AGMSEMI

● **General Description**

The AGM612C 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

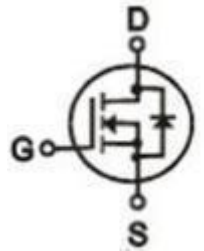■ 100% Avalanche tested

■ 100% DVDS tested

● **Application**

■ MB/VGA Vcore

■ SMPS 2nd Synchronous Rectifier

■ POL application

■ BLDC Motor driver

Product Summary

BVDSS	RDSON	ID
60V	13mΩ	60A

TO-220 Pin Configuration

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM612C	AGM612C	TO-220	---	---	1000

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

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V）	60	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25℃) **(Note 1)**	60	A
	Drain Current-Continuous(Tc=100℃)	40	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed **(Note 2)**	240	A
PD	Maximum Power Dissipation(Tc=25℃)	78	w
	Maximum Power Dissipation(Tc=100℃)	31	w
EAS	Avalanche energy **(Note 3)**	100	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]	---	58	℃/W
RθJC	Thermal Resistance Junction-Case[1]	---	1.6	℃/W

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	60	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=60V,VGS=0V	--	--	1.0	μA
IGSS	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=250μA	1.1	1.7	2.5	V
gFS	Forward Transconductance	VDS=5V,ID=10A	--	10	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=10A	--	13	16	mΩ
		VGS=4.5V, ID=6A	--	14	20	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=15V,VGS=0V, F=100 kHz	--	1000	--	pF
Coss	Output Capacitance		--	170	--	pF
Crss	Reverse Transfer Capacitance		--	9.9	--	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=15V RI=0.75Ω,RGEN=3.3Ω	--	25	--	nS
tr	Turn-on Rise Time		--	7.6	--	nS
td(off)	Turn-Off Delay Time		--	34	--	nS
tf	Turn-Off Fall Time		--	6.0	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=20V, ID=12A	--	17	--	nC
Qgs	Gate-Source Charge		--	3.8	--	nC
Qgd	Gate-Drain Charge		--	4.2	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	60	A
VSD	Forward on Voltage	VGS=0V,IS=6A	--	--	1.2	V
trr	Reverse Recovery Time	Is=6A , dI/dt=100A/μs , TJ=25℃	--	--	--	ns
Qrr	Reverse Recovery Charge		--	--	--	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℃,VDD=30V,Vgs=10V,ID=20 A,
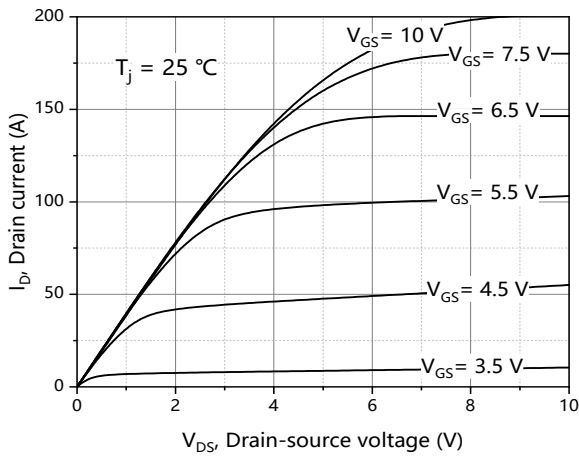
L=0.5mH,RG=25ohm

Electrical Characteristics Diagrams

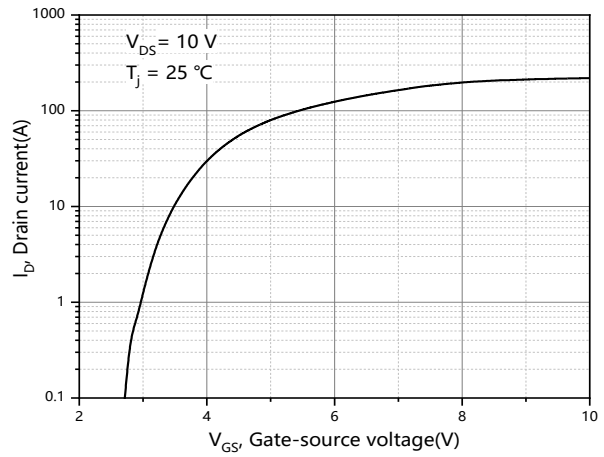
Figure 1. Typ. output characteristics
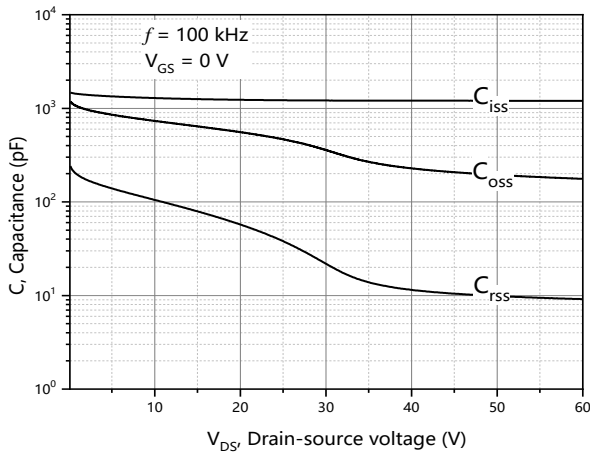

Figure 2. Typ. transfer characteristics
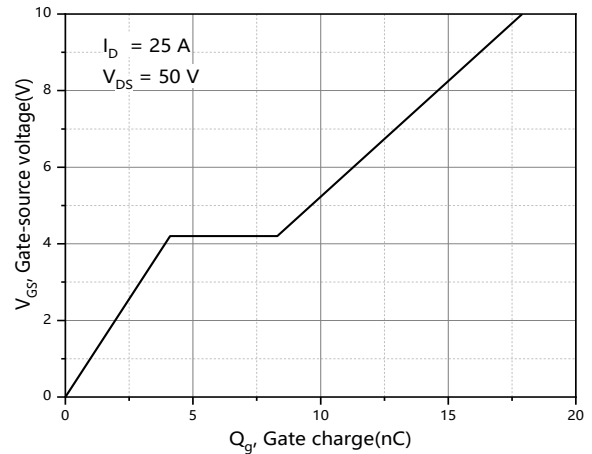

Figure 3. Typ. capacitances
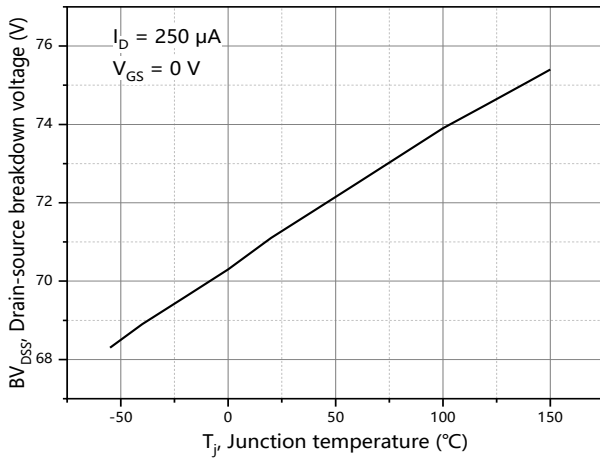

Figure 4. Typ. gate charge

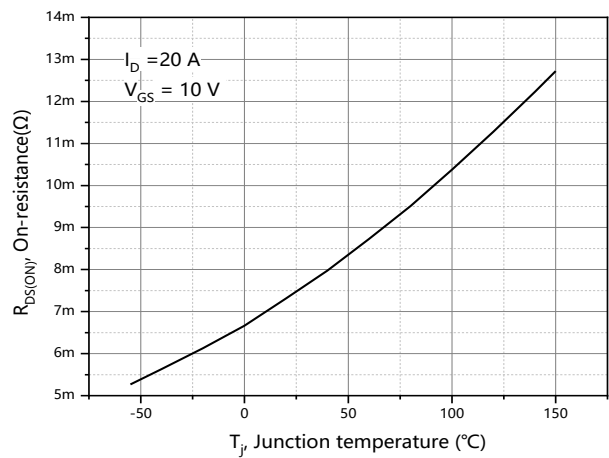**Figure 5. Drain-source breakdown voltage**

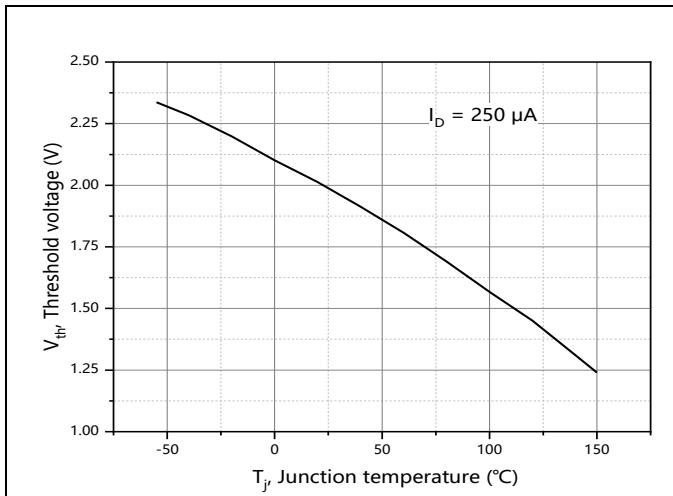**Figure 6. Drain-source on-state resistance**
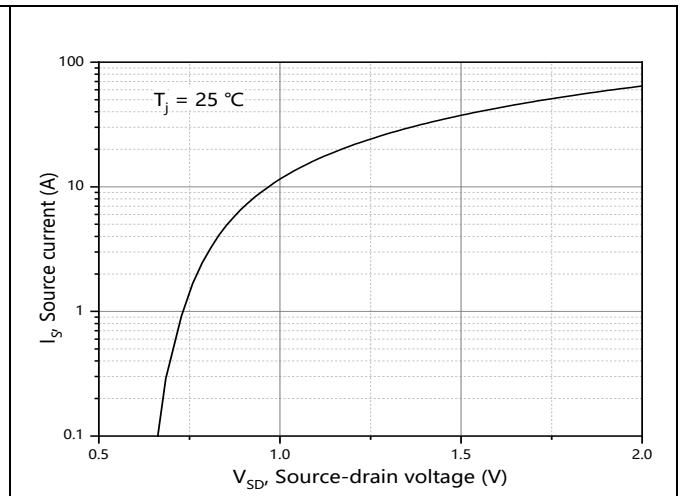
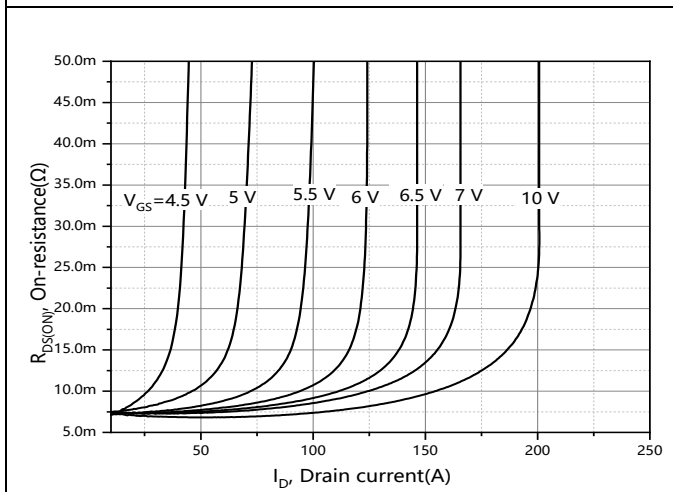Figure 7. Threshold voltage

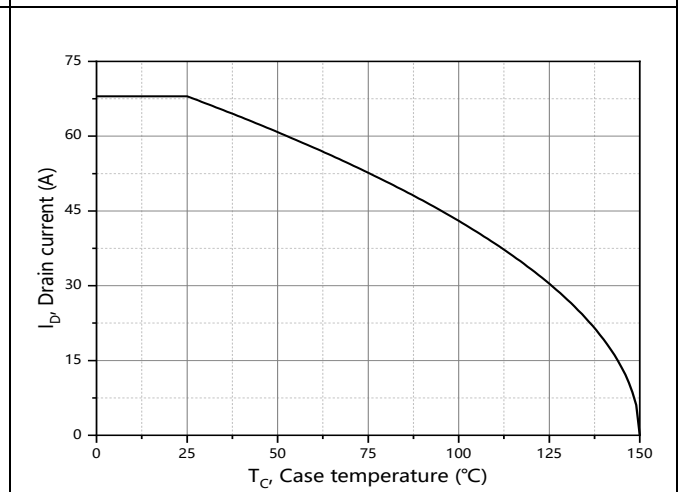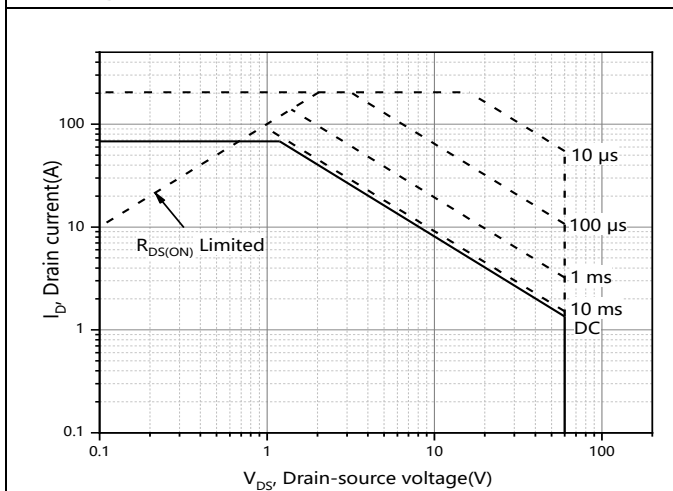Figure 8. Forward characteristic of body diode

Figure 9. Drain-source on-state resistance

Figure 10. Drain current

Figure 11. Safe operation area TC=25 ℃
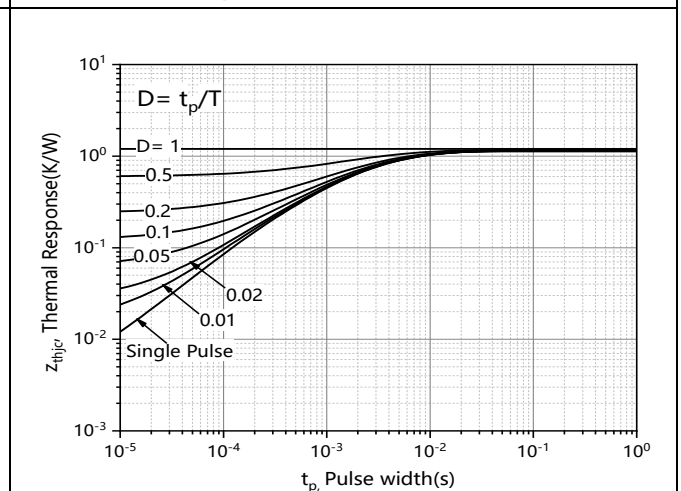
Figure 12. Max. transient thermal impedance
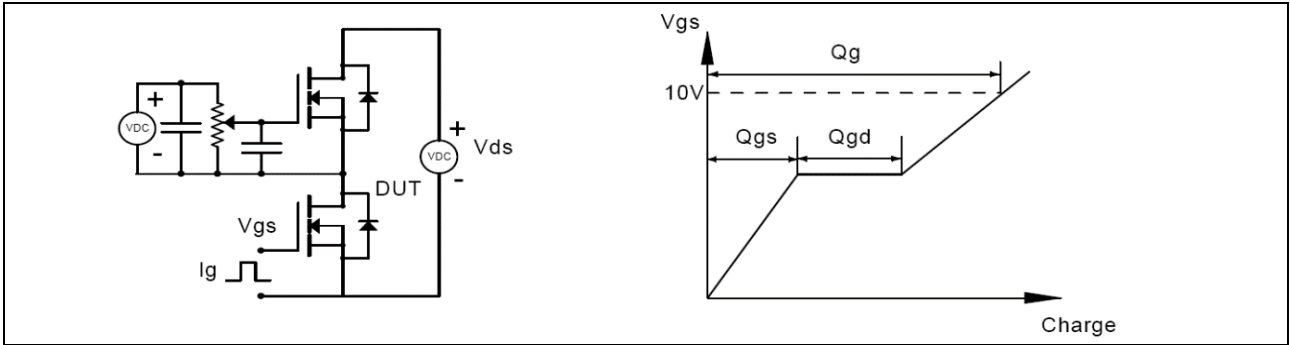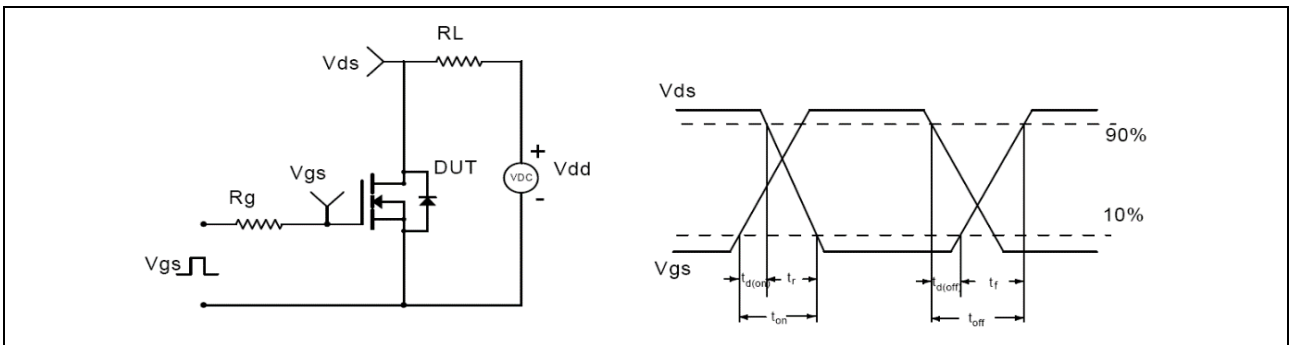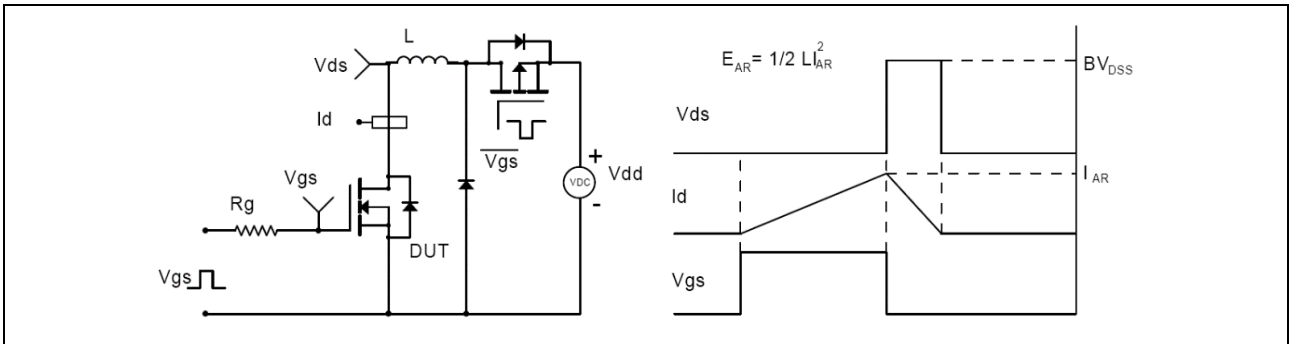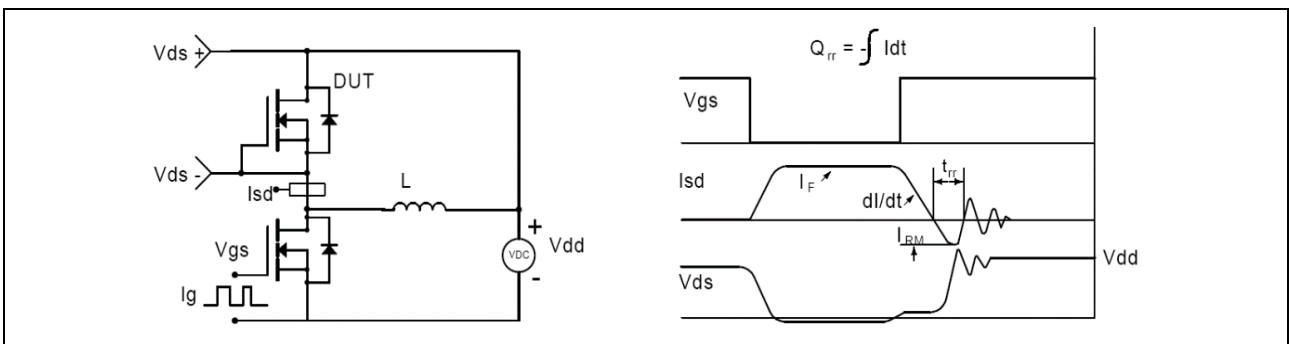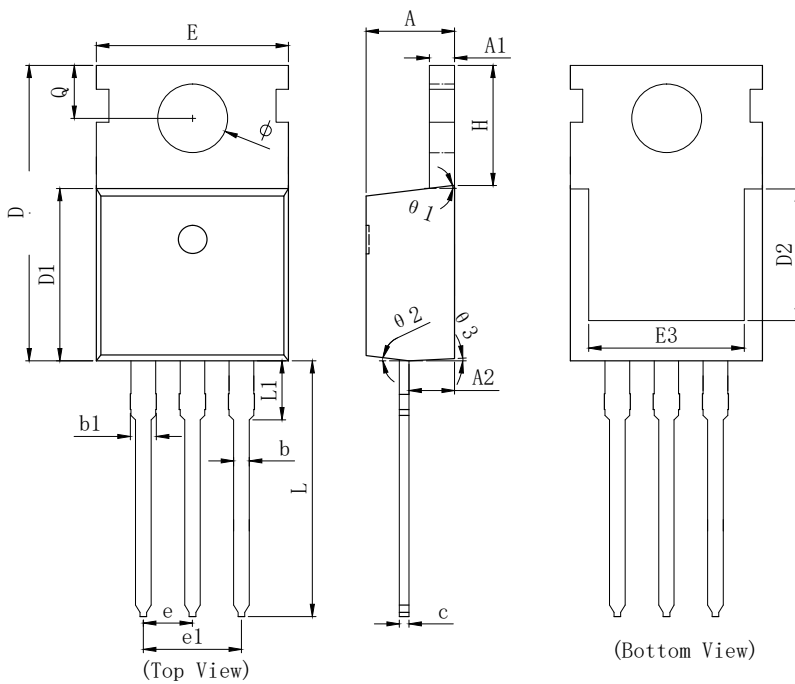
Test circuits and waveforms

Figure 1. Gate charge test circuit & waveform

Figure 2. Switching time test circuit & waveforms

Figure 3. Unclamped inductive switching (UIS) test circuit & waveforms

Figure 4. Diode reverse recovery test circuit & waveforms

TO-220 PACKAGE INFORMATION

(Top View)

(Bottom View)

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
θ1	7° TYP		
θ2	7° TYP		
θ3	3° TYP		

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