reference monitor system

QSC®

A **complete** audio system including loudspeakers, signal processing, and power amplification for critical listening applications.

- **RSC-112 3-way loudspeaker for low, mid, and high frequencies**
- **RSB-212 subwoofer featuring two high-excursion 12-inch drivers**
- **Q-SYS™ Core for digital signal processing, routing, and control**
- **Legendary DCA amplifiers for crystal-clear power**

The New Audio Reference Standard

The Reference Monitor System from QSC combines everything we know about achieving the best possible sound for critical listening situations. A collection of the best audio components is only part of the answer — the real secret is Total System Design. All parts are designed to work together in a system, as a system. It's what makes the QSC Reference Monitor System the new audio reference standard for the most demanding sound professionals and discriminating listeners.

A complete audio system including loudspeakers, signal processing, and power amplification for critical listening applications.

- **TV/Cinema Post-Production**
- **Screening Rooms**
- **Dub Stages**
- **Audio Mixing**
- **Premier Cinema**
- **High-end Home Theatre**

Loudspeakers

QSC's long history in professional sound has taught us many things, especially about how to build a rugged and reliable loudspeaker enclosure that will last, no matter what. Both loudspeaker components of the Reference Monitor System are built to the same dimensions, allowing them to be easily stacked behind a perforated screen. Each cabinet features a matte black so no reflection will visible on the viewing side. Each cabinet features a matte black finish so no reflection will visible on the viewing side. And since they're only 13 inches deep, they require very little space behind a cinema screen.

RSC-112
Screen Channel
Loudspeaker

Directivity Matched Transition (DMT™)

All woofers have wide coverage at lower frequencies that narrows as frequency increases. Many speaker designs ignore this acoustic principal and pretend that only the high frequency horn coverage matters. In reality, a smooth, directional transition from woofer to horn is important. QSC calls this design approach Directivity Matched Transition (DMT). DMT matches the high-frequency coverage angle to the coverage angle of the woofer at the crossover frequency. The result is smooth, even coverage at all frequencies throughout the listening area.

Coaxial Drivers

QSC's unique coaxial drivers align components in both time and space, eliminating phase cancellation and uneven frequency response.

When two drivers are spaced far apart relative to the wavelength of the crossover frequency, pattern interference occurs in the overlap region, resulting in audible effects like lobing and comb filtering. (Figure 1)

Coaxial drivers have the same origin, so they are aligned in both the horizontal and vertical planes. This eliminates interference and lobing/comb filtering, producing even coverage throughout the listening area. (Figure 2)

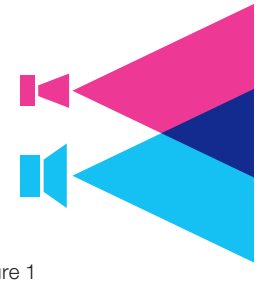


Figure 1

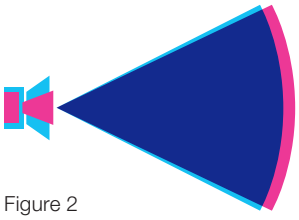


Figure 2

RSC-112 Screen Channel Loudspeaker

The RSC-112 is a 3-way, tri-amplified screen channel loudspeaker for listening spaces up to 35 feet (11 meters) in depth from front to back. A specially-designed coaxial neodymium compression driver provides a dramatic improvement in dynamic response, clarity and transparency for the mid and high frequencies. The annular mid -frequency diaphragm covers the frequency range between 1200 Hz and 7000 Hz with a smooth, linear response. The large diaphragm excursion of +/-0.8 mm results in high output and increased power handling. The high-frequency driver covers the frequency range from 7000 Hz to 20 kHz and eliminates the dome break up that plagues conventional drivers that can cause resonance and harsh, metallic sound. Because both drivers are coaxially aligned, all frequencies above 1200 Hz originate from the same point-source location, preventing audible lobing and comb filtering which can cause uneven sound in the listening area.

RSC-112 Specifications

Rated Coverage Angle (-6 dB)	90 degrees Axisymmetric
Frequency Range[1] (-10dB)	55 Hz to 20 kHz
Crossover Frequencies	80 to 120 Hz (selectable), 1.2 kHz, 7 kHz up to 48 dB/oct using dedicated Q-SYS DSP
Rated Noise Power / rms Voltage[2]	LF: 500 W / 63 V, MF: 80 W / 25 V, HF: 55 W / 20 V
Sensitivity[3]	LF: 94 dB, MF: 107 dB, HF: 105 dB
Maximum continuous SPL[4]	LF: 121, MF: 126, HF: 122,
Maximum peak SPL[4]	LF: 127, MF: 132, HF: 128
Rated Impedance	LF: 8Ω, MF: 8Ω, HF: 8Ω
Recommended Amplifier Power	LF: 1000 W, MF: 500 W, HF: 300 W
Transducers	LF: 12-inch (305 mm) woofer
	MF/HF: coaxial neodymium compression driver with 3.5-inch (90mm) MF voice coil and 1.75-inch (44mm) HF voice coil
Enclosure Details	
Input Connector	Parallel NL8: 1/to sub, 2/LF, 3/MF, 4/HF
Enclosure Material	15-ply Baltic birch plywood
Dimensions (HWD) inches	28.5 x 15.1 x 13.5
Dimensions (HWD) mm	725 x 383 x 344
Net Weight	66.4 lb (30.1 kg)
Included Accessories	None
Optional Accessories	RBK-12 baffle wing kit

[1] Free-field, unprocessed, -10 dB from on-axis sensitivity
[2] AES2-1984 noise signal for 2 hrs
[3] On-Axis, free-field sensitivity, 2.83V, 1 m
[4] Calculated from rated noise voltage and sensitivity

All specifications are subject to change without notice.

RSB-212 Subwoofer

The RSB-212 is the companion subwoofer for the RSC-112 screen channel loudspeaker. Since it is designed to the same physical dimensions as the RSC-112, it makes the perfect base for elevating each RSC-112 to approximate ear-height for most listening environments, and simplifies baffle wall cut-out. Each RSB-212 features a pair of 12-inch 500 watt Kevlar-reinforced woofers with 3-inch voice coils. Together, the powerful high excursion 12-inch woofers in the combined Left, Center, and Right enclosures actually displace more air than four 18-inch woofers.

Each driver is contained in its own tuned chamber, to ensure proper driver loading and maximize cabinet rigidity. Triangular, fully-radiused ports minimize potentially audible air noise through the ports.

RSB-212 Specifications

Rated Coverage Angle (-6 dB)	Omnidirectional
Frequency Range[1] (-10dB)	30 Hz to 120 Hz
Crossover Frequencies	80 to 120 Hz (selectable) up to 48 dB/oct using dedicated Q-SYS DSP
Rated Noise Power / rms Voltage[2]	1000 W / 55 V
Sensitivity[3]	96 dB
Maximum continuous SPL[4]	120.5 dB
Maximum peak SPL[4]	126.5 dB
Rated Impedance	3Ω
Recommended Amplifier Power	1000 W
Transducers	2 x 12 in. (305 mm) Kevlar-reinforced paper cones, 3 in. voice coils
Enclosure Details	
Input Connector	Parallel NL8: 1/to sub, 2/thru, 3/thru, 4/thru
Enclosure Material	15-ply Baltic birch plywood
Dimensions (HxWxD)	28.5" x 15.1" x 13.5" (725 x 383 x 344 mm)
Net Weight	89 lb (40.4 kg)
Included Accessories	None
Optional Accessories	RBK-12 baffle wing kit

[1] Free-field, unprocessed, -10 dB from on-axis sensitivity
[2] AES2-1984 noise signal for 2 hrs
[3] On-Axis, free-field sensitivity, 2.83V, 1 m
[4] Calculated from rated noise voltage and sensitivity

All specifications are subject to change without notice.

Q-SYS™ Signal Procesing

Since its introduction in 2007, Q-SYS has set a new standard for flexibility and power in a digital audio network platform. Q-SYS provides all signal processing and routing for any input/output combination you need, for any audio format including 2.1, 5.1, 7.1, or any of the new immersive sound formats. Q-SYS also provides DSP-based crossovers and equalization for both the RSC-112 screen channel system and RSB-212 subwoofer.

Using a customized Linux OS and running on Intel microprocessors, the Core 510c is amazingly powerful. Because Q-SYS doesn't depend on proprietary DSP hardware, it directly benefits from advancements driven by the entire global Computing/IT industry, and software improvements don't require new hardware. New capabilities are added on a regular basis.

Q-SYS Cores are configured using an intuitive object-based drag and drop user interface that provides for the creation of nearly any imaginable signal flow. Control logic objects are provided and custom scripting may also be used to accomplish a wide range of interface or control tasks. The design GUI is capable of quickly and easily generating graphical control screens that may be run on network-connected computers, tablet devices or QSC touch screen controllers

The Core 510c can accommodate up to eight Q-SYS input and/or output cards for a total onboard channel capacity of 32 channels. Channel count may be further expanded by the addition of Q-SYS I/O Frames and other peripheral devices. I/O card options include:

• **Mic/Line Analog Input Card (CIML4/CIML4-HP)** – Four channels of switchable mic/line-level analog audio input with 48 V phantom power. This input card provides the interface between Q-SYS and input devices such as microphones, mixers, and CD/DVD players.

• **Analog Line Output Card (COL4)** – Four channels of balanced, line-level analog output for interfacing between Q-SYS and outboard equipment such as non-DataPort amplifiers, recording devices and conferencing systems.

• **AES-3 Digital Input/Output Card (CAES4)** – Four input and four output channels of AES-3 digital audio for interfacing between Q-SYS and digital devices such as mixing consoles and recording devices.

• **DataPort™ Output Card (CODP4)** – Four audio output channels (2 DataPorts) for connection to DataPort equipped QSC amplifiers. The DataPort interface allows audio, status monitoring, and control between Q-SYS and QSC DataPort power amplifiers.

• **16-Channel AES-3 Card (CIAES-16)** – CIAES16 is a 16-channel AES/EBU (AES3) 24-bit digital input Q-SYS peripheral card that can be used in any Q-SYS Core or I/O Frame. It utilizes a pair of RJ45 connectors to connect to DCI-compliant D-Cinema Servers, and provides a simple and cost-effective way to interface Q-SYS into an existing or new installation.

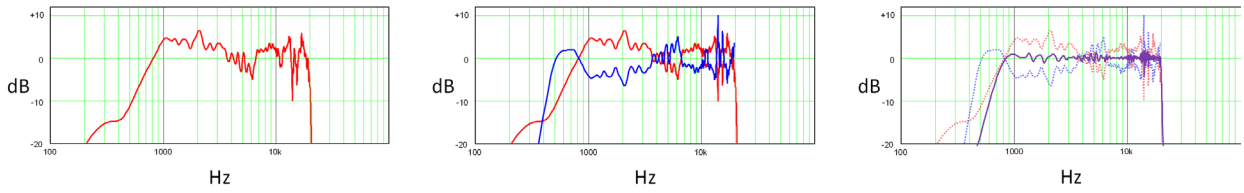
• **Dante Audio Bridge Card (CDN64)** – Provides a link for up to 64x64 channels at 48 kHz from any Dante™ edge network, such as wireless microphones and digital mixers, directly into the Q-SYS ecosystem for advanced processing and redistribution over Q-LAN for larger LAN and WAN IT infrastructures. It allows the use of MADI to Dante converters when Q-SYS is used in post-production applications.

Q-SYS Core 510c

Intrinsic Correction™

QSC has developed a new and reliably consistent, easy-to-use method for correcting loudspeaker performance. We call it Intrinsic Correction because it corrects the intrinsic behaviors of cinema loudspeakers, removing any anomalies from the equation of factors that affect measured response and, ultimately, the quality of sound.

Intrinsic Correction is implemented in the Q-SYS Core processor. Settings for each individual loudspeaker model are derived in the QSC sound laboratory. First, up to 75 measurements are taken of the loudspeaker using a custom-designed measurement rig and turntable. Then these measurements are used to create an inverse filter that corrects for equalization, phase, delay and other errors inherent in the loudspeaker components or enclosure. The inverse filter is then applied to the signal, resulting in a more uniform power response. Cinema Intrinsic Correction optimizes performance and minimizes the amount of on-site room-tuning, because many response anomalies are corrected before the loudspeakers are installed.

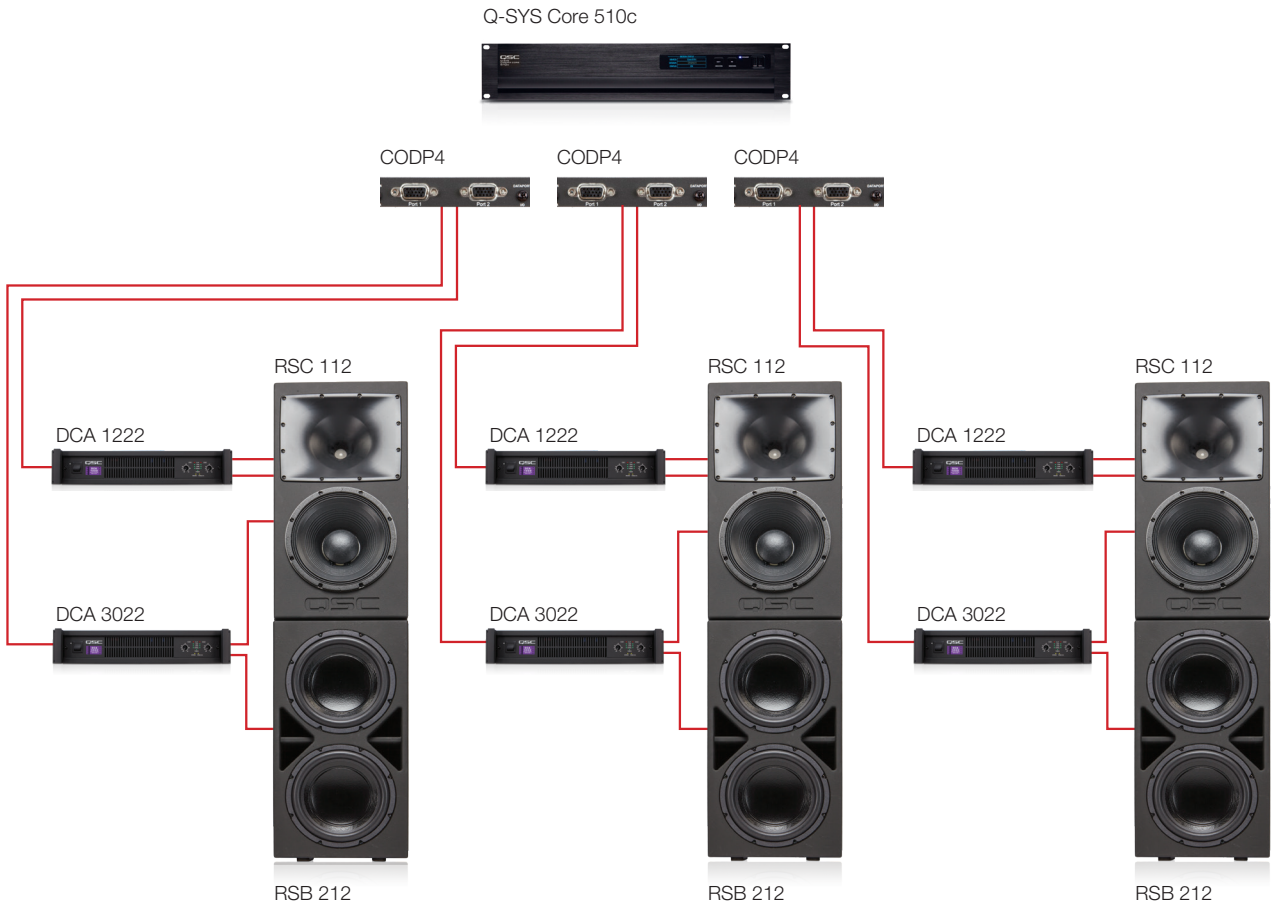


Lab measurements produce a response curve of the loudspeaker (left). Then, an inverse of that response is created using FIR filters (center). When the two are combined, the result is a much flatter response (purple line, right).

Power Amplifiers

After over 50 years of engineering R&D excellence and real-world use by the world's most demanding sound professionals, we've learned a lot about making the most reliable, best–sounding amplifiers on the planet. That's why each RSC/RSB loudspeaker stack uses one each of our DCA 1222 and DCA 3022 amplifiers—more than enough power for crystal-clear highs, intelligible midrange, and deep, impactful lows.

DCA power amplifiers feature our exclusive PowerLight™ technology, which uses a switching power supply that provides ample current to the audio power circuitry by charging the supply rails 230,000 times per second through an ultra-low impedance circuit. So unlike high-powered amplifiers with conventional power supplies, the audio signal is never starved prematurely, but remains crisp and clean. The result is extraordinarily deep, punchy bass and superior high frequencies to make every mix or soundtrack sparkle.



DCA 1222

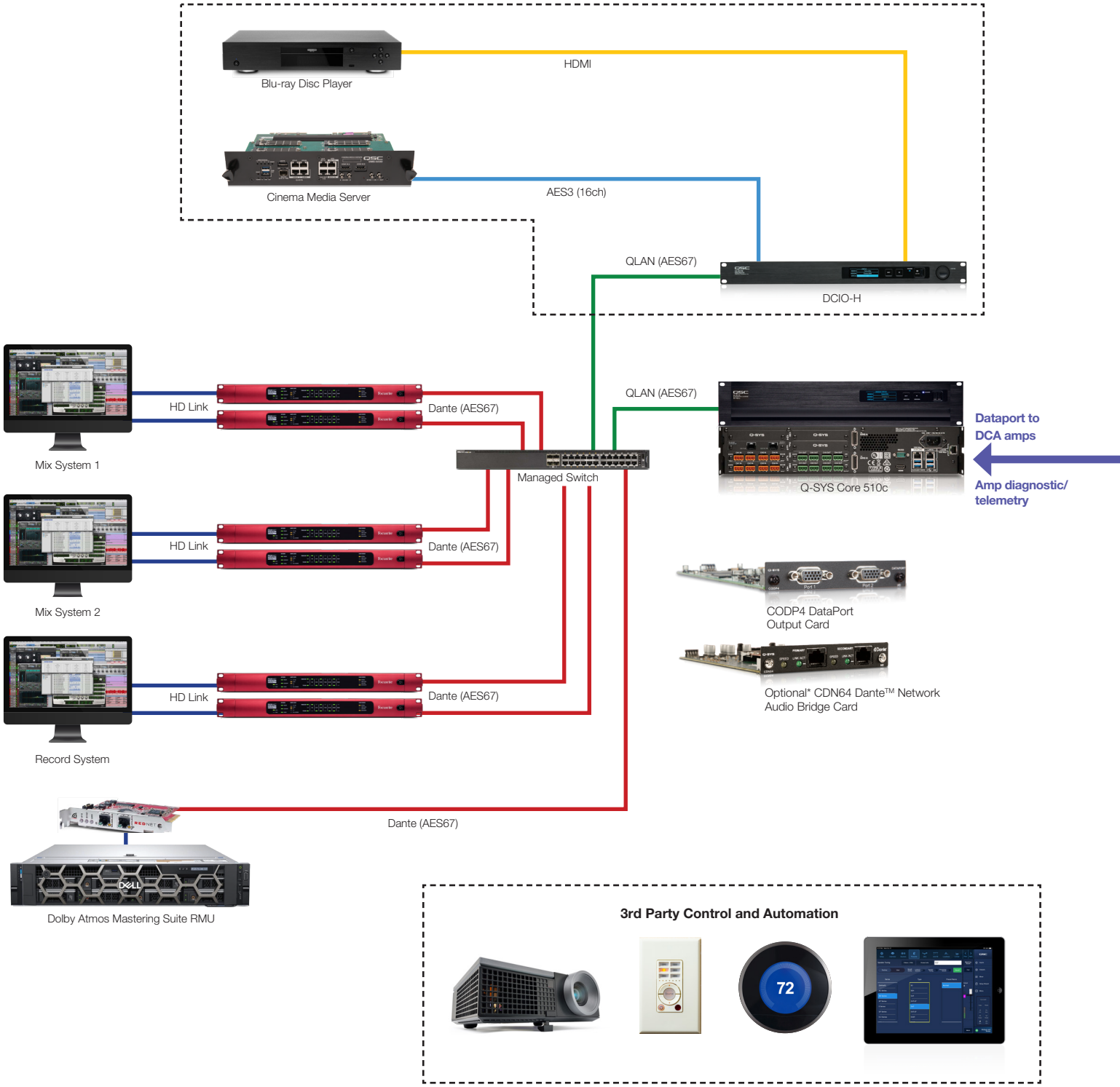
DCA 3022

DCA Specifications

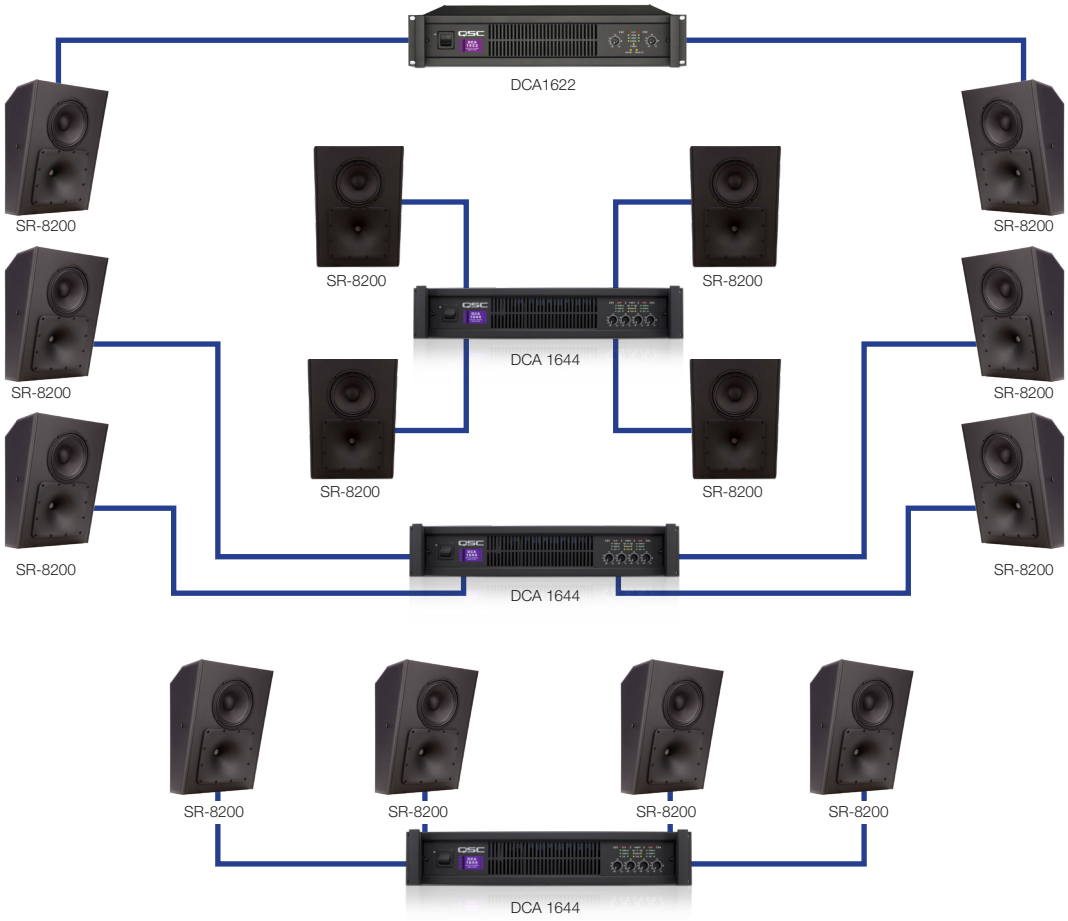
	DCA 1222	DCA 3022
Stereo Mode (both channels driven)		
Continuous average output power per channel		
8Ω / 20 Hz – 20 kHz / 0.03% THD	200 W	550 W
8Ω / 1 kHz / 1% THD	215 W	625 W
4Ω / 20 Hz – 20 kHz / 0.05% THD	325 W	900 W
4Ω / 1 kHz / 1% THD	375 W	1050 W
2Ω / 1 kHz / 1% THD	600 W	1500 W
Bridge-Mono Mode		
Continuous average output power		
16Ω / FTC 20 Hz – 20 kHz / 0.1% THD	400 W	1000 W
8Ω / FTC 20 Hz – 20 kHz / 0.1% THD	700 W	2000 W
4Ω / EIA 1 kHz / 1% THD	1200 W	3000 W
Signal to Noise (20 Hz – 20 kHz)	< -106 dB	< -107 dB
Input Sensitivity at 8Ω	1.0 Vrms	1.7 Vrms
Input Sensitivity at 4Ω	0.9 Vrms	1.5 Vrms
Output Circuitry	Class AB	2 tier Class H
Power Requirements (1/8 pink noise at 4Ω)	6 A*	12 A*
Distortion (SMPTE-IM)	< 0.01%	0.02%
Distortion (typical) 20 Hz to 20 kHz: 10 dB below rated power 1.0 kHz and below: full rated power	< 0.01% THD / 4Ω and 8Ω 20 Hz – 20 kHz, ± 0.2 dB | 8 Hz – 50 kHz, + 0, -3 dB	
Frequency Response	20 Hz – 20 kHz, ± 0.2 dB | 8 Hz – 50 kHz, + 0, -3 dB	
Damping factor (1 kHz and below)	> 500	
Input Impedance	10k ohms unbalanced, 20k ohms balanced	
Input Clipping	10 Vrms (+22 dBu)	
Dimensions (HxWxD)	3.5 x 19 x 14 inches (8.9 x 48.3 x 35.6 cm)	
Voltage Gain	40x (32 dB)	
Weight (Net / Shipping)	21 lb (9.5 kg) / 27 lb (12.3 kg)	

* at 120 VAC, both channels driven; multiply current by 0.5 for 230V units

Sample System Cinema Post-Production




DCA 1222
DCA 3022
DCA 1222
DCA 3022
RSC-112 w/Baffle Kit
RSB-212 w/Baffle Kit
RSC-112 w/Baffle Kit
RSB-212 w/Baffle Kit


DCA1622
SR-8200
SR-8200
SR-8200
SR-8200
SR-8200
DCA 1644
SR-8200
SR-8200
SR-8200
SR-8200
SR-8200
DCA 1644
SR-8200
SR-8200
SR-8200
SR-8200
DCA 1644

qsc.com/cinema

US only: 1-800-854-4079
Outside the U.S. +1-714-754-6175
Fax +1-714-754-6174

Address:
1675 MacArthur Boulevard
Costa Mesa, CA 92626