

**Features**

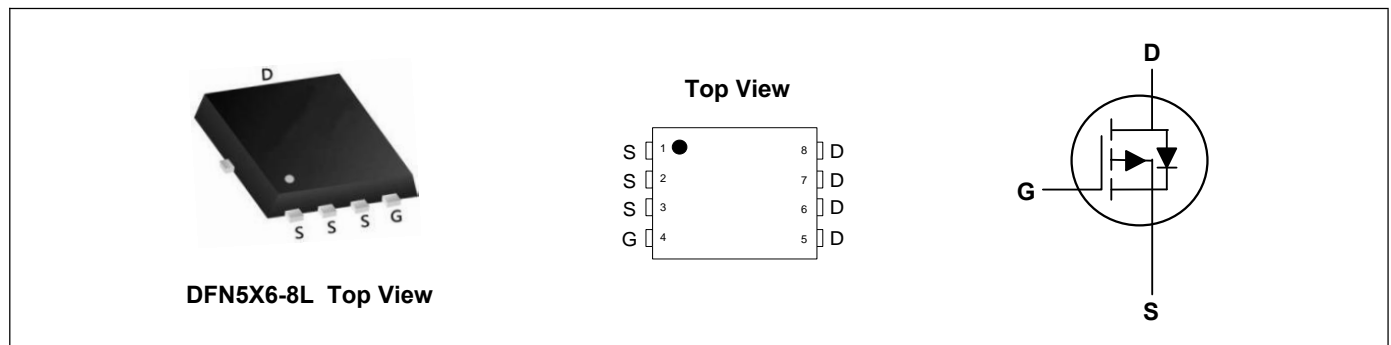
- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Green Device Available

**Product Summary**


$V_{DS}$	-30	V
$I_D$ (at $V_{GS}=-10V$ )	-59	A
$R_{DS(ON)}$ (at $V_{GS}=-10V$ )	9.8	m $\Omega$
$R_{DS(ON)}$ (at $V_{GS}=-4.5V$ )	15	m $\Omega$

**Applications**

- High Frequency Point-of-Load, Synchronous Buck Converter for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- Load Switch


**Absolute Maximum Ratings ( $T_C=25^\circ C$ , unless otherwise noted)**

Parameter	Symbol	Rating		Units
		10S	Steady State	
Drain-Source Voltage	$V_{DS}$	-30		V
Gate-Source Voltage	$V_{GS}$	$\pm 25$		V
Continuous Drain Current, $V_{GS} @ -10V^1$	$I_D @ T_C=25^\circ C$	-59		A
Continuous Drain Current, $V_{GS} @ -10V^1$	$I_D @ T_C=100^\circ C$	-37		A
Continuous Drain Current, $V_{GS} @ -10V^1$	$I_D @ T_A=25^\circ C$	-18	-11.6	A
Continuous Drain Current, $V_{GS} @ -10V^1$	$I_D @ T_A=70^\circ C$	-14.6	-9.3	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	-180		A
Single Pulse Avalanche Energy <sup>3</sup>	EAS	153		mJ
Avalanche Current	$I_{AS}$	-55.4		A
Total Power Dissipation <sup>3</sup>	$P_D @ T_C=25^\circ C$	52.1		W
Total Power Dissipation <sup>3</sup>	$P_D @ T_A=25^\circ C$	5	2	W
Storage Temperature Range	$T_{STG}$	-55 to 150		$^\circ C$
Operating Junction Temperature Range	$T_J$	-55 to 150		$^\circ C$

**Thermal Characteristics**

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance Junction-Ambient <sup>1</sup> ( $t \leq 10s$ )	$R_{\theta JA}$	---	25	$^\circ C/W$
Thermal Resistance Junction-Ambient <sup>1</sup>		---	62	$^\circ C/W$
Thermal Resistance Junction-Case <sup>1</sup>	$R_{\theta JC}$	---	2.4	$^\circ C/W$

**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
BV <sub>DSS</sub> Temperature Coefficient	ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	Reference to 25°C, I <sub>D</sub> =-1mA	---	-0.018	---	V/°C
Static Drain-Source On-Resistance <sup>2</sup>	R <sub>DS(ON)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-20A	---	7.8	9.8	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-15A	---	11	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	---	-2.5	V
V <sub>GS(th)</sub> Temperature Coefficient	ΔV <sub>GS(th)</sub>		---	5.04	---	mV/°C
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	---	---	1	uA
		V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C	---	---	5	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±25V, V <sub>DS</sub> =0V	---	---	±100	nA
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> =-5V, I <sub>D</sub> =-30A	---	26.4	---	S
Total Gate Charge (-4.5V)	Q <sub>g</sub>	V <sub>DS</sub> =-15V, V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-15A	---	33	---	nC
Gate-Source Charge	Q <sub>gs</sub>		---	10.7	---	
Gate-Drain Charge	Q <sub>gd</sub>		---	12.8	---	
Turn-On Delay Time	T <sub>d(on)</sub>	V <sub>DD</sub> =-15V, V <sub>GS</sub> =-10V, R <sub>G</sub> =3.3Ω, I <sub>D</sub> =-15A	---	8	---	ns
Rise Time	T <sub>r</sub>		---	17.8	---	
Turn-Off Delay Time	T <sub>d(off)</sub>		---	78.4	---	
Fall Time	T <sub>f</sub>		---	43.6	---	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V, f=1MHz	---	3448	---	pF
Output Capacitance	C <sub>oss</sub>		---	508	---	
Reverse Transfer Capacitance	C <sub>rss</sub>		---	421	---	

**Drain-Source Diode Characteristics**

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current <sup>1,5</sup>	I <sub>S</sub>	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	-59	A
Diode Forward Voltage <sup>2</sup>	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =-1A, T <sub>J</sub> =25°C	---	---	-1.2	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =-15A, di/dt=100A/μs, T <sub>J</sub> =25°C	---	29	---	nS
Reverse Recovery Charge	Q <sub>rr</sub>		---	15	---	nC

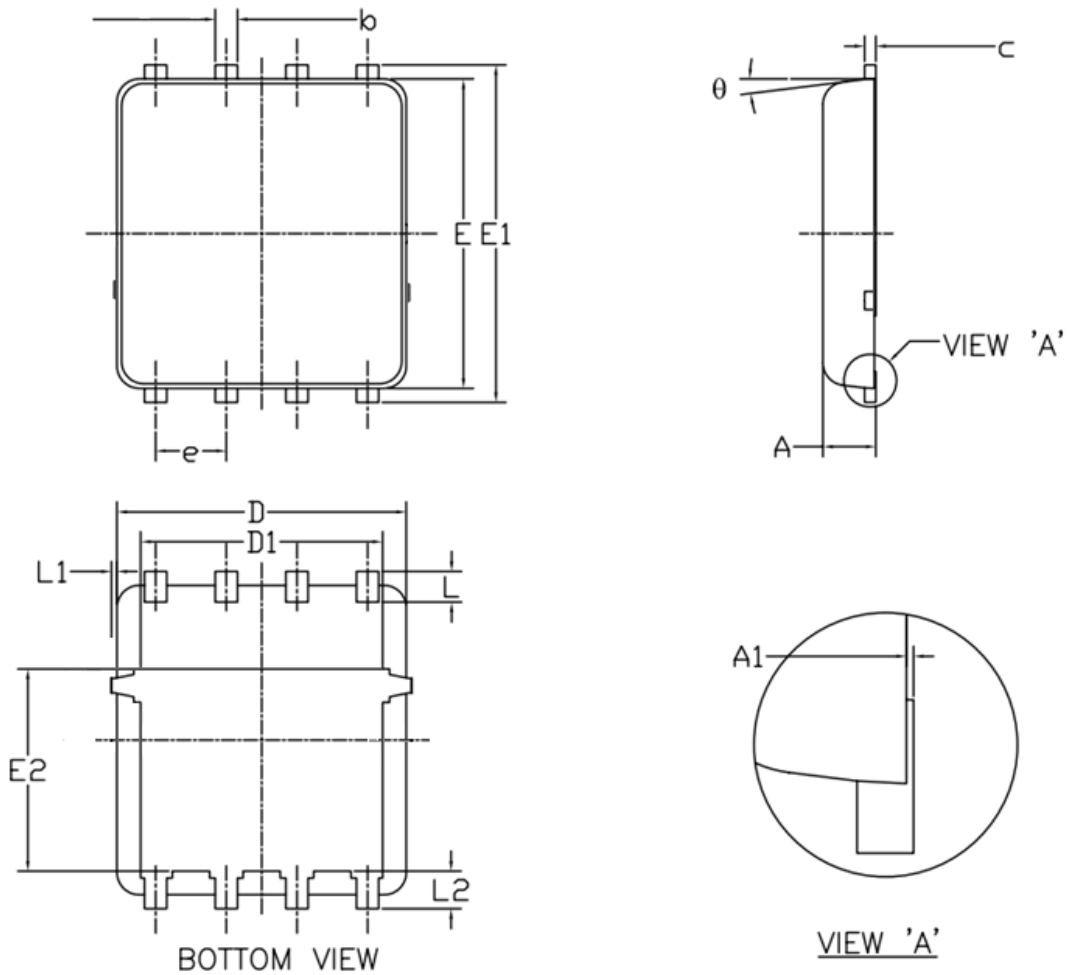
**Note:**

1. The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 20Z 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, I<sub>AS</sub>=-55.4A
4. The power dissipation is limited by 150°C junction temperature
5. The data is theoretically the same as I<sub>D</sub> and I<sub>DM</sub>, in real applications, should be limited by total power dissipation.

## Typical Characteristics



## DFN5X6-8L Package Outline Dimensions



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
<b>A</b>	0.90	1.00	1.20	<b>E1</b>	5.90	6.10	6.35
<b>A1</b>	0.00	--	0.05	<b>E2</b>	3.38	3.58	3.92
<b>b</b>	0.30	0.40	0.51	<b>e</b>	1.27 BSC		
<b>c</b>	0.20	0.25	0.33	<b>L</b>	0.51	0.61	0.71
<b>D</b>	4.80	4.90	5.40	<b>L1</b>	--	--	0.15
<b>D1</b>	3.61	4.00	4.25	<b>L2</b>	0.41	0.51	0.61
<b>E</b>	5.65	5.80	6.06	<b><math>\theta</math></b>	0°	--	12°