4G LTE/NB IoT Low-Profile Surface Mount Antenna SZP-C-2L23/24

4G LTE/3G:

698-960; 1427-1518; 1710-2200; 2300-2400; 2500-2690MHz

Description

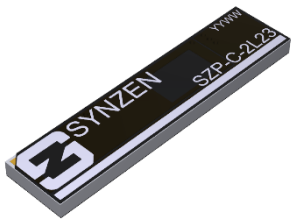
ATRIA, for the ultimate compact and low-profile 4G LTE solution, ATRIA was developed to be compact but still cover bands from **698-2690MHz**. With a small footprint of 30.0 x 7.0 (mm). With a fall back to 3G/2G.

Typical applications include:

- For 4G LTE/NB-IoT/3G Cellular Applications
- Ideal for MIMO 4G LTE systems
- Small form factor of 30.0 x 7.0 x 1.6 (mm).
- Minimal clearance of 30.0 x 12.0 (mm)
- Left and Right corner mount versions

Typical Applications

Telematics	Pico base stations	MIMO Routers
Smart Metering	Connected Health	Payment Terminals



General Specifications

Mechanical Specifications

Part Number	SZP-C-2L23 / SZP-C-2L24
Name	**ATRIA**
Dimensions	30.0 x 7.0 x 1.6 (mm)
Required Clearance area	30.0 x 12.0 (mm)
Weight	<1g
Antenna Type	Surface Mount Device

RF Specifications*

Band	Frequency Range (MHz)	Avg Efficiency (%)	Peak Gain (dBi)	Impedance	Polarization
5GNR/4G LTE B5,8,12,13,14,17,18,20,26,27,28,29	698-960	>50	1.50	50Ω	Linear
5GNR/4G LTE B1,2,3,4,9,23,35,39,66	1710-2200	>60	3.71		
5GNR/4G LTE B40	2300-2400	>50	0.97		
5GNR/4G LTE B7,38,41	2490-2690	>55	2.15		

*All performance stated is measured of SZDV-C-2L23 evaluation kit with 130 x 35 (mm) GND.

Environmental Specifications

Operational Temperature	-40 to +125 (°C)
Storage Temperature	-10 to +40 (°C)
Relative Humidity	≤75%
Moisture Sensitivity Level (MSL)	1
RoHs & REACH compliant	Yes

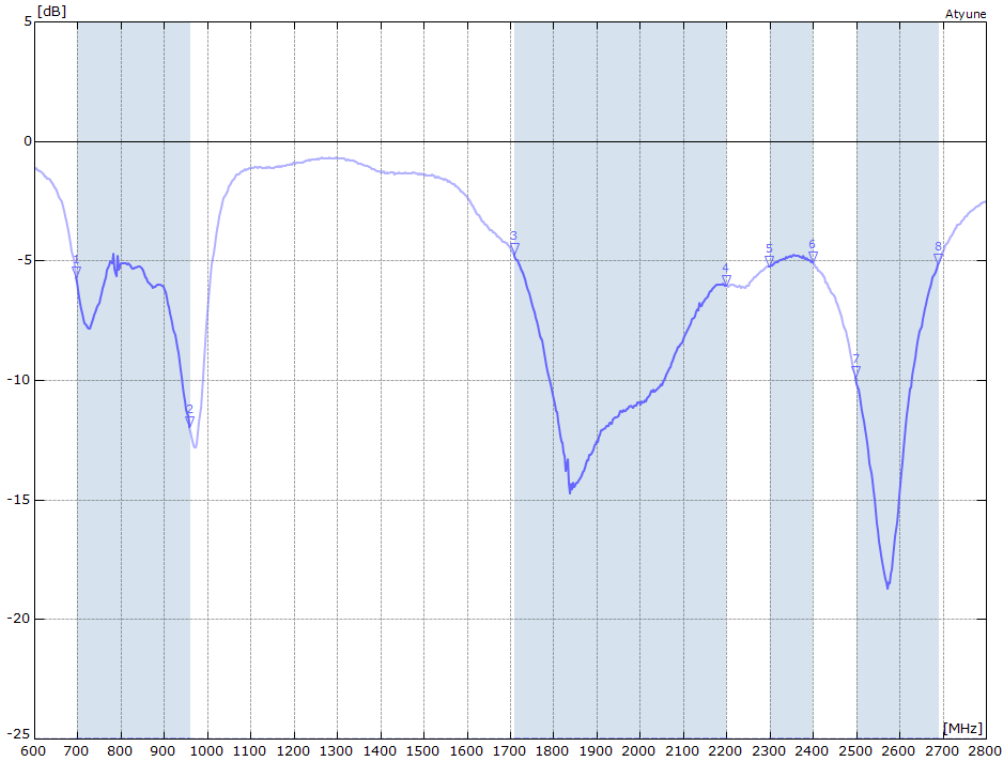
Bands

Supported Band List

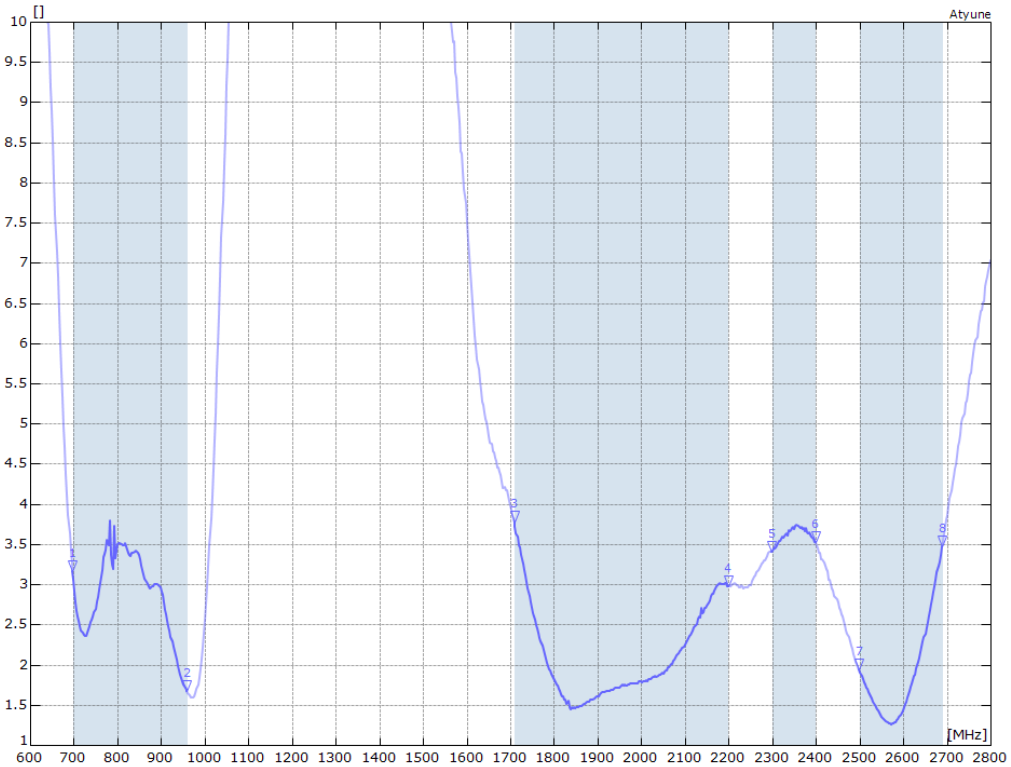
LTE Band	Frequency Band	Uplink (MHz)	Downlink (MHz)	Supported
1	2100	1920 – 1980	2110 – 2170	YES
2	1900	1850 – 1910	1930 – 1990	YES
3	1800	1710 – 1785	1805 – 1880	YES
4	1700	1710 – 1755	2110 – 2155	YES
5	850	824 – 849	869 – 894	YES
7	2600	2500 – 2570	2620 – 2690	YES
8	900	880 – 915	925 – 960	YES
10	1700	1710 – 1770	2110 – 2170	YES
11	1500	1427.9 – 1447.9	1475.9 – 1495.9	NO
12	700	699 – 716	729 – 746	YES
13	700	777 – 787	746 – 756	YES
14	700	788 – 798	758 – 768	YES
17	700	704 – 716	734 – 746	YES
18	850	815 – 830	860 – 875	YES
19	850	830 – 845	875 – 890	YES
20	800	832 – 862	791 – 821	YES
21	1500	1447.9 – 1462.9	1495.9 – 1510.9	NO
22	3500	3410 – 3490	3510 – 3590	NO
24	1600	1626.5 – 1660.5	1525 – 1559	NO
25	1900	1850 – 1915	1930 – 1995	YES
26	850	814 – 849	859 – 894	YES
27	800	807 – 824	852 – 869	YES
28	700	703 – 748	758 – 803	YES
29	700	*N/A*	717 – 728	YES
30	2300	2305 – 2315	2350 – 2360	YES
31		452.5 – 457.5	462.5 – 467.5	NO
32	1500	*N/A*	1452 – 1496	NO
33	2100	1900 – 1920		YES
34	2100	2010 – 2025		YES
35	1900	1850 – 1910		YES
36	1900	1930 – 1990		YES
37		1910 – 1930		YES
38	2600	2570 – 2620		YES
39	1900	1880 – 1920		YES
40	2300	2300 – 2400		YES
41	2500	2496 – 2690		YES
42	3500	3400 – 3600		NO
43	3700	3600 – 3800		NO
44	700	703 – 803		YES
45	1500	1447 – 1467		NO
46	5200	5150 – 5925		NO
47	5900	5855 – 5925		NO
48	3600	3550 – 3700		NO
50	1500	1432 – 1517		NO
51	1500	1427 – 1432		NO
65	2100	1920 – 2010	2110 – 2200	YES
66	1700	1710 – 1780	2110 – 2200[2]	YES
67	700	N/A	738 – 758	YES
68	700	698 – 728	753 – 783	YES
69	2600	N/A	2570 – 2620	YES
70	2000	1695 – 1710	1995 – 2020	NO

RF Characteristics

S11 Parameter

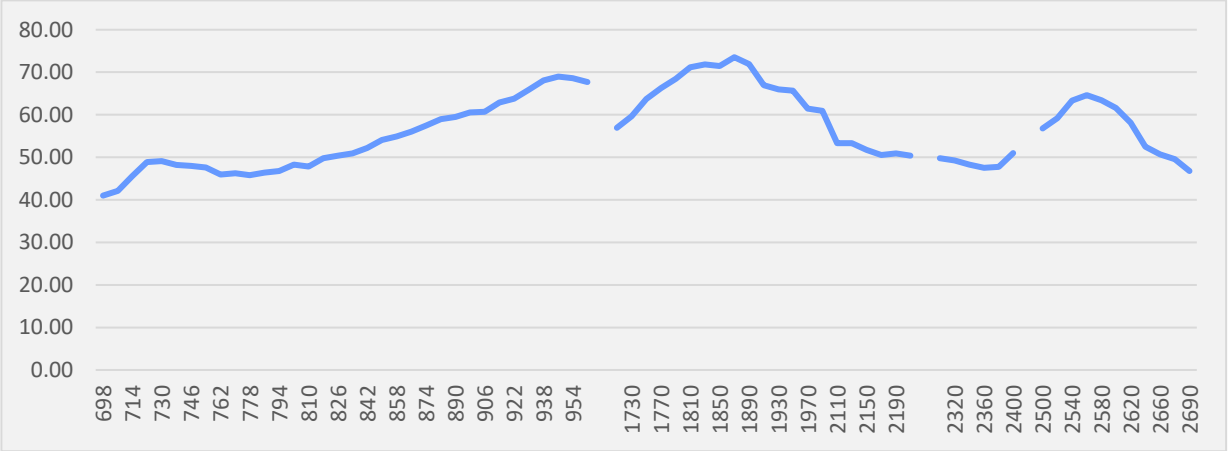


VSWR

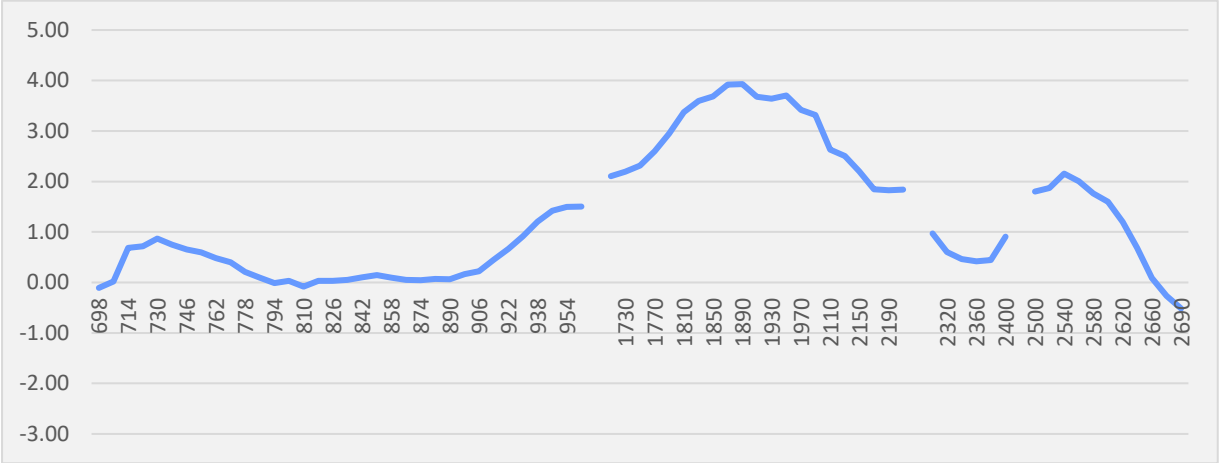


Antenna Performance

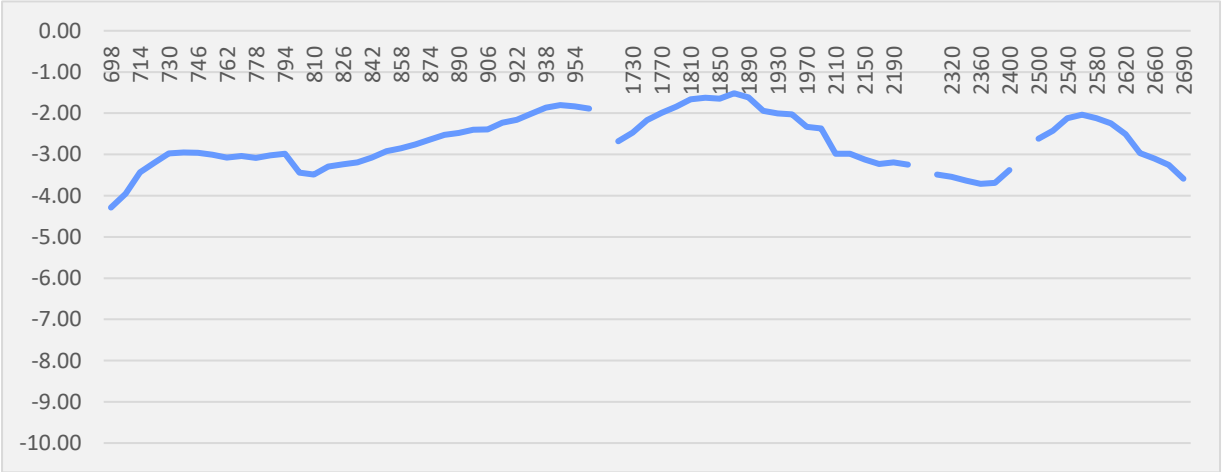
Efficiency



Peak Gain



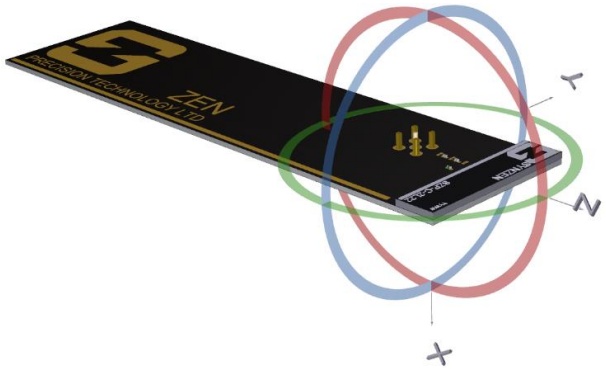
Average Gain



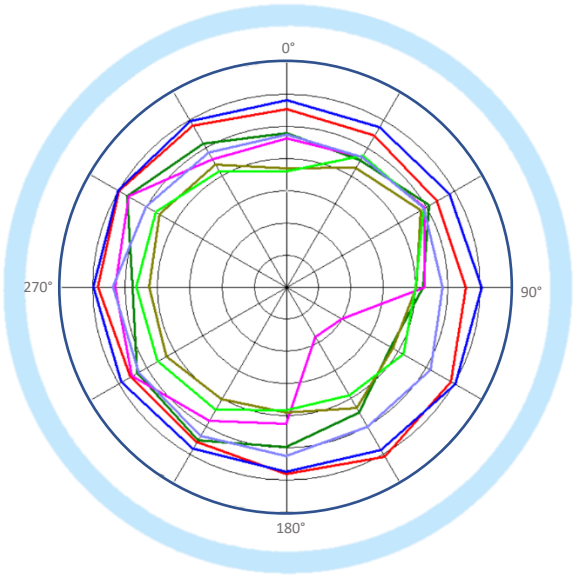
Radiated Performance

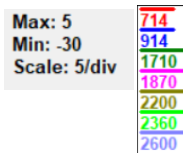
2D Polar Plot 698-2690

The data shown was measured on Synzen EVK (SZDV-C-2L23)

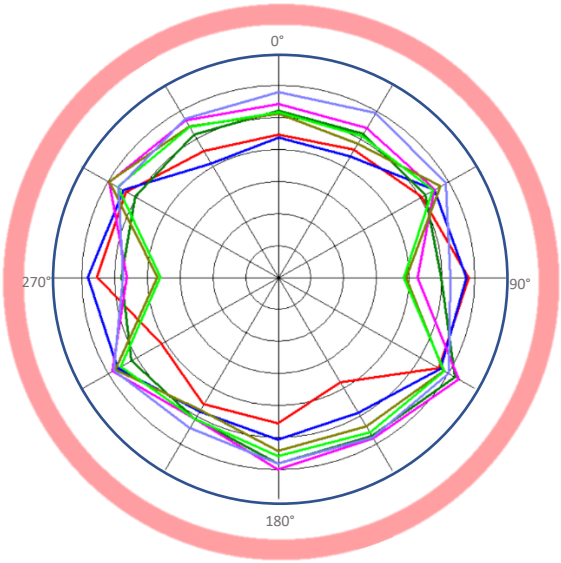


XY

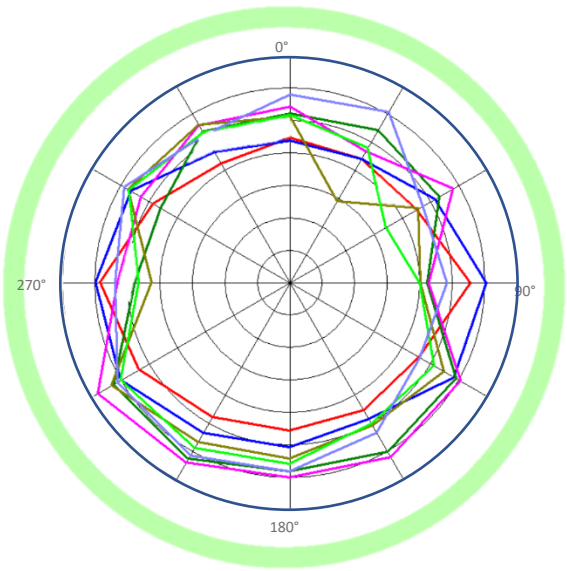




XZ



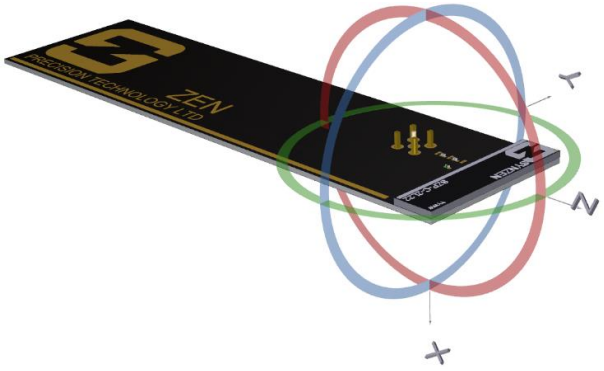
YZ



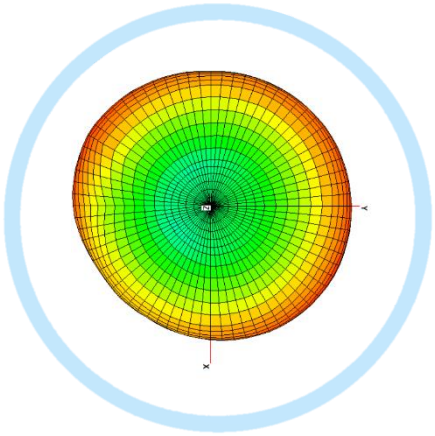
Radiated Performance

3D Radiation Pattern at 880MHz

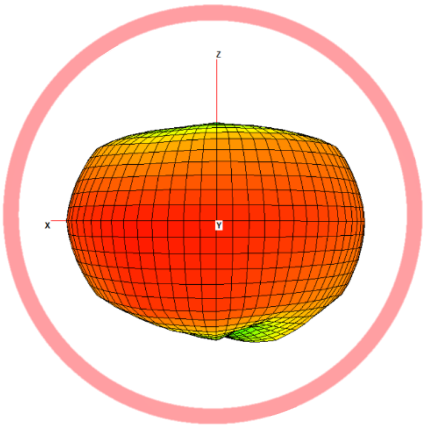
The data shown was measured on Synzen EVK (SZDV-C-2L23). The frequency point shown here is 880MHz.



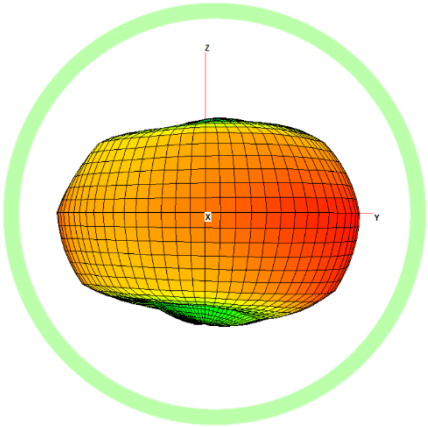
XY

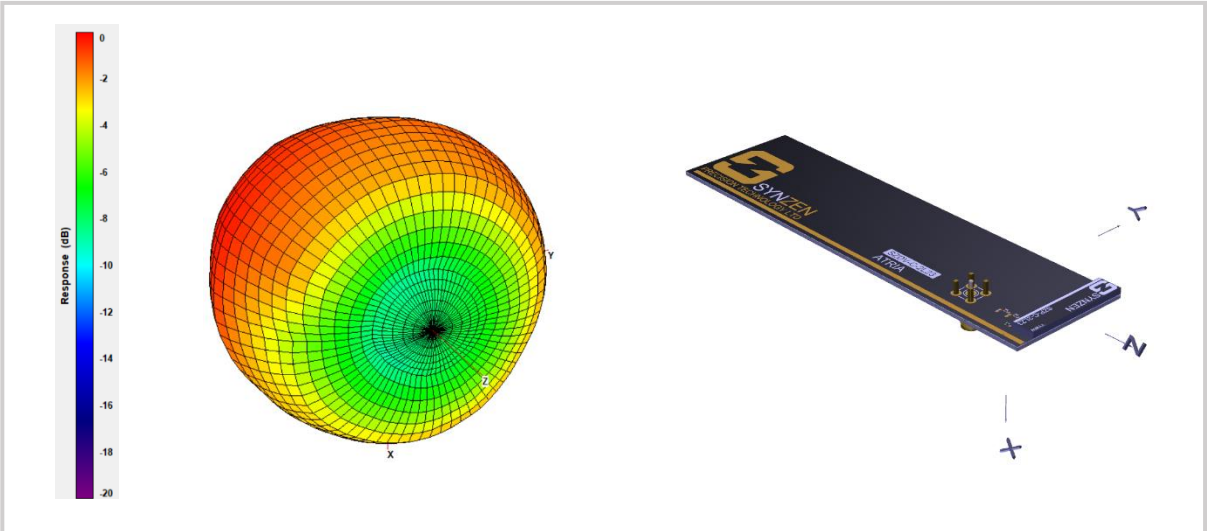


XZ



YZ

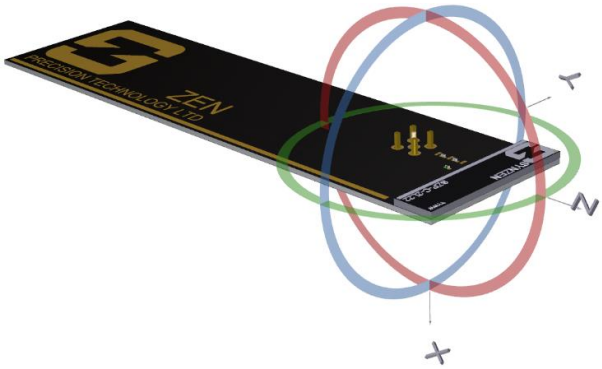


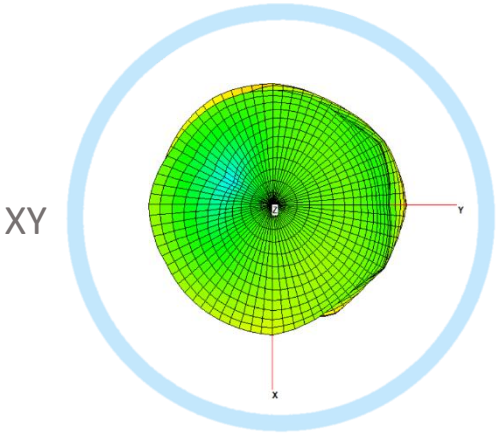


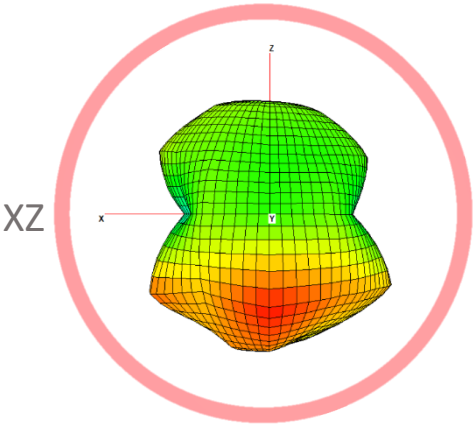
Radiated Performance

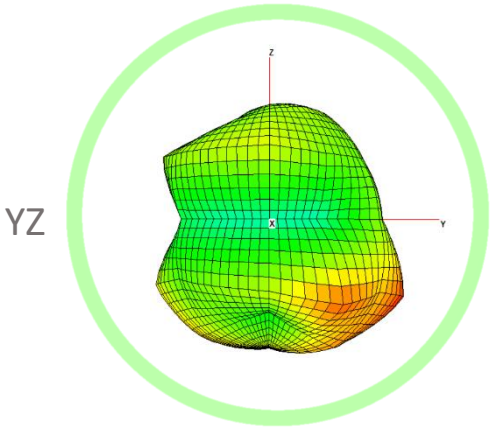
3D Radiation Pattern at 1880MHz

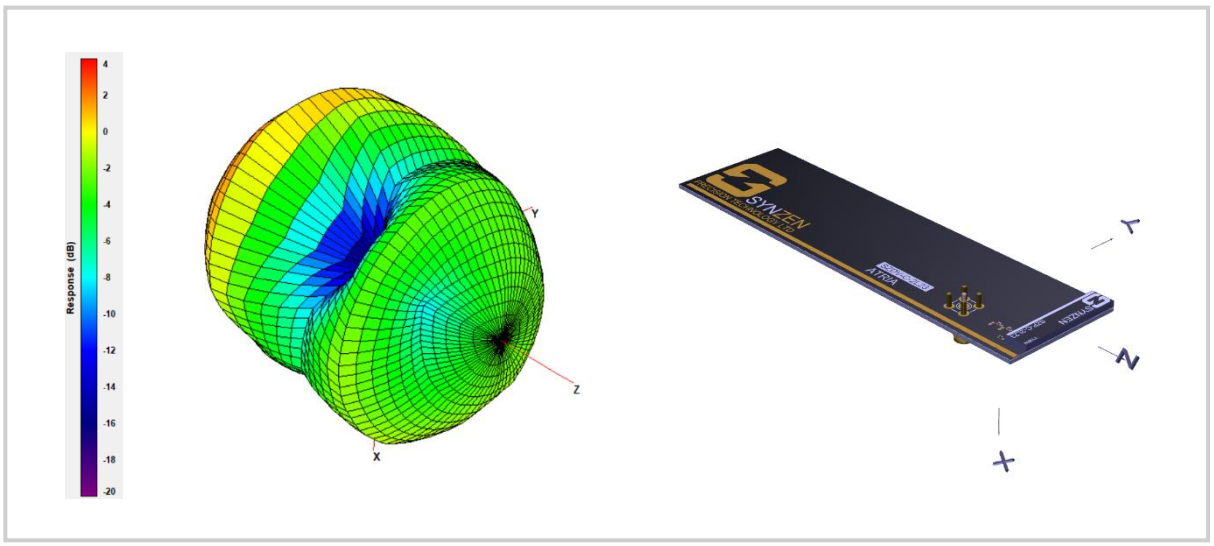
The data shown was measured on Synzen EVK (SZDV-C-2L23). The frequency point shown here is 1880MHz.







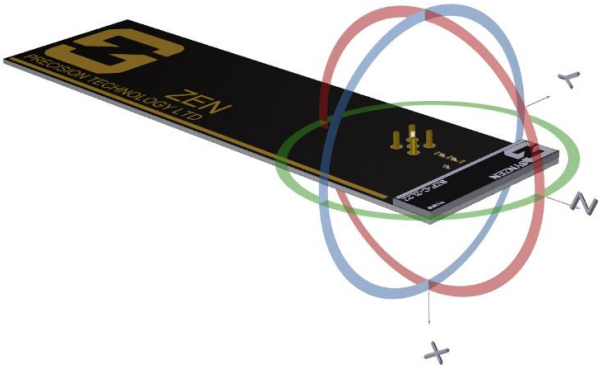


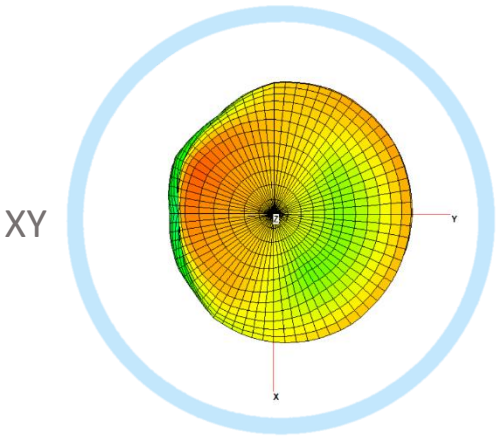


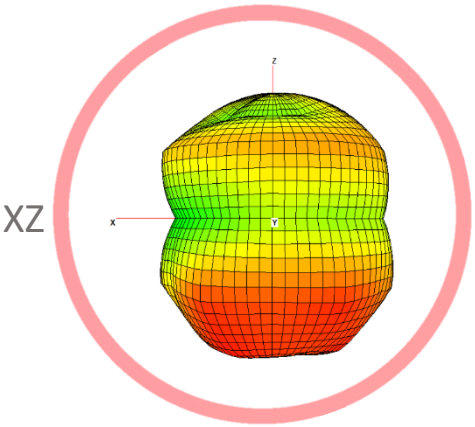
Radiated Performance

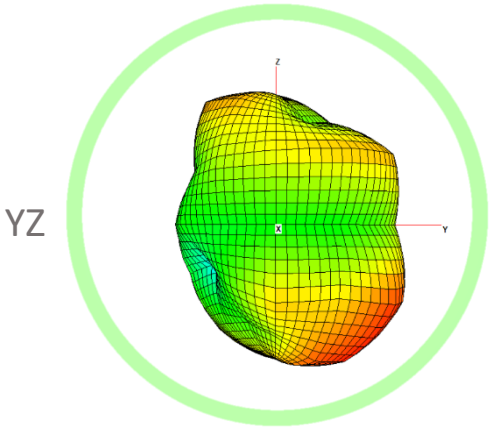
3D Radiation Pattern at 2600MHz

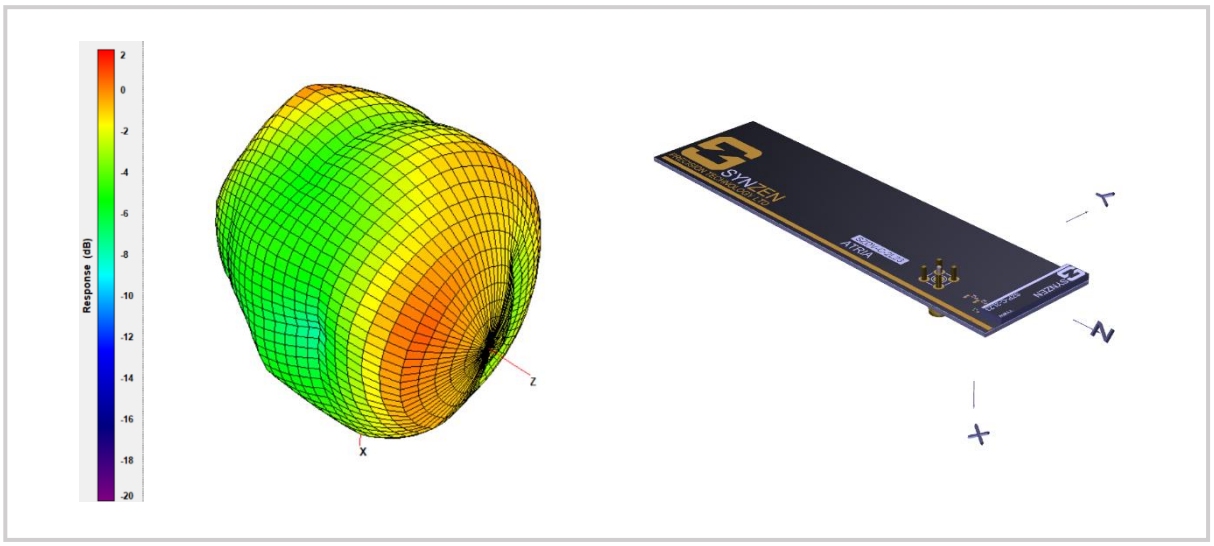
The data shown was measured on Synzen EVK (SZDV-C-2L23). The frequency point shown here is 2600MHz.





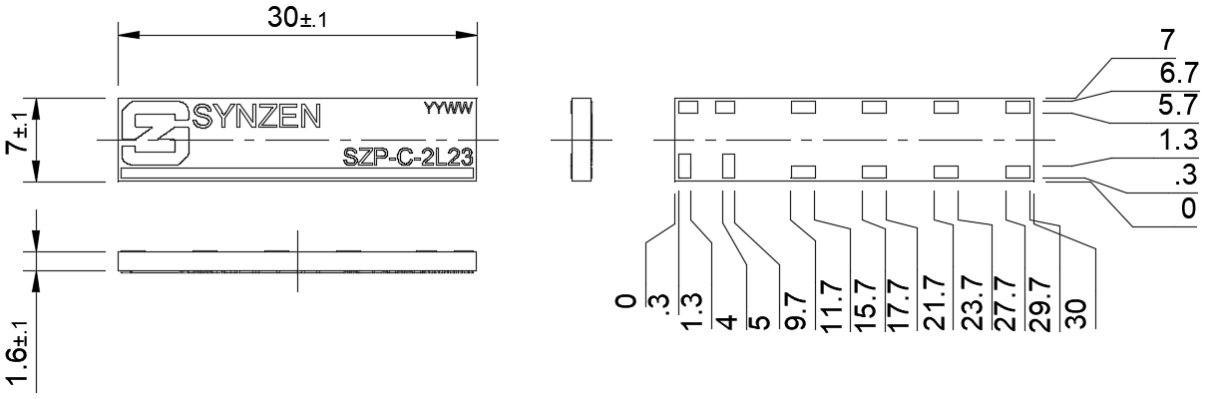






Mechanical

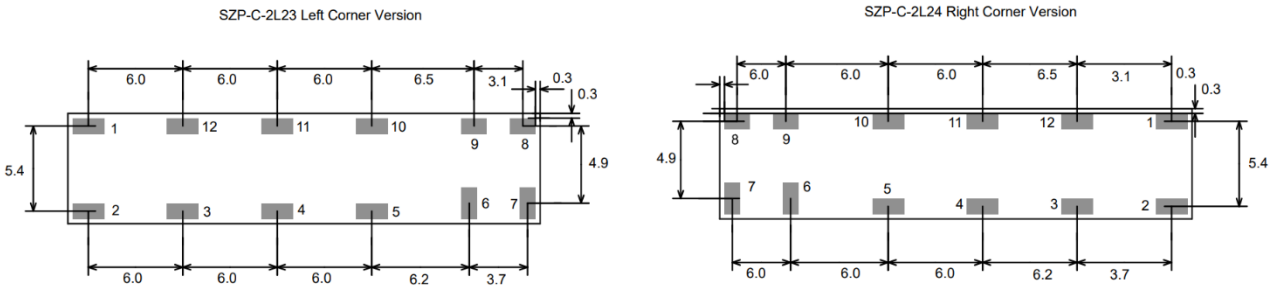
Antenna Mechanical Drawing



All dimensions in mm

Required Host PCB Footprint

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

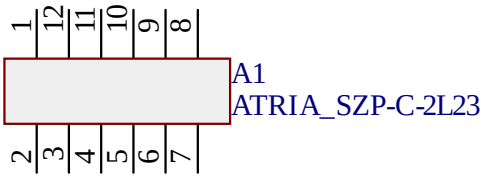


PADS 1,2,3,4,5,6,7,10,11,12 = 2.0 X 1.0 (MM)
PADS 8,9 = 1.6 X 1.0 (MM)
ALL DIMENSIONS IN MM

Antenna Pinout

SZP-C-2L23 Schematic Symbol

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

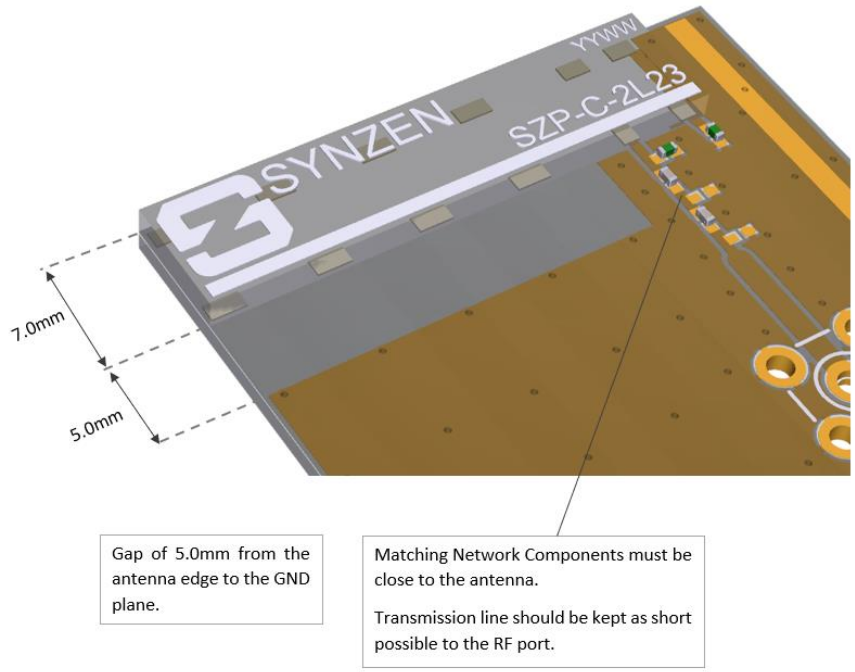


Pin	Description
1,2,3,4,5,8,9,10,11,12	Not Connected for mechanical strength only
6	RF Feed
7	RTN – Tuning to GND via component

PCB Layout Requirements

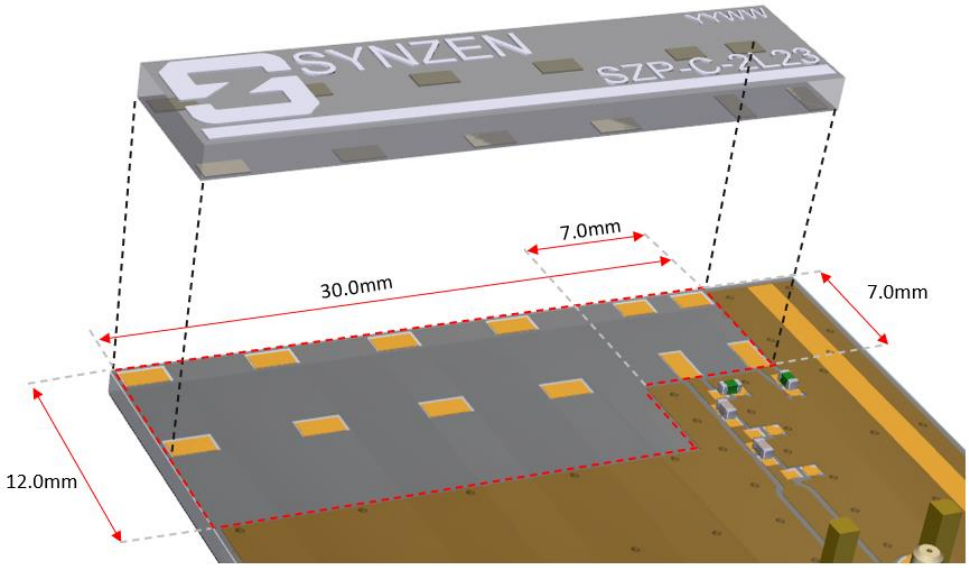
Placement

The antenna is designed to function placed at the shortest edge to utilise the PCB length for optimal low band performance.



Required Clearance

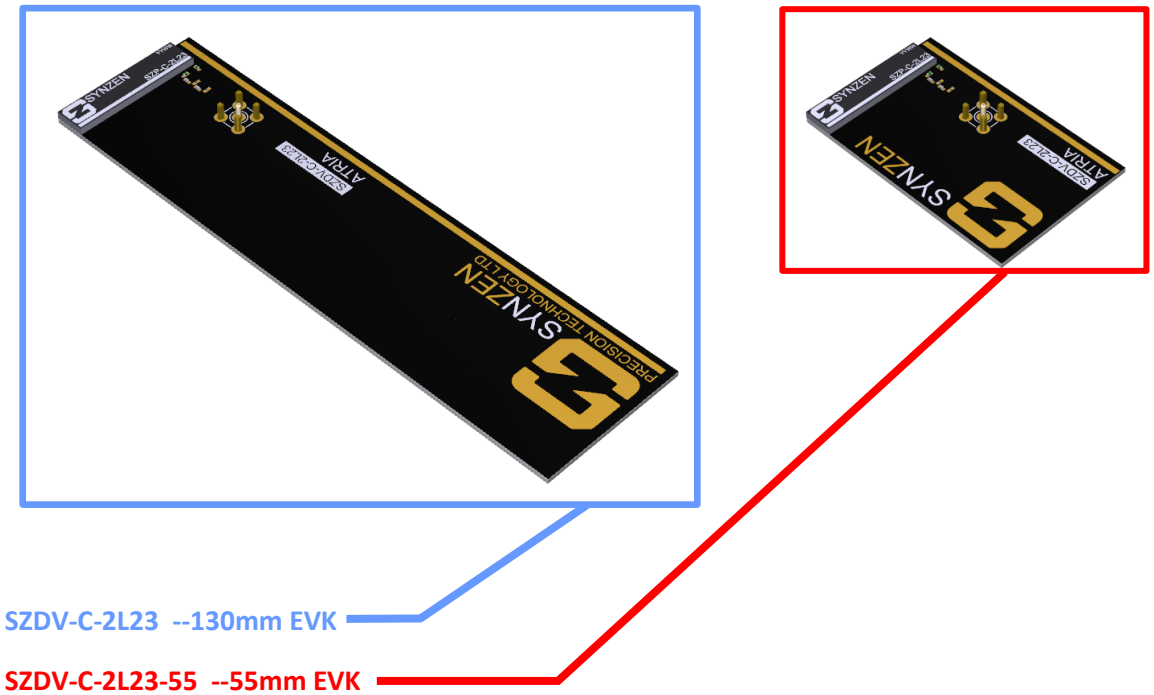
Clearance is required through all PCB layers as shown.

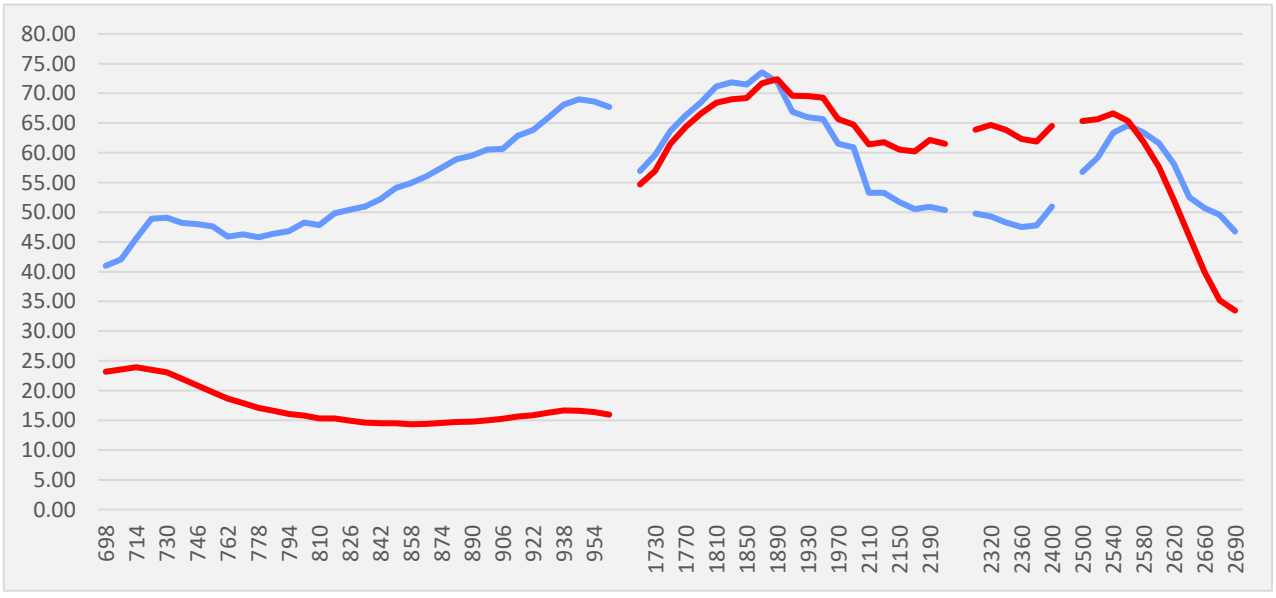


Efficiency Vs. GND Length

Antenna Efficiency

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

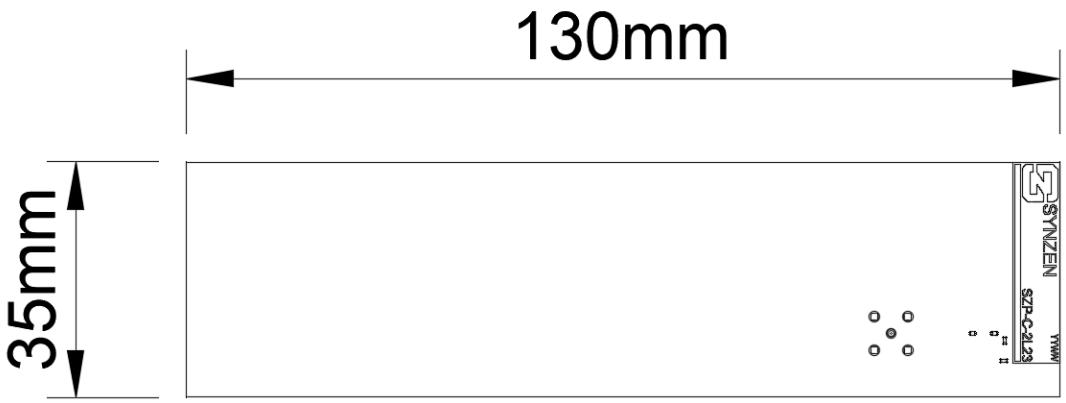


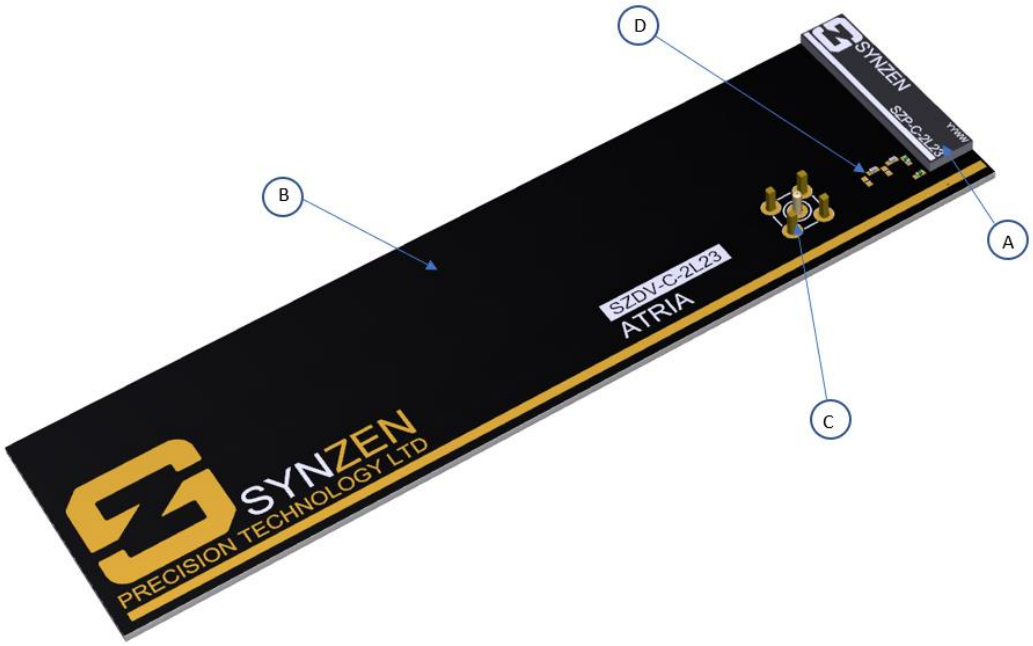


Evaluation Kit

SZDV-C-2L23 Evaluation Kit

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



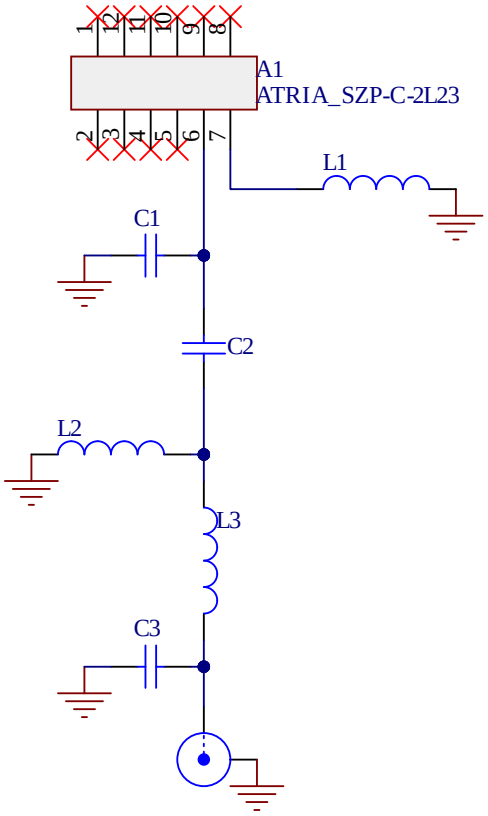


A	SZP-C-2L23 (Antenna)
B	Host PCB
C	SMA Connector
D	Matching Circuit

Evaluation Kit Schematic

Evaluation Kit Matching Circuit

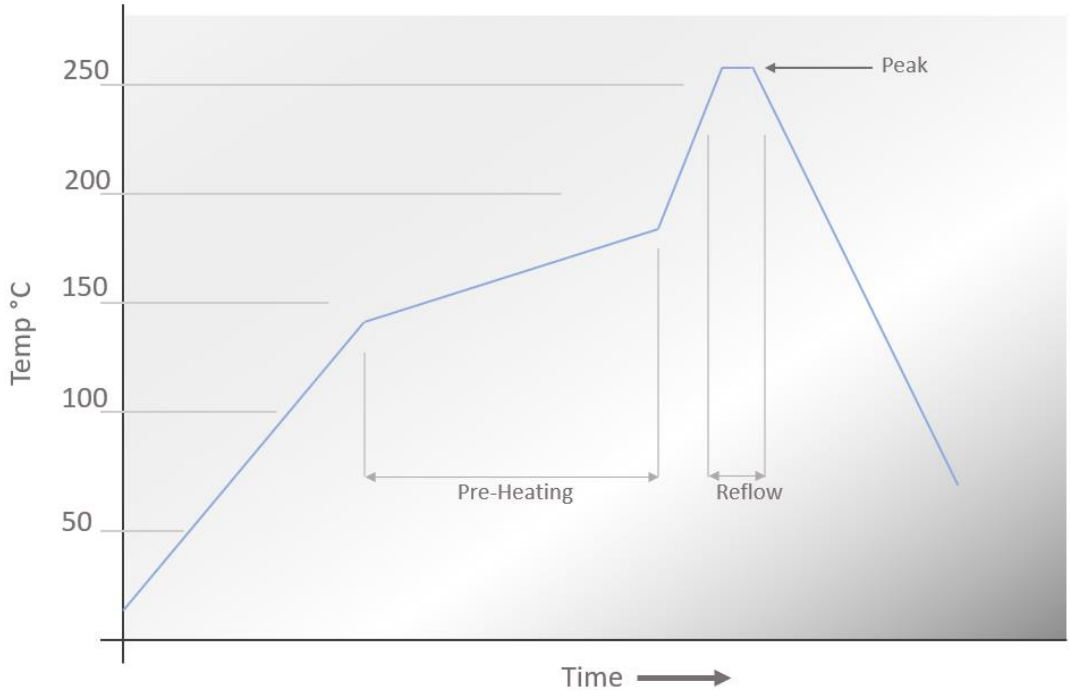
The circuit of the EVK kit along with the BOM is shown below. The matching network topology should be used on the device host PCB although the matching values will be dependent on the host PCB and device environment. Synzen provide a matching service to optimise your device to ensure the best performance,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



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

Soldering

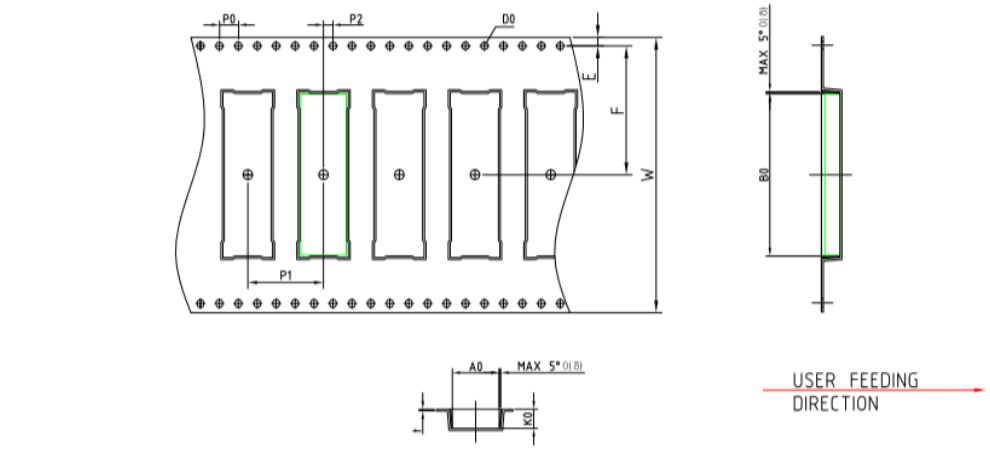
Reflow Profile



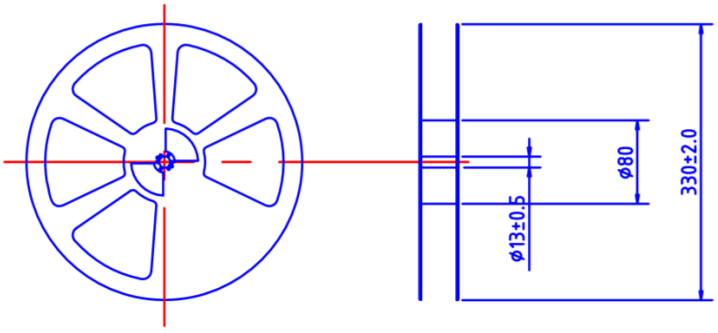
Pre-Heating	130 - 180°C	50 to 190 seconds
Reflow	>220 °C	50 to 160 seconds
Peak Temperature	260 °C	15 to 45 seconds

Packaging

Tape and Reel



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



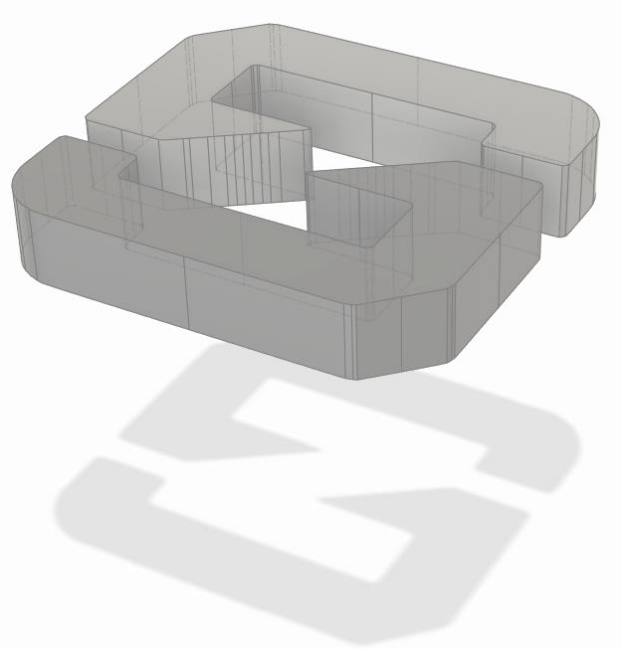
ANTI-STATIC

REEL DIMENSION	Type	Color	Size	Hub
	PS	Black	ø330	ø80

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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