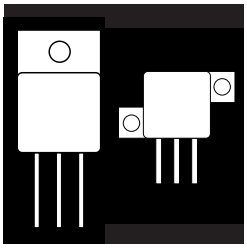
POWER MOSFET IN HERMETIC ISOLATED TO-254AA PACKAGE



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

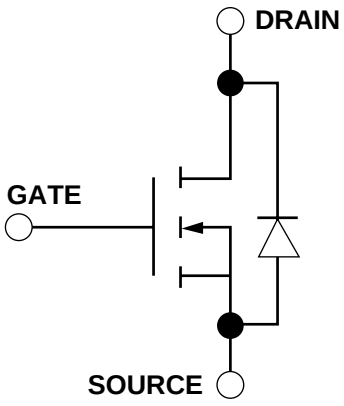
This series of hermetically packaged products feature the latest advanced MOSFET and packaging technology. The device breakdown ratings provide a substantial voltage margin for stringent applications such as 270 VDC aircraft power and/or rectified 230 VAC power (line operation). They are ideally suited 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	11A
OM11N55	550V	.44	11A

3.1

SCHEMATIC



Omnirel

ELECTRICAL CHARACTERISTICS: T_C = 25° unless otherwise noted
STATIC P/N OM11N60SA

Parameter		Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage	600			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_{GSS}	Gate-Body Leakage			± 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} = Max. Rat., V_{GS} = 0 V_{DS} = 0.8 Max. Rat., V_{GS} = 0, T_C = 125° C
$I_{D(on)}$	On-State Drain Current[1]	11.0			A	V_{DS} > $I_{D(on)}$ x $R_{DS(on)}$, V_{GS} = 10 V
$V_{DS(on)}$	Static Drain-Source On-State Voltage[1]			3.1	V	V_{GS} = 10 V, I_D = 5.5 A
$R_{DS(on)}$	Static Drain-Source On-State Resistance[1]		.47	.50		V_{GS} = 10 V, I_D = 5.5 A
$R_{DS(on)}$	Static Drain-Source On-State Resistance[1]			1.0		V_{GS} = 10 V, I_D = 5.5 A, T_C = 125 C

DYNAMIC

g_{fs}	Forward Transductance[1]	5.0			S(M)	V_{DS} 2 $V_{DS(on)}$, I_D = 5.5 A
C_{iss}	Input Capacitance		3000		pF	V_{GS} = 0
C_{oss}	Output Capacitance		440		pF	V_{DS} = 25 V
C_{rss}	Reverse Transfer Capacitance		220		pF	f = 1 MHz
$T_{d(on)}$	Turn-On Delay Time		55		ns	V_{DD} = 210 V, I_D @ 7.0 A
t_r	Rise Time		75		ns	R_g = 5 W, R_L = 30 W
$T_{d(off)}$	Turn-Off Delay Time		225		ns	(MOSFET) switching times are essentially independent of operating temperature.
t_f	Fall Time		135		ns	

BODY-DRAIN DIODE RATINGS AND CHARACTERISTICS

I_S	Continuous Source Current (Body Diode)			- 11	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 = -11 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%.

ELECTRICAL CHARACTERISTICS: T_C = 25° unless otherwise noted
STATIC P/N OM11N55SA

Parameter		Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage	550			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_{DSS}	Zero Gate Voltage Drain Current		0.1 0.2	0.25 1.0	mA mA	V_{DS} = Max. Rat., V_{GS} = 0 V_{DS} = 0.8 Max. Rat., V_{GS} = 0, T_C = 125° C
$I_{D(on)}$	On-State Drain Current[1]	11.0			A	V_{DS} > $I_{D(on)}$ x $R_{DS(on)}$, V_{GS} = 10 V
$V_{DS(on)}$	Static Drain-Source On-State Voltage[1]			3.3	V	V_{GS} = 10 V, I_D = 5.5 A
$R_{DS(on)}$	Static Drain-Source On-State Resistance[1]		.37	.44		V_{GS} = 10 V, I_D = 5.5 A
$R_{DS(on)}$	Static Drain-Source On-State Resistance[1]			.88		V_{GS} = 10 V, I_D = 5.5 A, T_C = 125 C

DYNAMIC

g_{fs}	Forward Transductance[1]	5.0			S(M)	V_{DS} 2 $V_{DS(on)}$, I_D = 5.5 A
C_{iss}	Input Capacitance		3000		pF	V_{GS} = 0
C_{oss}	Output Capacitance		440		pF	V_{DS} = 25 V
C_{rss}	Reverse Transfer Capacitance		220		pF	f = 1 MHz
$T_{d(on)}$	Turn-On Delay Time		55		ns	V_{DD} = 210 V, I_D @ 7.0 A
t_r	Rise Time		75		ns	R_g = 5 W, R_L = 30 W
$T_{d(off)}$	Turn-Off Delay Time		225		ns	(MOSFET) switching times are essentially independent of operating temperature.
t_f	Fall Time		135		ns	

BODY-DRAIN DIODE RATINGS AND CHARACTERISTICS

I_S	Continuous Source Current (Body Diode)			- 11	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 = -11 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%.

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

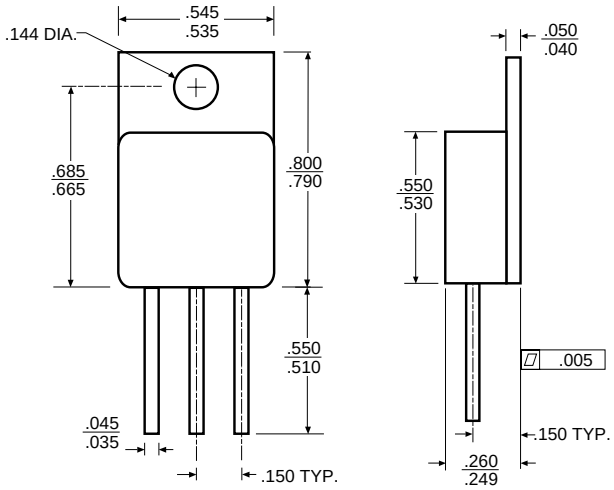
Symbol	Parameter	OM11N60	OM11N55	Units
V_{DGR}	Drain Source Voltage	600	550	V
V_{DS}	Drain Gate Voltage (R_{GS} = 1.0 M)	600	550	V
I_D	Continuous Drain Current @ T_C = 25°C	11	11	A
I_D	Continuous Drain Current @ T_C = 100°C	7.2	7.2	A
I_{DM}	Pulsed Drain Current[1]	52	52	A
P_D	Max. Power Dissipation @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

1 Pulse Test: Pulse width 300 µsec. Duty Cycle 2%.

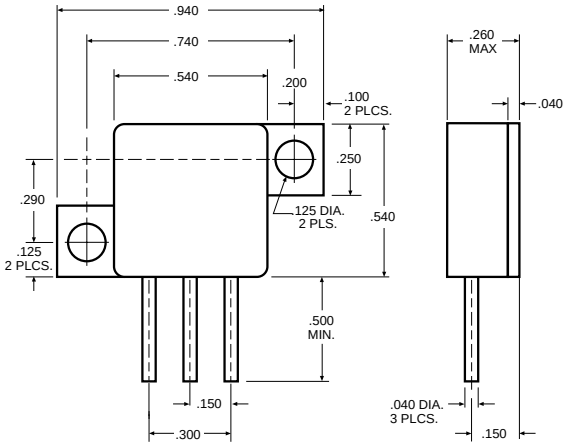
THERMAL RESISTANCE (Maximum at T_A = 25°C)

R_{thJC}	Junction-to-Case	1.0	1.0	°C/W
R_{thJA}	Junction-to-Ambient (Free Air Operation)	50	50	°C/W

MECHANICAL OUTLINES



TO-254 AA Package



Omnirel AZ Package

For Z-Pack configuration, add letter "**Z**" to part number, **Example - OMXXXXSA<u>Z</u>**

Standard Products are supplied with glass feedthroughs, for ceramic feedthroughs, add letter "**C**" to part number,
Example - OMXXXX<u>C</u>SA

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