Dual N-CH60V Fast Switching MOSFETs

❖ GENERAL DESCRIPTION

The AMS6204 is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The AMS6204 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

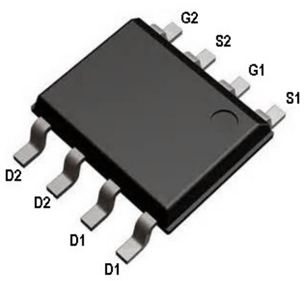
❖ FEATURES

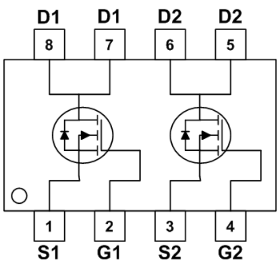
- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

Product Summery

BVDSS	RDSON	ID
60V	30mΩ	4.8A

Dual SOP8 Pin configuration





❖ ORDER/MARKING INFORMATION

Order Information	Top Marking
AMS6204 X X Package Type: S: SOP-8L Packing: Blank : Bag; A : Taping	**AM**6 2 0 4 → Part number YYWWX → ID code:internal WW:01~26 (A~Z), 27~52 (a~z) Year: 11=2011, 12=2012 … 19=2019

❖ ABSOLUTE MAXIMUM RATINGS

Characteristics	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, V_{GS} @ 10V (Note 1)	I_D@T_A=25°C	4.8	A
Continuous Drain Current, V_{GS} @ 10V (Note 1)	I_D@T_A=70°C	3.8	A
Pulsed Drain Current (Note 2)	I_{DM}	9.6	A
Single Pulse Avalanche Energy (Note 3)	EAS	34.5	mJ
Avalanche Current	I_{AS}	22.6	A
Total Power Dissipation (Note 4)	P_D@T_A=25°C	1.5	W
Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 150	°C
Thermal Resistance Junction-Ambient (Note 1)	$R_{\theta JA}$	85	°C/W
Thermal Resistance Junction-Case (Note 1)	$R_{\theta JC}$	36	°C/W

Note 1: The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
Note 2: The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
Note 3: The EAS data shows Max. rating. The test condition is V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=22.6A
Note 4: The power dissipation is limited by 150°C junction temperature
Note 5: The Min. value is 100% EAS tested guarantee.
Note 6: The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.

❖ ELECTRICAL CHARACTERISTICS

(T_J=25 °C, unless otherwise noted)

Characteristics	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V , I_D=250uA	60	-	-	V
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C, I_D=1mA	-	0.063	-	V/°C
Static Drain-Source On-Resistance (Note 2)	$R_{DS(ON)}$	V_{GS}=10V , I_D=4A	-	25	30	mΩ
		V_{GS}=4.5V , I_D=2A	-	30	38	
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =250uA	1.2	-	2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	-5.24	-	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	gfs	V_{DS}=5V , I_D=4A	-	21	---	S
Gate Resistance	R_g	V_{DS}=0V , V_{GS}=0V , f=1MHz	-	3.2	6.4	Ω
Total Gate Charge (4.5V)	Q_g	V_{DS}=48V , V_{GS}=4.5V, I_D=4A	-	12.6	-	nC
Gate-Source Charge	Q_{gs}		-	3.2	-	
Gate-Drain Charge	Q_{gd}		-	6.3	-	
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=30V , V_{GS}=10V, R_G=3.3Ω, I_D=4A	-	8	-	ns
Rise Time	T_r		-	14.2	-	
Turn-Off Delay Time	$T_{d(off)}$		-	24.4	-	
Fall Time	T_f		-	4.6	-	
Input Capacitance	C_{iss}	V_{DS}=15V , V_{GS}=0V , f=1MHz	-	1378	-	pF
Output Capacitance	C_{oss}		-	86	-	
Reverse Transfer Capacitance	C_{rss}		-	64	-	
Guaranteed Avalanche Characteristics						
Single Pulse Avalanche Energy (Note 5)	EAS	V_{DD}=25V , L=0.1mH , I_{AS}=15A	15.2	-	-	mJ
Diode Characteristics						
Continuous Source Current (Note 1, 6)	I_S	V_G=V_D=0V , Force Current	-	-	4.8	A
Pulsed Source Current (Note 2, 6)	I_{SM}		-	-	9.6	A
Diode Forward Voltage (Note 2)	V_{SD}	V_{GS}=0V , I_S=1A , T_J=25°C	-	-	1.2	V

Note 1: The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
Note 2: The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
Note 3: The EAS data shows Max. rating. The test condition is V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=22.6A
Note 4: The power dissipation is limited by 150°C junction temperature
Note 5: The Min. value is 100% EAS tested guarantee.
Note 6: The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.

❖ TYPICAL CHARACTERISTICS

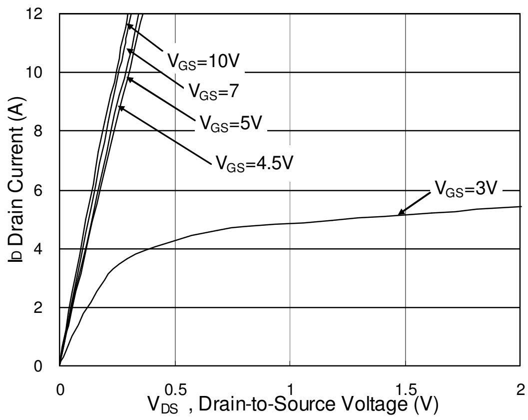


Fig.1 Typical Output Characteristics

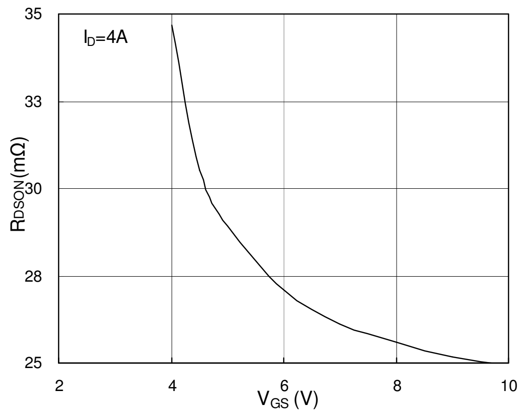


Fig.2 On-Resistance v.s Gate-Source

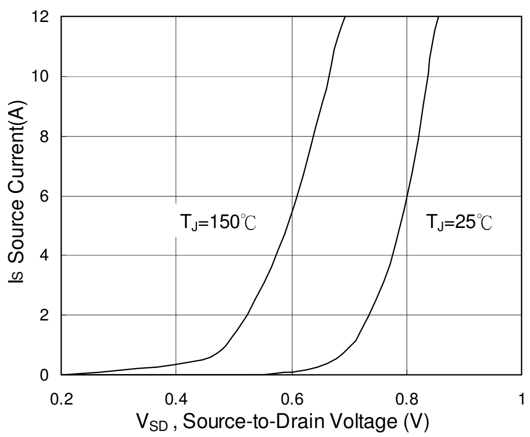


Fig.3 Forward Characteristics of Reverse

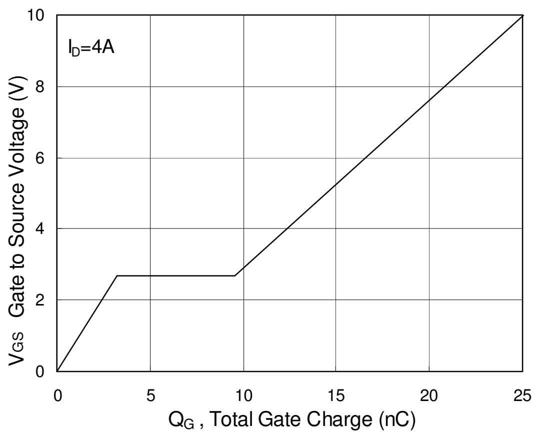


Fig.4 Gate-Charge Characteristics

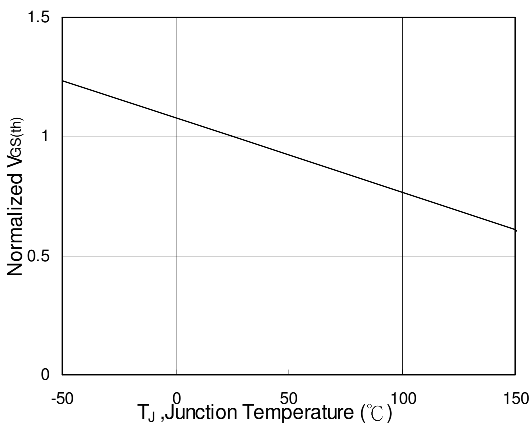


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

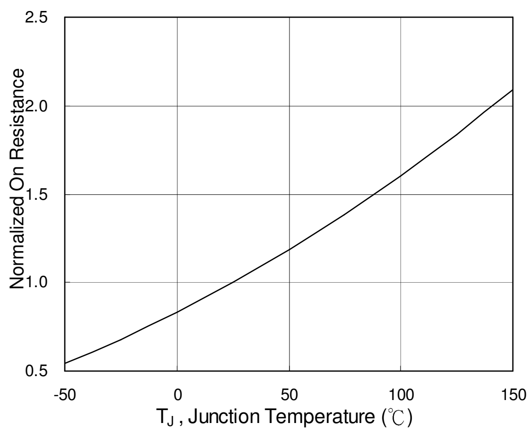


Fig.6 Normalized R_{DSON} vs. T_J

❖ TYPICAL CHARACTERISTICS (COUNTINOUS)

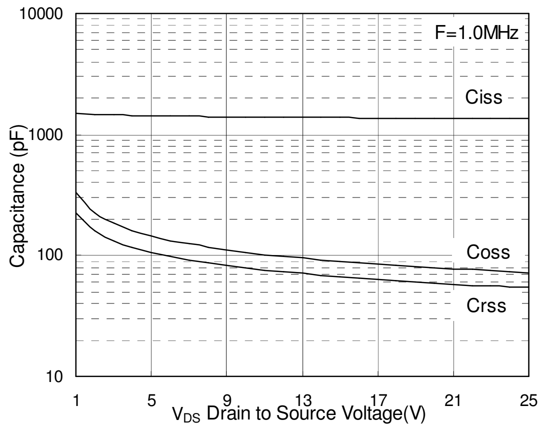


Fig.7 Capacitance

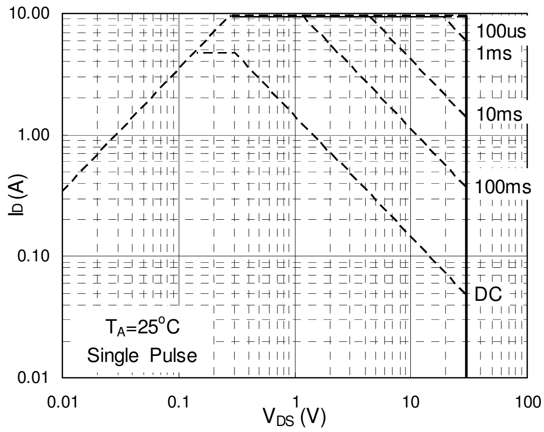


Fig.8 Safe Operating Area

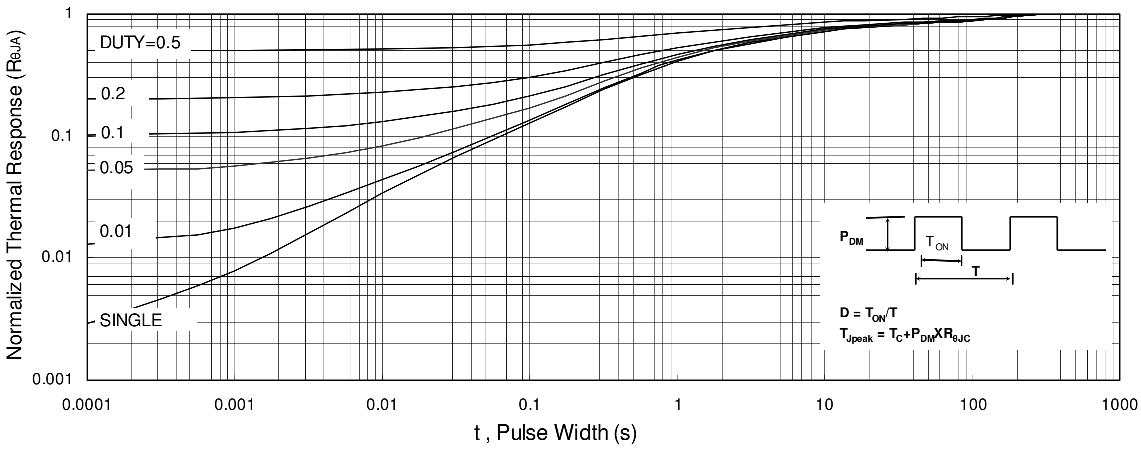


Fig.9 Normalized Maximum Transient Thermal Impedance

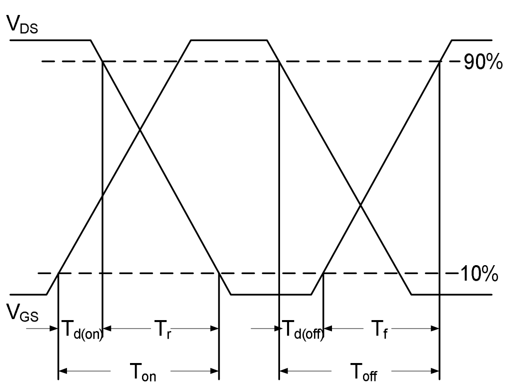


Fig.10 Switching Time Waveform

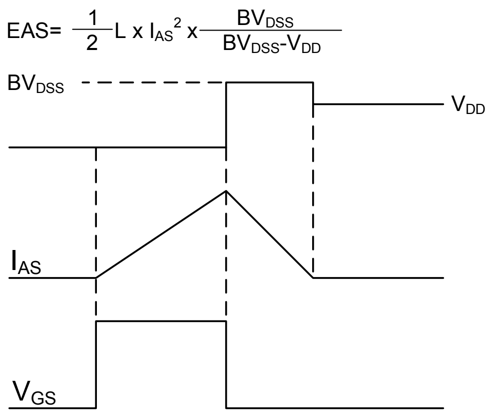


Fig.11 Unclamped Inductive Waveform