

Product Summary

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

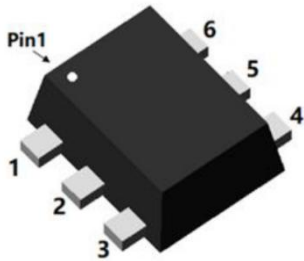
Feature

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

Application

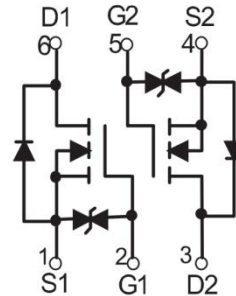
- PWM application
- Load switch

Package



SOT-563

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 ($T_A=70^{\circ}\text{C}$)	$I_D(70^{\circ}\text{C})$	0.4	A
Pulsed Drain Current ¹⁾	I_{DM}	3.3	A
Power Dissipation	P_D	0.18	W
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	694	$^{\circ}\text{C}/\text{W}$
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}	$V_{DS}=0\text{V}, V_{GS}=\pm 10\text{V}$			± 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	$R_{DS(on)}$	$V_{GS}=4.5\text{V}, I_D=0.5\text{A}$		220	300	m Ω
		$V_{GS}=2.5\text{V}, I_D=0.45\text{A}$		290	400	
		$V_{GS}=1.8\text{V}, I_D=0.2\text{A}$		420	700	
Dynamic characteristics³⁾						
Input Capacitance	C_{iss}	$V_{DS}=10\text{V}, V_{GS}=0\text{V}, f=1\text{MHz}$		33		pF
Output Capacitance	C_{oss}			20		
Reverse Transfer Capacitance	C_{rss}			10		
Total Gate Charge	Q_g	$V_{DS}=10\text{V}, V_{GS}=4.5\text{V}, I_D=0.5\text{A}$		0.8		nC
Gate-Source Charge	Q_{gs}			0.3		
Gate-Drain Charge	Q_{gd}			0.15		
Turn-on delay time	$t_{d(on)}$	$V_{DS}=10\text{V}, V_{GS}=4.5\text{V}, I_D=0.5\text{A}$ $R_G=10\Omega$		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}	$V_{GS}=0\text{V}, I_S=0.5\text{A}$			1.2	V
Reverse Recovery Time	T_{rr}	$I_S=0.5\text{A}, di/dt=-20\text{A}/\mu\text{s}$		14.4		nS
Reverse Recovery Charge	Q_{rr}			0.4		nC

Notes:

- 1) Repetitive Rating: Pulse width limited by maximum junction temperature.
- 2) Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 0.5\%$.
- 3) Guaranteed by design, not subject to production testing.

Typical Characteristics

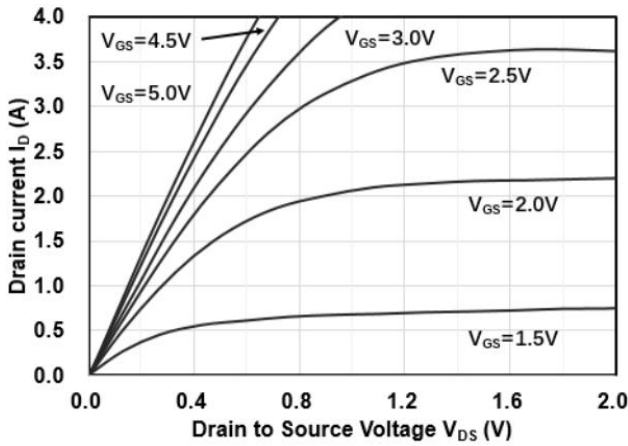


Figure1. Output Characteristics

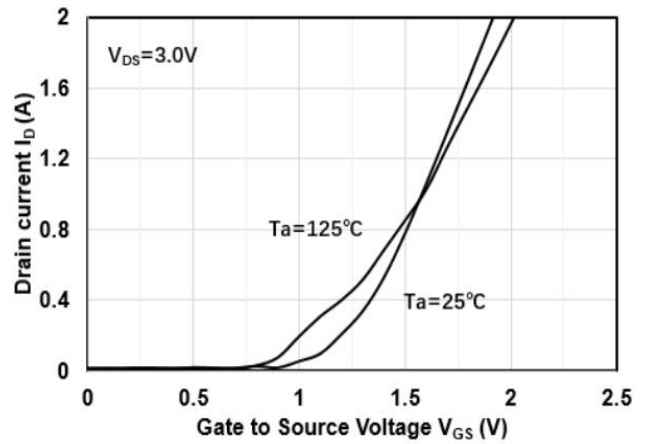


Figure2. Transfer Characteristics

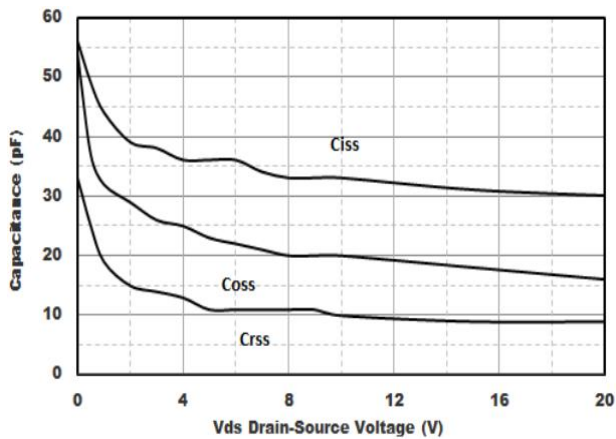


Figure3. Capacitance Characteristics

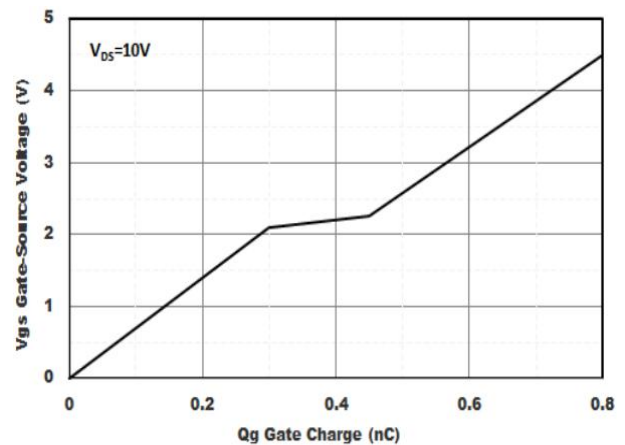


Figure4. Gate Charge

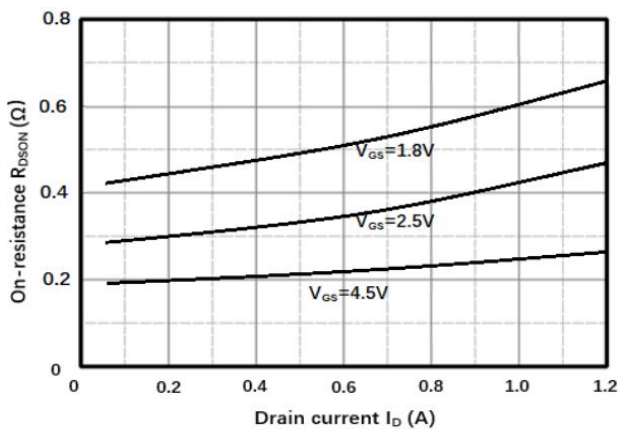


Figure5. Drain-Source on Resistance

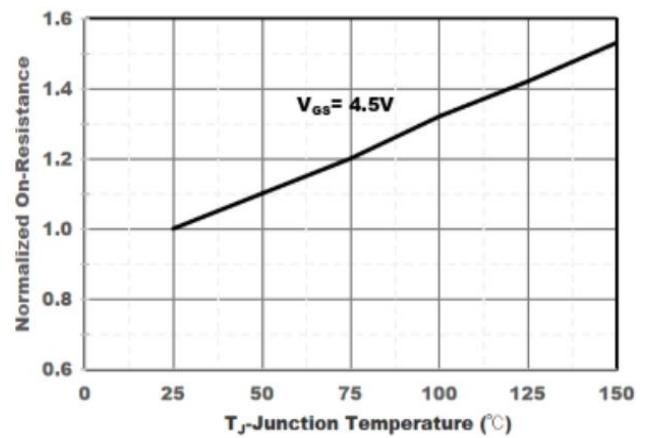


Figure6. Drain-Source on Resistance

Typical Characteristics

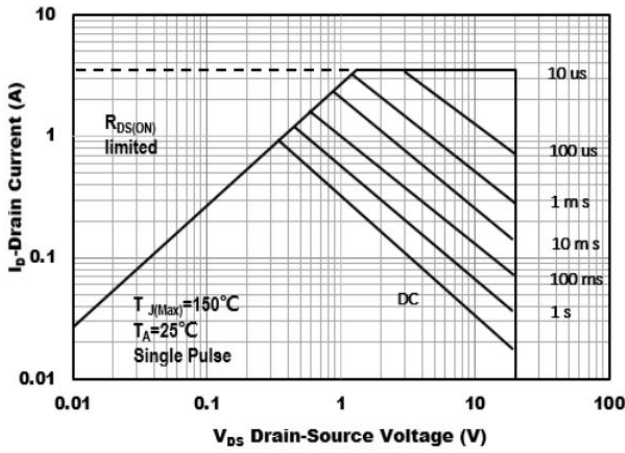


Figure7. Safe Operation Area

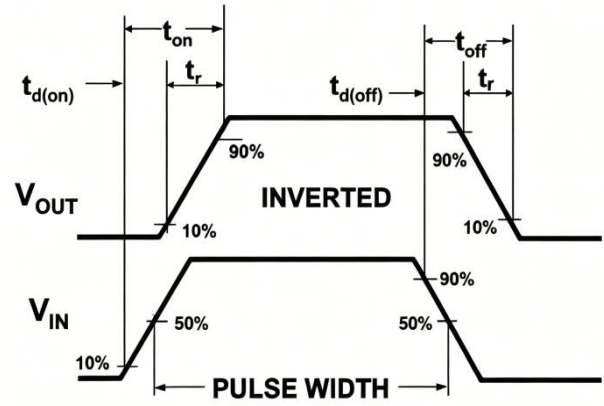
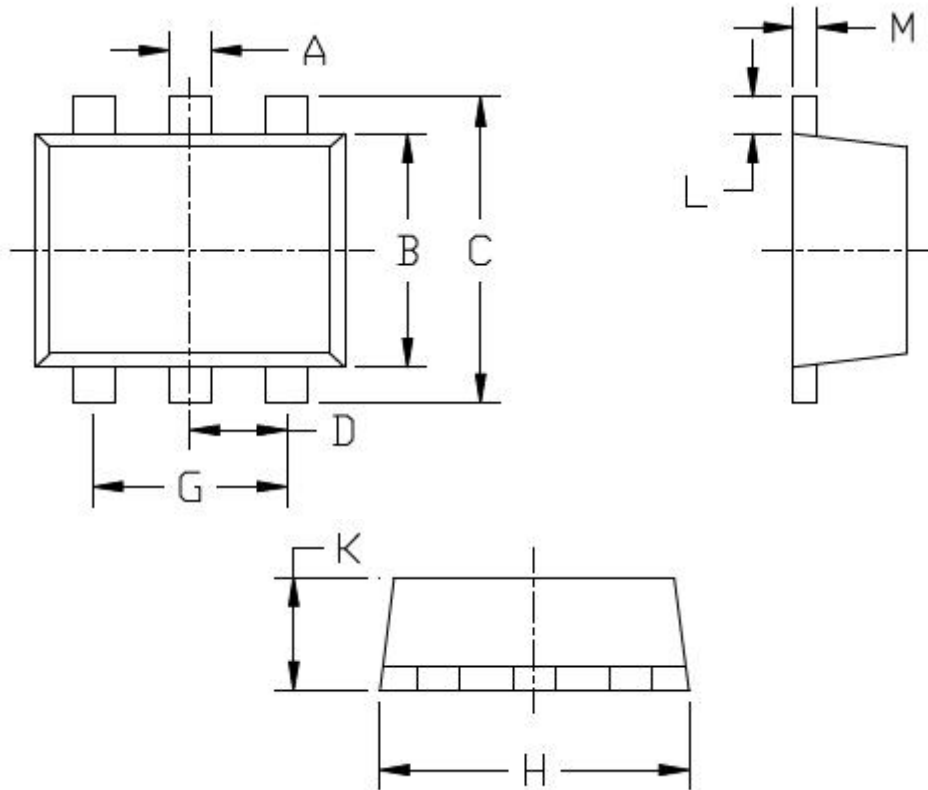


Figure8. Switching wave

SOT-563 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.150	0.300	0.006	0.011
B	1.100	1.300	0.043	0.051
C	1.500	1.700	0.059	0.067
D	0.400	0.600	0.016	0.024
G	0.900	1.100	0.035	0.043
H	1.500	1.700	0.059	0.067
K	0.550	0.650	0.021	0.026
L	0.100	0.300	0.004	0.011
M	0.100	0.180	0.004	0.007