



## Ultra-Wide Band Ceramic Antenna

**SZC-C-2U02**

UWB Channels 1,2,3,4,5,6,7: 3.0-7.0GHz

### Description

**ORIONIS**, for the ultimate compact and low-profile UWB solution, ORIONIS was developed to be compact but still cover frequency range **3 – 7.0GHz**. With a small footprint of 1.6 x 0.8 (mm).

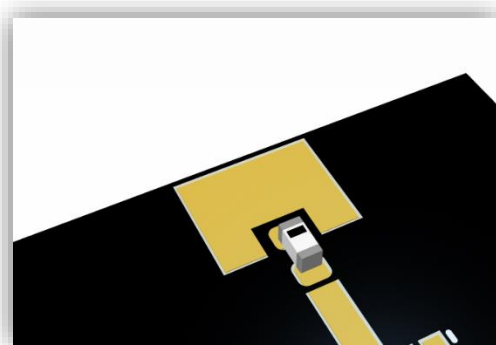
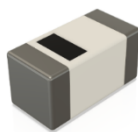
- For European and USA applications
- Channels 1 to 7
- Small form factor of 1.6 x 0.8 x 0.8 (mm).
- Minimal clearance of 10.0 x 6.0 (mm)

### Typical Applications

Automotive  
Tracking

Precision Surveying  
Entertainment Devices

Smart home  
Sensors





## General Specifications

### Mechanical Specifications

<b>Part Number</b>	SZC-C-2U02
<b>Name</b>	<b>ORIONIS</b>
<b>Dimensions</b>	1.6 x 0.8 x 0.8 (mm)
<b>Required Clearance area</b>	10.0 x 6.0(mm)
<b>Weight</b>	<0.5g
<b>Antenna Type</b>	Surface Mount Device
<b>Material</b>	Ceramic

### Electrical / RF Specifications\*

Band	Frequency Range (MHz)	Avg Efficiency (%)	Peak Gain (dBi)	Impedance	Polarization
1,2,3,4	3000-4800	>75	3.60	50Ω	Linear
5,6,7	5900-7000	>70	5.09		

\*All performance stated is measured of SZDV-C-2U02 evaluation kit with 21 x 20 (mm) GND plane.

### Environmental Specifications

<b>Operational Temperature</b>	-40 to +125 (°C)
<b>Storage Temperature</b>	-10 to +40 (°C)
<b>Relative Humidity</b>	≤75%
<b>Moisture Sensitivity Level (MSL)</b>	1
<b>RoHs &amp; REACH compliant</b>	Yes



## UWB Channel List

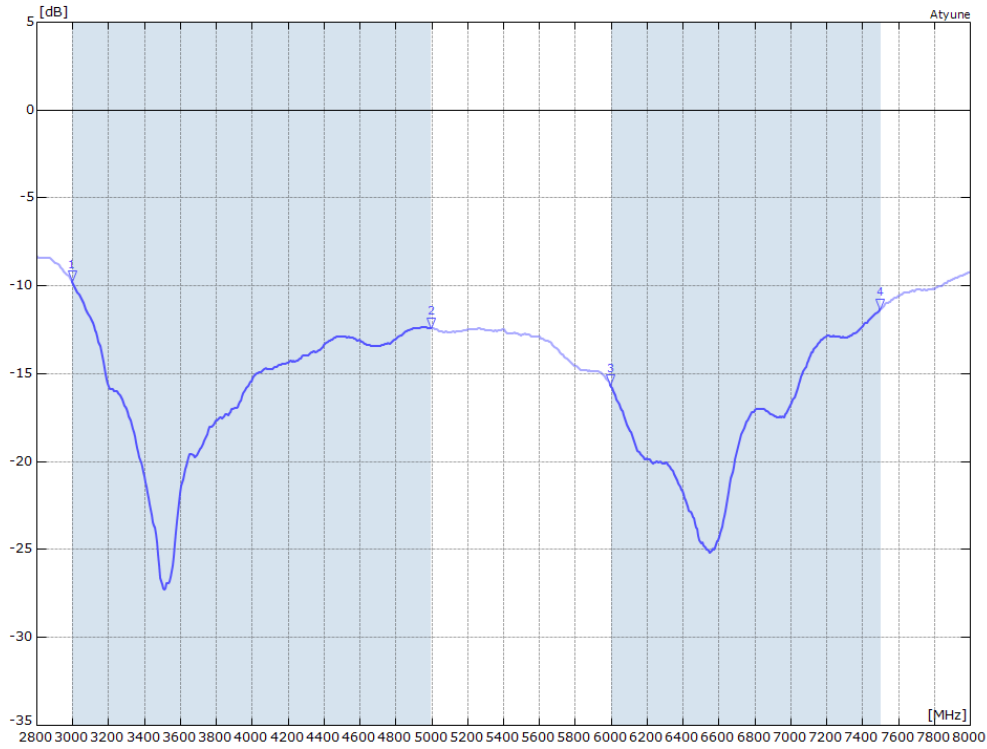
### Supported Channels

Channel	Centre Frequency (MHz)	BW (MHz)	Region	Supported
1	3494.4	499.2	USA	Y
2	3993.6	499.2	USA,Europe	Y
3	4492.8	499.2	USA,Europe, Japan, Korea	Y
4	3993.6	1331.2	USA,Europe, Japan, Korea	Y
5	6489.6	499.2	USA,Europe	Y
6	6988.8	499.2	USA,Europe	Y
7	6489.6	1081.6	USA,Europe	Y
8	7488	499.2	USA	N
9	7987.2	499.2	USA,Europe, Japan, Korea	N
10	8486.4	499.2	USA,Europe, Japan, Korea	N
11	7987.2	1331.2	USA,Europe, Japan, Korea	N
12	8985.6	499.2	USA, Japan, Korea	N
13	9484.8	499.2	USA, Japan, Korea	N
14	9984	499.2	USA, Japan, Korea	N
15	9484.8	1354.97	USA, Japan, Korea	N

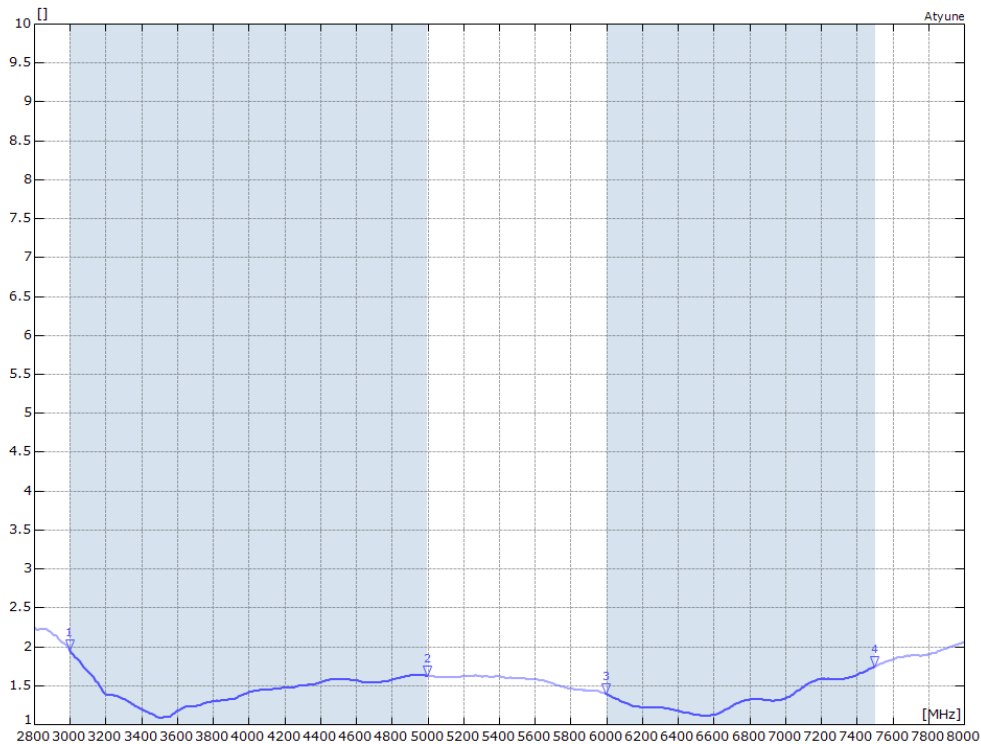


## RF Characteristics

### S11 Parameter



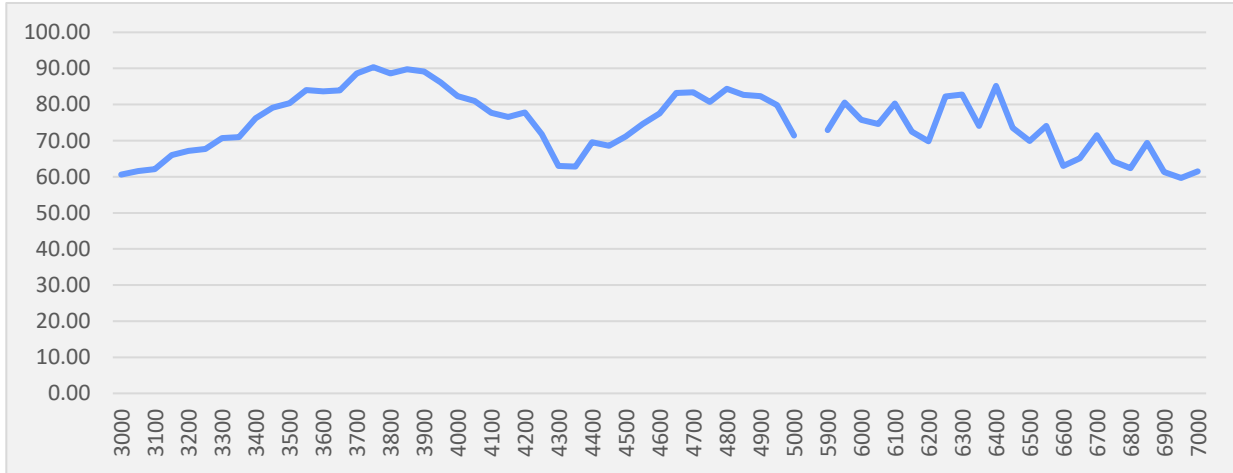
### VSWR



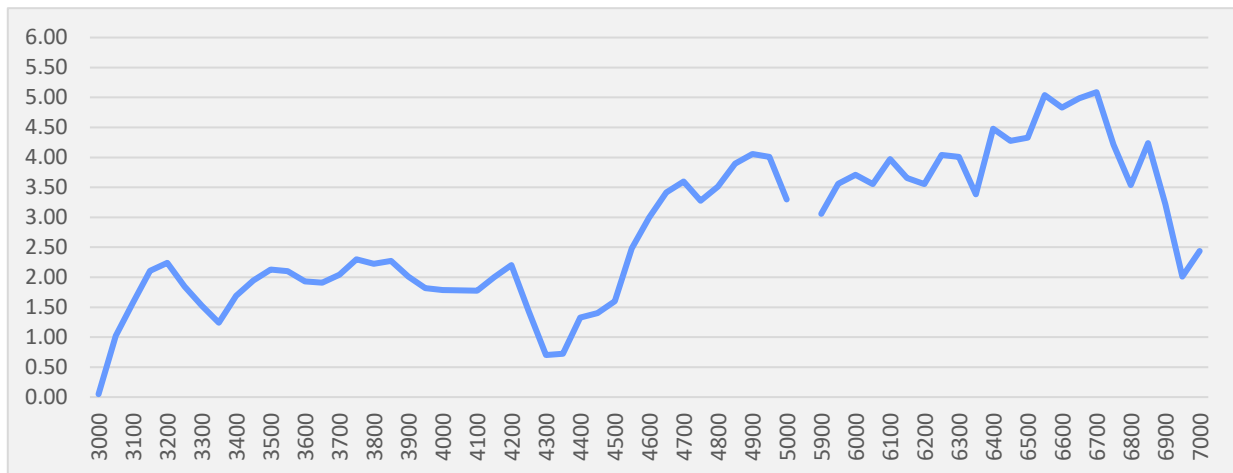


## Antenna Performance

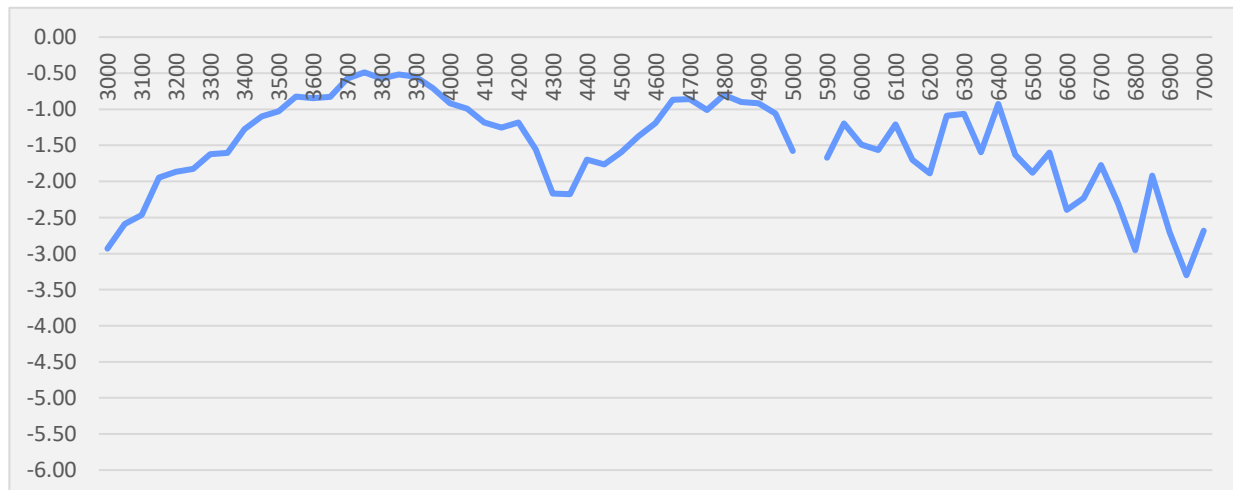
### Efficiency



### Peak Gain



### Average Gain

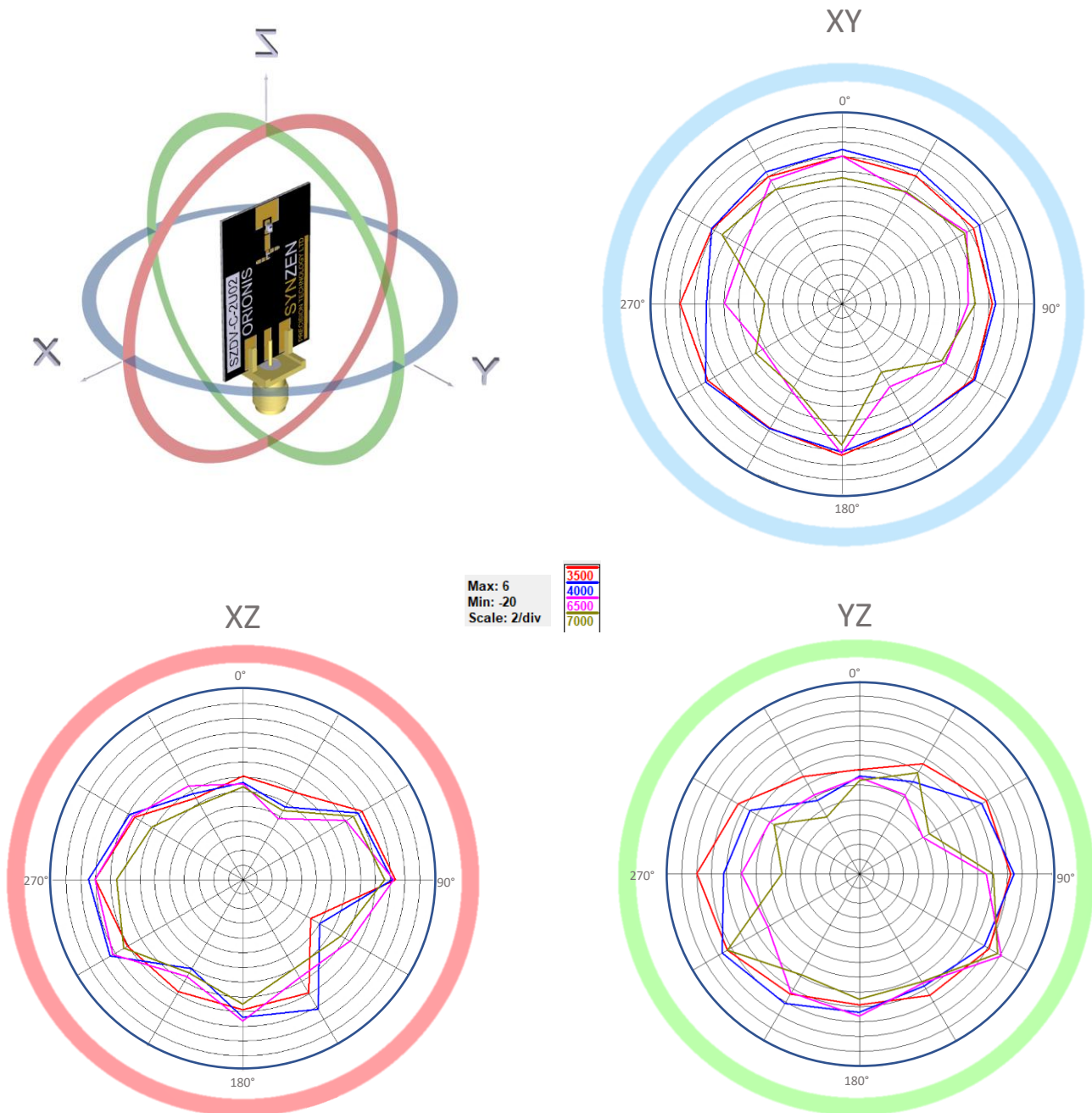




## Radiated Performance

### 2D Polar Plot 3000 - 7000MHz

The data shown was measured on Synzen EVK (SZDV-C-2U02)

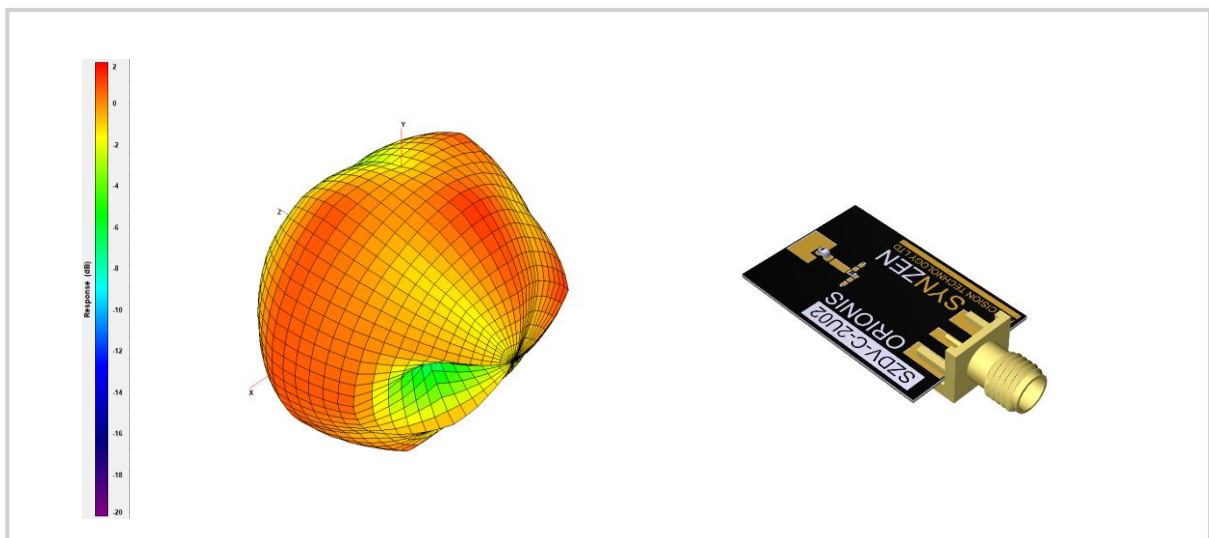
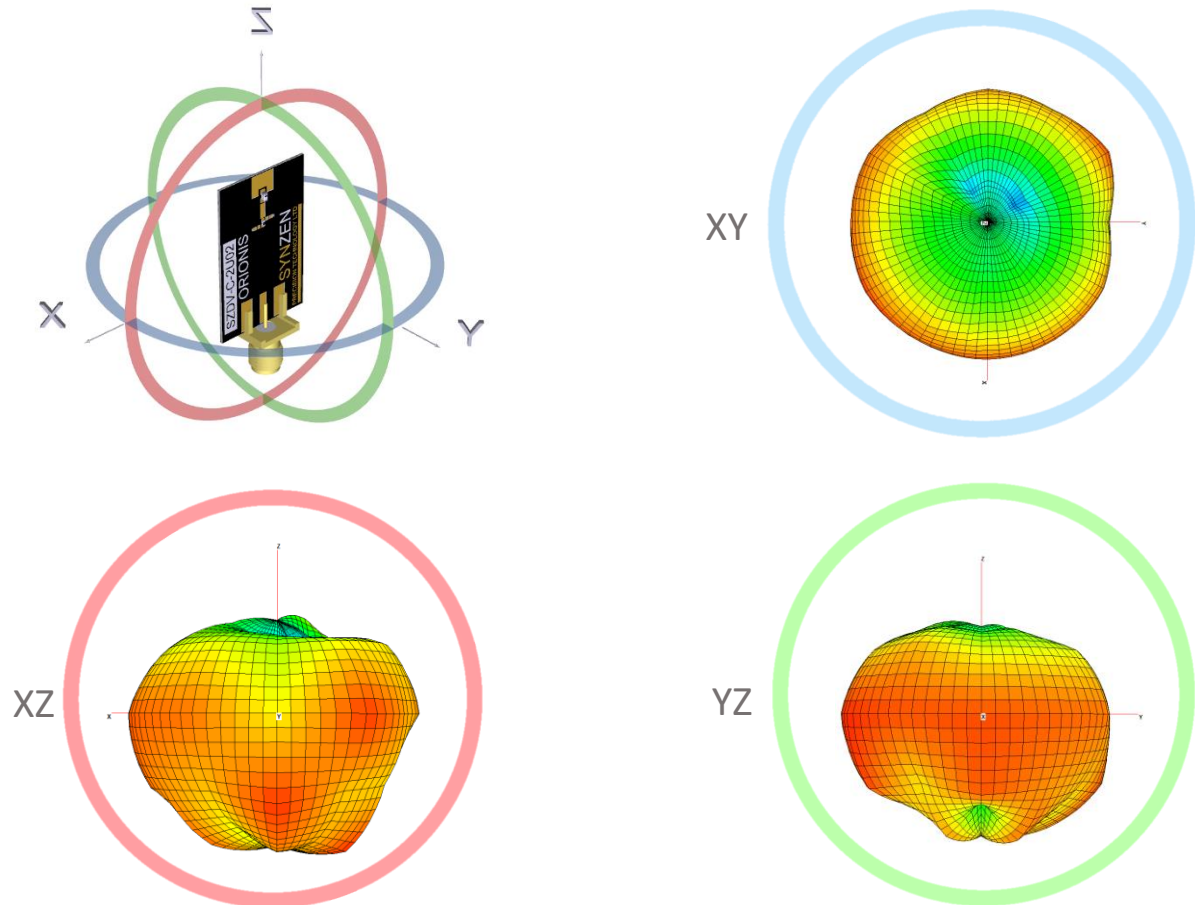




## Radiated Performance

### 3D Radiation Pattern at 4000MHz

The data shown was measured on Synzen EVK (SZDV-C-2U02). The frequency point shown here is 4000MHz.

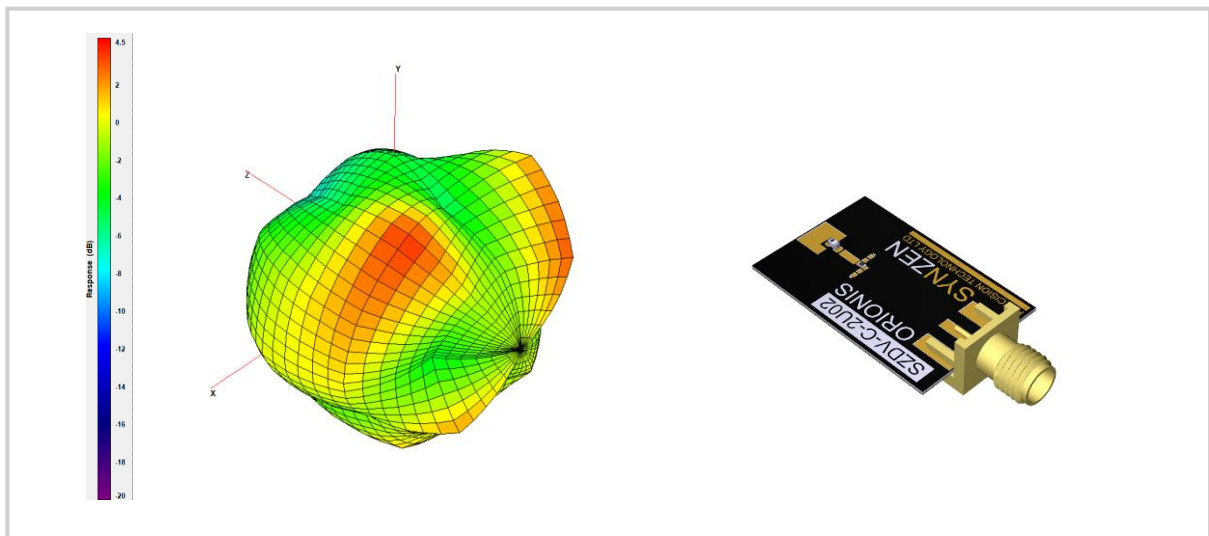
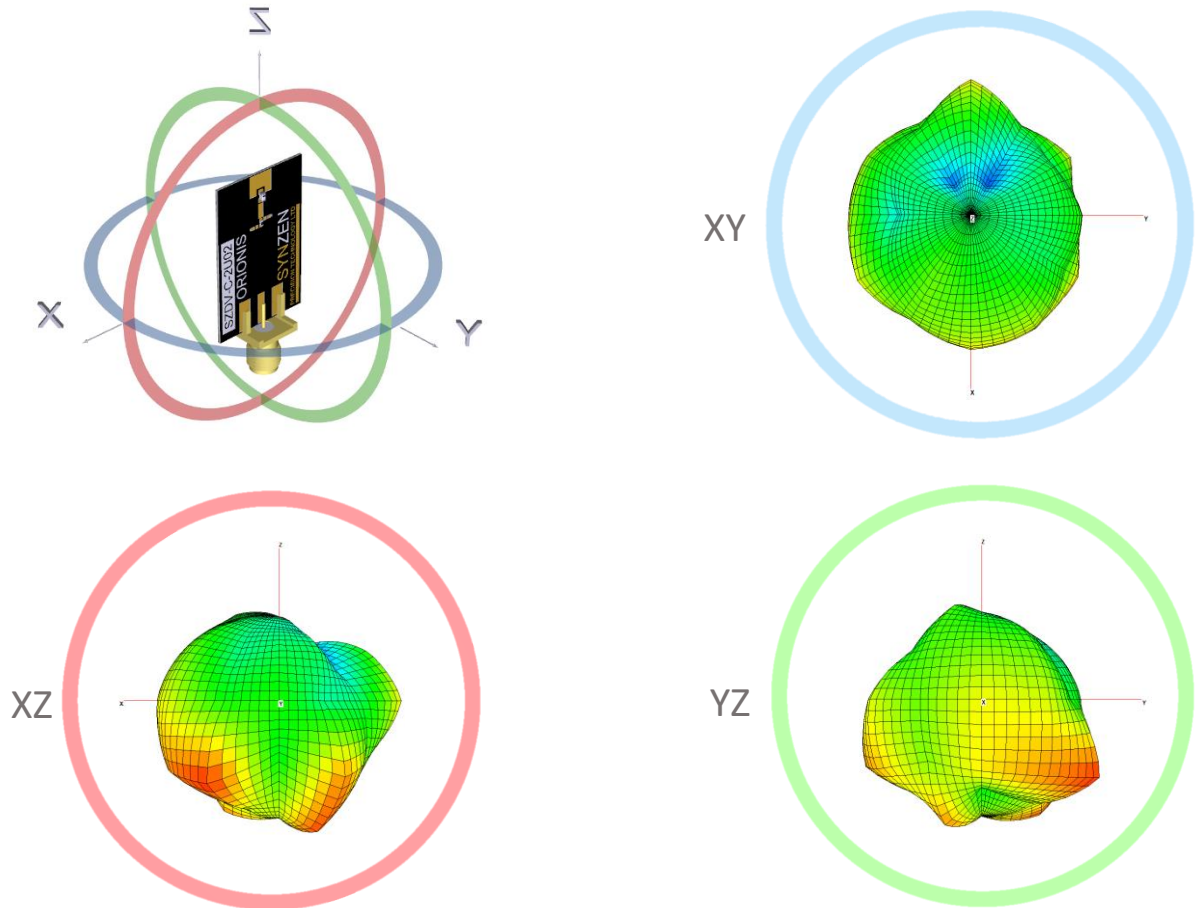




## Radiated Performance

### 3D Radiation Pattern at 6500MHz

The data shown was measured on Synzen EVK (SZDV-C-2U02). The frequency point shown here is 6500MHz.

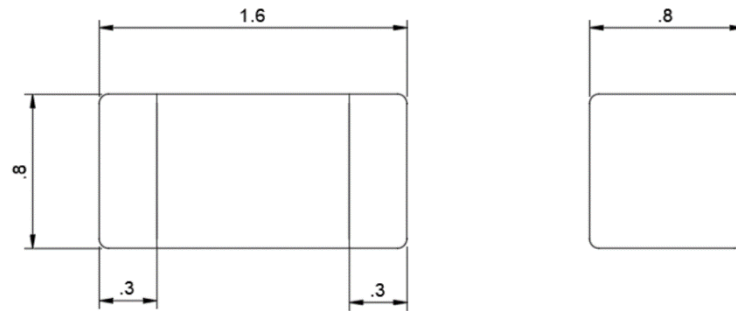






## Mechanical

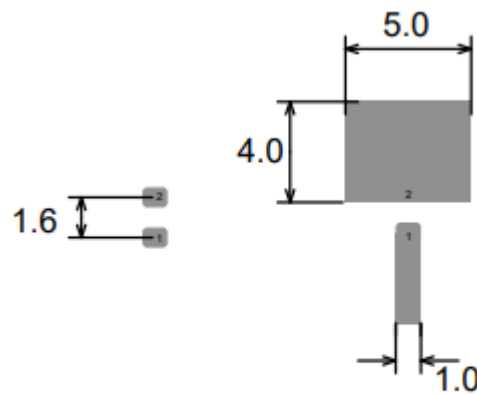
### Antenna Mechanical Drawing



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](http://www.synzen.com.tw/products).



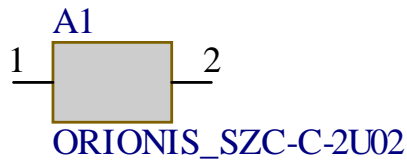
PADS 1,2 = 1.0 x 0.8  
ALL DIMENSIONS IN MM



## Antenna Pinout

### SZC-C-2U02 Schematic Symbol

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

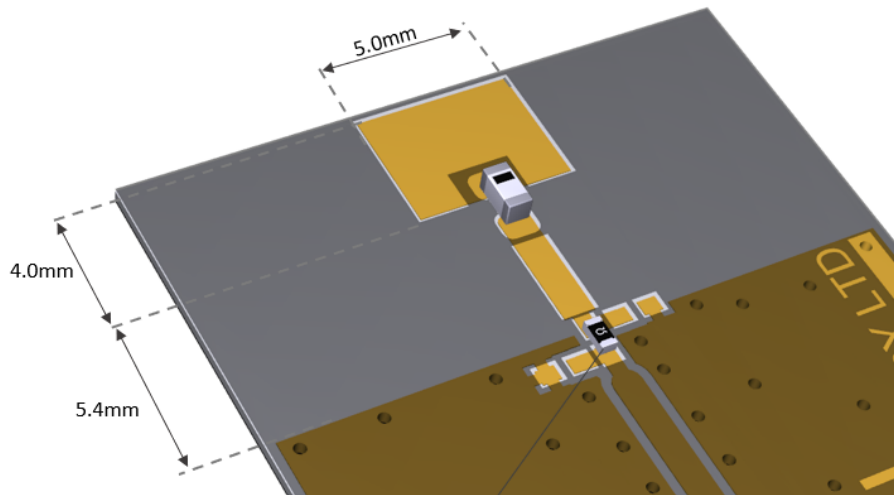


Pin	Description
1	RF Feed
2	Mechanical / PCB Patch Section

## PCB Layout Requirements

### Placement

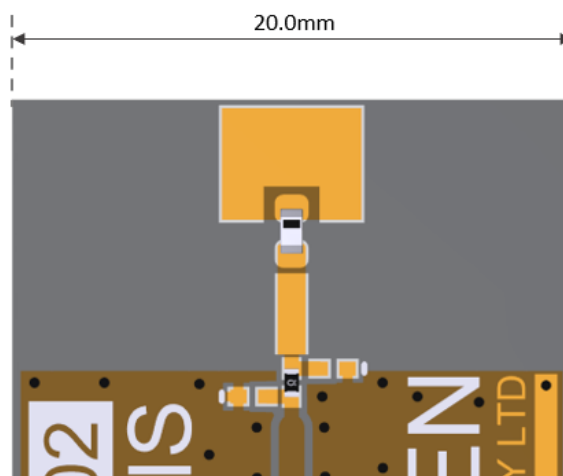
The antenna is designed to function placed at the PCB edge with clearance either side to the PCB ends.



Matching Network Components must be close to the antenna.  
Transmission line should be kept as short possible to the RF port.

### Required Clearance

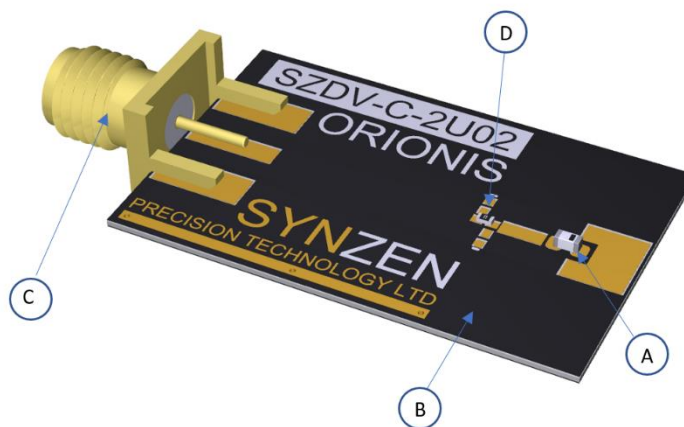
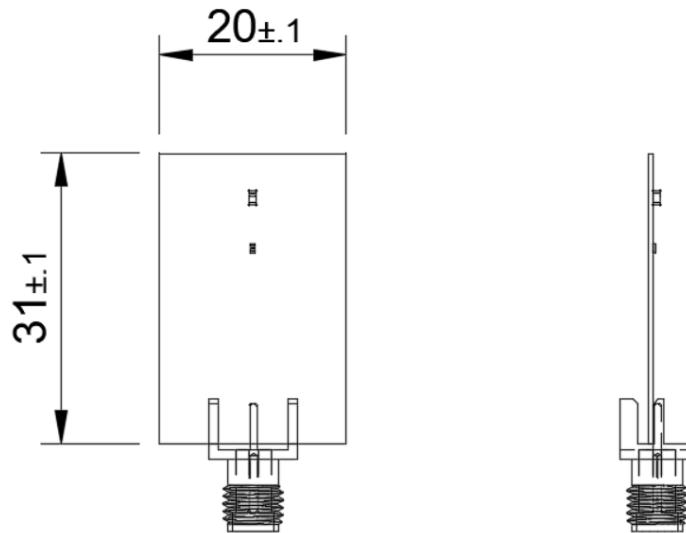
A clearance is required through all PCB layers. Adjacent copper to either side should be a minimum of 10mm distance, ask Synzen for advice on placement and use our free support service for optimal performance.



## Evaluation Kit

### SZDV-C-2U02 Evaluation Kit

The SZDV-C-2U02 evaluation kit is a PCBA with the antenna (SZP-C-2U02) fitted and optimised with a matching network. Connection to the antenna is made using the fitted female SMA connector.

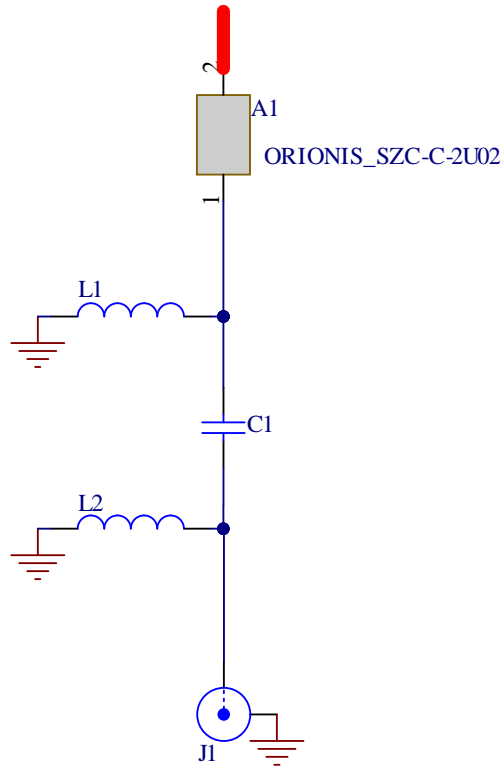


A	SZC-C-2U02 (ORIONIS)
B	Host PCB
C	SMA Connector
D	Matching Circuit

## Evaluation Kit Schematic

### Evaluation Kit Matching Circuit

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](mailto:sales@synzen.com.tw) for more information.

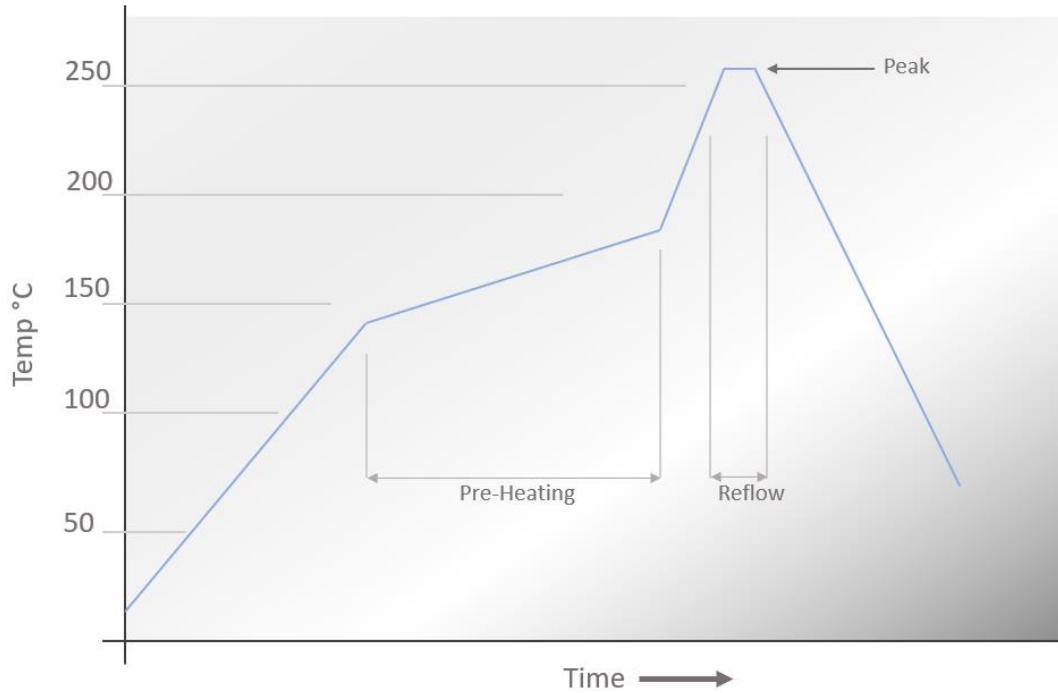


Designator	Component Type	Value	Size	Manufacturing Part No.
A1	Antenna	ORIONIS	-	SZC-C-2U02
C1	Resistor	OR	0402	Non-specific part
L1, L2	NA	DNP	-	Not Fitted
J1	SMA Connector		-	ct-sab04x (Joymax)



## Soldering

### Reflow Profile



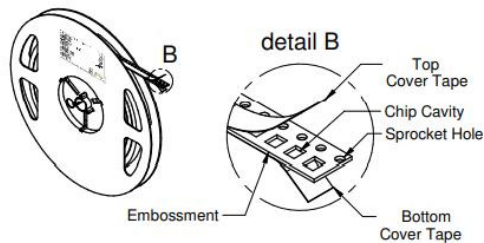
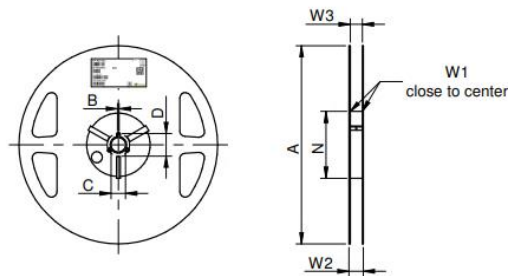
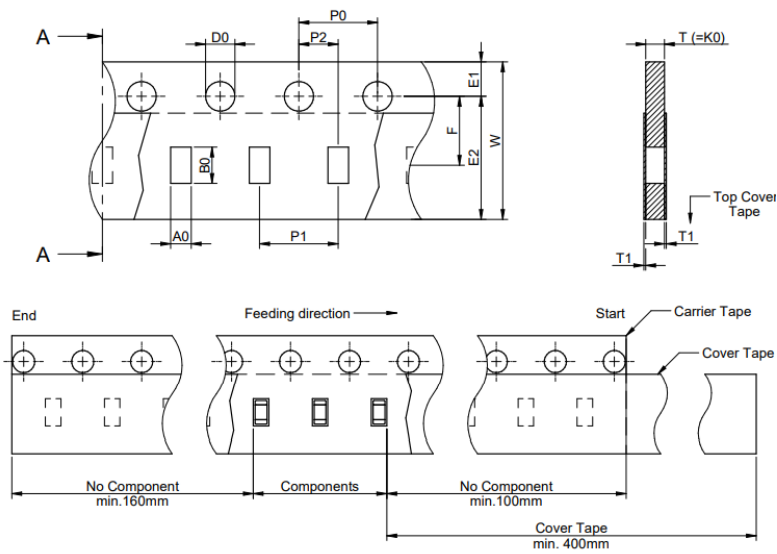
<b>Pre-Heating</b>	130 - 180°C	50 to 190 seconds
<b>Reflow</b>	>220 °C	50 to 160 seconds
<b>Peak Temperature</b>	260 °C	15 to 45 seconds



## Packaging

### Tape and Reel

		A0	B0	W	T	T1	P0	P1	P2	D0	E1	E2	F	Tape Type 1a	VPE / packaging unit
<b>tolerance</b>	Tolerances	typ.	typ.	+0.3/-0.1	typ.	max.	±0.1		+0.05	+0.1 / -0.0	±0.1	min.	±0.05		pcs.
<b>size</b>	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.	Polystyrene/ Polyurethane
178	1.5	12.8	20.2	50	8.4	14.4	7.9	10.9	

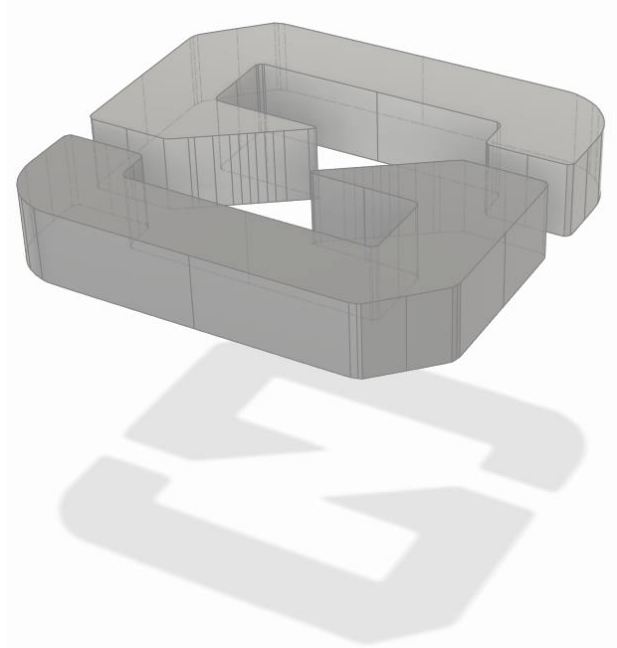


## Environmental

### Material Regulation

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





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