

Shielded Tent

1 Introduction

The TBST-100/100/200 shielded tent is designed to suppress interference from ambient noise when carrying out EMC pre-compliance measurements. The TBST-100/100/200 has a footprint of 100 cm x 100 cm and a height of 100 cm. The tent is designed to accommodate Tekbox open GTEM cells.

The shielded tent is made of two layers of conductive fabrics. It is supported by 2020 aluminium profiles. The filter panel at the rear side provides a 240V/10A mains AC filter, two general purpose 240V/10A AC/DC filters and four coaxial feed-through adapters with screw caps. The access opening is sealed with conductive Velcro tape.



2 Warning

Make sure that your set up prevents main phase getting into contact with the metal parts/fabrics of the tent. Always connect protective earth to avoid any hazard of electrical shock.

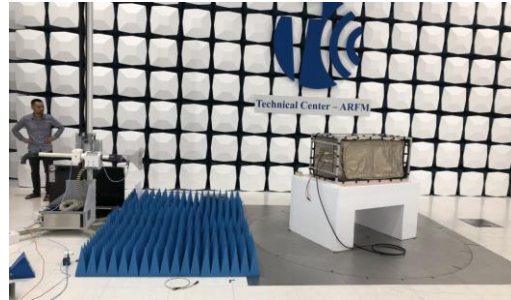
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3 Specification

Outer dimensions:	104 cm x 101 cm x 204 cm
Opening dimensions:	130 cm x 46 cm
Frame:	20 mm x 20 mm extruded aluminium profiles
Shielding:	two layer of conductive silver fabrics
Suspension:	Velcro tape
Filter panel:	1 x 240V / 10A mains AC filter, C19 socket 2 x 240V / 10 A AC/DC filters, attached cables with Banana couplers 3 x N-Female coaxial feed-through connectors with screw caps 1 x BNC-Female coaxial feed-through connector with screw caps
Internal AC-socket:	pigtail cable with detachable female Schuko socket + country specific AC cables with C13 connector
Attenuation:	up to 50 dB in the range 10 MHz to 6 GHz, see chapter 3
Weight:	17kg + 3kg (packaging)

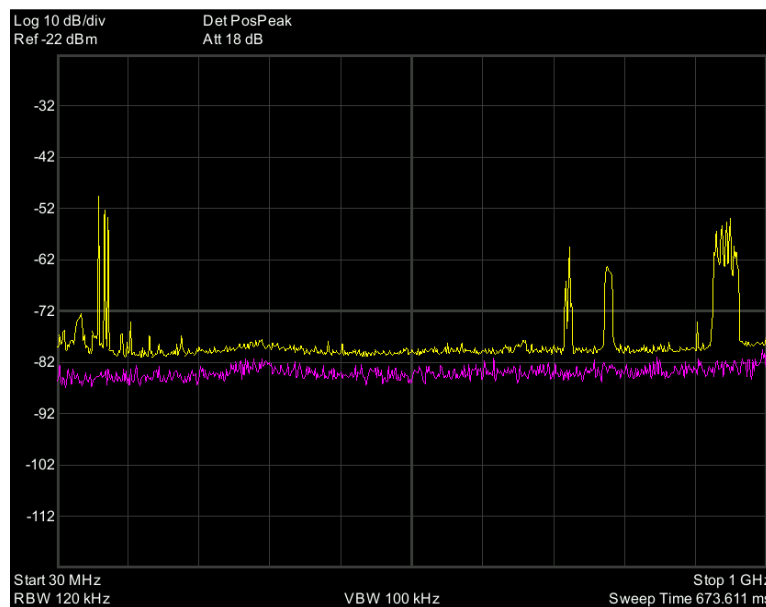
4 Ambient noise attenuation

Up to 10 MHz: up to 30 dB
10 MHz – 6 GHz: up to 50 dB



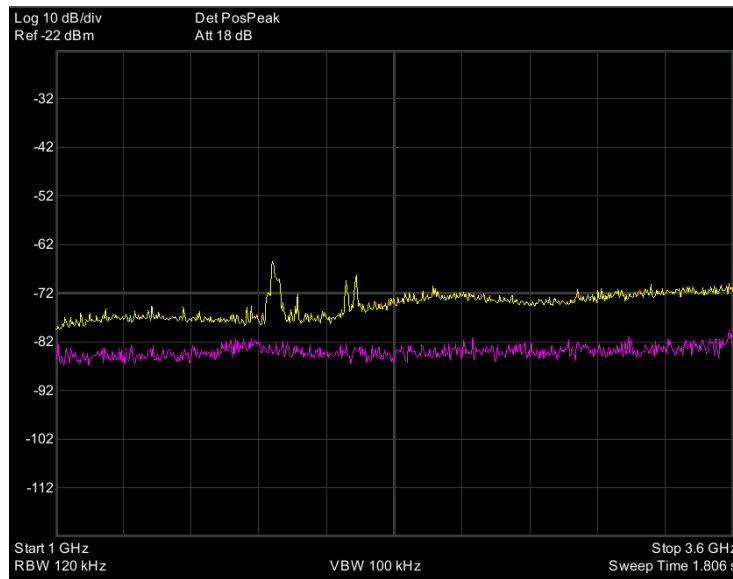
4.1 Example: GTEM cell

The ambient noise spectrum plots below were taken with the TBGTC1 open GTEM cell. The pink graph shows the ambient spectrum inside the shielded tent and the yellow graph shows the ambient noise spectrum picked up by the GTEM cell outside the tent.



TBGTC1, ambient noise outside (yellow) and inside the tent (pink); 30 MHz – 1 GHz

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TBGTC1, ambient noise outside (yellow) and inside the tent (pink); 30 MHz – 1 GHz

5 Assembly

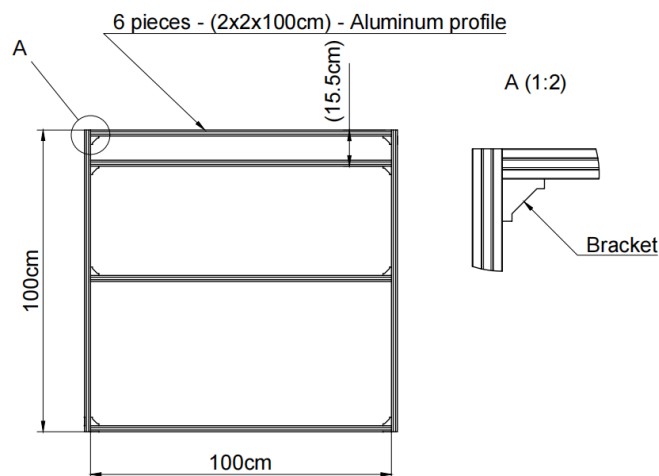
It is not essential to first insert the profile nuts into the profile grooves. The nuts can be inserted and positioned in line with the grooves. When tightened, the nuts spin 90° and lock at a right angle to the direction of the groove.

The tent frame consists of 10 pieces aluminum profiles with 100cm length and 4 pieces aluminum profiles with 200 cm length.

There are two kinds of screws. The shorter version is used to secure the filter plate to the frame.

Step 1:

First, assemble the top and bottom frames. For each frame, attach four pieces 100 cm aluminum profiles to each other as shown in the drawing below.

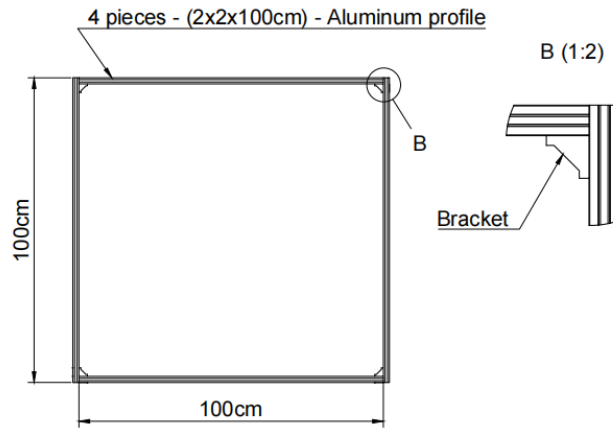


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bottom frame

Step 2:

Attach the brackets to the top and bottom frame as shown below

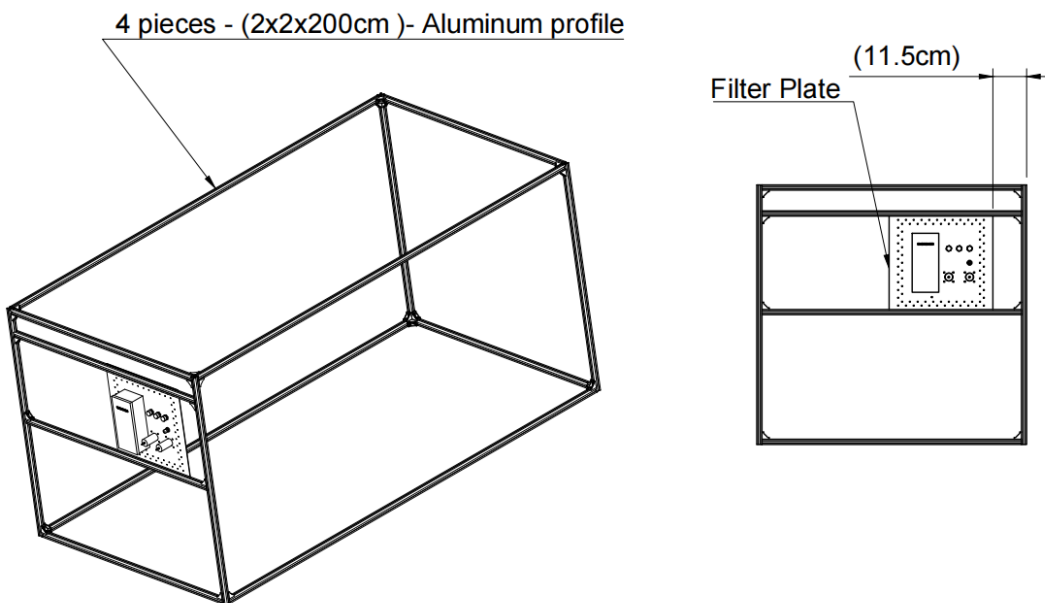


Brackets for the vertical profiles added

Step 3:

Complete the frame by connecting the top and bottom frames with 4 pieces 120 cm (82 cm) aluminum profiles.

It should be noted that the filter plate is only shown for illustration purposes. The filter plate is pre-assembled with the tent fabrics and is connected after the frame is completed.



Picture 8: completed frame

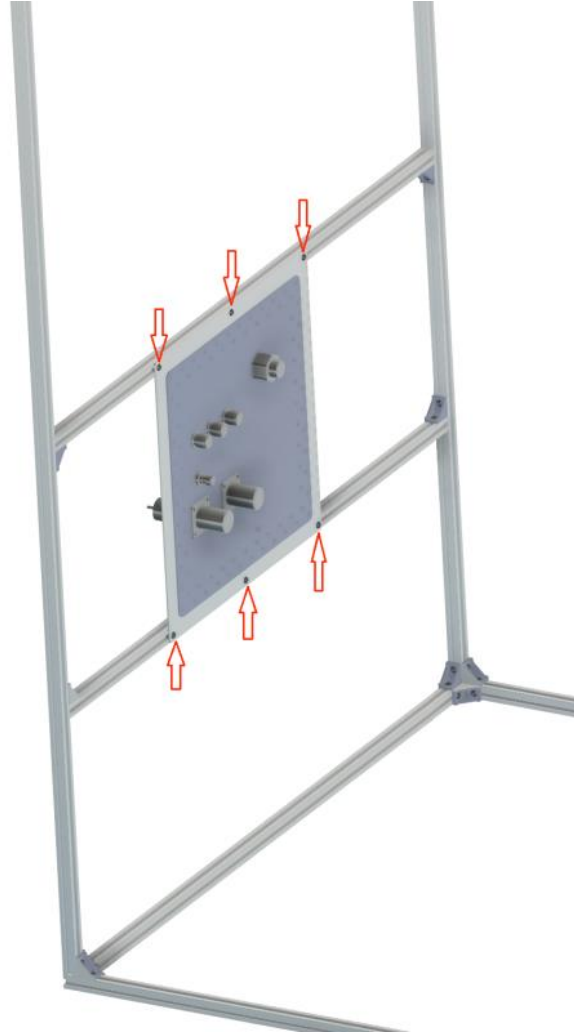
Step 4:

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Unpack the fabrics and remove the outer foam protection of the filter plate. **To avoid damaging the fabrics, do not open the plastic wrapping with a knife or scissors.**

Place the frame with the left side at the bottom and support the four corners to get clearance for the filters.

Attach the filter plate with six screws to the frame. Note that the attached fabrics is not displayed in the rendering below



Picture 9: location of the filter plate (attached fabrics not shown)

Step 5:

Unfold the fabrics and fasten it to the frame with the attached Velcro straps.

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Picture 10: fabrics before attaching it to the frame

6 Hints

Minimize residual ambient noise:

When sealing the access opening, make sure there are no gaps between the conductive Velcro hook and loop tapes. Begin closing it at the upper left or right corner and work your way to the diagonally opposite corner. Then begin at the opposite upper corner and see if you can finish without a large wave or gap. If there is a gap, rip the tapes apart at the lowest corner and re-attach them until they fit.

Connect the spectrum analyzer to the tent's connector panel with an RG223 or better cable. RG58 cables should be avoided since they may pick up more ambient noise.

DUT control:

If your DUT requires connectivity to outside control devices or additional multiple voltages, use shielded control cables and feed it through any unused filter or coaxial connector at the filter panel of the shielded tent. You can also use the AC-filter to feed DC supply voltages into the tent. Similarly, the DC filters are capable of carrying AC. Should you need multiple control cables or a USB or HDMI interface, you can feed it sideways through the Velcro tape: use shielded cables and remove a section of the outer jacket to expose the shielding mesh of the respective cable where it would pass the Velcro tape. Then, tightly close the tape, ensuring that the cable shield has good electrical contact with the Velcro. Ensure that the setup is properly grounded, and avoid connecting the mains phase to the sheet metal of the filter panel or the tent's surface.

Internal AC mains connector:

The output of the AC filter is connected to a pigtail with detachable (non over molded) female Schuko connector. Use the supplied Schuko/C13 cable or a travel adapter or similar, to match it with any

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other country specific connector. Alternatively detach the Schuko connector from the pigtail cable and mount a connector that fits your specific requirements.

Protection:

The tent is made of two layers of conductive fabrics that can be damaged by sharp instruments or equipment with sharp edges. Handle with caution.

Insert a cardboard, foam, or other suitable material at the bottom for more protection.

You may also attach MDF or plywood panels to the aluminium frame to cover the tent's bottom or stack stuff on top.

Patch any cuts with the included fabric remnants. You can stitch it with any thread as long as it makes a close contact with the overlaying fabric.

7 Ordering Information

Part Number	Description
TBST-100/100/200-EU	Shielded tent 124 cm x 64 cm x 60 cm, RF cable RG223/N-male to N-male/1.5m, repair patch fabrics, C19 Schuko Power cord
TBST-100/100/200-US	Shielded tent 124 cm x 64 cm x 60 cm, RF cable RG223/N-male to N-male/1.5m, repair patch fabrics, C19 US Power cord, C13 Schuko cable
TBST-100/100/200-UK	Shielded tent 124 cm x 64 cm x 60 cm, RF cable RG223/N-male to N-male/1.5m, repair patch fabrics, C19 UK Power cord, C13 Schuko cable
TBST-100/100/200-AU	Shielded tent 124 cm x 64 cm x 60 cm, RF cable RG223/N-male to N-male/1.5m, repair patch fabrics, C19 Australian Power cord, C13 Schuko cable

8 History

Ar	Date	Author	Changes
V 1.0	28.12.2023	Mayerhofer	Creation of the document

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