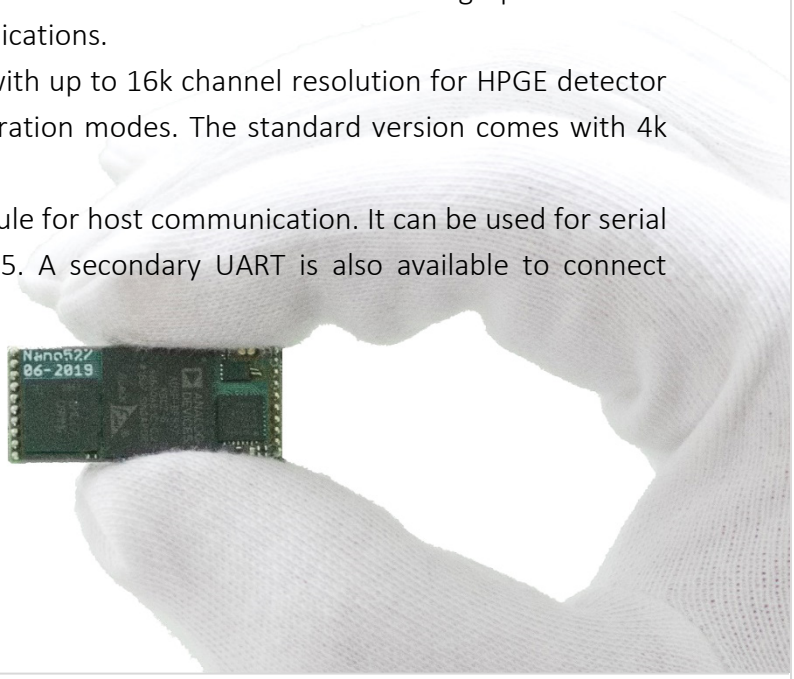
DIGITAL MULTI CHANNEL ANALYZER

MCA527 NANO / NANO+

DESCRIPTION

The MCA527 nano / nano+ is an ultra-small multi-channel-analyzer PCB, that is suitable for applications with limited space and very low power consumption requirements. It is intended for the direct integration into NaI-, HPGe- or CdZnTe- detectors but it may be also usable for other applications such as neutron counters or CsI detectors.
In conjunction with a preamplifier and a high-voltage supply, it is possible to realize an ultra-small spectrometer. Two or more combined MCA527nano can form a high-performance spectrometer-cluster for tomography applications.
The MCA527nano+ Version can operate with up to 16k channel resolution for HPGE detector purposes and offers some additional operation modes. The standard version comes with 4k channel resolution.
An UART interface is provided by the module for host communication. It can be used for serial communication like USB, RS232 or RS485. A secondary UART is also available to connect external devices like a GPS module.

The application programs from our MCA-software family are free of charge and allow operating the device as a general-purpose multi-channel analyzer, multi-channel scaler, universal counter or oscilloscope.



Key Features of the MCA527nano

- ✓ Cost-effective high integrated design
- ✓ Outline Dimensions: 30mm x 12.8mm x 3.8mm
- ✓ Outstanding price-performance ratio
- ✓ Ultra-low power consumption
- ✓ Up to 4k / 16k channel resolution (nano+)
- ✓ Sample rate with up to 20MS/s
- ✓ Various user interfaces (UART, GPIO) on board
- ✓ Ready for host communication
- ✓ Direct integration in detector housings
- ✓ Realization of compact spectrometer cluster

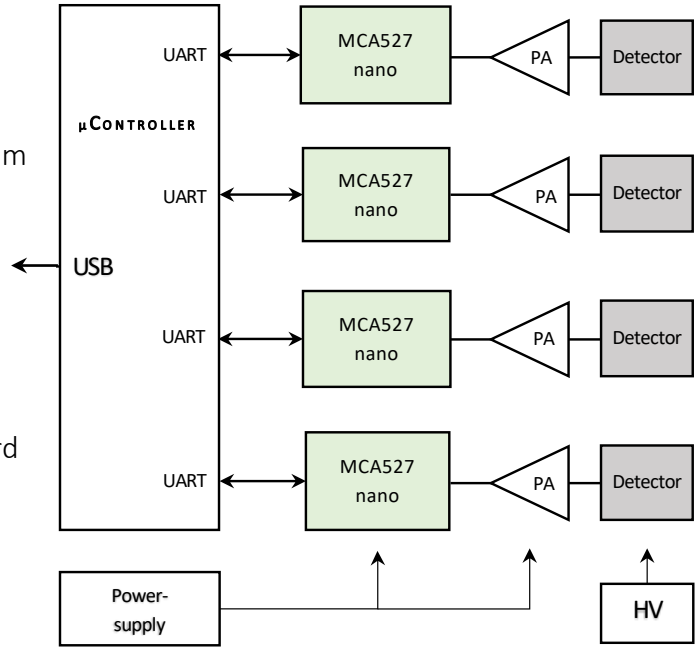


Figure 1 Schematic diagram of a spectrometer-cluster with four combined MCA527nano

TECHNICAL SPECIFICATION

MCA 527 NANO / NANO+

Spectrometric Performance	
Example Resolution 2k channels Input: Test generator signal	(FWHM) <<0.1%
Throughput into memory (input rate 150kcps, 0.2µs shaping time)	> 100.000cps

Operation Modes	
PHA (Pulse Height Analysis)	✓
MCS (Multichannel Scaling)	✓
Sample Mode (Transient Record)	✓
Oscilloscope Mode	✓
Firmware Repeat Mode	✓
Gate Mode (by time)	✓ (nano+)
Gate Mode (by state)	✓ (nano+)
List Modes (optional)	✓ (nano+)

Digital Signal Processing	
Trigger Filter	double differential filtering
Trigger Filter (nano+)	single and double differential filtering
Differential non-linearity	<1% (for 2k, @ 1µs shaping time)
Pile Up Rejection	✓
Pulse Pair Resolution	~400ns
Trigger Threshold Adjustment	automatically / manually
Shaping Time	0.1µs to 2µs, step 0.1µs
Shaping Time (nano+)	0.1µs to 25.5µs, step 0.1µs
Flat Top Time	0µs to 15µs, step 0.1µs
Fine Gain Adjustment	0.5 to 6.5, step 0.0001
Channel Splitting	128, 256, 512, 1024, 2048, 4096
Channel Splitting (nano+)	128, 256, 512, 1024, 2048, 4096, 8192, 16384
Base Line Restorer	BLR with fixed averaging
Base Line Restorer (nano+)	BLR with adjustable averaging
Pole Zero Adjustment	Decay time down to 40µs can be compensated
Peak Stabilization Modes	standard mode LED mode

Analog Digital Converter	
Input signal	DC coupled, differential
Differential input voltage range	± 1V
Common mode voltage	0.9V
Temperature stability	TK50
Sample Rate	up to 20MS/s
Resolution	14bit
Integral non-linearity	≤0.05%

MCA Power Supply	
Input Voltage DC (to be supplied from external)	2.5V, 1.8V, (1.0V*/ 1.2V*) (*depends on processor clock setting)
Power consumption (Measurement / Idle)	175mW / 125mW

Mechanical	
Dimension L x W x H	30mm x 12.8mm x 3mm
Weight	2g

Communication & Connections	
User Interfaces	UART, 4x digital I/O
Pin assignment	Kindly refer to our internet site for the extended datasheet.

Environmental Conditions	
Operation Temperature Range	-40°C to 70°C
Humidity	≤90%, non-condensing
IP Protection Class	IP00

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