TITLE

2.4/5GHz WIDE DUAL BAND ANTENNA WITH SIDE SOLDER CABLE

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2.4/5GHz WIDE DUAL BAND ANTENNA WITH SIDE SOLDER CABLE

1.0 SCOPE

This Product Specification covers the mechanical, electrical and environmental performances specification for 2.4/5GHz Wide Dual Band Antenna with side solder cable. Although this document PS-2042810100 is for U.FL compatible connector and 100mm cable, it is applicable to all products under 204281 series.

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAME AND SERIES NUMBER (S)

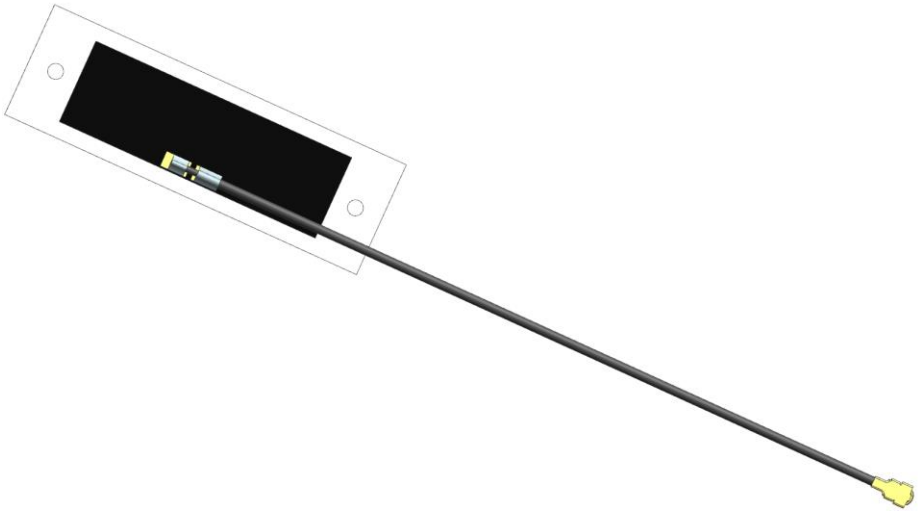
Product name: 2.4/5GHz Wide Dual Band Antenna with side solder cable
Series Number: 204281

2.2 DESCRIPTION

Series 204281 is a balanced, side-fed, dipole-type, high efficiency antenna for 2.4/5 GHz applications, including WiFi, Bluetooth, Zigbee and others. This antenna is made from poly-flexible material with small size 35*11*0.1mm, and has double-sided adhesive tape for easy “peel and stick” mounting. This balanced antenna with ground plane independent design offers various cable length options for ease of integration into various devices.

2.3 FEATURES.

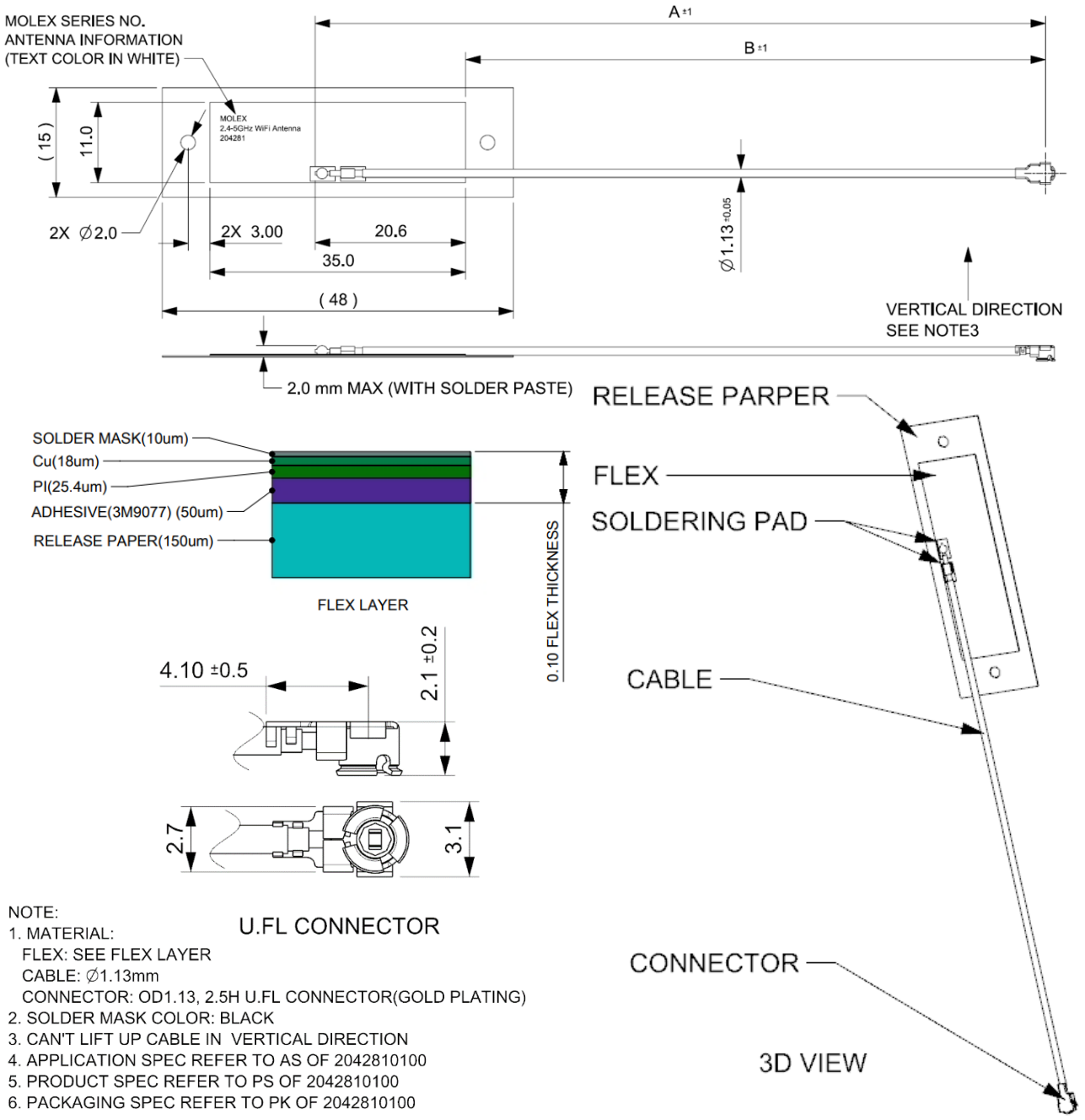
- Ground plane independent, balanced dual band antenna
- 2.4/5GHz, Linear polarization, high efficiency over 65% on all bands (cable 100mm)
- 35x11x0.1mm FPC size
- Two IPEX connector options: MHF4 (2042811***) and U.FL compatible (2042810***)
- Cable OD1.13mm, 6 standard length options (50-300mm)
- Cable and connector can be customized
- RoHS Compliant



Molex 204281XXXX 2.4/5GHz Wide dual band Antenna 3D View

2.4 PRODUCT STRUCTURE INFORMATION

P/N	2042810***



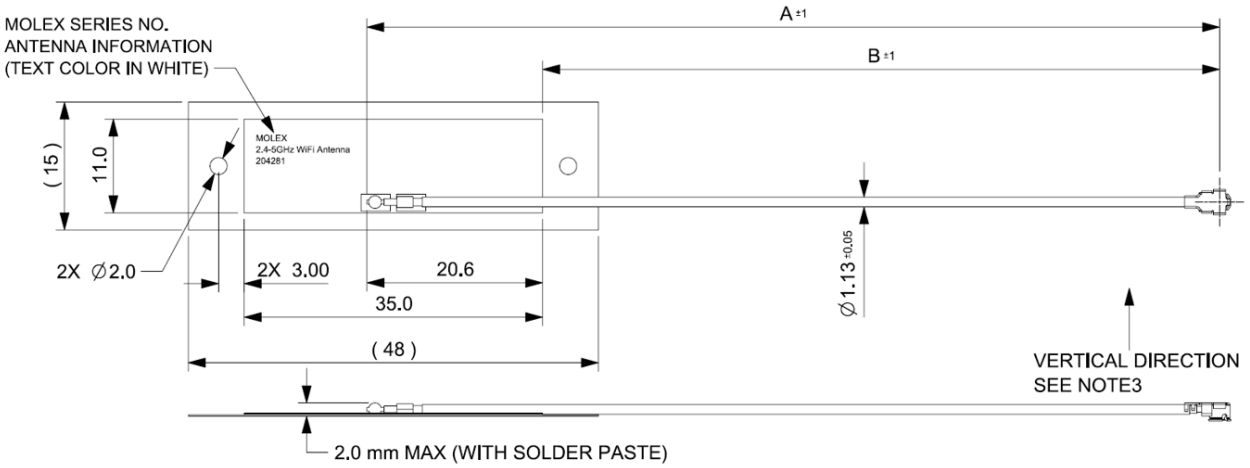
NOTE:
1. MATERIAL:
   FLEX: SEE FLEX LAYER
   CABLE: Ø1.13mm
   CONNECTOR: OD1.13, 2.5H U.FL CONNECTOR(GOLD PLATING)
2. SOLDER MASK COLOR: BLACK
3. CAN'T LIFT UP CABLE IN VERTICAL DIRECTION
4. APPLICATION SPEC REFER TO AS OF 2042810100
5. PRODUCT SPEC REFER TO PS OF 2042810100
6. PACKAGING SPEC REFER TO PK OF 2042810100

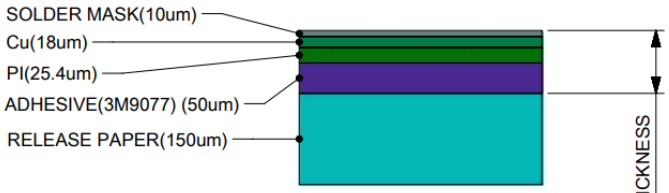
GENERAL TOLERANCE TABEL	
Tolerance Description	Tolerance(mm)
Copper edge to Copper edge	+/-0.05
Copper edge to Polymer edge	+/-0.2
Die cut outline	+/-0.15
Die Cut Hole diameter	+/-0.1
Die cut hole to Die cut outline	+/-0.15
Solder mask opening	+/-0.3

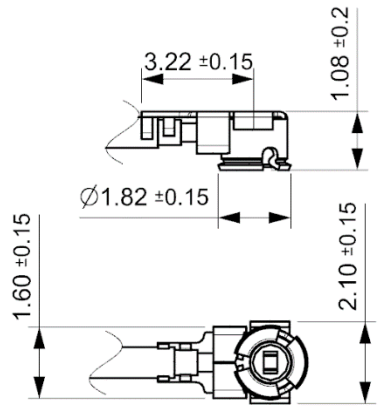
ITEM	MATERIAL NO.	DIM "A"	DIM "B"
1	2042810050	50MM	29.4MM
2	2042810100	100MM	79.4MM
3	2042810150	150MM	129.4MM
4	2042810200	200MM	179.4MM
5	2042810250	250MM	229.4MM
6	2042810300	300MM	279.4MM

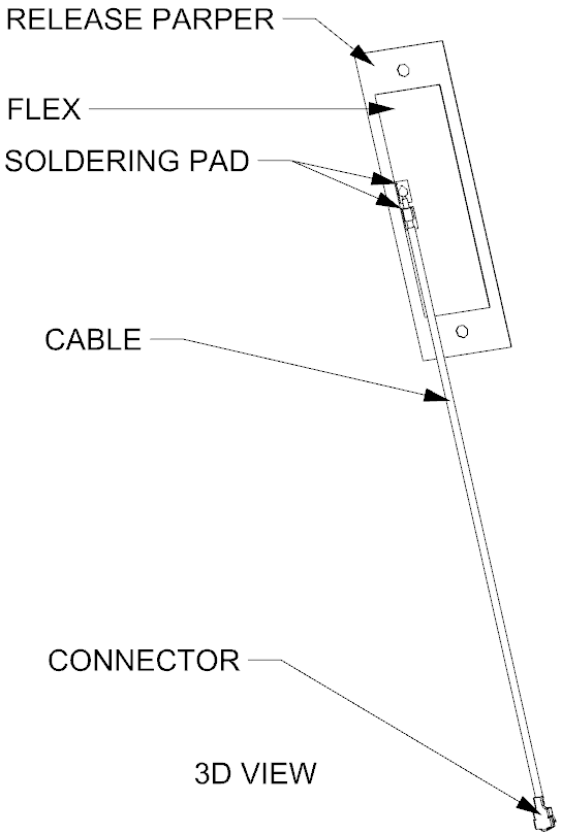
Mechanical Structure Information for 2042810*** (U.FL Connector)

P/N	2042811***









NOTE:
1. MATERIAL:
   FLEX: SEE FLEX LAYER
   CABLE: Ø1.13mm
   CONNECTOR:I-PEX MHF4L PLUG P/N:20565-001R-13
2. SOLDER MASK COLOR: BLACK
3. CAN'T LIFT UP CABLE IN VERTICAL DIRECTION
4. APPLICATION SPEC REFER TO AS OF 2042810100
5. PRODUCT SPEC REFER TO PS OF 2042810100
6. PACKAGING SPEC REFER TO PK OF 2042810100

ITEM	MATERIAL NO.	DIM "A"	DIM "B"
1	2042811050	50mm	29.4m
2	2042811100	100mm	79.4mm
3	2042811150	150mm	129.4mm
4	2042811200	200mm	179.4mm
5	2042811250	250mm	229.4mm
6	2042811300	300mm	279.4mm

GENERAL TOLERANCE TABEL	
Tolerance Description	Tolerance(mm)
Copper edge to Copper edge	+/-0.05
Copper edge to Polymer edge	+/-0.2
Die cut outline	+/-0.15
Die Cut Hole diameter	+/-0.1
Die cut hole to Die cut outline	+/-0.15
Solder mask opening	+/-0.3

Mechanical Structure Information for 2042811*** (MHF4L Connector)

3.0 APPLICABLE DOCUMENTS

Document	Number	Description
Sales Drawing(SD)	SD-2042810100	Mechanical Dimension of the product
	SD-2042811100	
Application Guide(AS)	AS-2042810100	Antenna Application and surrounding
Packing Drawing(PK)	PK-2042810100	Product packaging specifications

4.0 GENERAL SPECIFICATION

Product name	2.4/5GHz Wide Dual Band Antenna with side solder cable
Part number	204281****
Frequency	2.4GHz-2.5GHz
	5.15GHz-5.85GHz
Polarization	Linear
Operating with matching	-30℃ to 85℃
Storage with matching	-40℃ to 95℃
RF Power	2 Watts
Impedance with matching	50 Ohms
Antenna type	Flex
Connector type	U.FL for 2042810***
	IPEX MHF4 for 2042811***
User Implementation type	Adhesive 3M9077
Cable diameter	Ø1.13mm
Cable length	50mm (P/N for 2042810050 and 2042811050)
	100mm (P/N for 2042810100 and 2042811100)
	150mm (P/N for 2042810150 and 2042811150)
	200mm (P/N for 2042810200 and 2042811200)
	250mm (P/N for 2042810250 and 2042811250)
	300mm (P/N for 2042810300 and 2042811300)

5.0 ANTENNA SPECIFICATION

All measurements are done of the antenna mounted on a PC/ABS material block of 1mm thickness with VNA Agilent 5071C and Over-The-Air (OTA) chamber. All measurements in this document are done with the part no.2042810100 and 2042811100 for different cable length.

5.1 ANTENNA PERFORMANCE

5.1.1 ANTENNA PERFORMANCE FOR CABLE LENGTH 50mm		
P/N	2042810050 and 2042811050	
Frequency Range	2.4GHz-2.5GHz	5.15GHz-5.85GHz
Peak Gain(Max)	2.2dBi	3.5dBi
Total efficiency	>68%	>70%
Return Loss	<-10dB	

5.1.2 ANTENNA PERFORMANCE FOR CABLE LENGTH 100mm		
P/N	2042810100 and 2042811100	
Frequency Range	2.4GHz-2.5GHz	5.15GHz-5.85GHz
Peak Gain(Max)	2.0dBi	3.3dBi
Total efficiency	>65%	>68%
Return Loss	<-10dB	

5.1.3 ANTENNA PERFORMANCE FOR CABLE LENGTH 150mm		
P/N	2042810150 and 2042811150	
Frequency Range	2.4GHz-2.5GHz	5.15GHz-5.85GHz
Peak Gain(Max)	1.8dBi	3.0dBi
Total efficiency	>62%	>65%
Return Loss	<-10dB	

5.1.4 ANTENNA PERFORMANCE FOR CABLE LENGTH 200mm		
P/N	2042810200 and 2042811200	
Frequency Range	2.4GHz-2.5GHz	5.15GHz-5.85GHz
Peak Gain(Max)	1.6dBi	2.8dBi
Total efficiency	>59%	>60%
Return Loss	<-10dB	

5.1.5 ANTENNA PERFORMANCE FOR CABLE LENGTH 250mm		
P/N	2042810250 and 2042811250	
Frequency Range	2.4GHz-2.5GHz	5.15GHz-5.85GHz
Peak Gain(Max)	1.5dBi	2.6dBi
Total efficiency	>56%	>55%
Return Loss	<-10dB	

5.1.6 ANTENNA PERFORMANCE FOR CABLE LENGTH 300mm		
P/N	2042810300 and 2042811300	
Frequency Range	2.4GHz-2.5GHz	5.15GHz-5.85GHz
Peak Gain(Max)	1.3dBi	2.3dBi
Total efficiency	>53%	>50%
Return Loss	<-10dB	

Note that the above antenna performance is measured with just the antenna mounted on a PC/ABS block to similar a free-space condition. 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.

5.2 CABLE LOSS

DESCRIPTION	TEST CONDITION	REQUIREMENTS	
Frequency Range	2.4GHz/5GHz	2.0GHz~3.0GHz	5.0GHz~6.0GHz
Attenuation	1m cable measured by VNA5071C	≤3.5dB/m	≤5dB/m

Balance antenna resonance is insensitive to cable's length, but the cable's loss will affect the total efficiency.

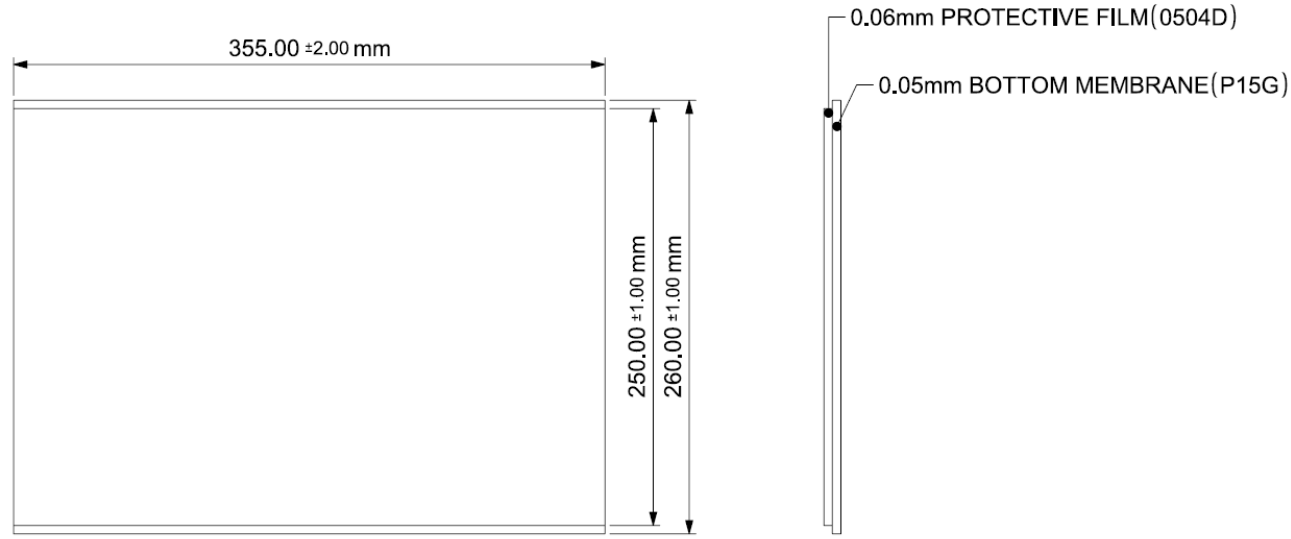
6.0 MECHANICAL SPECIFICATION

DESCRIPTION	SPECIFICATION
Pull Test	1. Test Machine: Max intelligent load tester 2. The flexible antenna attached to the plastic plate, the cable pulled to the axial direction. 3. Pull force >8N
Un-mating force (connector)	1. Mate the receptacle that is soldered onto a PCB and plug at a speed of 25±3mm/minutes. 2. Un-mating force (total): initial 8N Min. after 30 cycles 5N Min. 3. Un-mating force (inner contact): initial 0.15N Min. after 30 cycles 0.1N Min.

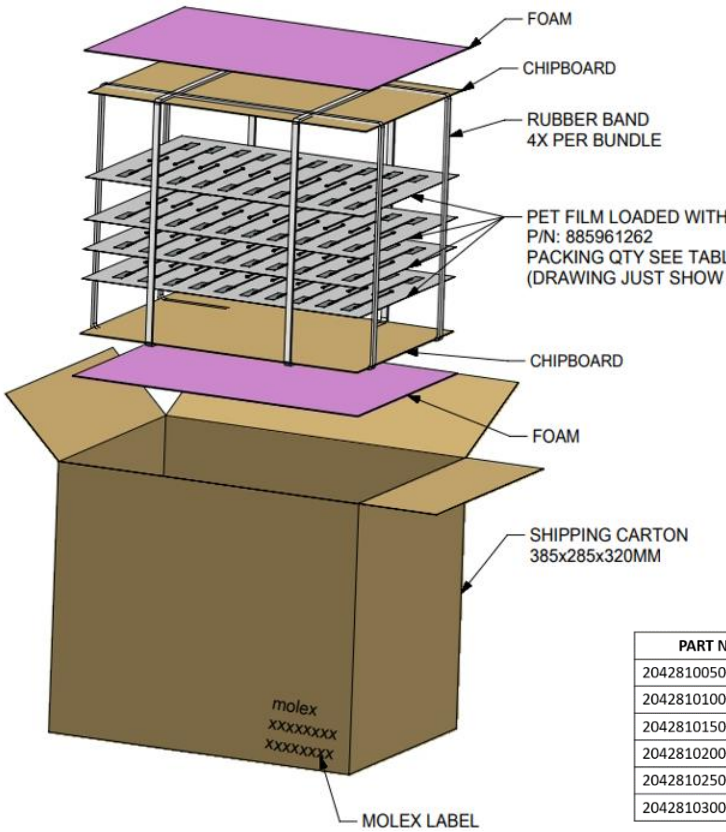
7.0 ENVIRONMENTAL SPECIFICATION

DESCRIPTION	SPECIFICATION
Temperature /Humidity cycling	1.The device under test is kept for 30 mins in an environment with a temperature of -40 ℃. 2. Kept for 4 Hours in an environment with a temperature of 85 degrees and a relative humidity of 95%. 3. Kept for 2 Hours in an environment with a temperature of 125 degrees and a relative humidity of 95%. 4. The cycle is repeated until a total of 40 cycles have been completed. Hereafter the conditions are stabilized at room temperature. 5. Parts meet antenna performance per section 5.0 before and after test. 6. No cosmetic problem（No soldering problem； No adhesion problem of glue.
Temperature Shock	1.The device under test at -40 ℃⇔125 ℃ by 100 cycles, Dwell of 30 mins, transition time between Dwell 30 secs (~ 61 mins / cycle) and each item should be measured after exposing them in normal temperature and humidity for 24 h. 2. Parts meet antenna performance per section 5.0 before and after test. 3. No cosmetic problem（No soldering problem； No adhesion problem of glue）.
High Temperature	1.Temperature:125℃, time:1008 hours 2.There is no substantial obstruction to air flow across and around the samples, and the samples are not touching each other 3. Parts meet antenna performance per section 5.0 before and after test. 4. No cosmetic problem（No soldering problem； No adhesion problem of glue）.
Salt mist test	1. The device under test is exposed to a spray of a 5% (by volume) resolution of NACL in water for 2 hours. Thereafter the device under test is left for 1 week in room temperature at a relative humidity of 95%. The cycle is repeated until a total of 2 cycles have been completed. Here after the conditions are stabilized at room temperature. 2. Parts meet antenna performance per section 5.0 before and after test. 3. No visible corrosion. Discoloration is acceptable.

8.0 PACKING



PET FILM
P/N:885961262



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 PACKAGING SPECIFICATION TO BE USED FOR "2.4/5GHZ WIFI DUAL BAND ANTENNA"
5. WHEN TAKING PRODUCT FROM PET FILM, PLEASE REMOVE THE COVER TAPE FIRST, THEN PICK UP THE PART FROM FLEX NOT THE CABLE, TO AVOID SOLDER JOINT DAMAGE.

PART NUMBER	PCS/FILM	FILMS/BUNDLE	BUNDLES/CARTON	PCS/CARTON
2042810050/2042811050	30	40	4	4800PCS
2042810100/2042811100	20	40	5	4000PCS
2042810150/2042811150	12	40	5	2400PCS
2042810200/2042811200	12	40	5	2400PCS
2042810250/2042811250	6	40	5	1200PCS
2042810300/2042811300	6	40	5	1200PCS

Packaging information for 2042810XXX and 2042811XX