

## — 2.4 GHZ CERAMIC SMD

# SIRIUSa

WLAN / BLE Ceramic Chip Antenna

SZC-C-0W02

FREQUENCY  
2400 to 2500 MHz

PEAK GAIN  
3.0 dBi

EFFICIENCY  
>75%

SIZE  
1.6 × 0.8 × 0.8 mm

2.4 GHZ

2400 to 2500 MHz

Covers Wi-Fi, BLE, ISM

## — Key Features

- Optimal for WLAN / Bluetooth / ISM applications (2400 to 2500 MHz)
- Highly resistant to detuning for reliable performance
- Clean resonance with no unwanted out-of-band responses
- SMD component supplied in tape and reel for streamlined assembly
- Ultra-small form factor with >70% efficiency for high-performance results
- Ideal for compact, wearable designs
- Compatible with resin and potting compounds for robust sealing

## 1 Introduction

SIRIUSa ceramic chip antenna, the ultimate solution for WLAN, Bluetooth, and ISM applications. Designed to simplify your design process, SIRIUSa empowers you to focus on product development while delivering exceptional performance.

Engineered to resonate best when placed at the center of the longest PCB edge, SIRIUSa provides a near-omnidirectional radiation pattern. Its robust design ensures consistent performance, even in challenging environments.

Choose SIRIUSa for a reliable, efficient, and space-saving antenna solution that meets the demands of modern embedded design.

### — Features

- ◆ Optimal for WLAN / Bluetooth / ISM applications (2400 to 2500 MHz)
- ◆ Highly resistant to detuning for reliable performance
- ◆ Clean resonance with no unwanted out-of-band responses
- ◆ SMD component supplied in tape and reel for streamlined assembly
- ◆ Ultra-small form factor with >70% efficiency for high-performance results
- ◆ Ideal for compact, wearable designs
- ◆ Compatible with resin and potting compounds for robust sealing

### — Applications

- |                                     |              |
|-------------------------------------|--------------|
| ◆ Industrial / Scientific / Medical | ◆ Healthcare |
| ◆ M2M Industrial                    | ◆ Smart Grid |
| ◆ Smart Meters                      | ◆ OBD-II     |
| ◆ Access Points                     | ◆ Tablets    |
| ◆ Headsets                          |              |

## 2 Mechanical Specifications

|                 |                            |
|-----------------|----------------------------|
| Part Number     | SZC-C-0W02                 |
| Name            | SIRIUSa                    |
| Dimensions (mm) | 1.6 × 0.8 × 0.8            |
| Weight          | <0.1 g                     |
| Antenna Type    | Surface Mount Ceramic Chip |

## 3 Electrical / RF Specifications

| Band        | Frequency Range (MHz) | Efficiency (%) | Peak Gain (dBi) | VSWR   | Impedance |
|-------------|-----------------------|----------------|-----------------|--------|-----------|
| Wi-Fi / BLE | 2400 to 2500          | >75            | 3.0             | 1.75:1 | 50 Ω      |

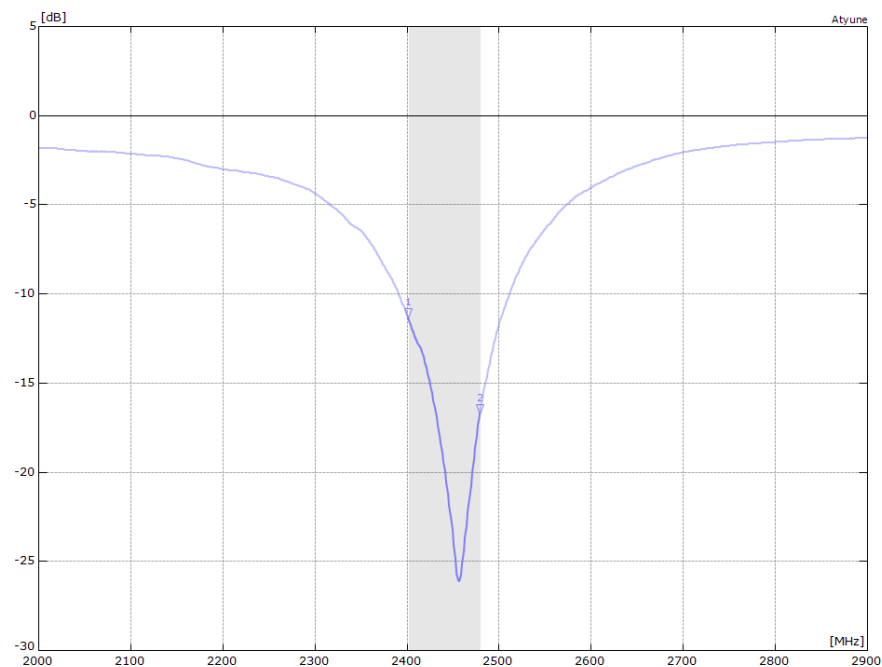
Note: All performance stated is measured on the SZDV-C-0W02 evaluation kit.

## 4 Environmental

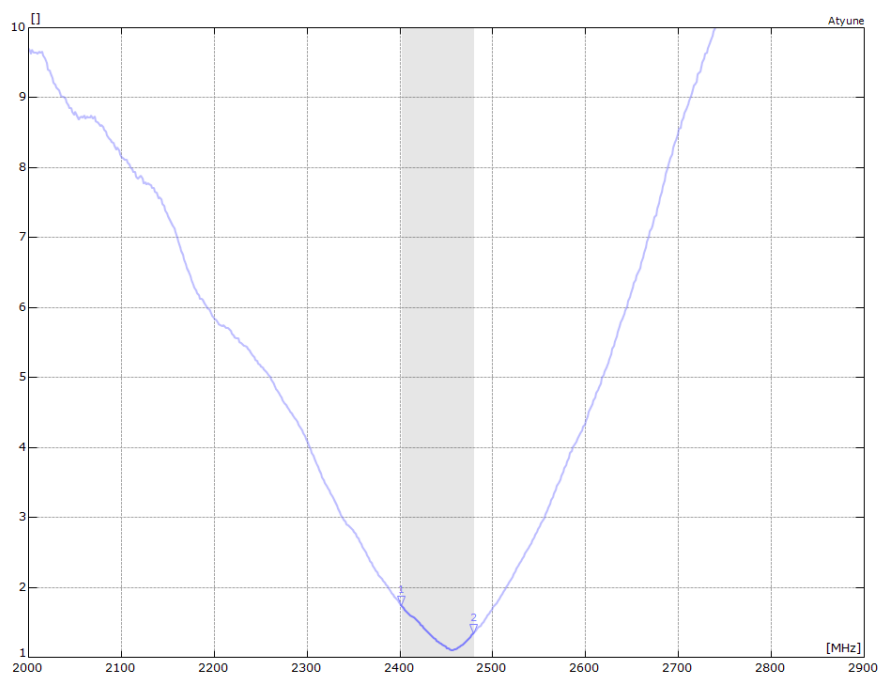
|                                  |               |
|----------------------------------|---------------|
| Operational Temperature          | -40 to +125°C |
| Storage Temperature              | -10 to +40°C  |
| Relative Humidity (Storage)      | 65 ±20% RH    |
| Moisture Sensitivity Level (MSL) | 1             |
| RoHS and REACH compliant         | Yes           |

## 5 RF Characteristics

S11 Parameter

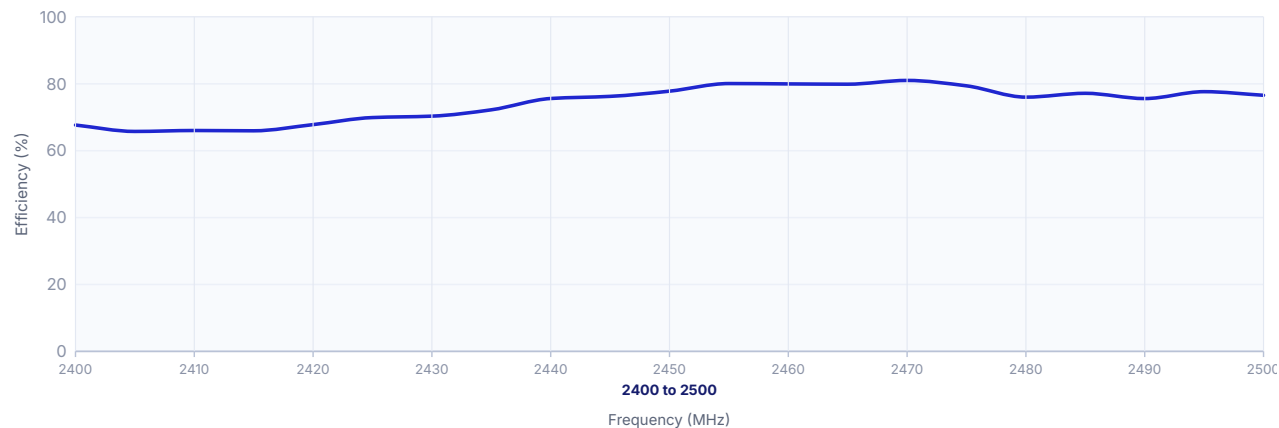


VSWR

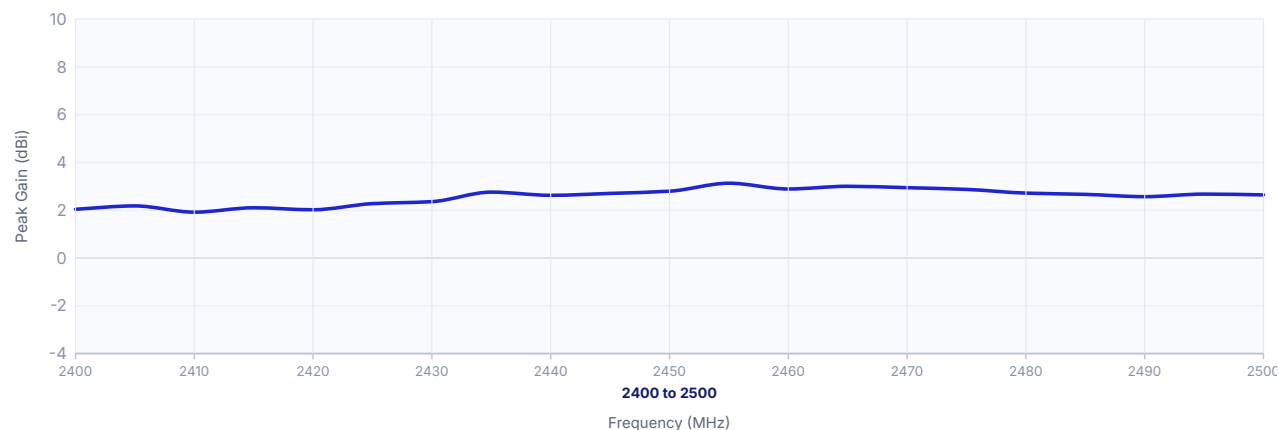


## 6 Antenna Performance

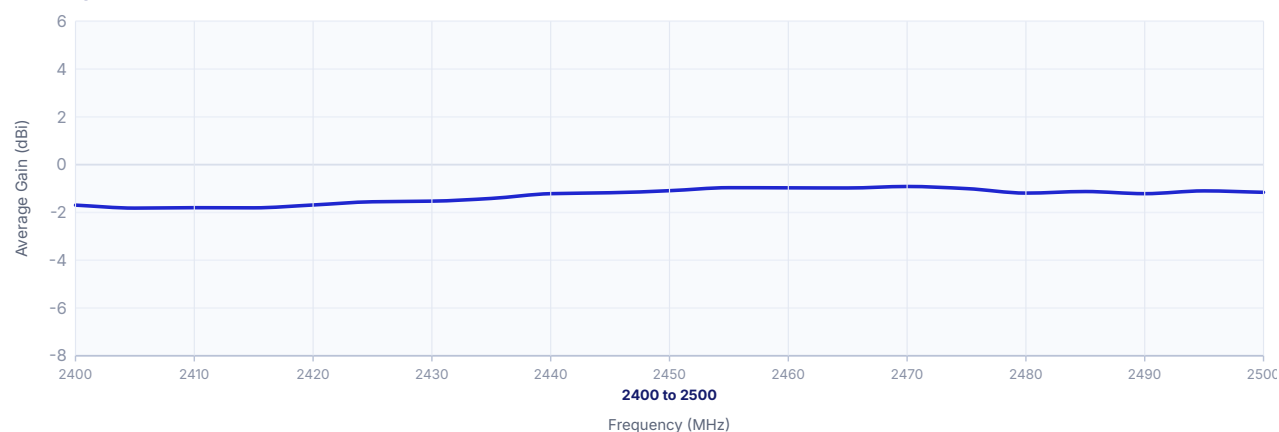
### Efficiency



### Peak Gain

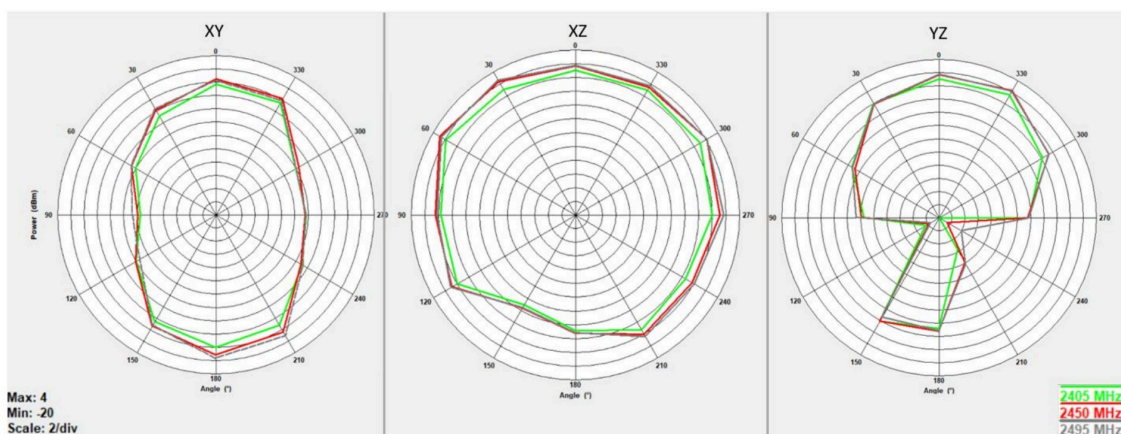
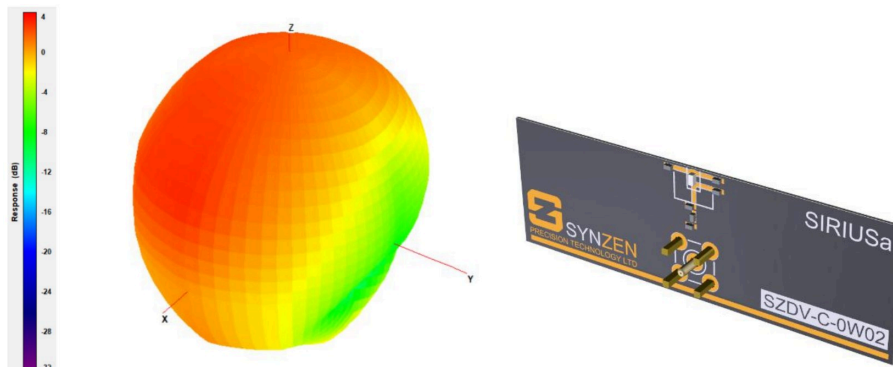


### Average Gain

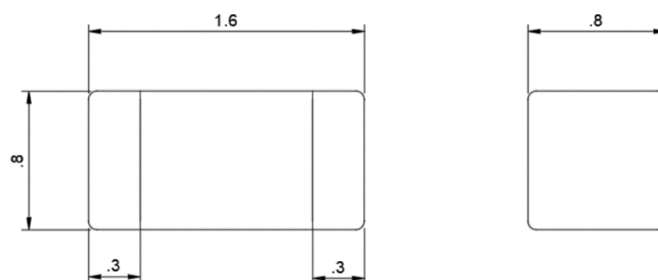


## 7 Radiation Patterns at 2450 MHz

MEASURED ON SYNZEN EVK (SZDV-C-0W02)



## 8 Mechanical Drawing

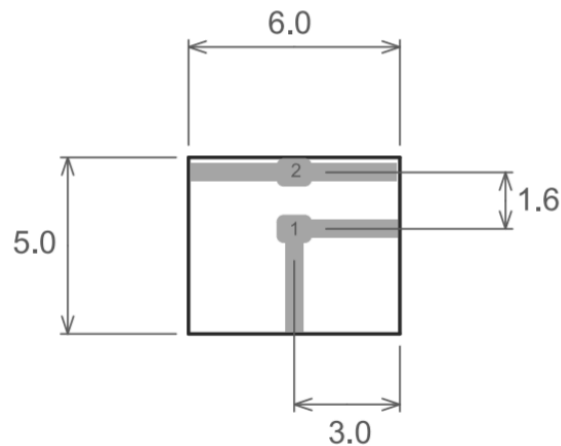


All dimensions in mm

| L         | W         | T         |
|-----------|-----------|-----------|
| 1.6 ±0.15 | 0.8 ±0.15 | 0.8 ±0.15 |

## 9 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](http://www.synzen.com.tw/products). The required clearance for the host PCB is 6.0 × 5.0 mm on all layers.

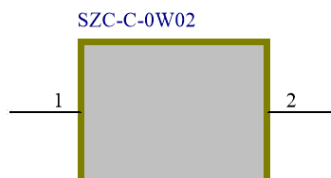


All dimensions in mm

Pins 1, 2 = 1.0 × 0.8 mm

Trace = 0.5 mm width

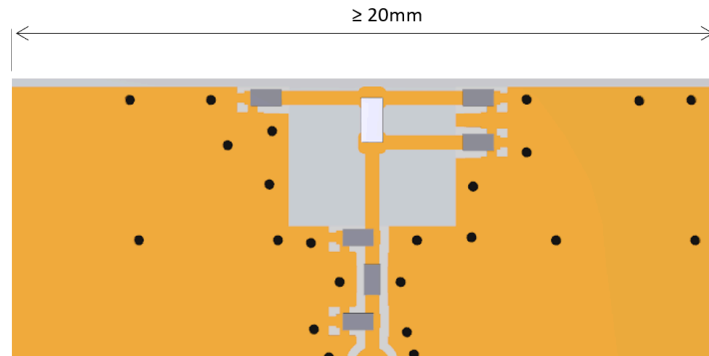
## 10 SZC-C-0W02 Schematic Symbol



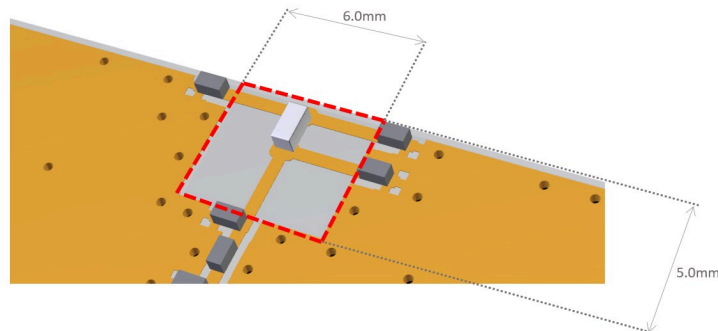
| Pin | Description               |
|-----|---------------------------|
| 1   | Not orientation sensitive |
| 2   | Not orientation sensitive |

## 11 Placement

The antenna is designed to function placed at the center of the longest PCB edge. Where possible the top and bottom layers of the PCB should be flooded with GND; this optimizes the antenna performance.



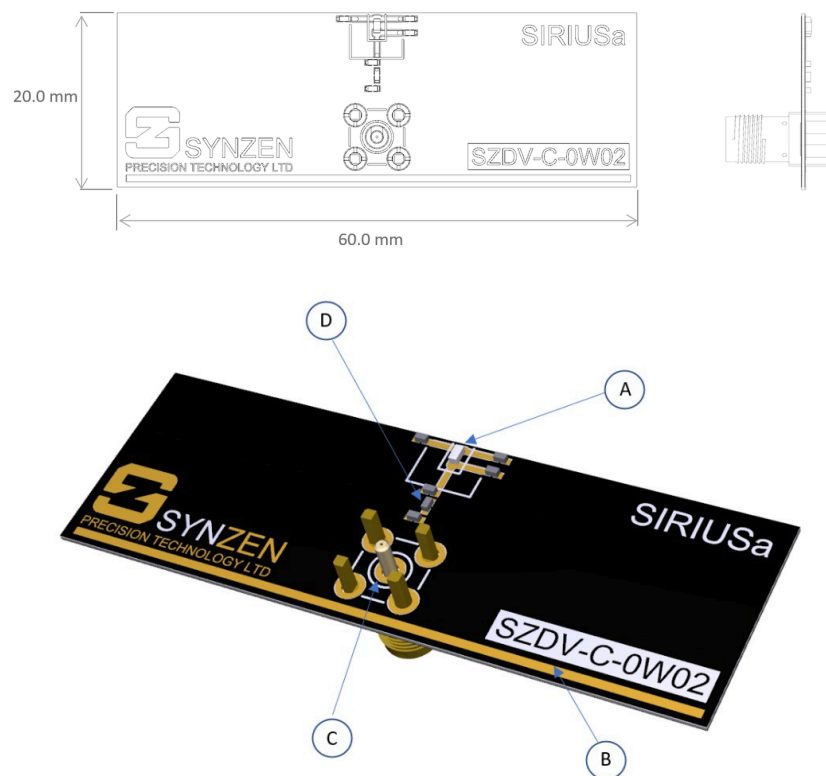
## 12 Clearance



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.

## 13 SZDV-C-0W02 Evaluation Kit

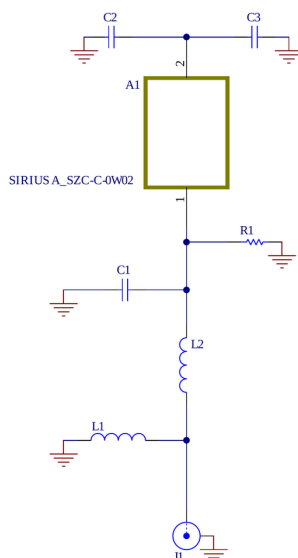
The SZDV-C-0W02 evaluation kit is a PCBA with the antenna (SZC-C-0W02) fitted and optimized with a matching network. Connection to the antenna is made using the fitted female SMA connector.



| Item | Description          |
|------|----------------------|
| A    | SZC-C-0W02 (Antenna) |
| B    | Host PCB             |
| C    | SMA Connector        |
| D    | Matching Circuit     |

## 14 Evaluation Kit Matching Circuit

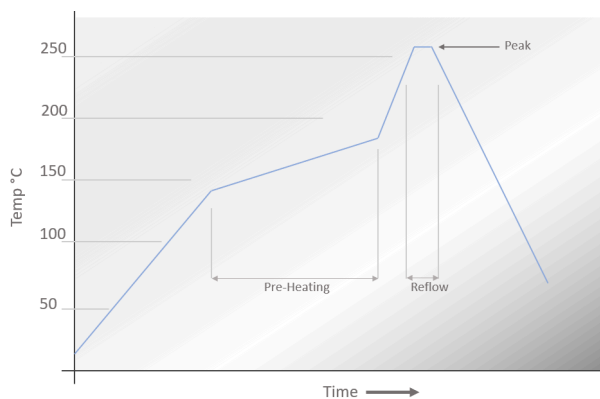
The circuit of the evaluation kit along with the BOM is shown below. The matching network topology should be used on the device host PCB, although the matching values will be dependent on the host PCB and device environment. Synzen provide a matching service to optimize your device to ensure the best performance. Please contact [sales@synzen.com.tw](mailto:sales@synzen.com.tw) for more information.



| Designator | Component Type | Value      | Size | Manufacturing Part No.   |
|------------|----------------|------------|------|--------------------------|
| A1         | Antenna        | SIRIUSa    |      | SZC-C-0W02               |
| R1         | Resistor       | 0R         | 0402 | Nonspecific part         |
| C3         | Capacitor      | 0.5 pF     | 0402 | GJM1555C1HR50BB01D       |
| L2         | Inductor       | 1.2 nH     | 0402 | LQG15HS1N2B02D           |
| C2         | Capacitor      | 1.0 pF     | 0402 | GCM1555C1H1R0CA16J       |
| L1         | Inductor       | Not Fitted | 0402 | Do Not Place             |
| C1         | Capacitor      | 0.3 pF     | 0402 | GJM1555C1HR30BB01D       |
| J1         | SMA Connector  |            |      | ACE solution A3SAFTST135 |

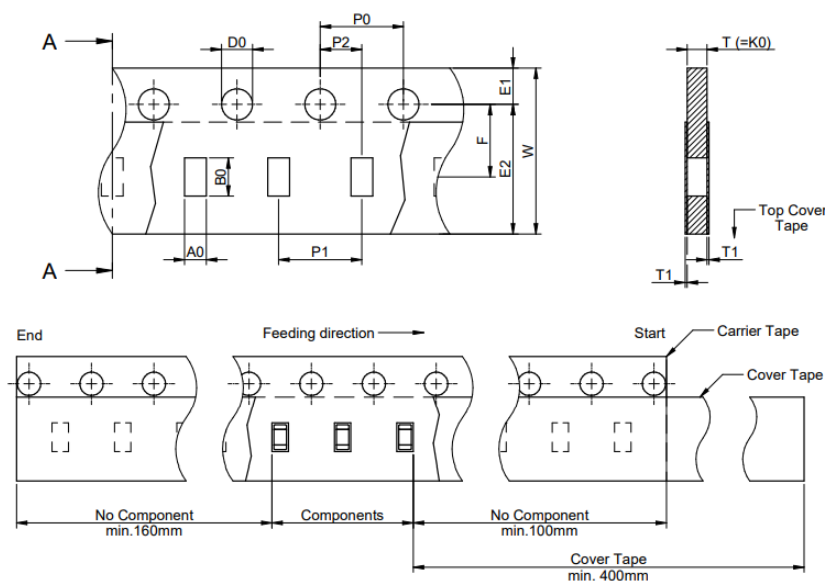
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## Reflow Profile



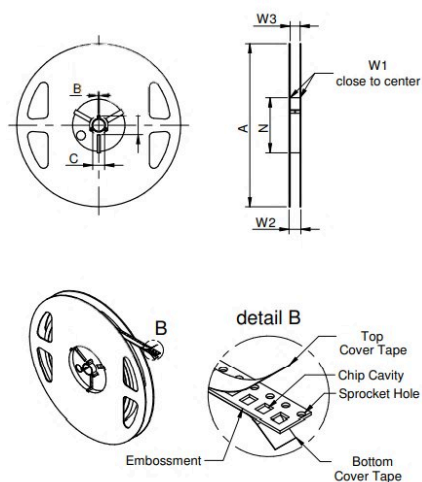
| Stage            | Temperature  | Time              |
|------------------|--------------|-------------------|
| Pre-Heating      | 130 to 180°C | 50 to 190 seconds |
| Reflow           | >220°C       | 50 to 160 seconds |
| Peak Temperature | 260°C        | 15 to 45 seconds  |

## 16 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        |             |

## 17 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 |             |

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## 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](mailto:sales@synzen.com.tw).

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