RF Over Fiber Systems
C-Band RF over Fiber Link

50 Ω C-Band HRx-C Card

- C-Band 3.4 – 7.1 GHz (500 MHz – 7.5 GHz)
- Excellent Wideband performance
- Up to 112 dB/Hz SFDR
- No IF down conversion required
- Lower overall CapEx
- Rack chassis card or purple OEM module
- 5-year warranty

ViaLiteHD C-Band (HRx-C) RF over fiber links have been designed for customers who need even greater dynamic range. The rack chassis card and OEM module negate the need to down convert from IF; allowing a direct LNB connection over long distances with no impact to cross-site link budget.

The HRx-C products use DFB Lasers with longer wavelengths making them ideal for use with multiplexers. Options for DWDM 1550nm and CWDM 1310nm/1550nm 10mW photodiodes provide deployment flexibility in a broad range of applications within Broadcast, Satcom and Military verticals, amongst others.

OPTIONS

<table>
<thead>
<tr>
<th>RF Connection</th>
<th>Optical connectors</th>
<th>BiasT</th>
<th>LNB control circuit</th>
<th>Rack chassis</th>
</tr>
</thead>
<tbody>
<tr>
<td>50Ω electrical connectors, SMA</td>
<td>FC/APC, SC/APC, E2000/APC</td>
<td>Built-in LNB power through RF 1</td>
<td>3/18 VDC &amp; 22 kHz tone</td>
<td>1U, 3U</td>
</tr>
</tbody>
</table>

APPLICATIONS

- Full Satcom transponder applications
- Government Signal Intelligence (SIGINT)
- Fixed Satcom earth stations and teleports
- Telemetry
- Government installations
- Remote monitoring stations

IP3 = 3.2 dB @ 5 GHz
P1 = -4.0 dB @ 5 GHz
Noise = 21 dB @ 5 GHz
SFDR = 105 dB @ 5
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PRODUCT PERFORMANCE

C-Band : Frequency response

Frequency (MHz)

C-Band : Noise Figure

Frequency (MHz)

C-Band : SF DR

Frequency (MHz)

C-Band : Compression P 1d B

Frequency (MHz)

PRODUCT CONFIGURATOR

Module type:
1. Receiver (optical, RF, opto)
2. Transmitter (RF, opto, optical)

Start Electrical Connectors:
1. 3C/168mMMA

Module Package:
5. Fiber opto link

Nominal Gain (dB)
1. 0 dB
2. 10 dB
3. 20 dB
4. 30 dB
5. 40 dB

RF Properties:
A. High power photodetector (long fiber, only)
B. Half wave photodetector
C. Fiber optic link

Laser:
- C1: 1550 nm (ch. 1, only)
- C2: 1560 nm (ch. 2, only)
- C3: 1570 nm (ch. 3, only)
- C4: 1580 nm (ch. 4, only)
- C5: 1590 nm (ch. 5, only)

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# RF Over Fiber Systems

## C-Band RF over Fiber Link

### TECHNICAL SPECIFICATION

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Transmitter</strong></td>
<td>HRT-C1-8R-09-G1310 (example)</td>
</tr>
<tr>
<td><strong>Receiver</strong></td>
<td>HRR-C1-8R-05-A (example)</td>
</tr>
<tr>
<td><strong>Frequency range</strong></td>
<td>500 – 7500 MHz</td>
</tr>
<tr>
<td><strong>Impedance, RF connector</strong></td>
<td>50Ω SMA</td>
</tr>
<tr>
<td><strong>VSWR</strong></td>
<td>1.15 (typ)</td>
</tr>
<tr>
<td><strong>Link gain (Tx gain / Rx gain), default</strong></td>
<td>0/15 dB (nom)</td>
</tr>
<tr>
<td><strong>Tx gain adjustment range</strong></td>
<td>15.5 dB (typ)</td>
</tr>
<tr>
<td><strong>Tx gain adjustment from default gain</strong></td>
<td>-12 to 3.5 dB (typ)</td>
</tr>
<tr>
<td><strong>Rx gain adjustment range</strong></td>
<td>15.5 dB (typ)</td>
</tr>
<tr>
<td><strong>Rx gain adjustment from default gain</strong></td>
<td>-9.5 to +25 dB (typ)</td>
</tr>
<tr>
<td><strong>Gain adjustment step size Rx and Tx</strong></td>
<td>0.5 dB (typ)</td>
</tr>
<tr>
<td><strong>Gain stability over temperature range</strong></td>
<td>±1 dB (max)</td>
</tr>
<tr>
<td><strong>Nominal input signal / output signal</strong></td>
<td>-15/0 dBm</td>
</tr>
<tr>
<td><strong>P1dB input</strong></td>
<td>-9 dBm (typ)</td>
</tr>
<tr>
<td><strong>P1dB input, at maximum Tx gain</strong></td>
<td>-4 dBm (typ)</td>
</tr>
<tr>
<td><strong>IP3 input, at default gain</strong></td>
<td>+3.2 dBm (typ)</td>
</tr>
<tr>
<td><strong>Noise figure, at default gain</strong></td>
<td>21 @ 5 GHz dB (typ)</td>
</tr>
<tr>
<td><strong>SFDR</strong></td>
<td>105 @ 5 GHz dB/Hz²/³ (typ)</td>
</tr>
<tr>
<td><strong>Maximum input power without damage</strong></td>
<td>15 dBm</td>
</tr>
<tr>
<td><strong>LNB power</strong></td>
<td>Internal 13/18 V up to 700 mA (3.4 – 7.1 GHz) up to 350 mA</td>
</tr>
<tr>
<td><strong>Optical connector</strong></td>
<td>SC/APC</td>
</tr>
<tr>
<td><strong>Laser type</strong></td>
<td>DFB (Distributed feedback), thermo-electric cooled laser</td>
</tr>
<tr>
<td><strong>Optical power output</strong></td>
<td>10 mW (typ)</td>
</tr>
<tr>
<td><strong>Summary alarm output</strong></td>
<td>Open drain alarm: OPEN: Alarm, CURRENT SINK: okay</td>
</tr>
<tr>
<td><strong>Operating temperature range</strong></td>
<td>-10 °C to +50 °C</td>
</tr>
<tr>
<td><strong>Storage temperature range</strong></td>
<td>-40 °C to +70 °C</td>
</tr>
<tr>
<td><strong>Humidity</strong></td>
<td>95% non-condensing humidity</td>
</tr>
</tbody>
</table>
ACCESSORIES

SNMP/Web Browser Card

- Easy to use graphical user interface (GUI)
- Real time monitoring of card performance
- Alarm monitoring and event logging
- Control of gain adjustment
- Compatible with all ViaLiteHD rack chassis and cards
- Easy integration with network management systems (NMS) using management information base (MIB) tables
- Actively manage redundancy switching
- New RF cards can be automatically reprogrammed with the previous card parameters
- Remote SNMP to local SNMP connection via optical fiber
- Provides remote LAN 10/100 Ethernet link

Rack Chassis

- 3U accepts up to 13 RF or Support cards, plus an SNMP card and dual power supplies
- A 1U chassis accepts up to 3 RF or Support cards or 2 cards and an SNMP card (with dual power supplies)
- Up to 26 channels per 3U chassis (using dual RF cards) – reducing the amount of rack space required
- Blind mate option
- All modules hot-swappable and auto-reconfigure with SNMP option
- On-card LNB and BUC power options
- Power fed through rear chassis connector to card Bias Tees
- System can be monitored and controlled remotely via SNMP using a web browser

DWDM Systems

- DWDM multiplexers
- EDFAs
- Delay lines
- Optical switches
- Dispersion Compensation
- System design and configuration
- Remote link monitoring

Outdoor Enclosures

- CE approved and EMC compatible
- IP rated and NEMA approved
- Plug and play format
- Suitable for harsh environments
- All modules hot swappable
- Dual redundant power options
- Interface for monitor and control (M&C) systems