RWC7100A

RF Shielding Enclosure



DESCRIPTION

The RWC7100A features a triple contact shield structure that guarantees more than 100 dB isolation. Such an excellent shielding effectiveness in wide band up to 6GHz is very suitable for measuring the following products which have quite good sensitivity performance.

LTE, NB-IoT devices (700MHz, 2-6GHz)
WIFI devices (2.4GHz, 5.8GHz)
Bluetooth devices (2.4GHz)
Sigfox, LoRa devices (400MHz, 900MHz, 2.4GHz)
GNSS devices(1.2-1.6GHz)

FEATURES

Triple Contact Shield Structure

It guarantees stable shielding characteristics in a wide frequency range up to 6GHz.

Internal RF Absorber

It provides a more stable internal RF test condition.

Easy Maintenance

Users can easily replace shield gaskets manually.

Various IO Modules Provided

Users can easily replace any IO modules manually.

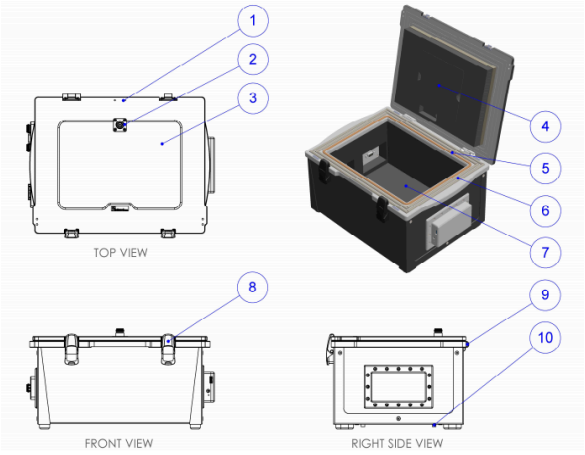
Antenna Can be Mounted on the Lid

It provides users with a more stable test environment.

A Steady Hold Hinge Applied

This ensures user safety and facilitates ease of operation.

SPECIFICATION



Part Names

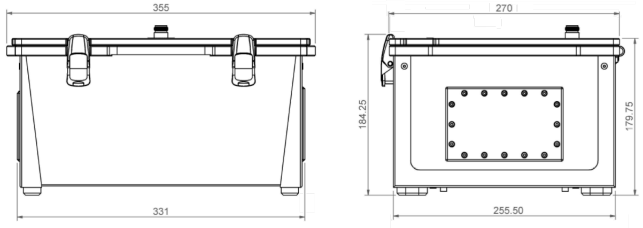
① 2 x M3 Hole	M3 screw holes for cable fixing (DP 5mm)
② N type Ant. Port	Additional RF port for RWC8201A antenna
③ Lid(Door)	Manual method to open/close the door from the top
④ 4 x M3 Hole	Mounting position for RWC8201A (DP 8mm)
⑤ EMI Mesh Gasket	Detachable for optimal RF shielding
⑥ EMI Foam Gasket	Detachable for optimal RF shielding.
⑦ Absorber	Attached to minimize RF reflections.
⑧ Latch	Lid latch handle
⑨ Hinge	Lid Hinge
⑩ 4 x M4 Hole	M4 screw holes for the enclosure fixing (DP 5mm)

Shielding Effectiveness

Shield Effectiveness (dB)	Frequency
≥ 100*	400MHz to 6.4GHz

*It is measured with blank panels mounted.

Dimension & Weight



Dimensions, W x D x H mm (inches)

Workspace	260 x 190 x 100 (10.2 x 7.5 x 3.9)
Exterior	355 x 270 x 185 (14.0 x 10.6 x 7.3)
Weight	Approx. 8.5 kg

Packing, W x D x H mm (inches)

Packing	450 x 350 x 270 (17.7 x 13.8 x 10.6)
Weight	Approx. 10.5 kg

Environmental Conditions

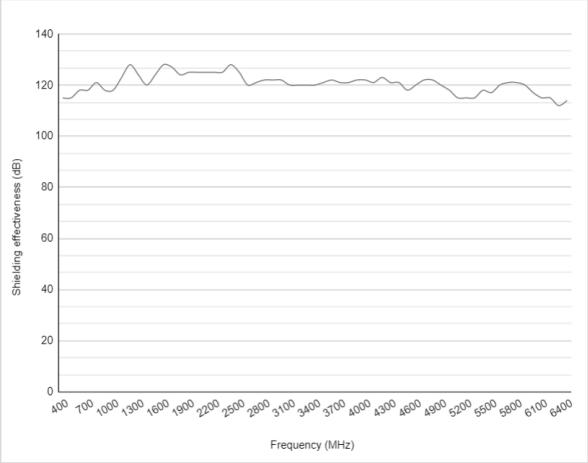
Temperature Range	For operating +20 °C to +30 °C
	For storage –10 °C to +50 °C
Damp heat	75 % relative humidity, non condensing at +10 °C to +30°C

SHIELDING EFFECTIVENESS

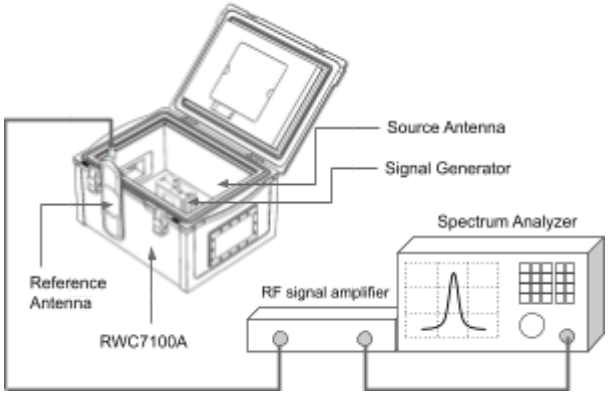
The RWC7100A is a precise RF Shielding Enclosure designed and manufactured to be robust. To maintain optimal shielding performance at all times, maintenance is required according to the prescribed procedure. Additionally, depending on the number of uses and the period of use, it may require calibration. Regular measurement of shielding effectiveness is also recommended.

Measurement Result of SE of the RWC7100A

This is an example data measured using a method modified from the IEEE-STD-299.1 standard.

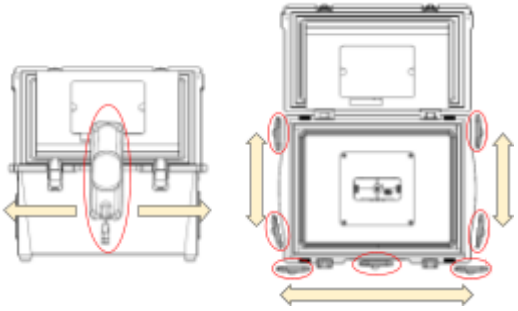


How to Set Up for Measuring Shielding Effectiveness

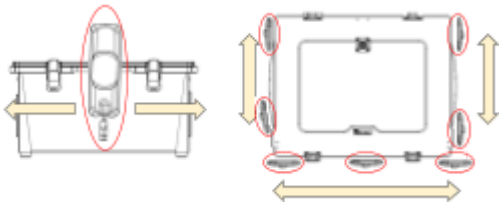


Measurement Procedure

1) Set up the source antenna with a signal Generator inside the RWC7100A to be located in the center.
2) Connect the spectrum analyzer and reference antenna with RF cable. If necessary, use an adequate RF amplifier as well.
3) Set up the spectrum analyzer as follows:
   - Center Frequency: 400.1MHz (Change to 900.1MHz, 2400.1MHz, 5800.1MHz, respectively)
   - Span: 500Hz
   - Resolution BW: 4.7Hz (or Auto)
   - Reference Level: 0dBm
   - Scale 20 dB/div
4) Set up the signal generator as follows:
   - Frequency : 400.1MHz
   - Power : +10dBm
5) Open the RWC7100A lid and measure the power(Pref) moving the reference antenna to several points.



6) Close the RWC7100A lid and measure the output power (Pmes) moving the reference antenna at the same positions in step 5).



7) Calculate the Shielding Effectiveness.
   Pse[dB] = Pref[dBm] - Pmes[dBm]
8) Change the signal generator to the next frequency and repeat the measurement process, step 3) to 7).

MAINTENANCE

Precautions During Operation

Refrain from using the RWC7100A in a place subject to much vibration, direct sunlight, outdoor and where the ground is not flat. If the RWC7100A is not used for a long time, store it in a dry place away from direct sunlight, covered with vinyl or placed in a cardboard box. If the RWC7100A is left with the lid closed for a long time, the performance of the shield gasket may deteriorate. Before using it again, be sure to open the lid and keep it open for at least one day, then check the shielding effectiveness.

Recommended Routine Maintenance and Method

In order to ensure the optimal performance of the product, periodic inspection is required according to the number of uses and period of use.

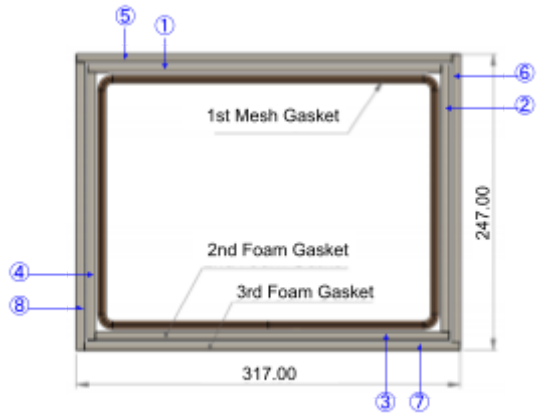
1) Check to ensure that the Module, Hinge, and Latch screws are not loose and tighten if necessary.
2) Check to ensure that the torque of the hinge mounted on the lid has not weakened. The hinge has passed the 30,000 open-close private cycle test, but the torque may weaken as the number of openings and closings increases. However, weakening of hinge torque does not affect the shielding effectiveness.
   If the torque is weak, the lid could shut abruptly at a certain point, so please be careful as it may be hazardous. If necessary, please contact customer support or an agent for replacement. It can be replaced by the customer, but special attention and consultation are required as it may affect the shielding effectiveness.
3) Check for damaged cable harnesses and replace them if necessary.
4) Shielding performance may be greatly reduced if metal corrosion or oxidation progresses on the surface that the gasket touches on the lid or on the gasket frame. Clean thoroughly with alcohol and a soft cloth. It must be kept clean at all times.
5) Typically, the shielding effectiveness performance of new products has passed 10,000 open-closed private cycle tests. However, it is recommended to replace the gasket if the shielding performance does not improve even after regular maintenance has been performed.
6) To maintain the shielding effect, refer to the performance test. It is recommended to perform a test approximately every 5,000 times or at intervals of 6 months.

Recommended EMI Gasket Replacement

1) Generally, after opening and closing the lid about 30,000 times, the gasket's contact surface may be damaged. In this case, perform routine maintenance first, and if it does not improve, replace the gasket.
2) Generally, long-term storage of the product with the lid closed may affect the elasticity of the foam gasket to decrease even if it is used less than the recommended number of lid openings and closings.
   In this case, perform routine maintenance first and keep the lid open for more than one day, and then perform the performance test. If there is no improvement, replace the gasket.

How to Replace EMI Gasket

1) Order the O7100A-91 option for maintenance.
2) Remove all EMI gaskets already installed. (1st Mesh gasket, 2nd Foam gasket, 3rd Foam gasket)
3) Wipe the foreign substances on the surface that the gasket touches on the lid or inside the gasket frame thoroughly with alcohol and a soft cloth.



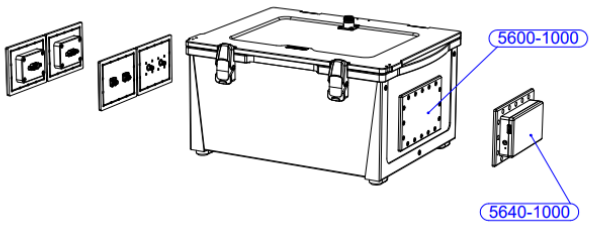
4) In the case of the 1st Mesh Gasket, place the seam in the center and insert it slowly with an even density.
5) In the case of the 2nd and 3rd Foam Gasket, refer to the picture above, remove the tape on the back of the gasket and insert it into the gasket frame in the order of ① to ⑧
6) Visually inspect for excess RF gasket between the top lid and gasket frame.
7) Check the shielding effectiveness by referring to the performance test method. Refer to page 9 for the Performance Tests. If it is not normal even after replacement, please contact customer support.

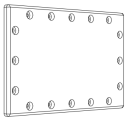
IO MODULES

When ordering the RWC7100A, customers can choose from IO modules to be installed. The IO modules are designed so that customers can replace them themselves while using the RWC7100A. To replace and install a newly ordered module later, remove the already installed module from the enclosure, check for any foreign substances on the surface where the IO module contacts, and clean it thoroughly with a soft cloth using alcohol. Then, install by tightening the hexagon bolts included with the purchased module. After installation, be sure to measure the shielding effectiveness following the guided procedure.

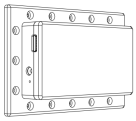
Applicable Modules to Each Side

Item	Descriptions
Type A, IO Module Mounted on the Right Side	

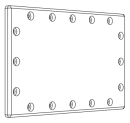




Blank Module, Type A (5600-1000)
- Outside dimensions (W x D x H mm): 135 x 85 x 5

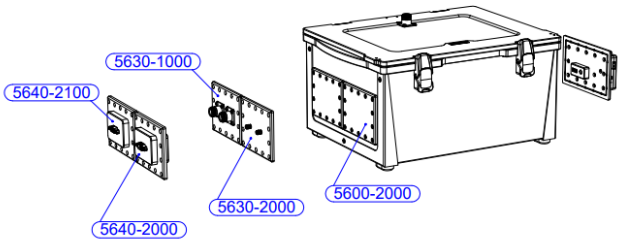


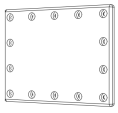
USB3.0 Fiber Interface Module, TypeA (5640-1000)
- Outside dimensions (W x D x H mm): 135 x 85 x 26
- IO Port: 1 x USB3.0 only (not backward compatible)
- IO Port: 1 x DC IN (V In: DC 5V to DC 17V)
- IO Port: 1 x DC Out(V Out=VIn), USB3.0 Out(USB Vout:5V3A)
- One 1 x DC 12V 3A Adapter included
- One USB 3.0 compatible cable included



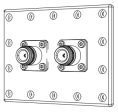
Customization Panel, Type A (5690-A00X)
- Outside dimensions (W x D mm): 135 x 85
- Additional customization panel to the use cases

Type B, IO Module Mounted on the Left Side

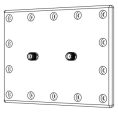




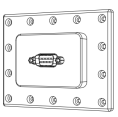
Blank Module, Type B (5600-2000)
- Outside dimensions (W x D x H mm): 102 x 80 x 5



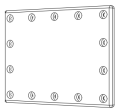
RF N Type Module, Type B (5630-1000)
- Outside dimensions (W x D x H mm): 102 x 80 x 22
- Connector: 2 x N(F) outside to SMA(F) inside
- Unused RF ports must be covered with caps, and please use shielded cables to ensure shielding effectiveness.



RF SMA Module, Type B (5630-2000)
- Outside dimensions (W x D x H mm): 102 x 80 x 13
- Connector: 2 x SMA(F) outside to SMA(F) inside
- Unused RF ports must be covered with caps, and please use shielded cables to ensure shielding effectiveness



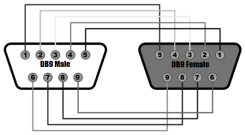
D-Sub 9Pin Module, Type B (5640-2000)
- Outside dimensions (W x D x H mm): 102 x 80 x 24
- DB 9P(M) outside to DB 9S(F) inside 5,000pF Pi Filter
- Unused ports must be covered with a cap, and please use shielded cables to ensure shielding effectiveness



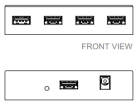
Customization Panel, Type B (5690-B00X)
- Outside dimensions (W x D mm): 102 x 80
- Additional customization panel to the use cases

D-SUB9 Module Pin map

The DB9 is connected 1:1 in a cross configuration, as shown below Figure A-4, and cannot be changed by user's order. Specifically, the DB9 type is configured with Female on the inside and Male on the outside, as shown below. The DB9 type can be specified as either Male or Female when placing an order.



OTHER ACCESSORIES

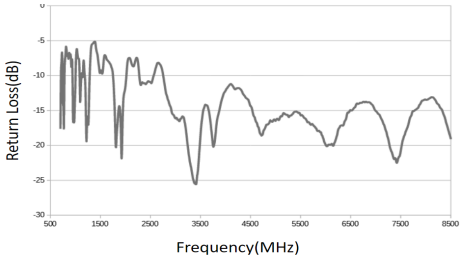
Item	Descriptions
	**EMI Shielding Gasket Set(07100A-91)** • 1 x Mesh Gasket is included • 2 x Foam Gaskets are included • Installation guide sheet included
	**IO USB 3.0 to 2.0/3.0 HUB** • Dimensions (W x D x H mm): 94 x 63 x 22 • IO Port: 1 x USB 3.0 to 1 x USB 2.0 and 3 x USB 3.0 • IO Port: 1 x DC IN (12V to 24V) • 1 x DC Plug to DC Plug cable included • 1 x USB A(M) to USB A(M) cable included • This hub can be used inside the enclosure with the • Window driver need to be installed 5640-1000, and both USB 3.0 and USB 2.0 are available
	**Wide-band RHCP*/ LHCP** Antenna Set** • RWC8201A mounted on the lid of RWC7100A • Antenna Dimensions (W x D x H mm): 130 x 130 x 15.5 • Frequency Range: 700MHz to 8.5GHz • N(F) to SMA(F) Adaptor and RF cables installed * RHCP(Right Hand Circular Polarized) ** LHCP(Left Hand Circular Polarized)

Wide-band RHCP/LHCP Antenna Set

The RWC8201A is a circular polarized antenna that has circular polarization. It provides an excellent test environment for measuring the RF characteristics of the DUT, without issues of positional sensitivity or the angle of the DUT inside a shielding enclosure. This is due to its low gain and the fact that the polarized main beam is isotropically propagated forward. It is designed for standalone use or to be mounted on the lid of the RWC7100A, which has a very high shielding effectiveness of over

100dB. For a detailed description of the RWC8201A, Refer to its datasheet. RWC8201A Antenna Datasheet.
RWC8201A is the product code of the wideband antenna set, and O7100A-92/93 is the order code for the RWC8201A, used to order its installation on the RWC7100A.

Mounted RWC8201A	N-type Port of RWC8201A
	



ORDERING INFORMATION

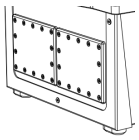
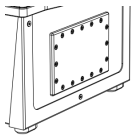
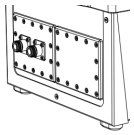
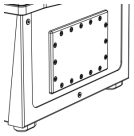
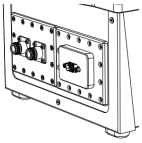
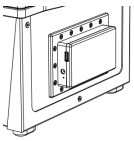
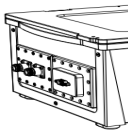
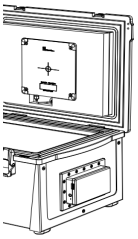
When placing an order, please select the C7100A-0x with IO modules. All IO modules and antenna sets are shipped after being installed in the enclosure.

Ordering Information

Order Code	Descriptions
C7100A-00	RWC7100A RF Shielding Enclosure - Frequency Range: 400 - Workspace(W x D x H mm): 260 x 190 x 100
5600-1000	Module, Blank A (135 x 85 mm)
5600-2000	Module, Blank B (102 x 80 mm)
5630-1000	Module, 2 x N(F) to SMA(F) (102 x 80 mm)
5630-2000	Module, 2 x SMA(F) to SMA(F) (102 x 80 mm)
5640-1000	Module, USB 3.0 Fiber Interface (135 x 85 mm) - 1 x USB3.0 only (not backward compatible)
5640-1100	Module, USB 3.0 to 2.0 HUB (94 x 63 x 22 mm) - 4 USB Connectors
5640-2000	Module, D-Sub 9P(M) to 9P(M) (102 x 80 mm)
5640-2100	Module, D-Sub 9P(F) to 9P(F) (102 x 80 mm)
5690-X00X	Module, Panel Customization
O7100A-92 O7100A-93	Wide Band Circular Antenna Set - Frequency Range: 700MHz to 6.5GHz - Dimensions(W x D x H mm): 130 x 130 x 15 - Connector: SMA(F) Antenna - O7100A-92 : RHCP / O7100A-93 : LHCP * Options available for initial order *

Ordering Example

The below is an example of how customers order the RWC7100A with IO modules. For more information, please contact our sales team or distributor before placing an order.

Selected Option	Module Type		Order Code
	Type B (Left Side)	Type A (Right Side)	
• Blank Modules			• C7100A-0x • 5600-1000 • 2 x 5600-2000
• RF Module Unspecified ports should be selected as blank panels			• C7100A-0x • 5600-1000 • 5600-2000 • 5630-1000 or 5630-2000
• RF Module • D-Sub Module • USB Module			• C7100A-0x • 5630-1000 or 5630-2000 • 5640-1000 • 5640-1100 (if necessary) • 5640-2000
• RF Module • D-Sub Module • USB Module • Wide-band Circular Antenna			• C7100A-0x • 5630-1000 or 5630-2000 • 5640-1000 • 5640-1100 (if necessary) • 5640-2000 • O7100A-92 or O7100A-93

WARRANTY

RedwoodComm provides a 2-year warranty for the RWC7100A RF shielded enclosures. Issues arising from normal wear and tear are excluded from the warranty. Normal wear and tear refers to the wear or discoloration of foam gaskets and mesh gaskets, scratches or discoloration of panels, loosening or damage to hinges due to use, damage to internal RF absorbers, and contamination from water or chemicals. Foam and mesh gaskets can affect shielding performance depending on usage and storage conditions, and should be replaced to maintain performance. Additionally, hinges, latches, and RF absorbers are consumables that will need replacement at some point, and the cost will be charged to the customer. Please refer to the maintenance guide for details.

sales@redwoodcomm.com
https://www.redwoodcomm.com/
All specifications are subject to change without notice.