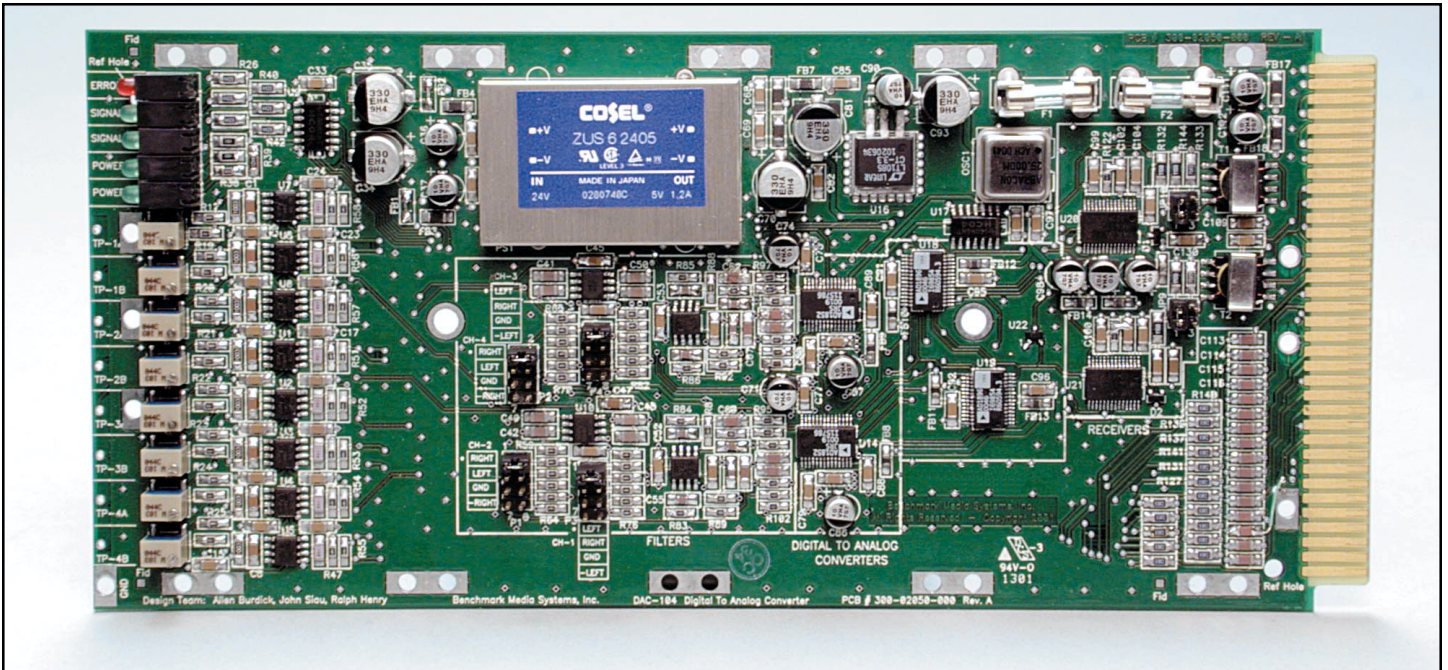


Benchmark
...the measure of excellence™!

DAC-104

4-Channel Audio D-to-A Converter

A System 1000 Digital Audio Module



FEATURES:

DAC-104

- 4-channel, 24-bit, 96-kHz D-to-A conversion
- Two balanced audio outputs per channel, 8 total
- Adjustable Output Levels – Multi-turn trimmers – 1 trimmer per output — 20 dB Range
- *Total* jitter immunity!
- Phase Accurate D-to-A conversion across *any* number of channels
- THD+N = -102 dB (0.00079%) measured at -3 dBFS, any sample rate, any test frequency
- 4 power, 2 error, and 4 range indicating LEDs
- Polarity Invert function – jumper selectable
- LR swap – jumper selectable
- L+R to L out, L-R to R out – jumper selectable
- L+R Sum to both L and R outputs – jumper selectable
- Automatic De-emphasis for 44.1, 48, 88.2, and 96 kHz when Pre-emphasis bit is set
- Front edge test points
- 165 mA quiescent draw @ ±15 V, 171 mA - full signal into a bridging load

The DAC-104 is a four-channel, 24-bit, 96-kHz Digital-to-Analog audio converter module for the System 1000 audio cardframe.

Benchmark digital converters have a reputation for high-end performance without a high-end price tag. The DAC-104 is no exception. Most cardframe DACs lack a two-stage phase-lock-loop, making them very susceptible to jitter, the bane of digital audio. Those DACs can rarely achieve their rated performance in real world applications. The DAC-104, however, takes full advantage of our latest digital lockup technology to provide *total* jitter immunity and very high performance. Best of all, the rated performance is bullet proof: it is repeatable under the most adverse input signal conditions!

The DAC-104 has a worst-case THD+N of 0.0011% at 0 dBFS and an input sample-rate range of 28 through 108-kHz. Features include; auto-detection and processing of pre-emphasized digital audio, jumper selection of discrete stereo, matrix stereo (L+R and L-R), polarity inversion, and Mono sum on all outputs. Output level controls are at the front card edge and provide an output adjustment range of +7.5 dBu to +27.5 dBu at 0 dBFS.

DAC-104

Four Channel Digital-to-Analog Converter

A System 1000 Digital Audio Module

Audio Performance:

Test Conditions: $F_s = 44.1$ to 96 kHz, 20 to 20 kHz BW, 1 kHz test tone, 0 dBFS = +24 dBu (unless noted):

SNR:
SNR – A-Weighted, (0 dBFS = 20 to 27.5 dBu): = 110 dB

SNR – Unweighted, (0 dBFS = 20 to 27.5 dBu): = 108 dB

SNR at Reduced Gain:

SNR – A-Weighted (0 dBFS = 10 to 18 dBu): = 109 dB

SNR – A-Weighted (0 dBFS = 8 dBu): = 108 dB

THD+N:

THD+N, 1 kHz at 0 dBFS: = -99 dBFS, -99 dB, 0.0011%

THD+N, 1 kHz at -1 dBFS: = -101 dBFS, -100 dB, 0.0010%

THD+N, 1 kHz at -3 dBFS: = -105 dBFS, -102 dB, 0.0009%

THD+N, 20 to 20 kHz test tone at -3 dBFS: = -104 dBFS, -101 dB, 0.0010%

Frequency Response:

Frequency Response at $F_s = 48,000$: = ± 0.1 dB (20 to 20 kHz) = -0.02 dB at 10 Hz, -0.20 dB at 20 kHz

Frequency Response at $F_s = 96,000$: = ± 0.1 dB (20 to 20 kHz) = -0.02 dB at 10 Hz, -0.20 dB at 20 kHz, -0.86 dB at 40 kHz, -2.7 dB at 45 kHz

Spurious Tones:

Maximum Amplitude of Jitter Induced Sidebands: = < -141 dB (10 kHz 0 dBFS tone, 12.75 UI sinusoidal jitter at 1 kHz)

Max. Amplitude of Spurious Tones with 0 dBFS test signal: = < -130 dB

Maximum Amplitude of Idle Tones: = < -130 dB

Phase:

Interchannel Differential Phase (Stereo Pair): = ± 0.5 degrees at 20 kHz

Interchannel Differential Phase (Channel 1 to Channel 3): = ± 0.5 degrees at 20 kHz

Interchannel Differential Phase (Between Boards): = ± 0.5 degrees at 20 kHz

Delay:

Delay (Digital Input to Analog Output):

1.01 mS + $[48/F_s]$, (2.10 mS at 44.1 kHz, 2.02 mS at 48 kHz, 1.53 mS at 88.2 kHz, 1.49 mS at 96 kHz)

Lock Time:

Maximum Lock Time – after F_s change: = 100 mS

Mute:

Soft Mute Ramp Up/Down Time: = 20 mS

Mute on Receive Error: Yes

Mute on Lock Error: Yes

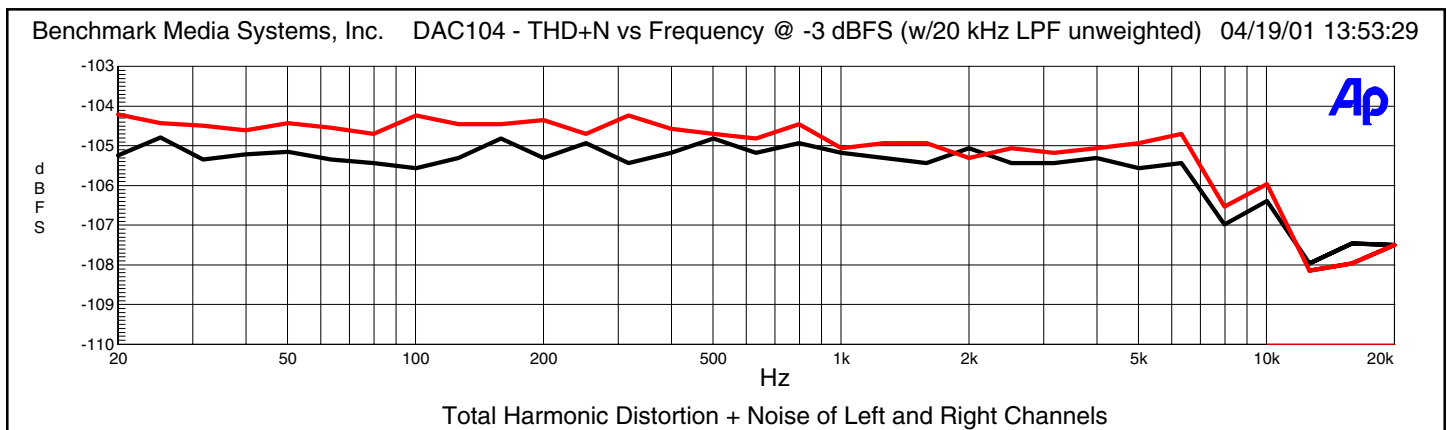
Mute on Idle Channel: No

De-Emphasis:

50/15 μ S De-Emphasis Enable: Automatic

De-Emphasis Method: Digital IIR

De-Emphasis Supported at: $F_s = 32, 44.1, 48,$ and 96 kHz



Benchmark
...the measure of excellence™!

BENCHMARK MEDIA SYSTEMS, INC.

5925 Court Street Road
Syracuse, NY 13206-1707
315-437-6300 Phone, 315-437-8119 Fax
Toll Free 800-262-4675 (800-BNCHMRK)