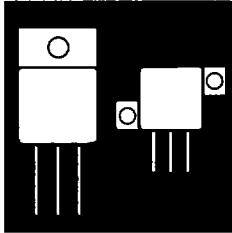


# POWER MOSFET IN HERMETIC ISOLATED TO-254AA PACKAGE



600V & 550V, 11 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
- Ceramic Feedthroughs Also Available

## DESCRIPTION

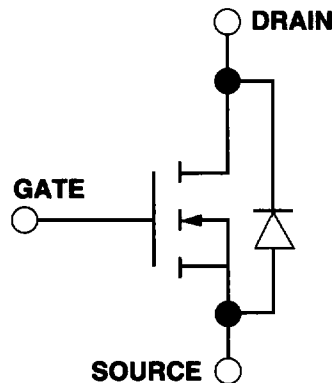
This series of hermetically packaged products feature the latest advanced MOSFET and packaging technology. The device breakdown ratings provide a substantial voltage margin for stringent applications such as 270 VDC aircraft power and/or rectified 230 VAC power (line operation). They are ideally suited 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	$V_{DS}$	$R_{DS(on)}$	$I_{D(MAX)}$
OM11N60	600V	.50 $\Omega$	11A
OM11N55	550V	.44 $\Omega$	11A

3.1

## SCHEMATIC



**ELECTRICAL CHARACTERISTICS: T<sub>C</sub> = 25° unless otherwise noted  
STATIC P/N OM11N60SA**

Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV <sub>DS</sub> Drain-Source Breakdown Voltage	600			V	V <sub>GS</sub> = 0, I <sub>D</sub> = 250 μA
V <sub>GS(th)</sub> Gate-Threshold Voltage	2.0	4.0		V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA
I <sub>SS</sub> Gate-Body Leakage		± 100		nA	V <sub>GS</sub> = ± 20 V
I <sub>SS</sub> Zero Gate Voltage Drain Current		0.1 0.2	0.25 1.0	mA	V <sub>DS</sub> = Max. Rat., V <sub>GS</sub> = 0 V <sub>DS</sub> = 0.8 Max. Rat., V <sub>GS</sub> = 0, T <sub>C</sub> = 125° C
I <sub>DS(on)</sub> On-State Drain Current <sup>1</sup>	11.0			A	V <sub>DS</sub> > I <sub>DS(on)</sub> × R <sub>DS(on)</sub> , V <sub>GS</sub> = 10 V
V <sub>DS(on)</sub> Static Drain-Source On-State Voltage <sup>1</sup>		3.1		V	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 5.5 A
R <sub>DS(on)</sub> Static Drain-Source On-State Resistance <sup>1</sup>		.47	.50	Ω	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 5.5 A
R <sub>DS(on)</sub> Static Drain-Source On-State Resistance <sup>1</sup>		1.0		Ω	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 5.5 A, T <sub>C</sub> = 125° C

**DYNAMIC**

Symbol	Min.	Typ.	Max.	Units	Test Conditions
g <sub>fs</sub> Forward Transconductance <sup>1</sup>	5.0			S(Ω)	V <sub>DS</sub> ≥ 2 V <sub>DS(on)</sub> , I <sub>D</sub> = 5.5 A
C <sub>iss</sub> Input Capacitance		3000		pF	V <sub>GS</sub> = 0
C <sub>oss</sub> Output Capacitance		440		pF	V <sub>DS</sub> = 25 V
C <sub>rev</sub> Reverse Transfer Capacitance		220		pF	f = 1 MHz
T <sub>rd(on)</sub> Turn-On Delay Time		55		ns	V <sub>DS</sub> = 210 V, I <sub>D</sub> = 7.0 A
t <sub>r</sub> Rise Time		75		ns	R <sub>θ</sub> = 5 Ω, R <sub>L</sub> = 30 Ω
T <sub>rd(off)</sub> Turn-Off Delay Time		225		ns	(MOSFET) switching times are essentially independent of operating temperature.
t <sub>f</sub> Fall Time		135		ns	

**BODY-DRAIN DIODE RATINGS AND CHARACTERISTICS**

Symbol	Min.	Typ.	Max.	Units	Test Conditions
I <sub>S</sub> Continuous Source Current (Body Diode)			- 11	A	Modified MOSPOWER symbol showing the integral P-N Junction rectifier.
I <sub>SM</sub> Source Current <sup>1</sup> (Body Diode)			- 52	A	
V <sub>SD</sub> Diode Forward Voltage <sup>1</sup>			- 1.4	V	T <sub>C</sub> = 25° C, I <sub>S</sub> = -11 A, V <sub>GS</sub> = 0
t <sub>r</sub> Reverse Recovery Time		700		ns	T <sub>J</sub> = 150° C, I <sub>r</sub> = I <sub>S</sub> , dI <sub>F</sub> /ds = 100 A/μs

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

**ELECTRICAL CHARACTERISTICS: T<sub>C</sub> = 25° unless otherwise noted  
STATIC P/N OM11N55SA**

Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV <sub>DS</sub> Drain-Source Breakdown Voltage	550			V	V <sub>GS</sub> = 0, I <sub>D</sub> = 250 μA
V <sub>GS(th)</sub> Gate-Threshold Voltage	2.0	4.0		V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA
I <sub>SS</sub> Gate-Body Leakage		± 100		nA	V <sub>GS</sub> = ± 20 V
I <sub>SS</sub> Zero Gate Voltage Drain Current		0.1 0.2	0.25 1.0	mA	V <sub>DS</sub> = Max. Rat., V <sub>GS</sub> = 0 V <sub>DS</sub> = 0.8 Max. Rat., V <sub>GS</sub> = 0, T <sub>C</sub> = 125° C
I <sub>DS(on)</sub> On-State Drain Current <sup>1</sup>	11.0			A	V <sub>DS</sub> > I <sub>DS(on)</sub> × R <sub>DS(on)</sub> , V <sub>GS</sub> = 10 V
V <sub>DS(on)</sub> Static Drain-Source On-State Voltage <sup>1</sup>		3.3		V	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 5.5 A
R <sub>DS(on)</sub> Static Drain-Source On-State Resistance <sup>1</sup>		.37	.44	Ω	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 5.5 A
R <sub>DS(on)</sub> Static Drain-Source On-State Resistance <sup>1</sup>		.88		Ω	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 5.5 A, T <sub>C</sub> = 125° C

**DYNAMIC**

Symbol	Min.	Typ.	Max.	Units	Test Conditions
g <sub>fs</sub> Forward Transconductance <sup>1</sup>	5.0			S(Ω)	V <sub>DS</sub> ≥ 2 V <sub>DS(on)</sub> , I <sub>D</sub> = 5.5 A
C <sub>iss</sub> Input Capacitance		3000		pF	V <sub>GS</sub> = 0
C <sub>oss</sub> Output Capacitance		440		pF	V <sub>DS</sub> = 25 V
C <sub>rev</sub> Reverse Transfer Capacitance		220		pF	f = 1 MHz
T <sub>rd(on)</sub> Turn-On Delay Time		55		ns	V <sub>DS</sub> = 210 V, I <sub>D</sub> = 7.0 A
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**BODY-DRAIN DIODE RATINGS AND CHARACTERISTICS**

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I <sub>S</sub> Continuous Source Current (Body Diode)			- 11	A	Modified MOSPOWER symbol showing the integral P-N Junction rectifier.
I <sub>SM</sub> Source Current <sup>1</sup> (Body Diode)			- 52	A	
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t <sub>r</sub> Reverse Recovery Time		700		ns	T <sub>J</sub> = 150° C, I <sub>r</sub> = I <sub>S</sub> , dI <sub>F</sub> /ds = 100 A/μs

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

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

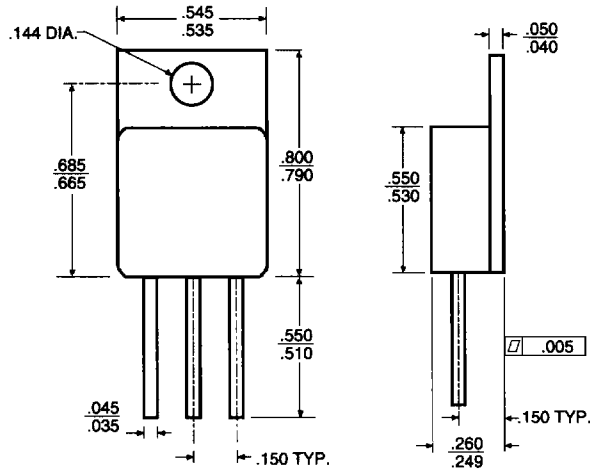
Symbol	Parameter	OM11N60	OM11N55	Units
$V_{DGR}$	Drain Source Voltage	600	550	V
$V_{DS}$	Drain Gate Voltage ( $R_{GS} = 1.0\text{ M}\Omega$ )	600	550	V
$I_D$	Continuous Drain Current @ $T_C = 25^\circ\text{C}$	11	11	A
$I_D$	Continuous Drain Current @ $T_C = 100^\circ\text{C}$	7.2	7.2	A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	52	52	A
$P_D$	Max. Power Dissipation @ $T_C = 25^\circ\text{C}$	125	125	W
$P_D$	Max. Power Dissipation @ $T_C = 100^\circ\text{C}$	50	50	W
	Linear Derating Factor Jct. to Case	1.0	1.0	W/ $^\circ\text{C}$
	Linear Derating Factor Jct. to Ambient	.020	.020	W/ $^\circ\text{C}$
$T_J, T_{stg}$	Operating and Storage Temp. Range	-55 to 150		$^\circ\text{C}$
	Lead Temperature <small>(1/16" from case for 10 sec.)</small>	300	300	$^\circ\text{C}$

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

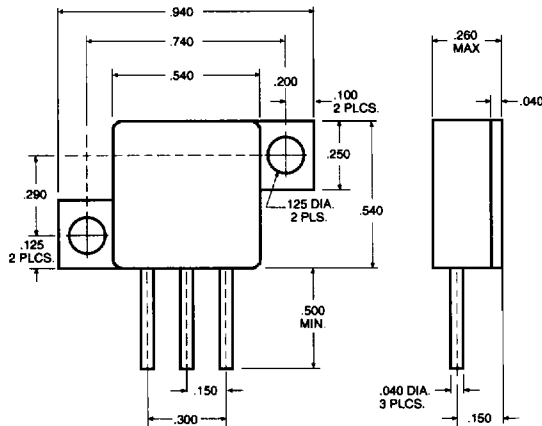
**THERMAL RESISTANCE** (Maximum at  $T_A = 25^\circ\text{C}$ )

$R_{thJC}$	Junction-to-Case	1.0	1.0	$^\circ\text{C}/\text{W}$
$R_{thJA}$	Junction-to-Ambient (Free Air Operation)	50	50	$^\circ\text{C}/\text{W}$

## MECHANICAL OUTLINES



**TO-254 AA Package**



**Omnirel AZ Package**

For Z-Pack configuration, add letter "Z" to part number, **Example - OMXXXXSAZ**

Standard Products are supplied with glass feedthroughs, for ceramic feedthroughs, add letter "C" to part number, **Example - OMXXXXCSA**