AG190SN150MQTL-Q1

N-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
150V	3.9mΩ@10V	190A

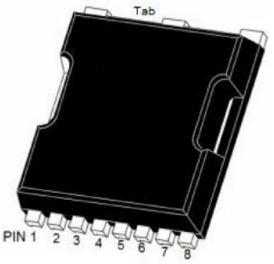
Feature

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

Application

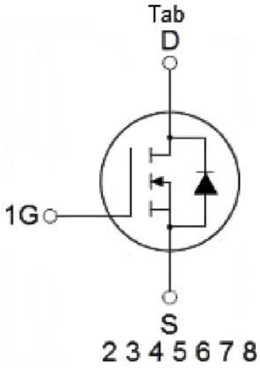
- Power switching application
- Uninterruptible power supply
- DC-DC convertor

Package

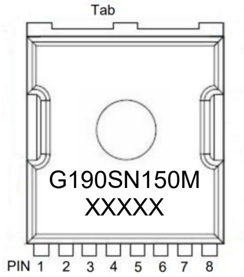


TOLL

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	190	A
Continuous Drain Current[1,3] (V_{GS} =10V,T_C =100℃)	I_D(100℃)	134.4	A
Pulsed Drain Current (t_p ≤10us)	I_{DM}	620	A
Single Pulse Avalanche Energy[2]	E_{AS}	1056.25	mJ
Power Dissipation[1,3]	P_D	340.9	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	0.44	℃/W
Operating Junction Temperature	T_J	-55 ~ +175	℃
Storage Temperature Range	T_{STG}	-55 ~ +175	℃

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	3	3.8	4.6	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =50A		3.2	3.9	mΩ
Dynamic characteristics[4]						
Input Capacitance	C_{iss}	V_{DS} =75V, V_{GS} =0V, f =1MHz		6250		pF
Output Capacitance	C_{oss}			1820		
Reverse Transfer Capacitance	C_{rss}			23		
Total Gate Charge	Q_g	V_{DS} =75V, V_{GS} =10V, I_D =50A		80.3		nC
Gate-Source Charge	Q_{gs}			35.1		
Gate-Drain Charge	Q_{gd}			19.9		
Turn-on delay time	$t_{d(on)}$	V_{DS} =75V, V_{GS} =10V, I_D =50A R_G =3Ω		31.7		nS
Turn-on rise time	t_r			77.4		
Turn-off delay time	$t_{d(off)}$			40.4		
Turn-off fall time	t_f			7.79		
Source-Drain Diode characteristics						
Diode Forward Current	I_S	T_C=25℃			190	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		73.3		nS
Reverse Recovery Charge	Q_{rr}			176.3		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 test condition is T_J =25℃, V_G=10V, L=0.5mH, R_G =25Ω, I_{AS}=65A .

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

4) Guaranteed by design, not subject to production.

Typical Characteristics

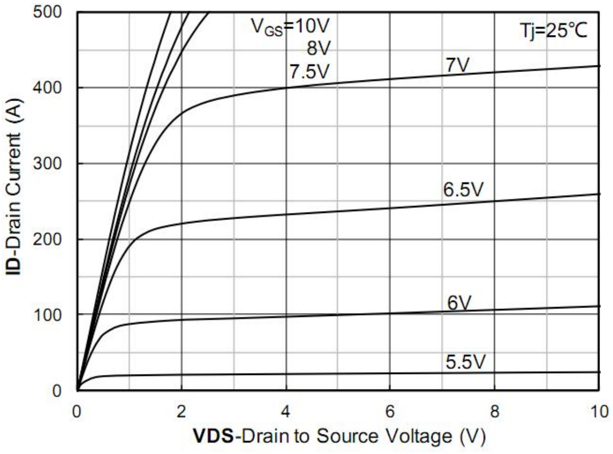


Figure 1. Output Characteristics; typical values

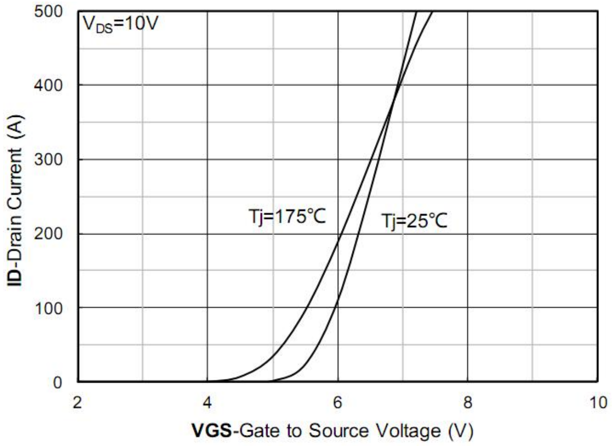


Figure 2. Transfer Characteristics; typical values

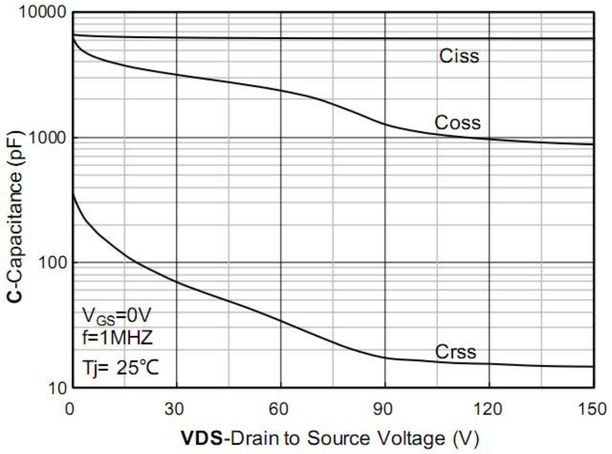


Figure 3. Capacitance Characteristics; typical values

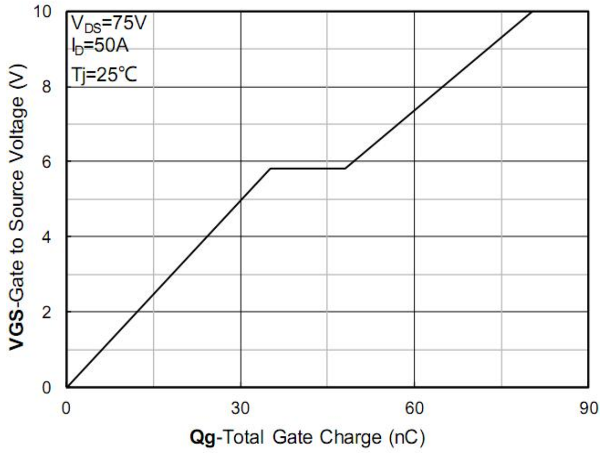


Figure 4. Gate Charge; typical values

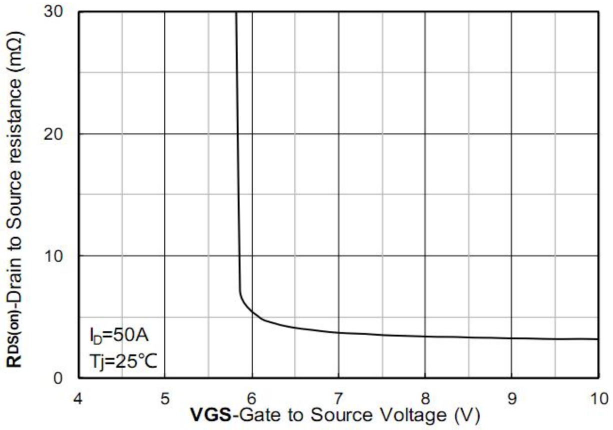


Figure 5. On-Resistance vs. Gate to Source Voltage; typical values

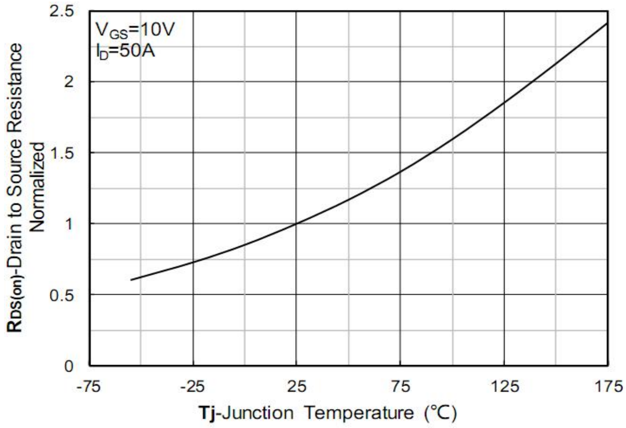


Figure 6. Normalized On-Resistance

Typical Characteristics

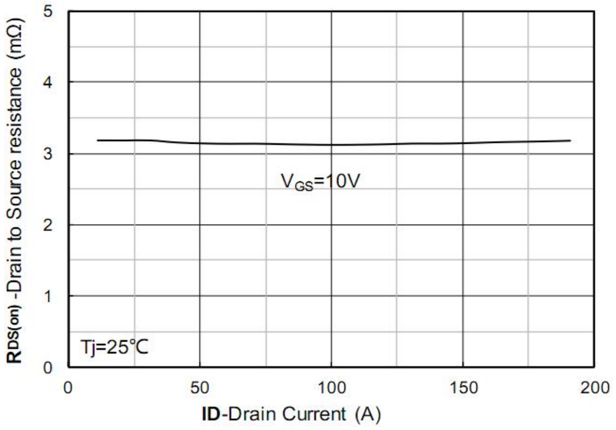


Figure 7. RDS(on) vs. Drain Current; typical values

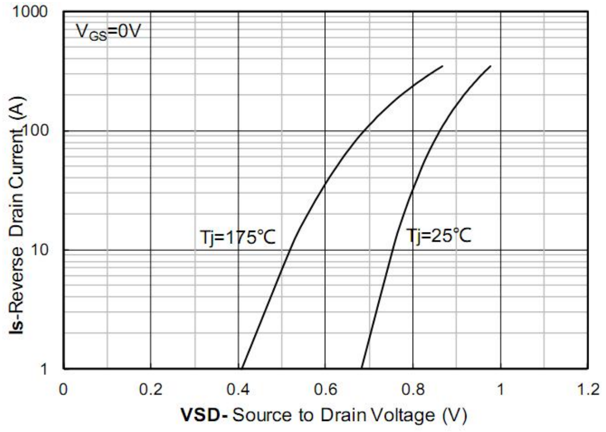


Figure 8. Forward characteristics of reverse diode; typical values

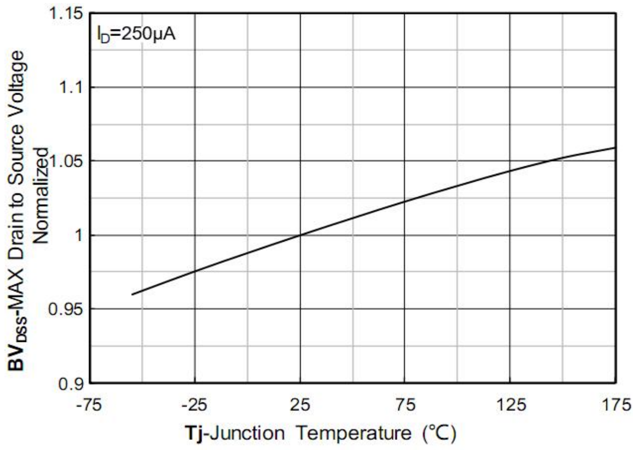


Figure 9. Normalized breakdown voltage

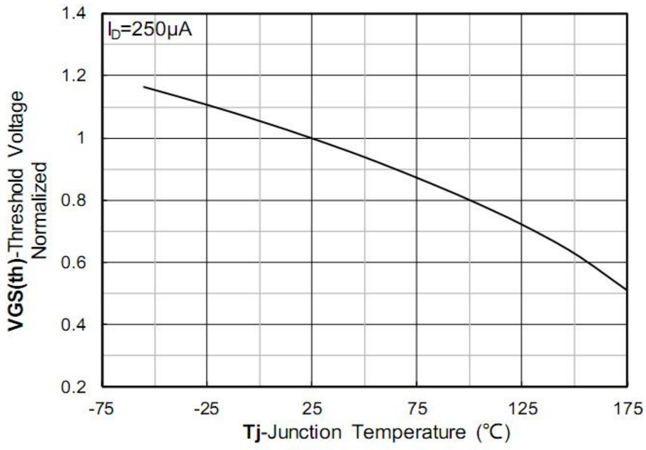


Figure 10. Normalized Threshold voltage

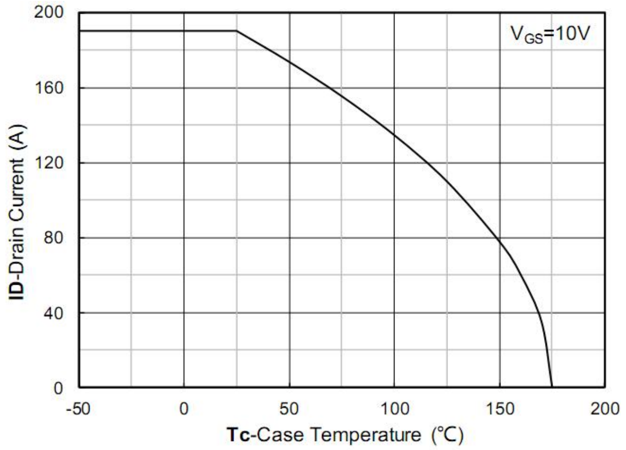


Figure 11. Current dissipation

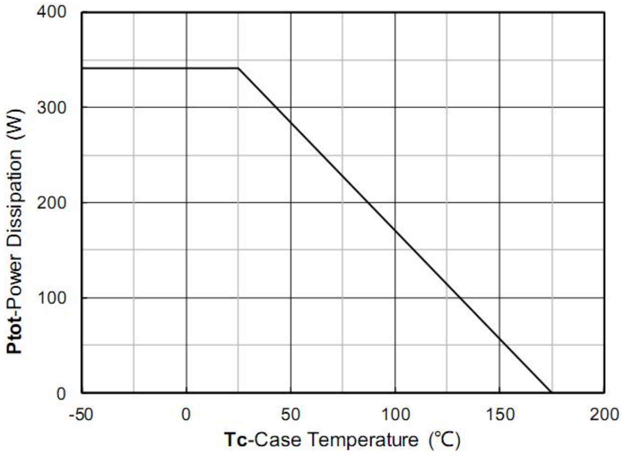


Figure 12. Power dissipation

Typical Characteristics

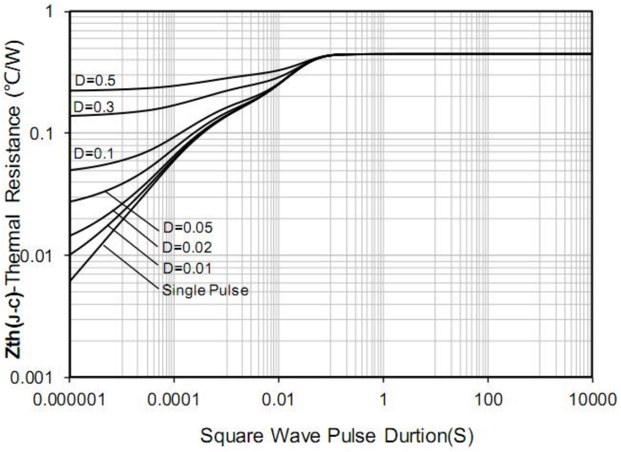


Figure 13. Maximum Transient Thermal Impedance

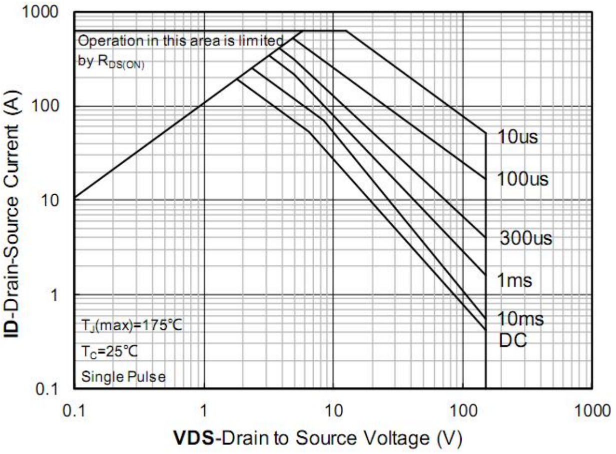
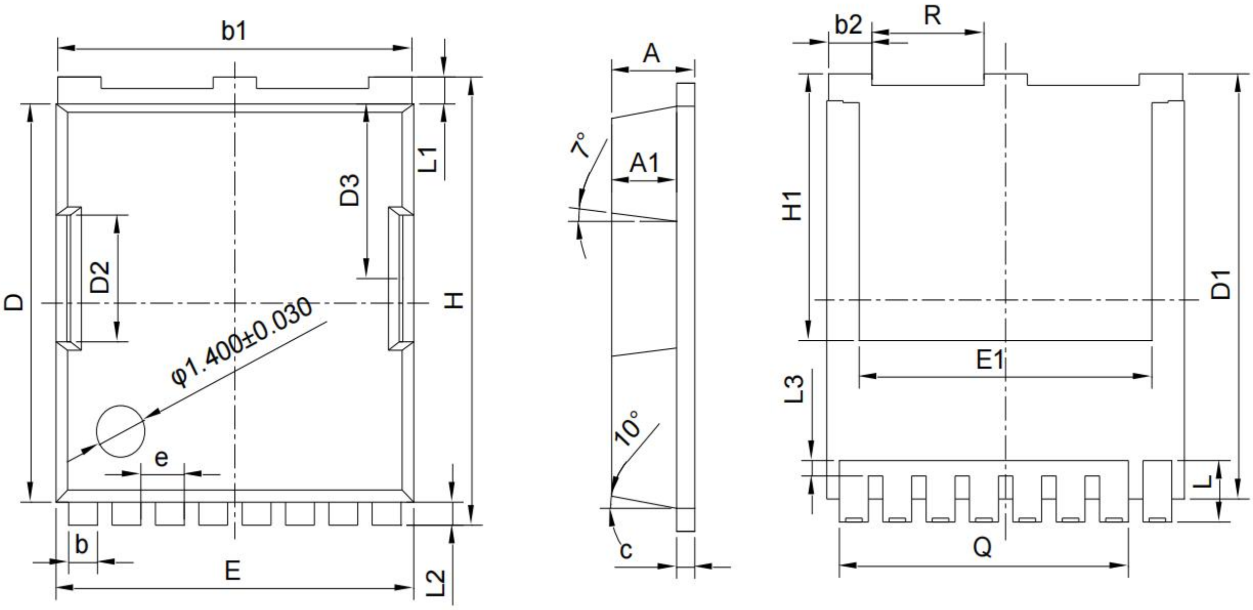


Figure 14. Safe Operation Area

TOLL Package Information



TOP VIEW SIDE VIEW BOTTOM VIEW

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	1.700	1.900	0.067	0.075
b	0.700	0.900	0.028	0.035
b1	9.700	9.900	0.382	0.390
b2	1.100	1.300	0.043	0.051
c	0.400	0.600	0.016	0.024
D	10.280	10.480	0.405	0.413
D1	10.980	11.180	0.432	0.440
D2	3.200	3.400	0.126	0.134
D3	4.450	4.650	0.175	0.183
E	9.800	10.000	0.386	0.394
E1	8.000	8.200	0.315	0.323
e	1.200 BSC.		0.047 BSC.	
H	11.580	11.780	0.456	0.464
H1	6.950 BSC.		0.274 BSC.	
L	1.500	1.700	0.059	0.067
L1	0.600	0.800	0.024	0.031
L2	0.500	0.700	0.020	0.028
L3	0.300	0.500	0.012	0.020
Q	8.000 REF.		0.315 REF.	
R	3.000	3.200	0.118	0.126