

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	1.75mΩ@10V	130A
	2.5mΩ@4.5V	

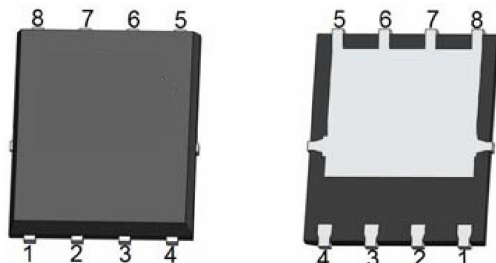
Feature

- Split gate trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(on)}$

Application

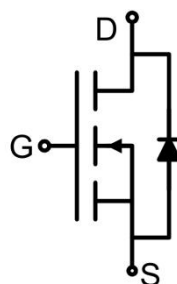
- DC/DC converters
- Power management functions
- Uninterruptible power supply

Package

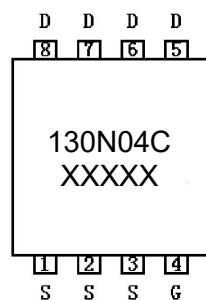


DFN5X6-8L

Circuit diagram



Marking



Absolute maximum ratings ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_C=25^{\circ}\text{C}$)	I_D	130	A
Continuous Drain Current ($T_C=100^{\circ}\text{C}$)	I_D	82	A
Pulsed Drain Current ¹⁾	I_{DM}	450	A
Power Dissipation ($T_C=25^{\circ}\text{C}$)	P_D	125	W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	50	$^{\circ}\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1	$^{\circ}\text{C/W}$
Single pulse avalanche energy	E_{AS}	661	mJ
Junction Temperature	T_J	150	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150	$^{\circ}\text{C}$

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

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	40			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =40V,V _{GS} = 0V			1	μA
Gate-body leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} = 0V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0	1.8	2.5	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A		1.45	1.75	mΩ
		V _{GS} =4.5V, I _D =20A		2.0	2.5	
Gate resistance	R _G	f=1.0MHz,Open drain		1.5		Ω
Dynamic characteristics ²⁾						
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f =1MHz		7400		pF
Output Capacitance	C _{oss}			1340		
Reverse Transfer Capacitance	C _{rss}			70		
Total Gate Charge	Q _g	V _{DS} =20V, V _{GS} =10V, I _D =20A		129		nC
Gate-Source Charge	Q _{gs}			18		
Gate-Drain Charge	Q _{gd}			32		
Turn-on delay time	t _{d(on)}	V _{DD} =20V, V _{GS} =10V, I _D =20A, R _{GEN} =2.2Ω		28		nS
Turn-on rise time	t _r			113		
Turn-off delay time	t _{d(off)}			56		
Turn-off fall time	t _f			21		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				130	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =20A			1.2	V
Reverse Recovery Time	t _{rr}	I _F =20A di/dt = 100A/μs		73		nS
Reverse Recovery Charge	Q _{rr}			120		nC

Notes:

1) Repetitive rating; pulse width limited by max. junction temperature.

2) Guaranteed by design, not subject to production testing.

Typical Characteristics

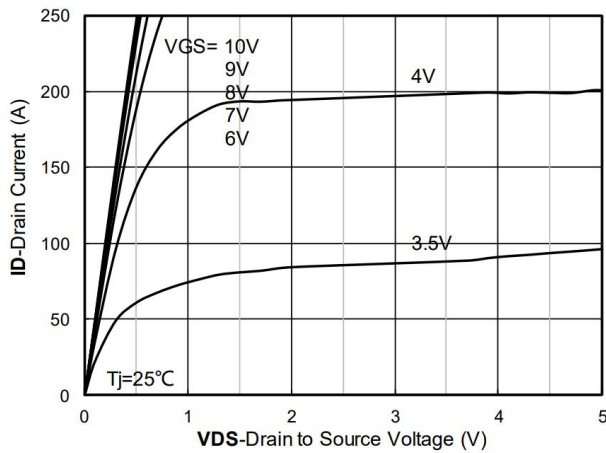


Figure 1. Output Characteristics

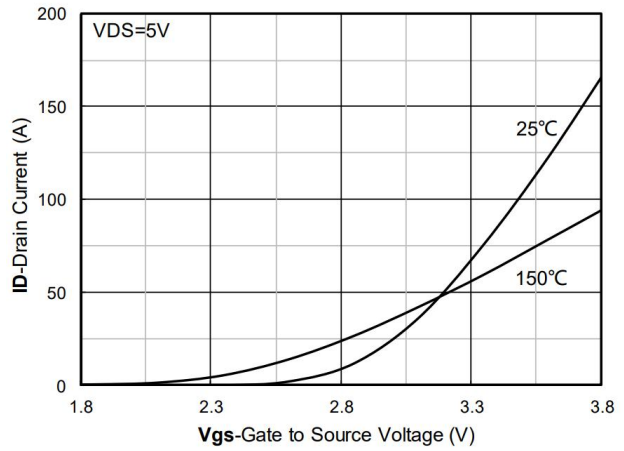


Figure 2. Transfer Characteristics

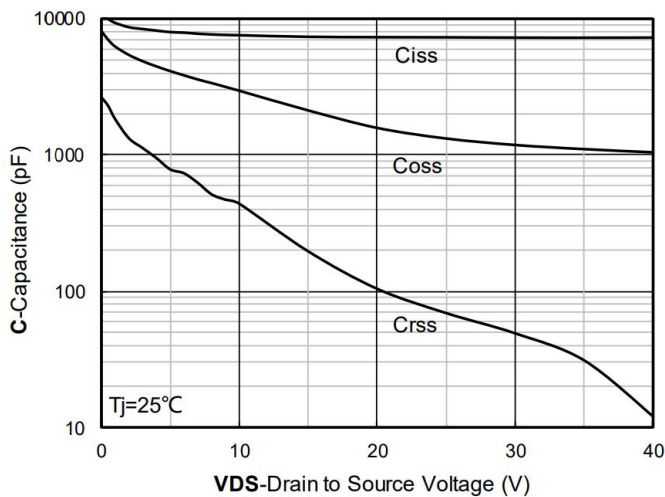


Figure 3. Capacitance Characteristics

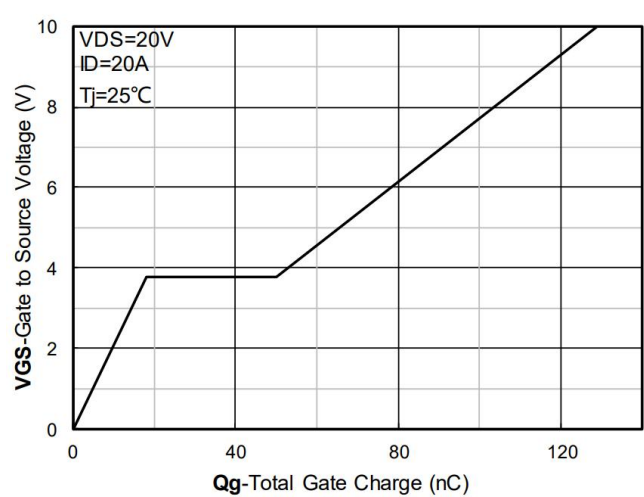


Figure 4. Gate Charge

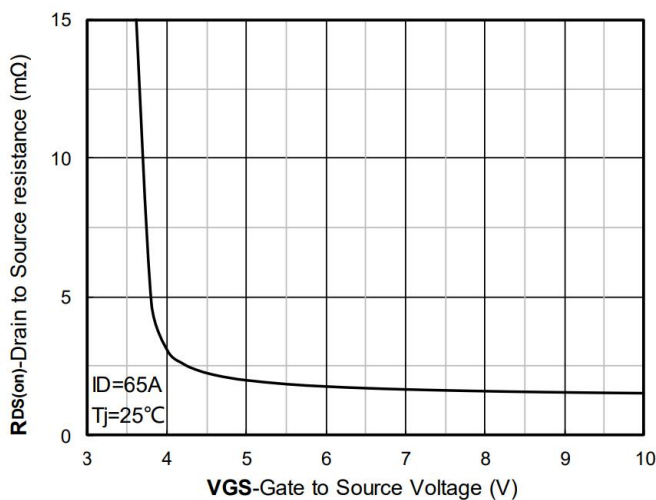


Figure 5. On-Resistance vs Gate to Source Voltage

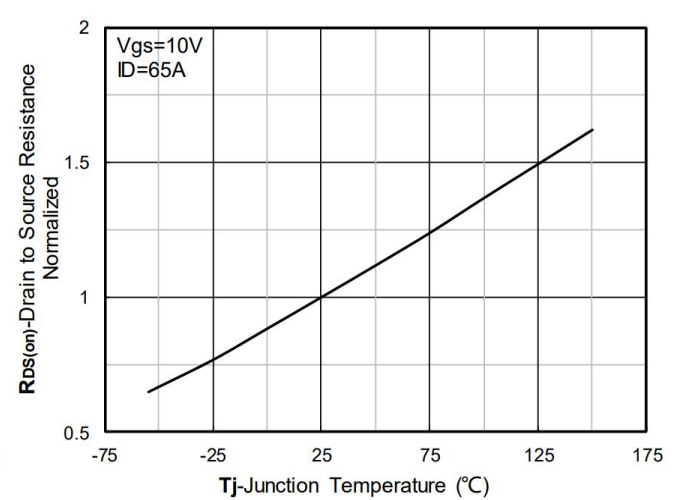


Figure 6. Normalized On-Resistance

Typical Characteristics

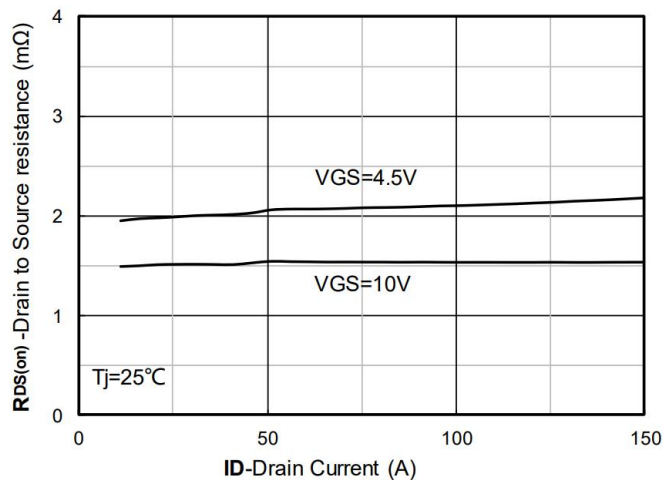


Figure 7. RDS(on) VS Drain Current

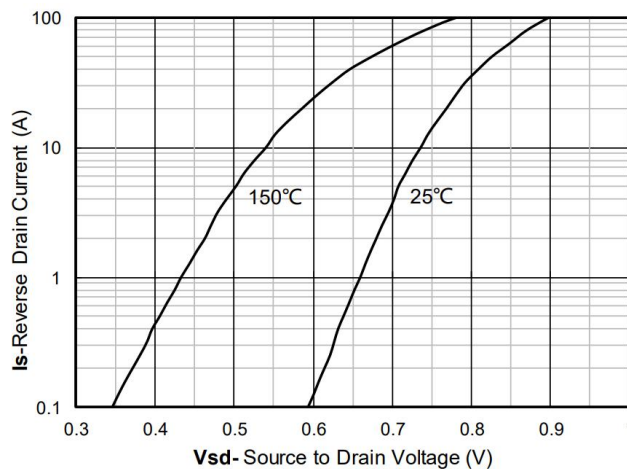


Figure 8. Forward characteristics of reverse diode

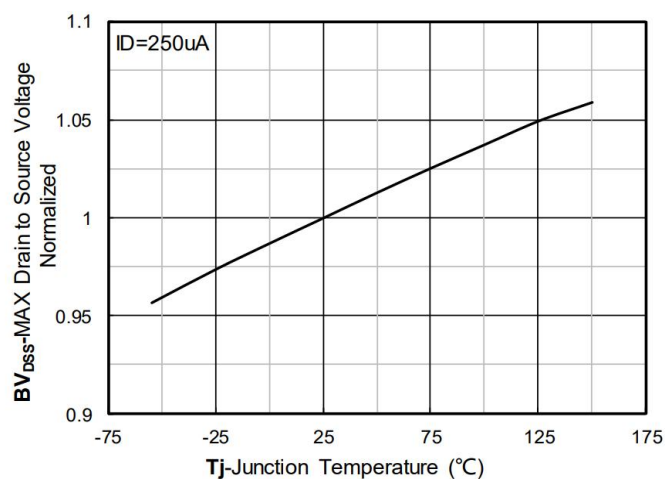


Figure 9. Normalized breakdown voltage

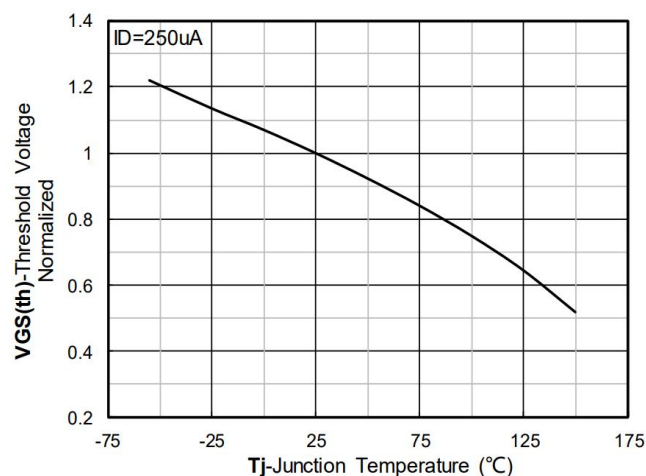


Figure 10. Normalized Threshold voltage

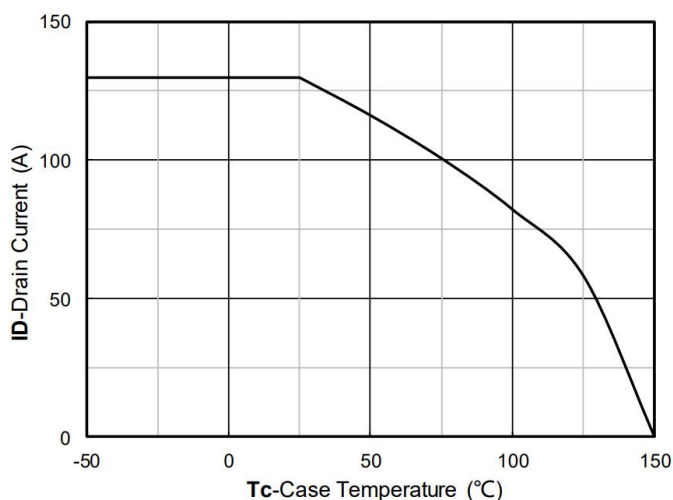


Figure 11. Current dissipation

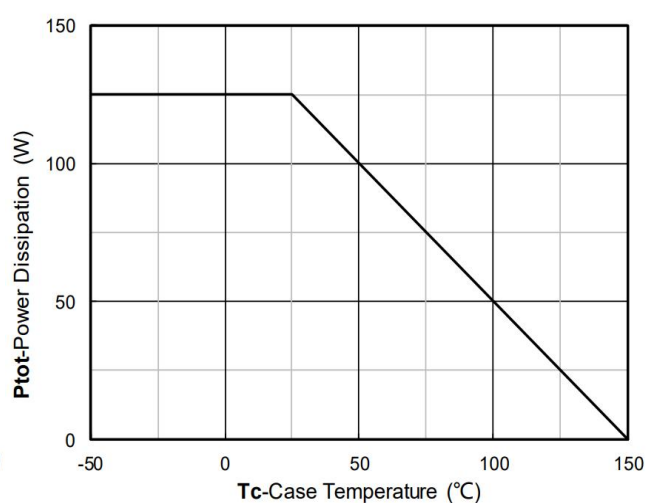


Figure 12. Power dissipation

Typical Characteristics

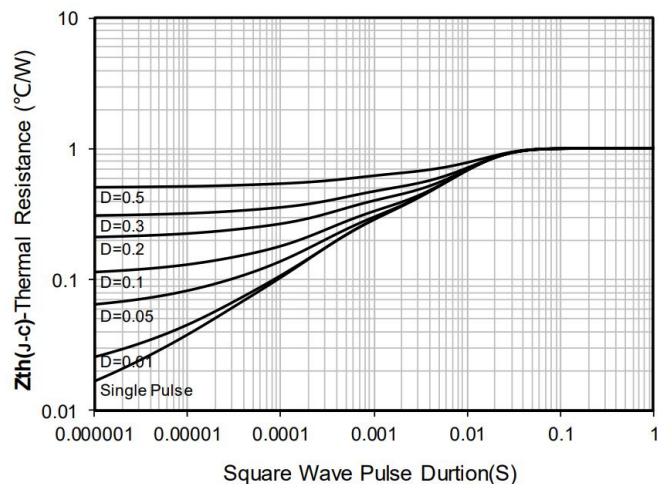


Figure 13. Maximum Transient Thermal Impedance

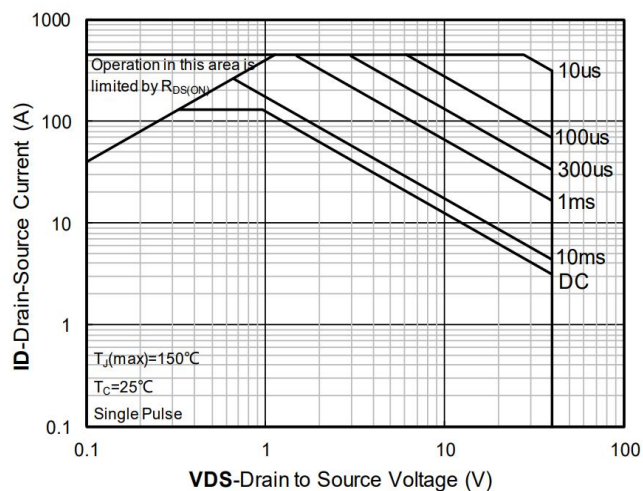
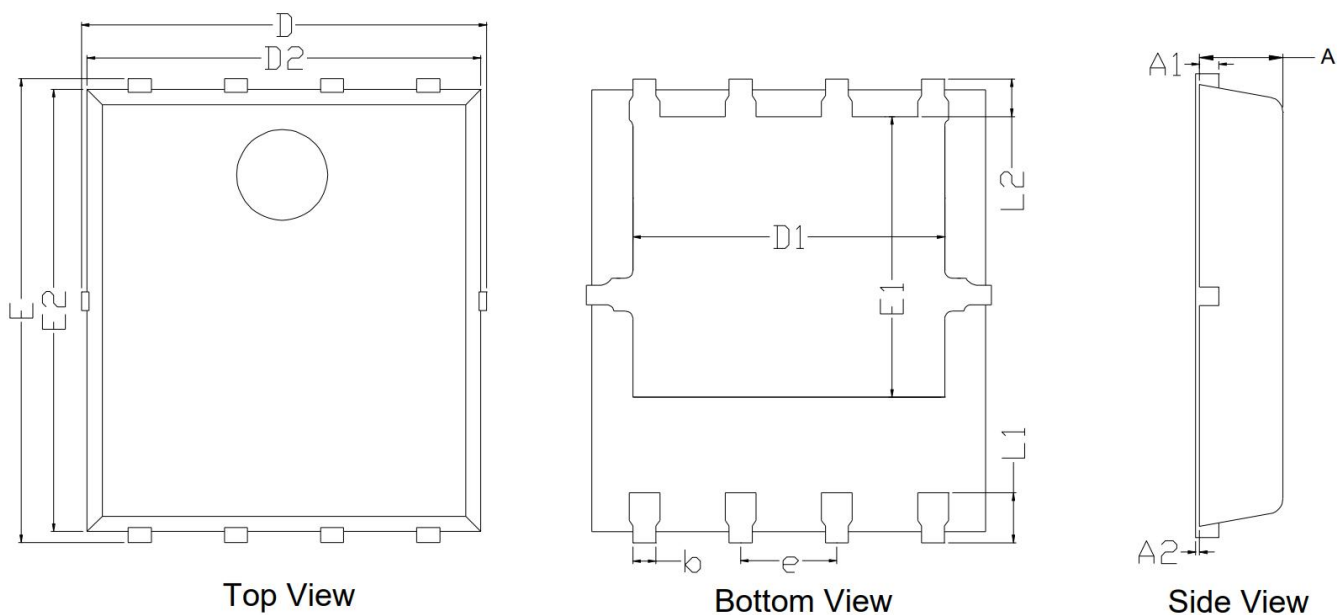


Figure 14. Safe Operation Area

DFN5X6-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.200	0.035	0.047
A1	0.254BSC.		0.010BSC.	
A2	0.000	0.100	0.000	0.004
D	4.850	5.550	0.191	0.219
E	5.800	6.350	0.228	0.250
D1	3.920	4.400	0.154	0.173
E1	3.350	3.920	0.132	0.154
D2	4.700	5.400	0.197	0.212
E2	5.550	6.060	0.219	0.239
b	0.200	0.510	0.008	0.020
e	1.270BSC.		0.050BSC.	
L1	0.550	0.760	0.022	0.030
L2	0.538BSC.		0.021BSC.	