

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
50V	2.5Ω@10V	0.34A
	3Ω@4.5V	

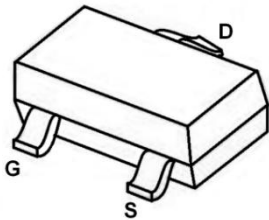
### Feature

- Trench power MV MOSFET technology
- Voltage controlled small signal switch
- Low input capacitance
- Fast switching speed
- Low input / output leakage
- Suffix “-Q1” for AEC-Q101

### Application

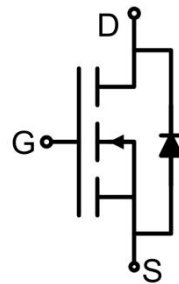
- Battery operated systems
- Solid-state relays
- Direct logic-level interface:TTL/CMOS

### Package

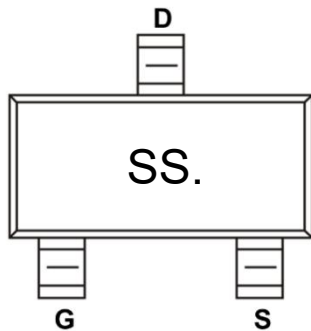


SOT-323

### Circuit diagram



### Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	50	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	0.34	A
Continuous Drain Current ( $T_A=70^\circ\text{C}$ )	$I_D(70^\circ\text{C})$	0.272	A
Pulsed Drain Current <sup>1)</sup>	$I_{DM}$	1.5	A
Power Dissipation	$P_D$	150	mW
Thermal Resistance Junction to Ambient <sup>2)</sup>	$R_{\theta JA}$	833	$^\circ\text{C}/\text{W}$
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
<b>Static Characteristics</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$	50			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 50\text{V}, V_{GS} = 0\text{V}$			1	$\mu\text{A}$
Gate-body leakage current	$I_{GSS}$	$V_{DS} = 0\text{V}, V_{GS} = \pm 20\text{V}$			$\pm 100$	$\mu\text{A}$
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	0.8	1.2	1.6	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS} = 10\text{V}, I_D = 0.3\text{A}$		1.1	2.5	$\Omega$
		$V_{GS} = 4.5\text{V}, I_D = 0.2\text{A}$		1.2	3	
<b>Dynamic characteristics<sup>3)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 25\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$		28.5		pF
Output Capacitance	$C_{oss}$			2.7		
Reverse Transfer Capacitance	$C_{rss}$			1.78		
Total Gate Charge	$Q_g$	$V_{DS} = 25\text{V}, V_{GS} = 10\text{V}, I_D = 0.3\text{A}$		1.7		nC
Gate-Source Charge	$Q_{gs}$			0.4		
Gate-Drain Charge	$Q_{gd}$			0.24		
Turn-on delay time	$t_{d(on)}$	$V_{DS} = 25\text{V}, V_{GS} = 10\text{V}, I_D = 0.3\text{A}$ $R_G = 6\Omega$		2.6		nS
Turn-on rise time	$t_r$			18.8		
Turn-off delay time	$t_{d(off)}$			9.7		
Turn-off fall time	$t_f$			47		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current	$I_S$				0.34	A
Diode Forward voltage	$V_{SD}$	$V_{GS} = 0\text{V}, I_S = 0.3\text{A}$			1.2	V
Reverse Recovery Time	$T_{rr}$	$I_S = 0.3\text{A}, di/dt = -100\text{A}/\mu\text{s}$		12.2		nS
Reverse Recovery Charge	$Q_{rr}$			2.65		nC

Notes:

- 1) Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty cycle  $\leq 2\%$ .
- 2) Device mounted on FR-4 PCB, 1inch x 0.85inch x 0.062 inch.
- 3) Guaranteed by design, not subject to production testing.

## Typical Characteristics

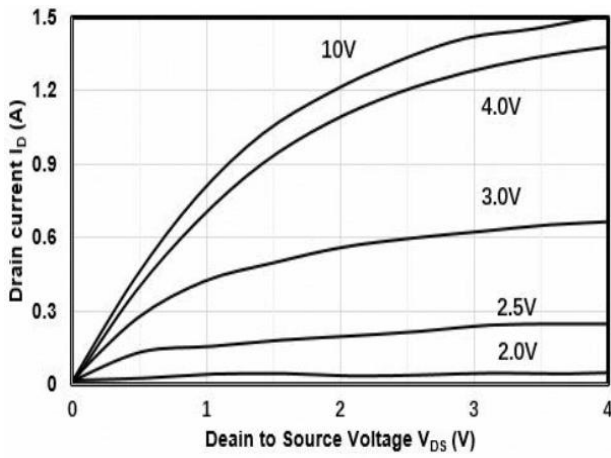


Figure1. Output Characteristics

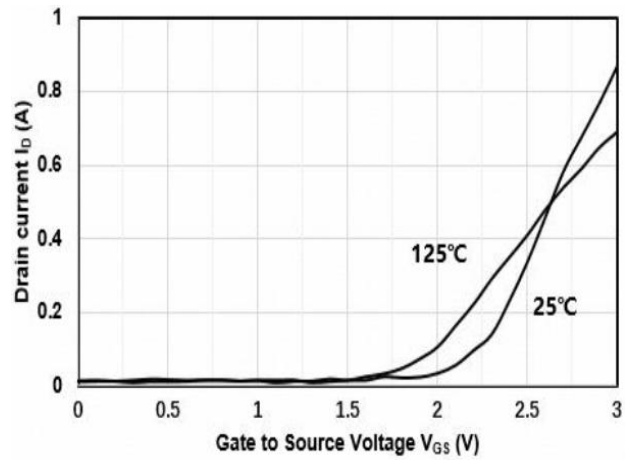


Figure2. Transfer Characteristics

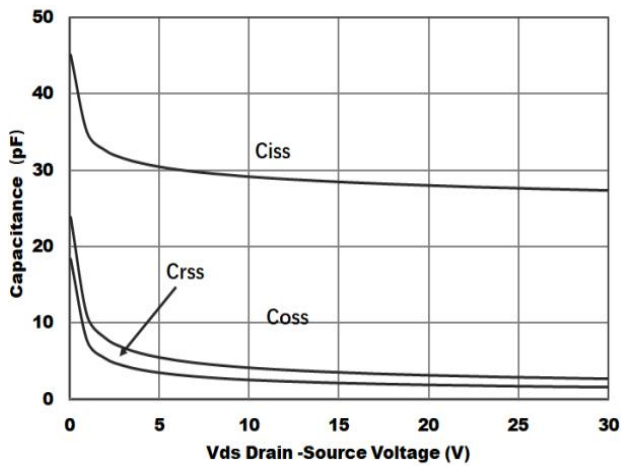


Figure3. Capacitance Characteristics

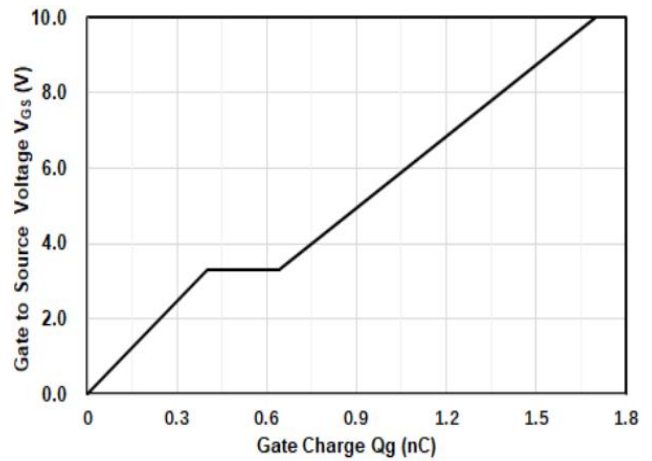


Figure4. Gate Charge

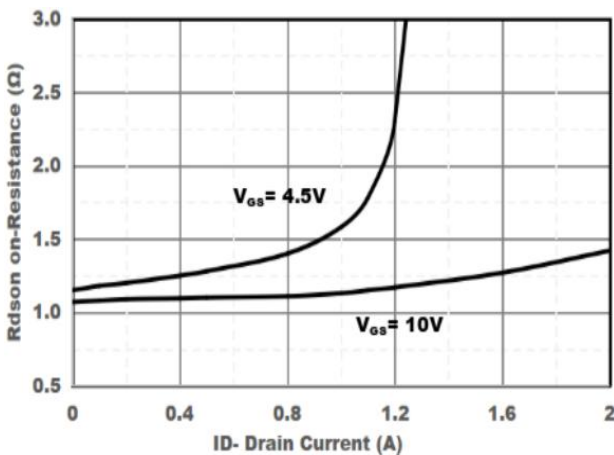


Figure5. Drain-Source on Resistance

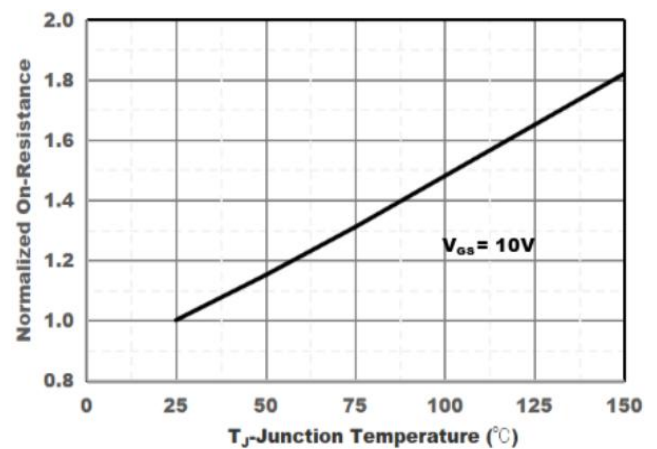


Figure6. Drain-Source on Resistance

## Typical Characteristics

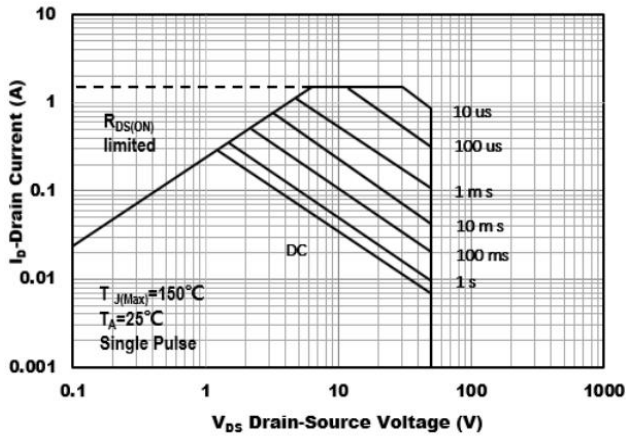


Figure7. Safe Operation Area

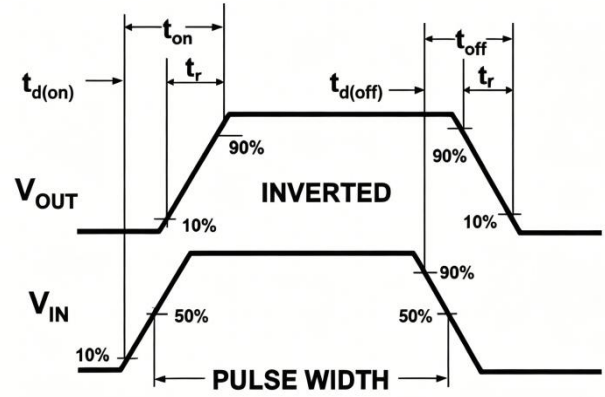
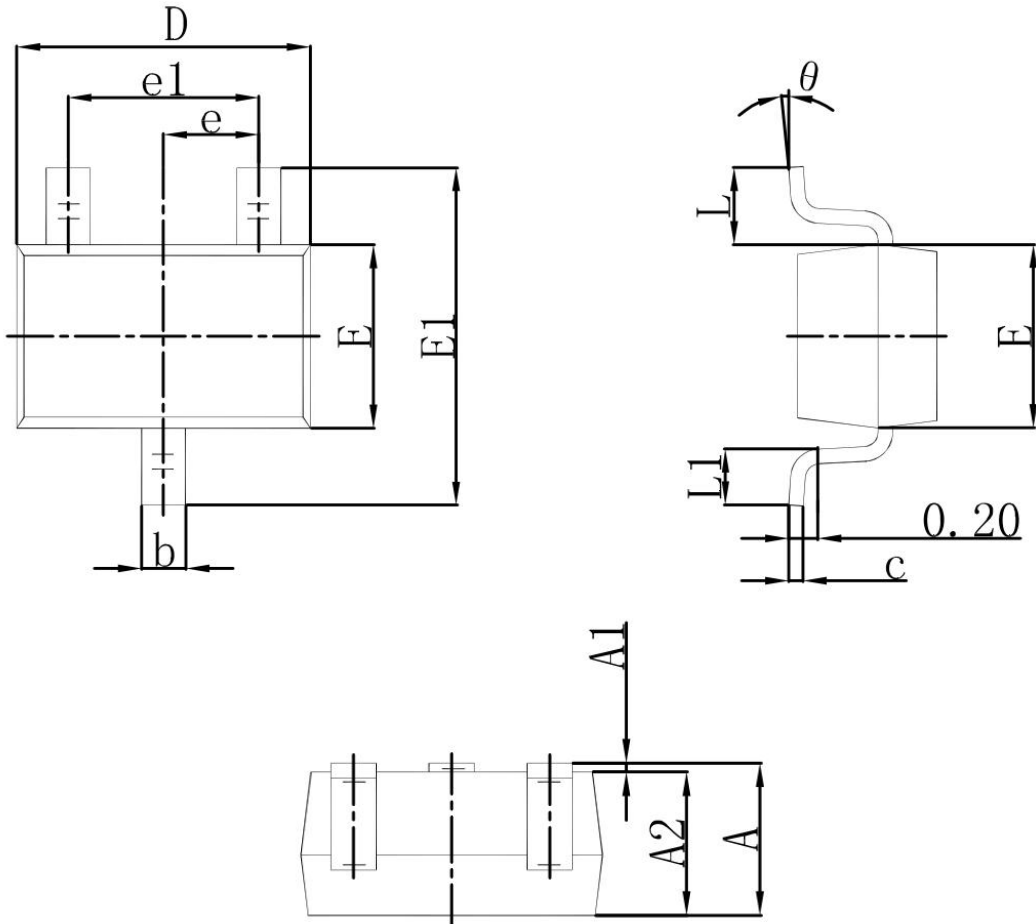


Figure8. Switching wave

## SOT-323 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.400	0.006	0.016
c	0.100	0.250	0.004	0.010
D	1.800	2.200	0.071	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP.		0.026 TYP.	
e1	1.200	1.400	0.047	0.055
L	0.525 REF.		0.021 REF.	
L1	0.260	0.460	0.010	0.018
$\theta$	0°	8°	0°	8°