Transceiver Single Channel Module
17-21 & 27-31 GHz

Arralis

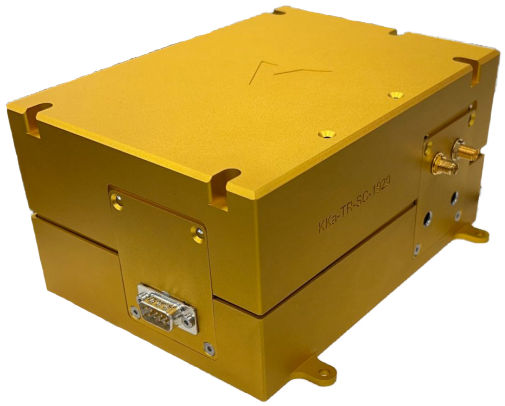
Product Datasheet

KKa-TR-SC-1929
Single channel satellite communications transceiver module for K/Ka-band.

Overview
The KKa-TR-SC-1929 transceiver module enables direct interface with a modem or Software Defined Radio (SDR) enabling full-function Ka-band satellite systems.

The module is a complete RF satellite system that allows spacecraft designers a fast, reliable and cost effective means of implementing high data-rate Ka-band payloads. Additional channels can be added in both the Transmit and Receive paths to accommodate specific customer requirement.

The RF outputs and inputs are standard waveguide flanges for high reliability and low loss antenna connections. In order to maximize data rates, the transmitter has an output monitoring function that enables precise amplitude stability when coupled with external pre-distortion or gain control systems.



Dimensions: 180 L x 130 W x 87 H (mm)

Features
- Single channel transmit and receive satellite communications transceiver with option to extend for dual channel right and left circular polarization
- TX output frequency 17-21 GHz
- RX input frequency 27-31 GHz
- Low noise receiver <3 dB
- 20 W transmitter power
- Transmitter feedback for digital pre-distortion
- Programmable transmitter gain

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

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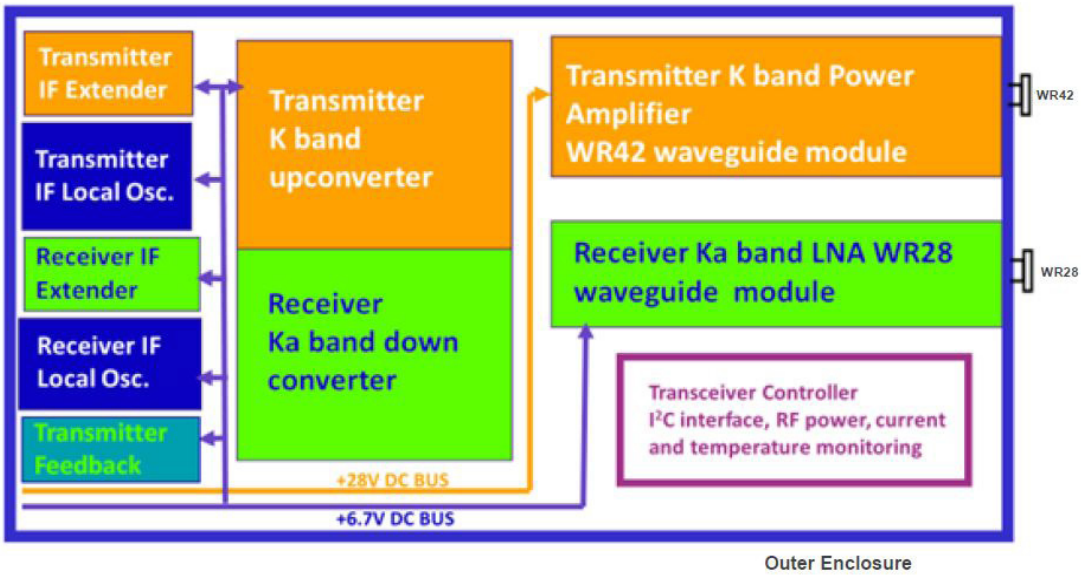
Simplified Block Diagram



Operational Data

Transmitter (TX)

Notes
All tests carried out at 25 °C

Parameter	Rating
TX Output Frequency Range	17-21 GHz (band filter dependant)
IF Input Frequency Range (programmable)	1.4 - 2.5 GHz
IF Input Power	-10 dBm (max)
TX Output Power	20 W CW
Small Signal Gain	55 dB ±1 dB
Programmable Gain adjustment	11 dB ±0.1 dB
Gain Flatness	±3 dB over 800 MHz bandwidth
ACPR	<-28 dBc typical
Operating Temperature	-40 °C to +85 °C
Supply Voltage Range	6-36
DC Power	<6

Transmitter Feedback

Parameter	Rating
TX IF Feedback Output Frequency (programmable)	1.4 to 2.5 GHz
TX Output P1dB	>11 dBm
TX OIP3	>22 dBm

Transmitter Power Sensor

Parameter	Rating
IF Input Power Sensor Reading Accuracy	±0.1 dB
TX Power Amplifier Sensor Reading Accuracy	±0.2 dB

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TX Phase Noise

Notes
All tests carried out at 25 °C

Parameter	Phase Noise Power
10 Hz	-35 dBc
100 Hz	-55 dBc
1 kHz	-65 dBc
10 kHz	-75 dBc
100 kHz	-94 dBc
1 MHz	-110 dBc
10 MHz	-120 dBc

TX Monitoring (remotely by GUI interface)

Parameter	Rating
Transceiver Current	Yes
Transceiver Temperature	Yes
Power Amplifier Current (per polarisation)	Yes
Power Amplifier Power (per polarisation)	Yes

TX Control

Parameter	Rating
Power Cycling of TX IF	Yes
Power Cycling of TX Transceiver	Yes
Power Cycling of TX Power Amplifier	Yes
Programmable Gain	Yes
Programmable IF Frequency	Yes

Receiver (RX)

Parameter	Rating
RX Input Frequency Range	27-31 GHz (band filter dependant)
RX IF Output Frequency Range (programmable)	0.9 to 3.6 GHz
RX Gain Adjustment	42 dB
RX Gain Adjustment Step Size	0.25 dB
RX IF Output P1dB	>11 dBm
RX IF OIP3	>22 dBm
Noise Figure	<3 dB

RX Phase Noise

Parameter	Phase Noise Power
10 Hz	-35 dBc
100 Hz	-55 dBc
1 kHz	-65 dBc
10 kHz	-75 dBc
100 kHz	-94 dBc

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Connectors
IF Baseband Connectors
1 x 50 Ω SMA for TX, VSWR < 1.35:1

1 x 50 Ω SMA for RX, VSWR < 1.35:1

1 x 50 Ω SMA for TX/Feedback, VSWR < 1.35:1

RF Connectors to Antennas
1 x WR42 waveguide for TX, VSWR < 1.35:1

1 x WR28 waveguide for RX, VSWR < 1.35:1

3D Module Render
Dimensions: 180 L x 130 W x 87 H (mm)

DC Connector ,Monitoring and Control Connector
15 way D-sub Micro-D Connector

Control Interface
I2C 3 wire interface (other interfaces are available as an option)

GUI Windows based interface for bench testing

Environmental
Operational temperature range -40 °C to +70 °C

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