

Description

The SQ2301ES uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

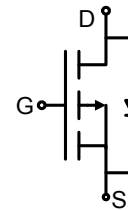
Dimensions SOT-23



General Features

- $V_{DS} = -20V$ $I_D = -2.3A$
- $R_{DS(ON)} < 150m\Omega @ V_{GS} = -4.5V$

Pin Configuration



Application

- Battery protection
- Load switch
- Uninterruptible power supply

Package Marking and Ordering Information

Device	Device Marking	Device Package	Reel Size	Tape width	Quantity
SQ2301ES	A1SHB	SOT-23	Ø180mm	8 mm	3000 units

Absolute Maximum Ratings (TC=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	±12	V
I_D	Drain Current-Continuous	-2.3	A
I_{DM}	Drain Current -Pulsed ^(Note 1)	-10	A
P_D	Maximum Power Dissipation	0.7	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	°C
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient ^(Note 2)	178	°C/W

Electrical Characteristics (T_J=25°C, unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =-250μA	-20		-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-20V, V _{GS} =0V	-	-	-1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±12V, V _{DS} =0V	-	-	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-0.5	-0.7	-1.2	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =-4.5V, I _D =-2 A	-	135	165	mΩ
		V _{GS} =-2.5V, I _D =-1.8A	-	150	185	mΩ
g _{FS}	Forward Transconductance	V _{DS} =-5V, I _D =-2A	4	-	-	S
C _{ISS}	Input Capacitance	V _{DS} =-10V, V _{GS} =0V, F=1.0MHz	-	290	-	PF
C _{OSS}	Output Capacitance		-	60	-	PF
C _{RSS}	Reverse Transfer Capacitance		-	34	-	PF
t _{d(on)}	Turn-on Delay Time	V _{DD} =-10V, R _L =5Ω V _{GS} =- 4.5V, R _{GEN} =3Ω	-	10	-	nS
t _r	Turn-on Rise Time		-	5.0	-	nS
t _{d(off)}	Turn-Off Delay Time		-	21	-	nS
t _f	Turn-Off Fall Time		-	7	-	nS
Q _g	Total Gate Charge	V _{DS} =-10V, I _D =-2A, V _{GS} =-4.5V	-	3.0	-	nC
Q _{gs}	Gate-Source Charge		-	0.5	-	nC
Q _{gd}	Gate-Drain Charge		-	0.8	-	nC
V _{SD}	Diode Forward Voltage ^(Note 3)	V _{GS} =0V, I _S =-2A	-	-	-1.2	V

Notes:

- 1、 Repetitive Rating: Pulse width limited by maximum junction temperature.
- 2、 Surface Mounted on FR4 Board, t ≤ 10 sec.
- 3、 Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
- 4、 Guaranteed by design, not subject to production

Typical Characteristics

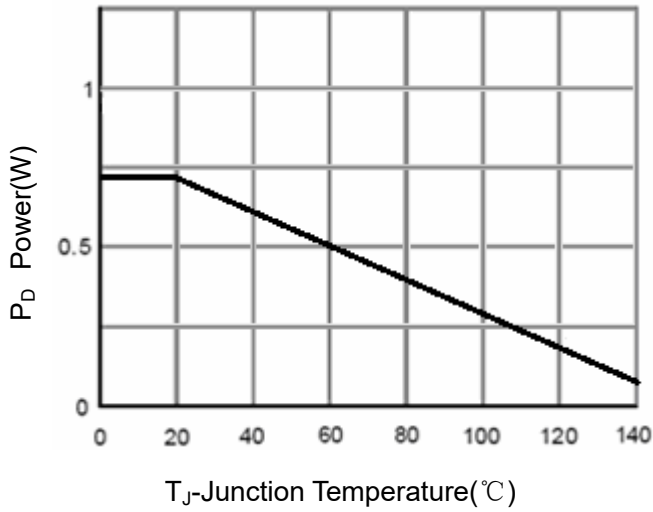


Figure 1 Power Dissipation

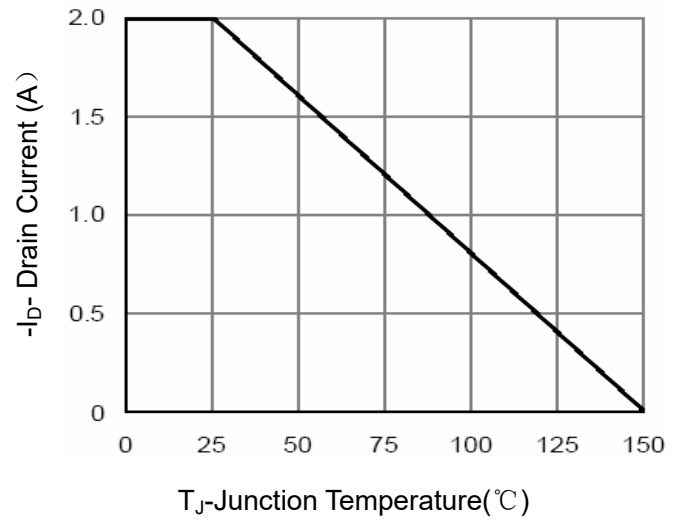


Figure 2 Drain Current

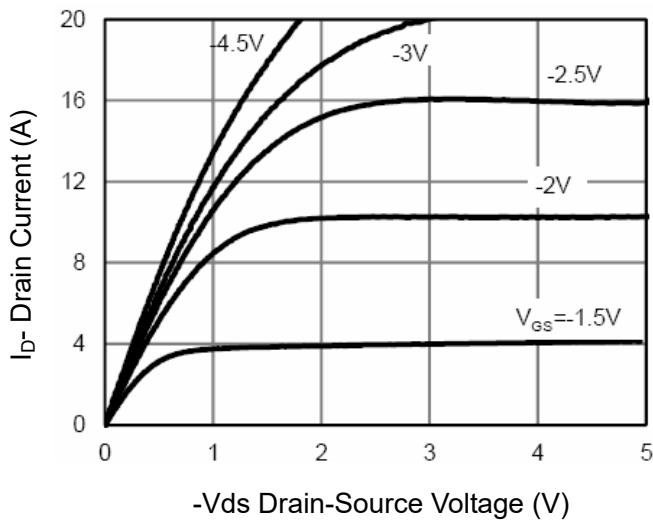


Figure 3 Output Characteristics

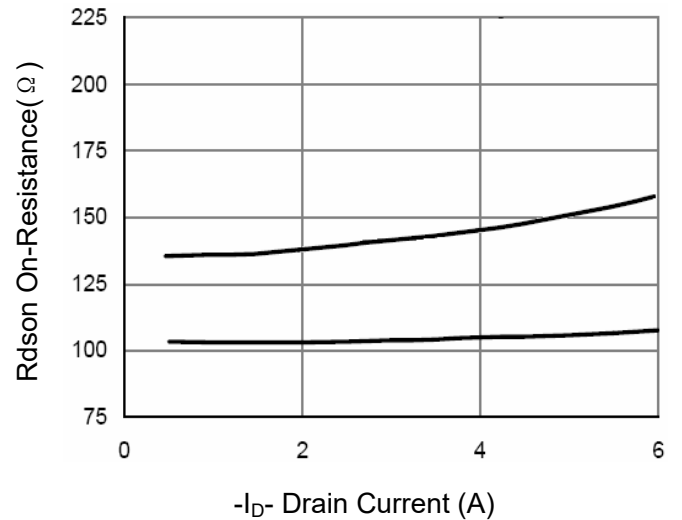


Figure 4 Drain-Source On-Resistance

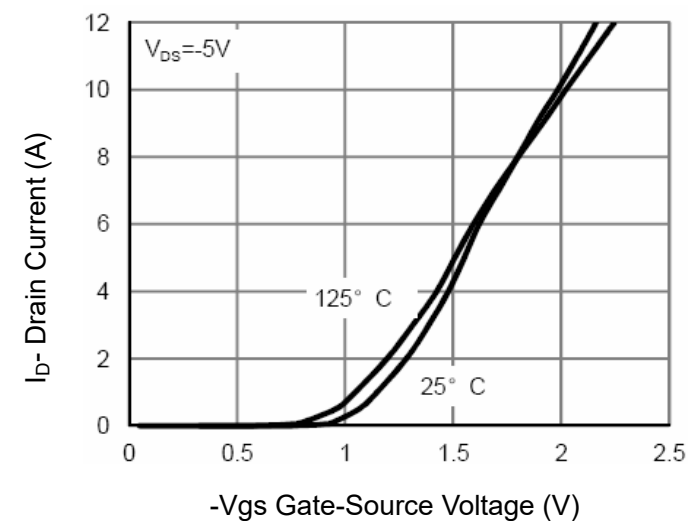


Figure 5 Transfer Characteristics

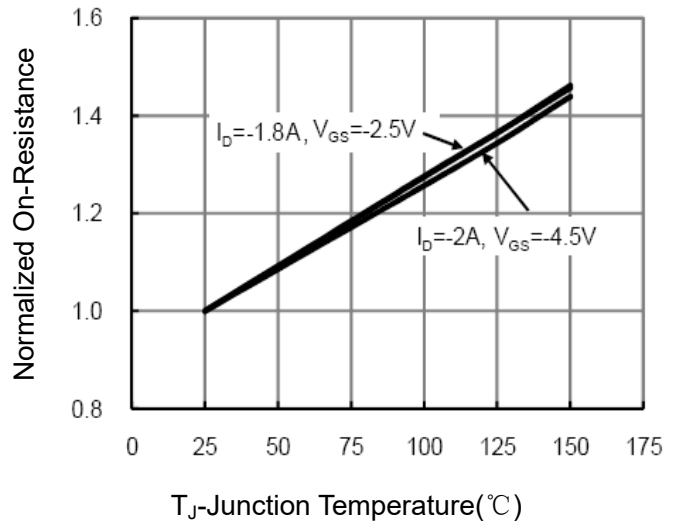


Figure 6 Drain-Source On-Resistance

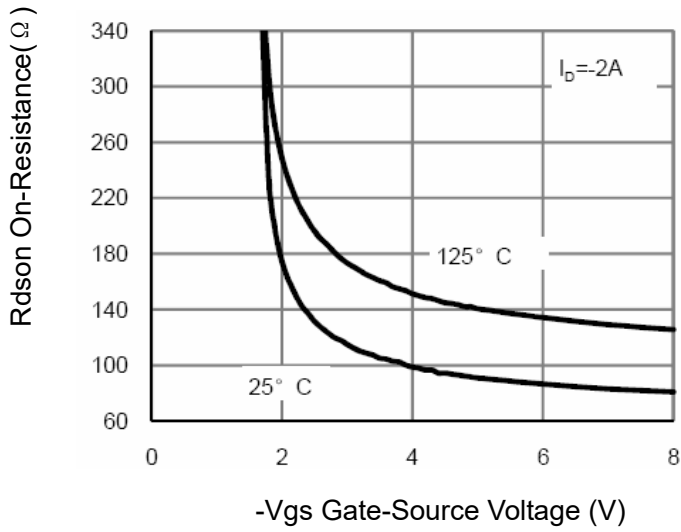


Figure 7 Rdson vs Vgs

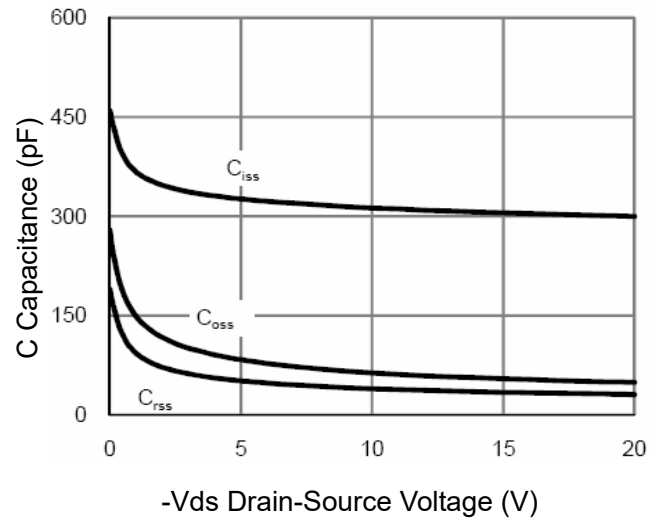


Figure 8 Capacitance vs Vds

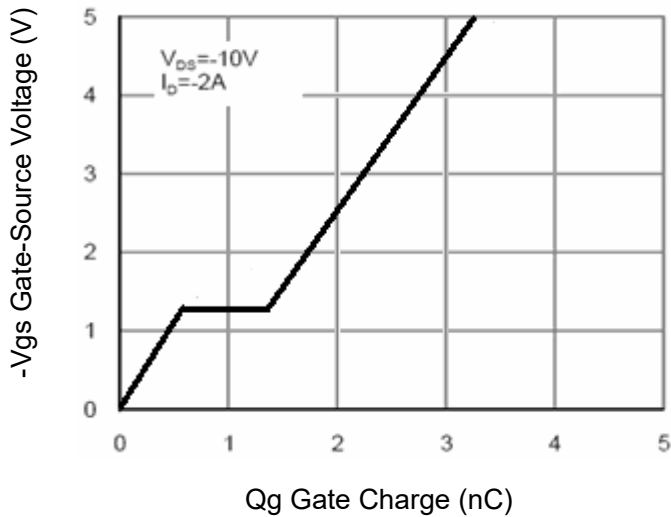


Figure 9 Gate Charge

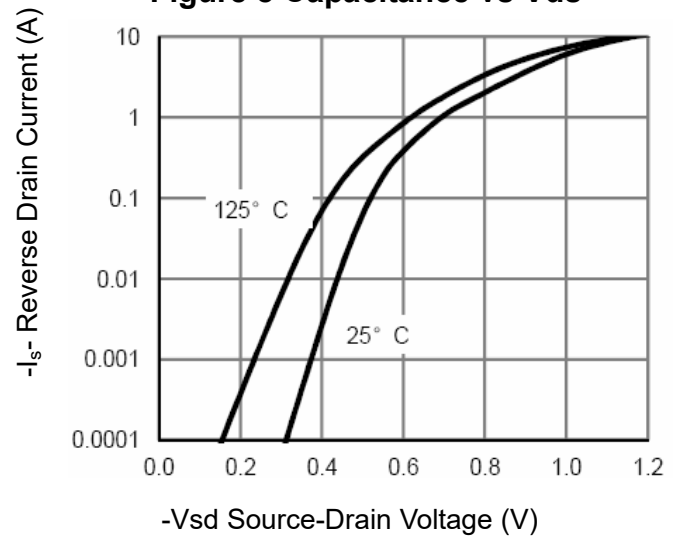


Figure 10 Source- Drain Diode Forward

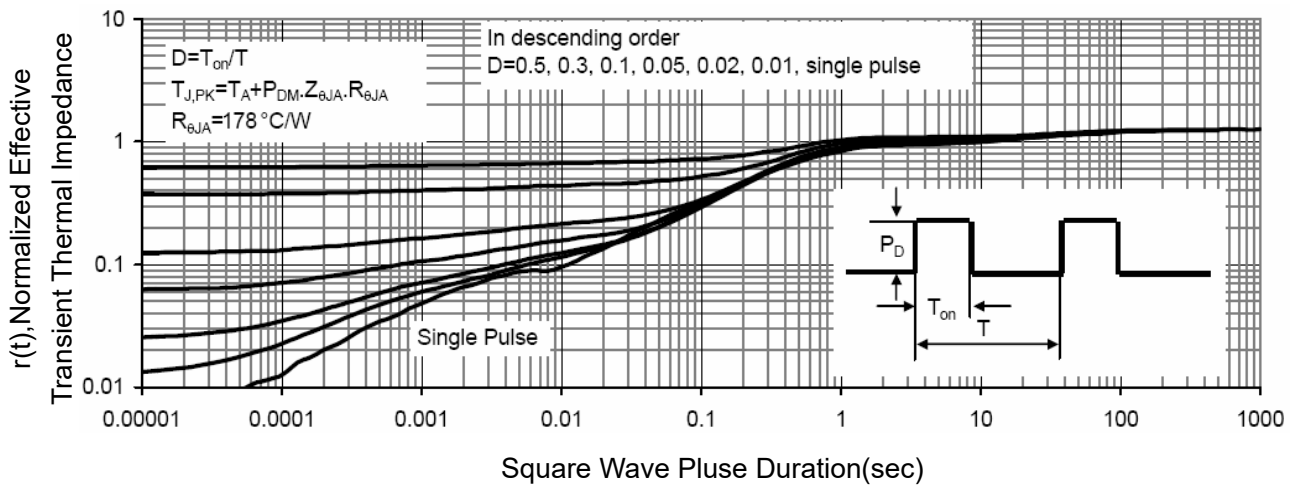
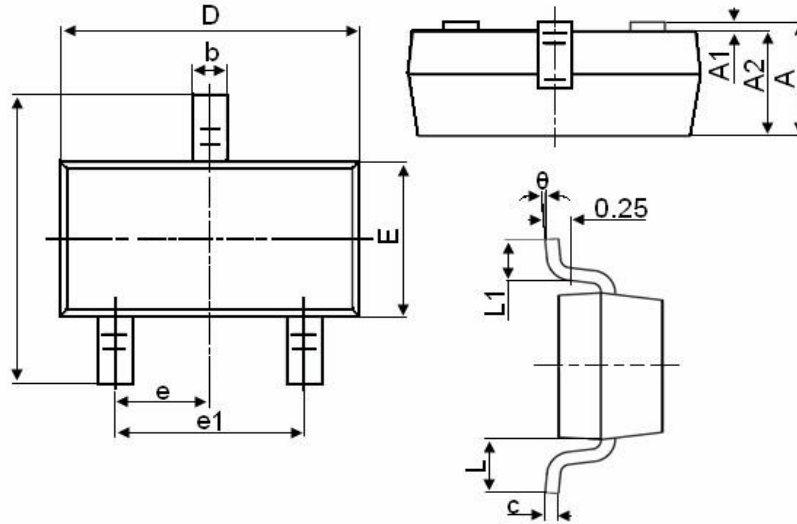


Figure 11 Normalized Maximum Transient Thermal Impedance

Package Mechanical Data:SOT-23



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°