AS55P02S-Q1

P-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-20V	8.3mΩ@-4.5V	-55A
	10.0mΩ@-2.5V	
	15.0mΩ@-1.8V	

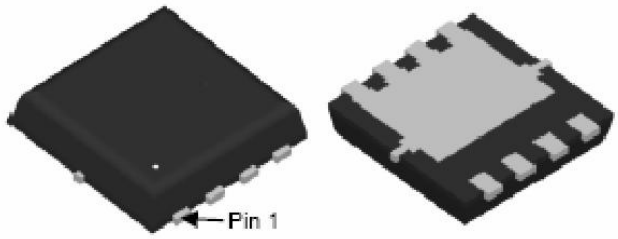
Feature

- High density cell design for ultra low Rdson
- High Speed switching
- Suffix "-Q1" for AEC-Q101

Application

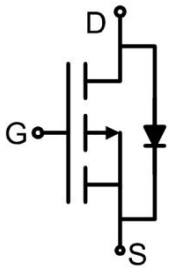
- High current load applications
- Load switching
- Hard switched and high frequency circuits

Package



DFN3.3X3.3-8L

Circuit diagram



Marking

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

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	±10	V
Continuous Drain Current	Ta=25℃	I_D	-55	A
	Ta=100℃		-35	
Pulsed Drain Current		I_{DM}	-160	A
Power Dissipation	Tc=25℃	P_D	38	W
	Ta=25℃		3.2	
Thermal Resistance,Junction-to-Case		$R_{\theta JC}$	3.3	℃/W
Single pulse avalanche energy		E_{AS}	75	mJ
Junction Temperature		T_J	150	℃
Storage Temperature		T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_A=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	-20			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =-20V,V_{GS} = 0V			-1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±10V, V_{DS} = 0V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =-250μA	-0.4	-0.62	-1.0	V
Drain-source on-resistance[1]	$R_{DS(on)}$	V_{GS} =-4.5V, I_D =-15A		6.5	8.3	mΩ
		V_{GS} =-2.5V, I_D =-10A		8.0	10.0	
		V_{GS} =-1.8V, I_D =-8A		10.3	15.0	
Dynamic characteristics[2]						
Input Capacitance	C_{iss}	V_{DS} =-10V,V_{GS} =0V,f =1MHz		6358		pF
Output Capacitance	C_{oss}			690		
Reverse Transfer Capacitance	C_{rss}			477		
Total Gate Charge	Q_g	V_{DS} =-15V,V_{GS} =-10V, ID =-9.1A		12.7		nC
Gate-Source Charge	Q_{gs}			21		
Gate-Drain Charge	Q_{gd}			149		
Turn-on delay time	$t_{d(on)}$	V_{DD}=-15V,V_{GS}=-10V, I_D =-6A,R_{GEN}=2.5Ω		11		nS
Turn-on rise time	t_r			36		
Turn-off delay time	$t_{d(off)}$			182		
Turn-off fall time	t_f			191		
Source-Drain Diode characteristics						
Diode Forward Current[1]	I_S				-55	A
Diode Forward voltage	V_{DS}	V_{GS} =0V, I_S=-20A			-1.2	V

Notes:

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

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

Typical Characteristics

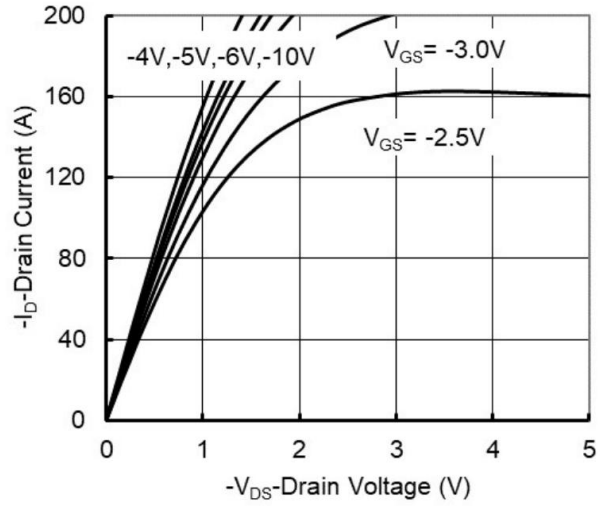


Figure 1. Output Characteristics

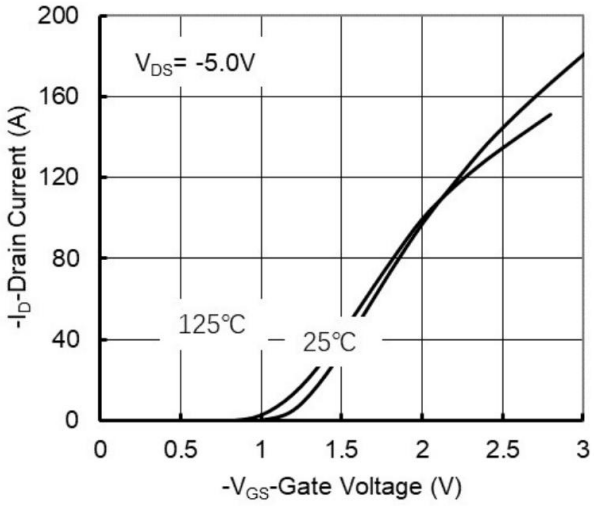


Figure 2. Transfer Characteristics

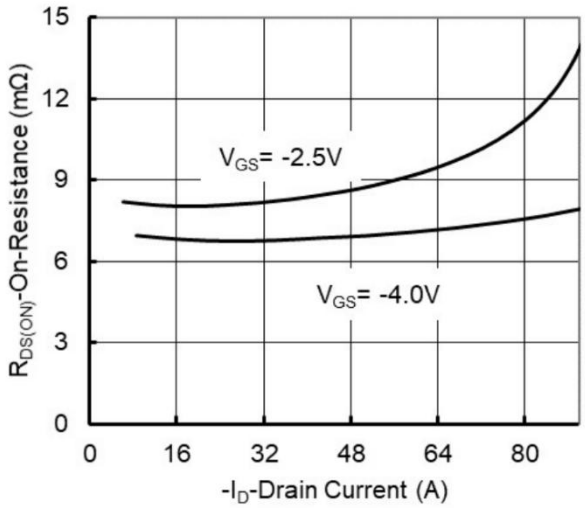


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

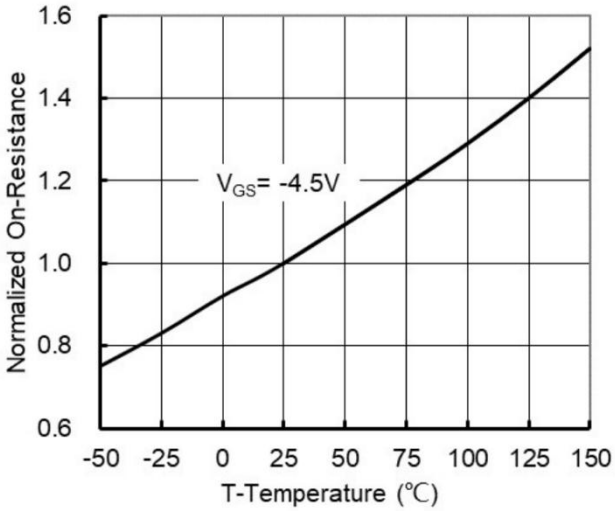


Figure 4. On-Resistance vs. Junction Temperature

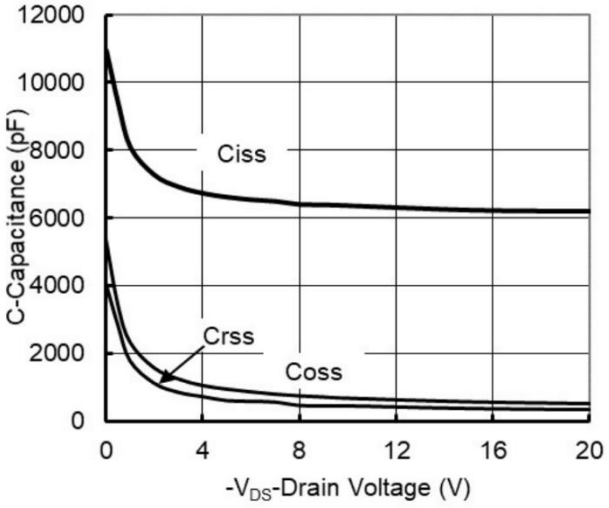


Figure 5. Capacitance Characteristics

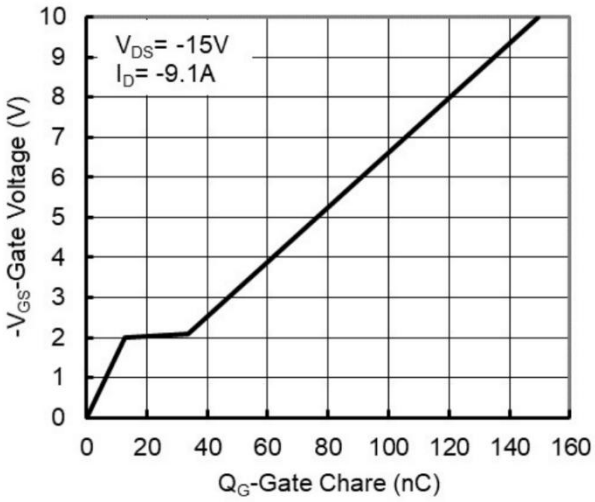


Figure 6. Gate Charge

Typical Characteristics

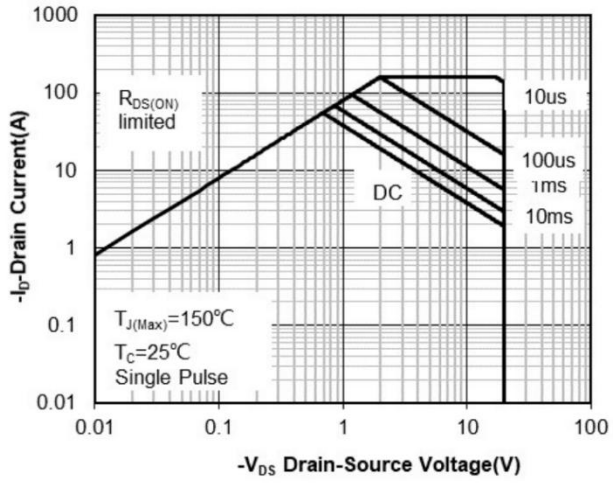


Figure 7. Safe Operation Area

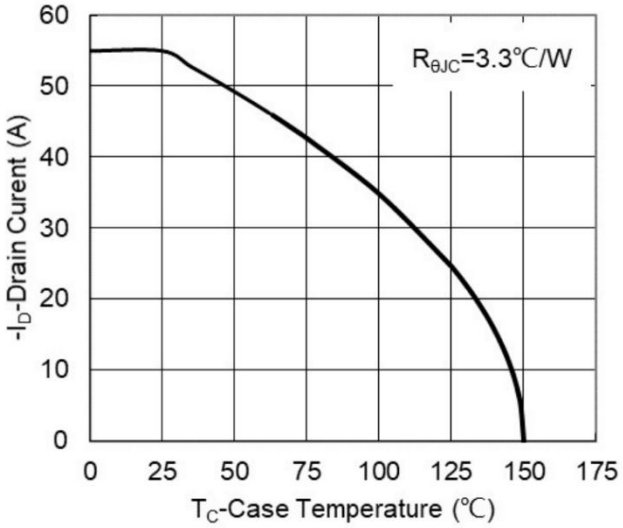


Figure 8. Maximum Continuous Drain Current vs Case Temperature

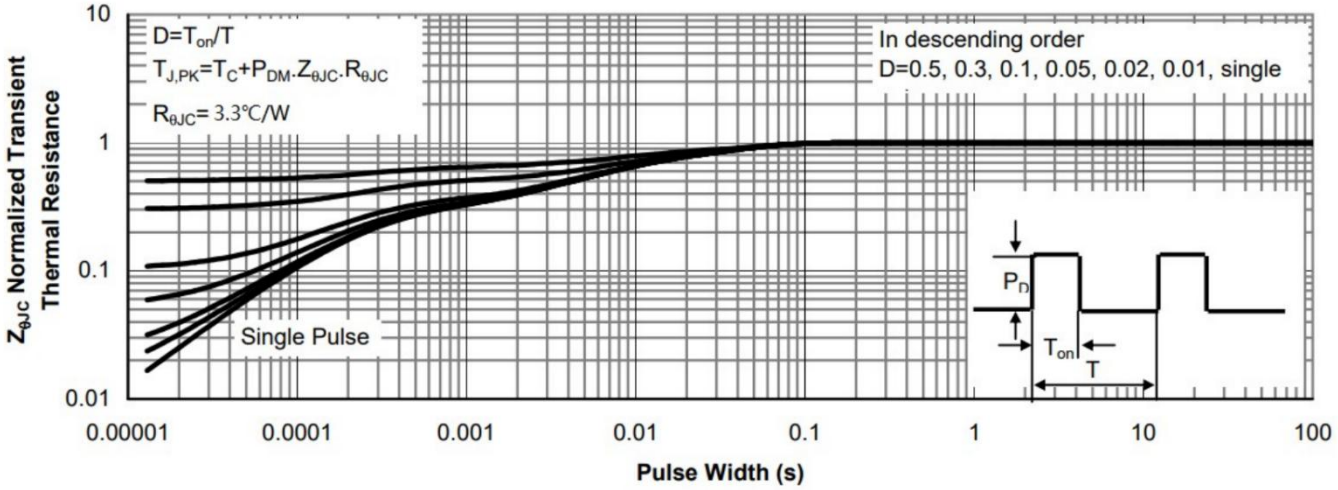
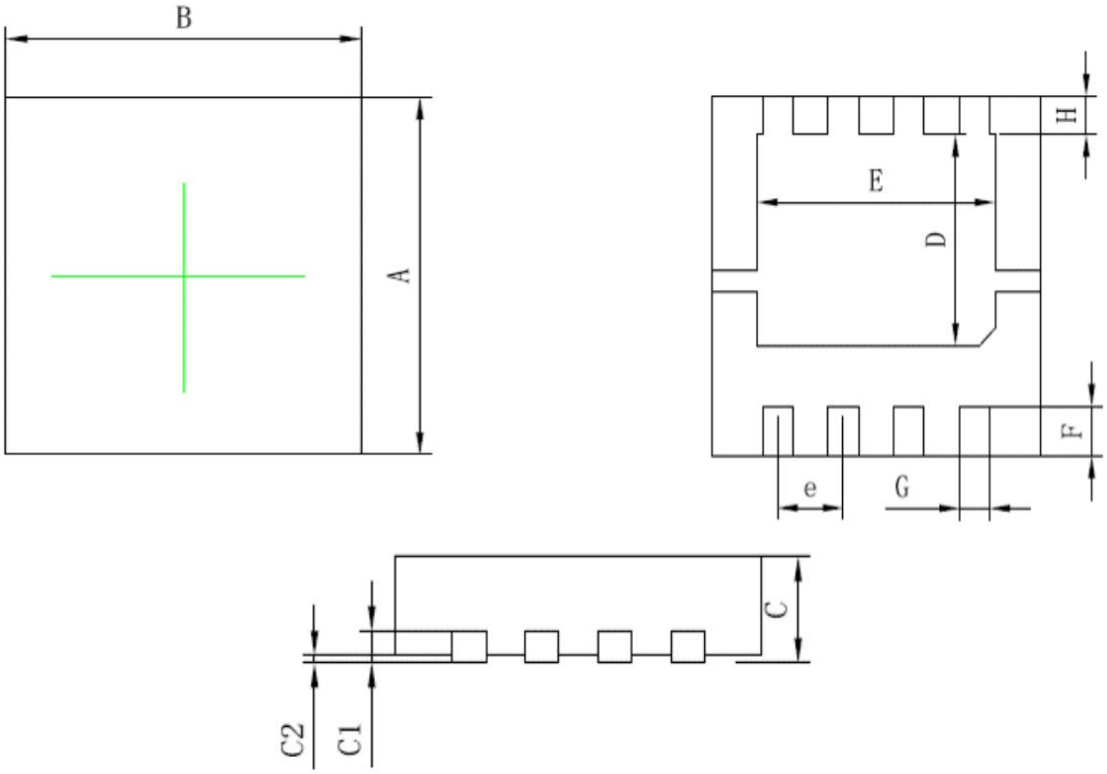


Figure 9. Normalized Maximum Transient Thermal Impedance

DFN3.3X3.3-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	3.150	3.350	0.124	0.132
B	3.150	3.350	0.124	0.132
C	0.700	1.000	0.027	0.039
C1	0.200 BSC		0.008 BSC	
C2	0.100 Max		0.004 Max	
D	1.800	2.000	0.071	0.079
E	2.200	2.500	0.087	0.098
F	0.350	0.550	0.013	0.022
G	0.200	0.400	0.007	0.016
H	0.350 BSC		0.014 BSC	
e	0.650 BSC		0.026 BSC	