Body Leakage Reverse			-100	nA	$V_{GS} = -20\ \text{V}$
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	$T_C = 125^\circ\text{C}$
$I_{D(on)}$ On-State Drain Current ¹	15			A	$V_{DS} \geq 2\ V_{DS(on)}$, $V_{GS} = 10\ \text{V}$
$V_{DS(on)}$ Static Drain-Source On-State Voltage ¹		2.0	2.64	V	$V_{GS} = 10\ \text{V}$, $I_D = 8.0\ \text{A}$
$R_{DS(on)}$ Static Drain-Source On-State Resistance ¹		0.25	.33	Ω	$V_{GS} = 10\ \text{V}$, $I_D = 8.0\ \text{A}$
$R_{DS(on)}$ Static Drain-Source On-State Resistance ¹		0.50	0.66	Ω	$V_{GS} = 10\ \text{V}$, $I_D = 8.0\ \text{A}$, $T_C = 125^\circ\text{C}$

DYNAMIC

g_m Forward Transconductance ¹	6.0			$S(\Omega)$	$V_{DS} \geq 2\ V_{DS(on)}$, $I_D = 8.0\ \text{A}$
C_{iss} Input Capacitance	2900			pF	$V_{GS} = 0$
C_{oss} Output Capacitance	450			pF	$V_{DS} = 25\ \text{V}$
C_{res} Reverse Transfer Capacitance	150			pF	$f = 1\ \text{MHz}$
$t_{d(on)}$ Turn-On Delay Time	30			ns	$V_{GS} = 200\ \text{V}$, $I_D = 8.0\ \text{A}$
t_r Rise Time	40			ns	$R_g = 5.0\ \Omega$, $V_{GS} = 10\ \text{V}$
$t_{d(off)}$ 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 ¹ (Body Diode)			-60	A	
V_{SD} Diode Forward Voltage ¹			-1.6	V	$T_C = 25^\circ\text{C}$, $I_S = -15\ \text{A}$, $V_{GS} = 0$
t_r Reverse Recovery Time	600			ns	$T_J = 100^\circ\text{C}$, $I_F = I_S$, $dI_F/dt = 100\ \text{A}/\mu\text{s}$

1 Pulse Test: Pulse Width $\leq 300\ \mu\text{sec}$, Duty Cycle $\leq 2\%$.

ELECTRICAL CHARACTERISTICS: ($T_C = 25^\circ\text{C}$ unless otherwise noted)
STATIC P/N OM6020SA

Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV_{DS} Drain-Source Breakdown Voltage	500			V	$V_{GS} = 0$, $I_D = 250\ \mu\text{A}$
$V_{GS(th)}$ Gate-Threshold Voltage	2.0		4.0	V	$V_{DS} = V_{GS}$, $I_D = 250\ \mu\text{A}$
I_{GSSF} Gate-Body Leakage Forward			100	nA	$V_{GS} = +20\ \text{V}$
I_{GSSR} Gate-Body Leakage Reverse			-100	nA	$V_{GS} = -20\ \text{V}$
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	$T_C = 125^\circ\text{C}$
$I_{D(on)}$ On-State Drain Current ¹	13			A	$V_{DS} \geq 2\ V_{DS(on)}$, $V_{GS} = 10\ \text{V}$
$V_{DS(on)}$ Static Drain-Source On-State Voltage ¹		2.1	2.94	V	$V_{GS} = 10\ \text{V}$, $I_D = 7.0\ \text{A}$
$R_{DS(on)}$ Static Drain-Source On-State Resistance ¹		0.3	0.42	Ω	$V_{GS} = 10\ \text{V}$, $I_D = 7.0\ \text{A}$
$R_{DS(on)}$ Static Drain-Source On-State Resistance ¹		0.66	0.88	Ω	$V_{GS} = 10\ \text{V}$, $I_D = 7.0\ \text{A}$, $T_C = 125^\circ\text{C}$

DYNAMIC

g_m Forward Transconductance ¹	6.0			$S(\Omega)$	$V_{DS} \geq 2\ V_{DS(on)}$, $I_D = 7.0\ \text{A}$
C_{iss} Input Capacitance	2600			pF	$V_{GS} = 0$
C_{oss} Output Capacitance	280			pF	$V_{DS} = 25\ \text{V}$
C_{res} Reverse Transfer Capacitance	40			pF	$f = 1\ \text{MHz}$
$t_{d(on)}$ Turn-On Delay Time	30			ns	$V_{GS} = 210\ \text{V}$, $I_D = 7.0\ \text{A}$
t_r Rise Time	46			ns	$R_g = 5.0\ \Omega$, $V_{GS} = 10\ \text{V}$
$t_{d(off)}$ 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	$T_C = 25^\circ\text{C}$, $I_S = -13\ \text{A}$, $V_{GS} = 0$
t_r Reverse Recovery Time	700			ns	$T_J = 150^\circ\text{C}$, $I_F = I_S$, $dI_F/dt = 100\ \text{A}/\mu\text{s}$

1 Pulse Test: Pulse Width $\leq 300\ \mu\text{sec}$, Duty Cycle $\leq 2\%$.

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

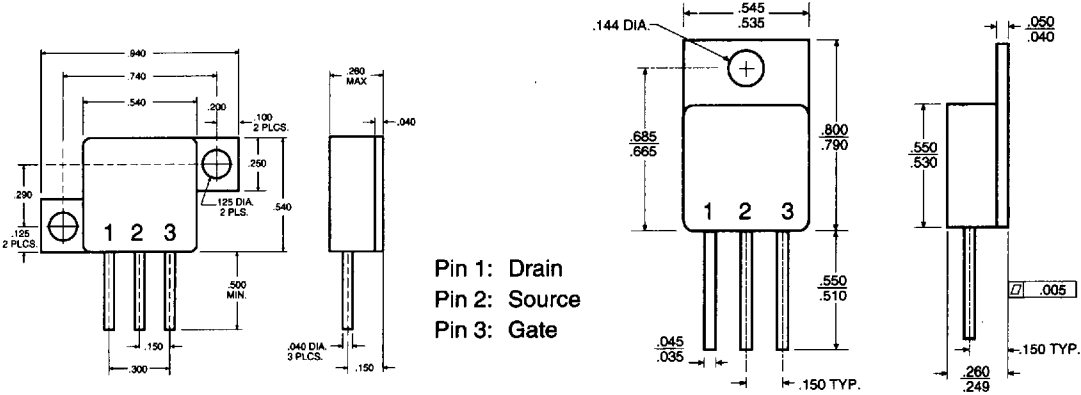
	Parameter	OM6017SA	OM6018SA	OM6019SA	OM6020SA	Units
V _{DS}	Drain-Source Voltage	100	200	400	500	V
V _{DGR}	Drain-Gate Voltage (R _{GS} = 1 MΩ)	100	200	400	500	V
I _D @ T _C = 25°C	Continuous Drain Current ²	±25	±25	±13	±11	A
I _D @ T _C = 100°C	Continuous Drain Current ²	±16	±16	±8	±7	A
I _{DM}	Pulsed Drain Current ¹	±100	±80	±54	±40	A
V _{GS}	Gate-Source Voltage	± 20	± 20	±20	± 20	V
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	1.0	1.0	1.0	1.0	W/°C
Junction To Ambient	Linear Derating Factor	.020	.020	.020	.020	W/°C
T _J	Operating and					
T _{sg}	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 = 15 Amps

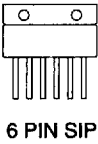
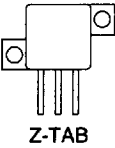
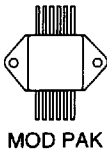
THERMAL RESISTANCE

R _{thJC}	Junction-to-Case	1.0	°C/W
R _{thJA}	Junction-to-Ambient	50	°C/W Free Air Operation

MECHANICAL OUTLINE



PACKAGE OPTIONS



NOTE: Standard Products are supplied with glass feedthroughs. For ceramic feedthroughs, add the letter "C" to the part number.
Example - OMXXXXCSA MOSFETs are also available in Z-Tab, dual and quad pak styles - Please call the factory for more information.

3.1-88