

DATASHEET

The Wireless Connector™



RC-01-0202



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Millimeter-wave over-the-air measurement chamber

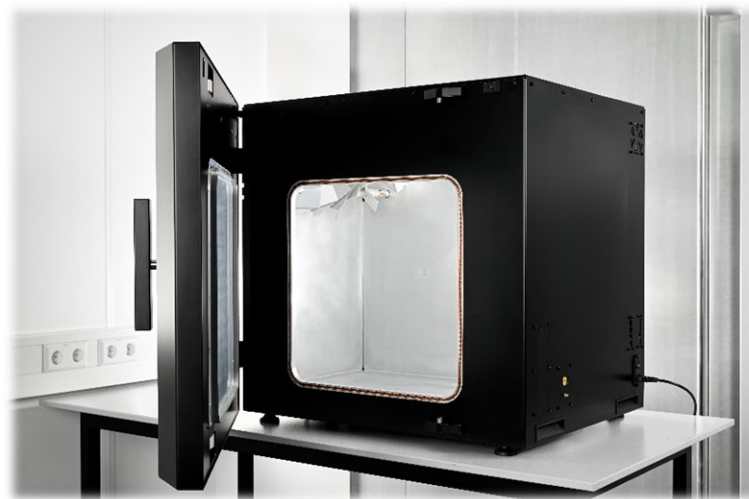
The Wireless Connector™ is a tabletop measurement chamber for testing radiated or received power spectral density of integrated wireless devices. This document provides an overview of the specifications of the system.

Overview

The Wireless Connector™ type RC-01-0202 is a tabletop shielded reverberation chamber for fast over-the-air measurements of metrics related to power spectral density. Type RC-01-0202 covers the 18-140 GHz band.

The chamber includes two mode-stirring mechanisms and a reflective pyramid at the ceiling for optimal performance when the DUT is placed inside a dedicated region. The chamber has two bulkhead feedthroughs with RF and DC heads supporting integration of reference antennas, and connections to the DUT. The chamber has a third panel in the ceiling for integration of calibration and extension modules.

An integrated control panel with GUI is included to control the measurement system and process the data. The chamber can also be controlled with an API. The software allows automatic connection with Spectrum Analyzers of several selected vendors.



Inside of the measurement chamber.

Key Features

The Wireless Connector™ type RC-01-0202 has the following key features:

- Full spectrum testing in Tx and Rx (PSD, ACLR, out-of-band emissions, LOFT, etc.)
- Software to control and calibrate the chamber, and for data processing and analysis
- Software to control and connect automatically to selected-vendor spectrum analyzers
- Custom bulkhead feedthroughs for access to the DUT
- Fast mode for accelerated testing
- Specified working volume for easy configuration and set up
- Fully electromagnetically shielded
- Connector panels for DUT and for reference antennas

Supported Use Cases

The Wireless Connector™ type RC-01-0202 supports, among others, the following use cases:

- Radiated and received power spectral density testing for both modulated and CW signals
- Mapping of TRP reduction for wide scan angles in phased arrays
- Fast feedback of RFIC bias settings for optimized performance
- Detection of time-varying spurious emissions
- Out-of-band emissions for radar and telecommunication applications
- Spectrum testing for communications (e.g. spectral regrowth, ACLR)
- Testing of harmonic distortion and compression in modules with power amplifiers
- System gain and efficiency testing for various beamforming settings in phased arrays
- Antenna efficiency testing of passive modules
- EMC testing for radiated emissions and immunity in the mmWave band
- Spectrogram of FMCW radars
- Etc..

Services

Included with purchasing The Wireless Connector™ is installation, warranty and training.



System Specifications

RC-01-0202: Reverberation chamber

DESCRIPTION	SPECIFICATION (NOMINAL)	ADDITIONAL INFORMATION
Construction	Aluminum body	
Length (external / internal)	846 mm (33.3") / 800 mm (31.5")	
Depth (external / internal)	803 mm (31.6") / 528 mm (20.8")	
Height (external / internal)	808 mm (31.8") / 695 mm (27.4")	501 mm (19.7") to the tip of the pyramid in the ceiling
Volume (external / internal)	0.466 m ³ / 0.257 m ³	
Weight	55 kg (121 lbs.)	
Frequency range	18 – 140 GHz	Validated for this frequency range, could be used for a wider band
Empty chamber losses	20 GHz: 25.9 dB 25 GHz: 28.1 dB 30 GHz: 29.8 dB 35 GHz: 31.2 dB 40 GHz: 32.2 dB 45 GHz: 33.5 dB 50 GHz: 34.4 dB 55 GHz: 35.7 dB 60 GHz: 36.7 dB 65 GHz: 36.9 dB 70 GHz: 37.3 dB 75 GHz: 38.0 dB 80 GHz: 38.6 dB 85 GHz: 39.1 dB 90 GHz: 39.7 dB 95 GHz: 40.1 dB 100 GHz: 40.8 dB 105 GHz: 41.2 dB 110 GHz: 41.7 dB 115 GHz: 42.1 dB 120 GHz: 42.6 dB 125 GHz: 42.9 dB 130 GHz: 43.3 dB 135 GHz: 43.7 dB 140 GHz: 44.1 dB	
Operating voltage	110 – 230 V AC (+/- 10%)	Euro C13 connector
Typical power consumption	45 W	
DUT region	300 x 300 x 300 mm (11.8" x 11.8" x 11.8")	Optimized region in the chamber for a phased array scan angle range of -60° to 60°
Connectivity ports	4x USB 3.0	

	2x RJ45 Ethernet	1x for connection to local measurement instrumentation 1x for remote control
	1x HDMI	For external display
Display size	12" (Multi-touch)	
Display resolution	1920 x 1080 pixels	
Operating temperature	10 – 30 °C	
Operating humidity	20 – 80 % (non-condensing)	
Operating altitude	Max. 2000 m	
Storage temperature	5 - 50 °C	

CT-02-0104: Chamber control box

DESCRIPTION	SPECIFICATION (NOMINAL)	ADDITIONAL INFORMATION
Stirrer stepped rotation		
Step size	0.1 °	
Range	0 - 360 ° (continuous rotation)	
Speed	2 rpm (12 °/s)	
Acceleration	120 °/s ²	
Stirrer continuous rotation		
Step size	0.1 rpm (0.6 °/s)	
Range	0 – 20 rpm	
Acceleration	120 °/s ²	

Calibration modules

CT-01-0104: RF control box for calibration modules

CT-01-0201: Calibration module 18 – 50 GHz

DESCRIPTION	SPECIFICATION (NOMINAL)	ADDITIONAL INFORMATION
Frequency range	18 – 50 GHz	
Maximum output power	3 dBm	

CT-01-0301: Calibration module 50 – 90 GHz

DESCRIPTION	SPECIFICATION (NOMINAL)	ADDITIONAL INFORMATION
Frequency range	50 – 90 GHz	
Maximum output power	-3 dBm	

Connector panels

FT-04-01XX: Connector panel Reference Antenna

DESCRIPTION	SPECIFICATION (NOMINAL)	ADDITIONAL INFORMATION
RF Connection option		
Option <u>01</u>	Empty	FT-04-0101
Option <u>02</u>	1x WR12 Waveguide	FT-04-0102: 50-90 GHz
Option <u>03</u>	1x 1.85mm Coax	FT-04-0103: 0-67 GHz
Option <u>04</u>	1x 1.85mm Coax 1x WR12 Waveguide	FT-04-0104: 0-90 GHz
Dimensions (inner / outer)	70 x 45 x 8 mm (2.76" x 1.77" x 0.31") 106 x 81 x 8 mm (4.17" x 3.19" x 0.31")	

FT-04-02XX: Connector panel DUT

DESCRIPTION	SPECIFICATION (NOMINAL)	ADDITIONAL INFORMATION
RF Connection option		
Option <u>01</u>	Empty	FT-04-0201
Option <u>02</u>	4x SMA 2x BNC 1x Ethernet 1x WR12	FT-04-0202
Option <u>03</u>	4x BNC 2x 1.85mm Coax 1x Ethernet 1x WR12	FT-04-0203
Dimensions (inner / outer)	170 x 47.6 x 8 mm (6.69" x 1.87" x 0.31") 200 x 90 x 8 mm (7.87" x 3.54" x 0.31")	

FT-05-XXXX: Custom connector panel DUT

DESCRIPTION	SPECIFICATION (NOMINAL)	ADDITIONAL INFORMATION
RF Connections	Custom	
Power Connections	Custom	
Connectivity ports	Custom	
Dimensions (inner / outer)	170 x 47.6 x 8 mm (6.69" x 1.87" x 0.31") 200 x 90 x 8 mm (7.87" x 3.54" x 0.31")	

Reference Antennas

RA-01-0101: Reference Vivaldi antenna 18-50 GHz

DESCRIPTION	SPECIFICATION (NOMINAL)	ADDITIONAL INFORMATION
RF Connection	2.4mm Coax	
Dimensions	17.0 x 32.9 x 62.3 mm (0.67" x 1.30" x 2.45")	

RA-02-0101: Reference OEWG antenna 50-90 GHz

DESCRIPTION	SPECIFICATION (NOMINAL)	ADDITIONAL INFORMATION
RF Connection	WR12 Waveguide	
Gain	6.5 dBi	
Return loss	9 dB	
Dimensions	19.1 x 19.1 x 30.5 mm (0.75" x 0.75" x 1.20")	

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