



30 Years of Excellence

IN SATELLITE COMMUNICATIONS



Product Range around the world 2016

SMW [®]
SWEDISH MICROWAVE AB



Since we started Swedish Microwave in 1986 our business has seen many companies come and go. Today we are Europe's oldest manufacturer of Low noise block converters (LNB), serving a global market.

There are several keys to our success. One is that we specialize in LNBs only and thus manage to focus on developing products in line with customer needs. Another is our in-house manufacturing capacity. Which generates shortlead times, great flexibility and prompt delivery of products as well as of services and support. As a result the general customer opinion is that we are uncomplicated and pleasant to work with.

Whatever changes may arise, now or in the future, one thing is certain. We will continue to tailor-make our customers' communications. As we have done since 1986.



1986

LNB with Noise Figure 2.1 dB maximum

1988

The world's first LNB manufacturer with HEMT transistor. NF 1.5 dB maximum.

1990

2-band (switchable 13/18 V) Ku-band LNB. NF 1.4 dB maximum.

1992

LNBF for the consumer market.

1996

The world's first dual output Ku-band LNB for simultaneous reception of low-and high Ku-band.

1998

LNB with low phase noise. LNA (Ku-band).

1999

PLL LNB (Ku-band).

2000

Dual PLL LNB to receive Low- & High Ku-band simultaneously. First BDC (Ku-band).

2001

LNB with an IF up to 3 000 MHz to receive the Low- & High Ku-band simultaneously in one

2005

PLL LNB with high IP3.

2006

2-band switchable Ku-band PLL LNB.

2007

3/4-band switchable Ku-band PLL LNB.

2010

First X-Band product. X-Band PLL-LNB. PLL LNB 14 GHz for Tx monitoring; X-band PLL LNB for Tx monitoring; Multi-Ku-band BDC.

2011

The world's first dual output LNB for simultaneously reception of the Low- and High Ku-band with two PLL-oscillators. (WDL-PLL).

2012

PLL LNB/BDC for the 9-10 GHz market.

2013

First C-Band product. C-Band PLL-LNB with integrated filters to isolate interfering (WiMAX, radar etc.) products.

2014

RF-components, 10 MHz reference source & BiasTee. First Ka-Band products. Professional PLL-LNBs, Wideband LNA & Ka Quad Band system to receive the whole Ka-band simultaneously.

2015

C-Band BDC, C-Band BDC for Tx Monitoring & X-Band BDC. AGC (Automatic Gain Control) Line Amplifier. First fiber Product – Quad Link RF over fiber (single cable). PLL LNB Ku Wideband IF up to 3000 MHz.

2016

First Professional Fiber Output LNB. Ku-band WDFL PLL LNB and QUATTRO Rx Receiver.



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Dual Fiber output Ku band PLL LNB

SMW Dual Fiber output Ku band PLL LNB



Full Ku band downlink on two fiber outputs simultaneously

- Shares the internal design with our top performing LNB for Ku Band – the WDL-PLL with internal reference $\pm 5\text{kHz}$ frequency accuracy

Highest RF and optical performance

- Single frequency conversion and directly modulated DFB lasers results in best possible performance.
- Up to 15 km single mode fiber cable distance.

Fully outdoor proof

- Fully sealed high quality Q-ODC fiber connectors.
- -40° to $+70^{\circ}\text{C}$ operating temp range.
- All parts designed to withstand outdoor environmental conditions long term.

Features

- Directly compatible with SMW fiber receiver and compatible with a wide range of RF over fiber receivers on the market.
- Small size and low power consumption
- RF monitor and DC supply via SMA connectors.
- Cost effective compared to running a separate fiber transmitter to a RF output LNB.

Applications

Perfect for applications where professional fiber distribution from an antenna is needed but space and/or budget is limited.



SPECIFICATION SMW Dual Fiber output Ku band PLL LNB

SMW

Frequency range Low & High
LO frequency
Output frequency
Spurious signal in Low band
High band

Optical output

General specification

Gain typ.
Gain variation max.
Noise figure, typ.
LO Phase noise typ.

LO radiation at WG input
Image rejection
Max usable input level.
Usable antenna diameter range
Input IP3 typ.
Input flange
RF outputs

DC supply.
Power consumption

Input VSWR typ.
Operating temperature
Storage temperature
Dimensions
Weight

LO stability

Fiber output specification

Fiber type:

Fiber connector:

Link distance:
Frequency conversion/laser modulation:
Link total RF gain

Optical power:

Optical wavelength:

RF Isolation between bands:

Standards compliance

Enclosed accessories

Options

Accessories:

WDFL-PLL LNB type E

10.70-11.70 & 11.70-12.75 GHz
9.75 GHz (Low band)
10.60 GHz (High band)
950-1950 MHz (Low band)
1100-2150 MHz (High band)
-60 dBm typ. @ 1700 MHz
-70 dBm typ. @ 1700 MHz

Direct modulation 2mW@1310nm (High band)
Direct modulation 2mW@1310nm (Low band)
Option: 1550nm

60 dB (internal)
±2 dB/each band
±0.25 dB within 30 MHz
0.9 dB
-35 dBc @ 10 Hz
-62 dBc @ 100 Hz
-75 dBc @ 1 kHz
-80 dBc @ 10 kHz
-90 dBc @ 100 kHz
-120 dBc @ >1 MHz
-60 dBm max

40 dB min.
-55dBm total power per band. Note a gain limiter (AGC) activates at > -75dBm.

50cm to 400cm

-35 dBm

WR-75 waveguide / PBR 120 flange

Two built in RF -20 dB monitor outputs for high and low band respectively, for alignment/signal monitoring with standard RF instruments (L-band output).

F-connectors 75 ohm,

N-connectors 50 ohm or

SMA-connectors 50 ohm

12-20VDC. The DC supply is fed via one or both of the RF monitor outputs (for PSU redundancy or long DC cable runs)

5 W

2.3:1

-40 to +70°C

-40 to +85°C

130 x 56 x 76 mm

510 g

±5 kHz (±0.5 ppm) -10° to +70°C (±1.5 ppm -40° to +70°C)

Single mode G652/G657 duplex fiber recommended.

Single mode Huber&Suhner Q-ODC



Up to 15km*

Standard LNB, Ku to L band conversion, 2x directly modulated DFB lasers.

+70dB RF gain max with SMW fiber receiver @ 0dB optical loss. (a 3dB optical link loss results in 6dB reduced link RF gain)

Fiber transmitter gain is automatically limited with high RF input levels to avoid distortion.

2mW. Built in limiter to 20% max optical modulation index.

1310nm as standard for both low and high band outputs. Other options on request.

>40 dB

Optical interfaces: EIA/TIA 568, ITU std G694.2

EMC: EN 55013:2013, EN55020

Safety: EN62368-1, EN60950-22, EN 60065:2002+A1+A2+A12, ANSI Z136.2, EN 207

O-ring

4 pcs Screw M4 x 10

Connector type for combined DC supply and RF monitor output: F,N,SMA

Outdoor to Outdoor fiber cable- 50,100,150,200, 500 meters, other lengths on request.

(For use with SMW Quad/Dual link receiver).

Outdoor to Indoor fiber patch cable, Q-ODC-2 to LC-APC duplex.

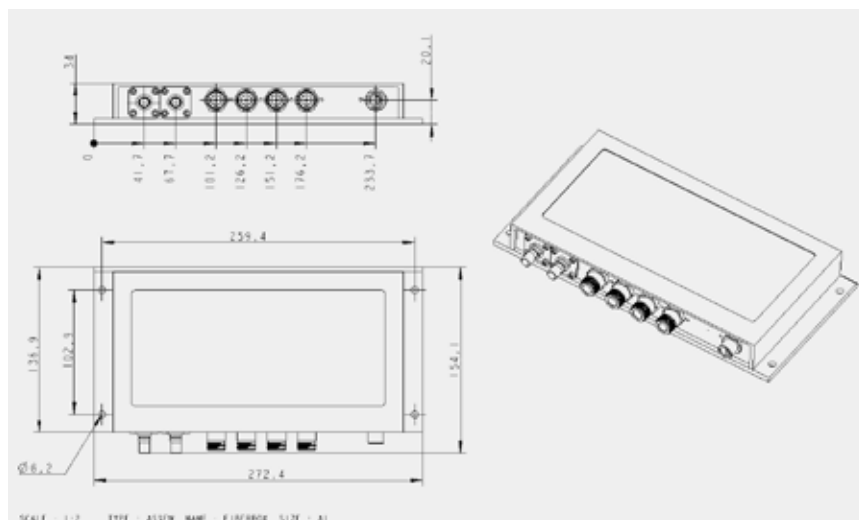
2-500 meters. SC-APC/FC-APC connector on request.



SMW Quattro receiver for WDFL fiber LNB

SPECIFICATION SMW QUATTRO receiver for WDFL Fiber LNB

Parameter	Quattro Fiber-optic Receiver
Optical wavelengths	All four (4) optical channels: 1310 - 1630 nm. Two (2) optical channels per Q-ODC connector.
Optical power	-8dBm per channel min
Optical Connector	Single mode Huber & Suhner Q-ODC®, see separate spec sheet. Note. The fiber connector/cable contains two fibers Optional LC-APC in lieu of Q-ODC, intended for indoor use only, no UV or water protection.
10MHz return path:	Not available. Only available on QUAD-LINK system
RF output IP3	+25dBm
RF output return loss	12dB min (VSWR 1:1.7)
RF Connectors	F-type 75 ohm, N-type 50 ohm or SMA-type 50 ohm
Power consumption	3W
DC supply voltage	10-28V, reverse polarity and over voltage protected. Built in support for 1+1 active/active redundancy without using separate controller.
DC connector	Fischer® 103 series Circular IP68 sealed connector.
LED indicators	White=All OK, RED=Optical input low
Enclosure:	T 6061 aluminium
Finish	Passivation by chromate conversion, Powder coating
Temperature range	-40° to +80°C
Protection class:	IP67
Weight	1890 g (F & SMA), 1950 g (N)
Size	273 x 154.4 x 34.4 mm
Receiver Options	Depending on system options and additionally- DC connector type, RF connector types Indoor fiber connector LC-APC in lieu of Q-ODC
Receiver accessories	Standard accessories: DC outdoor cable 30 m, water, UV petrol proof, 6.6mm OD 3x AWG18 with connector for circular DC connector type Fischer 103 series IP68 rated. One end terminated bare wires Dust caps for Q-ODC fiber connector



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Quad-Link RF over fiber system



SMW Quad-link, single fiber to the antenna system

Features

High RF and optical performance

- 4x L-band forward channels + 10MHz return channel using single fiber.
- Up to 10km Link distance minimum with very high C/N maintained.

Fully outdoor proof

- Both the transmitter and the receiver unit packaged in a small sized outdoor rugged aluminium enclosure.
- -40° to +80°C fully operating temp range.
- Highly rugged push/pull fiber connector on both units.

Versatility

- Fully outdoor 4 x L-band fibre link in any direction simply by swapping location of the receiver/transmitter pair.
- Ideal to mount on the satellite antenna or structure, without using a bulky separate outdoor enclosure.
- Built in bias- tee's and 10MHz ref diplexer.
- Available with custom options.

Applications

Single fiber connection to one Quattro LNB equipped satcom antenna

Single fiber connection to 4 separate single band LNB's

Single fiber connection to multiband or multiple BUC's



SPECIFICATION SMW Quad-link System

Parameter	Quad link system
Fiber type:	Single mode G652 fiber
Link distance:	Up to 10km min*
Link RF gain:	Fixed gain mode: +3dB at 3dB optical loss, +9dB at 0dB optical loss. AGC mode: Depends on the input level and optical loss, see formula. Note, the system automatically switches between AGC and fixed gain mode depending on input level. For special applications the system can be factory set to fixed gain mode only.
L band forward paths frequency range:	300-3000 MHz
L band gain flatness within 30 MHz	± 0.2 dB
L band gain flatness across band	± 1 dB (950-2150 MHz), ±2 dB (300-3000 MHz)
10MHz reference return channel (option)	Phase noise and level stable independent of RF and optical level.
RF Isolation between channels:	>40 dB
System noise figure:	18dB at 0 dB optical loss.
C/N single carrier (30 MHz):	>56dB**
C/N fully loaded including max link loss:	>33dB***
SFDR	115dB/Hz
Standards compliance	Optical interfaces: EIA/TIA 568, ITU std. G694.2 EMC: EN 55013:2013, EN 55020 Safety: EN62368-1, EN60950-22, EN 60065:2002+A1+A11+A2+A12 ANSI Z136.2, EN 207

*Including EIA/TIA 568 max optical attenuation spec for 4 mated connector pairs, one splice and 10km fiber. (6.3 dB optical loss)

** -6dBm RF input level and 0dB link loss

*** 40x 30MHz transponders, input level -22dBm per mux, optical link loss 6.3dB

System Options

10MHz external reference transport over fiber comes as standard on Quad-Link version.
Dual-Link, lower cost version for applications only requiring 2x RF over fiber.
Dual-Link does not include 10MHz external reference over fiber as standard.
Note, dual link uses both fibers in the fiber interface.

System accessories:

Outdoor fiber cable assembly, Q-ODC connectors in both ends. UV and water proof. For direct connection of a Quad-Link Tx and Rx pair. 50, 100, 150, 200 meters standard lengths available on request.
Fiber adapter cable assembly. Q-ODC to standard connector. Available with LC-APC, SC-APC or FC-APC (2.0mm key) connector. 3, 10 or 25 meters as standard. For connection between Quad-Link Tx or Rx and a fiber ODF.

The RF output level from the optical receiver depends on two things:

1. Optical attenuation
2. Input level on the optical transmitter

The formulas are:

$$\text{Rx channel power} = -6\text{dBm} - (2 \times \text{optical_attenuation}) - (\log_{10}(\text{number of channels}) \times 10)$$

If the RF input level is less than -15dBm on the optical transmitter (sum of all carriers power)

$$\text{Rx channel power} = \text{Tx_input_level} + 9 - (2 \times \text{optical_attenuation}) - (\log_{10}(\text{number_of_channels}) \times 10)$$



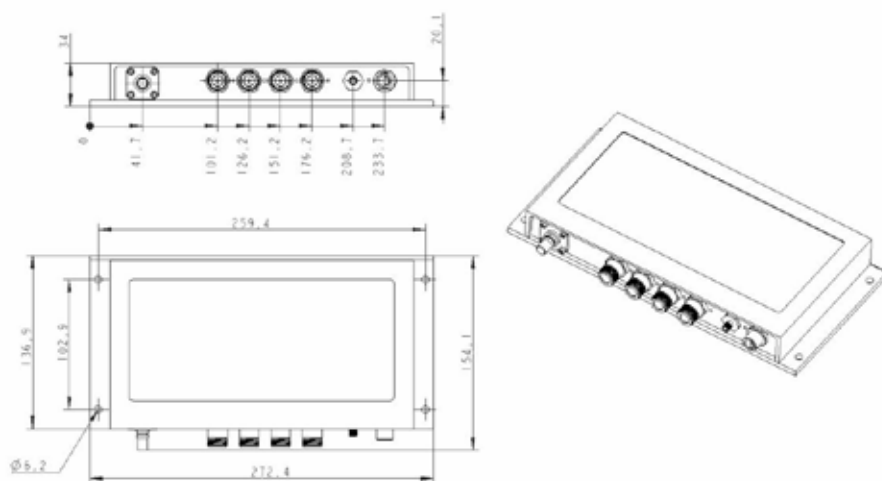
SPECIFICATION SMW Quad-link transmitter

Parameter	Quad –Link transmitter
Optical wavelengths	CH1-1470nm, CH2-1510nm, CH3-1550nm, CH4-1590nm. Return channel 1310nm
Optical power	8mW (total optical power at fiber connector output)
Optical Connector	Single mode Huber & Suhner Q-ODC®, see separate spec sheet. Note. The fiber connector/cable contains two fibers, only the left ferrule seen from front is used normally. The Dual link option uses both fibers.
RF Input IP3	>+25dBm
RF input return loss	12dB min (VSWR 1:1.7)
RF Connectors	F-type 75 ohm, N-type 50 ohm or SMA-type 50 ohm
RF input level range typ.	The Quad link transmitter switches seamlessly between fixed gain and limited gain (AGC) to maximize signal quality for different applications. The trip point is factory set at -15dBm (total) power at each RF input.
AGC mode modulation compatibility	All DVB-S and DVB-S2/S2X modes, QAM and FM
Power consumption	5W
DC supply voltage	10-28V, reverse polarity and over voltage protected. Built in support for 1+1 active/active redundancy without using separate controller.
DC connector	Fischer® 103 series Circular IP68 sealed connector. DC cable and connector included DC cable lengths up to 200 meter possible depending on LNB voltage and load.
LNB DC supply:	Input voltage feed through, 600mA max per port, individually short circuit protected.
10MHz output level:	0dBm on all LNB ports and on separate output port.
10MHz phase noise:	Fixed- Independent of link loss and input source. 100Hz -123dBc 1kHz -140dBc 10kHz -150dBc 100kHz -155dBc Higher performance or 100MHz reference on request Above performance sufficient for all SMW LNB products
Separate 10MHz connector:	F-type 75 ohm, N-type 50 ohm or SMA-type 50 ohm
LED indicators L band	White=All OK, RED=Optical output low Purple=RF level below AGC trip point, transmitter operates in fixed gain mode
LED indicator reference	White=All OK, RED=Low input optical level, Green=Optical level OK no 10MHz detected
Enclosure:	T 6061 aluminium
Finish	Passivation by chromate conversion, Powder coating
Temperature range	-40° to +80°C
Protection class:	IP67
Weight	1890 g (F & SMA), 1950 g (N)
Size	273 x 154.4 x 34.4 mm
Transmitter Options	Depending on System options and additionally- DC connector type, RF connector types, 10MHz connector type. No LNB DC supply Fixed RF gain (no AGC)
Transmitter accessories	Standard accessories: DC Cable with waterproof connector, 30 meters Optional accessories: 19 inch rack mount kit



SPECIFICATION SMW Quad-link receiver

Parameter	Quad-Link Receiver
Optical wavelengths	CH1-1470nm, CH2-1510nm, CH3-1550nm, CH4-1590nm. Return channel 1310nm
Optical power	CH47, 51, 55, 59 acc to ITU std G694.2
Optical Connector	-6dBm per channel min. Single mode Huber & Suhner Q-ODC®, see separate spec sheet. Note. The fiber connector/cable contains two fibers, only the right ferrule seen from front is used normally. The Dual link option uses both fibers.
Optical power 10MHz return path:	1mW
RF output IP3	+25dBm
RF output return loss	12dB min (VSWR 1:1.7)
RF Connectors	F-type 75 ohm, N-type 50 ohm or SMA-type 50 ohm
10MHz input level:	-10 to +5dBm. Feed on L-band connector or on separate ref connector.
Separate 10MHz connector:	F-type 75 ohm, N-type 50 ohm or SMA-type 50 ohm
Power consumption	3W
DC supply voltage	10-28V, reverse polarity and over voltage protected.
DC connector	Built in support for 1+1 active/active redundancy without using separate controller. Fischer® 103 series Circular IP68 sealed connector.
LED indicators L band	White=All OK, RED=Optical output low, Purple=RF input level to high
LED indicator reference	White=All OK, RED=Low input optical level, Green=Optical level OK no 10MHz detected.
Enclosure:	T 6061 aluminium
Finish	Passivation by chromate conversion, Powder coating
Temperature range	-40° to +80°C
Protection class:	IP67
Weight	1890 g (F & SMA), 1950 g (N)
Size	273 x 154.4 x 34.4 mm
Receiver Options	Depending on system options and additionally- RF connector types, 10MHz connector type 10MHz/DC supply via receiver RF connector 4 4 fiber interface, for compability with legacy RF over fiber transmitters (10MHz return not available together with this option)
Receiver accessories	Standard accessories: DC Cable with waterproof connector, 30 meters Optional Accessories: 19 inch rack mount kit





Professional C-Band PLL LNB with integrated filters



Swedish Microwaves C-Band PLL LNB has a unique design with integrated filters providing isolation from interfering signals (WiMAX etc.). This model is available either with internal high LO stability or with external 10 MHz reference. The Low Phase Noise is compliant to DVB-S2X standard.

Options include customized LO, customized gain, separate DC power input and separate input for the external 10 MHz reference.

Features

- Integrated filters
- Wide frequency range
- Low phase noise compliant to DVB-S2X
- High P1dB and IP3
- Internal or External 10 MHz reference
- Compact size and light weight
- High operating temperature range

TECHNICAL SPECIFICATIONS

MODEL:	C-PLL 5.15 S	C-PLL 5.15 E	C-PLL 5.15 B	C-PLL 5.25 C	C-PLL 5.75 W	C-PLL 5.75 U	C-PLL 5.95 U
Input freq. (GHz)	3.625–4.200	3.400–4.200	3.700-4.200	3.800-4.200	3.600–4.800	4.500–4.800	4.500–4.800
LO (GHz)	5.15	5.15	5.15	5.25	5.75	5.75	5.95
Output freq. (MHz)	950–1525	950–1750	950–1450	1050–1450	950–2150	950–1250	1150–1450
Filtering (internal) Provides isolation from interfering signals.	>40 dB @ <3.2 GHz 15 dB @ 3.4 GHz 15 dB @ 4.4 GHz >40 dB @ >4.5 GHz	>40 dB @ <3.0 GHz 20 dB @ 3.2 GHz 15 dB @ 4.4 GHz >40 dB @ >4.5 GHz	>40dB @ <3.4 GHz 35dB @ 3.5 GHz 15dB @ 4.4 GHz >40dB @ >4.5 GHz	>40dB @ <3.5 GHz 35dB @ 3.6 GHz 15dB @ 4.4 GHz >40dB @ >4.5 GHz	>40 dB @ <3.2 GHz 15 dB @ 3.4 GHz 25 dB @ 5.0 GHz >40 dB @ >5.1 GHz		
Gain	60 dB typ. (55 dB min.) Option customized gain and variation						
Gain flatness	±0.4 dB max. within 30 MHz						
Gain flatness	±2 dB max.				±3 dB max.	±2 dB max.	
Noise Temperature	50K typ.						
Phase Noise typ. (C-PLL 5.75 W)	-70 dBc @ 100 Hz	-80 dBc @ 1 kHz	-88 dBc @ 10 kHz	-95 dBc @ 100 kHz	-120 dBc @ >1MHz	-120 dBc @ >1MHz	
	-70 dBc @ 100 Hz	-80 dBc @ 1 kHz	-83 dBc @ 10 kHz	-95 dBc @ 100 kHz	-120 dBc @ >1MHz		
Image rejection	40 dB min.						
Output P1 dB typ.	+15 dBm						
Output IP3 typ.	+25 dBm						
Output VSWR	2.1:1 typ.						
Output connector	F-type 75Ω / N-type 50Ω / SMA-type 50Ω						
Input	Waveguide WR 229 / R 40, CPR 229G flange						
Input VSWR	2.3:1 typ.						
LO leakage	-60 dBm @ waveguide input						
Internal ref. stability	±0.5 ppm -20 to +70°C (±1 ppm -40 to +80°C) ±1 ppm -20 to +70°C (±1.5 ppm -40 to +80°C) ± 2.5 ppm -40 to +80°C						
External 10 MHz ref	Level: -15 to + 5 dBm. Supplied through output connector (no ext. 10 MHz ref. present -20 ppm)						
DC power	+12 to +18 V, 380 mA typ. Supplied through output connector Option separate DC input connector F-, N- or SMA-type						
Temperature range	-40 to +80°C						
Dimensions	142 x 99 x 70 mm (F- & SMA-connector)			148 x 99 x 70 mm (N-connector)			
Weight	380 g (F- & SMA-connector)			396 g (N-connector)			
Options	Customized LO, gain & variation, separate DC input, separate 10 MHz ref. input.						
Miscellaneous	Enclosed O-ring, screws, washers and nuts M6						

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3.4-4.8 GHz to L-band BDC (Block-Down converter)



The C-Band PLL block down converter is intended for receiving C-Band transmissions within the frequency range 3.4 to 4.8 GHz. Fixed gain configurable between 0 dB and 50 dB (factory set). It's normally used together with an external C-band low noise amplifier.

RF input is SMA female. IF output is standard L-band inverted spectrum via N-, F- or SMA- connector. Options include customized LO, customized gain, separate DC power input and separate input for the external 10 MHz reference.

Features

- Wide frequency range
- Low phase noise
- Internal or External 10 MHz reference
- Compact size and light weight
- High operating temperature range
- For outdoor use or build-in applications

TECHNICAL SPECIFICATIONS

MODEL:	C-BDC 5.15 S	C-BDC 5.15 E	C-BDC 5.15 B	C-BDC 5.25 C	C-BDC 5.75 W	C-BDC 5.75 U	C-BDC 5.95 U
Input freq. (GHz)	3.625-4.200	3.400-4.200	3.700-4.200	3.800-4.200	3.600-4.800	4.500-4.800	4.500-4.800
LO (GHz)	5.15	5.15	5.15	5.25	5.75	5.75	5.95
Output freq. (MHz)	950-1525	950-1750	950-1450	1050-1450	950-2150	950-1250	1150-1450
Filtering (internal) Provides isolation from interfering signals.	>40dB @ <3.2 GHz 15dB @ 3.4 GHz 15dB @ 4.4 GHz >40dB @ >4.5 GHz	>40dB @ <3.0 GHz 20dB @ 3.2 GHz 15dB @ 4.4 GHz >40dB @ >4.5 GHz	>40dB @ <3.4 GHz 35dB @ 3.5 GHz 15dB @ 4.4 GHz >40dB @ >4.5 GHz	>40dB @ <3.5 GHz 35dB @ 3.6 GHz 15dB @ 4.4 GHz >40dB @ >4.5 GHz	>40dB @ <3.2 GHz 15dB @ 3.4 GHz 25dB @ 5.0 GHz >40dB @ >5.1 GHz		
Gain nominal	Fixed gain, factory configurable from 0 dB to 50 dB in 5 dB steps						
Gain flatness	±0.4 dB max. within 30 MHz						
Gain flatness	±2 dB max.				±3 dB max.	±2 dB max.	
Gain variation	±4 dB max. from nominal value						
Noise Figure typ.	3dB @ 50dB gain configuration increasing linear to 20 dB @ 0 dB gain configuration						
	-40 dBc @ 10 Hz	-62 dBc @ 100 Hz	-80 dBc @ 1 kHz	-88 dBc @ 10 kHz	-95 dBc @ 100 kHz	-120 dBc @ >1MHz	
Image rejection	40 dB min.						
Output P1 dB typ.	+15 dBm +5 dBm @ 10 dB and below gain configuration						
Output IP3 typ.	+25 dBm +15 dBm @ 10 dB and below gain configuration						
Output VSWR	2.1:1 max.						
Output connector	F-type 75Ω / N-type 50Ω / SMA-type 50Ω						
Input connector	SMA-type (female)						
Input VSWR	2.3:1 max.						
LO leakage	-60 dBm @ RF input						
Internal ref. stability	±1 ppm -40 to +60°C (±1.5 ppm -40 to +80°C) ±2.5 ppm -40 to +60°C (±3.5 ppm -40 to +80°C)						
External 10 MHz ref	Level: -15 to + 5 dBm. Supplied through output connector (no ext. 10 MHz ref. present -20 ppm)						
DC power	+12 to +18 V, 300-400 mA typ. Supplied through output connector Option separate DC input connector F-, N- or SMA-type						
Temperature range	-40 to +80°C						
Dimensions	127 x 80 x 30 mm (F- & SMA-connector)				133 x 80 x 30 mm (N-connector)		
Weight	330 g (F- & SMA-connector)				344 g (N-connector)		
Options	Customized LO and frequency ranges, customized gain, separate DC input, separate 10 MHz ref. input.						

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5.7-7.25 GHz to L-band BDC (Block down-converter)



The C-Band PLL block down converter is intended for monitoring C-Band uplink transmissions within the frequency range 5.7 to 7.25 GHz. Fixed gain between 0 dB and 55 dB.

RF input is SMA female. IF output is standard L-band non inverted spectrum via N-,F- or SMA-connector. Options include customized LO, customized gain, separate DC power input and separate input for the external 10 MHz reference.

Features

- Wide frequency range
- Low phase noise
- Internal or External 10 MHz reference
- Compact size and light weight
- High operating temperature range
- For outdoor use or build-in applications

TECHNICAL SPECIFICATIONS

MODEL:	C-BAND BDC					
Input freq. (GHz)	5.7-7.25 GHz Any 1.2 GHz block within the frequency range					
LO (GHz)	4.75 – 5.4 GHz Factory programmable					
Output freq. (MHz)	950 – 2150 MHz min/max, non-inverted spectrum					
Gain nominal	0 dB to 55 dB (Factory programmable)					
Gain flatness	± 0.4 dB max. within 30 MHz ± 2 dB max. over band					
Noise Figure typ.	2 dB @ 55 dB gain 20 dB @ 0 dB gain					
Phase Noise typ.	-40 dBc @ 10 Hz	-62 dBc @ 100 Hz	-80 dBc @ 1 kHz	-88 dBc @ 10 kHz	-95 dBc @ 100 kHz	-120 dBc @ >1MHz
Image rejection	40 dB min.					
Output P1 dB typ.	+15 dBm +5 dBm <10 dB gain					
Output IP3 typ.	+25 dBm +15 dBm <10 dB gain					
Output VSWR	2.1:1 max.					
Output connector	F-type 75 Ω / N-type 50 Ω / SMA-type 50 Ω					
Input connector	SMA-type					
Input VSWR	2.3:1 max.					
LO leakage	-60 dBm @ waveguide input					
Internal ref. stability	± 0.5 ppm -20 to +70°C (± 1 ppm -40 to +80°C) ± 1 ppm -20 to +70°C (± 1.5 ppm -40 to +80°C) ± 2.5 ppm -40 to +80°C					
External 10 MHz ref	Level: -15 to + 5 dBm. Supplied through output connector (no ext. 10 MHz ref. present -20 ppm)					
DC power	+12 to +18 V, 300-400 mA typ. Supplied through output connector Option separate DC input connector F-, N- or SMA-type					
Temperature range	-40 to +80°C					
Dimensions	127 x 80 x 30 mm (F- & SMA-connector) 133 x 80 x 30 mm (N-connector)					
Weight	330 g (F- & SMA-connector) 344 g (N-connector)					
Options	Customized gain & variation, separate DC input, separate 10 MHz ref. input.					

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7.25-7.75 GHz to L-band BDC (Block down-converter)



The X-Band PLL block down converter covers X-band within the frequency range 7.25 to 7.75 GHz. Fixed gain between 0 dB and 55 dB.

The BDC has some built in filtering for improved TX and IF margin, high IP3 and Low power consumption.

RF input is SMA female. IF output is standard L-band non inverted spectrum via N-,F- or SMA-connector. Options include customized LO, customized gain, separate DC power input and separate input for the external 10 MHz reference.

Features

- Built in filtering
- Low phase noise
- Internal or External 10 MHz reference
- Compact size and light weight
- High operating temperature range
- For outdoor use or build-in applications

TECHNICAL SPECIFICATIONS

MODEL:	X-BAND BDC					
Input freq. (GHz)	7.25-7.75 GHz					
LO (GHz)	6.30 GHz or customizable					
Output freq. (MHz)	950 – 1450 MHz min/max					
Gain nominal	0 dB to 55 dB (Factory programmable)					
Gain flatness	± 0.4 dB max. within 30 MHz ± 2 dB max. over band					
Noise Figure typ.	0.9 dB @ 55 dB gain 20 dB @ 0 dB gain					
Phase Noise typ.	-40 dBc @ 10 Hz	-62 dBc @ 100 Hz	-80 dBc @ 1 kHz	-88 dBc @ 10 kHz	-95 dBc @ 100 kHz	-120 dBc @ >1MHz
Image rejection	40 dB min.					
Output P1 dB typ.	+15 dBm +5 dBm <10 dB gain					
Output IP3 typ.	+25 dBm +15 dBm <10 dB gain					
Output VSWR	2.1:1 max.					
Output connector	F-type 75 Ω / N-type 50 Ω / SMA-type 50 Ω					
Input connector	SMA-type					
Input VSWR	2.3:1 max.					
LO leakage	-60 dBm @ waveguide input					
Internal ref. stability	± 0.5 ppm -20 to +70°C (± 1 ppm -40 to +80°C) ± 1 ppm -20 to +70°C (± 1.5 ppm -40 to +80°C) ± 2.5 ppm -40 to +80°C					
External 10 MHz ref	Level: -15 to +5 dBm. Supplied through output connector (no ext. 10 MHz ref. present -20 ppm)					
DC power	+12 to +18 V, 300-400 mA typ. Supplied through output connector Option separate DC input connector F-, N- or SMA-type					
Temperature range	-40 to +80°C					
Dimensions	127 x 80 x 30 mm (F- & SMA-connector) 133 x 80 x 30 mm (N-connector)					
Weight	330 g (F- & SMA-connector) 344 g (N-connector)					
Options	Customized gain & variation, separate DC input, separate 10 MHz ref. input.					

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X-Band PLL LNB with integrated filters. For band 7.25-8.25 GHz or 7.9-8.4 GHz



The professional X-Band PLL LNB comes standard with Low Phase Noise to meet DVB-S2X Professional services.

The LNB has some built-in filtering for improved TX margin, High IP3 and Low power consumption. The compact size and light weight allows installation in various professional applications.

Available either with internal high LO stability or with external 10 MHz reference.

Features

- Wide frequency range
- Low phase noise
- High P1dB and IP3
- Internal or External 10 MHz reference
- Compact size and light weight
- High operating temperature range
- Option customized gain
- Option separate DC / 10 MHz ref input

TECHNICAL SPECIFICATIONS

MODEL:	X-PLL 6.30	X-PLL 6.80	X-PLL 6.95	X-PLL 6.95 (MONITORING)
Input freq. (GHz)	7.25 – 7.75	7.75 - 8.25	7.90 – 8.40	7.90 – 8.40
LO (GHz)	6.30	6.80	6.95	6.95
Output freq. (MHz)	950 – 1450	950 – 1450	950 – 1450	950 – 1450
Gain	58 dB typ. (53 dB min.) <i>Option customized gain and variation</i>			0 dB or customized
Gain flatness	±0.4 dB max. within 30 MHz ±2 dB max. over band			
Noise Figure typ.	50 K			28000 K @ Gain 0 dB
Phase Noise typ.	-35 dBc @ 10 Hz	-62 dBc @ 100 Hz	-85 dBc @ 1 kHz	-90 dBc @ 10 kHz -95 dBc @ 100 kHz -120 dBc @ >1 MHz
Image rejection	60 dB min.			
Output P1 dB typ.	+15 dBm			+5 dBm
Output IP3 typ.	+25 dBm			+15 dBm
Output VSWR	2.0:1 typ.			
Output connector	F-type 75Ω / N-type 50Ω / SMA-type 50Ω			
Input	Waveguide WR 112 / R 84. Flange PBR 84. <i>Option CPR112G flange adapter.</i>			
Input VSWR	2.0:1 typ.			2.5:1 typ.
LO leakage	-60 dBm @ waveguide input			
Internal ref. stability	±0.5 ppm -20 to +70°C (±1 ppm -40 to +80°C) ±1 ppm -20 to +70°C (±1.5 ppm -40 to +80°C)			± 2.5 ppm -40 to +80°C
External 10 MHz ref	Level: -15 to +5 dBm. Supplied through output connector (no ext. 10 MHz ref. present -20 ppm)			
DC power	+12 to +24 V Supplied through output connector <i>Option separate DC input connector F-, N- or SMA-type</i>			
Current	260 mA @ +13 V 240 mA @ +15 V 200 mA @ +18 V 170 mA @ +24 V			
Temperature range	-40 to +80°C			
Filtering (internal)	15 dB @ 7.9 GHz 30 dB @ 8.0 GHz 40 dB @ 8.1 GHz 50 dB @ 8.2 GHz >60 dB @ 8.3 - 8.4 GHz			
Dimensions	130 x 56 x 51 mm (F- & SMA-connector) 135 x 56 x 51 mm (N-connector)			
Weight	353 g WR112, 420 g CPR112G (F- & SMA-connector) 369 g WR112, 446 g CPR112G (N-connector)			
Options	Customized gain & variation, separate DC input, separate 10 MHz ref. input.			
Miscellaneous	Enclosed O-ring, mounting screws (M4 x 10) 4 pcs for WR112			

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Ku-Band PLL LNB

High Stab./Ext. 10 MHz ref.

Single Ku-band PLL LNB
High stability internal or
external 10 MHz reference



The professional PLL has low phase noise, high IP3 and low noise figure. Available either with high internal High LO Stability or External 10 MHz reference.

Options include customized LO, customized gain, separate DC power input and separate input for the external 10 MHz reference.

Features

- Wide frequency range
- Internal or External 10 MHz reference
- Several LO frequencies
- Low phase noise
- High P1dB and IP3
- Compact size and light weight
- High operating temperature range

TECHNICAL SPECIFICATIONS

MODEL:	9.75	10.00	10.0 E	10.25	10.50	10.60	10.70	10.75	11.20	11.25	11.30
Input freq. (GHz)	10.70–11.80	10.95–11.80	10.95–12.10	11.20–11.70	11.45–12.20	11.70–12.75	11.65–12.75	11.70–12.75	12.20–12.75	12.20–12.75	12.25–12.75
LO (GHz)	9.75	10.00	10.00	10.25	10.50	10.60	10.70	10.75	11.20	11.25	11.30
Output freq. (MHz)	950–2050	950–1800	950–2100	950–1450	950–1700	1100–2150	950–2050	950–2000	1000–1550	950–1500	950–1450
Gain	60dB typ. 55dB min. <i>Option customized gain and variation</i>										
Gain flatness	±0.4 dB max. within 30 MHz ±3 dB max. over band										
Noise Figure typ.	0.8 dB										
Phase Noise typ.	-35 dBc @ 10 Hz	-62 dBc @ 100 Hz	-75 dBc @ 1 kHz	-83 dBc @ 10 kHz	-93 dBc @ 100 kHz	-120 dBc @ >1MHz					
Image rejection	40 dB min.										
Output P1 dB typ.	+15 dBm										
Output IP3 typ.	+25 dBm										
Output VSWR	2.1:1 typ.										
Output connector	F-type 75Ω / N-type 50Ω / SMA-type 50Ω										
Input	Waveguide WR 75 / R 120. Flange PBR 120. <i>Option SMA-connector via transition</i>										
Input VSWR	2.3:1 typ.										
LO leakage	-60 dBm @ waveguide input										
Internal ref. stability	±5 kHz -20 to +70°C (±10 kHz -40 to +80°C) ±10 kHz -20 to +70°C (±15 kHz -40 to +80°C) ±25 kHz -40 to +80°C										
External 10 MHz ref	Level: -15 to +5 dBm. Supplied through output connector (no ext. 10 MHz ref. present -20 ppm)										
DC power	+12 to +24 V, 270 mA typ. Supplied through output connector <i>Option separate DC input connector F-, N- or SMA-type</i>										
Temperature range	-40 to +80°C										
Dimensions	122 x 56 x 44 mm (F- & SMA-connector) 127 x 56 x 44 mm (N-connector)										
Weight	329 g (F- & SMA-connector) 345 g (N-connector)										
Options	Customized LO frequency and frequency range										
Miscellaneous	Enclosed O-ring, mounting screws (M4 x 10) 4 pcs										

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Dual DRO LNB for simultaneous reception of low & high Ku-band



The WDL DRO LNB supports reception of full Ku-band frequency range simultaneously on low and high band outputs.

The LNB is ideal for installation in various professional TVRO applications.

Available with LO stability from ± 3 MHz to ± 1 MHz.

Features

- Full Ku-band coverage
- Low phase noise
- Option with low gain

TECHNICAL SPECIFICATIONS

MODEL:	WDL-DRO LNB type E		WDL-DRO LNB type B	
	Low band	High band	Low band	High band
Input freq. (GHz)	10.70 – 11.70	11.70 – 12.75	10.95 – 11.70	11.70 – 12.75
LO (GHz)	9.75	10.60	10.00	10.75
Output freq. (MHz)	950 – 1950	1100 – 2150	950 – 1700	950 – 2000
Spurious	-60 dBm typ. @ 1700 MHz	-70 dBm typ. @ 1700 MHz	-60 dBm typ. @ 1500 MHz	-70 dBm typ. @ 1500 MHz
Gain	52 dB typ. <i>Option with low gain 48 dB max. (Recommended for antenna size >1.8m)</i>			
Gain flatness	±0.4 dB max. within 30 MHz ±3 dB max. each band			
Noise Figure typ.	0.8 dB			
Phase Noise typ.	-75 dBc @ 1 kHz	-95 dBc @ 10 kHz	-110 dBc @ 100 kHz	-115 dBc @ >1MHz
Image rejection	50 dB min.			
Output P1 dB typ.	+5 dBm			
Output IP3 typ.	+15 dBm			
Output VSWR	2.1:1 typ.			
Output connector	F-type 75Ω / N-type 50Ω			
Input	WR75 / R120			
Input VSWR	2.3:1 typ.			
LO leakage	-60 dBm @ waveguide input			
Internal ref. stability	±3 MHz (SR ≥25 Msps)	±2 MHz (SR ≥ 20 Msps)	±1.5 MHz (SR ≥ 15 Msps)	±1 MHz (SR ≥10 Msps)
Age drifting	±500 kHz / year			
DC power	+12 to +24 V, 180 mA typ. Supplied through any or both of the output connectors			
Temperature range	-30 to +60°C Operating		-40 to +80°C Storage	
Dimensions	134 x 58 x 50 mm (F-connectors)		139 x 58 x 50 mm (N-connectors)	
Weight	587 g (F-connectors)		626 g (N-connectors)	
Options	Low gain 48 dB max.			
Miscellaneous	Enclosed O-ring, mounting screws (M4 x 10) 4 pcs			

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Dual band / Wideband PLL LNB for simultaneous recep- tion of low & high Ku-band



The WDL-PLL LNB supports reception of full Ku-band frequency range simultaneously with 2 LO's for low and high band outputs.

The wideband LNB supports reception of full Ku-band with 1 LO and extended IF output 950-3000 MHz or 950-2750 MHz.

The LNB is ideal for installation in various professional applications with low symbolrate carriers.

Available with external 10 MHz or internal high-stability reference.

Features

- Full Ku-band coverage
- Low phase noise
- High P1dB and IP3
- Internal or External 10 MHz reference
- Compact size and light weight
- High operating temperature range
- Low gain option

TECHNICAL SPECIFICATIONS

MODEL:	WDL-PLL LNB type E		WDL-PLL LNB type B		9.75 GHz Wideband	10.00 GHz Wideband
	Low band	High band	Low band	High band		
Input freq. (GHz)	10.70 - 11.70	11.70 - 12.75	10.95 - 11.70	11.70 - 12.75	10.70 - 12.75	10.95 - 12.75
LO (GHz)	9.75	10.60	10.00	10.75	9.75	10.00
Output freq. (MHz)	950 - 1950	1100 - 2150	950 - 1700	950 - 2000	950 - 3000	950 - 2750
Spurious typ.	-60 dBm @ 1700 MHz	-70 dBm @ 1700 MHz	-60 dBm @ 1500 MHz	-70 dBm @ 1500 MHz		
Gain nominal	60dB typ. Opt: 52/50/48 dB typ. 50 dB max +90 mA. 40 dB typ: NF 3.0 dB typ. +90 mA.				60 dB (55 dB min)	
Gain flatness max.	±0.25 dB max. within 30 MHz		±2 dB max. each band		±0.4dB within 30 MHz ± 4 dB over band	
Noise Figure typ.	0.9 dB					
Phase Noise typ.	-35 dBc @ 10 Hz	-62 dBc @ 100 Hz	-75 dBc @ 1 kHz	-80 dBc @ 10 kHz	-90 dBc @ 100 kHz	-120 dBc @ >1MHz
Image rejection	40 dB min.					
Output P1 dB typ.	+15 dBm				+10 dBm	
Output IP3 typ.	+25 dBm				+20 dBm	
Output VSWR	2.1:1 typ.					
Output connector	2 pcs F-type 75Ω / N-type 50Ω / SMA-type 50Ω				F-type 75Ω / N-type 50Ω / SMA-type 50Ω	
Input	Waveguide WR 75 / R 120. Flange PBR 120.					
Input VSWR	2.3:1 typ.					
LO leakage	-60 dBm @ waveguide input					
Internal ref. stability	±5 kHz -20 to +70°C (±10 kHz -40 to +80°C) ±10 kHz -20 to +70°C (±15 kHz -40 to +80°C)					
External 10MHz ref.	Level: -15 to +5 dBm. Supplied through the High band output connector (no ext. 10 MHz ref. present -20 ppm)					
DC power	+12 to +20 V. supplied through any or both output connectors (Ext 10 MHz ref model: High band output connector) Option +15 to +26 V					
Current WDL-PLL	260 mA @ +20 V	290 mA @ +18 V	320 mA @ +16 V	365 mA @ +14 V	370 mA @ +12 V	
Current Wideband	160 mA @ +20 V	180 mA @ +18 V	200 mA @ +16 V	225 mA @ +14 V	260 mA @ +12 V	
Temperature range	-40 to +80°C					
Dimensions	122 x 56 x 44 mm (F-connector) 127 x 56 x 44 mm (N-connector)					
Weight	335 g (F-connector) 371 g (N-connector)				329 g (F/SMA-connector) 345 g (N-connector)	
Options WDL-PLL	Customized gain and variation. Extended low band 10.95-11.8 GHz / 10.95-12.15 GHz (type B)					
Options Wideband	Customized LO, gain and variation. Separate DC, 10 MHz ref input connector (SMA, F or N)					
Miscellaneous	Enclosed O-ring, mounting screws (M4 x 10) 4 pcs					

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2x Dual DRO LNB's for Low / High Ku-band & Vertical / Horizontal polarization



The Quattro DRO LNB consists of two Dual DRO LNB's mounted on an orthomode transducer (OMT) protected under a plastic cover.

The LNB supports reception of full Ku-band frequency range simultaneously on low and high band outputs and both polarizations.

The Quattro DRO LNB is ideal for installation in various TVRO applications.

Available with internal LO stability from ± 3 MHz to ± 1 MHz.

Features

- Full Ku-band and both polarizations
- High cross polarization isolation
- Low phase noise
- High operating temperature range
- Low gain option

TECHNICAL SPECIFICATIONS

MODEL:	Quattro-DRO LNB type E		Quattro-DRO LNB type B	
	Low band	High band	Low band	High band
Input freq. (GHz)	10.70 – 11.70	11.70 – 12.75	10.95 – 11.70	11.70 – 12.75
LO (GHz)	9.75	10.60	10.00	10.75
Output freq. (MHz)	950 – 1950	1100 – 2150	950 – 1700	950 – 2000
Spurious	-60 dBm typ. @ 1700 MHz	-70 dBm typ. @ 1700 MHz	-60 dBm typ. @ 1500 MHz	-70 dBm typ. @ 1500 MHz
Gain	52 dB typ. Option with low gain 48 dB max. (Recommended for antenna size >1.8m)			
Gain flatness	± 0.4 dB max. within 30 MHz ± 3 dB max. each band			
Noise Figure typ.	0.9 dB			
Phase Noise typ.	-75 dBc @ 1 kHz	-95 dBc @ 10 kHz	-110 dBc @ 100 kHz	-115 dBc @ >1MHz
Image rejection	50 dB min.			
Cross polarization	31.5 dB min.			
Output P1 dB typ.	+5 dBm			
Output IP3 typ.	+15 dBm			
Output VSWR	2:1 typ.			
Output connector	F-type 75 Ω / N-type 50 Ω			
Input	C120. Flange PBR 120.			
Input VSWR	1:5 typ.			
LO leakage	-60 dBm @ waveguide input			
Internal ref. stability	± 3 MHz (SR ≥ 25 Msps)	± 2 MHz (SR ≥ 20 Msps)	± 1.5 MHz (SR ≥ 15 Msps)	± 1 MHz (SR ≥ 10 Msps)
DC power / LNB	+12 to +24 V, 180 mA typ. Supplied through any or both of the output connectors			
Temperature range	-30 to +60°C (Operating) -40 to +80°C (Storage)			
Dimensions	154 x 76 x 206 mm			
Weight	1666 g (F-connectors) 1741 g (N-connectors)			
Options	Low gain 48 dB max. for large dish sizes			
Miscellaneous	Enclosed O-ring, mounting screws (M4 x 10) 4 pcs			

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2x Dual PLL LNB's for Low / High Ku-band & Vertical / Horizontal polarization



The Quattro PLL LNB consists of two Dual PLL LNB's mounted on an orthomode transducer (OMT) protected under a plastic cover.

The LNB supports reception of full Ku-band frequency range simultaneously on low and high band outputs and both polarizations.

The Quattro PLL LNB is ideal for installation in various professional applications with low symbolrate carriers.

Available with external 10 MHz reference or internal (± 5 kHz / ± 10 kHz)

Features

- Full Ku-band and both polarizations
- High cross polarization isolation
- Low phase noise
- High P1dB and IP3
- Internal or External 10 MHz reference
- High operating temperature range
- Low gain option

TECHNICAL SPECIFICATIONS

MODEL:	Quattro-PLL LNB type E				Quattro-PLL LNB type B			
	Low band		High band		Low band		High band	
Input freq. (GHz)	10.70 – 11.70		11.70 – 12.75		10.95 – 11.70		11.70 – 12.75	
LO (GHz)	9.75		10.60		10.00		10.75	
Output freq. (MHz)	950 – 1950		1100 – 2150		950 – 1700		950 – 2000	
Spurioues	-60 dBm typ. @ 1700 MHz		-70 dBm typ. @ 1700 MHz		-60 dBm typ. @ 1500 MHz		-70 dBm typ. @ 1500 MHz	
Gain	60dB typ. Opt: 52/50/48 dB typ. 50 dB max +90 mA. 40 dB typ: NF 3.0 dB typ. +90 mA.							
Gain flatness	±0.25 dB max. within 30 MHz ±2 dB max. each band							
Noise Figure typ.	1.0 dB							
Phase Noise typ.	-35 dBc @ 10 Hz	-62 dBc @ 100 Hz	-75 dBc @ 1 kHz	-80 dBc @ 10 kHz	-90 dBc @ 100 kHz	-120 dBc @ >1MHz		
Image rejection	40 dB min.							
Cross polarization	31.5 dB min.							
Output P1 dB typ.	+15 dBm							
Output IP3 typ.	+25 dBm							
Output VSWR	2:1 typ.							
Output connector	F-type 75Ω / N-type 50Ω							
Input	C120. Flange PBR 120.							
Input VSWR	1.5:1 typ.							
LO leakage	-60 dBm @ waveguide input							
Internal ref. stability	±5 kHz -20 to +70°C (±10 kHz -40 to +80°C) ±10 kHz -20 to +70°C (±15 kHz -40 to +80°C)							
External 10MHz ref.	Level: -15 to +5 dBm. Supplied through each High band output connector (no ext. 10 MHz ref. present -20 ppm)							
DC power / LNB	+12 to +20 V. supplied through any or both output connectors (Ext 10 MHz ref model: High band output connector) Option +15 to +26 V							
Current typ. / LNB	260 mA @ +20 V	290 mA @ +18 V	320 mA @ +16 V	365 mA @ +14 V	370 mA @ +12 V			
Temperature range	-40 to +80°C							
Dimensions	154 x 76 x 206 mm							
Weight	1162 g (F-connectors) 1231 g (N-connectors)							
Options	Customized gain and variation. Extended low band 10.95-11.8 GHz / 10.95-12.15 GHz (type B)							
Miscellaneous	Enclosed O-ring, mounting screws (M4 x 10) 4 pcs							

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Multi-band PLL-LNB Switchable 2-, 3- or 4-band



The professional switchable Multiband Ku-Band Q-PLL LNB is available either with internal high LO stability or with external 10 MHz reference.

Options include customized switching (e.g. 13/18/24 V), customized LO, customized gain, separate input connector for DC power and/or external 10 MHz reference.

The Q-PLL LNB is ideal for installation in e.g. maritime VSAT or SNG applications where change of satellite band is common.

The remotely controlled band switching eliminates the need for changing the LNB.

Features

- Frequency range 10.70-12.75 GHz
- Several LO frequencies available
- LO switching by voltage and/or 22kHz
- Internal or External 10 MHz reference
- Low phase noise
- High P1dB and IP3
- Compact size and light weight
- High operating temperature range

TECHNICAL SPECIFICATIONS

MODEL:	Q-PLL Multiband LNB					
Input freq. (GHz)	10.70 – 12.75 GHz					
LO (GHz)	Max. 4 LO frequencies of following: 9.75 / 10.00 / 10.25 / 10.50 / 10.60 / 10.70 / 10.75 / 10.80 / 10.90 / 11.00 / 11.05 / 11.20 / 11.25 / 11.30					
Output freq. (MHz)	950 – 2150 MHz					
Gain	60dB typ. 55dB min. Option customized gain and variation					
Gain flatness	±0.4 dB max. within 30 MHz ±3 dB max. over band					
Noise Figure typ.	0.8 dB					
Phase Noise typ.	-35 dBc @ 10 Hz	-62 dBc @ 100 Hz	-75 dBc @ 1 kHz	-83 dBc @ 10 kHz	-93 dBc @ 100 kHz	-120 dBc @ >1MHz
Image rejection	40 dB min.					
Output P1 dB typ.	+15 dBm					
Output IP3 typ.	+25 dBm					
Output VSWR	2.1:1 typ.					
Output connector	F-type 75Ω / N-type 50Ω Option SMA-type 50Ω					
Input	Waveguide WR 75 / R 120. Flange PBR 120.					
Input VSWR	2.3:1 typ.					
LO leakage	-60 dBm @ waveguide input					
Internal ref. stability	±5 kHz -20 to +70°C (±10 kHz -40 to +80°C) ±10 kHz -20 to +70°C (±15 kHz -40 to +80°C) ±25 kHz -40 to +80°C					
External 10 MHz ref	Level: -15 to +5 dBm. Supplied through output connector (no ext. 10 MHz ref. present -20 ppm)					
DC power	+12 to +24 V, 270 mA typ. Supplied through output connector Option separate DC input connector F-, N- or SMA-type					
Temperature range	-40 to +80°C					
Dimensions	122 x 56 x 44 mm (F- & SMA-connector) 127 x 56 x 44 mm (N-connector)					
Weight	329 g (F- & SMA-connector) 345 g (N-connector)					
Options	Customized LO frequency and frequency range. Gain and variation, Separate inputs for DC and 10 MHz ref.					
Miscellaneous	Enclosed O-ring, mounting screws (M4 x 10) 4 pcs					

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2 – BAND				
Type	Band	LO	Ku-band (GHz)	L-band (MHz)
A	1	10.00	10.95-11.70	950-1700
	2	11.00	11.95-12.75	950-1750
B	1	10.00	10.95-11.70	950-1700
	2	10.75	11.70-12.75	950-2000
C	1	9.75	10.70-11.70	950-1950
	2	10.75	11.70-12.75	950-2000
D	1	10.00	10.95-11.75	950-1750
	2	10.80	11.75-12.75	950-1950
E	1	9.75	10.70-11.70	950-1950
	2	10.60	11.70-12.75	1100-2150
G	1	10.00	10.95-11.70	950-1700
	2	11.30	12.25-12.75	950-1450
W	1	10.50	11.45-11.95	950-1450
	2	11.30	12.25-12.75	950-1450
Z	1	10.00	10.95-11.85	950-1850
	2	10.90	11.85-12.75	950-1850

3 – BAND				
Type	Band	LO	Ku-band (GHz)	L-band (MHz)
F	1	10.00	10.95-11.70	950-1700
	2	10.75	11.70-12.20	950-1450
	3	11.25	12.20-12.75	950-1500
H	1	10.00	10.95-11.70	950-1700
	2	10.75	11.70-12.25	950-1500
	3	11.30	12.25-12.75	950-1450
I	1	9.75	10.70-11.70	950-1950
	2	10.75	11.70-12.20	950-1450
	3	11.25	12.20-12.75	950-1500
J	1	10.00	10.95-11.70	950-1700
	2	10.60	11.55-12.25	950-1650
	3	11.05	12.00-12.75	950-1700
K	1	10.00	10.95-11.70	950-1700
	2	10.60	11.55-12.25	950-1650
	3	11.25	12.20-12.75	950-1500
L	1	9.75	10.70-11.80	950-2050
	2	10.00	10.95-12.10	950-2100
	3	10.60	11.70-12.75	1100-2150
S	1	9.75	10.70-11.70	950-1950
	2	10.60	11.70-12.70	1100-2100
	3	11.30	12.25-12.75	950-1450
U	1	9.75	10.70-11.45	950-1700
	2	10.50	11.45-12.20	950-1700
	3	11.25	12.20-12.75	950-1500
T	1	9.75	10.70-11.70	950-1950
	2	10.75	11.70-12.25	950-1500
	3	11.30	12.25-12.75	950-1450
Y	1	9.75	10.70-11.45	950-1700
	2	10.50	11.45-12.25	950-1750
	3	11.30	12.25-12.75	950-1450

4 – BAND				
Type	Band	LO	Ku-band (GHz)	L-band (MHz)
M	1	9.75	10.70-11.20	950-1450
	2	10.25	11.20-11.70	950-1450
	3	10.75	11.70-12.25	950-1500
	4	11.30	12.25-12.75	950-1450
N	1	9.75	10.70-10.95	950-1200
	2	10.00	10.95-11.70	950-1700
	3	10.75	11.70-12.25	950-1500
	4	11.30	12.25-12.75	950-1450
O	1	9.75	10.70-11.20	950-1450
	2	10.25	11.20-11.70	950-1450
	3	10.75	11.70-12.20	950-1450
	4	11.25	12.20-12.75	950-1500
P	1	10.00	10.95-11.45	950-1450
	2	10.50	11.45-11.95	950-1450
	3	10.75	11.70-12.20	950-1450
	4	11.25	12.20-12.75	950-1500
R	1	10.00	10.95-11.70	950-1700
	2	10.75	11.70-12.25	950-1500
	3	11.30	12.25-12.75	950-1450
	4	9.75	10.70-11.70	950-1950
V	1	9.75	10.70-11.50	950-1750
	2	10.00	10.95-11.75	950-1750
	3	10.50	11.45-12.25	950-1750
	4	11.05	12.00-12.80	950-1750

2 – BAND SWITCHING			
Option	Band	Voltage	Tone
V	1	13 V	
	2	18 V	
T	1	12-20 V	
	2	12-20 V	22 kHz

3 – BAND SWITCHING			
Option	Band	Voltage	Tone
VT	1	13 V	
	2	13 V	22 kHz
	3	18 V	
V	1	13 V	
	2	15 V	
	3	18 V	
V (24V)	1	13 V	
	2	18 V	
	3	24 V	

4 – BAND SWITCHING			
Option	Band	Voltage	Tone
VT	1	13 V	
	2	13 V	22 kHz
	3	18 V	
	4	18 V	22 kHz

Ordering information

Q-PLL type C F ± 25 kHz V

Band switching: V / T / VT / V (24V)
 LO stability: ± 25 kHz / ± 10 kHz / ± 5 kHz / ext. 10 MHz
 Output connector: F / N / SMA
 LO frequencies C = LO 9.75 & 10.75 GHz



LNA / PLL BDC system for simultaneous reception of Low & High Ku-band



The Dual PLL is the professional solution to receive the two bands simultaneously with high LO-stability and low phase noise. Available with internal reference (LO stability ± 25 kHz or ± 10 kHz), or external 10 MHz reference.

Any LO frequencies can be combined without spurious e.g. low-band 10.0 GHz & high-band 11.3 GHz.

The standard solution consists of one LNA and two Block Down-converters including RF and DC cables 3-6 m. All parts are optimized, adjusted and tested as a complete matched unit.

Features

- Wide frequency range
- Internal or External 10 MHz reference
- Several LO frequencies
- Low phase noise
- High P1dB and IP3
- High operating temperature range
- BDC's for outdoor or build-in applications

TECHNICAL SPECIFICATIONS

LO LOW (GHz)	9.75	10.00	10.25	10.50	10.60	10.75					
LO HIGH (GHz)							10.60	10.75	11.20	11.25	11.30

Input freq. (GHz)	10.70–11.80	10.95–11.80	11.20–11.70	11.45–12.20	11.70–12.75	11.70–12.75	11.70–12.75	11.70–12.75	12.20–12.75	12.20–12.75	12.25–12.75
LO (GHz)	9.75	10.00	10.25	10.50	10.60	10.75	10.60	10.75	11.20	11.25	11.30
Output freq. (MHz)	950–2050	950–1800	950–1450	950–1700	1100–2150	950–2000	1100–2150	950–2000	1000–1550	950–1500	950–1450

Gain nominal	60 dB typ. Option customized gain and variation					
Gain flatness	±0.4 dB max. within 30 MHz ±3 dB max. over band					
Gain variation	±4 dB max. from nominal value					
Noise Figure typ.	1.0 dB					
Phase Noise typ.	-35 dBc @ 10 Hz	-62 dBc @ 100 Hz	-75 dBc @ 1 kHz	-83 dBc @ 10 kHz	-93 dBc @ 100 kHz	-120 dBc @ >1MHz
Spurious signals	-60 dBm typ. at the first spurious (e.g. 1000 MHz with LO 9.75 & 10.75 GHz)					
Image rejection	40 dB min.					
Output P1 dB typ.	+15 dBm					
Output IP3 typ.	+25 dBm					
Output VSWR	2.0:1 typ.					
Output LNA	SMA-connectors 50Ω					
Output BDC	F-connector 75Ω / N-connector 50Ω					
Input LNA	Waveguide WR 75 / R 120. Flange 120.					
Input BDC	SMA-connector 50Ω					
Input VSWR	2.3:1 typ.					
LO leakage	-60 dBm @ waveguide input					
Internal ref. stability	±5 kHz -20 to +70°C (±10 kHz -40 to +80°C)		±10 kHz -20 to +70°C (±15 kHz -40 to +80°C)		±25 kHz -40 to +80°C	
External 10 MHz ref	Level: -15 to +5 dBm. Input via output connector			(no ext. 10 MHz ref. present -20 ppm)		
DC power LNA	+12 to +24 V, 40 mA typ. Input through separate SMA connector. DC feed from low band BCD.					
DC power BDC	+12 to +24 V, 280 mA typ.		Option separate DC input connector F-, N- or SMA-type			
Temperature range	-40 to +80°C					
Dimensions	LNA: 81 x 40 x 40 mm BDC: 142 x 99 x 70 mm (F-connector), 148 x 99 x 70 mm (N-connector)					
Weight	LNA: 124 g BDC: 329 g (F-connector) 345 g (N-connector)					
Options	Customized LO frequency and frequency range. Customized cable length. Flexible cables.					

Specifications are subject to change without notice. Customized LO frequencies 9.20125 MHz to 11.30000 MHz. Customized cable length. Flexible cables.



Single- or Multi-band BDC (Block Downconverter) Ku-band to L-band



The Single-band BDC has a selection of several frequency bands. The Multi-band BDC can be remotely switched across 2-4 bands by voltage and/or 22 kHz tone control. See Q-PLL LNB pages 22-23 for full details on available bands.

The BDC is ideal for installation in various professional applications with low symbolrate carriers.

Available with external 10 MHz reference or internal (± 5 kHz / ± 10 kHz / ± 25 kHz).

Options include customized LO, customized gain, separate DC power input and separate input for the external 10 MHz reference.

Features

- Wide Frequency range
- Low phase noise
- High P1dB and IP3
- Internal or External 10 MHz reference
- Compact size and light weight
- High operating temperature range
- For outdoor or build-in applications

TECHNICAL SPECIFICATIONS

MODEL:	9.75	10.0	10.0 E	10.25	10.50	10.60	10.70	10.75	11.20	11.25	11.30
Input freq. (GHz)	10.70–11.80	10.95–11.80	10.95–12.10	11.20–11.70	11.45–12.20	11.70–12.75	11.65–12.75	11.70–12.75	12.20–12.75	12.20–12.75	12.25–12.75
LO (GHz)	9.75	10.00	10.00	10.25	10.50	10.60	10.70	10.75	11.20	11.25	11.30
Output freq. (MHz)	950–2050	950–1800	950–2100	950–1450	950–1700	1100–2150	950–2050	950–2000	1000–1550	950–1500	950–1450
Multiband LO (GHz)	Max. 4 LO frequencies of following: 9.75 / 10.00 / 10.25 / 10.50 / 10.60 / 10.70 / 10.75 / 10.80 / 10.90 / 11.00 / 11.05 / 11.20 / 11.25 / 11.30 (See Q-PLL LNB specifications page 22-23)										
Gain nominal	10 to 60 dB typ. (Factory programmable)										
Gain flatness	±0.4 dB max. within 30 MHz ±3 dB max. over band										
Gain variation	±4 dB max. from nominal value										
Noise Figure typ.	3 dB										
Phase Noise typ.	-35 dBc @ 10 Hz	-62 dBc @ 100 Hz	-75 dBc @ 1 kHz	-83 dBc @ 10 kHz	-93 dBc @ 100 kHz	-120 dBc @ >1 MHz					
Image rejection	40 dB min.										
Output P1 dB typ.	+15 dBm (+10 dBm @10-30 dB gain)										
Output IP3 typ.	+25 dBm (+20 dBm @10-30 dB gain)										
Output VSWR	2.1:1 typ.										
Output connector	F-type 75Ω / N-type 50Ω / SMA-type 50Ω										
Input	SMA-connector										
Input VSWR	2.3:1 typ.										
LO leakage	-60 dBm @ waveguide input										
Internal ref. stability	±5 kHz -20 to +70°C (±10 kHz -40 to +80°C) ±10 kHz -20 to +70°C (±15 kHz -40 to +80°C) ±25 kHz -40 to +80°C										
External 10 MHz ref	Level: -15 to +5 dBm. Supplied through output connector (no ext. 10 MHz ref. present -20 ppm)										
DC power	+12 to +24 V, 270 mA typ. Supplied through output connector Option separate DC input connector F-, N- or SMA-type										
Temperature range	-40 to +80°C										
Dimensions	174.3 x 60 x 48.8 mm (F-connector) 180.3 x 60 x 48.8 mm (N-connector)										
Weight	399 g (F-& SMA-connector) 415 g (N-connector)										
Options	Customized LO frequency and gain										

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Dual BDC (Block Down-converter) for simultaneous Low & High Ku-band



The Dual BDC covers full Ku-band frequency range simultaneously on low and high band outputs.

The BDC is ideal for installation in various professional applications with low symbolrate carriers.

Available with external 10 MHz reference or internal (± 5 kHz / ± 10 kHz / ± 25 kHz).

Features

- Full Ku-band coverage
- Low phase noise
- High P1dB and IP3
- Internal or External 10 MHz reference
- Compact size and light weight
- High operating temperature range
- Low gain option
- For outdoor or build-in applications

TECHNICAL SPECIFICATIONS

MODEL:	Ku-band Dual BDC type E			Ku-band Dual BDC type B		
	Low band		High band	Low band		High band
Input freq. (GHz)	10.70 – 11.70		11.70 – 12.75	10.95 – 11.70		11.70 – 12.75
LO (GHz)	9.75		10.60	10.00		10.75
Output freq. (MHz)	950 – 1950		1100 – 2150	950 – 1700		950 – 2000
Spuriouses	-60 dBm typ. @ 1700 MHz		-70 dBm typ. @ 1700 MHz	-60 dBm typ. @ 1500 MHz		-70 dBm typ. @ 1500 MHz
Gain nominal	By request (min. 30 dB)					
Gain flatness	±0.4 dB max. within 30 MHz ±3 dB max. over band					
Gain variation	±4 dB max. from nominal value					
Noise Figure typ.	5 dB					
Phase Noise typ.	-35 dBc @ 10 Hz	-62 dBc @ 100 Hz	-75 dBc @ 1 kHz	-80 dBc @ 10 kHz	-90 dBc @ 100 kHz	-120 dBc @ >1 MHz
Image rejection	40 dB min.					
Output P1 dB typ.	+15 dBm					
Output IP3 typ.	+25 dBm					
Output VSWR	2.1:1 max.					
Output connector	F-type 75Ω / N-type 50Ω / SMA-type 50Ω					
Input	SMA-connector					
Input VSWR	2.3:1 max.					
LO leakage	-60 dBm @ waveguide input					
Internal ref. stability	±5 kHz -20 to +70°C (±10 kHz -40 to +80°C) ±10 kHz -20 to +70°C (±15 kHz -40 to +80°C) ±25 kHz -40 to +80°C					
External 10 MHz ref	Level: -15 to +5 dBm. Supplied through the High band output connector (no ext. 10 MHz ref. present -20 ppm)					
DC power	+12 to +20 V. supplied through any or both output connectors (Ext 10 MHz ref model: High band output connector) Option +15 to +26 V					
Current typ.	260 mA @ +20 V	290 mA @ +18 V	320 mA @ +16 V	365 mA @ +14 V	370 mA @ +12 V	
Temperature range	-40 to +80°C					
Dimensions	174.3 x 60 x 48.8 mm (F-connectors)			180.3 x 60 x 48.8 mm (N-connectors)		
Weight	405 g (F-connectors)			441 g (N-connectors)		
Options	Customized gain and variation. Extended low band 10.95-11.8 GHz / 10.95-12.15 GHz (type B)					

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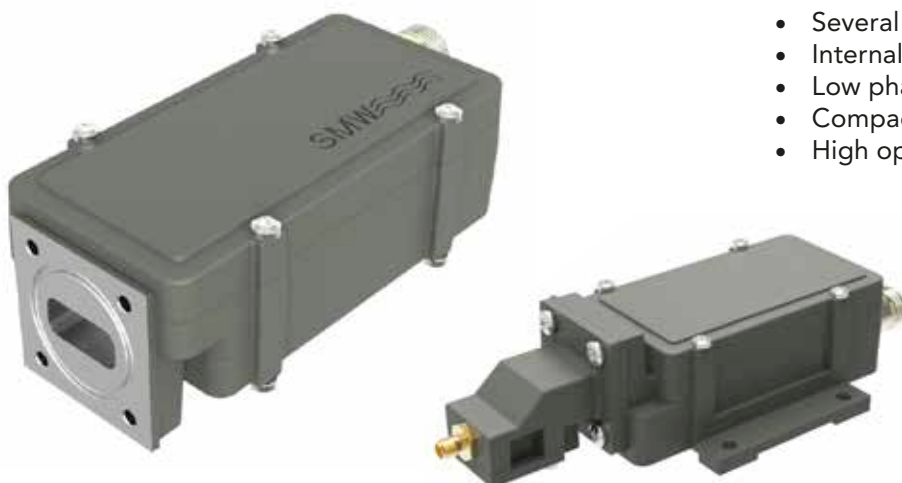
LNB / Block down-converter for monitoring uplink transmissions

The LNB / BDC is a cost effective alternative to monitor the satellite uplink transmissions with L-band measurement equipment. The unit covers several uplink bands within the range 12.7–15.5 GHz.

Options include customized LO, customized gain, separate DC power input and separate input for external 10 MHz reference.

Features

- Wide frequency range
- Several LO frequencies
- Internal or External 10 MHz reference
- Low phase noise
- Compact size and light weight
- High operating temperature range



TECHNICAL SPECIFICATIONS

MODEL:	11.75	11.80	11.80 E	12.00	12.50	12.55	12.80	13.00	13.05	13.10	13.20	13.50
Input freq. (GHz)	12.7-13.7	12.75-13.25	12.75-13.75	13.0-14.0	13.45-14.5	13.5-14.5	13.75-14.5	13.95-14.5	14.0-14.5	14.05-14.55	14.9-15.3	14.5-15.5
LO (GHz)	11.75	11.80	11.80	12.00	12.50	12.55	12.80	13.00	13.05	13.10	13.20	13.50
Output freq. (MHz)	950-1950	950-1450	950-1950	1000-2000	950-2000	950-1950	950-1700	950-1500	950-1450	950-1450	1700-2100	1000-2000

Gain	TBD, any within 0 - 60 dB nominal											
Gain flatness	±0.4 dB max. within 30 MHz ±3 dB max. over band											
Noise Figure typ.	1.2 dB (2.0 dB with transition) @ 50-60 dB gain nominal 20 dB @ 0 dB gain nominal											
Phase Noise typ.	-35 dBc @ 10 Hz -62 dBc @ 100 Hz -75 dBc @ 1 kHz -83 dBc @ 10 kHz -93 dBc @ 100 kHz -120 dBc @ >1MHz											
Image rejection	40 dB min.											
Output P1 dB typ.	+10 dBm (Gain 0 dB +5 dBm)											
Output IP3 typ.	+20 dBm (Gain 0 dB +15 dBm)											
Output VSWR	2.1:1 typ.											
Output connector	F-type 75Ω / N-type 50Ω / SMA-type 50Ω											
Input	WR75 / R120. Flange PBR 120. TLT – Test Loop Translator: SMA-connector via transition.											
Input VSWR	2.3:1 typ.											
LO leakage	-60 dBm @ waveguide input											
Internal ref. stability	±5 kHz -20 to +70°C (±10 kHz -40 to +80°C) ±10 kHz -20 to +70°C (±15 kHz -40 to +80°C) ±25 kHz -40 to +80°C											
External 10 MHz ref	Level: -15 to +5 dBm. Input via output connector (no ext. 10 MHz ref. present -20 ppm)											
DC power	+12 to +24 V, 270 mA typ. supplied through output connector Option separate DC input connector F-, N- or SMA-type											
Temperature range	-40 to +80°C											
Dimensions	122 x 56 x 44 mm (F- & SMA-connector) 127 x 56 x 44 mm (N-connector)											
Weight	329 g, 399 g with transition (F- & SMA-connector) 345 g, 415 g with transition (N-connector)											
Options	Customized LO frequency and frequency range											

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Ku Band LNA + Ka Band LNA

LNA (Low Noise Amplifier) Ku band



All LNA (Low Noise Amplifier) units are individually hand tuned for the very best performance available. Quality and long term reliability is also essential. Therefore all LNA's are tested according to a very extensive test program, which includes heating, cooling, water-proof testing and rigorous electrical testing.

The SMW waveguide Ku-Band LNA covers 10.70-12.75 GHz and is available with 46 dB, 33 dB or 26 dB gain. Low input VSWR with optional waveguide isolator.

Ka band



The SMW waveguide Ka-Band LNA covers 17.30-22.30 GHz and has two SMA-conductor outputs. DC input via either one of the output connectors or a separate SMA-conductor. Low input VSWR with waveguide isolator.

TECHNICAL SPECIFICATIONS

MODEL:	Ku LNA 33 dB	Ku LNA 26 dB Dual output	Ka LNA 34 dB Dual output
Input frequency	10.7 - 12.75 GHz		17.3 - 22.3 GHz
Gain nominal	33 dB	26 dB	34 dB
Gain flatness	±2 dB max. @ +25°C		±2 dB max. @ +25°C
	±0.3 dB within 30 MHz		±0.3 dB within 30 MHz
Gain variation	±1 dB over -40 to +80°C		±2 dB max. over -40 to +85°C
Noise Temperature	59 K typ. / 0.8 dB typ. (10K / 0.15dB added with isolator)		120K typ. (180K max.)
Output P1 dB typ.	0 dBm	-8 dBm	+8 dBm typ.
Output IP3 typ.	+10 dBm	+2 dBm	+18 dBm typ.
Output VSWR	3.0:1 max		2.0:1 typ. (2.3:1 max.)
Output connector	SMA 50 Ω (f)	2 pcs SMA 50Ω	2 pcs SMA 50Ω
Input waveguide	WR75 / R120		WR 42
Input flange	PBR 120 with M4 thread		PBR 220 with M3 thread
Input VSWR	2.3:1 max (option 1.35:1 with isolator)		2.3:1 typ. (option 1.5:1 with isolator)
DC power	+12 to +24V / 40 mA typ.		+10 to +26V / 110 mA typ.
DC connector	SMA		One of the output connectors or a separate SMA-conductor
Temperature range	-40°C to +80°C		-40 to +85°C
Dimensions	81 x 40x 40 mm		77 x 46 x 34 mm
Weight	124 g		124 g
Enclosed items	O-ring, 4 pcs M4x10 screws		O-ring, 4 pcs M3x8 screws

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Professional Ka-Band PLL LNB with Low Phase Noise



The Ka-PLL LNB is a single-band LNB covering the wide frequency range 17.3-22.2 GHz with several sub bands and LO frequencies.

The LNB has a Low Phase Noise which is compliant to DVB-S2X Professional services.

The LNB has a compact size and light weight. It is designed for reliable operation over a high temperature range for installation in various outdoor environments or build-in applications.

Options include customized LO, customized gain, separate DC power input and separate input for the external 10 MHz reference.

Features

- Frequency range 17.3-22.2 GHz
- Several LO frequencies available
- Internal or external 10 MHz reference
- Low phase noise (DVB-S2X compliant)
- High P1dB and IP3
- Compact size and light weight
- High operating temperature range

TECHNICAL SPECIFICATIONS

MODEL:	16.35	16.75	17.20	17.25	18.20	18.25	18.75	19.20	19.25	20.20	20.25
Input freq. (GHz)	17.30-18.30	17.70-18.70	18.20-19.20	18.20-19.20	19.20-20.20	19.20-20.20	19.70-20.20	20.20-21.20	20.20-21.20	21.20-22.20	21.20-22.20
LO (GHz)	16.35	16.75	17.20	17.25	18.20	18.25	18.75	19.20	19.25	20.20	20.25
Output freq. (MHz)	950-1950	950-1950	1000-2000	950-1950	1000-2000	950-1950	950-1450	1000-2000	950-1950	1000-2000	950-1950
Gain	60 dB typ. (55 dB min.) <i>Option customized gain and variation</i>										
Gain flatness	±0.4 dB max. within 30 MHz ±2 dB max. over each band										
Noise Figure typ.	1.3 dB									1.5 dB	
Phase Noise typ.	-40 dBc @ 10 Hz	-65 dBc @ 100 Hz	-85 dBc @ 1 kHz	-90 dBc @ 10 kHz	-95 dBc @ 100 kHz	-112 dBc @ >1 MHz					
Image rejection	30 dB min.										
Output P1 dB typ.	+15 dBm										
Output IP3 typ.	+25 dBm										
Output VSWR	2.1:1 typ.										
Output connector	F-type 75Ω / N-type 50Ω / SMA-type 50Ω										
Input	Waveguide WR 42 / R 220. Flange PBR 220.										
Input VSWR	2.3:1 typ. <i>Option 1.4:1 max. with waveguide isolator</i>										
LO leakage	-60 dBm @ waveguide input										
Internal ref. stability	±1 ppm -40 to +60°C (±1.5 ppm -40 to +80°C) / ±2.5 ppm -40 to +60°C (±3.5 ppm -40 to +80°C)										
External 10 MHz ref	Level: -15 to +5 dBm. Supplied through output connector (no ext. 10 MHz ref. present -20 ppm)										
DC	+12 to +24 V (LO 18.75 GHz +13 to +24 V) Supplied through output connector <i>Option separate DC input connector F-, N- or SMA-type</i>										
Power typ.	5 W										
Temperature range	-40 to +80°C										
Dimensions	121 x 56 x 44 mm (F- & SMA-connector) 127 x 56 x 44 mm (N-connector)										
Weight	326 g (F- & SMA-connector) 345 g (N-connector)										
Options	Customized LO, gain & variation, separate DC input, separate 10 MHz ref. input.										

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Professional 2-Band Switchable Ka-Band PLL LNB



The 2-band switchable Ka-Band PLL LNB covers the wide frequency range 17.75-22.20 GHz. The LNB switches across two sub bands by changing the LO frequency with voltage supply 13/18V.

The LNB has a Low Phase Noise which is compliant to DVB-S2X Professional services.

The LNB has a compact size and light weight. It is designed for reliable operation over a high temperature range for installation in various outdoor environments or build-in applications.

Options include customized LO, customized gain, separate DC power input and separate input for the external 10 MHz reference.

Features

- Frequency range 17.75-22.20 GHz
- Several LO frequencies available
- Internal or external 10 MHz reference
- Low phase noise (DVB-S2X compliant)
- High P1dB and IP3
- Compact size and light weight
- High operating temperature range

TECHNICAL SPECIFICATIONS

MODEL:		16.80 / 17.40	17.20 / 18.20	17.25 / 18.25	17.45 / 18.25	18.20 / 19.20	18.25 / 19.25	19.20 / 20.20	19.25 / 20.25
Input freq. (GHz)	Band 1	17.75 - 18.75	18.20 - 19.20	18.20- 19.20	18.40 - 19.20	19.20 - 20.20	19.20 - 20.20	20.20 - 21.20	20.20 - 21.20
Input freq. (GHz)	Band 2	18.35 - 19.35	19.20 - 20.20	19.20 - 20.20	19.20 - 20.20	20.20 - 21.20	20.20 - 21.20	21.20 - 22.20	21.20 - 22.20
LO (GHz)	Band 1/2	16.80 / 17.40	17.20 / 18.20	17.25 / 18.25	17.45 / 18.25	18.20 / 19.20	18.25 / 19.25	19.20 / 20.20	19.25 / 20.25
Output freq. (MHz)	Band 1	950 - 1950	1000 - 2000	950 - 1950	950 - 1750	1000 - 2000	950 - 1950	1000 - 2000	950 - 1950
Output freq. (MHz)	Band 2	950 - 1950	1000 - 2000	950 - 1950	950 - 1950	1000 - 2000	950 - 1950	1000 - 2000	950 - 1950
Switching voltage	Band 1	13 V (11.5 - 14.0 V)							
	Band 2	18 V (16.0 - 19.0 V)							

Gain	60 dB typ. (55 dB min.) Option customized gain and variation								
Gain flatness	±0.4 dB max. within 30 MHz ±3 dB max. over each band								
Gain variation	±0.03 dB / °C								
Noise Figure typ.	1.3 dB							1.5 dB	
Phase Noise typ.	-40 dBc @ 10 Hz	-65 dBc @ 100 Hz	-85 dBc @ 1 kHz	-90 dBc @ 10 kHz	-95 dBc @ 100 kHz	-112 dBc @ >1 MHz			
Image rejection	30 dB min.								
Output P1 dB typ.	+15 dBm								
Output IP3 typ.	+25 dBm								
Output VSWR	2.1:1 typ.								
Output connector	F-type 75Ω / N-type 50Ω / SMA-type 50Ω								
Input	Waveguide WR 42 / R 220. Flange PBR 220.								
Input VSWR	2.3:1 typ. Option 1.4:1 max. with waveguide isolator								
LO leakage	-60 dBm @ waveguide input								
Internal ref. stability	±1 ppm -40 to +60°C (±1.5 ppm -40 to +80°C) / ±2.5 ppm -40 to +60°C (±3.5 ppm -40 to +80°C)								
External 10 MHz ref	Level: -15 to +5 dBm. Supplied through output connector (no ext. 10 MHz ref. present -20 ppm)								
Power typ.	5 W								
Temperature range	-40 to +80°C								
Dimensions	121 x 56 x 44 mm (F- & SMA-connectors)					127 x 56 x 44 mm (N-connectors)			
Weight	326 g (F- & SMA-connectors)					345 g (N-connectors)			
Options	Customized LO, gain & variation, separate DC input, separate 10 MHz ref. input.								

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Professional Ka-Band BDC with Low Phase Noise



The Ka-Band BDC is a single or 2-band switchable BDC covering the wide frequency range 17.3-22.2 GHz with several sub bands and LO frequencies.

The BDC has a Low Phase Noise which is compliant to DVB-S2X Professional services.

The BDC has a compact size and light weight. It is designed for reliable operation over a high temperature range for installation in various outdoor environments or build-in applications.

Options include customized LO, customized gain, separate DC power input and separate input for the external 10 MHz reference.

Features

- Frequency range 17.3-22.2 GHz
- Several LO frequencies available
- Internal or external 10 MHz reference
- Low phase noise (DVB-S2X compliant)
- High P1dB and IP3
- Compact size and light weight
- High operating temperature range

TECHNICAL SPECIFICATIONS

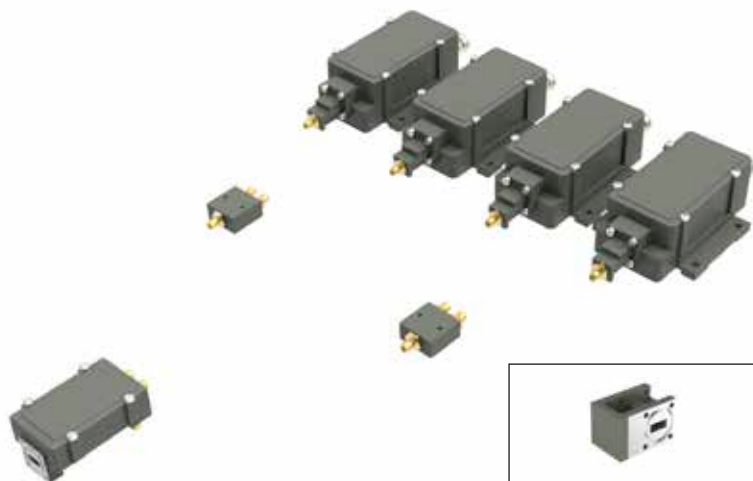
MODEL:	16.35	16.75	17.20	17.25	18.20	18.25	18.75	19.20	19.25	20.20	20.25
Input freq. (GHz)	17.30-18.30	17.70-18.70	18.20-19.20	18.20-19.20	19.20-20.20	19.20-20.20	19.70-20.20	20.20-21.20	20.20-21.20	21.20-22.20	21.20-22.20
LO (GHz)	16.35	16.75	17.20	17.25	18.20	18.25	18.75	19.20	19.25	20.20	20.25
Output freq. (MHz)	950-1950	950-1950	1000-2000	950-1950	1000-2000	950-1950	950-1450	1000-2000	950-1950	1000-2000	950-1950
Gain nominal	60 dB single band / 44 dB (4-band system) / 37 dB (3-band system) <i>Option customized gain and variation</i>										
Gain flatness	± 0.4 dB max. within 30 MHz ± 2 dB max. over each band										
Gain variation	± 4 dB max. from nominal value										
Noise Figure typ.	2 dB (60 dB typ.) / 3 dB (44 dB typ.) / 7 dB (37 dB typ.)										
Phase Noise typ.	-40 dBc @ 10 Hz -65 dBc @ 100 Hz -85 dBc @ 1 kHz -90 dBc @ 10 kHz -95 dBc @ 100 kHz -112 dBc @ >1 MHz										
Image rejection	30 dB min.										
Output P1 dB typ.	+15 dBm										
Output IP3 typ.	+25 dBm										
Output VSWR	2.1:1 typ.										
Output connector	F-type 75 Ω / N-type 50 Ω / SMA-type 50 Ω										
Input	SMA connector										
Input VSWR	2.3:1 typ.										
LO leakage	-60 dBm @ waveguide input										
Internal ref. stability	± 1 ppm -40 to +60°C (± 1.5 ppm -40 to +80°C) / ± 2.5 ppm -40 to +60°C (± 3.5 ppm -40 to +80°C)										
External 10 MHz ref	Level: -15 to +5 dBm. Supplied through output connector (no ext. 10 MHz ref. present -20 ppm)										
DC	+12 to +24 V (LO 18.75 GHz +13 to +24 V) Supplied through output connector <i>Option separate DC input connector F-, N- or SMA-type</i>										
Power typ.	5W										
Temperature range	-40 to +80°C										
Dimensions	155 x 80 x 44 mm (F- & SMA-connector) 161 x 80 x 44 mm (N-connector)										
Weight	399 g (F- & SMA-connector) 418 g (N-connector)										
Options	Customized LO, gain and variation, separate DC input, separate 10 MHz ref. input.										

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Ka Quad/Triple/Dual Band System

Receives full Ka-Band
17.30-22.20 GHz
simultaneously



Waveguide isol. on
LNA and 2x BDC

The Ka-Band Systems consists of Ka LNA Wideband, Ka splitters, Ka BDC's and matched Ka cables. Comes standard with Low Phase Noise to meet DVB-S2X Professional services.

Options include customized LO, customized frequency ranges, customized gain, separate DC power input and separate input for the external 10 MHz reference.

The standard Quad system consists of:
1 pc Ka-Band LNA Dual Output SMA
2 pcs Ka-Band splitters
6 pcs Ka-Band SMA-cables
4 pcs BDC's
3 pcs Waveguide isolators
1 pc DC cable from Low band BDC to LNA

Features

- Wide frequency range
- Internal or external 10 MHz reference
- Low phase noise (DVB-S2X compliant)
- High P1dB and IP3
- High operating temperature range

TECHNICAL SPECIFICATIONS

MODEL:	QUAD BAND SYSTEM 17.30 - 22.20 GHz				TRIPLE BAND SYSTEM 17.70 - 21.30 GHz		
Input freq. (GHz)	17.30-18.50	18.50-19.70	19.70-20.90	20.90-22.00	17.70-18.90	18.90-20.10	20.10-21.30
LO (GHz)	16.35	17.55	18.75	19.95	16.75	17.95	19.15
Output freq. (MHz)	950-2150	950-2150	950-2150	950-2150	950-2150	950-2150	950-2150
Gain nominal	60 dB Option customized gain and variation						
Gain flatness	±0.4 dB max. within 30 MHz ±2 dB max. over each band						
Gain variation	±4 dB max. from nominal value						
Noise Figure typ.	1.8 dB						
Phase Noise typ.	-40 dBc @ 10 Hz -65 dBc @ 100 Hz -85 dBc @ 1 kHz -90 dBc @ 10 kHz -95 dBc @ 100 kHz -112 dBc @ >1 MHz						
Image rejection	30 dB min.						
Output P1 dB typ.	+15 dBm						
Output IP3 typ.	+25 dBm						
Output VSWR	2.1:1 typ.						
Output connector	F-type 75Ω / N-type 50Ω / SMA-type 50Ω						
Input LNA	Waveguide WR 75 / R 120. Flange 120.						
Input BDC	SMA connector						
Input VSWR	2.3:1 typ. (option 1.5:1 with isolator)						
LO leakage	-60 dBm @ RF input						
Internal ref. stability	±1 ppm -40 to +60°C (±1.5 ppm -40 to +80°C) / ±2.5 ppm -40 to +60°C (±3.5 ppm -40 to +80°C)						
External 10 MHz ref	Level: -15 to +5 dBm. Supplied through output connector (no ext. 10 MHz ref. present -20 ppm)						
DC BDC	+12 to +24 V (LO 18.75 GHz +13 to +24 V) Supplied through output connector						
Power typ. BDC	5 W						
Dimensions BDC	155 x 80 x 44 mm (F- & SMA-connector) 161 x 80 x 44 mm (N-connector)						
Weight BDC	399 g (F- & SMA-connector) 418 g (N-connector)						
DC LNA	+10 to +26 V / 110 mA typ. Supplied through any of the RF output connectors or a separate SMA connector (bottom side)						
Power typ. LNA	1.32 W @ 12VDC 2.64 W @ 24VDC						
Dimensions LNA	77 x 46 x 34 mm						
Weight LNA	154 g						
Temperature range	-40 to +80°C						
Options	Customized LO frequency and ranges, gain and variation, separate DC input, separate 10 MHz ref. input.						

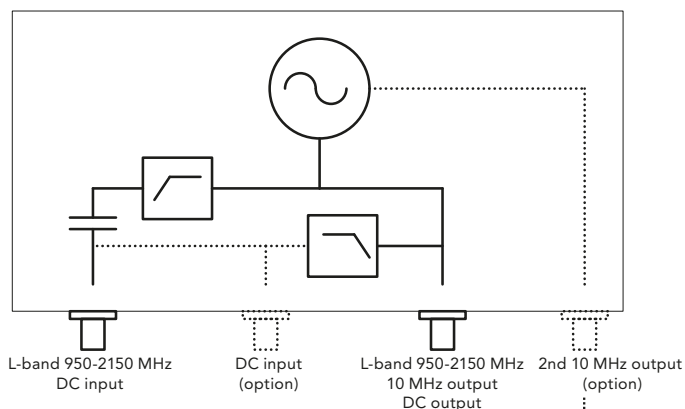
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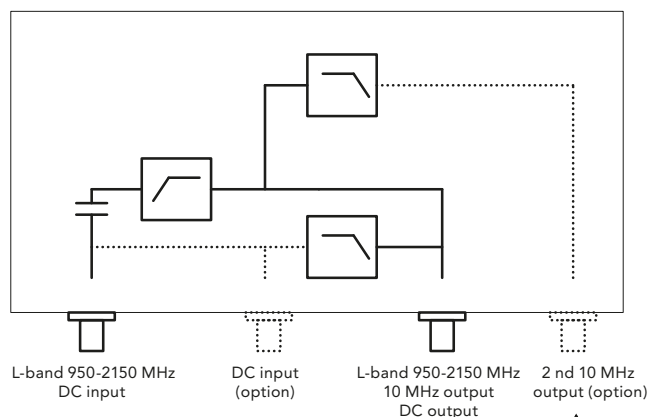
Bias-Tee / Inserter with 10 MHz & 22 kHz bypass



10 MHz reference oscillator



Bias-Tee / Inserter with 10 MHz and 22 kHz bypass



TECHNICAL SPECIFICATIONS

	10 MHz ref. oscillator	Bias Tee	10 MHz ref. inserter
DC supply	13-28 V, Option: Separate DC input		
Maximum load	800 mA @ DC output	1 A	
IF insertion loss	1 dB max. 950-2150 MHz		
Return loss 10 MHz input	>20 dB		
Return loss 10 MHz output	>20 dB		
Return loss L-band output	>12 dB		
10 MHz Harmonic suppression	>70 dBc (L-Band output) >40 dBc (separate 10 MHz output)		
Operating temperature	-40 to +80°C (Made for outdoor use)		
Connectors	F-type 75Ω / N-type 50Ω / SMA-type 50Ω Option: 2nd 10 MHz output, SMA-type only		
22 kHz bypass (standard)	Through receiver or external source		
Output frequency	10 MHz, Sinewave		
Output level	+6dBm (option 2 outputs +3dBm / each)		
Frequency stability	±30 ppb 0 to +50°C ±50 ppb -40 to +85°C		
Calibration tolerance	±10 ppb @ 25°C		
Ageing	±500 ppb max @ 10 years		
Phase noise typ.	-85 dBc @ 1 Hz -115 dBc @ 10 Hz -140 dBc @ 100 Hz -150 dBc @ 1 kHz -155 dBc @ 10 kHz		
Current consumption	200 mA warm up 5 min. 100 mA steady state		
Options	Dual Output, +3 dBm / each output, Separate DC input, Factory recalibration		

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Line amplifiers Automatic gain control 0–30 dB Fixed gain 18–24 dB



The AGC (Automatic Gain Control) Line Amplifier 0-30 dB is intended for situations where you need a constant level output from a LNB. Due to it's very high IP3 together with the AGC it is usually possible to place the unit very close to the LNB.

Available with F-, N- or SMA-connectors. DC bypass is standard. Options include Separate DC power input via connector (F, N or SMA) or via two thin cables, 10 MHz bypass, DC-blocks and high current 5A bypass.

Features

- High P1dB +16 dBm typ.
- Compact and light weight
- High temperature range
- Several options available

TECHNICAL SPECIFICATIONS

MODEL:	ILA 18-24 dB	AGC amplifier 0-30 dB
Gain typ.	18 dB @ 950 MHz 24 dB @ 2150 MHz	0-30 dB @ 950 MHz 0-30 dB @ 2150 MHz
Gain flatness	±0.2 dB within 30 MHz	
Gain flatness	+/- 1dB across band	
Frequency range	950-2150 MHz	
Output P1 dB typ.	+16 dBm	+25 dBm
Output IP3 typ.	+26 dBm	+35 dBm at max gain.
Input IP3 typ.		+20dBm at min gain
Noise figure	5dB at max gain, 8dB at mid gain, 18dB at min gain.	
Level detector	Total average power level in the range 950-2150MHz	
Output level	Internally adjustable between -25dBm and +10dBm (total power)	
Modulation compatibility	PSK, QAM, FM	
Input VSWR	1.9:1 typ.	
Output VSWR	1.9:1 typ.	
Connectors	F-type 75Ω / N-type 50Ω / SMA-type 50Ω	
DC power	+12 to +24 V, 70 mA max. (DC bypass is standard)	+12 to +28 V, 70 mA max. through output, input or via separate port
Material & Finish	Die-cast aluminium, Powder coated	
Temperature range	-30 to +60°C	-40 to +80°C
Dimensions	96.3 x 26.1 x 82.8 mm (F)	
Weight	310 g (F & SMA), 352 g (N)	
Options	Separate DC input (via F / N / SMA-connector, or via cable) with integrated DC-block(s) 10 MHz bypass (loss 1 dB) High current 5A max. bypass (this option is not possible together with 10 MHz bypass)	Separate DC input (via F / N / SMA-connector, or cable) with integrated DC-block(s) 10 MHz bypass (loss 1 dB) 22kHz bypass 1450MHz limited frequency range -5 to +25dB gain range -15 to +15dB gain range High current 5A max. bypass (this option is not possible together with 10 MHz bypass)

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Waveguide isolators for Ku and Ka band



A waveguide isolator transfers RF signals in only one direction on the waveguide with minimum loss. This is very useful in cases where a very low input SWR is needed or to reduce reverse direction interfering signals.

All isolators are designed and tested to work seamlessly together with Swedish Microwave LNB and LNA products. All isolators have high operating temperature range and are water-proof and corrosion resistant for use in outdoor environments.

TECHNICAL SPECIFICATIONS

MODEL:	Ku-band Isolator	Ka band Isolator
Frequency range	10.70-12.75 GHz	17.30-22.30 GHz
Input/output VSWR	1.3:1 max	1.4:1 max
Isolation output to input	18 dB min.	16 dB min.
Insertion loss input to output	0.4 dB max.	0.5 dB max.
Waveguide	R 120 / WR75 input and output	R 220 / WR42
Input flange	PBR 120 (O-ring groove, 4x threaded M4 holes)	PBR 220 (O-ring groove, 4x threaded M3 holes)
Output flange	UBR 120 (flat flange with 4x 4.2mm dia holes)	UBR 220 (flat flange with 4x 4.1mm dia holes)
Input power	1W max.	
Material	T 6061 AL	
Surface treatment	Passivated by chromate conversion (electrically conductive)	
Operating temperature	-40 to +80 °C	
Weight	60 g	40 g
Included Accessories	O-ring, 4x M4x10mm screws	O-ring, 4x M3x10mm screws

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Ku band OMT (Ortho mode transducer)



Swedish Microwave's OMT is used to separate two orthogonal linearly polarized signals simultaneously.

The OMT can also support circular polarizations with a depolarizer.

Greater than 31.5 dB isolation between the two linear polarizations is achieved.

Accessories:

Bend for the vertical polarization.

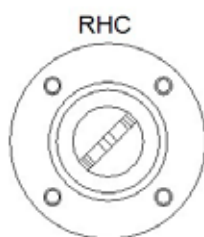
Waveguide cover for unused port.

Depolarizer for circular polarizations.

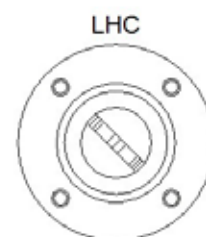
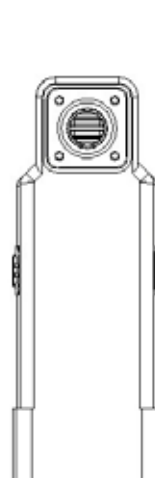
TECHNICAL SPECIFICATIONS

OMT Ku			
Frequency range Vertical	10.70 - 14.50 GHz	Input VSWR	1.5:1 max
Frequency range Horizontal	10.70 - 12.75 GHz	Cross polarization (isolation)	31.5 dB min.
Input	C120 (circular waveguide 18 mm)	Transmission loss	0.1 dB
Output	WR75 waveguides	Weight	200 g (Material: Zinc)

Depolarizer (Circular to linear polarization)



RHC @ Vertical output
LHC @ Horizontal output

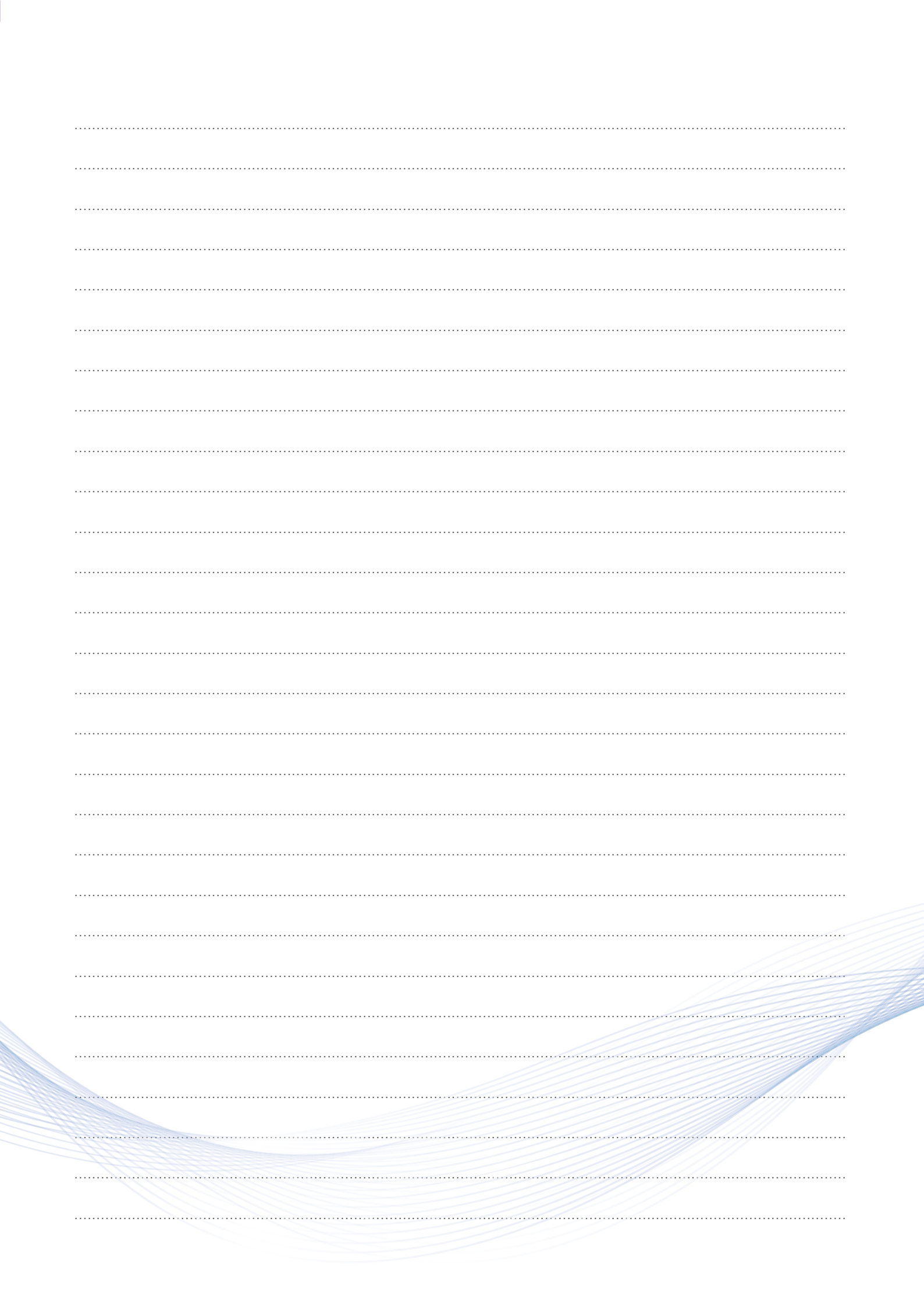


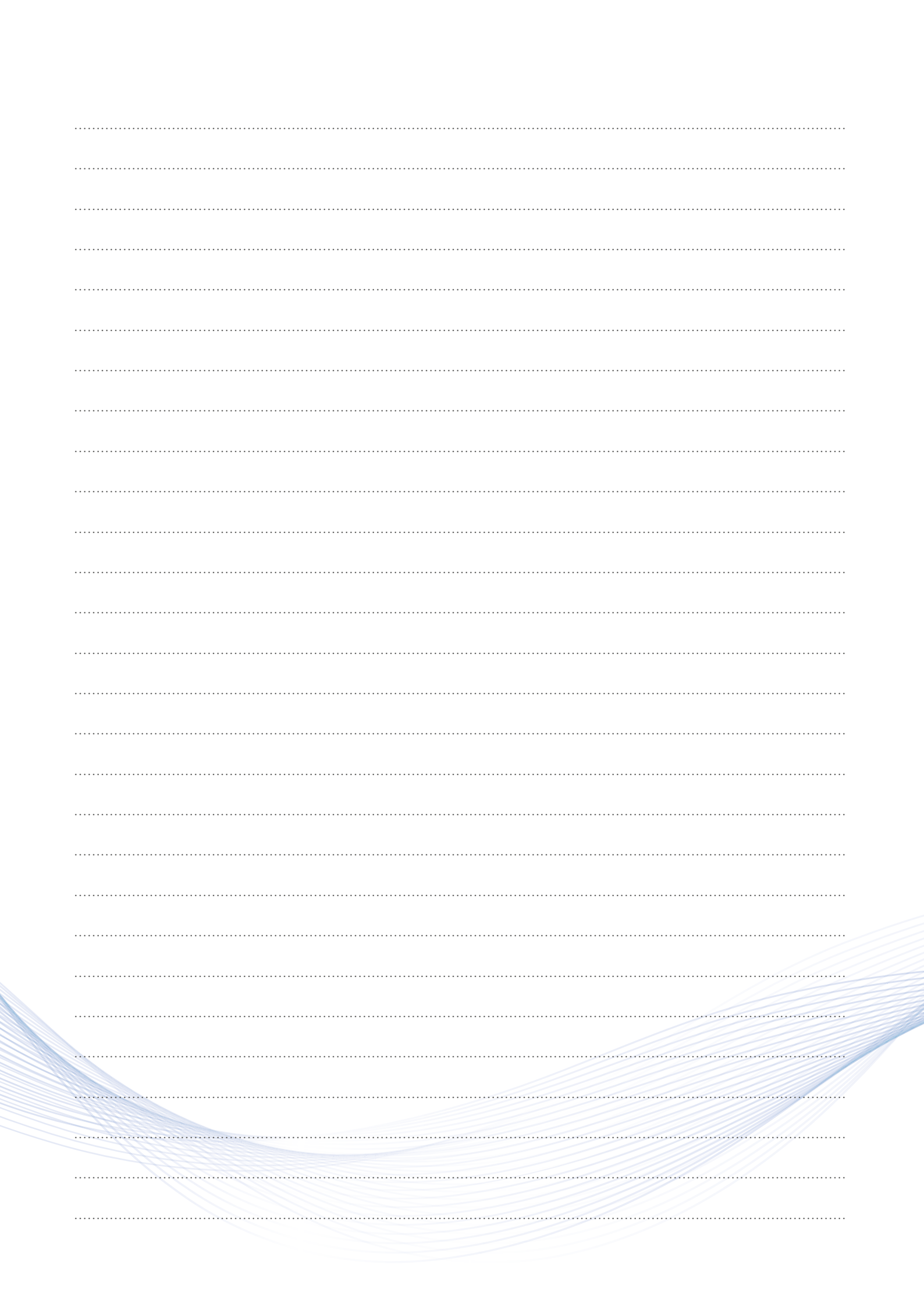
LHC @ Vertical output
RHC @ Horizontal output

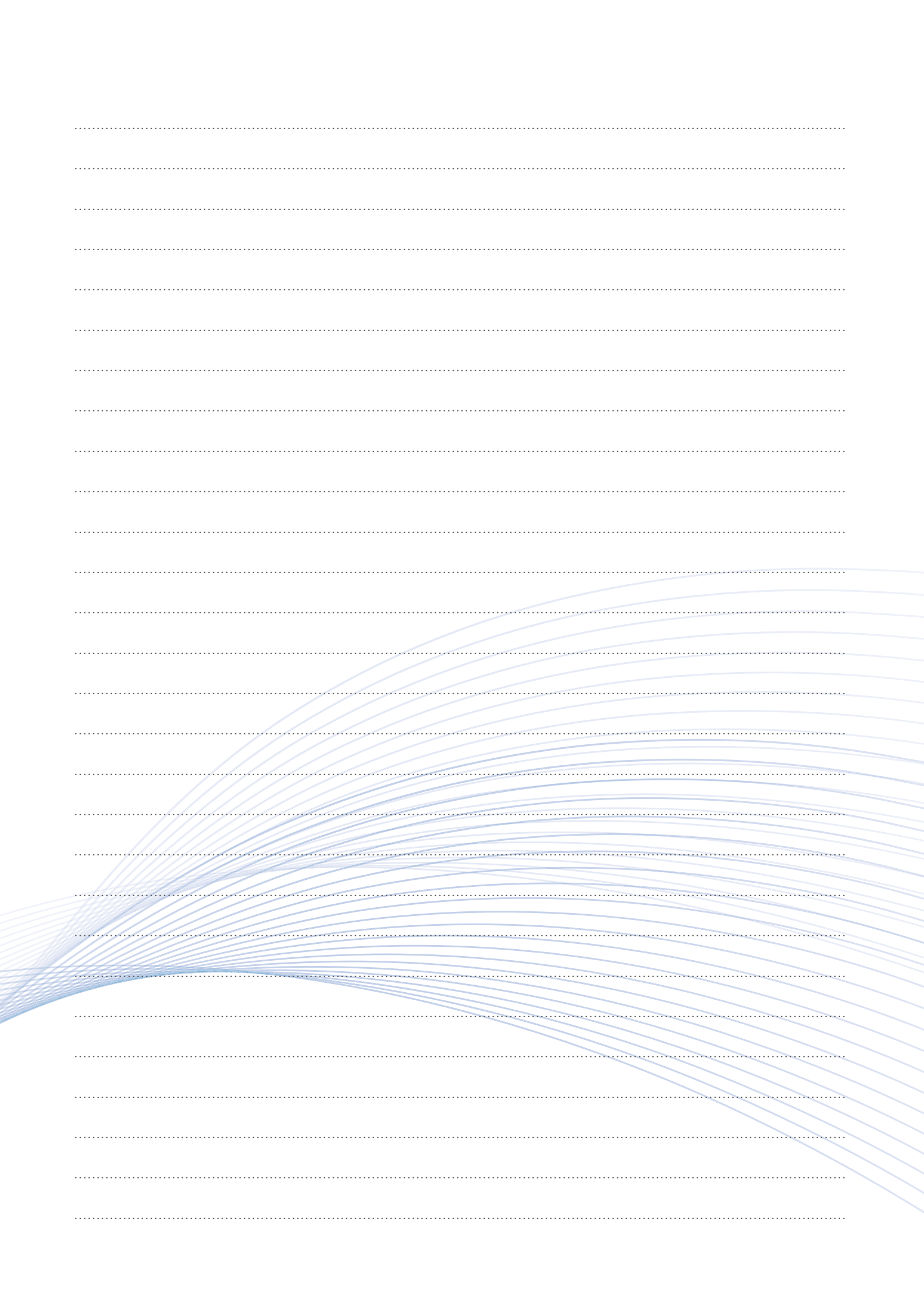
TECHNICAL SPECIFICATIONS

Depolarizer LHC & RHC Ku			
Polarization	Circular LHC & RHC together with SMW Twin/OMT Ku	Cross polar rejection	20 dB typ.
Frequency range	10.70 - 12.75 GHz	Waveguide	C120 (circular waveguide 18 mm)
VSWR	1.25:1 typ.	Material	Aluminium (black anodized)
Transmission loss	0.1 dB typ.	Weight	90 g

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