ROSTEC Engineering
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ROSTEC ADD24, 24Bit Analog/digital Converter for GPU frame

The ADD24 is a true 24-bit, 96 kHz stereo Analog/Digital Converter, using dual-bit Sigma Delta conversion with 64 and 128x oversampling and linear digital anti-alias filtering and decimation.
It offers a full differential architecture with electrically balanced input circuitry and transformer-balanced digital input and output.

The converter is designed to operate in a GPU frame environment with a Digital Reference Generator installed in the frame, the DRG supplying all the necessary system clocks via the GPU bus.
It features an automatic out-of-sync detector circuit, comparing the output AES block position with the block position of the GPU bus, ensuring perfect sync between the digital outputs of all modules installed in the GPU frame.

When no Digital Reference Generator is installed in the GPU frame, the converter can be configured to run from an external AES sync source. External sync mode is selected by means of a jumper on the PCB, enabling the converter to synchronize to an incoming AES signal through the back panel connector. When operating in this mode, only the audio data bits from the A/D converter chip are used in the output. System clocks, channel status, user and validity information is extracted from the external AES input and passed through transparently to the converters AES output.

All digital input and output formats conform to the AES3, IEC60958 (S/PDIF) and EIAJ CP1201 interface standards.

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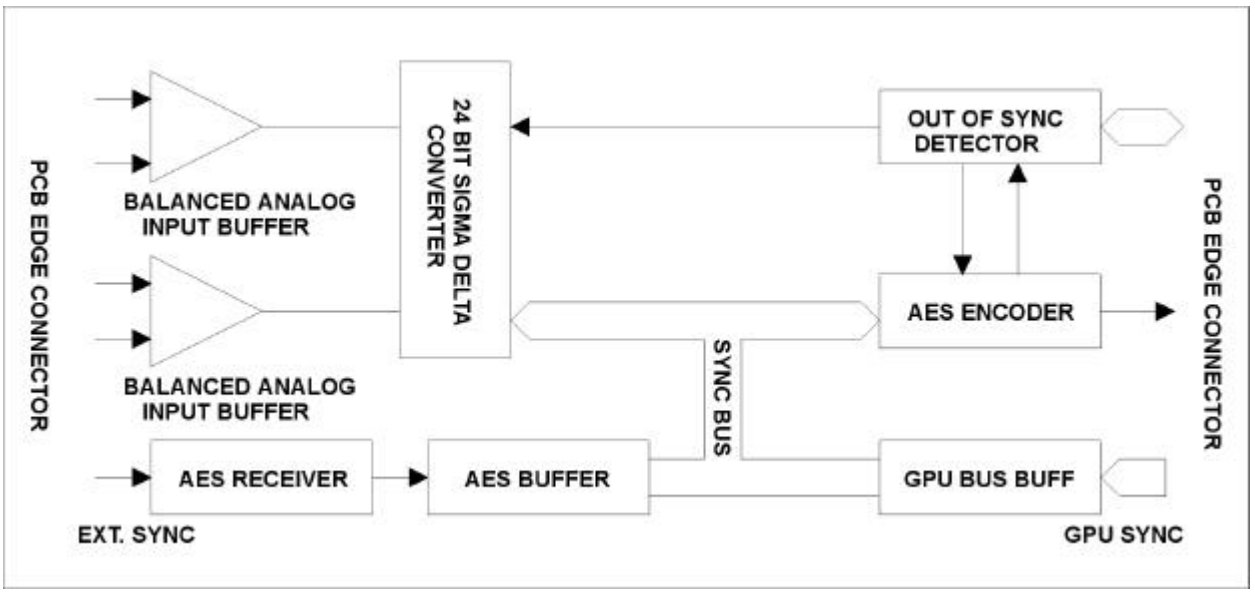
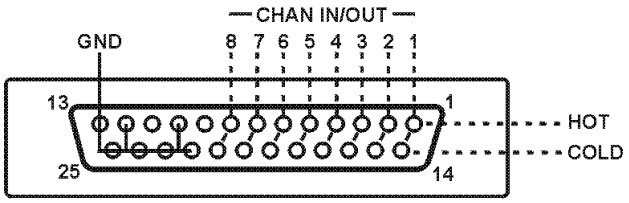
Block Schematic:



IN/OUT CONNECTIONS ADD24



CHA Input: Hot pin1, Cold pin14, Gnd pin 15
CHB Input: Hot pin3, Cold pin16, Gnd pin17
Sync Input: Hot pin6, Cold pin19, Gnd pin20
AES output: Hot pin8, Cold pin21, Gnd pin22

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Electrical specifications (typical):

Dimensions	: GPU Card Standard
Weight	:
Power requirements	: +5V , +12V, -12V
Analog Audio Inputs	: +18 dBu for 0 dBFs, 10 kohms electrically balanced
Digital Audio Outputs	: AES Transformer Balanced 110 Ohms, 4V PP into 110 Ohms
Digital Audio specs:	: Resolution 24 bit
	: Dynamic range 20-20 kHz, 115 dB A weighted
	: THD+N < -105 dB/1 kHz, Measured at –1 dBFs, bandwidth 20-20kHz
	: Linearity +/1dB 0 dBFs to –120 dBFs
	: Passband ripple: 0,001 dB
	: Stopband attenuation: >110 dB
	: CMRR > 80 dB 20-20 kHz
	: Crosstalk L/R < -90 dBFs 20-20 kHz
External reference	: AES balanced 110 ohms
Internal Reference	: GPU bus

Channel Status reporting

Using External Reference	: Channel status, validity and user bits received from the External Reference are transferred unchanged to the AES output.	
Using GPU Reference	: Byte 0, bit 0:	**PRO**
	: Byte 0, bit 1:	**AUDIO USE**
	: Byte 0, bit 2,3,4:	**NO EMPHASIS**
	: Byte 0, bit 5:	**Fs LOCK**
	: Byte 0, bit 6,7:	**44,1kHz, 48kHz**. 96kHz is reported as **"not indicated"**
	: Byte 1, bit 0,1,2,3:	Not indicated. Receiver defaults to **2-channel mode**.
	: Byte 1, bit 4,5,6,7:	**No user info**
	: Byte 2, bit 0,1,2:	Auxiliary sample bits, **Not defined** (default)
	: Byte 2, bit 3,4,5:	Source Word length, **Not indicated** (default)
	: Byte 2, bit 6,7:	Not used
	: Byte 3, bit 0-7:	Vector target, **Not indicated**
	: Byte 4, bit 0,1:	**Not reference** signal (default)
	: Byte 4, bit 2-7:	Not used
	: Validity:	**VALID**

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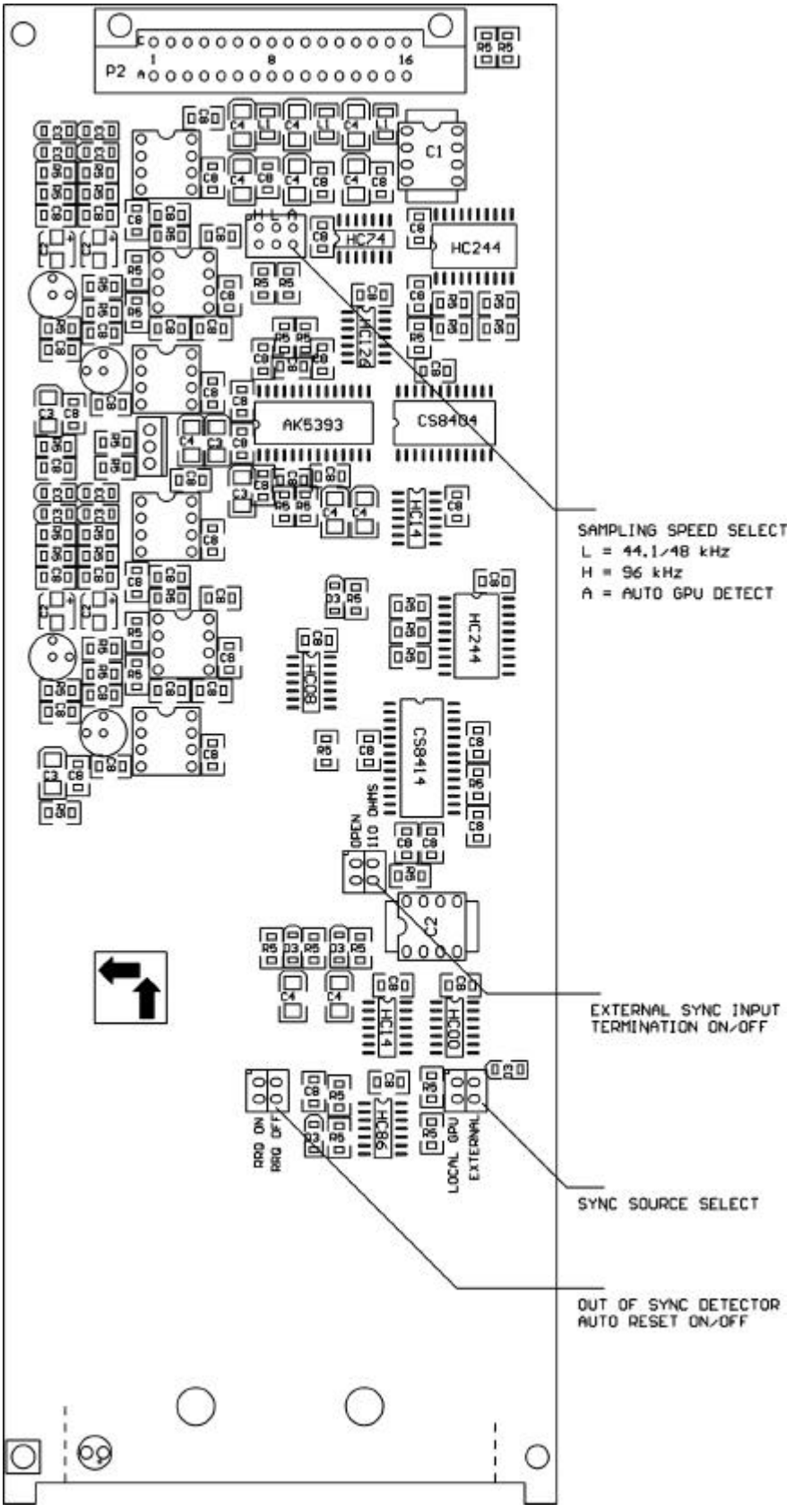

Sampling speed:
L: 44.1/48 kHz, 128x
H: 96 kHz, 64x
A: Auto (default)

Termination:
110 ohms (default)
Open (approx 16 kohms). Used for serial chain connection. Last unit in the chain must be terminated.

Sync source:
GPU bus (default)
External AES input

Out of sync detector:
On (default): Calls for a master reset when difference in sync position between GPU and AES output occurs.
Off: Accepts out of sync condition.

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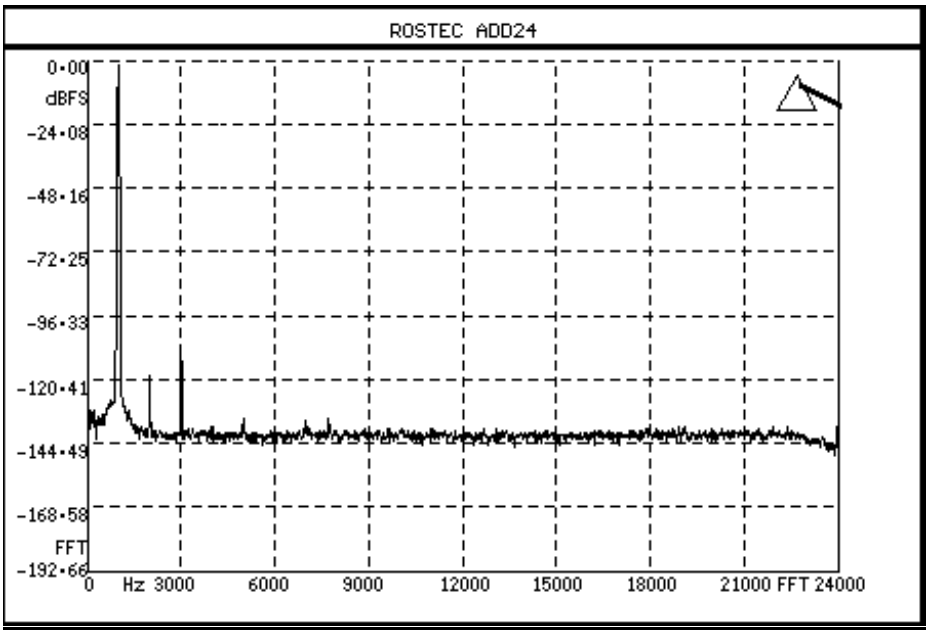
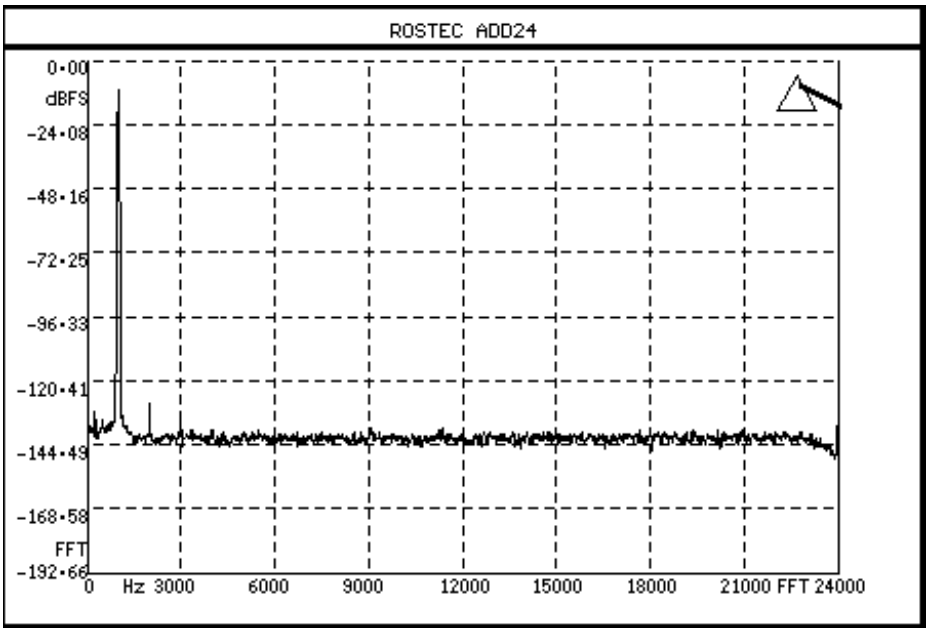
FFT analysis



Output 1 kHz, -1 dBFs at 48 kHz
THD+N -106,32 dBFs, 20 Hz – 20 kHz unweighted



Output 1 kHz, -10 dBFs at 48 kHz
THD+N -112,17 dBFs, 20 Hz – 20 kHz unweighted

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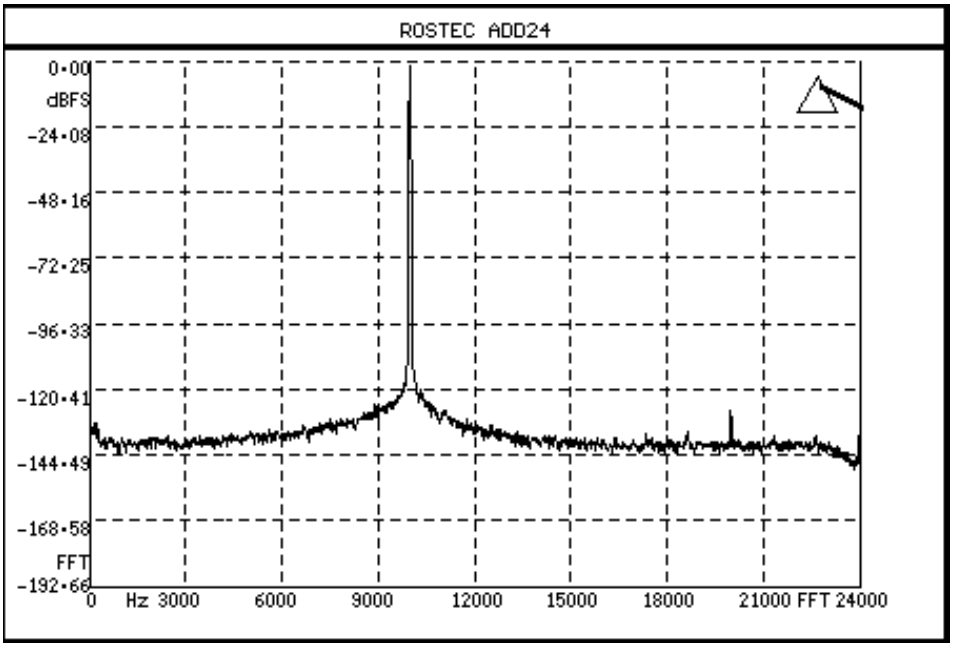
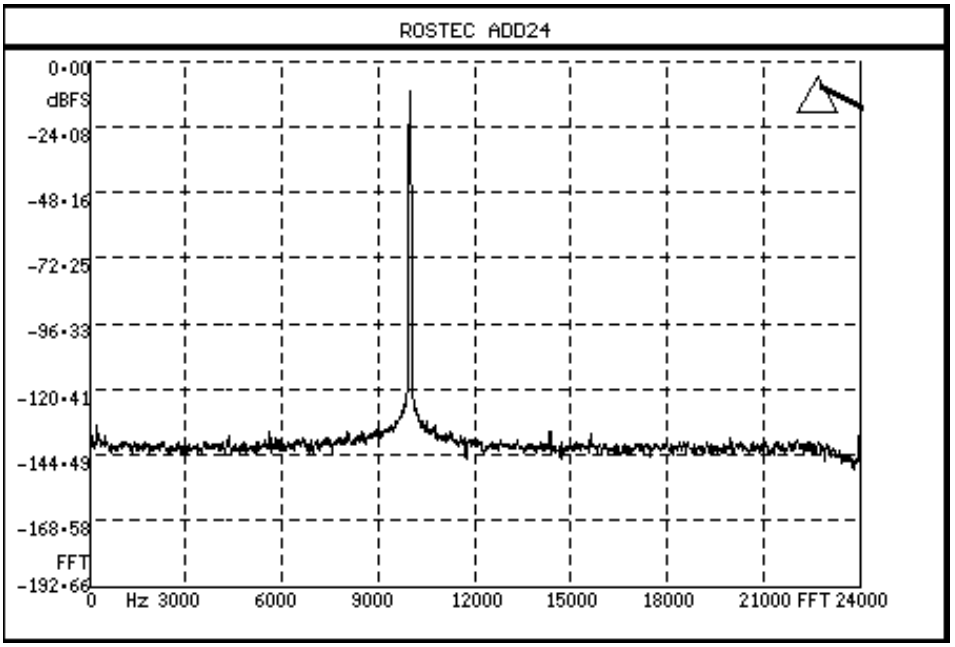


Output	10 kHz, -1 dBFS at 48 kHz
THD+N	-104,84 dBFS, 20 Hz – 20 kHz unweighted



Output	10 kHz, -10 dBFS at 48 kHz
THD+N	-111,79 dBFS, 20 Hz – 20 kHz unweighted