

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
60V	12.5mΩ@10V	40A

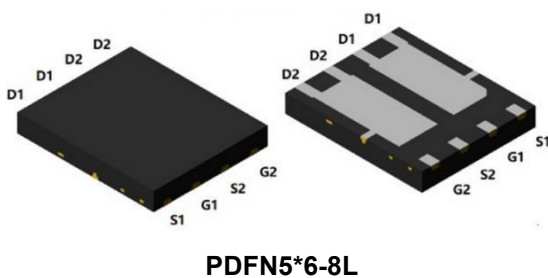
Feature

- Fast switching speed
- Surface mount package
- Advanced Split Gate Trench Technology
- Suffix "-Q1" for AEC-Q101

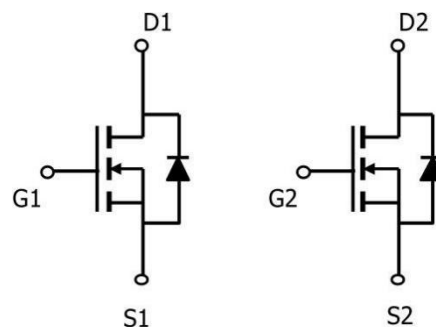
Application

- DC/DC converter
- Motor Control

Package



Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current($T_C=25^{\circ}\text{C}$)	I_D	40	A
Continuous Drain Current($T_C=100^{\circ}\text{C}$)	$I_D(100^{\circ}\text{C})$	23	A
Pulsed Drain Current	I_{DM}	160	A
Power Dissipation ($T_C=25^{\circ}\text{C}$)	P_D	53	W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.36	$^{\circ}\text{C/W}$
Single pulse avalanche energy ¹⁾	E_{AS}	100	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)

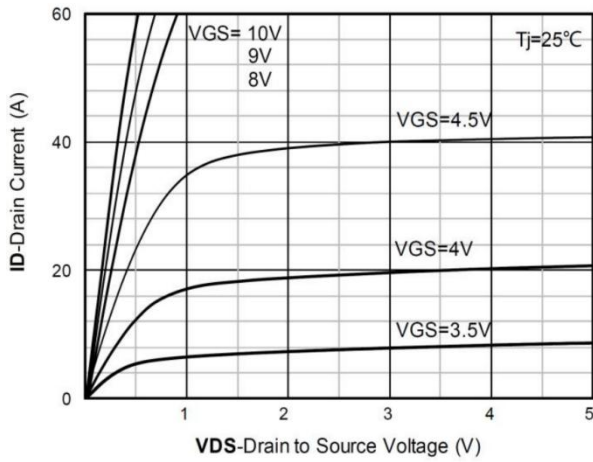
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250mA$	60			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 48V, V_{GS} = 0V$			1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2	3	4	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$		10	12.5	m Ω
Dynamic characteristics ²⁾						
Input Capacitance	C_{iss}	$V_{DS} = 30V, V_{GS} = 0V, f = 1MHz$		998		pF
Output Capacitance	C_{oss}			242		
Reverse Transfer Capacitance	C_{rss}			7.6		
Total Gate Charge	Q_g	$V_{DS} = 30V, V_{GS} = 10V, I_D = 20A$		21.5		nC
Gate-Source Charge	Q_{gs}			4.5		
Gate-Drain Charge	Q_{gd}			3.5		
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 30V, V_{GS} = 10V, I_D = 20A, R_G = 1.6\Omega$		11.4		nS
Turn-on rise time	t_r			16.5		
Turn-off delay time	$t_{d(off)}$			17.5		
Turn-off fall time	t_f			3.8		
Source-Drain Diode characteristics						
Diode Forward voltage	V_{SD}	$V_{GS} = 0V, I_S = 1A, T_J = 25^{\circ}C$			1.2	V
Diode Forward Current	I_S				40	A
Reverse Recovery Time	T_{rr}	$I_S = 30A, di/dt = 100A/\mu s, T_J = 25^{\circ}C$		30		nS
Reverse Recovery Charge	Q_{rr}			35		nC

Notes:

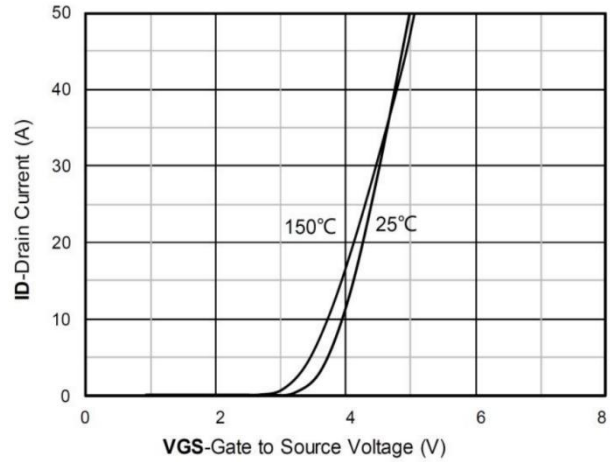
1) The test condition is $V_{DD}=30\text{V}, V_{GS}=10\text{V}, L=0.5\text{mH}, R_G=25\Omega$.

2) Guaranteed by design, not subject to production.

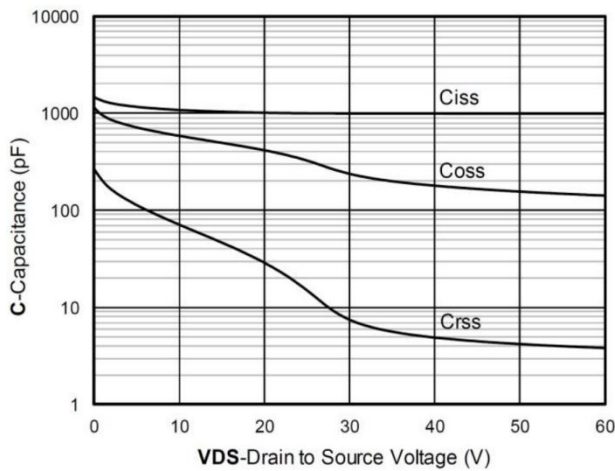
Typical Characteristics



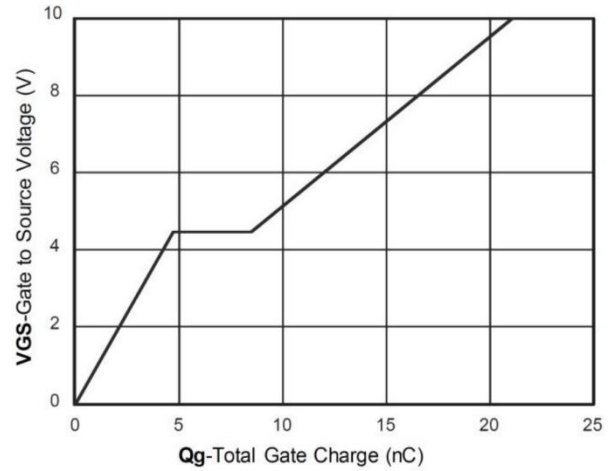
Output Characteristics



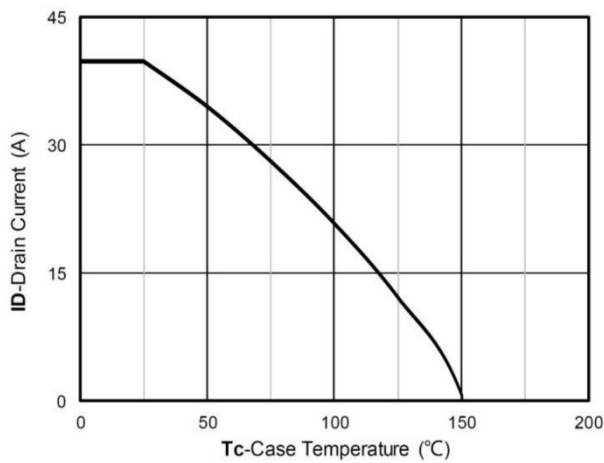
Transfer Characteristics



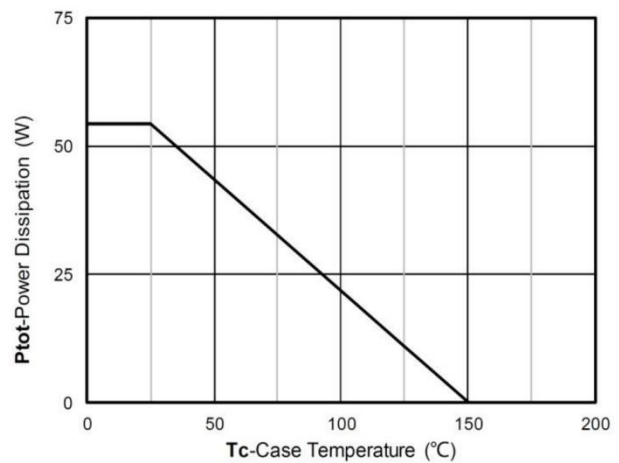
Capacitance Characteristics



Gate Charge

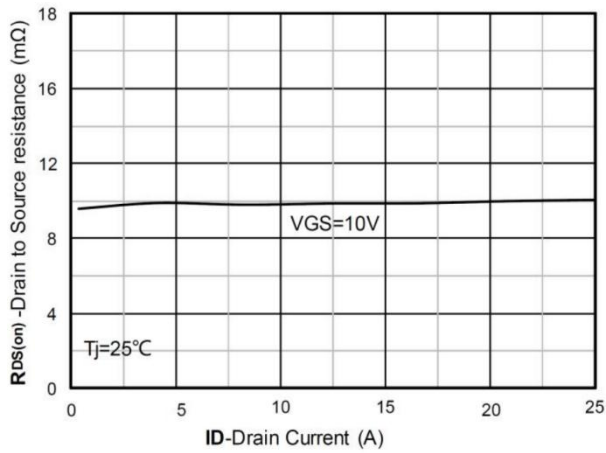


Current dissipation

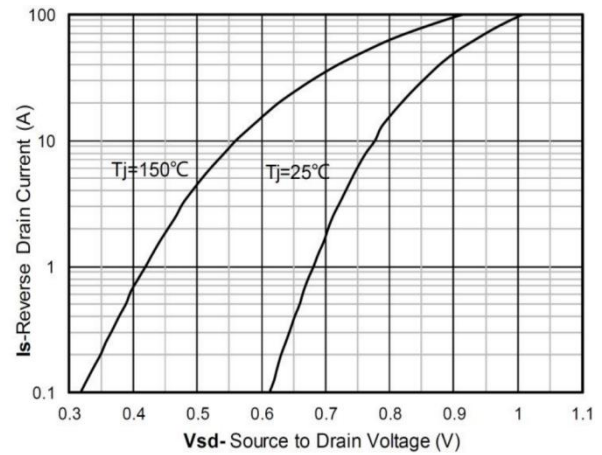


Power dissipation

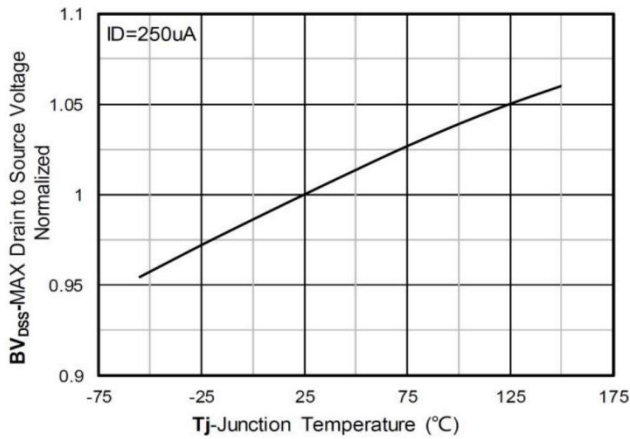
Typical Characteristics



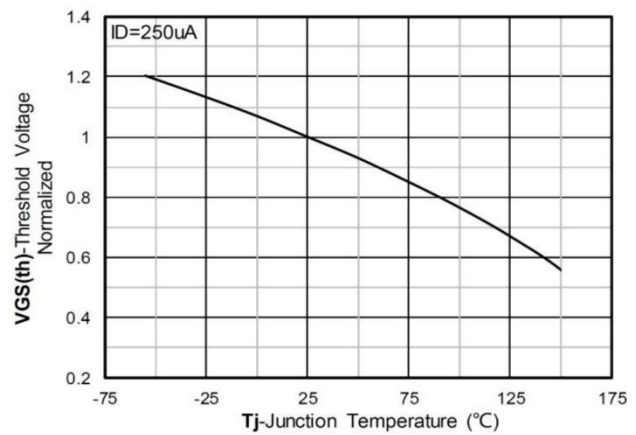
$R_{DS(on)}$ VS Drain Current



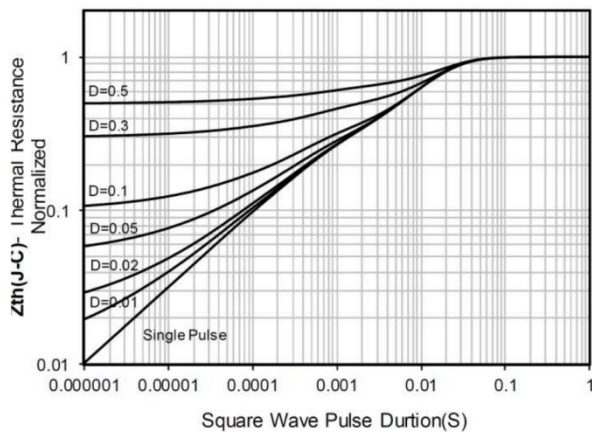
Forward characteristics of reverse diode



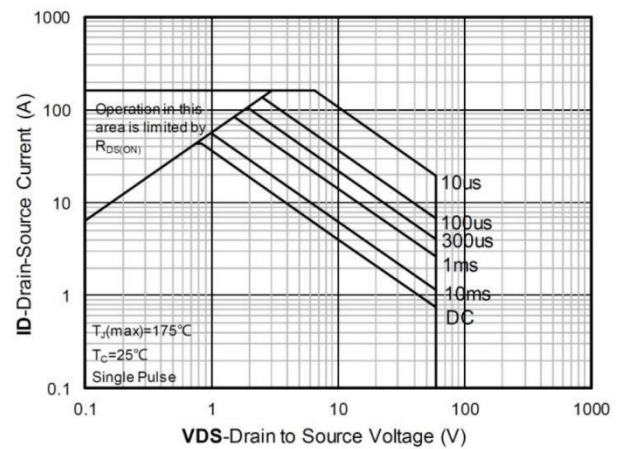
Normalized breakdown voltage



Normalized Threshold voltage

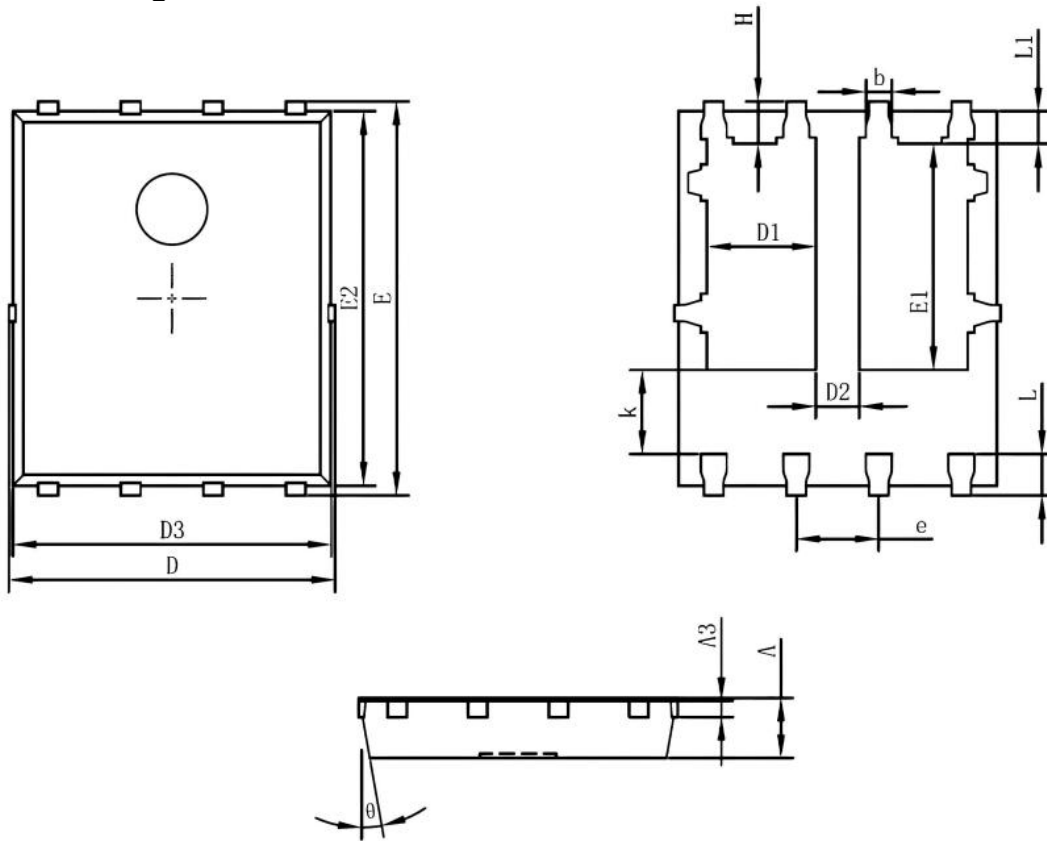


Maximum Transient Thermal Impedance



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°