

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	3.1mΩ@10V	125A

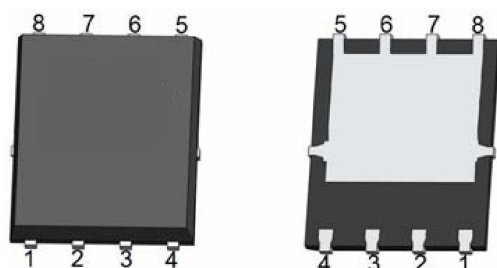
Feature

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

Application

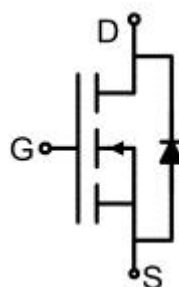
- Power switching application
- Uninterruptible power supply

Package

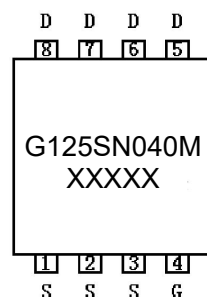


PDFN5*6-8L

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)	I _D	125	A
Continuous Drain Current ^{1,3)} (V _{GS} =10V, T _c =100°C)	I _D (100°C)	88	A
Pulsed Drain Current (tp ≤ 10μs)	I _{DM}	450	A
Single Pulse Avalanche Energy ²⁾	E _{AS}	156	mJ
Power Dissipation ^{1,3)}	P _D	83	W
Thermal Resistance Junction to Case	R _{θJC}	1.8	°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 =1mA	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	2	3	4	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A		2.4	3.1	mΩ
Dynamic characteristics ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f =1MHz		2120		pF
Output Capacitance	C _{oss}			1090		
Reverse Transfer Capacitance	C _{rss}			106		
Total Gate Charge	Q _g	V _{DS} =20V, V _{GS} =10V, I _D =40A		38		nC
Gate-Source Charge	Q _{gs}			10		
Gate-Drain Charge	Q _{gd}			12.5		
Turn-on delay time	t _{d(on)}	V _{DS} =20V, V _{GS} =4.5V, I _D =40A R _G =1Ω		14.2		nS
Turn-on rise time	t _r			12.6		
Turn-off delay time	t _{d(off)}			23.9		
Turn-off fall time	t _f			11.3		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				125	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =20A			1.2	V
Reverse Recovery Time	T _{rr}	V _{GS} =0V, V _R =20V, I _F =40A di/dt =100A/μs		45		nS
Reverse Recovery Charge	Q _{rr}			40		nC

Notes:

- 1) The entire application environment impacts the thermal resistance values shown, they are not constant and are only valid for the particular conditions noted.
- 2) T_J=25°C, V_{GS}=10V, R_G=25Ω, L=0.5mH, I_{AS}=25A.
- 3) Thermal resistance from junction to soldering point (on the exposed drain pad).
- 4) Guaranteed by design, not subject to production.

Typical Characteristics

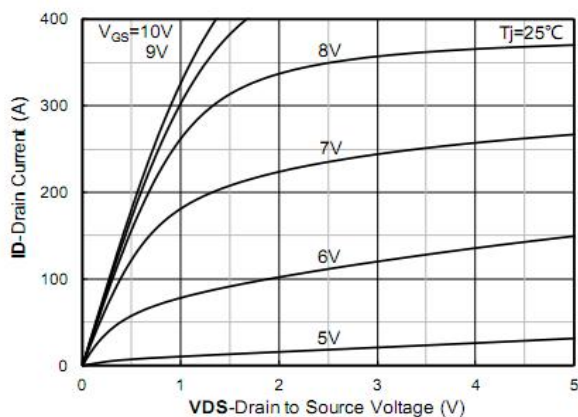


Figure 1. Output Characteristics; typical values

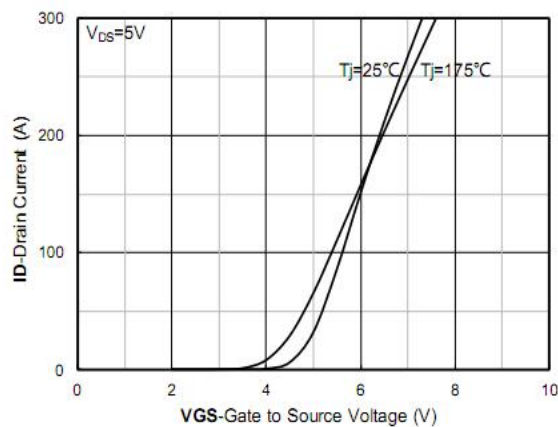


Figure 2. Transfer Characteristics; typical values

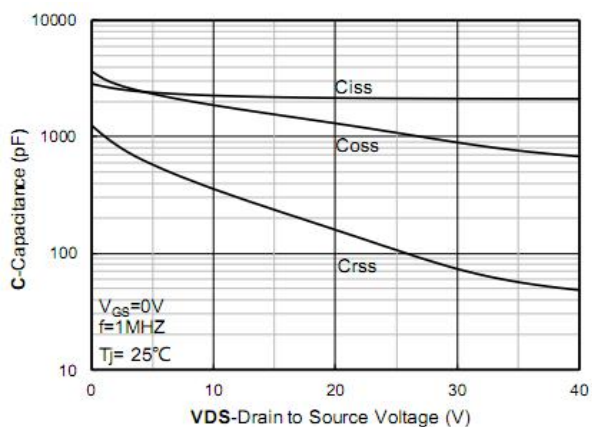


Figure 3. Capacitance Characteristics; typical values

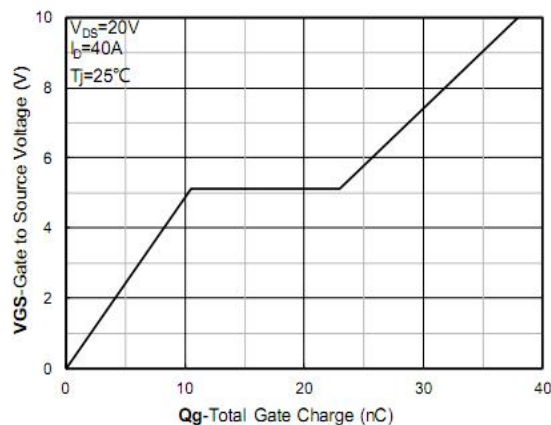


Figure 4. Gate Charge; typical values

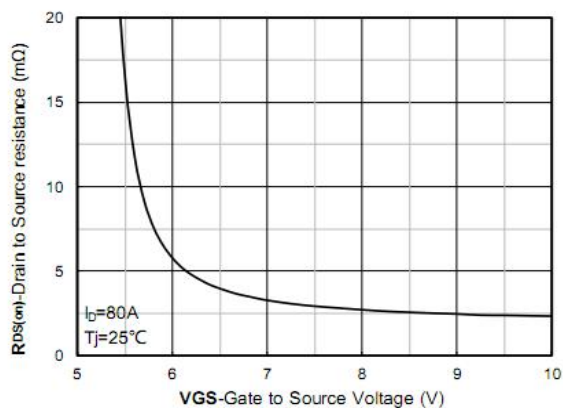


Figure 5. On-Resistance vs Gate to Source Voltage; typical values

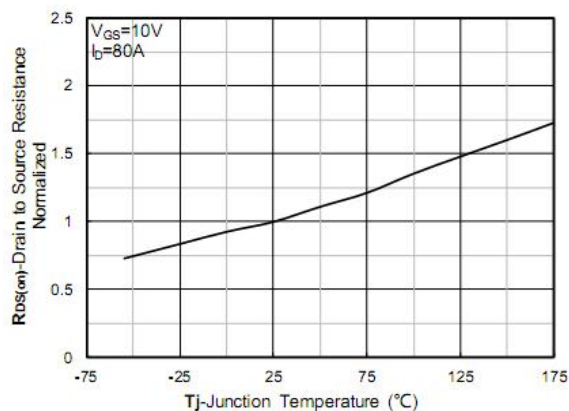


Figure 6. Normalized On-Resistance

Typical Characteristics

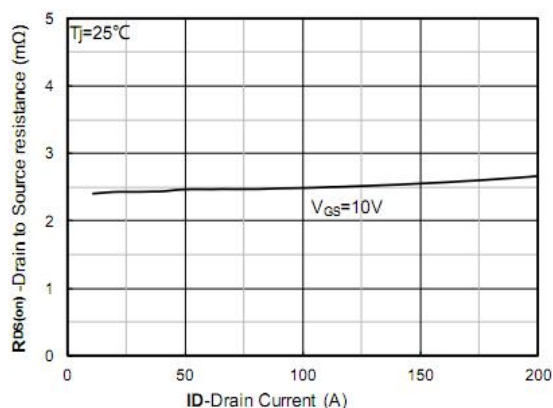


Figure 7. $R_{DS(on)}$ VS Drain Current; typical values

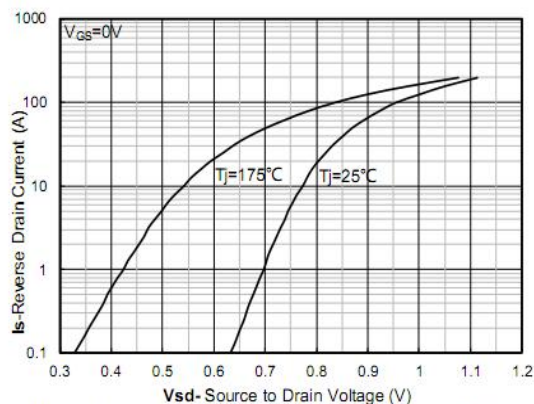


Figure 8. Forward characteristics of reverse diode; typical values

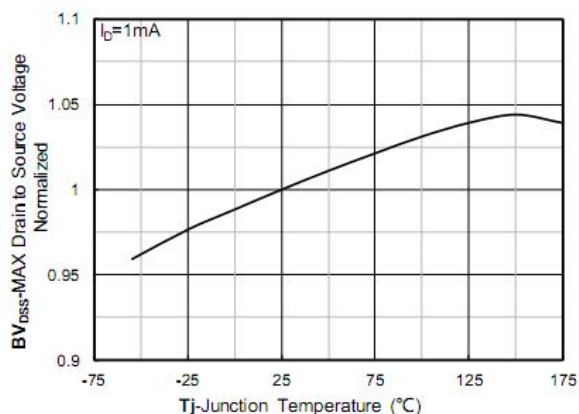


Figure 9. Normalized breakdown voltage

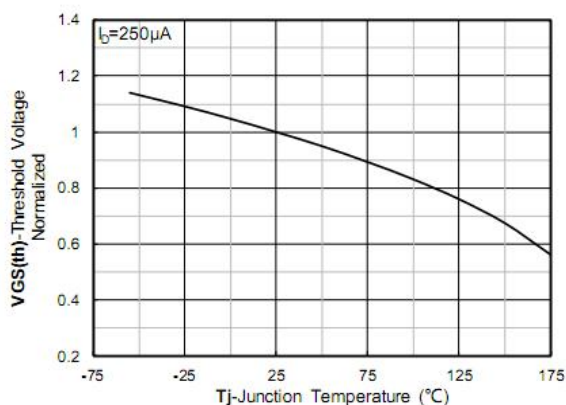


Figure 10. Normalized Threshold voltage

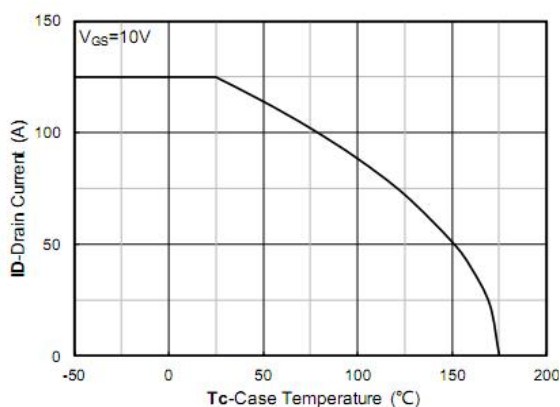


Figure 11. Current dissipation

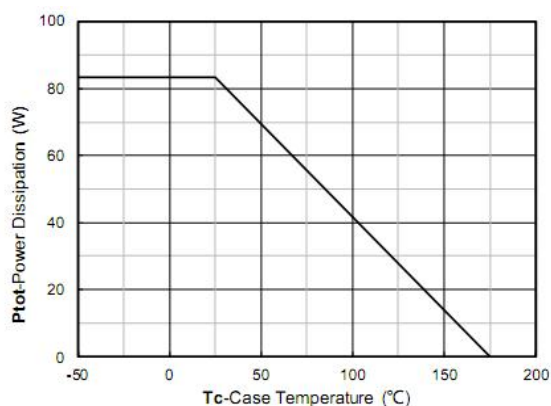


Figure 12. Power dissipation

Typical Characteristics

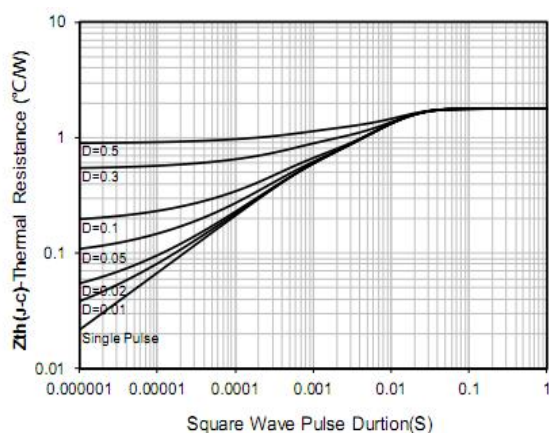


Figure 13. Maximum Transient Thermal Impedance

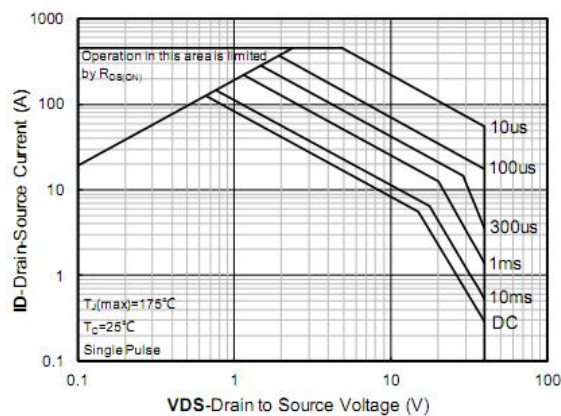
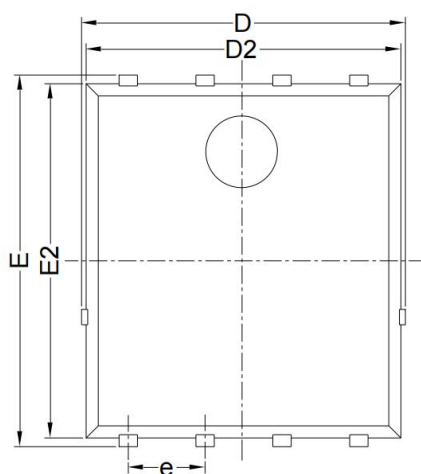
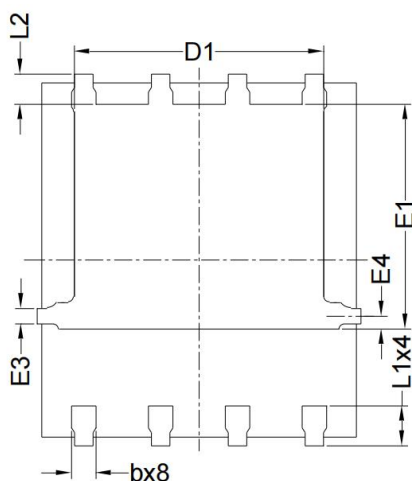


Figure 14. Safe Operation Area

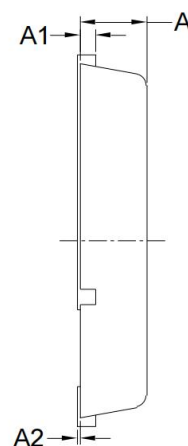
PDFN5*6-8L Package Information



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.	