



**DESCRIPTION**

The AM3401A is available in SOT-23 and SOT-23S Package.

V <sub>DS</sub>	R <sub>DS(ON)</sub>	I <sub>D</sub>
-30 V	38 mΩ	-4.5 A

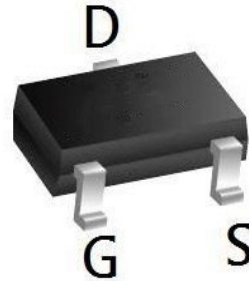
**FEATURE**

- Green Device Available
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

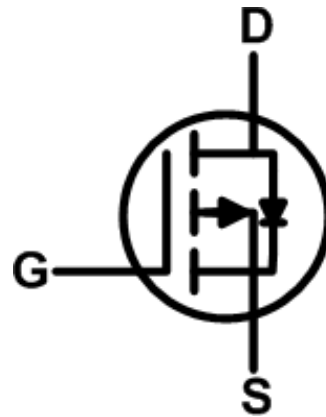
**ORDERING INFORMATION**

Package Type	Part Number	
SOT-23 SPQ: 3,000pcs/Reel	E3	AM3401AE3VR
SOT-23S SPQ: 3,000pcs/Reel	E3S	AM3401AE3SVR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products		

**PIN DESCRIPTION**



SOT-23/SOT-23S



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

**ABSOLUTE MAXIMUM RATINGS**

V <sub>DS</sub> , Drain-Source Voltage		-30 V
V <sub>GS</sub> , Gate-Source Voltage		±12 V
I <sub>D</sub> , Continuous Drain Current	T <sub>A</sub> = 25 °C	-4.5 A
	T <sub>A</sub> = 70 °C	-3.6 A
I <sub>DM</sub> , Pulsed Drain Current <sup>(1)</sup>		-16 A
P <sub>D</sub> , Total Power Dissipation <sup>(2)</sup>	T <sub>C</sub> = 25 °C	1.4 W
	T <sub>C</sub> = 70 °C	0.9 W
T <sub>STG</sub> , Storage Temperature Range		-55 °C ~ +150 °C
T <sub>J</sub> , Operating Junction 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 are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

- (1) The data tested by surface mounted on 1 inch<sup>2</sup> FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
- (2) Pulse Test: Pulse width ≤ 300 μs, duty cycle ≤ 2%.

**THERMAL CHARACTERISTICS**

Parameter	Typ.	Max.	Unit
R <sub>θJA</sub> , Thermal Resistance Junction to Ambient <sup>(3)</sup>	-	105	°C/W
R <sub>θJA</sub> , Thermal Resistance Junction to Ambient <sup>(3)</sup> (t ≤ 10s)	-	-	°C/W

- (3) Repetitive rating, pulse width limited by junction temperature T<sub>J(MAX)</sub> = 150 °C

**ELECTRICAL CHARACTERISTICS**T<sub>J</sub> = 25°C, unless otherwise Noted

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = -250 μA	-30	-	-	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -30 V, V <sub>GS</sub> = 0 V	-	-	-1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±12 V	-	-	±100	nA
Gate-Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA	-0.7	-1	-1.3	V
Drain-Source On-Resistance <sup>(4)</sup>	R <sub>DS(ON)</sub>	V <sub>GS</sub> = -10 V, I <sub>D</sub> = -4.2 A	-	38	42	mΩ
		V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -4 A	-	42	52	
		V <sub>GS</sub> = -2.5 V, I <sub>D</sub> = -1 A	-	60	90	
<b>Dynamic Characteristics <sup>(5)</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = -15 V f = 1 MHz	-	745	-	pF
Output Capacitance	C <sub>oss</sub>		-	70	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	57	-	
<b>Switching Characteristics <sup>(5)</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> = -4.5 V, V <sub>DS</sub> = -15 V, I <sub>D</sub> = -4.2 A,	-	8	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	1.8	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	2.7	-	
Turn-on Delay Time	t <sub>d(ON)</sub>	V <sub>GS</sub> = -10 V, V <sub>DD</sub> = -15 V, I <sub>D</sub> = -4.2 A R <sub>GEN</sub> = 6 Ω	-	7	-	ns
Rise Time	t <sub>r</sub>		-	3	-	
Turn-Off Delay Time	t <sub>d(OFF)</sub>		-	30	-	
Fall Time	t <sub>f</sub>		-	12	-	
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage <sup>(4)</sup>	V <sub>SD</sub>	I <sub>S</sub> = -4.2A, V <sub>GS</sub> = 0 V	-	-	-1.2	V
Continuous Source Current	I <sub>S</sub>	-	-	-	-4.2	A

(4) Pulse Test: Pulse width ≤ 300 μs, duty cycle ≤ 2%.

(5) This value is guaranteed by design hence it is not included in the production test.



## TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. Output Characteristics

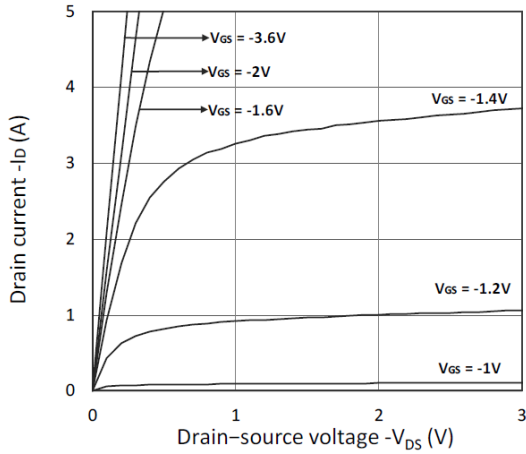


Fig 2. Transfer Characteristics

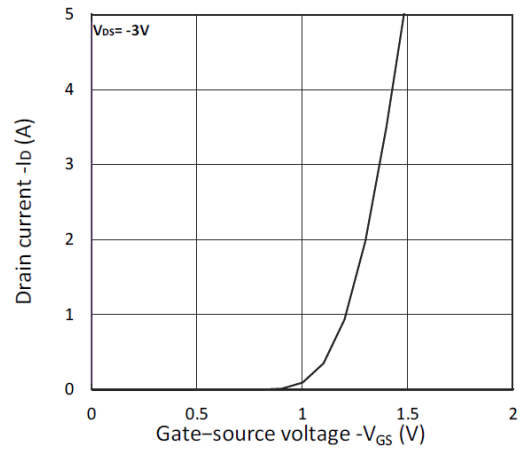


Fig 3. Forward Characteristics of Reverse

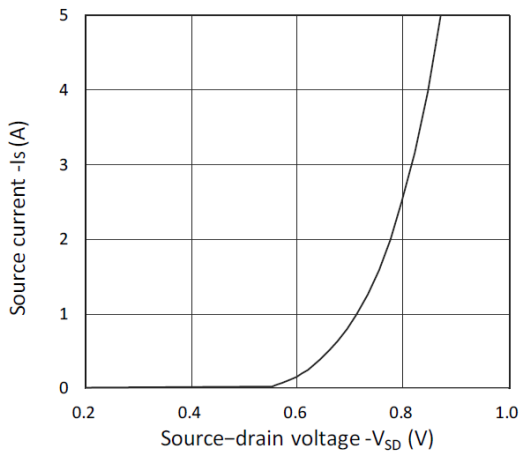


Fig 4.  $R_{DS(ON)}$  vs.  $V_{GS}$

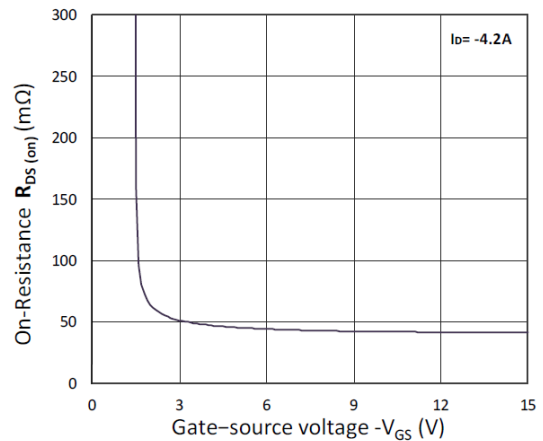


Fig 5.  $R_{DS(ON)}$  vs.  $I_D$

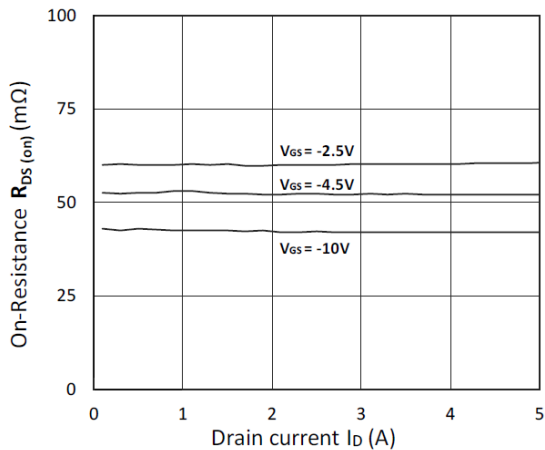


Fig 6. Normalized  $R_{DS(on)}$  vs. Temperature

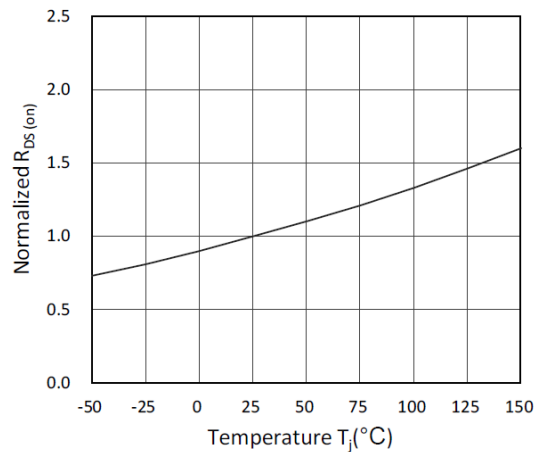




Fig 7. Capacitance Characteristics

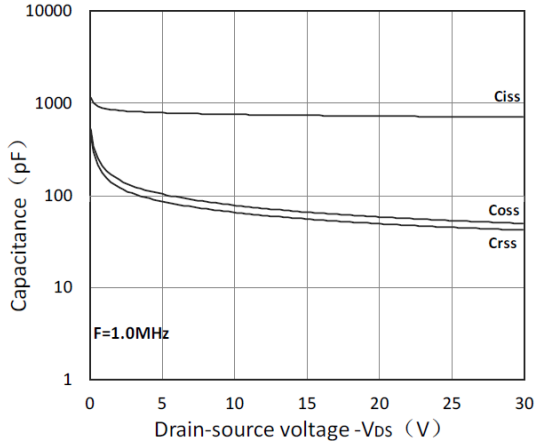


Fig 8. Gate Charge Characteristics

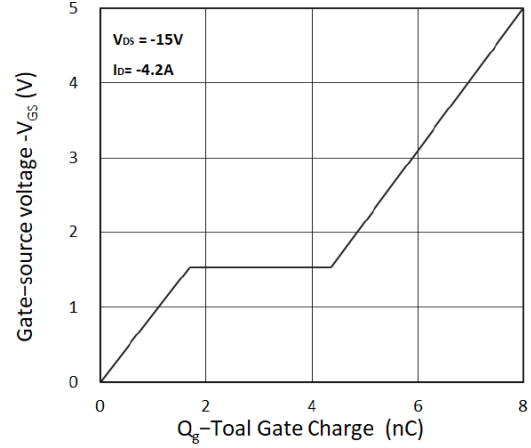


Fig 9. Normalized Maximum Transient Thermal Impedance

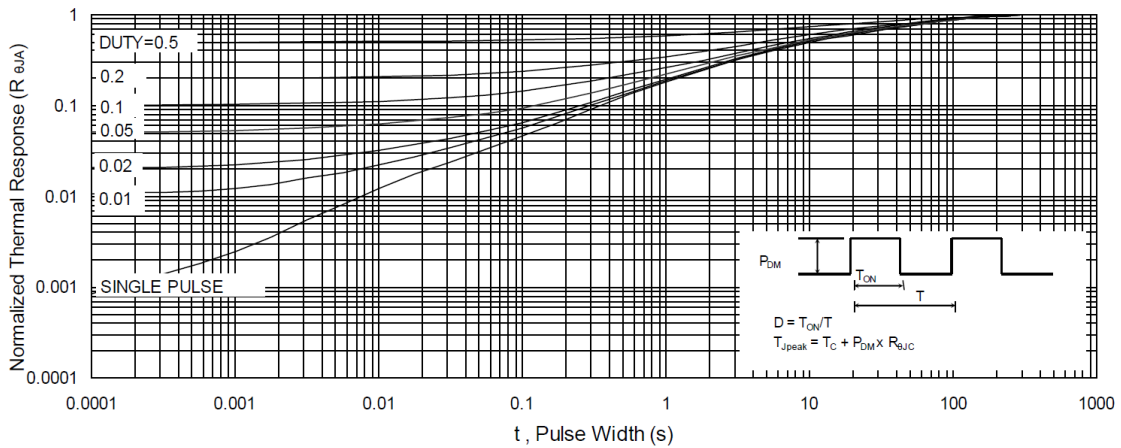


Fig 10. Switching Time Waveform

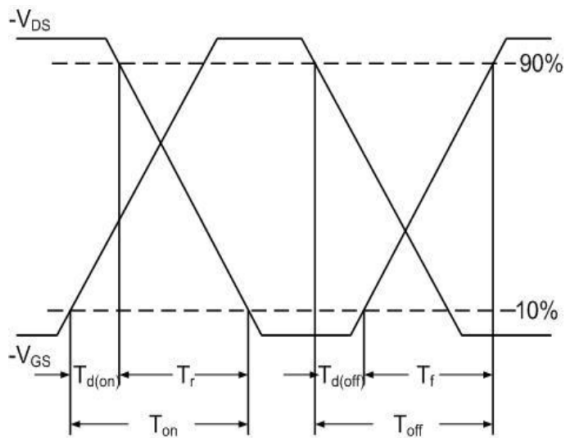
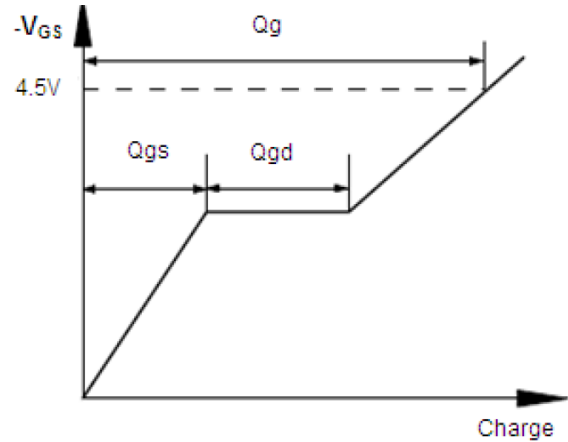


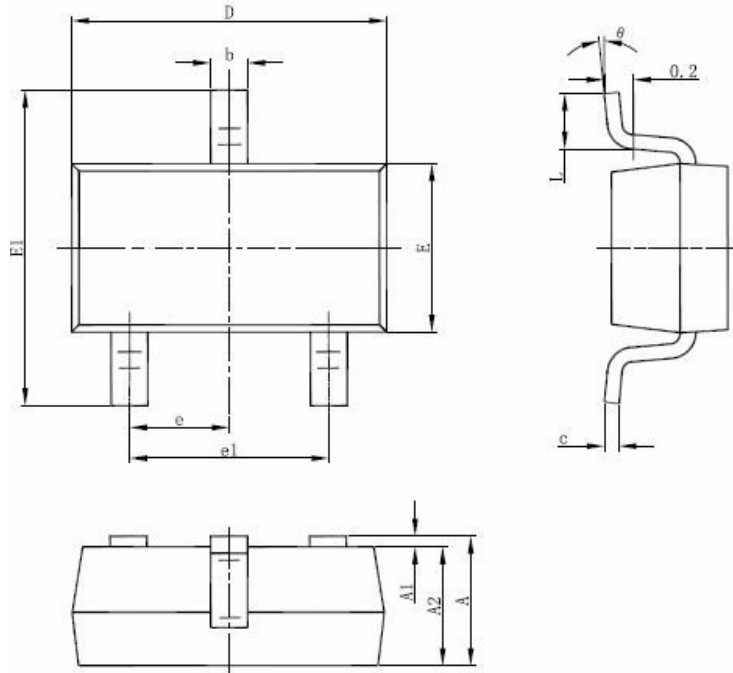
Fig 11. Gate Charge Waveform





**PACKAGE INFORMATION**

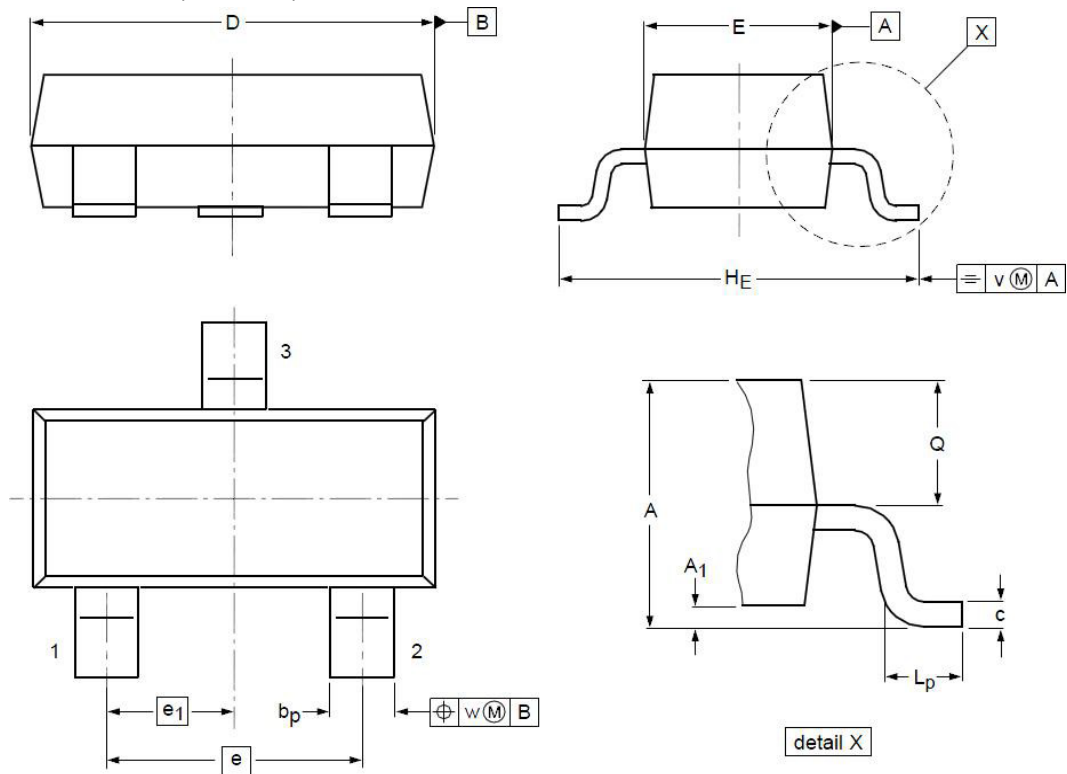
Dimension in SOT-23 (Unit: mm)



Symbol	Millimeters	
	Min.	Max.
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.300	0.500
c	0.100	0.200
D	2.820	3.020
E	1.500	1.700
E1	2.650	2.950
e	0.950 (BSC)	
e1	1.800	2.000
L	0.300	0.600
$\theta$	0°	8°



Dimension in SOT-23S (Unit: mm)



Symbol	Millimeters	
	Min.	Max.
A	0.900	1.150
A1	0.010	0.100
b <sub>p</sub>	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
e	1.900 TYP.	
e <sub>1</sub>	0.950 TYP.	
H <sub>E</sub>	2.250	2.550
L <sub>P</sub>	0.300	0.500
Q	0.450	0.550
v	0.200 TYP.	
w	0.100 TYP.	



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