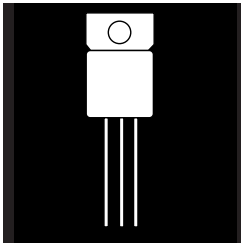


OMY140 OMY340  
OMY240 OMY440

# POWER MOSFETS IN HERMETIC ISOLATED TO-257AA PACKAGE



**100V Thru 500V, Up To 14 Amp, N-Channel MOSFETs 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
- Equivalent To IRFY 140 Series

## DESCRIPTION

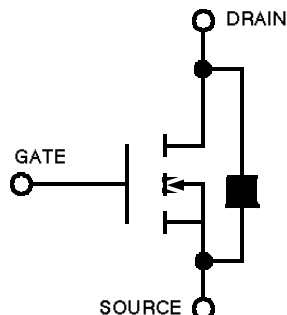
This series of hermetically packaged products feature the latest advanced MOSFET and packaging technology. They are ideally suited for Military requirements where small size, high performance and high reliability are required, and in applications such as switching power supplies, motor controls, inverters,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

## MAXIMUM RATINGS @ 25°C

PART NUMBER	$V_{DS}$	$R_{DS(on)}$	$I_{D(MAX)}$
OMY140	100V	.115	14A
OMY240	200V	.21	14A
OMY340	400V	.58	10A
OMY440	500V	.88	7A

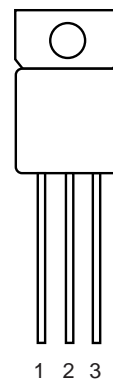
3.1

## SCHEMATIC



## CONNECTION DIAGRAM

1. GATE
2. DRAIN
3. SOURCE



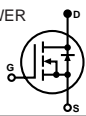
**ELECTRICAL CHARACTERISTICS:  $T_C = 25^\circ$  unless otherwise noted  
STATIC P/N OMY140**

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
$I_{GSSF}$ Gate-Body Leakage Forward			100	nA	$V_{GS} = 20$ V
$I_{GSSR}$ Gate-Body Leakage Reverse			-100	nA	$V_{GS} = -20$ V
$I_{DSS}$ Zero Gate Voltage Drain Current		0.1 0.2	0.25 1.0	mA mA	$V_{DS} = \text{Max. Rat.}$ , $V_{GS} = 0$ $V_{DS} = 0.8$ Max. Rat., $V_{GS} = 0$ , $T_C = 125^\circ$ C
$I_{D(on)}$ On-State Drain Current <sup>1</sup>	14			A	$V_{DS} = 2 V_{DS(on)}$ , $V_{GS} = 10$ V
$V_{DS(on)}$ Static Drain-Source On-State Voltage <sup>1</sup>		1.40	1.73	V	$V_{GS} = 10$ V, $I_D = 15$ A
$R_{DS(on)}$ Static Drain-Source On-State Resistance <sup>1</sup>			.115		$V_{GS} = 10$ V, $I_D = 15$ A
$R_{DS(on)}$ Static Drain-Source On-State Resistance <sup>1</sup>			.20		$V_{GS} = 10$ V, $I_D = 15$ A, $T_C = 125$ C

**DYNAMIC**

$g_{fs}$ Forward Transconductance <sup>1</sup>	10			S (M)	$V_{DS} = 2 V_{DS(on)}$ , $I_D = 15$ A
$C_{iss}$ Input Capacitance		1275		pF	$V_{GS} = 0$
$C_{oss}$ Output Capacitance		550		pF	$V_{DS} = 25$ V
$C_{rss}$ Reverse Transfer Capacitance		160		pF	$f = 1$ MHz
$T_{d(on)}$ Turn-On Delay Time		16		ns	$V_{DD} = 30$ V, $I_D @ 5$ A
$t_r$ Rise Time		19		ns	$R_g = 5$ W, $V_{GS} = 10$ V
$T_{d(off)}$ Turn-Off Delay Time		42		ns	(MOSFET) switching times are essentially independent of operating temperature.
$t_f$ Fall Time		24		ns	

**BODY-DRAIN DIODE RATINGS AND CHARACTERISTICS**

$I_S$ Continuous Source Current (Body Diode)			- 27	A	Modified MOSPOWER symbol showing the integral P-N Junction rectifier. 
$I_{SM}$ Source Current <sup>1</sup> (Body Diode)			- 108	A	
$V_{SD}$ Diode Forward Voltage <sup>1</sup>			- 2.0	V	$T_C = 25$ C, $I_S = -24$ A, $V_{GS} = 0$
$t_{rr}$ Reverse Recovery Time		200		ns	$T_J = 150$ C, $I_F = I_S$ , $di_F/ds = 100$ A/ms

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

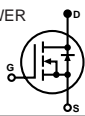
**ELECTRICAL CHARACTERISTICS:  $T_C = 25^\circ$  unless otherwise noted  
STATIC P/N OMY240**

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
$I_{GSSF}$ Gate-Body Leakage Forward			100	nA	$V_{GS} = 20$ V
$I_{GSSR}$ Gate-Body Leakage Reverse			- 100	nA	$V_{GS} = -20$ V
$I_{DSS}$ Zero Gate Voltage Drain Current		0.1 0.2	0.25 1.0	mA mA	$V_{DS} = \text{Max. Rat.}$ , $V_{GS} = 0$ $V_{DS} = 0.8$ Max. Rat., $V_{GS} = 0$ , $T_C = 125^\circ$ C
$I_{D(on)}$ On-State Drain Current <sup>1</sup>	14			A	$V_{DS} = 2 V_{DS(on)}$ , $V_{GS} = 10$ V
$V_{DS(on)}$ Static Drain-Source On-State Voltage <sup>1</sup>		1.8	2.1	V	$V_{GS} = 10$ V, $I_D = 10$ A
$R_{DS(on)}$ Static Drain-Source On-State Resistance <sup>1</sup>			0.21		$V_{GS} = 10$ V, $I_D = 10$ A
$R_{DS(on)}$ Static Drain-Source On-State Resistance <sup>1</sup>			0.40		$V_{GS} = 10$ V, $I_D = 10$ A, $T_C = 125$ C

**DYNAMIC**

$g_{fs}$ Forward Transconductance <sup>1</sup>	6.0			S (M)	$V_{DS} = 2 V_{DS(on)}$ , $I_D = 10$ A
$C_{iss}$ Input Capacitance		1000		pF	$V_{GS} = 0$
$C_{oss}$ Output Capacitance		250		pF	$V_{DS} = 25$ V
$C_{rss}$ Reverse Transfer Capacitance		100		pF	$f = 1$ MHz
$T_{d(on)}$ Turn-On Delay Time		17		ns	$V_{DD} = 75$ V, $I_D @ 18$ A
$t_r$ Rise Time		52		ns	$R_g = 5$ W, $V_{GS} = 10$ V
$T_{d(off)}$ Turn-Off Delay Time		36		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)			- 18	A	Modified MOSPOWER symbol showing the integral P-N Junction rectifier. 
$I_{SM}$ Source Current <sup>1</sup> (Body Diode)			- 72	A	
$V_{SD}$ Diode Forward Voltage <sup>1</sup>			- 1.5	V	$T_C = 25$ C, $I_S = -18$ 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:  $T_C = 25^\circ$  unless otherwise noted  
STATIC P/N OMY340**

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 Forward			100	nA	$V_{GS} = 20$ V
$I_{GSSR}$ Gate-Body Leakage Reverse			-100	nA	$V_{GS} = -20$ V
$I_{DSS}$ Zero Gate Voltage Drain Current		0.1 0.2	0.25 1.0	mA	$V_{DS} = \text{Max. Rat.}$ , $V_{GS} = 0$ $V_{DS} = 0.8 \text{ Max. Rat.}$ , $V_{GS} = 0$ , $T_C = 125^\circ$ C
$I_{D(on)}$ On-State Drain Current <sup>1</sup>	10			A	$V_{DS} = 2 V_{DS(on)}$ , $V_{GS} = 10$ V
$V_{DS(on)}$ Static Drain-Source On-State Voltage <sup>1</sup>		2.5	2.9	V	$V_{GS} = 10$ V, $I_D = 5$ A
$R_{DS(on)}$ Static Drain-Source On-State Resistance <sup>1</sup>			0.58		$V_{GS} = 10$ V, $I_D = 5$ A
$R_{DS(on)}$ Static Drain-Source On-State Resistance <sup>1</sup>			1.16		$V_{GS} = 10$ V, $I_D = 5$ A, $T_C = 125$ C

**DYNAMIC**

$g_{fs}$ Forward Transconductance <sup>1</sup>	4.0	4.4		S(M)	$V_{DS} = 2 V_{DS(on)}$ , $I_D = 5$ A
$C_{iss}$ Input Capacitance		1150		pF	$V_{GS} = 0$
$C_{oss}$ Output Capacitance		165		pF	$V_{DS} = 25$ V
$C_{rss}$ Reverse Transfer Capacitance		70		pF	$f = 1$ MHz
$T_{d(on)}$ Turn-On Delay Time		17		ns	$V_{DD} = 175$ V, $I_D = 5$ A
$t_r$ Rise Time		12		ns	$R_g = 5$ W, $V_{DS} = 10$ V
$T_{d(off)}$ Turn-Off Delay Time		45		ns	
$t_f$ Fall Time		30		ns	

**BODY-DRAIN DIODE RATINGS AND CHARACTERISTICS**

$I_S$ Continuous Source Current (Body Diode)			- 10	A	Modified MOSPOWER symbol showing the integral P-N Junction rectifier.
$I_{SM}$ Source Current <sup>1</sup> (Body Diode)			- 40	A	
$V_{SD}$ Diode Forward Voltage <sup>1</sup>			- 2	V	$T_C = 25$ C, $I_S = -10$ A, $V_{GS} = 0$
$t_{rr}$ Reverse Recovery Time		530		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 OMY440**

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 Forward			100	nA	$V_{GS} = 20$ V
$I_{GSSR}$ Gate-Body Leakage Reverse			- 100	nA	$V_{GS} = -20$ V
$I_{DSS}$ Zero Gate Voltage Drain Current		0.1 0.2	0.25 1.0	mA	$V_{DS} = \text{Max. Rat.}$ , $V_{GS} = 0$ $V_{DS} = 0.8 \text{ Max. Rat.}$ , $V_{GS} = 0$ , $T_C = 125^\circ$ C
$I_{D(on)}$ On-State Drain Current <sup>1</sup>	4.5			A	$V_{DS} = 2 V_{DS(on)}$ , $V_{GS} = 10$ V
$V_{DS(on)}$ Static Drain-Source On-State Voltage <sup>1</sup>		3.2	3.52	V	$V_{GS} = 10$ V, $I_D = 4$ A
$R_{DS(on)}$ Static Drain-Source On-State Resistance <sup>1</sup>			0.88		$V_{GS} = 10$ V, $I_D = 4$ A
$R_{DS(on)}$ Static Drain-Source On-State Resistance <sup>1</sup>			1.76		$V_{GS} = 10$ V, $I_D = 4$ A, $T_C = 125$ C

**DYNAMIC**

$g_{fs}$ Forward Transconductance <sup>1</sup>	4.0	4.8		S(M)	$V_{DS} = 2 V_{DS(on)}$ , $I_D = 4$ A
$C_{iss}$ Input Capacitance		1225		pF	$V_{GS} = 0$
$C_{oss}$ Output Capacitance		200		pF	$V_{DS} = 25$ V
$C_{rss}$ Reverse Transfer Capacitance		85		pF	$f = 1$ MHz
$T_{d(on)}$ Turn-On Delay Time		17		ns	$V_{DD} = 200$ V, $I_D = 4$ A
$t_r$ Rise Time		5		ns	$R_g = 5$ W, $V_{DS} = 10$ V
$T_{d(off)}$ Turn-Off Delay Time		42		ns	(MOSFET) switching times are essentially independent of operating temperature.
$t_f$ Fall Time		14		ns	

**BODY-DRAIN DIODE RATINGS AND CHARACTERISTICS**

$I_S$ Continuous Source Current (Body Diode)			- 8	A	Modified MOSPOWER symbol showing the integral P-N Junction rectifier.
$I_{SM}$ Source Current <sup>1</sup> (Body Diode)			- 32	A	
$V_{SD}$ Diode Forward Voltage <sup>1</sup>			- 2	V	$T_C = 25$ C, $I_S = -18$ 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%.

## OMY140 - OMY440

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

Parameter	OMY140	OMY240	OMY340	OMY440	Units
$V_{DS}$ Drain-Source Voltage	100	200	400	500	V
$V_{DGR}$ Drain-Gate Voltage ( $R_{GS} = 1\text{ M}$ )	100	200	400	500	V
$I_D @ T_C = 25^\circ\text{C}$ Continuous Drain Current <sup>2</sup>	$\pm 14$	$\pm 14$	$\pm 10$	$\pm 8$	A
$I_D @ T_C = 100^\circ\text{C}$ Continuous Drain Current <sup>2</sup>	$\pm 14$	$\pm 11$	$\pm 6$	$\pm 5$	A
$I_{DM}$ Pulsed Drain Current <sup>1</sup>	$\pm 56$	$\pm 56$	$\pm 40$	$\pm 32$	A
$V_{GS}$ Gate-Source Voltage	$\pm 20$	$\pm 20$	$\pm 20$	$\pm 20$	V
$P_D @ T_C = 25^\circ\text{C}$ Maximum Power Dissipation	125	125	125	125	W
$P_D @ T_C = 100^\circ\text{C}$ Maximum Power Dissipation	50	50	50	50	W
Junction To Case Linear Derating Factor	1.0	1.0	1.0	1.0	W/ $^\circ\text{C}$
Junction To Ambient Linear Derating Factor	.015	.015	.015	.015	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	$^\circ\text{C}$

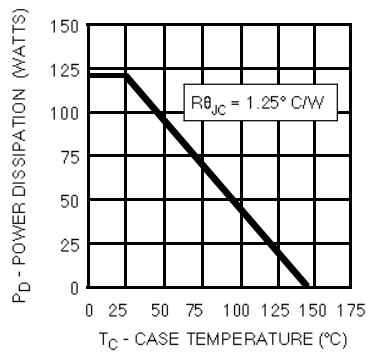
<sup>1</sup> Pulse Test: Pulse width 300  $\mu\text{sec}$ . Duty Cycle 2%.

<sup>2</sup> Package pin limitation = 10 Amps

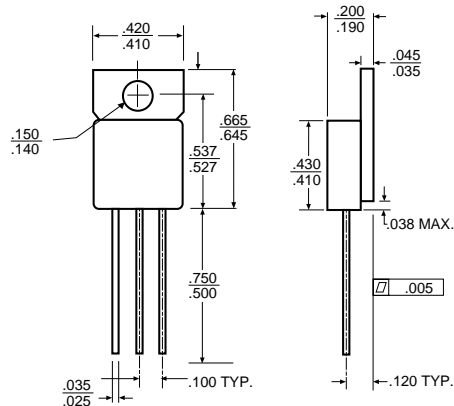
### THERMAL RESISTANCE

$R_{thJC}$ Junction-to-Case	1.00	$^\circ\text{C}/\text{W}$	
$R_{thJA}$ Junction-to-Ambient	65	$^\circ\text{C}/\text{W}$	Free Air Operation

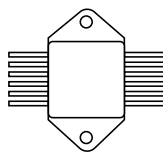
### POWER DERATING



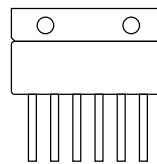
### MECHANICAL OUTLINE



### PACKAGE OPTIONS



MOD PAK



6 PIN SIP

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