DESCRIPTION

The AM6003 is available in SOT-23 Package

BVDSS	RDSON	ID
60V	78mΩ	3A

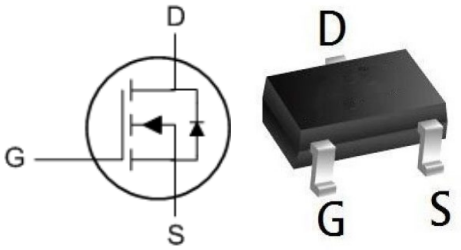
FEATURE

- Super Low Gate Charge
- $R_{DS(ON)}$ = 78mΩ(Typ.) @V_{GS}=10V
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

APPLICATION

- Small Power Switching and Load Switching applications

PIN DESCRIPTION



SOT-23

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

ORDERING INFORMATION

Package Type	Part Number	
SOT-23 SPQ: 3,000pcs/Reel	E3	AM6003E3R
		AM6003E3VR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products		

ABSOLUTE MAXIMUM RATINGS

T_A = 25°C, unless otherwise specified.

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, V_{GS} @ 10V (1)	I_D@T_A=25℃	3.0	A
Continuous Drain Current, V_{GS} @ 10V (1)	I_D@T_A=70℃	1.8	A
Pulsed Drain Current (2)	I_{DM}	9.2	A
Total Power Dissipation (3)	P_D@T_A=25℃	1	W
Storage Temperature Range	T_{STG}	-55 to 150	℃
Operating Junction Temperature Range	T_J	-55 to 150	℃
Thermal Resistance Junction-Ambient (1)	$R_{\theta JA}$	125	°C/W
Thermal Resistance Junction-Case (1)		80	

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 a 1 inch^2 FR-4 board with 2OZ copper.

(2) The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

(3) The power dissipation is limited by 150℃ junction temperature.

ELECTRICAL CHARACTERISTICS

T_A = 25°C, unless otherwise specified.

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250uA	60	-	-	V
BVDSS Temperature Coefficient	$\triangle BV_{DSS}/\triangle T_J$	Reference to 25℃ , I_D=1mA	-	0.054	-	V/℃
Static Drain-Source On-Resistance (2)	$R_{DS(ON)}$	V_{GS}=10V, I_D=2A	-	78	105	mΩ
		V_{GS}=4.5V, I_D=1A	-	85	110	
Gate Threshold Voltage	$V_{GS\ (th)}$	V_{GS}=V_{DS}, I_D =250uA	1.2	-	2.5	V
V_{GS} (th) Temperature Coefficient	$\triangle V_{GS\ (th)}$		-	-4.96	-	mV/℃
Drain-Source Leakage Current	I_{DSS}	V_{DS}=48V , V_{GS}=0V , T_J=25℃	-	-	1	uA
		V_{DS}=48V , V_{GS}=0V , T_J=55℃	-	-	5	
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Forward Transconductance	gfs	V_{DS}=5V, I_D=2A	-	13	-	S
Total Gate Charge (4.5V)	Q_g	V_{DS}=48V, V_{GS}=4.5V, I_D=2A	-	5	7.0	nC
Gate-Source Charge	Q_{gs}		-	1.68	2.4	
Gate-Drain Charge	Q_{gd}		-	1.9	2.7	
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=30V , V_{GS}=10V , R_G=3.3Ω, I_D=2A	-	1.6	3.2	ns
Rise Time	T_r		-	7.2	13	
Turn-Off Delay Time	$T_{d(off)}$		-	25	50	
Fall Time	T_f		-	14.4	28.8	
Input Capacitance	C_{iss}	V_{DS}=15V, V_{GS}=0V, f=1MHz	-	511	715	pF
Output Capacitance	C_{oss}		-	38	53	
Reverse Transfer Capacitance	C_{rss}		-	25	35	
Diode Characteristics						
Continuous Source Current (1)(4)	I_S	V_G=V_D=0V, Force Current	-	-	2.3	A
Pulsed Source Current (2)(4)	I_{SM}		-	-	9.2	A
Diode Forward Voltage (2)	V_{SD}	V_{GS}=0V , I_S=1A , T_J=25℃	-	-	1.2	V
Reverse Recovery Time	t_{rr}	I_F=2A , dI/dt=100A/μs , T_J=25℃	-	9.7	-	nS
Reverse Recovery Charge	Q_{rr}		-	5.8	-	nC

(1) The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.

(2) The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

(4) The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.

TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. Typical Output Characteristics

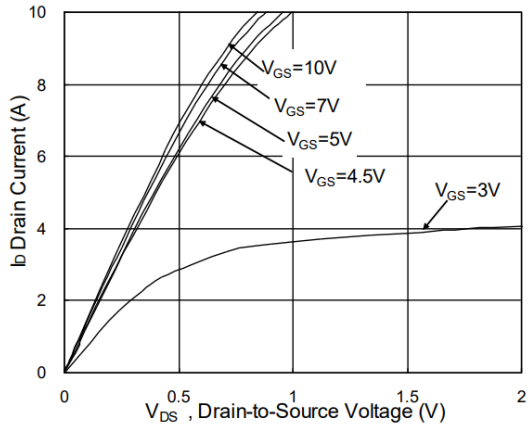


Fig 2. On-Resistance vs Gate-Source

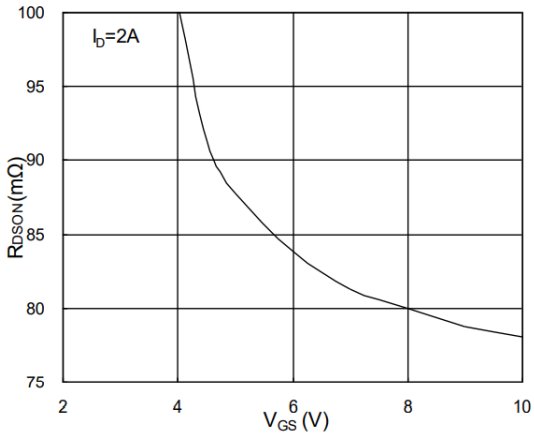


Fig 3. Forward Characteristics of Reverse

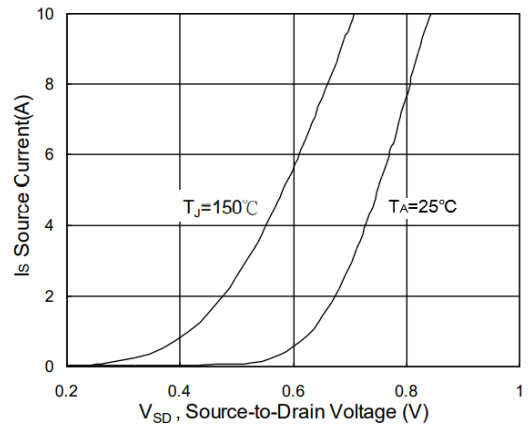


Fig 4. Gate-Charge Characteristics

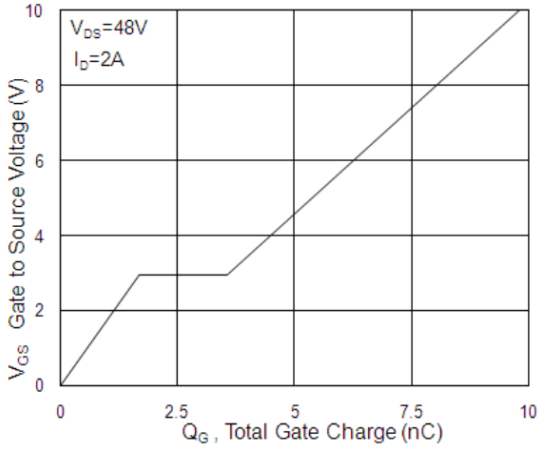


Fig 5. Normalized V_{GS} (th) vs T_J

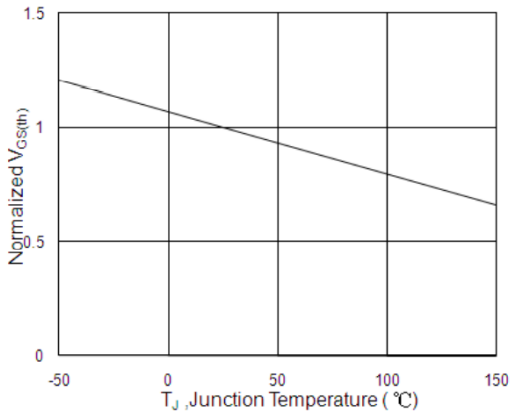


Fig 6. Normalized R_{DSON} vs T_J

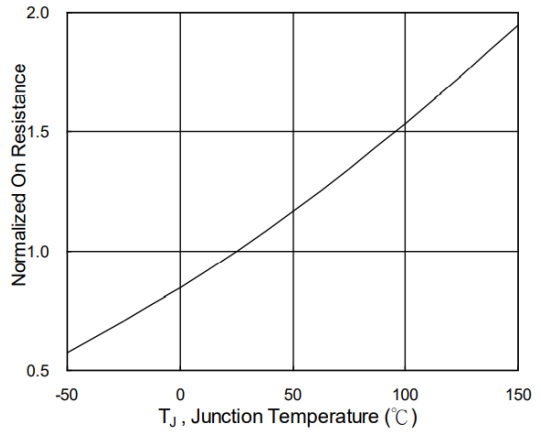


Fig 7. Capacitance

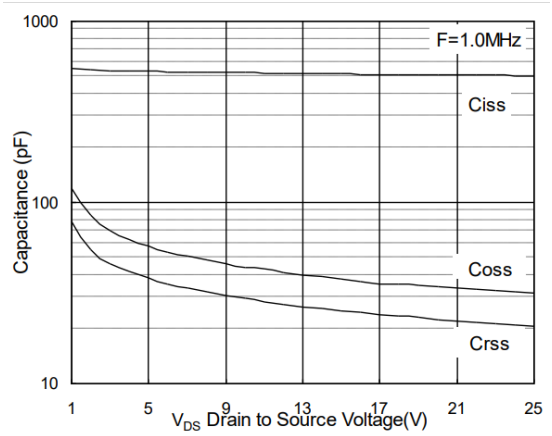


Fig 8. Safe Operating Area

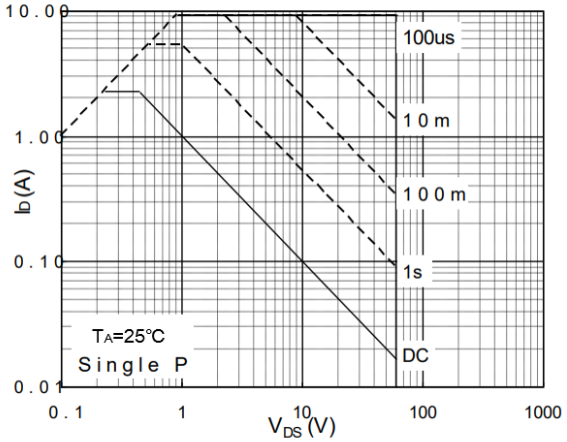


Fig 9. Maximum Safe Operation Area

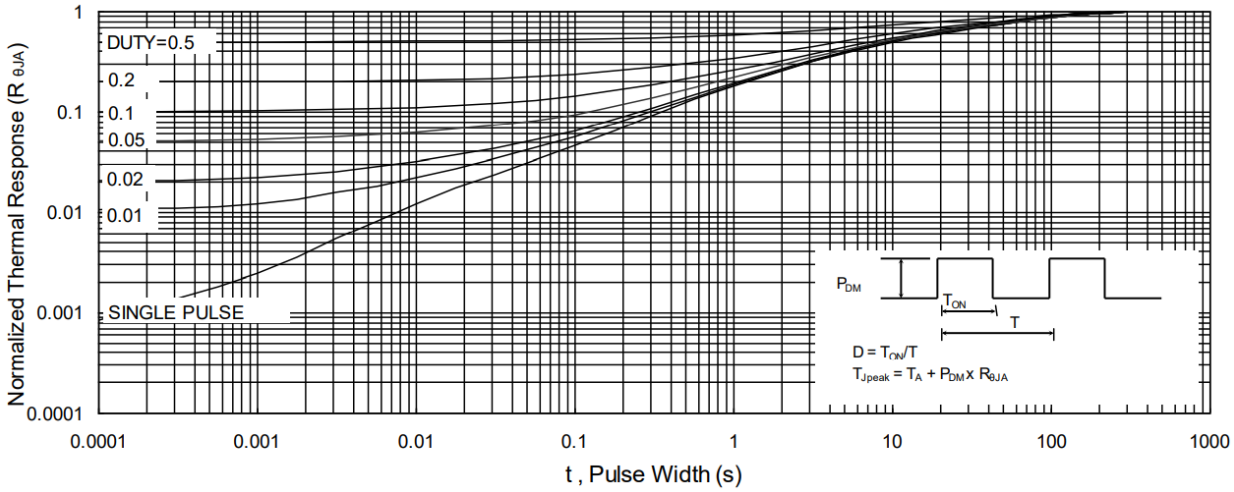


Fig 10. Switching Time Waveform

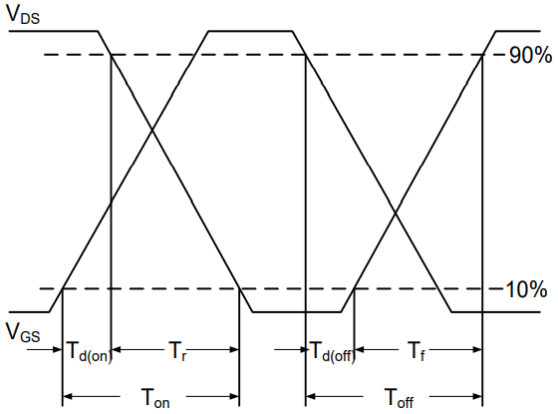
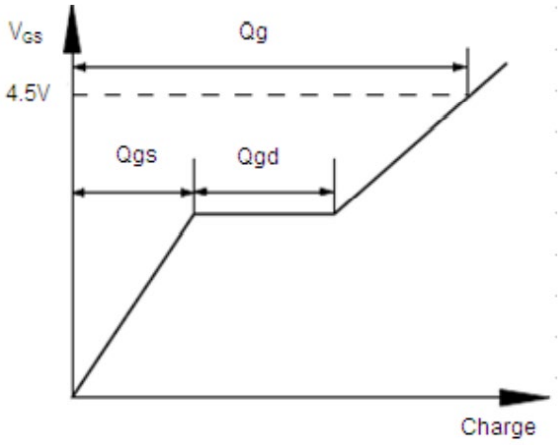
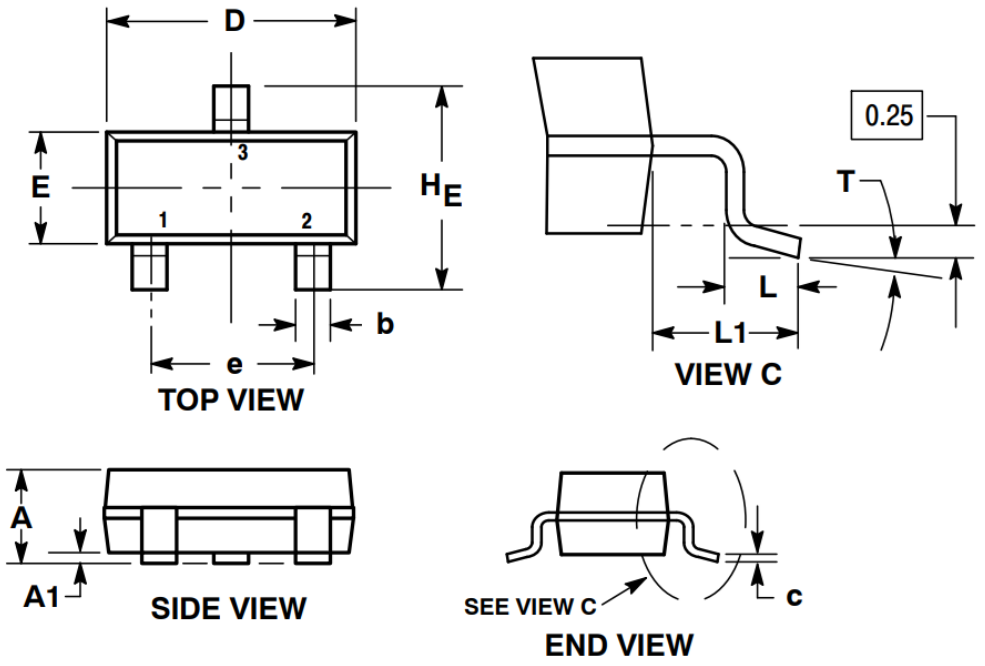


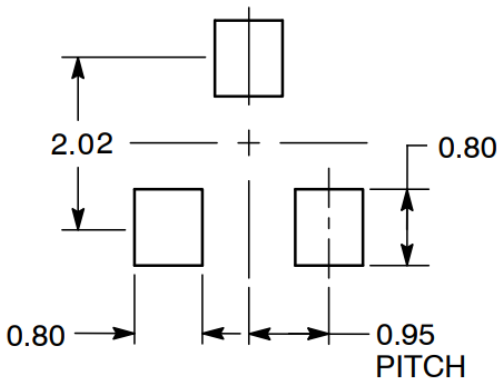
Fig 11. Gate Charge Waveform



PACKAGE INFORMATION

Dimension in SOT-23 (Unit: mm)





RECOMMENDED SOLDERING FOOTPRINT

Symbol	Min	Max
A	0.90	1.15
A1	0.00	0.10
b	0.30	0.50
c	0.08	0.15
D	2.80	3.00
E	1.20	1.40
e	1.80	2.00
L	0.30	0.50
L1	0.55 REF	
H_E	2.25	2.55
θ	0°	8°

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