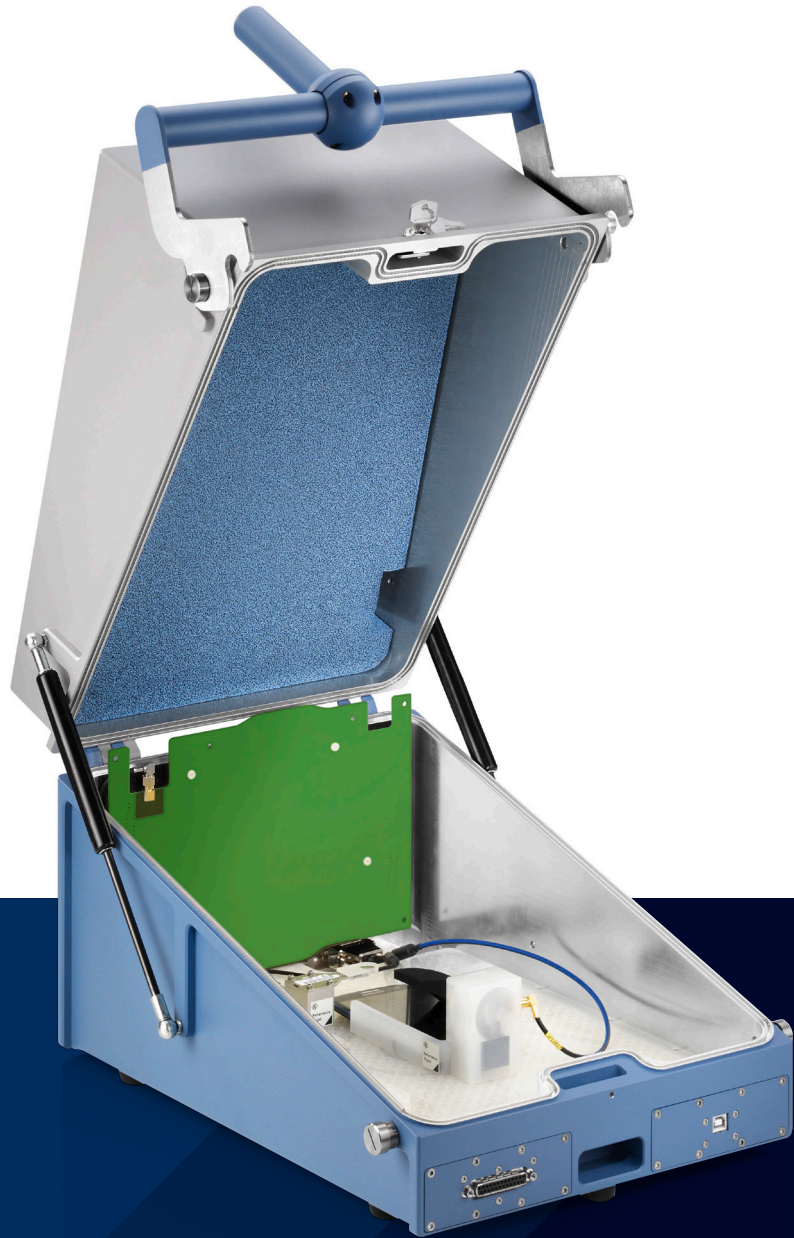


R&S® CMW-Z10 RF SHIELD BOX

The standard in shielding and coupling



Product Brochure
Version 09.00

ROHDE & SCHWARZ

Make ideas real



AT A GLANCE

The R&S®CMW-Z10 RF shield box clearly set standards. Offering excellent shielding effectiveness and superior coupling characteristics, it can be used for frequencies up to 6 GHz. These outstanding features combined with a modular options concept make the R&S®CMW-Z10 indispensable for any radiocommunications tester.

Modern mobile devices usually do not have an external antenna connector. Connection to a radiocommunications tester must therefore be made over the air. The link between the device under test (DUT) and the test equipment should be reliable and path losses kept to a minimum. Interference from external radio sources should be prevented as far as possible. The R&S®CMW-Z10 RF shield box perfectly meets these requirements.

The R&S®CMW-Z10 is made of solid aluminum. It is firmly closed by means of a lever handle with a defined stop. The bottom and cover will not distort under normal conditions. This ensures uniform compression of the sealing cords provided around the entire box – an important prerequisite for effective RF shielding. The cover is lined with absorber material, which minimizes reflections.

The antenna structure on the R&S®CMW-Z11 antenna coupler board has been optimized to enable an excellent radio connection between the DUT and the tester. The highly broadband spiral antenna allows a wide variety of applications. Further highlights of the R&S®CMW-Z11 include low coupling attenuation and the ability to place the DUT at any desired position inside the box without affecting attenuation caused by reflection.

Key facts

- ▶ Frequency range up to 6 GHz
- ▶ Excellent shielding characteristics (< 80 dB)
- ▶ Broadband spiral antenna allowing a wide variety of applications
- ▶ Optimized antenna structure for extremely good RF coupling
- ▶ Ergonomic closing mechanism
- ▶ Sufficient space for tablets



As an aid to both opening and closing the shield box, the R&S®CMW-Z120 option provides an additional rotatable handle.

RF chamber overview

With our well-established experience in innovative solutions based on top-quality engineering, Rohde & Schwarz provides you with a wide variety of OTA chambers.



	R&S®DST200 RF diagnostic chamber	R&S®TS7124 RF shielded box	R&S®CMW-Z10 RF shield box
Application	R&D, production sample testing, diagnostics	R&D, production	R&D, service
Frequency range	0.4 GHz to 18 GHz	0.7 GHz to 18 GHz	0.4 GHz to 6 GHz
Type	Near field	Near field	Coupling
Quiet zone	–	–	–
Positioner	3D great circle cut (optional)	–	–
Shielding effectiveness	100 dB	80 dB	> 60 dB
Dimensions (W × H × D)	0.77 m × 0.76 m × 0.7 m (30.3 in × 29.9 in × 27.5 in)	0.45 m × 0.4 m × 0.48 m (17.7 in × 15.7 in × 18.9 in)	0.32 m × 0.27 m × 0.53 m (12.6 in × 10.6 in × 20.9 in)



	R&S®CMQ200 shielding cube (opt. 1)	R&S®CMQ500 shielding cube	R&S®CMQ200 shielding cube (opt. 2)
Application	R&D, production, automotive device/components	R&D, production, 5G FR1 and 5G FR2 device/components LBS, NPT	R&D, production, automotive device/component
Frequency range	0.3 GHz to 14 GHz	0.7 GHz to 77 GHz	20 GHz to 77 GHz
Type	Near field	Direct far field (FR2)/near field (FR1)	White box direct far field/near field
Quiet zone	–	Ø 2 cm at 40 GHz	Ø 2 cm at 40 GHz
Positioner	–	–	–
Shielding effectiveness	> 80 dB	> 80 dB	> 60 dB
Dimensions (W × H × D)	0.45 m × 0.7 m × 0.72 m (17.7 in × 27.6 in × 28.3 in)	0.45 m × 0.7 m × 0.72 m (17.7 in × 27.6 in × 28.3 in)	0.45 m × 0.7 m × 0.72 m (17.7 in × 27.6 in × 28.3 in)

BENEFITS AND KEY FEATURES

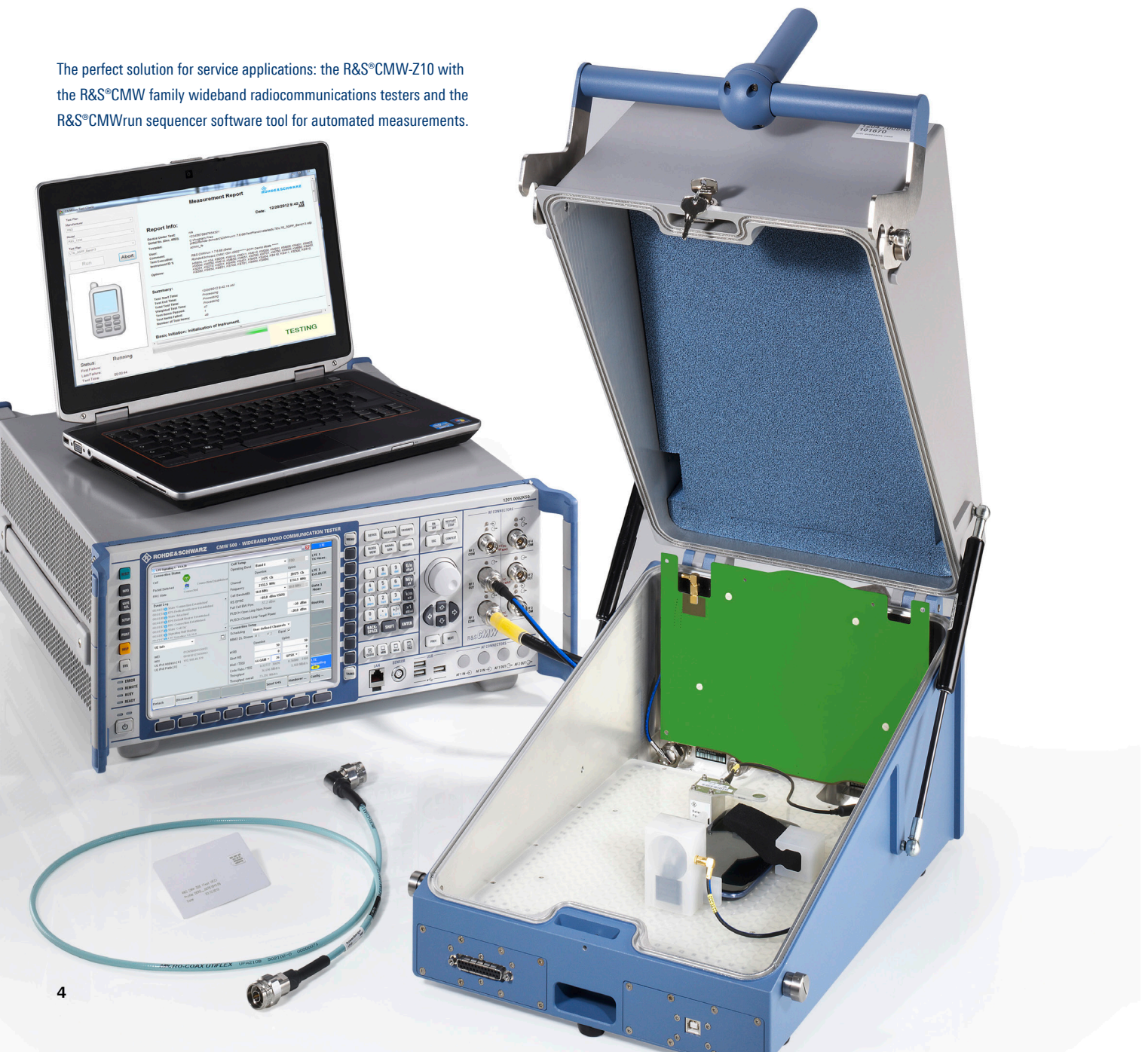
Wide frequency range up to 6 GHz

The R&S®CMW-Z10 is suitable for applications up to 6 GHz, thereby covering all common wireless standards such as GSM, UMTS, CDMA2000®, WLAN, LTE, Bluetooth® and GPS. The R&S®CMW-Z10 offers high shielding effectiveness, so that the effects of external interference are reduced to a minimum. The R&S®CMW-Z110 RF cable also provides excellent shielding for frequencies from 4 GHz to 6 GHz.

Ultralow reflections

The cover of the R&S®CMW-Z10 is lined with absorber material in order to minimize reflections. Strong reflections would cause a significant variation in attenuation as a function of the DUT position.

The perfect solution for service applications: the R&S®CMW-Z10 with the R&S®CMW family wideband radiocommunications testers and the R&S®CMWrun sequencer software tool for automated measurements.



Modular options concept and flexible assignment of modules

The R&S®CMW-Z10 has four module slots for different optional modules. Available options currently include a 25-pole D-Sub feedthrough (R&S®CMW-Z12), a USB 2.0 feedthrough (R&S®CMW-Z13), a twin N connector (R&S®CMW-Z14), a 15-pole D-Sub feedthrough (R&S®CMW-Z15) and an Ethernet feedthrough (R&S®CMW-Z18) for bidirectional audio testing. All modules are optimized so that their effect on shielding characteristics is kept to a minimum. The optional connectors can be flexibly assigned. It is also possible to insert user-specific modules.

Sufficient space allows optimum positioning, even for large DUTs such as tablets

Even large DUTs, such as tablets, can be accommodated. The RF shield box provides ample space for positioning DUTs to minimize the coupling attenuation between the DUT and the tester.

Designed for harsh, continuous duty and ergonomic operation

The R&S®CMW-Z10 RF shield box is designed to withstand the harsh conditions encountered in service and manufacturing environments. The hinges and dampers are extremely robust. The aluminum case offers high resistance to distortion, ensuring precise closing of the box over time. The closing mechanism has been optimized for ergonomic use, ensuring fatigue-proof handling while providing high-quality results.

Antenna diversity and MIMO tests

Mobile devices and wireless networks use multiple antenna concepts to benefit from diversity gain and enhance the signal to noise ratio or to exploit the spatial multiplexing scenario of the radio channel to offer users significantly more data capacity. The R&S®CMW-Z16 second antenna option, a circular polarized second antenna element, makes it possible to test the limits of

wireless communications and benefit from transmit diversity antennas and measurements of the data throughput increase provided by multiple input multiple output (MIMO) systems.

Mounted on the rear of the RF shield box, the R&S®CMW-Z16 allows radiated coupling of a MIMO DUT such as LTE MIMO 2x2. In applications like these, the standard antenna provides a coupling field in a 90° direction to the second antenna element (R&S®CMW-Z16). This provides the best coupling of MIMO devices in a near field environment and eliminates the need for using RF cables to connect the DUT to a wireless communications tester like the R&S®CMW500.

Bidirectional audio tests

The R&S®CMW-Z15 audio measurement option offers the accessories required for bidirectional audio measurements in the R&S®CMW-Z10. The microphone and loudspeaker needed for the audio measurements can be connected and optimally positioned within the RF shield box. The audio signals are transmitted via a D-Sub feedthrough. This feedthrough is specially shielded to minimize the effects of external interference on the shield box's characteristics. Audio signals applied via the loudspeaker are picked up by the DUT's microphone and transmitted over the RF interface to a radiocommunications tester. The tester uses a voice decoder to recover the audio signal and compares it to the original signal. To test the audio path with the DUT's loudspeaker, the tester generates an audio signal and sends it to the DUT via the RF interface. There, the audio signal is recovered and picked up by the microphone included with the R&S®CMW-Z15 option. Again, the audio path can be measured by comparing the original fed-in signal to the recovered signal.

SPECIFICATIONS IN BRIEF

Specifications in brief

R&S®CMW-Z10 RF shield box

Scope of delivery: RF shield box, 1 m RF cable with N connectors for frequencies up to 3 GHz

Shielding effectiveness

Including R&S®CMW-Z11/-Z12/-Z14	0.4 GHz to 4 GHz	> 80 dB
	4 GHz to 6 GHz	> 60 dB
With R&S®CMW-Z13 USB 2.0 feedthrough	0.4 GHz to 4 GHz	> 60 dB
	4 GHz to 6 GHz	> 55 dB
With R&S®CMW-Z18 LAN feedthrough	0.4 GHz to 4 GHz	> 80 dB
	4 GHz to 6 GHz	> 70 dB

Outer dimensions

W × H × D
320.9 mm × 267.5 mm × 527.7 mm
(12.6 in × 10.5 in × 20.8 in)

Weight

9 kg (19.8 lb)

R&S®CMW-Z11 antenna coupler (mandatory selection)

Scope of delivery: antenna coupler, PE bracket and stabilizing piece and spacers for secure repeatable positioning of DUTs

VSWR	VSWR without DUT, with R&S®CMW-Z110, R&S®CMW-Z10 open	
	0.4 GHz to 1.4 GHz	< 3.5
	1.4 GHz to 3.5 GHz	< 2
	3.5 GHz to 6 GHz	< 3.5
Maximum power rating	from DUT	+37 dBm
	from R&S®CMW	+33 dBm
Polarization		circular
Connector		N female

R&S®CMW-Z12 D-Sub feedthrough (var. 02)

Power pins 14 to 18	maximum current rating, per pin	1 A
	maximum rated voltage	15 V
	cut-off frequency	1 kHz
Data pins 1 to 13 and 19 to 25	maximum current rating	50 mA
	maximum rated voltage	15 V
	maximum pass frequency	5 MHz
	filter shunt capacitance	< 800 pF

R&S®CMW-Z12 D-Sub feedthrough, extended DC power pin connectors (var. 04)

Power pins 12 to 18, 24, 25	maximum current rating, per pin	1 A
	maximum rated voltage	15 V
	cut-off frequency	1 kHz
Data pins 1 to 11 and 19 to 23	maximum current rating	50 mA
	maximum rated voltage	15 V
	maximum pass frequency	5 MHz
	filter shunt capacitance	< 800 pF

R&S®CMW-Z13 USB 2.0 feedthrough

Connector inside antenna coupler		USB-A
Connector outside antenna coupler		USB-B
Power supply	maximum rated current	0.5 A
	rated voltage	5 V
Data rate		low speed
		full speed
		USB 2.0 high speed

R&S®CMW-Z14 RF feedthrough

Connector inside antenna coupler		2 × N female
Connector outside antenna coupler		2 × N female
Impedance		50 Ω
Frequency range		0 Hz to 6 GHz

Specifications in brief

R&S®CMW-Z15 audio measurement option

Scope of delivery: microphone, speaker, internal and external audio cables

Supply pin 1, ground pin 2	rated voltage	5 V
	supply current	< 10 mA
Microphone output pin 11, microphone ground pin 3	recommended operating frequency	1 kHz
	operating frequency range	300 Hz to 10 kHz
	maximum rated output voltage	1 V (pp)
	gain settings (switches inside)	+10 dB (default), +20 dB and 0 dB
Speaker input pin 5, speaker ground pin 15	operating frequency range	300 Hz to 5 kHz
	maximum rated input voltage	20 V (pp)
	rated input impedance	600 Ω

R&S®CMW-Z16 second antenna element for diversity/MIMO measurements

(requires R&S®CMW-Z14)

VSWR	VSWR without DUT, with R&S®CMW-Z110, R&S®CMW-Z10 open	
	0.45 GHz to 1.4 GHz	< 3.5
	1.4 GHz to 3.5 GHz	< 2.3
Maximum power rating	3.5 GHz to 6 GHz	< 3.5
	from DUT	+37 dBm
	from R&S®CMW	+33 dBm
Polarization		circular
Connector		N female with N feedthrough

R&S®CMW-Z18 Ethernet feedthrough

Connector		RJ-45 (female – female)
Supported speed classes		1000BASE-T
Power over Ethernet (PoE)		not supported

ORDERING INFORMATION

Designation	Type	Order No.
Base unit		
RF shield box, internal gas springs, assembled	R&S®CMW-Z10	1204.7008.02
RF shield box, external gas springs, assembled	R&S®CMW-Z10	1204.7008.04
Antenna coupler, up to 6 GHz (mandatory selection)	R&S®CMW-Z11	1204.7108.02
Options		
D-Sub feedthrough	R&S®CMW-Z12	1204.7208.02
D-Sub feedthrough, extended DC power pin connector	R&S®CMW-Z12	1204.7208.04
USB 2.0 feedthrough	R&S®CMW-Z13	1204.7308.04
RF feedthrough	R&S®CMW-Z14	1204.7408.02
Audio measurement	R&S®CMW-Z15	1204.7508.02
Second antenna element for diversity/MIMO measurements (requires R&S®CMW-Z14)	R&S®CMW-Z16	1204.7808.02
Ethernet feedthrough	R&S®CMW-Z18	1204.7050.02
RF cable, up to 6 GHz	R&S®CMW-Z110	1204.7608.02
Additional handle, rotatable	R&S®CMW-Z120	1204.7708.02

Service that adds value

- ▶ Worldwide
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- ▶ Customized and flexible
- ▶ Uncompromising quality
- ▶ Long-term dependability

Rohde & Schwarz

The Rohde&Schwarz technology group is among the trailblazers when it comes to paving the way for a safer and connected world with its leading solutions in test & measurement, technology systems and networks & cybersecurity. Founded more than 85 years ago, the group is a reliable partner for industry and government customers around the globe. The independent company is headquartered in Munich, Germany and has an extensive sales and service network with locations in more than 70 countries.

www.rohde-schwarz.com

Sustainable product design

- ▶ Environmental compatibility and eco-footprint
- ▶ Energy efficiency and low emissions
- ▶ Longevity and optimized total cost of ownership

Certified Quality Management

ISO 9001

Certified Environmental Management

ISO 14001

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