

# VEGA ADC30

30 GS/s, 6-bit Ultrafast Analog to Digital Converter

MICRAM

Type: Module

Technology: SiGe

$f_T / f_{max}$ : 170/250 GHz

Metallization: 4

Ref.-No.: R1030

## Brief description

The ADC30 is an up to 30 GS/s, 6-bit analog to digital converter with 20 GHz bandwidth. Main features are:

- single-ended and differential operation,
- variable sampling rate 1 ... 30 GS/s
- FPGA compatible 24 channel data interface,
- programmable FPGA reference clock divider,
- data scrambling,
- serial configuration/calibration register (LVTTTL).

The ADC30 analog differential input, which can also be driven single ended, has a high sensitivity of 282 mV full scale ratio. At the input stage circuitry for generating calibration test signals is included. The whole input path up to the track/hold was designed for highest bandwidth, i.e. at 20 GHz there is only 1 LSB voltage loss.

Conversion is driven by a half-rate clock (i.e. 15 GHz for 30 GS/s), which can be applied either single-ended or differential. To adjust the sampling point to the data or to interleave two ADC30, the sampling phase can be adjusted in a 100 ps range.

The 6-bit gray-coded binary conversion results are demultiplexed by 4 and send via a 24 channel LVDS/PCML interface. This interface is compatible to e.g. Virtex 4/5/6 and Stratix-IV FPGA with high-speed SerDes. For channel synchronization as well as dc-balancing an on-chip SONET-scrambler can be enabled.

Finally, the ADC30 provides a programmable reference clock to drive the FPGA, as well as a LVTTTL register interface to perform configuration and calibration.

Main fields of application are:

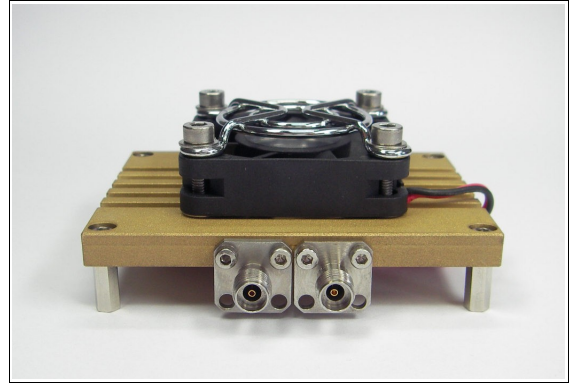
- 100G Ethernet applications using DQPSK/OFDM,
- Test and measurement applications.

## Package

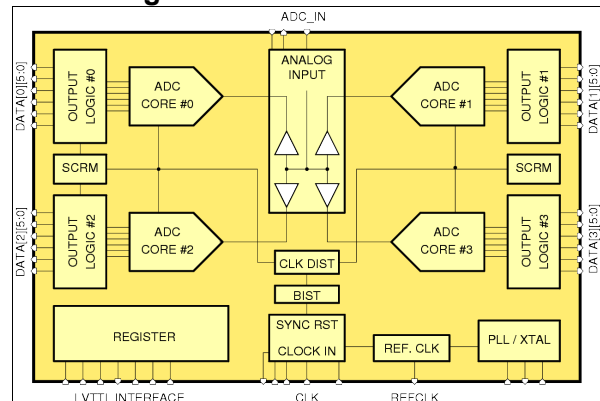
The ADC30 module is equipped with K-connectors for clock and analog. All other signals are carried out on four mezzanine connectors.

For further information on the ADC30, please contact your MICRAM sales representative.

## ADC30 Module



## Block diagram of the ADC30

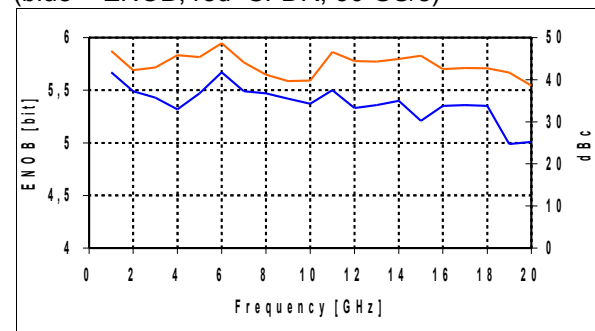


## ADC30 electrical data

Power supplies	+3.3V / +1.5V / -3.3V / -4.5V
Power dissipation	10 ... 13 W
Clock rate	0.5 ... 15 GHz
Full scale analog input	282 mV
Effective bits (ENOB)	> 4.5 @ 14 GHz
Bandwidth	20 GHz

## ADC30 simulated results

(blue = ENOB; red=SFDR; 30 GS/s)



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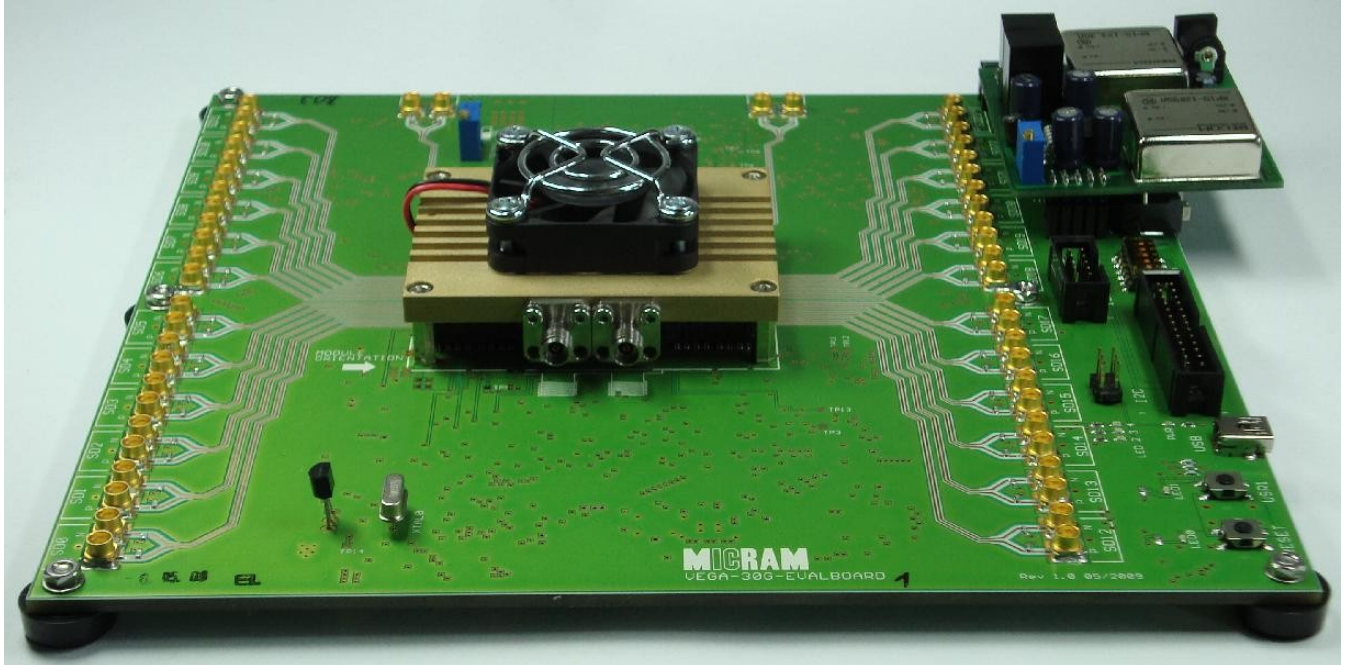
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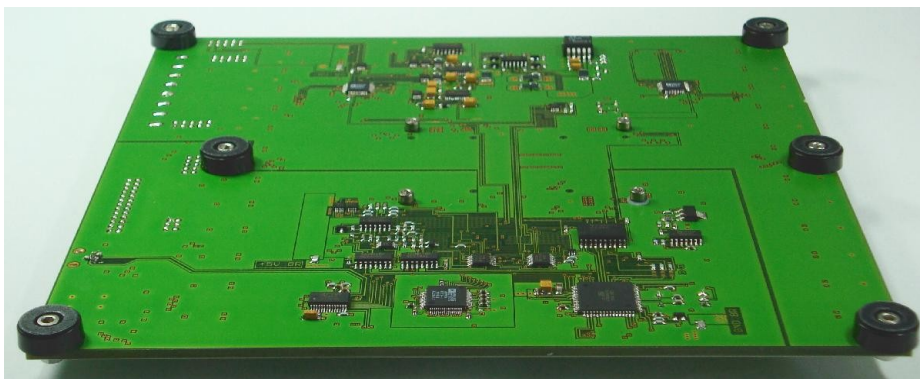
## ADC30 Module mounted on VEGA evaluation board (with power supply module attached)



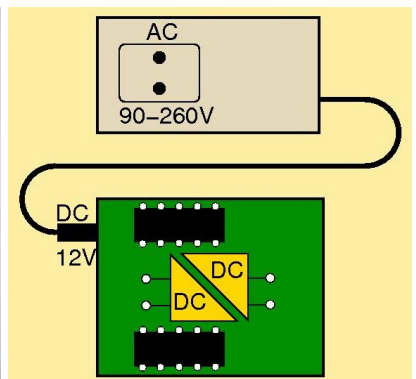
The VEGA evaluation board can be used to mount VEGA ADC30 modules for easy deployment in a laboratory environment. The board incorporates a microcontroller for communication with a PC via a USB 2.0 connector. VEGA board firmware allows easy setup of VEGA ADC30 operating modes as well as read/write access to all internal registers.

Optionally an FPGA connector can be used to control the VEGA ADC30 directly from an FPGA. The 24 differential lines of the digital outputs are accessible by SMP connectors. Clock input and the analog input are connected directly to the VEGA ADC30 module via K-connectors.

## VEGA evaluation board (bottom)



## VEGA power supply module



Micram offers a matching power supply module and preconfigured RF cable sets (RG 316/U standard).

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