DESCRIPTION

AM2304 is available in a SOT-23 package.

FEATURES

- 30V/5.1A
  $R_{DS(ON)}$= 25mΩ(max.) @ V_{GS}= 10V
  $R_{DS(ON)}$= 35mΩ(max.) @ V_{GS}= 4.5V
- Reliable and Rugged
- Available in a SOT-23 package.

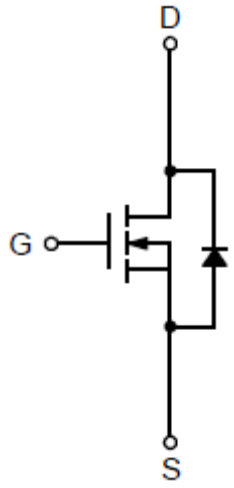
ORDERING INFORMATION

Package Type	Part Number	
SOT-23	E3	AM2304E3R
		AM2304E3VR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products Suffix " V " means Halogen free Package		

APPLICATION

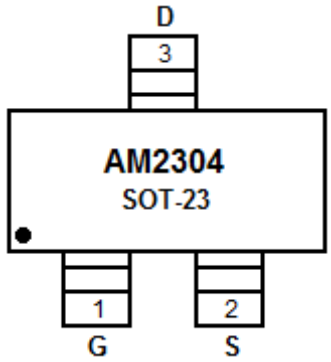
- Power Management in Notebook Computer, Portable Equipment and Battery Powered Systems.
- Load Switch

PIN DESCRIPTION



N-Channel MOSFET

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_{DSS}, Drain-Source Voltage		30V
V_{GSS}, Gate-Source Voltage		±20V
I_D, Continuous Drain Current	T_A=25℃	5.1A
	T_A=70℃	4.1A
I_{DM}, 300μs Pulsed Drain Current	V_{GS}=10V	20A
I_S, Diode Continuous Forward Current		1.5A
T_J, Maximum Junction Temperature		150℃
T_{STG}, Storage Temperature Range		-55℃~150℃
P_D, Maximum Power Dissipation	T_A=25℃	1W
	T_A=70℃	0.64W
$R_{\theta JA}$[NOTE1], Thermal Resistance-Junction to Ambient	t ≤ 10sec.	90°C/W
	Steady state	125°C/W

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: Surface Mounted on 1in² pad area, t ≤ 10sec.

ELECTRICAL CHARACTERISTICS

T_A = 25℃, unless otherwise noted

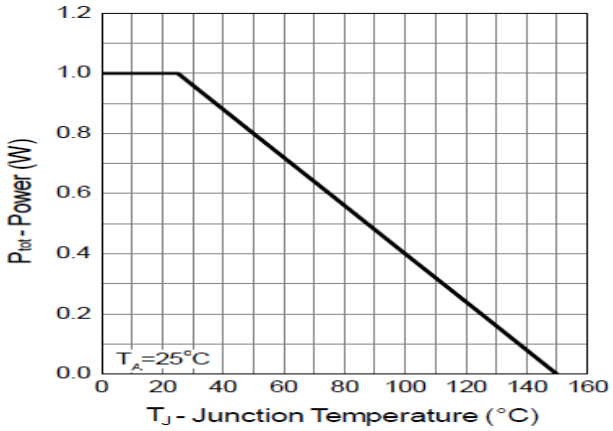
Parameter	Symbol	Conditions	Min	Typ.	Max	Units
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_{DS}=250μA	30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=24V,V_{GS}=0V	-	-	1	μA
		T_J=85°C			30	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_{DS}=250μA	1.3	1.8	2.5	V
Gate Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Drain-Source On-state Resistance	$R_{DS(ON)}$ NOTE2	V_{GS}=10V,I_{DS}=8A	-	21	25	mΩ
		V_{GS}=4.5V,I_D=5A	-	27	35	
Diode Characteristics						
Diode Forward Voltage	V_{SD} NOTE2	I_{SD}=1A,V_{GS}=0V	-	0.75	1.1	V
Reverse Recovery Time	t_{rr}	I_{SD}=8A, dI_{SD}/dt=100A/μs	-	12.8	-	ns
Reverse Recovery Charge	Q_{rr}		-	3.8	-	nC
Dynamic Characteristics NOTE3						
Gate Resistance	R_G	V_{GS}=0V,V_{DS}=0V,F=1MHz	-	1.5	-	W
Input Capacitance	C_{ISS}	V_{GS}=0V,	-	410	-	pF
Output Capacitance	C_{OSS}	V_{DS}=15V,	-	70	-	
Reverse Transfer Capacitance	C_{RSS}	Frequency=1.0MHz	-	41	-	
Turn-on Delay Time	$t_{D(ON)}$	V_{DD}=15V, R_L=15Ω	-	6	10	ns
Turn-on Rise Time	t_R	I_{DS}=1A, V_{GEN}=10V,	-	9	13	
Turn-off Delay Time	$t_{D(OFF)}$	R_G=6Ω	-	14	20	
Turn-off Fall Time	t_F		-	3.2	5	
Gate Charge Characteristics NOTE3						
Total Gate Charge	Q_G	V_{DS}=30V, V_{GS}=4.5V	-	4	-	nC
		V_{GS}=8V, V_{GS}=10V	-	8	-	
Gate-Source Charge	Q_{GS}	V_{DS}=30V, V_{GS}=10V,	-	1.5	-	
Gate-Drain Charge	Q_{GD}	I_{DS}=8A	-	1.5	-	
Threshold Gate Charge	Q_{Gth}		-	0.75	-	

NOTE2: Pulse test; pulse width≤300μs, duty cycle≤2%.

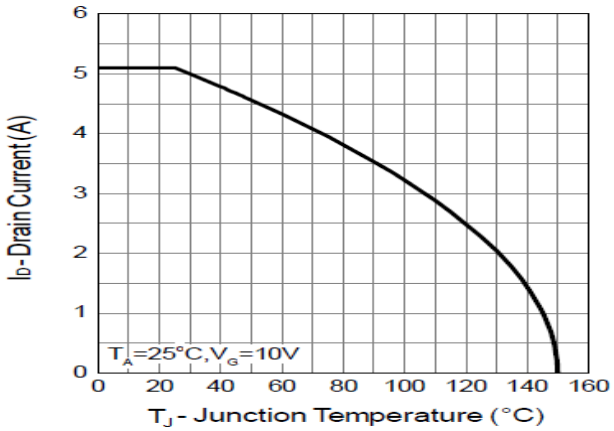
NOTE3: Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS

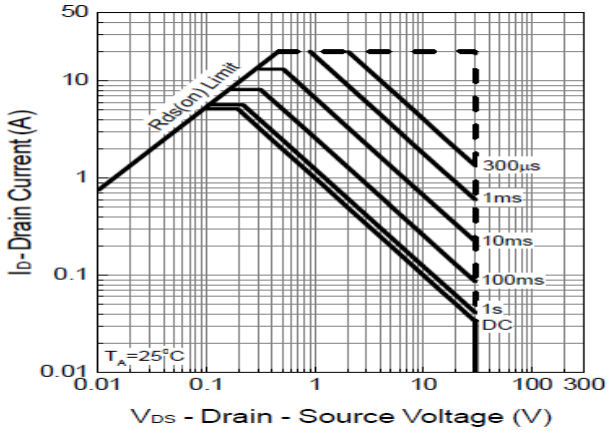
1. Power Dissipation



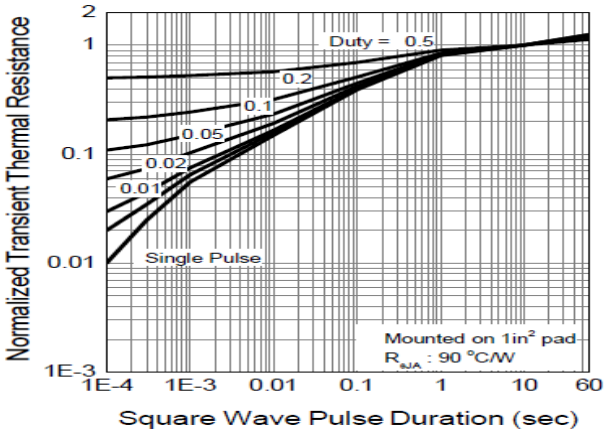
2. Drain Current



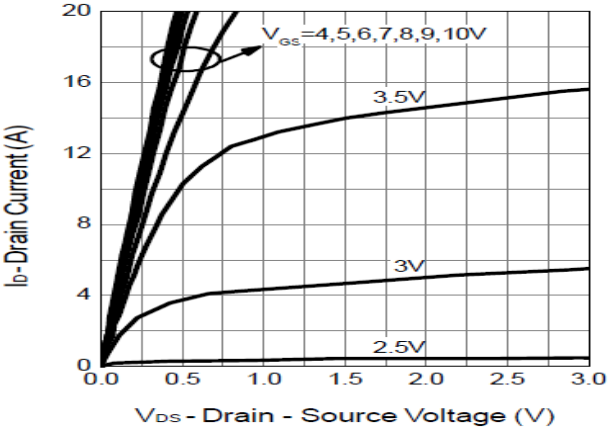
3. Safe Operation Area



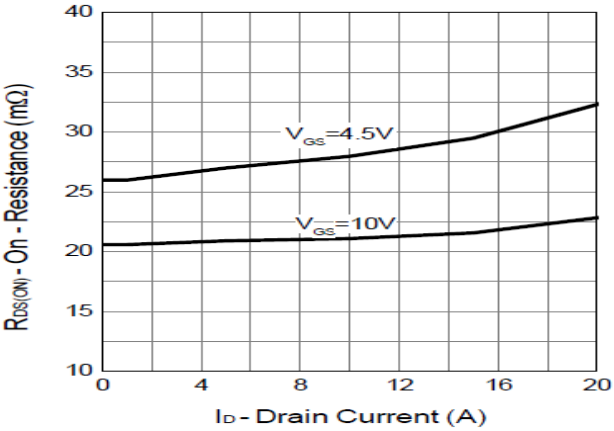
4. Thermal Transient Impedance



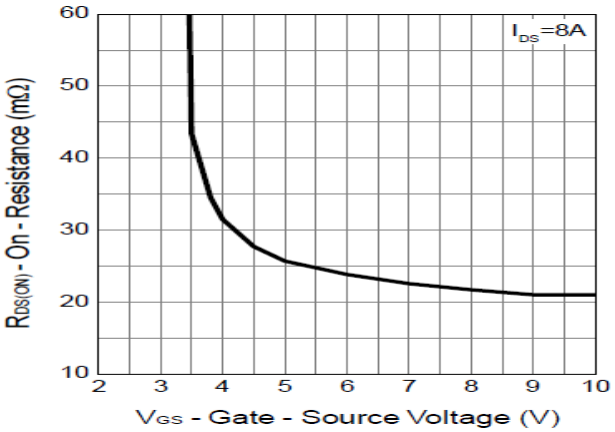
5. Output Characteristics



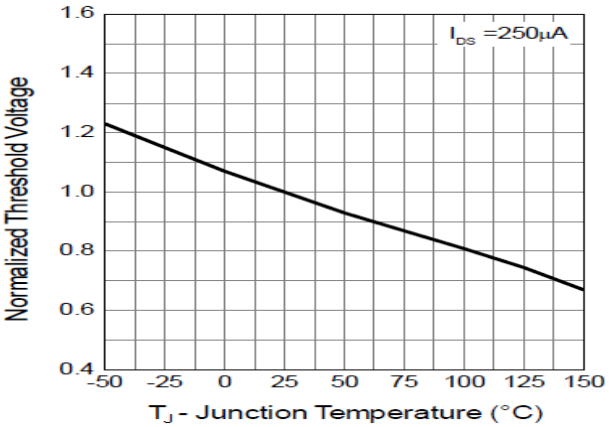
6. Drain-Source On Resistance



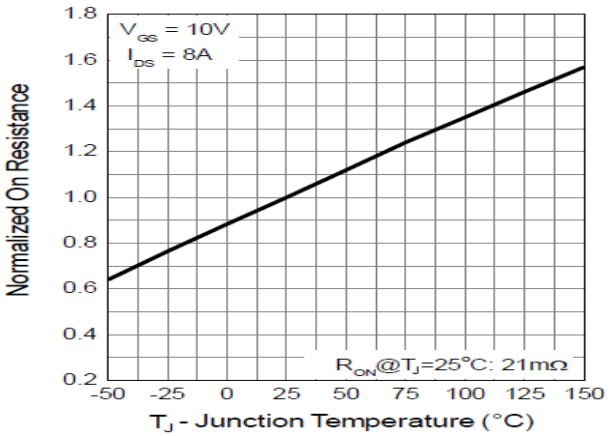
7. Gate-Source On Resistance



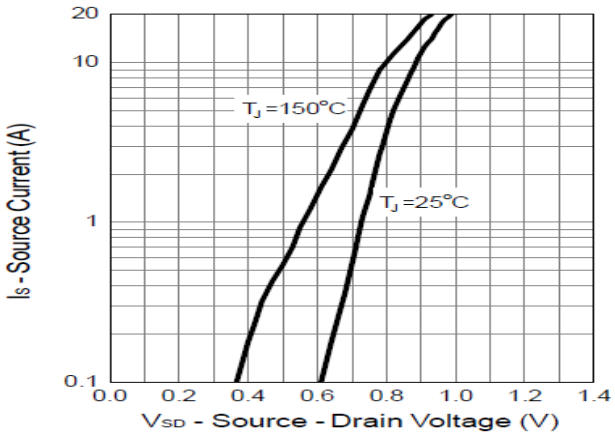
8. Gate Threshold Voltage



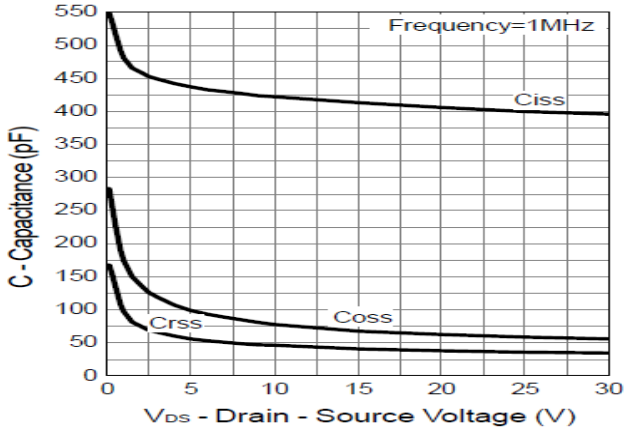
9. Drain-Source On Resistance



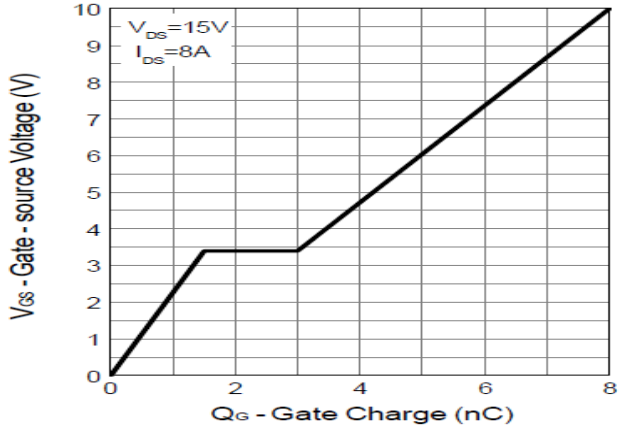
10. Source-Drain Diode Forward



11. Capacitance

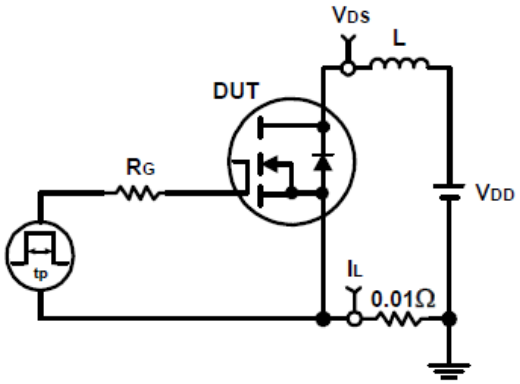


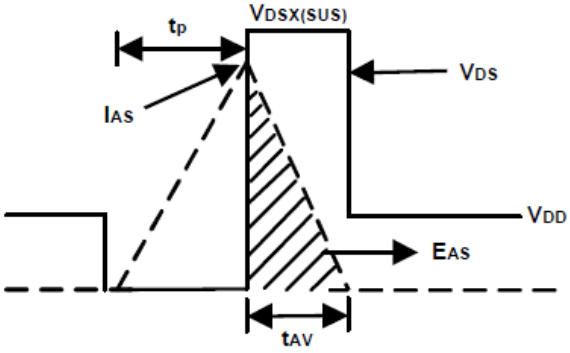
12. Gate Charge



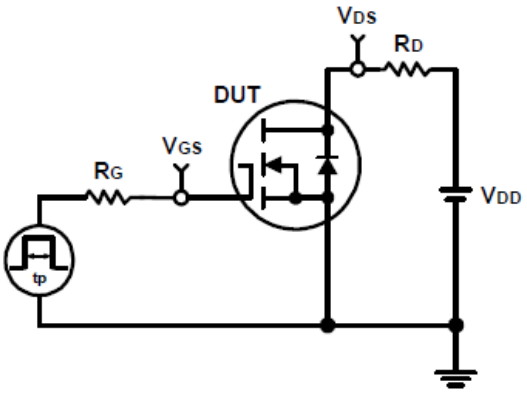
DETAILED INFORMATION

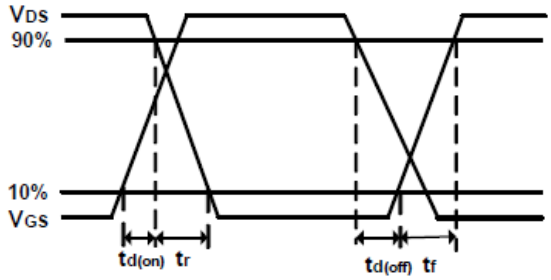
Avalanche Test Circuit and Waveforms





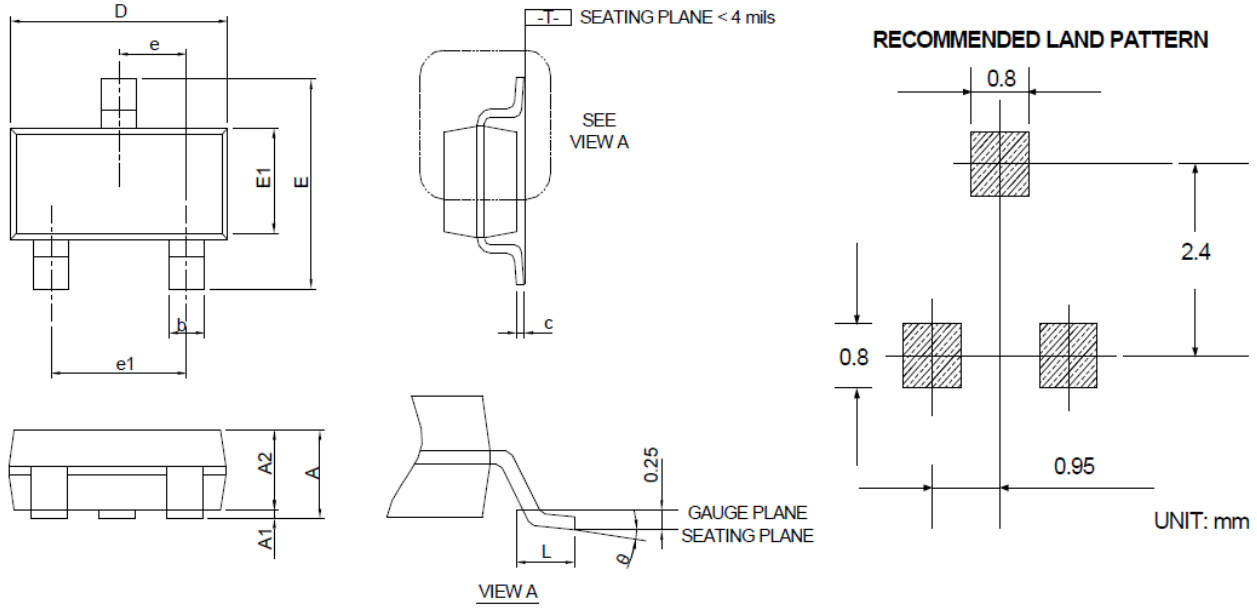
Switching Time Test Circuit and Waveforms





PACKAGE INFORMATION

Dimension in SOT-23 Package (Unit: mm)



SYMBOL	MIN	MAX
A	-	1.200
A1	0.000	0.800
A2	0.900	1.120
b	0.300	0.500
c	0.080	0.220
D	2.700	3.100
E	2.600	3.000
E1	1.400	1.800
e	0.950(BSC)	
e1	1.900(BSC)	
L	0.300	0.600
θ	0°	8°

NOTE: Dimension D and E1 do not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 10 mil per side.

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