

3U RF Up/Down Converter with Preselection

PRELIMINARY

Description

Designed to be an RF front end for electronic warfare, ELINT and electronic support/surveillance/attack, this 0.5 – 18 GHz wideband converter is a SOSA-aligned, conduction cooled, VPX RF Payload Card, which provides one channel up, one channel down, and a synthesizer in a single, 3U slice. The synthesizer utilizes a wideband DDS mixed with several fixed pickets to provide agile LOs which in turn enables fast tuning of the converters. See specifications for target performance.

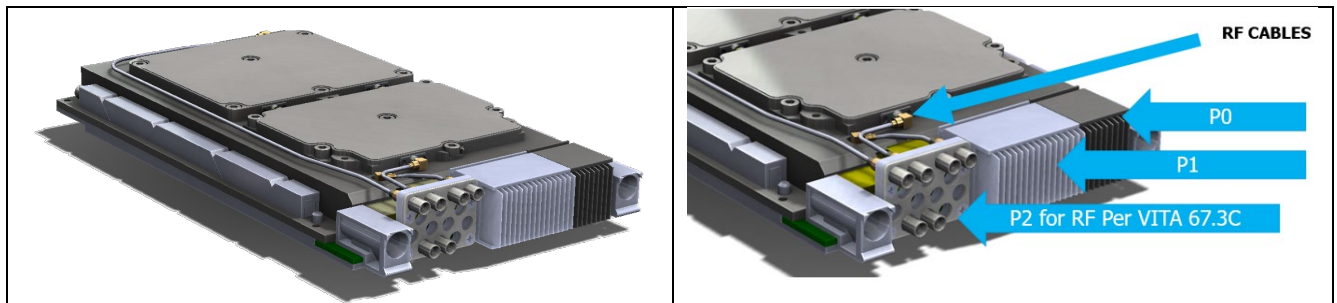
This 3U converter has a modular architecture designed for phase coherent applications and will accommodate the following converter channel configurations: 1 up and 1 down, 2 up or 2 down. This functionality and performance with double the number of channels will be coming out in a 6U form factor.

Applications

- Electronic Warfare
- ELINT
- Electronic Support
- Electronic Surveillance
- Electronic Attack

Key Features

- SOSA-aligned, open systems architecture
- Fast tuning speed
- Built-in synthesizer
- External reference
- Low noise figure
- Low spurious
- Low harmonics
- Excellent gain flatness
- SWaP optimized
- Conduction cooled



0.5 – 18 GHz, SOSA-aligned RF Payload Card

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Specifications	Down-Converter	Up-Converter
RF Frequency Conversion	.5 - 18 GHz	
RF VSWR	2.5:1	2.0:1
Nominal Gain	25 dB	25 dB
Nominal Gain Tolerance	+/- .75 dB	+/- .75 dB
Noise Figure	17 dB	19 dB
OP1dB (with max gain)	20 dBm	17 dBm
OIP3 (with max gain)	30 dBm	29 dBm
Maximum RF input power (without damage)	20 dBm	20 dBm
IF Frequency	3.5 Ghz	
Instantaneous IF Bandwidth (IBW)	2.0 GHz	
Gain Flatness in IBW	± 2.25 dB	
Center Frequency Tuning Step Size	1 MHz	
Group Delay Flatness (80% of IBW)	< 5 ns	
Tuning Speed	350 ns	
# of tune states for high speed tuning	32	
Phase Coherency	Required	
Single Signal Spurious	-60 dBc at P _{in} <-15 dBm	-45 dBc at P _{in} <-10 dBm
Second Order, Two Tone Performance	-60 dBc at P _{in Avg} <-15 dBm	N/A
Harmonics	-60 dBc at P _{in} <-15 dBm	-55 dBc at P _{in} <-10 dBm
Internally Generated Spurious	-70 dBm	-60 dBm
Integrated Phase Noise	0.5 degrees RMS (100 Hz to 40 MHz)	
Customer Attenuation	RF: 15 dB, 0.5 dB steps IF: 15 dB, 0.5 dB steps	RF: 15 dB, 0.5 dB steps IF: 15 dB, 0.5 dB steps
- Attenuation change time (via Ethernet)	TBD	TBD
BIT Detectors	-10 dBm Threshold Detector at Output (2.5 to 4.5 GHz)	-10 dBm Threshold Detector at Output (0.5 to 18 GHz)
Power	Vsupplies: V _{S1} =12.0 V, V _{AUX} =3.3V, <85W	
Temperature Range	-40°C to +75°C, Conduction Cooled	
Size	3U, 1.0" - Single Slot	
Weight (estimate)	2.4 lbs.	
Frequency Reference (to RF)	125 or 150 MHz	
SOSA (aligned) RF slot definition for RF Module, VITA 65.1	MOD3-PAY-1F1U1S1S1U1U2F1H-16.6.11-16 for SLT3-PAY-1F1U1S1S1U1U2F1H-14.6.11-4	

0.5 – 18 GHz, SOSA-aligned RF Payload Card

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- Available configurations:
 - 1 Up-Converter / 1 Down-Converter; Common Synthesizer
 - 2 Up-Converters; Common Synthesizer
 - 2 Down-Converters; Common Synthesizer
- Customer controlled DCAs
 - RF Input DCA and IF Output DCA of Down-Converter
 - IF Input DCA and RF Output DCA of Up-Converter
- SOSA Aligned Control Interface
 - Control Plane – 10GB Ethernet; 10GBASE-KR-5.1.7
 - Communication via Single Board Computer (SBC)
 - Intelligent Platform Management Bus (IPMB)
 - Communication via Utility Plane – Monitoring of Temperature, Voltage Supply Levels, etc.
 - Software command structure will be SOSA aligned
- User Defined SOSA pins will be configured as LVDS lines to allow 350 ns switching between 32 saved and defined states
- With a modest level of design effort it can be configured for independently tuned channels



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