AS4003PS-Q1

P-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-40V	80mΩ@-10V	-3A
	110mΩ@-4.5V	

Feature

- Trench Power LV MOSFET Technology
- High Speed Switching
- Suffix "-Q1" for AEC-Q101

Application

- Power switching application
- Uninterruptible power supply
- PWM application

Package
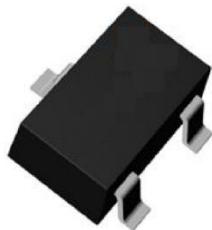
SOT-23

Circuit diagram

Marking

AS4003PS-Q1

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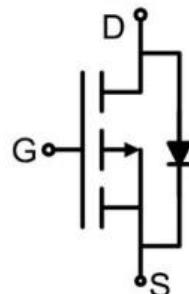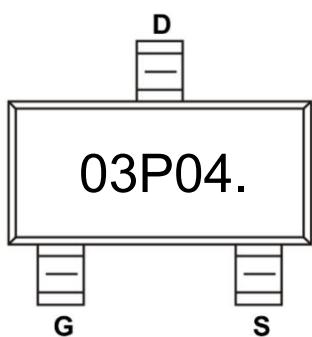
Absolute maximum ratings (T$_A$=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V$_{DS}$	-40	V
Gate-Source Voltage	V$_{GS}$	±20	V
Continuous Drain Current	I$_D$	-3	A
Continuous Drain Current(T$_A$=100℃)	I$_D$(100℃)	-1.9	A
Pulsed Drain Current[1]	I$_{DM}$	-20	A
Power Dissipation[2]	P$_D$	1.0	W
Thermal Resistance from Junction to Ambient[3]	R$_{θJA}$	120	℃/W
Junction Temperature	T$_J$	150	℃
Storage Temperature	T$_{STG}$	-55 ~ +150	℃

Electrical characteristics (T$_J$=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	-40			V
Zero gate voltage drain current	I$_{DSS}$	V$_{DS}$ =-40V,V$_{GS}$ = 0V			-1	µA
		V$_{DS}$ =-40V,V$_{GS}$ = 0V,T$_j$=150℃			-100	
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	-1.5	-2.5	V
Drain-source on-resistance	R$_{DS(on)}$	V$_{GS}$ =-10V, I$_D$ =-3A		61	80	mΩ
		V$_{GS}$ =-4.5V, I$_D$ =-2A		81	110	
Dynamic characteristics[4]						
Input Capacitance	C$_{iss}$	V$_{DS}$ =-20V,V$_{GS}$ =0V,f =1MHz		400		pF
Output Capacitance	C$_{oss}$			50		
Reverse Transfer Capacitance	C$_{rss}$			40		
Gate Charge	Q$_g$	V$_{DS}$ =-20V,V$_{GS}$ =-10V,I$_D$=-3A		8.5		nC
Gate-Source Charge	Q$_{gs}$			1		
Gate-Drain Charge	Q$_{gd}$			2		
Gate resistance	R$_g$	f =1.0MHz		20		Ω
Turn-on delay time	t$_{d(on)}$	V$_{DD}$=-20V, V$_{GS}$=-10V, I$_D$=-3A, R$_{GEN}$=3Ω		6		nS
Turn-on rise time	t$_r$			6		
Turn-off delay time	t$_{d(off)}$			31		
Turn-off fall time	t$_f$			19		
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
Reverse Recovery Charge	Q$_{rr}$	I$_F$=-3A,di/dt=100A/µs		31		nC
Reverse Recovery Charge	T$_{rr}$			34		nS

Notes:

1) Repetitive rating; pulse width limited by max. junction temperature.

2) P$_d$ is based on max. junction temperature, using junction-case and junction-ambient thermal resistance.

3) The value of R$_{θJA}$ is measured with the device mounted on the minimum recommend pad size, in the still air environment with T$_A$ =25℃. The maximum allowed junction temperature of 150℃. The value in any given application depends on the user's specific board design.

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

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## Typical Characteristics
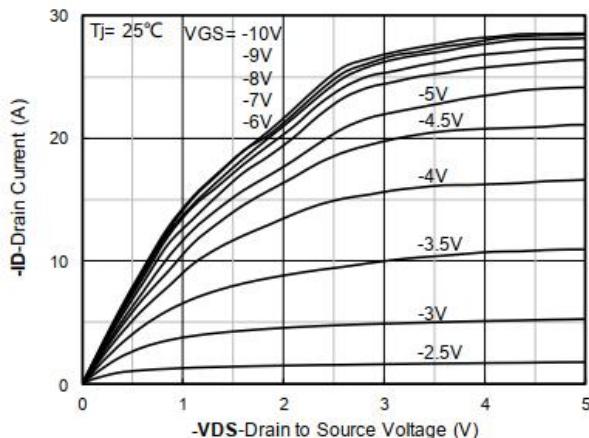
Figure 1. Output Characteristics
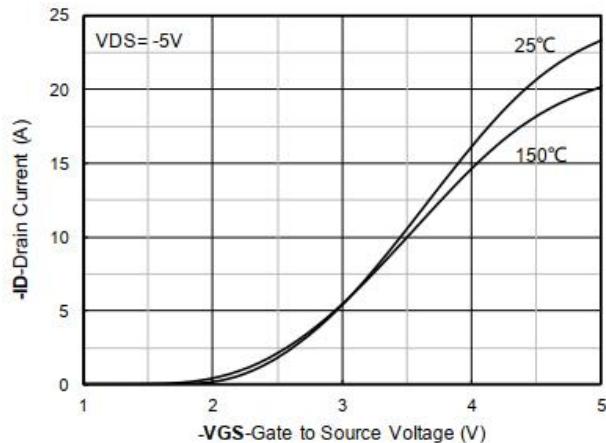

Figure 2. Transfer Characteristics
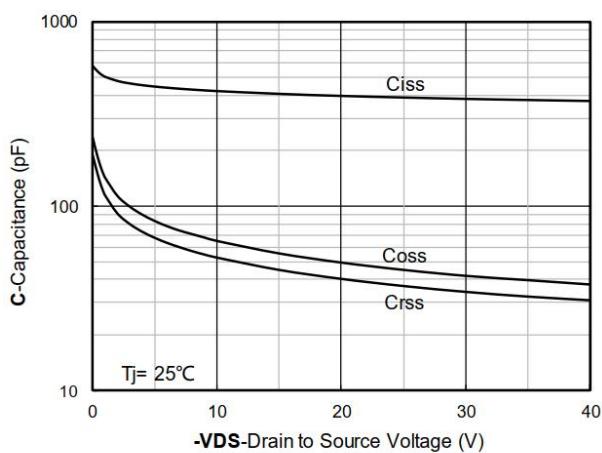
Figure 3. Capacitance Characteristics
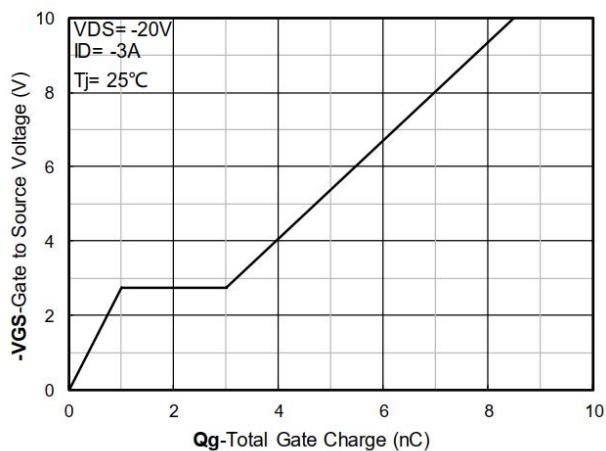
Figure 4. Gate Charge
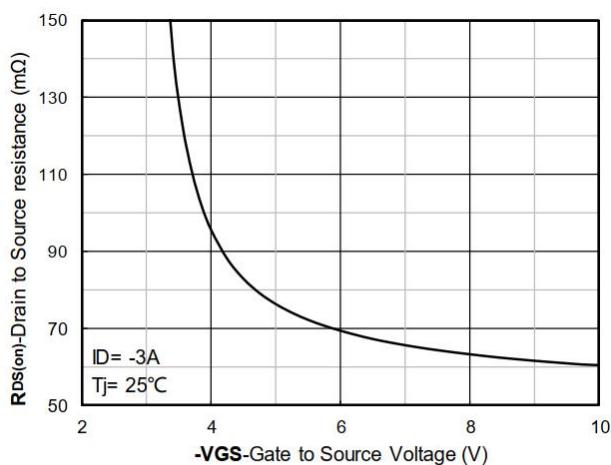
Figure 5. On-Resistance vs Gate to Source Voltage
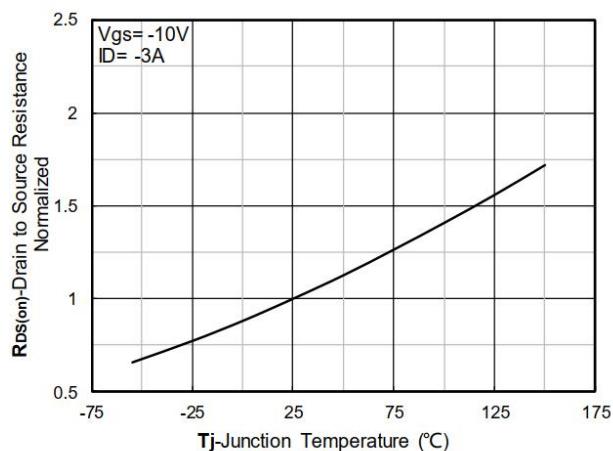
Figure 6. Normalized On-Resistance

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Typical Characteristics
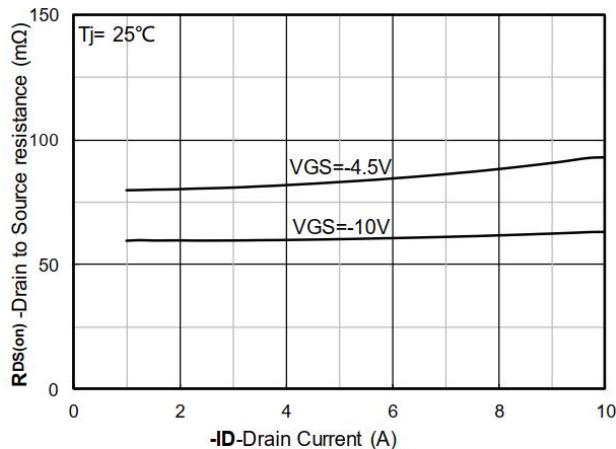
Figure 7. RDS(on) VS Drain Current
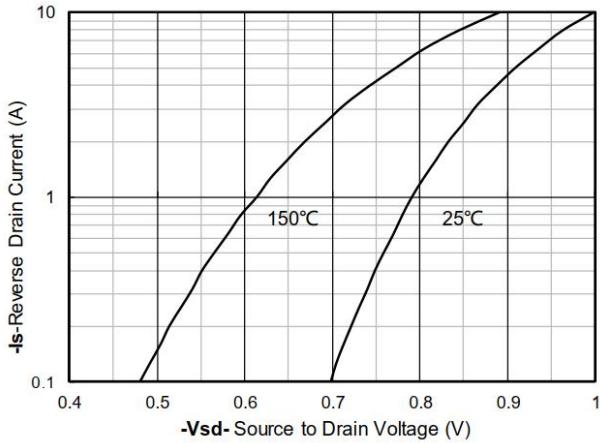
Figure 8. Forward characteristics of reverse diode
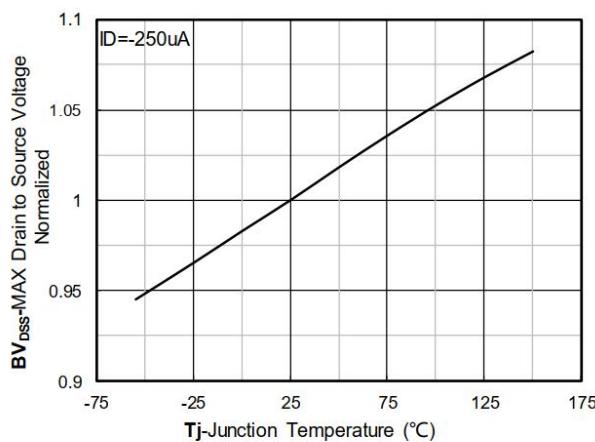

Figure 9. Normalized breakdown voltage
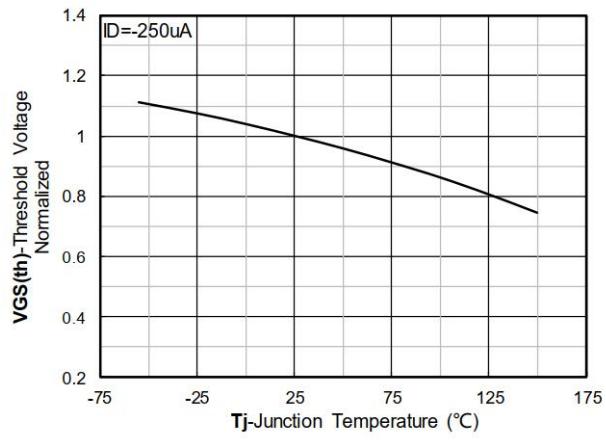

Figure 10. Normalized Threshold voltage
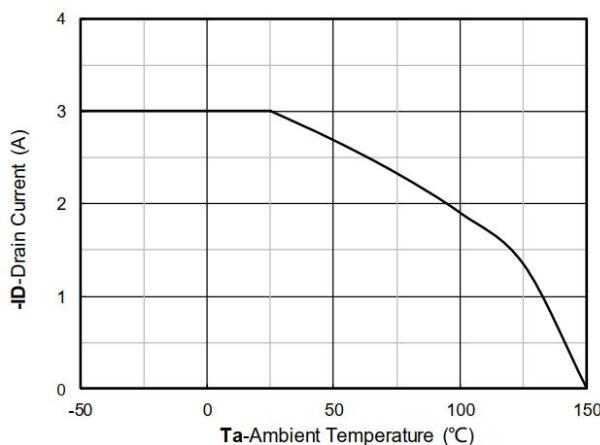
Figure 11. Current dissipation
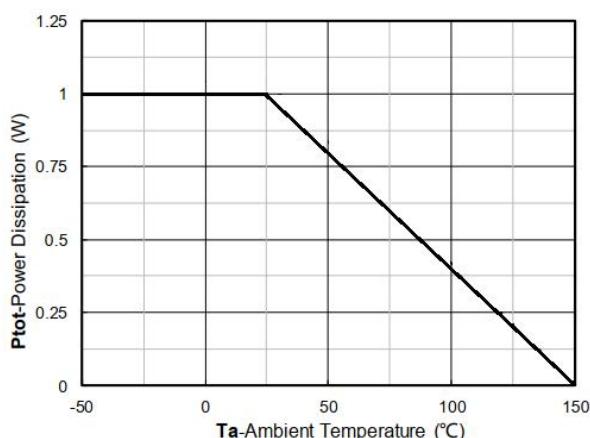
Figure 12. Power dissipation

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Typical Characteristics
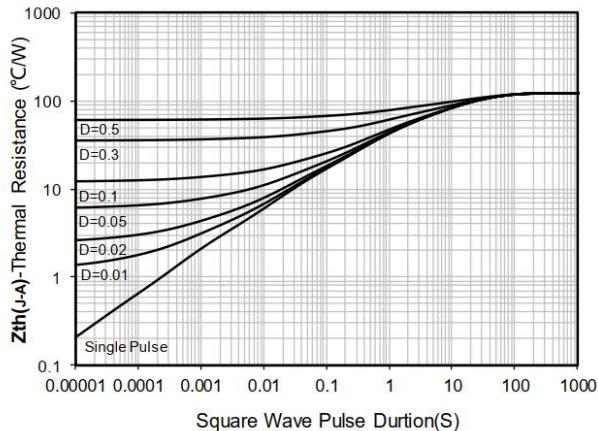
Figure 13. Maximum Transient Thermal Impedance
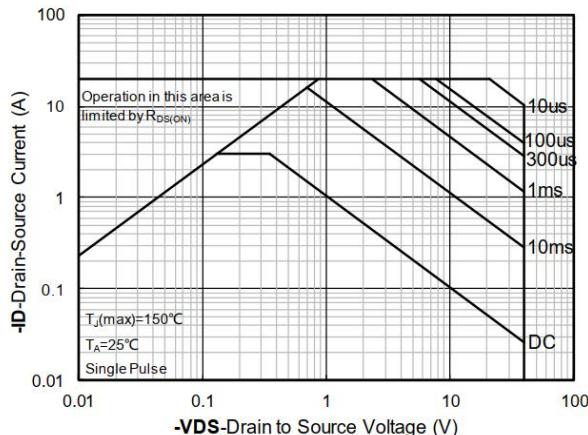
Figure 14. Safe Operation Area

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SOT-23 Package Information
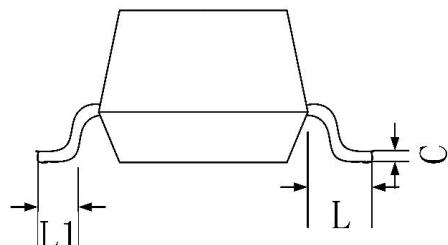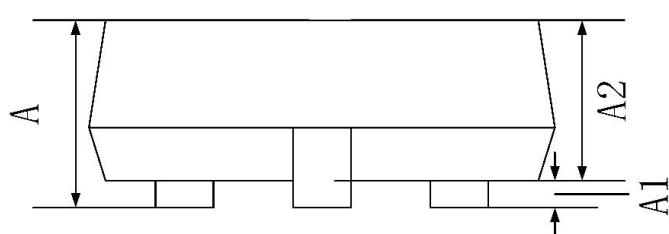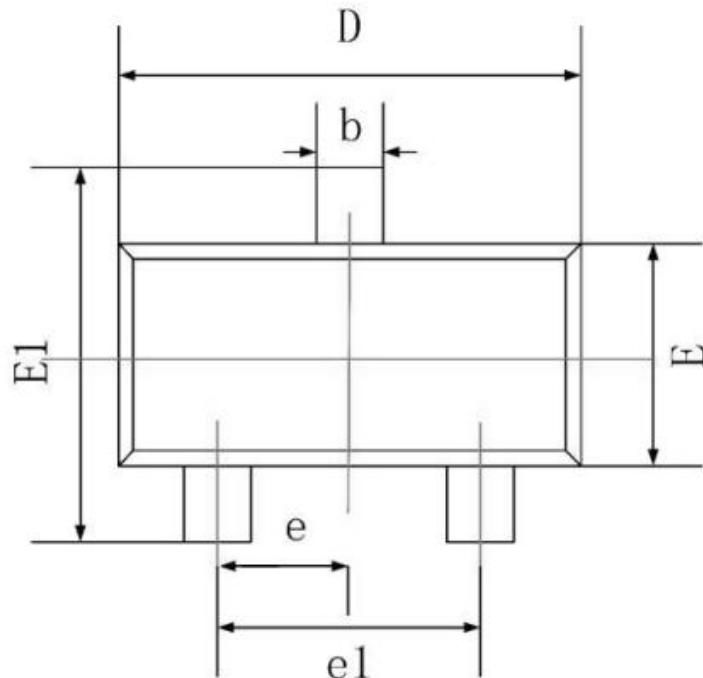
| Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.200	0.003	0.008
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		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

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