

Kyocera RFID Tag Introduction



30 September 2019

KYOCERA Corporation

**Ceramic Packages Division.2
Design Engineering Section**

RFID Tag Features[HF]

PYE-3763-I

LTCC Built-in Antenna Inductor Pattern

1. Longer Reading Distance

Lower Resistance Material : Cu
Built-in Inductor Antenna

- ✓ Longer Reading Distance for Miniaturized Size

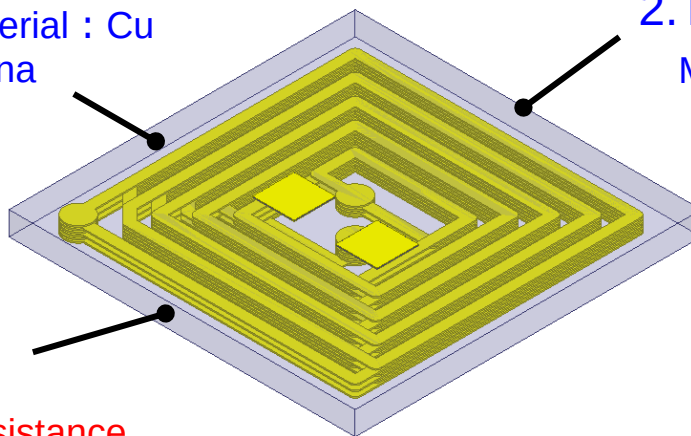
2. Thin Layer Ceramic

Material : LTCC GL580

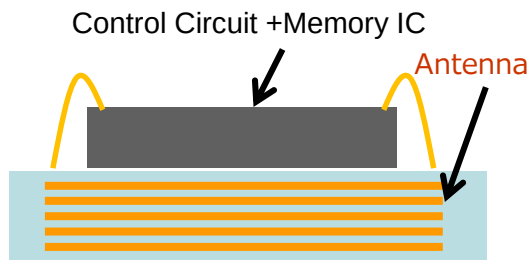
- ✓ Small Size , Low Profile
- ✓ Attachable in Small Space (Next page)

3. High Reliability

- ✓ Heat, Chemical Resistance

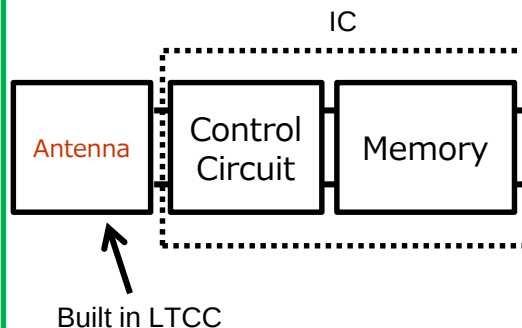


Cross Section Image

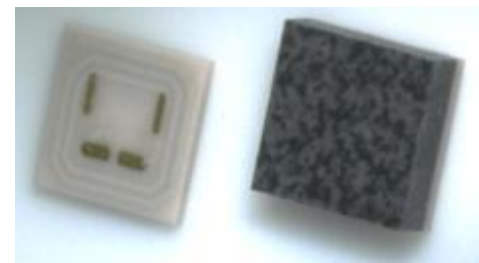


- Antenna built in LTCC
- Antenna made by Inductor

Circuit Block



Product Appearance

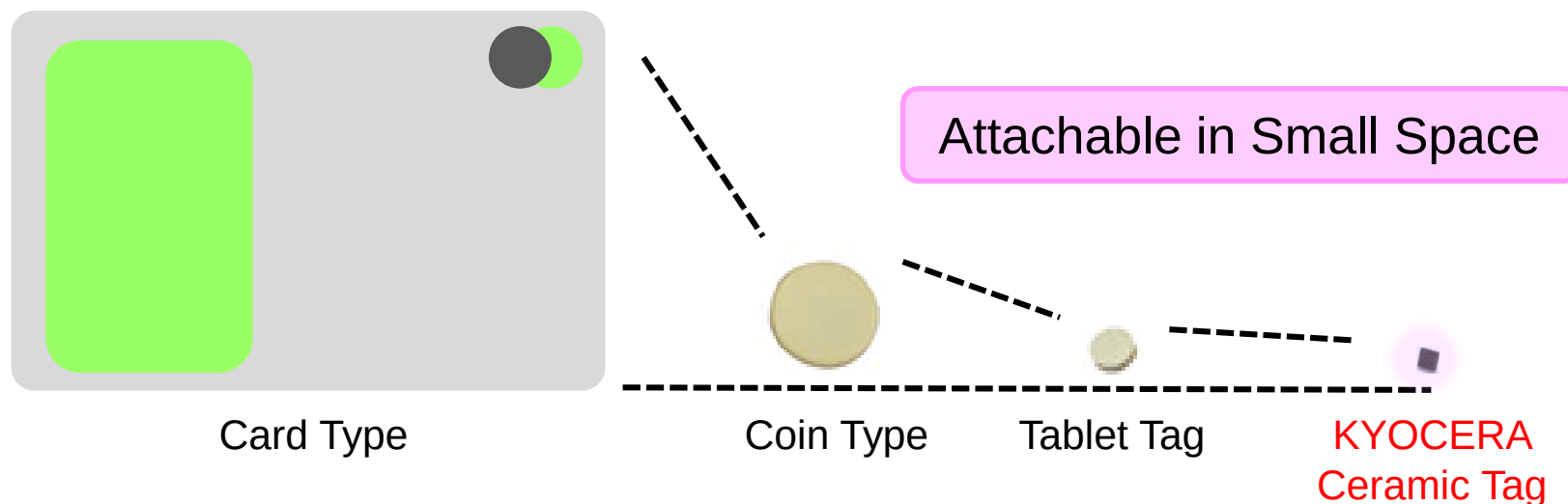


Left : LTCC ceramic body only
Right : RFID (After IC assembled)

RFID Tag Features[HF]

PYE-3763-I

Size Comparison of RFID Tag



	Card Type	Coin Type	Tablet Tag	KYOCERA Ceramic Tag
Size	85.5x54mm	Φ15mm	Φ6.5mm	2.5x2.5mm
Ratio	740	28	5	1

The performance data listed in this presentation is not guaranteed value It may depend on how RFID is used / attached to object.

Other performance which is not shown on this presentation should be discussed separately.

PYE-3763-I

■ Measurement Condition

IC TYPE

NXP ICODE SLIX2(13.56MHz)

Reader/Writer

TAKAYA TR3-MD001E(300mW)

Antenna

TAKAYA A301-3 :15x52.5mm

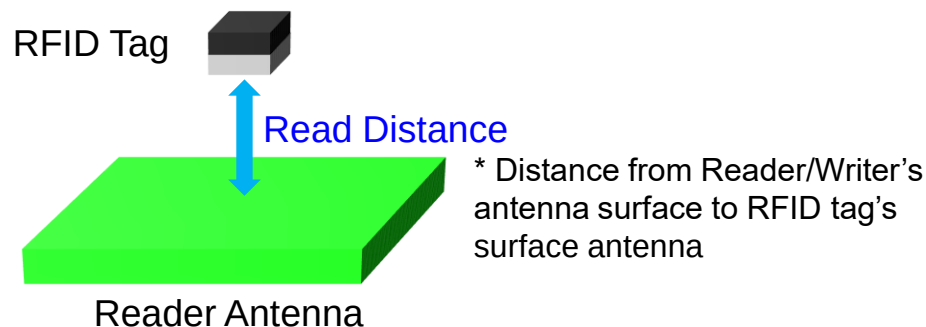
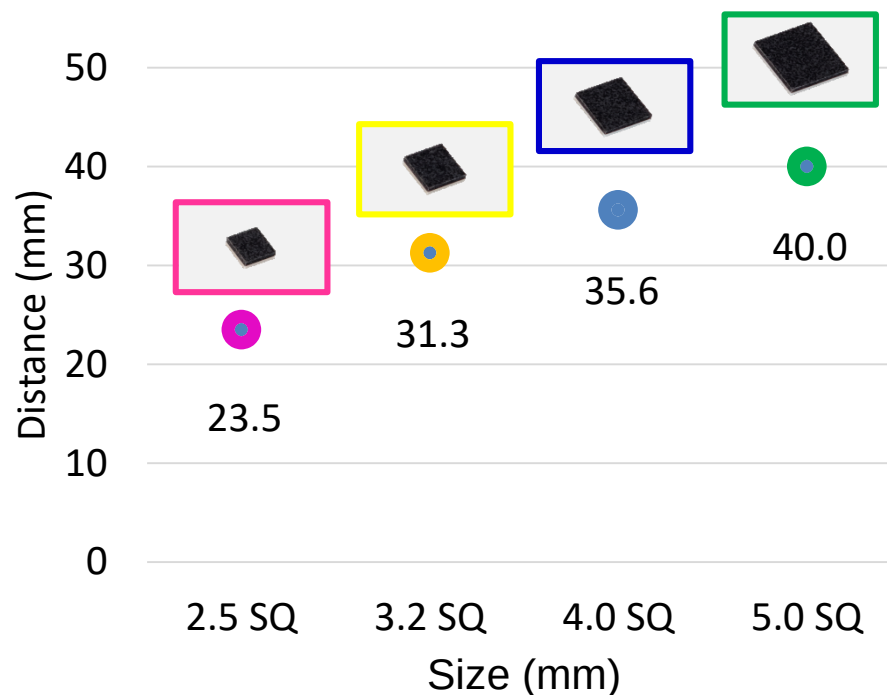
Tag Size

2.5, 3.2, 4.0, 5.0mmSQ

IC

ICODE SLIX2 23.5[pF]

■ Read Distance



The performance data listed in this presentation is not guaranteed value It may depend on how RFID is used / attached to object.

Other performance which is not shown on this presentation should be discussed separately.

P/N	CAA-210211	CAA-210221	CAA-210231	CAA-210241
Appearance				
Freq. Band	HF(13.56MHz)			
IC	NXP ICODE SLIX2			
Size	2.5mmSQ (2.5x2.5mm)	3.2mmSQ (3.2x3.2mm)	4mmSQ (4x4mm)	5mmSQ (5x5mm)
Thickness	0.9mm NOM			
Read Distance*	23.5mm	31.3mm	35.6mm	40.0mm

*Detailed condition for the measurement is listed in previous page. Read distance may depend on performance of Reader, such as power, antenna size etc. and also how RFID tag is used or attached to object.

[Features]

- Miniaturized RFID has superior read distance.
- Inductor antenna pattern is built in ceramic body.
- Operating temperature : -40~85 degree C

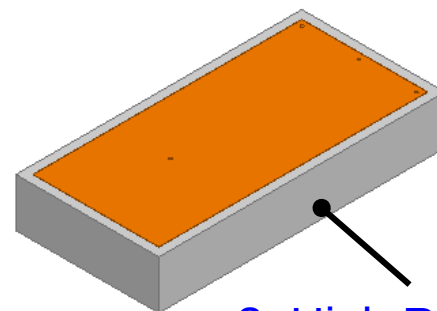
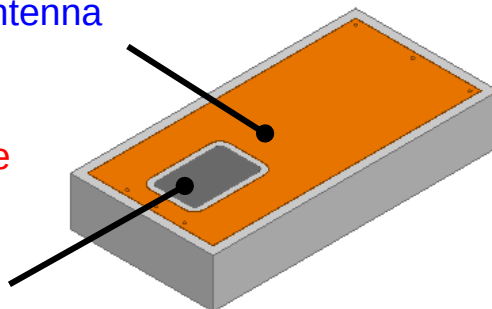
RFID Tag Features[UHF]

PYE-3763-I

1. Longer Reading Distance

Lower Resistance Material : Cu
Built-in Inductor Antenna

- ✓ Longer Reading Distance for Miniaturized Size



2. Robustness

IC is mounted inside cavity

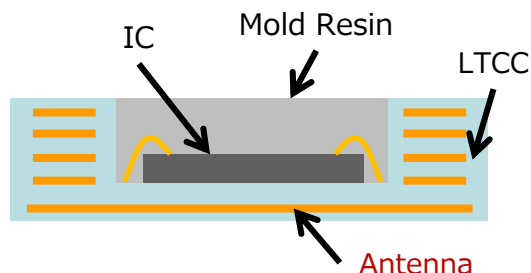
- ✓ IC is protected from outside stress

3. High Reliability

Material : LTCC GL330

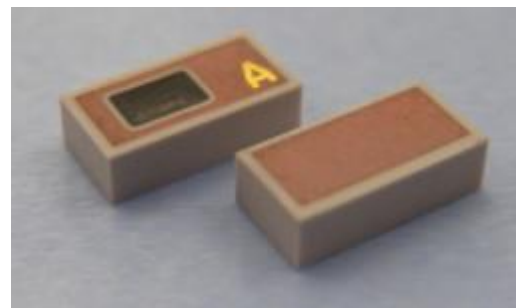
- ✓ Heat, Chemical Resistance
- ✓ Heat Resistant Type available (Next page)

Cross Section Image



- Antenna built-in LTCC
- Solder reflow type - available

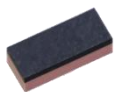
Product Appearance



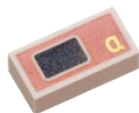
UHF Band - 920MHz & 866MHz

PYE-3763-I

■ Product Appearance



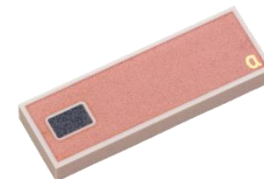
5 x 2 x 1.5mm



6 x 3 x 1.7mm



10 x 5 x 1.7mm

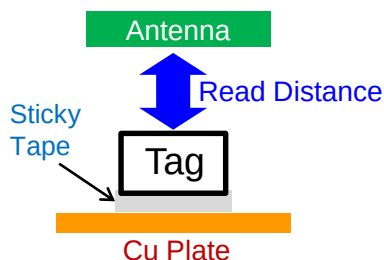


15 x 5 x 1.7mm

■ Measurement Condition



Cu Plate:200mmSQ



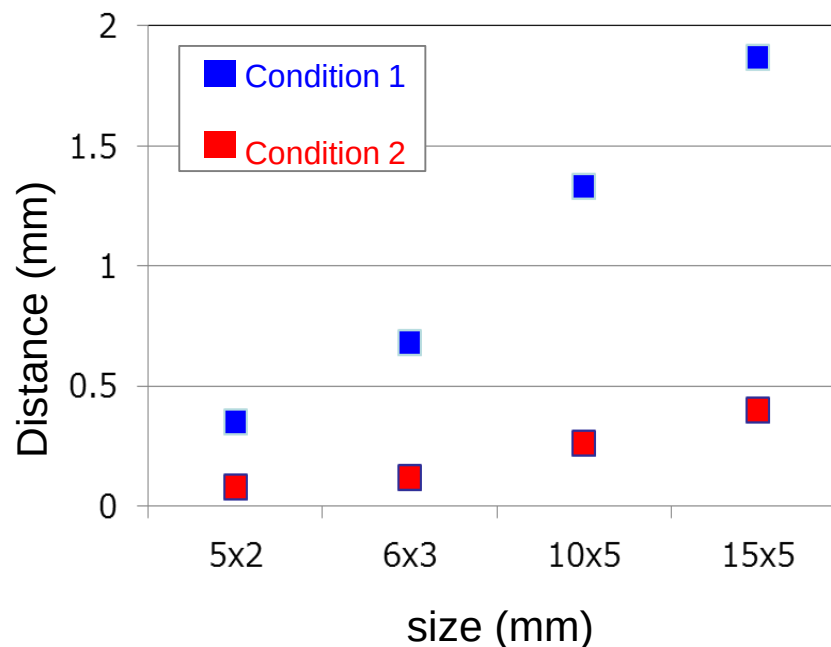
Condition 1

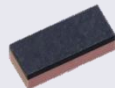
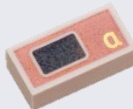
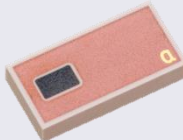
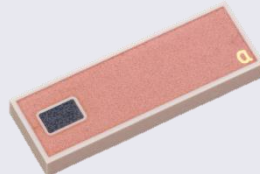
- Power : 1W
- Antenna Gain : +6dBi

Condition 2

- Power : 250mW
- Antenna Gain : +0.3dBi

■ Read Distance



P/N	CAA-200231	CAA-200240	CAA-200251	CAA-200260	CAA-200271	CAA-200280	CAA-200291	CAA-200300
Freq. Band	920MHz	866MHz	920MHz	866MHz	920MHz	866MHz	920MHz	866MHz
Appearance								
IC	Impinj Monza R6P		Impinj Monza 4QT					
size	5.0x2.0mm		6.0x3.0mm		10.0x5.0mm		15.0x5.0mm	
Thickness	1.5mm		1.7mm					
Read Distance*	0.35m		0.7m		1.3m		1.9m	

*Detailed condition for the measurement is listed in previous page. Read distance may depend on performance of Reader, such as power, antenna size etc. and also how RFID tag is used or attached to object.

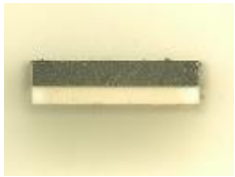
[Features]

- Miniaturized RFID has superior read distance.
- Inductor antenna pattern is built in ceramic body.
- Operating temperature : -40~85 degree C

PYE-3763-I

N=20pcs

Environmental

Evaluation Items	Condition	Result	Appearance (After Test)	
High Temperature Storage	+175°C 1000h	OK		
Low Temperature Storage	-65°C 1000h	OK		
Temperature Cycle	40°C⇔160°C 1000cycles	OK		
High Temperature & High Humidity Test	85°C85%RH 1000h	OK		

(Tested Tag)

Dimensions 2.5x2.5x0.9mm

IC TYPE NXP ICODE SLIX(13.56MHz)

Chemical

N=3pcs

Evaluation Items	Condition	Result
Boiling Water	100°C/48h	OK
Brine (5%)	48h	OK
Na Carbonate Aqueous Solution (5%)	48h	OK
Ethanol	48h	OK
Methanol	48h	OK
MEK (Methyl Ethyl Ketone)	48h	OK
Toluene	48h	OK

(Tested Tag)

Dimensions 2.5x2.5x0.9mm

IC TYPE NXP ICODE SLIX(13.56MHz)

THE NEW VALUE FRONTIER



KYOCERA Corporation