Five Channels BTL Power Driver AM5810C

The AM5810C is a 5-channel BTL driver - 2 of the channels are able to drive stepping motor, and 1 channel is for reversible driver. Package material is Pb Free for purpose of environmental protection.

● **Applications**

DVD, CD players

● **Features**

1) A power saving mode is enabled by power-save terminal.
2) Small surface mounting power package (HSOP-28)
3) Separating Vcc into Pre and Pow, can make better power efficiency
4) Thermal-shut-down circuit built in
5) Wide dynamic range ＜4.OV (Typ.) at PreVcc=12V, PowVcc=5V＞

6) BTL driver:
   Input pins consist of (+) and (-), therefore various input types are available such as differential input.
7) Loading driver:
   a. The output voltage is adjustable by output voltage control terminal. (Only "H" side voltage)
   b. Brake circuit built in
   c. Circuit protection diode built in

● **Absolute Maximum Ratings**

Parameter	Symbol	Limits	Unit
Supply voltage	PREVCC, POWVCC	13.5	V
Power dissipation	Pd	2.2 [*1]	W
Operating temperature	Topr	-40 ~ +85	℃
Storage temperature	Tstg	-55 ~ +150	℃

* PCB (70X70X1.6mm) glass epoxy mounting.
* 1.Derating: 17.6mW/℃ for operation above Ta=25℃

● **Guaranteed Operating Ranges**

PREVCC	4.3 ~ 13.2V
POWVCC	4.3 ~ PREVCC

● **Electrical Characteristics (Unless otherwise specified, Ta = 25℃ , PREVCC = 12V, POWVCC12/34 = 5V, BIAS = 1.65V, PS = 2V, RL = 8Ω)**

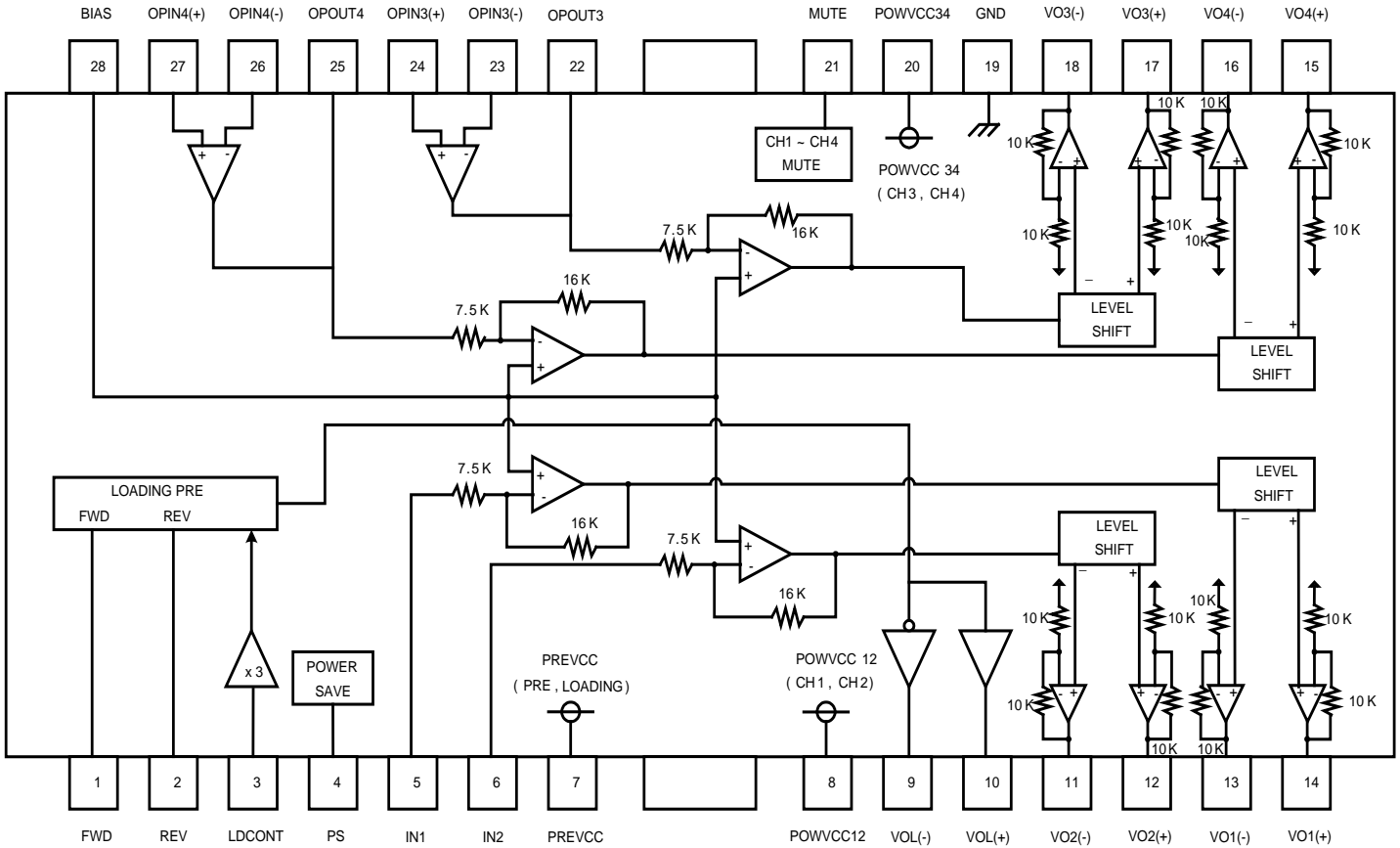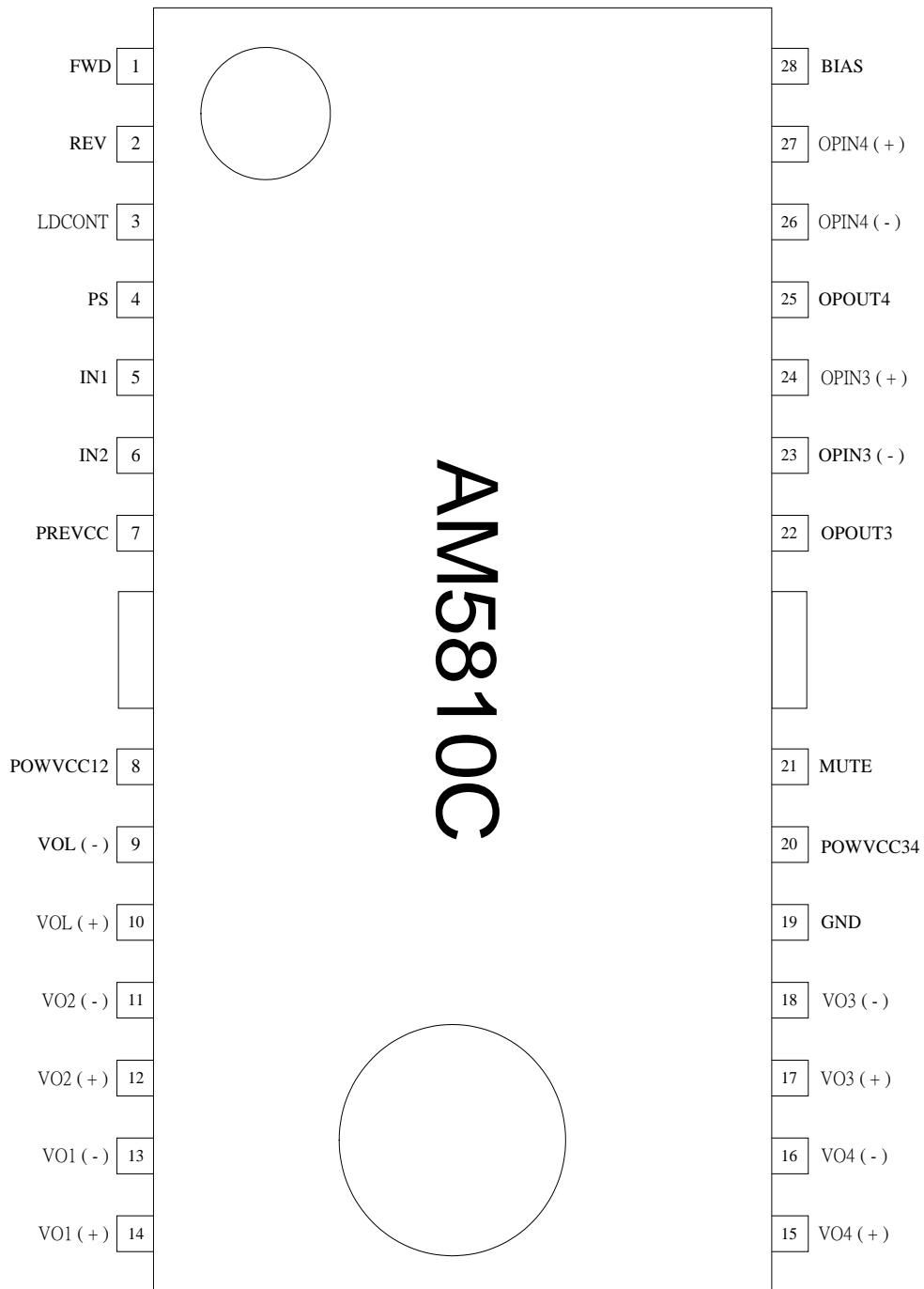| Parameter	Symbol	Conditions	Limit			Unit
			Min	Typ	Max	
Quiescent Current	ICC	RL = ∞	-	23.5	34	mA
	ICC	PREVCC=12V, POWVCC12/34=12V. RL=∞			37	mA
\Power save on current	IPS	PS = "L"	-	1.2	2.8	mA
Power save on voltage	VPSON		-	-	0.5	V
Power save off voltage	VPSOFF		2.0	-	-	V
＜**BTL Driver**＞						
Output offset voltage	VOO		-50	0	50	mV
Max. output voltage	VOM		3.6	4.0	-	V
Closed loop voltage gain	GVC		17.2	19.0	20.8	dB
Mute on voltage	VMTON		-	-	0.5	V
Mute off voltage	VMTOFF		1.5	-	-	V
Input current for mute pin	IMUTE	VMUTE = 5V	-	160	270	μA
Input current for Bias pin	IBIAS	BVIAS = 2.5V	-	75	120	μA
＜**OP-AMP　(CH3,4)　**＞						
Common mode input voltage range	VICM		0.5	-	10.0	V
Input offset voltage	VOFOP		-6	0	6	mV
Input bias current	IBOP		-	-	300	nA
High level output voltage	VOHOP	BIAS = 6V	11.5	-	-	V
Low level output voltage	VOLOP	BIAS = 6V	-	-	0.5	V
Output sink current	ISIN		1	-	-	mA
Output source current	ISOU		1	-	-	mA
Slew rate	SROP	Input pulse 100KHz, 2Vp-p	-	1	-	V/μs
＜**Loading Driver**＞						
Output saturation voltage 1	VSAT1	Upper ＋ Lower saturation, IL = 200mA	0.7	1.1	1.5	V
Output saturation voltage between F&R	ΔVSAT1	Output saturation voltage 1 between FWD and REV	-	-	0.1	V
Output saturation voltage 2	VSAT2	Upper ＋ Lower saturation, IL = 500mA	1.0	1.55	2.2	V
Output adjustable gain on "H" side voltage	GVH	"H" side output for input (LDCNT)	7.4	9.4	11	dB
＜**Loading driver input logic**＞						
Input high level voltage	VIHLD		1.5	-	VCC	V
Input low level voltage	VILLD		-0.3	-	0.5	V
Input high level current	IIHLD	VFWD = VREV = 5V	-	190	270	μA

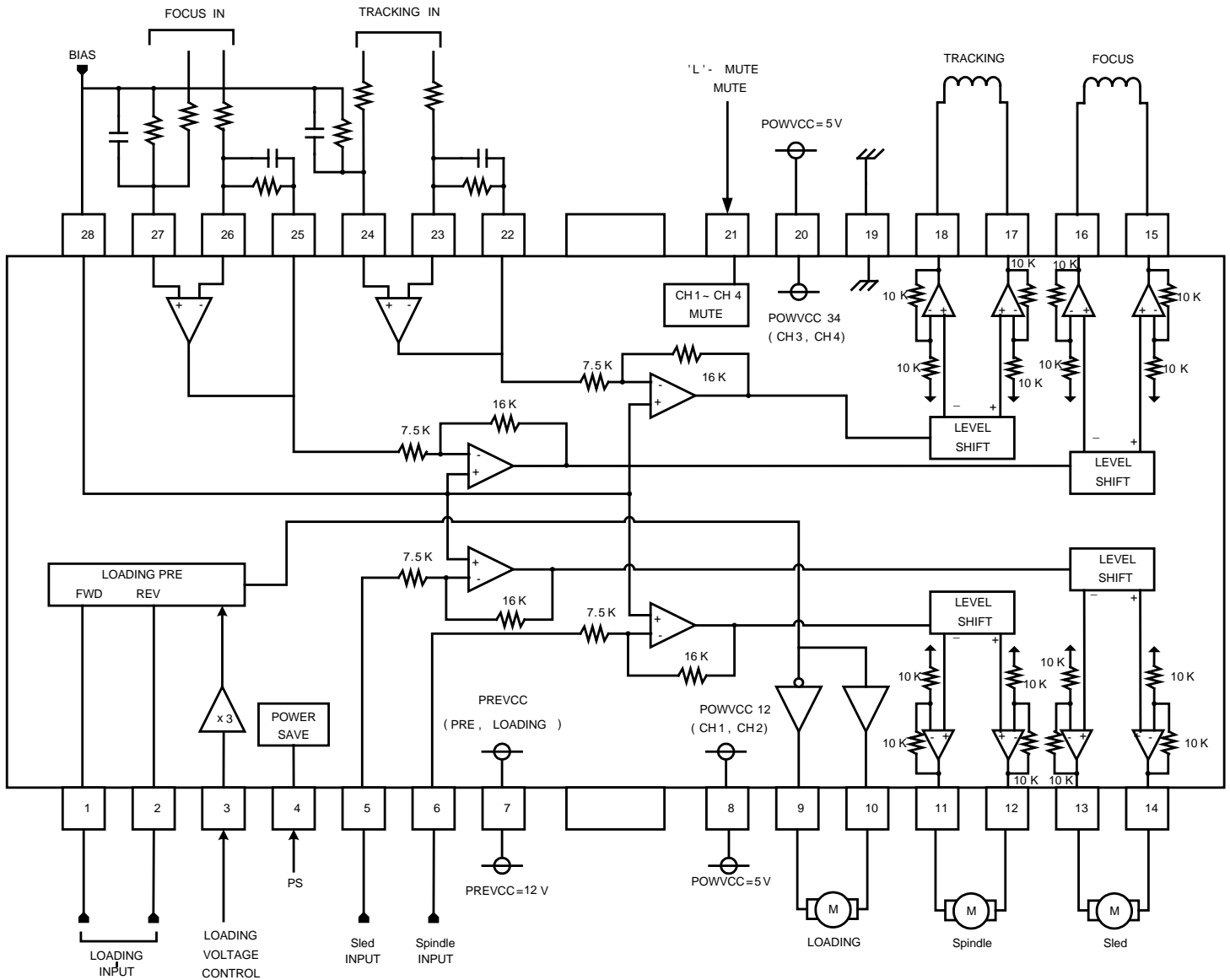※This product is not designed for protection against radioactive rays.

- **Block Diagram**

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● **Pin configuration**

Left pins		Right pins	
FWD	1	28	BIAS
REV	2	27	OPIN4 (+)
LDCONT	3	26	OPIN4 (-)
PS	4	25	OPOUT4
IN1	5	24	OPIN3 (+)
IN2	6	23	OPIN3 (-)
PREVCC	7	22	OPOUT3
POWVCC12	8	21	MUTE
VOL (-)	9	20	POWVCC34
VOL (+)	10	19	GND
VO2 (-)	11	18	VO3 (-)
VO2 (+)	12	17	VO3 (+)
VO1 (-)	13	16	VO4 (-)
VO1 (+)	14	15	VO4 (+)

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● **Pin Description**

PIN No	Pin Name	Description
1	FWD	Input for loading forward
2	REV	Input for loading reverse
3	LDCONT	Output control terminal for loading
4	PS	Control terminal for power saving mode
5	IN1	Input 1 of CH1
6	IN2	Input 2 of CH2
7	PREVCC	Pre and loading unit power supply input terminal
8	POWVCC12	Power unit power supply input terminal (CH1, CH2)
9	VOL (-)	Inverted output of loading
10	VOL (+)	Not inverted output of loading
11	VO2 (-)	Inverted output of CH2
12	VO2 (+)	Not inverted output of CH2
13	VO1 (-)	Inverted output of CH1
14	VO1 (+)	Not inverted output of CH1
15	VO4 (+)	Not inverted output of CH4
16	VO4 (-)	Inverted output of CH4
17	VO3 (+)	Not inverted output of CH3
18	VO3 (-)	Inverted output of CH3
19	GND	Substrate ground
20	POWVCC34	Power unit power supply input terminal (CH3, CH4)
21	MUTE	Input for mute control
22	OPOUT3	Output of CH3 OP-AMP
23	OPIN3 (-)	Inverting input of CH3 OP-AMP
24	OPIN3 (+)	Not inverting input of CH3 OP-AMP
25	OPOUT4	Output of CH4 OP-AMP
26	OPIN4 (-)	Inverting input of CH4 OP-AMP
27	OPIN4 (+)	Not inverting input of CH4 OP-AMP
28	BIAS	Input for reference voltage

● Application

● **Power dissipation curve :**

Pd (W)

*70mm×70mm×1.6mm glass epoxy board.

● **Operation notes**

1) The built-in thermal shutdown circuit mutes the output current when the chip temperature reaches 175℃ (typ.). The hysteresis is set to 25℃ (typ.), so the circuit will start up again when the chip temperature falling to 150℃ (typ.).
2) In case mute pin voltage is under 0.5V or NC, output current is muted (except for tray motor driver). Mute pin voltage should be more than 1.5V for normal application.
3) Bias pin (pin 28) should be pulled up to more than 1.2V. In case the bias pin voltage is pulled down below 0.9V (typ.), the output current is muted.
4) Insert the bypass capacitor (~ 0.1uF) between Vcc pin and GND pin as close as possible.
5) Heat dissipation fins are attached to the GND on the inside of the package. Make sure to connect them to the external GND.

6) Tray driver logic input:

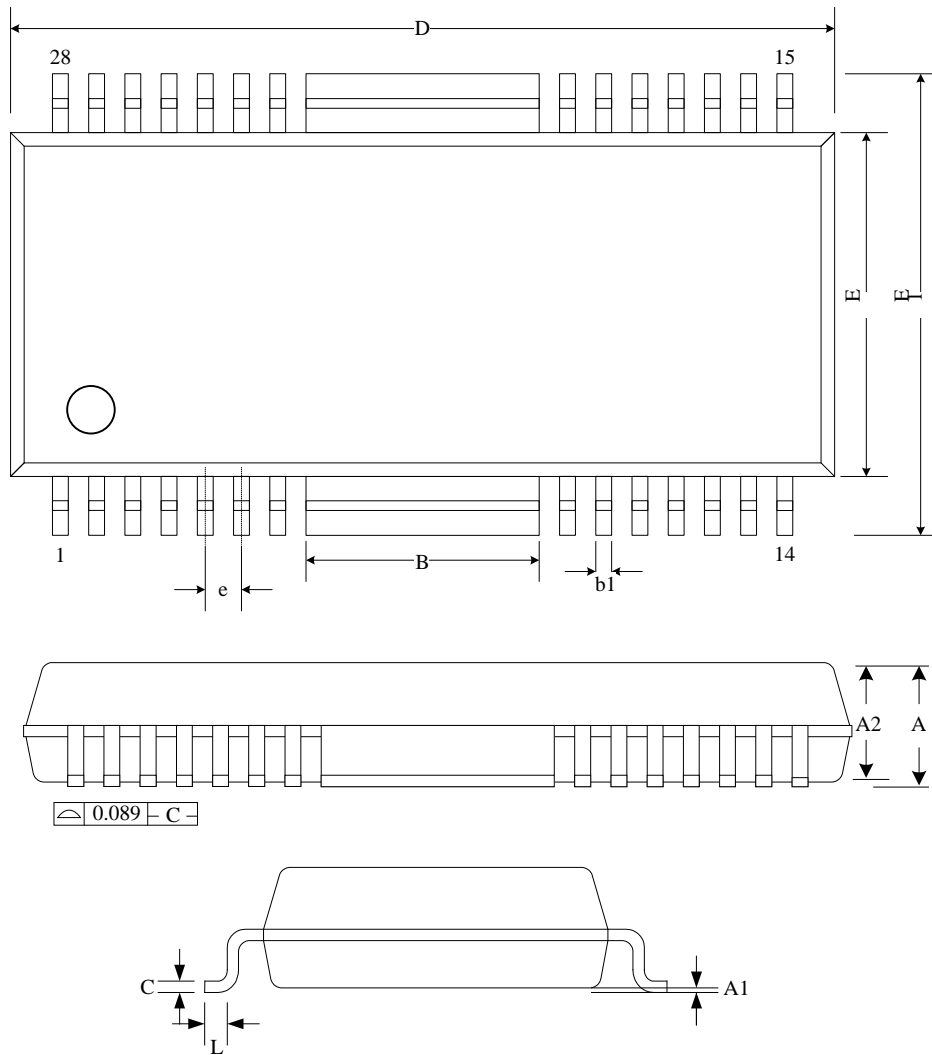| FWD (pin1)	REV (pin2)	VOL+ (pin10)	VOL- (pin9)	Function
L	L	OPEN	OPEN	Open mode
L	H	L	H	Reverse mode
H	L	H	L	Forward mode
H	H	L	L	Brake mode

Input circuit of pin1 and pin2 is designed to avoid simultaneous activation of upper and lower output tr. ; however, in order to improve reliability, apply motor forward/reverse input once through open mode.
We recommend time period for open longer than 10msec.

"H" side Output voltage on output voltage (VOL+, VOL-) varies depending on output control terminal for tray (pin3). "H" side output voltage is set three times (9.2dB Typ.) LDCONT(pin3). And, "L" side output voltage is equal to output saturation voltage.
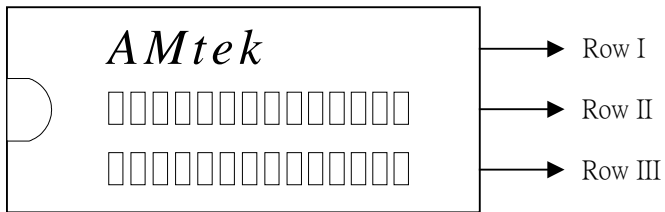
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● **Packaging outline**

HSOP28

SYMBOL	MILLIMETERS		INCHES	
	Min.	Max.	Min.	Max.
A	-	2.75	-	0.108
A1	-	0.3	-	0.012
A2	-	2.45	-	0.096
B	4.95	5.35	0.195	0.211
b1	0.23	0.47	0.009	0.019
C	0.2	0.36	0.008	0.014
D	17.89	18.8	0.704	0.740
E	7.3	7.9	0.287	0.311
E1	9.6	10.65	0.378	0.419
e	0.8 (TYP)		0.031(TYP)	
L	0.3	-	0.012	-

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● **Marking Identification**

Row I

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Row II

AM5810C

Row III

Lot number