General Description

The AGM401A combines advanced Super Trench II 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

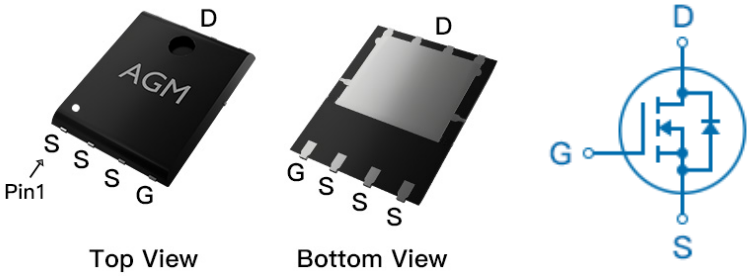
Application

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

Product Summary

BVDSS	RDSON	ID
40V	0.65mΩ	290A

PDFN5*6 Pin Configuration



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM401A	AGM401A	PDFN5*6	330mm	12mm	3000

Table 1. Absolute Maximum Ratings (TA=25℃)

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	40	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25℃) **(Note 1)**	290	A
	Drain Current-Continuous(Tc=100℃)	184	A
IDM (pluse)	Drain Current-Pulsed **(Note 2)**	1160	A
PD	Maximum Power Dissipation(Tc=25℃)	119	w
	Maximum Power Dissipation(Tc=100℃)	48	w
EAS	Avalanche energy **(Note 3)**	992	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]	---	20	℃/W
RθJC	Thermal Resistance Junction-Case[1]	---	1.05	℃/W

Table 3. Electrical Characteristics (TJ=25℃unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	40	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=40V,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=10A	--	30	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=30A	--	0.65	0.83	mΩ
		VGS=4.5V, ID=20A	--	0.9	1.5	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=20V,VGS=0V, F=1MHZ	--	5750	--	pF
Coss	Output Capacitance		--	2301	--	pF
Crss	Reverse Transfer Capacitance		--	242	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	3.5	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V,VDS=20V, ID=50A,RGEN=3Ω	--	18	--	nS
tr	Turn-on Rise Time		--	100	--	nS
td(off)	Turn-Off Delay Time		--	204	--	nS
tf	Turn-Off Fall Time		--	73	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=20V, ID=50A	--	103	--	nC
Qgs	Gate-Source Charge		--	51	--	nC
Qgd	Gate-Drain Charge		--	10	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	290	A
VSD	Forward on Voltage	VGS=0V,IS=30A	--	--	1.2	V
trr	Reverse Recovery Time	IF=50A , dI/dt=100A/μs , TJ=25℃	--	64	--	ns
Qrr	Reverse Recovery Charge		--	98	--	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℃,VDD=25V,Vgs=10V,ID=63A,L=0.5mH,RG=25ohm

Typical Performance Characteristics

Figure 1: Output Characteristics

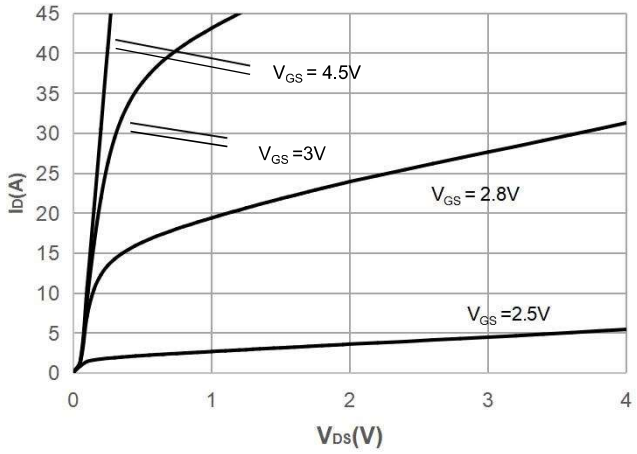


Figure 2: Typical Transfer Characteristics

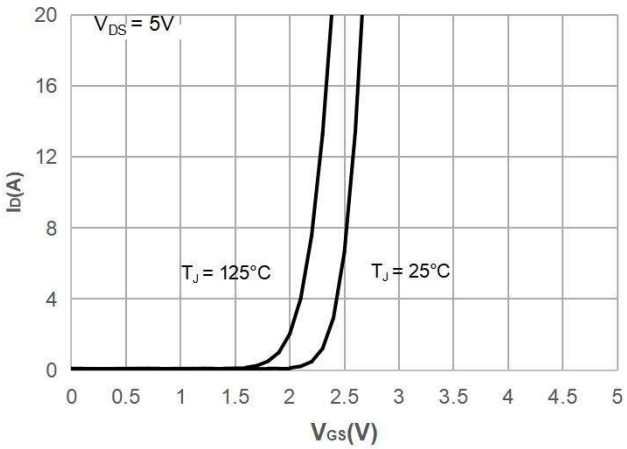


Figure 3: On-resistance vs. Drain Current

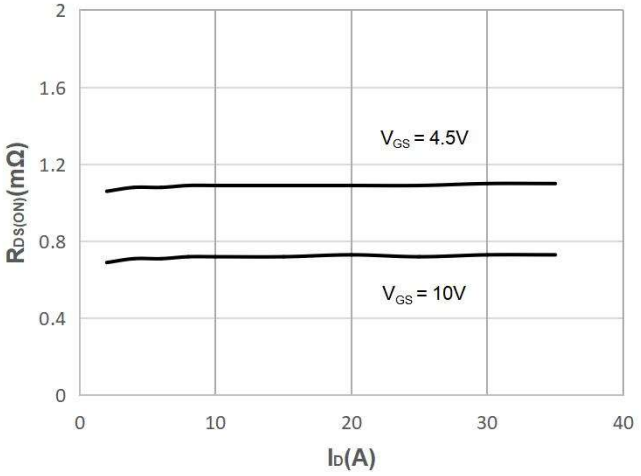


Figure 4: Body Diode Characteristics

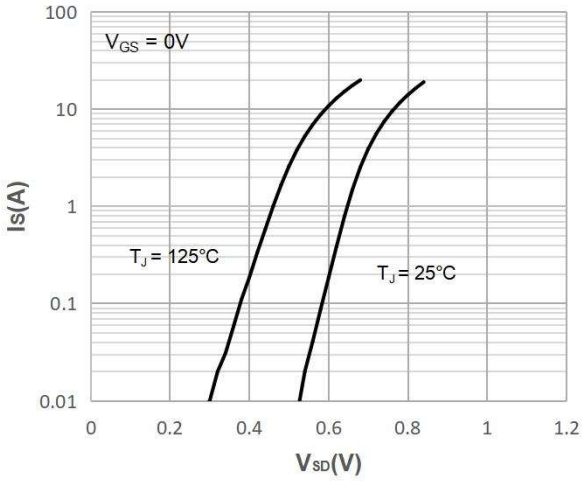


Figure 5: Gate Charge Characteristics

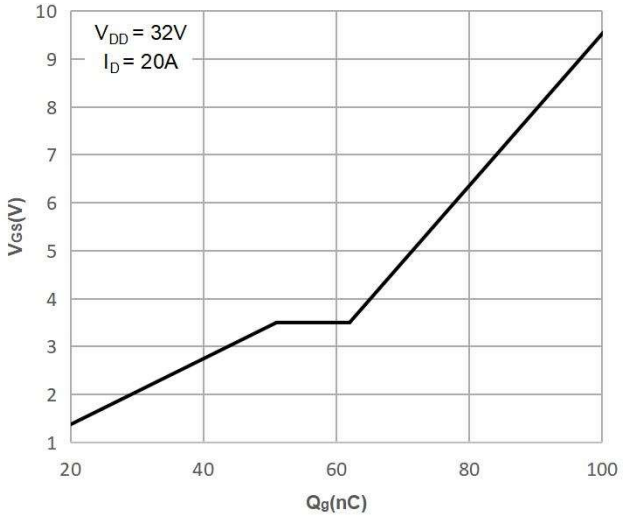
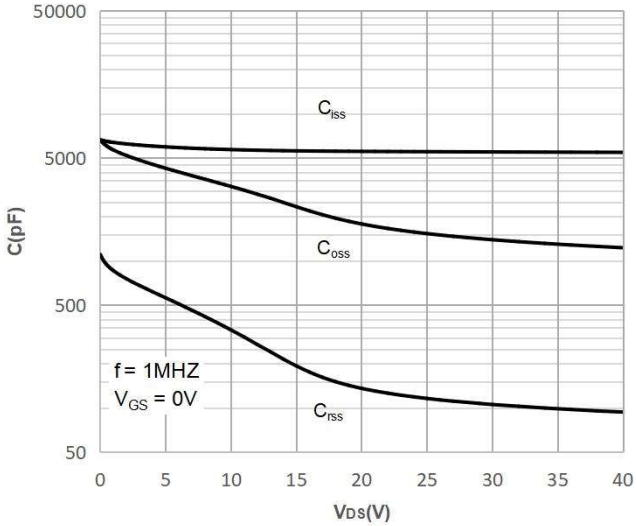


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

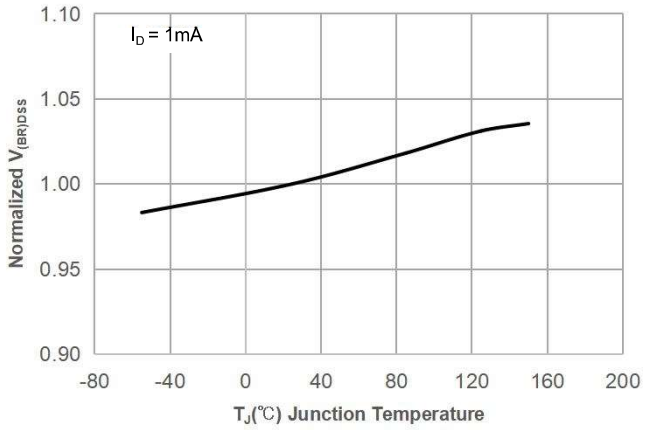


Figure 8: Normalized on Resistance vs. Junction Temperature

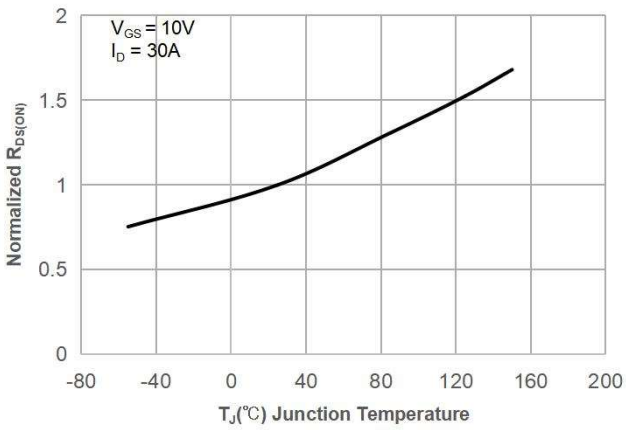


Figure 9: Maximum Safe Operating Area

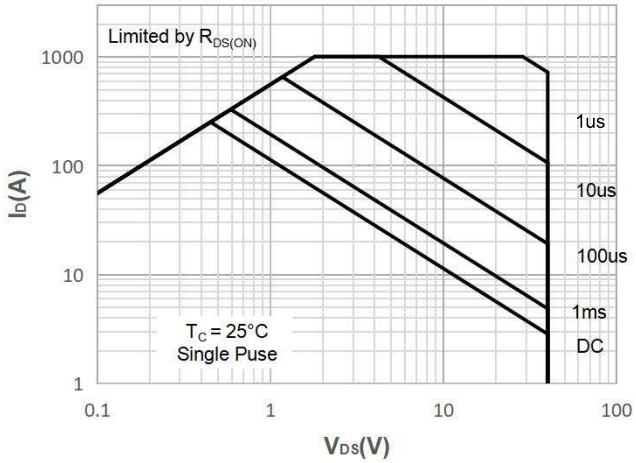


Figure 10: Current Derating

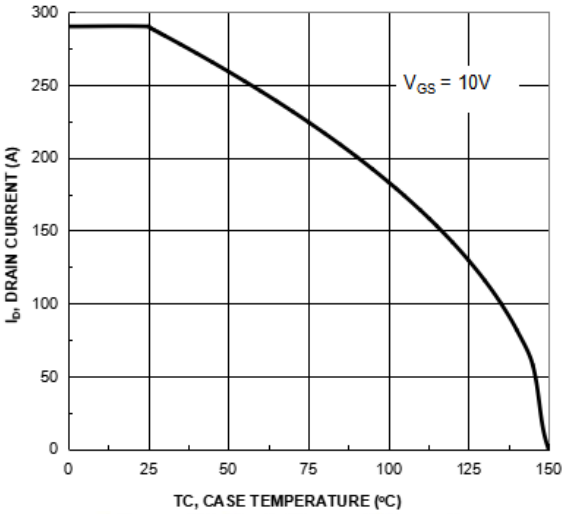


Figure 11: Normalized Maximum Transient Thermal Impedance

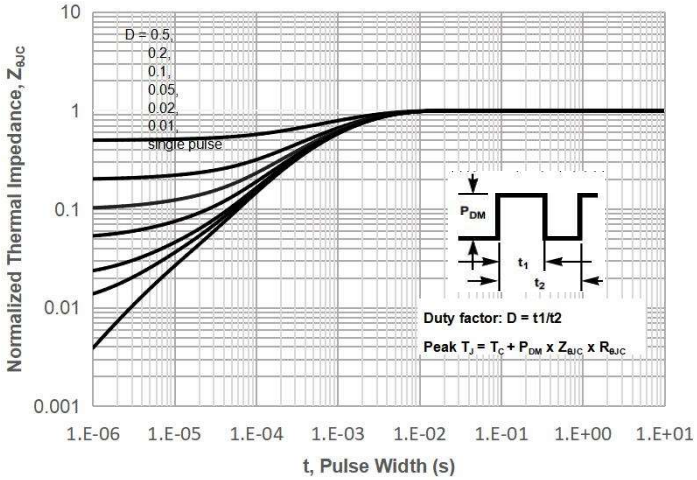
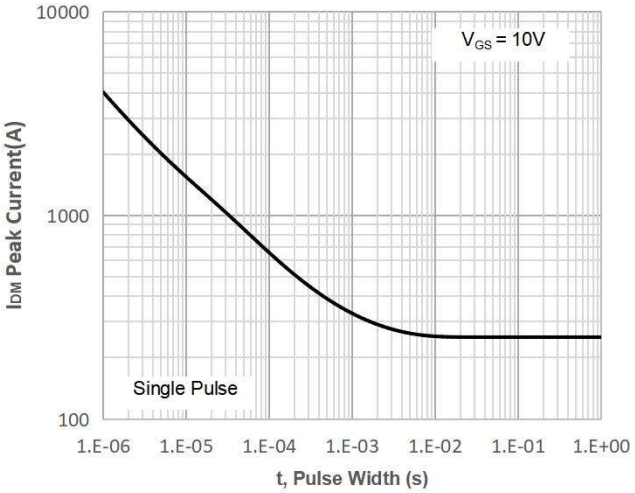


Figure 12: Peak Current Capacity



Test Circuit

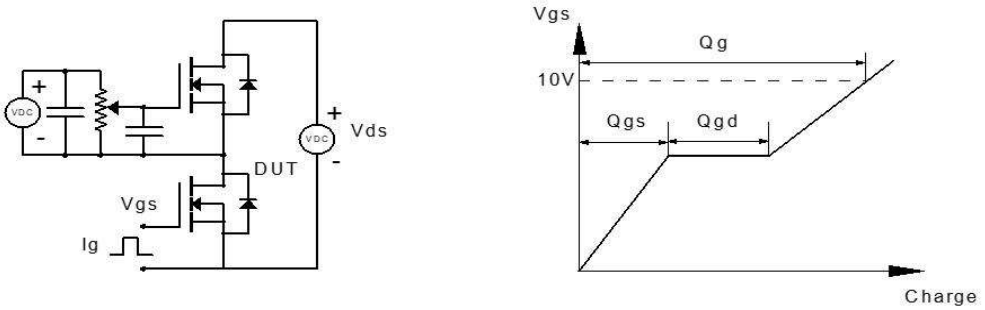


Figure 1: Gate Charge Test Circuit & Waveform

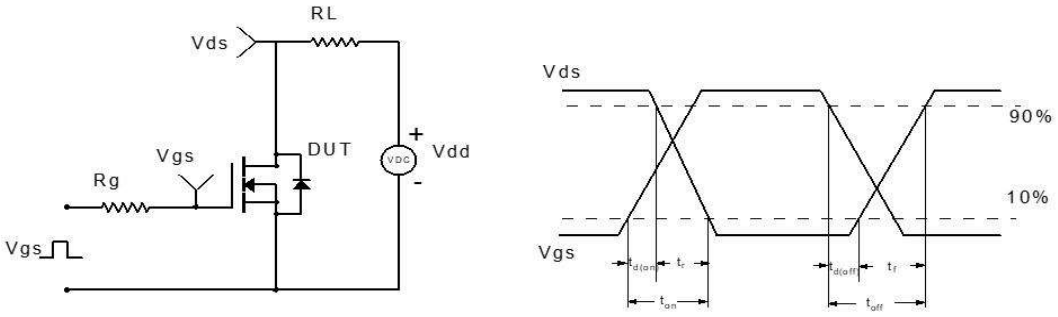


Figure 2: Resistive Switching Test Circuit & Waveform

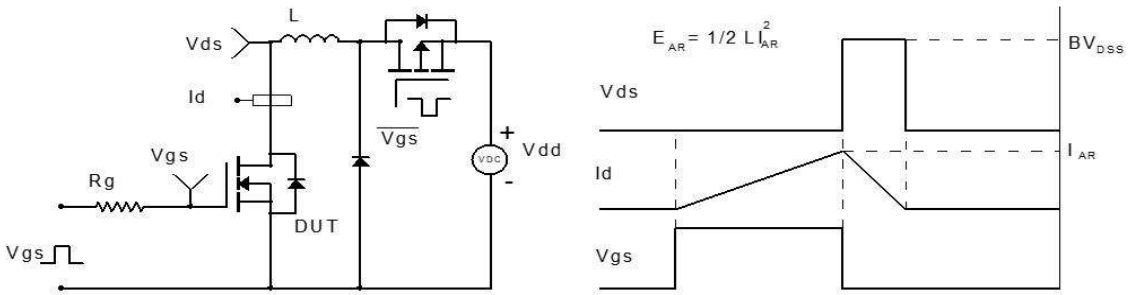


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

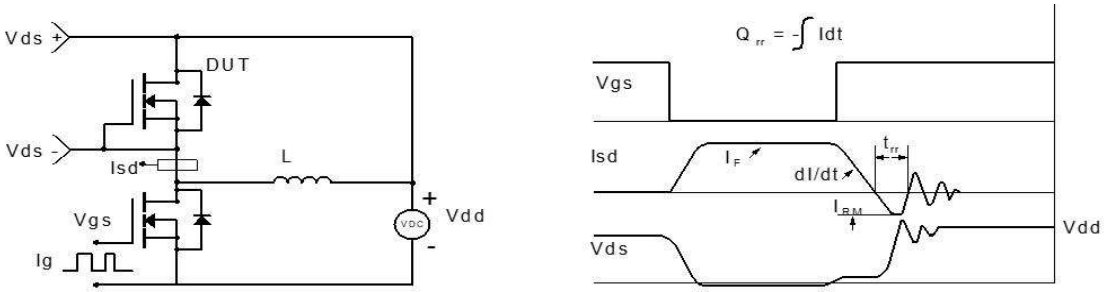
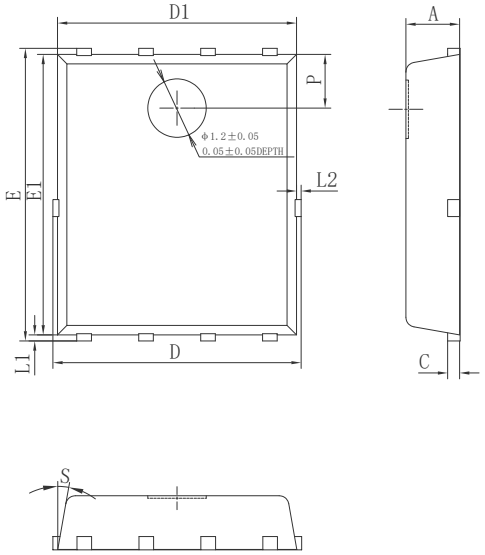
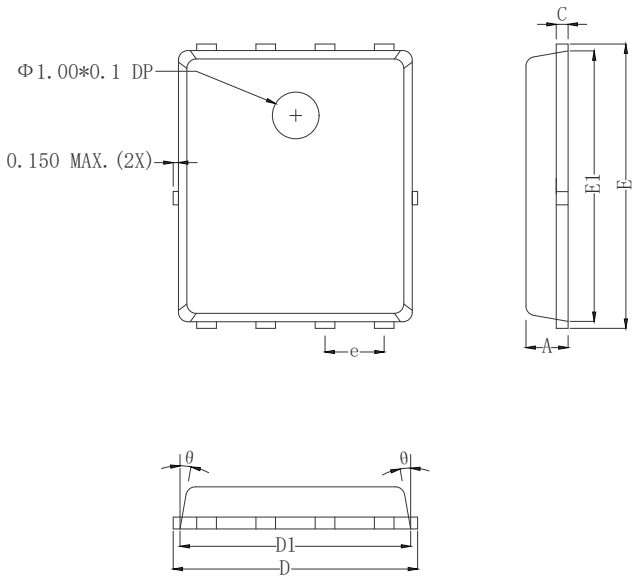


Figure 4: Diode Recovery Test Circuit & Waveform

●Dimensions（PDFN5*6）



SYMBOL	MILLIMETER		
	MIN.	NOM.	MAX.
A	1.000	1.100	1.200
b	0.350	0.400	0.450
c	0.190	0.250	0.300
D	4.800	5.100	5.200
D1	4.800	4.900	5.000
D2	3.900	4.000	4.100
e	1.170	1.270	1.370
E	5.900	6.000	6.100
E1	5.700	5.750	5.800
E2	3.350	3.450	3.550
H	0.500	0.600	0.700
K	1.200	1.300	1.400
L	0.550	0.650	0.750
L1	0.000	0.100	0.200
L2	0.000	0.100	0.200
P	1.000	1.100	1.200
S	8°	10°	12°

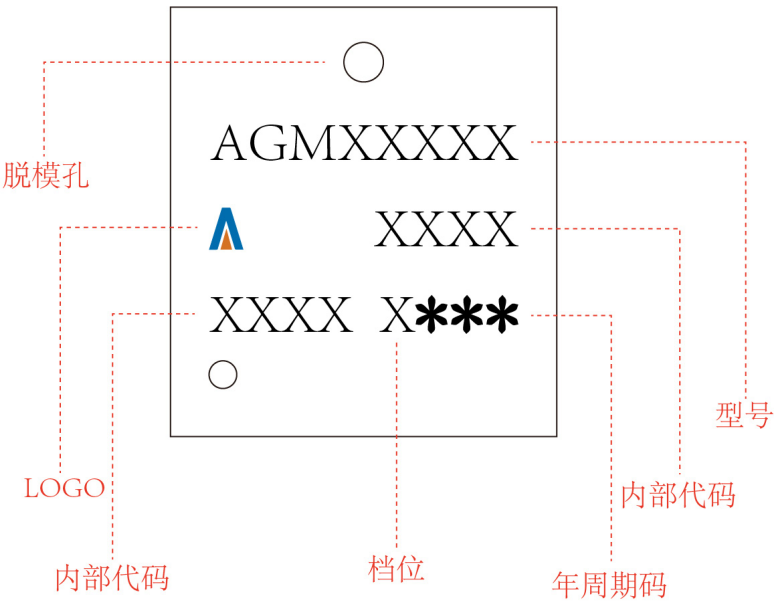


	DIM.	MILLIMETER		
	SYMBOL	MIN.	TYP.	MAX.
*	A	0.900	1.000	1.100
	b	0.310	0.410	0.510
	c	0.210	0.250	0.340
*	D	5.050	5.200	5.400
	D1	4.950	5.050	5.150
	D2	4.000	4.100	4.200
*	E	6.300	6.400	6.500
*	E1	5.750	5.850	5.950
	E2	3.430	3.530	3.630
	e	1.27 BSC.		
	H	0.730	0.830	0.930
*	L	0.610	0.710	0.810
	θ	0°	--	12°

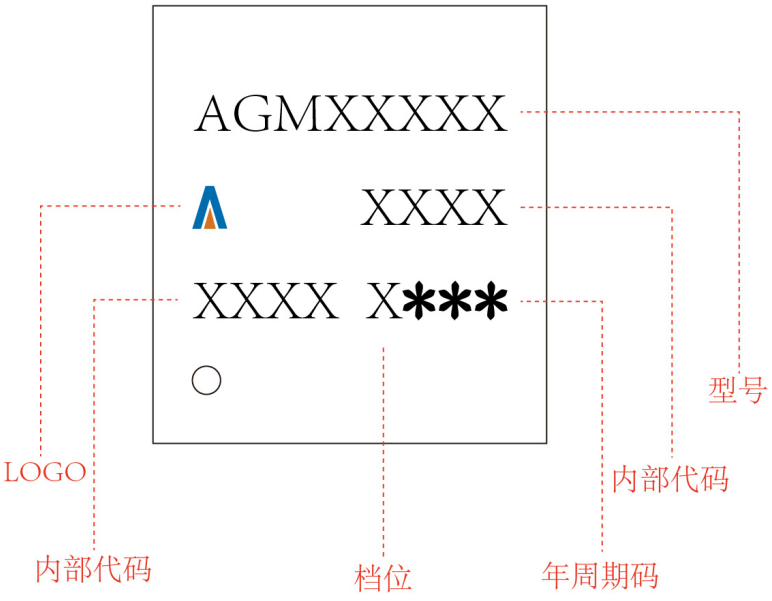
PDFN5*6

Marking Instructions:

Model1:



Model2:



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This document is the ninth version issued on May 20th, 2025. This document replaces all previously provided information.