APPROVAL SHEET

Chip Antenna

2.4~2.5 / 5.25~5.85 GHz Band Working Frequency

P/N: ACM3-3216-P1-CC-S

Customer：振曜

Customer ‘s Part No.：5062-000009+191

Production：

Address：

INPAQ
INPAQ TECHNOLOGY CO., LTD

Part Number：ACM3-3216-P1-CC-S **History List**

REV.	EDITOR	PAGE	ITEMS OF CHANGE	DATE	VALID DATE	ECN NO.
A0	CXLIU	ALL	發行	2021/06/29	According to the date of PLM Release	N/A
A3	CXLIU	ALL	增加地址及變更Gain	2023/11/21	According to the date of PLM Release	N/A

品名：ACM3-3216-P1-CC-S

1. Explanation of part number：

AC	M3	-	3216	-	P1	-	CC	-	S
Product Type	**Center Frequency/Band Code**		**Product Code (Unit: mm)**		**Design Revision Code**		**Antenna Type**		**Special Code**
Chip Antenna	A: 2.4GHz E: Cellular G:868MHz H:915MHz L:5GHz M3:2G+5GHz N:NFC		Per 2 digits of length, width e.g.: 3216 3.1*1.6(Length * Width)		P1:Rev.1		CC: Coupling Ceramic GF: On Ground, FR4 LC: Loop ceramic MC: Monopole Ceramic MF: Monopole FR4 PF: PIFA FR4		S: RoHS Compliant

2. Electrical Specification：

Item	Specification
Working Frequency Range	2.4~2.5 / 5.15~5.85 GHz (Note-1)
Gain	3.91 / 3.41 dBi (Peak)
VSWR	2.1 max.
Polarization	Linear
Azimuth Bandwidth	Omni-directional
Impedance	50Ω

3. Other：

Item	Information
Address	桃園市楊梅區高獅路 566 之 1 號 . No. 566-1, Kao-Shi Rd., Yangmei Dist. Taoyuan City 32668, Taiwan (R.O.C.)
Antenna Type	Chip antenna

4. Antenna Drawing：

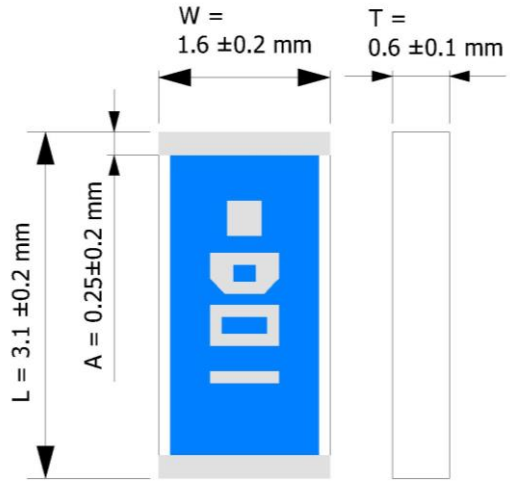
CONSTRUCTION

P1

P2

PIN	Connection
1	Feeding
2	Soldering terminal

DIMENSIONS

Figure	Symbol	Dimension (mm)
	L	3.10 ± 0.20
	W	1.60 ± 0.20
	T	0.60 ± 0.10
	A	0.25 ± 0.20

UNLESS OTHER SPECIFIED TOLERANCES ON： X＝N/A X.X＝N/A X.XX＝N/A ANGLES＝N/A HOLEDIA＝N/A		INPAQ TECHNOLOGY CO., LTD.	
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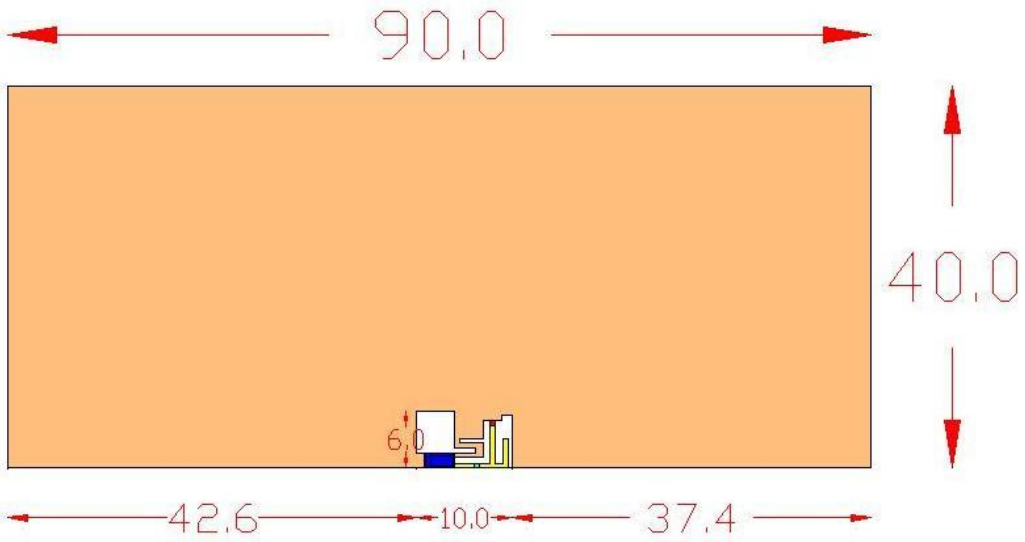
DESIGNED BY：	APPROVED BY：陳振榮		
TITLE：ACM3-3216-P1-CC-S		DOCUMENT NO.	ENS070001800-000824000238 SPEC REV. A3

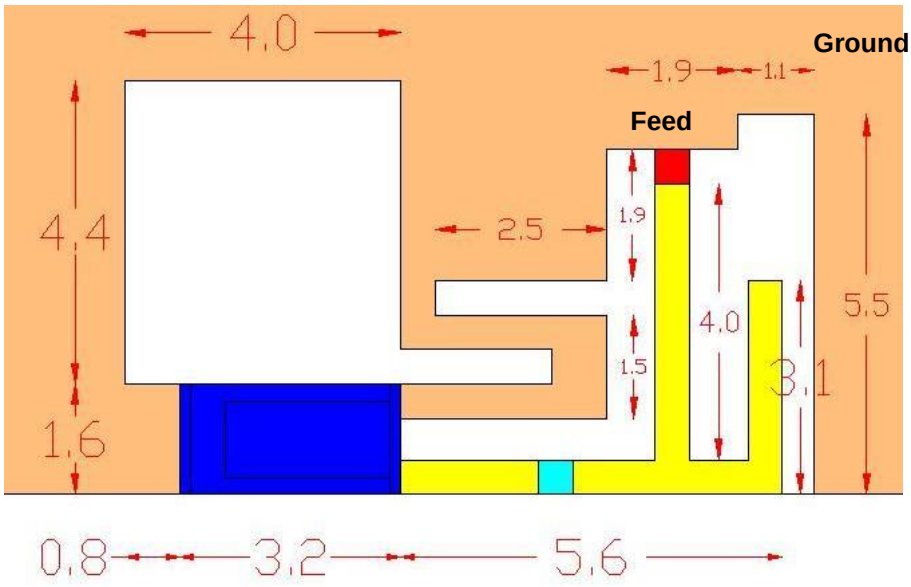
5. Performance Report：

SOLDER LAND PATTERN DESIGN

Figure (Empty Space 10.0 mm x 6.0 mm)



Land Pattern



Antenna

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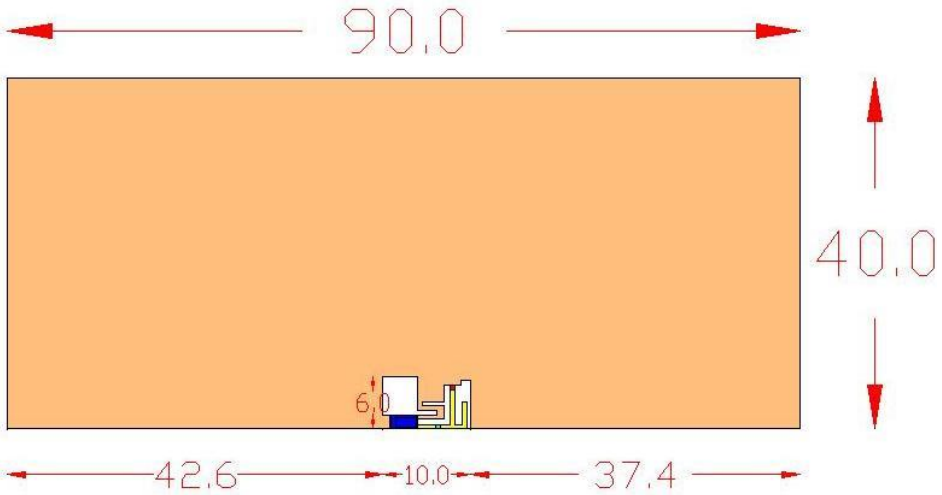
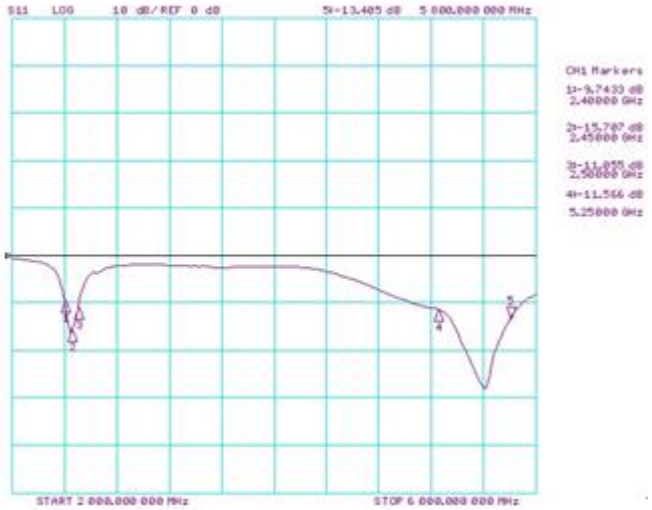
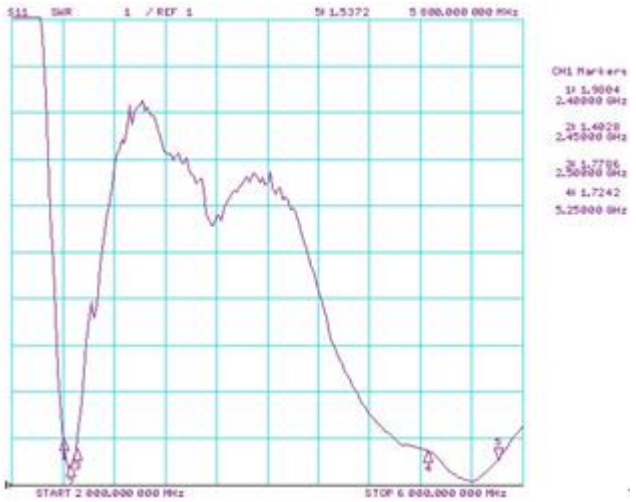
Antenna on Test Board (Thickness 0.8mm)



Antenna S11 on Test Board



Antenna VSWR on Test Board



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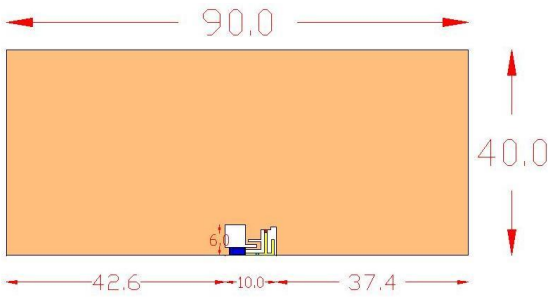
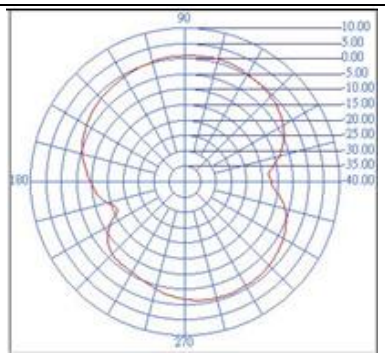
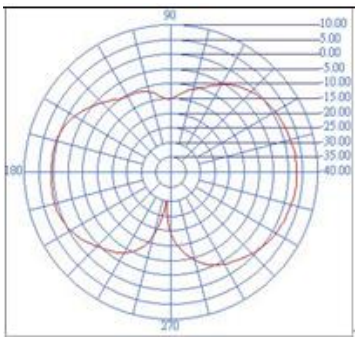
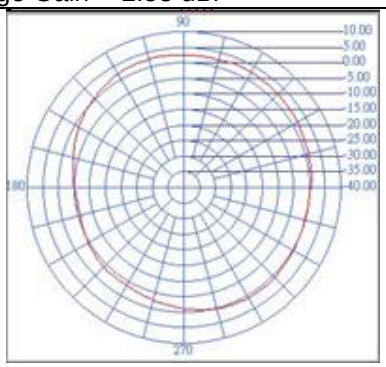
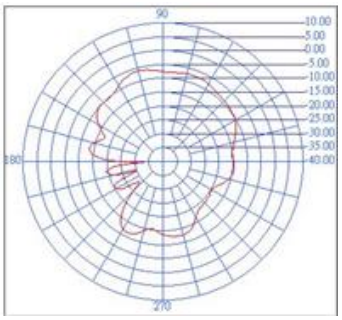
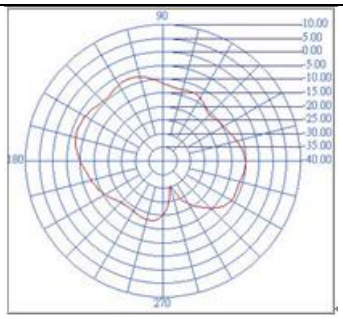
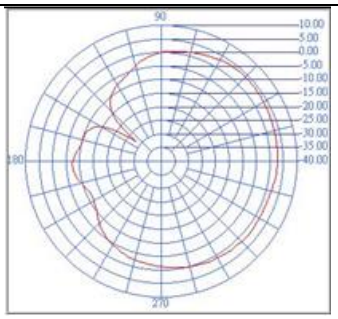
RADIATION PATTERN

Radiation Pattern and Gain were dependent on measurement board design. The specification of ACM3-3216-P1-CC-S antenna was measured based on the PCB size and installation position as shown in the below figure Test Board.



2.4GHz

	Vertical	Horizontal
Y - Z Plane Average Gain= 0.959 dBi	 Peak Gain = 1.18 dBi Average Gain =-2.53 dBi	 Peak Gain= 2.97 dBi Average Gain=-1.62 dBi
X - Z Plane Average Gain= 0.540 dBi	 Peak Gain= 2.77 dBi Average Gain=0.26 dBi	 Peak Gain= -6.7 dBi Average Gain= -11.5dBi
X - Y Plane Average Gain= 0.129 dBi	 Peak Gain= -6.89 dBi Average Gain= -11.64dBi	 Peak Gain= 3.91 dBi Average Gain= -0.17 dBi

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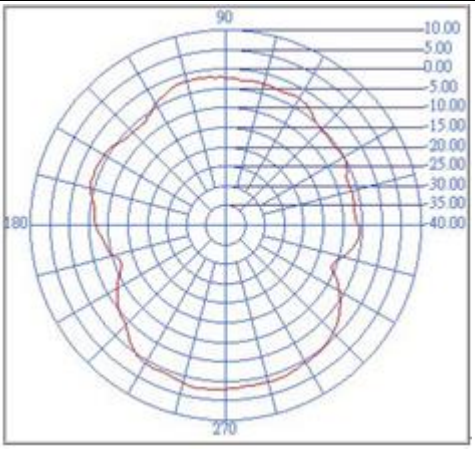
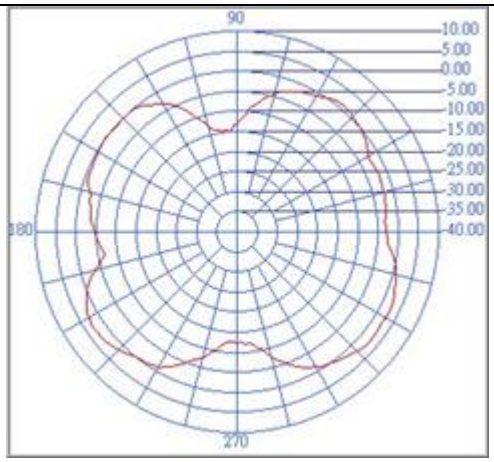
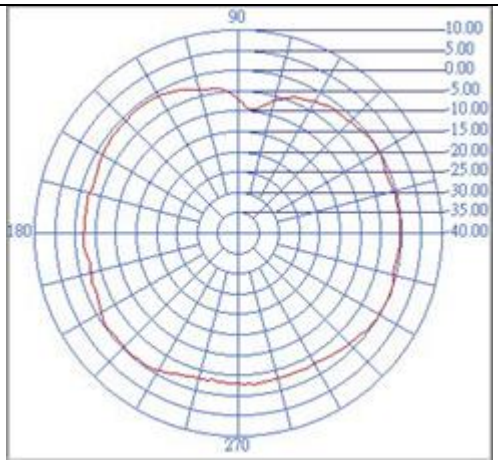
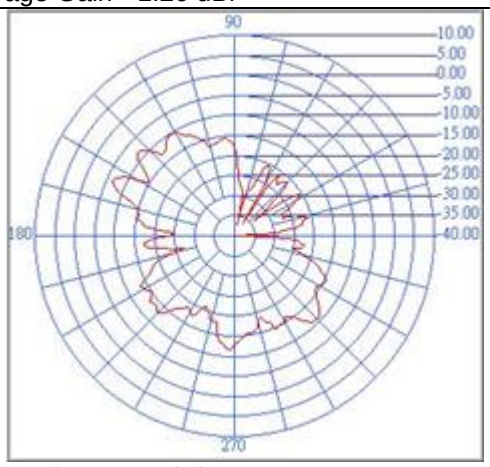
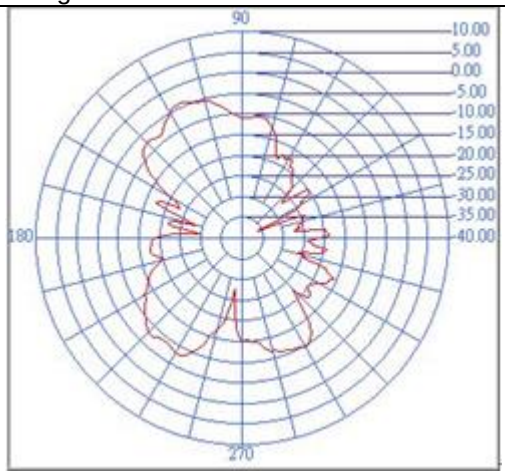
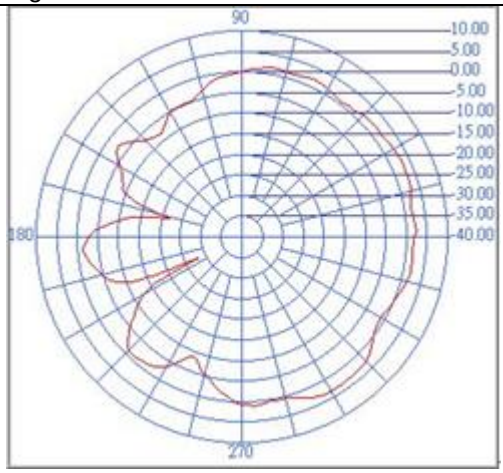
5.55GHz

	Vertical	Horizontal
Y - Z Plane Average Gain= 1.209 dBi	 Peak Gain =2.32 dBi Average Gain = -2.42 dBi	 Peak Gain= 2.81 dBi Average Gain=-1.26 dBi
X - Z Plane Average Gain= -1.476 dBi	 Peak Gain= 0.15 dBi Average Gain=-1.67 dBi	 Peak Gain= -6.68 dBi Average Gain= -15.07dBi
X - Y Plane Average Gain= -0.002 dBi	 Peak Gain= -4.18 dBi Average Gain= -11.93 dBi	 Peak Gain=3.41 dBi Average Gain= -0.29 dBi

UNLESS OTHER SPECIFIED TOLERANCES ON：
X＝N/A X.X＝N/A X.XX＝N/A
ANGLES＝N/A HOLEDIA＝N/A

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SCALE：N/A | UNIT：mm
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DESIGNED BY： | APPROVED BY：陳振榮

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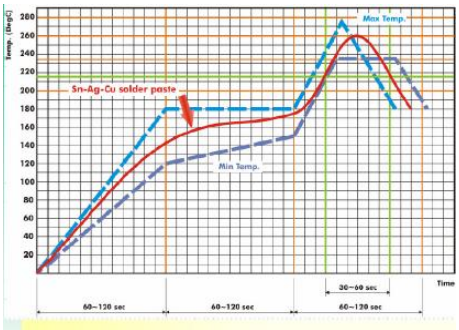
6. RELIABILITY TEST

Test item	Test condition / Test method	Specification
Solderability JIS C 0050-4.6 JESD22-B102D	*Solder bath temperature：235 ± 5°C *Immersion time：2 ± 0.5 sec *Solder：Sn3Ag0.5Cu for lead-free	At least 95% of a surface of each terminal electrode must be covered by fresh solder.
Leaching **(Resistance to dissolution of metallization)** IEC 60068-2-58	*Solder bath temperature：260 ± 5°C *Leaching immersion time：30 ± 0.5 sec *Solder : SN63A	Loss of metallization on the edges of each electrode shall not exceed 25%.
Resistance to soldering heat JIS C 0050-5.4	*Preheating temperature：120~150℃, 1 minute. *Solder temperature：270±5°C *Immersion time：10±1 sec *Solder：Sn3Ag0.5Cu for lead-free Measurement to be made after keeping at room temperature for 24±2 hrs	No mechanical damage. Samples shall satisfy electrical specification after test. Loss of metallization on the edges of each electrode shall not exceed 25%.
Drop Test JIS C 0044	*Height：75 cm *Test Surface：Rigid surface of concrete or steel. *Times：6 surfaces for each units；2 times for each side.	No mechanical damage. Samples shall satisfy electrical specification after test.
Adhesive Strength of Termination JIS C 0051- 7.4.3	*Pressurizing force： 5N(≦0603)；10N(>0603) ***Test time：10±1 sec**	No remarkable damage or removal of the termination.
Bending test JIS C 0051- 7.4.1	The middle part of substrate shall be pressurized by means of the pressurizing rod at a rate of about 1 mm/s per second until the deflection becomes 1mm/s and then pressure shall be maintained for 5±1 sec. Measurement to be made after keeping at room temperature for 24±2 hours	No mechanical damage. Samples shall satisfy electrical specification after test.

Temperature cycle JIS C 0025	1. 30±3 minutes at -40°C±3°C, 2. 10~15 minutes at room temperature, 3. 30±3 minutes at +85°C±3°C, 4. 10~15 minutes at room temperature, Total 100 continuous cycles Measurement to be made after keeping at room temperature for 24±2 hrs	No mechanical damage. Samples shall satisfy electrical specification after test.
Vibration JIS C 0040	*Frequency：10Hz~55Hz~10Hz(1min) *Total amplitude：1.5mm *Test times：6hrs.(Two hrs each in three mutually perpendicular directions)	No mechanical damage. Samples shall satisfy electrical specification after test.
High temperature JIS C 0021	*Temperature：85°C±2°C *Test duration：1000+24/-0 hours Measurement to be made after keeping at room temperature for 24±2 hrs	No mechanical damage. Samples shall satisfy electrical specification after test.
Humidity (steady conditions) JIS C 0022	*Humidity：90% to 95% R.H. *Temperature：40±2°C *Time：1000+24/-0 hrs. Measurement to be made after keeping at room temperature for 24±2 hrs ※ 500hrs measuring the first data then 1000hrs data	No mechanical damage. Samples shall satisfy electrical specification after test.
Low temperature JIS C 0020	*Temperature：-40°C±2°C *Test duration：1000+24/-0 hours Measurement to be made after keeping at room temperature for 24±2 hrs	No mechanical damage. Samples shall satisfy electrical specification after test.

SOLDERING CONDITION

Typical examples of soldering processes that provide reliable joints without any damage are given in Fig 2



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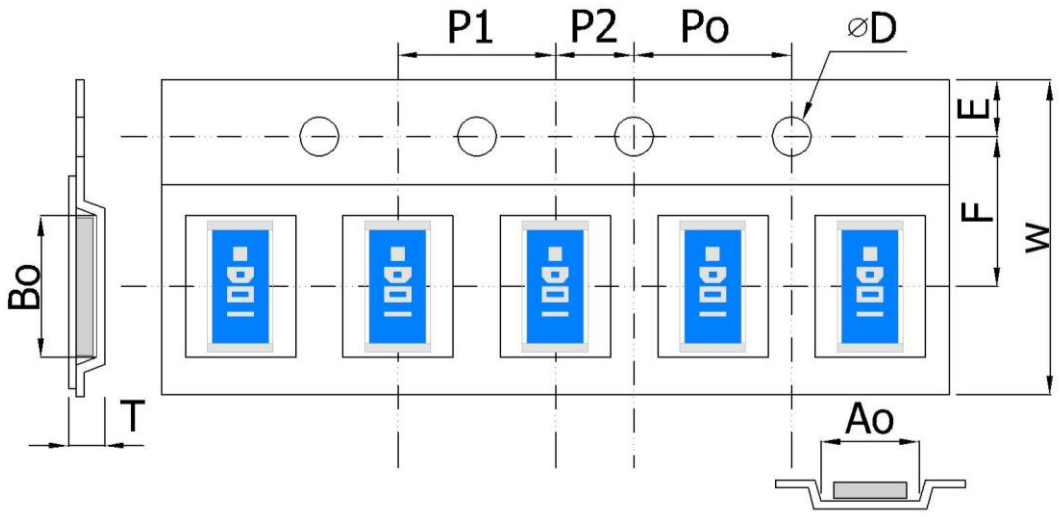
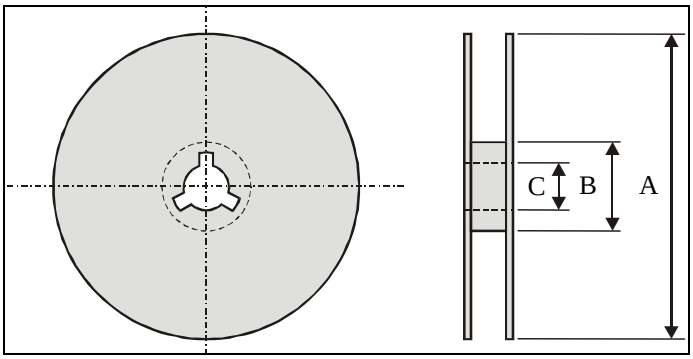
7. Package



Plastic Tape specifications (unit :mm)

Index	Ao	Bo	ΦD	T	W
Dimension (mm)	1.85 ± 0.10	3.45 ± 0.10	1.55 ± 0.05	0.75 ± 0.10	8.20 ± 0.30
Index	E	F	Po	P1	P2
Dimension (mm)	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.10

Reel dimensions



Index	A	B	C
Dimension (mm)	Φ178.0	Φ60.0	Φ13.0

Taping Quantity:2000 pieces per 7” reel

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