

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	6.3mΩ@10V	45A
	10.5mΩ@4.5V	

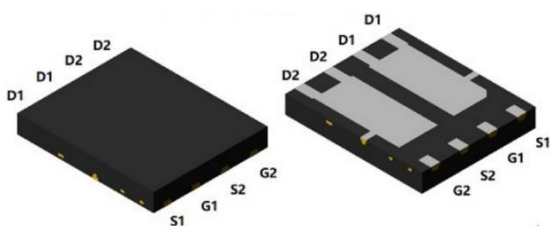
Feature

- Fast switching speed
- Surface mount package
- Low gate charge and $R_{DS(on)}$

Application

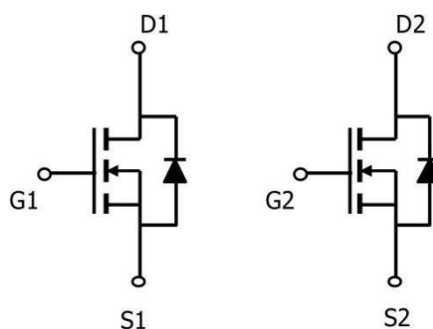
- DC/DC converter
- Motor Control

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	45	A
Continuous Drain Current($T_C=100^{\circ}\text{C}$)	$I_D(100^{\circ}\text{C})$	30	A
Pulsed Drain Current	I_{DM}	180	A
Power Dissipation ($T_C=25^{\circ}\text{C}$)	P_D	92	W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	1.35	$^{\circ}\text{C}/\text{W}$
Single pulse avalanche energy ¹⁾	E_{AS}	110	mJ
Junction Temperature	T_J	150	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150	$^{\circ}\text{C}$

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

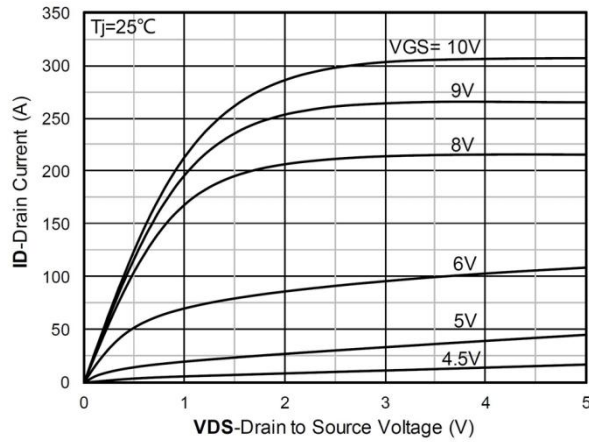
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	40			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =32V,V _{GS} = 0V,T _J =25℃			1	μA
Gate-body leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} = 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 =15A		5.0	6.3	mΩ
		V _{GS} =4.5V, I _D =10A		8.0	10.5	
Dynamic characteristics ²⁾						
Input Capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V, f =1MHz		885		pF
Output Capacitance	C _{oss}			478		
Reverse Transfer Capacitance	C _{rss}			12.1		
Total Gate Charge	Q _g	V _{DS} =20V, V _{GS} =10V, I _D =20A		35		nC
Gate-Source Charge	Q _{gs}			6.4		
Gate-Drain Charge	Q _{gd}			3.5		
Turn-on delay time	t _{d(on)}	V _{DD} =20V, V _{GS} =10V, I _D =20A, R _G =1.6Ω		8		nS
Turn-on rise time	t _r			5		
Turn-off delay time	t _{d(off)}			24		
Turn-off fall time	t _f			3.5		
Source-Drain Diode characteristics						
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =1A,T _J =25℃			1.2	V
Diode Forward Current	I _S				55	A
Reverse Recovery Time	T _{rr}	I _S =10A,di/dt =300A/μs, T _J =25℃		14		nS
Reverse Recovery Charge	Q _{rr}			16		nC

Notes:

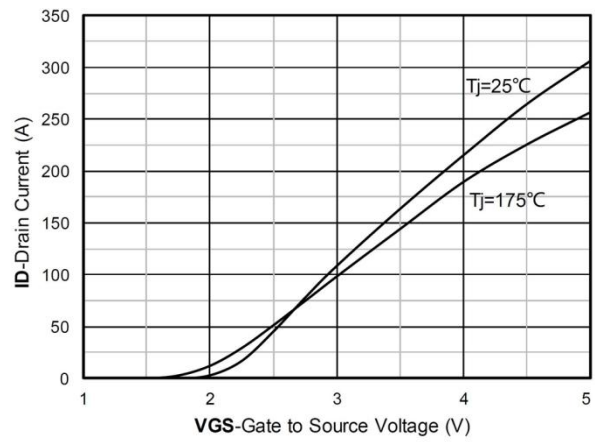
1) The test condition is $V_{DD}=20\text{V}, V_{GS}=10\text{V}, L=0.5\text{mH}, R_G=25\Omega$

2) Guaranteed by design, not subject to production.

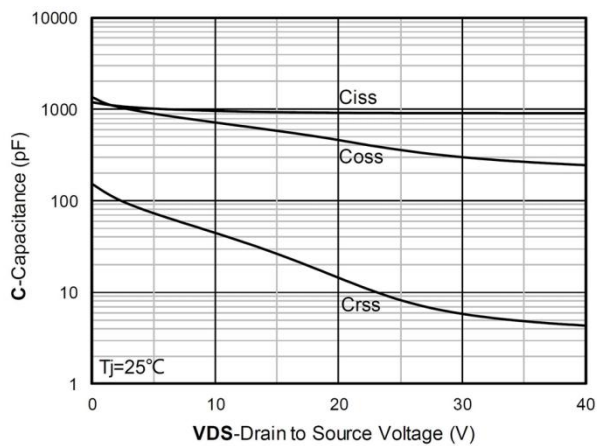
Typical Characteristics



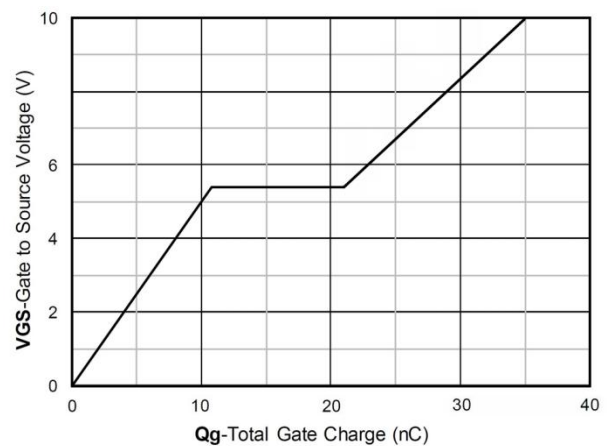
Output Characteristics



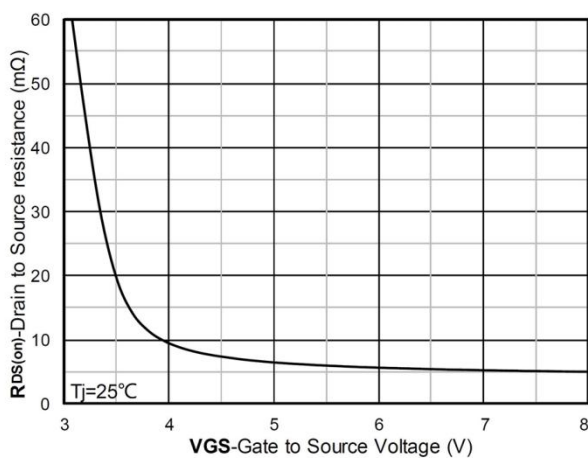
Transfer Characteristics



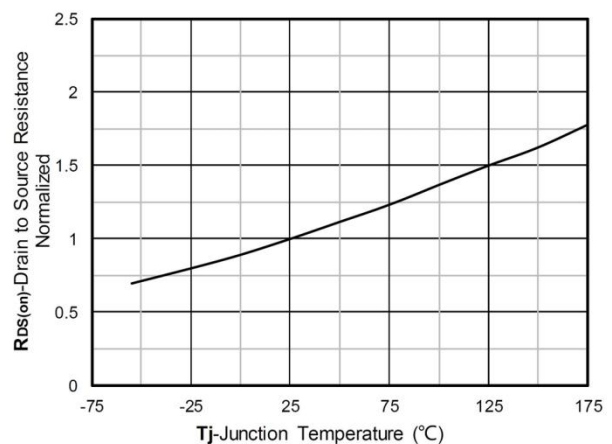
Capacitance Characteristics



Gate Charge

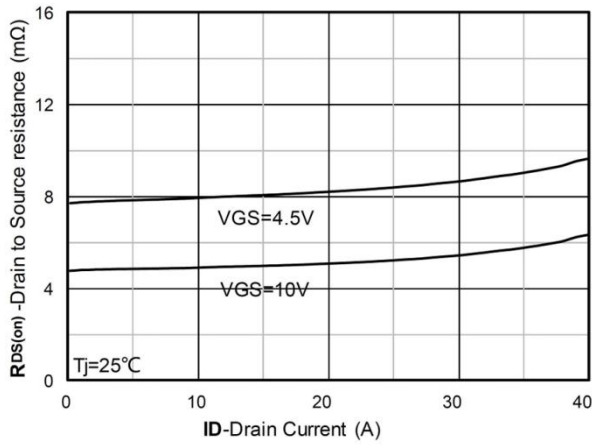


On-Resistance vs Gate to Source Voltage

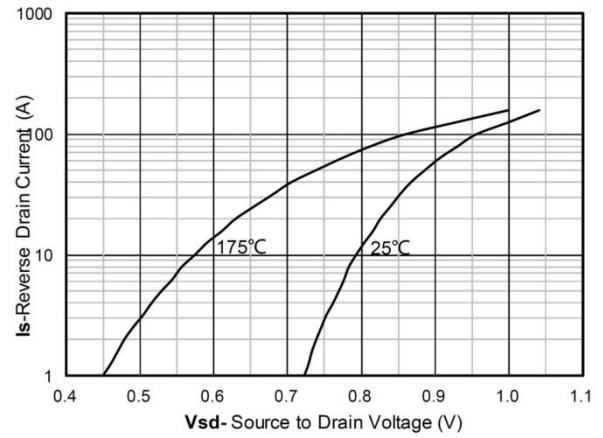


Normalized On-Resistance

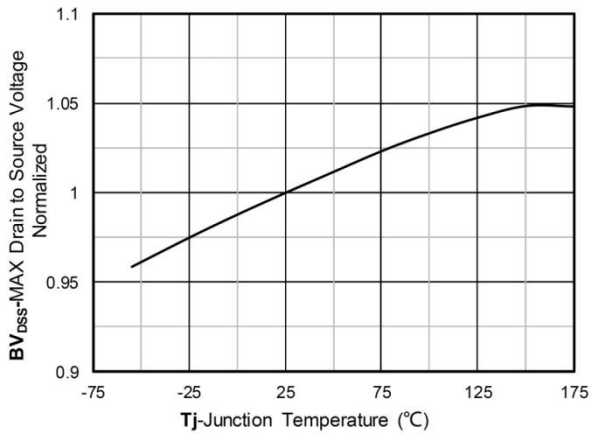
Typical Characteristics



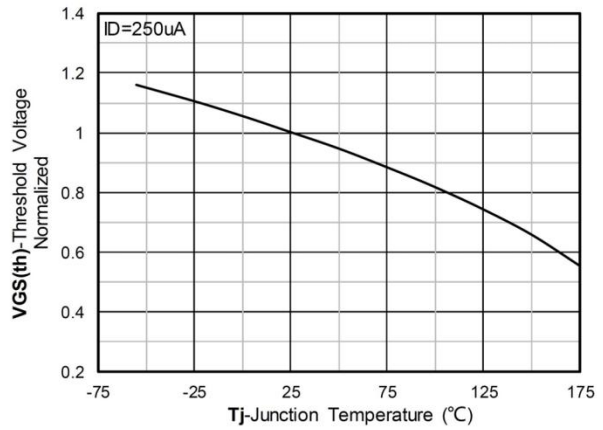
$R_{DS(on)}$ VS Drain Current



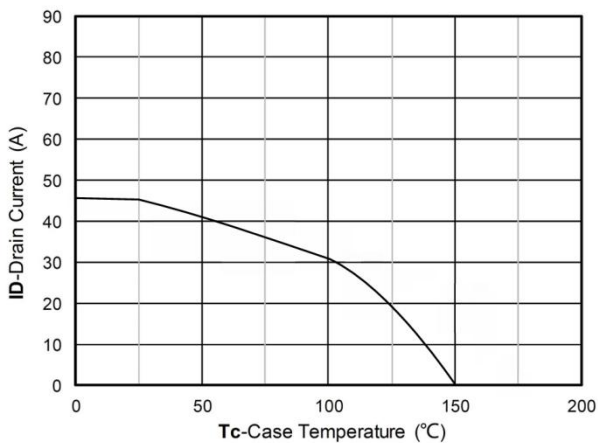
Forward characteristics of reverse diode



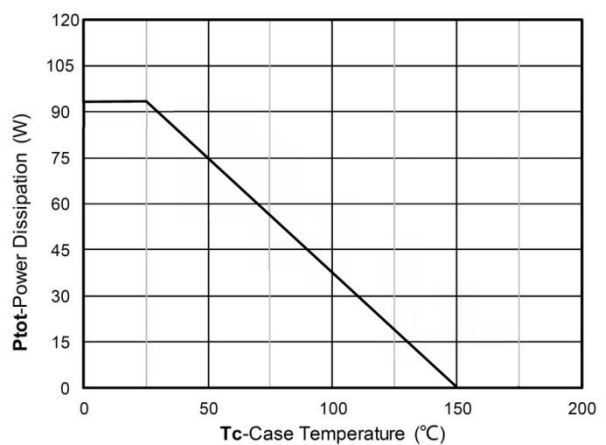
Normalized breakdown voltage



Normalized Threshold voltage

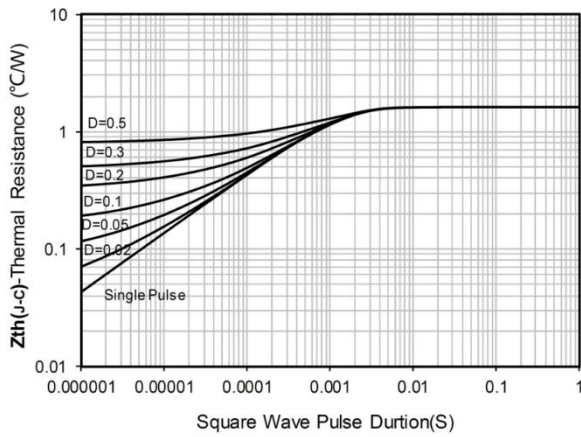


Current dissipation

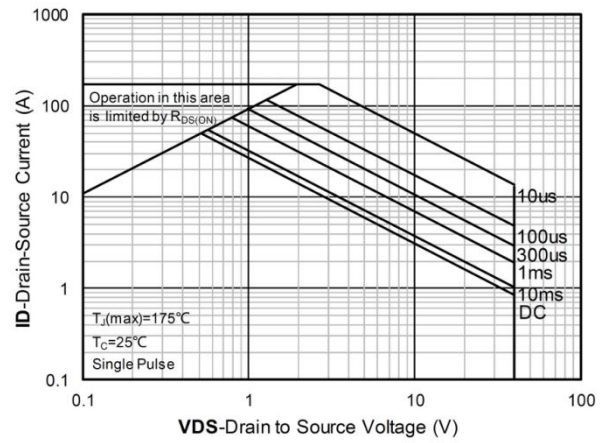


Power dissipation

Typical Characteristics

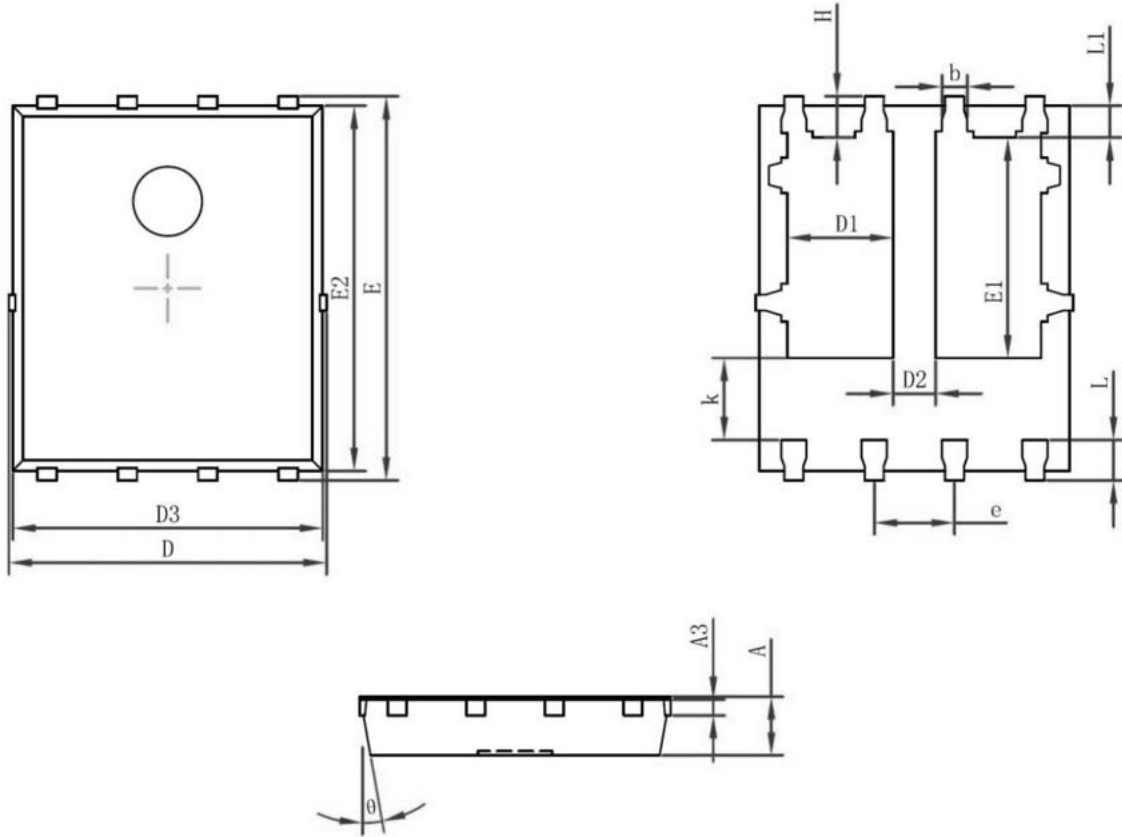


Maximum Transient Thermal Impedance



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	0.254 REF.		0.010 REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	1.470	1.870	0.058	0.074
D2	0.470	0.870	0.019	0.034
E1	3.375	3.575	0.133	0.141
D3	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°