

C340-220-5 Communications Transducer

Features

- Centre Frequency of 340 kHz
- Wide bandwidth of 220 kHz
- Transmit response of 158 dB
- Receive response of -221 dB
- Full ocean depth
- Toroidal beam pattern
- Beamwidth of 5 degrees
- Max continuous power 100 W
- Customisation possible

Applications

- Underwater communications
- High speed modem



Description

The C340-220-5 is an electroacoustic ultrasonic transducer for underwater applications. The transduction is achieved through the use of piezoelectric ceramics which allows conversion of electrical signals into ultrasonic waves (transmission mode or projector mode) as well as reverse conversion of ultrasonic waves into electrical signals (reception mode or hydrophone mode).

The C340-220-5 is a small cylindrical transducer with a centre frequency of 340 kHz and a bandwidth of 220 kHz producing an omni-directional toroidal beam pattern with a beam width of approximately 5 degrees at 340 kHz. The wide bandwidth combined with a TVR of 158 dB and OCVR of -221 dB makes this transducer very attractive for underwater communications. As the cylinder has a flooded inner space, it has a depth rating of 11 km.

This datasheet describes the transducer and its electroacoustic properties obtained from tests.

Customisation

The C340-220-5 design can be adjusted to meet custom specifications. Please contact Callaghan Innovation. This includes centre frequency and vertical beamwidth, mounting, cable, protective coating, etc.

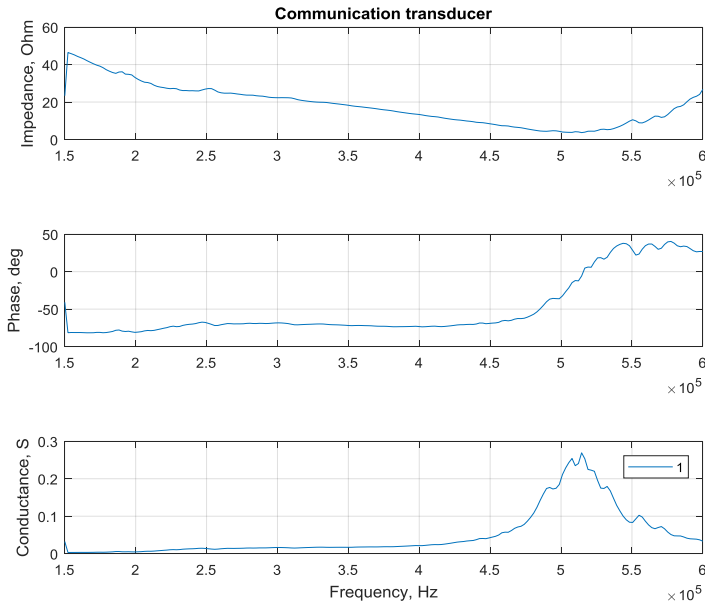
Technical specifications

Unless otherwise noted the specifications are for 20 °C transducer and ambient water temperature. Measured values are with 1 metre cable attached.

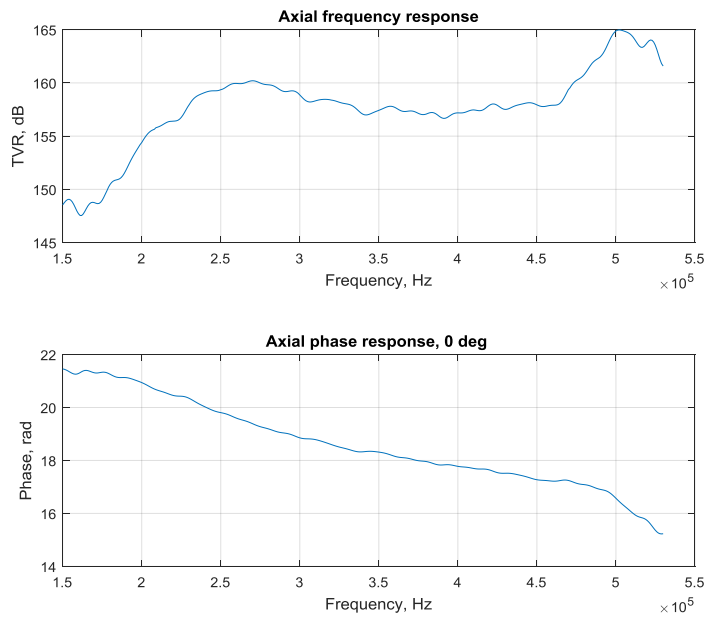
Parameter	Min	Typ	Max	Unit
Centre frequency		340		kHz
Bandwidth (-3 dB)	230		450	kHz
Impedance magnitude	8	19*	26	Ohm
Impedance phase	-73	-70*	-69	deg
Transmit response (TVR)**	157	158*	160	dB
Receive response (OCVR) ***	-229	-221*	-216	
Beamwidth	3.5	5*	8	deg
Side lobes		TBD		dB
Maximum peak power input			500	W
Maximum continuous power input			100	W
Maximum transducer depth			11	km
Weight without cable (in air)			0.3	kg
Storage temperature	-10		50	°C
Dimensions	Diameter 50 mm, height 55 mm			

* At the centre frequency, ** re 1 μ Pa per 1 V, *** Open circuit voltage response re 1 V per 1 μ Pa

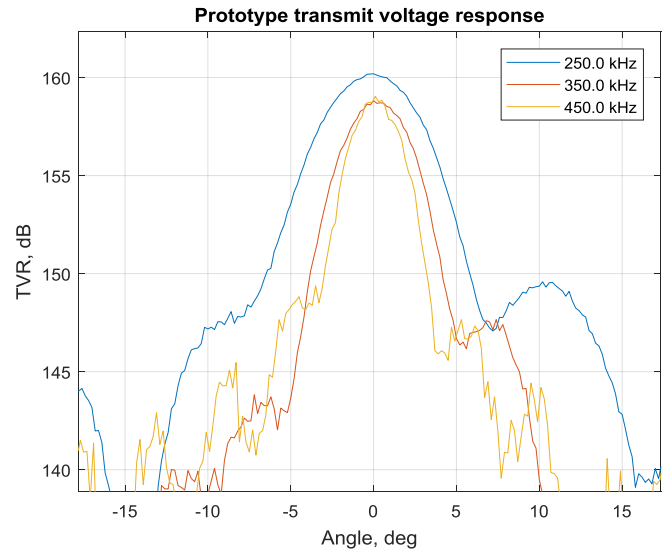
Electrical impedance and conductance



Frequency response (TVR)



Directivity patterns in vertical plane



The horizontal plane directivity pattern is circular with variations of approximately ± 0.5 dB.

Revision history

Date	Version	Notes
14 May 2018	1.0	First release

69 Gracefield Rd
PO Box 31310
Lower Hutt 5040
New Zealand

Telephone: +64(0) 4 9313 061 or +64(0) 4 9313 262
E-mail: marco.meijer@callaghaninnovation.govt.nz or
E-mail: eugene.stytsenko@callaghaninnovation.govt.nz
Within New Zealand 0800 4 CALLAGHAN (0800 422 552)
From overseas: +64 4 931 3578

[https://www.callaghaninnovation.govt.nz/research-papers?f%5Bsearch%5D=Underwater Ultrasound](https://www.callaghaninnovation.govt.nz/research-papers?f%5Bsearch%5D=Underwater+Ultrasound)