AG149SN150MQTD-Q1

N-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
150V	5.9mΩ@10V	149A

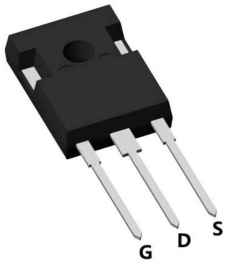
Feature

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

Application

- UPS and Inverter applications
- Motor drivers
- DC-DC convertor

Package



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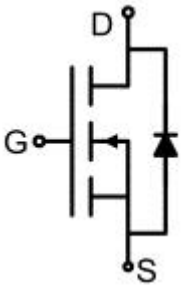
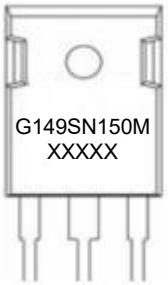
Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	150	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current[1,3] (V_{GS} =10V, Chip limitation)	I_D	149	A
Continuous Drain Current[1,3] (V_{GS} =10V, T_C=100℃)	I_D (100℃)	94	A
Pulsed Drain Current (t_p ≤10μs)	I_{DM}	596	A
Single Pulse Avalanche Energy[2]	E_{AS}	1361	mJ
Power Dissipation[1,3]	P_D	271	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	0.46	℃/W
Operating Junction Temperature	T_J	-55 ~ +150	℃
Storage Temperature Range	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_J=25℃ 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	150			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =150V, 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	2.2	3	3.8	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =50A		4.5	5.9	mΩ
Dynamic characteristics[4]						
Input Capacitance	C_{iss}	V_{DS} =75V, V_{GS} =0V, f =1MHz		4987		pF
Output Capacitance	C_{oss}			769		
Reverse Transfer Capacitance	C_{rss}			10.5		
Total Gate Charge	Q_g	V_{DS} =75V, V_{GS} =10V, I_D =50A		65.4		nC
Gate-Source Charge	Q_{gs}			23.2		
Gate-Drain Charge	Q_{gd}			9.7		
Turn-on delay time	$t_{d(on)}$	V_{DS} =75V, V_{GS} =10V, I_D =50A R_G =3Ω		23.7		nS
Turn-on rise time	t_r			14.4		
Turn-off delay time	$t_{d(off)}$			40.4		
Turn-off fall time	t_f			13.5		
Source-Drain Diode characteristics						
Diode Forward Current	I_S	T_C =25℃			149	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S =50A			1.2	V
Reverse Recovery Time	T_{rr}	V_{GS} =0V, V_R =75V, I_F =50A di/dt =-100A/μs		111		nS
Reverse Recovery Charge	Q_{rr}			328		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) EAS condition :T_J=25℃, V_G =10V, L=2mH, R_G=25Ω, I_{AS}=36.9A.

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

4) Guaranteed by design, not subject to production.

Typical Characteristics

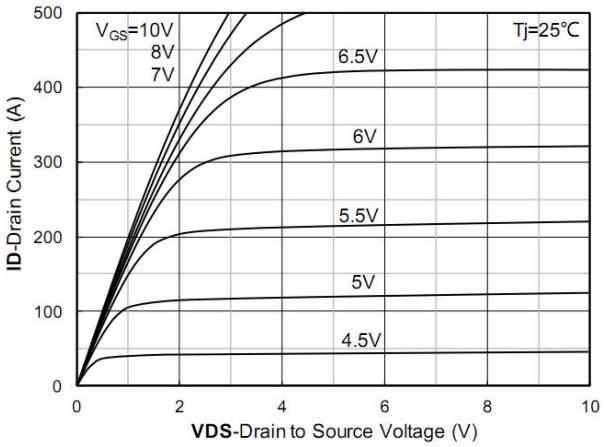


Figure 1. Output Characteristics; typical values

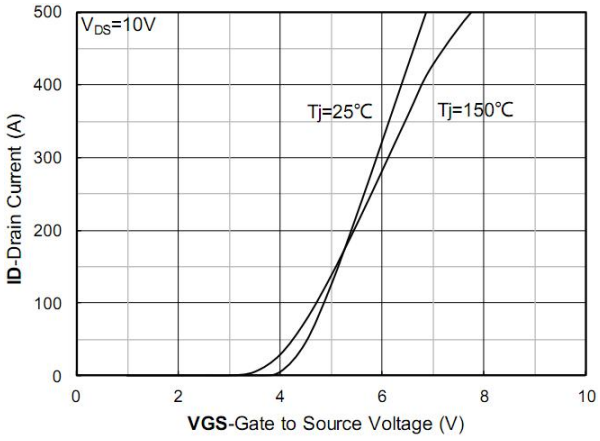


Figure 2. Transfer Characteristics; typical values

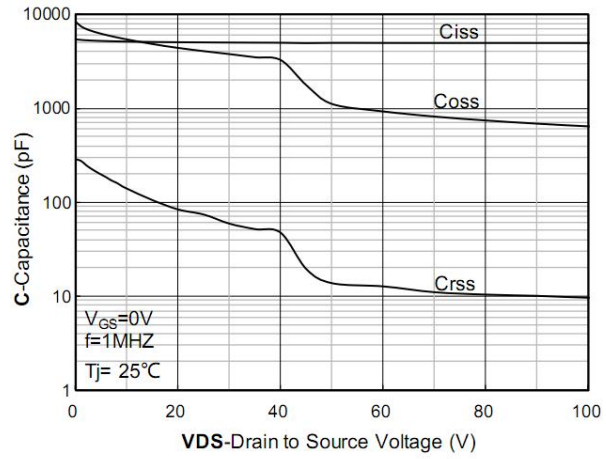


Figure 3. Capacitance Characteristics; typical values

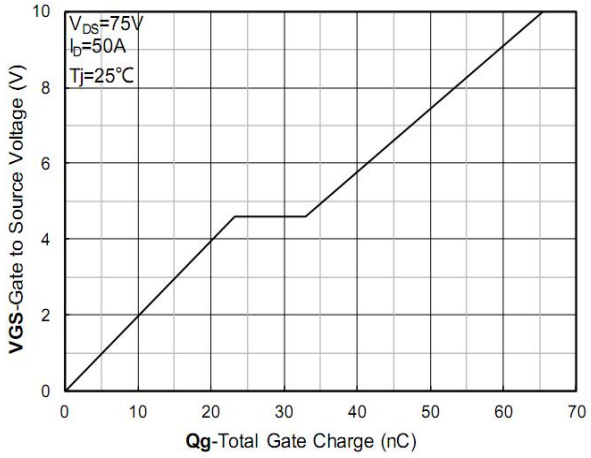


Figure 4. Gate Charge; typical values

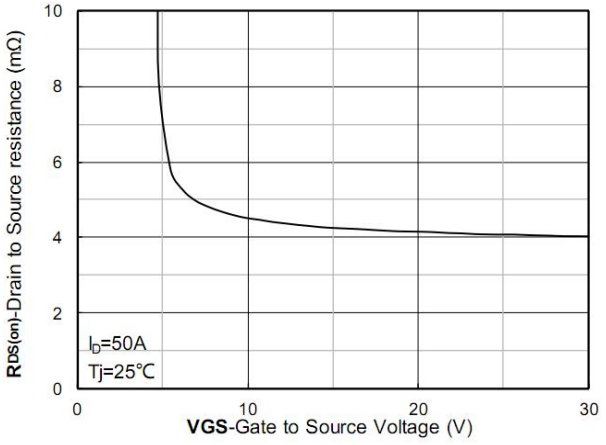


Figure 5. On-Resistance vs Gate to Source Voltage; typical values

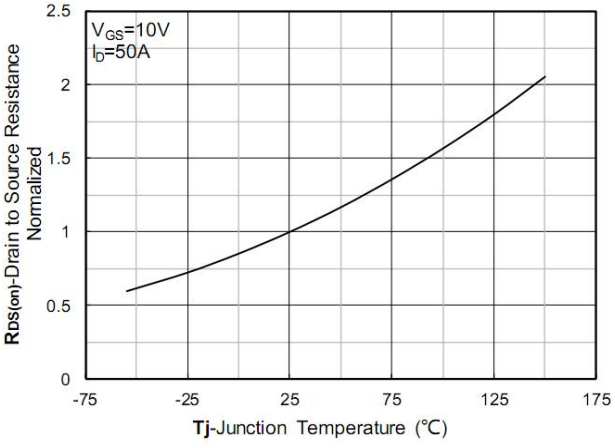


Figure 6. Normalized On-Resistance

Typical Characteristics

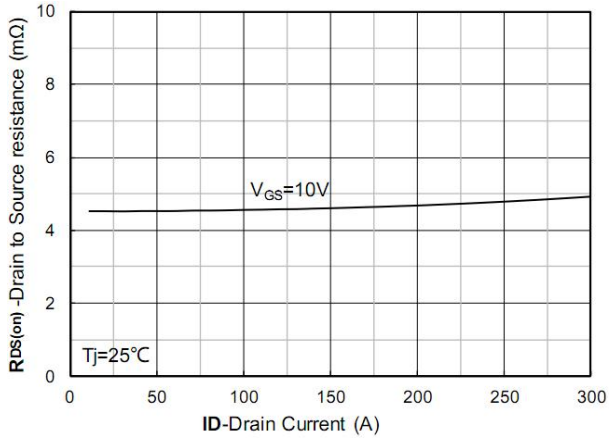


Figure 7. RDS(on) VS Drain Current; typical values

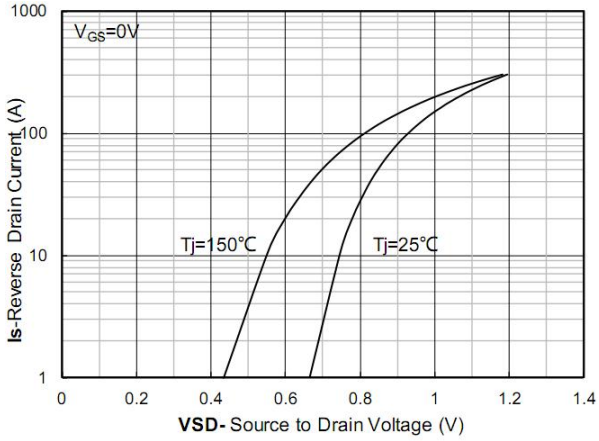


Figure 8. Forward characteristics of reverse diode; typical values

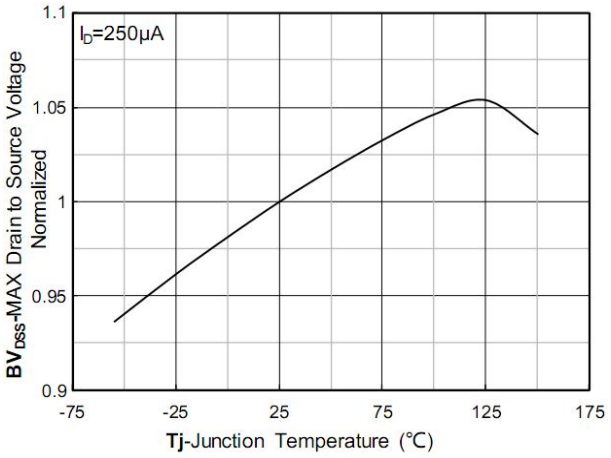


Figure 9. Normalized breakdown voltage

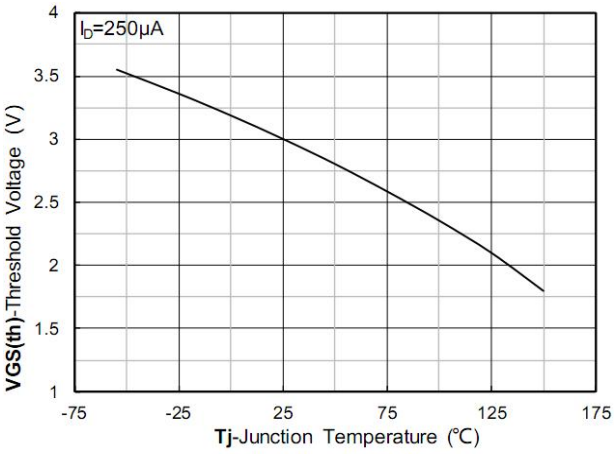


Figure 10. Gate threshold voltage; typical values

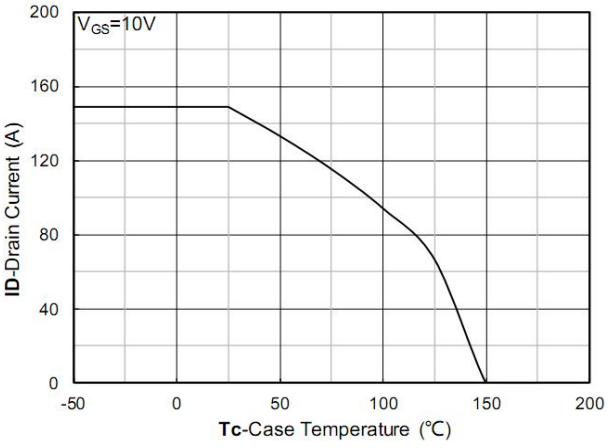


Figure 11. Current dissipation

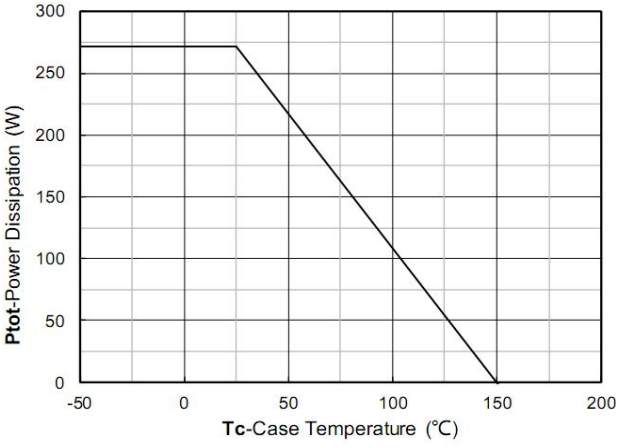


Figure 12. Power dissipation

Typical Characteristics

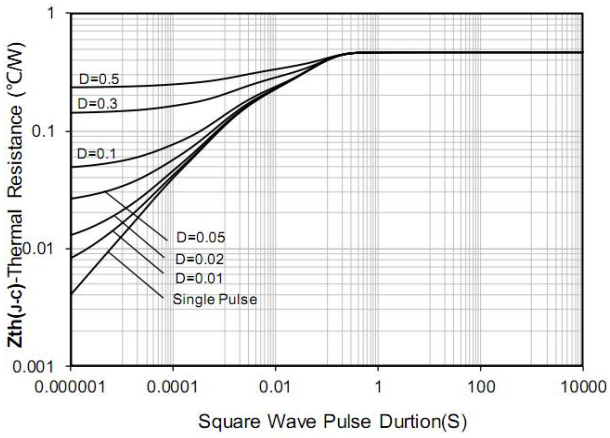


Figure 13. Maximum Transient Thermal Impedance

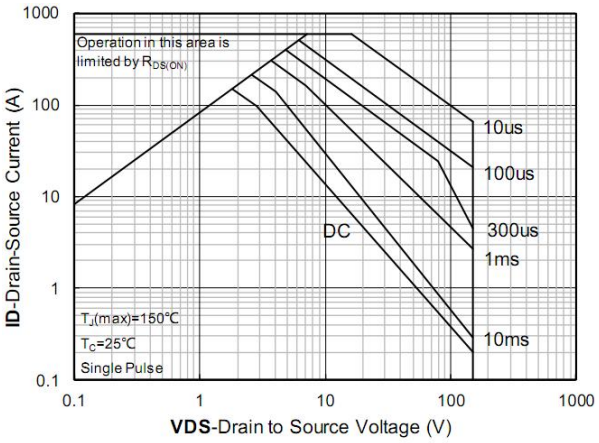
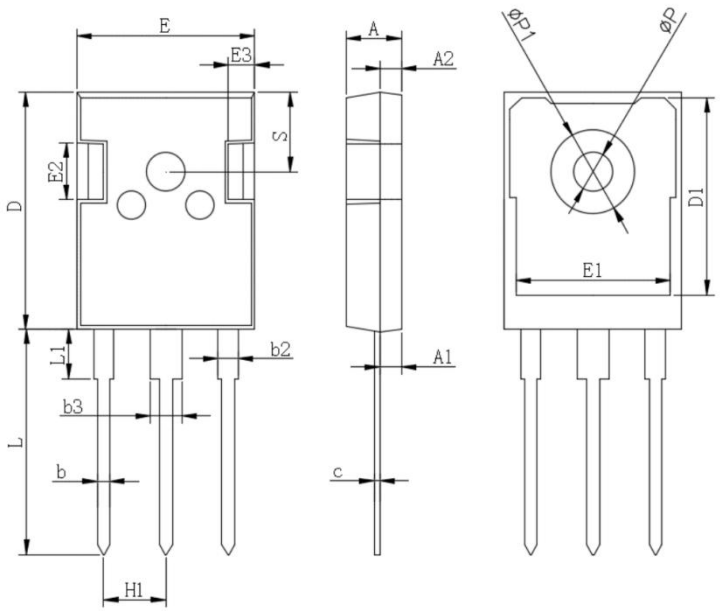


Figure 14. Safe Operation Area

TO-247AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.800	5.200	0.189	0.205
A1	2.210	2.610	0.087	0.103
A2	1.850	2.150	0.073	0.085
b	1.000	1.400	0.039	0.055
b2	1.910	2.210	0.075	0.087
b3	2.800	3.200	0.110	0.126
c	0.500	0.700	0.020	0.028
D	20.700	21.300	0.815	0.839
D1	16.250	16.850	0.640	0.663
E	15.500	16.100	0.610	0.634
E1	13.000	13.600	0.512	0.535
E2	4.800	5.200	0.189	0.205
E3	2.300	2.700	0.091	0.106
L	19.620	20.220	0.772	0.796
L1	-	4.300	-	0.169
Φ P	3.400	3.800	0.134	0.150
Φ P1	-	7.300	-	0.287
S	6.150 TYP.		0.242 TYP.	
H1	5.440 TYP.		0.214 TYP.	