

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	9.5mΩ@10V	54A
	13.5mΩ@4.5V	

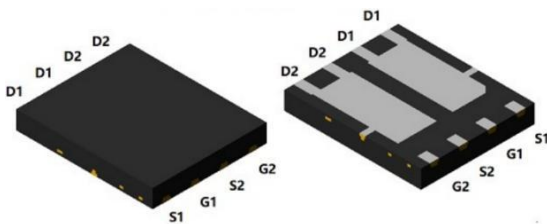
Feature

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

Application

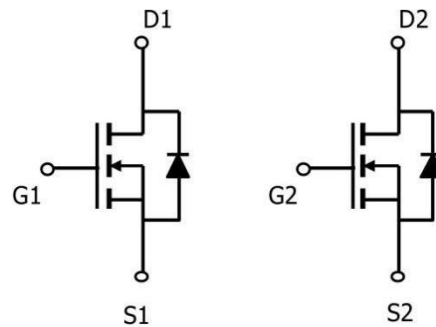
- DC/DC converter
- Motor Control

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	54	A
Continuous Drain Current($T_C = 100^\circ\text{C}$)	$I_D(100^\circ\text{C})$	37	A
Pulsed Drain Current	I_{DM}	216	A
Power Dissipation ($T_C = 25^\circ\text{C}$)	P_D	46	W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.7	$^\circ\text{C}/\text{W}$
Single pulse avalanche energy ¹⁾	E_{AS}	49	mJ
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150	$^\circ\text{C}$

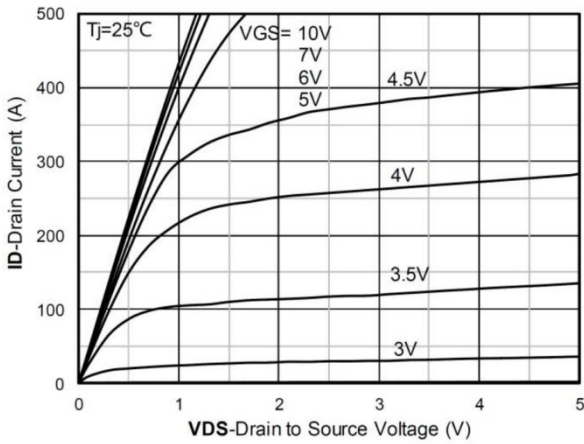
Electrical characteristics ($T_A=25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu\text{A}$	40			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 32V, V_{GS} = 0V, T_J = 25^\circ\text{C}$			1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	1.0	1.5	2.5	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 8A$		6.8	9.5	m Ω
		$V_{GS} = 4.5V, I_D = 4A$		10.0	13.5	
Dynamic characteristics²⁾						
Input Capacitance	C_{iss}	$V_{DS} = 20V, V_{GS} = 0V, f = 1\text{MHz}$		2450		pF
Output Capacitance	C_{oss}			168		
Reverse Transfer Capacitance	C_{rss}			135		
Total Gate Charge	Q_g	$V_{DS} = 20V, V_{GS} = 10V, I_D = 20A$		45		nC
Gate-Source Charge	Q_{gs}			11		
Gate-Drain Charge	Q_{gd}			11		
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 20V, V_{GS} = 10V, I_D = 20A, R_G = 3\Omega$		11		nS
Turn-on rise time	t_r			29		
Turn-off delay time	$t_{d(off)}$			42		
Turn-off fall time	t_f			7		
Source-Drain Diode characteristics						
Diode Forward voltage	V_{SD}	$V_{GS} = 0V, I_S = 1A, T_J = 25^\circ\text{C}$			1.2	V
Diode Forward Current	I_S				54	A
Reverse Recovery Time	T_{rr}	$I_S = 20A, di/dt = 100A/\mu\text{s}, T_J = 25^\circ\text{C}$		12		nS
Reverse Recovery Charge	Q_{rr}			7		nC

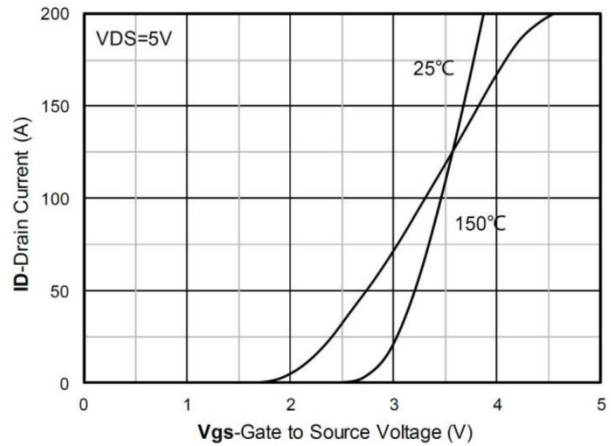
Notes:

- 1) The EAS Test condition is $V_{DD} = 20V, V_{GS} = 10V, L = 0.1\text{mH}, R_g = 25\Omega$.
- 2) Guaranteed by design, not subject to production.

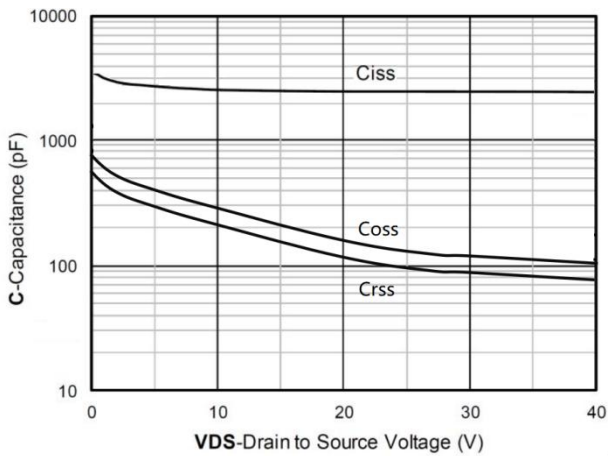
Typical Characteristics



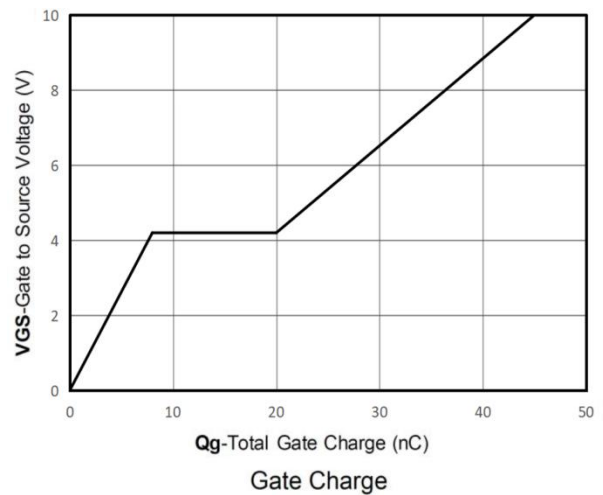
Output Characteristics



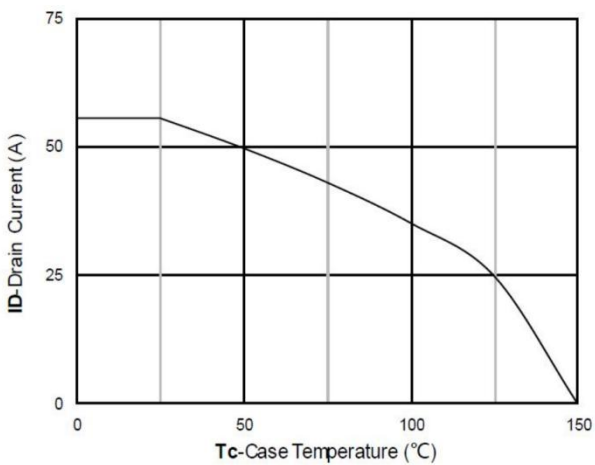
Transfer Characteristics



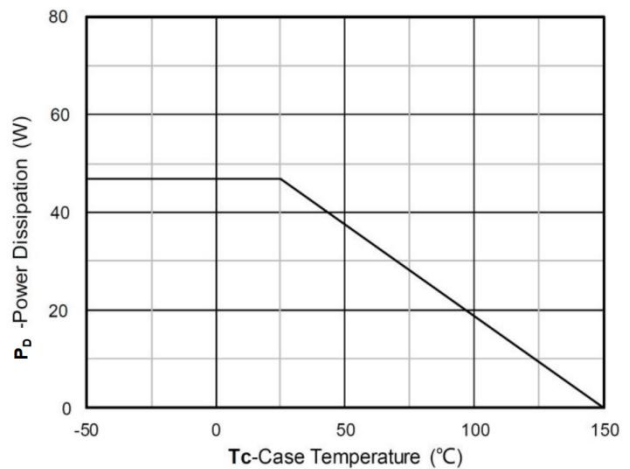
Capacitance Characteristics



Gate Charge

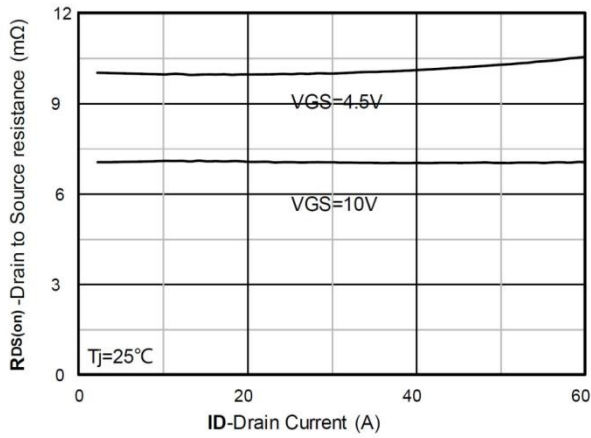


Current dissipation

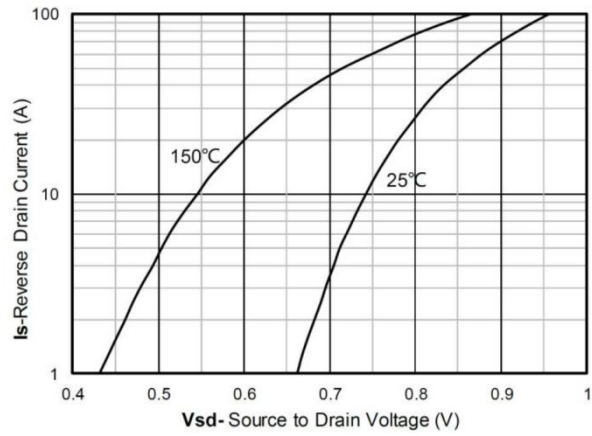


Power dissipation

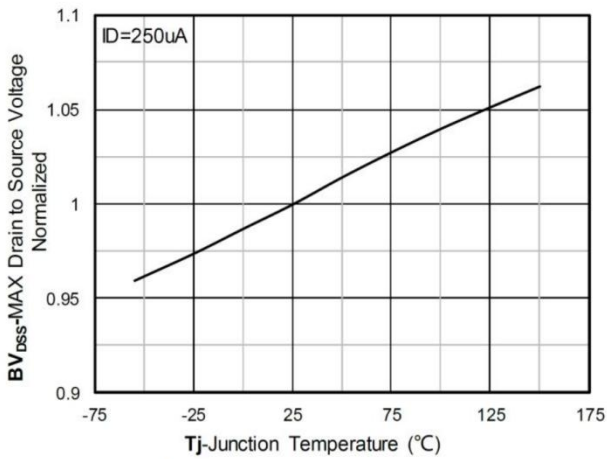
Typical Characteristics



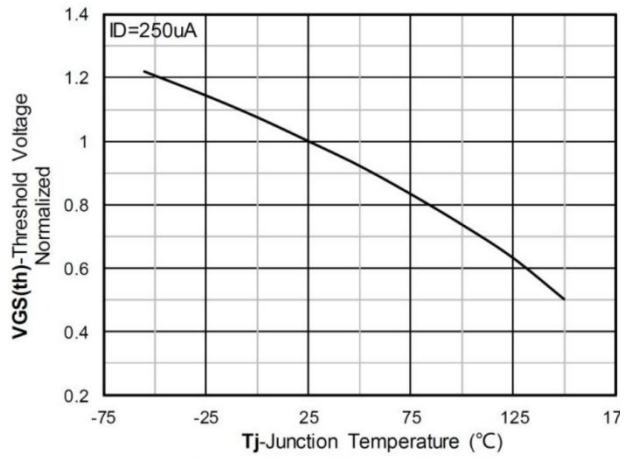
RDS(on) VS Drain Current



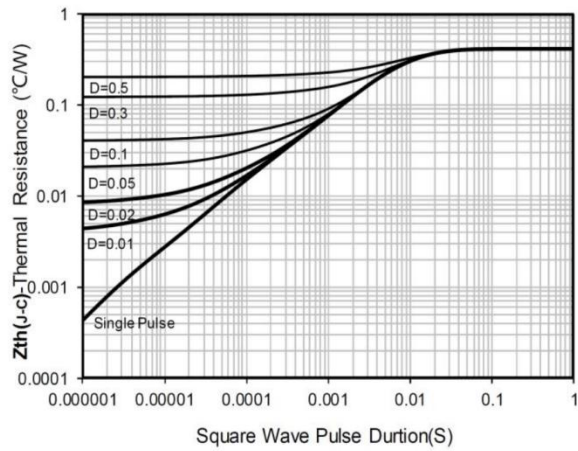
Forward characteristics of reverse diode



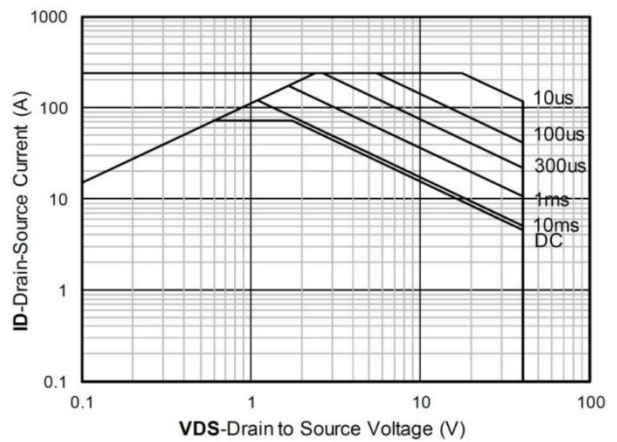
Normalized breakdown voltage



Normalized Threshold voltage

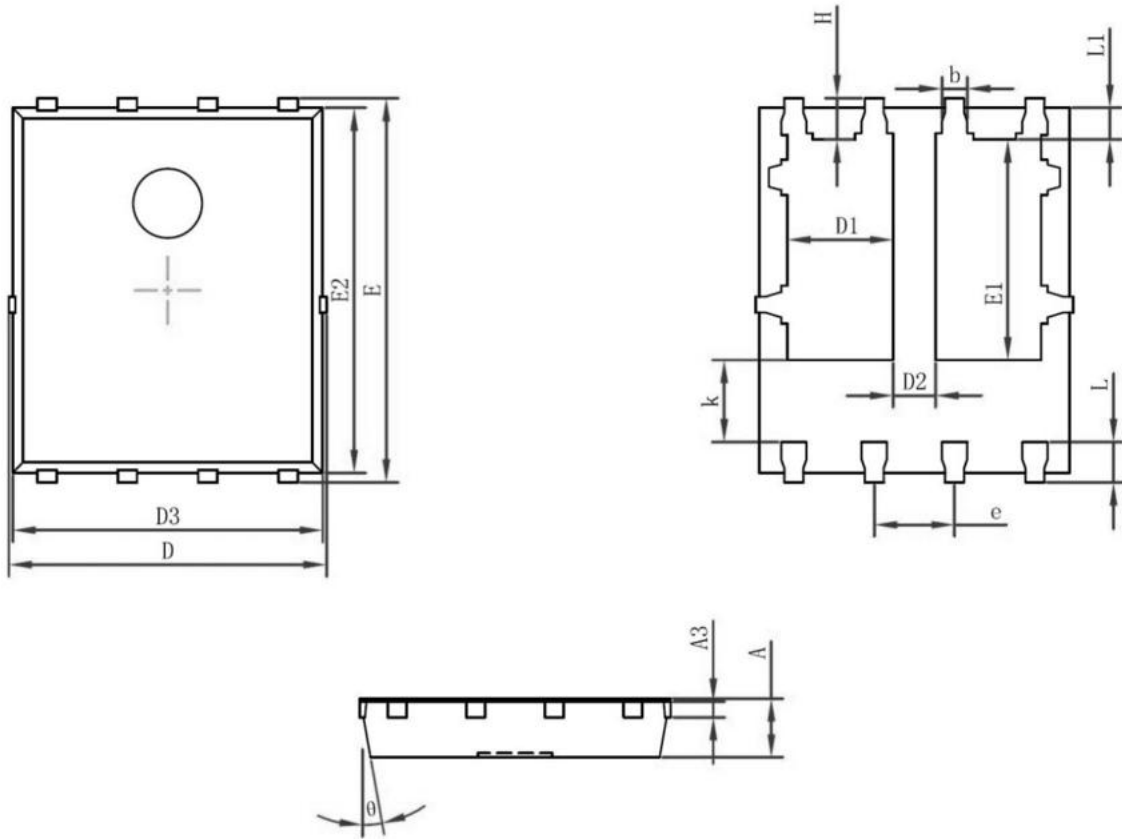


Maximum Transient Thermal Impedance



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°