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TDK Corporation

# Multilayer Antenna

For 2.4GHz W-LAN & Bluetooth / 5GHz W-LAN

ANT Series 1608 TYPE

P/N: **ANT016008LCD2442MA1**

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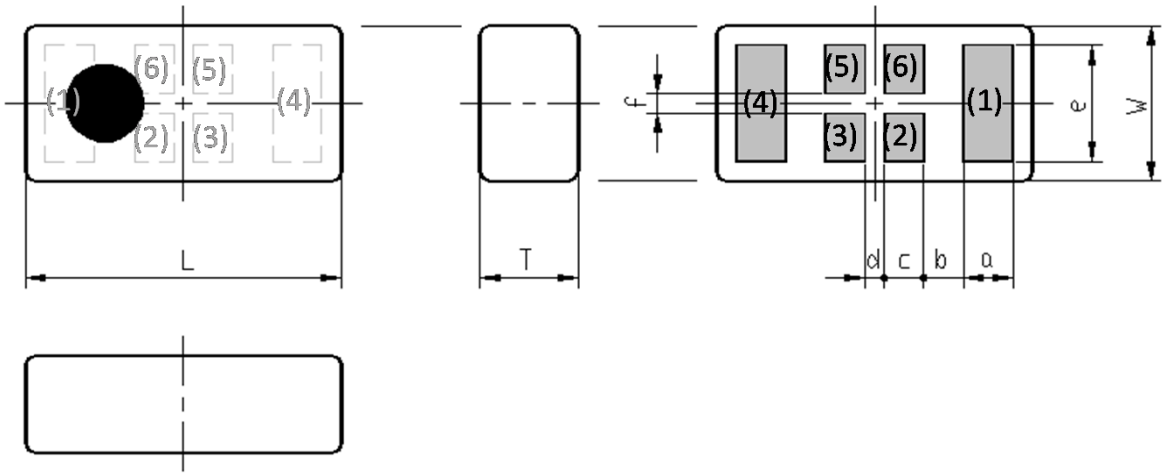
# ANT016008LCD2442MA1

## SHAPES AND DIMENSIONS




Dimensions (mm)

| L | W | T | a | b | c | d | e | f |
|---|---|---|---|---|---|---|---|---|
| 1.60 +/-0.10 | 0.80 +/-0.10 | 0.40 Max | 0.215 +/-0.10 | 0.25 +/-0.10 | 0.20 +/-0.10 | (0.10) | 0.63 +/-0.10 | (0.10) |

Terminal functions

| | |
|---|---|
| **(1)** | Radiator electrode for 2.4GHz ISM |
| **(2)** | Feed point |
| **(3)** | Feed point |
| **(4)** | Radiator electrode for 5.5GHz |
| **(5)** | Feed point |

| | |
|---|---|
| **(6)** | Feed point |

***Terminal (2),(3),(5) and (6) :Connected in inner structure**

Note:
These samples are marked with trial sample identification.
In mass production, this sample marking will be changed to show in the TDK full specification.

## TEMPERATURE RANGE

| Operating temperature | Storage temperature |
|---|---|
| –40 to +85 ℃ | –40 to +85 ℃ |

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## ELECTRICAL CHARACTERISTICS

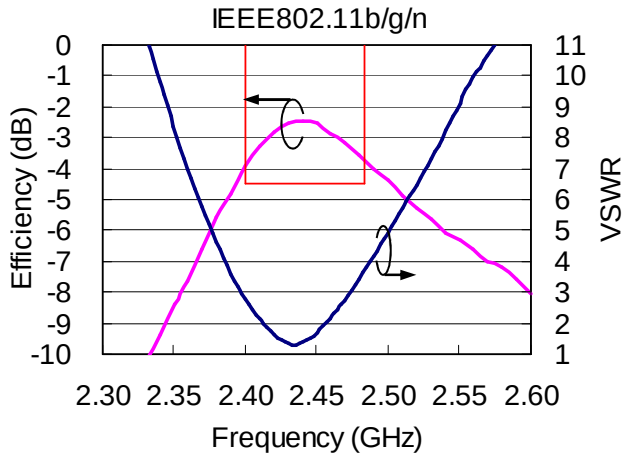
( Measurement )

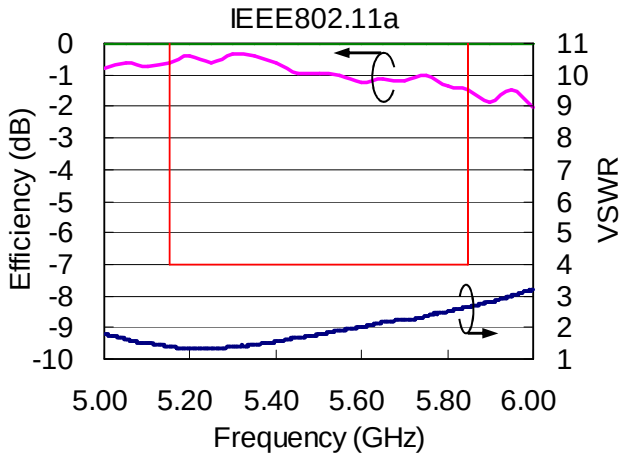
| Parameter | Frequency (MHz) | TDK Spec | | |
|---|---|---|---|---|
| | | Min. | Typ. | Max. |
| VSWR | 2400 to 2484 | - | 3.81 | 6.5 |
| | 5150 to 5850 | - | 2.65 | 4.0 |
| Polarization | | Linear | | |
| PCB Size (mm) | | 120x65 | | |
| Antenna keep-out Area (mm) | | 8x5 | | |
| Characteristic Impedance (ohm) | | 50 (Nominal) | | |

* This is typical antenna performance with the standard PCB.

## FREQUENCY CHARACTERISTICS

Note: Tested antenna has been soldered. Evaluation board size is 120x65x1 mm.



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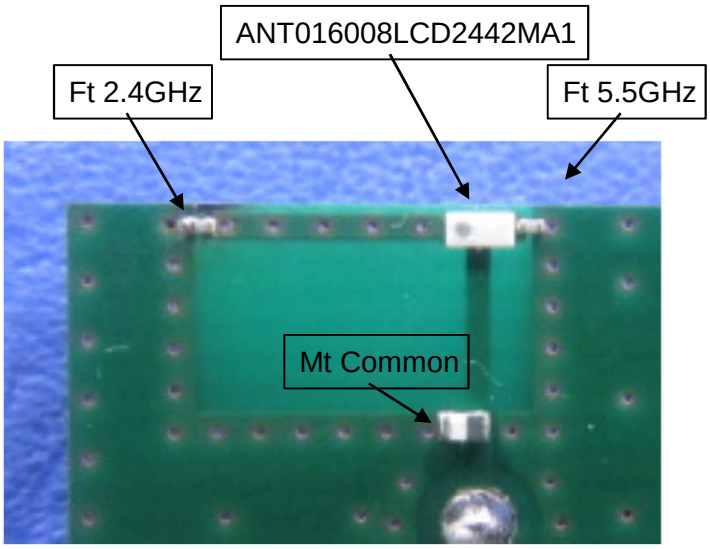
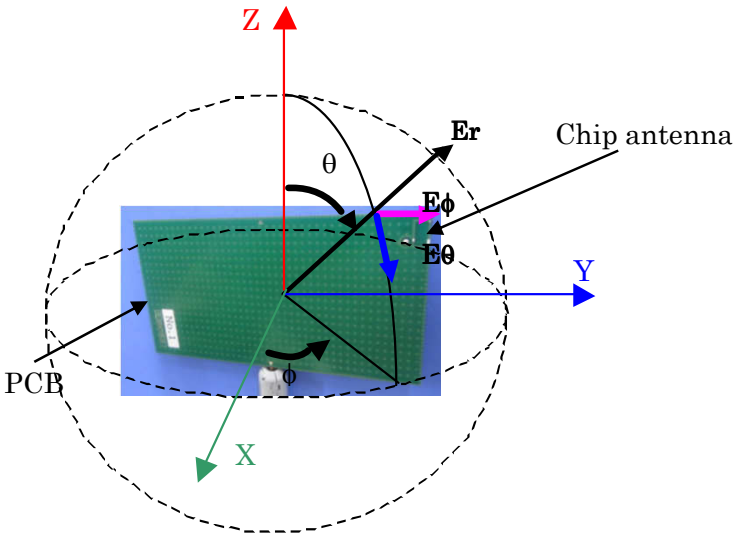
## ■ EVALUATION BOARD


PCB size : 120mm x 65mm x 1mm
Antenna area : 8 x 5 mm




| | Component P/N |
|---|---|
| Ft 2.4GHz | 2.5pF(C0603CH1E2R5B:TDK) |
| Ft 5.5GHz | 0.3pF(C0603CH1E0R3B:TDK) |
| Mt Common | 1.5nH(MLG1005S1N5C:TDK) |

Measurement condition for Radiation Pattern



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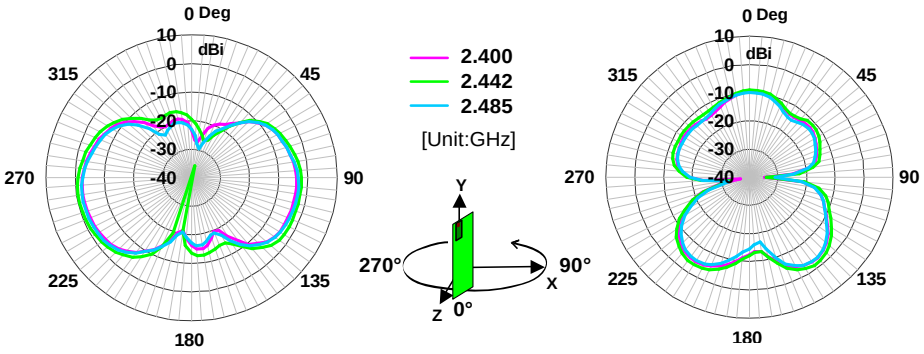
## Radiation Pattern

Note: Tested antenna has been soldered. Evaluation board size is 120x65x1 mm.

2.4GHz ISM Band

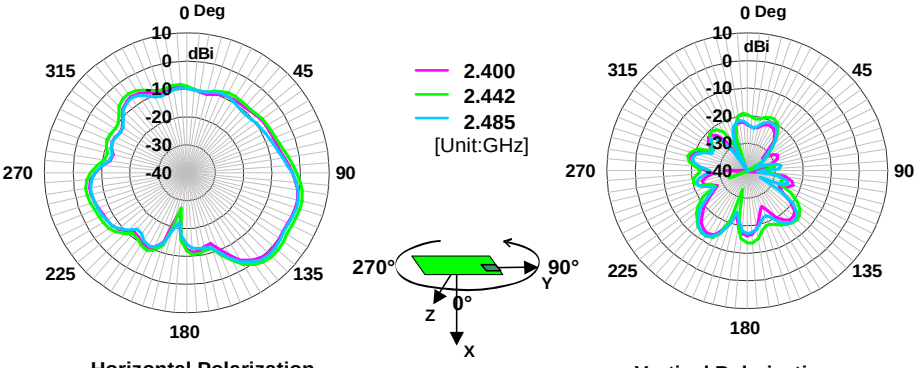



**Horizontal Polarization**

| Frequency[GHz] | 2.400 | 2.442 | 2.485 |
|---|---|---|---|
| Average[dBi] | -7.06 | -5.44 | -6.82 |
| Maximum[dBi] | -2.18 | -0.48 | -1.94 |
| Minimum[dBi] | -27.38 | -44.31 | -29.46 |

**Vertical Polarization**

| Frequency[GHz] | 2.400 | 2.442 | 2.485 |
|---|---|---|---|
| Average[dBi] | -9.62 | -8.45 | -10.13 |
| Maximum[dBi] | -2.82 | -1.44 | -3.02 |
| Minimum[dBi] | -36.90 | -34.11 | -32.46 |

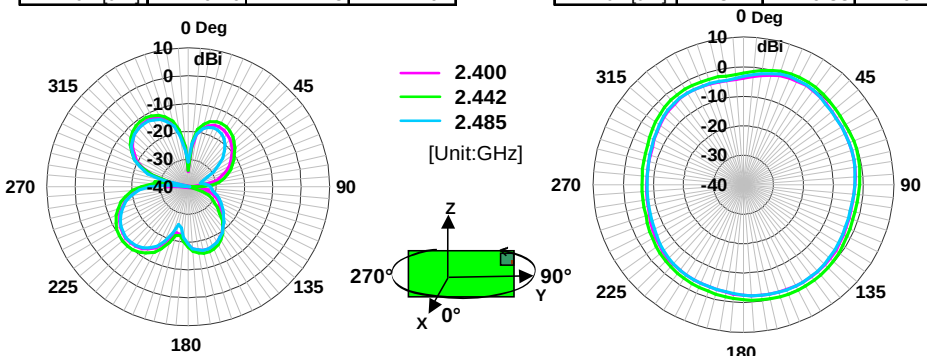



**Horizontal Polarization**

| Frequency[GHz] | 2.400 | 2.442 | 2.485 |
|---|---|---|---|
| Average[dBi] | -5.81 | -4.32 | -5.70 |
| Maximum[dBi] | 0.54 | 2.27 | 1.19 |
| Minimum[dBi] | -26.20 | -27.25 | -22.01 |

**Vertical Polarization**

| Frequency[GHz] | 2.400 | 2.442 | 2.485 |
|---|---|---|---|
| Average[dBi] | -21.03 | -19.00 | -20.43 |
| Maximum[dBi] | -13.19 | -12.04 | -12.29 |
| Minimum[dBi] | -48.22 | -46.88 | -40.26 |




**Horizontal Polarization**

| Frequency[GHz] | 2.400 | 2.442 | 2.485 |
|---|---|---|---|
| Average[dBi] | -17.05 | -15.74 | -17.47 |
| Maximum[dBi] | -11.24 | -9.64 | -11.46 |
| Minimum[dBi] | -48.22 | -51.80 | -40.53 |

**Vertical Polarization**

| Frequency[GHz] | 2.400 | 2.442 | 2.485 |
|---|---|---|---|
| Average[dBi] | -3.21 | -1.68 | -3.18 |
| Maximum[dBi] | -0.54 | 0.98 | -0.23 |
| Minimum[dBi] | -7.87 | -6.33 | -7.97 |

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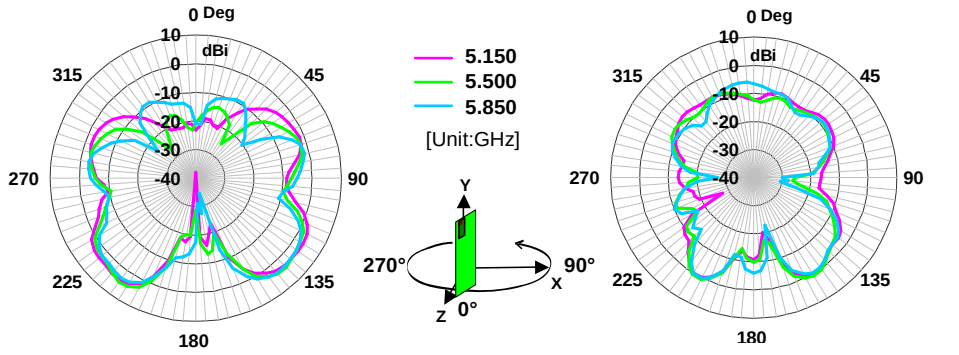
## Radiation Pattern

Note: Tested antenna has been soldered. Evaluation board size is 120x65x1 mm.

5.5GHz Band

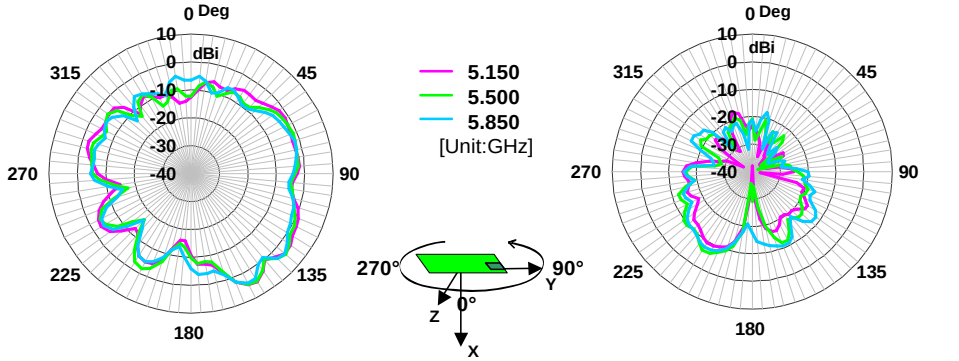



**Horizontal Polarization**

| Frequency[GHz] | 5.150 | 5.500 | 5.850 |
|---|---|---|---|
| Average[dBi] | -2.39 | -2.73 | -3.25 |
| Maximum[dBi] | 4.22 | 4.78 | 3.29 |
| Minimum[dBi] | -42.06 | -29.06 | -34.55 |

**Vertical Polarization**

| Frequency[GHz] | 5.150 | 5.500 | 5.850 |
|---|---|---|---|
| Average[dBi] | -7.05 | -7.06 | -7.32 |
| Maximum[dBi] | 0.04 | 0.89 | 0.31 |
| Minimum[dBi] | -27.83 | -26.31 | -30.64 |

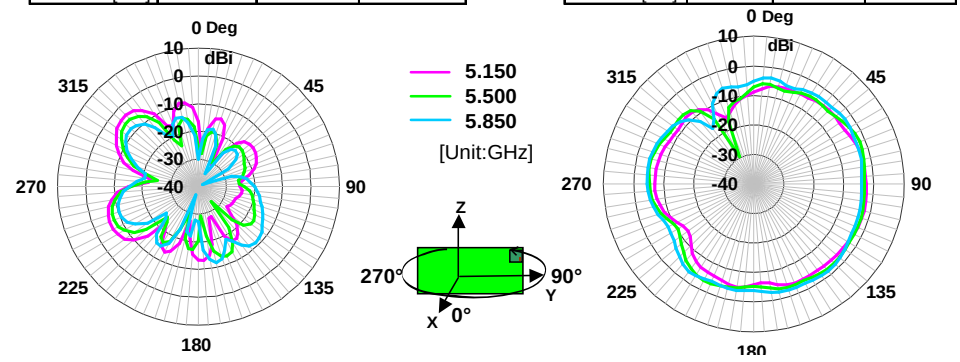



**Horizontal Polarization**

| Frequency[GHz] | 5.150 | 5.500 | 5.850 |
|---|---|---|---|
| Average[dBi] | -2.74 | -3.11 | -3.60 |
| Maximum[dBi] | 5.18 | 5.04 | 4.09 |
| Minimum[dBi] | -15.95 | -17.14 | -16.56 |

**Vertical Polarization**

| Frequency[GHz] | 5.150 | 5.500 | 5.850 |
|---|---|---|---|
| Average[dBi] | -17.92 | -15.62 | -15.19 |
| Maximum[dBi] | -9.40 | -6.43 | -7.73 |
| Minimum[dBi] | -42.06 | -37.80 | -33.50 |




**Horizontal Polarization**

| Frequency[GHz] | 5.150 | 5.500 | 5.850 |
|---|---|---|---|
| Average[dBi] | -11.65 | -13.95 | -15.05 |
| Maximum[dBi] | -3.56 | -5.67 | -8.20 |
| Minimum[dBi] | -31.10 | -32.99 | -38.35 |

**Vertical Polarization**

| Frequency[GHz] | 5.150 | 5.500 | 5.850 |
|---|---|---|---|
| Average[dBi] | -5.64 | -4.76 | -4.21 |
| Maximum[dBi] | -2.18 | -1.95 | -1.61 |
| Minimum[dBi] | -15.95 | -29.68 | -16.91 |

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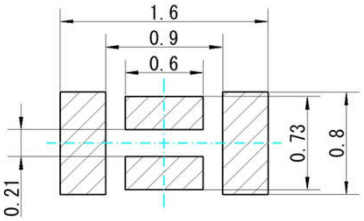
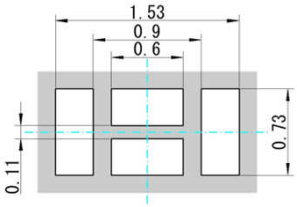
## ■ RECOMMENDED LAND PATTERN

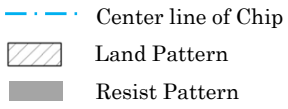
**Recommend land pattern and solder resist pattern**

**< Land pattern >**

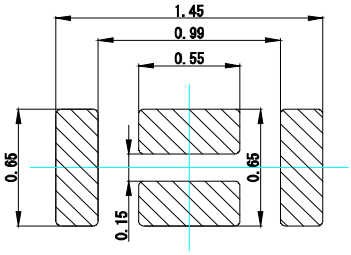



**< Solder resist pattern >**



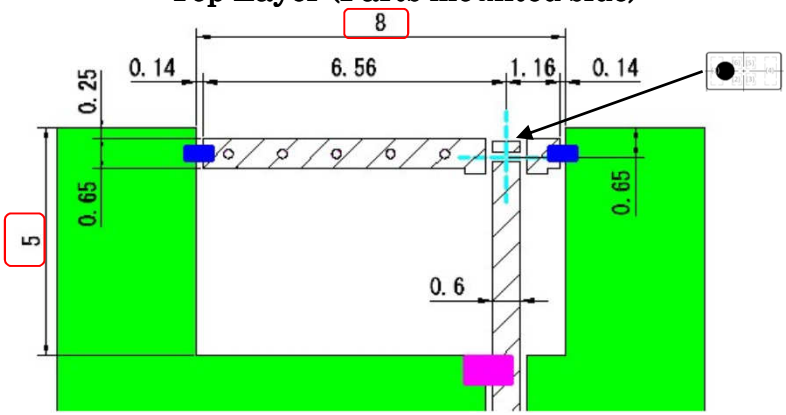

**Recommend aperture size of metal mask for solder printing**

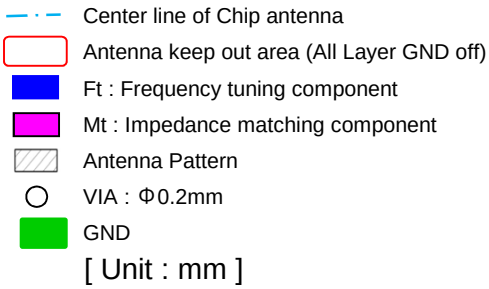




**Example of Antenna pattern layout (TDK Standard PCB)**

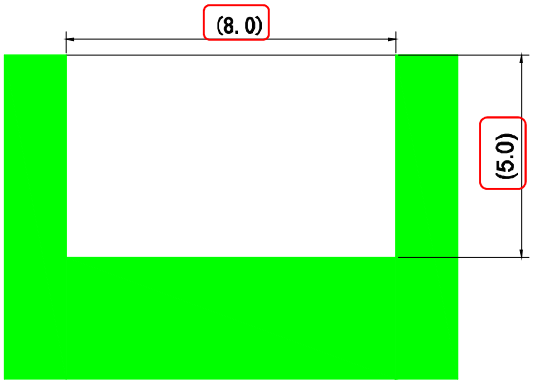
**<Top Layer (Parts mounted side) >**



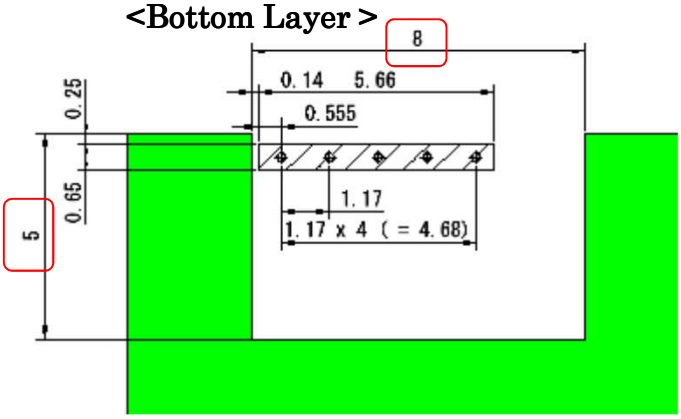




50ohm line feeding

**<Inner Layer >**




**<Bottom Layer >**



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## ■ ENVIROMENT INFORMATION

RoHS Statement
RoHS Compliance

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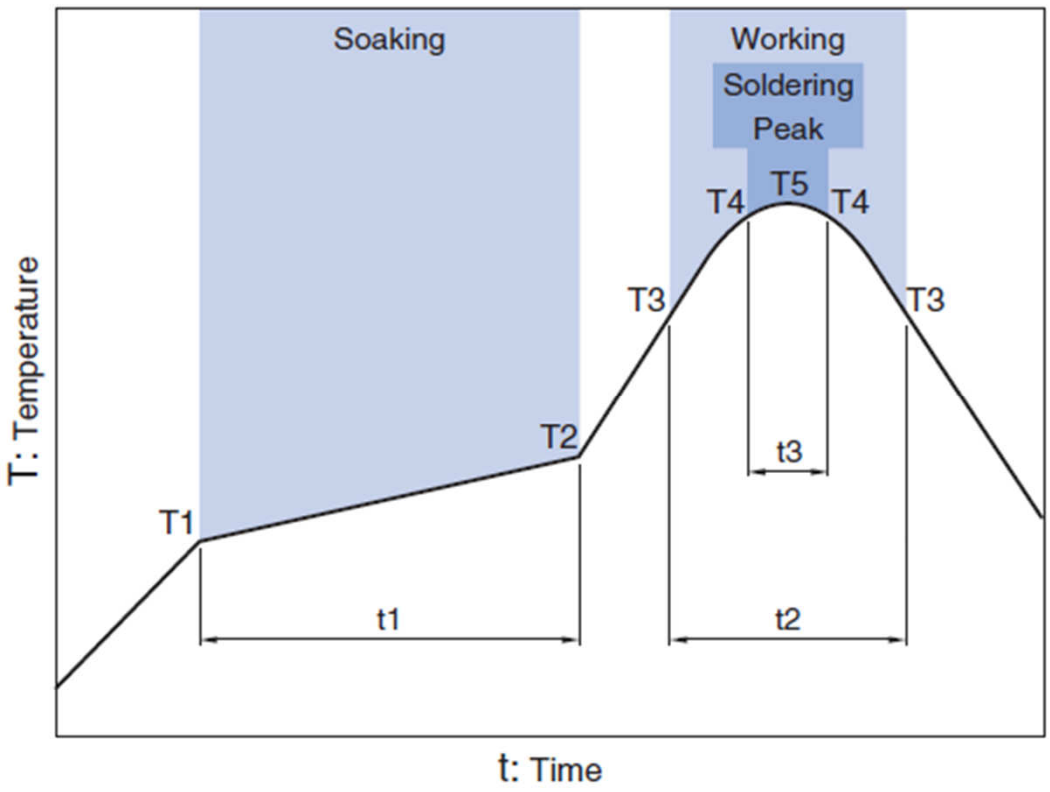
## RECOMMENDED REFLOW PROFILE

Pb free solder




| Soaking | | | Working | | Soldering | | Peak |
|---|---|---|---|---|---|---|---|
| Temp. | | Time | Temp. | Time | Temp. | Time | Temp. |
| T1 | T2 | t1 | T3 | t2 | T4 | t3 | T5 |
| 150℃ | 180℃ | 60 to 120sec | 230℃ | 30 to 60sec | 247 to 253℃ | within 10sec | 260℃ Max. |

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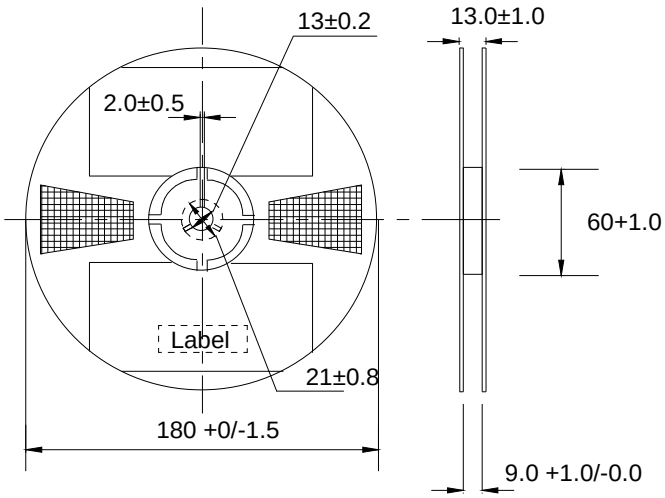
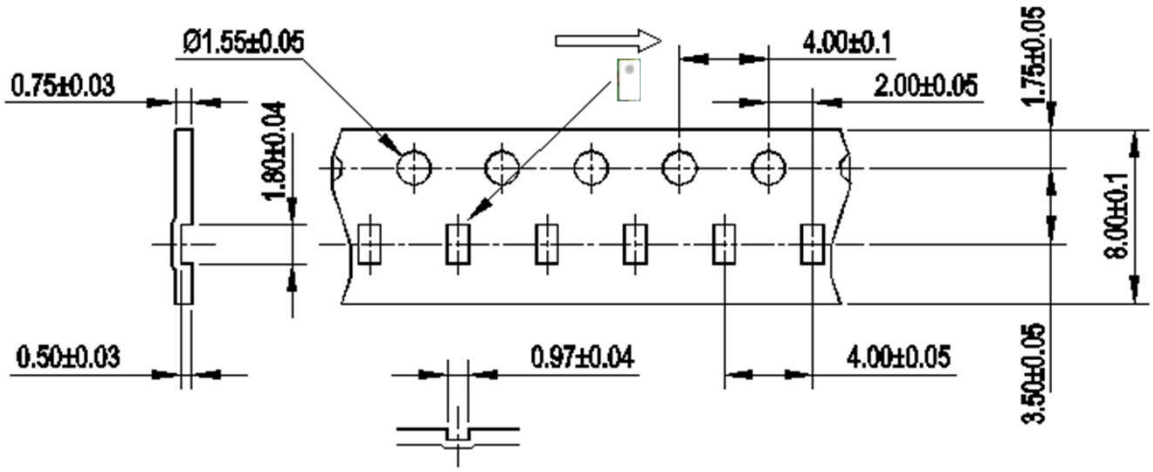
## ■ PACKAGING STYLE

Reel Dimensions




Carrier Tape




| STANDARD PACKAGE QUANTITY ( pieces/reel ) |
|---|
| 4,000 |

# REMINDERS FOR USING THESE PRODUCTS

Before using these products, be sure to request the delivery specifications.

# SAFETY REMINDERS

Please pay sufficient attention to the warnings for safe designing when using these products.

## ⚠ REMINDERS

The products listed on this specification sheet are intended for use in general electronic equipment (AV equipment, telecommunications equipment, home appliances, amusement equipment, computer equipment, personal equipment, office equipment, measurement equipment, industrial robots) under a normal operation and use condition.

The products are not designed or warranted to meet the requirements of the applications listed below, whose performance and/or quality require a more stringent level of safety or reliability, or whose failure, malfunction or trouble could cause serious damage to society, person or property. Please understand that we are not responsible for any damage or liability caused by use of the products in any of the applications below or for any other use exceeding the range or conditions set forth in this specification sheet.

1. Aerospace/Aviation equipment
2. Transportation equipment (cars, electric trains, ships, etc.)
3. Medical equipment
4. Power-generation control equipment
5. Atomic energy-related equipment
6. Seabed equipment
7. Transportation control equipment
8. Public information-processing equipment
9. Military equipment
10. Electric heating apparatus, burning equipment
11. Disaster prevention/crime prevention equipment
12. Safety equipment
13. Other applications that are not considered general-purpose applications

When using this product in general-purpose applications, you are kindly requested to take into consideration securing protection circuit/equipment or providing backup circuits, etc., to ensure higher safety.