



5G / LTE SMD

ALCOR

5G Low-Profile Surface Mount Antenna

SZP-C-2L22

FREQUENCY
617 to 6000 MHz

PEAK GAIN
Up to 5.22 dBi

MOUNTING
SMD

SIZE
40 × 10 × 1.6 mm

LOW BAND	617 to 960 MHz	Covers B5, B8, B12, B13, B14, B17, B18, B20, B26, B27, B28, B29, B71
L BAND	1427 to 1518 MHz	Covers B21, B32, B74, B75, B76
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
HIGH BAND	3300 to 4200 MHz	Covers B48, B77, B78
ULTRA HIGH	4400 to 6000 MHz	Covers B79, B46, B47

1 Introduction

ALCOR, for the ultimate compact and low-profile 5G solution, ALCOR was developed to be compact but still cover bands from 617 to 6000 MHz. With a small footprint of 40 × 10 mm. With a fall back to 4G/3G/2G.

— Features

- ◆ For 5G/4G Cellular Applications
- ◆ Ideal for MIMO 5G systems
- ◆ Small form factor of 40.0 × 10.0 × 1.6 mm
- ◆ Minimal clearance of 40.0 × 13.5 mm

— Applications

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

2 Mechanical Specifications

Part Number	SZP-C-2L22
Name	ALCOR
Dimensions (mm)	40.0 × 10.0 × 1.6
Required Clearance Area (mm)	40.0 × 13.5
Weight	<2 g
Antenna Type	Surface Mount Device

3 Electrical / RF Specifications

Band	Frequency Range (MHz)	Avg Efficiency (%)	Peak Gain (dBi)	Impedance	Polarization
5G NR/4G LTE B5, 8, 12, 13, 14, 17, 18, 20, 26, 27, 28, 29, 71	617 to 960	>55	2.05	50 Ω	Linear
5G NR/4G LTE B21, 32, 74, 75, 76	1427 to 1518	>40	0.00		
5G NR/4G LTE B1, 2, 3, 4, 9, 23, 35, 39, 66	1710 to 2200	>65	3.49		
5G NR/4G LTE B40	2300 to 2400	>60	3.77		
5G NR/4G LTE B7, 38, 41	2490 to 2690	>55	3.99		
5G NR/4G LTE B48, 77, 78	3300 to 4200	>50	5.22		
5G NR/4G LTE B79	4400 to 5000	>45	3.26		
5G NR/4G LTE B46, 47	5000 to 6000	>40	1.70		

*All performance stated is measured on the SZDV-C-2L22 evaluation kit with 145 × 40 mm GND.

4 Environmental

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

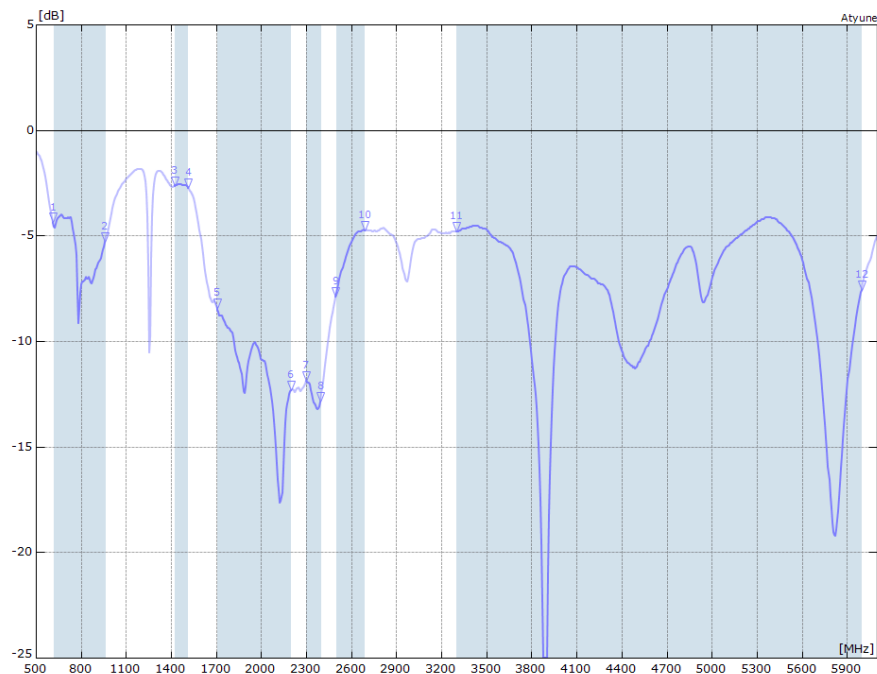
5 5G NR / 4G LTE Supported Band List

Band	Freq. Band (MHz)	Uplink (MHz)	Downlink (MHz)	Supported
1	2100	1920 to 1980	2110 to 2170	YES
2	1900	1850 to 1910	1930 to 1990	YES
3	1800	1710 to 1785	1805 to 1880	YES
4	1700	1710 to 1755	2110 to 2155	YES
5	850	824 to 849	869 to 894	YES
7	2600	2500 to 2570	2620 to 2690	YES
8	900	880 to 915	925 to 960	YES
9		1749.9 to 1784.9	1844.9 to 1879.9	YES
10	1700	1710 to 1770	2110 to 2170	YES
11	1500	1427.9 to 1447.9	1475.9 to 1495.9	YES
12	700	699 to 716	729 to 746	YES
13	700	777 to 787	746 to 756	YES
14	700	788 to 798	758 to 768	YES
17	700	704 to 716	734 to 746	YES
18	850	815 to 830	860 to 875	YES
19	850	830 to 845	875 to 890	YES
20	800	832 to 862	791 to 821	YES
21	1500	1447.9 to 1462.9	1495.9 to 1510.9	YES
22	3500	3410 to 3490	3510 to 3590	YES
24	1600	1626.5 to 1660.5	1525 to 1559	NO
25	1900	1850 to 1915	1930 to 1995	YES
26	850	814 to 849	859 to 894	YES
27	800	807 to 824	852 to 869	YES
28	700	703 to 748	758 to 803	YES
29	700	N/A	717 to 728	YES
30	2300	2305 to 2315	2350 to 2360	YES
31		452.5 to 457.5	462.5 to 467.5	NO
32	1500	N/A	1452 to 1496	YES
33	2100		1900 to 1920	YES

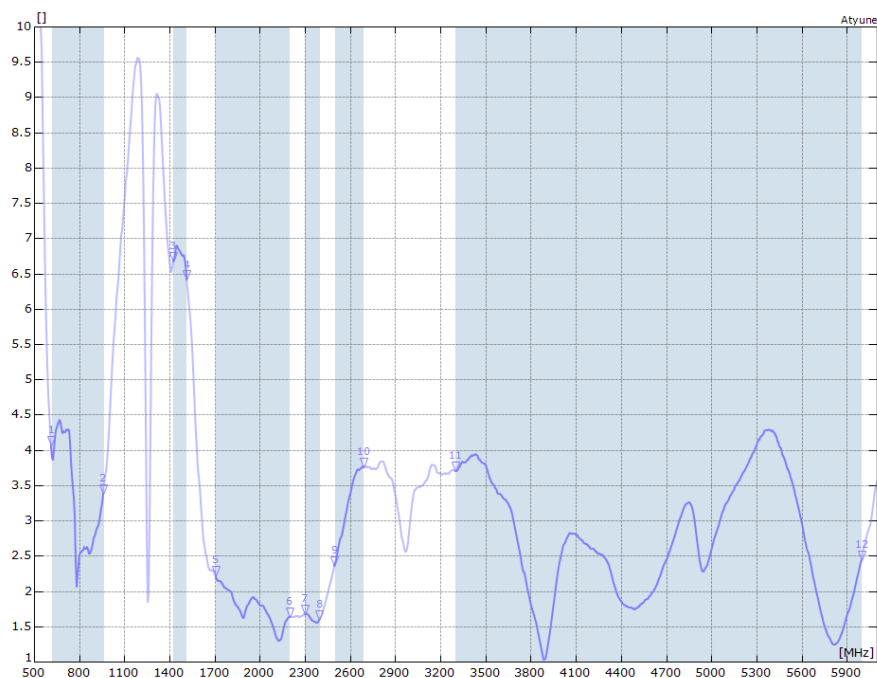
Band	Freq. Band (MHz)	Uplink (MHz)	Downlink (MHz)	Supported
34	2100		2010 to 2025	YES
35	1900		1850 to 1910	YES
36	1900		1930 to 1990	YES
37			1910 to 1930	YES
38	2600		2570 to 2620	YES
39	1900		1880 to 1920	YES
40	2300		2300 to 2400	YES
41	2500		2496 to 2690	YES
42	3500		3400 to 3600	YES
43	3700		3600 to 3800	YES
44	700		703 to 803	YES
45	1500		1447 to 1467	YES
46	5200		5150 to 5925	YES
47	5900		5855 to 5925	YES
48	3600		3550 to 3700	YES
50	1500		1430 to 1517	YES
51	1500		1427 to 1432	YES
65	2100	1920 to 2010	2110 to 2200	YES
66	1700	1710 to 1780	2110 to 2200	YES
67	700	N/A	738 to 758	YES
68	700	698 to 728	753 to 783	YES
69	2600	N/A	2570 to 2620	YES
70	2000	1695 to 1710	1995 to 2020	YES
71		663 to 698	617 to 652	NO
74			1427 to 1518	YES
77			3300 to 4200	YES
78			3300 to 3800	YES
79			4400 to 5000	YES
85		698 to 716	728 to 746	YES

6 RF Characteristics

S11 Parameter



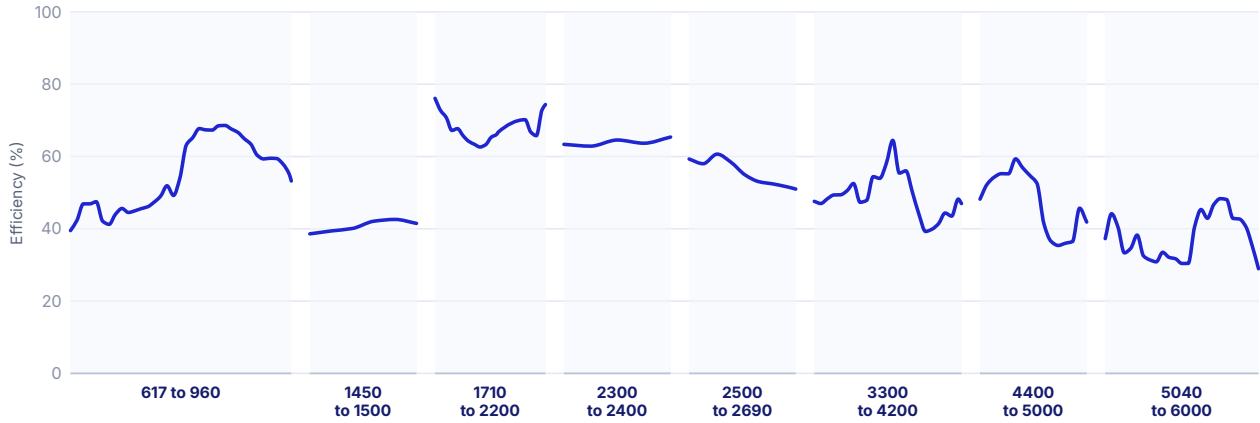
VSWR



7 Antenna Performance

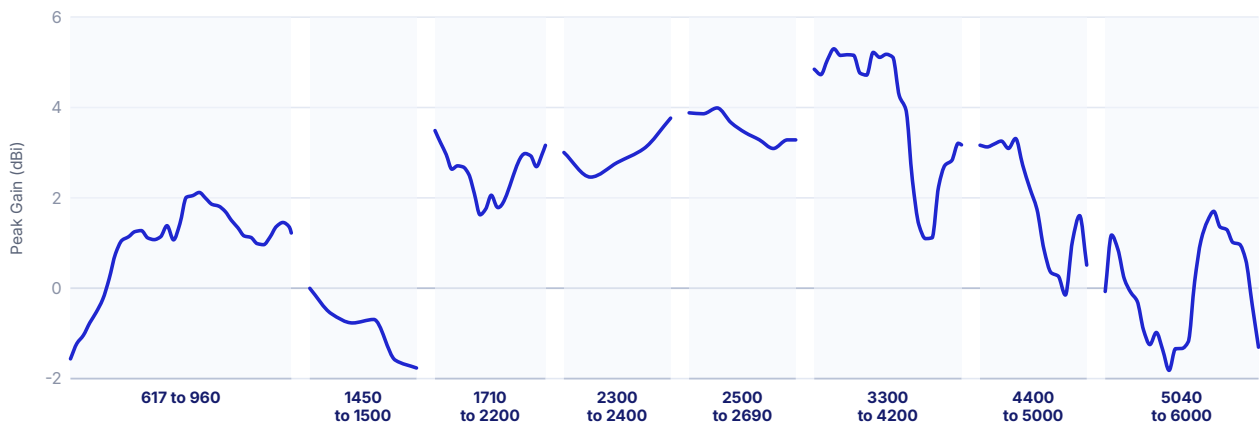
Efficiency

Frequency in MHz



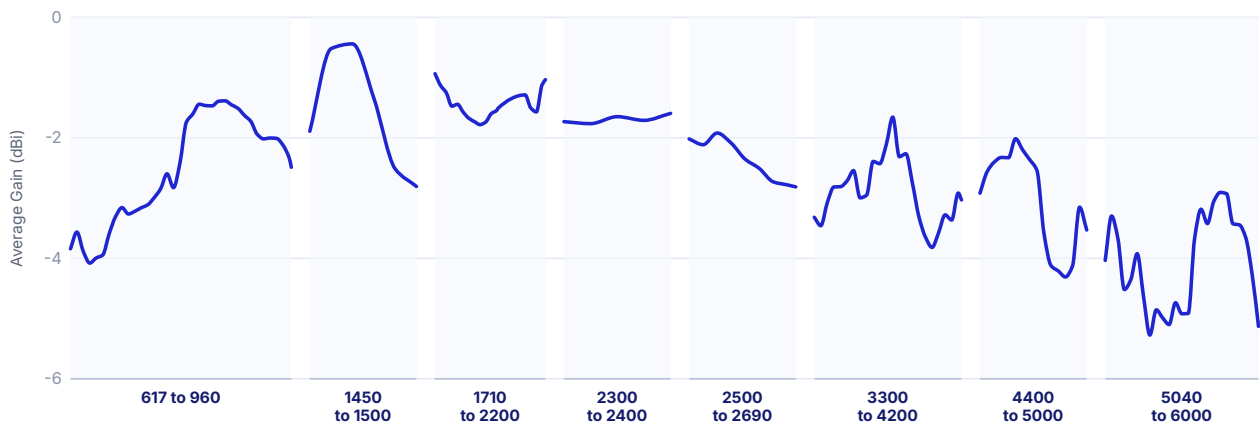
Peak Gain

Frequency in MHz



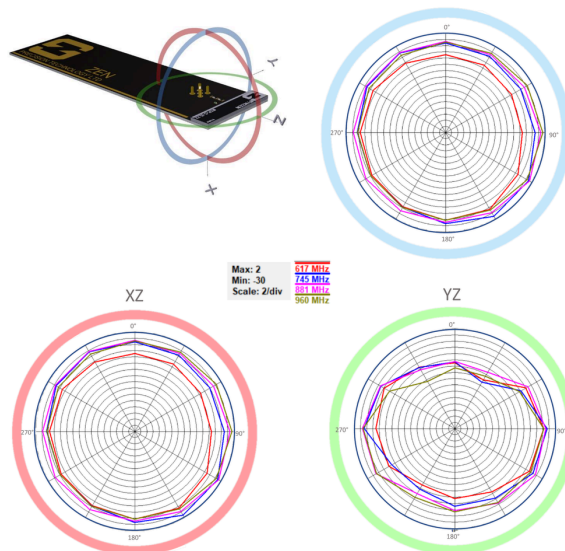
Average Gain

Frequency in MHz



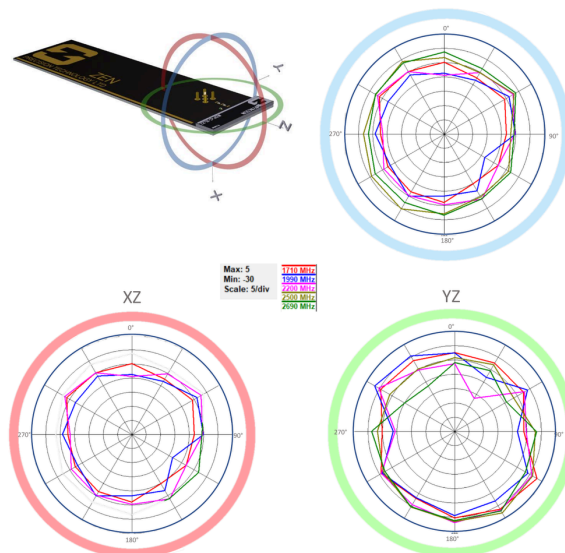
8 2D Polar Plot 617 to 960 MHz

MEASURED ON SYNZEN EVK (SZDV-C-2L22)



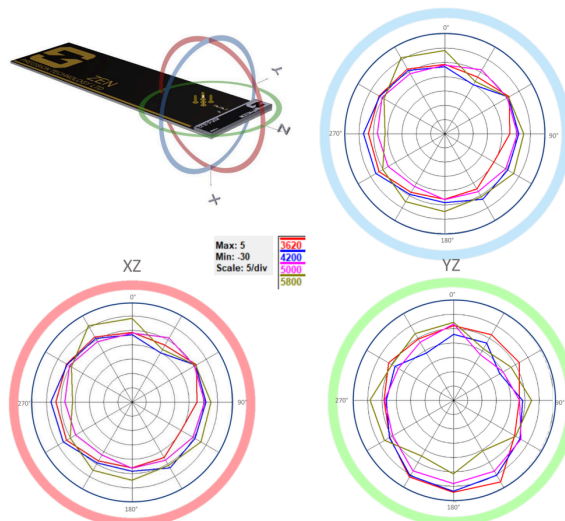
9 2D Polar Plot 1710 to 2690 MHz

MEASURED ON SYNZEN EVK (SZDV-C-2L22)



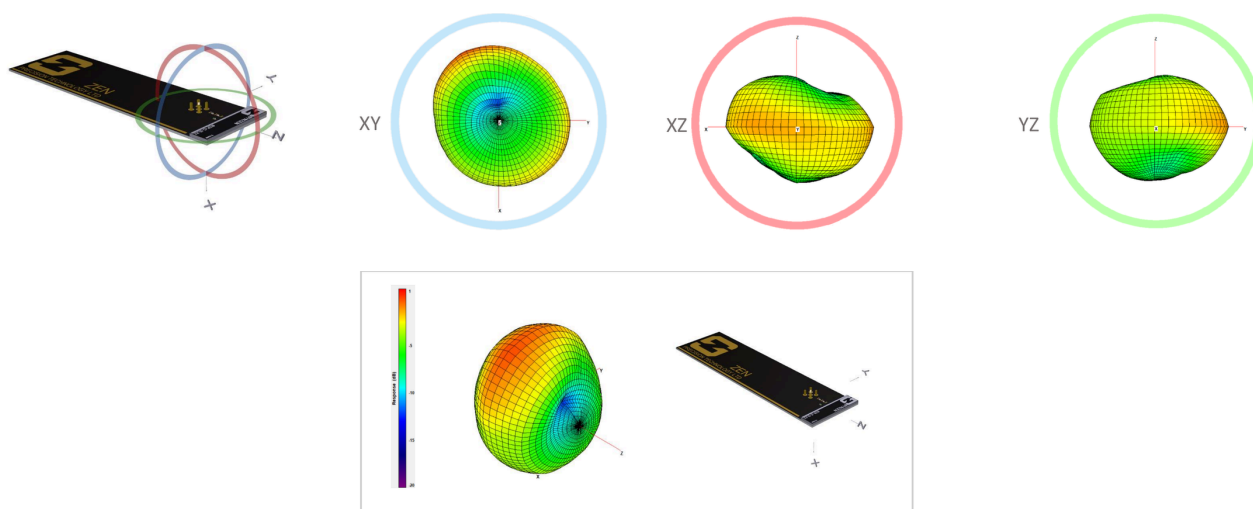
10 2D Polar Plot 3300 to 6000 MHz

MEASURED ON SYNZEN EVK (SZDV-C-2L22)



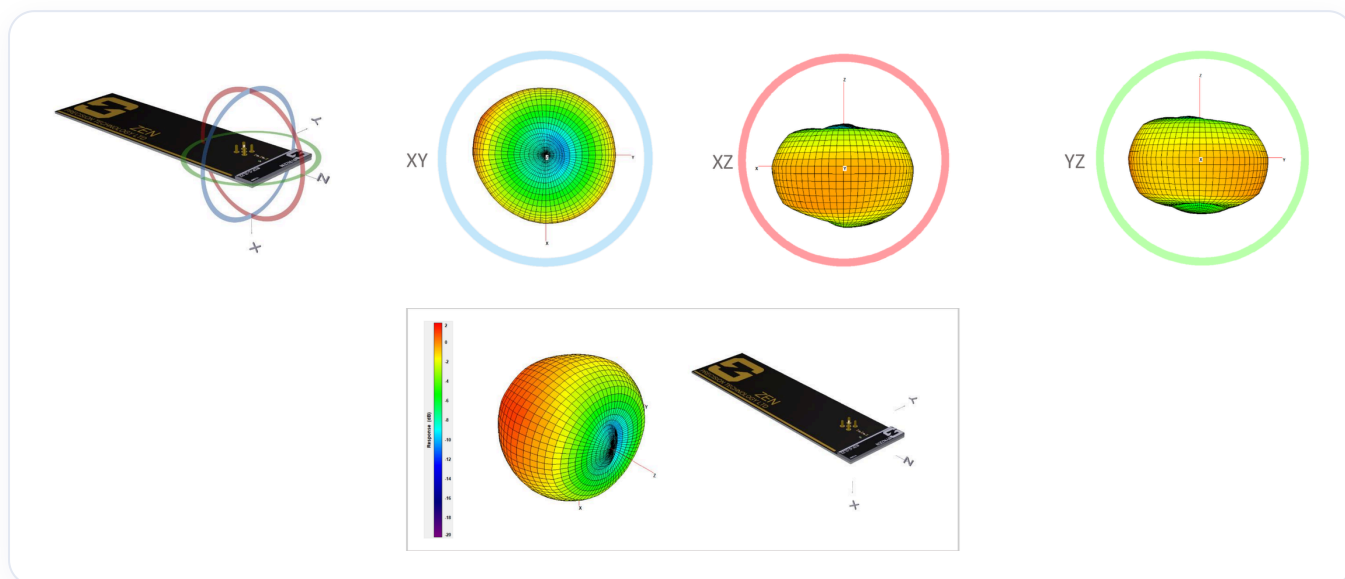
11 3D Radiation Pattern at 650 MHz

MEASURED ON SYNZEN EVK (SZDV-C-2L22), FREQUENCY POINT 650 MHz



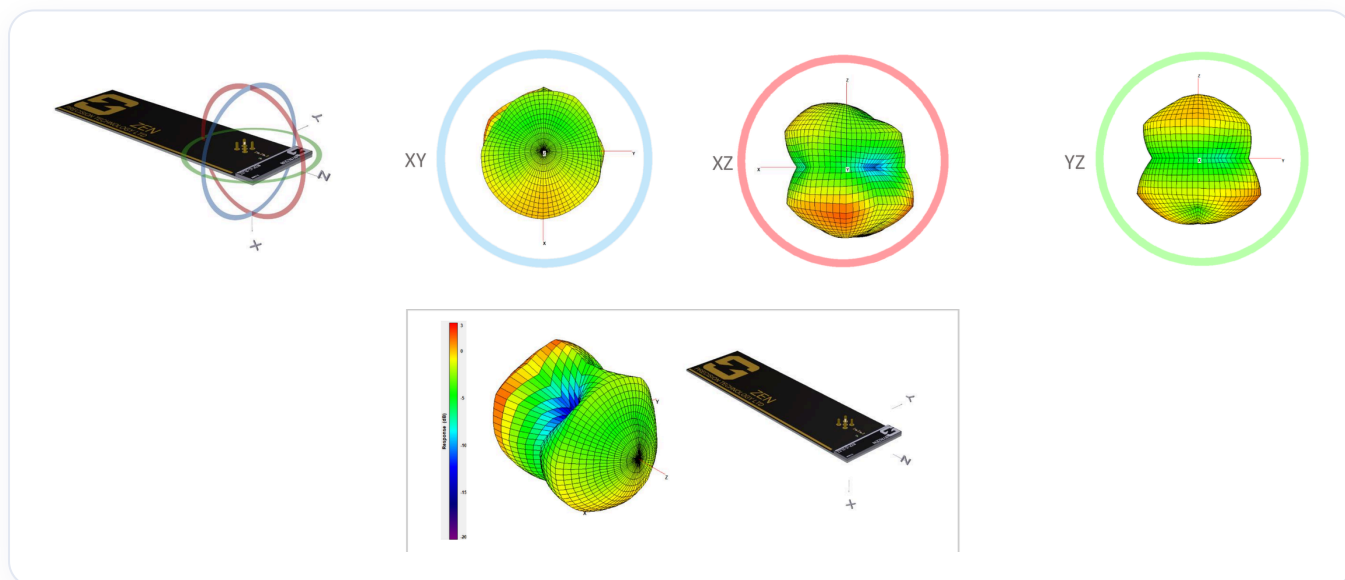
12 3D Radiation Pattern at 880 MHz

MEASURED ON SYNZEN EVK (SZDV-C-2L22), FREQUENCY POINT 880 MHZ



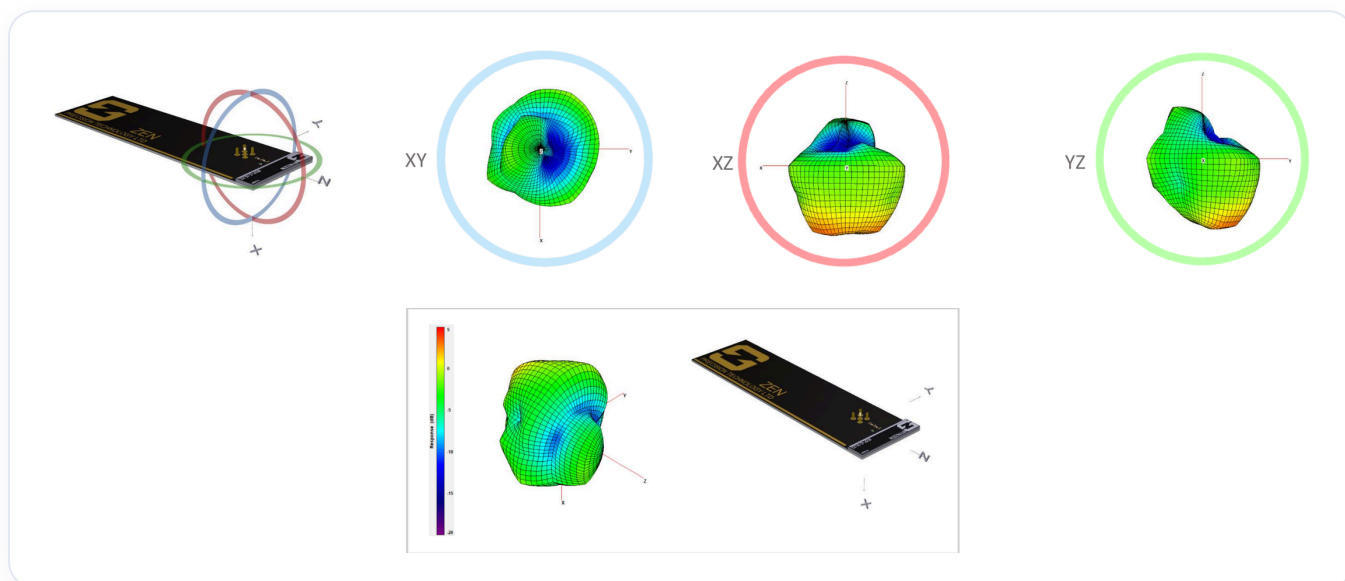
13 3D Radiation Pattern at 1880 MHz

MEASURED ON SYNZEN EVK (SZDV-C-2L22), FREQUENCY POINT 1880 MHZ



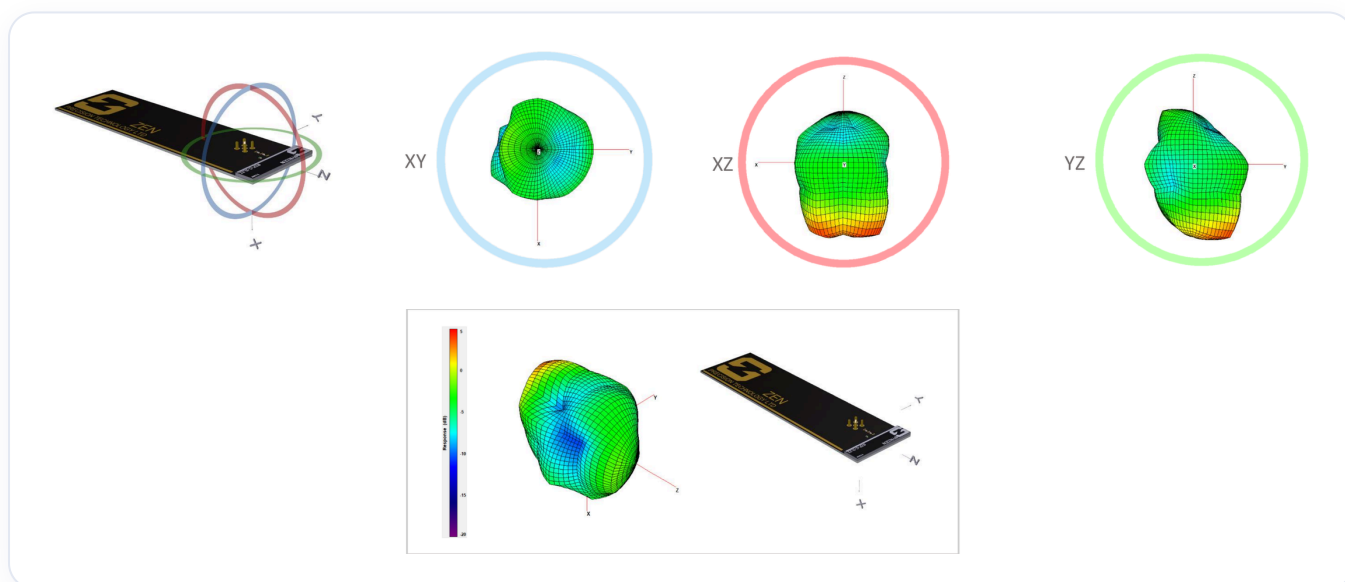
14 3D Radiation Pattern at 2600 MHz

MEASURED ON SYNZEN EVK (SZDV-C-2L22), FREQUENCY POINT 2600 MHZ



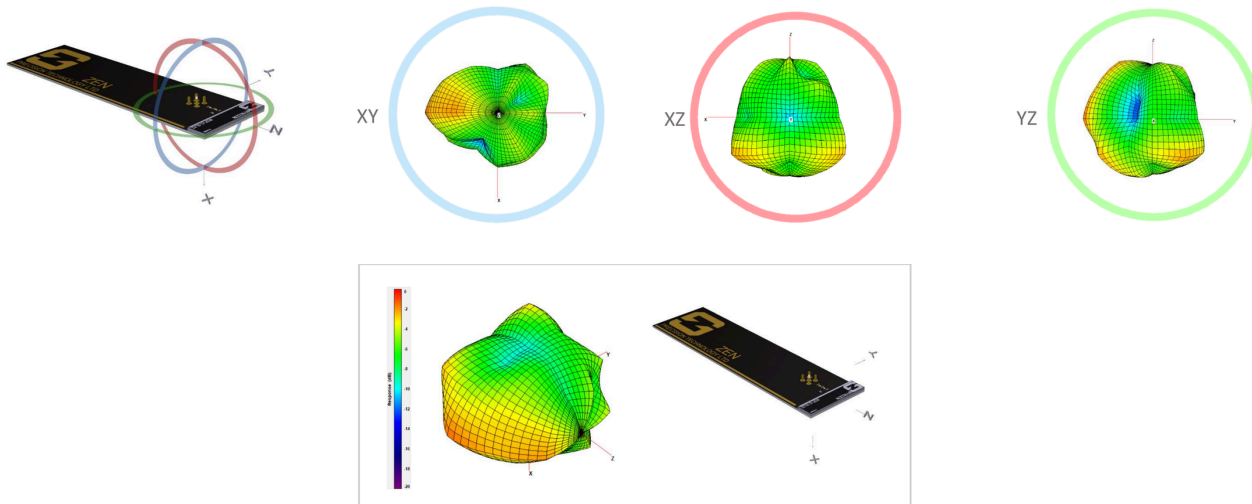
15 3D Radiation Pattern at 3600 MHz

MEASURED ON SYNZEN EVK (SZDV-C-2L22), FREQUENCY POINT 3600 MHZ

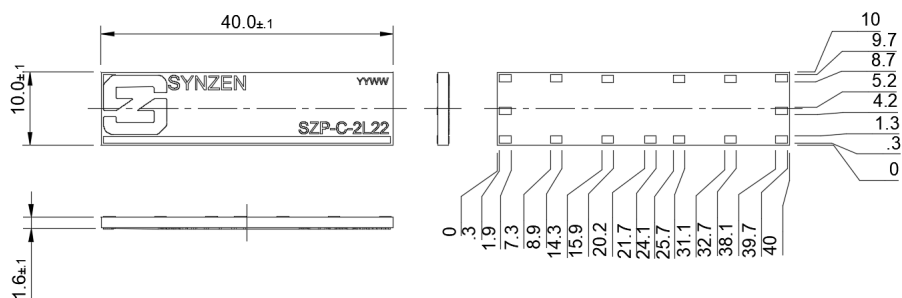


16 3D Radiation Pattern at 5700 MHz

MEASURED ON SYNZEN EVK (SZDV-C-2L22), FREQUENCY POINT 5700 MHZ

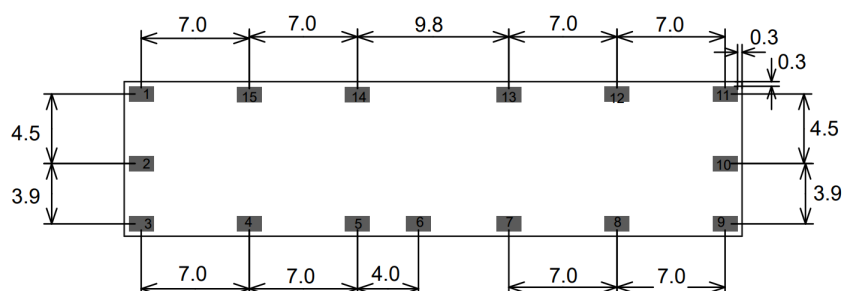


17 Antenna Mechanical Drawing



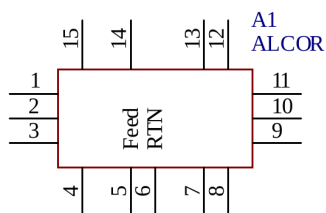
All dimensions in mm

18 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.

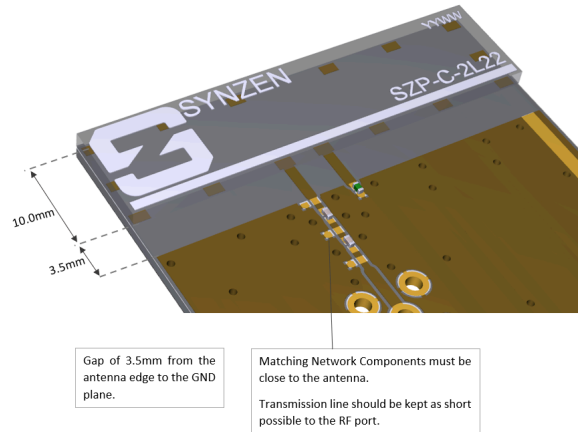
19 SZP-C-2L22 Schematic Symbol



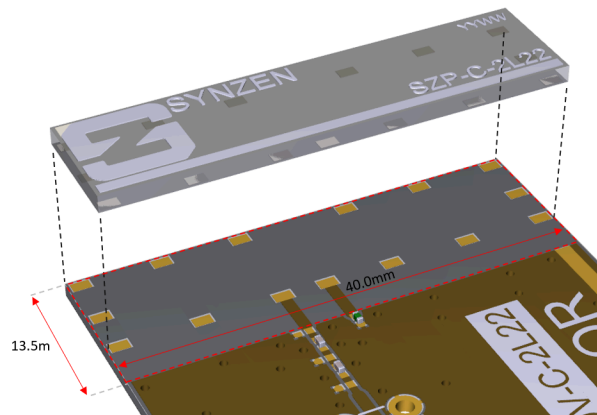
Pin	Description
1, 2, 3, 4, 7 to 15	Not connected, for mechanical strength only
5	RF Feed
6	RTN, tuning to GND via component

20 Placement

The antenna is designed to function placed at the shortest edge to utilize the PCB length for optimal low band performance. Keep a gap of 3.5 mm from the antenna edge to the GND plane. Matching network components must be close to the antenna, and the transmission line should be kept as short as possible to the RF port.



21 Required Clearance



A clearance is required through all PCB layers.

22 GND Length Test Board

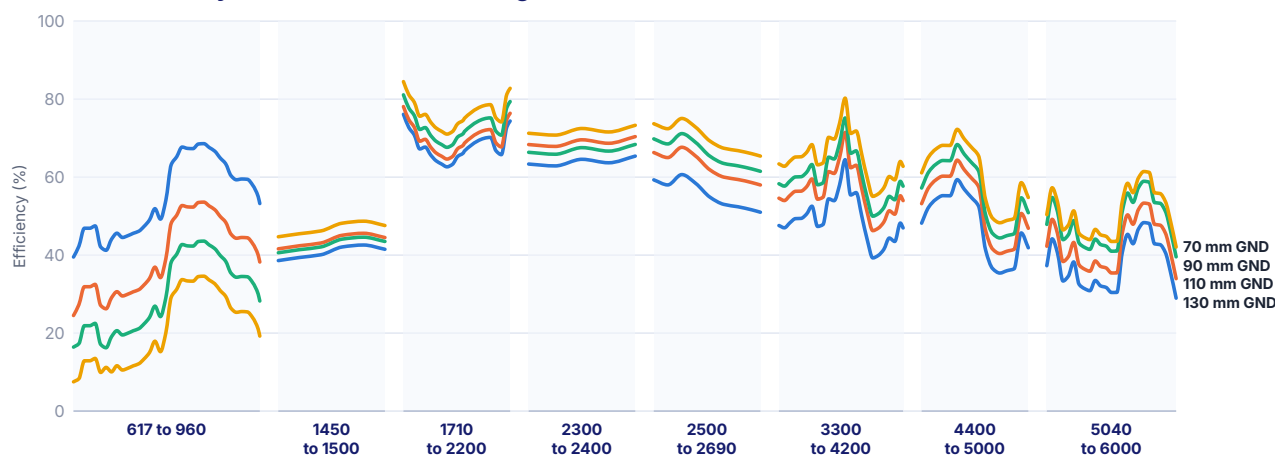


23 Efficiency vs GND Length

130 mm GND 110 mm GND 90 mm GND 70 mm GND

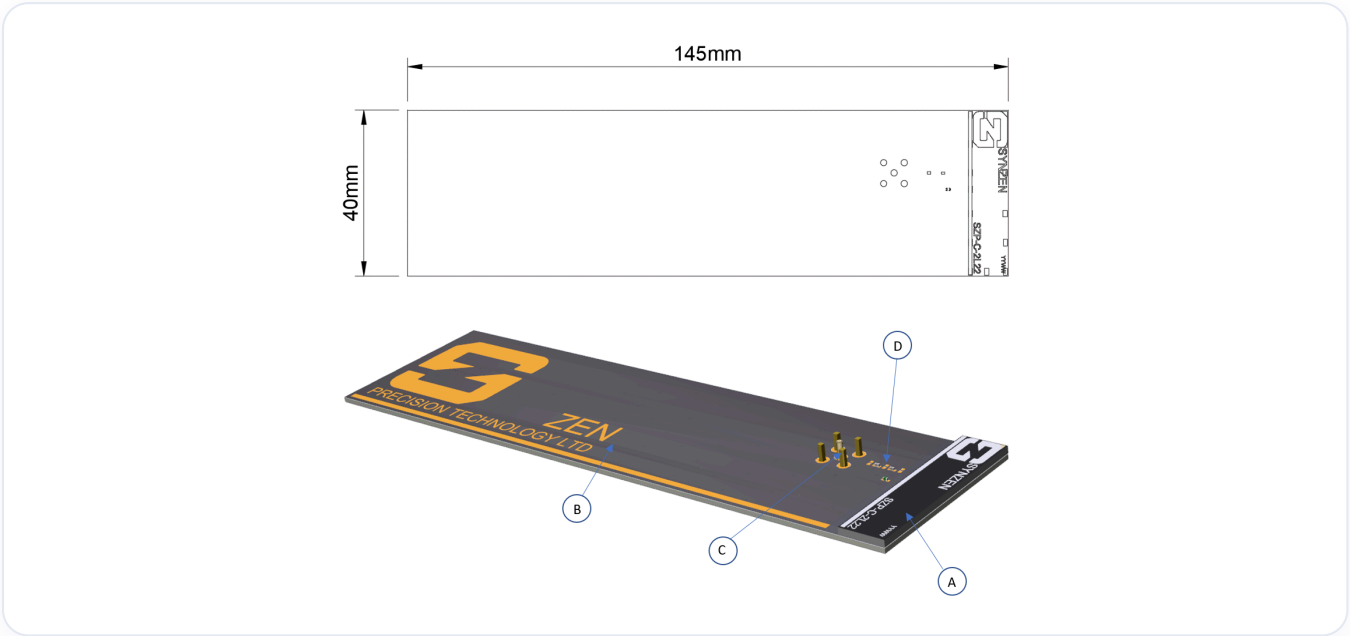
Antenna efficiency on various PCB GND lengths

Frequency in MHz



24 **SZDV-C-2L22 Evaluation Kit**

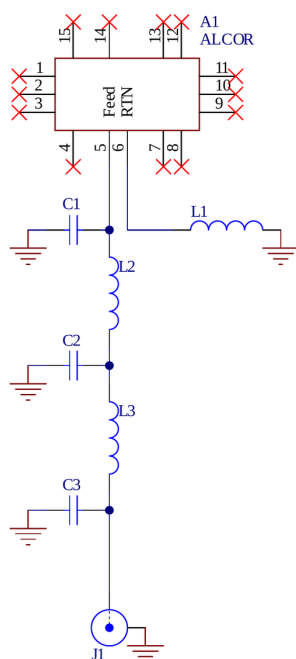
The SZDV-C-2L22 evaluation kit is a PCBA with the antenna (SZP-C-2L22) fitted and optimized with a matching network. Connection to the antenna is made using the fitted female SMA connector.



Item	Description
A	SZP-C-2L22 (Antenna)
B	Host PCB
C	SMA Connector
D	Matching Circuit

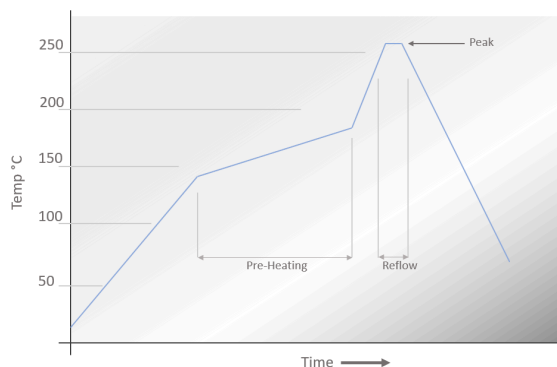
25 Evaluation Kit Matching Circuit

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.



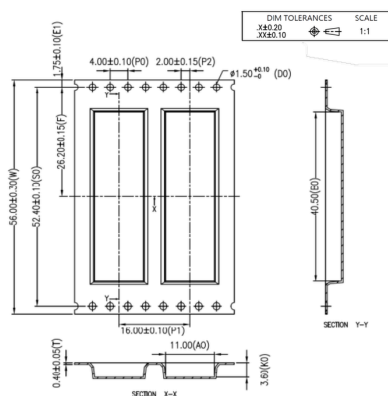
Designator	Component Type	Value	Size	Manufacturing Part No.
A1	Antenna	ALCOR		SZP-C-2L22
L2, L3	Resistor	0R	0402	Nonspecific part
L1	Inductor	5.1 nH	0402	
C1, C2, C3	NA	DNP	0402	Not Fitted
J1	SMA Connector			ACE solution A3SAFTST135

26 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

27 Tape and Reel



Dimension	Value (mm)
A0	11.00 ± 0.20
B0	40.50 ± 0.20
K0	3.60 ± 0.20

28 Reel Notes

- ◆ Part conforms to EIA-481-D standards
- ◆ All dimensions in millimeters unless otherwise stated
- ◆ Material: Conductive polystyrene
- ◆ Packing length for 22" reel: 51.0 meters (1:3)
- ◆ Component packing to 13" reel: 1000 pcs

29 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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