

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
60V	25mΩ@10V	18A
	32mΩ@4.5V	

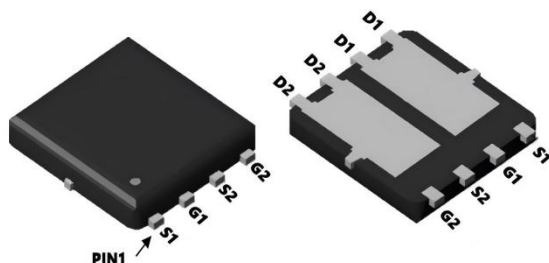
Feature

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high EAS
- Excellent package for good heat dissipation
- Suffix "-Q1" for AEC-Q101

Application

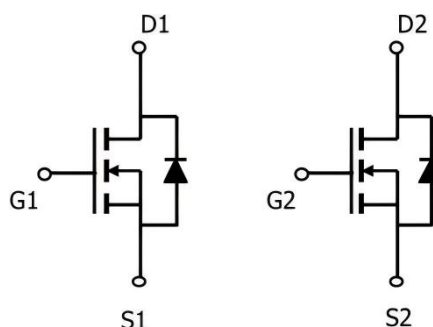
- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Package

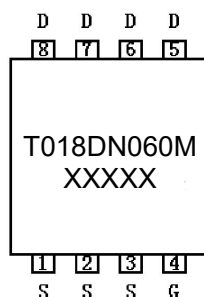


PDFN5*6-8L

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	18	A
Continuous Drain Current ($T_c = 100^\circ\text{C}$)	$I_D (100^\circ\text{C})$	12.7	A
Pulsed Drain Current	I_{DM}	60	A
Single Pulse Avalanche Energy ³⁾	E_{AS}	72	mJ
Power Dissipation	P_D	45	W
Thermal Resistance Junction to Case ¹⁾	$R_{\theta JC}$	3.3	$^\circ\text{C}/\text{W}$
Operating Junction Temperature	T_J	$-55 \sim +175$	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	$-55 \sim +175$	$^\circ\text{C}$

Electrical characteristics ($T_c=25^\circ\text{C}$, 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	60			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =60V, V _{GS} =0V			1	μA
Gate-body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Gate threshold voltage ²⁾	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.2	1.6	2.5	V
Drain-source on-resistance ²⁾	R _{DS(on)}	V _{GS} =10V, I _D =10A		22	25	mΩ
		V _{GS} =4.5V, I _D =10A		27	32	
Dynamic characteristics ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V, f =1MHz		973		pF
Output Capacitance	C _{oss}			61.2		
Reverse Transfer Capacitance	C _{rss}			58.8		
Total Gate Charge	Q _g	V _{DS} =30V, V _{GS} =10V, I _D =10A		25		nC
Gate-Source Charge	Q _{gs}			4.5		
Gate-Drain Charge	Q _{gd}			6.5		
Turn-on delay time	t _{d(on)}	V _{DS} =30V, V _{GS} =10V R _L =6.7Ω, R _G =3Ω		5		nS
Turn-on rise time	t _r			2.6		
Turn-off delay time	t _{d(off)}			16.1		
Turn-off fall time	t _f			2.3		
Source-Drain Diode characteristics						
Diode Forward Current ¹⁾	I _S				18	A
Diode Forward voltage ²⁾	V _{SD}	V _{GS} =0V, I _S =10A			1.2	V
Reverse Recovery Time	T _{rr}	I _F =10A, di/dt =100A/μs ²⁾ T _J =25°C		29		nS
Reverse Recovery Charge	Q _{rr}			49		nC

Notes:

- 1) Surface Mounted on FR4 Board, $t \leq 10$ sec.
- 2) Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
- 3) EAS condition: $T_J = 25^\circ\text{C}$, $V_{DD} = 30V$, $V_G = 10V$, $L = 0.5mH$, $R_g = 25\Omega$.
- 4) Guaranteed by design, not subject to production.

Typical Characteristics

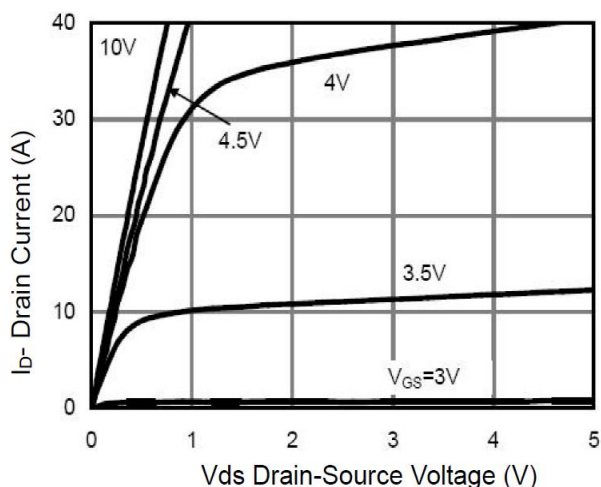


Figure 1 Output Characteristics

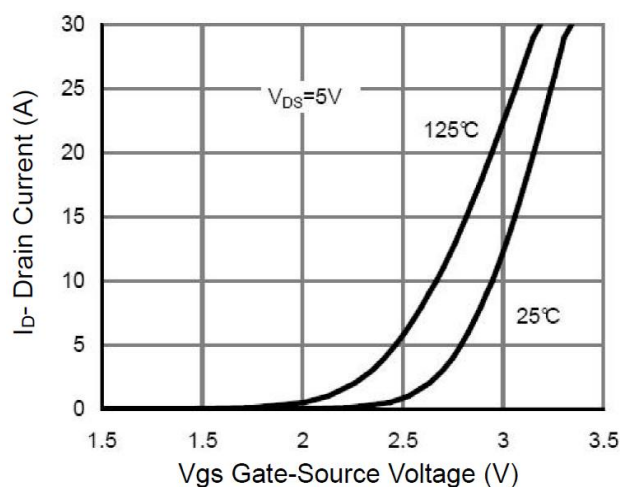


Figure 2 Transfer Characteristics

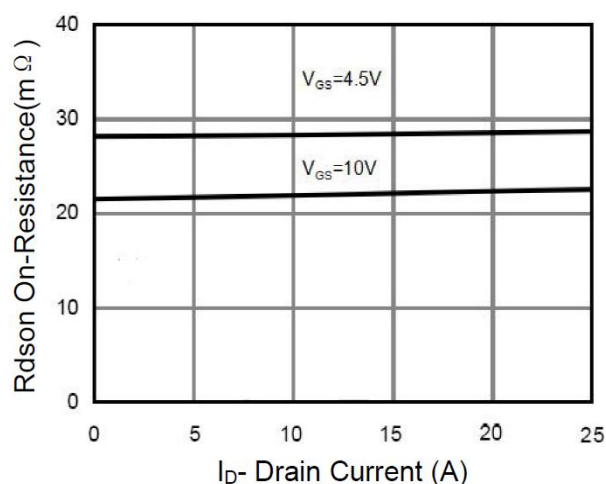


Figure 3 Rdson- Drain Current

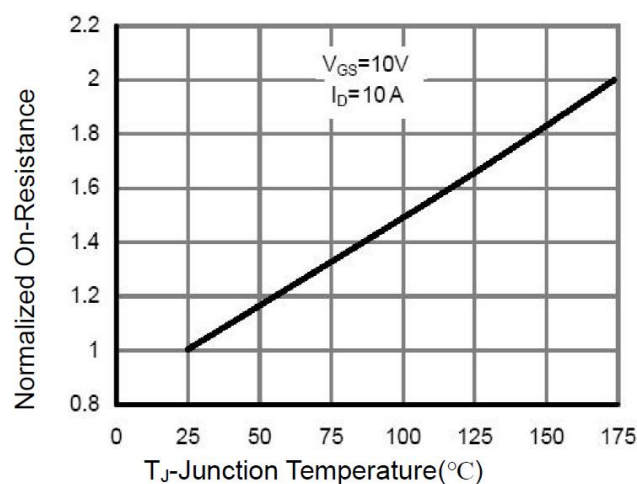


Figure 4 Rdson-Junction Temperature

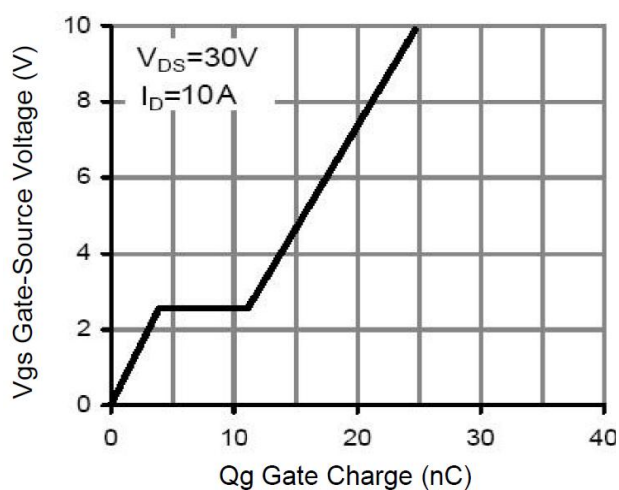


Figure 5 Gate Charge

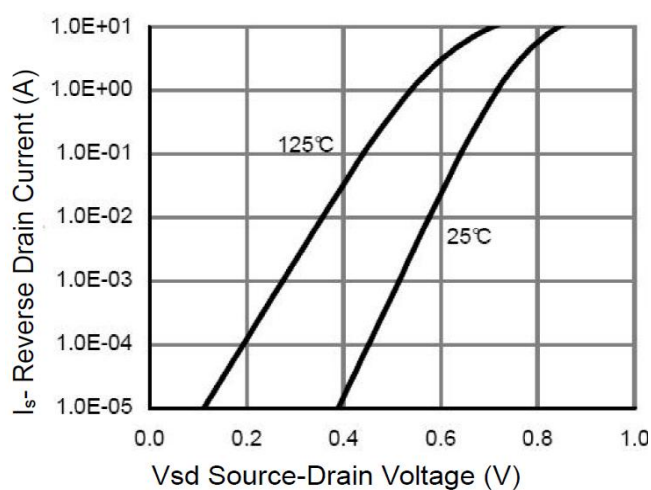


Figure 6 Source- Drain Diode Forward

Typical Characteristics

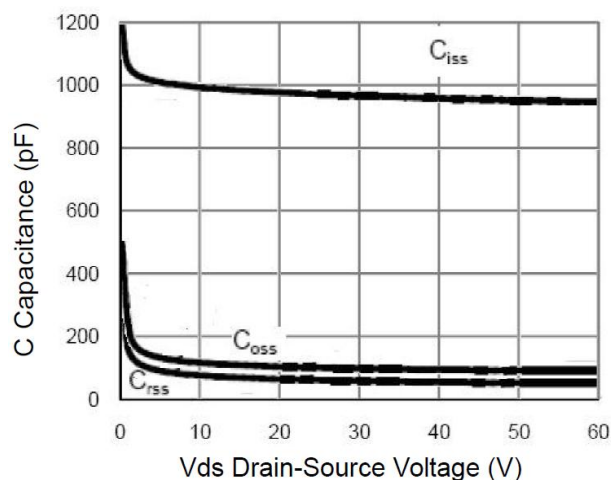


Figure 7 Capacitance vs Vds

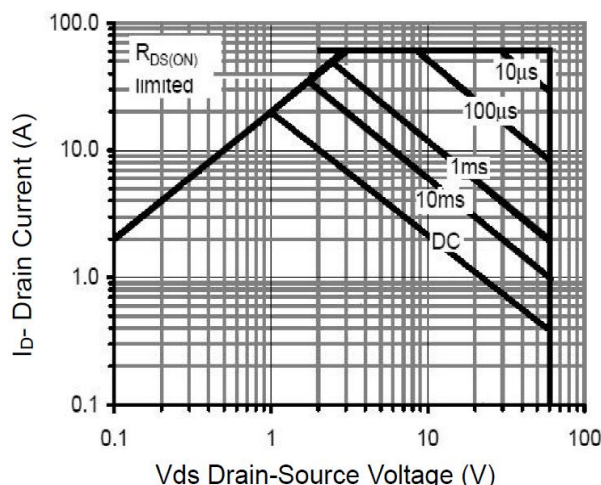


Figure 8 Safe Operation Area

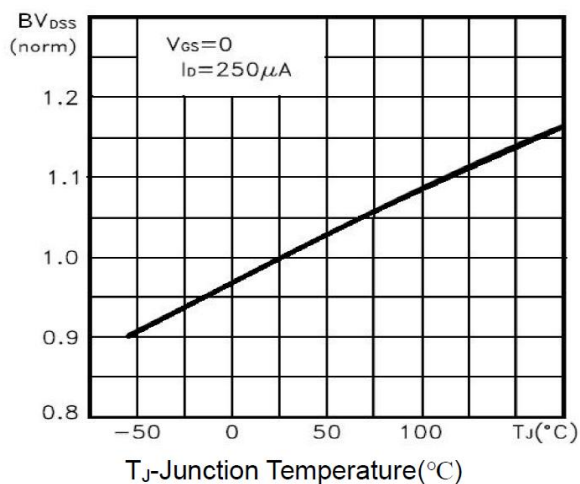


Figure 9 BV_{DSS} vs Junction Temperature

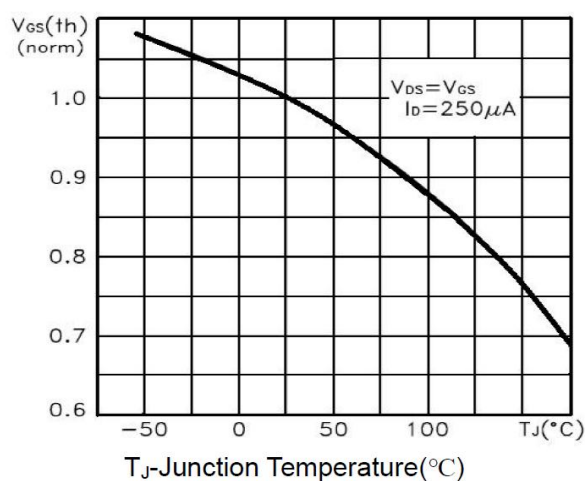


Figure 10 V_{GS(th)} vs Junction Temperature

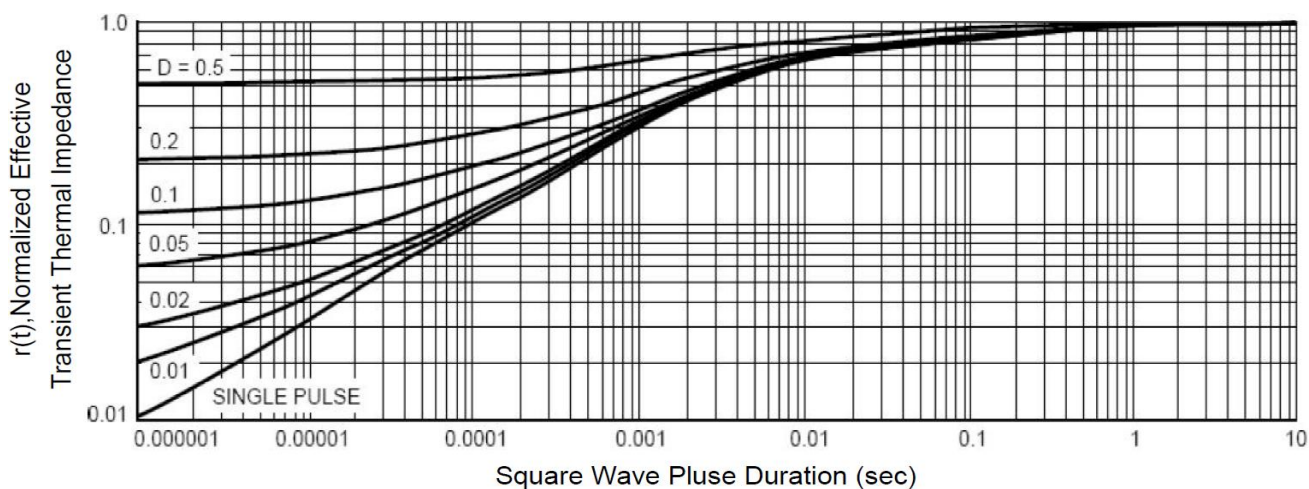
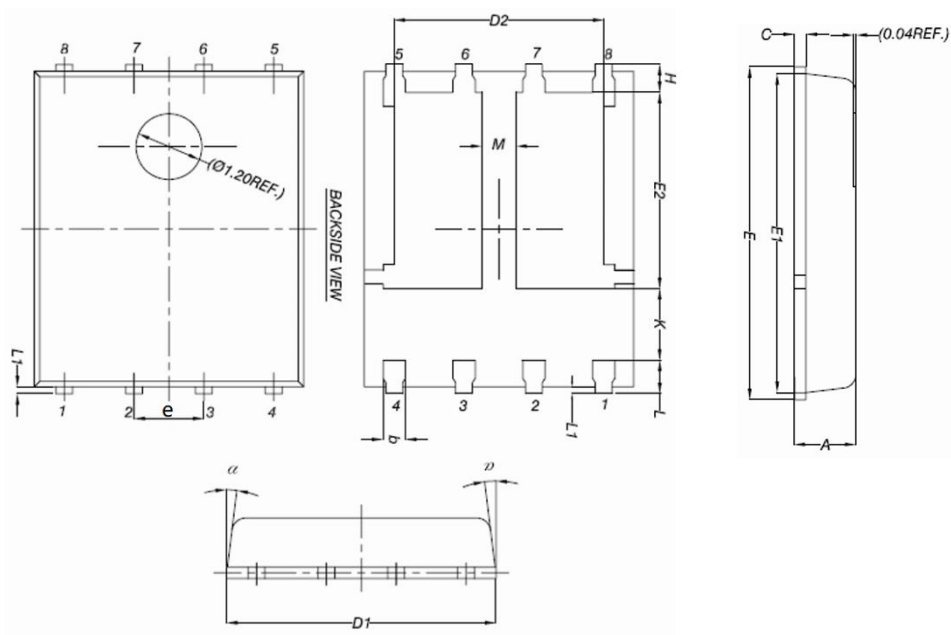


Figure 11 Normalized Maximum Transient Thermal Impedance

PDFN5*6-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
b	0.330	0.510	0.013	0.020
C	0.200	0.300	0.008	0.012
D1	4.800	5.000	0.189	0.197
D2	3.610	3.960	0.142	0.156
E	5.900	6.100	0.232	0.240
E1	5.700	5.800	0.224	0.228
E2	3.380	3.780	0.133	0.149
e	1.270 BSC		0.050 BSC	
H	0.410	0.610	0.016	0.024
K	1.100	-	0.043	-
L	0.510	0.710	0.020	0.028
L1	0.060	0.200	0.002	0.008
M	0.500	-	0.020	-
α	0°	12°	0°	12°