

## Features

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

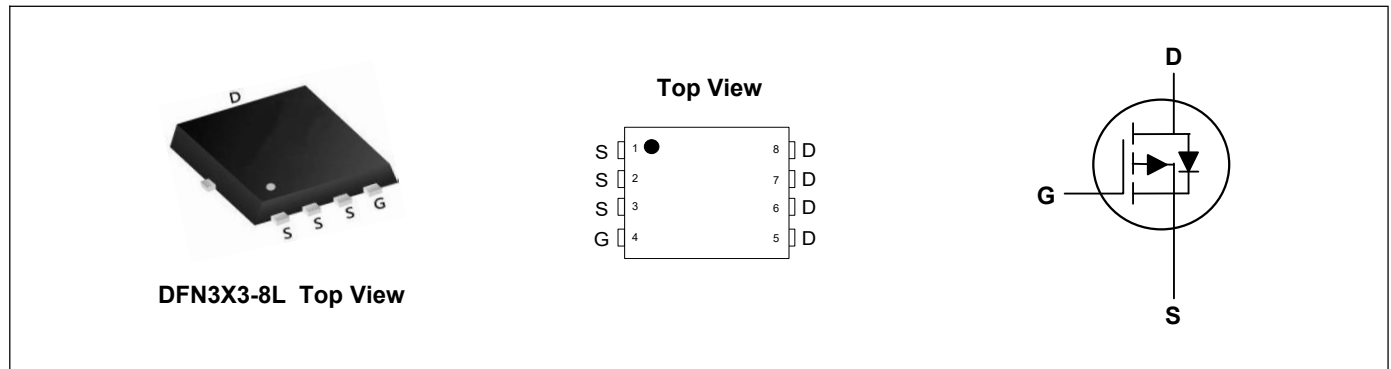
## Applications

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

## Product Summary



$V_{DS}$	-30	V
$I_D$	-51.8	A
$R_{DS(ON)}$ (at $V_{GS}=-10V$ )	10.5	m $\Omega$
$R_{DS(ON)}$ (at $V_{GS}=-4.5V$ )	15	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>	$I_D@T_C=25^\circ\text{C}$	-51.8	A
Continuous Drain Current <sup>1</sup>	$I_D@T_C=100^\circ\text{C}$	-41.4	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	-70	A
Single Pulse Avalanche Energy <sup>3</sup>	EAS	39.2	mJ
Avalanche Current	$I_{AS}$	-28	A
Total Power Dissipation <sup>4</sup>	$P_D@T_C=25^\circ\text{C}$	41.7	W
Total Power Dissipation <sup>4</sup>	$P_D@T_C=100^\circ\text{C}$	26.7	W
Storage Temperature Range	$T_{STG}$	-55 to 175	$^\circ\text{C}$
Operating Junction Temperature Range	$T_J$	-55 to 175	$^\circ\text{C}$

## Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance Junction-Ambient <sup>1</sup>	$R_{\theta JA}$	---	80	$^\circ\text{C/W}$
Thermal Resistance Junction-Case <sup>1</sup>	$R_{\theta JC}$	---	3	$^\circ\text{C/W}$

**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 <sup>2</sup>	R <sub>DS(ON)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-13A	---	8.6	10.5	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-9A	---	11.5	15	mΩ
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =-250uA	-1.0	-1.5	-2.0	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> =-13A	---	25	---	S
Gate Resistance	R <sub>g</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1MHz	---	6.6	---	Ω
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-25V, V <sub>GS</sub> =-10V, I <sub>D</sub> =-13A	---	65	---	nC
Gate-Source Charge	Q <sub>gs</sub>		---	8.7	---	
Gate-Drain Charge	Q <sub>gd</sub>		---	15	---	
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	---	11.4	---	ns
Rise Time	T <sub>r</sub>		---	24	---	
Turn-Off Delay Time	T <sub>d(off)</sub>		---	104	---	
Fall Time	T <sub>f</sub>		---	56.8	---	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V, f=1MHz	---	2828	---	pF
Output Capacitance	C <sub>oss</sub>		---	343	---	
Reverse Transfer Capacitance	C <sub>rss</sub>		---	291	---	

**Drain-Source Diode Characteristics**

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Diode Forward Voltage <sup>2</sup>	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =-3A, T <sub>J</sub> =25°C	---	-0.75	-1.1	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =-20A, V <sub>R</sub> =0V di/dt=100A/μs, T <sub>J</sub> =25°C	---	15.6	---	nS
Reverse Recovery Charge	Q <sub>rr</sub>		---	7.9	---	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**

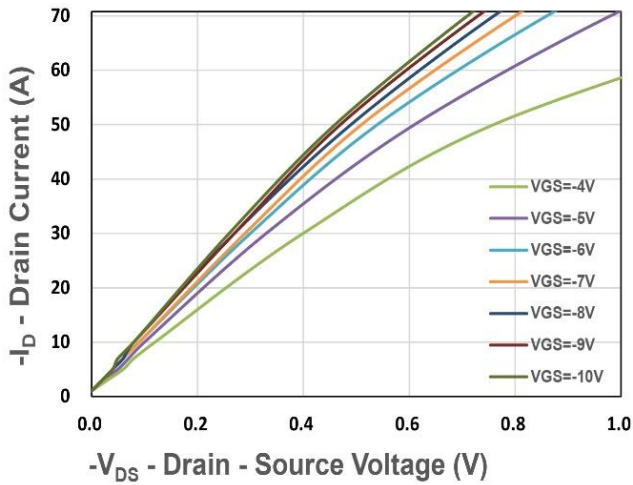


Figure 1. Output Characteristics

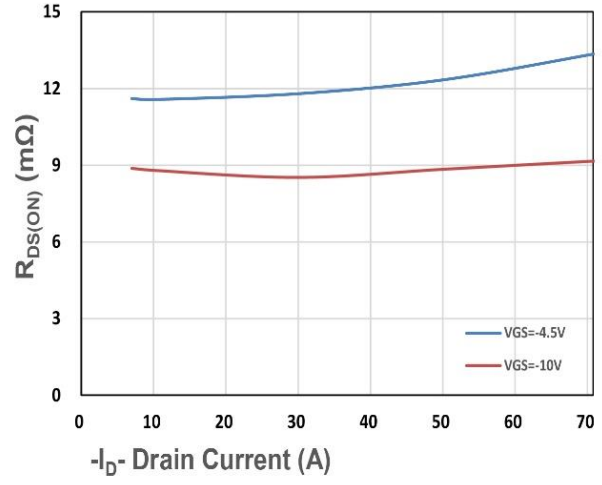


Figure 2. On-Resistance vs.  $I_D$

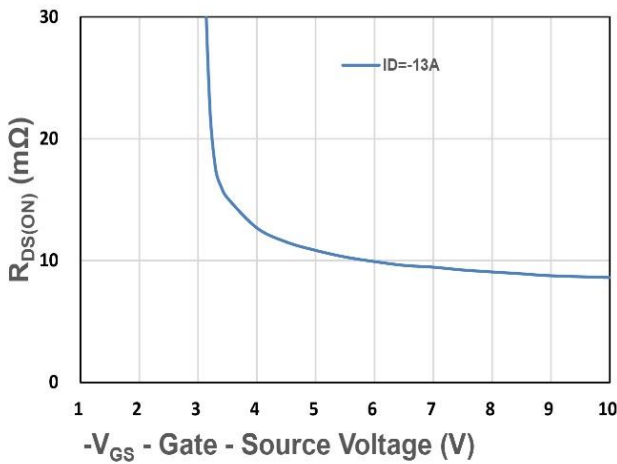


Figure 3. On-Resistance vs.  $V_{GS}$

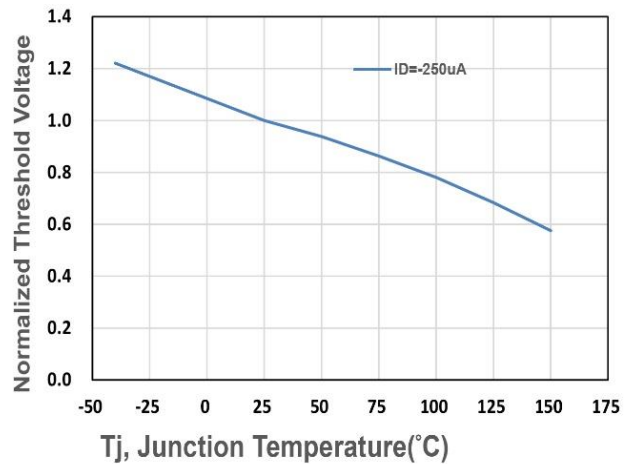


Figure 4. Gate Threshold Voltage

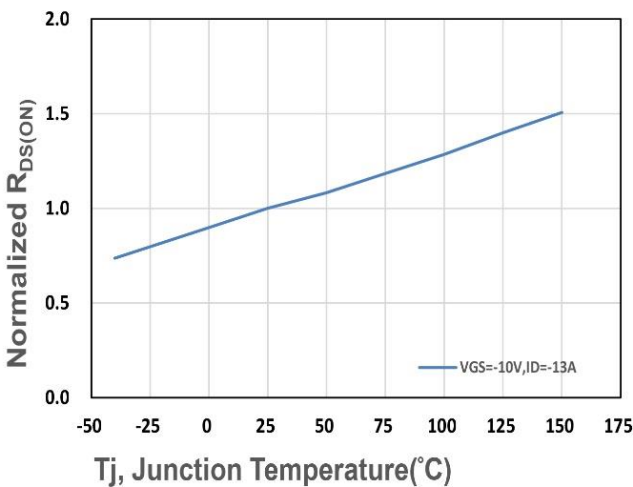


Figure 5. Drain-Source On Resistance

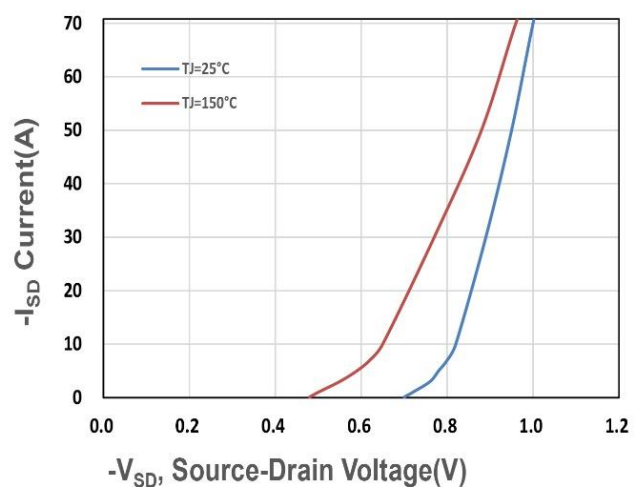


Figure 6. Source-Drain Diode Forward

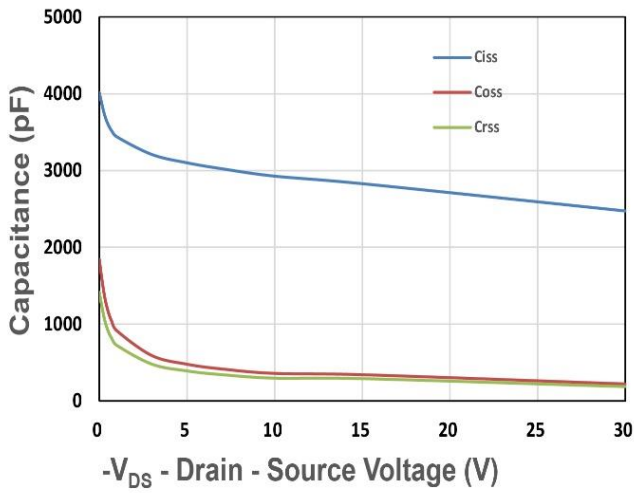


Figure 7. Capacitance

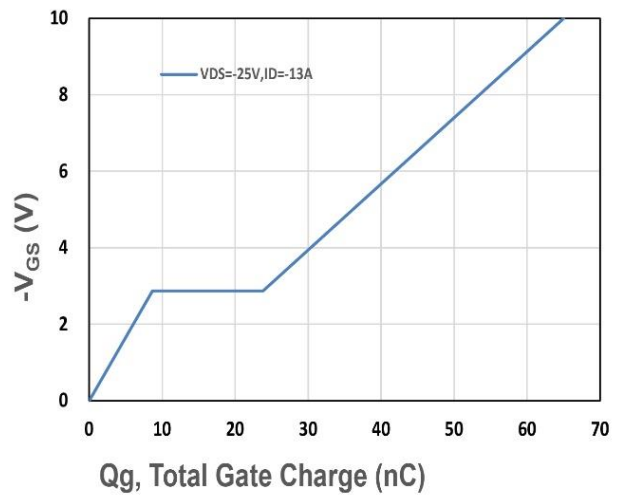


Figure 8. Gate Charge Characteristics

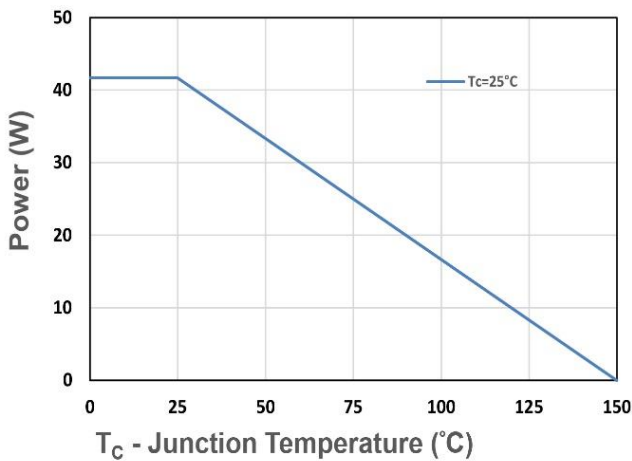


Figure 9. Power Dissipation

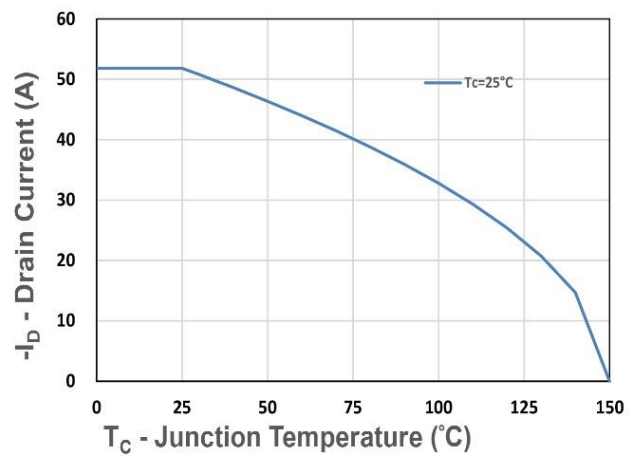


Figure 10. Drain Current

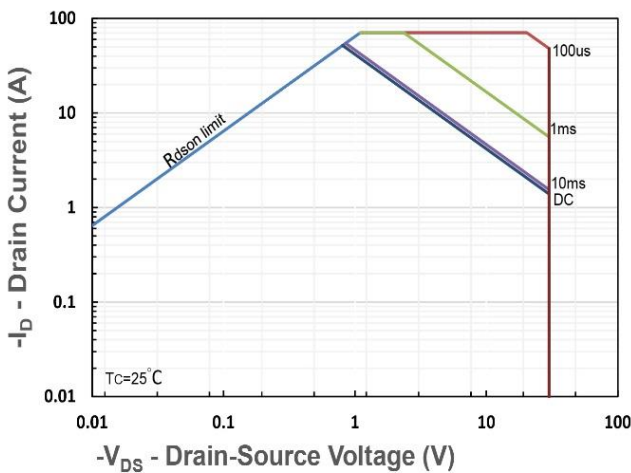


Figure 11. Safe Operating Area

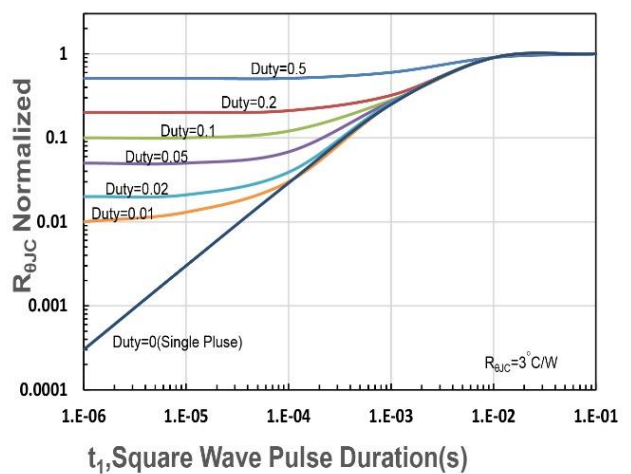
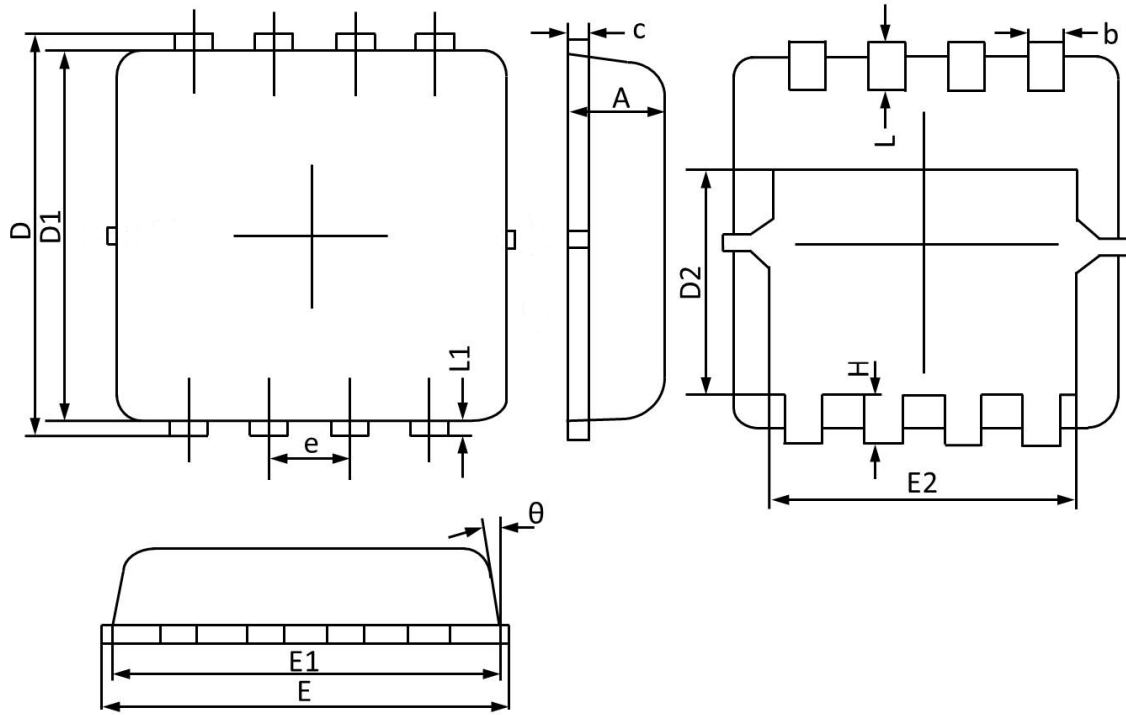


Figure 12.  $R_{\theta JC}$  Transient Thermal Impedance

**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°