ISM Ceramic SMD Antenna SZC-C-1M07

ISM: 863-870 or 902-928 MHz

Description

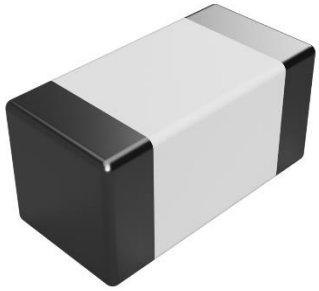
A small and versatile ceramic antenna for embedded design. Synzen have created CORVI, the optimal solution for ISM applications. Focused tuning for either 868 or 915 using a simple tuning selection required for your application.

This antenna resonates best when placed at the centre of the longest PCB edge and produces a near omni directional pattern.

- For ISM Applications 868/915MHz
- Highly Resistant to detuning
- Clean resonance with no unwanted out of band response.
- SMD ceramic chip component supplied in Tape and reel
- High performance yet ultra-small form factor >55% efficiency
- Ideal for smaller wearable designs for de-tuning resistance
- Suitable for sealing with resin / potting compounds

Applications

Wearables	Sigfox	LoRa
Alarm Systems	Meter Reading	Remote Monitoring
Smart Grid	RFID	LPWAN



General Specifications

Mechanical Specifications

Part Number	SZC-C-1M07
Name	CORVI
Dimensions	1.6 x 0.8 x 0.8 (mm)
Required Clearance area	12.0 x 5.7 (mm)
Weight	<0.2g
Antenna Type	Surface Mount Device

RF Specifications

Band	Frequency Range (MHz)	Efficiency (%) At centre frequency	Peak Gain (dBi)	Impedance	Polarization
ISM 868	863-870	>50	0.35	50Ω	Linear
ISM 915	902-928	>55	1.60		

*All performance stated is measured of SZDV-C-1M07 evaluation kit

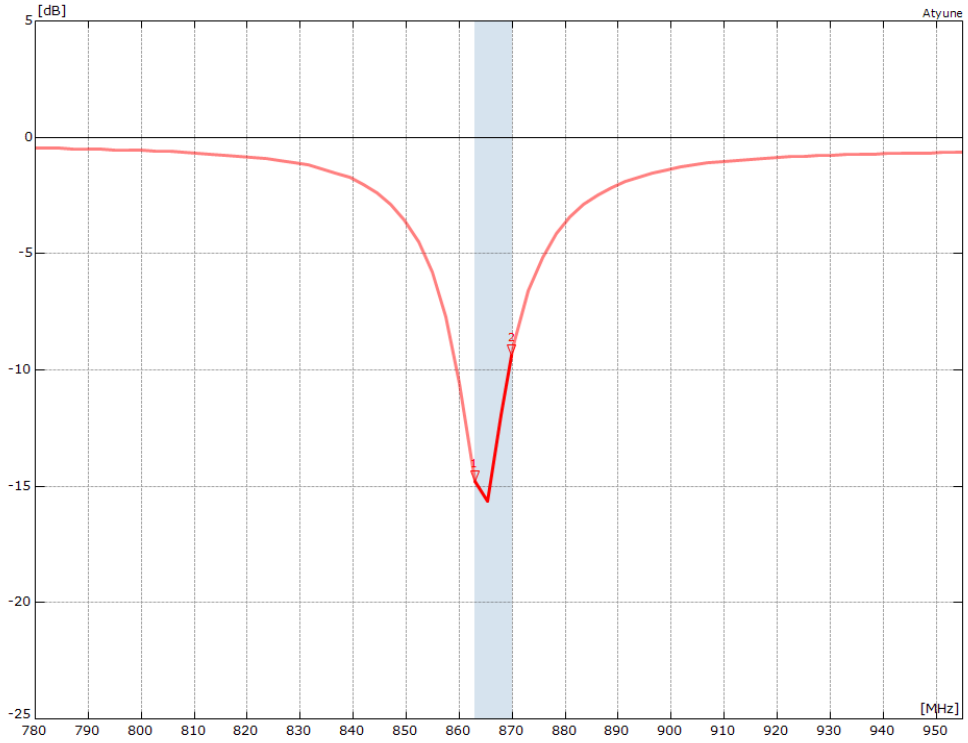
**Tuning for each ISM band was conducted separately.

Environmental Specifications

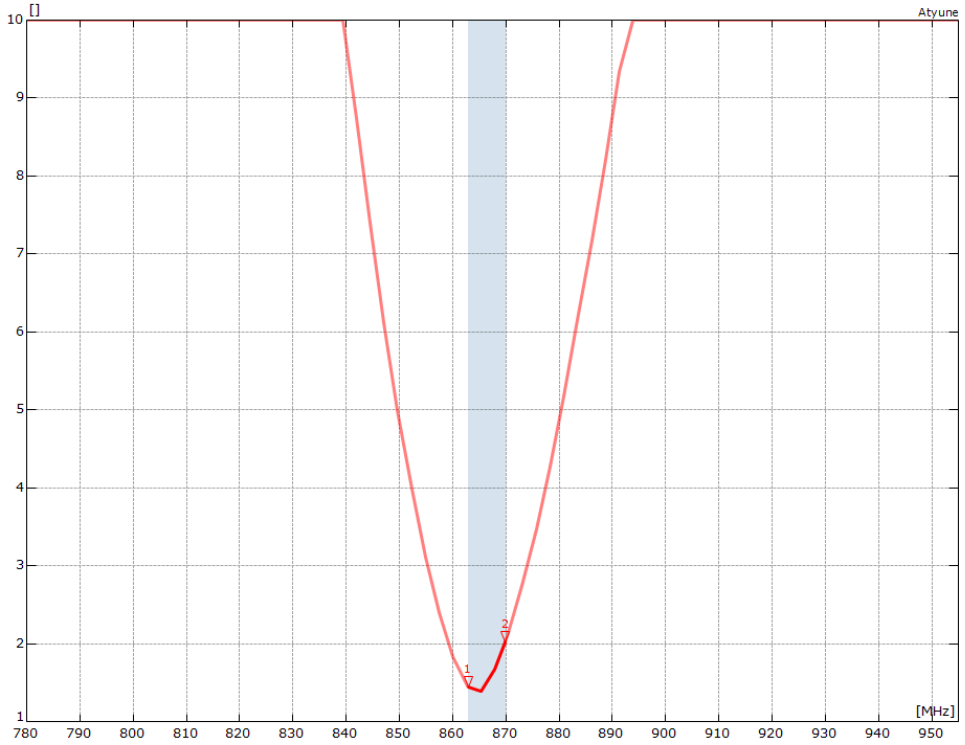
Operational Temperature	-40 to +125 (°C)
Storage Temperature	-10 to +40 (°C)
Relative Humidity	≤75%

RF Characteristics

S11 Parameter at ISM 868

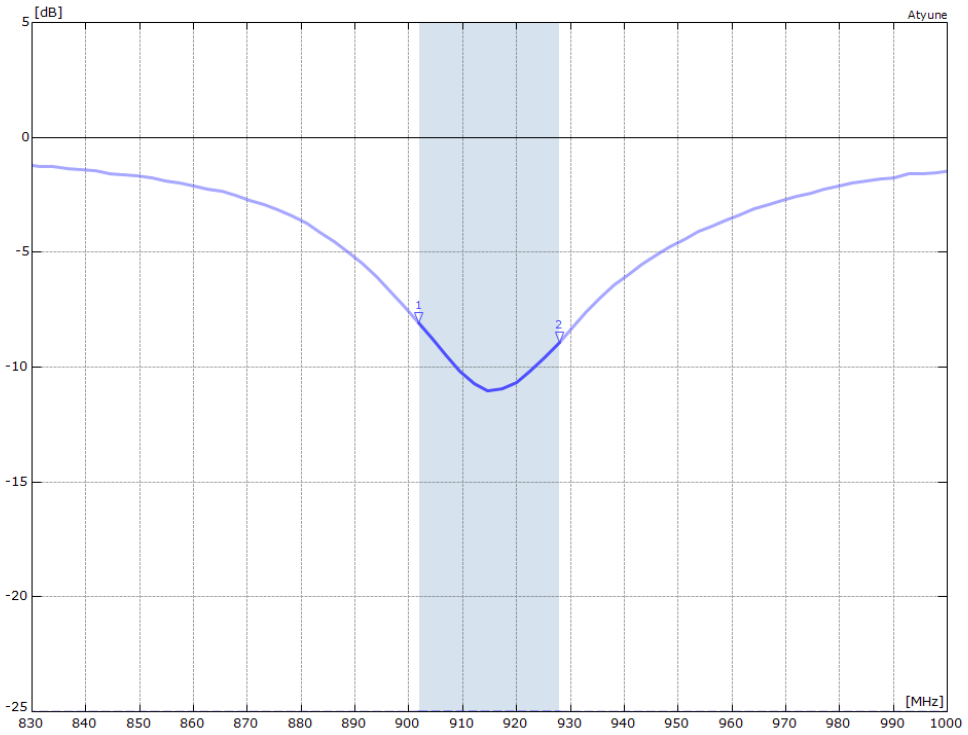


VSWR at ISM 868

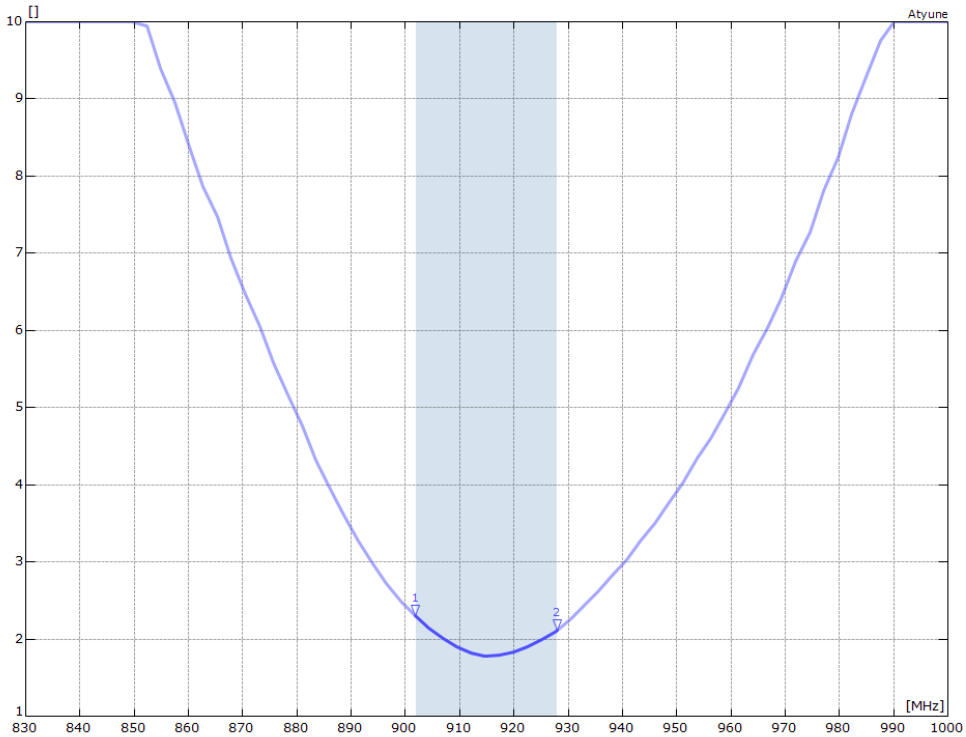


RF Characteristics

S11 Parameter at ISM 915

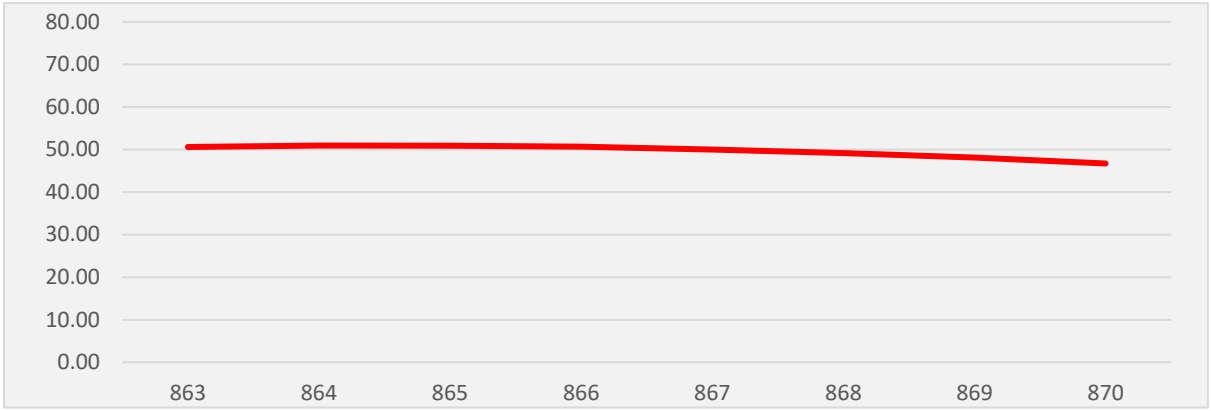


VSWR at ISM 915

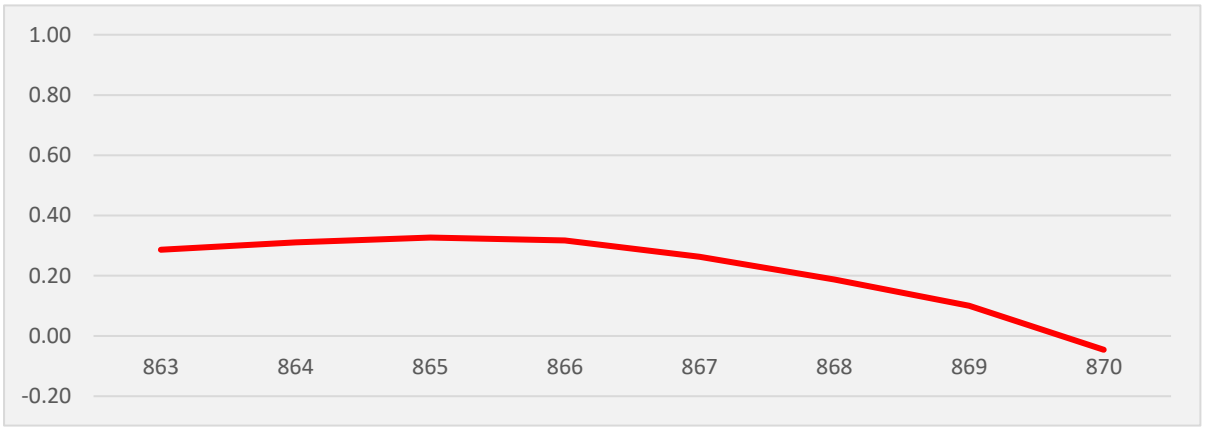


Antenna Performance at ISM 868

Efficiency



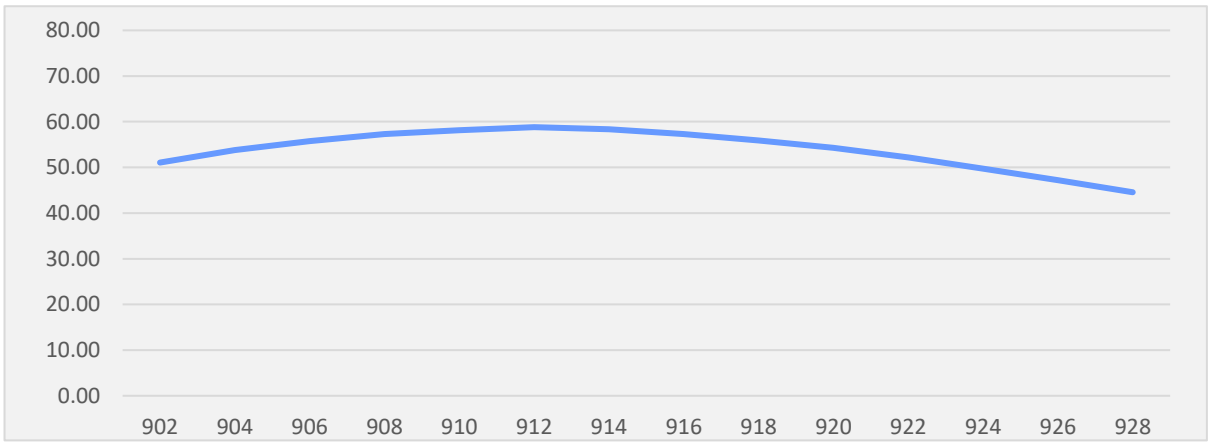
Peak Gain



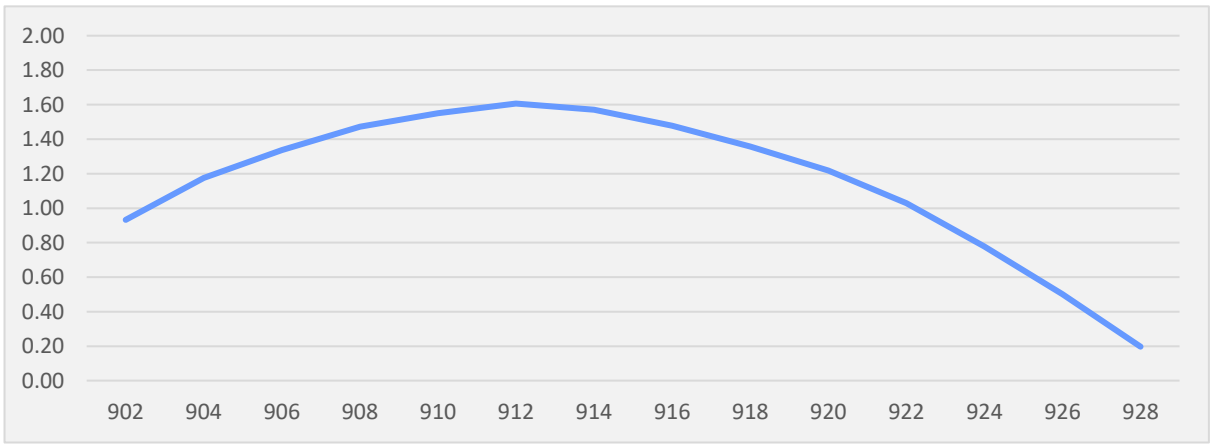
Average Gain

Antenna Performance at ISM 915

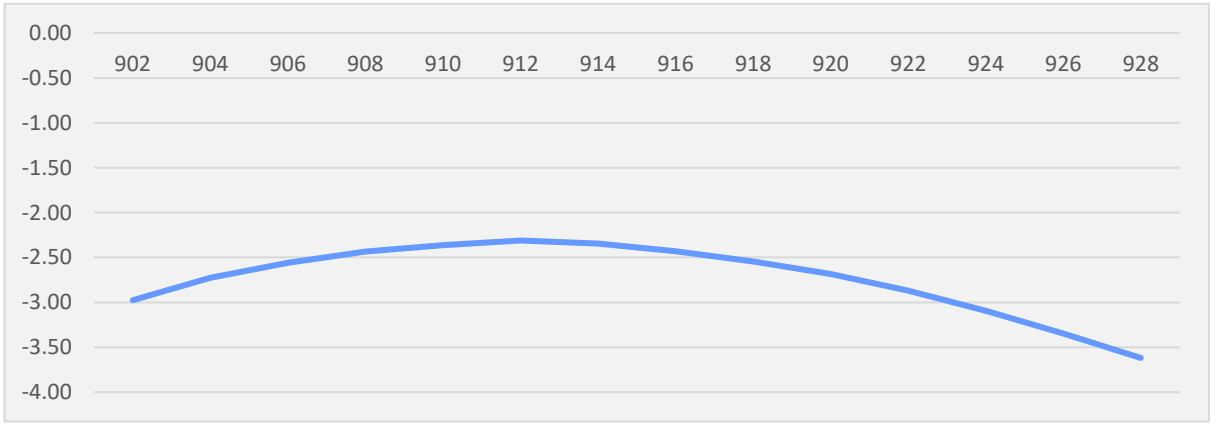
Efficiency



Peak Gain



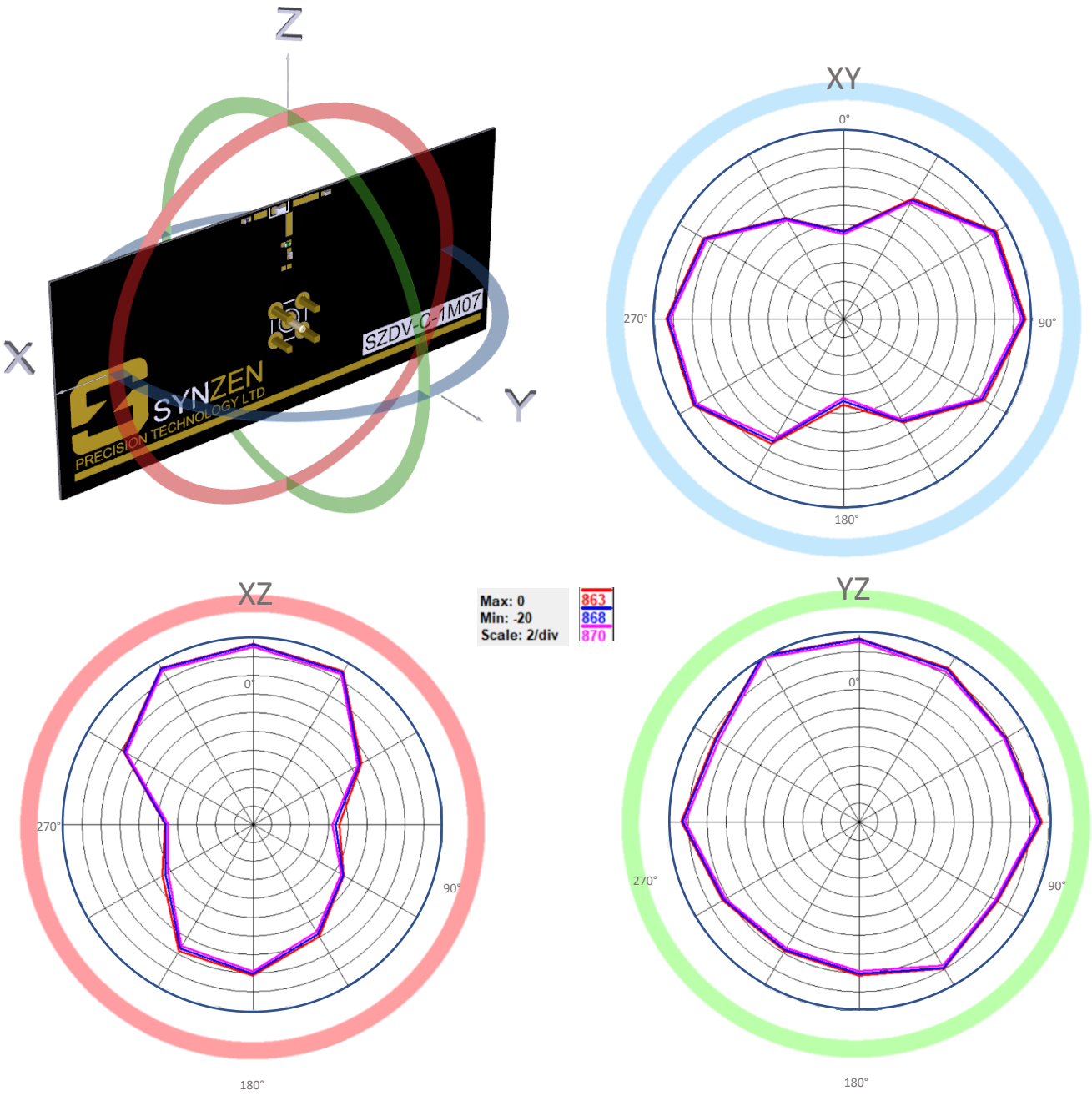
Average Gain



Radiated Performance

2D Polar Plot 863-870 MHz

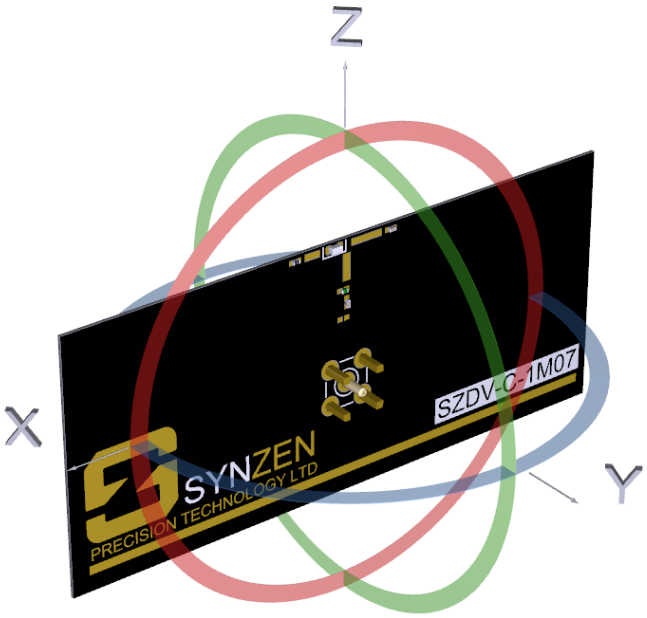
The data shown was measured on Synzen EVK (SZDV-C-1M07)

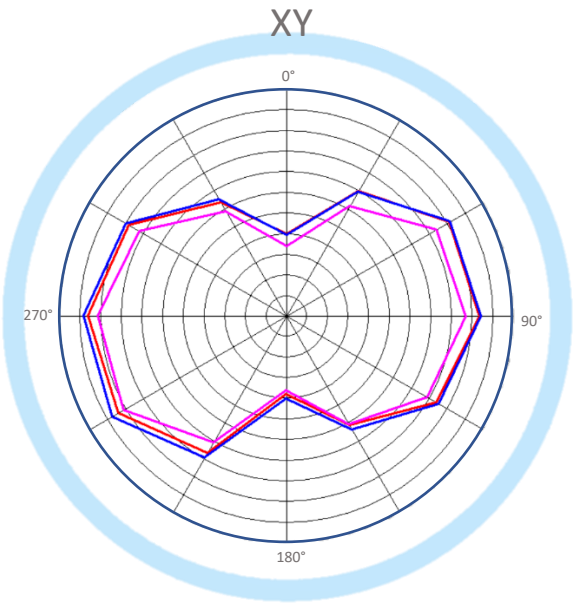


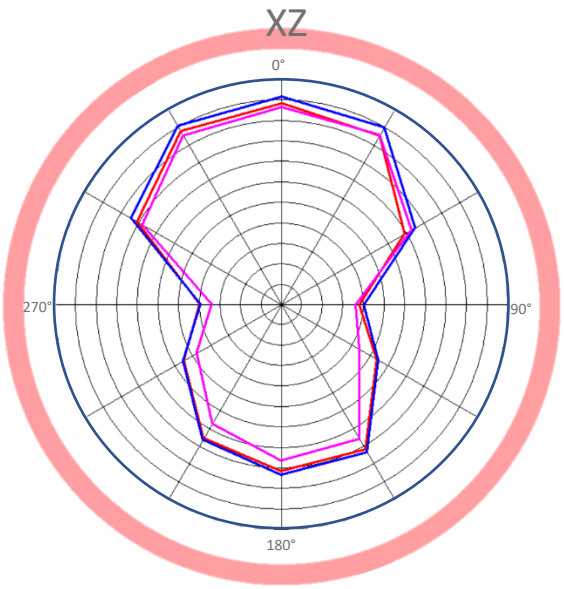
Radiated Performance

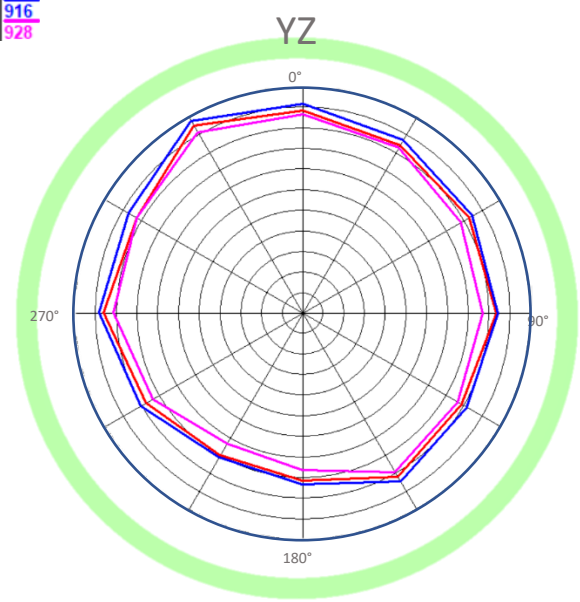
2D Polar Plot 902-928 MHz

The data shown was measured on Synzen EVK (SZDV-C-1M07)





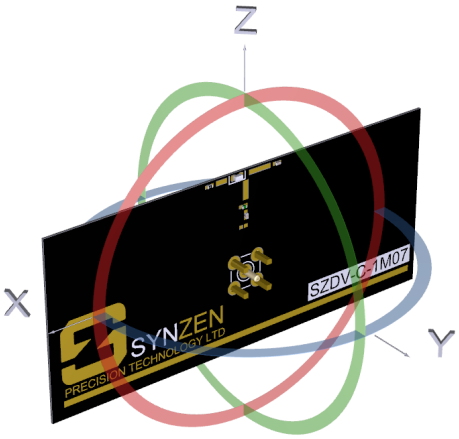


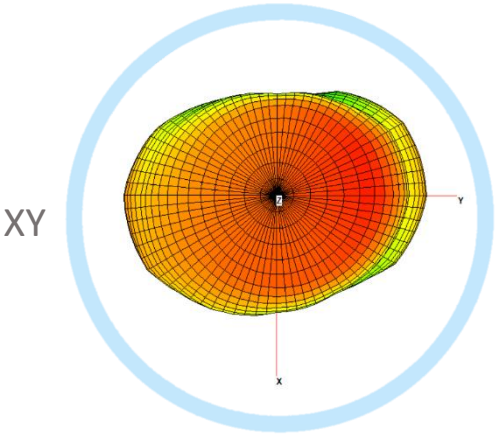


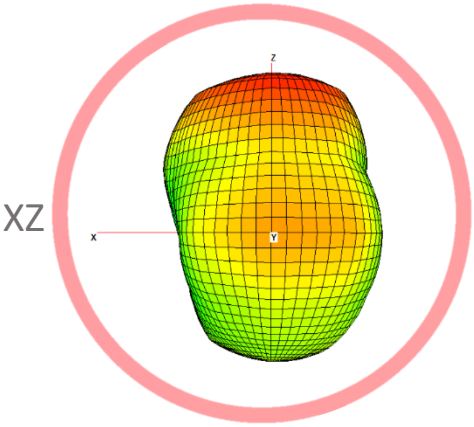
Radiated Performance

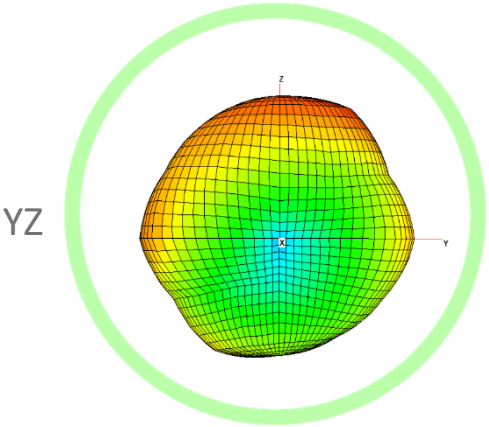
3D Radiation Pattern at 868MHz

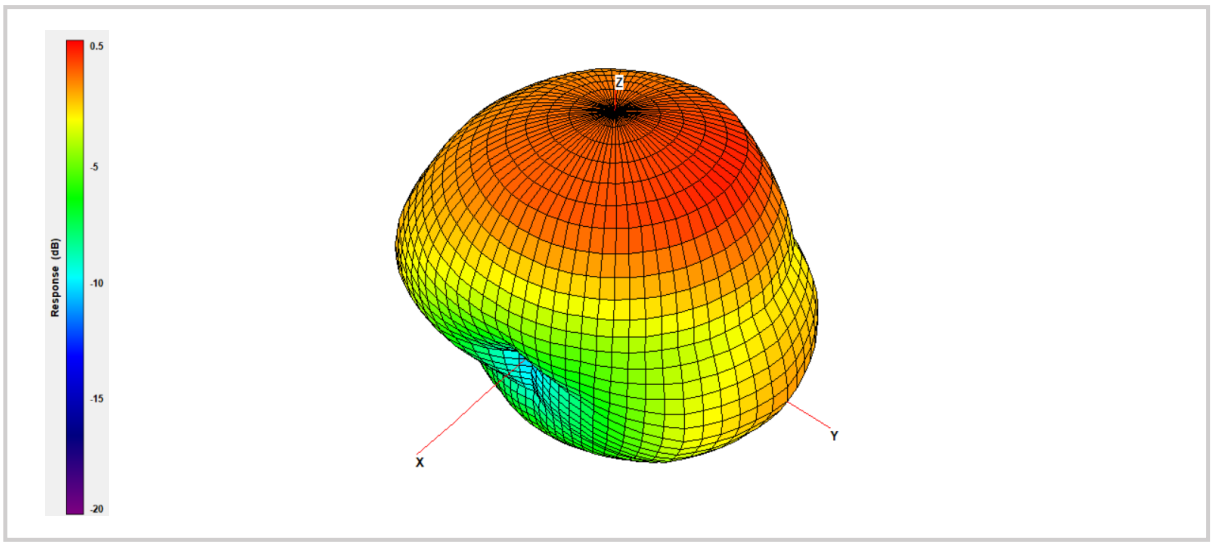
The data shown was measured on Synzen EVK (SZDV-C-1M07). The frequency point shown here is 868MHz.







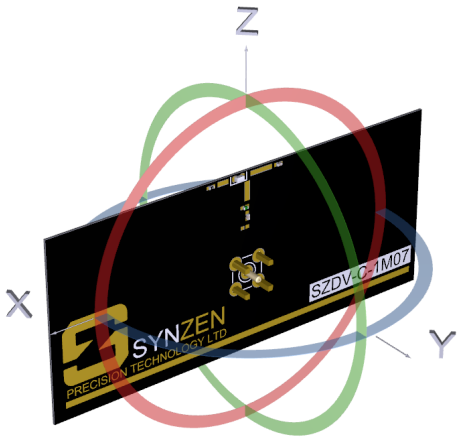


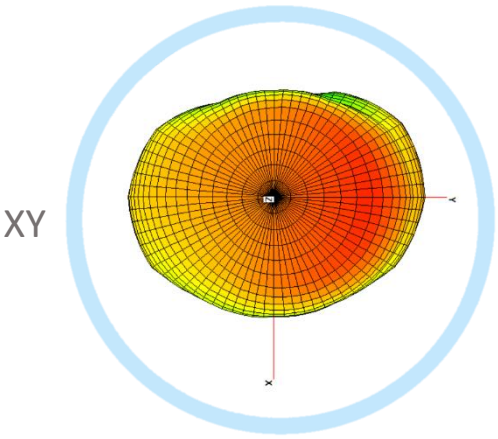


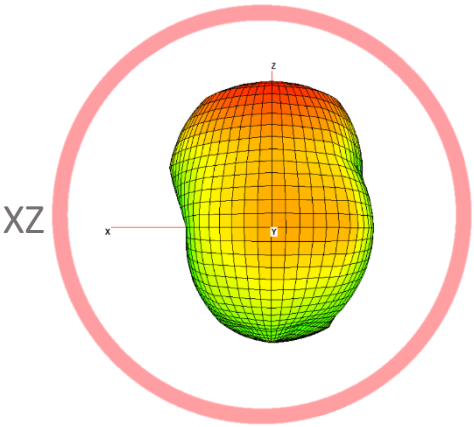
Radiated Performance

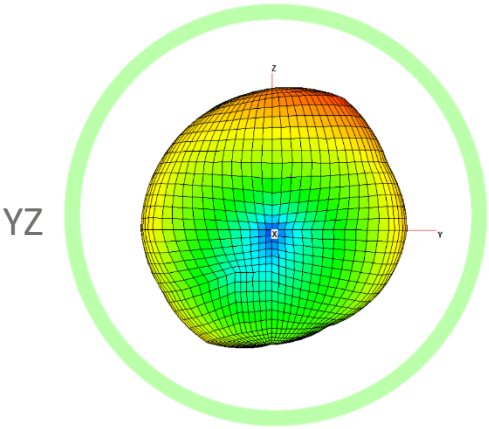
3D Radiation Pattern at 915MHz

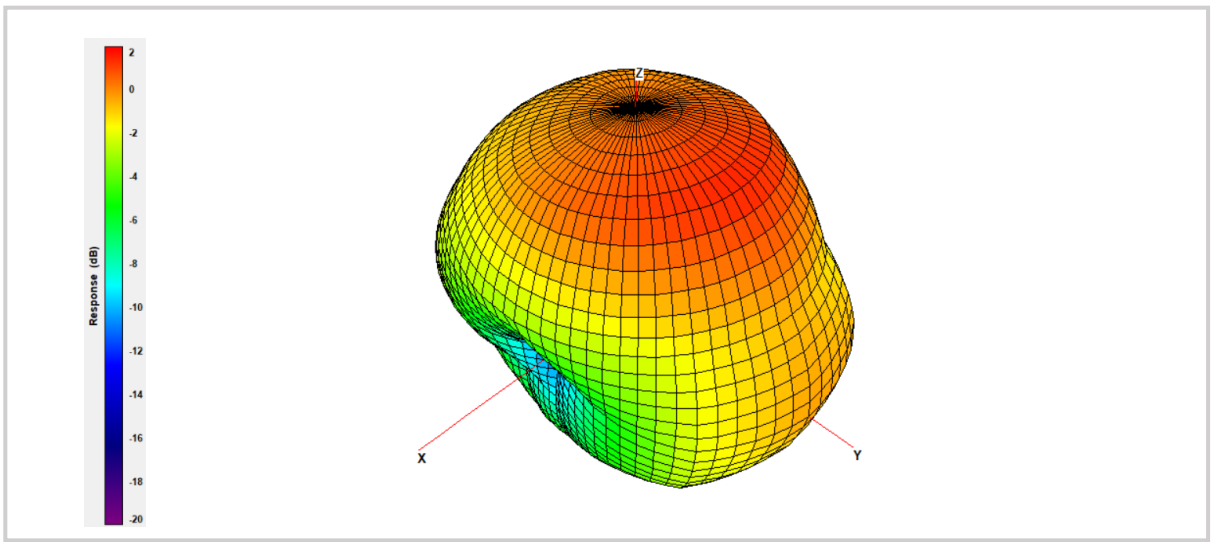
The data shown was measured on Synzen EVK (SZDV-C-1M07). The frequency point shown here is 915MHz.





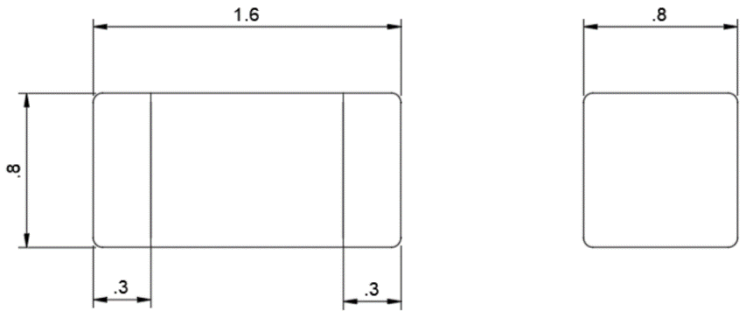






Mechanical

Antenna Mechanical Drawing



All dimensions in mm

Required Host PCB Footprint

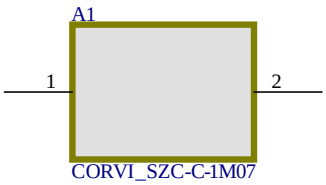
The host PCB requires the footprint shown below. PCB library files and DXF is available from our website www.synzen.com.tw/products.

The required clearance for the host PCB is 12.0 x 5.7 (mm) on all layers.

Antenna Pinout

SZC-C-1M07 Schematic Symbol

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

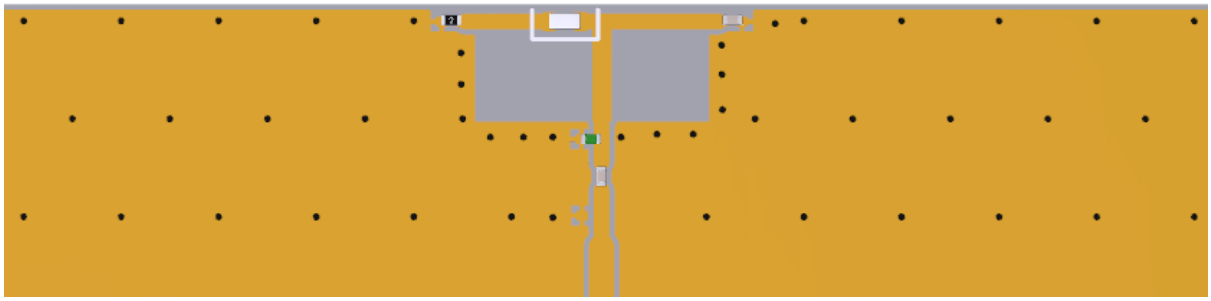


Pin	Description
1	Not orientation sensitive
2	Not orientation sensitive

PCB Layout Requirements

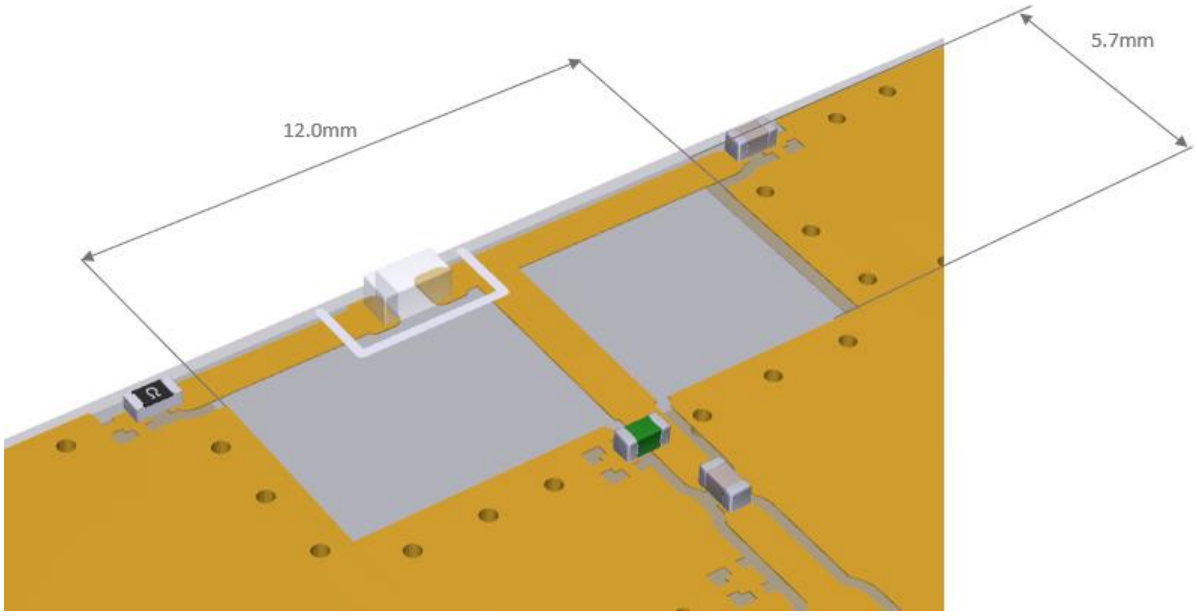
Placement

The antenna is designed to function placed at the centre of the longest PCB edge.



Required Clearance

A clearance is required through all PCB layers and is identical to the antenna size. For any components such as battery or display, these must avoid this area.

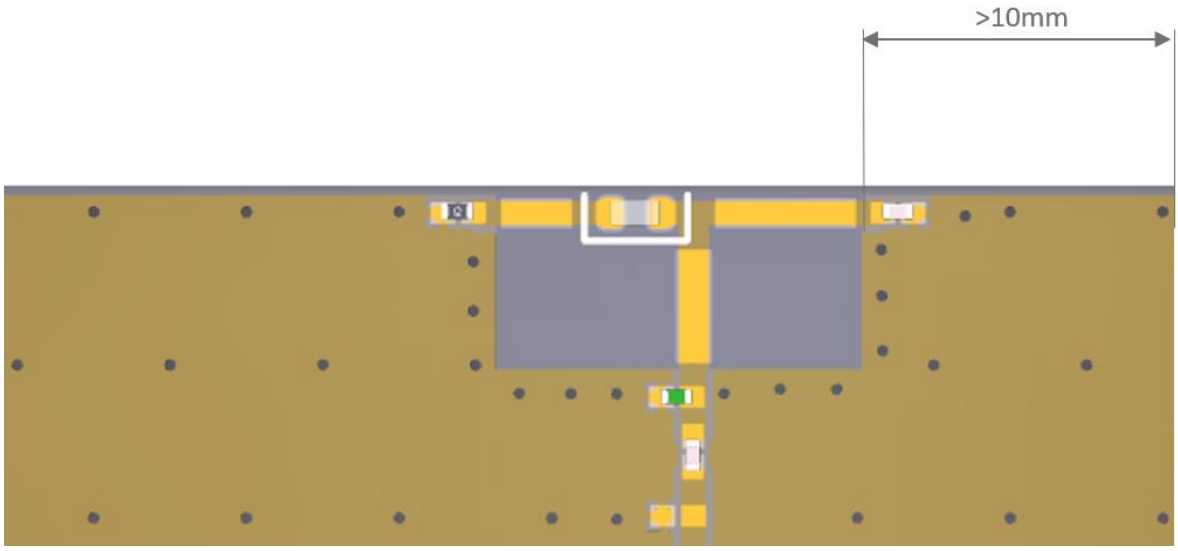


PCB Layout Requirements

Offset Placement

If the antenna is unable to be placed into the PCB centre, then the following rules should be followed to ensure performance.

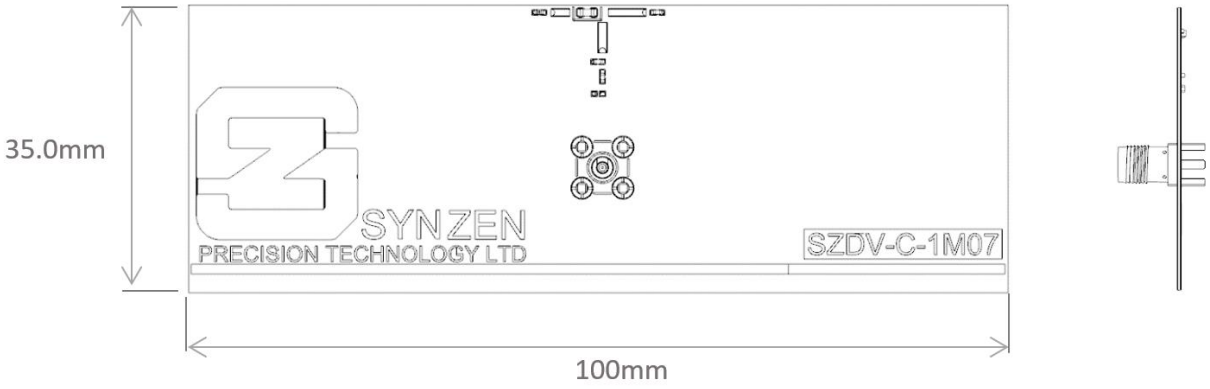
Antenna away from corner with a distance no closer than 10mm from the edge as shown below.

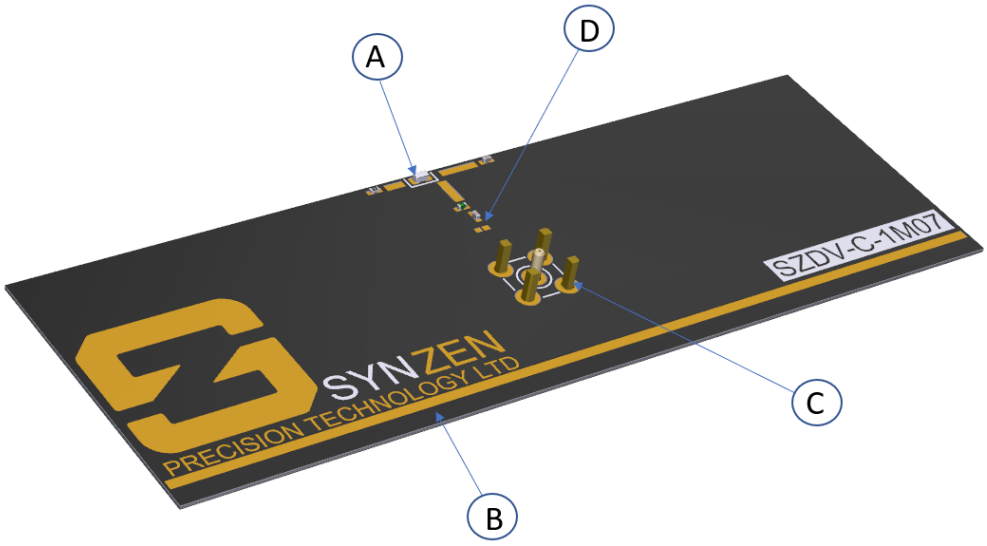


Evaluation Kit

SZDV-C-1M07 Evaluation Kit

The SZDV-C-1M07 evaluation kit is a PCBA with the antenna (SZC-C-1M07) fitted and optimised with a matching network. Connection to the antenna is made using the fitted female SMA connector.



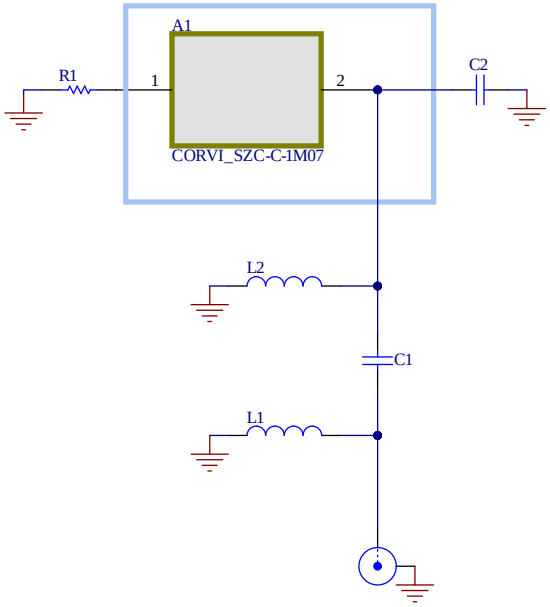


A	SZC-C-1M07 (CORVI)
B	Host PCB
C	SMA Connector
D	Matching Circuit

Evaluation Kit Schematic

Evaluation Kit Matching Circuits

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.



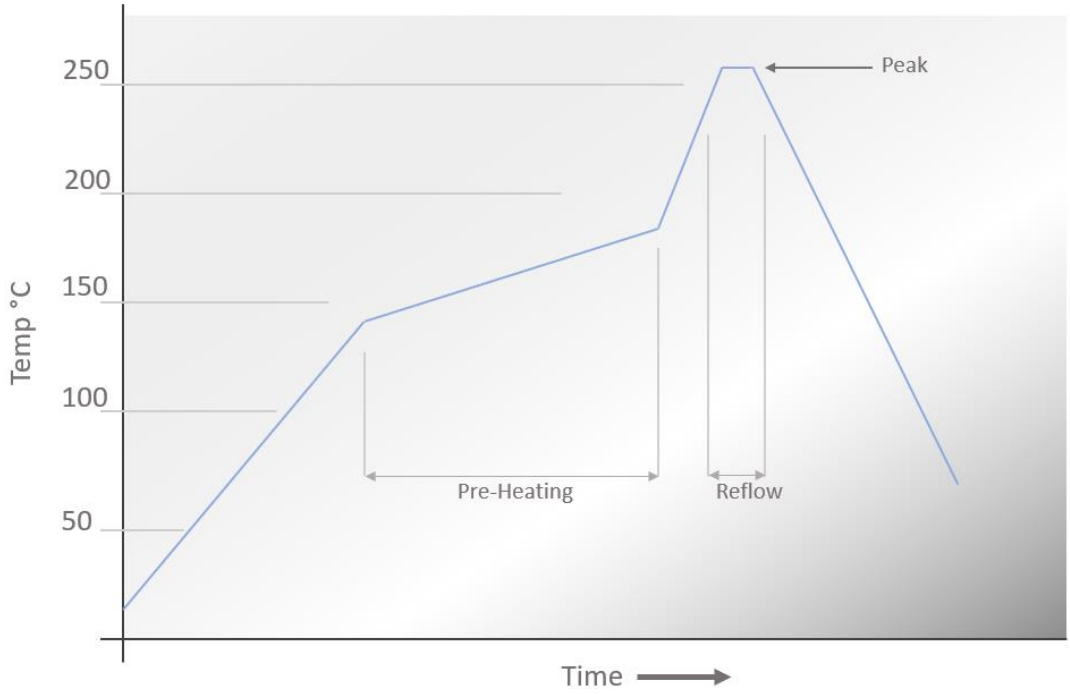
Designator	Component Type	Value	Size	Manufacturing Part No.
A1	Antenna	CORVI	-	SZC-C-1M07
J1	SMA Connector		-	ACE solution A3SAFTST135

Matching for 868MHz Centre Frequency				
Designator	**Component Type**	**Value**	**Size**	**Manufacturing Part No.**
R1	Resistor	0R	0402	Non-specific part
L1	NA	DNP	0402	Not Fitted
C1	Capacitor	3.9pF	0402	GCM1555C1H3R9BA16D
L2	Inductor	8.2nH	0402	LQG15HH8N2J02D
C2	Capacitor	6.8pF	0402	GCM1555C1H6R8FA16D

Matching for 915MHz Centre Frequency				
Designator	**Component Type**	**Value**	**Size**	**Manufacturing Part No.**
R1, C1	Resistor	0R	0402	Non-specific part
L1, L2	NA	DNP	0402	Not Fitted
C2	Capacitor	4.7pF	0402	GCQ1555C1H4R7CB01D

Soldering

Reflow Profile

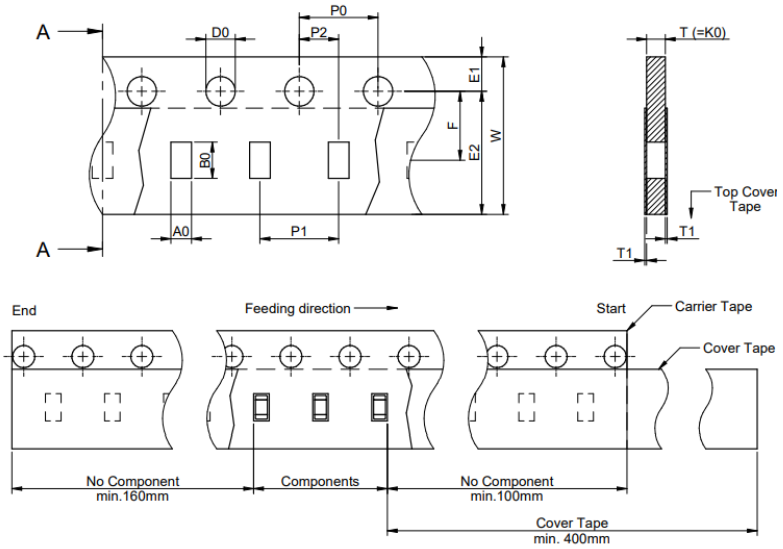


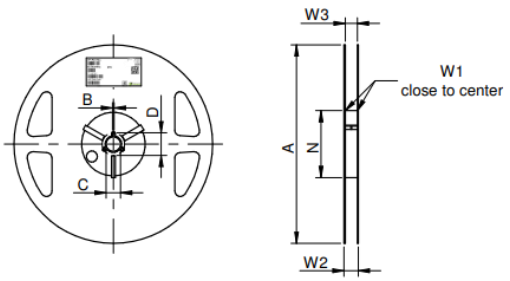
Pre-Heating	130 - 180°C	50 to 190 seconds
Reflow	>220 °C	50 to 160 seconds
Peak Temperature	260 °C	15 to 45 seconds

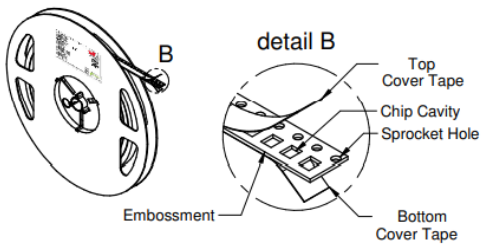
Packaging

Tape and Reel

		A0	B0	W	T	T1	P0	P1	P2	D0	E1	E2	F	Tape Type 1a	VPE / packaging unit
tolerance	Tolerances	typ.	typ.	+0,3/ -0,1	typ.	max.	±0,1		+0,05	+0,1 / -0,0	±0,1	min.	±0,05		pcs.
size	0603	1.05	1.85	8.00	0.95	0.10	4.00	4.00	2.00	1.50	1.75	6.25	3.50	Paper	4000







A (mm)	B (mm)	C (mm)	D (mm)	N (mm)	W1 (mm)	W2 (mm)	W3 (mm)	W3 (mm)	Material
± 2,0	min.	min.	min.	min.	+1,5	max.	min.	max.	
178	1.5	12.8	20.2	50	8.4	14.4	7.9	10.9	Polystyrene/ Polyurethane

Environmental

Material Regulation

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