



DESCRIPTION

The AM2312 is available in SOT-23S package.

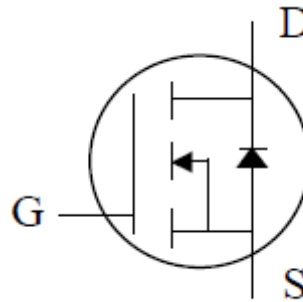
ORDERING INFORMATION

Package Type	Part Number	
SOT-23S	E3S	AM2312E3SR
		AM2312E3SVR
Note	V: Halogen free Package R: Tape & Reel SPQ: 3,000pcs/Reel	
AiT provides all RoHS products Suffix " V " means Halogen free Package		

FEATURES

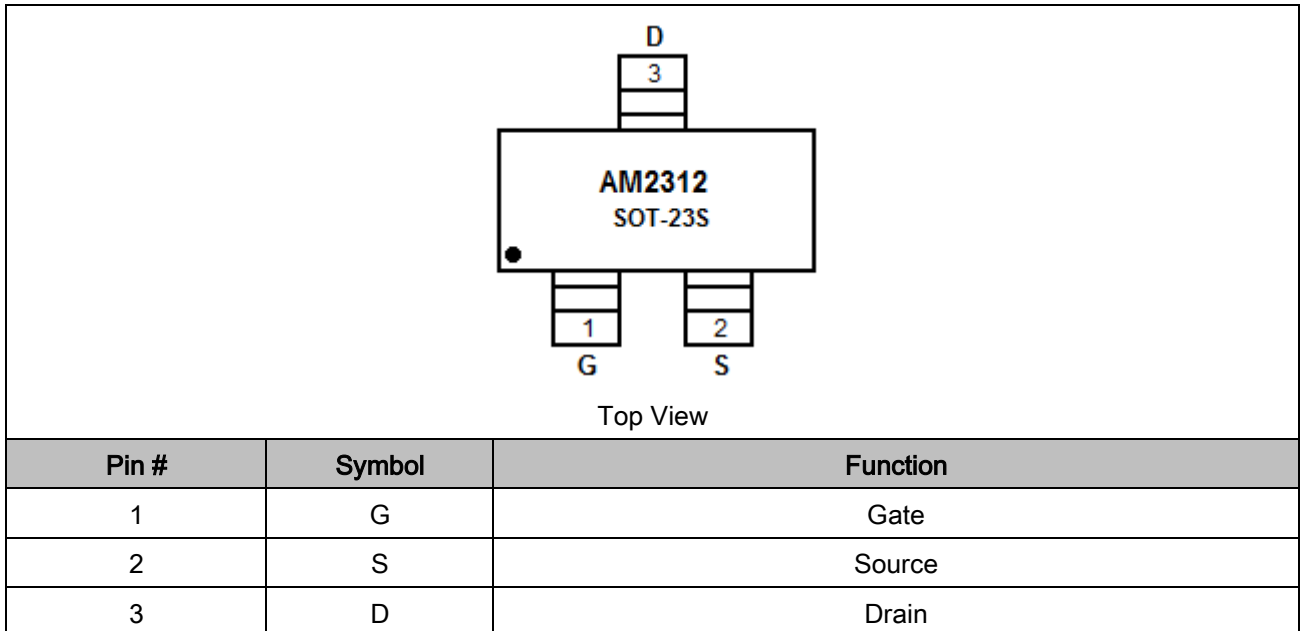
- $V_{DS} = 20V$
 $R_{DS(ON)}, V_{GS}@4.5V, I_{DS}@5.0A = 41m\Omega$
 $R_{DS(ON)}, V_{GS}@2.5V, I_{DS}@4.5A = 47m\Omega$
- Advanced trench process technology
- High Density Cell Design For Ultra Low On-Resistance
- Capable of 2.5V gate drive
- Lower on-resistance
- Available in SOT-23S Package

PIN DESCRIPTION





PIN DESCRIPTION





ABSOLUTE MAXIMUM RATINGS

V _{DS} , Drain-Source Voltage		20V
V _{GS} , Gate-Source Voltage		±8V
I _D , Continuous Drain Current ^{NOTE3} , V _{GS} @ 4.5V	T _A =25°C	4.9A
	T _A =70°C	3.4A
I _{DM} , Pulsed Drain Current ^{NOTE1,2}		15A
P _D , Total Power Dissipation	T _A =25°C	0.75W
Linear Derating Factor		1.3W/°C
T _{STG} , Storage Temperature Range		-55°C ~ 150°C
T _J , Operating Junction Temperature Range		-55°C ~ 150°C

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 DATA

Parameter	Symbol	Value	Units
Max. Thermal Resistance Junction-ambient ^{NOTE3}	R _{thj-a}	140	°C/W

NOTE1: Pulse width limited by Max. junction temperature.

NOTE2: Pulse width ≤300us, duty cycle ≤2%.

NOTE3: Surface mounted on 1 in² copper PCB board



ELECTRICAL CHARACTERISTICS

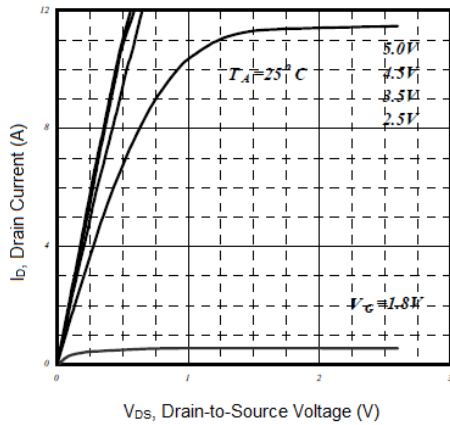
T_J=25°C, unless otherwise specified

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = 250uA	20			V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} = 1.8V, I _D = 4.0A		31	57	mΩ
		V _{GS} = 2.5V, I _D = 4.5A		24	47	
		V _{GS} = 4.5V, I _D = 5.0A		21	41	
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250uA	0.4	0.6	1	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 20V, V _{GS} = 0V			1	uA
Gate Body Leakage	I _{GSS}	V _{GS} = ±8V, V _{DS} = 0V			±100	nA
Gate Resistance	R _g					
Forward Transconductance	g _{fs}	V _{DS} = 10V, I _D = 5A		40		S
Dynamic						
Total Gate Charge	Q _g	V _{DS} = 10V, I _D = 5A V _{GS} = 4.5V		11.2		nC
Gate-Source Charge	Q _{gs}			1.4		
Gate-Drain Charge	Q _{gd}			2.2		
Turn-On Delay Time	t _{d(on)}	V _{DD} = 10V, I _D = 1A, V _{GEN} = 4.5V, R _G = 6Ω		15	25	ns
Turn-On Rise Time	t _r			40	60	
Turn-Off Delay Time	t _{d(off)}			48	70	
Turn-Off Fall Time	t _f			31	45	
Input Capacitance	C _{iss}	V _{DS} = 8V, V _{GS} = 0V f = 1.0 MHz		500		pF
Output Capacitance	C _{oss}			300		
Reverse Transfer Capacitance	C _{rss}			140		
Source-Drain Diode						
Max. Diode Forward Current	I _S				1.7	A
Diode Forward Voltage	V _{SD}	I _S = 1.7A, V _{GS} = 0V			1.2	V

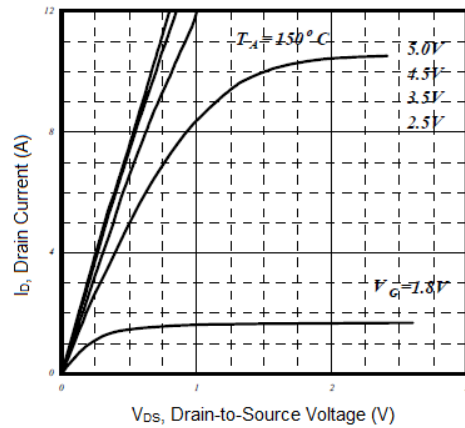


TYPICAL PERFORMANCE CHARACTERISTICS

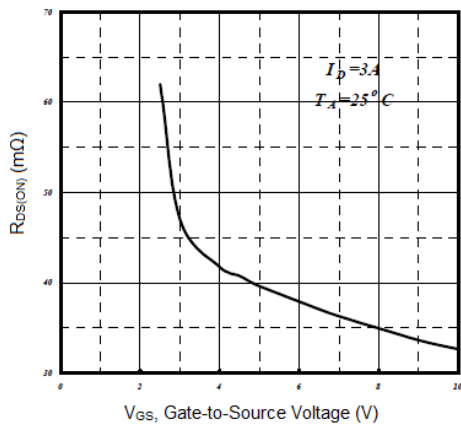
1. Typical Output Characteristics



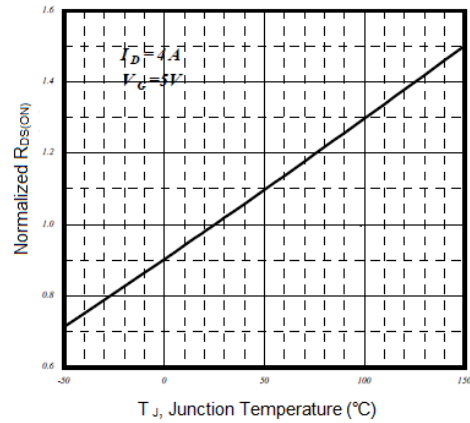
2. Typical Output Characteristics



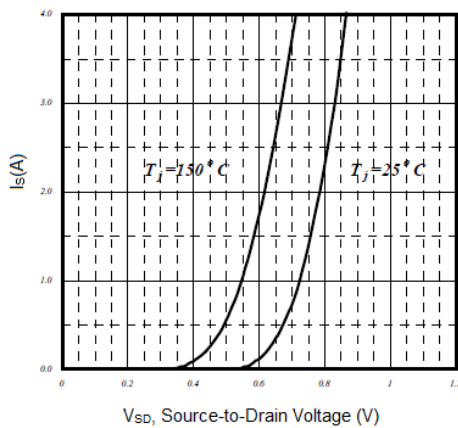
3. On-Resistance vs. Gate Voltage



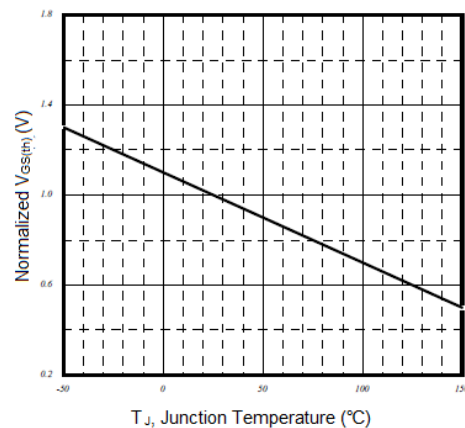
4. Normalized On-Resistance vs. Junction Temperature



5. Forward Characteristic of Reverse Diode

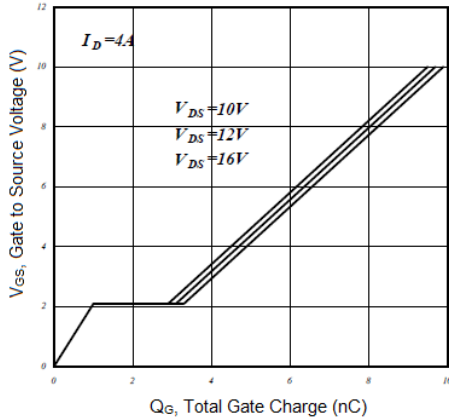


6. Gate Threshold Voltage vs. Junction Temperature

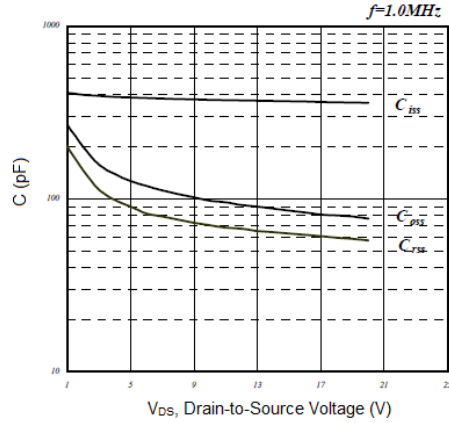




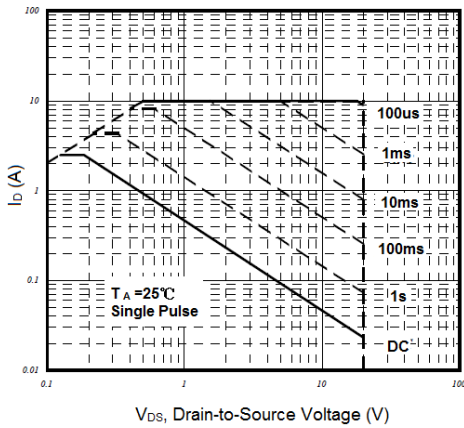
7. Gate Charge Characteristics



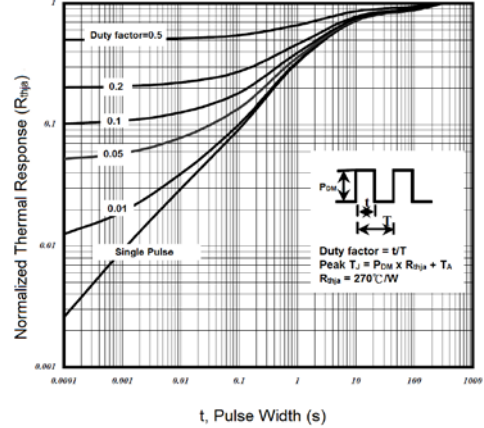
8. Typical Capacitance Characteristics



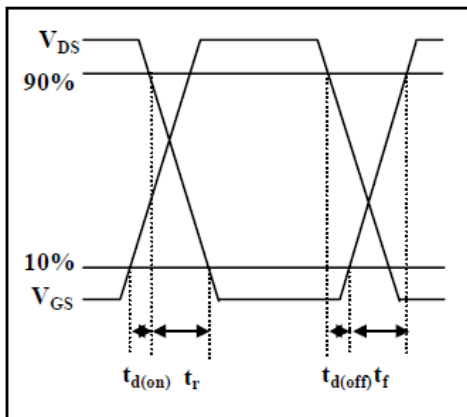
9. Maximum Safe Operating Area



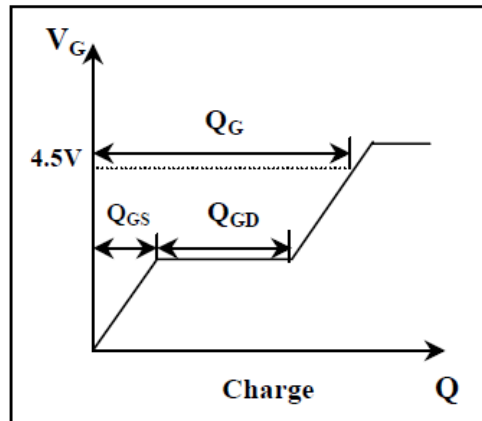
10. Effective Transient Thermal Impedance



11. Switching Time Circuit



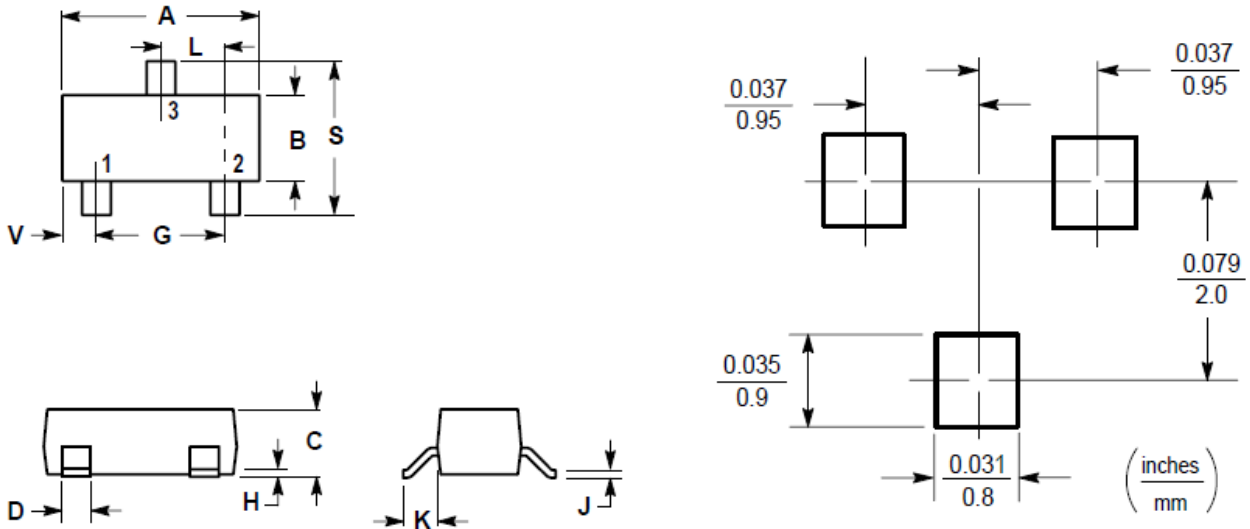
12. Gate Charge Circuit





PACKAGE INFORMATION

Dimension in SOT-23S Package (Unit: mm)



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.80	3.04	0.1102	0.1197
B	1.20	1.40	0.0472	0.0551
C	0.89	1.11	0.0350	0.0440
D	0.37	0.50	0.0150	0.0200
G	1.78	2.04	0.0701	0.0807
H	0.013	0.10	0.0005	0.0040
J	0.085	0.177	0.0034	0.0070
K	0.35	0.69	0.0140	0.0285
L	0.89	1.02	0.0350	0.0401
S	2.10	2.64	0.0830	0.1039
V	0.45	0.60	0.0177	0.0236



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