

# Fusca 2.4 GHz SMD Antenna

Part No. A10192

gigaNOVA<sup>®</sup>

Product Specification

## 1 Features

- Designed for 2.4 GHz applications: Bluetooth<sup>®</sup>, Wi-Fi<sup>®</sup> (802.11a/b/g/n), ZigBee<sup>®</sup>, etc. as well as 2.3 GHz WiMAX<sup>™</sup>, 2.5 GHz WiMAX<sup>™</sup> and WiBro.
- Easy to integrate
- Low profile design for use with no ground beneath the antenna
- High efficiency
- Light weight
- Intended for SMD mounting
- Supplied in tape on reel

## 2 Description

Fusca is intended for use with all 2.4 GHz applications. The antenna uses a ground plane in order to radiate efficiently, but this ground plane must not extend underneath the antenna itself.

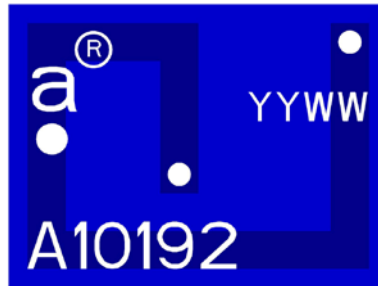
## 3 Applications

- Mobile phones
- PDAs
- PNDs
- Headsets
- PMPs / MP3s
- Laptops
- PC-Cards
- Medical devices
- Sensors



## 4 Part number

Fusca: A10192



## 5 General data

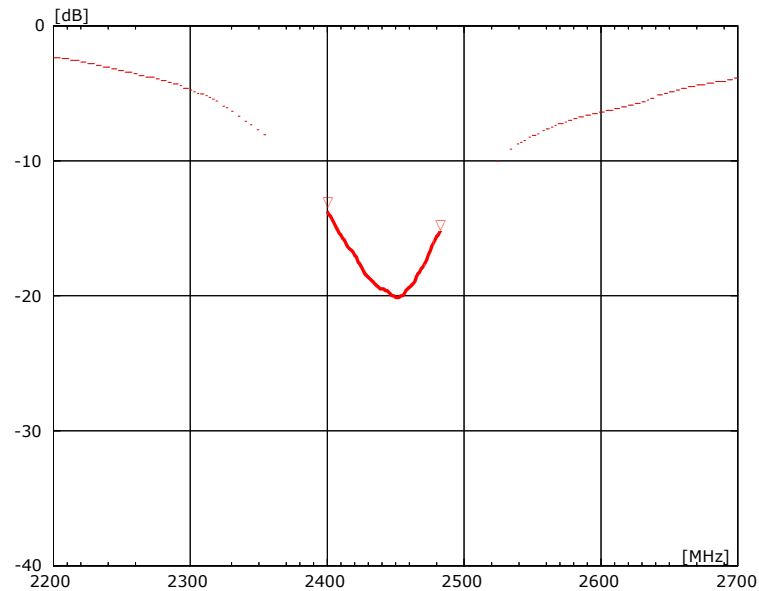
|                         |                  |
|-------------------------|------------------|
| Product name            | Fusca 2.4 GHz    |
| Part Number             | A10192           |
| Frequency               | 2.4 – 2.5 GHz    |
| Polarization            | Linear           |
| Operating temperature   | -40 °C to +85 °C |
| Impedance with matching | 50 $\Omega$      |
| Weight                  | < 0.03 g         |
| Antenna type            | SMD              |
| Dimensions              | 4 x 3 x 1.1 [mm] |

## 6 Electrical characteristics

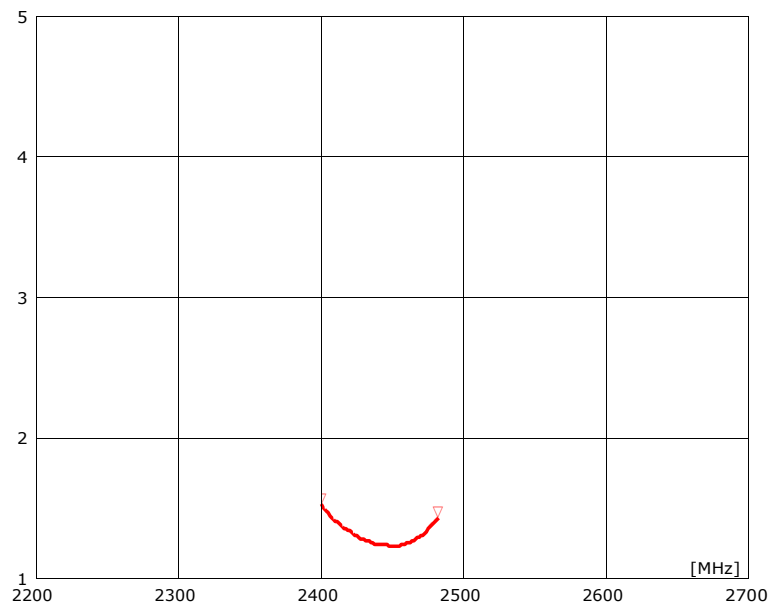
|                     | Typical performance | Conditions                                                                                                                        |
|---------------------|---------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Peak gain           | 0.8 dBi             | All data measured on Antenova's reference board,<br>part number A10192-U1<br><br>Data given for the 2.4 – 2.5 GHz frequency range |
| Average gain        | -1.9 dBi            |                                                                                                                                   |
| Average efficiency  | 65%                 |                                                                                                                                   |
| Maximum Return Loss | -10 dB              |                                                                                                                                   |
| Maximum VSWR        | 2:1                 |                                                                                                                                   |

## 7 Electrical performance

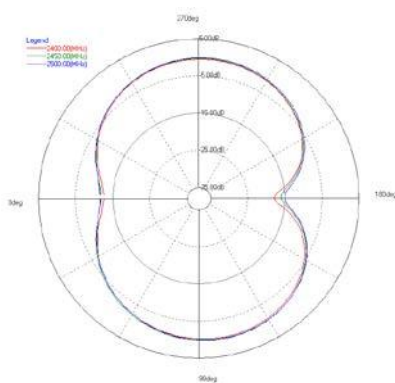
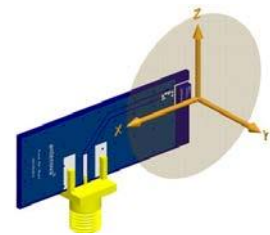
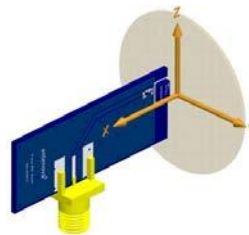
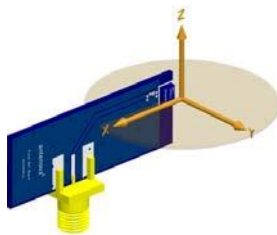
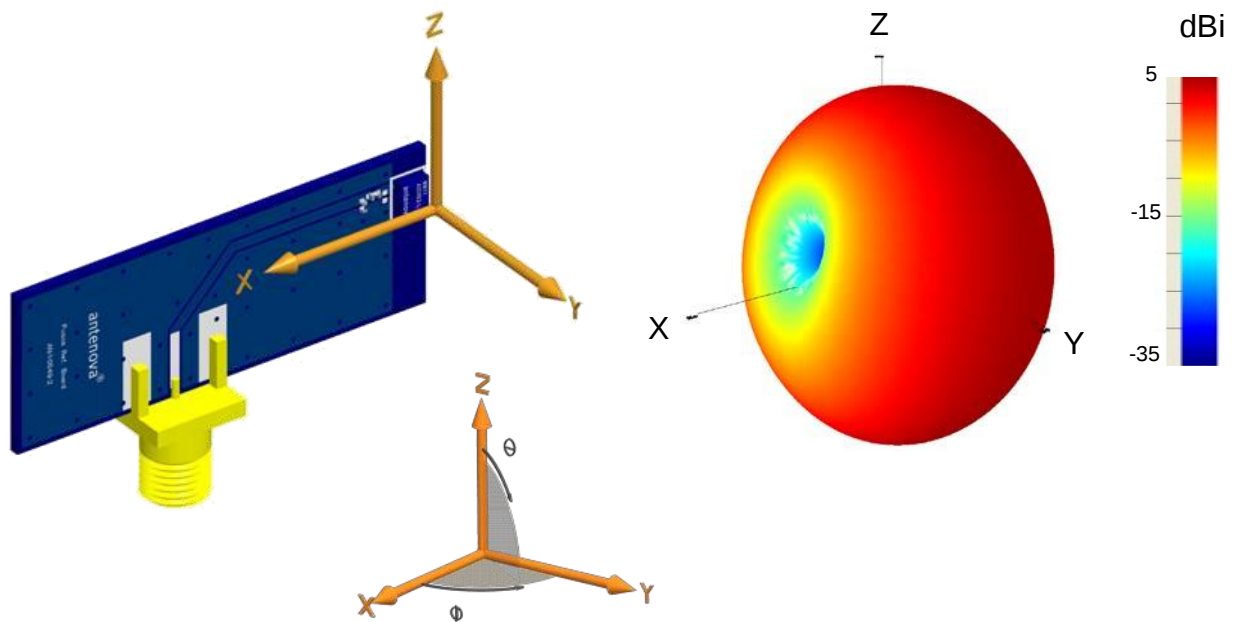
### 7-1 Return Loss



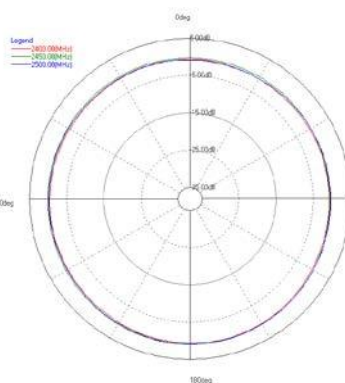
### 7-2 VSWR



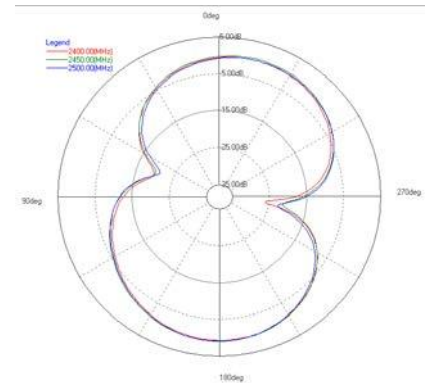
## 7-3 Antenna patterns



XY plane



ZY plane

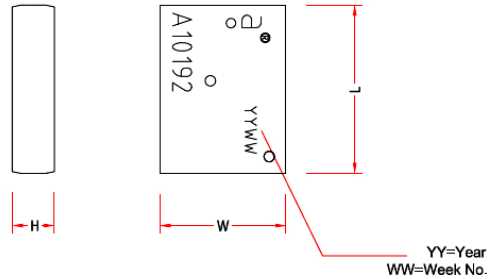


XZ plane

Patterns show combined polarisations  
measured on reference board A10192-U1

## 8 Antenna dimensions

### Fusca

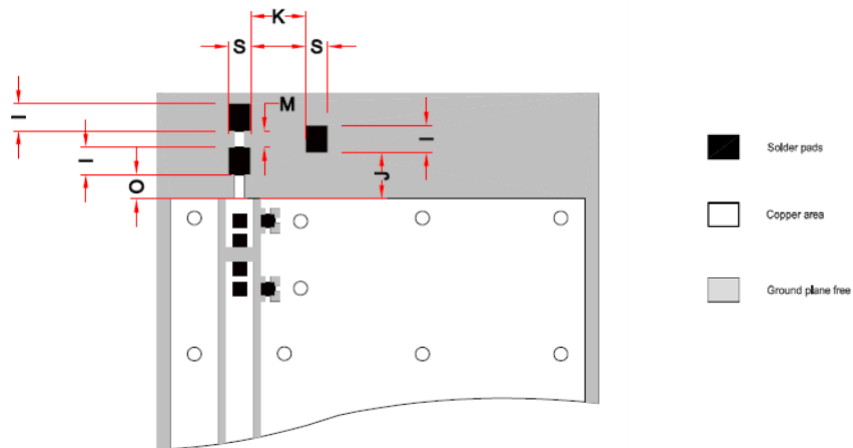


| L             | W             | H             |
|---------------|---------------|---------------|
| Length        | Width         | Height        |
| $4.0 \pm 0.2$ | $3.0 \pm 0.2$ | $1.1 \pm 0.2$ |

Dimensions in mm

## 9 Antenna footprint

### Fusca (Part No: A10192)



\* CAD files of the antenna footprint are available to download from [www.antenova-m2m.com](http://www.antenova-m2m.com).

| I             | S             | O                  | J             | M             | K             |
|---------------|---------------|--------------------|---------------|---------------|---------------|
| $1.0 \pm 0.1$ | $0.8 \pm 0.1$ | $\geq 0.9 \pm 0.1$ | $1.7 \pm 0.1$ | $0.6 \pm 0.1$ | $2.0 \pm 0.1$ |

Dimensions in mm

## 10 Electrical interface

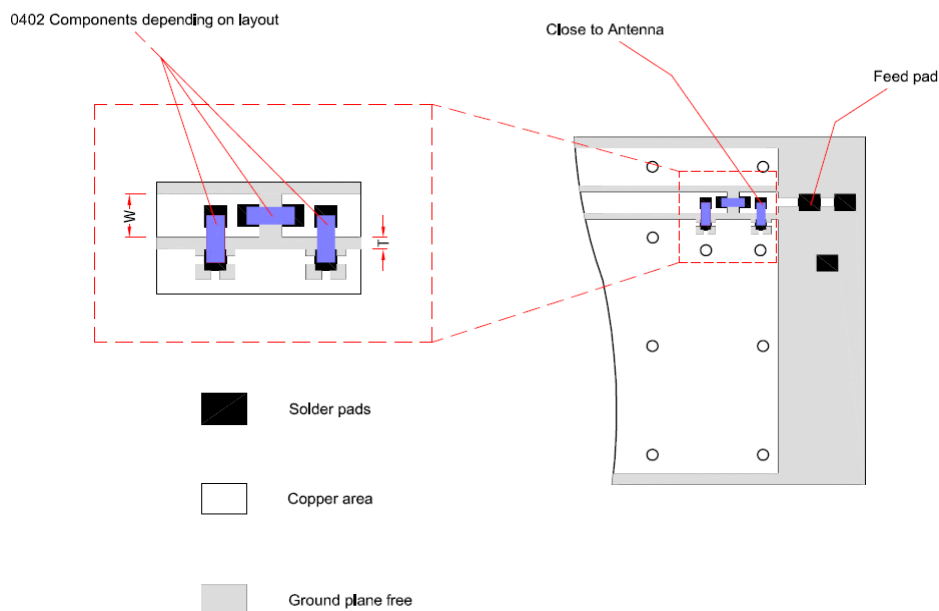
### 10-1 Transmission lines

- All transmission lines should be designed to have a characteristic impedance of  $50\ \Omega$
- The length of the transmission lines should be kept to a minimum
- Any other parts of the RF system like transceivers, power amplifiers, etc, should also be designed to have an impedance of  $50\ \Omega$

Once the material for the PCB has been chosen (PCB thickness and dielectric constant), a coplanar transmission line can easily be designed using any of the commercial software packages for transmission line design. For the chosen PCB thickness, copper thickness and substrate dielectric constant, the program will calculate the appropriate transmission line width and gaps on either side of the track so the characteristic impedance of the coplanar transmission line is  $50\ \Omega$ .

### 10-2 Matching circuit

The antenna requires a matching circuit that must be optimized for each customer's product. The matching circuit will require up to three components and the following pad layout should be designed into the device so the correct circuit can be installed:



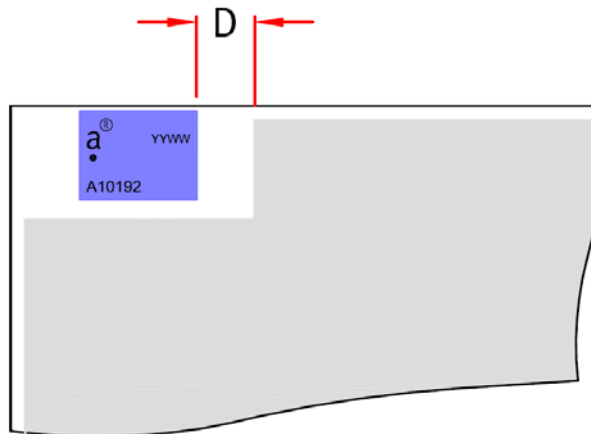
The antenna feed pad is indicated in the drawing above. Additional pads are for mechanical attachment only and should not be grounded.

In addition to the matching circuit, a separate DC blocking capacitor will also be required between the radio and the antenna matching circuit.

**Note: The component values for the matching circuit will vary depending on the size of the PCB and surrounding components.** The impedance of the antenna should be measured before selecting suitable matching components. Antenova M2M offers this service on request. Contact [sales@antenova-m2m.com](mailto:sales@antenova-m2m.com) for further information.

### 10-3 Antenna placement

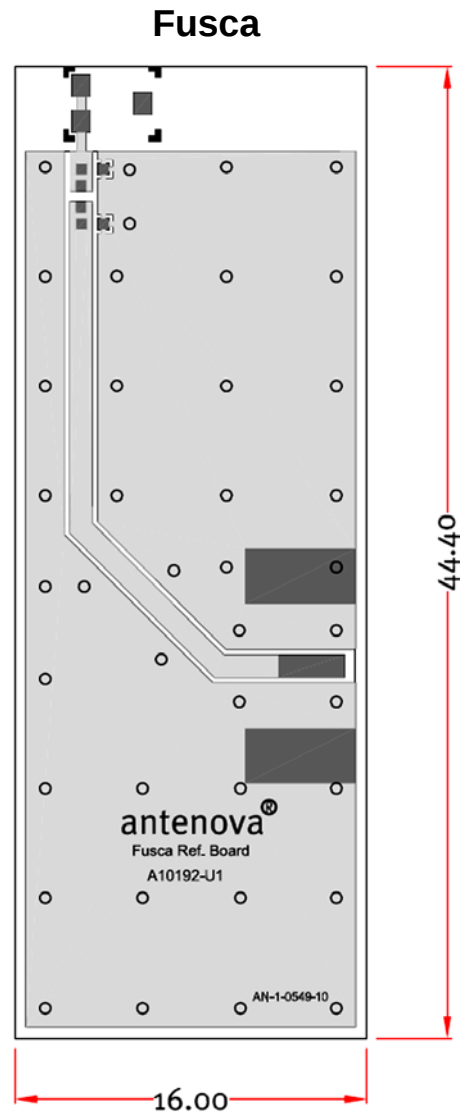
Antenova M2M strongly recommends placing the antenna near the edge of the board. Maximum antenna performance is achieved by placing the antenna towards one of the corners of the PCB and with the feed point of the antenna as close to same corner of the PCB as possible.



Additional ground and components near the antenna should be at a distance of at least 2 mm. Where possible the antenna should be clear of ground from both sides, although the antenna can work well with a minimum clearance of  $D \geq 2 \text{ mm}$  as shown in the drawing above.

## 10-4 Reference boards

The reference board has been designed for evaluation purposes of Fusca 2.4 GHz and it includes a SMA female connector



Dimensions in mm

To order a reference board contact [sales@antenna-m2m.com](mailto:sales@antenna-m2m.com).

## 11 Soldering

This antenna is suitable for lead free soldering.

The reflow profile should be adjusted to suit the device, oven and solder paste, while observing the following conditions:

- The maximum temperature should not exceed 240 °C
- However for lead free soldering, a maximum temperature of 255 °C for no more than 20 seconds is permitted.
- The antenna should not be exposed to temperatures exceeding 120 °C more than 3 times during the soldering process.

## 12 Hazardous material regulation conformance

The antenna has been tested to conform to RoHS requirements. A certificate of conformance is available from Antenova M2M's website.

## 13 Packaging

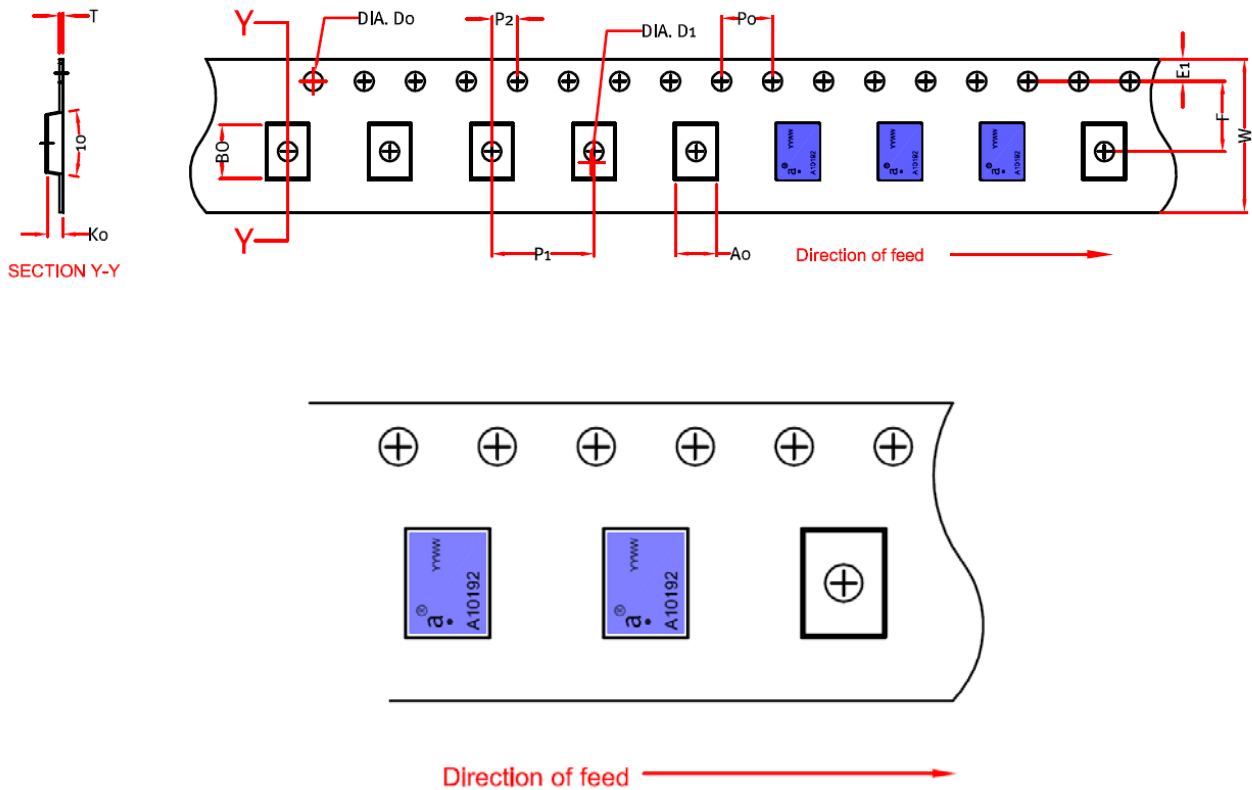
### 13-1 Optimal storage conditions for packaged reels

|               |                                                                             |
|---------------|-----------------------------------------------------------------------------|
| Temperature   | -10°C to 40°C                                                               |
| Humidity      | Less than 75% RH                                                            |
| Shelf Life    | 18 Months                                                                   |
| Storage place | Away from corrosive gas and direct sunlight                                 |
| Packaging     | Reels should be stored in unopened sealed manufacturer's plastic packaging. |

**Note:** Storage of open reels of antennas is not recommended due to possible oxidization of pads on antennas. If short term storage is necessary, then it is highly recommended that the bag containing the antenna reel is re-sealed and stored in like storage conditions as in above table.

## 13-2 Tape characteristics

### Fusca

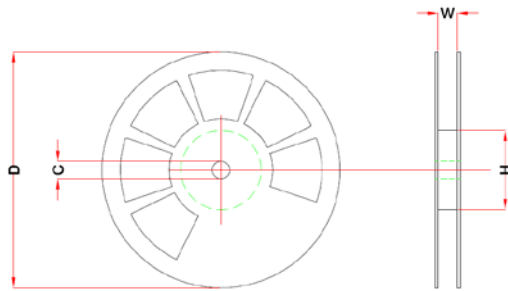


| W        | F         | E1         | P0      | P1      | P2      | A0        | B0        | K0        | T          | D0      | D1      |
|----------|-----------|------------|---------|---------|---------|-----------|-----------|-----------|------------|---------|---------|
| 12 ± 0.2 | 5.5 ± 0.1 | 1.75 ± 0.1 | 4 ± 0.1 | 8 ± 0.1 | 2 ± 0.1 | 3.2 ± 0.1 | 4.2 ± 0.1 | 1.3 ± 0.1 | 0.3 ± 0.05 | Min 1.5 | Min 1.5 |

Dimensions in mm

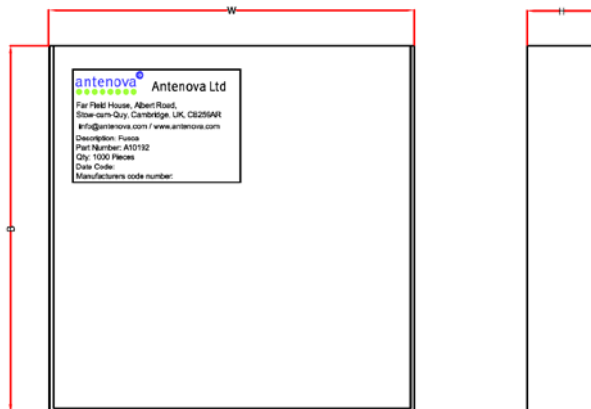
| Quantity        | Leading Space            | Trailing Space           |
|-----------------|--------------------------|--------------------------|
| 1000 pcs / reel | 50 blank antenna holders | 37 blank antenna holders |

### 13-3 Reel dimensions



| Width | Reel Diameter | Hub Diameter | Shaft Diameter |
|-------|---------------|--------------|----------------|
| 14 mm | 178 mm        | 60 mm        | 13.2 mm        |

### 13-4 Box dimensions

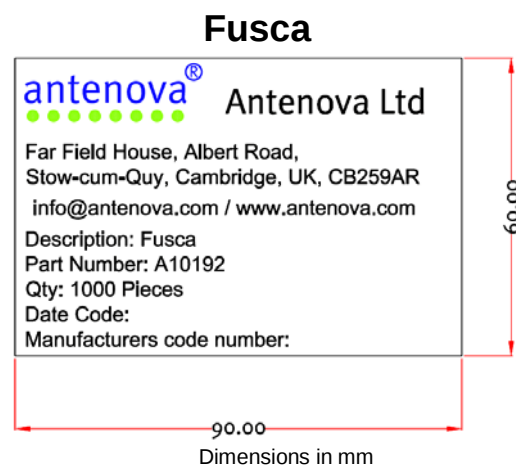


| Width W | Breadth B | Thickness H |
|---------|-----------|-------------|
| 195 mm  | 195 mm    | 37 mm       |

### 13-5 Bag properties

Reels are supplied in protective plastic packaging

### 13-6 Reel label information





**[www.antenova-m2m.com](http://www.antenova-m2m.com)**

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