

## GENERAL DESCRIPTION

The MDSGN-750ELMV is an internally matched, COMMON SOURCE, class AB, GaN on SiC HEMT transistor capable of providing over 18.5 dB gain, 750 Watts of pulsed RF output power at ELM pulse format across the 1030 to 1090 MHz band. The transistor has internal pre-match for optimal performance. This hermetically sealed transistor is specifically designed for Mode-S ELM Avionics applications. It utilizes gold metallization and eutectic attach to provide highest reliability and superior ruggedness.

## ABSOLUTE MAXIMUM RATINGS

### Maximum Power Dissipation

Device Dissipation @ 25°C      1375 W

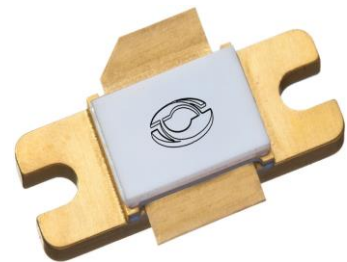
### Maximum Voltage and Current

Drain-Source Voltage ( $V_{DSS}$ )      150 V  
Gate-Source Voltage ( $V_{GS}$ )      -8 to +0 V

### Maximum Temperatures

Storage Temperature ( $T_{STG}$ )      -55 to +125° C  
Operating Junction Temperature      +250° C

## CASE OUTLINE 55-KR Common Source



## ELECTRICAL CHARACTERISTICS @ 25°C

Symbol	Characteristics	Test Conditions	Min	Typ	Max	Units
Pout	Output Power	Pout=750W, Freq=1030,1090 MHz	750	800		W
Gp	Power Gain	Pout=750W, Freq=1030,1090 MHz	18.5	19.1		dB
$\eta_d$	Drain Efficiency	Pout=750W, Freq=1030,1090 MHz	60	70		%
Dr	Droop	Pout=750W, Freq=1030,1090 MHz			1.2	dB
VSWR-T	Load Mismatch Tolerance	Pout=750W, Freq= 1030MHz			3:1	
$\Theta_{jc}$	Thermal Resistance	ELM Pulse Format			0.23	°C/W

- Mode-S ELM pulse format – 32us (on) / 18us (off) x 48, Period = 24ms, LTDF=6.4%
- Data taken at pulse #1
- Bias Condition: Vdd=+50V, Idq=100mA average current (Vgs= -2.0 ~ -4.5V typical)

## FUNCTIONAL CHARACTERISTICS @ 25°C

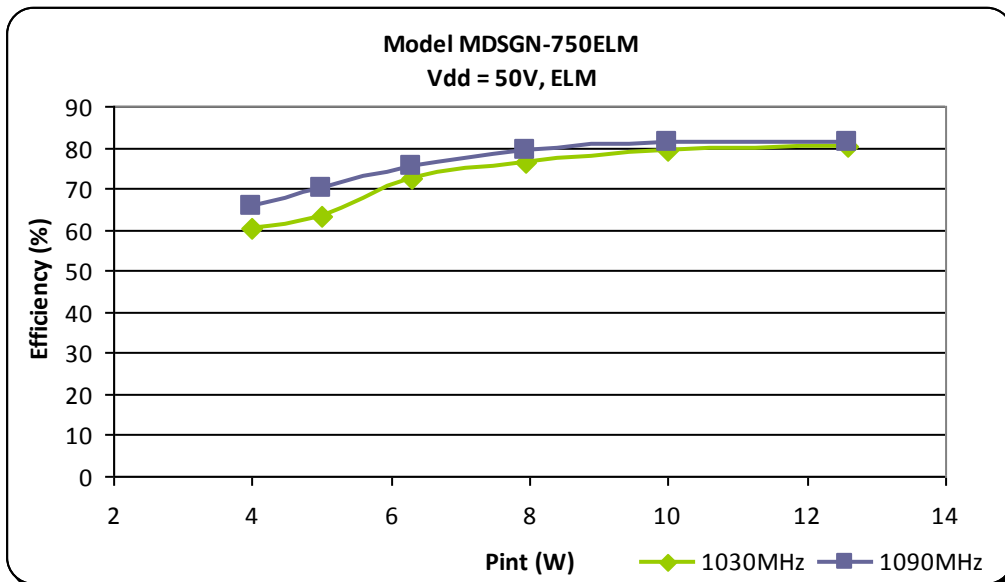
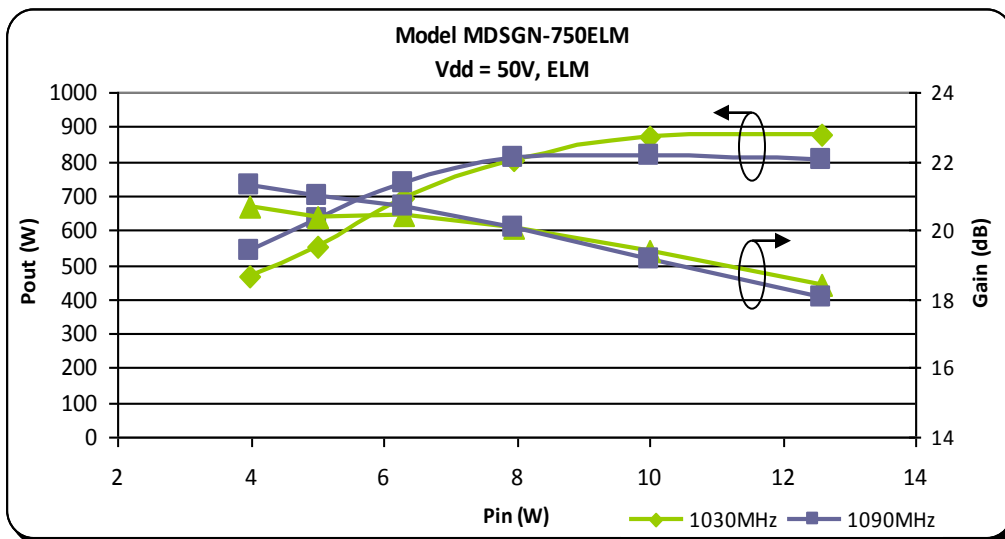
$I_{D(Off)}$	Drain leakage current	$V_{gs} = -8V, V_D = 150V$			64	mA
$I_{G(Off)}$	Gate leakage current	$V_{gs} = -8V, V_D = 0V$			20	mA
$BV_{DSS}$	Drain-source breakdown voltage	$V_{gs} = -8V, I_D = 64mA$	150			V

# MDSGN-750ELMV

750 Watts - 50 Volts, ELM  
L-Band Avionics 1030 - 1090 MHz

## TYPICAL BROAD BAND PERFORMANCE DATA

Frequency	Pin (W)	Pout (W)	Id (A)	RL (dB)	Nd (%)	G (dB)	Drop (dB)
1030 MHz	10	850	1.41	-8	70	19.4	1.1
1090 MHz	10	815	1.29	-11	70	19.1	1.0



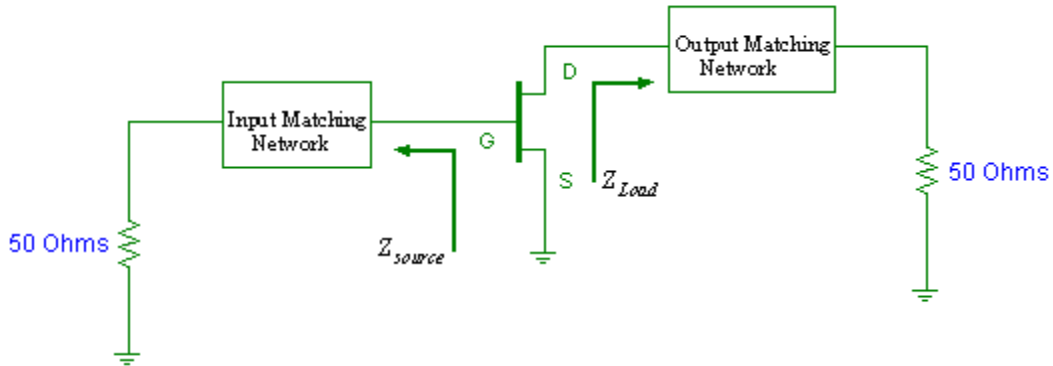
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## **Transistor Impedance Information**



Note:  $Z_{Source}$  is looking into the input circuit;  
 $Z_{Load}$  is looking into the output circuit.

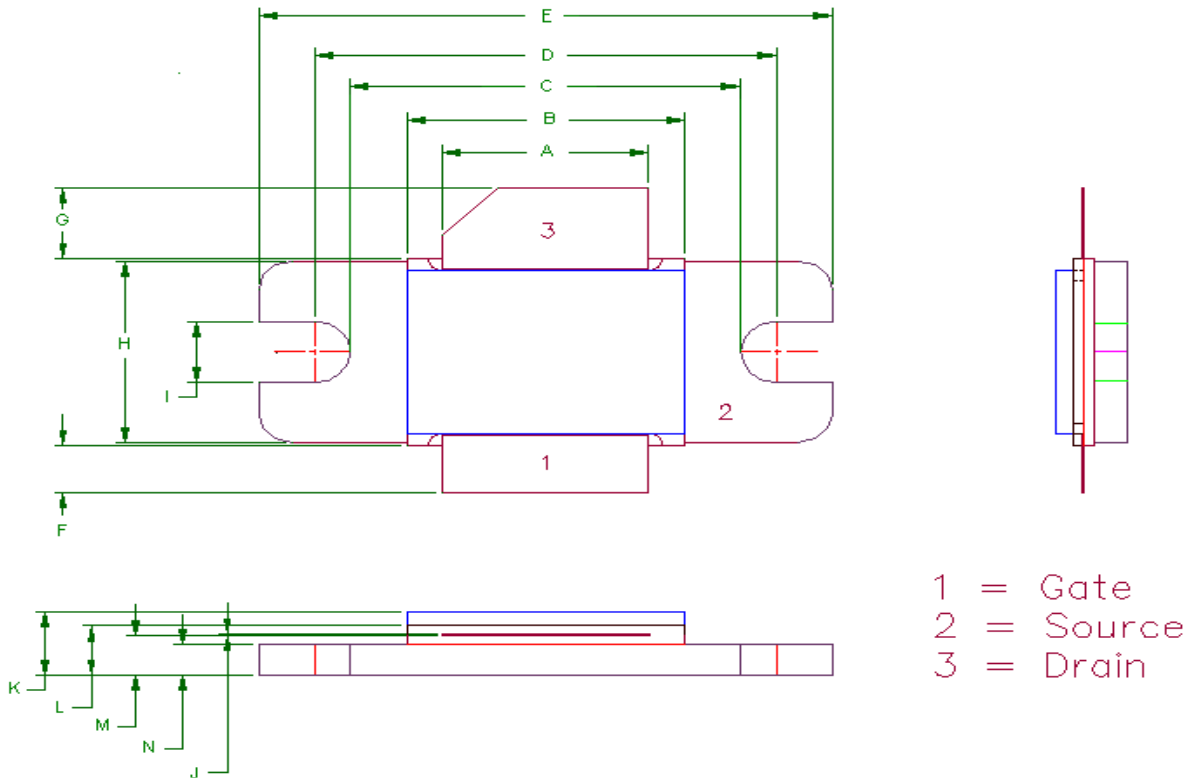
## **Test Circuit Diagram**

Please contact our representative for the test circuit

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## 55-KR PACKAGE DIMENSION



Dimension	Min (mil)	Min (mm)	Max (mil)	Max (mm)
A	370	9.40	372	9.44
B	498	12.65	500	12.7
C	700	17.78	702	17.83
D	830	21.08	832	21.13
E	1030	26.16	1032	26.21
F	101	2.56	102	2.59
G	151	3.84	152	3.86
H	385	9.78	387	9.83
I	130	3.30	132	3.35
J	003	.076	004	0.10
K	135	3.43	137	3.48
L	105	2.67	107	2.72
M	085	2.16	86	2.18
N	065	1.65	66	1.68



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#### Revision History

Revision Level / Date	Para. Affected	Description
01/ July 2013	-	Initial Release

For the most current data, consult MICROSEMI's website: [www.MICROSEMI.com](http://www.MICROSEMI.com)  
Specifications are subject to change, consult the RFIS factory at [\(408\) 986-8031](tel:4089868031) for the latest information