



Coverage.  
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**Profile Series  
N2420DGCSS2**

**Airgain  
Embedded  
Antenna  
Preliminary  
Engineering  
Data Sheet**

3611 Valley Centre Drive, Suite 150  
San Diego, CA 92130 USA  
Tel: +1 760 579 0200  
Fax: +1 760 579 0892  
Information: [info@airgain.com](mailto:info@airgain.com)  
Sales: [sales@airgain.com](mailto:sales@airgain.com)  
Support: [support@airgain.com](mailto:support@airgain.com)

## Revision History (Required)

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***Please verify with Airgain before finalizing a product design.***

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## 1. Airgain N2420DGCSS2 Embedded Antenna

The Model N2420DGCSS2 Embedded Antenna provides a high efficiency, dual band embedded antenna solution for Wi-Fi and ISM band applications, such as WLAN products. As embedded antenna solutions become the focus of next generation wireless product design, the Model N2420DGCSS2 provides the flexibility of an embedded antenna with top performance. It is designed to accommodate most WLAN access point applications, such as routers and gateways and can be easily integrated into an ID package design.

## 2. Features

The Airgain N2420DGCSS2 embedded antenna includes the following features:

- IEEE 802.11 a/b/g/n/ac standards
- Dual 2.4/5-GHz band operation
- Case mount
- 1.2 dBi @ 2.44 GHz; 2.4 dBi @ 5.2 GHz ; 3.1 dBi @ 5.8 GHz peak gain
- High efficiency
- Quick integration



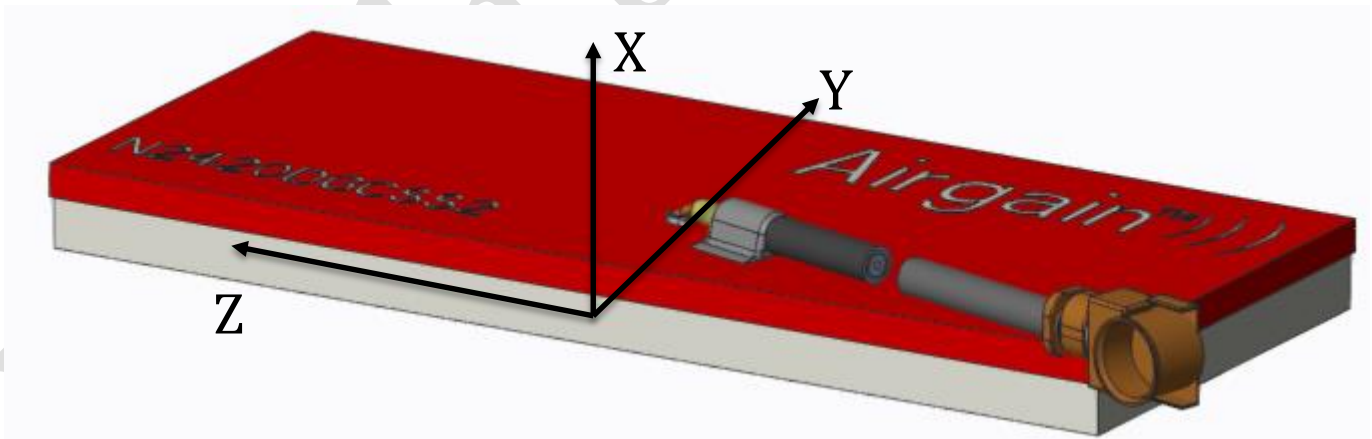
**Figure 1** Airgain N2420DGCSS2 embedded antenna

### 3. Specifications and Interface

Standard	IEEE 802.11 a/b/g/n/ac
Frequency range	2.4 to 2.49 and 4.9 to 5.9 GHz
Peak gain	1.2 dBi @ 2.44 GHz; 2.4 dBi @ 5.2 GHz ; 3.1 dBi @ 5.8 GHz
VSWR	2:1
Feed impedance	50 ohms
Power handling	30 dBm
Interface	50 ohms, 1.13 mm diameter, micro coax cable (available with optional U.FL-compatible cable connector and/or cable-mounted EMI ferrites)
Antenna dimensions	34.5 x 14.53 x 1 mm
Weight	0.99 g ( 0.035 oz)
Temperature range	Operating: -40° C to +75° C (-40° F to +167° F) Storage: -40° C to +85° C (-40° F to +185° F)
Humidity range	0% to 95% non-condensing

### 4. Radiation Patterns

Patterns taken with Model N2420DGCSS2 mounted on 90mm x 90mm x 2.2mm thick, ABS Plastic sheet using 1.6mm double sided tape.



**Figure 2** Airgain N2420DGCSS2 measurement axes

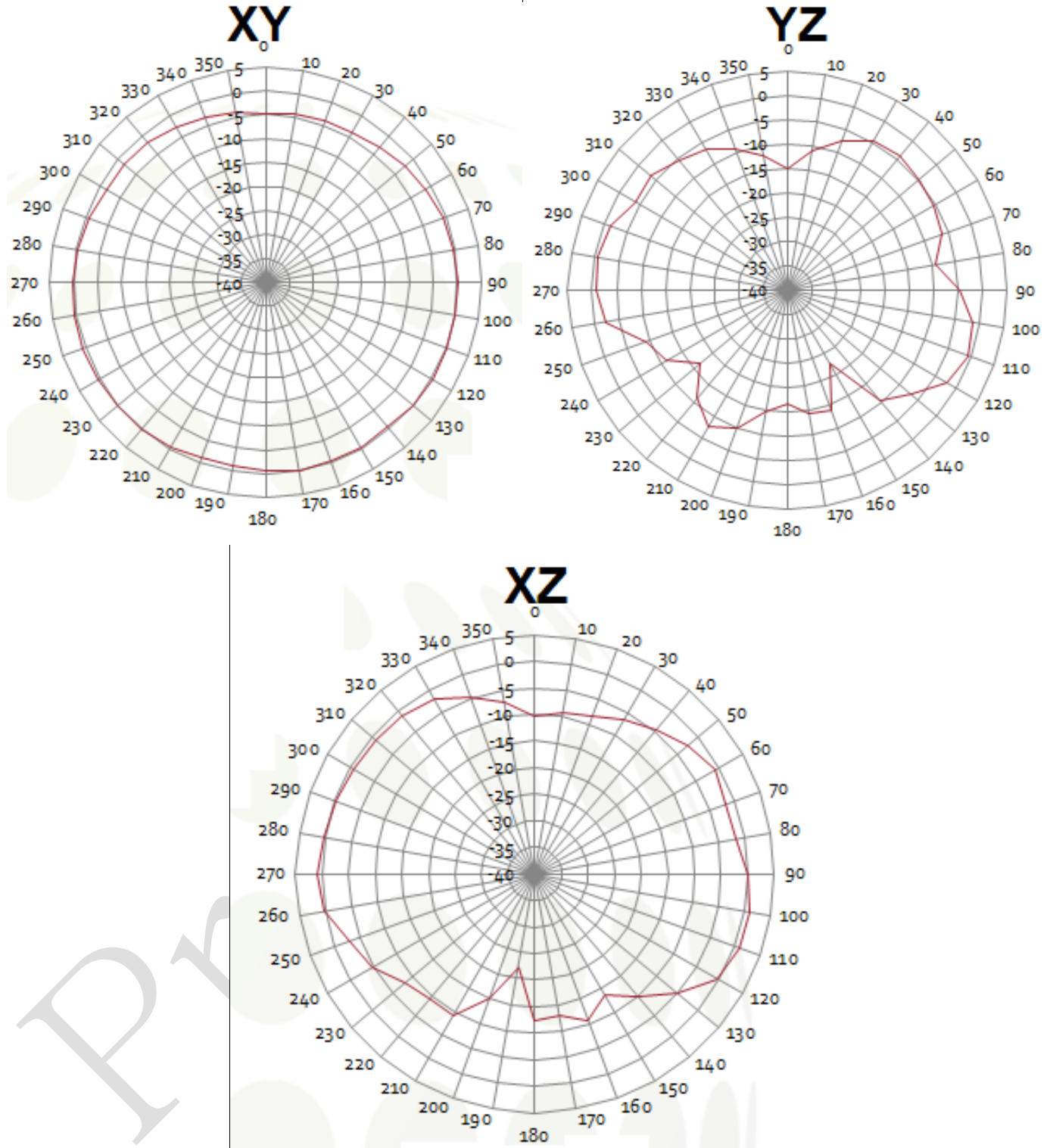


Figure 3 Airgain N2420DGCSS2 radiation patterns at 2.4 GHz

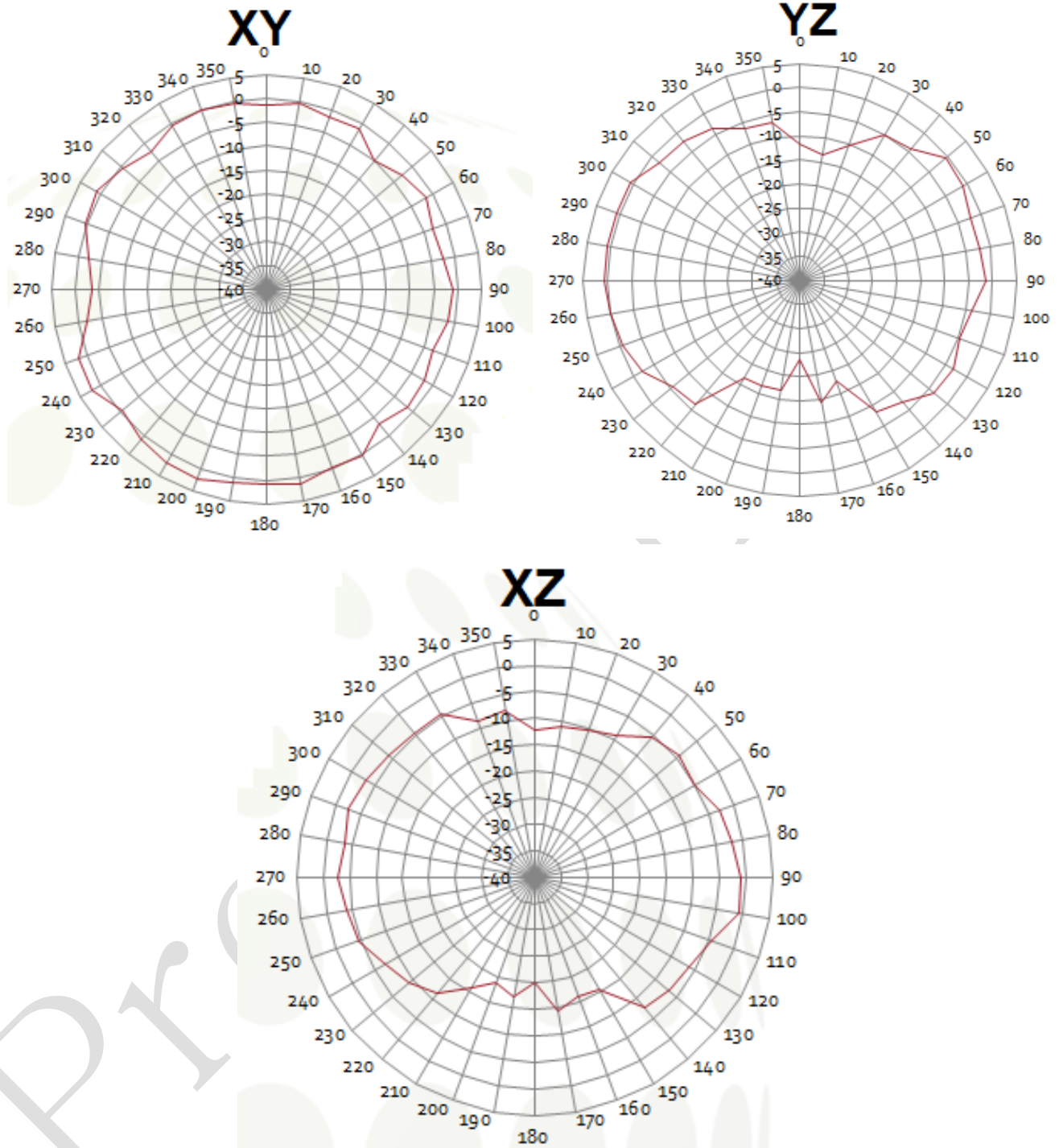


Figure 4 Airgain N2420DGCSS2 radiation patterns at 5.2 GHz

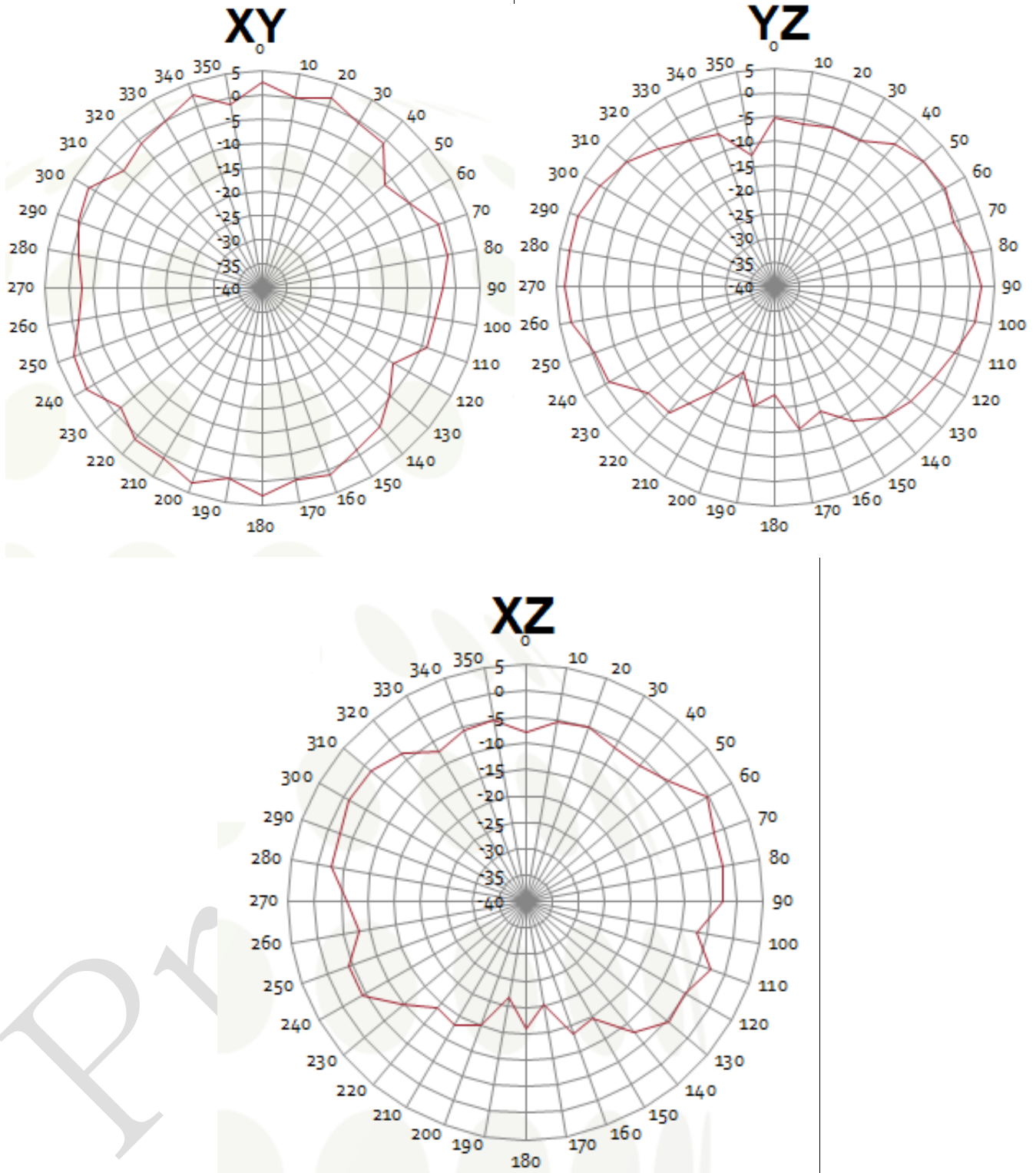


Figure 5 Airgain N2420DGCSS2 radiation patterns at 5.8 GHz



## 5. Dimensions

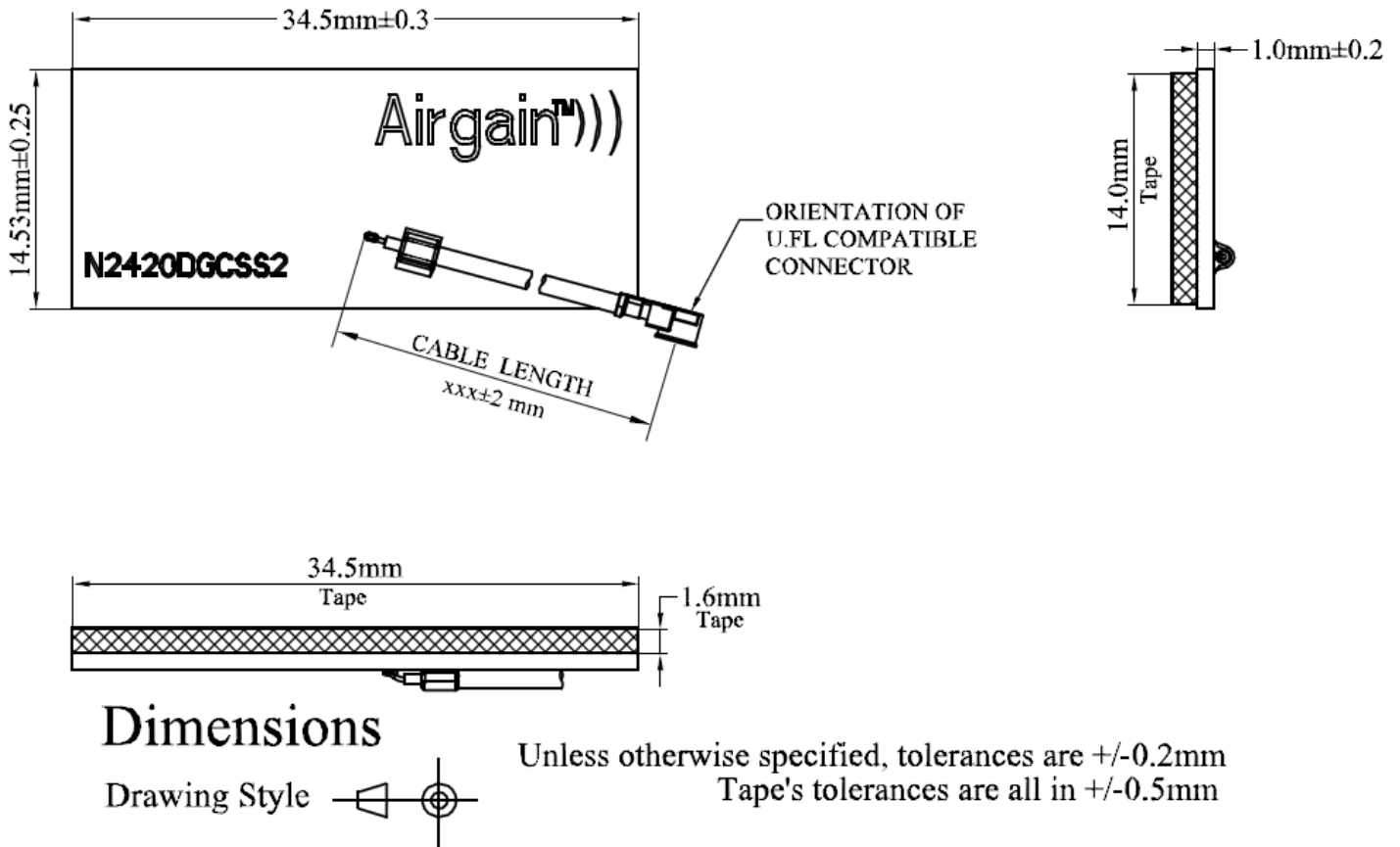


Figure 6 Airgain N2420DGCSS2-T pre-applied tape dimensions

## 6. ROHS

Airgain N2420DGCSS2 embedded antennas are RoHS compliant.

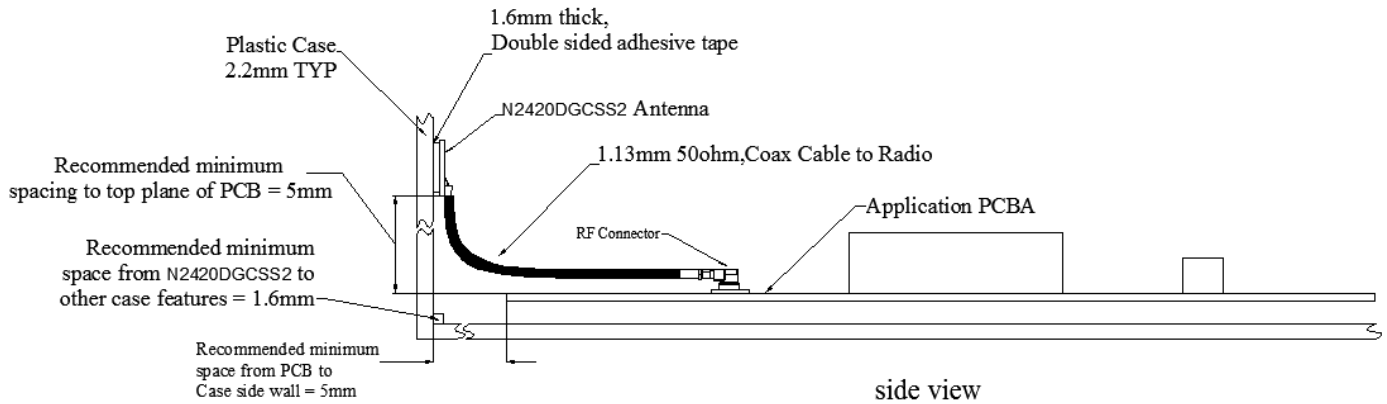
## 7. Mounting Guidelines

The Airgain N2420DGCSS2 embedded antenna can be simply mounted on the interior of an ABS plastic case using double-sided adhesive tape. This can simplify the industrial design process and shorten the product development cycle.

The N2420DGCSS2 is mildly loaded (detuned) if it is not properly spaced away from the ABS plastic mounting surface. You should mount the N2420DGCSS2 antenna onto a 2.2-mm thick ABS plastic case with 1.6-mm double-sided tape for optimum performance. You can mount the N2420DGCSS2 to case walls of different thicknesses, but should determine the optimum separation between the N2420DGCSS2 and the case wall on a case-by-case basis. As the case material becomes thicker, the loading effect becomes more pronounced, which can be offset by a larger air gap.

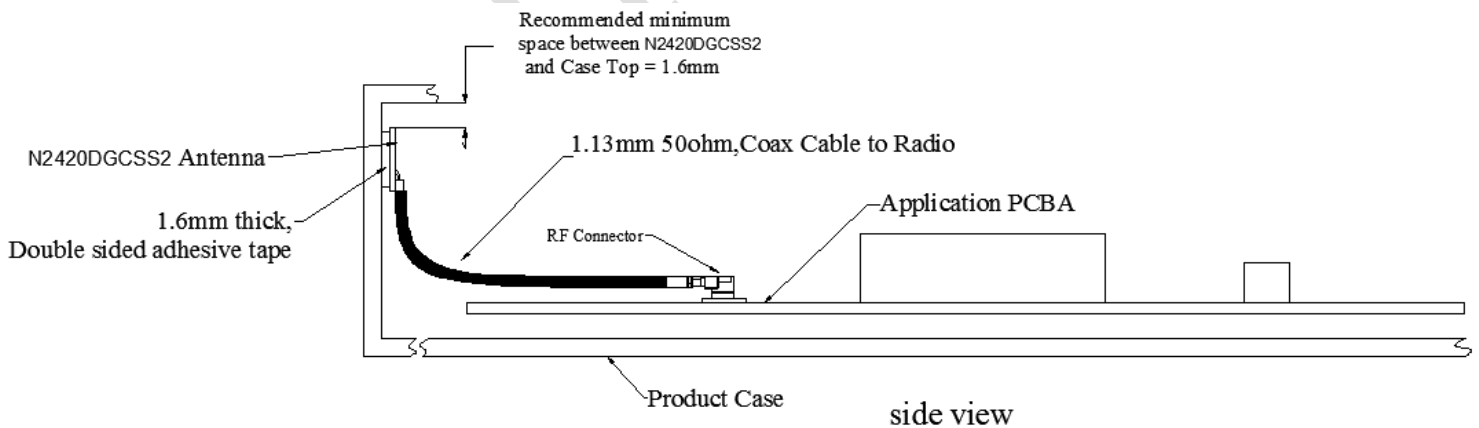
## Case Mounting the N2420DGCSS2 using Double Sided Tape

For a case wall mount, mount the N2420DGCSS2 in an application case by using a 14mm by 34.5 mm piece of double-sided adhesive tape placed behind the antenna PCB, as shown in Figure 7 and Figure 10. Place the N2420DGCSS2 on the case side wall at a height where the lowest antenna PCB edge is 5 mm above the application PCBA top plane. A space of 5 mm is recommended between the PCBA edge near the N2420DGCSS2 and the case wall mounting location, as shown in Figure 7.



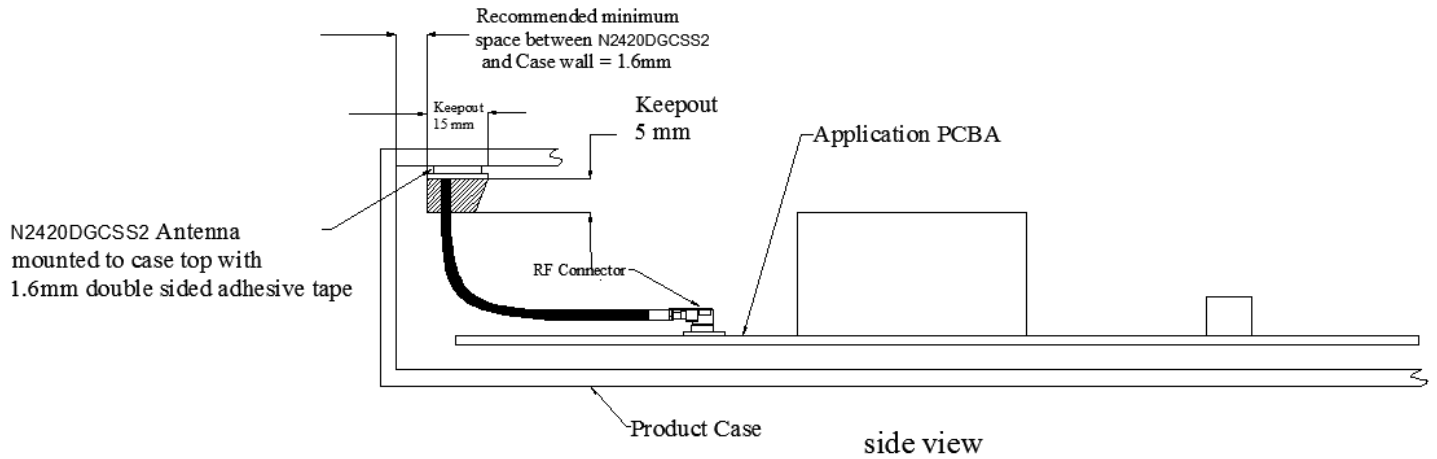
**Figure 7** Case side wall mounting considerations for Airgain N2420DGCSS2 (side view)

For a case top location, ensure that a space of 1.6 mm minimum is maintained between any other case walls, case features, or case top, which are near the N2420DGCSS2 antenna mounting location, as shown in Figure 8 and Figure 9.

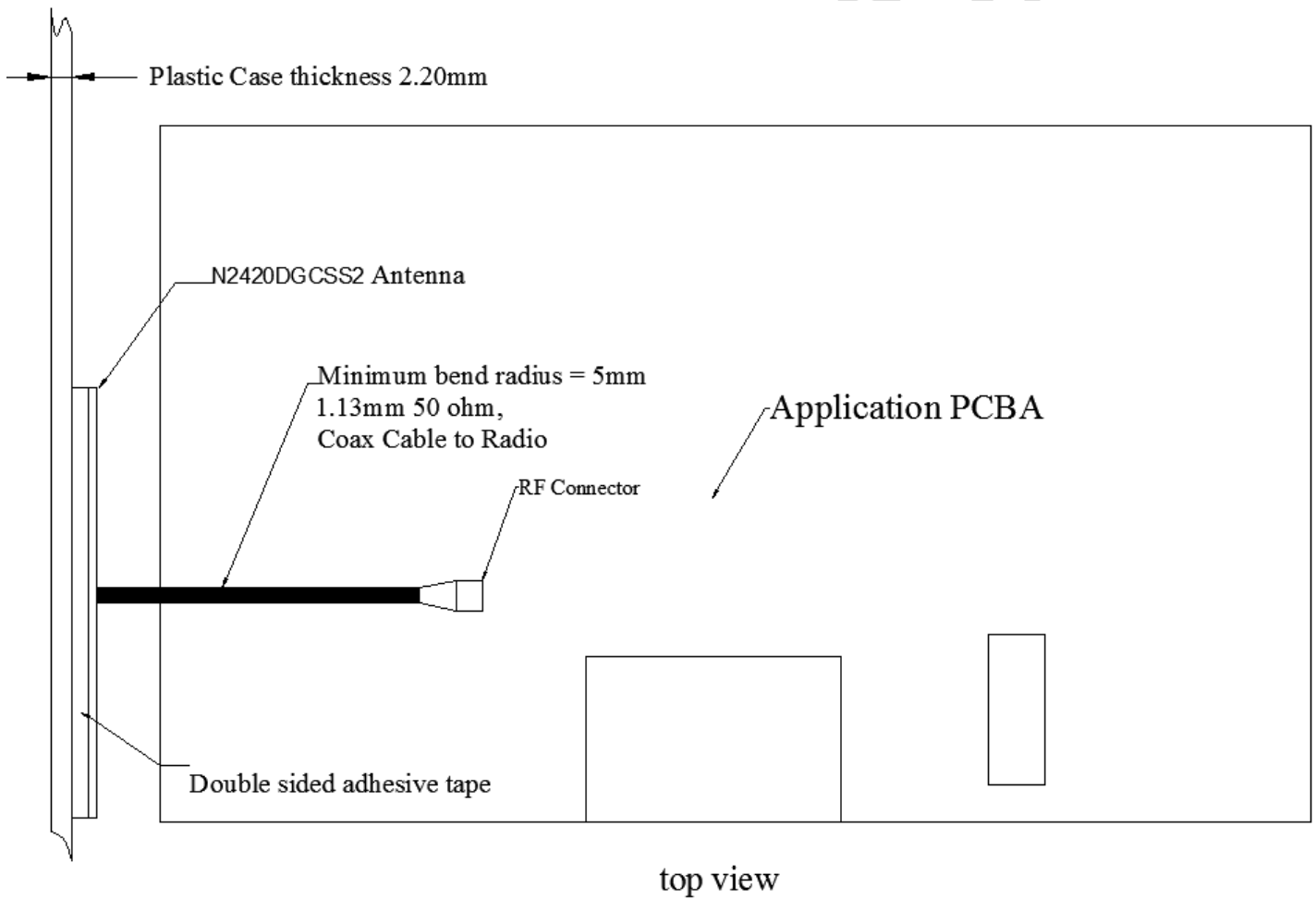


**Figure 8** Case top considerations when mounting Airgain N2420DGCSS2 on case side wall

In Figure 9, a tall component keepout area is defined beneath the N2420DGCSS2 antenna. No portion of any tall components on the application PCBA should come within 5 mm of the N2420DGCSS2. This helps ensure maximum antenna performance.



**Figure 9** Clearance considerations when case top mounting Airgain N2420DGCSS2 (side view)



**Figure 10** Case side wall mounting considerations when mounting Airgain N2420DGCSS2 (top view)

## 8. Feature and Options Information

Airgain N2420DGCSS2 Series antennas are equipped with an RF cable I/O interface. Optional cable termination such as U.FL-compatible micro coax connectors and cable mounted EMI ferrite cores are available. To aid mounting the N2420DGCSS2, pre-applied, double-sided adhesive tape is available on the N2420DGCSS2 Series.

### 8.1 Part Number Conventions

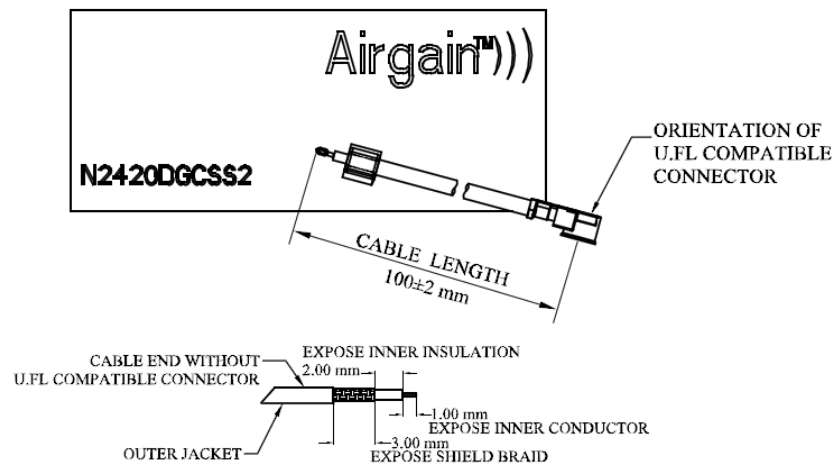
Airgain uses a six-staged standard number system for our part numbers, which serially define the antenna type, tape type, packaging type, cable type/length, and connector type/interface, as described below:

Antenna #	Tape type -XX (if required)	Packaging type -XX	Cable type -X	Cable length - XXX	Connector type -XX (if required)
N2420DGCSS2	Blank = No tape T = Tape on bottom of element	Blank= parts shipped in panels of 18 pieces  PK1= singulated (individual) antennas	G = Grey (Standard) B = Black (Non Standard) W = White (Non Standard) A = Blue (Non Standard)	Cable length in millimeters (mm)  Sample lengths*: 65, 100, 130, 150, 190, 230, 250, 300,400	Blank = Stripped Cable U = U.FL connector  C = U.FL connector plus Ferrite Core, core size: 3.5mm * 9.0mm * 1.5mm  CS = stripped cable plus Ferrite Core, core size: 3.5mm * 9.0mm * 1.5mm

\* Standard cable lengths listed in RF Cable Datasheet

### 8.2 Part Number Example

**N2420DGCSS2-T-G100U** – N2420DGCSS2 antenna with 1.6-mm double-sided adhesive tape, 100-mm cable, and U.FL-compatible connector.

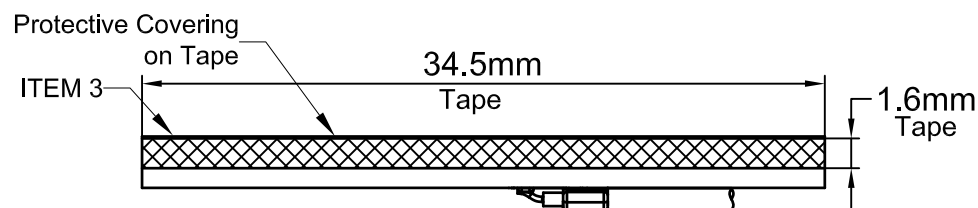
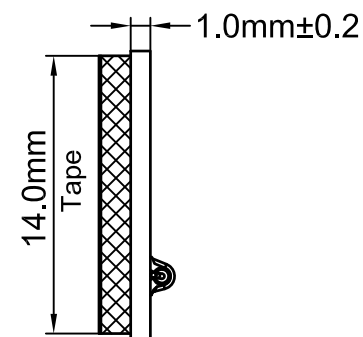
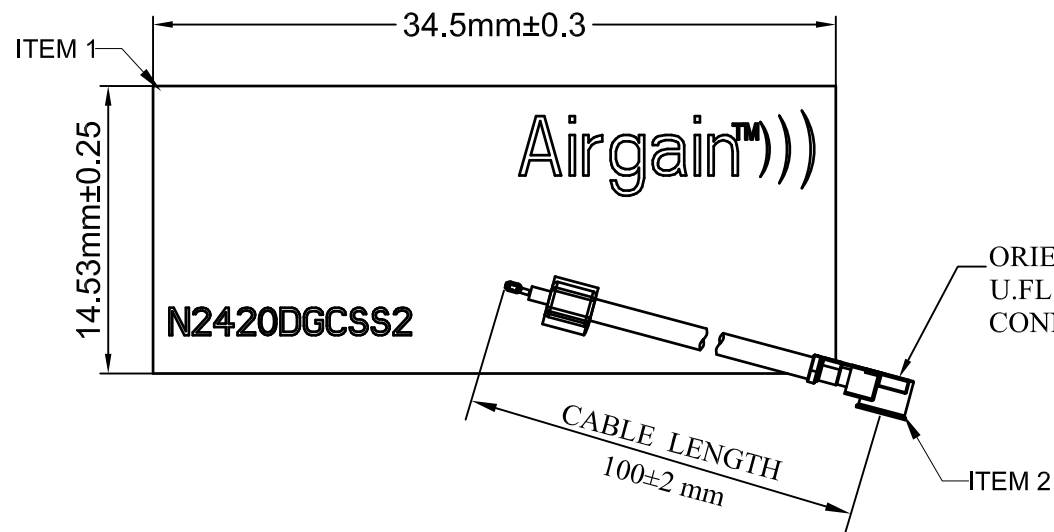


**Figure 11** Airgain N2420DGCSS2 with connector or stripped cable

## 9. Cable Data Sheet

Item	Specification	
Cable type	OD1.13	
Impedance	50 ± 3 ohms	
Inner conductor	Material	Tin-coated copper
	Conductor numbers	7
	Conductor size	0.08 mm
	Outer diameter	0.24 mm
Dielectric layer	Material	FEP
	Color	Clear
	Average thickness	0.22 mm
	Diameter	0.68 mm
Braid (shielding)	Material	Tin-coated copper
	Construction	16-4-0.05 mm
	Coverage	90%±5%
Outer cover	Material	FEP
	Color	Black / white / grey
	Average thickness	0.10 mm
	Diameter	1.13 ± 0.05 mm
VSWR testing	< 1.3	
Attenuation (dB/1meter)	100 MHz	0.60
	400 MHz	1.25
	1800 MHz	2.23
	2400 MHz	2.70
	5200 MHz	4.15
Capacitance	97 ± 3 ( pF / meter)	
Maximum power	33 dBm	
Spark test	500 V	
Rating, temperature, and voltage	200° C / 30 V	
Conductor resistance	520 ohms / KM / 20° C max.	
Dielectric resistance	1500 M ohms / KM / 20° C min.	

REV	DESCRIPTION	BY	DATE
A	Initial Design	BBIAN	17/APR/2015



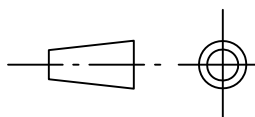
Notes:

The processes used to assemble this antenna shall comply with the following specifications ,unless otherwise specified.

- 1.Solder:use lead free solder if applies for lead free soldering process to assemble the antenna , unless otherwise specified.
- 2.Bom:use the bom file for assembling the antenna.this table is provided for reference only.
- 3.Unless otherwise specified dimension, tolerances are +/-0.2mm
- 4.Unless otherwise specified dimension, tape tolerances are +/-0.5mm
- 5.Packaging type: break up panel packaging.

ITEM#	DESIGNATOR	QUANTITY	NOTE
1	Antenna	1	
2	Coax Cable	1	Cable color is Grey
3	Tape	1	

DRAWING STYLE



BOM No. 509C-06-00-001-1	3611 Valley Centre Drive, Suite 150 San Diego, CA 92130 USA		Airgain™))	
PCB No. 509C-12-00-001-1	Project PROFILE EMBEDDED ANTENNA			
Drawn by BBIAN	Date 17/April/2015	Title N2420DGCSS2-T-PK1-G100U		
Checked by	Date	Size B	Number 509C-07-02-002-3	Rev. A
Approved by	Date	Layer	Scale	
		File	Sheet 1 of 1	

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