General Description

The AGM056N10C 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

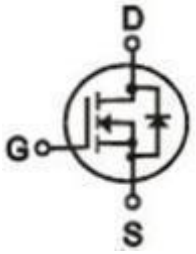
Application

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

Product Summary

BVDSS	RDSON	ID
100V	5.4mΩ	140A

TO-220 Pin Configuration



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM056N10C	AGM056N10C	TO-220	----	----	1000

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

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℃) **(Note 1)**	140	A
	Drain Current-Continuous(Tc=100℃)	95	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed **(Note 2)**	390	A
PD	Maximum Power Dissipation(Tc=25℃)	227	w
	MaximumPowerDissipation(Tc=100 ℃)	91	w
EAS	Avalanche energy **(Note 3)**	400	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]	---	65	℃/W
RθJC	Thermal Resistance Junction-Case[1]	---	0.55	℃/W

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV_{DSS}	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
$V_{GS(th)}$	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=20A	--	5.4	6.8	mΩ
		VGS=4.5V, ID=7A	--	--	--	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=50V,VGS=0V, F=1MHZ	--	3650	--	pF
Coss	Output Capacitance		--	290	--	pF
Crss	Reverse Transfer Capacitance		--	88	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	1.6	--	Ω
Switching Times						
$t_{d(on)}$	Turn-on Delay Time	VGS=10V,VDS=50V, ID=20A,RGEN=10Ω	--	17	--	nS
tr	Turn-on Rise Time		--	40	--	nS
$t_{d(off)}$	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=20A	--	0.9	1.2	V
trr	Reverse Recovery Time	IF=20A , dI/dt=500A/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: TJ=25℃

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

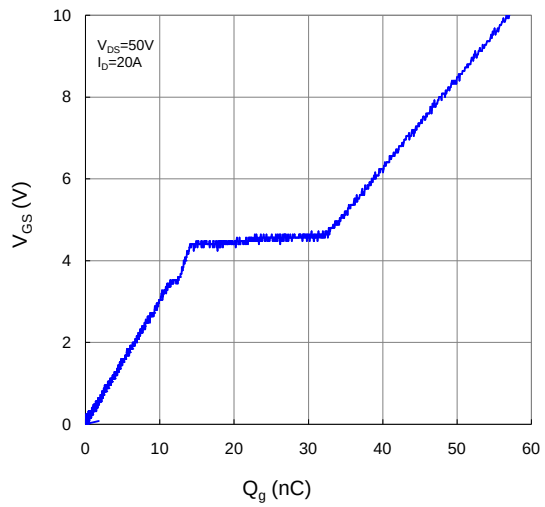


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

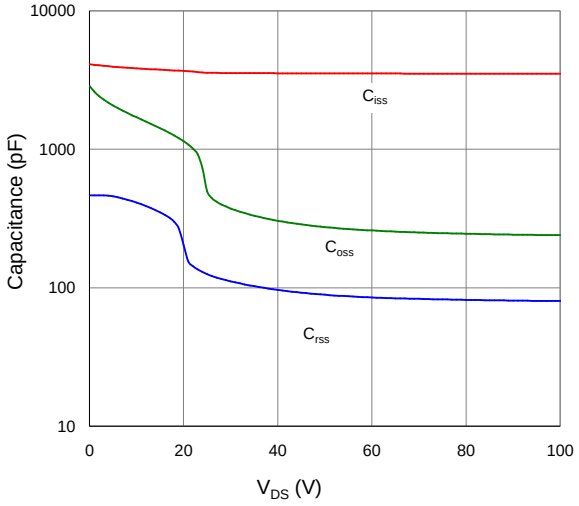


Figure 9. Maximum Safe Operating Area

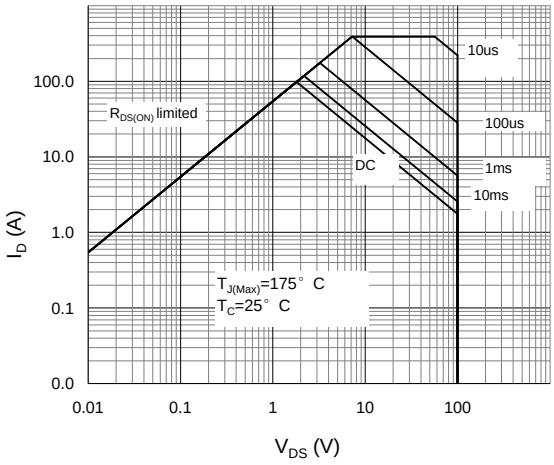


Figure 10. Maximun Drain Current vs. Case Temperature

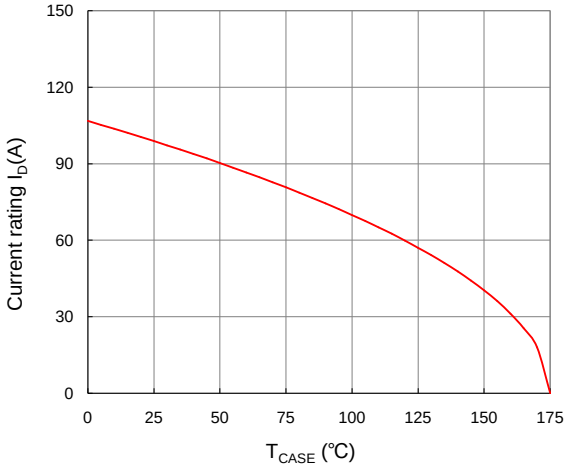


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case

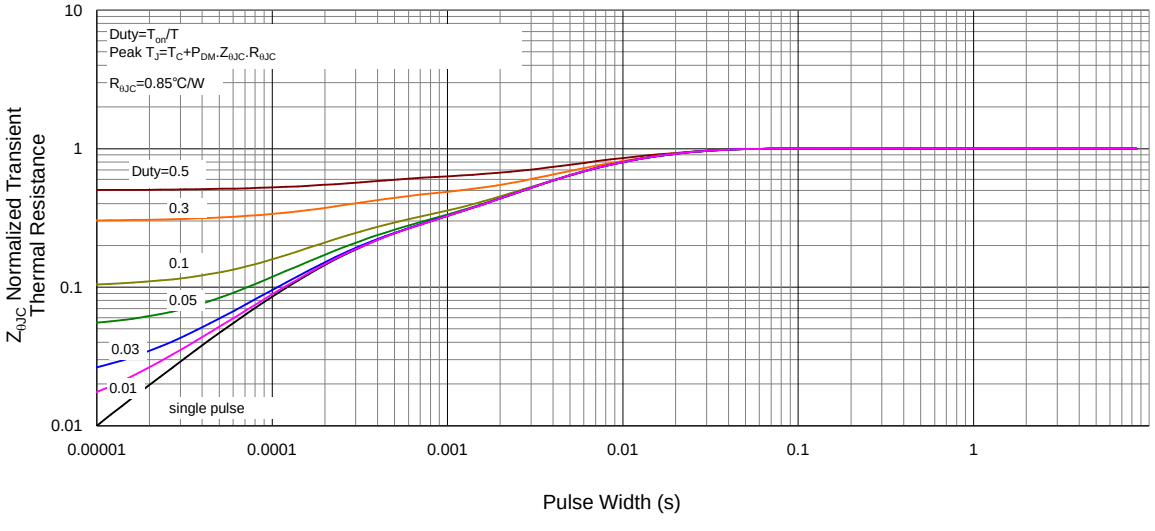


Fig 1. Typical Output Characteristics

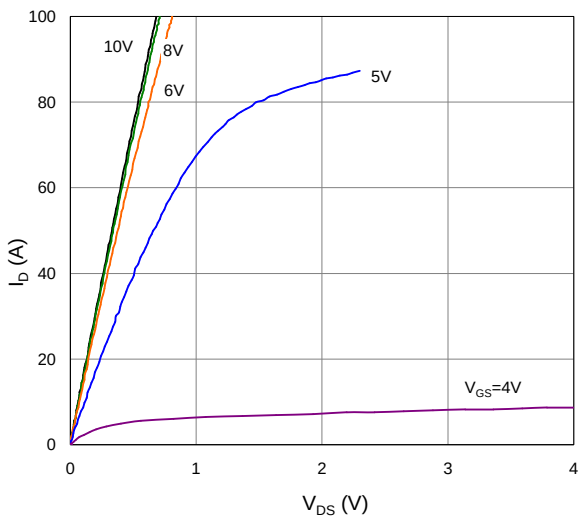


Figure 2. On-Resistance vs. Gate-Source Voltage

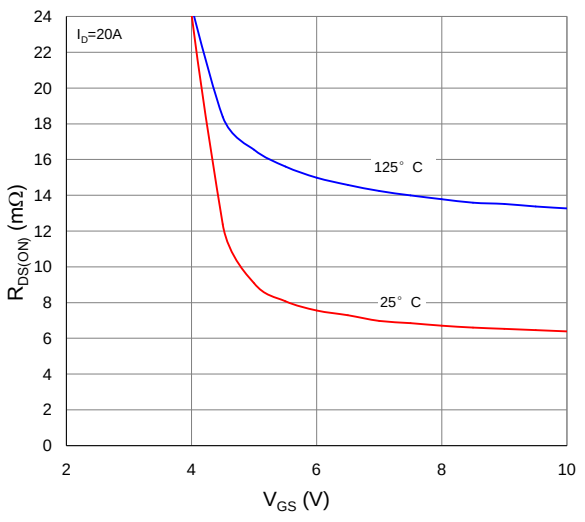


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

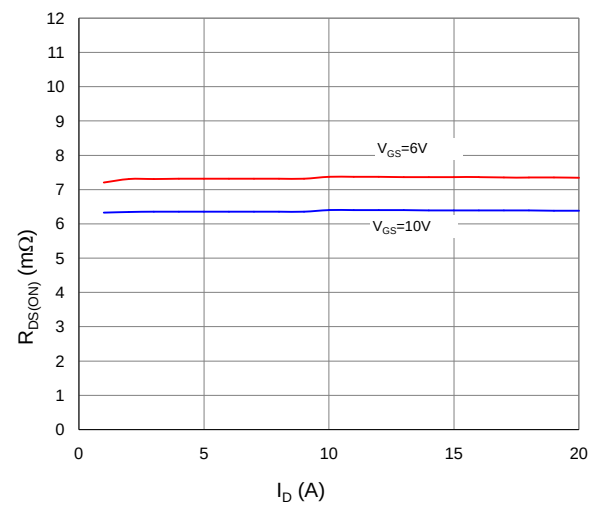


Figure 4. Normalized On-Resistance vs. Junction Temperature

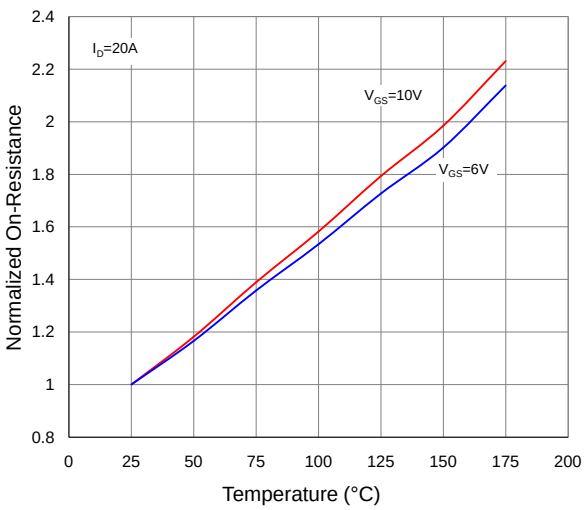


Figure 5. Typical Transfer Characteristics

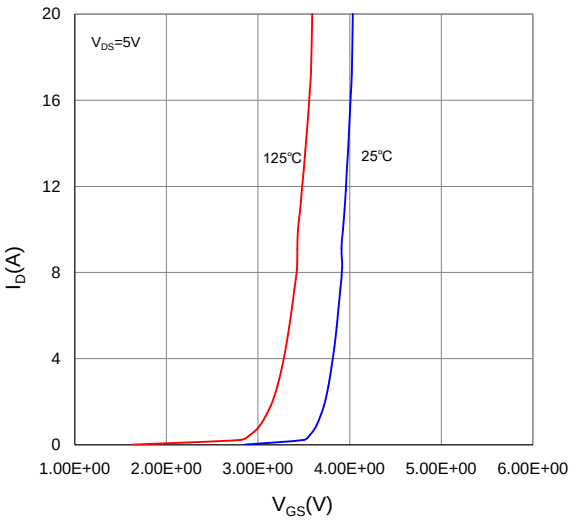
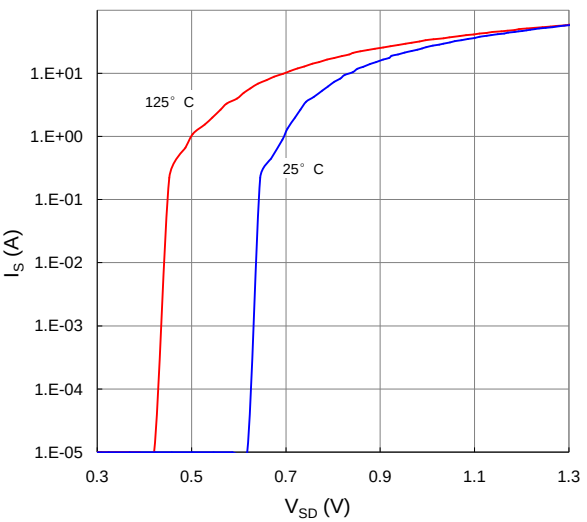
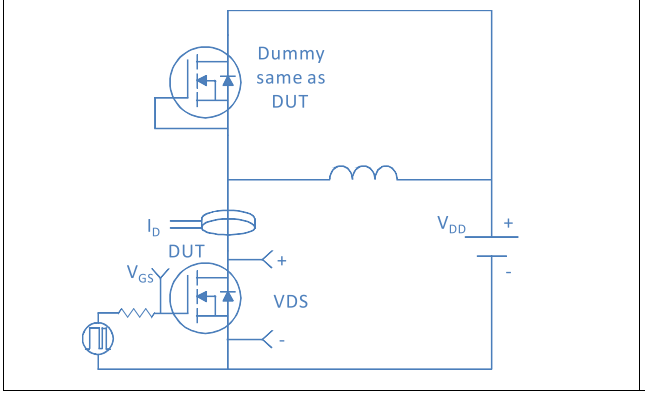
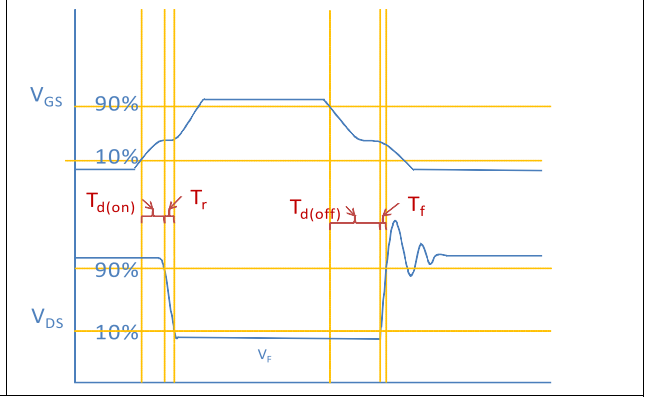


Figure 6. Typical Source-Drain Diode Forward Voltage

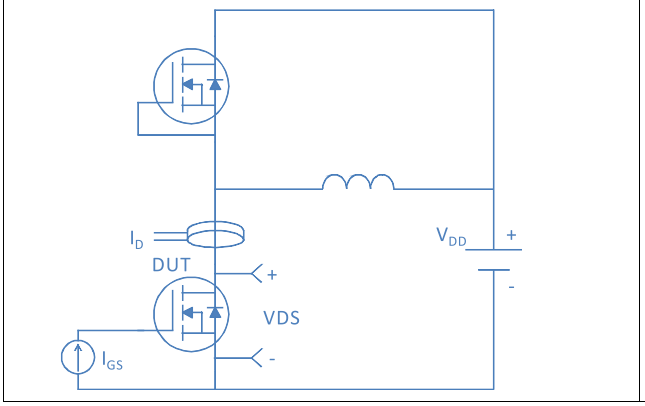


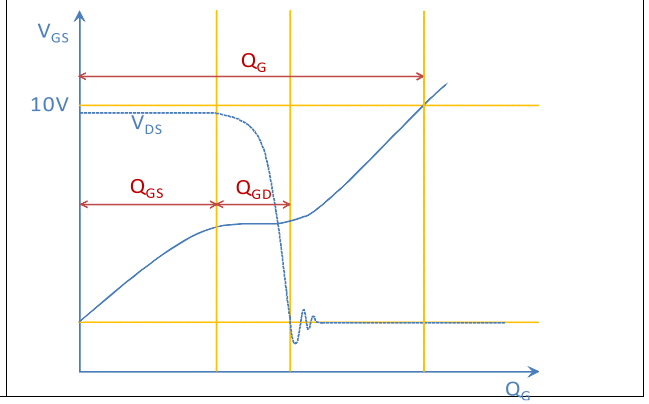
Inductive switching Test



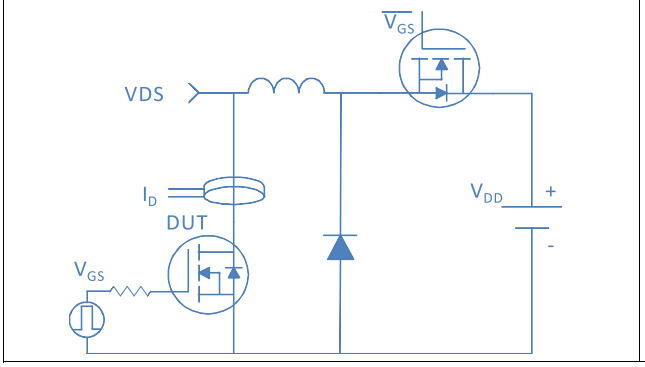


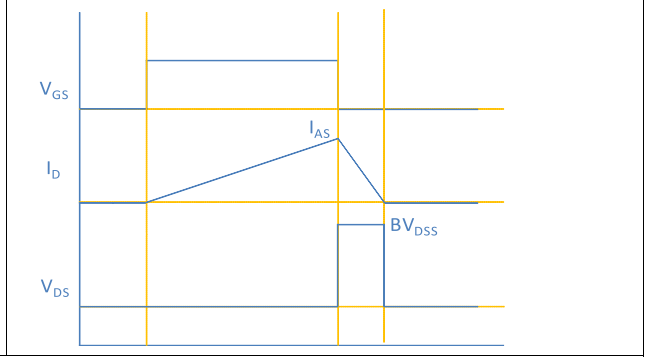
Gate Charge Test



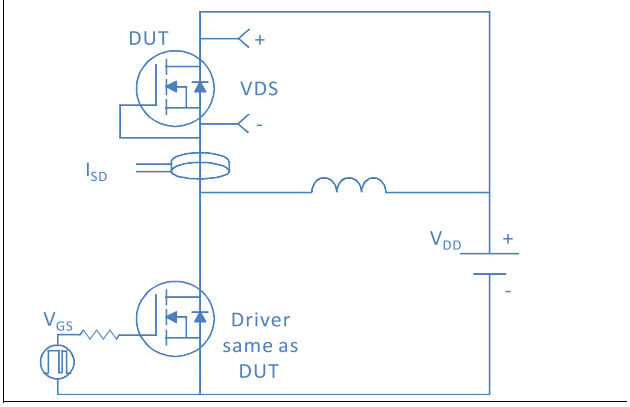


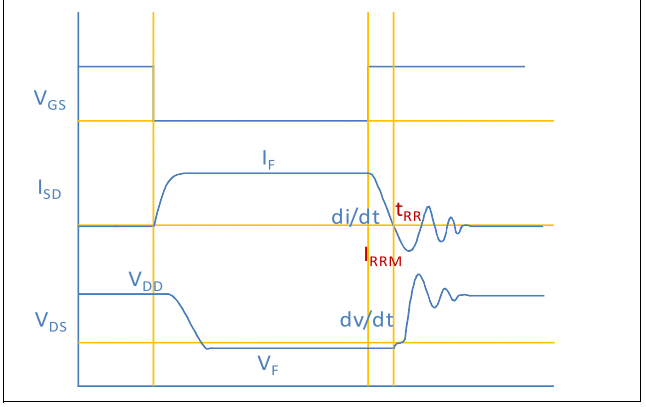
Uclamped Inductive Switching (UIS) Test



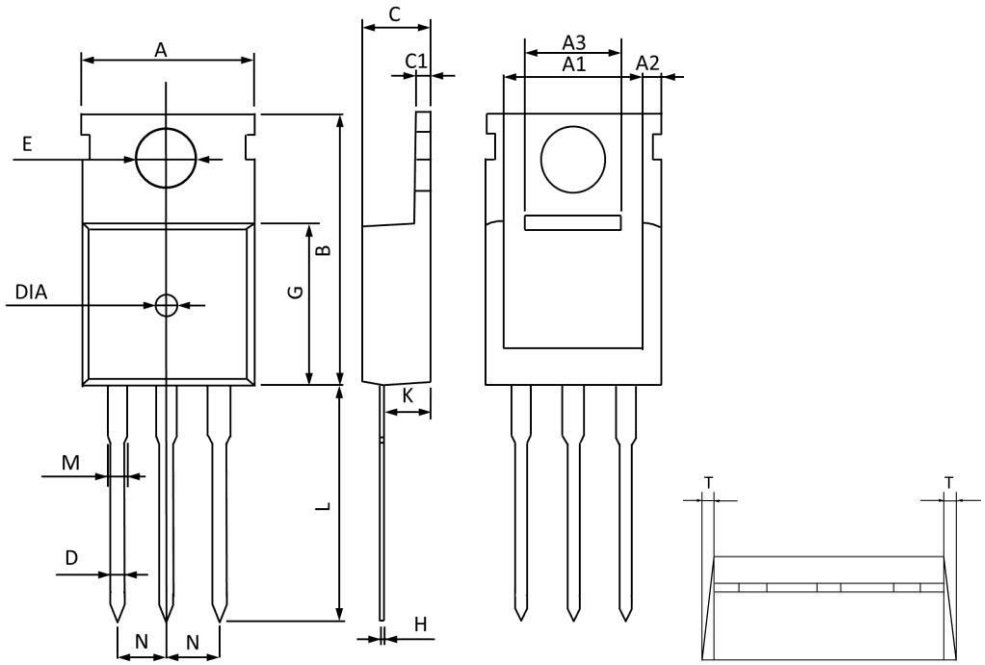


Diode Recovery Test





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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