AG050DN060MQPF-Q1

Dual N-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
60V	8.5mΩ@10V	50A
	11mΩ@4.5V	

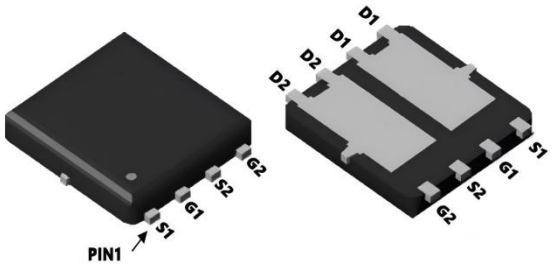
Feature

- 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 management functions
- Industrial and motor drive application
- DC-DC convertor

Package



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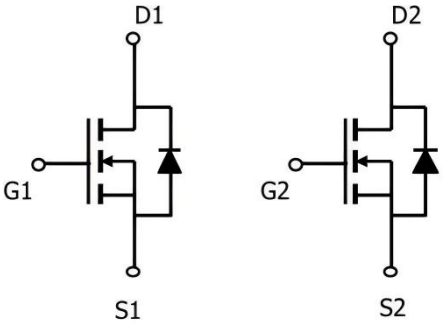
Circuit diagram



Marking

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current(T_C =25℃)	I_D	50	A
Continuous Drain Current(T_C =100℃)	I_D (100℃)	31	A
Pulsed Drain Current[1]	I_{DM}	200	A
Single Pulse Avalanche Energy[2]	E_{AS}	162	mJ
Power Dissipation[3] (T_C =25℃)	P_D	56	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	2.2	℃/W
Operating Junction Temperature	T_J	-55 ~ +150	℃
Storage Temperature Range	T_{STG}	-55 ~ +150	℃

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	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	1.8	2.5	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =20A		6.5	8.5	mΩ
		V_{GS} =4.5V, I_D =10A		8	11	
Dynamic characteristics[4]						
Input Capacitance	C_{iss}	V_{DS} =30V, V_{GS} =0V, f =1MHz		1930		pF
Output Capacitance	C_{oss}			400		
Reverse Transfer Capacitance	C_{rss}			6		
Total Gate Charge	Q_g	V_{DS} =30V, V_{GS} =10V, I_D =25A		30.4		nC
Gate-Source Charge	Q_{gs}			6.6		
Gate-Drain Charge	Q_{gd}			5		
Turn-on delay time	$t_{d(on)}$	V_{DS} =30V, V_{GS} =10V, I_D =25A R_G =2.2Ω		13.7		nS
Turn-on rise time	t_r			62		
Turn-off delay time	$t_{d(off)}$			25		
Turn-off fall time	t_f			4.4		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				50	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S =20A			1.2	V
Reverse Recovery Time	T_{rr}	I_F =25A, di/dt =-100A/μs		38		nS
Reverse Recovery Charge	Q_{rr}			38		nC

Notes:

1) Repetitive rating; pulse width limited by max. junction temperature.

2) T_J =25℃, V_G =10V, R_G =25Ω, L =1mH, I_{AS} =18A.

3) Pd is based on max. junction temperature, using junction-case and junction-ambient thermal resistance.

4) Guaranteed by design,not subject to production.

Typical Characteristics

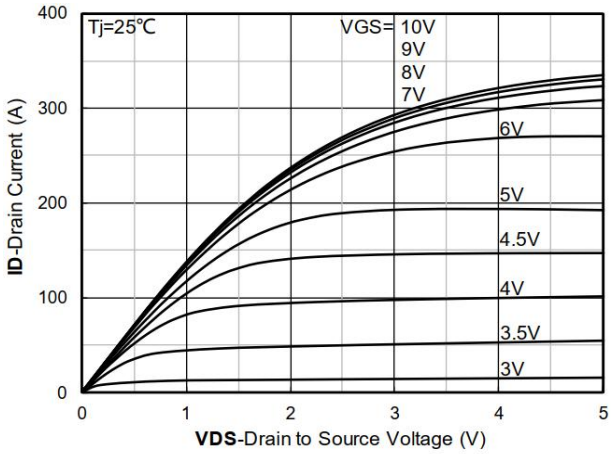


Figure 1. Output Characteristics

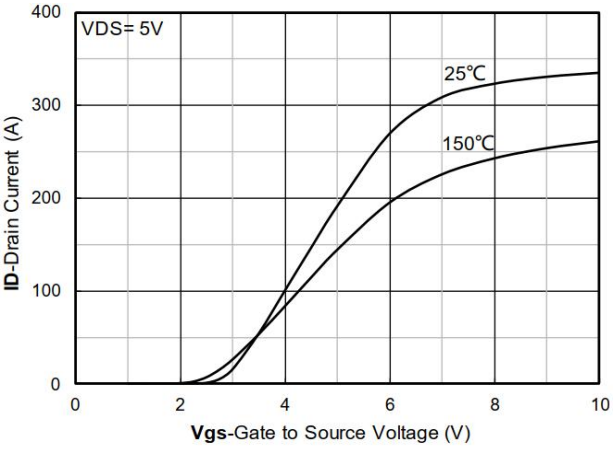


Figure 2. Transfer Characteristics

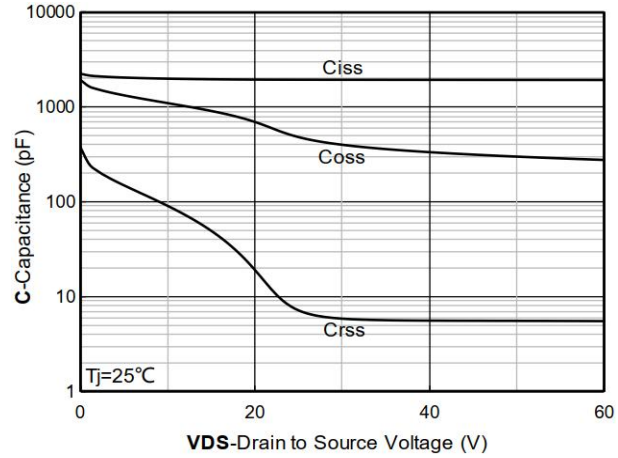


Figure 3. Capacitance Characteristics

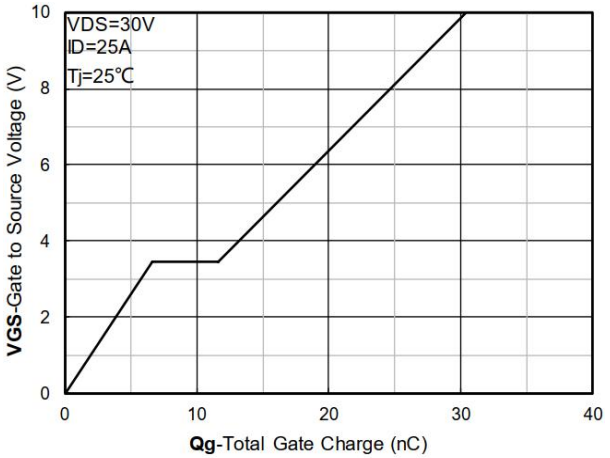


Figure 4. Gate Charge

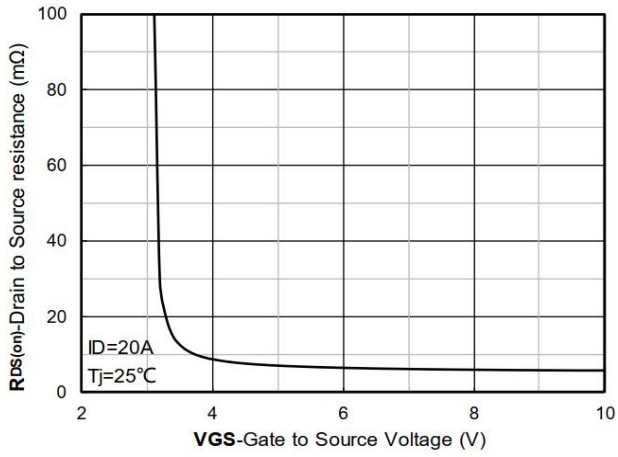


Figure 5. On-Resistance vs Gate to Source Voltage

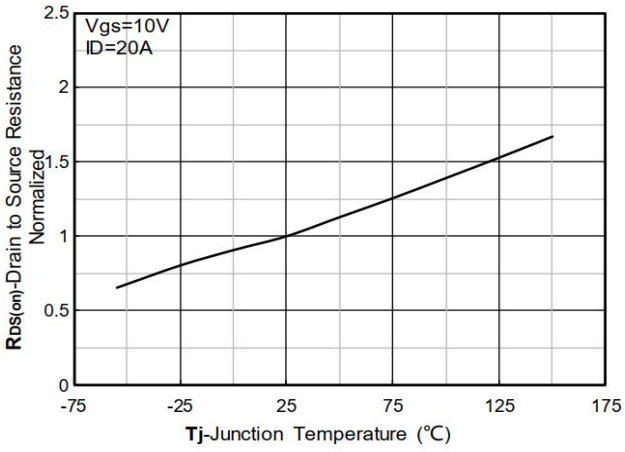


Figure 6. Normalized On-Resistance

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AS-1151470	2023/12/30	2026/05/13	B1	6

Typical Characteristics

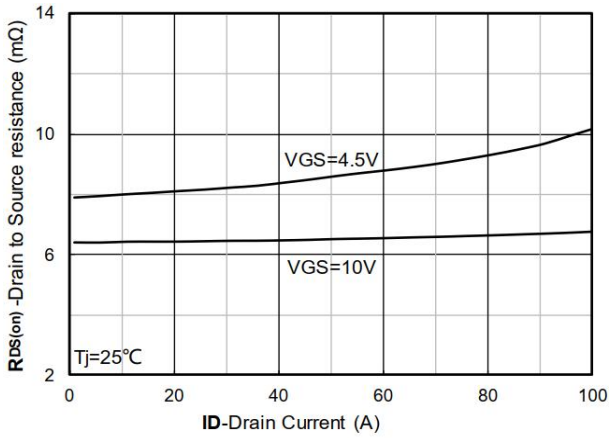


Figure 7. $R_{DS(on)}$ VS Drain Current

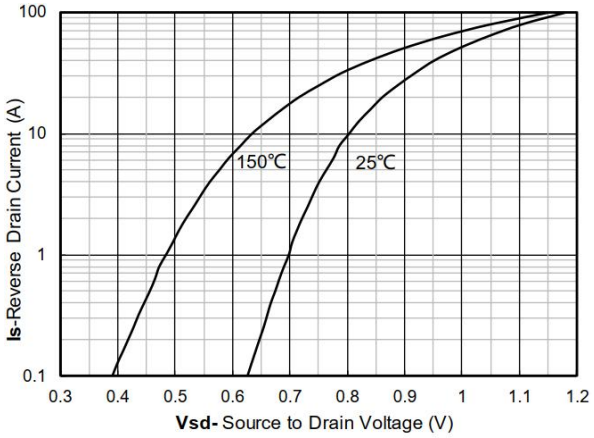


Figure 8. Forward characteristics of reverse diode

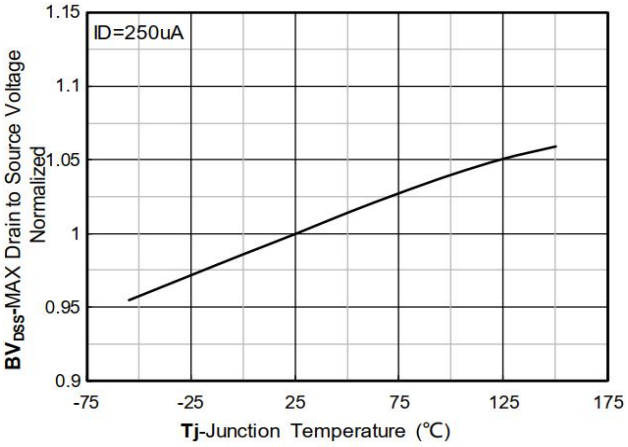


Figure 9. Normalized breakdown voltage

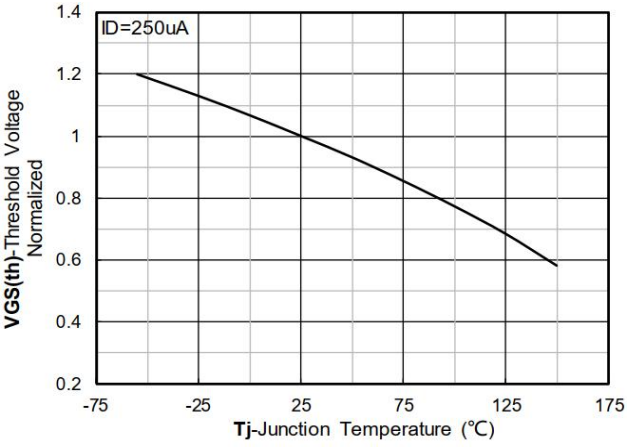


Figure 10. Normalized Threshold voltage

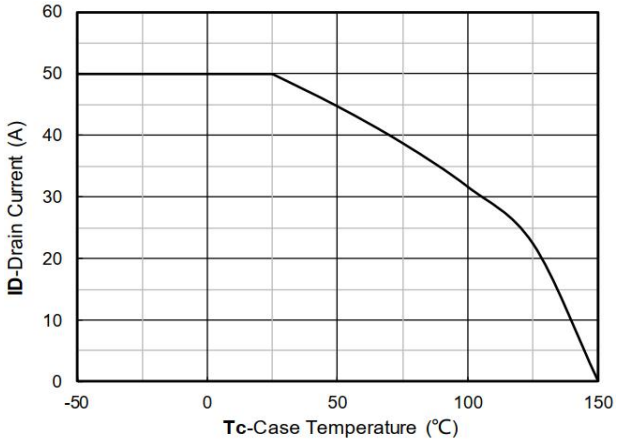


Figure 11. Current dissipation

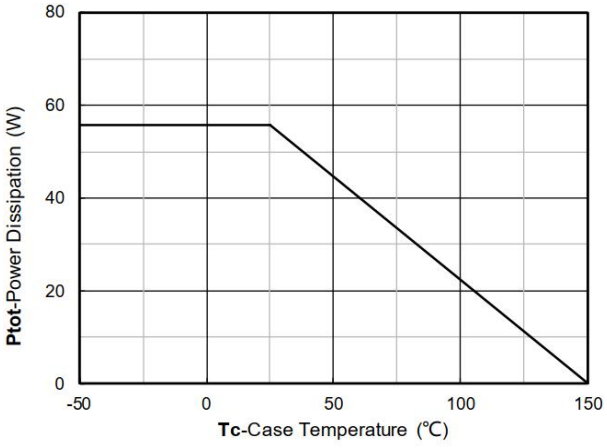


Figure 12. Power dissipation

Typical Characteristics

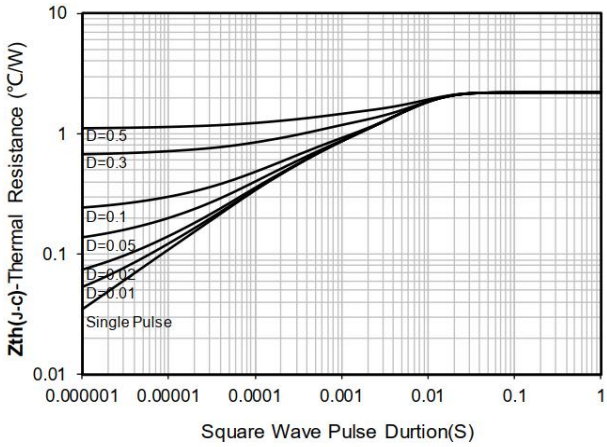


Figure 13. Maximum Transient Thermal Impedance

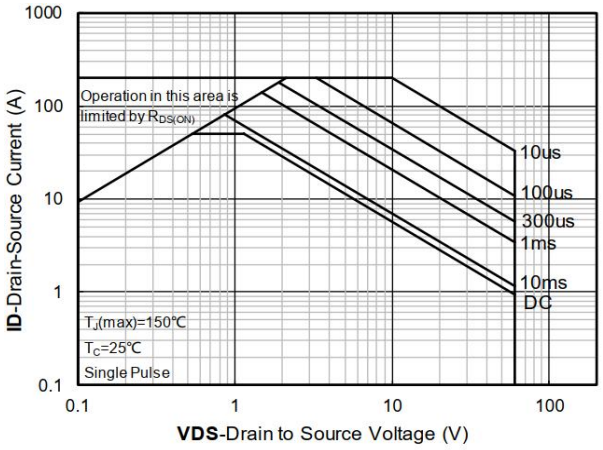
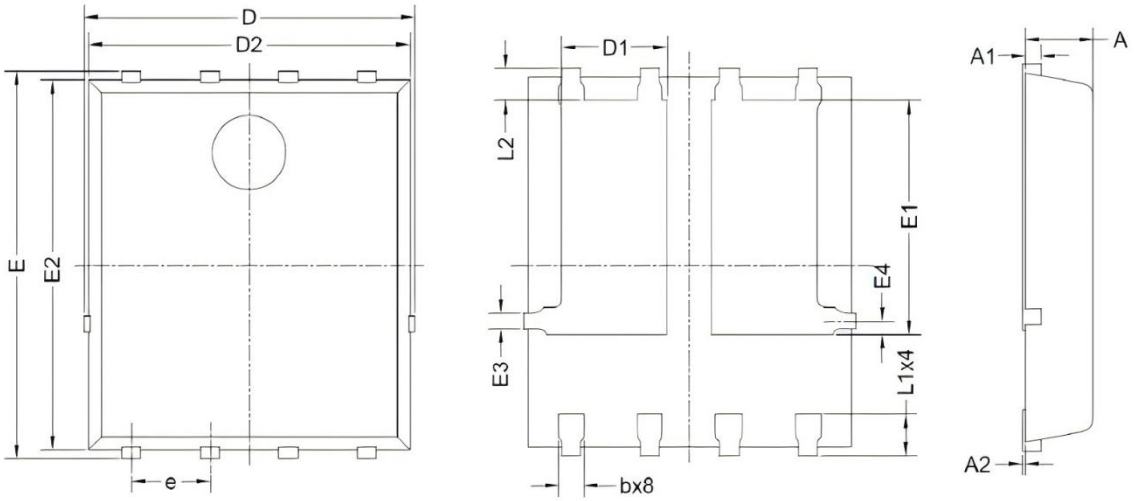


Figure 14. Safe Operation Area

PDFN5*6-8L Package Information



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	1.500	1.900	0.059	0.075
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.	