SP TECHNOLOGY

PRODUCT DATASHEET



UWB SMD

RIGEL

Ultra-Wideband SMD Antenna

SZP-C-0U01

FREQUENCY	PEAK GAIN	UWB CHANNELS	SIZE
3.2 to 4.8 / 5.9 to 7.0 GHz	Up to 3.60 dBi	1 to 7	10.0 × 9.0 × 1.7 mm

UWB LOW	3200 to 4800 MHz	Covers UWB channels 1, 2, 3, 4
UWB HIGH	5900 to 7000 MHz	Covers UWB channels 5, 6, 7

Key Features

- UWB channels 1 to 7
- Highly resistant to de-tuning
- Ideal for tags or smaller devices
- SMD, supplied in tape and reel
- Patent pending design

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2026
Rev A

1 Introduction

A high performance solution for embedded design. For UWB applications including ranging, sensors, and position tracking. Simple design-in with high performance, while keeping costs low with this ultra-small form factor.

Features

- For UWB applications
- Highly resistant to de-tuning
- SMD component supplied in tape and reel
- High performance
- Ideal for tags or smaller devices
- Channels 1 to 7
- 10 × 9.0 × 1.7 mm, smaller than other OTS antennas
- Patent pending design

Applications

- Asset Tracking
- M2M Industrial
- Location
- Wearable Devices
- Smart Home
- Precision Survey
- Sensor Tags
- Automotive Sensors
- Medical

2 Mechanical Specifications

Part Number	SZP-C-0U01
Name	RIGEL
Dimensions (mm)	10.0 × 9.0 × 1.7
Weight	<1.0 g
Antenna Type	Surface Mount Device

3 RF Specifications

Frequency Range (MHz)	Average Efficiency	Peak Gain (dBi)	S11 (max) dB	VSWR (max)	Impedance
3200 to 4800	>80%	3.60	<-8.0	2.30:1	**50 Ω**
5900 to 7000	>70%	1.5	<-10.0	2.00:1	

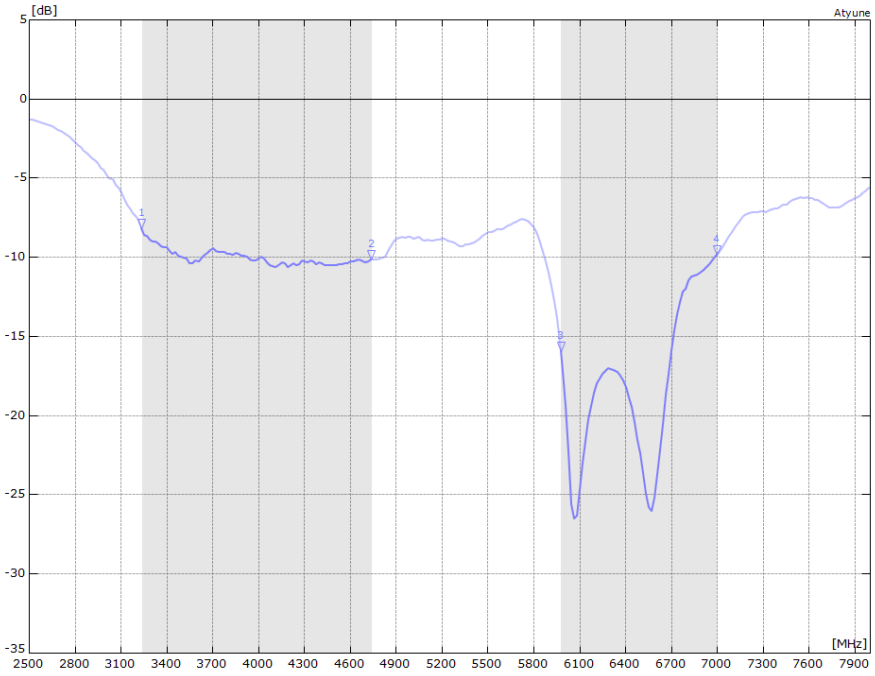
Polarization: Linear. Measured on Synzen DVK (SZDV-C-0U01).

4 Environmental

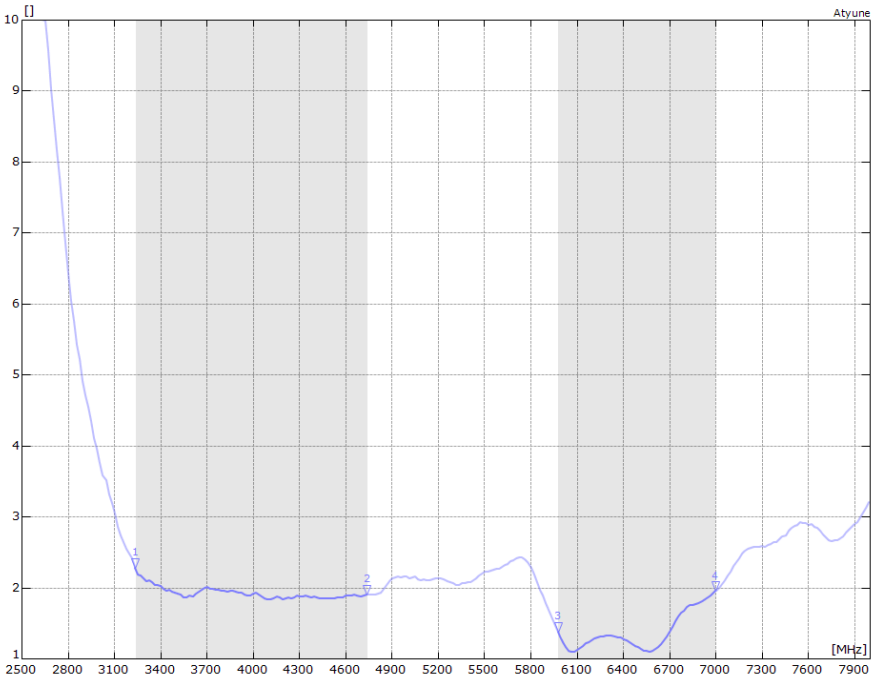
Operational Temperature	-40 to +125°C
Storage Temperature	-10 to +40°C
Relative Humidity	≤75%
Halogen Free	Yes

5 RF Characteristics

S11 Parameter

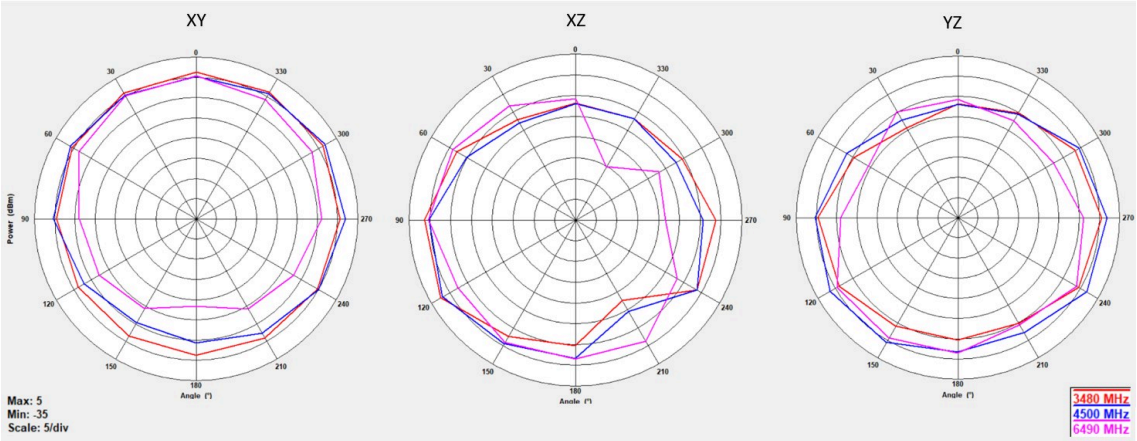


VSWR



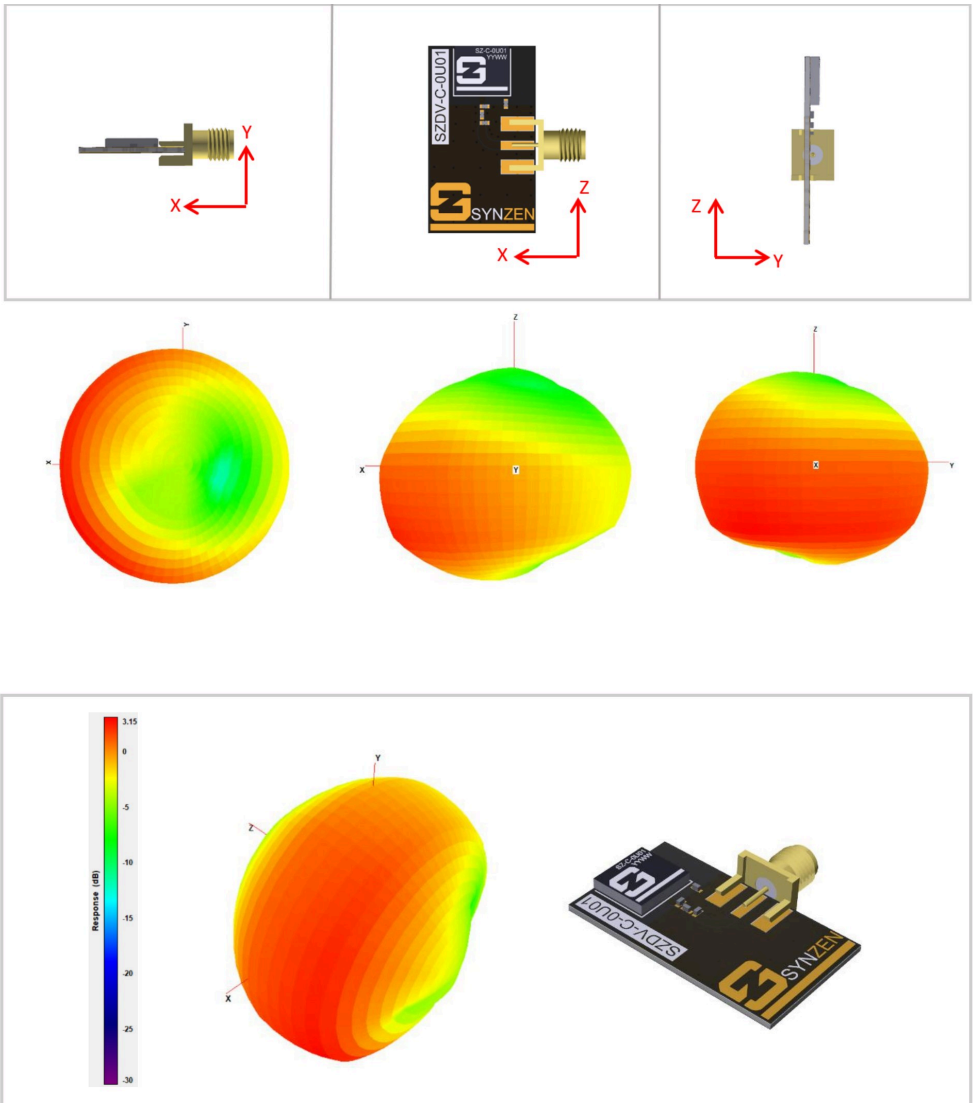
6 2D Polar Plot

MEASURED ON SYNZEN DVK (SZDV-C-0U01)



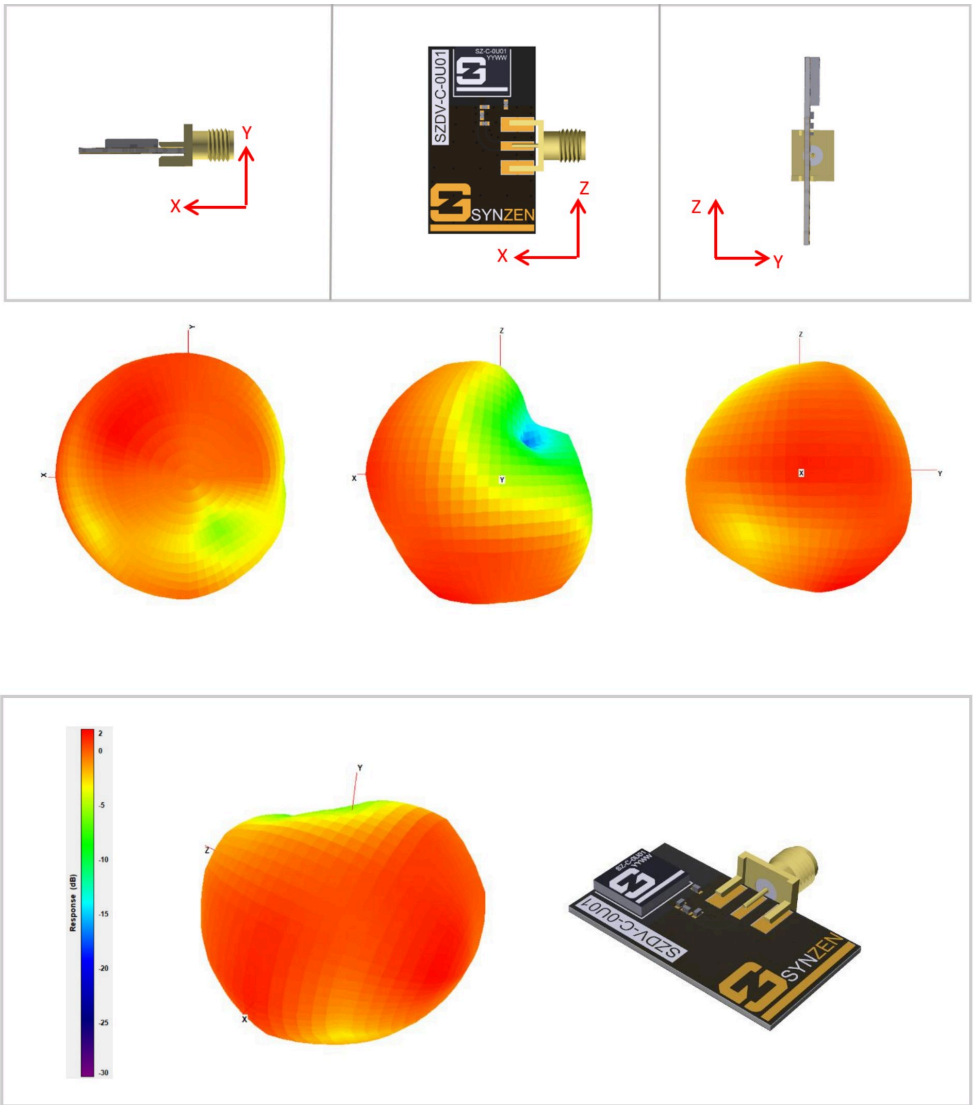
7 3D Radiation Pattern at 3500 MHz

MEASURED ON SYNZEN DVK (SZDV-C-0U01), FREQUENCY POINT 3500 MHZ

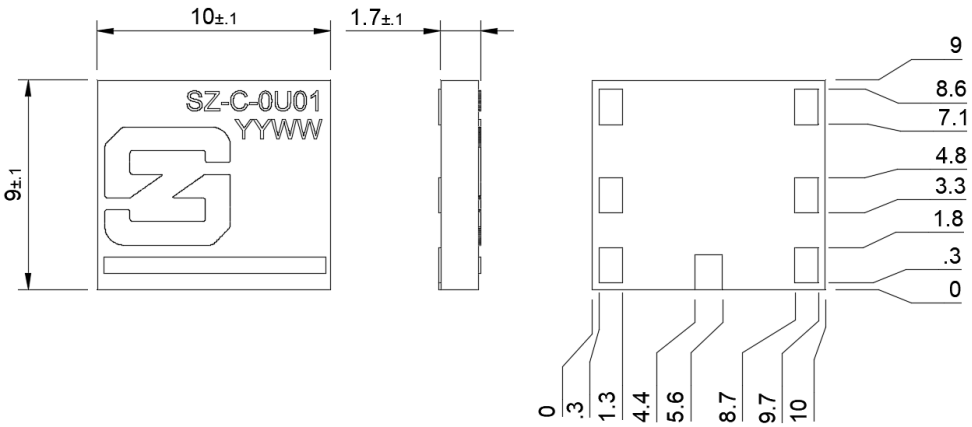


8 3D Radiation Pattern at 6400 MHz

MEASURED ON SYNZEN DVK (SZDV-C-0U01), FREQUENCY POINT 6400 MHZ



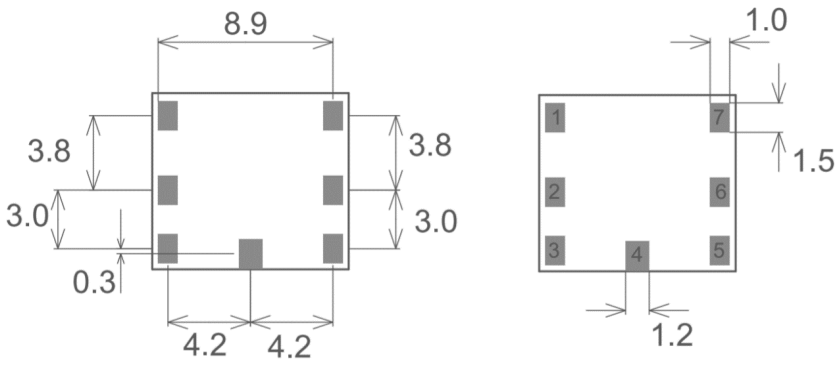
9 Antenna Mechanical Drawing



All dimensions in mm

10 Required Host PCB Footprint

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



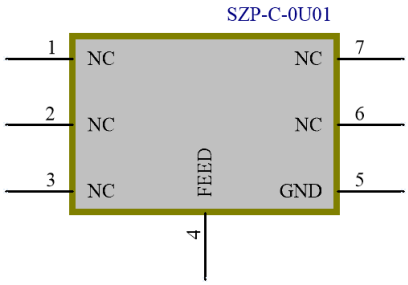
All dimensions in mm

Pins 1, 2, 3, 5, 6, 7 = 1.0 × 1.5 mm

Pin 4 = 1.2 × 1.5 mm

11 SZP-C-0U01 Schematic Symbol

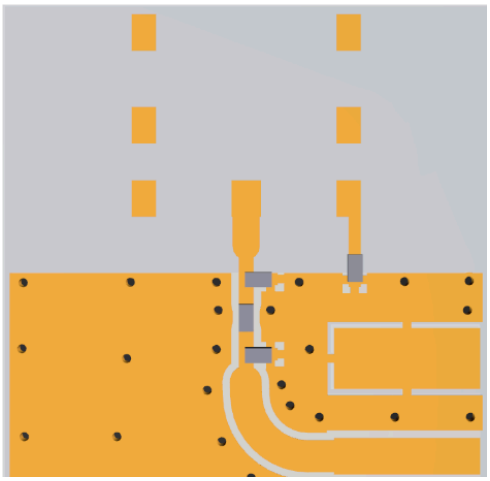
The schematic symbol for the antenna is shown below with a description of each pin.

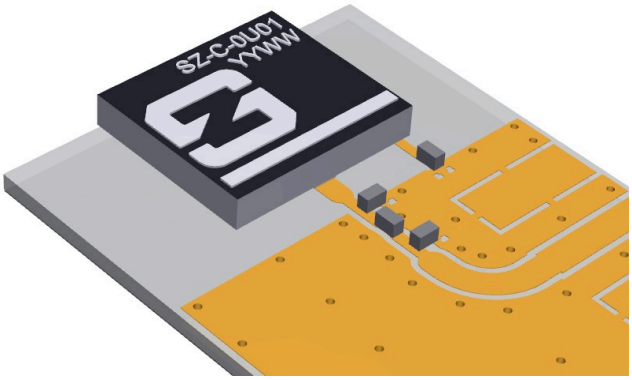


Pin	Description
1, 2, 3, 6, 7	Not used, leave unconnected
4	Feed to matching network
5	Ground

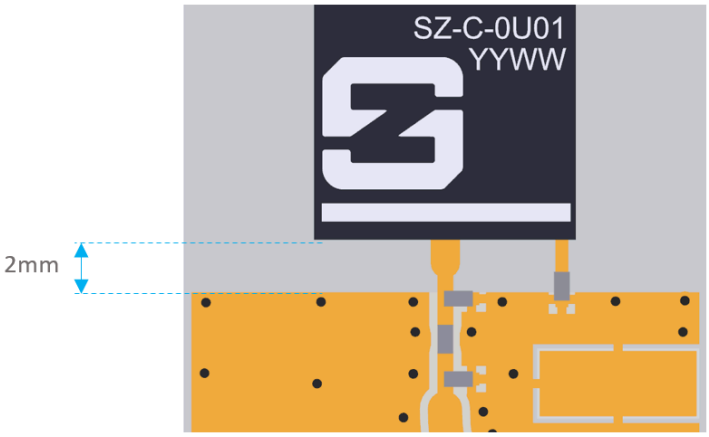
12 Placement

The antenna is designed to function placed at the center of the shortest PCB edge, equidistant from either side as shown here.





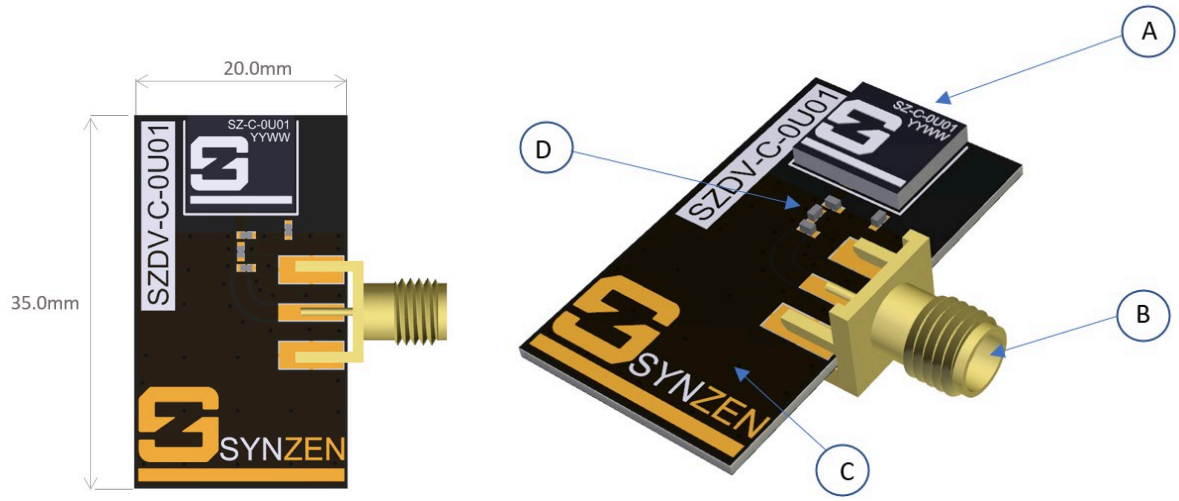
13 Clearance



A clearance is required through all PCB layers. Also, any components such as battery or display must also avoid this area. A 2 mm distance must be maintained from the antenna to the GND plane.

14 SZDV-C-0U01 Development Kit

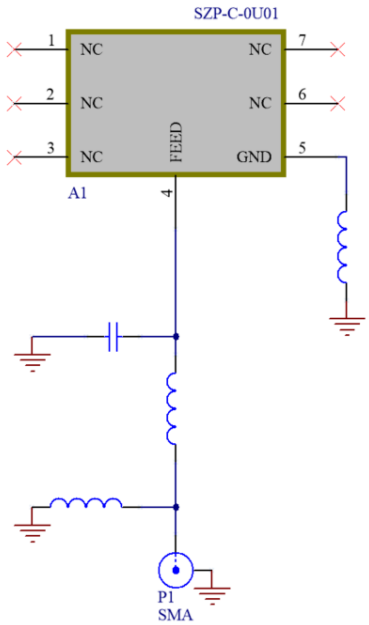
The SZDV-C-0U01 development kit is a PCBA with the UWB antenna (SZP-C-0U01) fitted and optimized with a matching network. Connection to the antenna is made using the fitted female SMA connector.



Item	Description
A	SZP-C-0U01-1 (Antenna)
B	SMA Connector
C	Host PCB
D	Matching Circuit

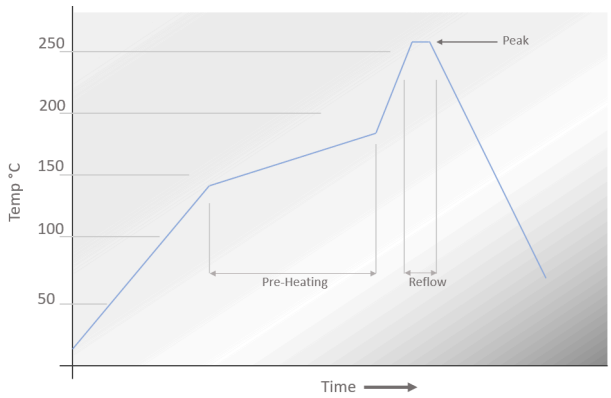
15 Development Kit Matching Circuit

The circuit of the development 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 optimize your device to ensure the best performance. Please contact sales@synzen.com.tw for more information.



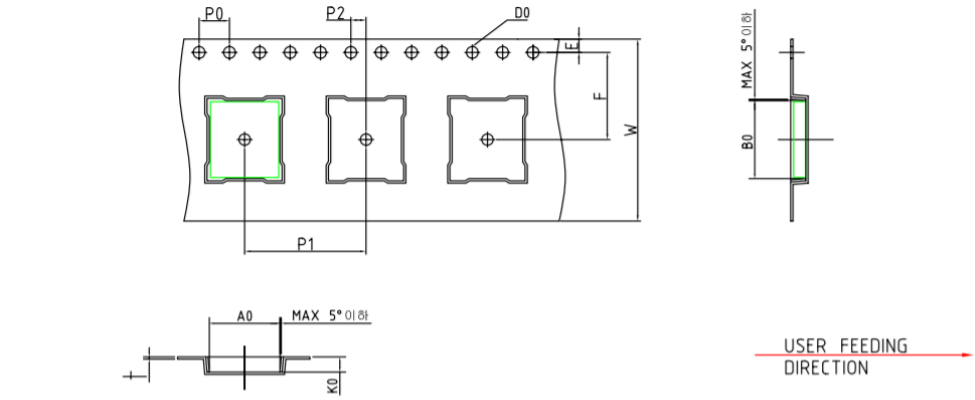
Designator	Component Type	Value	Size	Manufacturing Part No.
A1	Antenna	RIGEL		SZP-C-0U01
L1	Inductor	47 nH	0402	LQG15HN47NH02D
L2	Inductor	1.0 nH	0402	LQG15HS1N0S02D
C1	Capacitor	Not Fitted	0402	Do Not Place
L3	Inductor	1.5 nH	0402	LQG15HS1N5S02D
J1	SMA Connector			ACE solution A3SAFTST135

16 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

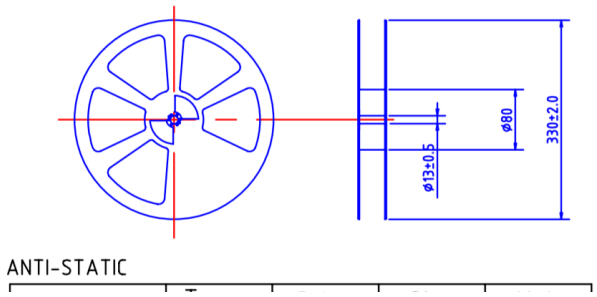
17 Tape



1. 10 sprocket hole pitch cumulative tolerance ±0.2
2. Camber not to exceed 1mm in 100mm.
3. Ao and Bo measured on a plane 0.1mm above the bottom of the pocket
4. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.

Name	Spec (mm)
W	24.00 ±0.3
E	1.75 ±0.1
F	11.50 ±0.1
D0	1.55 ±0.05
P1	16.00 ±0.1
P0	4.0 ±0.1
P2	2.0 ±0.1
A0	9.30 ±0.1
B0	10.30 ±0.1
K0	2.00 ±0.1
T	0.3 ±0.05

18 Reel



Type	Color	Size	Hub
PS, anti-static	Black	Ø 330 mm	Ø 80 mm

19 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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