

UWB CERAMIC SMD

ORIONIS

Ultra-Wideband Ceramic Antenna

SZC-C-2U02

FREQUENCY
3.0 to 7.0 GHz

PEAK GAIN
Up to 5.09 dBi

UWB CHANNELS
1 to 7

SIZE
1.6 × 0.8 × 0.8 mm

UWB LOW **3000 to 4800 MHz** Covers UWB channels 1, 2, 3, 4

UWB HIGH **5900 to 7000 MHz** Covers UWB channels 5, 6, 7

Key Features

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

1 Introduction

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

— Features

- ◆ For European and USA applications
- ◆ Channels 1 to 7
- ◆ Small form factor of $1.6 \times 0.8 \times 0.8$ mm
- ◆ Minimal clearance of 10.0×6.0 mm

— Applications

- | | |
|-----------------------|-------------------------|
| ◆ Automotive | ◆ Tracking |
| ◆ Precision Surveying | ◆ Entertainment Devices |
| ◆ Smart Home | ◆ Sensors |

2 Mechanical Specifications

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

3 Electrical / RF Specifications

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

*All performance stated is measured on the SZDV-C-2U02 evaluation kit with 21 × 20 mm GND plane.

4 Environmental

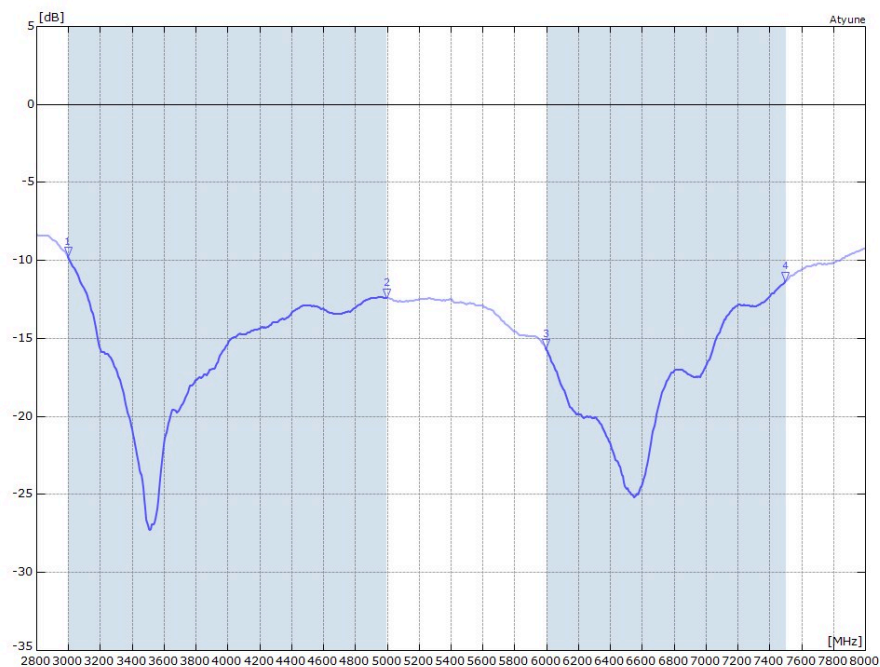
Operational Temperature	-40 to +125°C
Storage Temperature	-10 to +40°C
Relative Humidity	≤75%
Moisture Sensitivity Level (MSL)	1
RoHS and REACH compliant	Yes

5 Supported UWB Channels

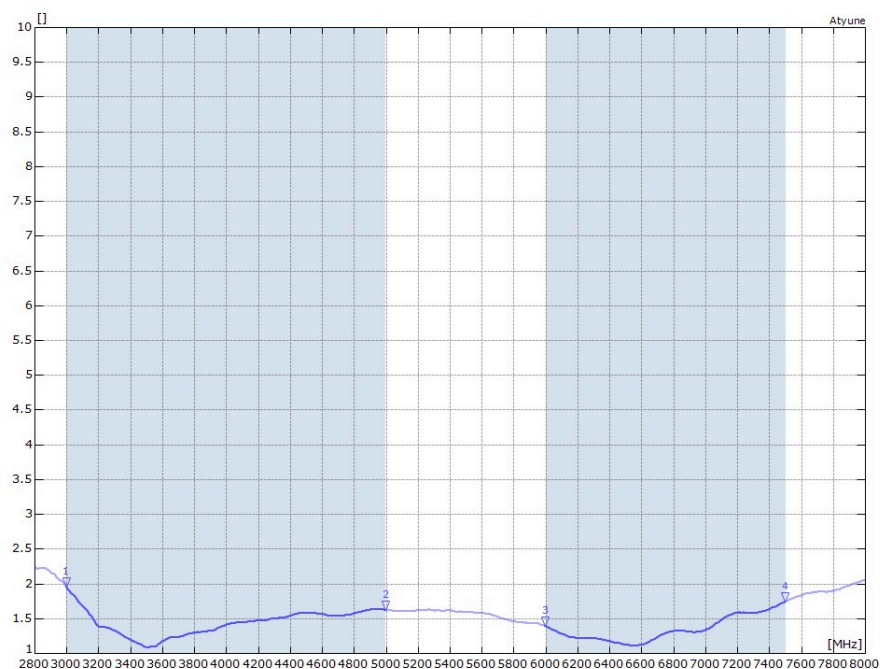
Channel	Centre Frequency (MHz)	BW (MHz)	Region	Supported
1	3494.4	499.2	USA	Yes
2	3993.6	499.2	USA, Europe	Yes
3	4492.8	499.2	USA, Europe, Japan, Korea	Yes
4	3993.6	1331.2	USA, Europe, Japan, Korea	Yes
5	6489.6	499.2	USA, Europe	Yes
6	6988.8	499.2	USA, Europe	Yes
7	6489.6	1081.6	USA, Europe	Yes
8	7488	499.2	USA	No
9	7987.2	499.2	USA, Europe, Japan, Korea	No
10	8486.4	499.2	USA, Europe, Japan, Korea	No
11	7987.2	1331.2	USA, Europe, Japan, Korea	No
12	8985.6	499.2	USA, Japan, Korea	No
13	9484.8	499.2	USA, Japan, Korea	No
14	9984	499.2	USA, Japan, Korea	No
15	9484.8	1354.97	USA, Japan, Korea	No

6 RF Characteristics

S11 Parameter



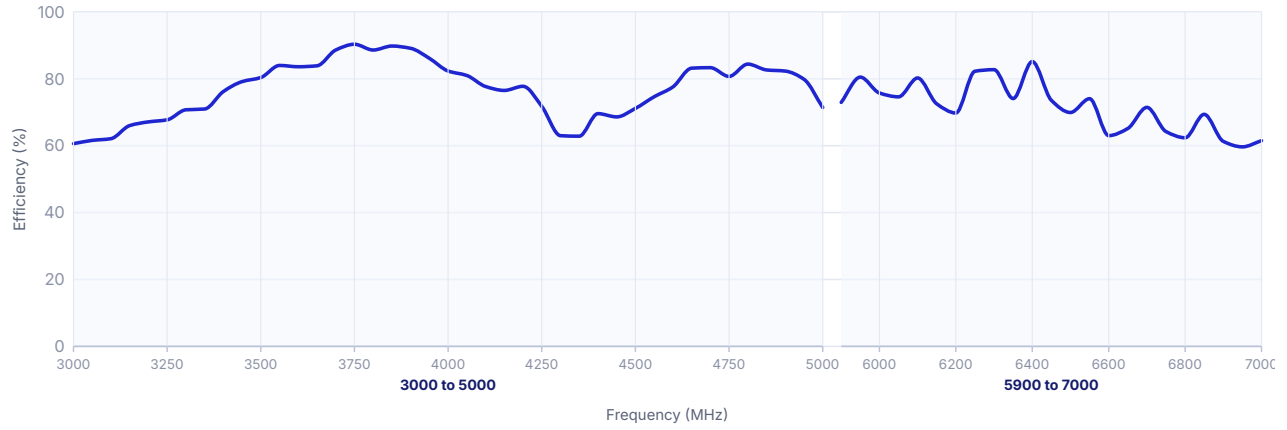
VSWR



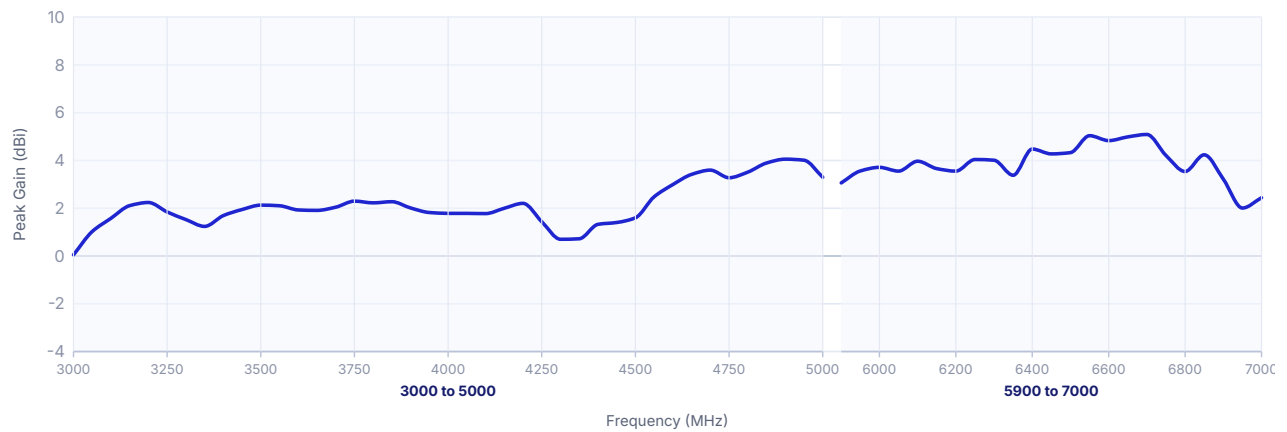
7

Antenna Performance

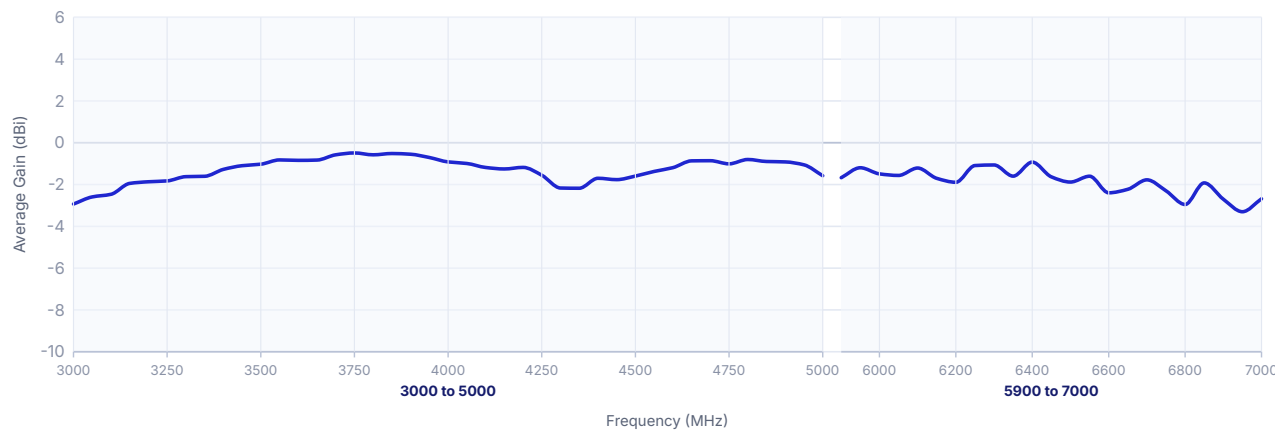
Efficiency



Peak Gain

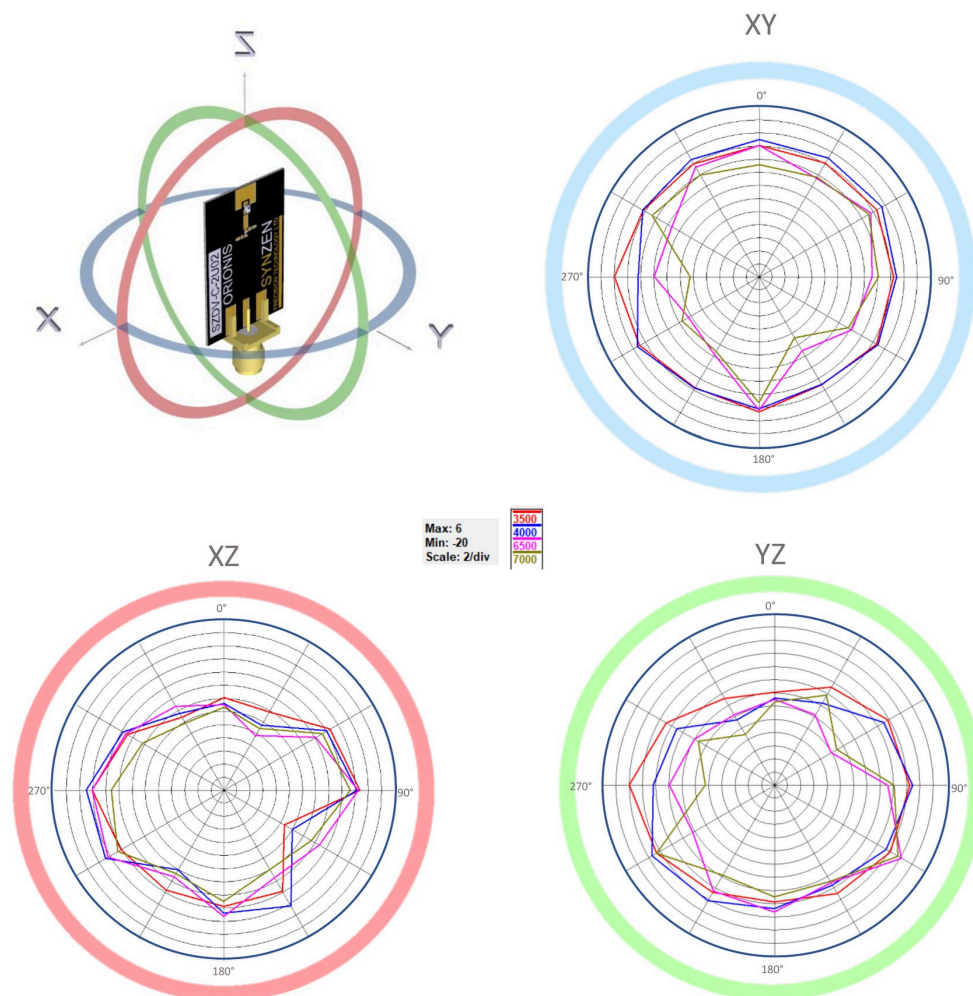


Average Gain



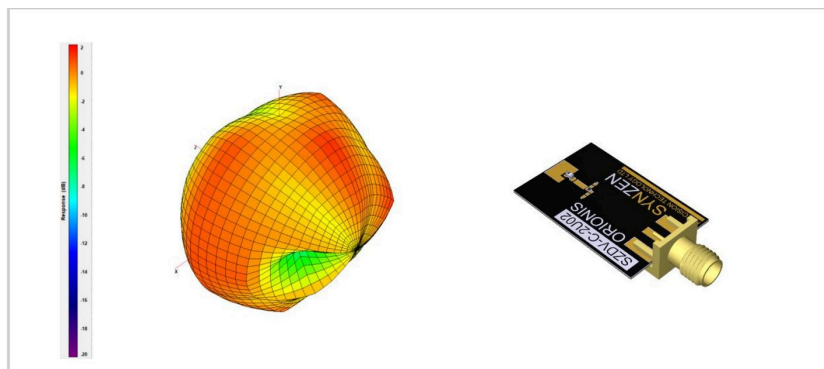
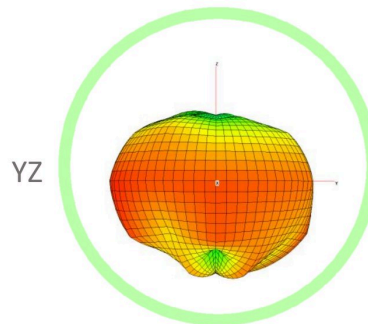
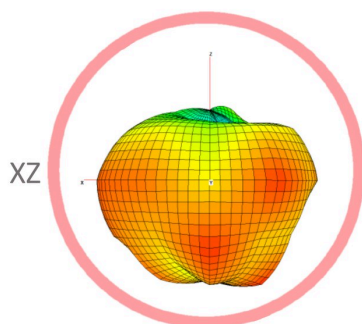
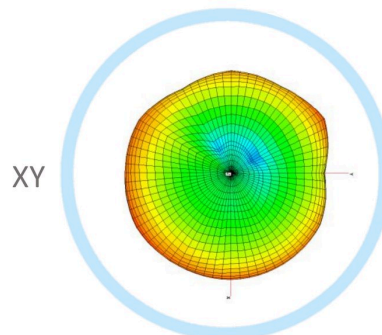
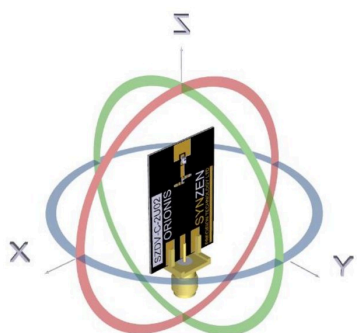
8 2D Polar Plot 3000 to 7000 MHz

MEASURED ON SYNZEN EVK (SZDV-C-2U02)



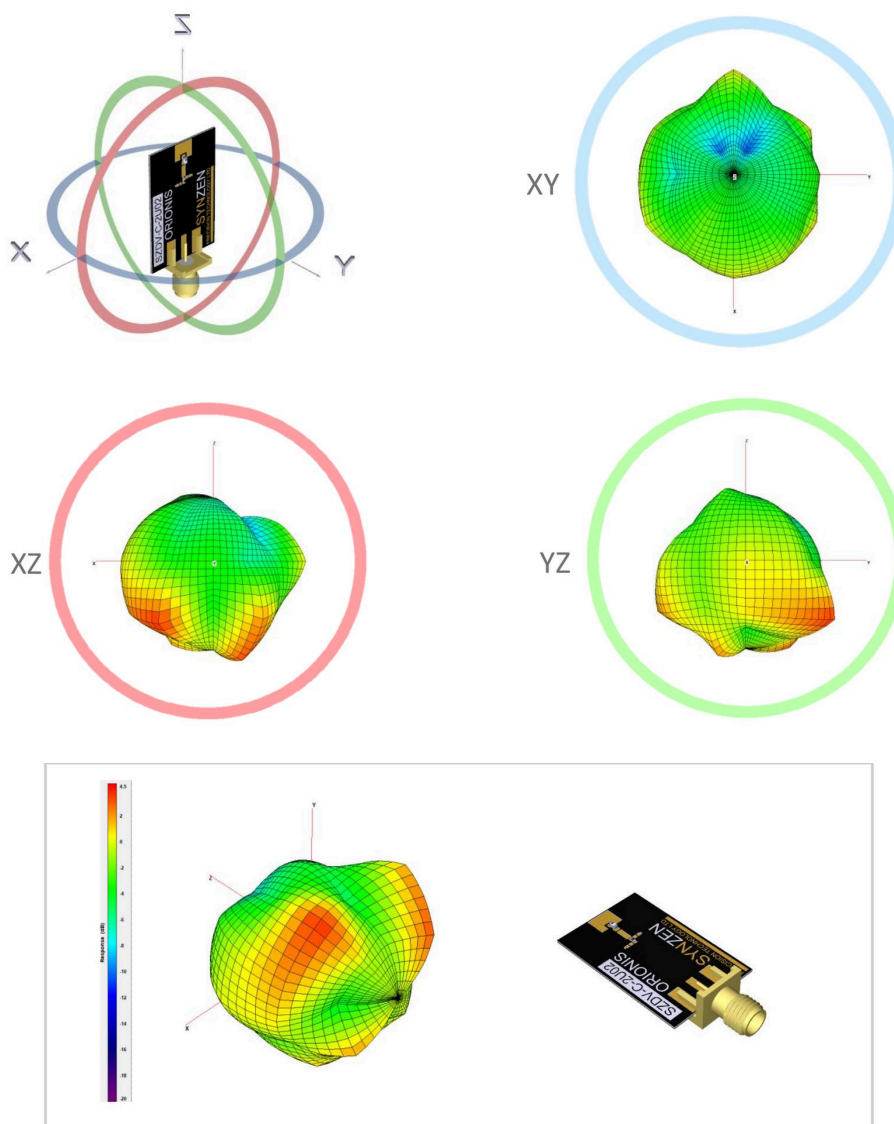
9 3D Radiation Pattern at 4000 MHz

MEASURED ON SYNZEN EVK (SZDV-C-2U02), FREQUENCY POINT 4000 MHZ

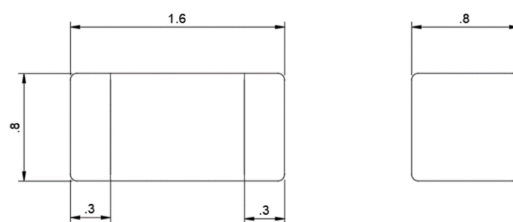


10 3D Radiation Pattern at 6500 MHz

MEASURED ON SYNZEN EVK (SZDV-C-2U02), FREQUENCY POINT 6500 MHZ

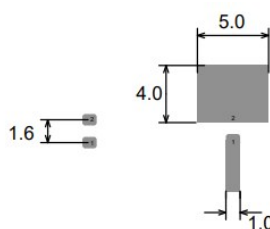


11 Antenna Mechanical Drawing



All dimensions in mm

12 Required Host PCB Footprint



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

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

13 SZC-C-2U02 Schematic Symbol

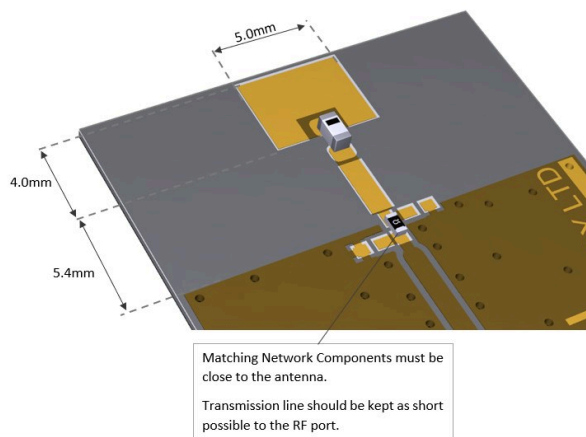
The schematic symbol for the antenna is shown below with a description of each pin.



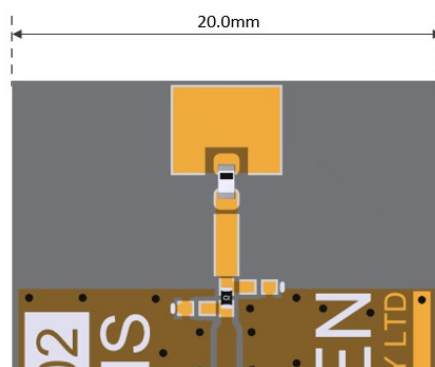
Pin	Description
1	RF Feed
2	Mechanical / PCB Patch Section

14 Placement

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



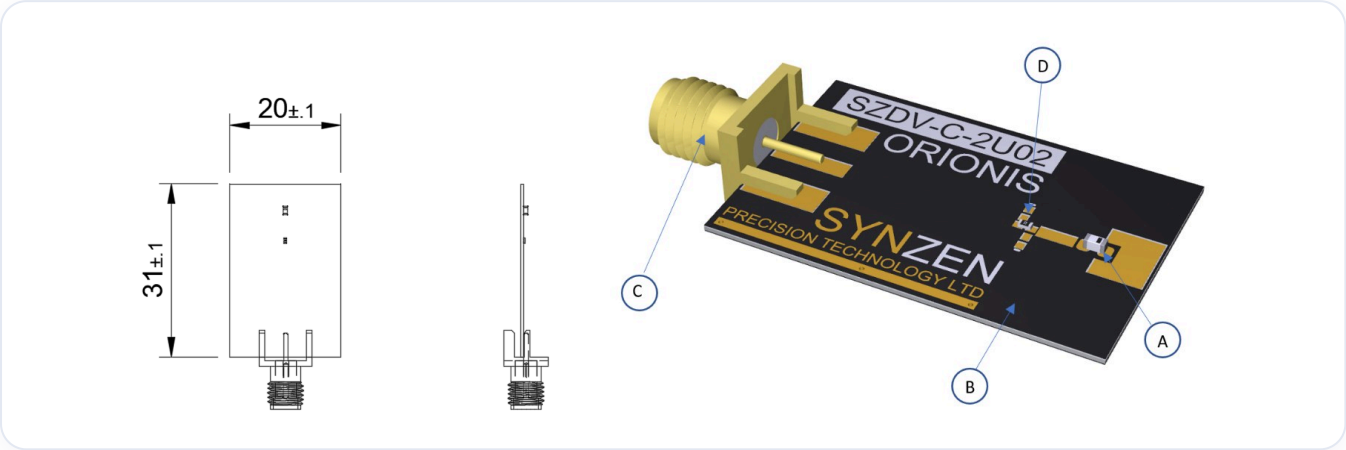
15 Required Clearance



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

16 **SZDV-C-2U02 Evaluation Kit**

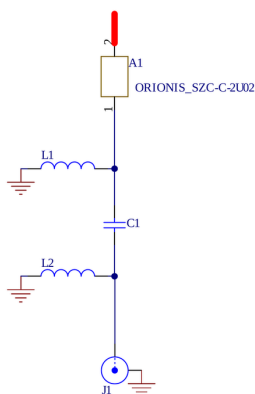
The SZDV-C-2U02 evaluation kit is a PCBA with the antenna (SZP-C-2U02) fitted and optimized with a matching network. Connection to the antenna is made using the fitted female SMA connector.



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

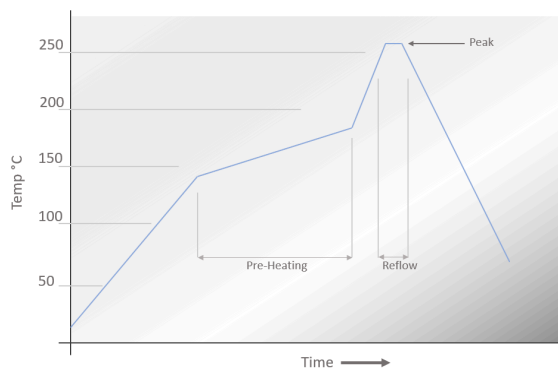
17 Evaluation Kit Matching Circuit

The circuit of the EVK 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.



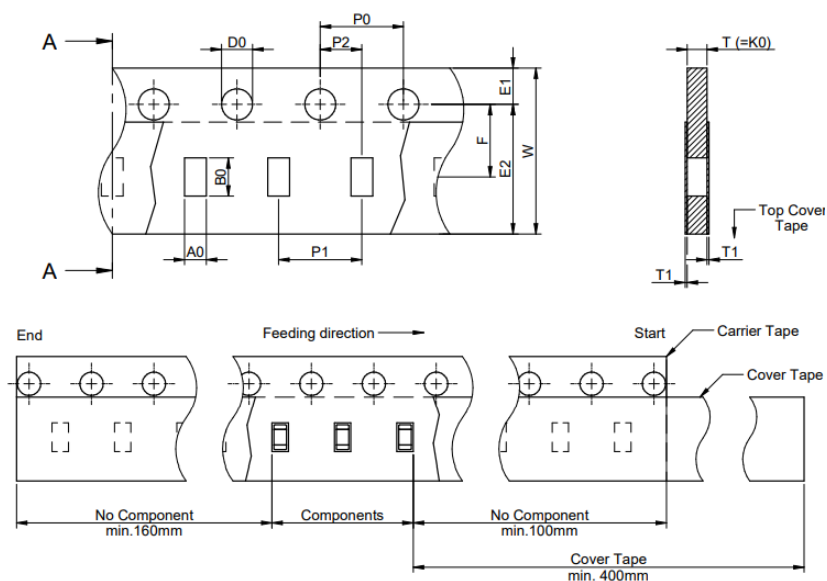
Designator	Component Type	Value	Size	Manufacturing Part No.
A1	Antenna	ORIONIS		SZC-C-2U02
C1	Resistor	0R	0402	Nonspecific part
L1, L2	NA	DNP		Not Fitted
J1	SMA Connector			CT-SAB04X (Joymax)

18 Reflow Profile



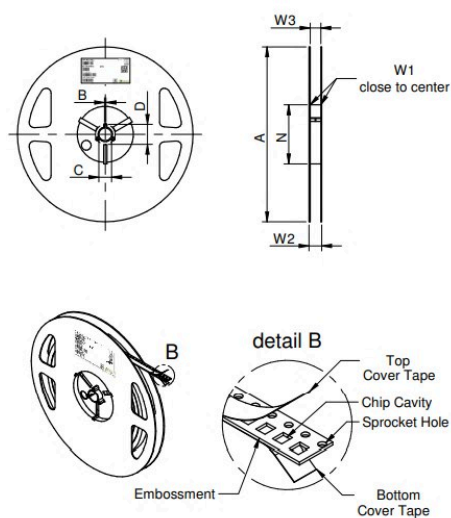
Stage	Temperature	Time
Pre-Heating	130 to 180°C	50 to 190 seconds
Reflow	>220°C	50 to 160 seconds
Peak Temperature	260°C	15 to 45 seconds

19 Tape



Dimension	Size 0603 (mm)	Tolerance
A0	1.05	typ.
B0	1.85	typ.
W	8.00	+0.3 / -0.1
T	0.95	typ.
T1	0.10	max.
P0	4.00	±0.1
P1	4.00	
P2	2.00	+0.05
D0	1.50	+0.1 / -0.0
E1	1.75	±0.1
E2	6.25	min.
F	3.50	±0.05
Tape type	Paper (type 1a)	
Packaging unit	4000 pcs	

20 Reel



Dimension	Value (mm)	Tolerance
A	178	±2.0
B	1.5	min.
C	12.8	min.
D	20.2	min.
N	50	min.
W1	8.4	+1.5
W2	14.4	max.
W3	7.9 to 10.9	min. / max.
Material	Polystyrene / Polyurethane	

21 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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