

— LTE / REDCAP SMD

ARAKKIS

4G LTE / 5G RedCap SMD Antenna

SZP-C-1L12 / SZP-C-1L13

FREQUENCY

698 to 2690 MHz

PEAK GAIN

Up to 3.20 dBi

MOUNTING

SMD, PCB corner

SIZE

30.0 × 7.0 × 3.3 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	2500 to 2690 MHz	Covers B7, B38, B41

— Key Features

- Wideband coverage for 4G LTE and 5G RedCap
- Backward compatible with 3G and 2G systems
- Compact SMD corner mounted design (30.0 × 7.0 × 3.3 mm)
- High efficiency and peak gain across global bands
- Reduced dependency on ground plane size
- Suitable for diversity and MIMO configurations
- RoHS and REACH compliant, halogen free

1 Introduction

ARAKKIS is a compact SMD antenna engineered for 4G LTE and 5G RedCap applications. Supporting wideband coverage from 698 to 960 MHz, 1710 to 2200 MHz, 2300 to 2400 MHz, and 2500 to 2690 MHz, it delivers reliable connectivity for both existing LTE networks and the next generation of reduced capability 5G systems.

Its corner mounted design minimizes PCB footprint while maintaining high efficiency and gain, even on compact host devices. With reduced dependency on ground plane size and full compatibility for diversity or MIMO setups, ARAKKIS provides an adaptable solution for long term product lifecycles.

Suitable for global IoT and cellular markets, ARAKKIS is ideal for telematics, smart metering, home automation, gateways, drones, healthcare devices, POS, and OBD-II systems. It ensures robust performance today while being ready for tomorrow's RedCap networks.

— Features

- ◆ Wideband coverage for 4G LTE and 5G RedCap
- ◆ Backward compatible with 3G and 2G systems
- ◆ Compact SMD corner mounted design (30.0 × 7.0 × 3.3 mm)
- ◆ High efficiency and peak gain across global bands
- ◆ Reduced dependency on ground plane size
- ◆ Suitable for diversity and MIMO configurations
- ◆ RoHS and REACH compliant, halogen free

— Applications

- | | |
|---|-------------------------------------|
| ◆ Telematics and vehicle tracking | ◆ Point of Sale (POS) systems |
| ◆ Smart metering and energy management | ◆ OBD-II and automotive electronics |
| ◆ Smart city and infrastructure systems | ◆ Drones and UAVs |
| ◆ Gateways and IoT hubs | ◆ Home automation solutions |
| ◆ Healthcare and medical monitoring devices | |

2 Mechanical Specifications

Part Number	SZP-C-1L12 / SZP-C-1L13
Name	ARAKKIS a / b
Dimensions (mm)	30.0 × 7.0 × 3.3
Weight	<1.8 g
Antenna Type	SMD
Required Clearance Area	310 mm ²

3 Electrical / RF Specifications

Band	Frequency Range (MHz)	Avg Efficiency (%) 130 / 45 mm PCB	Peak Gain (dBi) 130 / 45 mm PCB	VSWR (worst case) 130 / 45 mm PCB	Impedance
5G NR/4G LTE B5, 8, 12, 13, 14, 17, 18, 20, 26, 27, 28, 29	698 to 960	>60 / >25	2.20 / 0.41	3.6:1 / 6.0:1	50 Ω
5G NR/4G LTE B1, 2, 3, 4, 9, 23, 35, 39, 66	1710 to 2200	>65 / >58	3.20 / 1.22	2.6:1 / 5.0:1	
5G NR/4G LTE B40	2300 to 2400	>55 / >55	3.15 / 0.40	3.2:1 / 4.0:1	
5G NR/4G LTE B7, 38, 41	2500 to 2690	>60 / >65	3.15 / 1.68	2.9:1 / 6.2:1	

Values shown for the 130 mm and 45 mm PCB ground lengths. Note: The antenna performance was measured on EVK (SZDV-C-1L12).

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 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
10	1700	1710 to 1770	2110 to 2170	YES
11	1500	1427.9 to 1447.9	1475.9 to 1495.9	NO
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	NO
22	3500	3410 to 3490	3510 to 3590	NO
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

Band	Freq. Band (MHz)	Uplink (MHz)	Downlink (MHz)	Supported
32	1500	N/A	1452 to 1496	NO
33	2100		1900 to 1920	YES
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	NO
43	3700		3600 to 3800	NO
44	700		703 to 803	YES
45	1500		1447 to 1467	NO
46	5200		5150 to 5925	NO
47	5900		5855 to 5925	NO
48	3600		3550 to 3700	NO
50	1500		1432 to 1517	NO
51	1500		1427 to 1432	NO
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	NO

RF Characteristics

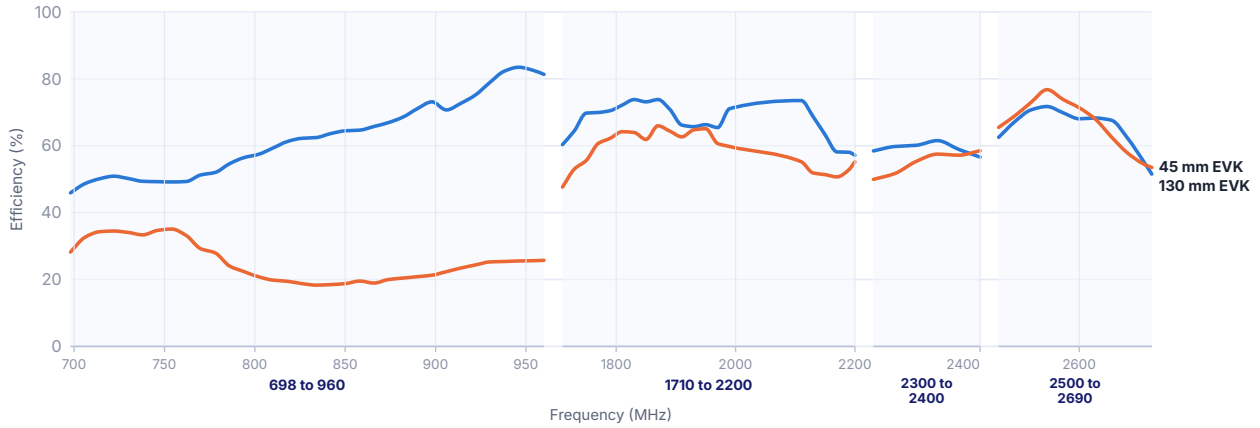
The graph displays the frequency response of the Atyune antenna. The x-axis represents frequency in MHz, ranging from 500 to 2900. The y-axis represents gain in dB, ranging from 1 to 10. The curve shows a broad bandwidth with several peaks and valleys. Shaded regions indicate specific frequency bands. Numbered points (1-8) are marked on the curve.

Point	Frequency (MHz)	Gain (dB)
1	~700	~3.5
2	~900	~2.5
3	~1700	~2.5
4	~2200	~2.5
5	~2300	~2.5
6	~2400	~3.5
7	~2500	~3.0
8	~2600	~1.5

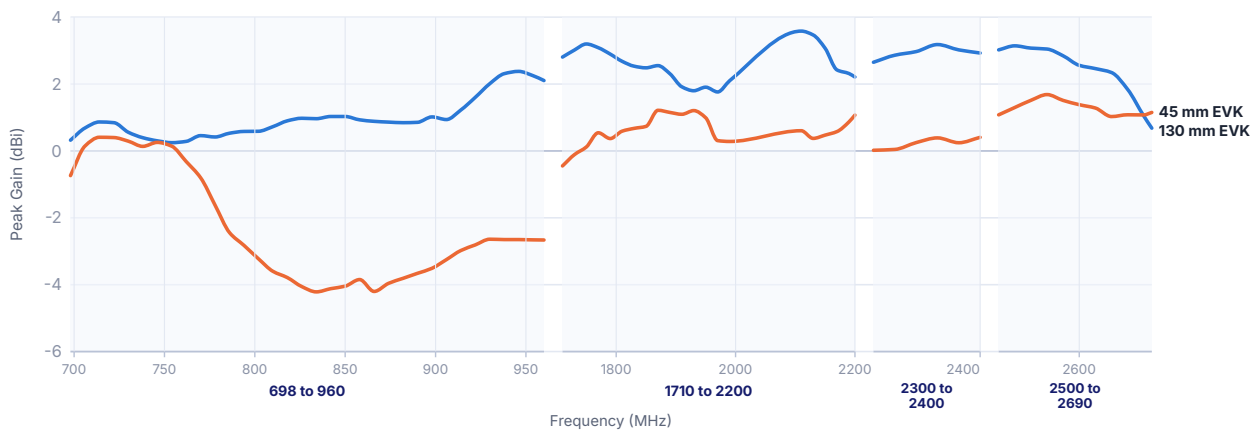
7 Antenna Performance

— 130 mm EVK — 45 mm EVK

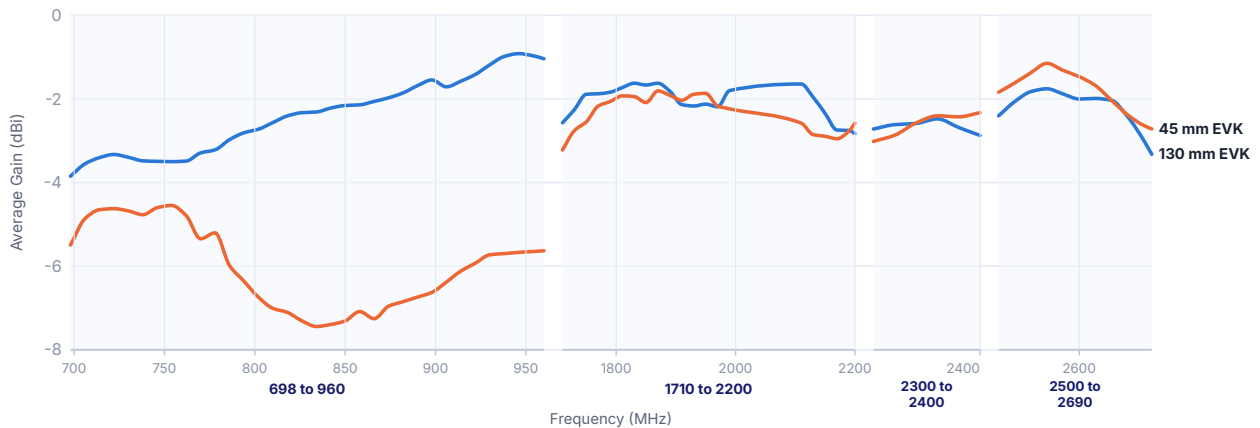
Efficiency



Peak Gain

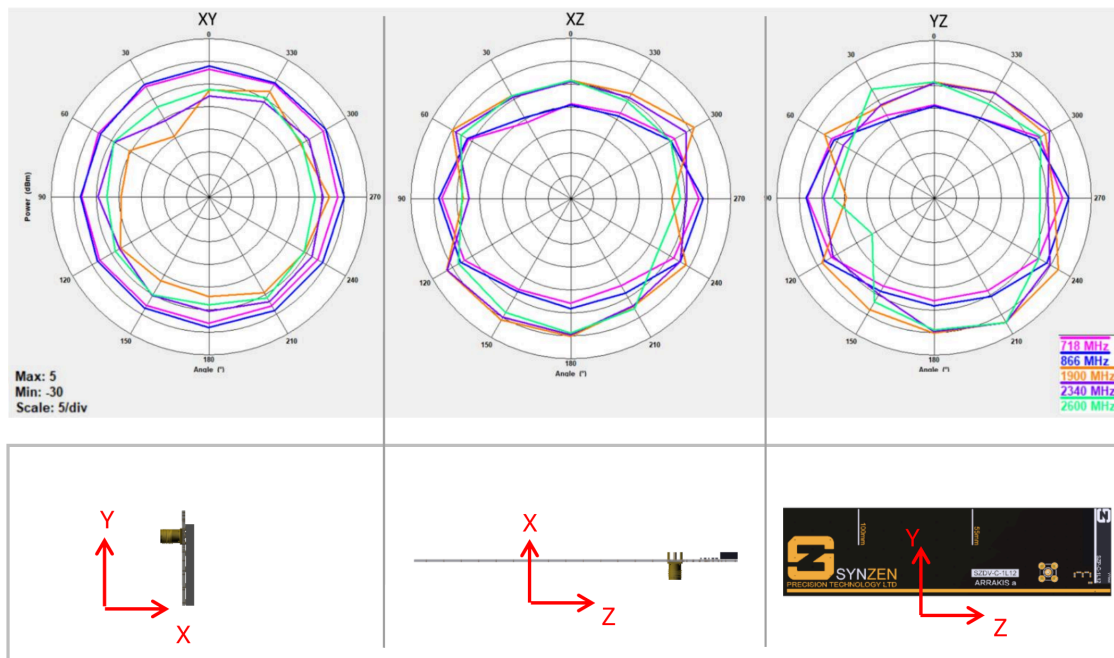


Average Gain



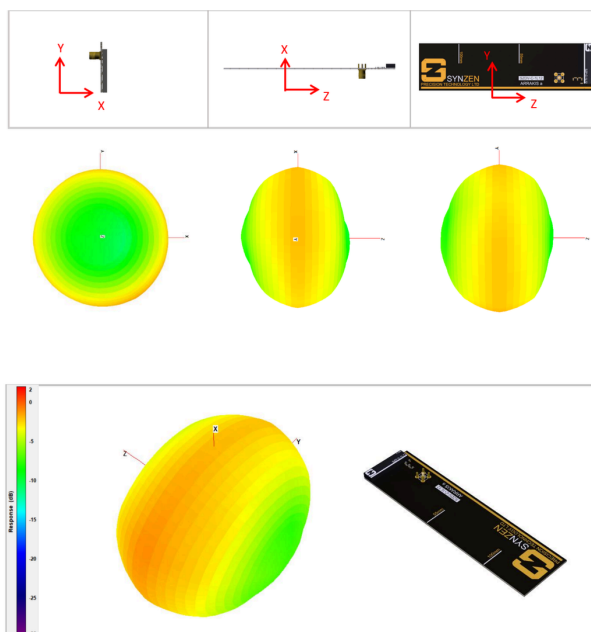
8 2D Polar Plot

MEASURED ON SYNZEN DVK (SZDV-C-1L12)



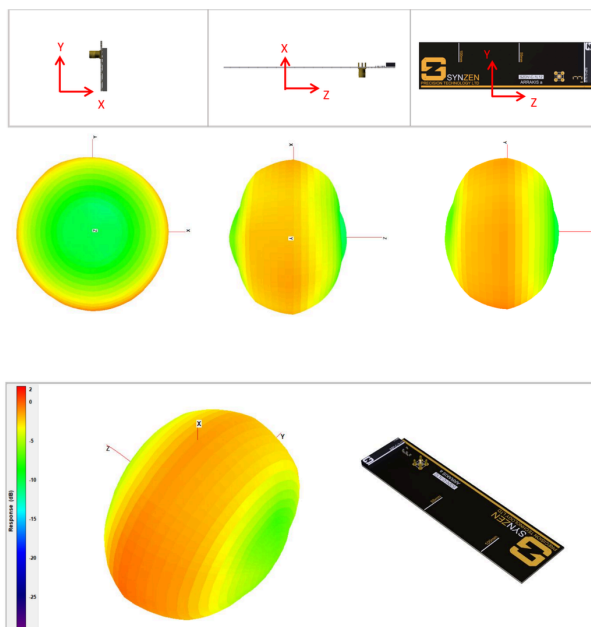
9 3D Radiation Patterns at 714 MHz

MEASURED ON SYNZEN DVK (SZDV-C-1L12)



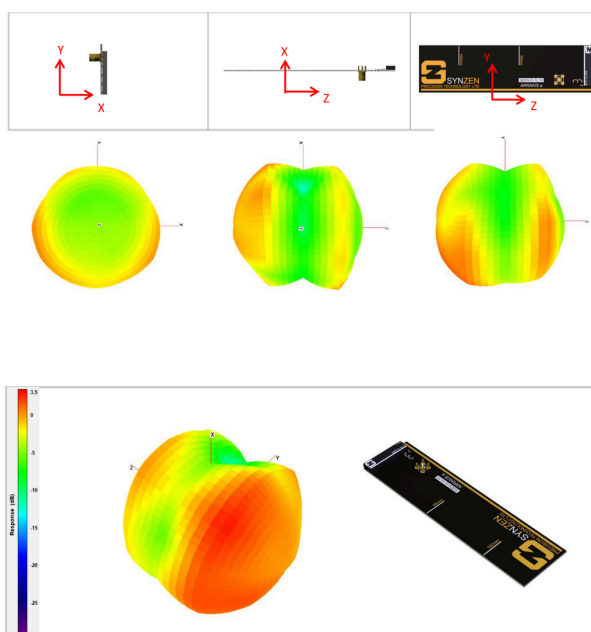
10 3D Radiation Patterns at 870 MHz

MEASURED ON SYNZEN DVK (SZDV-C-1L12)



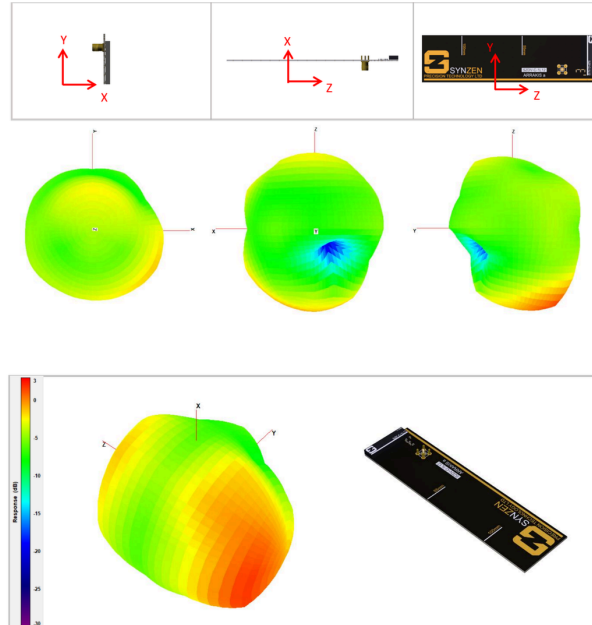
11 3D Radiation Patterns at 1880 MHz

MEASURED ON SYNZEN DVK (SZDV-C-1L12)

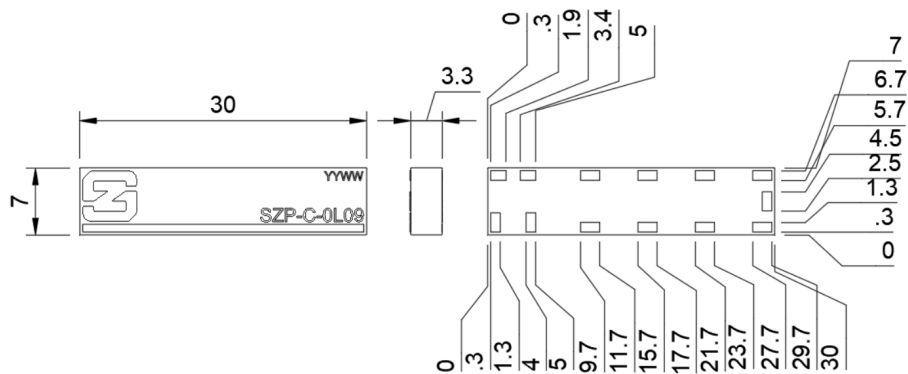


12 3D Radiation Patterns at 2600 MHz

MEASURED ON SYNZEN DVK (SZDV-C-1L12)



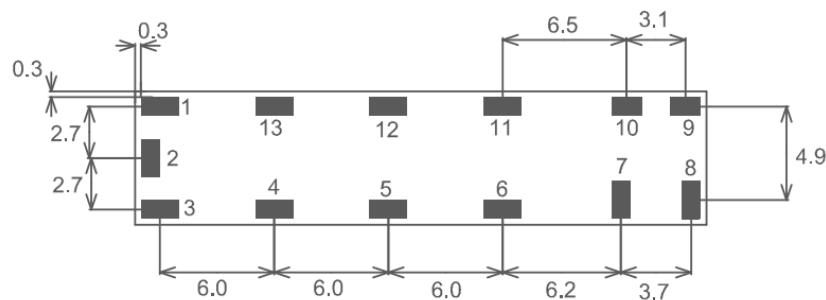
13 Mechanical Drawing



All dimensions in mm

14 PCB Footprint

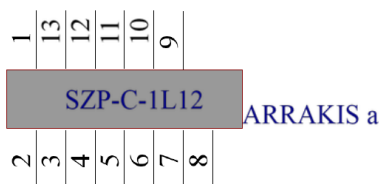
The host PCB requires the footprint shown below. PCB library files and DXF are available from our website www.synzen.com.tw/products.



PADS 1,2,3,4,5,6,7,8,11,12,13 = 2.0 x 1.0
PADS 9,10 = 1.6 x 1.0
ALL DIMENSIONS IN MM

15 Antenna Pinout

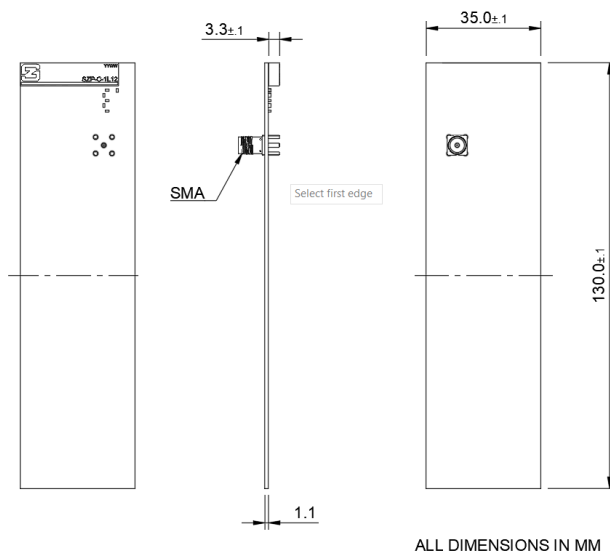
The schematic symbol for the antenna is shown below with a description of each pin.



Pin	Description
1, 2, 3, 4, 5, 6, 9, 10, 11, 12, 13	Not used (mechanical support)
7	Feed to matching network
8	Tuning return

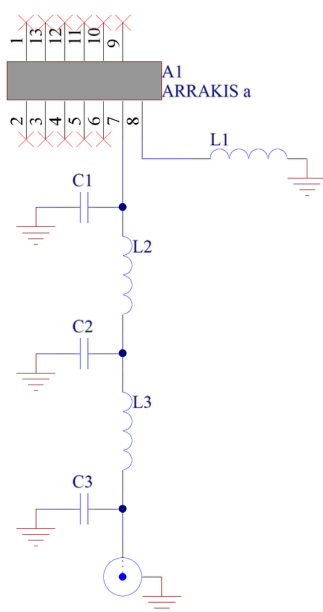
16 Evaluation Kit

The SZDV-C-1L12 development kit is a PCBA with the LTE antenna (SZP-C-1L12) fitted and optimized with a matching network. Connection to the antenna is made using the fitted female SMA connector.



17 Evaluation Kit Matching Circuit

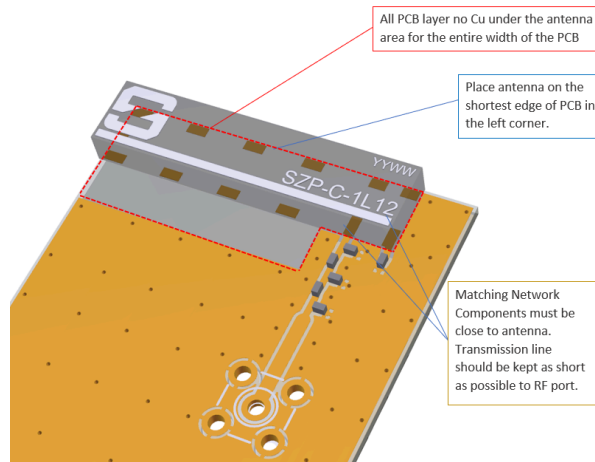
The circuit of the DEV kit along with the BOM is shown below. The matching network topology should be used on the device host PCB, although the matching values will be dependent on the host PCB and device environment. Synzen provide a matching service to optimize your device to ensure the best performance.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



Designator	Component Type	Value	Size	Manufacturing Part No.
A1	Antenna	ARRAKIS a		SZP-C-1L12
L1	Inductor	5.6 nH	0402	LQG15HS5N6H02D
C1, C2, C3	NA	DNP	0402	Do Not Place
L2	Capacitor	2.0 pF	0402	GJM1555C1H2R0WB01D
L3	Inductor	3.0 nH	0402	LQG15HS3N0C02D
J1	SMA Connector			ACE solution A3SAFTST135

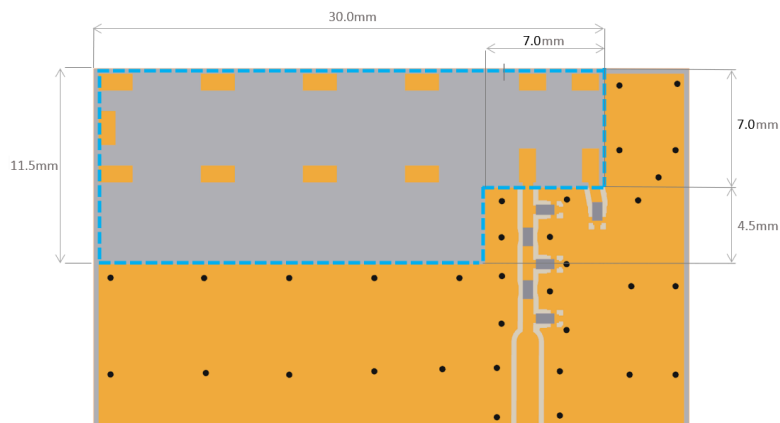
18 Placement

The antenna is designed to function placed at the left side corner of the host PCB. For a right hand side version see ARAKKIS b (SZP-C-1L13).

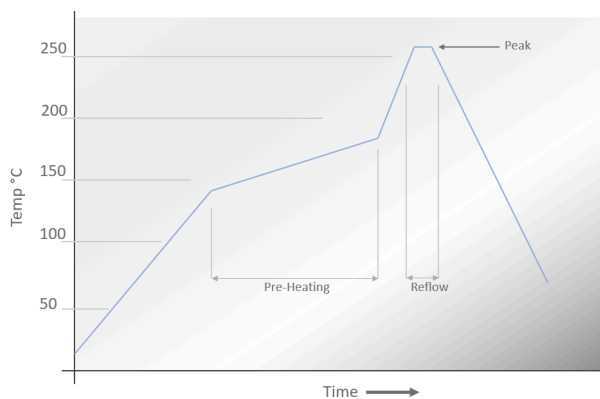


19 Clearance

A clearance is required through all PCB layers for the precise area shown. No components must be placed within this area, otherwise RF coupling from the antenna to any conductor will occur, reducing performance significantly. Any components such as a battery or display must also avoid this area.

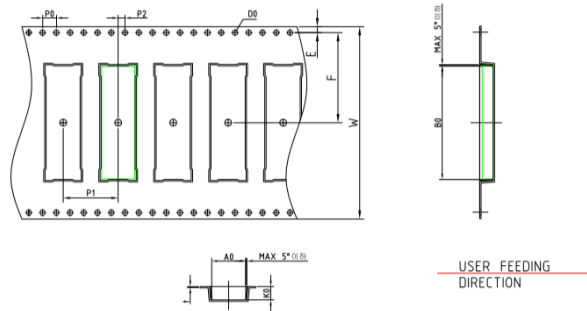


20 Reflow Profile

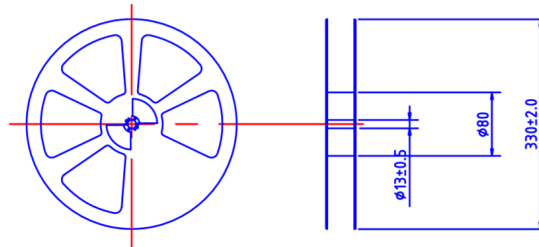


Stage	Temperature	Time
Pre-Heating	130 to 180°C	50 to 190 seconds
Reflow	>220°C	50 to 160 seconds
Peak Temperature	260°C	15 to 45 seconds

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 DIMENSION	Type	Color	Size	Hub
	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.

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