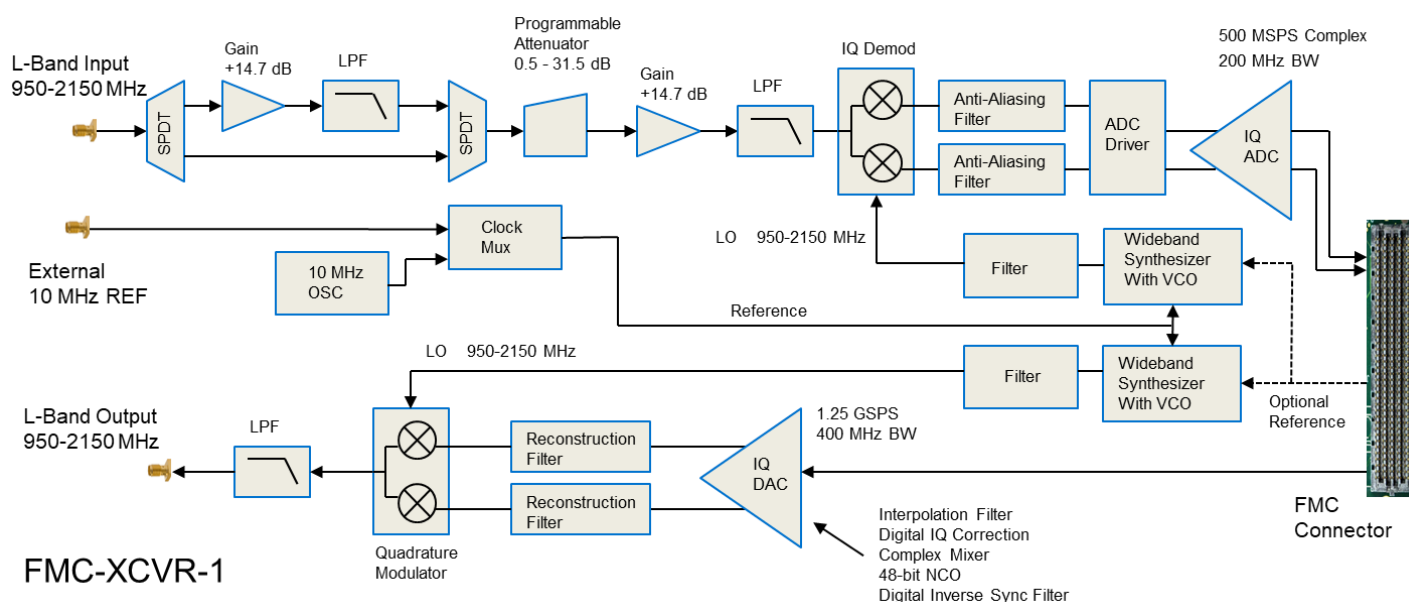


- **SATCOM**
- **Software Defined Radio**
- **Modulation / Demodulation**
- **Interference Cancellation**
- **Search and Survey**
- **Spectral Monitoring**

FMC Wideband L-Band Transceiver

The FMC-XCVR-1 uses an analog mixer to center 200 MHz of the analog L-Band input (950 MHz–2150 MHz input frequency range) at baseband. The tunable 200 MHz bandwidth is then digitized by an oversampled 500 MSPS Complex ADC, with the LVDS output routed to the FMC connector.

The FMC-XCVR-1 also features an IQ 16-bit DAC, followed by an IQ modulator to provide up to 400 MHz bandwidth between 950 MHz-2150 MHz. The output center frequency is tunable across the L-Band Output.



Key Specifications— L-band Input and Digitizer

Connector.....	SMA, 50 Ohm
L-Band Input Frequency Range.....	950-2150 MHz
Input Power Range, VSWR.....	-87 dBm to 0 dBm (up to +10 dBm without damage), VSWR ≤ 1.3:1
Gain.....	14.7dB (selectable), +14.7dB Fixed
Attenuation.....	Programmable 0.5–31.5 dB
IQ Demod.....	950-2150 MHz, 950-2150 MHz LO
ADC Clocking.....	Internal Wideband Synthesizer with VCO, Internal 10 MHz, External, or from Carrier
Carrier 10 MHz Reference Requirement.....	LVDS, 325mV swing
IQ ADC Converter.....	12-bit, 500 MSPS, Texas Instruments—ADC12D500RFIUT/NOPB
IQ Output Correction.....	Digital, IP Core provided by Apogee
ADC LVDS Output.....	LVDS outputs are compatible with IEEE 1596.3-1996
FMC Card Form Factor.....	ANSI/ VITA 57.1 FPGA Mezzanine Card (FMC), High Pin Count (HPC)



Wideband L-Band Transceiver

200 MHz ADC BW

400 MHz DAC BW

FMC-XCVR-1

RF Input Chain and Digitizer Performance

Amplitude Flatness Typical.....	Uncorrected amplitude ripple over any 80 MHz segment less than ± 0.5 dB
	Uncorrected amplitude ripple over any 40 MHz segment less than ± 0.3 dB
Out of Band Rejection Typical.....	Minimum of 50 dB rejection between 0-900 MHz.
	Minimum of 50 dB rejection between 2200 -3200 MHz.
System Spurious Performance Typical.....	Minimum SFDR of -50 dBc, Minimum IMD3 of -57 dBFS
Noise Figure Typical.....	Noise Figure of 26.9 dB, bypassed input gain
	Noise Figure of 10 dB with input gain selected
Phase Noise Typical.....	-78 dBc at 100 Hz.
	-82 dBc/Hz at 1 kHz.
	-89 dBc/Hz at 10kHz.
	-103 dBc/Hz at 100 kHz.
	-115 dBc/Hz at 1 MHz.

Digital to Analog Converter

Digital to Analog Converter.....	Texas Instruments— Part Number — DAC3482IRKDT
Resolution, Sample Rate.....	16-bit, Dual Channel, 800 MSPS
Data Interface.....	The DAC3482 has a 16-bit LVDS bus that accepts 16-bit I and Q data in either word-wide or byte-wide formats. In word-wide mode data is sent through a 16-bit bus.
Input FIFO.....	The DAC3482 includes a 2-channel, 16-bits wide, and 8-samples deep input FIFO which acts as an elastic buffer.
Interpolation.....	2x to 16x digital interpolation filters with over 90 dB of stop-band rejection
Mixer.....	Complex mixer allows flexible carrier placement, 32-bit frequency register, 12-bit phase
IQ Offset Correction.....	Digital Offset, 2s-complement range from -4096 to 4095
Group Delay Correction.....	DAC3482 has group delay correction block for each DAC channel. The maximum delay ranges from 30 ps to 100 ps.
Quadrature Modulator.....	Up-convert DAC output to RF frequencies of 950–2150 MHz
Output Power.....	3-5 dBm typical
Output Frequency Range.....	L-band, 950 to 2150 MHz
Output Connector.....	SMA, 50 Ohm

