

Ka-band Frequency Agile Transceiver

17.3-20.7 & 27.5-30.5 GHz



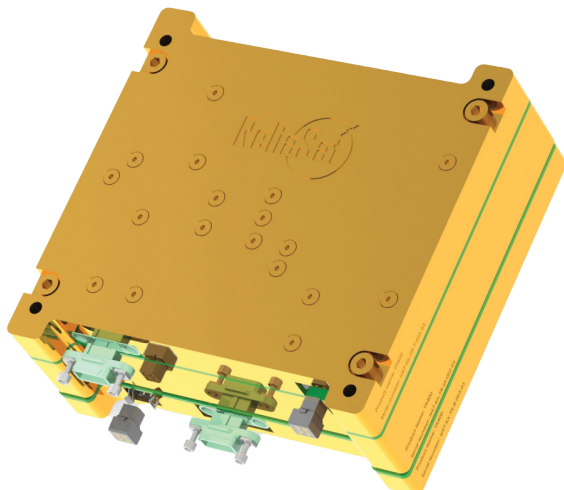
Product Datasheet

TR400

Integrated transceiver downlink module with programmable local oscillators for Ka-band frequencies.

Overview

The TR400 is a highly sophisticated, fully integrated transceiver module for Ka-band satellite communications. It functions as a wideband up/down converter, compatible with modems or Software Defined Radios (SDRs), and offers broad frequency coverage (TX: 17.3-20.7 GHz, RX: 27.5-30.5 GHz) with precise frequency adjustments through two programmable local oscillators. Reliable across extreme temperatures (-40°C to 85°C) with high-precision oscillators and a robust aluminum housing, the TR400 supports high-speed data transmissions for IoT, security, and 5G, handling up to 250 MHz of bandwidth.



Features

- TX output frequency 17.3-20.7 GHz
- RX input frequency 27.5-30.5 GHz
- TX IF frequency 0.4-2 GHz
- RX IF frequency 0.4-2 GHz



Applications

- Satellite communications
- High speed data communications
- IOT
- Security
- 5G

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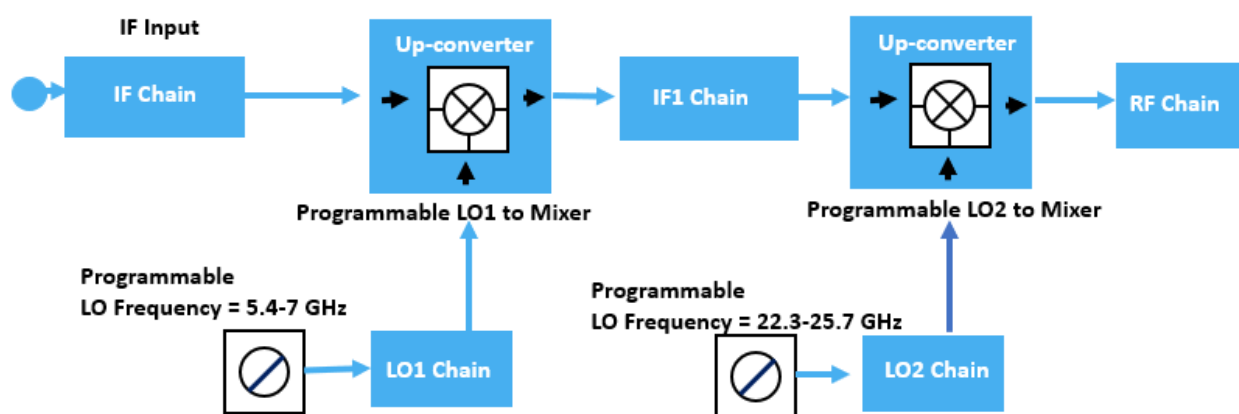


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Specification Overview

Upconverter

Parameter	Specifications	Unit
TX Output Frequency Range	17.3-20.7	GHz
TX Output Power, P1dB	25-27	dBm
IF Input Frequency Range	0.4-2	GHz
IF Input Power Range	-40	dBm
LO Frequency Both LOs are Programmable	LO1=5.4-7	GHz
	LO2=22.5-25	
Reference Frequency	100	MHz
Reference Stability	<0.3	PPM
Conversion Gain Programmable in 0.25 dB steps.	0-66	dB
Gain Flatness	<5	dB
Typical Phase Noise		
1 kHz	-87	dBc/Hz
10 kHz	-98	dBc/Hz
100 kHz	-100	dBc/Hz
1 MHz	-117	dBc/Hz
Spurious	50	dBc
Supply Voltage Range	6-60	Vdc
DC Power (Watts)	10 (at 28 VDC)	W
Operating Temperature Range	-40-85	°C



IF (GHz)	Programmable LO1 (GHz)	IF1 (GHz)	Programmable LO2 (GHz)	RF (GHz)
0.95	5.95	5	22.3	17.3
1	6	5	23.0	18
2	7	5	25.7	20.7

* Programmable Lo Frequencies LO1 and LO2 have a step size of 200 KHz

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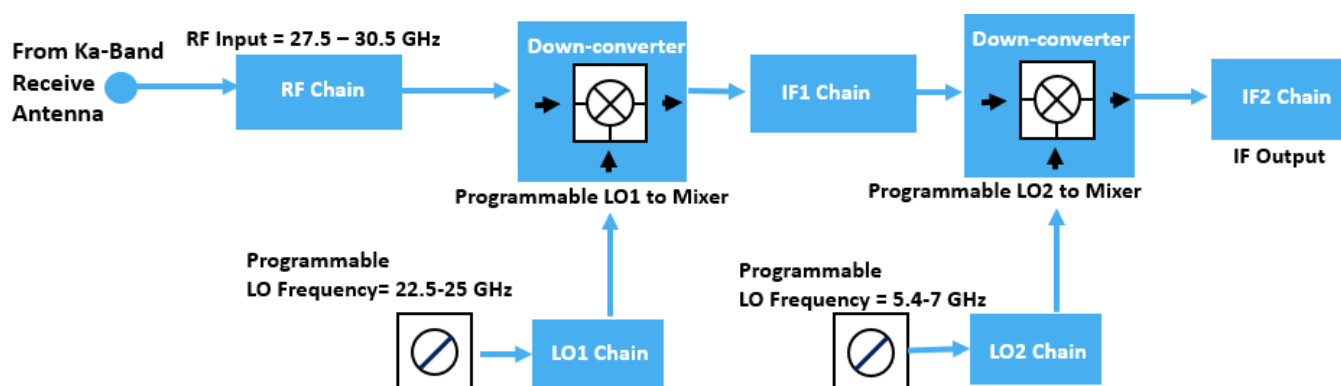
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Downconverter

Parameter	Typical	Unit
Rx Input Frequency Range	27.5-30.5	GHz
IF Output Frequency Range	0.4-2	GHz
LO Frequency	LO1=22.5-25	GHz
	LO2=5.4-7	
Noise Figure	<2.4	dB
Image Rejection	>60	dB
Input and Output Port Return Loss	<-10	dB
Input and Output Port VSWR	<1.8	
Reference Frequency	100	MHz
Reference Stability	<0.3	PPM
Conversion Gain	0 to 63	dB
Gain Flatness (250 MHz RTBW)	<5	dB
Phase Noise		
1 kHz	-87	dBc/Hz
10 kHz	-98	dBc/Hz
100 kHz	-100	dBc/Hz
1 MHz	-117	dBc/Hz
Spurious	<50	dBc
Supply Voltage Range	6-60	Vdc
DC Power (Watts)	6 (at 28 VDC)0	W
Operating Temperature Range	-40-85	°C



RF (GHz)	Programmable LO1 (GHz)	IF1 (GHz)	Programmable LO2 (GHz)	IF2 (GHz)
27.5	22.5	5	5.95	0.95
28.8	23.8	5	6	1
30.5	25.5	5	7	2

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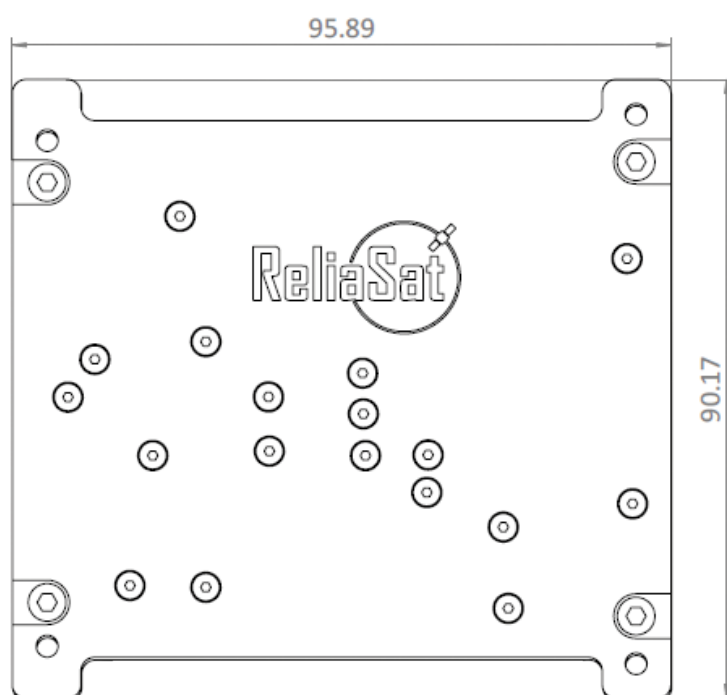
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Mechanical and Environmental

Mechanical

Parameter	Typical	Unit
PCB Dimensions	96 x 91 x 1 (max)	mm
Mechanical Enclosure Required	Yes	
Mechanical Enclosure Dimensions	95.89 x 90.17 x 38.14	mm
Total Mass	<1	kg
Form Factor Requirement	Cube Sat	
Enclosure Material Requirement	>2.4 mm thick aluminium	mm
Enclosure Plating Requirement	Gold or Nickel	
RF Connector Types	SMPM edge mount for Receiver SMP edge mount for Transmitter	
DC Connector Types	Harwin 4-pin Connector	
IF Signal Connector Types	SMP edge mounts	
Current Sensor, Temperature Sensor, Frequency Synthesiser Lock & DC Power Enable Connections, MCU		
Harwin 12-pin Connector		

Mechanical Enclosure Dimensions

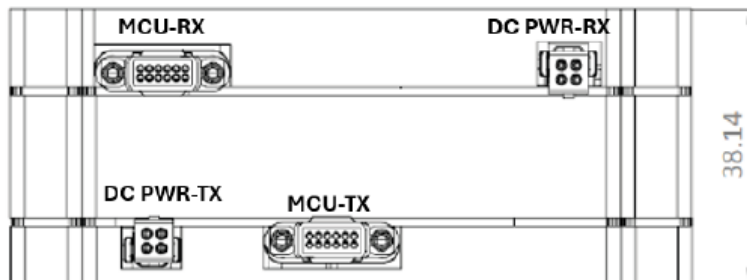


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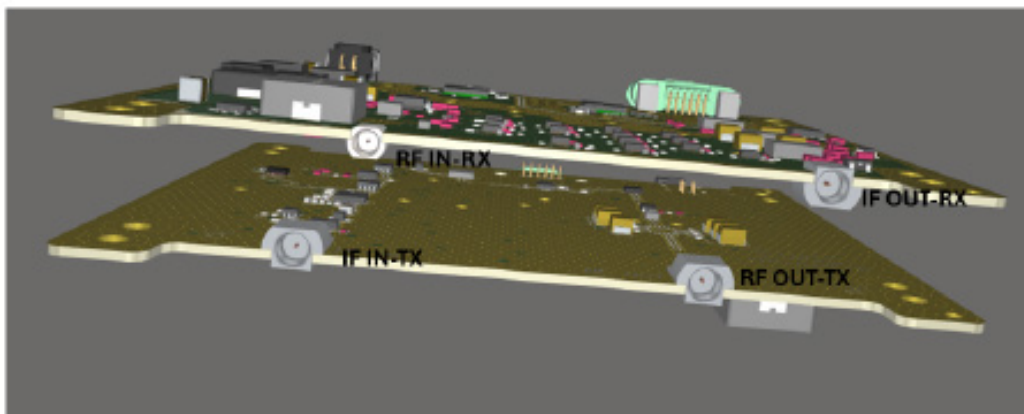
Where

DC PWR-RX- DC power connection to Receiver

MCU-RX-DC power connection to Receiver

DC PWR-TX- DC power connection to Transmitter

MCU-TX-DC power connection to Transmitter



Where

RF IN-RX - RF Input to Receiver

IF OUT-RX- IF Output from Receiver

IF IN-TX - RF Input to Transmitter

RF OUT-TX- RF Output from Transmitter

Contact Information

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