

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-60V	13mΩ@-10V	-74A
	22mΩ@-4.5V	

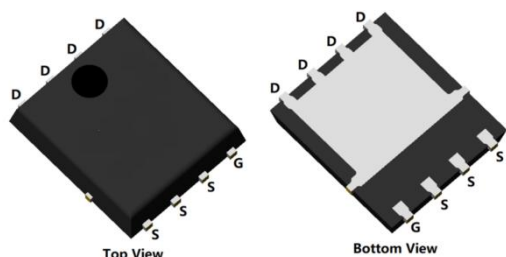
Feature

- Excellent package for heat dissipation
- High density cell design for low $R_{DS(on)}$
- Suffix "-Q1" for AEC-Q101

Application

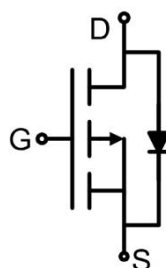
- Power management
- Load Switch

Package

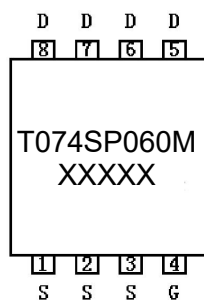


PDFN5*6-8L

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ^{1,3)} ($V_{GS}=-10\text{V}$, $T_C=25^{\circ}\text{C}$)	I_D	-74	A
Continuous Drain Current ^{1,3)} ($V_{GS}=-10\text{V}$, $T_C=100^{\circ}\text{C}$)	$I_D(100^{\circ}\text{C})$	-52	A
Pulsed Drain Current	I_{DM}	-296	A
Single Pulse Avalanche Energy ²⁾	E_{AS}	225	mJ
Power Dissipation ^{1,3)} ($T_C=25^{\circ}\text{C}$)	P_D	150	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	1	$^{\circ}\text{C/W}$
Operating Junction Temperature	T_J	$-55 \sim +175$	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	$-55 \sim +175$	$^{\circ}\text{C}$

Electrical characteristics ($T_J=25^{\circ}\text{C}$, 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	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-1.2	-1.8	-2.4	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-35A		10	13	mΩ
		V _{GS} =-4.5V, I _D =-20A		14.5	22	
Dynamic characteristics ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =-30V, V _{GS} =0V, f =1MHz		5029		pF
Output Capacitance	C _{oss}			327		
Reverse Transfer Capacitance	C _{rss}			299		
Total Gate Charge	Q _g	V _{DS} =-30V, V _{GS} =-10V I _D =-35A		112		nC
Gate-Source Charge	Q _{gs}			16.6		
Gate-Drain Charge	Q _{gd}			26.7		
Turn-on delay time	t _{d(on)}	V _{DS} =-30V, V _{GS} =-10V I _D =-35A, R _G =3Ω		12.6		nS
Turn-on rise time	t _r			36		
Turn-off delay time	t _{d(off)}			150		
Turn-off fall time	t _f			83		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				-74	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =-35A			-1.2	V
Reverse Recovery Time	T _{rr}	V _{GS} =0V, V _R =-30V, I _F =-35A di/dt =-100A/μs		28.4		nS
Reverse Recovery Charge	Q _{rr}			37.6		nC

Notes:

- 1) The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
- 2) $T_J=25^{\circ}\text{C}$, $V_G=-10\text{V}$, $R_G=25\Omega$, $L=0.5\text{mH}$, $I_{AS}=-30\text{A}$.
- 3) Thermal resistance from junction to soldering point (on the exposed drain pad).
- 4) Guaranteed by design, not subject to production testing.

Typical Characteristics

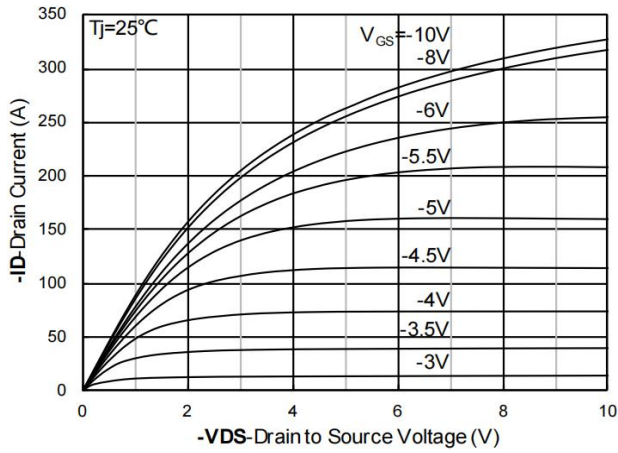


Figure 1. Output Characteristics; typical values

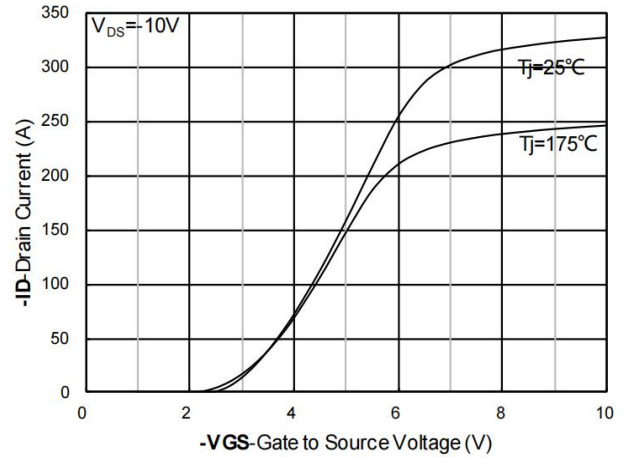


Figure 2. Transfer Characteristics; typical values

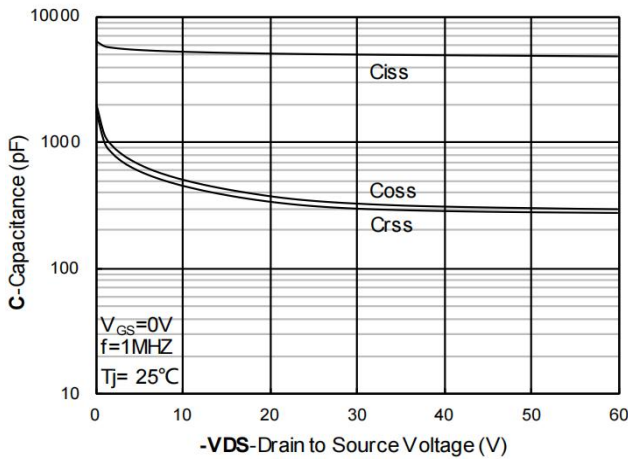


Figure 3. Capacitance Characteristics; typical values

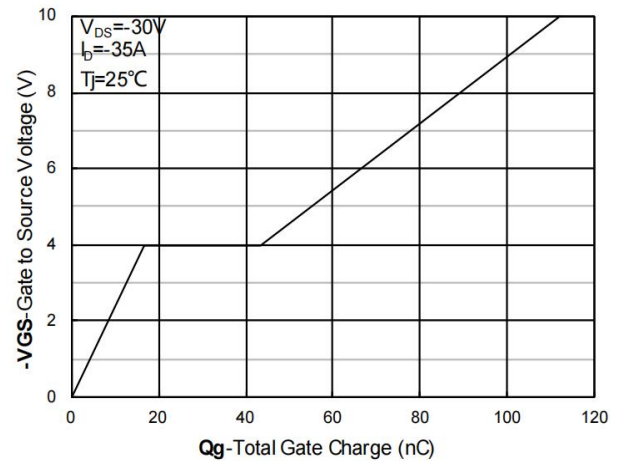


Figure 4. Gate Charge; typical values

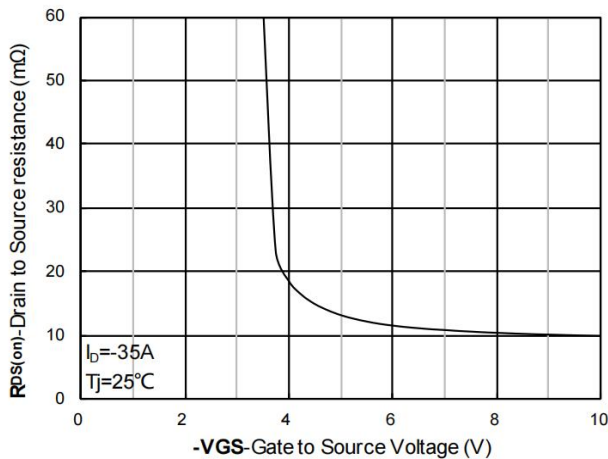


Figure 5. On-Resistance vs. Gate to Source Voltage; typical values

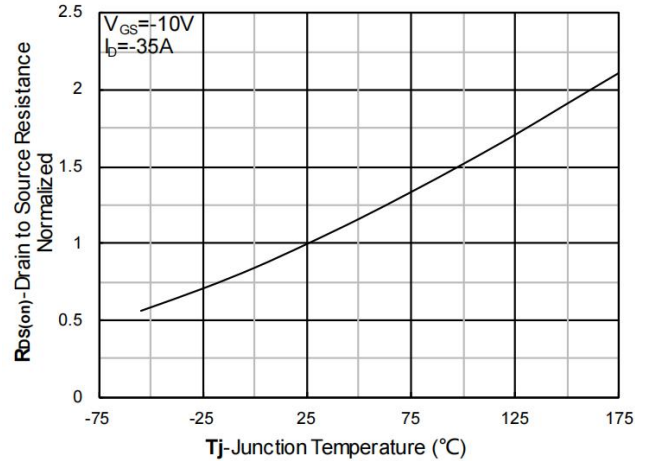


Figure 6. Normalized On-Resistance

Typical Characteristics

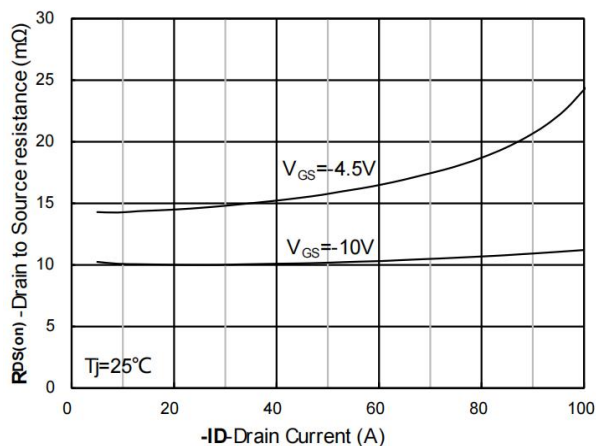


Figure 7. $R_{DS(on)}$ vs. Drain Current; typical values

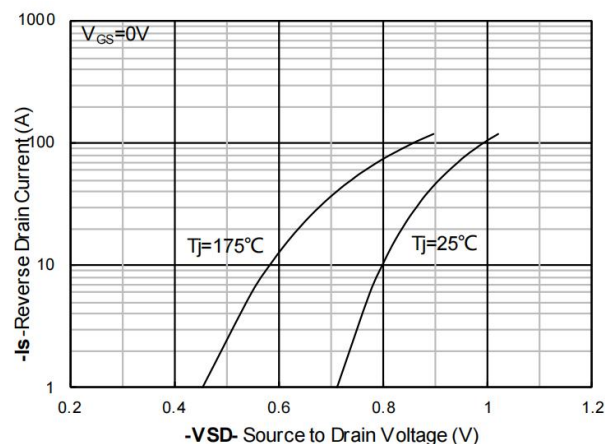


Figure 8. Forward characteristics of reverse diode; typical values

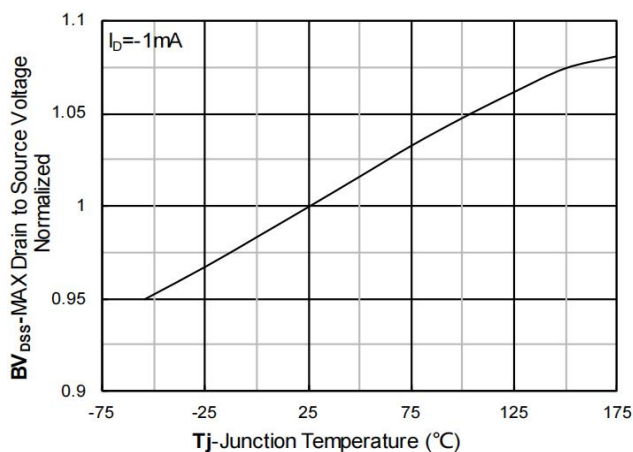


Figure 9. Normalized breakdown voltage

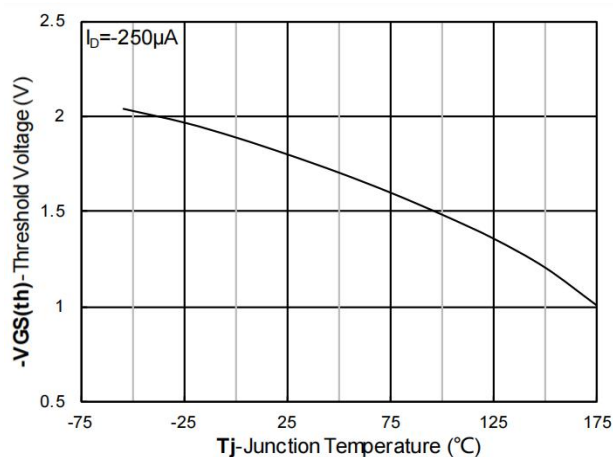


Figure 10. Gate Threshold voltage; typical values

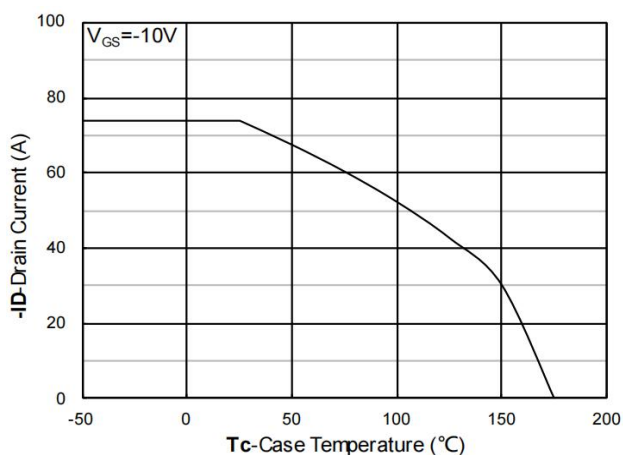


Figure 11. Current dissipation

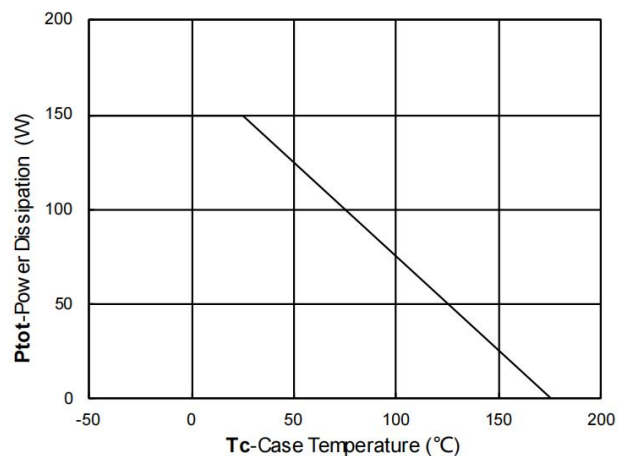


Figure 12. Power dissipation

Typical Characteristics

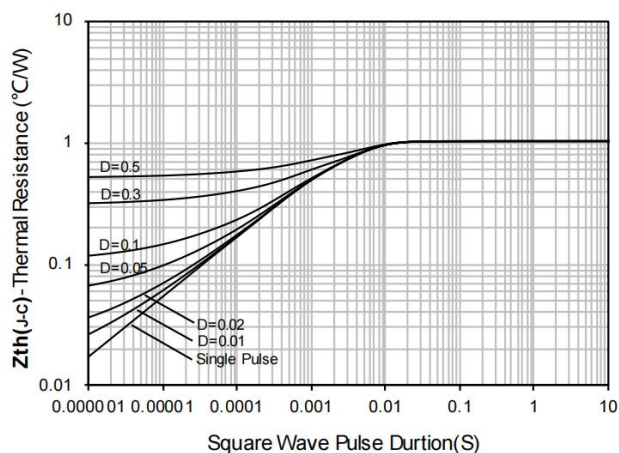


Figure 13. Maximum Transient Thermal Impedance

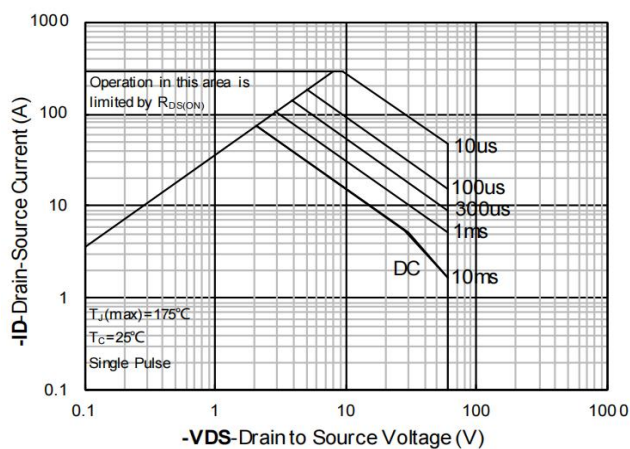
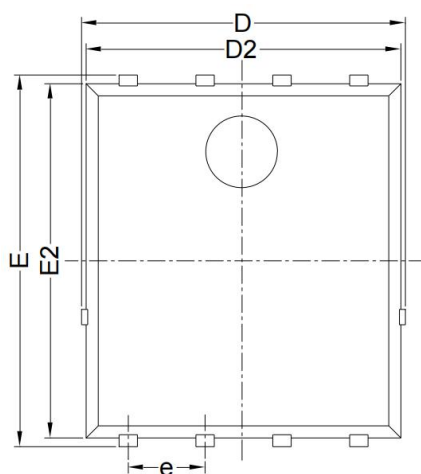
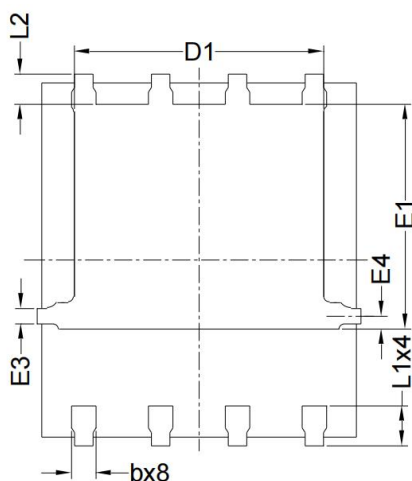


Figure 14. Safe Operation Area

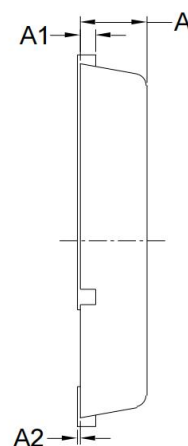
PDFN5*6-8L Package Information



Top View



Bottom View



Side View

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
D	5.150	5.550	0.203	0.219
E	5.950	6.350	0.234	0.250
A	1.000	1.200	0.039	0.047
A1	0.254 BSC.		0.010 BSC.	
A2	0.000	0.100	0.000	0.004
D1	3.920	4.320	0.154	0.170
E1	3.520	3.920	0.139	0.154
D2	5.000	5.400	0.197	0.213
E2	5.660	6.060	0.223	0.239
E3	0.254 REF.		0.010 REF.	
E4	0.210 REF.		0.008 REF.	
L1	0.560	0.760	0.022	0.030
L2	0.500 BSC.		0.020 BSC.	
b	0.310	0.510	0.012	0.020
e	1.270 BSC.		0.050 BSC.	