PRODUCT SPECIFICATION

TITLE

2.4/5GHz Balance Flex Antenna

TABLE OF CONTENTS

Manufacturer:

Molex Corporate Headquarters (USA)
Molex LLC
2222 Wellington Court
Lisle, IL 60532
United States
Phone: +1 (800) 78-MOLEX
Other Major Locations:
Europe, Middle East, Africa (EMEA)
Molex Netherlands BV
Krijn Taconiskade 414
1087 HW Amsterdam
The Netherlands
MOLEX : 1461530100

We,Control Technology China Co., LTD , states that All measurements were performed radiated and therefore additional antenna gain documentation is not required.

2.4/5GHz Balance Flex Antenna

1.0 SCOPE

This Product Specification covers the mechanical, electrical and environmental performances requirements and test methods for 2.4/5GHz balance flex antenna.

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAME AND SERIES NUMBER (S)

Product name: 2.4/5 GHz Balance Flex Antenna 1461530100

2.2 Design and Construction

Antenna shall be of the design, construction and physical dimensions specified on the applicable sales drawing.

2.3 Materials

a) Flex: Refer to respective Molex sales or engineering drawings
b) Plating: Refer to respective Molex sales or engineering drawings
c) Cable Line: Refer to respective Molex sales or engineering drawings
d) Connector: OD1.13MM RF 2.5H plug connector. Please contact sales if you need to use other connector.

3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

See drawings and other sections of this specification for the relevant reference documents. In cases where the specification differs from the drawings, the drawings take precedence.

4.0 RATINGS

4.1 RF POWER

2 WATTS

4.2 TEMPERATURE

Operating: - 30°C to + 85°C
Storage : - 40°C to + 95°C

4.3 HUMIDITY

Operating : -30℃to+85℃
-30℃to+50℃, 85%RH or less
+50℃to+85℃, 60%RH or less

Storage : -40℃to+95℃
-40℃to+50℃, 85%RH or less
+50℃to+95℃, 60%RH or less

5.0 PERFORMANCE

5.1 ELECTRICAL REQUIREMENTS FOR CABLE LENGTH 50mm (1461530050)

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENTS	
5.1.1	Frequency Range	2.4GHz~5.85GHz	2.4GHz~2.5GHz	5.15GHz~5.85GHz
5.1.2	Return Loss	Antenna loaded on PC/ABS housing with 100mm long, 1.13mm diameter micro coaxial cable. Measured by VNA5071C	< -10 dB	
5.1.3	Peak Gain	Measure antenna on recommended PC/ABS housing through OTA chamber	3.2 dBi	4.75 dBi
5.1.4	Total Efficiency	Measure antenna on recommended PC/ABS housing through OTA chamber	>78%	>75%
5.1.5	Polarization	Measure antenna through the OTA chamber	Linear	
5.1.6	Input Impedance	Measure antenna on recommended PC/ABS housing through VNA E5071C	50 Ohms	

5.2 ELECTRICAL REQUIREMENTS FOR CABLE LENGTH 100mm (1461530100)

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	
5.2.1	Frequency Range	2.4GHz~5.85GHz	2.4GHz~2.5GHz	5.15GHz~5.85GHz
5.2.2	Return Loss	Antenna loaded on PC/ABS housing with 100mm long, 1.13mm diameter micro coaxial cable. Measured by VNA5071C	< -10 dB	
5.2.3	Peak Gain	Measure antenna on recommended PC/ABS housing through OTA chamber	3.0 dBi	4.5 dBi
5.2.4	Total Efficiency	Measure antenna on recommended PC/ABS housing through OTA chamber	>75%	>70%
5.2.5	Polarization	Measure antenna through the OTA chamber	Linear	
5.2.6	Input Impedance	Measure antenna on recommended PC/ABS housing through VNA E5071C	50 Ohms	

5.3 ELECTRICAL REQUIREMENTS FOR CABLE LENGTH 150mm (1461530150)

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	
5.3.1	Frequency Range	2.4GHz~5.85GHz	2.4GHz~2.5GHz	5.15GHz~5.85GHz

5.3.2	Return Loss	Antenna loaded on PC/ABS housing with 100mm long, 1.13mm diameter micro coaxial cable. Measured by VNA5071C	< -10 dB	
5.3.3	Peak Gain	Measure antenna on recommended PC/ABS housing through OTA chamber	2.8 dBi	4.2 dBi
5.3.4	Total Efficiency	Measure antenna on recommended PC/ABS housing through OTA chamber	>72%	>66%
5.3.5	Polarization	Measure antenna through the OTA chamber	Linear	
5.3.6	Input Impedance	Measure antenna on recommended PC/ABS housing through VNA E5071C	50 Ohms	

5.4 ELECTRICAL REQUIREMENTS FOR CABLE LENGTH 200mm (1461530200)

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	
5.4.1	Frequency Range	2.4GHz~5.85GHz	2.4GHz~2.5GHz	5.15GHz~5.85GHz
5.4.2	Return Loss	Antenna loaded on PC/ABS housing with 100mm long, 1.13mm diameter micro coaxial cable. Measured by VNA5071C	< -10 dB	
5.4.3	Peak Gain	Measure antenna on recommended PC/ABS housing through OTA chamber	2.6 dBi	4.0 dBi
5.4.4	Total Efficiency	Measure antenna on recommended PC/ABS housing through OTA chamber	>69%	>62%
5.4.5	Polarization	Measure antenna through the OTA chamber	Linear	
5.4.6	Input Impedance	Measure antenna on recommended PC/ABS housing through VNA E5071C	50 Ohms	

5.5 ELECTRICAL REQUIREMENTS FOR CABLE LENGTH 250mm (1461530250)

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	
5.5.1	Frequency Range	2.4GHz~5.85GHz	2.4GHz~2.5GHz	5.15GHz~5.85GHz
5.5.2	Return Loss	Antenna loaded on PC/ABS housing with 100mm long, 1.13mm diameter micro coaxial cable. Measured by VNA5071C	< -10 dB	
5.5.3	Peak Gain	Measure antenna on recommended PC/ABS housing through OTA chamber	2.4 dBi	3.7 dBi

5.5.4	Total Efficiency	Measure antenna on recommended PC/ABS housing through OTA chamber	>66%	>58%
5.5.5	Polarization	Measure antenna through the OTA chamber	Linear	
5.5.6	Input Impedance	Measure antenna on recommended PC/ABS housing through VNA E5071C	50 Ohms	

5.6 ELECTRICAL REQUIREMENTS FOR CABLE LENGTH 300mm (1461530300)

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	
5.6.1	Frequency Range	2.4GHz~5.85GHz	2.4GHz~2.5GHz	5.15GHz~5.85GHz
5.6.2	Return Loss	Antenna loaded on PC/ABS housing with 100mm long, 1.13mm diameter micro coaxial cable. Measured by VNA5071C	< -10 dB	
5.6.3	Peak Gain	Measure antenna on recommended PC/ABS housing through OTA chamber	2.2 dBi	3.3 dBi
5.6.4	Total Efficiency	Measure antenna on recommended PC/ABS housing through OTA chamber	>63%	>55%
5.6.5	Polarization	Measure antenna through the OTA chamber	Linear	
5.6.6	Input Impedance	Measure antenna on recommended PC/ABS housing through VNA E5071C	50 Ohms	

5.7 CABLE LOSS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENTS	
5.7.1	Frequency Range	2GHz~6GHz	2GHz~3GHz	5GHz~6GHz
5.7.2	Attenuation	1m cable measured by VNA5071C	≤3.5dB/m	≤5dB/m

5.8 CABLE LENGTH AFFECT THE ANTENNA PERFORMANCE

Balance antenna resonance is insensitive by cable's length, but the cable's loss will affect the total efficiency. Refer to 5.7

5.9 MECHANICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
5.9.1	Pull test	Test machine :Max intelligent load tester Stick the Flex antenna in a PC block, pull cable in horizontal direction	Pull force <18N

5.10 RELIABILITY REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
5.10.1	Cross section	Cross section on pad soldering area. Check under microscope	No soldering problem

5.11 ENVIRONMENTAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
5.11.1	Temperature /Humidity cycling	Test condition: 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.	1) Parts should meet RF spec before and after test. 2） No cosmetic problem
5.11.2	Temperature Shock	Test condition: 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.	1) Parts should meet RF spec before and after test. 2） No cosmetic problem
5.11.3	High Temperature	Test condition: 1) Temperature:125℃, time:1008hours 2) There is no substantial obstruction to air flow across and around the samples, and the samples are not touching each other	1) Parts should meet RF spec before and after test. 2) No cosmetic problem

5.11.4	Salt mist test	1.Test condition: 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.	1) Parts should meet RF spec before and after test. 2) No visible corrosion. Discoloration accept.

The meaning of text "**No Cosmetic Problem"** in the table above is:

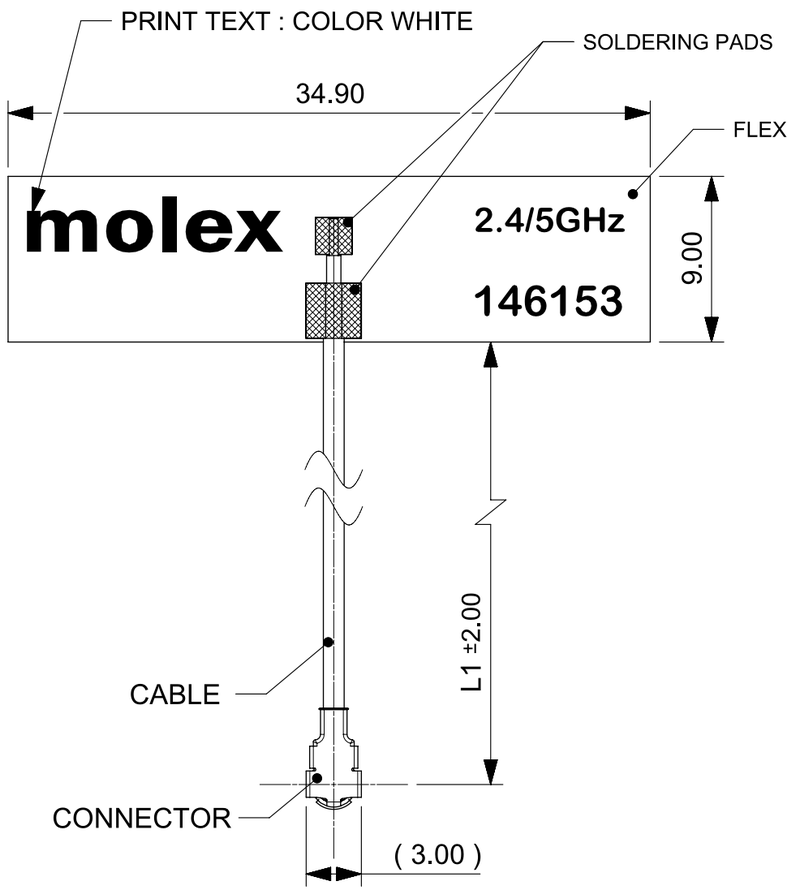
a. no soldering problem
b. no adhesion problem of glue
c. no peel off of plating
d. Cable & connector assembly orientation rotates 20°Max

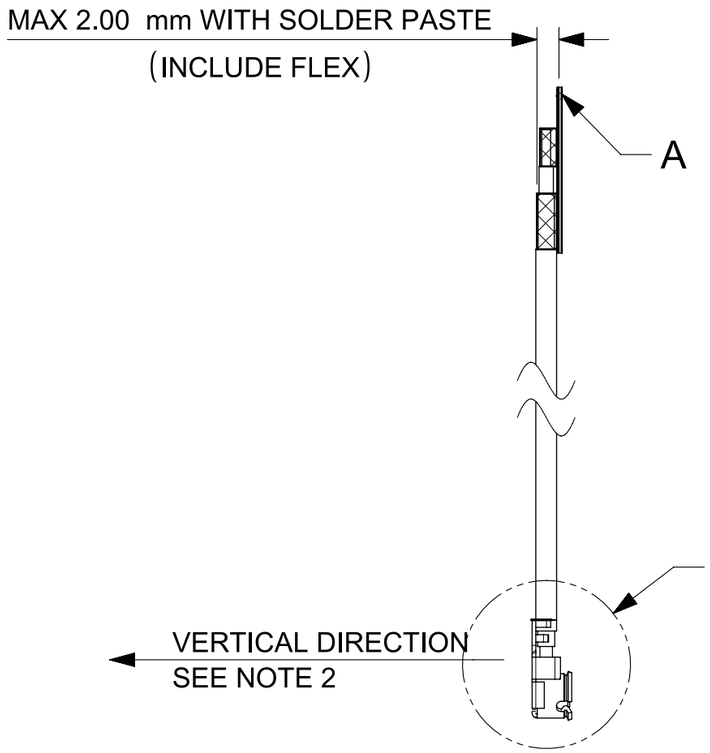
6.0 TEST GROUPINGS

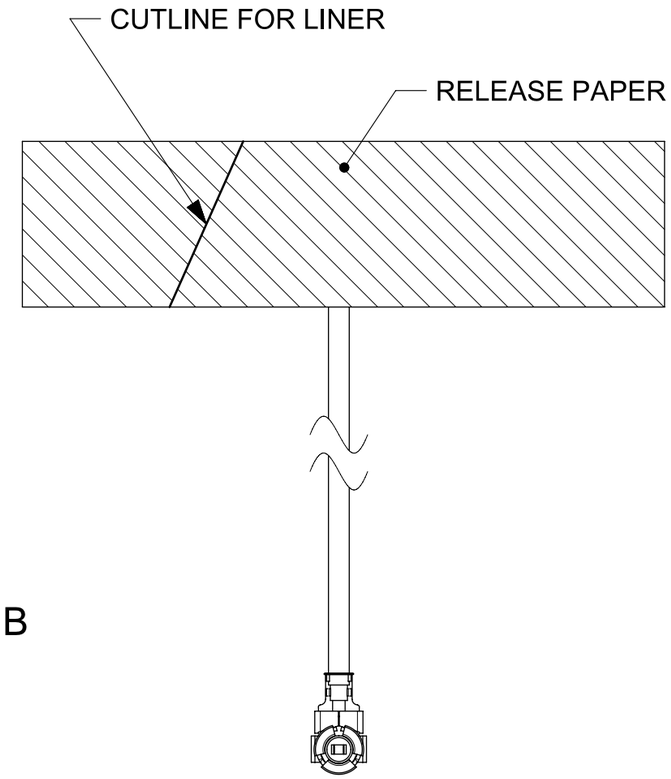
Test Item	Description	Group1	Group2	Group3	Group4	Group5	Group6
5.9.1	Pull test	X					
5.10.1	Cross section		X				
5.11.1	Temperature /Humidity cycling			X			
5.11.2	Temperature Shock				X		
5.11.3	High Temperature					X	
5.11.4	Salt mist test						X
	Sample Quantity	5	5	5	5	5	5

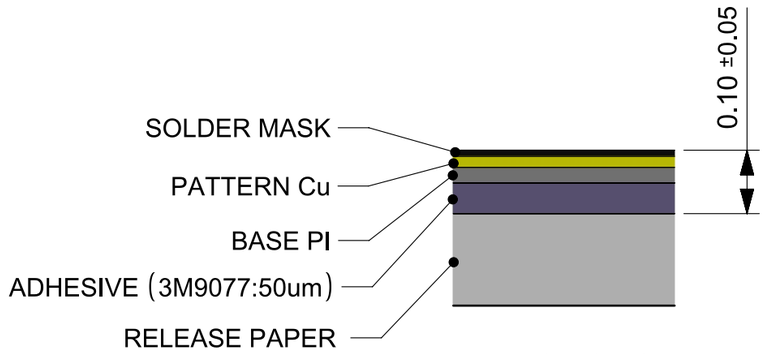
7.0 PACKAGING

Refer to the Molex related packaging drawings.

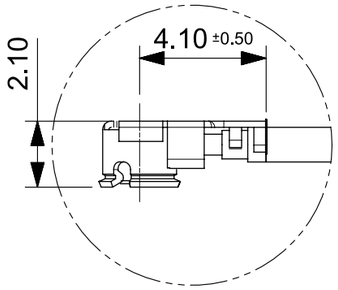








FLEX LAYER



CONNCETOR

ITEM	MATERIAL NO.	CABLE LENGTH"L1"
1	1461530050	43.3 mm
2	1461530100	93.3 mm
3	1461530150	143.3 mm
4	1461530200	193.3 mm
5	1461530250	243.3 mm
6	1461530300	293.3 mm

NOTES:
1. MATERIAL:
   FLEX SIZE: 34.9*9mm
   CABLE:∅1.13 mm
   CONNECTOR:OD1.13 RF 2.5H U.FL CONNECTOR-PLUG GOLD PLATED
   (IPEX MHF-I COMPATIBLE)
2. FOR PULL TEST, CAN NOT LIFT UP IN THE VERTICAL DIRECTION.
3. SOLDER MASK:BLACK.
4. THE CONNECTOR WILL BE PROTECTED WITH A CAP.

SYMBOLS	
F = 0	
E = 0	
B = 0	
S = 0	
▼ = 0	
C = 0	
☒ = 0	
■ = 0	
▽ = 0	

DIMENSION UNITS	SCALE
mm	3:1

GENERAL TOLERANCES (UNLESS SPECIFIED)		
ANGULAR TOL	±	1/2 °
4 PLACES	±	
3 PLACES	±	0.2
2 PLACES	±	0.25
1 PLACE	±	0.3
0 PLACES	±	0.5

DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS

CURRENT REV DESC: EC DESCRIPTION

EC NO: 615969
DRWN: KCHENG 2019/04/22
CHK'D: CZHOU 2019/04/22
APPR: XJSONG 2019/04/22

INITIAL REVISION:
DRWN: KCHENG 2019/04/22
APPR: XJSONG 2019/04/22

THIRD ANGLE PROJECTION	DRAWING	SERIES
	A3-SIZE	146153

molex

2.4/5GHz BALANCE FLEX ANTENNA

PRODUCT DESIGN DRAWING

DOCUMENT NUMBER	DOC TYPE	DOC PART	REVISION
1461530050	PSD	SD	D1

MATERIAL NUMBER	CUSTOMER	SHEET NUMBER
SEE TABLE	GENERAL MARKET	1 OF 1

DOCUMENT STATUS		RELEASE DATE	

FORMAT: master-sheet-ckdA3
REVISION: H
DATE: 2018/01/16