

# Specification

Part No. : **NFR.01**

Product Name : Radius External Bracket Mount  
NFC Antenna with RJ45 Connector

Features : For use with NFC readers  
Frequency: 13.56MHz  
Cable: 1M Ethernet  
Connector: RJ45 Jack  
Dimensions: 75\*75\*28mm

**RoHS Compliant**



## 1.Introduction

The Radius, NFR.01, is an external bracket mount NFC (Near Field Communication) antenna for use with NFC readers.

This enables your device to execute point-to-point data transmission without contact. This design is matched for optimal performance with typical NFC chipsets.

With its own mounting bracket, the NFR.01 can be easily installed on a wall or metal panel. To strengthen robustness in outdoor applications, the NFR.01 antenna and mounting bracket are protected by a heat-resistant, high-impact resistant UV stabilized ASA enclosure.

An RJ45 Jack connector is embedded in the housing to allow for ease of connection with ethernet cables to the reader. A 1m ethernet cable is included in the kit for connection purposes.

Custom cable length or type such as twisted pair is also available. Contact your regional Taoglas sales office for any product support.



## 2. Specifications

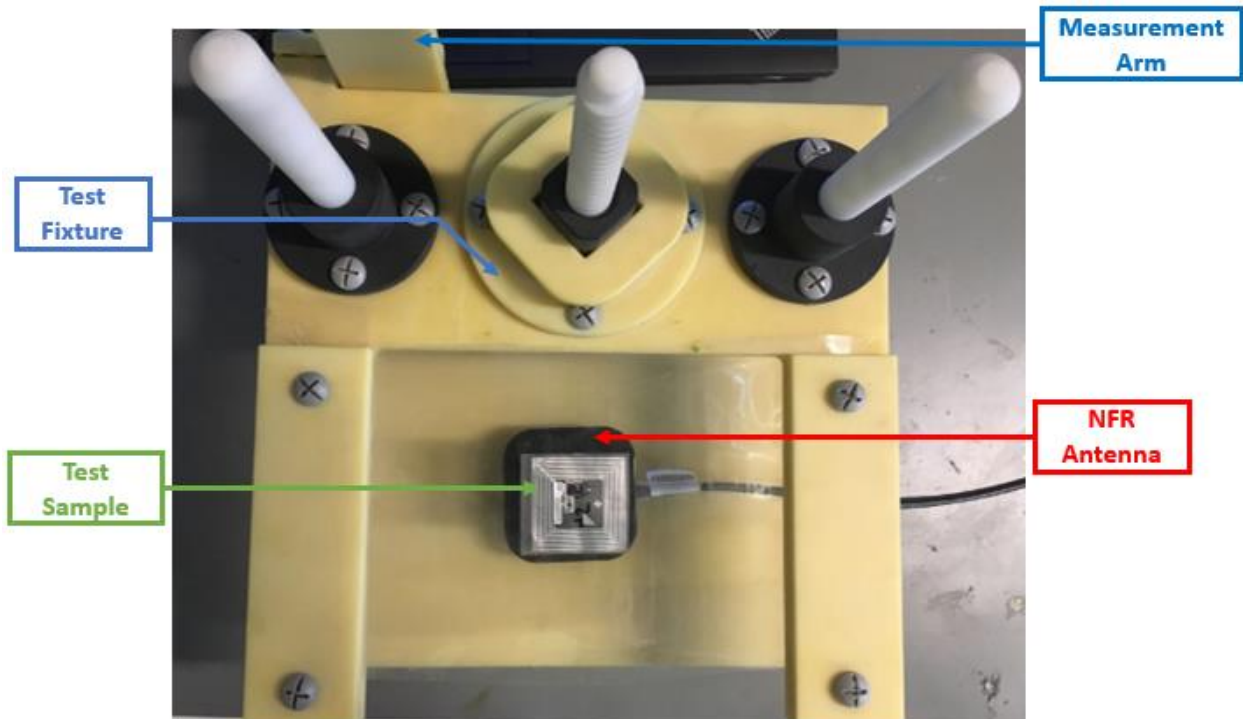
<b>Flexible PCB Near-Field Communications Reader Antenna</b>	
Frequency	13.56 MHz

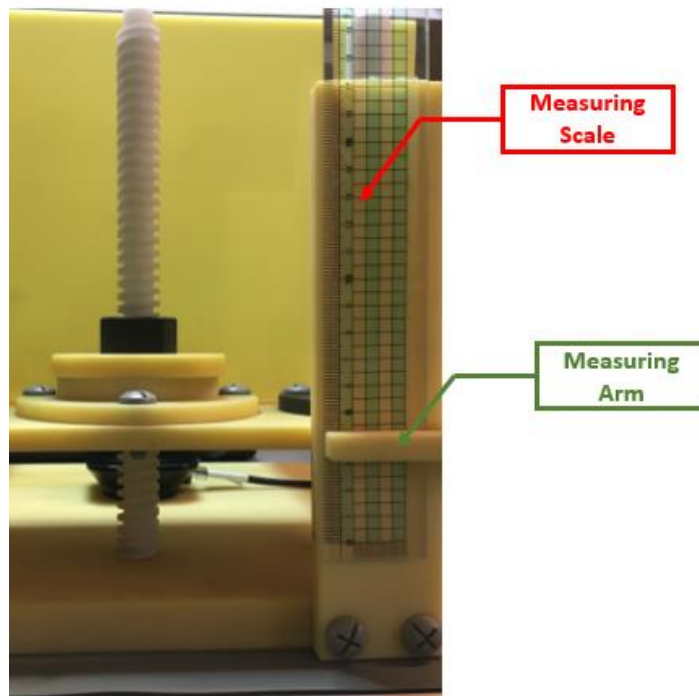
<b>MECHANICAL</b>	
Antenna Dimensions	75x75x28mm
Weight	32g
Enclosure	ASA
<b>ENVIRONMENTAL</b>	
Operation Temperature	-40°C to 85°C
Storage Temperature	-40°C to 85°C
Humidity	Non-condensing 65°C 95% RH

## 3. Antenna Application

### 3.1. Test Setup

A test fixture is used to measure the maximum interrogation distance. The NFR.01 antenna is connected to a NFC evaluation board and then placed on the fixed part of the fixture.





The test sample is placed on a thin sheet of plastic connected to the moveable part of the fixture. Then the distance is carefully adjusted until the reader can no longer read the sample, thus the maximum interrogation distance is displayed in the ruler.

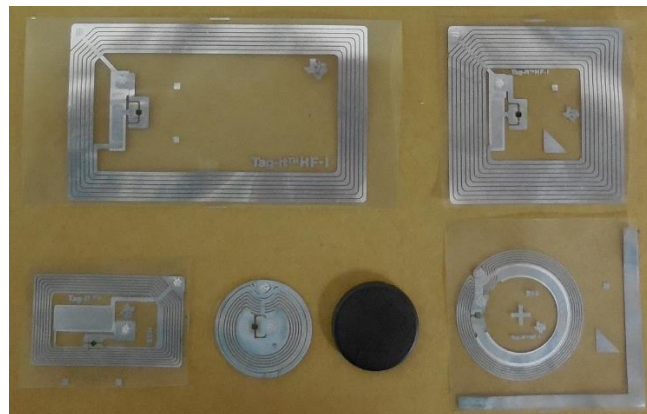
### 3.2. RFID tags used for test

A total of 10 RFID tags were used to measure the interrogation distances. The next picture shows type 1, type 2 and type 4 tags, respectively.



Type 1 tag is based on ISO/IEC 14443A standard and has 512 bytes of memory.  
 Type 2 tag is based on ISO/IEC 14443A standard and has 192 bytes of memory.  
 Type 4 is based on ISO / IEC 14443A 1-4 compliant and has 2K of memory.

The next picture shows the Tag-it HF-I RFID tags from Texas Instruments: RI-102-112, RI-I11-112, RI-I03-112, RI-I16-112, Button and RI-I17-112.



The Tag-it HF-I Plus Transponder Inlay family of Texas Instruments RFID is based on the ISO/IEC 15693 standard for contactless integrated circuit cards (vicinity cards) and ISO/IEC 18000-3 standard for item management.

### **3.3. Matching**

The interrogation distances presented here were taken with the antenna connected directly to the evaluation boards with the default matching circuit. This is not necessarily the optimal matching circuit that could be designed for a particular antenna. We kept the default matching of each evaluation board to minimize the number of variables in testing and keep integration as simple as possible.

As with any matching network the exact circuit and values for an optimal network depend on the combination of antenna, NFC circuit, any intervening transmission line and the environment presented to the antenna. These factors are specific to the particular end product.

As a starting point, to achieve the read range results presented here, use the matching network detailed in the schematic of the evaluation board for your particular NFC chip and keep the antenna free of any obstruction. Once you can demonstrate successful reads you can then optimize performance as desired.

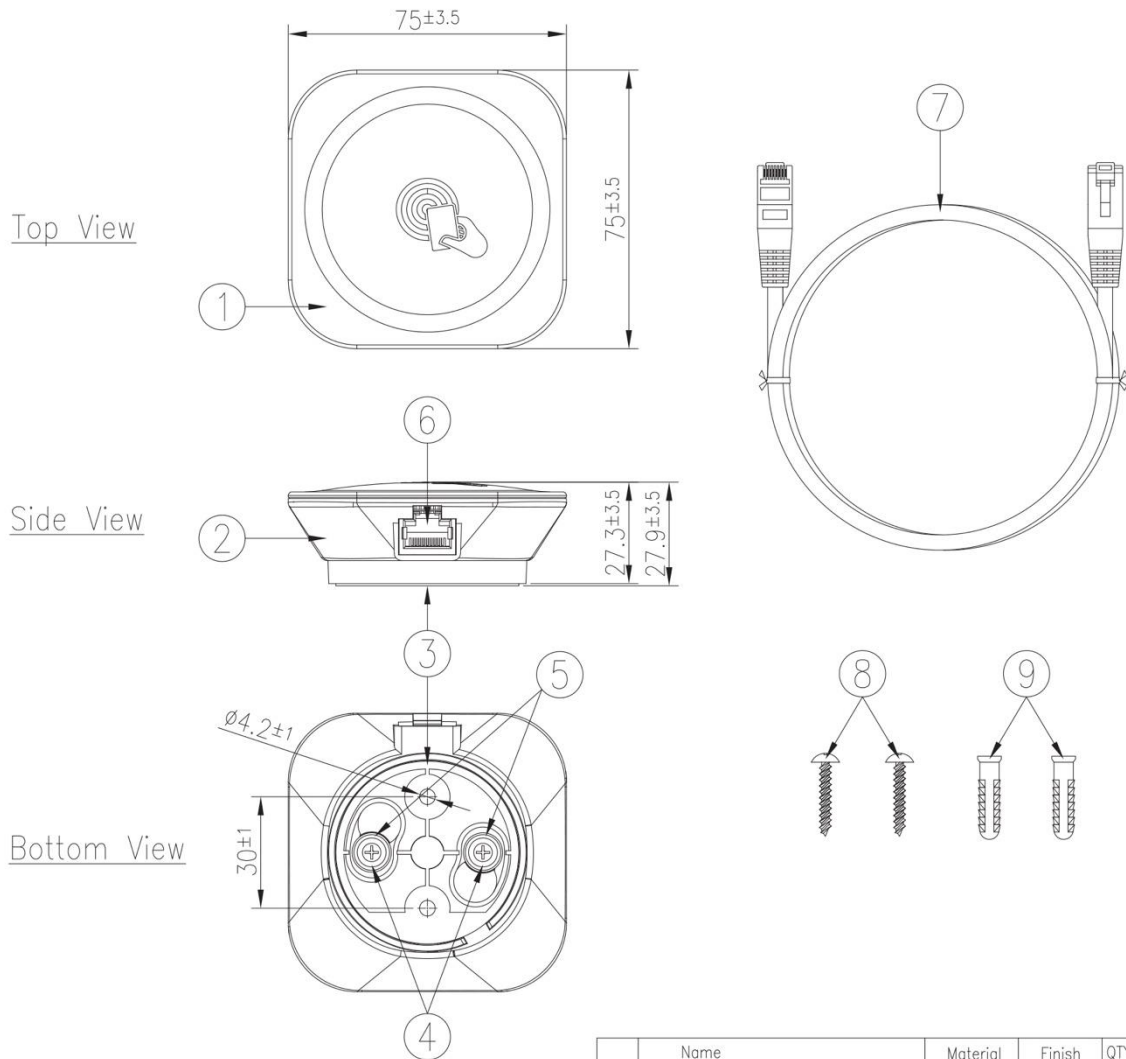
### 3.4. Test Results

A total of 10 NFC tags were selected to measure the interrogation distances using the Texas Instruments TRF7970AEVM evaluation board. The results are in the following table:

<b>NFC Tag</b>	<b>Dimensions (mm.)</b>	<b>Interrogation Distance (mm.)</b>
Mifare Ultralight C	80 x 50	8
Topaz512 (Type 1)	43 x 43	23
NTAG203 (Type 2)	Φ 42	26
Mifare DESFire (Type 4)	80 x 50	15
Tag-it HFI Plus RI-I11-112	45 x 45	43
Tag-it HFI Plus RI-I02-112	76 x 48	65
Tag-it HFI Plus RI-I03-112	38 x 22.5	18
Tag-it HFI Plus RI-I16-112	Φ 24.2	24
Tag-it HFI Plus RI-I17-112	Φ 32.5	33
Button type	Φ 22	22



## 4. Mechanical Drawing (Unit mm)



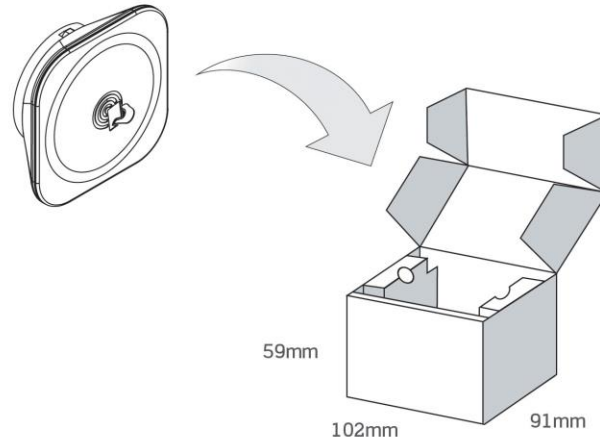
**Notes:**

1. All material must be RoHS compliant.
2. Color Codes: PANTONE Black / Plastics Color Q728-1-1.
3. Housing Finish: Mirror Polish / SPI A-3.
4. Deburring: Less than 0.02mm.
5. No gate, parting line and any other tooling marks on appearance of product.
6. Once product have any crack/break damage or any structural tooling issue, Molding supplier need to correct the issue unconditionally.
7. Use this drawing together with the corresponding 3D CAD database file to fully describe the part.

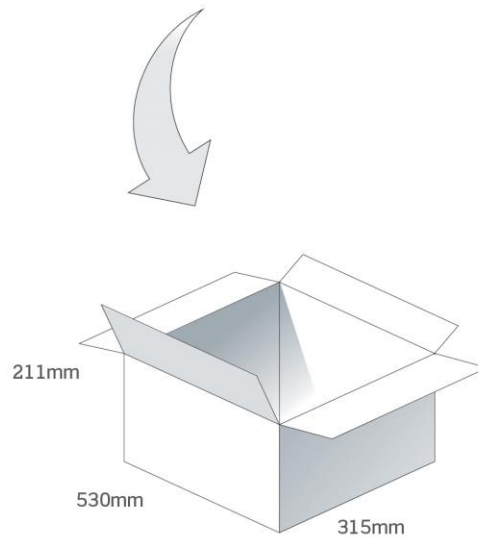
	Name	Material	Finish	QTY
1	NFR_Housing_Top	ASA	Black	1
2	NFR_Housing_Bottomx1Hole	ASA	Black	1
3	NFR_Bracket	ASA	Black	1
4	Fastening Washer	ABS+PC	Black	2
5	Screw TP1(3x8L)	Steel	Ni Plated	2
6	RJ45 Jack	Phosphor Bronze	Black	1
7	Ethernet Cable (1M)	PVC	Black	1
8	Screw TP4x25L	Steel	Ni Plated	2
9	Wall mount stud 6x24L	Nylon	White	2

## 5. Packaging

1 pc NFR.01 in box  
Dimensions - 102\*91\*59mm  
Weight - 119g



50 pcs NFR.01 in one carton  
Carton Dimensions - 530\*315\*211mm  
Weight - 6.95Kg



## 6. Installation Instructions

