DESCRIPTION

The AM2302 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.

AM2302 is available in a SOT-23S package.

ORDERING INFORMATION

Package Type	Part Number	
SOT-23S SPQ: 3,000pcs/Reel	E3S	AM2302E3SR
		AM2302E3SVR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products		

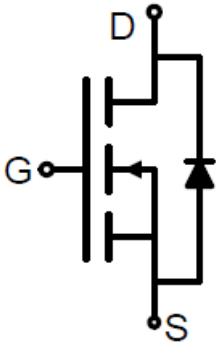
FEATURES

- V_{DS} =20V,I_D =2.9A
  $R_{DS(ON)}$ <59mΩ @ V_{GS}=2.5V
  $R_{DS(ON)}$ <45mΩ @ V_{GS}=4.5V
- High Power and current handing capability
- Surface Mount Package
- Available in a SOT-23S package.

APPLICATION

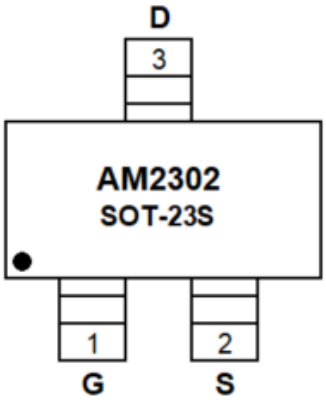
- Battery protection
- Load switch
- Power management

PIN DESCRIPTION



Schematic diagram

PIN DESCRIPTION



Top View

Pin #	Symbol	Function
1	G	Gate
2	S	Source
3	D	Drain

ABSOLUTE MAXIMUM RATINGS

T_A = 25℃, unless otherwise noted

V_{DS}, Drain-Source Voltage	20V
V_{GS}, Gate-Source Voltage	±10V
I_D, Drain Current-Continuous	2.9A
I_{DM}, Pulsed Drain Current[NOTE1]	10A
P_D, Maximum Power Dissipation	1W
T_J, T_{STG}, Operating Junction and Storage Temperature Range	-55℃~150℃

Stress beyond above listed “Absolute Maximum Ratings” may lead permanent damage to the device. These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

THERMAL CHARACTERISTIC

Parameter	Symbol	Value	Units
Thermal Resistance , Junction-to-Ambient[NOTE2]	$R_{\theta JA}$	125	℃/W

ELECTRICAL CHARACTERISTICS

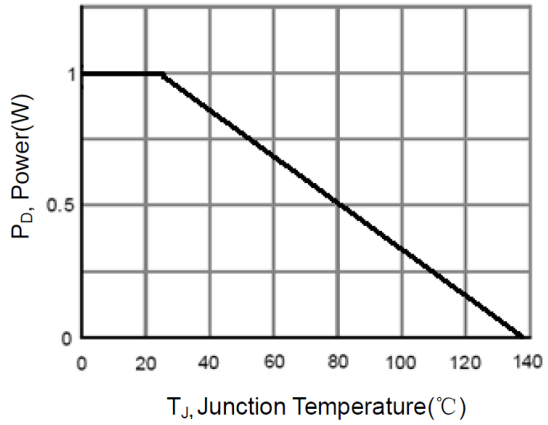
T_A = 25℃, unless otherwise noted

Parameter	Symbol	Conditions	Min	Typ.	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	20	22	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V, V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±10V, V_{DS}=0V	-	-	±100	nA
On Characteristics[NOTE3]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	0.5	0.75	1.2	V
Drain-Source On-state Resistance	$R_{DS(ON)}$	V_{GS}=2.5V, I_D=2.5A	-	37	59	mΩ
		V_{GS}=4.5V, I_D=2.9A	-	30	45	
Forward Transconductance	g_{FS}	V_{DS}=5V, I_D=2.9A	-	8	-	S
Dynamic Characteristics[NOTE4]						
Input Capacitance	C_{iss}	V_{DS}=10V,V_{GS}=0V, f=1.0MHz	-	300	-	pF
Output Capacitance	C_{oss}		-	120	-	
Reverse Transfer Capacitance	C_{rss}		-	80	-	
Switching Characteristics[NOTE4]						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=10V, I_D=2.9A, V_{GS}=4.5V, R_{GEN}=6Ω	-	10	15	ns
Turn-on Rise Time	t_r		-	50	85	
Turn-off Delay Time	$t_{d(off)}$		-	17	45	
Turn-off Fall Time	t_f		-	10	20	
Total Gate Charge	Q_g	V_{DS}=10V, I_D=2.9A, V_{GS}=4.5V	-	4.0	10	nC
Gate-Source Charge	Q_{gs}		-	0.65	-	
Gate-Drain Charge	Q_{gd}		-	1.2	-	
Drain-Source Diode Characteristics						
Diode Forward Voltage[NOTE3]	V_{SD}	V_{GS}=0V, I_S=2.9A	-	0.75	1.2	V
Diode Forward Current[NOTE2]	I_S		-	-	2.9	A

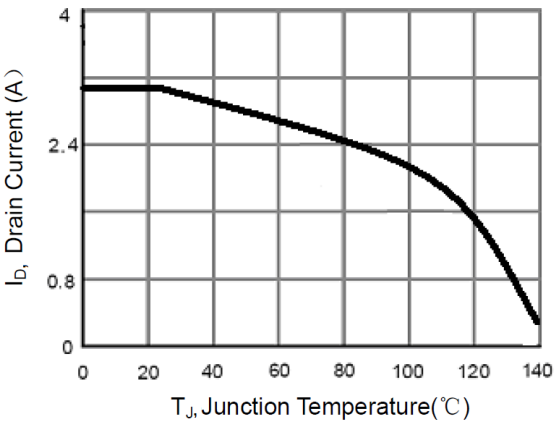
NOTE1: Repetitive Rating: Pulse width limited by maximum junction temperature.
NOTE2: Surface Mounted on FR4 Board, t ≤ 10 sec.
NOTE3: Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
NOTE4: Guaranteed by design, not subject to production

TYPICAL CHARACTERISTICS

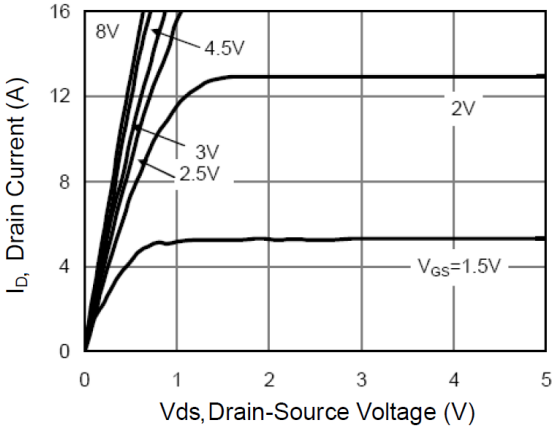
1. Power Dissipation



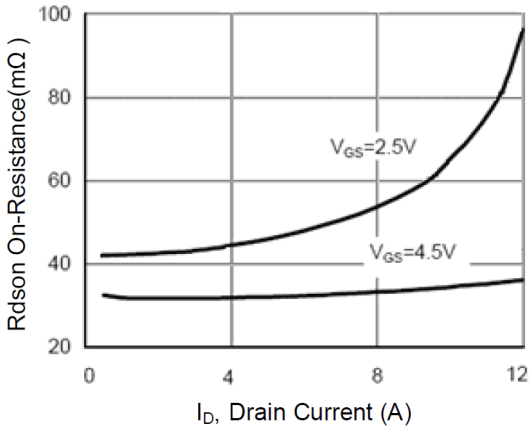
2. Drain Current



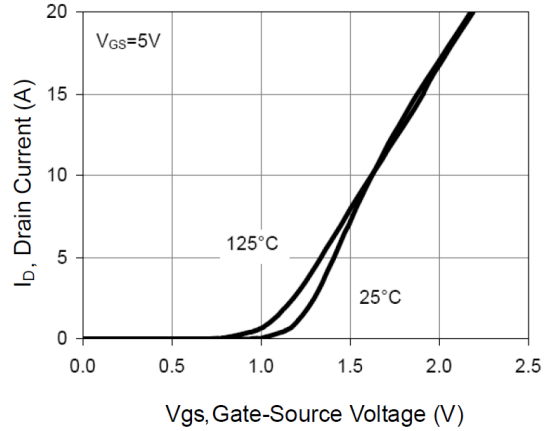
3. Output Characteristics



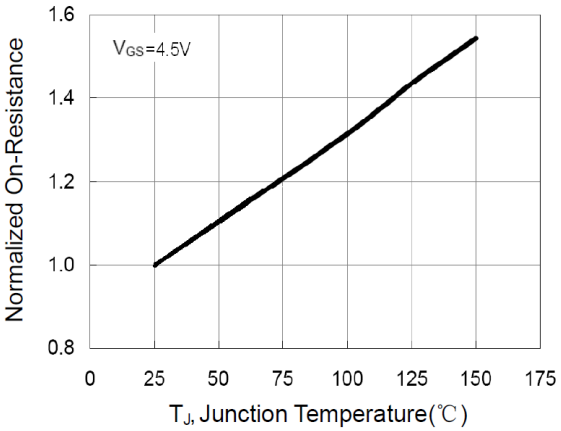
4. Drain-Source On-Resistance



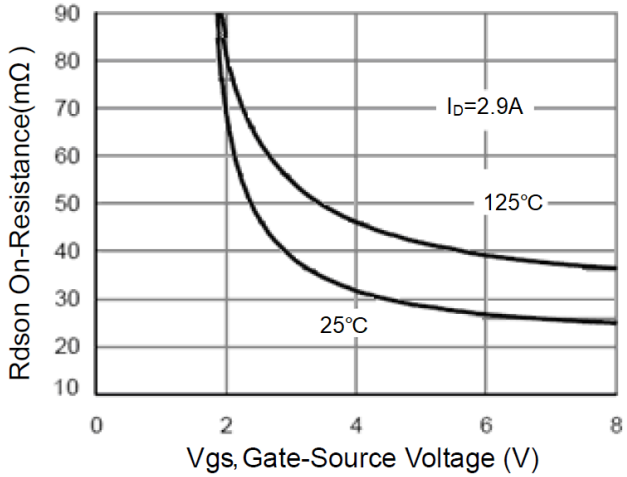
5. Transfer Characteristics



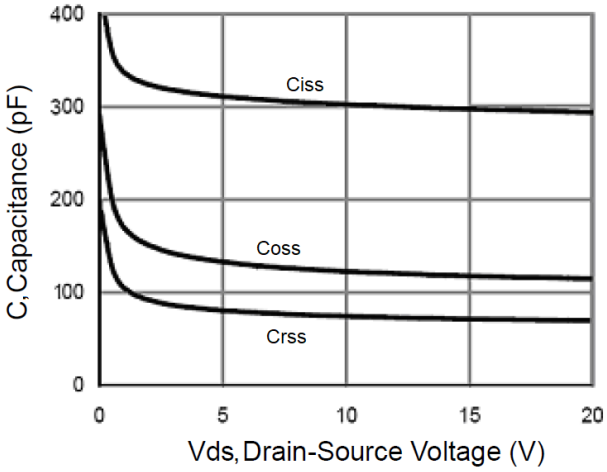
6. Drain-Source On-Resistance



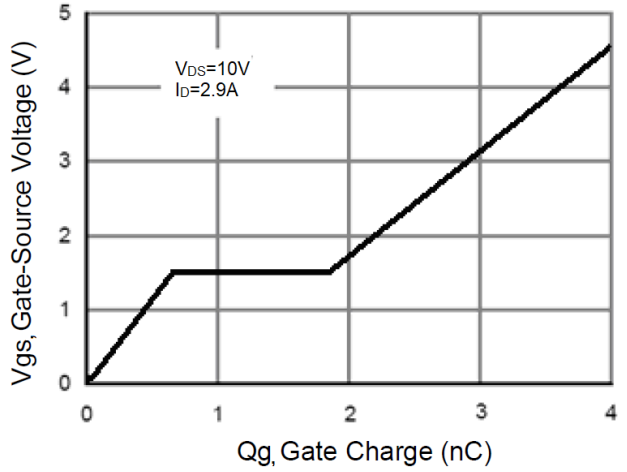
7. $R_{DS(ON)}$ vs. V_{GS}



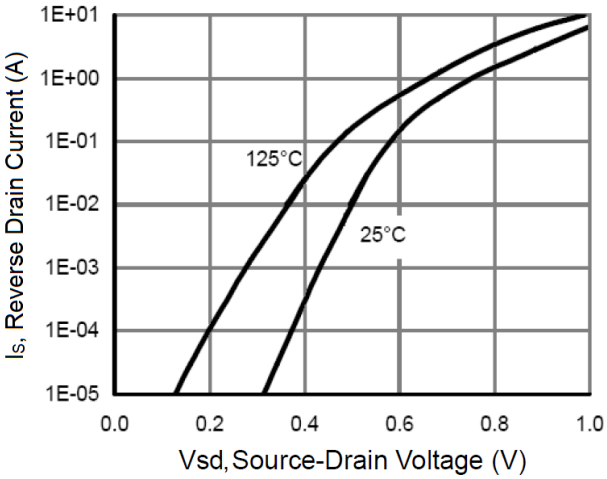
8. Capacitance vs. V_{DS}



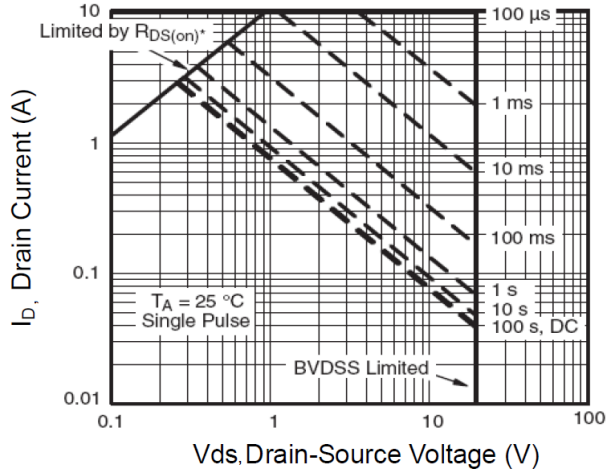
9. Gate Charge



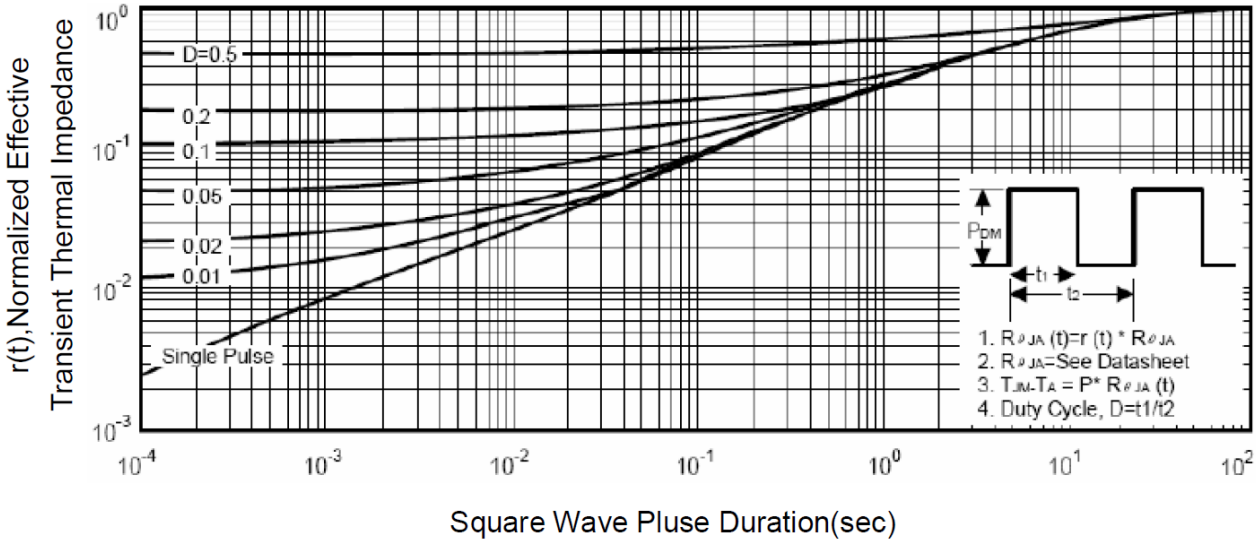
10. Source- Drain Diode Forward



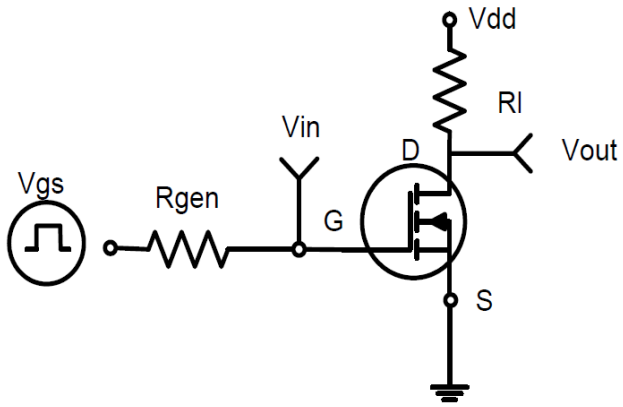
11. Safe Operation Area



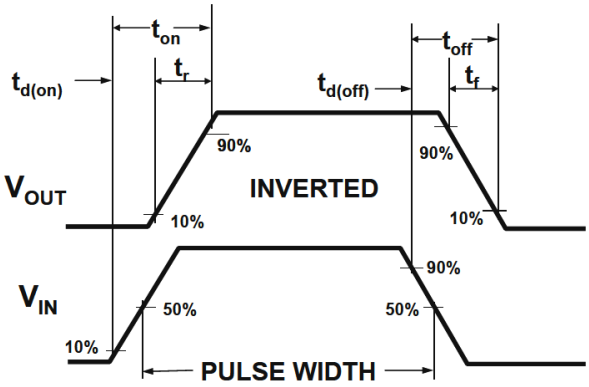
12. Normalized Maximum Transient Thermal Impedance



13. Switching Test Circuit

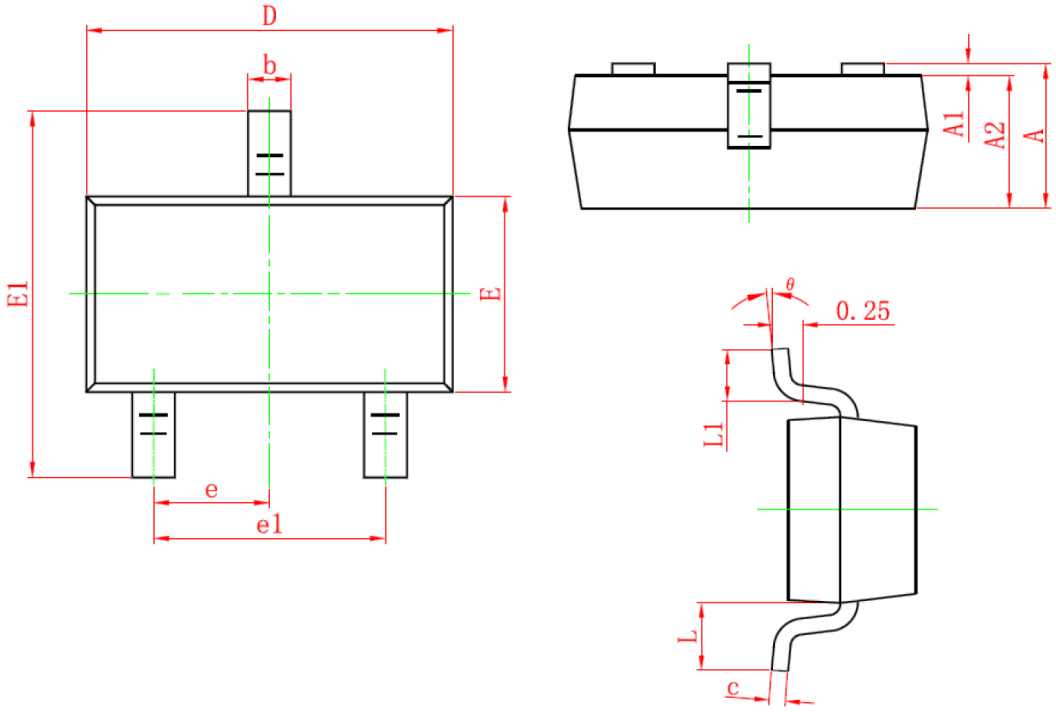


14. Switching Waveforms



PACKAGE INFORMATION

Dimension in SOT-23S (Unit: mm)



Symbol	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	0.950 TYP	
e1	1.800	2.000
L	0.550 REF	
L1	0.300	0.500
θ	0°	8°

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