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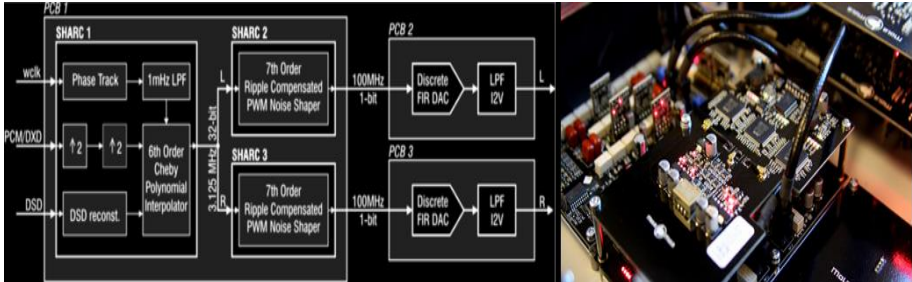**info@mola-mola.nl**

Mola-Mola DAC

The Mola-Mola DAC: Future-Proof by Being Far Ahead.

You probably know the frustration of discovering your DAC has suddenly gone out of date because some new super chip has hit the market. We decided to stay out of that cycle and design, from the ground up, a discrete DAC whose unbeatable staying power results simply from being more than 10 years ahead of the performance curve. There's room enough for improvement: today's best DAC chip claims no better than 22 bits' worth of dynamic range and only 20 bits' worth of linearity. High resolution music deserves better than that. Mola-Mola's DAC is designed from the ground up using circuits and digital algorithms that were entirely developed in house.

The converter is a three board stack that fits in one of the option slots in the preamp. On the first board, all incoming digital audio is upsampled to 3.125MHz/32 bits and converted to noise shaped PWM. The two remaining boards are mono DACs, in which a discrete 32-stage FIR DAC and a single-stage 4th order filtering I/V converter convert the PWM into analogue with a breathtaking 140dB SNR. This is near the theoretical limit for 24-bit files and far beyond that of even quad-speed DSD. Uniquely, distortion remains below the noise floor even for full scale signals. A quick look at current and historic trends of high-end IC's indicates that for the foreseeable future this kind of performance will remain unavailable to manufacturers forced to rely on the same "chip du jour" that also powers their competitors' products.

Even by today's exacting standards, extraordinary care has been taken deal with jitter. Mola-Mola's DAC uses a home-grown asynchronous upsampling algorithm whose input frequency measurement slows down rapidly until after a few seconds of lock, the frequency ratio measurement is frozen. Frequency stability is then wholly determined by the internal clock, a laboratory grade 100MHz SC-cut oscillator. This is effectively an atomic clock sans the physics package (which contributes nothing to spectral purity but quite a lot to cost).

Inputs

AES/EBU (XLR), Optical (Toslink), USB and Bluetooth (A2DP, APTX). Ethernet connection for internal purposes only.

Supported formats

PCM up to 384 kHz /32 bits (>192 kHz and >24 bits only via USB)

DoP up to double speed and Native DSD up to quad speed (USB only)

Performance

Full-Scale Output Level: 20 dBu

Signal to Noise Ratio: 140 dB (standalone version), 130dB (preamp option board)

THD, IMD: not measurable (estimated -150 dB).

Bandwidth: Up to 80 kHz. Choice of sharp or slow upsampling filters, minimum or linear phase.

Integrated jitter: <1 ps from 10 Hz upwards, <300 fs from 1 kHz upwards.

Jitter rejection: >80 dB at 1 Hz after 20 seconds of lock.