

### 2-PIEZO LAYER BENDING MOTORS HIGH PERFORMANCE - USING 5A4E PIEZOCERAMIC

#### DESCRIPTION: HIGH PERFORMANCE BENDING MOTORS

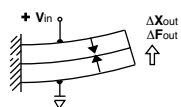
Composite reinforced (CL) bending elements are available for use in applications requiring the highest performance. These elements provide higher motion, higher force, and higher response in the same size package. They are constructed of 5A4E piezoceramic and are X-poled for series bending operation.

**Custom** sizes, configurations and mounting options upon request\*. Maximum size: 2.65" (67.3mm) long x 2.65" (67.3mm) wide.

Delivery: Typically stocked for "off-the-shelf" delivery.

#### PERFORMANCE: 5A4E - HIGH PERFORMANCE BENDER (Cantilever Mount)

VALUES TO BE USED AS GUIDELINES

PART NUMBERS HIGH PERFORMANCE BENDERS	WEIGHT (Grams)	STIFFNESS (N/m)	CAPACITANCE (nF) (Series Operation)	RATED VOLTAGE (Vp) (Series Operation)	RESONANT FREQUENCY ① (Hz)	FREE DEFLECTION ① (µm)	BLOCKED FORCE ① (N)	PRICE & ORDERING INFORMATION						
								1 pc.	5	25	100			
 <p>X-poled for series bending operation (2 wire)</p>								UNIT PRICE						
<b>.015" (.38mm) THICK</b>														
T215-A4CL-103X	.22	1.0x10 <sup>2</sup>	6	± 120	275	± 370	± .04	\$75	\$40	\$20	\$13			
T215-A4CL-203X	.45	2.0x10 <sup>2</sup>	11	± 120	275	± 370	± .09	\$80	\$55	\$28	\$16			
T215-A4CL-303X	.90	4.0x10 <sup>2</sup>	22	± 120	275	± 370	± .17	\$90	\$65	\$33	\$25			
T215-A4CL-503X	4.5	1.3x10 <sup>2</sup>	110	± 120	68	± 1480	± .23	\$160	\$115	\$82	\$72			
<b>.019" (.48mm) THICK</b>														
T219-A4CL-103X	.32	2.6x10 <sup>2</sup>	4	± 180	360	± 305	± .08	\$75	\$35	\$17	\$10			
T219-A4CL-203X	.64	5.2x10 <sup>2</sup>	8	± 180	360	± 305	± .16	\$80	\$45	\$22	\$13			
T219-A4CL-303X	1.3	1.0x10 <sup>3</sup>	16	± 180	360	± 305	± .31	\$90	\$55	\$28	\$20			
T219-A4CL-503X	6.4	3.2x10 <sup>2</sup>	76	± 180	90	± 1,220	± .39	\$130	\$100	\$77	\$65			
<b>.023" (.58mm) THICK</b>														
T223-A4CL-103X	.34	3.9x10 <sup>2</sup>	4	± 180	425	± 254	± .10	\$80	\$37	\$18	\$11			
T223-A4CL-203X	.68	8.3x10 <sup>2</sup>	8	± 180	425	± 254	± .21	\$90	\$48	\$24	\$14			
T223-A4CL-303X	1.4	1.7x10 <sup>3</sup>	16	± 180	425	± 254	± .42	\$100	\$60	\$30	\$22			
T223-A4CL-503X	6.8	5.2x10 <sup>2</sup>	80	± 180	106	± 1,016	± .53	\$150	\$110	\$82	\$70			
<b>.034" (.86mm) THICK</b>														
T234-A4CL-103X	.48	1.1x10 <sup>3</sup>	2.7	± 250	620	± 160	± .18	\$100	\$45	\$25	\$15			
T234-A4CL-203X	.97	2.2x10 <sup>3</sup>	5.5	± 250	620	± 160	± .36	\$110	\$60	\$35	\$18			
T234-A4CL-303X	1.9	4.5x10 <sup>3</sup>	11	± 250	620	± 160	± .72	\$125	\$70	\$40	\$25			
T234-A4CL-503X	9.7	1.4x10 <sup>3</sup>	55	± 250	152	± 640	± .89	\$175	\$130	\$90	\$75			

① -103, -203, and -303 performance based on 1.0" bending length. -503 performance based on 2.0" bending length.

\* Quick-Mounts and Double-Quick-Mounts for High Performance elements are wired for series operation.

Suitable for cryogenic use.

**ROHS: Compliant.**

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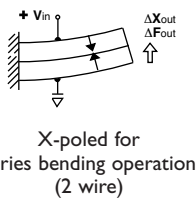
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#### PERFORMANCE: 5H4E - HIGH PERFORMANCE BENDER (Cantilever Mount)

VALUES TO BE USED AS GUIDELINES

PART NUMBERS HIGH PERFORMANCE BENDERS	WEIGHT (Grams)	STIFFNESS (N/m)	CAPACITANCE (nF) (Series Operation)	RATED VOLTAGE (Vp) (Series Operation)	RESONANT FREQUENCY ① (Hz)	FREE DEFLECTION ① (µm)	BLOCKED FORCE ① (N)	PRICE & ORDERING INFORMATION				
								1 pc.	5	25	100	
								UNIT PRICE				
 <p>X-poled for series bending operation (2 wire)</p>												
<b>.015" (.38mm) THICK</b>												
T215-H4CL-103X	.22	1.2x10 <sup>2</sup>	9	± 80	270	± 370	± .045	\$75	\$40	\$20	\$13	
T215-H4CL-203X	.45	2.2x10 <sup>2</sup>	17	± 80	270	± 370	± .08	\$80	\$55	\$28	\$16	
T215-H4CL-303X	.90	4.6x10 <sup>2</sup>	35	± 80	270	± 370	± .17	\$90	\$65	\$33	\$25	
T215-H4CL-503X	4.5	1.6x10 <sup>2</sup>	175	± 80	68	± 1,480	± .23	\$160	\$115	\$82	\$72	
<b>.019" (.48mm) THICK</b>												
T219-H4CL-103X	.32	2.6x10 <sup>2</sup>	6.5	± 120	350	± 305	± .08	\$75	\$35	\$17	\$10	
T219-H4CL-203X	.64	5.2x10 <sup>2</sup>	13	± 120	350	± 305	± .16	\$80	\$45	\$22	\$13	
T219-H4CL-303X	1.3	1.0x10 <sup>3</sup>	26	± 120	350	± 305	± .31	\$90	\$55	\$28	\$20	
T219-H4CL-503X	6.4	3.2x10 <sup>2</sup>	130	± 120	88	± 1,220	± .39	\$130	\$100	\$77	\$65	
<b>.023" (.58mm) THICK</b>												
T223-H4CL-103X	.34	4.0x10 <sup>2</sup>	6.5	± 120	440	± 270	± .11	\$80	\$37	\$18	\$11	
T223-H4CL-203X	.68	8.1x10 <sup>2</sup>	13	± 120	440	± 270	± .22	\$90	\$48	\$24	\$14	
T223-H4CL-303X	1.4	1.6x10 <sup>3</sup>	26	± 120	440	± 270	± .44	\$100	\$60	\$30	\$22	
T223-H4CL-503X	6.8	5.1x10 <sup>2</sup>	130	± 120	110	± 1,080	± .55	\$150	\$110	\$82	\$70	
<b>.034" (.86mm) THICK</b>												
T234-H4CL-103X	.48	1.1x10 <sup>3</sup>	4.5	± 170	600	± 165	± .18	\$100	\$45	\$25	\$15	
T234-H4CL-203X	.97	2.2x10 <sup>3</sup>	9	± 170	600	± 165	± .36	\$110	\$60	\$35	\$18	
T234-H4CL-303X	1.9	4.3x10 <sup>3</sup>	18	± 170	600	± 165	± .71	\$125	\$70	\$40	\$25	
T234-H4CL-503X	9.7	1.3x10 <sup>3</sup>	88	± 170	150	± 660	± .89	\$175	\$130	\$90	\$75	

① -103, -203, and -303 performance based on 1.0" bending length. -503 performance based on 2.0" bending length.

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