

Features

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

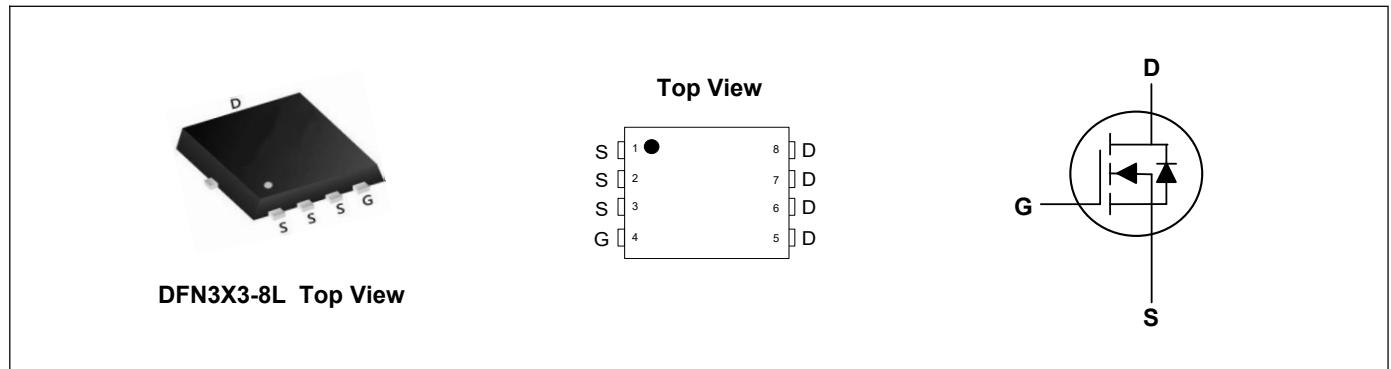
Applications

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

Product Summary



V_{DS}	30	V
I_D	54	A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	5.5	m Ω
$R_{DS(ON)}$ (at $V_{GS}=4.5V$)	7.5	m Ω



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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ¹	$I_D@T_C=25^\circ\text{C}$	54	A
Continuous Drain Current ¹	$I_D@T_C=70^\circ\text{C}$	42	A
Continuous Drain Current ¹	$I_D@T_A=25^\circ\text{C}$	12	A
Continuous Drain Current ¹	$I_D@T_A=70^\circ\text{C}$	9.5	A
Pulsed Drain Current ²	I_{DM}	110	A
Single Pulse Avalanche Energy ³	EAS	31.25	mJ
Avalanche Current	I_{AS}	25	A
Total Power Dissipation ³	$P_D@T_C=25^\circ\text{C}$	29	W
Total Power Dissipation ³	$P_D@T_C=70^\circ\text{C}$	19	W
Total Power Dissipation ³	$P_D@T_A=25^\circ\text{C}$	1.6	W
Total Power Dissipation ³	$P_D@T_A=70^\circ\text{C}$	1	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 ¹	$R_{\theta JC}$	---	60	$^\circ\text{C/W}$
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	---	3.5	$^\circ\text{C/W}$

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30	---	---	V
Static Drain-Source On-Resistance ²	$R_{DS(ON)}$	$V_{GS}=10V, I_D=12A$	---	4.0	5.5	m Ω
		$V_{GS}=4.5V, I_D=9A$	---	6.1	7.5	m Ω
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1.5	1.8	2.5	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=24V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	---	---	1	μA
		$V_{DS}=24V, V_{GS}=0V, T_J=85^{\circ}\text{C}$	---	---	30	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
Gate Resistance	R_g	$V_{DS}=0V, V_{GS}=0V, f=1\text{MHz}$	---	3	4.5	Ω
Total Gate Charge	Q_g	$V_{DS}=15V, V_{GS}=4.5V, I_D=12A$	---	12.9	---	nC
Gate-Source Charge	Q_{gs}		---	4.2	---	
Gate-Drain Charge	Q_{gd}		---	7.3	---	
Turn-On Delay Time	$T_{d(on)}$	$V_{DD}=15V, V_{GS}=10V, R_G=6\Omega, R_L=15\Omega, I_D=1A$	---	14	---	ns
Rise Time	T_r		---	10	---	
Turn-Off Delay Time	$T_{d(off)}$		---	44	---	
Fall Time	T_f		---	12	---	
Input Capacitance	C_{iss}	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$	---	1155	---	pF
Output Capacitance	C_{oss}		---	245	---	
Reverse Transfer Capacitance	C_{rss}		---	105	---	

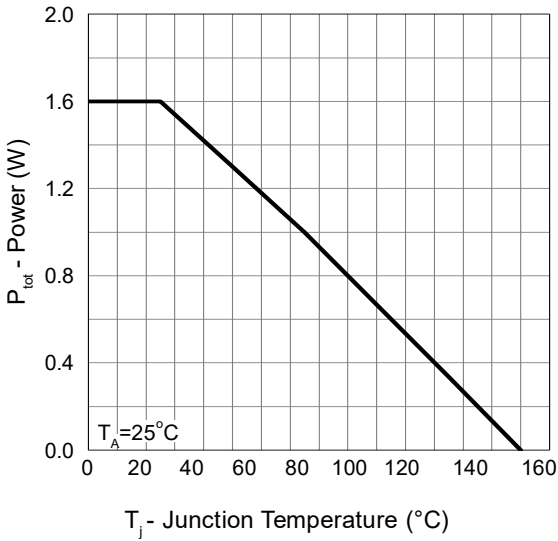
Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current ¹	I_S	$T_C=25^{\circ}\text{C}$	---	---	40	A
Diode Forward Voltage ²	V_{SD}	$V_{GS}=0V, I_S=2A, T_J=25^{\circ}\text{C}$	---	0.8	1.1	V
Reverse Recovery Time	t_{rr}	$I_F=12A, di/dt=100A/\mu s, T_J=25^{\circ}\text{C}$	---	10	---	nS
Reverse Recovery Charge	Q_{rr}		---	3	---	nC

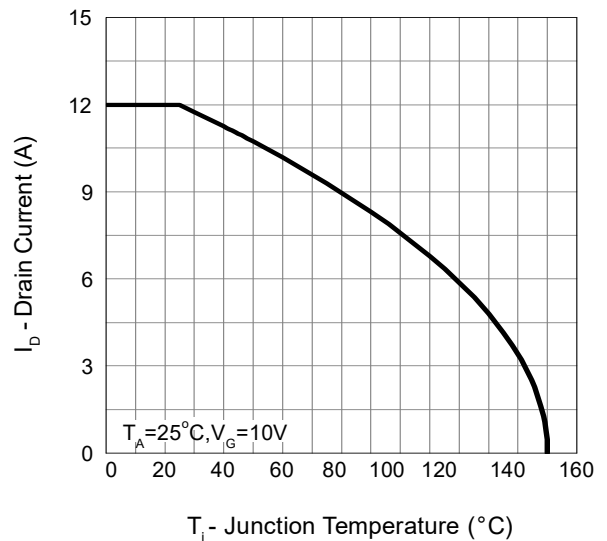
Note:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. The power dissipation is limited by 150 $^{\circ}\text{C}$ junction temperature

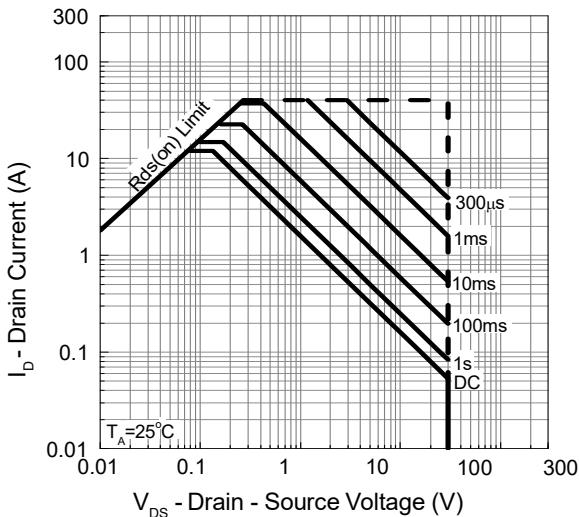
Typical Characteristics



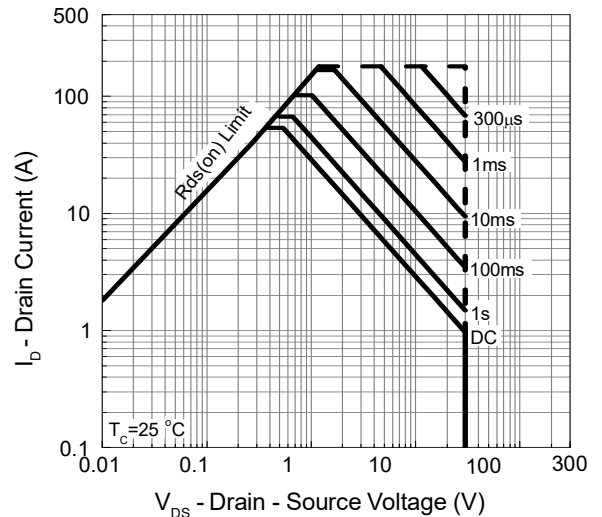
Power Dissipation



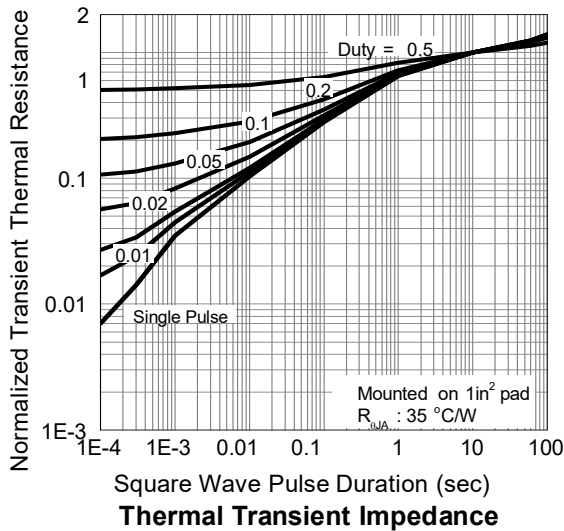
Drain Current



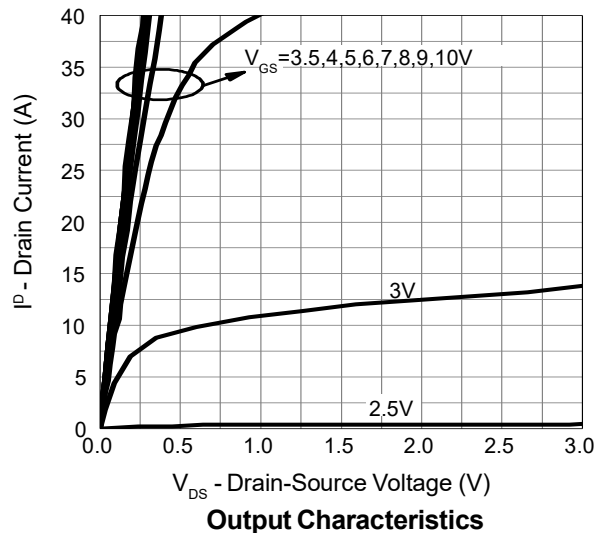
Safe Operation Area



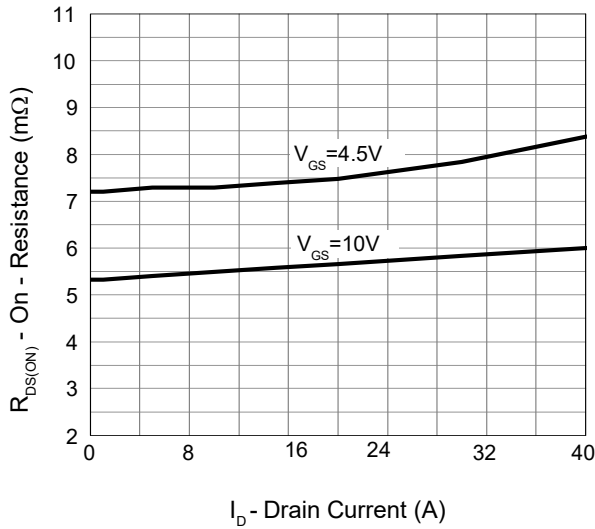
Safe Operation Area



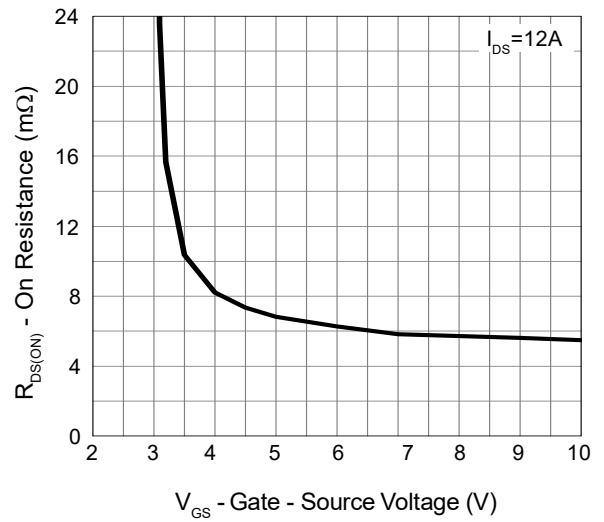
Thermal Transient Impedance



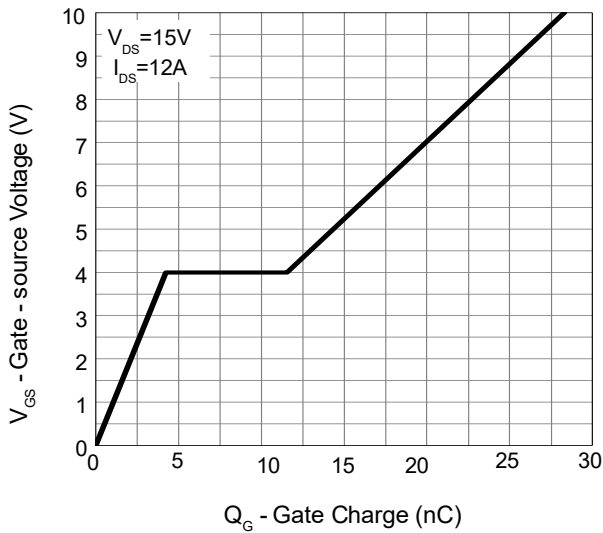
Output Characteristics



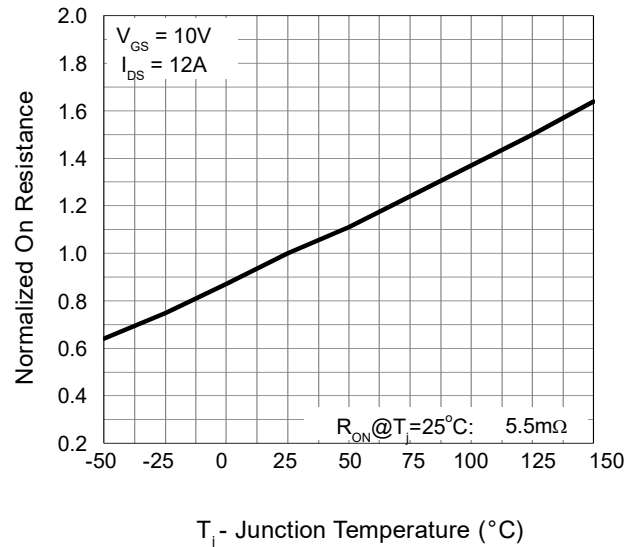
Drain-Source On Resistance



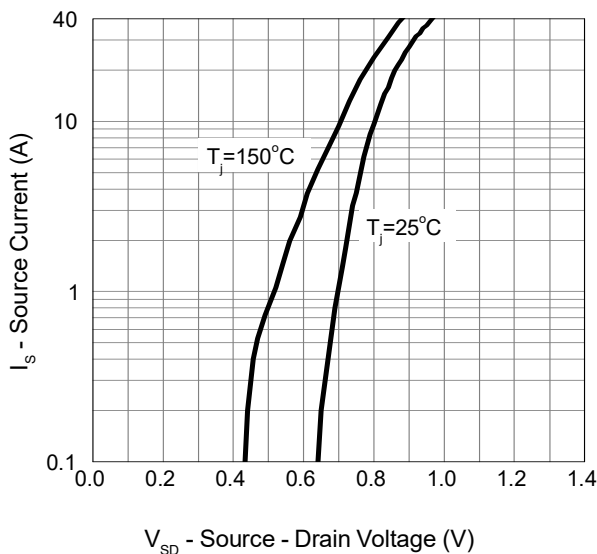
Gate-Source On Resistance



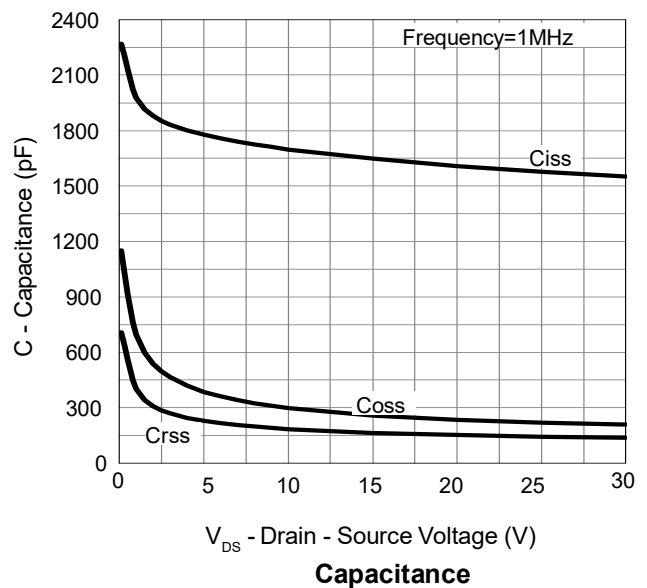
Gate Charge



Drain-Source On Resistance

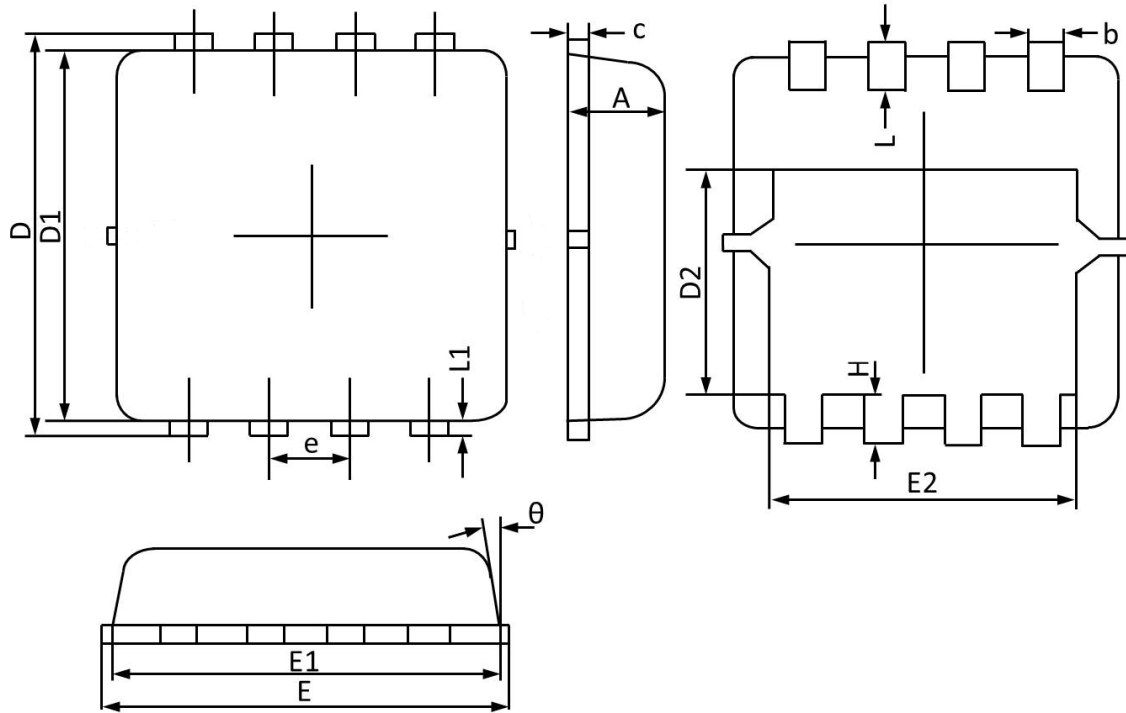


Source-Drain Diode Forward



Capacitance

DFN3X3-8L Package Outline Dimensions



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