K/Ka band Transceiver
Single Channel Module

KKa-TR-SC-1929 Previously named LE-KaCM-TRX100

K/Ka Band Single Channel Satellite Communications Transceiver Module

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 RF outputs and inputs are standard waveguide flanges for high reliability and low loss antenna connections.

In order to maximize data rates, the tranmitter has an output monitoring function that enables precise amplitude stability when coupled with external pre-distortion or gain control 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.

Features

- 27-31GHz receive band.
- 17-21GHz transmit band.
- Low noise receiver < 3dB.

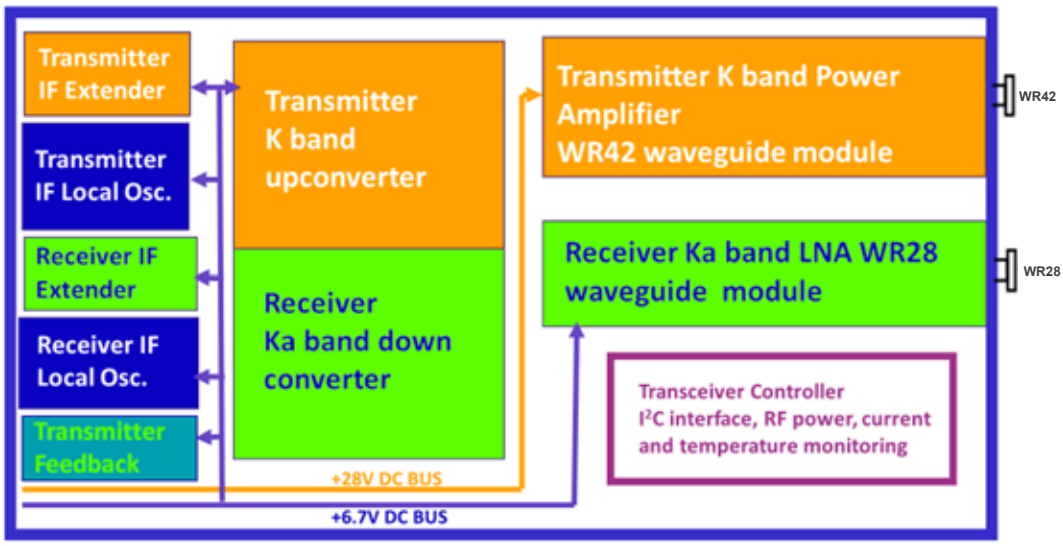
Applications

- High speed data communications.
- Space communications.
- IOT.
- Security.

Key Features

- Single channel Transmit and Receive satellite communications transceiver with possibility to extend for dual channel right and left circular polarisation.
- 20 W transmitter power.
- Transmitter feedback for digital predistortion.
- Programmable transmitter gain.
- Low noise receiver <3dB Noise Figure.
- 27-31GHz Receive Band.
- 17-21GHz Transmit Band.

Simplified Block Diagram



Outer Enclosure

Operational Data

Transmitter (Tx)

Parameter	Rating
Tx Output Frequency	17-21GHz (band filter dependent)
IF Input Frequency (programmable)	1.4 to 2.5 GHz
IF Input Power	-10 dBm (max)
Tx Output Power	20W CW
Small signal gain	55 dB ± 1dB
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

Notes
All tests are carried out at 25°C.

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

Operational Data

Tx 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
1 MHz	-110 dBc
10 MHz	-120 dBc

Notes
All tests are carried out at 25°C.

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

Operational Data

Receiver (Rx)

Parameter	Rating
RX Input Frequency	27-31GHz (band filter dependent)
RX IF Output Frequency (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

Notes
All tests are carried out at 25°C.

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

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

DC Connector and 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

Module 3D Render

Dimensions: 50 x 140 x 225mm

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