

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
-30V	21mΩ@-10V	-7A
	28mΩ@-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

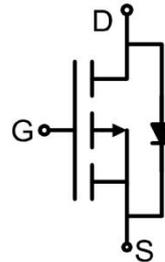
- Battery protection
- Load switch
- Power management

## Package

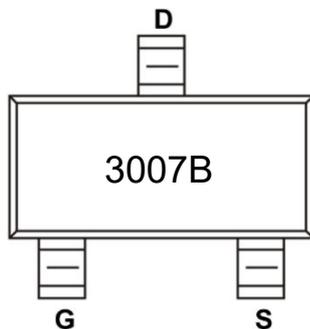


SOT-23-3L

## 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	$I_D$	-7	A
Continuous Drain Current ( $T_A=100^\circ\text{C}$ )	$I_D(100^\circ\text{C})$	-4	A
Pulsed Drain Current <sup>1)</sup>	$I_{DM}$	-60	A
Power Dissipation <sup>2)</sup>	$P_D$	1.2	W
Thermal Resistance from Junction to Ambient <sup>3)</sup>	$R_{\theta JA}$	100	$^\circ\text{C}/\text{W}$
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
<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	$I_{GSS}$	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$			$\pm 100$	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$	-1.0	-1.5	-2.5	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS} = -10\text{V}, I_D = -7\text{A}$		16	21	m $\Omega$
		$V_{GS} = -4.5\text{V}, I_D = -5\text{A}$		21	28	
<b>Dynamic characteristics<sup>4)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS} = -15\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$		1220		pF
Output Capacitance	$C_{oss}$			170		
Reverse Transfer Capacitance	$C_{rss}$			160		
Total Gate Charge	$Q_g$	$V_{DS} = -15\text{V}, V_{GS} = -10\text{V}, I_D = -7\text{A}$		24		nC
Gate-Source Charge	$Q_{gs}$			2		
Gate-Drain Charge	$Q_{gd}$			6		
Turn-on delay time	$t_{d(on)}$	$V_{DD} = -15\text{V}, V_{GS} = -10\text{V}, I_D = -7\text{A}, R_{GEN} = 2.5\Omega$		11		nS
Turn-on rise time	$t_r$			4		
Turn-off delay time	$t_{d(off)}$			70		
Turn-off fall time	$t_f$			50		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current	$I_S$				-7	A
Diode Forward voltage	$V_{SD}$	$V_{GS} = 0\text{V}, I_S = -7\text{A}$			-1.2	V

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.

## Typical Characteristics

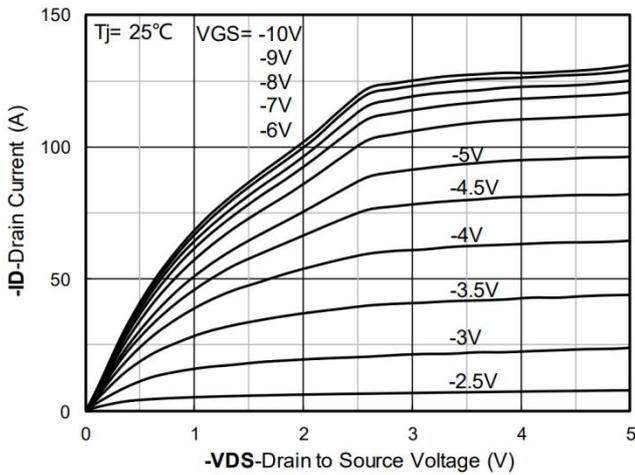


Figure 1. Output Characteristics

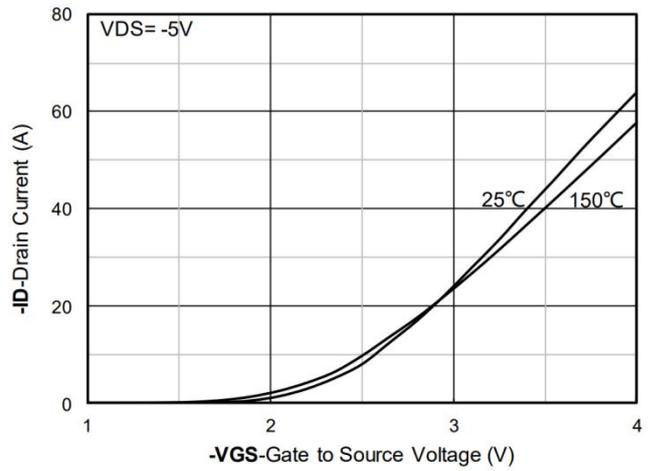


Figure 2. Transfer Characteristics

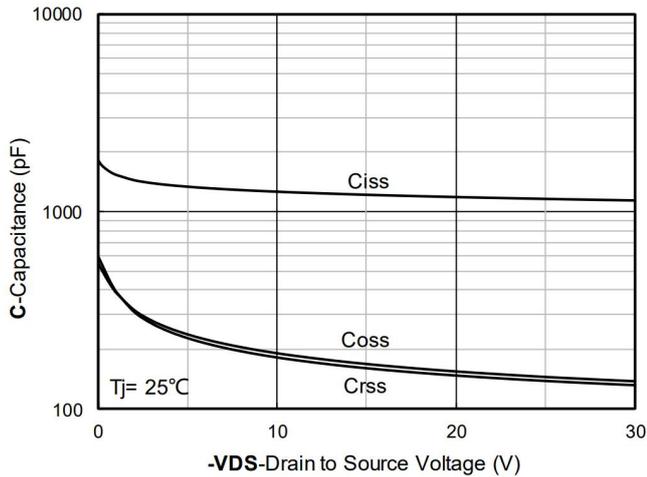


Figure 3. Capacitance Characteristics

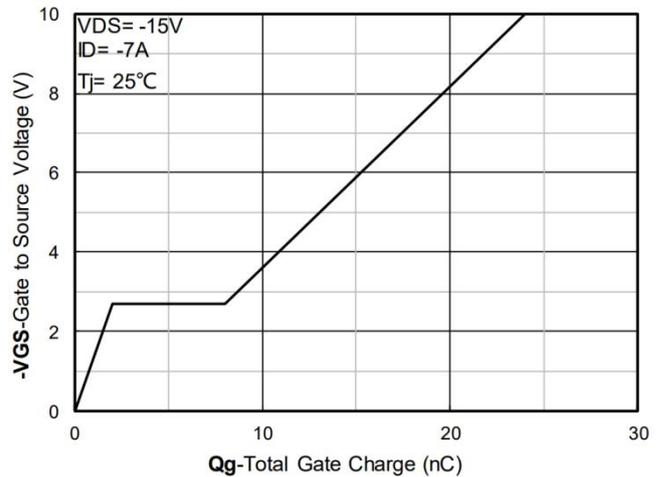


Figure 4. Gate Charge

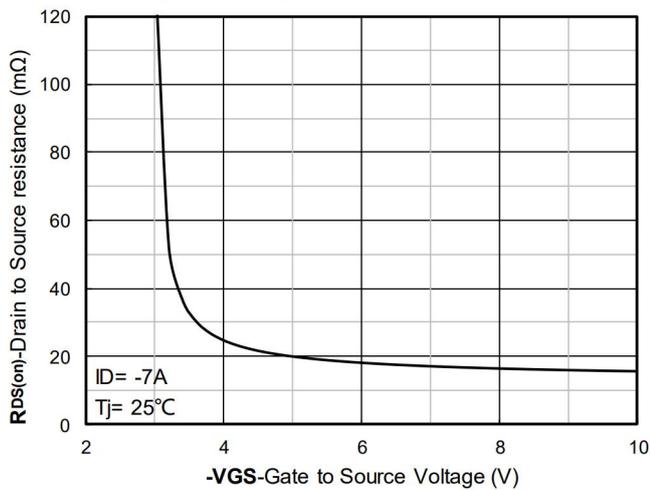


Figure 5. On-Resistance vs Gate to Source Voltage

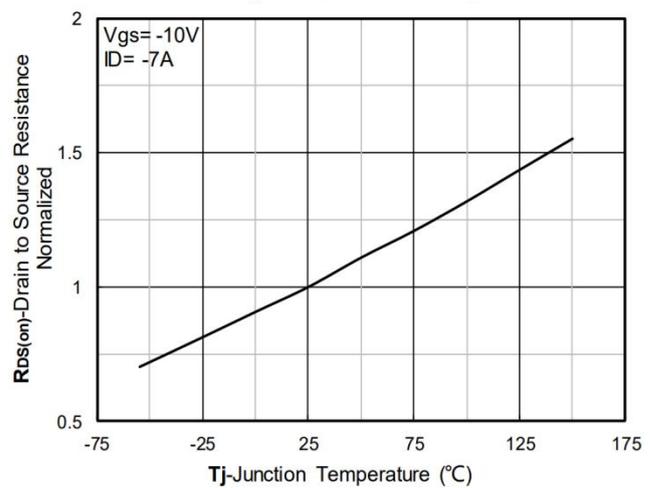


Figure 6. Normalized On-Resistance

## Typical Characteristics

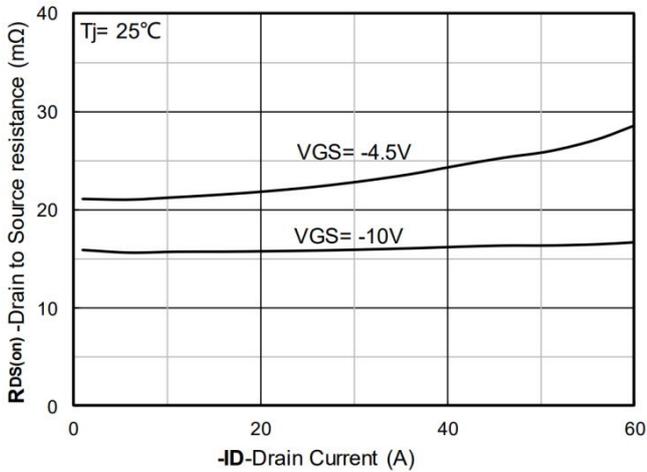


Figure 7.  $R_{DS(on)}$  VS Drain Current

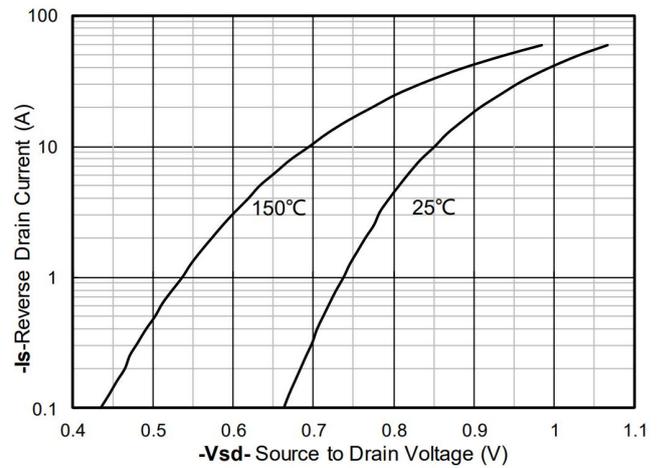


Figure 8. Forward characteristics of reverse diode

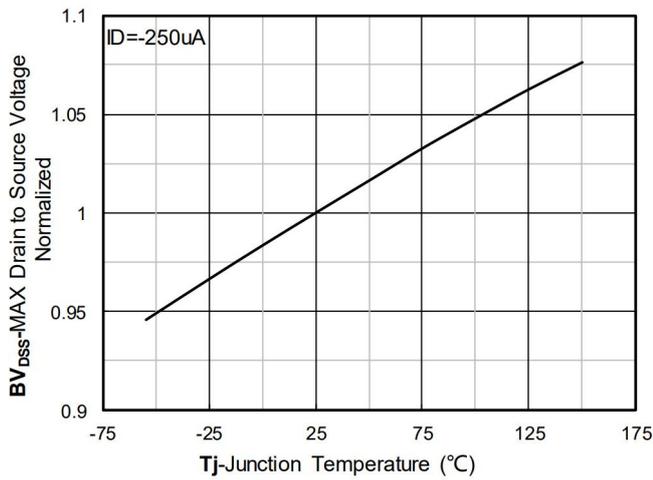


Figure 9. Normalized breakdown voltage

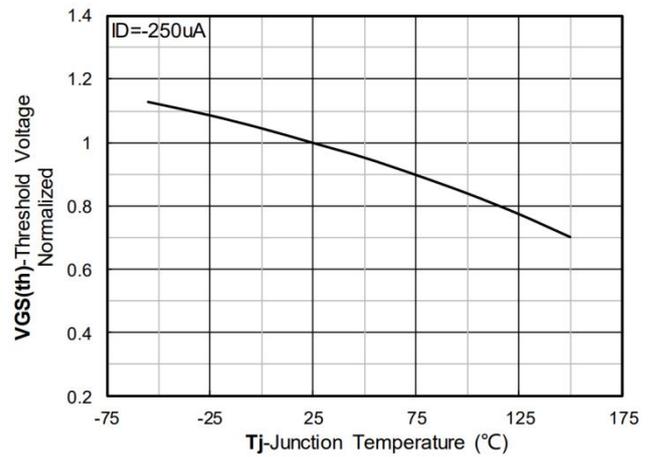


Figure 10. Normalized Threshold voltage

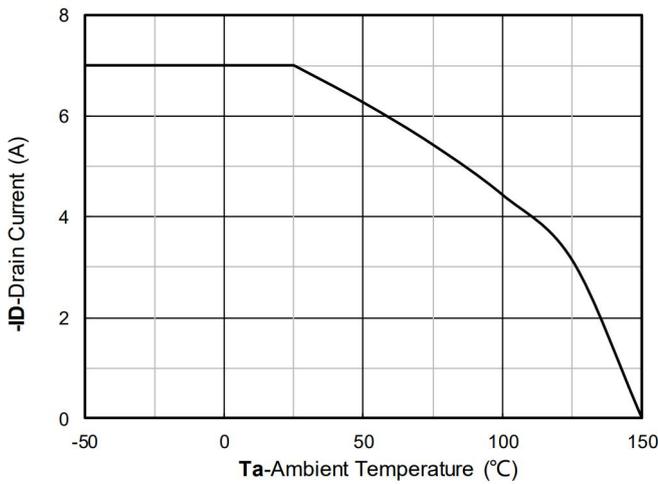


Figure 11. Current dissipation

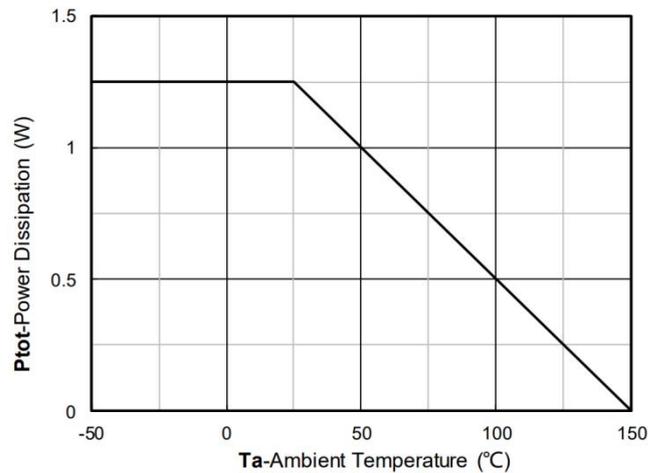


Figure 12. Power dissipation

## Typical Characteristics

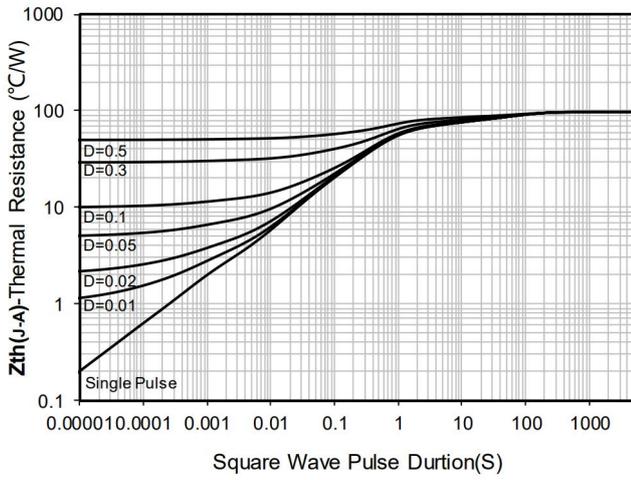


Figure 13. Maximum Transient Thermal Impedance

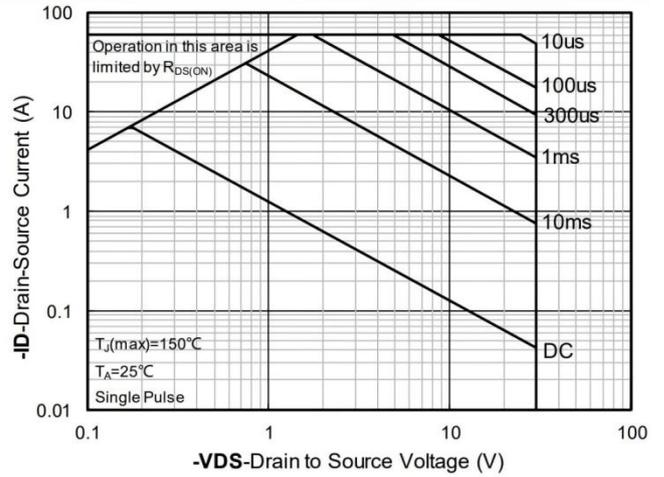
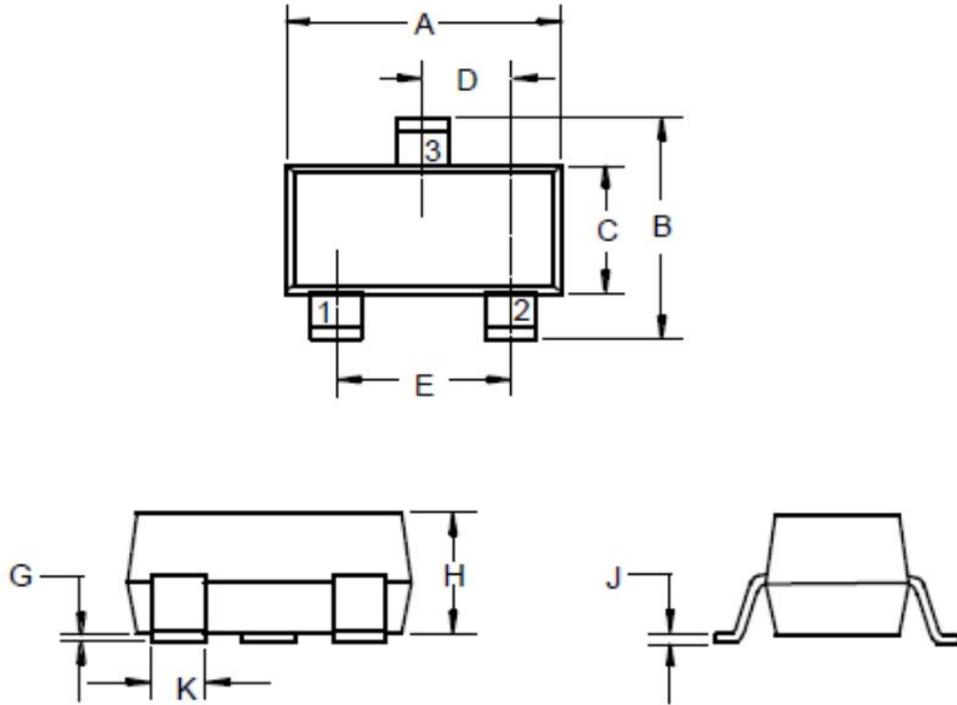


Figure 14. Safe Operation Area

## SOT-23-3L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.820	3.020	0.111	0.119
B	2.650	2.950	0.104	0.116
C	1.500	1.700	0.059	0.067
D	0.865	1.015	0.034	0.040
E	1.800	2.000	0.071	0.079
G	0.000	0.200	0.000	0.008
H	1.050	1.250	0.041	0.049
J	0.100	0.200	0.004	0.008
K	0.300	0.500	0.012	0.020