



## DESCRIPTION

The AM2N7002K is available in SOT-23 Package

## ORDERING INFORMATION

Package Type	Part Number	
SOT-23	E3	AM2N7002KE3R
		AM2N7002KE3VR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products Suffix " V " means Halogen free Package		

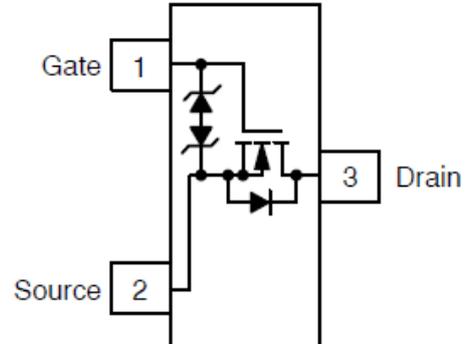
## FEATURES

- ESD Protected
- Low  $R_{DS(ON)}$
- Surface Mount Package
- RoHS Compliant
- Available in SOT-23 package

## APPLICATION

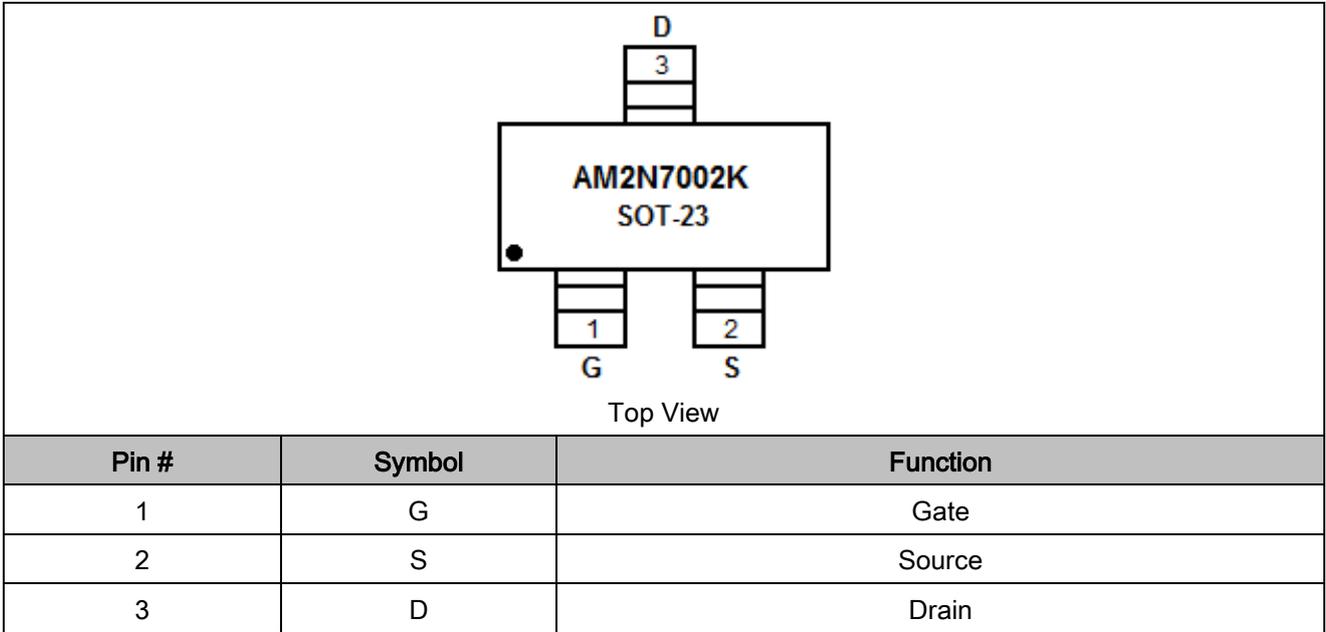
- Low Side Load Switch
- Level Shift Circuits
- DC-DC Converter
- Portable Applications i.e. DSC, PDA, Cell Phone, etc.

## SIMPLIFIED SCHEMATIC





## PIN DESCRIPTION





## ABSOLUTE MAXIMUM RATINGS

T<sub>J</sub> = 25°C, unless otherwise stated

V <sub>DSS</sub> , Drain-to-Source Voltage		60V
V <sub>GS</sub> , Gate-to-Source Voltage		±20 V
I <sub>D</sub> , Drain Current <sup>NOTE1</sup>		
Steady State	T <sub>A</sub> = 25°C	320mA
	T <sub>A</sub> = 85°C	230mA
t < 5 s	T <sub>A</sub> = 25°C	380mA
	T <sub>A</sub> = 85°C	270mA
P <sub>D</sub> , Power Dissipation <sup>NOTE1</sup>		
Steady State		300mW
t < 5 s		420mW
I <sub>DM</sub> , Pulsed Drain Current (t <sub>p</sub> = 10μs)		1.5A
T <sub>J</sub> , T <sub>STG</sub> , Operating Junction and Storage Temperature Range		-55°C ~ +150°C
I <sub>S</sub> , Source Current (Body Diode)		300mA
T <sub>L</sub> , Lead Temperature for Soldering Purposes (1/8" from case for 10s)		260°C
ESD, Gate-Source ESD Rating (HBM, Method 3015)		2kV

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.

## THERMAL CHARACTERISTICS

Parameter	Symbol	Max.	Unit
Junction-to-Ambient - Steady State <sup>NOTE1</sup>	R <sub>θJA</sub>	417	°C/W
Junction-to-Ambient - t ≤ 5s <sup>NOTE1</sup>	R <sub>θJA</sub>	300	°C/W

NOTE1: Surface-mounted on FR4 board using 1 in sq pad size (Cu area = 1.127 in sq [1 oz] including traces)



## ELECTRICAL CHARACTERISTICS

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-to-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0, I <sub>D</sub> = 250μA	60			V
Drain-to-Source Breakdown Voltage Temperature Coefficient	V <sub>(BR)DSS</sub> / T <sub>J</sub>			71		mV/°C
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 60V	T <sub>J</sub> = 25°C		1	μA
			T <sub>J</sub> = 125°C		500	
		V <sub>GS</sub> = 0V, V <sub>DS</sub> = 50V	T <sub>J</sub> = 25°C			100
Gate-to-Source Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±20 V			±10	μA
<b>ON CHARACTERISTICS</b> NOTE2						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = 250μA	1.0		2.5	V
Negative Threshold Temperature Coefficient	V <sub>GS(TH)</sub> / T <sub>J</sub>			4.0		mV/°C
Drain-to-Source On Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 500mA			1.8	Ω
		V <sub>GS</sub> = 5.0V, I <sub>D</sub> = 50mA			2.5	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> = 5V, I <sub>D</sub> = 200mA		80		S
<b>CHARGES AND CAPACITANCES</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>GS</sub> = 0V,		32.8		pF
Output Capacitance	C <sub>OSS</sub>	f = 1.0MHz,		5.4		
Reverse Transfer Capacitance	C <sub>RSS</sub>	V <sub>DS</sub> = 25V		2.9		
Total Gate Charge	Q <sub>G(TOT)</sub>	V <sub>GS</sub> = 45V, V <sub>DS</sub> = 10V I <sub>D</sub> = 200mA		0.7		nC
Threshold Gate Charge	Q <sub>G(TH)</sub>			0.1		
Gate-to-Source Charge	Q <sub>GS</sub>			0.3		
Gate-to-Drain Charge	Q <sub>GD</sub>			0.1		
<b>SWITCHING CHARACTERISTICS</b> NOTE3						
Turn-On Delay Time	t <sub>d(ON)</sub>	V <sub>GS</sub> = 10V, V <sub>DD</sub> = 10V, I <sub>D</sub> = 500mA		9.9		ns
Rise Time	t <sub>r</sub>			5.0		
Turn-Off Delay Time	t <sub>d(OFF)</sub>			39.4		
Fall Time	t <sub>f</sub>			17.9		
<b>DRAIN-SOURCE DIODE CHARACTERISTICS</b>						
Forward Diode Voltage	V <sub>SD</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> = 115mA	T <sub>J</sub> = 25°C		1.4	V
			T <sub>J</sub> = 85°C		0.7	

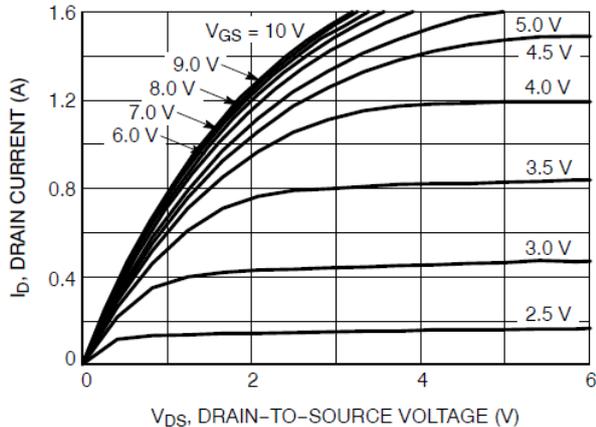
NOTE2: Pulse Test: pulse width ≤ 300 us, duty cycle ≤ 2%

NOTE3: Switching characteristics are independent of operating junction temperatures

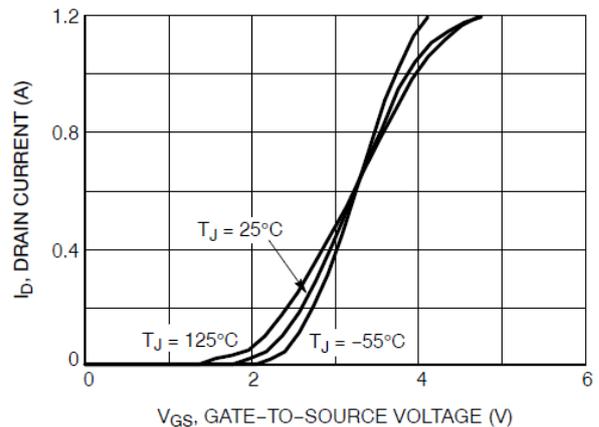


## TYPICAL PERFORMANCE CHARACTERISTICS

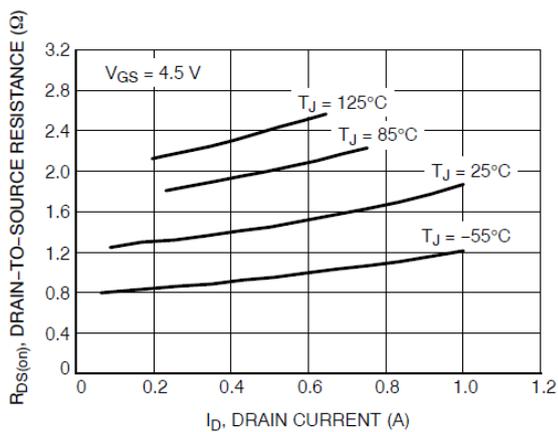
### 1. On-Region Characteristics



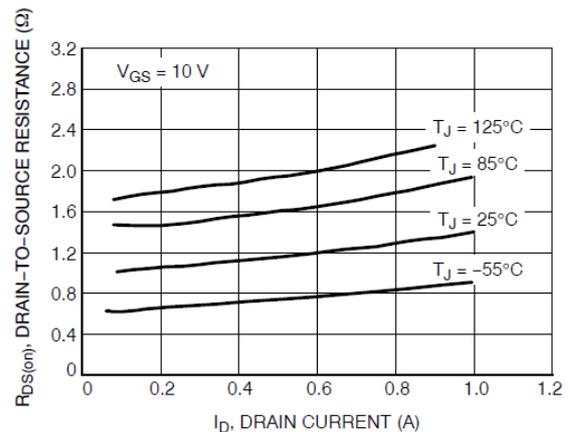
### 2. Transfer Characteristics



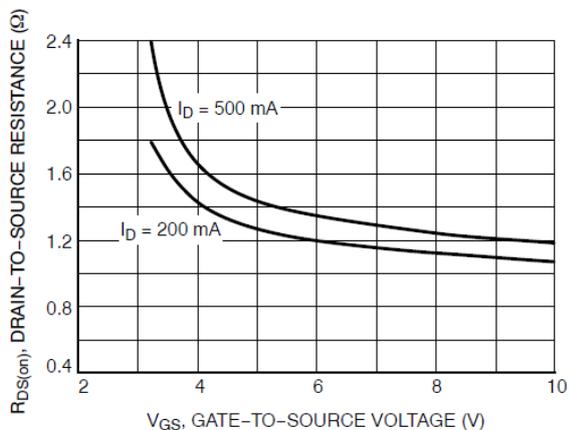
### 3. On-Resistance vs. Drain Current and Temperature



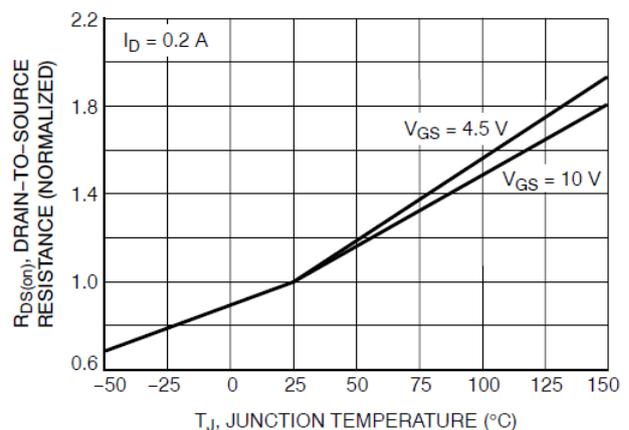
### 4. On-Resistance vs. Drain Current and Temperature



### 5. On-Resistance vs. Gate-to-Source Voltage

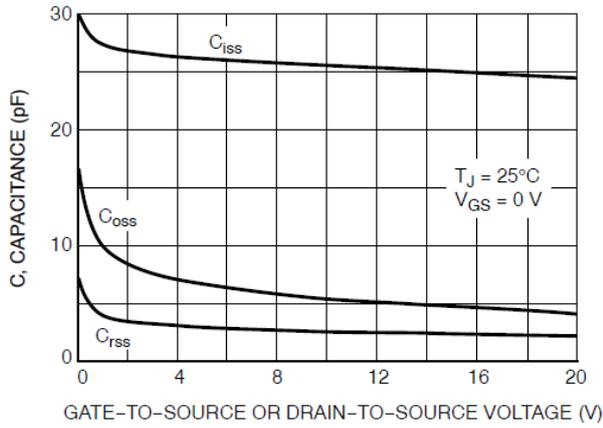


### 6. On-Resistance Variation with Temperature

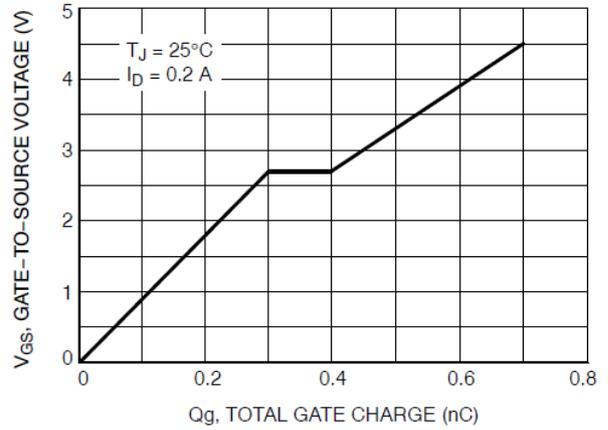




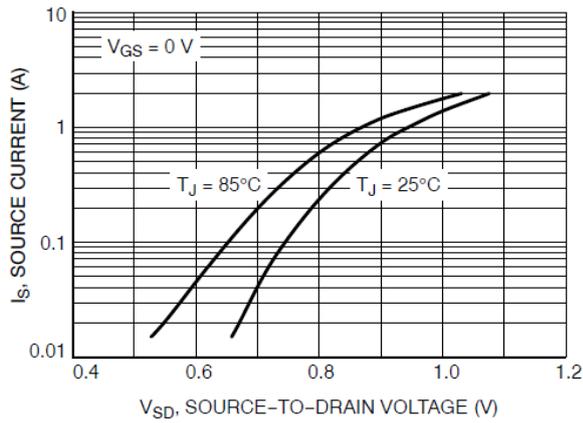
7. Capacitance Variation



8. Gate-to-Source and Drain-to-Source Voltage vs. Total Charge



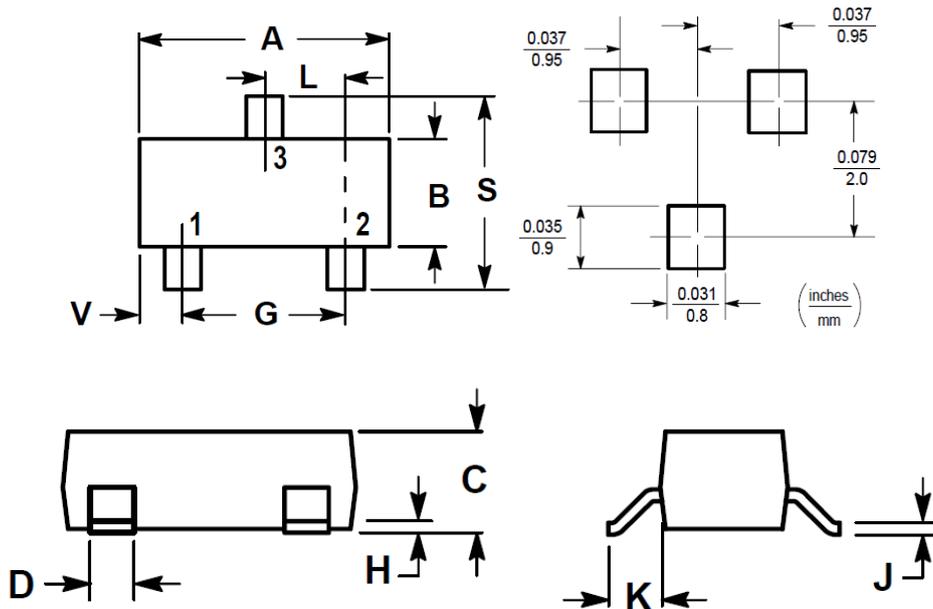
9. Diode Forward Voltage vs. Current





**PACKAGE INFORMATION**

Dimension in SOT-23 Package (Unit: mm)



SYMBOL	MIN	MAX
A	2.80	3.04
B	1.20	1.40
C	0.89	1.11
D	0.37	0.50
G	1.78	2.04
H	0.013	0.10
J	0.085	0.177
K	0.35	0.69
L	0.89	1.02
S	2.10	2.64
V	0.45	0.60



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