

# N-Channel 150 V (D-S) MOSFET

## PRODUCT SUMMARY

$V_{DS}$ (V)	$R_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
150	0.241 at $V_{GS} = 10$ V	6
	0.250 at $V_{GS} = 4.5$ V	4

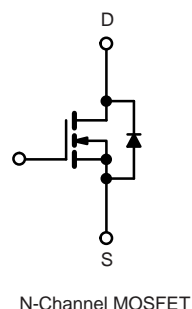
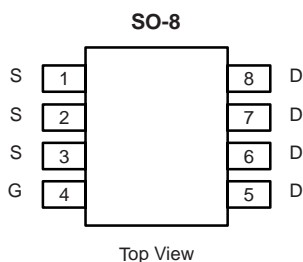
## FEATURES

- TrenchFET® Power MOSFETS
- 175 °C Junction Temperature
- 100 %  $R_g$  Tested


**RoHS**  
 COMPLIANT

## APPLICATIONS

- Primary Side Switch



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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	150	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	
Continuous Drain Current ( $T_J = 175$ °C) <sup>b</sup>	$I_D$	$T_C = 25$ °C	A
		$T_C = 125$ °C	
Pulsed Drain Current	$I_{DM}$	25	
Continuous Source Current (Diode Conduction)	$I_S$	5.2	
Avalanche Current	$I_{AR}$	4.5	mJ
Repetitive Avalanche Energy (Duty Cycle $\leq 1$ %)	$E_{AR}$	11.3	
Maximum Power Dissipation	$P_D$	$T_C = 25$ °C	W
		$T_A = 25$ °C	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	- 55 to 175	°C

## THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Ambient <sup>a</sup>	$R_{thJA}$	$t \leq 10$ s	16	°C/W
		Steady State	45	
Junction-to-Case	$R_{thJC}$	2	2.4	

Notes:

a. Surface mounted on 1" x 1" FR4 board.

b. See SOA curve for voltage derating.

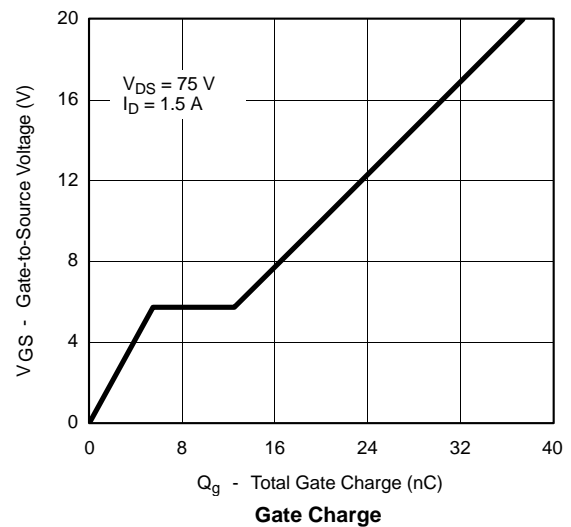
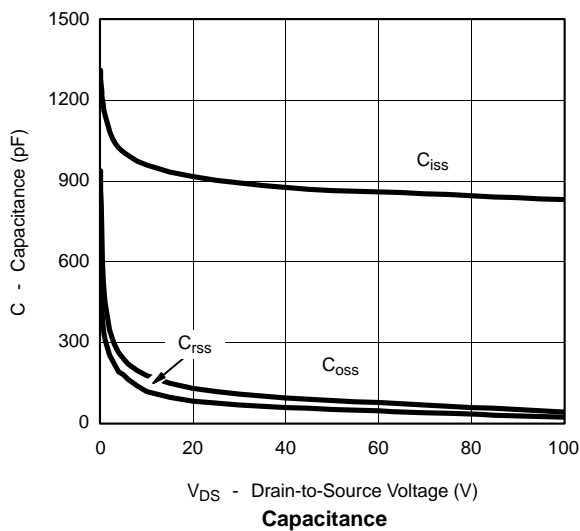
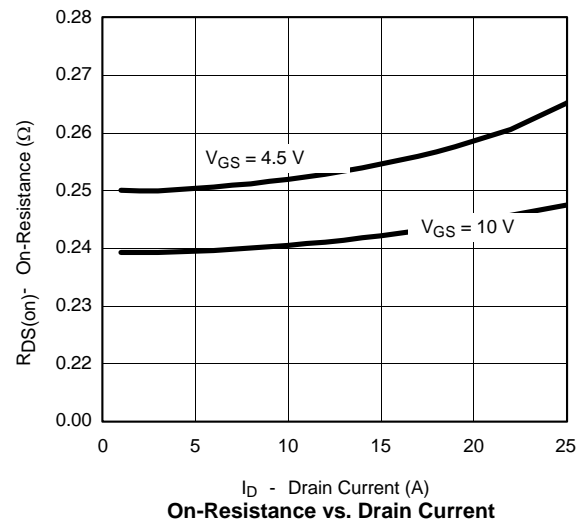
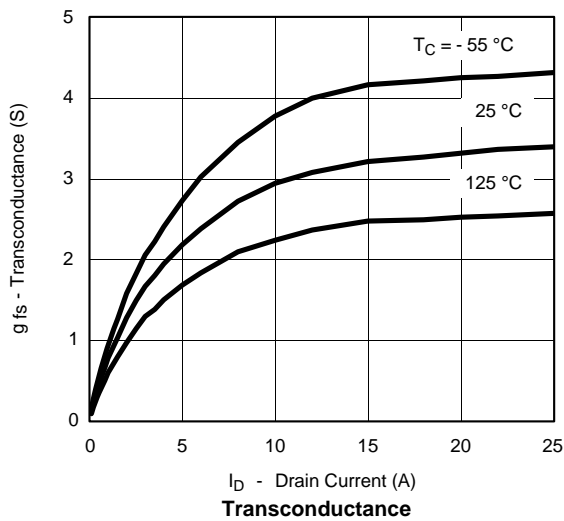
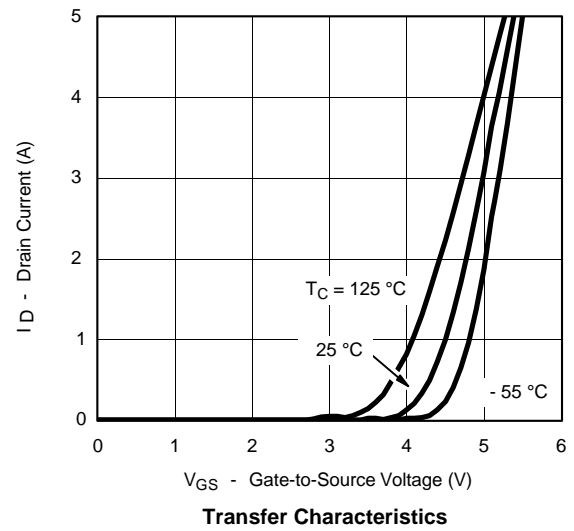
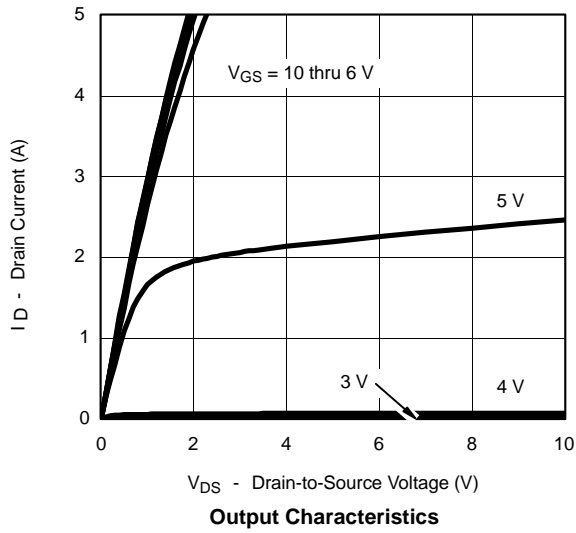
SPECIFICATIONS (T <sub>J</sub> = 25 °C, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ. <sup>a</sup>	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V <sub>DS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 μA	150			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	2			
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 150 V, V <sub>GS</sub> = 0 V			1	μA
		V <sub>DS</sub> = 150 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 125 °C			50	
		V <sub>DS</sub> = 150 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 175 °C			250	
On-State Drain Current <sup>b</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> = 5 V, V <sub>GS</sub> = 10 V	15			A
Drain-Source On-State Resistance <sup>b</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 2 A		0.241	0.263	Ω
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 2 A, T <sub>J</sub> = 125 °C		0.249	0.273	
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 2 A, T <sub>J</sub> = 175 °C		0.280	0.302	
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 2 A		0.250	0.275	
Forward Transconductance <sup>b</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 2 A		25		S
Dynamic <sup>a</sup>						
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 25 V, f = 1 MHz		900		pF
Output Capacitance	C <sub>oss</sub>			115		
Reverse Transfer Capacitance	C <sub>rss</sub>			70		
Total Gate Charge <sup>c</sup>	Q <sub>g</sub>	V <sub>DS</sub> = 75 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 2 A		20	25	nC
Gate-Source Charge <sup>c</sup>	Q <sub>gs</sub>			5.5		
Gate-Drain Charge <sup>c</sup>	Q <sub>gd</sub>			7		
Gate Resistance	R <sub>g</sub>		1		3.2	Ω
Turn-On Delay Time <sup>c</sup>	t <sub>d(on)</sub>	V <sub>DD</sub> = 75 V, R <sub>L</sub> = 5 Ω I <sub>D</sub> ≅ 2 A, V <sub>GEN</sub> = 10 V, R <sub>G</sub> = 2.5 Ω		8	12	ns
Rise Time <sup>c</sup>	t <sub>r</sub>			35	55	
Turn-Off Delay Time <sup>c</sup>	t <sub>d(off)</sub>			17	25	
Fall Time <sup>c</sup>	t <sub>f</sub>			30	45	
Source-Drain Diode Ratings and Characteristic (T <sub>C</sub> = 25 °C)						
Pulsed Current	I <sub>SM</sub>				6	A
Diode Forward Voltage <sup>b</sup>	V <sub>SD</sub>	I <sub>F</sub> = 2 A, V <sub>GS</sub> = 0 V		0.9	1.5	V
Source-Drain Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 2 A, dI/dt = 100 A/μs		55	85	ns

Notes:

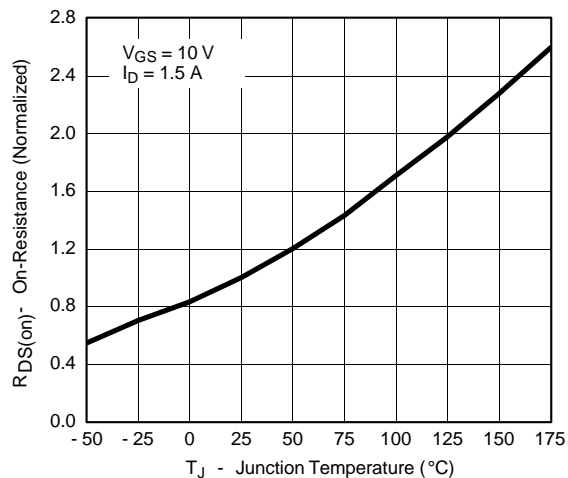
- Guaranteed by design, not subject to production testing.
- Pulse test; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ .
- Independent of operating temperature.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

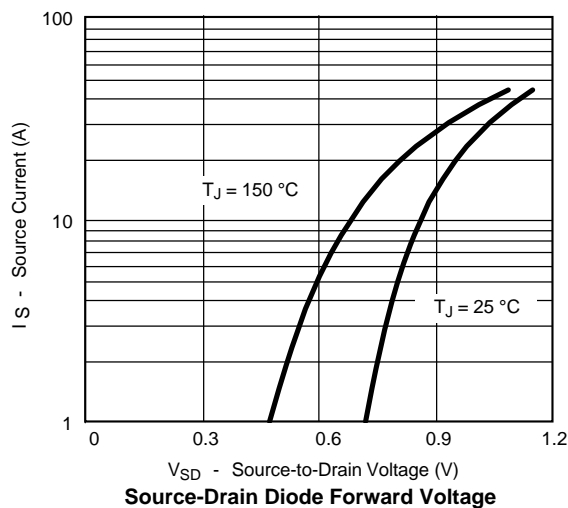
**TYPICAL CHARACTERISTICS** (25 °C unless noted)



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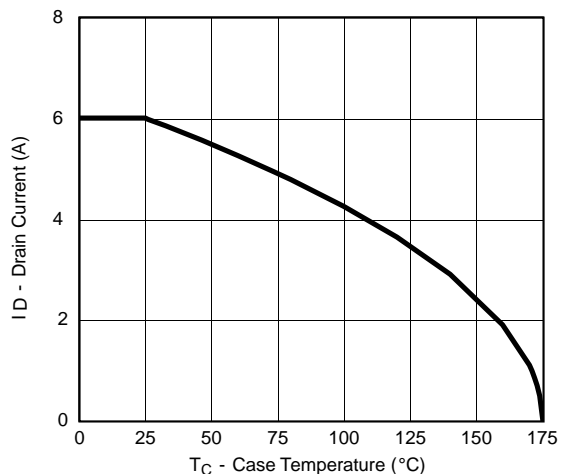


On-Resistance vs. Junction Temperature

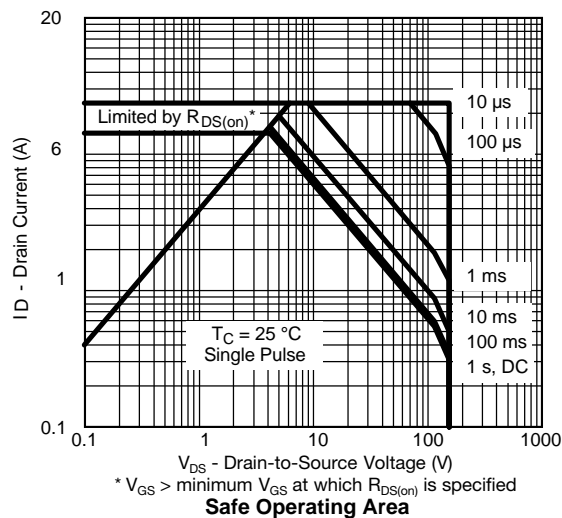


Source-Drain Diode Forward Voltage

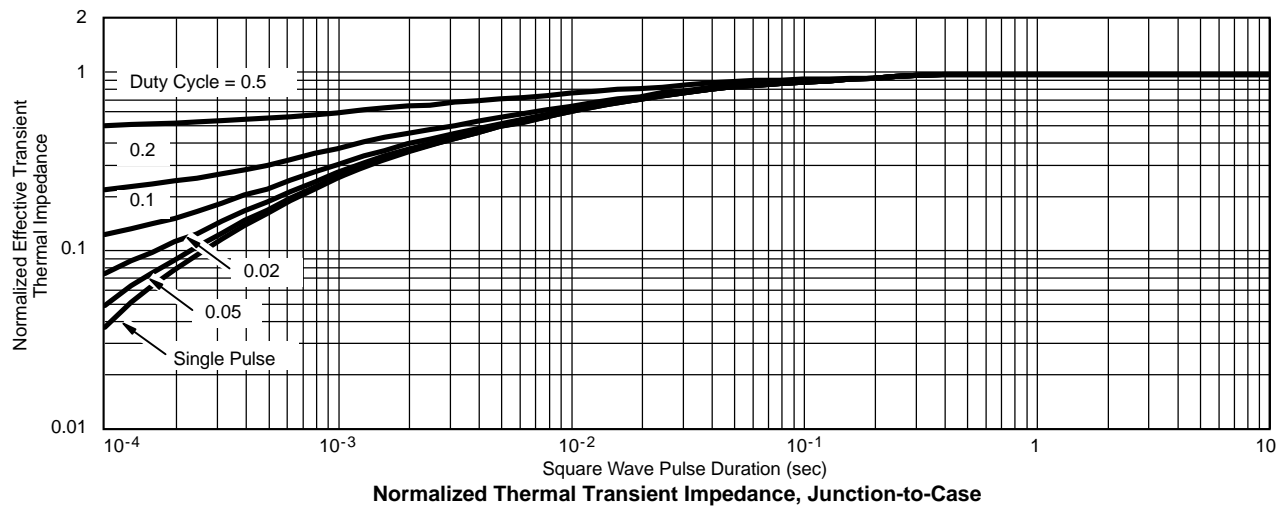
**THERMAL RATINGS**



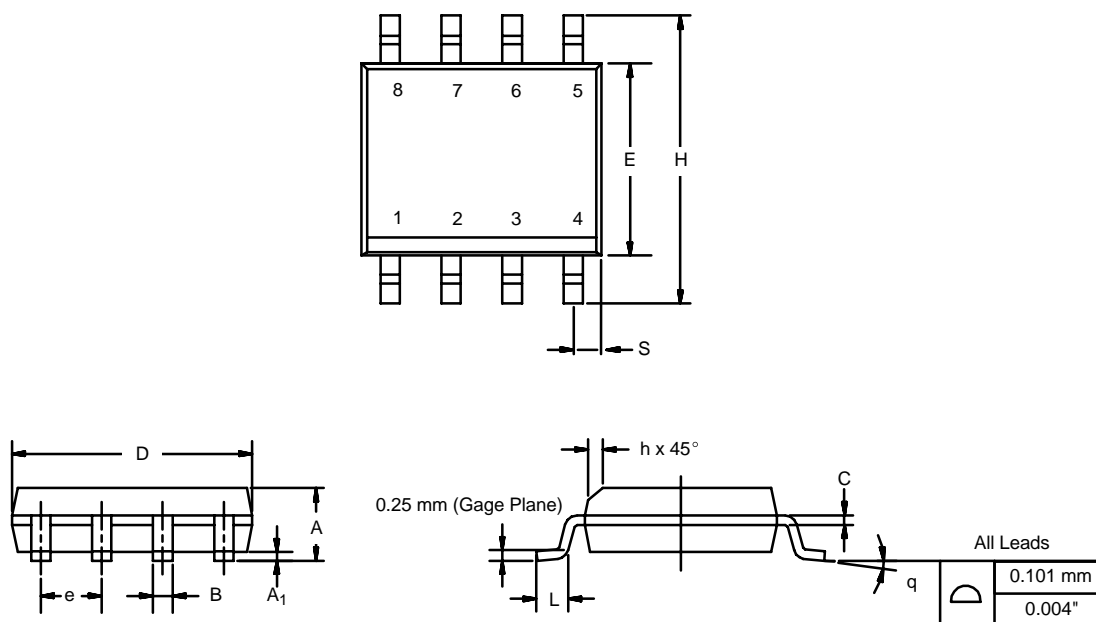
Maximum Avalanche Drain Current  
vs. Case Temperature



\*  $V_{GS} >$  minimum  $V_{GS}$  at which  $R_{DS(on)}$  is specified  
Safe Operating Area



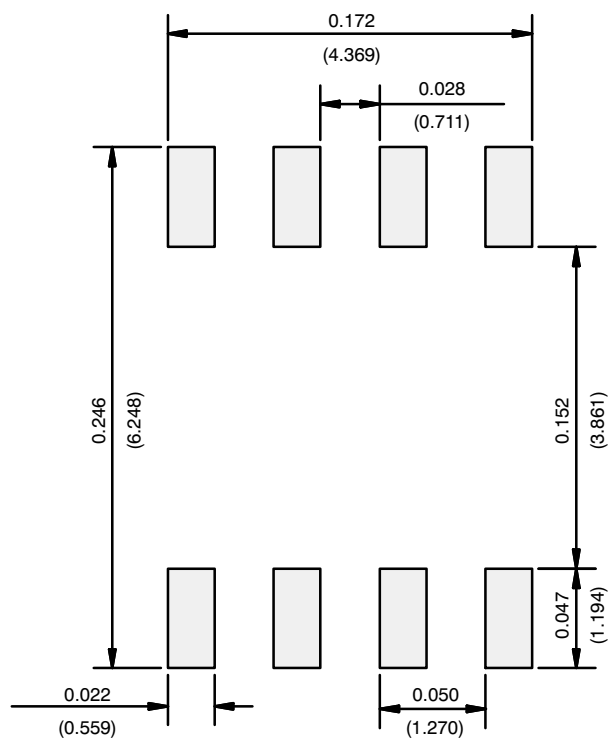
**SOIC (NARROW): 8-LEAD**  
JEDEC Part Number: MS-012



DIM	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	1.35	1.75	0.053	0.069
A <sub>1</sub>	0.10	0.20	0.004	0.008
B	0.35	0.51	0.014	0.020
C	0.19	0.25	0.0075	0.010
D	4.80	5.00	0.189	0.196
E	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
H	5.80	6.20	0.228	0.244
h	0.25	0.50	0.010	0.020
L	0.50	0.93	0.020	0.037
q	0°	8°	0°	8°
S	0.44	0.64	0.018	0.026

ECN: C-06527-Rev. I, 11-Sep-06  
DWG: 5498

**RECOMMENDED MINIMUM PADS FOR SO-8**



Recommended Minimum Pads  
Dimensions in Inches/(mm)

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