

HITACHI

Hitachi Chemical
Working On Wonders

***ULTRA Small Package
UHF RFID Tag***

Design Guideline

Rev.1 Aug. 2012

 **Hitachi Chemical Co., Ltd.**
www.hitachi-chem.co.jp/RFID/e

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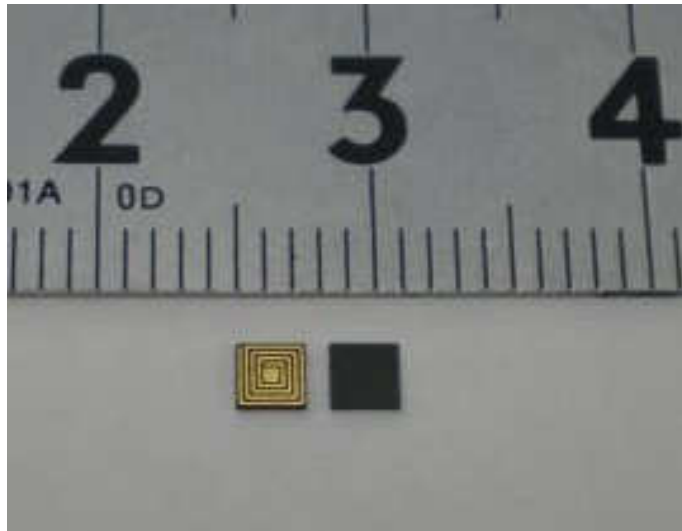
Contents

1. Features

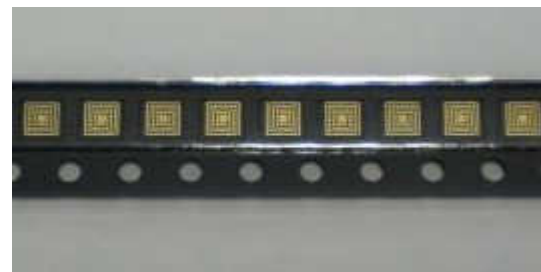
2. Antenna Design & Case Example

1-1. Features

Size:
2.5 x 2.5 x 0.3 mm



Delivery Form



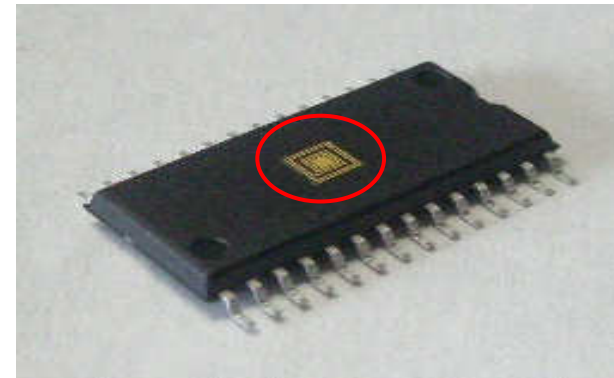
1-2. Features

【Small】 【High Heat Resistance】 ⇒

- Very Small Products
- Plastic Molding
- Solder Reflow



Apply for Reagent Bottles



*Image

Built-in Semiconductor Package

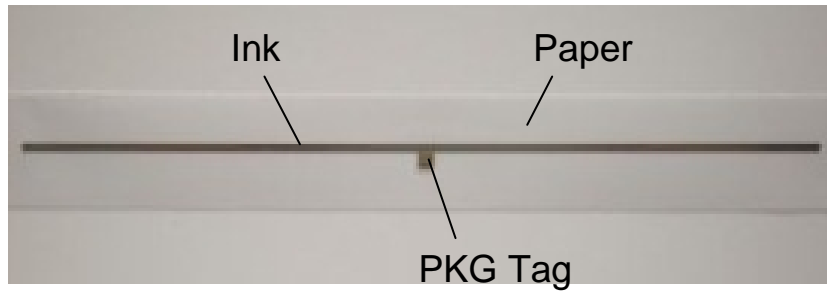


Mounted on PCB

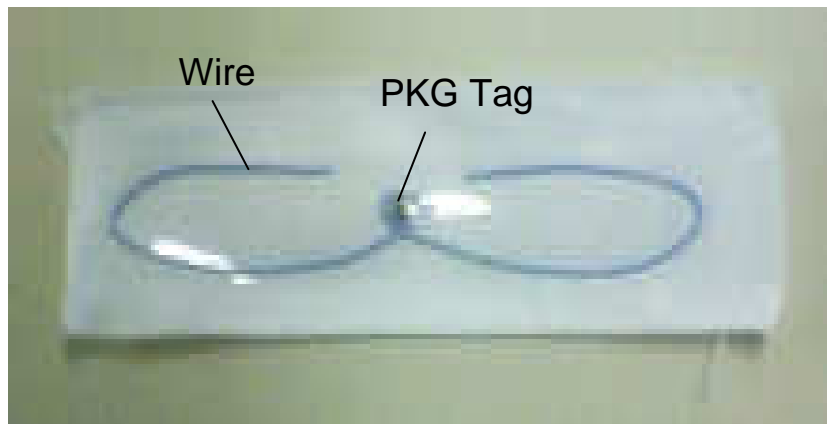
*Image

1-3. Features

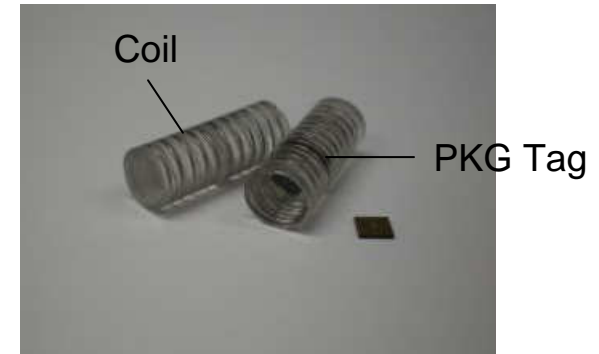
Conductive Paste/Ink



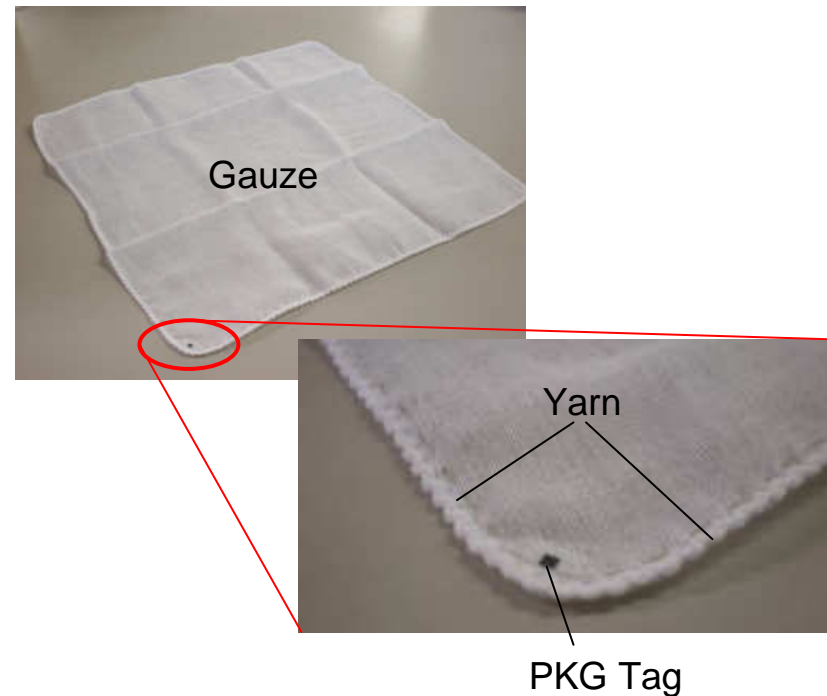
Metallic Wire



Coil



Conductive Yarn



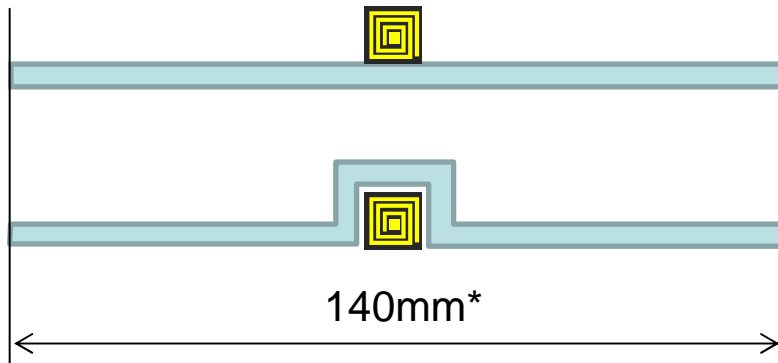
2. Antenna Design & Case Example

Notes:

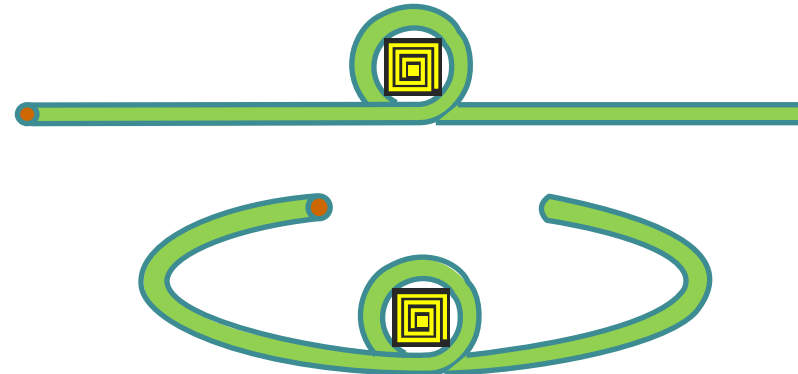
- This Design Guideline shows just a basic concept and case example.
- Booster antenna should be optimized the size and figure for each material and conditions.
- If you need help to design booster antenna, Hitachi Chemical will support it.

2-1 Booster Antenna Design 1 (Dipole Antenna)

Antenna pattern for
Al foil, Conductive Paste/Ink

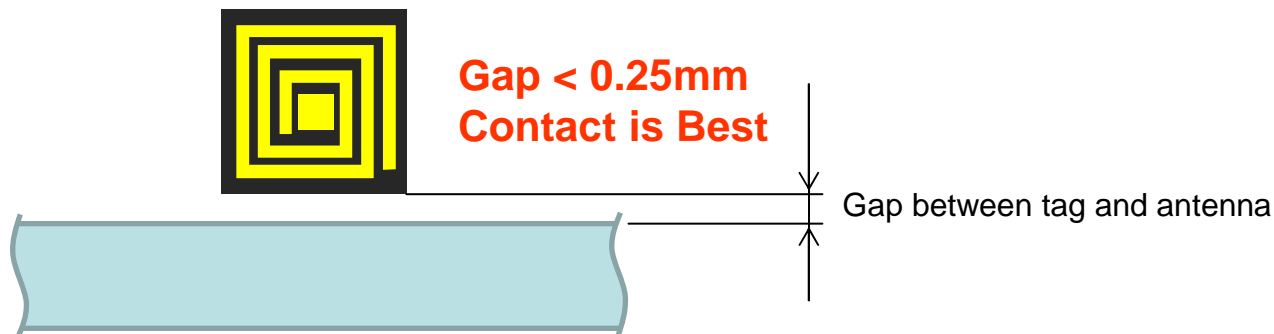


Conductive Wire/Yarn

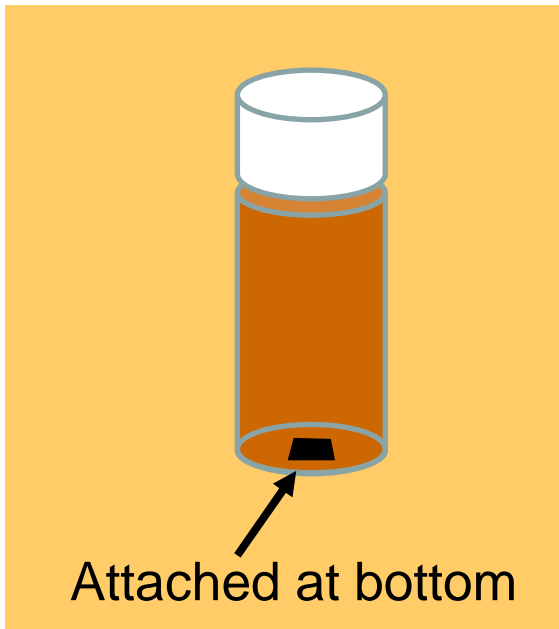


*Length of antenna depends on material and other conditions, and must be adjust at the site.

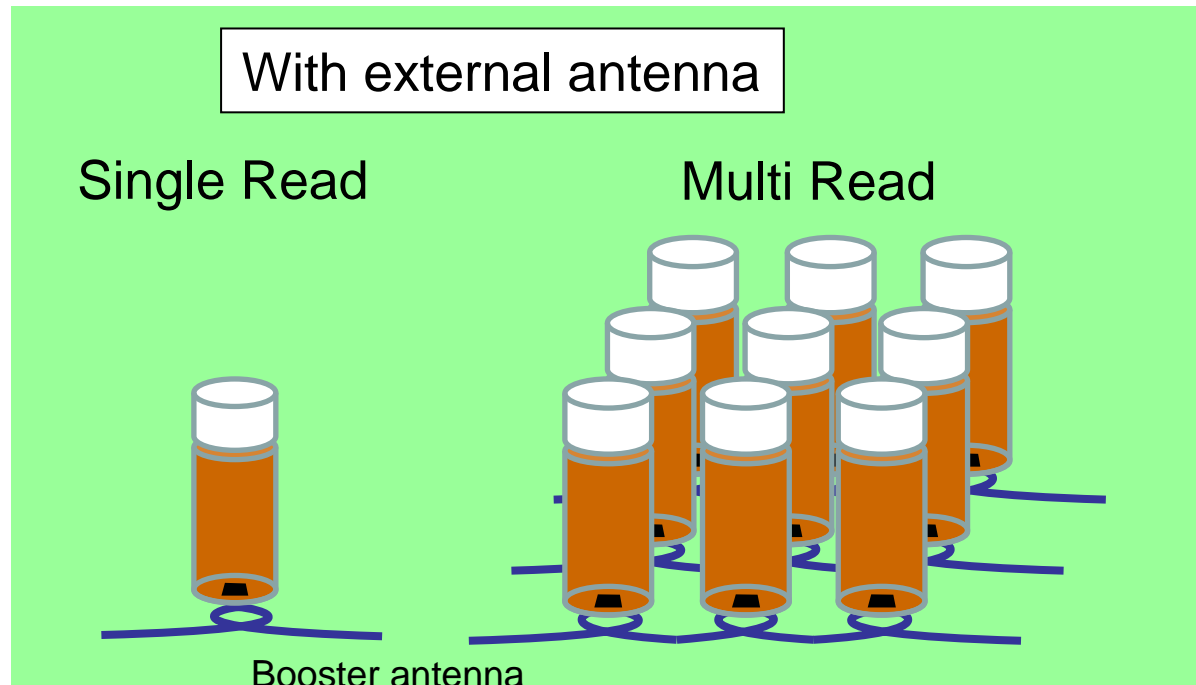
Antenna should be located at a edge of Tag



2-2 Case example for Reagent Bottles



Please refer video
on our website.



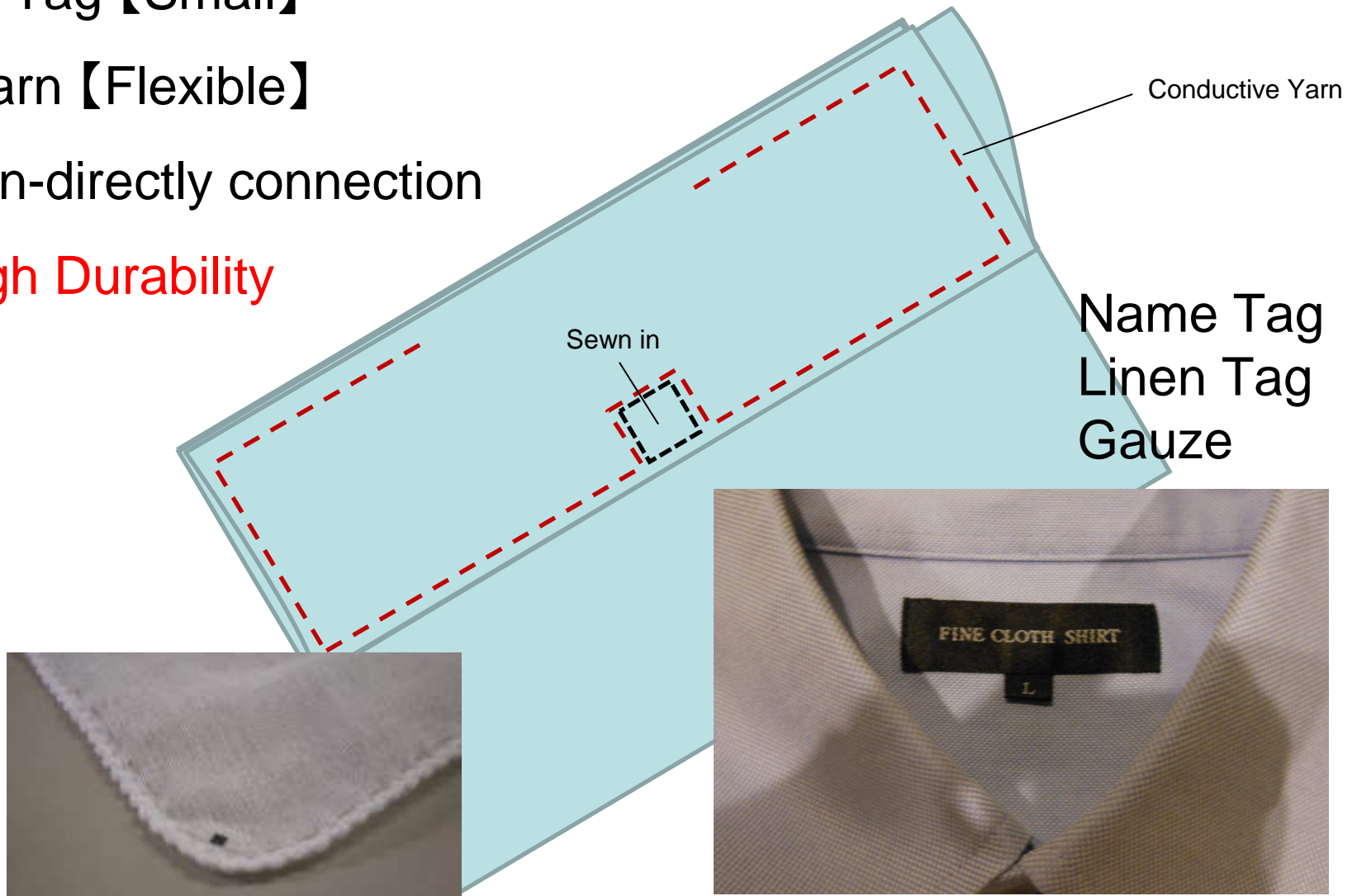
2-3 Case example for linen/apparel

PKG Tag 【Small】

+ Yarn 【Flexible】

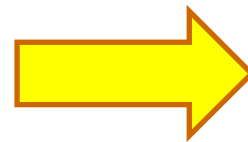
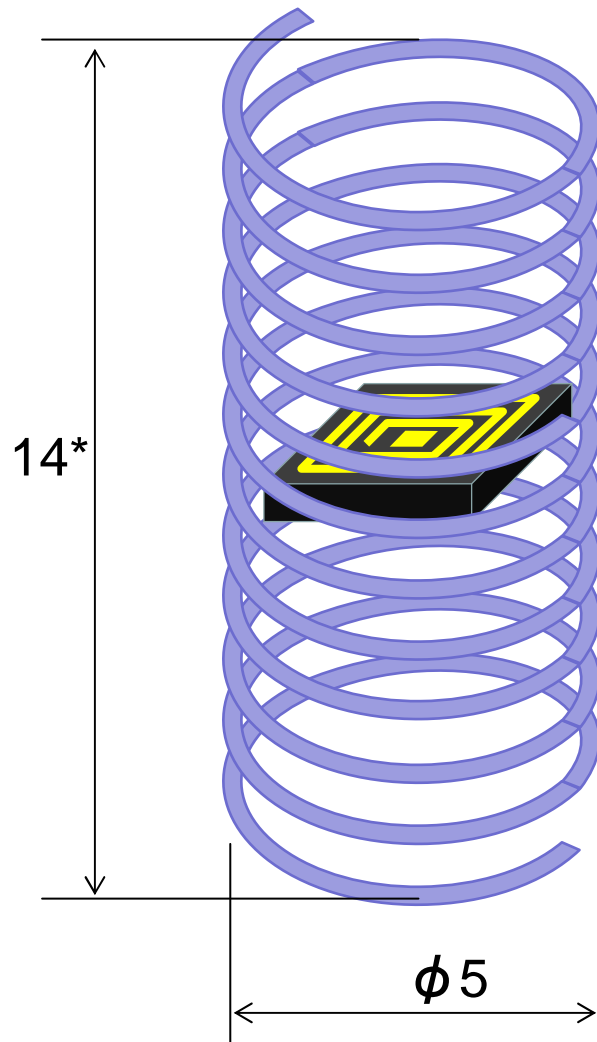
+ Non-directly connection

= High Durability



*Image

2-4 Booster Antenna Design 2 (Coil type)



Resin molding

【Small】 【Heat resistant】

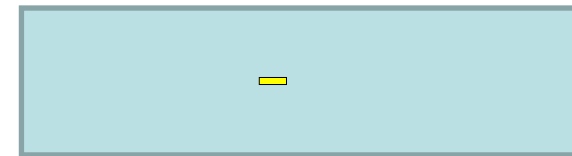
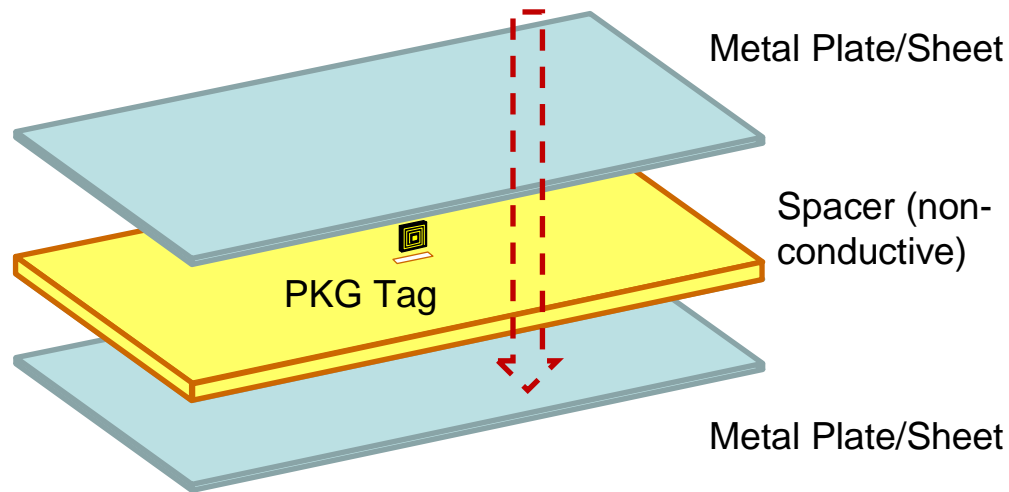
Reading Range : ~ 30cm

Wire Length: approximately 150mm*

***Length of antenna depends on material and other conditions, and must be adjusted at the site.**

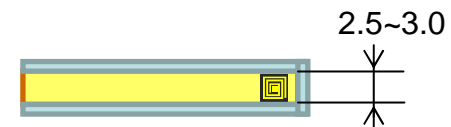
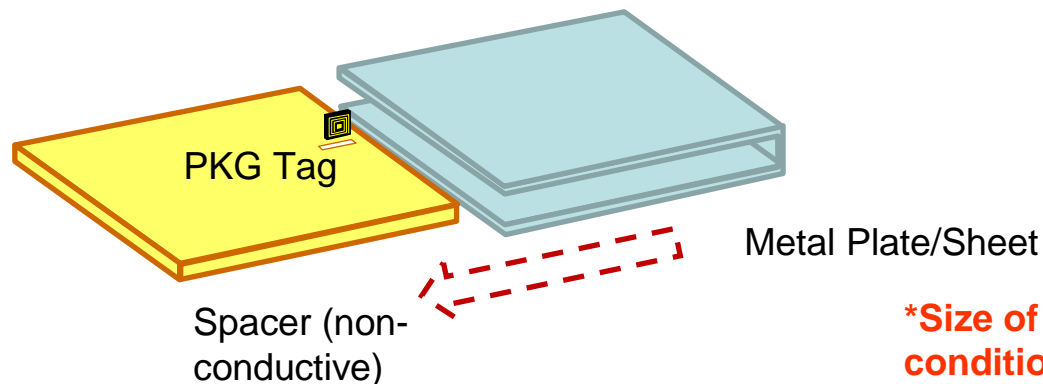
2-5 Booster Antenna Design 3 (Patch Antenna)

Double-side type



Reading range : ~ 3m

Folding back type

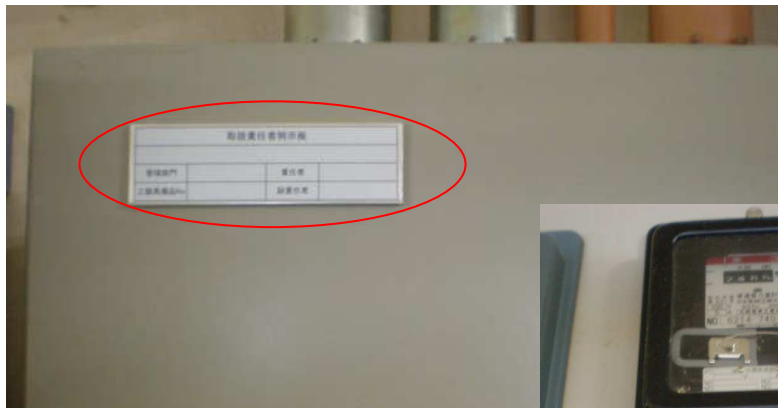


Reading range : ~2m

***Size of antenna depends on material and other conditions, and must be adjust at the site.**

2-6 Case example for On-Metal Tag (Hard type)

Nameplate type



*Image



*Image

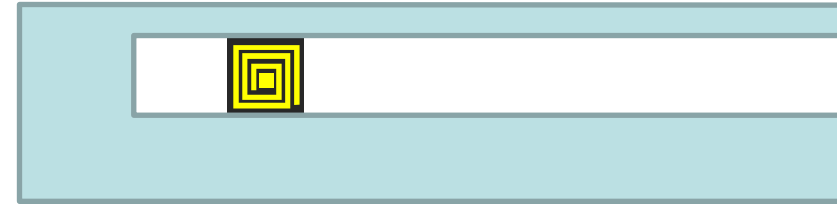
Weldable type



2-7 Booster Antenna Design 4 (Inverted L Antenna)

【Flexible】

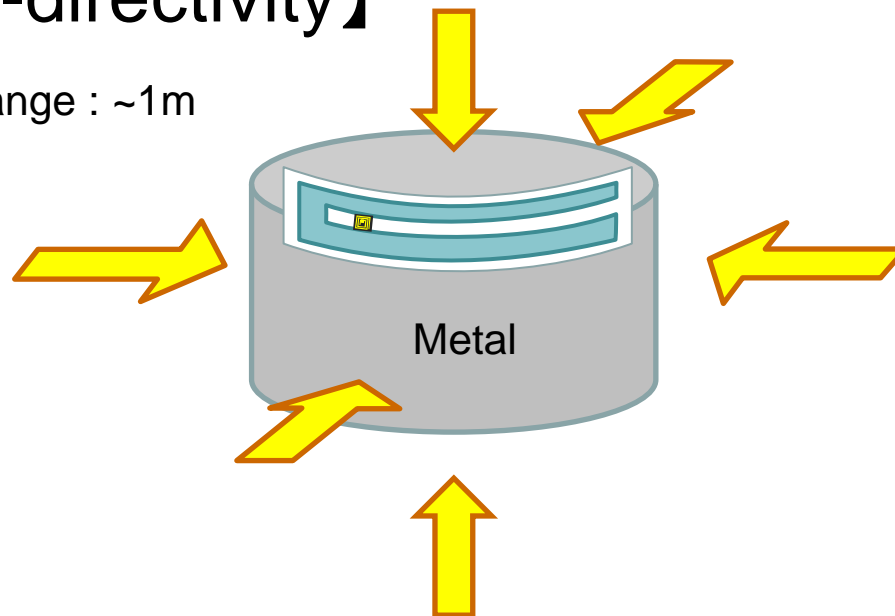
Antenna Material	Tag type
Metallic foil Vapor-deposited film	Label



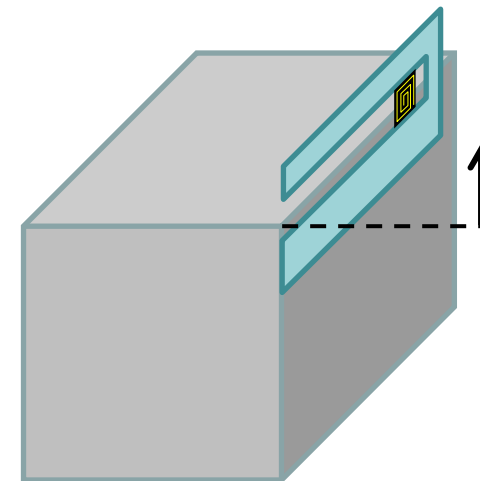
***Size of antenna depends on material and other conditions, and must be adjust at the site.**

【Non-directivity】

Read range : ~1m

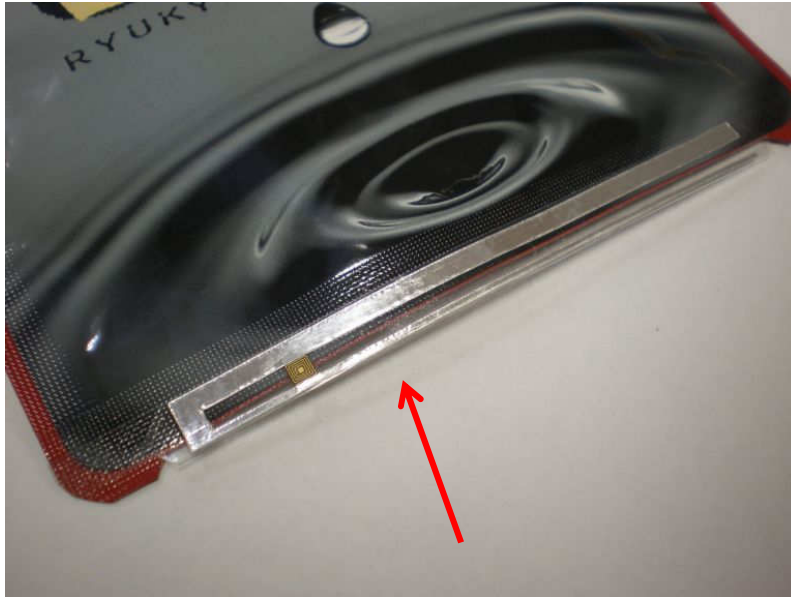


At least half of the slit should be located upper the metal surface



2-8 Case example On-Metal Tag (Label type)

For Aluminum bag



*Image

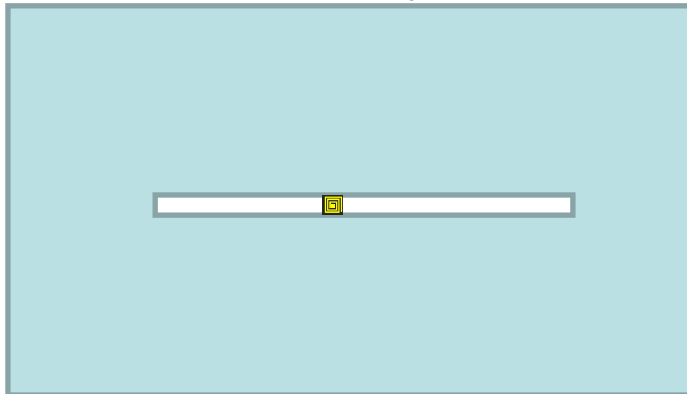
For Steel can
(cylindrical)



2-9 Booster Antenna Design 5 (Slit Antenna)

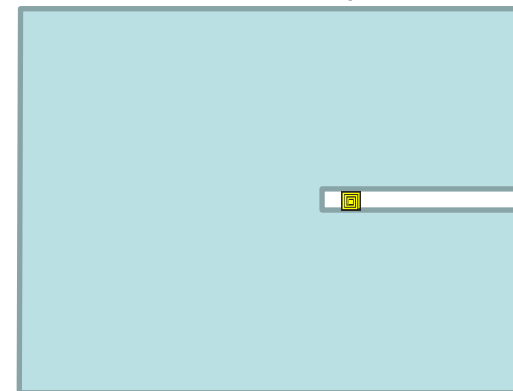
Antenna Material	Tag type
Metallic foil Vapor-deposited film	Flexible
Metallic plate	Rigid

Full slit type



Read range : ~3m

Half slit type



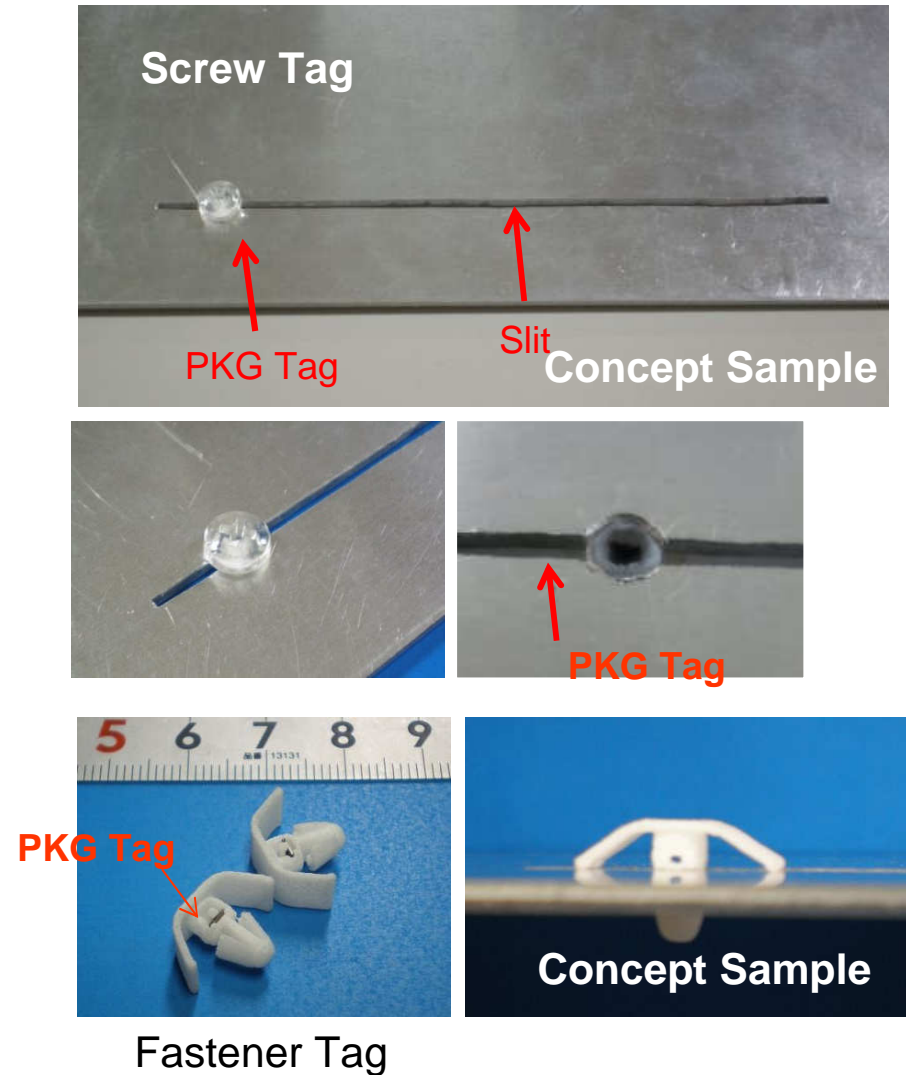
***Size of antenna depends on material and other conditions, and must be adjust at the site.**

2-10 Case example for On-Metal Tag (Slit type)

For Aluminum bag

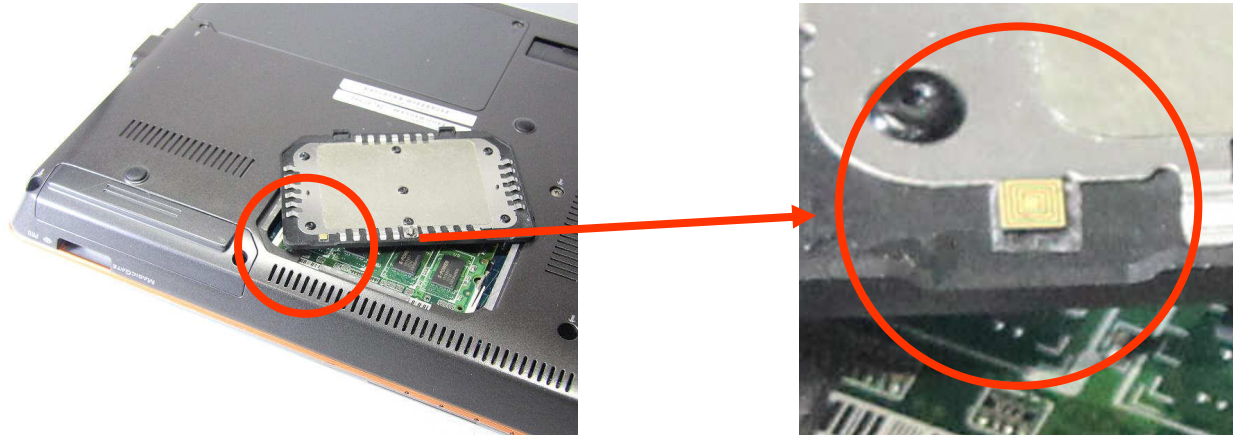


For Metallic Plate/Case

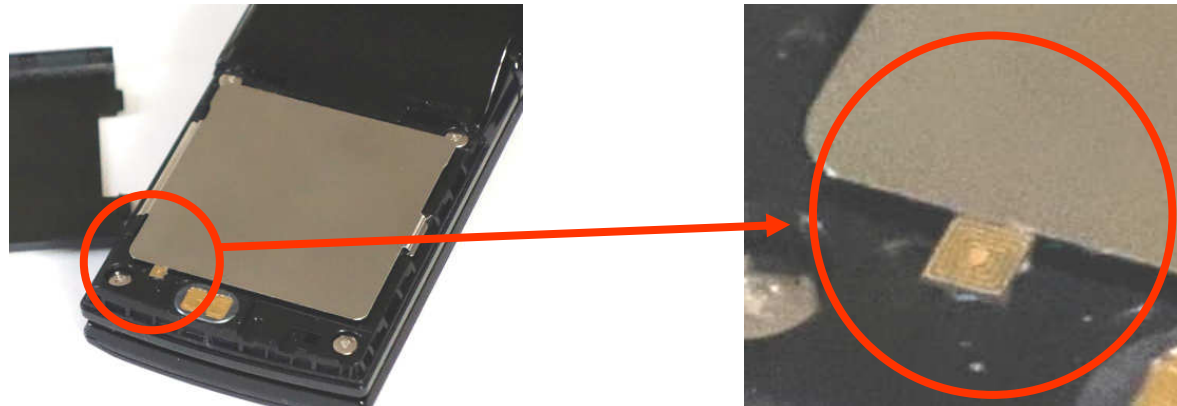


2-11 Case example for Metal Plate

Any metal plate can be booster antenna



Memory Module cover of Notebook PC



Battery cover of Mobile phone

One side of Package Tag must contact with edge of metal plate.
Read range depends on figure of metal plate and condition of each products.

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