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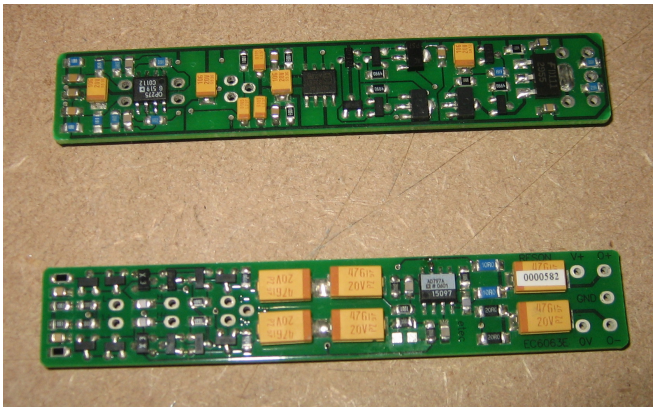
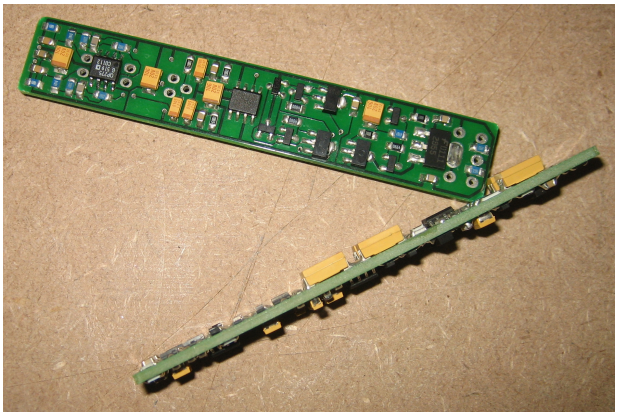
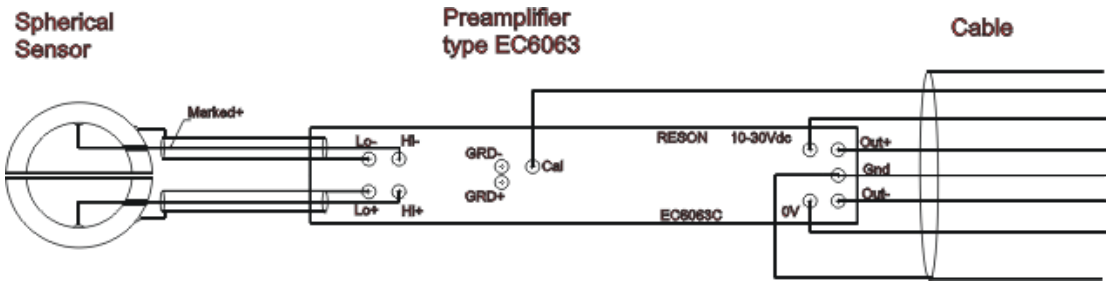
Tech Note: EC6063





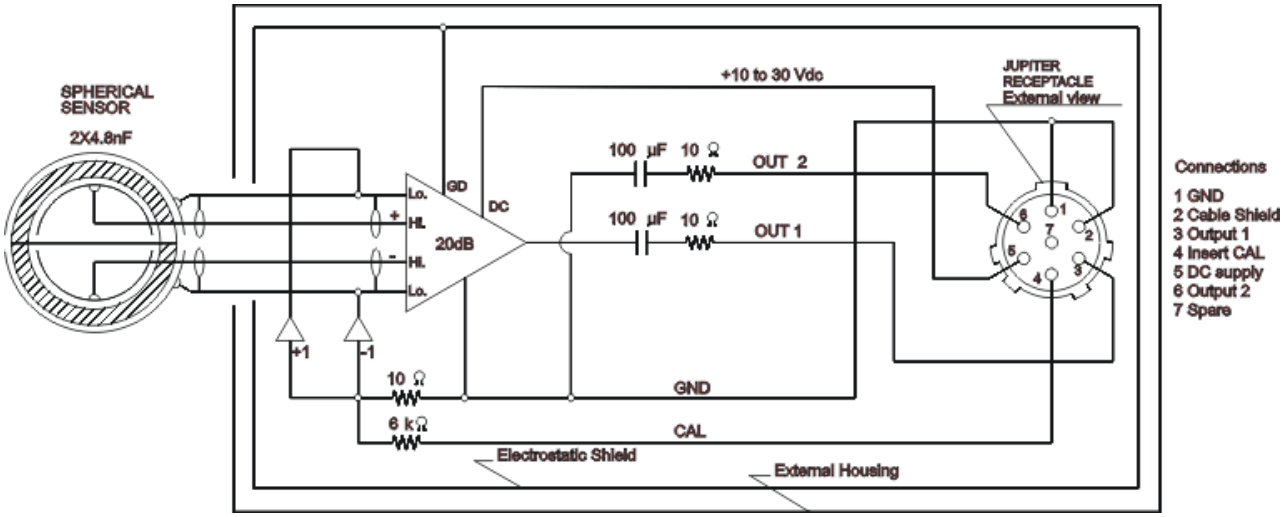
The EC6063 is a high quality low-noise differential preamplifier board. It has been designed for operation with hydrophone sensors with differential output such as the sensor units TC4037 and TC4042C1.
The preamplifier board is delivered as a circuit board without protective housing or shielding but ready for "solder-on connections" of sensor and cable wires.
The circuit board most be protected against moisture which otherwise will degrade the amplifier performance. The positions of the solder points, for connections of the TC4042C1 and the cable wires are shown below:



Wiring of EC6063

High input impedance ensures low noise and frequency operation down to the frequency limit of the built-in 7 Hz high pass filter.
The EC6063 is prepared for operations with ether single end or impedance balanced output.
The single end output is obtained with the signal output wire connected to solder point (+ out). The single end output operation requires a shielded four wires cable, - one for DC supply, one for Signal, one for Ground, and one for Insert Voltage Calibration.
The balanced output mode is established by impedance balance of the two output lines (+ out) and (-out). The advantage of this mode is that induced noise on the cable is cancelled in the receiver module.
The balanced output mode requires an impedance-matched input with a receiver amplifier for cancellation of noise.

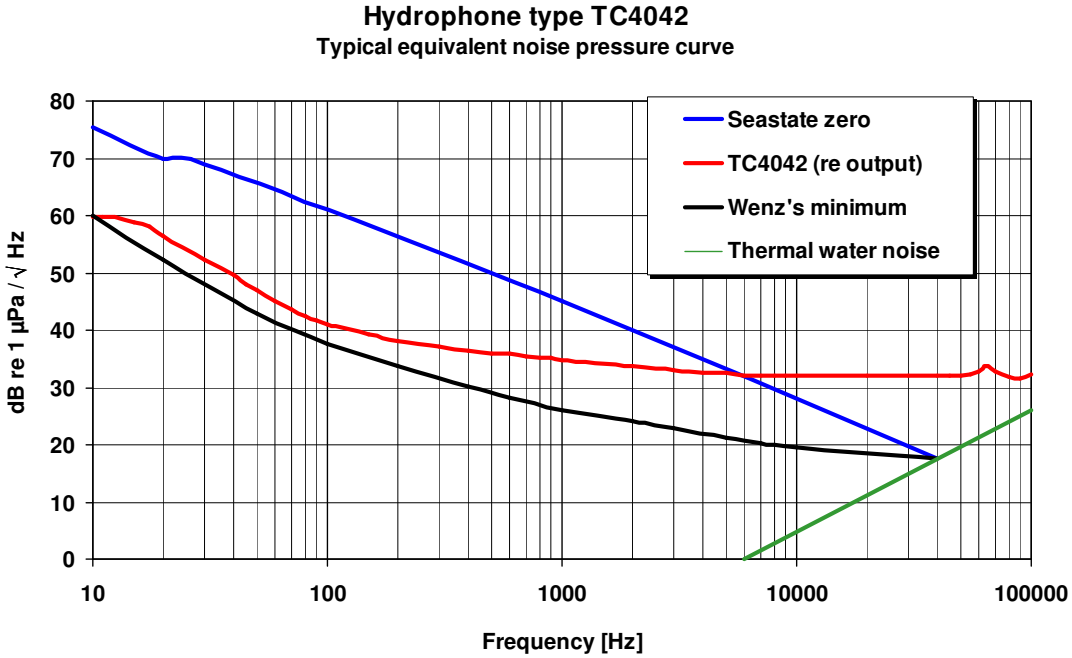
To obtain low noise figures it is extremely important that the preamplifier and wires from the ceramic (sensor element) is proper shielded. An example of this is shown below. The case is TC4042. TC4042 has got an external housing made of brass. Behind the housing there is a shield called guard.



TC4042 case

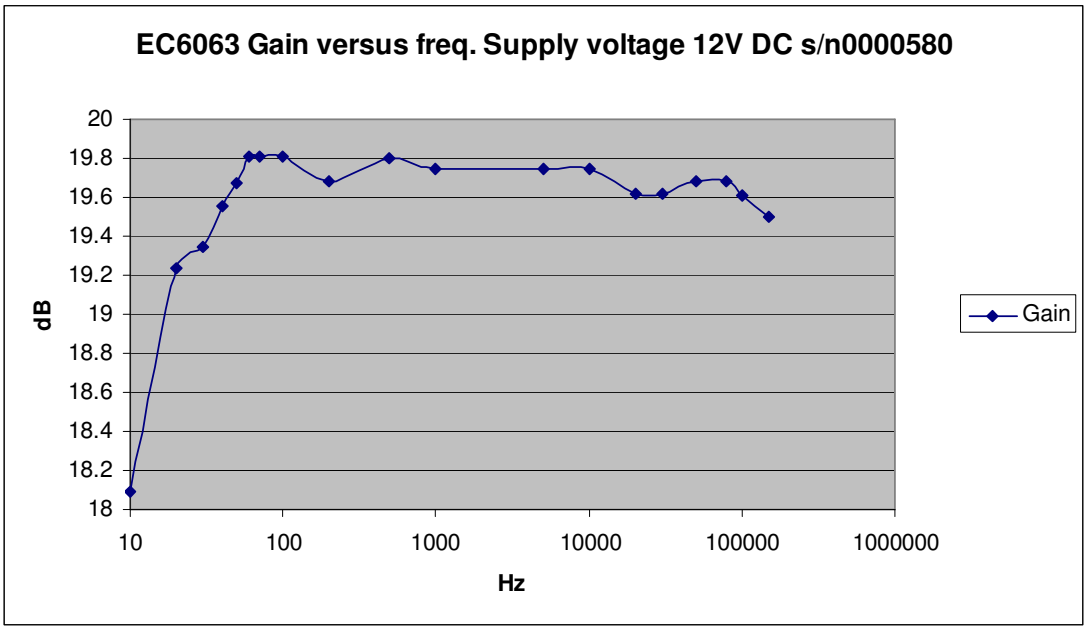
With the proper shielding and a sensor element like TC4037 and 4042C01 the following noise characteristics can be obtained.

Typical equivalent noise pressure curve for EC6063 with 4042C01 sensor element



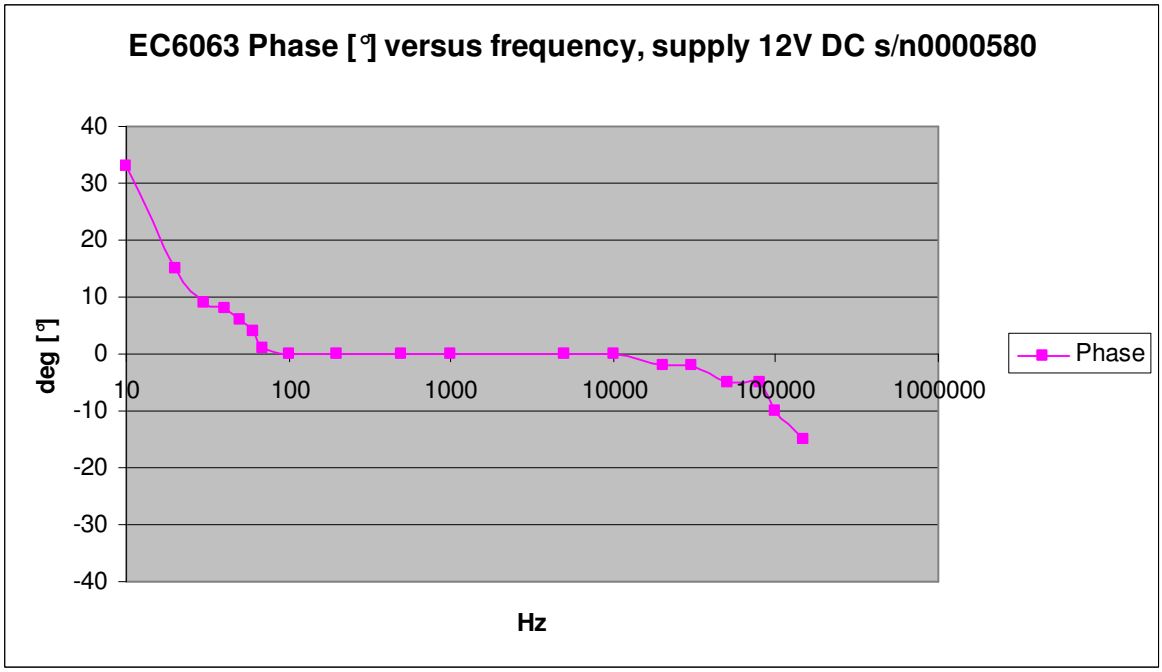
Notice that proper shielding is required.

Response of EC6063 versus frequency 10Hz to 170 kHz



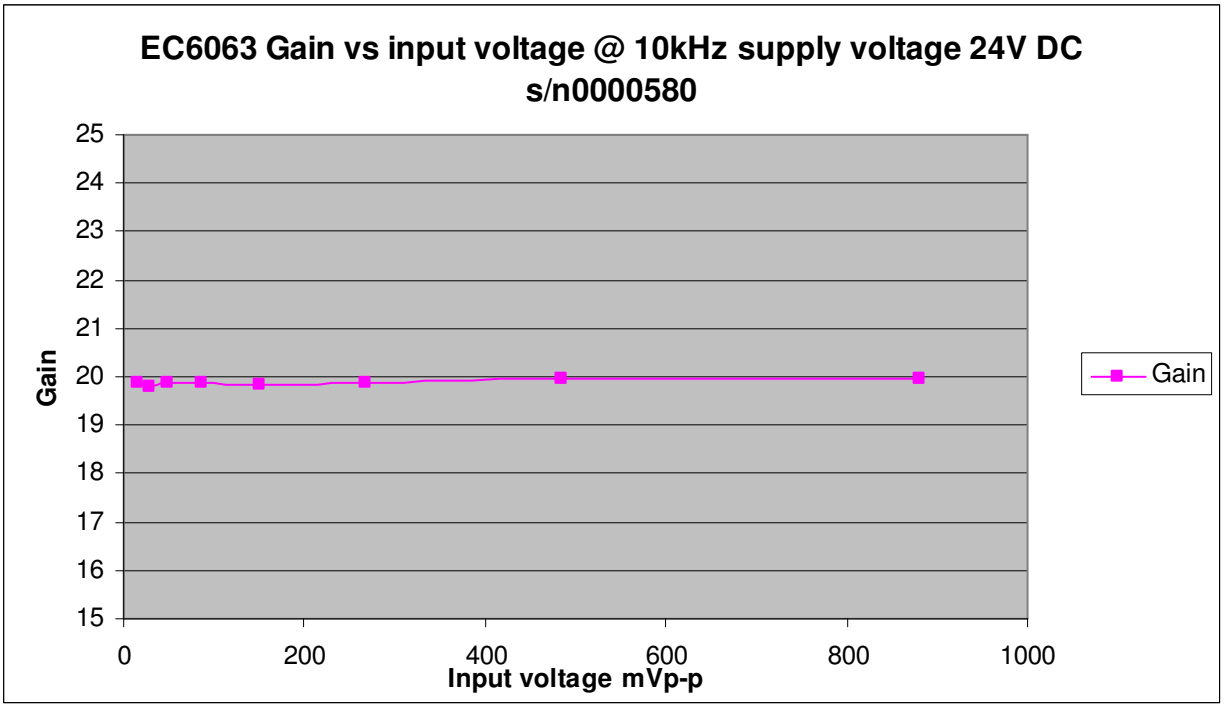
The roll of in the low freq. end is caused by the 7Hz high pass filter (-3dB @ 7Hz, -6dB @ 1MHz).

Phase response of EC6063 versus frequency 10Hz to 170 kHz



The phase response at the low and high frequency ends are caused by the filters built in to the preamplifier board.

Gain of EC6063 preamplifier versus input voltage @ 10 kHz.



Notice that max output voltage from EC6063 is 3Vrms at 12V DC supply and 7Vrms with a 24V DC supply.