



Tri-band Wi-Fi SMD Antenna

SZC-C-2W14

WLAN/Wi-Fi 6E 2400-2500; 4900-7125MHz

Description

EPSILON, for the complete Wi-Fi solution, Wi-Fi 6 and 6E applications. For use internal to a device which requires an integrated antenna solution. High performance with a small form factor for simple integration.

A corner mounted ultra-small ceramic chip antenna. Also ideal for MIMO applications using multiple antennas placed on the same PCB.

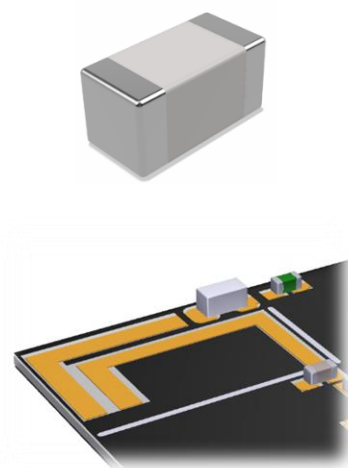
- For WLAN Applications 2.4-2.5GHz; 4.9-5.85GHz; 5.90 – 7.125GHz
- Ideal for MIMO systems 2x2, 4x4, 8x8.
- Simple integration, plug and operate the device without designing onboard antenna.
- Small form factor of 1.6 x 0.8 x 0.8 (mm).

Applications

Access Points
Smart Grid

M2M Industrial
Healthcare

Smart Meters
Set Top Box





General Specifications

Mechanical Specifications

| | |
|-------------------------|----------------------|
| Part Number | SZC-C-2W14 |
| Name | EPSILON |
| Dimensions | 1.6 x 0.8 x 0.8 (mm) |
| Required Clearance area | 8.9 x 5.8 (mm) |
| Weight | <0.2g |
| Antenna Type | Surface Mount Device |

RF Specifications*

| Band | Frequency Range (MHz) | Efficiency (%) | Peak Gain (dBi) | Impedance | Polarization |
|--------------|-----------------------|----------------|-----------------|-----------|--------------|
| 2.4GHz Wi-Fi | 2400-2500 | >45 | 0.50 | 50Ω | Linear |
| 5.8GHz Wi-Fi | 4900-5850 | >65 | 2.26 | | |
| 7.1Ghz Wi-Fi | 5925-7125 | >55 | 2.52 | | |

*All performance stated is measured of SZDV-C-2W14 evaluation kit

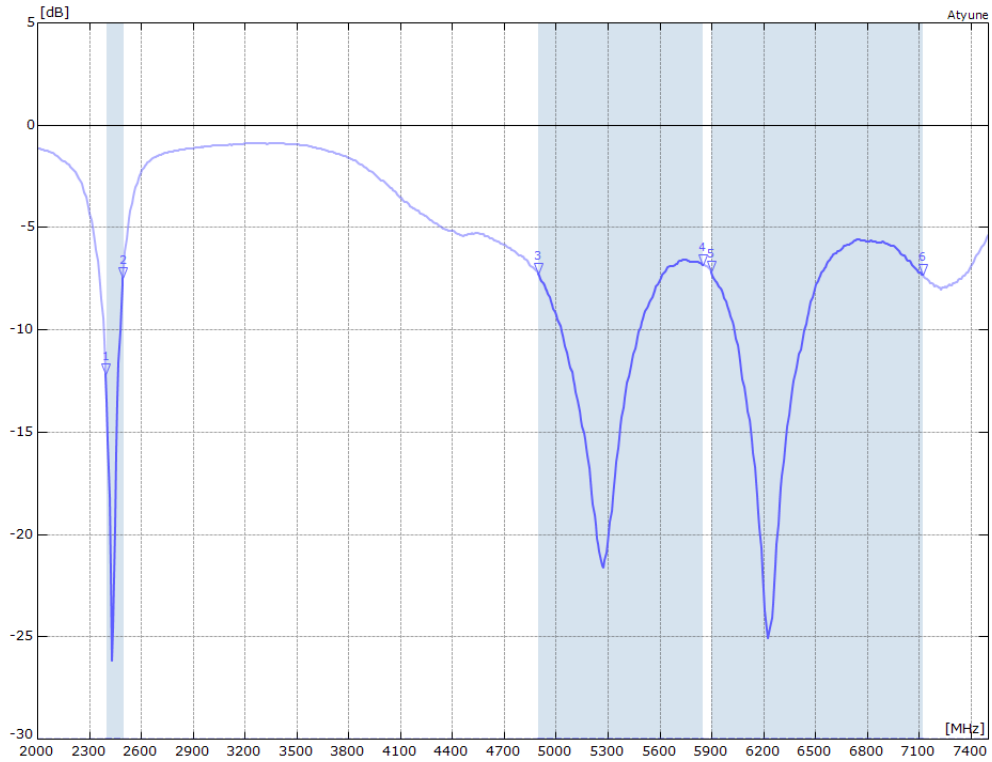
Environmental Specifications

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

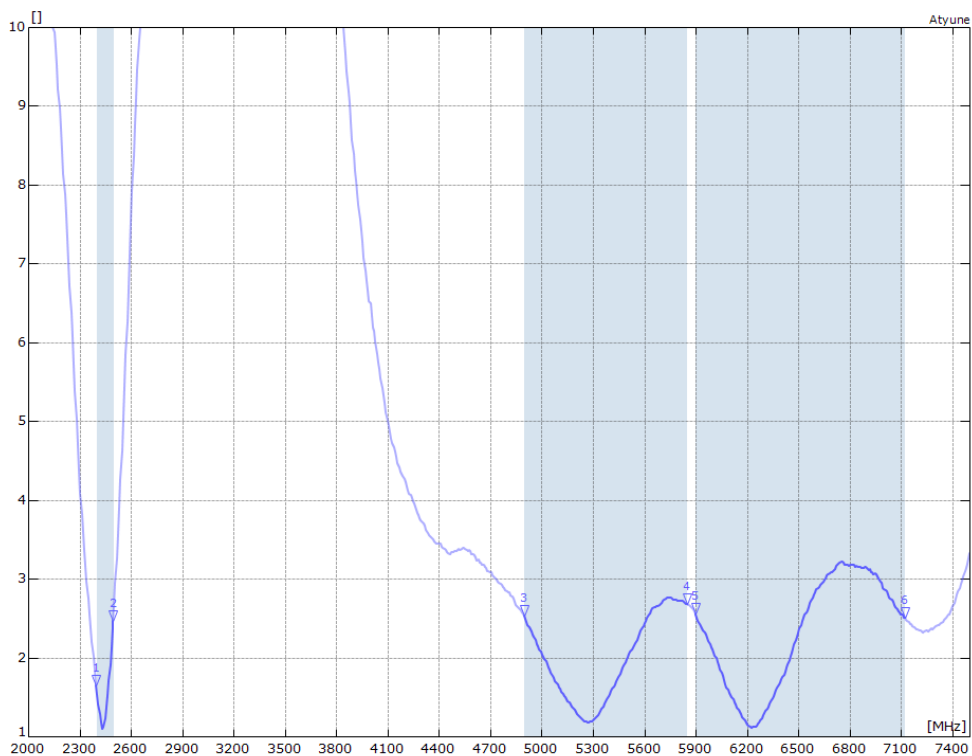


RF Characteristics

S11 Parameter



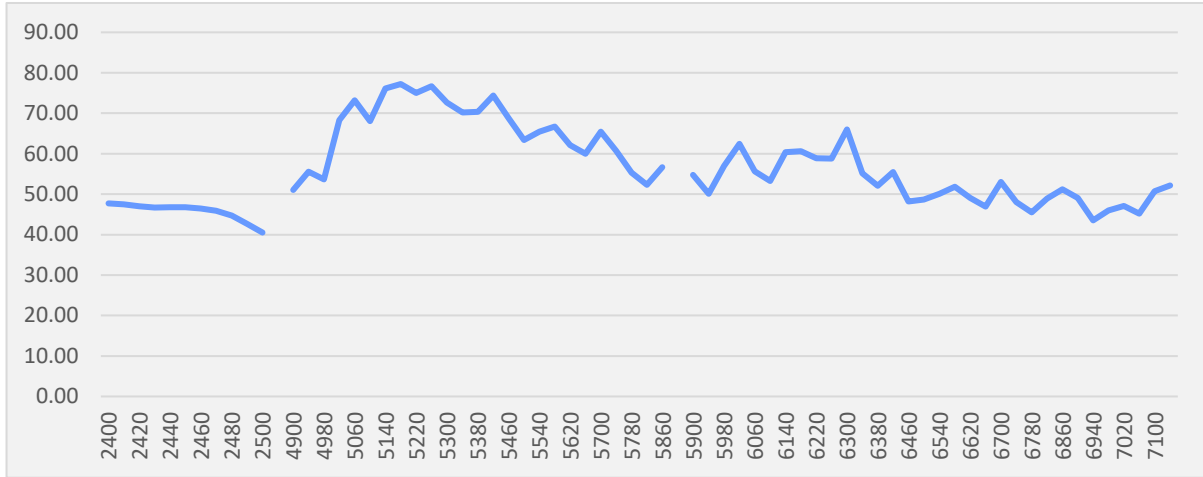
VSWR



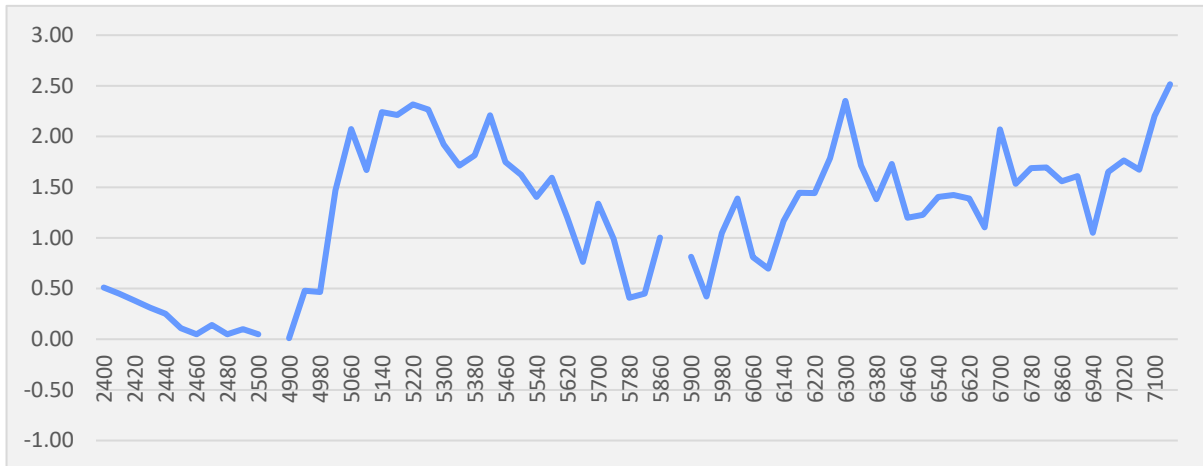


Antenna Performance

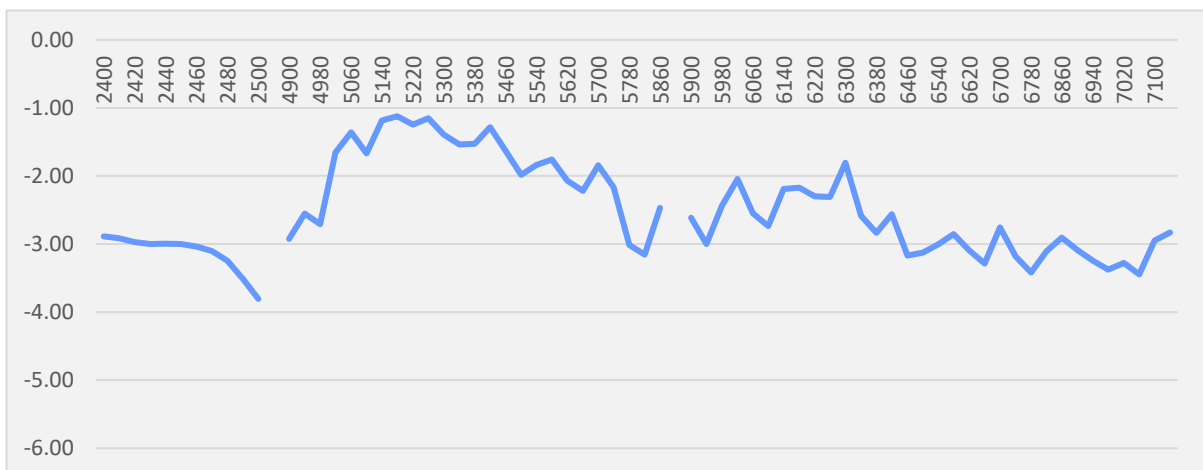
Efficiency



Peak Gain



Average Gain

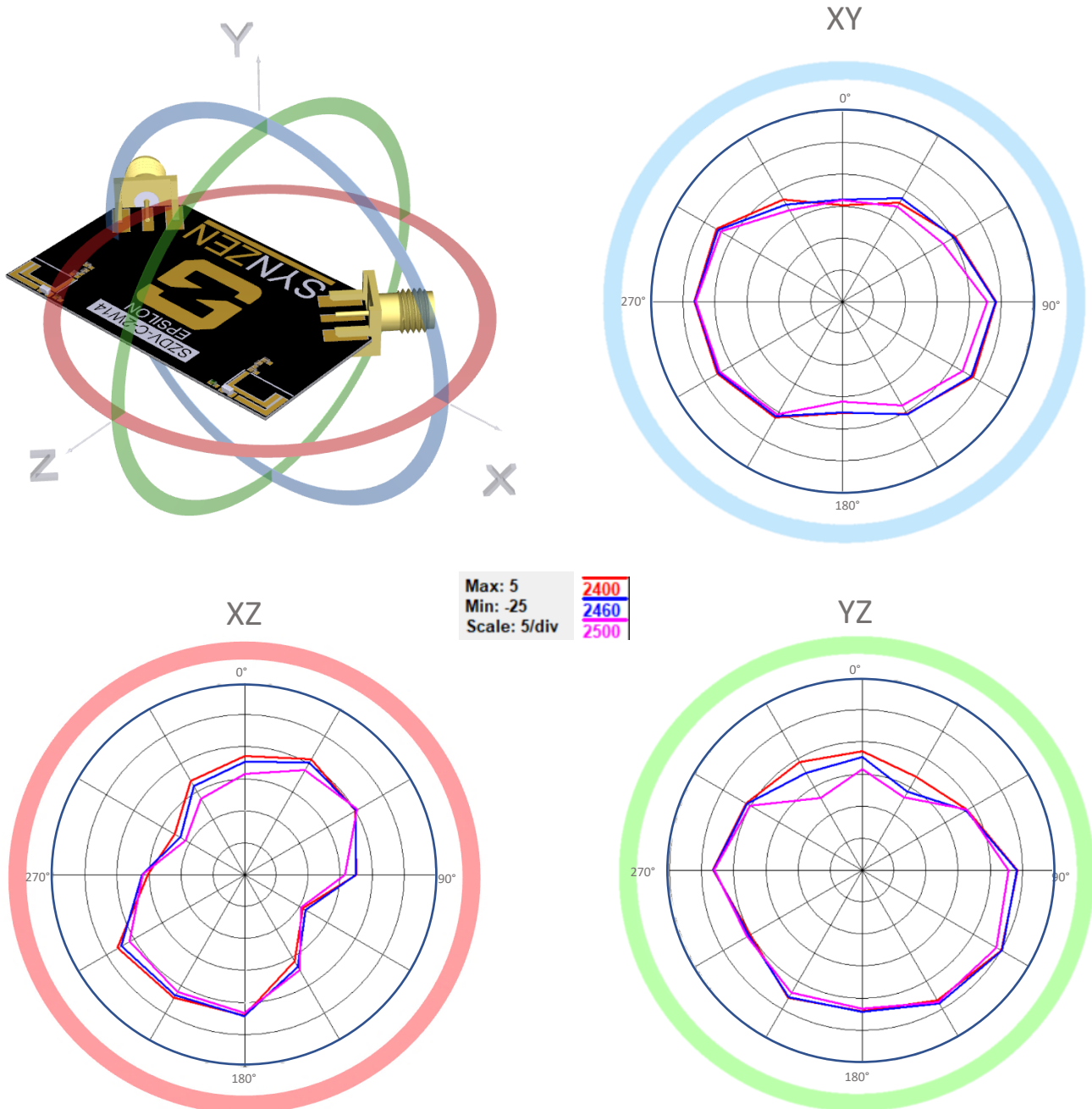




Radiated Performance

2D Polar Plot 2400-2500

The data shown was measured on Synzen EVK (SZDV-C-2W14)

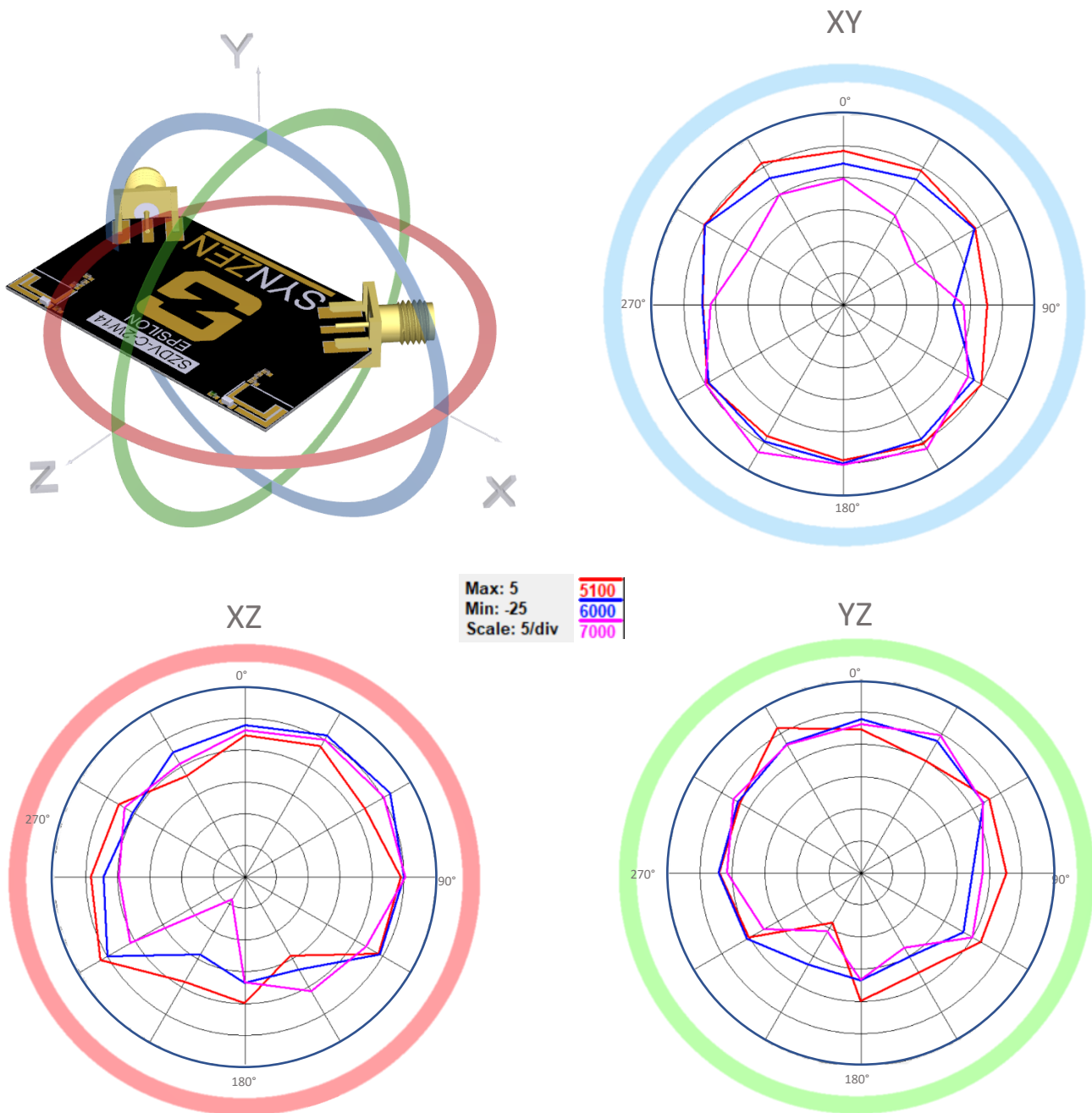




Radiated Performance

2D Polar Plot 4900-7125

The data shown was measured on Synzen EVK (SZDV-C-2W14)

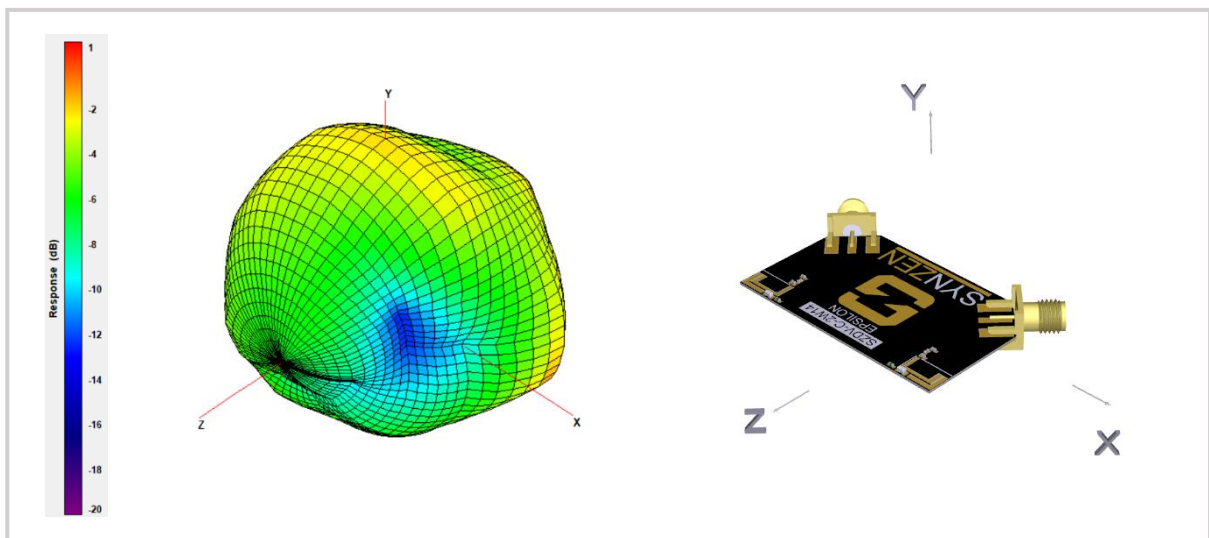
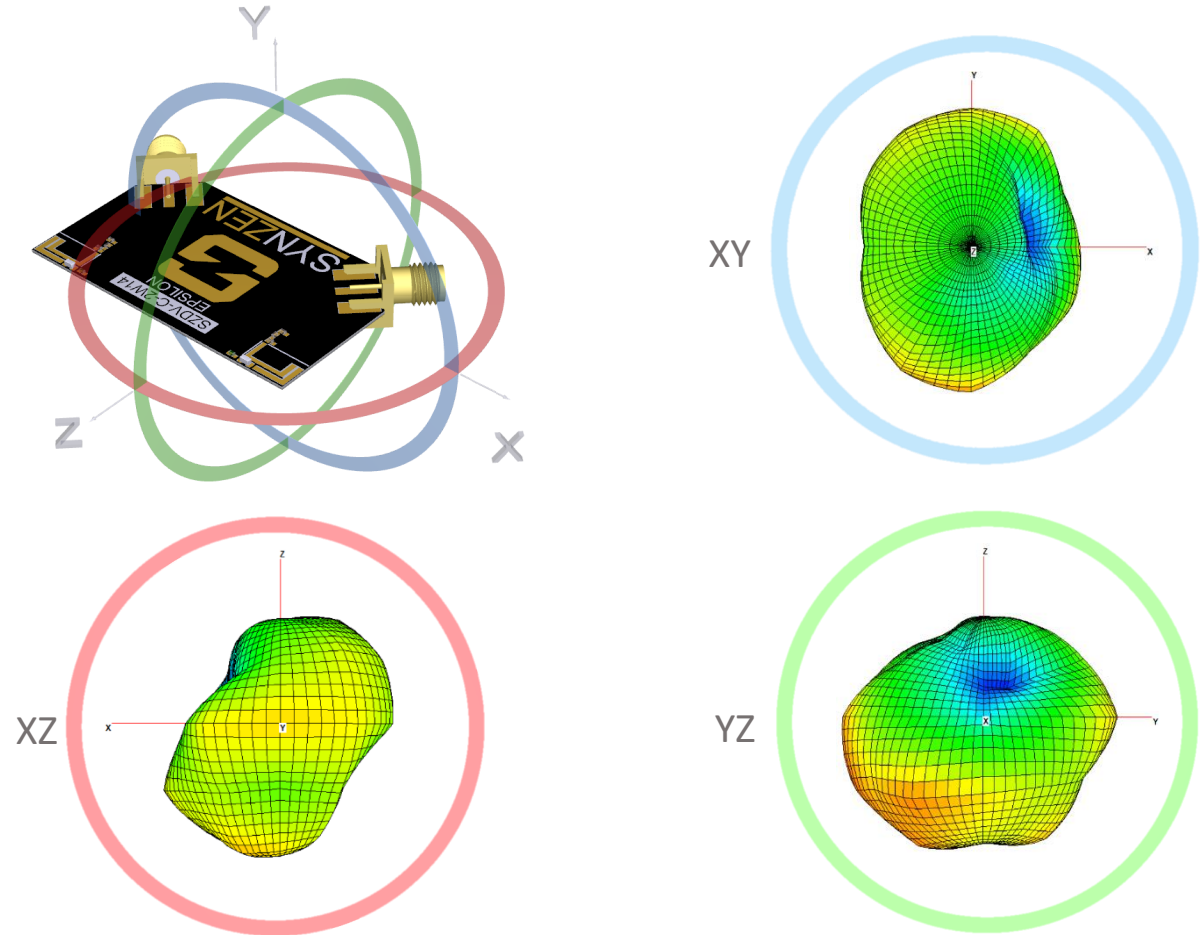




Radiated Performance

3D Radiation Pattern at 2450MHz

The data shown was measured on Synzen EVK (SZDV-C-2W14). The frequency point shown here is 2450MHz.

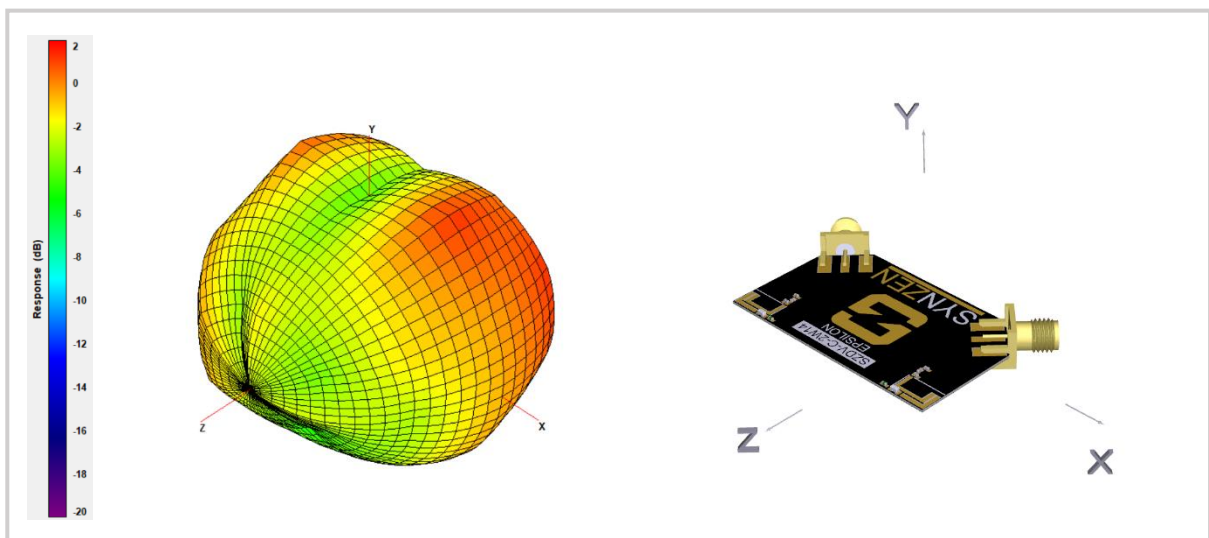
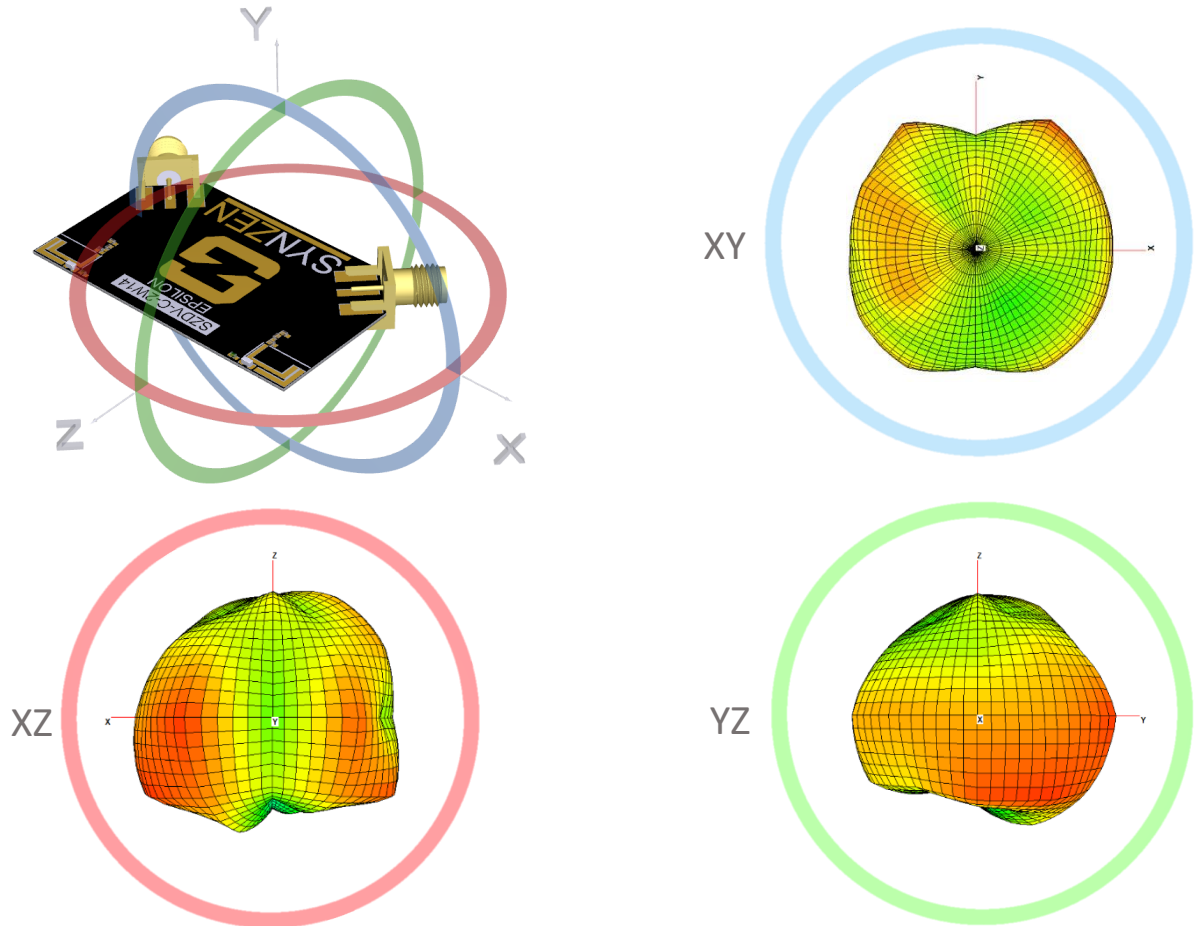




Radiated Performance

3D Radiation Pattern at 5500MHz

The data shown was measured on Synzen EVK (SZDV-C-2W14). The frequency point shown here is 5700MHz.

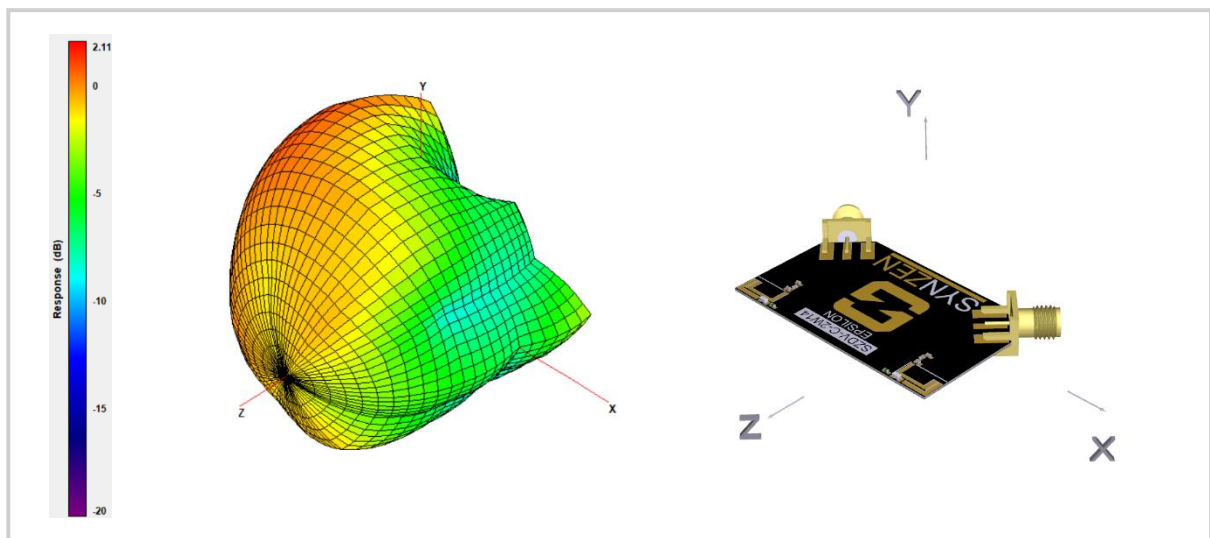
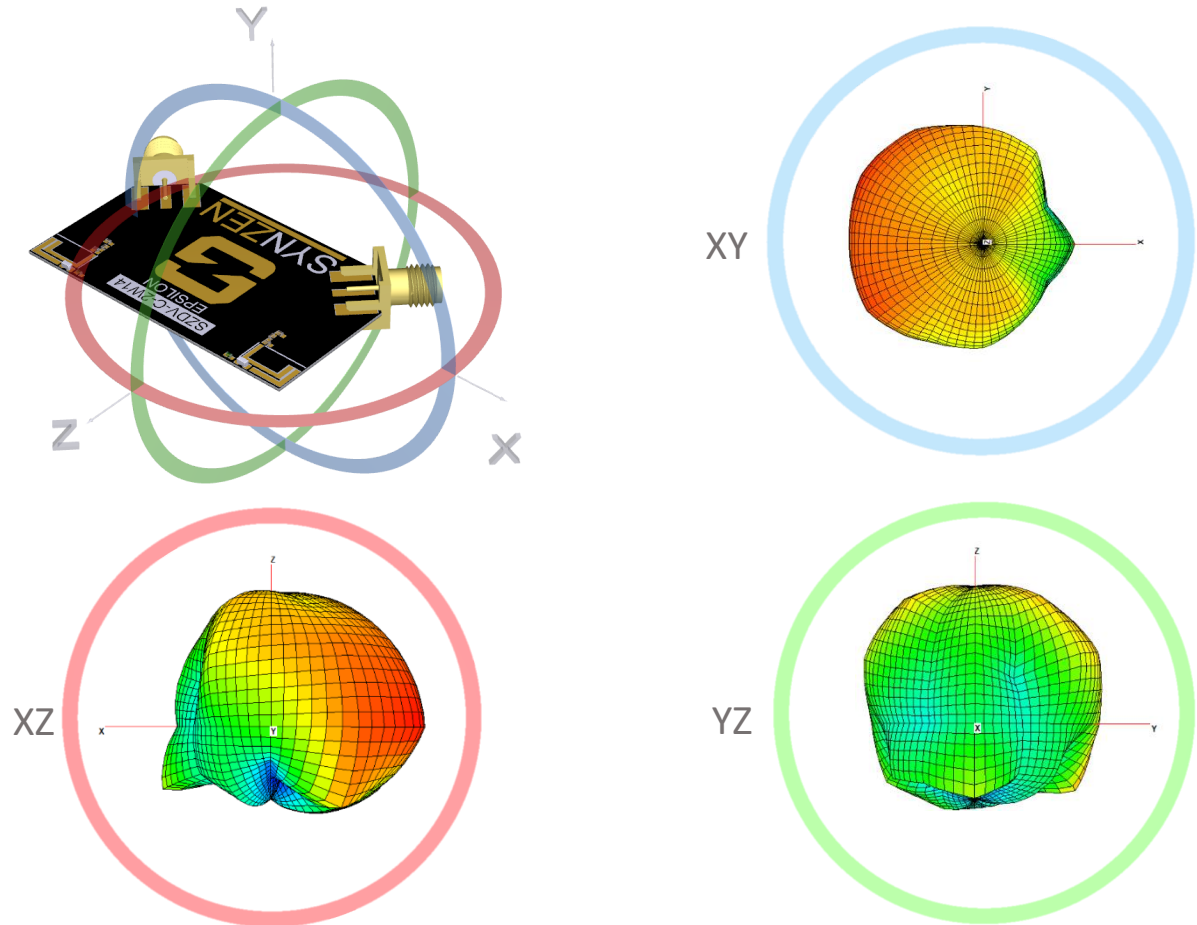




Radiated Performance

3D Radiation Pattern at 6700MHz

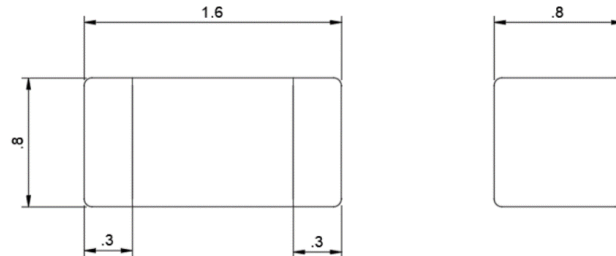
The data shown was measured on Synzen EVK (SZDV-C-2W14). The frequency point shown here is 6700MHz.





Mechanical

Antenna Mechanical Drawing

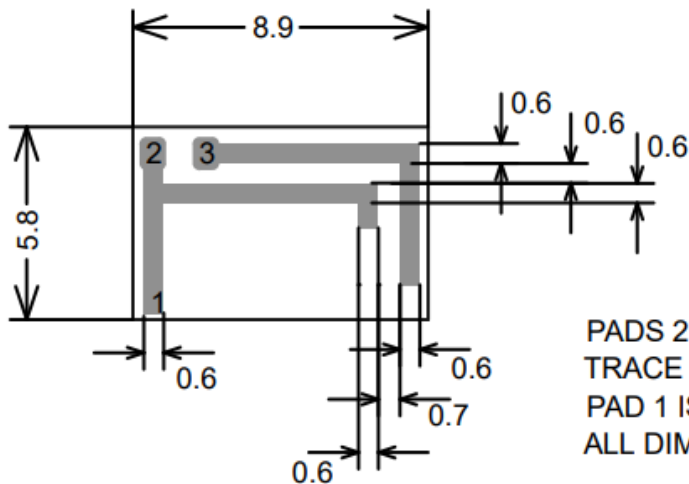


All dimensions in mm

Required Host PCB Footprint

The host PCB requires the footprint shown below. PCB library files and DXF is available from our website www.synzen.com.tw/products.

The required clearance for the host PCB is 8.9 x 5.8 (mm) on all layers.



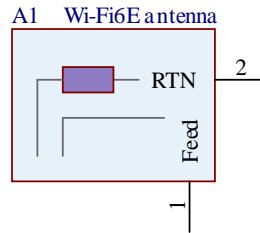
PADS 2, 3 ARE ANTENNA PADS
TRACE WIDTH is 0.6MM FOR ALL TRACES
PAD 1 IS LOCATION FOR FEED
ALL DIMENSIONS IN MM



Antenna Pinout

SZC-C-2W14 Schematic Symbol

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

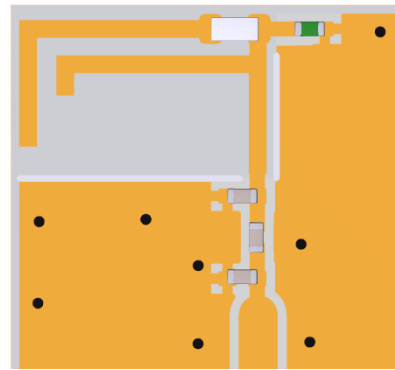
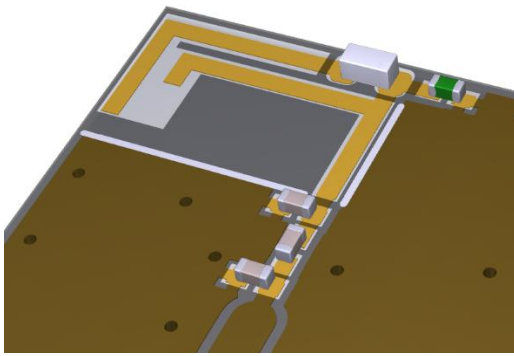


| Pin | Description |
|-----|------------------|
| 1 | RF Feed |
| 2 | RTN = Tuning Pin |

PCB Layout Requirements

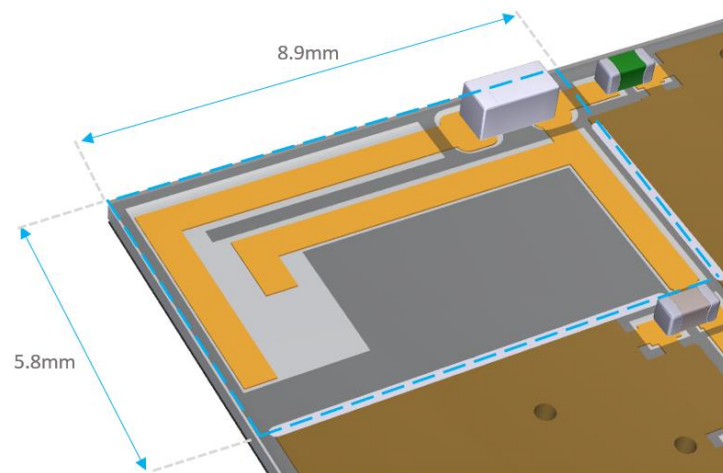
Placement

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



Required Clearance

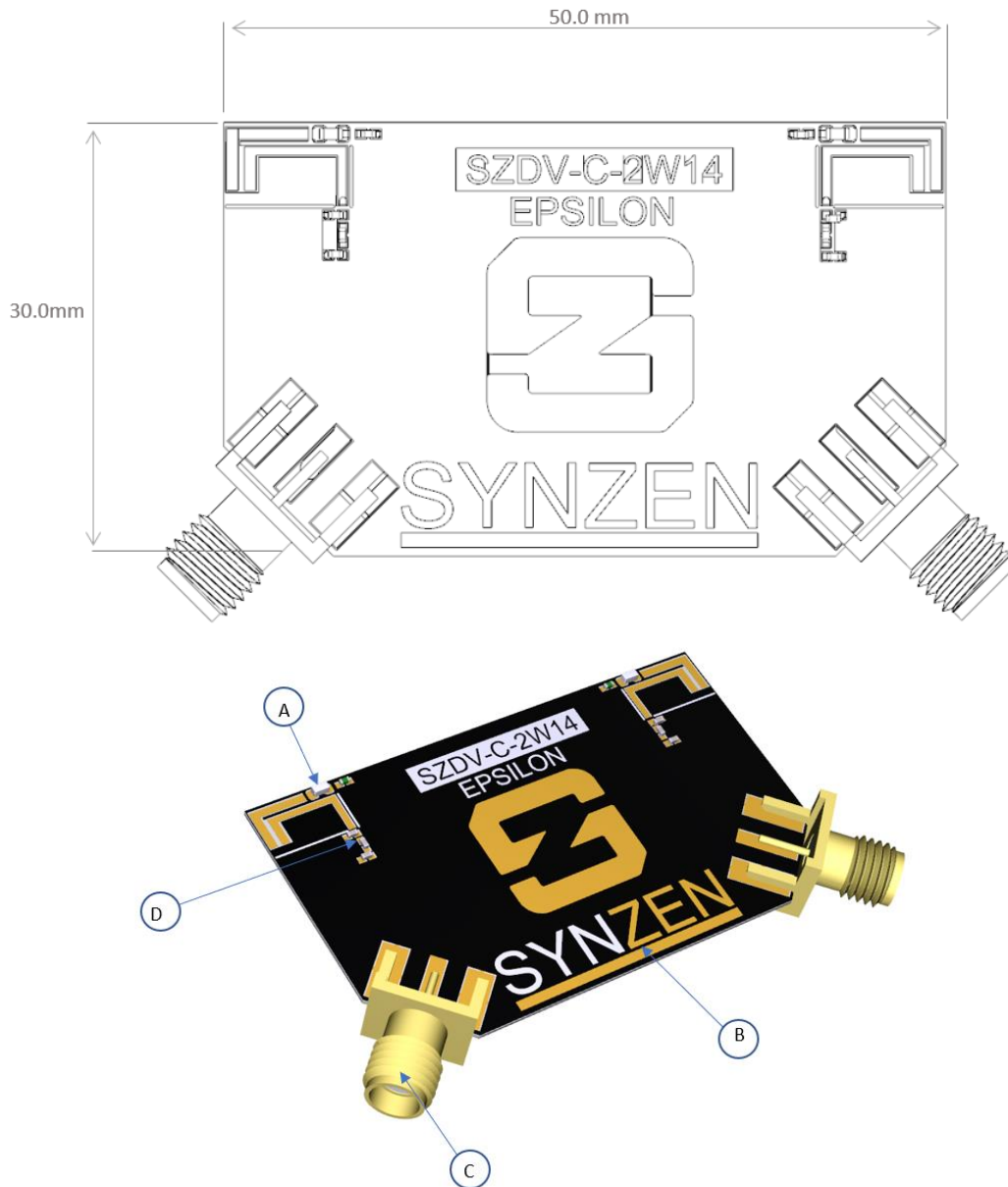
A clearance is required through all PCB layers and is identical to the antenna size. For any components such as battery or display, these must avoid this area.



Evaluation Kit

SZDV-C-2W14 Evaluation Kit

The SZDV-C-2W14 evaluation kit is a PCBA with the antenna (SZC-C-2W14) fitted and optimised with a matching network. Connection to the antenna is made using the fitted female SMA connector.

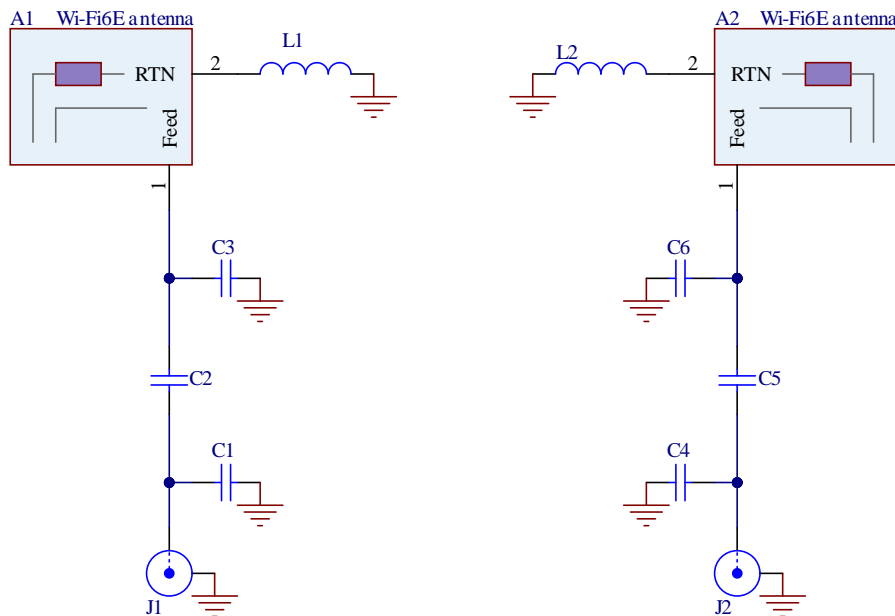


| | |
|---|----------------------|
| A | SZC-C-2W14 (Antenna) |
| B | Host PCB |
| C | SMA Connector |
| D | Matching Circuit |

Evaluation Kit Schematic

Evaluation Kit Matching Circuit

The circuit of the evaluation kit 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. The EPSILON EVK shows the placement for 2x2 MIMO with 2 EPSILON antennas on the board. Synzen provide a matching service to optimise your device to ensure the best performance, please contact sales@synzen.com.tw for more information.

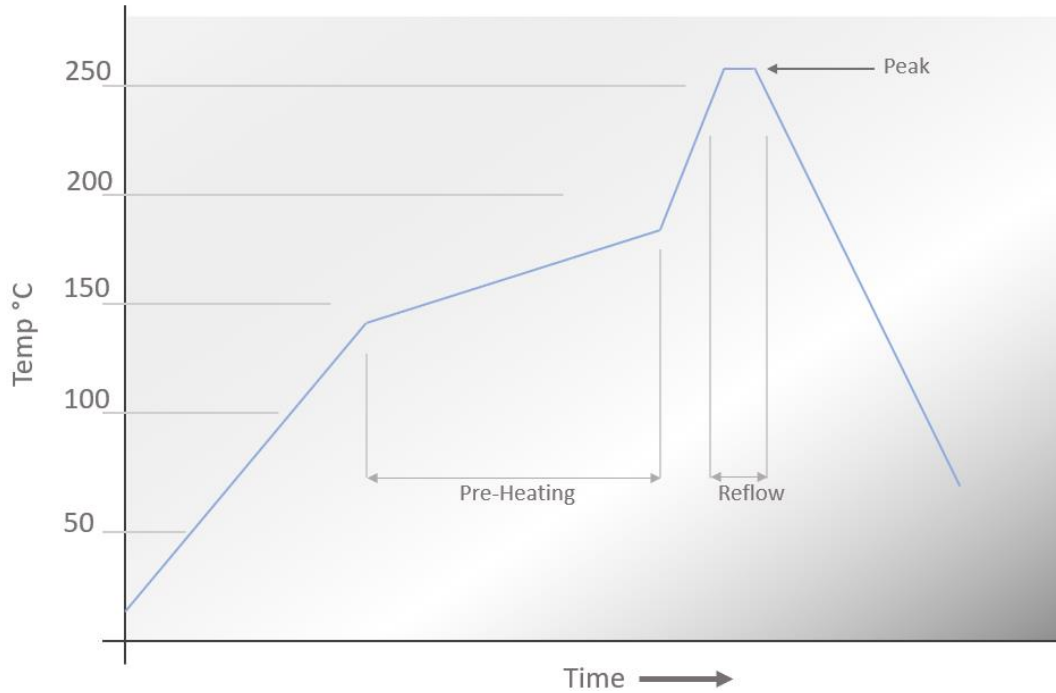


| Designator | Component Type | Value | Size | Manufacturing Part No. |
|-------------|----------------|---------|------|--------------------------|
| A1, A2 | Antenna | EPSILON | - | SZP-C-2W14 |
| L1, L2 | Inductor | 4.3nH | 0402 | LQG15HS4N3S02D |
| C1,C3,C4,C6 | Capacitor | 0.2pF | 0402 | GCQ1555C1HR20BB01D |
| C2, C5 | Capacitor | 10pF | 0402 | GCQ1555C1H100RB01D |
| J1,J2 | SMA Connector | - | - | ACE solution A3SAFTST135 |



Soldering

Reflow Profile



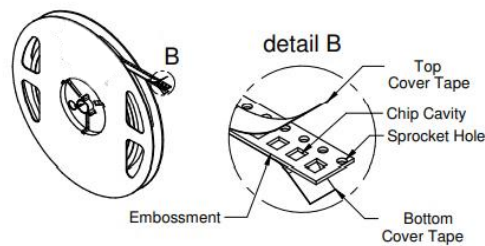
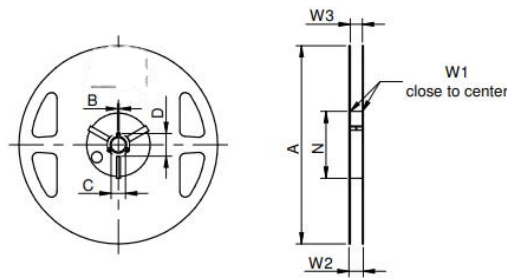
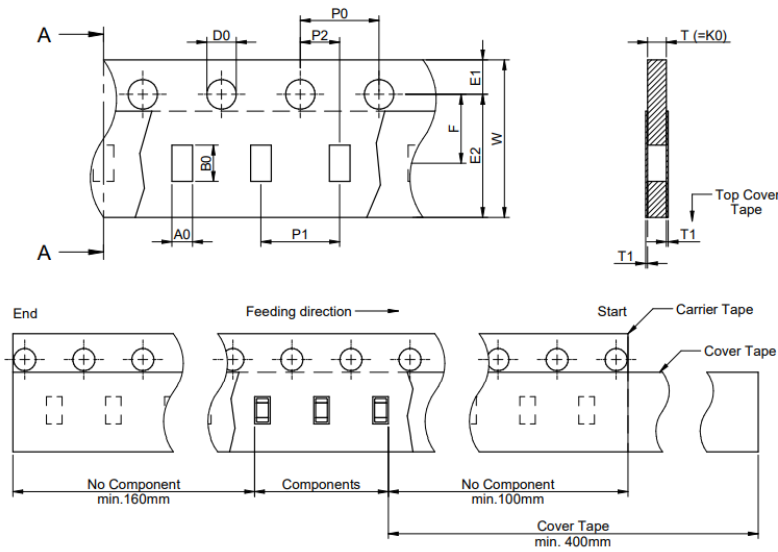
| | | |
|-------------------------|-------------|-------------------|
| Pre-Heating | 130 - 180°C | 50 to 190 seconds |
| Reflow | >220 °C | 50 to 160 seconds |
| Peak Temperature | 260 °C | 15 to 45 seconds |



Packaging

Tape and Reel

| | | A0 | B0 | W | T | T1 | P0 | P1 | P2 | D0 | E1 | E2 | F | Tape Type 1a | VPE / packaging unit |
|------------------|------------|------|------|-----------|------|------|------|------|-------|-------------|------|------|-------|--------------|----------------------|
| tolerance | Tolerances | typ. | typ. | +0.3/-0.1 | typ. | max. | ±0.1 | | +0.05 | +0.1 / -0.0 | ±0.1 | min. | ±0.05 | | pcs. |
| size | 0603 | 1.05 | 1.85 | 8.00 | 0.95 | 0.10 | 4.00 | 4.00 | 2.00 | 1.50 | 1.75 | 6.25 | 3.50 | Paper | 4000 |

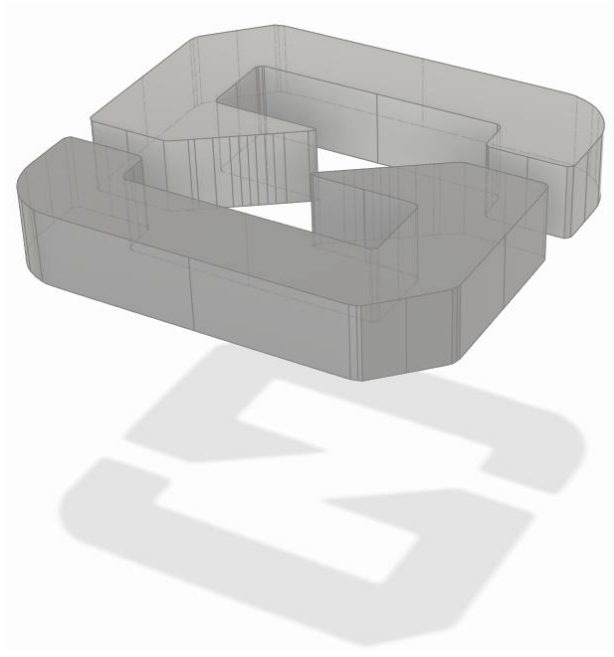




Environmental

Material Regulation

The antenna has been tested to conform to RoHS requirements. A certificate of conformance is available upon request.



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