ANBONSEMI
INNOVATOR IN SEMICONDUCTOR

AG150SN040MQPF-Q1

N-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	2.0mΩ@10V	150A
	3.9mΩ@4.5V	

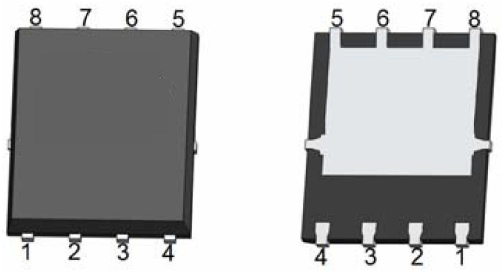
Feature

- 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

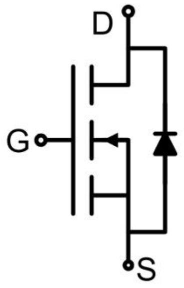
- Power switching application
- Uninterruptible power supply
- DC-DC converter

Package

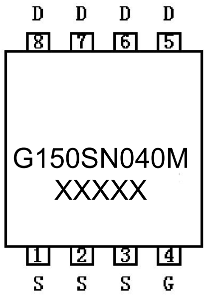


PDFN5*6-8L

Circuit diagram



Marking



Absolute maximum ratings (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current$^{1,3)}$ (T_C =25℃)	I_D	150	A
Continuous Drain Current$^{1,3)}$ (T_C =100℃)	I_D(100℃)	106	A
Pulsed Drain Current (T_C =25℃, t_p=100μs)	I_{DM}	600	A
Power Dissipation$^{1,3)}$ (T_C =25℃)	P_D	88	W
Thermal Resistance,Junction-to-Ambient$^{2)}$	$R_{θJA}$	55	℃/W
Thermal Resistance,Junction-to-Case	$R_{θJC}$	1.7	℃/W
Single pulse avalanche energy$^{4)}$	E_{AS}	169	mJ
Junction Temperature	T_J	175	℃
Storage Temperature	T_{STG}	-55 ~ +175	℃

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} =40V,V_{GS} = 0V			1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1.1	1.7	2.2	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =50A		1.6	2.0	mΩ
		V_{GS} =4.5V, I_D =20A		2.7	3.9	
Gate resistance	R_G	F =1.0MHz		1.8		Ω
Dynamic characteristics$^{5)}$						
Input Capacitance	C_{iss}	V_{DS} =20V, V_{GS} =0V, f =1MHz		2255		pF
Output Capacitance	C_{oss}			970		
Reverse Transfer Capacitance	C_{rss}			43		
Total Gate Charge	Q_g	V_{DS} =20V, V_{GS} =10V, I_D =70A		44.6		nC
Gate-Source Charge	Q_{gs}			8.4		
Gate-Drain Charge	Q_{gd}			11.4		
Turn-on delay time	$t_{d(on)}$	V_{DD}=20V, V_{GS}=10V, I_D=40A, R_{GEN}=2.2Ω		12.5		nS
Turn-on rise time	t_r			172		
Turn-off delay time	$t_{d(off)}$			36		
Turn-off fall time	t_f			15.4		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				150	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S=50A			1.2	V
Reverse Recovery Time	t_{rr}	I_F =30A,di/dt = 220A/μs		31		nS
Reverse Recovery Charge	Q_{rr}			25		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) The value of RθJA is measured with the device mounted on the 40mm*40mm*1.1mm single layer FR-4 PCB board with 1 in2 pad of 2oz. Copper, in the still air environment with TA =25℃.The maximum allowed junction temperature of 175℃. The value in any given application depends on the user's specific board design.

3) Thermal resistance from junction to soldering point (on the exposed drain pad).

4) VG=10V, RG=25Ω, L=0.5mH, IAS=26A.

5) Guaranteed by design, not subject to production testing.

Typical Characteristics

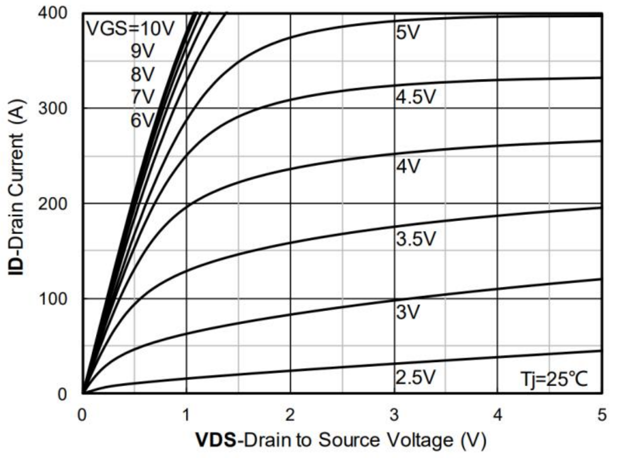


Figure 1. Output Characteristics

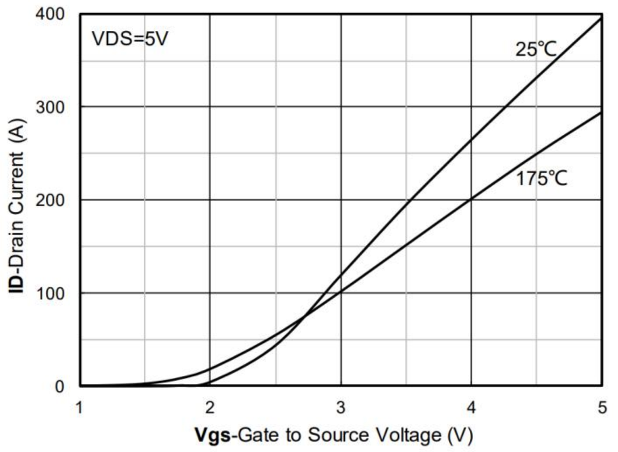


Figure 2. Transfer Characteristics

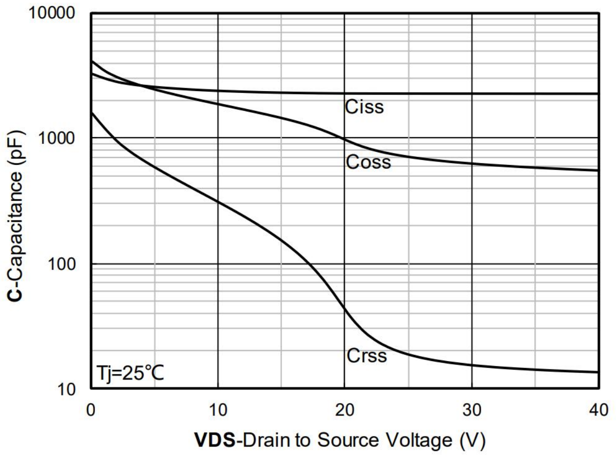


Figure 3. Capacitance Characteristics

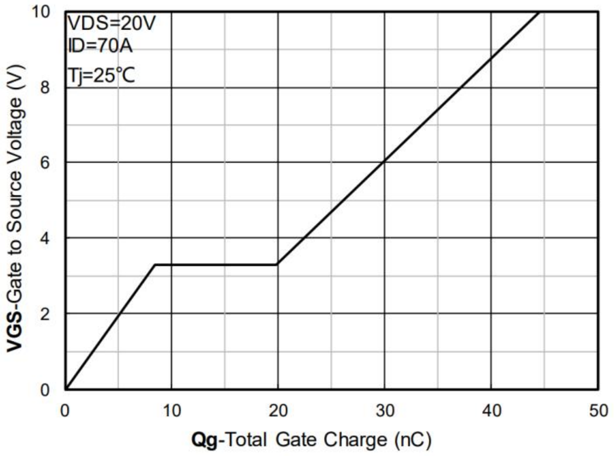


Figure 4. Gate Charge

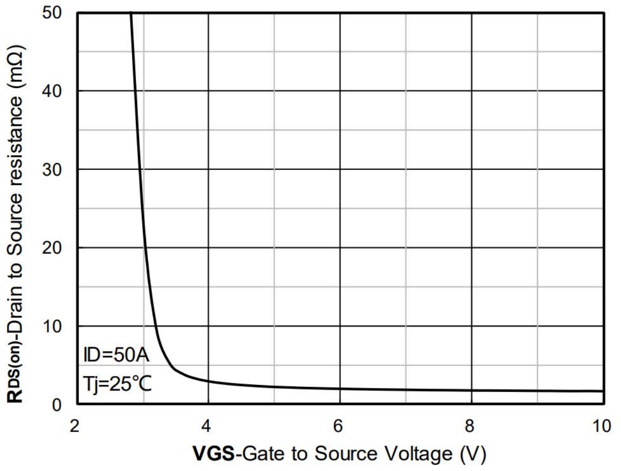


Figure 5. On-Resistance vs Gate to Source Voltage

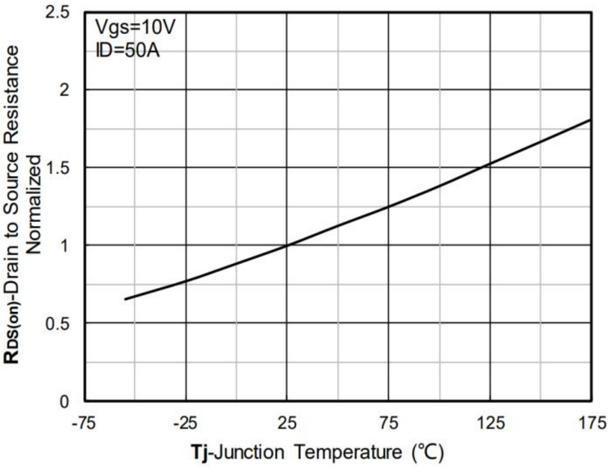


Figure 6. Normalized On-Resistance

Typical Characteristics

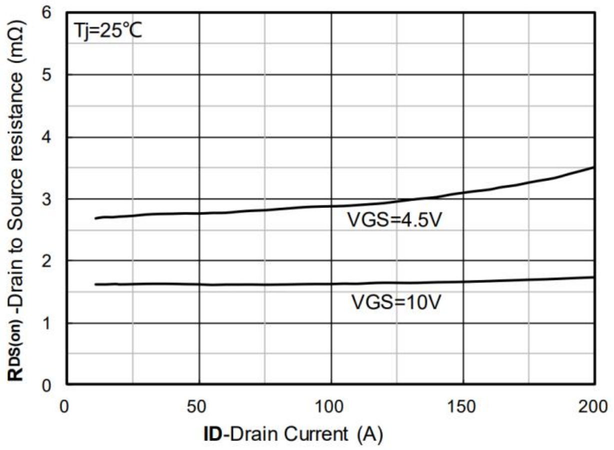


Figure 7. RDS(on) VS Drain Current

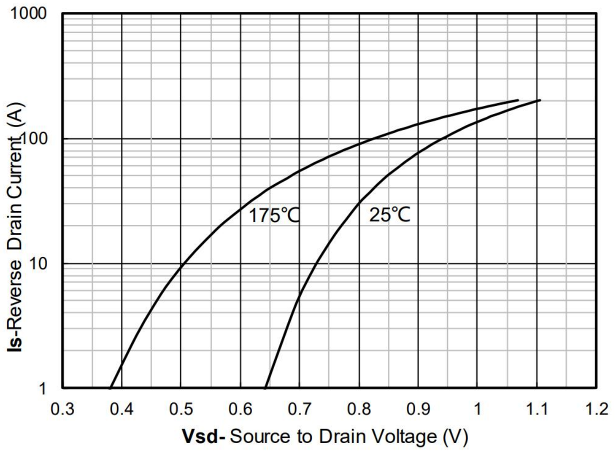


Figure 8. Forward characteristics of reverse diode

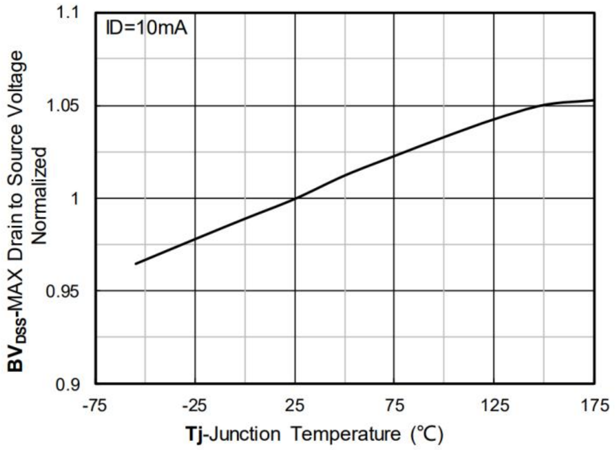


Figure 9. Normalized breakdown voltage

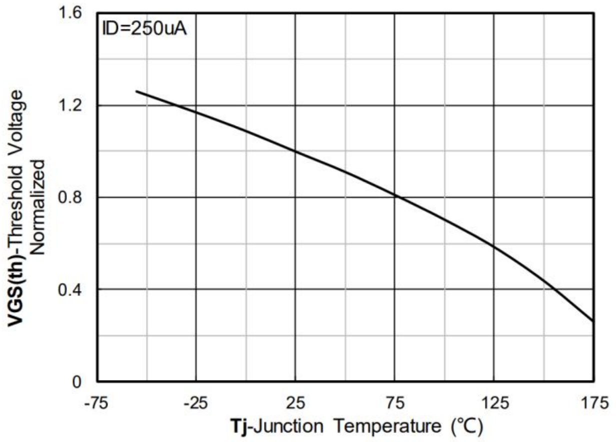


Figure 10. Normalized Threshold voltage

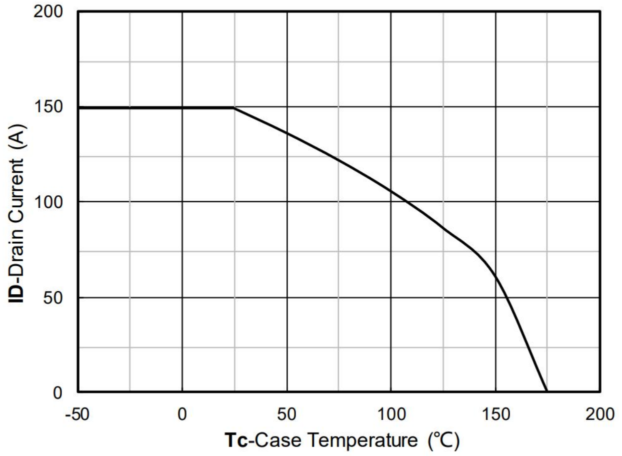


Figure 11. Current dissipation

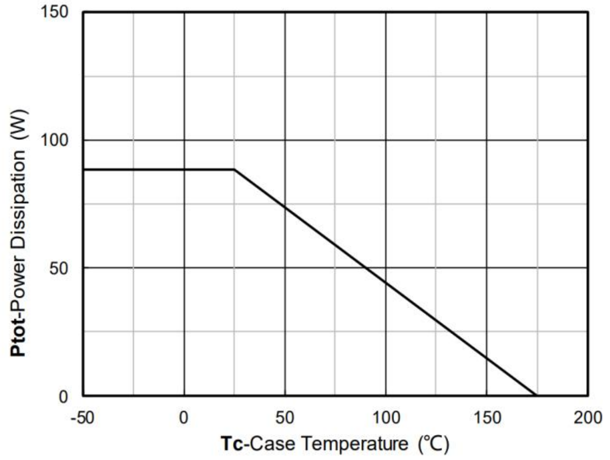


Figure 12. Power dissipation

Typical Characteristics

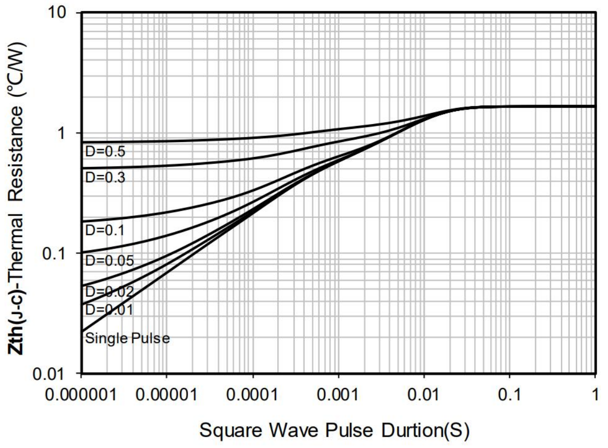


Figure 13. Maximum Transient Thermal Impedance

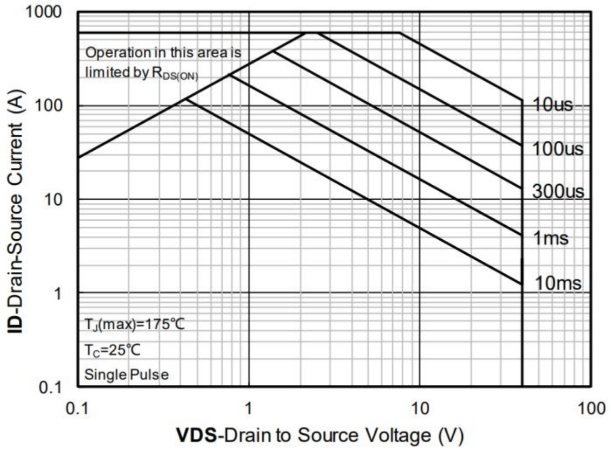
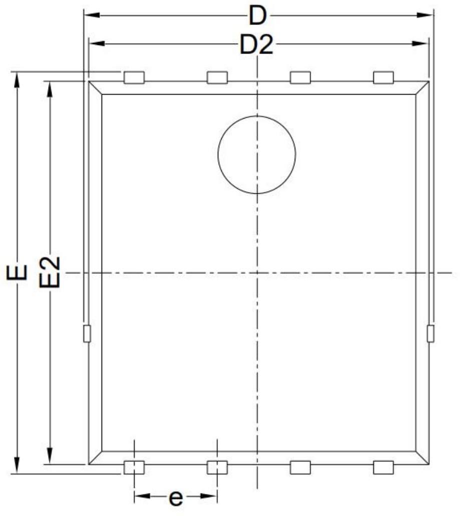
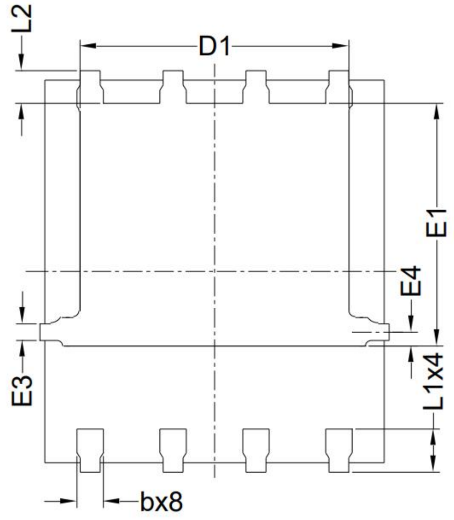


Figure 14. Safe Operation Area

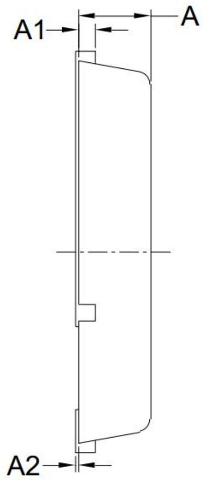
PDFN5*6-8L Package Information



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	