

# **RNG-EXT-01**

**RF range extender**

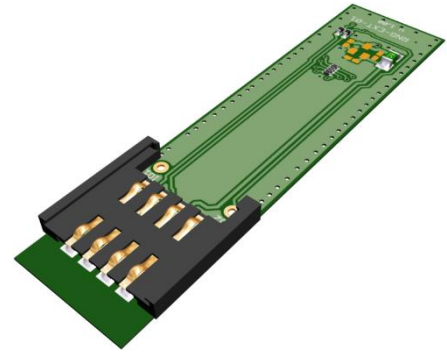
**User's guide**



## Description

RNG-EXT-01 is an adapter to extend RF range of TR transceivers with built-in PCB antenna used with the DK-EVAL-04(A) development kit.

*DK-EVAL-04(A) is optimized for space but not for the range. Thus, the range is shortened due to compressed PCB layout for about 50 % when used without RNG-EXT-01.*



## Key features

- To be plugged in DK-EVAL-04(A) via SIM connector
- Allowing to plug TR transceivers compatible with the SIM connector with plastic holder (e.g. TR-72DA or TR-52DA)
- Series protection resistors on I/O pins
- Resettable fuse for power supply
- Optimized for 868 MHz band

## Applications

- RF range check using DK-EVAL-04(A)
- Demonstration of IQRF range using small antennas
- Reference for user-specific designs

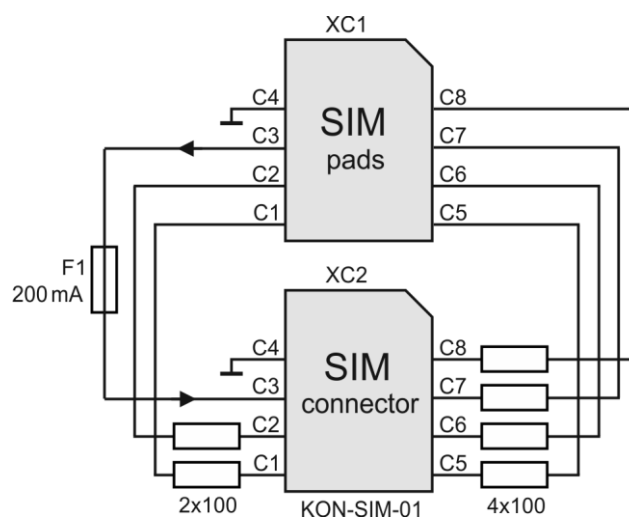
## Counterpoise effect

RF range strongly depends on construction of the device, especially on PCB layout. One of the key factors is layout of the ground with respect to antenna location. Artificial ground can serve to extend the range when located on proper position to create antenna counterpoise. RF signal stays omnidirectional.

RNG-EXT-01 arranges ground planes of the DK-EVAL-04(A) kit in optimal distance towards PCB antenna built in TR transceiver. Thus, it works when used with DK-EVAL-04(A) only, optimally at 868 MHz band. The counterpoise effect at 916 MHz band is somewhat lower.

To utilize counterpoise as much as possible in user equipment, **antenna position should be designed individually for every specific case.**

## Schematic



## Hardware

### Connectors

- XC1: PCB edge connector to be plugged in the DK-EVAL-04(A) SIM socket
- XC2: SIM connector for TR transceiver

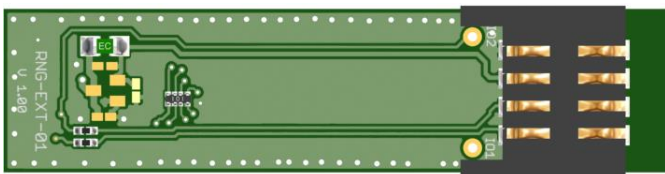
### Supported TR transceiver types

TR types compatible with SIM connector KON-TR-02 (with plastic SIM holder) only. Moreover, TR types without LDO voltage regulator are not allowed when used with DK-EVAL-04 (but may be allowed with DK-EVAL-04A).

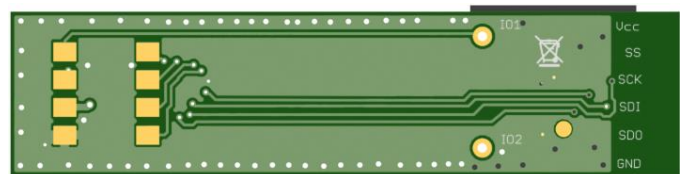
| TR           | Supported        |                 |
|--------------|------------------|-----------------|
|              | With DK-EVAL-04A | With DK-EVAL-04 |
| TR-72D       | Yes              | Yes             |
| TR-76D       | Yes              | –               |
| TR-52D       | Yes              | Yes             |
| TR-53D       | –                | –               |
| TR-54D v1.01 | –                | –               |
| TR-54D v1.02 | Yes              | –               |
| TR-55D       | Yes              | –               |
| TR-56D       | Yes              | –               |
| TR-52B       | Yes              | Yes             |
| TR-53B       | –                | –               |

### Protection

Power supply is protected by resettable fuse. TR I/O pins are protected by serial resistors. These parts have no influence on RF range.



Top view

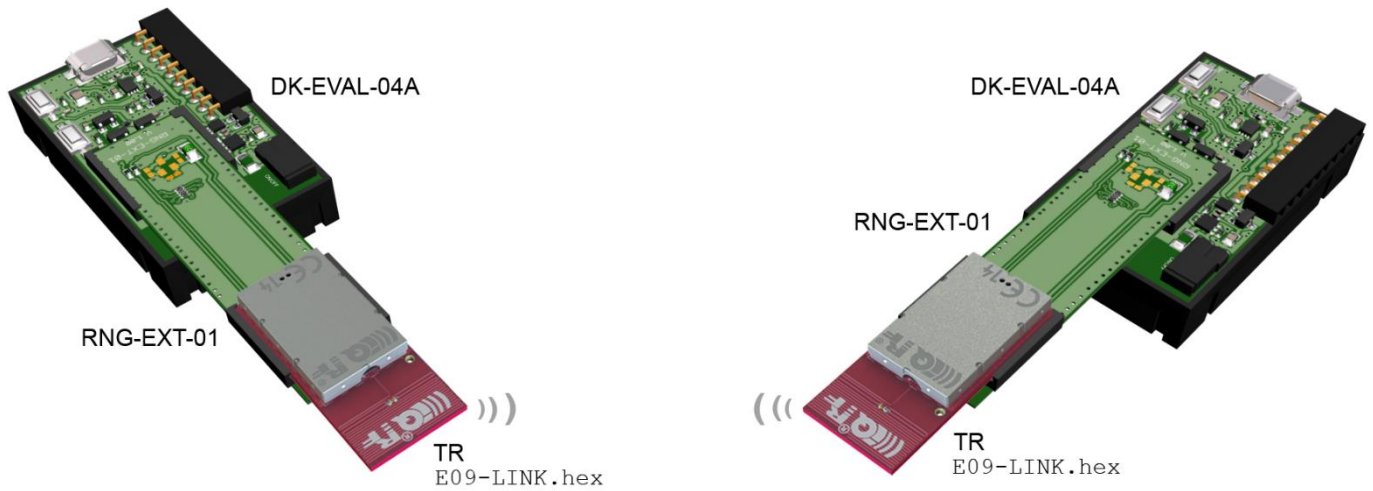


Bottom view

## Application

RNG-EXT-01 is intended for use with DK-EVAL-04(A) only.

## Typical usage



**Tip:** Use basic example E09-LINK from IQRF Startup package for range check.

**Tip:** Use DK-EVAL-04(A) with and without adapter RNG-EXT-01 to observe the counterpoise effect.

**Caution:** The TR transceiver can be plugged / unplugged into / from the SIM connector while powered off only.

## *Product information*

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### **Ordering code**

- RNG-EXT-01      RF range extender

### **Hardware revision**

- v1.01      Standard production
- v1.00      Not public release

### **Document history**

- 160308      First release

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# Sales and Service

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## Quality management

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