

4G / 5G REDCAP SMD

ATRIA

4G LTE / 5G RedCap Low-Profile Surface Mount Antenna

SZP-C-2L23/2L24

FREQUENCY

698 to 2690 MHz

PEAK GAIN

Up to 3.70 dBi

MOUNTING

SMD, left / right corner

SIZE

30.0 × 7.0 × 1.7 mm

LOW BAND	698 to 960 MHz	Covers B5, B8, B12, B13, B14, B17, B18, B20, B26, B27, B28, B29
MID BAND	1710 to 2200 MHz	Covers B1, B2, B3, B4, B9, B23, B35, B39, B66
2.3 GHZ	2300 to 2400 MHz	Covers B40
2.6 GHZ	2490 to 2690 MHz	Covers B7, B38, B41

Key Features

- Covers 698 to 2690 MHz for global 4G and 5G RedCap networks
- Small form factor 30.0 × 7.0 × 1.6 mm
- Minimal clearance area 30.0 × 12.0 mm
- Left and right corner mount versions available (SZP-C-2L23 / SZP-C-2L24)

1 Introduction

ATRIA is a compact, low-profile antenna designed for 4G LTE, NB-IoT, 5G RedCap, and legacy 3G/2G applications. It provides full frequency coverage from 698 MHz to 2690 MHz within a small footprint of 30.0 × 7.0 mm, making it ideal for space-limited designs that still require excellent wideband performance. ATRIA maintains excellent wideband performance within an exceptionally thin 1.7 mm profile, making it ideal for ultra-slim and space-limited designs. With strong efficiency across both low and high bands, ATRIA delivers stable performance and easy integration into modern cellular devices.

— Features

- ◆ Covers 698 to 2690 MHz for global 4G and 5G RedCap networks
- ◆ Small form factor 30.0 × 7.0 × 1.6 mm
- ◆ Minimal clearance area 30.0 × 12.0 mm
- ◆ Left and right corner mount versions available (SZP-C-2L23 / SZP-C-2L24)

— Applications

- | | |
|--------------------------------------|---|
| ◆ LTE Cat-M1 and NB-IoT devices | ◆ Smart meters and asset trackers |
| ◆ 5G RedCap and compact IoT gateways | ◆ Industrial monitoring and telemetry |
| ◆ MIMO 4G/5G systems | ◆ Remote sensors and handheld terminals |

2 Mechanical Specifications

Part Number	SZP-C-2L23 / SZP-C-2L24
Name	ATRIA1 / ATRIA2
Dimensions (mm)	30.0 × 7.0 × 1.7
Clearance Area (mm)	30.0 × 12.0
Weight	<1 g
Antenna Type	Surface Mount Device

3 Electrical / RF Specifications

Band	Frequency Range (MHz)	Efficiency (%)	Peak Gain (dBi)	VSWR	Impedance
5G NR/4G LTE B5, 8, 12, 13, 14, 17, 18, 20, 26, 27, 28, 29	698 to 960	>50	1.50	3.50:1	50 Ω
5G NR/4G LTE B1, 2, 3, 4, 9, 23, 35, 39, 66	1710 to 2200	>60	3.70	3.70:1	
5G NR/4G LTE B40	2300 to 2400	>50	0.97	3.80:1	
5G NR/4G LTE B7, 38, 41	2490 to 2690	>55	2.15	3.50:1	

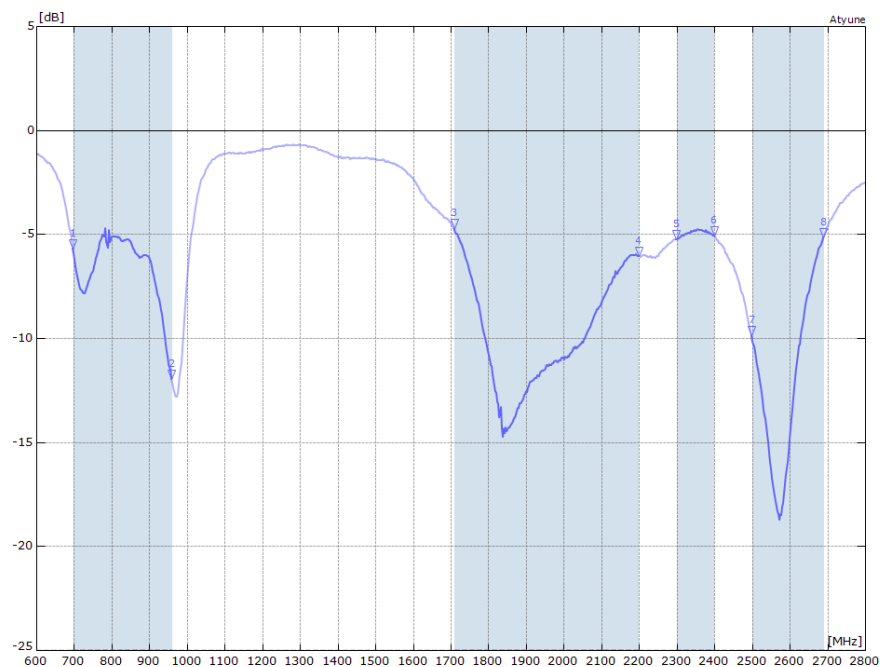
*All performance stated is measured on the SZDV-C-2L23 evaluation kit.

4 Environmental

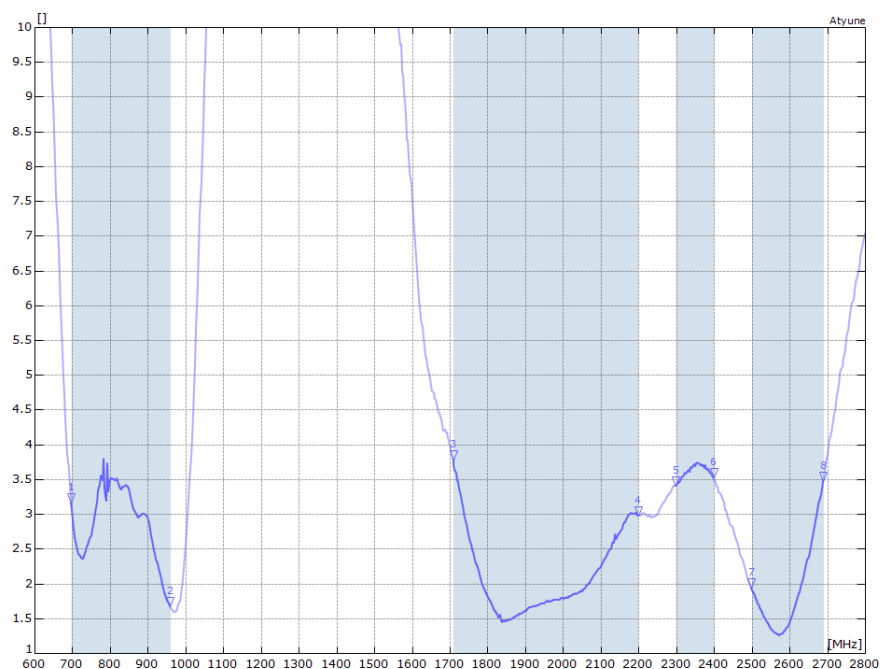
Operational Temperature	-40 to +125°C
Storage Temperature	-10 to +40°C
Relative Humidity (Storage)	65 ±20% RH
Moisture Sensitivity Level (MSL)	1
RoHS and REACH compliant	Yes

5 RF Characteristics

S11 Parameter



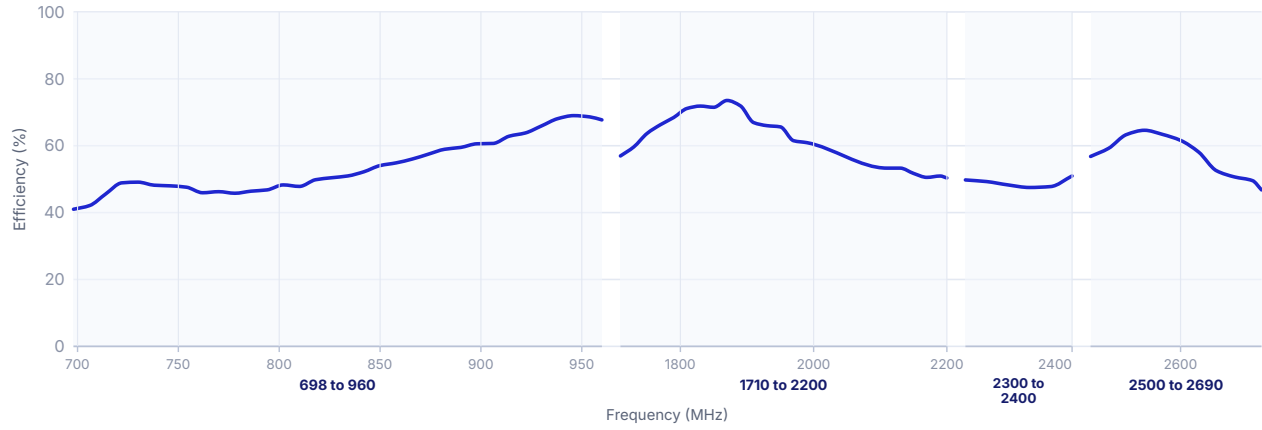
VSWR



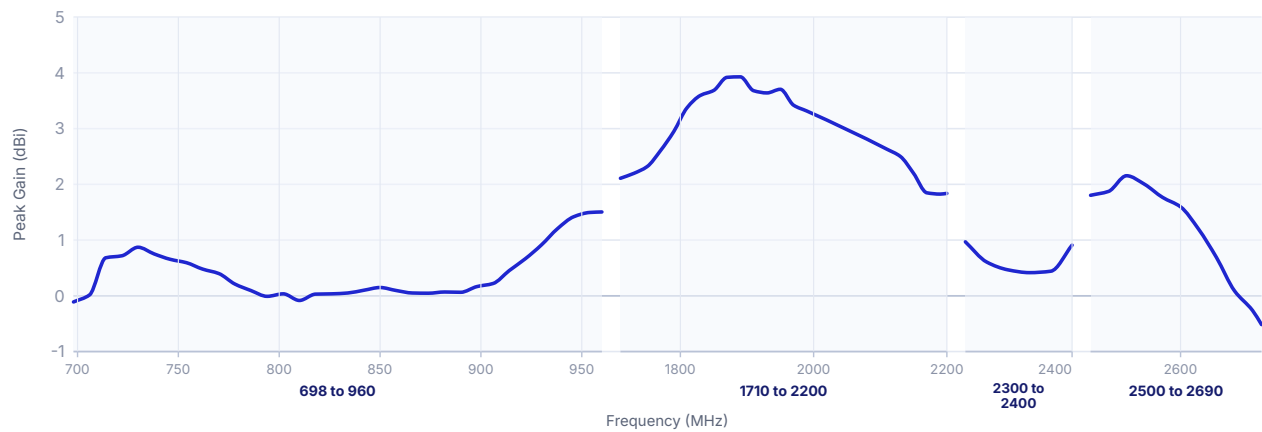
6

Antenna Performance

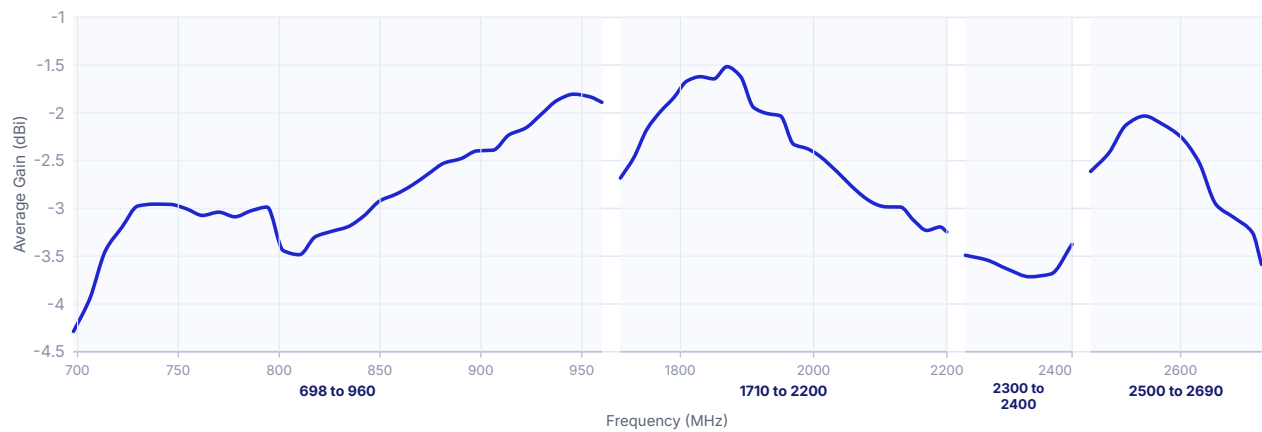
Efficiency



Peak Gain

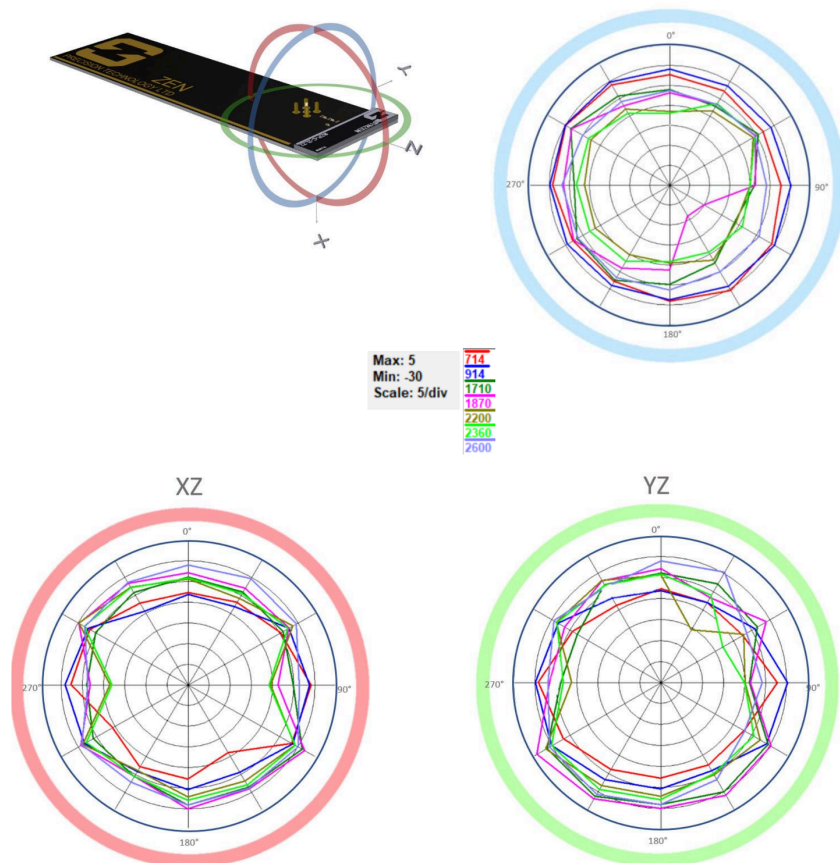


Average Gain



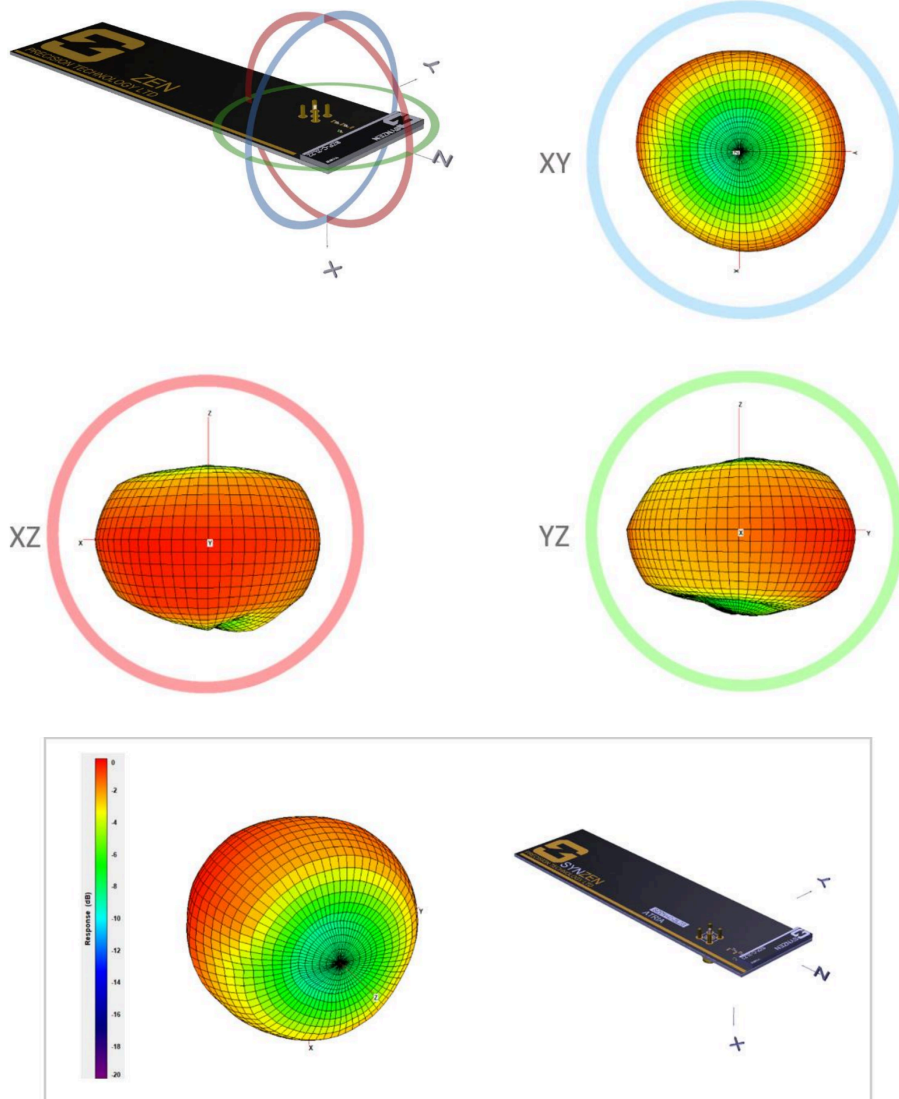
7 2D Polar Plot 698 to 2690 MHz

MEASURED ON SYNZEN EVK (SZDV-C-2L23)



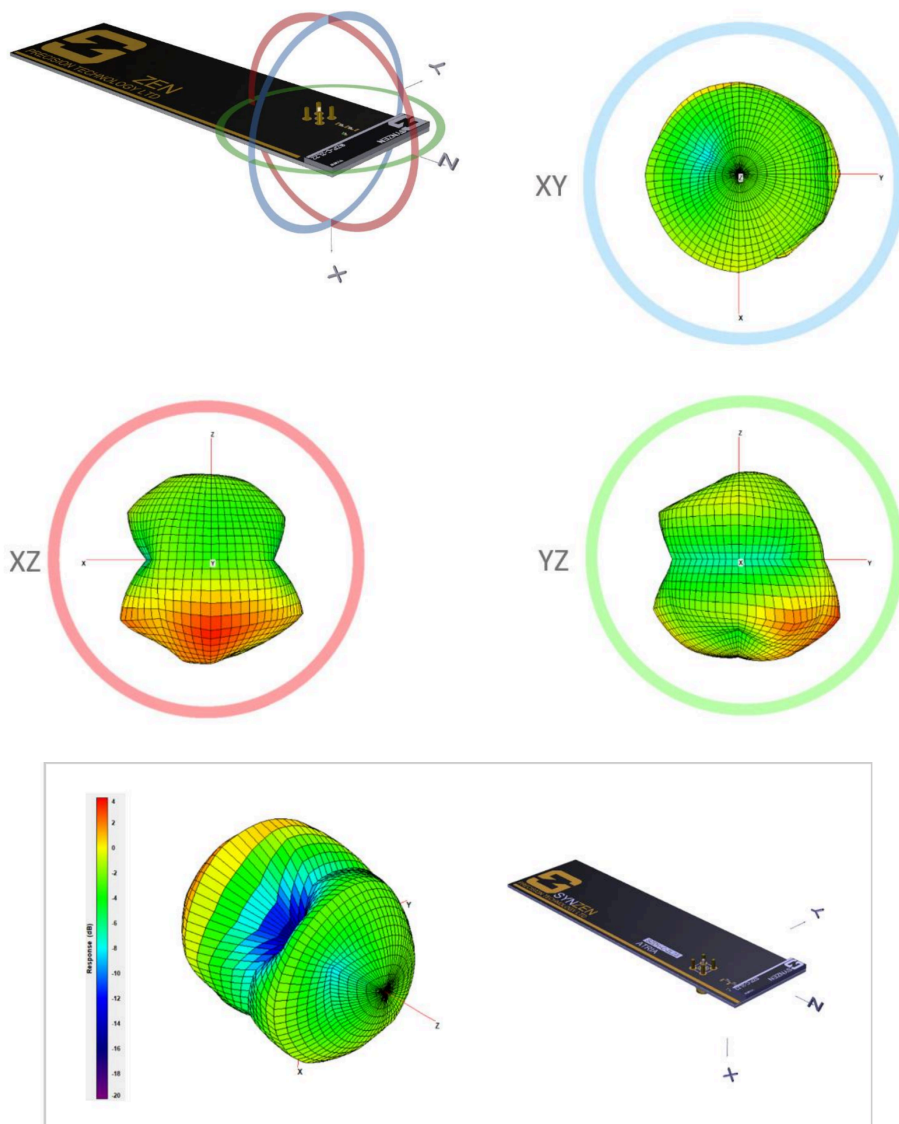
8 3D Radiation Pattern at 880 MHz

MEASURED ON SYNZEN EVK (SZDV-C-2L23), FREQUENCY POINT 880 MHZ



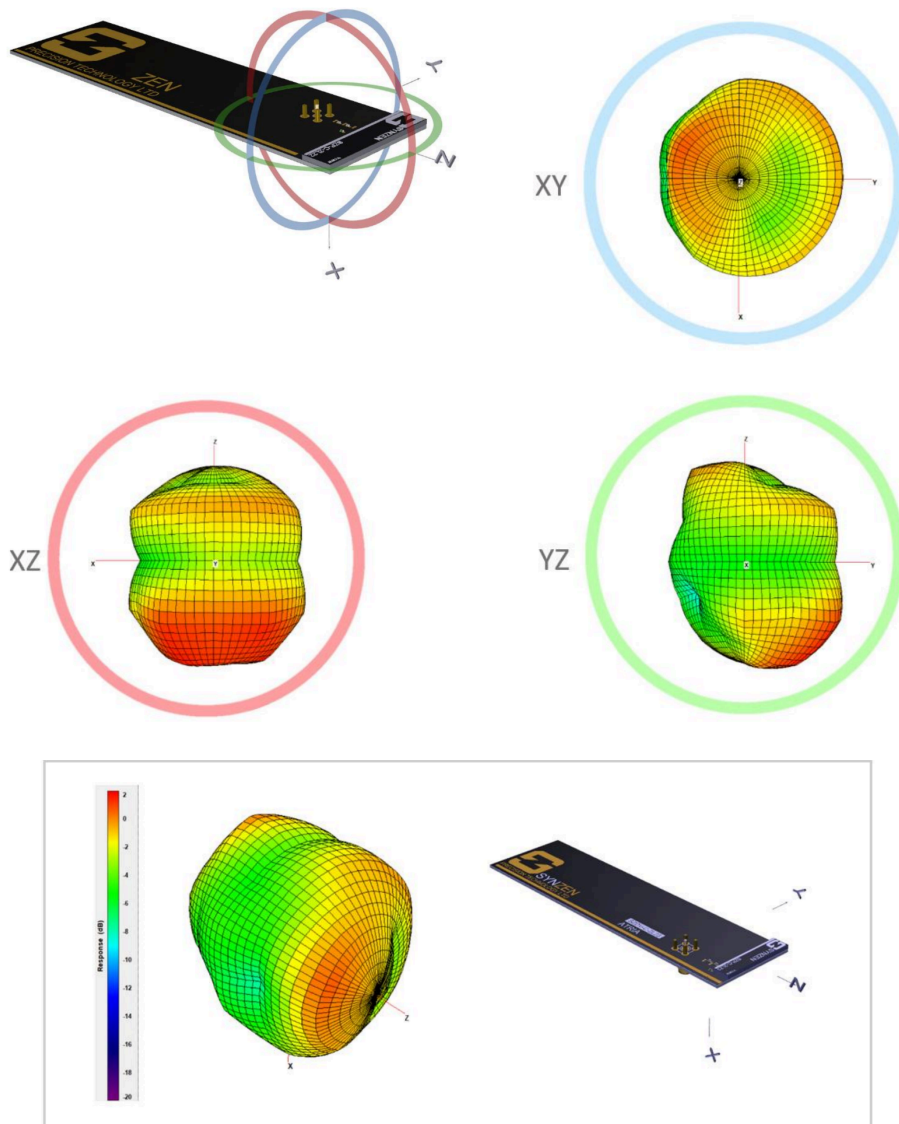
9 3D Radiation Pattern at 1880 MHz

MEASURED ON SYNZEN EVK (SZDV-C-2L23), FREQUENCY POINT 1880 MHZ

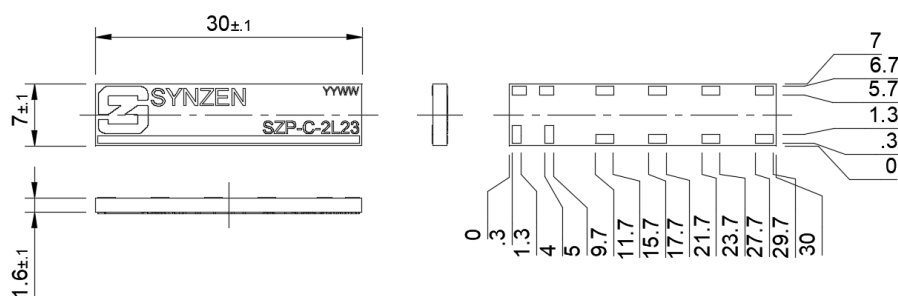


10 3D Radiation Pattern at 2600 MHz

MEASURED ON SYNZEN EVK (SZDV-C-2L23), FREQUENCY POINT 2600 MHZ

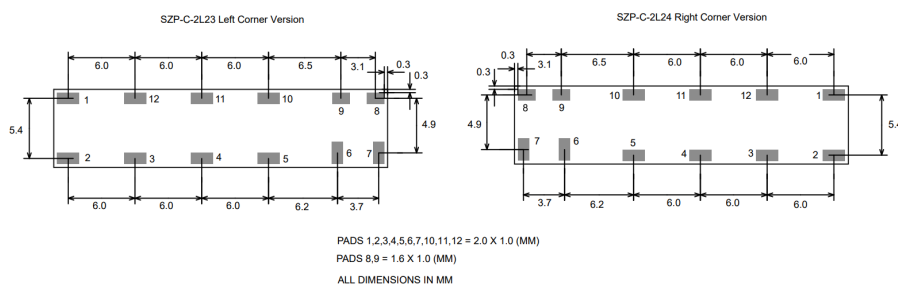


11 Antenna Mechanical Drawing



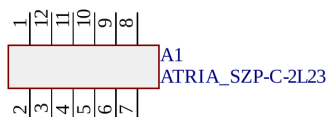
All dimensions in mm

12 Required Host PCB Footprint



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

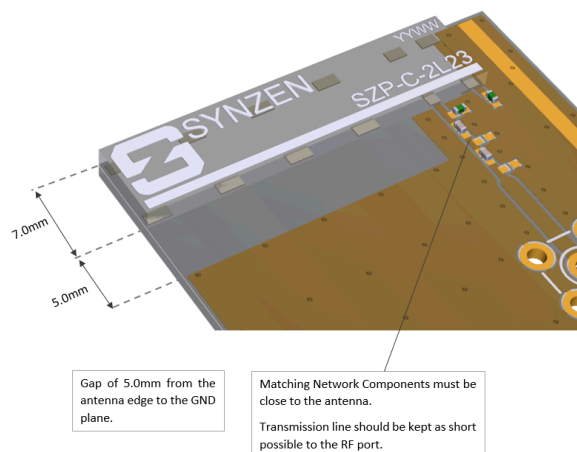
13 Schematic Symbol



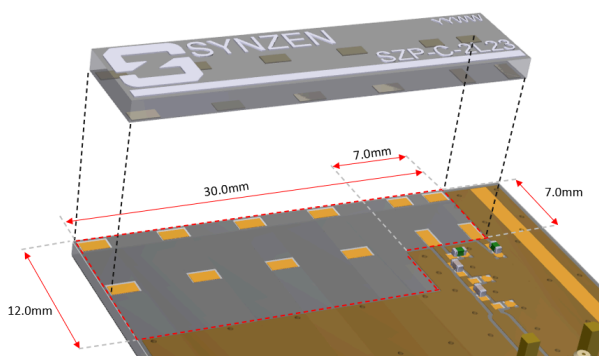
Pin	Description
1, 2, 3, 4, 5, 8, 9, 10, 11, 12	Not connected, for mechanical strength
2	Feed
3	RTN, tuning to GND via inductor

14 Placement

The antenna is designed to function placed at the shortest PCB edge.



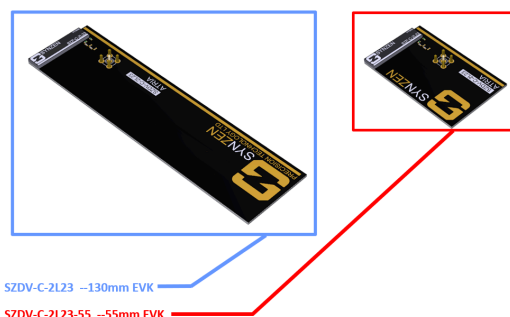
15 Required Clearance



A clearance is required through all PCB layers for the precise area shown. Also, any components such as battery or display must also avoid this area.

16 130 mm and 55 mm Evaluation Kits

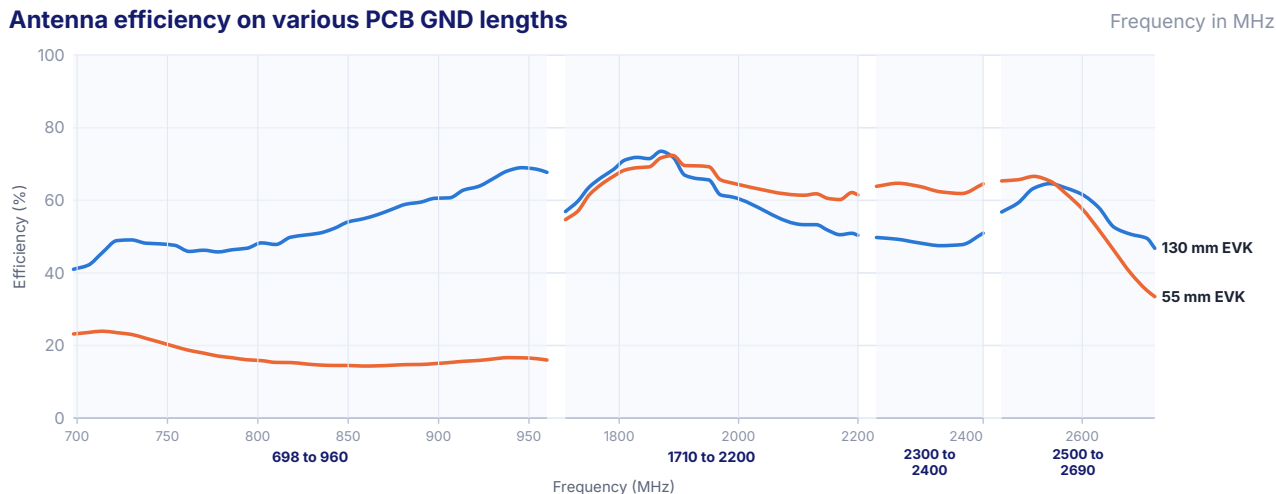
Antenna efficiency comparison for 130 mm and 55 mm EVK versions.



17 Efficiency vs GND Length

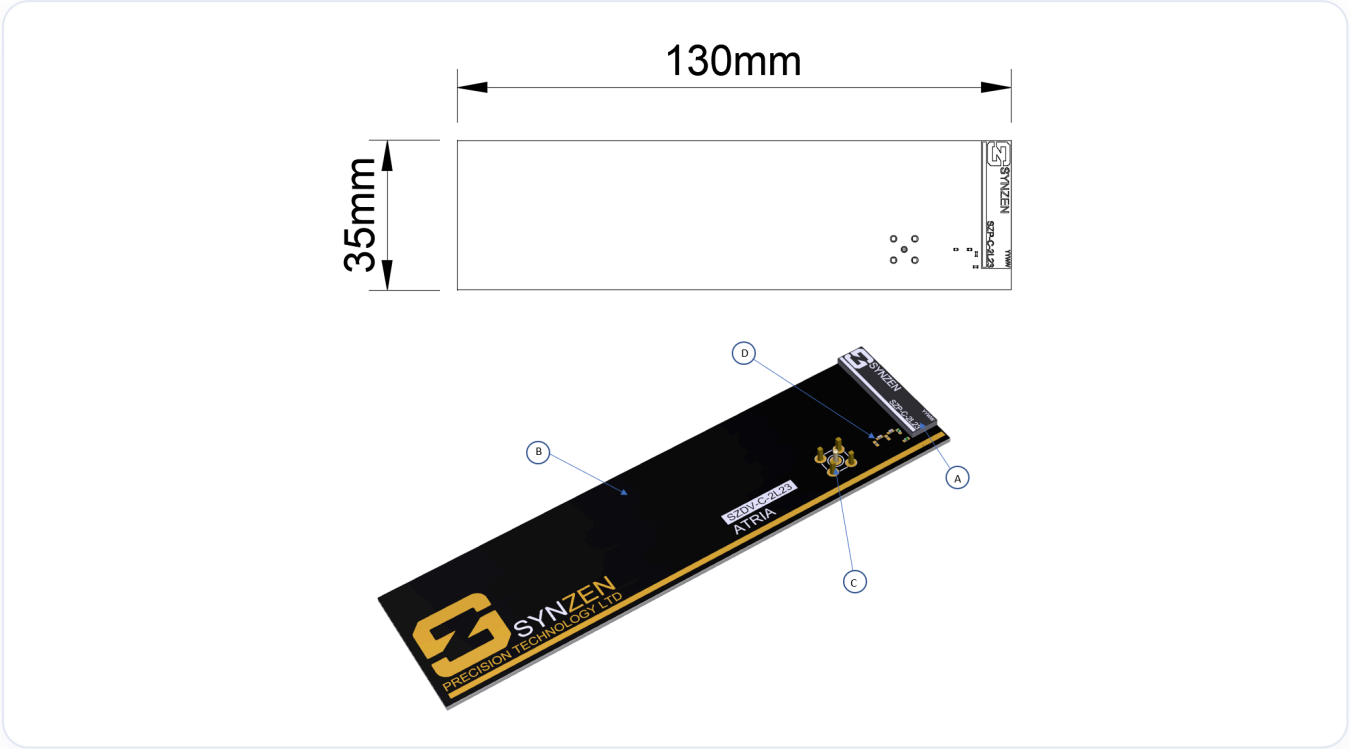
— 130 mm EVK — 55 mm EVK

Antenna efficiency on various PCB GND lengths



18 **SZDV-C-2L23 Evaluation Kit**

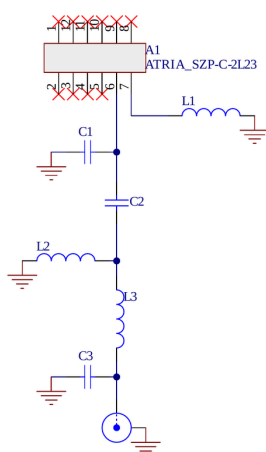
The SZDV-C-2L23 evaluation kit is a PCBA with the antenna (SZP-C-2L23) fitted and optimized with a matching network. Connection to the antenna is made using the fitted female SMA connector.



Item	Description
A	SZP-C-2L23 (Antenna)
B	Host PCB
C	SMA Connector
D	Matching Circuit

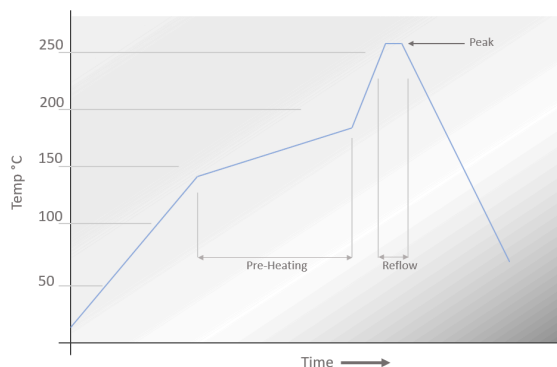
19 Evaluation Kit Matching Circuit

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 for more information.



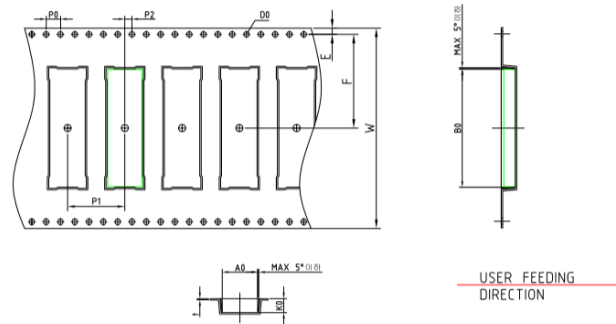
Designator	Component Type	Value	Size	Manufacturing Part No.
A1	Antenna	ATRIA		SZP-C-2L23
L3	Inductor	3.6 nH	0402	LQG15HN3N6S02D
L2	Inductor	22 nH	0402	LQG15HS22NJ02D
C2	Capacitor	1.8 pF	0402	GJM1555C1H1R8BB01D
L1	Inductor	5.1 nH	0402	LQG15HS5N1S02D
C1, C3	NA	DNP	0402	Not Fitted
J1	SMA Connector			ACE solution A3SAFTST135

20 Reflow Profile

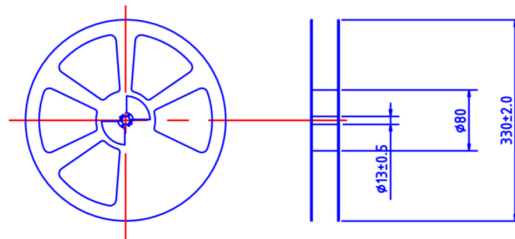


Stage	Temperature	Time
Pre-Heating	130 to 180°C	50 to 190 seconds
Reflow	>220°C	50 to 160 seconds
Peak Temperature	260°C	15 to 45 seconds

21 Tape and Reel



1. 10 sprocket hole pitch cumulative tolerance ± 0.2
2. Camber not to exceed 1mm in 100mm.
3. A0 and B0 measured on a plane 0.1mm above the bottom of the pocket
4. K0 measured from a plane on the inside bottom of the pocket to the top surface of the carrier.



Anti-static Reel	Type	Color	Size	Hub
Reel dimension	PS	Black	Ø330	Ø80

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.

Synzen Precision Technology Ltd 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. Synzen reserves all rights to this document and the information contained herein. Reproduction, use or disclosure to third parties without express permission is strictly prohibited.