

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
20V	0.3Ω@4.5V	0.5A
	0.4Ω@2.5V	
	0.7Ω@1.8V	

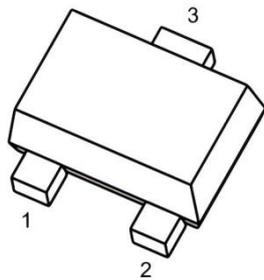
Feature

- Trench power LV MOSFET technology
- High power and current handling capability
- ESD protected
- Suffix "-Q1" for AEC-Q101

Application

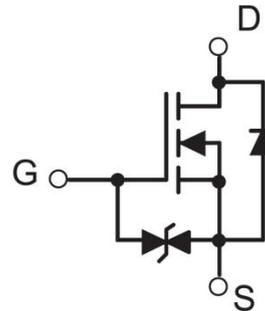
- PWM application
- Load switch

Package

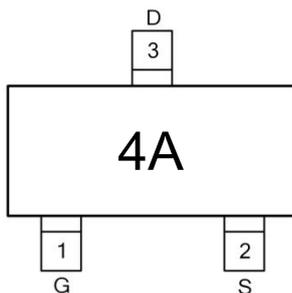


SOT-723

Circuit diagram



Marking



Absolute maximum ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current	I_D	0.5	A
Continuous Drain Current ($T_A=100^\circ\text{C}$)	$I_D(100^\circ\text{C})$	0.3	A
Pulsed Drain Current ¹⁾	I_{DM}	4	A
Power Dissipation ²⁾	P_D	0.25	W
Thermal Resistance from Junction to Ambient ³⁾	$R_{\theta JA}$	500	$^\circ\text{C}/\text{W}$
Operating Junction Temperature	T_J	-55 ~ +150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150	$^\circ\text{C}$

Electrical characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0\text{V}, I_D=250\mu\text{A}$	20			V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=20\text{V}, V_{GS}=0\text{V}$			1	μA
Gate-body leakage current	I_{GSS}	$V_{GS}=\pm 10\text{V}, V_{DS}=0\text{V}$			± 10	μA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	0.35	0.75	1.1	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS}=4.5\text{V}, I_D=0.5\text{A}$		0.2	0.3	Ω
		$V_{GS}=2.5\text{V}, I_D=0.4\text{A}$		0.29	0.4	
		$V_{GS}=1.8\text{V}, I_D=0.2\text{A}$		0.48	0.7	
Dynamic characteristics⁴⁾						
Input Capacitance	C_{iss}	$V_{DS}=10\text{V}, V_{GS}=0\text{V}, f=1\text{MHz}$		56		pF
Output Capacitance	C_{oss}			20		
Reverse Transfer Capacitance	C_{rss}			2.5		
Total Gate Charge	Q_g	$V_{DS}=10\text{V}, V_{GS}=4.5\text{V}, I_D=0.5\text{A}$		1		nC
Gate-Source Charge	Q_{gs}			0.28		
Gate-Drain Charge	Q_{gd}			0.22		
Turn-on delay time	$t_{d(on)}$	$V_{DD}=10\text{V}, V_{GS}=4.5\text{V}, I_D=0.5\text{A}$ $R_{GEN}=10\Omega$		2		nS
Turn-on rise time	t_r			18.8		
Turn-off delay time	$t_{d(off)}$			10		
Turn-off fall time	t_f			23		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				0.5	A
Diode Forward voltage	V_{SD}	$V_{GS}=0\text{V}, I_S=0.5\text{A}$			1.2	V
Reverse Recovery Time	T_{rr}	$I_F=0.5\text{A}, di/dt=-20\text{A}/\mu\text{s}$		14.4		nS
Reverse Recovery Charge	Q_{rr}			0.4		nC

Notes:

- 1) Repetitive rating; pulse width limited by max. junction temperature.
- 2) P_D is based on max. junction temperature, using junction-case thermal resistance.
- 3) The value of $R_{\theta JA}$ is measured with the device mounted on the minimum recommend pad size, in the still air environment with $T_A=25^\circ\text{C}$. The maximum allowed junction temperature of 150°C . The value in any given application depends on the user's specific board design.
- 4) Guaranteed by design, not subject to production testing.

Typical Characteristics

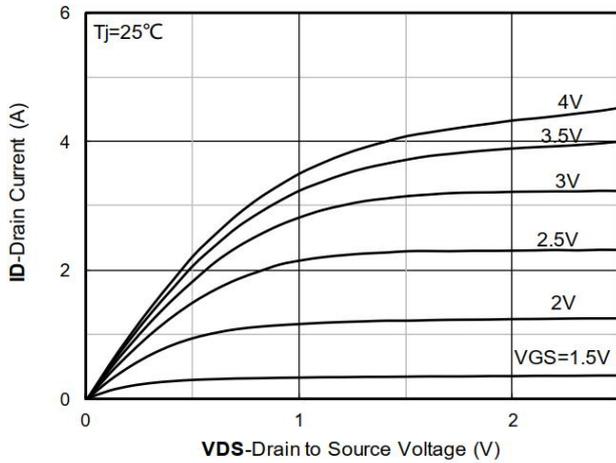


Figure1. Output Characteristics

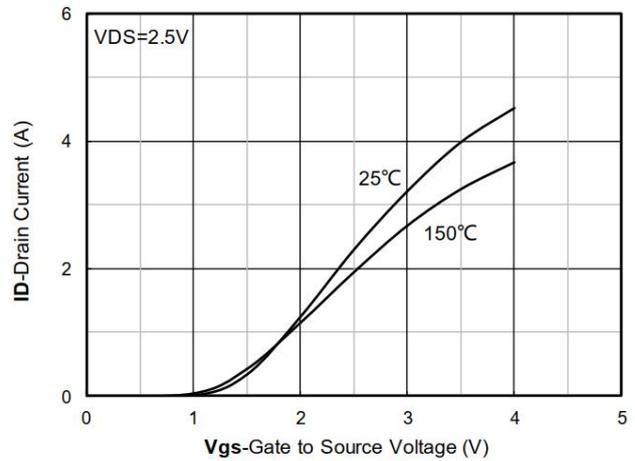


Figure2. Transfer Characteristics

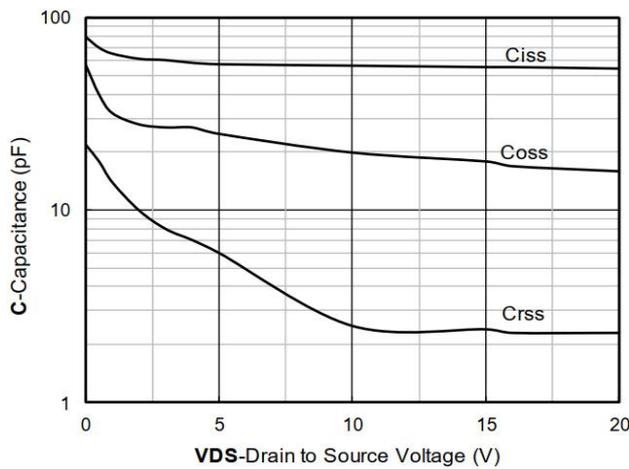


Figure3. Capacitance Characteristics

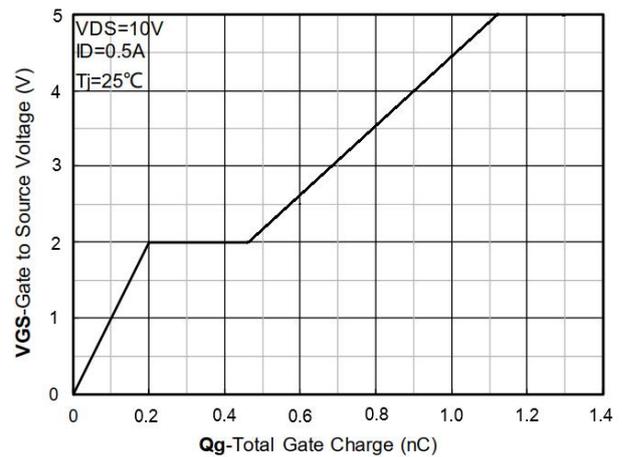


Figure4. Gate Charge

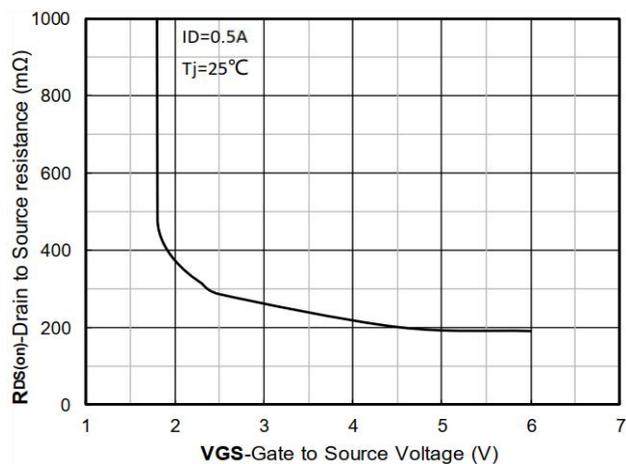


Figure5. On-Resistance vs Gate to Source Voltage

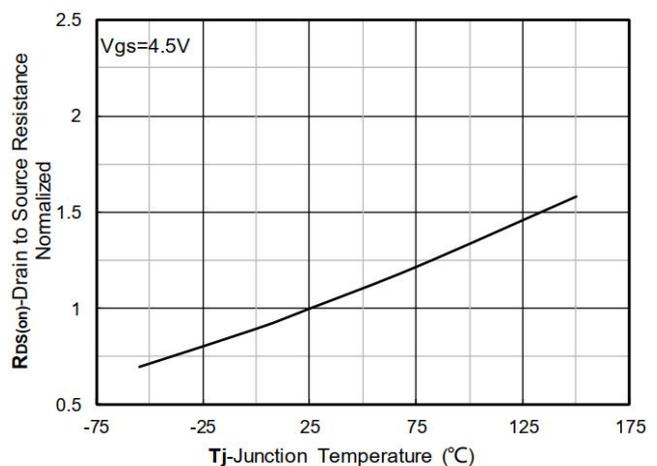


Figure6. Normalized On-Resistance

Typical Characteristics

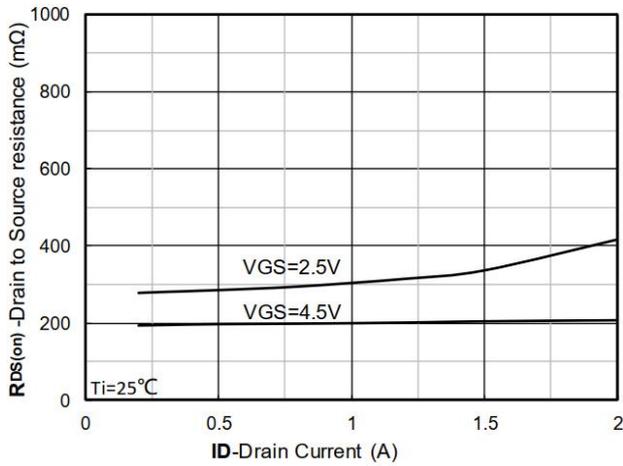


Figure7. RDS(on) VS Drain Current

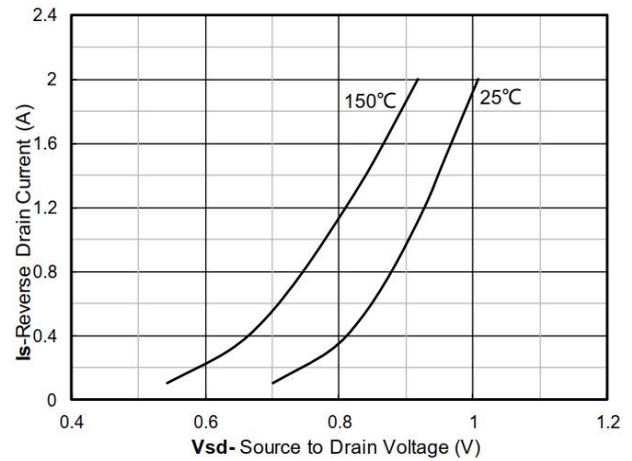


Figure8. Forward characteristics of reverse diode

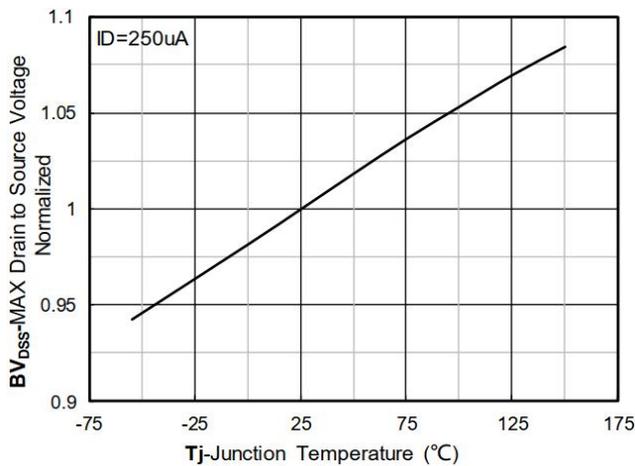


Figure9. Normalized breakdown voltage

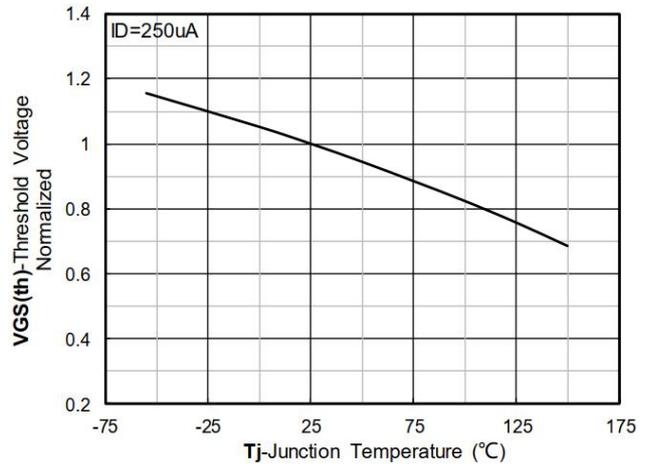


Figure10. Normalized Threshold voltage

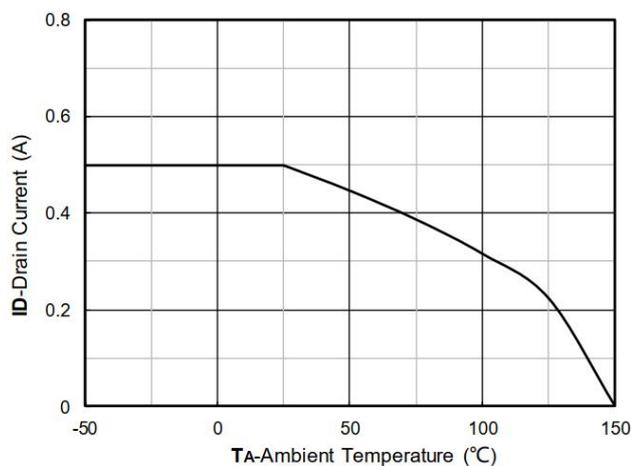


Figure11. Current dissipation

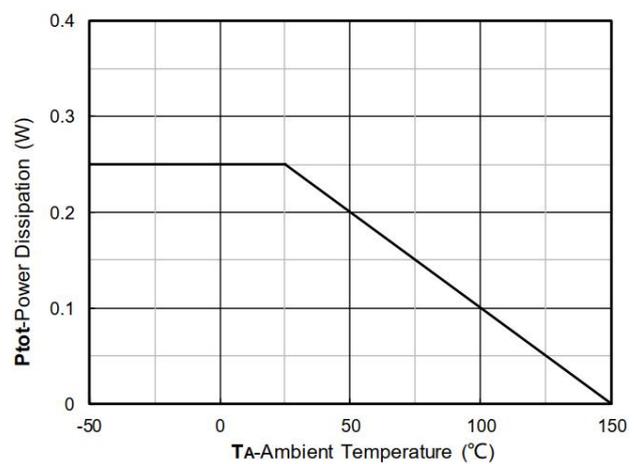


Figure12. Power dissipation

Typical Characteristics

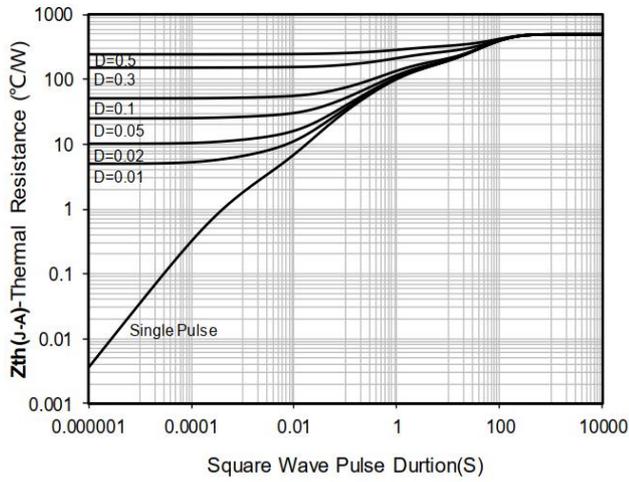


Figure 13. Maximum Transient Thermal Impedance

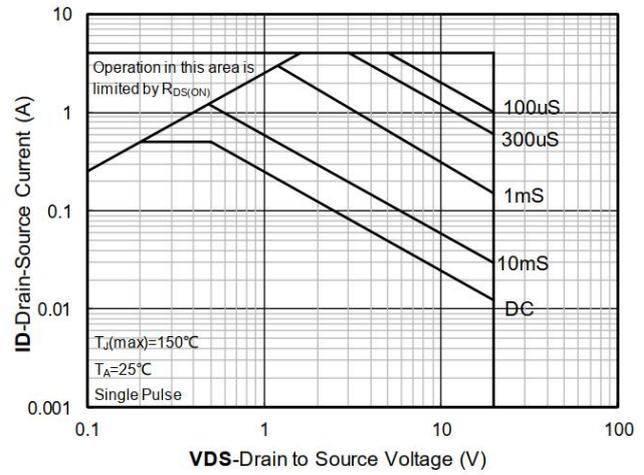
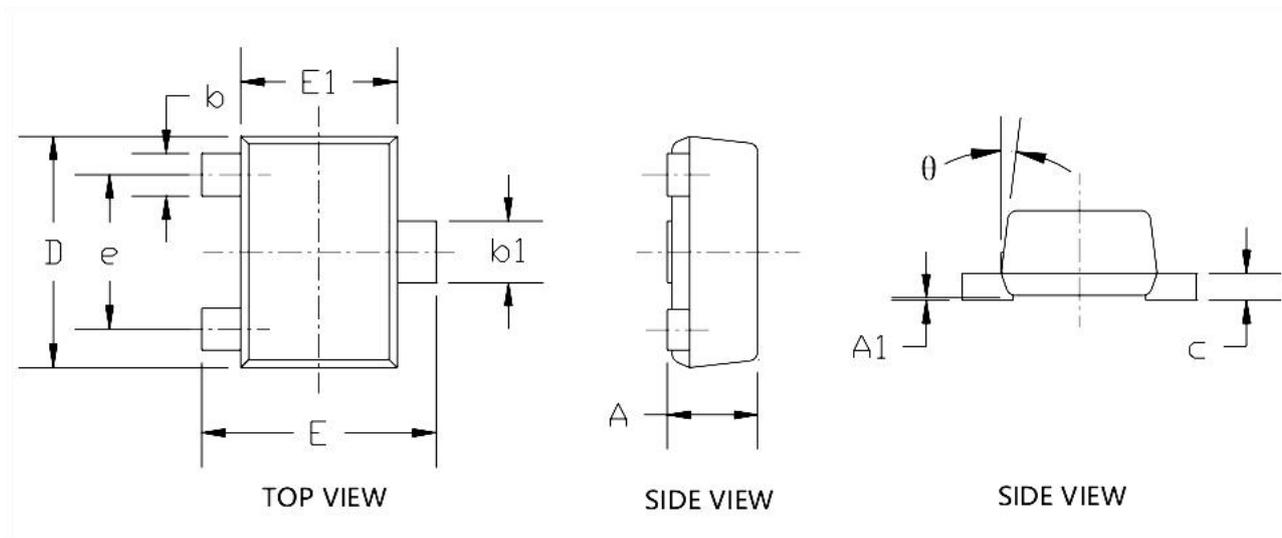


Figure 14. Safe Operation Area

SOT-723 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.430	0.550	0.017	0.022
A1	0.000	0.050	0.000	0.002
b	0.170	0.270	0.007	0.011
b1	0.270	0.370	0.011	0.015
c	0.080	0.200	0.003	0.008
D	1.150	1.250	0.045	0.049
E	1.150	1.250	0.045	0.049
E1	0.750	0.850	0.030	0.033
e	0.800 TYP.		0.031 TYP.	
θ	7° REF.		7° REF.	