



## DESCRIPTION

The AM2303 is the P-Channel logic enhancement mode power field effect transistor is produced using high cell density. advanced trench technology to provide excellent  $R_{DS(ON)}$  low gate charge and operation gate as 2.5V.

This device is suitable for use as a load switch or other general applications.

The AM3401 is available in SOT-23 Package

## ORDERING INFORMATION

Package Type	Part Number	
SOT-23	E3	AM2303E3R
		AM2303E3VR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products Suffix " V " means Halogen free Package		

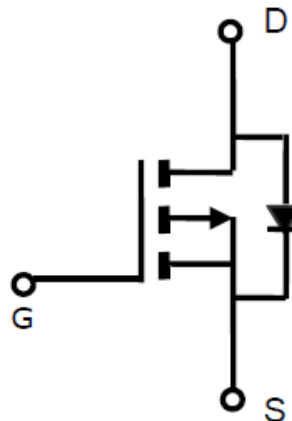
## FEATURES

- -30V/-4.3A,  $R_{DS(ON)} = 50m\Omega$ (typ.)@ $V_{GS} = -10V$
- -30V/-3.5A,  $R_{DS(ON)} = 58m\Omega$ (typ.)@ $V_{GS} = -4.5V$
- -30V/-2.5A,  $R_{DS(ON)} = 73m\Omega$ (typ.)@ $V_{GS} = -2.5V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and Maximum DC current capability
- Available in SOT-23 Package

## APPLICATIONS

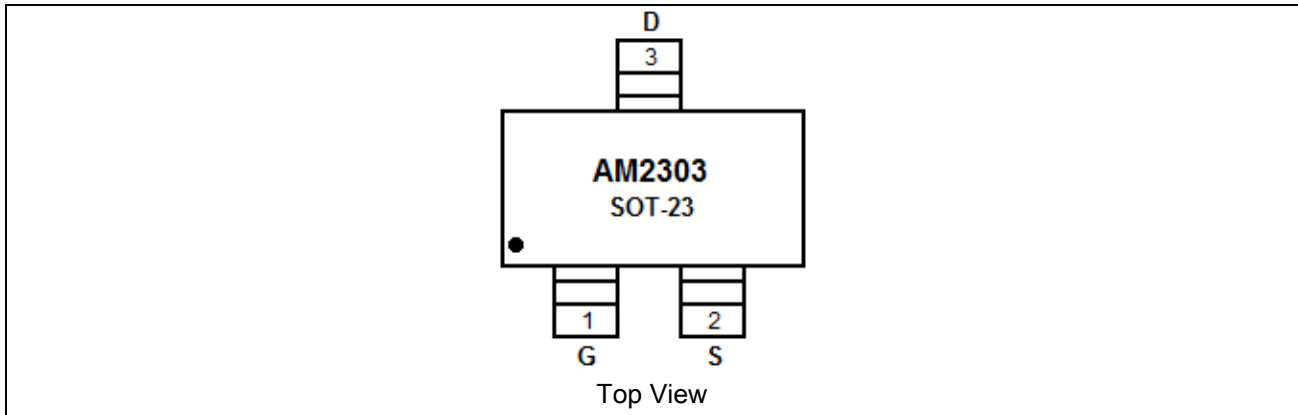
- High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA
- DC/DC Converter
- Load Switch

## P CHANNEL MOSFET





## PIN DESCRIPTION



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



## ABSOLUTE MAXIMUM RATINGS

T<sub>A</sub> = 25°C, unless otherwise noted

V <sub>DSS</sub> , Drain-Source Voltage		-30V
V <sub>GSS</sub> , Gate-Source Voltage		±12V
I <sub>D</sub> , Continuous Drain Current , V <sub>GS</sub> = -10V <sup>NOTE1</sup>	T <sub>c</sub> =25°C	-4.3A
	T <sub>c</sub> =70°C	-3.8A
I <sub>DM</sub> , Pulsed Drain Current <sup>NOTE2</sup>		-20A
P <sub>D</sub> , Power Dissipation	T <sub>A</sub> =25°C	1.25W
	T <sub>A</sub> =70°C	0.8W
T <sub>J</sub> , Operation Junction Temperature		-55°C~150°C
T <sub>STG</sub> , 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 are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

NOTE1: The value of R<sub>θJA</sub> is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with T<sub>A</sub>=25°C.

NOTE2: The data tested by pulsed , pulse width≤300uS , duty cycle≤2%

## THERMAL INFORMATION

Symbol	Max	Unit
R <sub>θJA</sub>	120	°C/W
R <sub>θJL</sub>	80	°C/W



## ELECTRICAL CHARACTERISTICS

T<sub>A</sub> = 25°C, unless otherwise noted

Parameter	Symbol	Conditions	Min	Typ.	Max	Units
<b>Static Parameters</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA	-30	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	-0.6	-	-1.0	V
Gate Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±12V	-	-	±100	nA
Zero Gate Voltage Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V T <sub>J</sub> =25°C	-	-	-1	μA
		V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V T <sub>J</sub> =55°C	-	-	-5	
Drain-source On-Resistance <sup>NOTE2</sup>	R <sub>DS(ON)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-4.3A	-	50	58	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-3.5A	-	58	65	
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-2.5A	-	73	92	
Forward Transconductance	G <sub>FS</sub>	V <sub>DS</sub> =-5V, I <sub>D</sub> =-4.0A	-	10	-	S
<b>Source-Drain Diode</b>						
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =-1.0A, V <sub>GS</sub> =0V	-	-0.7	-1.0	V
Continuous Source Current <sup>NOTE1,3</sup>	I <sub>S</sub>		-	-	-5.6	A
<b>Dynamic Parameters</b>						
Total Gate Charge	Q <sub>G(-4.5V)</sub>	V <sub>DS</sub> =-20V, V <sub>GS</sub> =-4.5V I <sub>D</sub> =-4.0A	-	6.8	-	nC
Gate-Source Charge	Q <sub>GS</sub>		-	3.0	-	
Gate-Drain Charge	Q <sub>GD</sub>		-	3.3	-	
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =-12V, V <sub>GS</sub> =0V f=1MHz	-	681	-	pF
Output Capacitance	C <sub>OSS</sub>		-	290	-	
Reverse Transfer Capacitance	C <sub>RSS</sub>		-	112	-	
Turn-On Time	t <sub>D(ON)</sub>	V <sub>DD</sub> =-12V, I <sub>D</sub> =-4A V <sub>GEN</sub> =-10V, R <sub>G</sub> =3.3Ω	-	10	-	nS
	t <sub>R</sub>		-	16	-	
Turn-Off Time	t <sub>D(OFF)</sub>		-	24	-	
	t <sub>F</sub>		-	22	-	

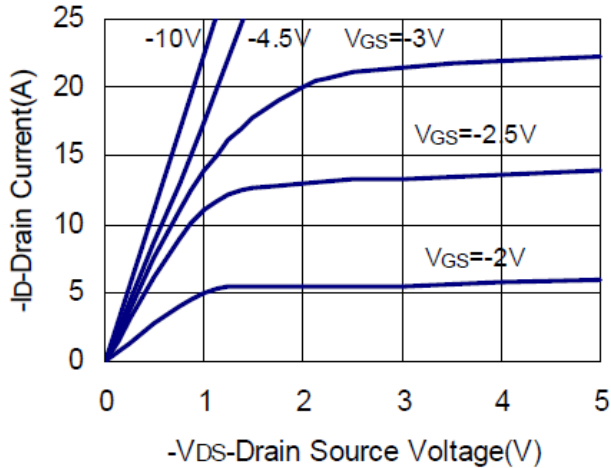
NOTE3: The data is theoretically the same as I<sub>D</sub> and I<sub>DM</sub>, in real applications, should be limited by total power dissipation.



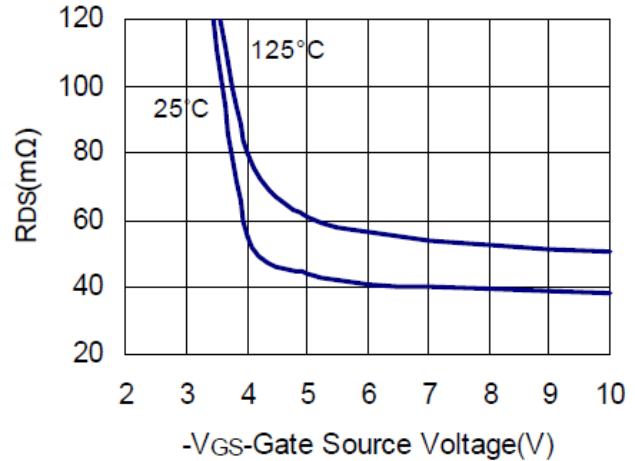
## TYPICAL CHARACTERISTICS

25°C, unless noted

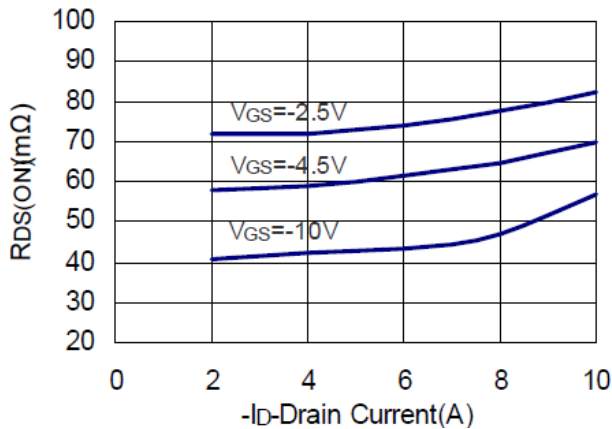
### 1. Output Characteristics



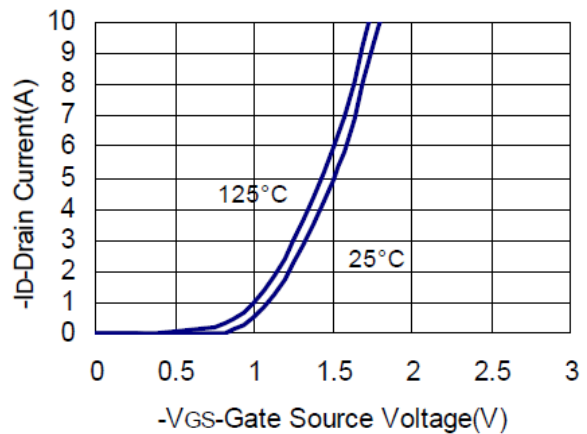
### 2. Drain-Source On Resistance



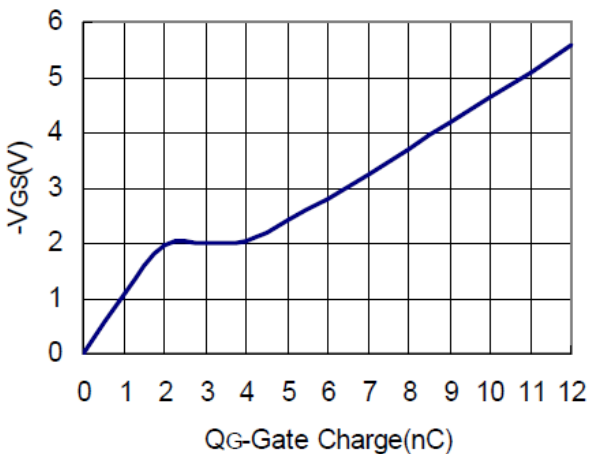
### 3. Drain Source On Resistance



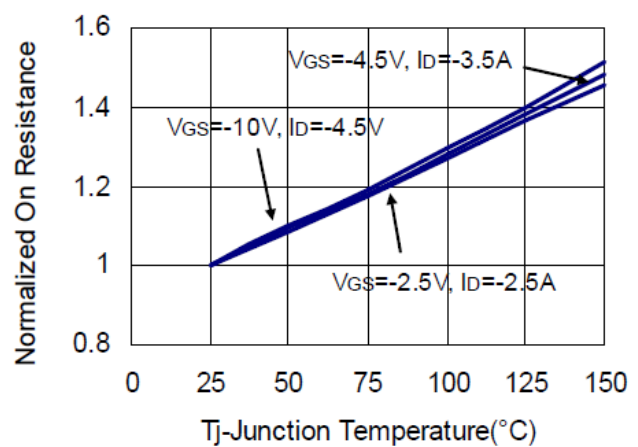
### 4. Transfer Characteristics



### 5. Gate Charge

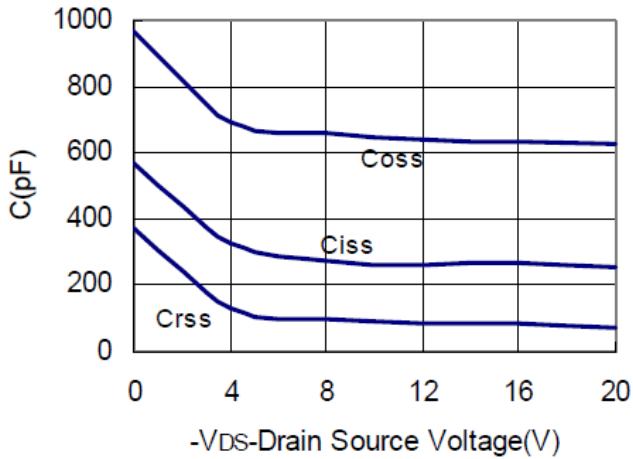


### 6. Drain Source Resistance

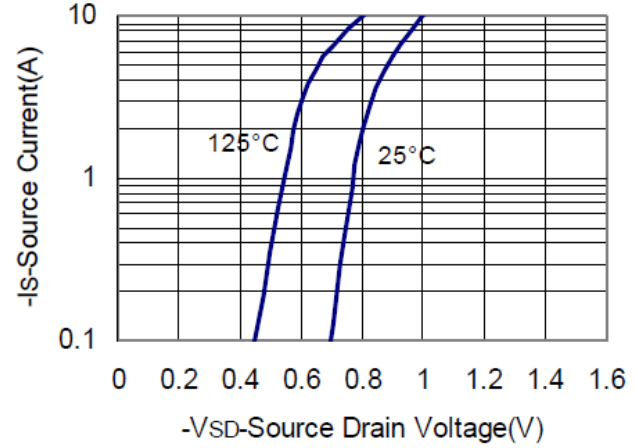




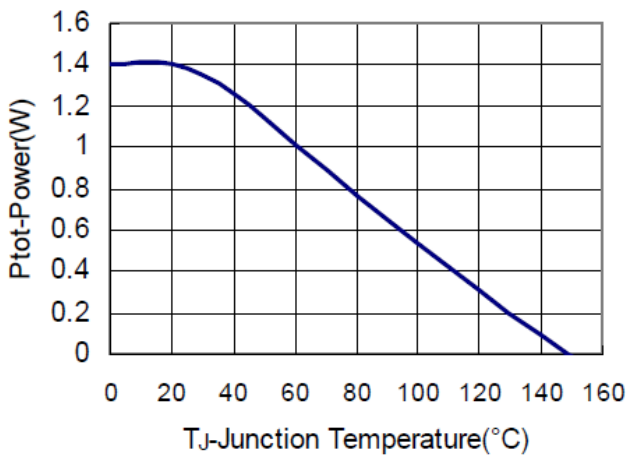
7. Capacitance



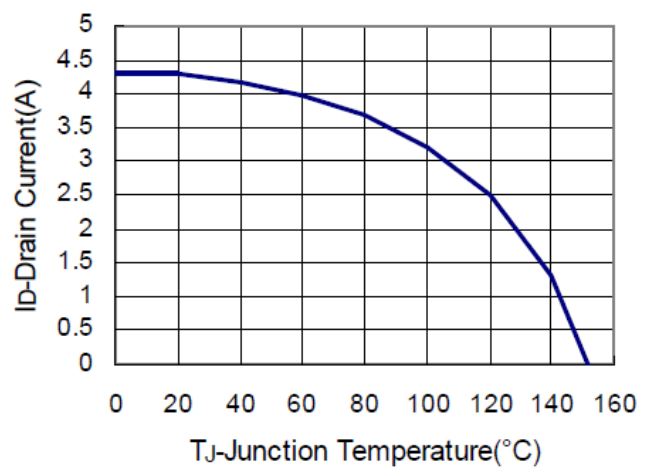
8. Source Drain Diode Forward



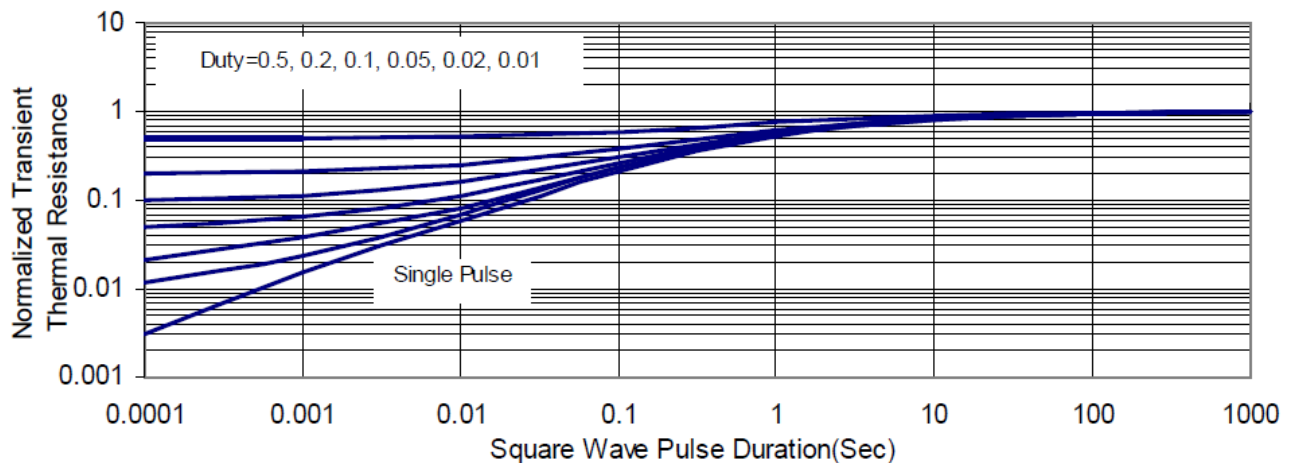
9. Power Dissipation



10. Drain Current



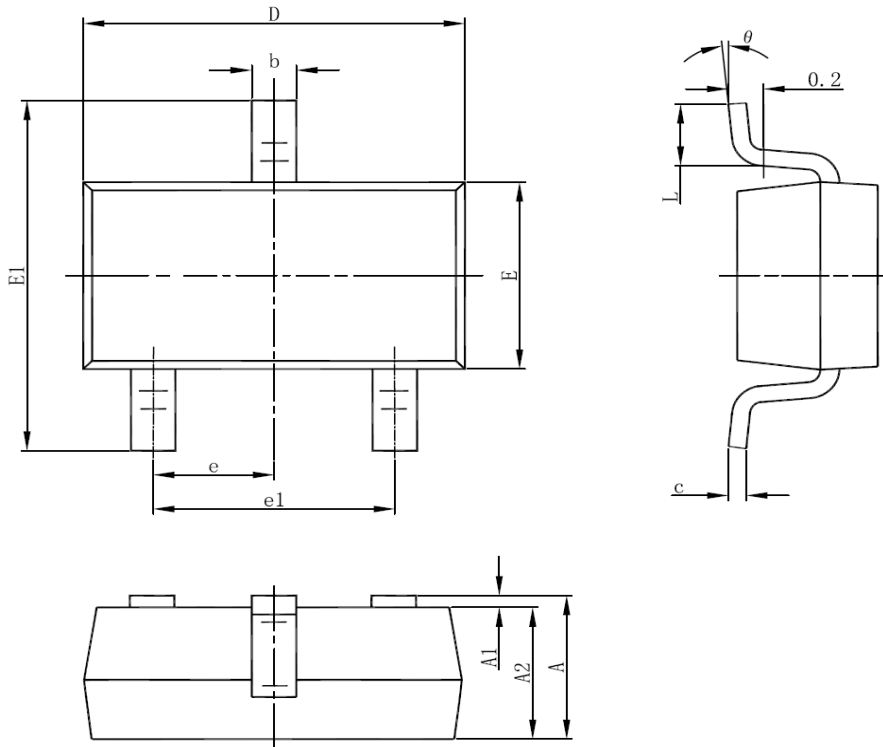
11. Thermal Transient Impedance





## PACKAGE INFORMATION

Dimension in SOT-23 Package (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	0.950(TYP.)	
e1	1.800	2.000
L	0.300	0.500
$\theta$	0°	8°



## IMPORTANT NOTICE

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