AT2302BQSA-Q1

N-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
20V	50mΩ@4.5V	3A
	70mΩ@2.5V	

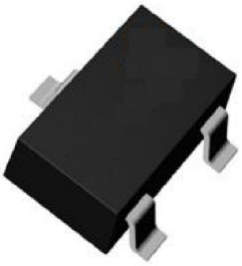
Feature

- Trench power LV MOSFET technology
- High power and current handing capability
- Suffix “-Q1” for AEC-Q101

Application

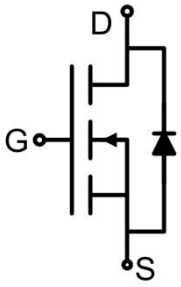
- PWM application
- Load switch

Package

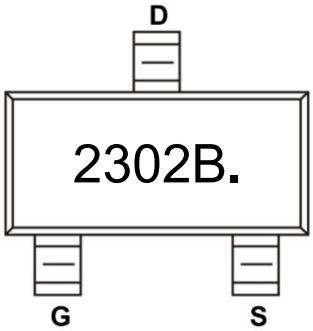


SOT-23

Circuit diagram



Marking



Absolute maximum ratings (T_A=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	I_D	3	A
Continuous Drain Current (T_A=70℃)	I_D (70℃)	2.4	A
Pulsed Drain Current[1]	I_{DM}	14	A
Power Dissipation	P_D	0.7	W
Thermal Resistance Junction to Ambient[2]	$R_{\theta JA}$	178	℃/W
Operating Junction Temperature	T_J	-55 ~ +150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_J=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, T_C=25℃			1	μA
Gate-body leakage current	I_{GSS}	V_{DS} =0V, V_{GS} =±10V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	0.55	0.78	1.1	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =4.5V, I_D =3A		38.5	50	mΩ
		V_{GS} =2.5V, I_D =2A		53.5	70	
Dynamic characteristics[3]						
Input Capacitance	C_{iss}	V_{DS} =10V, V_{GS} =0V, f =1MHz		220		pF
Output Capacitance	C_{oss}			34		
Reverse Transfer Capacitance	C_{rss}			26		
Gate Charge	Q_g	V_{DS} =10V, V_{GS} =4.5V, I_D =3A		3.61		nC
Gate-Source Charge	Q_{gs}			0.88		
Gate-Drain Charge	Q_{gd}			0.77		
Turn-on delay time	$t_{d(on)}$	V_{DS} =10V, V_{GS} =4.5V R_L =1.5Ω, R_G =3Ω		6.8		nS
Turn-on rise time	t_r			57		
Turn-off delay time	$t_{d(off)}$			14		
Turn-off fall time	t_f			53		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				3	A
Diode Forward Voltage	V_{SD}	V_{GS} =0V, I_S =3A			1.2	V

Notes:

1) Pulse Test: Pulse Width ≤300us,Duty cycle ≤2%.

2) Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

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

Typical Characteristics

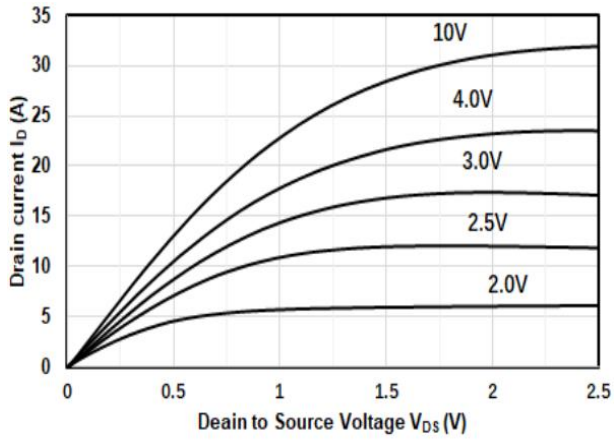


Figure1. Output Characteristics

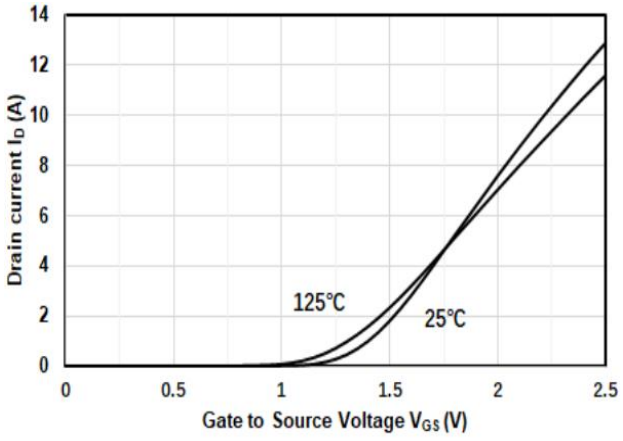


Figure2. Transfer Characteristics

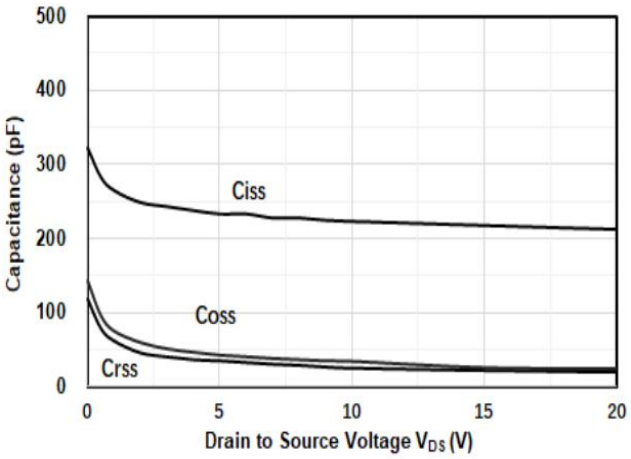


Figure3. Capacitance Characteristics

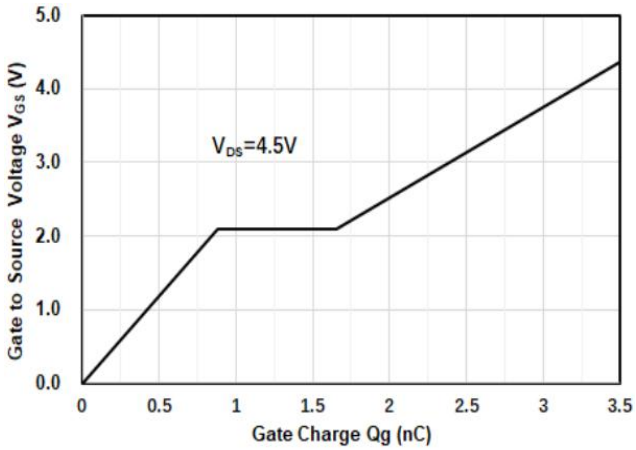


Figure4. Gate Charge

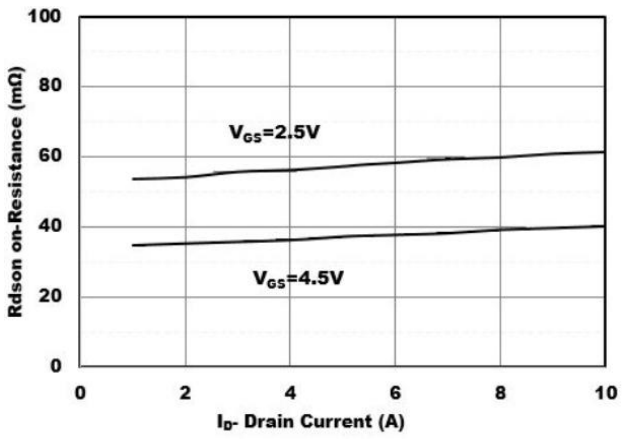


Figure5. Drain-Source on Resistance

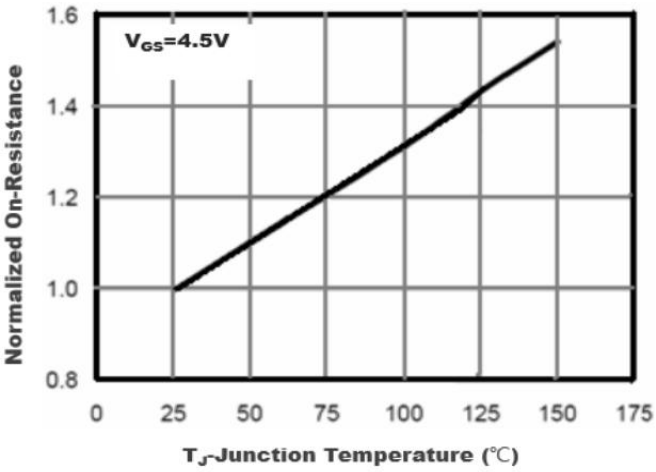


Figure6. Drain-Source on Resistance

Typical Characteristics

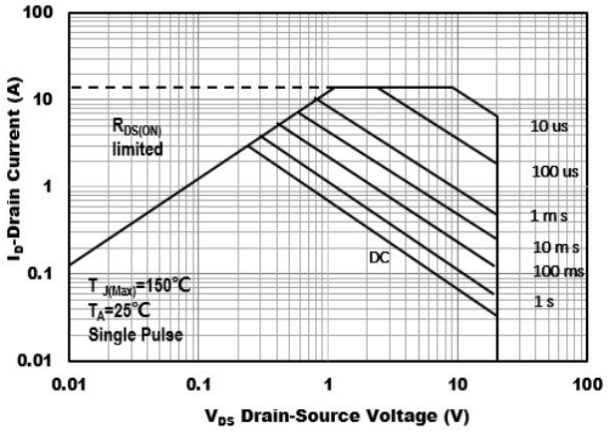


Figure7. Safe Operation Area

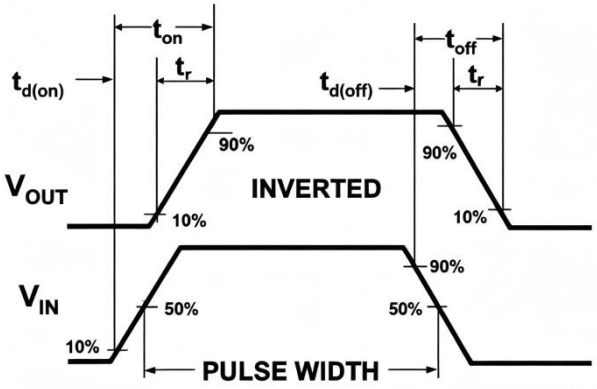


Figure8. Switching wave

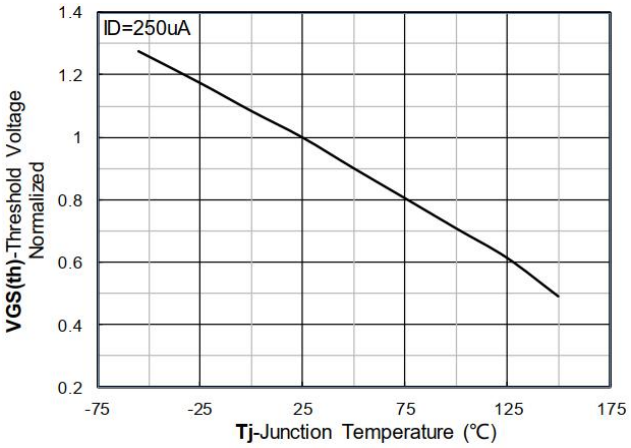


Figure 9. Normalized Threshold voltage

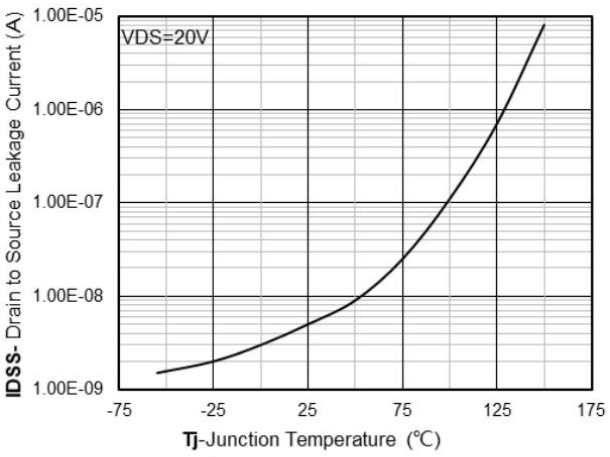
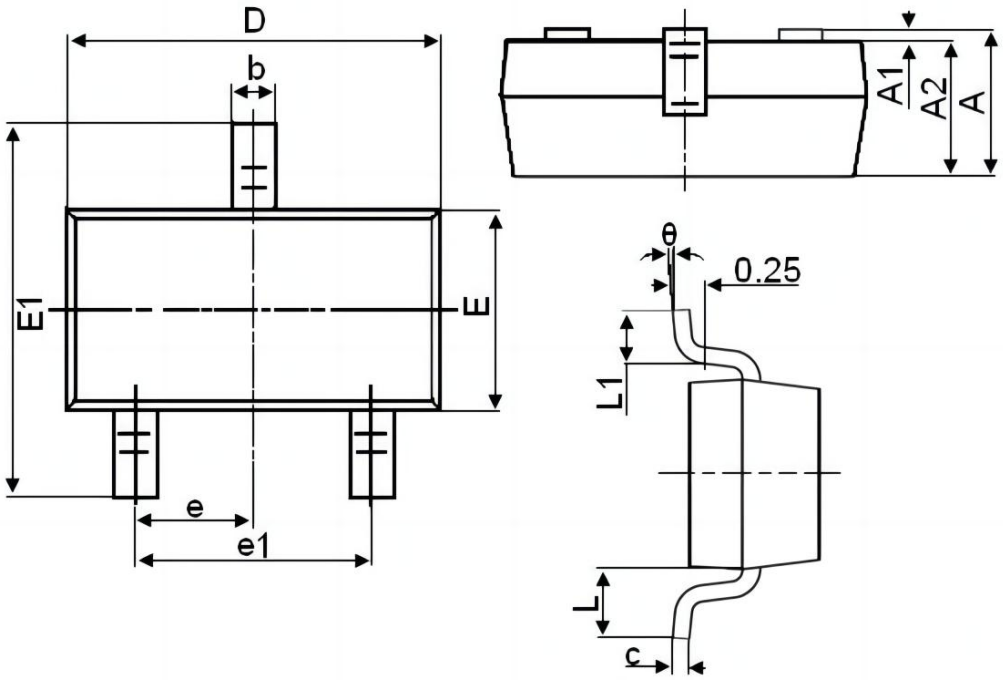


Figure 10. Drain to Source Leakage Current

SOT-23 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
C	0.100	0.200	0.004	0.008
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°