

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-20V	40mΩ@-4.5V	-5A
	70mΩ@-2.5V	

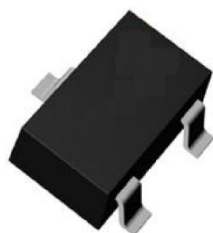
Feature

- Split gate trench MOSFET technology
- Extremely low switching loss
- Excellent stability and uniformity
- Low $R_{DS(on)}$ & FOM
- Suffix "-Q1" for AEC-Q101

Application

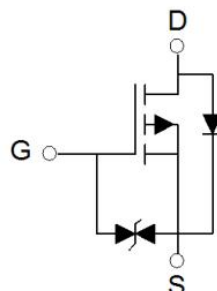
- power management
- Portable equipment

Package

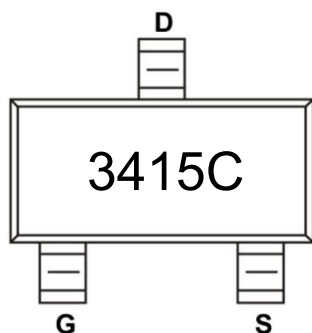


SOT-23

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	-5	A
Continuous Drain Current ($T_A=100^{\circ}\text{C}$)	$I_D(100^{\circ}\text{C})$	-3.2	A
Pulsed Drain Current ¹⁾	I_{DM}	-30	A
Power Dissipation ²⁾	P_D	1	W
Thermal Resistance Junction to Ambient ³⁾	$R_{\theta JA}$	125	$^{\circ}\text{C}/\text{W}$
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	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20			V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=-20V, V_{GS}=0V$			-1	μA
Gate-body leakage current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 10V$			± 10	μA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.55	-0.85	-1.25	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-5A$		28	40	m Ω
		$V_{GS}=-2.5V, I_D=-4A$		50	70	
Dynamic characteristics ⁴⁾						
Input Capacitance	C_{iss}	$V_{DS}=-10V, V_{GS}=0V, f=1MHz$		540		pF
Output Capacitance	C_{oss}			120		
Reverse Transfer Capacitance	C_{rss}			100		
Total Gate Charge	Q_g	$V_{DS}=-10V, V_{GS}=-10V, I_D=-5A$		13		nC
Gate-Source Charge	Q_{gs}			2		
Gate-Drain Charge	Q_{gd}			2		
Turn-on delay time	$t_{d(on)}$	$V_{DS}=-10V, V_{GS}=-10V, I_D=-5A$ $R_G=2.2\Omega$		5		nS
Turn-on rise time	t_r			47		
Turn-off delay time	$t_{d(off)}$			52		
Turn-off fall time	t_f			69		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				-5	A
Diode Forward voltage	V_{SD}	$V_{GS}=0V, I_S=-5A$			-1.2	V
Reverse Recovery Time	T_{rr}	$I_F=-5A, di/dt=-100A/us$		20		nS
Reverse Recovery Charge	Q_{rr}			2.5		nC

Notes:

- 1) Repetitive rating; pulse width limited by max. junction temperature.
- 2) P_D is based on max. junction temperature, using junction-case and junction-ambient thermal resistance.
- 3) The value of $R_{\theta JA}$ is measured with the device mounted on 1 in² FR-4 board with 2oz. Copper, 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

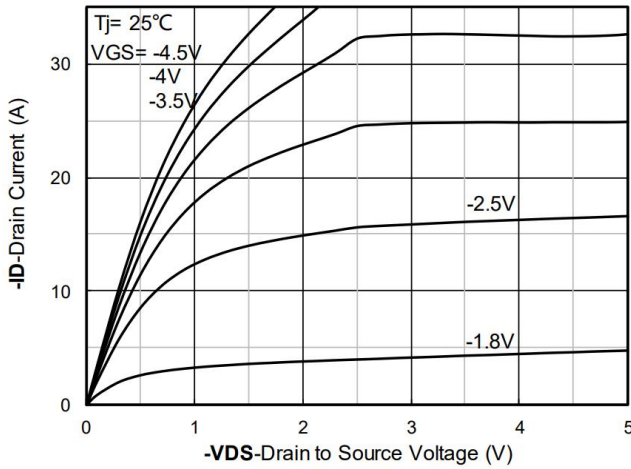


Figure 1. Output Characteristics

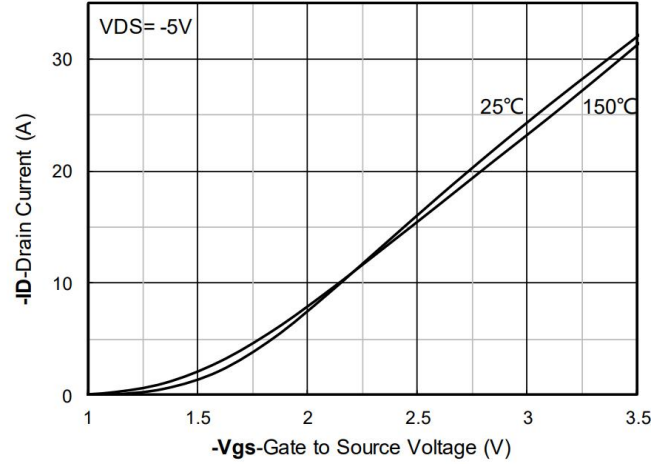


Figure 2. Transfer Characteristics

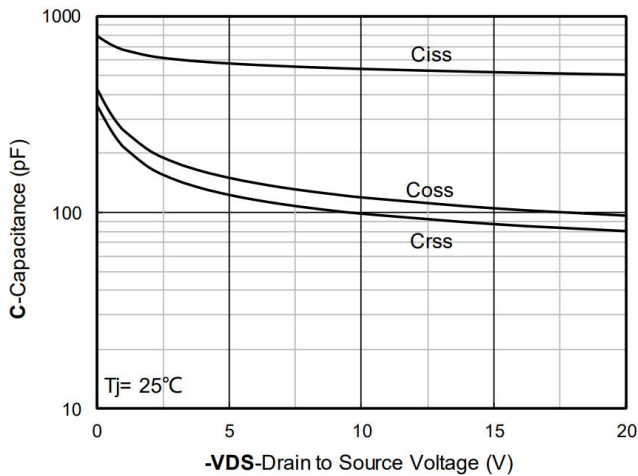


Figure 3. Capacitance Characteristics

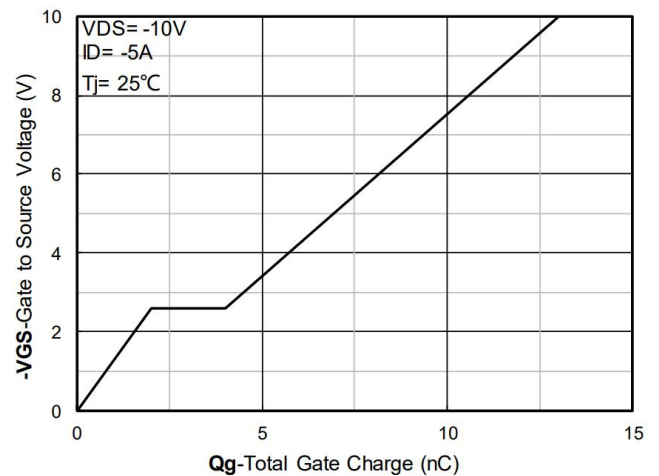


Figure 4. Gate Charge

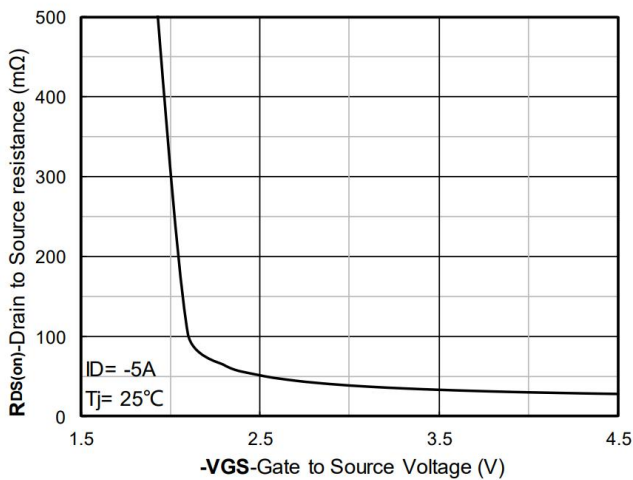


Figure 5. On-Resistance vs Gate to Source Voltage

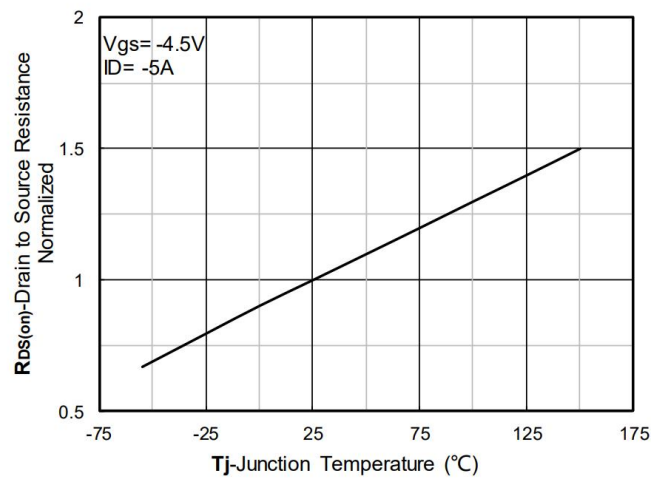


Figure 6. Normalized On-Resistance

Typical Characteristics

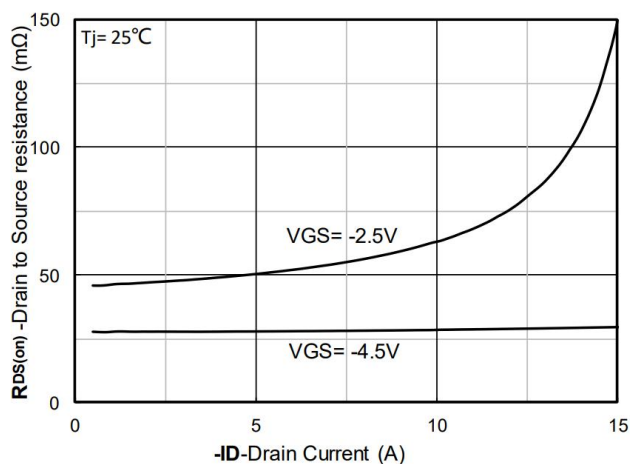


Figure 7. $R_{DS(on)}$ VS Drain Current

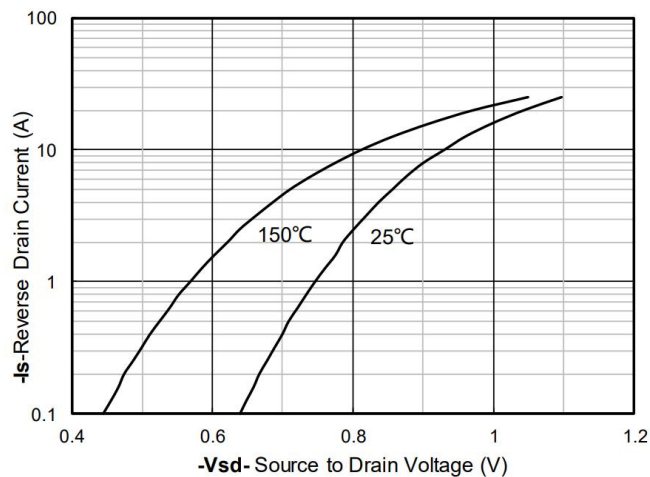


Figure 8. Forward characteristics of reverse diode

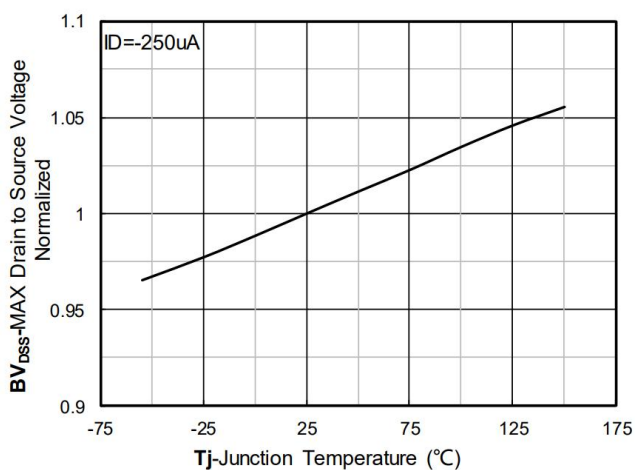


Figure 9. Normalized breakdown voltage

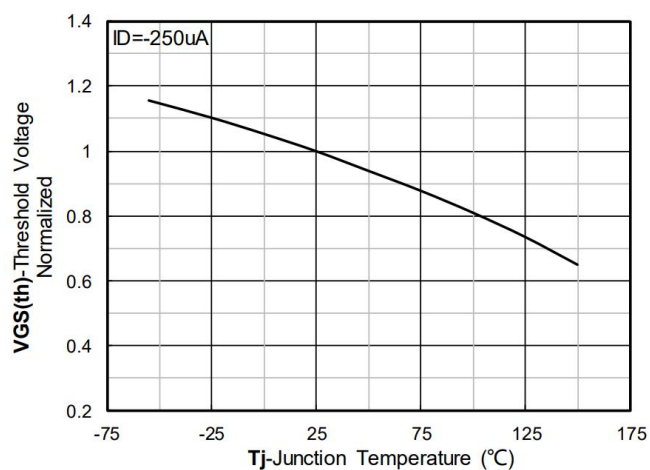


Figure 10. Normalized Threshold voltage

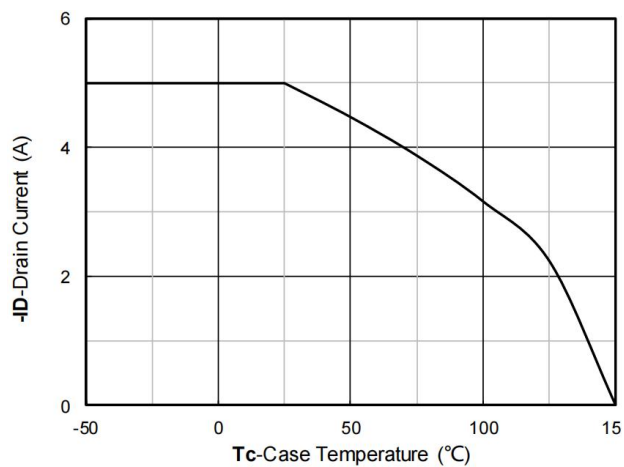


Figure 11. Current dissipation

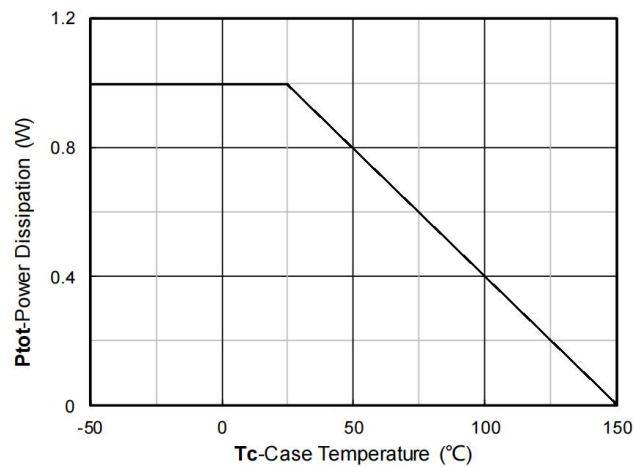
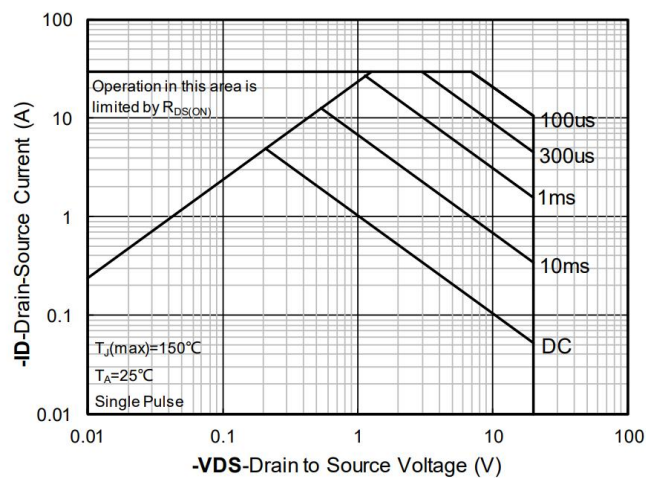
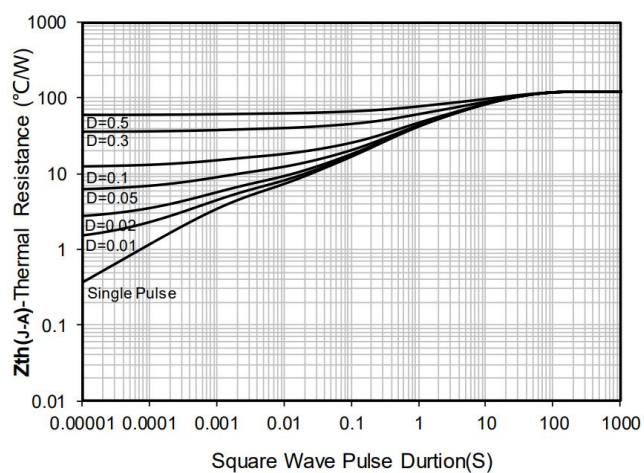
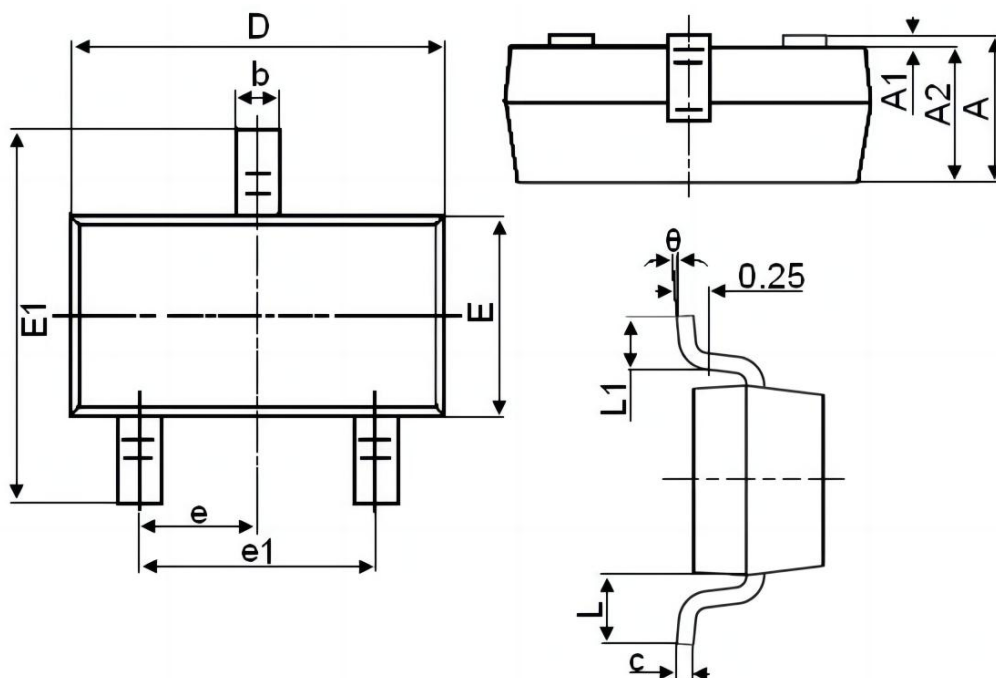


Figure 12. Power dissipation

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	0.100	0.200	0.004	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
θ	0°	8°	0°	8°