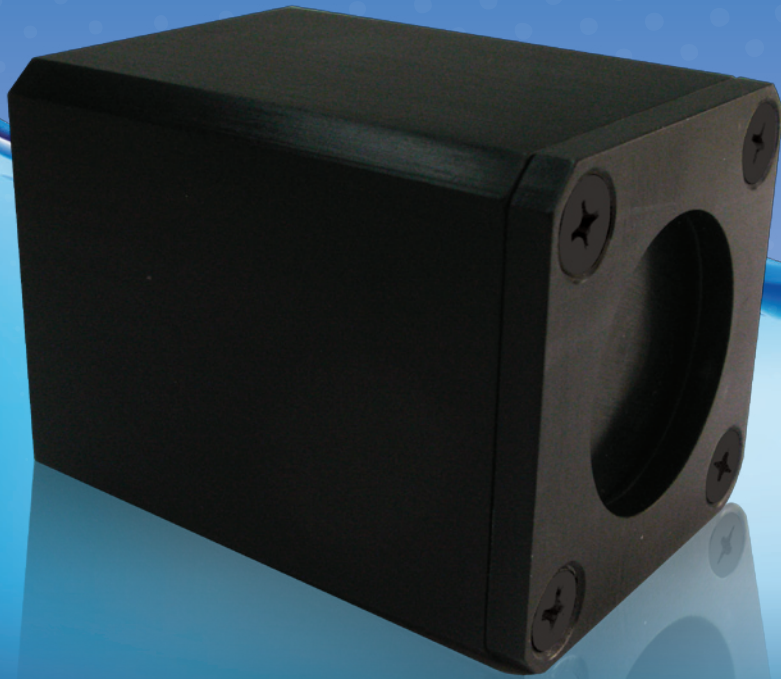


PROJECTOR TP16 AND ARRAYS

Powered by PZN-PT Single Crystal Technology



- **Compact**
(only 24 mm in thickness in bare, unpackaged form)
- **Low-frequency wide-band imaging**
(fundamental mode: 16 ± 4 kHz)
- **Wide-band communication**
(12-52 kHz operating frequency range)
- **Power efficient**
(180 dB source level per element at 20W without d.c. bias)



3x8 panel array



8-element ring array

Despite its low operating frequency from 12 kHz onwards, MMT TP16 projector is only about 24 mm thick in bare, unpackaged form. Its compact size, extremely broad bandwidth and power efficiency make TP16 ideal for wide-band communication and imaging sonar. This includes imaging of buried objects, particularly as conformal sonar arrays on AUV/UUV and other similar platforms.

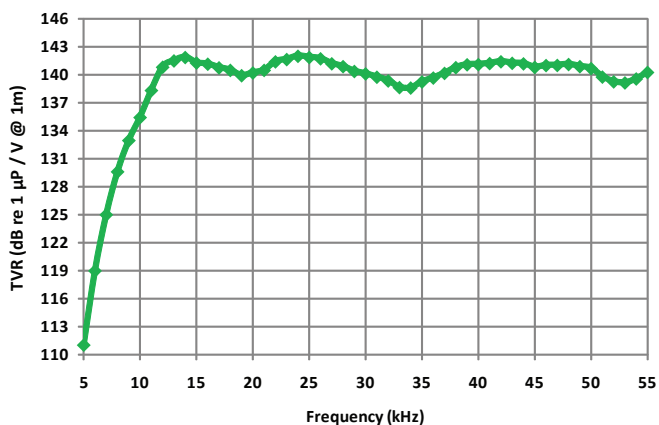
Specifications

Description	Specifications
Individual TP16 Element	
Operating frequency range (kHz)	12 - 52
Design fundamental frequency (kHz)	16 ± 4
Transmit voltage response (dB re 1 μ Pa/V @ 1 m)	140
Source level @ 100 V_{rms} (dB re 1 μ Pa @ 1 m)	180
Receive sensitivity (dB re 1 V/ μ Pa)	Better than -192
Beam pattern	Conical
Vertical beam width [-3dB](degrees) @ 15 kHz / @ 30 kHz	100-120 / 50-65 (approx.)
Horizontal beam width [-3dB] (degrees)	Omni-directional (approx.)
Input power (W)	≤ 20
Operating depth (m)	200
Dimensions - bare (mm)	$\phi 33 \times 24$ (H)
Dimensions - packaged (mm)	45 (L) x 45 (W) x 84 (H)
Weight - bare / packaged (grams)	60 / 350
Casing material	Al 5083 (hard black anodized)
Underwater connector on projector	SEACON® XFS-2-BC
Mating connector	SEACON® RMF-2-FS
Customized TP16 Arrays	
Acoustic characteristics and input power requirement	Can be predicted using beam forming theory and above elemental characteristics
Minimum center-to-center separation of elements for panel arrays (mm)	39
Minimum height of TP16 panel arrays excluding mounting plate (mm)	35 (approx.)
Other details	Please contact us

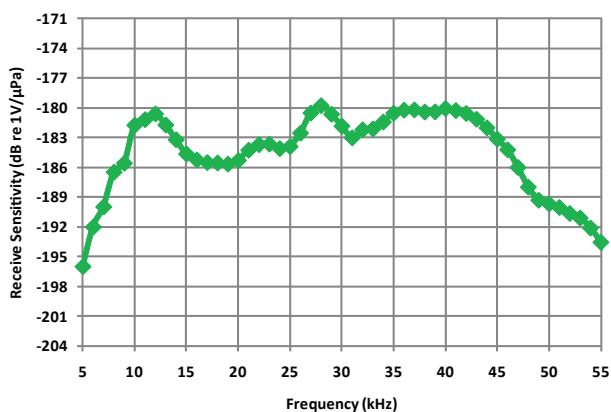
Specifications are nominal and may be changed without prior notice.

PERFORMANCE CHARTS

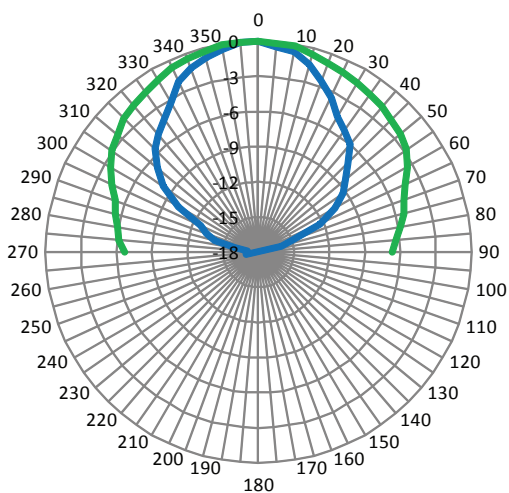
Transmit Voltage Response



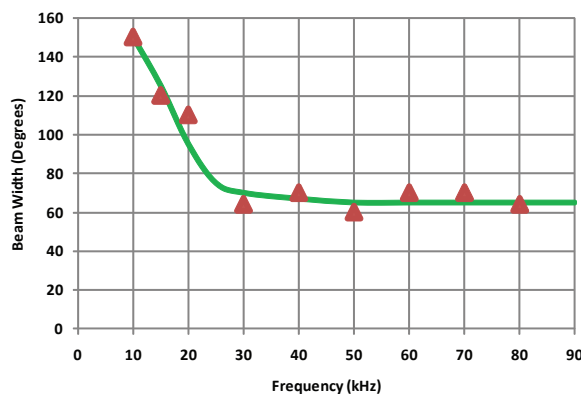
Receive Sensitivity



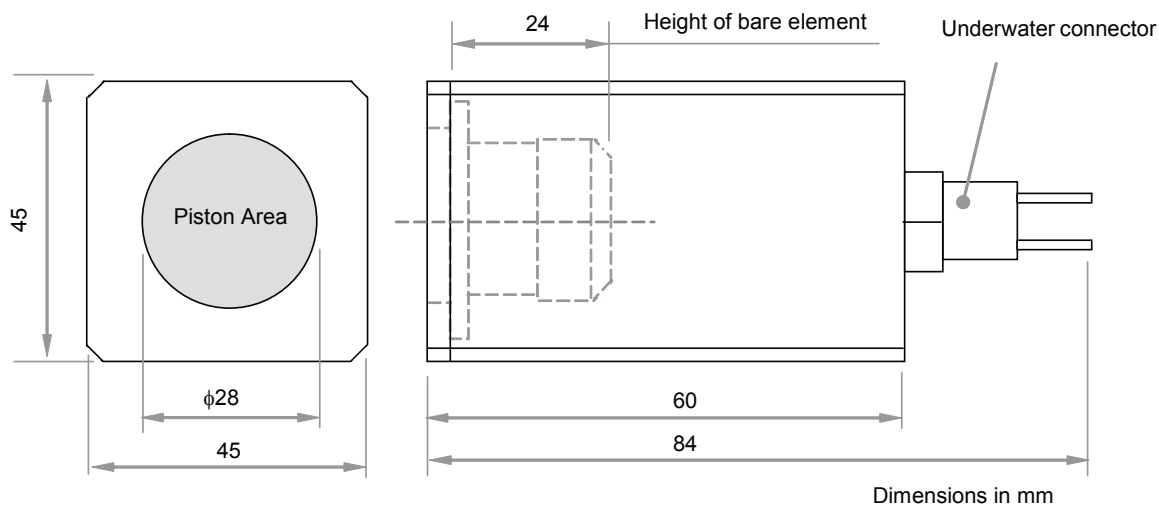
Vertical Beam patterns @ 15 kHz (green) & @ 30 kHz (blue)



Vertical Beam Width vs Frequency



SCHEMATIC DRAWING OF PACKAGED PROJECTOR



Please contact us for dimensions of customized TP16 arrays.

Microfine Materials Technologies Pte Ltd

10 Bukit Batok Crescent, The Spire #06-02, S(658079) SINGAPORE

Tel/Fax: +65 6515 3122 Web: www.microfine-piezo.com

Product & Sales Enquiries: sales@microfine-piezo.com

Technical & Other Enquiries: info@microfine-piezo.com

