

SUB-GHZ + 2.4 GHZ CERAMIC SMD

HYDOR

Dual Band ISM / BLE Ceramic Chip Antenna

SZC-C-5X01

FREQUENCY

868 / 915 + 2.4 GHz

PEAK GAIN

Up to 4.60 dBi

MOUNTING

SMD, PCB end

SIZE

1.6 × 0.8 × 0.8 mm

ISM 868	863 to 870 MHz	Covers ISM 868 (standard tuning)
ISM 915	902 to 928 MHz	Covers ISM 915 (optional tuning)
2.4 GHZ	2400 to 2500 MHz	Covers Wi-Fi, BLE

Key Features

- Ultra miniature ceramic antenna with a 1.6 mm by 0.8 mm by 0.8 mm form factor
- Single port dual band operation
- Standard tuning for 863 to 870 MHz + 2400 to 2500 MHz
- Optional tuning for 902 to 928 + 2400 to 2500 MHz for NA ISM devices
- Stable performance within a compact 26 mm by 12 mm clearance region
- Suitable for standard SMT manufacturing processes
- Low profile design for dense and space constrained layouts
- Excellent reliability and consistent batch performance

1 Introduction

HYDOR is a miniature dual band ceramic antenna designed for compact wireless devices that require stable performance in both <1 GHz and 2.4 GHz bands. With a footprint of only 1.6 mm by 0.8 mm by 0.8 mm, HYDOR delivers dependable radiation efficiency despite its extremely small size. The antenna operates in 863 to 870 MHz and 2400 to 2500 MHz as standard and can also be tuned for 902 to 928 MHz to support NA ISM requirements. HYDOR uses a single feed structure and requires a ground clearance of 26 × 12 mm in order to achieve optimal performance. This device is well suited for high density designs where board space is limited but robust wireless range and reliability are still required.

— Features

- ◆ Ultra miniature ceramic antenna with a 1.6 mm by 0.8 mm by 0.8 mm form factor
- ◆ Single port dual band operation
- ◆ Standard tuning for 863 to 870 MHz + 2400 to 2500 MHz
- ◆ Optional tuning for 902 to 928 + 2400 to 2500 MHz for NA ISM devices
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- ◆ Low profile design for dense and space constrained layouts
- ◆ Excellent reliability and consistent batch performance

— Applications

- | | |
|---|---|
| ◆ ISM band telemetry and control systems | ◆ Smart home and smart building devices |
| ◆ Smart meters and utility monitors | ◆ Security systems and wireless alarm nodes |
| ◆ Low power industrial and agricultural sensors | ◆ Wearable devices and compact portable equipment |
| ◆ Asset tracking and location tags | ◆ Low power <1 GHz and 2.4 GHz wireless modules |

2 Mechanical Specifications

Part Number	SZC-C-5X01
Name	HYDOR
Dimensions (mm)	1.6 × 0.8 × 0.8
Clearance Area (mm)	26.0 × 12.0
Weight	<1 g
Antenna Type	Surface Mount Ceramic Chip

3 Electrical / RF Specifications

Band	Frequency Range (MHz)	Avg Efficiency (%)	Peak Gain (dBi)	VSWR	Impedance
ISM 868	863 to 870	>50	1.06	1.80:1	50 Ω
ISM 915	902 to 928	>60	0.94	1.90:1	
Wi-Fi / BLE	2400 to 2500	>60	4.60	2.30:1	

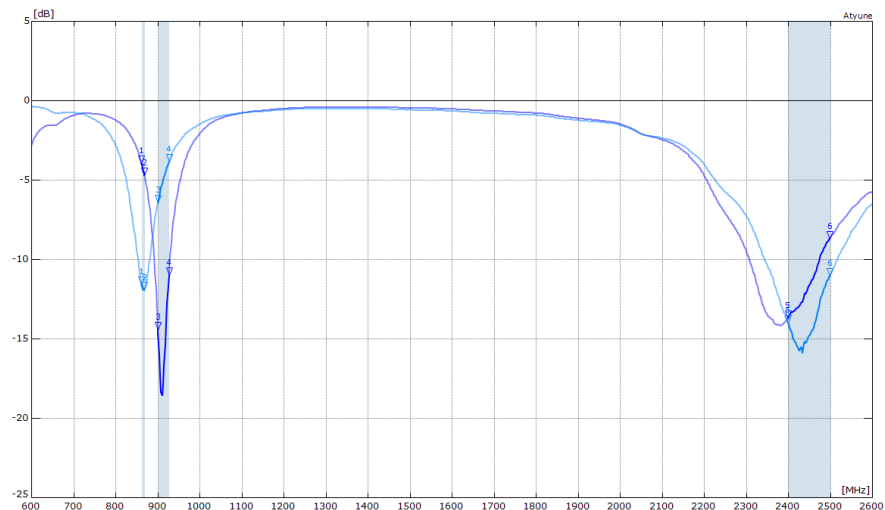
All performance stated is measured on the SZDV-C-5X01 evaluation kit. Can be tuned for either ISM 868 and Wi-Fi, or ISM 915 and Wi-Fi.

4 Environmental

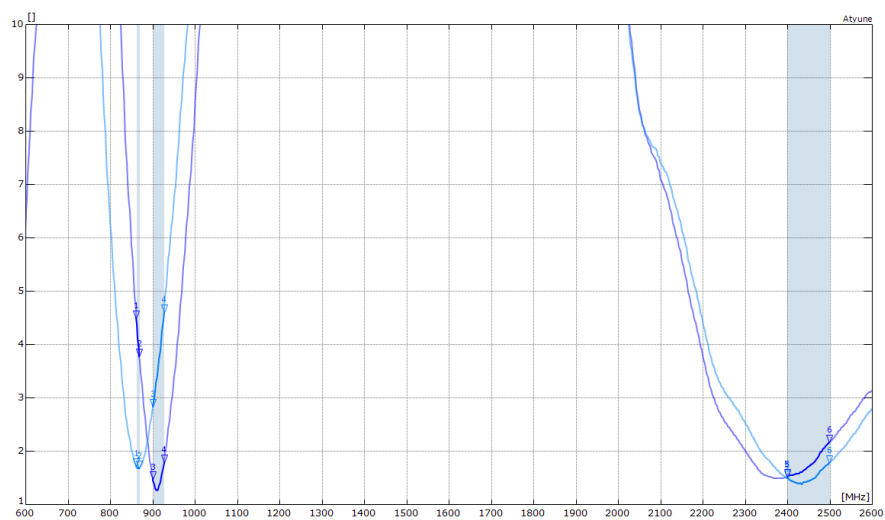
Operational Temperature	-55 to +125°C
Storage Temperature	-65 to +125°C
Relative Humidity (Storage)	65 ±20% RH
Moisture Sensitivity Level (MSL)	1
RoHS and REACH compliant	Yes

5 RF Characteristics

S11 Parameter



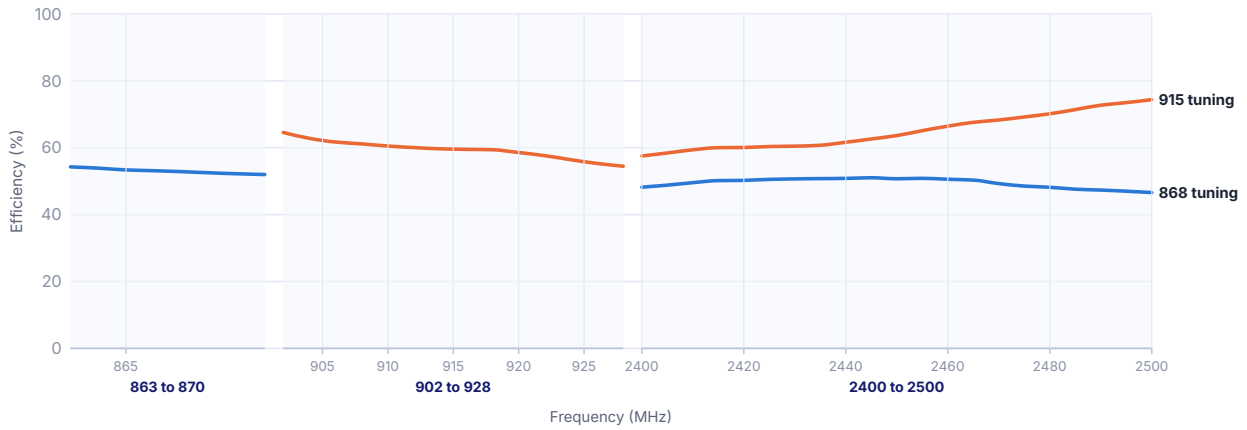
VSWR



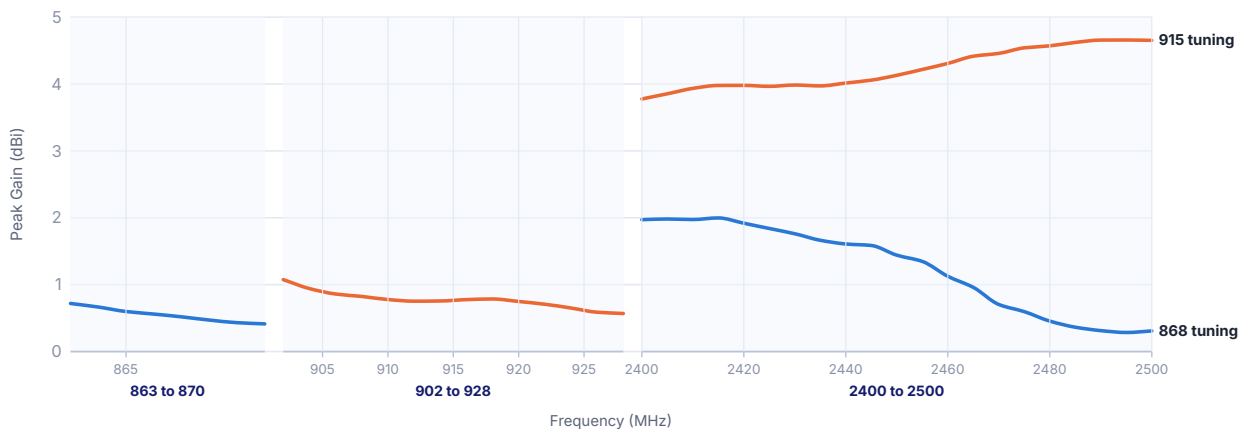
6 Antenna Performance

— 868 tuning — 915 tuning

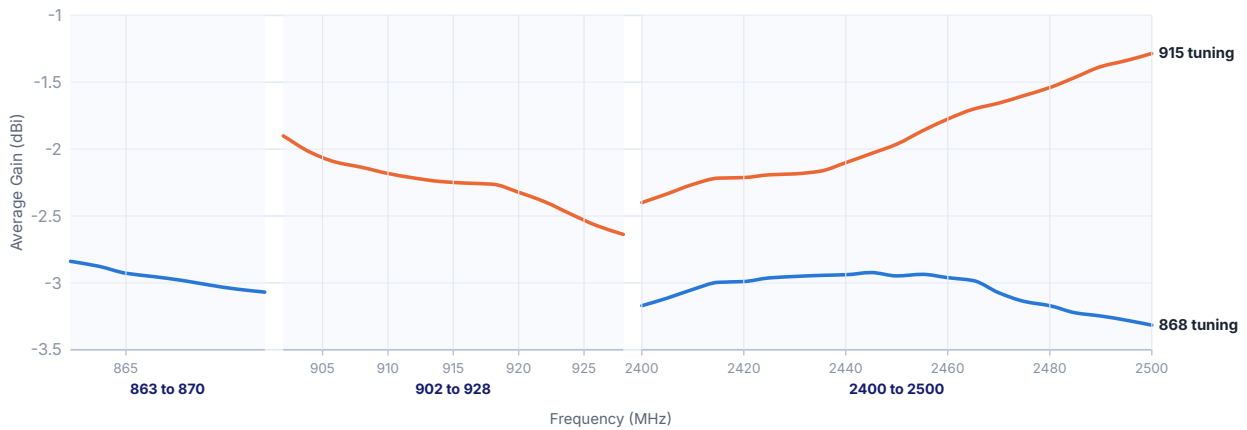
Efficiency



Peak Gain

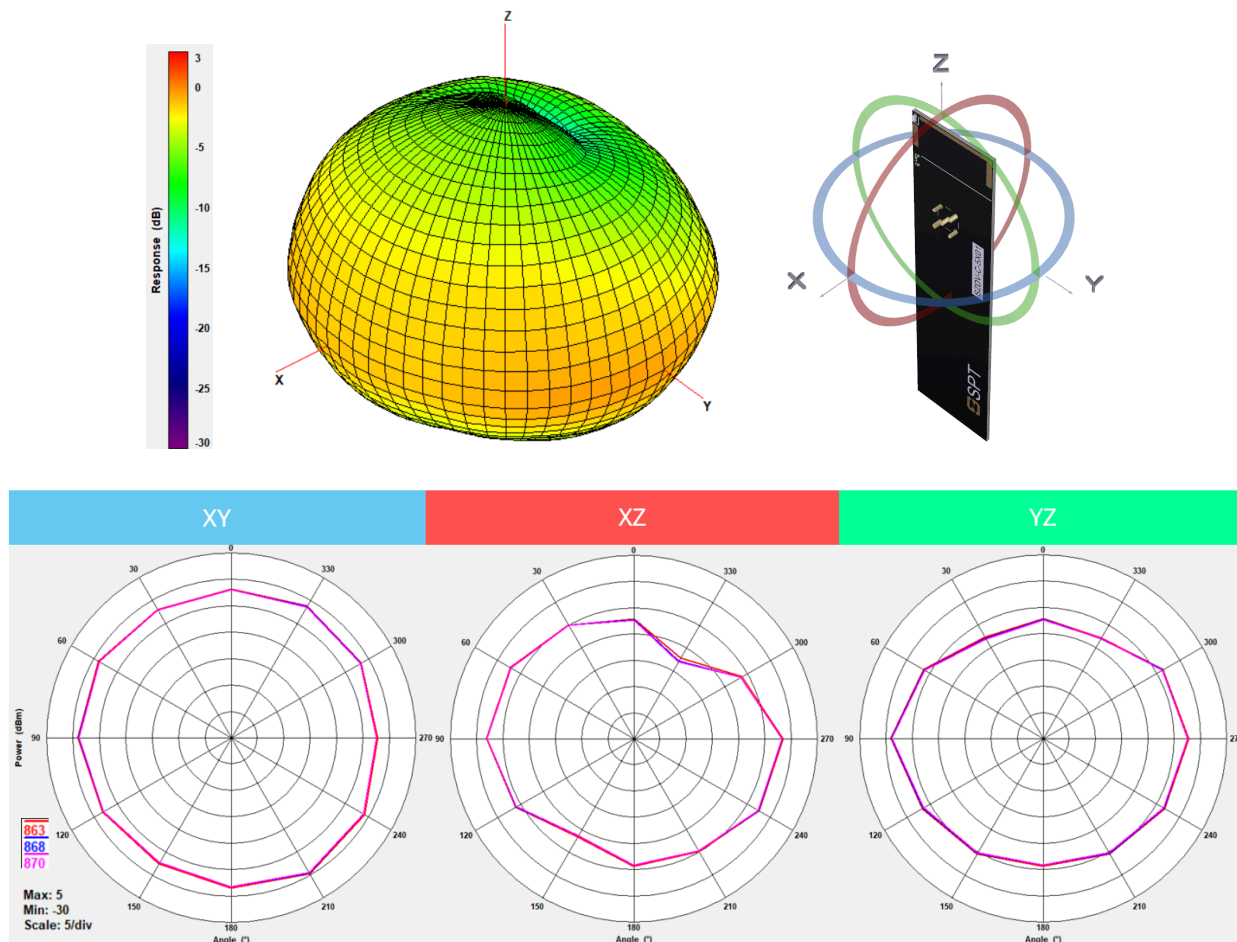


Average Gain



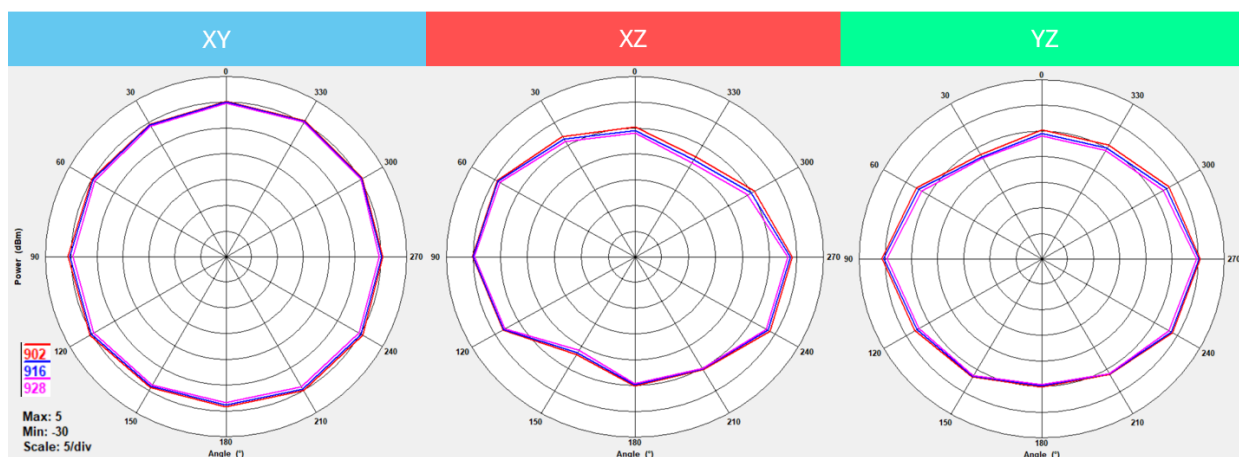
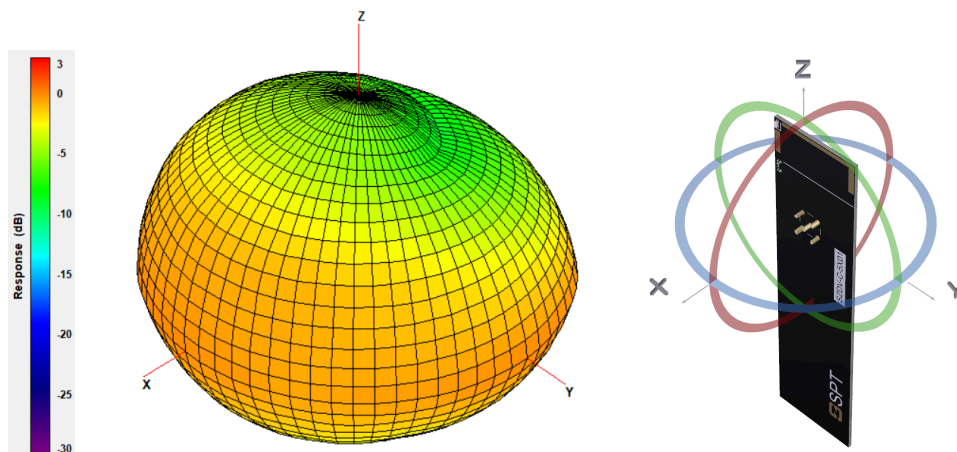
7 Radiation Patterns at 868 MHz

MEASURED ON SYNZEN EVK (SZDV-C-5X01)



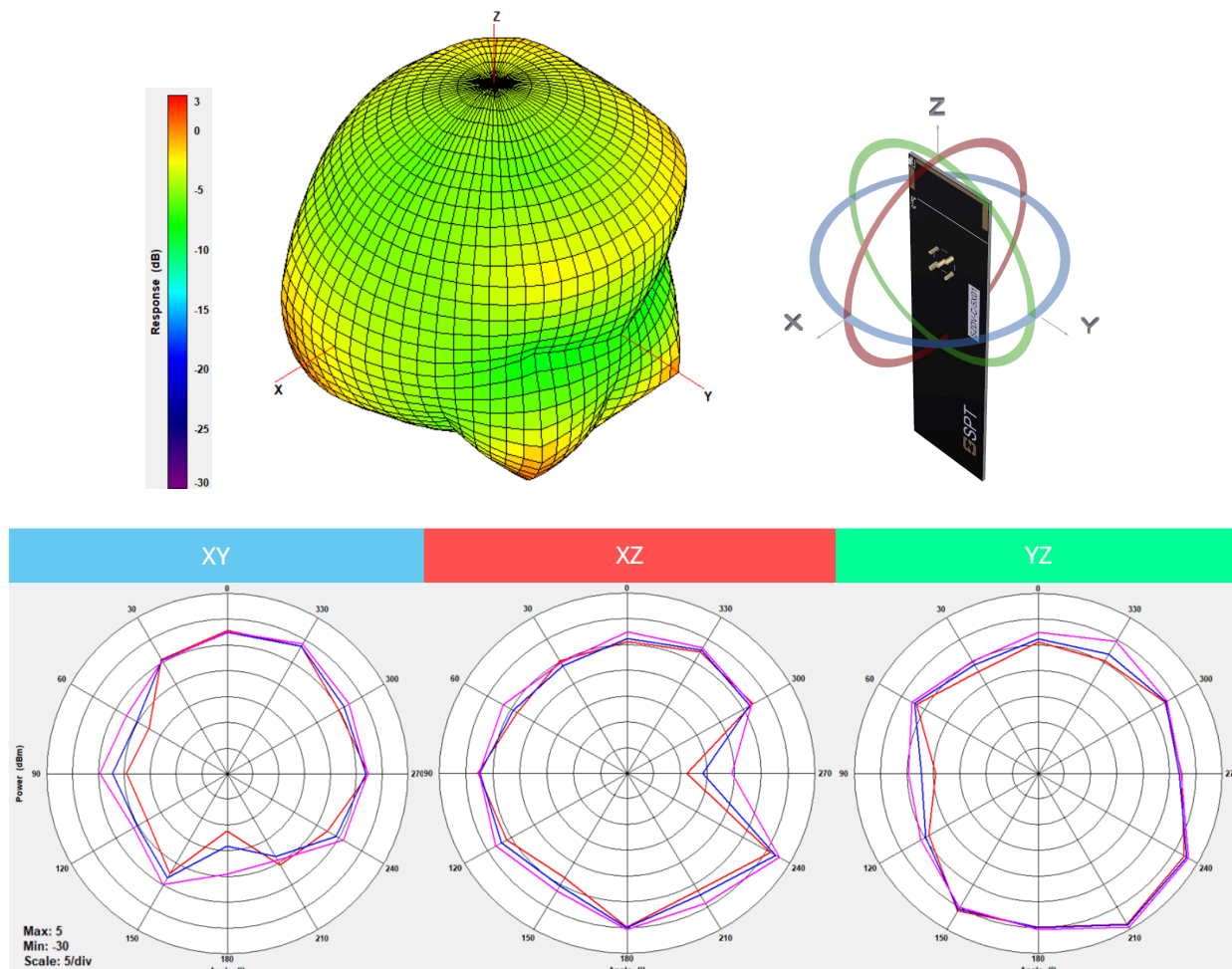
8 Radiation Patterns at 915 MHz

MEASURED ON SYNZEN EVK (SZDV-C-5X01)

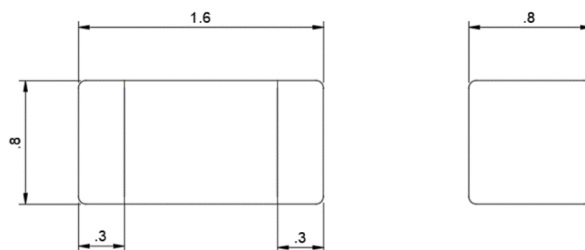


9 Radiation Patterns at 2450 MHz

MEASURED ON SYNZEN EVK (SZDV-C-5X01)



10 Mechanical Drawing



All dimensions in mm

11 Required Host PCB Footprint

PCB library files and DXF for the required host PCB footprint are available from our website www.synzen.com.tw/products.

The required clearance for the host PCB is 26.0 × 12.0 mm on all layers.

12 Schematic Symbol

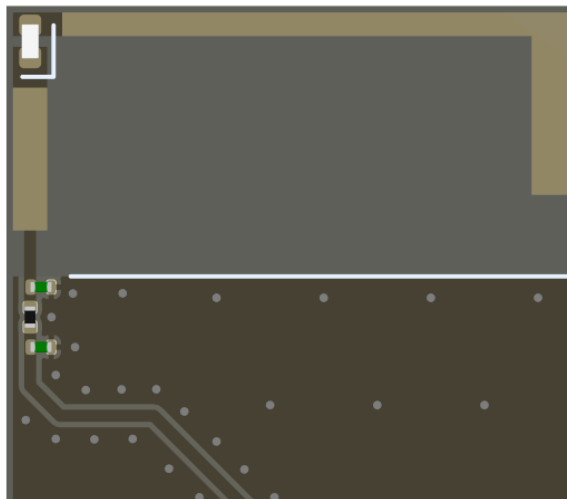
A1
ANT_ISM+WIFI_SZC-C-5X01_ANT



Pin	Description
1	Not orientation sensitive
2	Not orientation sensitive

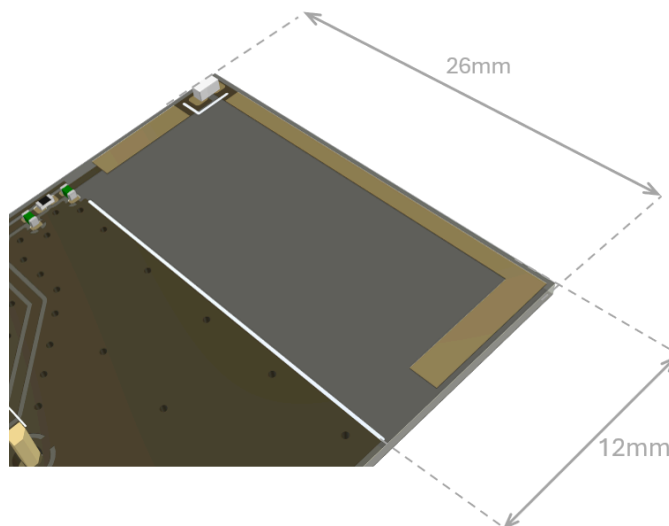
13 Placement

The antenna is designed to function placed at the end of the PCB on the shortest edge.



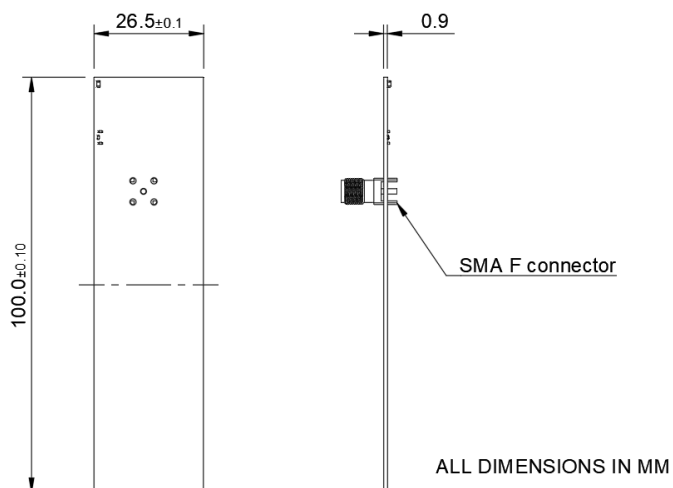
14 Clearance

A clearance is required through all PCB layers for the precise area shown. Also, any components such as battery or display must also avoid this area. The rest of the area under the antenna should be filled GND.

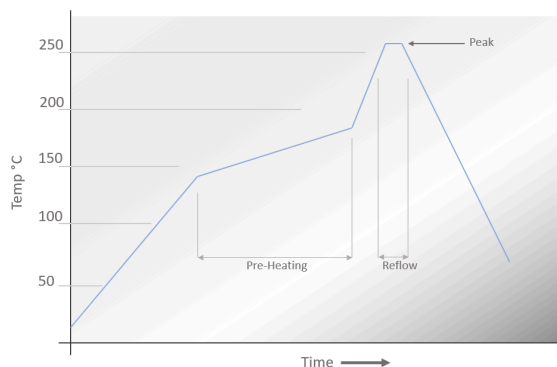


15 SZDV-C-5X01 Evaluation Kit

The SZDV-C-5X01 evaluation kit is a PCBA with the antenna (SZC-C-5X01) fitted and optimized with a matching network. Connection to the antenna is made using the fitted female SMA connector.

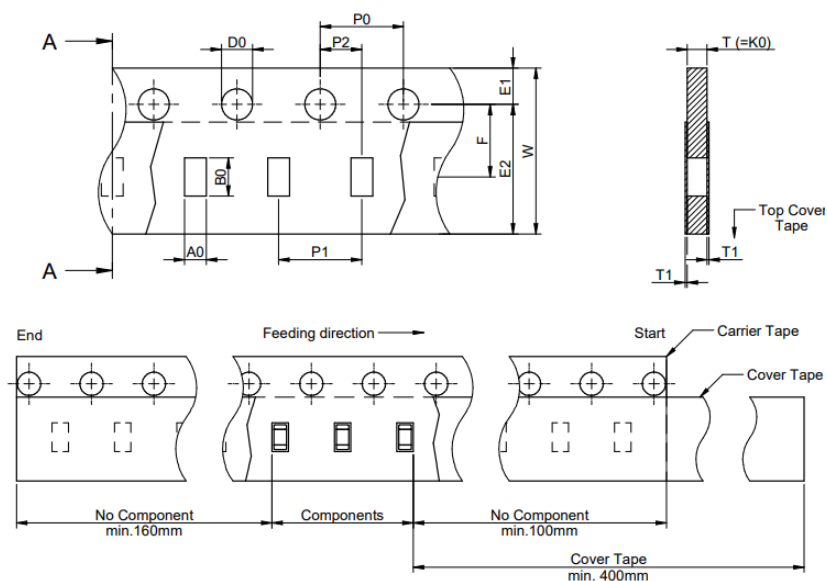


16 Reflow Profile



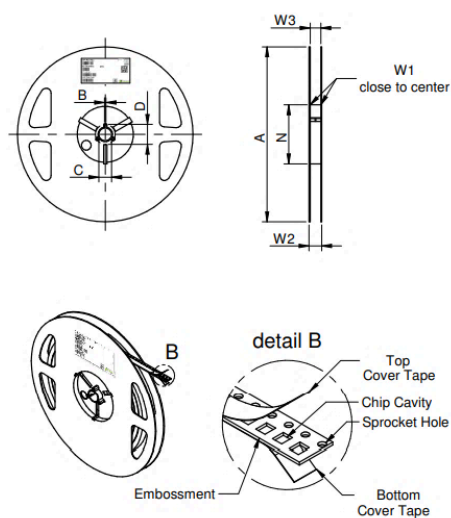
Stage	Temperature	Time
Pre-Heating	130 to 180°C	50 to 190 seconds
Reflow	>220°C	50 to 160 seconds
Peak Temperature	260°C	15 to 45 seconds

17 Tape



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	

18 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	

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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