

General Description

The AGM1005EL 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

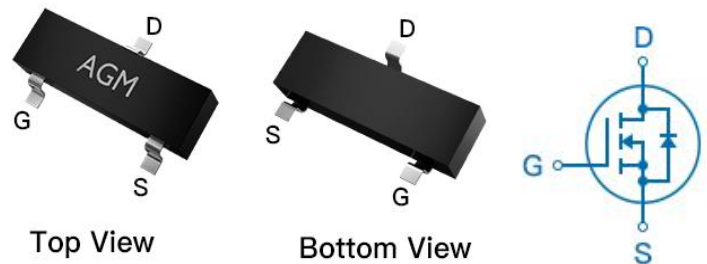
Application

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

Product Summary

BVDSS	RDSON	ID
100V	90mΩ	3A

SOT23 Pin Configuration



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
1005	AGM1005EL	SOT23	178mm	8mm	3000

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

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°C) (Note 1)	3	A
	Drain Current-Continuous(Tc=100°C)	2	A
IDM (pluse)	Drain Current-Pulsed (Note 2)	12	A
PD	Maximum Power Dissipation(Tc=25°C)	1.25	w
EAS	Avalanche energy (Note 3)	16.2	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	---	100	°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	100	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=100V,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	1.6	2.2	V
gFS	Forward Transconductance	VDS=5V,ID=2A	--	--	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=3A	--	90	120	mΩ
		VGS=4.5V, ID=2A	--	95	137	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=40V,VGS=0V, F=1MHZ	--	846	--	pF
Coss	Output Capacitance		--	41	--	pF
Crss	Reverse Transfer Capacitance		--	12	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	--	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V,VDS=50V, ID=3A,RGEN=1.8Ω	--	6.0	--	nS
tr	Turn-on Rise Time		--	7.0	--	nS
td(off)	Turn-Off Delay Time		--	21	--	nS
tf	Turn-Off Fall Time		--	3.0	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=50V, ID=2A	--	20	--	nC
Qgs	Gate-Source Charge		--	2.8	--	nC
Qgd	Gate-Drain Charge		--	3.9	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	3.0	A
VSD	Forward on Voltage	VGS=0V,IS=3A	--	--	1.2	V
trr	Reverse Recovery Time	IF=3A , dI/dt=100A/μs , TJ=25℃	--	15	--	ns
Qrr	Reverse Recovery Charge		--	20	--	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, V_{DD}=50V, V_{gs}=10V, I_D=18A, L=0.1mH, R_G=25ohm

Typical Performance Characteristics

Figure 1: Output Characteristics

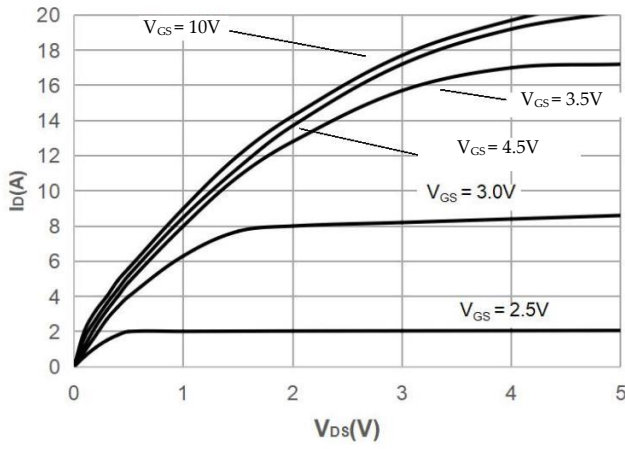


Figure 2: Typical Transfer Characteristics

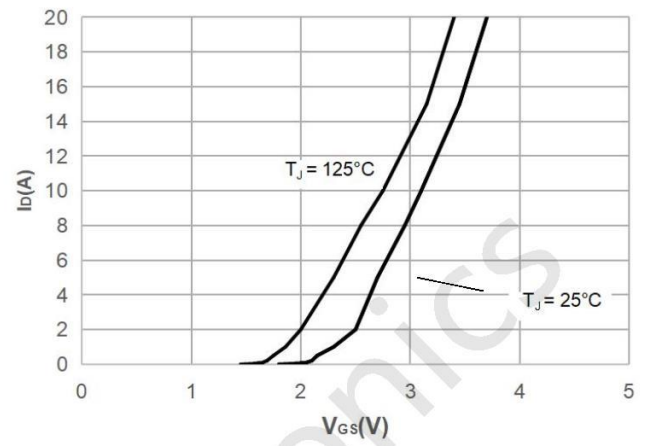


Figure 3: On-resistance vs. Drain Current

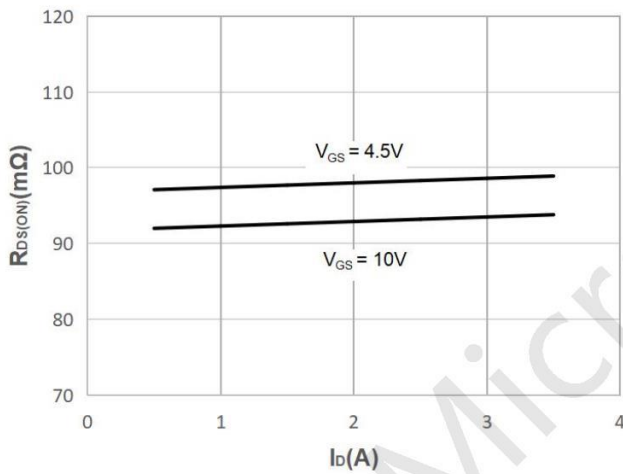


Figure 4: Body Diode Characteristics

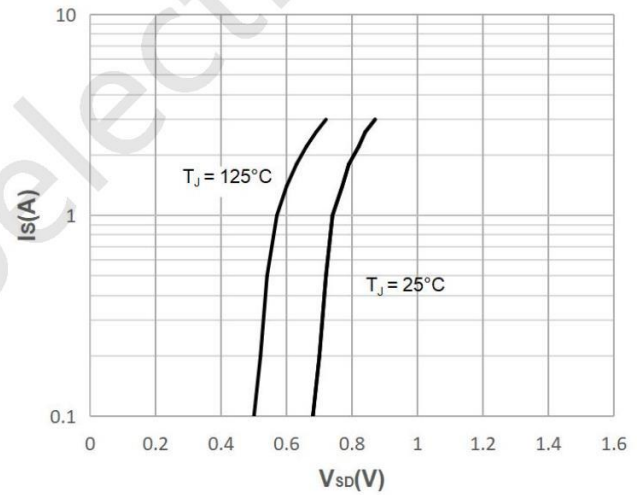


Figure 5: Gate Charge Characteristics

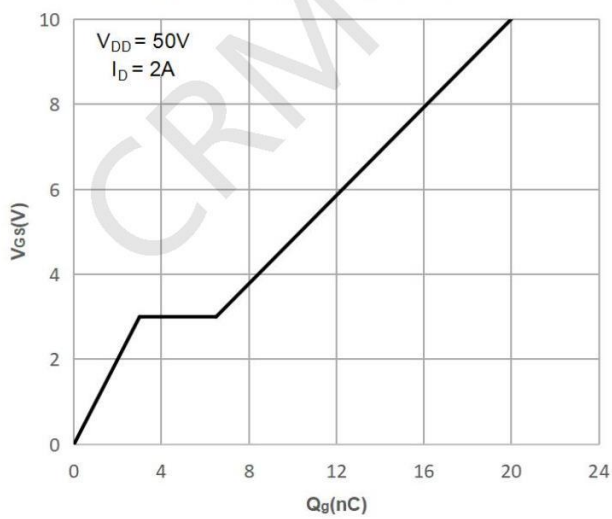
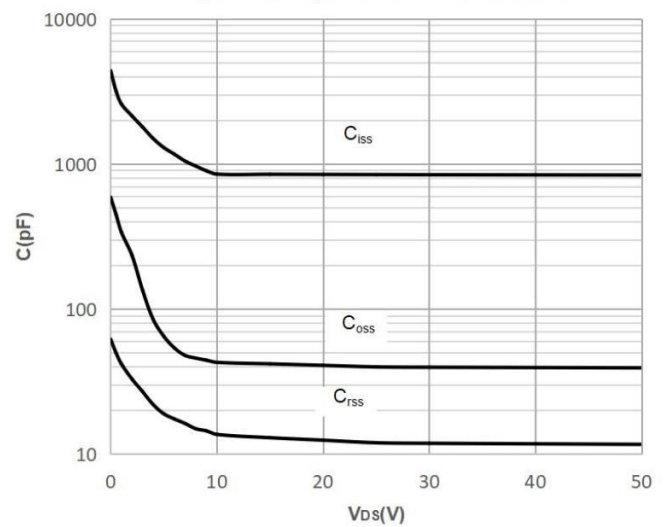


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

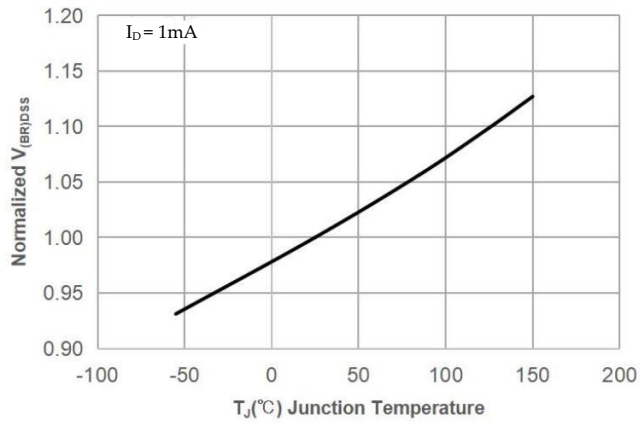


Figure 8: Normalized on Resistance vs. Junction Temperature

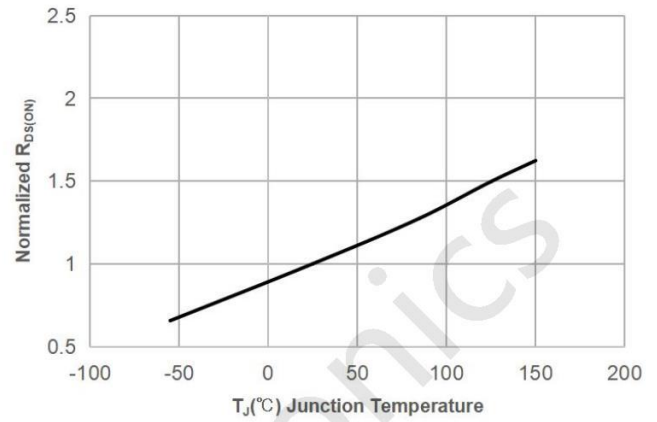


Figure 9: Maximum Safe Operating Area

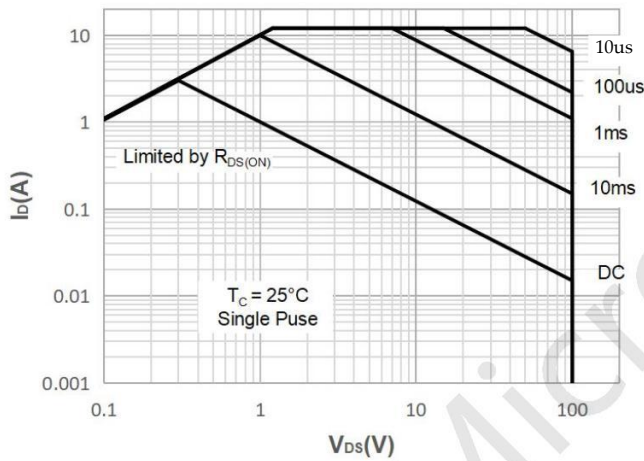


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

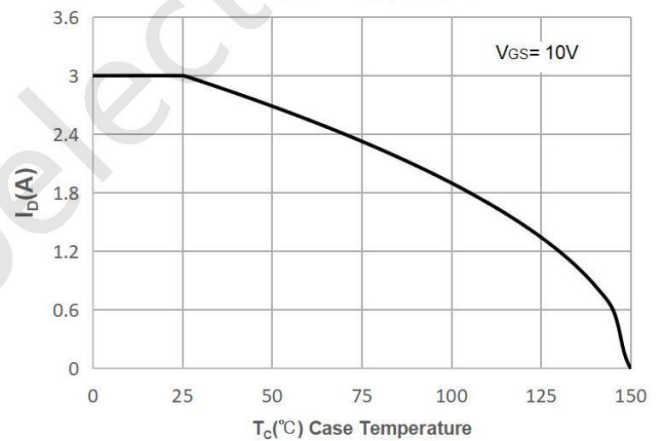


Figure 11: Normalized Maximum Transient Thermal Impedance

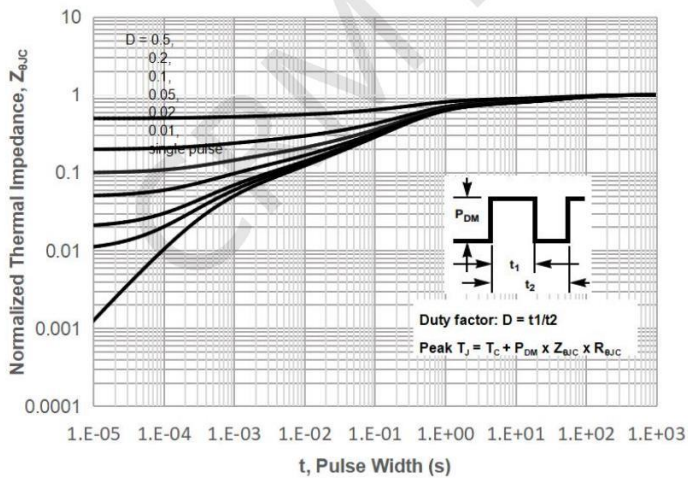
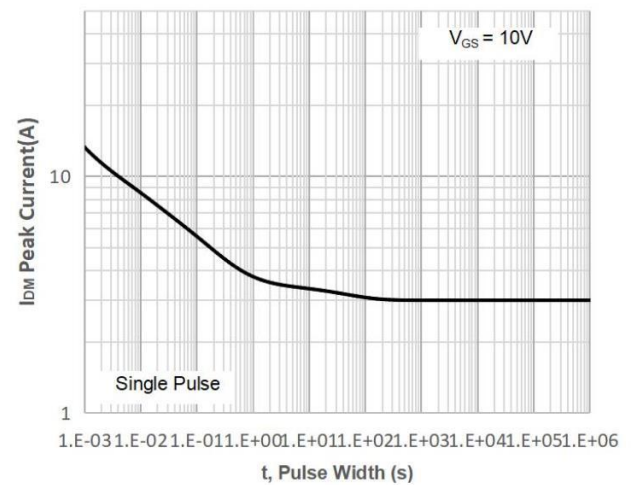


Figure 12: Peak Current Capacity



Test Circuit

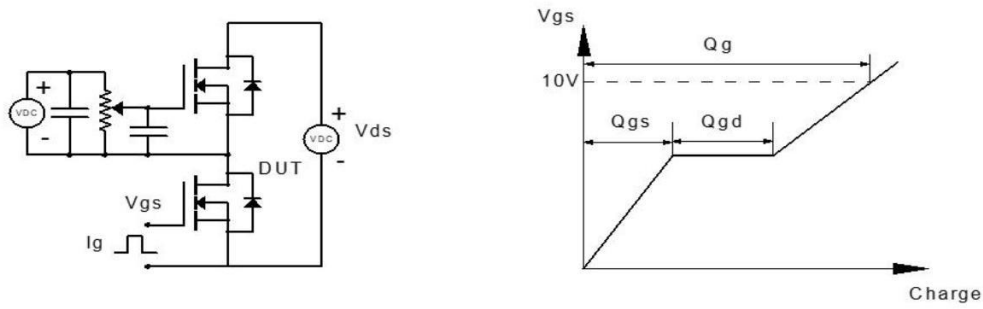


Figure 1: Gate Charge Test Circuit & Waveform

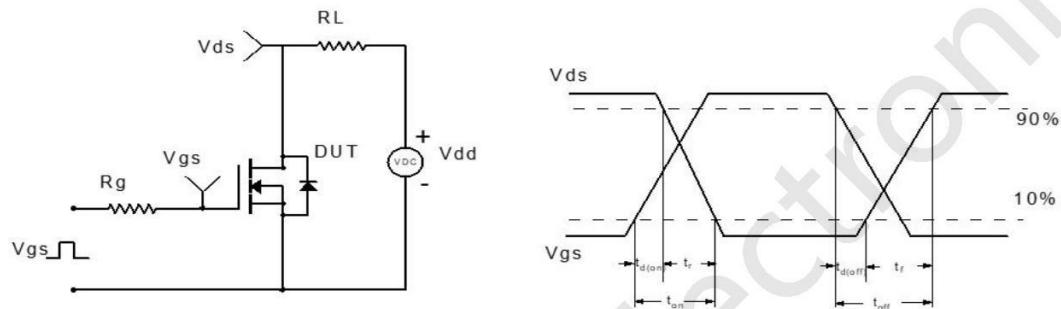


Figure 2: Resistive Switching Test Circuit & Waveform

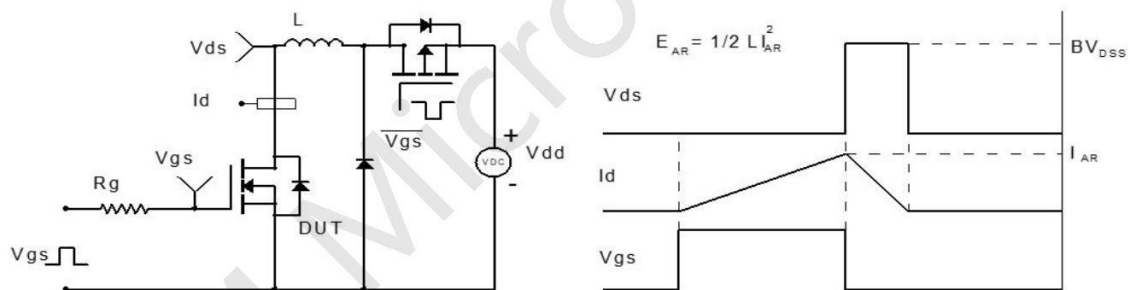


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

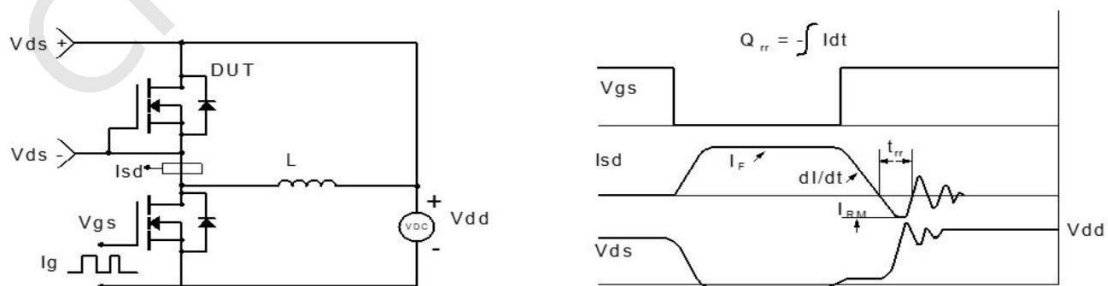
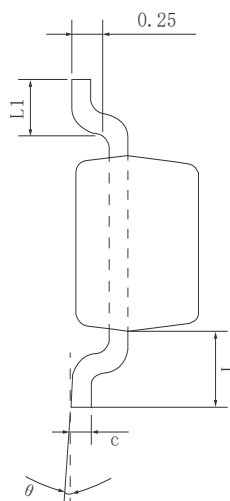
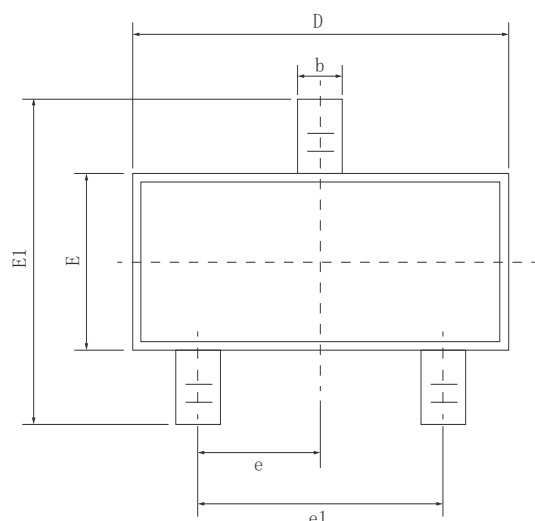
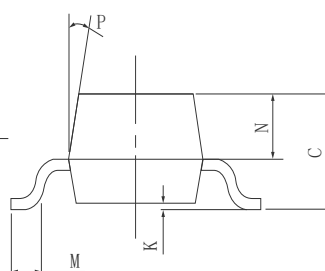
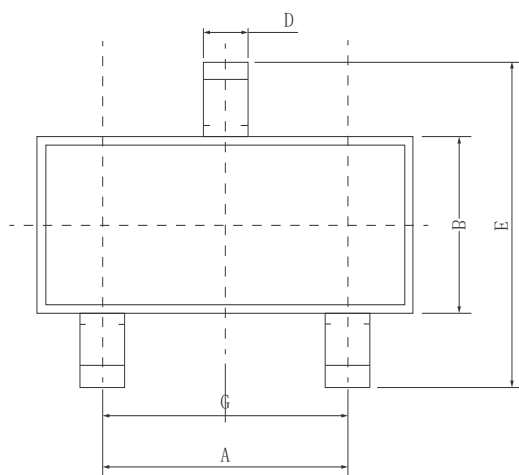
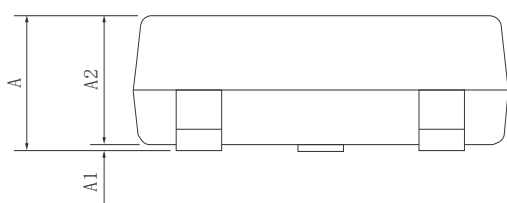


Figure 4: Diode Recovery Test Circuit & Waveform

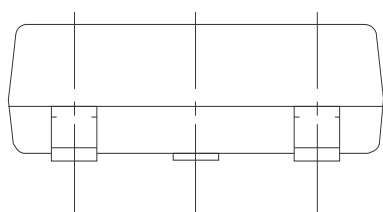
Dimensions (SOT23)



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.90	—	1.15
A1	0.00	—	0.10
A2	0.90	0.95	1.05
b	0.30	0.40	0.50
c	0.15	—	0.25
D	2.85	2.90	2.95
E	1.25	1.30	1.35
E1	2.25	2.40	2.55
e	0.95 TYP.		
e1	1.80	—	2.00
L	0.55 REF.		
L1	0.30	—	0.50
θ	0°	—	8°

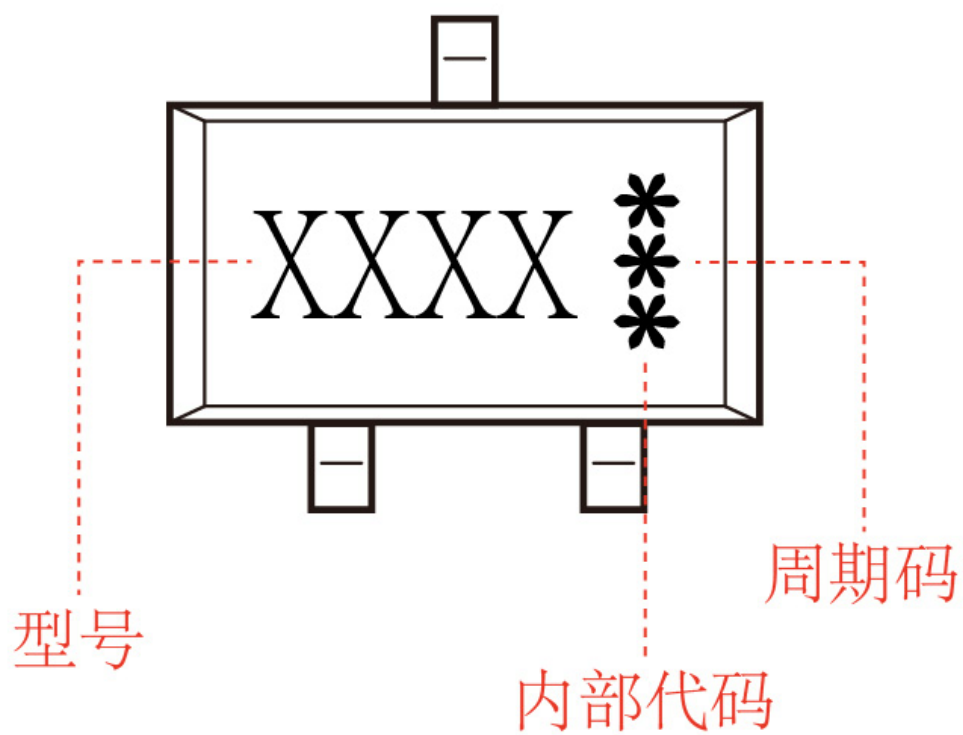


DIM	MILLIMETERS
A	2.90 ± 0.1
B	1.30 ± 0.10
C	$0.90 \sim 1.15$
D	0.40 ± 0.10
E	2.40 ± 0.15
G	1.90 ± 0.10
K	$0.00 \sim 0.10$
M	0.30MIN
N	0.60 ± 0.10
P	10° TYP



SOT23

Marking Instructions:



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