ASR022N06S-Q1

N-Channel Super Trench Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
60V	2.2mΩ@10V	150A

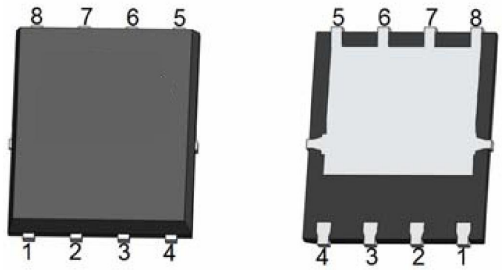
Feature

- Excellent gate charge x $R_{DS(on)}$ product(FOM)
- Very low on-resistance $R_{DS(on)}$
- Suffix "-Q1" for AEC-Q101

Application

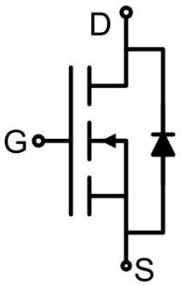
- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

Package

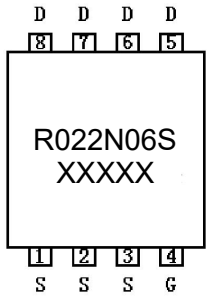


DFN5X6-8L

Circuit diagram



Marking



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N-Channel Super Trench Power MOSFET

Absolute maximum ratings (T_C=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 (Silicon limited)	I_D	150	A
Drain Current-Continuous(T_C =100℃)	I_D (100℃)	98	A
Pulsed Drain Current	I_{DM}	450	A
Power Dissipation	P_D	85	W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	1.67	℃/W
Single pulse avalanche energy	E_{AS}	552	mJ
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_C=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_{GS} =±20V, V_{DS} = 0V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1.0		2.5	V
Drain-source on-resistance[1)]	$R_{DS(on)}$	V_{GS} =10V, I_D =30A		1.8	2.2	mΩ
Dynamic characteristics[2)]						
Input Capacitance	C_{iss}	V_{DS} =25V,V_{GS} =0V,f =1MHz		5460		pF
Output Capacitance	C_{oss}			2040		
Reverse Transfer Capacitance	C_{rss}			5.5		
Total Gate Charge	Q_g	V_{DS} =30V,V_{GS} =10V,ID =30A		70		nC
Gate-Source Charge	Q_{gs}			21		
Gate-Drain Charge	Q_{gd}			33		
Turn-on delay time	$t_{d(on)}$	V_{DD}=30V,V_{GS}=10V, ID =30A,R_{GEN}=25Ω		15		nS
Turn-on rise time	t_r			10		
Turn-off delay time	$t_{d(off)}$			23		
Turn-off fall time	t_f			65		
Source-Drain Diode characteristics						
Diode Forward Current[1)]	I_S				150	A
Diode Forward voltage	V_{DS}	V_{GS} = 0V, I_S= 30A			1.4	V
Reverse Recovery Time	t_{rr}	T_J = 25°C, I_F = 30A di/dt = 100A/μs [1)]		52		nS
Reverse Recovery Charge	Q_{rr}			68		nC

Notes:

1) Pulse Test: Pulse Width < 300μs, Duty Cycle ≤2%.

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

Typical Characteristics

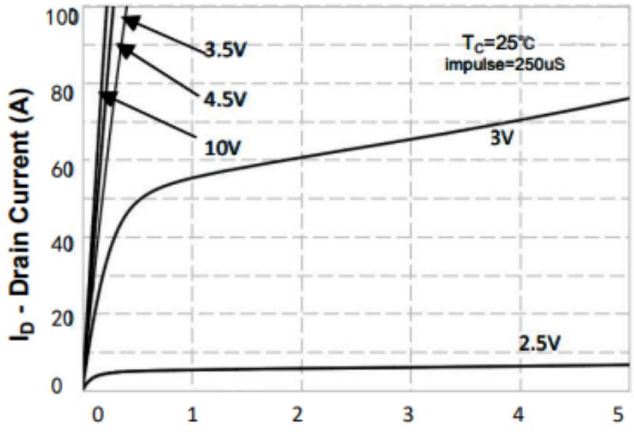


Figure 1. On-Region Characteristics

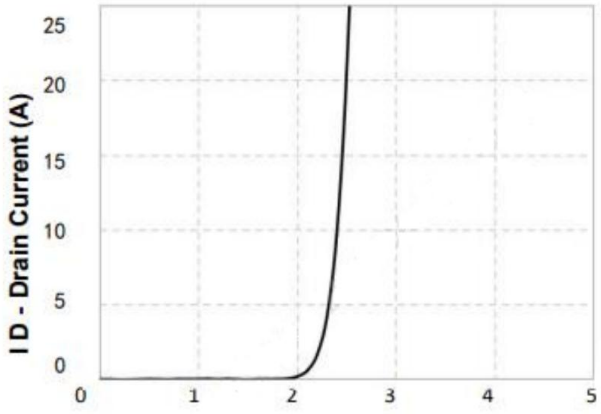


Figure 2. Transfer Characteristics

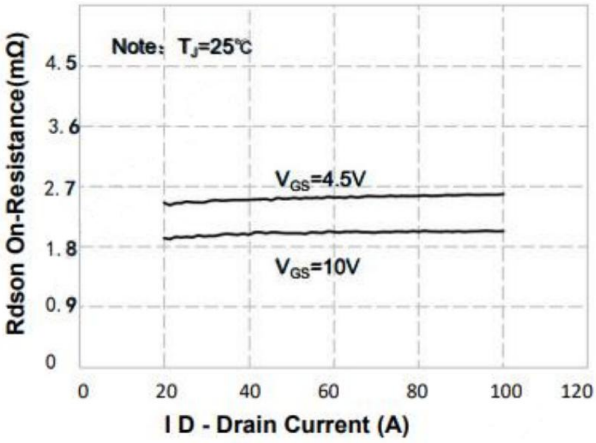


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

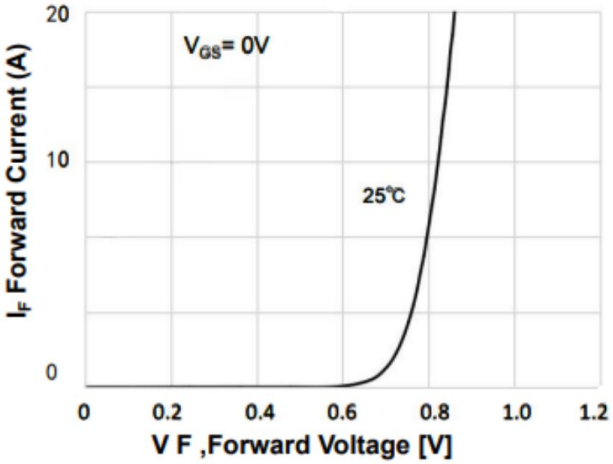


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

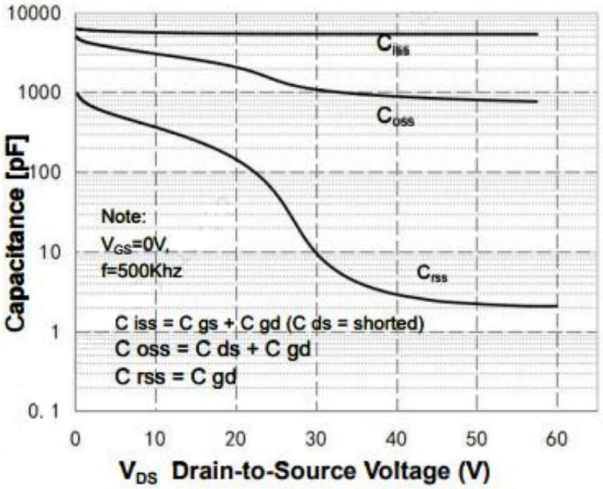


Figure 5. Capacitance Characteristics

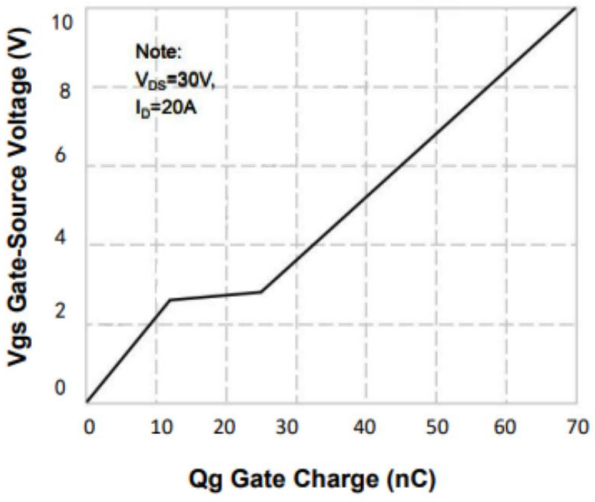


Figure 6. Gate Charge Characteristics

Typical Characteristics

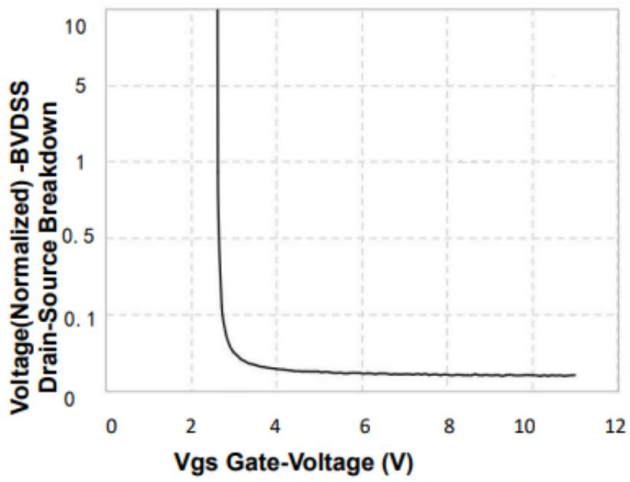


Figure 7. Breakdown Voltage Variation vs Gate-Voltage

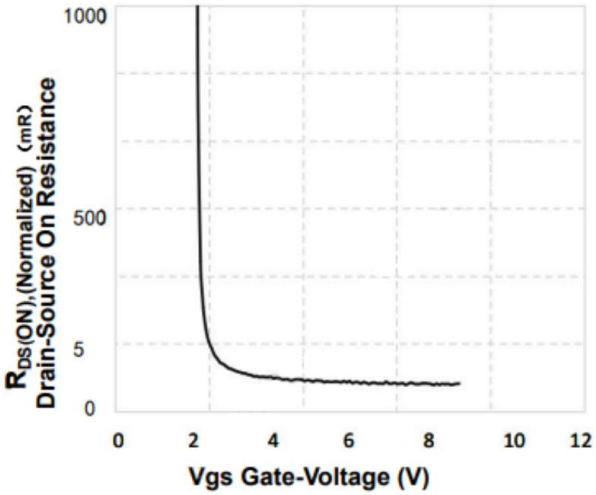


Figure 8. On-Resistance Variation vs Gate Voltage

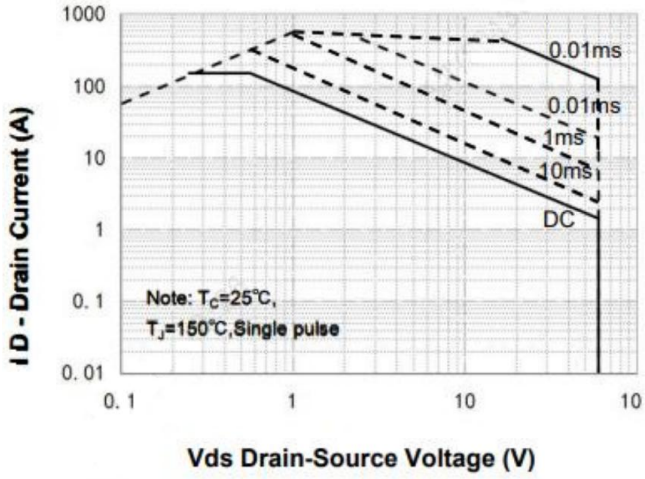


Figure 9. Maximum Safe Operating Area

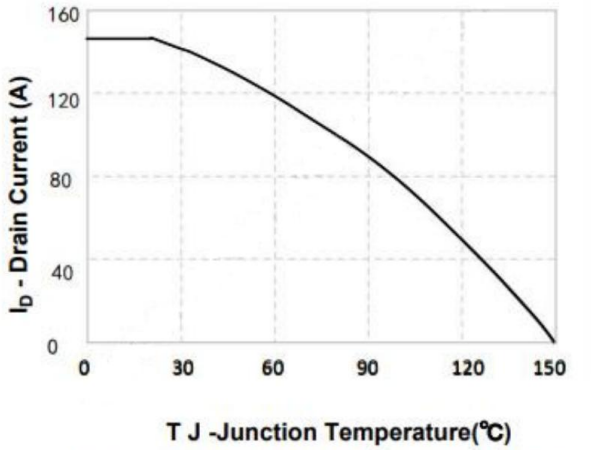


Figure 10. Maximum PContinuous Drain Currentvs Case Temperature

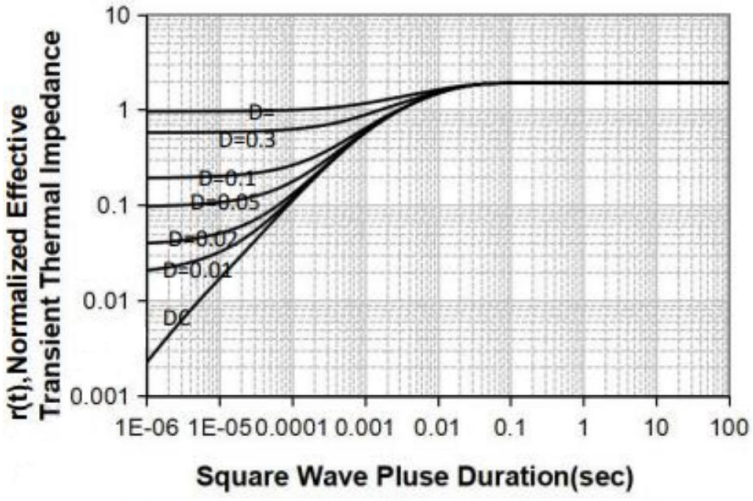
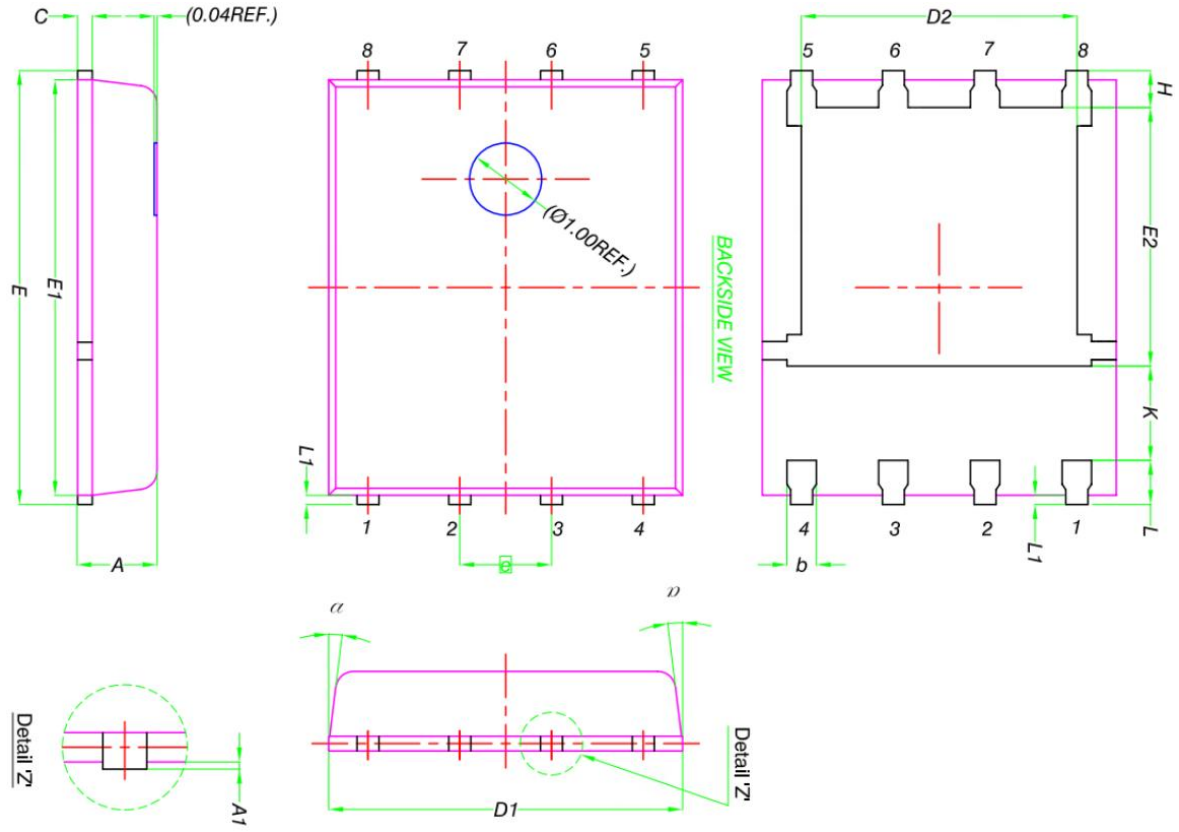


Figure 11. Transient Thermal Response Curve

DFN5X6-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.044
A1	0.000	0.050	0.000	0.002
b	0.330	0.510	0.012	0.020
c	0.200	0.300	0.007	0.012
D1	4.800	5.000	0.188	0.197
D2	3.610	3.960	0.142	0.156
E	5.900	6.100	0.232	0.240
E1	5.700	5.800	0.224	0.229
E2	3.380	3.780	0.133	0.149
e	1.270TYP.		0.050TYP.	
H	0.410	0.610	0.016	0.024
K	1.100	-	0.043	-
L	0.510	0.710	0.020	0.028
L1	0.060	0.200	0.002	0.008
α	0°	12°	0°	12°