AS55P10S-Q1

P-Channel Super Trench Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-100V	26mΩ@-10V	-55A
	30mΩ@-4.5V	

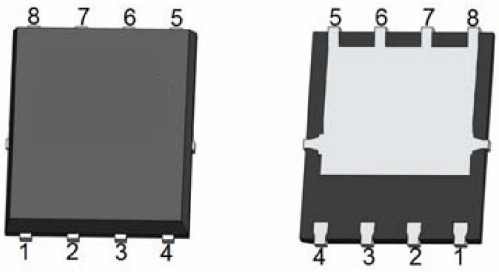
Feature

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

Application

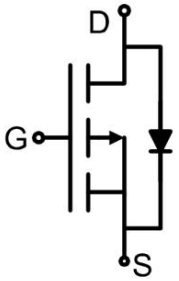
- DC/DC converters
- Ideal for high-frequency switching and synchronous rectification

Package

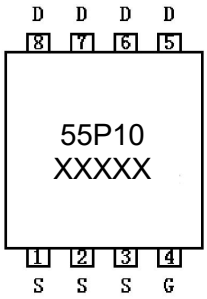


DFN5X6-8L

Circuit diagram



Marking



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Absolute maximum ratings (T_C=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	I_D	-55	A
Continuous Drain Current (T_C =100℃)	I_D(100℃)	-39	A
Pulsed Drain Current	I_{DM}	-220	A
Power Dissipation	P_D	140	W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	0.89	℃/W
Single pulse avalanche energy[1)]	E_{AS}	670	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	-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	-1.2	-1.7	-2.5	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =-10V, I_D =-20A		19.5	26	mΩ
		V_{GS} =-4.5V, I_D =-20A		22.5	30	
Dynamic characteristics[2)]						
Input Capacitance	C_{iss}	V_{DS} =-50V, V_{GS} =0V, f =1MHz		6900		pF
Output Capacitance	C_{oss}			430		
Reverse Transfer Capacitance	C_{rss}			10.5		
Total Gate Charge	Q_g	V_{DS} =-50V, V_{GS} =-10V, I_D =-20A		86.5		nC
Gate-Source Charge	Q_{gs}			16.6		
Gate-Drain Charge	Q_{gd}			9		
Turn-on delay time	$t_{d(on)}$	V_{DD}=-50V, V_{GS}=-10V, R_G=1.6Ω, I_D=-20A		15		nS
Turn-on rise time	t_r			18		
Turn-off delay time	$t_{d(off)}$			50		
Turn-off fall time	t_f			18		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				-55	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S=-20A			-1.2	V
Reverse Recovery Time	t_{rr}	T_J=25℃, I_F = -20A di/dt = 100A/μs		55		nS
Reverse Recovery Charge	Q_{rr}			101		nC

Notes:

1) EAS condition : T_j=25℃,V_{DD}=-50V,V_G=-10V,L=0.5mH,Rg=25Ω.

2) Guaranteed by design, not subject to production.

3) These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsin k, assuming a maximum junction temperature of TJ(MAX)=150°C. The SOA curve provides a single pulse rating.

Typical Characteristics

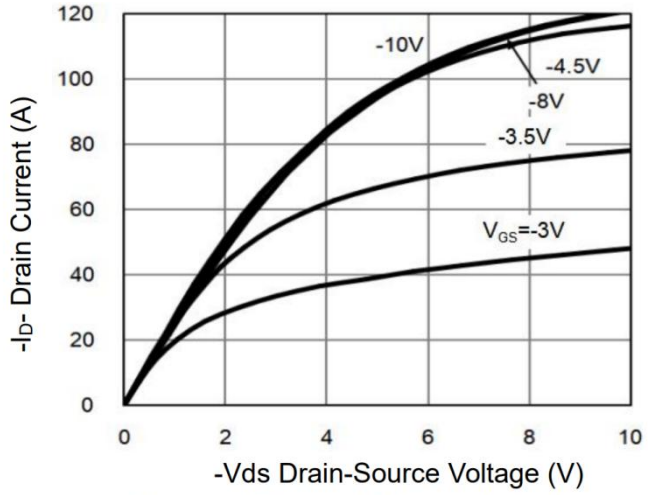


Figure 1 Output Characteristics

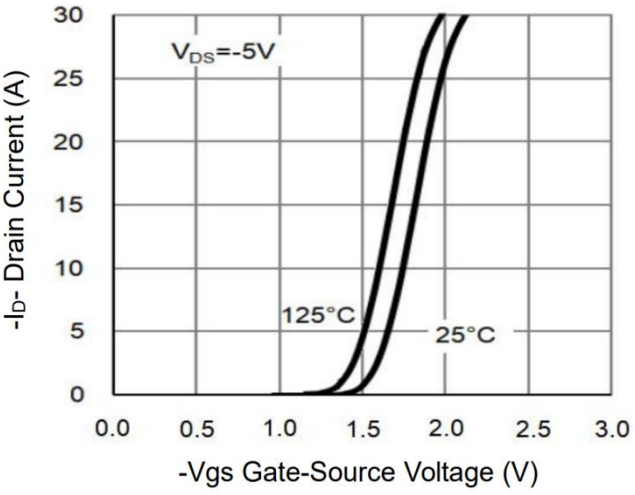


Figure 2 Transfer Characteristics

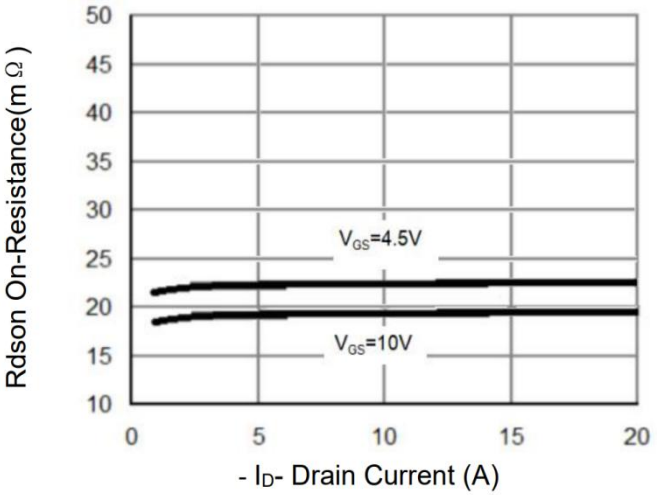


Figure 3 Rdson- Drain Current

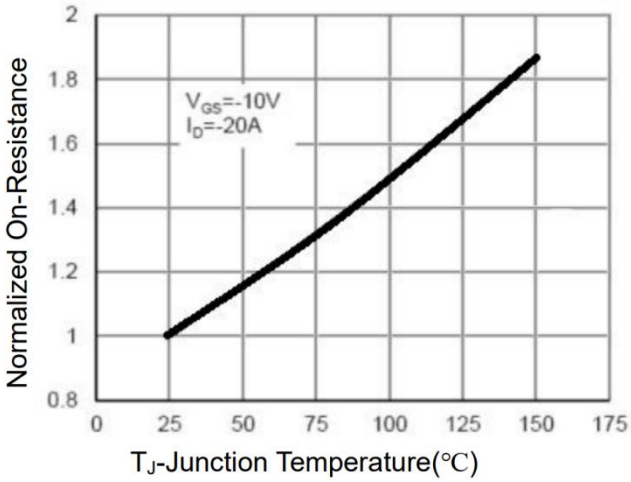


Figure 4 Rdson-JunctionTemperature

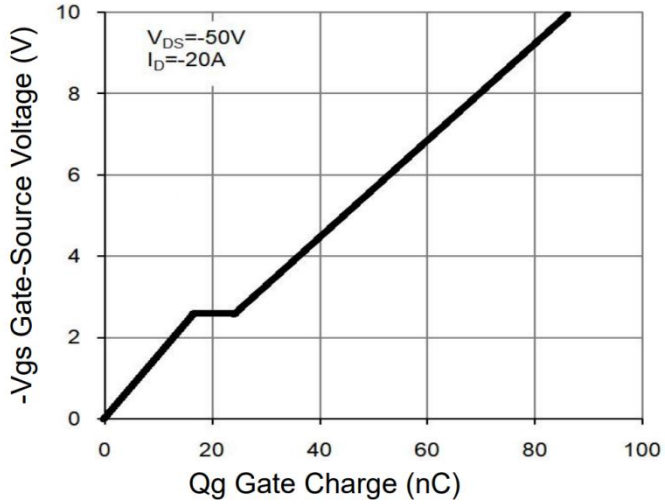


Figure 5 Gate Charge

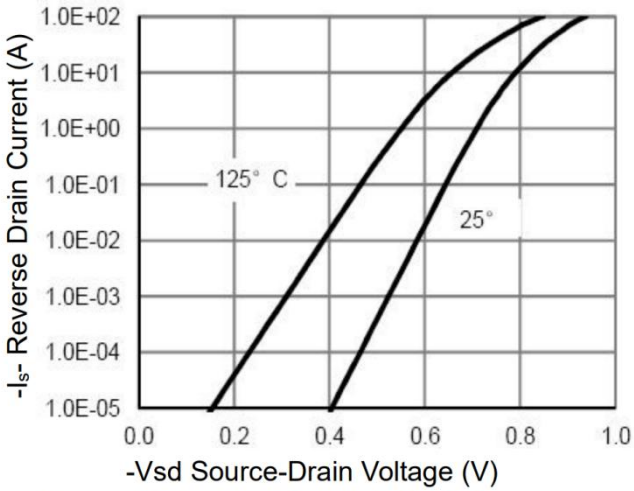


Figure 6 Source- Drain Diode Forward

Typical Characteristics

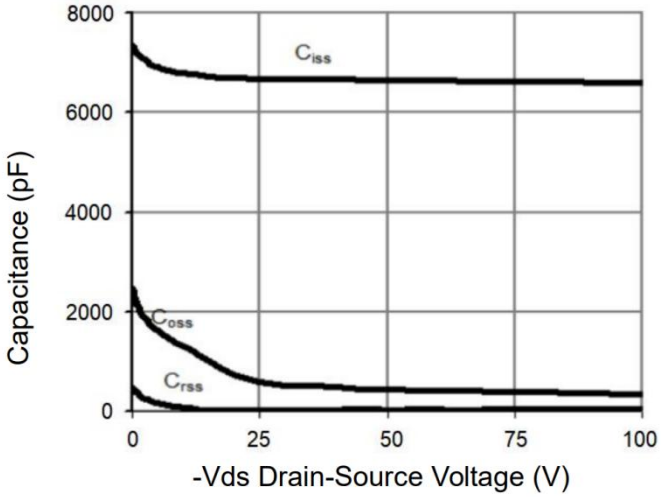


Figure 7 Capacitance vs Vds

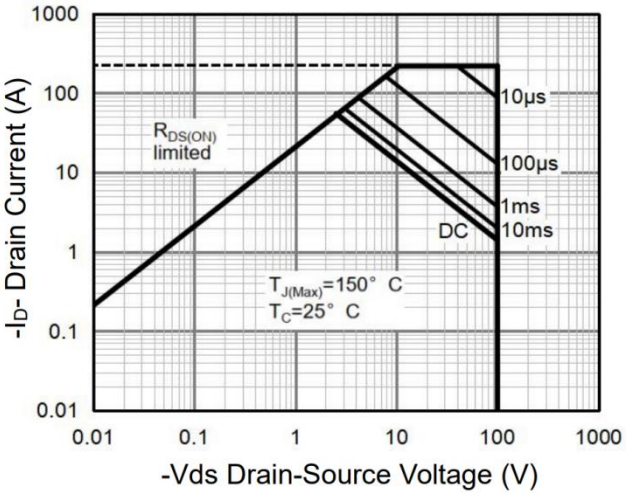


Figure 8 Safe Operation Area(Note 3)

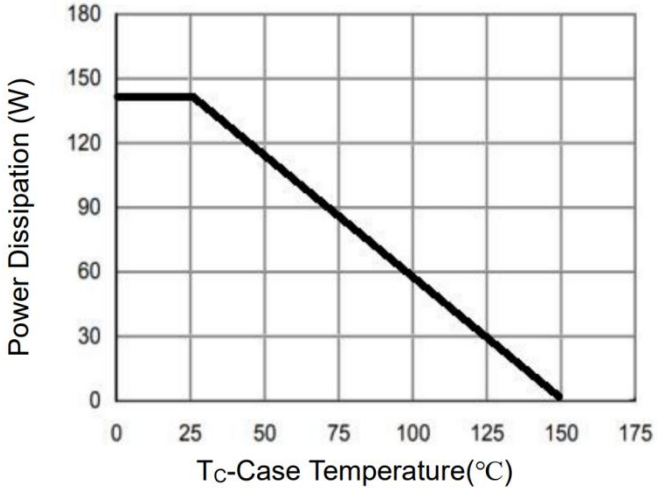


Figure 9 Power De-rating

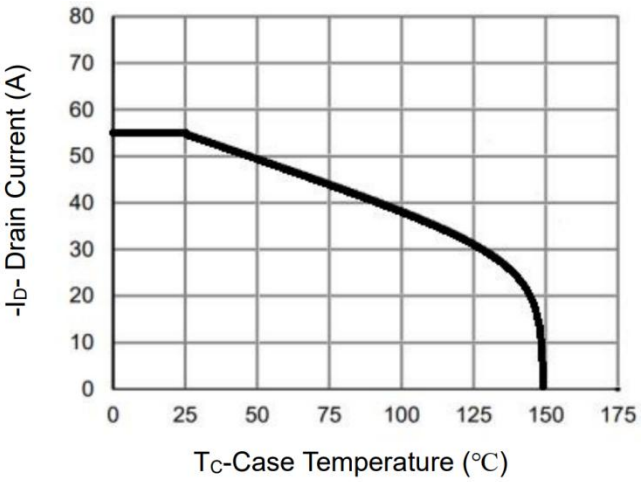


Figure 10 Current De-rating

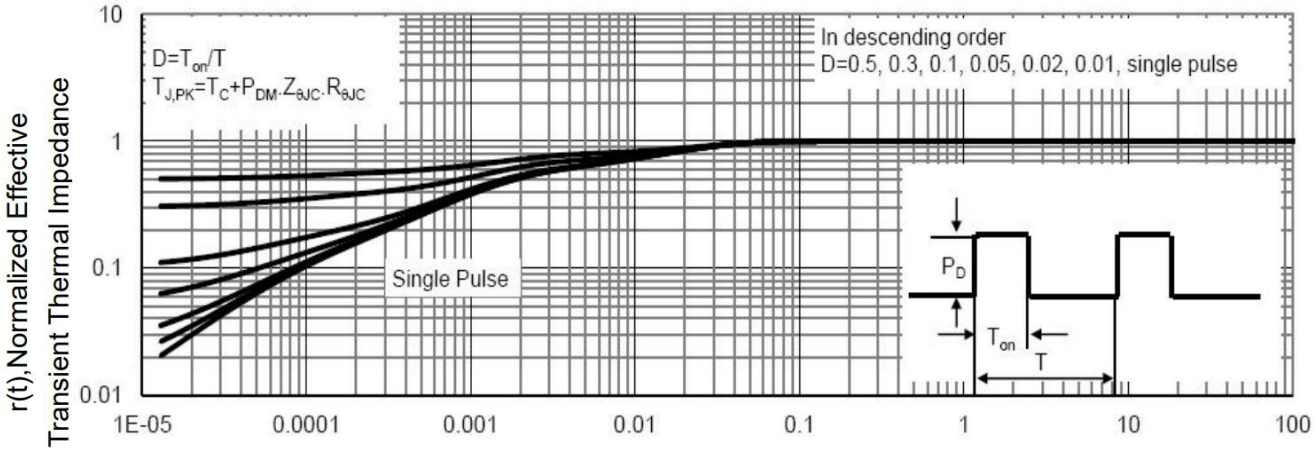
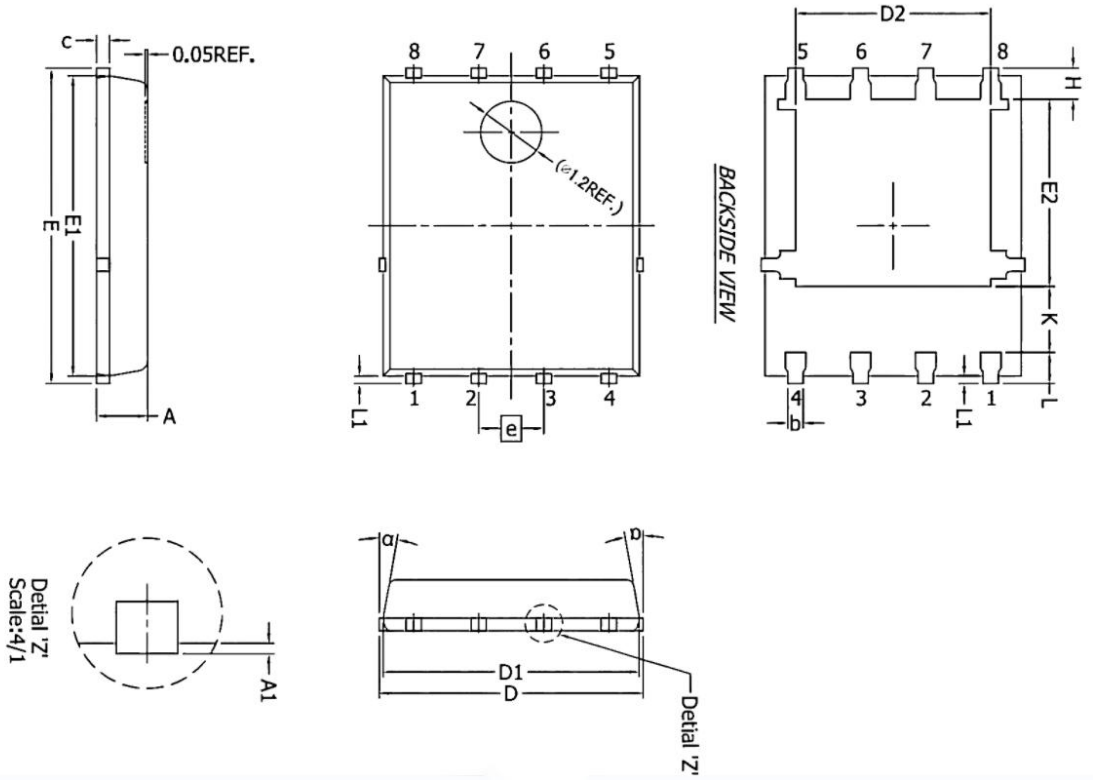


Figure 11 Normalized Maximum Transient Thermal Impedance

DFN5X6-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
A1	-	0.050	-	0.002
b	0.300	0.500	0.012	0.020
c	0.200	0.300	0.008	0.012
D	5.15 BSC		0.203 BSC	
D1	5.00 BSC		0.197 BSC	
D2	3.760	3.860	0.148	0.152
E	6.150 BSC		0.242 BSC	
E1	5.800	5.900	0.228	0.232
E2	3.450	3.850	0.136	0.152
e	1.270 BSC		0.050 BSC	
H	0.510	0.710	0.020	0.028
K	1.100	-	0.043	-
L	0.510	0.710	0.020	0.028
L1	0.080	0.230	0.003	0.009
α	10°	12°	10°	12°