



DESCRIPTION

$V_{DS}=20V$

$V_{GS}=\pm 12V$

$I_D(A)= 5A$

$R_{DS(ON)} = 22m\Omega(\text{typ.})@V_{GS} = 4.5V$

$R_{DS(ON)} = 25m\Omega(\text{typ.})@V_{GS} = 2.5V$

$R_{DS(ON)} = 30m\Omega(\text{typ.})@V_{GS} = 1.8V$

AM2300 is available in SOT-23 and SOT-23S packages.

ORDERING INFORMATION

Package Type	Part Number	
SOT-23 SPQ: 3,000pcs/Reel	E3	AM2300E3R
		AM2300E3VR
SOT-23S SPQ: 3,000pcs/Reel	E3S	AM2300E3SR
		AM2300E3SVR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS free products		

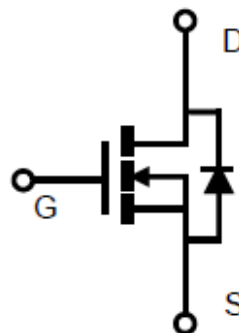
FEATURES

- Fast switch
- 1.8V Low gate drive applications
- High power and current handling capability
- Available in SOT-23 and SOT-23S packages

APPLICATION

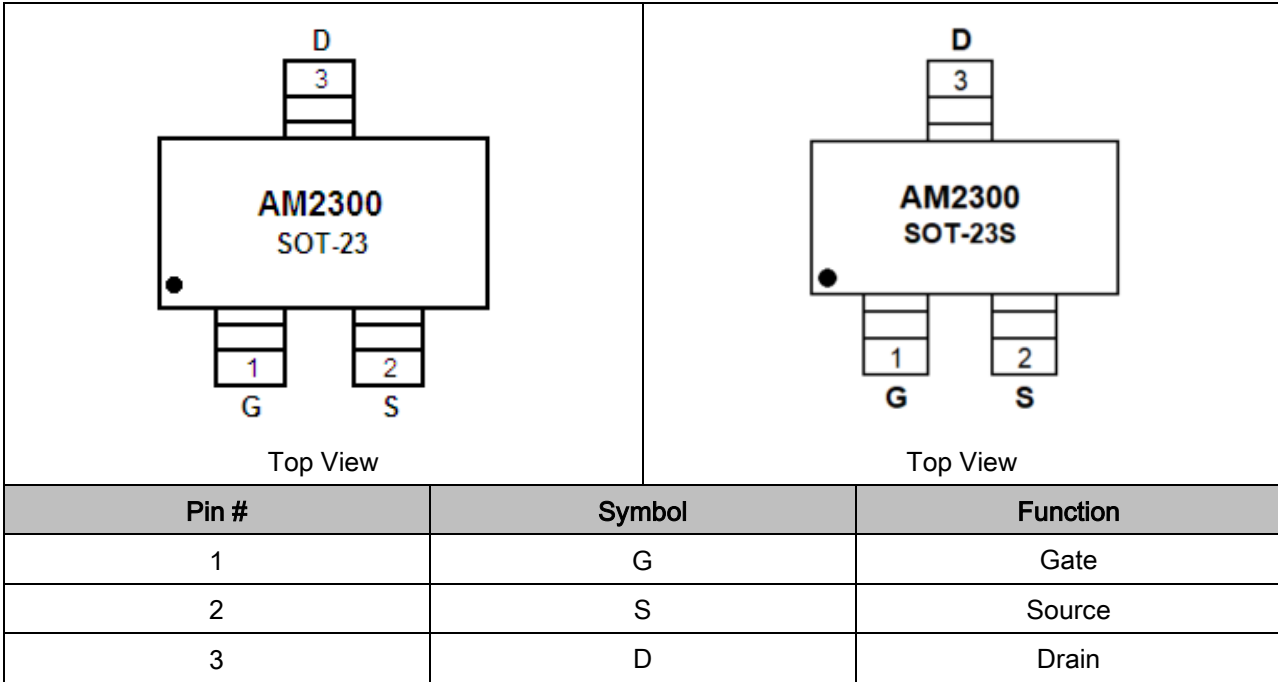
- Hand-Held Instruments
- Load Switch

PIN CONFIGURATION





PIN DESCRIPTION





ABSOLUTE MAXIMUM RATINGS

T_A = 25°C, unless otherwise noted

V _{DSS} , Drain-Source Voltage		20V
V _{GSS} , Gate-Source Voltage		±12V
I _D , Continuous Drain Current	T _A =25°C	5A
	T _A =70°C	4A
I _{DM} , Pulsed Drain Current ^{NOTE1}		20A
P _D , Power Dissipation	T _A =25°C	1.0W
	T _A =70°C	0.6W
T _J , Operation Junction Temperature		-55°C~150°C
T _{STG} , Storage Temperature Range		-55°C~150°C

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 is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

THERMAL RESISTANCE

Parameter		Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to Ambient ^{NOTE2}	t ≤ 10s	R _{θJA}	-	95	°C/W
Thermal Resistance Junction to Ambient ^{NOTE2,3}	Steady-State		-	130	



ELECTRICAL CHARACTERISTICS

T_A = 25°C, unless otherwise noted

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Parameters						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	20	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.4	0.7	1	V
Gate Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±12V	-	-	±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =20V, V _{GS} =0V, T _J =25°C	-	-	1	μA
		V _{DS} =16V, V _{GS} =0V, T _J =75°C	-	-	10	
Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =5A	-	22	26	mΩ
		V _{GS} =2.5V, I _D =3A	-	25	29	
		V _{GS} =1.8V, I _D =2A	-	30	38	
Forward Transconductance	g _{fs}	V _{DS} =5V, I _D =5A	-	7	-	S
Diode Characteristics						
Diode Forward Voltage	V _{SD}	I _S =1A, V _{GS} =0V	-	-	1	V
Continuous Source Current	I _S		-	-	2.5	A
Reverse Recovery Time	t _{rr}	I _S =5A, di/dt=100A/μs	-	8.5	-	ns
Reverse Recovery Charge	Q _{rr}		-	2.7	-	nC
Dynamic Parameters						
Total Gate Charge	Q _g	V _{DS} =10V, V _{GS} =4.5V I _D =5A	-	8	11.2	nC
Gate-Source Charge	Q _{gs}		-	1.2	1.7	
Gate-Drain Charge	Q _{gd}		-	2.5	3.5	
Input Capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V f=1MHz	-	485	-	pF
Output Capacitance	C _{oss}		-	50	-	
Reverse Transfer Capacitance	C _{rss}		-	30	-	
Gate Resistance	R _g	V _{GS} =0V, V _{DS} =0V, f=1MHz	-	1.6	-	Ω
Turn-On Time	t _{d(on)}	V _{DD} =10V, V _{GEN} =4.5V, R _G =25Ω, I _D =1.0A	-	3.9	7	ns
	t _r		-	11	21	
Turn-Off Time	t _{d(off)}		-	21	40	
	t _f		-	6.8	13	

NOTE1: Pulsed width limited by maximum junction temperature, T_{J(MAX)}=150°C.

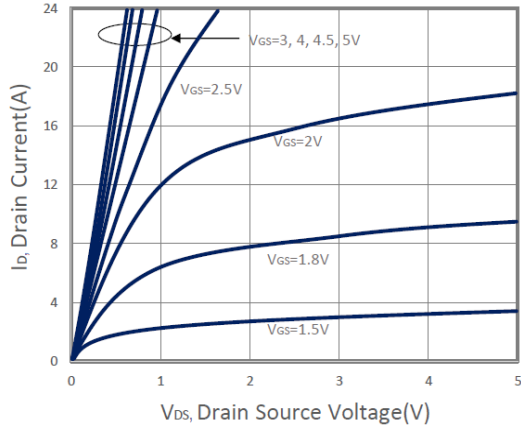
NOTE2: The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board in a still air environment with maximum junction temperature T_{J(MAX)}=150°C (initial temperature T_A=25°C).

NOTE3: T_{J(MAX)}=150°C, using junction-to-case thermal resistance (R_{θJC}) is more useful in additional heat sinking is used.

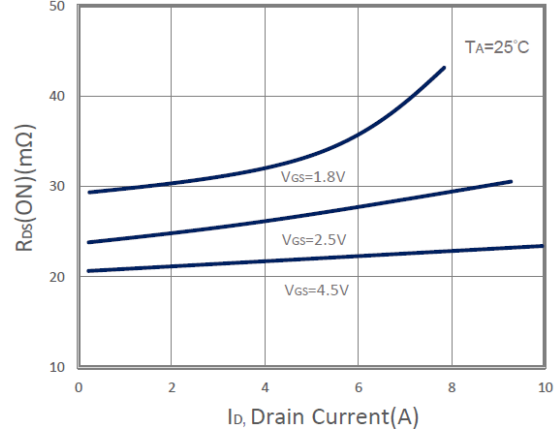


TYPICAL PERFORMANCE CHARACTERISTICS

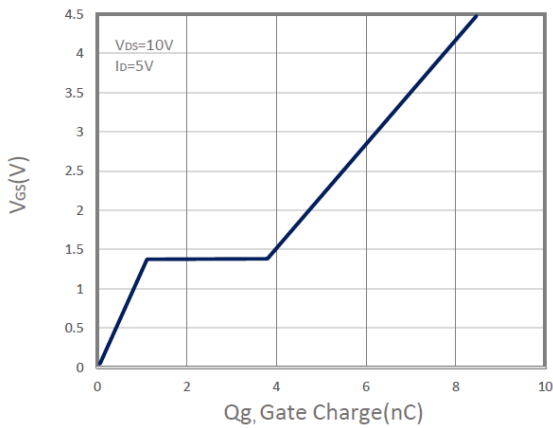
1. Output Characteristics



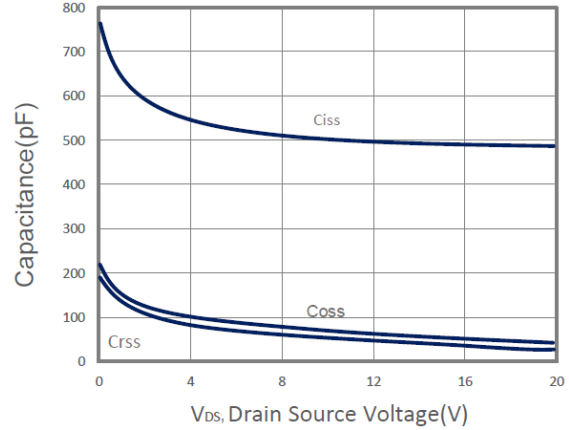
2. Drain-Source On Resistance



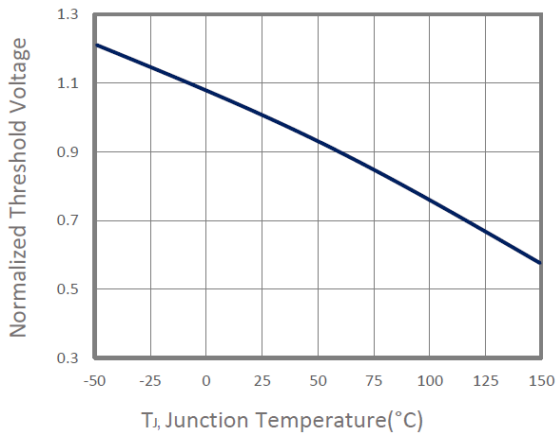
3. Gate Charge



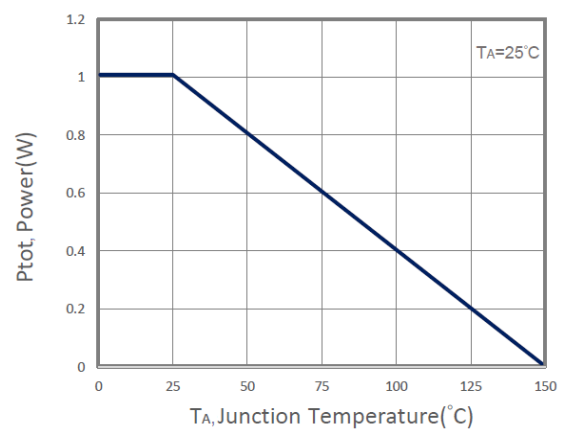
4. Capacitance



5. Gate Threshold Voltage

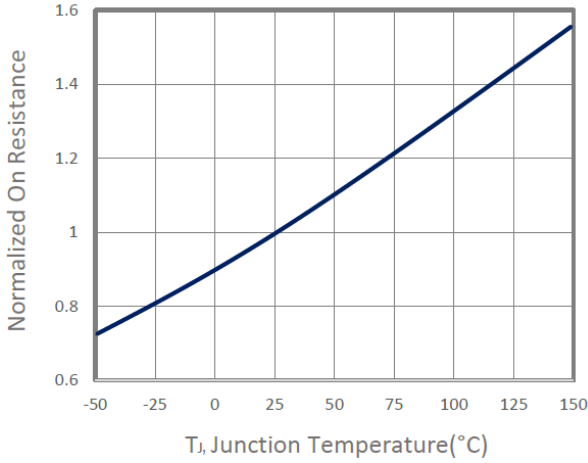


6. Power Dissipation

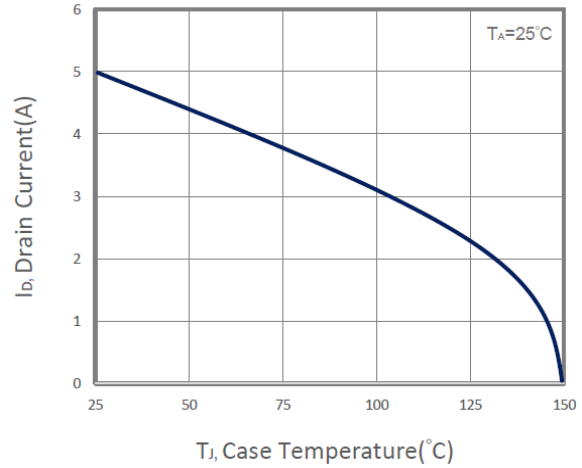




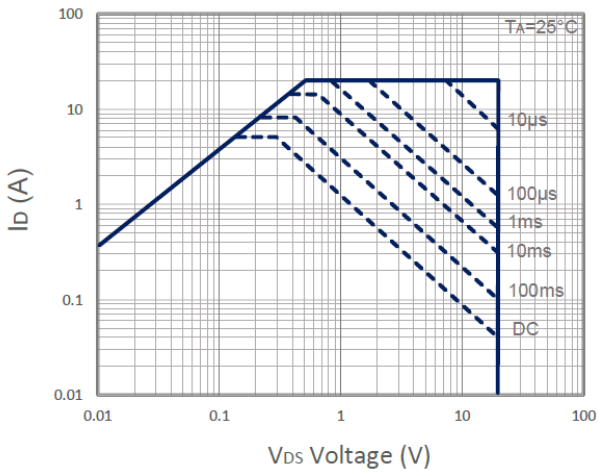
7. $R_{DS(ON)}$ vs. Junction Temperature



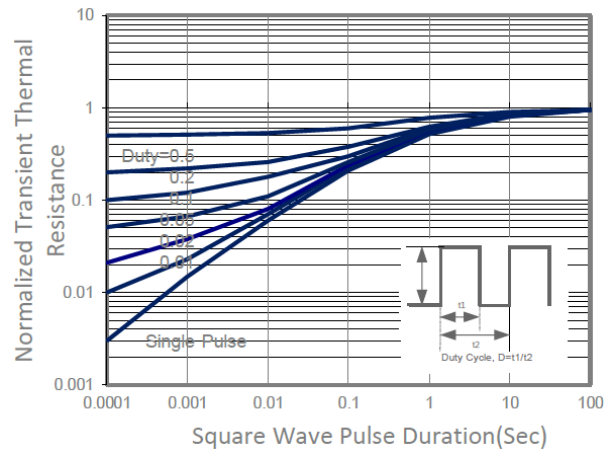
8. Drain Current vs. T_j



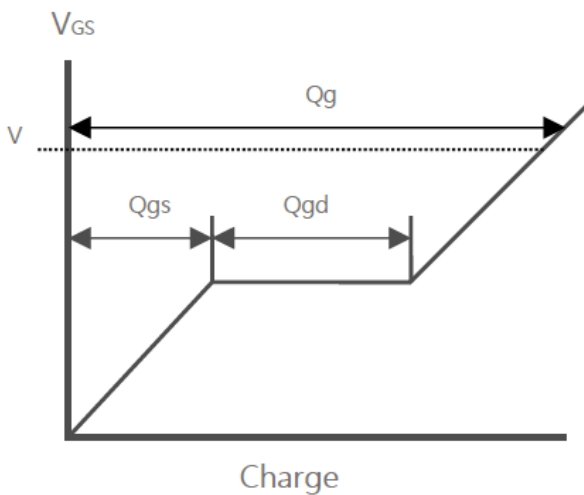
9. Maximum Safe Operation Area



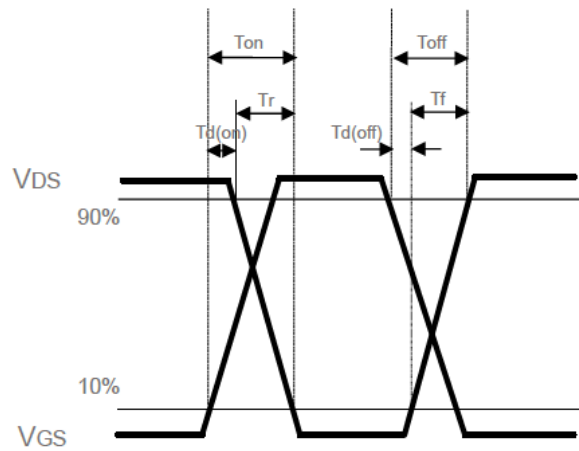
10. Thermal Transient Impedance



11. Gate Chrg Waveform



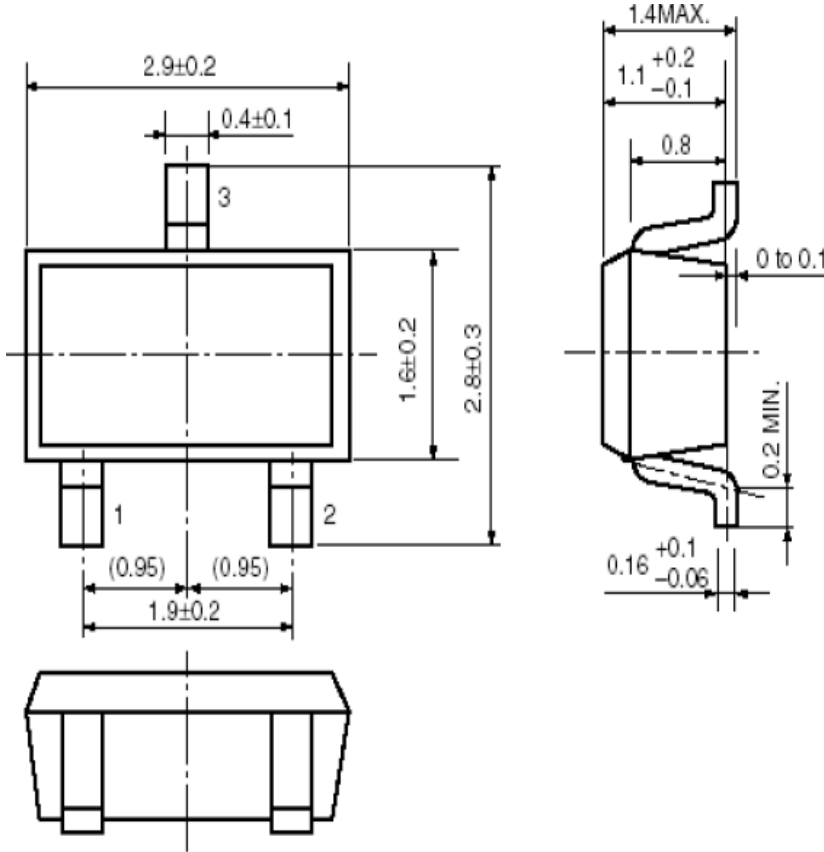
12. Switching Time Waveform





PACKAGE INFORMATION

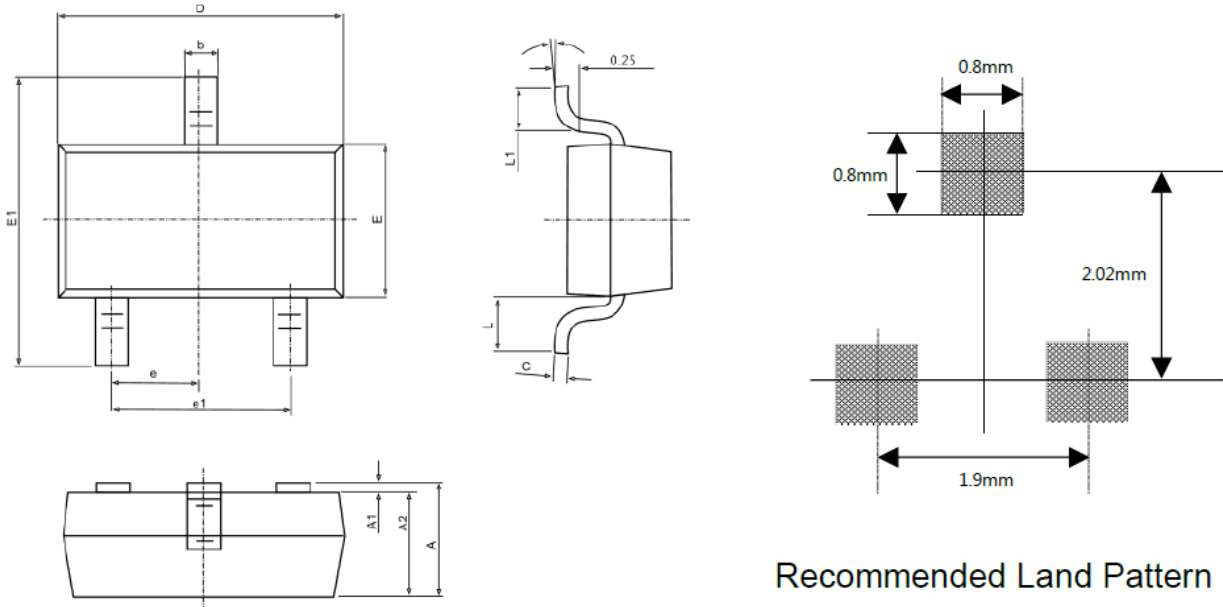
Dimension in SOT-23 Package (Unit: mm)



Symbol	Min	Max
A	2.800	3.040
B	2.100	2.640
C	1.200	1.400
D	0.890	1.030
E	1.780	2.050
F	0.450	0.600
G	0.013	0.100
H	0.890	1.120
J	0.085	0.180
K	0.370	0.510



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



Recommended Land Pattern

Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°



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