



DESCRIPTION

AM2304 is available in a SOT-23 package.

FEATURES

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

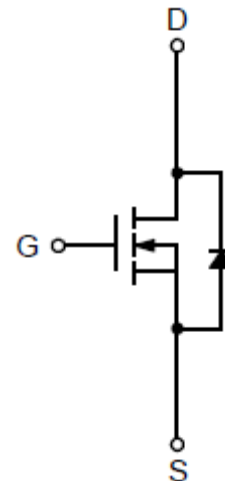
ORDERING INFORMATION

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

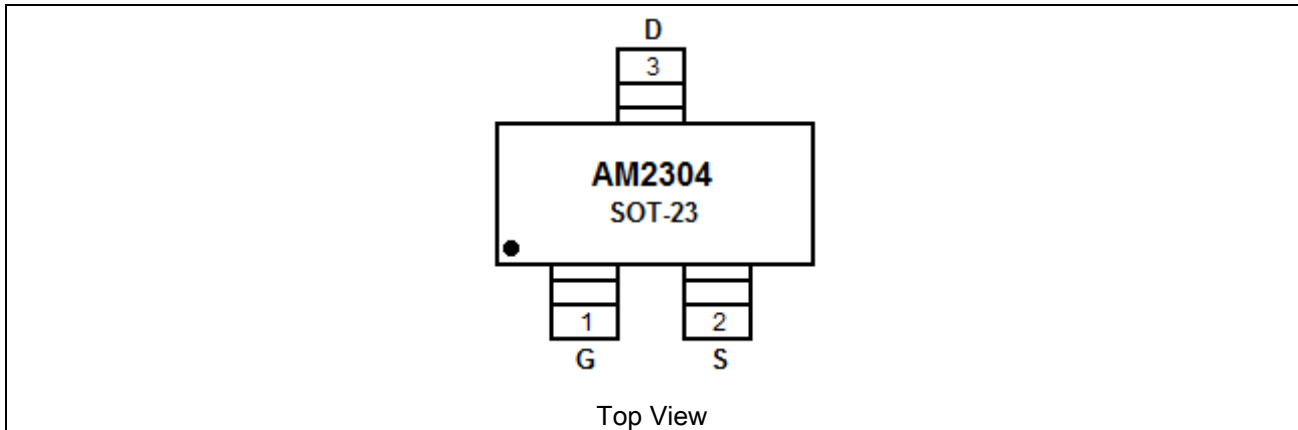
PIN DESCRIPTION



N-Channel MOSFET



PIN DESCRIPTION



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



ABSOLUTE MAXIMUM RATINGS

T_A = 25°C, unless otherwise noted

V _{DSS} , Drain-Source Voltage		30V
V _{GSS} , Gate-Source Voltage		±20V
I _D , Continuous Drain Current	T _A =25°C	5.1A
	T _A =70°C	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°C
T _{STG} , Storage Temperature Range		-55°C~150°C
P _D , Maximum Power Dissipation	T _A =25°C	1W
	T _A =70°C	0.64W
R _{θJA} ^{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°C, 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, V _{DS} =15V, Frequency=1.0MHz	-	410	-	pF	
Output Capacitance	C _{OSS}		-	70	-		
Reverse Transfer Capacitance	C _{RSS}		-	41	-		
Turn-on Delay Time	t _{D(ON)}	V _{DD} =15V, R _L =15Ω I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	6	10	ns	
Turn-on Rise Time	t _R		-	9	13		
Turn-off Delay Time	t _{D(OFF)}		-	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} =8V,	V _{GS} =4.5V	-	4	-	nC
			V _{GS} =10V	-	8	-	
Gate-Source Charge	Q _{GS}	V _{DS} =30V, V _{GS} =10V, I _{DS} =8A	-	1.5	-		
Gate-Drain Charge	Q _{GD}		-	1.5	-		
Threshold Gate Charge	Q _{Gth}		-	0.75	-		

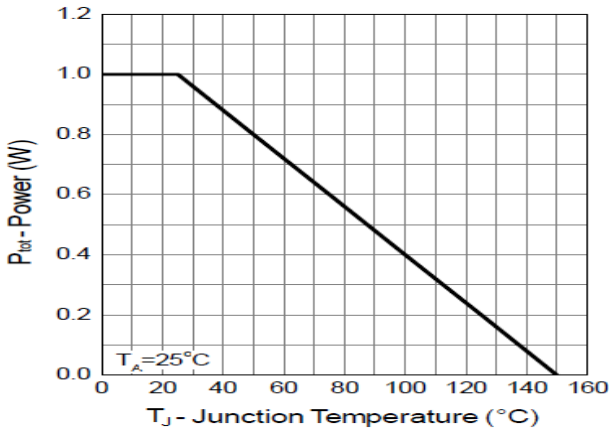
NOTE2: Pulse test; pulse width≤300μs, duty cycle≤2%.

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

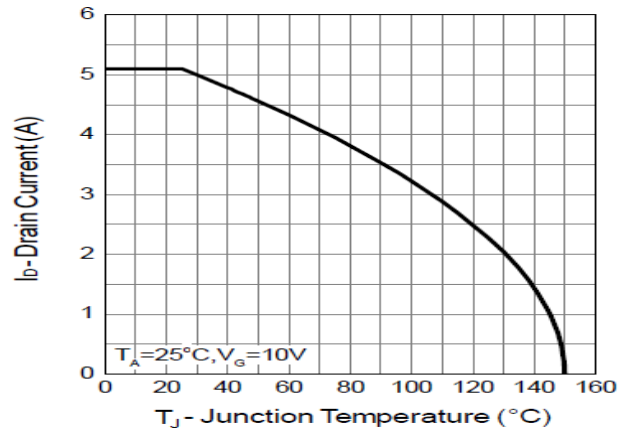


TYPICAL CHARACTERISTICS

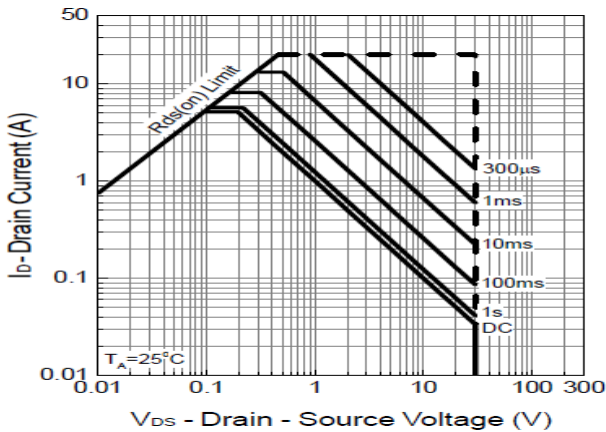
1. Power Dissipation



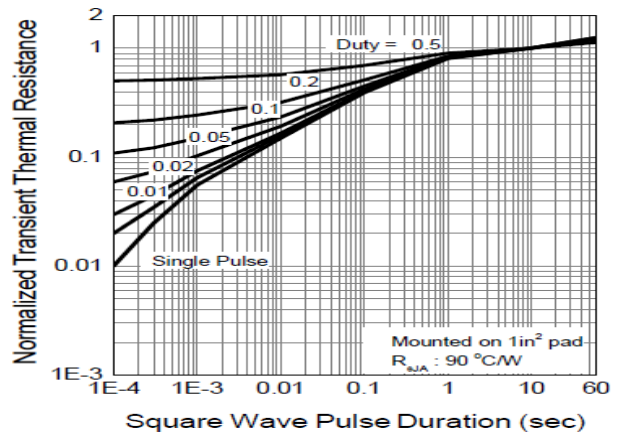
2. Drain Current



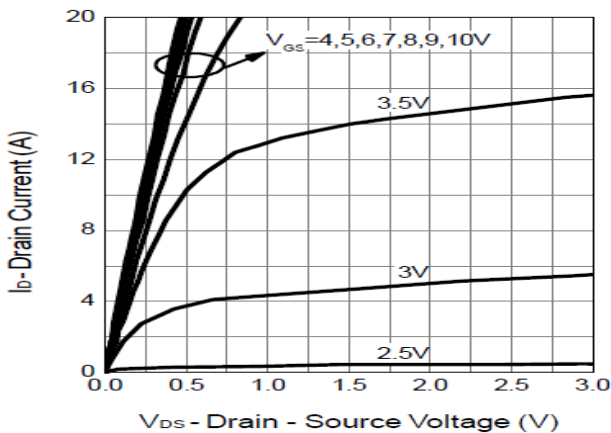
3. Safe Operation Area



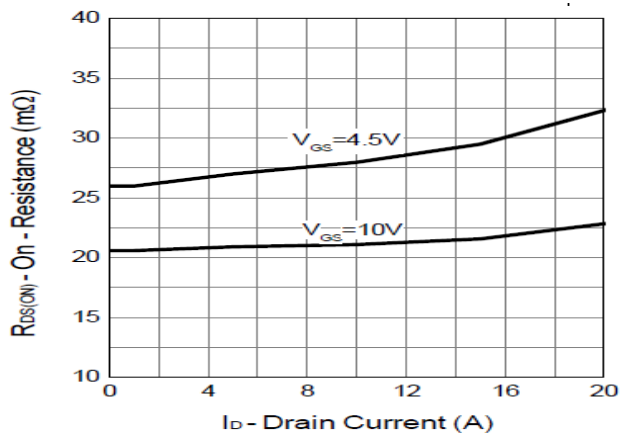
4. Thermal Transient Impedance



5. Output Characteristics

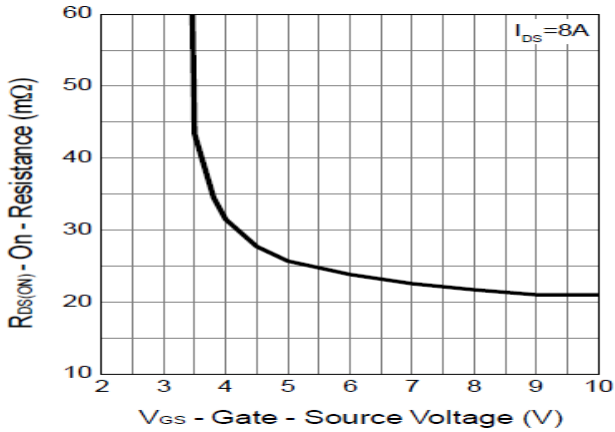


6. Drain-Source On Resistance

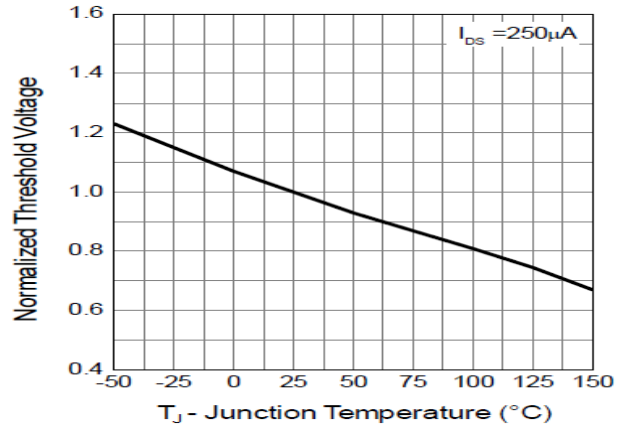




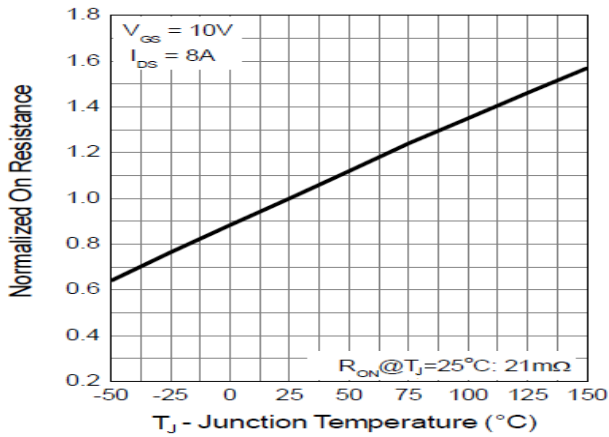
7. Gate-Source On Resistance



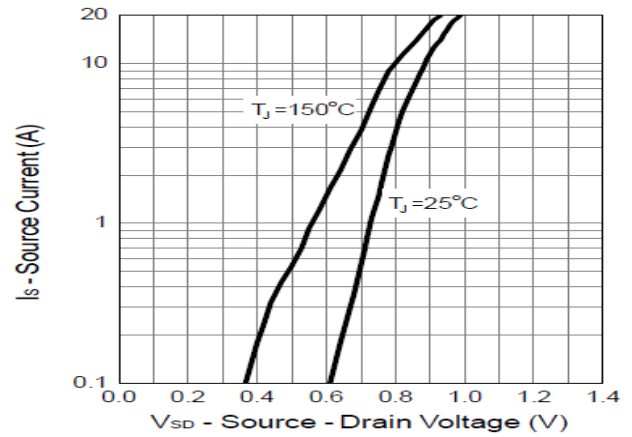
8. Gate Threshold Voltage



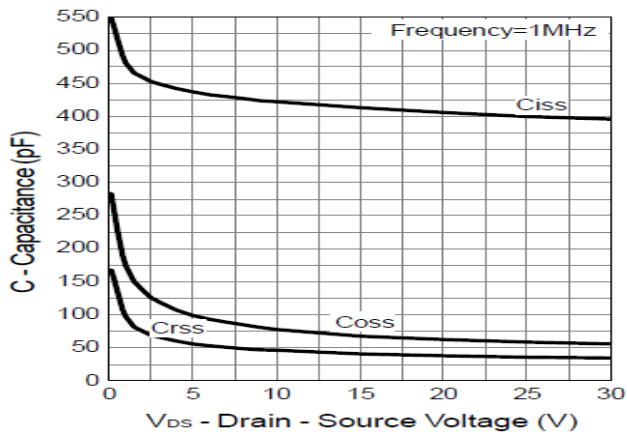
9. Drain-Source On Resistance



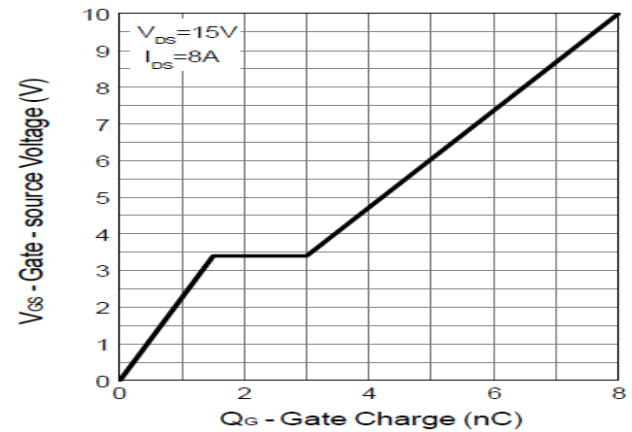
10. Source-Drain Diode Forward



11. Capacitance



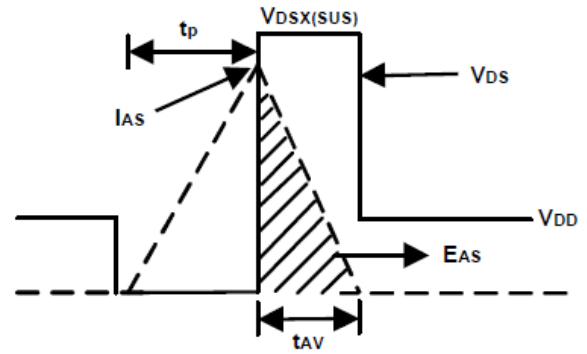
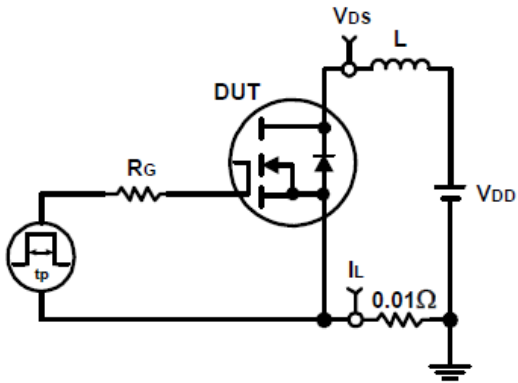
12. Gate Charge



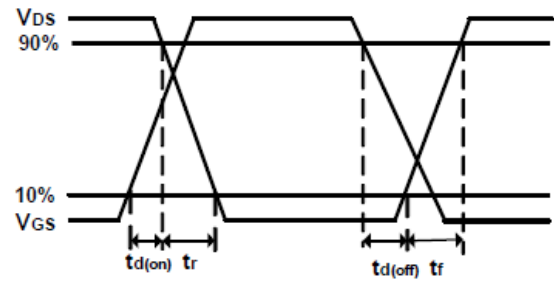
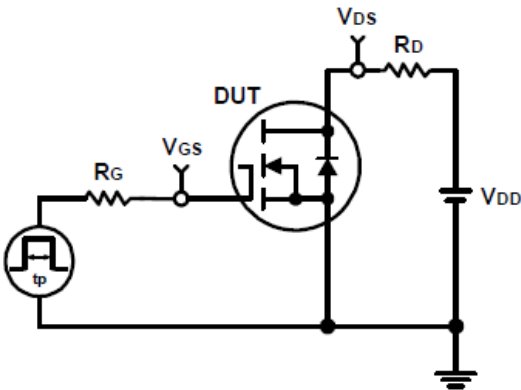


DETAILED INFORMATION

Avalanche Test Circuit and Waveforms



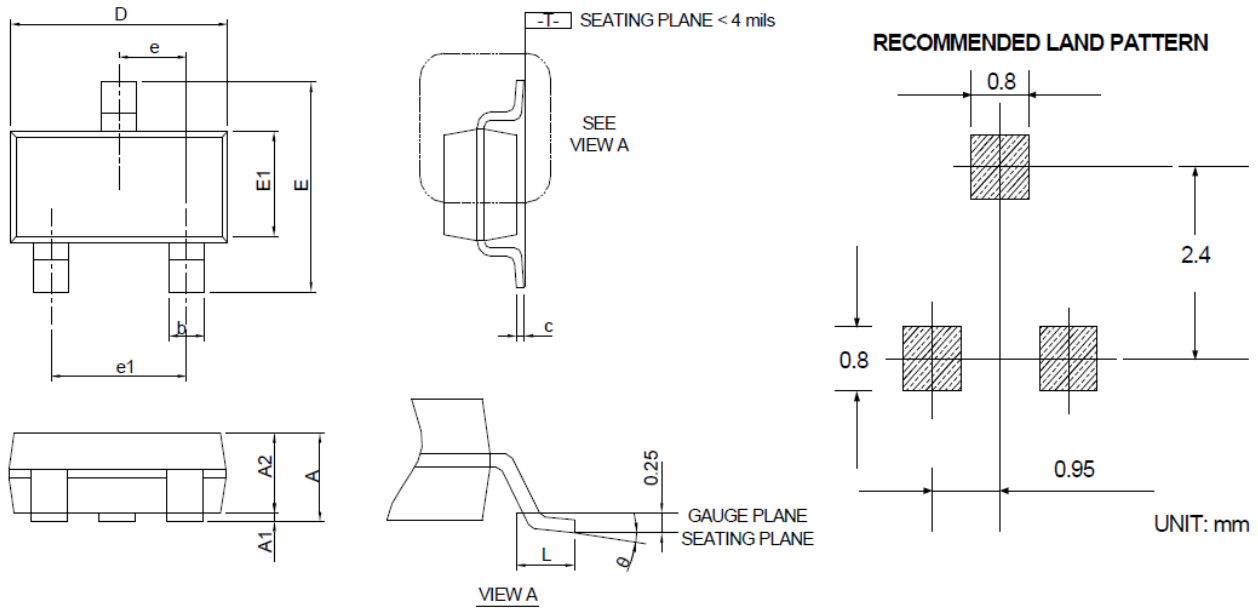
Switching Time Test Circuit and Waveforms





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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