● General Description

The AGM056N08C 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

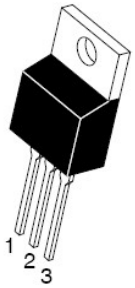
● Application

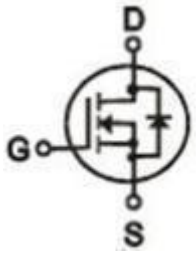
- MB/VGA Vcore
- SMPS 2nd Synchronous Rectifier
- POL application
- BLDC Motor driver

Product Summary

BVDSS	RDSON	ID
85V	4.4mΩ	120A

TO-220 Pin Configuration





Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM056N08C	AGM056N08C	TO-220	----	----	1000

Table 1. Absolute Maximum Ratings (TC=25℃)

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	85	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25℃) **(Note 1)**	138	A
	Drain Current-Continuous(Tc=100℃)	87.4	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed **(Note 2)**	480	A
PD	Maximum Power Dissipation(Tc=25℃)	173.6	w
	Maximum Power Dissipation(Tc=100℃)	69	w
EAS	Avalanche energy **(Note 3)**	306	mJ
TJ,TSTG	Operating Junction and Storage Temperature Range	-55 To 150	℃

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
RθJA	Thermal Resistance Junction-ambient (Steady State)[1]	---	62.5	℃/W
RθJC	Thermal Resistance Junction-Case[1]	---	0.72	℃/W

Table 3. Electrical Characteristics (TC=25℃unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	85	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=85V,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	3	4	V
gFS	Forward Transconductance	VDS=5V,ID=20A	--	--	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=50A	--	4.4	5	mΩ
		VGS=4.5V, ID=40A	--	--	--	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=42.5V, VGS=0V, F=1MHZ	--	4020	--	pF
Coss	Output Capacitance		--	607	--	pF
Crss	Reverse Transfer Capacitance		--	15	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	1.7	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V,VDS=42.5V, ID=50A,RGEN=3Ω	--	22	--	nS
tr	Turn-on Rise Time		--	42	--	nS
td(off)	Turn-Off Delay Time		--	48	--	nS
tf	Turn-Off Fall Time		--	25	--	nS
Qg	Total Gate Charge	VGS=42.5V, VDS=10V, ID=50A	--	80	--	nC
Qgs	Gate-Source Charge		--	23	--	nC
Qgd	Gate-Drain Charge		--	24	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	120	A
VSD	Forward on Voltage	VGS=0V,IS=50A	--	--	1.2	V
trr	Reverse Recovery Time	Is=20A , dI/dt=500A/μs , TJ=25℃	--	60	--	ns
Qrr	Reverse Recovery Charge		--	136	--	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: TJ=25℃

Characteristics Curves

Figure 1. Safe Operating Area

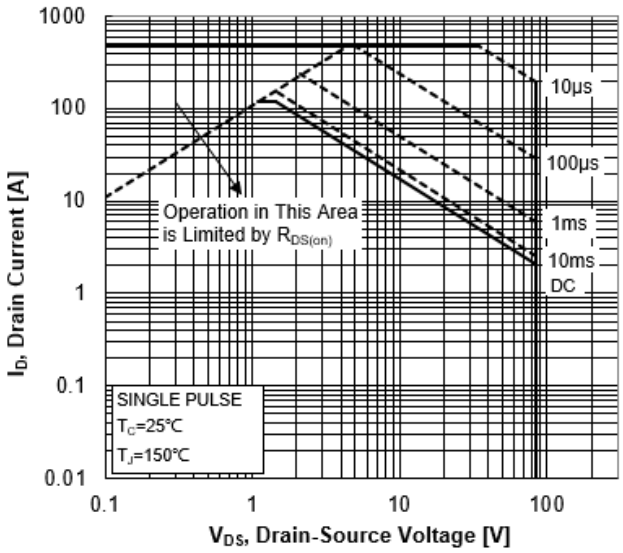


Figure 2. Maximum Power Dissipation vs Case Temperature

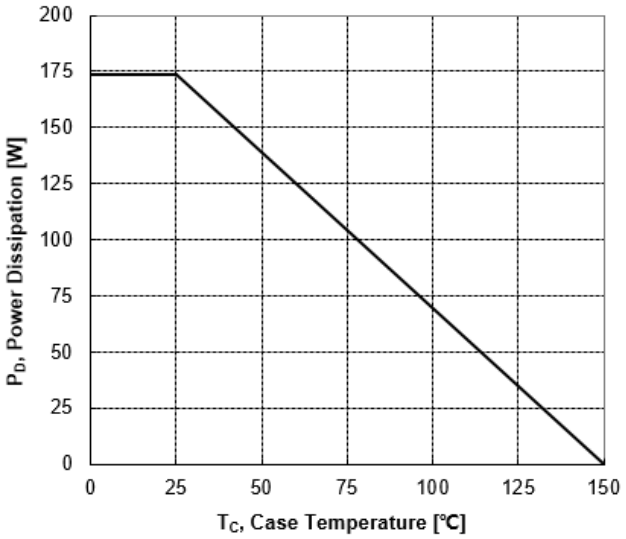


Figure 3. Maximum Continuous Drain Current vs Case Temperature

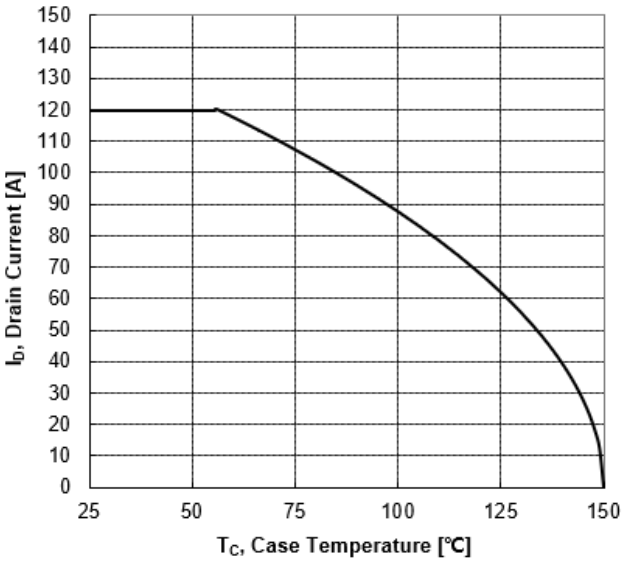


Figure 4. Typical Output Characteristics

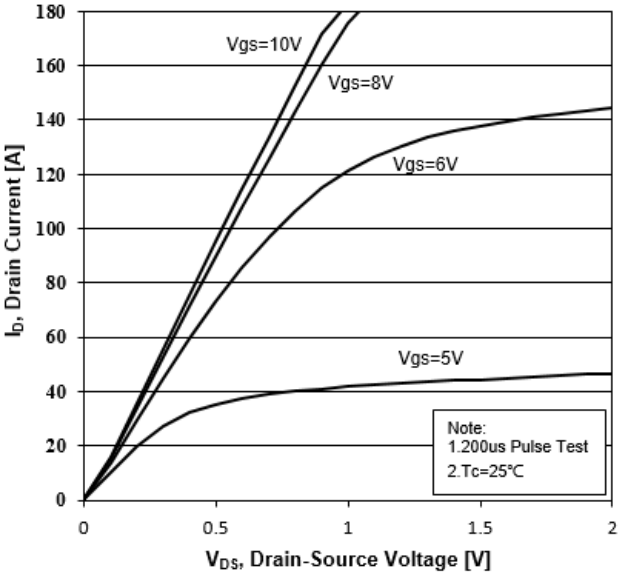


Figure 5. Transient Thermal Impedance

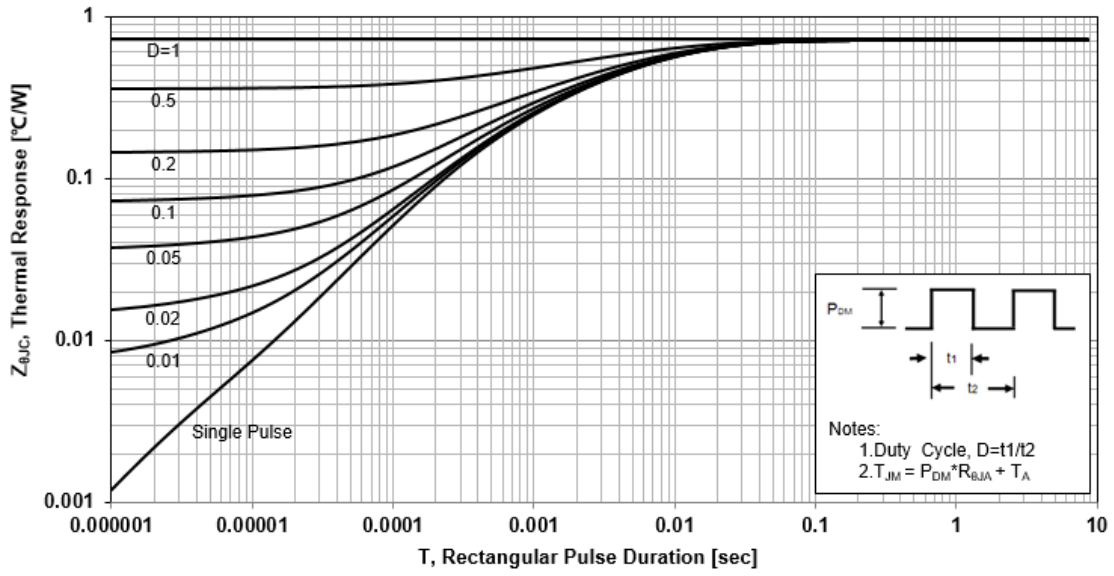


Figure 6. Typical Transfer Characteristics

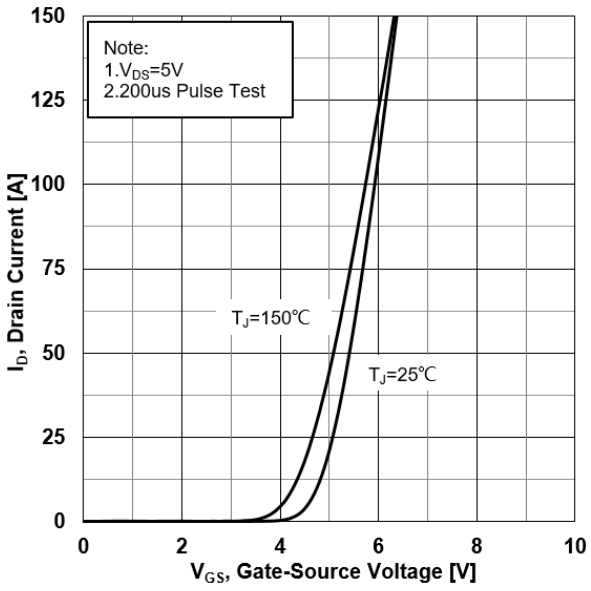


Figure 7. Source-Drain Diode Forward Characteristics

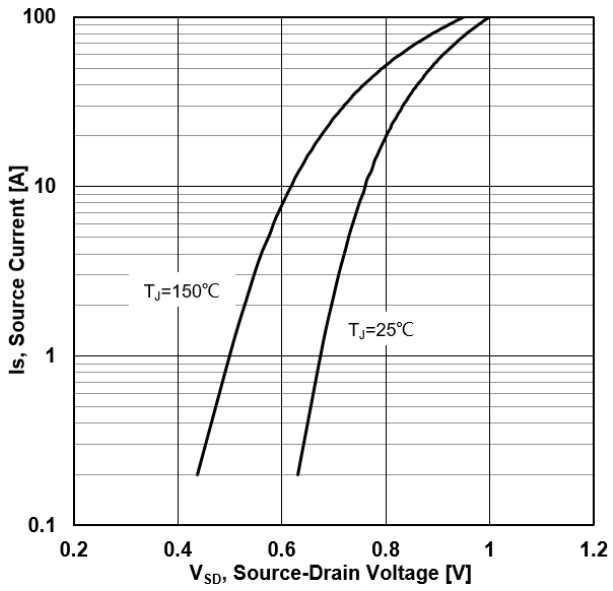


Figure 8. Drain-Source On-Resistance vs Drain Current

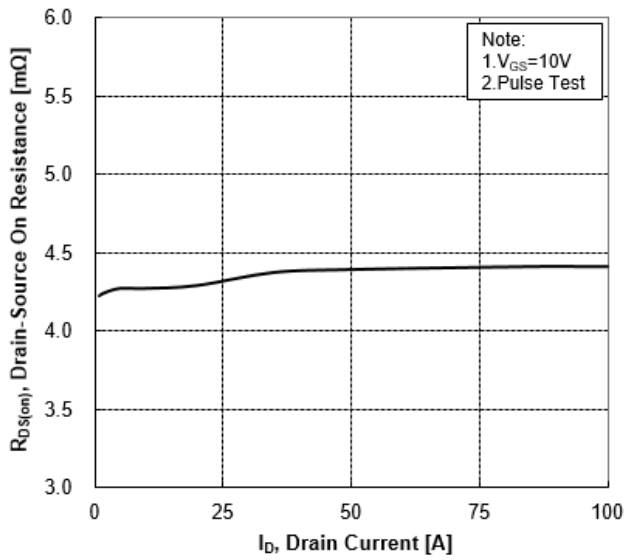


Figure 9. Normalized On-Resistance vs Junction Temperature

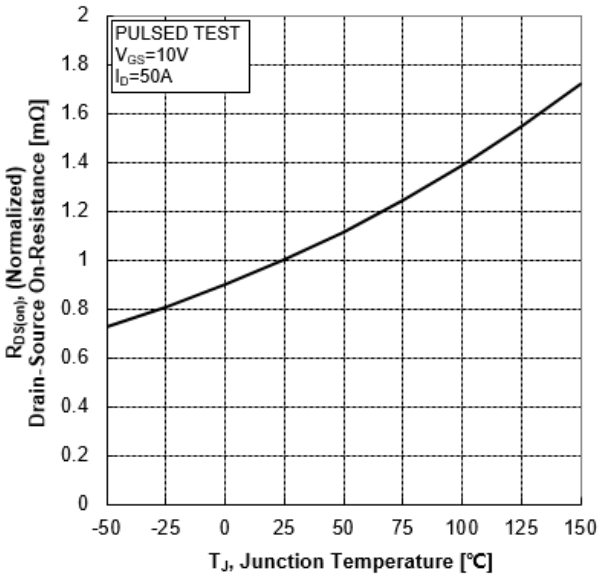


Figure 10. Normalized Threshold Voltage vs Junction Temperature

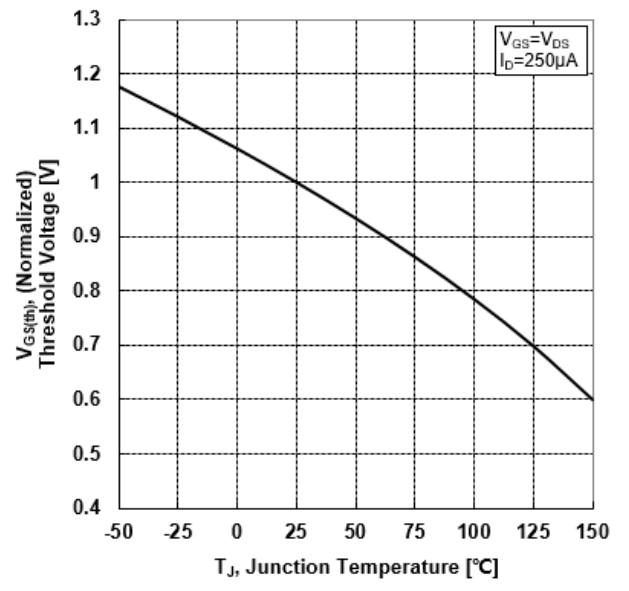


Figure 11. Normalized Breakdown Voltage vs Junction Temperature

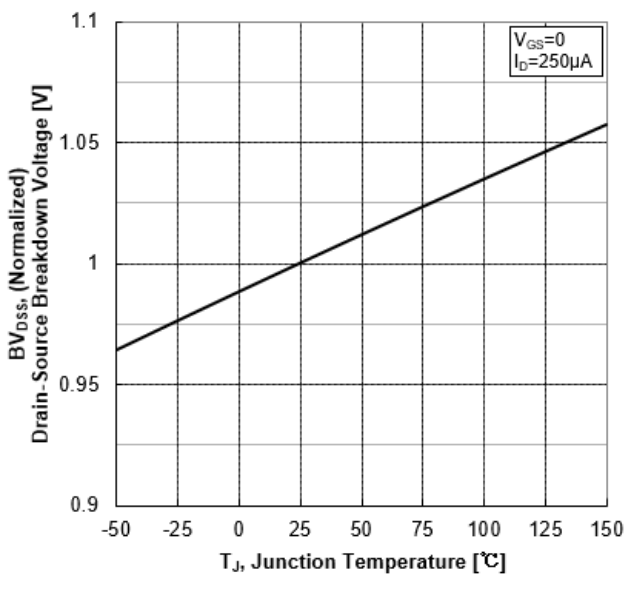


Figure 12. Capacitance Characteristics

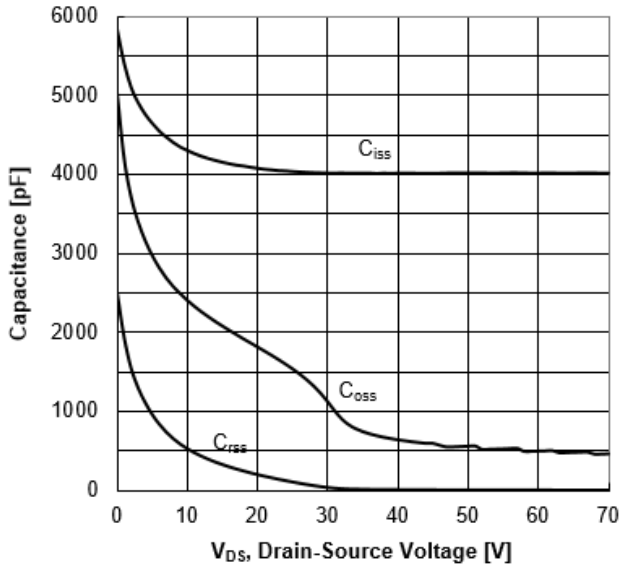
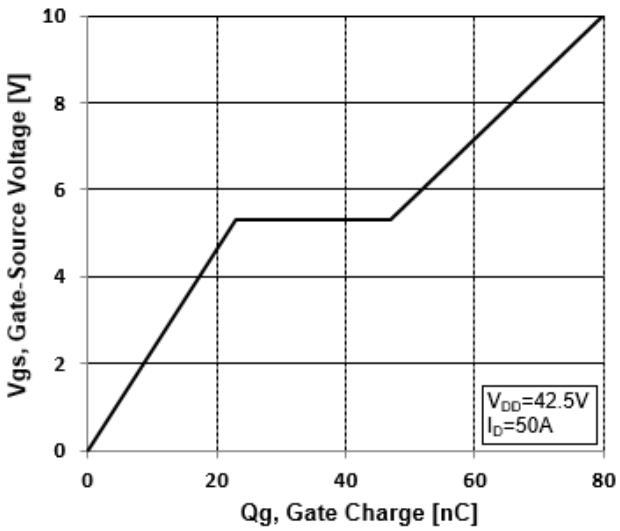


Figure 13. Typical Gate Charge vs Gate-Source Voltage



Test Circuit and Waveform

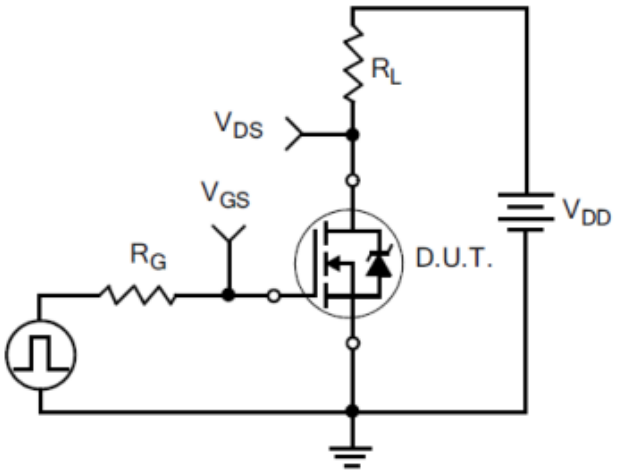
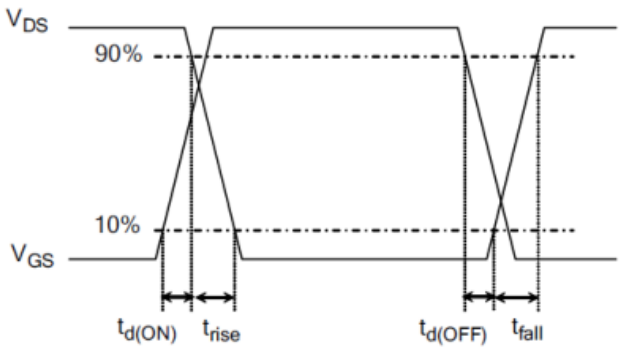
Figure 14. Resistive Switching Test Circuit	Figure 15. Resistive Switching Waveforms
	

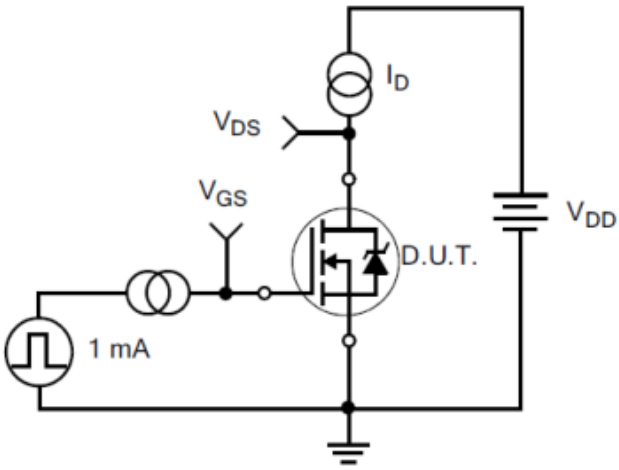
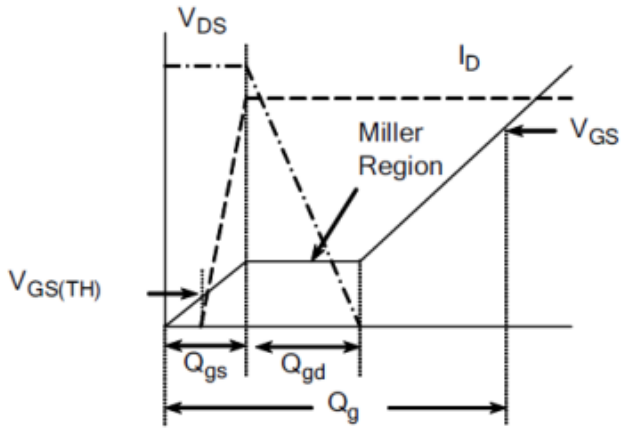
Figure 16. Gate Charge Test Circuit	Figure 17. Gate Charge Waveforms
	

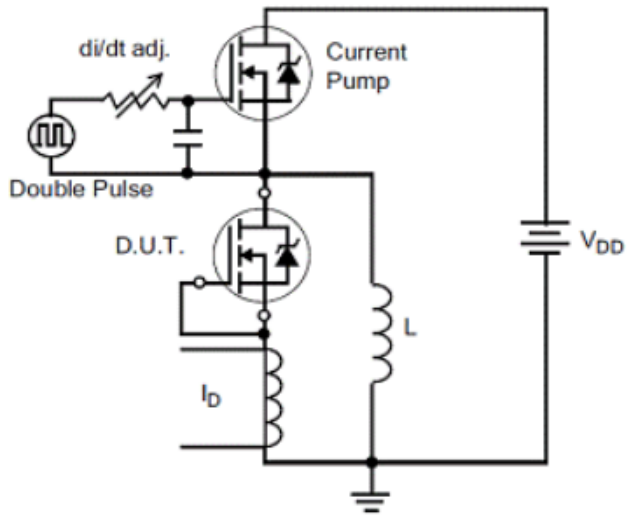
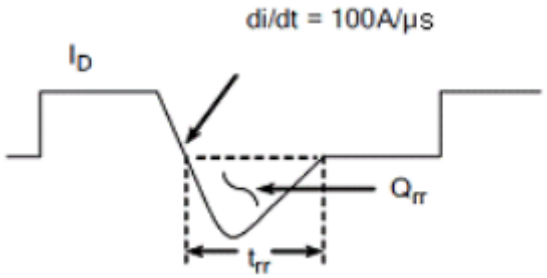
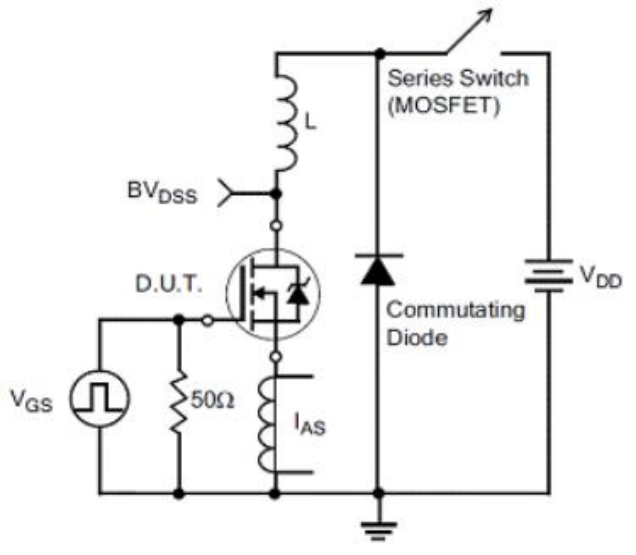
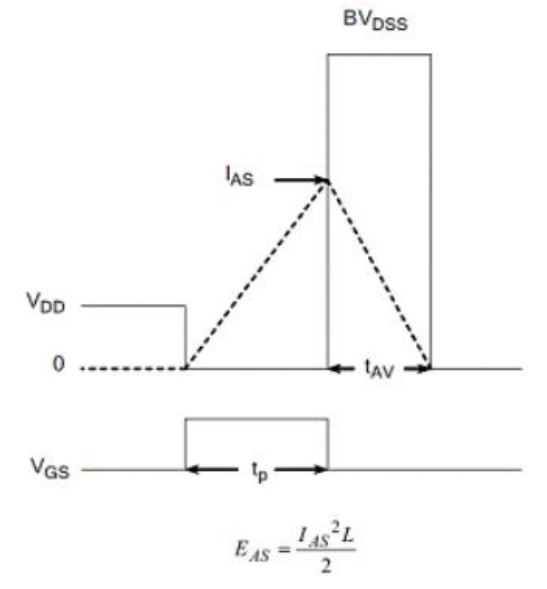
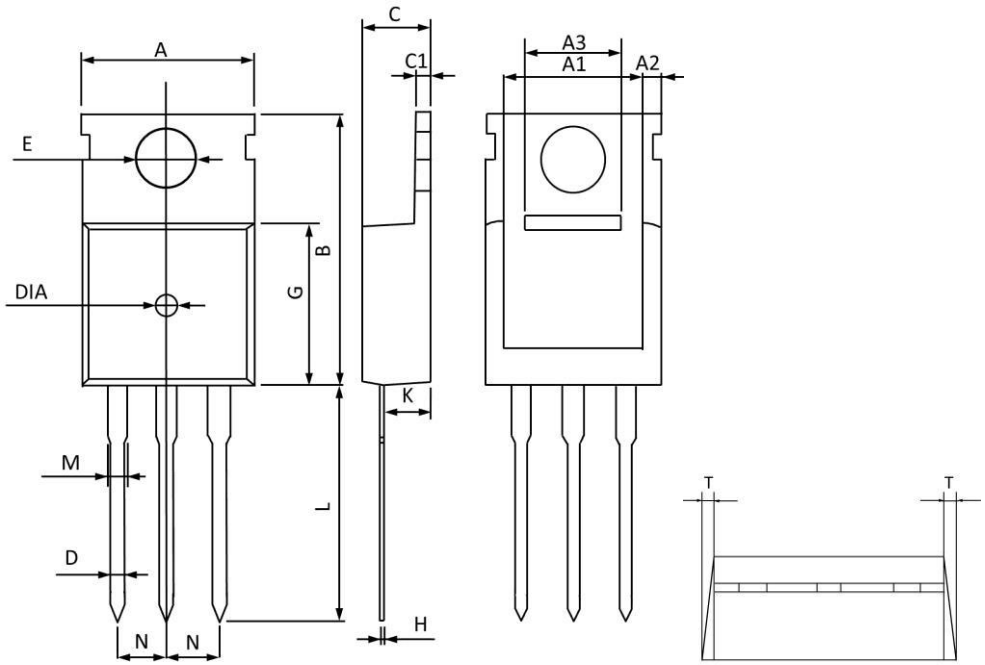
Figure 18. Diode Reverse Recovery Test Circuit	Figure 19. Diode Reverse Recovery Waveform
	

Figure 20. Unclamped Inductive Switching Test Circuit	Figure 21. Unclamped Inductive Switching Waveform
	

TO220 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	10.300	9.700	0.406	0.382
A1	8.840	8.440	0.348	0.332
A2	1.250	1.050	0.049	0.041
A3	5.300	5.100	0.209	0.201
B	16.200	15.400	0.638	0.606
C	4.680	4.280	0.184	0.169
C1	1.500	1.100	0.059	0.043
D	1.000	0.600	0.039	0.024
E	3.800	3.400	0.150	0.134
G	9.300	8.700	0.366	0.343
H	0.600	0.400	0.024	0.016
K	2.700	2.100	0.106	0.083
L	13.600	12.800	0.535	0.504
M	1.500	1.100	0.059	0.043
N	2.590	2.490	0.102	0.098
T	W0.35		W0.014	
DIA	Φ1.5 TYP.	deep0.2 TYP.	Φ0.059 TYP.	deep0.008 TYP.

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