

● General Description

The AGMH1405C 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
45V	2.8mΩ	100A

TO-220 Pin Configuration

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGMH1405C	AGMH1405C	TO-220	----	----	1000

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

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	45	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25°C) (Note 1)	100	A
	Drain Current-Continuous(Tc=100°C)	67	A
IDM (pluse)	Drain Current-Pulsed (Note 2)	400	A
PD	Maximum Power Dissipation(Tc=25°C)	96	w
	Maximum Power Dissipation(Tc=100°C)	38	w
EAS	Avalanche energy (Note 3)	505	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	°C/W
RθJC	Thermal Resistance Junction-Case ¹	---	1.3	°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	V _{GS} =0V ID=250μA	45	--	--	V
IDSS	Zero Gate Voltage Drain Current	V _{DS} =40V, V _{GS} =0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	--	--	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , ID=250μA	2.0	2.5	4.0	V
g _{FS}	Forward Transconductance	V _{DS} =5V, ID=15A	--	33	--	S
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =10V, ID=20A	--	2.8	4.9	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =40V, V _{GS} =0V , F=1MHZ	--	2400	--	pF
C _{oss}	Output Capacitance		--	250	--	pF
C _{rss}	Reverse Transfer Capacitance		--	200	--	pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1.0MHz	--	2	--	Ω
Switching Times						
t _{d(on)}	Turn-on Delay Time	V _{GS} =10V, V _{DS} =15V, R _{GEN} =3.3Ω R _L =0.75Ω	--	25	--	nS
t _r	Turn-on Rise Time		--	10	--	nS
t _{d(off)}	Turn-Off Delay Time		--	128	--	nS
t _f	Turn-Off Fall Time		--	34	--	nS
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =20V, ID=40A	--	80	--	nC
Q _{gs}	Gate-Source Charge		--	9	--	nC
Q _{gd}	Gate-Drain Charge		--	12	--	nC
Source-Drain Diode Characteristics						
I _{SD}	Source-Drain Current(Body Diode)		--	--	100	A
V _{SD}	Forward on Voltage	V _{GS} =0V, I _S =20A	--	--	1.2	V
t _{rr}	Reverse Recovery Time	I _F =20A , di/dt=100A/μs , T _J =25°C	--	--	18	ns
Q _{rr}	Reverse Recovery Charge		--	--	40	nc

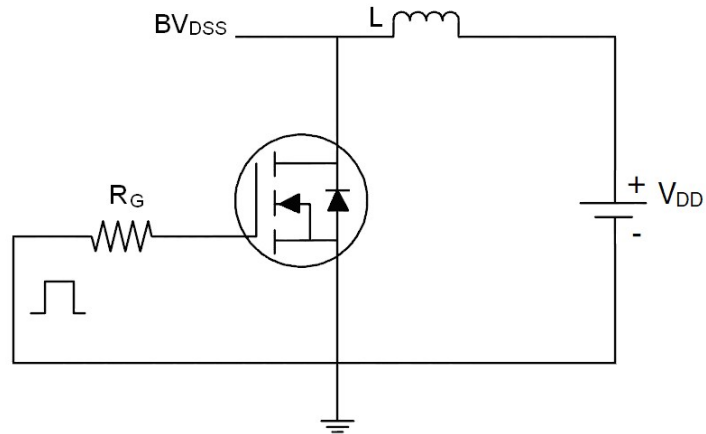
Notes 1.The maximum current rating is package limited.

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

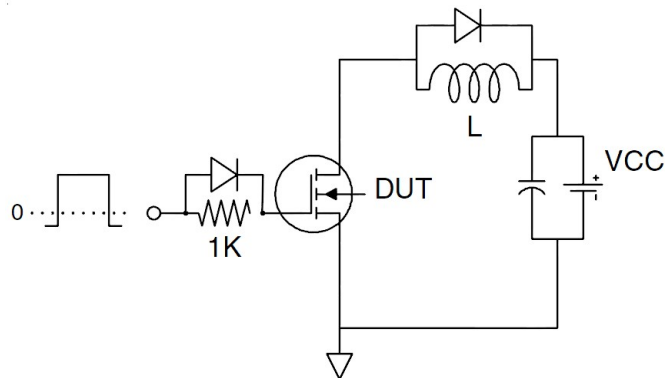
Notes 3.EAS condition: T_J=25°C, V_{DD}=20V, V_{gs}=10V, I_D=58A, L=0.3mH, R_G= 25ohm

Test circuit

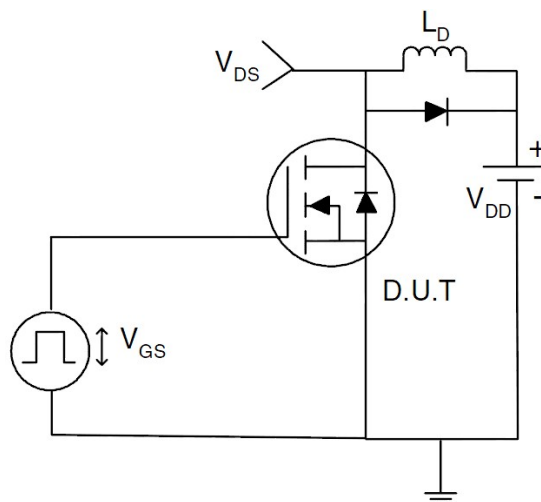
(1) E_{AS} test circuits



(2) Gate charge test circuit



(3) Switch time test circuit



Typical Characteristics

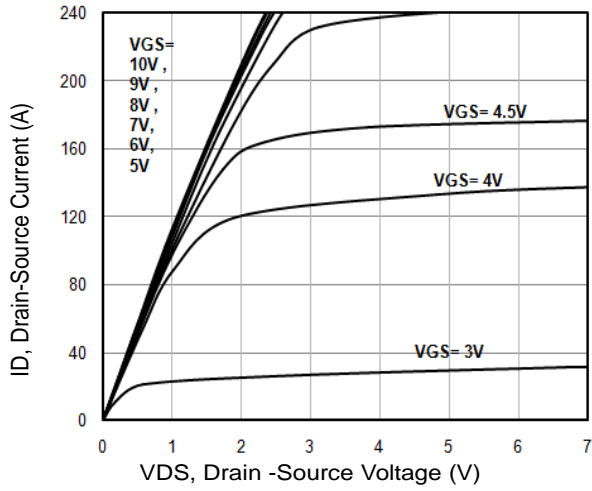


Fig1. Typical Output Characteristics

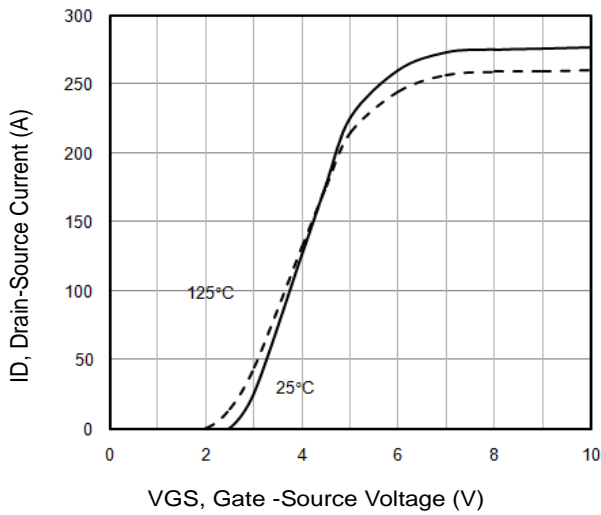


Fig3. Typical Transfer Characteristics

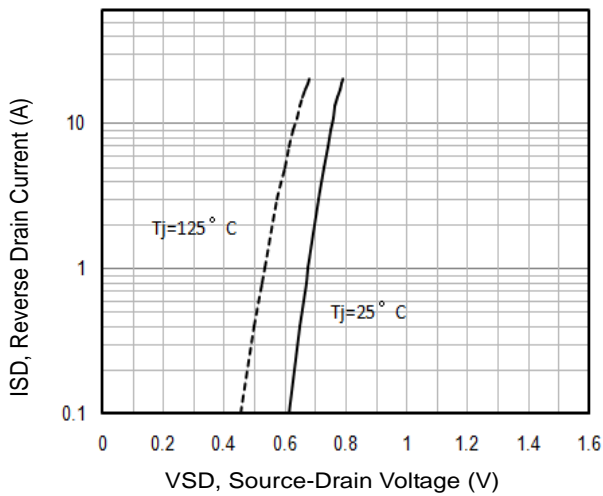


Fig5. Typical Source-Drain Diode Forward Voltage

Fig2. $V_{GS(TH)}$ Gate -Source Voltage Vs. T_j
 T_j - Junction Temperature ($^{\circ}C$)

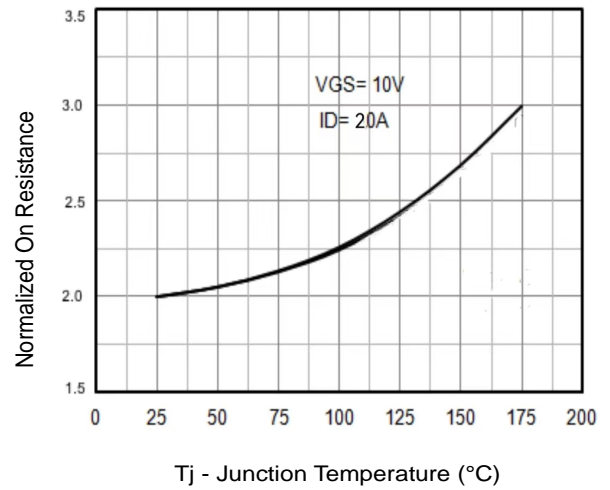


Fig4. Normalized On-Resistance Vs. Temperature

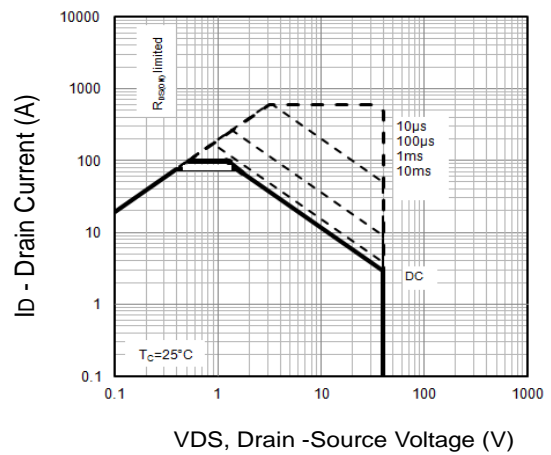


Fig6. Maximum Safe Operating Area

Typical Characteristics

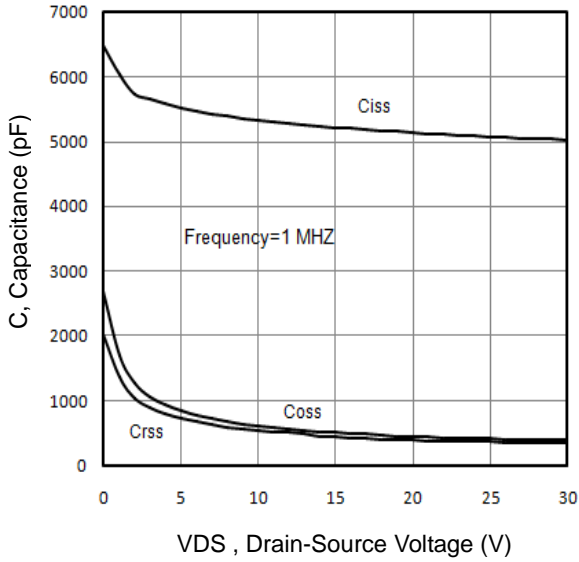


Fig7. Typical Capacitance Vs. Drain-Source Voltage

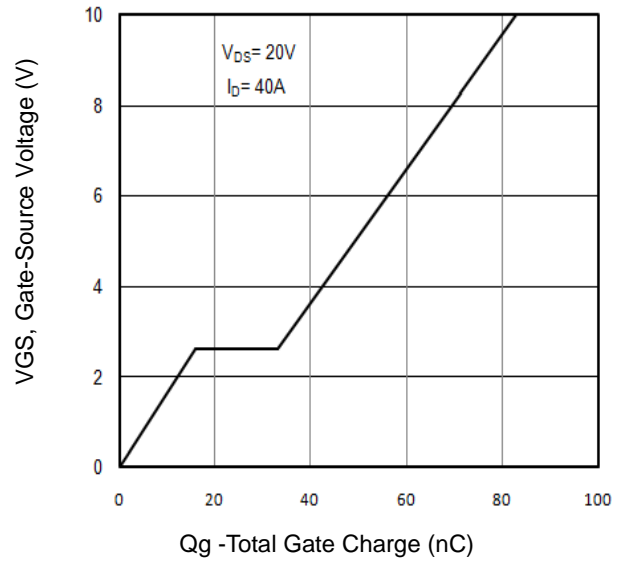


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

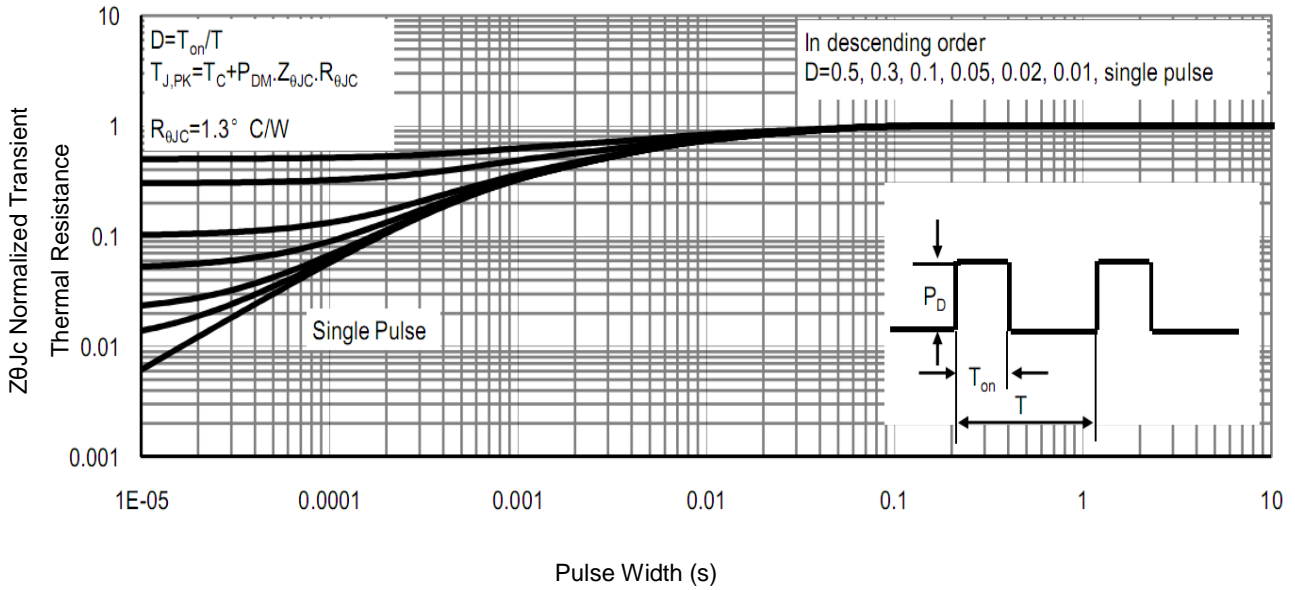
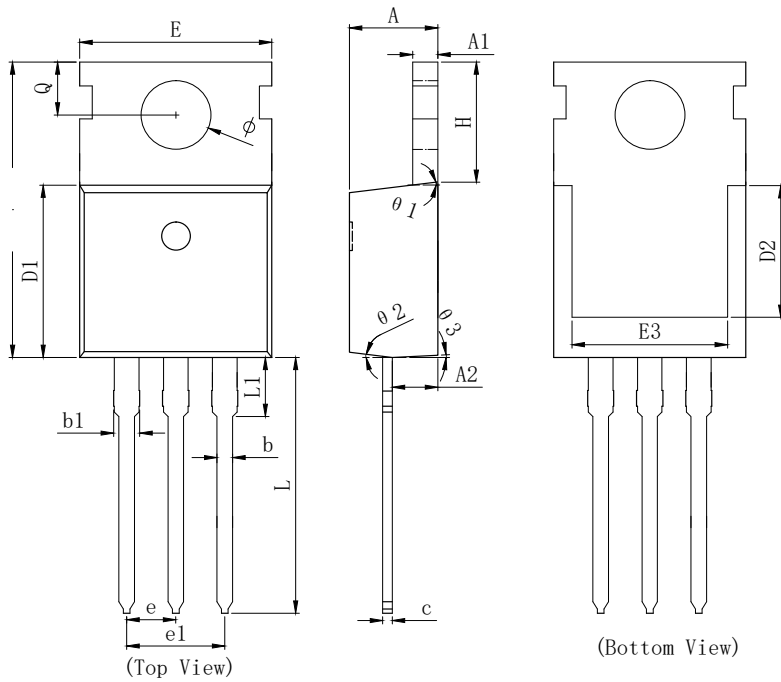


Fig9 . Normalized Maximum Transient Thermal Impedance

TO220 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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