Transceiver Uplink Module
17-21 & 27-30 GHz

ReliaSat

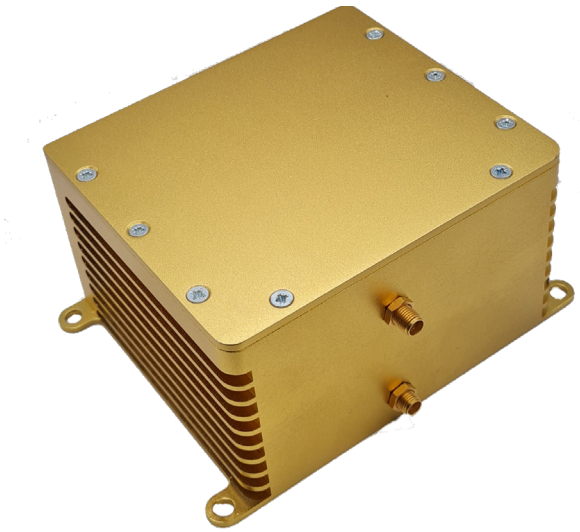
Product Datasheet

TR300
Integrated transceiver uplink module for K/Ka-band frequencies.

Overview
TR300 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		-10 to 0	(dBm)
Reference Frequency		100 (on-board or external)	(MHz)
Reference Phase Noise		-145	(dBc/Hz)
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		5	(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			(dBc/Hz)
	1 kHz	-70	(dBc/Hz)
	10 kHz	-80	(dBc/Hz)
	100 kHz	-100	(dBc/Hz)
	1 MHz	-123	(dBc/Hz)
	10 MHz	-140	(dBc/Hz)
Spurious		-60	(dBc)
Supply Voltage Range		6-42	(Vdc)
DC Current		<1.5	(Amps)
DC Power		<6	(Watts)

Receiver

Parameter		Typical	Unit
RX Input Frequency Range		17-21	(GHz)
RX Input Power Range		-90 to -30	(dBm)
IF Output Frequency Range		1-5	(GHz)
IF Output Power Range		-60 to 0	(dBm)
Reference Frequency		100 (on-board or external)	(MHz)
Reference Phase Noise		-145	(dBc/Hz)
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		5	(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	-80	(dBc/Hz)
	100 kHz	-100	(dBc/Hz)
	1 MHz	-123	(dBc/Hz)
	10 MHz	-140	(dBc/Hz)
Spurious		-60	(dBc)
Noise Figure		<2.5	(dB)
Supply Voltage Range		6-42	(Vdc)
DC Current		<1.5	(Amps)
DC Power		<6	(Watts)

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Mechanical and Environmental

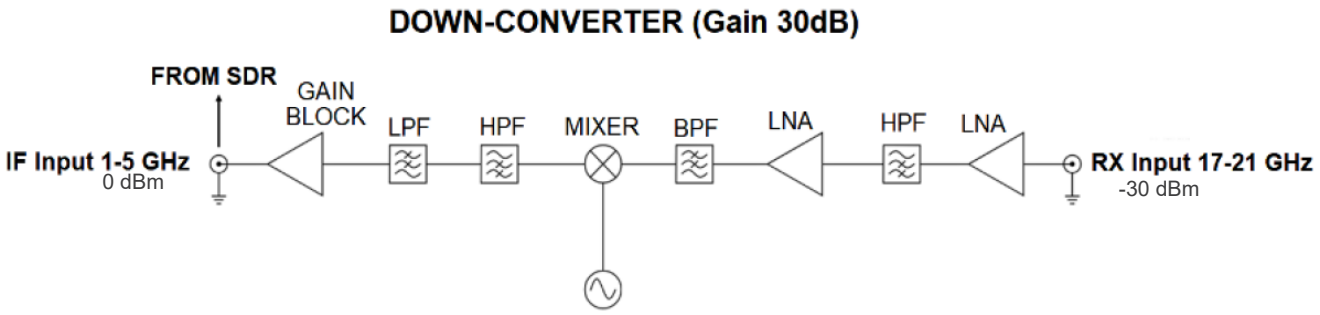
Mechanical

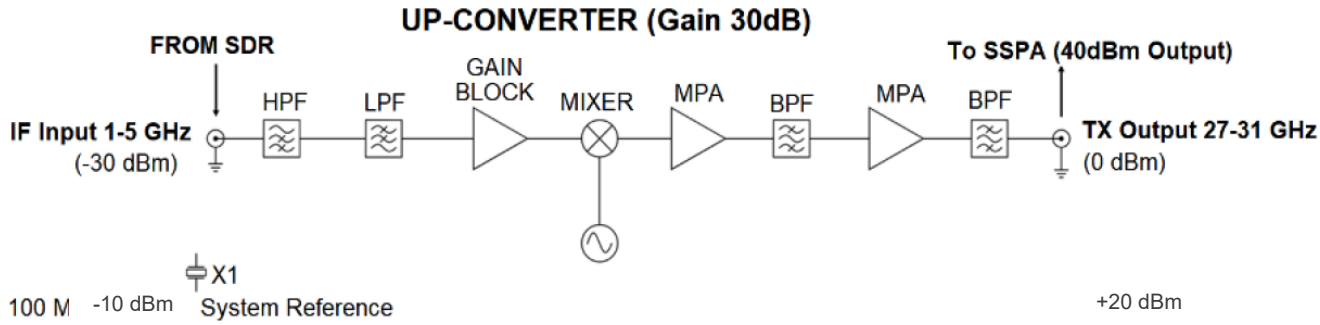
Parameter	Typical	Unit
PCB Dimensions	80 x 80 x 2 (max)	(mm)
Mechanical Enclosure Required	Yes	
Mechanical Enclosure Dimensions	100 x 120 x 70 (max)	(mm)
Total Mass	<2	(kg)
Form Factor Requirement	Enclosure	
Enclosure Material Requirement	>2.54 mm Aluminium	(mm)
Enclosure Planting Requirement	Gold	
RF Connector Types	2.92	(mm)
DC Connector Types	DC feedthrough or alt. high rel. panel mount	
IF Signal Connector Types	SMA	

Environmental

Parameter	Typical
Operating Temperature Range	-40 °C to +70 °C
Storage Temperature Range	-40 °C to +85 °C
Operating Environment	Terrestrial; IP65 enclosures standard
Vibration Requirement	MIL-STD-810
Compliance Standards	1) ETSI EN 301 459 2) ETSI EN 301.489-12 (EMC standard for satellite earth stations)

Simplified Schematic Diagram





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