



NB-IoT Low Profile SMD Antenna

SZP-C-1C02

NB-IoT/ 4G/3G/2 G: 791-960; 1710-2170; 2300-2400; 2500-2690MHz



Name: TAU 1

Part Number: SZP-C-1C02

Description: NB-IoT / 4G/3G/2G Surface Mount Device Antenna

- SMD PCB Antenna using precision laminate materials
- Dimensions: 26.0 x 6.0 x 1.7 (mm)
- RoHS & Reach Compliant, Halogen free



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Description

A low profile and compact and high performing solution for smaller devices. A complete solution for NB-IoT applications.

- Designed to work in compact devices with limited space, corner mounted.
- For NB-IoT Applications, but also suitable for 4G/3G/2G systems
- Less dependency on GND plane length
- SMD component supplied in Tape and reel.
- Higher performance than larger OTS solutions
- Project life support direct from Synzen Engineers
- Suitable for sealing with resin / potting compounds.



Applications

Telematics
Smart City
Drones

Smart Metering
Gateways
POS

Home Automation
Healthcare
OBD-II



26.0 x 6.0 x 1.7 (mm)



Patent pending design



General Specifications

Mechanical Specifications

Part Number	SZP-C-1C02
Name	TAU 1
Dimensions	26.0 x 6.0 x 1.7 (mm)
Required Clearance area	286 mm ²
Weight	0.5g
Antenna Type	Surface Mount Device

RF Specifications

Frequency Range (MHz)	791-960	1710-2170	2300-2400	2500-2690
Average Efficiency (Linear)	>55%	>55%	>60%	>65%
Peak Gain (dBi)	1.14	2.99	2.67	3.00
S11 (max) dB	<-5.6	<-5.3	<-5.1	<-7.0
VSWR (max)	3.2:1	3.3:1	3.4:1	2.6:1
Impedance	50 Ω			
Polarization	Linear			

The data shown was measured on Synzen DVK (SZDV-C-1C02)

Environmental Specifications

Operational Temperature	-40 to +125 (°C)
Storage Temperature	-10 to +40 (°C)
Relative Humidity	≤75%



Bands Covered by SZP-C-1C02

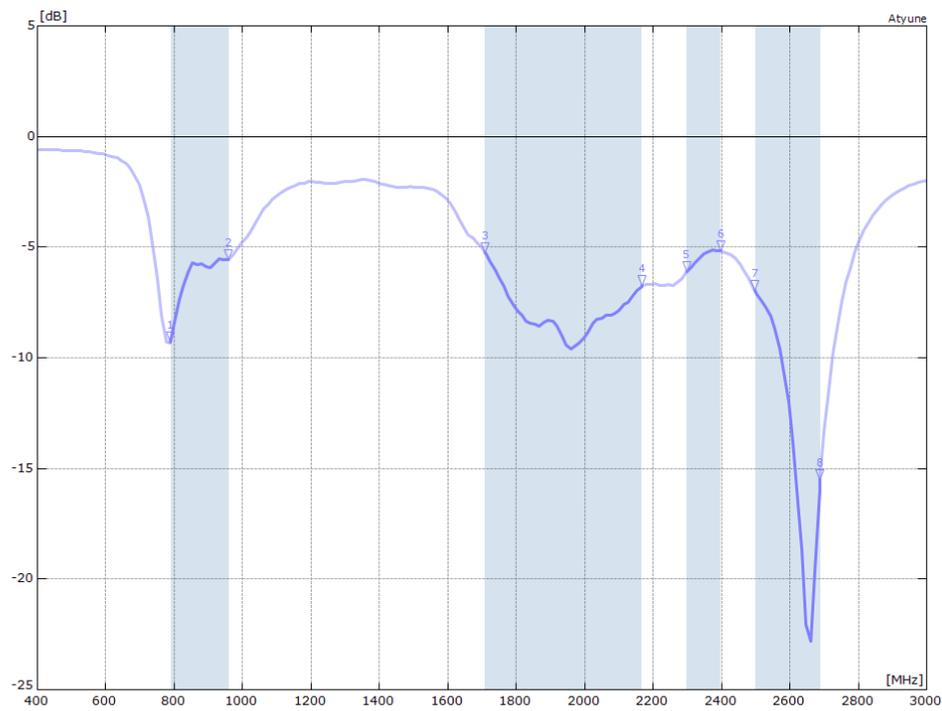
Supported band list

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	No
13	700	777-787	746-756	No
14	700	788-798	758-768	No
17	700	704-716	734-746	No
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	No
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	YES
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		YES
43	3700	3600-3800		YES
44	700	703-803		No
45	1500	1447-1467		No
46	5200	5150-5925		No
47	5900	5855-5925		No
48	3600	3550-3700		No
50	1500	1430-1517		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	No
69	2600	N/A	2570-2620	YES
70	2000	1695-1710	1995-2020	YES
71		663-698	617-652	No
74		1427-1518		No
77		3300-4200		No
78		3300-3800		No
79		4400-5000		No

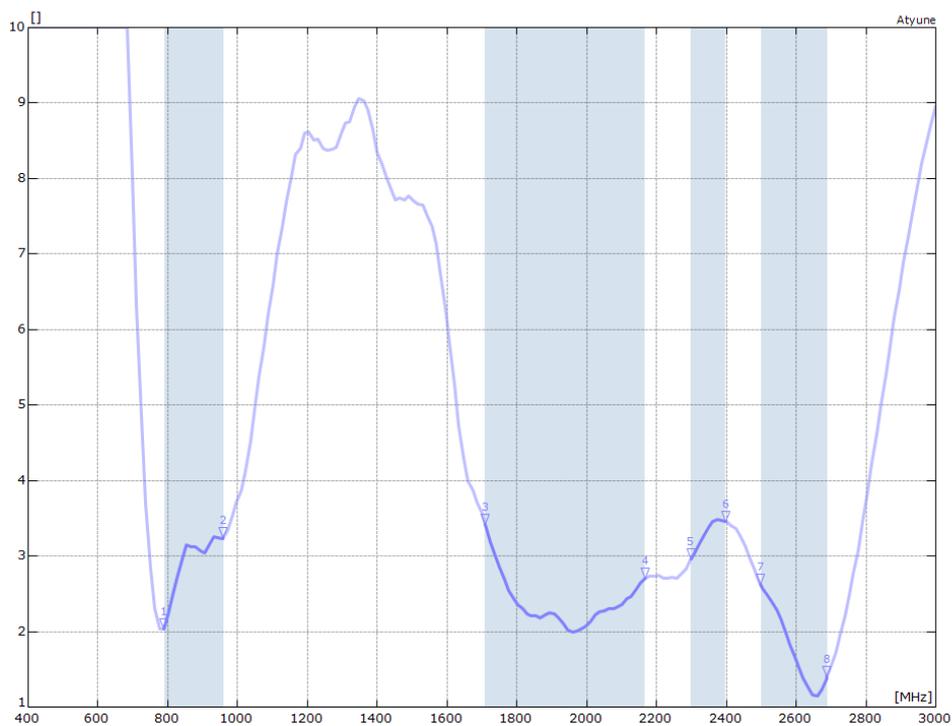


RF Characteristics

S11 Parameter



VSWR



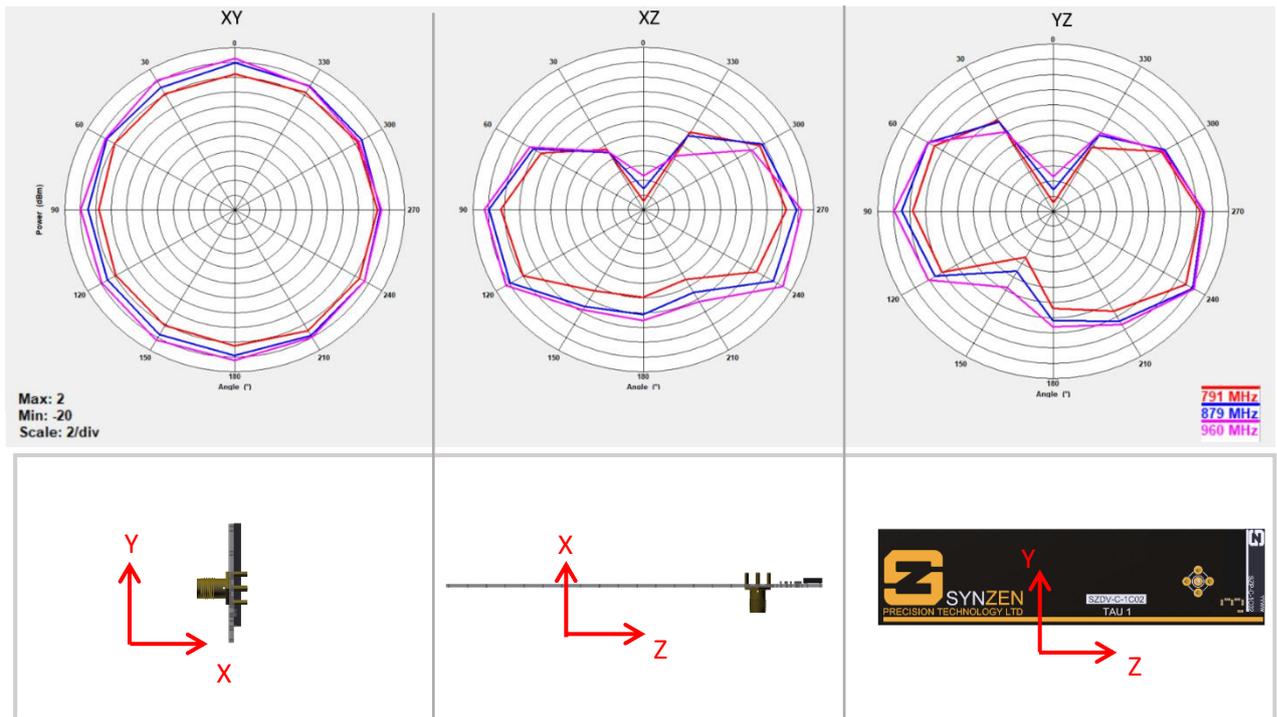


Radiated Performance

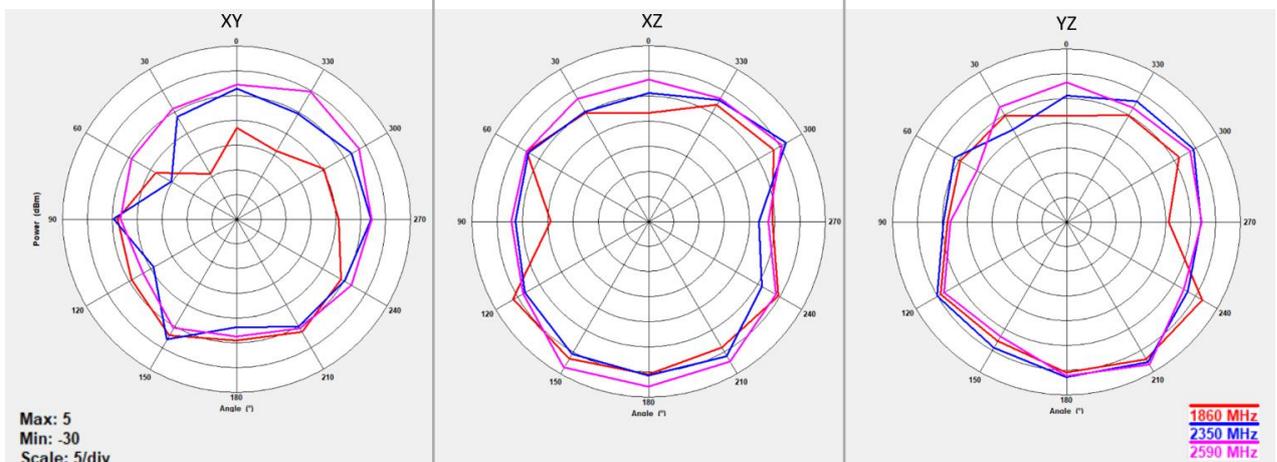
2D Polar Plot

The data shown was measured on Synzen DVK (SZDV-C-1C02)

791-960MHz



1710 -2690MHz

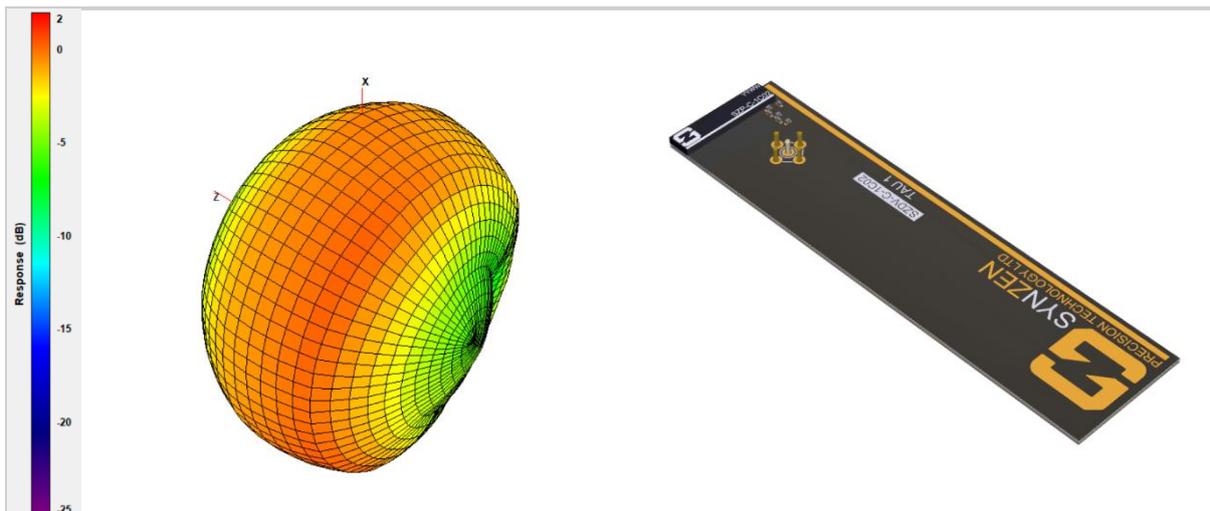
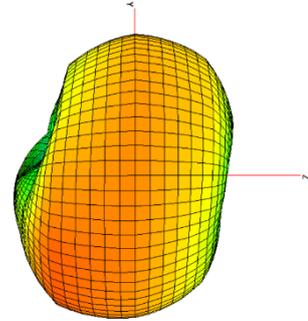
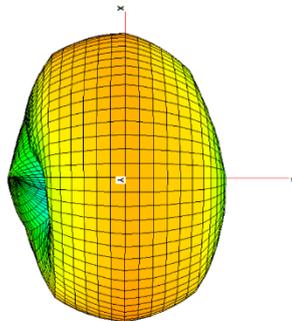
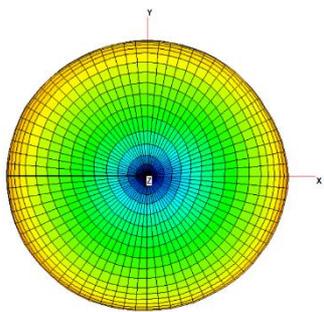
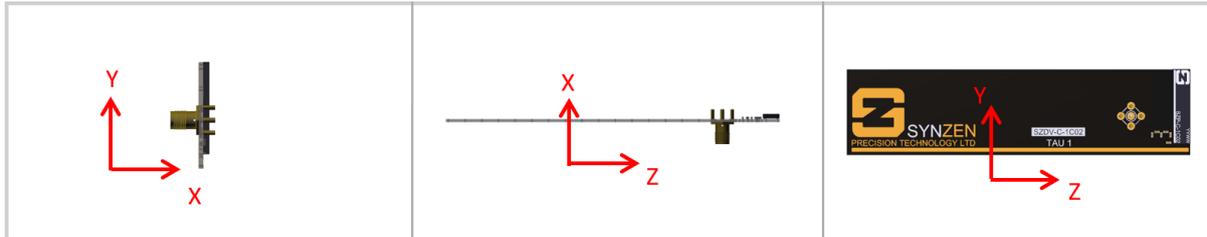




Radiated Performance

3D Radiation Pattern at 880MHz

The data shown was measured on Synzen DVK (SZDV-C-1C02).

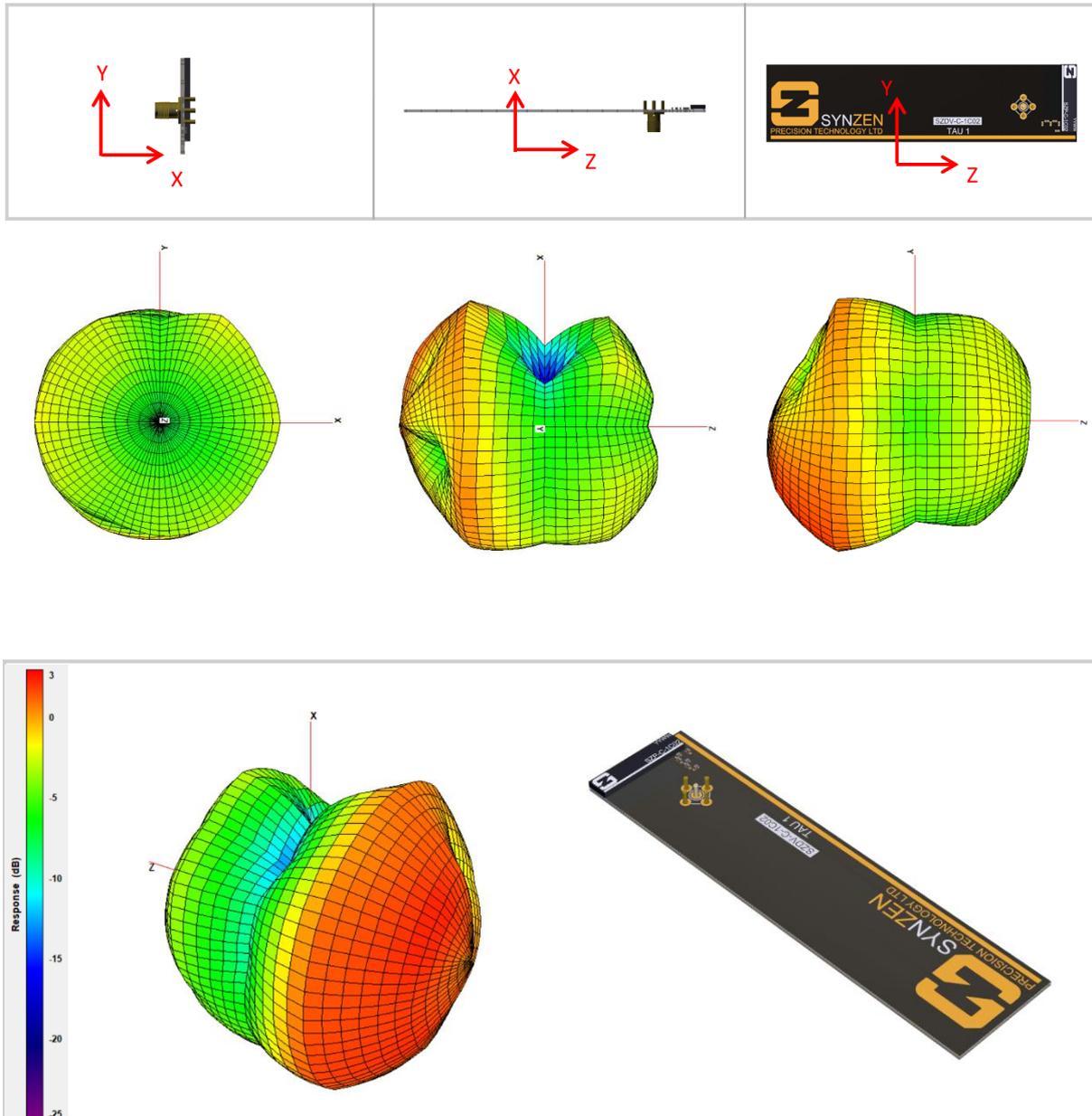




Radiated Performance

3D Radiation Pattern at 1880MHz

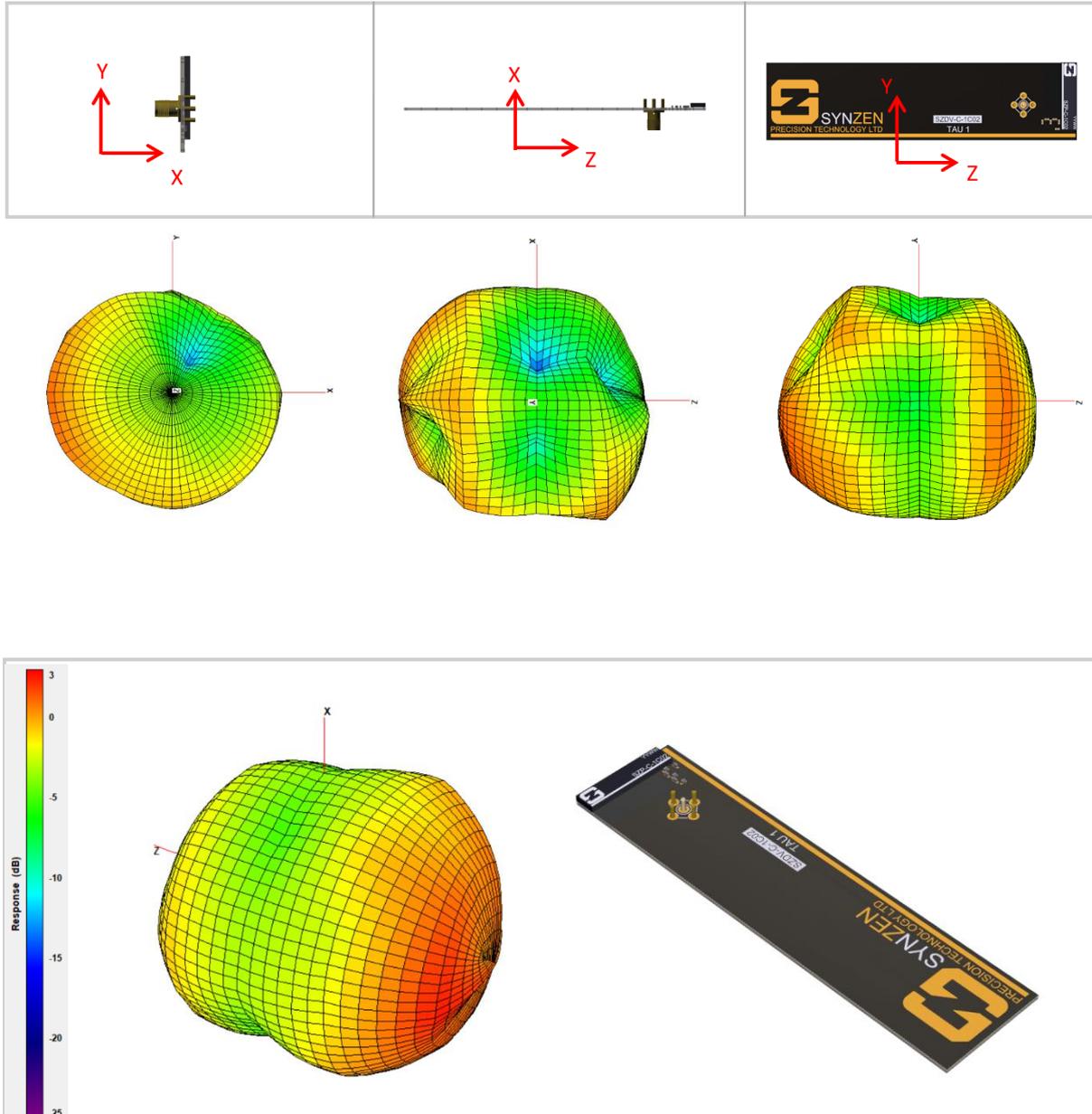
The data shown was measured on Synzen DVK (SZDV-C-1C02).



Radiated Performance

3D Radiation Pattern at 2350MHz

The data shown was measured on Synzen DVK (SZDV-C-1C02).

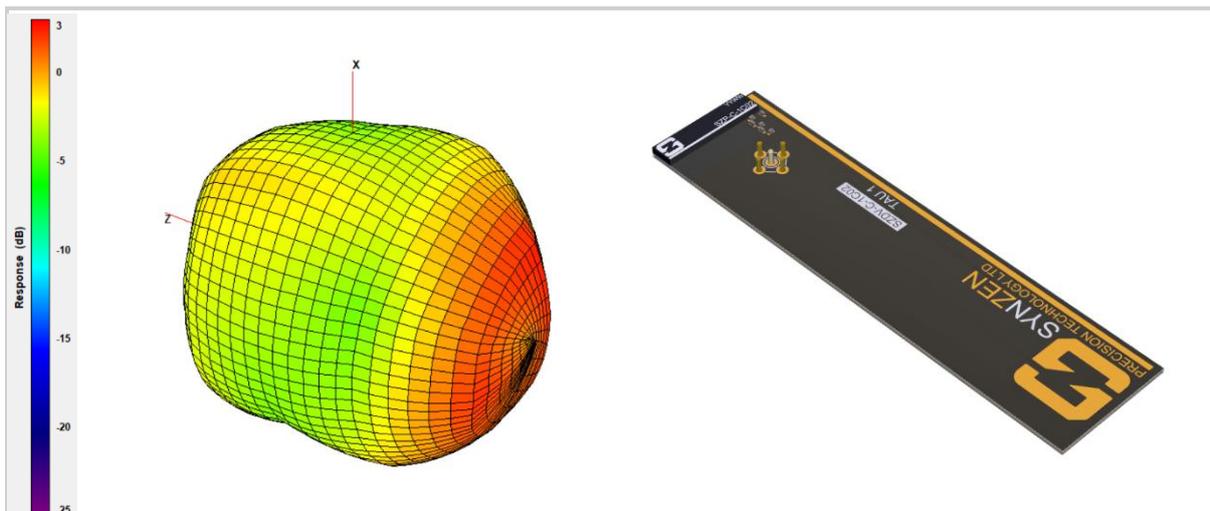
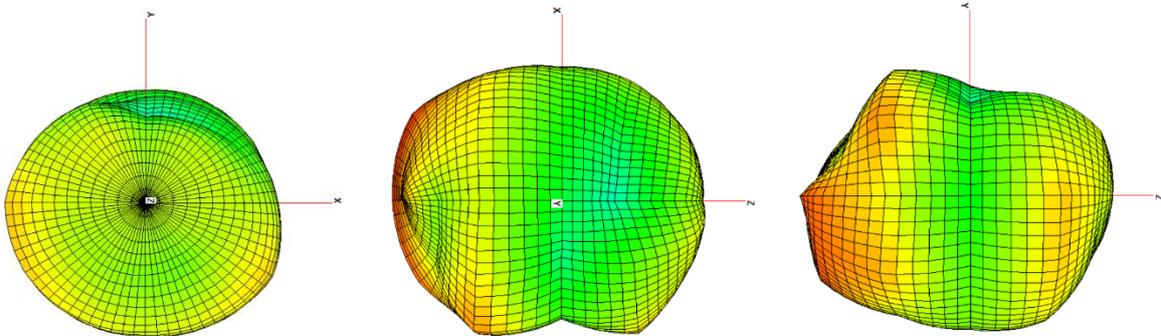
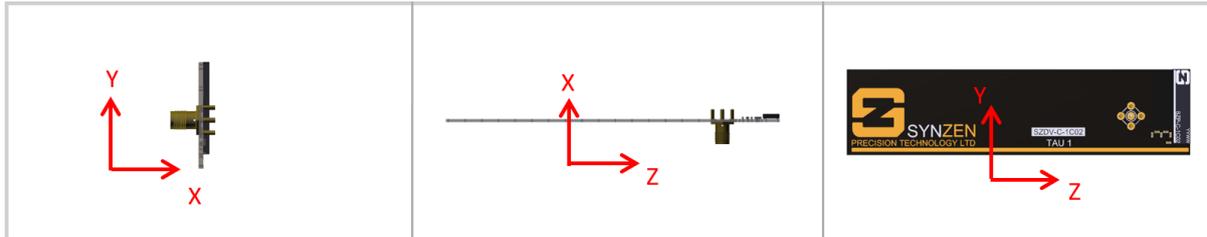




Radiated Performance

3D Radiation Pattern at 2600MHz

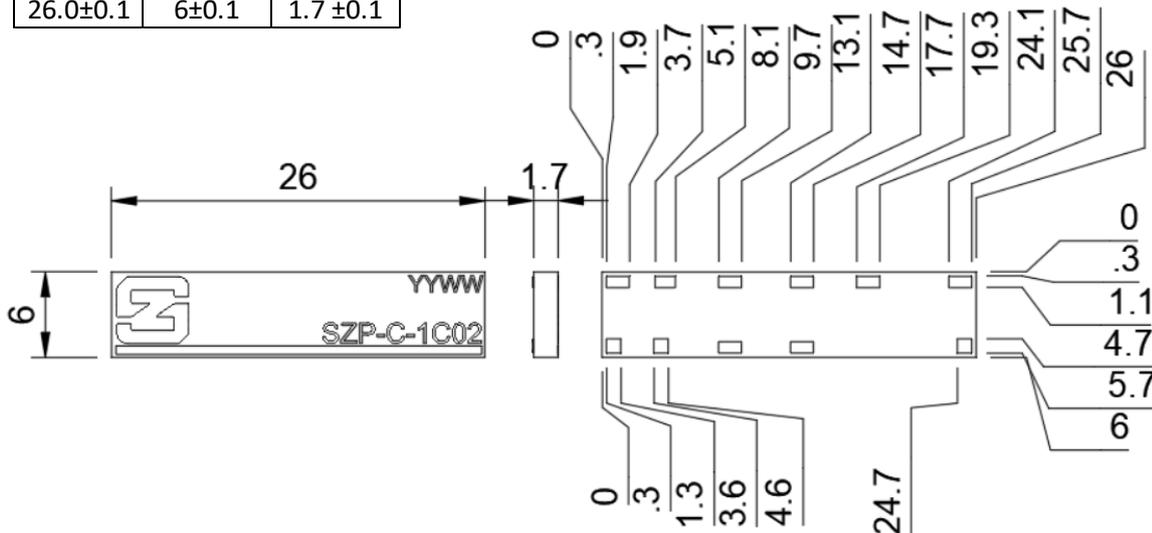
The data shown was measured on Synzen DVK (SZDV-C-1C02).



Mechanical

Antenna Mechanical Drawing

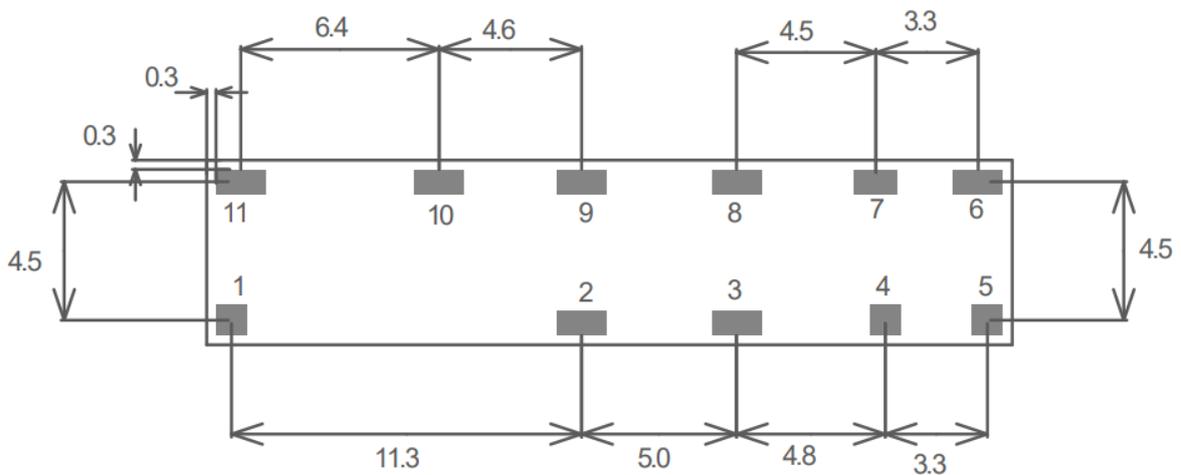
L	W	H
26.0±0.1	6±0.1	1.7±0.1



All dimensions in mm

Required Host PCB Footprint

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

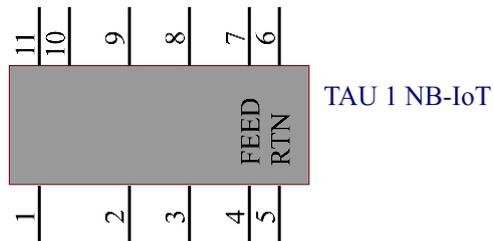


PADS 1,4,5 = 1.0X1.0
 PAD 7 = 1.4X0.8
 PAD 2,3,6,8,9,10,11 = 1.6X0.8

Antenna Pinout

SZP-C-1C02 Schematic Symbol

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



Pin	Description
1,2,3,6,9,10,11	Not used (Mechanical support)
4	Feed to Matching network
5	Tuning Return

Development Kit Mechanical

SZDV-C-1C02 Development Kit

The SZDV-C-1C02 development kit is a PCBA with the NB-IoT antenna (SZP-C-1C02) fitted and optimised with a matching network. Connection to the antenna is made using the fitted female SMA connector.

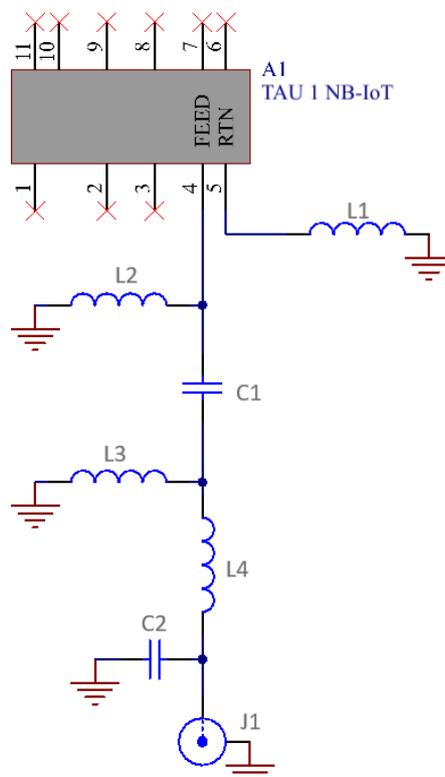


A	SZP-C-1C02 (TAU1)
B	Host PCB
C	SMA Connector
D	Matching Circuit

Development Kit Circuit

Development 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 optimise your device to ensure the best performance, please contact sales@synzen.com.tw for more information.

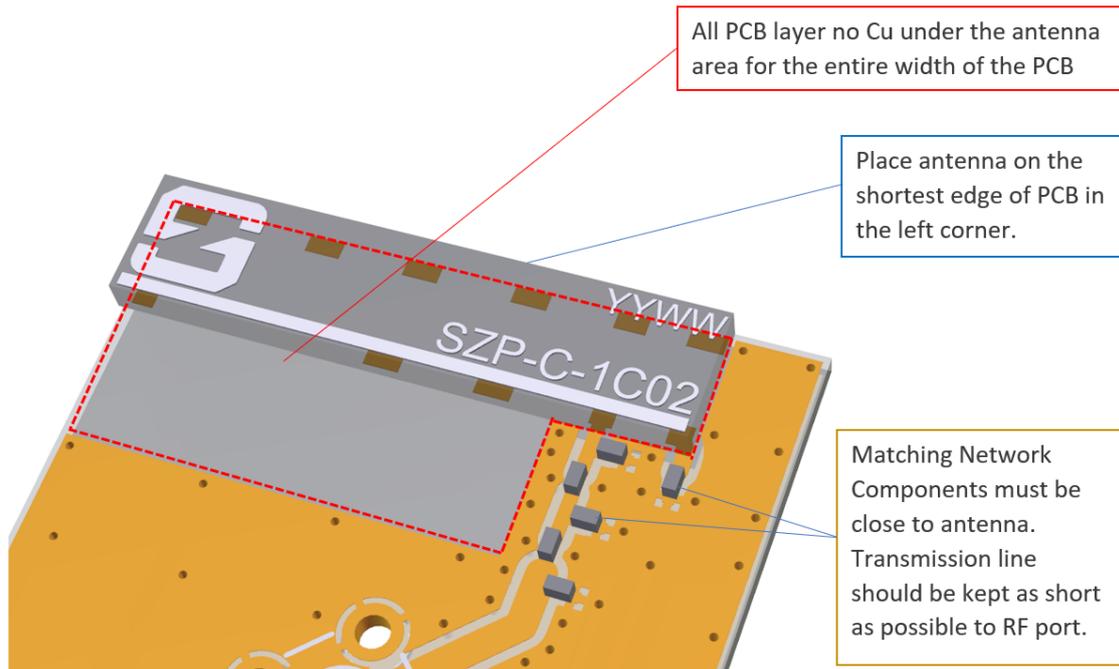


Designator	Component Type	Value	Size	Manufacturing Part No.
A1	Antenna	TAU 1	-	SZP-C-1C02
L1	Inductor	6.2nH	0402	LQG15HN6N2S02D
L2	Inductor	33nH	0402	LQG15HS33NJ02D
L3	Inductor	47nH	0402	LQG15HS47NJ02D
L4	Inductor	3.9nH	0402	LQG15HS3N9S02D
C1	Capacitor	2.2pF	0402	GJM1555C1H2R2CB01D
C2	NA	DNP	0402	Not Fitted
J1	SMA Connector	-	-	ACE solution A3SAFTST135

Host PCB Placement and Clearance

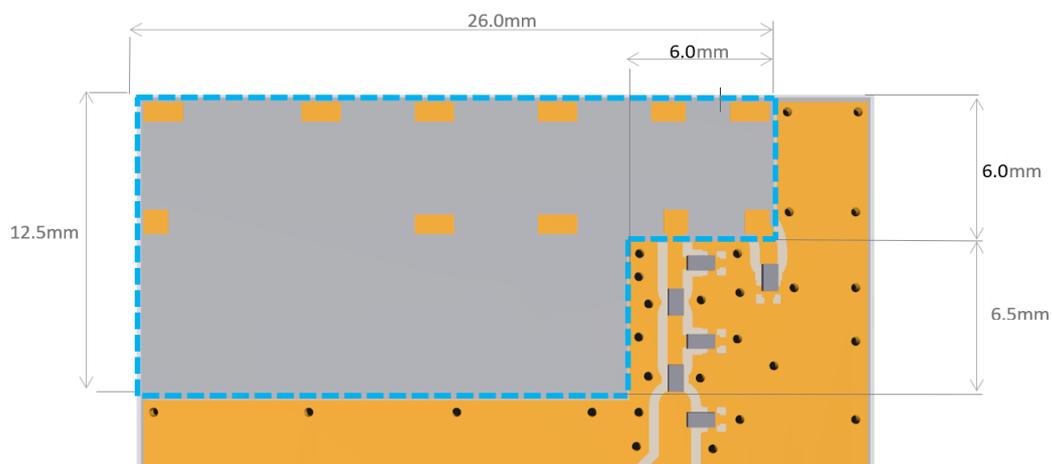
Placement

The antenna is designed to function placed at the left side corner of the host PCB. For a right-hand side version see TAU b (SZP-C-1C03).



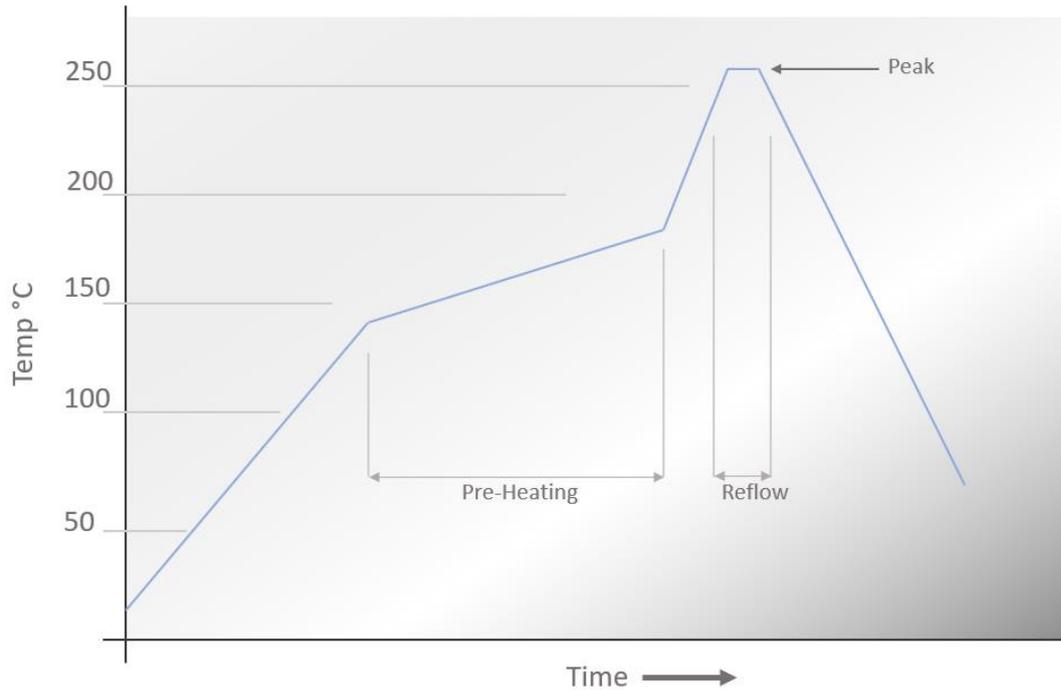
Clearance

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. Also, any components such as battery or display must also avoid this area.



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



Environmental

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.



Synzen Precision Technology Ltd



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