AS55N06S-Q1

N-Channel Super Trench Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
60V	7.5mΩ@10V	55A
	8.8mΩ@4.5V	

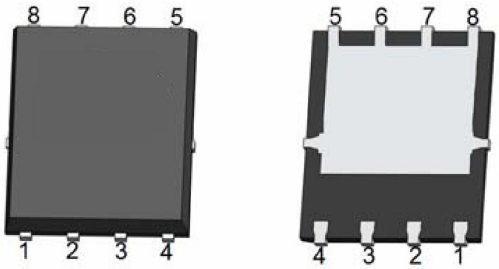
Feature

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

Application

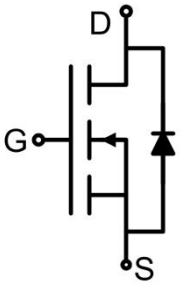
- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

Package

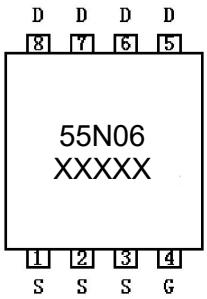


DFN5X6-8L

Circuit diagram



Marking



AS55N06S-Q1

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	55	A
Drain Current-Continuous(T_C =100℃)	I_D (100℃)	42.9	A
Pulsed Drain Current	I_{DM}	220	A
Power Dissipation	P_D	65	W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	1.92	℃/W
Single pulse avalanche energy[3]	E_{AS}	350	mJ
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_C=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	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	1.2	2.8	2.4	V
Drain-source on-resistance[1]	$R_{DS(on)}$	V_{GS} =10V, I_D =25A		6.5	7.5	mΩ
		V_{GS} =4.5V, I_D =25A		7.7	8.8	
Forward transconductance[1]	g_{FS}	V_{DS} =5V, I_D =25A		60		S
Dynamic characteristics[2]						
Input Capacitance	C_{iss}	V_{DS} =30V,V_{GS} =0V,f =1MHz		2000		pF
Output Capacitance	C_{oss}			315		
Reverse Transfer Capacitance	C_{rss}			9.9		
Total Gate Charge	Q_g	V_{DS} =30V,V_{GS} =10V,I_D =25A		34.8		nC
Gate-Source Charge	Q_{gs}			7		
Gate-Drain Charge	Q_{gd}			5.3		
Turn-on delay time	$t_{d(on)}$	V_{DD}=30V,V_{GS}=10V, I_D=25A,R_{GEN}=1.6Ω		8		nS
Turn-on rise time	t_r			2		
Turn-off delay time	$t_{d(off)}$			29		
Turn-off fall time	t_f			4		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				55	A
Diode Forward voltage[1]	V_{DS}	V_{GS} =0V, I_S=25A			1.2	V
Reverse Recovery Time	t_{rr}	T_J = 25°C, I_F =25A di/dt = 100A/μs [1]		38		nS
Reverse Recovery Charge	Q_{rr}			48		nC

Notes:

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

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

3) EAS condition : Tj=25℃,VDD=30V,VG=10V,L=0.5mH,Rg=25Ω

Typical Characteristics

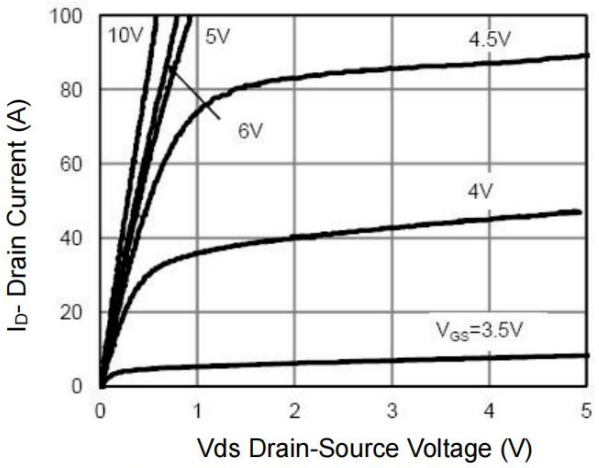


Figure 1 Output Characteristics

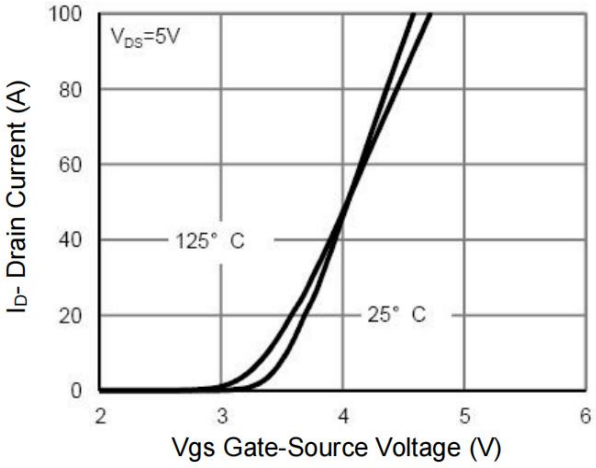


Figure 2 Transfer Characteristics

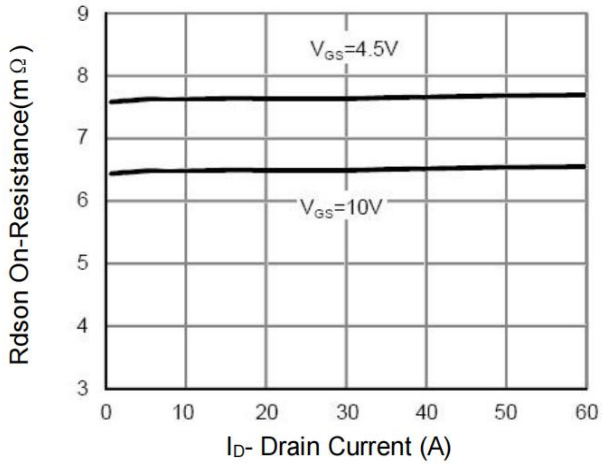


Figure 3 Rdson- Drain Current

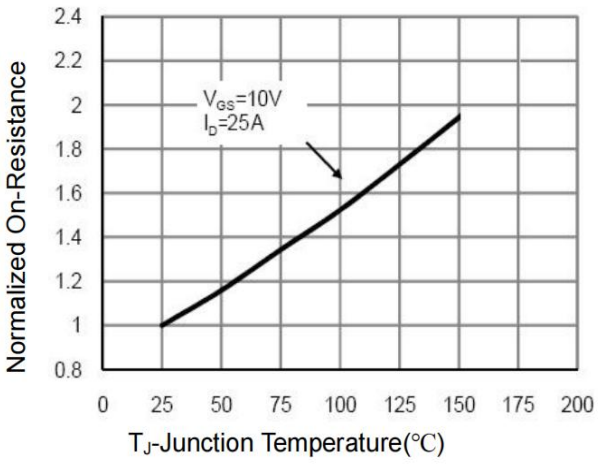


Figure 4 Rdson-Junction Temperature

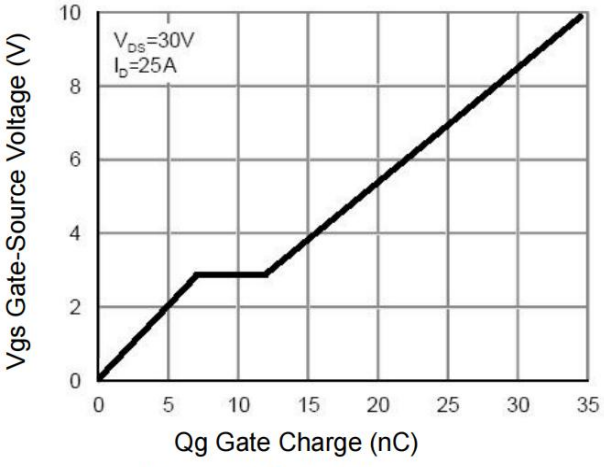


Figure 5 Gate Charge

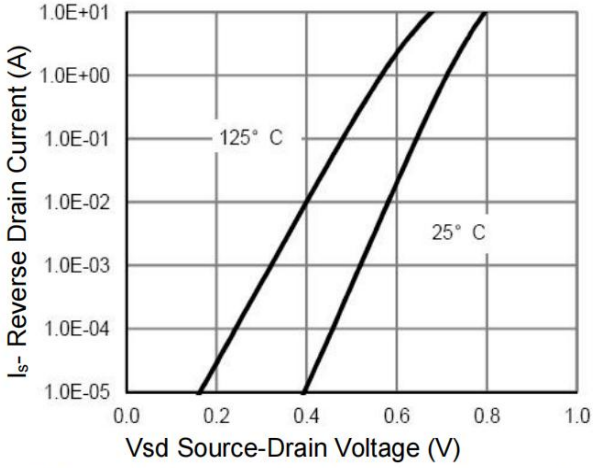


Figure 6 Source- Drain Diode Forward

Typical Characteristics

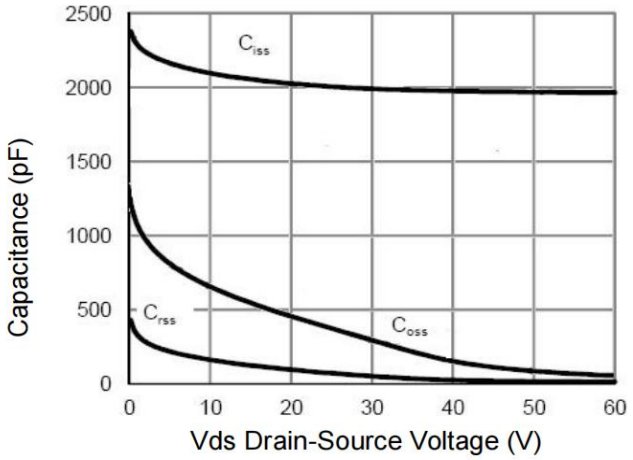


Figure 7 Capacitance vs Vds

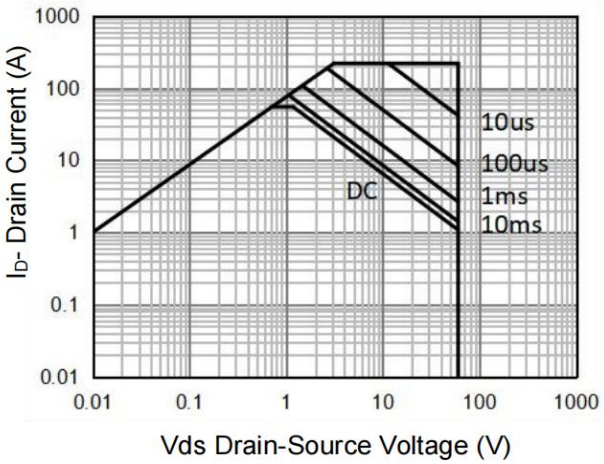


Figure 8 Safe Operation Area

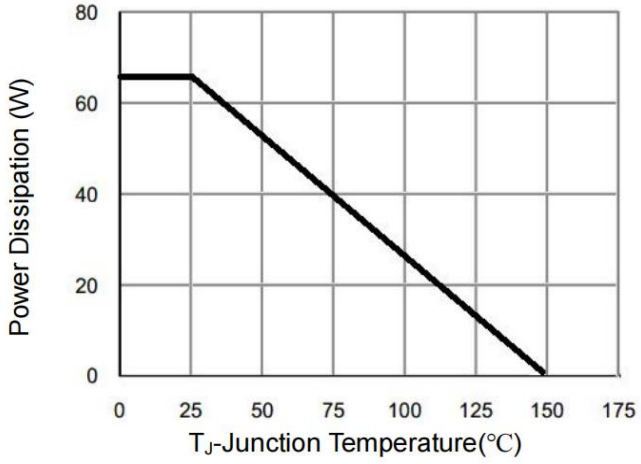


Figure 9 Power De-rating

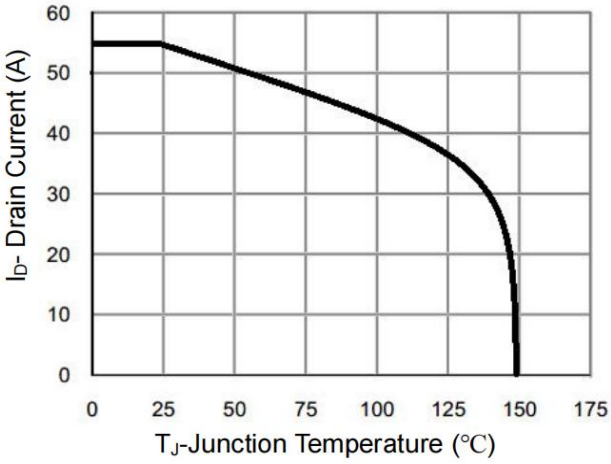


Figure 10 Current De-rating

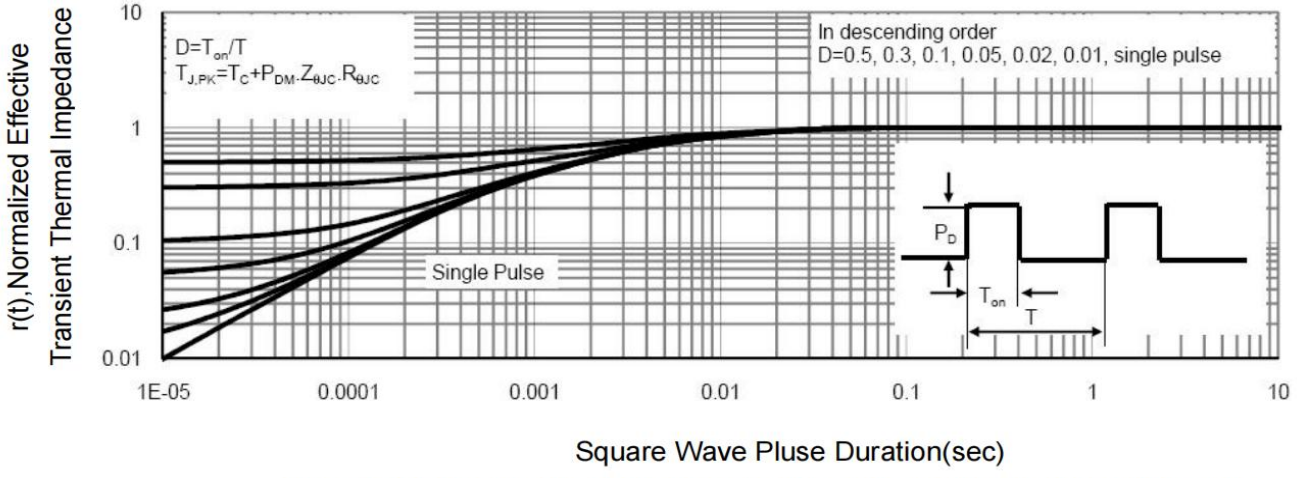
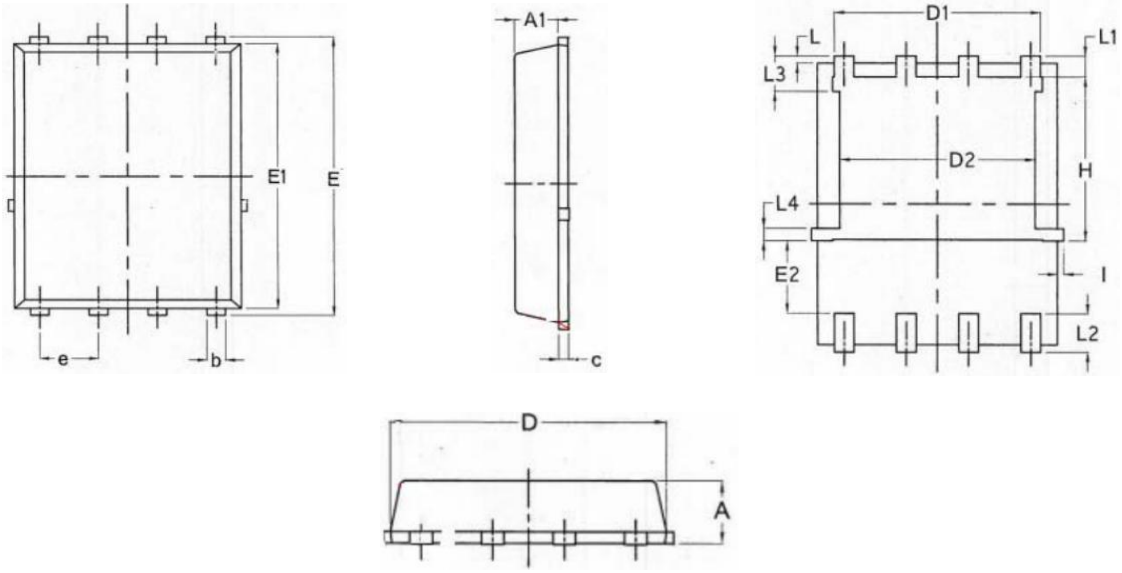


Figure 11 Normalized Maximum Transient Thermal Impedance

DFN5X6-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.170	0.035	0.046
A1	0.824	0.970	0.032	0.038
b	0.330	0.500	0.013	0.020
C	0.150	0.300	0.006	0.0122
D	4.800	5.000	0.189	0.197
D1	3.910	4.360	0.154	0.172
D2	3.610	4.150	0.142	0.163
e	1.270BSC		0.050BSC	
E	5.900	6.150	0.232	0.242
E1	5.650	5.850	0.222	0.230
E2	1.100	-	0.043	-
L	0.050	0.250	0.002	0.010
L1	0.380	0.610	0.015	0.024
L2	0.510	0.860	0.020	0.034
L3	0.550	0.850	0.022	0.034
L4	0.100	0.400	0.004	0.016
H	3.250	3.780	0.128	0.149
I	0.000	0.180	0.000	0.007