

Falcon Series Frequency Converter Module

L-Band to X-Band Agile Upconverter

L-Band to X-Band agile upconverter module with variable gain.

The 1U chassis has the capacity for up to four hot-swap frequency converter modules. These can be all upconverters, all downconverters or a mix of both.

Frequency Converter Module



Frequency Converter Module

Compact form factor allowing multiple modules to be housed in the Genus chassis. Each module occupies 4 slots in the chassis.

Redundancy Configurations

Field-replaceable 2+1 or 1+1 redundant configuration

Hot Swap & Replaceable

RF Frequency Converter modules

Variable Gain & Slope For balancing input signals.

Frequency Conversion Up conversion from L-Band to X-Band.

Chassis Options

Local control & monitoring

via HMI high resolution touchscreen

Resilience

from dual redundant hot-swap power supplies & field replaceable CPU & HMI

Compact indoor & outdoor

chassis options, which can be part populated

Secure protocols

with SNMPv3 and HTTPS

Flexible Module Configurations

choose from a mixture of up and down converters with different operating frequencies.

Remote control & monitoring

via RJ45 Ethernet port with SNMP & web browser interface

Field replaceable Internal reference source

and external reference inject port with auto detection



Indoor Chassis



Outdoor Unit



Model Numbers FN-U-X3L1-24479AA-XXXX	Frequency Upconverter Module - RF Parameters			
Redundancy	Model Numbers		FN-U-X3L1-24479AA-XXXX	
Input Frequency Range	Size		4 slots wide	
Output Frequency Range 7145—7235 MHz (tuneable in 1 KHz steps) Mean Conversion Gain Max 30 ± 1.5 dB / Min -30 ± 1.5 dB Gain Step Size 0.25 ± 0.15 dB Gain Flatness (50 Ohm) Full band: ±1.0 dB Input Return Loss (RF-Band, 50 Ohm) Typ18 dB / Min15 dB Output Return Loss (IF-Band, 50 Ohm) Typ18 dB / Min15 dB Output Return Loss (IF-Band, 50 Ohm) Typ18 dB / Min15 dB Ohm) Typ18 dB / Min15 dB Ohm Typ18 dB / Min15 dB Maximum Operational Input Level -35 dBm (At max gain) OP1dB At max. gain Typ. +15 dBm / Min.+12 dBm OP13 At max. gain Typ. +15 dBm / Min.+12 dBm OP13 At max. gain Typ. +27 dBm / Min.+12 dBm OP14 B At max. gain Typ. +27 dBm / Min.+12 dBm OP15 At max. gain Typ. +27 dBm / Min.+12 dBm OP16 At max. gain Typ. +27 dBm / Min.+12 dBm OP1	Redundancy		Standalone module	
Mean Conversion Gain Max 30 ± 1.5 dB / Min -30 ± 1.5 dB Gain Step Size 0.25 ± 0.15 dB Gain Flatness (50 Ohm) Full band: ±1.0 dB Input Return Loss (RF-Band, 50 Ohm) Typ18 dB / Min15 dB Output Return Loss (IF-Band, 50 Ohm) Typ18 dB / Min15 dB Ohm) Typ18 dB / Min15 dB Noise Figure At max. gain Typ. 15 dB / Max. 18 dB Maximum Operational Input Level -35 dBm (At max gain) OP1dB At max. gain Typ. +15 dBm / Min.+12 dBm OIP3 At max. gain Typ. +27 dBm / Min.+25 dBm Internal Reference Stability ± 5 x 10-8 over 0 to 50°C -68 dBc / Hz -80 dBc / Hz @10 Hz offset -80 dBc / Hz @10 Hz offset -90 dBc / Hz @10 KHz offset -106 dBc / Hz @10 KHz offset -106 dBc / Hz @10 KHz offset -115 dBc / Hz @10 KHz offset -115 dBc / Hz @10 KHz offset -115 dBc / Hz @10 KHz offset -15 dBm @10 KHz offset -60 dBc &2 of BBm Output) -60 dBc Carrier related	Input Frequency Range		950 –2100 MHz	
Gain Step Size	Output Frequency Range		7145—7235 MHz (tuneable in 1 KHz steps)	
Full band: ±1.0 dB	Mean Conversion Gain		Max 30 ± 1.5 dB / Min -30 ± 1.5 dB	
Any 40MHz: ±0.25 dB	Gain Step Size		0.25 ± 0.15 dB	
Output Return Loss (IF-Band, 50 Ohm) Typ18 dB / Min15 dB Noise Figure At max. gain Typ. 15 dB / Max. 18 dB Maximum Operational Input Level -35 dBm (At max gain) OP1dB At max. gain Typ. +15 dBm / Min.+12 dBm OIP3 At max. gain Typ. +27 dBm / Min.+25 dBm Internal Reference Stability ± 5 x 10-8 over 0 to 50°C @10 Hz offset -68 dBc / Hz @100 Hz offset -80 dBc / Hz Phase Noise @1 KHz offset -90 dBc / Hz (Typical Values) @1 KHz offset -106 dBc / Hz @10 KHz offset -107 dBc / Hz -115 dBc / Hz %10 KHz offset -115 dBc / Hz -75 dBm %25dBm Output) <-60 dBc	Gain Flatness (50 Ohm)			
Ohm) Typ. 15 dB / Max. 18 dB Noise Figure At max. gain Typ. 15 dB / Max. 18 dB Maximum Operational Input Level -35 dBm (At max gain) OP1dB At max. gain Typ. +15 dBm / Min.+12 dBm OIP3 At max. gain Typ. +27 dBm / Min.+25 dBm Internal Reference Stability ± 5 x 10-8 over 0 to 50°C @10 Hz offset -68 dBc / Hz @10 Hz offset -80 dBc / Hz @10 Hz offset -90 dBc / Hz @10 KHz offset -106 dBc / Hz @10 KHz offset -107 dBc / Hz @10 KHz offset -115 dBc / Hz Spurs In-band (@-5dBm Output) Non-carrier related Carrier related <-60 dBc	Input Return Loss (RF-Band, 50 Ohm)		Typ18 dB / Min15 dB	
Maximum Operational Input Level -35 dBm (At max gain) OP1dB At max. gain Typ. +15 dBm / Min.+12 dBm OIP3 At max. gain Typ. +27 dBm / Min.+25 dBm Internal Reference Stability ± 5 x 10-8 over 0 to 50°C @10 Hz offset -68 dBc / Hz @100 Hz offset -80 dBc / Hz @100 Hz offset -90 dBc / Hz @100 KHz offset -106 dBc / Hz @100 KHz offset -107 dBc / Hz @100 KHz offset -115 dBc / Hz % On-carrier related <-75 dBm	· ·		Typ18 dB / Min15 dB	
OP1dB At max. gain Typ. +15 dBm / Min.+12 dBm OIP3 At max. gain Typ. +27 dBm / Min.+25 dBm Internal Reference Stability ± 5 x 10-8 over 0 to 50°C @10 Hz offset -68 dBc / Hz @100 Hz offset -80 dBc / Hz @100 Hz offset -90 dBc / Hz @10 KHz offset -106 dBc / Hz @10 KHz offset -107 dBc / Hz @10 KHz offset -115 dBc / Hz Spurs In-band (@-5dBm Output) Non-carrier related Carrier Related <-60 dBc	Noise Figure At max. gain		Typ. 15 dB / Max. 18 dB	
Typ. +27 dBm / Min. +25 dBm	Maximum Operational Input Level		-35 dBm (At max gain)	
Internal Reference Stability # 5 x 10-8 over 0 to 50°C # Gas and Bc / Hz # Gas and Bc	OP1dB At max. gain		Typ. +15 dBm / Min.+12 dBm	
Phase Noise @10 Hz offset @100 Hz offset &80 dBc / Hz @100 Hz offset &90 dBc / Hz @10 KHz offset &106 dBc / Hz @10 KHz offset &106 dBc / Hz @10 KHz offset &107 dBc / Hz @10 MHz offset &115 dBc / Hz @1 MHz offset &115 dBc / Hz Spurs In-band (@-5dBm Output) Carrier related &-60 dBc Spurs Out-of-band (@-5dBm Output) Carrier Related &-60 dBc Non-carrier related &-60 dBm Spurs Out-of-band (@-5dBm Output) Non-carrier related &-60 dBc Non-carrier related &-6	OIP3 At max. gain		Typ. +27 dBm / Min.+25 dBm	
Phase Noise	Internal Reference Stability		± 5 x 10-8 over 0 to 50°C	
Phase Noise (Typical Values) @1 KHz offset @10 KHz offset @100 KHz offset @100 KHz offset @100 KHz offset @11 MHz offset @11 MHz offset @12 MNon-carrier related Carrier related Carrier Related Carrier Related Carrier Related Conductorier Related Carrier Related Non-carrier related Non-carrier related Carrier Related Non-carrier related Carrier Related Non-carrier related Non-carrier related Non-carrier related Non-carrier related Non-carrier related Non-carrier relat		@10 Hz offset	-68 dBc / Hz	
Typical Values) @10 KHz offset @100 KHz offse		@100 Hz offset	-80 dBc / Hz	
@100 KHz offset		@1 KHz offset	-90 dBc / Hz	
@1 MHz offset115 dBc / Hz Spurs In-band (@-5dBm Output) Carrier related60 dBc Spurs Out-of-band (@-5dBm Output) Carrier Related60 dBc Spurs Output) Carrier Related60 dBc Non-carrier related75 dBm LO Breakthrough75 dBm LO Breakthrough60 dBm Image Rejection60 dB typ. External Reference Input Frequency		@10 KHz offset	-106 dBc / Hz	
Spurs In-band (@-5dBm Output) Non-carrier related Carrier related Carrier Related Spurs Out-of-band (@-5dBm Output) Carrier Related Carrier Related Non-carrier related Non-carrier related Non-carrier related Carrier Related Non-carrier related Non-carrier related Carrier Related Non-carrier related Non-carrier related Carrier Related Non-carrier related Non-carrier related Non-carrier related Non-carrier related Non-carrier related Non-carrier related Carrier Related Non-carrier related Carrier Related Non-carrier related Non-carrier related Non-carrier related Carrier Related Non-carrier related Carrier Related Non-carrier related Non-carrier related Non-carrier related Carrier Related Non-carrier		@100 KHz offset	-107 dBc / Hz	
Spurs In-band (@-5dBm Output) Carrier related Carrier Related Spurs Out-of-band (@-5dBm Output) Carrier Related Carrier Related Non-carrier related Corrier Re		@1 MHz offset	-115 dBc / Hz	
Carrier related < -60 dBc Spurs Out-of-band (@-5dBm Output) Carrier Related			<-75 dBm	
Spurs Out-of-band (@-5dBm Output) Non-carrier related LO Breakthrough Image Rejection External Reference Input Frequency External Reference Input Level Mute South of the magnetic stress of the magnet		Carrier related	<-60 dBc	
(@-5dBm Output) Non-carrier related LO Breakthrough <-60 dBm		Carrier Related	<-60 dBc	
Image Rejection >60 dB typ. External Reference Input Frequency 10MHz or 100MHz (auto detection) External Reference Input Level +0dBm ± 10dB Mute 60 dB		Non-carrier	<-75 dBm	
External Reference Input Frequency External Reference Input Level HodBm ± 10dB Mute 60 dB	LO Breakthrough		<-60 dBm	
External Reference Input Level +0dBm ± 10dB Mute 60 dB	Image Rejection		>60 dB typ.	
Mute 60 dB	External Reference Input Frequency		10MHz or 100MHz (auto detection)	
	External Reference Input Level		+0dBm ± 10dB	
Number of conversion stages Single	Mute		60 dB	
	Number of conversion stages		Single	
Spectral Inversion Non-inverting	Spectral Inversion		Non-inverting	
IF Monitor Port Yes	IF Monitor Port		Yes	
Spec version 0.1	Spec version		0.1	

Note 1: The specification is subject to regular reviews and will be updated from time to time as part of our continuing product development and improved spec accuracy.

Note 2: Operation beyond the quoted limits stated above may cause instantaneous and permanent damage.

Note 3: All specs are for 50 Ohm connectors unless detailed otherwise.