

## Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

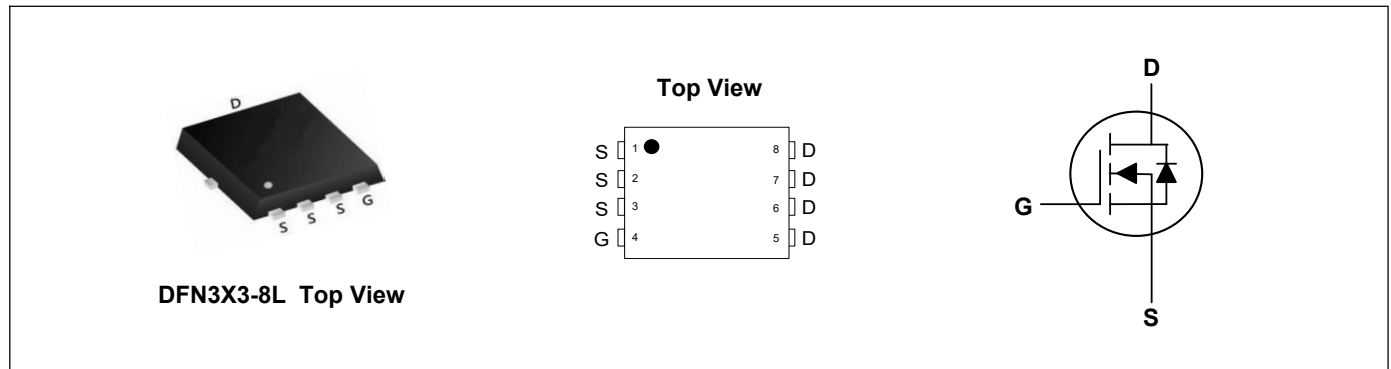
## Applications

- High Frequency Point-of-Load, Synchronous Buck Converter
- Networking DC-DC Power System
- Load Switch

## Product Summary



$V_{DS}$	30	V
$I_D$	50	A
$R_{DS(ON)}$ (at $V_{GS}=10V$ )	7.4	m $\Omega$
$R_{DS(ON)}$ (at $V_{GS}=4.5V$ )	10.7	m $\Omega$



## Absolute Maximum Ratings ( $T_C=25^\circ\text{C}$ , unless otherwise noted)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>1</sup>	$I_D@T_C=25^\circ\text{C}$	50	A
Continuous Drain Current <sup>1</sup>	$I_D@T_C=100^\circ\text{C}$	32	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	71	A
Single Pulse Avalanche Energy <sup>3</sup>	EAS	22	mJ
Avalanche Current	$I_{AS}$	21	A
Total Power Dissipation <sup>4</sup>	$P_D@T_C=25^\circ\text{C}$	30	W
Total Power Dissipation <sup>4</sup>	$P_D@T_C=100^\circ\text{C}$	12	W
Storage Temperature Range	$T_{STG}$	-55 to 150	$^\circ\text{C}$
Operating Junction Temperature Range	$T_J$	-55 to 150	$^\circ\text{C}$

## Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance Junction-Ambient <sup>1</sup>	$R_{\theta JA}$	---	95	$^\circ\text{C/W}$
Thermal Resistance Junction-Case <sup>1</sup>	$R_{\theta JC}$	---	4.2	$^\circ\text{C/W}$

**Electrical Characteristics (T<sub>J</sub>=25°C, unless otherwise noted)**

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	30	---	---	V
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =8A	---	6.2	7.4	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =6A	---	8.2	10.7	mΩ
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	1.1	1.6	2.1	V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =24V, V <sub>GS</sub> =0V	---	---	1	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	---	---	±100	nA
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =8A	---	12	---	S
Gate Resistance	R <sub>g</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1MHz	---	3.5	---	Ω
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =10V, I <sub>D</sub> =8A	---	31	---	nC
Gate-Source Charge	Q <sub>gs</sub>		---	1.4	---	
Gate-Drain Charge	Q <sub>gd</sub>		---	9.3	---	
Turn-On Delay Time	T <sub>d(on)</sub>	V <sub>DD</sub> =15V, V <sub>GS</sub> =10V, R <sub>G</sub> =6Ω, I <sub>D</sub> =1A	---	6	---	ns
Rise Time	T <sub>r</sub>		---	22.5	---	
Turn-Off Delay Time	T <sub>d(off)</sub>		---	48.6	---	
Fall Time	T <sub>f</sub>		---	19.8	---	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz	---	1094	---	pF
Output Capacitance	C <sub>oss</sub>		---	147	---	
Reverse Transfer Capacitance	C <sub>rss</sub>		---	127	---	

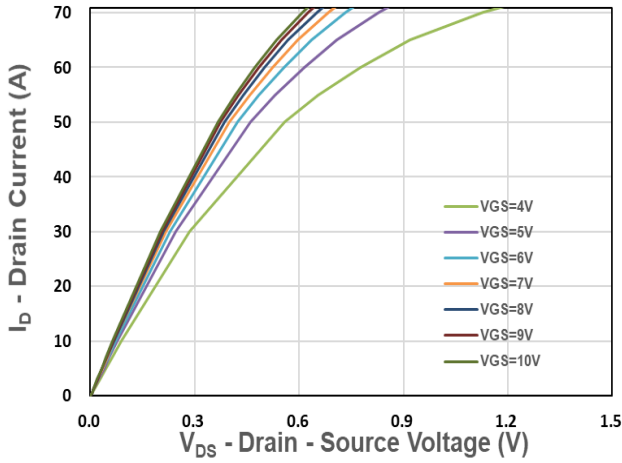
**Drain-Source Diode Characteristics**

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current <sup>1,4</sup>	I <sub>S</sub>		---	---	20	A
Diode Forward Voltage <sup>2</sup>	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =1A	---	0.7	1.1	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =1A, V <sub>GS</sub> =0V di/dt=100A/μs, T <sub>J</sub> =25°C	---	14	---	nS
Reverse Recovery Charge	Q <sub>rr</sub>		---	5.6	---	nC

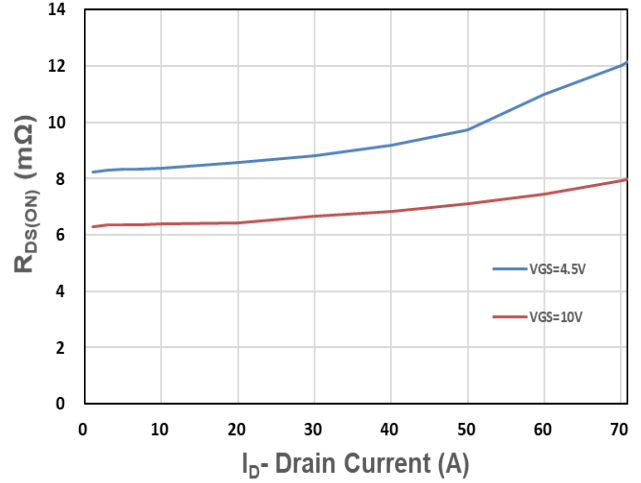
**Note:**

1. The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
2. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%
3. The EAS data shows Max. rating. The test condition is V<sub>DD</sub>=25V, V<sub>GS</sub>=10V, L=0.1mH
4. The power dissipation is limited by 150°C junction temperature

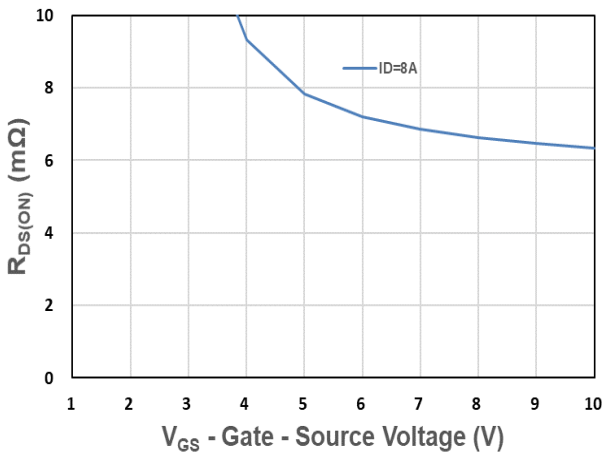
**Typical Characteristics**



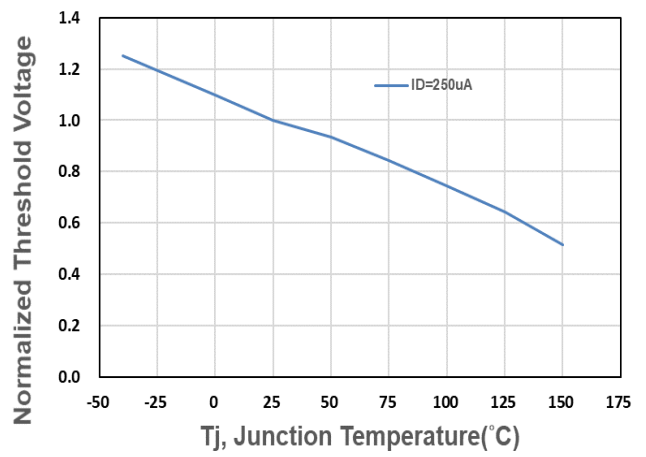
**Figure 1. Output Characteristics**



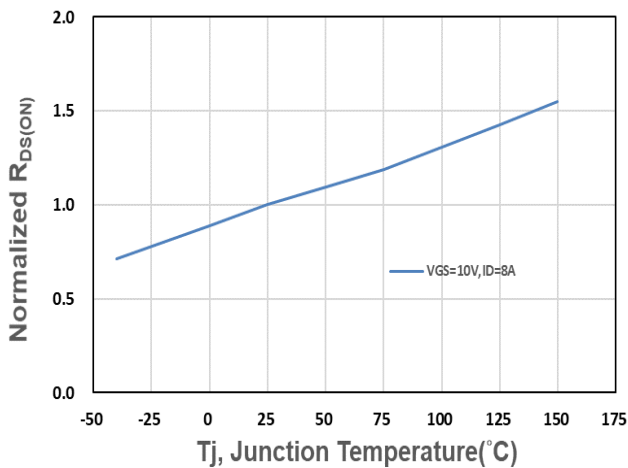
**Figure 2. On-Resistance vs.  $I_D$**



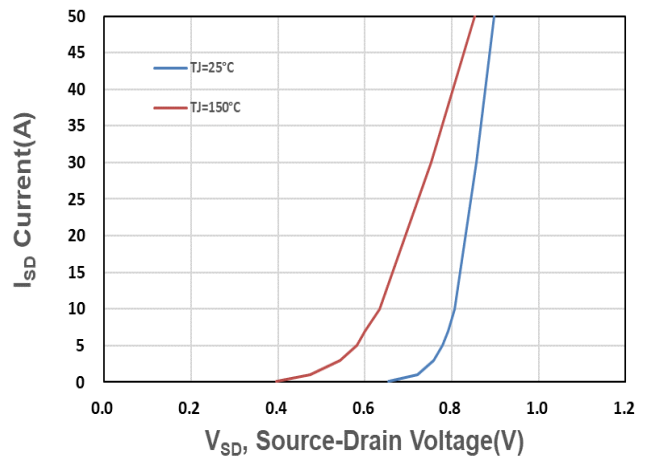
**Figure 3. On-Resistance vs.  $V_{GS}$**



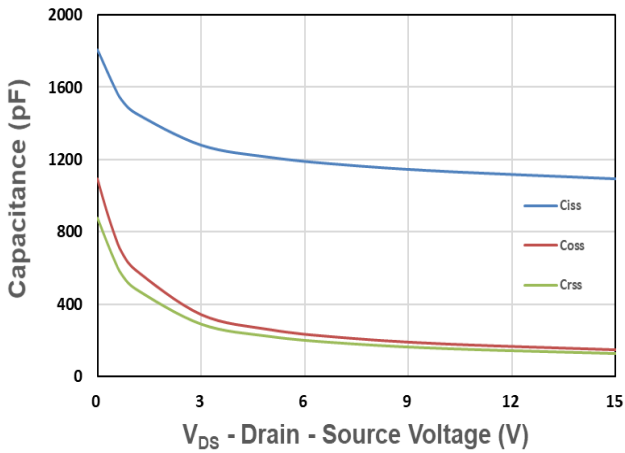
**Figure 4. Gate Threshold Voltage**



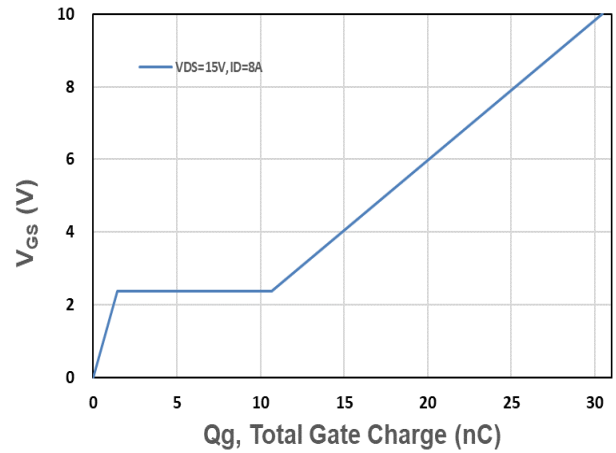
**Figure 5. Drain-Source On Resistance**



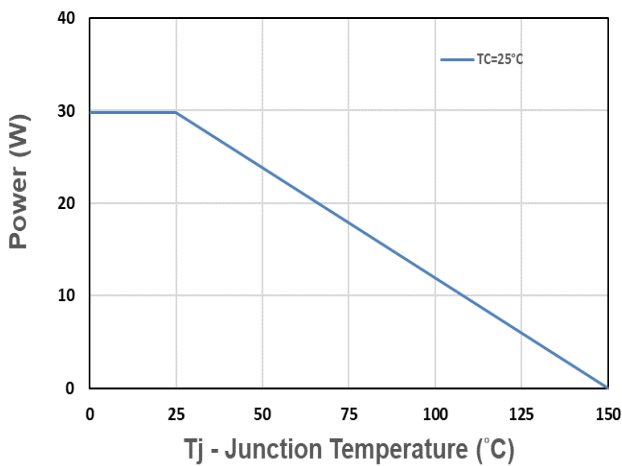
**Figure 6. Source-Drain Diode Forward**



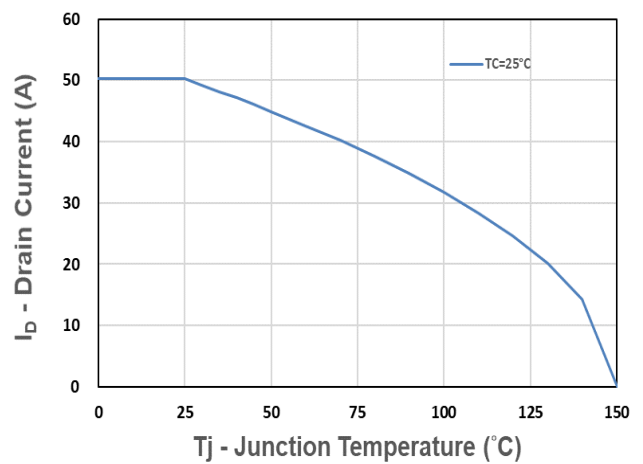
**Figure 7. Capacitance**



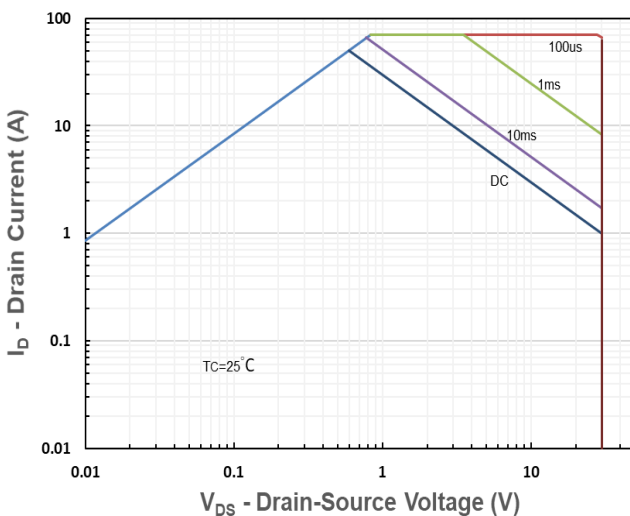
**Figure 8. Gate Charge Characteristics**



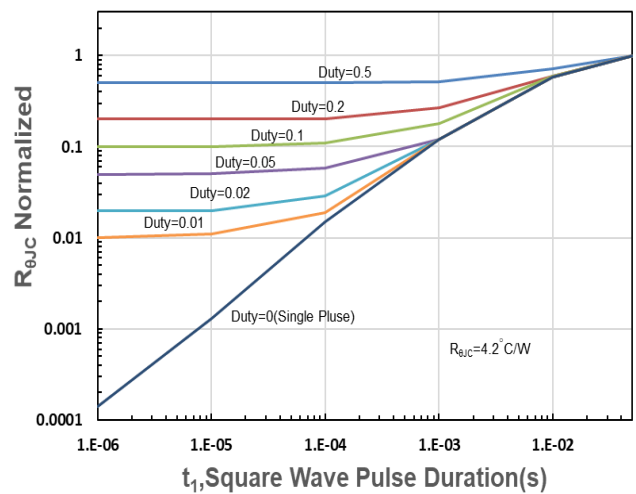
**Figure 9. Power Dissipation**



**Figure 10. Drain Current**

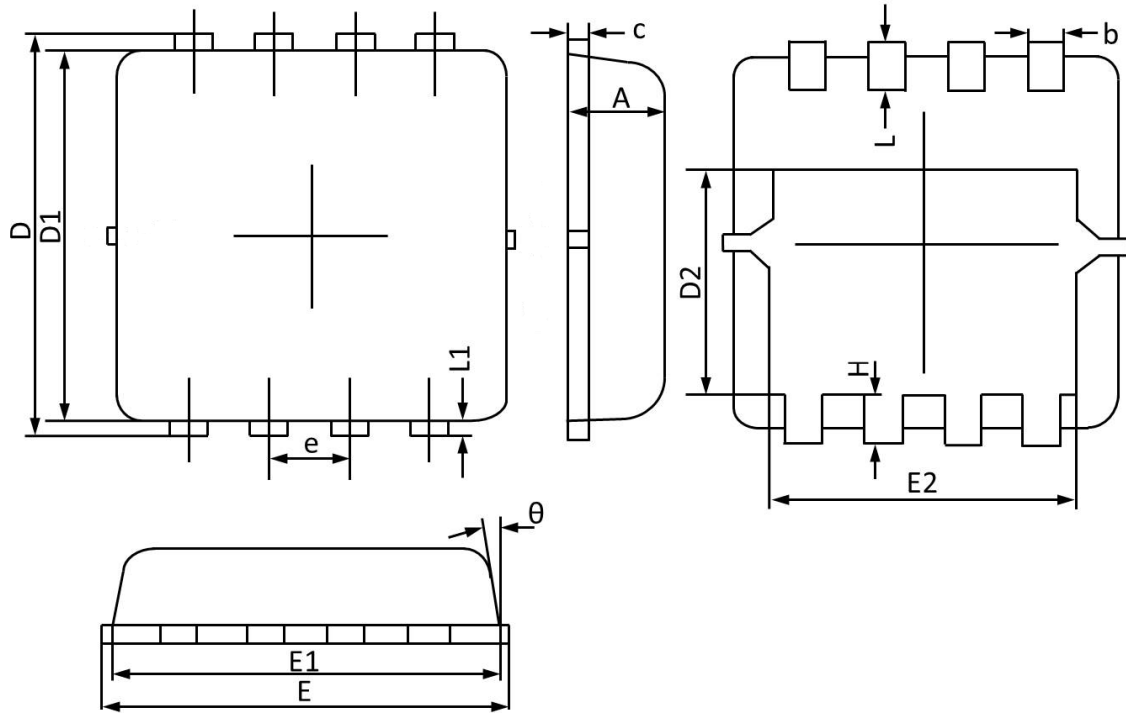


**Figure 11. Safe Operating Area**



**Figure 12.  $R_{\theta JC}$  Transient Thermal Impedance**

**DFN3X3-8L Package Outline Dimensions**



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
<b>A</b>	0.70	0.75	0.85	<b>E1</b>	2.90	3.10	3.25
<b>b</b>	0.24	0.30	0.35	<b>E2</b>	2.35	2.50	2.60
<b>c</b>	0.10	0.17	0.25	<b>e</b>	0.65 BSC		
<b>D</b>	3.10	3.30	3.45	<b>H</b>	0.30	0.40	0.50
<b>D1</b>	2.90	3.05	3.20	<b>L</b>	0.30	0.40	0.50
<b>D2</b>	1.45	1.70	1.95	<b>L1</b>	--	0.13	--
<b>E</b>	3.05	3.25	3.40	<b>theta</b>	0°		14°