



# PRODUCT SPECIFICATION

## TITLE

### 2.4/5GHz CERAMIC ANTENNA

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REVISION: <b>A</b>	ECR/ECN INFORMATION: EC No: 619513 DATE: 2019/06/27	TITLE: <b>2.4/5GHz Ceramic Antenna Product Specification</b>	SHEET No. <b>1 of 10</b>
DOCUMENT NUMBER: <b>PS-2065140001</b>	CREATED / REVISED BY: Kang Cheng 2019/05/09	CHECKED BY: Cooper Zhou 2019/05/09	APPROVED BY: Stary Song 2019/05/09

## 2.4/5GHz CERAMIC ANTENNA

### 1.0 SCOPE

This product specification covers the mechanical, electrical and environmental performances specification for 2.4/5GHz ceramic antenna.

### 2.0 PRODUCT DESCRIPTION

#### 2.1 PRODUCT NAME AND SERIES NUMBER (S)

Product name: 2.4/5GHz ceramic antenna

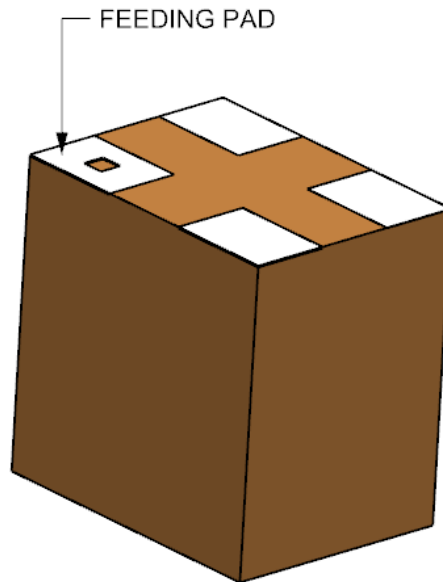
Series Number: 2065140001

#### 2.2 DESCRIPTION

206514 is a SMT high performance antenna implemented using ceramic with recommendation to meet the customer needs. It is designed to cover the frequency bands from 2.4-2.5GHz and 5.15-5.85GHz.

#### 2.3 FEATURES.

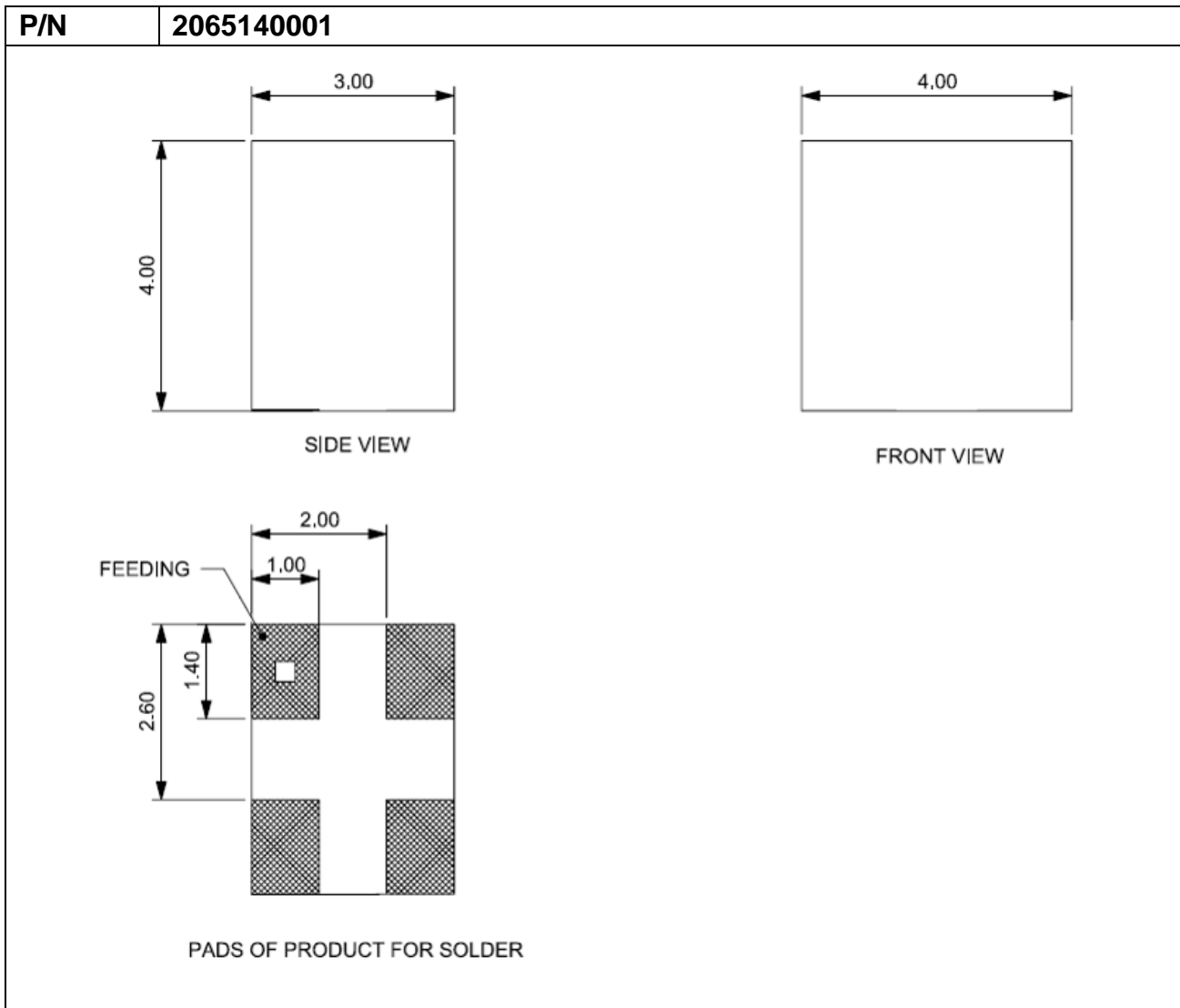
- 2.4/5GHz, monopole,
- Ceramic, SMT embedded, PCB corner mounting
- High efficiency over 75% on 2.4-2.5GHz and 5.15-5.85GHz
- Antenna size 3x4x4mm, PCB keep-out area 6.6x4.7 mm
- RoHS Compliant



Molex 2065140001 2.4/5GHz CERAMIC ANTENNA 3D VIEW

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## 2.4 PRODUCT STRUCTURE INFORMATION



MECHANICAL STRUCTURE INFORMATION FOR 2065140001

## 3.0 APPLICABLE DOCUMENTS

DOCUMENT	NUMBER	DESCRIPTION
Sale Drawing(SD)	SD-2065140001	Mechanical Dimension of the product
Application Guide(AS)	AS-2065140001	Antenna Application and surrounding
Packing Drawing(PK)	PK-2065140001	Product packaging specifications

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<b>PS-2065140001</b>		Kang Cheng 2019/05/09	Cooper Zhou 2019/05/09	Stary Song 2019/05/09



# PRODUCT SPECIFICATION

## 4.0 GENERAL SPECIFICATION

PRODUCT NAME	2.4/5GHz Ceramic Antenna	
PART NUMBER	2065140001	
FREQUENCY RANGE	2.4-2.5GHz	5.15-5.85GHz
POLARIZATION	Linear	
IMPEDANCE WITH MATCHING	50 Ohms	
OPERATION TEMPERATURE	-40°C to 85°C	
STORAGE TEMPERATURE	-40°C to 85°C	
RELATIVE HUMIDITY	55%-85%	
RF POWER	2 Watts	
NET WEIGHT	0.139g/PCS	
ANTENNA TYPE	Ceramic	

\*If you plan to re-use the products that be taken out from packaging. Suggest to repacked them within 48 hours by re-seal to prevent oxidation!

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## 5.0 ANTENNA SPECIFICATION

All measurements are done of the antenna mounted on reference PCB (100\*40\*0.8mm) with VNA Agilent E5071C and Over-The-Air (OTA) chamber.

5.0.1 ANTENNA PERFORMANCE		
P/N	2065140001	
FREQUENCY RANGE	2.4-2.5GHz	5.15-5.85GHz
PEAK GAIN(MAX)	3.5dBi	6.2dBi
AVERAGE TOTAL EFFICIENCY	>75%	>75%
RETURN LOSS	< -8 dB	< -5 dB

Note that the above antenna performance is measured with just the antenna mounted on a reference PCB (100\*40mm) in free space. When implement into the system, the frequency resonant might be off-tune due to the loading of surrounding components especially metal plane. This off-tune can be compensated through matching. Although module manufacturers specify a peak gain limit, it is based on free-space conditions. The peak gain will be degraded by 1 to 2dBi in the actual implementation as the radiation pattern will change due to the surround components. As such, during selection of antenna, you can select one with high peak gain to compensate for the loss. Molex can offer assistant to choose the best location and best tuning in-order to meet this peak gain requirement.

## 6.0 MECHANICAL REQUIREMENTS

DESCRIPTION	SPECIFICATION
Shear Force	Apply three axial peeling force on parts soldered on the PCB at the speed rate of 25±3 mm/minute. Shear force:15N Min.
Solder-Ability Test	Dip solder pad in flux then immerse in solder bath at 245+/-50°C for 4~5seconds,95% of immersed area mush show no voids

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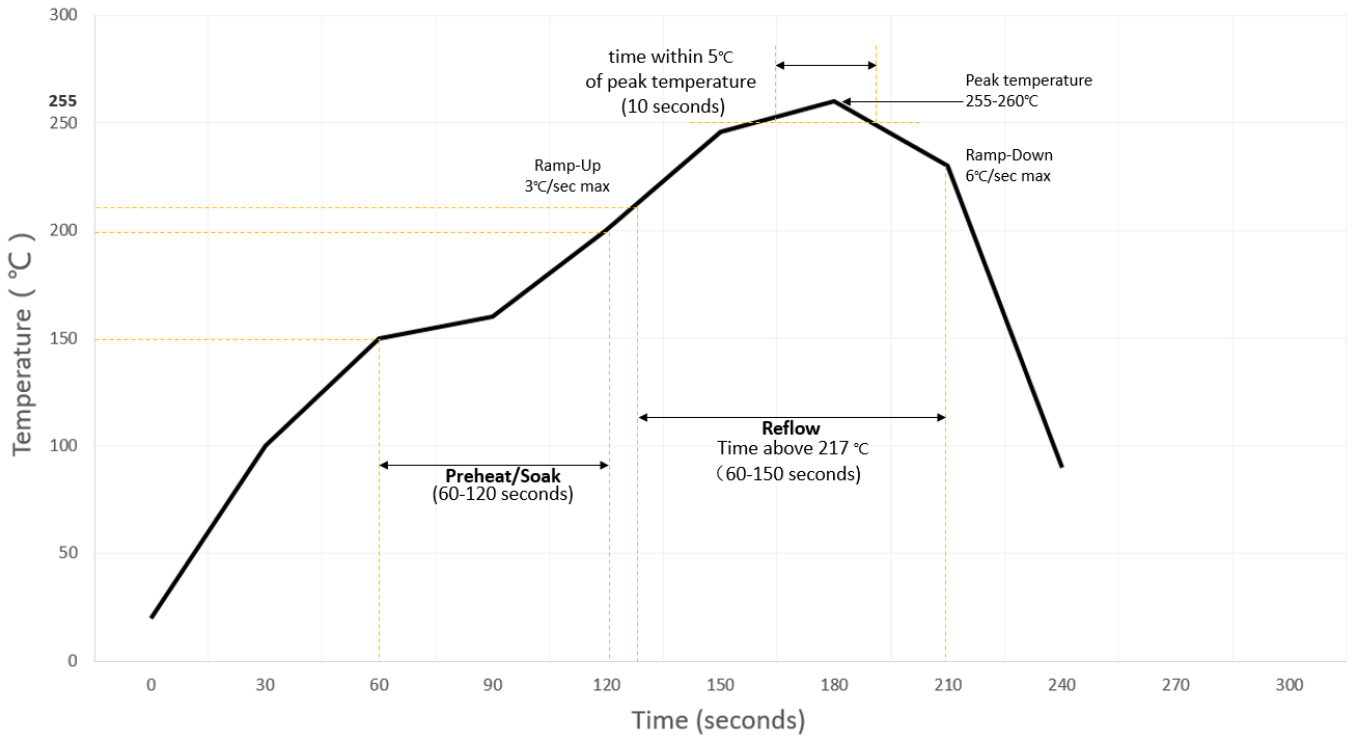
# PRODUCT SPECIFICATION

## 7.0 ENVIRONMENTAL SPECIFICATION

DESCRIPTION	SPECIFICATION
Humidity Test	<ol style="list-style-type: none"> <li>Temperature:25°C humidity:95%, time:12h. Temperature:55°C humidity:95%, time:12h. The cycle is repeated until a total of 6 cycles have been completed.</li> <li>Parts should meet RF spec before and after test.</li> <li>No cosmetic problem (No bubble issue、 No plating peeling off issue、 No mechanical damage.)</li> </ol>
Temperature Cycling Test	<ol style="list-style-type: none"> <li>The device under test at -40 °C↔125 °C by 72 cycles, Dwell of 30 min, Shift time: Within 5 minutes.</li> <li>Parts should meet RF spec before and after test.</li> <li>No cosmetic problem (No bubble issue、 No plating peeling off issue、 No mechanical damage.)</li> </ol>
High Temperature Test	<ol style="list-style-type: none"> <li>Temperature:125°C, time:1008 hours</li> <li>There is no substantial obstruction to air flow across and around the samples, and the samples are not touching each other</li> <li>Parts should meet RF spec before and after test.</li> <li>No cosmetic problem (No bubble issue、 No plating peeling off issue、 No mechanical damage.)</li> </ol>
Salt Mist Test	<ol style="list-style-type: none"> <li>NaCl:5%±1%;Temperature:35°C±2°C;Spray time:48h.</li> <li>Parts should meet RF spec before and after test.</li> <li>No visible corrosion.</li> <li>Discoloration acceptable.</li> </ol>

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## 8.0 RECOMMENDED REFLOW CONDITION



Recommended IR reflow times: 1 time.

Recommended solder paste: ALPHA CAP-390 SAC305(Ag%≥3%)

For mechanically challenging applications Molex recommends using surface mount adhesive (e.g. Loctite 3611) before reflow soldering process, to ensure increased mechanical retention on the PCB. (Figure 8.1)

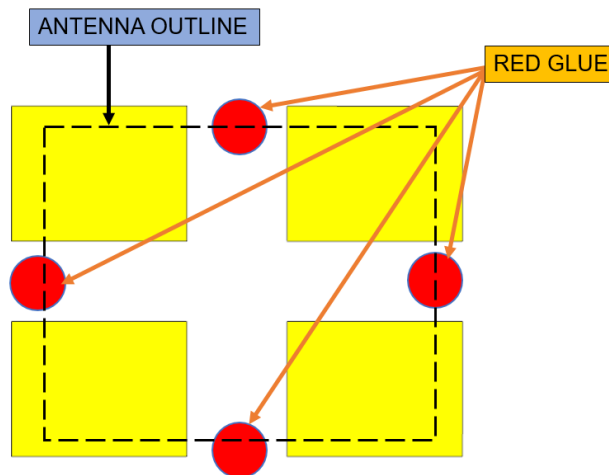
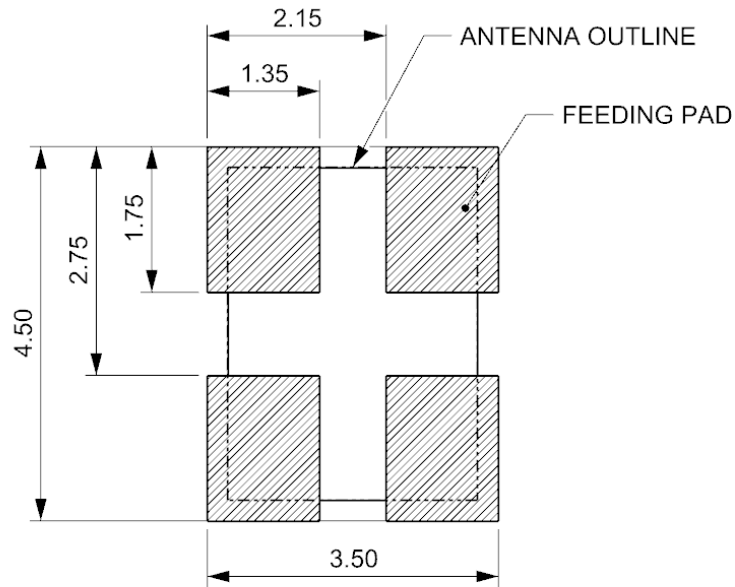


FIGURE 8.1 PCB BOARD SCHEMATIC PICTURE

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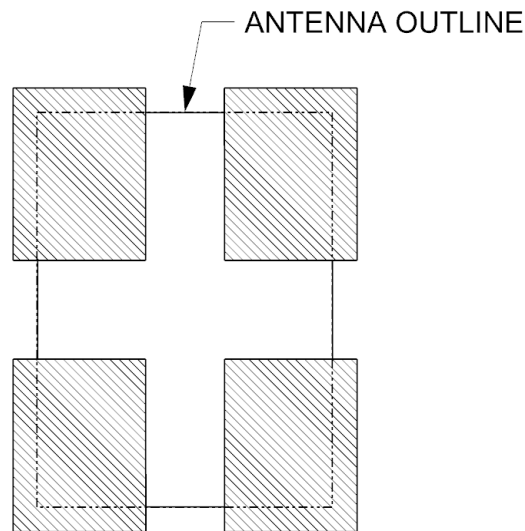
## 9.0 RECOMMENDED FOOTPRINT ON PCB FOR SOLDERING

### 9.1 RECOMMENDED PCB PADS AREA



RECOMMENDED PCB LAYOUT

### 9.2 RECOMMENDED STENCIL OPENING DESIGN

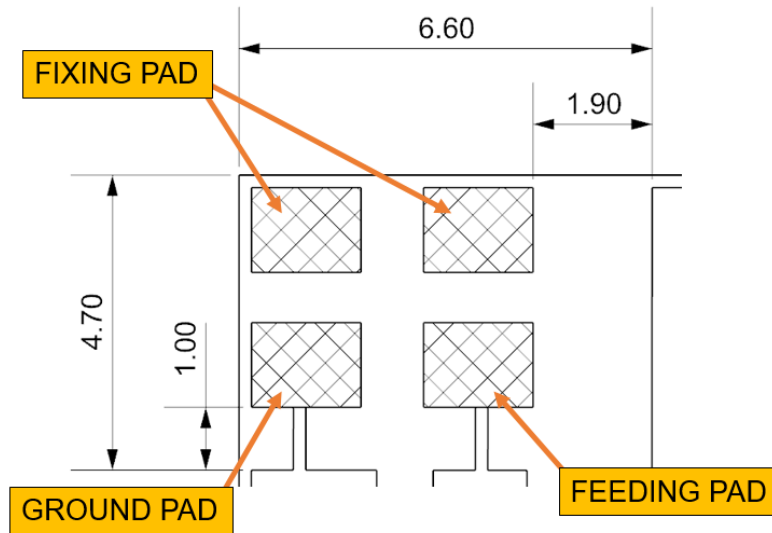


Recommended Stencil Thickness > 0.1mm

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## 9.3 RECOMMENDED PCB CLEARANCE KEEP OUT AREA

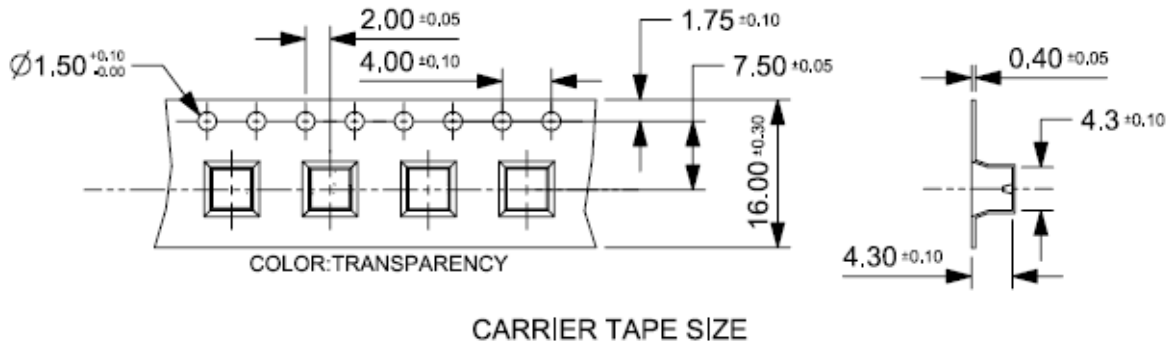


RECOMMENDED PCB CLEARANCE KEEP OUT AREA = 4.7X6.6mm  
 CLEARANCE AROUND THE PERIMETER OF THE ANTENNA FOOTPRINT = 1X1.9mm

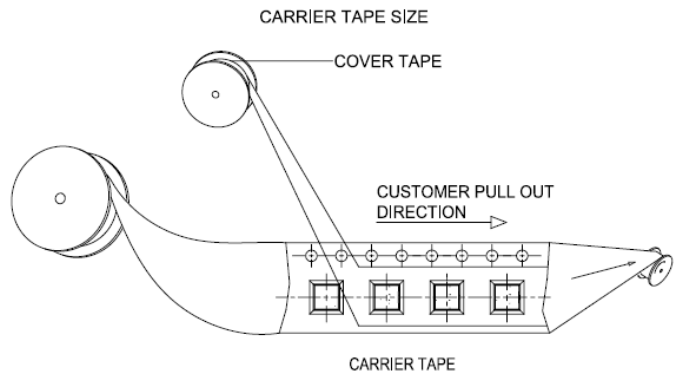
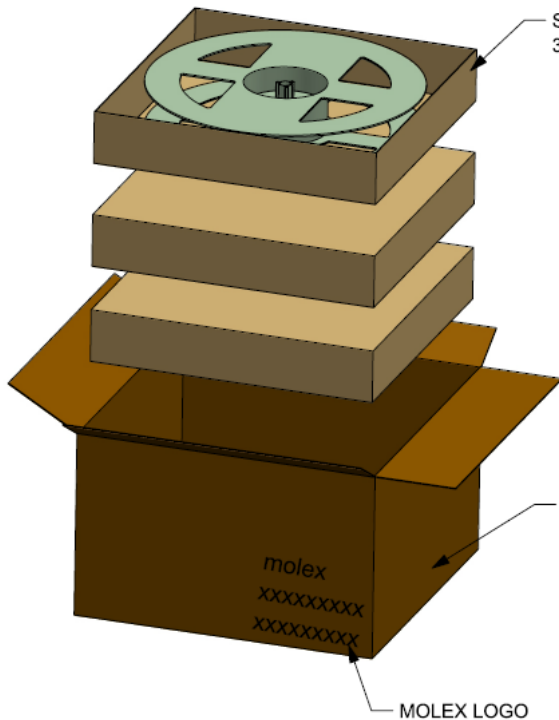
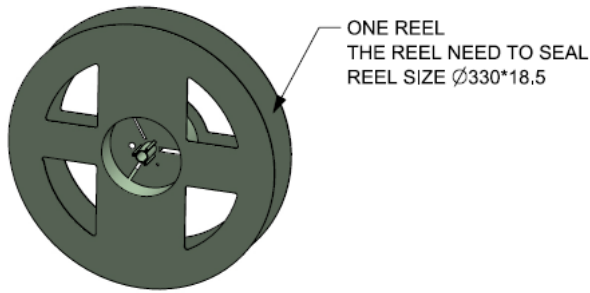
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## 10.0 PACKING



P/N	Q'TY/REEL	REEL/SMALL BOX	SMALL BOX/BIG BOX	PCS/BIG BOX
2065140001	1500	1	5	7500



- NOTES:
- 1.PRODUCTS MUST BE PACKED IN CARTONS AND SEALED UP WITH TAPE.
  - 2.STICK LABEL WITH PART NUMBER AND DATE CODE
  - 3.STANDARD PACKAGING QUANTITY:SEE TABLE
  - 4.THIS PACKAGINGSPECIFICATION TO BE USED FOR "2,4/5GHz CERAMIC ANTENNA",

### PACKAGING INFORMATION FOR 2065140001

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