

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
-30V	43mΩ@-10V	-6A
	65mΩ@-4.5V	

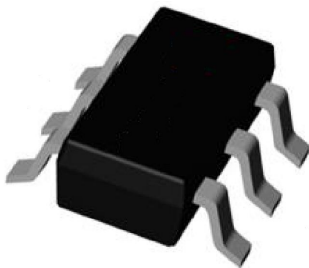
## Feature

- Trench power LV MOSFET technology
- High density cell design for low  $R_{DS(on)}$
- High speed switching
- Suffix “-Q1” for AEC-Q101

## Application

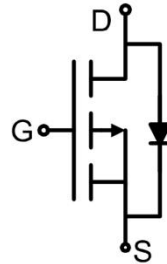
- Battery protection
- Load switch
- Power management

## Package

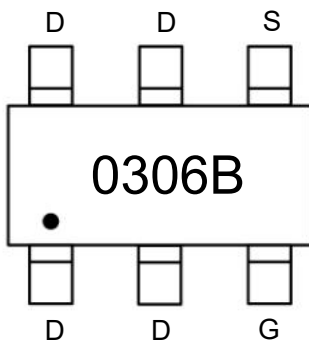


SOT-23-6L

## Circuit diagram



## Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	-6	A
Continuous Drain Current ( $T_A=100^{\circ}\text{C}$ )	$I_D(100^{\circ}\text{C})$	-3.8	A
Pulsed Drain Current <sup>1)</sup>	$I_{DM}$	-40	A
Power Dissipation <sup>2)</sup>	$P_D$	1.25	W
Thermal Resistance Junction to Ambient <sup>3)</sup>	$R_{\theta JA}$	100	$^{\circ}\text{C}/\text{W}$
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	$V_{(BR)DSS}$	$V_{GS}=0\text{V}, I_D=-250\mu\text{A}$	-30			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS}=-30\text{V}, V_{GS}=0\text{V}$			-1	$\mu\text{A}$
Gate-body leakage current	$I_{GSS}$	$V_{DS}=0\text{V}, V_{GS}=\pm 20\text{V}$			$\pm 100$	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu\text{A}$	-1	-1.5	-2.5	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS}=-10\text{V}, I_D=-6\text{A}$		33	43	m $\Omega$
		$V_{GS}=-4.5\text{V}, I_D=-4\text{A}$		50	65	
<b>Dynamic characteristics<sup>4)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS}=-15\text{V}, V_{GS}=0\text{V}, f=1\text{MHz}$		490		pF
Output Capacitance	$C_{oss}$			75		
Reverse Transfer Capacitance	$C_{rss}$			60		
Total Gate Charge	$Q_g$	$V_{DS}=-15\text{V}, V_{GS}=-10\text{V}$ $I_D=-4.1\text{A}$		9		nC
Gate-Source Charge	$Q_{gs}$			1.5		
Gate-Drain Charge	$Q_{gd}$			2.3		
Turn-on delay time	$t_{d(on)}$	$V_{DS}=-15\text{V}, V_{GS}=-10\text{V}$ $I_D=-4.1\text{A}, R_G=2.5\Omega$		9		nS
Turn-on rise time	$t_r$			3		
Turn-off delay time	$t_{d(off)}$			29		
Turn-off fall time	$t_f$			15		
<b>Source-Drain Diode characteristics</b>						
Diode Continuous Current	$I_S$				-6	A
Diode Forward voltage	$V_{SD}$	$V_{GS}=0\text{V}, I_S=-6\text{A}$			-1.2	V
Reverse recover time	$T_{rr}$	$I_S=-4.1\text{A}, di/dt=-100\text{A}/\mu\text{s}$		32		nS
Reverse recovery charge	$Q_{rr}$			12		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 in<sup>2</sup> FR-4 board with 2oz. Copper, in the still air environment with  $T_A=25^{\circ}\text{C}$ . The maximum allowed junction temperature of  $150^{\circ}\text{C}$ . 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

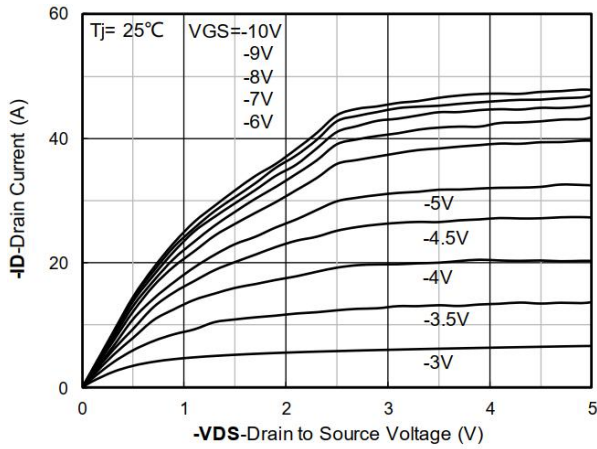


Figure 1. Output Characteristics

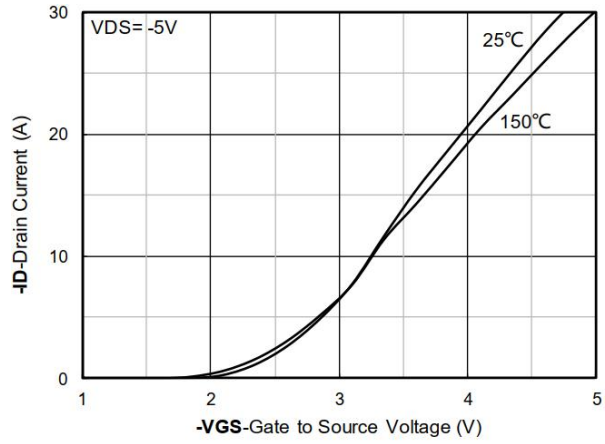


Figure 2. Transfer Characteristics

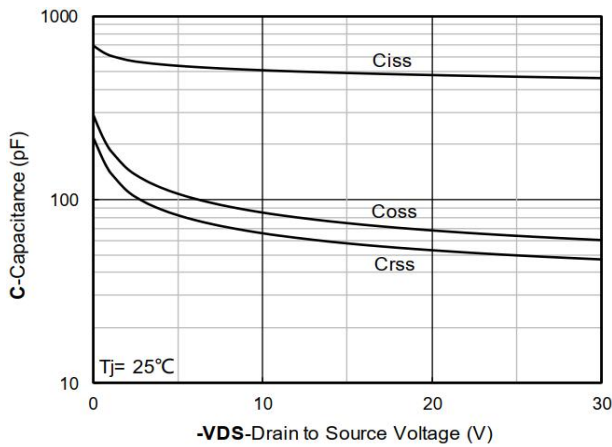


Figure 3. Capacitance Characteristics

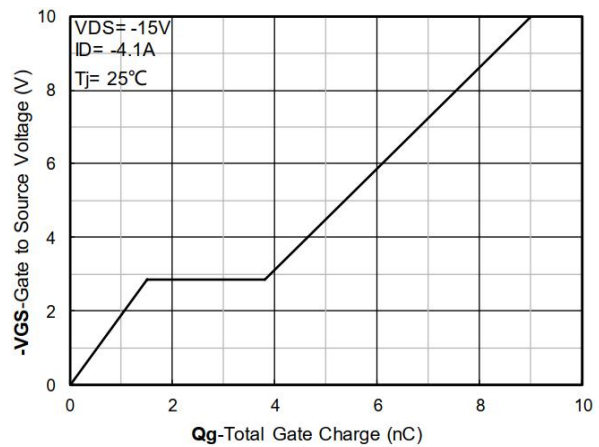


Figure 4. Gate Charge

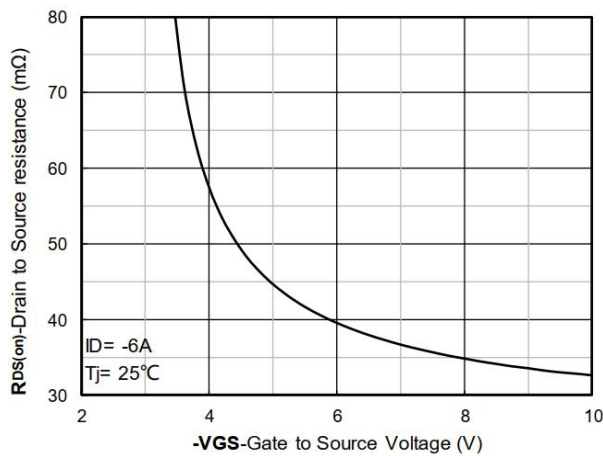


Figure 5. On-Resistance vs Gate to Source Voltage

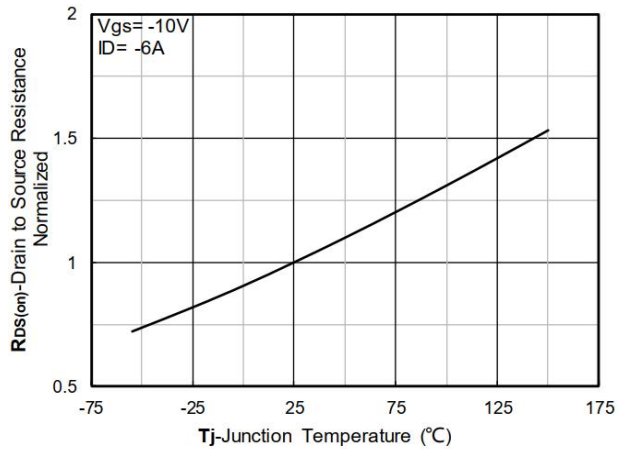


Figure 6. Normalized On-Resistance

## Typical Characteristics

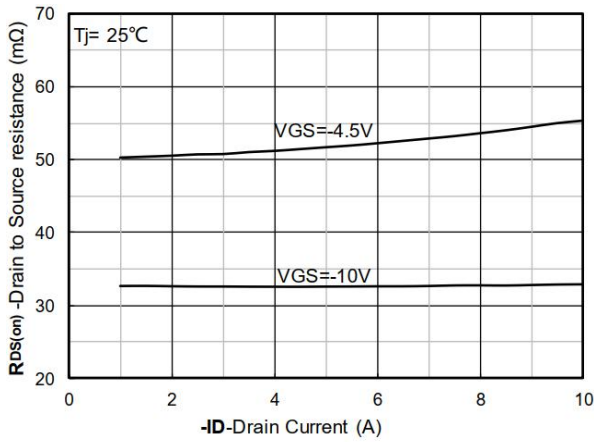


Figure 7.  $R_{DS(on)}$  VS Drain Current

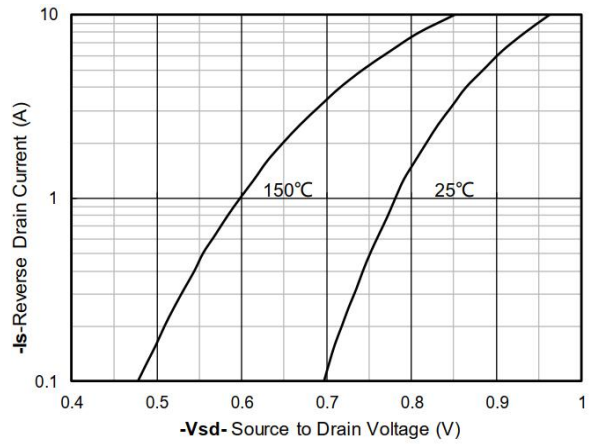


Figure 8. Forward characteristics of reverse diode

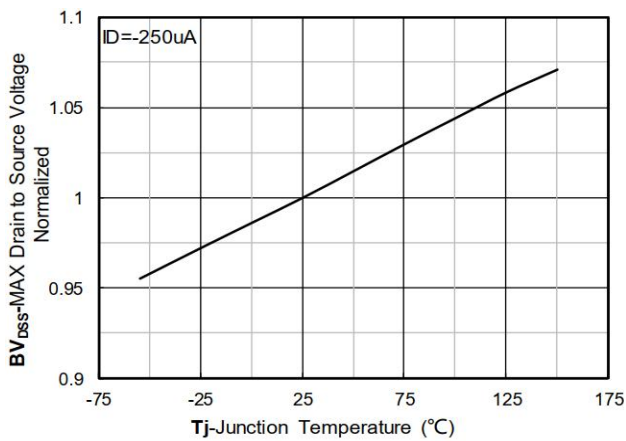


Figure 9. Normalized breakdown voltage

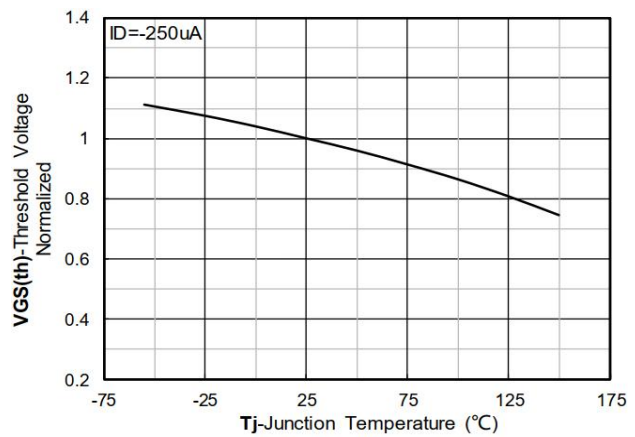


Figure 10. Normalized Threshold voltage

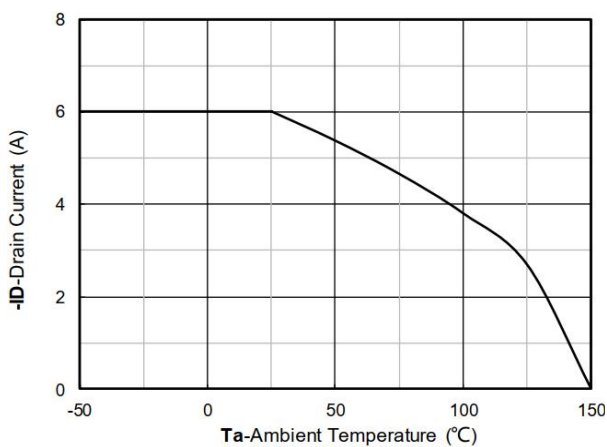


Figure 11. Current dissipation

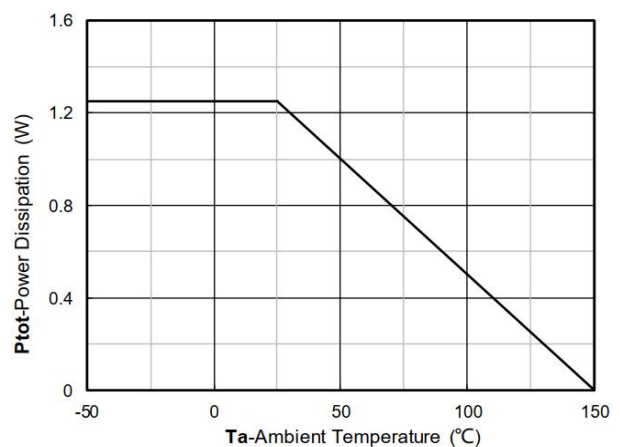


Figure 12. Power dissipation

## Typical Characteristics

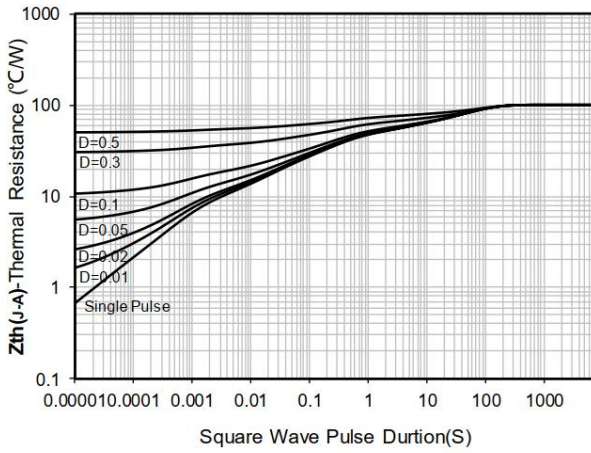


Figure 13. Maximum Transient Thermal Impedance

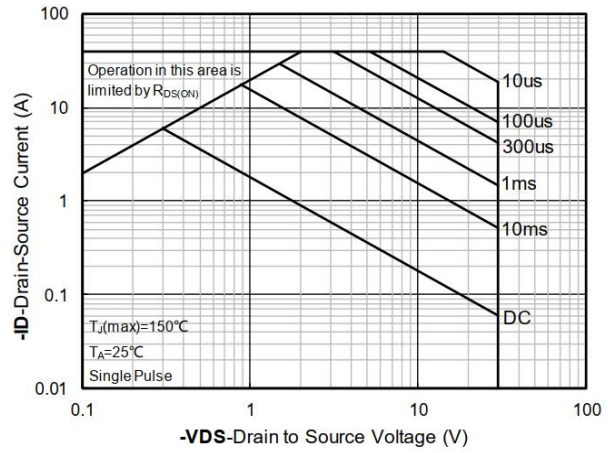
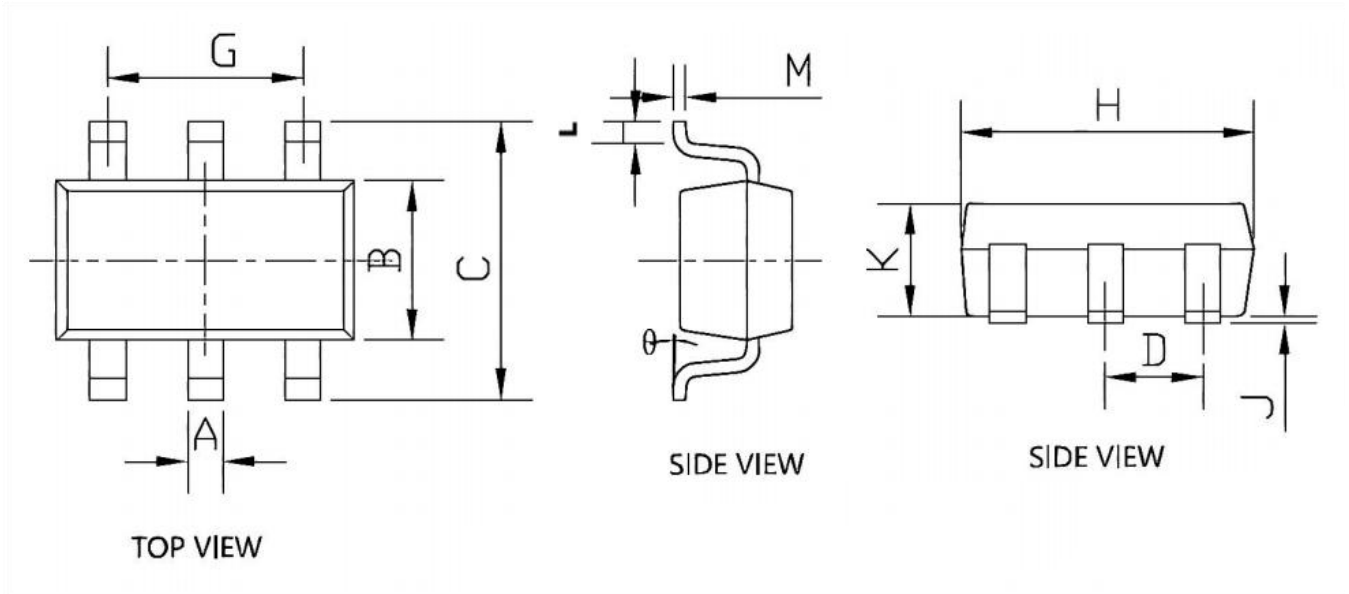


Figure 14. Safe Operation Area

## SOT-23-6L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.300	0.500	0.012	0.020
B	1.500	1.700	0.059	0.067
C	2.650	2.950	0.104	0.116
D	0.950 BSC.		0.037 BSC.	
G	1.900 BSC.		0.075 BSC.	
H	2.820	3.020	0.111	0.119
J	0.000	0.100	0.000	0.004
K	1.050	1.150	0.041	0.045
L	0.300	0.600	0.012	0.024
M	0.100	0.200	0.004	0.008
$\theta$	0°	8°	0°	8°