

● General Description

The AGM13T15C 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

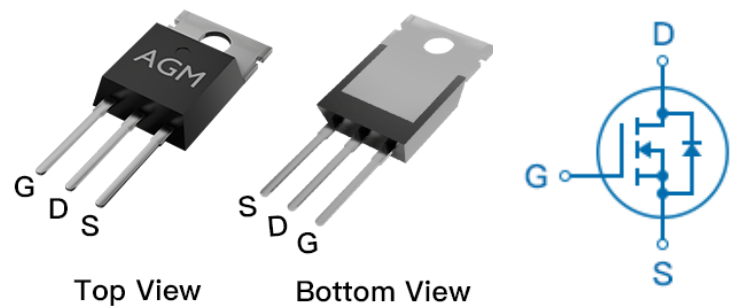
● Application

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

Product Summary

BVDSS	RDSON	ID
135V	15.5mΩ	58A

TO-220 Pin Configuration



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM13T15C	AGM13T15C	TO-220	---	---	1000

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

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	135	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25°C) (Note 1)	58	A
	Drain Current-Continuous(Tc=100°C)	39	A
IDM (pluse)	Drain Current-Pulsed (Note 2)	232	A
PD	Maximum Power Dissipation(Tc=25°C)	120	w
	Maximum Power Dissipation(Tc=100°C)	60	w
EAS	Avalanche energy (Note 3)	21	mJ
TJ,TSTG	Operating Junction and Storage Temperature Range	-55 To 175	°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	---	1.25	°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	135	147	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=135V,VGS=0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=250μA	2	2.8	4	V
gFS	Forward Transconductance	VDS=5V,ID=5A	--	17	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=10A	--	15.5	21	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=40V,VGS=0V, F=1MHZ	--	1935	--	pF
Coss	Output Capacitance		--	145	--	pF
Crss	Reverse Transfer Capacitance		--	11	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	2.8	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V,VDS=75V, RGEN=3Ω, RL=7.5Ω	--	10	--	nS
tr	Turn-on Rise Time		--	6.5	--	nS
td(off)	Turn-Off Delay Time		--	16	--	nS
tf	Turn-Off Fall Time		--	7.0	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=75V, ID=20A	--	33	--	nC
Qgs	Gate-Source Charge		--	7.2	--	nC
Qgd	Gate-Drain Charge		--	7.2	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	58	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	--	30	--	ns
Qrr	Reverse Recovery Charge		--	135	--	nc

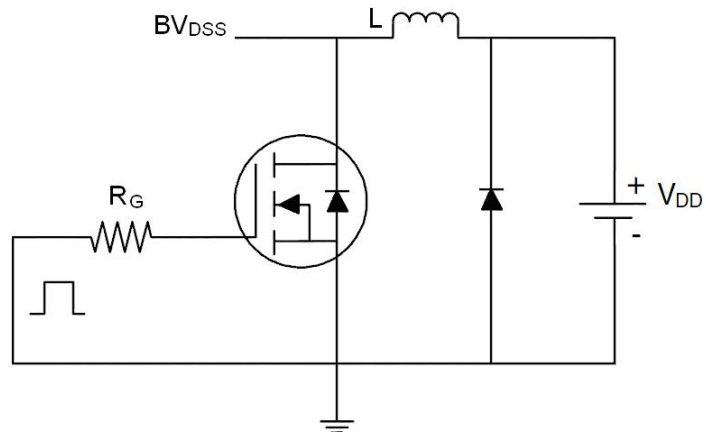
Notes 1.The maximum current rating is package limited.

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

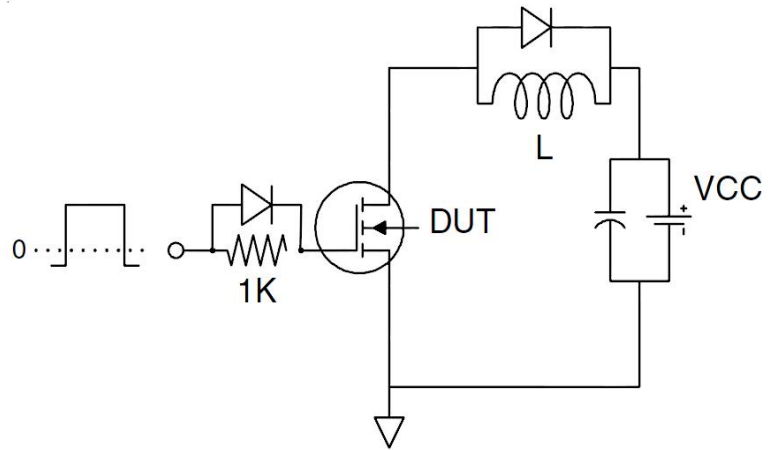
Notes 3.EAS condition: T_J=25°C,VDD=50V,Vgs=10V,ID=20.5A, L=0.1mH,RG=25ohm

Test Circuit

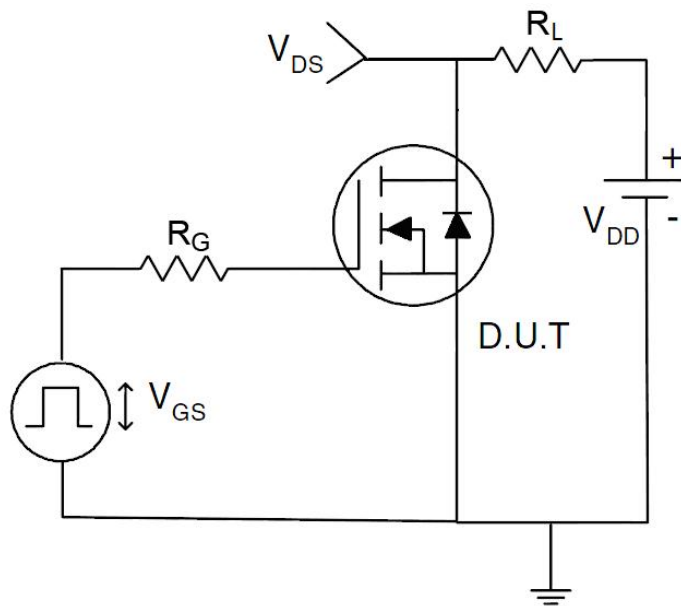
1) E_{AS} test Circuit



2) Gate charge test Circuit



3) Switch Time Test Circuit



Typical Electrical and Thermal Characteristics

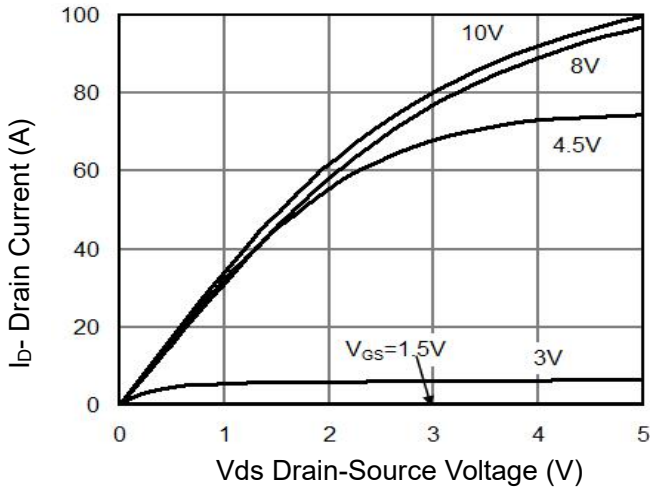


Figure 1 Output Characteristics

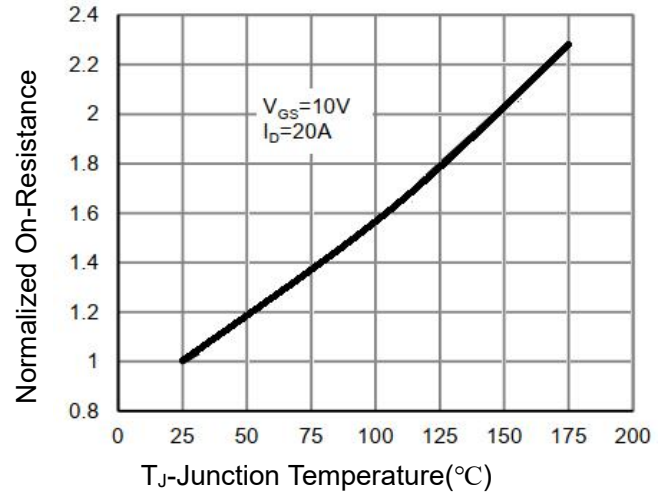


Figure 4 Rdson-Junction Temperature

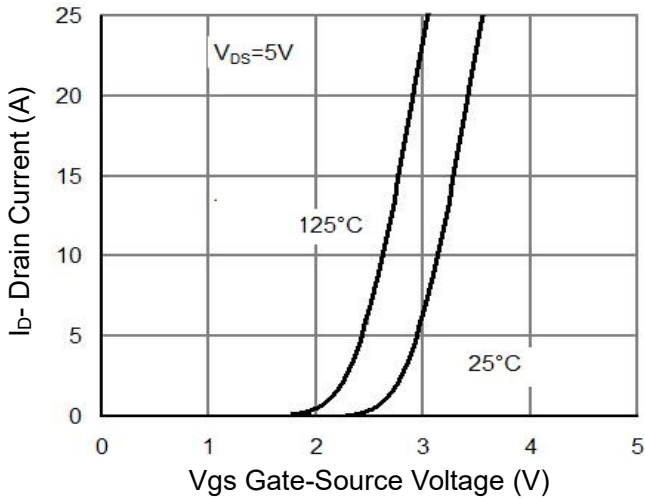


Figure 2 Transfer Characteristics

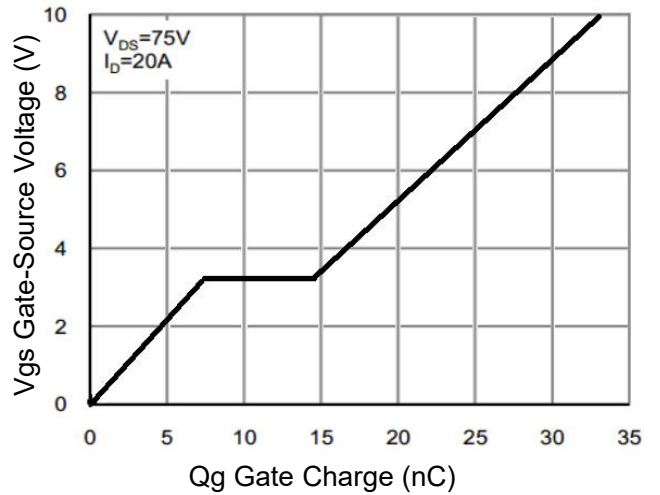


Figure 5 Gate Charge

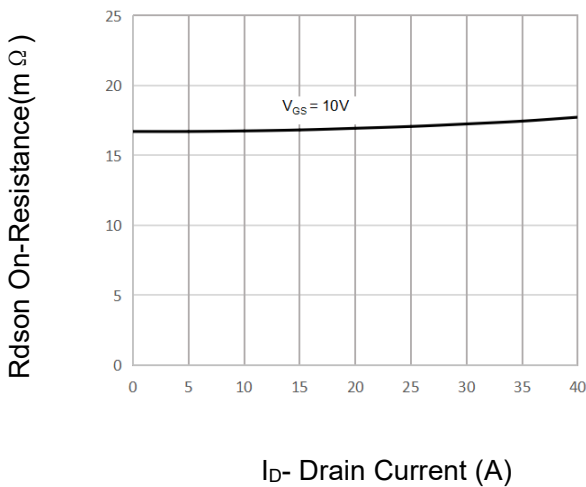


Figure 3 Rdson- Drain Current

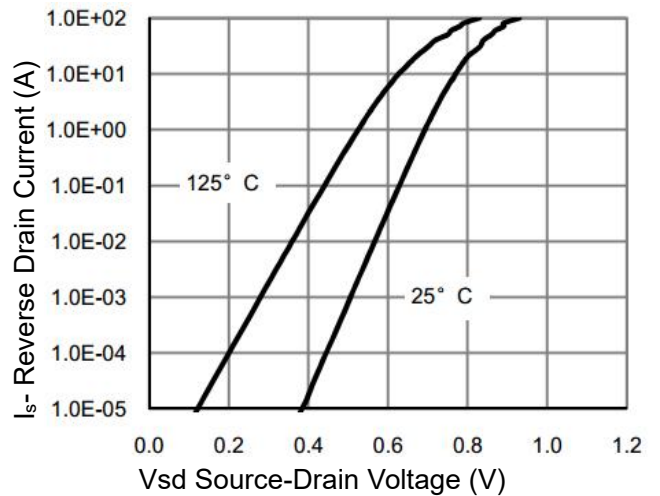


Figure 6 Source- Drain Diode Forward

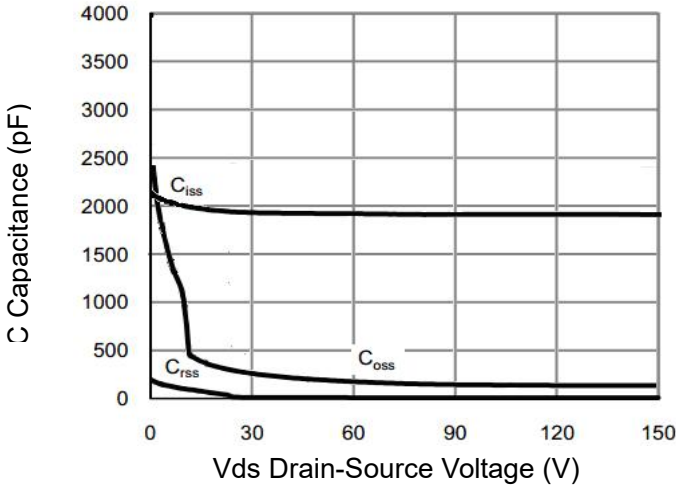


Figure 7 Capacitance vs Vds

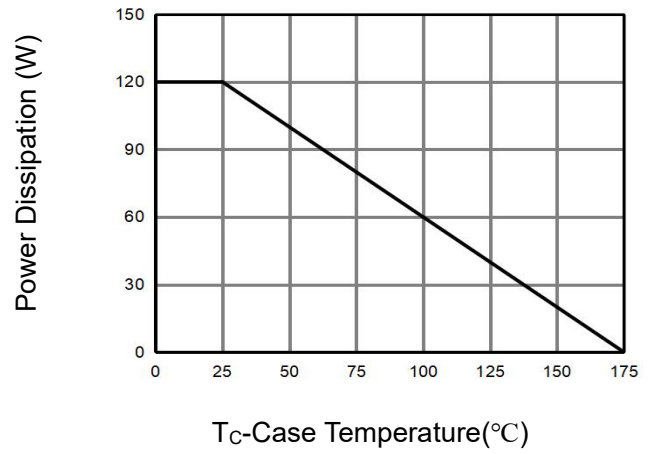


Figure 9 Power De-rating

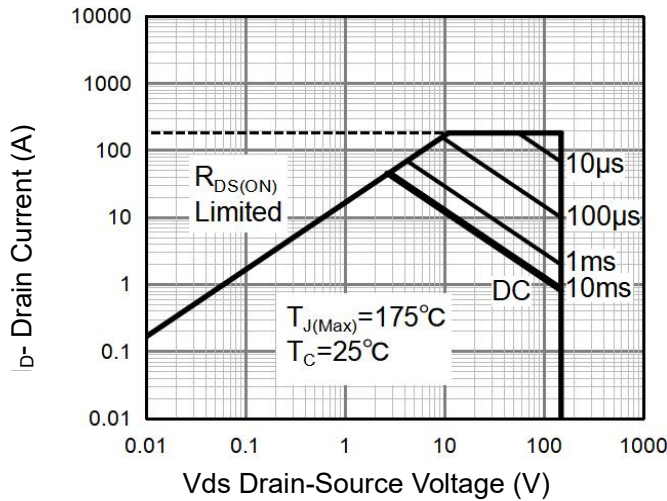


Figure 8 Safe Operation Area (Note3)

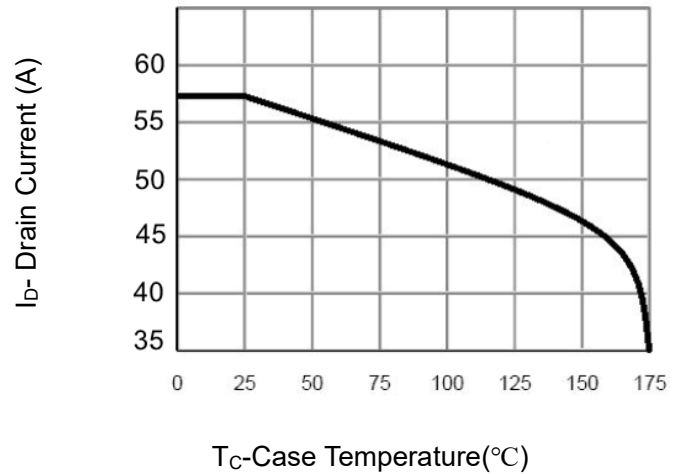


Figure 10 Current De-rating

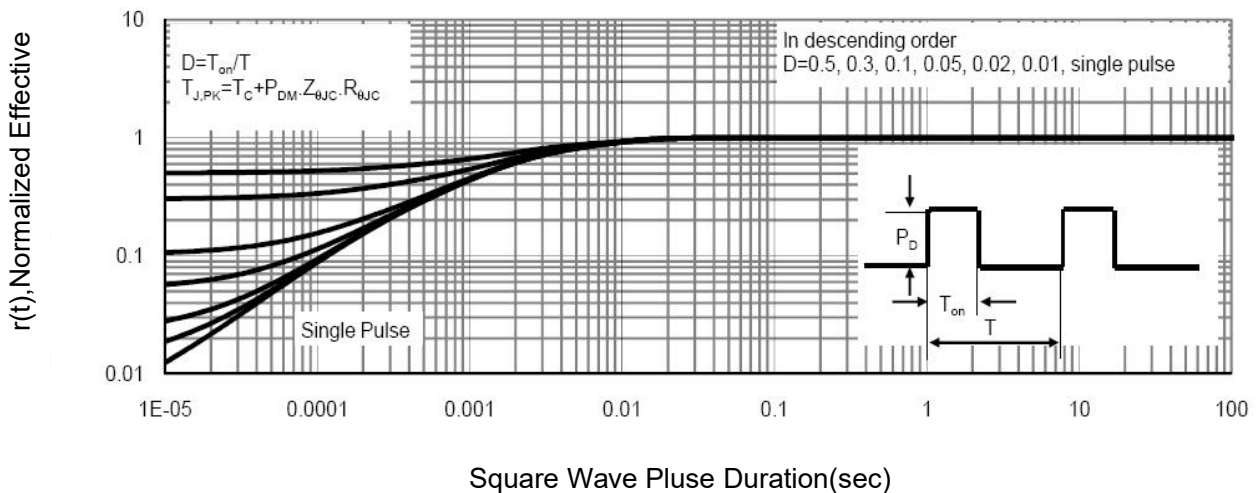
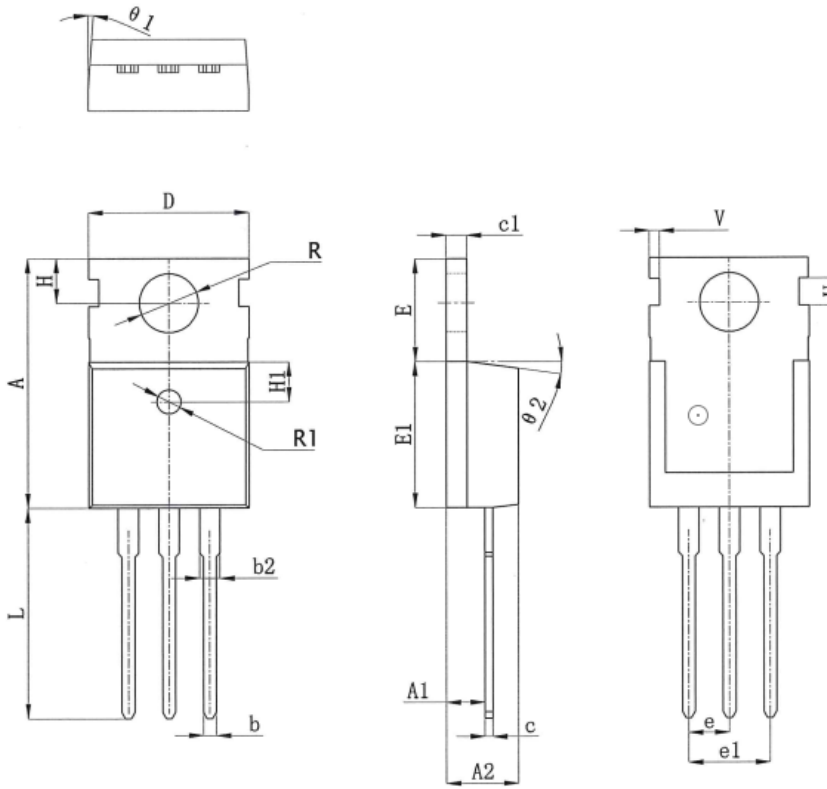


Figure 11 Normalized Maximum Transient Thermal Impedance

TO-220 PACKAGE INFORMATION



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	15.400	15.600	15.800
A1	2.350	2.400	2.500
A2	4.400	4.500	4.700
b	0.700	0.800	0.900
b2	1.180	1.310	1.440
c	0.480	0.500	0.560
c1	1.290	1.300	1.320
D	9.800	10.000	10.200
E	6.400	6.500	6.600
E1	9.000	9.100	9.200
e	2.420	2.540	2.660
e1	4.840	5.080	5.320
H	2.730	2.800	2.870
H1	2.400	2.500	2.600
L	13.020	13.370	13.720
R	3.500	3.600	3.730
R1	1.400	1.500	1.600
U	1.650	1.750	1.850
V	0.580	0.680	0.780
θ_1	2°	2.5°	3°
θ_2	6.5°	7°	7.5°


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