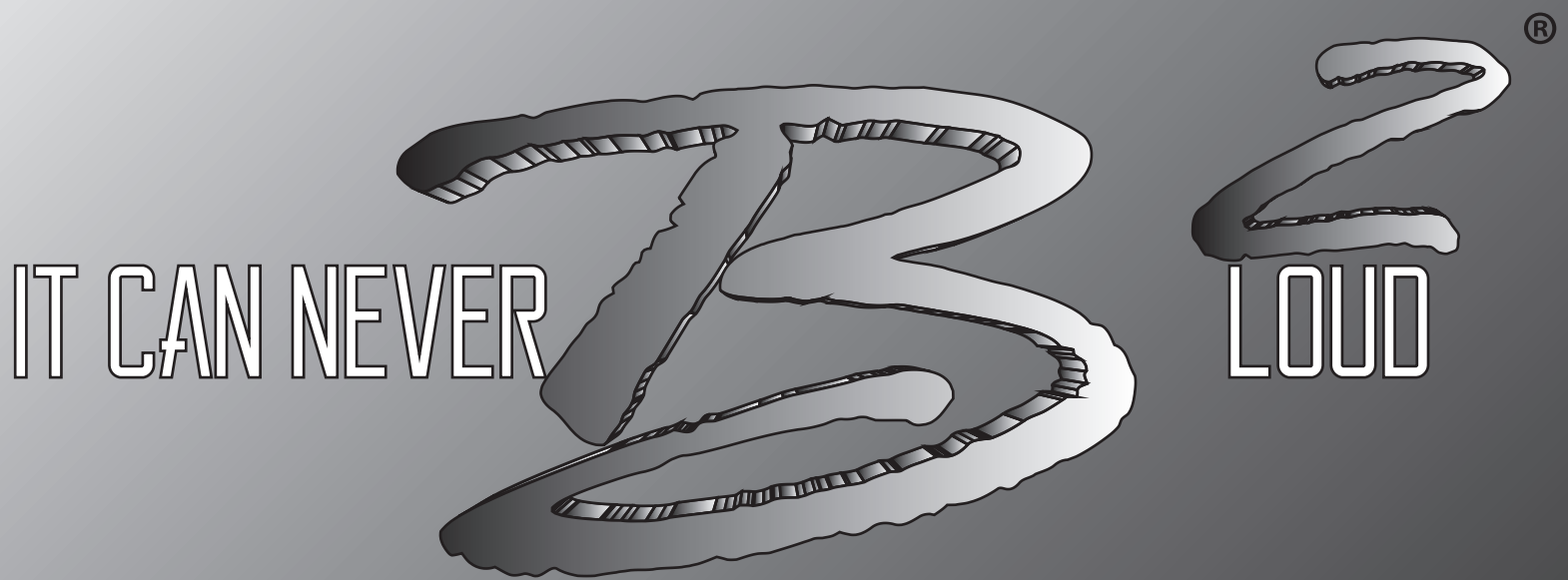




REFERECE SQ 63

USER MANUAL



#ITCANNEVERB2LOUD

INTRODUCTION: BUILT FROM EMOTION

The B2 Audio Reference SQ63 Series — a loudspeaker system crafted not just to play music, but to bring it to life. This series is a return to our beginnings — nearly 20 years ago — when sound was about emotion, not compromise. It’s a reflection of why we started: to build something authentic.

Crafted Without Compromise

The Reference Series wasn’t designed around a price point. It was built around a vision — one driven by passion, not production quotas. Every element is chosen with intent, built for those who demand more than just volume: those who seek depth, soul, and clarity in every note.

Tuned for Truth. Designed for Versatility.

This system is about accuracy above all — delivering a sound that’s honest, transparent, and rich with detail.

- No artificial coloring.
- No forced tuning.
- Just pure sonic integrity.

Whether you’re installing in an active DSP-controlled system or a refined passive network, the Reference Series adapts with ease — never sacrificing its core identity.

Follow our social media and visit our websites for continuous news and updates
b2audio.com - b2audioua.com - facebook.com/b2audio - instagram: @b2audiogram - tiktok: @b2audio - youtube.com/b2audio



AT THE HEART OF B2 AUDIO LIES A RELENTLESS PURSUIT OF EXCELLENCE. WE BELIEVE IN DOING THINGS DIFFERENTLY AND PUSHING THE BOUNDARIES OF WHAT’S POSSIBLE. OUR TALENTED TEAM OF AUDIOPHILES AND INDUSTRY ENTHUSIASTS IS UNITED BY A PASSION FOR DESIGNING THE BEST POSSIBLE PRODUCTS—PRODUCTS THAT ARE MORE THAN JUST “GOOD ENOUGH.” OUR UNWAVERING DEDICATION HAS ALLOWED US TO MAKE OUR MARK SINCE OUR FOUNDING IN 2008.

OUR JOURNEY HAS BEEN MARKED BY NUMEROUS MILESTONES AND ACCOLADES, REFLECTING OUR COMMITMENT TO PUSHING THE ENVELOPE AND SETTING NEW STANDARDS IN THE INDUSTRY. AS WE CONTINUE TO GROW AND EVOLVE, WE REMAIN DEDICATED TO OUR MISSION OF DELIVERING EXCEPTIONAL AUDIO PRODUCTS THAT INSPIRE AND DELIGHT.

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■ DESIGN SPECIFICATIONS

MODEL:

REF SQ MIDWOOFER

6.5" MIDWOOFER



Key Feature:

Multi-layered hexagonal carbonfiber cone and dustcap
Non-conducting TIL Voice Coil former for minimum damping
FEA optimized motor structure with copper shorting ring
Vented aluminum basket with SAFT for optimum strenght and low compression
Vented pole piece with smooth cell foam for reduced compression and noise
Gold plated Top plate and T yoke with CNC aluminum ring

Power Handling :

100h RMS Noise Test (IEC-18-4)	100	Watts
Long Term Max Power (IEC-18-2)	200	Watts
X-over:2 Order HP Butterworth (IEC-268-5)	100	Hertz

Mounting Information:

Overall Diameter	OD	6.5 / 165	Inch / mm
Cutout Diameter	CD	5.51 / 140	Inch / mm
Total Depth	TD	3.23 / 82	Inch / mm
Mounting Depth	MD	2.99 / 76	Inch / mm

Electrical Data:

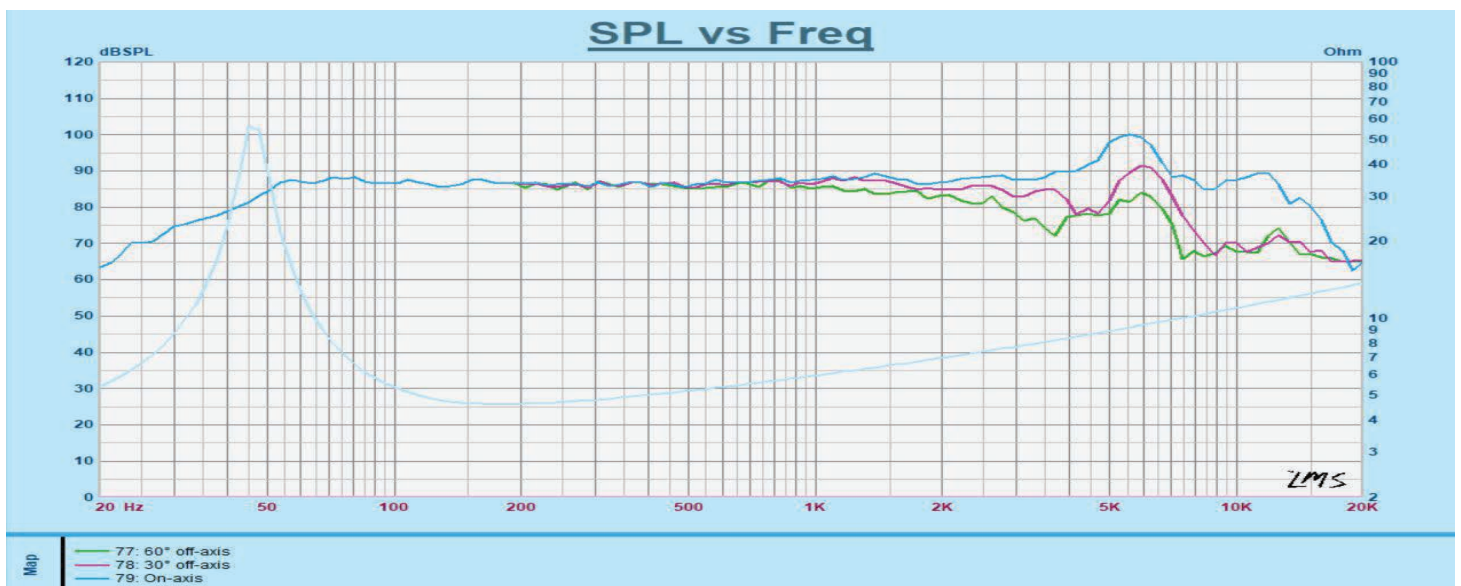
Nominal Impedance	Zn	4.0	Ω
DC Resistance	Re	3.34	Ω
Maximum Impedance	Zo	68.829	Ω
Minimum Impedance	Zmin	4.019	Ω
Minimum Frequency	Fmin	201.265	Hz
Voice Coil Inductance (1khz)	Le	0.279	mH

T-S Parameters:

Resonance Frequency	Fs	46.318	Hz
Mechanical Q Factor	Qms	10.396	
Electrical Q Factor	Qes	0.530	
Total Q Factor	Qts	0.504	
Force Factor	BL	6.204	T-M
Mechanical Resistance	Rms	0.588	Ns/M
Moving Mass without Air Load	Mmd	20.113	g
Moving Mass within Air Load	Mms	20.992	g
Suspension Compliance	Cms	0.562	mm/N
Effective Piston Area	SD	132.732	cm ²
Equivalent Volume	Vas	14.071	Ltr
Reference Efficiency	No	0.255	%
Frequency Response (-3db)	Free Air	50~5000	Hz
Sensitivity @1W/1M (± 3 db)	E	87.6	db

Mechanical Data :

Voice Coil Diameter	Id	1.4 / 35.5	Inch / mm
Voice Coil Former	VCfm	TIL	
Voice Coil Wire Composition		Copper	
Voice Coil Winding Length	h	16	mm
Voice Coil Layers	n	2	
Magnetic Material		Ferrite	
Magnet Diameter	Sm	100	mm
Magnet Weight	MW	20	Oz
Magnetic Flux Density	HG	N/A	Tesla
Magnetic Gap Height	HE	6.0	mm
Linear Excursion	P-P	10	mm
Max Mech. Excursion	P-P	± 13	mm
Unit Weight	UW	1700	Grams



DESIGN SPECIFICATIONS

MODEL:

REF SQ MIDRANGE

3" FULLRANGE



Key Feature:

Multi-layered hexagonal carbonfiber cone and dustcap
Non-conducting TIL Voice Coil former for minimum damping
FEA optimized motor structure with copper shorting ring
Vented aluminum basket for optimum strenght and low compression
Vented pole piece with smooth cell foam for reduced compression and noise
Gold plated Top plate and T yoke with CNC aluminum ring

Power Handling :

100h RMS Noise Test (IEC-18-4)	50	Watts
Long Term Max Power (IEC-18-2)	100	Watts
X-over:2 Order HP Butterworth (IEC-268-5)	200	Hertz

Mounting Information:

Overall Diameter	OD	3.62 / 92	Inch / mm
Cutout Diameter	CD	3.02 / 76.8	Inch / mm
Total Depth	TD	2.11 / 53.6	Inch / mm
Mounting Depth	MD	1.52 / 38.6	Inch / mm

Electrical Data:

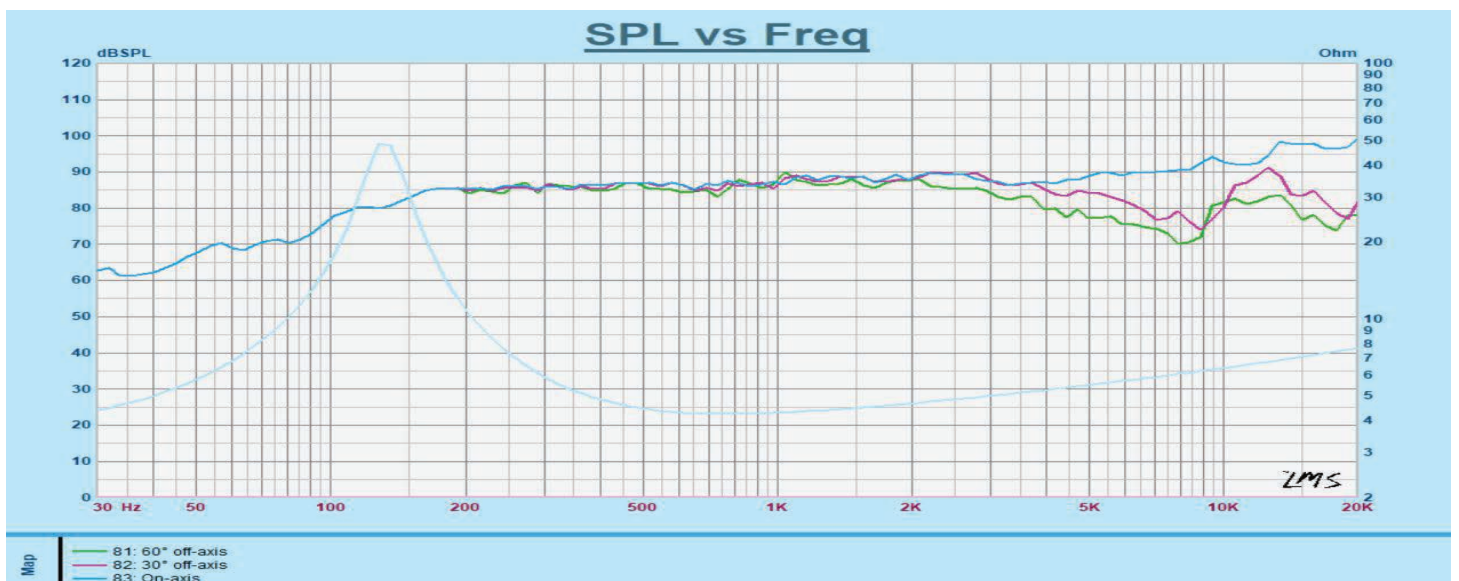
Nominal Impedance	Zn	4.0	Ω
DC Resistance	Re	3.35	Ω
Maximum Impedance	Zo	52.653	Ω
Minimum Impedance	Zmin	3.974	Ω
Minimum Frequency	Fmin	752.841	Hz
Voice Coil Inductance (1khz)	Le	0.151	mH

T-S Parameters:

Resonance Frequency	Fs	131.816	Hz
Mechanical Q Factor	Qms	5.575	
Electrical Q Factor	Qes	0.379	
Total Q Factor	Qts	0.355	
Force Factor	BL	5.392	T-M
Mechanical Resistance	Rms	0.590	Ns/M
Moving Mass without Air Load	Mmd	3.874	g
Moving Mass within Air Load	Mms	3.970	g
Suspension Compliance	Cms	0.367	mm/N
Effective Piston Area	SD	30.190	cm ²
Equivalent Volume	Vas	0.475	Ltr
Reference Efficiency	No	0.278	%
Frequency Response (-3db)	Free Air	200~20,000	Hz
Sensitivity @1W/1M (± 3 db)	E	88	db

Mechanical Data :

Voice Coil Diameter	Id	1.2 / 30.5	Inch / mm
Voice Coil Former	VCfm	TIL	
Voice Coil Wire Composition		Copper	
Voice Coil Winding Length	h	7	mm
Voice Coil Layers	n	2	
Magnetic Material		Neodymium	
Magnet Diameter	Sm	60	mm
Magnet Weight	MW	4	Oz
Magnetic Flux Density	HG	N/A	Tesla
Magnetic Gap Height	HE	4	mm
Linear Excursion	P-P	3	mm
Max Mech. Excursion	P-P	± 6.5	mm
Unit Weight	UW	450	Grams



■ DESIGN SPECIFICATIONS

MODEL:

REF SQ TWEETER

1" WIDEBAND TWEETER



Key Feature:

1" Ceramic dome for increased accuracy and clarity
 DSCC (Direct Surround to Coil Connection) eliminates dome alterations & interaction
 CCAW voice coil for reduced mass and increased sensitivity
 Ventilated coil cooling system with a copper cap conduction
 Machined Aluminum housing reduces resonance and acts as heat dissipation
 Low distortion dual neodymium Inter magnetic circuit

Power Handling :

100h RMS Noise Test (IEC-18-4)	50	Watts
Long Term Max Power (IEC-18-2)	100	Watts
X-over: 2 Order HP Butterworth (IEC-268-5)	1500	Hertz

Mounting Information:

Overall Diameter	OD	2.24 / 57	Inch / mm
Cutout Diameter	CD	1.79 / 45.4	Inch / mm
Total Depth	TD	1.61 / 41	Inch / mm
Mounting Depth	MD	1.1 / 28	Inch / mm

Electrical Data:

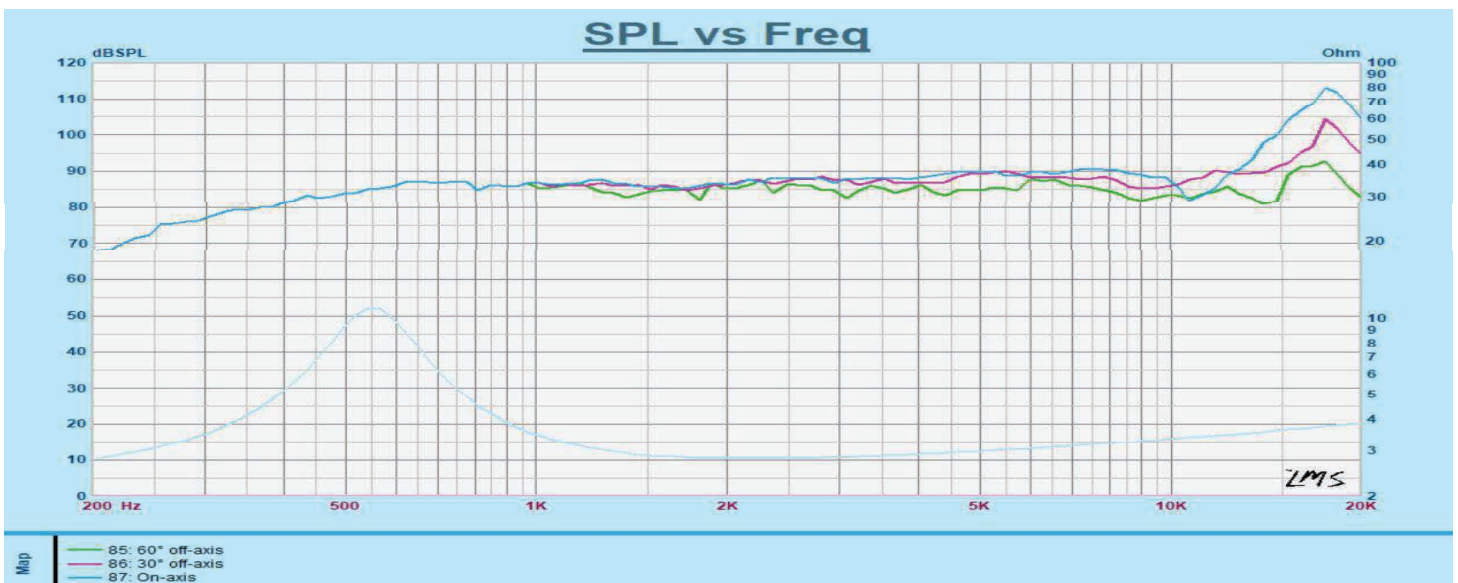
Nominal Impedance	Zn	3.0	Ω
DC Resistance	Re	2.3	Ω
Maximum Impedance	Zo	10.955	Ω
Minimum Impedance	Zmin	2.903	Ω
Minimum Frequency	Fmin	1595	Hz
Voice Coil Inductance (1kHz)	Le	0.040	mH

T-S Parameters:

Resonance Frequency	Fs	553.918	Hz
Mechanical Q Factor	Qms	3.359	
Electrical Q Factor	Qes	0.893	
Total Q Factor	Qts	0.705	
Force Factor	BL	2.691	T-M
Mechanical Resistance	Rms	0.837	Ns/M
Moving Mass without Air Load	Mmd	0.795	g
Moving Mass within Air Load	Mms	0.808	g
Suspension Compliance	Cms	0.102	mm/N
Effective Piston Area	SD	8.042	cm ²
Equivalent Volume	Vas	0.009386	Ltr
Reference Efficiency	No	0.173	%
Frequency Response	Free Air	550~25,000	Hz
Sensitivity @1W/1M (±3db)	E	86	db

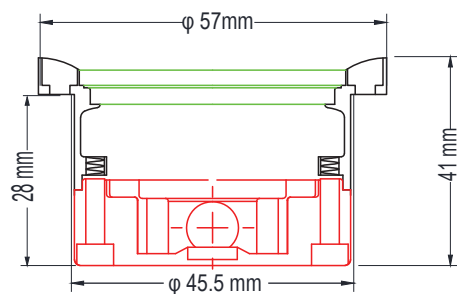
Mechanical Data :

Voice Coil Diameter	Id	1.0 / 25.4	Inch / mm
Voice Coil Former	VCfm	Polyimide	
Voice Coil Wire Composition		CCA	
Voice Coil Winding Length	h	3.2	mm
Voice Coil Layers	n	2	
Magnetic Material		NdFeB	
Magnet Diameter	Sm	Dual 25	mm
Magnet Weight	MW	1.1	Oz
Magnetic Flux Density	HG	N/A	Tesla
Magnetic Gap Height	HE	2	mm
Linear Excursion	P-P	1.2	mm
Max Mech. Excursion	P-P	±4	mm
Unit Weight	UW	150	Grams

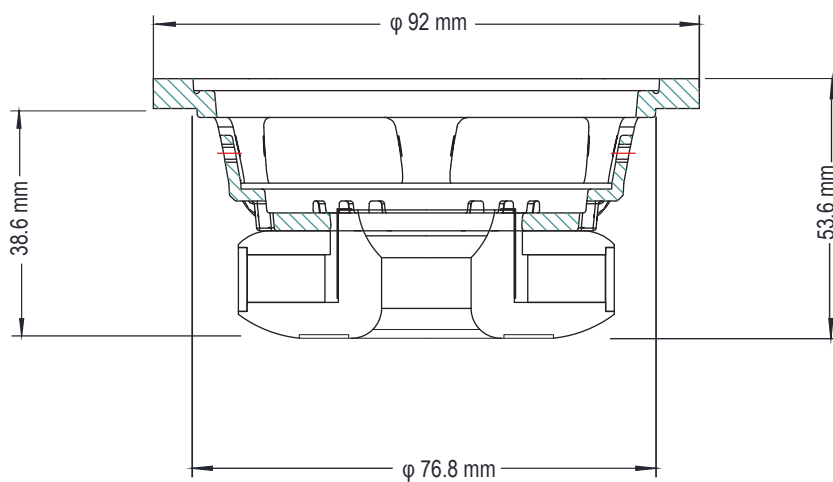


■ DIMENSIONAL DATA DRAWINGS

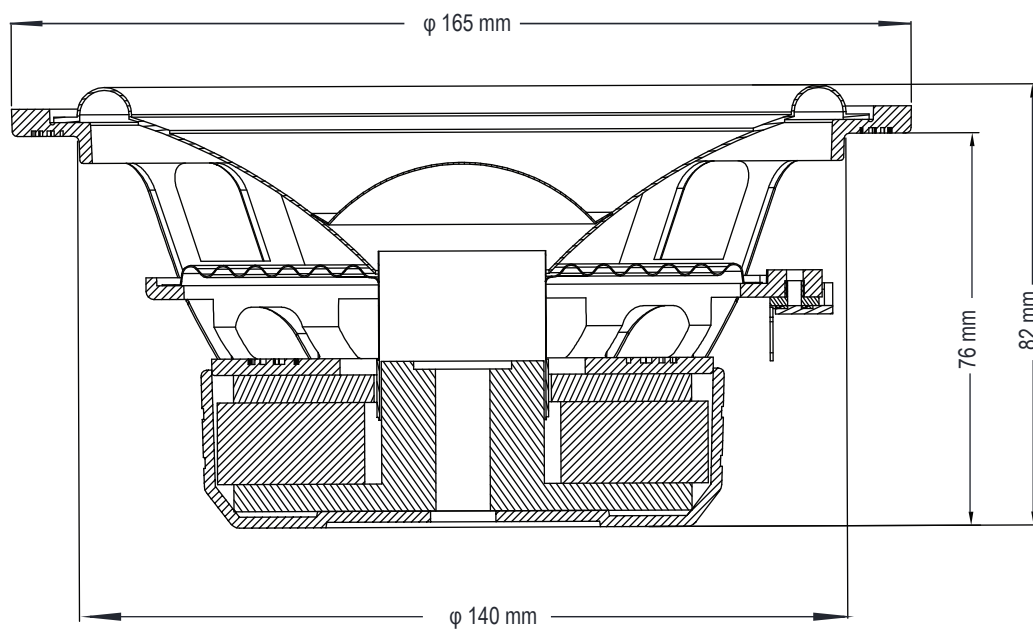
MODEL: REF SQ TWEETER



REF SQ MIDRANGE



REF SQ MIDWOOFER



■ DESIGN SPECIFICATIONS

DETAILS:

REF SQ TWEETER

1" Ceramic Dome Tweeter for Enhanced Accuracy and Clarity.

The use of a 1-inch ceramic dome in the tweeter offers several acoustic advantages. Ceramic materials are exceptionally rigid and lightweight, allowing for precise high-frequency reproduction with minimal distortion. This leads to crisper, more detailed sound and improved imaging in the upper frequency range.

DSCC (Direct Surround to Coil Connection) for Pure Signal Transfer.

The Direct Surround to Coil Connection eliminates the need for intermediate components between the dome and the voice coil. By connecting the dome directly to the coil, this design removes unnecessary mechanical interference, preserving the integrity of the audio signal and maintaining accuracy in sound reproduction.

CCAW Voice Coil for High Sensitivity and Low Mass,

The voice coil is made using Copper-Clad Aluminum Wire (CCAW), which is significantly lighter than pure copper but still maintains excellent conductivity. The reduced mass improves the tweeter's ability to respond quickly to audio signals, resulting in higher sensitivity and more dynamic sound.

Advanced Cooling System with Copper Cap Conduction.

The tweeter includes a ventilated coil cooling system, which helps to dissipate heat more effectively during high-power operation. A copper cap enhances thermal conductivity and further reduces heat buildup, ensuring consistent performance and long-term reliability, even under demanding conditions.

Precision-Machined Aluminum Housing for Resonance Control.

The entire assembly is enclosed in a machined aluminum housing, which serves two important purposes. First, it minimizes unwanted resonances that can color the sound. Second, it acts as a passive heat sink, helping to cool the internal components and improve thermal stability.

Dual Neodymium Internal Magnetic Circuit for Low Distortion.

At the heart of the tweeter is a dual neodymium magnet system arranged in an internal magnetic circuit for a compact yet powerful magnetic field. This configuration enhances motor control over the diaphragm, reducing distortion and improving transient response.

REF SQ MIDRANGE

3" Midrange Driver – Engineered for Clarity, Efficiency, and Precision.

Multi-Layered Hexagonal Carbon Fiber Cone and Dust Cap for Rigidity and Control.

This midrange driver features a cone and dustcap constructed from multi-layered hexagonal carbon fiber, known for its exceptional stiffness-to-weight ratio. The hexagonal layering pattern further strengthens the structure, minimizing flex and breakup at high frequencies. This results in accurate midrange reproduction, low distortion, and excellent transient response. The matching carbon fiber dustcap ensures coherent cone movement and enhances overall sonic consistency.

Non-Conductive TIL Voice Coil Former for Reduced Damping and Improved Efficiency.

The voice coil is wound on a TIL (thermally stable, non-conductive) former, which significantly reduces eddy current losses and unwanted damping that can degrade performance. By avoiding conductive materials in the coil former, this design helps preserve signal purity and allows the driver to react more responsively to input; yielding higher sensitivity and natural midrange dynamics.

FEA-Optimized Motor Structure with Copper Shorting Ring for Low Distortion.

The motor assembly is designed using Finite Element Analysis (FEA) to optimize magnetic flux distribution and maximize efficiency. A copper shorting ring is integrated into the motor to reduce inductance modulation and magnetic distortion, especially at high excursion levels. This ensures clean, low-distortion output with precise control over diaphragm movement, which is critical in the vocal range.

Vented Aluminum Basket for Strength, Cooling, and Minimal Air Compression.

The frame is built from rigid, lightweight aluminum, providing a strong foundation for the moving components while resisting resonance. Strategic venting in the basket improves airflow behind the cone and voice coil, helping to dissipate heat and reduce air compression artifacts. The result is cooler operation, more consistent performance, and better power handling over extended listening sessions.

Vented Pole Piece with Smooth Cell Foam for Noise Reduction and Pressure Relief.

The vented pole piece reduces back pressure and compression, particularly during high-excursion movement. The addition of smooth cell foam around the vent acts as an acoustic damper, absorbing turbulence and reducing mechanical noise, ensuring a smoother, quieter performance even at high volumes.

Gold-Plated Top Plate and T-Yoke with CNC Aluminum Cosmetic Ring.

For enhanced conductivity, corrosion resistance, and a premium finish, the top plate and T-yoke are gold-plated; a detail that also improves magnetic field consistency. A precisely CNC-machined aluminum ring surrounds the motor structure, not only for aesthetic appeal but also for added structural integrity and vibration control.

■ DESIGN SPECIFICATIONS

DETAILS:

REF SQ MIDWOOFER

6.5" Midwoofer – High-Performance Driver for Precision, Power, and Purity.

Multi-Layered Hexagonal Carbon Fiber Cone and Dustcap for Rigidity and Accuracy.

This midwoofer is equipped with a multi-layered hexagonal carbon fiber cone and matching dustcap, offering a near-ideal balance of lightweight construction and structural rigidity. The hexagonal weave pattern enhances mechanical stability, ensuring that the cone maintains its shape even under high excursion. This results in clean, punchy bass and articulate midrange, free from distortion caused by cone flex or breakup modes.

Non-Conductive TIL Voice Coil Former for Maximum Efficiency and Minimum Damping.

The voice coil is wound on a TIL (Thermally Isolated Laminated) former, a high-temperature, non-conductive composite material that minimizes unwanted damping and prevents eddy current losses. Unlike metallic formers, TIL helps preserve micro-dynamic detail and enhances transient response, allowing the driver to reproduce subtle nuances with greater clarity and efficiency.

FEA-Optimized Motor Structure with Copper Shorting Ring for Low Distortion Performance.

The motor system has been carefully optimized using Finite Element Analysis (FEA) to ensure even magnetic flux distribution across the coil's excursion range.

A copper shorting ring is integrated into the magnetic gap to lower inductance, reduce flux modulation, and suppress harmonic distortion; particularly at higher drive levels.

The result is cleaner, more accurate sound with excellent control throughout the midbass and lower midrange frequencies.

Vented Aluminum Basket with SAFT Technology for Strength and Airflow Optimization.

The precision-cast vented aluminum basket provides a lightweight yet incredibly rigid frame, maintaining driver alignment and structural integrity under heavy load.

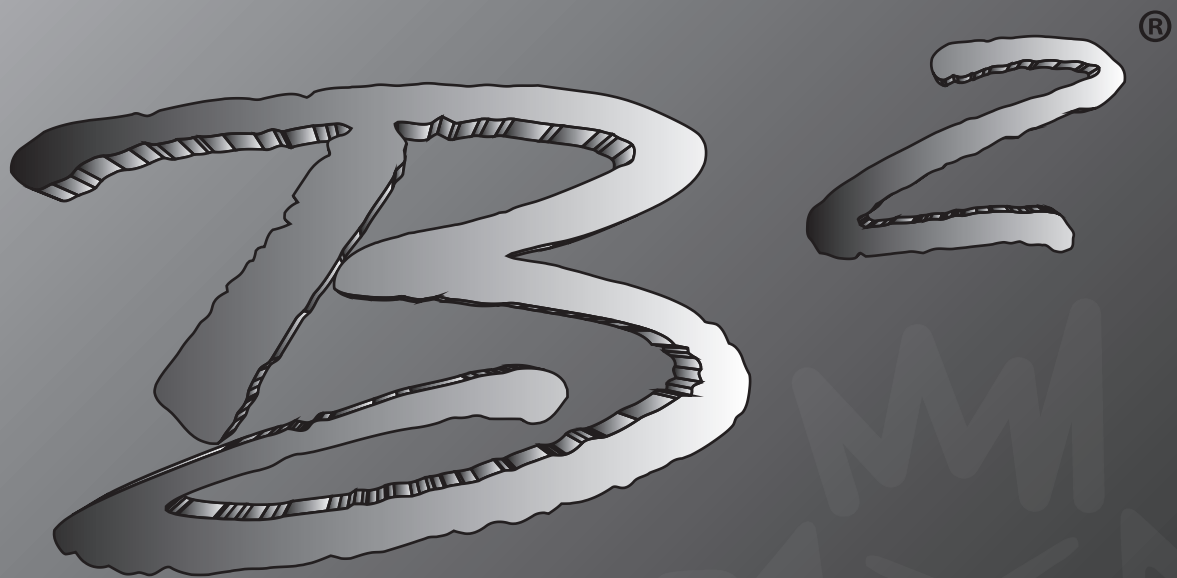
It incorporates SAFT (Structural Air-Flow Technology); a design that strategically channels air around the voice coil and spider assembly. This dramatically improves cooling and pressure relief, resulting in lower compression, extended durability, and consistent performance at high volumes.

Vented Pole Piece with Smooth Cell Foam for Noise Dampening and Compression Reduction.

The vented pole piece effectively reduces air compression and mechanical resistance during large cone movements. To further enhance acoustic performance, the vent is treated with smooth cell foam, which acts as a dampening material to suppress turbulence and reduce mechanical noise, delivering a quieter and more transparent performance.

Gold-Plated Top Plate and T-Yoke with CNC-Machined Aluminum Cosmetic Ring.

For both functional and aesthetic refinement, the top plate and T-yoke are gold-plated, providing enhanced conductivity and corrosion resistance, while also helping to stabilize the magnetic field. A CNC-machined aluminum ring adds a premium visual touch and contributes to mechanical damping, reinforcing the motor structure and reducing resonant artifacts.



LIMITED WARRANTY INFORMATION

B2 audio offers a limited warranty under the following terms:

The product is to be free of defects in material & workmanship under normal use for a period of 1 year from the date of the original purchase, when installed by an authorized dealer. Items not installed by authorized dealers will be warrantied for 30 days from the original purchase. Original sales receipts must be accompanied with all returns. The warranty applies to the original purchaser of the product & it being sold by authorized B2 audio dealers.

The warranty does not cover: 1. Damage caused by accident, abuse, misuse, improper operation, water / solvents & shipping.

2. Product modification, neglect, failure to follow installation instructions & misrepresentation by the seller.

3. Products used for competition purposes or are of such a character 4. Any product that has been opened.

5. Products that has had the serial number defaced, altered or removed.

6. The cost of shipping the product back for repair to an authorized repair centre & cost of return of non-defective items.