

### General Description

The AGMH03N85C 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 test
- 100% DVDS tested

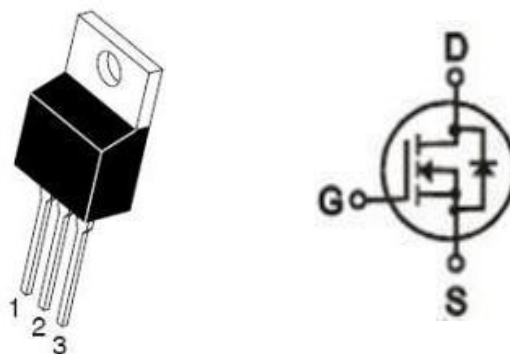
### Application

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

### Product Summary

BVDSS	RDSON	ID
85V	2.8mΩ	140A

### TO-220 Pin Configuration



### Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGMH03N85C	AGMH03N85C	TO-220	----	----	1000

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

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°C) (Note 1)	140	A
	Drain Current-Continuous(Tc=100°C)	116	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 2)	550	A
PD	Maximum Power Dissipation(Tc=25°C)	227	w
	Maximum Power Dissipation(Tc=100°C)	90	w
EAS	Avalanche energy (Note 3)	560	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>	---	62	°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
<b>On/Off States</b>						
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	2.0	3.0	4.0	V
gFS	Forward Transconductance	VDS=10V,ID=15A	--	10	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=50A	--	2.8	3.4	mΩ
<b>Dynamic Characteristics</b>						
Ciss	Input Capacitance	VDS=50V,VGS=0V, F=1MHZ	--	6890	--	pF
Coss	Output Capacitance		--	2500	--	pF
Crss	Reverse Transfer Capacitance		--	140	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	--	--	Ω
<b>Switching Times</b>						
td(on)	Turn-on Delay Time	VGS=10V,VDS=50V ID=10A,RGEN=3Ω	--	29	--	nS
tr	Turn-on Rise Time		--	33	--	nS
td(off)	Turn-Off Delay Time		--	48	--	nS
tf	Turn-Off Fall Time		--	26	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=50V, ID=12A	--	102	--	nC
Qgs	Gate-Source Charge		--	30	--	nC
Qgd	Gate-Drain Charge		--	20	--	nC
<b>Source-Drain Diode Characteristics</b>						
ISD	Source-Drain Current(Body Diode)		--	--	140	A
VSD	Forward on Voltage	VGS=0V,IS=50A	--	--	1.2	V
trr	Reverse Recovery Time	IS=50A , dI/dt=100A/μs , TJ=25°C	--	82	--	ns
Qrr	Reverse Recovery Charge		--	170	--	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

Figure 1. Safe Operating Area

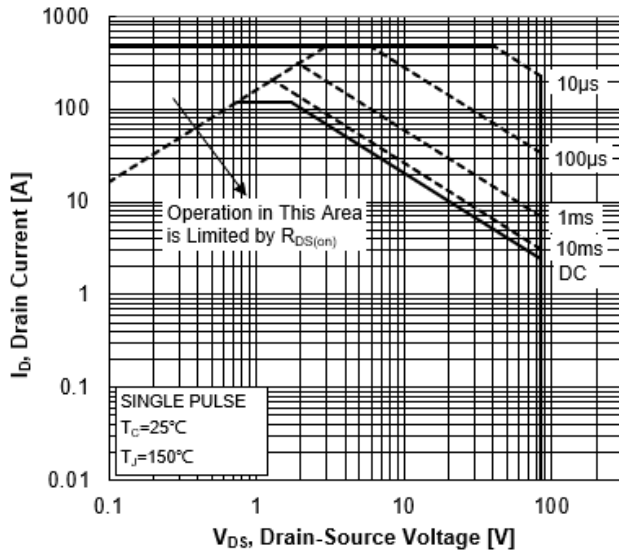


Figure 2. Maximum Power Dissipation vs Case Temperature

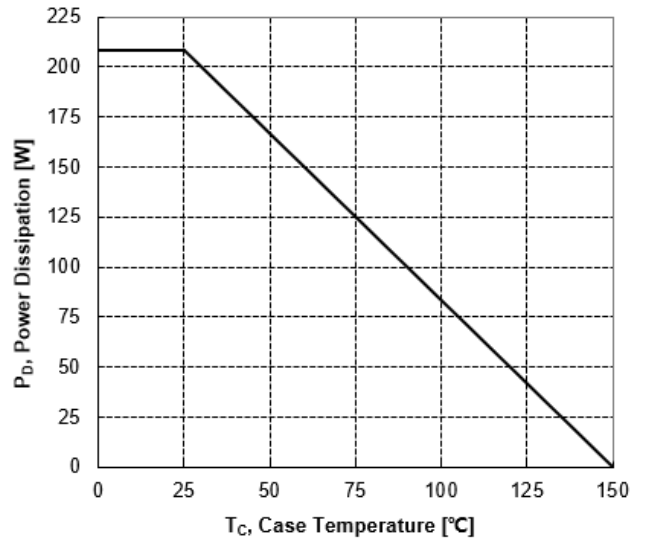


Figure 3. Maximum Continuous Drain Current vs Case Temperature

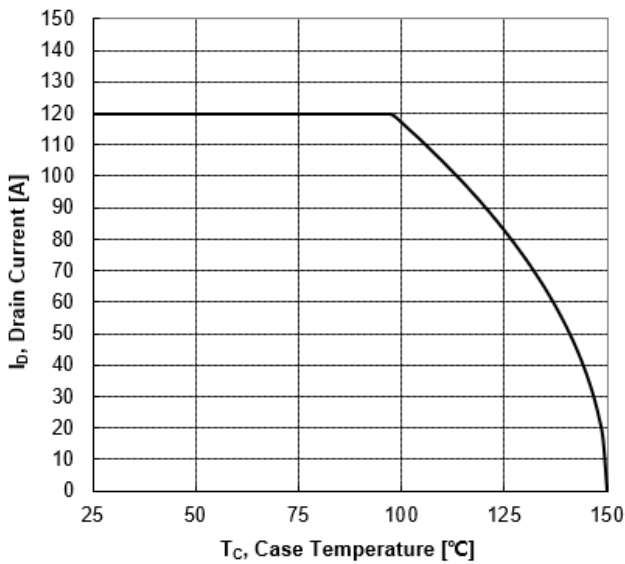


Figure 4. Typical Output Characteristics

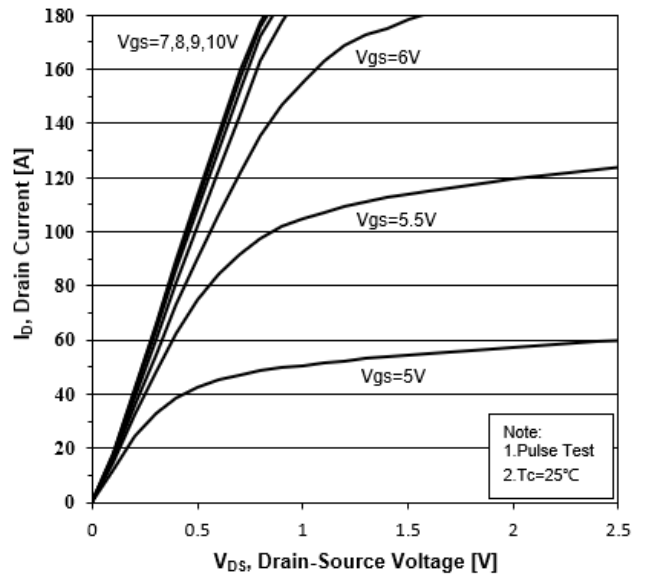


Figure 5. Transient Thermal Impedance

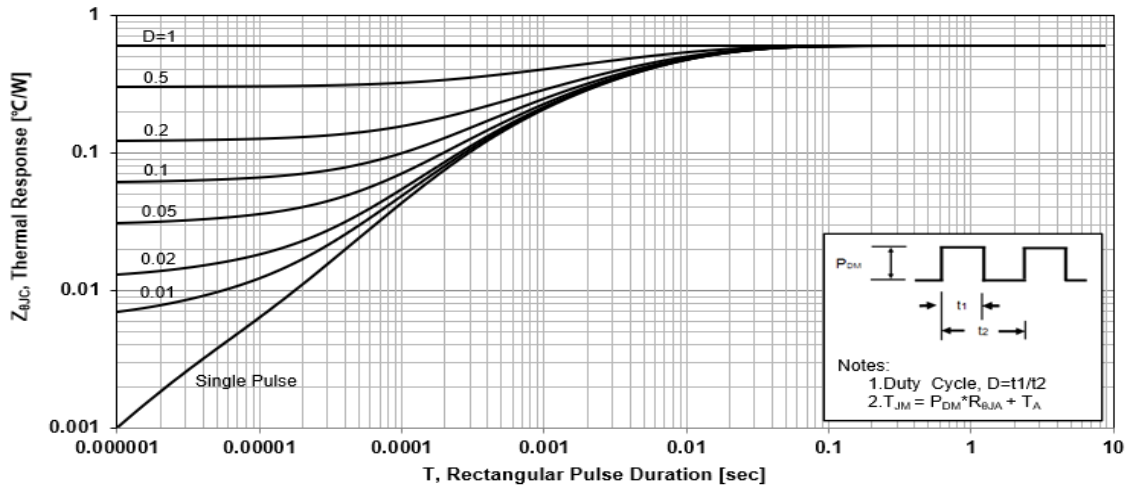


Figure 6. Typical Transfer Characteristics

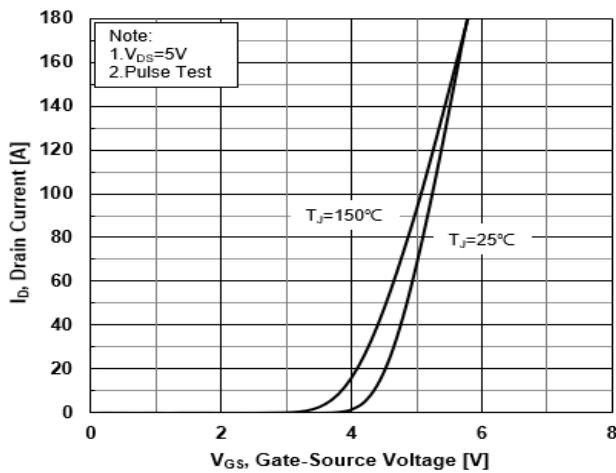


Figure 7. Source-Drain Diode Forward Characteristics

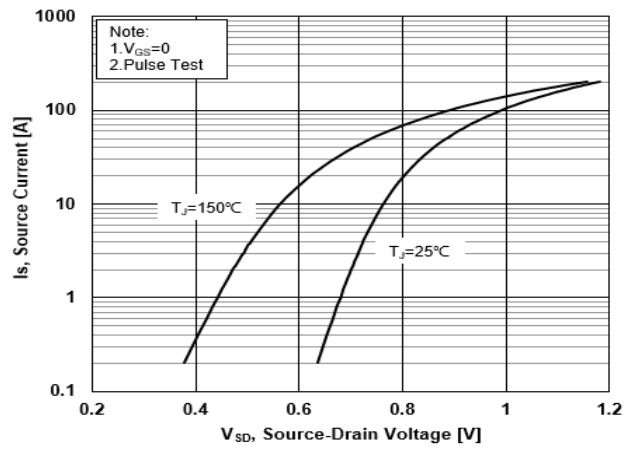


Figure 12. Capacitance Characteristics

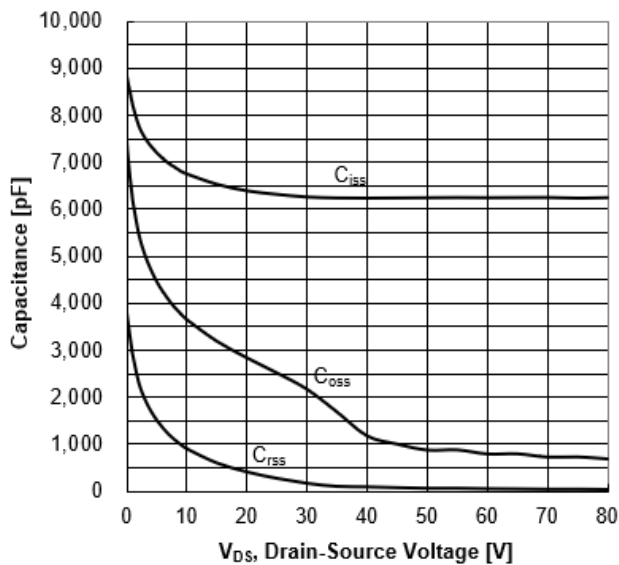
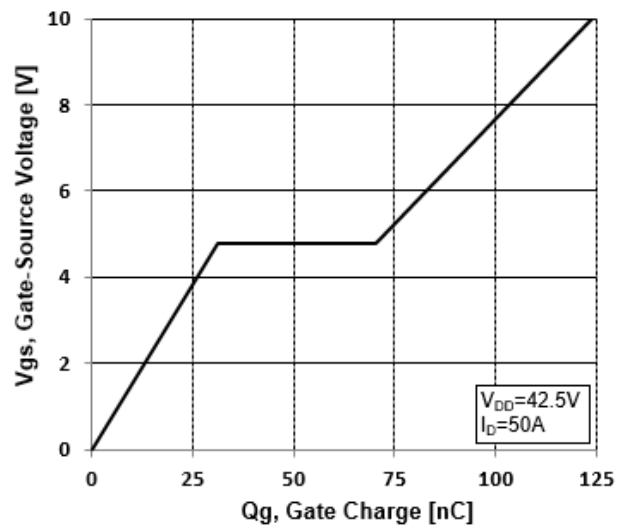


Figure 13. Typical Gate Charge vs Gate\_Source Voltage



## Test Circuit and Waveform

Figure 14. Resistive Switching Test Circuit

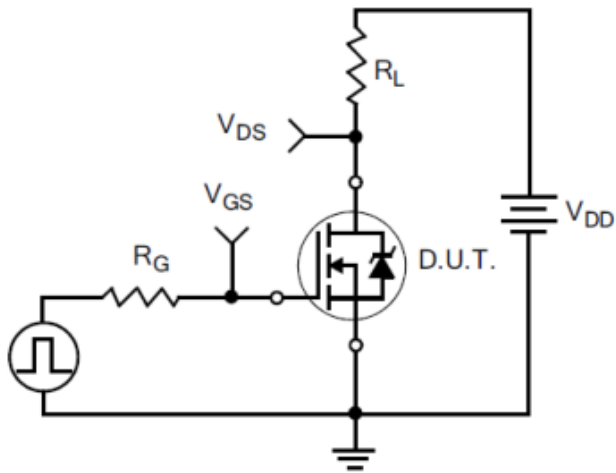


Figure 15. Resistive Switching Waveforms

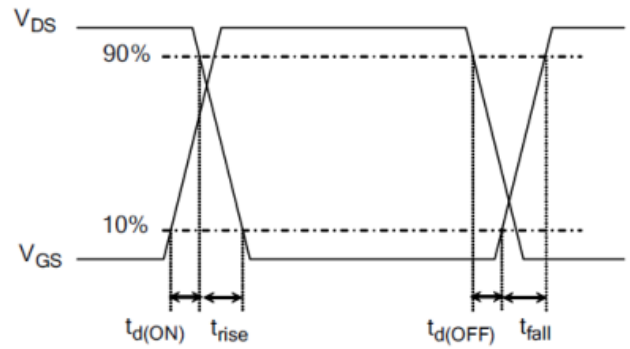


Figure 16. Gate Charge Test Circuit

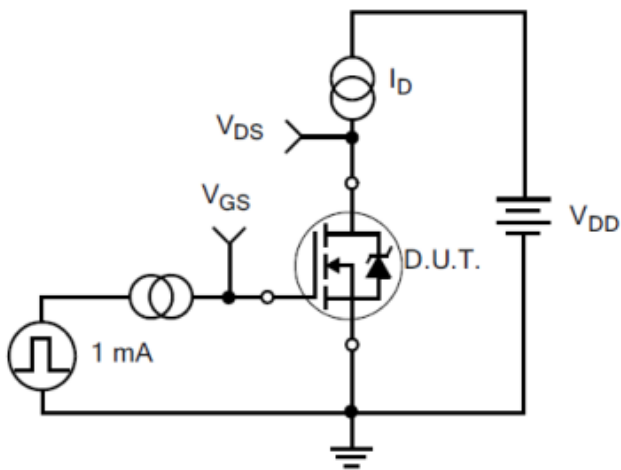


Figure 17. Gate Charge Waveforms

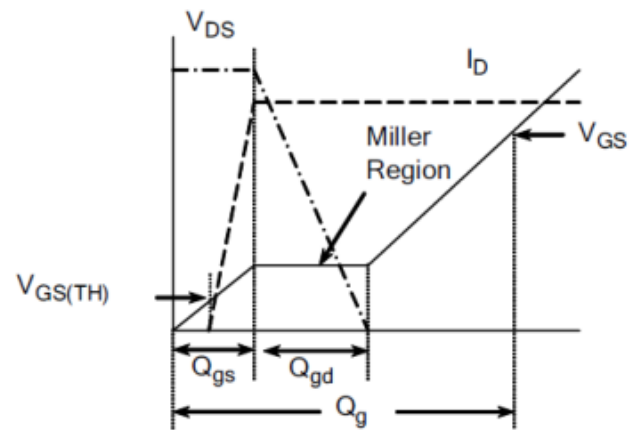


Figure 18. Diode Reverse Recovery Test Circuit

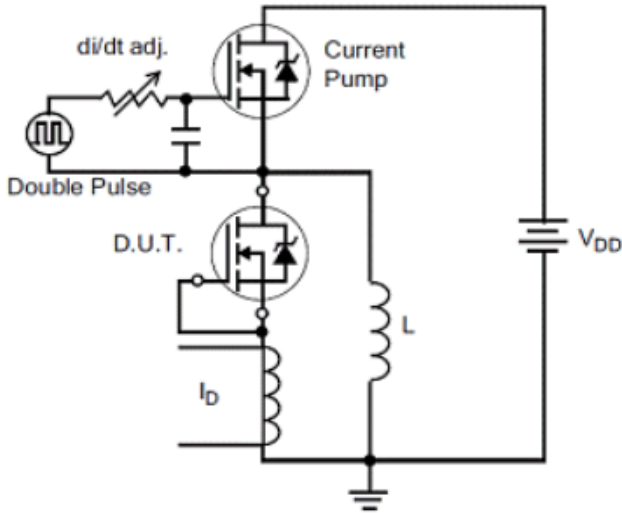


Figure 19. Diode Reverse Recovery Waveform

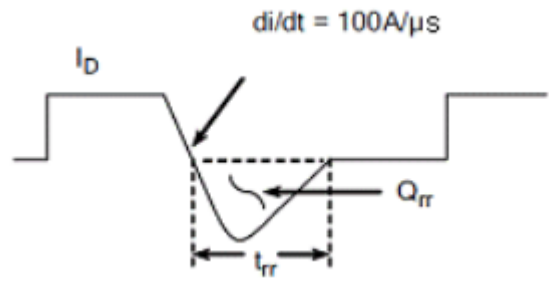


Figure 20. Unclamped Inductive Switching Test Circuit

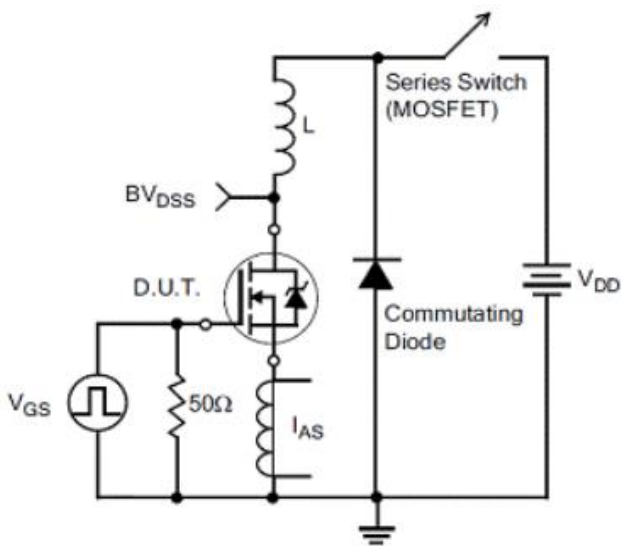
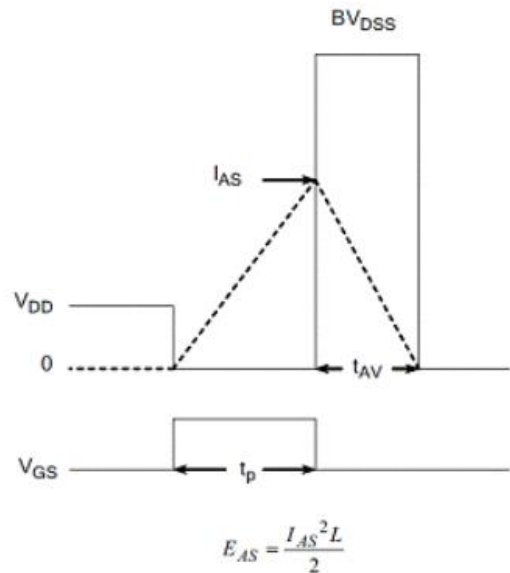
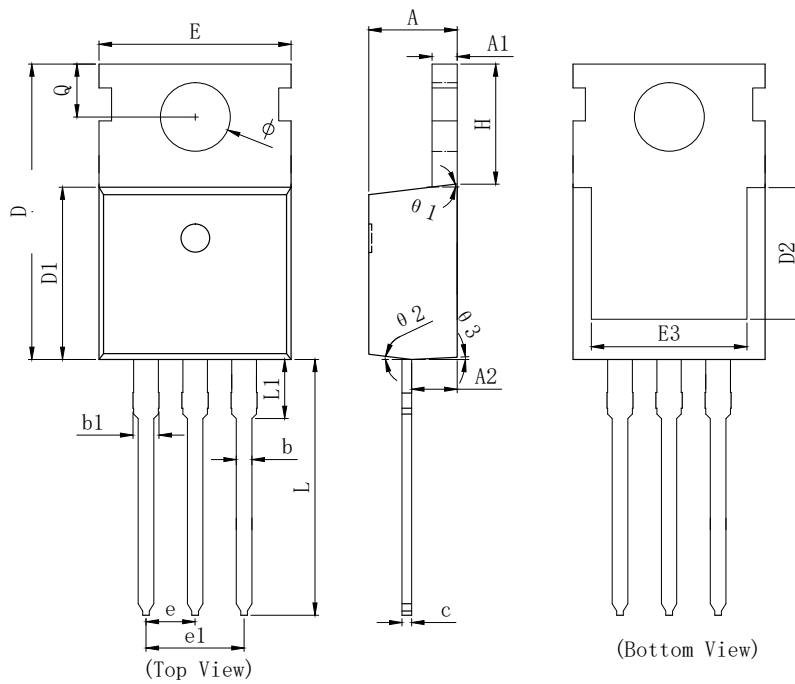


Figure 21. Unclamped Inductive Switching Waveform



# TO-220 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
$\phi$	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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