● General Description

The AGMH12N10I 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

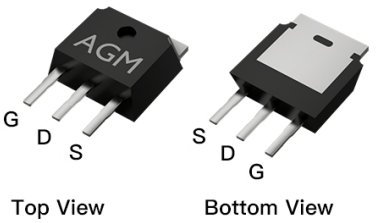
● Application

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

Product Summary

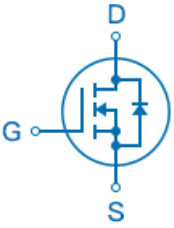
BVDSS	RDSON	ID
100V	9.6mΩ	65A

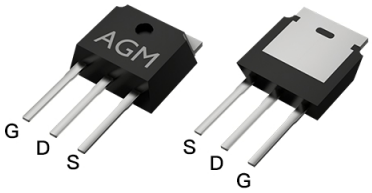
TO-251 Pin Configuration



Top View Bottom View

AGMH12N10IS





Top View Bottom View

AGMH12N10I

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGMH12N10I	AGMH12N10I	TO-251	---	---	4500
AGMH12N10IS	AGMH12N10IS	TO-251	---	---	4500

Table 1. Absolute Maximum Ratings (TC=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)**	65	A
	Drain Current-Continuous(Tc=100℃)	39	A
IDM (pluse)	Drain Current-Pulsed **(Note 2)**	260	A
PD	Maximum Power Dissipation(Tc=25℃)	96	w
	Maximum Power Dissipation(Tc=100℃)	38	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]	---	50	℃/W
RθJC	Thermal Resistance Junction-Case[1]	---	1.3	℃/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	100	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=100V,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	2.5	3.0	4.0	V
gFS	Forward Transconductance	VDS=5V,ID=15A	--	22	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=20A	--	9.6	13	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=40V,VGS=0V, F=1MHZ	--	1200	--	pF
Coss	Output Capacitance		--	460	--	pF
Crss	Reverse Transfer Capacitance		--	9.0	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	11.5	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V,VDS=50V, ID=10A,RGEN=5Ω	--	16	--	nS
tr	Turn-on Rise Time		--	18	--	nS
td(off)	Turn-Off Delay Time		--	32	--	nS
tf	Turn-Off Fall Time		--	10	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=50V, ID=10A	--	21.8	--	nC
Qgs	Gate-Source Charge		--	3.7	--	nC
Qgd	Gate-Drain Charge		--	5.0	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	65	A
VSD	Forward on Voltage	VGS=0V,IS=20A	--	--	1.2	V
trr	Reverse Recovery Time	Is=20A , VDD=50V,dI/dt=100A/μs	--	43	--	ns
Qrr	Reverse Recovery Charge		--	90	--	nc

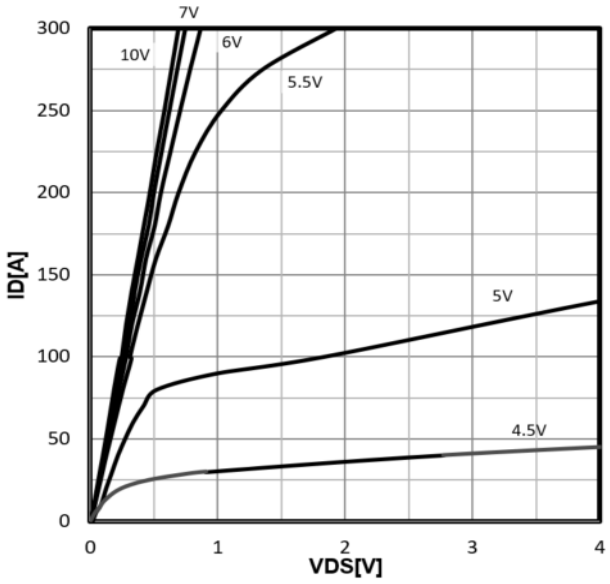
Notes 1.The maximum current rating is package limited.

Notes 2.Repetitive Rating: Pulse width limited by maximum junction temperature

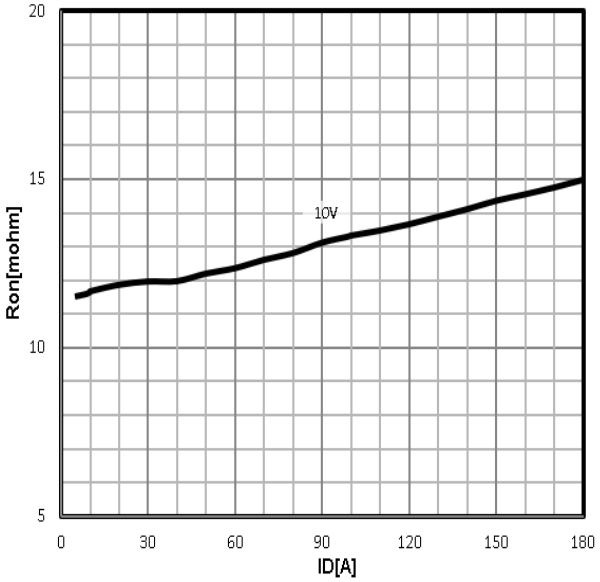
Notes 3.EAS condition: TJ=25℃,VDD=50V,Vgs=10V，ID=20A,L=0.5mH,RG=25ohm

Characteristics Curve:

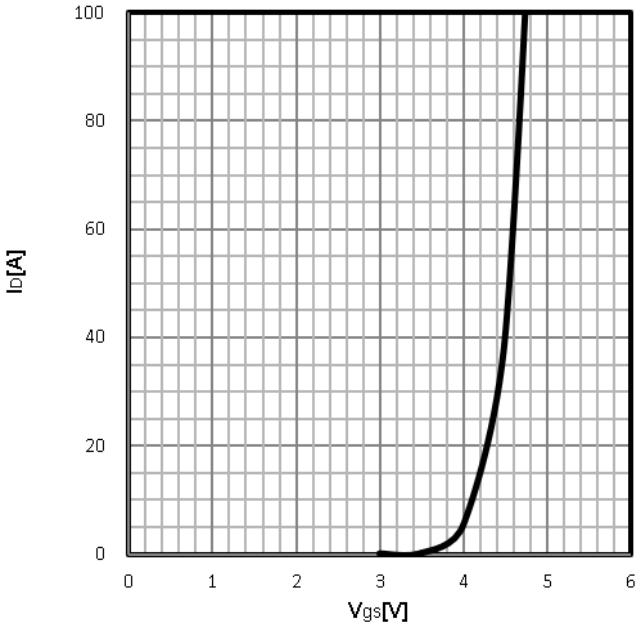
Typ. output characteristics
$I_D=f(V_{DS})$



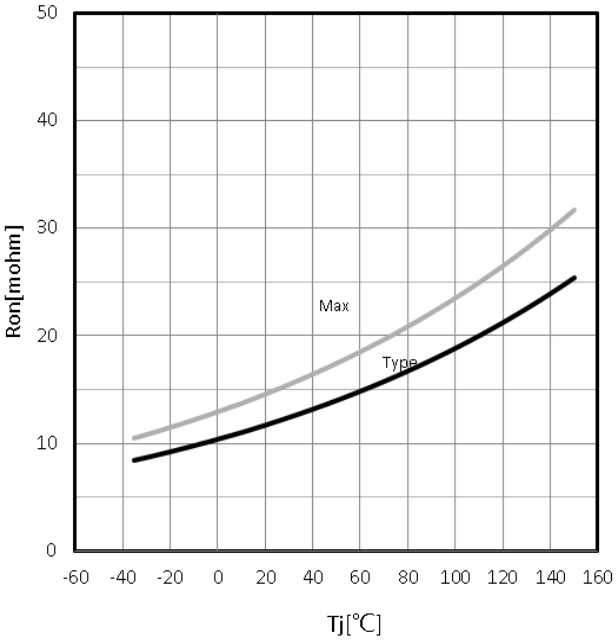
Typ. drain-source on resistance
$R_{DS(on)}=f(I_D)$



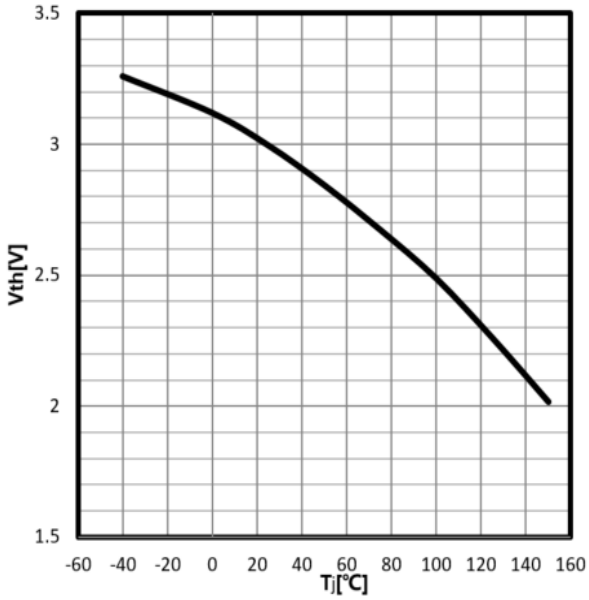
Typ. transfer characteristics
$I_D=f(V_{GS})$



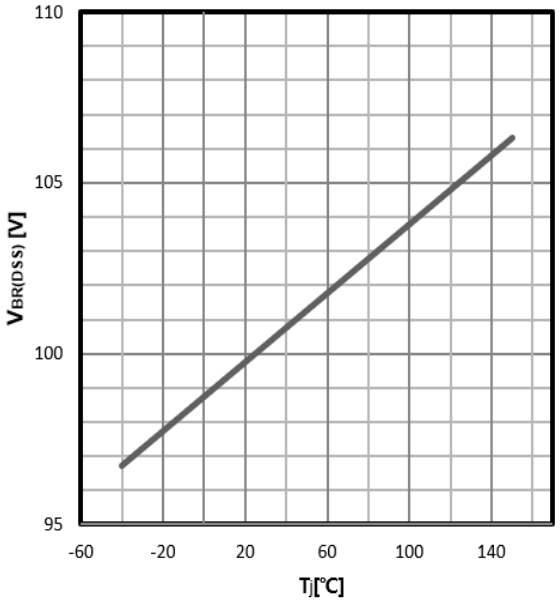
Drain-source on-state resistance
$R_{DS(on)}=f(T_j);I_D=20A;\ V_{GS}=10V$



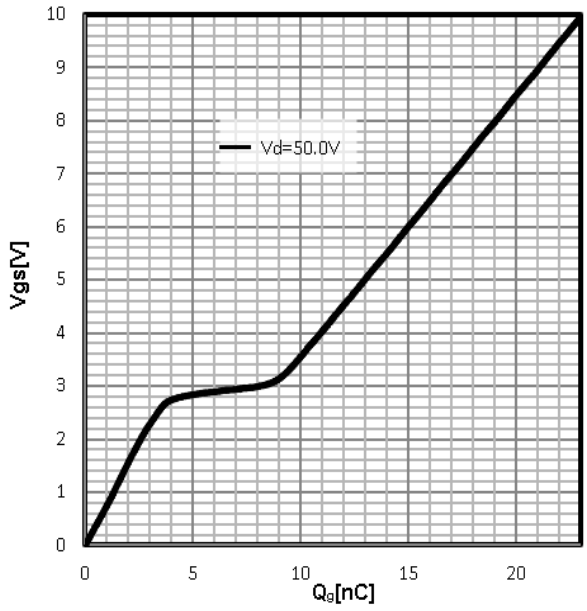
Gate Threshold Voltage
$V_{TH}=f(T_j)$; $I_D=250uA$



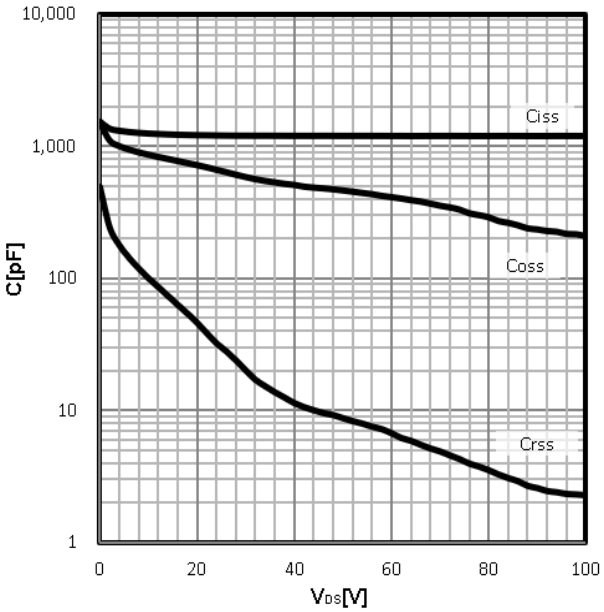
Drain-source breakdown voltage
$V_{BR(DSS)}=f(T_j)$; $I_D=250uA$



Typ. gate charge
$V_{GS}=f(Q_g)$; $I_D=10A$

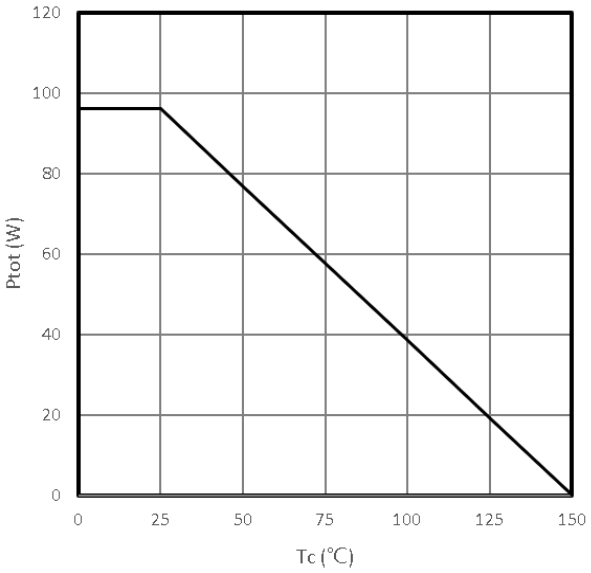


Typ. capacitances
C =f(V_{DS}); V_{GS}=0V; f =1MHz



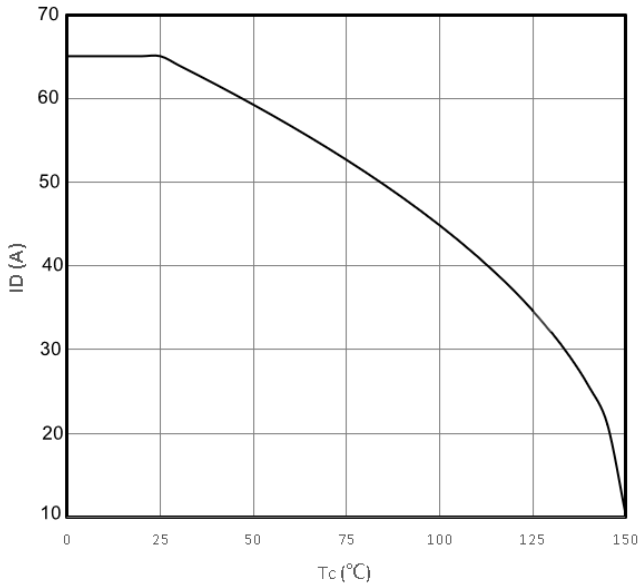
Power Dissipation

$P_{tot}=f(T_C)$



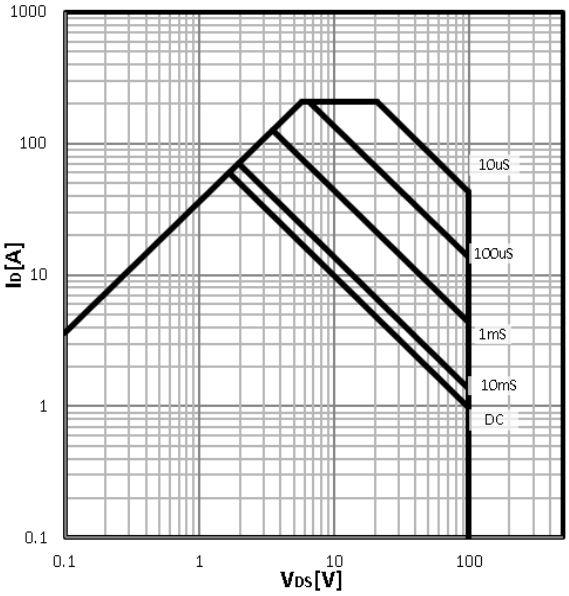
Maximum Drain Current

$I_D=f(T_C)$



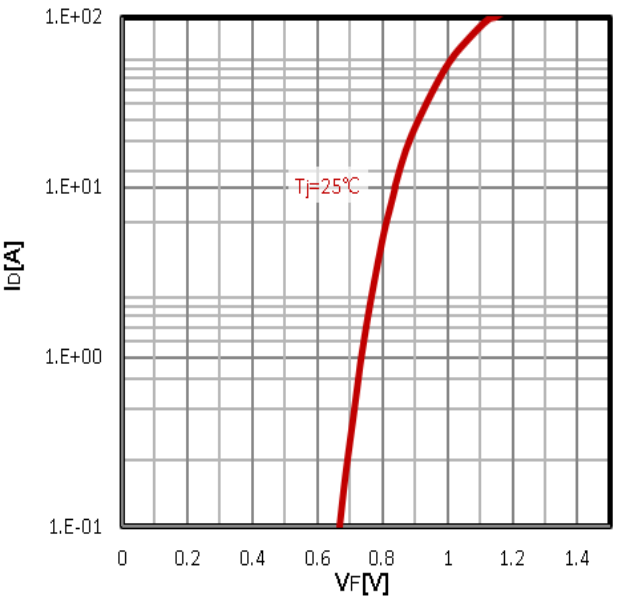
Safe operating area

$I_D=f(V_{DS})$



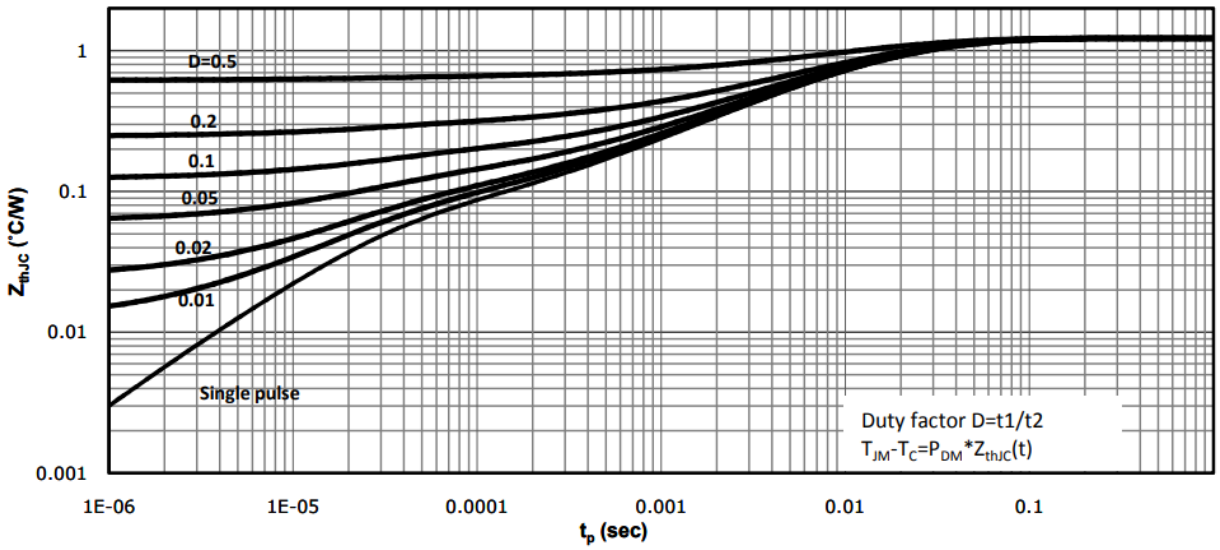
Body Diode Forward Voltage Variation

$I_F=f(V_{GS})$

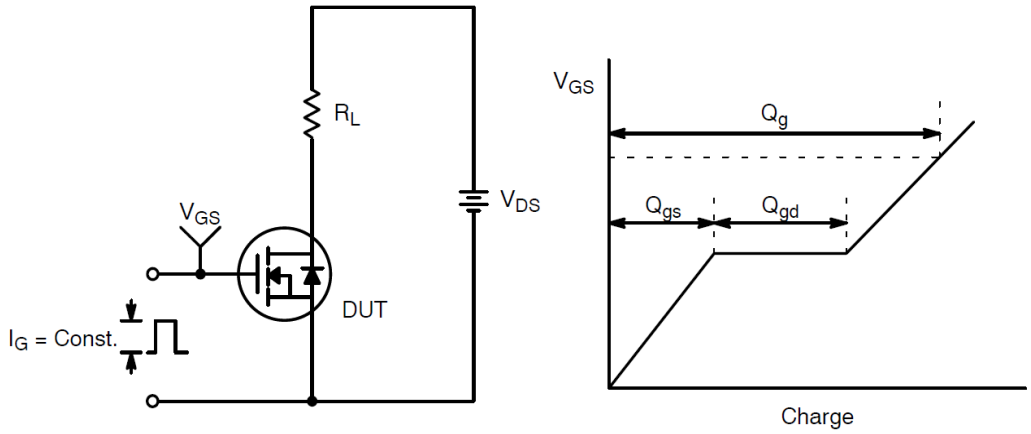


Max. transient thermal impedance

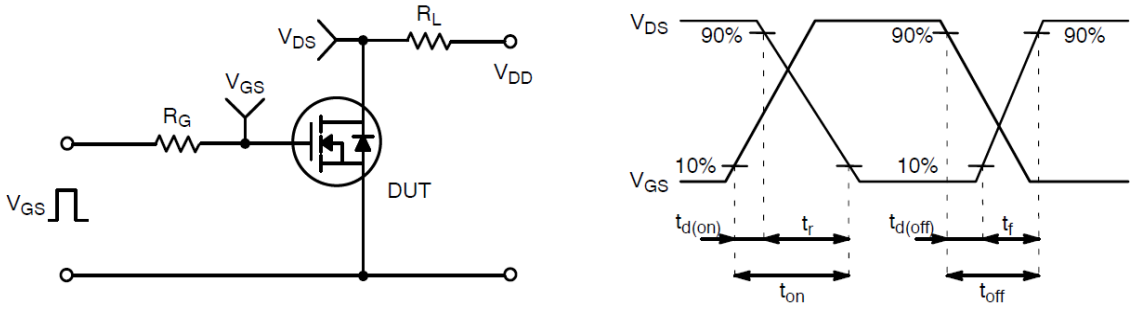
$Z_{thJC}=f(t_p)$



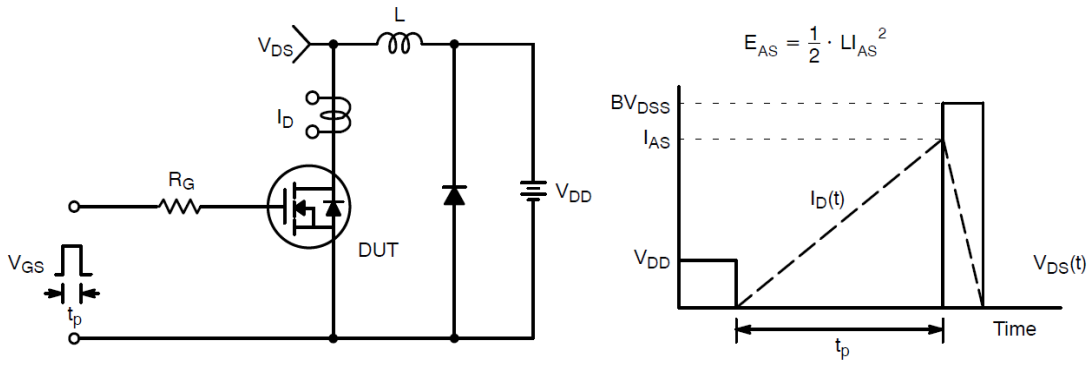
Test Circuit and Waveform:



Gate Charge Test Circuit & Waveform

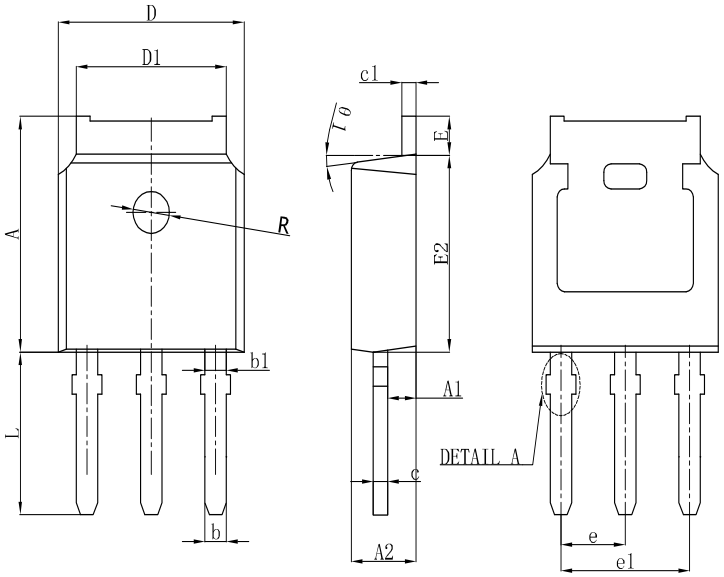


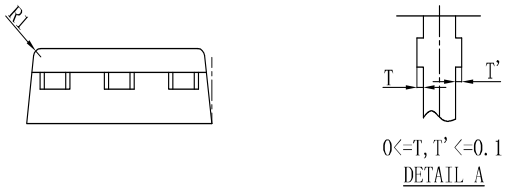
Resistive Switching Test Circuit & Waveforms

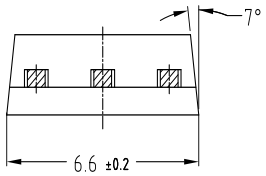


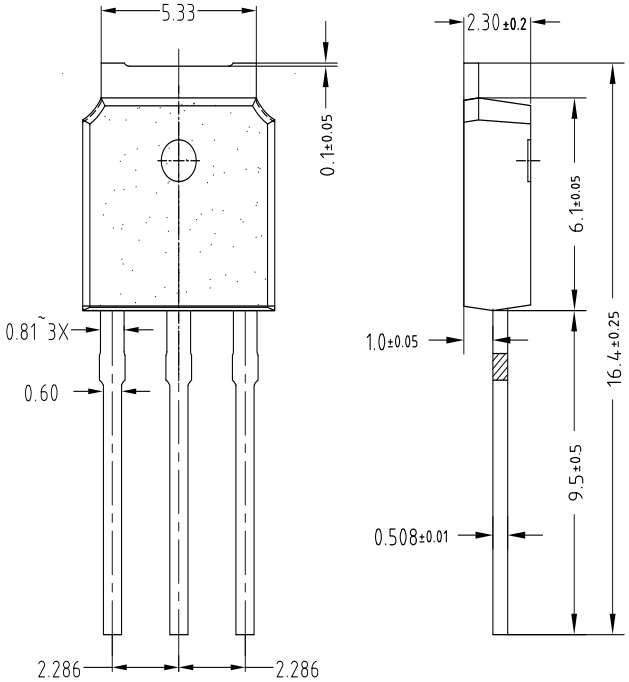
Unclamped Inductive Switching Test Circuit & Waveforms

TO-251 Package Outline Data



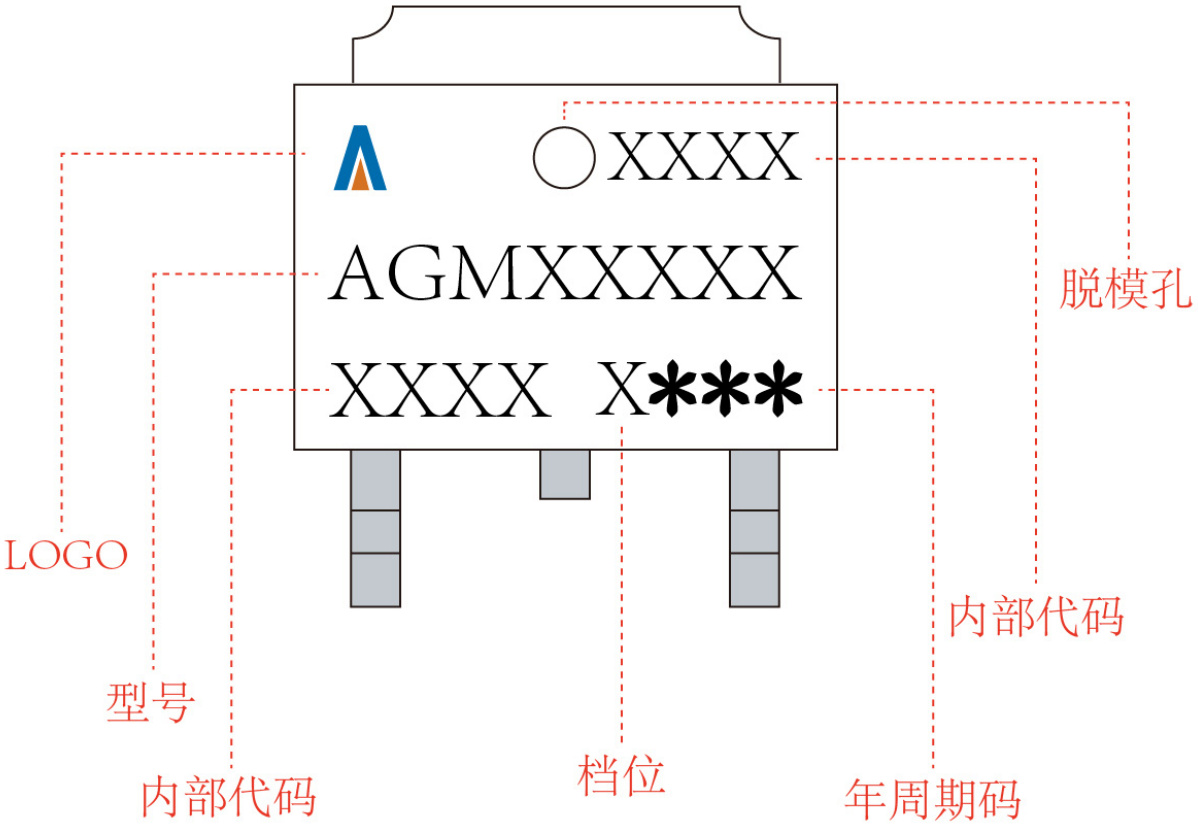






SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	7.050	7.100	7.150
A1	0.960	1.010	1.060
A2	2.250	2.300	2.350
b		0.760REF.	
b1		1.000REF.	
c		0.508REF.	
c1		0.508REF.	
D	6.550	6.600	6.650
D1	5.220	5.320	5.420
E	0.950	1.000	1.050
E2	6.050	6.100	6.150
e		2.286BSC	
e1		4.572REF.	
L	4.800	5.000	5.200
θ1		7° REF.	
R		1.300REF.	
R1		0.250REF.	

TO-251
Marking Instructions:



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