

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
60V	1.5mΩ@10V	246A

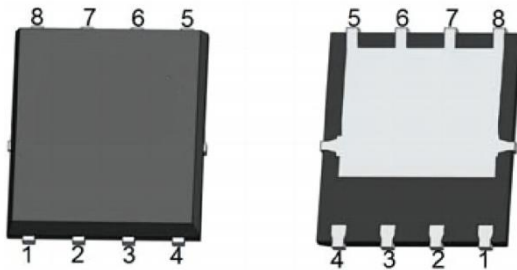
Feature

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

Application

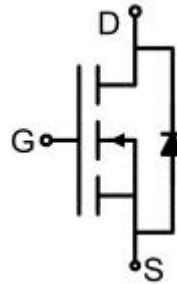
- Power switching application
- Uninterruptible power supply
- DC-DC convertor

Package

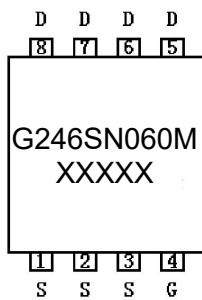


PDFN5*6-8L

Circuit diagram



Marking



Absolute maximum ratings (T_C=25°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} =10V, Chip limitation)	I _D	246	A
Continuous Drain Current ^{1, 3)} (V _{GS} =10V, T _C =100°C)	I _D (100°C)	173	A
Pulsed Drain Current (t _p ≤10μs)	I _{DM}	667	A
Single Pulse Avalanche Energy ²⁾	E _{AS}	841	mJ
Power Dissipation ^{1, 3)}	P _D	176.4	W
Thermal Resistance Junction to Case	R _{θJC}	0.85	°C/W
Operating Junction Temperature	T _J	-55 ~ +175	°C
Storage Temperature	T _{STG}	-55 ~ +175	°C

Electrical characteristics (T_J=25 °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 =1mA	60			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =48V, 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	1.3	1.7	2.3	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =50A		1.15	1.5	mΩ
Dynamic characteristics⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V, f =1MHz		6331		pF
Output Capacitance	C _{oss}			1681		
Reverse Transfer Capacitance	C _{rss}			212		
Total Gate Charge	Q _g	V _{DS} =30V, V _{GS} =10V, I _D =50A		114		nC
Gate-Source Charge	Q _{gs}			20.1		
Gate-Drain Charge	Q _{gd}			23.2		
Turn-on delay time	t _{d(on)}	V _{DS} =30V, V _{GS} =10V, I _D =50A R _G =3Ω		16.9		nS
Turn-on rise time	t _r			97.7		
Turn-off delay time	t _{d(off)}			105.2		
Turn-off fall time	t _f			123.8		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				246	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =50A			1.2	V
Reverse Recovery Time	T _{rr}	V _{GS} =0V, V _R =30V, I _F =50A di/dt =-100A/μs		34.6		nS
Reverse Recovery Charge	Q _{rr}				27.7	

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°C, V_G =10V, R_G =25Ω, L =0.5mH, I_{AS} =58A.
- 3) Thermal resistance from junction to soldering point (on the exposed drain pad).
- 4) Guaranteed by design, not subject to production testing.

Typical Characteristics

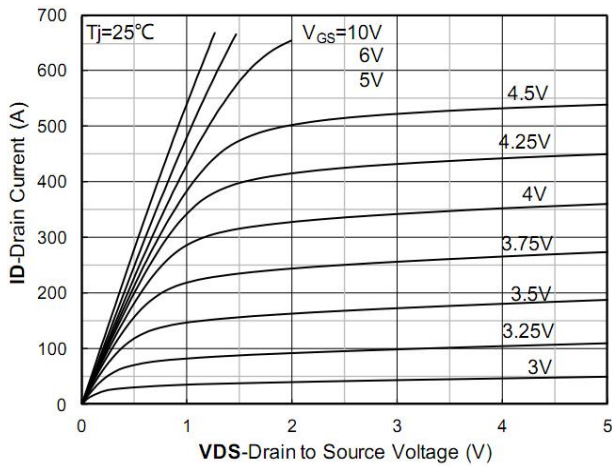


Figure 1. Output Characteristics; typical values

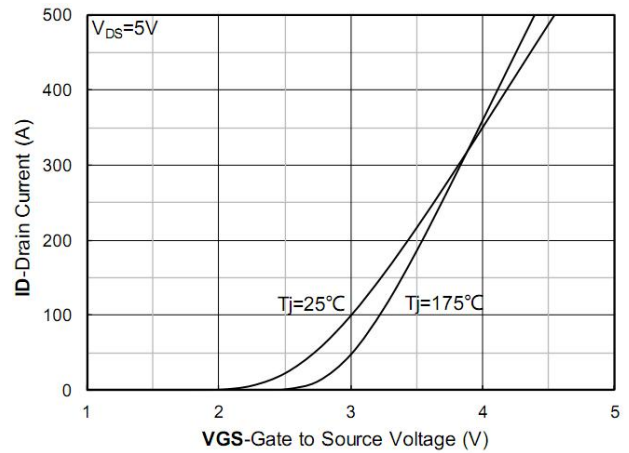


Figure 2. Transfer Characteristics; typical values

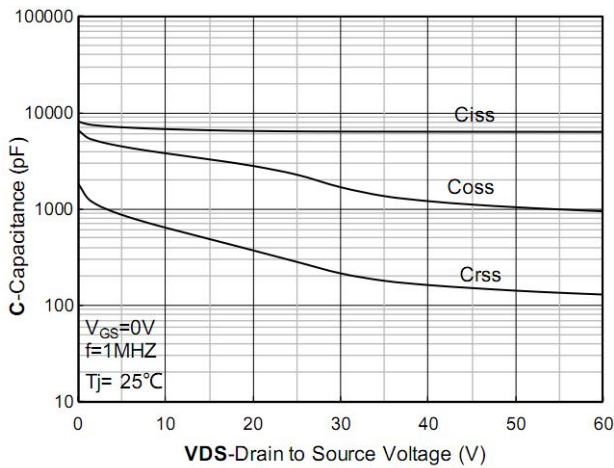


Figure 3. Capacitance Characteristics; typical values

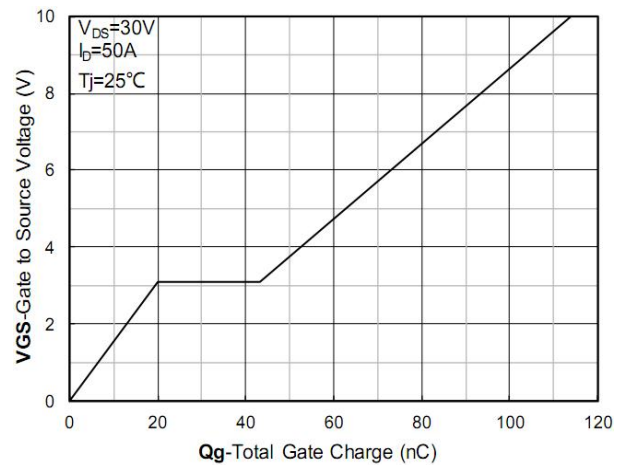


Figure 4. Gate Charge; typical values

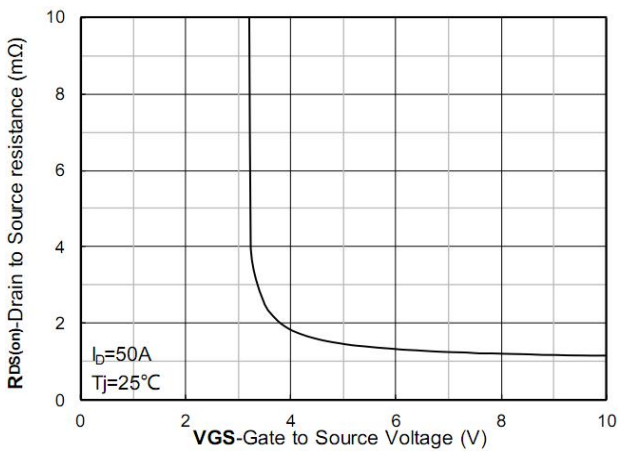


Figure 5. On-Resistance vs. Gate to Source Voltage; typical values

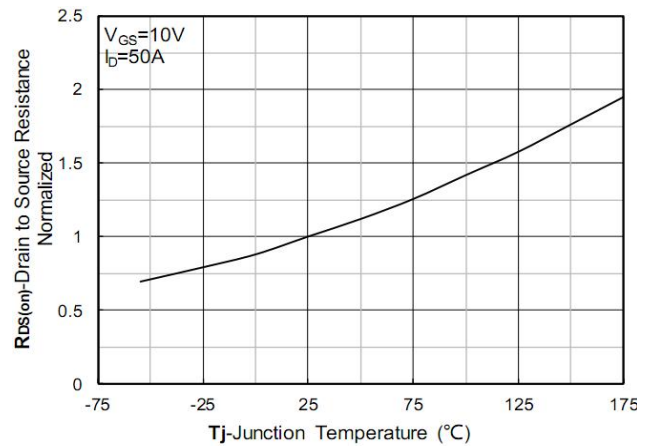


Figure 6. Normalized On-Resistance

Typical Characteristics

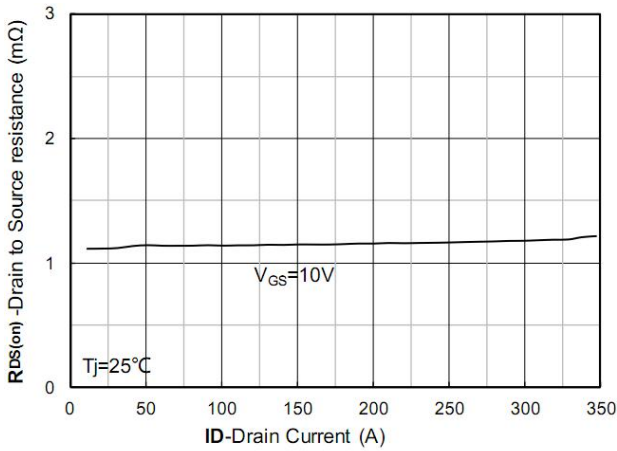


Figure 7. $R_{DS(on)}$ vs. Drain Current; typical values

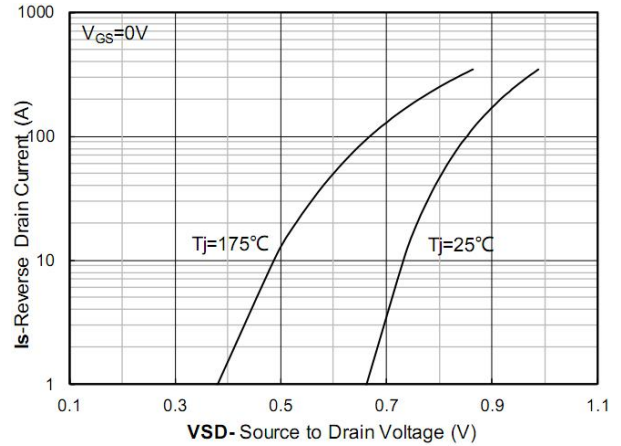


Figure 8. Forward characteristics of reverse diode; typical values

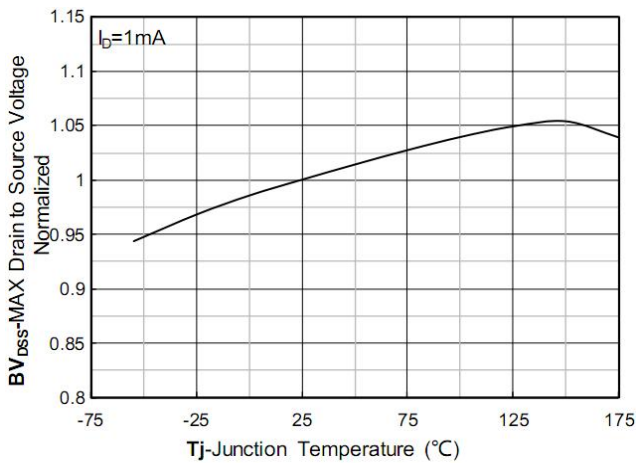


Figure 9. Normalized breakdown voltage

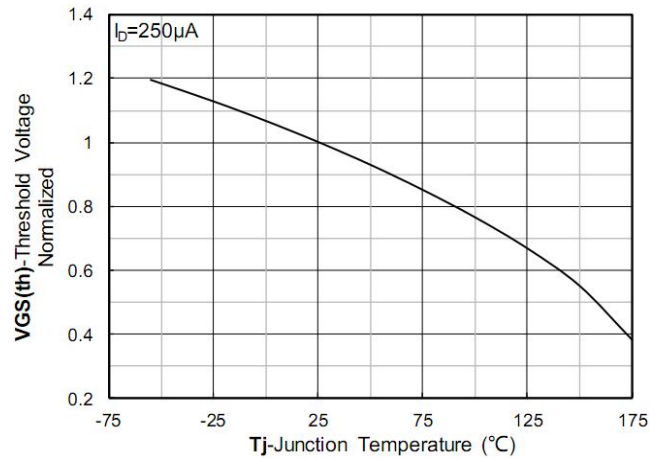


Figure 10. Normalized Threshold voltage

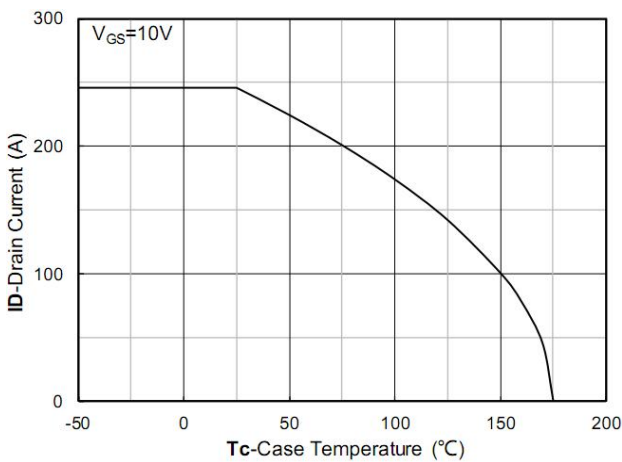


Figure 11. Current dissipation

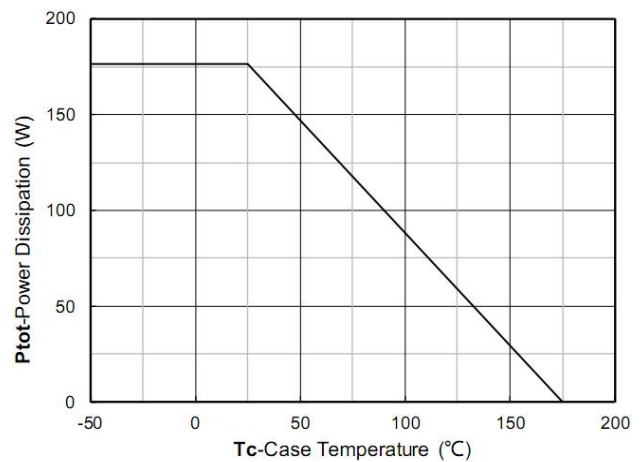


Figure 12. Power dissipation

Typical Characteristics

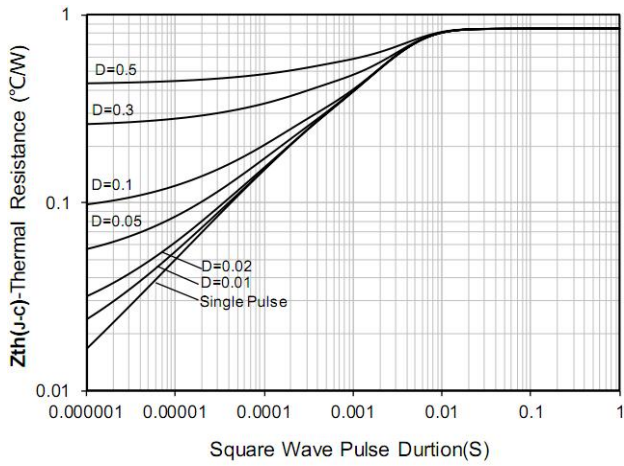


Figure 13. Maximum Transient Thermal Impedance

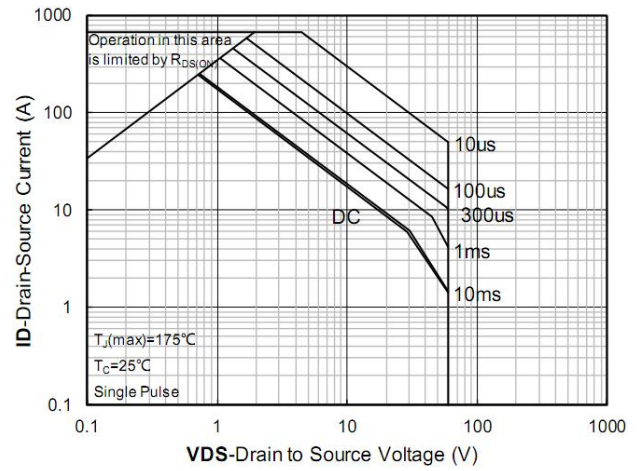
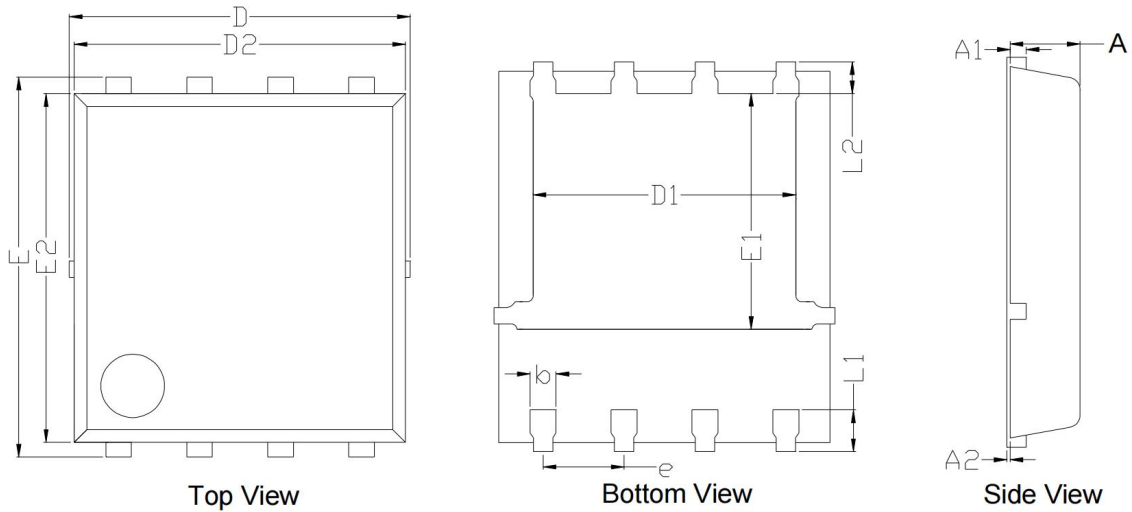


Figure 14. Safe Operation Area

PDFN5*6-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
D	5.150	5.550	0.203	0.219
E	5.950	6.150	0.234	0.242
A	0.850	1.050	0.033	0.041
A1	0.203 BSC.		0.008 BSC.	
A2	0.000	0.080	0.000	0.003
D1	4.250	4.450	0.167	0.175
E1	3.525	3.725	0.139	0.147
D2	5.200 REF.		0.205 REF.	
E2	5.550 REF.		0.219 REF.	
L1	0.450	0.650	0.018	0.026
L2	0.680 BSC.		0.027 BSC.	
b	0.300	0.500	0.012	0.020
e	1.270 BSC.		0.050 BSC.	