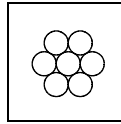


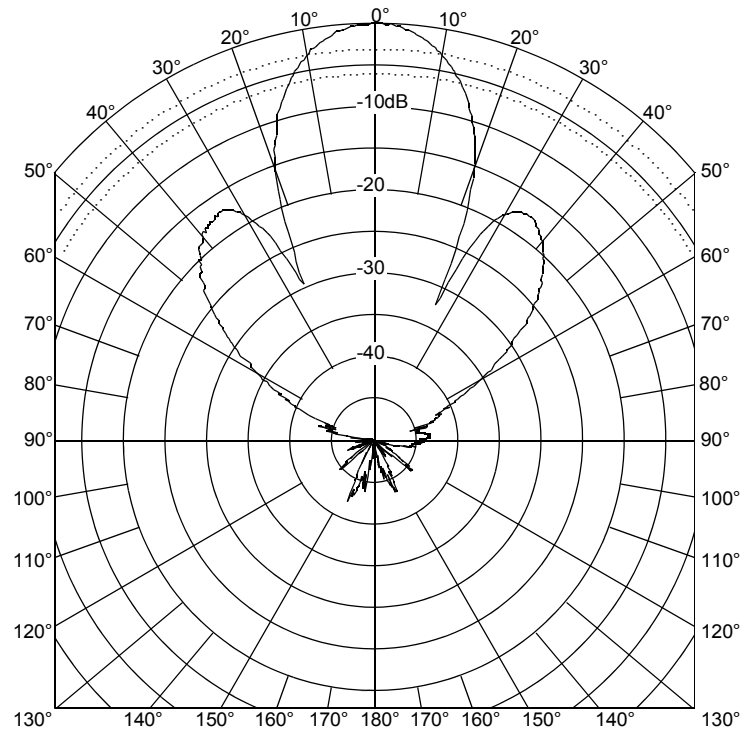
50 kHz – AE

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

Array:



Transmit Radiation Pattern



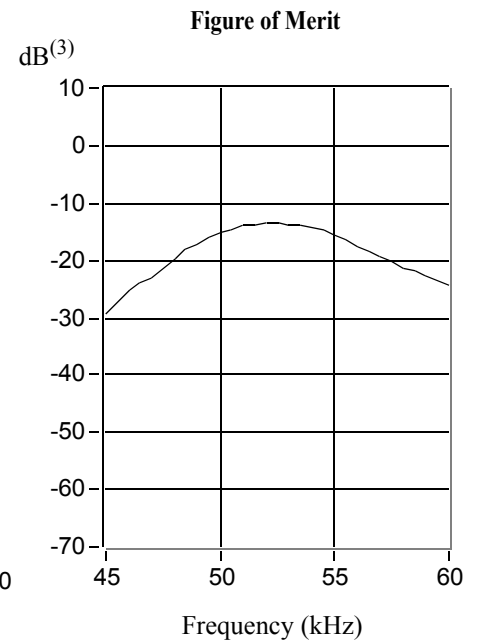
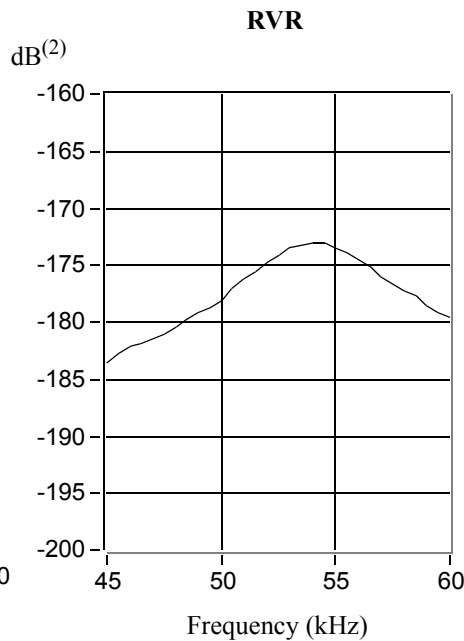
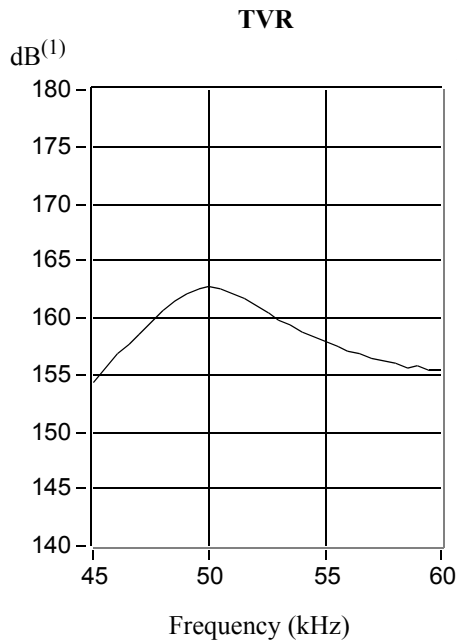
Beamwidth:

-3dB: 19°
 -6dB: 27°
 -10dB: 34°

Directivity Index: 18.9
 Frequency Tolerance: ±2kHz
 Peak TVR⁽¹⁾, nominal: 162dB
 Peak TVR⁽¹⁾, minimum: 160dB
 Q (transmit): 9
 Peak Source Level⁽⁴⁾: 216dB
 Peak RVR⁽²⁾, nominal: -173dB
 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



Technical Data Catalog

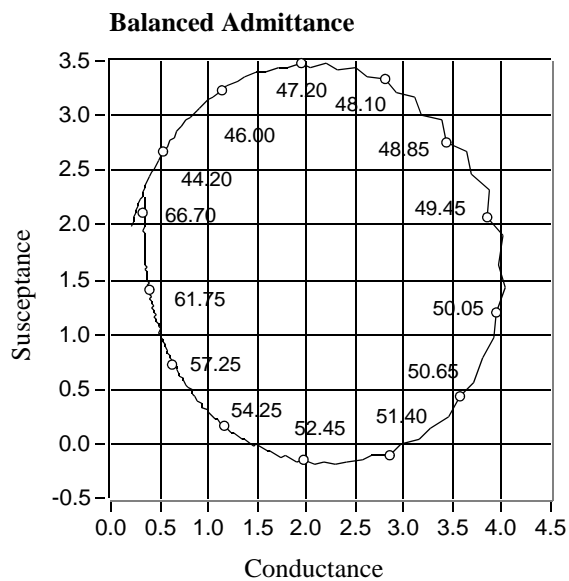
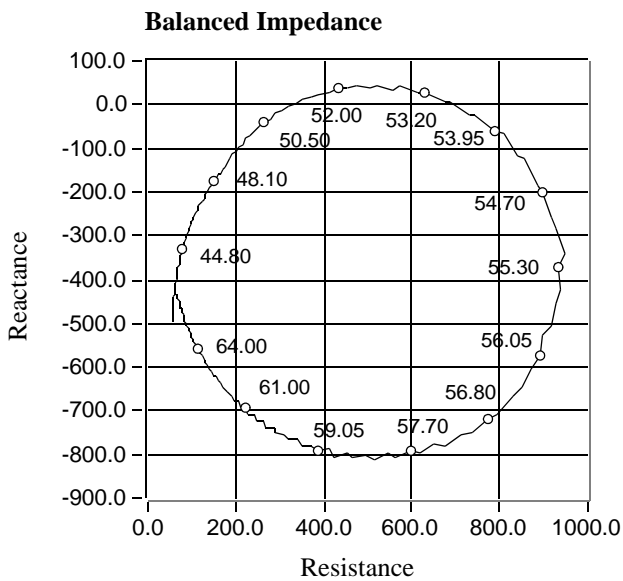
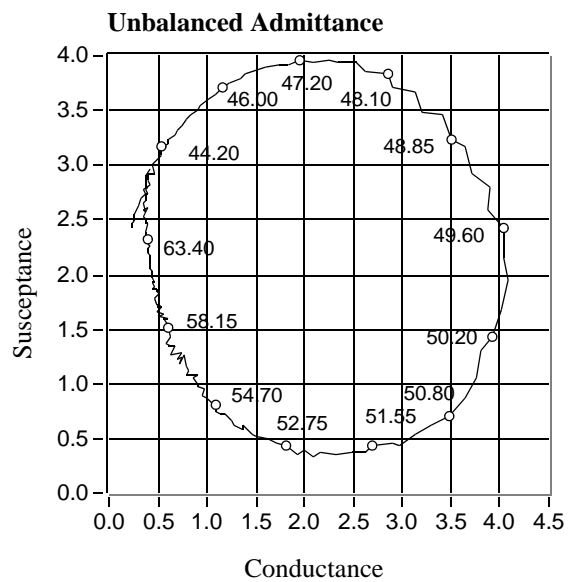
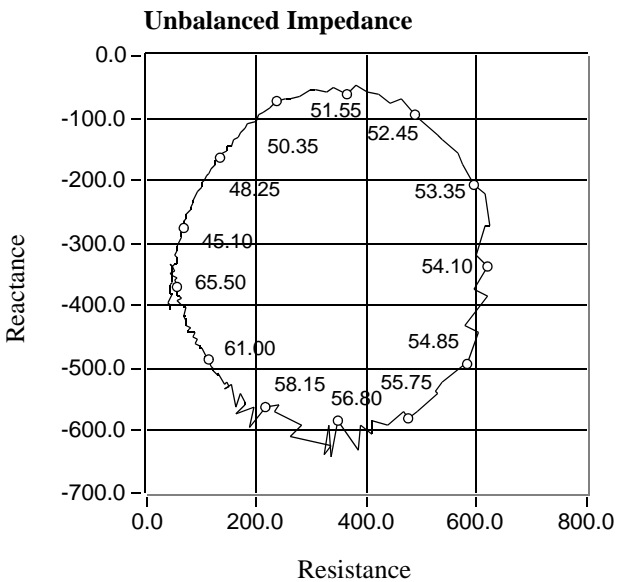
50 kHz – AE

7x28mm (1.13") PZT/L

Cable Type: C32

Cable Length: 10.4 m (34.0')

Impedance Data		
	Balanced	Unbalanced
Parallel: Rp.	250ohms-20%,+40%	250ohms-20%,+40%
Parallel: Cp. (nominal)	5000pF	6500pF
Series [R – jX] (nominal)	222 – j80 ohms	200 – j100 ohms
1 kHz Capacitance	6530pF±20%	8220 pF±20%



50 kHz – AE

Transformed to 70 ohms

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

7x28mm (1.13") PZT/L

Active Area: 45 cm²

Urethane Window

Beamwidth:

-3dB: 19°

-6dB: 27°

-10dB: 34°

Directivity Index: 18.9

Frequency Tolerance: ±2kHz

Peak TVR⁽¹⁾, nominal: 168dB

Peak TVR⁽¹⁾, minimum: 165dB

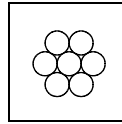
Q (transmit): 8

Peak Source Level⁽⁴⁾: 217dB

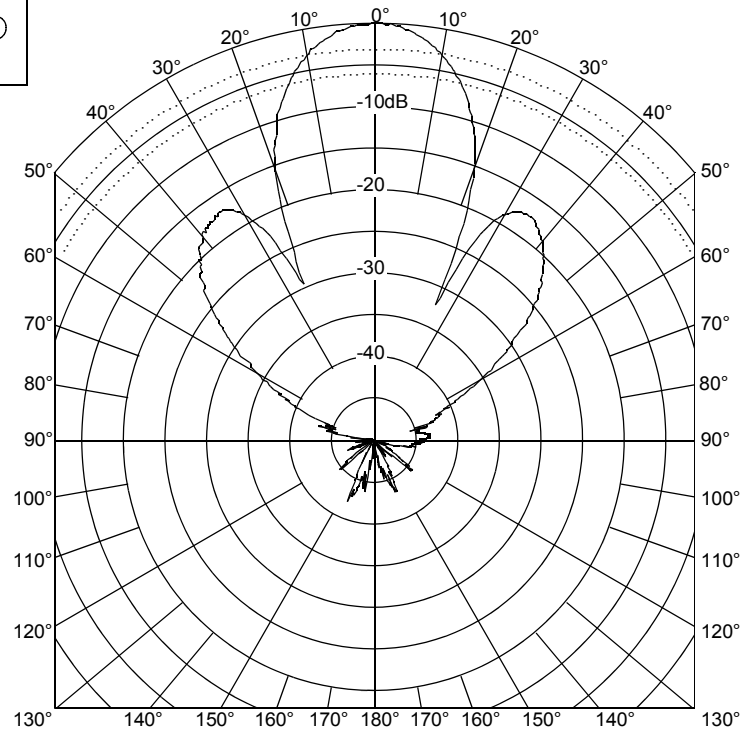
RVR⁽²⁾, nominal: -176dB

Peak Figure of Merit⁽³⁾: -14dB

Array:

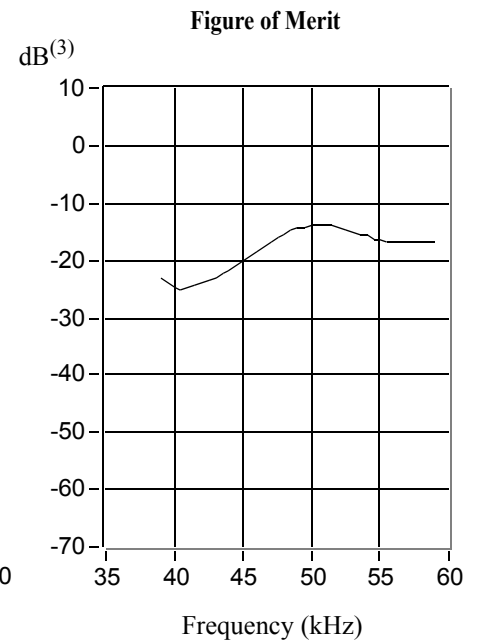
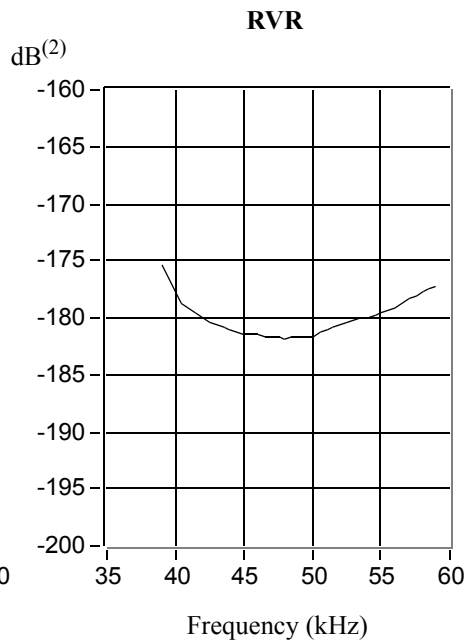
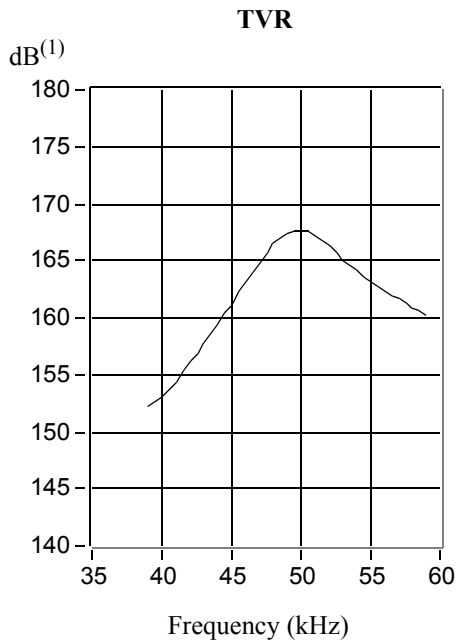


Transmit Radiation Pattern



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



Technical Data Catalog

50 kHz – AE

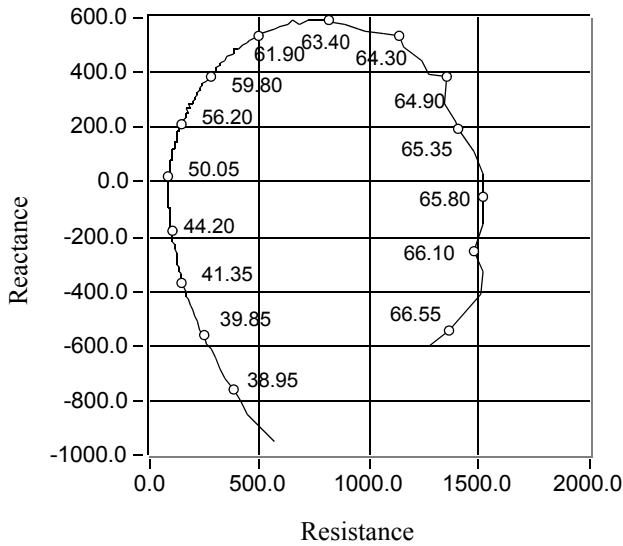
7x28mm (1.13") PZT/L

Cable Type: C35

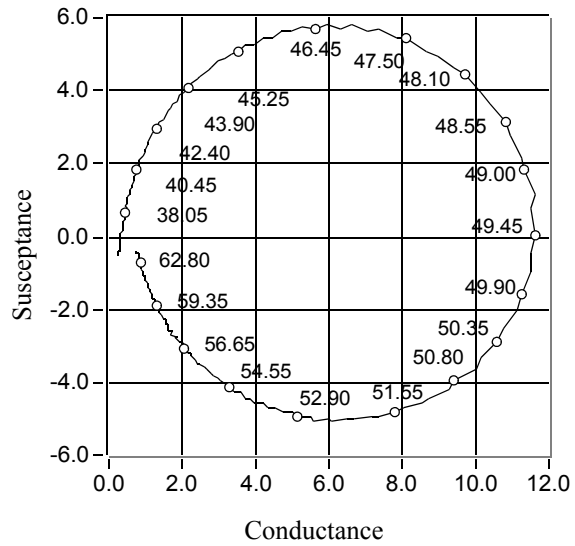
Cable Length: 10.1m (33.0')

Impedance Data w/transformer		
	Balanced	Unbalanced
Parallel: Rp.	70 ohms -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

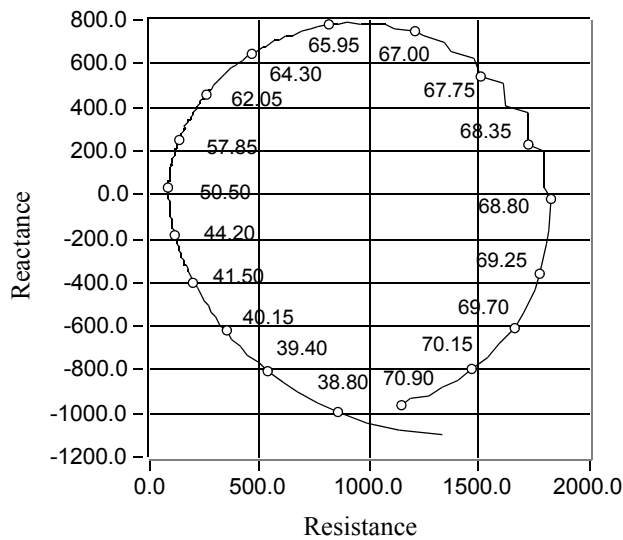
Unbalanced Impedance



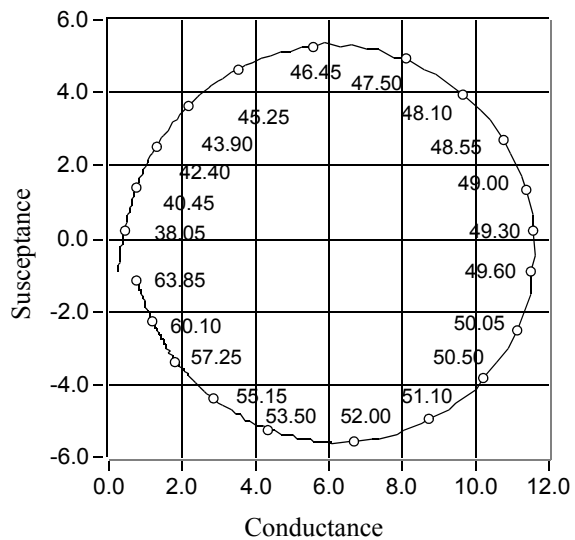
Unbalanced Admittance



Balanced Impedance



Balanced Admittance



50 kHz – AE

Transformed to 130 ohms

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

7x28 mm (1.13") PZT/L

Active Area: 45 cm²

Urethane Window

Beamwidth:

-3 dB: 19°

-6 dB: 27°

-10 dB: 34°

Directivity Index: 18.9

Frequency Tolerance: ±1.5 kHz

Peak TVR⁽¹⁾, nominal: 165 dB

Peak TVR⁽¹⁾, minimum: 163 dB

Q (transmit): 8

Peak Source Level⁽⁴⁾: 216 dB

Peak RVR⁽²⁾, nominal: -169 dB

Peak Figure of Merit⁽³⁾: -14 dB

Notes:

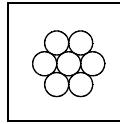
(1) dB re 1 μPa per volt at 1 meter

(2) dB re 1 volt per μPa

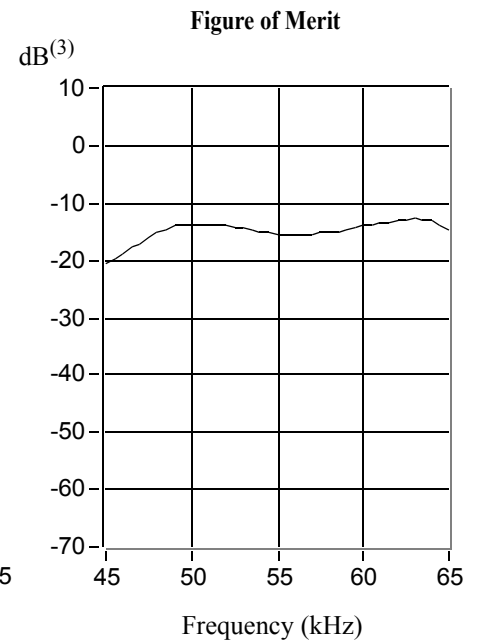
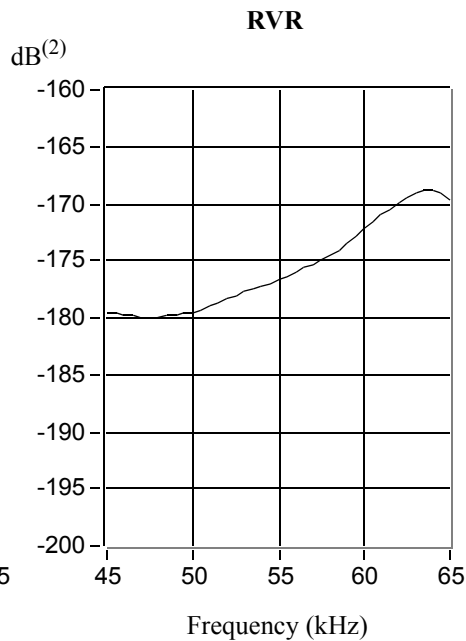
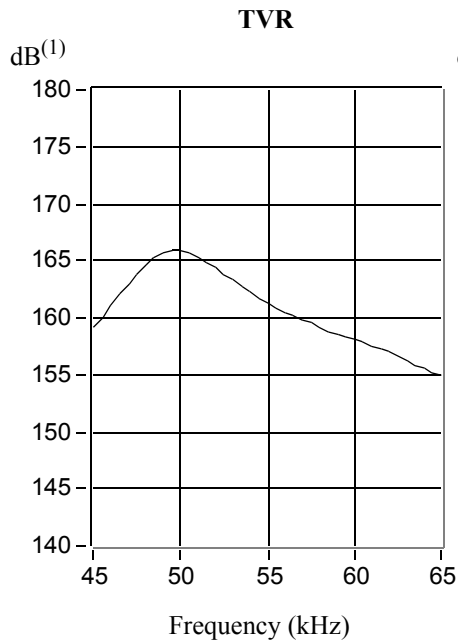
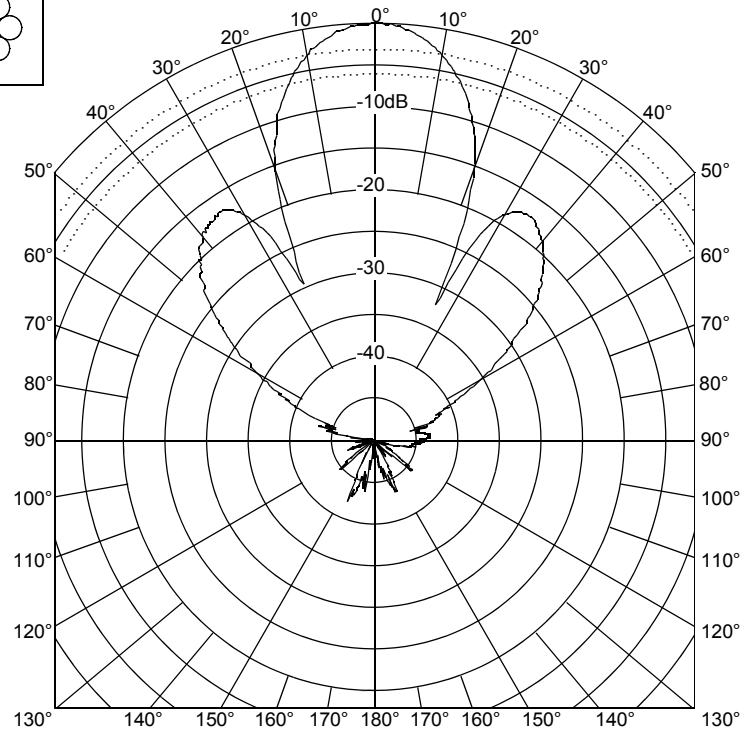
(3) sum of transmitting voltage response and receiving voltage response

(4) Nominal peak TVR, rated power, and no cavitation

Array:



Transmit Radiation Pattern



Technical Data Catalog

50 kHz – AE

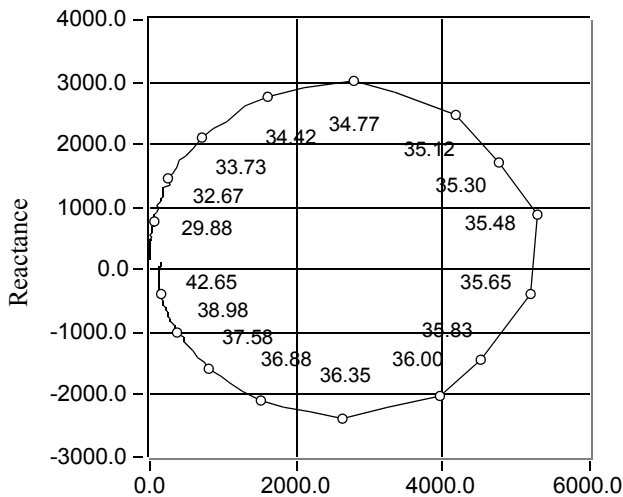
7x28mm (1.13") PZT/L

Cable Type: C44

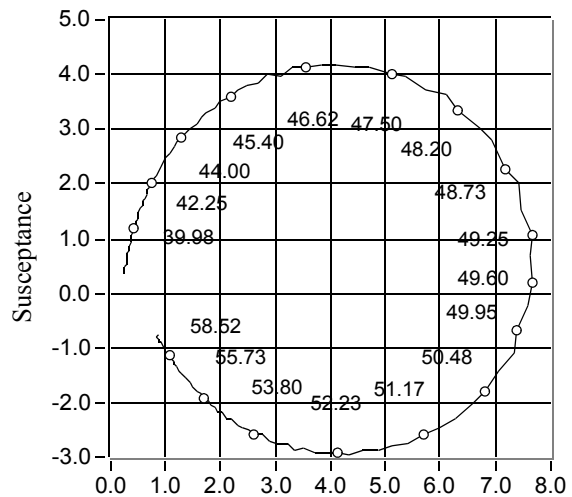
Cable Length: 10.1m (33.0')

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

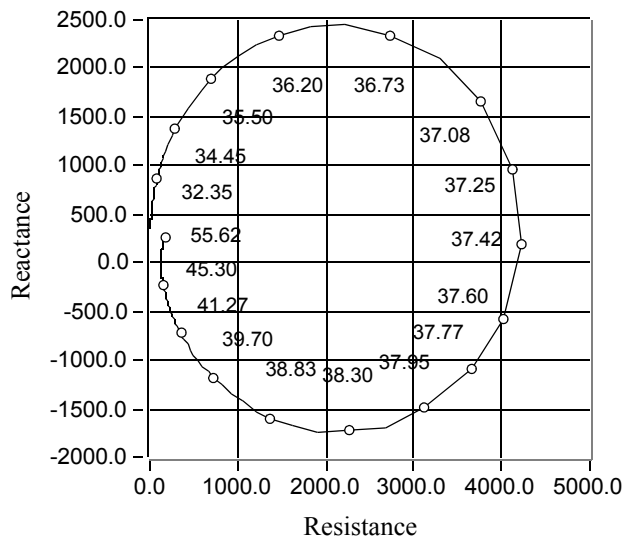
Unbalanced Impedance



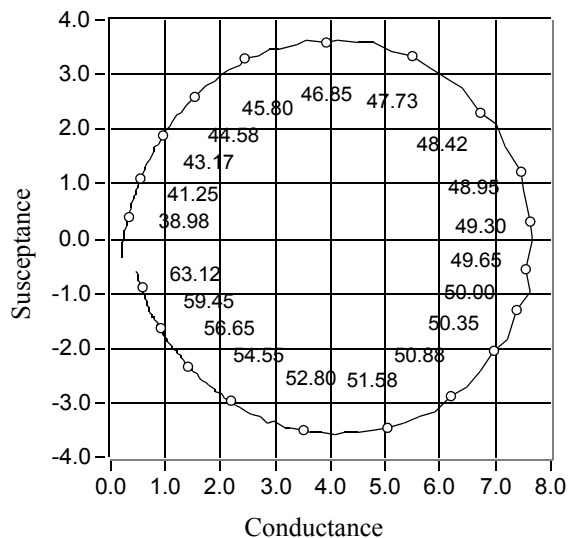
Unbalanced Admittance



Balanced Impedance



Balanced Admittance

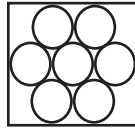


50 kHz-AE

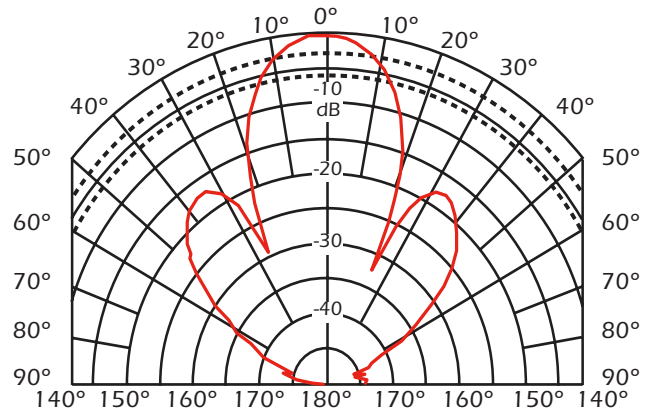
Ceramics Wired in Parallel with Internal Diplexer

Power Rating: 1 kW @ 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

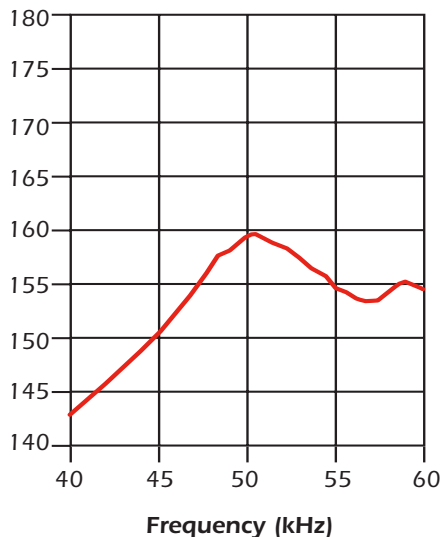


Beamwidth:

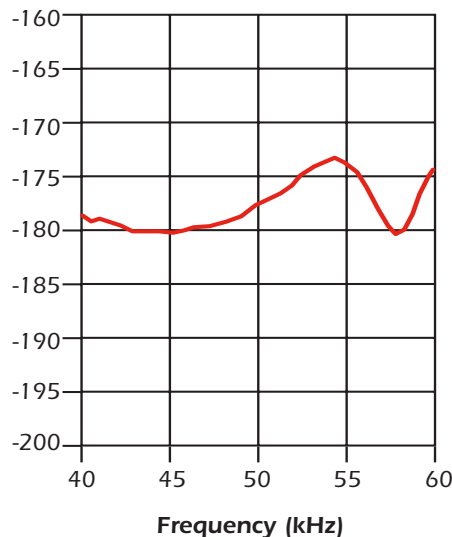
-3 dB: 19°
 -6 dB: 27°
 -10 dB: 34°

Directivity Index: 18.9
 Frequency Tolerance: +/-2kHz
 Peak TVR⁽¹⁾, nominal: 160 dB
 Peak TVR⁽¹⁾, minimum: 158 dB
 Q (transmit): 9
 Peak Source Level⁽⁴⁾: 216 dB
 Peak RVR⁽²⁾, nominal: -173 dB
 Peak Figure of Merit⁽³⁾: -17 dB

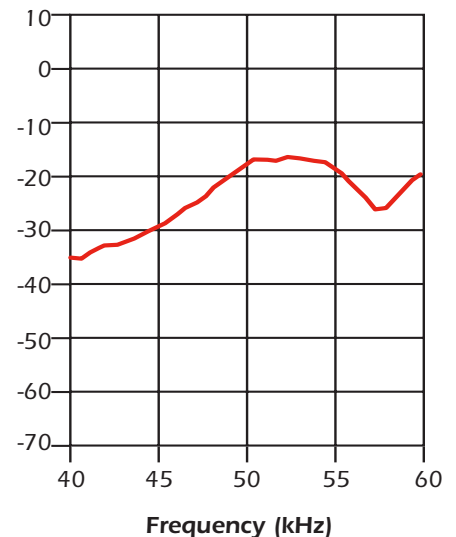
TVR
dB⁽¹⁾



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



Sensing Technology

Technical Data Catalog

50 kHz-AE

7 x 28 mm (1.13") PZT/L

Cable Type: C332

Cable Length: 15 m (50')

Note:

Impedance data includes cable

Impedance Data		
	<i>Balanced</i>	<i>Unbalanced</i>
Parallel: Rp.	370 Ω: -20%, +40%	370 Ω: -20%, +40%
Parallel: Cp. (nominal)	3000 pF	3000 pF
Series [R - jX]: (nominal)	330-j110 Ω	330-j110 Ω
1 kHz capacitance: (nominal)	n/a	n/a

Balance Impedance Table

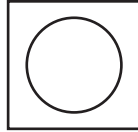
Test Frequency (kHz)	Impedance Magnitude (Ω)	Phase Angle (°)	Series Resistance (Ω)	Series Reactance (Ω)	Parallel Conductance (mS)	Parallel Susceptance (mS)	Parallel Resistance (Ω)	Parallel Capacitance (pF)
40.00	1711.93	-74.35	461.82	-1648.46	0.16	0.56	6346.00	2238.04
41.00	1369.74	-74.86	357.71	-1322.21	0.19	0.70	5244.97	2735.64
42.00	1120.89	-74.52	299.25	-1080.21	0.24	0.86	4198.49	3258.00
43.00	933.83	-73.68	262.44	-896.19	0.30	1.03	3322.75	3803.82
44.00	782.70	-72.03	241.54	-744.50	0.39	1.22	2536.31	4395.83
45.00	659.79	-69.58	230.18	-618.34	0.53	1.42	1891.21	5023.65
46.00	552.84	-65.81	226.56	-504.28	0.74	1.65	1349.01	5708.73
47.00	463.02	-59.94	231.95	-400.73	1.08	1.87	924.28	6329.56
48.00	389.49	-50.35	248.55	-299.87	1.64	1.98	610.33	6554.31
49.00	349.67	-36.22	282.10	-206.61	2.31	1.69	433.42	5488.65
50.00	348.03	-19.12	328.83	-113.99	2.71	0.94	368.35	2995.69
51.00	401.29	-4.23	400.20	-29.60	2.49	0.18	402.39	573.53
52.00	511.46	5.61	509.01	50.02	1.95	-0.19	513.92	-585.27
53.00	686.35	7.17	680.99	85.63	1.45	-0.18	691.76	-545.85
54.00	884.61	1.42	884.34	21.85	1.13	-0.03	884.88	-82.29
55.00	1037.19	-12.89	1011.06	-231.36	0.94	0.22	1064.00	622.35
56.00	966.45	-29.77	838.90	-479.86	0.90	0.51	1113.39	1460.13
57.00	738.19	-37.63	584.63	-450.71	1.07	0.83	932.10	2309.42
58.00	536.29	-24.26	488.92	-220.36	1.70	0.77	588.24	2102.51
59.00	639.83	3.48	638.66	38.82	1.56	-0.09	641.02	-255.81
60.00	1072.37	5.81	1066.87	108.47	0.93	-0.09	1077.90	-250.21



Sensing Technology

200 kHz-BH

Array



with Parallel Inductor

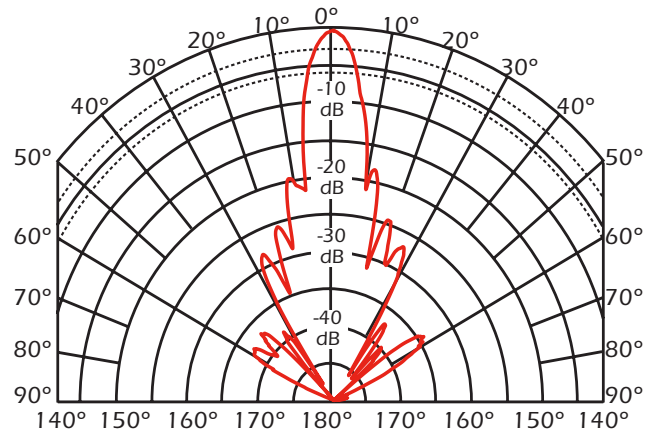
Power Rating: 1 kW rms @ 1% duty cycle
 65 mm (2.56") PZT
 Active Area: 33 cm² (5.1 in²)
 Urethane Window

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

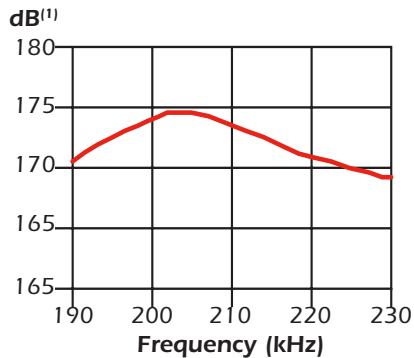
Transmit Radiation Pattern



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

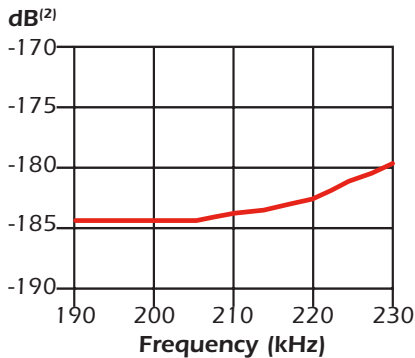
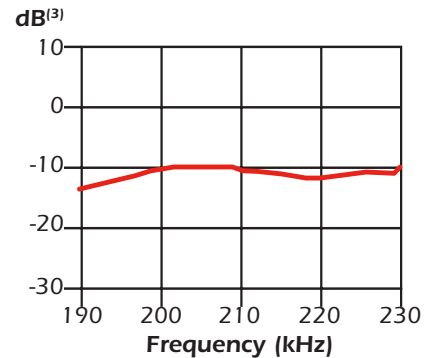


Figure of Merit



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



Sensing Technology

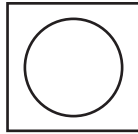
200 kHz-BH

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

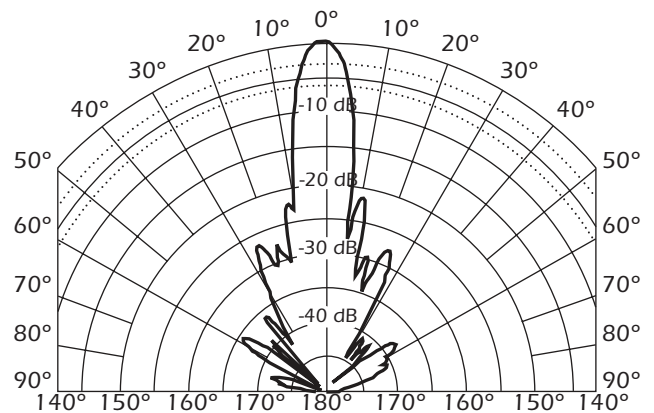
Beamwidth:
 -3 dB: 7°
 -6 dB: 9°
 -10 dB: 12°

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



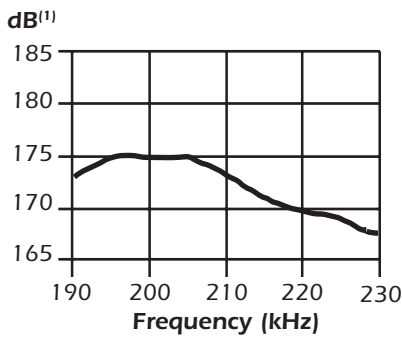
Transmit Radiation Pattern



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

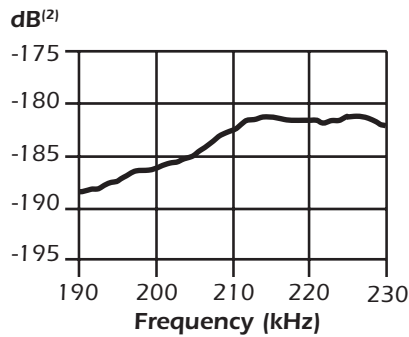
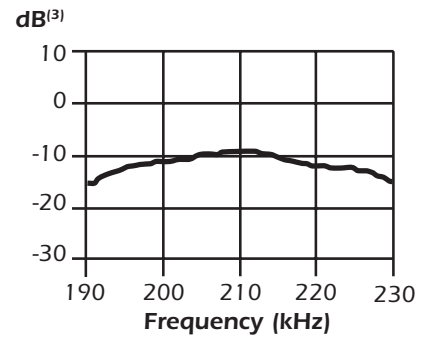


Figure of Merit



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		
	Balanced	Unbalanced
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



Sensing Technology