

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	13mΩ@10V	30A
	20mΩ@4.5V	

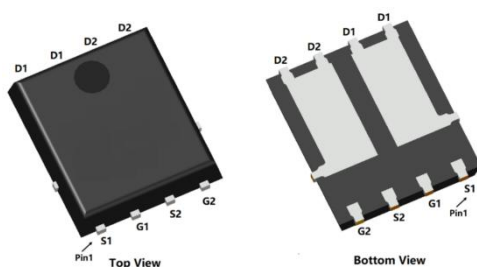
Feature

- Trench Power MV MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Epoxy Meets UL 94 V-0 Flammability Rating

Application

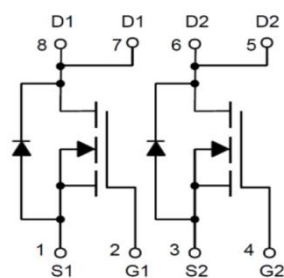
- Power switching application
- Uninterruptible power supply
- DC-DC converter

Package

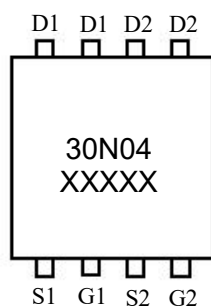


DFN5X6-8L

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	30	A
Drain Current-Continuous($T_C=100^\circ\text{C}$)	$I_D(100^\circ\text{C})$	19	A
Pulsed Drain Current ¹⁾	I_{DM}	120	A
Power Dissipation ³⁾	P_D	2	W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	3.5	$^\circ\text{C}/\text{W}$
Single pulse avalanche energy ²⁾	E_{AS}	42	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	1.5	2.5	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A		10	13	mΩ
		V _{GS} =4.5V, I _D =10A		14	20	
Dynamic characteristics ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =20V,V _{GS} =0V,f =1MHz		970		pF
Output Capacitance	C _{oss}			100		
Reverse Transfer Capacitance	C _{rss}			90		
Total Gate Charge	Q _g	V _{DS} =20V,V _{GS} =10V,I _D =20A		22		nC
Gate-Source Charge	Q _{gs}			3		
Gate-Drain Charge	Q _{gd}			6		
Turn-on delay time	t _{d(on)}	V _{DD} =20V,V _{GS} =10V, I _D =20A,R _{GEN} =2.2Ω		7		nS
Turn-on rise time	t _r			73		
Turn-off delay time	t _{d(off)}			19		
Turn-off fall time	t _f			10		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				30	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		12		nS
Reverse Recovery Charge	Q _{rr}			10		nC

Notes:

- 1) Repetitive rating; pulse width limited by max. junction temperature.
- 2) $T_J=25^\circ\text{C}$, $V_{DD}=40V$, $V_G=10V$, $R_G=25\Omega$, $L=0.5\text{mH}$, $I_{AS}=13A$.
- 3) P_d is based on max. junction temperature, using junction-case thermal resistance.
- 4) Guaranteed by design, not subject to production testing.

Typical Characteristics

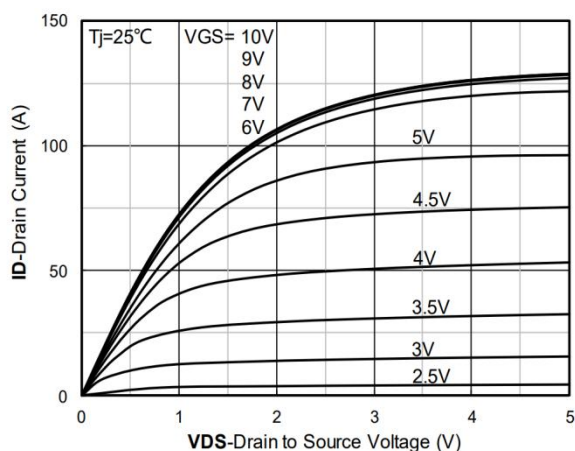


Figure 1. Output Characteristics

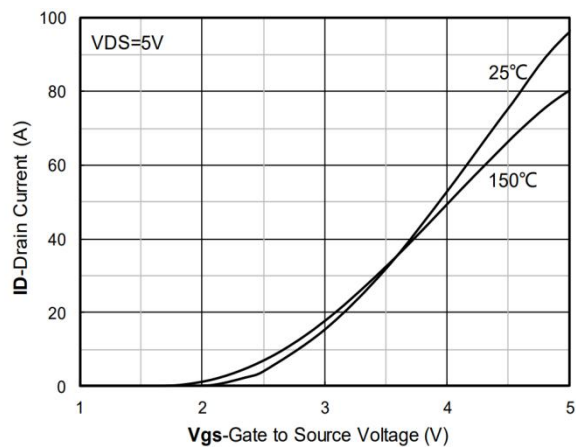


Figure 2. Transfer Characteristics

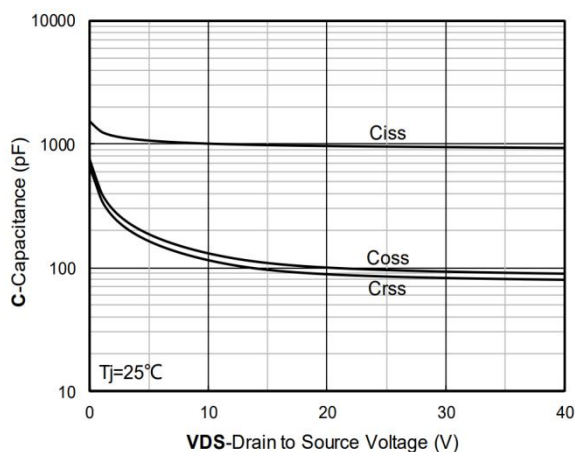


Figure 3. Capacitance Characteristics

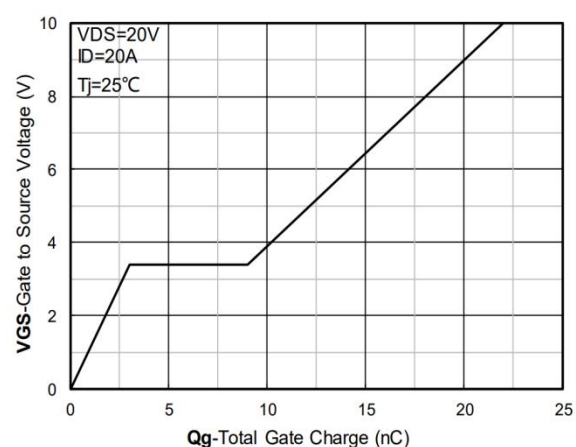


Figure 4. Gate Charge

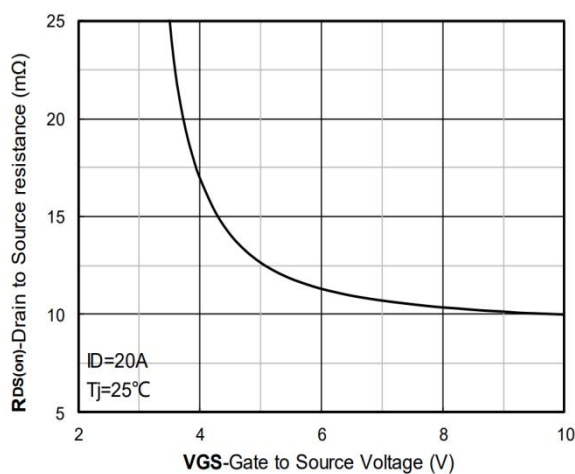


Figure 5. On-Resistance vs Gate to Source Voltage

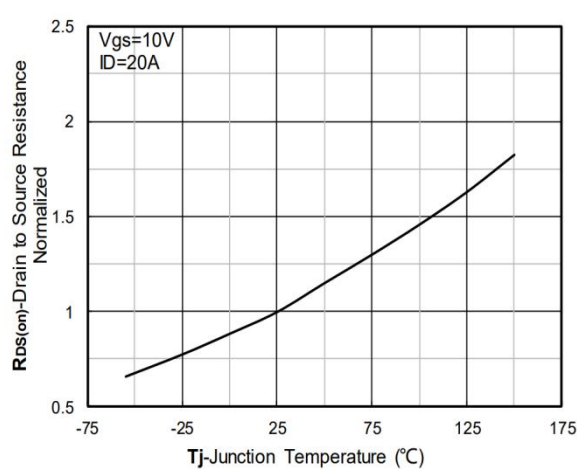


Figure 6. Normalized On-Resistance

Typical Characteristics

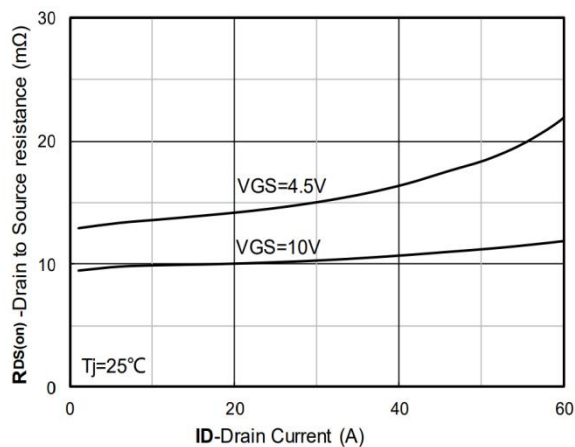


Figure 7. $R_{DS(on)}$ VS Drain Current

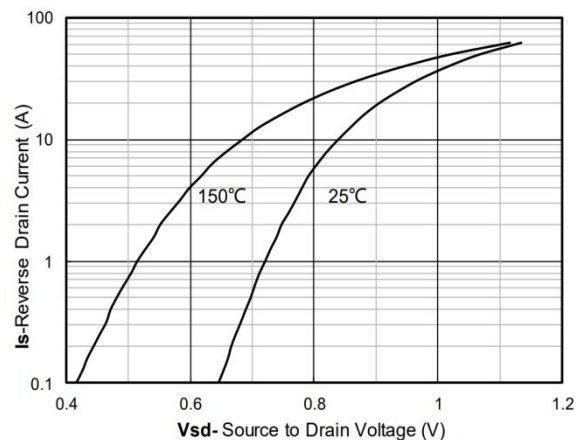


Figure 8. Forward characteristics of reverse diode

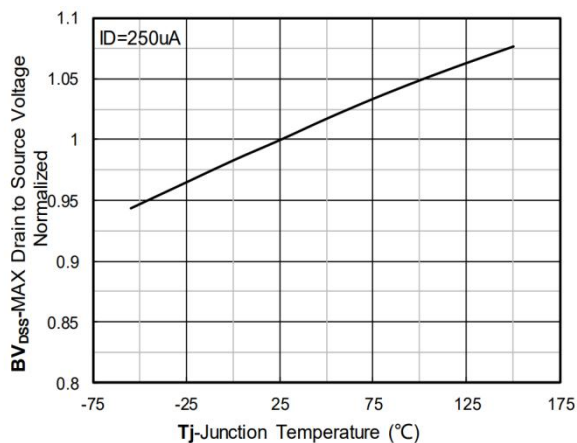


Figure 9. Normalized breakdown voltage

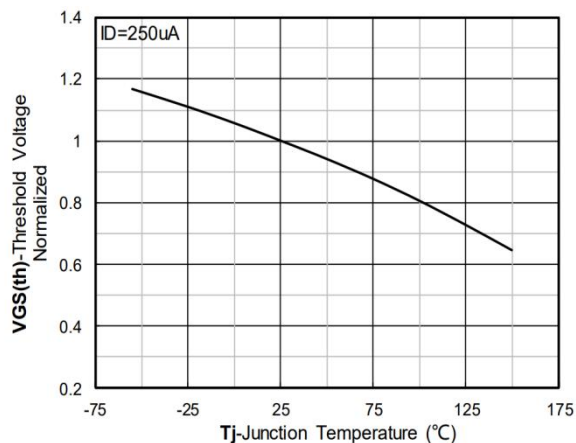


Figure 10. Normalized Threshold voltage

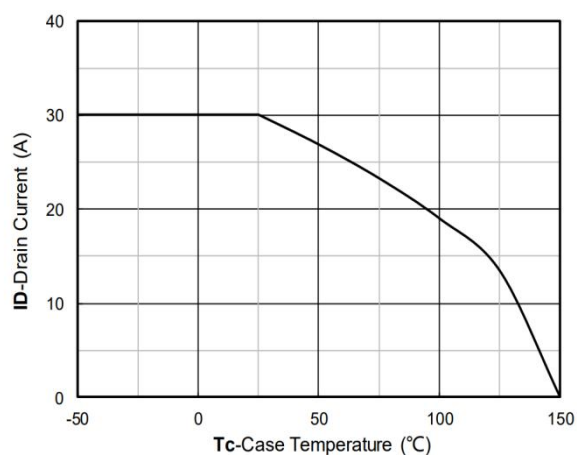


Figure 11. Current dissipation

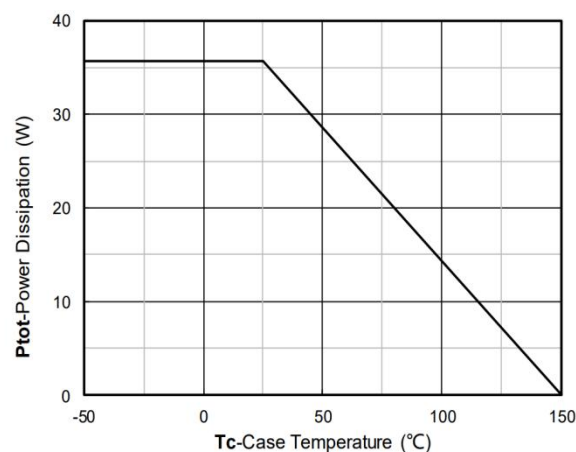


Figure 12. Power dissipation

Typical Characteristics

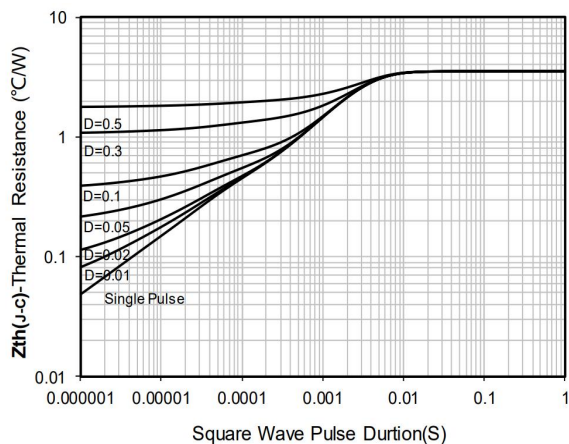


Figure 13. Maximum Transient Thermal Impedance

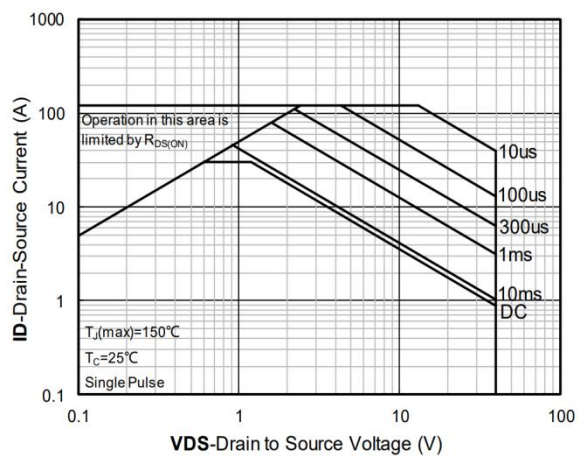
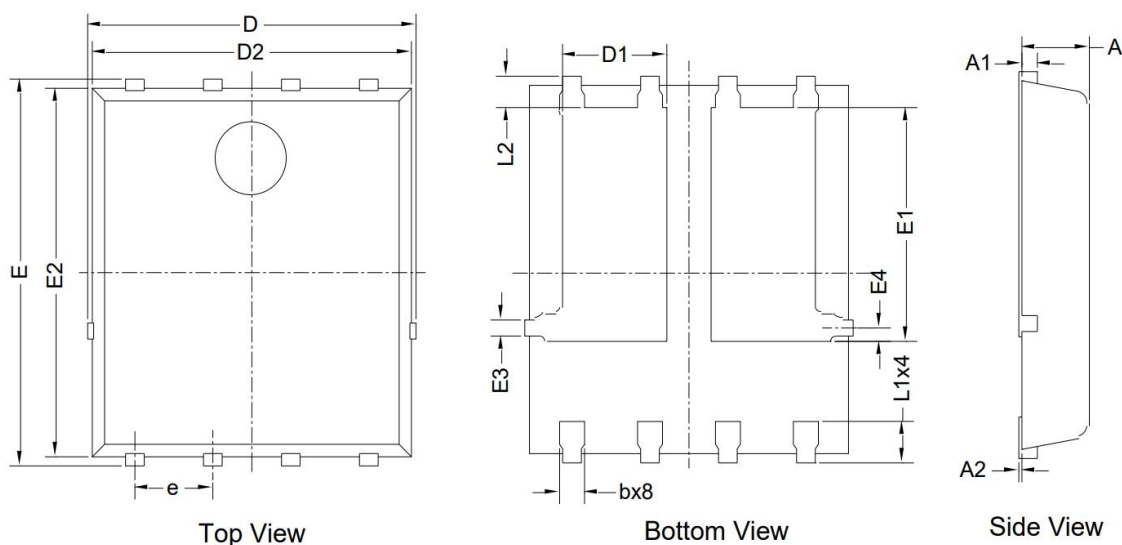


Figure 14. Safe Operation Area

DFN5X6-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
D	5.150	5.550	0.203	0.219
E	5.950	6.350	0.234	0.250
A	1.000	1.200	0.039	0.047
A1	0.254 BSC		0.010 BSC	
A2	0.000	0.100	0.000	0.004
D1	1.500	1.900	0.059	0.075
E1	3.520	3.920	0.139	0.154
D2	5.000	5.400	0.197	0.213
E2	5.660	6.060	0.223	0.239
E3	0.254 REF		0.010 REF	
E4	0.210 REF		0.008 REF	
L1	0.560	0.760	0.022	0.030
L2	0.500 BSC		0.020 BSC	
b	0.310	0.510	0.012	0.020
e	1.270 BSC		0.050 BSC	