AT0P3SN060MQSA-Q1

N-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
60V	3Ω@10V	0.3A
	3.5Ω@4.5V	

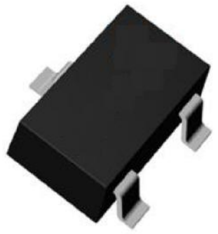
Feature

- Advanced trench cell design
- Extremely low threshold voltage
- Suffix "-Q1" for AEC-Q101

Application

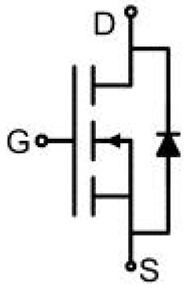
- PWM application

Package

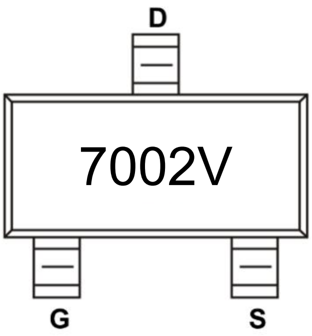


SOT-23

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}	±30	V
Continuous Drain Current[1)]	I_D	0.3	A
Pulsed Drain Current (t_p =10μs, T_A =25℃)	I_{DM}	2	A
Single Pulse Avalanche Energy[2)]	E_{AS}	0.11	mJ
Power Dissipation[1)]	P_D	0.35	W
Thermal Resistance Junction to Ambient[1)]	$R_{\theta JA}$	357	℃/W
Operating Junction Temperature	T_J	-55 ~ +150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_A=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	60			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =60V, V_{GS} =0V			1	μA
Gate-body leakage current	I_{GSS}	V_{DS} =0V, V_{GS} =±30V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1	1.5	2.5	V
Drain-source on-resistance[3)]	$R_{DS(on)}$	V_{GS} =10V, I_D =0.5A		0.9	3	Ω
		V_{GS} =4.5V, I_D =0.075A		1	3.5	
Dynamic characteristics[4)]						
Input Capacitance	C_{iss}	V_{DS} =25V, V_{GS} =0V, f =1MHz		35		pF
Output Capacitance	C_{oss}			7		
Reverse Transfer Capacitance	C_{rss}			3		
Total Gate Charge	Q_g	V_{DS} =10V, V_{GS} =4.5V, I_D =0.2A		0.41		nC
Gate-Source Charge	Q_{gs}			0.15		
Gate-Drain Charge	Q_{gd}			0.2		
Turn-on delay time	$t_{d(on)}$	V_{DS} =30V, V_{GS} =10V, I_D =0.2A R_G =25Ω		3.6		nS
Turn-on rise time	t_r			3.3		
Turn-off delay time	$t_{d(off)}$			20		
Turn-off fall time	t_f			11		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				0.3	A
Diode Forward voltage[3)]	V_{SD}	V_{GS} =0V, I_S =0.3A			1.5	V

Notes:

1) The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.

2) The EAS test condition is V_{DD} = 30V, L = 0.1mH, V_{GS} = 15V.

3) The data tested by pulsed, pulse width ≤300μs, duty cycle ≤2%.

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

Typical Characteristics

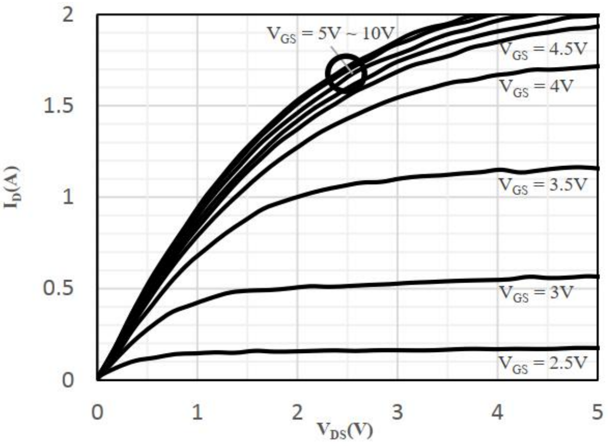


Fig 1 Typical Output Characteristics

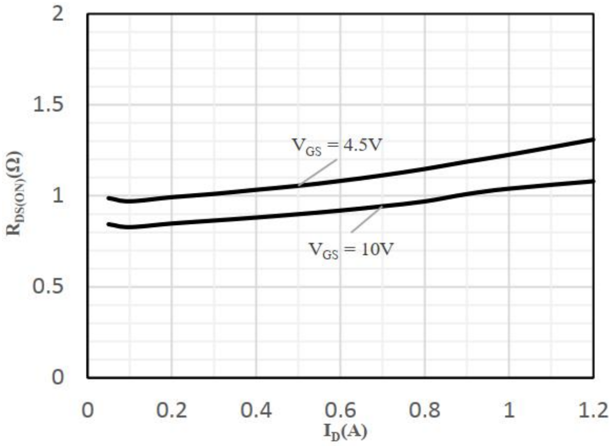


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

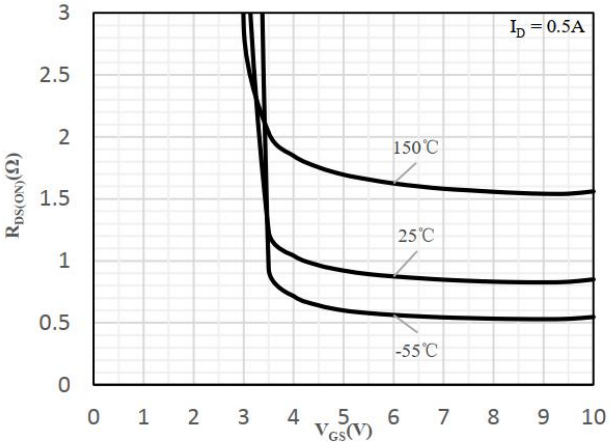


Fig 3 On-Resistance vs. Gate-Source Voltage

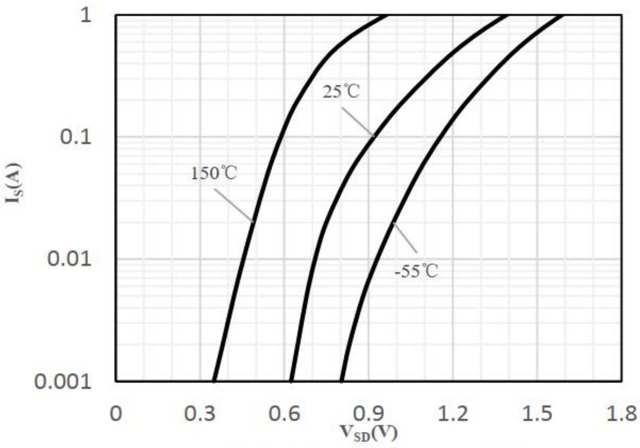


Fig 4 Body-Diode Characteristics

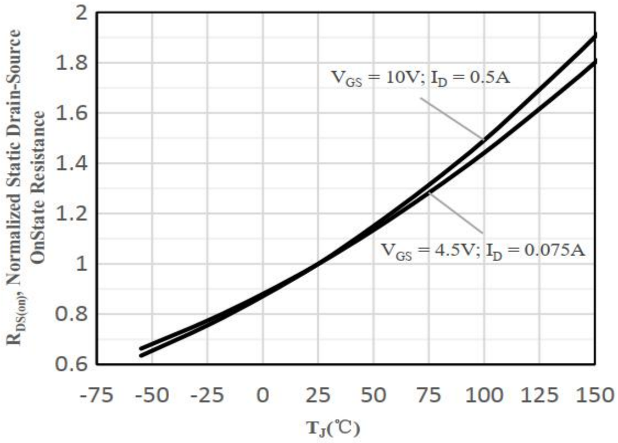


Fig 5 Normalized On-Resistance vs. Junction Temperature

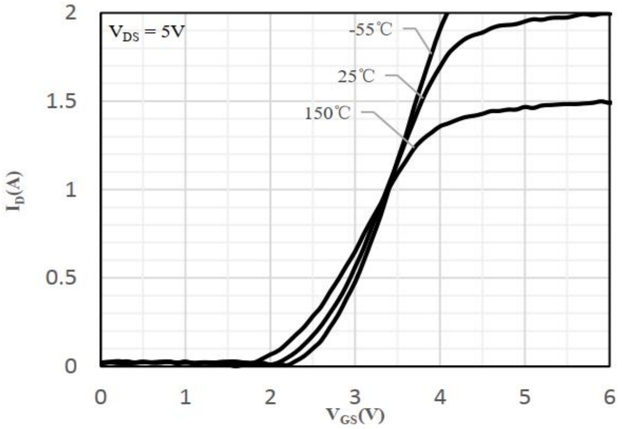


Fig 6 Transfer Characteristics

Typical Characteristics

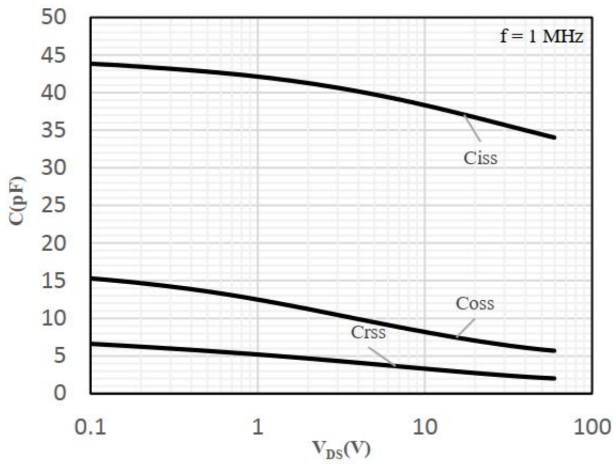


Fig 7 Capacitance Characteristics

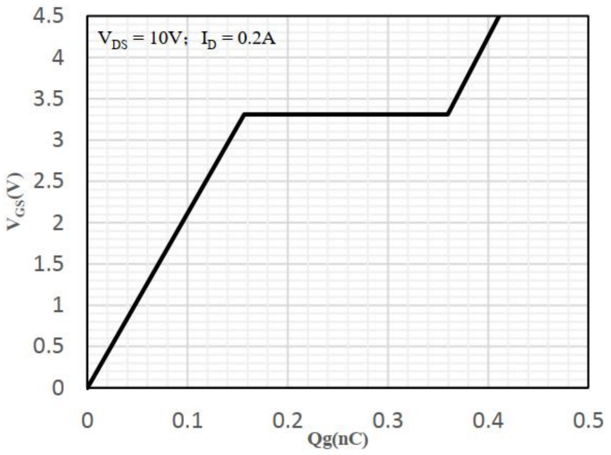


Fig 8 Gate-Charge Characteristics

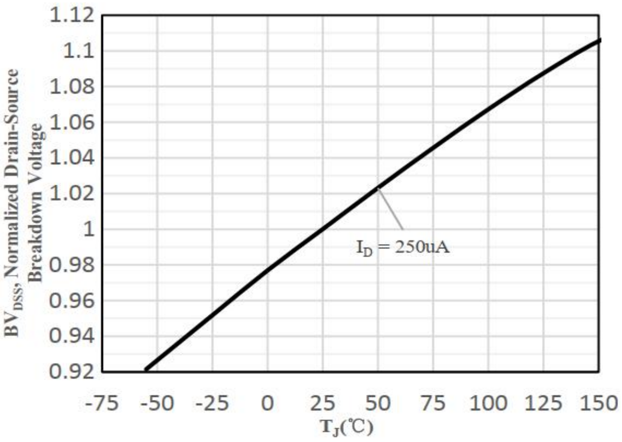


Fig 9 Normalized Breakdown Voltage vs. Junction Temperature

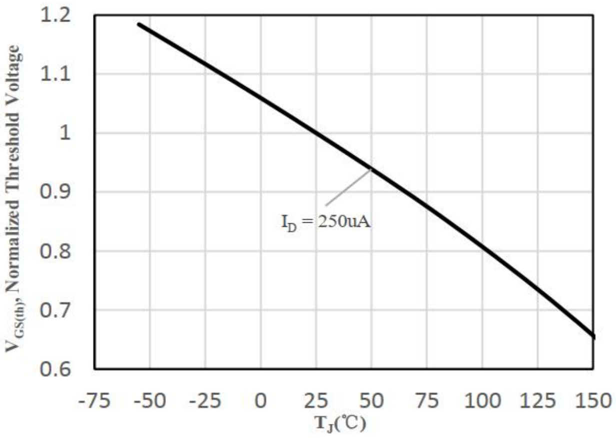


Fig 10 Normalized $V_{GS(th)}$ vs. Junction Temperature

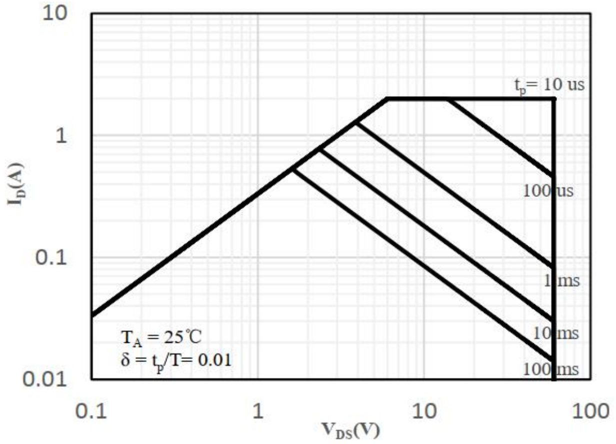


Fig 11 Safe Operation Area

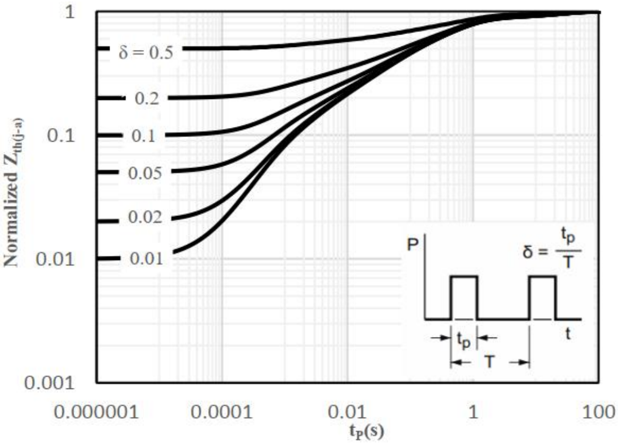
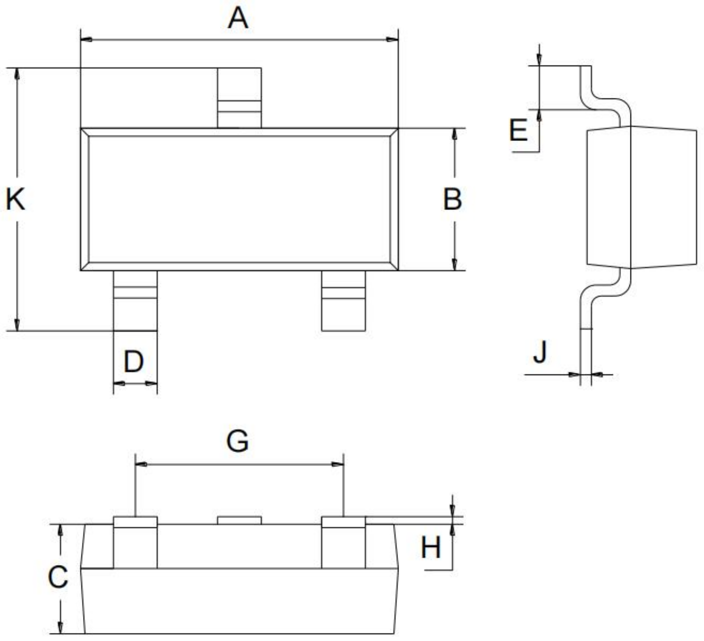


Fig 12 Normalized Maximum transient thermal impedance

SOT-23 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	**Max.**	**Min.**	**Max.**
A	2.700	3.100	0.106	0.122
B	1.100	1.500	0.043	0.059
C	0.900	1.100	0.035	0.043
D	0.300	0.500	0.012	0.020
E	0.350	0.480	0.014	0.019
G	1.800	2.000	0.071	0.079
H	0.020	0.100	0.001	0.004
J	0.050	0.150	0.002	0.006
K	2.200	2.600	0.087	0.102