

# 承 認 書 SPECIFICATION FOR APPROVAL

各戶名稱	
CUSTOMER :	

客戶料號

CUSTOMER'S P/N:

料號

PART NUMBER: WAN5010F245H05

規格

DESCRIPTION : Chip Antenna 5010 M-Ant 2.4~2.5G Type HO

版本

VERSION: V1.4

日期

ISSUE DATE : 2023/06/14



4		工 程 部 R&D CENTER	
	承認 APPROVAL	確 認 CHECKED	製 作 DRAWN
0	Ray	Tennyson	Snow





# 萬誠科技股份有限公司

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電話: (02) 2898-2220 傳真: (02) 2898-5055

# OneWave Electronic Co., Ltd.

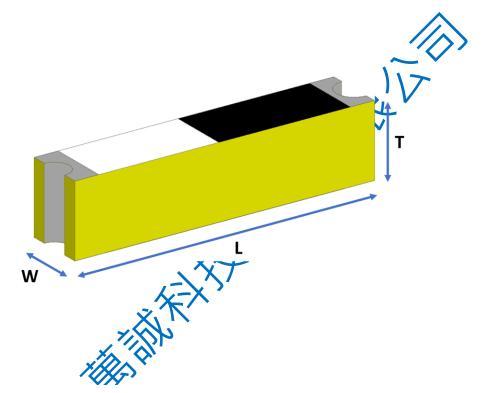
1F, No. 151, Li Gong Street, Beitou District, Taipei City 112, Taiwan

TEL: +886 2 2898-2220 FAX: +886 2 2898-5055



# 5010 Chip antenna

# For Bluetooth / WLAN Applications



P/N: WAN5010F245H05

	Dimension (mm)
L	5.01 ± 0.20
W	1.02 ± 0.20
Т	1.25 ± 0.20



# **Part Number Information**

WAN 5010 F 245 H 05
A B C D E F

Α	Product Series	Antenna		
В	Dimension L x W	5.0X1.0mm (+-0.2mm)		
С	Material	High K material		
D	Working Frequency	2.4 ~ 2.5GHz		
E	Feeding mode	Monopole & Single Feeding		
F	Antenna type	Type = 05		

# 1. Electrical Specification

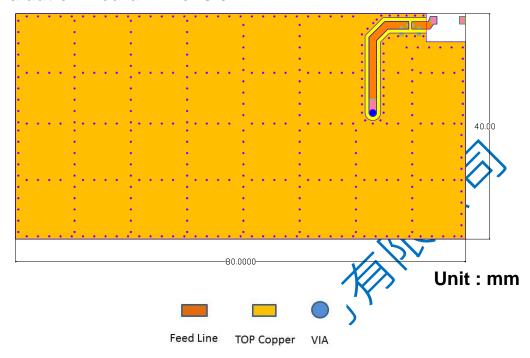
Specification						
Part Number	WAN5010F245H05					
Central Frequency	2450	MHz				
Bandwidth	100 (Min.)	MHz				
Return Loss	-10 (Max)	dB				
Peak Gain	3.12	dBi				
Impedance	50	Ohm				
Operating Temperature	-40~+110	$^{\circ}$ C				
Maximum Power	4	W				
Resistance to Soldering Heats	10 ( @ 260℃)	sec.				
Polarization	Linear					
Azimuth Beamwidth	Omni-directional					
Termination	Cu / Sn (Leadless)					

 $Remark: Bandwidth \ \& \ Peak \ Gain \ was \ measured \ under \ evaluation \ board \ of \ next \ page$ 



# 2. Recommended PCB Pattern

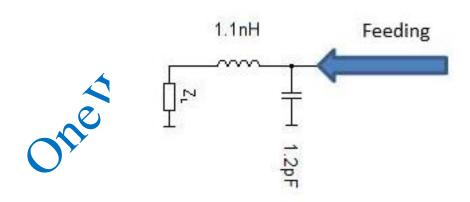
#### **Evaluation Board Dimension**



**Suggested Matching Circuit,** 

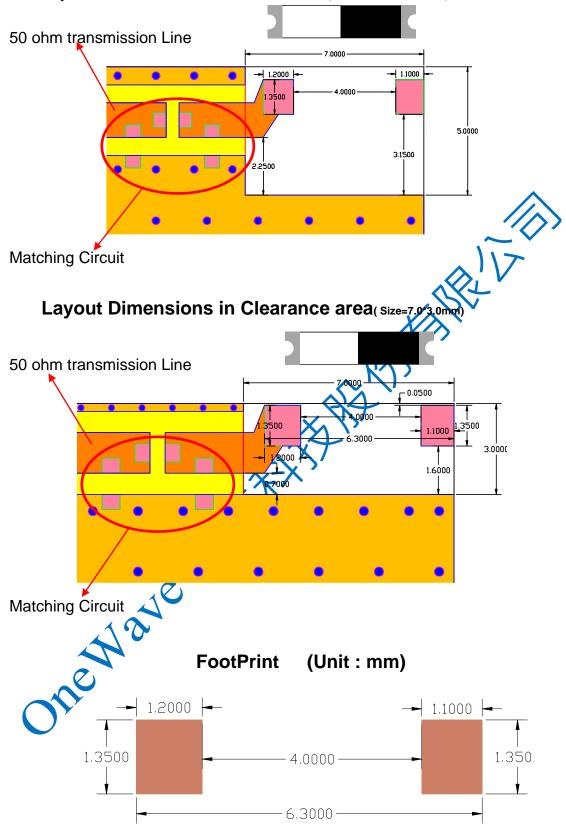
重要資訊:

匹配元件建議使用精準(富)的電感±0.1~0.3nH、電容±0.1pF





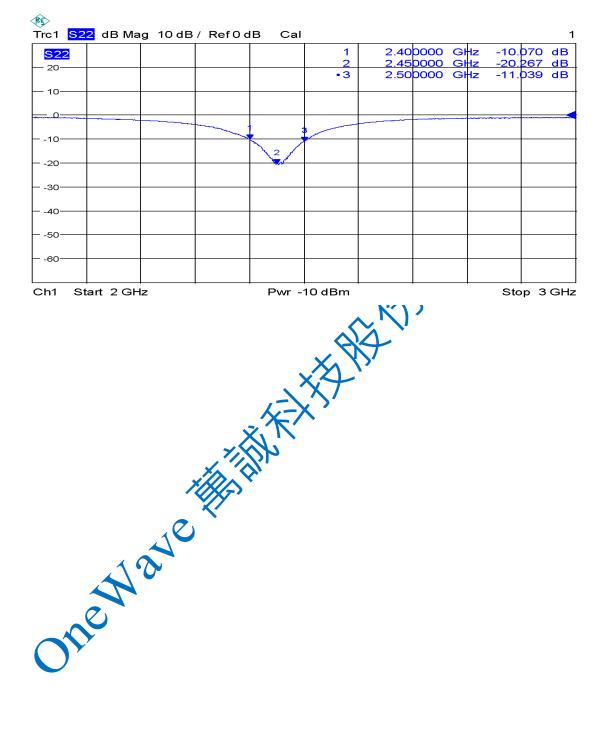
#### **Layout Dimensions in Clearance area( Size=7.0\*5.0mm)**





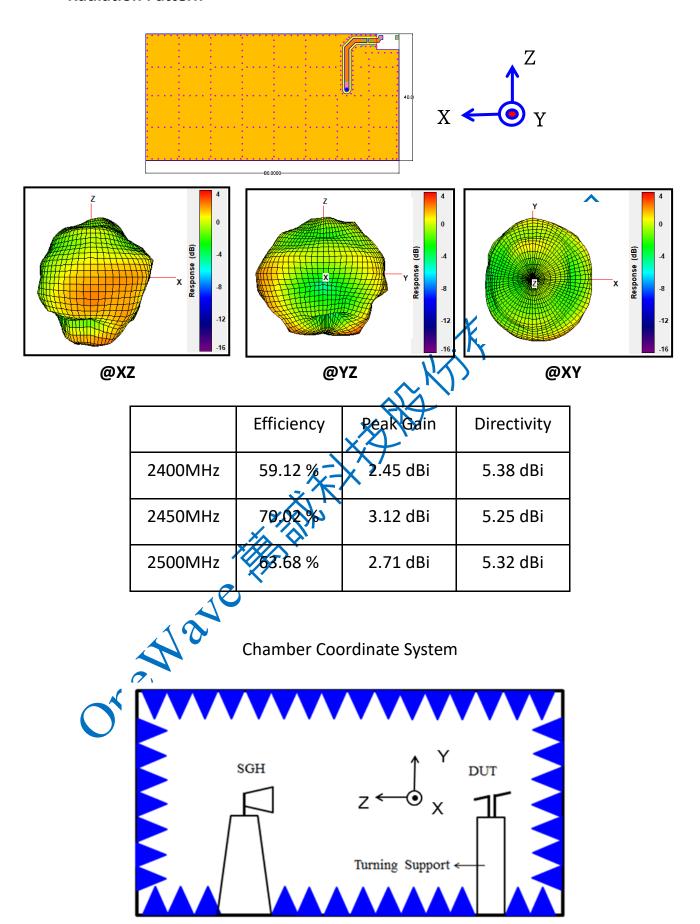
#### 3. Measurement Results

#### **Return Loss**





#### **Radiation Pattern**





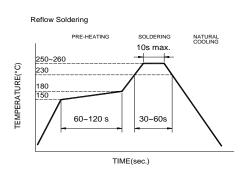
**4. Reliability and Test Condictions** 

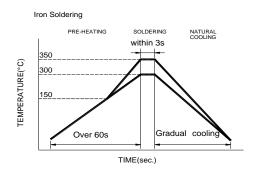
2. No visible mechanical damage TEMP (C) 230°C 150°C 260°C 2	ITEM	REQUIREMENTS	TEST CONDITION
Solder heat Resistance   1. No visible mechanical damage   2. Central Freq. change :within ±6%   1. No visible mechanical damage   2. Central Freq. change :within ±6%   1. No visible mechanical damage   2. Central Freq. change :within ±6%   1. No visible mechanical damage   1. No visible mechanical damage   2. Central Freq. change :within ±6%   3. No disconnection or short circuit.   3. No visible mechanical damage   3. No disconnection or short circuit.   4. 110.±5°	Solderability	1. Wetting shall exceed 90% coverage	Pre-heating temperature:150°C/60sec.
Solder heat Resistance  1. No visible mechanical damage 2. Central Freq. change :within ± 6%  TEMP (C) 260°C 10:10.5 sec.  1. No visible mechanical damage 3. No visible mechanical damage 4. Component Adhesion (Push test)  1. No visible mechanical damage 4. No visible mechanical damage 5. Component Adhesion (Push test)  1. No visible mechanical damage 4. No visible mechanical damage 5. Component Adhesion (Pull test)  1. No visible mechanical damage 7. The device must within 0.5 kg without failure of the terminal attached to component. The device must within 0.5 kg without failure of the terminal attached to component. The device must within 0.5 kg without failure of the terminal attached to component. The device must within 0.5 kg without failure of the terminal attached to component. The device must within 0.5 kg without failure of the terminal attached to component. The device must within 0.5 kg without failure of the terminal attached to component. The device must within 0.5 kg without failure of the terminal attached to component. The device must within 0.5 kg without failure of the terminal attached to component. The device must within 0.5 kg without failure of the terminal attached to component. The device must within 0.5 kg without failure of the terminal attached to component. The device must within 0.5 kg without failure of the terminal attached to component. The device must within 0.5 kg without failure of the terminal attached to component. The device must within 0.5 kg without failure of the terminal attached to component. The device must within 0.5 kg without failure of the terminal attached to component. The device must within 0.5 kg without failure of the terminal attached to component. The device must within 0.5 kg without failure of the terminal attached to component. The device must within 0.5 kg within 1. No visible mechanical damage  2. Central Freq. change : within ±6%  3. No disconnection or short circuit.  Temperature: 40±5°C Duration: 1000±12brs The chip shall be stabilized at norm condit		No visible mechanical damage	Solder temperature:230±5°C
Solder heat Resistance  1. No visible mechanical damage 2. Central Freq. change :within ± 6%  TEMP (C)  260°C  150°C  10±0.5 sec.  1. No visible mechanical damage 3. No visible mechanical damage 4. Central Freq. change :within ± 6%  The rmal shock  Thermal shoc		TEMP (℃)	Duration:4±1sec.
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Solder heat Resistance  1. No visible mechanical damage 2. Central Freq. change :within ± 6%  TEMP (**C)  150°C  10:10.5 sec.  10:10.5 sec.  Solder: Sn-Ag3.0-Cu06  Flux for lead free: rdsin  The device should be reflow solder temperature: 260±5 solder: Sn-Ag3.0-Cu06  Flux for lead free: rdsin  The shock of the terminal damage  1. No visible mechanical damage  2. Central Freq. change :within ±6%  Phase Temperature Sacc 3 40±2°C 3 30±3 4 Rosom Temperature Sacc 3 1. No visible mechanical damage 2. Central Freq. change :within ±6%  Phase Temperature Sacc 3 1. No visible mechanical damage 2. Central Freq. change :within ±6%  Phase Temperature Sacc 3 1. No visible mechanical damage 2. Central Freq. change :within ±6%  Temperature: 40±2°C  Duration: 1000±12hrs The chip shall be stabilized at norm condition for 2-3 hours before mea  Temperature: 40±5 C  Duration: 1000±12hrs The chip shall be stabilized at norm condition for 2-3 hours before mea  Temperature: 40±5 C  Duration: 1000±12hrs The chip shall be stabilized at norm condition for 2-3 hours before mea  Temperature: 40±5 C  Duration: 1000±12hrs The chip shall be stabilized at norm condition for 2-3 hours before mea		230°C 4±1 sec.	Flux for lead free: rosin
Solder heat Resistance  1. No visible mechanical damage 2. Central Freq. change :within ± 6%  TEMP (**C)  150°C  10:10.5 sec.  10:10.5 sec.  Solder: Sn-Ag3.0-Cu06  Flux for lead free: rdsin  The device should be reflow solder temperature: 260±5 solder: Sn-Ag3.0-Cu06  Flux for lead free: rdsin  The shock of the terminal damage  1. No visible mechanical damage  2. Central Freq. change :within ±6%  Phase Temperature Sacc 3 40±2°C 3 30±3 4 Rosom Temperature Sacc 3 1. No visible mechanical damage 2. Central Freq. change :within ±6%  Phase Temperature Sacc 3 1. No visible mechanical damage 2. Central Freq. change :within ±6%  Phase Temperature Sacc 3 1. No visible mechanical damage 2. Central Freq. change :within ±6%  Temperature: 40±2°C  Duration: 1000±12hrs The chip shall be stabilized at norm condition for 2-3 hours before mea  Temperature: 40±5 C  Duration: 1000±12hrs The chip shall be stabilized at norm condition for 2-3 hours before mea  Temperature: 40±5 C  Duration: 1000±12hrs The chip shall be stabilized at norm condition for 2-3 hours before mea  Temperature: 40±5 C  Duration: 1000±12hrs The chip shall be stabilized at norm condition for 2-3 hours before mea			
Solder heat Resistance  2. Central Freq. change :within ± 6%  TEMP (**C)  260°C  150°C  150°		150℃	
Solder heat Resistance  2. Central Freq. change :within ± 6%  TEMP (°C)  260°C  150°C		60000	
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Component Adhesion (Push test)			
Component Adhesion (Push test)  1. No visible mechanical damage  2. Central Freq. change : within ±6%  Resistance to High Temperature  1. No visible mechanical damage  2. Central Freq. change : within ±6%  Resistance to Low  1. No visible mechanical damage  2. Central Freq. change : within ±6%  2. Central Freq. change : within ±6%  3. No disconnection or short circuit.  Component  1. No visible mechanical damage  2. Central Freq. change : within ±6%  2. Central Freq. change : within ±6%  3. No disconnection or short circuit.  Duration:10±0.5sec.  Solder:Sn-Ag3.0-Cu0.6  Flux for lead free: robin  The device should be reflow solder if for 15 solder: Solder:Sn-Ag3.0-Cu0.6  Flux for lead free: robin  The device should be reflow solder if for 15 solder: Solder: Solder: Solder: Sn-Ag3.0-Cu0.6  Flux for lead free: robin  The device should be reflow solder if for 15 solder: Solder: Sn-Ag3.0-Cu0.6  Flux for lead free: robin  The device should be reflow solder if for 15 solder: Sn-Ag3.0-Cu0.6  Flux for lead free: robin  The device should be reflow solder if for 15 solder: Sn-Ag3.0-Cu0.6  Flux for lead free: robin  The device should be reflow solder if for 15 solder: Snowledge and state and			
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Component Adhesion (Push test)  1. No visible mechanical damage  1. No visible mechanical damage  2. Component Adhesion (Pull test)  1. No visible mechanical damage  3. No visible mechanical damage  2. Central Freq. change :within ±6%  Phase Temperature Temperature Temperature  3. No visible mechanical damage  2. Central Freq. change :within ±6%  Resistance to High Temperature  1. No visible mechanical damage  2. Central Freq. change :within ±6%  Phase Temperature Temperature Temperature Temperature  3. No visible mechanical damage  2. Central Freq. change :within ±6%  1. No visible mechanical damage  2. Central Freq. change :within ±6%  3. No disconnection or short circuit.  Temperature: +110±5 □  Duration: 1000±12brs  The chip shall be stabilized at norm condition for 2-3 hours before mea  Temperature: +110±5 □  Duration: 1000±12brs  The chip shall be stabilized at norm condition for 2-3 hours before mea  Temperature: +0±5 □  Duration: 1000±12brs  The chip shall be stabilized at norm condition for 2-3 hours before mea  Temperature: +0±5 □  Duration: 1000±12brs  The chip shall be stabilized at norm condition for 2-3 hours before mea  Temperature: +0±5 □  Duration: 1000±12brs  The chip shall be stabilized at norm condition for 2-3 hours before mea		260°C 10±d.3 sec.	Flux for lead free: rosin
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Component Adhesion (Push test)  Component Adhesion (Push test)  Component Adhesion (Push test)  Component Adhesion (Pull test)  Thermal shock  Thermal shock  1. No visible mechanical damage  2. Central Freq. change: within ±6%  Phase Temperature (C) Time(min)  1 +110±5°C 30±3  2 Room Within  1 Room Within  Temperature  3. No disconnection or short circuit.  Resistance to Low Temperature  Resistance to Low Temperature  Resistance to Low Temperature  1. No visible mechanical damage  2. Central Freq. change: within ±6%  Temperature  1. No visible mechanical damage  2. Central Freq. change: within ±6%  Temperature  1. No visible mechanical damage  2. Central Freq. change: within ±6%  Temperature: +110±5°C  Duration: 1000±12hrs  The chip shall be stabilized at norm condition for 2-3 hours before mea  Temperature: +10±5°C  Duration: 1000±12hrs  The chip shall be stabilized at norm condition for 2-3 hours before mea  Temperature: +10±5°C  Duration: 1000±12hrs  The chip shall be stabilized at norm condition for 2-3 hours before mea  Temperature: +10±5°C  Duration: 1000±12hrs  The chip shall be stabilized at norm condition for 2-3 hours before mea  Temperature: +10±5°C  Duration: 1000±12hrs  The chip shall be stabilized at norm condition for 2-3 hours before mea		150 (	
Adhesion (Push test)    Adhesion (Push test)		60sec	
Adhesion (Push test)    Adhesion (Push test)			
Adhesion (Push test)    Adhesion (Push test)	Component	1 No visible mechanical damage	The day ce should be reflow soldered (230)
(Push test)    Push test		1. 140 Visible incontaineal damage	
Thermal shock  Therm			1
Component. The device must with-3 0.5 Kg without failure of the terminal attached to component.  Insert 10cm wire into the remaining eye bend, the ends of even wire let upward and wind together. Terminal shall not be remarkably damaged.  1. No visible mechanical damage 2. Central Freq. change :within ±6%  Phase Temperature(C) Time(min) 1 +110±5°C 30±3 2 Room Within Temperature 3sec 3 -40±2°C 30±3 4 Room Within Temperature 3sec  Resistance to High Temperature  Resistance to Low Temperature  Resistance to Low Temperature  Resistance to Low Temperature  Resistance to Low Temperature  1. No visible mechanical damage 2. Central Freq. change :within ±6% 3. No disconnection or short circuit.  Temperature  Temperature: +110±5°C Duration: 1000±12hrs The chip shall be stabilized at norm condition for 2~3 hours before mean condition for 2~3 hours before mea	,	<b>~</b> ¹	
Thermal shock  The short shours before mean within ±6%  The short shours before mean within ±6%  The short shours before mean short short short shours before mean short short shours before mean short short short shours before mean short sh			component. The device must with-ST-F
Component Adhesion (Pull test)   1. No visible mechanical damage   Insert 10cm wire into the remaining eye bend ,the ends of even wire let upward and wind together. Terminal shall not be remarkably damaged.   1. No visible mechanical damage   2. Central Freq. change :within ±6%   Phase   Temperature(℃)   Time(min)   1			0.5 Kg without failure of the termination
Adhesion (Pull test)  Thermal shock  Thermal shock  1. No visible mechanical damage 2. Central Freq. change :within ±6%  Phase Temperature(°C) Time(min) 1 +110±5°C 30±3 2 Room Within 2 Room Within 3 remperature 3sec 3 -40±2°C 30±3 4 Room Within 1 Femperature 3sec 3 No disconnection or short circuit.  Temperature: +110±5°C Duration: 1000±12hrs The chip shall be stabilized at norm condition for 2~3 hours before mea  Temperature: -40±5°C Duration: 1000±12hrs The chip shall be stabilized at norm condition for 2~3 hours before mea  Temperature: -40±5°C Duration: 1000±12hrs The chip shall be stabilized at norm condition for 2~3 hours before mea  Temperature: -40±5°C Duration: 1000±12hrs The chip shall be stabilized at norm condition for 2~3 hours before mea  Temperature: -40±5°C Duration: 1000±12hrs The chip shall be stabilized at norm condition for 2~3 hours before mea  Temperature: -40±5°C Duration: 1000±12hrs The chip shall be stabilized at norm condition for 2~3 hours before mea		X \'	
(Pull test)  Thermal shock  Thermal shock  1. No visible mechanical damage 2. Central Freq. change :within ±6%  Phase Temperature(°C) Time(min) 1 +110±5°C 30±3 2 Room Within 3sec  Resistance to High Temperature 3. No disconnection or short circuit.  Resistance to Low Temperature  Resistance to Low Temperature  Resistance to Low Temperature  Resistance to Low Temperature  1. No visible mechanical damage 2. Central Freq. change :within ±6% 3. No disconnection or short circuit.  Temperature  1. No visible mechanical damage 2. Central Freq. change :within ±6% 3. No disconnection or short circuit.  Temperature: 40±5°C Duration: 1000±12hrs The chip shall be stabilized at norm condition for 2~3 hours before mea  Temperature: 40±5°C Duration: 1000±12hrs The chip shall be stabilized at norm condition for 2~3 hours before mea  Temperature: 40±5°C Duration: 1000±12hrs The chip shall be stabilized at norm condition for 2~3 hours before mea  Temperature: 40±5°C Duration: 1000±12hrs The chip shall be stabilized at norm condition for 2~3 hours before mea	Component	1. No visible mechanical damage	Insert 10cm wire into the remaining open
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Thermal shock   1. No visible mechanical damage   2. Central Freq. change :within ±6%   Phase   Temperature(°C)   Time(min)   1	(Pull test)	<b>%</b> >	upward and wind together.
Thermal shock  1. No visible mechanical damage 2. Central Freq. change :within ±6%  Phase Temperature(°C) Time(min) 1 +110±5°C 30±3 2 Room Within Temperature 3sec 3 -40±2°C 30±3 4 Room Within Temperature 3sec  1. No visible mechanical damage 2. Central Freq. change :within ±6%  Phase Temperature 3sec  3 -40±2°C 30±3 4 Room Within Temperature 3sec  1. No visible mechanical damage 2. Central Freq. change :within ±6% 3. No disconnection or short circuit.  Resistance to Low Temperature  1. No visible mechanical damage 2. Central Freq. change :within ±6% 3. No disconnection or short circuit.  Temperature  1. No visible mechanical damage 2. Central Freq. change :within ±6% 3. No disconnection or short circuit.  Temperature: -40±5°C Duration: 1000±12hrs The chip shall be stabilized at norm condition for 2~3 hours before mea  Temperature: -40±5°C Duration: 1000±12hrs The chip shall be stabilized at norm condition for 2~3 hours before mea  Temperature: -40±5°C Duration: 1000±12hrs The chip shall be stabilized at norm condition for 2~3 hours before mea		Ž, N	Terminal shall not be remarkably
2. Central Freq. change :within ±6%  Phase Temperature(°C) Time(min)  1 +110±5°C 30±3  2 Room Within Temperature 3sec  3 -40±2°C 30±3  4 Room Within Temperature 3sec  1. No visible mechanical damage 2. Central Freq. change :within ±6%  Temperature  Resistance to High Temperature  Resistance to Low Temperature  1. No visible mechanical damage 2. Central Freq. change :within ±6% 3. No disconnection or short circuit.  Resistance to Low Temperature  1. No visible mechanical damage 2. Central Freq. change :within ±6% 3. No disconnection or short circuit.  Temperature: 40±5°C Duration: 1000±12hrs The chip shall be stabilized at norm condition for 2~3 hours before mea  Temperature:-40±5°C Duration: 1000±12hrs The chip shall be stabilized at norm condition for 2~3 hours before mea  Temperature:-40±5°C Duration: 1000±12hrs The chip shall be stabilized at norm condition for 2~3 hours before mea  Temperature:-40±5°C Duration: 1000±12hrs The chip shall be stabilized at norm condition for 2~3 hours before mea		~~~	
2. Central Freq. change :within ±6%  Phase Temperature(℃) Time(min)  1 +110±5℃ 30±3 2 Room Within 3sec  3 -40±2℃ 30±3 4 Room Within 3sec  1. No visible mechanical damage 2. Central Freq. change :within ±6%  Temperature  Resistance to High 2. Central Freq. change :within ±6%  Temperature  Resistance to Low Temperature  Resistance to Low Temperature  1. No visible mechanical damage 2. Central Freq. change :within ±6% 3. No disconnection or short circuit.  Temperature  1. No visible mechanical damage 2. Central Freq. change :within ±6% 3. No disconnection or short circuit.  Temperature: -40±5℃ Duration: 1000±12brs The chip shall be stabilized at norm condition for 2~3 hours before mea  Temperature: -40±5℃ Duration: 1000±12brs The chip shall be stabilized at norm condition for 2~3 hours before mea  Temperature: -40±5℃ Duration: 1000±12brs The chip shall be stabilized at norm condition for 2~3 hours before mea	Thermal shock	No visible mechanical damage	
Phase Temperature(℃) Time(min)  1		2 Central Freq. change within +6%	-40°C=>30±3min
Resistance to High Temperature  Resistance to High Temperature  Resistance to Hogh Temperature  1. No visible mechanical damage 2. Central Freq. change :within ±6% 3. No disconnection or short circuit.  Resistance to Low Temperature  1. No visible mechanical damage 2. Central Freq. change :within ±6% 3. No disconnection or short circuit.  Resistance to Low Temperature  1. No visible mechanical damage 2. Central Freq. change :within ±6% 3. No disconnection or short circuit.  1. No visible mechanical damage 2. Central Freq. change :within ±6% 3. No disconnection or short circuit.  1. No visible mechanical damage 2. Central Freq. change :within ±6% 3. No disconnection or short circuit.  Temperature: 40±5°C Duration: 1000±12hrs The chip shall be stabilized at norm condition for 2~3 hours before mea			Test cycle:10 cycles
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2. Central Freq. change :within ±6%  Humidity: 90% to 95% RH Duration: 1000+12hrs			
2. Central Freq. change :within ±6%  Humidity: 90% to 95% RH Duration: 1000±12hrs	Humidity	No visible mechanical damage	Temperature: 40±2°C
Duration: 1000+12hrs	-	_	Humidity: 90% to 95% RH
3. No disconnection or short circuit.  The chip shall be stabilized at norm		3. No disconnection or short circuit.	The chip shall be stabilized at normal
			condition for 2~3 hours before measuring.



#### 5. Soldering and Mounting

Mildly activated rosin fluxes are preferred. The minimum amount of solder can lead to damage from the stresses caused by the difference in coefficients of expansion between solder, chip and substrate. The terminations are suitable for all wave and re-flow soldering systems. If hand soldering cannot be avoided, the preferred technique is the utilization of hot air soldering tools.





Recommended temperature profiles for re-flow soldering in Figure 1.

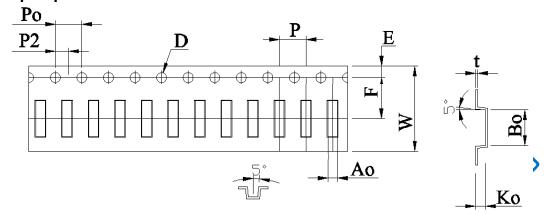
Products attachment with a soldering iron is discouraged due to the inherent process control limitations. In the event that a soldering iron must be employed the following precautions are recommended.

- Preheat circuit and products to 150°C
- Never contact the ceramic with the iron tip
- Use a 20 watt soldering iron with tip diameter of 1.0mm
- 280°C tip temperature (max)
- 1.0mm tip diameter (max)
- Limit soldering time to 3 sec.



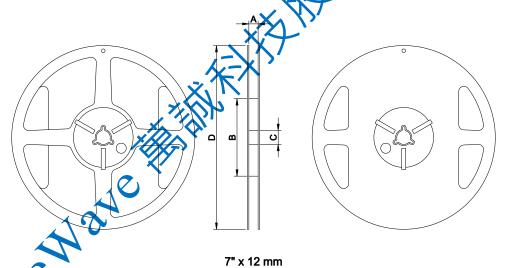
# **6.Packaging Information**

# **♦** Tape Specification:



W	Ao	Во	Ко	Р	F			D1		P2	t
12.0	1.30	5.50	1.50	4.00	5.50	1.75	1.50	0.50	4.00	2.00	0.25
±0.30	±0.10	±0.10	±0.10	±0.10	±0.05	±0.10	±0.10	±0.10	±0.10	±0.10	±0.05

♦ Reel Specification: (7", Φ180 mm)



Tape Width(mm)	A(mm)	B(mm)	C(mm)	D(mm)	Chip/Reel(pcs)
12	12±1.0	60±2	13.5±0.5	178±2	3000



#### 7. Storage and Transportation Information

#### **Storage Conditions**

To maintain the solderability of terminal electrodes:

- 1. Temperature and humidity conditions: -10~ 40°C and 30~70% RH.
- 2. Recommended products should be used within 6 months from the time of delivery.
- 3. The packaging material should be kept where no chlorine or sulfur exists in the

#### **Transportation Conditions**

- 1. Products should be handled with care to avoid damage or contamination from perspiration and skin oils.
- 2. The use of tweezers or vacuum pick up is strongly recommended for individual components.
- 3. Bulk handling should ensure that abrasion and mechanical shock are minimized.