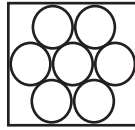


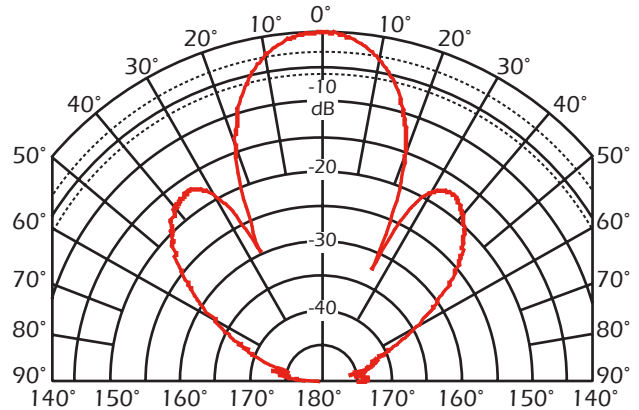
50 kHz-AE

Power Rating: 1kW rms @ 1% duty cycle
 7 x 28 mm (1.13") PZT/L
 Active Area: 45 cm² (6.97 in²)
 Radiating Surface: Urethane

Array



Transmit Radiation Pattern

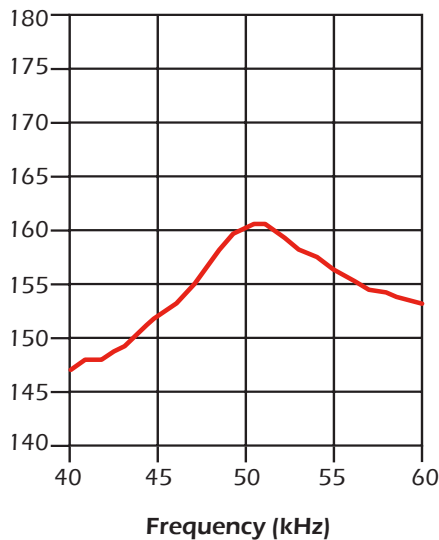


Beamwidth:

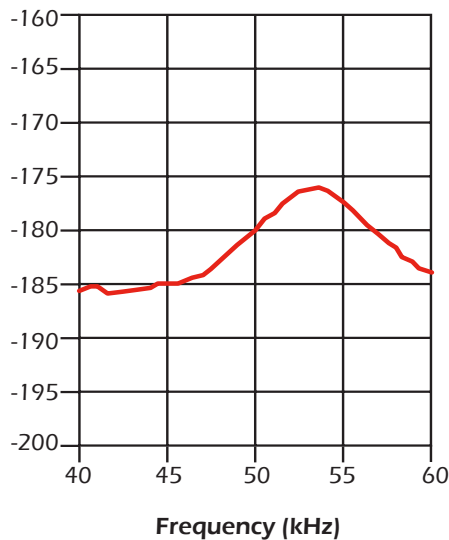
- 3 dB: 19°
- 6 dB: 27°
- 10 dB: 34°

- Directivity Index: 18.9 dB
- Frequency Tolerance: ± 2 kHz
- Peak TVR⁽¹⁾, nominal: 160.7 dB
- Peak TVR⁽¹⁾, minimum: 158.7 dB
- Q (transmit): 9
- Peak Source Level⁽⁴⁾: 215 dB
- Peak RVR⁽²⁾, nominal: -176 dB
- Peak Figure of Merit⁽³⁾: -17.2 dB

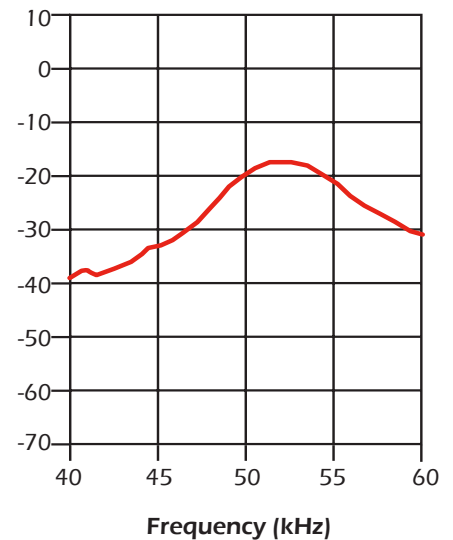
TVR dB⁽¹⁾



RVR dB⁽²⁾



FOM dB⁽³⁾



Notes:

- (1) dB re 1 μPa per volt at 1 meter
- (2) dB re 1 volt per μPa
- (3) Sum of transmitting voltage response and receiving voltage response
- (4) Nominal peak TVR, rated power, and no cavitation

Technical Data Catalog

50 kHz-AE

7 x 28 mm (1.13") PZT/L

Cable Type: C332

Cable Length: 10.4 m (34')

Note:

Impedance data includes cable

Impedance Data		
	<i>Balanced</i>	<i>Unbalanced</i>
Parallel: Rp.	300 Ω: -20%, +40%	300 Ω: -20%, +40%
Parallel: Cp. (nominal)	5,850 pF	7,430 pF
Series [R - jX]: (nominal)	240 - j150 Ω	210 - j160 Ω
1 kHz capacitance: (nominal)	8,100 pF	9,620 pF

Balance Impedance Table

Test Frequency (kHz)	Impedance Magnitude (Ω)	Phase Angle (°)	Series Resistance (Ω)	Series Reactance (Ω)	Parallel Conductance (mS)	Parallel Susceptance (mS)	Parallel Resistance (Ω)	Parallel Capacitance (pF)
40.00	583.85	-84.07	60.36	-580.72	0.18	1.70	5647.66	6778.36
40.50	558.21	-84.18	56.62	-555.33	0.18	1.78	5503.00	7003.67
41.00	534.12	-84.19	54.07	-531.38	0.19	1.86	5276.04	7230.36
42.00	487.82	-84.00	51.03	-485.15	0.21	2.04	4663.34	7725.35
42.50	466.79	-83.63	51.82	-463.90	0.24	2.13	4205.12	7973.00
43.00	445.96	-83.11	53.52	-442.73	0.27	2.23	3715.76	8239.66
44.00	407.74	-81.90	57.45	-403.67	0.35	2.43	2893.66	8782.72
44.50	388.90	-80.90	61.52	-384.01	0.41	2.54	2458.52	9080.63
45.00	370.50	-79.69	66.29	-364.52	0.48	2.66	2070.61	9391.90
46.00	335.58	-76.64	77.53	-326.50	0.69	2.90	1452.50	10031.33
46.50	317.44	-74.64	84.10	-306.10	0.83	3.04	1198.22	10396.82
47.00	301.72	-72.14	92.55	-287.18	1.02	3.15	983.64	10682.21
48.00	272.05	-64.54	116.94	-245.64	1.58	3.32	632.93	11004.43
48.50	262.68	-59.79	132.16	-227.01	1.92	3.29	522.11	10796.13
49.00	255.91	-53.29	152.96	-205.17	2.34	3.13	428.17	10175.38
49.50	253.11	-46.44	174.41	-183.43	2.72	2.86	367.32	9205.66
50.00	260.90	-38.85	203.19	-163.65	2.99	2.40	334.99	7652.76
50.50	282.12	-31.58	240.33	-147.75	3.02	1.86	331.17	5850.64
51.00	311.13	-24.83	282.37	-130.66	2.92	1.35	342.83	4211.95
51.50	357.02	-20.43	334.56	-124.64	2.62	0.98	380.99	3021.88
52.00	421.33	-18.63	399.24	-134.61	2.25	0.76	444.63	2320.92
52.50	492.19	-19.47	464.05	-164.05	1.92	0.68	522.04	2052.82
53.00	571.22	-21.77	530.49	-211.83	1.63	0.65	615.08	1949.53
54.00	706.53	-34.07	585.23	-395.85	1.17	0.79	852.98	2337.17
54.50	745.89	-40.07	570.78	-480.17	1.03	0.86	974.73	2520.40
55.00	760.19	-47.11	517.37	-556.98	0.90	0.96	1116.99	2789.00
56.00	740.90	-57.88	393.95	-627.48	0.72	1.14	1393.39	3248.75
56.50	713.58	-62.46	329.97	-632.70	0.65	1.24	1543.15	3500.18
57.00	688.47	-66.22	277.59	-630.03	0.59	1.33	1707.50	3711.37
58.00	635.08	-71.15	205.16	-601.03	0.51	1.49	1965.94	4089.14
58.50	609.86	-73.32	175.04	-584.20	0.47	1.57	2124.82	4273.36
59.00	589.73	-74.91	153.55	-569.39	0.44	1.64	2265.02	4416.40
60.00	546.54	-77.13	121.75	-532.81	0.41	1.78	2453.56	4731.44

50 kHz-AE

Transformed to 70 ohms

Power rating: 1 kW_{rms} @ 2% duty cycle
 7x28mm (1.13") PZT/L
 Active Area: 45cm²
 Urethane Window

Beamwidth:

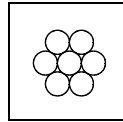
-3 dB: 19°
 -6 dB: 27°
 -10 dB: 34°

Directivity Index: 18.9
 Frequency Tolerance: ±2kHz
 Peak TVR⁽¹⁾, nominal: 168dB
 Peak TVR⁽¹⁾, minimum: 165dB
 Q (transmit): 8
 Peak Source Level⁽⁴⁾: 217dB
 RVR⁽²⁾, nominal: -176dB
 Peak Figure of Merit⁽³⁾: -14dB

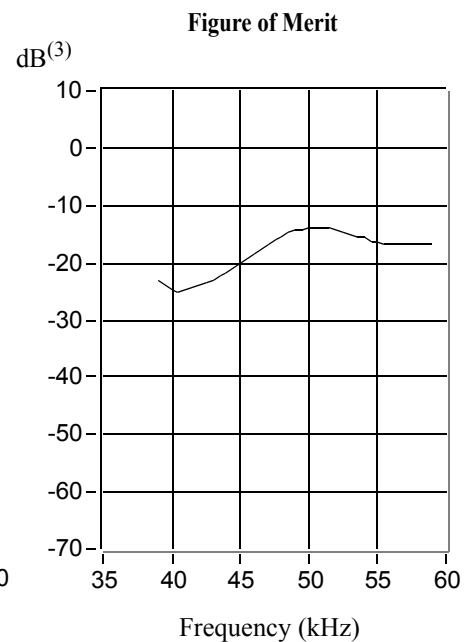
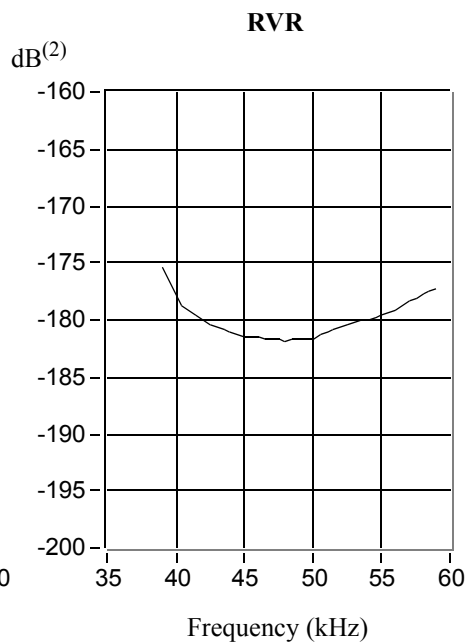
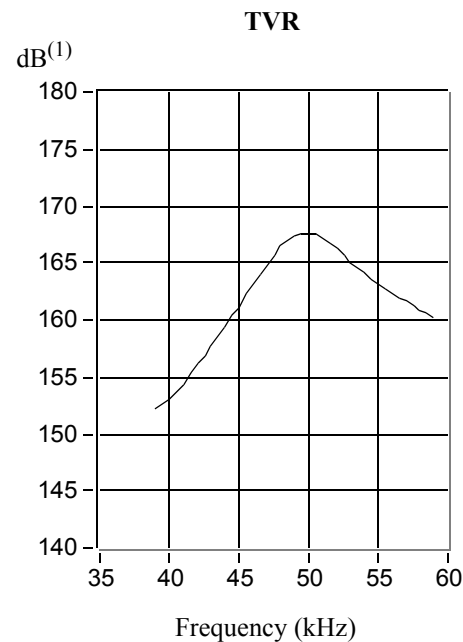
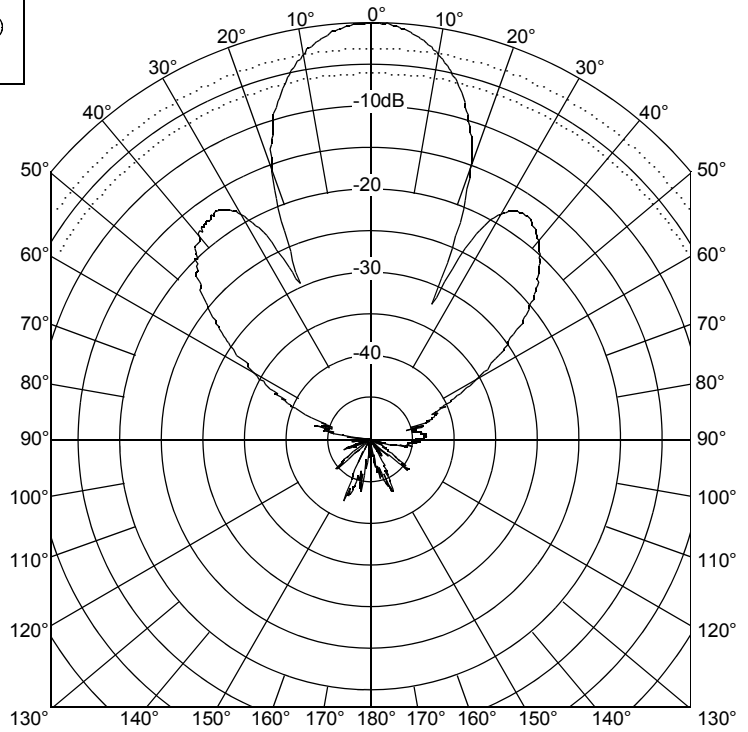
Notes:

- (1) dB re 1 μPa per volt at 1 meter
- (2) dB re 1 volt per μPa
- (3) sum of transmitting voltage response and receiving voltage response
- (4) Nominal peak TVR, rated power, and no cavitation

Array:



Transmit Radiation Pattern



Technical Data Catalog

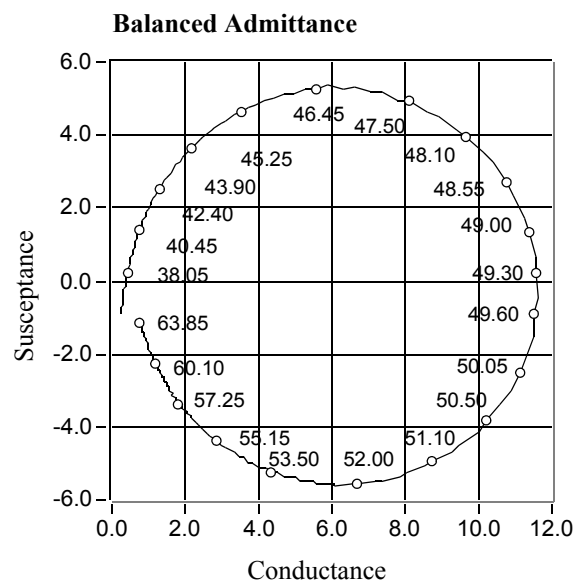
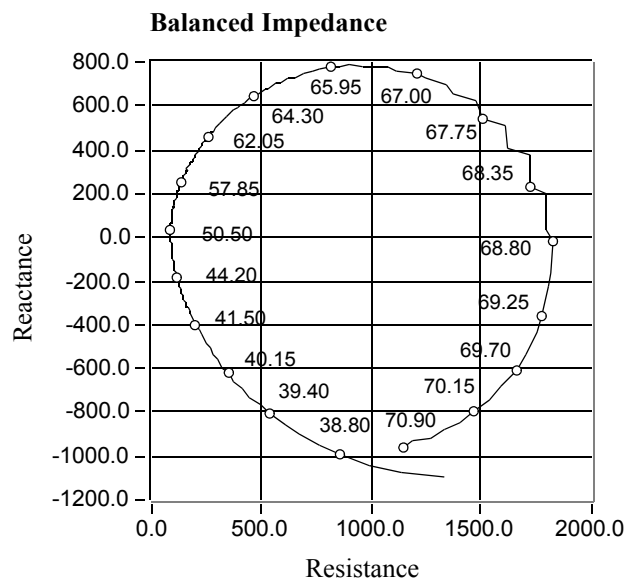
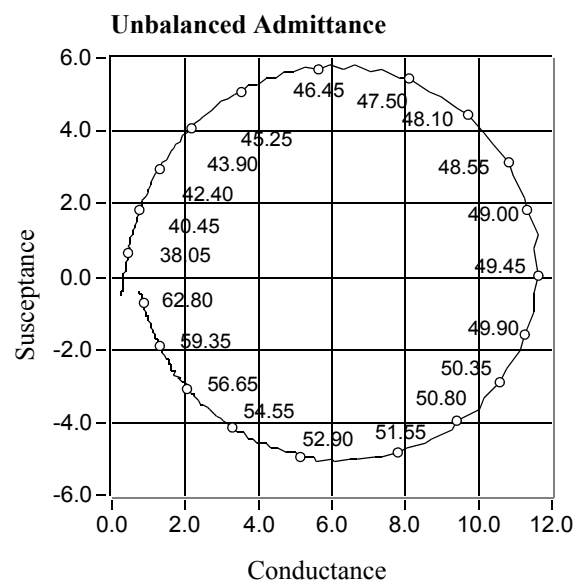
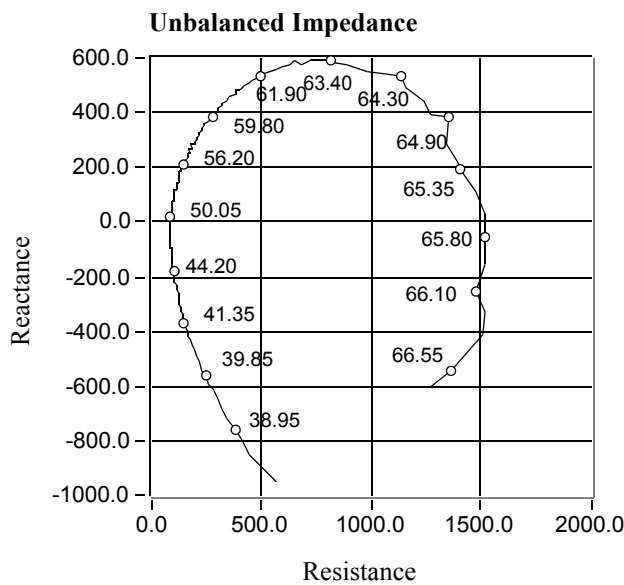
50 kHz-AE

7x28mm (1.13") PZT/L

Cable Type: C35

Cable Length: 10.1 m (33.0')

Impedance Data w/transformer		
	Balanced	Unbalanced
Parallel: Rp.	70ohms -20%,+40%	70ohms -20%,+40%
Parallel: Cp. (nominal)	0pF	0pF
Series [R - jX] (nominal)	70 - j0 ohms	70 - j0 ohms
1 kHz Capacitance	n/a	n/a



50 kHz-AE

Transformed to 130 ohms

Power rating: 1 kW_{rms} @ 2% duty cycle

7x28mm (1.13") PZT/L

Active Area: 45cm²

Urethane Window

Beamwidth:

-3 dB: 19°

-6 dB: 27°

-10 dB: 34°

Directivity Index: 18.9

Frequency Tolerance: ±1.5kHz

Peak TVR⁽¹⁾, nominal: 165dB

Peak TVR⁽¹⁾, minimum: 163dB

Q (transmit): 8

Peak Source Level⁽⁴⁾: 216dB

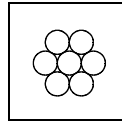
Peak RVR⁽²⁾, nominal: -169dB

Peak Figure of Merit⁽³⁾: -14dB

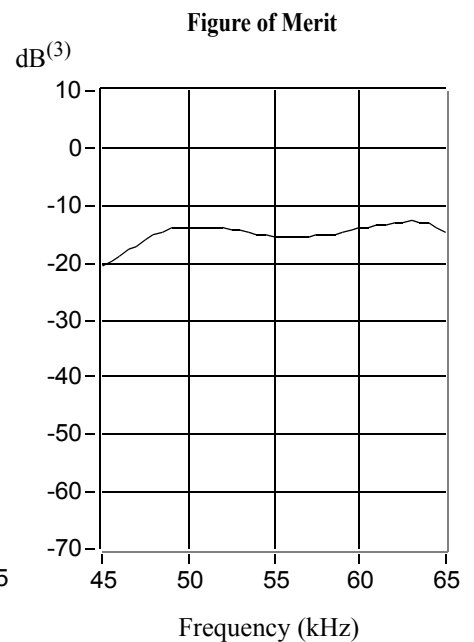
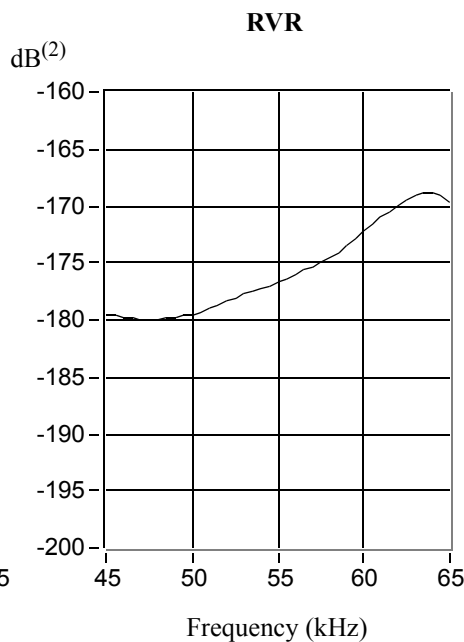
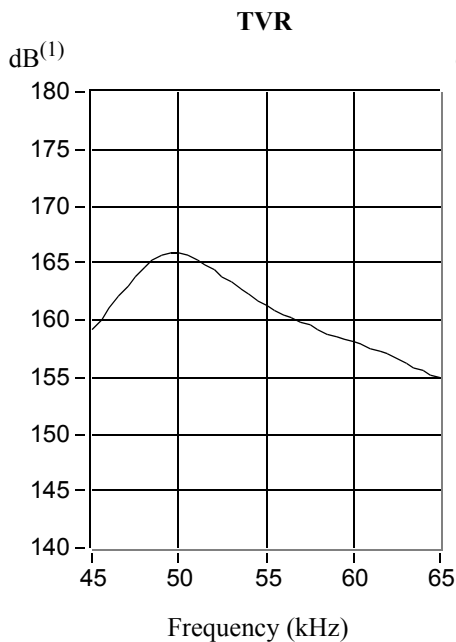
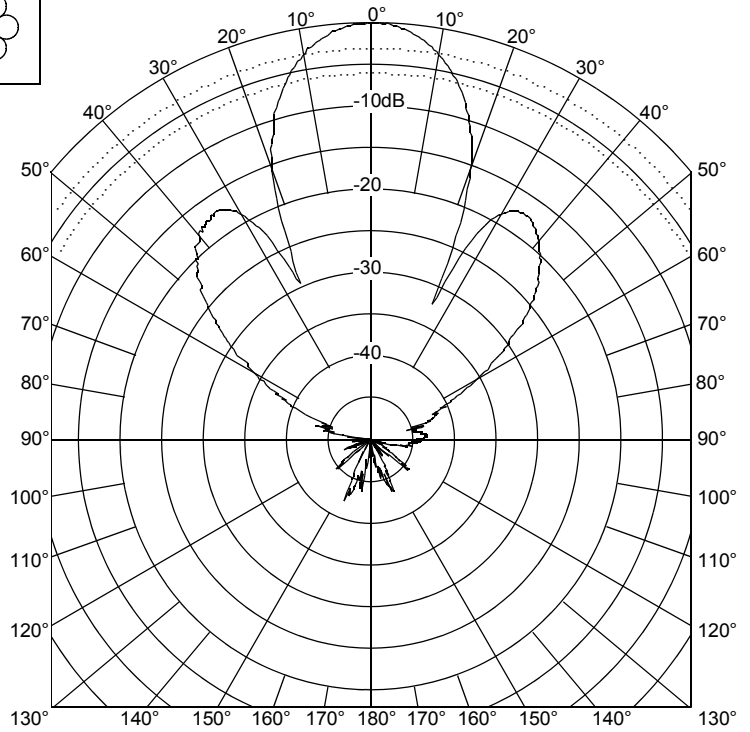
Notes:

- (1) dB re 1 μPa per volt at 1 meter
- (2) dB re 1 volt per μPa
- (3) sum of transmitting voltage response and receiving voltage response
- (4) Nominal peak TVR, rated power, and no cavitation

Array:



Transmit Radiation Pattern



Technical Data Catalog

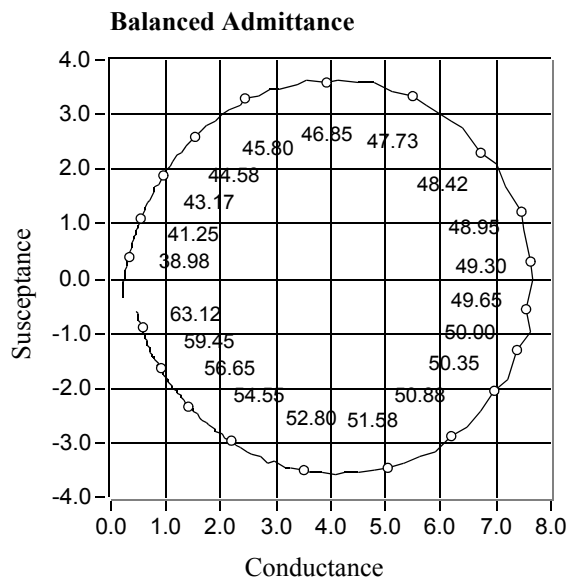
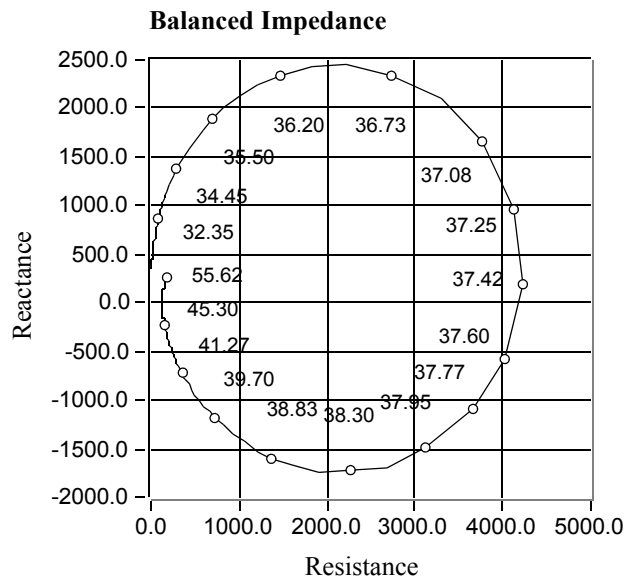
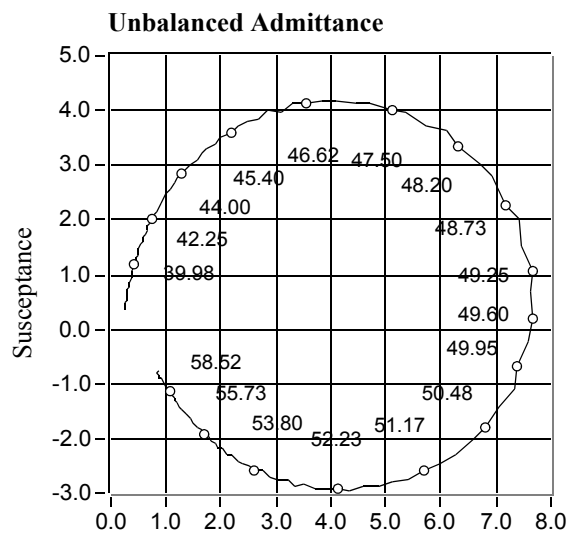
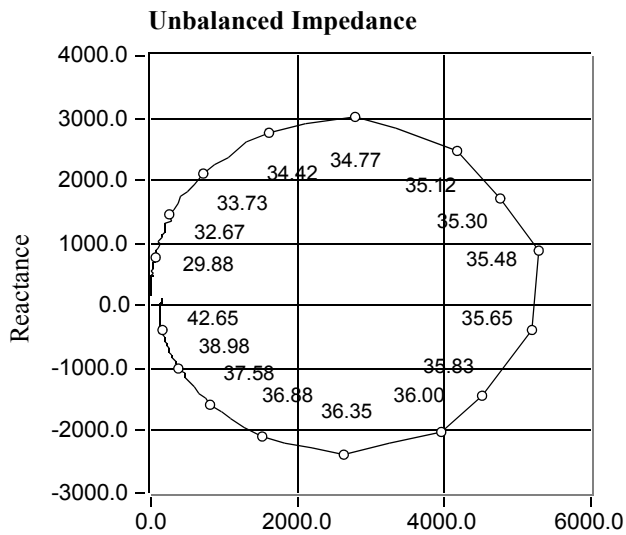
50 kHz-AE

7x28mm (1.13") PZT/L

Cable Type: C44

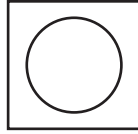
Cable Length: 10.1 m (33.0')

Impedance Data w/transformer		
	Balanced	Unbalanced
Parallel: Rp.	130 ohms-20%, +40%	130 ohms-20%, +40%
Parallel: Cp. (nominal)	0 pF	0 pF
Series [R - jX] (nominal)	130 - j0 ohms	130 - j0 ohms
1 kHz Capacitance	n/a	n/a



200 kHz-BH

Array



with Parallel Inductor

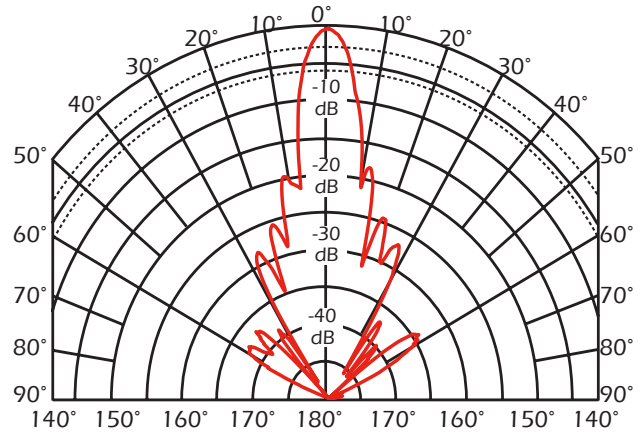
Power Rating: 1 kW rms @ 1% duty cycle
 65 mm (2.56") PZT
 Active Area: 33 cm² (5.1 in²)
 Urethane Window

Beamwidth:

-3 dB: 6°
 -6 dB: 9°
 -10 dB: 12°

Directivity Index: 27
 Frequency Tolerance: ± 8 kHz
 Peak TVR⁽¹⁾, nominal: 175 dB
 Peak TVR⁽¹⁾, minimum: 173 dB
 Q (transmit): 9
 Peak Source Level⁽⁴⁾: 225 dB
 Peak RVR⁽²⁾, nominal: -180 dB
 Peak Figure of Merit⁽³⁾: -10 dB

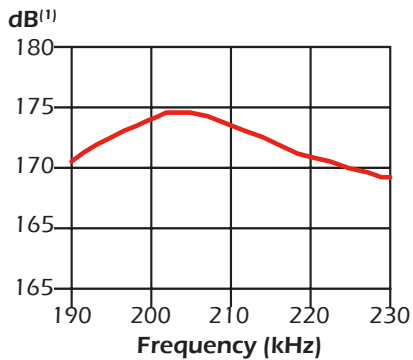
Transmit Radiation Pattern



Notes:

- (1) dB re 1 μPa per volt at 1 meter
- (2) dB re 1 volt per μPa
- (3) Sum of transmitting voltage response and receiving voltage response
- (4) Nominal peak TVR, rated power, and no cavitation

TVR



RVR

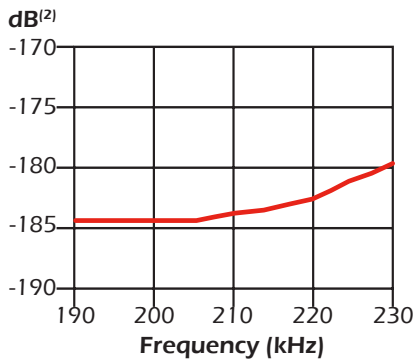
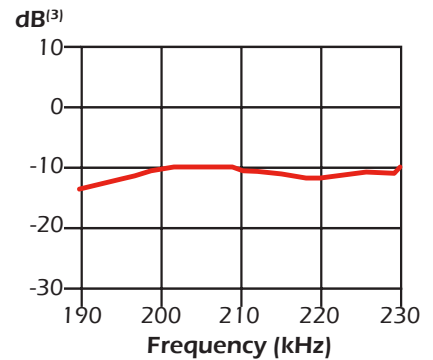


Figure of Merit



Technical Data Catalog

200 kHz-BH

65 mm (2.56") PZT

Cable Type: C44-02

Cable Length: 15.2 m (50')

Note:

Impedance data includes cable

Impedance Data		
	<i>Unbalanced</i>	<i>Balanced</i>
Parallel: Rp.	110 Ω: -20%, +40%	110 Ω: -20%, +40%
Parallel: Cp. (nominal)	N/A	N/A
Series [R - jX]: (nominal)	110 - j0 Ω	110 - j0 Ω
1 kHz capacitance: (nominal)	N/A	N/A

Balanced Impedance Table

Test Frequency (kHz)	Impedance Magnitude (Ω)	Phase Angle (°)	Series Resistance (Ω)	Series Reactance (Ω)	Parallel Conductance (mS)	Parallel Susceptance (mS)	Parallel Resistance (Ω)	Parallel Capacitance (pF)
190.00	194.09	-30.58	167.10	-98.74	4.44	2.62	225.44	2195.57
191.00	181.02	-28.83	158.59	-87.29	4.84	2.66	206.63	2219.57
192.00	169.98	-26.79	151.74	-76.61	5.25	2.65	190.42	2197.67
193.00	160.77	-24.47	146.33	-66.60	5.66	2.58	176.64	2124.76
194.00	153.08	-21.92	142.02	-57.14	6.06	2.44	165.00	2000.32
196.00	140.89	-17.27	134.54	-41.82	6.78	2.11	147.54	1710.67
197.00	135.49	-15.07	130.83	-35.23	7.13	1.92	140.31	1550.36
198.00	129.96	-12.74	126.75	-28.67	7.51	1.70	133.24	1364.55
199.00	124.79	-10.04	122.88	-21.76	7.89	1.40	126.73	1117.66
200.00	120.01	-6.97	119.13	-14.56	8.27	1.01	120.91	804.68
202.00	112.57	0.44	112.56	0.86	8.88	-0.07	112.57	-53.21
203.00	110.55	4.71	110.18	9.07	9.01	-0.74	110.93	-582.05
204.00	109.48	9.28	108.05	17.66	9.01	-1.47	110.93	-1149.28
205.00	109.99	13.83	106.80	26.28	8.83	-2.17	113.27	-1686.91
206.00	111.96	18.17	106.38	34.92	8.49	-2.79	117.84	-2152.29
208.00	120.20	25.65	108.36	52.03	7.50	-3.60	133.34	-2755.27
209.00	125.28	28.47	110.13	59.73	7.02	-3.81	142.52	-2897.69
210.00	130.44	30.52	112.36	66.25	6.60	-3.89	151.42	-2950.85
211.00	135.41	32.25	114.52	72.25	6.25	-3.94	160.11	-2972.23
212.00	139.97	33.97	116.09	78.20	5.93	-3.99	168.77	-2996.53
214.00	149.62	37.85	118.15	91.80	5.28	-4.10	189.47	-3049.76
215.00	155.68	39.72	119.74	99.49	4.94	-4.11	202.40	-3038.82
216.00	162.32	41.28	121.98	107.10	4.63	-4.06	216.02	-2995.03
217.00	169.78	42.32	125.54	114.31	4.35	-3.97	229.63	-2908.37
218.00	177.07	43.14	129.20	121.08	4.12	-3.86	242.67	-2819.39
219.00	183.38	43.94	132.04	127.25	3.93	-3.78	254.68	-2750.04
220.00	189.74	45.01	134.13	134.19	3.73	-3.73	268.39	-2696.68
222.00	206.34	47.76	138.71	152.76	3.26	-3.59	306.94	-2572.26
223.00	216.75	48.67	143.14	162.77	3.05	-3.46	328.22	-2472.59
224.00	228.15	49.10	149.39	172.44	2.87	-3.31	348.43	-2353.84
225.00	240.02	49.09	157.17	181.41	2.73	-3.15	366.55	-2227.33
226.00	250.34	49.14	163.79	189.32	2.61	-3.02	382.62	-2127.48
228.00	268.67	49.80	173.43	205.20	2.40	-2.84	416.22	-1984.36
229.00	279.46	50.64	177.23	216.08	2.27	-2.77	440.67	-1922.83
230.00	293.09	51.52	182.38	229.43	2.12	-2.67	470.99	-1848.16

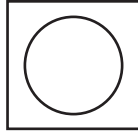
200 kHz-BH

Power Rating: 1 kW rms @ 2% duty cycle
 65 mm (2.56") PZT
 Active Area: 33 cm²
 Urethane Window

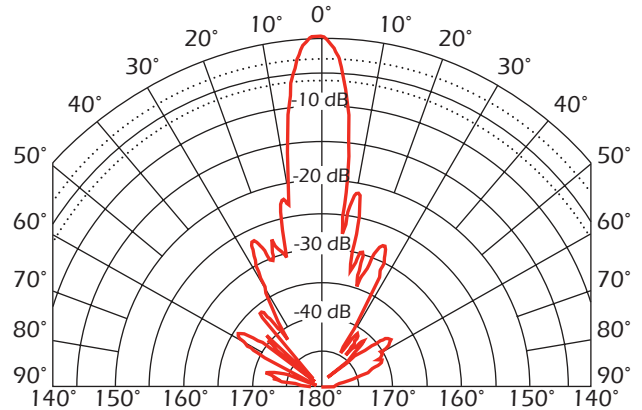
Beamwidth:
 -3 dB: 7°
 -6 dB: 9°
 -10 dB: 12°

Directivity Index: 29.2
 Frequency Tolerance: ± 8 kHz
 Peak TVR⁽¹⁾, nominal: 175 dB
 Peak TVR⁽¹⁾, minimum: 173 dB
 Q (transmit): 8
 Peak Source Level⁽⁴⁾: 225 dB
 Peak RVR⁽²⁾, nominal: -182 dB
 Peak Figure of Merit⁽³⁾: -10 dB

Array



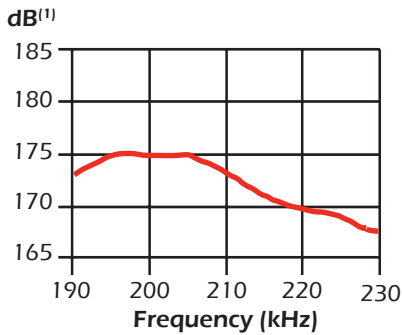
Transmit Radiation Pattern



Notes:

- (1) dB re 1 μPa per volt at 1 meter
- (2) dB re 1 volt per μPa
- (3) Sum of transmitting voltage response and receiving voltage response
- (4) Nominal peak TVR, rated power, and no cavitation

TVR



RVR

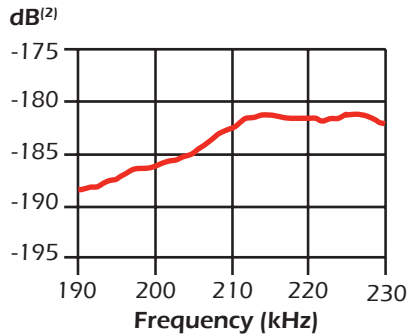
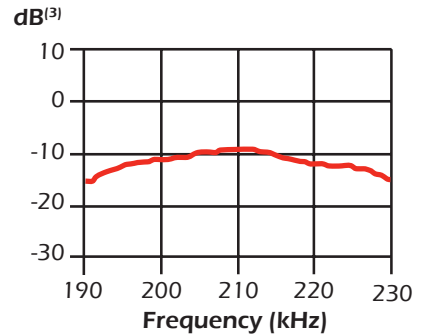


Figure of Merit



Technical Data Catalog

200 kHz-BH

65 mm (2.56") PZT

Cable Type: C332

Cable Length: 10.4 m (34')

Note:

Impedance data includes cable

Impedance Data		
	<i>Balanced</i>	<i>Unbalanced</i>
Parallel: Rp.	100 Ω: -20%, +40%	100 Ω: -20%, +40%
Parallel: Cp. (nominal)	1510 pF	2960 pF
Series [R - jX]: (nominal)	90 - j20 Ω	90 - j20 Ω
1 kHz capacitance: (nominal)	n/a	n/a

Unbalanced Impedance Table

Test Frequency (kHz)	Impedance Magnitude (Ω)	Phase Angle (°)	Series Resistance (Ω)	Series Reactance (Ω)	Parallel Conductance (mS)	Parallel Susceptance (mS)	Parallel Resistance (Ω)	Parallel Capacitance (pF)
180.00	113.07	-58.93	58.35	-96.84	4.56	7.58	219.08	6698.23
182.00	107.82	-53.34	64.38	-86.49	5.54	7.44	180.57	6505.62
184.00	108.56	-51.18	68.06	-84.58	5.77	7.18	173.17	6207.53
186.00	103.03	-50.53	65.50	-79.53	6.17	7.49	162.07	6410.90
188.00	96.02	-47.75	64.55	-71.08	7.00	7.71	142.81	6526.81
190.00	90.11	-43.14	65.75	-61.62	8.10	7.59	123.50	6356.72
192.00	86.60	-37.24	68.95	-52.40	9.19	6.99	108.78	5791.63
194.00	85.64	-31.05	73.37	-44.18	10.00	6.02	99.97	4941.41
196.00	86.35	-25.03	78.24	-36.53	10.49	4.90	95.30	3978.41
198.00	87.95	-18.86	83.22	-28.43	10.76	3.68	92.94	2955.08
200.00	91.29	-12.38	89.16	-19.57	10.70	2.35	93.46	1868.90
202.00	97.91	-5.46	97.46	-9.31	10.17	0.97	98.35	765.09
204.00	109.37	0.85	109.36	1.62	9.14	-0.14	109.38	-105.59
206.00	126.91	4.76	126.47	10.54	7.85	-0.65	127.35	-505.53
208.00	149.87	6.05	149.03	15.80	6.64	-0.70	150.71	-538.15
210.00	176.36	3.95	175.94	12.15	5.66	-0.39	176.78	-296.08
212.00	199.04	-0.88	199.02	-3.07	5.02	0.08	199.07	58.18
214.00	212.62	-6.34	211.32	-23.47	4.67	0.52	213.93	386.08
216.00	216.04	-10.18	212.64	-38.20	4.56	0.82	219.50	603.05
218.00	223.00	-7.91	220.88	-30.68	4.44	0.62	225.15	450.38
220.00	262.75	-10.18	258.61	-46.46	3.75	0.67	266.96	486.82
222.00	289.51	-17.21	276.54	-85.66	3.30	1.02	303.08	732.73
224.00	311.18	-25.19	281.58	-132.45	2.91	1.37	343.88	971.90
226.00	315.52	-34.23	260.88	-177.47	2.62	1.78	381.60	1255.37
228.00	303.59	-42.01	225.58	-203.17	2.45	2.20	408.57	1538.82
230.00	288.73	-47.76	194.09	-213.76	2.33	2.56	429.51	1774.34