
# TAGGED CATEGORY PERFORMANCE SPECIFICATION

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**VERSION 0.8**



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## 1 TEST OVERVIEW

| | |
|---|---|
| Prerequisite | ARC Quality certification of inlay manufacturer |
| Equipment | ARC Benchmarking Equipment Document |
| Test process | ARC Benchmarking Methodology Document |
| Distance between antennas and inlay | Antenna 1: 1.5 meter<br>Antenna 2: 1.5 meter<br>Antenna 3: 1.5 meter<br>Antenna 4: 1.5 meter |
| Sensitivity at Receiver | -70 dB |
| Standard test configurations | Single Inlay on Cardstock<br>Single Inlay on Rubber |
| Custom test configurations | Single Inlay on Tires |

## 2 DESCRIPTION OF CUSTOM TEST CONFIGURATIONS

### 2.1 Single Inlay on Tires

The inlay is measured when applied on the tread of the tire. The tire is placed on the testing platform as shown in Figure 1. The face of the inlay will be parallel to the face of antenna 1. The orientation of the inlay on the tire can be specified by the Inlay Manufacturer.

**Figure 1: Single Inlay on Tire**

The tag is tested on two positions on the tire. The silicon directly on the tread (Position 1) and the silicon in the gap between the treads (position2).

**Figure 2: Position of Tag on Tire**

## 3 READ SENSITIVITY

The inlay should meet the following read sensitivity (dBm) requirements in the following test configurations through the frequency range. All of the inlay samples tested should meet the minimum requirements. It is noted that the sensitivity is calculated at the tag by calibrating the measured power at the transmitter with the loss/gain during transmission.

### 3.1 Standard Test - Single Inlay on Cardstock

Frequency 902 MHz to 928 MHz in steps of 1 MHz

| Position 0 Ant 1 | Position 0: Ant 2 | Position 0: Ant 3 | Position 0: Ant 4 |
|---|---|---|---|
| -12 | -11 | -11 | -12 |
| Position 30: Ant 1 | Position 30: Ant 2 | Position 30: Ant 3 | Position 30: Ant 4 |
| -9 | -8 | -8 | -8 |
| Position 150: Ant 1 | Position 150: Ant 2 | Position 150: Ant 3 | Position 150: Ant 4 |
| -9 | -8 | -8 | -8 |
| Position 180: Ant 1 | Position 180: Ant 2 | Position 180: Ant 3 | Position 180: Ant 4 |
| -12 | -11 | -11 | -12 |
| Position 210: Ant 1 | Position 210: Ant 2 | Position 210: Ant 3 | Position 210: Ant 4 |
| -9 | -8 | -8 | -8 |
| Position 330 Ant 1 | Position 330: Ant 2 | Position 330: Ant 3 | Position 330: Ant 4 |
| -9 | -8 | -8 | -8 |

### 3.2 Standard Test - Single Inlay on Rubber

Frequency 902 MHz to 928 MHz in steps of 1 MHz

Frequency 970 MHz to 980 MHz in steps of 1 MHz

| Position 0 Ant 1 | Position 0: Ant 2 | Position 0: Ant 3 | Position 0: Ant 4 |
|---|---|---|---|
| -16 | NA | NA | NA |
| Position 180: Ant 1 | Position 180: Ant 2 | Position 180: Ant 3 | Position 180: Ant 4 |
| -16 | NA | NA | NA |

### 3.3 Custom Test - Single Inlay on Tires

Frequency 902 MHz to 928 MHz in steps of 1 MHz

| Position 0 Ant 1 | Position 0: Ant 2 | Position 0: Ant 3 | Position 0: Ant 4 |
|---|---|---|---|
| -16 | NA | NA | NA |

## 4. READ BACKSCATTER

The inlay should meet the following read backscatter (dBm) requirements in the following test configurations through the entire frequency range. The backscatter value in the table below is the minimum backscatter that should be observed at the corresponding minimum read sensitivity value in section 3. All of the tagged item samples tested should meet the minimum requirements. It is noted that the backscatter is calculated at the tag by calibrating the measured power at the receiver with the loss/gain during transmission.

### 4.1 Standard Test - Single Inlay on Rubber

Frequency 902 MHz to 928 MHz in steps of 1 MHz

| Position 0 Ant 1 | Position 0: Ant 2 | Position 0: Ant 3 | Position 0: Ant 4 |
|---|---|---|---|
| -18 | NA | NA | NA |

### 4.2 Custom Test - Single Inlay on Tires

Frequency 902 MHz to 928 MHz in steps of 1 MHz

| Position 0 Ant 1 | Position 0: Ant 2 | Position 0: Ant 3 | Position 0: Ant 4 |
|---|---|---|---|
| -24 | NA | NA | NA |