DIGITAL MULTI CHANNEL ANALYZER

MCA527MICROE / MICROE+

GBS ELEKTRONIK GmbH

DESCRIPTION

The MCA527microE / microE+ is a very small and ultra low power consuming multichannel analyzer module designed for direct integration into a detector housing. It is intended for use in NaI- and 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 power supply it is possible to create an ultra compact spectrometer. The microE+ Version is able to operate with up to 16k channel resolution for HPGE detector applications and extra operation modes.

Two basic interfaces are provided by the module for host communication, UART and RMII. The UART may be used for serial interfaces like USB and RS232, while RMII enables 10/100 Ethernet communication. A large set of different interface and power supply lines makes it possible to attach additional functions, like GPS receivers, sensors or microcontrollers. Kindly refer to our internet site for the extended datasheet.

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	BENEFITS
Cost-effective high integrated design	• *Offers outstanding price-performance ratio and ultra low power consumption of 0.4W*
Up to 4k / 16k channel resolution (microE+)	• *Best performance with NaI, CdZnTe, LaBr / HPGE detectors*
Equipped with useful Interface- and power supplies	• *Development of additional applications like GPS-receivers, sensors or microcontrollers possible*
Dimensions in ultra small format (45x 20x 5mm)	• *Realization of ultra small spectrometer* • *Direct integration in detector housings possible*
Designed to interconnect with our Add-on PCB´s	• *Easy and suitably expandable*

Technical Specification

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Spectrometric Performance	
Example1: (microE+) Resolution: 16k channels Detector: HPGE 500mm² planar Count rates < 10kcps Source: Am241 @ 59keV	(FWHM) @ 2µs shaping time < 460eV
Example 2: 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)	✓ (microE+)
Gate Mode (by state)	✓ (microE+)
List Modes (optional)	✓ (microE+)

Digital Signal Processing	
Trigger Filter	double differential filtering
Trigger Filter (microE+)	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 (microE+)	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 (microE+)	128, 256, 512, 1024, 2048, 4096, 8192, 16384
Base Line Restorer	BLR with fixed averaging
Base Line Restorer (microE+)	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	1.5V
Temperature stability	TK50
Sample Rate	10MS/s
Resolution	14bit
Integral non-linearity	≤0.05%

MCA Power Supply	
Input Voltage DC	3.5 V - 5.5V, 80mA
Power consumption (running, without detector, HV off)	0.4W

Mechanical	
Dimension L x W x H (in mm)	45 x 20 x 5
Weight	5g

Communication & Connections	
Computer Interfaces	RMII(Ethernet), TTL UART
Pin assignment	Kindly refer to our internet site for the extended datasheet.

Environmental Conditions	
Operation Temperature Range	0°C − 50°C
Humidity	≤90%, non condensing
IP Protection Class	IP00

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