

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
20V	300mΩ@4.5V	0.5A
	400mΩ@2.5V	
	700mΩ@1.8V	

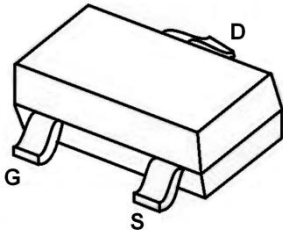
Feature

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

Application

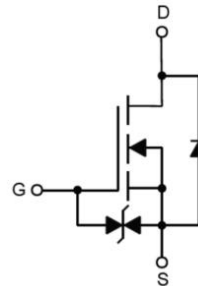
- PWM application
- Load switch

Package

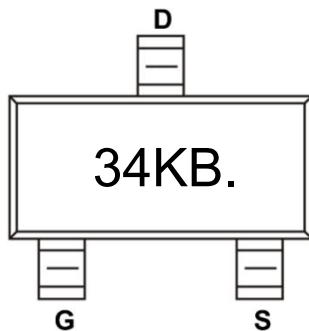


SOT-323

Circuit diagram



Marking



Absolute maximum ratings (T_A=25°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 =70°C)	I _D (70°C)	0.4	A
Pulsed Drain Current ¹⁾	I _{DM}	3.3	A
Power Dissipation	P _D	0.15	W
Thermal Resistance Junction to Ambient	R _{θJA}	833	°C/W
Operating Junction Temperature	T _J	-55 ~ +150	°C
Storage Temperature Range	T _{STG}	-55 ~ +150	°C

Electrical characteristics (T_J=25 °C, 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	20			V
Zero gate voltage drain current	I _{DSS}	V _{DS} = 20V, 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	0.35	0.75	1.1	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} = 4.5V, I _D = 0.5A		220	300	mΩ
		V _{GS} = 2.5V, I _D = 0.4A		290	400	
		V _{GS} = 1.8V, I _D = 0.2A		420	700	
Dynamic characteristics³⁾						
Input Capacitance	C _{iss}	V _{DS} = 10V, V _{GS} = 0V, f = 1MHz		33		pF
Output Capacitance	C _{oss}			20		
Reverse Transfer Capacitance	C _{rss}			10		
Total Gate Charge	Q _g	V _{DS} = 10V, V _{GS} = 4.5V, I _D = 0.5A		0.8		nC
Gate-Source Charge	Q _{gs}			0.3		
Gate-Drain Charge	Q _{gd}			0.15		
Turn-on delay time	t _{d(on)}	V _{DS} = 10V, V _{GS} = 4.5V, I _D = 0.5A R _G = 10Ω		4		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 ²⁾	V _{SD}	V _{GS} = 0V, I _S = 0.5A			1.2	V
Reverse Recovery Time	T _{rr}	I _F = 0.5A, di/dt = -20A/us		14.4		nS
Reverse Recovery Charge	Q _{rr}				0.4	

Notes:

- 1) Repetitive Rating: Pulse width limited by maximum junction temperature.
- 2) Pulse Test: Pulse Width ≤ 300us, Duty Cycle ≤ 0.5%.
- 3) Guaranteed by design, not subject to production testing.

Typical Characteristics

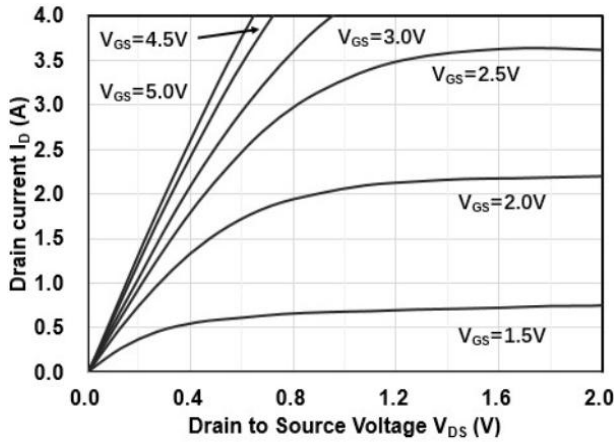


Figure1. Output Characteristics

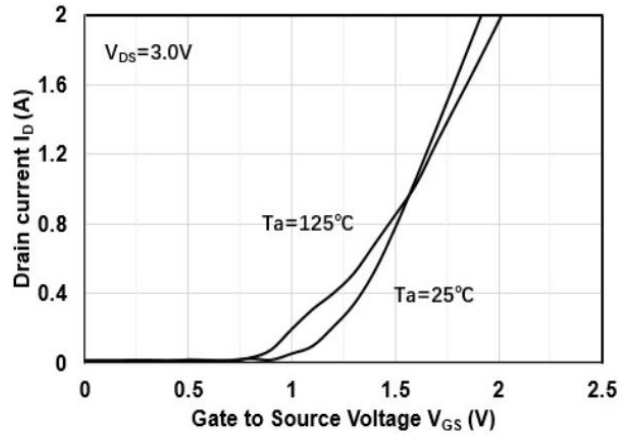


Figure2. Transfer Characteristics

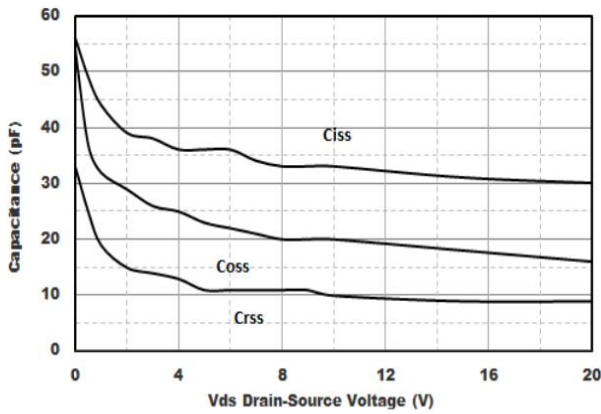


Figure3. Capacitance Characteristics

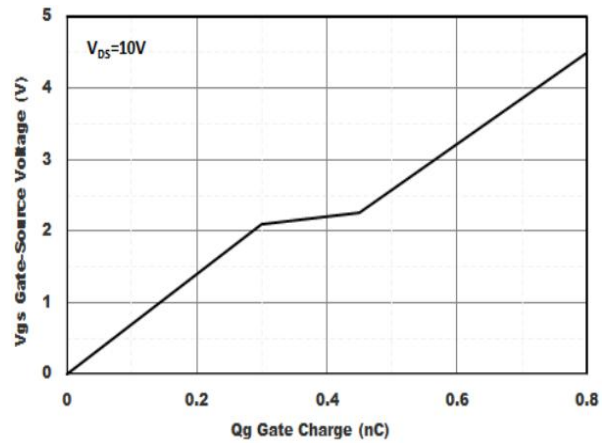


Figure4. Gate Charge

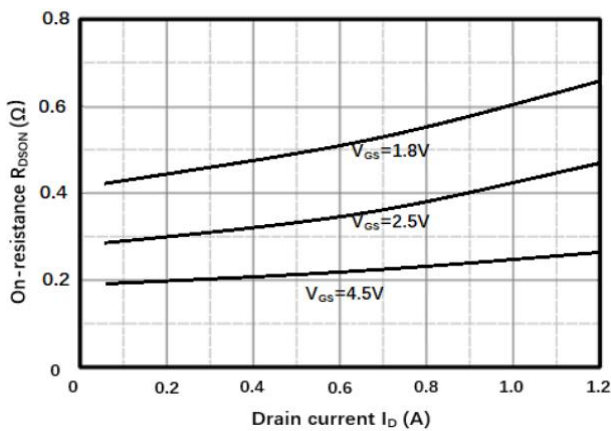


Figure5. Drain-Source on Resistance

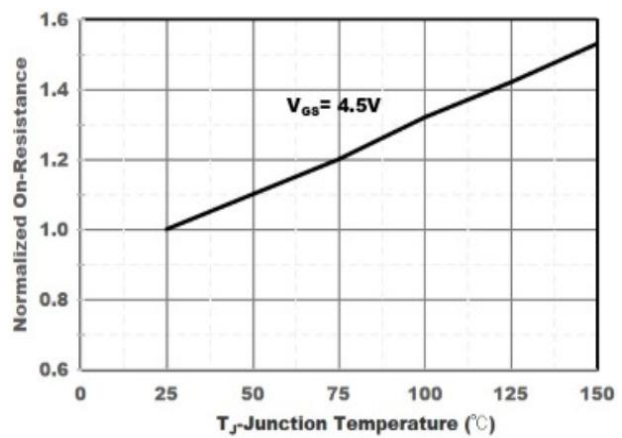


Figure6. Drain-Source on Resistance

Typical Characteristics

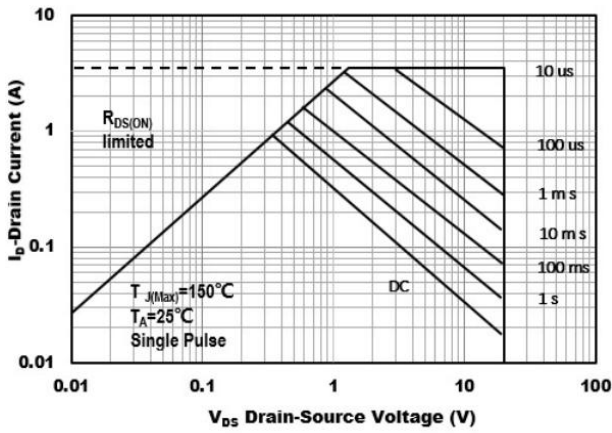


Figure7. Safe Operation Area

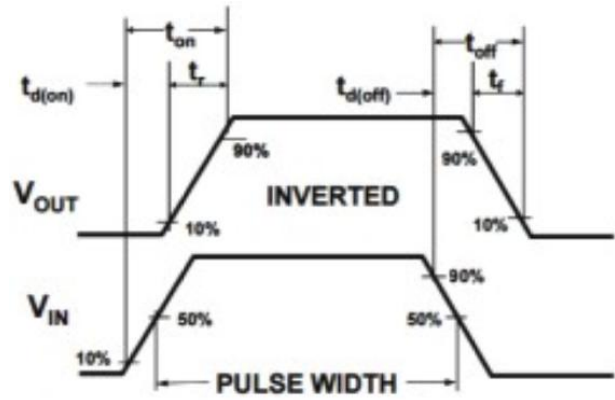
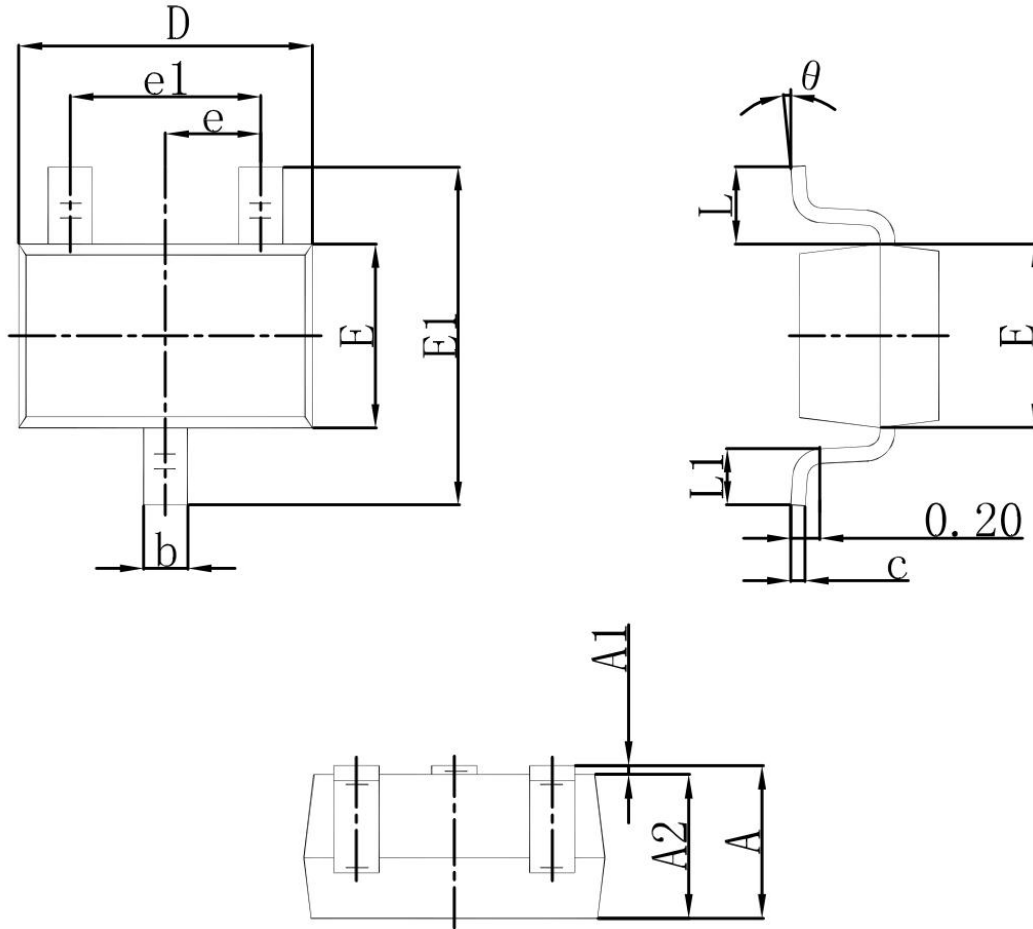


Figure8. Switching wave

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	0.250	0.460	0.010	0.018
θ	0°	8°	0°	8°