Transceiver Uplink Module
17-21 & 27-30 GHz

ReliaSat™

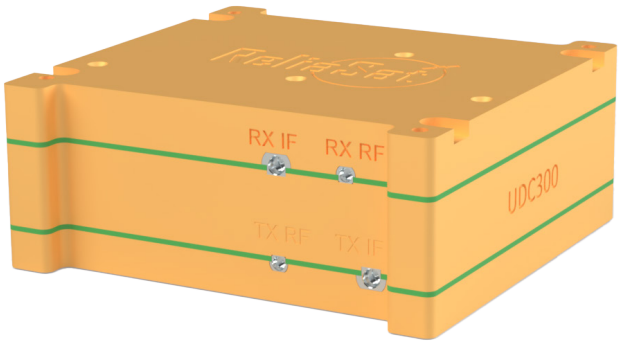
Product Datasheet

UDC300
Integrated transceiver uplink module for K/Ka-band frequencies.

Overview
UDC300 is a fully integrated stand-alone transceiver module designed for K/ Ka-band communications systems. This Transceiver operates as a wideband up/down converter designed for either on ground segment or an airborne environment. It includes an on-board frequency synthesizer and low power consumption in a stackable enclosure. This transceiver offers up to 250 MHz of instantaneous bandwidth.

It also includes a high-precision clock for LO generation; this clock can be used as a reference for other modules, or lock to an external system reference.

This transceiver can be used as a stand-alone up/ down converter or combined with a modem/ Software Defined Radio (SDR) enabling full-function K/Ka-band satellite communication.



Features
- TX output frequency 27-30 GHz
- RX input frequency 17-21 GHz
- TX IF frequency 1-4 GHz
- RX IF frequency 1-5 GHz

Applications
- High speed data communications
- Space communications
- IOT
- Security
- 5G

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Specification Overview

Transmitter

Parameter	Typical	Unit
TX Output Frequency Range	27-30	(GHz)
TX Output Linear Power	20	(dBm)
IF Input Frequency Range	1-4	(GHz)
IF Input Power	-40 to 0	(dBm)
Reference Frequency	100 (on-board or external)	(MHz)
Reference Signal Characteristics	Square input: 0.6 Vpp (min) / 2.5 Vpp (max) - slew rate >0.5 V/ns Sine wave: +5 dBm (min) / +15 dBm (max)	
Reference Stability	± 0.05 (on board ref)	(PPM)
Conversion Gain	30 (extended 50 dB with SSPA)	(dB)
Gain Flatness Over typical channel bandwidth from SDR (250 MHz)	3 (specified over max channel bandwidth (250 MHz) across entire 4 GHz) RX bandwidth. (SDR input channel band)	(dB)
Typical Phase Noise	at 100 MHz Reference	(dBc/Hz)
1 kHz	-93	(dBc/Hz)
10 kHz	-103	(dBc/Hz)
100 kHz	-107	(dBc/Hz)
1 MHz	-121	(dBc/Hz)
10 MHz	-140	(dBc/Hz)
Spurious	-50	(dBc)
Supply Voltage Range	7-42	(Vdc)
DC Current	<1.8	(Amps)
DC Power	<12	(Watts)

Receiver

Parameter	Typical	Unit
RX Input Frequency Range	17-21	(GHz)
RX Input Power Range	-120 to -30	(dBm)
IF Output Frequency Range	1-5	(GHz)
IF Output Power Range	-90 to 0	(dBm)
Reference Frequency	100 (on-board or external)	(MHz)
Reference Signal Characteristics	Square input: 0.6 Vpp (min) / 2.5 Vpp (max) - slew rate >0.5 V/ns Sine wave: +5 dBm (min) / +15 dBm (max)	
Reference Stability	± 0.05 (on-board ref)	(PPM)
Conversion Gain	30 (extended 50 dB with SSPA)	(dB)
Gain Flatness Over Typical Channel Bandwidth from SDR (250MHz)	3 (specified over max channel bandwidth (250 MHz) across entire 4 GHz) RX bandwidth. (SDR input channel band)	(dB)
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10 kHz	-103	(dBc/Hz)
100 kHz	-107	(dBc/Hz)
1 MHz	-121	(dBc/Hz)
10 MHz	-140	(dBc/Hz)
Spurious	-50	(dBc)
Noise Figure	<2.5	(dB)
Supply Voltage Range	7-42	(Vdc)
DC Current	<1.25	(Amps)
DC Power	<7.5	(Watts)

Mechanical and Environmental

Mechanical

Parameter	Typical	Unit
PCB Dimensions	95.89 x 90.17 x 1	mm
Mechanical Enclosure Required	Yes	
Mechanical Enclosure Dimensions	95.89 x 90.17 x 38.15	mm
Total Mass	~0.430	kg
Form Factor Requirement	Cube Sat	
Enclosure Material	Aluminium	Al
RF Connector Types	SMPM edge mount	
DC Connector Types	DC flying leads	
IF Signal Connector Types	SMP edge mounts	
Current Sensor, Temperature Sensor, Frequency Synthesiser Lock & DC Power Enable Connections	6-pin Pico-Lock Connector	

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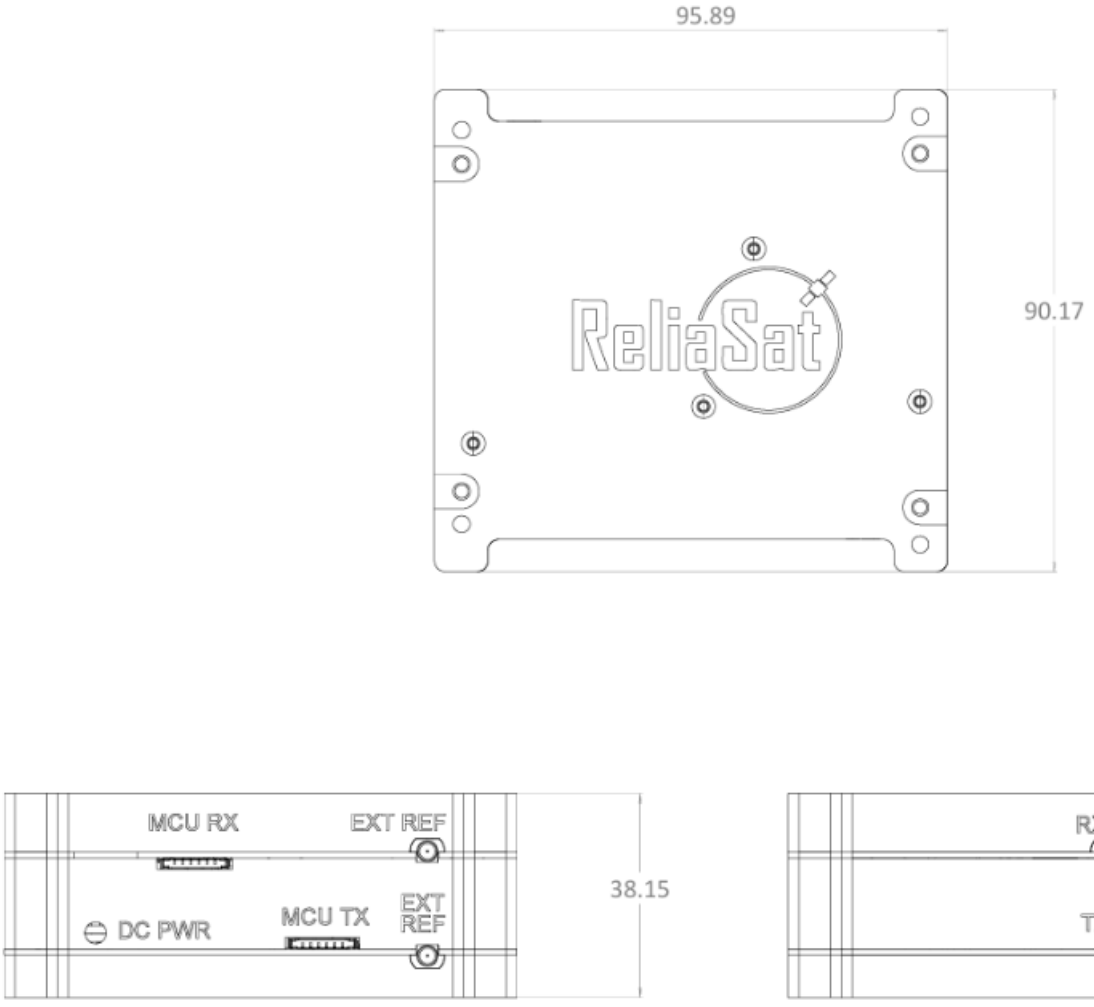
Environmental

Parameter	Typical
Operating Temperature Range	-40 °C to +85 °C
Compliance Standards	ECSS-Q-ST-70, ECSS-E-ST-10-03

Mechanical Enclosure Preliminary Dimensions



All dimensions in mm

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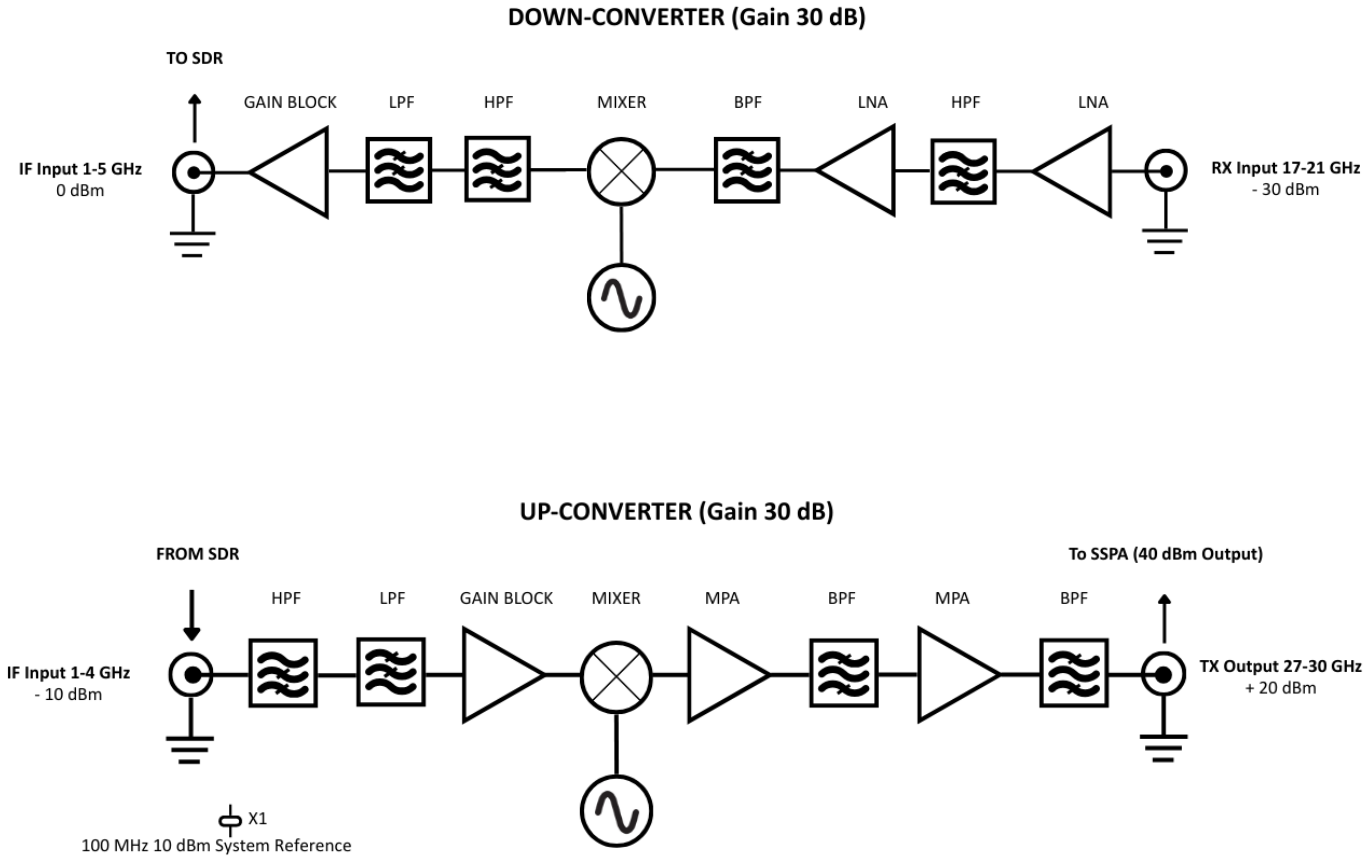
Simplified Schematic Diagram



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