

# FreeSpace® DS 40F VA and DS 40F 8Ω VA loudspeaker



## Key Features

- **Full-range** loudspeaker with a single 4.5" (114 mm) driver in a ported enclosure to deliver a 125° conical coverage pattern and clear, intelligible music and speech reproduction for flush-ceiling or pendant-mount applications
- **Integrated multi-tap transformer** with innovative thumb wheel adjustment for easy-to-change tap setting from underneath the loudspeaker grille
- **Shortcan design** allows installation in shallower ceilings with minimum depth of 6.4" (163 mm)
- **Shared voicing** across entire FreeSpace DS product family enables DS 16, DS 40 and DS 100 loudspeakers to be integrated on the same system and maintain consistent tonal quality
- **Supported** by a suite of accessories, including ceiling-mount bracket, adjustable tile bridge, pendant-mount kit and square grille



TECHNICAL DATA SHEET

## Product Overview

The Bose® FreeSpace DS 40F VA is the most versatile member of the DS loudspeaker family. It is a high-performance, full-range, flush-mount loudspeaker designed for foreground and background music and speech reproduction in a wide range of installed applications. The DS 40F VA features high output and 125° conical pattern with a frequency range down to 70 Hz.

## Technical Specifications

System Performance	
Frequency Response (+/-3 dB) <sup>1</sup>	80 Hz - 17 kHz
Frequency Range (-10 dB) <sup>1</sup>	70 Hz - 19 kHz
Nominal Dispersion	125° conical
Recommended High-Pass Filter	70 Hz high-pass filter
Loudspeaker EQ	Recommended
Overload Protection	PTC/Resistor
Long-Term Power Handling <sup>2</sup>	40 W (160 W peak)
Sensitivity (SPL / 1 W @ 1 m) <sup>3</sup>	87 dB SPL
Maximum SPL @ 1 m <sup>4</sup>	103 dB SPL (109 dB SPL peak)
Nominal Impedance	8 Ω (transformer bypassed)
Transformer Taps (70/100 V)	70 V: 2.5 W, 5 W, 10 W, 20 W, 40 W 100 V: 5 W, 10 W, 20 W, 40 W
Transducers	
Driver Compliment	4.5" (114 mm) full-range driver
Physical	
Enclosure	Polypropylene (front baffle), powder-coated steel (rear enclosure)
Grille	Powder-coated steel grille
Environmental	Indoor use only (EN 54-24 Type A)
Connectors	Three-terminal barrier strip; two-terminal barrier strip (8 ohm variant). Optional accessory available for use when ceramic connector and thermal fuse are required. Wire gauge: 18 AWG (0.8 mm) to 14 AWG (2.5 mm)
Suspension / Mounting	Three integrated quick-install mounting arms. Three mounting points at the rear of the enclosure for use with optional accessory pendant mount kit. Safety cable attachment: .35" (8.9 mm) diameter hole on junction box
Dimensions	Outer flange diameter: 11.8" (300 mm) Depth: 6.0" (153 mm) Ceiling hole diameter: 10.5" (267 mm)
Ceiling Thickness (Maximum)	2.5" (64 mm)
Net Weight	8.3 lb (3.7 kg) - with transformer 6.3 lb (2.8 kg) - 8 Ω variant
Shipping Weight	11.0 lb (5.0 kg) - with transformer 9.0 lb (4.1 kg) - 8 Ω variant
Product Code	
Black	321278-0150 - with transformer 321278-0160 - 8 Ω variant
White	321278-0250 - with transformer 321278-0260 - 8 Ω variant

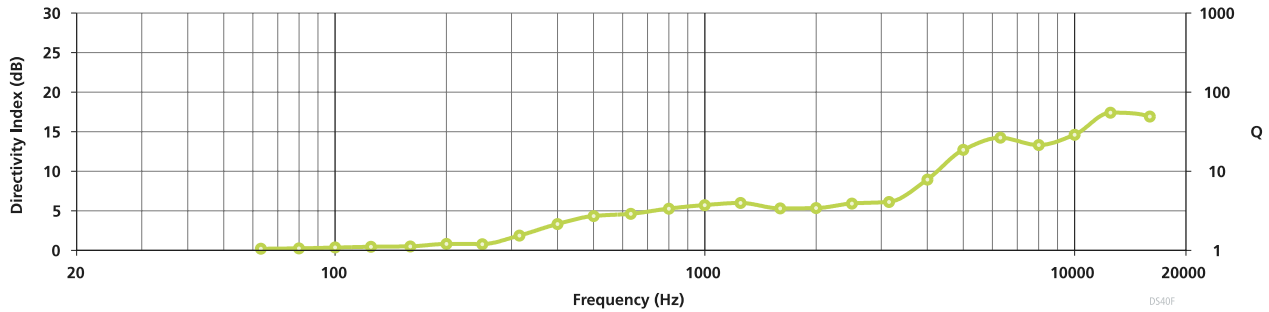
### Footnotes:

- <sup>1</sup> Frequency response and range measured on-axis with recommended active EQ in an anechoic environment.
- <sup>2</sup> Power handling tested using pink noise filtered to meet IEC 268-5, 6 dB crest factor, 100 hours, with recommended EQ.
- <sup>3</sup> Sensitivity measured in free field (no boundary-loading gain) with recommended active EQ, referenced to 1W/1m.
- <sup>4</sup> Maximum SPL calculated from sensitivity and power handling specifications, exclusive of power compression.

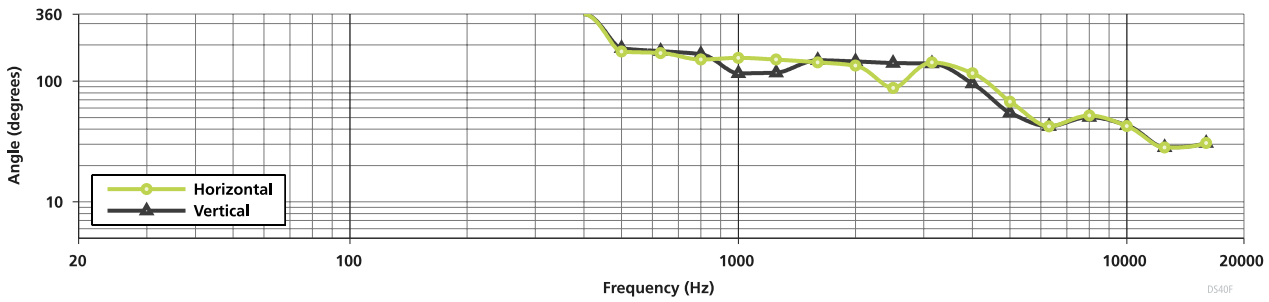
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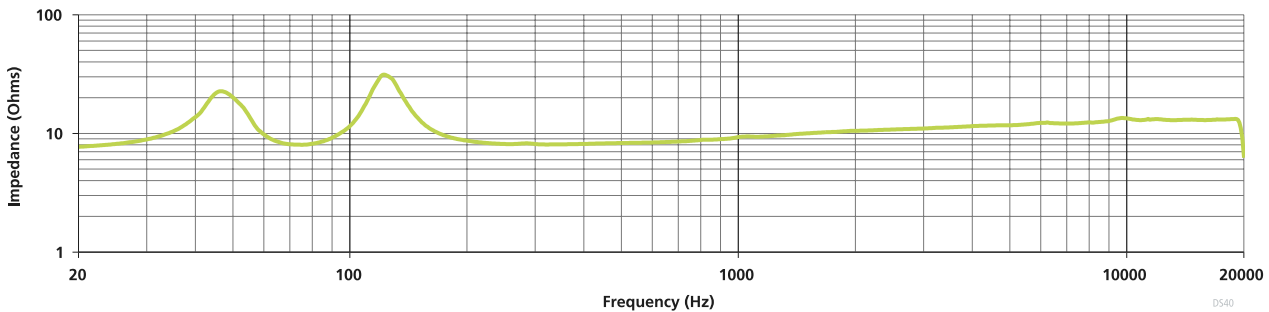
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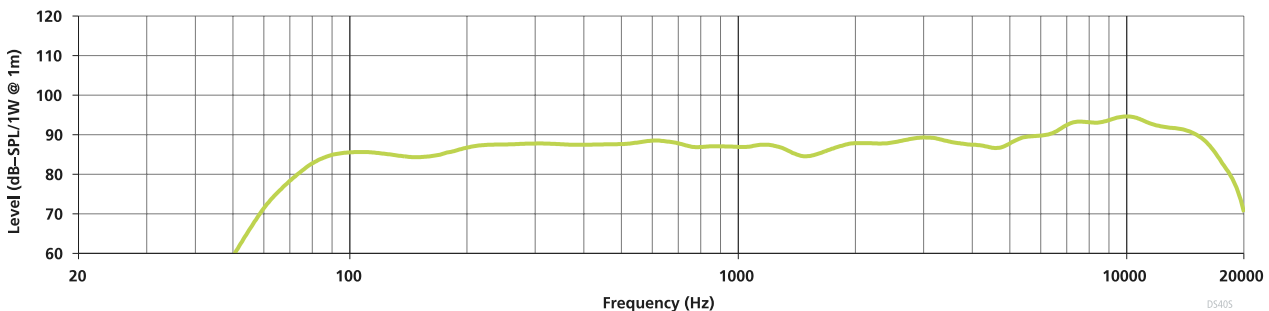
## Beamwidth



## Impedance



## On-Axis Response



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## Tap Chart

DS 40F VA												
Mount	m	2.4	3.0	3.6	4.2	4.8	5.5	6.1	6.7	7.3	8.0	
Height	ft	8	10	12	14	16	18	20	22	24	26	
T A P	2.5	94	91	89	86	85	83	82	81	80	79	dB <sub>SPL</sub>
	5	97	94	92	89	88	86	85	84	83	82	
	10	100	97	95	92	91	89	88	87	86	85	
	20	103	100	98	95	94	92	91	90	89	88	
	40	106	103	101	98	97	95	94	93	92	91	

Note: 2.5 Watt tap is not available for 100V operation.

Additional Product Specifications per EN54.24 (2008)

Environmental Type: A (Indoor Applications)

EN 54-24 testing done without EQ applied

## FreeSpace DS 40F VA

Rated impedance for each tapping	70V:	1236.9 Ω (2.5 W)	850.5 Ω (5 W)	448.0 Ω (10 W)	224.8 Ω (20 W)	111.5 Ω (40 W)
	100V:	-	1236.9 Ω (5 W)	850.5 Ω (10 W)	448.0 Ω (20 W)	224.8 Ω (40 W)
Sensitivity	77.1 dB SPL @ 1 W, 4 m					
Maximum Sound Pressure (at highest power setting)	91.2 dB SPL @ 40 W, 4 m					
Coverage Angle (-6 dB)	H:	500 Hz = 183°	1 kHz = 175°	2 kHz = 173°	4 kHz = 84°	
	V:	500 Hz = 179°	1 kHz = 178°	2 kHz = 161°	4 kHz = 83°	
Reference Axis, Reference Plane, & Horizontal Plane	The specifications data was measured in an anechoic chamber, free-field on standard EN S4-24 baffle: Reference axis: Axis is on the center of grille surface and perpendicular to the grille surface Reference plane: Plane is on the grille surface and perpendicular to the reference axis Horizontal plane: Plane is containing the reference axis and perpendicular to the reference plane					
Rated Noise Power	40 W					

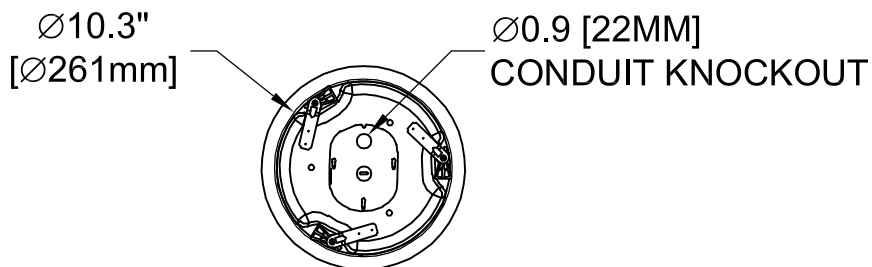
## FreeSpace DS 40F 8Ω VA

Rated impedance	8 OHM: 8.7 Ω					
Sensitivity	77.1 dB SPL @ 1 W, 4 m					
Maximum Sound Pressure	91.2 dB SPL @ 40 W, 4 m					
Coverage Angle (-6 dB)	H:	500 Hz = 183°	1 kHz = 175°	2 kHz = 173°	4 kHz = 84°	
	V:	500 Hz = 179°	1 kHz = 178°	2 kHz = 161°	4 kHz = 83°	
Reference Axis, Reference Plane, & Horizontal Plane	The specifications data was measured in an anechoic chamber, free-field on standard EN S4-24 baffle: Reference axis: Axis is on the center of grille surface and perpendicular to the grille surface Reference plane: Plane is on the grille surface and perpendicular to the reference axis Horizontal plane: Plane is containing the reference axis and perpendicular to the reference plane					
Rated Noise Power	40 W					

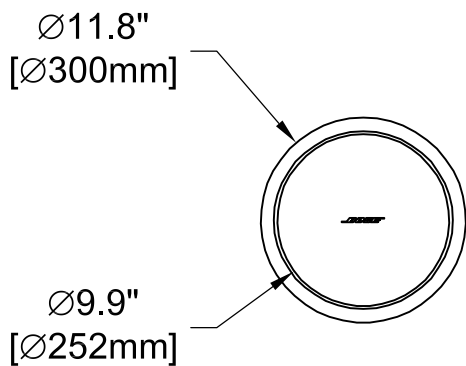
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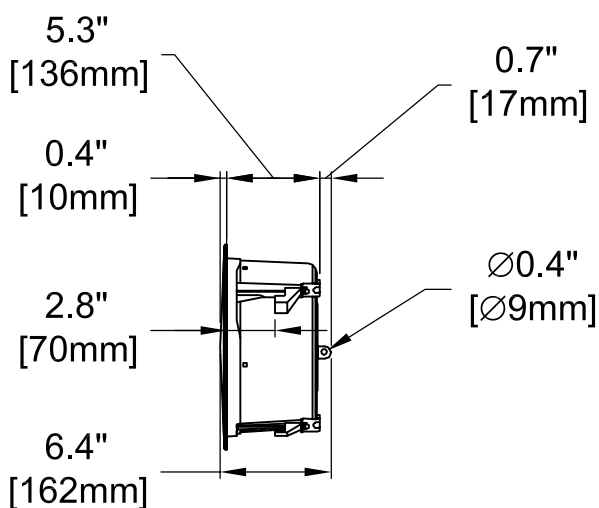
## Mechanical Diagrams



Back View



Front View

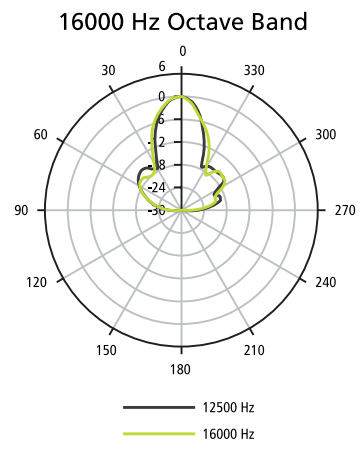
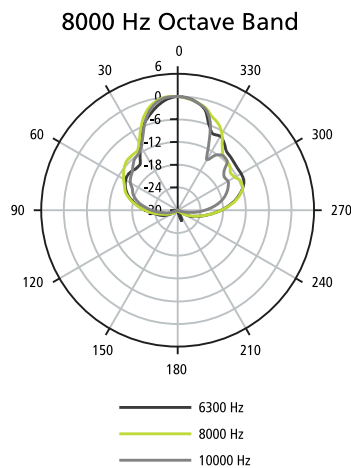
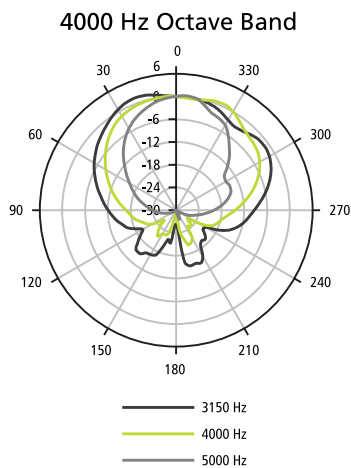
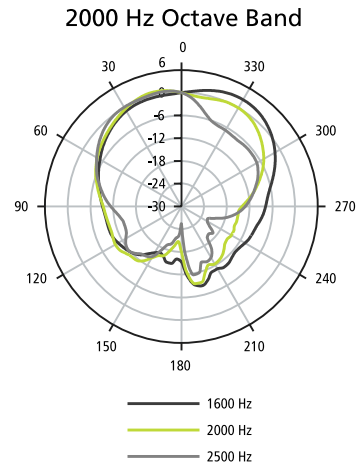
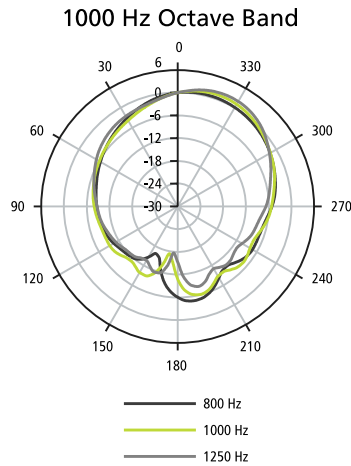
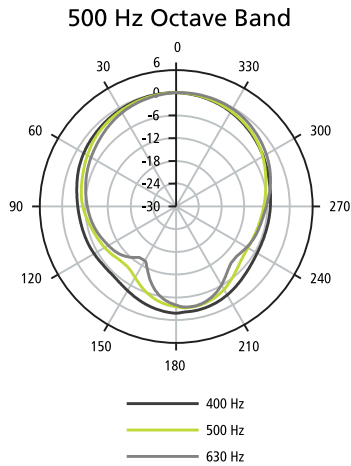
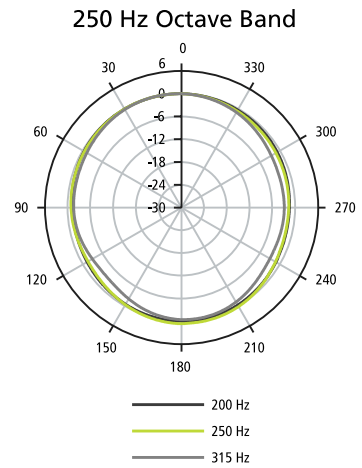
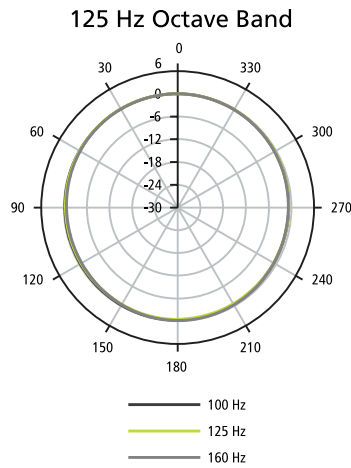
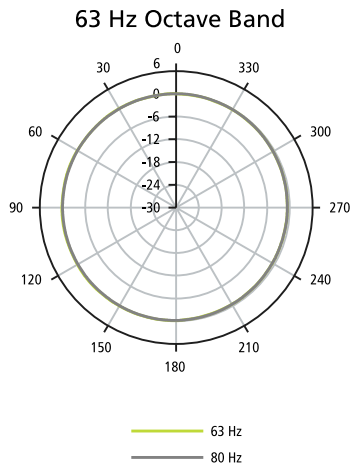


Side View

# FreeSpace® DS 40F VA and DS 40F 8Ω VA loudspeaker



## Horizontal Plots

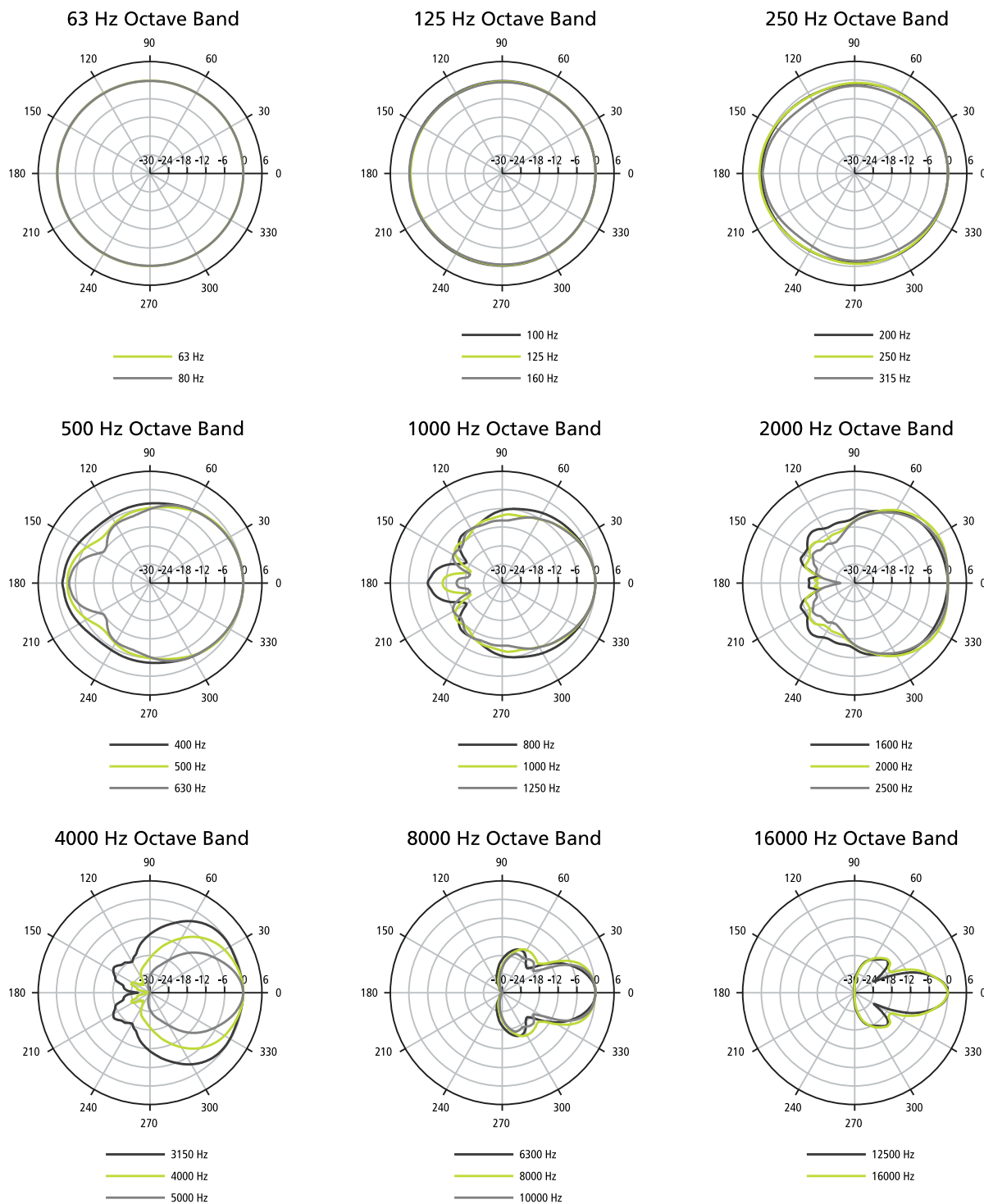


DS40F

# FreeSpace® DS 40F VA and DS 40F 8Ω VA loudspeaker



## Vertical Plots



DS40F

# FreeSpace® DS 40F VA and DS 40F 8Ω VA loudspeaker



## Architects' and Engineers' Specifications

The loudspeaker shall be a 40 watt, ported loudspeaker system utilizing one 4.5" (114 mm) full-range HVC (Helical Voice Coil) driver. The loudspeaker shall be designed for installation in ceilings up to 26 ft (8 m) high. An optional pendant-mount accessory allows the loudspeaker to be hung from open ceilings.

The loudspeaker shall have a nominal rated impedance of 8 ohms and shall be wired in parallel with a line voltage matching (step-down) transformer with a level selector appropriate for various output taps. The loudspeaker input connections will allow for direct connection to 70 volt, 100 volt or low-impedance amplifiers. An 8 ohm variant of the loudspeaker shall be available without a transformer for low-impedance applications only.

The loudspeaker shall have a protection circuit to protect the product from occasionally being overdriven. Each loudspeaker shall have a bandwidth of 80 Hz – 17 kHz and a maximum continuous acoustic output of 103 dB SPL referenced to a full bandwidth pink noise input at 1 meter at the loudspeaker's rated power. The input connection shall consist of a three-terminal barrier strip. The input connection of the 8 ohm variant of the loudspeaker shall consist of a two-terminal barrier strip.

Power settings available shall be: 2.5, 5, 10, 20, and 40 watts at 70 volts; 5, 10, 20, and 40 watts at 100 volts; and 40 watts at 8 ohms (when referenced to IEC noise for 100 hours). The nominal dispersion shall be 125° conical coverage pattern at -6 dB (average 1 – 4 kHz).

The loudspeaker shall be plenum-rated for use in air handling spaces. The loudspeaker shall meet numerous standards for combination music and evacuation systems around the world. Exposed cosmetic surfaces of the loudspeaker shall be paintable, and the acoustically transparent grille component shall be formed of powder-coated steel.

The loudspeaker shall be the Bose® FreeSpace® DS 40F loudspeaker.

## Safety and Regulatory Compliance

The FreeSpace® DS 40F VA loudspeaker and FreeSpace DS 40F VA loudspeaker – 8 Ohm have passed extensive testing and comply with the following specifications and uses:

Listed to EN 54-24:2008

Environmental Rating: Type A (indoor applications)

The DS 16F VA also has been designed to the requirements defined in the following European regulatory specifications for combination systems:

- British Standard Code of Practice BS 5839, Part 8 (with PC-16)
- Tested to IEC60268-5

## Wire Gauge

The FreeSpace DS 40F VA loudspeaker is designed to work with 18 AWG (0.8 mm<sup>2</sup>) to 14 AWG (2.5 mm<sup>2</sup>) size wire only.

This product conforms to all applicable EU directive requirements. The complete declaration of conformity can be found at [www.bose.com/compliance](http://www.bose.com/compliance)



ID # of the Certified Body: 0560

Year of the CE Mark: 2012

EC Certificate of Conformity #: 0560-CPD-12219001/AA/00