

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
40V	7mΩ@10V	60A
	9mΩ@4.5V	

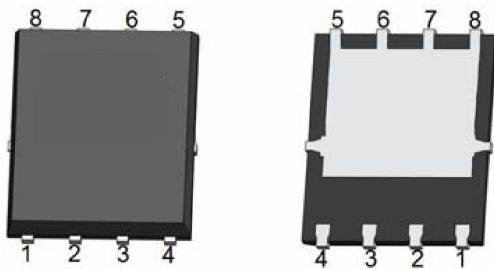
### Feature

- Trench Power MV MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low  $R_{DS(ON)}$

### Application

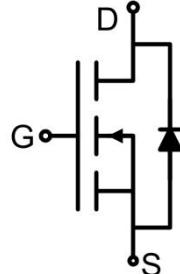
- Power switching application
- Uninterruptible power supply
- DC-DC converter

### Package

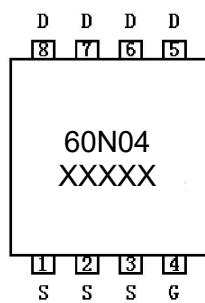


PDFN5\*6-8L

### Circuit diagram



### Marking



**Absolute maximum ratings (T<sub>A</sub>=25°C unless otherwise noted)**

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DS</sub>	40	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current(T <sub>C</sub> =25°C)	I <sub>D</sub>	60	A
Continuous Drain Current(T <sub>C</sub> =100°C)	I <sub>D</sub> (100°C)	37	A
Pulsed Drain Current <sup>1)</sup>	I <sub>DM</sub>	200	A
Power Dissipation <sup>3)</sup>	P <sub>D</sub>	2.5	W
Thermal Resistance,Junction-to-Ambient <sup>4)</sup>	R <sub>θJA</sub>	50	°C/W
Thermal Resistance,Junction-to-Case	R <sub>θJC</sub>	1.5	°C/W
Single pulse avalanche energy <sup>2)</sup>	E <sub>AS</sub>	100	mJ
Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature	T <sub>STG</sub>	-55 ~ +150	°C

**Electrical characteristics (T<sub>J</sub>=25 °C, unless otherwise noted)**

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	40			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =40V, V <sub>GS</sub> = 0V			1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> = 0V			±100	nA
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0	1.5	2.5	V
Drain-source on-resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A		5	7	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =10A		6.5	9	
Gate resistance	R <sub>G</sub>	F =1.0MHz		1.7		Ω
<b>Dynamic characteristics<sup>5)</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, f =1MHz		1900		pF
Output Capacitance	C <sub>oss</sub>			195		
Reverse Transfer Capacitance	C <sub>rss</sub>			175		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =10V, I <sub>D</sub> =30A		42		nC
Gate-Source Charge	Q <sub>gs</sub>			6		
Gate-Drain Charge	Q <sub>gd</sub>			11		
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> =20V, V <sub>GS</sub> =10V, I <sub>D</sub> =30A, R <sub>GEN</sub> =2.2Ω		9		nS
Turn-on rise time	t <sub>r</sub>			146		
Turn-off delay time	t <sub>d(off)</sub>			21		
Turn-off fall time	t <sub>f</sub>			18		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current	I <sub>S</sub>				60	A
Diode Forward voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =30A			1.2	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =30A,di/dt = 250A/μs		14		nS
Reverse Recovery Charge	Q <sub>rr</sub>			10		nC

Notes:

- 1) Repetitive rating; pulse width limited by max. junction temperature.
- 2) T<sub>J</sub>=25°C, V<sub>DD</sub>=38V, V<sub>G</sub>=10V, R<sub>G</sub>=25Ω, L=0.5mH, IAS=20A.
- 3) P<sub>d</sub> is based on max. junction temperature, using junction-case thermal resistance.
- 4) The value of R<sub>θJA</sub> is measured with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. Copper, in the still air environment with T<sub>A</sub> =25°C. The maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
- 5) Guaranteed by design, not subject to production testing.



### Typical Characteristics

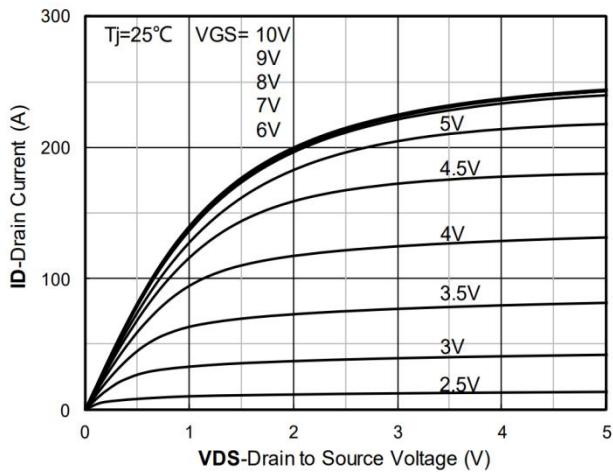


Figure 1. Output Characteristics

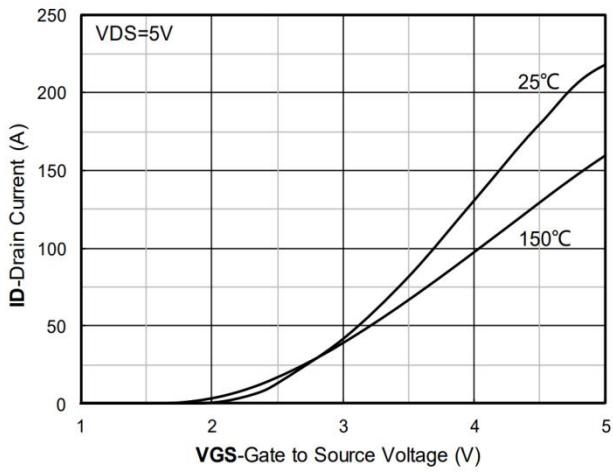


Figure 2. Transfer Characteristics

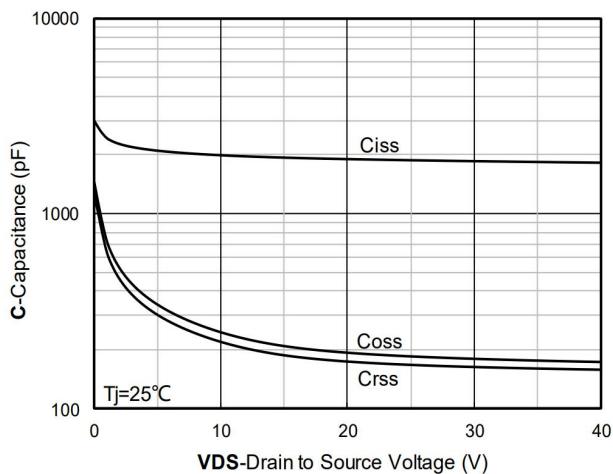


Figure 3. Capacitance Characteristics

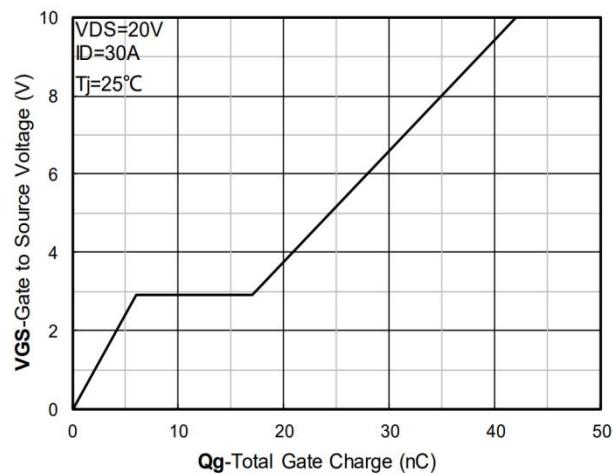


Figure 4. Gate Charge

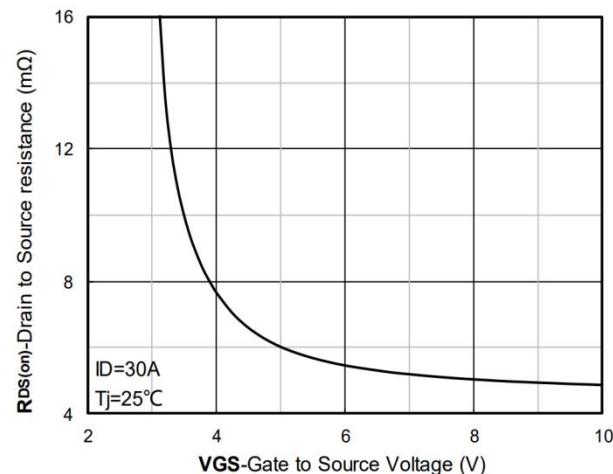


Figure 5. On-Resistance vs Gate to Source Voltage

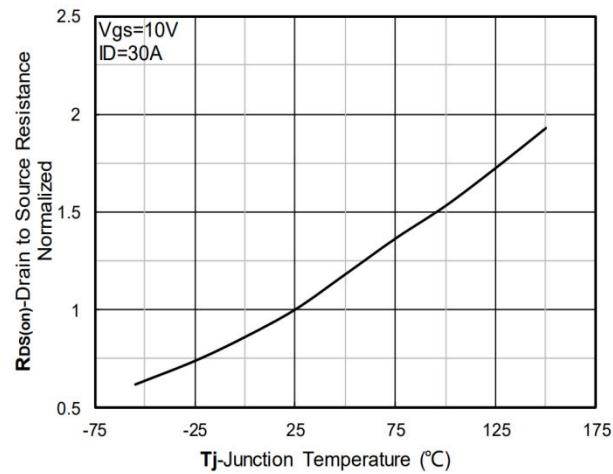


Figure 6. Normalized On-Resistance

### Typical Characteristics

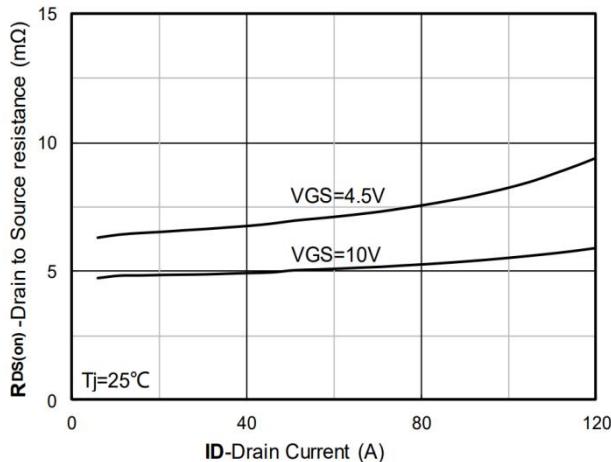


Figure 7. RDS(on) VS Drain Current

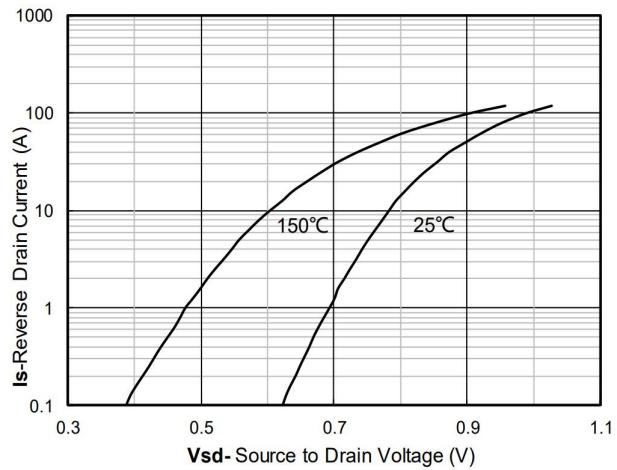


Figure 8. Forward characteristics of reverse diode

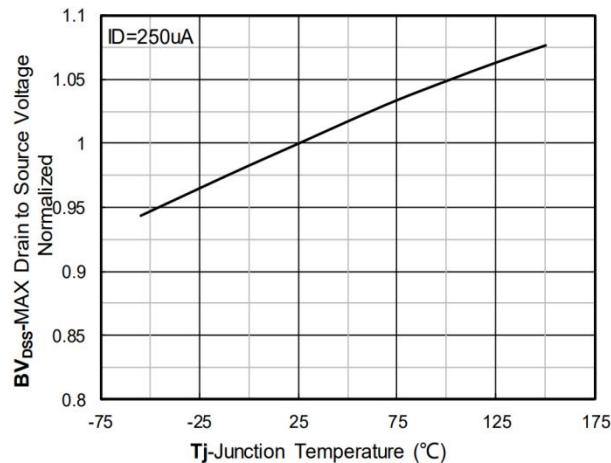


Figure 9. Normalized breakdown voltage

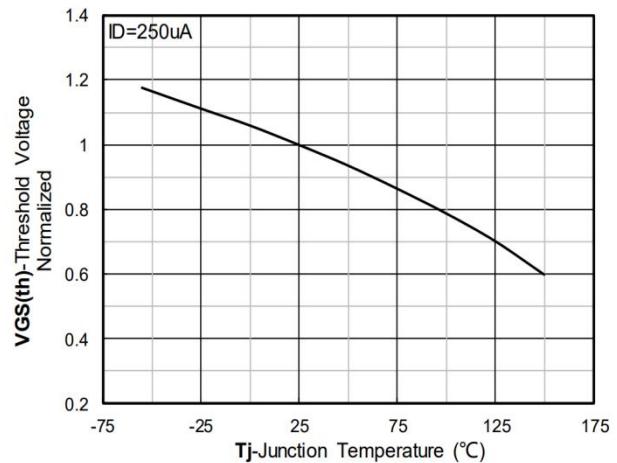


Figure 10. Normalized Threshold voltage

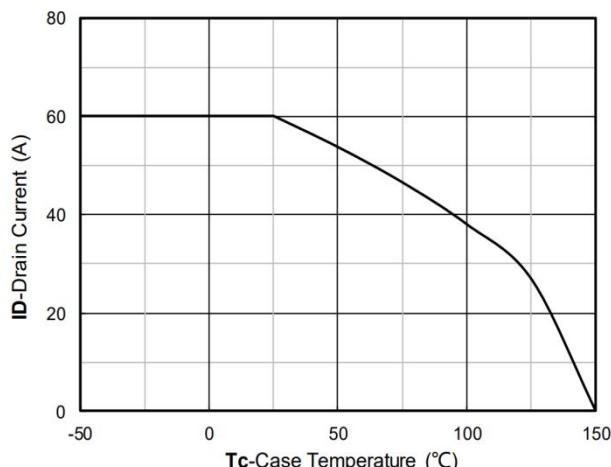


Figure 11. Current dissipation

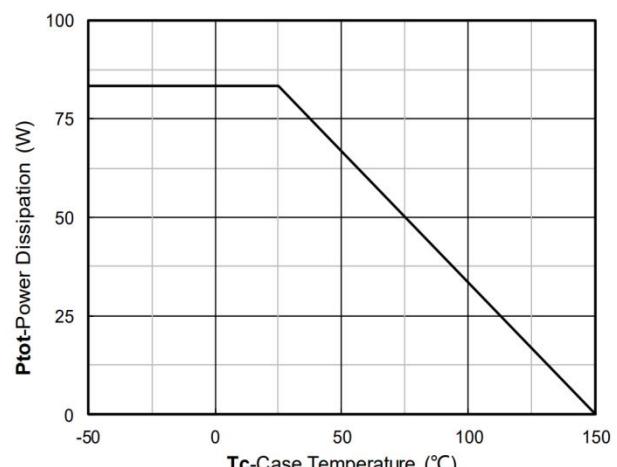


Figure 12. Power dissipation

### Typical Characteristics

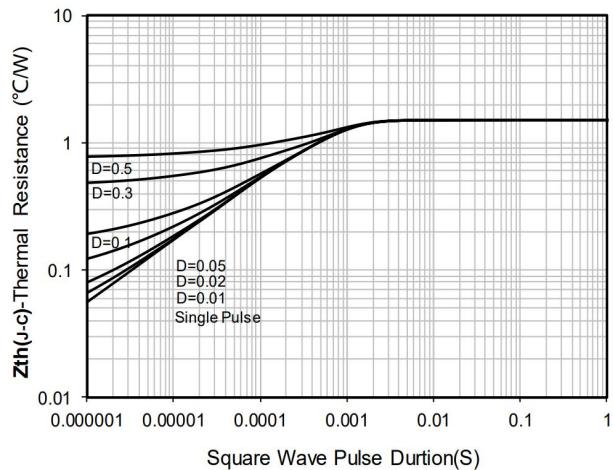


Figure 13. Maximum Transient Thermal Impedance

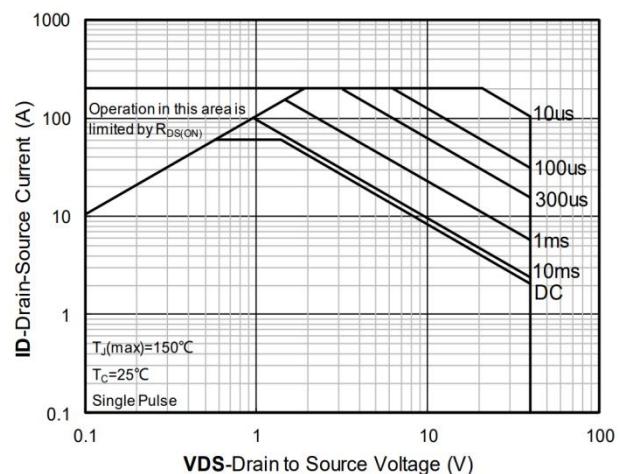
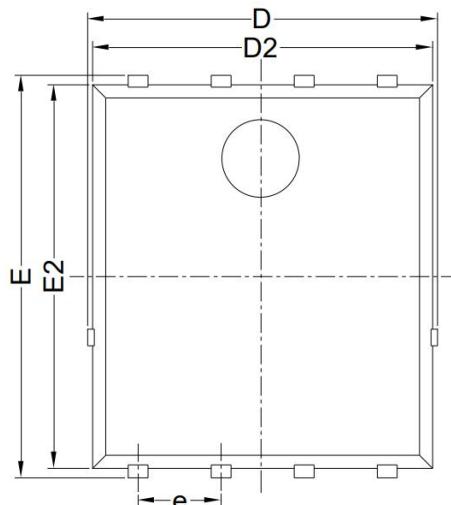
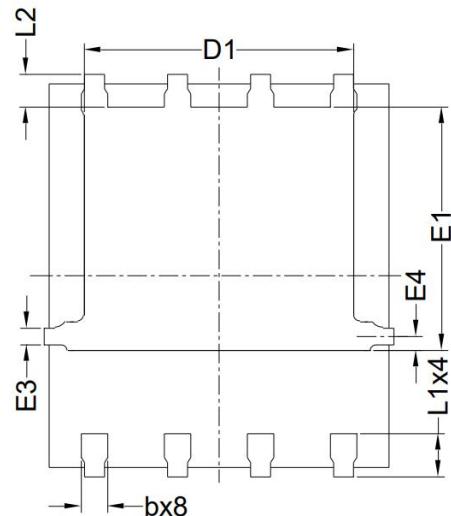


Figure 14. Safe Operation Area

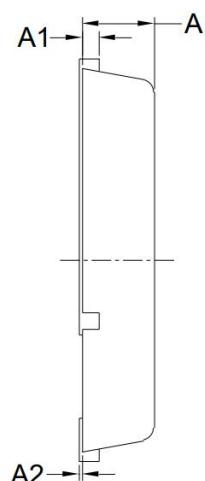
### PDFN5\*6-8L Package Information



Top View



Bottom View



Side View

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	3.920	4.320	0.154	0.170
E1	3.520	3.920	0.139	0.154
D2	5.000	5.400	0.197	0.213
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	