

### • General Description

The AGM30P25D 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

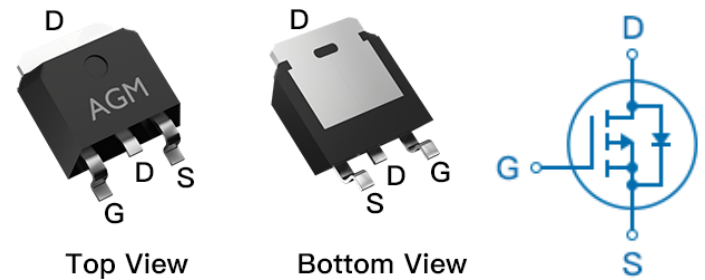
### • Application

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

### Product Summary

BVDSS	RDS(ON)	ID
-30V	21mΩ	-12A

### TO-252 Pin Configuration



### Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM30P25D	AGM30P25D	TO-252	330mm	16mm	2500

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

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	-30	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25°C) <b>(Note 1)</b>	-12	A
	Drain Current-Continuous(Tc=100°C)	-8.0	A
IDM (pulse)	Drain Current-Pulsed <b>(Note 2)</b>	-48	A
PD	Maximum Power Dissipation(Tc=25°C)	28	w
	Maximum Power Dissipation(Tc=100°C)	11	w
EAS	Avalanche energy <b>(Note 3)</b>	56	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>	---	50	°C/W
RθJC	Thermal Resistance Junction-Case <sup>1</sup>	---	4.4	°C/W

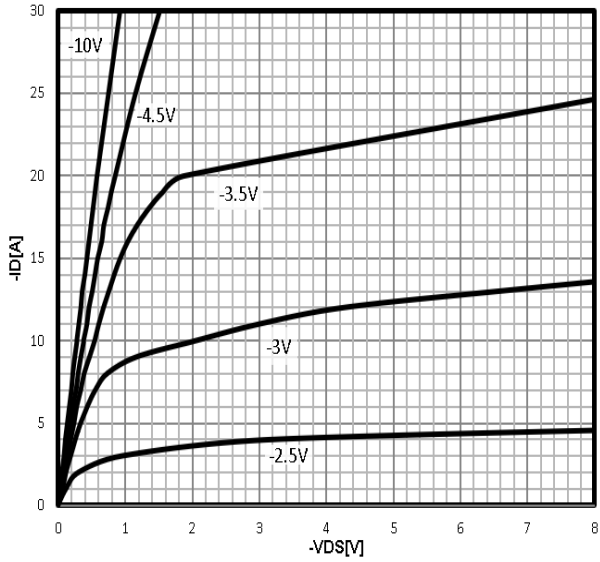
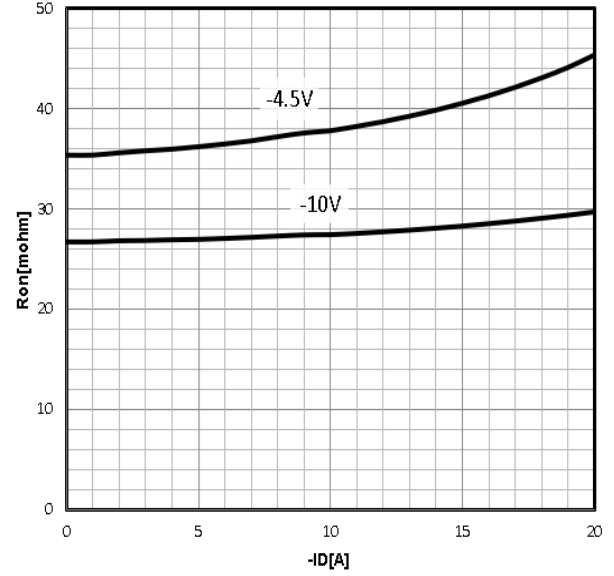
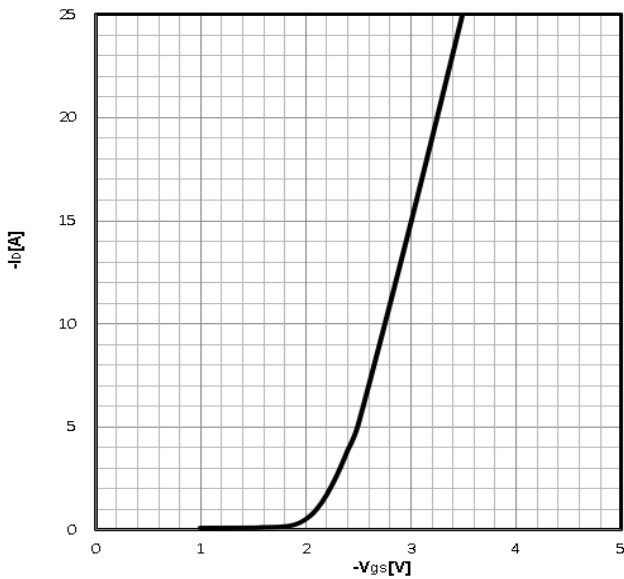
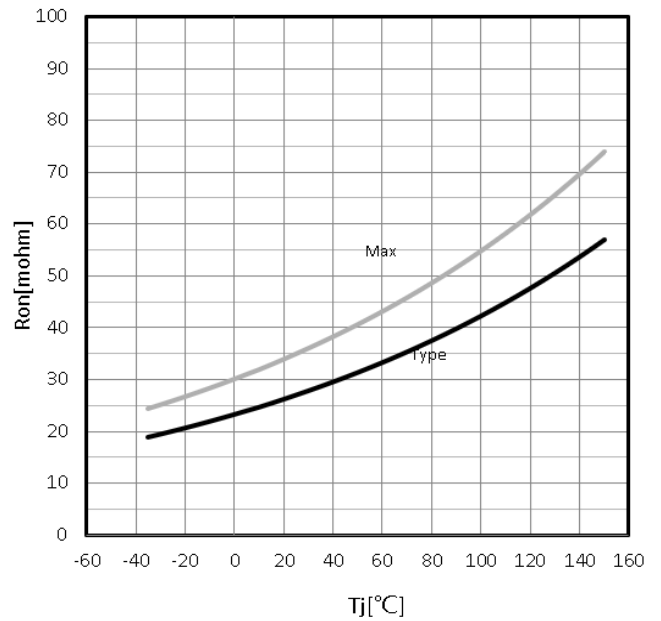
**Table 2. P-Channel Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>On/Off States</b>						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=-250μA	-30	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=-30V,VGS=0V	--	--	-1	μA
IGSS	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=-250μA	-1.2	-1.5	-2.2	V
gFS	Forward Transconductance	VDS=-10V,ID=-4A	--	6	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=-10V, ID=-5A	--	21	28	mΩ
		VGS=-4.5V, ID=-4A	--	30.5	40	mΩ
<b>Dynamic Characteristics</b>						
Ciss	Input Capacitance	VDS=-15V,VGS=0V, F=1MHZ	--	681	--	pF
Coss	Output Capacitance		--	102	--	pF
Crss	Reverse Transfer Capacitance		--	89	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	11.2	--	Ω
<b>Switching Times</b>						
td(on)	Turn-on Delay Time	VGS=-10V,VDS=-15V, ID=-4A,RGEN=3Ω, RL=3.6Ω	--	8.0	--	nS
tr	Turn-on Rise Time		--	4.0	--	nS
td(off)	Turn-Off Delay Time		--	26	--	nS
tf	Turn-Off Fall Time		--	12.5	--	nS
Qg	Total Gate Charge	VGS=-10V, VDS=-15V, ID=-1A	--	14	--	nC
Qgs	Gate-Source Charge		--	1.3	--	nC
Qgd	Gate-Drain Charge		--	3.0	--	nC
<b>Source-Drain Diode Characteristics</b>						
ISD	Source-Drain Current(Body Diode)		--	--	-12	A
VSD	Forward on Voltage	VGS=0V,IS=-5A	--	--	-1.2	V
trr	Reverse Recovery Time	IF=-5A , dl/dt=100A/μs , TJ=25°C	--	--	--	ns
Qrr	Reverse Recovery Charge		--	--	--	nc

Notes 1.The maximum current rating is package limited.

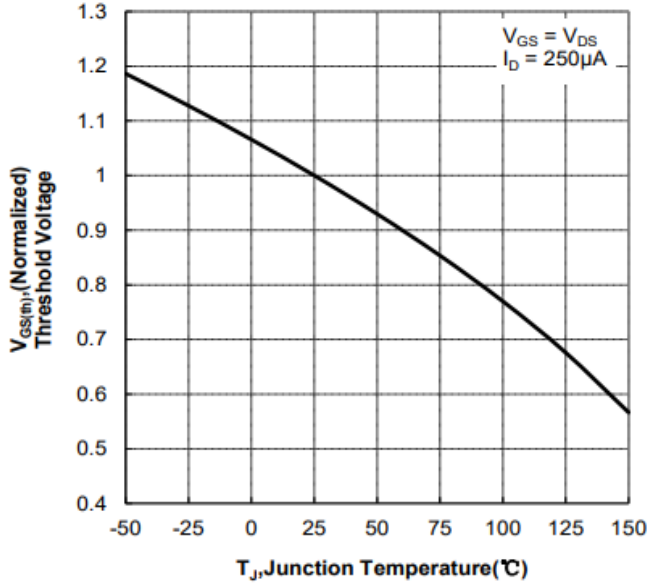
Notes 2.Repetitive Rating: Pulsewidth limited by maximum junction temperature Notes

3.EAS condition: T<sub>J</sub>=25°C,VDD=-15V,Vgs=-10V,ID=-15A, L=0.5mH,RG=25ohm

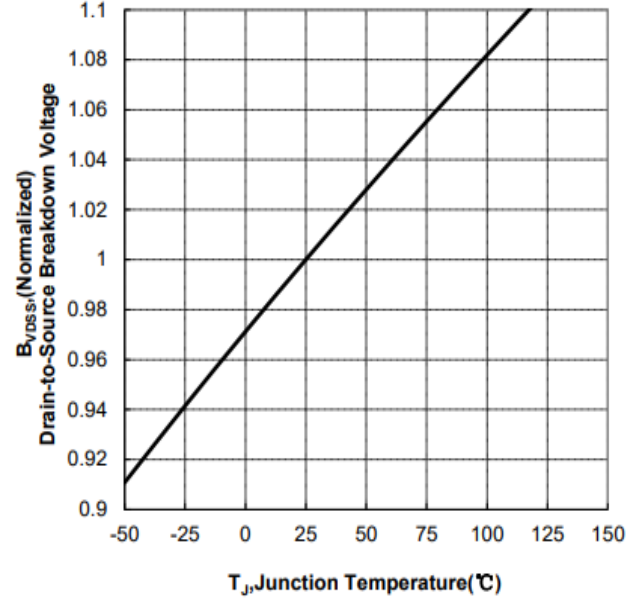
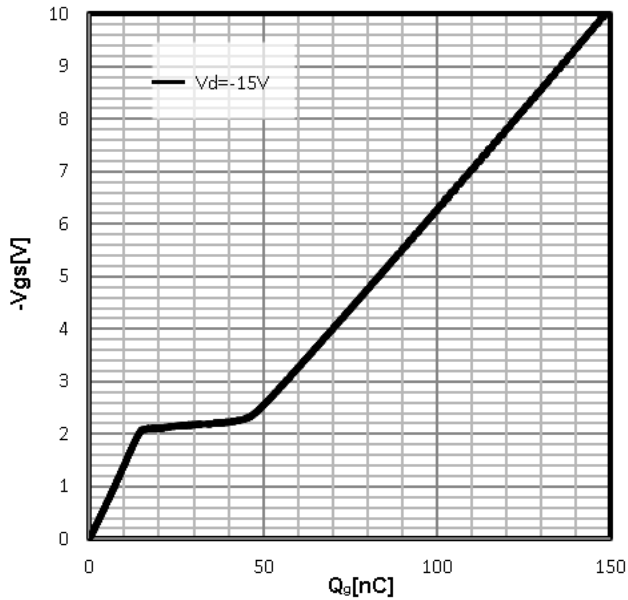
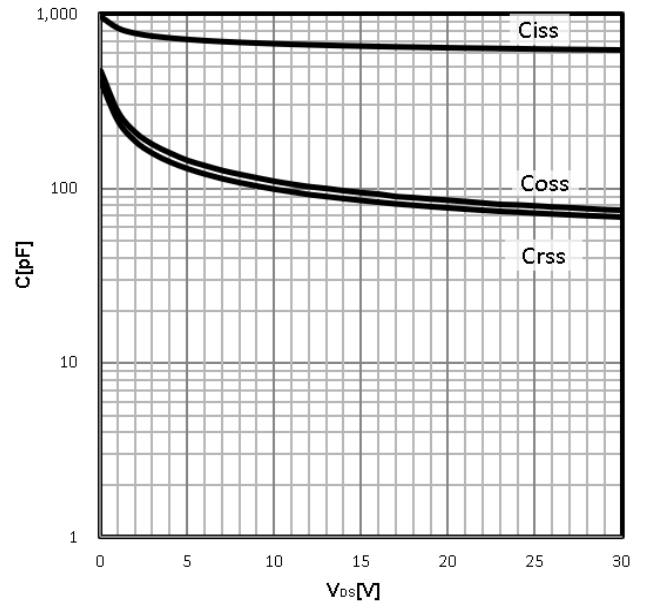
**Characteristics Curve:**
**Typ. output characteristics**  
 $I_D = f(V_{DS})$ 

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

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

**Drain-source on-state resistance**  
 $R_{DS(on)} = f(T_j); I_D = -5A; V_{GS} = -10V$ 


**Gate Threshold Voltage**

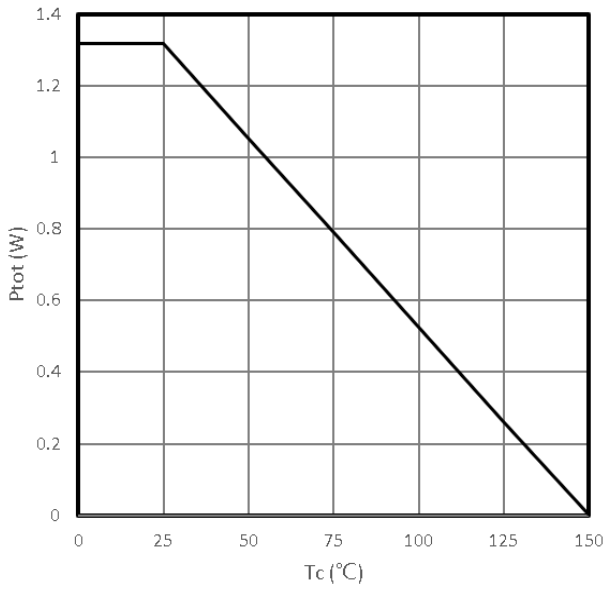
$$-V_{TH} = f(T_j); I_D = -250\mu A$$


**Drain-source breakdown voltage**

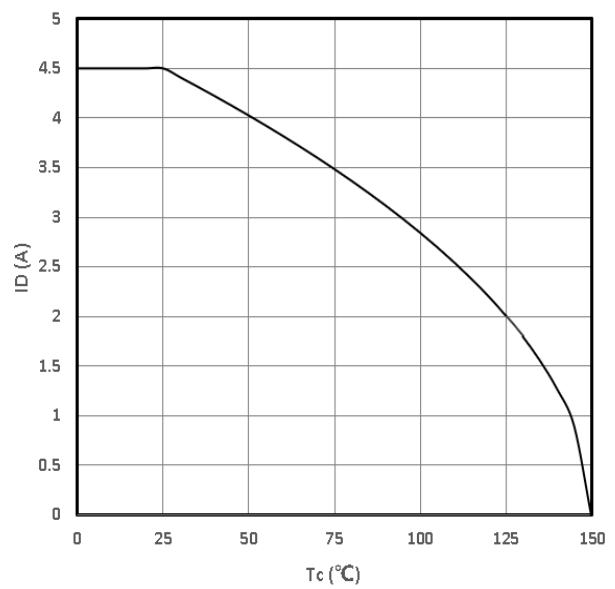
$$V_{BR(DSS)} = f(T_j); I_D = -250\mu A$$


**Typ. gate charge**  
 $V_{GS} = f(Q_{gate}); I_D = -1A$ 

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


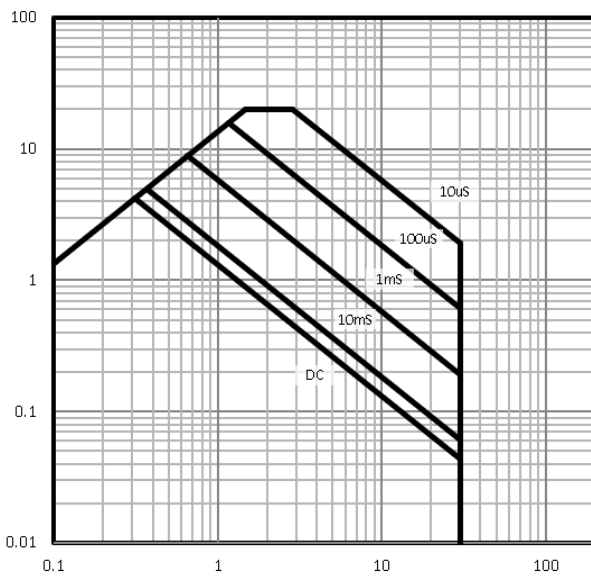
**Power Dissipation**  
 $P_{tot}=f(T_C)$



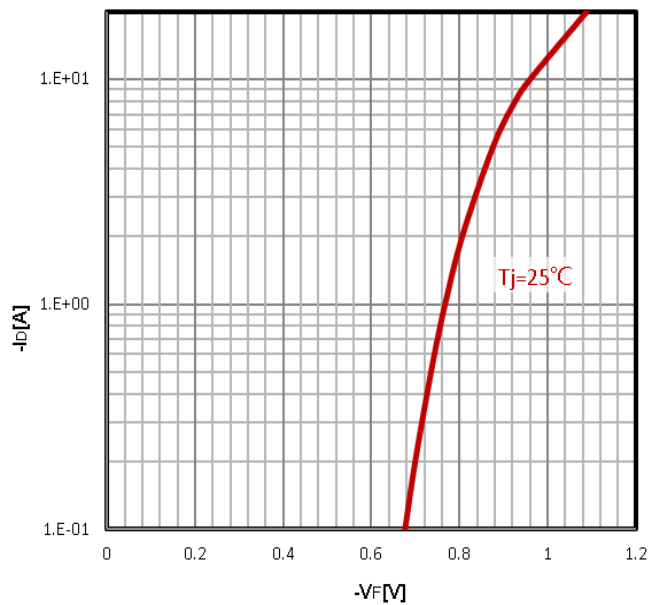
**Maximum Drain Current**  
 $-I_D=f(T_C)$



**Safe operating area**  
 $-I_D=f(-V_{DS})$

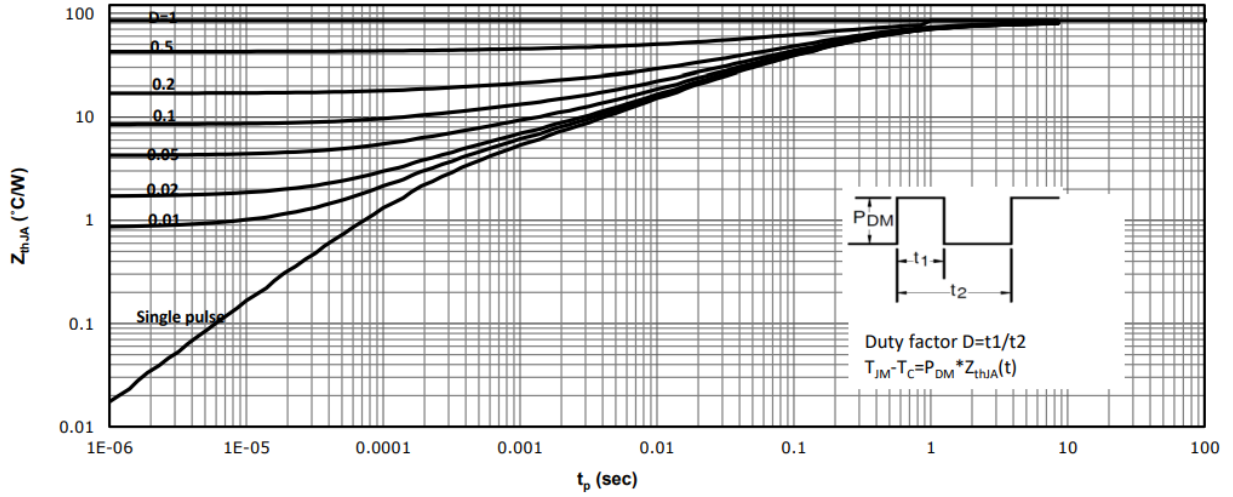


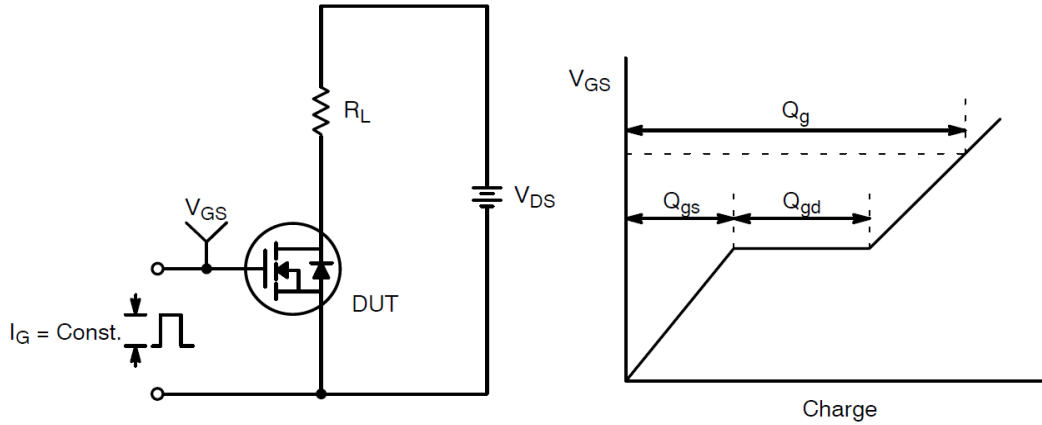
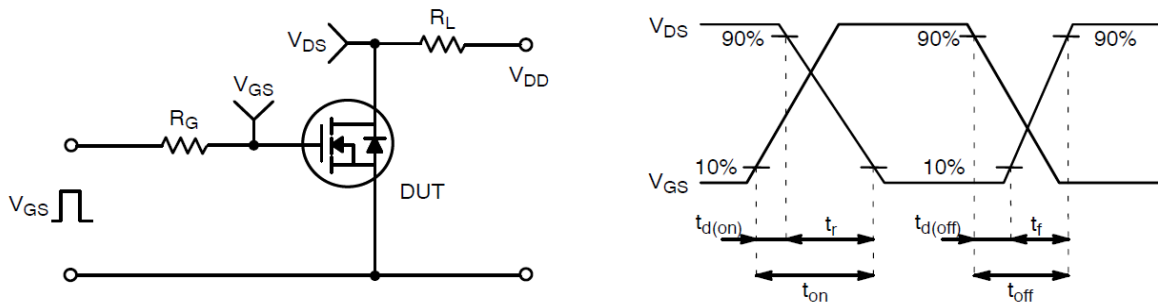
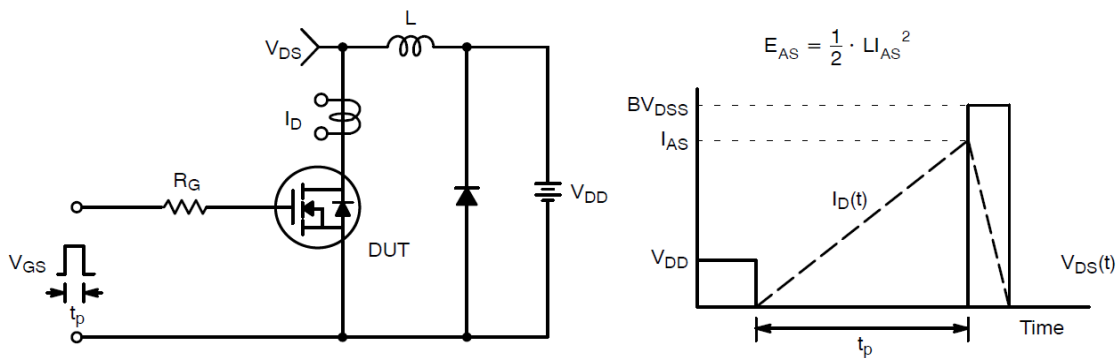
**Body Diode Forward Voltage Variation**  
 $-I_F=f(-V_{DS})$



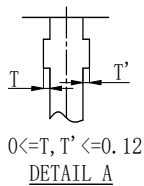
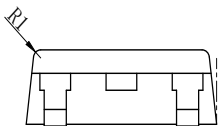
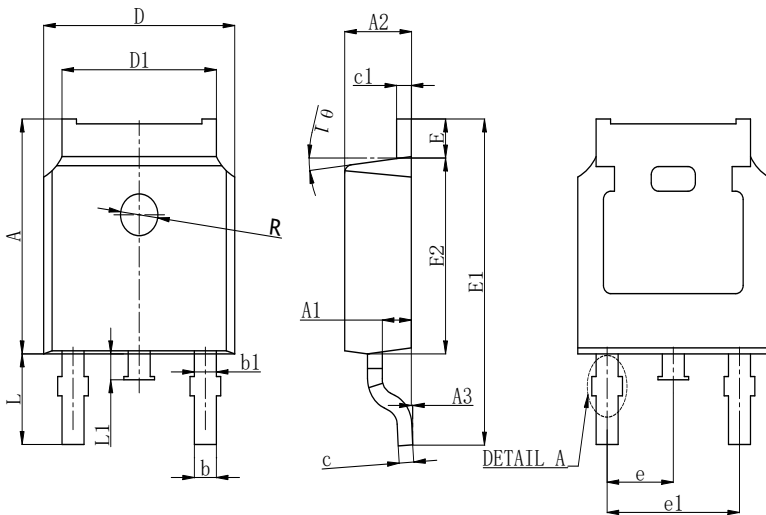
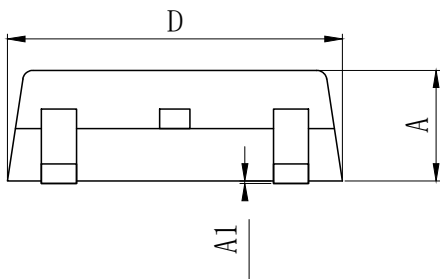
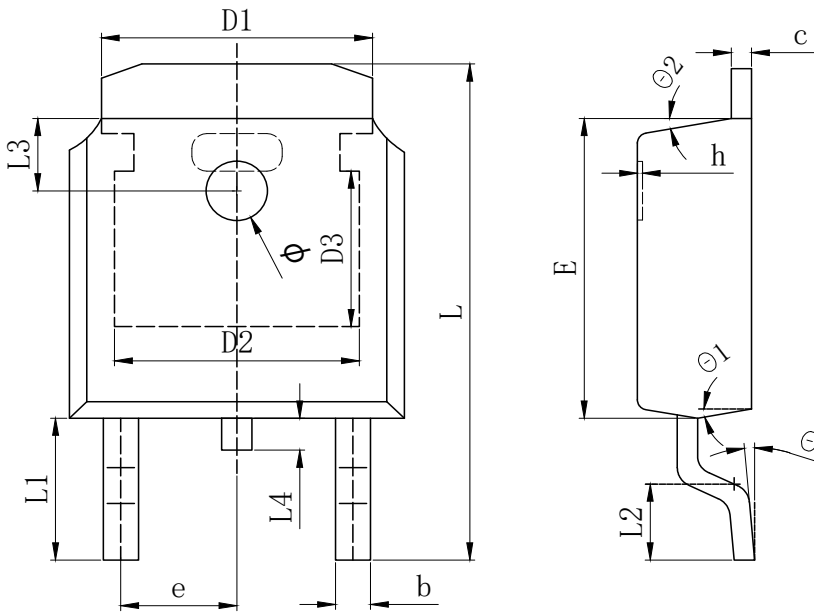
Max. transient thermal impedance

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



**Test Circuit and Waveform:**

**Gate Charge Test Circuit & Waveform**

**Resistive Switching Test Circuit & Waveforms**

**Unclamped Inductive Switching Test Circuit & Waveforms**

### TO-252 Package Outline Data



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	2.200	2.300	2.400
A1	0.000		0.127
b	0.640	0.690	0.740
c (电镀后)	0.460	0.520	0.580
D	6.500	6.600	6.700
D1	5.334 REF		
D2	4.826 REF		
D3	3.166 REF		
E	6.000	6.100	6.200
e	2.286 TYP		
h	0.000	0.100	0.200
L	9.900	10.100	10.300
L1	2.888 REF		
L2	1.400	1.550	1.700
L3	1.600 REF		
L4	0.600	0.800	1.000
Φ	1.100	1.200	1.300
θ	0°		8°
θ 1	9° TYP		
θ 2	9° TYP		

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
A3	0.000	0.050	0.100
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
E1	9.700	9.900	10.100
E2	6.050	6.100	6.150
e	2.286BSC		
e1	4.572REF.		
L	2.650	2.800	2.950
L1	0.700	0.800	0.900
θ 1	7° REF.		
R	1.300REF.		
R1	0.250REF.		




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