



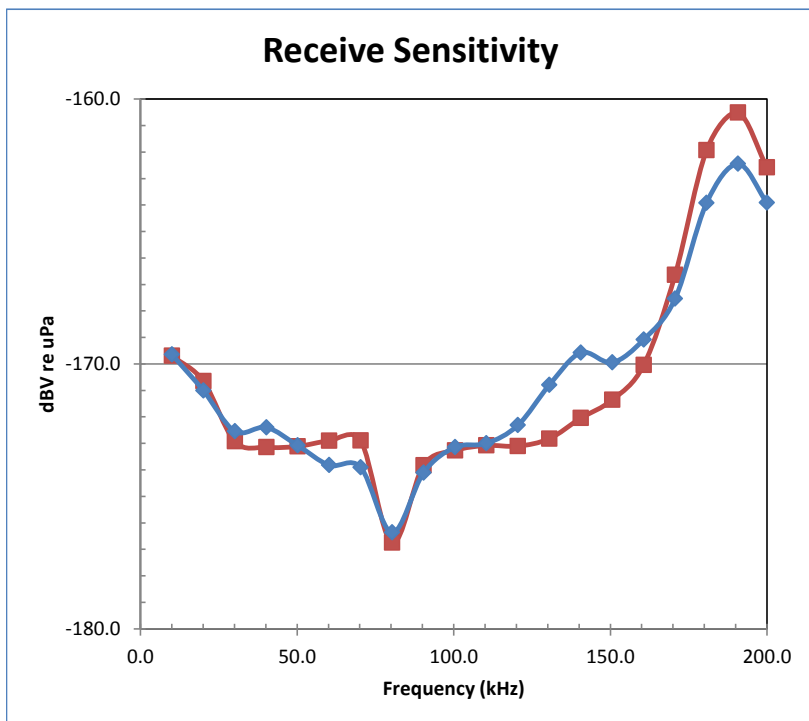
Certificate of Calibration

Ocean Sonics, Ltd.

Calibration Certificate Number: C3953

Test Result: 10 kHz to 100 kHz: -173.2 ± 3.6
 10 kHz to 200 kHz: -168.6 ± 8.1

Model Number	SB60L-ETH	Projector Manufacturer	Ocean Sonics
Serial Number	1636	Projector Model	TH2-SER-4F
Manufacture Date	24-Aug-2016	Projector Serial	2210
Measurement Date	15-Sep-2016	Measurement Distance	1 m
Certificate Date	15-Sep-2016	Output Level	127.8 dB re uPa @ 1 m
Sensitivity @ 26 Hz	-170.83 dB re V / uPa	Tone Burst	8.0 ms / 300 ms
Case Type	Titanium	Reference Manufacturer	Ocean Sonics
Element Manufacturer	GeoSpectrum	Reference Model	SB2-ETH
Element Model	M24HF	Reference Serial	1387
Element Serial	A004803	Primary Calibration	1-Dec-2015
Preamp Model	04-30035-02	Preamp Manufacturer	Ocean Sonics
Calibrated By	S.MacLean	Preamp Model	04-300419-01
Work Order Number	W1429	Preamp Serial	261
Test Type	RX Sensitivity	Preamp Gain	30 dB
Test Procedure	Complex RMS	ADC Manufacturer	Ocean Sonics
Test Location	Tank #2, 1 m	ADC Model Number	04-300423-01
Water Temperature	24 °C	ADC Serial Number	261



Frequency kHz	Sensitivity [dBV re uPa]	
	0 deg	90 deg
10.0	-169.7	-169.6
20.1	-170.7	-171.0
30.1	-172.9	-172.5
40.2	-173.1	-172.4
50.2	-173.1	-173.1
60.2	-172.9	-173.8
70.3	-172.9	-173.9
80.3	-176.8	-176.4
90.4	-173.8	-174.1
100.4	-173.3	-173.1
110.4	-173.1	-173.0
120.5	-173.1	-172.3
130.5	-172.8	-170.8
140.5	-172.0	-169.6
150.6	-171.4	-169.9
160.6	-170.0	-169.1
170.7	-166.6	-167.5
180.7	-161.9	-163.9
190.7	-160.5	-162.4
200.0	-162.6	-163.9