AT4P2SN030EQSA-Q1

N-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
30V	42mΩ@10V	4.2A
	48mΩ@4.5V	
	55mΩ@2.5V	

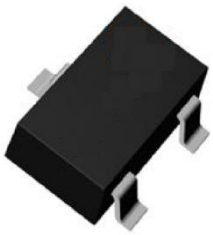
Feature

- Advanced trench cell design
- ESD protected
- Suffix “-Q1” for AEC-Q101

Application

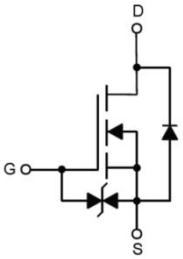
- Specially designed for switch load
- PWM application

Package

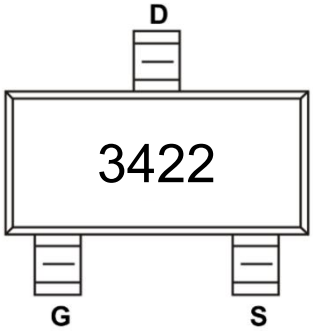


SOT-23

Circuit diagram



Marking



AT4P2SN030EQSA-Q1

N-Channel Enhancement Mode MOSFET

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±12	V
Continuous Drain Current	I_D	4.2	A
Pulsed Drain Current	I_{DM}	16.8	A
Single Pulse Avalanche Energy[1)]	E_{AS}	4.5	mJ
Power Dissipation[2)]	P_D	1.25	W
Thermal Resistance Junction to Ambient[2)]	$R_{\theta JA}$	100	℃/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	30			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =24V, V_{GS} =0V			1	μA
Gate-body leakage current	I_{GSS}	V_{DS} =0V, V_{GS} =±10V			±10	μA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	0.3	0.7	1.3	V
Drain-source on-resistance[3)]	$R_{DS(on)}$	V_{GS} =10V, I_D =4.2A			42	mΩ
		V_{GS} =4.5V, I_D =3.5A			48	
		V_{GS} =2.5V, I_D =2.8A			55	
Dynamic characteristics[4)]						
Input Capacitance	C_{iss}	V_{DS} =15V, V_{GS} =0V, f =1MHz		421		pF
Output Capacitance	C_{oss}			43		
Reverse Transfer Capacitance	C_{rss}			35		
Total Gate Charge	Q_g	V_{DS} =15V, V_{GS} =4.5V, I_D =4.2A		5.1		nC
Gate-Source Charge	Q_{gs}			0.8		
Gate-Drain Charge	Q_{gd}			1.4		
Turn-on delay time	$t_{d(on)}$	V_{DS} =15V, V_{GS} =10V, I_D =1A R_G =3Ω		11		nS
Turn-on rise time	t_r			7.4		
Turn-off delay time	$t_{d(off)}$			35		
Turn-off fall time	t_f			9.1		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				4.2	A
Diode Forward voltage[3)]	V_{SD}	V_{GS} =0V, I_S =1A			1.2	V

Notes:

1) The EAS test condition is V_{DD} = 20V, L = 0.5mH, V_{GS} = 6V, Starting T_J = 25°C

2) The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.

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

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

Typical Characteristics

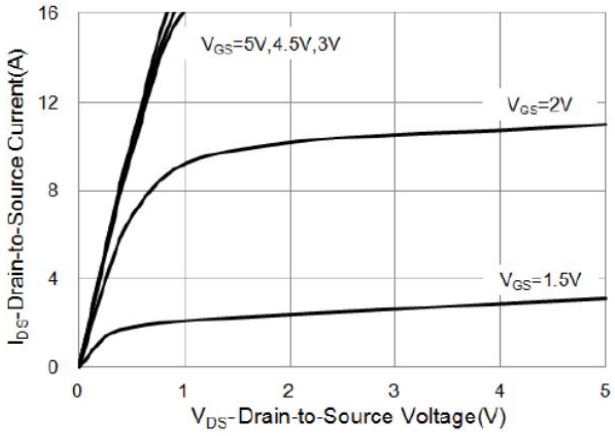


Fig 1 On-Region Characteristics

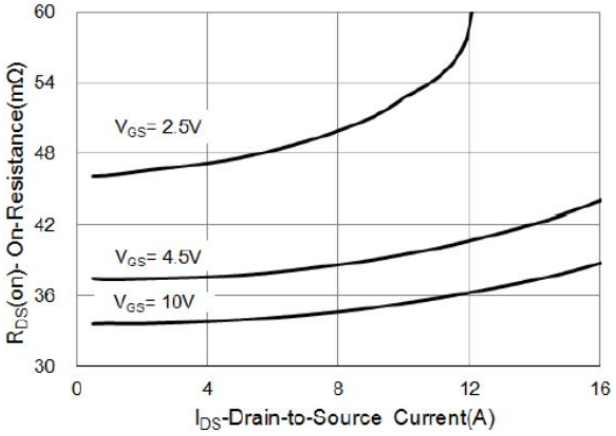


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

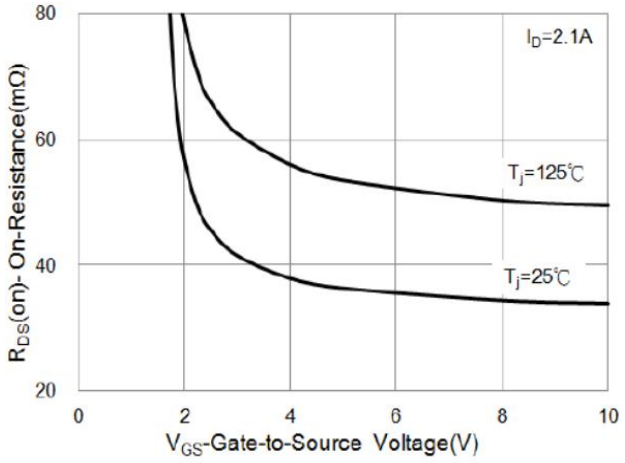


Fig 3 On-Resistance vs. Gate-Source Voltage

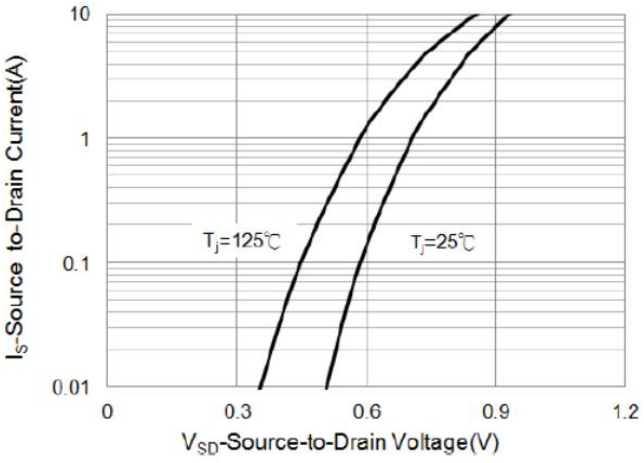


Fig 4 Body-Diode Characteristics

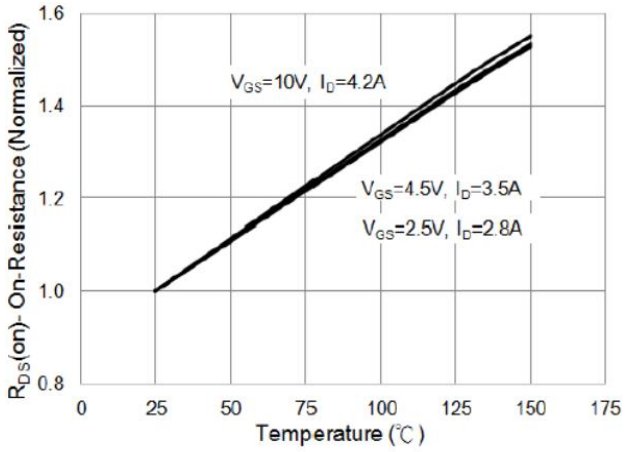


Fig 5 On-Resistance vs. Junction Temperature

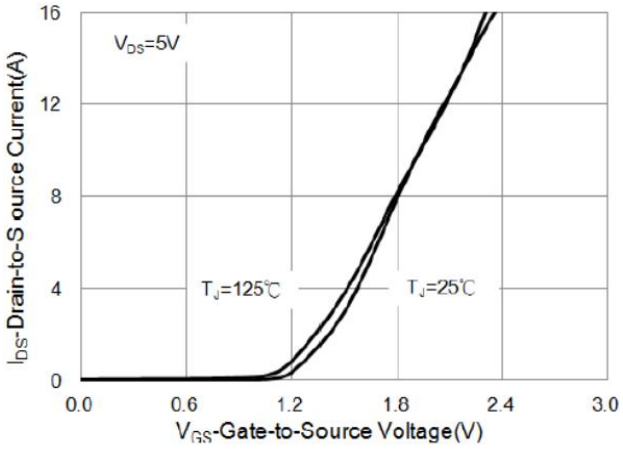


Fig 6 Transfer Characteristics

Typical Characteristics

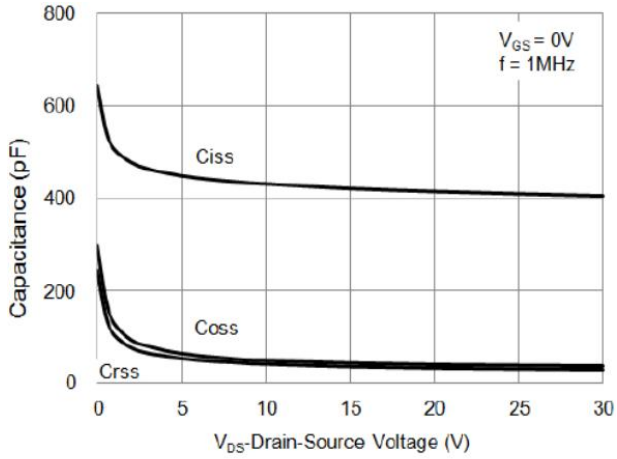


Fig 7 Capacitance Characteristics

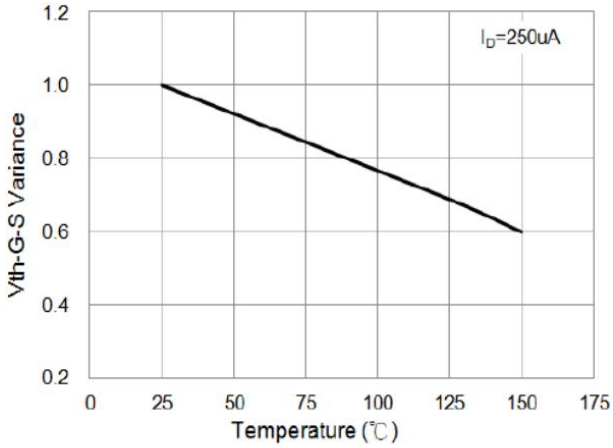


Fig 8 Gate Voltage vs. Junction Temperature

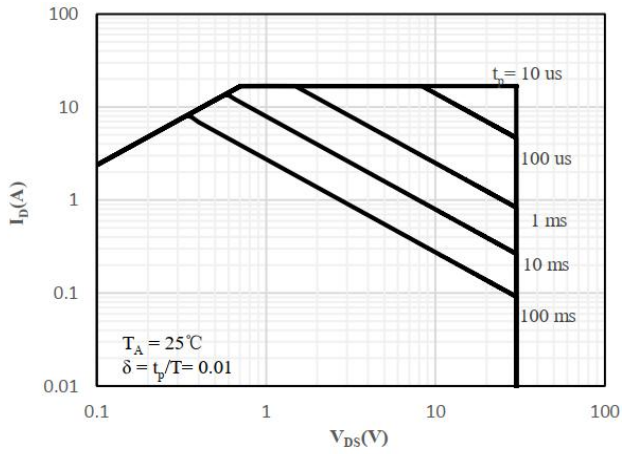


Fig 9 Safe Operation Area

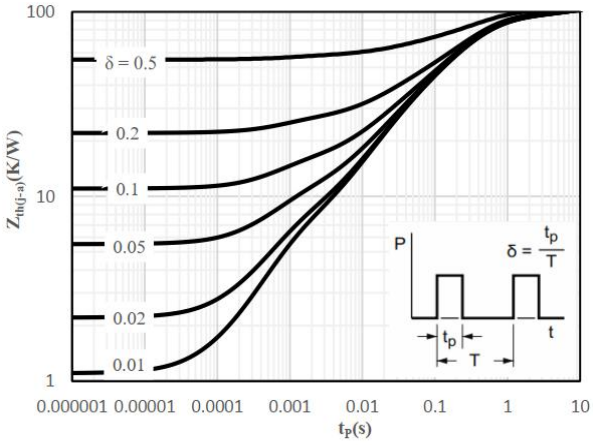
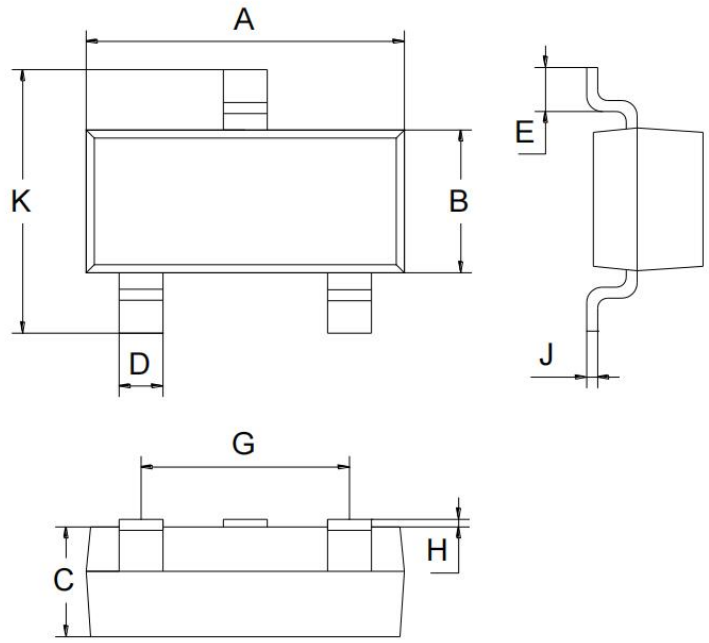


Fig 10 Maximum transient thermal impedance

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