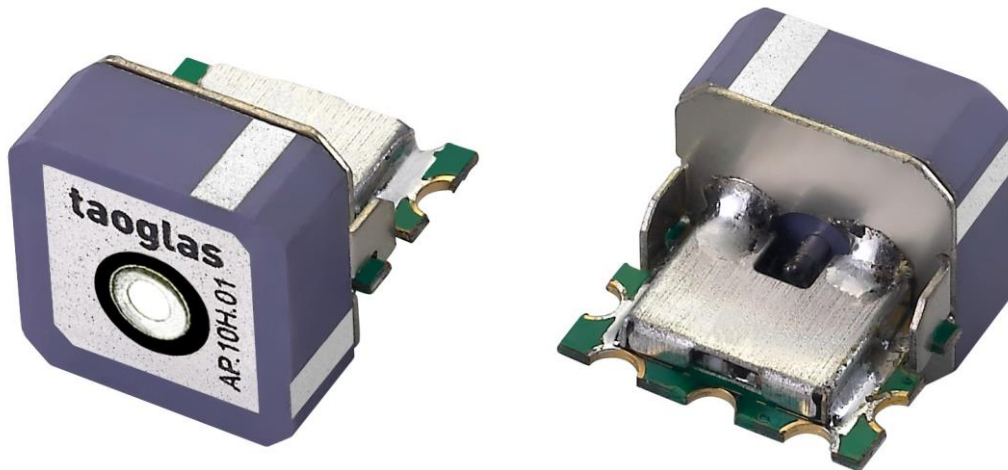


# SPECIFICATION

Part No. : AP.10H.01

Product Name : 10mm SMT 25dB Active GPS/GALILEO Patch Antenna  
With Front End Saw Filter

Features : Unique SMT GPS/GALILEO active patch  
Wide Input Voltage 1.8V to 5.5V  
Ultra low power consumption  
RoHS compliant

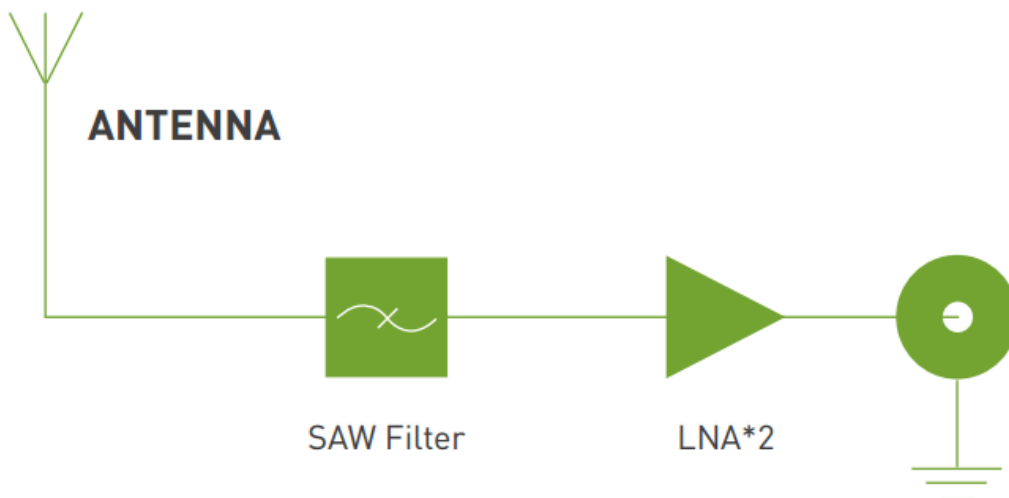


# 1. Introduction

The AP.10H.01 two stage 25dB active GPS patch antenna is the smallest SMT GPS high performance embedded antenna currently available in the world. Using extremely sensitive high dielectric constant powder formulation and tight process control the 10mm x 10mm x 4mm patch antenna is accurately tuned to have its frequency band right at 1575.42MHz for GPS/GALILEO systems.

A patented SMT structure gives high reliability in integration. With an ultra low power consumption two stage LNA with Saw Filter, this small active patch has the performance of an ordinary active patch, but at only a quarter of the size. This product is suited to small form factor mobile devices such as GPS/GALILEO Smartphones, Personal Location, Medical devices, Telematic devices and Automotive navigation and tracking. Custom gain, connector and cable versions are available.

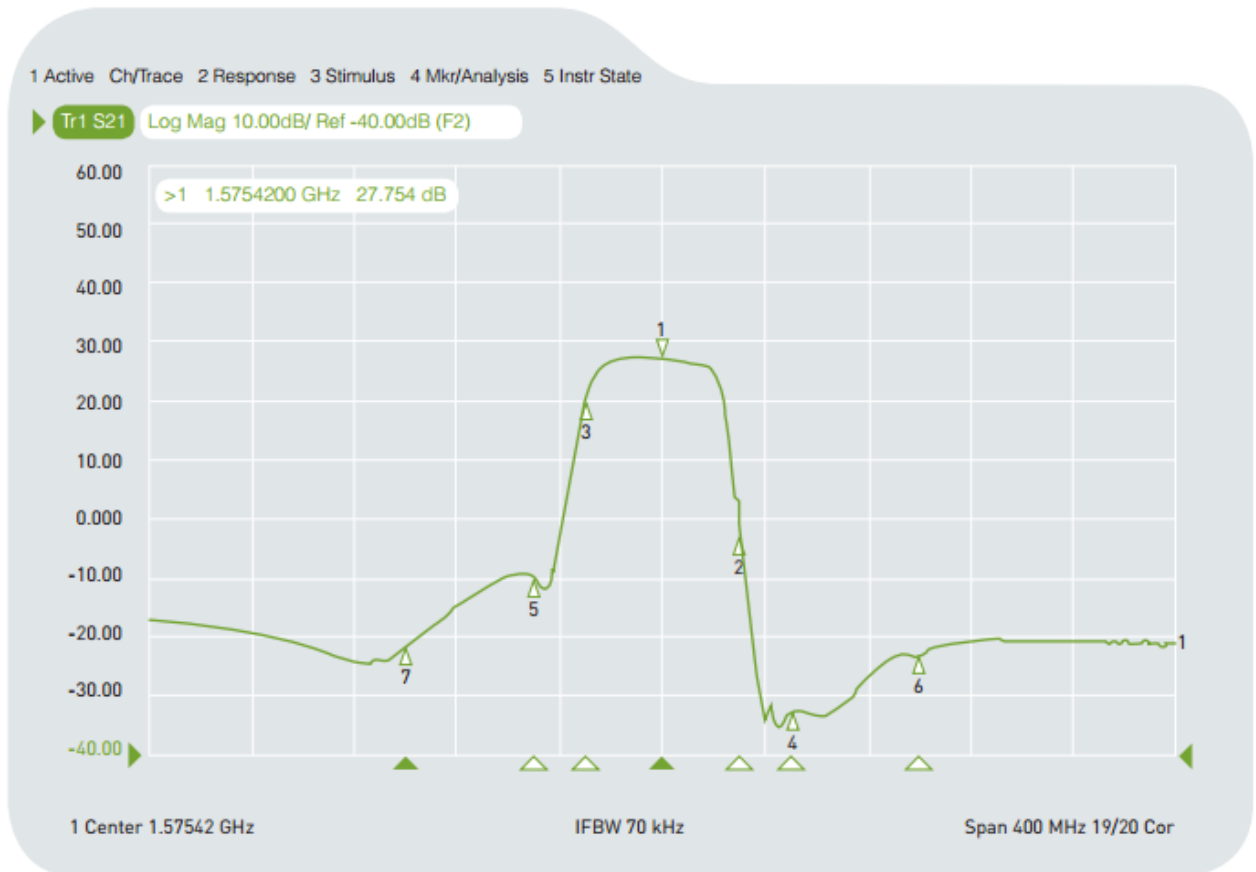
The AP.10H consists of 2 functional blocks – the LNA and also the patch antenna.



## 2. Specification

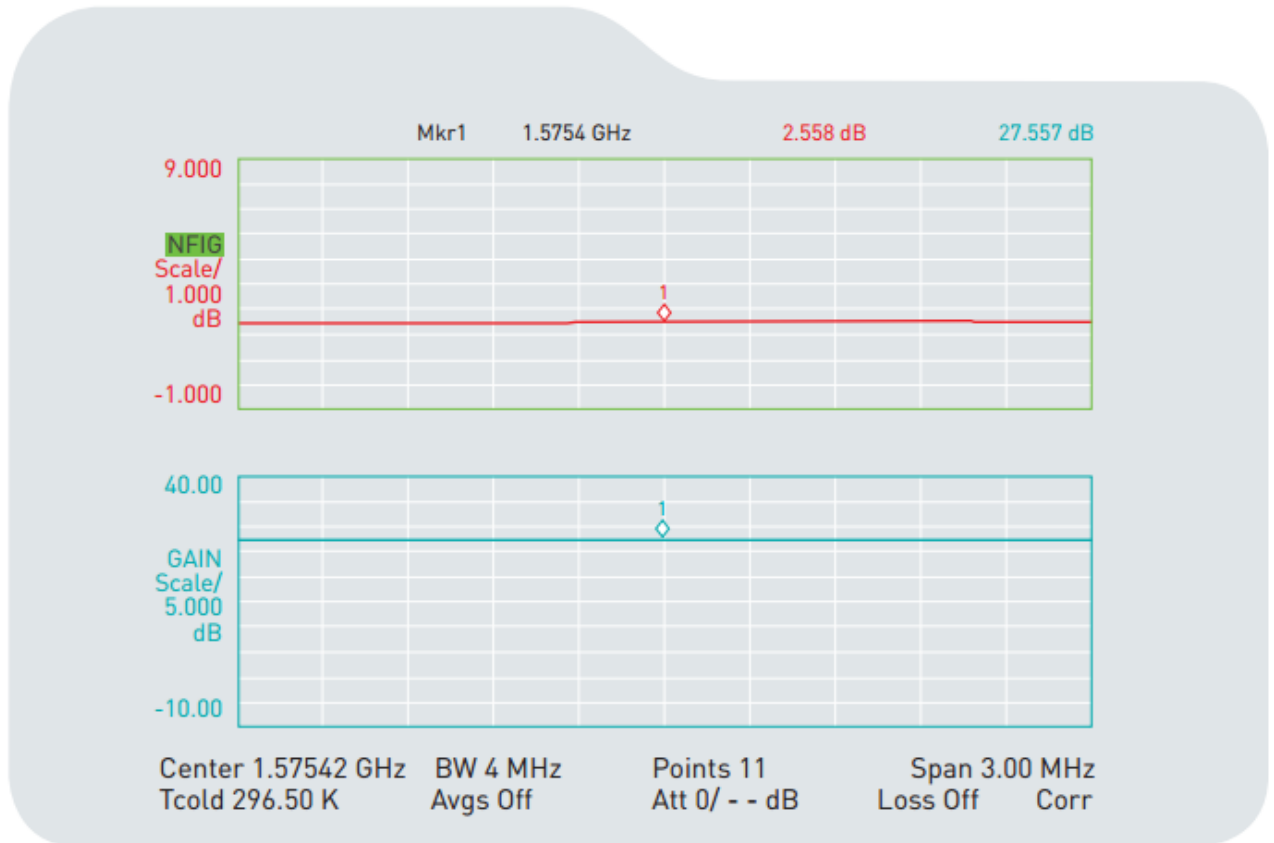
| ELECTRICAL                                   |  |                          |                   |
|--|--|--------------------------|-------------------|
| Frequency                                    | 1575.42 ± 1.023MHz                                   |                          |                   |
| Gain   | Typ. -10dBic @ Zenith                                |                          |                   |
| Gain@3.0V (With LNA)                         | 15 ± 4dBic @ 90°                                     |                          |                   |
| Impedance                                    | 50Ω  |                          |                   |
| Polarization                                 | RHCP   |                          |                   |
| Axial Ratio                                  | Max 4.0dB @ Zenith                                   |                          |                   |
| Input Voltage                                | Min. 1.8V, Typ. 3.0V, Max. 5.5V                      |                          |                   |
| ESD Capability                               | Direct Discharge: 4KV Min.                           |                          |                   |
| LNA  |  |                          |                   |
| Frequency                                    | 1575.42 ± 1.023MHz                                   |                          |                   |
| Outer Band Attenuation                       | F0=1575.42MHz  |                          |                   |
|  | F0±30MHz   | 5dB min.                 |                   |
|  | F0±50MHz   | 20dB min.                |                   |
|  | F0±100MHz  | 25dB min.                |                   |
| Output Impedance                             | 50Ω  |                          |                   |
| Output VSWR                                  | 2.0 Max  |                          |                   |
| Pout at 1dB Gain                             | Min. 8dBm  |                          |                   |
| Compression point                            | Typ. 11dBm   |                          |                   |
| LNA Gain, Power Consumption and Noise Figure |  |                          |                   |
|  | LNA Gain(Typ)  | Power Consumption(mA)Typ | Noise Figure(Typ) |
| Minimum 1.8V                                 | 20dB   | 5mA                      | 2.7dB             |
| Typical 3.0V                                 | 25dB   | 10mA                     | 2.5dB             |
| Maximum 5.5V                                 | 25dB   | 23mA                     | 2.7dB             |
| Input Voltage                                | Min. 1.8V  | Typ. 3.0V                | Max. 5.5V         |
| MECHANICAL                                   |  |                          |                   |
| Dimension                                    | 10mm x 10mm x 4mm (add 7.3mm depth for vertical PCB) |                          |                   |
| Connection                                   | SMT via solder pads                                  |                          |                   |
| ENVIRONMENTAL                                |  |                          |                   |
| Operation Temperature                        | -40°C to + 85°C                                      |                          |                   |
| Storage Temperature                          | -40°C to + 85°C                                      |                          |                   |
| Relative Humidity                            | 40% to 95%   |                          |                   |

### 3. LNA Gain and Out Band Rejection @3.0V



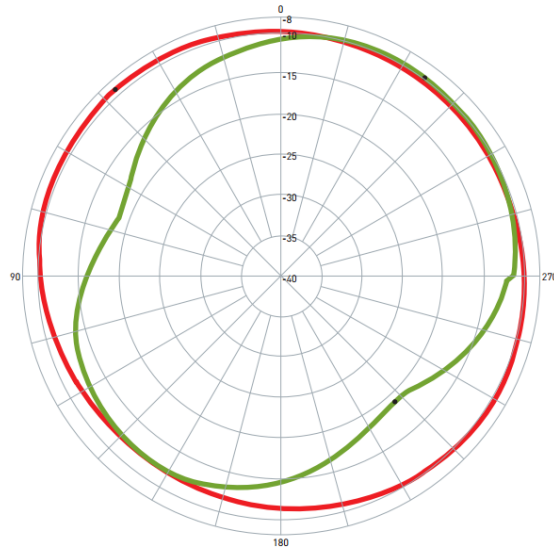
|     |     |     |    |               |            |
|-----|-----|-----|----|---------------|------------|
| Cg1 | Tr1 | S21 | >1 | 1.5754200 GHz | 27.754 dB  |
| Cg1 | Tr1 | S21 | 2  | 1.6054200 GHz | -2.2291 dB |
| Cg1 | Tr1 | S21 | 3  | 1.5454200 GHz | 20.458 dB  |
| Cg1 | Tr1 | S21 | 4  | 1.6254200 GHz | -32.691 dB |
| Cg1 | Tr1 | S21 | 5  | 1.5254200 GHz | -10.283 dB |
| Cg1 | Tr1 | S21 | 6  | 1.6754200 GHz | -23.132 dB |
| Cg1 | Tr1 | S21 | 7  | 1.4754200 GHz | -21.485 dB |

## 4. LNA Noise Figure @3.0V



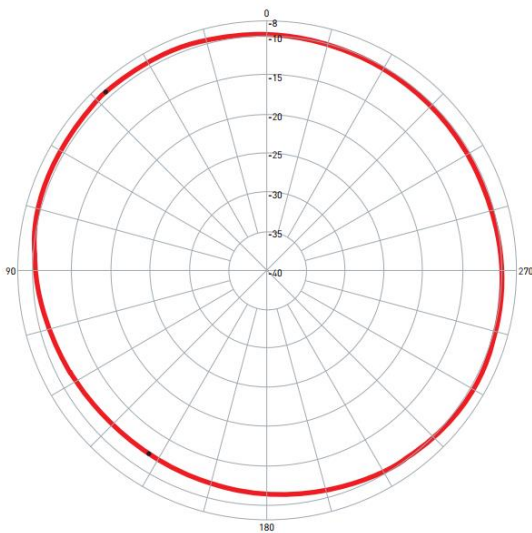
# 5. Radiation Patterns

XY Plane



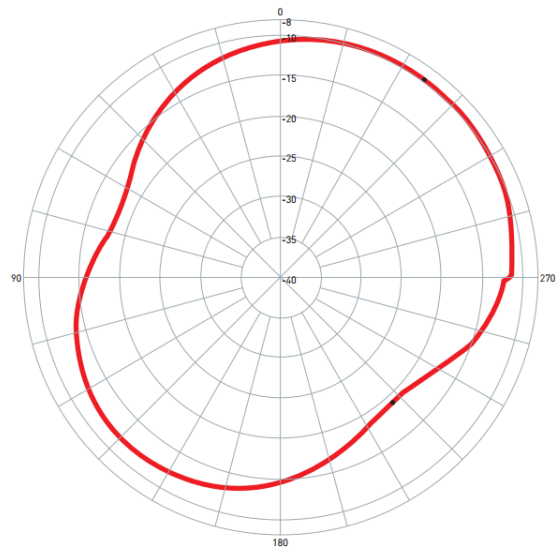
| Pattern | Model No. | Test Mode | Freq [MHz] | Max Gain[dBi]  | Min Gain[dBi]   | Avg. Gain[dBi] | Source Polar. | Date      |
|---------|-----------|-----------|------------|----------------|-----------------|----------------|---------------|-----------|
| 1       | AP.10H.01 | XZ        | 1620.00    | -9.20 / 42.00  | -11.99 / 147.00 | -10.24         | RHCP          | 2010/4/29 |
| 2       | AP.10H.01 | YZ        | 1620.00    | -9.73 / 324.00 | -19.18 / 222.00 | -12.80         | RHCP          | 2010/4/29 |

XZ Plane



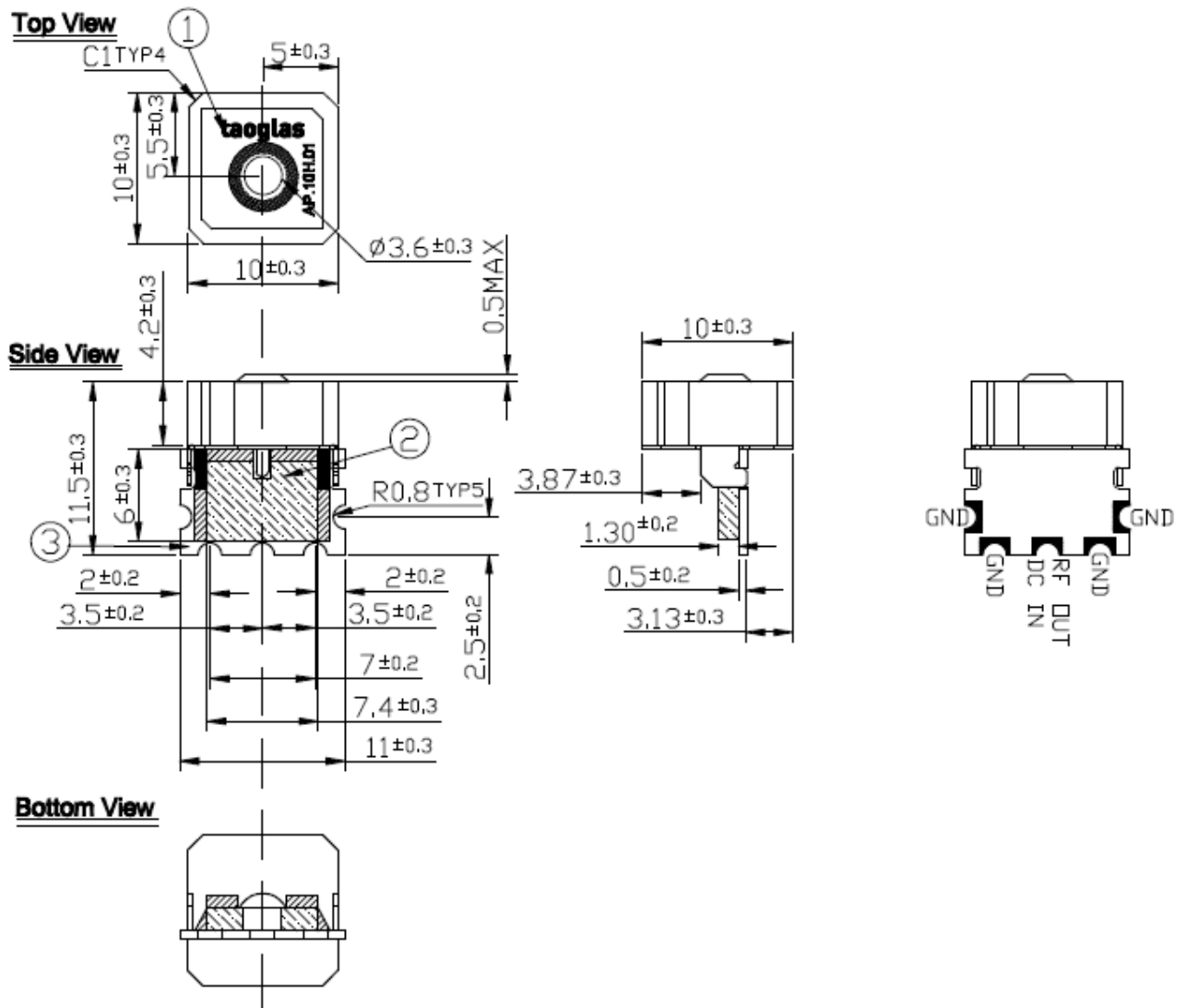
| Pattern | Model No. | Test Mode | Freq [MHz] | Max Gain[dBi] | Min Gain[dBi]   | Avg. Gain[dBi] | Source Polar. | Date      |
|---------|-----------|-----------|------------|---------------|-----------------|----------------|---------------|-----------|
| 1       | AP.10H.01 | XZ        | 1620.00    | -9.20 / 42.00 | -11.99 / 147.00 | -10.24         | RHCP          | 2010/4/29 |

YZ Plane








| Pattern | Model No. | Test Mode | Freq [MHz] | Max Gain[dBi]  | Min Gain[dBi]   | Avg. Gain[dBi] | Source Polar. | Date      |
|---------|-----------|-----------|------------|----------------|-----------------|----------------|---------------|-----------|
| 1       | AP.10H.01 | YZ        | 1620.00    | -9.73 / 324.00 | -19.18 / 222.00 | -12.80         | RHCP          | 2010/4/29 |

## 6. Technical Drawing

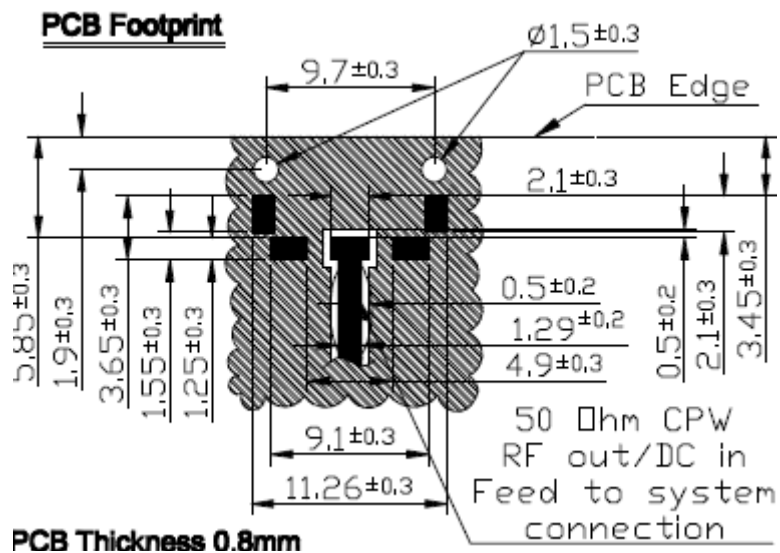


|   | Name                        | P/N    | Material   | Finish     | QTY |
|---|-----------------------------|--------|------------|------------|-----|
| 1 | Patch (10mm x 10mm x 4.2mm) | AP.10H | Ceramic    | Clear      | 1   |
| 2 | Shielding Case              |        | Tin (SPTE) | Tin Plated | 1   |
| 3 | PCB                         |        | FR4 0.6t   | Green      | 1   |

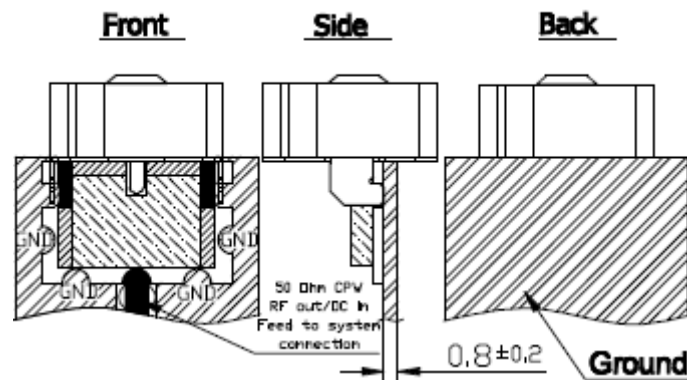
**NOTE:**

|   |                             |
|---|-----------------------------|
|  | 1. Soldered area            |
|  | 2. Solder Mask Area (Green) |
|  | 3. Clearance Area           |
|  | 4. Shielding Case Area      |
|  | 5. Area to be solder (Pad)  |

## 6.1. PCB Footprint



### Application Assembly



| Name                          | P/N    | Material   | Finish     | QTY | NOTE:   |
|-------------------------------|--------|------------|------------|-----|---|
| 1 Patch (10mm x 10mm x 4.2mm) | AP.10H | Ceramic    | Clear      | 1   |  1. Soldered area            |
| 2 Shielding Case              |        | Tin (SPTE) | Tin Plated | 1   |  2. Solder Mask Area (Green) |
| 3 PCB                         |        | FR4 0.6t   | Green      | 1   |  3. Clearance Area           |
|                               |        |            |            |     |  4. Shielding Case Area      |
|                               |        |            |            |     |  5. Area to be solder (Pad)  |

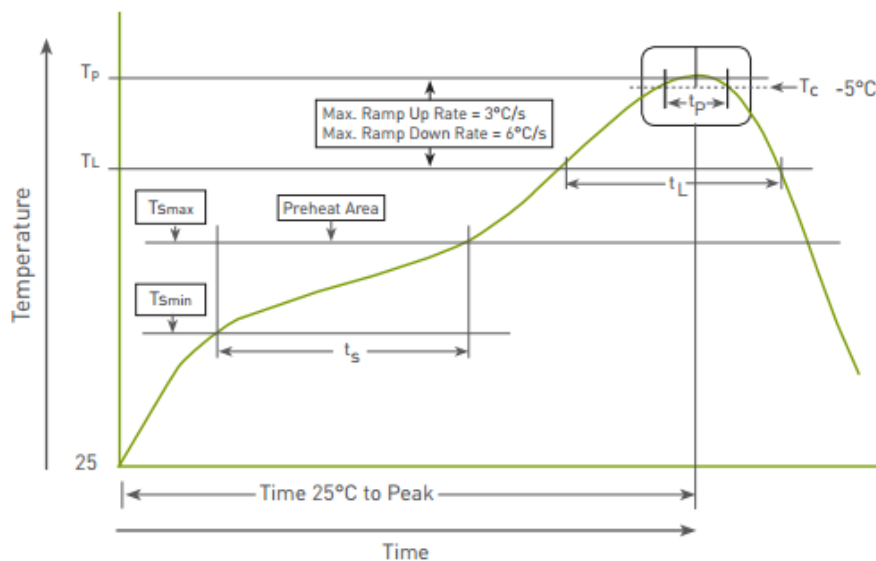


## 7. Recommended Reflow Soldering Profile

AP.10H can be assembled following Pb-free assembly. According to the Standard IPC/JEDEC J-STD-020C, the temperature profile suggested is as follows:

| Phase                              | Profile Features  | Pb-Free Assembly (SnAgCu)        |
|------------------------------------|---|----------------------------------|
| PREHEAT                            | Temperature Min( $T_{smin}$ )<br>Temperature Max( $T_{smax}$ )<br>Time( $t_s$ ) from ( $T_{smin}$ to $T_{smax}$ ) | 150°C<br>200°C<br>60-120 seconds |
| RAMP-UP                            | Avg. Ramp-up Rate ( $T_{smax}$ to TP)   | 3°C/second(max)                  |
| REFLOW                             | Temperature(TL)<br>Total Time above TL ( $t_L$ )  | 217°C<br>30-100 seconds          |
| PEAK                               | Temperature (TP)<br>Time ( $t_p$ )  | 260°C<br>2-5 seconds             |
| RAMP-DOWN                          | Rate  | 3°C/second(max)                  |
| Time from 25°C to Peak Temperature |   | 8 minutes max.                   |
| Composition of solder paste        |   | 96.5Sn/3Ag/0.5Cu                 |
| Solder Paste Model                 |   | SHENMAO PF606-P26                |

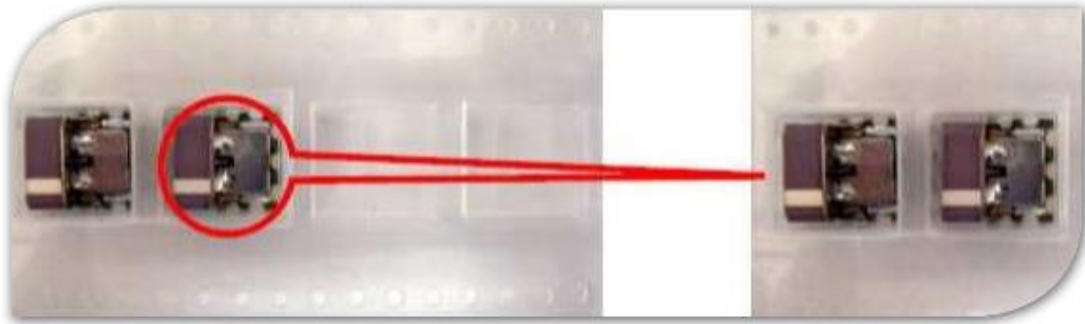
The graphic shows temperature profile for component assembly process in reflow ovens



Soldering Iron condition: Soldering iron temperature  $270^{\circ}\text{C} \pm 10^{\circ}\text{C}$ .

Apply preheating at  $120^{\circ}\text{C}$  for 2-3 minutes. Finish soldering for each terminal within 3 seconds, if soldering iron temperature over  $270^{\circ}\text{C} \pm 10^{\circ}\text{C}$  or 3 seconds, it will make cause component surface peeling or damage.

## 8. Packaging



|                               |                        |
|-------------------------------|------------------------|
| Packaged on Tape and Reel     | 250 pieces per reel    |
| Each Reel is packaged         | Inner Carton           |
| Outer Carton contains 5 Reels | 1250 pieces per Carton |

Taoglas makes no warranties based on the accuracy or completeness of the contents of this document and reserves the right to make changes to specifications and product descriptions at any time without notice. Taoglas reserves all rights to this document and the information contained herein.

Reproduction, use or disclosure to third parties without express permission is strictly prohibited.

Copyright © Taoglas Ltd.

## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [Antennas](#) category:*

*Click to view products by [Taoglas](#) manufacturer:*

Other Similar products are found below :

[GAN30084EU](#) [930-033-R](#) [GW17.07.0250E](#) [1513563-1](#) [EXE902SM](#) [APAMPG-117](#) [MAF94383](#) [W3908B0100](#) [W6102B0100](#) [YE572113-30RSMM](#) [108-00014-50](#) [66089-2406](#) [SPDA17RP918](#) [A09-F8NF-M](#) [A09-F5NF-M](#) [RGFRA1903041A1T](#) [W3593B0100](#) [W3921B0100](#) [SIMNA-868](#) [SIMNA-915](#) [SIMNA-433](#) [W1044](#) [W1049B090](#) [A75-001](#) [WTL2449CQ1-FRSMM](#) [CPL9C](#) [EXB148BN](#) [0600-00060](#) [TRA9020S3PBN-001](#) [GD5W-28P-NF](#) [MA9-7N](#) [GD53-25](#) [GD5W-21P-NF](#) [C37](#) [MAF94051](#) [MA9-5N](#) [EXD420PL](#) [B1322NR](#) [QWFTB120](#) [MAF94271](#) [MAF94300](#) [GPSMB301](#) [FG4403](#) [AO-AGSM-OM54](#) [5200232](#) [MIKROE-2349](#) [WCM.01.0111](#) [MIKROE-2393](#) [MIKROE-2352](#) [MIKROE-2350](#)