

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	4.4mΩ@10V	80A
	8mΩ@4.5V	

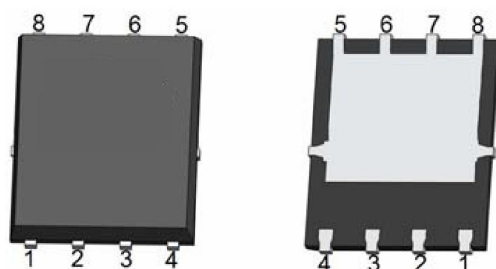
Feature

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

Application

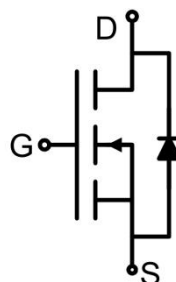
- Power switching application
- Uninterruptible power supply
- DC-DC convertor

Package

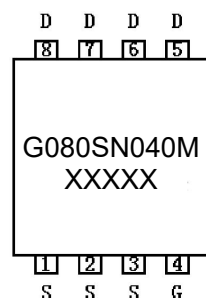


PDFN5*6-8L

Circuit diagram



Marking



Absolute maximum ratings (T_C=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	40	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current ^{1,3)} (V _{GS} =10V, Chip limitation)	I _D	80	A
Continuous Drain Current ^{1,3)} (V _{GS} =10V, T _C =100°C)	I _D (100°C)	56	A
Pulsed Drain Current (t _p ≤ 10μs)	I _{DM}	320	A
Single Pulse Avalanche Energy ²⁾	E _{AS}	60	mJ
Power Dissipation ^{1,3)}	P _D	51	W
Thermal Resistance Junction to Case	R _{θJC}	2.9	°C/W
Operating Junction Temperature	T _J	-55 ~ +175	°C
Storage Temperature Range	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 =250μA	40			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =32V, 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	1.7	2.5	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =40A		3.3	4.4	mΩ
		V _{GS} =4.5V, I _D =20A		5.8	8	
Dynamic characteristics ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V, f =1MHz		970		pF
Output Capacitance	C _{oss}			540		
Reverse Transfer Capacitance	C _{rss}			23		
Total Gate Charge	Q _g	V _{DS} =20V, V _{GS} =10V, I _D =50A		16.4		nC
Gate-Source Charge	Q _{gs}			3.3		
Gate-Drain Charge	Q _{gd}			5		
Turn-on delay time	t _{d(on)}	V _{DS} =20V, V _{GS} =10V, I _D =50A R _L =0.4Ω, R _G =3Ω		8.4		nS
Turn-on rise time	t _r			11.9		
Turn-off delay time	t _{d(off)}			18.7		
Turn-off fall time	t _f			5.8		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				50	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =40A			1.2	V
Reverse Recovery Time	T _{rr}	V _{GS} =0V, V _R =20V, I _F =50A		19.5		nS
Reverse Recovery Charge	Q _{rr}	di/dt =100A/μs		7		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) V_G=10V, R_G=25Ω, L=0.5mH, I_{AS}=15.5A.
- 3) Thermal resistance from junction to soldering point (on the exposed drain pad).
- 4) Guaranteed by design, not subject to production.

Typical Characteristics

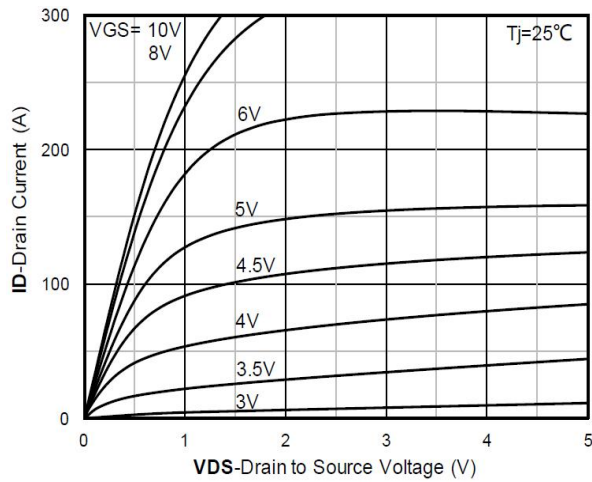


Figure 1. Output Characteristics

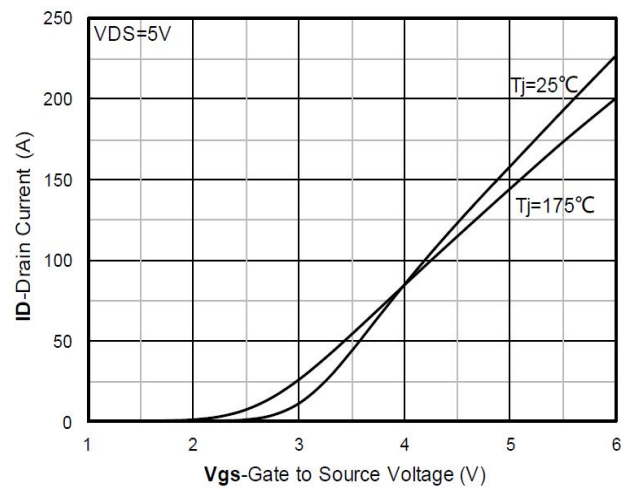


Figure 2. Transfer Characteristics

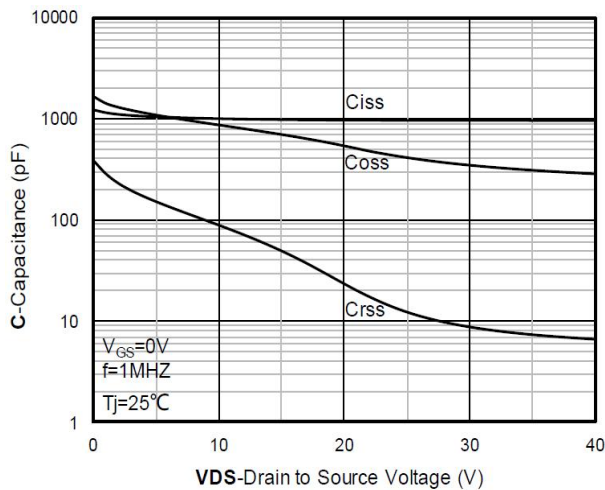


Figure 3. Capacitance Characteristics

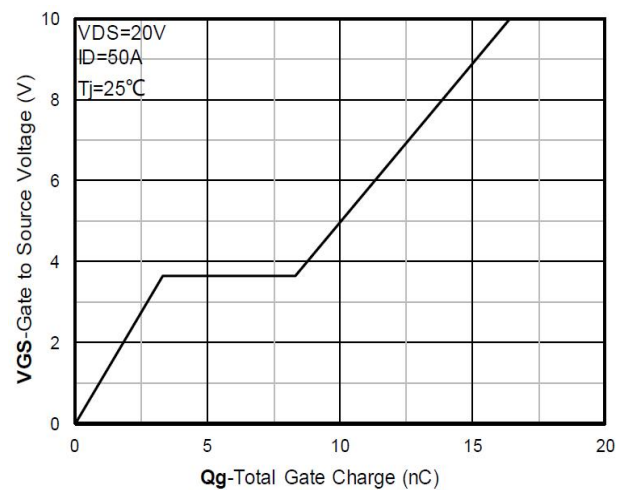


Figure 4. Gate Charge

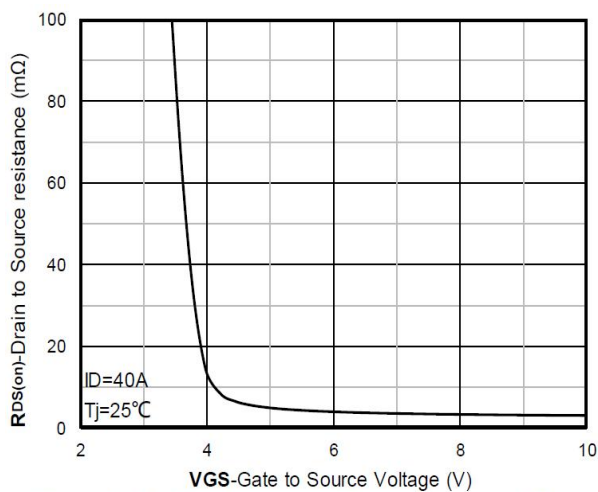


Figure 5. On-Resistance vs Gate to Source Voltage

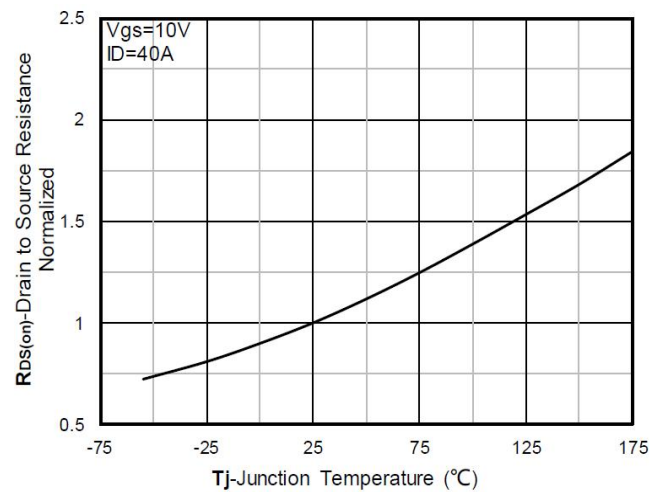


Figure 6. Normalized On-Resistance

Typical Characteristics

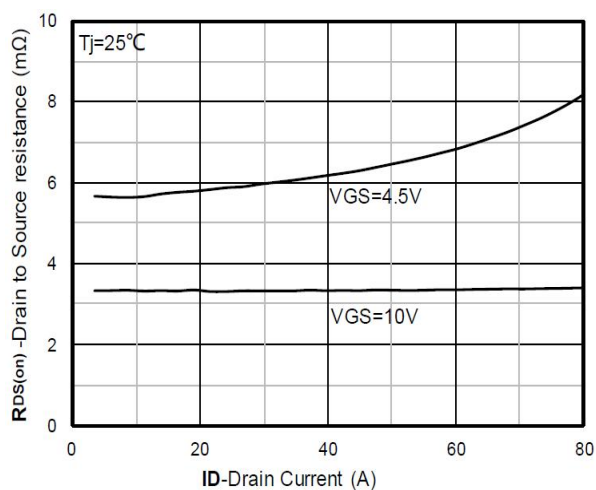


Figure 7. $R_{DS(on)}$ VS Drain Current

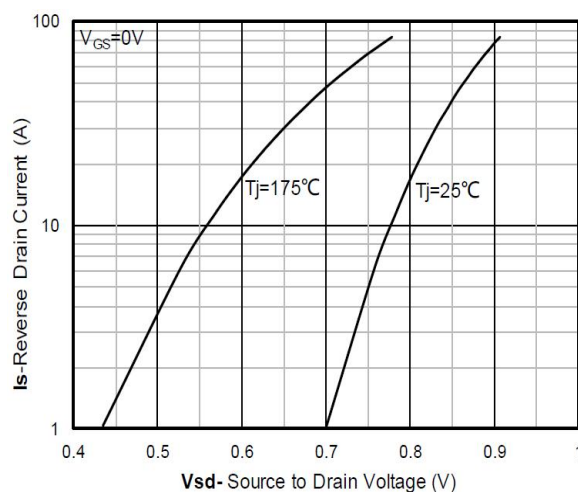


Figure 8. Forward characteristics of reverse diode

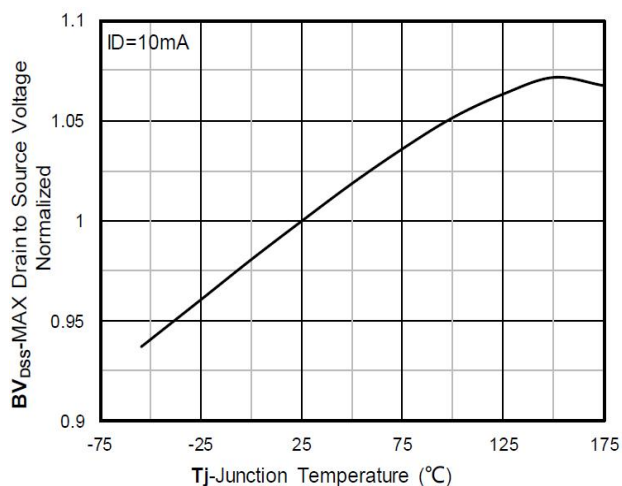


Figure 9. Normalized breakdown voltage

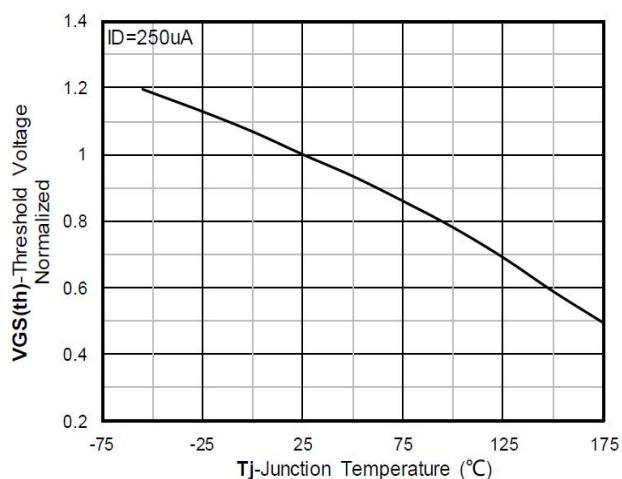


Figure 10. Normalized Threshold voltage

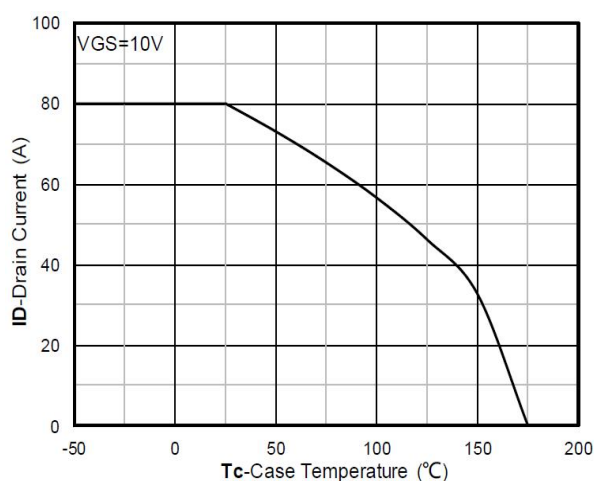


Figure 11. Current dissipation

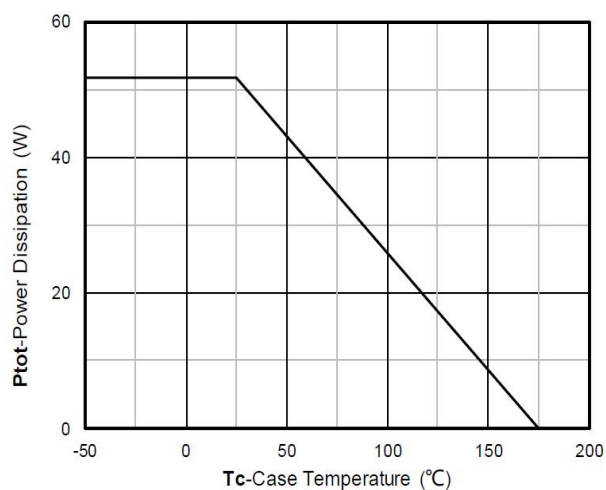


Figure 12. Power dissipation

Typical Characteristics

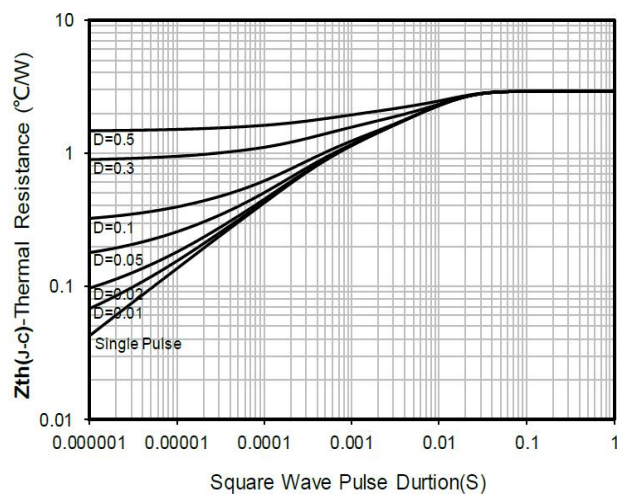


Figure 13. Maximum Transient Thermal Impedance

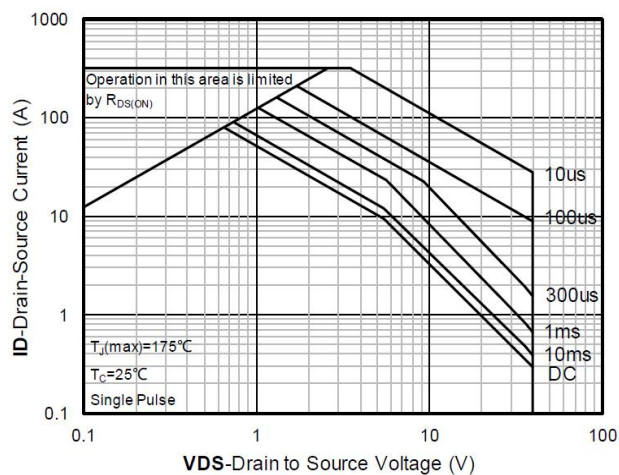
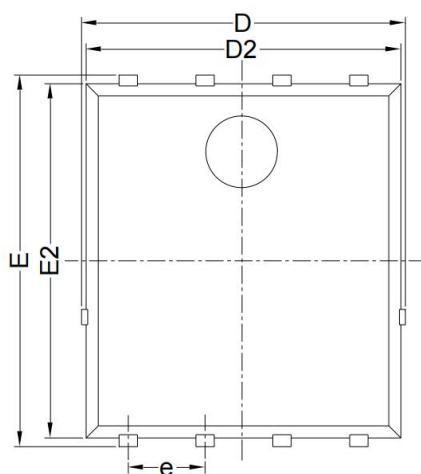
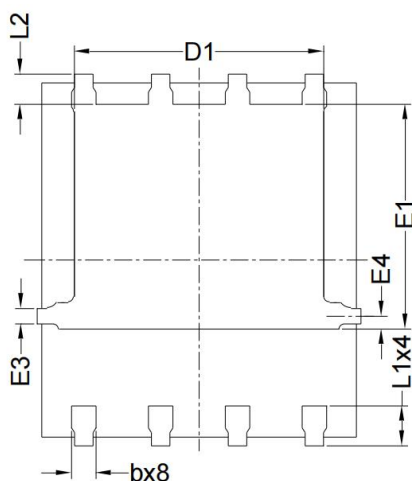


Figure 14. Safe Operation Area

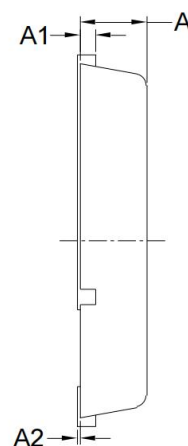
PDFN5*6-8L Package Information



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.	