RTX-CWDM

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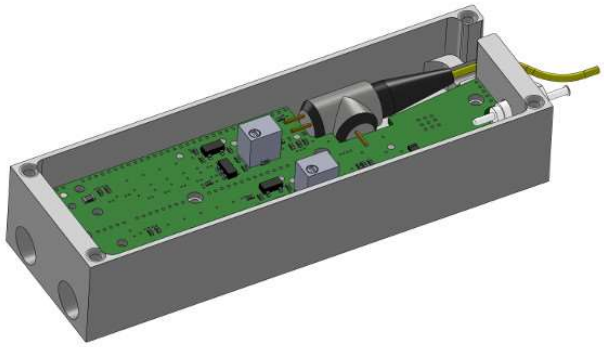
RF over fiber CWDM link module
100% Made In ITALY

Features

- Optimised for 50-350MHz SKA Low Band (other and wider bands are available upon request)
- Transmission distance up to 10 Km on G652D optical fibre
- CWDM dual lambda (1330nm / 1270nm)
- Mini-size TX and highly integrated RX
- RF shielded box
- Low voltage supply (min. 3.5V)
- Already compatible (RF, functional and mechanical) with ADU board, to realize a full Tile Processor Module (TPM) assembly



Applications

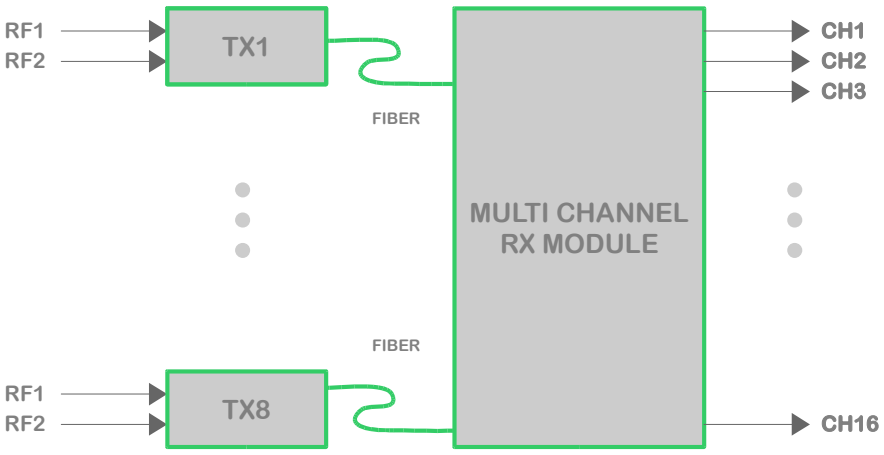
- General purpose RF over fiber links
- Radio astronomy
- RF delay lines

RTX-CWDM (Coarse Wavelength Division Multiplexing) family of RF over fiber links includes a dual lambda E/O transmitter (TX) module and an O/E receiver (RX) module that integrates in a single board 8 dual lambda receivers. RTX-CWDM modules, designed and developed by INAF for SKA-LFAA project, have been engineered and optimized by PROTECH.

The TX module integrates a coaxial DFB double laser diode (LD) with integrated WDM coupler and a couple of RF low noise amplifier (LNA) into a miniaturized package. The RX module also integrates 8 coaxial InGaAs dual lambda photodiodes (PD) with integrated WDM splitter and 16 RF chains.

These products are designed to meet high end needs and requirements of long distance and wideband RF over fiber application without band rejection. The overall link offers a nominal gain of 58dB (direct connection of TX and RX) and can be adjusted thanks to a digital step attenuator with 31 dB range/1dB step.

The RF input and output of standard products are matched to 50 Ohm impedance. The small size of the TX module makes it easy to integrate in target systems with less than 200mA of current consumption. The highly integrated multi channel RX allows to design compact multi link assemblies with an average consumption of 3A for 16 dual lambda receivers.



Thanks to CWDM technology and an highly integrated design of the RX, blocks of 16 RF channels links are easily realizable.

The CWDM approach allows the reduction of a factor of two for the number of the deployed fibers/connectors and joints, and the RX integration eases the design of compact multi channel racks.

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Electrical/Optical characteristics - Conditions: 1m of G652D optical fiber and 25°C.

Parameter	Unit	Value	Range/Notes
Frequency range	MHz	50 - 350	The frequency range can be optimized upon request.
Out-band rejection	dBc	> 50 > 50	f ≤ 20 MHz f ≥ 450 MHz
Link gain	dB	58	[50 ÷ 350] MHz DSA at minimum attenuation
Gain flatness	dB	+/- 1.5	[50 ÷ 350] MHz
OIP3	dBm	> +30	[50 ÷ 350] MHz DSA at minimum attenuation
OIP2	dBm	> +42	[50 ÷ 350] MHz DSA at minimum attenuation
OIP1	dBm	> +17	[50 ÷ 350] MHz DSA at minimum attenuation
Noise figure	dB	< 13	[50 ÷ 350] MHz DSA at minimum attenuation
IRL	dB	> 12	[50 ÷ 350] MHz, at the input of TX
ORL	dB	> 12	[50 ÷ 350] MHz at the output of RX
Input/output impedance	Ohm	50	
Laser optical wavelengths	nm	1270 / 1330	
Optical RX wavelengths	nm	1270 / 1330	
Optical output power	mW	> 2.3	
Fiber connector		LC/APC	Others available upon request
RF connector TX input		MCX	Samtec MCX-J-P-H-RA-TH1
RF connector RX multi-output		ISORATE ®	Samtec IP5-08-01-L-S-RA1-L-TR (Right Angle) or Samtec IP5-08-05.0-L-S-1-L-TR (Straight)
TX power connector		M3 Feed-thru capacitor	
RX power and DSA control connector		0.80 mm Edge Rate® Terminal Strip	Samtec ERM8-010-05.0-L-DV-TR
Power supply	V	3.5 - 5	Both TX and RX
Single lambda RF link power consumption	W	< 1	
Optical input max. power	dBm	6	
RF input max. power	dBm	-10	
Max. DC supply	V	7	
Storage temperature	°C	-40 ~ +80	
TX operating temperature	°C	-10 ~ +70	

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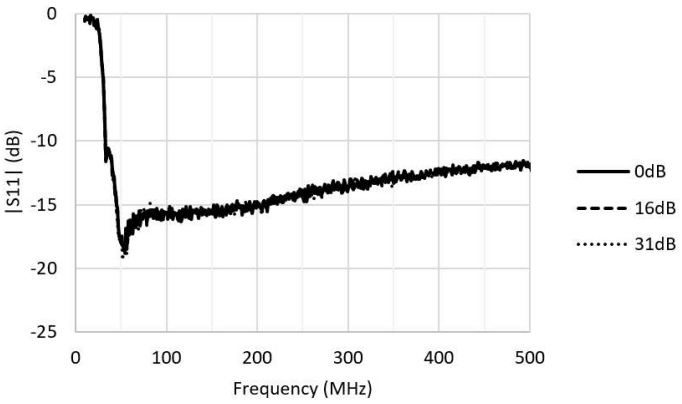
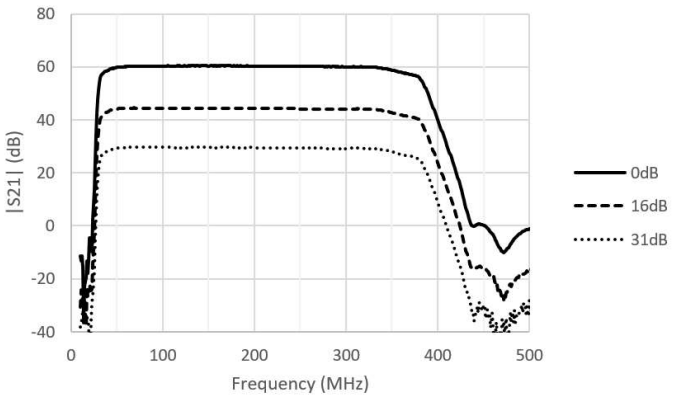
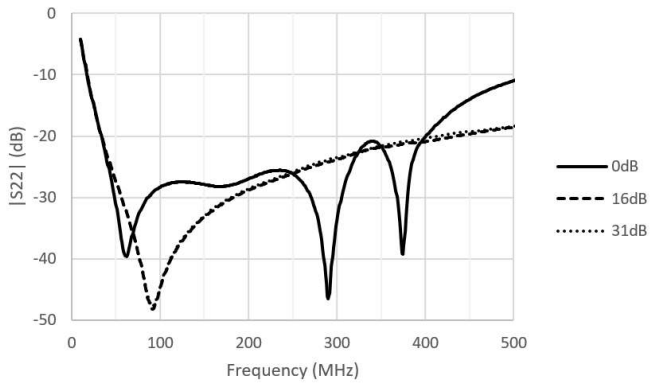
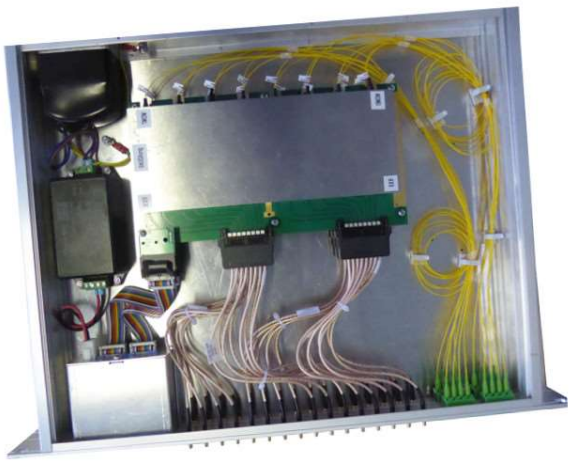
S Parameters of RTX-CWDM Link









Example of RX rack assembly
1U 19” rack with 2 preADU
16 WDM optical receivers, 32 RF output channels

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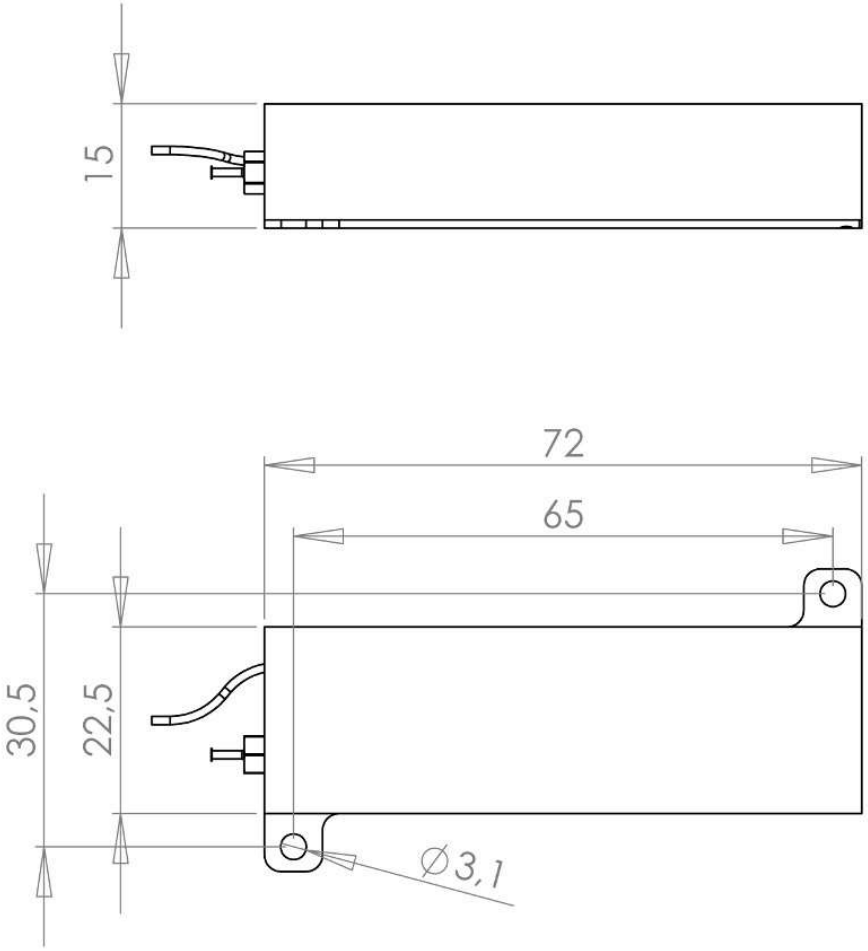
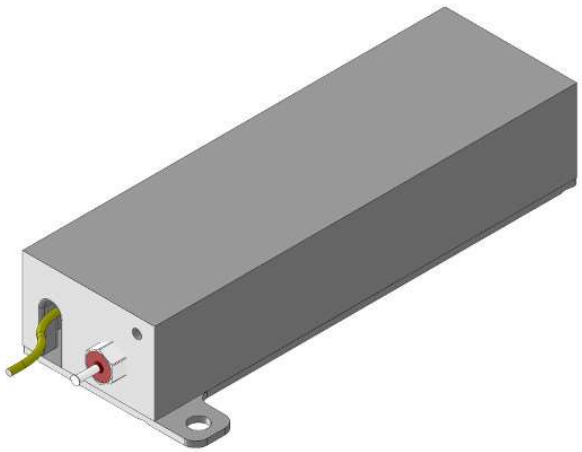
TX module, outline drawing
[Dimensions in mm]





Note: other assembly configurations are available upon request

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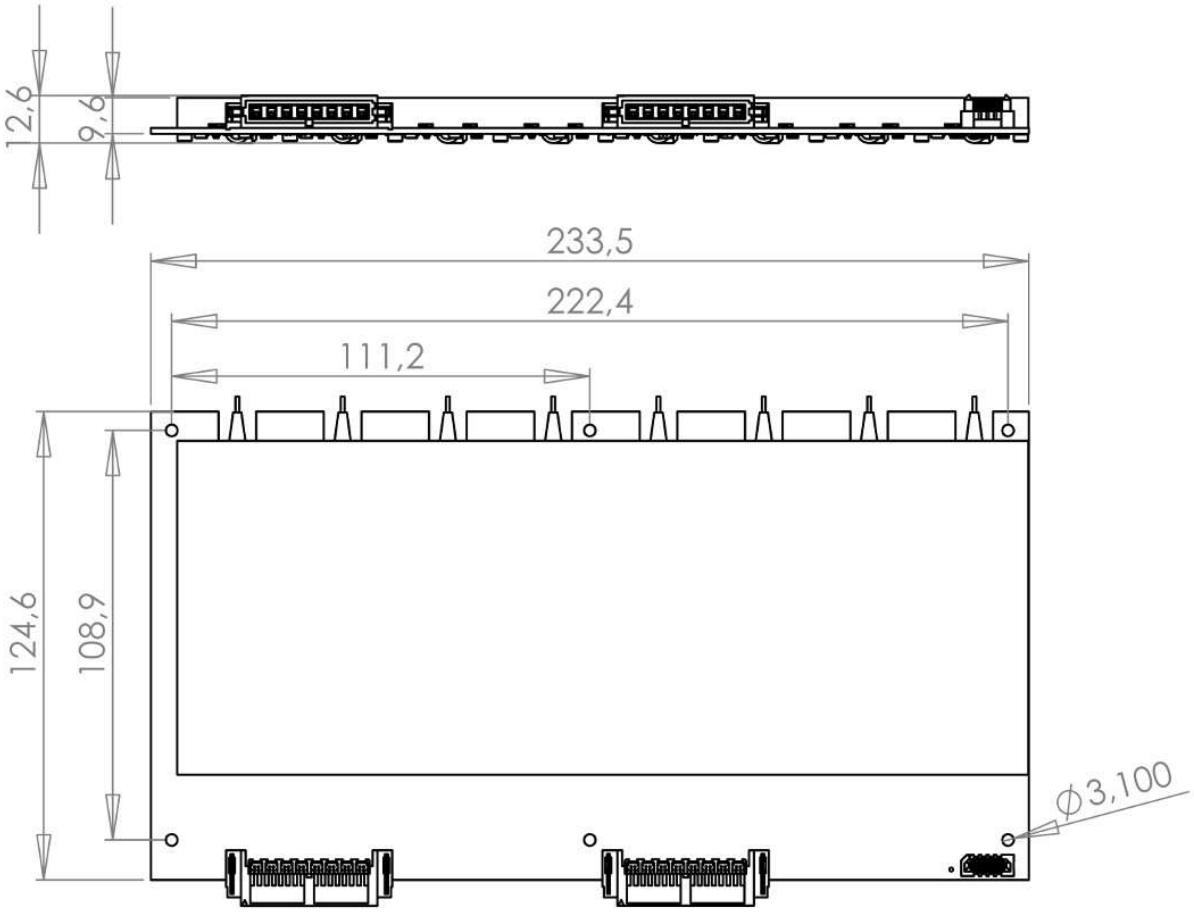
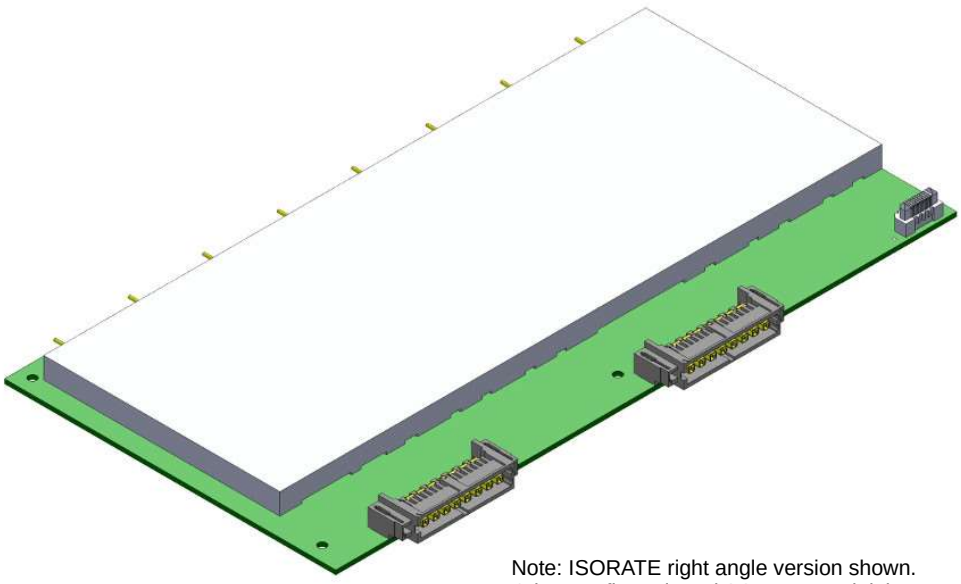
RX module, outline drawing
[Dimensions in mm]





Note: ISORATE right angle version shown.
Other configurations (ISORATE straight) are available upon request.

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