

### • General Description

The AGM30P25S 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

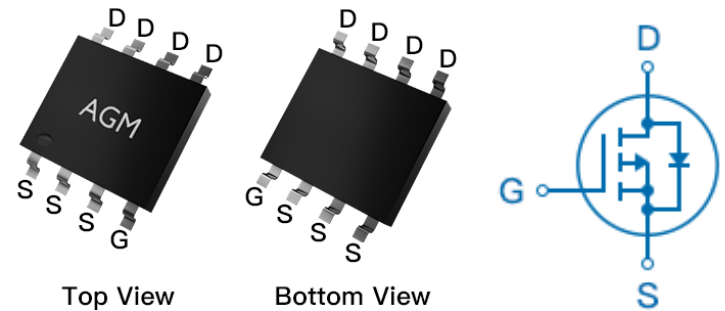
### • Application

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

### Product Summary

BVDSS	RDSON	ID
-30V	20mΩ	-8A

### SOP8 Pin Configuration



### Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM30P25S	AGM30P25S	SOP8	330mm	12mm	3000

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) (Note 1)	-8.0	A
	Drain Current-Continuous(Tc=100°C)	-4.8	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 2)	-32	A
PD	Maximum Power Dissipation(Tc=25°C)	2.5	w
	Maximum Power Dissipation(Tc=100°C)	1.0	w
EAS	Avalanche energy (Note 3)	72	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

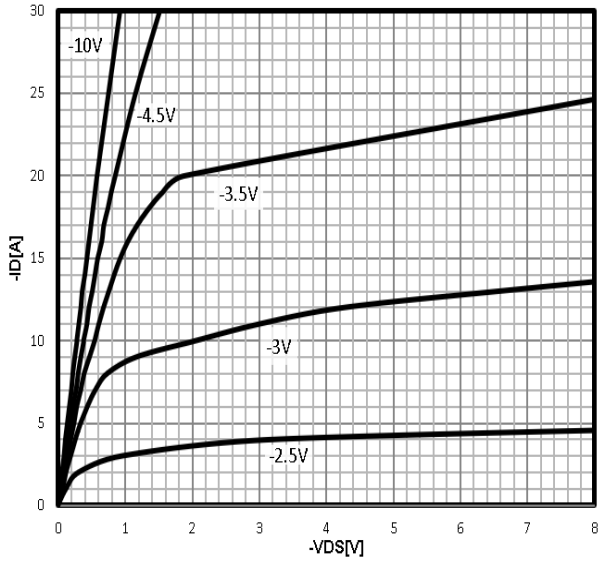
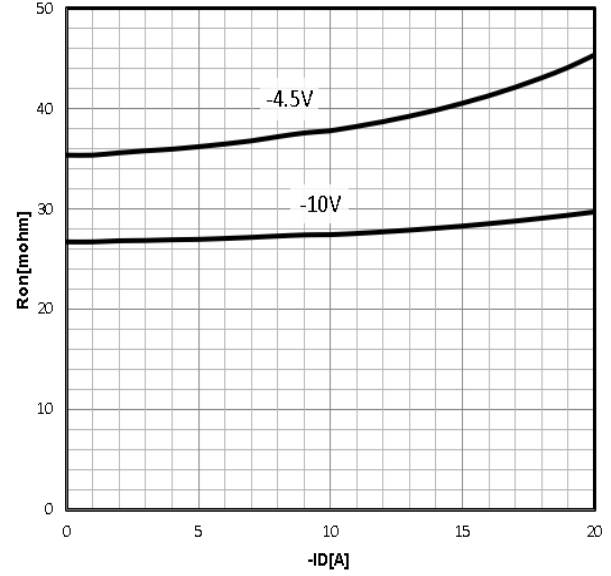
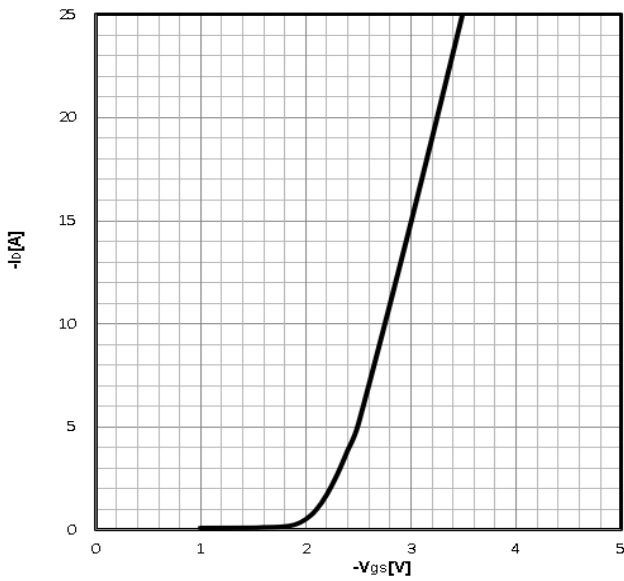
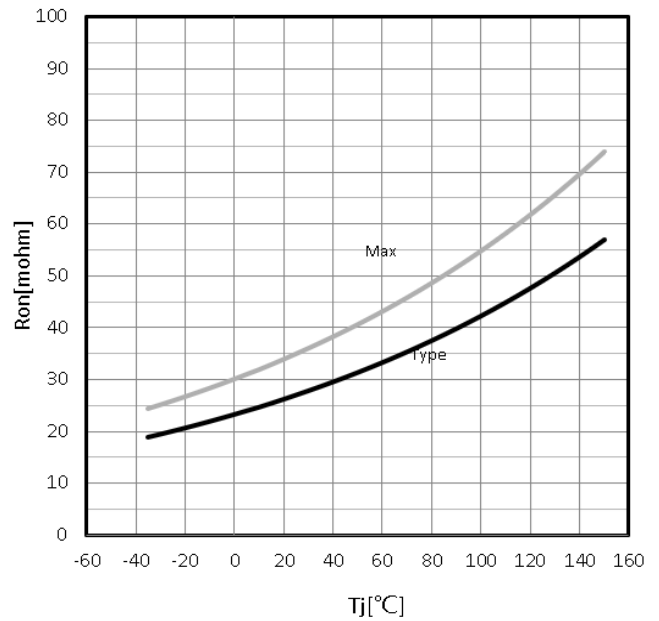
**Table 2. P-Channel Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>On/Off States</b>						
BVDSS	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA	-30	--	--	V
IDSS	Zero Gate Voltage Drain Current	V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V	--	--	-1	μA
IGSS	Gate-Body Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	--	--	±100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	-1.2	-1.5	-2.2	V
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =-5V, I <sub>D</sub> =-4A	--	7	--	S
R <sub>DS(on)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =-10V, I <sub>D</sub> =-5A	--	20	28	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4A	--	30	40	mΩ
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V, F=1MHZ	--	652	--	pF
C <sub>oss</sub>	Output Capacitance		--	95	--	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		--	85.7	--	pF
<b>Switching Times</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, I <sub>D</sub> =-4A, R <sub>GEN</sub> =3Ω, R <sub>L</sub> =3.6Ω	--	8.0	--	nS
t <sub>r</sub>	Turn-on Rise Time		--	4.0	--	nS
t <sub>d(off)</sub>	Turn-Off Delay Time		--	26	--	nS
t <sub>f</sub>	Turn-Off Fall Time		--	12.5	--	nS
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, I <sub>D</sub> =-1A	--	14	--	nC
Q <sub>gs</sub>	Gate-Source Charge		--	1.3	--	nC
Q <sub>gd</sub>	Gate-Drain Charge		--	3.0	--	nC
<b>Source-Drain Diode Characteristics</b>						
I <sub>SD</sub>	Source-Drain Current(Body Diode)		--	--	-8.0	A
V <sub>SD</sub>	Forward on Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =-5A	--	--	-1.2	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>F</sub> =-5A , dI/dt=100A/μs , T <sub>J</sub> =25°C	--	--	--	ns
Q <sub>rr</sub>	Reverse Recovery Charge		--	--	--	nc

Notes 1.The maximum current rating is package limited.

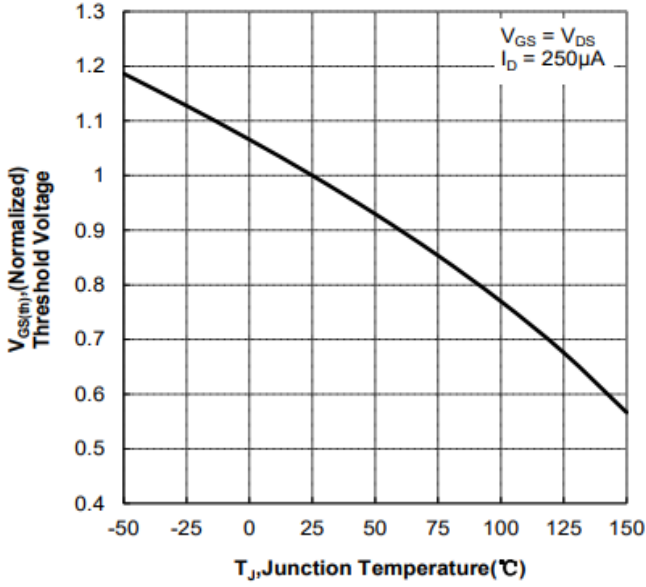
Notes2.Repetitive Rating: Pulse width limited by maximum junction temperature Notes

3.EAS condition: T<sub>J</sub>=25°C, V<sub>DD</sub>=-15V, V<sub>GS</sub>=-10V, I<sub>D</sub>=-17A, L=0.5mH, R<sub>G</sub>=25ohm

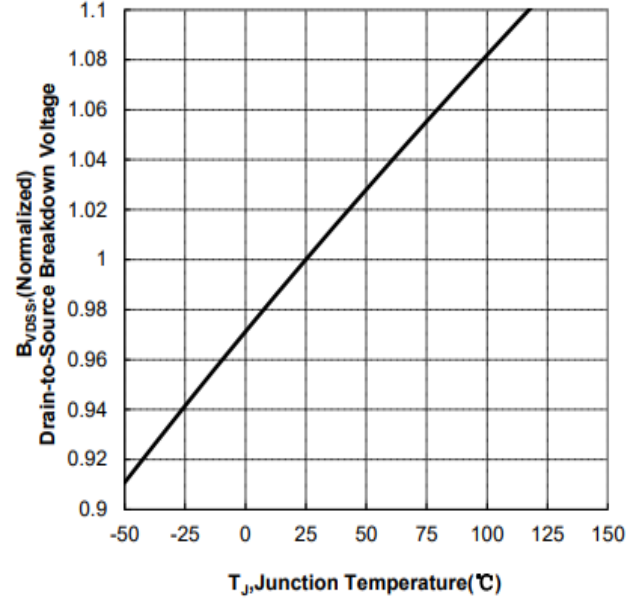
**Characteristics Curve:**
**Typ. output characteristics**  
 $I_D = f(V_{DS})$ 

**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**

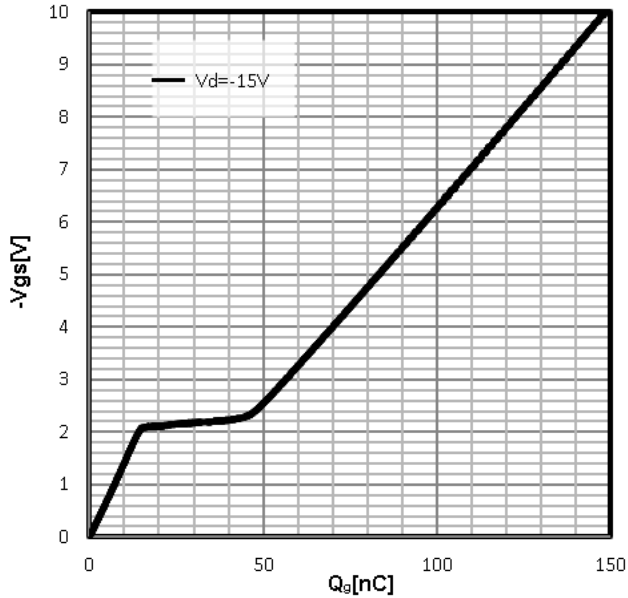
$$-V_{TH} = f(T_j); I_D = -250\mu A$$


**Drain-source breakdown voltage**

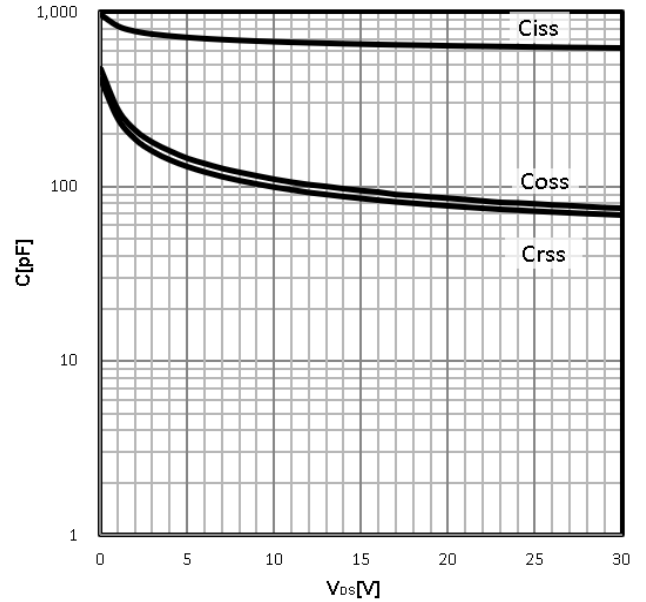
$$V_{BR(DSS)} = f(T_j); I_D = -250\mu A$$


**Typ. gate charge**

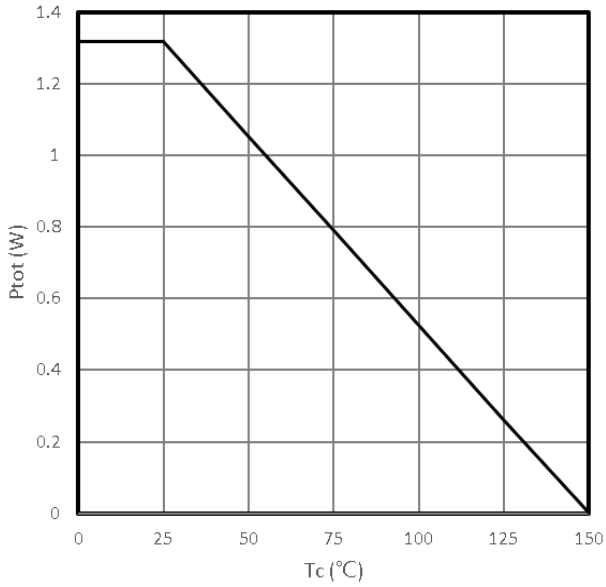
$$V_{GS} = f(Q_{gate}); I_D = -1A$$


**Typ. capacitances**

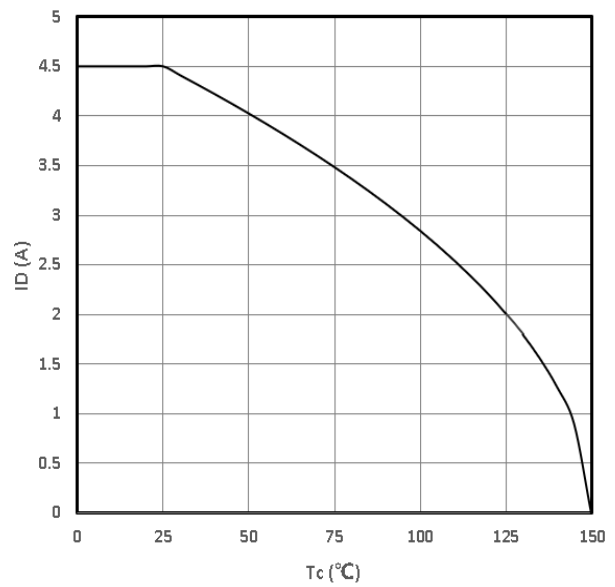
$$C = f(V_{DS}); V_{GS} = 0V; f = 1MHz$$



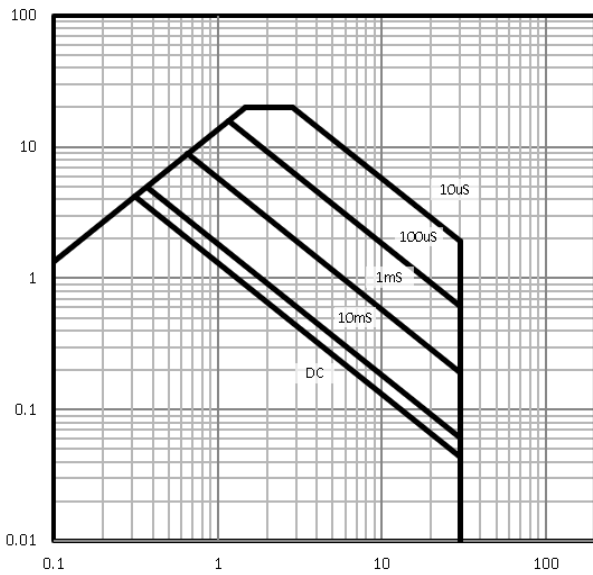
**Power Dissipation**  
 $P_{tot}=f(T_C)$



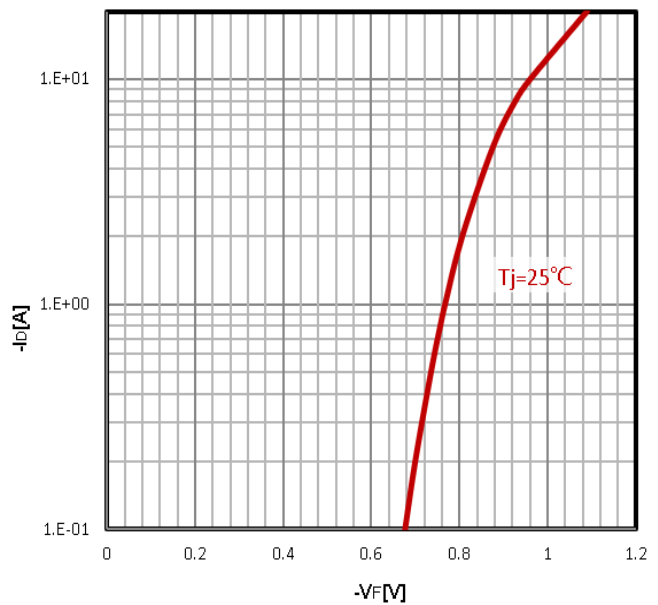
**Maximum Drain Current**  
 $-I_D=f(T_C)$



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

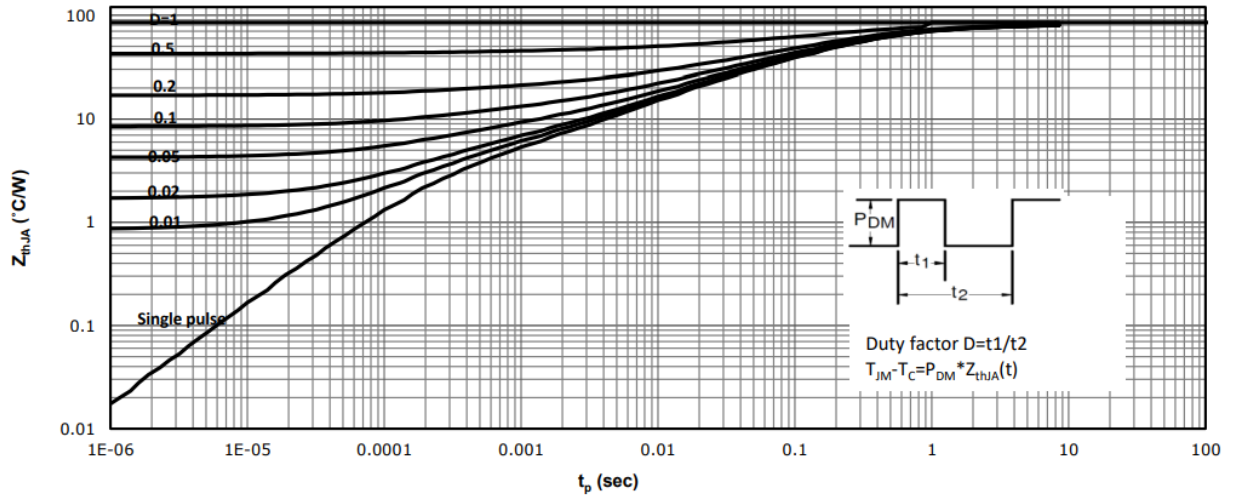


**Body Diode Forward Voltage Variation**  
 $-I_F=f(-V_{DS})$

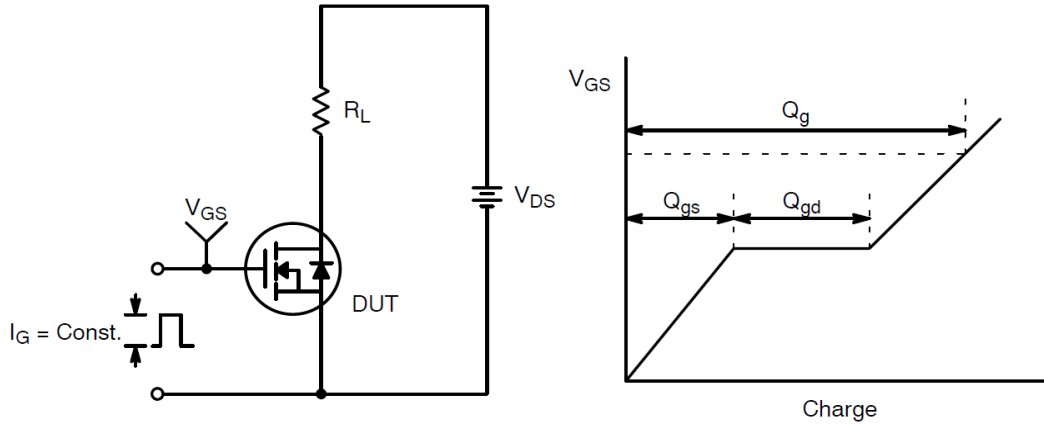


Max. transient thermal impedance

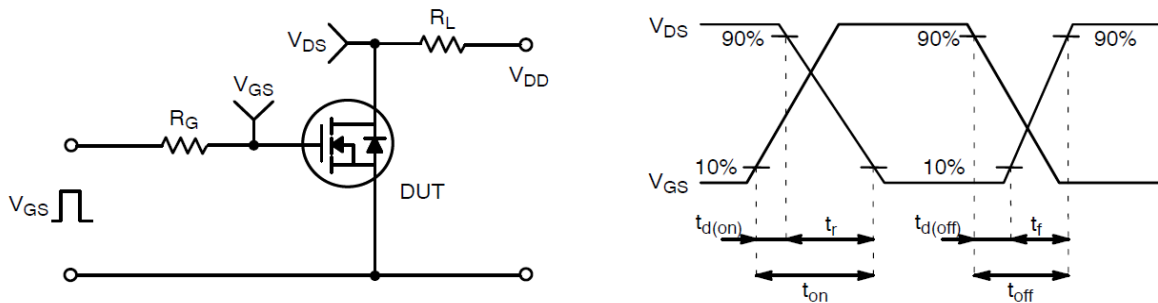
$$Z_{thJC} = f(t_p)$$



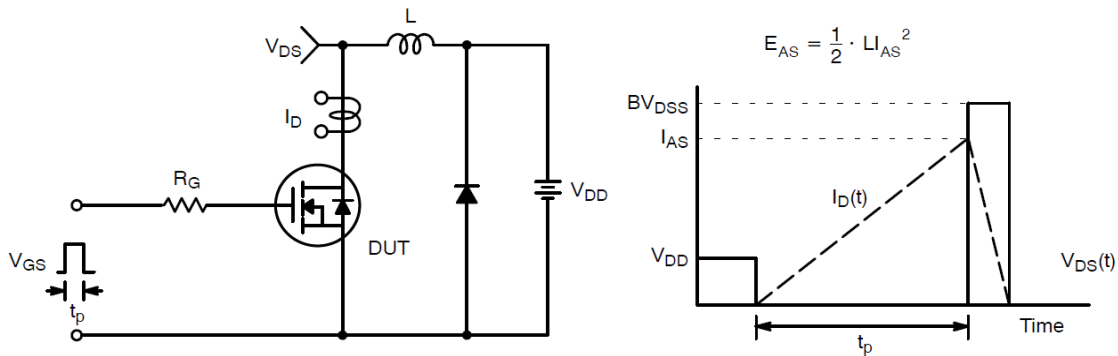
**Test Circuit and Waveform:**



**Gate Charge Test Circuit & Waveform**



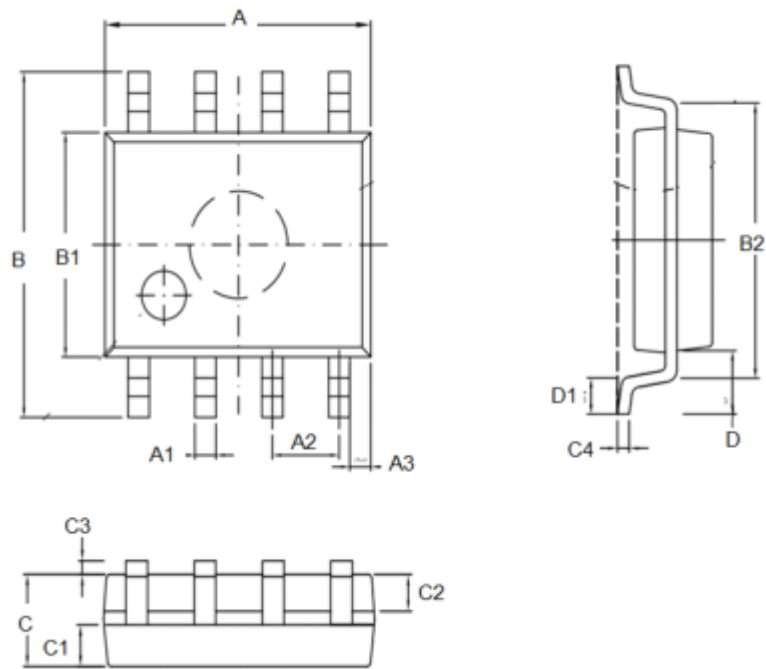
**Resistive Switching Test Circuit & Waveforms**



**Unclamped Inductive Switching Test Circuit & Waveforms**

**•Dimensions(SOP8)**

SYMBOL	min	TYP	max	SYMBOL	min		max
A	4.80		5.00	C	1.30		1.50
A1	0.37		0.47	C1	0.55		0.75
A2		1.27		C2	0.55		0.65
A3		0.41		C3	0.05		0.20
B	5.80		6.20	C4	0.19	0.20	0.23
B1	3.80		4.00	D		1.05	
B2		5.00		D1	0.40		0.62






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