

Cayin N6iii R202 Digital Audio Player

N6iii R202	
Product Name	Cayin N6iii R202
R202 Key Features	<p>Fully Discrete Fully Balanced Dual DAC Architecture</p> <p>Incorporates 320 ultra-precision thin-film resistors rated at 0.1% (1/1000) accuracy.</p> <p>Discrete R-2R PCM DAC is built with 192 pieces of 0.1% high-precision thin-film resistors in a balanced 24-bit DAC configuration, supporting native PCM decoding up to 384kHz.</p> <p>Discrete 1-Bit DSD DAC is built with 128 pieces of 0.1% high-precision thin-film resistors in a balanced 1-bit DAC architecture, supporting native DSD256 decoding.</p> <p>Dual Digital Audio Processor: Equipped with powerful algorithmic processing, the R202 supports decoding up to PCM 768kHz and DSD512, with sample rate and format conversion.</p> <p>Triple Decoding Modes: Auto, R-2R and 1-Bit</p> <p>Auto Mode – Intelligent Format Matching. In Auto Mode, the system intelligently selects the optimal DAC architecture based on the source format—PCM signals are decoded by the R-2R DAC, while DSD signals are processed by the 1-Bit DAC. This seamless switching ensures each decoding performs at its peak, delivering authentic, true-to-source sound reproduction that preserves the full character and nuance of the original recording.</p> <p>R-2R Mode: Delivers a rich, smooth, and emotionally engaging sound with an expansive, relaxed presentation.</p> <p>1-Bit Mode: Offers a more natural rendering of high-frequency overtones, with a clear soundstage and precise imaging.</p> <p>Quad-Channel Fully Balanced Headphone Amplifier Circuit</p> <p>Built on a fully balanced DAC architecture, the amplifier section uses six pieces OPA1612 and OPA1662 operational amplifiers to form a fully symmetrical differential signal chain.</p> <p>Four INA1620 op-amps forms the quad-channel balanced headphone amplifier, with dual internal channels paralleled per chip and four-chip balanced drive. This enables full differential amplification of analog audio signals, ensuring precise detail reproduction and exceptional dynamic response.</p> <p>Matrix-Structured Clean Power Supply Design</p> <p>The headphone amplifier is powered by an LT8582-based high-performance dual-polarity boost supply, delivering ultra-clean power with microvolt-level ripple suppression through LC filtering — significantly enhancing dynamic load response.</p>

	<p>The DAC and op-amps are powered by a matrix formed from TPS61087 and TPS61240 converters, followed by 7 ultra-low-noise LDOs that independently power the digital, analog, and clock sections. This minimizes noise density and lays a robust foundation for high-fidelity audio output.</p> <p>Quad-Channel Precision Analog Volume Control</p> <p>Utilizes the JRC NJW1195 full-balanced volume control chip, offering 256-step adjustments in 0.5dB increments. Through rigorous parameter analysis and acoustic matching, 100 core levels are carefully selected to ensure low distortion and excellent channel balance throughout the adjustment range — delivering pure sound quality with precise and efficient volume control.</p> <p>Phone Output Only: Pure and Purposeful</p> <p>Within the limited PCB space, a dedicated audio circuit architecture is meticulously optimized for direct load-driving using fully balanced signal transmission and amplification.</p> <p>The R202 features a PO (Phone Out) output only, with no LO (Line Out) function — a design choice made to maintain purity and focus in audio output performance.</p>
<p>N6iii</p> <p>Key Features</p>	<p>Large Display Design</p> <p>Optimized screen-to-body ratio for an enhanced viewing and control experience, offering a larger visible interface while maintaining portability and practicality.</p> <p>All-New Structure</p> <p>Screw-free, self-locking, press-to-engage power switch. Swappable audio motherboard design with multiple options available for different audio needs.</p> <p>Powerful Hardware</p> <p>Equipped with the Qualcomm Snapdragon 665 octa-core 64-bit processor, paired with 6GB RAM and 128GB internal storage. Supports TF card expansion up to 2TB.</p> <p>Android 12 Operating System</p> <p>Features system-wide support for DTA (Direct Transport Audio) lossless audio output under Android.</p> <p>High-Resolution Local Playback</p> <p>Supports up to PCM 768kHz and DSD512 playback (May vary depending on the installed audio motherboard).</p> <p>Premium Display</p> <p>5-inch Sharp TFT screen with 1080×1920 Full HD resolution. Covered with Corning Gorilla Glass 3. Supports multi-touch, double-tap to wake, and gesture controls.</p> <p>Large-Capacity Battery</p> <p>Built-in 9000mAh 3.85V high-capacity battery with ultra-low-loss protection circuitry. Supports PD2.0 fast charging.</p> <p>Wireless Audio</p> <p>Bluetooth 5.0 and Dual-band Wi-Fi (2.4GHz/5GHz). Supported Bluetooth audio formats:</p>

UAT (up to 192kHz), LDAC (up to 96kHz), SBC and AAC etc.

Versatile Connectivity

Supports USB Audio In/Out and S/PDIF Output.

Premium Craftsmanship

The chassis is made of 6063 aluminum alloy, precisely crafted using 5-axis CNC machining. The irregular dual-side curve design offers a comfortable and ergonomic grip.

Product Image



R202 Audio Motherboard – Technical Specifications

Digital Audio Processor	High-performance digital audio processor supporting ultra-high-resolution format and sample rate conversion.
DAC	R-2R DAC: Fully discrete 24-bit balanced R-2R DAC built with $192 \times 0.1\%$ ultra-precision thin-film resistors (48×4 configuration). 1-Bit DAC: Fully discrete 1-bit balanced DAC built with $128 \times 0.1\%$ ultra-precision thin-film resistors (32×4 configuration).
OP-AMP IC	OPA1612 $\times 4$, OPA1662 $\times 2$
Volume Control	NJW1195 full-balanced analog volume controller
Headphone Amplification Circuit	$4 \times$ INA1620 dual-channel op-amps, with internal channel parallel drive Forms a quad-channel fully balanced headphone amplifier architecture
Output Interface	3.5mm Single-Ended PO 4.4mm Balanced PO
Headphone Amp Power Supply	LT8582 ultra-clean dual-polarity boost supply
DAC Power Supply	TPS61087 + TPS61240 matrix 5 ultra-low-noise LDOs
LPF (Low-Pass Filter) Power Supply	2 ultra-low-noise LDOs
Audio Motherboard Net Weight	62 g
N6iii Net Weight (with R202 installed)	350 g

Battery Life (Tested with N6iii Main Unit)

Mode	3.5mm SE PO	4.4mm BAL PO
Auto	15 hrs	15 hrs
R-2R	16 hrs	16 hrs
1-Bit	14 hrs	14 hrs

Test conditions: R202 installed in N6iii, screen off, wireless off, mixed playback of 44.1kHz PCM & DSD64 files, 32Ω load, medium gain, volume at 30. Actual performance may vary depending on usage and environment.

R202 Specifications

Single-Ended Phone Output (3.5mm)

Parameter	1-Bit DAC (@DSD128)	R-2R DAC (@24bit 192kHz)
Output Impedance	0.5 Ω (32 Ω load)	0.5 Ω (32 Ω load)
Output Power	250mW (32 Ω)	250mW (32 Ω)
Frequency Response	20Hz–20kHz (± 0.2 dB)	20Hz–20kHz (± 0.1 dB)
THD+N	0.007%	0.013%
Dynamic Range	115dB	90dB
Signal-to-Noise Ratio	117dB	115dB
Channel Separation	78dB (1kHz, 32 Ω)	78dB (1kHz, 32 Ω)

Balanced Phone Output (4.4mm)

Parameter	1-Bit DAC (@DSD128)	R-2R DAC (@24bit 192kHz)
Output Impedance	0.8 Ω (32 Ω load)	0.8 Ω (32 Ω load)
Output Power	550mW (32 Ω)	550mW (32 Ω)
Frequency Response	20Hz–20kHz (± 0.2 dB)	20Hz–20kHz (± 0.1 dB)
THD+N	0.005%	0.013%
Dynamic Range	115dB	90dB
Signal-to-Noise Ratio	117dB	115dB
Channel Separation	110dB (1kHz, 32 Ω)	90dB (1kHz, 32 Ω)

Note: All specifications and measurements provided above are based on our prototype unit. Final product performance may vary. Specifications are subject to change without prior notice.