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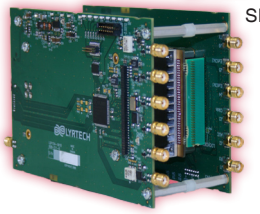
Infinite possibilities...

WiMAX RF modules

Add-on modules for SFF SDR development platforms

WiMAX RF modules are WiMAX, RF, analog front ends for Lyrtech's small form factor (SFF) software defined-radio (SDR) development platforms. The modules are designed to cover the WiMAX 2.5 GHz band and the WiMAX 3.5 GHz band, and, when they are combined with the SFF SDR evaluation module and ADACMaster III module (high-speed AD/DA board), the whole becomes a complete and integrated hardware and software development solution for advanced WiMAX development. In the 2.5 GHz band, the front end covers all the ISM bands and makes all sorts of Wi-Fi (b, g, n) applications possible with the SFF SDR development platform.

SISO configuration



2×2 MIMO or dual-band SISO configurations

At a glance

- Low-band RF range: 2.3–2.7 GHz
- High-band RF range: 3.3–3.8 GHz
- Superheterodyne receiver (IF baseband = 44 MHz)
- Superheterodyne transmitter (IF baseband = 18 MHz)
- Half-duplex transceiver—allows TDD
- Use up to two modules for dual-band or MIMO applications
- Plug and Play with Lyrtech's SFF SDR evaluation module
- 7 MHz and 22 MHz software-selectable RX bandwidths
- RF transmission power up to 30 dBm
- Controllable RX gain up to 15 dB (or 10-dB attenuation) for AGC implementation
- Dual SISO or 2×2 MIMO modes

Applications

MAN/WAN (WiMAX)

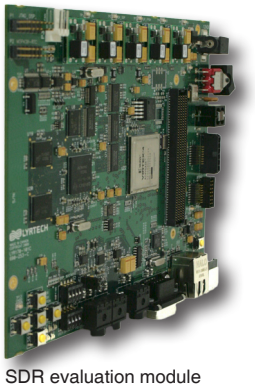
WiMAX RF modules allow targeting WiMAX applications in the 2.5 GHz and 3.5 GHz bands.

WLAN (Wi-Fi)

WLAN applications in all the ISM bands (Wi-Fi b, g, or n) can be developed with SFF SDR development platforms equipped with WiMAX RF modules.

Software-defined radio

WiMAX RF modules are handy in developing DSP–FPGA-based software-defined radio applications within the 2.5 GHz and 3.5 GHz ranges.



SFF SDR evaluation module

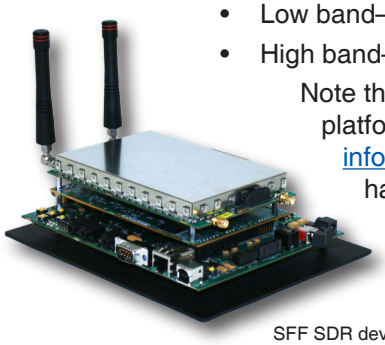
Software tools

WiMAX RF modules benefit from drivers and application examples suppplied with the SFF SDR evaluation module's board software development kit (BSDK) and model-based design blocksets supplied with the SFF SDR development platform's model-based design kit (MBDK). (The software allowing to target the FPGA of the ADACMaster III is also recommended to benefit from the module's real-time FPGA gain control parameters, useful in transceiver applications.)

Available hardware options

- Low band—covers the frequency range from 2.3 GHz to 2.7 GHz
- High band—covers the frequency range from 3.3 GHz to 3.8 GHz

Note that up to two of these modules can be used on the platform at any given time. Don't hesitate to write to info@lyrtech.com if you need different frequency bands or have different frequency requirements.



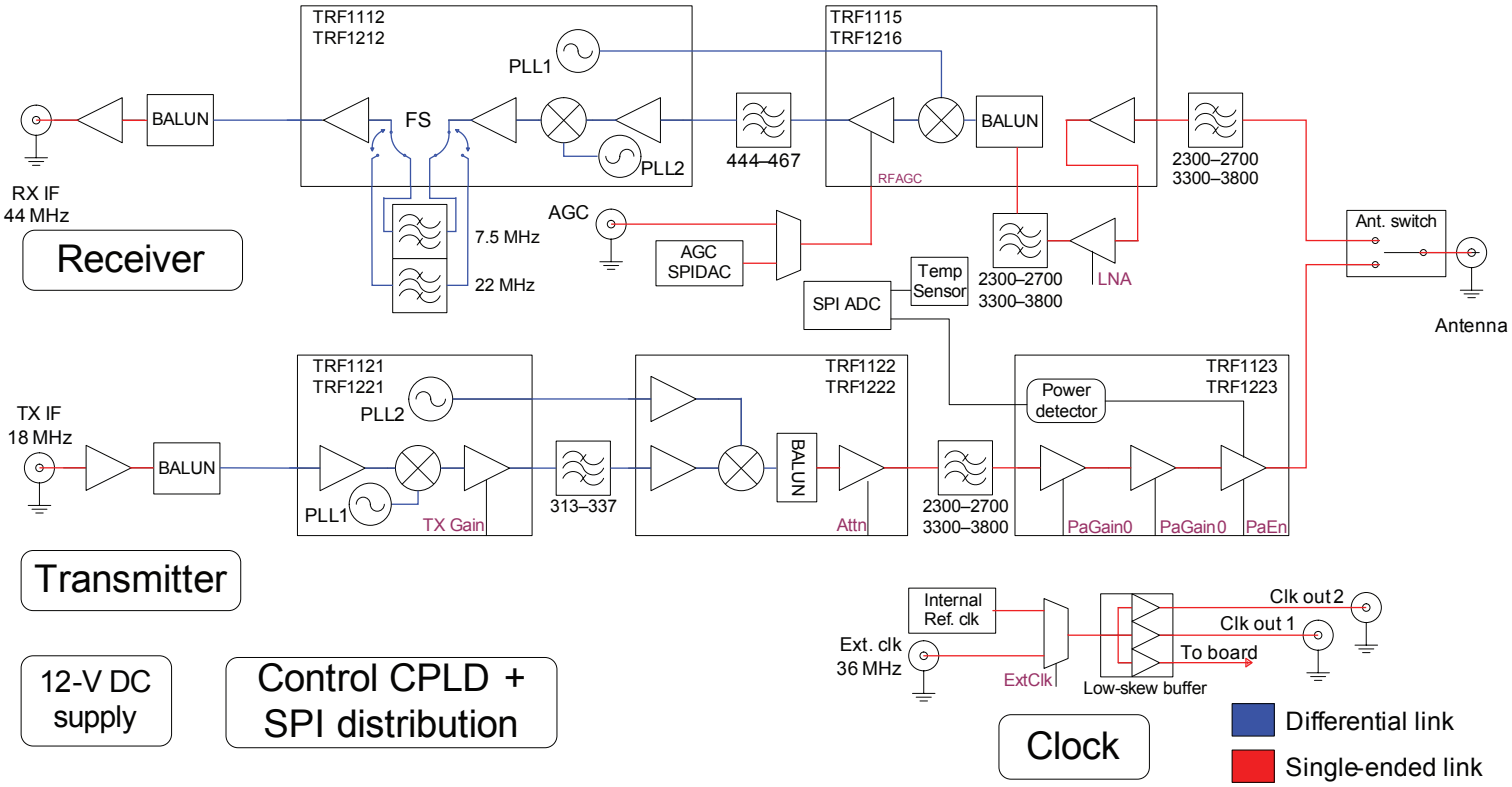
SFF SDR development platform

ADACMaster III

Specifications

General	Supply voltage: 12 V
	Supply current: 1.1 A
	Power consumption: 13.2 W
	GPIO-32 control interface (SPI ports, others)
	Supports configuration from the SFF SDR EVM's GPIO-32 port or the USB-2-GPIO-32 adapter
	Half-duplex transceiver (shared RX/TX antenna)
	Software-selectable reception bandwidth: 7.0 MHz and 22 MHz
2.5 GHz band channels	RF frequency range: 2.3 GHz to 2.7 GHz
	RF input • Gain: 20 dB to 100 dB (BW: 7 MHz) • Gain: 30 dB to 110 dB (BW: 22 MHz) • Noise: 7 dB • Phase noise at 100 kHz from carrier: –90 dBc/Hz (RF: 2.5 GHz) • Phase noise at 1 MHz from carrier: –92 dBc/Hz (RF: 2.5 GHz) • Minimum detectable signal: –98 dBm (BW: 7 MHz) • Minimum detectable signal: –94 dBm (BW: 22 MHz) • RX IF baseband center frequency: 44 MHz • RF resolution: 1 MHz
	RF output • Phase noise at 100 kHz from carrier: –89 dBc/Hz (RF: 2.5 GHz) • Phase noise at 1 MHz from carrier: –112 dBc/Hz (RF: 2.5 GHz) • Gain: -2 dB to 30 dB • IP3 output: 10 dBm • TX IF frequency range: 13 MHz to 23 MHz
	Reference clock input (36 MHz): 12 dBm to 17 dBm
	Reference clock output (36 MHz): 14 dBm
3.5 GHz band channels	RF frequency range: 3.3 GHz to 3.8 GHz
	RF input • Gain: 40 dB to 115 dB (BW: 7 MHz) • Gain: 30 dB to 105 dB (BW: 22 MHz) • Noise: 5 dB • Phase noise at 100 kHz from carrier: –90 dBc/Hz (RF: 3.5 GHz) • Phase noise at 1 MHz from carrier: –92 dBc/Hz (RF: 3.5 GHz) • Minimum detectable signal: 100 dBm (BW: 7 MHz) • Minimum detectable signal: –95 dBm (BW: 22 MHz) • RX IF baseband center frequency: 44 MHz • RF resolution: 1 MHz
	RF output • Phase noise at 100 kHz from carrier: –89 dBc/Hz (RF: 3.5 GHz) • Phase noise at 1 MHz from carrier: –112 dBc/Hz (RF: 3.5 GHz) • Gain: –5 dB to 27 dB • IP3 output: 17 dBm • TX IF frequency range: 13 MHz to 23 MHz
	Reference clock input (36 MHz): 12 dBm to 20 dBm
	Reference clock output (36 MHz): 15 dBm

Block diagram



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With over 25 years of experience delivering advanced digital signal processing solutions to companies worldwide, Lyrtech serves customers across the Americas, Asia, and Europe. Lyrtech offers a full range of DSP–FPGA development platforms, as well as product development services. Lyrtech works in partnership with such industry leaders as Texas Instruments, The MathWorks, and Xilinx to deliver unsurpassed quality and support to its large OEM customer base, which includes many prestigious names of the consumer electronics, telecommunications, aerospace, and defense fields. In a world where digital signal processing technology is vital to network and wireless communications, audio and video processing, as well as electronic systems in all fields of technology, Lyrtech is an ideal partner.

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