

● General Description

The AGM301C1 combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

This device is ideal for load switch and battery protection applications.

● Features

- Advance high cell density Trench technology
- Low $R_{DS(ON)}$ to minimize conductive loss
- Low Gate Charge for fast switching
- Low Thermal resistance
- 100% Avalanche tested
- 100% DVDS tested

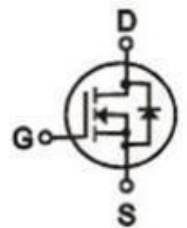
● Application

- MB/VGA Vcore
- SMPS 2nd Synchronous Rectifier
- POL application
- BLDC Motor driver

Product Summary

BVDSS	RDSON	ID
30V	1.5mΩ	170A

TO-220 Pin Configuration



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM301C1	AGM301C1	TO-220	---	---	1000

Table 1. Absolute Maximum Ratings (TA=25°C)

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	30	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25°C) (Note 1)	170	A
	Drain Current-Continuous(Tc=100°C)	102	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 2)	680	A
PD	Maximum Power Dissipation(Tc=25°C)	130	w
	Maximum Power Dissipation(Tc=100°C)	52	w
EAS	Avalanche energy (Note 3)	1700	mJ
TJ,TSTG	Operating Junction and Storage Temperature Range	-55 To 150	°C

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
RθJA	Thermal Resistance Junction-ambient (Steady State) ¹	---	62.5	°C/W
RθJC	Thermal Resistance Junction-Case ¹	---	0.96	°C/W

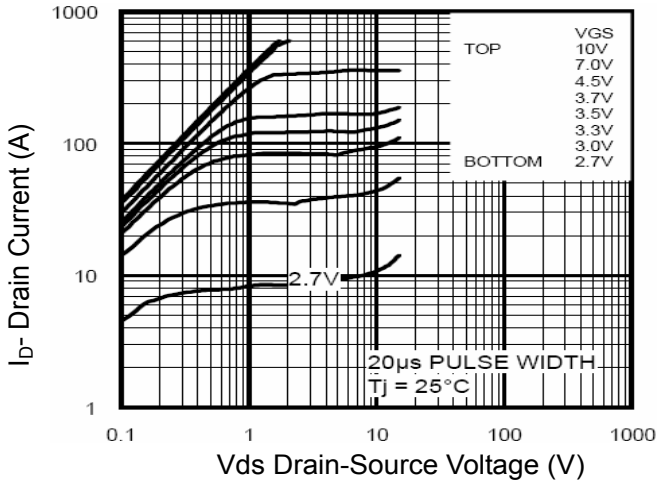
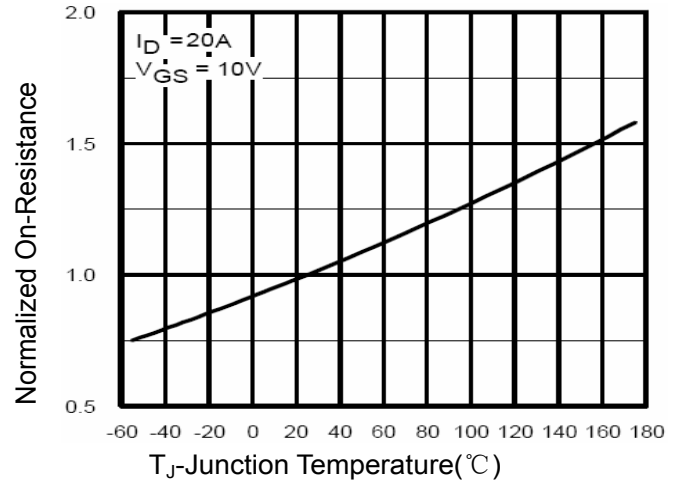
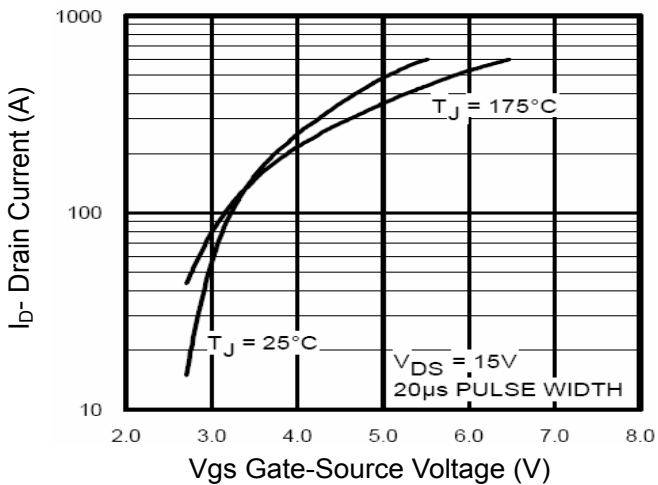
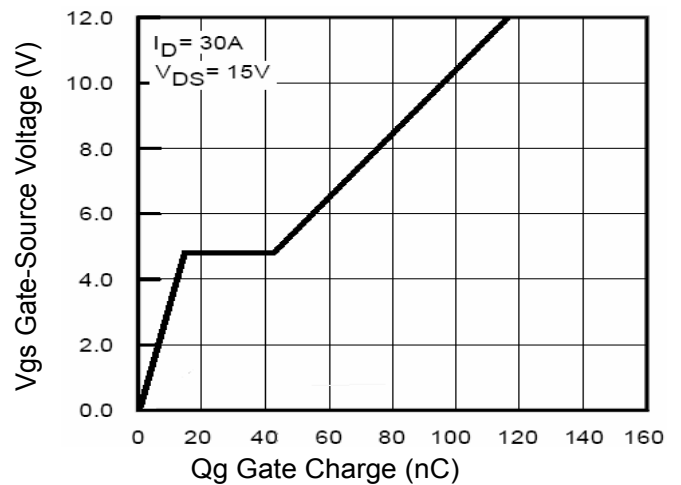
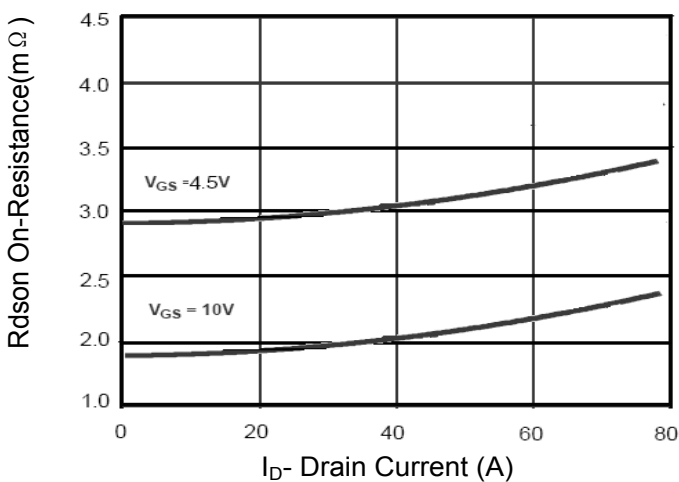
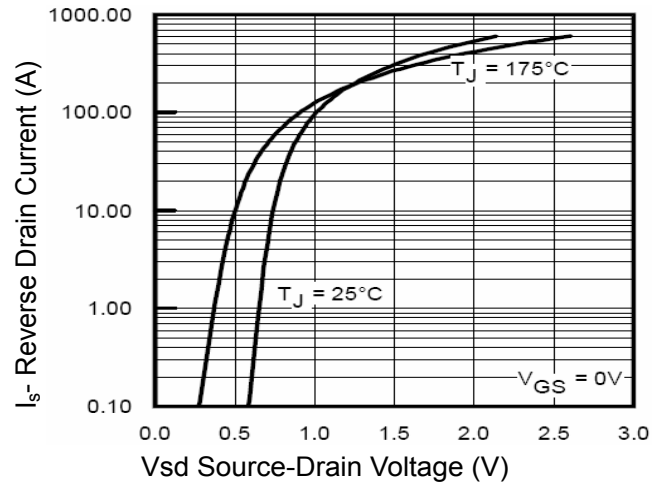
Table 3. Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	30	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=30V, VGS=0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	VGS=±20V, VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS, ID=250μA	1.0	1.5	2.5	V
gFS	Forward Transconductance	VDS=5V, ID=15A	--	45	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=20A	--	1.5	2.1	mΩ
		VGS=4.5V, ID=15A	--	2.5	4.0	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=15V, VGS=0V, F=1MHZ	--	5600	--	pF
Coss	Output Capacitance		--	800	--	pF
Crss	Reverse Transfer Capacitance		--	560	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V, f=1.0MHz	--	1.6	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V, VDS=15V, ID=10A, RGEN=6Ω	--	25	--	nS
tr	Turn-on Rise Time		--	23	--	nS
td(off)	Turn-Off Delay Time		--	90	--	nS
tf	Turn-Off Fall Time		--	39	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=15V, ID=12A	--	99	--	nC
Qgs	Gate-Source Charge		--	17	--	nC
Qgd	Gate-Drain Charge		--	11	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	170	A
VSD	Forward on Voltage	VGS=0V, IS=20A	--	--	1.2	V
trr	Reverse Recovery Time	IF=20A , dI/dt=100A/μs , TJ=25°C	--	39	--	ns
Qrr	Reverse Recovery Charge		--	35	--	nc

Notes 1.The maximum current rating is package limited.

Notes 2.Repetitive Rating: Pulse width limited by maximum junction temperature

Notes 3.EAS condition: T_J=25°C

Typical Electrical and Thermal Characteristics (Curves)

Figure 1 Output Characteristics

Figure 4 Rdson-Junction Temperature

Figure 2 Transfer Characteristics

Figure 5 Gate Charge

Figure 3 Rdson- Drain Current

Figure 6 Source- Drain Diode Forward

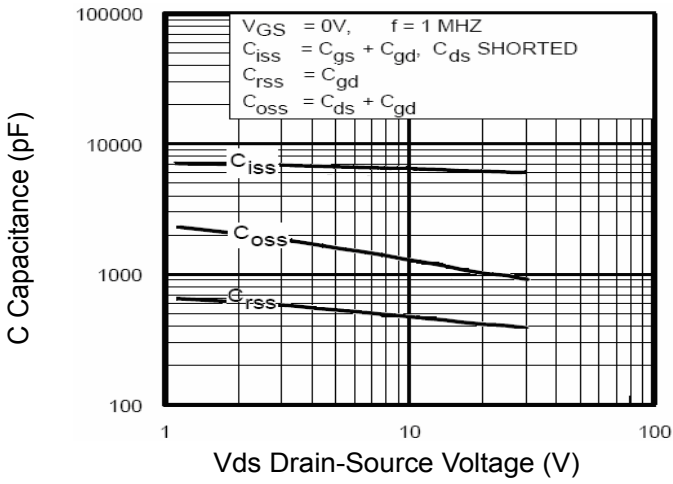


Figure 7 Capacitance vs Vds

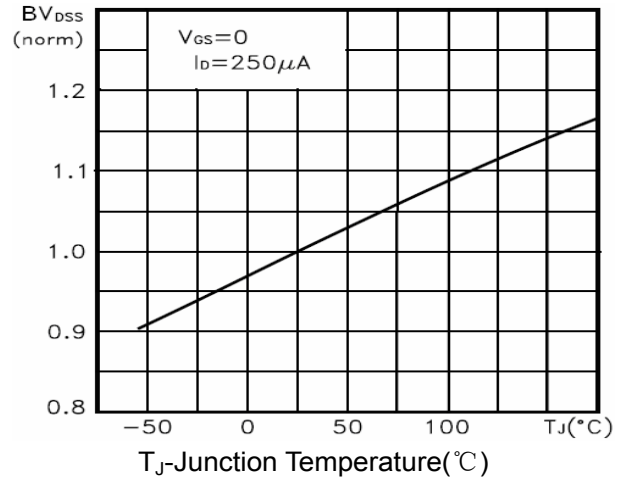


Figure 9 BV_{DSS} vs Junction Temperature

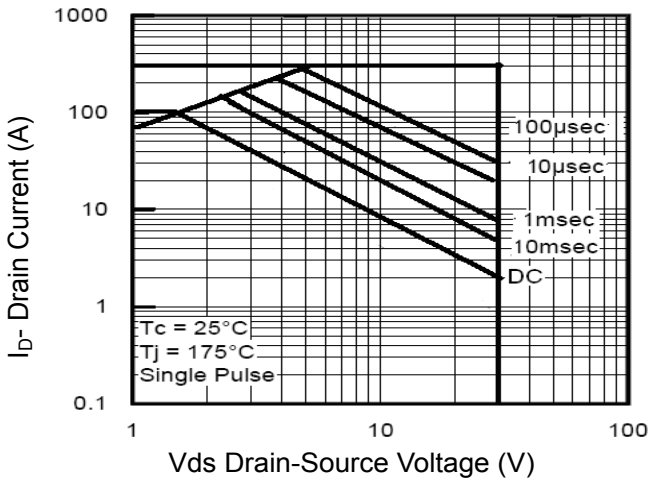


Figure 8 Safe Operation Area

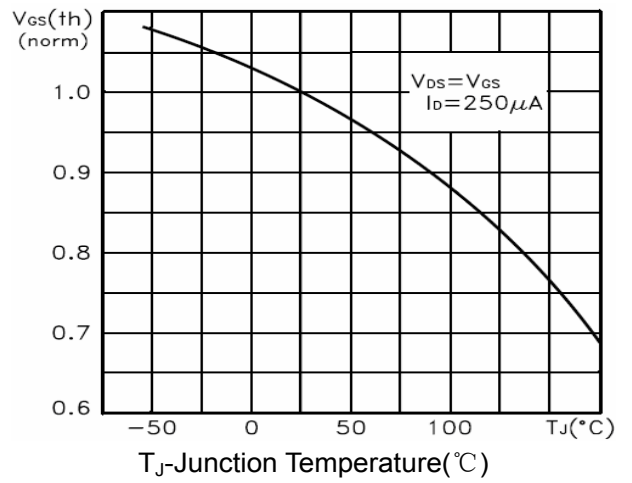


Figure 10 $V_{GS(th)}$ vs Junction Temperature

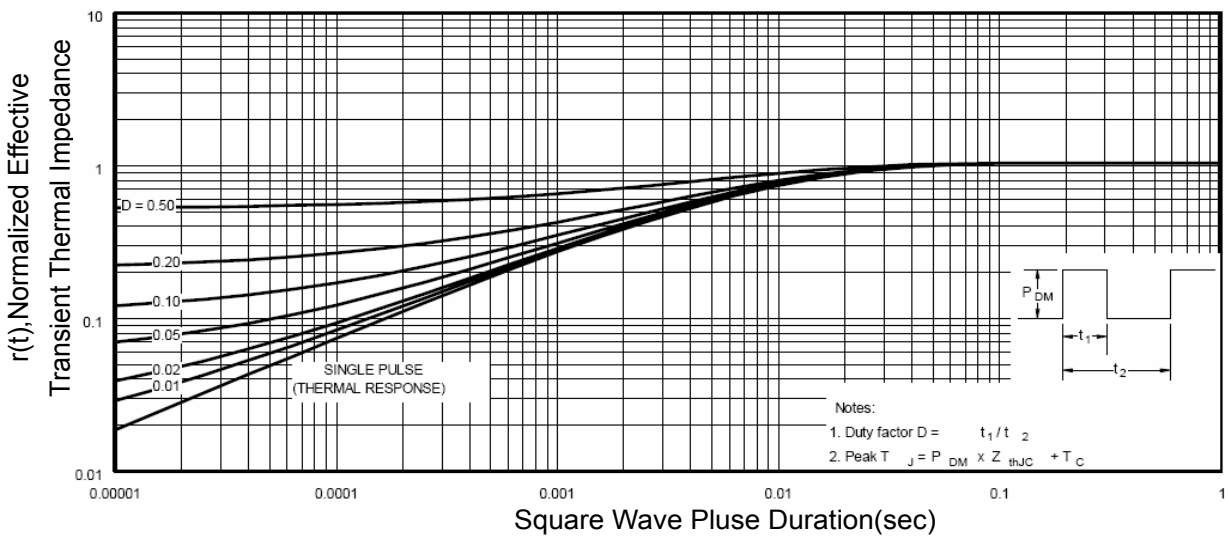
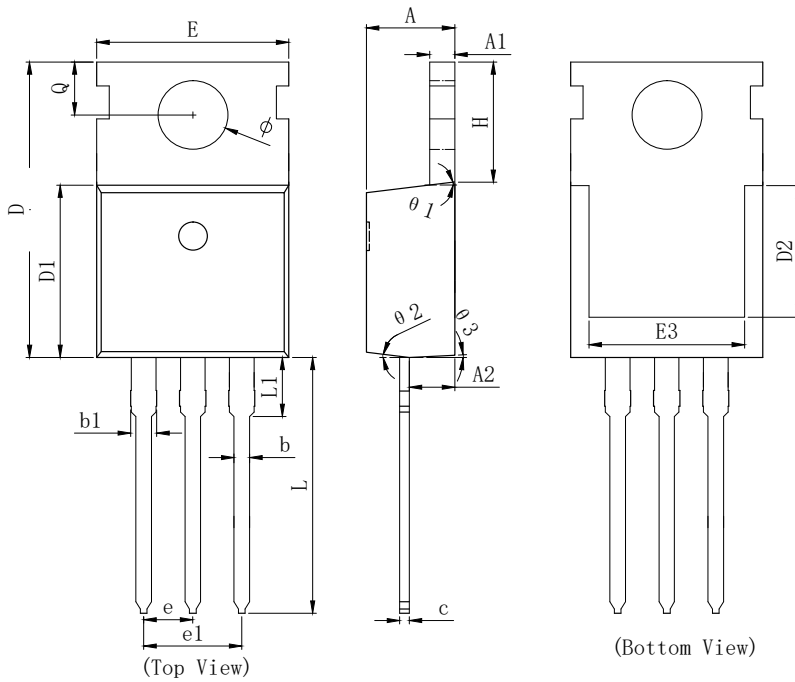


Figure 11 Normalized Maximum Transient Thermal Impedance

TO-220 PACKAGE INFORMATION



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	4.370	4.570	4.700
A1	1.250	1.300	1.400
A2	2.150	2.350	2.550
b	0.700	0.800	0.950
b1	1.170	1.270	1.470
c	0.450	0.500	0.600
D	15.100	15.600	16.100
D1	8.800	9.100	9.400
D2	5.500	6.300 REF	
E	9.700	10.000	10.300
E3	7.000	7.600 REF	
e	2.540 BSC		
e1	5.080 BSC		
L	13.200	13.500	13.800
L1		3.100	3.400
H	6.250	6.500	6.750
ϕ	3.400	3.600	3.800
Q	2.600	2.800	3.000
$\theta 1$	7° TYP		
$\theta 2$	7° TYP		
$\theta 3$	3° TYP		


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