

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	1.4mΩ@10V	185A
	2.1mΩ@4.5V	

Feature

- Fast Switching
- Low Gate Charge and Rdson
- Cu-Clip Process
- Advanced Split Gate Trench Technology

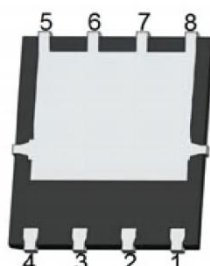
Application

- PWM Application
- Hard switched and high frequency circuits
- Home appliance control board

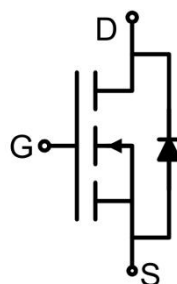
Package



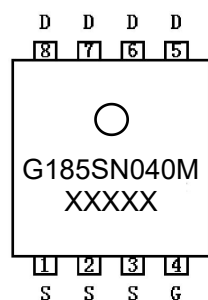
PDFN5*6-8L



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	185	A
Continuous Drain Current ($T_C = 100^{\circ}\text{C}$)	$I_D(100^{\circ}\text{C})$	125	A
Pulsed Drain Current	I_{DM}	740	A
Single Pulse Avalanche Energy ¹⁾	E_{AS}	1089	mJ
Power Dissipation ($T_C = 25^{\circ}\text{C}$)	P_D	142	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	0.88	$^{\circ}\text{C}/\text{W}$
Operating Junction Temperature	T_J	$-55 \sim +150$	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	$-55 \sim +150$	$^{\circ}\text{C}$

Electrical characteristics ($T_A=25^{\circ}\text{C}$, unless otherwise noted)

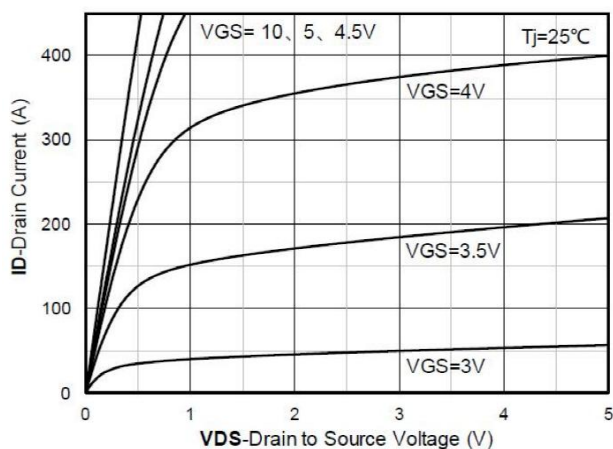
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	40			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =32V, V _{GS} =0V, T _J =25°C			1	μA
Gate-body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1	1.7	2.5	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =50A		1.1	1.4	mΩ
		V _{GS} =4.5V, I _D =50A		1.3	2.1	
Dynamic characteristics ²⁾						
Input Capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V, f =1MHz		5500		pF
Output Capacitance	C _{oss}			1850		
Reverse Transfer Capacitance	C _{rss}			65		
Total Gate Charge	Q _g	V _{DS} =20V, V _{GS} =10V, I _D =50A		128		nC
Gate-Source Charge	Q _{gs}			19		
Gate-Drain Charge	Q _{gd}			12		
Turn-on delay time	t _{d(on)}	V _{DS} =20V, V _{GS} =10V, I _D =50A R _G =1.6Ω		13.5		nS
Turn-on rise time	t _r			8.8		
Turn-off delay time	t _{d(off)}			52		
Turn-off fall time	t _f			9.6		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				185	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =1A, T _J =25°C			1.2	V
Reverse recover time	T _{rr}	I _S =50A, di/dt =100A/us		55		nS
Reverse recovery charge	Q _{rr}	T _J =25°C		53		nC

Notes:

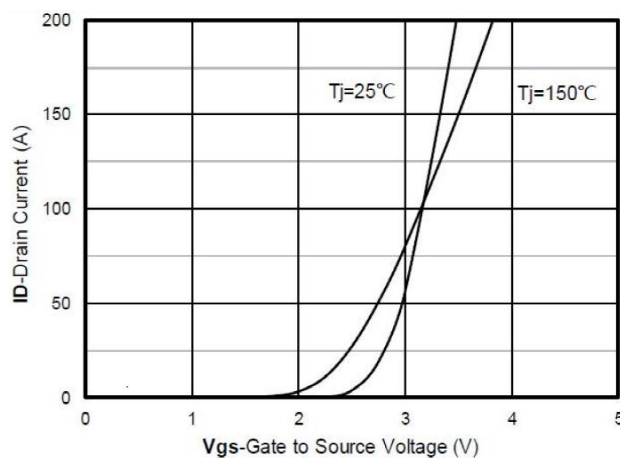
1) The test condition is $V_{DD}=20\text{V}, V_{GS}=10\text{V}, L=0.5\text{mH}, R_G=25\Omega$.

2) Guaranteed by design, not subject to production.

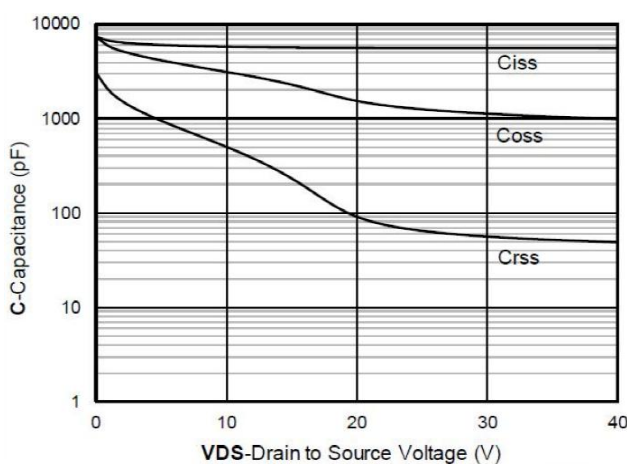
Typical Characteristics



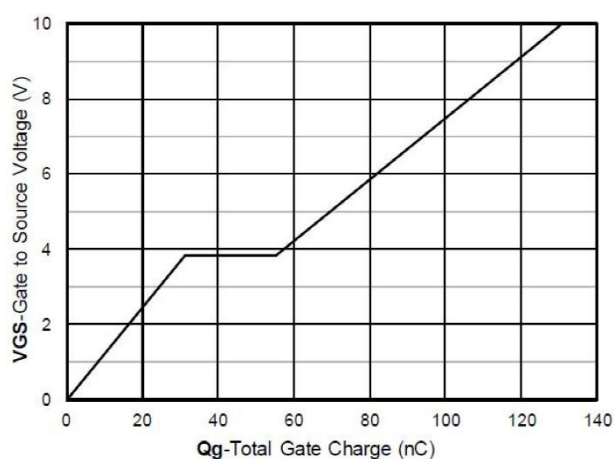
Output Characteristics



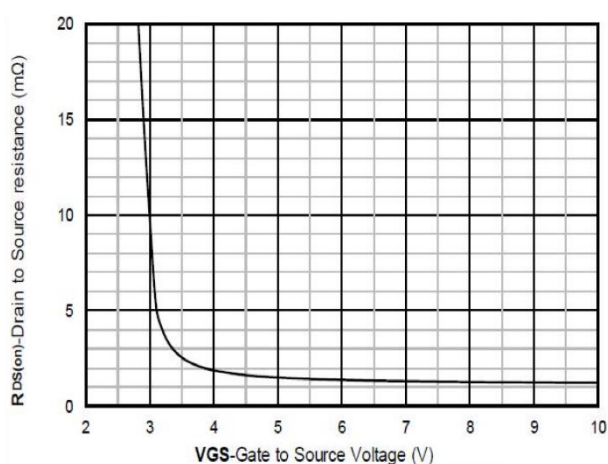
Transfer Characteristics



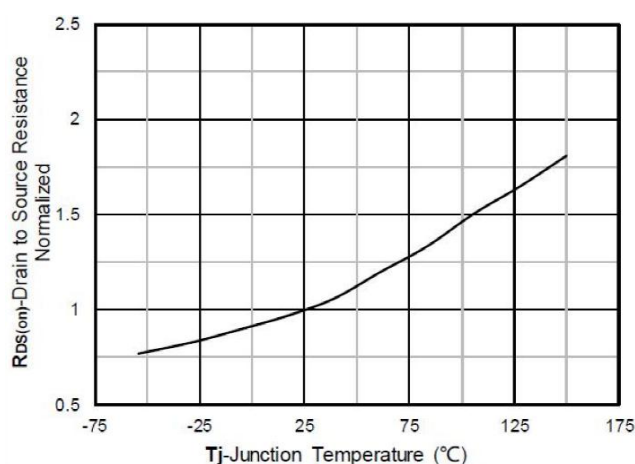
Capacitance Characteristics



Gate Charge

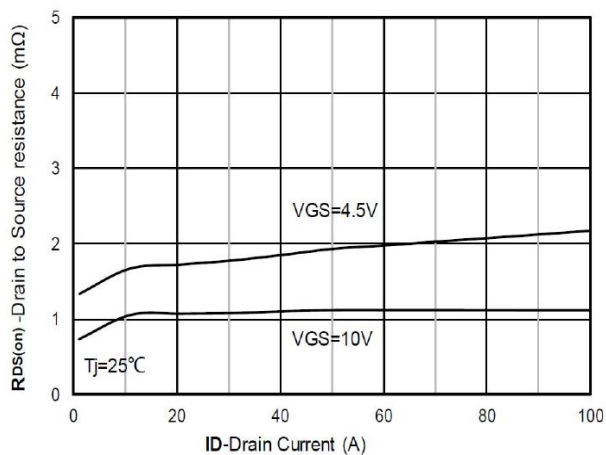


On-Resistance vs Gate to Source Voltage

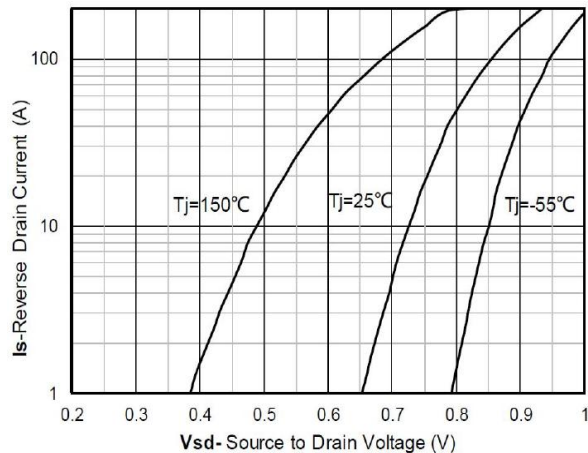


Normalized On-Resistance

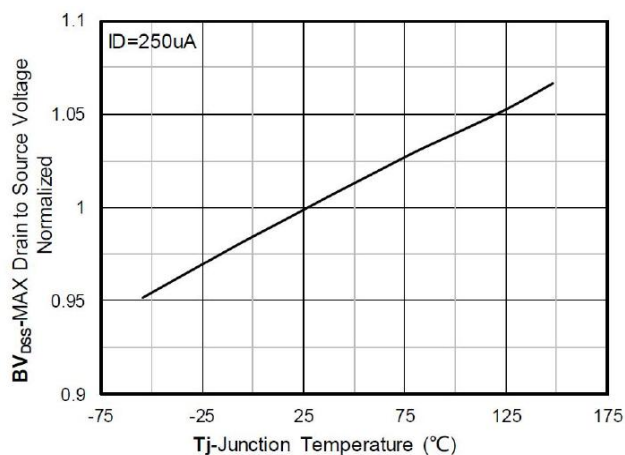
Typical Characteristics



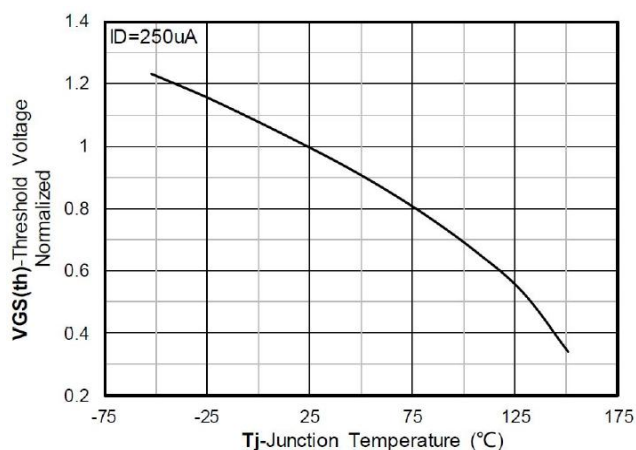
$R_{DS(on)}$ VS Drain Current



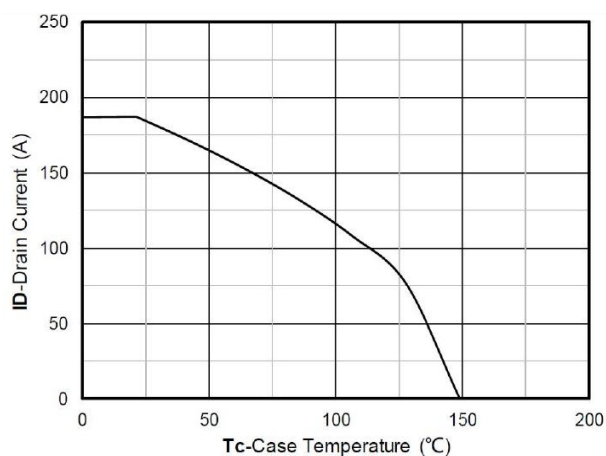
Forward characteristics of reverse diode



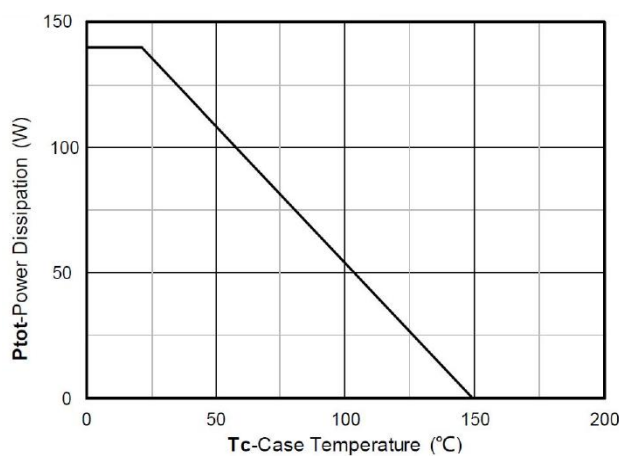
Normalized breakdown voltage



Normalized Threshold voltage

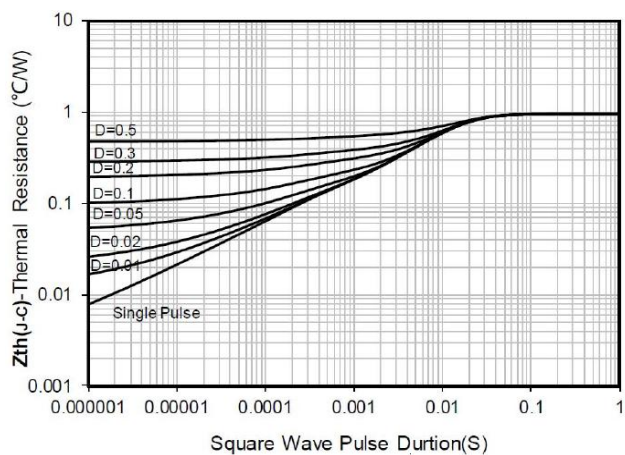


Current dissipation

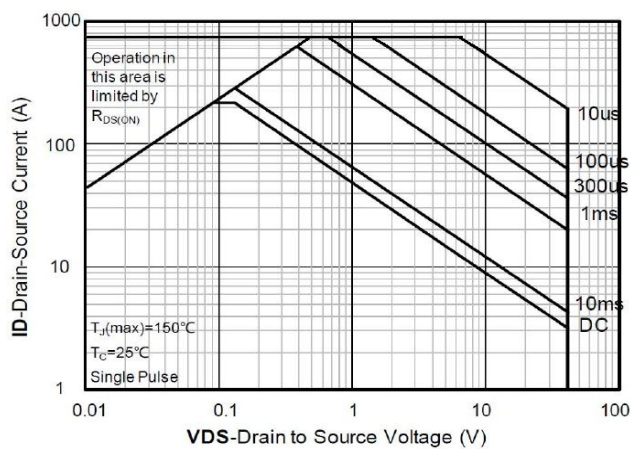


Power dissipation

Typical Characteristics

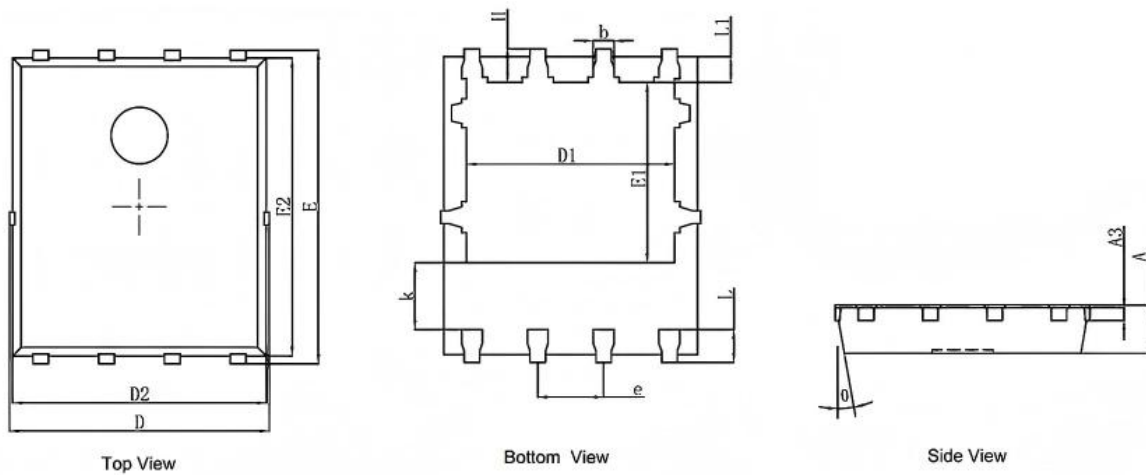


Maximum Transient Thermal Impedance



Safe Operation Area

PDFN5*6-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.245 REF.		0.010 REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270 TYP.		0.050 TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	10°	12°	10°	12°