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R&S® AMMOS® VHF/UHF Wideband ADC VXI Board R&S® GX405BP

Automatic Modular Monitoring of Signals

The R&S®GX405BP is the VHF/UHF wideband analog-to-digital converter of the R&S® AMMOS® GX 400 family. In combination with the VHF/UHF Digital Wideband Receiver R&S®EM050, it permits the wideband interception of signals in the VHF/UHF frequency band and subsequent signal processing.

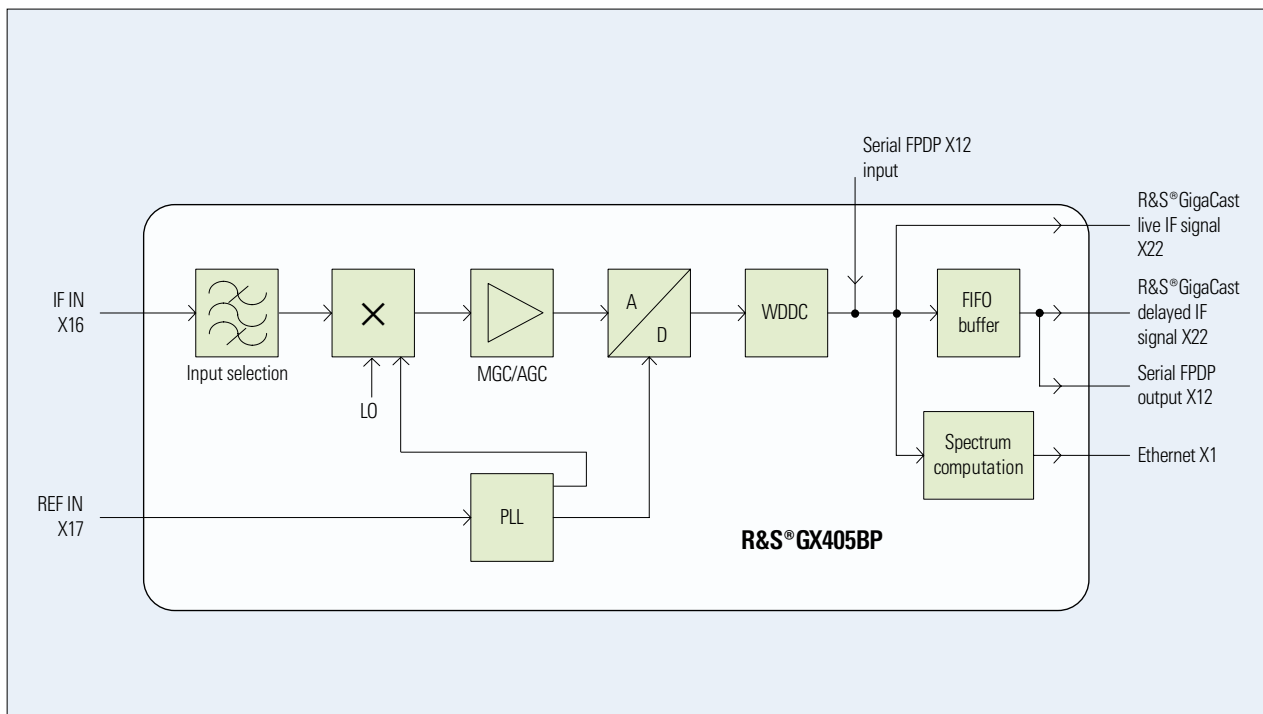
- ◆ A16/32 VXI slave, size C
- ◆ Wideband analog IF (R&S®EM 050) input path
- ◆ Realtime bandwidth 5 MHz, 10 MHz and 20 MHz
- ◆ 14 bits at 76.8 Msample/s analog-to-digital converter
- ◆ Digital filtering and decimation
- ◆ Wideband IF signal delay buffer
- ◆ R&S® AMMOS® interface for digital IF recording and replay
- ◆ Simultaneous live and delayed IF signals with adjustable delay time

Introduction

In combination, the R&S®GX405BP module and the VXI VHF/UHF Digital Wideband Receiver R&S®EM 050 offer a comprehensive basis for wideband interception in the VHF/UHF spectrum and provide the frontend requirements for the attached complex signal processing circuitry. The high-performance analog-to-digital converter with its additional analog signal preprocessing and phase-linear digital wideband filtering provides excellent VHF/UHF performance characteristics.

The R&S®GX405BP is a member of the R&S®AMMOS® R&S®GX 400 family. To enlarge the covered bandwidth, several pairs of the R&S®EM 050 and R&S®GX405BP may be used in parallel. In combination with the fully software-configurable R&S®AMMOS® VXI DDC/DSP Board R&S®GX401EM, the R&S®AMMOS® R&S®GX 400 family provides an extremely flexible and comprehensive wideband monitoring platform, capable of handling the most demanding modern signal scenarios.

Block diagram



Overview

- ◆ In combination with the VXI VHF/UHF Digital Wideband Receiver R&S®EM 050, the R&S®GX405BP fulfills the requirements for wideband VHF/UHF signal processing
- ◆ The R&S®GX405BP supports the modular R&S®AMMOS® sensor concept; flexible configurations for a large range of applications are possible
- ◆ The R&S®GX405BP features a wideband analog IF input for the R&S®EM 050 VXI receiver, serving as a frequency converter
- ◆ The ADC sampling rate can be synchronized to an external frequency reference; it allows the synchronization of several R&S®GX405BP boards to the external reference clock provided by the VXI VHF/UHF Digital Wideband Receiver R&S®EM 050
- ◆ The R&S®GX405BP offers an optical R&S®AMMOS® FPDP/serial digital data interface for lossless digital IF signal recording and replay
- ◆ The R&S®GX405BP provides the live and delayed digital IF signal in parallel; the delayed signal is generated by

a wideband FIFO buffer with adjustable depth

- ◆ The R&S®GX405BP uses TigerSHARC® (Super Harvard Architecture Computer) DSPs from Analog Devices in combination with the Rohde & Schwarz wideband DDC ASIC for digital signal processing
- ◆ The R&S®GX405BP features wideband FFT spectrum computation for a high-resolution IF panorama display

System integration

The R&S®GX405BP is fully integrated in the R&S®AMMOS® R&S®GX 400 family. The modular hardware and software concept of R&S®AMMOS® allows flexible application- and user-specific configurations, which provide narrowband and wideband signal monitoring throughout the entire HF to VHF/UHF range within one single R&S®GX 400 sensor group.

The R&S®AMMOS® R&S®GX 400 sensor group is fully remote-controlled via CORBA and TCP/IP connections by the R&S®AMMOS® IT software.

Specifications

IF input	SMA female connector, 50 Ω (X16), VSWR < 2.0
IF frequency	405.4 MHz
Frequency accuracy	1.5×10^{-6}
Aging	1.0×10^{-6} /year
External frequency synchronization	SMA female connector, 50 Ω (X17) 10 MHz 0 dBm \pm 10 dB
IF input bandwidth	5 MHz, 10 MHz, 20 MHz
Sampling rate	76.8 MHz bandpass undersampling
Gain control	
Mode	automatic (AGC) and manual (MGC) gain control
Attenuation	max. 45 dB manual or automatic, switchable
ADC	
Resolution	14 bits at 76.8 MHz sampling rate
Oscillator phase noise	< -140 dBc/Hz at 10 kHz offset
Nonlinearities, sensitivity	
3rd order intercept point, in-band	\geq +25 dBm
Noise figure	\leq 19 dB
Internal spurious	\leq -125 dBm, referenced to RF input of the R&S®EM 050 (normal/low noise mode)
Digital signal processing	
DSP	ADSP TS101 TigerSHARC® 1.44 GFLOPS 32 bits at 240 Mcycle/s 6144 kbit on-chip memory
DDC	Rohde & Schwarz WDDC ASIC
Spectral computation	
FFT length	64 to 32k FFT (powers of two)
Max. frequency resolution	approx. 200 Hz at 5 MHz bandwidth
Max. spectrum output rate	300/s at 64 to 2k FFT length 20/s at 4k to 32k FFT length
Display modes	averaging, min hold, peak hold, min hold short time, peak hold short time, difference
Wideband signal delay buffer	
Max. signal delay time	40 s at 5 MHz bandwidth 20 s at 10 MHz bandwidth 10 s at 20 MHz bandwidth

Control interface	R&S®AMMOS® VXI
Data interface	SFP optics FPDP/serial interface in accordance with VITA 17.1 (X12) for digital IF data recording and replay R&S®GigaCast interface (X22) RJ-45 Ethernet 100 Mbit/s (X1)
Displays	FAIL LED ACCE VXI bus access LED PWR LED
VXI module type	A16/32 VXI slave, shielded, single slot, size C VXI module
Weight	2.3 kg
Power supply	+12 V 1.4 A (max.) -12 V 0.2 A (max.) +5 V 6 A (max.) +24 V 0.2 A (max.)
Power consumption	55 W (max.)
Environmental data	
Operating temperature range	0 °C to +50 °C in accordance with EN 60068-2-1, EN 60068-2-2, MIL-STD-810 E, method 501.3/502.3
Storage temperature range	-40 °C to +70 °C in accordance with EN 60068-2-1, EN 60068-2-2, MIL-STD-810 E, method 501.3/502.3
Shock	EN 60068-2-27 MIL-STD-810E, method 516.4, procedure I, 40 g shock spectrum
Vibration, sinusoidal	EN 60068-2-6, EN 61010-1, VG95332, slide 24, grade A2: 5 Hz to 55 Hz, max 1.8 g, 55 Hz to 150 Hz, 0.5 g const., 12 min each axis
Vibration, random	IEC 60068-2-64 10 Hz to 300 Hz, 1.2 g (rms), 5 min each axis
Humidity	IEC 60068-2-30 operating, up to 95 % relative humidity at +25 °C to +40 °C, noncondensing, 2 cycles
Altitude, operating	2000 m, EN 61010-1
Altitude, storage	4500 m
EMC/VDE	CE mark, in accordance with 89/336/EEC EN 55022, class B EN 61000-3-2 EN 61000-3-3 EN 55024



More information at
www.rohde-schwarz.com
(search terms: GX405BP, AMMOS)



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