

PROCYON a

4G LTE SMD Corner Mounted Antenna

SZP-C-0L09

Key Features

- 4G LTE coverage: 698-960, 1710-2200, 2300-2400 and 2500-2690 MHz
- Backward compatible with 3G and 2G systems
- Designed for the left hand corner of the host PCB (mirror version: PROCYON b (SZP-C-0L10))
- Suitable for diversity applications
- Corner mounted design for compact devices with limited space
- Less dependency on GND plane length
- Higher performance than larger off the shelf solutions
- SMD component supplied in tape and reel
- Suitable for sealing with resin or potting compounds
- Project life support direct from Synzen engineers
- Patent pending design

1 Introduction

PROCYON a is a compact, high performing SMD antenna providing a complete solution for global 4G LTE applications, with backward compatibility for 3G and 2G systems. Designed for compact devices with limited space, it mounts in the left hand corner of the host PCB and has less dependency on ground plane length than conventional designs, delivering higher performance than larger off the shelf solutions. For a right hand corner version, see PROCYON b (SZP-C-0L10); together the mirrored pair gives full layout flexibility and suits diversity applications. PROCYON a is backed by project life support direct from Synzen engineers.

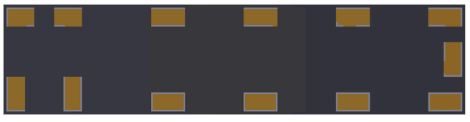
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Applications

- Telematics
- Smart metering
- Home automation
- Smart city
- Gateways
- Healthcare
- Drones
- POS
- OBD-II





2 Mechanical Specifications

Part Number	SZP-C-0L09
Name	PROCYON a
Dimensions (mm)	30.0 x 7.0 x 3.3
Required Clearance Area	310 mm²
Weight	< 1.8 g
Antenna Type	Surface Mount Device (SMD)
Polarization	Linear

Patent pending design. All dimensions in mm.

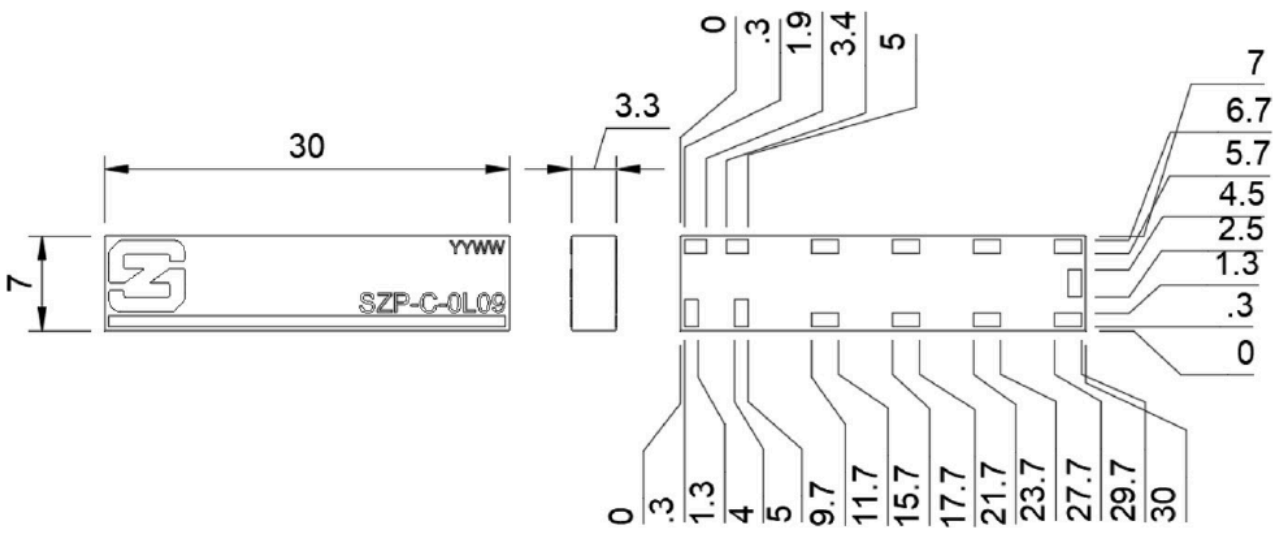
3 Electrical / RF Specifications

Band	Frequency Range (MHz)	Avg Efficiency	Peak Gain (dBi)	S11 max (dB)	VSWR max	Impedance
Low band: B5, B8, B12, B13, B14, B17, B18, B19, B20, B26, B27, B28, B29, B44, B67, B68, GSM 850/900	698-960	>50%	1.20	<-5.8	3.5:1	50 ohm
Mid band: B1, B2, B3, B4, B10, B25, B33, B34, B35, B36, B37, B39, B65, B66, GSM 1800/1900, UMTS	1710-2200	>60%	3.10	<-6.1	2.9:1	
High band: B30, B40	2300-2400	>60%	2.50	<-6.5	2.8:1	
High band: B7, B38, B41, B69	2500-2690	>50%	3.00	<-6.2	3.0:1	

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
Halogen free	Yes

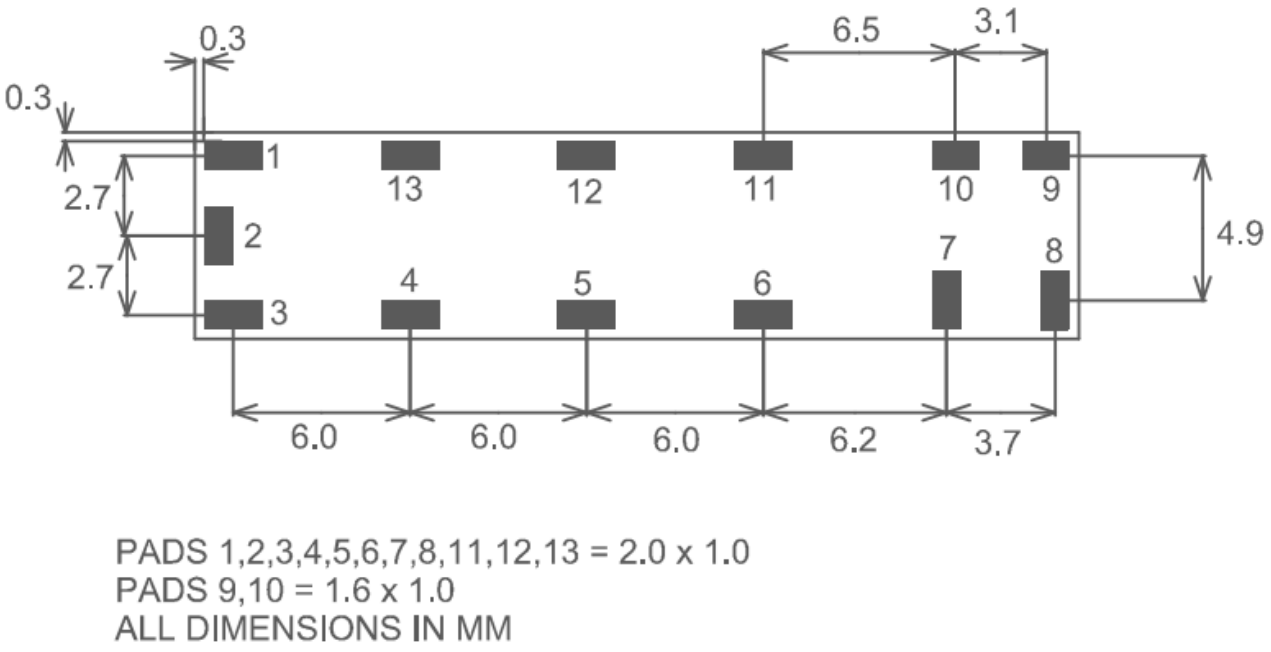
5 Mechanical Drawing



L	W	H
30.0 ±0.1	7.0 ±0.1	3.3 ±0.1

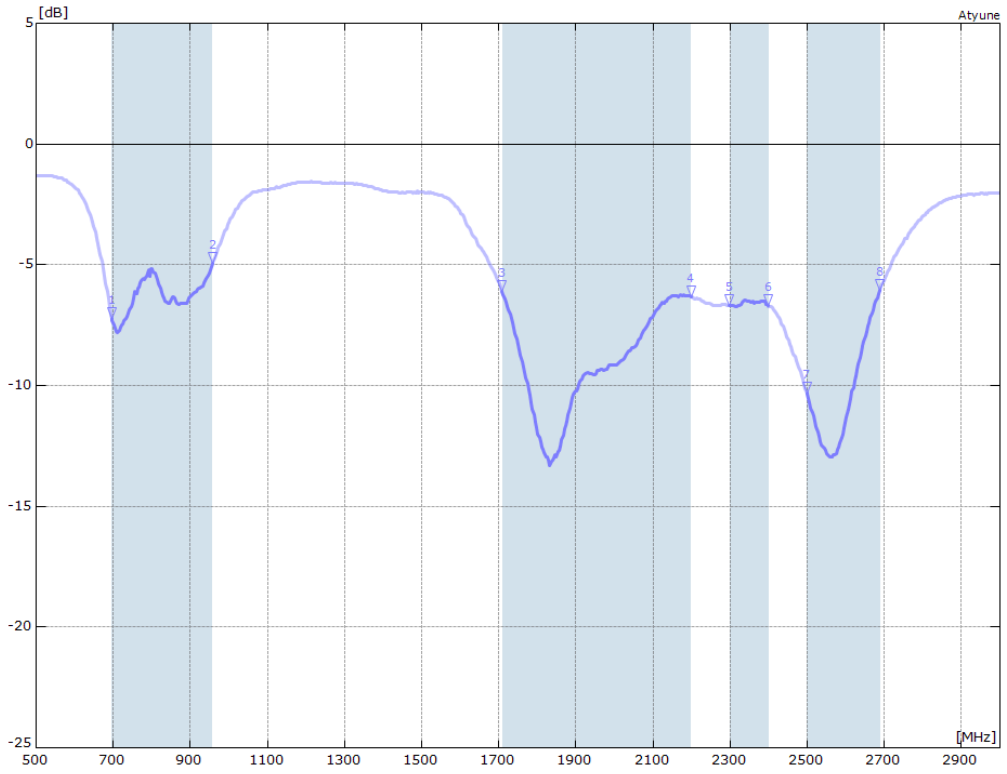
6 Required Host PCB Footprint

The host PCB requires the footprint shown below. PCB library files and DXF are available on request.

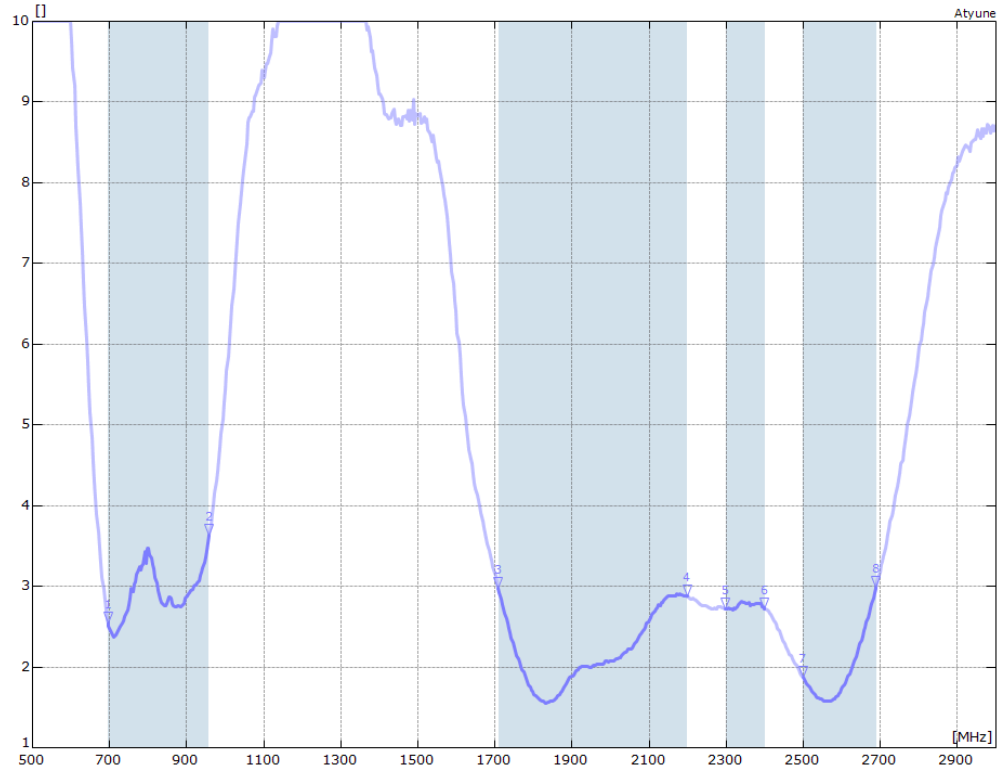


PADS 1,2,3,4,5,6,7,8,11,12,13 = 2.0 x 1.0
PADS 9,10 = 1.6 x 1.0
ALL DIMENSIONS IN MM

7 Return Loss (S11)



8 VSWR



9 Supported LTE Bands

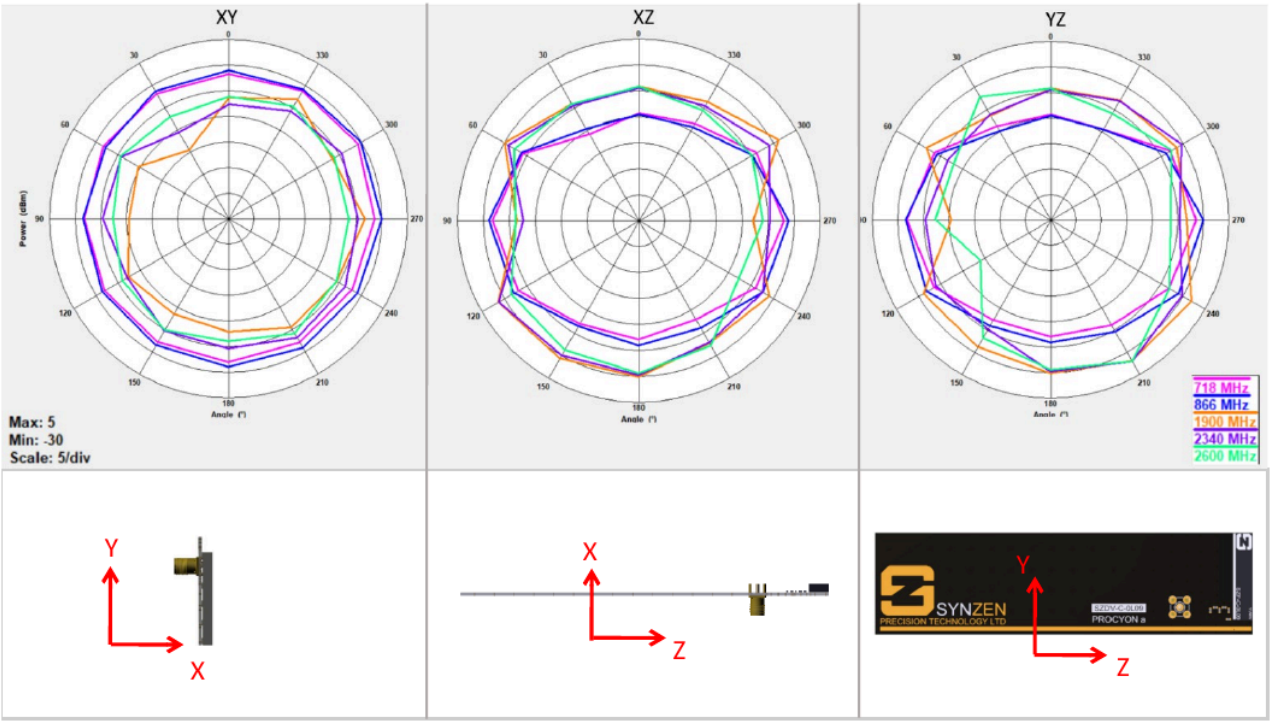
LTE bands covered by PROCYON a (SZP-C-0L09). For TDD bands the uplink and downlink share the same frequency range.

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	450	452.5-457.5	462.5-467.5	No

LTE Band	Frequency Band	Uplink (MHz)	Downlink (MHz)	Supported
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	1900	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	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

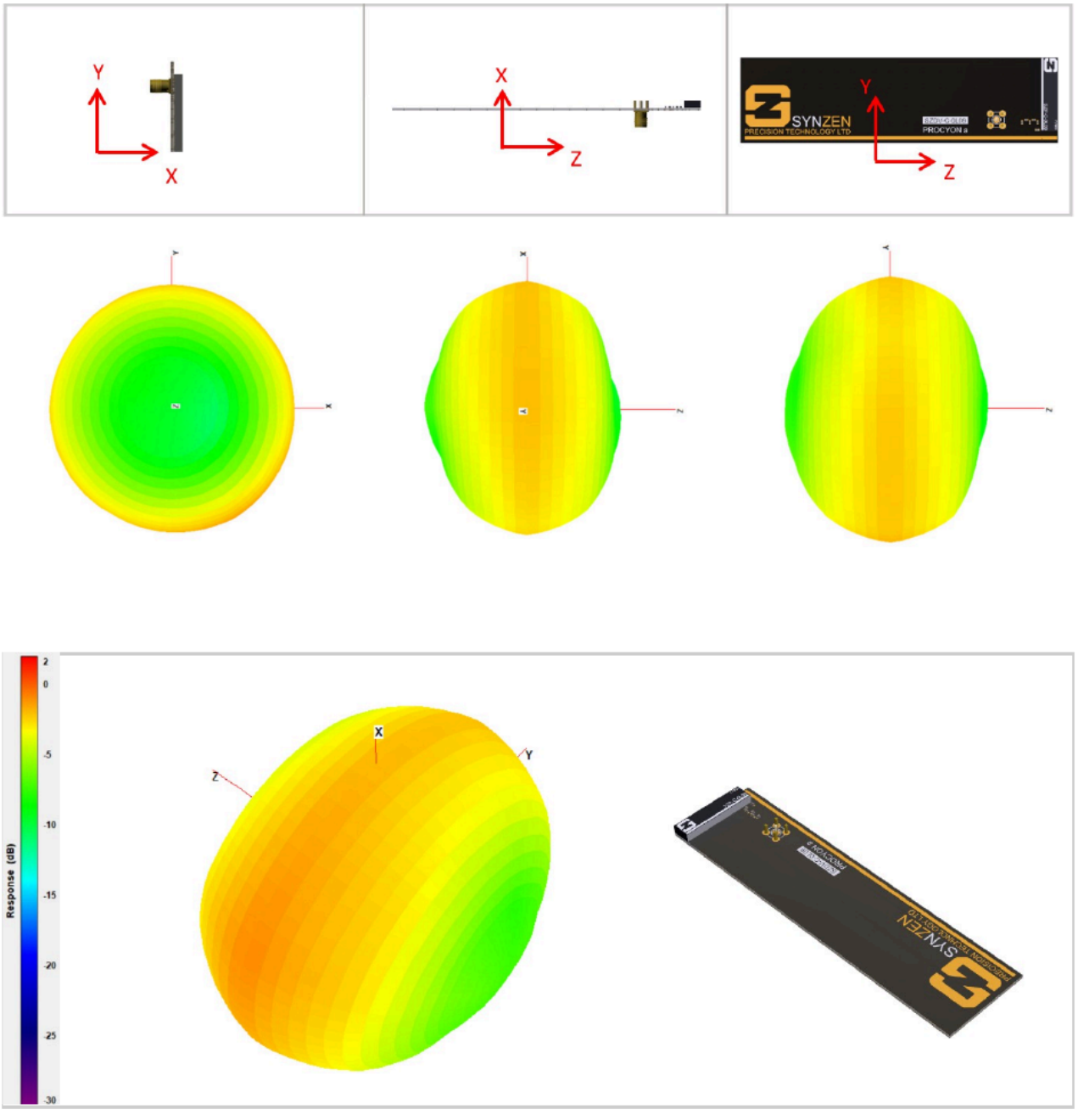
10 2D Polar Plot

The data shown was measured on the Synzen development kit (SZDV-C-0L09).



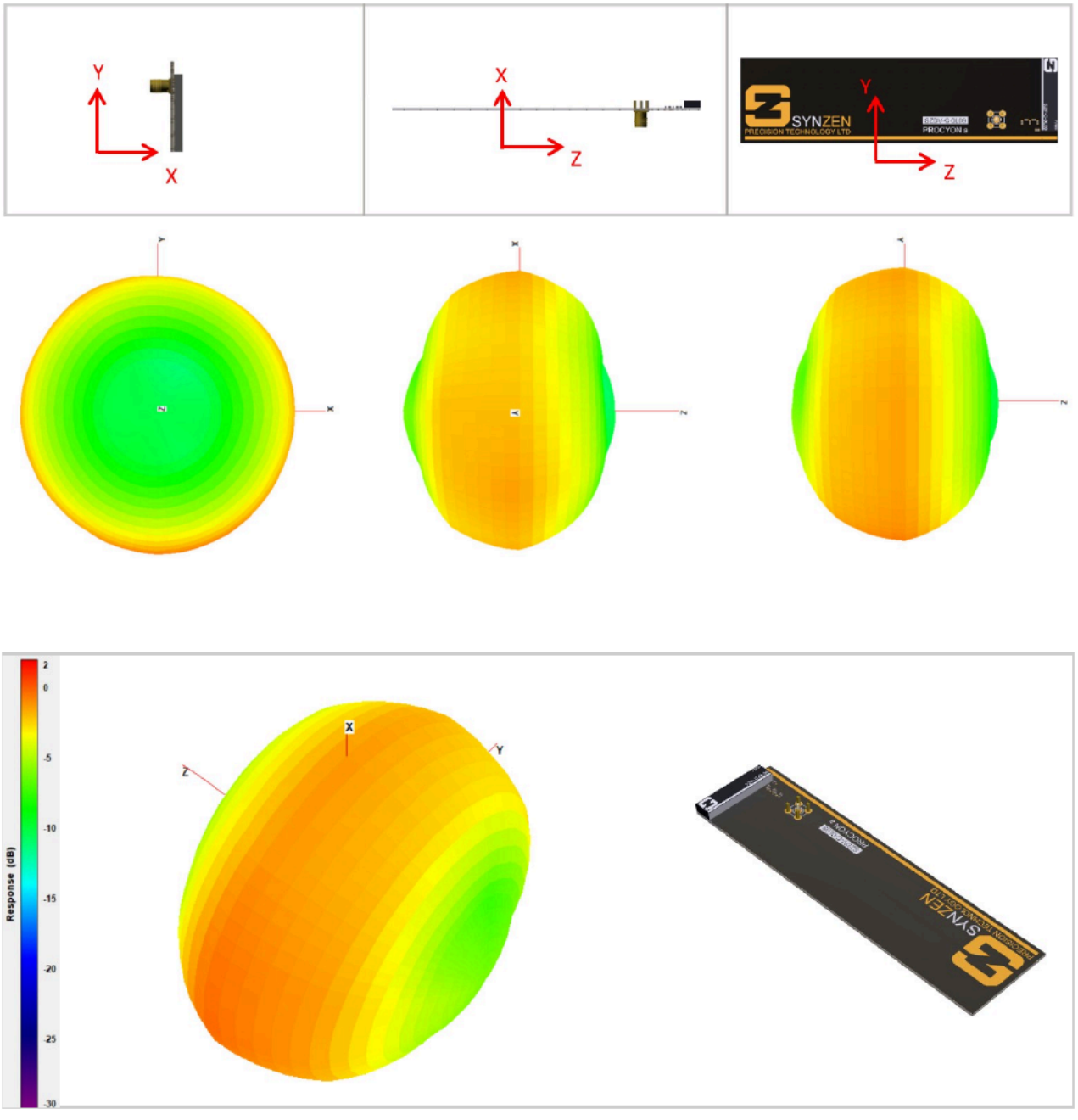
11 3D Radiation Pattern at 714 MHz

The data shown was measured on the Synzen development kit (SZDV-C-0L09) at 714 MHz.



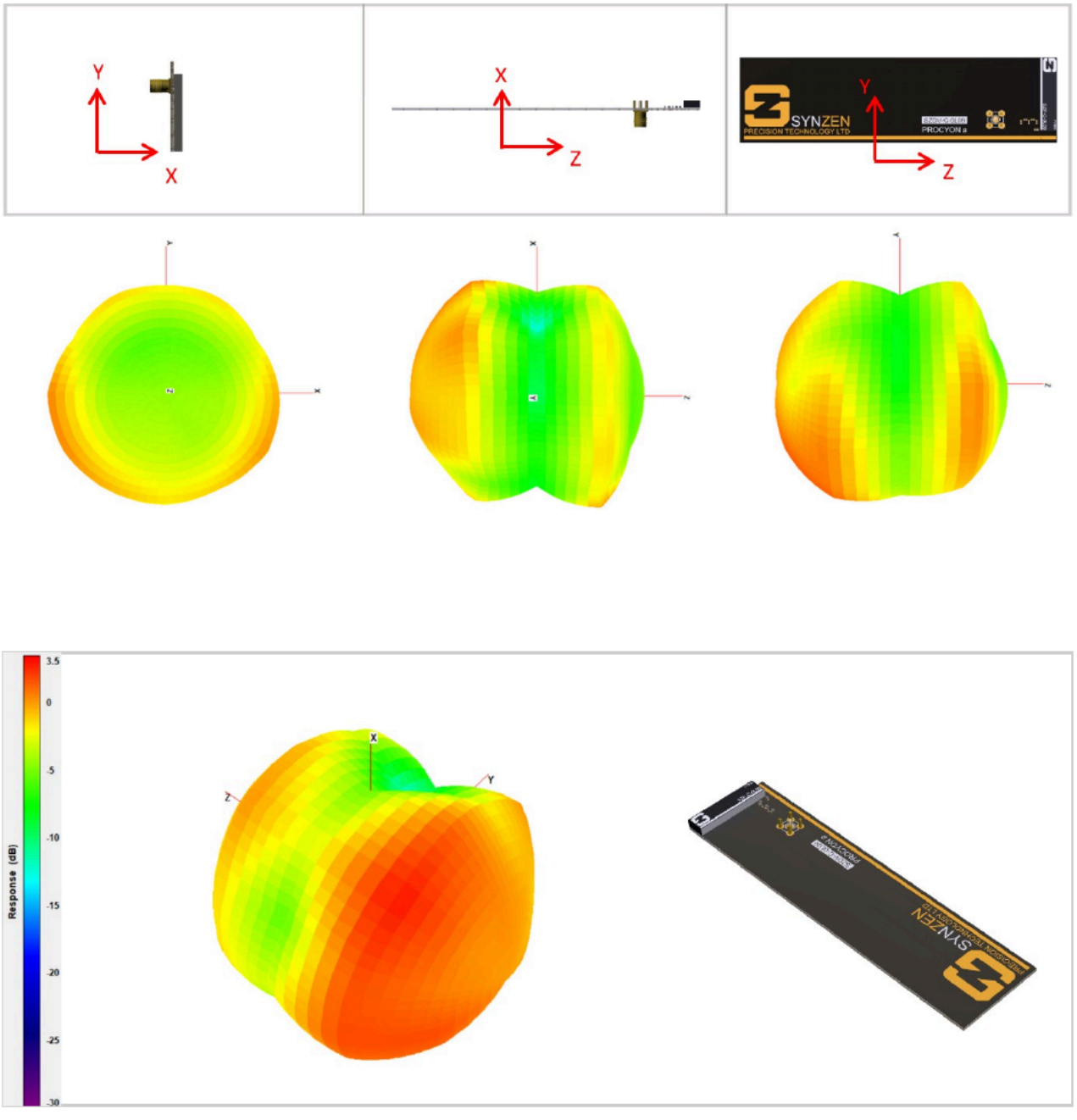
12 3D Radiation Pattern at 870 MHz

The data shown was measured on the Synzen development kit (SZDV-C-0L09) at 870 MHz.



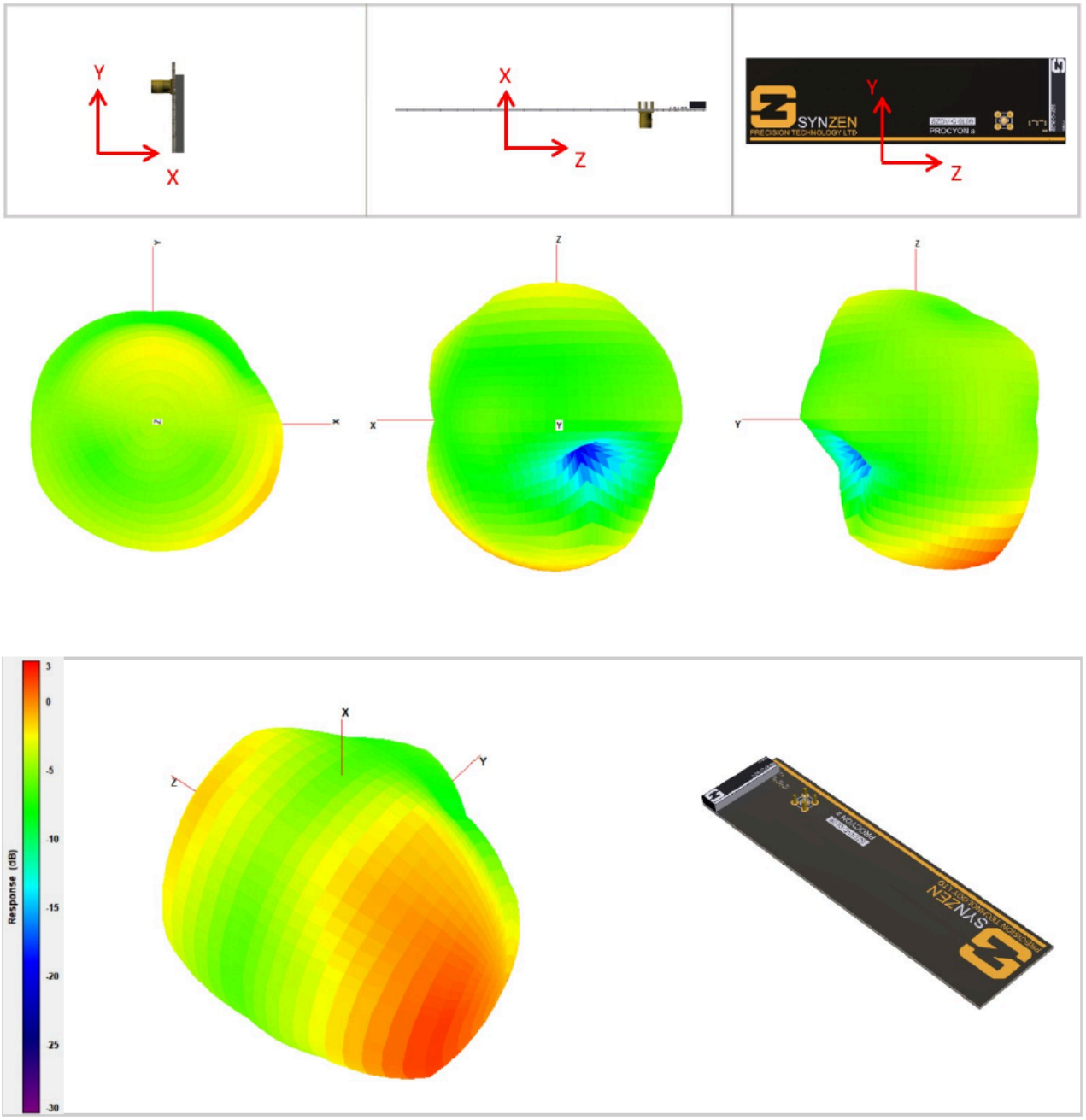
13 3D Radiation Pattern at 1880 MHz

The data shown was measured on the Synzen development kit (SZDV-C-0L09) at 1880 MHz.



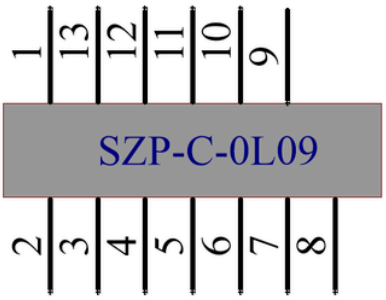
14 3D Radiation Pattern at 2600 MHz

The data shown was measured on the Synzen development kit (SZDV-C-0L09) at 2600 MHz.



15 Schematic Symbol and Pinout

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

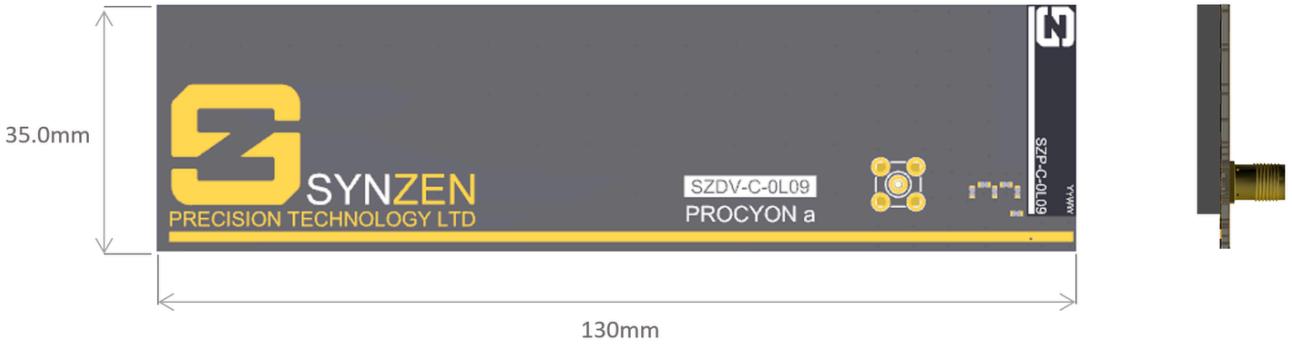


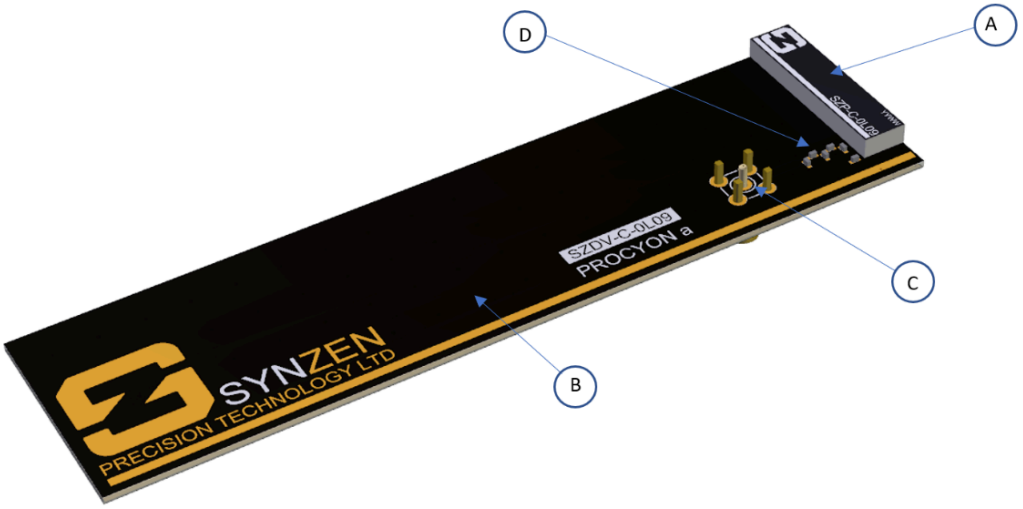
PROCYON a

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 Development Kit

The development kit is a PCBA with the antenna fitted and optimized with a matching network. Connection to the antenna is made using the fitted female SMA connector.

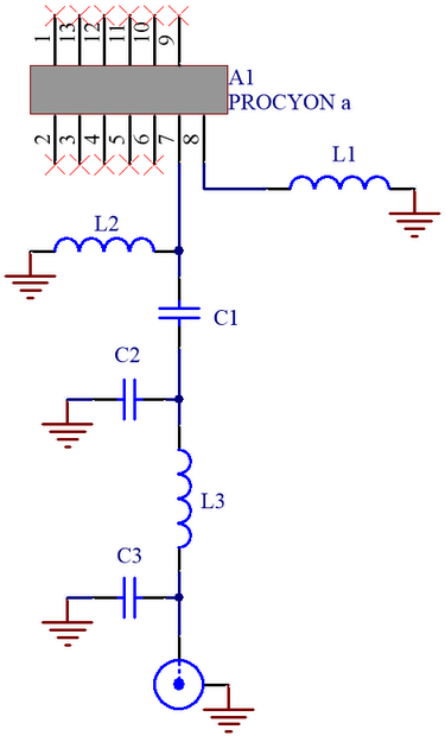




Item	Description
A	SZP-C-0L09 (PROCYON a antenna)
B	Host PCB
C	SMA connector
D	Matching circuit

17 Development Kit Matching Circuit

The development kit circuit and BOM are shown below. The matching network topology should be used on the device host PCB, although the matching values will depend on the host PCB and device environment. Synzen provides an antenna optimization service (AOS) to tune your device for best performance; please contact sales@synzen.com.tw for more information.



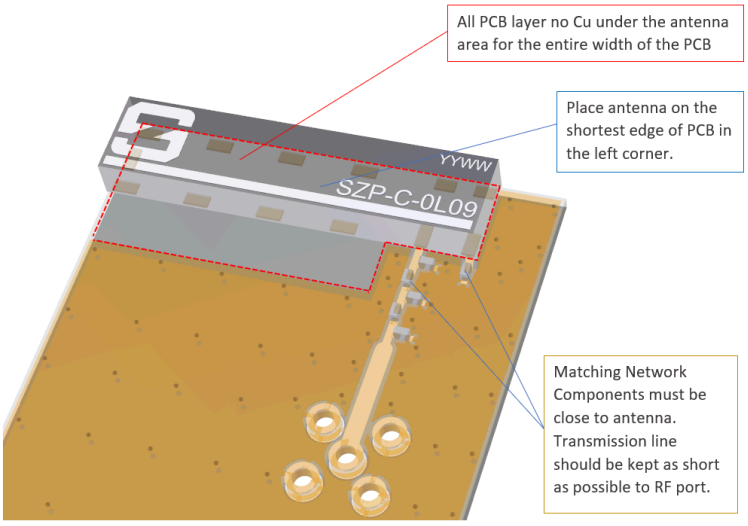
Designator	Component Type	Value	Size	Manufacturer Part No.
A1	Antenna	PROCYON a	-	SZP-C-0L09
L1	Inductor	5.1 nH	0402	LQG15HS5N1H02D
L2	Inductor	68 nH	0402	LQG15HS68NS02D
C2, C3	Not fitted	DNP	0402	Do not place
C1	Capacitor	2.4 pF	0402	GJM1555C1H2R4CB01D
L3	Inductor	2.2 nH	0402	LQG15HS2N2J02D
J1	SMA connector	-	-	ACE Solution A3SAFTST135

18 Placement and Clearance

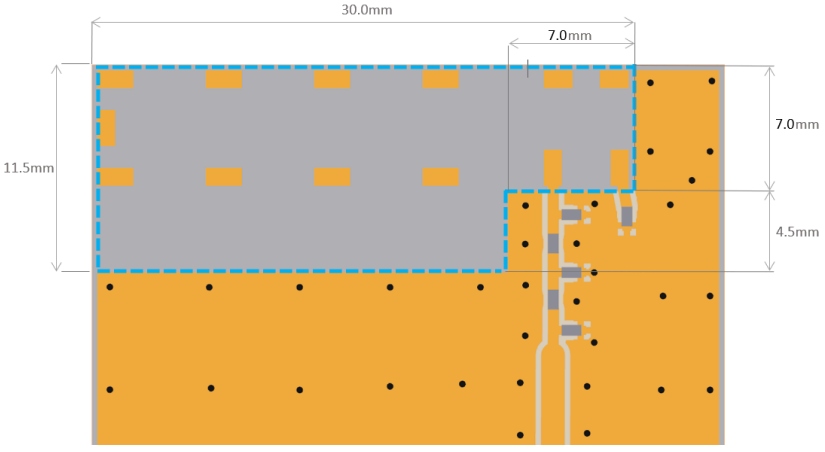
Placement: PROCYON a is designed to be placed at the left hand corner of the host PCB, on the shortest edge of the PCB. There must be no copper on any PCB layer under the antenna area for the entire width of the PCB. Matching network components must be close to the antenna, and the transmission line should be kept as short as possible to the RF port. For a right hand corner version, see PROCYON b (SZP-C-0L10).

Clearance: a clearance is required through all PCB layers for the precise area shown. No components may be placed within this area, otherwise RF coupling from the antenna to nearby conductors will reduce performance significantly. Components such as the battery or display must also avoid this area.

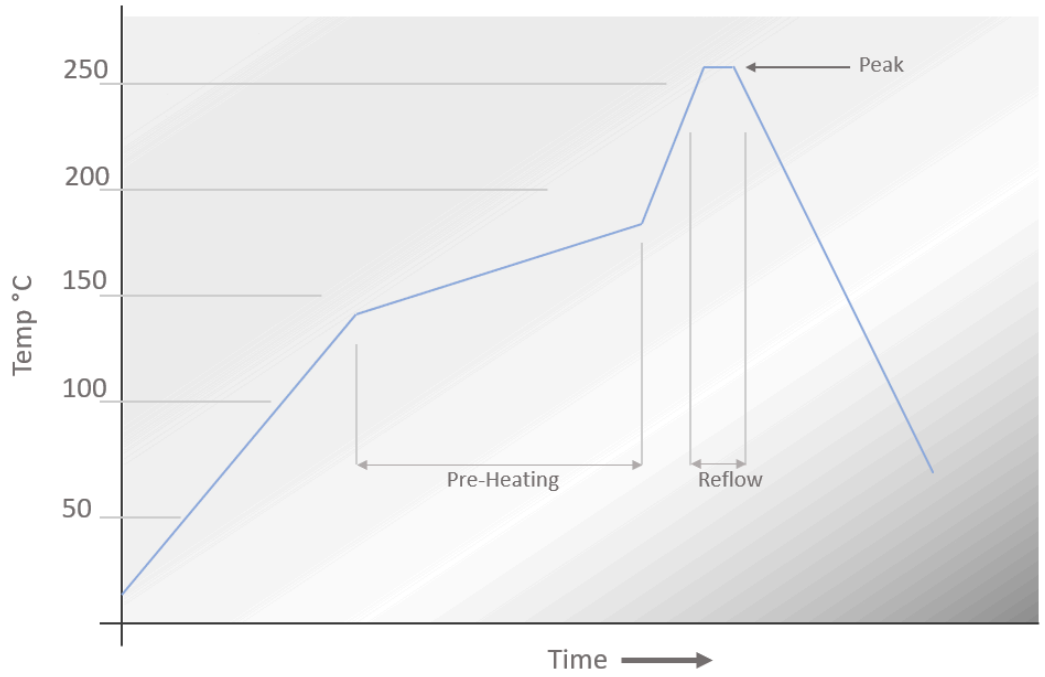
Placement



Clearance



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 Carrier Tape

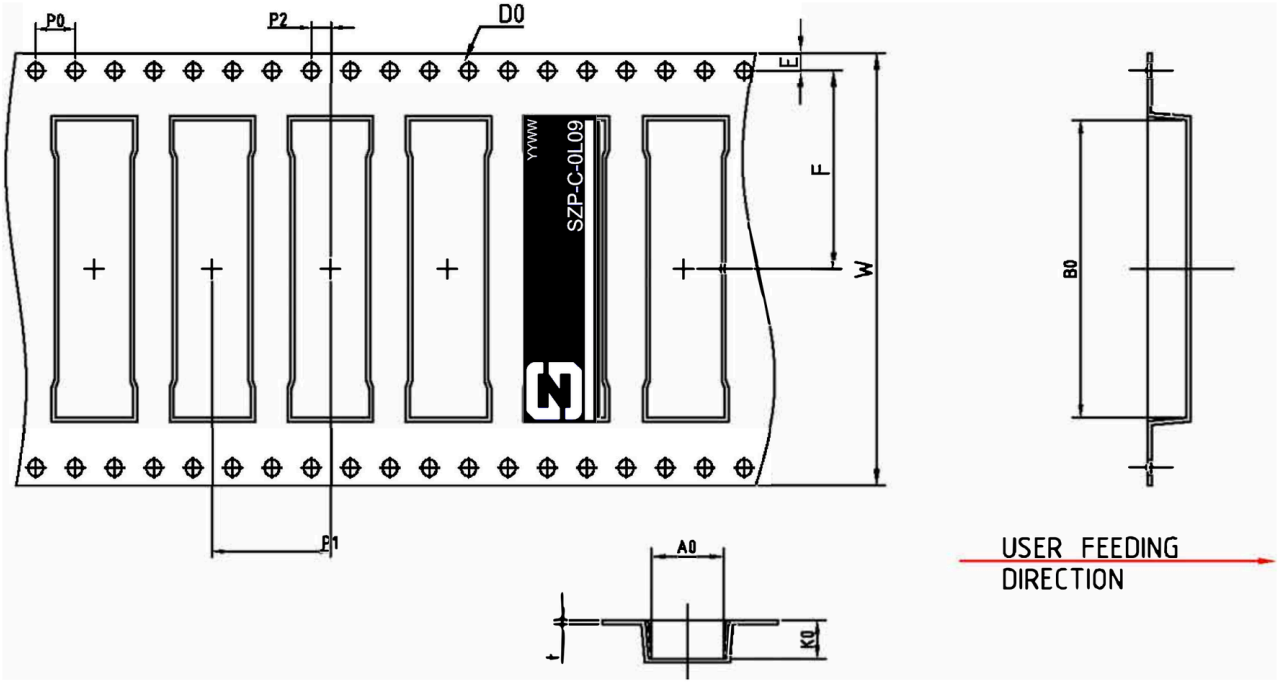
1. 10 sprocket hole pitch cumulative tolerance ±0.2.

2. Camber not to exceed 1 mm in 100 mm.

3. A0 and B0 measured on a plane 0.1 mm 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.

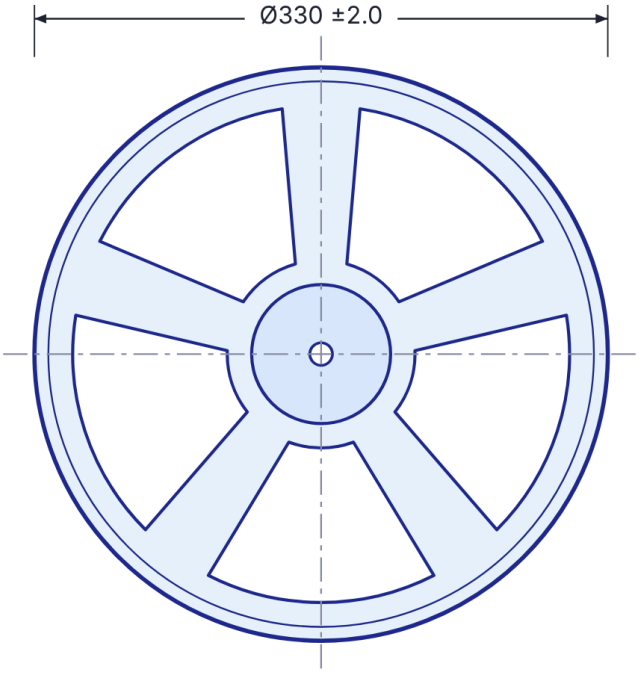
Material: PS. All dimensions in mm; untoleranced dimensions ±0.1.



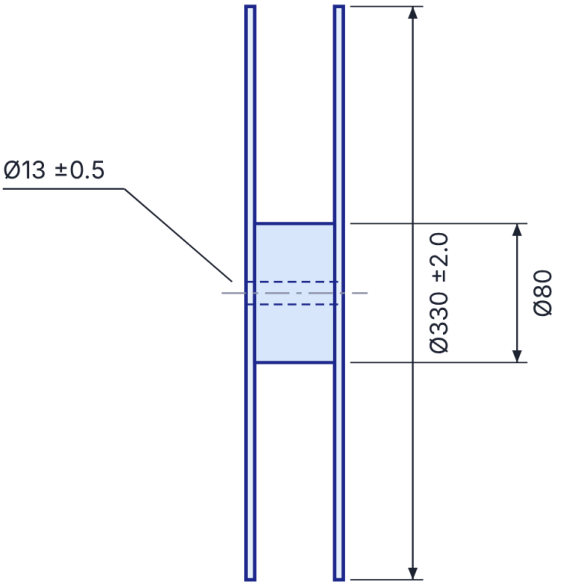
Name	Specification	Name	Specification
W	44.0 ±0.3	P2	2.0 ±0.1
E	1.75 ±0.1	A0	7.30 ±0.1
F	20.20 ±0.1	B0	30.30 ±0.1
D0	1.55 +0.05	K0	3.90 ±0.1
P1	12.0 ±0.1	T	0.40 ±0.05
P0	4.0 ±0.1		

21 Reel

Packed 1,000 pcs per 13 inch anti-static reel. Each reel is vacuum sealed in a moisture barrier bag with desiccant and a humidity indicator card, then shipped in a reel box.



FRONT VIEW



SIDE VIEW

Reel	Specification
Type	Anti-static PS
Color	Black
Reel diameter	Ø330 ±2.0 mm (13 inch)
Hub diameter	Ø80 mm
Spindle hole	Ø13 ±0.5 mm
Quantity per reel	1,000 pcs

22 Packaging

Supplied in tape and reel: 1,000 pcs per 13 inch reel (anti-static PS reel, black, Ø330 mm, hub Ø80 mm)

Each reel is vacuum sealed in a moisture barrier bag with desiccant and a humidity indicator card, then shipped in a reel box.

23 Material Regulation

The antenna has been tested to conform to RoHS requirements. A certificate of conformance is available upon request. This product is halogen free.

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