AS50N03GS-Q1

N-Channel Super Trench Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
30V	4.7mΩ@10V	50A
	6.0mΩ@4.5V	

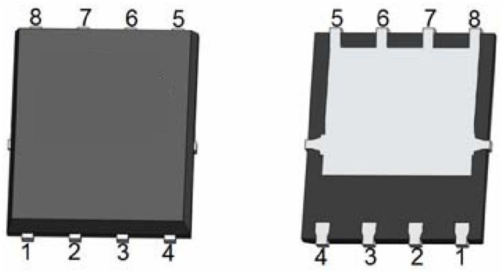
Feature

- Excellent package for heat dissipation
- Very low on-resistance $R_{DS(on)}$
- Suffix “-Q1” for AEC-Q101

Application

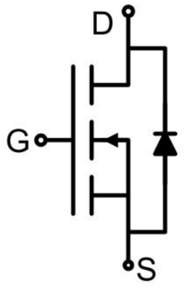
- High current load applications
- Load switching
- Hard switched and high frequency circuits
- Uninterruptible power suppl

Package

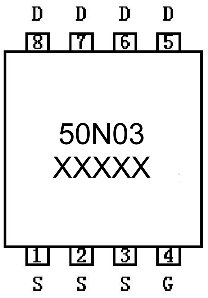


DFN5X6-8L

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	50	A
Pulsed Drain Current	I_{DM}	190	A
Power Dissipation	P_D	30	W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	5	℃/W
Single pulse avalanche energy	E_{AS}	80	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	30			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =30V,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 =15A			4.7	mΩ
		V_{GS} =4.5V, I_D =15A			6.0	
Dynamic characteristics$^{2)}$						
Input Capacitance	C_{iss}	V_{DS} =15V,V_{GS} =0V,f =1MHz		1620		pF
Output Capacitance	C_{oss}			336		
Reverse Transfer Capacitance	C_{rss}			195		
Total Gate Charge	Q_g	V_{DS} =15V,V_{GS} =10V,ID =20A		55.7		nC
Gate-Source Charge	Q_{gs}			13		
Gate-Drain Charge	Q_{gd}			11.3		
Turn-on delay time	$t_{d(on)}$	V_{DD}=20V,V_{GS}=10V, I_D =2A R_L=1Ω,R_{GEN}=3Ω		6		nS
Turn-on rise time	t_r			36		
Turn-off delay time	$t_{d(off)}$			29		
Turn-off fall time	t_f			7		
Source-Drain Diode characteristics						
Diode Forward Current$^{1)}$	I_S				50	A
Diode Forward voltage	V_{DS}	V_{GS} =0V, I_S=15A			1.2	V
Reverse Recovery Time	t_{rr}	T_J = 25°C, I_F = 25A di/dt = 100A/μs $^{1)}$		29		nS
Reverse Recovery Charge	Q_{rr}			27		nC

Notes:

1) Pulse Test: Pulse Width < 300μs, Duty Cycle ≤2%.
2) Guaranteed by design, not subject to production testing.

Typical Characteristics

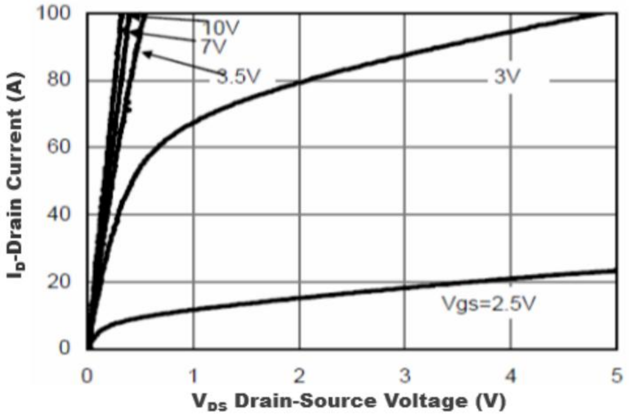


Figure1. Output Characteristics

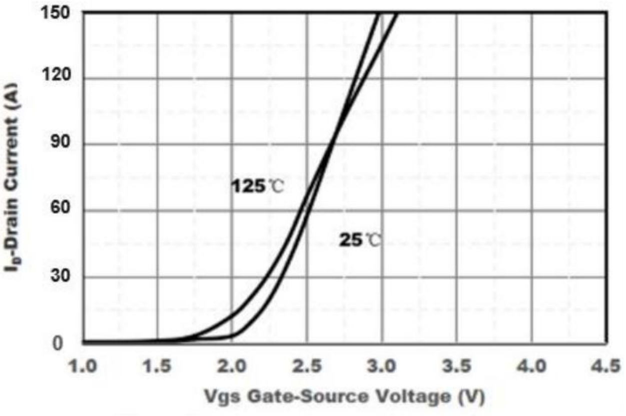


Figure2. Transfer Characteristics

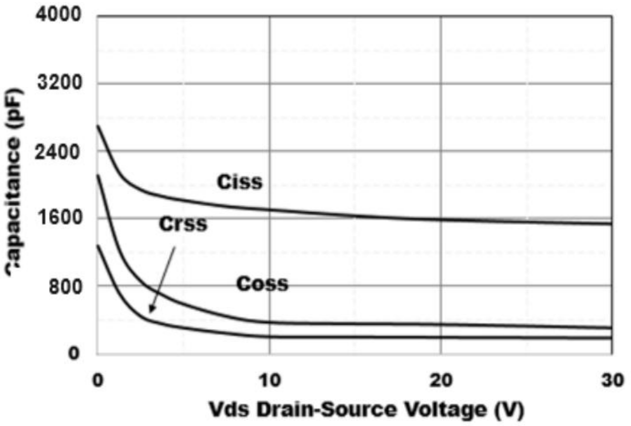


Figure3. Capacitance Characteristics

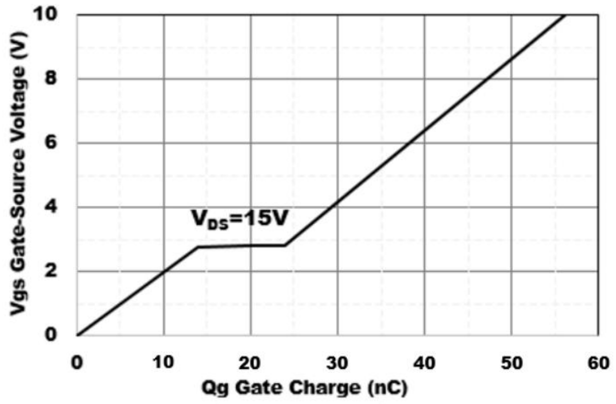


Figure4. Gate Charge

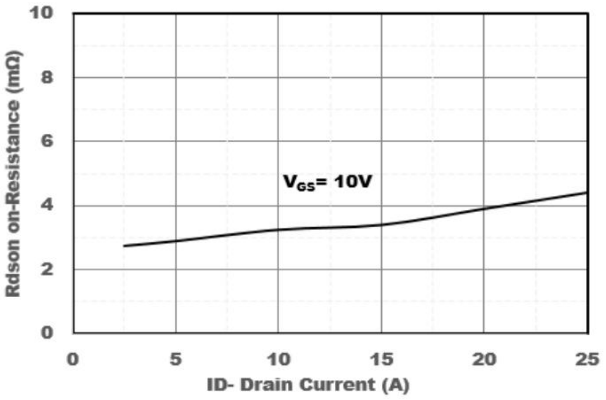


Figure5. Drain-Source on Resistance

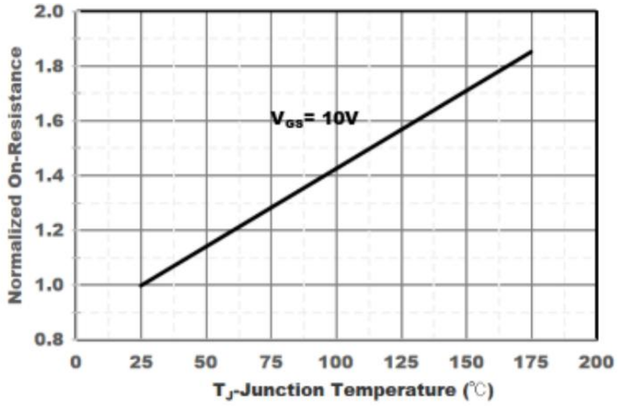
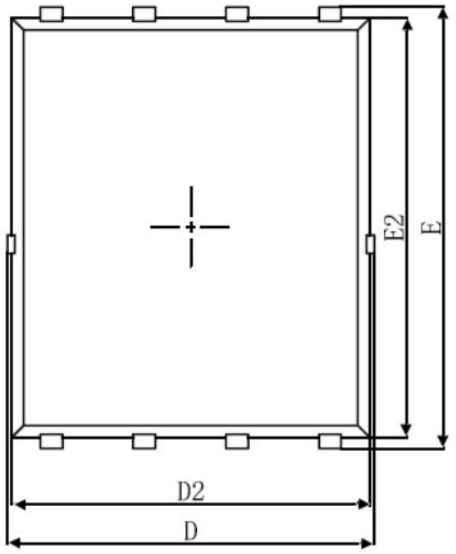
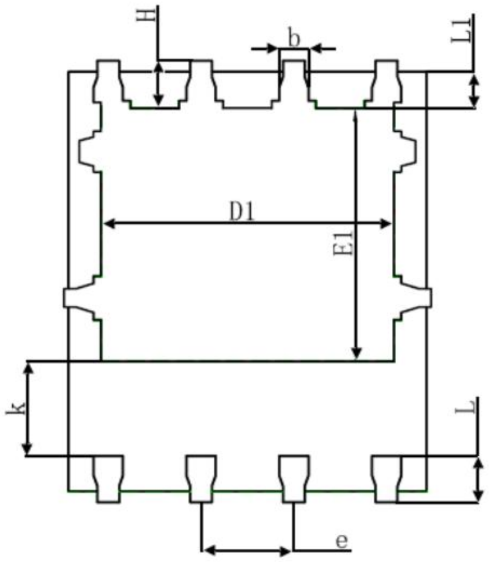


Figure6. Drain-Source on Resistance

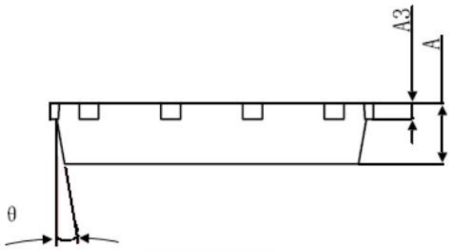
DFN5X6-8L Package Information



Top View



Bottom View



Side View

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	**Max.**	**Min.**	**Max.**
A	0.900	1.000	0.035	0.039
A3	0.254REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	8°	12°	8°	12°