

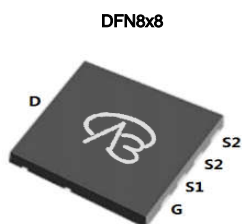
## N-Channel 150V (D-S) MOSFET

### PRODUCT SUMMARY

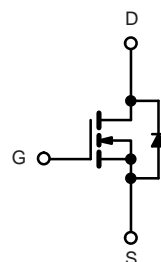
$V_{DS}$ (V)	$R_{DS(on)}$ ( $\Omega$ )	$I_D$ (A) <sup>a</sup>
150	0.006at $V_{GS} = 10$ V	100
	0.007at $V_{GS} = 4.5$ V	90

### FEATURES

- 175 °C Junction Temperature
- SGT technology Power MOSFET
- Material categorization:


**RoHS**  
 COMPLIANT


Top View



N-Channel MOSFET

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

Parameter		Symbol	Limit	Unit
Gate-Source Voltage		$V_{GS}$	$\pm 20$	V
Continuous Drain Current ( $T_J = 175$ °C) <sup>b</sup>	$T_C = 25$ °C	$I_D$	100	A
	$T_C = 100$ °C		60 <sup>a</sup>	
Pulsed Drain Current		$I_{DM}$	300	
Continuous Source Current (Diode Conduction)		$I_S$	110 <sup>a</sup>	
Avalanche Current		$I_{AS}$	120	
Single Avalanche Energy (Duty Cycle $\leq 1$ %)	$L = 0.1$ mH	$E_{AS}$	110	mJ
Maximum Power Dissipation	$T_C = 25$ °C	$P_D$	136	W
	$T_A = 25$ °C		3 <sup>b</sup> , 8.3 <sup>b, c</sup>	
Operating Junction and Storage Temperature Range		$T_J, T_{stg}$	- 55 to 175	°C

### THERMAL RESISTANCE RATINGS

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient <sup>a</sup>	$t \leq 10$ sec	$R_{thJA}$	15	18	°C/W
	Steady State		40	50	
Maximum Junction-to-Case		$R_{thJC}$	0.85	1.1	

Notes:

a. Package limited.

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

 c.  $t \leq 10$  s.

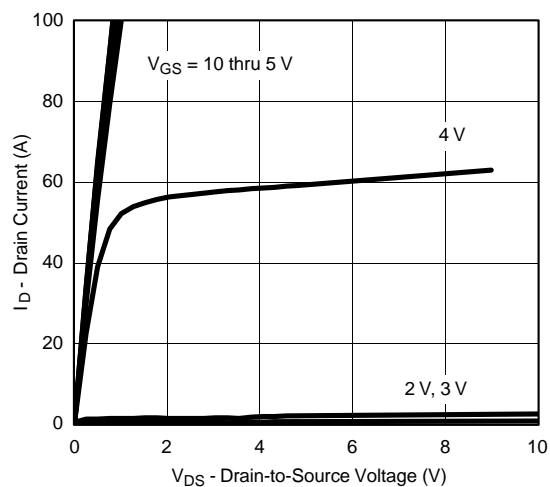
**SPECIFICATIONS** ( $T_J = 25\text{ }^{\circ}\text{C}$ , unless otherwise noted)

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	1	2	3	
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> = 150V, V <sub>GS</sub> = 0 V	-	-	1	μA
		V <sub>DS</sub> = 150V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 125 °C	-	-	50	
		V <sub>DS</sub> = 150V, 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	60	-	-	A
Drain-Source On-State Resistance <sup>b</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 20 A	-	0.006	-	Ω
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 20 A, T <sub>J</sub> = 125 °C	-	0.008	-	
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 20 A, T <sub>J</sub> = 175 °C	-	0.010	-	
		V <sub>GS</sub> = 7.5 V, I <sub>D</sub> = 30A	-	0.015	-	
Forward Transconductance <sup>b</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 20 A	-	60	-	S
Dynamic						
Input Capacitance	C <sub>iSS</sub>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 150 V, f = 1 MHz	-	9400	-	pF
Output Capacitance	C <sub>oss</sub>		-	470	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	225	-	
Total Gate Charge <sup>c</sup>	Q <sub>g</sub>	V <sub>DS</sub> = 150 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 50 A	-	75	70	nC
Gate-Source Charge <sup>c</sup>	Q <sub>gs</sub>		-	20	-	
Gate-Drain Charge <sup>c</sup>	Q <sub>gd</sub>		-	16	-	
Turn-On Delay Time <sup>c</sup>	t <sub>d(on)</sub>	V <sub>DD</sub> = 150 V, R <sub>L</sub> = 0.6 Ω I <sub>D</sub> ≅ 50 A, V <sub>GEN</sub> = 10 V, R <sub>g</sub> = 2.5 Ω	-	18	27	ns
Rise Time <sup>c</sup>	t <sub>r</sub>		-	15	25	
Turn-Off Delay Time <sup>c</sup>	t <sub>d(off)</sub>		-	35	50	
Fall Time <sup>c</sup>	t <sub>f</sub>		-	20	30	
Source-Drain Diode Ratings and Characteristics (T <sub>C</sub> = 25 °C)						
Pulsed Current	I <sub>SM</sub>		-	-	300	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>F</sub> = 20 A, V <sub>GS</sub> = 0 V	-	1	1.5	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 20 A, di/dt = 100 A/μs	-	4	135	ns

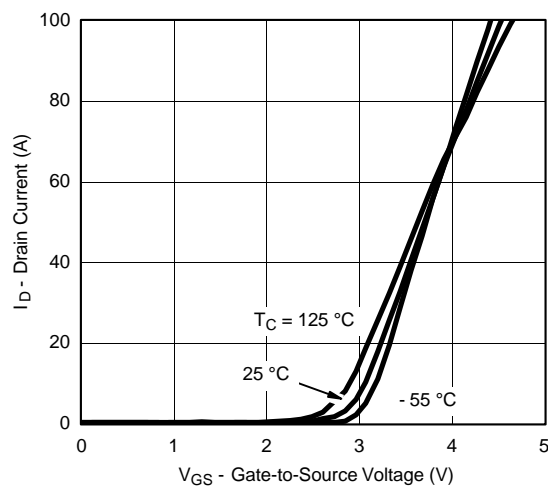
Notes:

- a. For design aid only; not subject to production testing.  
 b. Pulse test; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ .  
 c. Independent of operating temperature.

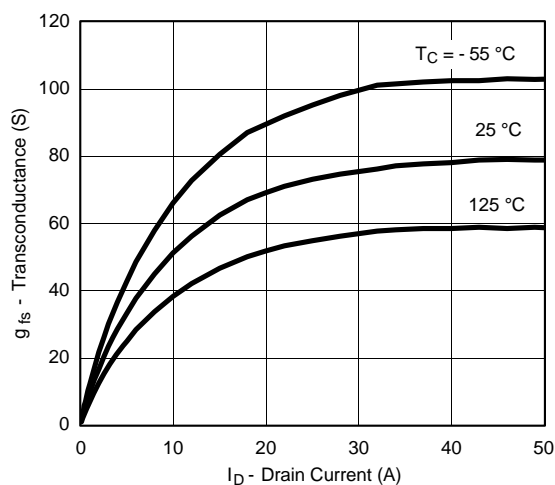
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

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


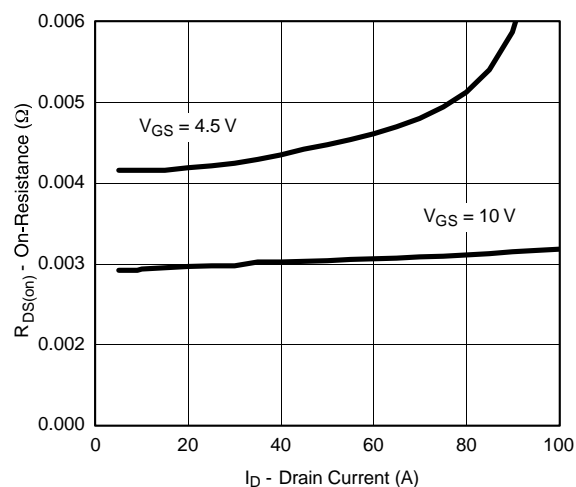
Output Characteristics



Transfer Characteristics



Transconductance



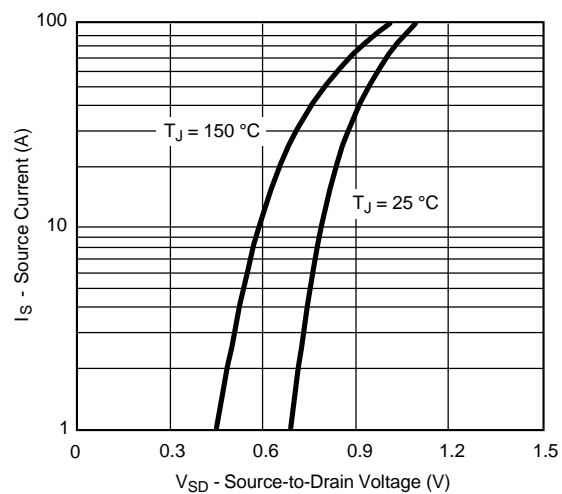
On-Resistance vs. Drain Current

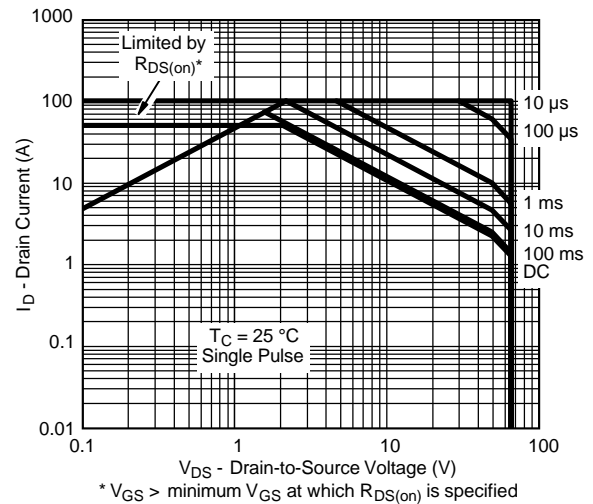


Capacitance

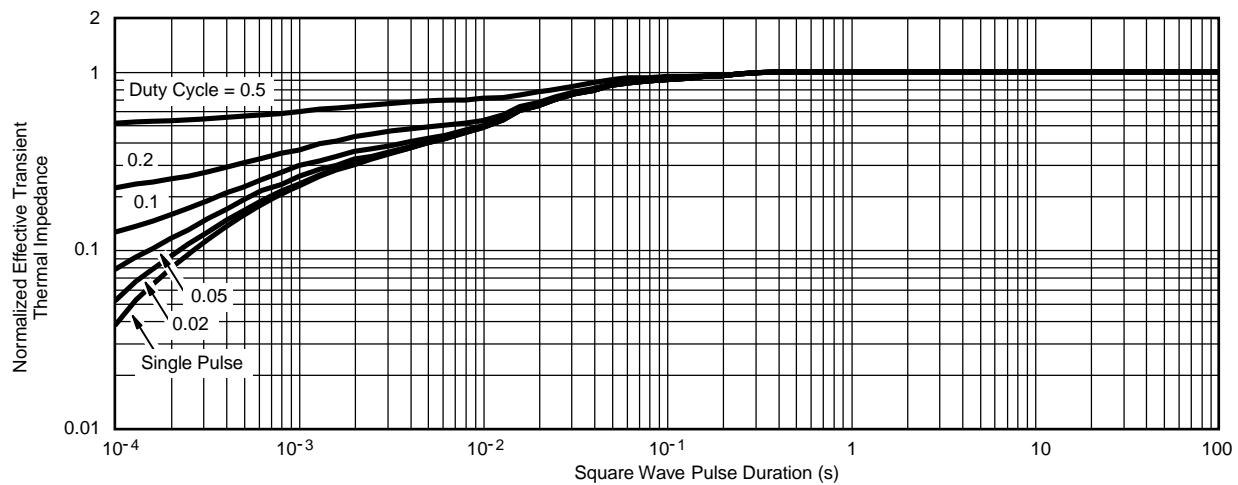


Gate Charge

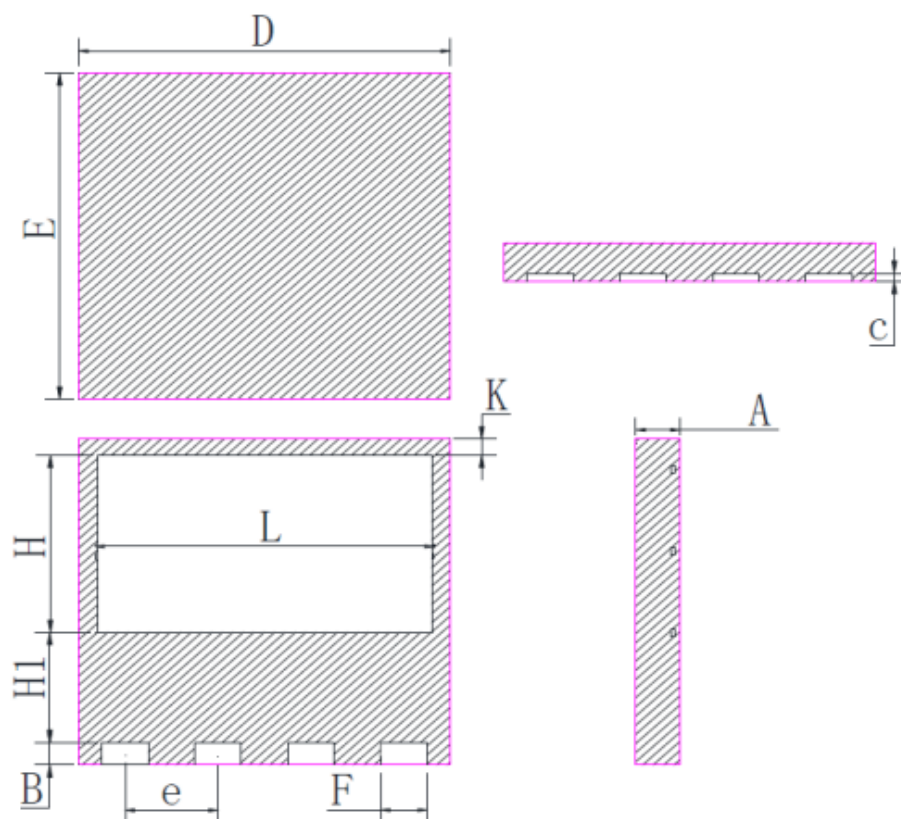
**TYPICAL CHARACTERISTICS** (25 °C unless noted)**On-Resistance vs. Junction Temperature****Source-Drain Diode Forward Voltage**

**THERMAL RATINGS****Maximum Drain Current vs. Ambient Temperature**

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

**Safe Operating Area****Normalized Thermal Transient Impedance, Junction-to-Case**

## Package Outline : D F N 8 X 8



Symbol	Min	Typ	Max
A	0.90	0.95	1.00
B	0.45	0.55	0.65
C	0.153	0.203	0.253
D	7.90	8.00	8.10
E	7.90	8.00	8.10
e	1.90	2.00	2.10
F	0.90	1.00	1.10
H	4.20	4.35	4.45
H1	2.60	2.70	2.80
K	0.30	0.40	0.50
L	7.10	7.20	7.30

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