

## Dual Asymmetric N-Channel 18 V (D-S) MOSFET

### PRODUCT SUMMARY

V <sub>DS</sub> (V)	R <sub>DS(on)</sub> (mΩ)(Typ.)	I <sub>D</sub> (A) <sup>a</sup>	Q <sub>g</sub> (Typ.)
18	3 at V <sub>GS</sub> = 4.5 V	58	36 nC
	3.7 at V <sub>GS</sub> = 2.5 V		

### FEATURES

- DT-Trench Power MOSFET
- 100 % R<sub>g</sub> and UIS Tested
- ESD Rating: HBM 2KV
- High Power and current handling capability

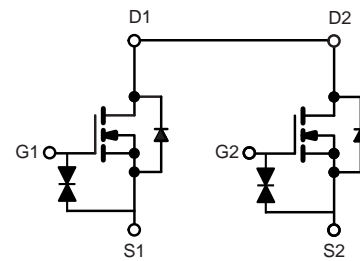
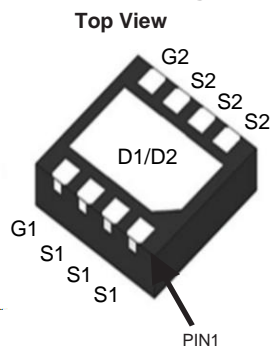


**RoHS**  
COMPLIANT

### APPLICATIONS

- Load Switch

### DFN3X3-8L Pin Configuration



Schematic diagram

### ABSOLUTE MAXIMUM RATINGS (T<sub>C</sub> = 25 °C, unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V <sub>DS</sub>	18	V
Gate-Source Voltage	V <sub>GS</sub>	± 10	
Continuous Drain Current (T <sub>J</sub> = 150 °C) <sup>a</sup>	I <sub>D</sub>	T <sub>C</sub> = 25 °C	58
		T <sub>C</sub> = 100 °C	36
Pulsed Drain Current <sup>b</sup>	I <sub>DM</sub>	232	A
Single Avalanche Energy	E <sub>AS</sub>	110	mJ
Maximum Power Dissipation <sup>c</sup>	P <sub>D</sub>	T <sub>C</sub> = 25 °C	22
		T <sub>C</sub> = 100 °C	8.7
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	- 55 to + 150	°C

### THERMAL RESISTANCE RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Junction-to-Case (Drain)	R <sub>thJC</sub>	5.7	°C/W

#### Notes

- Calculated continuous current based on maximum allowable junction temperature.
- Repetitive rating; pulse width limited by max. junction temperature.
- P<sub>d</sub> is based on max. junction temperature, using junction-case thermal resistance.

SPECIFICATIONS (T <sub>C</sub> = 25 °C, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>DS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 μA	18	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	0.5	-	1	
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ± 10 V	-	-	± 10	μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 18 V, V <sub>GS</sub> = 0 V	-	-	1	μA
		V <sub>DS</sub> = 18 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55 °C	-	-	100	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> ≥ 5 V, V <sub>GS</sub> = 10 V	58	-	-	A
Drain-Source On-State Resistance <sup>a</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 5 A	-	3	3.9	mΩ
		V <sub>GS</sub> = 2.5 V, I <sub>D</sub> = 4 A	-	3.7	4.9	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 5 V, I <sub>D</sub> = 5 A	-	13.5	-	S
<b>Dynamic <sup>b</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 9 V, f = 1 MHz	-	2727	-	pF
Output Capacitance	C <sub>oss</sub>		-	330	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	305	-	
Total Gate Charge <sup>c</sup>	Q <sub>g</sub>	V <sub>DS</sub> = 9 V, V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 5 A	-	36	-	nC
Gate-Source Charge <sup>c</sup>	Q <sub>gs</sub>		-	6	-	
Gate-Drain Charge <sup>c</sup>	Q <sub>gd</sub>		-	10	-	
Turn-On Delay Time <sup>c</sup>	t <sub>d(on)</sub>	V <sub>DD</sub> = 9 V, I <sub>D</sub> = 5 A, R <sub>g</sub> = 3 Ω V <sub>GS</sub> = 4.5 V, R <sub>L</sub> = 1.8 Ω	-	11	-	ns
Rise Time <sup>c</sup>	t <sub>r</sub>		-	34	-	
Turn-Off Delay Time <sup>c</sup>	t <sub>d(off)</sub>		-	72	-	
Fall Time <sup>c</sup>	t <sub>f</sub>		-	92	-	
<b>Drain-Source Body Diode Ratings and Characteristics <sup>b</sup> (T<sub>C</sub> = 25 °C)</b>						
Continuous Source-Drain Diode Current	I <sub>S</sub>	T <sub>C</sub> = 25 °C	-	-	58	A
Pulsed Current	I <sub>SM</sub>		-	-	232	A
Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>F</sub> = 1 A, V <sub>GS</sub> = 0 V	-	-	1.2	V

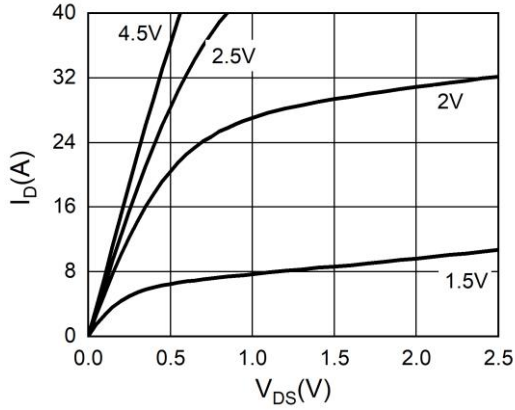
**Notes**

- Pulse test; pulse width ≤ 180 μs, duty cycle ≤ 2 %.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

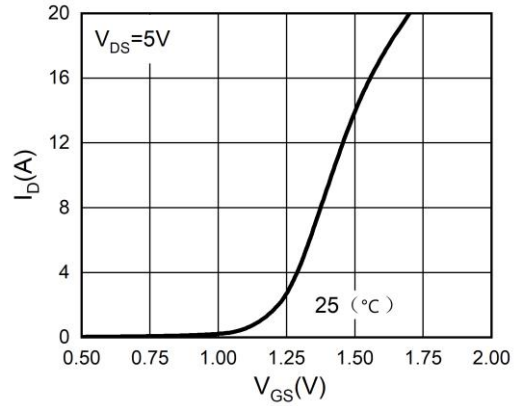
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

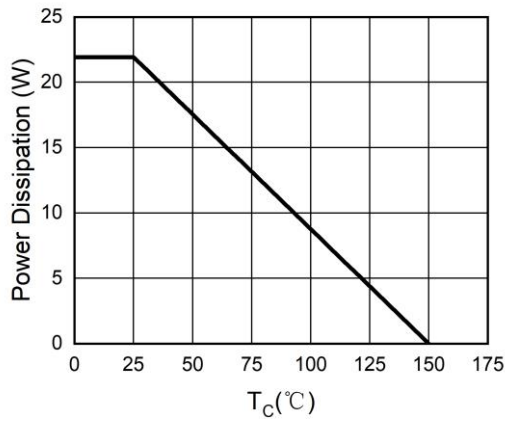
**Figure 1. Output Characteristics**



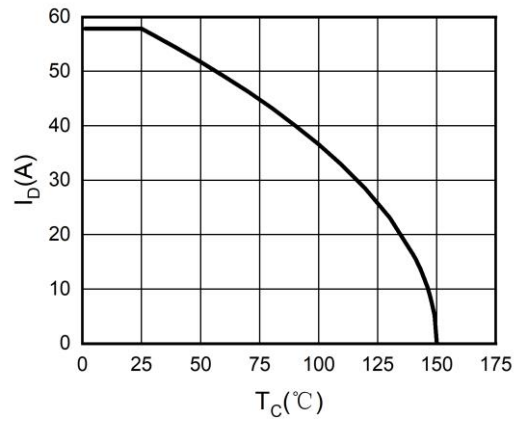
**Figure 2. Transfer Characteristics**



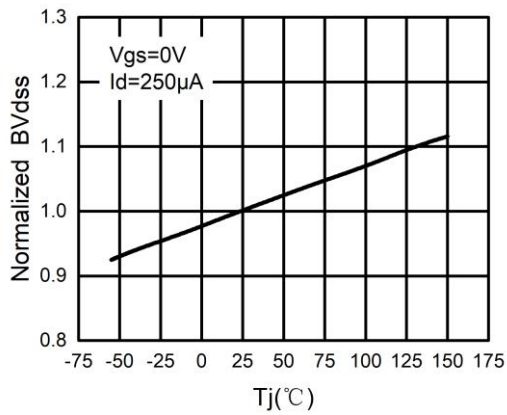
**Figure 3. Power Dissipation**



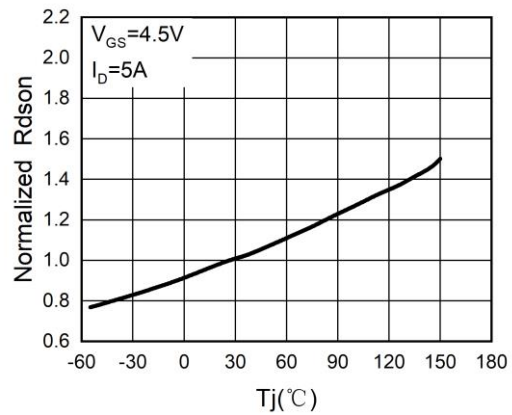
**Figure 4. Drain Current**



**Figure 5.  $BV_{DSS}$  vs Junction Temperature**

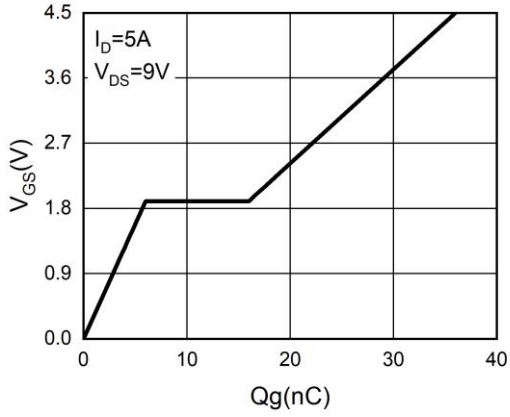


**Figure 6.  $R_{DS(ON)}$  vs Junction Temperature**

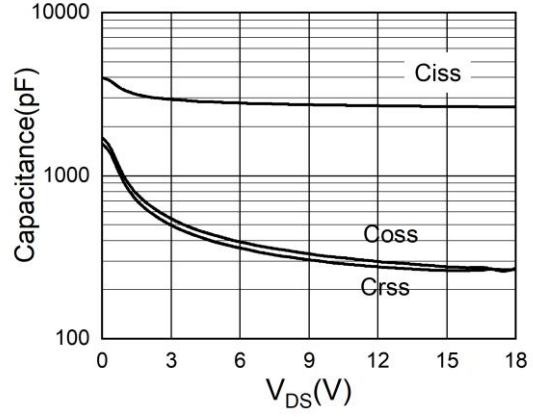


**TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)**

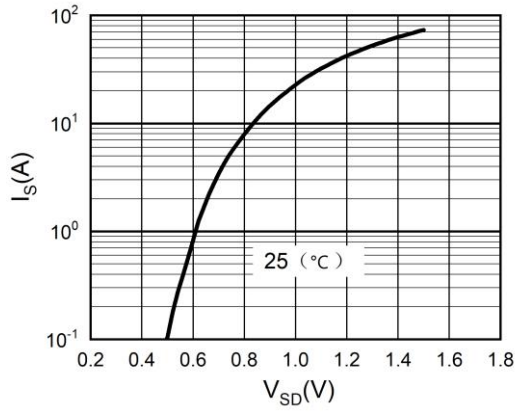
**Figure 7. Gate Charge Waveforms**



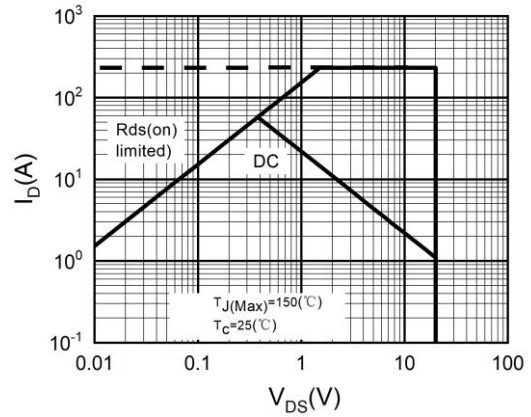
**Figure 8. Capacitance**



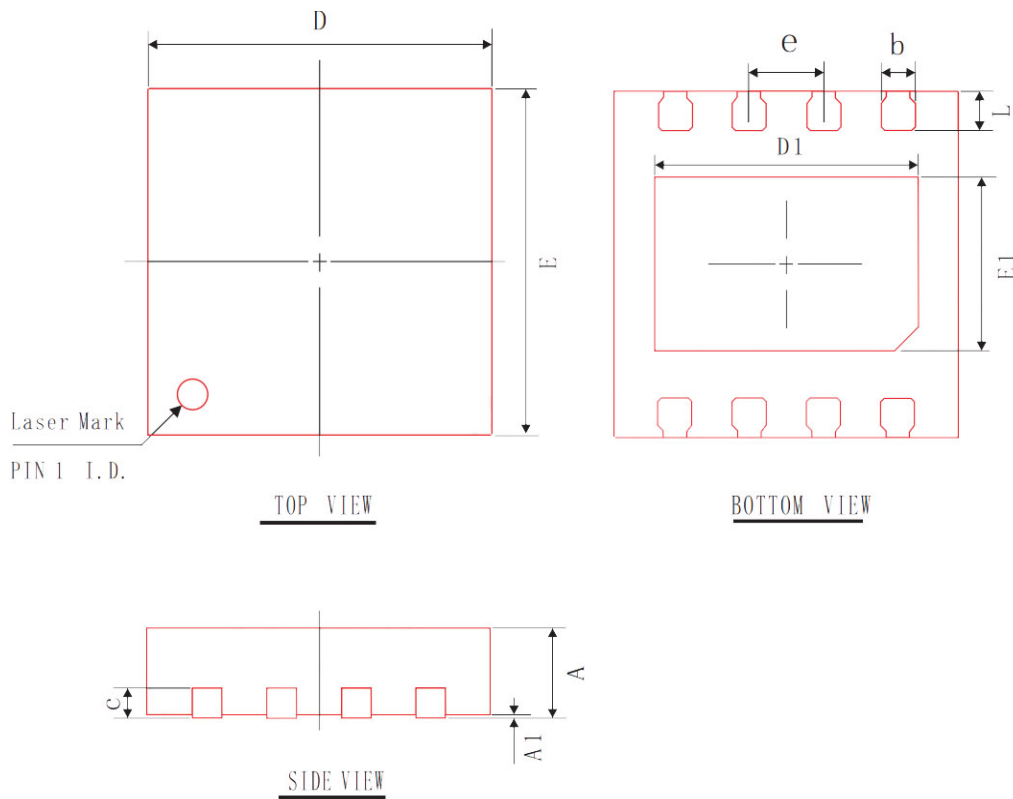
**Figure 9. Body-Diode Characteristics**



**Figure 10. Maximum Safe Operating Area**



**DFN3X3-8L Package Information**



COMMON DIMENSIONS  
(UNITS OF MEASURE=mm)

SYMBOL	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
B	0.25	0.30	0.35
D	2.95	3.00	3.07
E	2.95	3.00	3.07
D1	2.25	2.30	2.35
E1	1.40	1.50	1.60
L	0.25	0.35	0.45
c	0.203 REF		
e	0.65 BSC		

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