

General Description

The AGMH12H05H 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

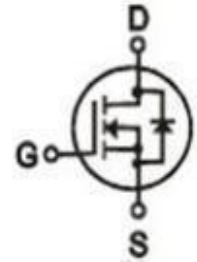
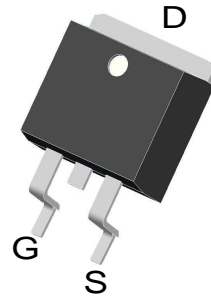
Application

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

Product Summary

BVDSS	RDSON	ID
120V	4.3mΩ	125A

TO-263 Pin Configuration



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGMH12H05H	AGMH12H05H	TO-263	330mm	25mm	800

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

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	120	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25°C) (Note 1)	125	A
	Drain Current-Continuous(Tc=100°C)	88	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 2)	500	A
PD	Maximum Power Dissipation(Tc=25°C)	208	w
	Maximum Power Dissipation(Tc=100°C)	83	w
EAS	Avalanche energy (Note 3)	375	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) ¹	---	62	°C/W
RθJC	Thermal Resistance Junction-Case ¹	---	0.6	°C/W

Table 3. Electrical Characteristics (T_j=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	120	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=120V,VGS=0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=250μA	2.5	3.0	3.5	V
gFS	Forward Transconductance	VDS=5V,ID=15A	--	38	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=20A	--	4.3	5.2	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=60V,VGS=0V, F=1MHZ	--	4280	--	pF
Coss	Output Capacitance		--	428	--	pF
Crss	Reverse Transfer Capacitance		--	17	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	0.77	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V,VDS=60V, ID=20A, RGEN=5Ω	--	20	--	nS
tr	Turn-on Rise Time		--	11	--	nS
td(off)	Turn-Off Delay Time		--	55	--	nS
tf	Turn-Off Fall Time		--	28	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=60V, ID=20A	--	61	--	nC
Qgs	Gate-Source Charge		--	17	--	nC
Qgd	Gate-Drain Charge		--	14	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	125	A
VSD	Forward on Voltage	VGS=0V,IS=20A	--	--	1.2	V
trr	Reverse Recovery Time	IF=20A , dI/dt=100A/μs , TJ=25°C	--	100	--	ns
Qrr	Reverse Recovery Charge		--	250	--	nc

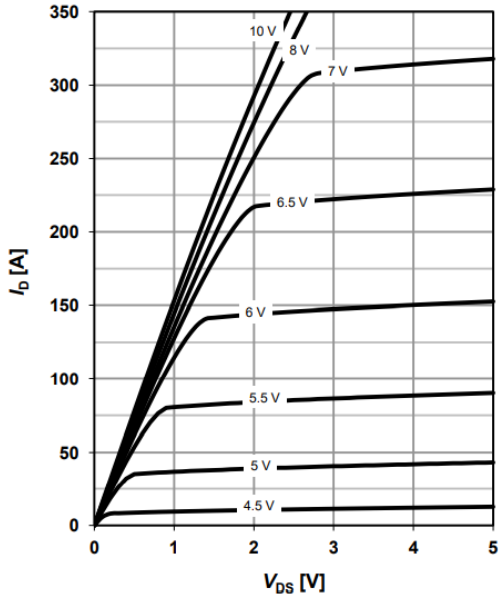
Notes 1.The maximum current rating is package limited.

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

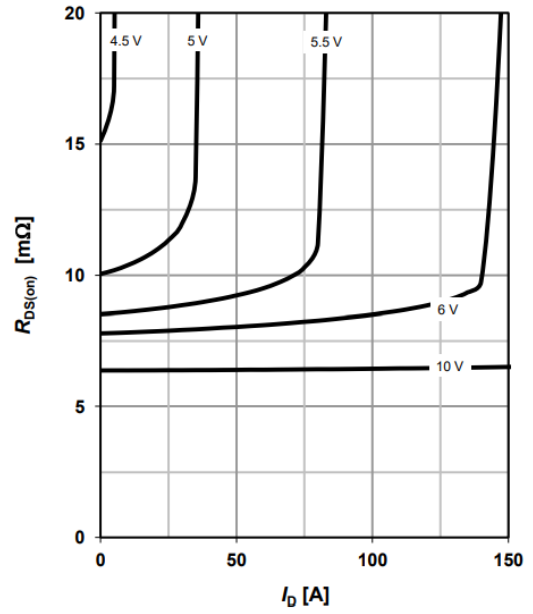
Notes 3.EAS condition: T_J=25°C

Characteristics Curve:
Typ. output characteristics

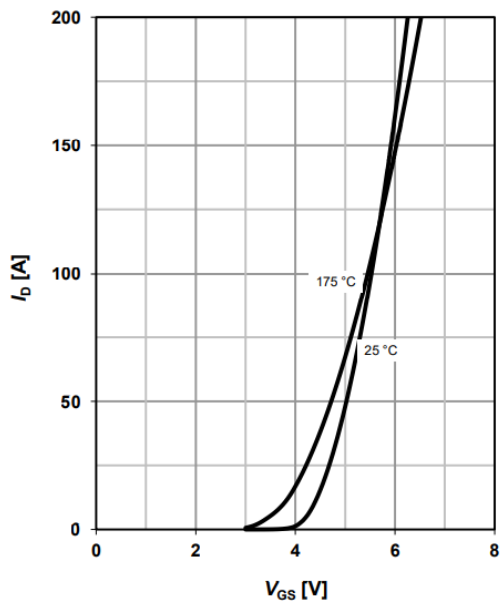
$$I_D = f(V_{DS})$$


Typ. drain-source on resistance

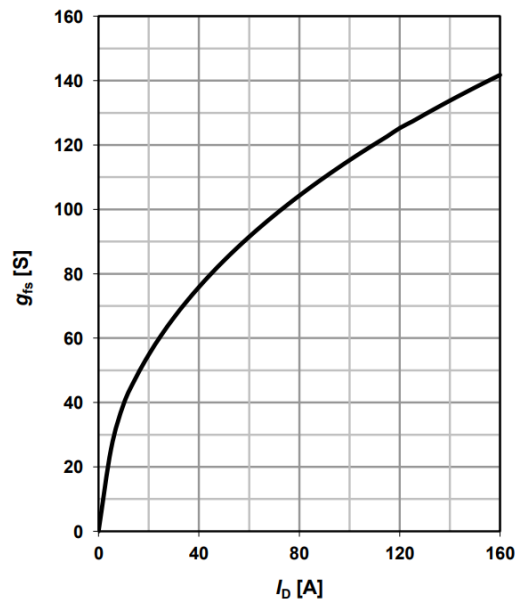
$$R_{DS(on)} = f(I_D)$$


Typ. transfer characteristics

$$I_D = f(V_{GS})$$

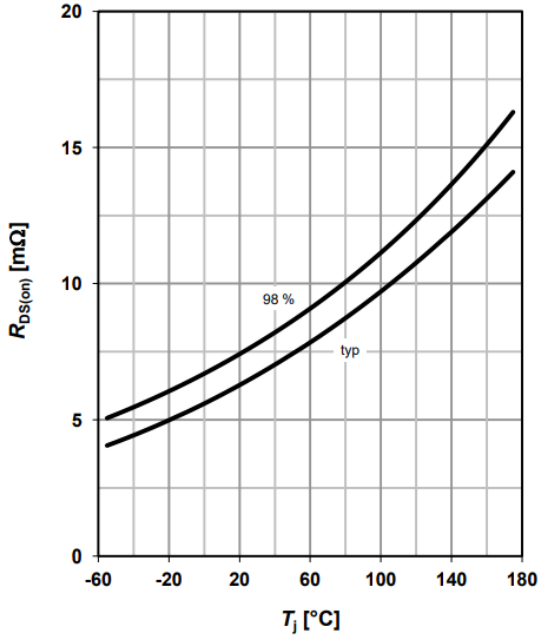

Typ. forward transconductance

$$g_{fs} = f(I_D)$$

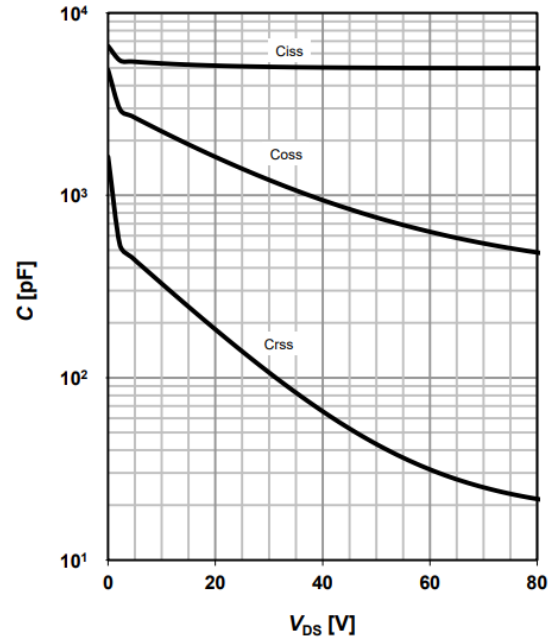


Drain-source on-state resistance

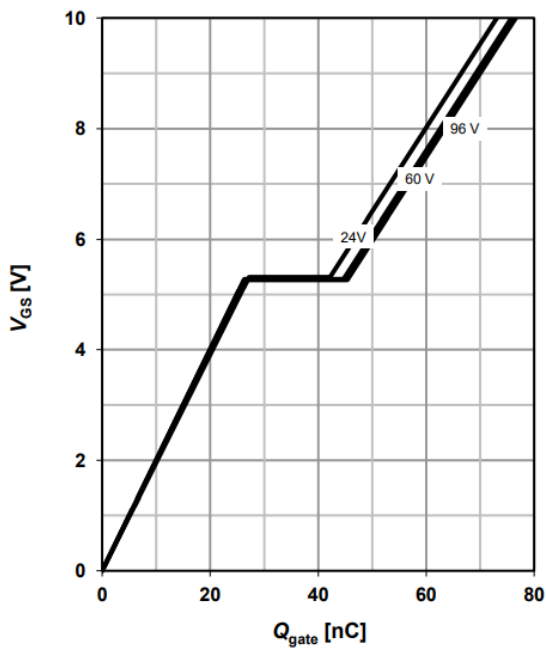
$$R_{DS(on)} = f(T_j); I_D = 50A; V_{GS} = 10V$$


Typ. capacitances

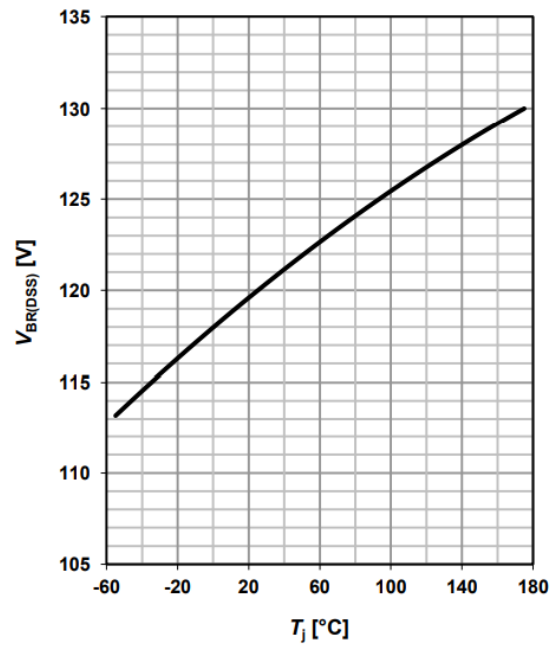
$$C = f(V_{DS}); V_{GS} = 0V; f = 1MHz$$


Typ. gate charge

$$V_{GS} = f(Q_{gate})$$

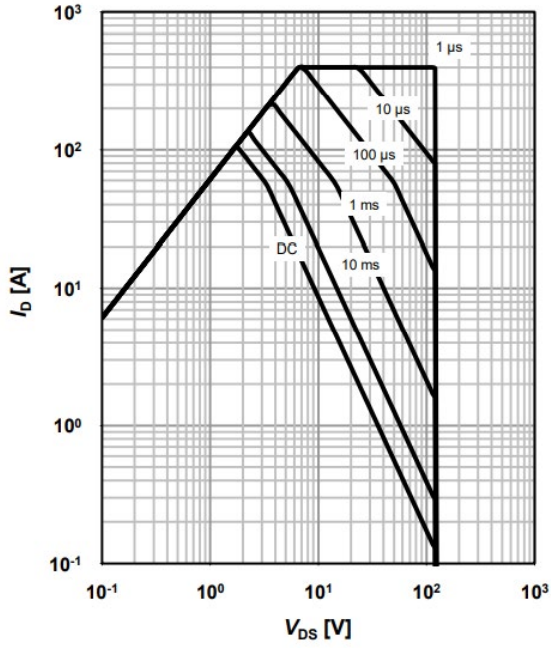

Drain-source breakdown voltage

$$V_{BR(DSS)} = f(T_j); I_D = 250\mu A$$



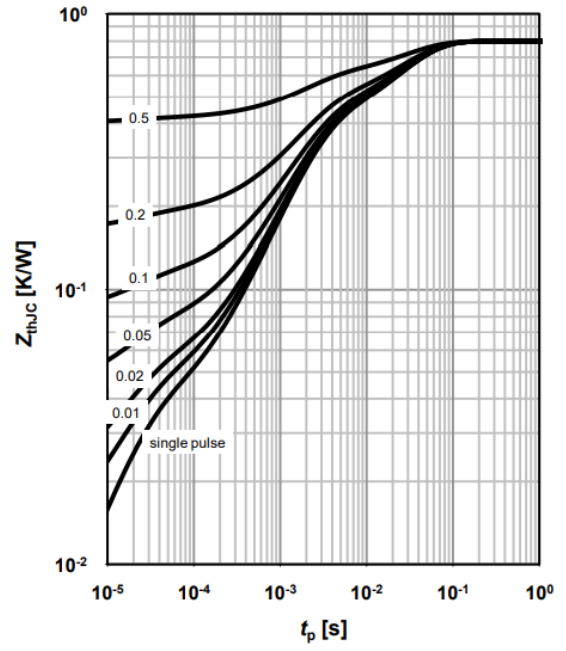
Safe operating area

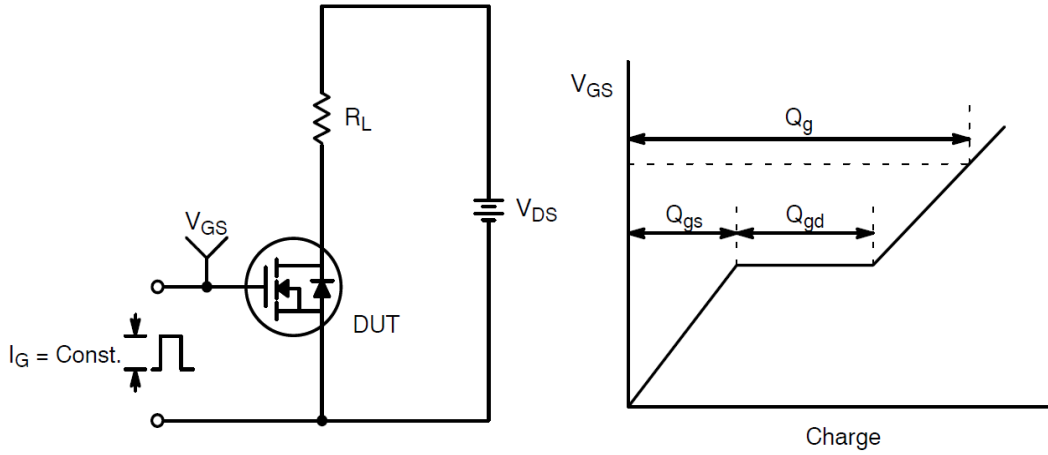
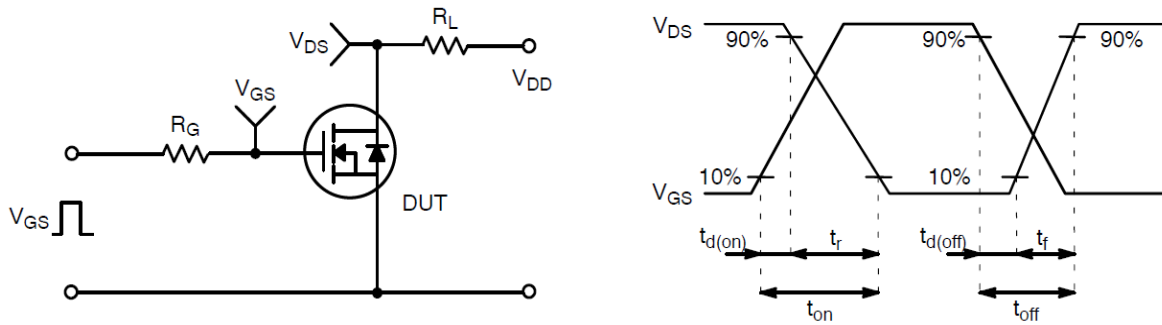
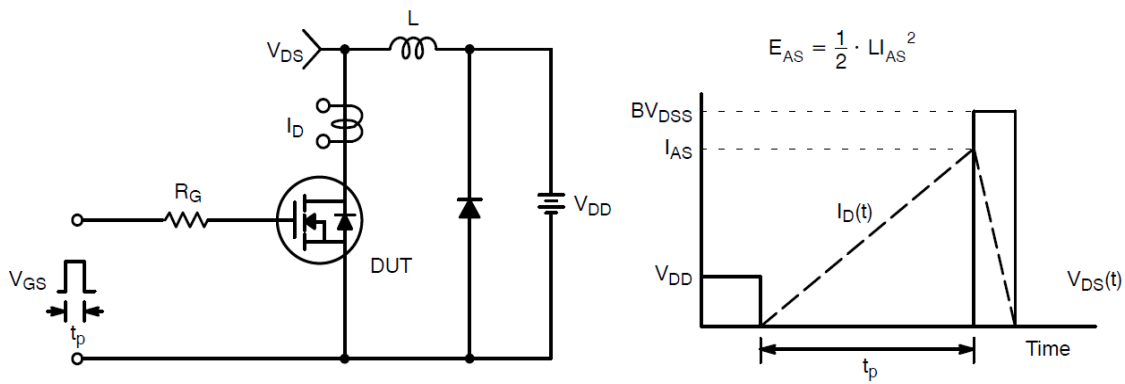
$$I_D = f(V_{DS})$$



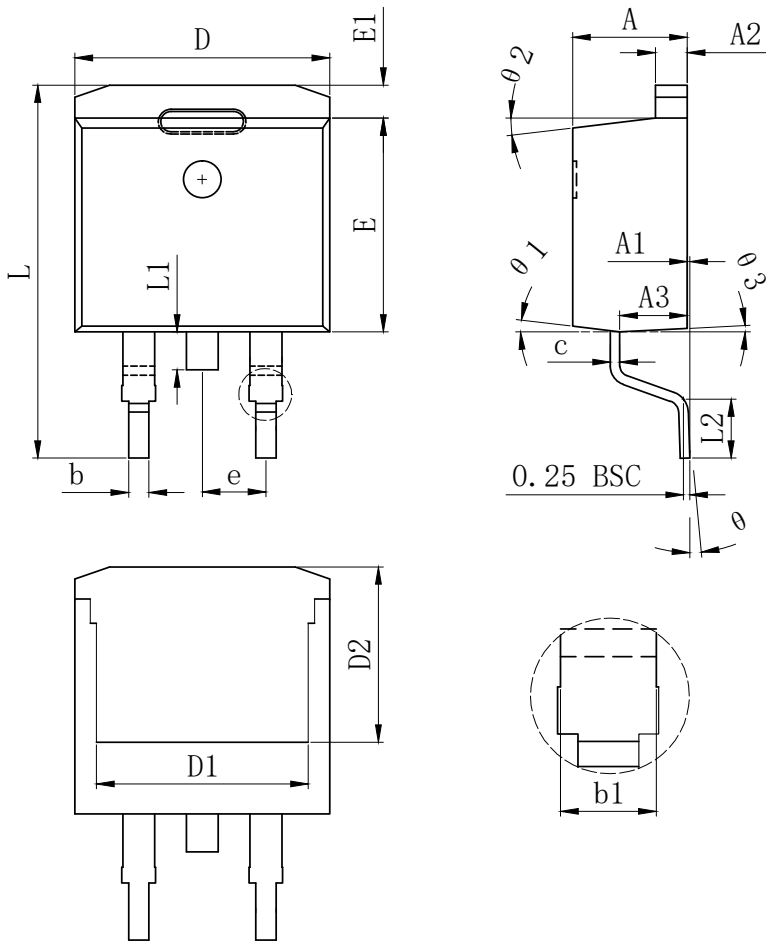
Max. transient thermal impedance

$$Z_{thJC} = f(t_p)$$

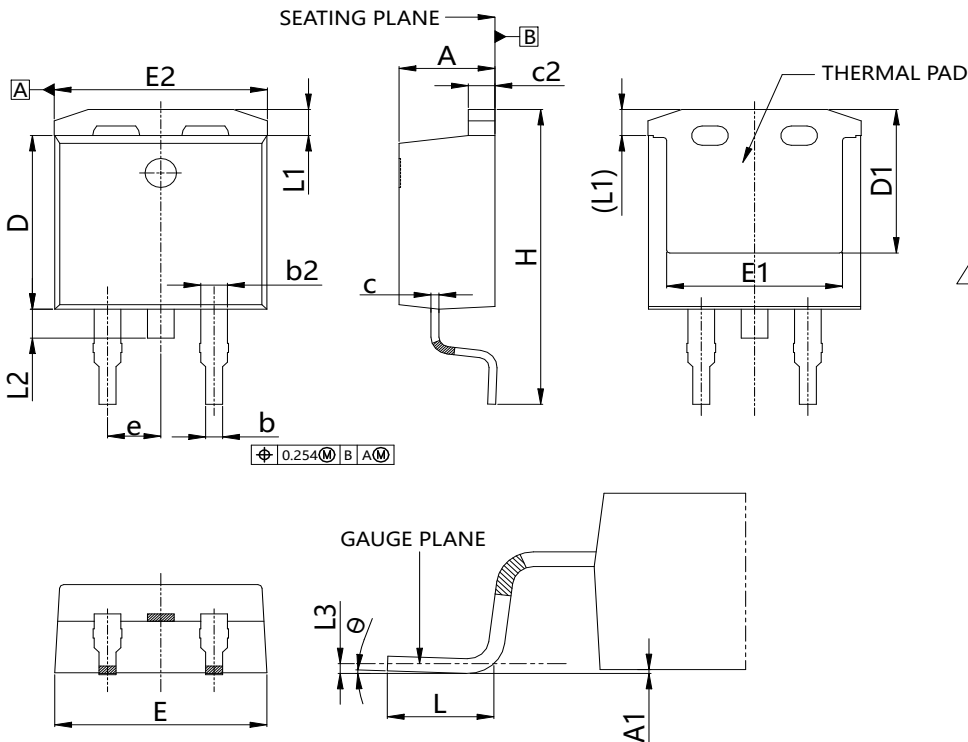


Test Circuit and Waveform

Gate Charge Test Circuit & Waveform

Resistive Switching Test Circuit & Waveforms

Unclamped Inductive Switching Test Circuit & Waveforms

TO-263 PACKAGE INFORMATION



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	4.370	4.570	4.770
A1	0.000		0.250
A2	1.220	1.270	1.420
A3	2.490	2.690	2.890
b	0.700	0.810	0.960
b1	1.170	1.270	1.470
c	0.300	0.380	0.530
D	9.860	10.160	10.360
D1	8.400 REF		
D2	7.073 REF		
E	8.500	8.700	8.900
E1	1.070	1.270	1.470
e	2.540 TYP		
L	14.700	15.100	15.500
L1	1.400	1.550	1.700
L2	2.000	2.300	2.600
θ	0°		9°
θ 1	7° TYP		
θ 2	7° TYP		
θ 3	3° TYP		



SYMBOL	MILLIMETER		
	MIN.	NOMINAL	MAX.
A	4.47	4.57	4.67
A1	0.00	0.10	0.25
b	0.71	0.81	0.91
b2	1.17	1.27	1.37
c	0.360	0.381	0.500
c2	1.17	1.27	1.37
D	8.70	9.00	9.30
D1	7.10	7.44	7.80
E	9.90	10.11	10.30
E1	8.08	8.38	8.68
E2	10.00	10.16	10.30
e	2.44	2.54	2.64
H	15.00	15.28	15.60
L	2.25	2.54	2.80
L1	1.10	1.35	1.60
L2	---	---	1.78
L3	0.254 BSC		
θ	0°	---	8°


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