



DESCRIPTION

The AM6003 is available in SOT-23 Package

BVDSS	RDS(ON)	ID
60V	78mΩ	3A

APPLICATION

- Small Power Switching and Load Switching applications

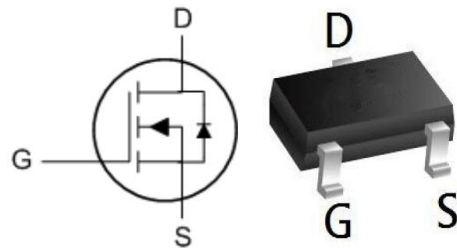
ORDERING INFORMATION

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

FEATURE

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

PIN DESCRIPTION



SOT-23

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



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°C	3.0	A
Continuous Drain Current, V _{GS} @ 10V ⁽¹⁾	I _D @T _A =70°C	1.8	A
Pulsed Drain Current ⁽²⁾	I _{DM}	9.2	A
Total Power Dissipation ⁽³⁾	P _D @T _A =25°C	1	W
Storage Temperature Range	T _{STG}	-55 to 150	°C
Operating Junction Temperature Range	T _J	-55 to 150	°C
Thermal Resistance Junction-Ambient ⁽¹⁾	R _{θJA}	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 inch² 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°C 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	Δ BV _{DSS} / Δ T _J	Reference to 25°C , I _D =1mA	-	0.054	-	V/°C
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	Δ V _{GS (th)}		-	-4.96	-	mV/°C
Drain-Source Leakage Current	I _{DSS}	V _{DS} =48V , V _{GS} =0V , T _J =25°C	-	-	1	uA
		V _{DS} =48V , V _{GS} =0V , T _J =55°C	-	-	5	
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
Forward Transconductance	g _{fs}	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°C	-	-	1.2	V
Reverse Recovery Time	t _{rr}	I _F =2A , dI/dt=100A/μs ,	-	9.7	-	nS
Reverse Recovery Charge	Q _{rr}	T _J =25°C	-	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

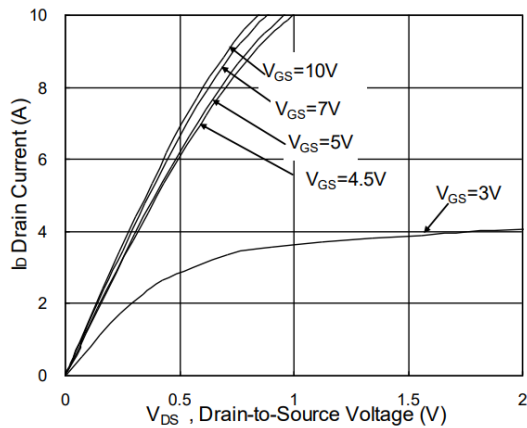


Fig 2. On-Resistance vs Gate-Source

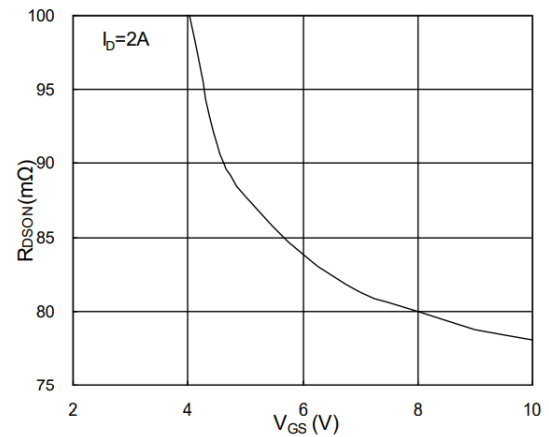


Fig 3. Forward Characteristics of Reverse

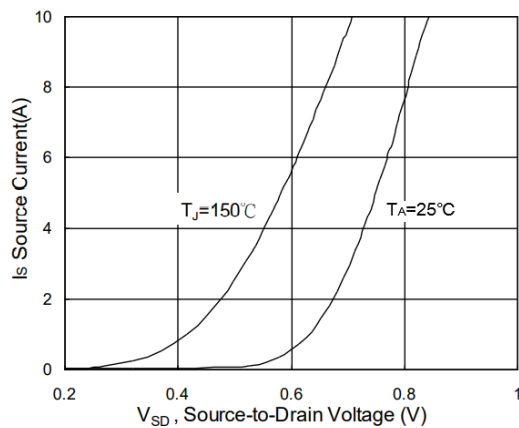


Fig 4. Gate-Charge Characteristics

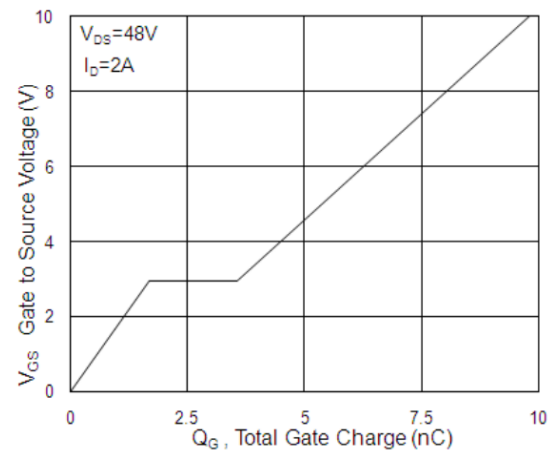


Fig 5. Normalized $V_{GS(th)}$ vs T_J

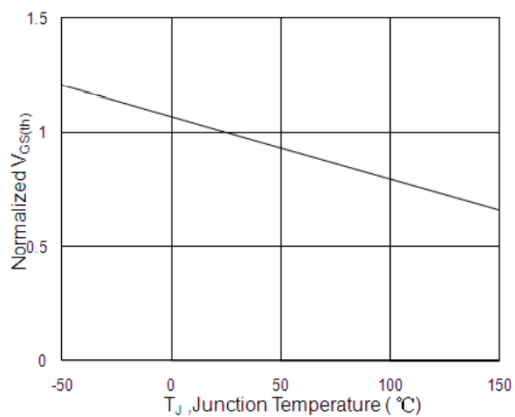


Fig 6. Normalized $R_{DS(on)}$ vs T_J

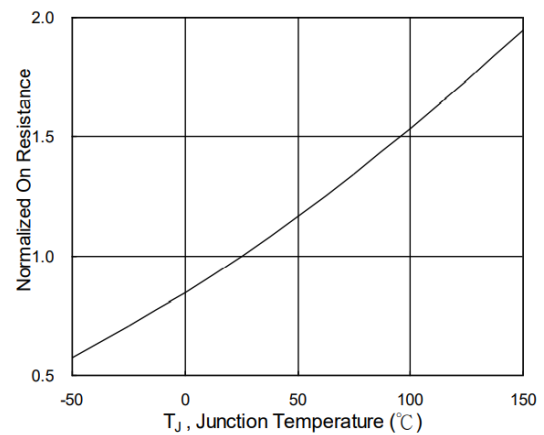




Fig 7. Capacitance

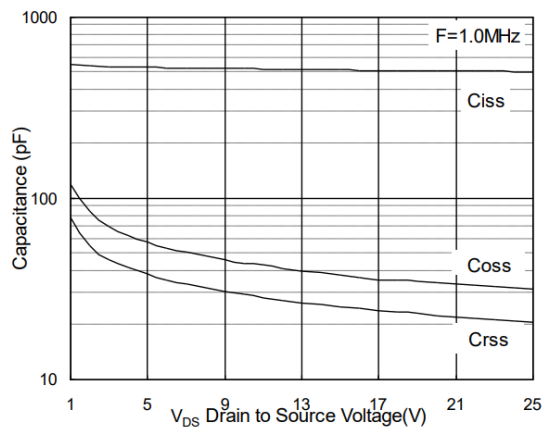


Fig 8. Safe Operating Area

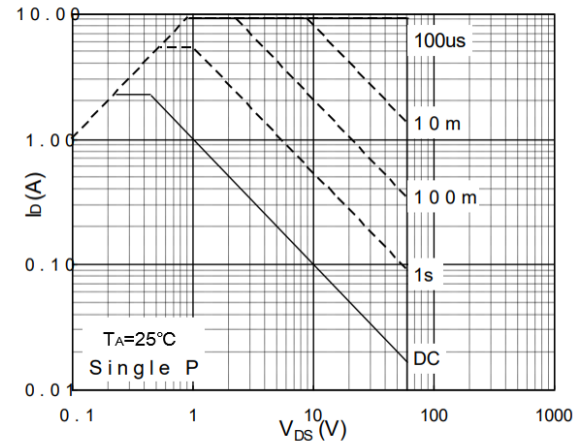


Fig 9. Maximum Safe Operation Area

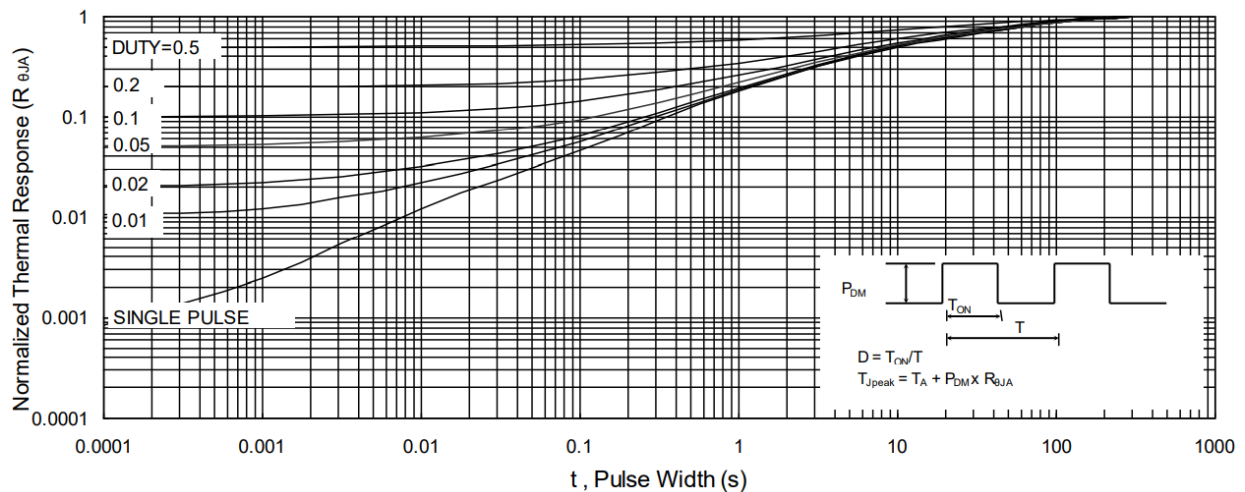


Fig 10. Switching Time Waveform

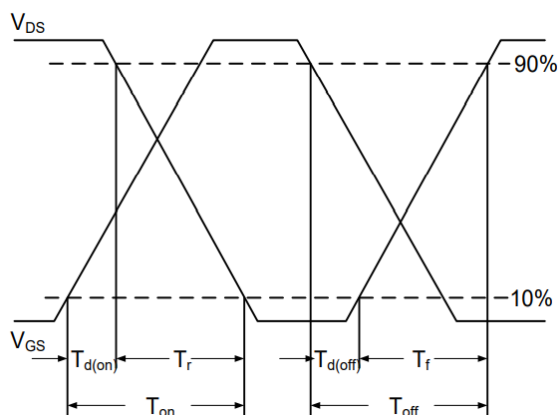
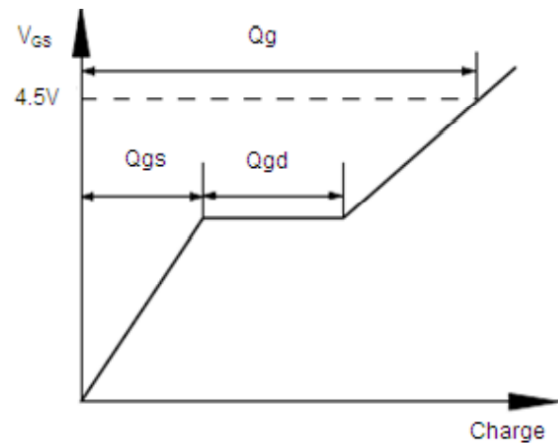


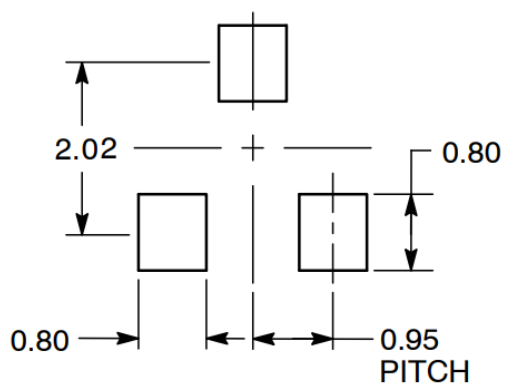
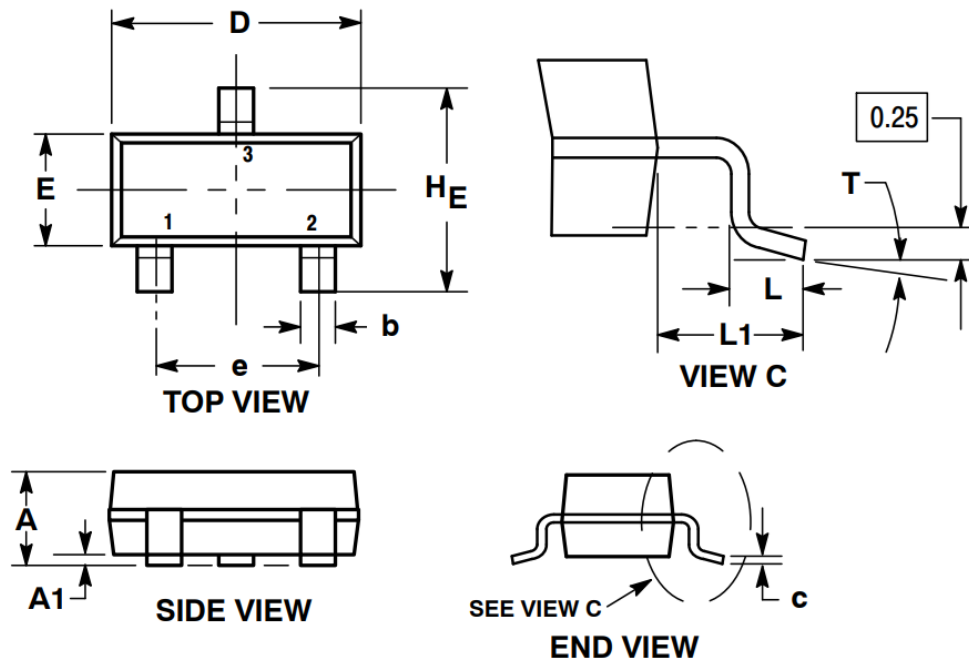
Fig 11. Gate Charge Waveform





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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