AVE GmbH

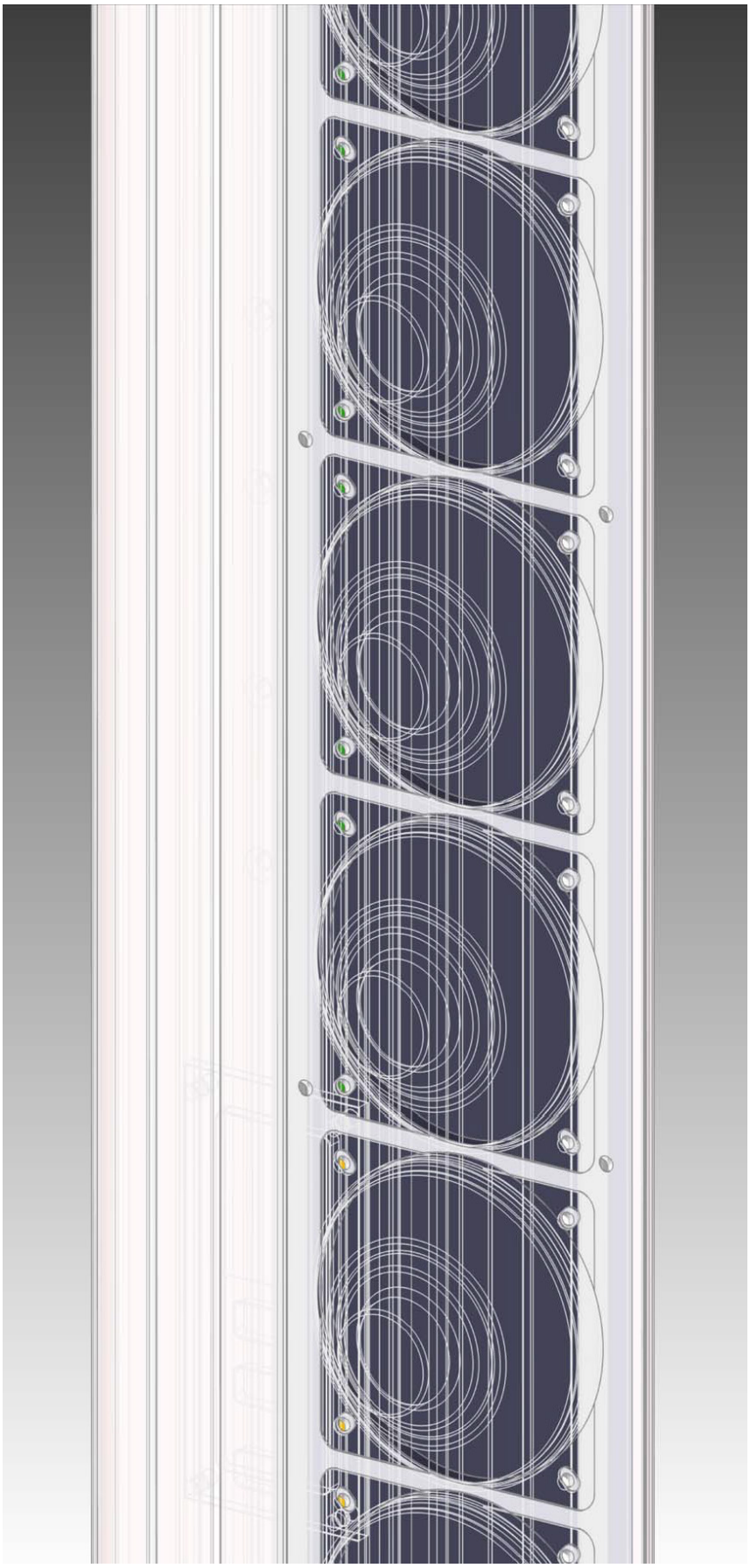
Digitally Steerable Column Speaker
Ascolto

A.V.E. GmbH

Audio Vertriebs-

Entwicklungsgesellschaft

Germany



Digitally

Steerable

Column

Speaker

Ascolto

FF2470

Datasheet

Table of Contents

1.0 – Acoustic Specifications

Frequency Bandwidth	
	80 Hz to 20 kHz (±2 dB)

Maximal SPL	
	135 dB (A-Weighted at 1 m)

Nominal SPL (1 W/Loudspeaker)	
	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 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 of Transducers	24 Coaxial Loudspeakers
Diameter	4.0” Woofer + 1.0 Dome Tweeter
Magnets Material	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_{rms}
Power Efficiency	92%
THD+N	0.025% at 10 $W_{rms/channel}$, 1 kHz
Input Signal	Balanced
Channel Protections	Thermal Shutdown ($T_{junction}$ >150°C)

	Output Short Circuit
DSP Module	
DSP Processors	48 bit Fixed Point DSP 76-bit Internal Accumulator 145 MHz
Sample Rate	48 kHz
A/D Conversion	Resolution: 24 bit Linear PCM Conversion: 1-bit delta-sigma 512× Sample Rate: 48 kHz SNR: 112 dB (A-Weighted)
D/A Conversion	Resolution: 24 bit Linear PCM Conversion: upsampling 128× Sample Rate: 48 kHz SNR: 105 dB (A-Weighted)
Signal Processing	Beam Forming Filtering Input Equalization (10 Biquad) Volume (-120 dB_{FS} to 0 dB_{FS}) Delay (0 m to 30 m, step 0.1 m) Dynamic Compressor 2-Bands Input Signal Activity Detector
Control Module	
Processor	32 bit ARM-Cortex M3 RISC 50 MHz
Setup Network Interface	RS485, Half Duplex, 115200 baud/s 120 Ω Parallel Termination (recommended for long distance)

	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 DSP Status Monitoring PWM Power Amplifier Functions Controlling PWM Power Amplifier Status Monitoring Audio Input Channel Functions Controlling Dante-Chip Ultimo XXT Control (in Ascolto – Dante Series) Auto Stand-By Controlling RS485 Communication Infrared Communication Panel LEDs Controlling Firmware Updating

Connectors	
Audio Inputs Connector	3-pole, 3.81 mm-pitch
Audio Inputs Pinout	pin 1: hot signal (+) pin 2: cold signal (-) pin 3: earth (chassis ground)
RS485 Network Connector	3-pole, 3.81 mm-pitch
RS485 Network Pinout	pin 1: data + pin 2: data - pin 3: digital ground
Dante Network Connector	8 pin Ethernet RJ45, female connector
Mains Connector	Strain relief housing Wago cod. 770-503, 3-pole, 4,00 mm², ratings 250 VAC, 25 A, IEC/EN 60664-1, UL 1977

Switched-Mode Power Supply Unit	
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 6.0 A typ at 230 VAC
Power Consumption	Continuous: 1080 VA Peak: 1404 VA Idle: 36 VA Stand-By: 12 VA
Protection	Thermal Protection Short Circuit Protection Output Current Limiting Under-Voltage Lock Out
Main Fuse	1 × 10 A (slow blow)

3.0 – Electromagnetic compatibility

Electromagnetic Interference (EMI)	
Complete System	EN 55032
Switched-Mode Power Supply Unit	EN 55024 EN 60601-1-2 (Medical Devices) EN 61000-4-2, -4-3, -4-4, -4-5, -4-6, -4-8, -4-11

Electromagnetic Susceptibility (EMS)	
Complete System	EN 61000-3-2, -3-3 EN 61000-4-2, -4-3, -4-4, -4-5, -4-6, -4-11
Switched-Mode Power Supply Unit	EN 60601-1-2 (Medical Devices) EN 55011 class A, B EN 55032 class A, B EN 61000-3-2, class A, D EN 61000-3-3

4.0 – General Specifications

Mechanical	
Height	3044 mm
Width	122 mm
Depth	120 mm
Weight	28.7 Kg (63.2 lbs)
Cabinet	Powder Coated
	Aluminum Extrusion
Colour	RAL 9010
Special colour	Available for an additional charge

Temperature Range	
	0°C to 40°C (32°F to 102°F)

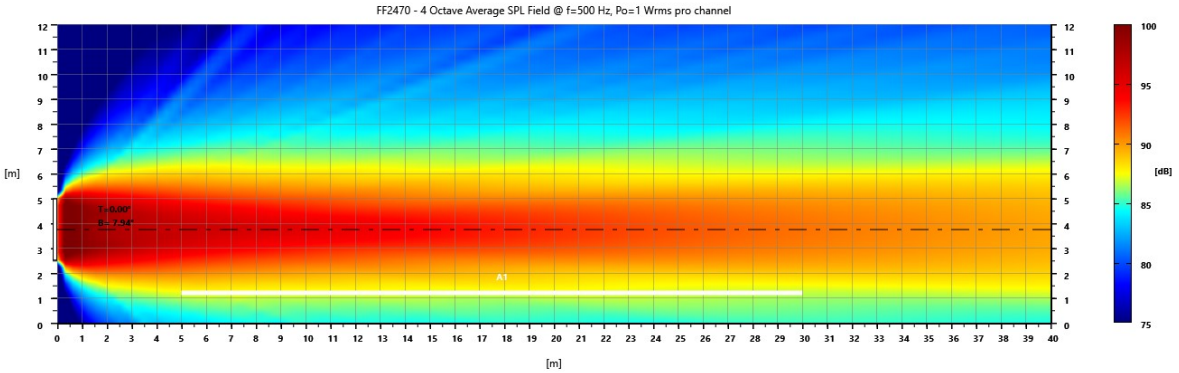
Dust and Water Protection Class	
	IP 54

Electrical Protection Class	
	IEC 61140 - Class 1

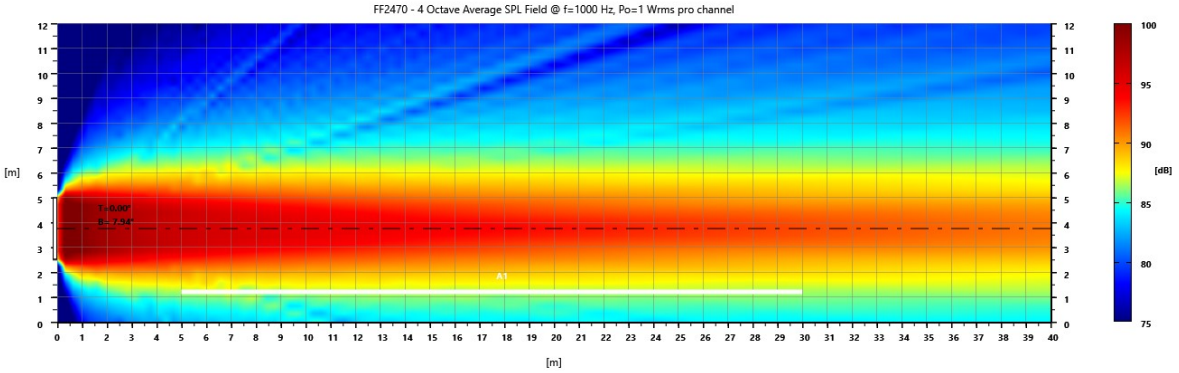
Certificates	
	CE

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

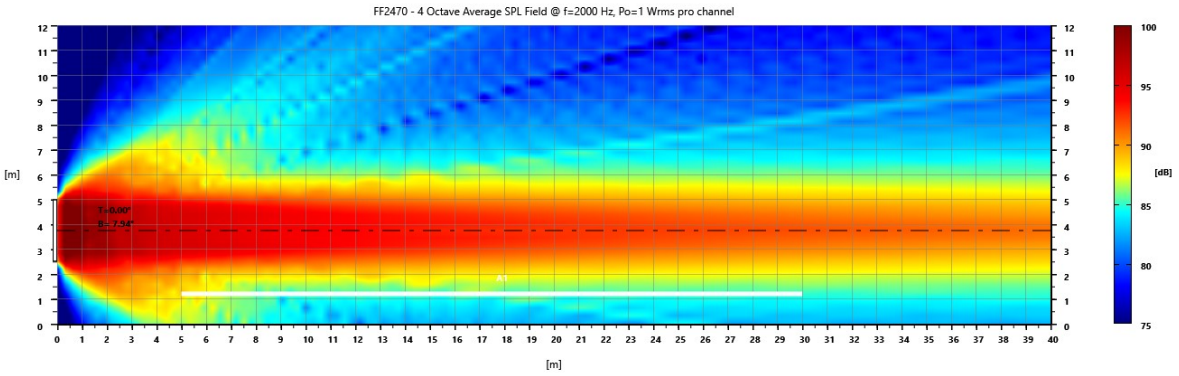
5.0 – Vertical Beam Pattern



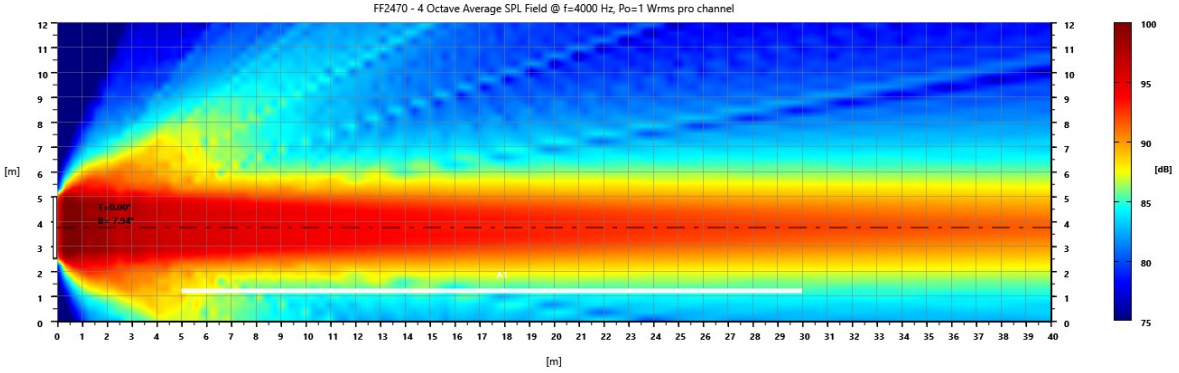
FF2470 – Vertical Beam Shape at 500 Hz, 4 Octaves average



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

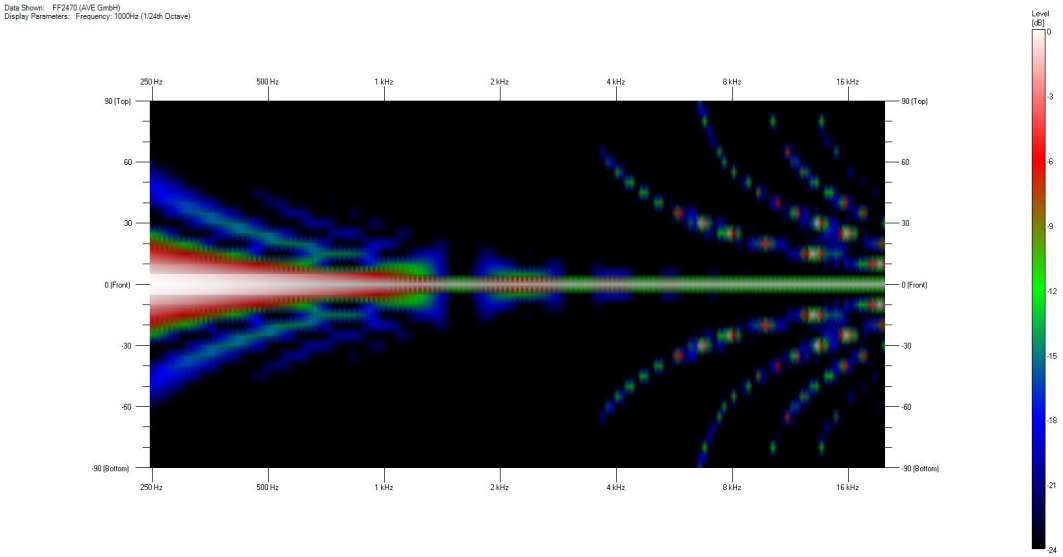


FF2470 – Vertical Beam Shape at 2000 Hz, 4 Octaves average

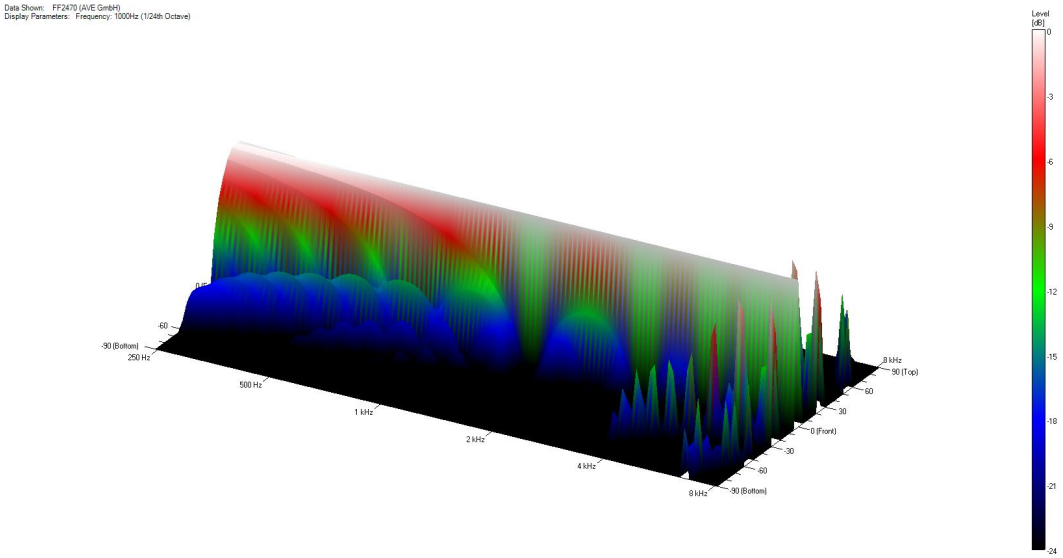


FF2470 – Vertical Beam Shape at 4000 Hz, 4 Octaves average

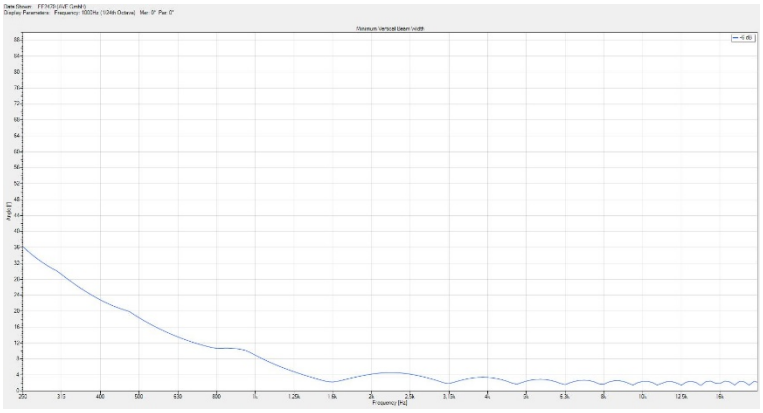
6.0 - Vertical Beam Width



FF2470 – 2D Vertical Beam Width vs Frequency

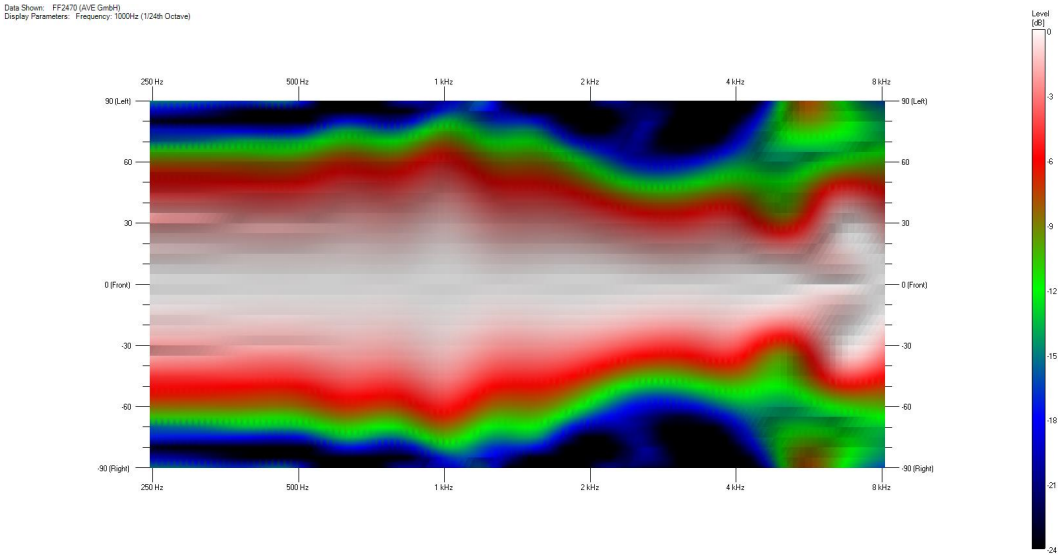


FF2470 – 3D Vertical Beam Width vs Frequency

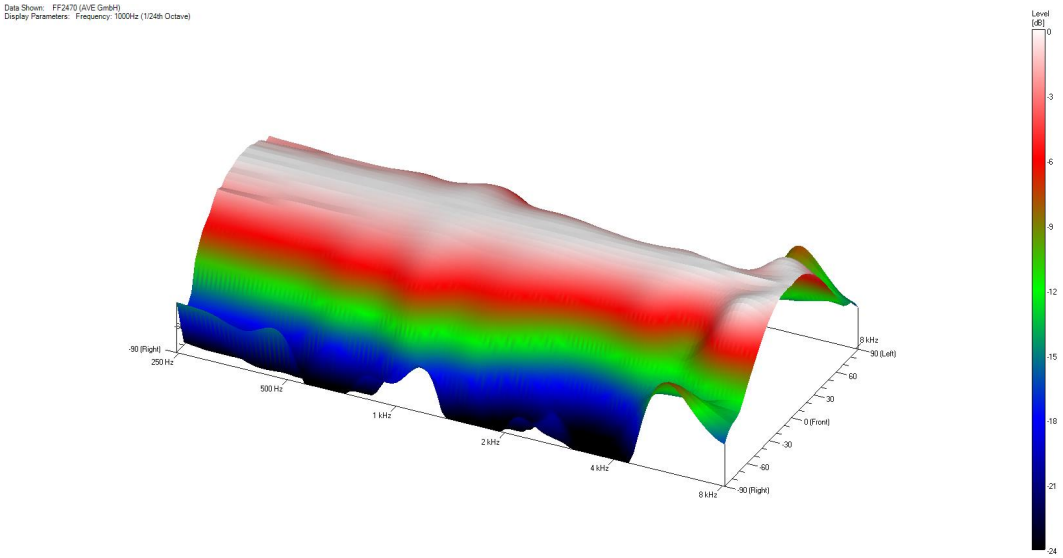


FF2470 – Vertical Beam Width vs Frequency

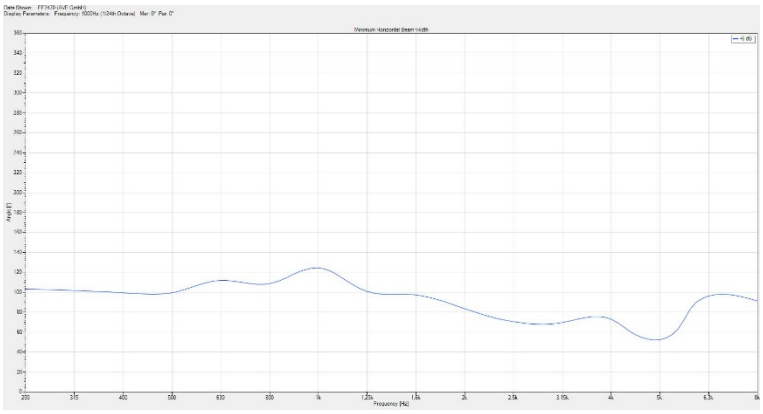
7.0 - Horizontal Beam Width



FF2470 – 2D Horizontal Beam Width vs Frequency



FF2470 – 3D Horizontal Beam Width vs Frequency



FF2470 – Horizontal Beam Width vs Frequency

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German Technology

Made in Germany

AVE GmbH
Gustav-Rau-Straße, 6
74321 - Bietigheim-Bissingen
Germany

Telefon: +49 (0) 7142-78879-10
Fax: +49 (0) 7142-78879-18

www.ave-stuttgart.com
info@ave-stuttgart.de