

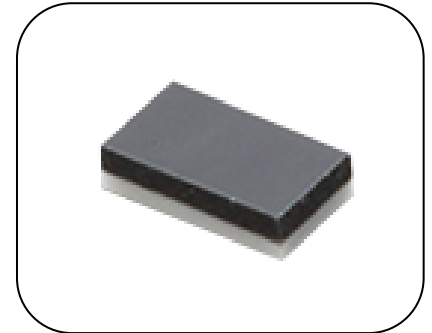
# UHF MAGICSTRAP® Data Sheet

## LXMS21ACMF-183



### 1. General descriptions

Murata MAGICSTRAP® is an innovative RFID module designed to operate in electronic products/applications. It incorporates an industry standard IC.



#### [Features]

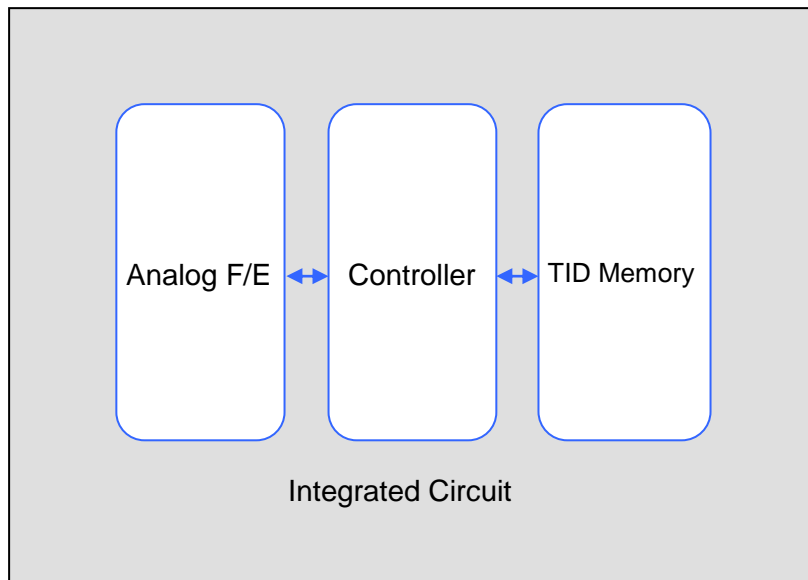
- Compliant with ISO18000-63 and EPC Global Gen2v2
- Reflow SMT compatible
- Ultra small package (2.0 x 1.2 x 0.5)
- RoHS compliant

### 2. Part number / IC / Memory

P/N	IC	TID	EPC
LXMS21ACMF-183	Impinj MonzaR6	96bits	96bit

### 3. Block diagram

Fig. 1 shows MAGICSTRAP® block diagram.



**Fig. 1 MAGICSTRAP® Block Diagram**

**4. Mechanical information**

4-1. Dimensions

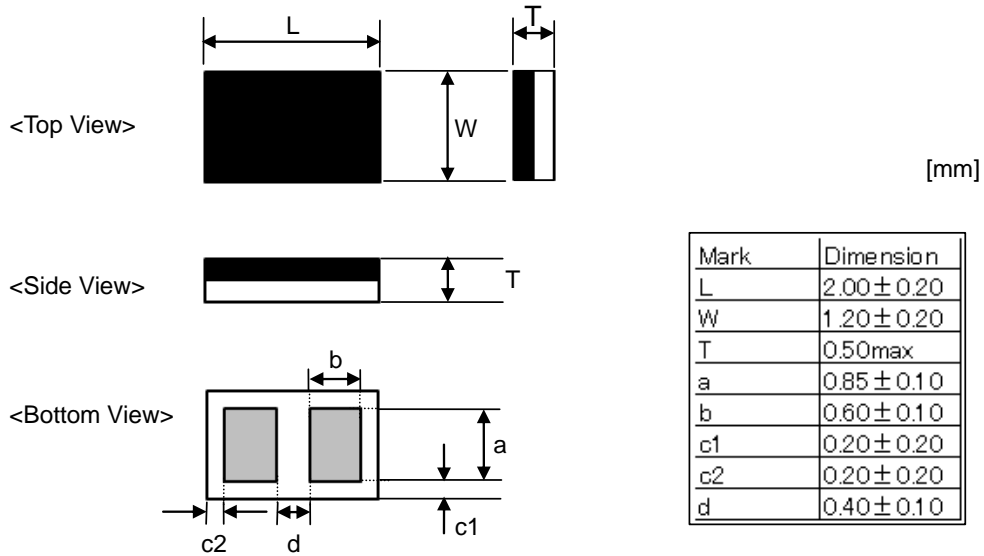
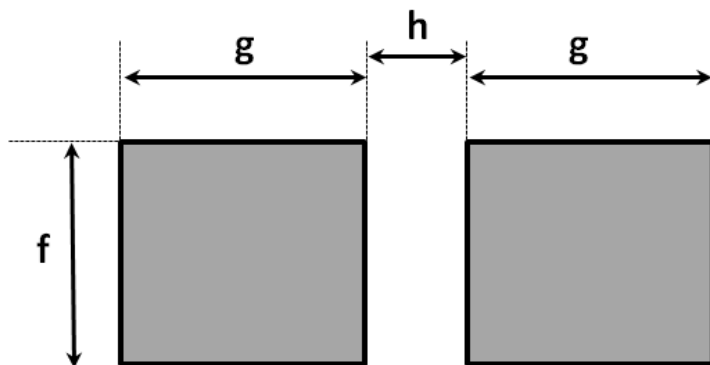


Fig. 2 MAGICSTRAP® Package Dimension

4-2. Recommended land pattern



Mark	Size
f	0.90
g	1.00
h	0.40

[mm]

Fig. 3 Land Pattern

**5. Electrical performance**

5-1. Frequency range  
865 – 928MHz

**6. Absolute rating**

Storage Temperature: -40°C ~ +85°C  
Operating Temperature: -40°C ~ +85°C  
MSL Rating: MSL1  
ESD: 2kV (Human Body Model, JESD22-A114-B)

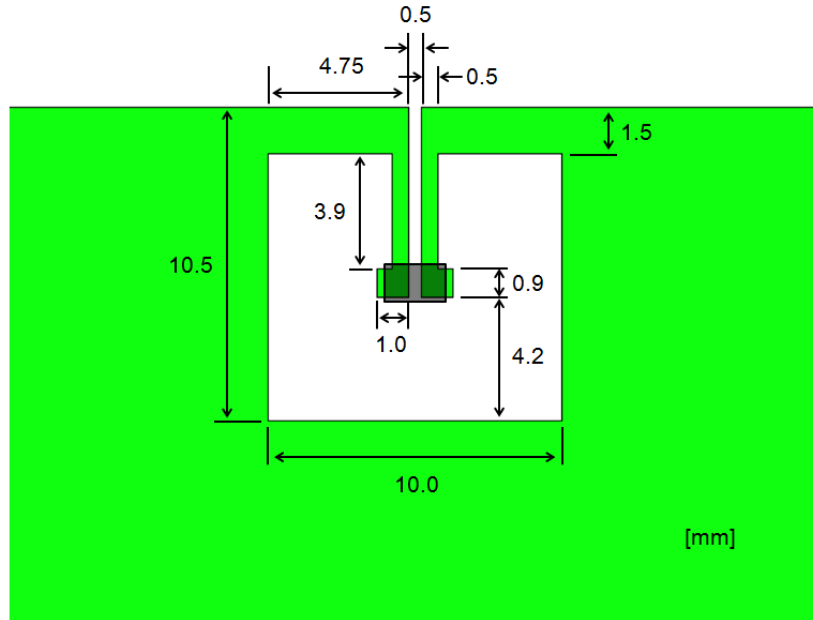
**7. RoHS compliance**

MAGICSTRAP® is compliant with RoHS directive.

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**8. Reference antenna design on PCB**

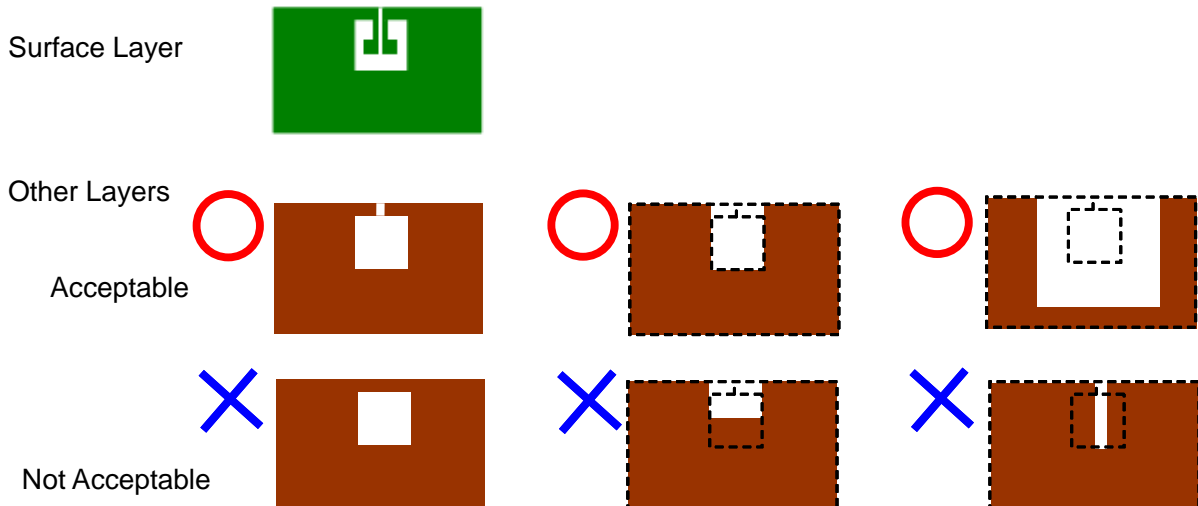
8-1. Top layer



Mounting pattern (normal)  
Please conduct to PCB ground

8-2. How to design layers below the mounting pattern

Please remove all the copper pattern area from all layers of the PCB, if it is located under mounting pattern on surface layer.

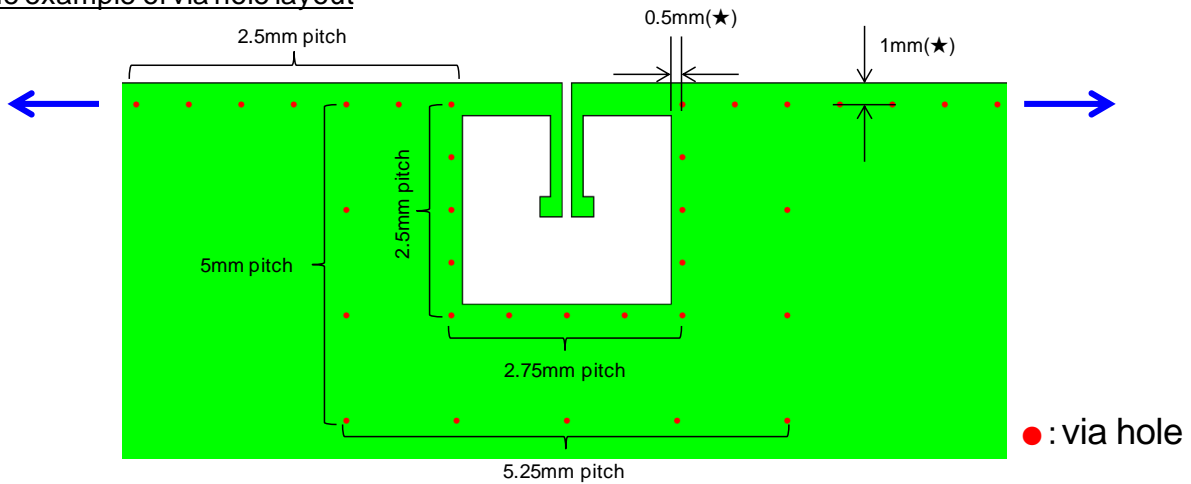


8-3 how to put via hole

Please put via holes as shown in the figure below. If there is no via hole in multi layered PCB, unnecessary inductance degrade performance.

8-3-1 For normal pattern

The example of via hole layout

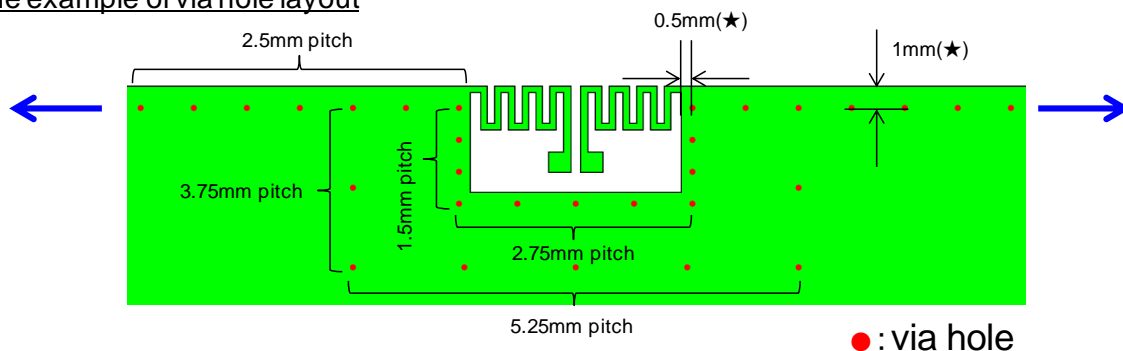


diameter: 0.3mm $\Phi$   
pitch: 2.5mm, 2.75mm (around pattern)  
5mm, 5.25 mm (other)

At the point of (★), The less value will get the less degradation.  
Also increasing the number of via holes will get PCB less degradation.  
At blue arrow direction, Please place the via holes to the edge of the board.  
(If there is a GND electrode on other layers)

8-3-2 For small pattern

The example of via hole layout



diameter: 0.3mm $\Phi$   
pitch: 1.5mm, 2.75mm (around pattern)  
3.75, 5.25 mm (other)

At the point of (★), The less value will get the less degradation.  
Also increasing the number of via holes will get PCB less degradation.  
At blue arrow direction, Please place the via holes to the edge of the board.  
(If there is a GND electrode on other layers)

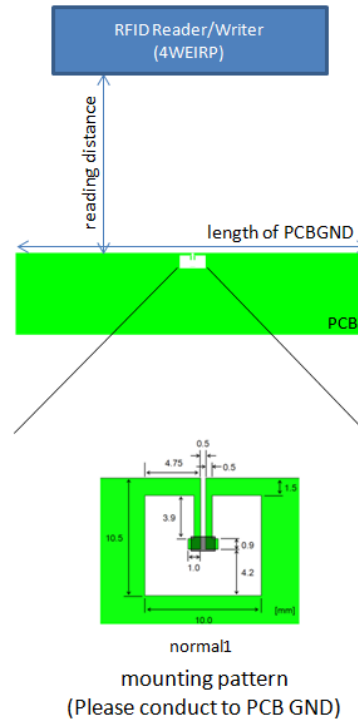
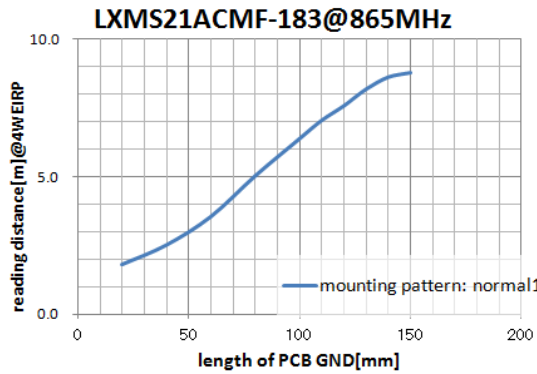
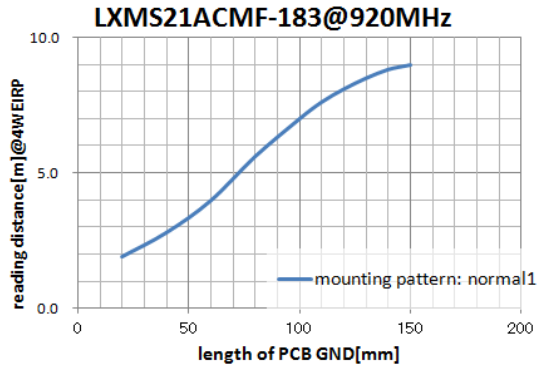
8-4. Reading distance

Max. 9.0meter (at 4wEIRP, with 15cm length of PCB ground)

The reading distance of MAGICSTRAP® onto PCB, depends on the length of PCB ground.

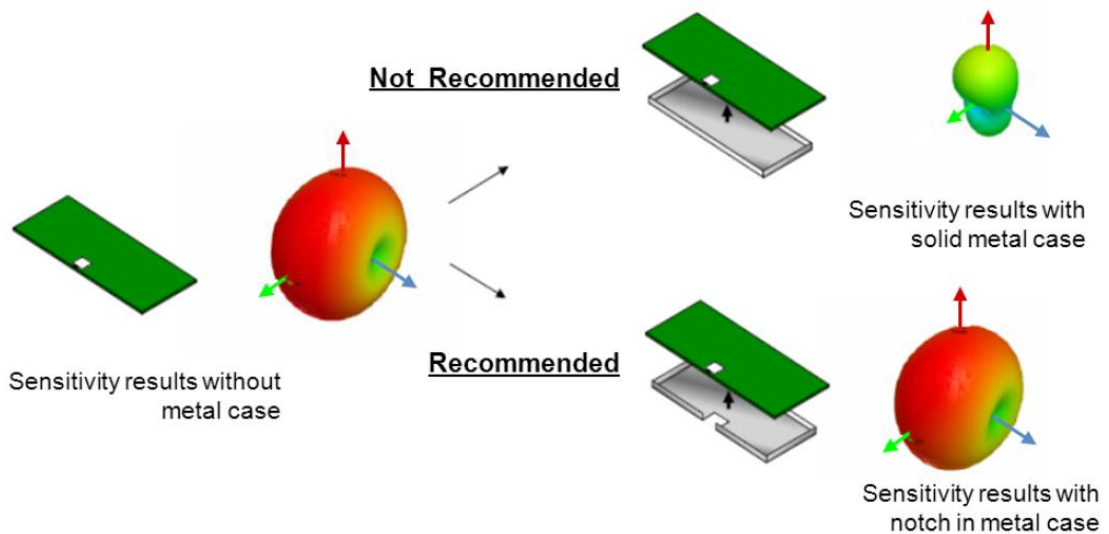
**technical information**

Reading distance is derived by the parameters of mounting pattern and length of PCB ground.



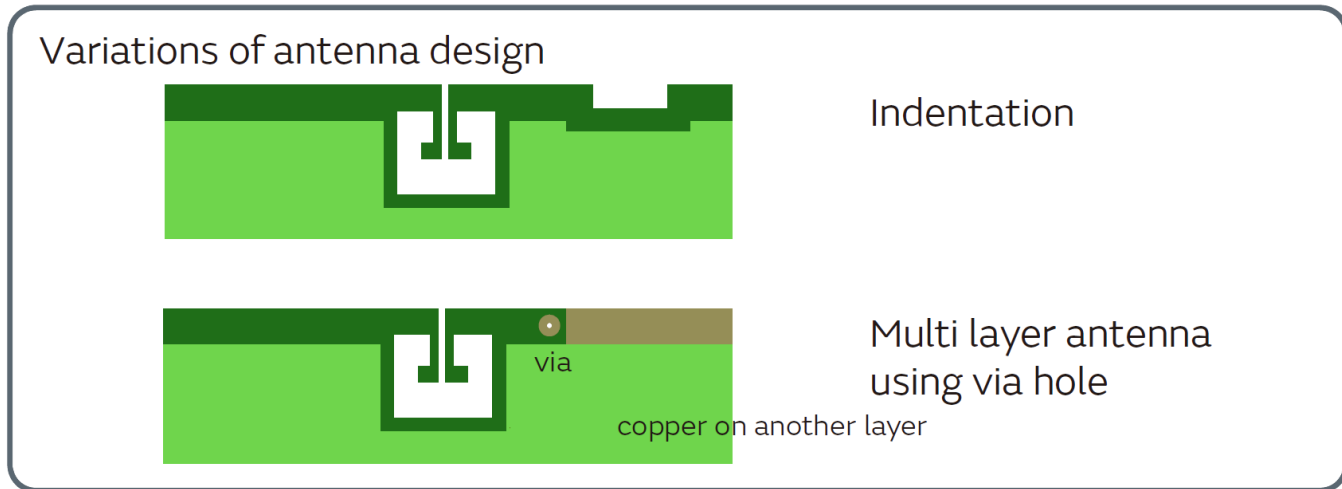
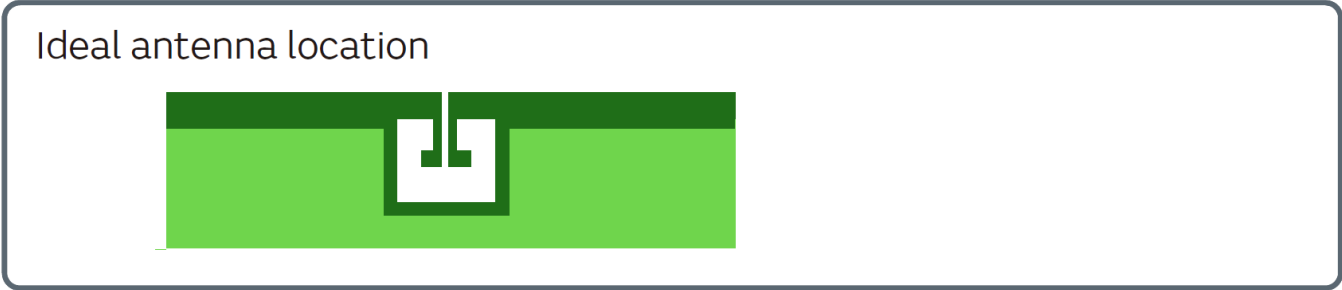
8-5. Metal enclosure under printed circuit board:

When the PCB is in close proximity to the metal enclosure, sensitivity is reduced. Removing material directly under the MAGICSTRAP® antenna pattern will greatly improve sensitivity.



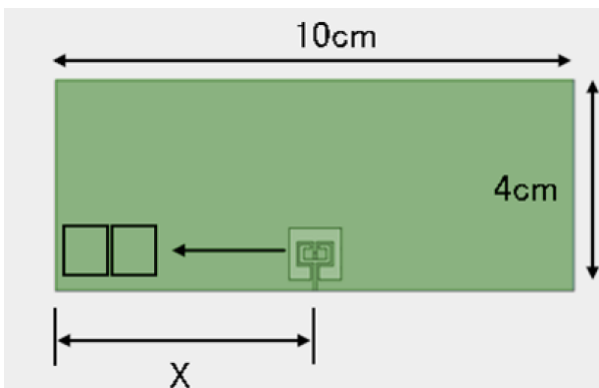
8-6. Antenna location on PCB

Important area of PCB ground is the edge part shown as “dark green” below. The mounting pattern should be located closest to the edge of the PCB. Variations of ideal design are also acceptable.



8-7. Position of MAGICSTRAP® on PCB:

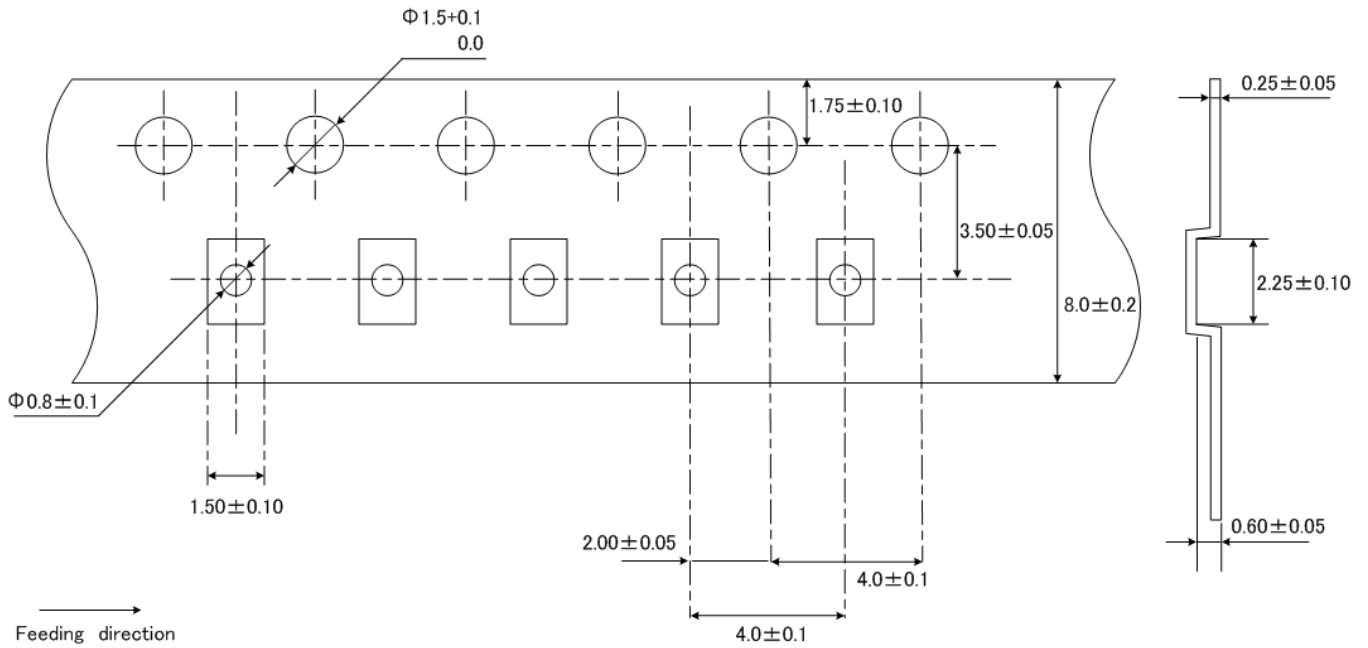
MAGICSTRAP® should be centered on the long side of the PCB to maximize read range. The following illustrates the relationship between “X” length and read range.



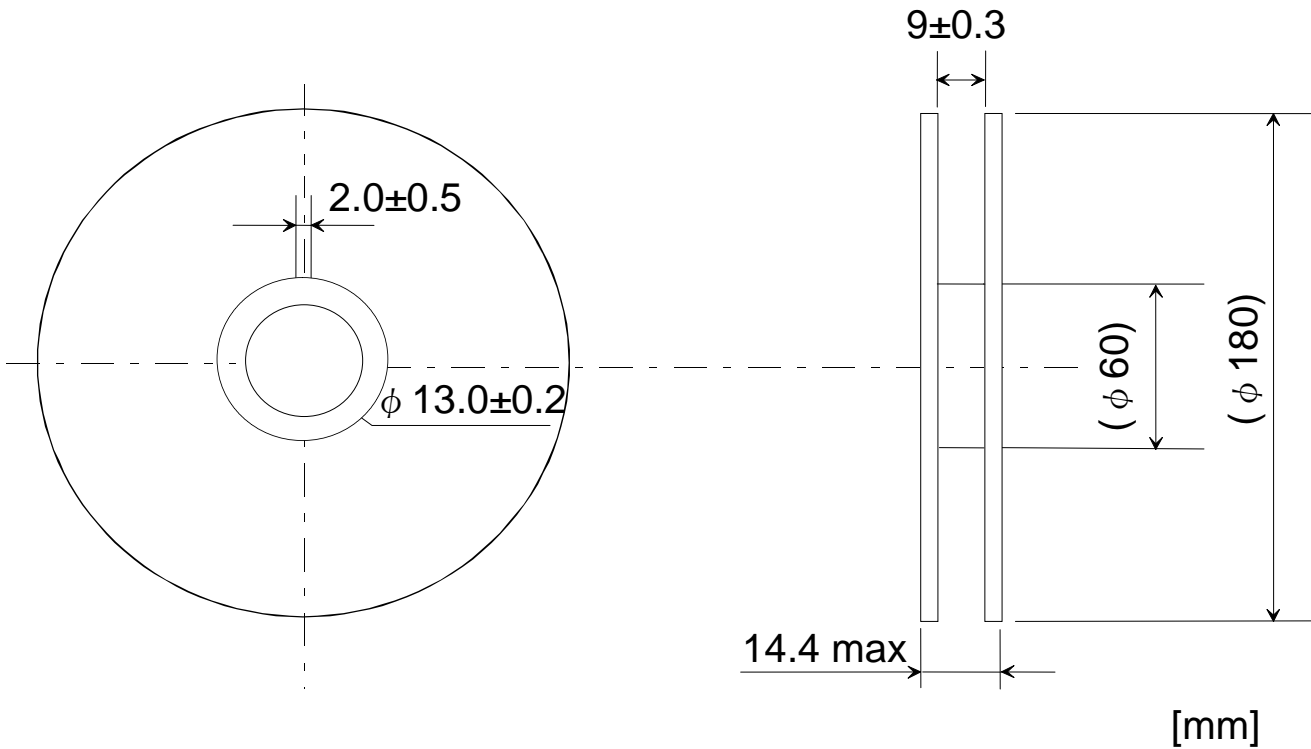
Length “X” (cm)	Read Range (m)
5	7
2	5
1	3.5

**9. Tape and Reel Packing**

9-1. Dimensions of Tape (Plastic tape)



9-2. Dimensions of Reel



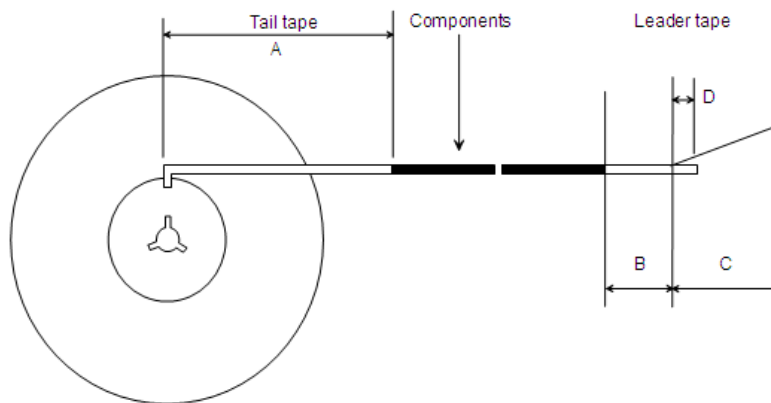


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### 9-3. Leader and Tail tape



[mm]

Tail tape Part	A	No components	160 ~ 190
Leader tape part	B	No components (adhered cover tape)	150 ~ 200
	C	Cover tape part (including D)	250 ~ 300
	D	Not adhered cover tape	20 ~ 40

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### 9-4. Taping direction

The tape for chips are wound clockwise, the feeding holes to the right side as the tape is pulled toward the user.

### 9-5. Quantity per reel

Packaging unit: 5,000 pcs / reel

### 9-6. Material

Base tape.....Plastic

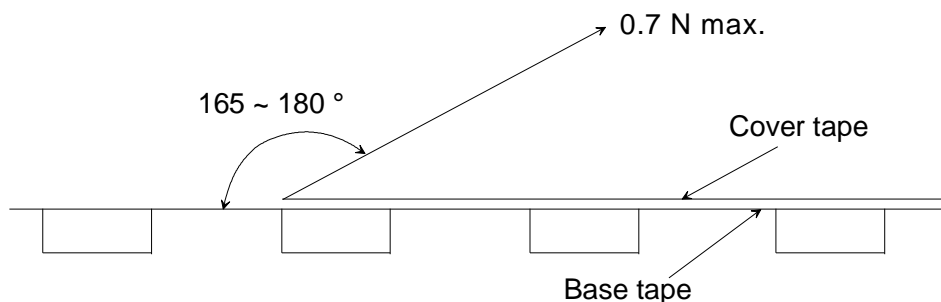
Reel.....Plastic

Cover tape and cavity tape are made with anti-static processing.

### 9-7. Strength/Peeling force

Tear off strength against pulling of cover tape: 5N min.

Peel off force: 0.7N max., in the direction as shown below.



### 9-8. Other packaging options

Other packaging options, such as FFC (Free Film Carrier) will be considered based upon customers' request.

## **10. Contact window**

URL : <http://www.murata.com/en-global/products/rfid>

" MAGICSTRAP<sup>®</sup> " is the registered trademark of Murata Manufacturing. Co., Ltd.

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