

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-20V	51mΩ@-4.5V	-3.4A
	67mΩ@-2.5V	
	100mΩ@-1.8V	

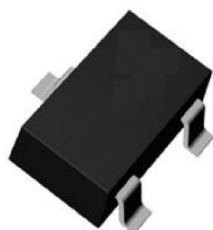
Feature

- Trench Power LV MOSFET technology
- High Power and Current handing capability
- Low Gate Charge
- Suffix "-Q1" for AEC-Q101

Application

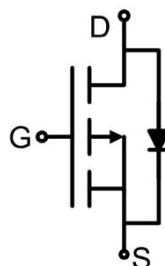
- PWM applications
- Power management
- Load switch

Package

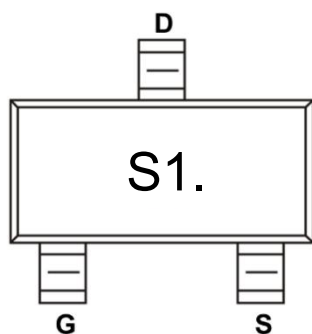


SOT-23

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}	± 10	V
Continuous Drain Current	I_D	-3.4	A
Pulsed Drain Current ¹⁾	I_{DM}	-14	A
Power Dissipation	P_D	1	W
Thermal Resistance Junction-to-Ambient ²⁾	$R_{\theta JA}$	125	$^{\circ}\text{C}/\text{W}$
Junction Temperature	T_J	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	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20			V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=-20V, V_{GS}=0V$			-1	μA
Gate-body leakage current	I_{GSS}	$V_{GS}=\pm 10V, V_{DS}=0V$			± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.4	-0.62	-1.0	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-3.4A$		42	51	m Ω
		$V_{GS}=-2.5V, I_D=-3.0A$		55	67	
		$V_{GS}=-1.8V, I_D=-2.5A$		86	100	
Dynamic characteristics ³⁾						
Input Capacitance	C_{iss}	$V_{DS}=-10V, V_{GS}=0V, f=1MHz$		438		pF
Output Capacitance	C_{oss}			76		
Reverse Transfer Capacitance	C_{rss}			62		
Total Gate Charge	Q_g	$V_{DS}=-10V, V_{GS}=-4.5V, I_D=-3.4A$		5.41		nC
Gate-Source Charge	Q_{gs}			1.17		
Gate-Drain Charge	Q_{gd}			1.24		
Turn-on delay time	$t_{d(on)}$	$V_{DS}=-10V, V_{GS}=-4.5V, I_D=-1A, R_{GEN}=3\Omega$		6.4		nS
Turn-on rise time	t_r			21.8		
Turn-off delay time	$t_{d(off)}$			37.4		
Turn-off fall time	t_f			34		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				-3.4	A
Diode Forward voltage	V_{SD}	$V_{GS}=0V, I_S=-3.4A$			-1.2	V
Reverse Recovery Time	t_{rr}	$I_F=-3.4A, di/dt=100 A/\mu s$		24.5		nS
Reverse Recovery Charge	Q_{rr}			4		nC

Notes:

- 1) Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.
- 2) $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance, where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design, while $R_{\theta JA}$ is determined by the board design. The maximum rating presented here is based on mounting on a 1 in 2 pad of 2oz copper.
- 3) Guaranteed by design, not subject to production testing.

Typical Characteristics

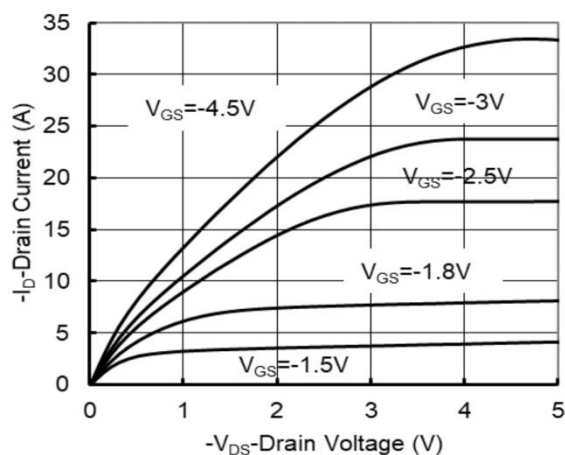


Figure1. Output Characteristics

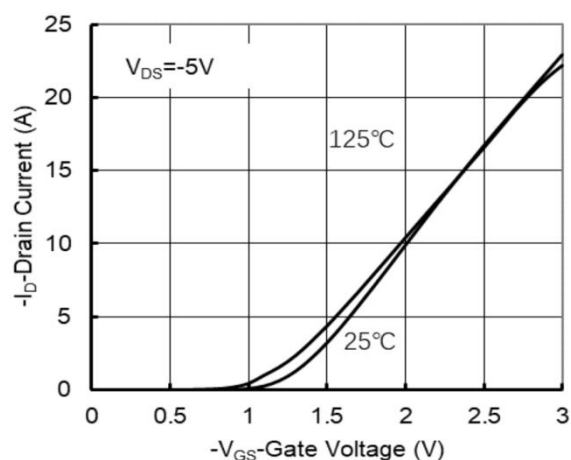


Figure2. Transfer Characteristics

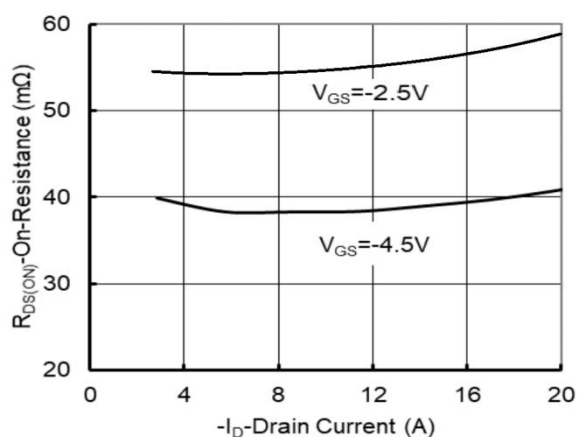


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

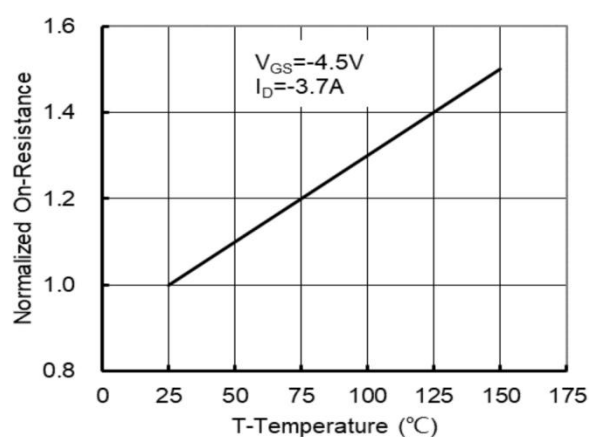


Figure 4: On-Resistance vs. Junction Temperature

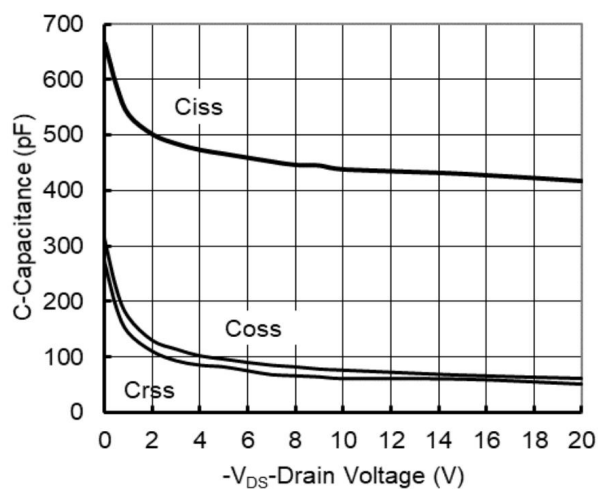


Figure5. Capacitance Characteristics

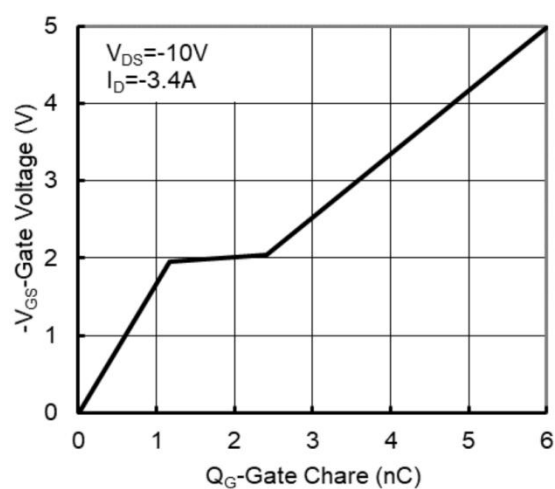
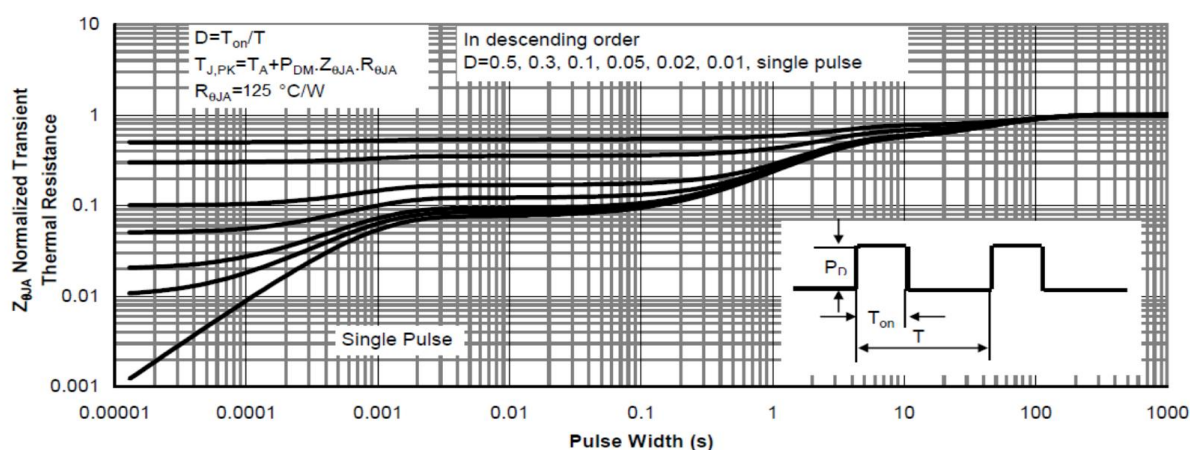
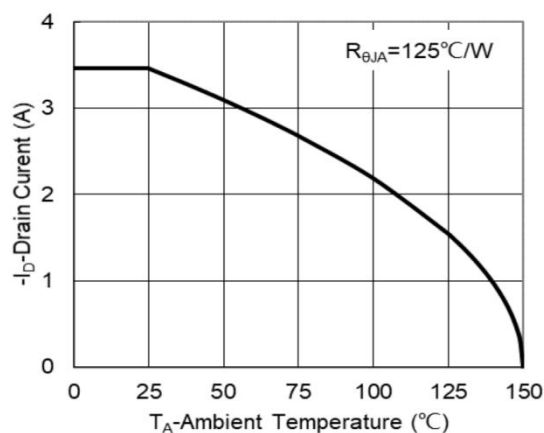
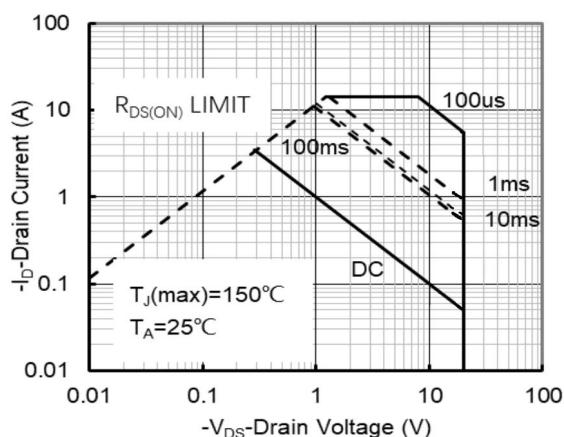
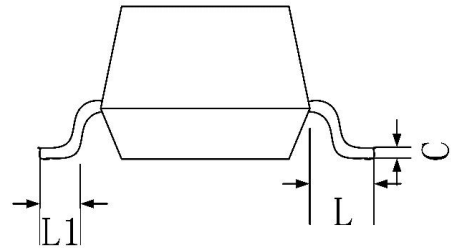
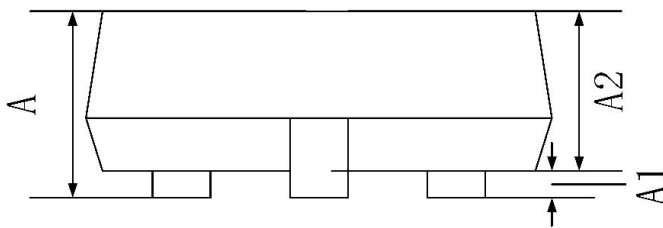
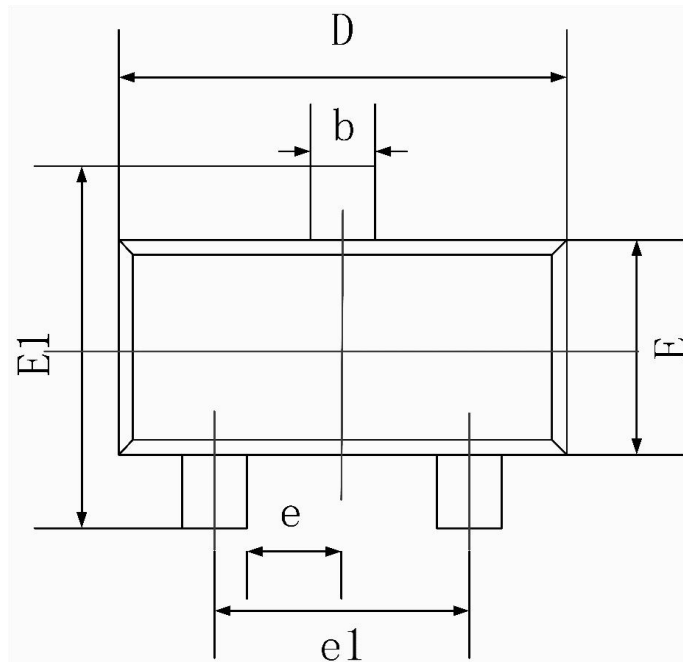


Figure6. Gate Charge

Typical Characteristics



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