ALR017N10S-Q1

N-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
100V	1.7mΩ@10V	300A
	2.5mΩ@6V	

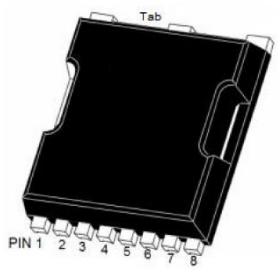
Feature

- 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

- Load switch
- Battery management

Package



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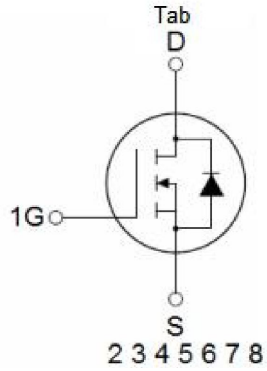
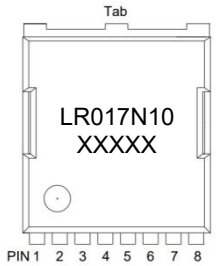
Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (T_C =25℃)	I_D	300	A
Continuous Drain Current (T_C =100℃)	I_D	190	A
Pulsed Drain Current[1)]	I_{DM}	1200	A
Power Dissipation [3)](T_C =25℃)	P_D	250	W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	0.5	℃/W
Single pulse avalanche energy[2)]	E_{AS}	1440	mJ
Junction Temperature	T_J	150	℃
Storage Temperature	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	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	2	2.8	4	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =150A		1.35	1.7	mΩ
		V_{GS} =10V, I_D =20A		1.35	1.7	
		V_{GS} =6V, I_D =20A		1.75	2.5	
Dynamic characteristics[4)]						
Input Capacitance	C_{iss}	V_{DS} =50V, V_{GS} =0V, f =1MHz		13600		pF
Output Capacitance	C_{oss}			4000		
Reverse Transfer Capacitance	C_{rss}			110		
Total Gate Charge	Q_g	V_{DS} =50V, V_{GS} =10V, I_D =150A		257		nC
Gate-Source Charge	Q_{gs}			89		
Gate-Drain Charge	Q_{gd}			88		
Turn-on delay time	$t_{d(on)}$	V_{DD}=50V, V_{GS}=10V, I_D=150A, R_{GEN}=2.2Ω		51		nS
Turn-on rise time	t_r			158		
Turn-off delay time	$t_{d(off)}$			98		
Turn-off fall time	t_f			52		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				300	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S=150A			1.2	V
Reverse Recovery Time	t_{rr}	I_F =150A , di/dt = 100A/μs		162		nS
Reverse Recovery Charge	Q_{rr}			374		nC

Notes:

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

2) T_J=25℃, V_{DD}=50V, V_G=10V, R_G=25Ω, L=5mH, IAS=24A.

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

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

Typical Characteristics

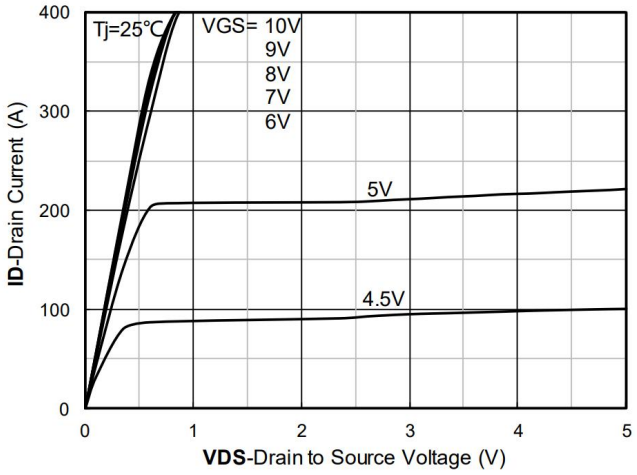


Figure 1. Output Characteristics

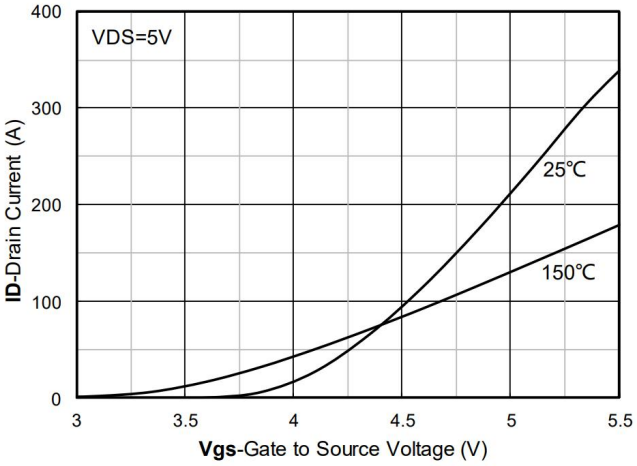


Figure 2. Transfer Characteristics

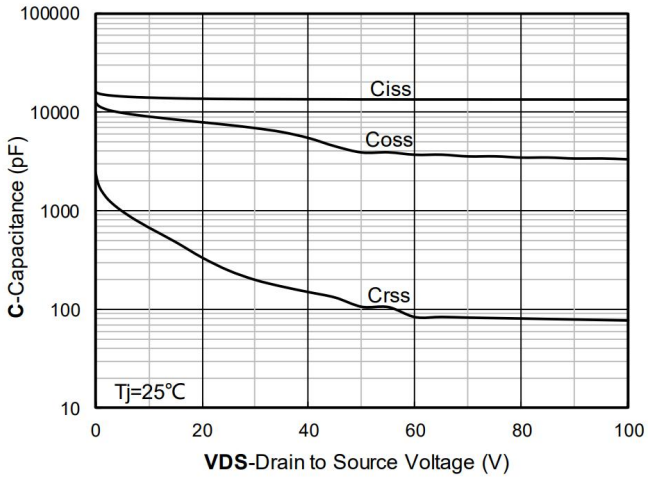


Figure 3. Capacitance Characteristics

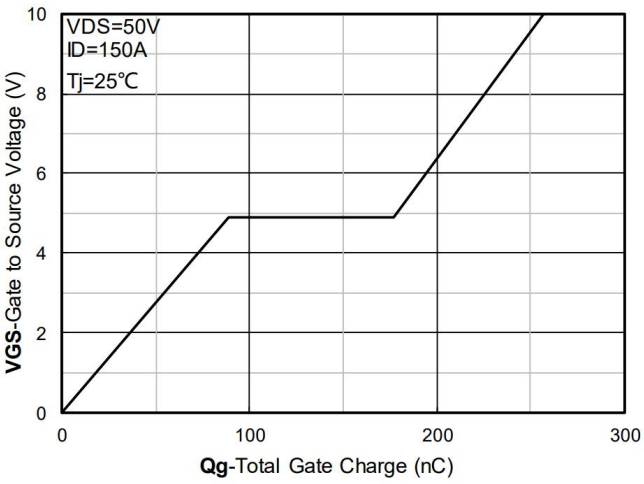


Figure 4. Gate Charge

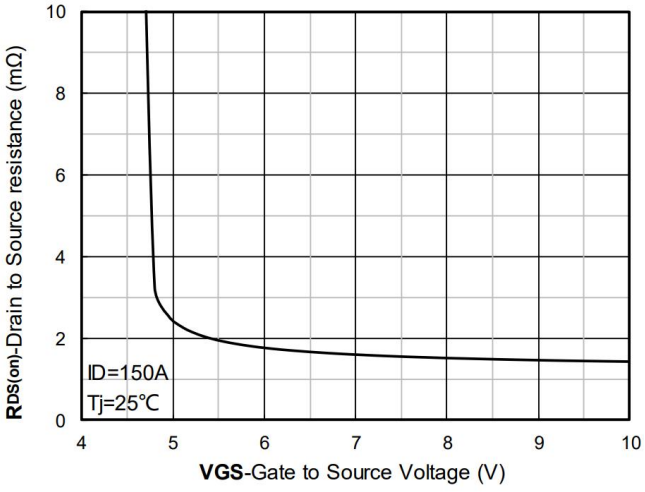


Figure 5. On-Resistance vs Gate to Source Voltage

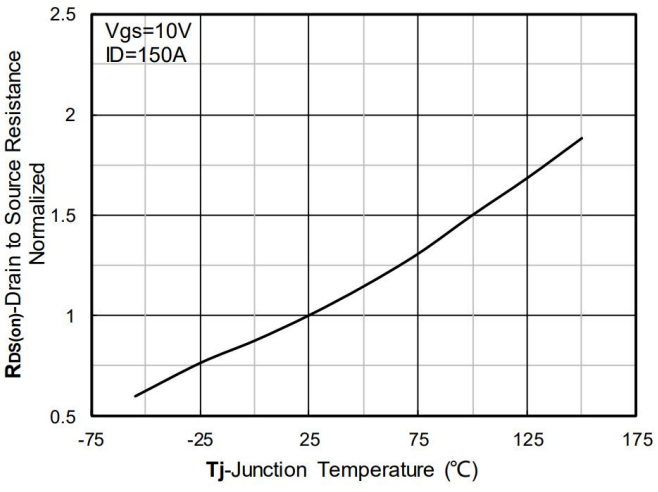


Figure 6. Normalized On-Resistance

Typical Characteristics

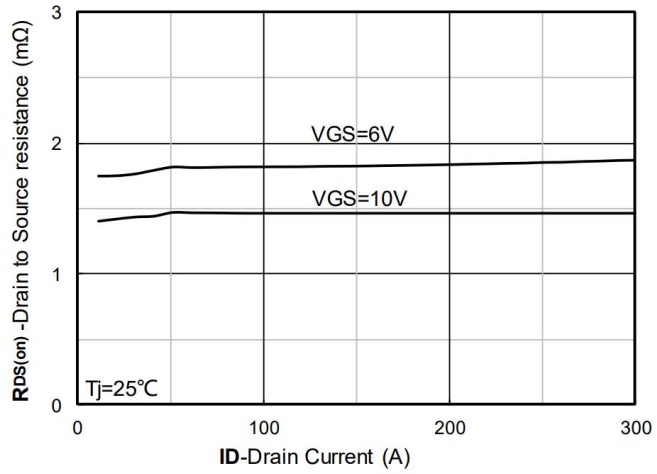


Figure 7. RDS(on) VS Drain Current

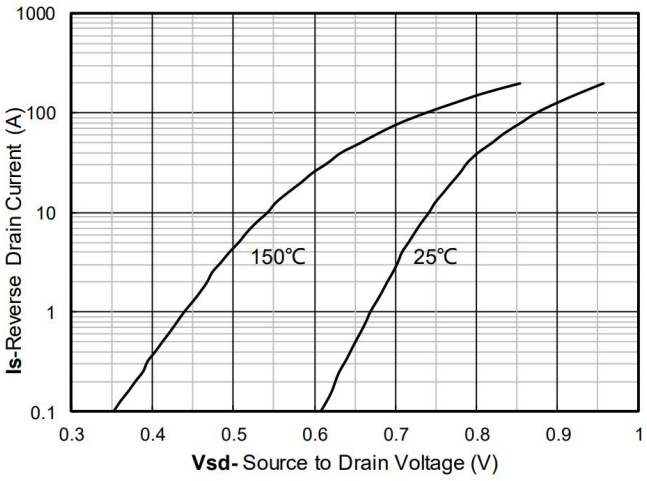


Figure 8. Forward characteristics of reverse diode

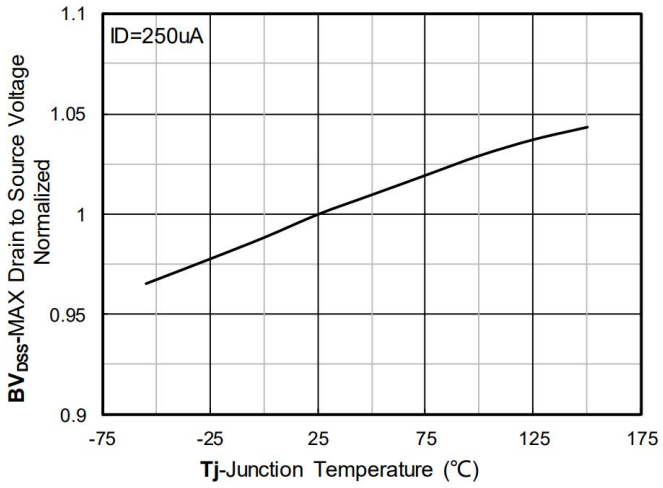


Figure 9. Normalized breakdown voltage

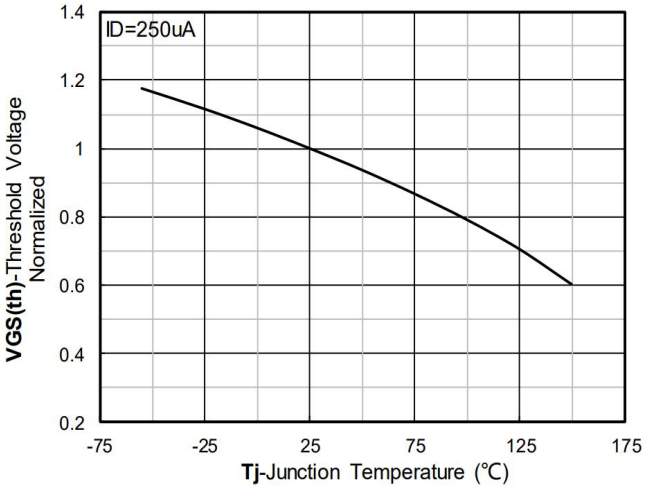


Figure 10. Normalized Threshold voltage

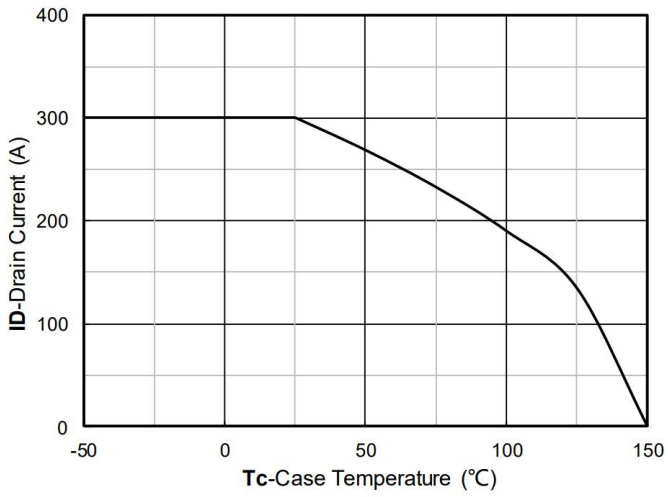


Figure 11. Current dissipation

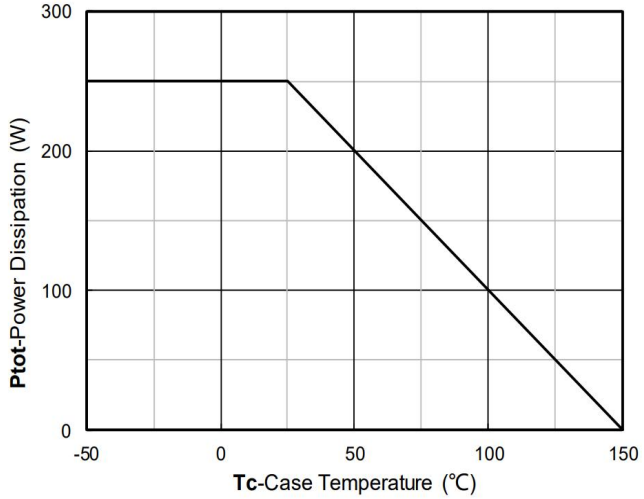


Figure 12. Power dissipation

Document ID	Issued Date	Revised Date	Revision	Page.
AS-1150442	2022/03/08	2023/07/03	B	6

Typical Characteristics

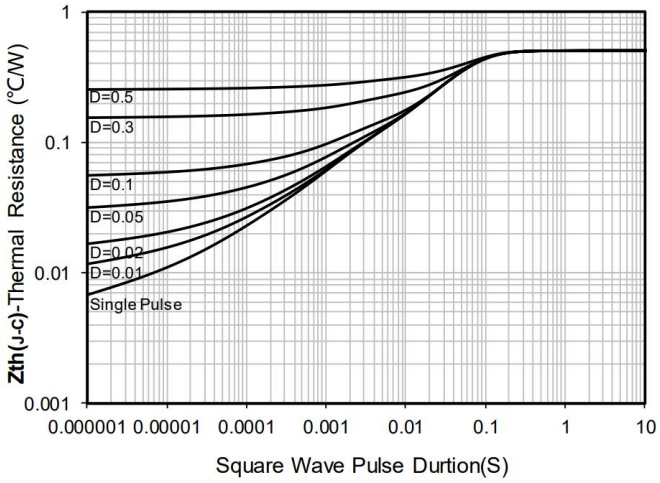


Figure 13. Maximum Transient Thermal Impedance

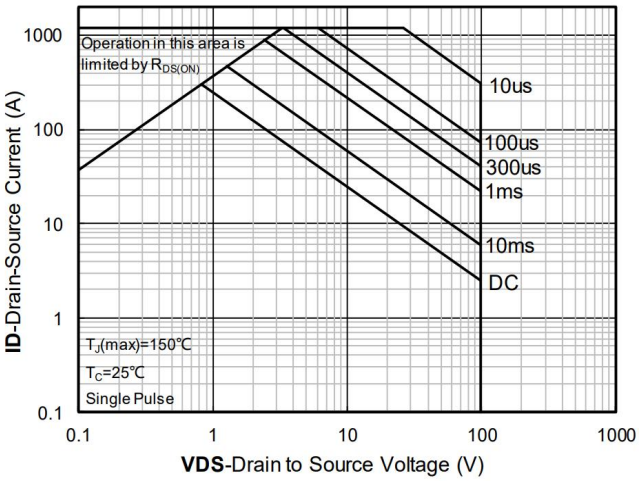
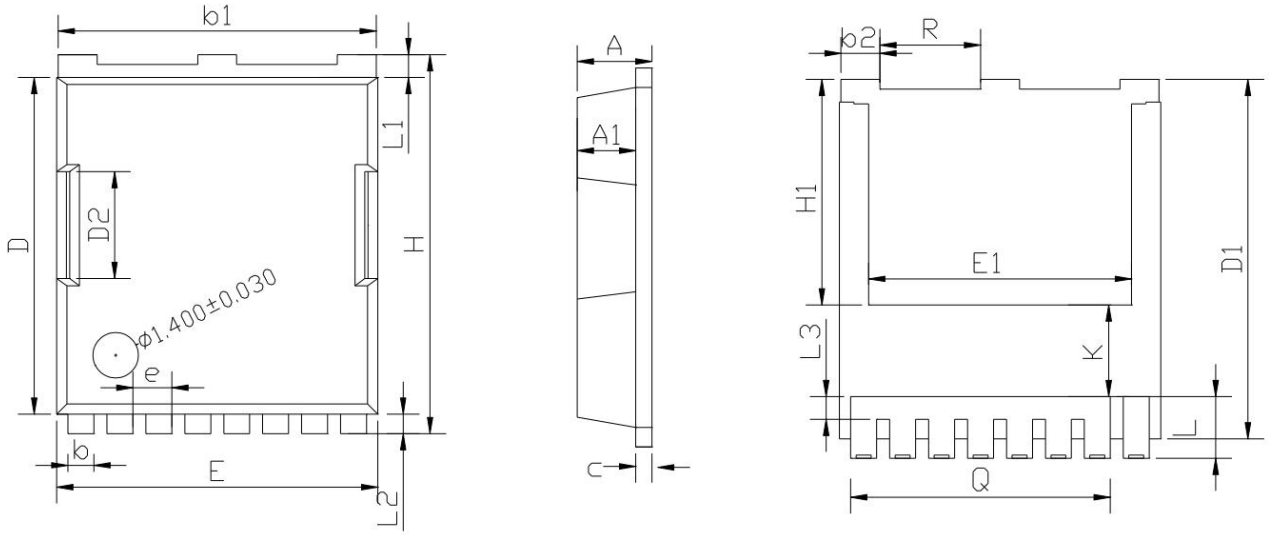


Figure 14. Safe Operation Area

TOLL Package Information



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
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