
**GNSS SMD**

# HYDRA 1/2

GNSS Corner SMD Antenna

**SZP-C-1G05 / SZP-C-1G15**

**FREQUENCY**

**1559 to 1609 MHz**

**PEAK GAIN**

**0.50 dBi**

**MOUNTING**

**SMD, left / right corner**

**SIZE**

**7.5 × 5.0 × 0.9 mm**

**GNSS**

**1559 to 1609 MHz**

Covers GNSS L1

## Key Features

- For GNSS applications 1559 to 1609 MHz
- Highly resistant to detuning
- Clean resonance with no unwanted out of band response
- SMD component supplied in tape and reel
- Ideal for smaller wearable designs
- Suitable for sealing with resin / potting compounds
- HYDRA 1 left and HYDRA 2 right corner version

## 1 Introduction

HYDRA1 and 2, for the complete GNSS solution. For use internal to a device which requires an integrated antenna solution. High performance with a small form factor for simple integration.

This antenna resonates best when placed in the corner of the host PCB.

### — Features

- ◆ For GNSS applications 1559 to 1609 MHz
- ◆ Highly resistant to detuning
- ◆ Clean resonance with no unwanted out of band response
- ◆ SMD component supplied in tape and reel
- ◆ Ideal for smaller wearable designs
- ◆ Suitable for sealing with resin / potting compounds
- ◆ HYDRA 1 left and HYDRA 2 right corner version

### — Applications

- |                  |              |
|------------------|--------------|
| ◆ Wearables      | ◆ Healthcare |
| ◆ Telematics     | ◆ Smart Grid |
| ◆ Smart Meters   | ◆ OBD-II     |
| ◆ Asset Trackers | ◆ Tablets    |
| ◆ Headsets       |              |

## 2 Mechanical Specifications

|                              |                         |
|------------------------------|-------------------------|
| Part Number                  | SZP-C-1G05 / SZP-C-1G15 |
| Name                         | HYDRA1 / HYDRA2         |
| Dimensions (mm)              | 7.5 × 5.0 × 0.9         |
| Required Clearance Area (mm) | 7.5 × 5.0               |
| Weight                       | <0.2 g                  |
| Antenna Type                 | Surface Mount Device    |

## 3 RF Specifications

| Band | Frequency Range (MHz) | Efficiency (%) | Peak Gain (dBi) | Impedance | Polarization |
|------|-----------------------|----------------|-----------------|-----------|--------------|
| GNSS | 1559 to 1609          | >50            | 0.50            | 50 Ω      | Linear       |

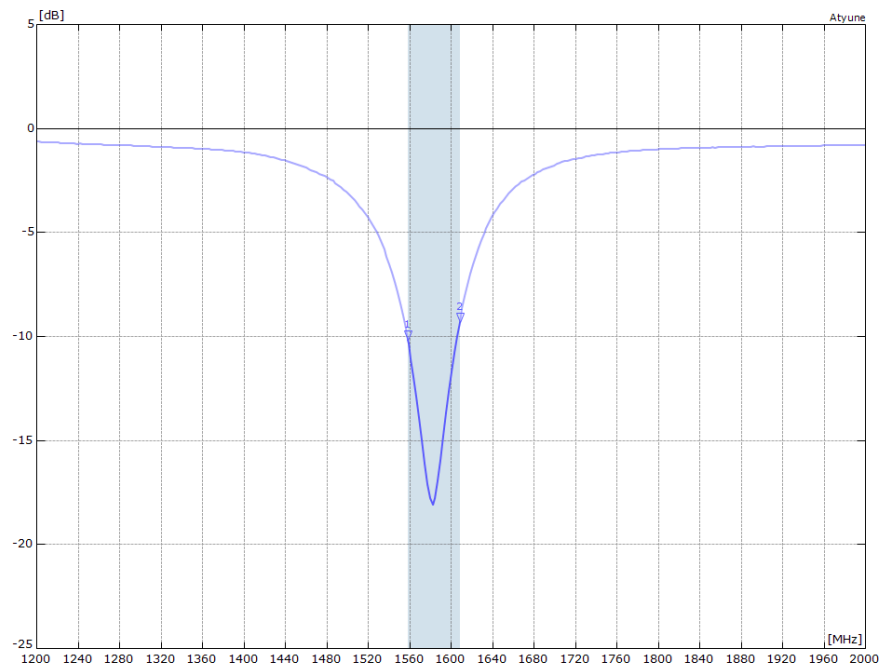
\*All performance stated is measured on the SZDV-C-1G05 evaluation kit.

## 4 Environmental

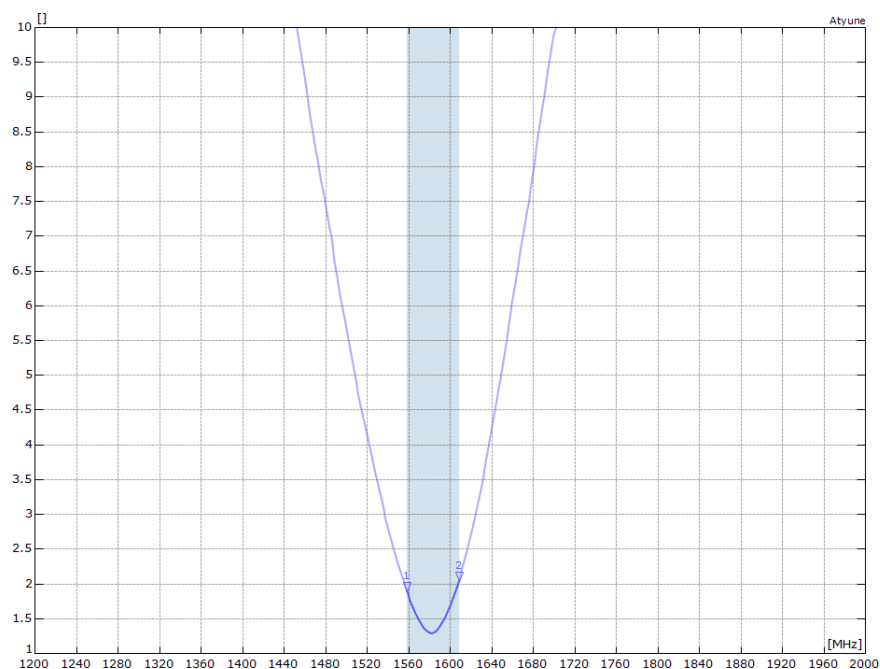
|                         |               |
|-------------------------|---------------|
| Operational Temperature | -40 to +125°C |
| Storage Temperature     | -10 to +40°C  |
| Relative Humidity       | ≤75%          |

## 5 RF Characteristics

S11 Parameter

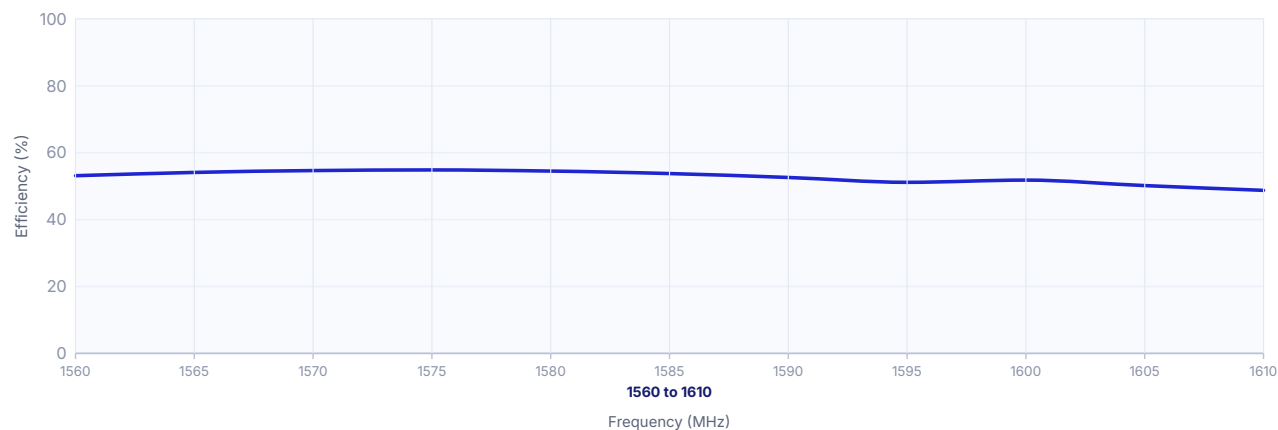


VSWR

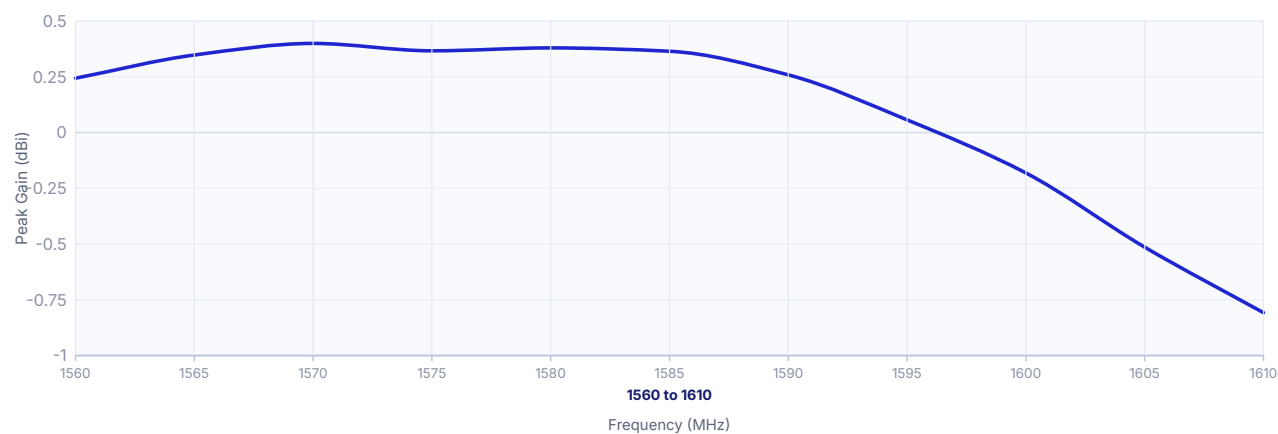


## 6 Antenna Performance

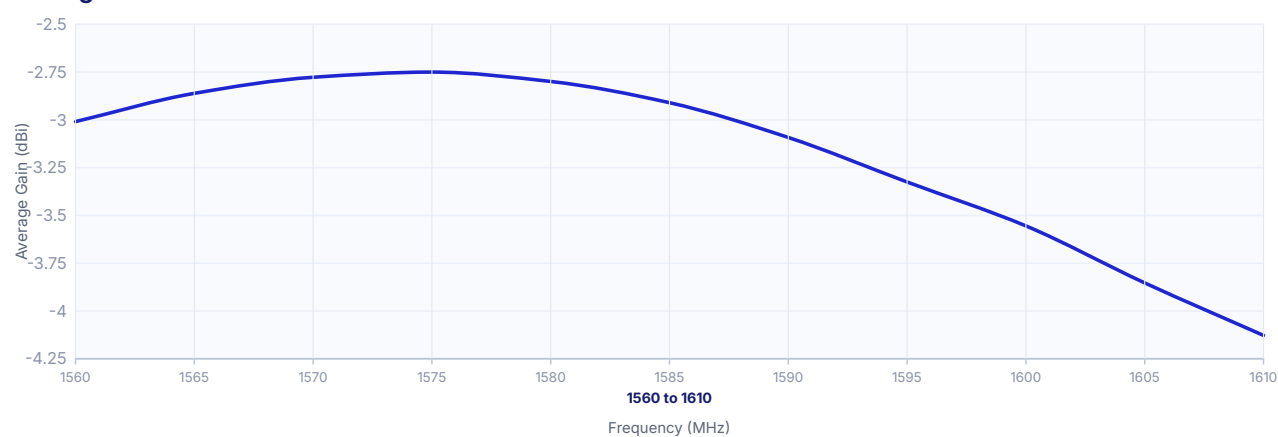
Efficiency



Peak Gain

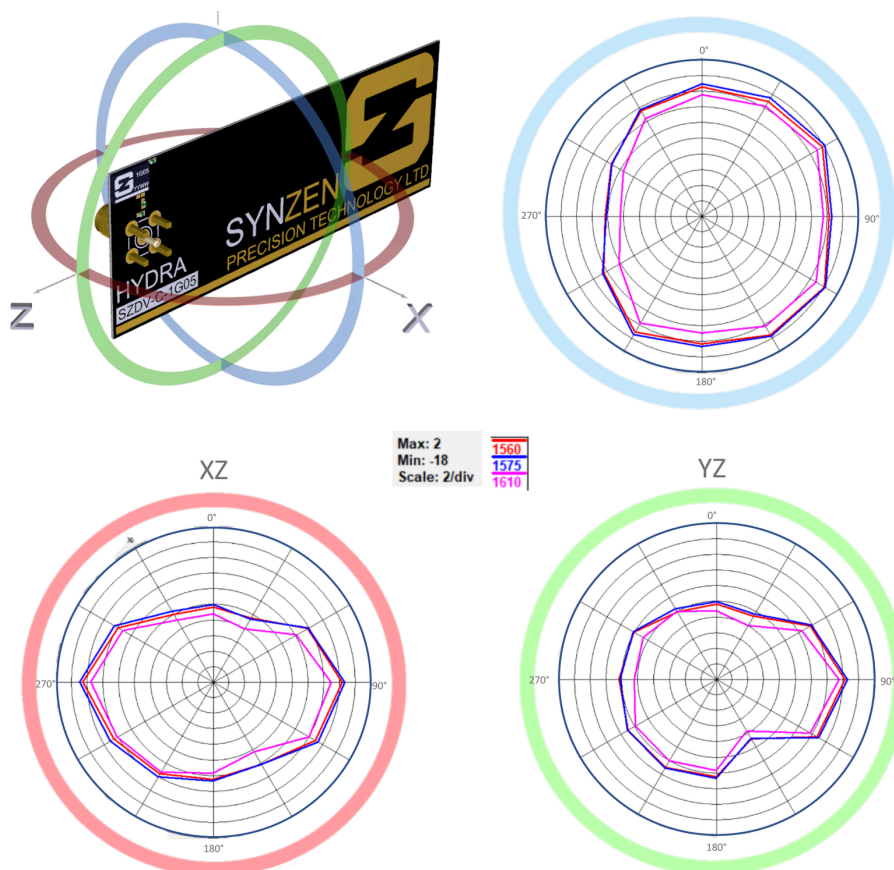


Average Gain



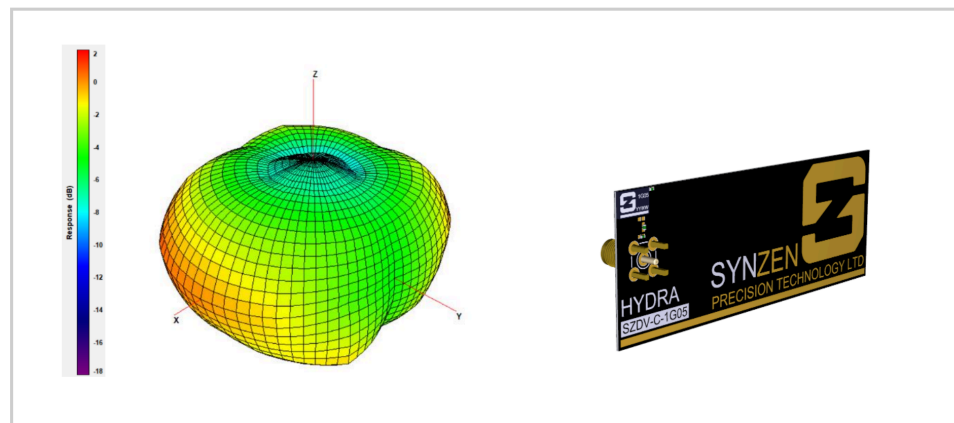
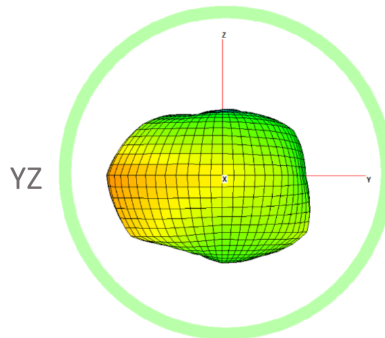
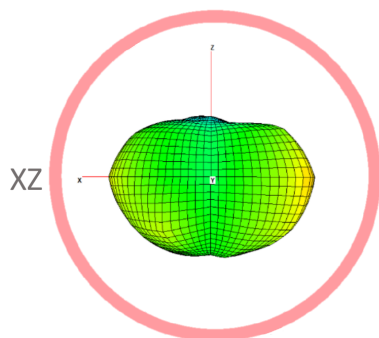
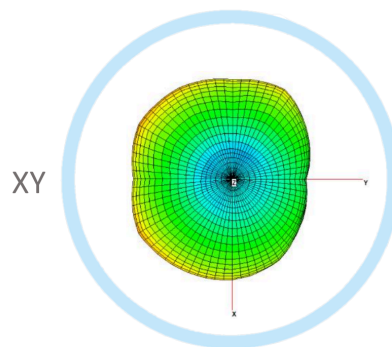
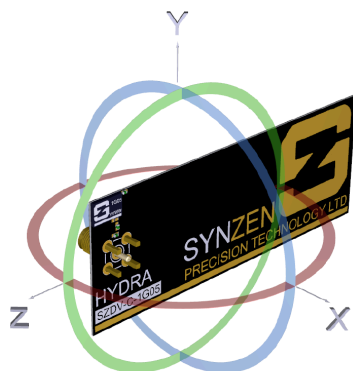
## 7 2D Polar Plot 1559 to 1609 MHz

MEASURED ON SYNZEN EVK (SZDV-C-1G05)

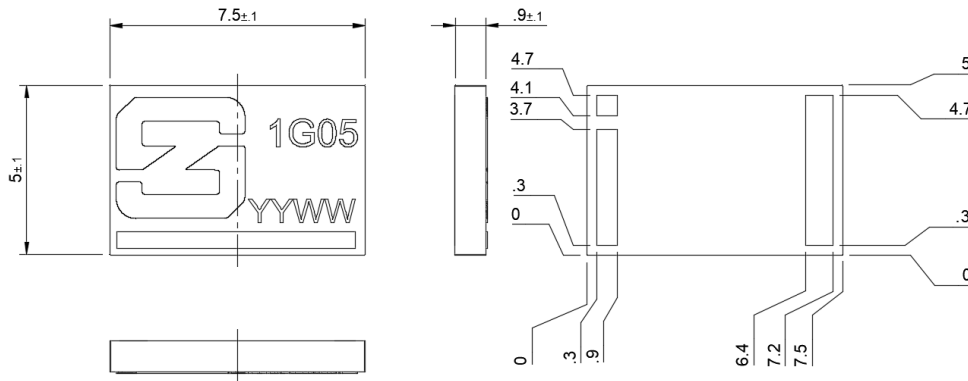


## 8 3D Radiation Pattern at 1575 MHz

MEASURED ON SYNZEN EVK (SZDV-C-1G05), FREQUENCY POINT 1575 MHZ

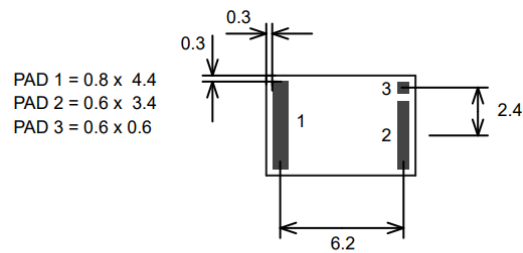


## 9 Antenna Mechanical Drawing



All dimensions in mm. HYDRA 2 is a mirror image of HYDRA 1.

## 10 Required Host PCB Footprint



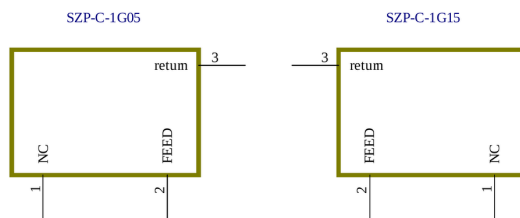
ALL DIMENSIONS IN MM

The host PCB requires the footprint shown above. PCB library files and DXF are available from our website [www.synzen.com.tw/products](http://www.synzen.com.tw/products).

The required clearance for the host PCB is  $7.5 \times 5.0$  mm on all layers.

## 11 SZP-C-1G05 / 1G15 Schematic Symbol

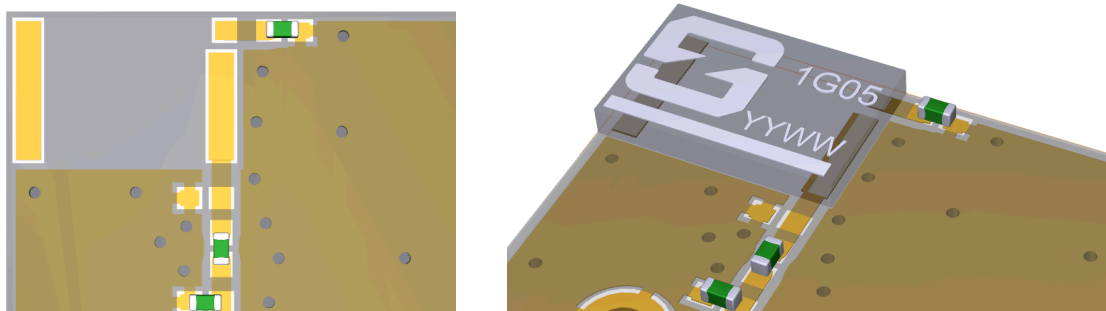
The schematic symbol for the antenna is shown below with a description of each pin.



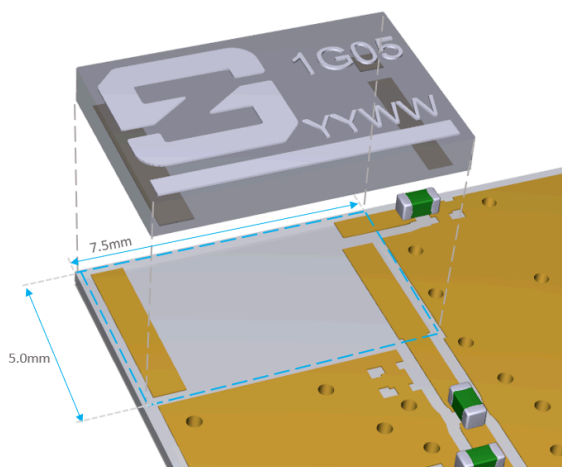
| Pin | Description                                 |
|-----|---------------------------------------------|
| 1   | Not connected, for mechanical strength only |
| 2   | RF Feed                                     |
| 3   | Return                                      |

## 12 Placement

The antenna is designed to function placed at the PCB corner.



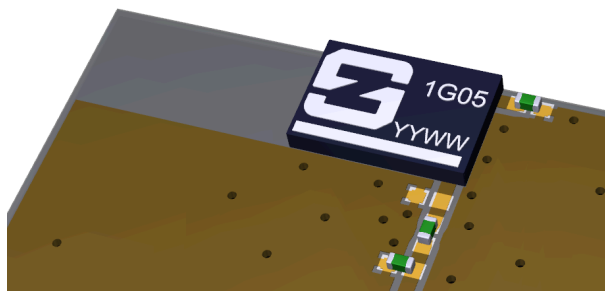
### 13 Required Clearance



A clearance is required through all PCB layers and is identical to the antenna size. Any components such as battery or display must avoid this area.

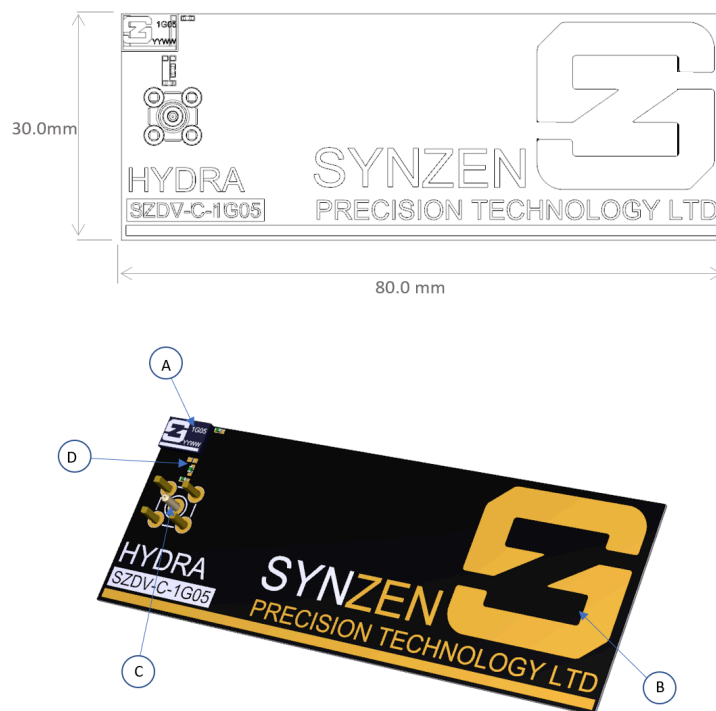
### 14 Offset Placement

If the antenna is unable to be placed into the PCB corner, then the antenna can be placed away from the corner with the clearance extended all the way to the PCB edge.



## 15 SZDV-C-1G05 Evaluation Kit

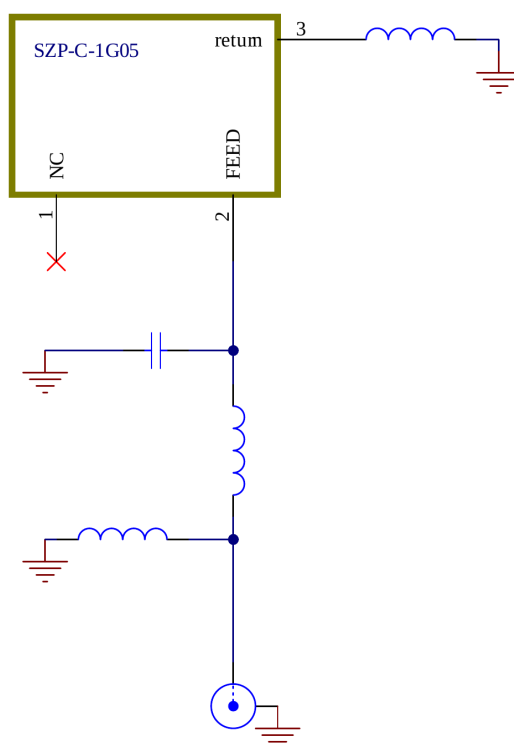
The SZDV-C-1G05 evaluation kit is a PCBA with the antenna (SZP-C-1G05) fitted and optimized with a matching network. Connection to the antenna is made using the fitted female SMA connector.



| Item | Description          |
|------|----------------------|
| A    | SZP-C-1G05 (Antenna) |
| B    | Host PCB             |
| C    | SMA Connector        |
| D    | Matching Circuit     |

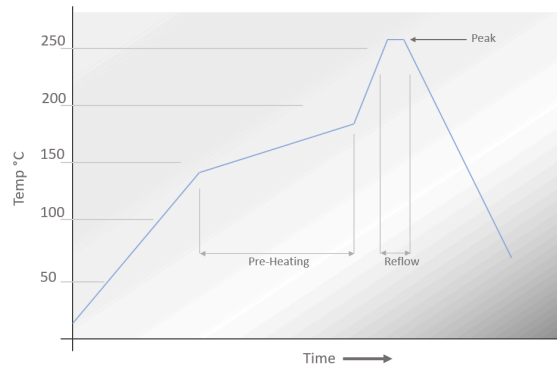
## 16 Evaluation Kit Matching Circuit

The circuit of the EVK along with the BOM is shown below. The matching network topology should be used on the device host PCB, although the matching values will be dependent on the host PCB and device environment. Synzen provide a matching service to optimize your device to ensure the best performance. Please contact [sales@synzen.com.tw](mailto:sales@synzen.com.tw) for more information.



| Designator | Component Type | Value  | Size | Manufacturing Part No.   |
|------------|----------------|--------|------|--------------------------|
| A1         | Antenna        | HYDRA1 |      | SZP-C-1G05               |
| L1         | Inductor       | 3.9 nH | 0402 | LQG15HH3N9S02D           |
| L2, L3     | Inductor       | 10 nH  | 0402 | LQG15HZ10NH02D           |
| C1         | NA             | DNP    | 0402 | Not Fitted               |
| J1         | SMA Connector  |        |      | ACE solution A3SAFTST135 |

## 17 Reflow Profile



| Stage            | Temperature  | Time              |
|------------------|--------------|-------------------|
| Pre-Heating      | 130 to 180°C | 50 to 190 seconds |
| Reflow           | >220°C       | 50 to 160 seconds |
| Peak Temperature | 260°C        | 15 to 45 seconds  |

## 18 Tape and Reel

1K per reel.

## 19 Compliance

### ROHS

#### Compliant

Conforms to EU RoHS Directive 2011/65/EU as amended by Delegated Directive (EU) 2015/863.

### REACH

#### Compliant

Conforms to EU REACH Regulation (EC) No 1907/2006.

### CERTIFICATE

#### On request

A certificate of conformance is available upon request from sales@synzen.com.tw.

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