

— WI-FI 6 / 6E CERAMIC SMD

EPSILON

Tri-band Wi-Fi Ceramic SMD Antenna

SZC-C-2W14

FREQUENCY

2.4 / 5 / 6 GHz

PEAK GAIN

Up to 2.52 dBi

MOUNTING

SMD, PCB corner

SIZE

1.6 × 0.8 × 0.8 mm

2.4 GHz	2400 to 2500 MHz	Covers Wi-Fi 2.4 GHz
5 GHz	4900 to 5850 MHz	Covers Wi-Fi 5 GHz
6 GHz	5925 to 7125 MHz	Covers Wi-Fi 6E

— Key Features

- For WLAN applications 2.4 to 2.5 GHz; 4.9 to 5.85 GHz; 5.90 to 7.125 GHz
- Ideal for MIMO systems 2×2, 4×4, 8×8
- Simple integration, plug and operate the device without designing onboard antenna
- Small form factor of 1.6 × 0.8 × 0.8 mm

1 Introduction

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.

— Features

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— Applications

- | | |
|------------------|---------------|
| ◆ Access Points | ◆ Smart Grid |
| ◆ M2M Industrial | ◆ Healthcare |
| ◆ Smart Meters | ◆ Set Top Box |

2 Mechanical Specifications

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

3 RF Specifications

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

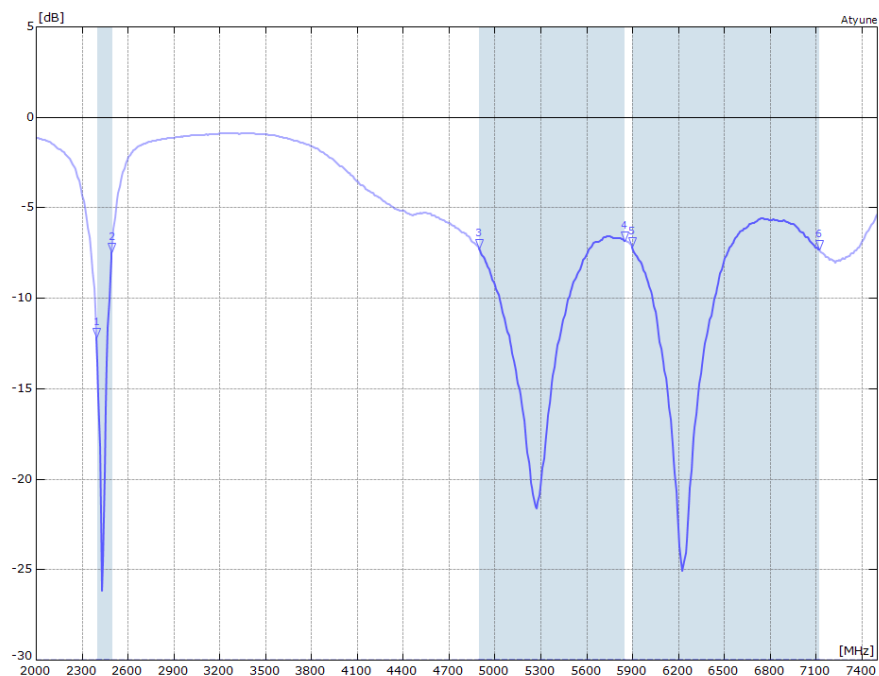
*All performance stated is measured on the SZDV-C-2W14 evaluation kit.

4 Environmental

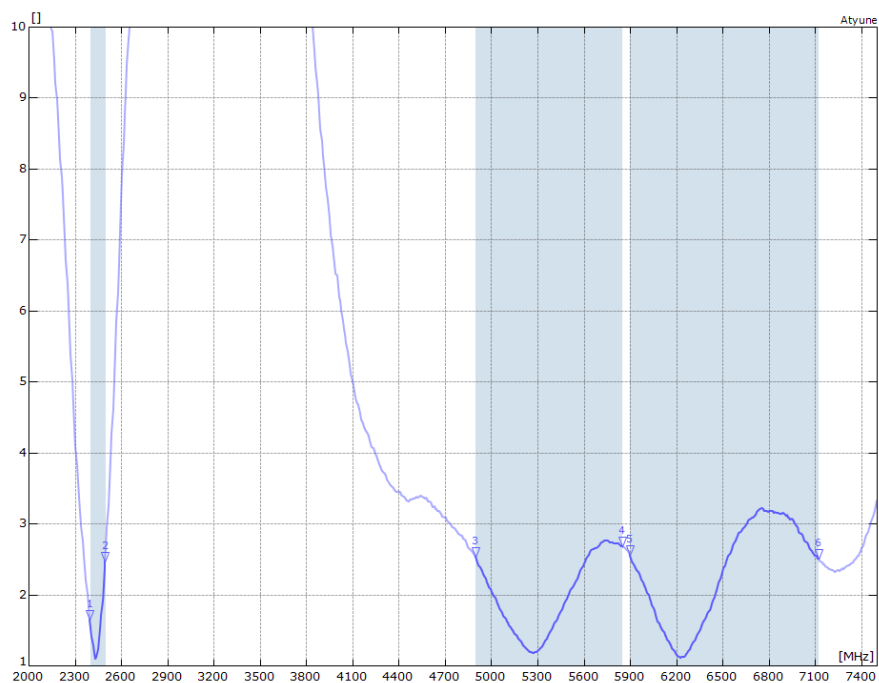
Operational Temperature	-40 to +125°C
Storage Temperature	-10 to +40°C
Relative Humidity	≤75%

5 RF Characteristics

S11 Parameter



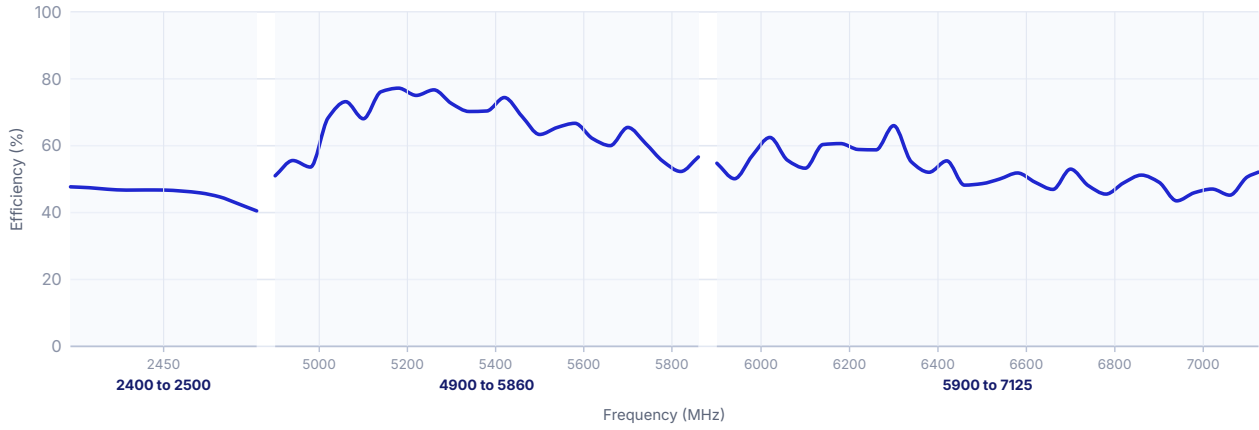
VSWR



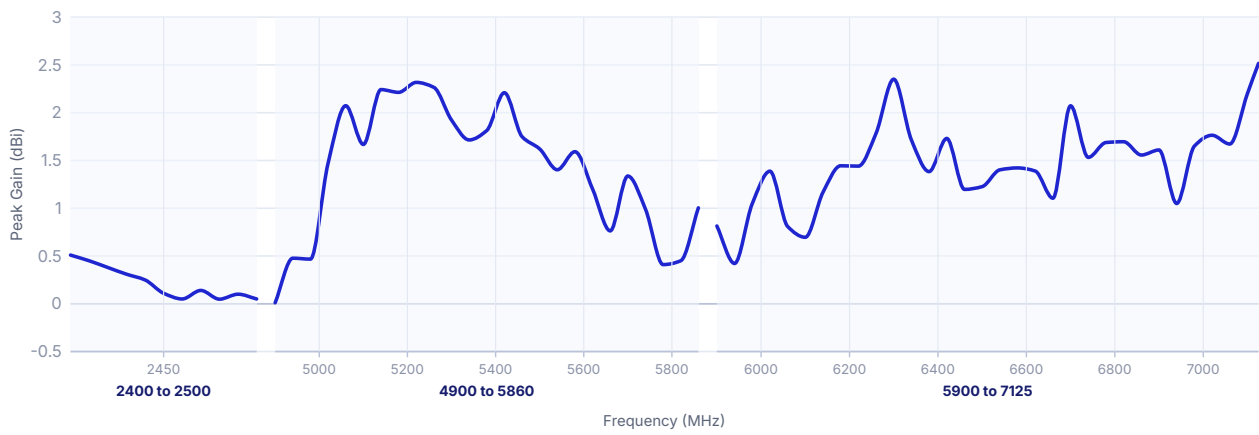
6

Antenna Performance

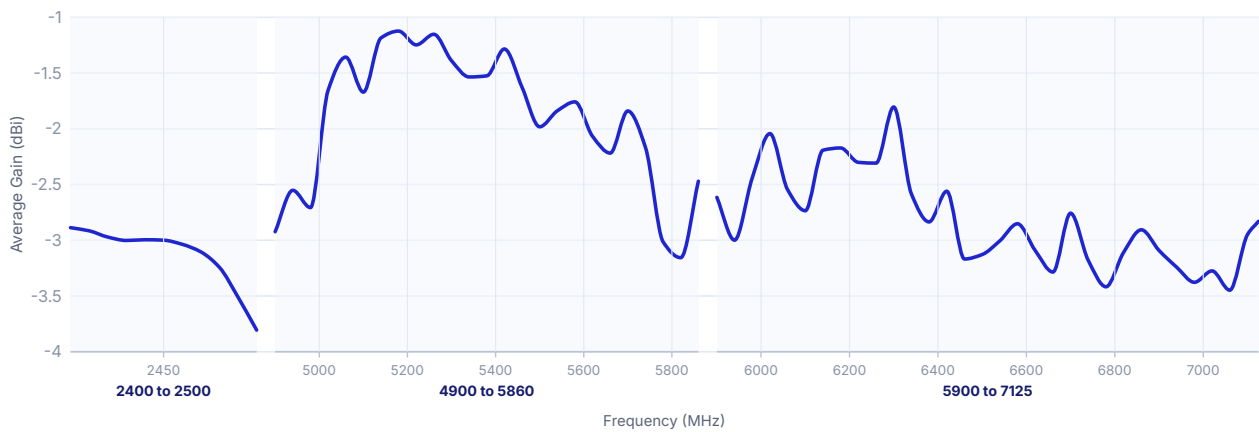
Efficiency



Peak Gain

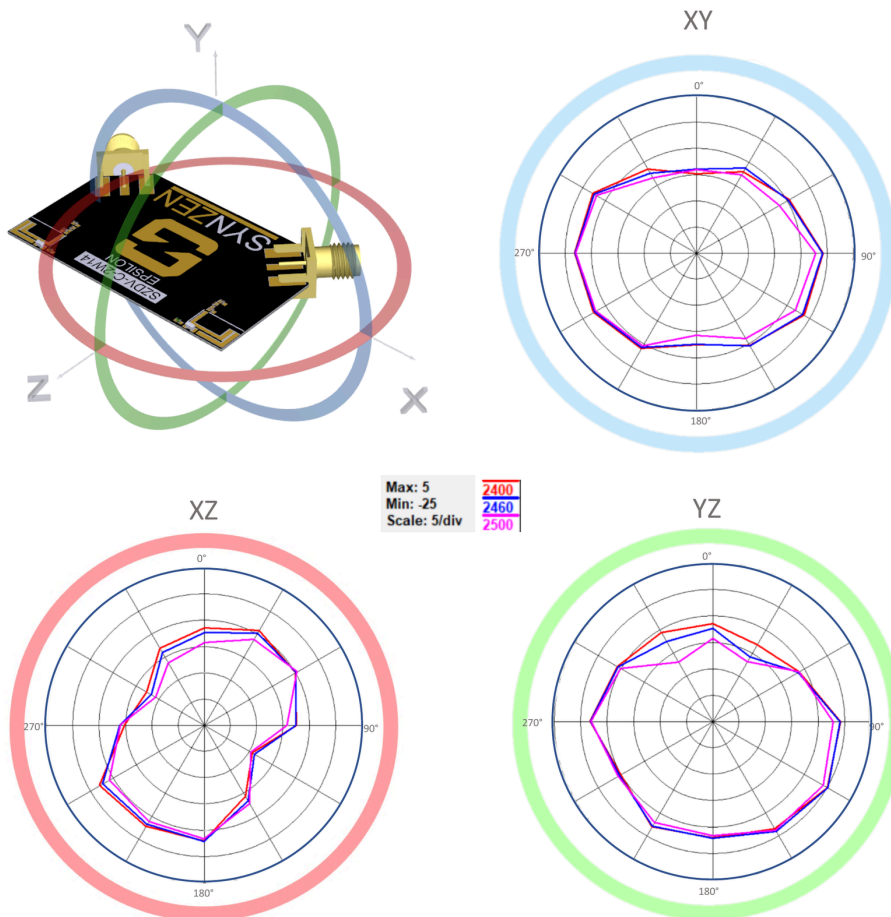


Average Gain



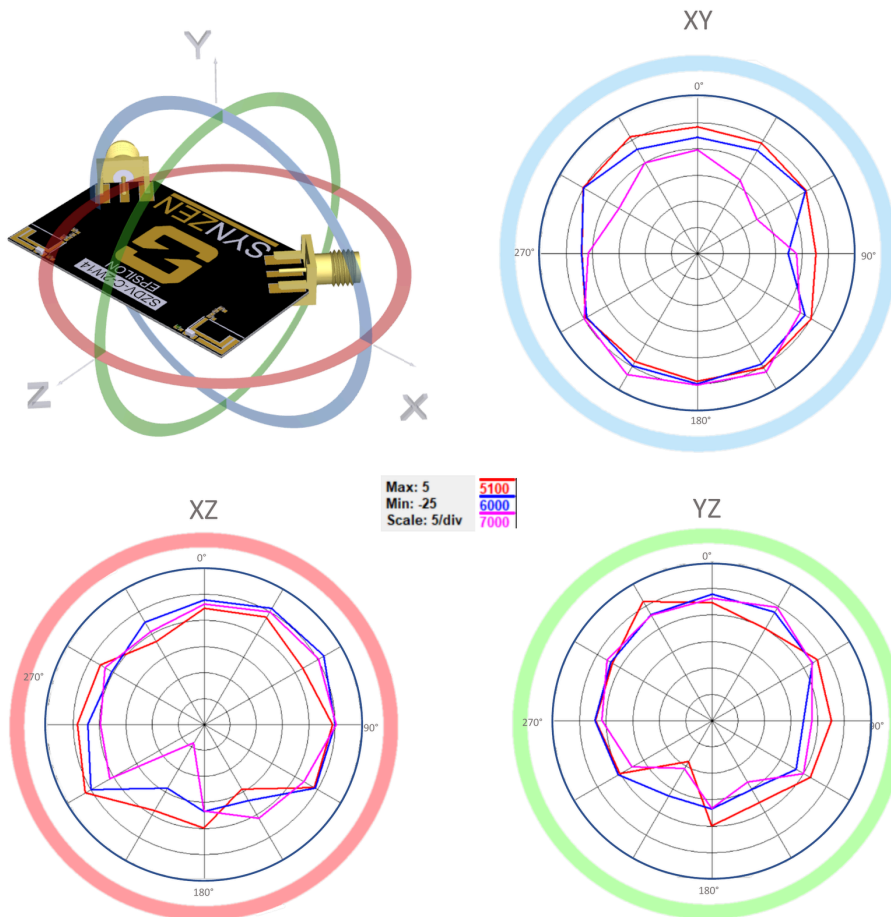
7 2D Polar Plot 2400 to 2500 MHz

MEASURED ON SYNZEN EVK (SZDV-C-2W14)



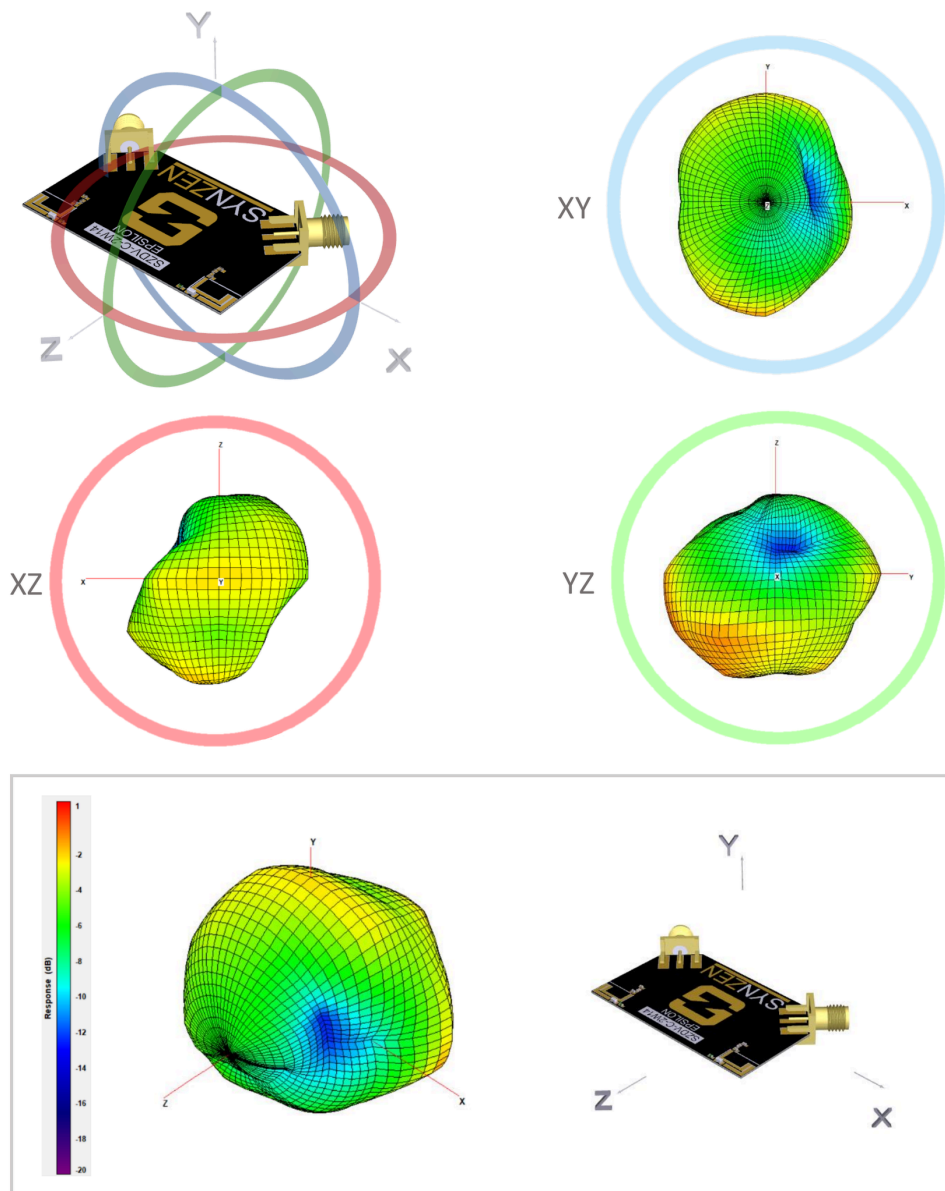
8 2D Polar Plot 4900 to 7125 MHz

MEASURED ON SYNZEN EVK (SZDV-C-2W14)



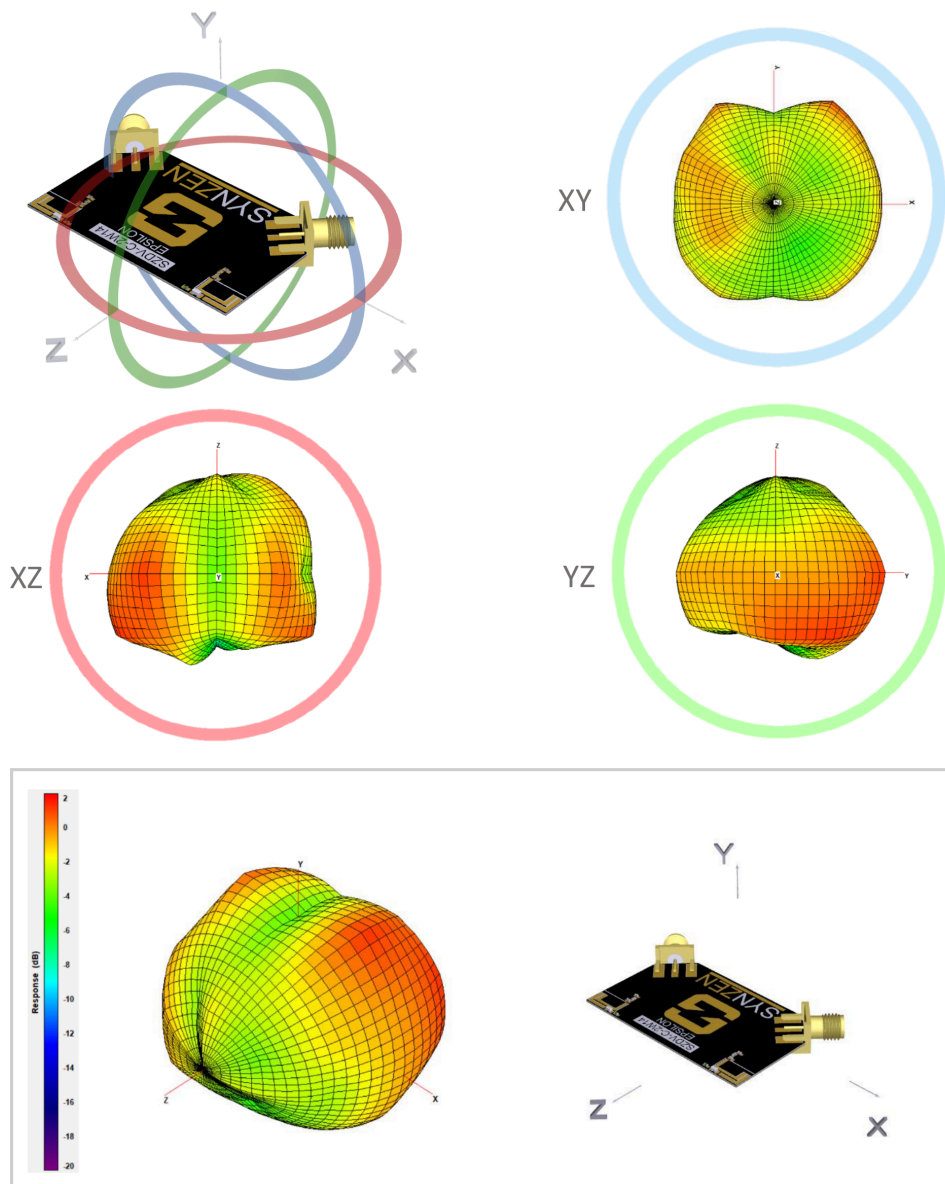
9 3D Radiation Pattern at 2450 MHz

MEASURED ON SYNZEN EVK (SZDV-C-2W14), FREQUENCY POINT 2450 MHZ



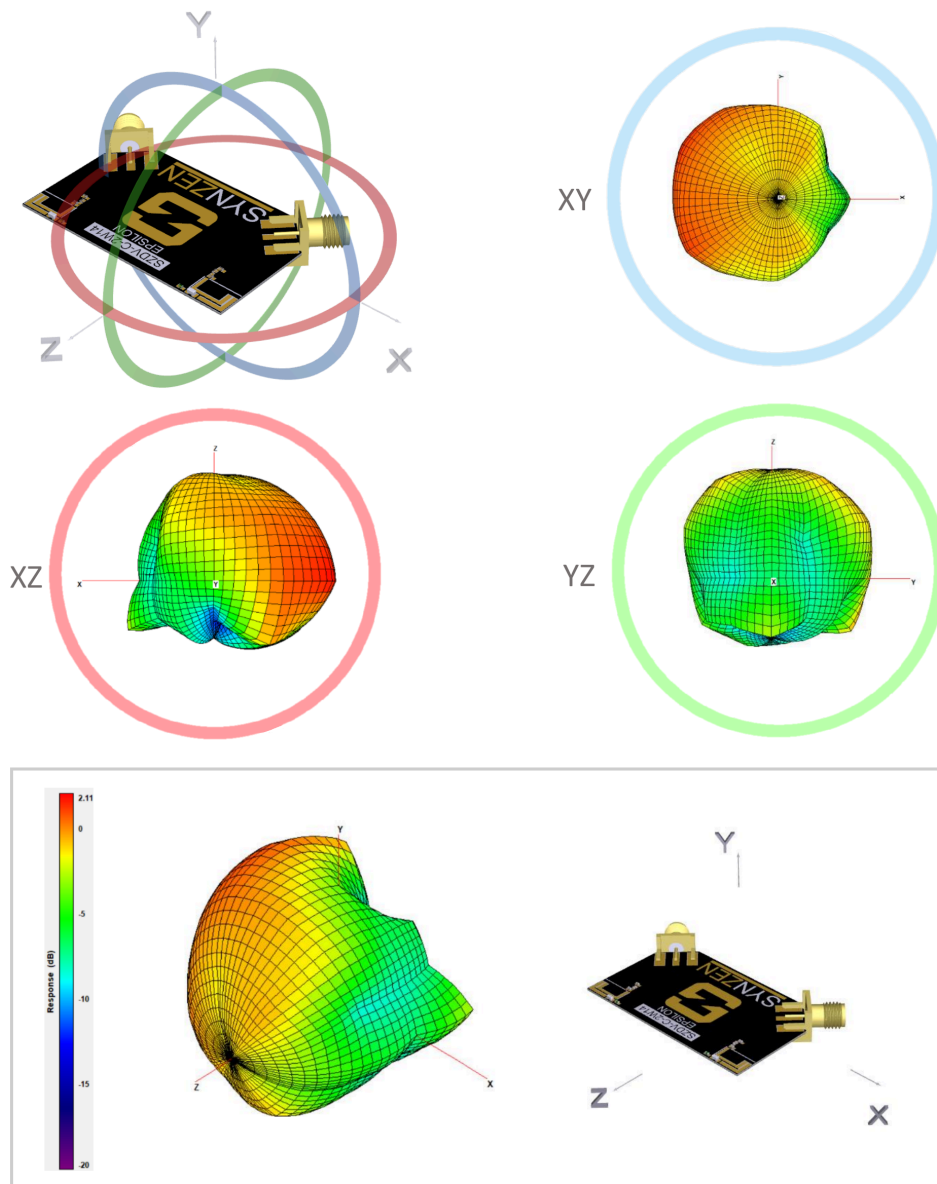
10 3D Radiation Pattern at 5700 MHz

MEASURED ON SYNZEN EVK (SZDV-C-2W14), FREQUENCY POINT 5700 MHZ

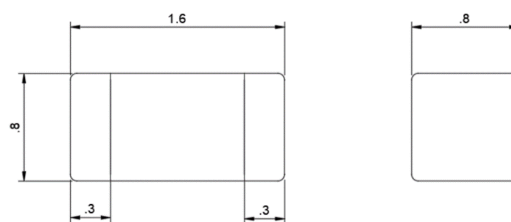


11 3D Radiation Pattern at 6700 MHz

MEASURED ON SYNZEN EVK (SZDV-C-2W14), FREQUENCY POINT 6700 MHZ

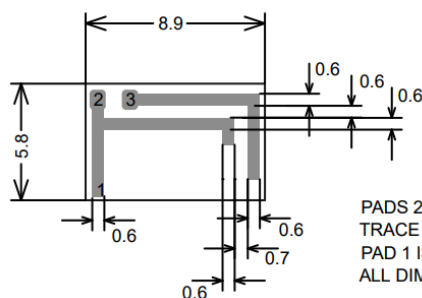


12 Antenna Mechanical Drawing



All dimensions in mm

13 Required Host PCB Footprint



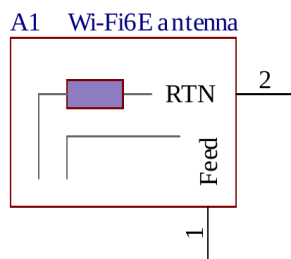
PADS 2, 3 ARE ANTENNA PADS
TRACE WIDTH is 0.6MM FOR ALL TRACES
PAD 1 IS LOCATION FOR FEED
ALL DIMENSIONS IN MM

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

The required clearance for the host PCB is 8.9 × 5.8 mm on all layers.

14 SZC-C-2W14 Schematic Symbol

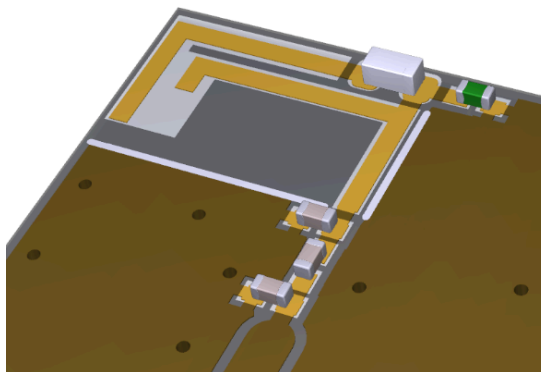
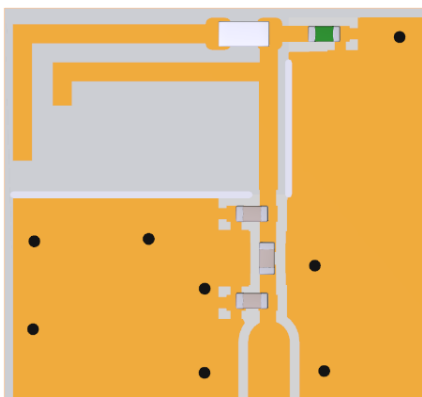
The schematic symbol for the antenna is shown below with a description of each pin.



Pin	Description
1	RF Feed
2	RTN = Tuning Pin

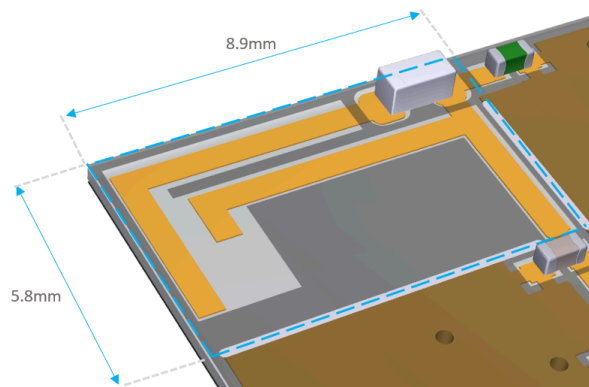
15 Placement

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



16

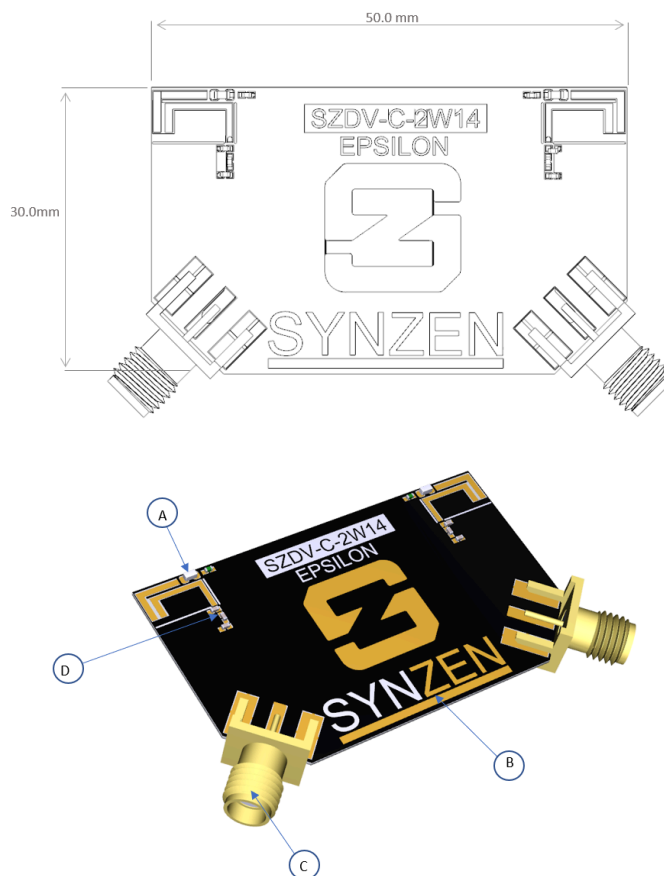
Required Clearance



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.

17 SZDV-C-2W14 Evaluation Kit

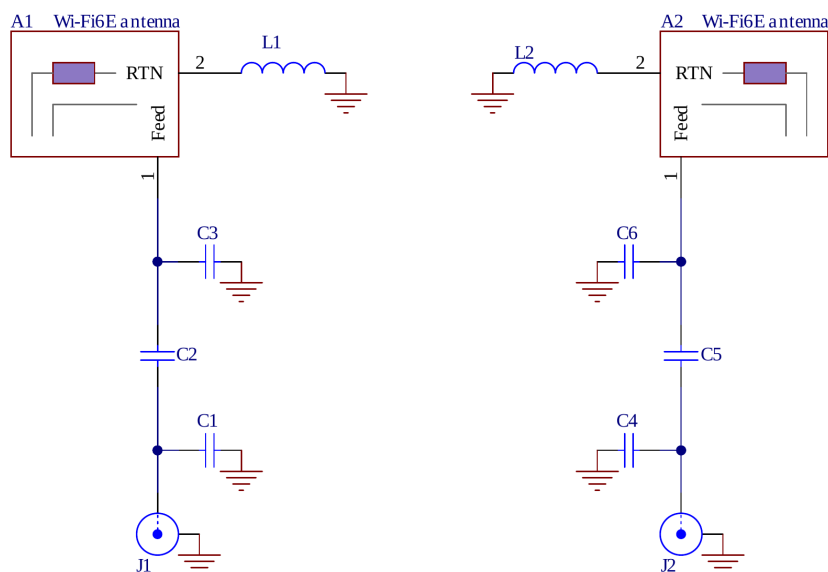
The SZDV-C-2W14 evaluation kit is a PCBA with the antenna (SZC-C-2W14) fitted and optimized with a matching network. Connection to the antenna is made using the fitted female SMA connector.



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

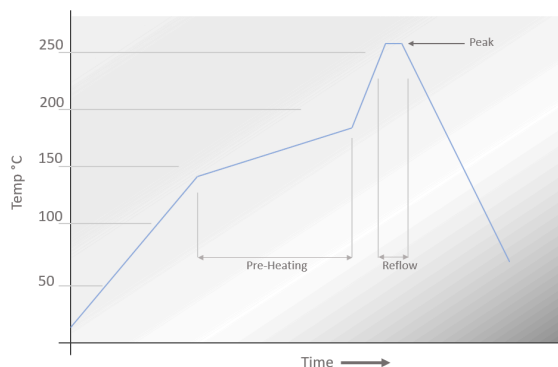
18 Evaluation Kit Matching Circuit

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 2×2 MIMO with 2 EPSILON antennas on the board. Synzen provide a matching service to optimize your device to ensure the best performance. Please contact sales@synzen.com.tw for more information.



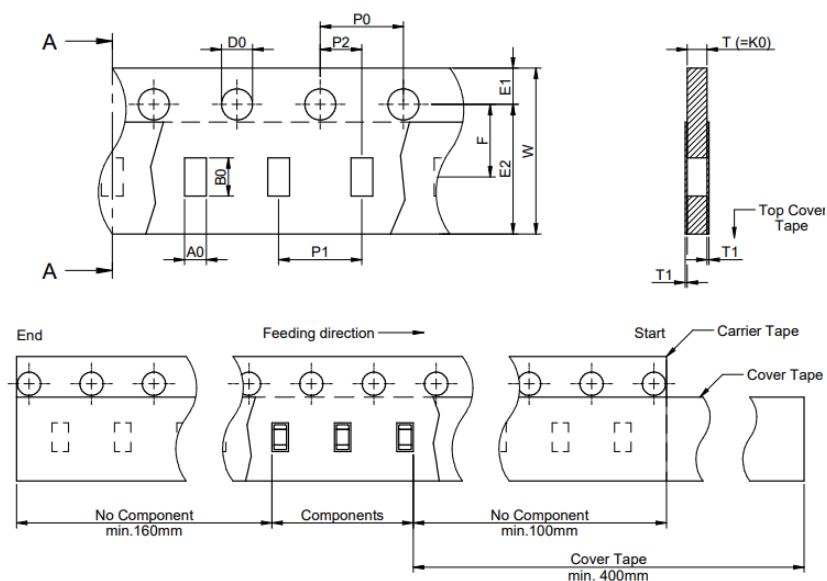
Designator	Component Type	Value	Size	Manufacturing Part No.
A1, A2	Antenna	EPSILON		SZC-C-2W14
L1, L2	Inductor	4.3 nH	0402	LQG15HS4N3S02D
C1, C3, C4, C6	Capacitor	0.2 pF	0402	GCQ1555C1HR20BB01D
C2, C5	Capacitor	10 pF	0402	GCQ1555C1H100RB01D
J1, J2	SMA Connector			ACE solution A3SAFTST135

19 Reflow Profile



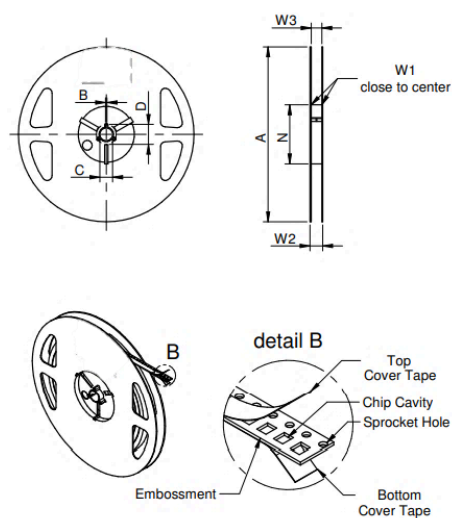
Stage	Temperature	Time
Pre-Heating	130 to 180°C	50 to 190 seconds
Reflow	>220°C	50 to 160 seconds
Peak Temperature	260°C	15 to 45 seconds

20 Tape



Dimension	Size 0603 (mm)	Tolerance
A0	1.05	typ.
B0	1.85	typ.
W	8.00	+0.3 / -0.1
T	0.95	typ.
T1	0.10	max.
P0	4.00	±0.1
P1	4.00	
P2	2.00	+0.05
D0	1.50	+0.1 / -0.0
E1	1.75	±0.1
E2	6.25	min.
F	3.50	±0.05
Tape type	Paper (type 1a)	
Packaging unit	4000 pcs	

21 Reel



Dimension	Value (mm)	Tolerance
A	178	±2.0
B	1.5	min.
C	12.8	min.
D	20.2	min.
N	50	min.
W1	8.4	+1.5
W2	14.4	max.
W3	7.9 to 10.9	min. / max.
Material	Polystyrene / Polyurethane	

22 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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