AM3402

axelite 亞瑟萊特科技股份有限公司 AXElite Technology Co.,Ltd

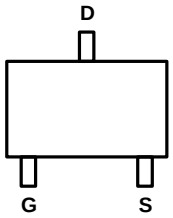
N-Channel Enhancement Mode MOSFET

Features

- 30V/4A
  $R_{DS(ON)}$= 55mΩ(Typ.) @ V_{GS}=10V
  $R_{DS(ON)}$= 70mΩ(Typ.) @ V_{GS}= 4.5V
  $R_{DS(ON)}$= 110mΩ(Typ.) @ V_{GS}=2.8V
- Super High Dense Cell Design
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

Pin Description

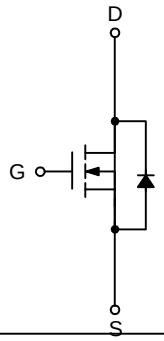
Top View



SOT-23

Applications

- Power Management in Notebook Computer, Portable Equipment and Battery Powered Systems



N-Channel MOSFET

Ordering and Marking Information

AM3402 □□

Packing
Package

Package
R : SOT23-3L

Packing
Blank : Tube
A : Taping

AM3402 : B2XXX

XXX - Date Code

Note: AXElite lead-free products contain molding compounds/die attach materials and 100% matte tin plate termination finish; which are fully compliant with RoHS. AXElite lead-free products meet or exceed the lead-free requirements to of IPC/JEDEC J-STD-020C for MSL classification at lead-free peak reflow temperature. AXElite defines "Green" mean lead-free (RoHS compliant) and halogen free (Br or Cl does not exceed 900ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500ppm by weight).

Absolute Maximum Ratings (T_A = 25°C unless otherwise noted)

Symbol	Parameter		Rating	Unit
V_{DSS}	Drain-Source Voltage		30	V
V_{GSS}	Gate-Source Voltage		±12	V
I_D	Continuous Drain Current [A]	T_A=25°C	4	A
		T_A=70°C	3.4	
I_{DM}	Pulsed Drain Current [B]		15	
P_D	Power Dissipation [A]	T_A=25°C	1.4	W
		T_A=70°C	1	
T_J, T_{STG}	Junction and Storage Temperature Range		-55 to 150	°C

Thermal Characteristics					
Parameter		**Symbol**	**Typ**	**Max**	**Unit**
Maximum Junction-to-Ambient [A]	t ≤ 10s	$R_{\theta JA}$	70	90	°C/W
Maximum Junction-to-Ambient [A]	Steady-State		100	125	°C/W
Maximum Junction-to-Lead [C]	Steady-State	$R_{\theta JL}$	63	80	°C/W

Electrical Characteristics (T_A = 25°C unless otherwise noted)

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
STATIC PARAMETERS							
BV_{DSS}	Drain-Source Breakdown Voltage	I_D=250μA, V_{GS}=0V		30			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=24V, V_{GS}=0V				1	μA
			T_J=55°C			5	
I_{GSS}	Gate-Body leakage current	V_{DS}=0V, V_{GS}=±12V				100	nA
$V_{GS(th)}$	Gate Threshold Voltag	V_{DS}=V_{GS} I_D=250μA		0.6	1	1.4	V
$I_{D(ON)}$	On state drain current	V_{GS}=4.5V, V_{DS}=5V		10			A
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V, I_D=4A			45	55	mΩ
			T_J=125°C		66	80	
		V_{GS}=4.5V, I_D=3A			55	70	mΩ
		V_{GS}=2.5V, I_D=2A			83	110	mΩ
g_{FS}	Forward Transconductance	V_{DS}=5V, I_D=4A			8		S
V_{SD}	Diode Forward Voltage	I_S=1A,V_{GS}=0V			0.8	1	V
I_S	Maximum Body-Diode Continuous Current					2.5	A

Electrical Characteristics (Cont.)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=15V, f=1MHz		390		pF
C_{oss}	Output Capacitance			54.5		pF
C_{rss}	Reverse Transfer Capacitance			41		pF
R_g	Gate resistanc	V_{GS}=0V, V_{DS}=0V, f=1MHz		3		Ω
SWITCHING PARAMETERS						
Q_g	Total Gate Charge	V_{GS}=4.5V, V_{DS}=15V, I_D=4A		4.34		nC
Q_{gs}	Gate Source Charge			0.6		nC
Q_{gd}	Gate Drain Charge			1.38		nC
$t_{D(on)}$	Turn-On DelayTime	V_{GS}=10V, V_{DS}=15V, R_L=3.75Ω, R_{GEN}=6Ω		3.3		ns
t_r	Turn-On Rise Time			1		ns
$t_{D(off)}$	Turn-Off DelayTime			21.7		ns
t_f	Turn-Off Fall Time			2.1		ns
t_{rr}	Body Diode Reverse Recovery Time	I_F=4A, dI/dt=100A/μs		12		ns
Q_{rr}	Body Diode Reverse Recovery Charge	I_F=4A, dI/dt=100A/μs		6.3		nC

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C. The value in any given application depends on the user's specific board design. The current rating is based on the t≤ 10s thermal resistance rating.

B: Repetitive rating, pulse width limited by junction temperature.

C. The $R_{\theta JA}$ is the sum of the thermal impedence from junction to lead $R_{\theta JL}$ and lead to ambient.

D. The static characteristics in Figures 1 to 6,12,14 are obtained using <300μs pulses, duty cycle 0.5% max.

E. These tests are performed with the device mounted on 1 in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The SOA curve provides a single pulse rating.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

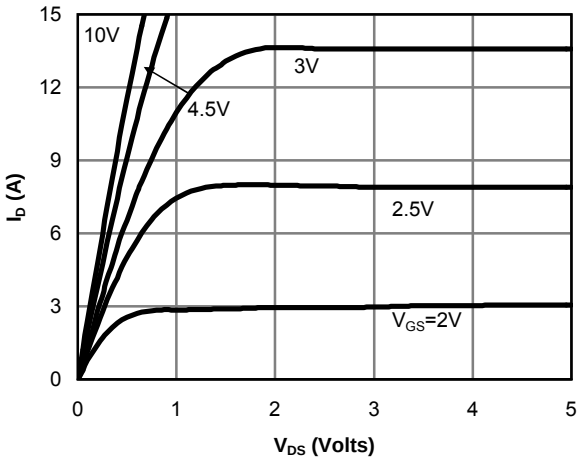


Fig 1: On-Region Characteristics

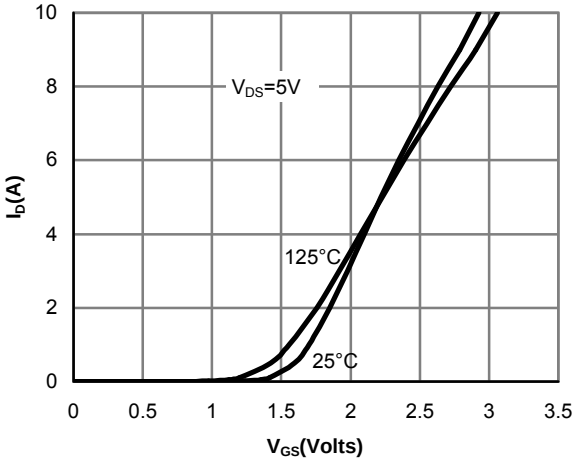


Figure 2: Transfer Characteristics

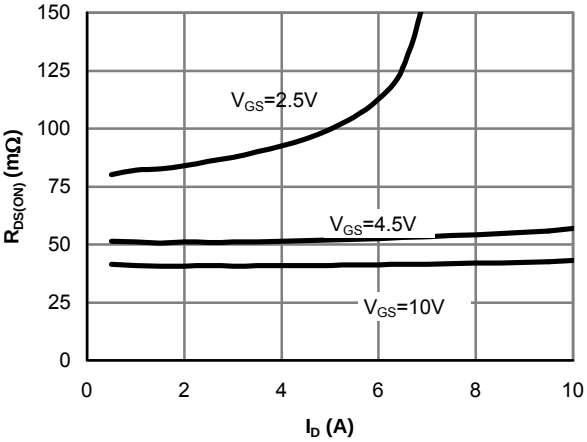


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

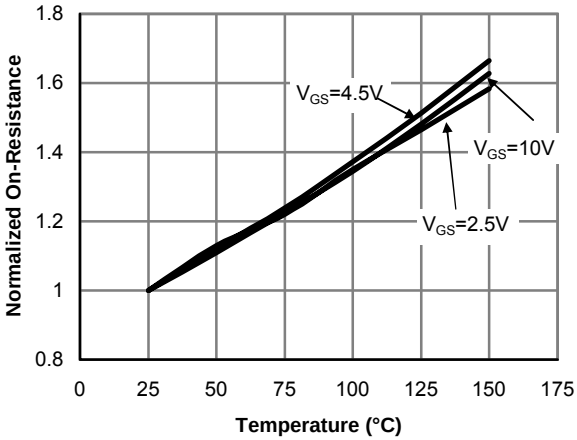


Figure 4: On-Resistance vs. Junction Temperature

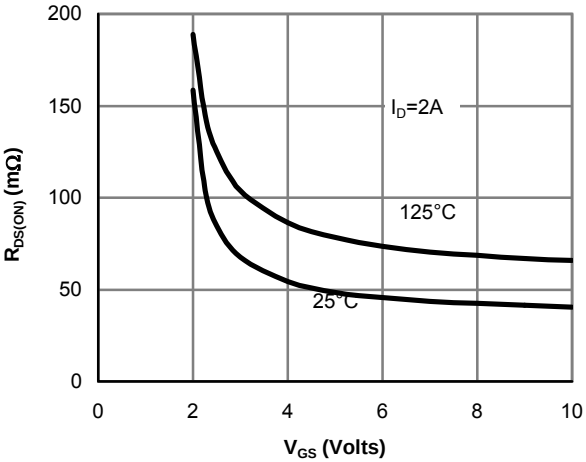


Figure 5: On-Resistance vs. Gate-Source Voltage

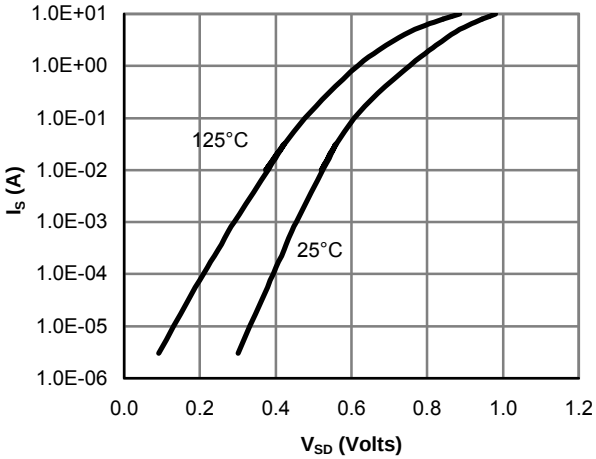


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

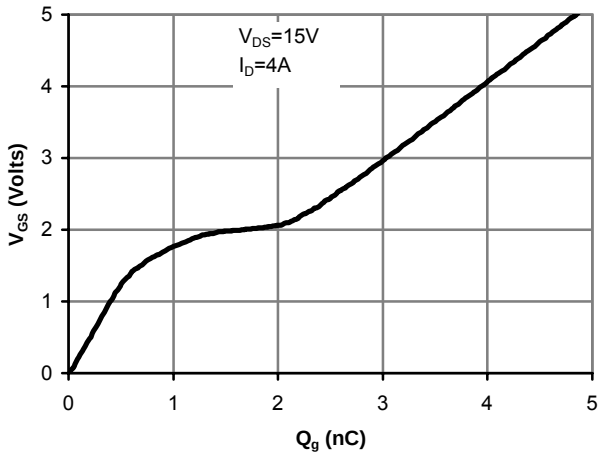


Figure 7: Gate-Charge Characteristics

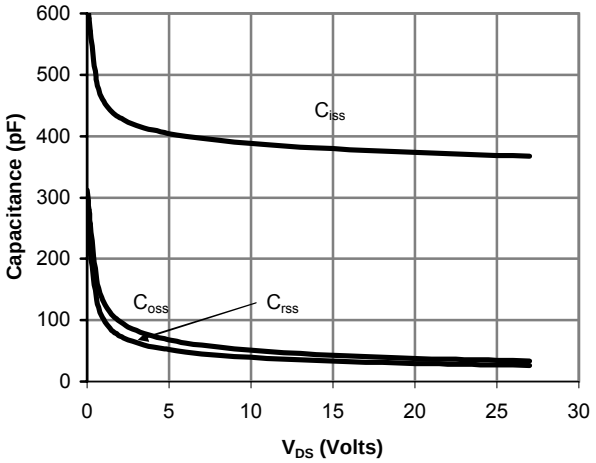


Figure 8: Capacitance Characteristics

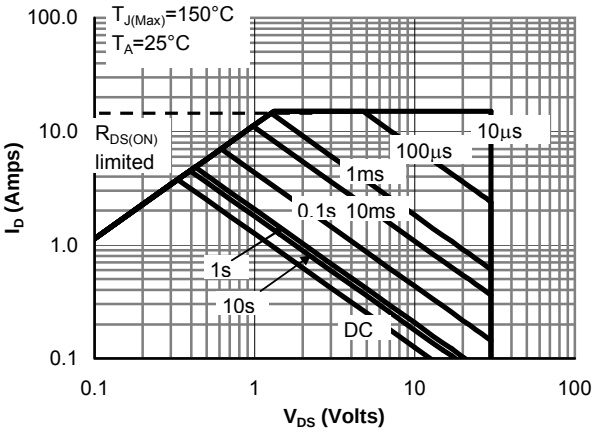


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

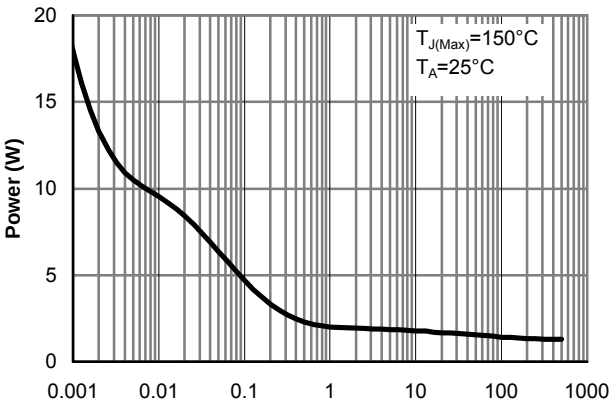


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

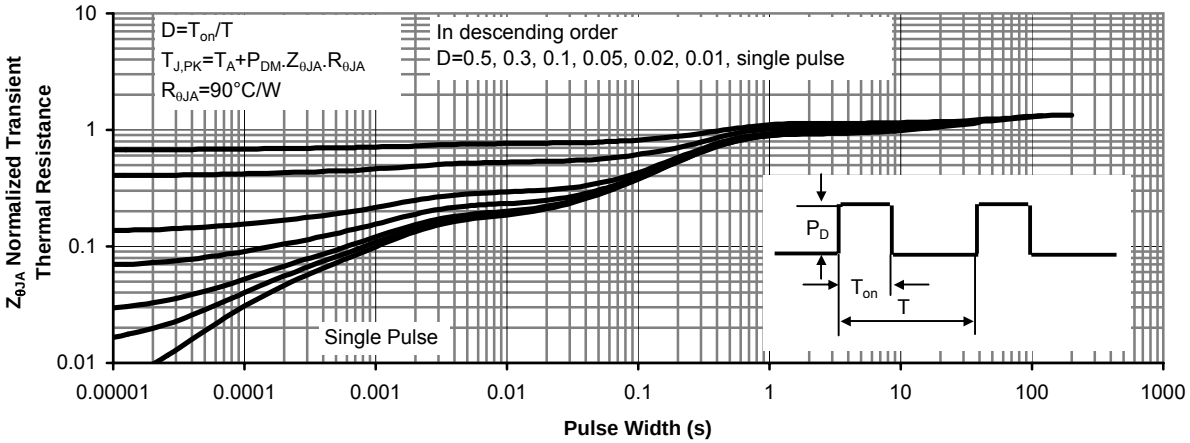


Figure 11: Normalized Maximum Transient Thermal Impedance