General Description

The AGM3P06E 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

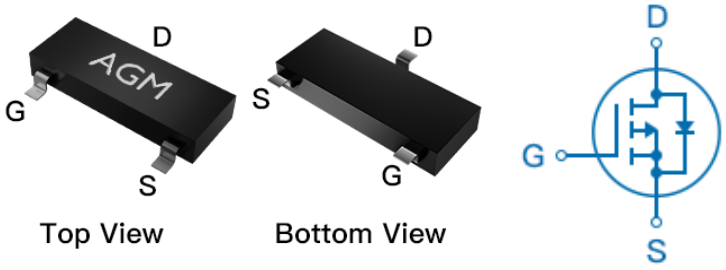
Application

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

Product Summary

BVDSS	RDSON	ID
-60V	90mΩ	-2.5A

SOT23-3 Pin Configuration



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
3P06	AGM3P06E	SOT23-3	178mm	8mm	3000

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(Ta=25℃) **(Note 1)**	-2.5	A
	Drain Current-Continuous(Tc=100℃)	-1.6	A
IDM (pluse)	Drain Current-Pulsed **(Note 2)**	-10	A
PD	Maximum Power Dissipation(Tc=25℃)	1.25	w
	Maximum Power Dissipation(Tc=100℃)	0.5	w
EAS	Avalanche energy **(Note 3)**	20	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]	---	100	℃/W

Table 3. Electrical Characteristics (TA=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	μA
IGSS	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=-250μA	-1.2	--	-2.2	V
gFS	Forward Transconductance	VDS=-5V,ID=-3A	--	5.8	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=-10V, ID=-3A	--	90	110	mΩ
		VGS=-4.5V, ID=-2A	--	110	150	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=-30V,VGS=0V ,F=1MHZ	--	315	--	pF
Coss	Output Capacitance		--	58	--	pF
Crss	Reverse Transfer Capacitance		--	3.0	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	--	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=-10V,VDS=-30V, ID=-2A,RGEN=5Ω	--	6.8	--	nS
tr	Turn-on Rise Time		--	8.0	--	nS
td(off)	Turn-Off Delay Time		--	16	--	nS
tf	Turn-Off Fall Time		--	4.0	--	nS
Qg	Total Gate Charge	VGS=-10V, VDS=-50V, ID=-5A	--	6.0	--	nC
Qgs	Gate-Source Charge		--	0.97	--	nC
Qgd	Gate-Drain Charge		--	0.72	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	-2.5	A
VSD	Forward on Voltage	VGS=0V,IS=-3A	--	--	-1.2	V
trr	Reverse Recovery Time	IF=-3A , 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℃

Characteristics Curve：

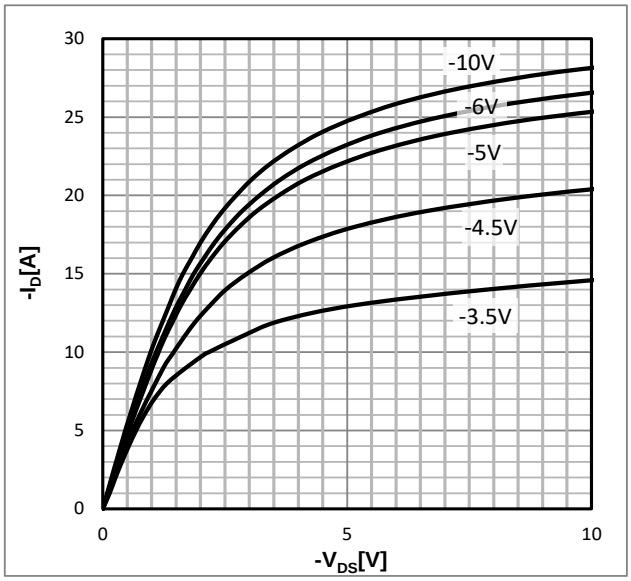
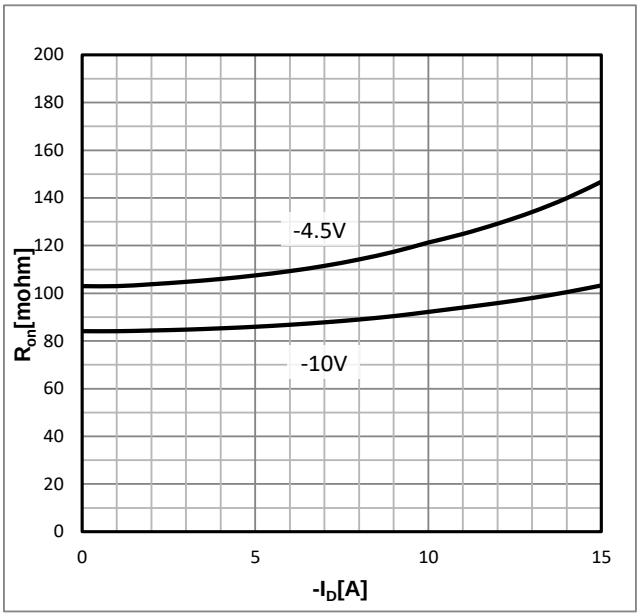
Figure 1: Typ. output characteristics	Figure 2: Typ. drain-source on resistance
	
$I_D=f(V_{DS})$, T_j=25 °C; parameter: V_{GS}	$R_{DS(on)}=f(I_D)$, T_j=25 °C; parameter: V_{GS}

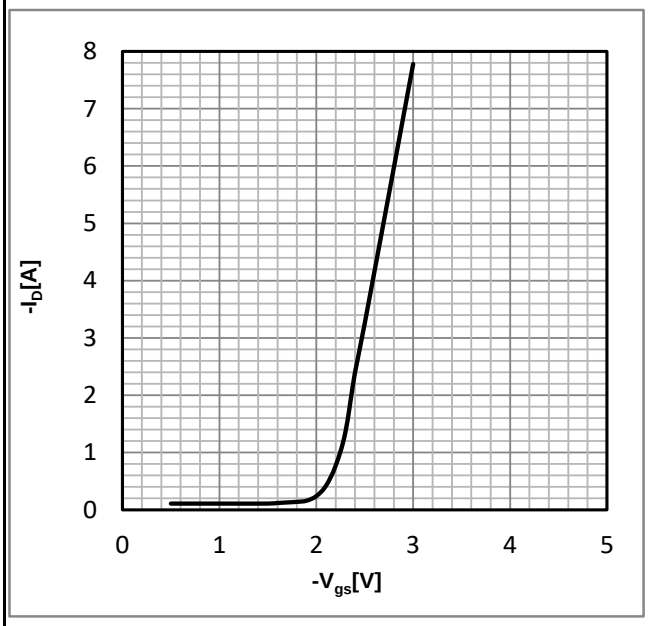
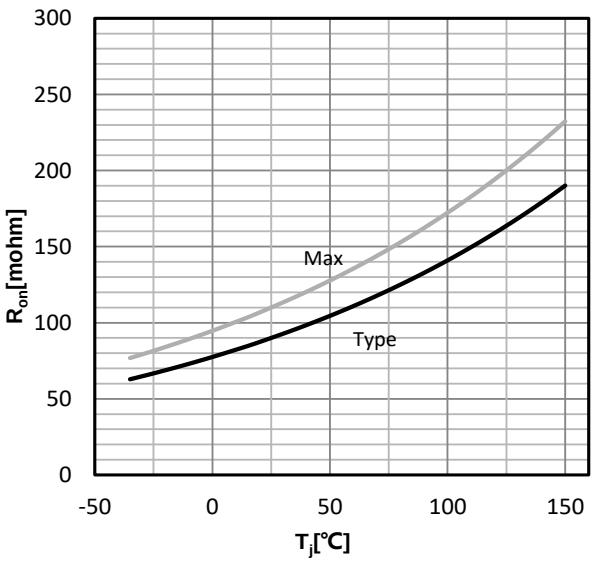
Figure 3: Typ. transfer characteristics	Figure 4: drain-source on resistance
	
$I_D=f(V_{GS})$, $\|V_{DS}\|>2\|I_D\|R_{DS}(on)max$;	$R_{DS(on)}=f(T_j)$, I_D=-3.0A, V_{GS}=-10V;

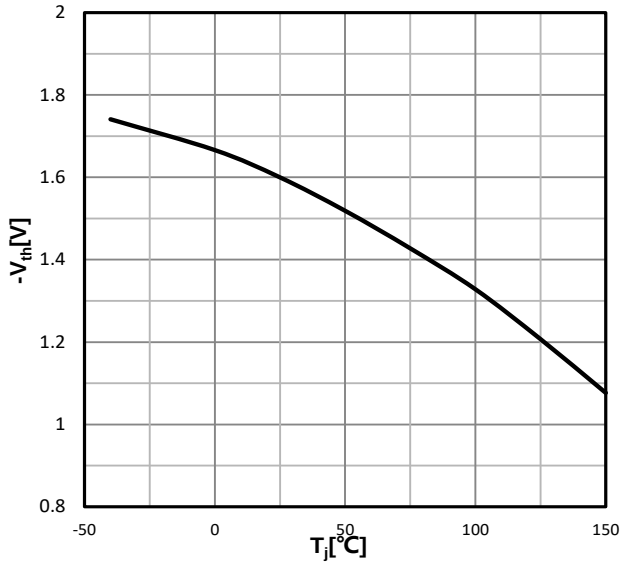
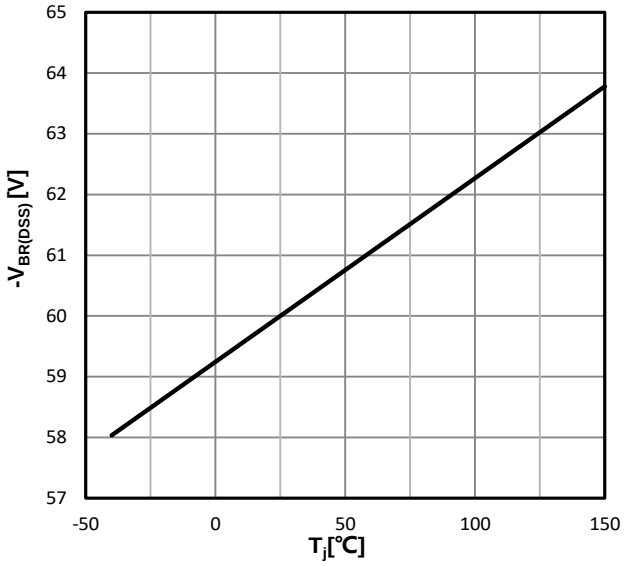
Figure 5: Typ. gate threshold voltage	Figure 6: Drain-source breakdown voltage
	
V_{GS}=f(T_j),I V_{GS}=$V_{DS,}$$I_D$=-250μA;	$V_{BR(DSS)}$=f(T_j); I_D=-250μA;

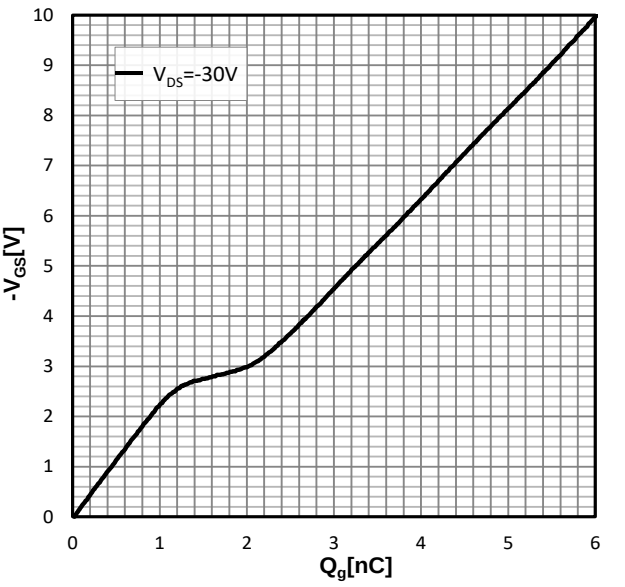
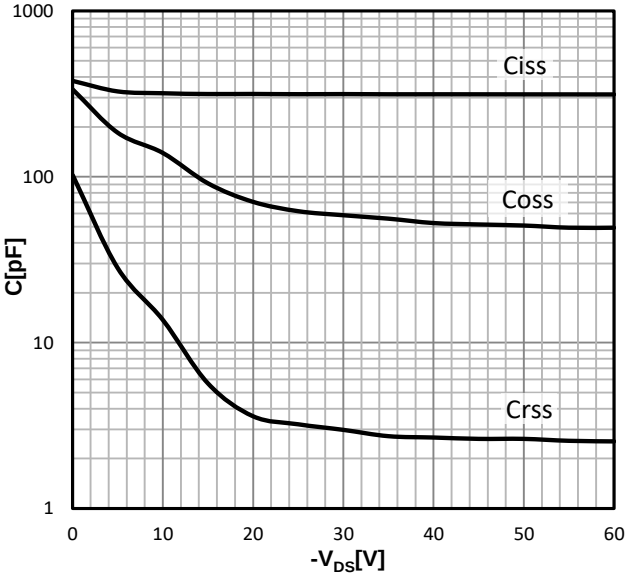
Figure 7: Typ. gate charge	Figure 8: Typ. Capacitances
	
V_{GS}=f(Q_g), I_D=-5.0A, T_j=25 °C; parameter: V_{DS}	C=f(V_{DS}); V_{GS}=0V; f=1.0 MHz;

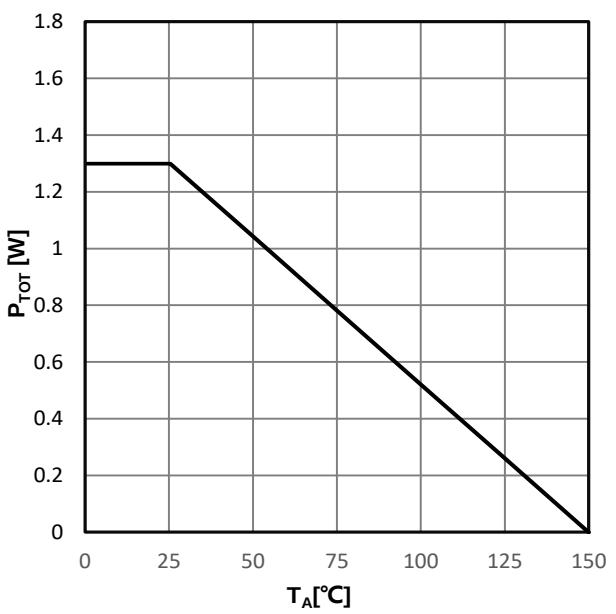
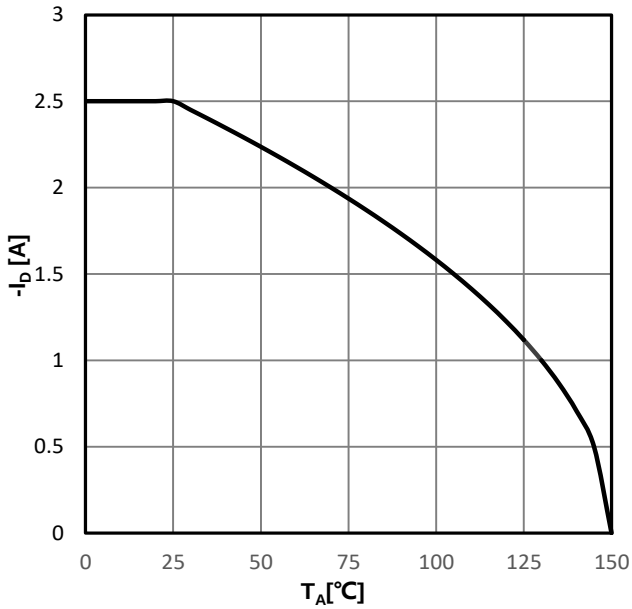
Figure 9: Power dissipation	Figure 10:Drain current
	
$P_{tot}=f(T_A)$;	$I_D=f(T_A)$;

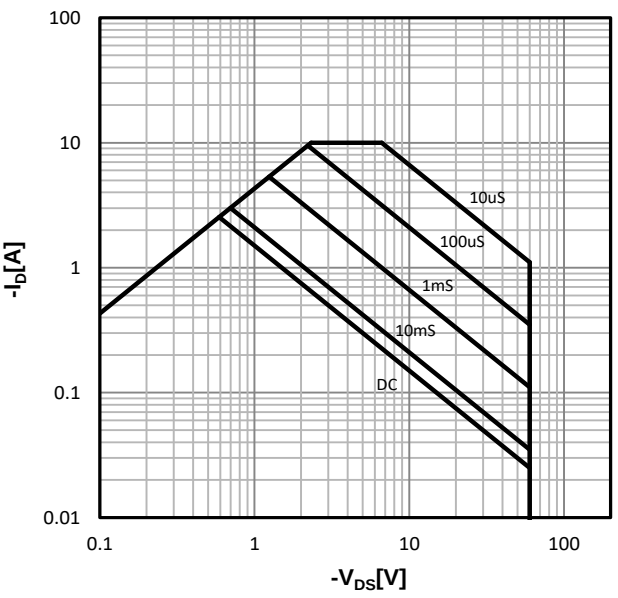
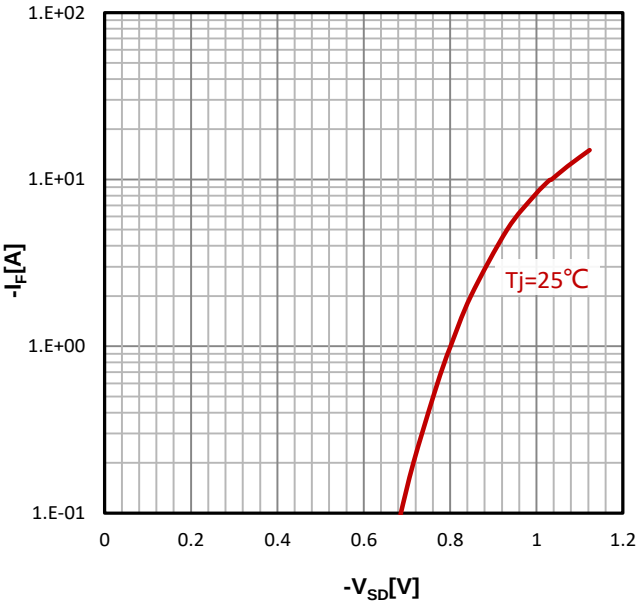
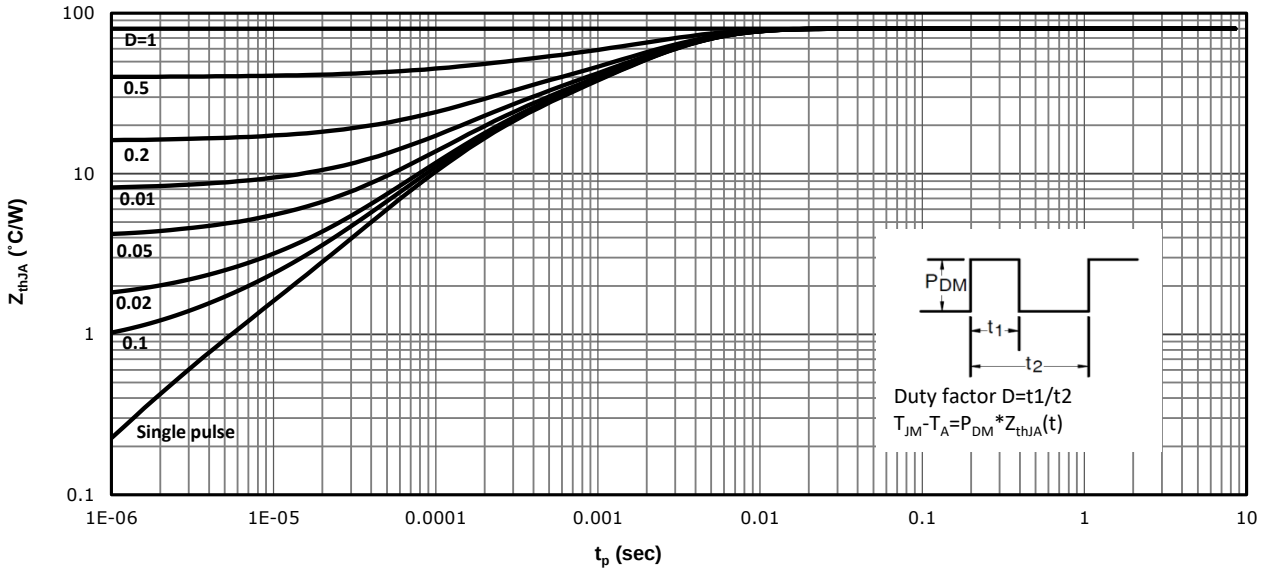
Figure 11: Safe operating area	Figure 12: Typ. forward characteristics
	
$I_D=f(V_{DS})$; $T_A=25$ °C; D=0; parameter: tp	$I_F=f(V_{SD})$;

Figure 13: Max. Transient Thermal Impedance



$Z_{thJA}=f(t_p)$; parameter: D

Test Circuit & Waveform:

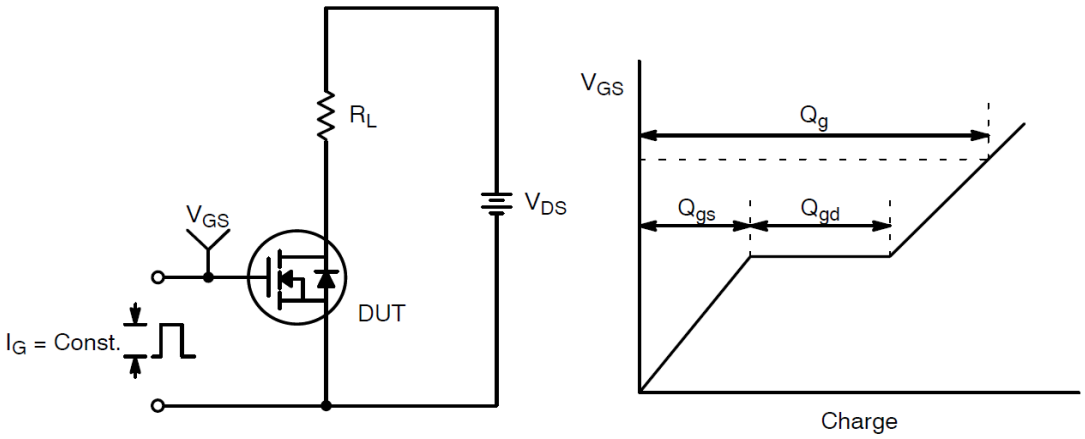


Figure 14: Gate Charge Test Circuit & Waveform

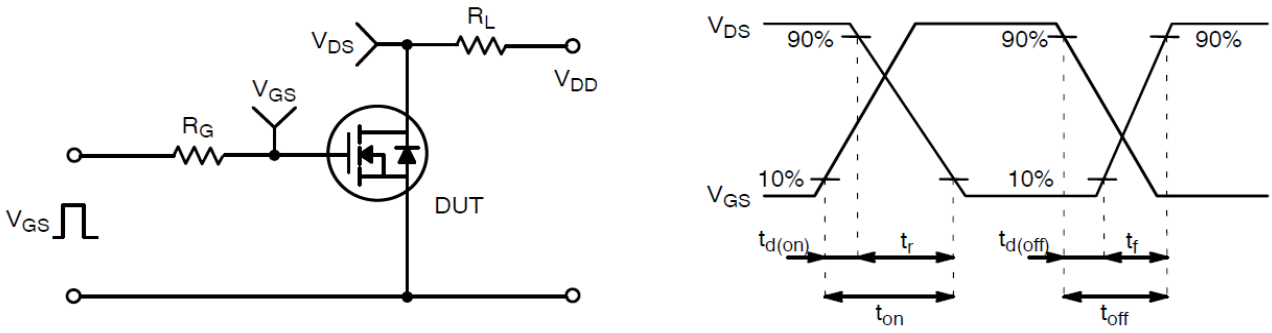


Figure 15: Resistive Switching Test Circuit & Waveforms

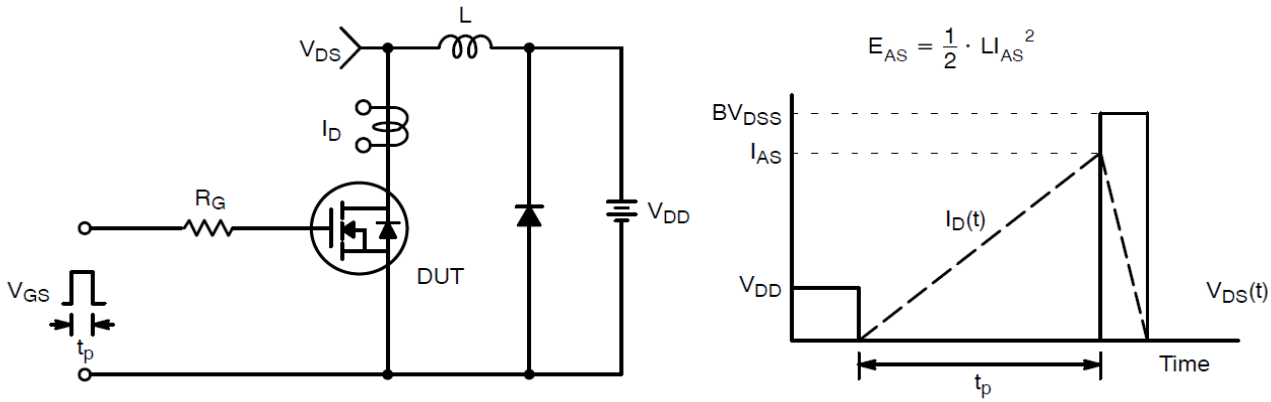
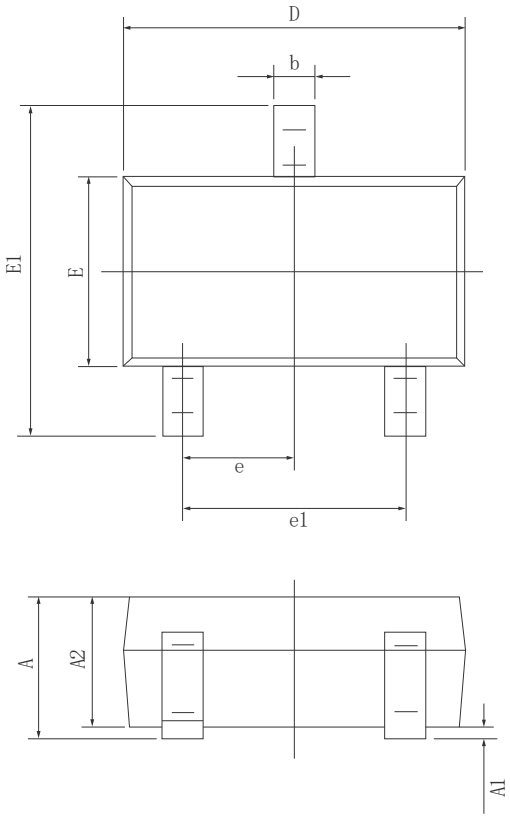
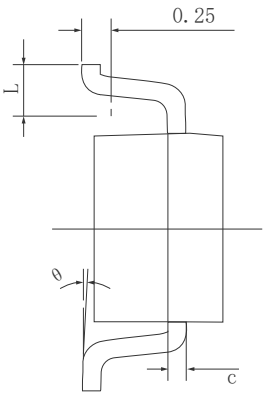


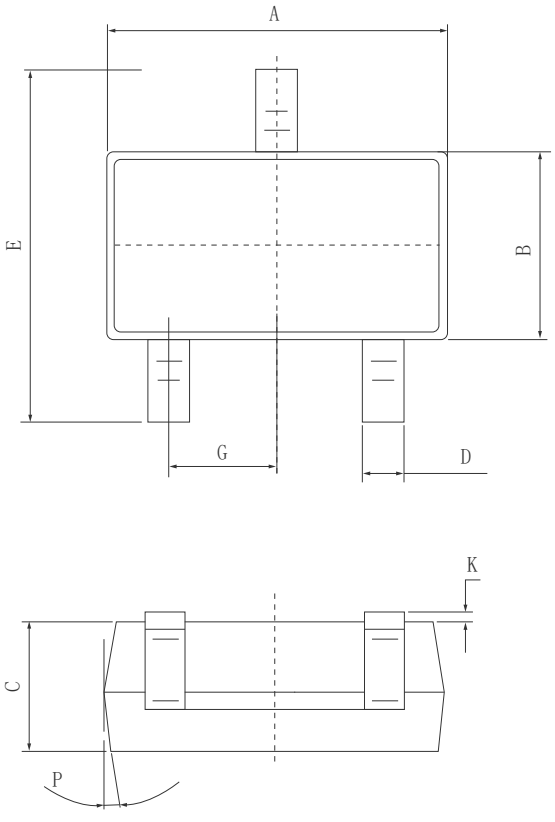
Figure 16: Unclamped Inductive Switching Test Circuit & Waveforms

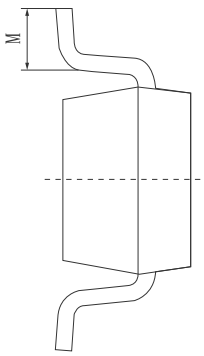
●Dimensions（SOT23-3）





SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	—	—	1.25
A1	0.03	—	0.10
A2	1.05	1.10	1.15
b	0.30	0.35	0.40
c	0.13	—	0.17
D	2.87	2.92	2.97
E	1.55	1.60	1.65
E1	2.70	2.85	3.00
e	0.95 BSC.		
e1	1.80	—	2.00
L	0.35	0.45	0.55
θ	0°	—	8°

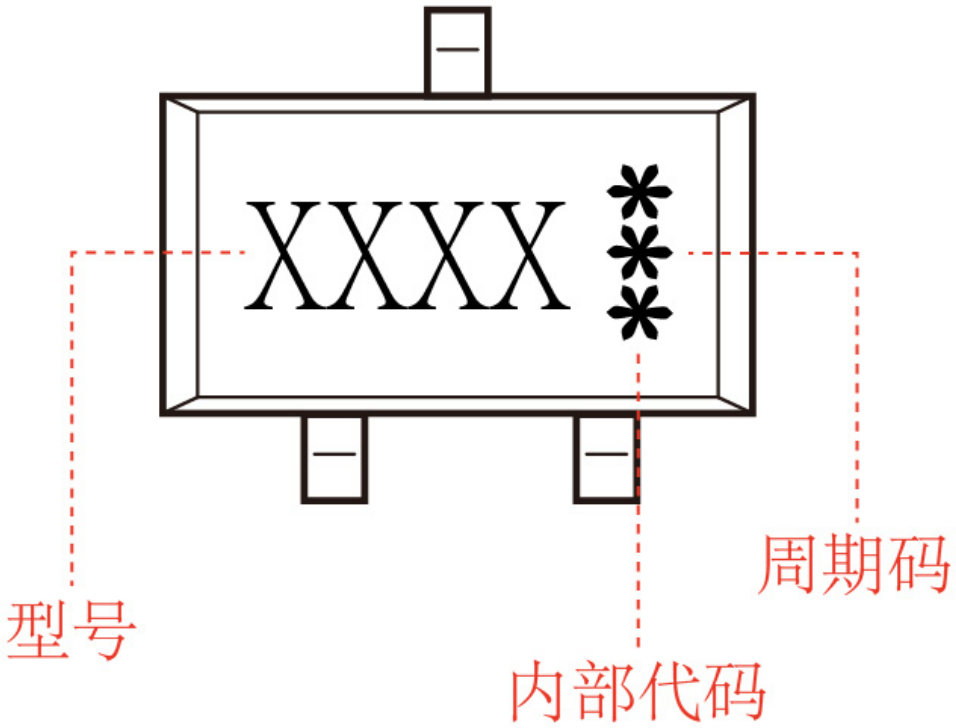




DIM	MILLIMETERS
A	2.82~3.02
B	1.60±0.10
C	1.10±0.05
D	0.40±0.10
E	2.65~2.95
G	0.95typ
K	0.00~0.10
M	0.20MIN
P	9±2°

SOT23-3

Marking Instructions:



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This document is the third version issued on June 20th, 2024. This document replaces all previously provided information.