

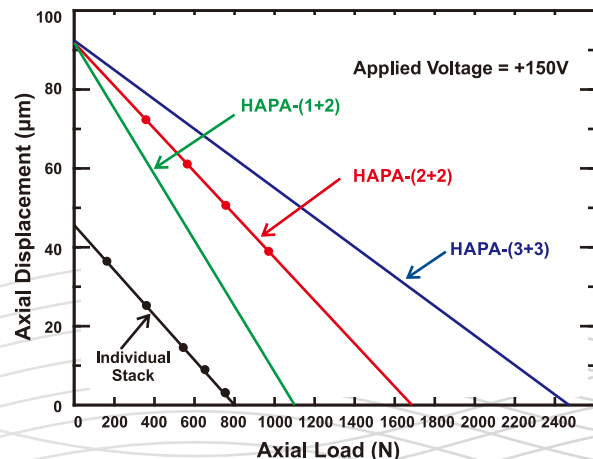
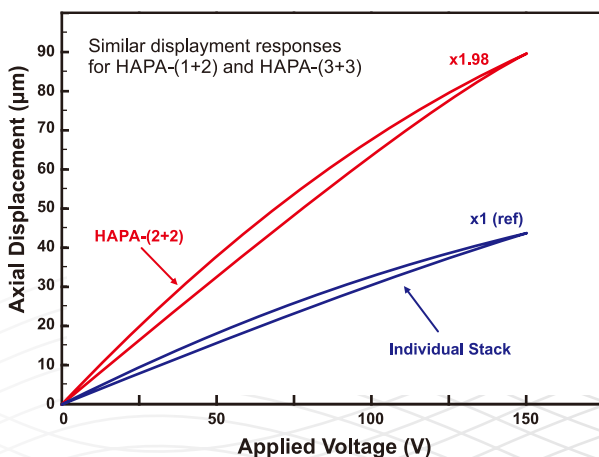
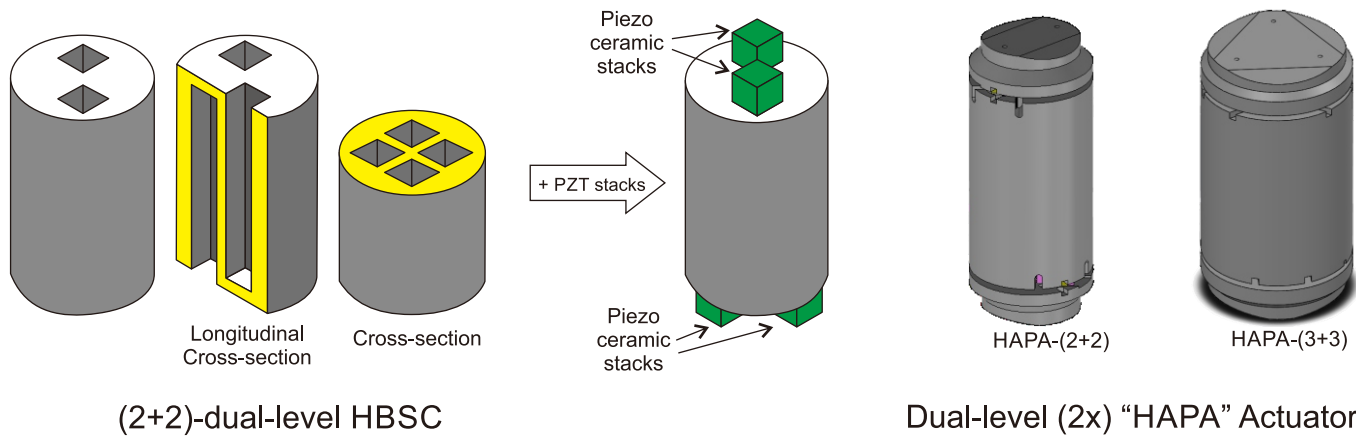
HAPA Piezoelectric Actuator

NEW HAPA Piezoelectric Actuator

HAPA = High-Authority (dual-level) Piezo Actuator
= Actuator of large stroke and high blocking force

- Made possible by patented High Bending Stiffness Connector (HBSC)
- $\geq 85 \mu\text{m}$ stroke & $> 1000\text{N}$ blocking force & only fractionally longer.

“HAPA” = High-Bending-Stiffness Connector (HBSC) + 4-to-6 Piezoceramic Stacks



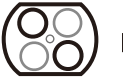



Double (2x) to triple (3x) the stroke, 1.5x to 3x the Blocking force
see page 2 for dimensions and performance characteristics of HAPAs and page 3 and 4 for available end cap designs.

For more information about “HAPA” piezo actuators, see [Actuator 2018-7-61 \(doi-10-390-act7030061\)](#)



Performance Characteristics of HAPAs (made from PZT stacks of 5x5 mm² & 40 mm length)

Type of HAPA	External Dimension (mm ³)	Stroke @150V (μm)	Blocking Force (N)	Stiffness (N/μm)	Op. Temp Range (°C)	Type of End Cap
 HAPA-(3+3)	Φ33 x 60(L)	≥85(2x)	2500(3x)	32	-25 to +80	A,B,C,D,E
 HAPA-(2+2)R	Φ25 x 60(L)		1700(2x)	20		A,B,C,D,E
 HAPA-(2+2)T	25(W) x 20(D) x 60(L)		1700(2x)	20		A,B,C,D,E
 HAPA-(1+2)	32(W) x 15(D) x 55(L)		12	A only		
Individual PZT Stake	5 x 5 x 40(L)	43 (ref.)	850 (ref.)	20	-25 to +80	

End cap designs to suit various pre-loading and fixation requirements

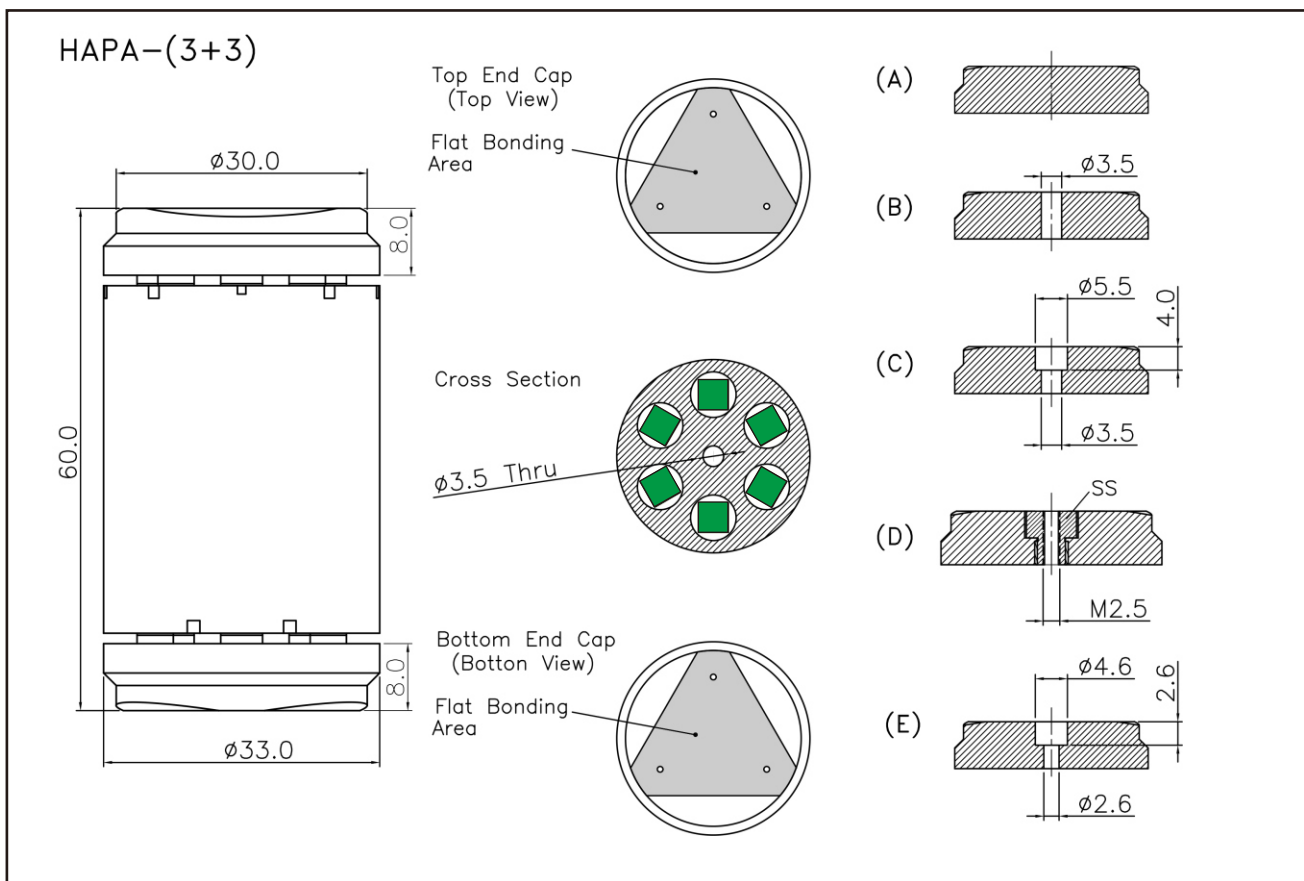
Type of end cap available: (A) Solid end cap;

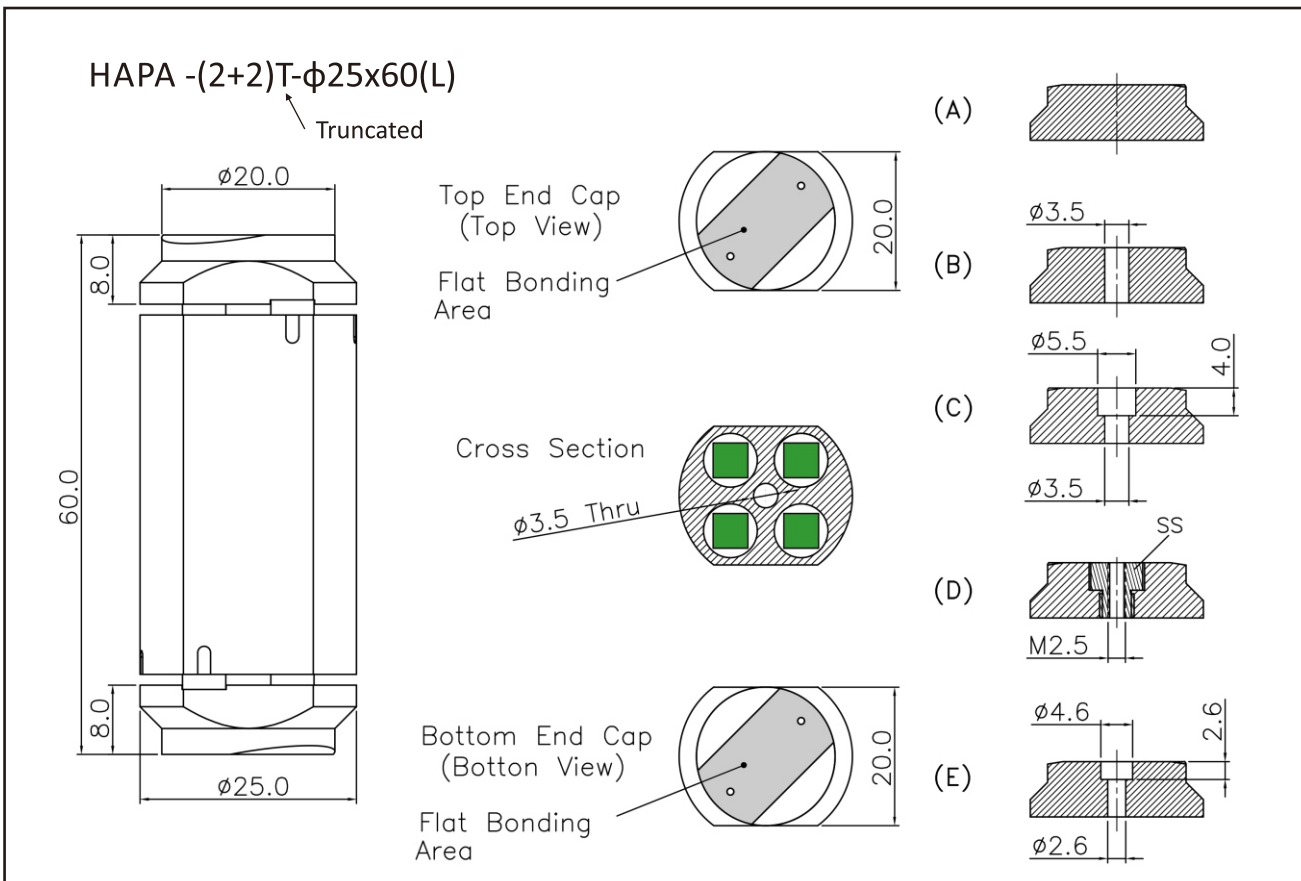
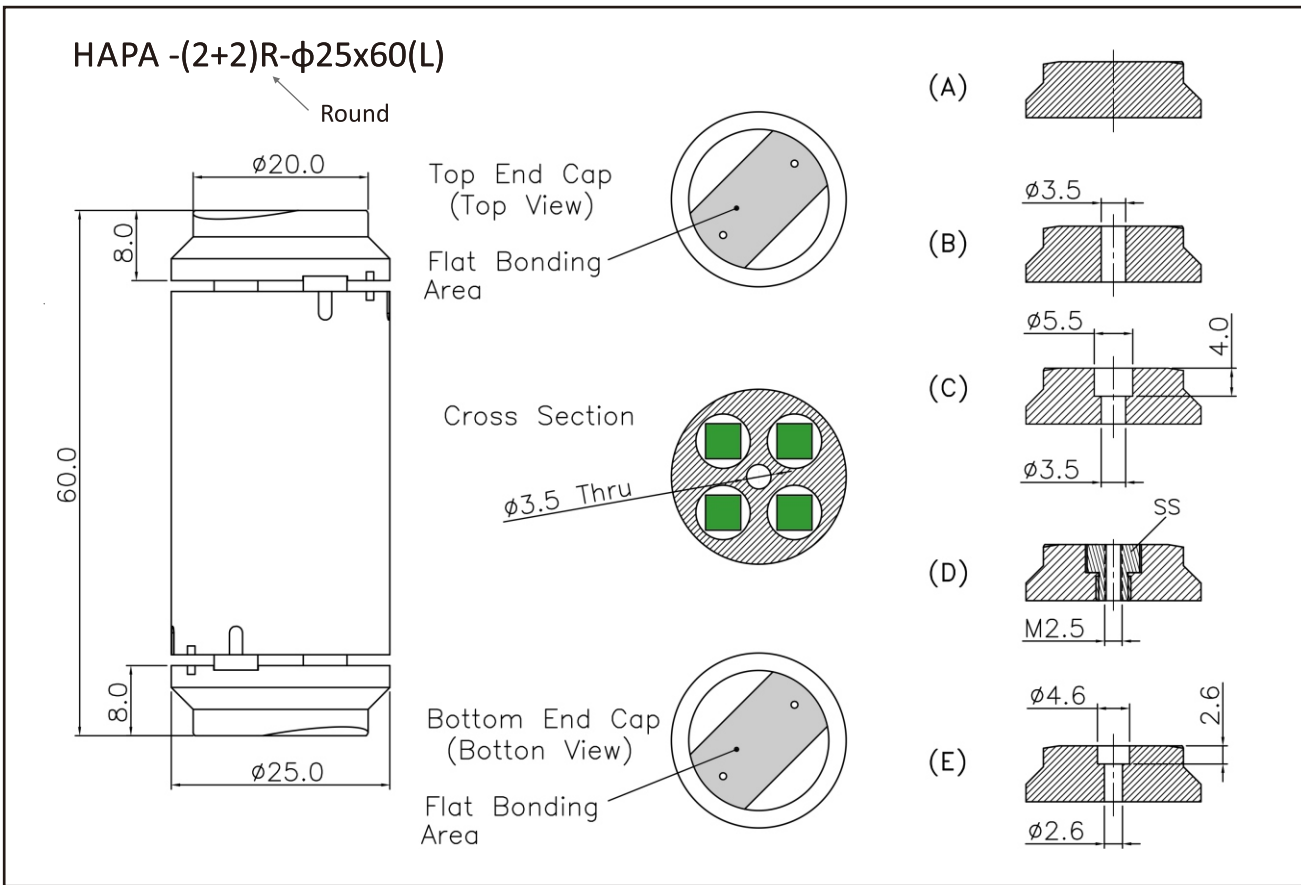
(B) End cap with a Φ3.5 mm central through hole;

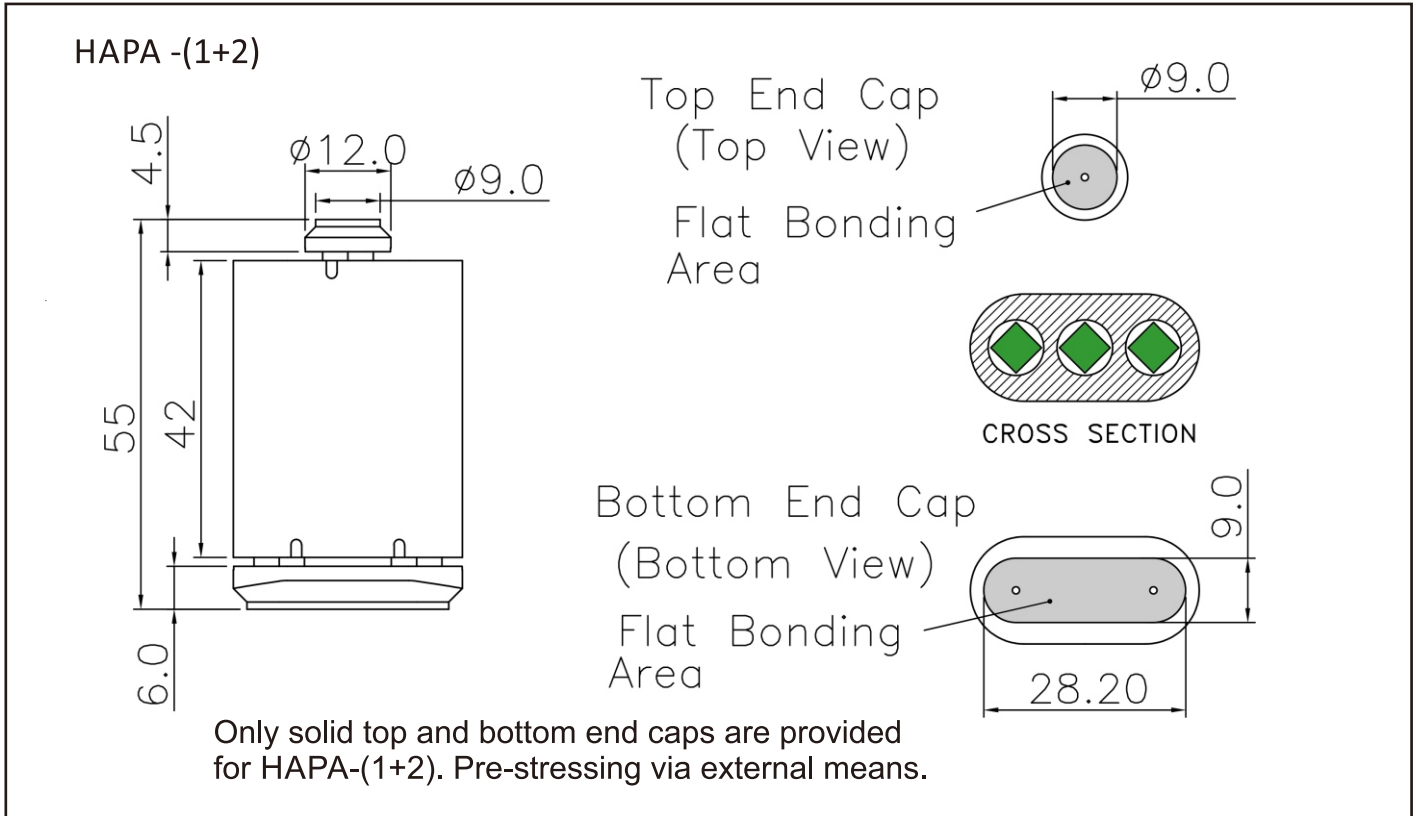
(C) End cap with a Φ3.5 mm C'bored (Φ5.5 ↓ 4.0) central through hole;

(D) End cap with a S.S. M2.5 central threaded through hole;

(E) End cap with a Φ2.6 mm C'bored (Φ4.6 ↓ 2.6) central through hole.







Ordering Information

e.g., HAPA-(3+3) -B-C

HAPA-(2+2)R -A-A

HAPA-(2+2)T -D-E

HAPA-(1+2) -A-A (for which only solid top and bottom end caps are available)

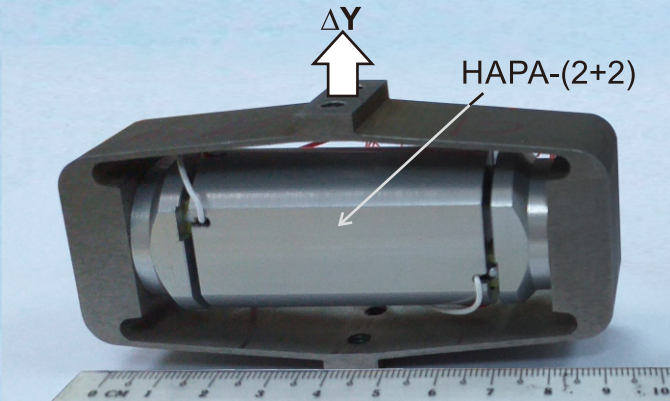
Type of top end cap

Type of bottom end cap

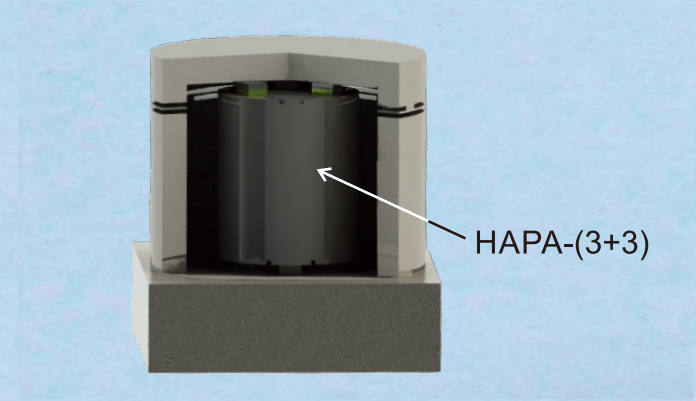
“R” and “T” after (2+2) stands for “Round” and “Truncated” cross-section, respectively.

Derivative Devices (Enquiries are welcome)

HAPA-Driven Flextensional Actuator (HD-FTA)



HAPA-Driven Fast-Steering Mirror / Platform (HD-FSM/P)



Microwave reserves the right to change specifications without notice.



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