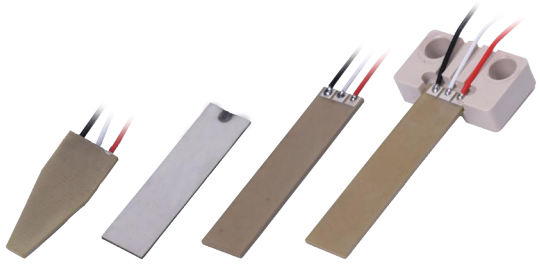
Bimorph Bending Actuator



Features

- Micron-level resolution
- Linear displacement output
- High service life
- Drive voltage of 0~24V or 0~150V
- High Curie temperature of 230°C

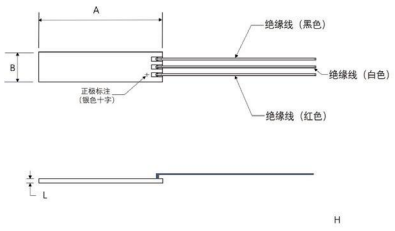
Applications

- Laser technology and laser beam control
- Accelerometers
- Medical technology
- Fiber optic switches
- Printing technology

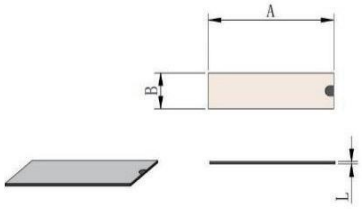
Description

The piezoelectric bimorph is composed of piezoelectric ceramic layers and internal electrodes co-fired together, allowing independent control of the drive voltage for each ceramic layer. Standard drive voltages include 0~24V and 0~150V, and they meet the requirements for low-frequency, medium-frequency, and high-frequency applications.

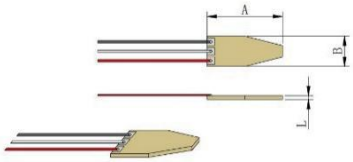
Interface Definition



PAA-B20-08W

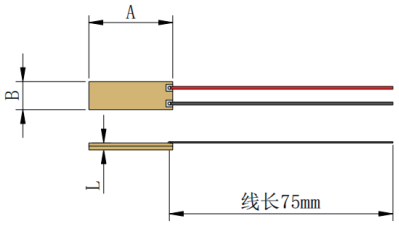


PAA-B25-07C

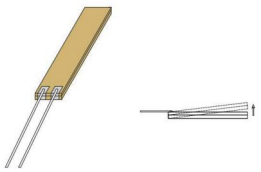


PAA-B20-08HF

PAA-B32-08W

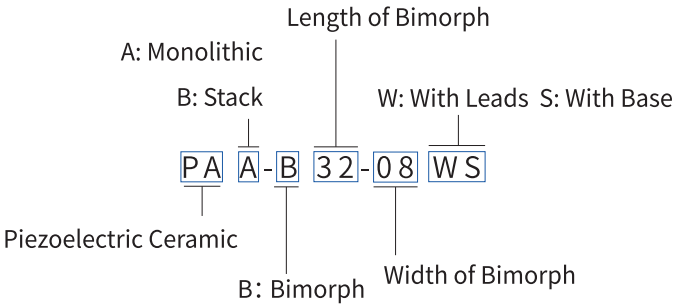


PAA-B15HM-08大负载低压双晶片的结构示意图



PAA-B15HM-08大负载低压双晶片的运动方向示意图

Model Interpretation



Technical Specifications

	PAA-B20-08W	PAA-B32-08W	Unit	Tolerance
Active axes	Z	Z		
Max. displacement	±135	±450	μm	±15%
Displacement hysteresis	<15%	<15%		
Free length	18	30	mm	
Max. load capacity	2.0	1.4	N	
Electrical properties				
Operating voltage	0-150	0-150	V	
Resonant frequency	0.93	0.35	kHz	±15%
Dielectric loss	<2.0%	<2.0%	%	
Electrical capacitance	145(unilateral)	550(unilateral)	nF	±15%
Miscellaneous				
Operating temperature range	-25~130	-25~130	°C	
Electrode	Silver	Silver		
Curie temperature	230	230	°C	
Dimensions				
A	20	32	mm	±0.1 mm
B	8	7.8	mm	±0.1 mm
L	0.8	0.8	mm	±0.05 mm
MTTF	15.3	13.7	year	

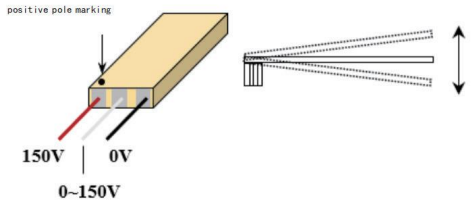
*Displacement test: drive voltage range 0 to 150V, tolerance ±15%
**Thrust test: drive voltage range 0 to 150V
***Capacitance test conditions: ambient temperature environment, 1Vpp, 1kHz, tolerance ±15%
**** MTTF test conditions: 150V, 85% humidity, 85℃ environment
Standard wiring harness, length 75mm, AWG32, PTFE insulation
Pre-installed PCB version available, followed by 'S' in the product code
Other specifications can be customized on request.

Technical Specifications

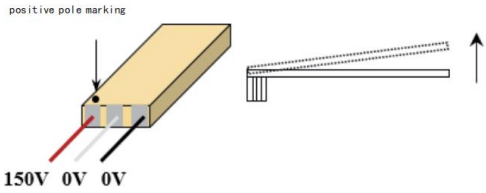
	PAA-B25-07C	PAA-B20-08HF	PAA-B15HM-08	Unit	Tolerance
Active axes	Z	Z	Z		
Max. displacement	+80	±110	+40	μm	±15%
Displacement hysteresis	<15%	<15%	<15%		
Free length	21	12	12	mm	
Blocking force	0.5	2.5	5.0	N	
Electrical properties					
Operating voltage	0-24	0-150	0-24	V	
Resonant frequency	25	3.1	13.1	kHz	±15%
Dielectric loss	<2.0%	<2.0%	<2.0%	%	
Electrical capacitance	70(overall device)	280(unilateral)	2000	nF	±15%
Miscellaneous					
Operating temperature range	-25~130	-25~130	-25~130	°C	
Electrode	Silver/Gold	Silver	Silver		
Curie temperature	230	230	230	°C	
Dimensions					
A	25±0.1	20±0.1	15±0.5	mm	
B	7.1±0.1	8±0.1	5.0±0.1	mm	
L	0.5±0.05	0.8±0.05	1.2±0.1	mm	
MTTF	6.1	13.8	13.8	year	

*Displacement test: drive voltage range 0 to 150V, tolerance ±15%
**Thrust test: drive voltage range 0 to 150V
***Capacitance test conditions: ambient temperature environment, 1Vpp, 1kHz, tolerance ±15%
**** MTTF test conditions: 150V, 85% humidity, 85°C environment
Standard wiring harness, length 75mm, AWG32, PTFE insulation
Pre-installed PCB version available, followed by 'S' in the product code
Other specifications can be customized on request.

Control Method



Differential Voltage Control: Three-wire drive, capable of bending upwards or downwards. The positive wire is connected to 150V, the negative wire to 0V, and the middle electrode is controlled between 0~150V. When the voltage is between 75~150V, it bends upwards; when the voltage is between 0~75V, it bends downwards.



Single-Side Control: Two-wire drive, bending only in one direction. The negative wire is connected to 0V, and the middle electrode is also connected to 0V. The positive wire is connected to 150V, resulting in upward bending.

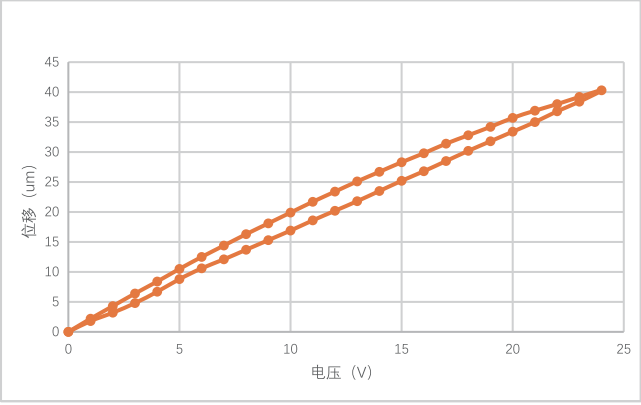
Model: PAA-B20-08W、PAA-B32-08W、PAA-B20-08HF

Customization Information

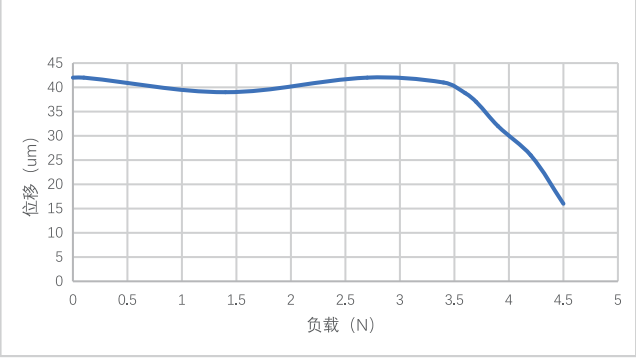
Depending on the application scenarios of the bimorph, it can be assembled with different structural components to meet application requirements. We can provide product customization for you in terms of performance parameters and structural shapes.

- **Drive Voltage:** Different drive voltages can meet various displacement requirements. Commonly available voltages include 6V, 12V, and 24V.
- **Wiring Harness:** A wiring harness can be optionally equipped while meeting the AWG usage standards. To facilitate the connection of positive and negative electrode wires, the soldering point position can be selected within the allowable error range of performance variation.
- **Dimensions:** In terms of length, options include 10mm, 15mm, 20mm, and 25mm. For thickness, customization is available for ⩾0.3mm.
- Other specifications, such as base structure, can be customized according to customer requirements.

Performance Chart

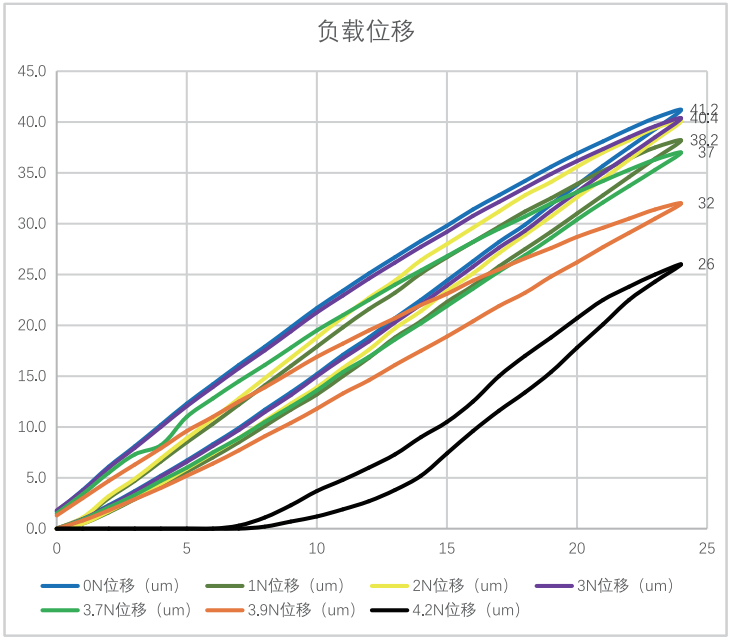


PAA-B15HM-08 Displacement Diagram (25°C, No Load, 24V)



PAA-B15HM-08 Displacement Diagram (25°C, Varied Loads, 24V)

Performance Chart



Displacement Diagram of PAA-B15HM-08 High-Load Low-Voltage Bimorph under Various Loads at 25°C, 24V