DESCRIPTION

The AM2306 uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. This device is suitable for use as a load switch and PWM applications.

The AM2306 is available in SOT-23S package.

FEATURES

- V_{DS} = 30V, I_D = 5.8A

  $R_{DS(ON)}$ < 31mΩ @ V_{GS}=10V

  $R_{DS(ON)}$ < 43mΩ @ V_{GS}=4.5V

- High Power and current handing capability

- Surface mount package

- Available in SOT-23S Package
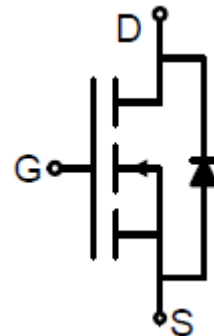
APPLICATION

- Load switch
- PWM application

ORDERING INFORMATION

Package Type	Part Number	
SOT-23S	E3S	AM2306E3SR
		AM2306E3SVR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products		

TYPICAL APPLICATION

Schematic diagram

PIN DESCRIPTION

Top View

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

ABSOLUTE MAXIMUM RATINGS

$T_A = 25°C$, unless otherwise noted

V_{DS}, Drain-Source Voltage	30V
V_{GS}, Gate-Source Voltage	±20V
I_D, Drain Current-Continuous	5.8A
I_{DM}, Drain Current-Pulsed [NOTE1]	20A
P_D, Maximum Power Dissipation	1.4W
T_J, T_{STG}, Operating Junction and Storage 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.

NOTE1: Repetitive Rating: Pulse width limited by maximum junction temperature.

THERMAL CHARACTERISTIC

Parameter	Symbol	Limit	Unit
Thermal Resistance, Junction-to-Ambient [NOTE2]	$R_{\theta JA}$	89	°C/W

NOTE2: Surface Mounted on FR4 Board, t ≤ 10 sec.

ELECTRICAL CHARACTERISTICS

T_A = 25°C, unless otherwise noted

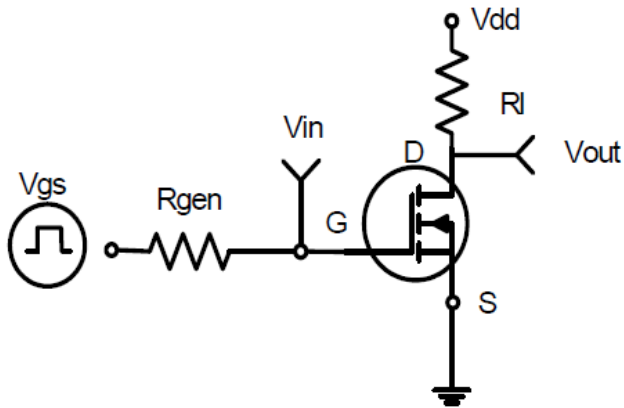| Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=250µA	30	33	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V	-	-	1	µA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
On Characteristics [NOTE3]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250µA	1.2	1.6	2.4	V
Drain-Source On-state Resistance	$R_{DS(ON)}$	V_{GS}=10V,I_D=5A	-	25.5	31	mΩ
		V_{GS}=4.5V,I_D=4A	-	34	43	
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=5A	-	15	-	S
Dynamic Characteristics [NOTE4]						
Input Capacitance	C_{iss}	V_{DS}=15V,V_{GS}=0V, F=1.0MHz	-	255	-	pF
Output Capacitance	C_{oss}		-	45	-	
Reverse Transfer Capacitance	C_{rss}		-	35	-	
Switching Characteristics [NOTE4]						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=15V, R_L=3Ω, V_{GS}=10V, R_{GEN}=3Ω	-	4.5	-	ns
Turn-on Rise Time	t_r		-	2.5	-	
Turn-off Delay Time	$t_{d(off)}$		-	14.5	-	
Turn-off Fall Time	t_f		-	3.5	-	
Total Gate Charge	Q_g	V_{DS}=15A, I_{DS}=5A, V_{GS}=10V	-	5.2	-	nC
Gate-Source Charge	Q_{gs}		-	0.85	-	
Gate-Drain Charge	Q_{gd}		-	1.3	-	
Drain-Source Diode Characteristics						
Diode Forward Voltage [NOTE3]	V_{SD}	V_{GS}=0V, I_S=5A	-	-	1.2	V
Diode Forward Current [NOTE2]	I_S		-	-	5	A

NOTE3: Pulse Test: Pulse Width ≤ 300µs, Duty Cycle ≤ 2%.
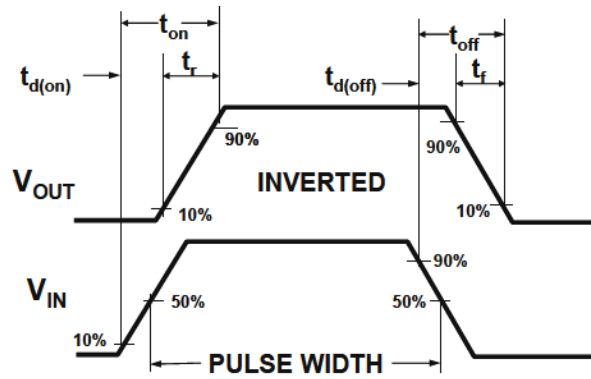NOTE4: Guaranteed by design, not subject to production
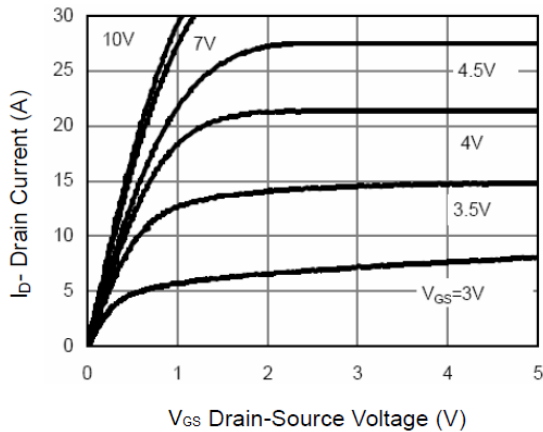
TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS
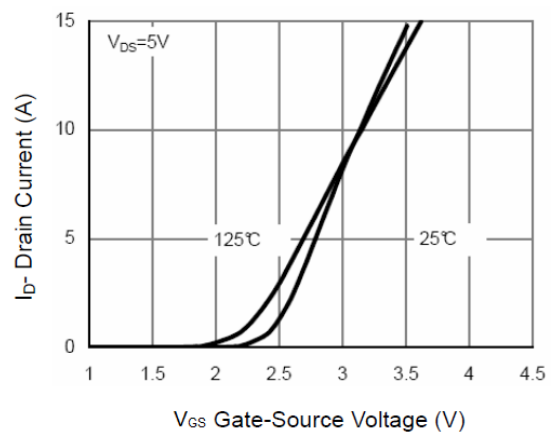
1. Switching Test Circuit
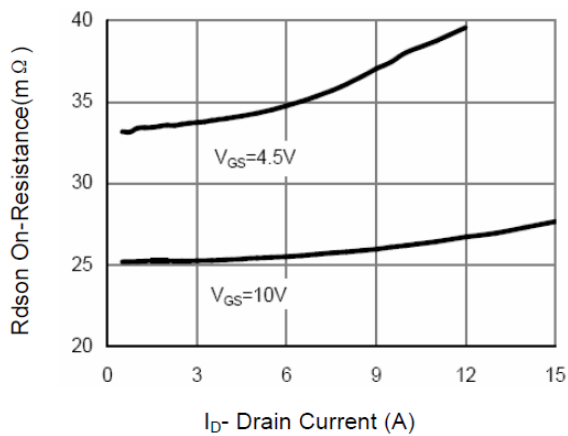
2. Switching Waveforms
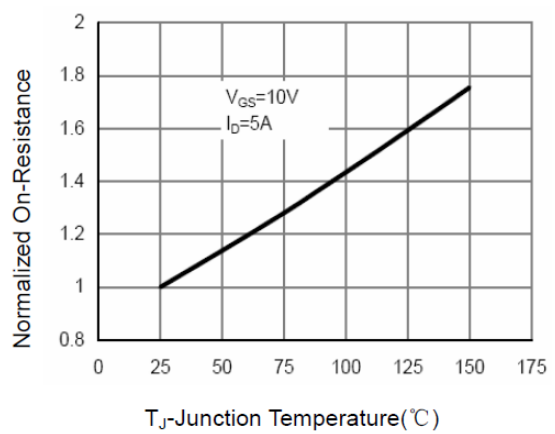
3. Output Characteristics

4. Transfer Characteristics

5. Drain-Source On-Resistance
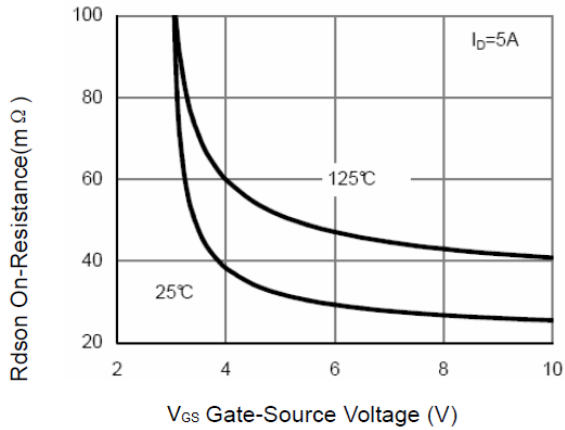
6. Drain-Source On-Resistance
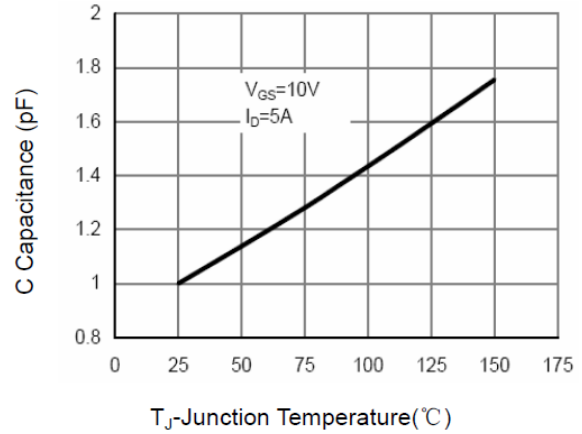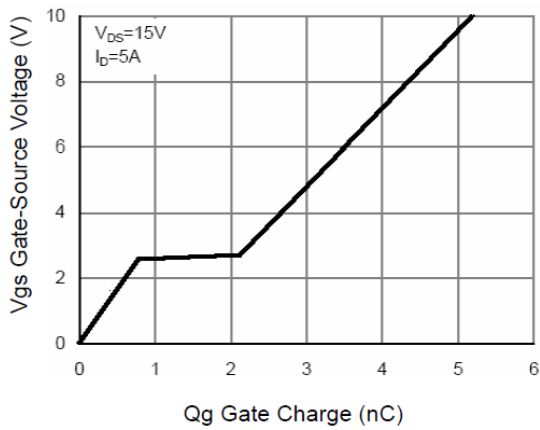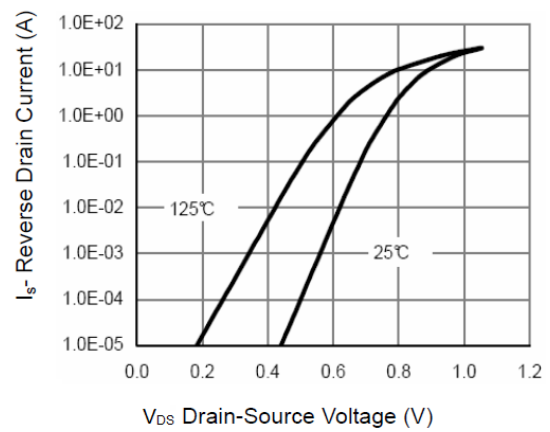
7.   R~DSON~ vs. V~GS~
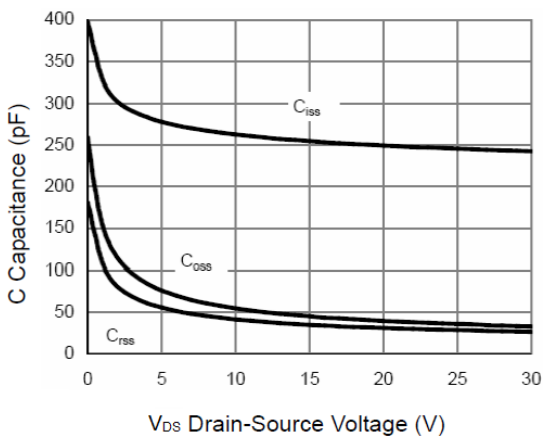

8.   Drain-Source On-Resistance
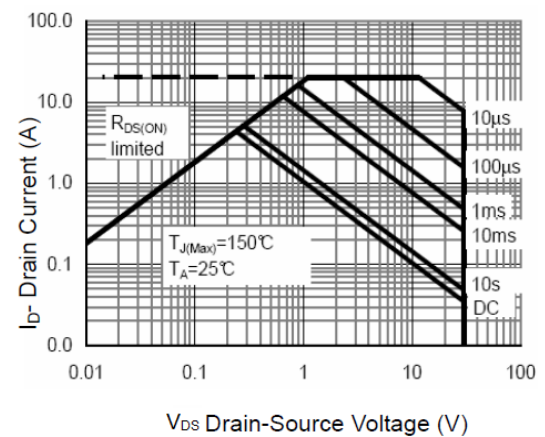

9.   Gate Charge

10.   Source- Drain Diode Forward
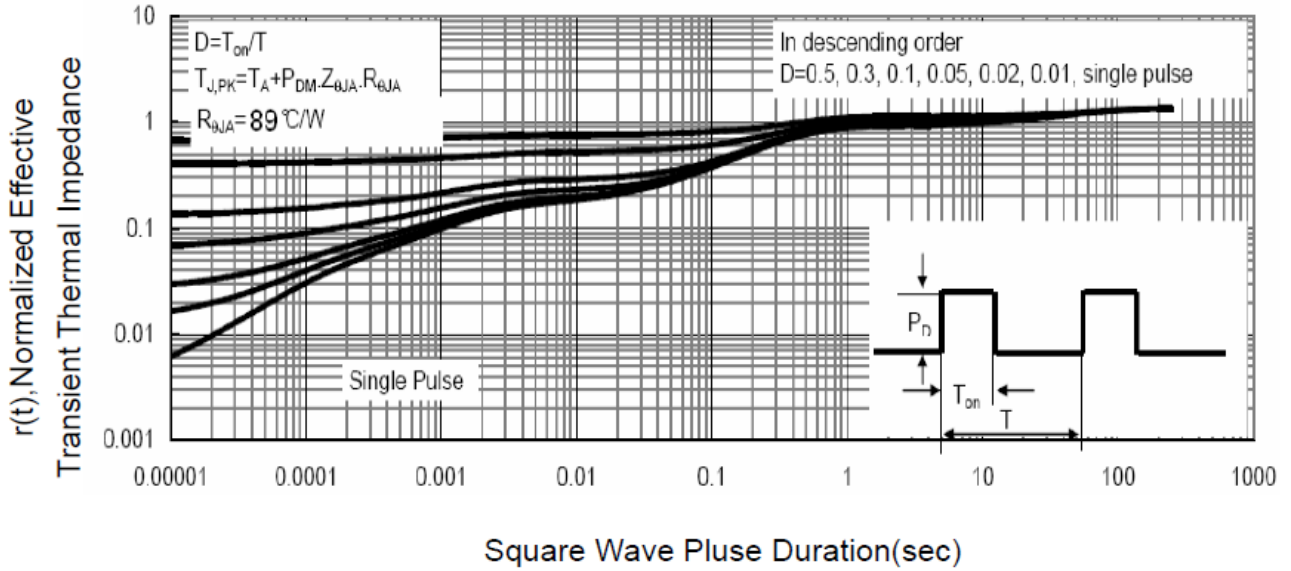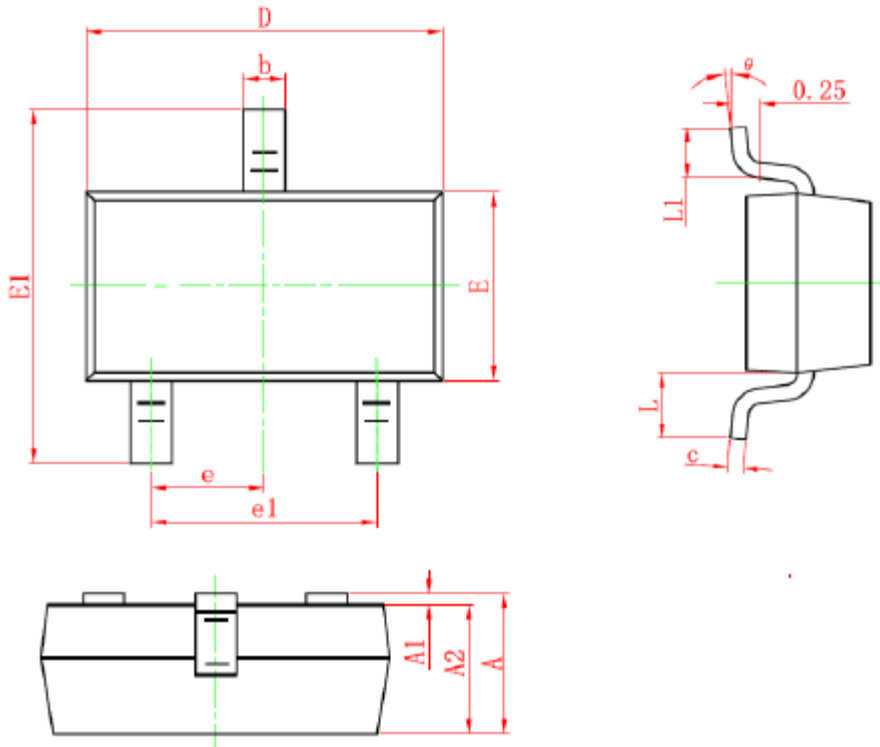

11.   Capacitance vs. Vds

12.   Safe Operation Area

13. Normalized Maximum Transient Thermal Impedance

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

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