

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
-30V	19mΩ@-10V	-10A
	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

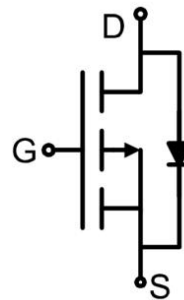
- Battery protection
- Load switch
- Power management

## Package



SOP-8

## Circuit diagram



## Marking



### Absolute maximum ratings (T<sub>A</sub>=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DS</sub>	-30	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current	I <sub>D</sub>	-10	A
Continuous Drain Current(T <sub>A</sub> =100°C)	I <sub>D</sub> (100°C)	-6.3	A
Pulsed Drain Current <sup>1)</sup>	I <sub>DM</sub>	-80	A
Avalanche energy <sup>2)</sup>	E <sub>AS</sub>	56	mJ
Power Dissipation <sup>3)</sup>	P <sub>D</sub>	2.5	W
Thermal Resistance,Junction-to-Ambient <sup>4)</sup>	R <sub>θJA</sub>	50	°C/W
Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature	T <sub>STG</sub>	-55 ~ +150	°C

### Electrical characteristics (T<sub>J</sub>=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA	-30			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = -30V, V <sub>GS</sub> = 0V			-1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V			±100	nA
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA	-1.0	-1.5	-2.5	V
Drain-source on-resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = -10V, I <sub>D</sub> = -10A		14	19	mΩ
		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -5A		20	28	
<b>Dynamic characteristics<sup>5)</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V, f = 1MHz		1220		pF
Output Capacitance	C <sub>oss</sub>			170		
Reverse Transfer Capacitance	C <sub>rss</sub>			160		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -15V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -10A		24		nC
Gate-Source Charge	Q <sub>gs</sub>			2		
Gate-Drain Charge	Q <sub>gd</sub>			6		
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> = -15V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -10A, R <sub>GEN</sub> = 2.5Ω		11		nS
Turn-on rise time	t <sub>r</sub>			4		
Turn-off delay time	t <sub>d(off)</sub>			70		
Turn-off fall time	t <sub>f</sub>			50		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current	I <sub>S</sub>				-10	A
Diode Forward voltage	V <sub>SD</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> = -10A			-1.2	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = -10A, di/dt = 100A/us		35		nS
Reverse Recovery Charge	Q <sub>rr</sub>			11		nC

Notes:

- 1) Repetitive rating; pulse width limited by max. junction temperature.
- 2) T<sub>J</sub> = 25°C, V<sub>DD</sub> = -30V, V<sub>G</sub> = -10V, R<sub>G</sub> = 25Ω, L = 0.5mH, I<sub>AS</sub> = -15A.
- 3) P<sub>d</sub> is based on max. junction temperature, using junction-case and junction-ambient thermal resistance.
- 4) The value of R<sub>θJA</sub> 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<sub>A</sub> = 25°C. The maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
- 5) Guaranteed by design, not subject to production.

## Typical Characteristics

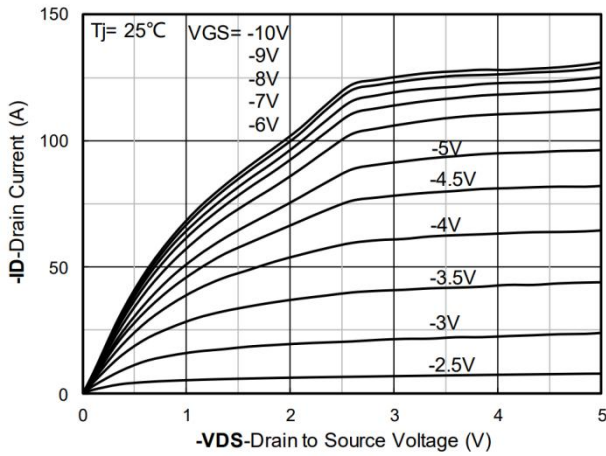


Figure 1. Output Characteristics

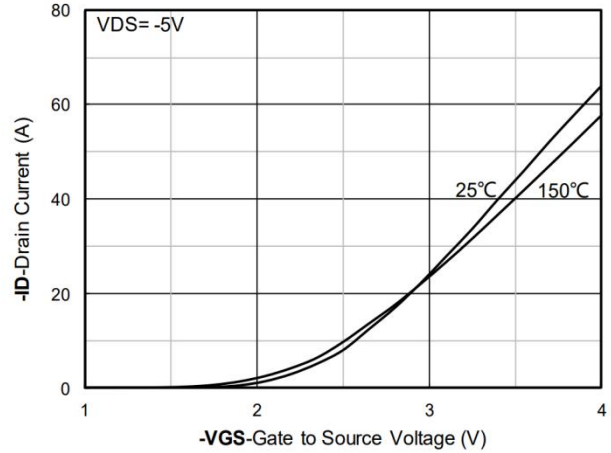


Figure 2. Transfer Characteristics

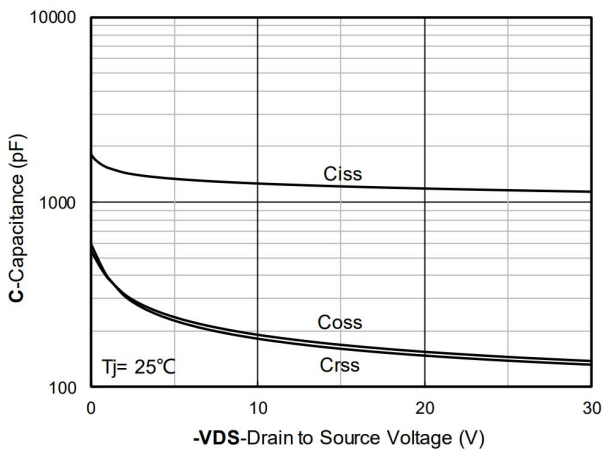


Figure 3. Capacitance Characteristics

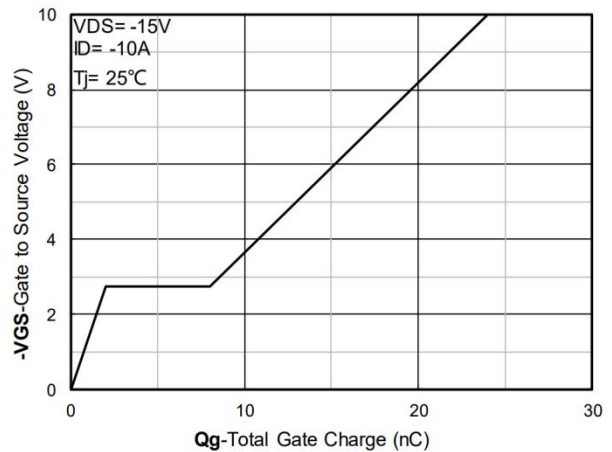


Figure 4. Gate Charge

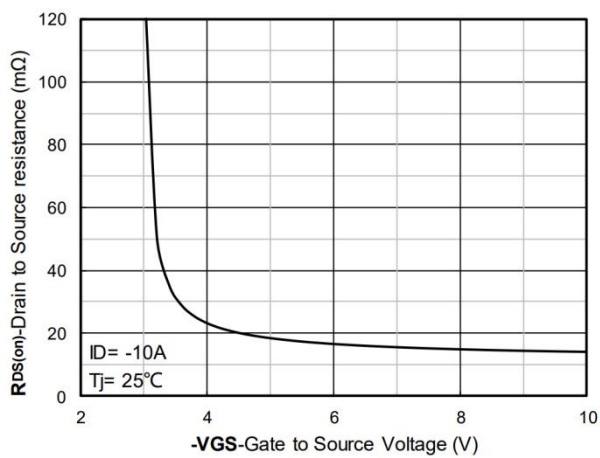


Figure 5. On-Resistance vs Gate to Source Voltage

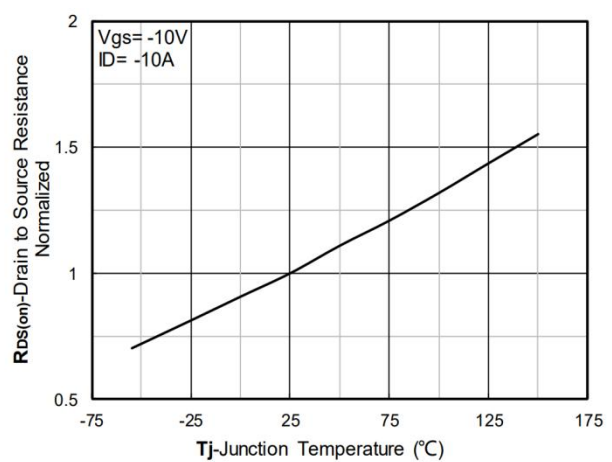


Figure 6. Normalized On-Resistance

## Typical Characteristics

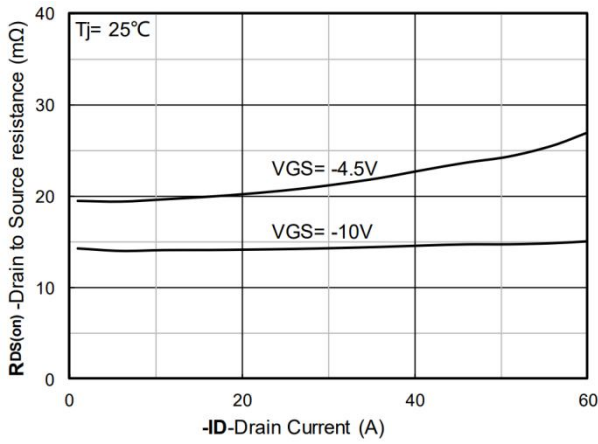


Figure 7.  $R_{DS(on)}$  VS Drain Current

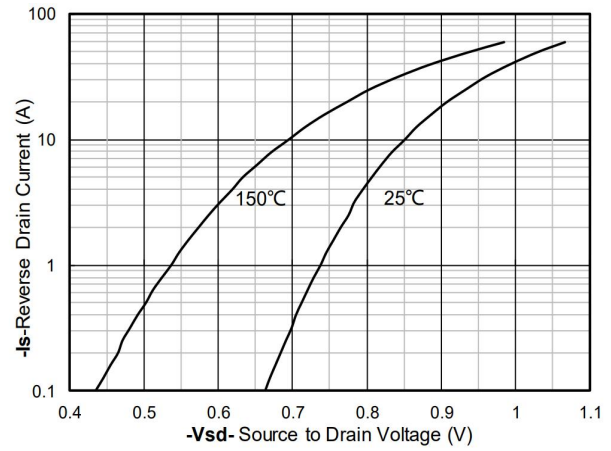


Figure 8. Forward characteristics of reverse diode

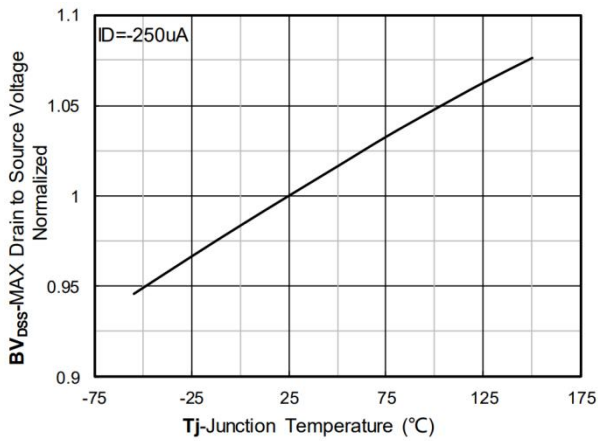


Figure 9. Normalized breakdown voltage

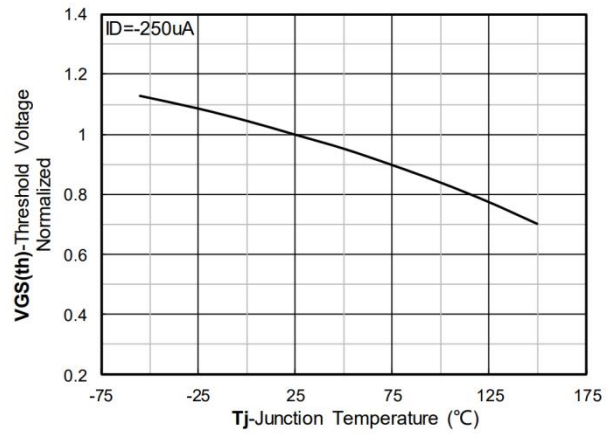


Figure 10. Normalized Threshold voltage

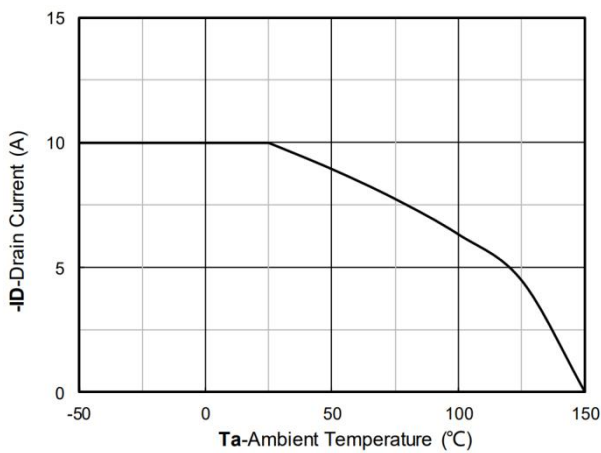


Figure 11. Current dissipation

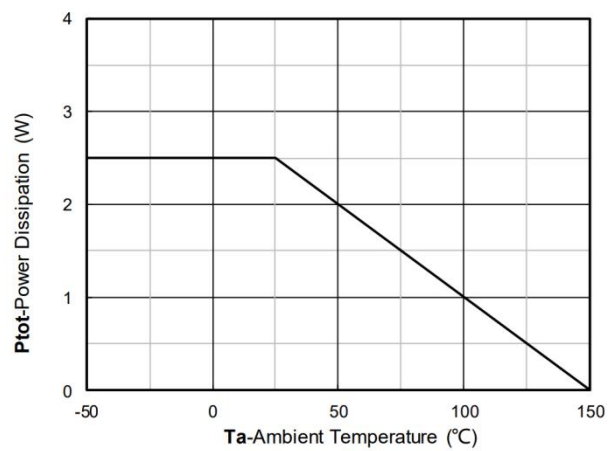


Figure 12. Power dissipation

## Typical Characteristics

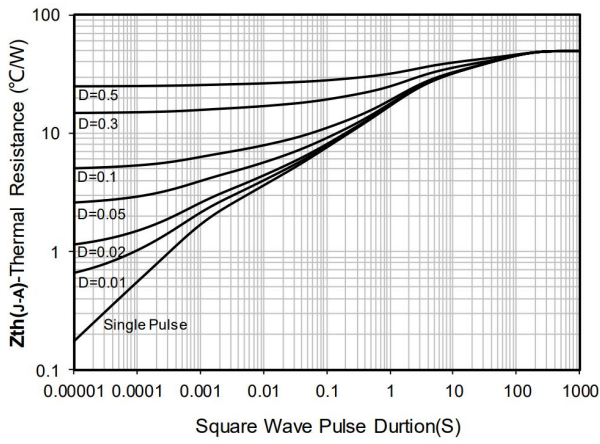


Figure 13. Maximum Transient Thermal Impedance

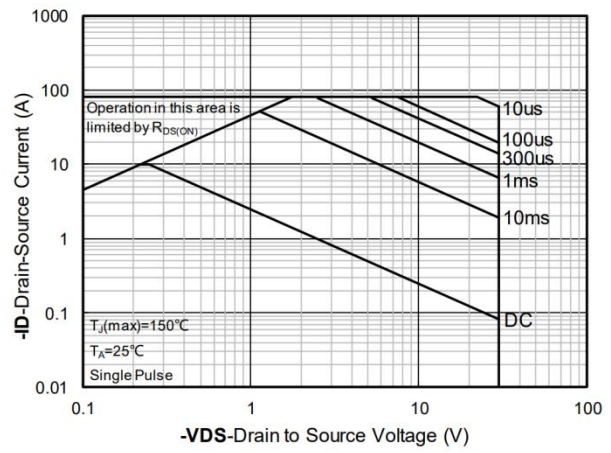
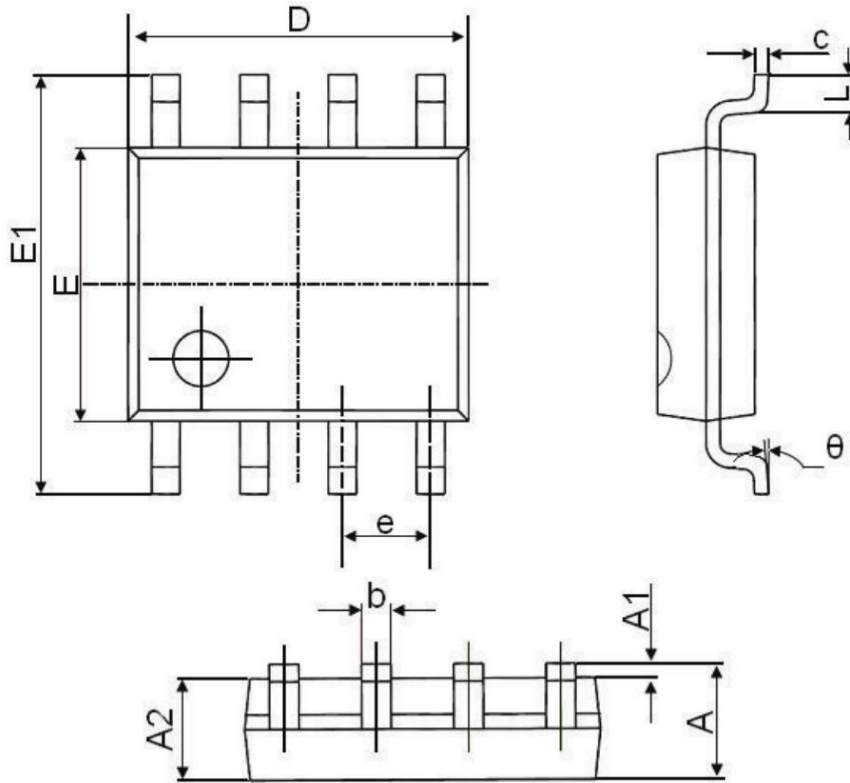


Figure 14. Safe Operation Area

## SOP-8 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.250	1.650	0.049	0.065
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°