AG040SN100MNK-Q1

N-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
100V	18.5mΩ@10V	40A
	22.5mΩ@4.5V	

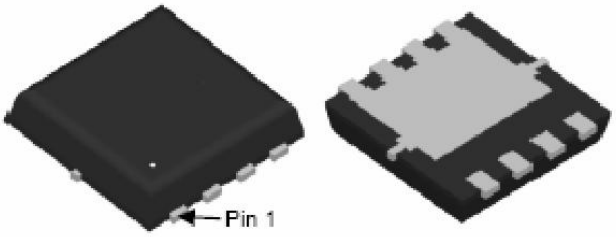
Feature

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

Application

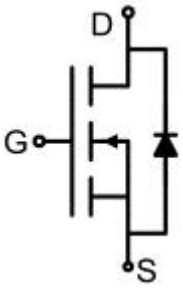
- Consumer electronic power supply
- DC/DC converter
- Synchronous-rectification
- Motor control
- Invertors

Package

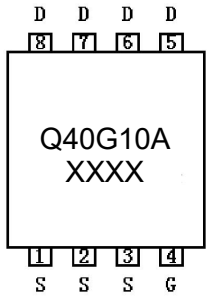


DFN3.3*3.3-8L

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (T_C =25ºC)	I_D	40	A
Continuous Drain Current (T_C =100 ºC)	I_D (100 ºC)	25.3	A
Pulsed Drain Current[1)]	I_{DM}	160	A
Avalanche Energy[2)]	E_{AS}	81	mJ
Power Dissipation[3)] (T_C =25ºC)	P_D	43	W
Thermal Resistance,Junction-to-Ambient[4)]	$R_{\theta JA}$	55	℃/W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	2.9	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_J=25 ºC, 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	100			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =100V,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	1.0	1.8	2.5	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =20A		15	18.5	mΩ
		V_{GS} =4.5V, I_D =20A		18	22.5	
Dynamic characteristics[5)]						
Input Capacitance	C_{iss}	V_{DS} =50V,V_{GS} =0V,f =1MHz		1051		pF
Output Capacitance	C_{oss}			399		
Reverse Transfer Capacitance	C_{rss}			18		
Total Gate Charge	Q_g	V_{DS} =50V,V_{GS} =10V, I_D =25A		16		nC
Gate-Source Charge	Q_{gs}			5.6		
Gate-Drain Charge	Q_{gd}			2.4		
Gate Resistance	Rg	f=1MHz, Open drain		1		Ω
Turn-on delay time	$t_{d(on)}$	V_{DD}=50V,V_{GS}=10V, I_D =25A,R_{GEN}=2.2Ω		39.2		nS
Turn-on rise time	t_r			11		
Turn-off delay time	$t_{d(off)}$			53.2		
Turn-off fall time	t_f			15.8		
Source-Drain Diode characteristics						
Diode Forward Current	Is				40	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S=20A			1.3	V
Reverse Recovery Time	t_{rr}	I_F =20A,di/dt = 100A/μs		39.8		nS
Reverse Recovery Charge	Q_{rr}			42		nC

Notes:

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

2) V_{DD}=50V, R_G=25Ω, L=2mH,I_{AS}=9A.

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

4) The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C. The Power dissipation PDSM is based on $R_{\theta JA}$ t≤ 10s and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.

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

Typical Characteristics

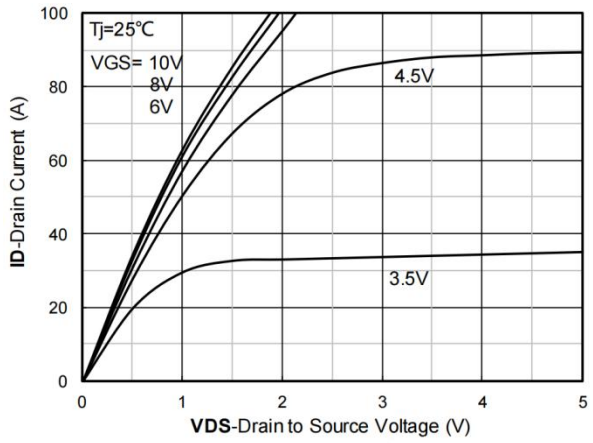


Figure1. Output Characteristics

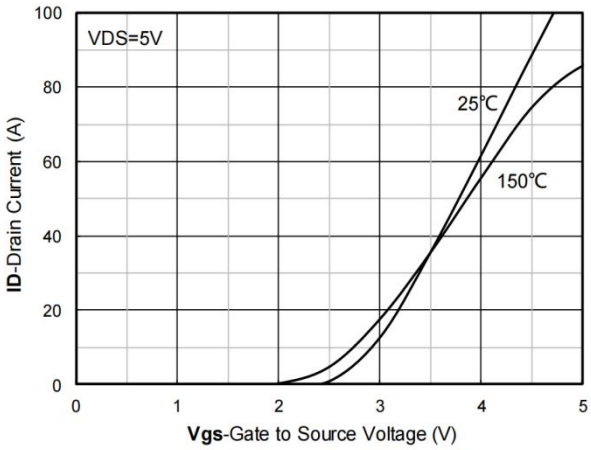


Figure2. Transfer Characteristics

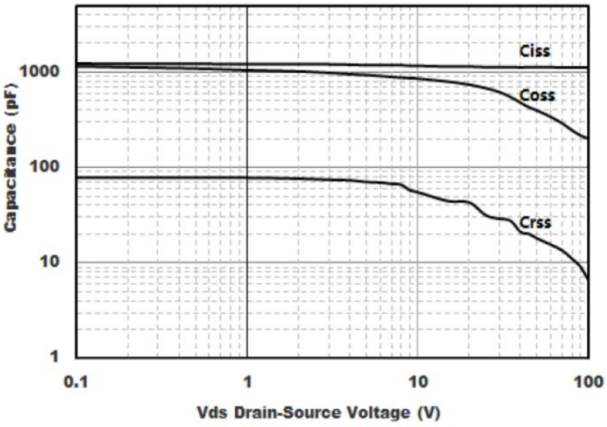


Figure3. Capacitance Characteristics

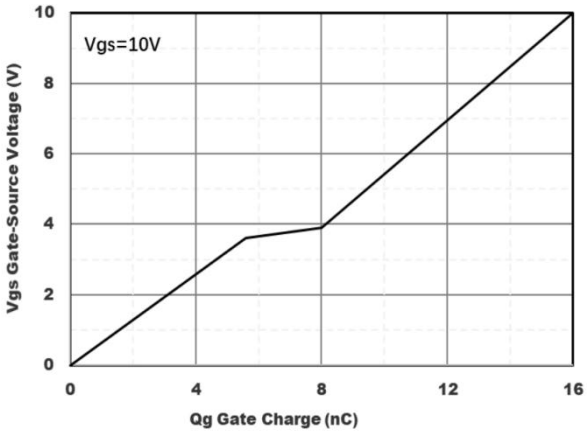


Figure4. Gate Charge

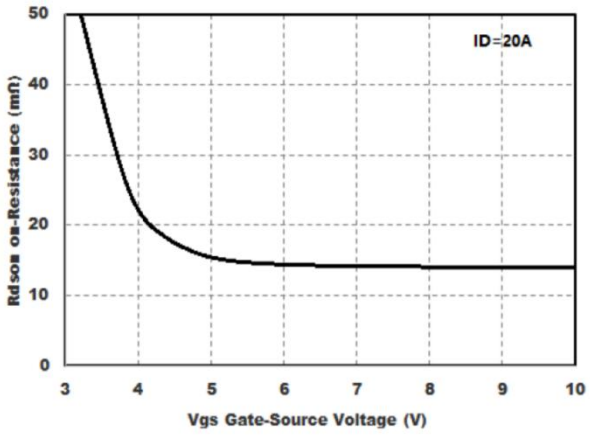


Figure5. : On-Resistance vs. Gate to Source Voltage

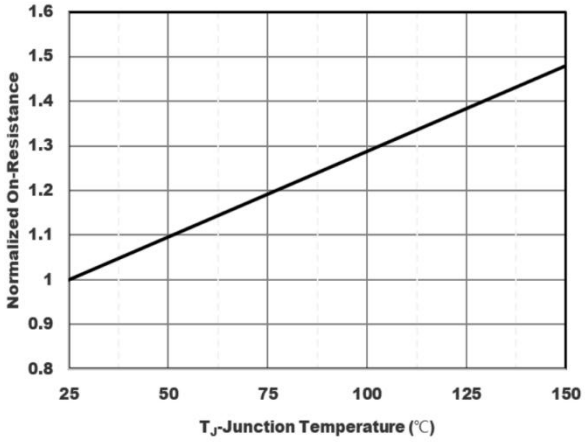


Figure6.Normalized On-Resistance

Typical Characteristics

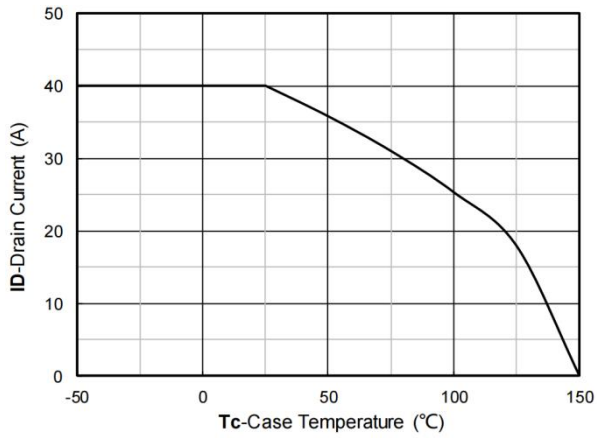


Figure7. Drain current

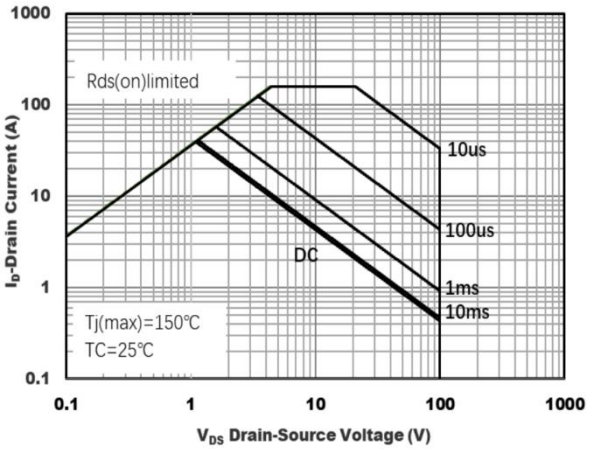


Figure8.Safe Operation Area

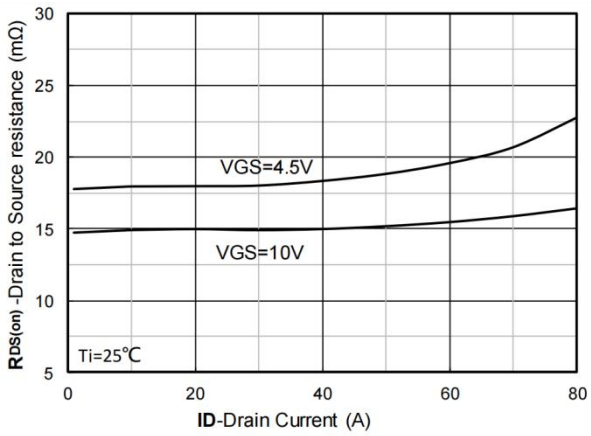


Figure 9. RDS(on) VS Drain Current

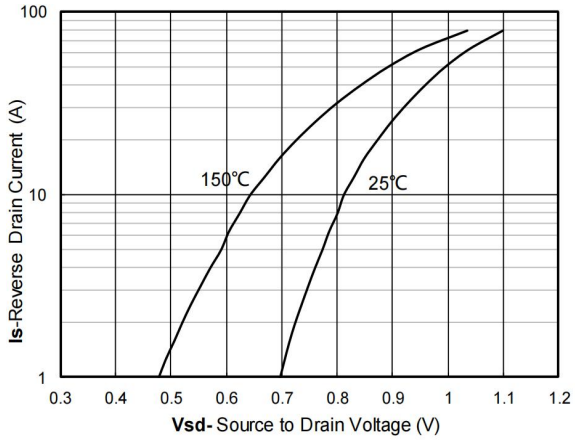


Figure 10. Forward characteristics of reverse diode

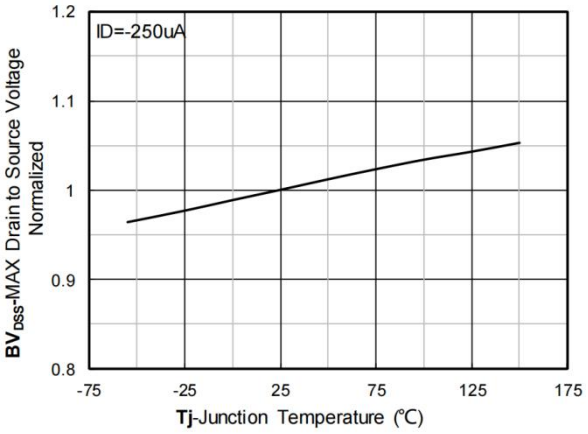


Figure 11. Normalized breakdown voltage

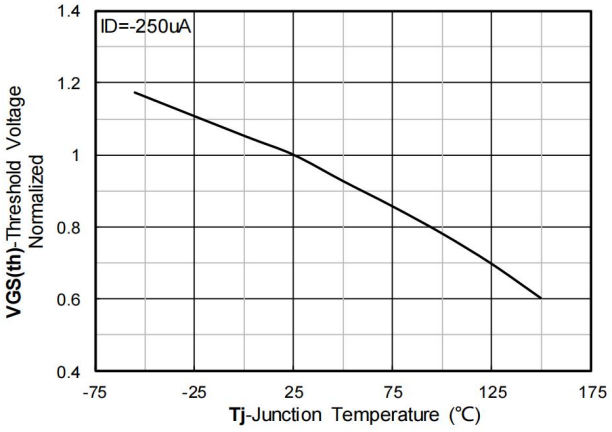


Figure 12. Normalized Threshold voltage

Typical Characteristics

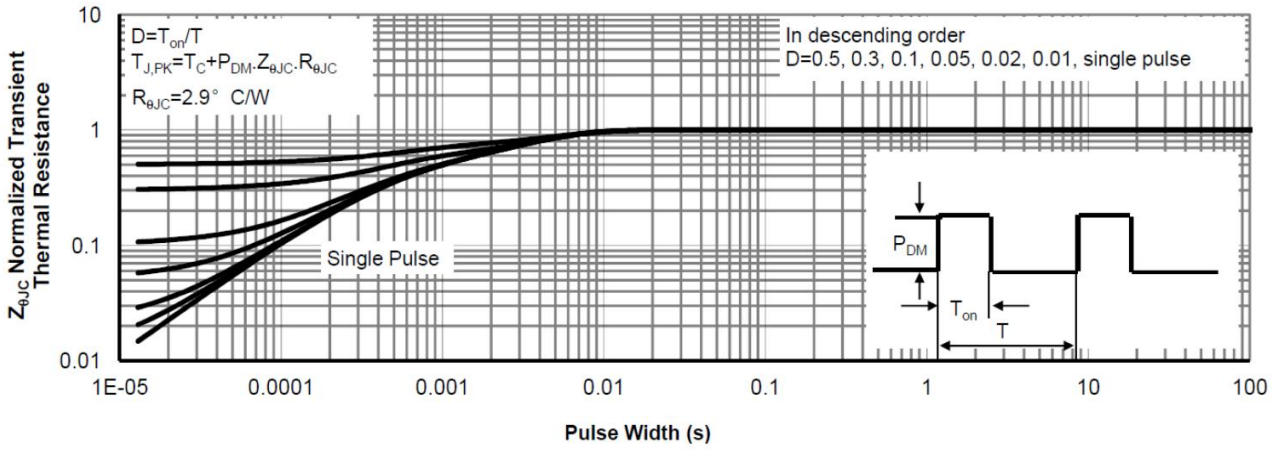
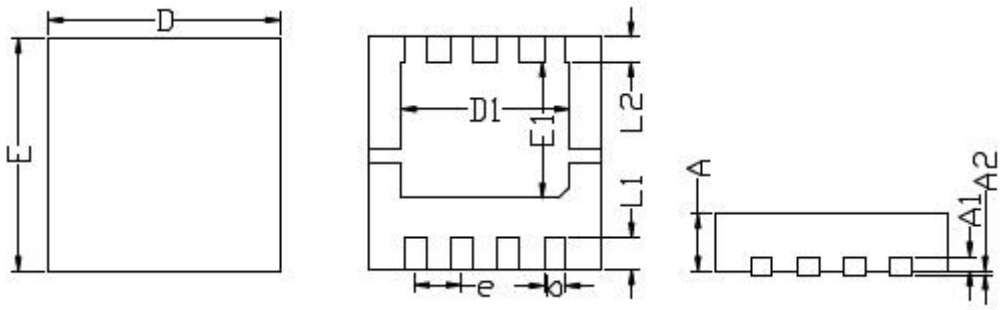


Figure13.Normalized Maximum Transient thermal impedance

DFN3.3*3.3-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.027	0.035
A1	0.200BSC		0.008BSC	
A2	0.000	0.100	0.000	0.004
b	0.200	0.400	0.008	0.016
D	3.150	3.350	0.124	0.132
D1	2.200	2.500	0.086	0.098
E	3.150	3.350	0.124	0.132
E1	1.800	2.000	0.071	0.079
e	0.650 BSC		0.026 BSC	
L1	0.350	0.550	0.013	0.022
L2	0.350 BSC		0.014BSC	