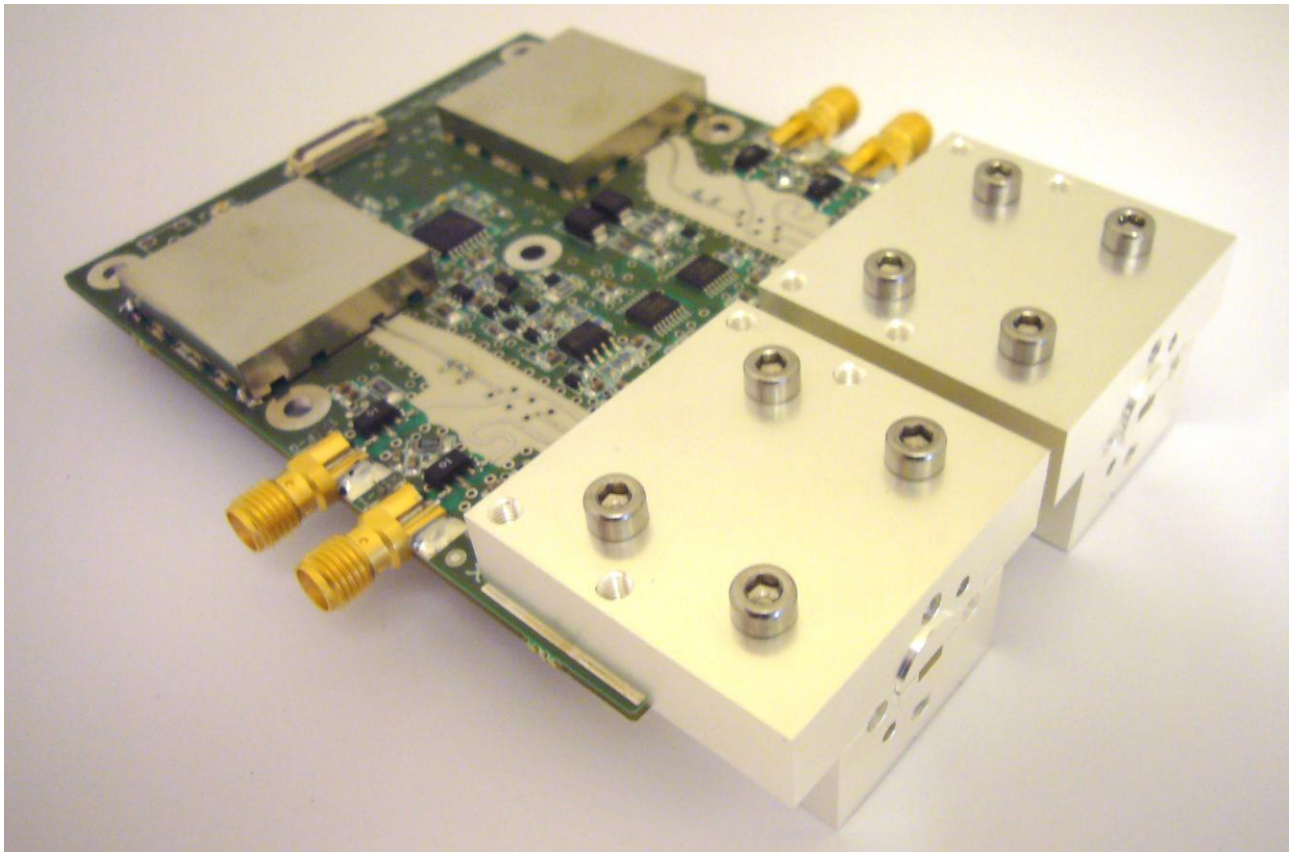
FC1005V Series

V-band Converters (57-64 GHz TX/RX) with LO



Applications

- Point-to-point or multi-point radio
- Multi-Gbps wireless transfer
- Measurement systems

Main features

- 57-64 GHz RF bandwidth
- Platform concept, easy to customize
- 0,1 to 5,0 GHz IF bandwidth
- Small size and weight
- Standard waveguide and SMA interface
- License free band in many regions

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General

This converter platform is a broadband and versatile building block for V-band (57-64 GHz) applications. It is intended as a platform where customer requirements will be implemented upon request. It consists of one up- and one down-converter in a single unit. The up- and down-converter works independently, and can thus be used in both frequency multiplexed and time multiplexed applications.

FC1005V features

The basic FC1005V unit possesses a very broad IF bandwidth, from 0,1 to 5,0 GHz. The IF gain can be increased. Please contact Sivers IMA for details.

A set of two identical FC1005V modules can be used in a full duplex configuration by appropriate choice of LO signals for the up- and down-converter modules respectively.

The FC1005V unit is fully controlled through a standard serial I2C interface. Converter and synthesizer settings can freely be configured and stored to a non-volatile memory area.

The standard version of the converter is equipped with standard waveguide WR-15 input/outputs. These waveguide input/outputs can be replaced by a diplexer for a single waveguide WR-15 input/output with very high isolation.

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RF, DC, and control interfaces

The FC1005V is intended as a sub-unit to be integrated into a user application.

For easy handling the unit is furnished with standard SMA connectors for IF signals. The RF input/output can be mated to a standard WR-15 waveguide flange for easy connection to other equipment or antennas.

Bias supply and control signals are provided to the unit through a Molex connector. Sequencing of bias is necessary. Apply first GND, then VSS, then VDD. Disconnect in reverse order.

External reference clock may be connected to a standard UMC coaxial connector.

Handling and precautions

Although the construction is of highest standard and sensitive parts such as MMICs and RF circuits are packaged, the unit must be handled with care. All semiconductor electronics are ESD sensitive, and this is of course also true for the delicate mm-wave structures. Normal handling with ESD protection is recommended and special care is advised before the unit is integrated into a protective case.

The RF circuits will develop heat during operation. The aluminum housing on the of RF modules provides enough cooling for lab usage. An additional heat sink may be attached to the converter using the four threaded M3 holes in the two waveguide launches. This additional heat sink is necessary for continuous operation of the converter. It is normally not necessary to use heat conducting paste between the FC1005V converter and the heat sink. Do not use excessive force when attaching the additional heat sink.

SMA connectors for IF and LO must be handled with care, otherwise damage to the PCB may occur. Use a wrench to counteract the torque when tightening the connection, see photograph below. Use a torque wrench for correct torque of SMA connector.

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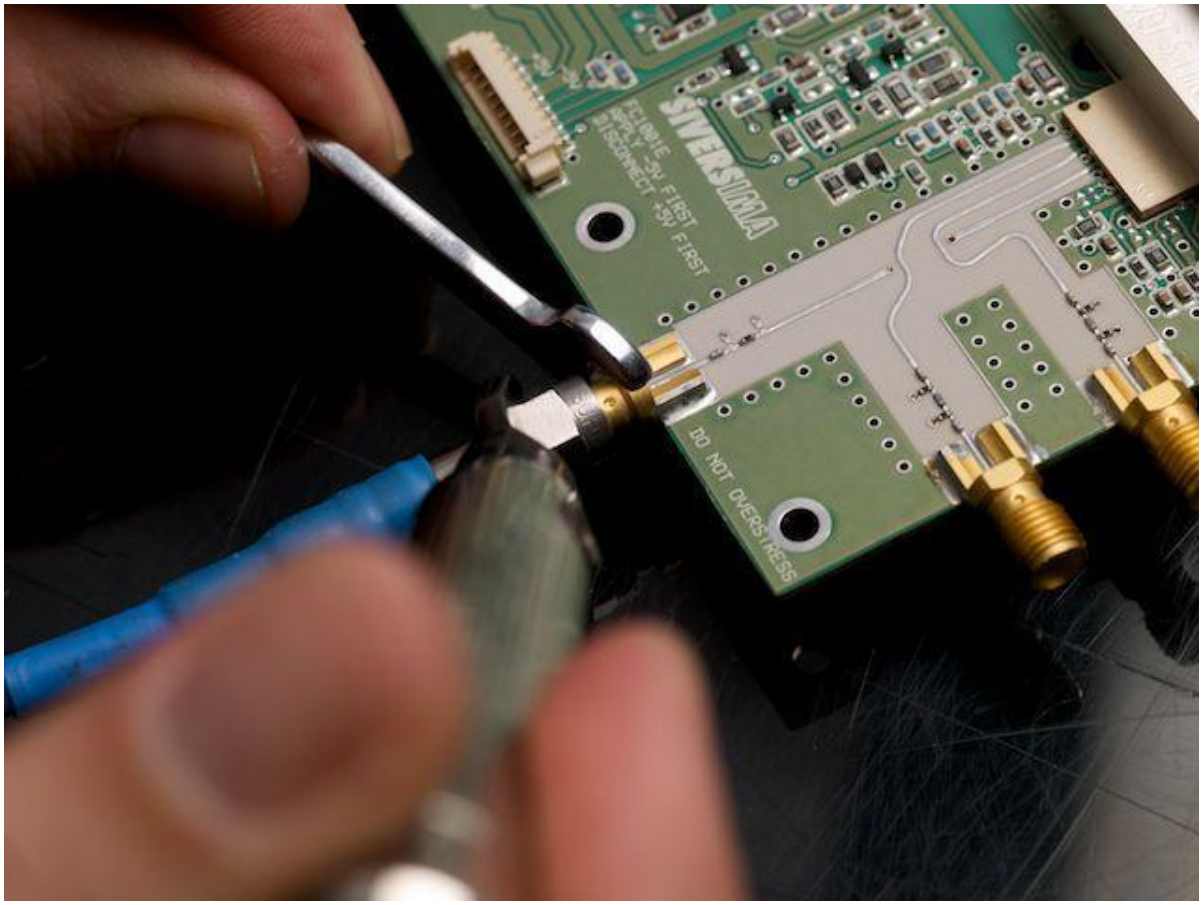

Tightening of SMA connectors- note that a wrench is used to unload force on the SMA connector, in order to avoid damage to the PCB.

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V-band Converters (57-64 GHz TX/RX) with LO

Transmitter (TX) up-converter, typical values

Parameter	FC1005V @ 57-64	Unit
RF output frequency range	57-64	GHz
Nominal gain IF to RF	30	dB
Saturated output power (TBC)	+16	dBm
1-dB output compression point (TBC)	+14	dBm
LO phase noise @ V-band @ 100 kHz offset	-80	dBc/Hz
LO synthesizer step size @ V-band	0.25	MHz
LO Synthesizer tuning range	14.2 –14.9	GHz
IF output frequency range	0.1 - 5	GHz

All data given for ambient temperature of +25 °C

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V-band Converters (57-64 GHz TX/RX) with LO

Receiver (RX) down-converter, typical values

Parameter	FC1005V @ 57-64 GHz	Unit
RF input frequency range	57-64	GHz
Nominal gain RF to IF	10	dB
Noise figure (TBC)	7	dB
1-dB input compression point	-25	dBm
LO phase noise @ V-band @ 100 kHz offset	-80	dBc/Hz
LO synthesizer step size @ V-band	0.25	MHz
LO Synthesizer tuning range	14.2 –14.9	GHz
IF output frequency range	0.1 - 5	GHz

All data given for ambient temperature of +25 °C

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Interface / environmental specifications

Parameter	Min	Max	Unit/Remark
Waveguide input/output			Mates to WR-15
Operating temperature	-30	+70	°C
Storage temperature	-50	+80	°C

* Note, sequencing of bias is necessary. Apply first GND, then Vgg , then Vdd, Disconnect in reverse order

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