

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
30V	2.0mΩ@10V	150A
	3.3mΩ@4.5V	

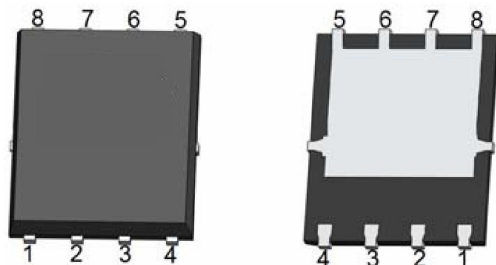
Feature

- Excellent package for heat dissipation
- High density cell design for low $R_{DS(on)}$
- Trench Power MV MOSFET technology
- Epoxy Meets UL 94 V-0 Flammability Rating
- Suffix "-Q1" for AEC-Q101

Application

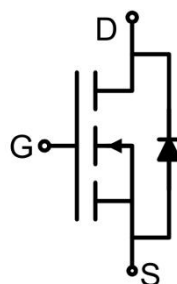
- DC/DC converters
- Power management functions

Package

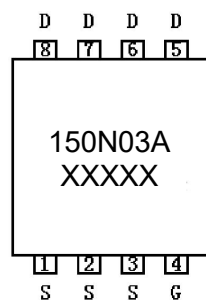


PDFN5X6-8L

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_C=25^{\circ}\text{C}$)	I_D	150	A
Continuous Drain Current ($T_C=100^{\circ}\text{C}$)	I_D	95	A
Pulsed Drain Current ¹⁾	I_{DM}	400	A
Power Dissipation ($T_C=25^{\circ}\text{C}$)	P_D	69	W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	46.5	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.8	$^{\circ}\text{C}/\text{W}$
Single pulse avalanche energy	E_{AS}	400	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	30			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =30V,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		1.58	2.0	mΩ
		V _{GS} =4.5V, I _D =20A		2.6	3.3	
Gate resistance	R _G	f=1.0MHz		2.9		Ω
Dynamic characteristics ²⁾						
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, f =1MHz		4498		pF
Output Capacitance	C _{oss}			800		
Reverse Transfer Capacitance	C _{rss}			643		
Total Gate Charge	Q _g	V _{DS} =15V, V _{GS} =10V, I _D =20A		92.7		nC
Gate-Source Charge	Q _{gs}			13.5		
Gate-Drain Charge	Q _{gd}			22.8		
Turn-on delay time	t _{d(on)}	V _{DD} =20V, V _{GS} =10V, I _D =4A, R _{GEN} =3Ω, R _L =0.75Ω		11		nS
Turn-on rise time	t _r			80		
Turn-off delay time	t _{d(off)}			39		
Turn-off fall time	t _f			92		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				150	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =20A			1.2	V
Reverse Recovery Time	t _{rr}	I _F =20A		15		nS
Reverse Recovery Charge	Q _{rr}	di/dt = 500A/μs		3.0		nC

Notes:

1) Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

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

Typical Characteristics

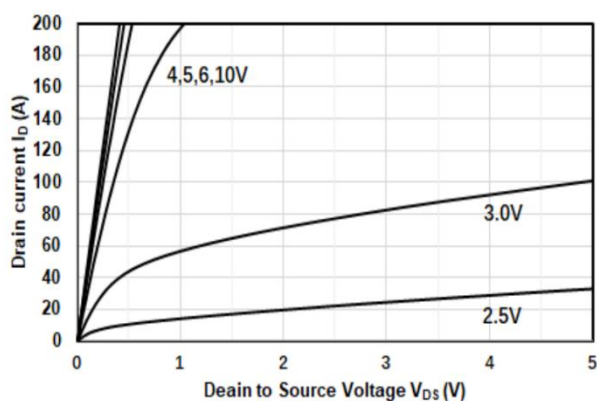


Figure1. Output Characteristics

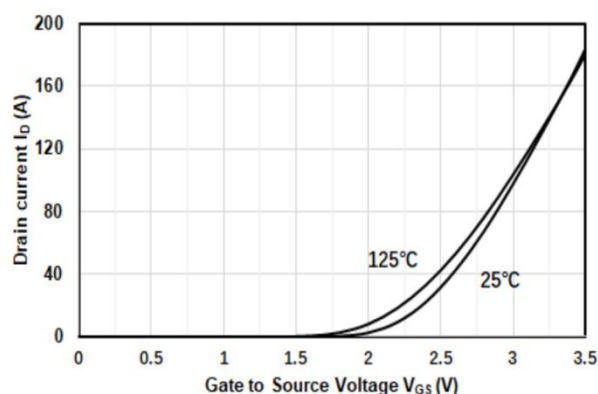


Figure2. Transfer Characteristics

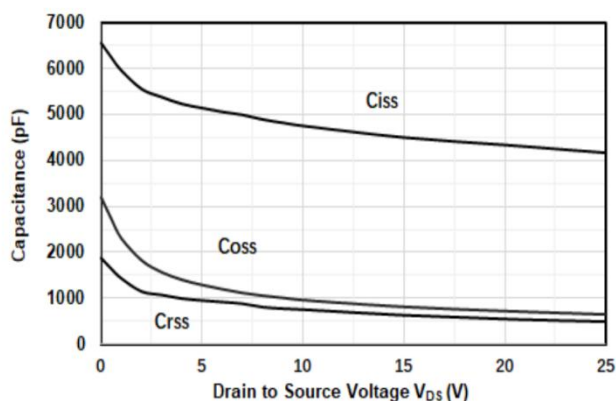


Figure3. Capacitance Characteristics

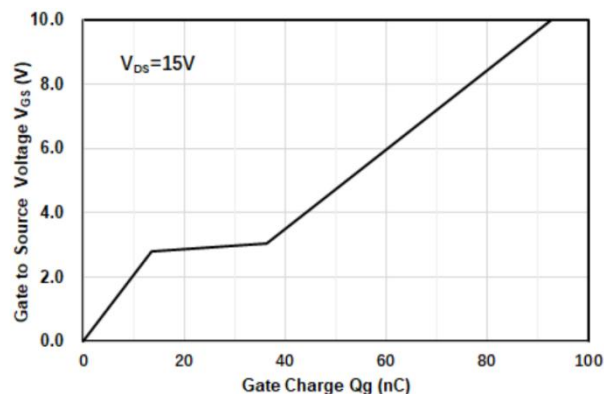


Figure4. Gate Charge

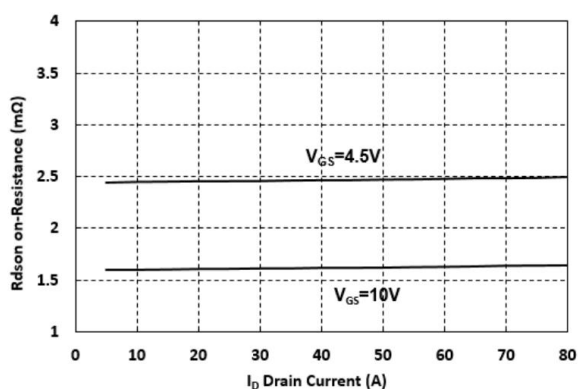


Figure5. Drain-Source on Resistance

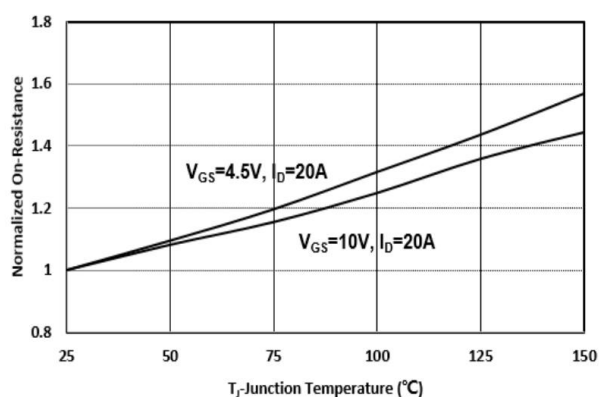


Figure6. Drain-Source on Resistance

Typical Characteristics

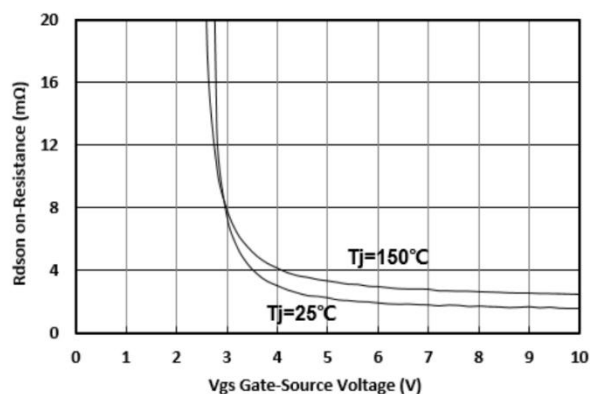


Figure7. On-Resistance vs V_{GS}

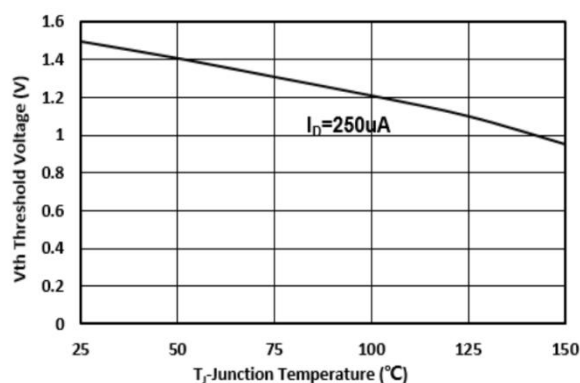


Figure8. V_{th} vs Temperature

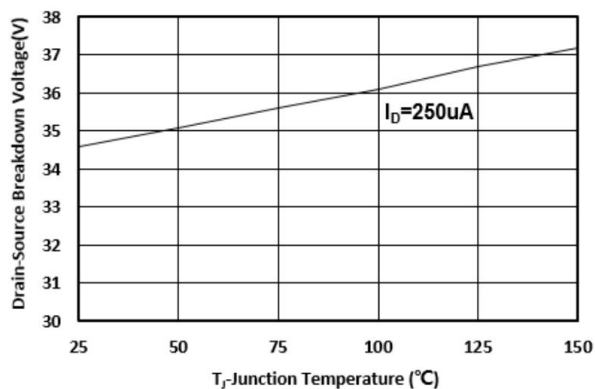


Figure9. Breakdown Voltage vs Temperature

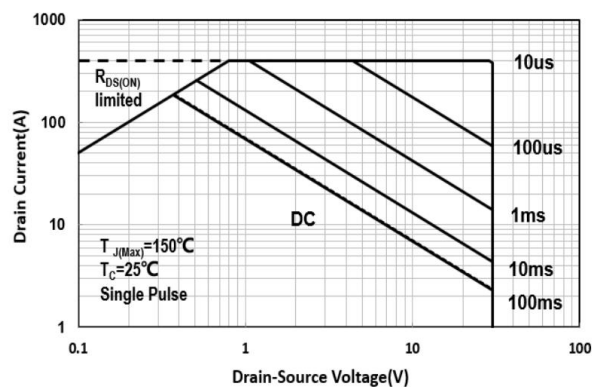


Figure10. Safe Operation Area

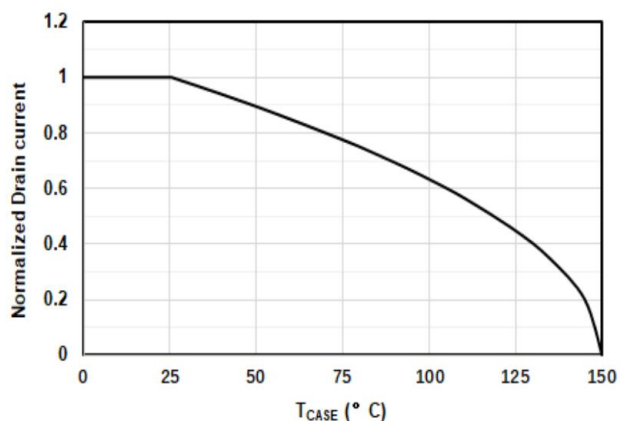


Figure11. Drain current vs. Case Temperature

Typical Characteristics

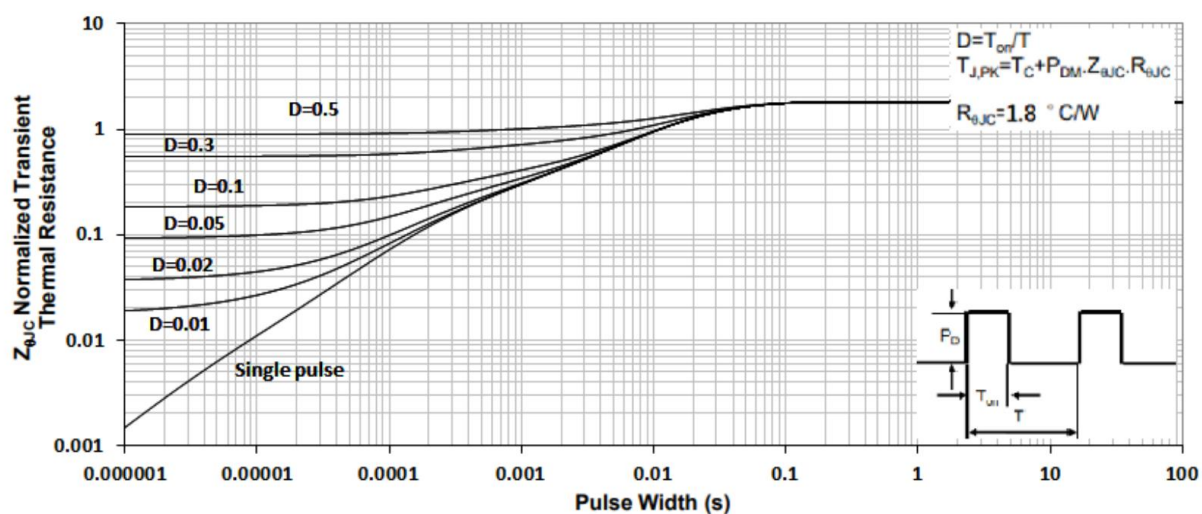
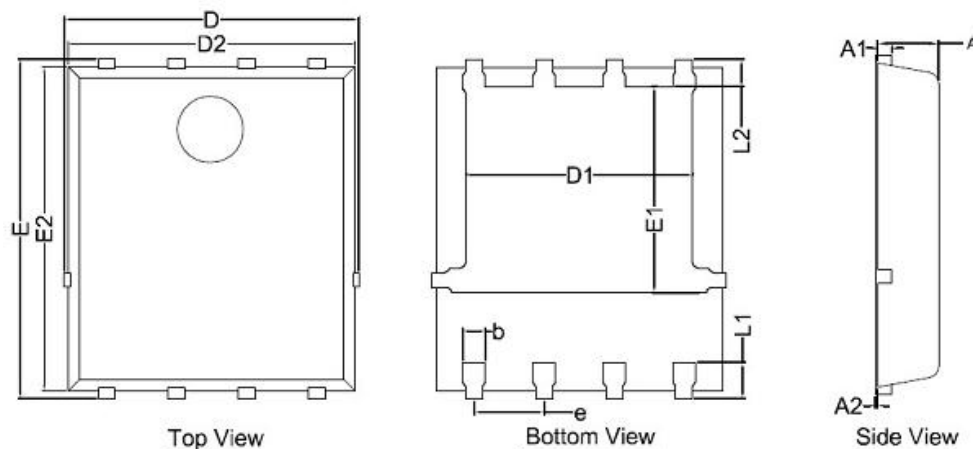


Figure12. Normalized Maximum Transient Thermal Impedance

PDFN5X6-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.000	1.200	0.039	0.047
A1	0.254BSC.		0.010BSC.	
A2	0.000	0.100		0.004
D	5.150	5.550	0.202	0.219
E	5.950	6.350	0.234	0.250
D1	3.920	4.320	0.154	0.170
E1	3.520	3.920	0.139	0.154
D2	5.000	5.400	0.197	0.212
E2	5.660	6.060	0.223	0.239
b	0.310	0.510	0.012	0.020
e	1.270BSC.		0.050BSC	
L1	0.560	0.760	0.022	0.030
L2	0.500BSC.		0.020BSC	