

WHITE RABBIT Simple FMC PCIe Carrier v4 SPEC

The
PCI-e FMC
carrier to bring
White Rabbit on
your computer

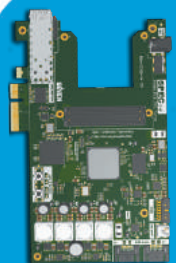
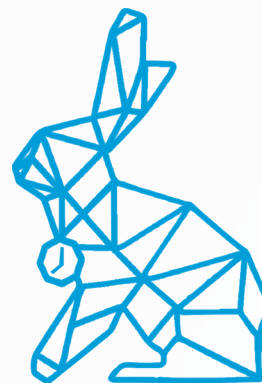
SPEC

The SPEC is a **FMC carrier** that can hold one **FMC card** and a **SFP connector**. By using different FMCs, it provides White Rabbit features for different applications: ADC (Analog to Digital Converter), TDC (Time to Digital Converter), DDS (Direct Digital Synthesizer), Fine Delay, Digital I/O, etc.

The standard SPEC v4 integrates a **Spartan-6** FPGA which enables the programming of various FMC boards in a standard and cost-optimized approach while the SPEC v4 XL incorporates a LX100T FPGA.

HIGHLIGHTS

- ✓ Sub-nanosecond time accuracy
- ✓ Thousands of nodes
- ✓ Distance range: over 80 km
- ✓ 4-lane interface on the PCIe side
- ✓ Low pin count connector on the FMC mezzanine slots



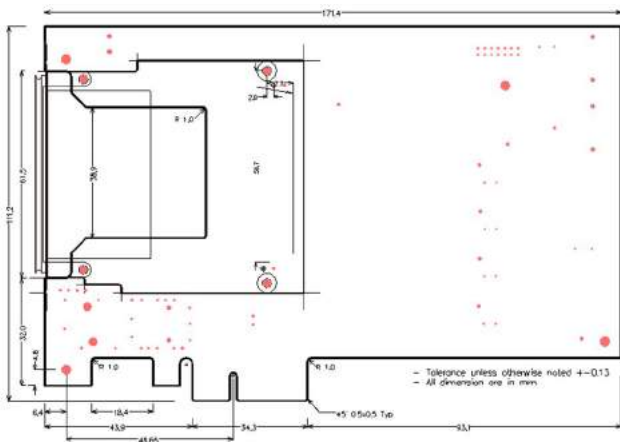
FPGA	
Type	Xilinx Spartan-6 (XC6SLX-45T/100T)
Slices (bRAM)	6822 (401Kb) / 15822 (976Kb)
Memories	2088Kb Block RAM 2Gb DDR3 32Mb Flash PROM (Boot, SPI)
Softcore	LatticeMico32 (LM32)
Internal I/O	4 GTP transceivers for SFP links
Configuration	<ul style="list-style-type: none"> GN4124 SPRIO interface (loaded by software driver at startup) JTAG header SPI 32Mbit flash PROM

Clocking resources	
XO	10-280 MHz I2C Programmable (Silicon Labs Si570)
TCXO	25 MHz TCXO controlled by a DAC with SPI interface (AD5662)
VCXO	20 MHz VCXO controlled by a DAC with SPI interface (AD5662)
Synthesizer	Low jitter TI CDCM61004 (Fixed configuration, Fout=125Mhz)

Certifications	
Soldering	IPC-A-610 Rev E Class 2
Others	ISO-9001, ISO-14001, CE, RoHS

Physical Specification	
Dimension	171,4x111,2 mm
Weight	

Environmental Conditions	
Temperature	-10°C ~ +50°C
Humidity	0% ~ 90% RH



Front panel	
FMC	FMC front panel to connect to FMC slot with low pin count (LPC) connector
SFP	1x Small Formfactor Pluggable (SFP) cage <i>*SFP transceiver is not included. Seven Solutions recommends 1.25Gbps, 1490/1310 nm, Single Fiber Bi-directional SFP (provided in our Starting Kit). More information: www.ohwr.org/projects/white-rabbit/wiki/SFP</i>
LED	Programmable LEDs (Red/Green)

Internal Slots	
PCIe	1x PCI express 4x (Gennum GN4124)
SATA	2x SATA connectors (GTP links)
USB	1x mini USB AB (USB-UART bridge)
JTAG	1x JTAG header for Xilinx programming during debugging

Stand-alone features	
Power Supply	External 12V DC, 2A (connector)
Ports	<ul style="list-style-type: none"> USB Mini-B connector 4 LEDs 2 buttons

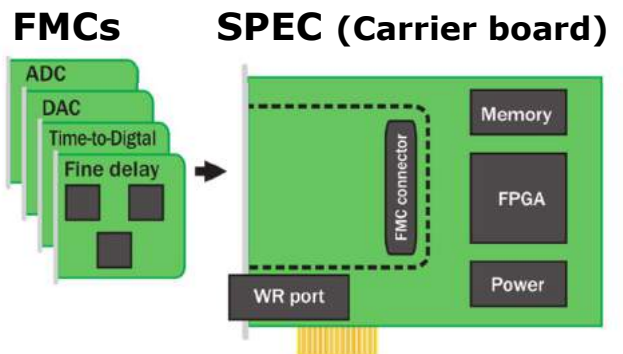


Illustration of the connection of SPEC with FMCs

