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：

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：

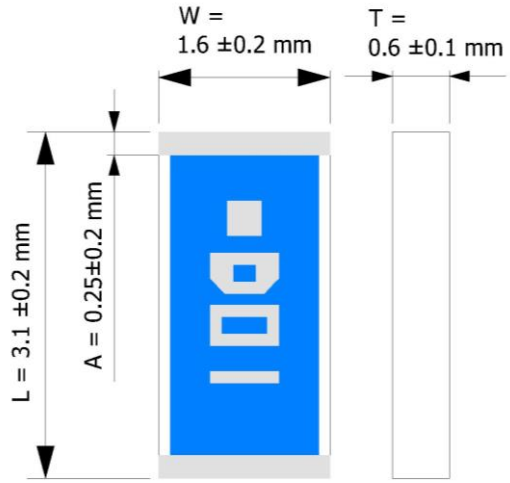
CONSTRUCTION

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.	
SCALE：N/A	UNIT：mm	THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF INPAQ TECHNOLOGY CO.,LTD.AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION	
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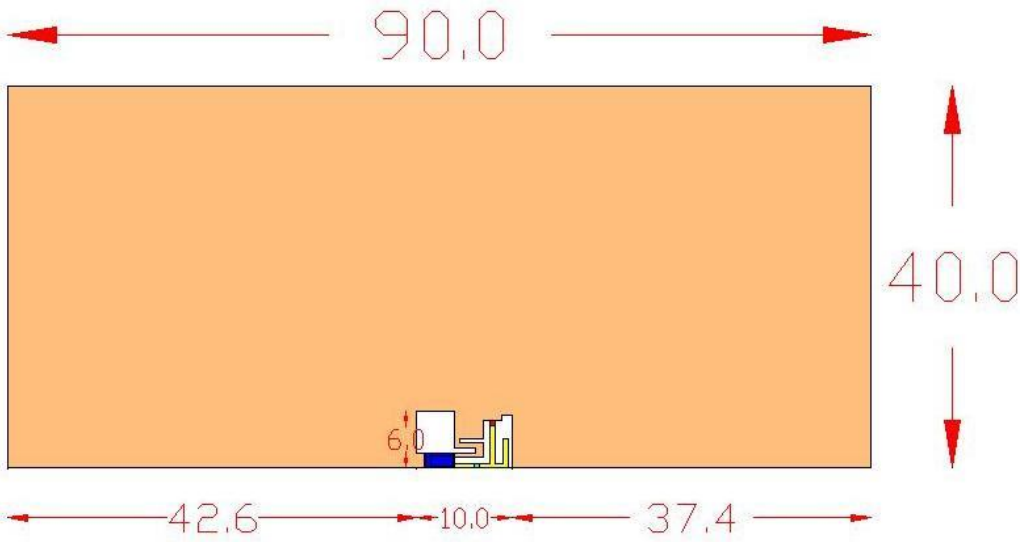
DESIGNED BY：	APPROVED BY：陳振榮		
TITLE：ACM3-3216-P1-CC-S		DOCUMENT NO.	ENS070001800-000824000238 SPEC REV. A3

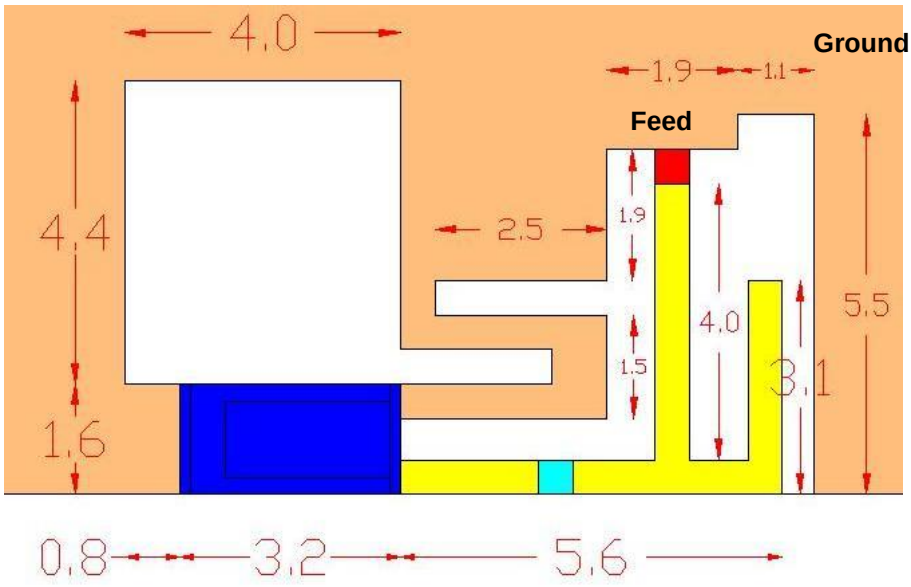
5. Performance Report：

SOLDER LAND PATTERN DESIGN

Figure (Empty Space 10.0 mm x 6.0 mm)



Land Pattern



Antenna

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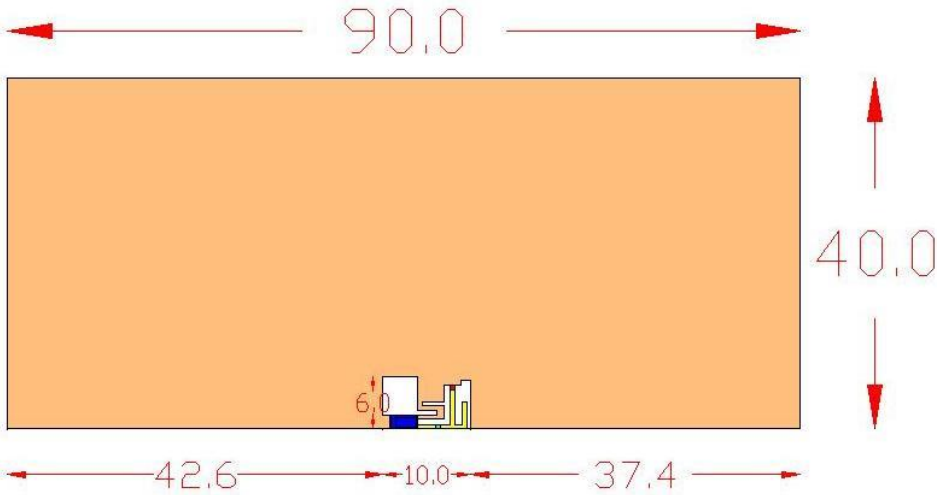
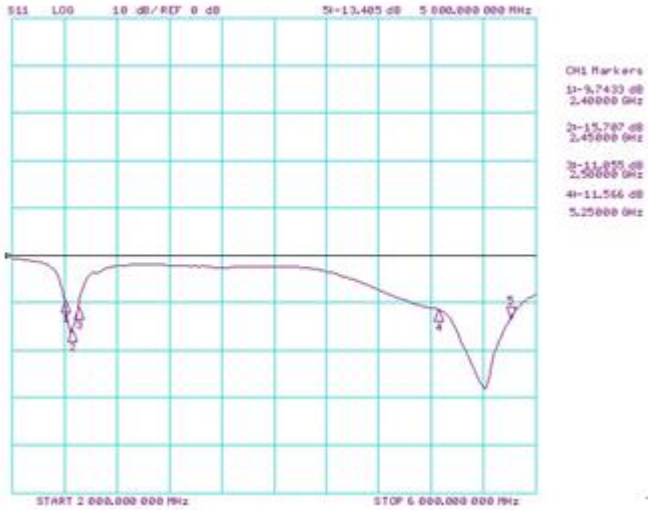
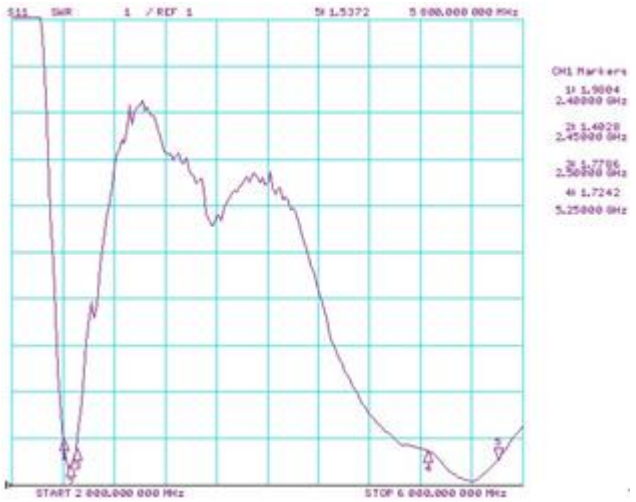
Antenna on Test Board (Thickness 0.8mm)



Antenna S11 on Test Board



Antenna VSWR on Test Board



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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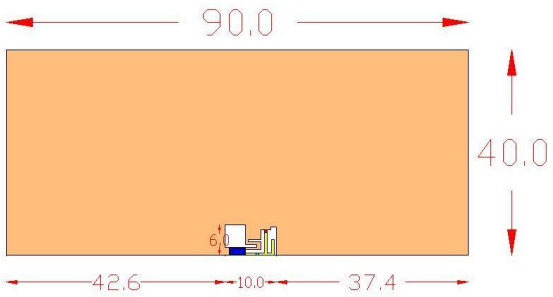
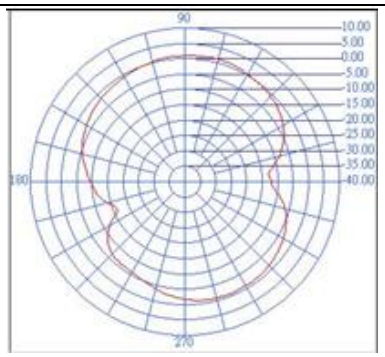
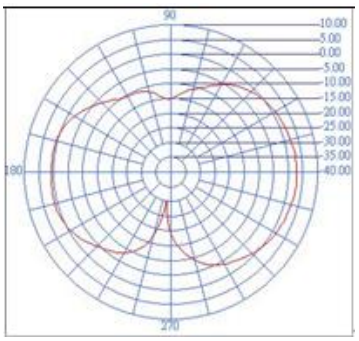
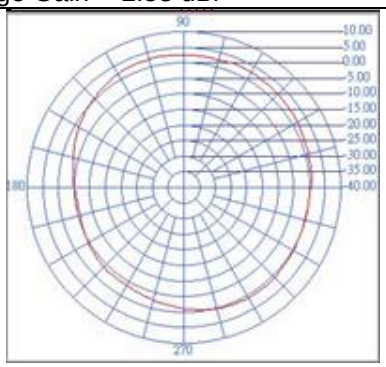
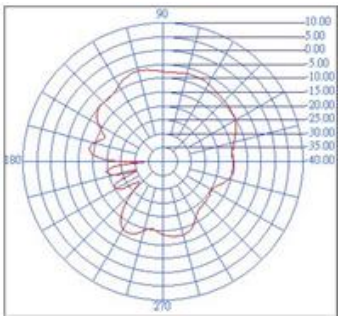
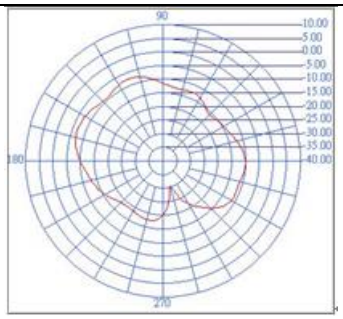
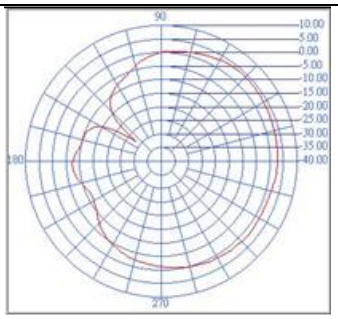
RADIATION PATTERN

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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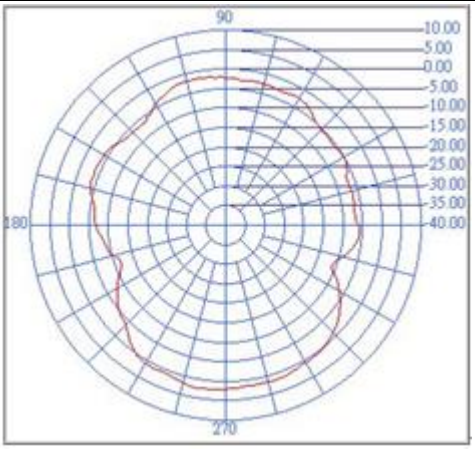
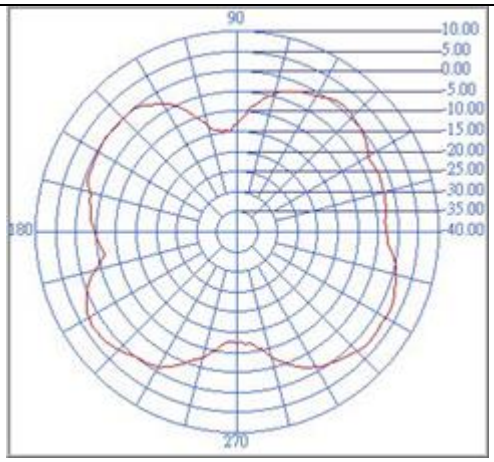
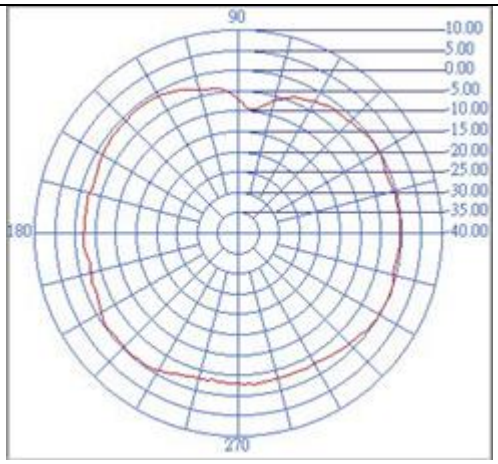
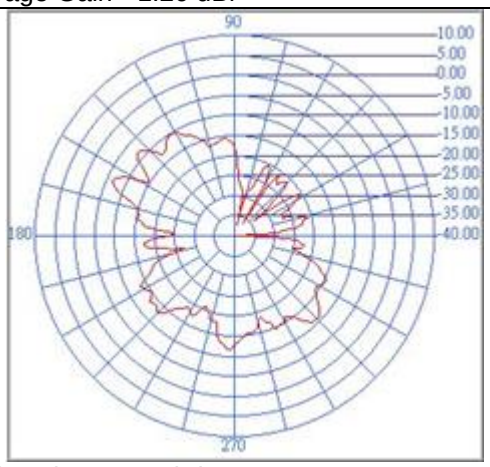
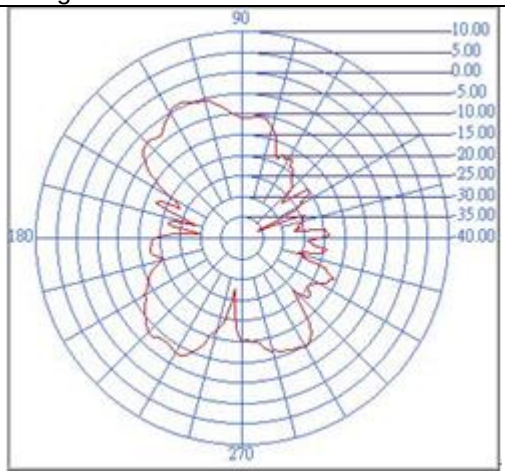
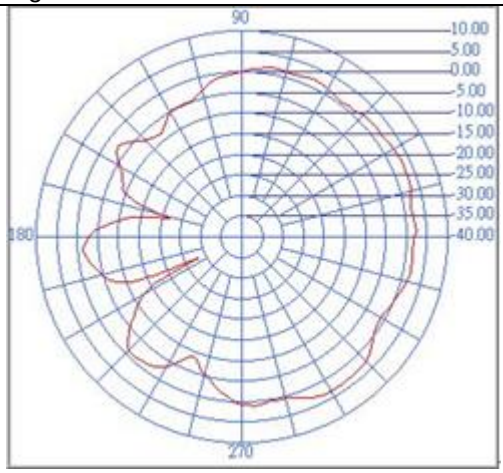
5.55GHz

	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

INPAQ TECHNOLOGY CO., LTD.

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

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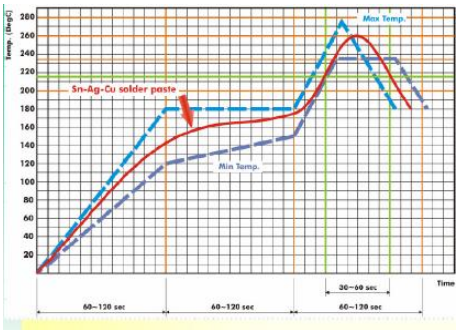
6. RELIABILITY TEST

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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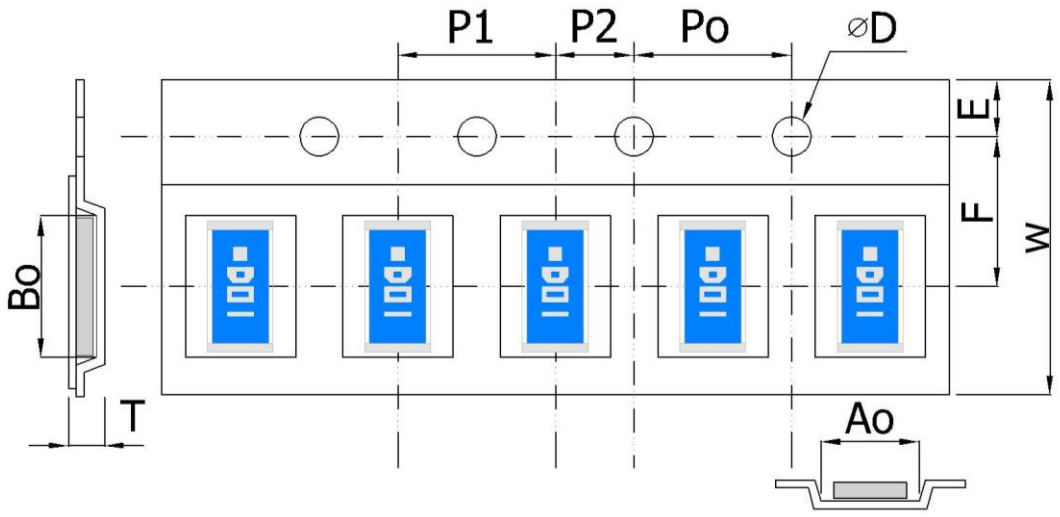
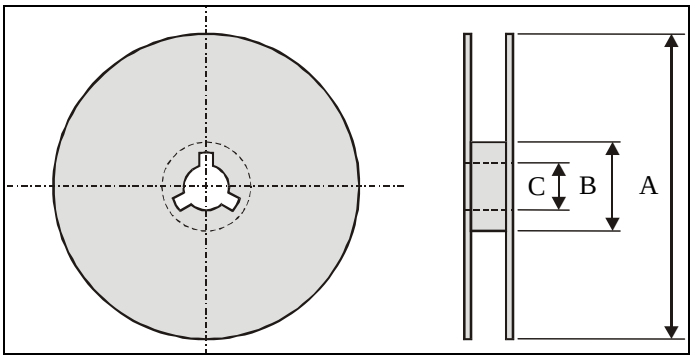
7. Package



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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