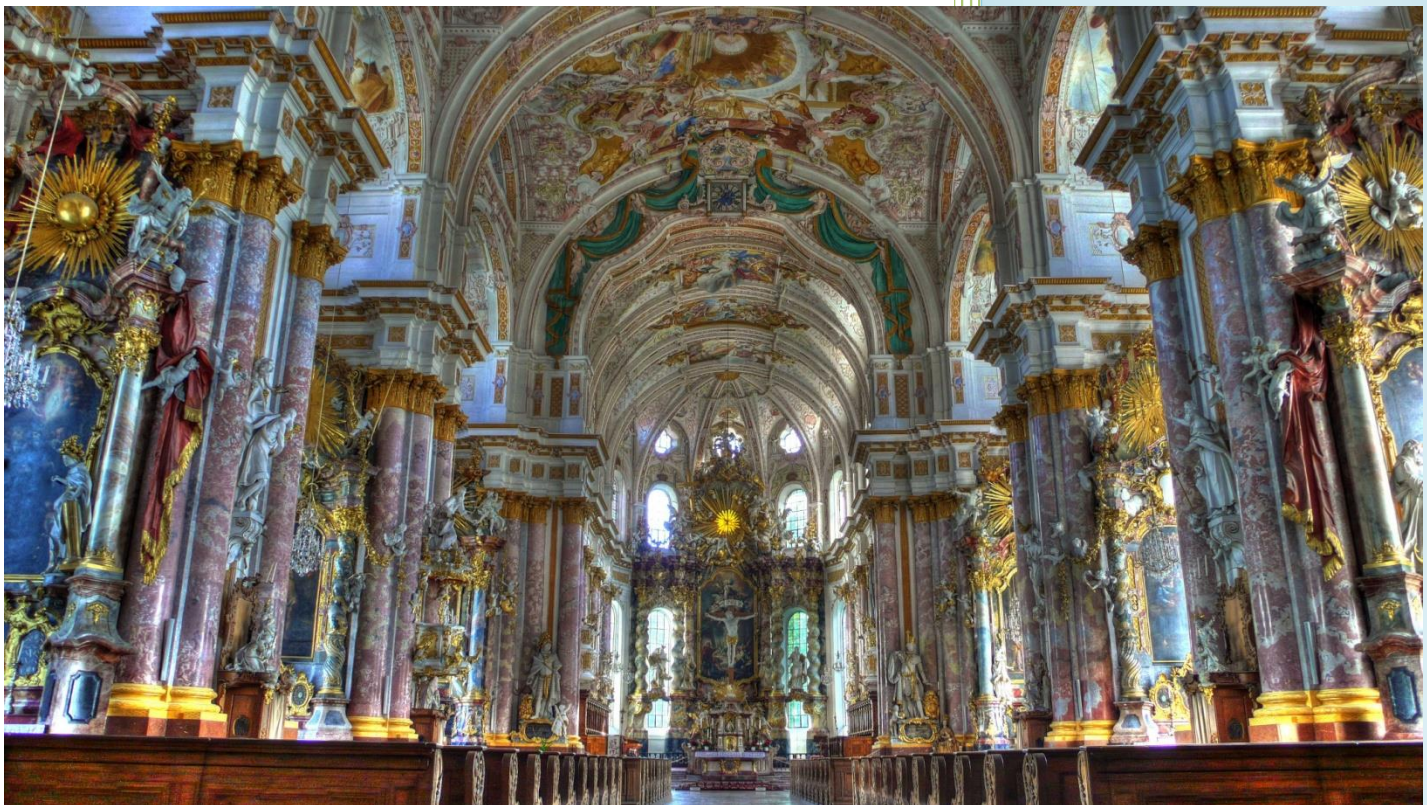


**AVE Audio**

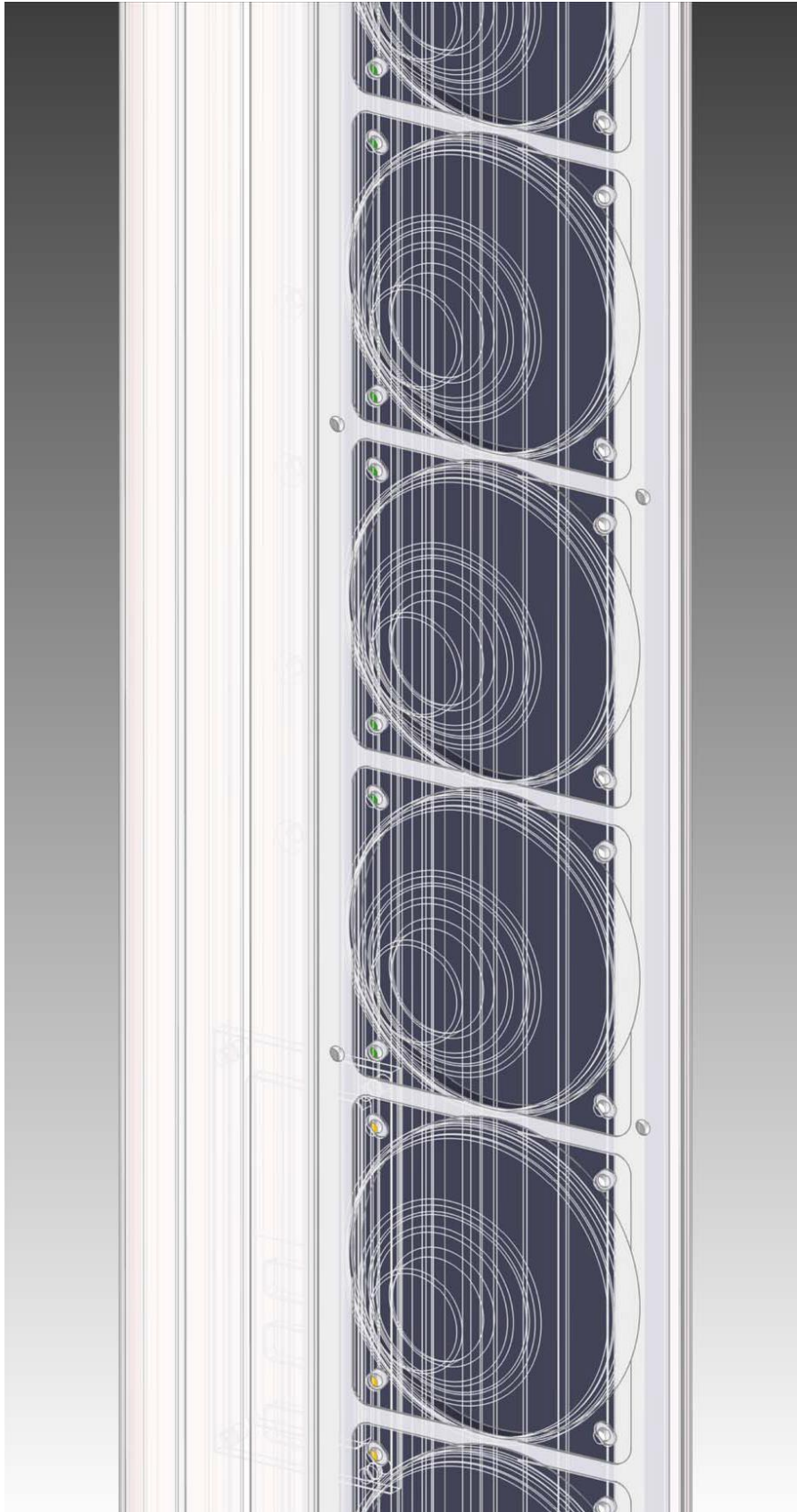
Digitally Steerable Column Speaker  
*Ascolto*<sup>®</sup>



**A.V.E. GmbH**

**Audio Vertriebs-Entwicklungsgesellschaft**

**Germany**



**Digitally  
Steerable  
Column  
Speaker**  
*Ascolto*<sup>®</sup>

**FF2470  
Datasheet**

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## 1.0 – Acoustic Specifications

### Frequency Bandwidth

80 Hz to 20 kHz ( $\pm 2$  dB)

### Maximal SPL

135 dB (A-Weighted at 1 m)

### Nominal SPL

119 dB (A-Weighted at 1 m),  
 108 dB (A-Weighted at 10 m),  
 105 dB (A-Weighted at 20 m),  
 103 dB (A-Weighted at 30 m),  
 98 dB (A-Weighted at 40 m)

### Coverage

|                       |  |
|-----------------------|--|
| Horizontal (fixed)    | 110° (-6 dB average 500 Hz to 8 kHz)   |
| Vertical (adjustable) | Tilting Up/Down Angle: -60° to 60° in 0.1° intervals<br>Opening Angle: 8° to 40° in 0.1° intervals |
| Typical Throw         | 40 m   |
| Maximum Throw         | 50 m   |

### Dynamic Range

102 dB (f=1 kHz, AES17 filter)

### Transducers Type

|          |                                |
|----------|--------------------------------|
| Number   | 24 Coaxial Loudspeakers        |
| Diameter | 4.0" Woofer + 1.0 Dome Tweeter |
| Magnets  | Neodymium                      |

## 2.0 – Electrical Specifications

### Audio Input 1: Line 0 dBu

|                     |                   |
|---------------------|-------------------|
| Input Level Nominal | 0 dBu (2.19 Vpp)  |
| Input Level Maximum | 10 dBu (6.92 Vpp) |
| Type                | Balanced          |
| Impedance           | 20 kΩ at 1 kHz    |

### Audio Input 2: 100 V (not available in Ascolto – Dante Series)

|                     |                           |
|---------------------|---------------------------|
| Input Level Nominal | 39.2 dBu (200 Vpp)        |
| Type                | Balanced with Transformer |
| Impedance           | 20 kΩ at 1 kHz            |

### Audio Input 3: Dante Audio Networking (available only in Ascolto – Dante Series)

|                   |   |
|-------------------|---|
| Network           | Dante Audio over IP                                 |
| Transport Layer   | Ethernet  |
| Dante Latency     | 1, 2, or 5 ms (configurable using Dante Controller) |
| Support for AES67 | Yes   |
| Sample Rates      | 48 kHz  |
| Bit Depths        | 24  |

### Power Amplifiers

|                  |   |
|------------------|---|
| Type             | PWM (Class D)                                 |
| Output Power     | 24 × 70 W <sub>rms</sub>                      |
| Power Efficiency | 92%   |
| THD+N            | 0.025% at 10 W <sub>rms/channel</sub> , 1 kHz |
| Input Signal     | Balanced                                      |

|                         |  |
|-------------------------|--|
| Channel Protections     | Thermal Shutdown ( $T_{\text{junction}} > 150^{\circ}\text{C}$ )<br>Output Short Circuit   |
| <b>DSP Module</b>       |  |
| DSP Processors          | 48 bit Fixed Point DSP<br>76-bit Internal Accumulator<br>145 MHz   |
| Sample Rate             | 48 kHz   |
| A/D Conversion          | Resolution: 24 bit Linear PCM<br>Conversion: 1-bit delta-sigma 512x<br>Sample Rate: 48 kHz<br>SNR: 112 dB (A-Weighted)   |
| D/A Conversion          | Resolution: 24 bit Linear PCM<br>Conversion: upsampling 128x<br>Sample Rate: 48 kHz<br>SNR: 105 dB (A-Weighted)  |
| Signal Processing       | Beam Forming Filtering<br>Input Equalization (10 Biquad)<br>Volume (-120 dB <sub>FS</sub> to 0 dB <sub>FS</sub> )<br>Delay (0 m to 30 m, step 0.1 m)<br>Dynamic Compressor 2-Bands<br>Input Signal Activity Detector |
| <b>Control Module</b>   |  |
| Processor               | 32 bit ARM-Cortex M3<br>RISC<br>50 MHz   |
| Setup Network Interface | RS485, Half Duplex, 115200 baud/s  |

|                         |  |
|-------------------------|--|
|                         | 120 $\Omega$ Parallel Termination (recommended for long distance)<br>This network interface is used by AVE Line Array User Control software to manage beam setup and other audio features.   |
| Dante Network Interface | Ethernet, 100 Mbit/s (available only in Ascolto – Dante Series).   |
| Processor Activities    | DSP Firmware Booting<br>DSP Status Monitoring<br>PWM Power Amplifier Functions Controlling<br>PWM Power Amplifier Status Monitoring<br>Audio Input Channel Functions Controlling<br>Dante-Chip Ultimo XXT Control (in Ascolto – Dante Series)<br>Auto Stand-By Controlling<br>RS485 Communication<br>Infrared Communication<br>Panel LEDs Controlling<br>Firmware Updating |

## Connectors

|                         |  |
|-------------------------|--|
| Audio Inputs Connector  | 3-pole, 3.81 mm-pitch  |
| Audio Inputs Pinout     | pin 1: hot signal (+)<br>pin 2: cold signal (-)<br>pin 3: earth (chassis ground)   |
| RS485 Network Connector | 3-pole, 3.81 mm-pitch  |
| RS485 Network Pinout    | pin 1: data +<br>pin 2: data -<br>pin 3: digital ground  |
| Dante Network Connector | 8 pin Ethernet RJ45, female connector  |
| Mains Connector         | Socket Wago cod. 770-103 with strain relief housing, 3-pole, 4,00 mm <sup>2</sup> , ratings 250 VAC, 25 A, IEC/EN 60664-1, UL 1977 |

| PSU Module  |   |
|---|---|
| AC Range  | 90 VAC to 264 VAC (Universal Input)   |
| Input Frequency                                   | 47 Hz to 67 Hz  |
| Efficiency  | 91% typ at 230 VAC  |
| Power Factor Correction                           | Yes   |
| Input Current at Full Load                        | 12.0 A typ at 115 VAC<br>6.0 A typ at 230 VAC   |
| Power Consumption                                 | Continuous: 1080 VA<br>Peak: 1404 VA<br>Idle: 36 VA<br>Stand-By: 12 VA                              |
| Protection  | Thermal Protection<br>Short Circuit Protection<br>Output Current Limiting<br>Under-Voltage Lock Out |
| Main Fuse   | 1 × 10 A (slow blow)  |
| Electromagnetic compatibility<br>(EMC), Emissions | EN 55022, class B, FCC part 15, level B<br>IEC/EN 61000-3-2 class B                                 |

### 3.0 – General Specifications

| Mechanical |                                     |
|------------|-------------------------------------|
| Height     | 3044 mm                             |
| Width      | 122 mm                              |
| Depth      | 120 mm                              |
| Weight     | 28.7 Kg (63.2 lbs)                  |
| Cabinet    | Powder Coated<br>Aluminum Extrusion |



|                |                                    |
|----------------|------------------------------------|
| Colour         | RAL 9010                           |
| Special colour | Available for an additional charge |

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### Temperature Range

0°C to 40°C (32°F to 102°F)

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### Protection Class

IP 54

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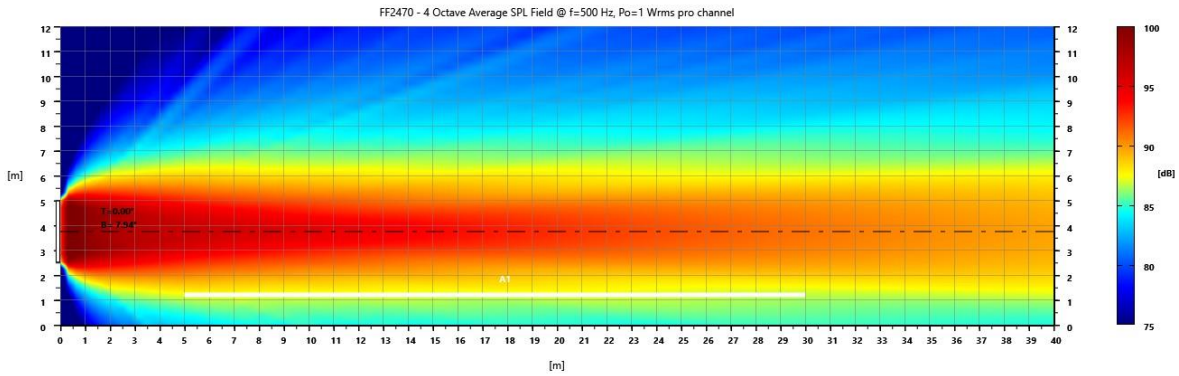
### Certificates

CE

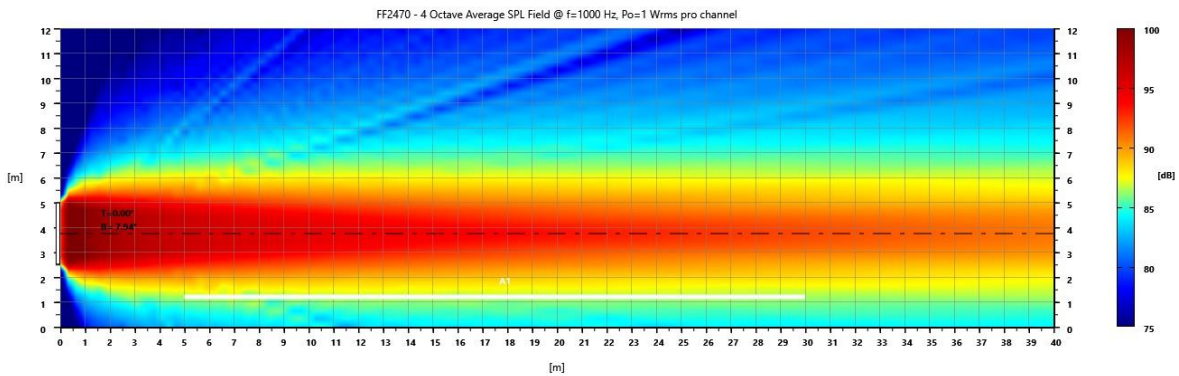
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- 1) Rated power measured with pink noise signal, 6 dB crest factor.
- 2) Polare response: -6 dB average 500 Hz to 8 kHz.

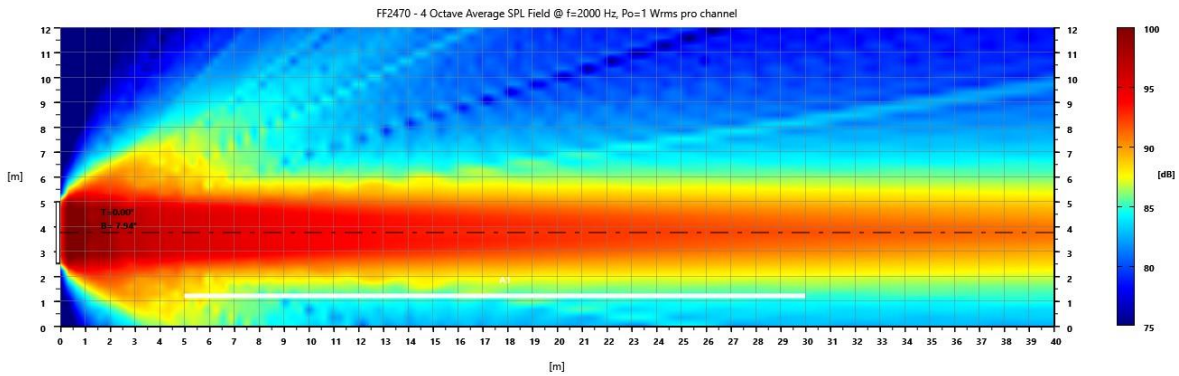
## 4.0 – Vertical Beam Pattern



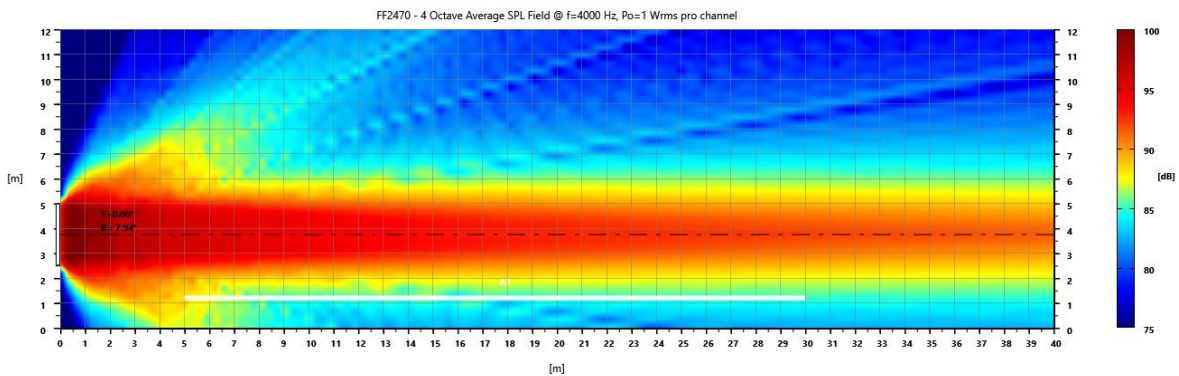
**FF2470 – Vertical Beam Shape at 500 Hz, 4 Octaves average**



**FF2470 – Vertical Beam Shape at 1000 Hz, 4 Octaves average**

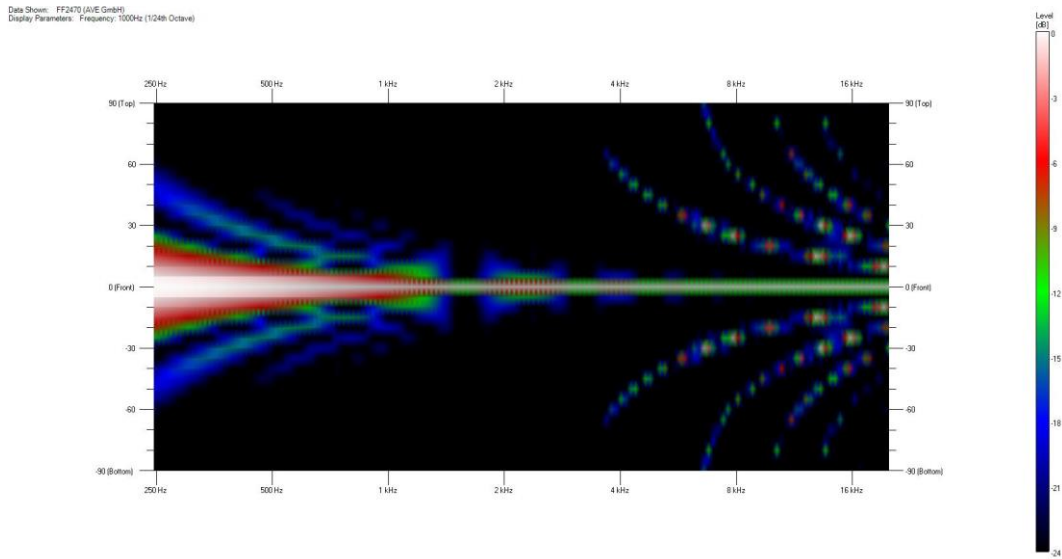


**FF2470 – Vertical Beam Shape at 2000 Hz, 4 Octaves average**

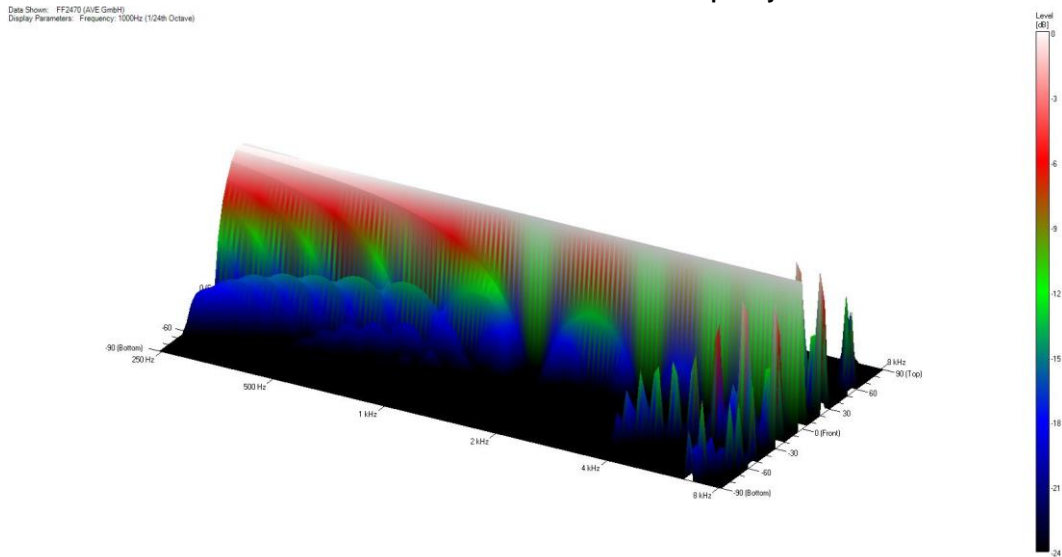


**FF2470 – Vertical Beam Shape at 4000 Hz, 4 Octaves average**

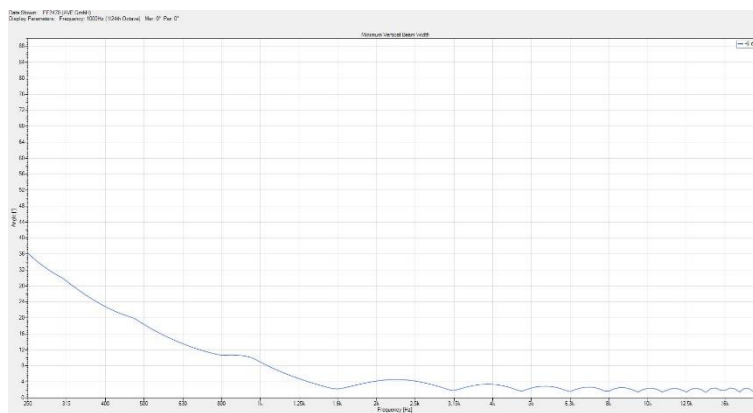
## 5.0 - Vertical Beam Width



FF2470 – 2D Vertical Beam Width vs Frequency

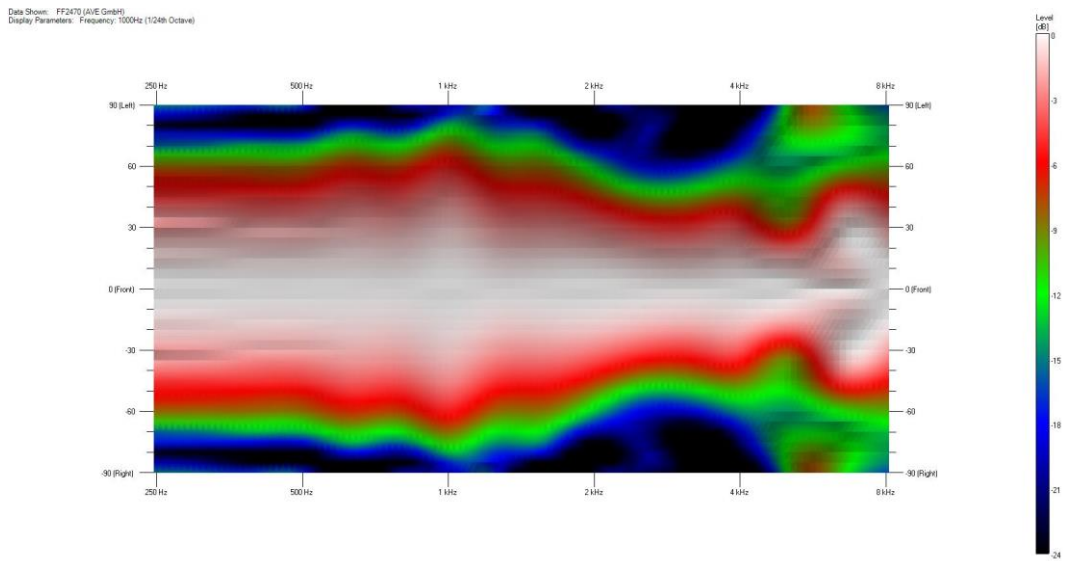


FF2470 – 3D Vertical Beam Width vs Frequency

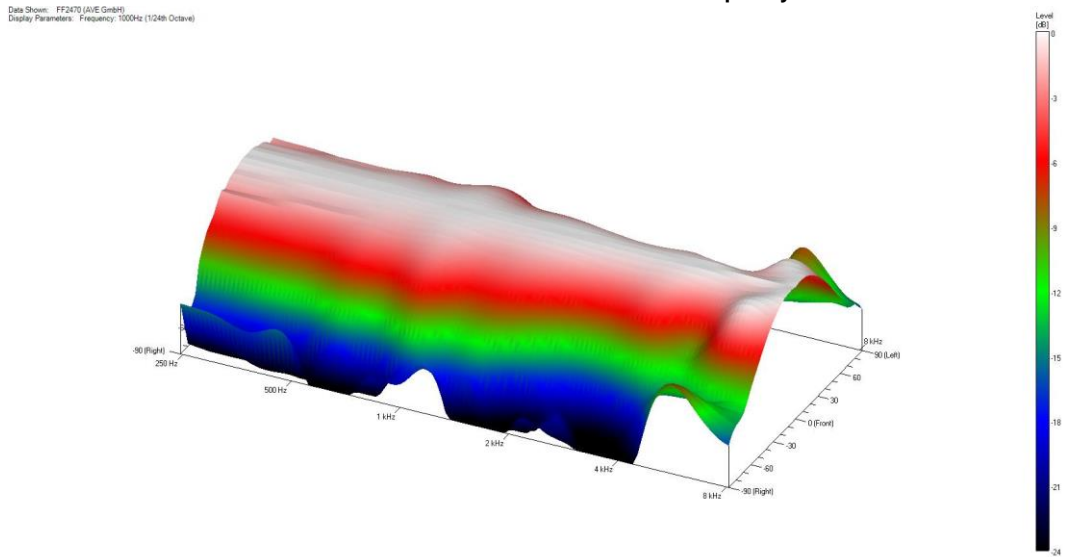


FF2470 – Vertical Beam Width vs Frequency

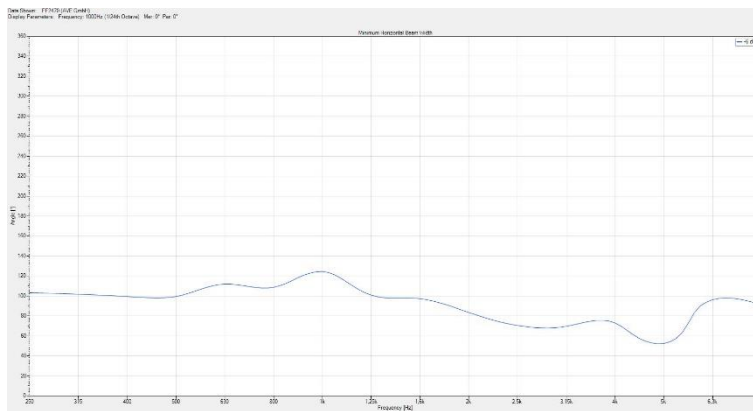
## 6.0 - Horizontal Beam Width



**FF2470 – 2D Horizontal Beam Width vs Frequency**



**FF2470 – 3D Horizontal Beam Width vs Frequency**



**FF2470 – Horizontal Beam Width vs Frequency**

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FF2470 DATASHEET - V1.2.0 - 02/2024