

## General Description

The AGM056N10H 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

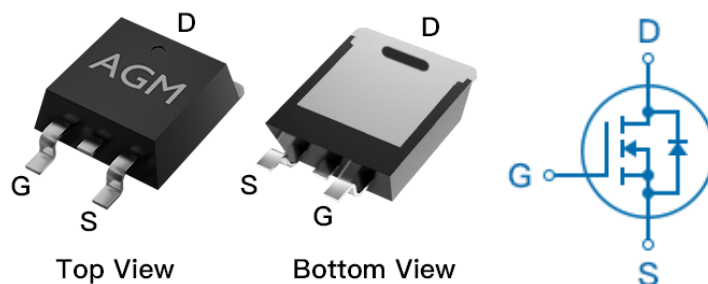
## Application

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

## Product Summary

BVDSS	RDSON	ID
100V	5.1mΩ	140A

## TO-263 Pin Configuration



## Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM056N10H	AGM056N10H	TO-263	330mm	25mm	800

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

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	100	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25°C) (Note 1)	140	A
	Drain Current-Continuous(Tc=100°C)	95	A
IDM (pluse)	Drain Current-Pulsed (Note 2)	560	A
PD	Maximum Power Dissipation(Tc=25°C)	227	w
	Maximum Power Dissipation(Tc=100°C)	91	w
EAS	Avalanche energy (Note 3)	625	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) <sup>1</sup>	---	65	°C/W
RθJC	Thermal Resistance Junction-Case <sup>1</sup>	---	0.55	°C/W

**Table 3. Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	100	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=100V,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=20A	--	75	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=40A	--	5.1	6.4	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=40V,VGS=0V ,F=1MHZ	--	3250	--	pF
Coss	Output Capacitance		--	1290	--	pF
Crss	Reverse Transfer Capacitance		--	68	--	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=50V, ID=20A,RGEN=10Ω	--	17	--	nS
tr	Turn-on Rise Time		--	40	--	nS
td(off)	Turn-Off Delay Time		--	57	--	nS
tf	Turn-Off Fall Time		--	37	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=50V, ID=20A	--	56	--	nC
Qgs	Gate-Source Charge		--	14	--	nC
Qgd	Gate-Drain Charge		--	18	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	140	A
VSD	Forward on Voltage	VGS=0V,IS=40A	--	0.9	1.2	V
trr	Reverse Recovery Time	IF=40A , dI/dt=100A/μs , TJ=25℃	--	50	--	ns
Qrr	Reverse Recovery Charge		--	255	--	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<sub>J</sub>=25°C,V<sub>DD</sub>=50V,V<sub>gs</sub>=10V,ID=50A,L=0.5mH,R<sub>G</sub>=25ohm

Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

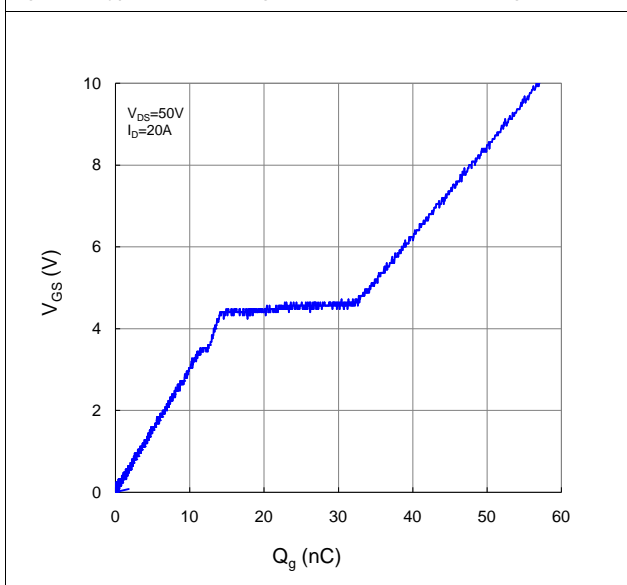


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

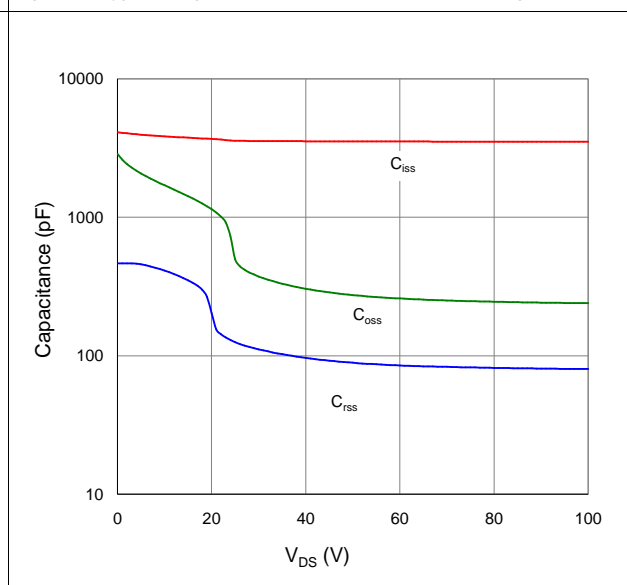


Figure 9. Maximum Safe Operating Area

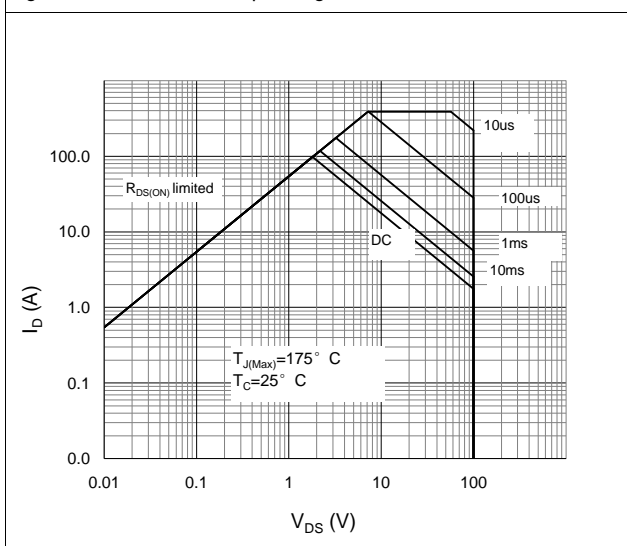


Figure 10. Maximun Drain Current vs. Case Temperature

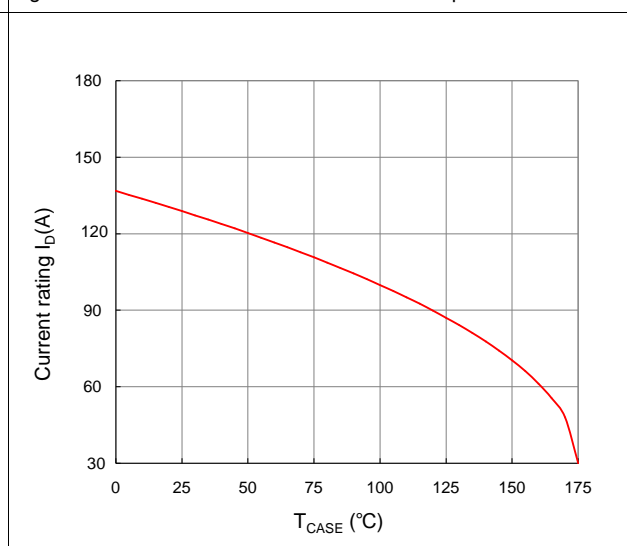


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case

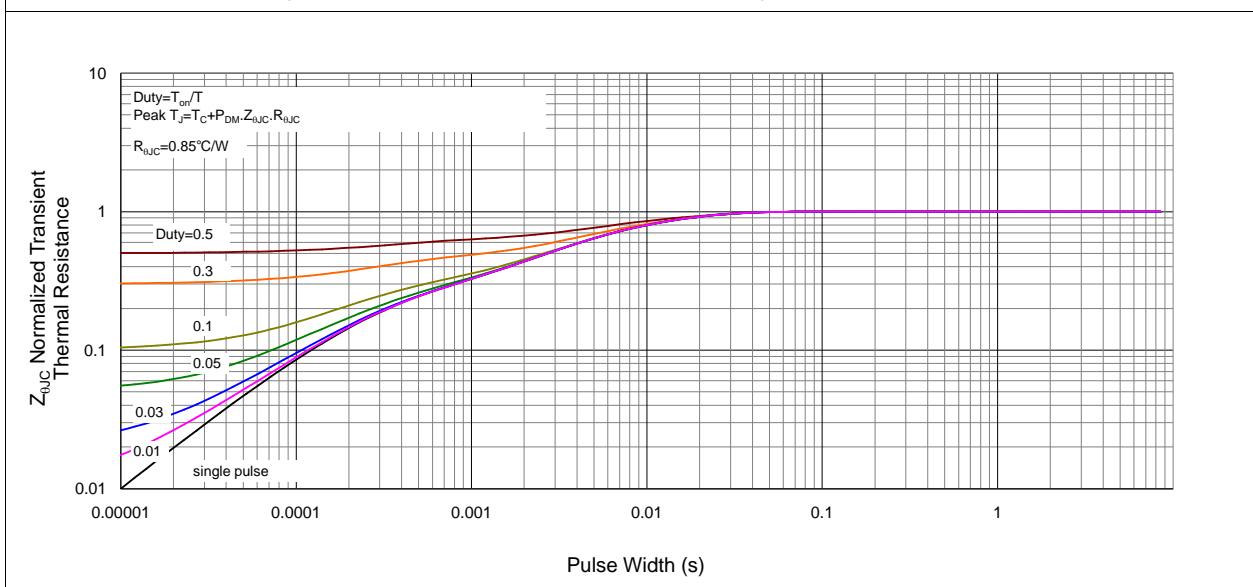


Fig 1. Typical Output Characteristics

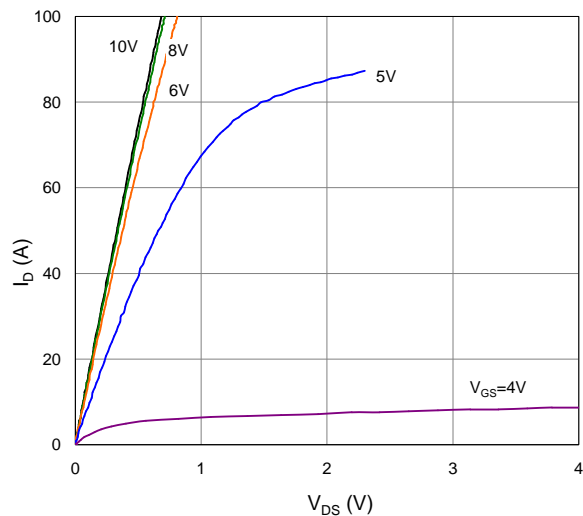


Figure 2. On-Resistance vs. Gate-Source Voltage

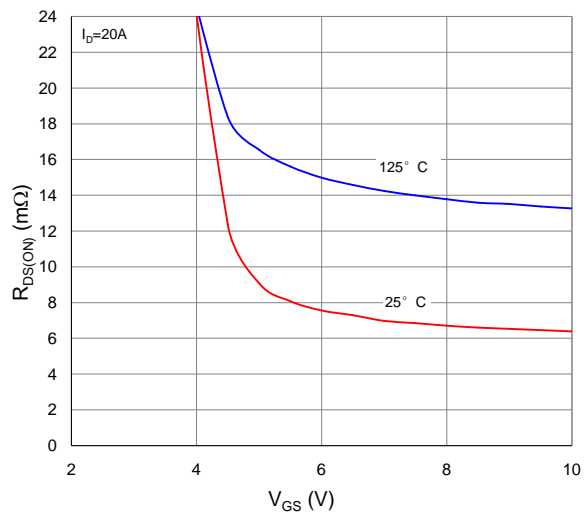


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

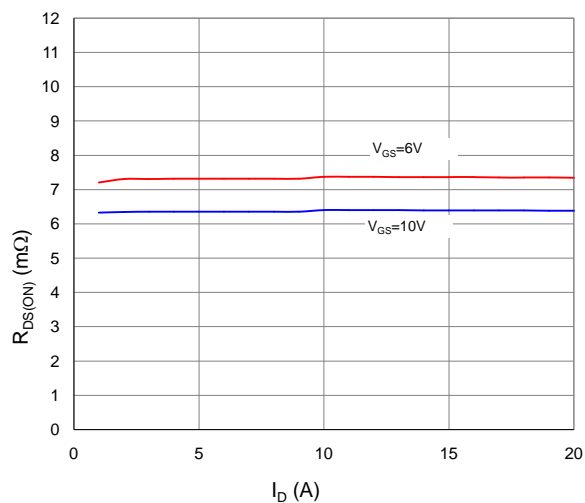


Figure 4. Normalized On-Resistance vs. Junction Temperature

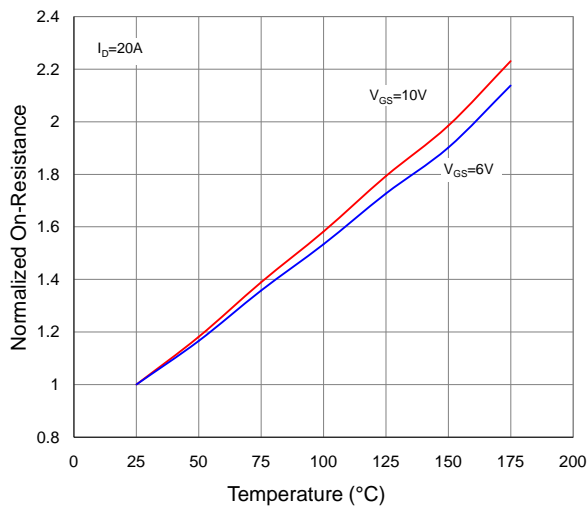


Figure 5. Typical Transfer Characteristics

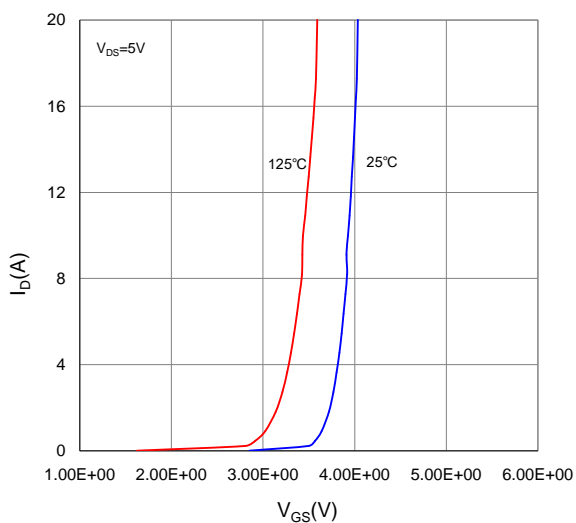
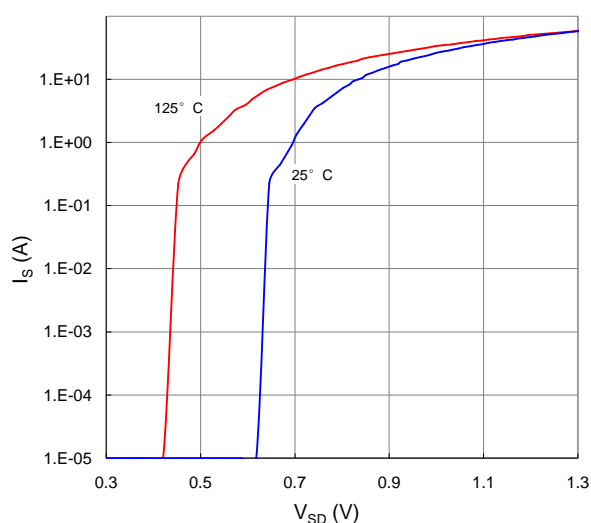
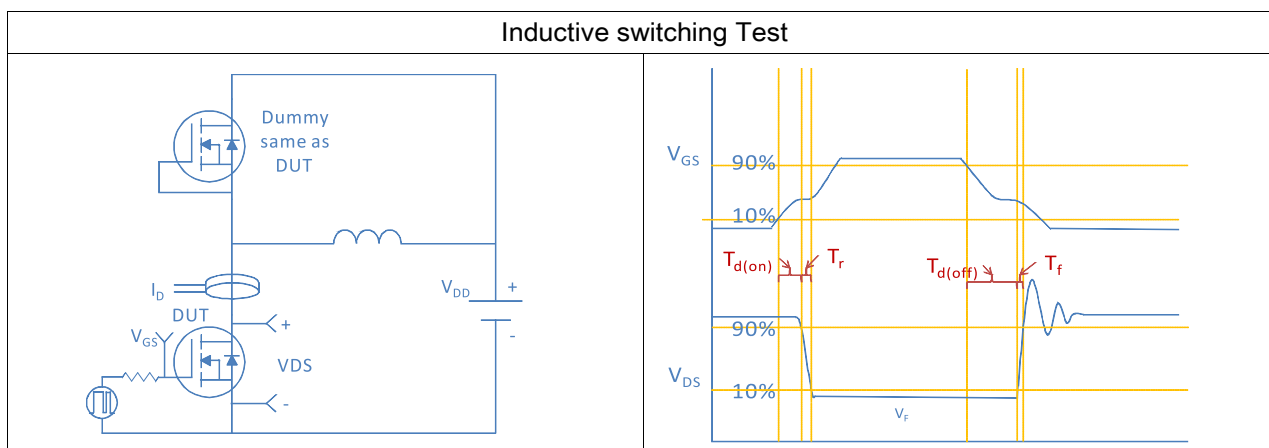


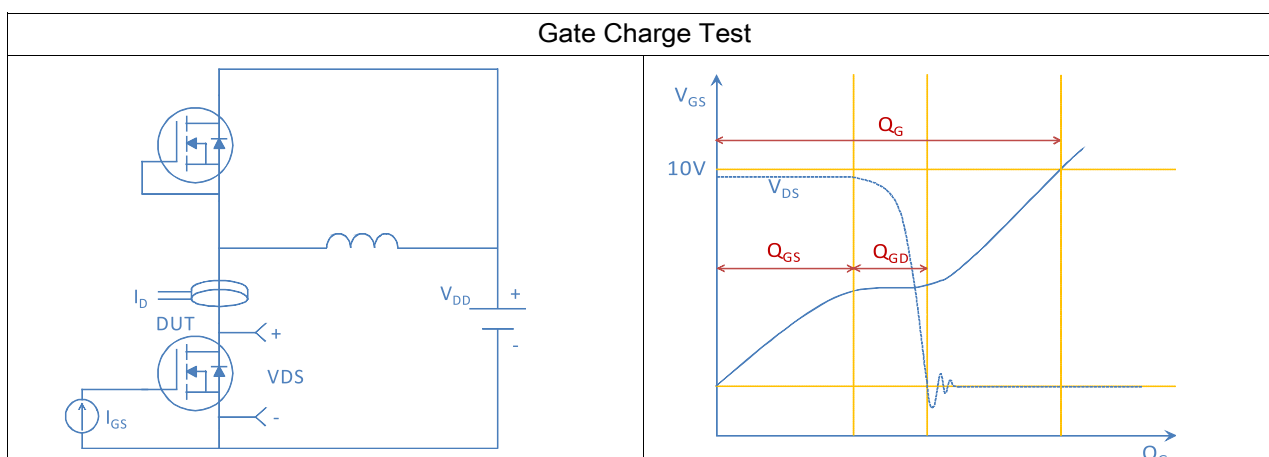
Figure 6. Typical Source-Drain Diode Forward Voltage



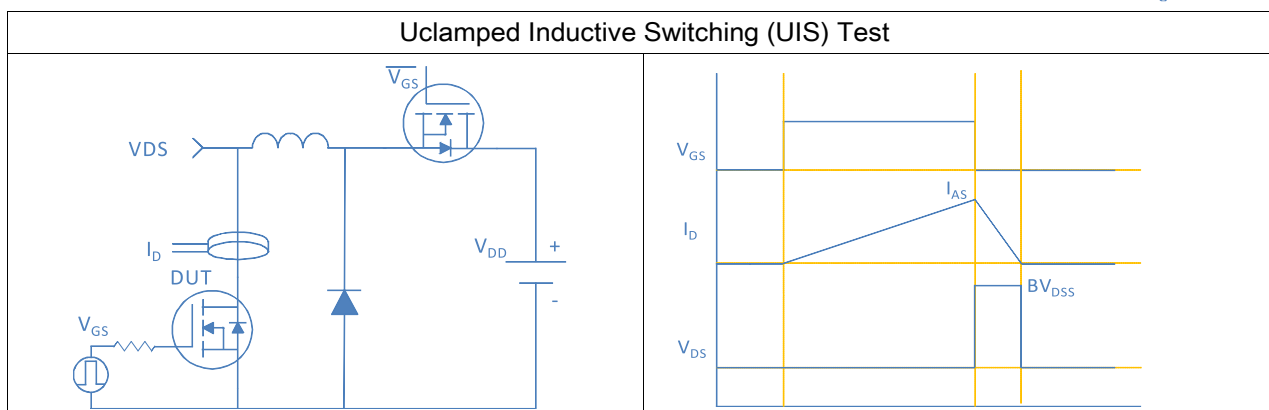
### Inductive switching Test



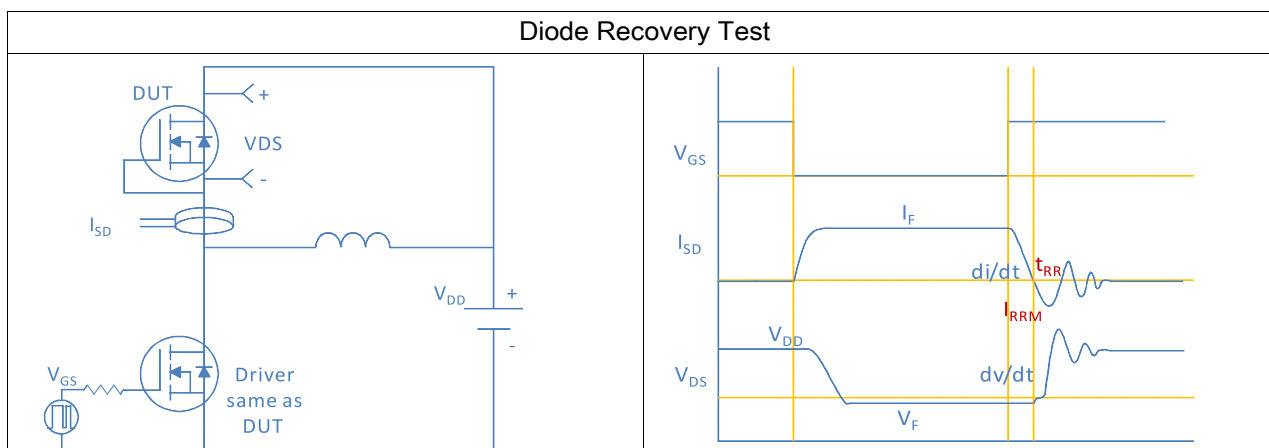
### Gate Charge Test



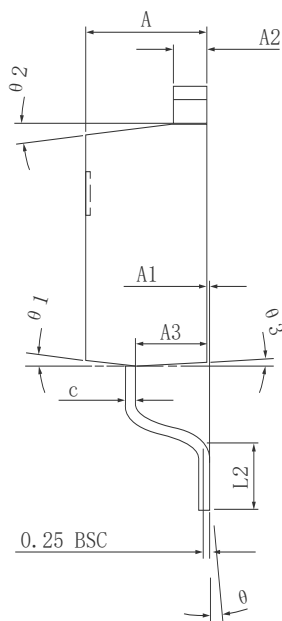
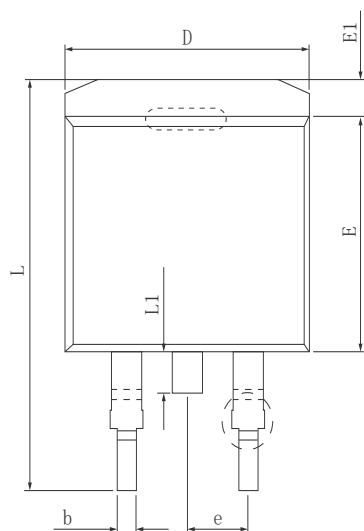
### Uclamped Inductive Switching (UIS) Test



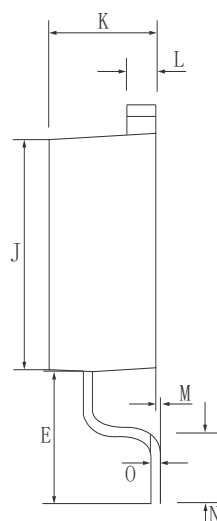
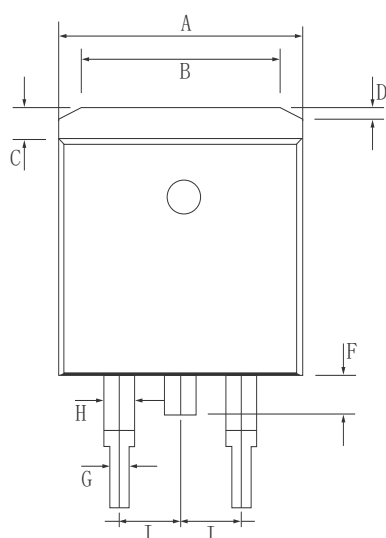
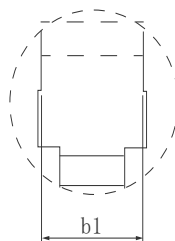
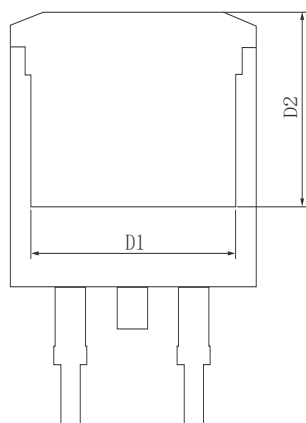
### Diode Recovery Test



# •Dimensions (TO-263)



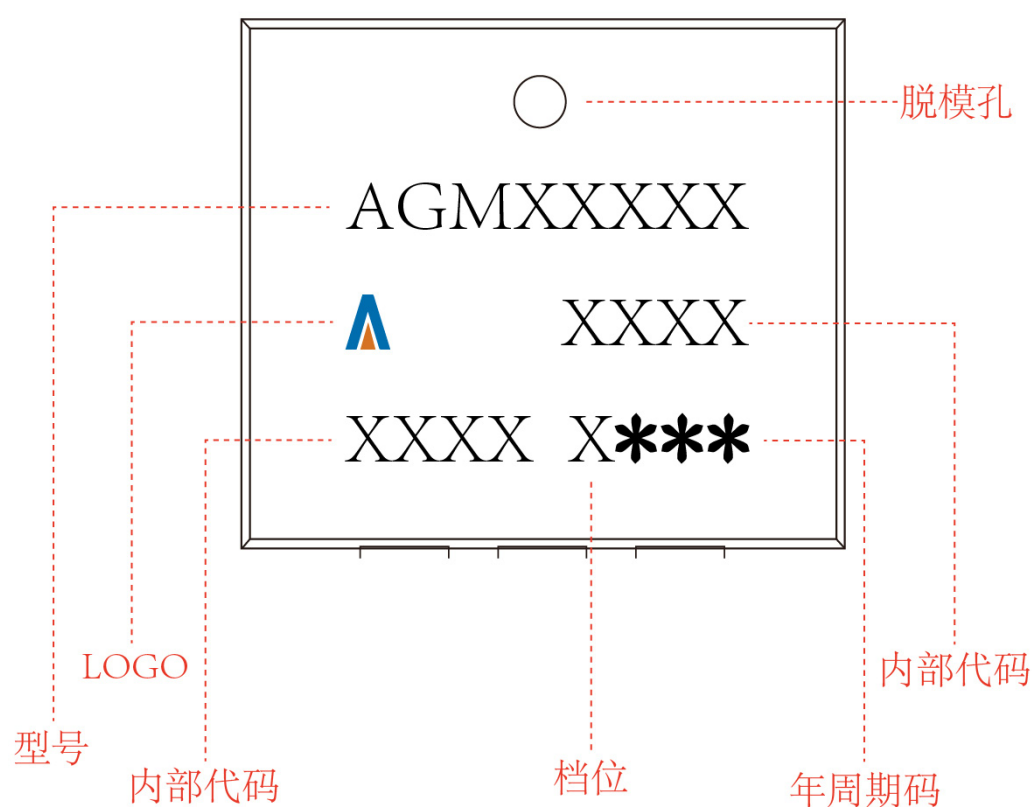
SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	4.370	4.570	4.770
A1	0.000		0.250
A2	1.220	1.270	1.420
A3	2.490	2.690	2.890
b	0.700	0.810	0.960
b1	1.170	1.270	1.470
c	0.300	0.380	0.530
D	9.860	10.160	10.360
D1	8.400 REF		
D2	7.073 REF		
E	8.500	8.700	8.900
E1	1.070	1.270	1.470
e	2.540 TYP		
L	14.700	15.100	15.500
L1	1.400	1.550	1.700
L2	2.000	2.300	2.600
$\theta$	0°		9°
$\theta 1$	7° TYP		
$\theta 2$	7° TYP		
$\theta 3$	3° TYP		



Dim.	Min.	Max.
A	9.8	10.2
B	6.1	6.7
C	1.1	1.4
D	0.5	1.0
E	4.6	5.0
F	1.4	1.6
G	0.7	0.9
H	1.17	1.37
I	Typ2.54	
J	9	9.2
K	4.3	4.7
L	1.25	1.35
M	0.02	0.23
N	2.2	2.8
O	0.45	0.55
All Dimensions in millimeter		

# TO-263

## Marking Instructions:




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