

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
100V	4mΩ@10V	120A
	5mΩ@4.5V	

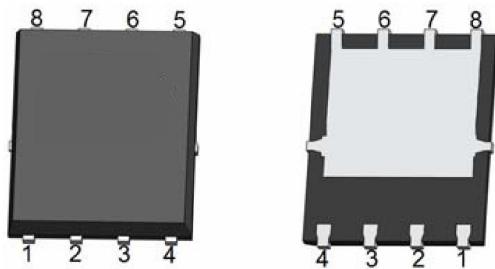
## Feature

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

## Application

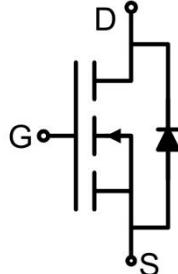
- DC-DC converter
- Power switching application
- Uninterruptible power supply
- PD charger

## Package

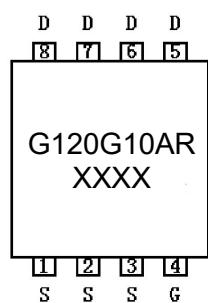


PDFN5\*6-8L

## Circuit diagram



## Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	100	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current( $T_C = 25^\circ\text{C}$ )	$I_D$	120	A
Continuous Drain Current ( $T_C = 100^\circ\text{C}$ )	$I_D(100^\circ\text{C})$	76	A
Pulsed Drain Current <sup>1)</sup>	$I_{DM}$	480	A
Power Dissipation( $T_C = 25^\circ\text{C}$ ) <sup>3)</sup>	$P_D$	108	W
Thermal Resistance,Junction-to-Ambient <sup>4)</sup>	$R_{\theta JA}$	51	$^\circ\text{C}/\text{W}$
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	1.16	$^\circ\text{C}/\text{W}$
Single pulse avalanche energy <sup>2)</sup>	$E_{AS}$	529	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
<b>Static Characteristics</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$	100			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 100\text{V}, V_{GS} = 0\text{V}$		1		$\mu\text{A}$
		$V_{DS} = 100\text{V}, V_{GS} = 0\text{V}, T_j = 150^\circ\text{C}$		100		
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$		$\pm 100$		nA
Gate threshold voltage	$V_{GS(\text{th})}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	1.0	1.8	2.5	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS} = 10\text{V}, I_D = 20\text{A}$		3.2	4.0	$\text{m}\Omega$
		$V_{GS} = 4.5\text{V}, I_D = 20\text{A}$		4.0	5.0	
<b>Dynamic characteristics<sup>5)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 50\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$		4400		$\text{pF}$
Output Capacitance	$C_{oss}$			1600		
Reverse Transfer Capacitance	$C_{rss}$			30		
Gate resistance	$R_G$	$f = 1.0\text{MHz}, \text{Open drain}$		0.9		$\Omega$
Total Gate Charge	$Q_g$	$V_{DS} = 50\text{V}, V_{GS} = 10\text{V}, I_D = 60\text{A}$		65		$\text{nC}$
Gate-Source Charge	$Q_{gs}$			10		
Gate-Drain Charge	$Q_{gd}$			13		
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 50\text{V}, V_{GS} = 10\text{V}, I_D = 60\text{A}, R_{GEN} = 2.2\Omega$		25		$\text{nS}$
Turn-on rise time	$t_r$			90		
Turn-off delay time	$t_{d(off)}$			27		
Turn-off fall time	$t_f$			7		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current	$I_S$				120	A
Diode Forward voltage	$V_{SD}$	$V_{GS} = 0\text{V}, I_S = 60\text{A}$			1.2	V
Reverse Recovery Time	$t_{rr}$	$I_F = 60\text{A}, di/dt = 350\text{A}/\mu\text{s}$		35		nS
Reverse Recovery Charge	$Q_{rr}$			90		nC

Notes:

- 1) Repetitive rating; pulse width limited by max. junction temperature.
- 2)  $T_J = 25^\circ\text{C}, V_{DD} = 50\text{V}, V_G = 10\text{V}, R_G = 25\Omega, L = 2\text{mH}, IAS = 23\text{A}$ .
- 3)  $P_d$  is based on max. junction temperature, using junction-case thermal resistance.
- 4) The value of  $R_{\theta JA}$  is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with  $T_A = 25^\circ\text{C}$ . The maximum allowed junction temperature of  $150^\circ\text{C}$ . 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

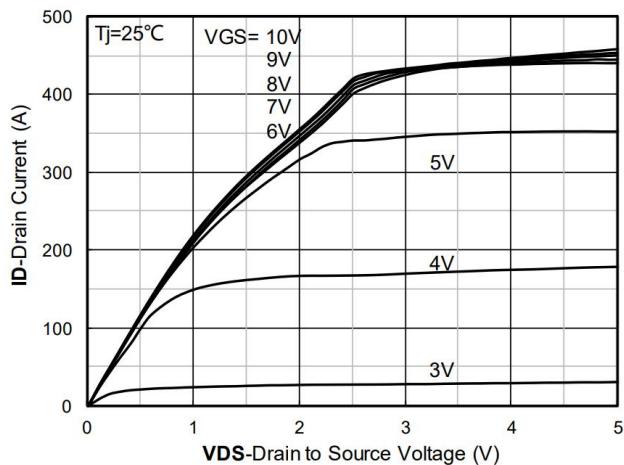


Figure 1. Output Characteristics

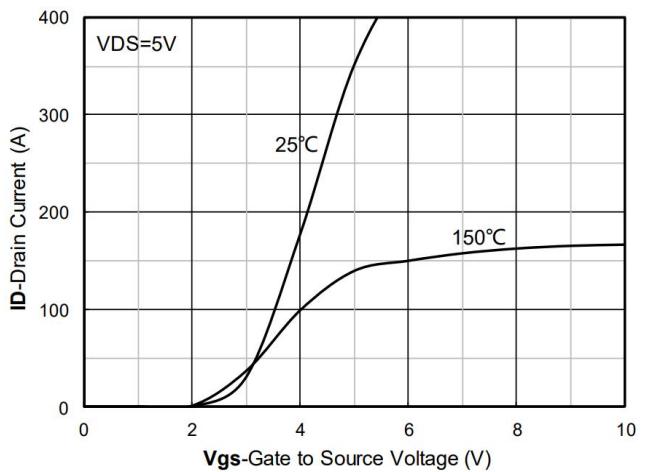


Figure 2. Transfer Characteristics

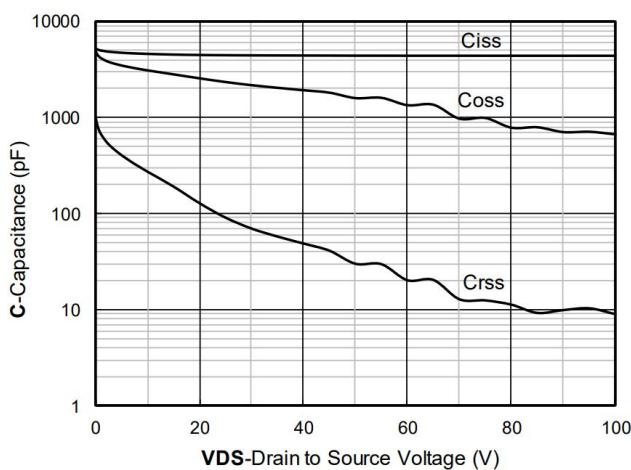


Figure 3. Capacitance Characteristics

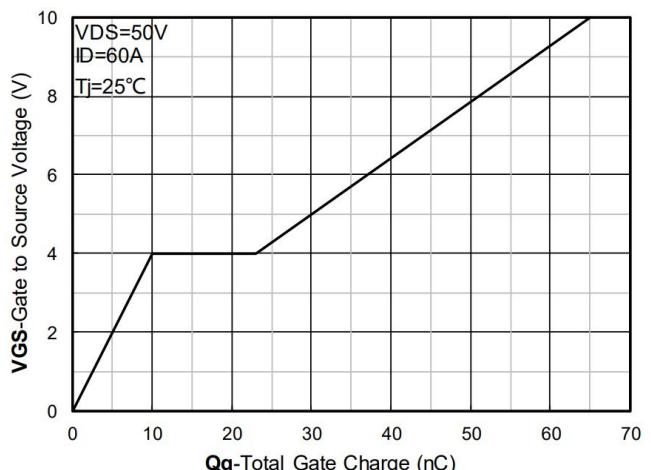


Figure 4. Gate Charge

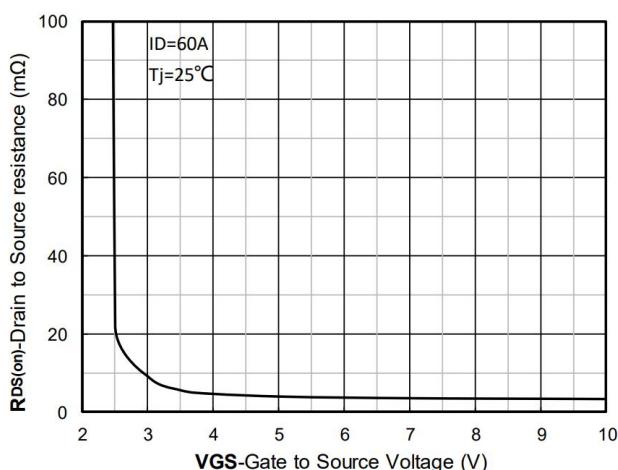


Figure 5. On-Resistance vs Gate to Source Voltage

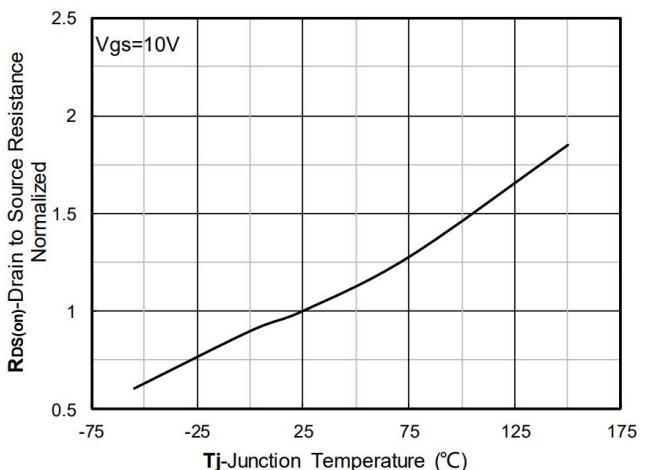


Figure 6. Normalized On-Resistance

### Typical Characteristics

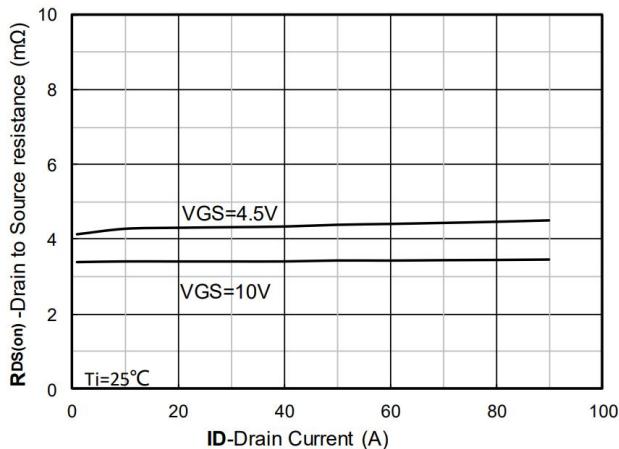


Figure7. RDS(on) VS Drain Current

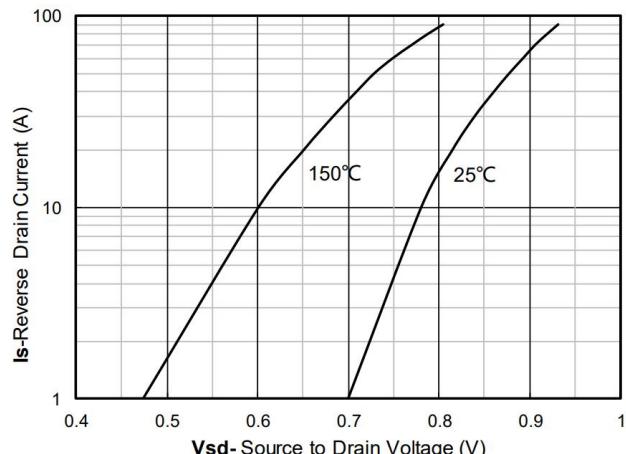


Figure8. Forward characteristics of reverse diode

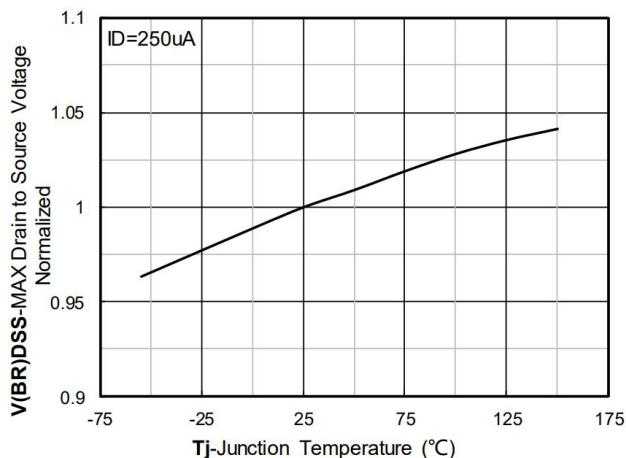


Figure9. Normalized breakdown voltage

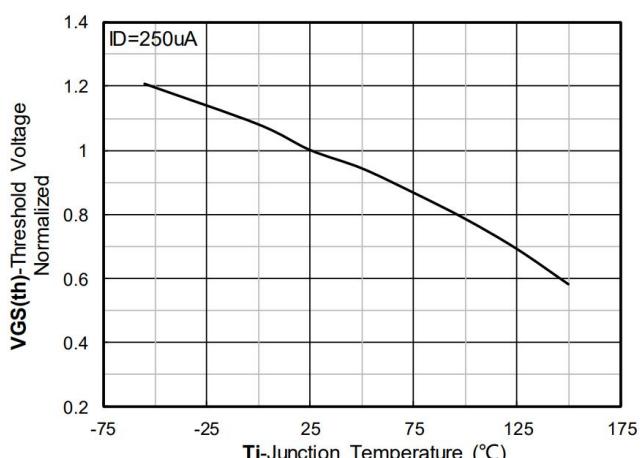


Figure10. Normalized Threshold voltage

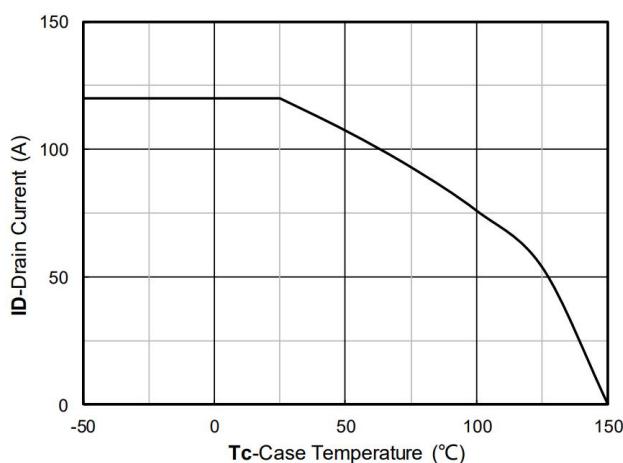


Figure11. Current dissipation

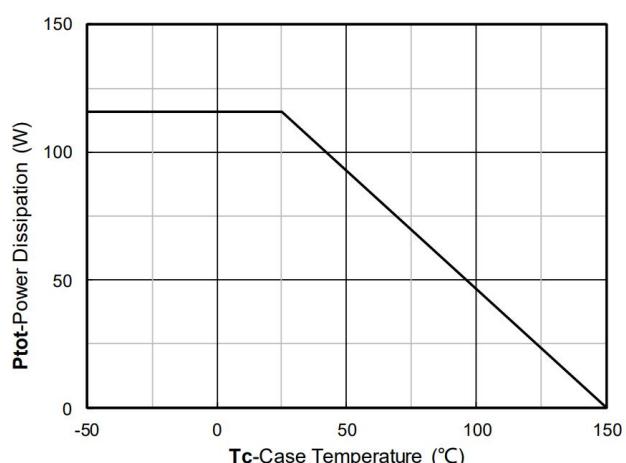


Figure12. Power dissipation

### Typical Characteristics

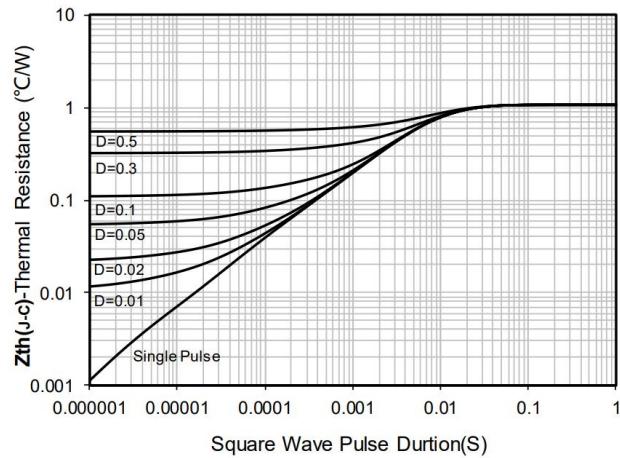


Figure13. Maximum Transient Thermal Impedance

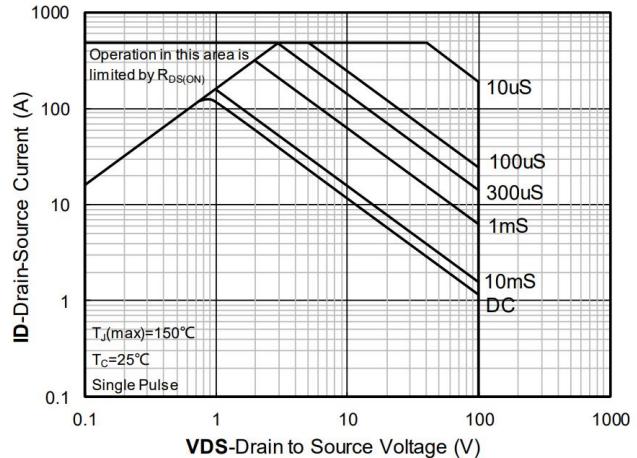
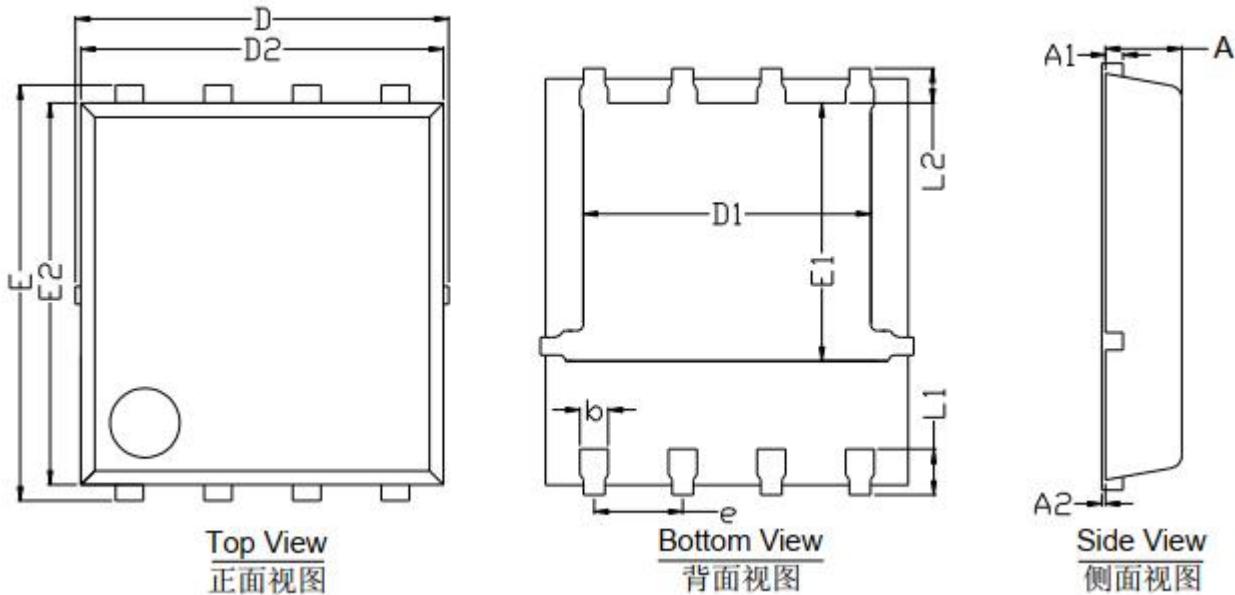


Figure14. Safe Operation Area

## PDFN5\*6-8L 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	6.150	0.234	0.242
A	0.850	1.000	0.033	0.039
A1	0.203 BSC		0.008 BSC	
A2	0.000	0.080	0.000	0.003
D1	4.250	4.450	0.167	0.175
E1	3.525	3.725	0.139	0.147
D2	5.200 REF		0.205 REF	
E2	5.550 REF		0.219 REF	
L1	0.450	0.650	0.018	0.026
L2	0.680 BSC		0.268 BSC	
b	0.300	0.500	0.012	0.020
e	1.270 BSC		0.050 BSC	