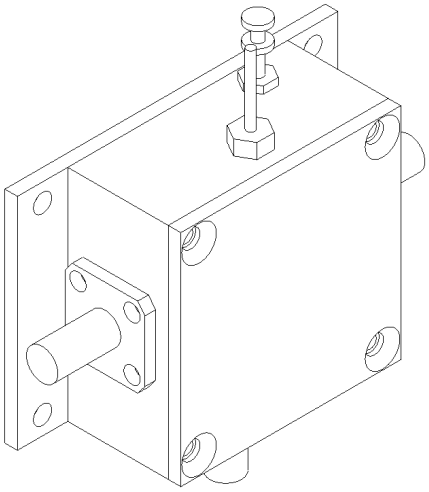
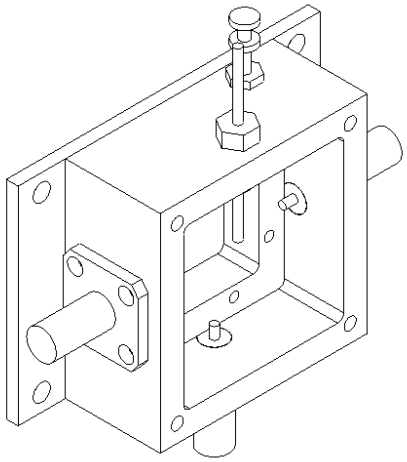
RF-ENCL-MINI-XX-01 RF Enclosure MINI





Features

- Solid aluminium case
- Modular design
- 3 SMA ports
- Blind cover plates for unused ports
- Turret solder terminal
- Feed-through capacitor
- Excellent RF shielding
- Enclosure as heatsink for PCB ground plane
- For radio-frequency applications

Applications

- Power splitters and combiners
- Couplers
- Filters
- LNA
- Power amplifiers
- Mixers
- RF circuit design testbed
- RF test equipment

General description

The RF-ENCL-MINI is a milled aluminium enclosure designed for radio-frequency applications. It consists of a body part which can mount a PCB and up to three SMA connectors. It also comes with a turret terminal for connecting ground and a feed-through capacitor to power a PCB.

The frame is attached to a bottom and top cover plate with a set of screws. This makes the inside of the enclosure easily accessible.

Due to the open and accessible design, the enclosure is also very well suited as a testbed for new radio-frequency PCB designs.

Specifications

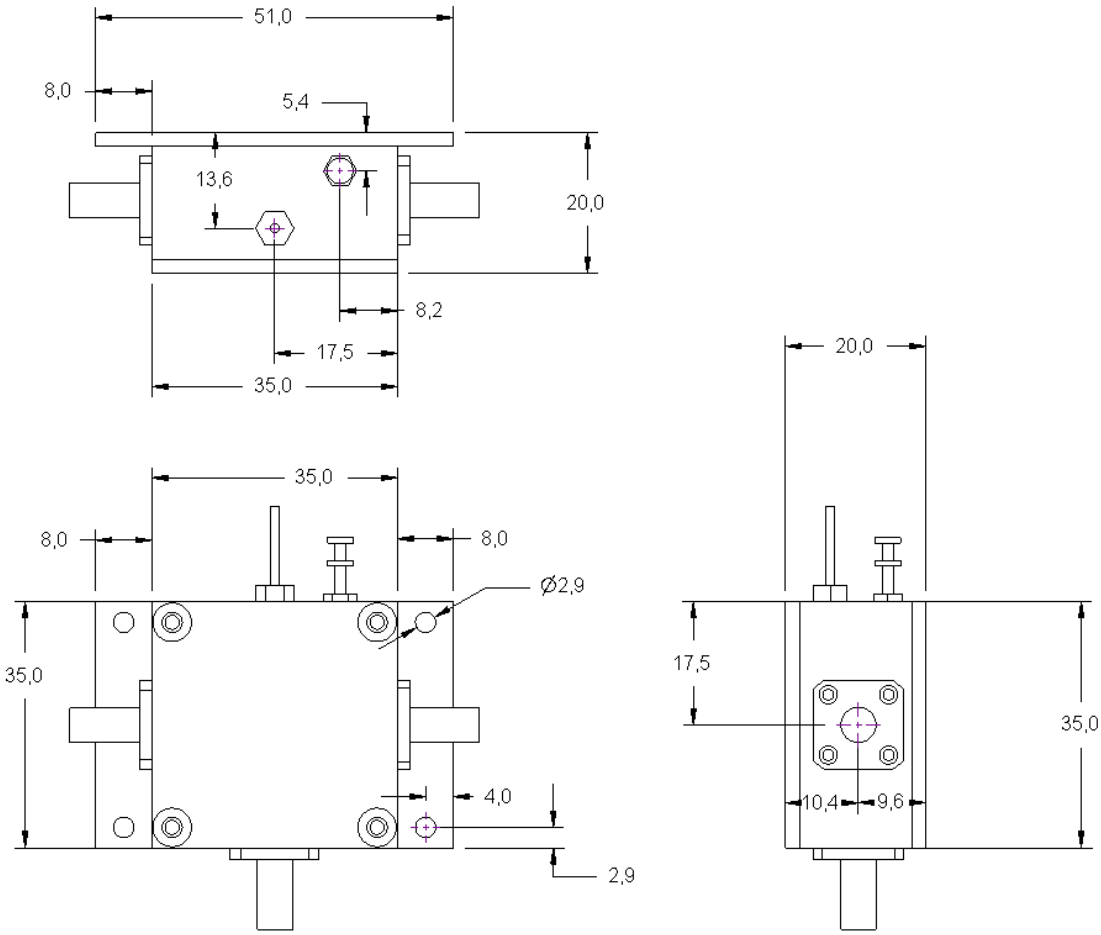
General

Item	Value	Tolerance	Dimension
Number of supported SMA connectors	3	-	-
Maximum interior height, top-side: H_TOP	10	0.1	mm
Maximum interior height, bottom-side : H_BOTTOM	6	0.1	mm
Box weight RF-ENCL-MINI-R01-	0.052 (..YF-01) 0.049 (..NF-01)		kg
Outer dimensions (width x depth x height)	35 x 35 x 20	0.1	mm
Suggested PCB dimensions (width x depth x height)	26.8 x 26.8 x 1.0	0.1	mm

Versions

Type	Feature
RF-ENCL-MINI-R01-**NF**	Box without mounting flange
RF-ENCL-MINI-R01-**YF**	Box with mounting flange

Enclosure Drawings

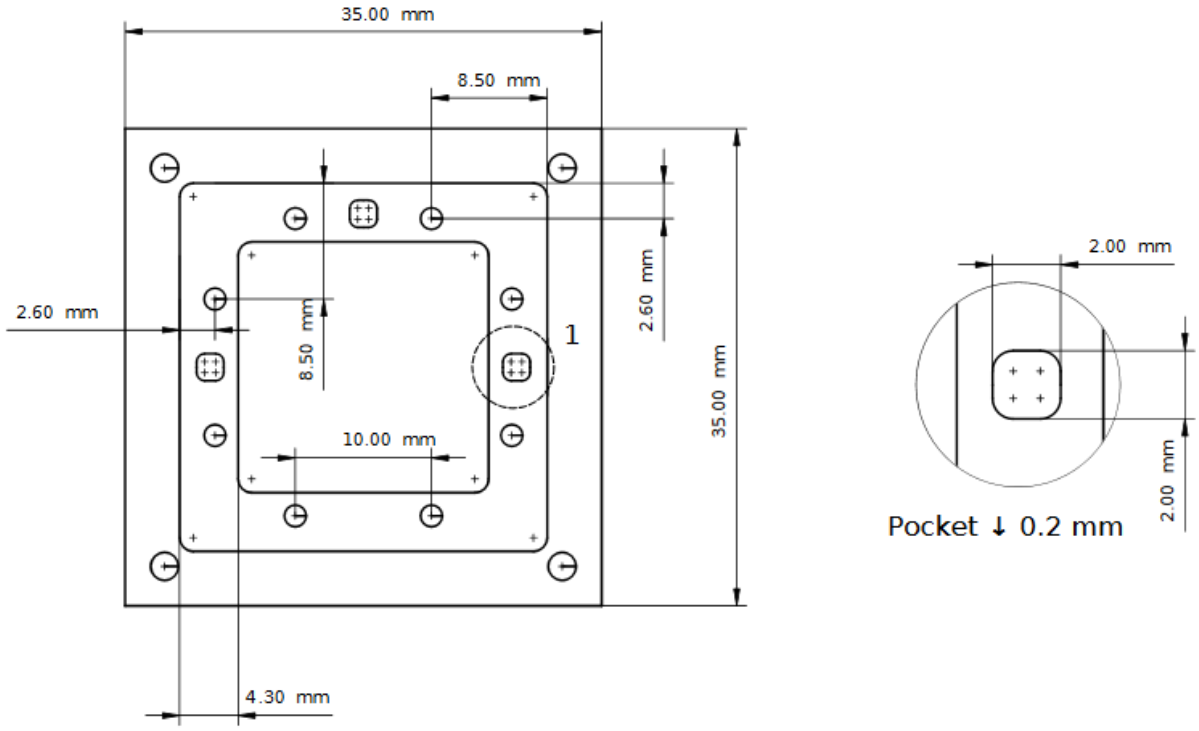


Note1 : All measures in mm. Tolerance : 0.1 mm.
Note2 : Drawing shows the RF-ENCL-MINI-R01-YF version only. However, all dimension for the version RF-ENCL-MINI-R01-NF are identical with the exception of the mounting flanges at the bottom side of the box, which don't exist in the '..-NF' version.

Equipment

PCB mounting points

This drawing shows the aluminum mounting points used to fix a PCB into the enclosure. The PCB is attached with up to eight screws. The PCB itself (and the screws) are not included in the drawing.



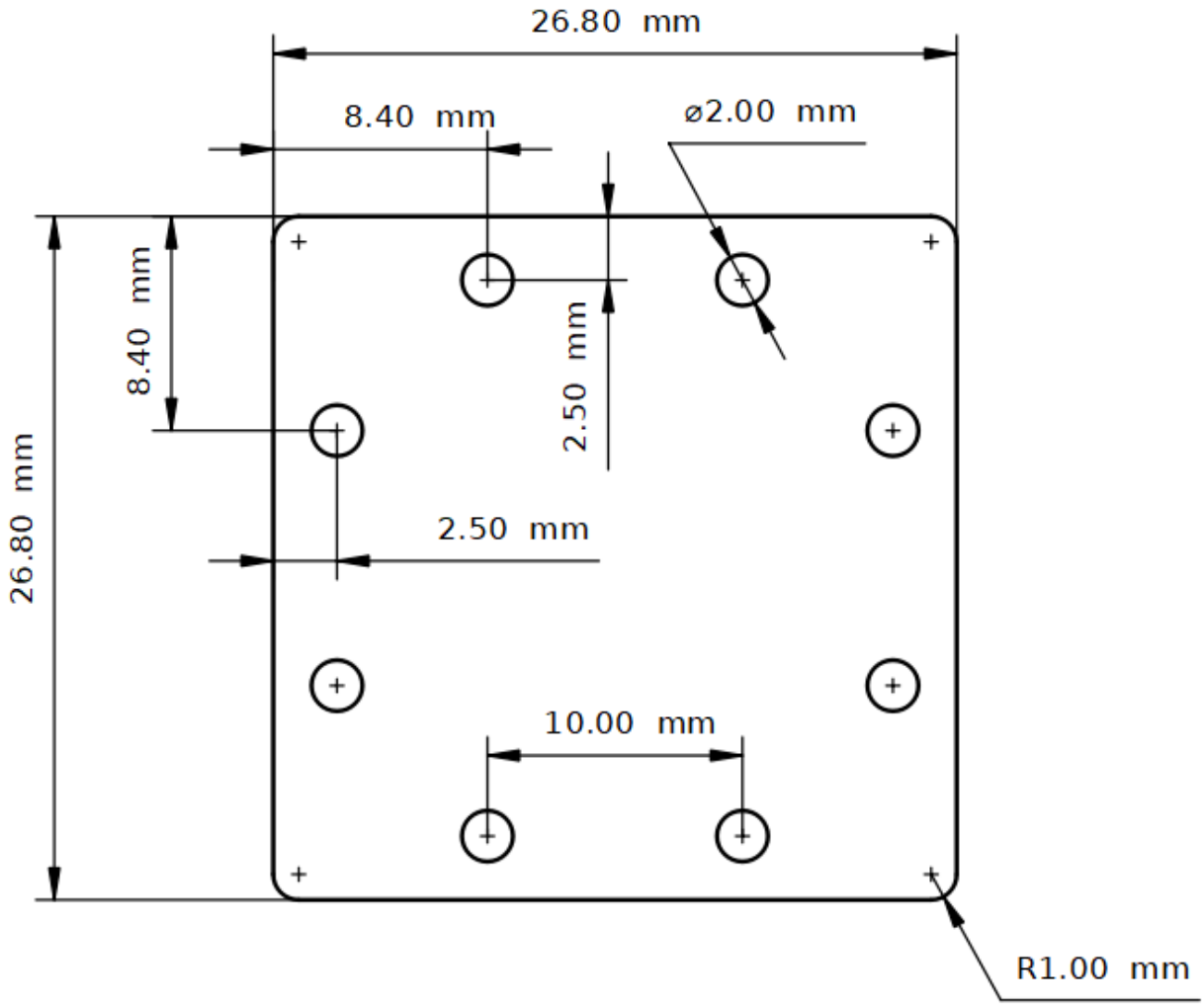
It also shows a small pocket located near each SMA port. It can be used by the designer to reduce the impedance of the SMA landing area. This feature was added during 2024.

Suggested PCB Dimension

The figure below displays a suggested PCB layout that will fit in the enlosure and uses all of the eight mouting holes.

Recommended substrate thickness : 1.0 mm

Note : the module ships with M2 mounting screws (ISO14583) which have a raised cheese head with a diameter of 4.0 mm.

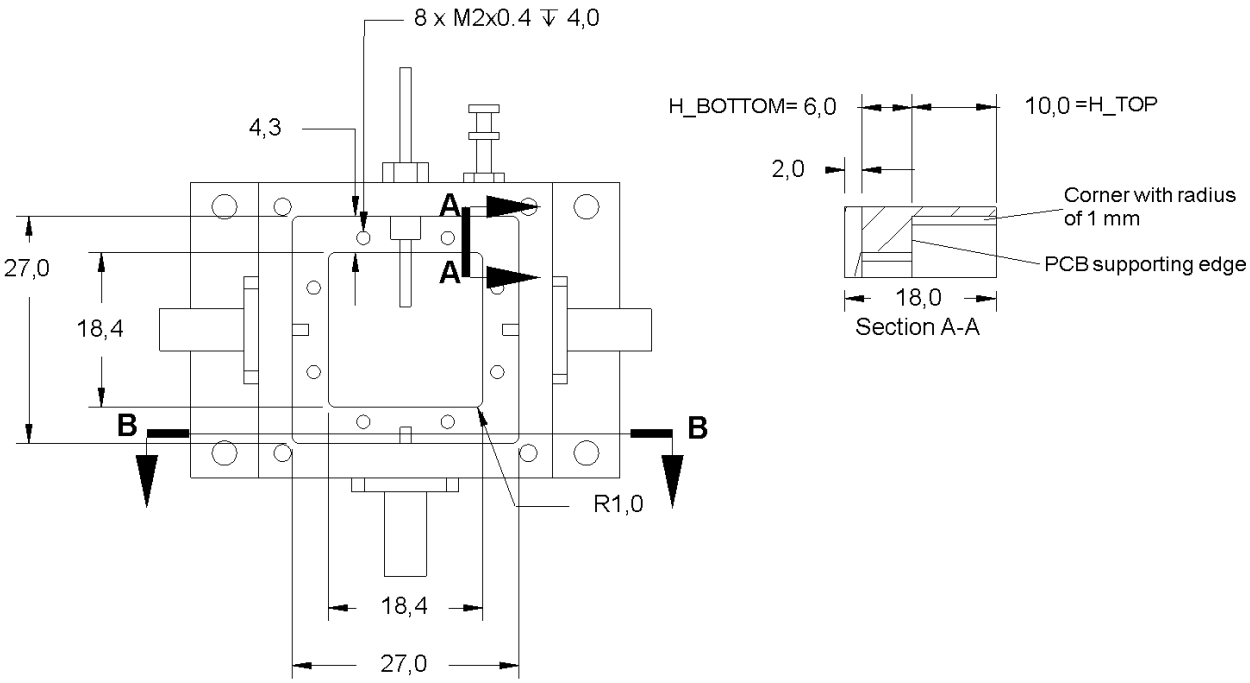


Note1 : All measures in mm. Tolerance : < 0.1 mm.

PCB Mounting Edge

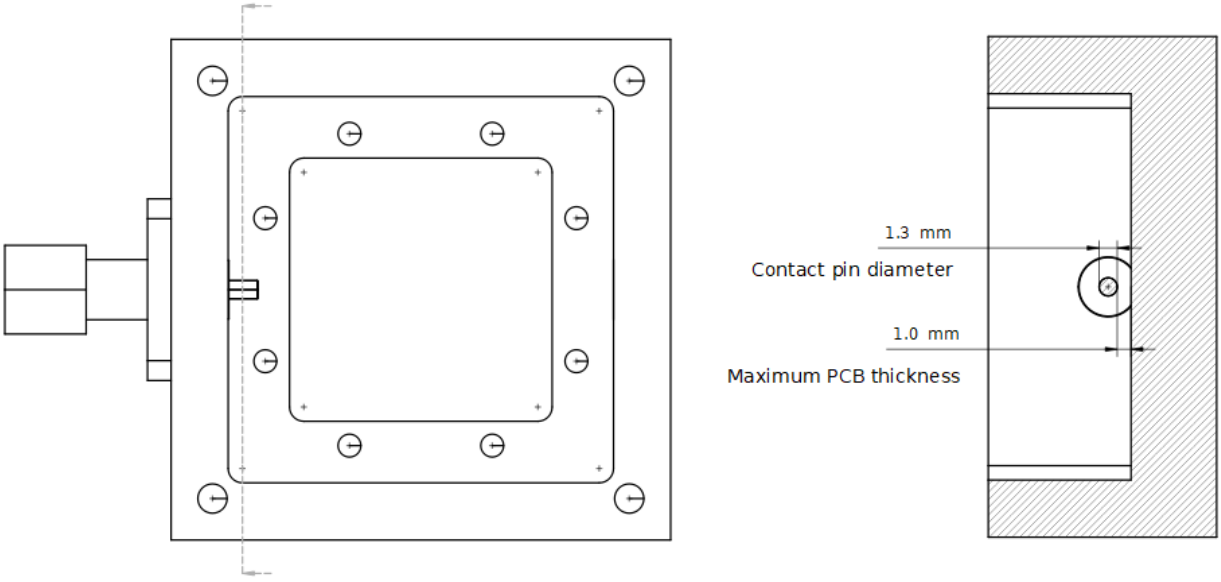
This drawing shows the construction that is used to fix a PCB into the enclosure. The PCB is fastened with up to eight screws. The PCB itself (and the screws) is (are) not included in the drawing.

Top view

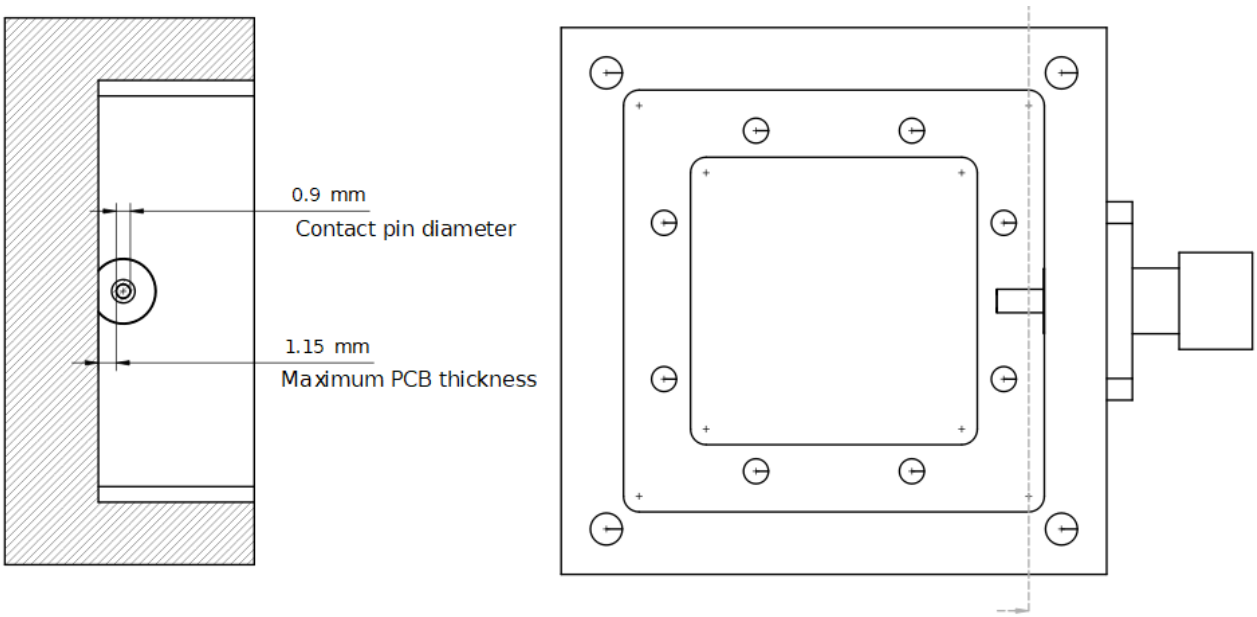


Distances PCB mounting frame and SMA connector pin

Next drawing shows maximum PCB thickness for SMA connector with contact pin diameter of 1.27 mm.



Next drawing shows maximum PCB thickness for SMA connector with contact pin diameter of 0.9 mm (6 GHz SMA connector type, which is obsolete).



Note 1 : All measures in mm. Tolerance : 0.1 mm.
Note 2 : Drawing shows the version RF-ENCL-MINI-R01-YF only. However, PCB mounting in other versions is identical.

Assembly Instructions

Assembly of the box, connectors, assessories and PCB is application dependend and therefore the sole responsibility of the user. The following procedure is intended just as an example of how to assemble the RF-ENCL-MINI with a PCB.

General assembly steps:

1. Fasten the (assembled and soldered) PCB to the frame with the M2 screws.
2. Fix the SMA connectors. Use the M2 screws.
3. Cover unused SMA connector holes with a blind plate. Use M2 screws.
4. Solder the SMA connectors to the PCB
5. Place the feed-through capacitor, if needed. Otherwise, fix the hole with the 4-40 UNC screw.
6. Make a solder connection between the feed through capacitor and the PCB. Generaly, this is done using a very short length of wire.
7. Fix the bottom cover to the frame, using the M2.5 screws.
8. Fix the top cover to the frame, using the M2.5 screws.
9. Fasten the turret terminal to the frame, if needed. Otherwise, fix the hole with the 8-32 UNC screw.

Recommended tooling:

Screw	**Tool**
M2	Torx T6 screw driver
M2.5	Torx T8 screw driver
4-40 UNC	Philips head screw driver
8-32 UNC	Philips head screw driver

General steps to change the PCB

1. Remove the top cover
2. Unscrew all SMA connectors
3. Desolder any connection to the feed-through capacitor, if applicable
4. Now, apply heat with a soldering iron to a SMA connector pin and gently retract the connector out of the frame.
5. Repeat for every SMA connector.
6. Remove the PCB.
7. Follow the general assembly steps to place a new PCB.

Ordering information

- There are two products to select from:
  - with mounting flange: RF-ENCL-MINI-YF-01
  - no mounting flange: RF-ENCL-MINI-NF-01
- Specify the correct SMA connector type for your application:
  - 18 GHz, brass body, gold plated
  - 18 GHz, stainless steel body, optimized for durability

Documentation

Document type	Document ID	URL
Application note	AN-RF-Enclosure-Mini-Ref-Designs-v001	Link..

Revision

Revision	Status	Date
015	Released	Dec 13, 2024

Legal

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