

## Features

- Stable and reliable in performance
- Low profile, compact size
- SMT processes compatible
- RoHS Compliant

## Applications

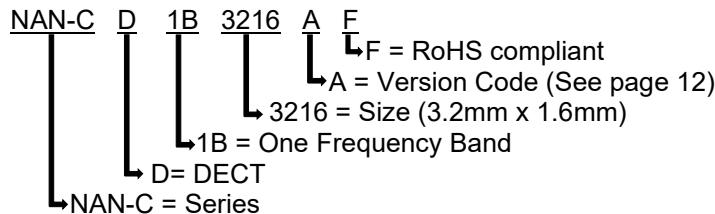
- Digital Enhanced Cordless Telecommunications, DECT (1880-1930 MHz)



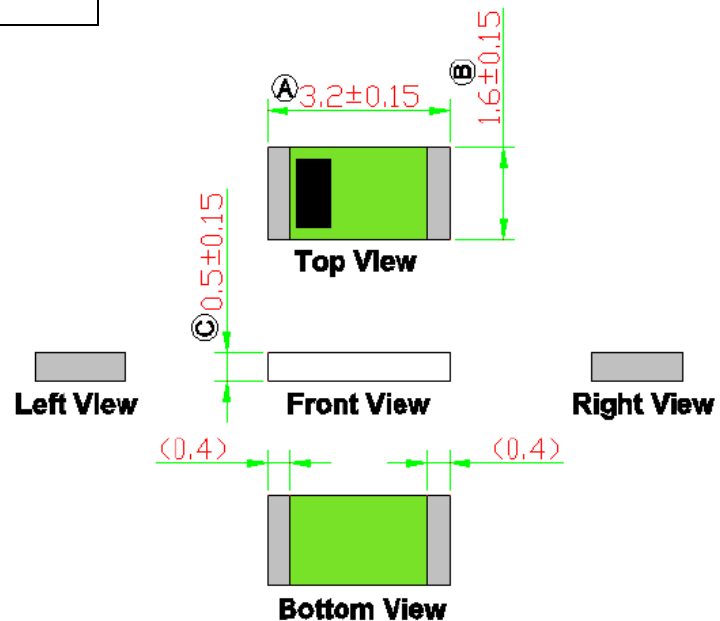
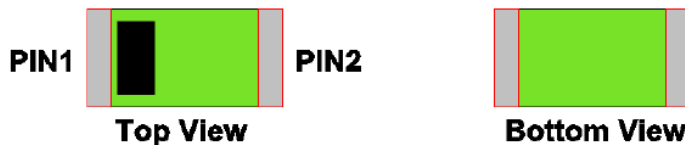
**RoHS Compliant**  
includes all homogeneous materials  
(see part numbering system for details)

## Specifications

|                           |                |
|---------------------------|----------------|
| <b>PN: NAN-CD1B3216AF</b> |                |
| <b>Electrical</b>         |                |
| Frequency Range           | 1880 ~ 1930MHz |
| Center Frequency          | 1905 MHz       |
| Polarization              | Linear         |
| Gain                      | 1.5 dBi typ.   |
| Efficiency                | 74% typ.       |
| V.S.W.R                   | 2.0 Max        |
| Impedance                 | 50Ω            |
| <b>Dimensions (mm):</b>   |                |
| Body Length (A)           | 3.2 ± 0.15     |
| Width (B)                 | 1.6 ± 0.15     |
| Thickness (C)             | 0.5 ± 0.15     |
| Connection Type           | SMT            |
| Ground Plane              | 80 mm x 40 mm  |



## PIN Definition



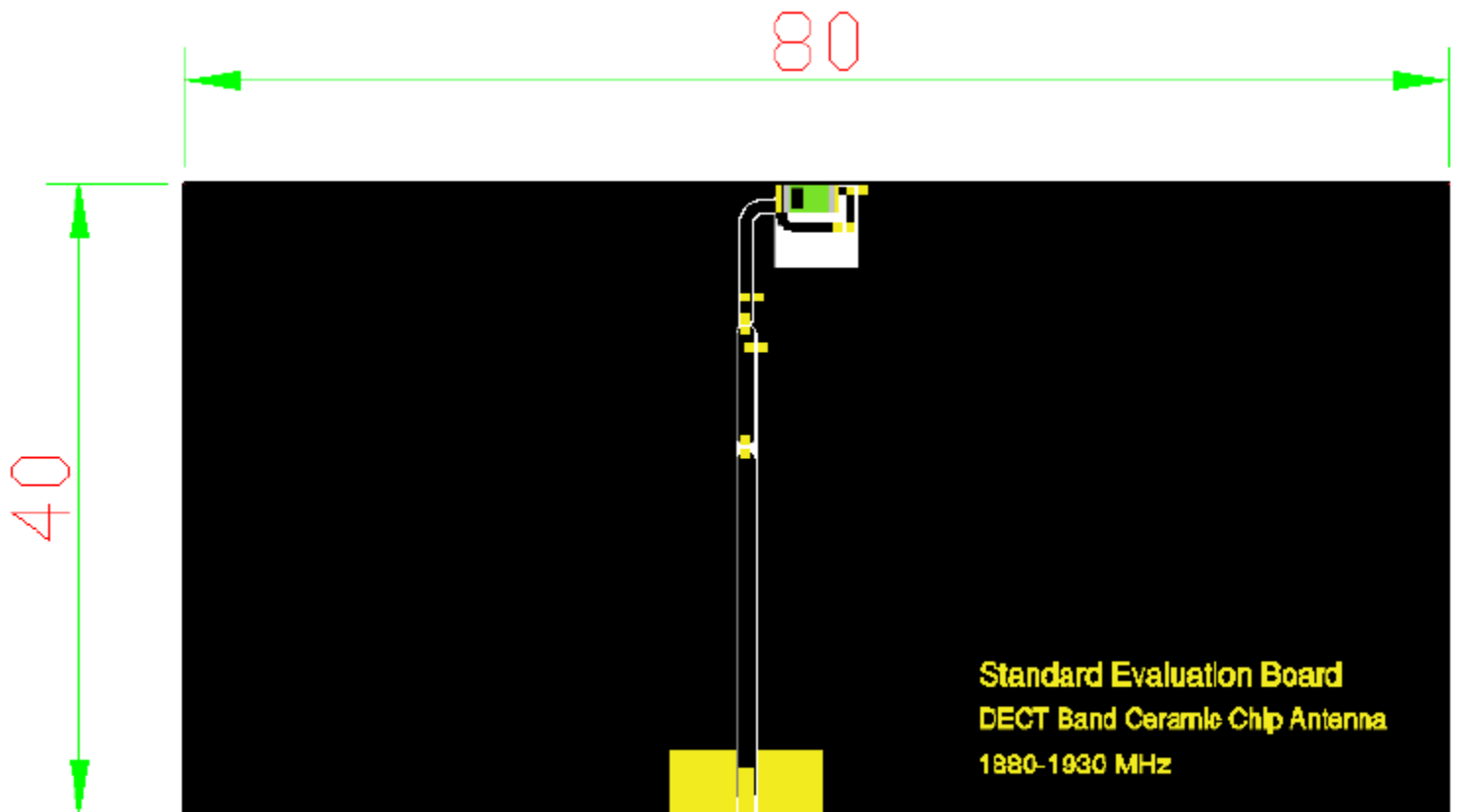
| PIN           | 1      | 2               |
|---------------|--------|-----------------|
| Soldering PAD | Signal | Tuning / Ground |

**NOTE:**  
1. All materials are RoHS compliant.  
2. "A~C" Critical Dimensions.  
3. "( )" Reference Dimensions.

## Operating & Storage Conditions

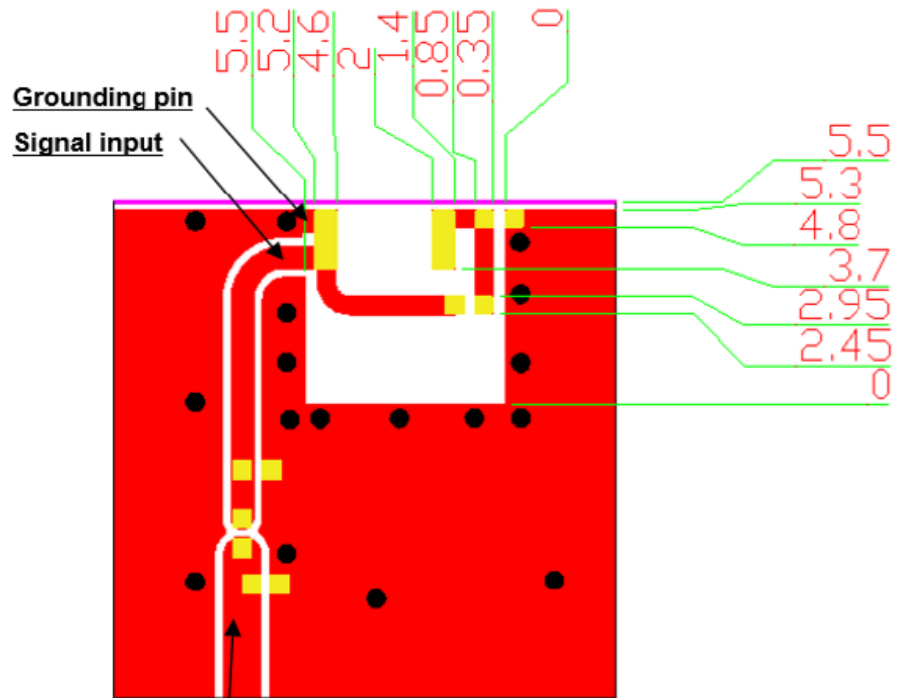
| Operating             |               |
|-----------------------|---------------|
| Maximum Input Power   | 2W            |
| Operating Temperature | -40°C to 85°C |
| Storage               |               |
| Storage Temperature   | -5°C to 40°C  |
| Relative Humidity     | 20% to 70%    |
| Shelf Life            | 1 Year        |

## Evaluation Board



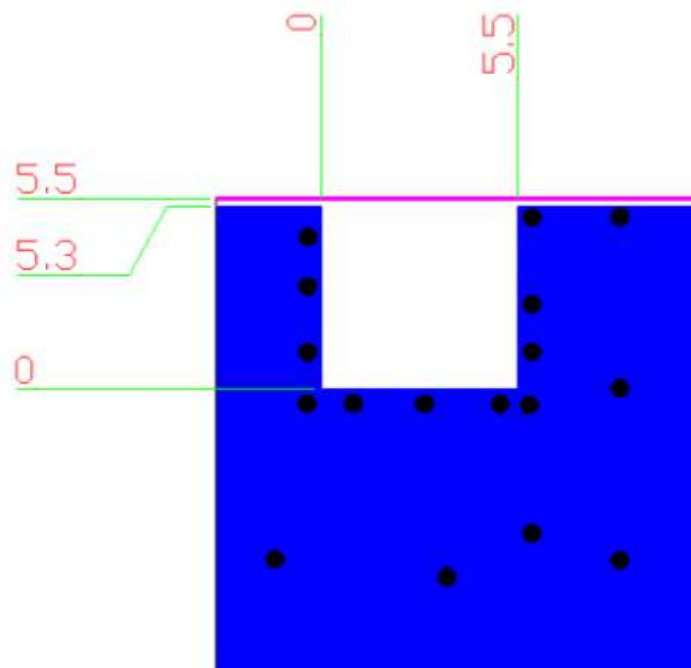
### Solder Ground Pattern

The gold areas represent the solder land pattern. Any recommendations on the matching circuit will be provided according to the customer's installation conditions.



Transmission Line with 50Ω Impedance Characteristic

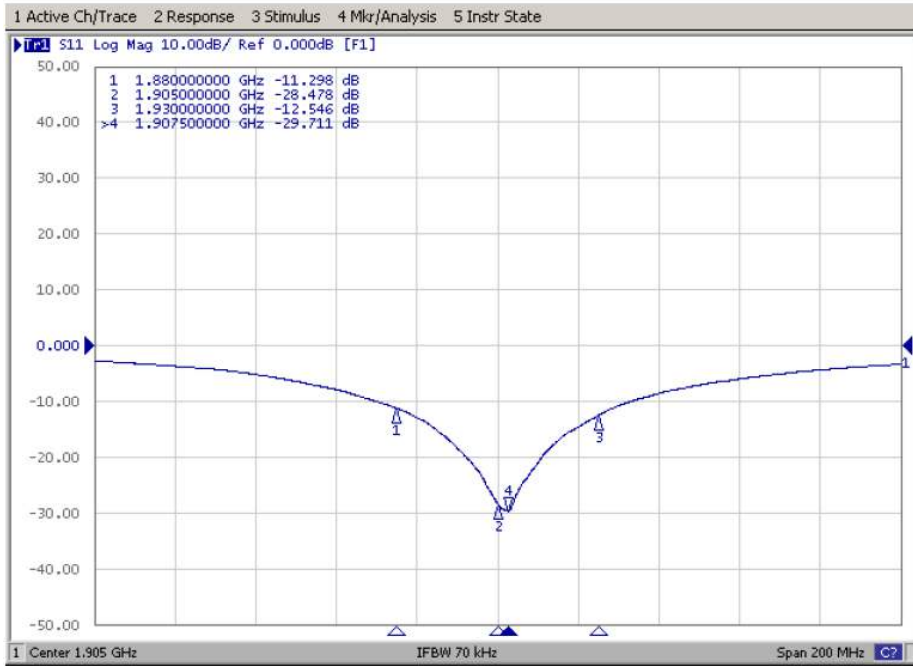
Top View



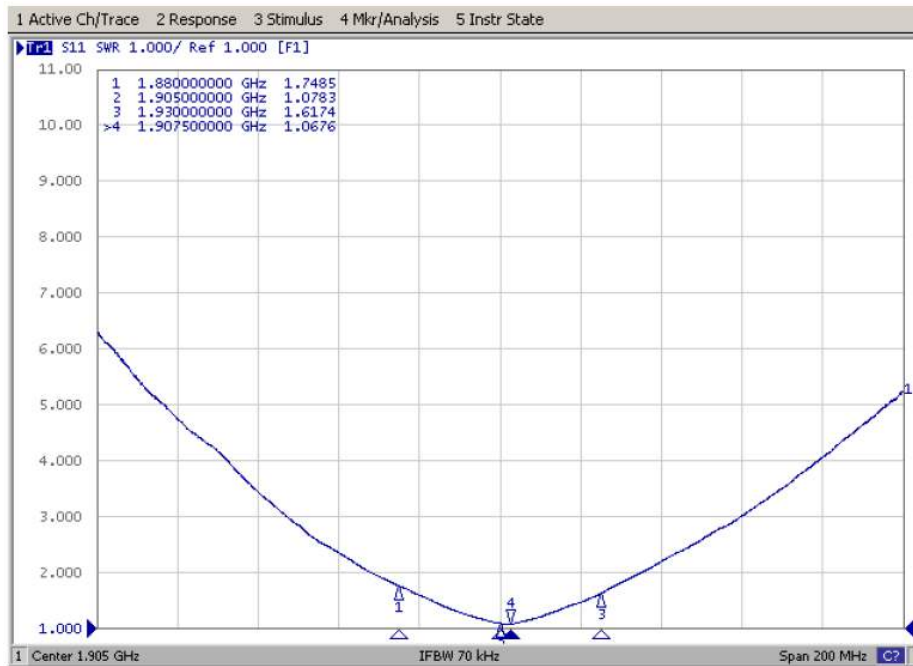
Bottom View

Return Loss & VSWR

Return Loss ( $S_{11}$ )

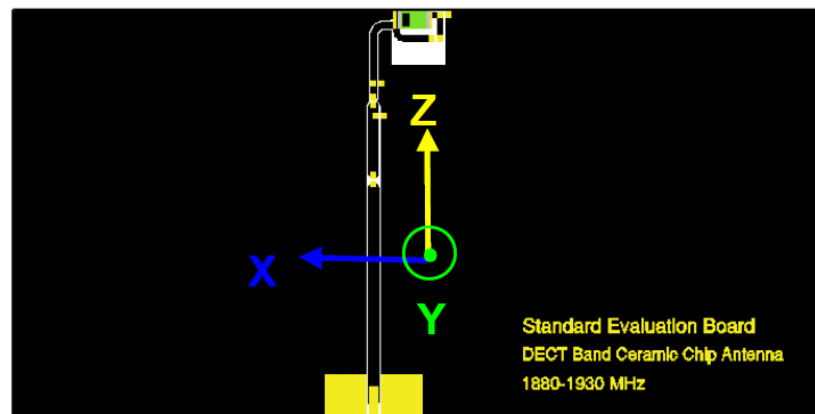
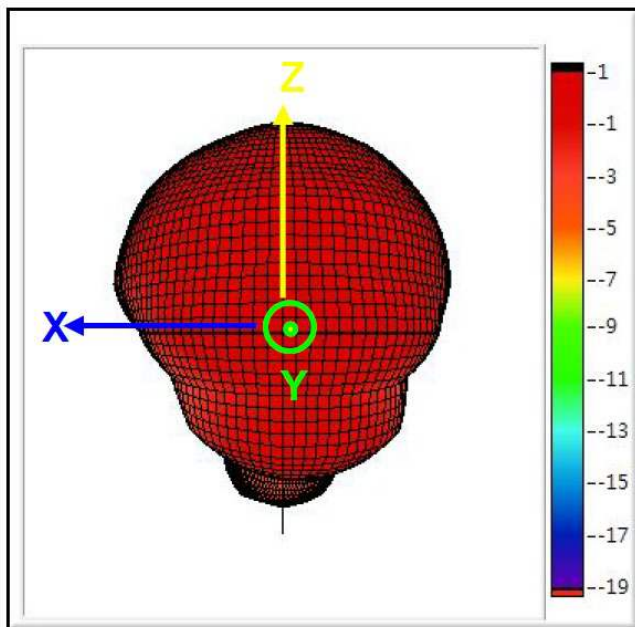
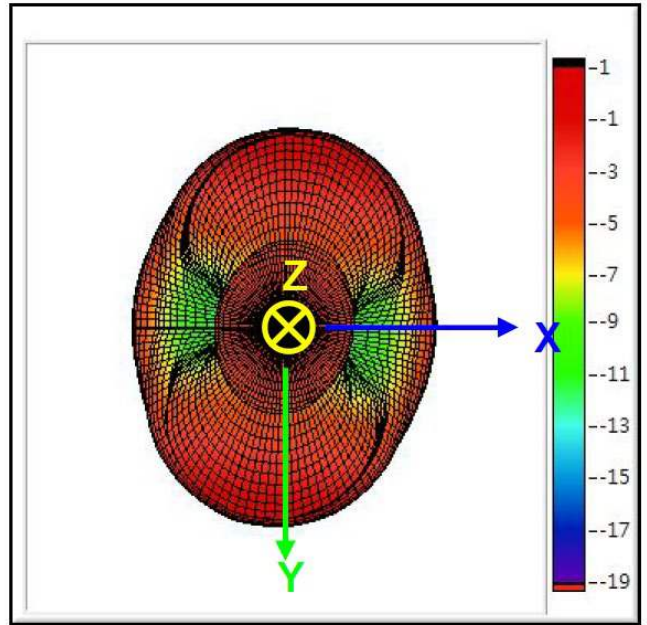
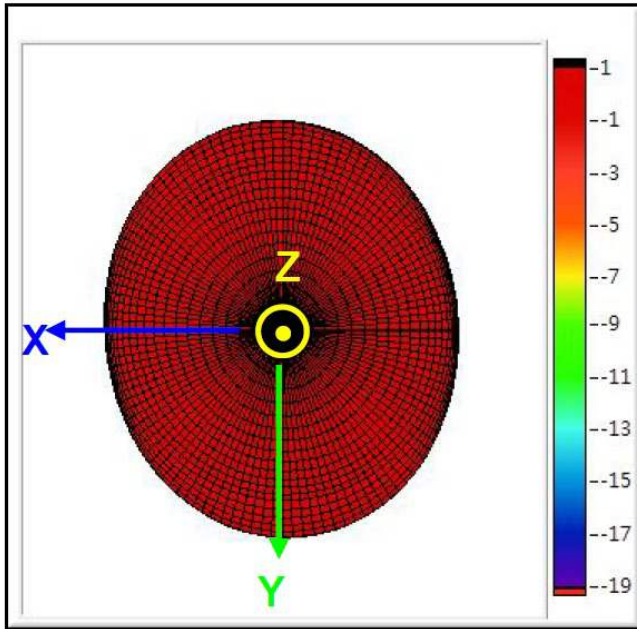


VSWR ( $S_{11}$ )

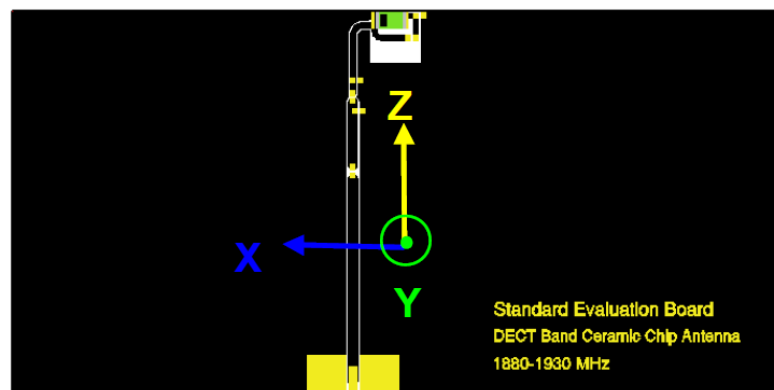
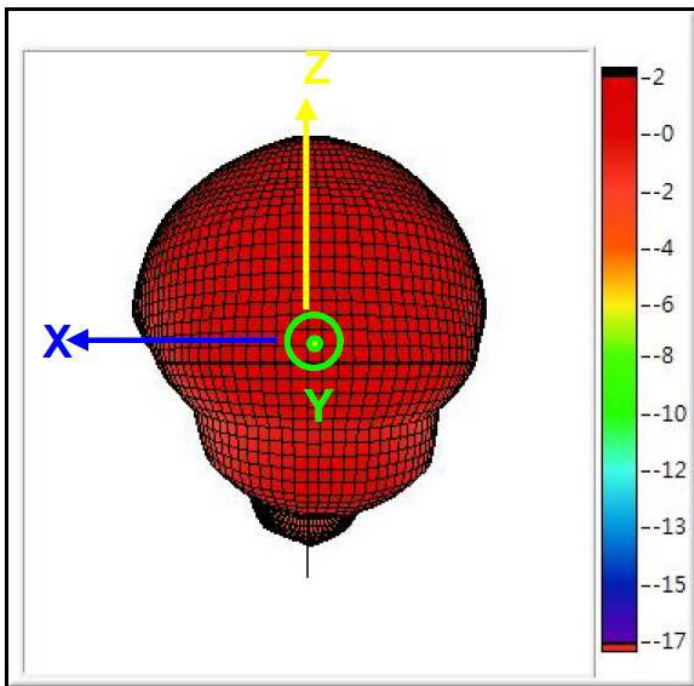
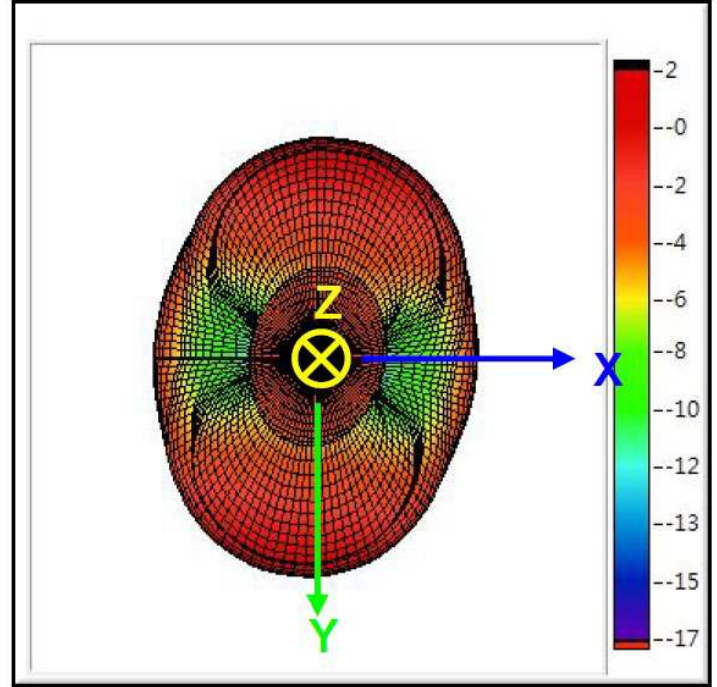
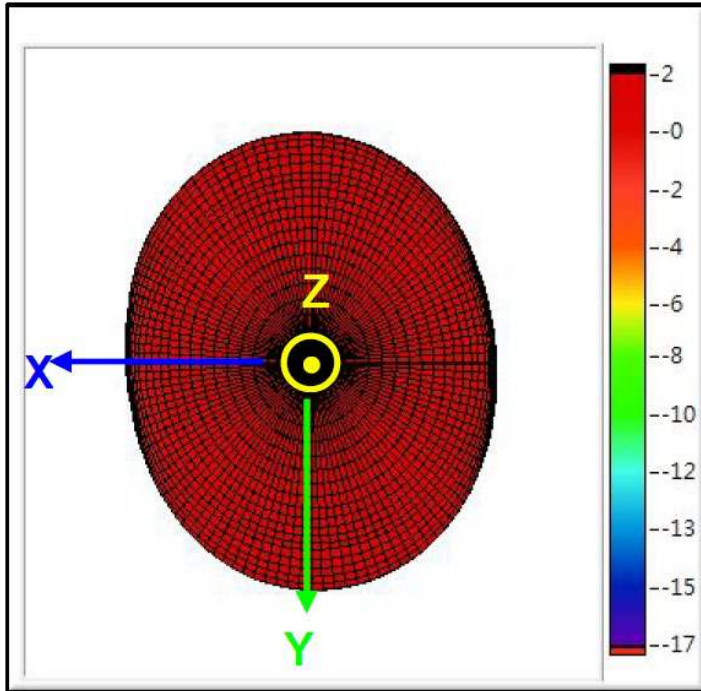


### Radiation Patterns

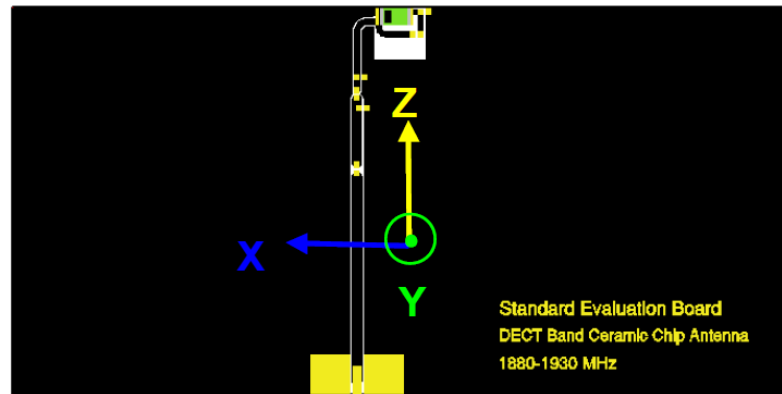
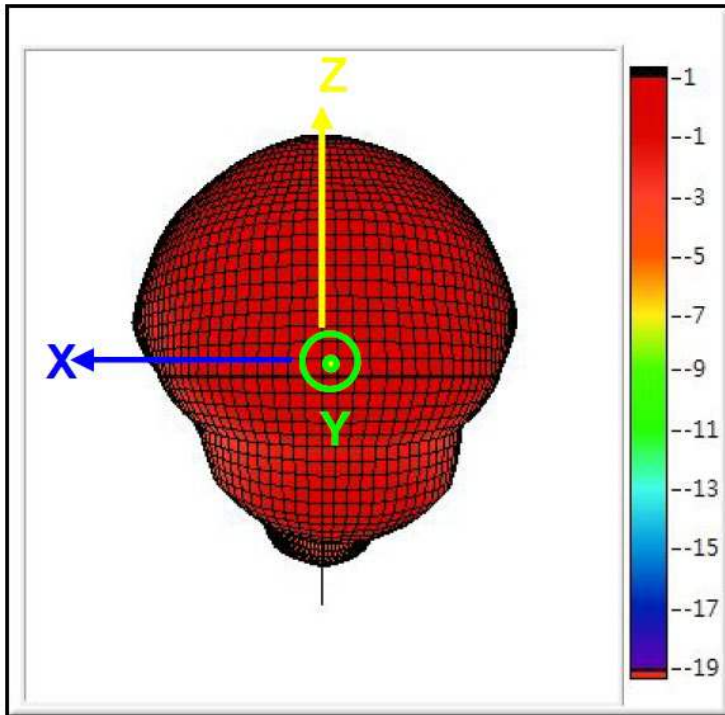
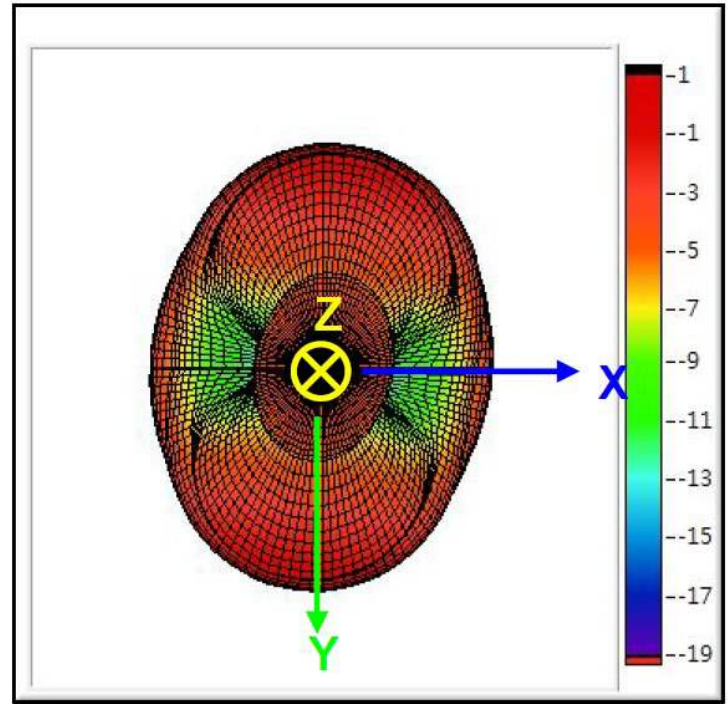
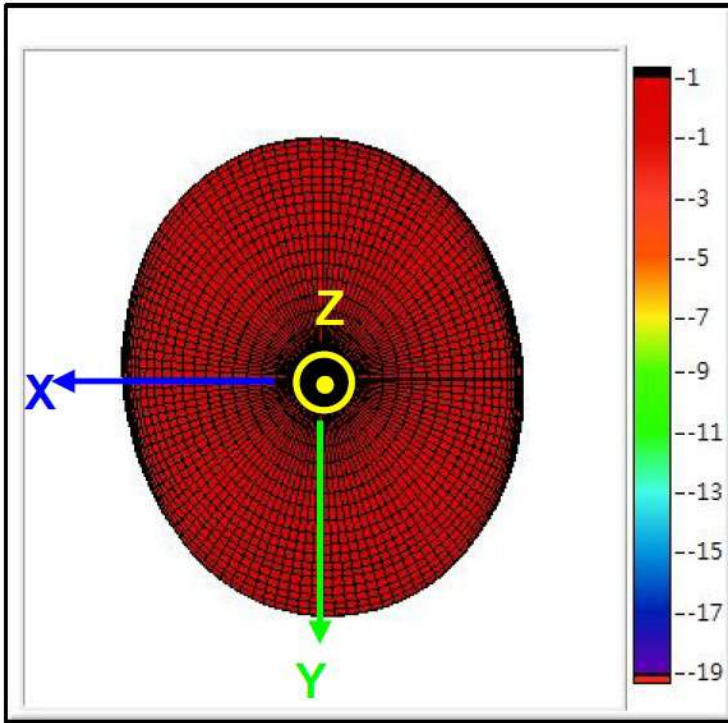
#### 3D Gain Patterns @ 1880 MHz ( Unit: dBi)



3D Gain Patterns @ 1905 MHz ( Unit: dBi)



3D Gain Patterns @ 1930 MHz ( Unit: dBi)

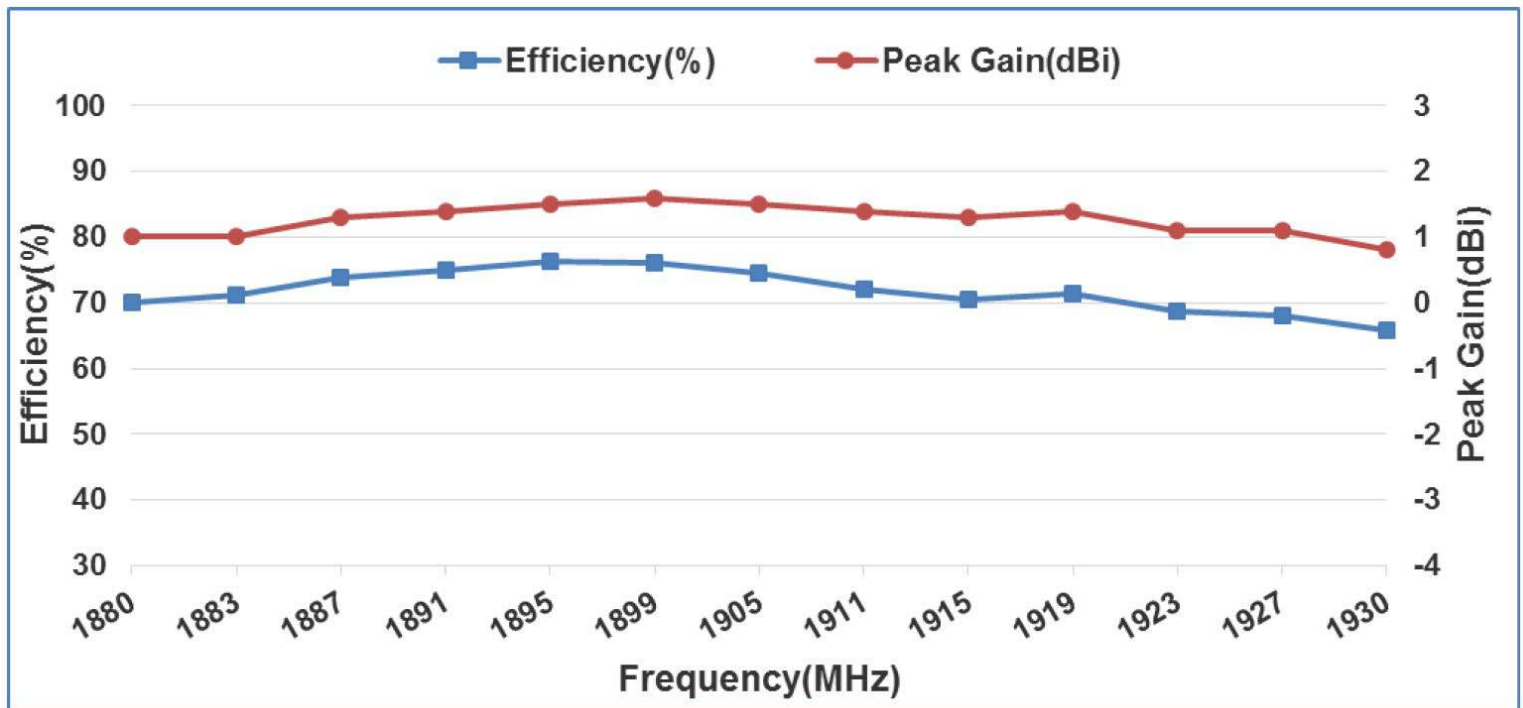


**Efficiency Table**

|                |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Frequency(MHz) | 1880 | 1881 | 1883 | 1885 | 1887 | 1889 | 1891 | 1893 | 1895 | 1897 | 1899 | 1901 | 1903 | 1905 |
| Efficiency(dB) | -1.6 | -1.5 | -1.5 | -1.4 | -1.3 | -1.3 | -1.3 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.3 | -1.3 |
| Efficiency(%)  | 70.0 | 70.2 | 71.1 | 72.6 | 73.9 | 73.7 | 75.0 | 75.8 | 76.3 | 75.5 | 76.1 | 75.6 | 74.3 | 74.5 |
| Peak Gain(dBi) | 1.0  | 1.0  | 1.0  | 1.1  | 1.3  | 1.3  | 1.4  | 1.4  | 1.5  | 1.5  | 1.6  | 1.6  | 1.5  | 1.5  |

|                |      |      |      |      |      |      |      |      |      |      |      |      |      |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Frequency(MHz) | 1907 | 1909 | 1911 | 1913 | 1915 | 1917 | 1919 | 1921 | 1923 | 1925 | 1927 | 1929 | 1930 |
| Efficiency(dB) | -1.4 | -1.4 | -1.4 | -1.5 | -1.5 | -1.5 | -1.5 | -1.6 | -1.6 | -1.6 | -1.7 | -1.8 | -1.8 |
| Efficiency(%)  | 72.6 | 72.3 | 72.0 | 71.5 | 70.6 | 71.2 | 71.4 | 69.9 | 68.7 | 68.5 | 68.1 | 66.1 | 65.8 |
| Peak Gain(dBi) | 1.4  | 1.4  | 1.4  | 1.4  | 1.3  | 1.4  | 1.4  | 1.3  | 1.1  | 1.1  | 1.1  | 0.9  | 0.8  |

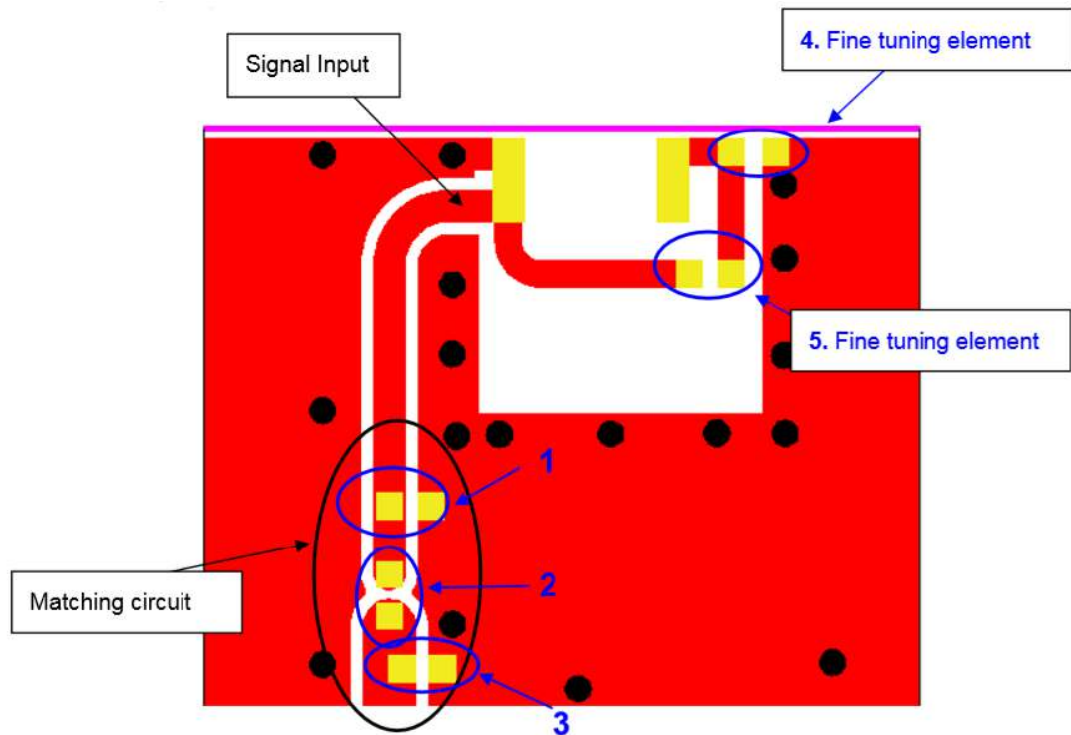
**Efficiency Vs. Frequency**





### Frequency Tuning and Matching Circuit

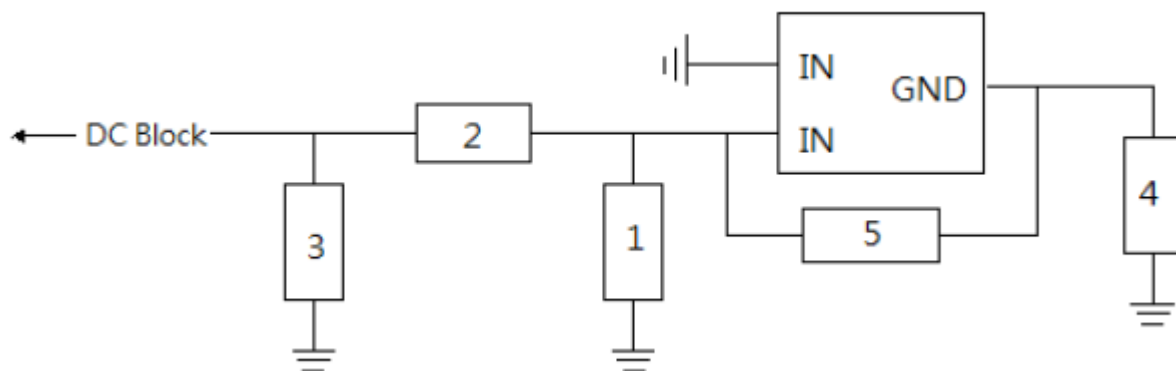
Chip Antenna tuning scenario:



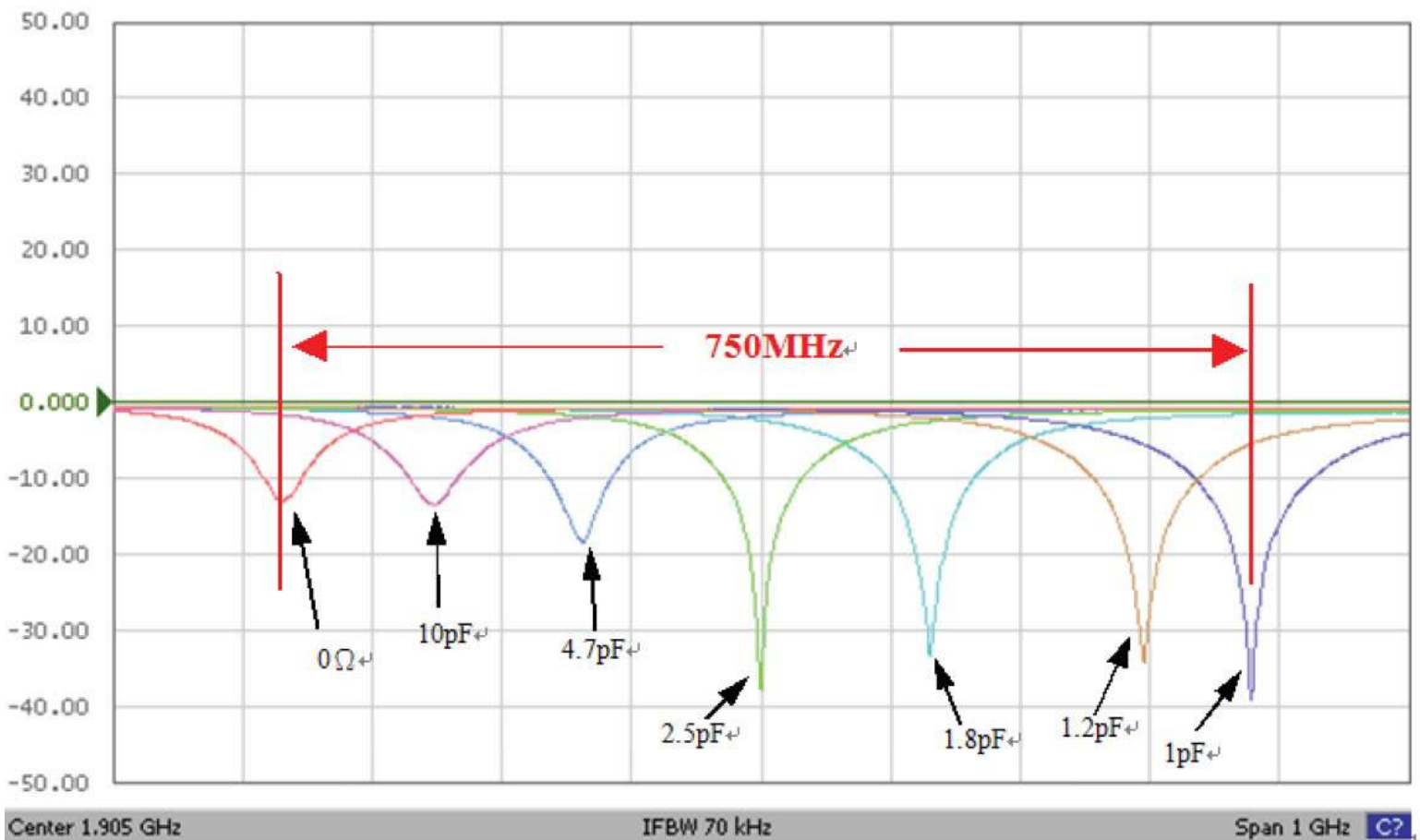
#### Matching circuit :

The center frequencies will be about 1905 MHz at our standard 80 x 40 mm evaluation board, with the following recommended values of matching and tuning components. \*

\* = These are typical reference values



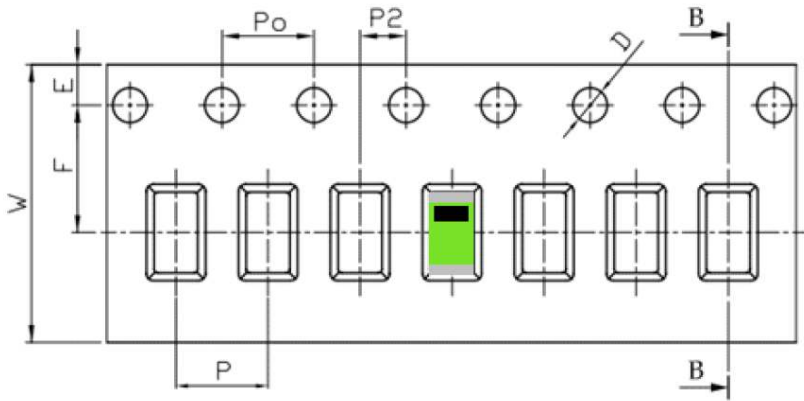
| System Matching Circuit Component |               |           |  |
|-----------------------------------|---------------|-----------|--|
| Location                          | Description   | Tolerance | NIC Part Number                        |
| 1                                 | 1.2pF, (0402) | ±0.1pF    | <a href="#">NMC-Q0402NPO1R2B50TRPF</a> |
| 2                                 | 0Ω, (0402)    | -         | <a href="#">NRC04ZOTRF</a>             |
| 3                                 | N/A           | -         | -                                      |
| 4<br>Fine Tuning Element          | 2.4pF, (0402) | ±0.1pF    | <a href="#">NMC-Q0402NPO2R4B50TRPF</a> |
| 5<br>Fine Tuning Element          | 0.5pF, (0402) | ±0.05pF   | <a href="#">NMC-Q0402NPO0R5A50TRPF</a> |



**Packing**

1. Quantity/Reel : 5000 pcs/Reel
2. Plastic Tape:

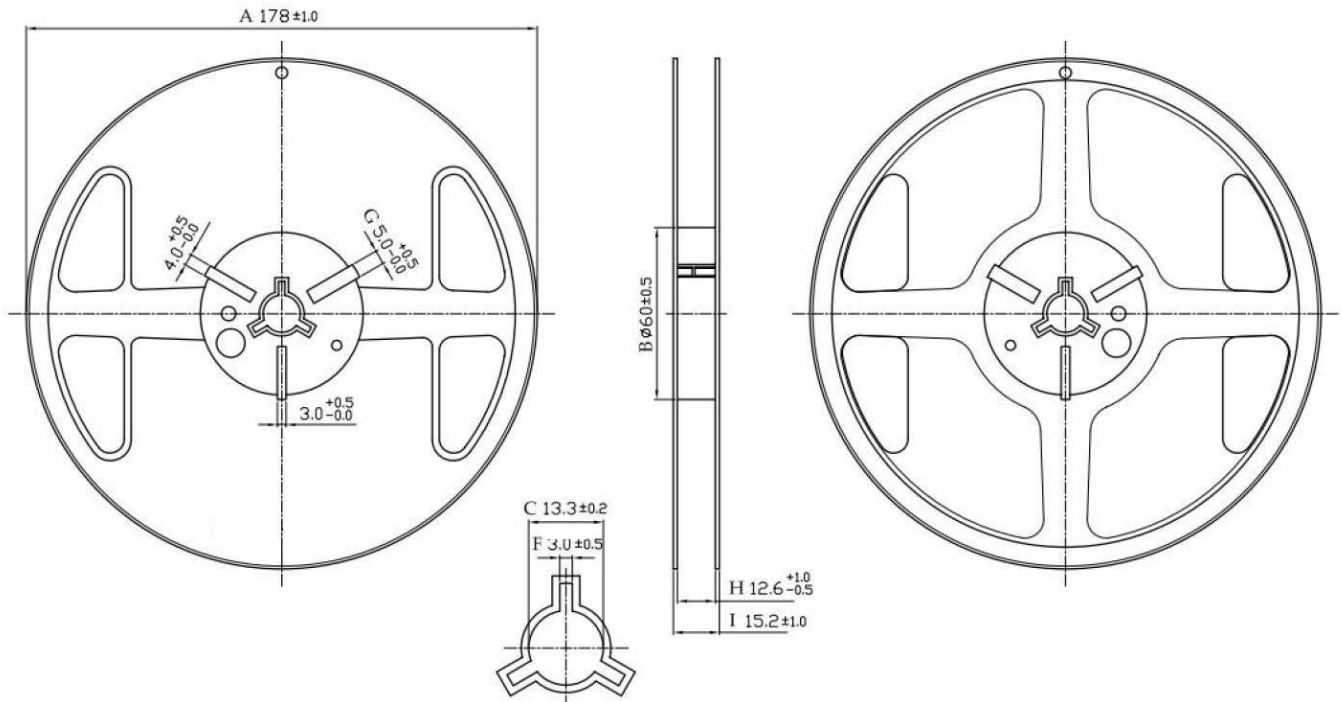
a. Tape Drawing



b. Tape Dimensions (unit: mm)

| Feature | Specifications | Tolerances     |
|---------|----------------|----------------|
| W       | 12.00          | ±0.30          |
| P       | 4.00           | ±0.10          |
| E       | 1.75           | ±0.10          |
| F       | 5.50           | ±0.10          |
| P2      | 2.00           | ±0.10          |
| D       | 1.50           | +0.10<br>-0.00 |
| Po      | 4.00           | ±0.10          |
| 10Po    | 40.00          | ±0.20          |

c. Reel Drawing



**Version History and Status**

| Version  | Date Issued       | Details         | Status    |
|----------|-------------------|-----------------|-----------|
| <b>A</b> | February 21, 2021 | Initial Release | Supported |
|          |                   |                 |           |
|          |                   |                 |           |
|          |                   |                 |           |
|          |                   |                 |           |

**Please reach out to NIC for any customization requests and other inquiries:**

- NIC Technical Support: [tpmg@niccomp.com](mailto:tpmg@niccomp.com)
- Compliance Support: [rohs@niccomp.com](mailto:rohs@niccomp.com)