

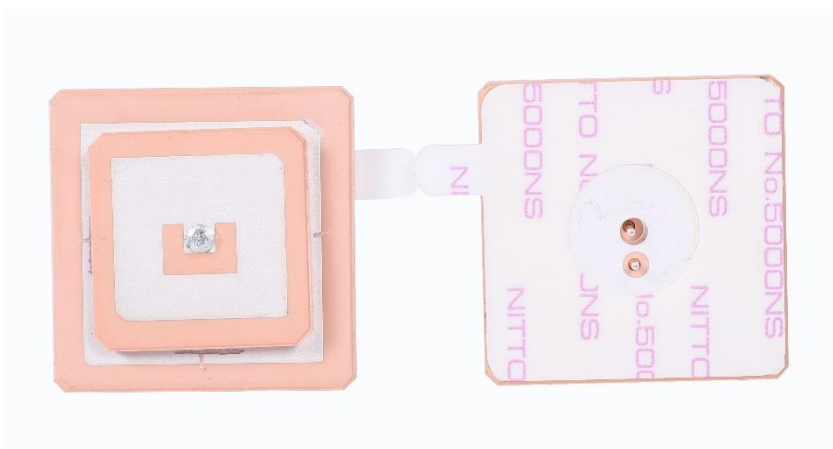
**Description:** GNSS L1+L5 Pin Feed Patch Antenna

**Series:** Combo Patch

**PART NUMBER:** W3231

**Features:**

- Antenna type stacked patch
- Gain +2 dBic @ 1176.45MHz
- Gain +3 dBic @ 1575.42MHz
- Gain 0 dBic @ 1602.65MHz
- Polarization RCHP
- Size 35 x 35 x 7 mm
- Separate feed pins for L1 and L5 bands



**Applications:**

- GNSS multiband receivers
- High precision navigation and tracking devices

All dimensions are in mm / inches

Issue: 2020

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

CONFIDENTIAL AND PROPRIETARY INFORMATION

This document contains confidential and proprietary information of Pulse Electronics, Inc. (Pulse) and is protected by copyright, trade secret and other state and federal laws. Its receipt or possession does not convey any rights to reproduce, disclose its contents, or to manufacture, use or sell anything it may describe. Reproduction, disclosure or use without specific written authorization of Pulse is strictly forbidden.

For more information:

Pulse Worldwide Headquarters  
15255 Innovation Drive #100  
San Diego, CA 92128  
USA  
Tel: 1-858-674-8100

Pulse/Larsen Antennas  
18110 SE 34<sup>th</sup> St Bldg 2 Suite 250  
Vancouver, WA 98683  
USA  
Tel: 1-360-944-7551

Europe Headquarters  
Pulse GmbH & Co, KG  
Zeppelinstrasse 15  
Herrenberg, Germany  
Tel: 49 7032 7806 0

Pulse (Suzhou) Wireless Products Co, Inc.  
99 Huo Ju Road(#29 Bldg, 4<sup>th</sup> Phase  
Suzhou New District  
Jiangsu Province, Suzhou 215009 PR China  
Tel: 86 512 6807 9998



**Description:** GNSS L1+L5 Pin Feed Patch Antenna**Series:** Combo Patch**PART NUMBER:** W3231**ELECTRICAL SPECIFICATIONS \***

|                   |  |
|-------------------|--|
| Antenna Type      | Stacked Patch Antenna                                      |
| Frequency         | 1176.45 ± 1.023MHz<br>1575.42 ± 1.023MHz<br>1602.56 ± 4MHz |
| Nominal Impedance | 50 Ω   |
| Return Loss (Max) | -10 / -8 / -4 dB   |
| Radiation Pattern | Omni Hor plane<br>Directional Ver plane                    |
| Gain (Typ)        | 2 / 3 / 0 dBic   |
| Efficiency (Min)  | 70 / 60 / 40 %   |
| Polarization      | RHCP   |
| Axial Ratio (Max) | 14 / 4 / 6 dB  |

**MECHANICAL SPECIFICATIONS**

|        |           |
|--------|-----------|
| Size   | 35x35x7mm |
| Weight | 25g       |
| Color  | Gray      |

**ENVIRONMENTAL SPECIFICATIONS**

|                       |             |
|-----------------------|-------------|
| Operating Temperature | -40~+85° C  |
| Storage Temperature   | -40~+85 ° C |
| RoHS Compliant        | Yes         |

\* Test with 70mm\*70mm ground plane.

Issue: 2020

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

CONFIDENTIAL AND PROPRIETARY INFORMATION

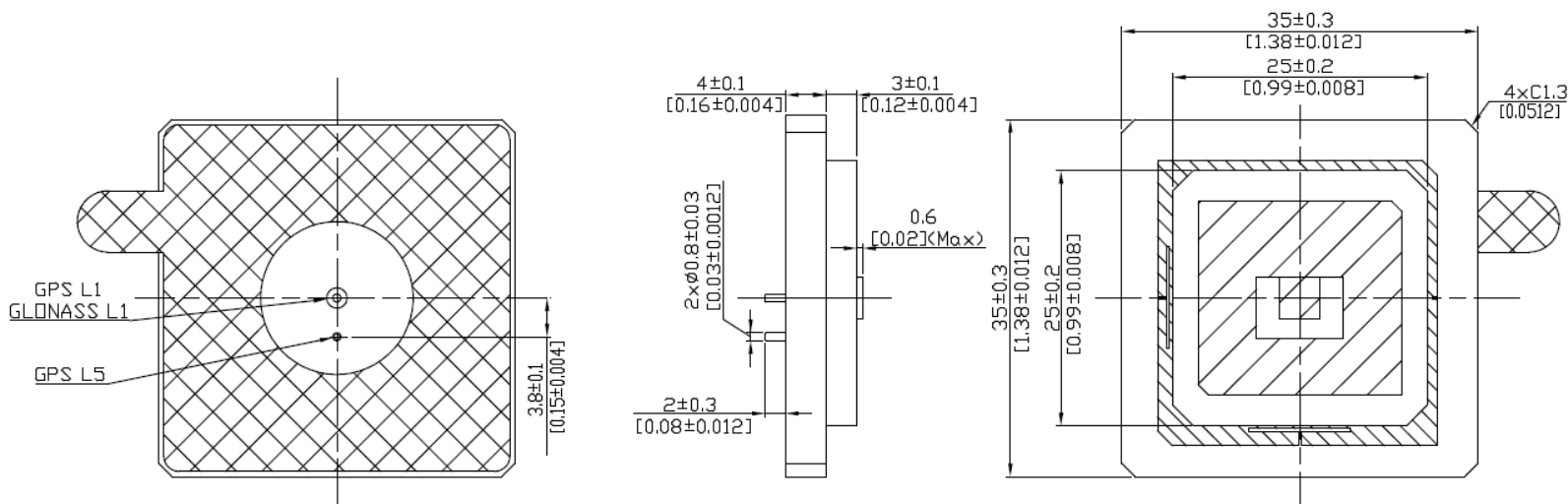
This document contains confidential and proprietary information of Pulse Electronics, Inc. (Pulse) and is protected by copyright, trade secret and other state and federal laws. Its receipt or possession does not convey any rights to reproduce, disclose its contents, or to manufacture, use or sell anything it may describe. Reproduction, disclosure or use without specific written authorization of Pulse is strictly forbidden.

**Description:** GNSS L1+L5 Pin Feed Patch Antenna

**Series:** Combo Patch

**PART NUMBER:** W3231

**MECHANICAL DRAWING**



Issue: 2020

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

CONFIDENTIAL AND PROPRIETARY INFORMATION

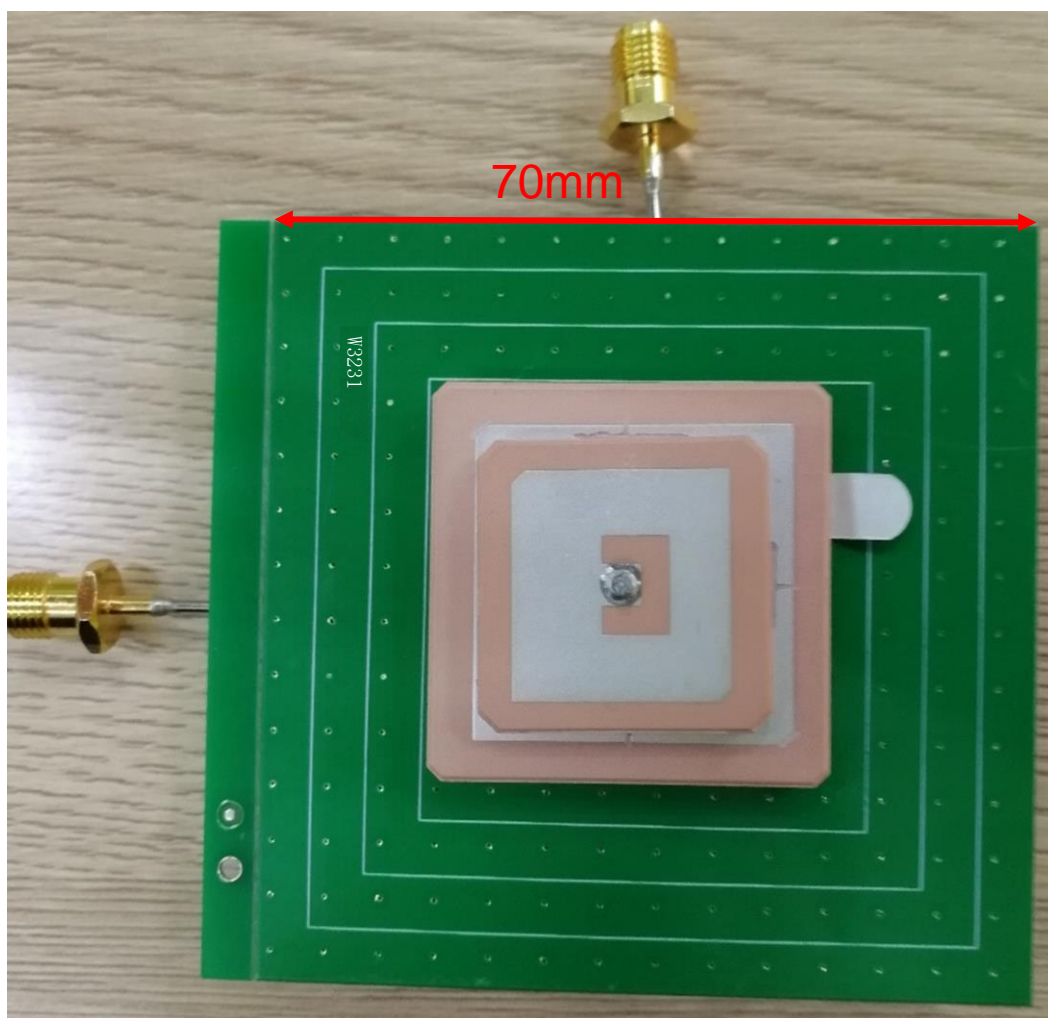
This document contains confidential and proprietary information of Pulse Electronics, Inc. (Pulse) and is protected by copyright, trade secret and other state and federal laws. Its receipt or possession does not convey any rights to reproduce, disclose its contents, or to manufacture, use or sell anything it may describe. Reproduction, disclosure or use without specific written authorization of Pulse is strictly forbidden.

**Description:** GNSS L1+L5 Pin Feed Patch Antenna

**Series:** Combo Patch

**PART NUMBER:** W3231

## TEST SETUP



\* Test with 70mm\*70mm ground plane.

Issue: 2020

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

CONFIDENTIAL AND PROPRIETARY INFORMATION

This document contains confidential and proprietary information of Pulse Electronics, Inc. (Pulse) and is protected by copyright, trade secret and other state and federal laws. Its receipt or possession does not convey any rights to reproduce, disclose its contents, or to manufacture, use or sell anything it may describe. Reproduction, disclosure or use without specific written authorization of Pulse is strictly forbidden.

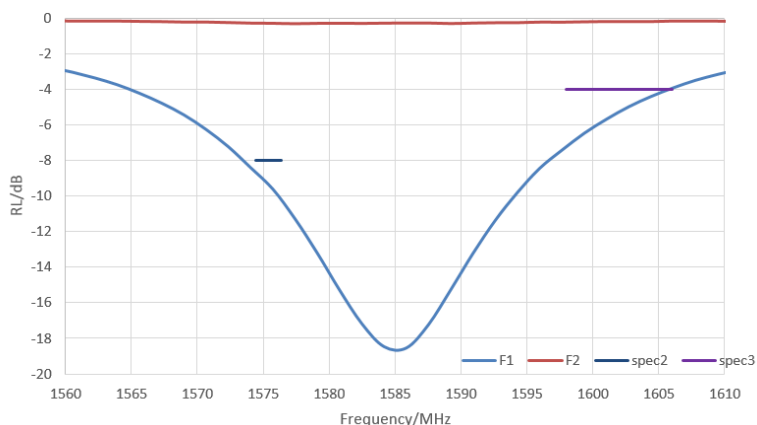
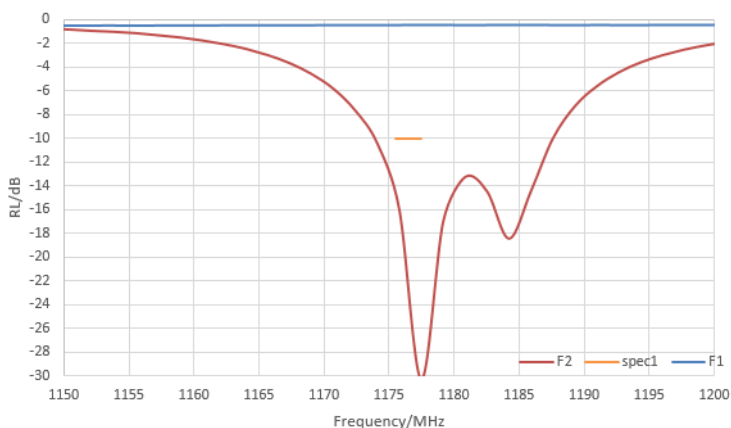
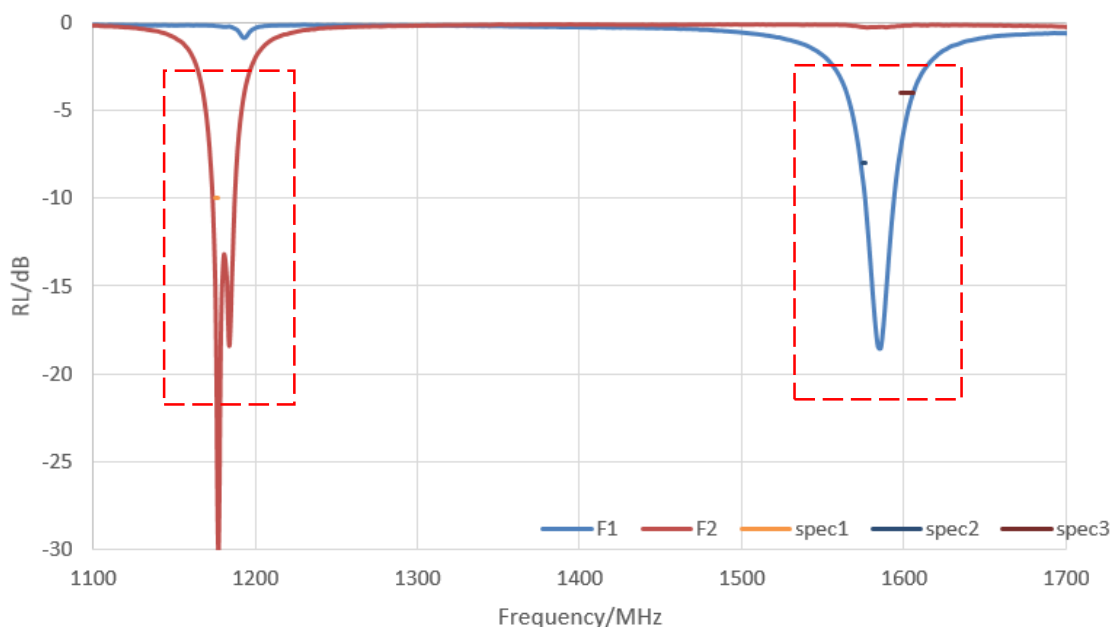
**Description:** GNSS L1+L5 Pin Feed Patch Antenna

**Series:** Combo Patch

**PART NUMBER:** W3231

## CHARTS

### Return Loss vs Frequency



Issue: 2020

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

CONFIDENTIAL AND PROPRIETARY INFORMATION

This document contains confidential and proprietary information of Pulse Electronics, Inc. (Pulse) and is protected by copyright, trade secret and other state and federal laws. Its receipt or possession does not convey any rights to reproduce, disclose its contents, or to manufacture, use or sell anything it may describe. Reproduction, disclosure or use without specific written authorization of Pulse is strictly forbidden.

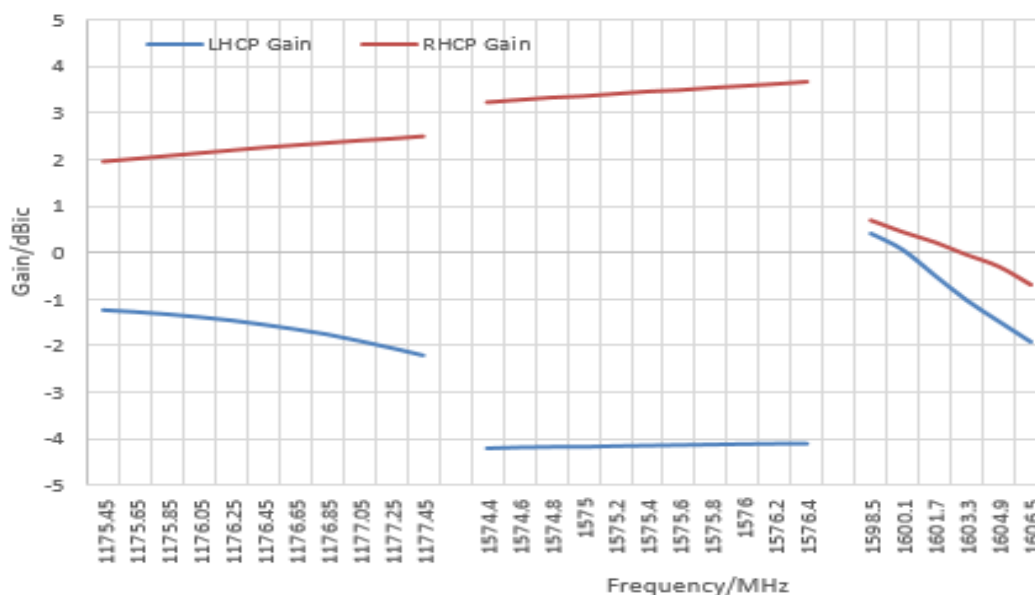
**Description:** GNSS L1+L5 Pin Feed Patch Antenna

**Series:** Combo Patch

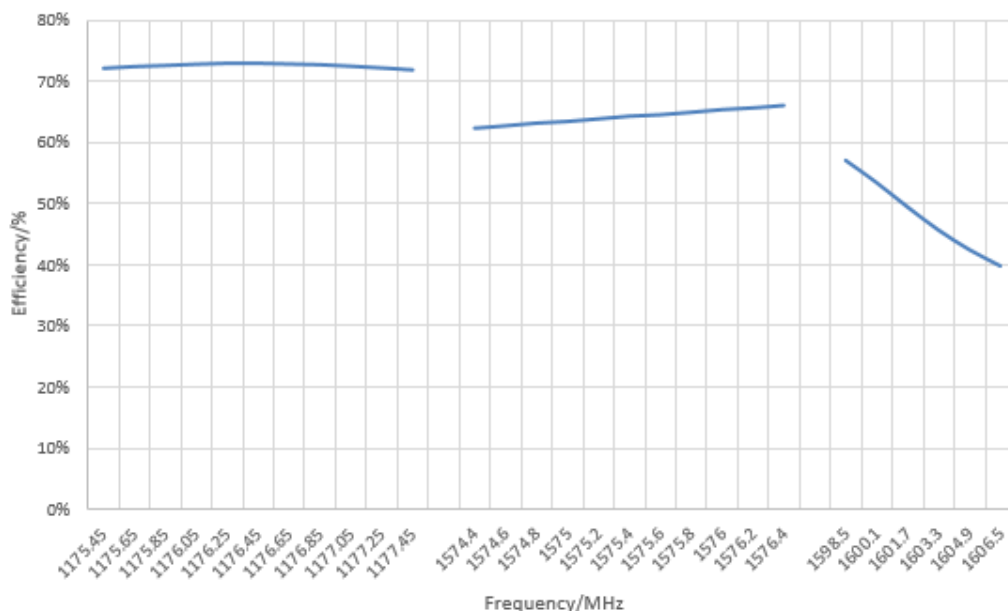
**PART NUMBER:** W3231

## CHARTS

### Gain vs Frequency



### Radiation Efficiency vs Frequency



Issue: 2020

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

CONFIDENTIAL AND PROPRIETARY INFORMATION

This document contains confidential and proprietary information of Pulse Electronics, Inc. (Pulse) and is protected by copyright, trade secret and other state and federal laws. Its receipt or possession does not convey any rights to reproduce, disclose its contents, or to manufacture, use or sell anything it may describe. Reproduction, disclosure or use without specific written authorization of Pulse is strictly forbidden.

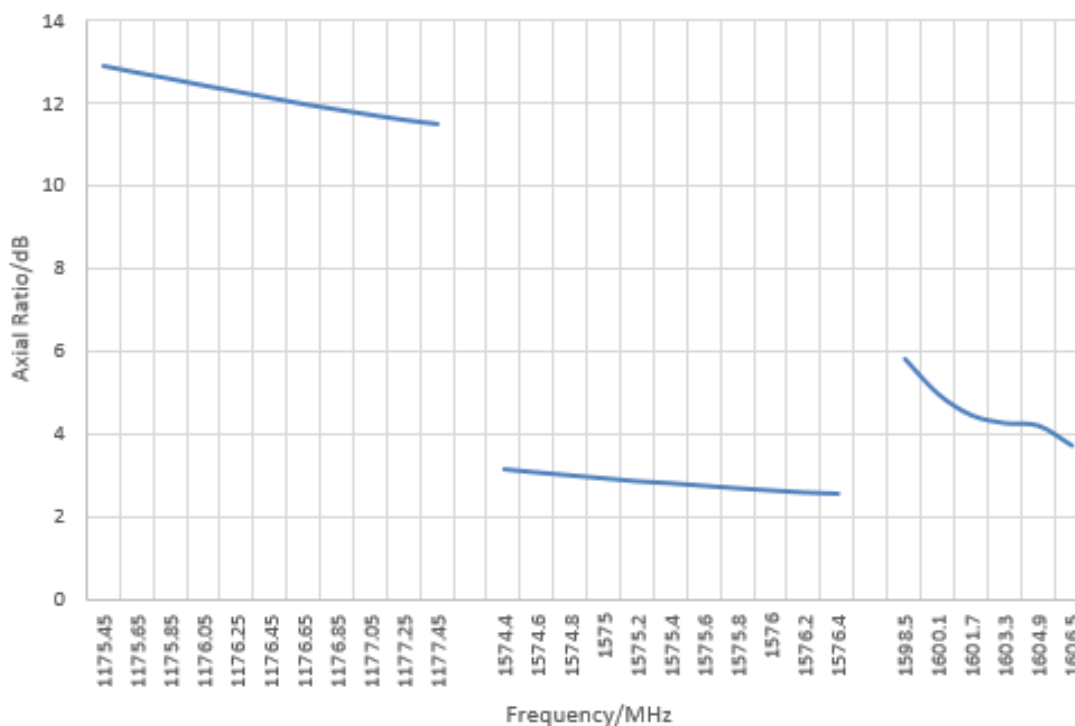
**Description:** GNSS L1+L5 Pin Feed Patch Antenna

**Series:** Combo Patch

**PART NUMBER:** W3231

## CHARTS

### Axial Ratio vs Frequency



Issue: 2020

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

CONFIDENTIAL AND PROPRIETARY INFORMATION

This document contains confidential and proprietary information of Pulse Electronics, Inc. (Pulse) and is protected by copyright, trade secret and other state and federal laws. Its receipt or possession does not convey any rights to reproduce, disclose its contents, or to manufacture, use or sell anything it may describe. Reproduction, disclosure or use without specific written authorization of Pulse is strictly forbidden.



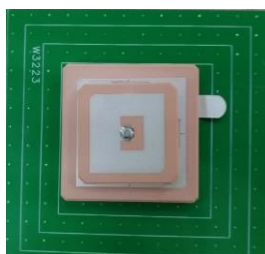
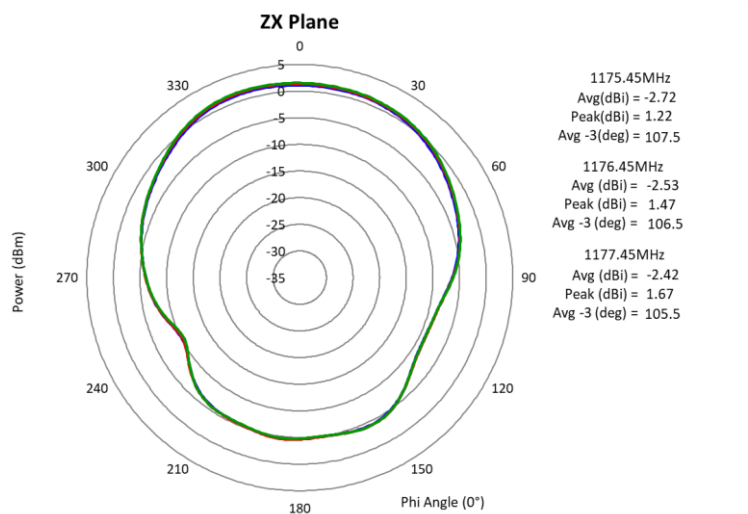
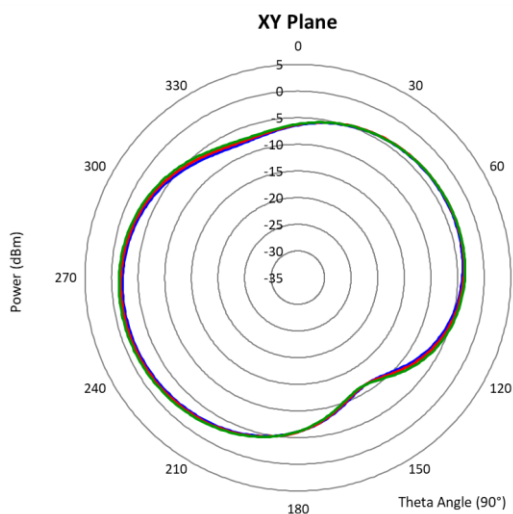
**Description:** GNSS L1+L5 Pin Feed Patch Antenna

**Series:** Combo Patch

**PART NUMBER:** W3231

CHARTS

Radiation Pattern 2D/GPS L5



Issue: 2020

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

CONFIDENTIAL AND PROPRIETARY INFORMATION

This document contains confidential and proprietary information of Pulse Electronics, Inc. (Pulse) and is protected by copyright, trade secret and other state and federal laws. Its receipt or possession does not convey any rights to reproduce, disclose its contents, or to manufacture, use or sell anything it may describe. Reproduction, disclosure or use without specific written authorization of Pulse is strictly forbidden.



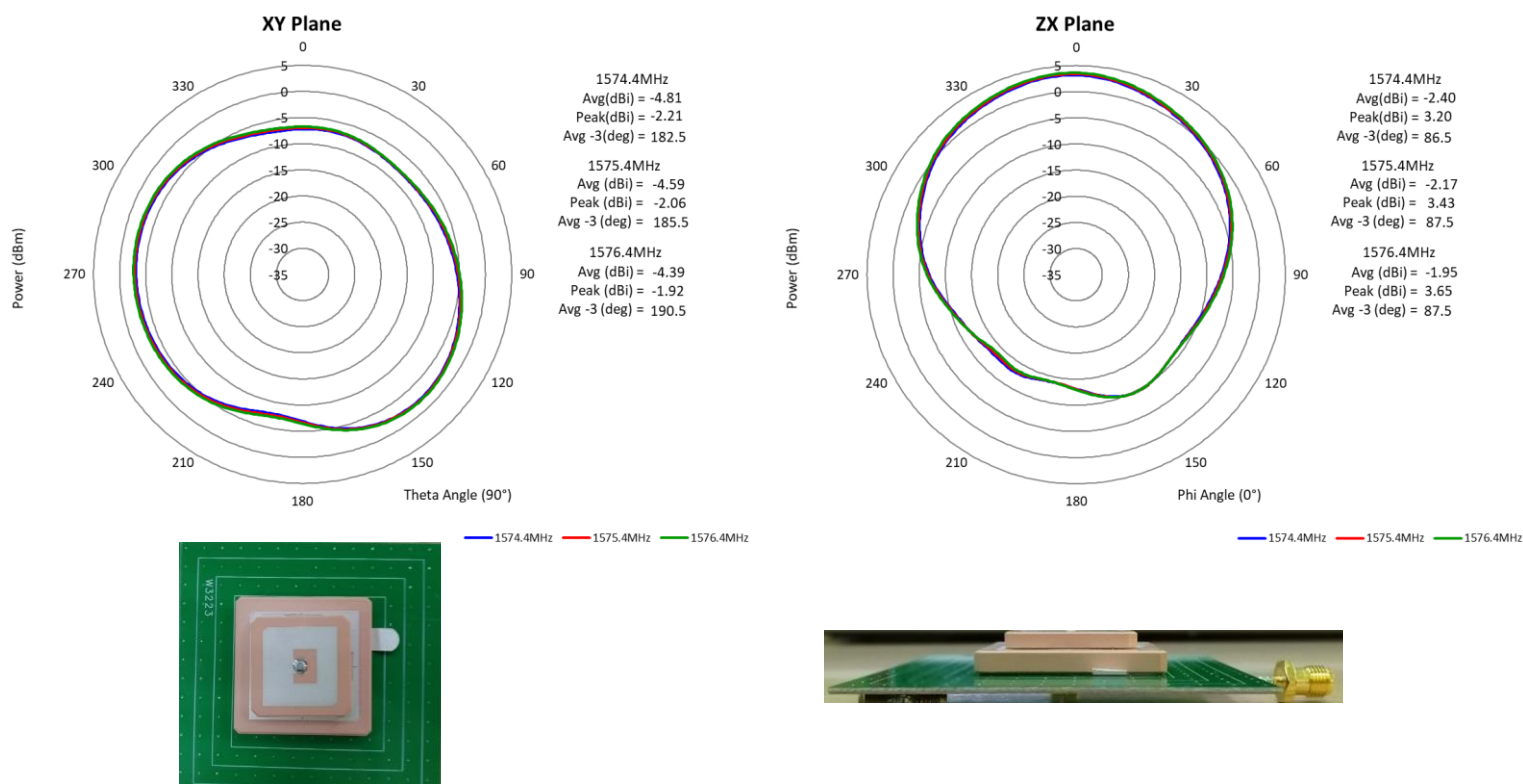
**Description:** GNSS L1+L5 Pin Feed Patch Antenna

**Series:** Combo Patch

**PART NUMBER:** W3231

**CHARTS**

**Radiation Pattern 2D/GPS L1**



Issue: 2020

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

CONFIDENTIAL AND PROPRIETARY INFORMATION

This document contains confidential and proprietary information of Pulse Electronics, Inc. (Pulse) and is protected by copyright, trade secret and other state and federal laws. Its receipt or possession does not convey any rights to reproduce, disclose its contents, or to manufacture, use or sell anything it may describe. Reproduction, disclosure or use without specific written authorization of Pulse is strictly forbidden.

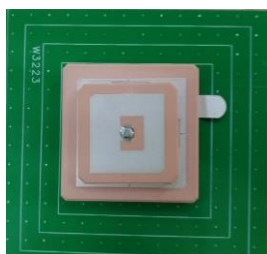
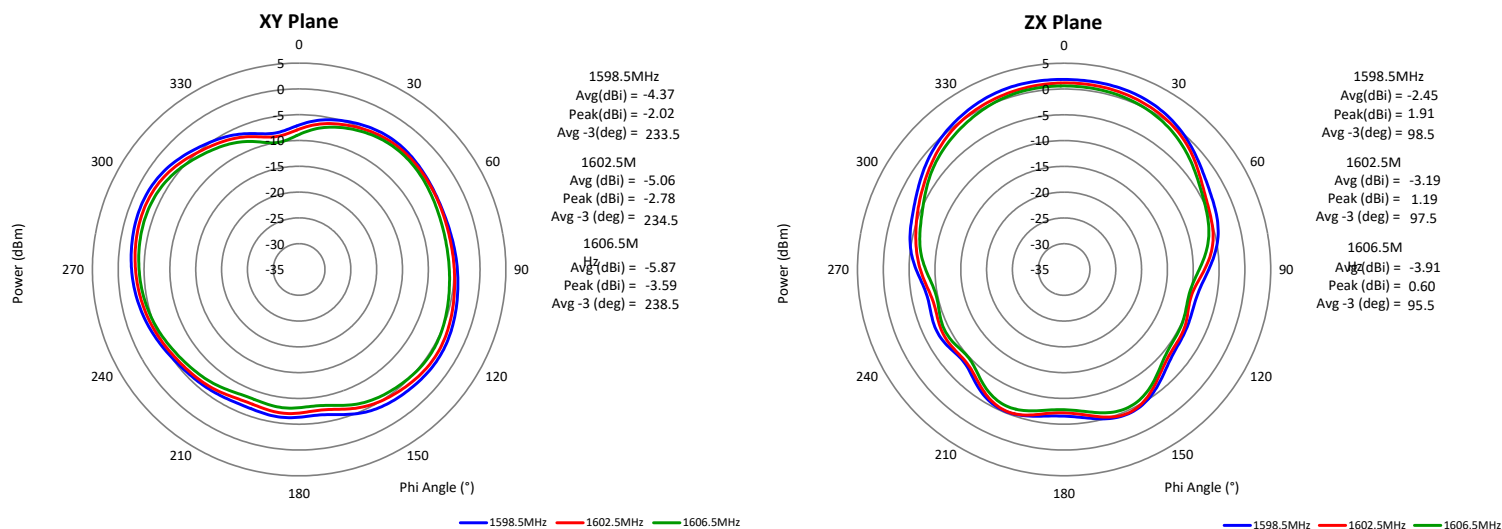
**Description:** GNSS L1+L5 Pin Feed Patch Antenna

**Series:** Combo Patch

**PART NUMBER:** W3231

CHARTS

Radiation Pattern 2D/ Glonass L1



Issue: 2020

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

CONFIDENTIAL AND PROPRIETARY INFORMATION

This document contains confidential and proprietary information of Pulse Electronics, Inc. (Pulse) and is protected by copyright, trade secret and other state and federal laws. Its receipt or possession does not convey any rights to reproduce, disclose its contents, or to manufacture, use or sell anything it may describe. Reproduction, disclosure or use without specific written authorization of Pulse is strictly forbidden.

**Description:** GNSS L1+L5 Pin Feed Patch Antenna

**Series:** Combo Patch

**PART NUMBER:** W3231

## PACKAGING

120pcs antenna per PE bag

120pcs antenna per inbox

240pcs antenna per outbox

Outbox: 400mm\*300mm\*180mm