AER016N06S-Q1

N-Channel Super Trench Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
60V	1.6mΩ@10V	318A

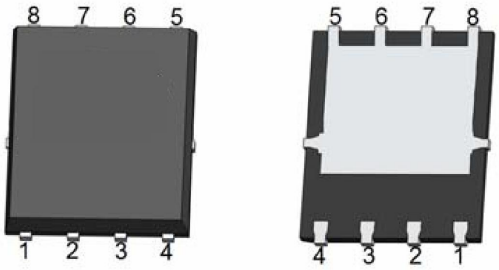
Feature

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

Application

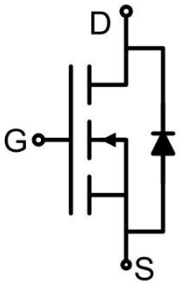
- DC-DC converter
- Ideal for high-frequency switching and synchronous rectification

Package



PDFN5*6-8L

Circuit diagram



Marking

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	I_D	318	A
Continuous Drain Current (T_C =100℃)	I_D(100℃)	200	A
Pulsed Drain Current[1]	I_{DM}	1272	A
Power Dissipation	P_D	280	W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	0.45	℃/W
Single pulse avalanche energy[5]	E_{AS}	520	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[3]	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	2.0	3.0	4.0	V
Drain-source on-resistance[3]	$R_{DS(on)}$	V_{GS} =10V, I_D =20A		1.3	1.6	mΩ
Forward Transconductance[3]	g_{FS}	V_{DS} =10V, I_D =20A		60		S
Dynamic characteristics[4]						
Input Capacitance	C_{iss}	V_{DS} =30V, V_{GS} =0V, f =1MHz		5478		pF
Output Capacitance	C_{oss}			2012		
Reverse Transfer Capacitance	C_{rss}			178		
Total Gate Charge	Q_g	V_{DS} =30V, V_{GS} =10V, I_D =20A		97.7		nC
Gate-Source Charge	Q_{gs}			29.7		
Gate-Drain Charge	Q_{gd}			31.3		
Turn-on delay time	$t_{d(on)}$	V_{DD}=30V, V_{GS}=10V, I_D=20A, R_G=4.7Ω		24		nS
Turn-on rise time	t_r			21		
Turn-off delay time	$t_{d(off)}$			45		
Turn-off fall time	t_f			18		
Source-Drain Diode characteristics						
Diode Forward Current[2]	I_S				318	A
Diode Forward voltage[3]	V_{SD}	V_{GS} =0V, I_S=20A			1.2	V
Reverse Recovery Time	t_{rr}	T_J =25℃, I_F =40A, di/dt =100A/μs[3]		60		nS
Reverse Recovery Charge	Q_{rr}			80		nC

Notes:

1) Repetitive Rating: Pulse width limited by maximum junction temperature.
2) Surface Mounted on FR4 Board, t ≤ 10 sec.
3) Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4) Guaranteed by design, not subject to production
5) EAS condition : Tj=25℃,VDD=30V,VG=10V,L=0.5mH,Rg=25Ω

Typical Characteristics

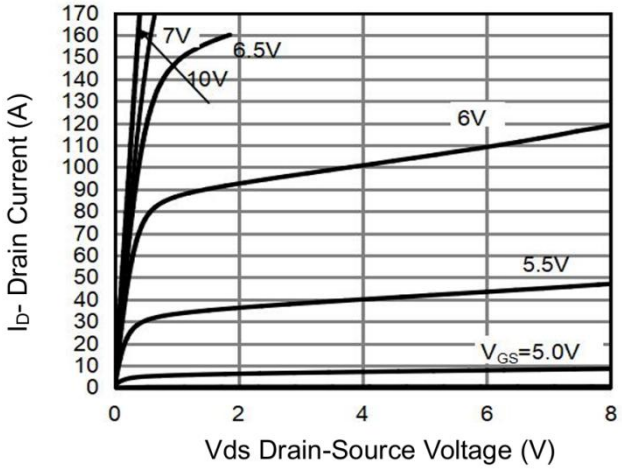


Figure 1 Output Characteristics

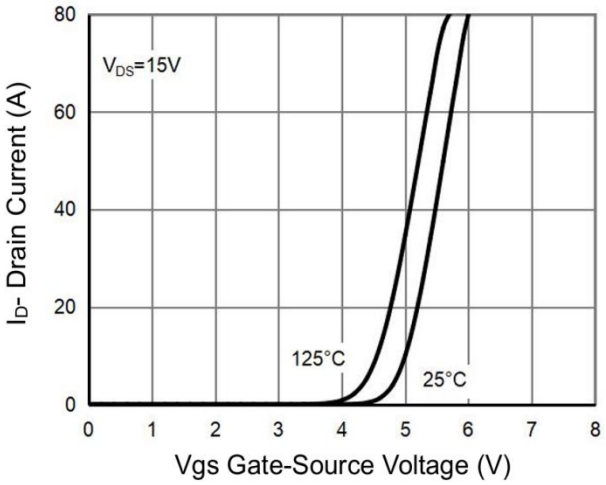


Figure 2 Transfer Characteristics

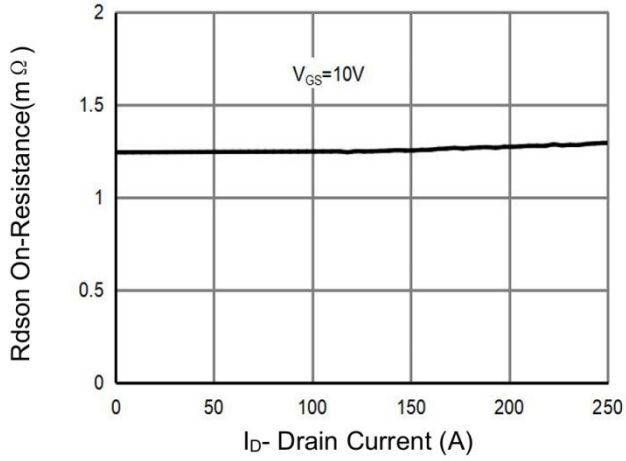


Figure 3 Rdson- Drain Current

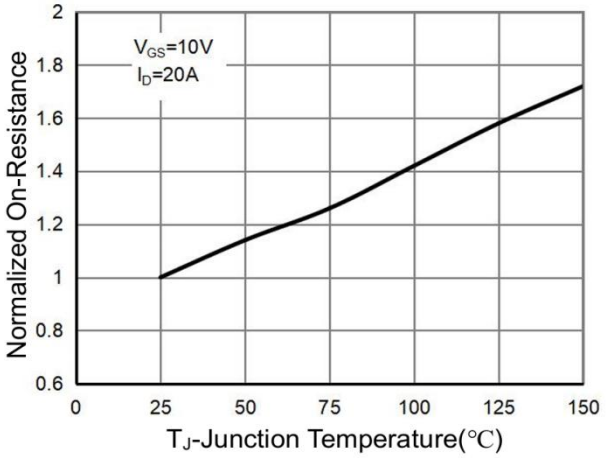


Figure 4 Rdson-JunctionTemperature

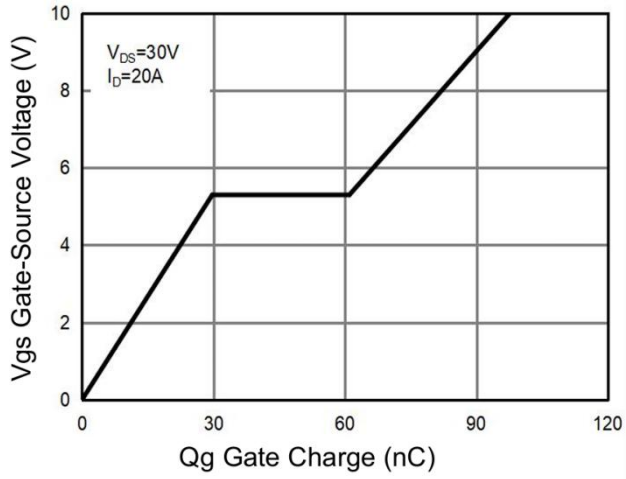


Figure 5 Gate Charge

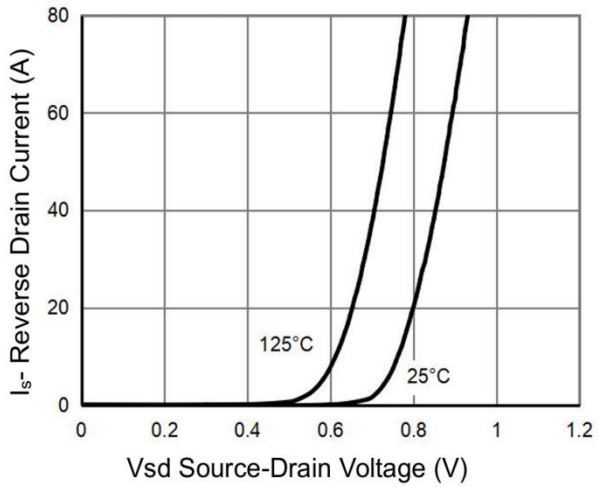


Figure 6 Source- Drain Diode Forward

Typical Characteristics

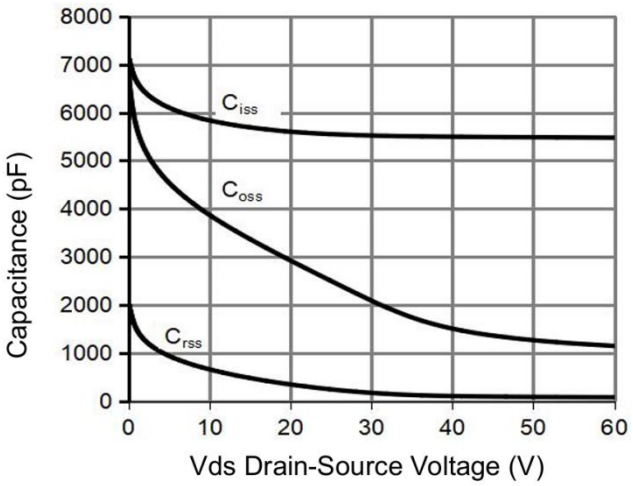


Figure 7 Capacitance vs Vds

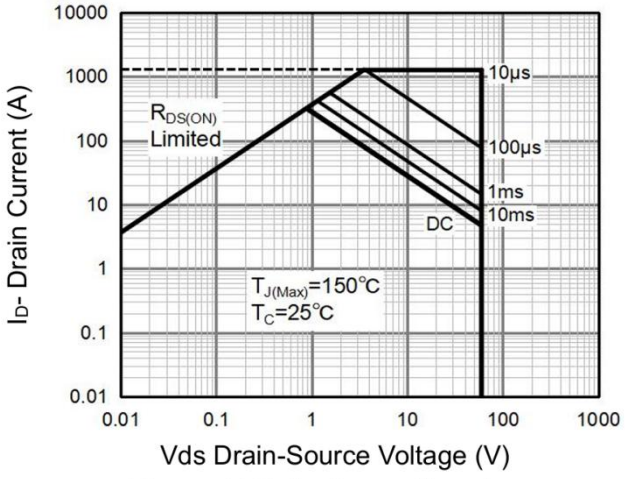


Figure 8 Safe Operation Area

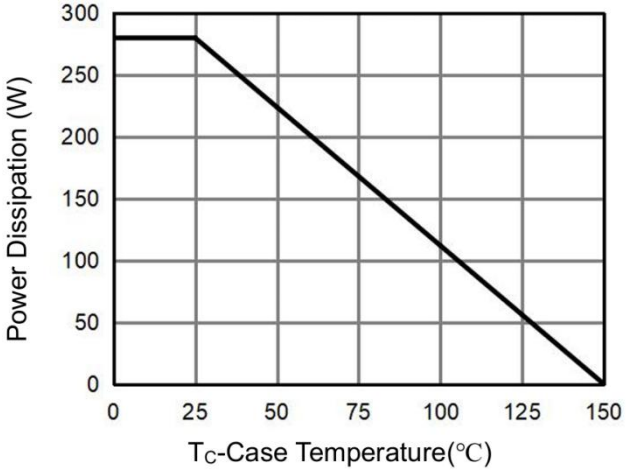


Figure 9 Power De-rating

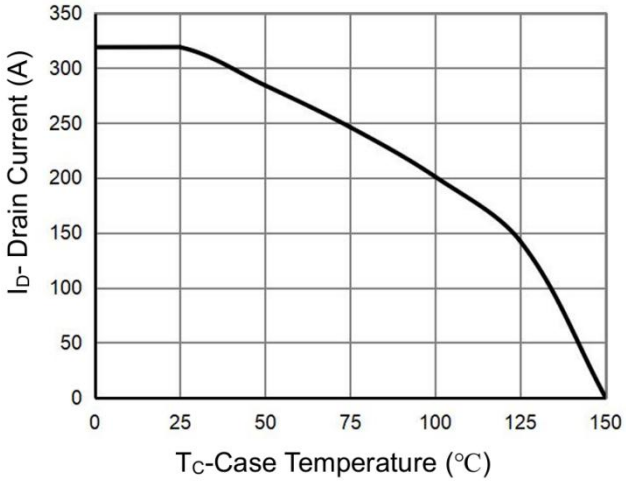


Figure 10 Current De-rating

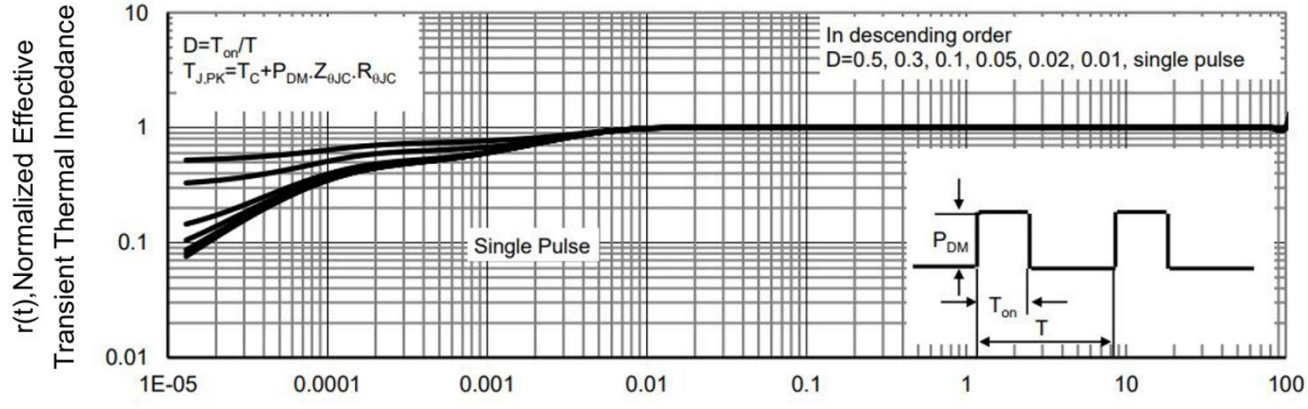
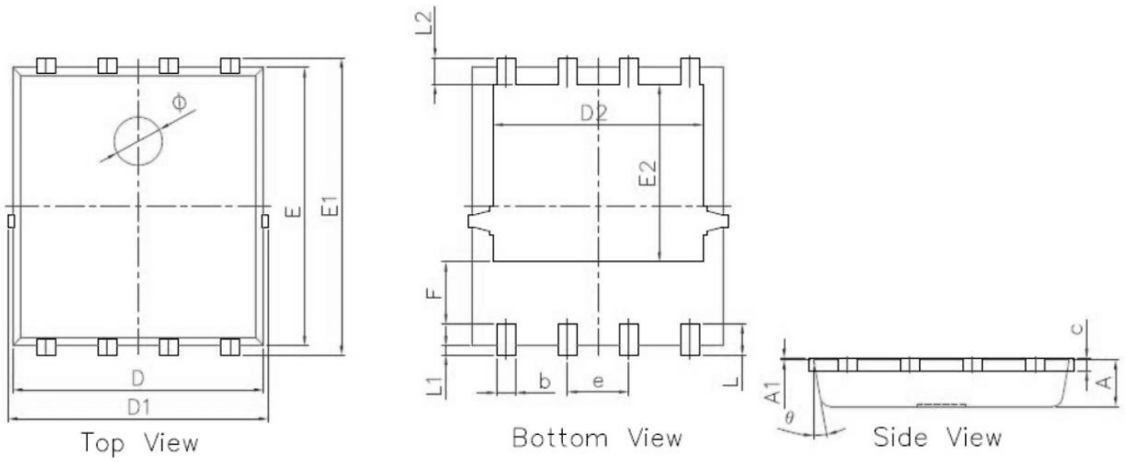


Figure 11 Normalized Maximum Transient Thermal Impedance

PDFN5*6-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A1	0.000	0.050	0.000	0.002
b	0.350	0.500	0.014	0.020
C	0.200	0.300	0.008	0.012
D	5.100	5.300	0.201	0.209
D1	5.100	5.500	0.201	0.217
D2	4.250	4.450	0.167	0.175
E	5.700	5.800	0.224	0.228
E1	6.000	6.300	0.236	0.248
E2	3.570	3.770	0.141	0.148
e	1.270 BSC.		0.050 BSC.	
F	1.180	1.380	0.046	0.054
L	0.550	0.750	0.022	0.030
L1	0.150	0.250	0.006	0.010
L2	0.450	0.650	0.018	0.026
Φ	0.900	1.100	0°	12°
θ	8°	12°	8°	12°