

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	1.3mΩ@10V	200A
	2.0mΩ@4.5V	

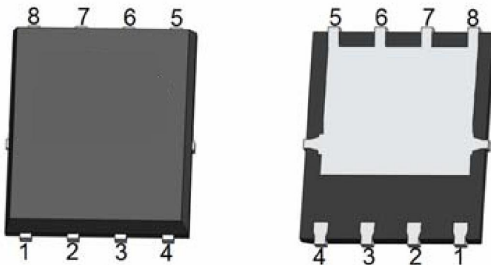
Feature

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

Application

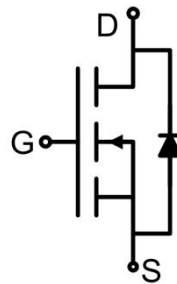
- Power switching application
- Uninterruptible power supply
- DC-DC converter

Package

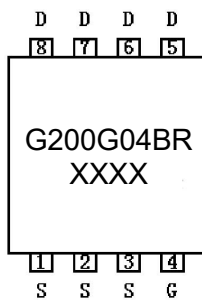


PDFN5*6-8L

Circuit diagram



Marking



Absolute maximum ratings ($T_A=25^\circ\text{C}$ 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	200	A
Continuous Drain Current ($T_C = 100^\circ\text{C}$)	$I_D(100^\circ\text{C})$	141	A
Pulsed Drain Current ¹⁾	I_{DM}	800	A
Power Dissipation ³⁾ ($T_C = 25^\circ\text{C}$)	P_D	187	W
Thermal Resistance, Junction-to-Ambient ⁴⁾	$R_{\theta JA}$	40	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.8	$^\circ\text{C}/\text{W}$
Single pulse avalanche energy ²⁾	E_{AS}	625	mJ
Junction Temperature	T_J	175	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55 ~ +175	$^\circ\text{C}$

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	$V_{(BR)DSS}$	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$	40			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 40\text{V}, V_{GS} = 0\text{V}$			1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$			± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	1.0	1.8	2.5	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS} = 10\text{V}, I_D = 100\text{A}$		1.0	1.3	m Ω
		$V_{GS} = 10\text{V}, I_D = 20\text{A}$		1.0	1.3	
		$V_{GS} = 4.5\text{V}, I_D = 20\text{A}$		1.5	2.0	
Gate resistance	R_G	$f = 1.0\text{MHz}$		1.5		Ω
Dynamic characteristics⁵⁾						
Input Capacitance	C_{iss}	$V_{DS} = 25\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$		7400		pF
Output Capacitance	C_{oss}			1340		
Reverse Transfer Capacitance	C_{rss}			70		
Total Gate Charge	Q_g	$V_{DS} = 20\text{V}, V_{GS} = 10\text{V}, I_D = 100\text{A}$		126		nC
Gate-Source Charge	Q_{gs}			21		
Gate-Drain Charge	Q_{gd}			38		
Turn-on delay time	$t_{d(on)}$			24		
Turn-on rise time	t_r	$V_{DD} = 20\text{V}, V_{GS} = 10\text{V}, I_D = 100\text{A}, R_{GEN} = 2.2\Omega$		276		nS
Turn-off delay time	$t_{d(off)}$			49		
Turn-off fall time	t_f			22		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				200	A
Diode Forward voltage	V_{SD}	$V_{GS} = 0\text{V}, I_S = 100\text{A}$			1.2	V
Reverse Recovery Time	t_{rr}	$I_F = 100\text{A}, di/dt = 100\text{A}/\mu\text{s}$		82		nS
Reverse Recovery Charge	Q_{rr}			150		nC

Notes:

- 1) Repetitive rating; pulse width limited by max. junction temperature.
- 2) $T_J = 25^\circ\text{C}$, $V_{DD} = 30\text{V}$, $V_G = 10\text{V}$, $R_G = 25\Omega$, $L = 0.5\text{mH}$, $I_{AS} = 50\text{A}$.
- 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 1 in² FR-4 board with 2oz. Copper, in the 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

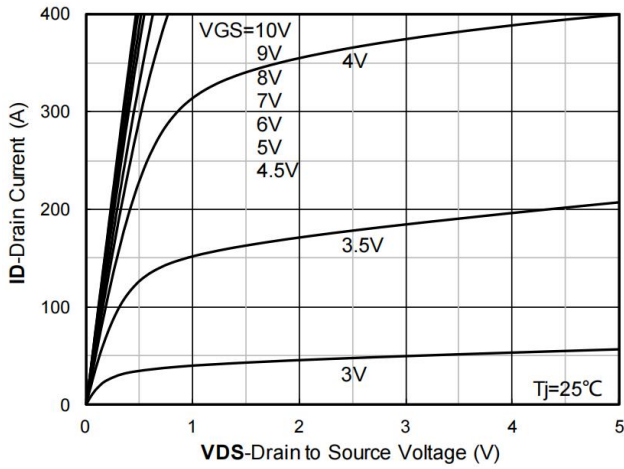


Figure 1. Output Characteristics

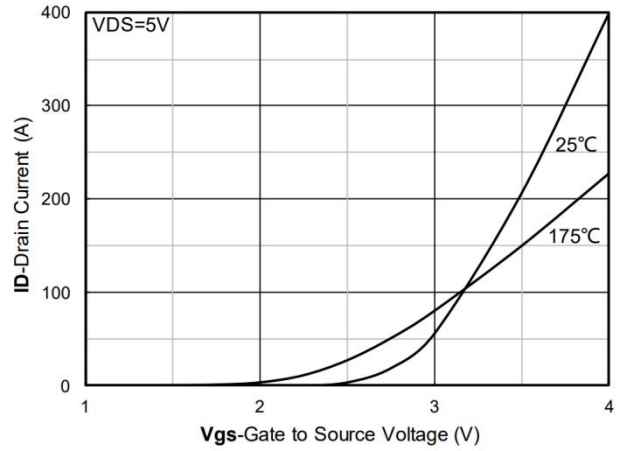


Figure 2. Transfer Characteristics

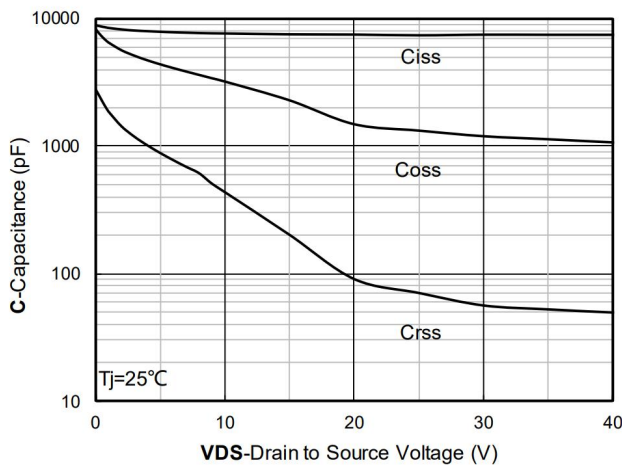


Figure 3. Capacitance Characteristics

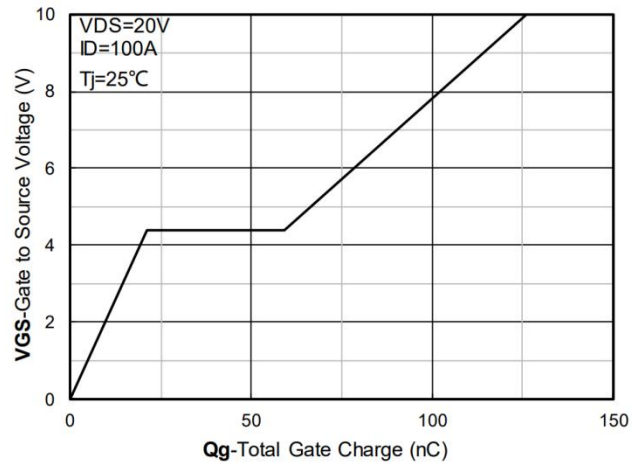


Figure 4. Gate Charge

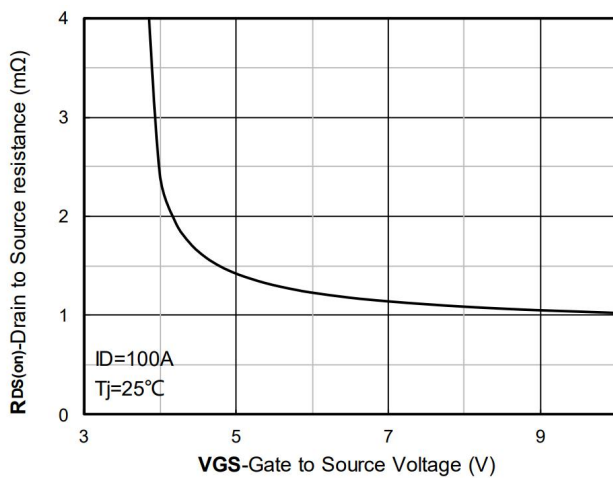


Figure 5. On-Resistance vs Gate to Source Voltage

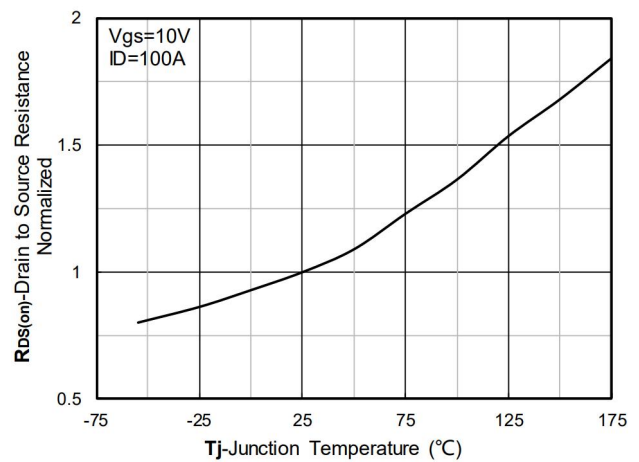


Figure 6. Normalized On-Resistance

Typical Characteristics

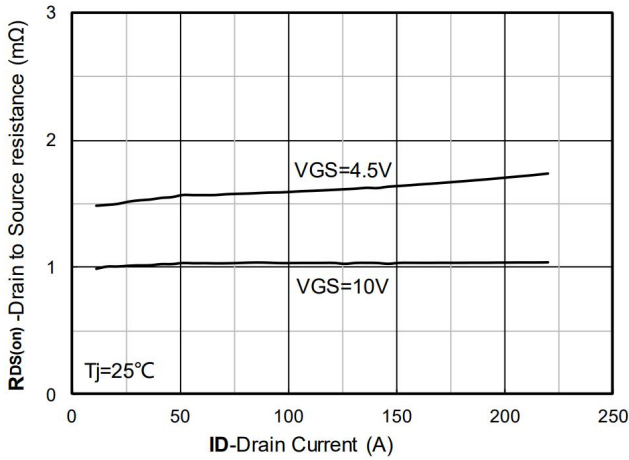


Figure 7. RDS(on) VS Drain Current

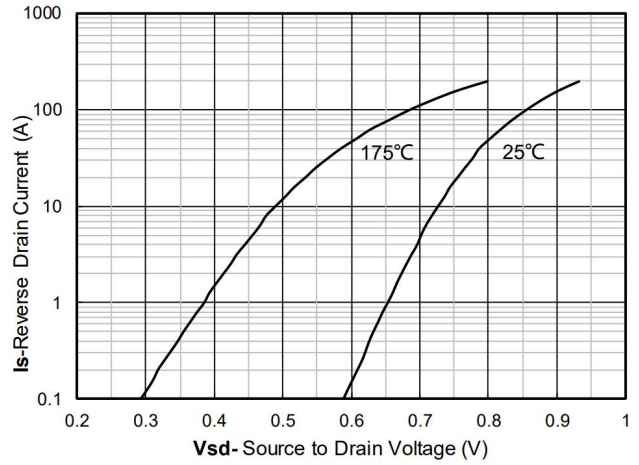


Figure 8. Forward characteristics of reverse diode

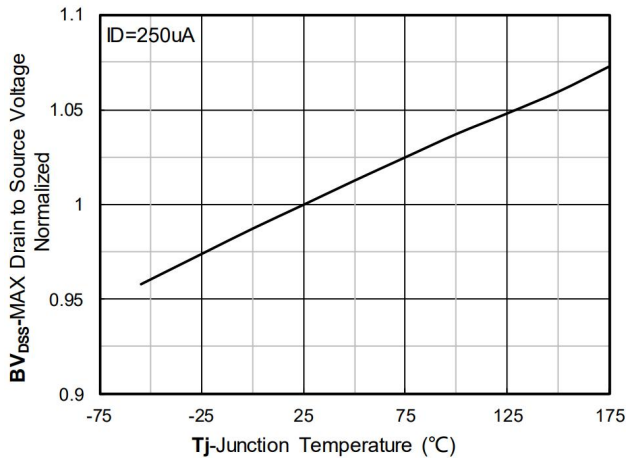


Figure 9. Normalized breakdown voltage

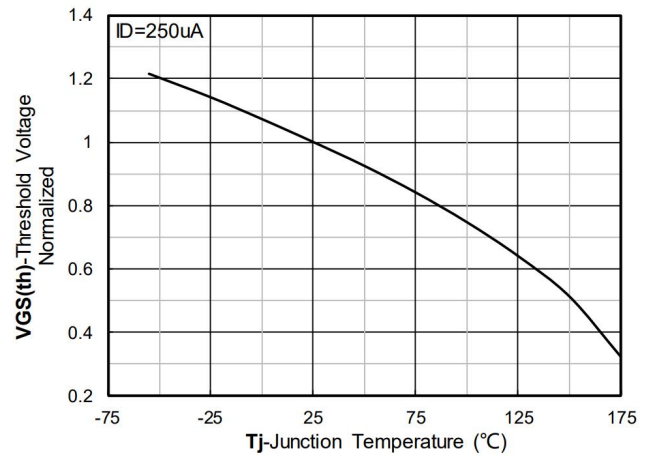


Figure 10. Normalized Threshold voltage

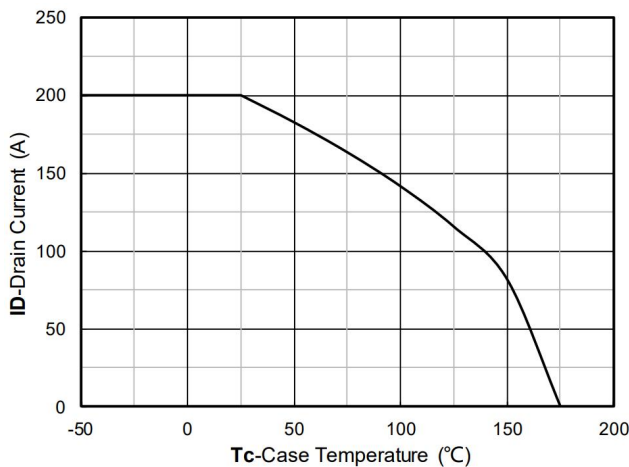


Figure 11. Current dissipation

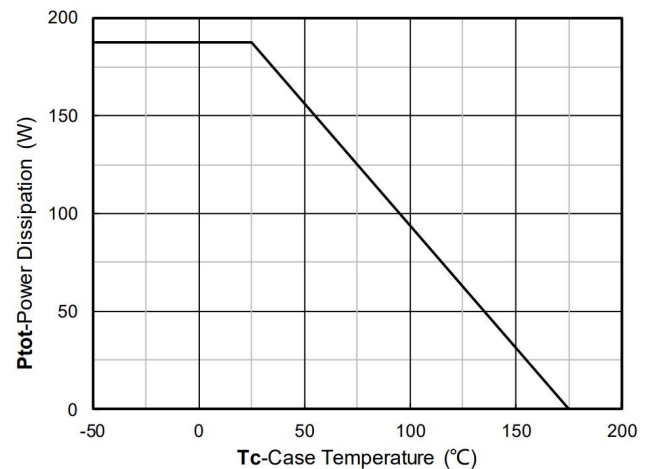


Figure 12. Power dissipation

Typical Characteristics

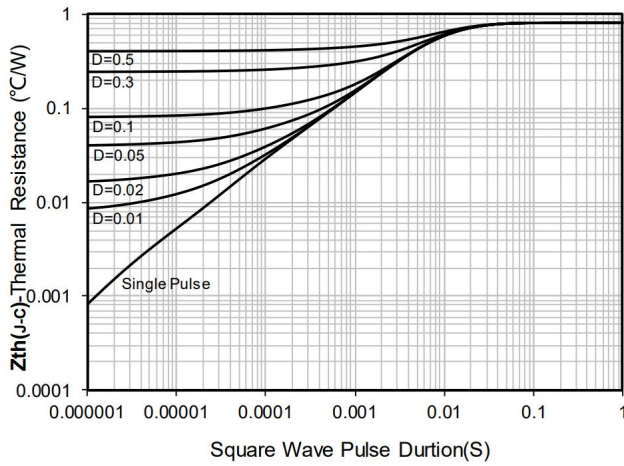


Figure 13. Maximum Transient Thermal Impedance

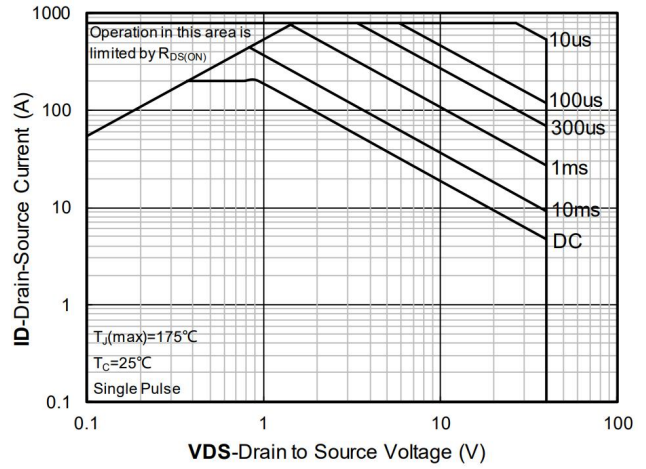
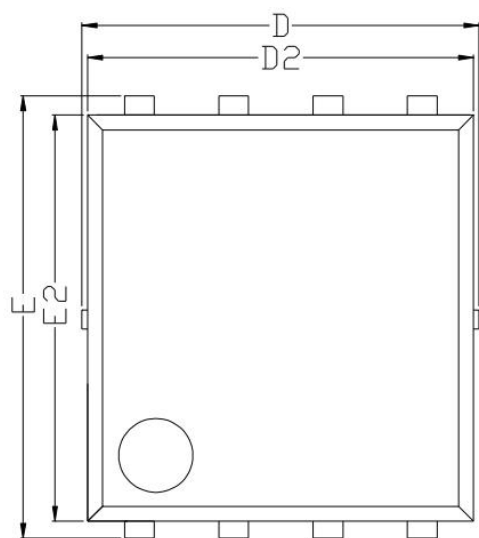
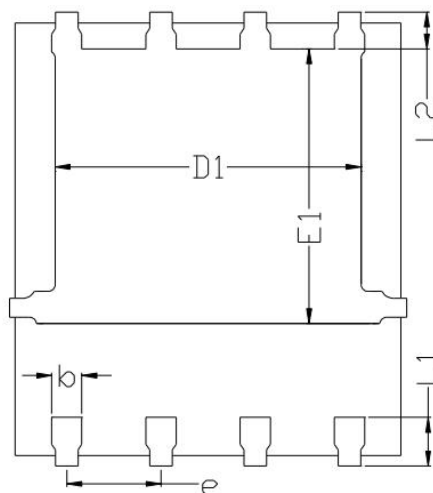


Figure 14. Safe Operation Area

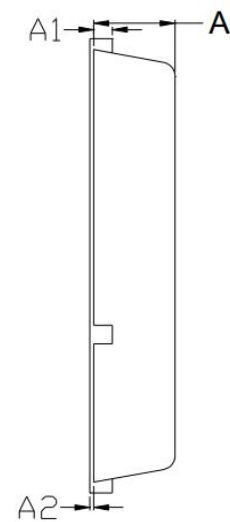
PDFN5*6-8L Package Information



Top View
正面视图



Bottom View
背面视图



Side View
侧面视图

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	