

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
-20V	39mΩ@-4.5V	-5.4A
	49mΩ@-2.5V	
	63mΩ@-1.8V	

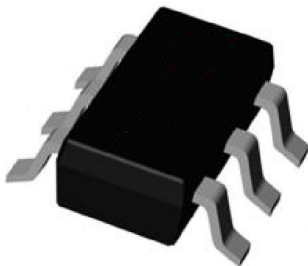
## Feature

- Advanced trench process technology
- High density cell design for ultra low on-resistance
- Low Gate Charge
- Suffix "-Q1" for AEC-Q101

## Application

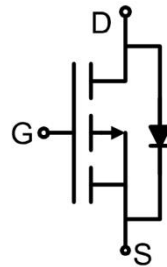
- Battery protection
- Power management
- Load switch

## Package

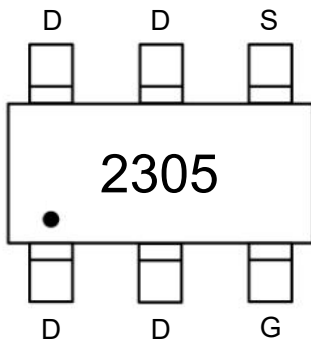


SOT-23-6L

## Circuit diagram



## Marking



### Absolute maximum ratings (Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	-20	V
Gate-Source Voltage	$V_{GS}$	$\pm 10$	V
Continuous Drain Current	$I_D$	-5.4	A
Pulsed Drain Current	$I_{DM}$	-22	A
Power Dissipation	$P_D$	1.2	W
Junction Temperature	$T_J$	150	°C
Storage Temperature	$T_{STG}$	-55 ~ +150	°C

### Electrical characteristics (Ta=25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-20			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = -16V, V_{GS} = 0V$			-1	$\mu A$
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 10V, V_{DS} = 0V$			$\pm 100$	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 <sup>1)</sup>	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -5.4A$		27	39	m $\Omega$
		$V_{GS} = -2.5V, I_D = -4.0A$		36	49	
		$V_{GS} = -1.8V, I_D = -3.0A$		48	63	
<b>Dynamic characteristics<sup>2)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS} = -10V, V_{GS} = 0V, f = 1MHz$		1010		pF
Output Capacitance	$C_{oss}$			130		
Reverse Transfer Capacitance	$C_{rss}$			109		
Total Gate Charge	$Q_g$	$V_{DS} = -10V, V_{GS} = -4.5V, I_D = -4.0A$		11		nC
Gate-Source Charge	$Q_{gs}$			2.17		
Gate-Drain Charge	$Q_{gd}$			2.54		
Turn-on delay time	$t_{d(on)}$	$V_{DD} = -10V, V_{GS} = -4.5V, R_L = 2.5\Omega, R_{GEN} = 3\Omega$		8.4		nS
Turn-on rise time	$t_r$			36.2		
Turn-off delay time	$t_{d(off)}$			76.8		
Turn-off fall time	$t_f$			56.2		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current <sup>1)</sup>	$I_S$				-5.4	A
Diode Forward voltage	$V_{DS}$	$V_{GS} = 0V, I_S = -5.4A$			-1.2	V

Notes:

- 1) Pulse Test: Pulse Width < 300 $\mu s$ , Duty Cycle  $\leq 2\%$ .
- 2) Guaranteed by design, not subject to production testing.

## Typical Characteristics

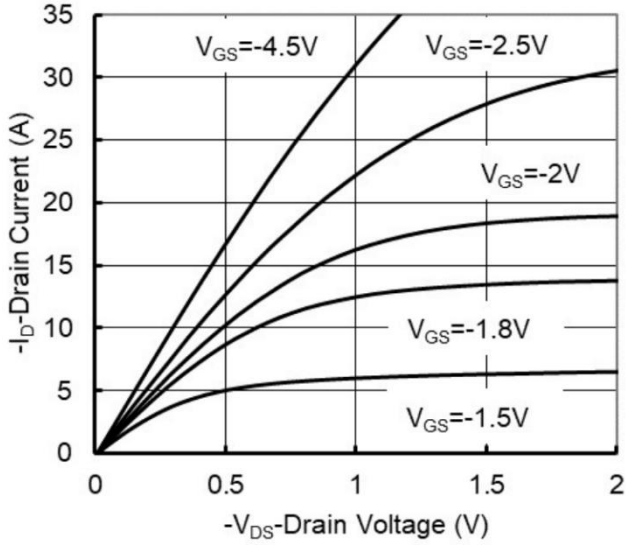


Figure1. Output Characteristics

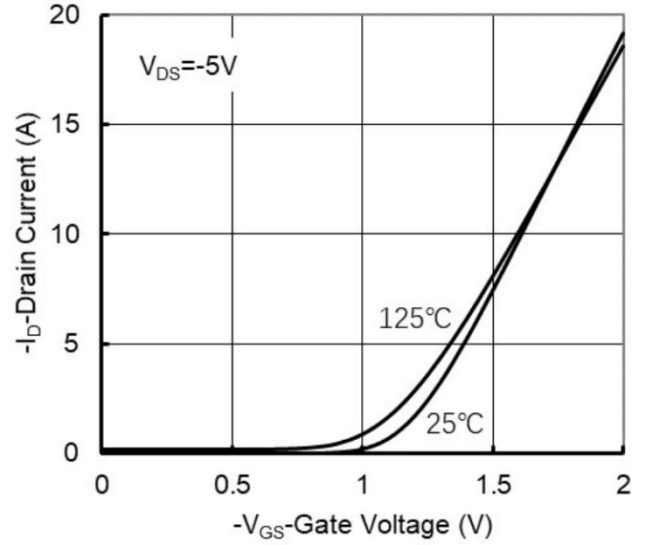


Figure2. Transfer Characteristics

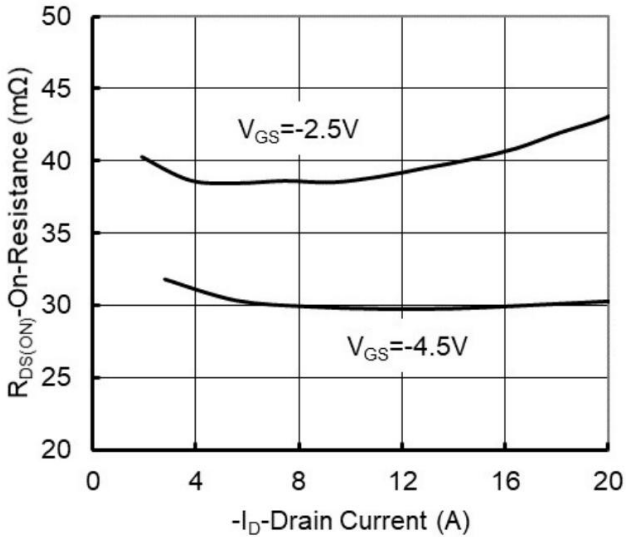


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

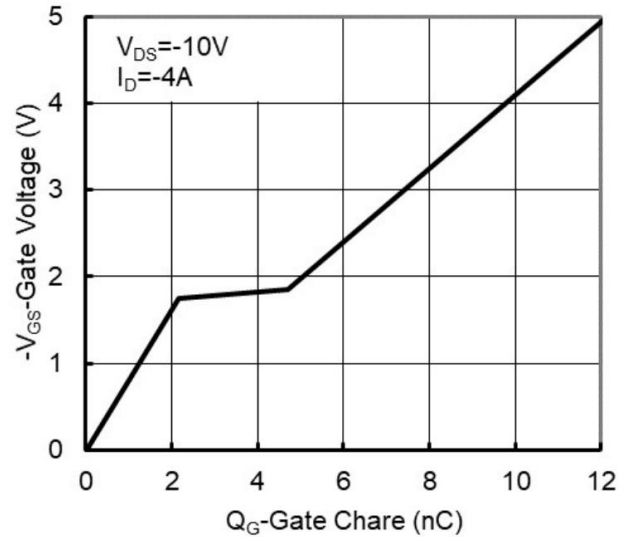


Figure 4: On-Resistance vs. Junction Temperature

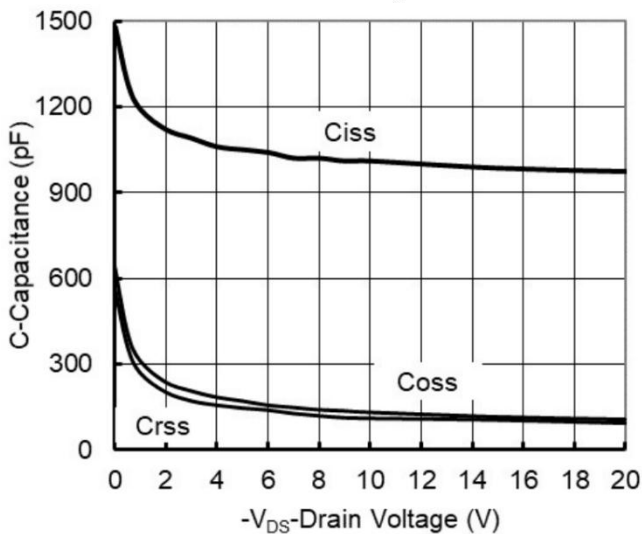


Figure5. Capacitance Characteristics

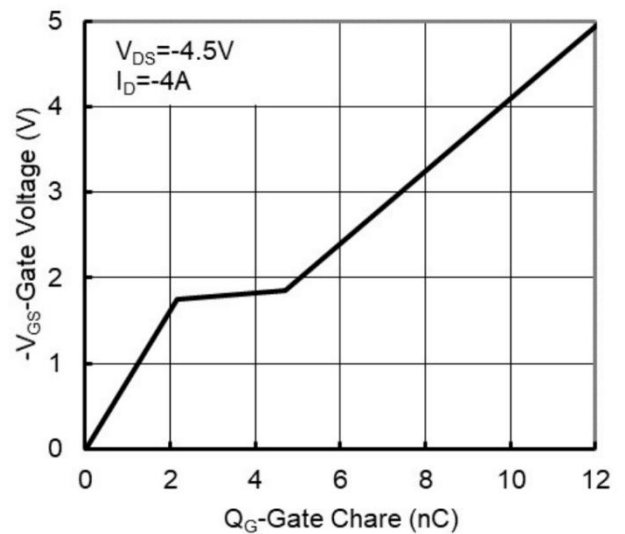


Figure6. Gate Charge

## Typical Characteristics

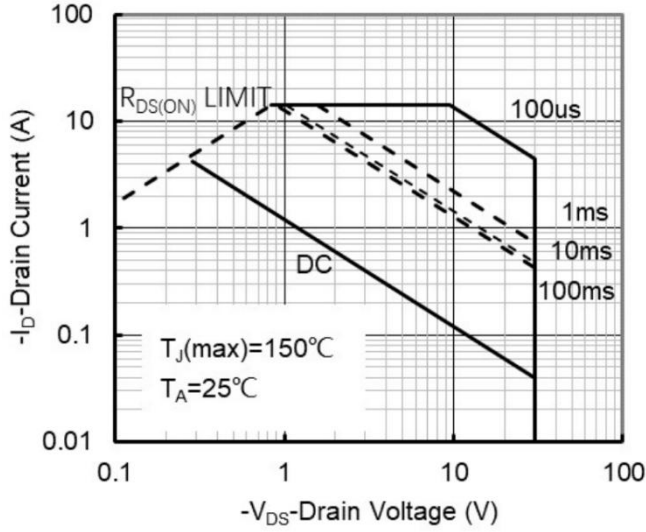


Figure7. Safe Operation Area

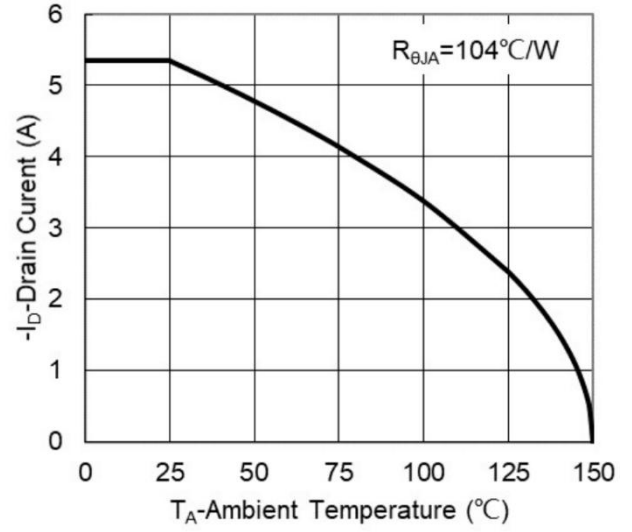


Figure8. Maximum Continuous Drain Current vs Ambient Temperature

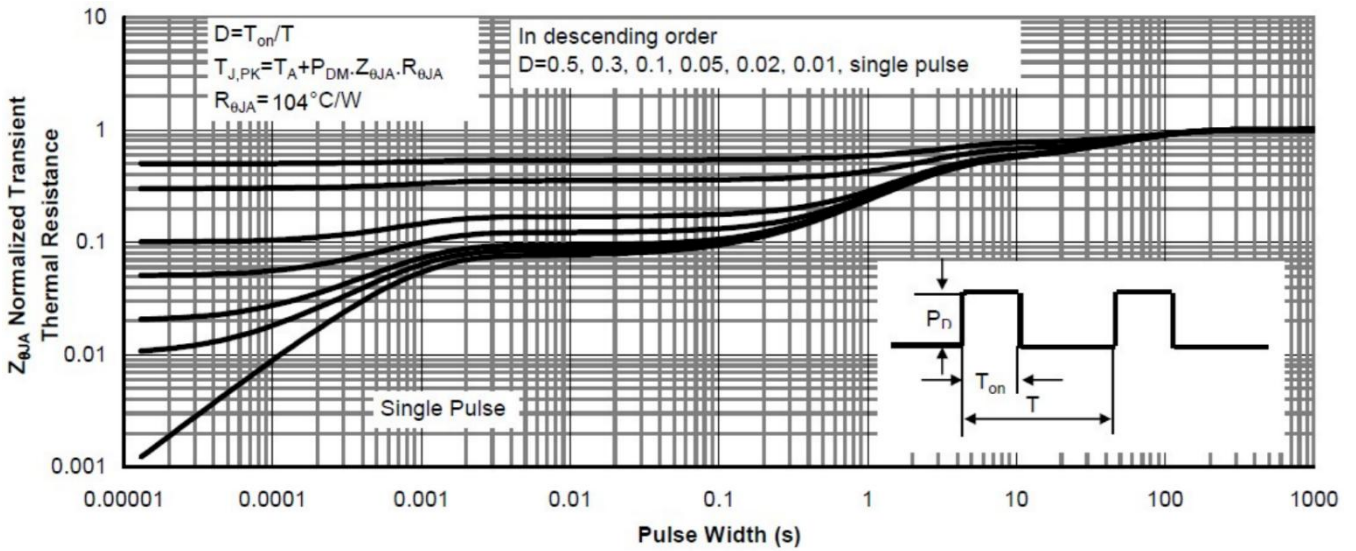
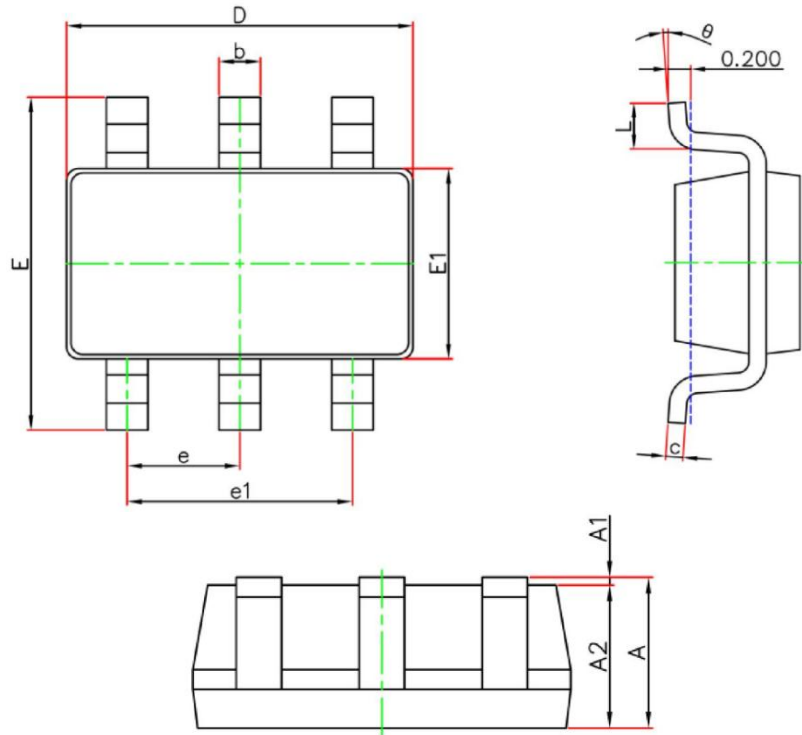


Figure9. Normalized Maximum Transient Thermal Impedance

### SOT-23-6L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	2.650	2.950	0.104	0.116
E1	1.500	1.700	0.059	0.067
e	0.950 (BSC)		0.037 (BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°