

Falcon Series Frequency Converter Module

Ka-Band to L-Band Agile Downconverter

Ka-Band to L-Band agile downconverter 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

For balancing input signals.

Frequency Conversion

Down conversion from Ka-Band to L-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



Size	Frequency Downconverter Module - RF Parameters			
Redundancy Supported (based on chassis configuration) Input Frequency Range 25500 - 27000 MHz (selectable in 1kHz steps) Output Frequency Range Mode 1: 900 — 1500, Mode 2: 1650 — 3150 Instantaneous Bandwidth (MHz) Mode 1: 600, Mode 2: 1650 — 3150 Mean Conversion Gain Gain Step Size 0.25 ± 0.15 dB Gain Flatness Full instantaneous band: ±1.5 dB / Any 40 MHz ±0.3 dB Input Return Loss (Ka-band) Typ16 dB / Min12 dB Output Return Loss (Ka-band) Typ16 dB / Min14 dB Noise Figure (At max. gain) Typ. 18 dB / Min14 dB Noise Figure (At max. gain) Typ. +12 dBm / Min. +19 dBm Input Power Range -75 to -30 dBm OP1dB (At max. gain) Typ. +12 dBm / Min. +19 dBm OP1dB (At max. gain) Typ. +22 dBm / Min. +19 dBm Internal Reference Stability **O HE C / Hz	Model Numbers		FN-D-K4L1-24465AA-K5S5	
Input Frequency Range	Size		4 slots wide	
Output Frequency Range Mode 1: 900—1500, Mode 2: 1650—3150 Instantaneous Bandwidth (MHz) Mode 1: 600, Mode 2: 500 Mean Conversion Gain Max. 20 ± 2.0 dB / Min10 ± 2.0 dB Gain Step Size 0.25 ± 0.15 dB Gain Flatness Full instantaneous band: ±1.5 dB / Any 40 MHz ±0.3 dB Input Return Loss (Ka-band) Typ16 dB / Min12 dB Output Return Loss (Ka-band) Typ18 dB / Min14 dB Noise Figure (At max. gain) Typ18 dB / Min14 dB Noise Figure (At max. gain) Typ. 14 dB / Max. 17 dB OP18 (At max. gain) Typ. 14 dB / Max. 17 dB OP3 (At max. gain) Typ. +12 dBm / Min. +19 dBm OP18 (At max. gain) Typ. +22 dBm / Min. +19 dBm Internal Reference Stability ± 5 x 10-8 over 0 to 50°C Phase Noise *010 Hz offset *010 Hz offset ***GYDical values, measured with internal 100MHz *01 Hz offset *010 Hz offset ***G100 KHz offset *010 KHz offset *010 KHz offset ***Offset *010 KHz offset *010 KHz offset ***Offset *010 KHz offset *010 KHz offset ***Offset *010 KHz offset	Redundancy		Supported (based on chassis configuration)	
Instantaneous Bandwidth (MHz) Mode 1: 600, Mode 2: 500 Mean Conversion Gain Max. 20 ± 2.0 dB / Min10 ± 2.0 dB Gain Step Size 0,25 ± 0.15 dB Gain Flatness Full instantaneous band: ±1.5 dB / Any 40 MHz ±0.3 dB Input Return Loss (Ka-band) Typ16 dB / Min12 dB Output Return Loss (Ka-band) Typ18 dB / Min14 dB Output Return Loss (Ka-band) Typ18 dB / Min14 dB Output Return Loss (Ka-band) Typ14 dB / Max. 17 dB Input Power Range -75 to -30 dBm Opt 10 Mc Max. gain) Typ. +12 dBm / Min. +9 dBm Opt 20 Mc Max. gain) Typ. +12 dBm / Min. +19 dBm Internal Reference Stability ±5 x 10.8 over 0 to 50°C Opt 20 Mc Mc Mcx. gain Typ. +12 dBm / Min. +19 dBm Internal Reference Stability ±0 Mc Mcx. gain Typ. +12 dBm / Min. +19 dBm Internal Reference Stability ±0 Mcx. gain Typ. +12 dBm / Min. +19 dBm Internal Reference Stability ±0 Mcx. gain Typ. +12 dBm / Min. +19 dBm Internal Reference Stability ±0 Mcx. gain Typ. +12 dBm / Min. +19 dBm Internal Reference Stability ±0 Mcx. gain Typ. +12 dBm / Min. +19 dBm Internal Reference Stability ±0 Mcx. gain Typ. +12 dBm / Min. +19 dBm Internal Reference Stability ±0 Mcx. gain Typ. +12 dBm / Min. +19 dBm Internal Reference Stability ±0 Mcx. gain Typ. +12 dBm / Min. +19 dBm Internal Reference Stability ±0 Mcx. gain Typ. +12 dBm / Min. +19 dBm Internal Reference Input Health Typ. +12 dBm / Min. +19 dBm Internal Reference Input Frequency 10 Mcx. gain Typ. +12 dBm / Min. +19 dBm Internal Reference Input Level Mcx. gain Typ. +12 dBm / Min. +19 dBm Internal Reference Input Level Mcx. gain Typ. +12 dBm / Min. +19 dBm Internal Reference Input Level Mcx. gain Typ. +12 dBm / Min. +19 dBm Internal Reference Input Level Mcx. gain Typ. +12 dBm / Min. +19 dBm Internal Reference Input Level Mcx. gain Typ. +12 dBm / Min. +19 dBm / Min.	Input Frequency Range		25500 - 27000 MHz (selectable in 1kHz steps)	
Mean Conversion Gain Max. 20 ± 2.0 dB / Min10 ± 2.0 dB Gain Step Size 0.25 ± 0.15 dB Gain Flatness Full instantaneous band: ±1.5 dB / Any 40 MHz ±0.3 dB Input Return Loss (Ka-band) Typ16 dB / Min12 dB Output Return Loss (Ka-band) Typ18 dB / Min14 dB Noise Figure (At max. gain) Typ. 14 dB / Max. 17 dB Input Power Range -75 to -30 dBm OP1dB (At max. gain) Typ. +12 dBm / Min. +9 dBm OIP3 (At max. gain) Typ. +22 dBm / Min. +19 dBm Internal Reference Stability ± 5 x 10-8 over 0 to 50°C Phase Noise 101 Hz offset Typ. 14 dB / Max. 4 Min. +19 dBm Internal Reference Stability ± 5 x 10-8 over 0 to 50°C 100 Hz offset -90 dBc / Hz 91 Hz offset -90 dBc / Hz 91 KHz offset -90 dBc / Hz 91 KHz offset -90 dBc / Hz 91 KHz offset -101 dBc / Hz 91 KHz offset -102 dBm	Output Frequency Range		Mode 1: 900—1500, Mode 2: 1650—3150	
Gain Step Size Gain Flatness Full instantaneous band: ±1.5 dB / Any 40 MHz ±0.3 dB Input Return Loss (Ka-band) Typ16 dB / Min12 dB Output Return Loss (Ka-band) Typ18 dB / Min14 dB Noise Figure (At max. gain) Input Power Range OP1dB (At max. gain) Typ. +12 dBm / Min.+9 dBm OP1dB (At max. gain) Typ. +12 dBm / Min.+9 dBm OP1dB (At max. gain) Typ. +22 dBm / Min.+19 dBm Internal Reference Stability Typ. +22 dBm / Min.+19 dBm OP1dB (At max. gain) Typ. +22 dBm / Min.+19 dBm Typ. +22 dBm / Min.+19 dBm Typ. +22 dBm / Min.+19 dBm Typ. +22 dBm / Min.+19	Instantaneous Bandwidth (MHz)		Mode 1: 600, Mode 2: 500	
Gain Flatness Full instantaneous band: ±1.5 dB / Any 40 MHz ±0.3 dB Input Return Loss (Ka-band) Typ16 dB / Min12 dB Output Return Loss (Ka-band) Typ18 dB / Min14 dB Noise Figure (At max. gain) Typ. 14 dB / Max. 17 dB Input Power Range Typ. 12 dBm / Min9 dBm OIP3 (At max. gain) Typ. +22 dBm / Min9 dBm Internal Reference Stability ±5 x 10-8 over 0 to 50°C OIP3 (At max. gain) Typ. +22 dBm / Min9 dBm Internal Reference Stability ±5 x 10-8 over 0 to 50°C OID Hz offset Typical values, measured with internal 100MHz reference) OID Hz offset Typical values, measured with internal 100MHz reference) OID My to offset Typical values, measured with internal 100MHz reference) OID My to offset Typical values, measured with internal 100MHz reference Typical values, measured with internal 100MHz reference) OID My to offset Typical values, measured with internal 100MHz reference Typical values, measured typical values, measured with internal 100MHz reference Typical values, measured with internal Reference Input Level Typical values, measured typical values, measured with internal Reference Input Level Typical values, measured typical values, measured typical values, measured with internal Reference Input Level Typical values, measured typical value	Mean Conversion Gain		Max. 20 ± 2.0 dB / Min. –10 ± 2.0 dB	
Input Return Loss (Ka-band) Output Return Loss (Ka-band) Output Return Loss (Ka-band) Noise Figure (At max. gain) Input Power Range OP1dB (At max. gain) OIP3 (At max. gain) Internal Reference Stability Phase Noise Typical values, measured with internal 100MHz reference) OIP (Burs In-band Characterised at SdBm out) Spurs In-band Characterised at Non-carrier related Char	Gain Step Size		0.25 ± 0.15 dB	
Output Return Loss (Ka-band) Noise Figure (At max. gain) Noise Figure (At max. gain) Input Power Range OPIdB (At max. gain) OIP3 (At max. gain) OIP3 (At max. gain) OIP3 (At max. gain) Internal Reference Stability Phase Noise (Typical values, measured with internal 100MHz reference) OIP3 (At Joffset	Gain Flatness		Full instantaneous band: ±1.5 dB / Any 40 MHz ±0.3 dB	
Noise Figure (At max. gain) Input Power Range OP1dB (At max. gain) Internal Reference Stability Internal Reference Input Reference Input Requency Internal Reference Input Level Internal Reference Input Level Internal Reference Input Level Internal Reference Input Level Internal Reference Input Reference Input Level Internal Reference Input Reference Input Level Internal Reference Input Reference	Input Return Loss (Ka-band)		Typ16 dB / Min12 dB	
Input Power Range OP1dB (At max. gain) OIP3 (At max. gain) OIP3 (At max. gain) OIP3 (At max. gain) Internal Reference Stability Phase Noise Phase Noise OID Hz offset Phase Noise OID Hz offset OID Hz offset	Output Return Loss (Ka-band)		Typ18 dB / Min14 dB	
OP1dB (At max. gain) Typ. +12 dBm / Min.+9 dBm OIP3 (At max. gain) Typ. +22 dBm / Min.+19 dBm Internal Reference Stability ± 5 x 10-8 over 0 to 50°C Phase Noise @10 Hz offset -70 dBc / Hz Phase Noise (Typical values, measured with internal 100MHz reference) @1 KHz offset -90 dBc / Hz ©100 KHz offset 91 dBc / Hz -98 dBc / Hz ©100 KHz offset -101 dBc / Hz Spurs In-band (Characterised at 5-dBm out) -70 dBm Spurs Out-of-band (Characterised at 7-dBm out) -70 dBm Carrier related (2-1MHz Offset) -50 dBc Spurs Out-of-band (Characterised at 7-dBm out) -50 dBc Spurs Out-of-band (Characterised at 7-dBm out) -50 dBc Carrier Related (2-1MHz Offset) -50 dBc Non-carrier related (2-1MHz Offset) -70 dBm LO Breakthrough -80 dBm Image Rejection 60 dB Typ. External Reference Input Frequency 10 MHz or 100 MHz (Auto-detection) External Reference Input Level 0dBm ± 10dB Mute 60 dB Number of conversion stages Single Spectr	Noise Figure (At max. gain)		Typ. 14 dB / Max. 17 dB	
OIP3 (At max. gain) Internal Reference Stability Internal Reference Stability # 5 x 10-8 over 0 to 50°C # 010 Hz offset # 010 Hz offset # 0100 Hz offset # 0100 Hz offset # 0100 Hz offset # 010 Hz offset # 0100 Hz offset # 010 KHz offset # 010	Input Power Range		-75 to -30 dBm	
Internal Reference Stability	OP1dB (At max. gain)		Typ. +12 dBm / Min.+9 dBm	
Phase Noise (Typical values, measured with internal 100MHz reference) Phase Noise (Typical values, measured with internal 100MHz reference) Phase Noise (Typical values, measured with internal 100MHz reference) Phase Noise (In KHz offset	OIP3 (At max. gain)		Typ. +22 dBm / Min.+19 dBm	
Phase Noise (Typical values, measured with internal 100MHz reference) © 10 KHz offset Peace of the control	Internal Reference Stability		± 5 x 10-8 over 0 to 50°C	
(Typical values, measured with internal 100MHz reference) @1 KHz offset	(Typical values, measured with internal 100MHz	@10 Hz offset	-70 dBc / Hz	
measured with internal 100MHz reference) @10 KHz offset		@100 Hz offset	-80 dBc / Hz	
internal 100MHz reference) @100 KHz offset @100 KHz offset @100 KHz offset @100 KHz offset @1100 KHz offset @100 KHz offset @1100 KHz offset %100 KHz		@1 KHz offset	-90 dBc / Hz	
@1 MHz offset		@10 KHz offset	-98 dBc / Hz	
Spurs In-band (Characterised at 5dBm out) Spurs Out-of-band (Characterised at 5dBm out) Spurs Out-of-band (Characterised at 5dBm out) Spurs Out-of-band (Characterised at 5dBm out) Carrier Related (Characterised at 5dBm out) LO Breakthrough LO Breakthrough Image Rejection External Reference Input Frequency External Reference Input Level Mute Mute Mute Spectral Inversion Non-inverting IF Monitor Ves. Internal RF detector monitored		@100 KHz offset	-101 dBc / Hz	
Spurs In-band (Characterised at 5dBm out) related Carrier related (>1MHz Offset) Carrier Re		@1 MHz offset	-107 dBc / Hz	
-5dBm out) Carrier related (>1MHz Offset) Spurs Out-of-band (Characterised at -5dBm out) LO Breakthrough Image Rejection External Reference Input Frequency External Reference Input Level Mute Mute Spectral Inversion Carrier related C-50 dBc Carrier Related Carrier Related C-70 dBm Carrier Related C-70 dBm Carrier Related Carrier Belated Carrier Belated Carrier Belated Carrier Belated Carrier Belated Carrier Belated Carri	(Characterised at		<-70 dBm	
(Characterised at -5dBm out) Non-carrier related CO Breakthrough LO Breakthrough Image Rejection External Reference Input Frequency External Reference Input Level Mute OdBm ± 10dB Number of conversion stages Single Spectral Inversion Non-inverting IF Monitor Yes. Internal RF detector monitored			<-50 dBc	
-5dBm out) related <-70 dBm LO Breakthrough <-80 dBm Image Rejection 60 dB Typ. External Reference Input Frequency 10 MHz or 100 MHz (Auto-detection) External Reference Input Level 0dBm ± 10dB Mute 60 dB Number of conversion stages Single Spectral Inversion Non-inverting IF Monitor Yes. Internal RF detector monitored	(Characterised at	Carrier Related	<-50 dBc	
Image Rejection 60 dB Typ. External Reference Input Frequency 10 MHz or 100 MHz (Auto-detection) External Reference Input Level 0dBm ± 10dB Mute 60 dB Number of conversion stages Single Spectral Inversion Non-inverting IF Monitor Yes. Internal RF detector monitored			<-70 dBm	
External Reference Input Frequency External Reference Input Level OdBm ± 10dB Mute 60 dB Number of conversion stages Single Spectral Inversion IF Monitor Non-inverting Yes. Internal RF detector monitored	LO Breakthrough		<-80 dBm	
External Reference Input Level 0dBm ± 10dB Mute 60 dB Number of conversion stages Single Spectral Inversion Non-inverting IF Monitor Yes. Internal RF detector monitored	Image Rejection		60 dB Typ.	
Mute 60 dB Number of conversion stages Single Spectral Inversion Non-inverting IF Monitor Yes. Internal RF detector monitored	External Reference Input Frequency		10 MHz or 100 MHz (Auto-detection)	
Number of conversion stages Single Spectral Inversion Non-inverting IF Monitor Yes. Internal RF detector monitored	External Reference Input Level		0dBm ± 10dB	
Spectral Inversion Non-inverting IF Monitor Yes. Internal RF detector monitored	Mute		60 dB	
IF Monitor Yes. Internal RF detector monitored	Number of conversion stages		Single	
	Spectral Inversion		Non-inverting	
Spec version 0.4	IF Monitor		Yes. Internal RF detector monitored	
Spec version 0.4	Spec version		0.4	

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.