DESCRIPTION

The AM2312A is available in SOT-23S Package.

B_{VDSS}	$R_{DS(ON)}$	I_D
20V	15mΩ	7A

APPLICATION

- Hand-Held Instruments
- Load Switch

ORDERING INFORMATION

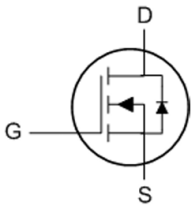
Package Type	Part Number	
SOT-23S SPQ: 3,000pcs/Reel	E3S	AM2312AE3SVR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products		

FEATURE

- V_{DS} = 20V, I_D = 7A
- Green Device Available (RoHS Compliant)
- Super Low Gate Charge
- Excellent dv/dt Immunity
- Advanced High Cell Density Trench Technology
- SOT-23S Package.

PIN DESCRIPTION

SOT-23S



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

ABSOLUTE MAXIMUM RATINGS

T_C=25°C Unless otherwise noted

V_{DS}, Drain-Source Voltage		20V
V_{GS}, Gate-Source Voltage		±12V
I_D(1), Drain Current- Continuous	T_A=25°C	7A
	T_A=70°C	5A
I_{DM}(2), Drain Current Pulsed		17A
P_D(3), Total Power Dissipation	T_A=25°C	1W
	T_A=70°C	0.66W
T_J, Operating Junction Temperature Range		-55℃~+150℃
T_{STG}, Storage Temperature Range		-55℃~+150℃
$R_{\theta JA}$ (1), Thermal Resistance Junction-Ambient		120℃/W

Stresses above may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the Electrical Characteristics are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

(1) Surface Mounted on FR4 Board, t ≤ 10 sec.

(2) The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

(3) The power dissipation is limited by 150℃ junction temperature

ELECTRICAL CHARACTERISTICS

T_J=25℃, unless otherwise specified.

Parameter	Symbol	Conditions	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D= 250μA	20	-	-	V
BVDSS Temperature Coefficient	$\triangle BV_{DSS}/\triangle T_J$	Reference to 25°C, I_D=1mA	-	0.018	-	V/°C
Drain-Source Leakage Current	I_{DSS}	V_{DS}=16V, V_{GS}=0V, T_J=25°C	-	-	1	μA
		V_{DS}=16V, V_{GS}=0V, T_J=55°C	-	-	5	
Gate-Source Leakage Current	I_{GSS}	V_{GS} =±12V, V_{DS}= 0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS\ (th)}$	V_{DS}=V_{GS}, I_D= 250μA	0.35	-	1	V
$V_{GS\ (th)}$ Temperature Coefficient	$\triangle V_{GS\ (th)}$		-	-3.1	-	mV/°C
Drain-Source On-Static Resistance(2)	$R_{DS\ (on)}$	V_{GS}= 4.5V, I_D= 4A	-	15	20	mΩ
		V_{GS}= 2.5V, I_D= 3A	-	20	25	
		V_{GS}= 1.8V, I_D= 2A	-	40	50	
Forward Transconductance	G_{fs}	V_{DS}= 5V, I_D= 4A	-	30	-	S
Input Capacitance	C_{iss}	V_{DS}= 15V, V_{GS}=0V, f=1MHz	-	670	-	pF
Output Capacitance	C_{oss}		-	75	-	
Reverse Transfer Capacitance	C_{rss}		-	68	-	
Turn-on Delay Time	$t_{d(on)}$	V_{DS}= 10V, I_D= 4A, R_G=3.3Ω, V_{GS}= 4.5V	-	5.2	-	nS
Turn-on Rise Time	t_r		-	34	-	
Turn-off Delay Time	$t_{d(off)}$		-	23	-	
Turn-off Fall Time	t_f		-	9.2	-	
Total Gate Charge	Q_g	V_{DS}= 15V, V_{GS}= 4.5V I_D= 4A	-	8.6	-	nC
Gate-Source Charge	Q_{gs}		-	1.37	-	
Gate-Drain Charge	Q_{gd}		-	2.3	-	
Diode Characteristics						
Drain Forward Current (1)(3)	I_S	V_G=V_D=0V, Force Current	-	-	6	A
Pulsed Source Current (2)(3)	I_{SM}		-	-	17	A
Diode Forward Voltage (2)	V_{SD}	V_{GS}=0V, I_S=1A, T_J=25°C	-	-	1.2	V

1. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.
2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3. The data is theoretically the same as ID and IDM, in real applications, should be limited by total power dissipation.

TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. Typical Output Characteristics

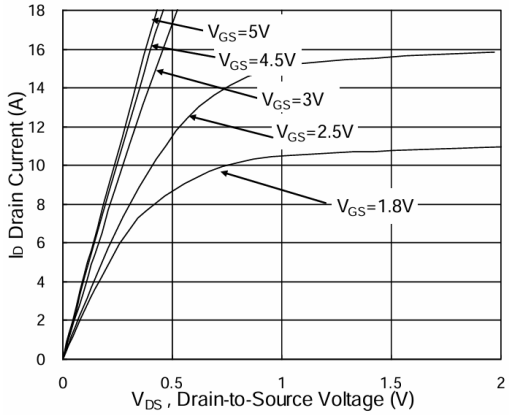


Fig 2. On-Resistance vs. Gate-Source

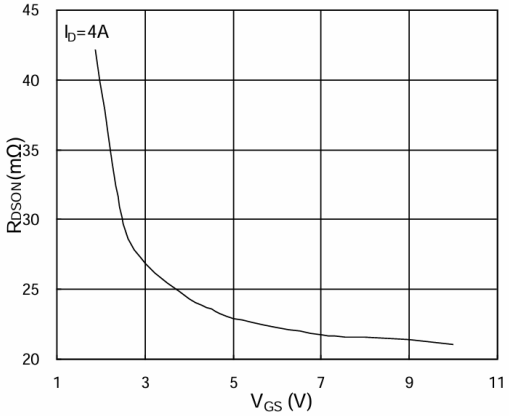


Fig 3. Forward Characteristics of Reverse

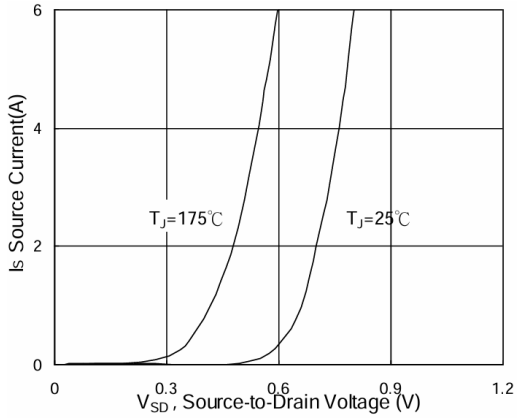


Fig 4. Gate-Charge Characteristics

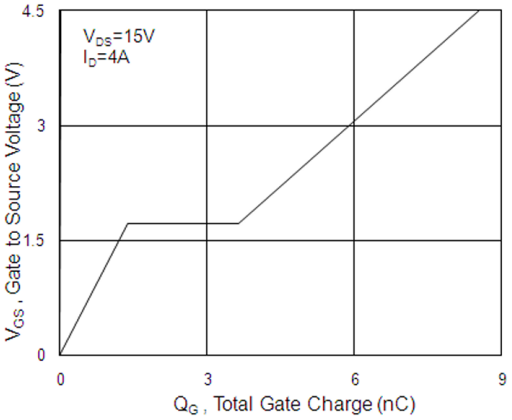


Fig 5. Normalized $V_{GS(th)}$ vs. T_J

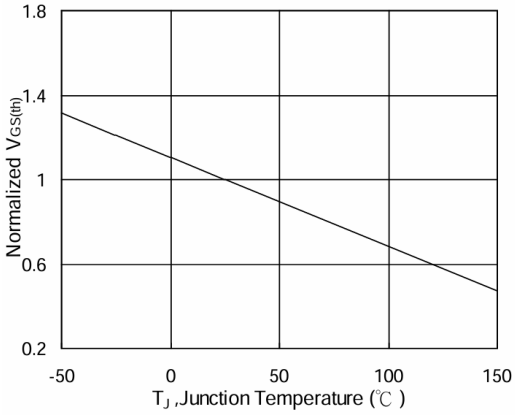


Fig 6. Normalized R_{DSON} vs. T_J

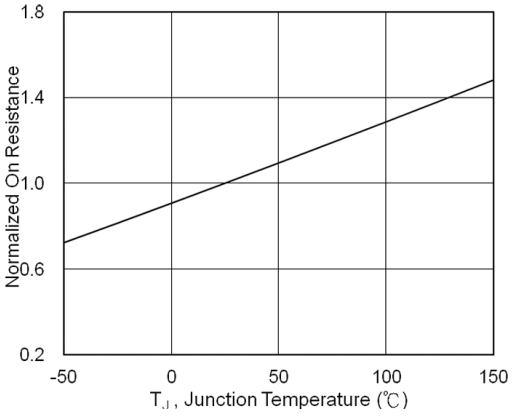


Fig 7. Capacitance

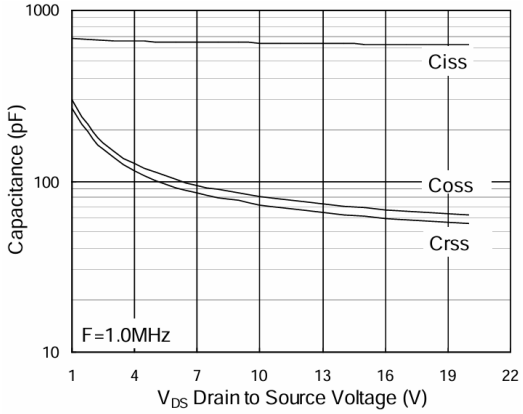


Fig 8. Safe Operating Area

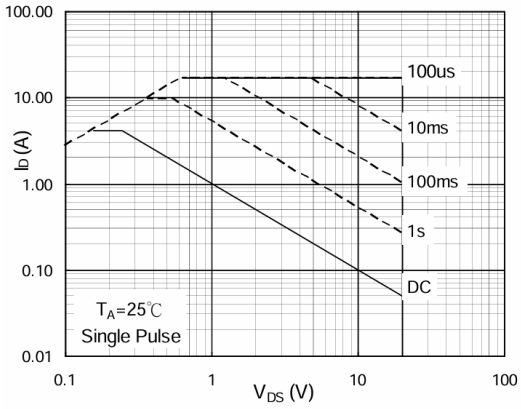


Fig 9. Normalized Maximum Transient Thermal Impedance

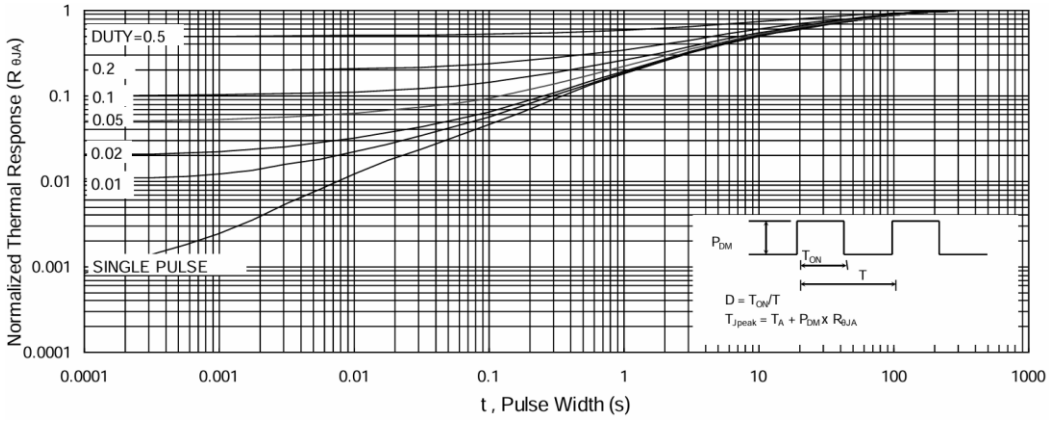


Fig 10. Switching Time Waveform

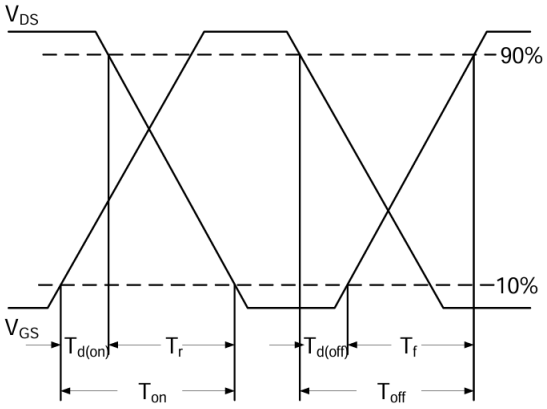
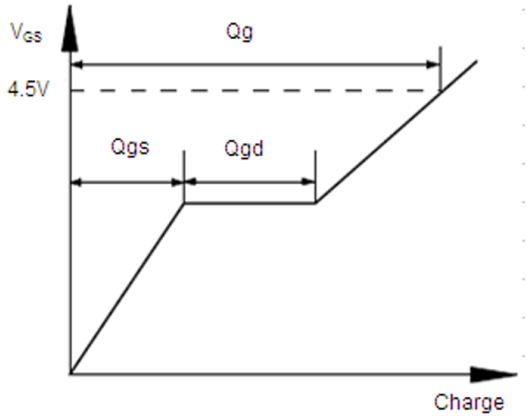
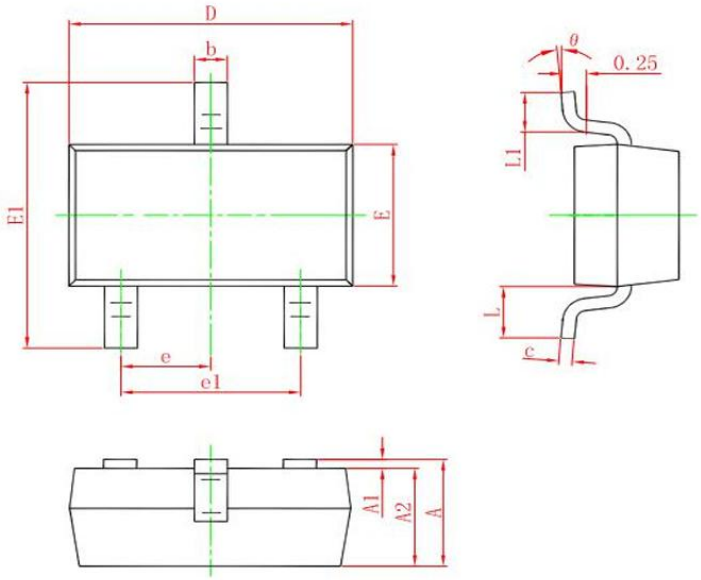


Fig 11. Gate Charge Waveform



PACKAGE INFORMATION

Dimension in SOT-23S (Unit: mm)



Symbol	Millimeters (mm)	
	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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