TITLE

FULL LTE SMT ANTENNA

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FULL LTE SMT ANTENNA

1.0 SCOPE

This Product Specification covers the mechanical, electrical and environmental performances Specification and test methods for full LTE SMT Antenna.

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAME AND SERIES NUMBER (S)

Product name: Full LTE SMT ANTENNA

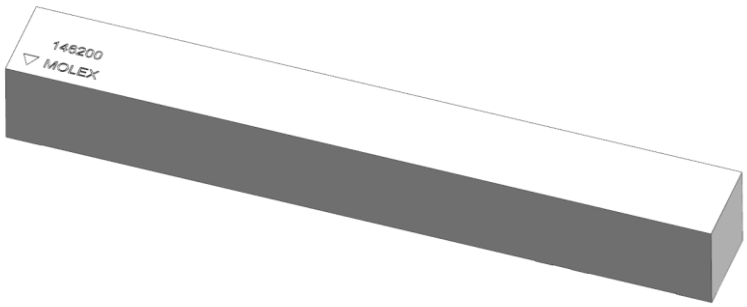
Series Number: 146200

2.2 DESCRIPTION

This is a SMT wide band high performance antenna implemented using ceramic with recommendation to meet the customer needs. It is designed to cover the various frequency bands from 698MHz~2.7GHz.

2.3 FEATURES

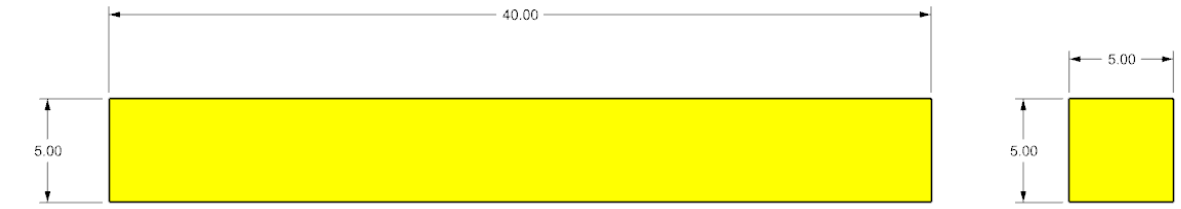
- Working frequency 698-960MHz, 1710-2700MHz
- High efficiency over 40% on all bands
- SMT embedded LTE 2*2 MIMO system application
- Antenna size 40mmx5mmx5mm, PCB keep-out area 60x12mm
- RoHS Compliant



ANTENNA 3D VIEW

2.4 PRODUCT STRUCTURE INFORMATION

P/N	146200 Series



MATERIAL:CERAMIC

3.0 APPLICABLE DOCUMENTS

Document	Number	Description
Sale Drawing (SD)	SD-1462000001	Mechanical Dimension of the product
Application Guide (AS)	AS-1462000001	Antenna Application and surrounding
Packing Drawing (PK)	PK-1462000001	Product packaging specifications

*If you plan to re-use the products that be taken out from packaging. Suggest to repacked them within 48 hours by re-seal to prevent oxidation!

4.0 GENERAL SPECIFICATION

Product name	Full LTE SMT Antenna			
Part number	1462000001		1462000011	
Frequency Range	698-960 MHz	1.7-2.7 GHz	698-960 MHz	1.7-2.7 GHz
Return Loss	<-4 dB	<-5 dB	<-5 dB	< -5 dB
Peak Gain	0.2 dBi	3.8 dBi	0.5 dBi	3.7 dBi
Avg. Total Efficiency	>40%	>60%	>45%	>60%
Polarization	Linear			
Impedance with matching	50 Ohms			
Operating with matching	-40℃ to 125℃			
Storage with matching	-40℃ to 125℃			
RF Power	2 Watts			
Antenna type	ceramic			

Note that the above antenna performance is measured under stand-alone 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 assistance to choose the best location and best tuning in order for you to meet this peak gain requirement.

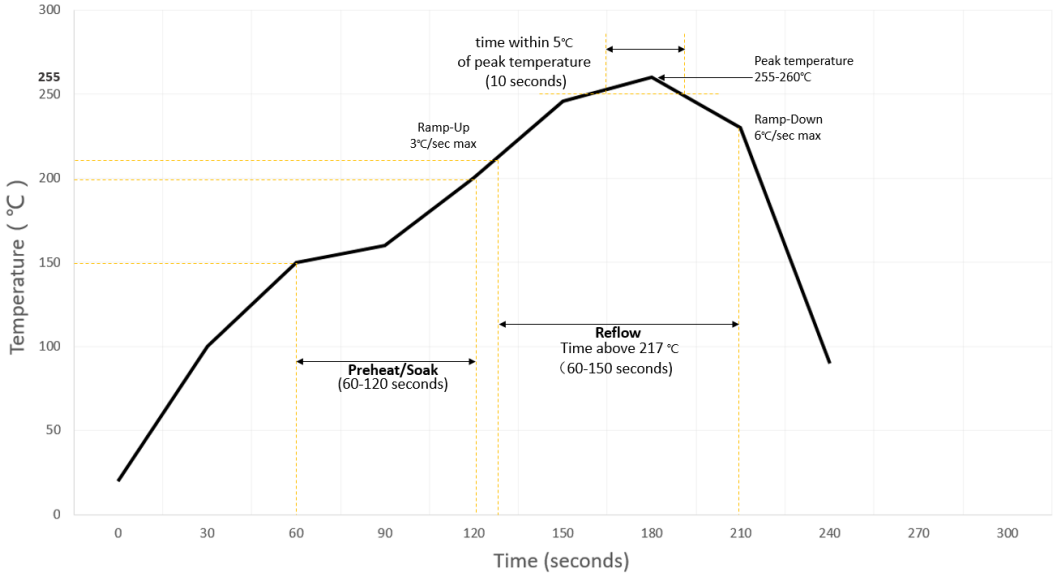
5.0 MECHANICAL REQUIREMENTS

DESCRIPTION	SPECIFICATION
Shear Force	Apply three axial peeling force on parts soldered on the PCB at the speed rate of 25±3 mm/minute. Shear force: 50N Min.
Solder-Ability Test	Dip solder pad in flux then immerse in solder bath at 245+/-50℃ for 4~5seconds,95% of immersed area mush show no voids

6.0 ENVIRONMENTAL SPECIFICATION

DESCRIPTION	SPECIFICATION
Humidity Test	1. Temperature:25℃ humidity:95%，time:12h. Temperature:55℃ humidity:95%，time:12h. The cycle is repeated until a total of 6 cycles have been completed. 2. Parts should meet RF spec before and after test. 3. No cosmetic problem (No bubble issue、No plating peeling off issue、 No mechanical damage.)
Temperature Cycling Test	1. a. The time of conversion to -40 ℃ is less than max 5 minutes and holding time 30 minutes. b. Conversion time to 125℃ is less than max 5 minutes, and holding time 30 minutes. c. 72 cycles. 2. Parts should meet RF spec before and after test. 3. No cosmetic problem (No bubble issue、No plating peeling off issue、 No mechanical damage.)
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 should meet RF spec before and after test. 4. No cosmetic problem (No bubble issue、No plating peeling off issue、 No mechanical damage.)
Salt Mist Test	1. NaCl:5%±1%;Temperature:35℃±2℃;Spray time:48h. 2. Parts should meet RF spec before and after test. 3. No visible corrosion. 4. Discoloration acceptable.

7.0 RECOMMENDED REFLOW CONDITION



Recommended IR reflow times：1 time.

Recommended solder paste: ALPHA CAP-390 SAC305(Ag%≥3%)

For mechanically challenging applications Molex recommends using surface mount adhesive (e.g. Loctite 3611) before reflow soldering process, to ensure increased mechanical retention on the PCB. (Figure 7.1)

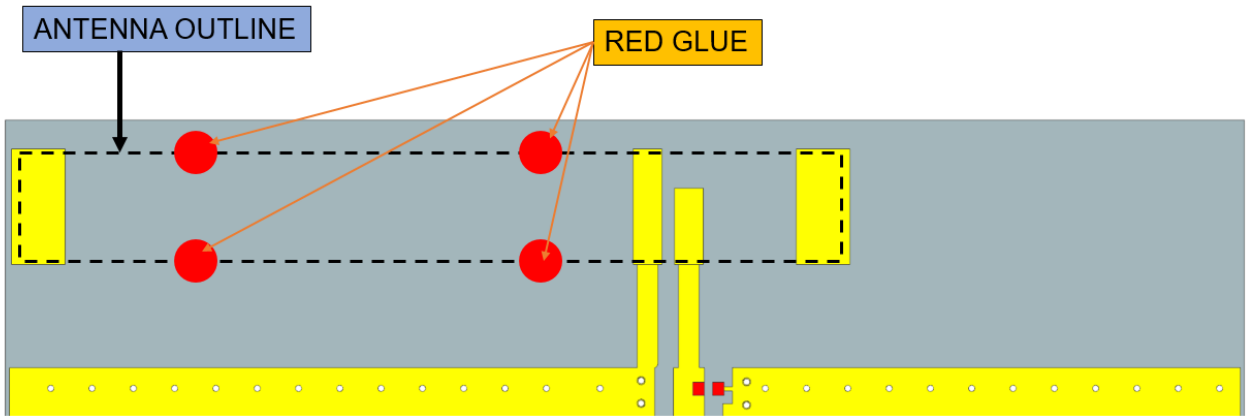
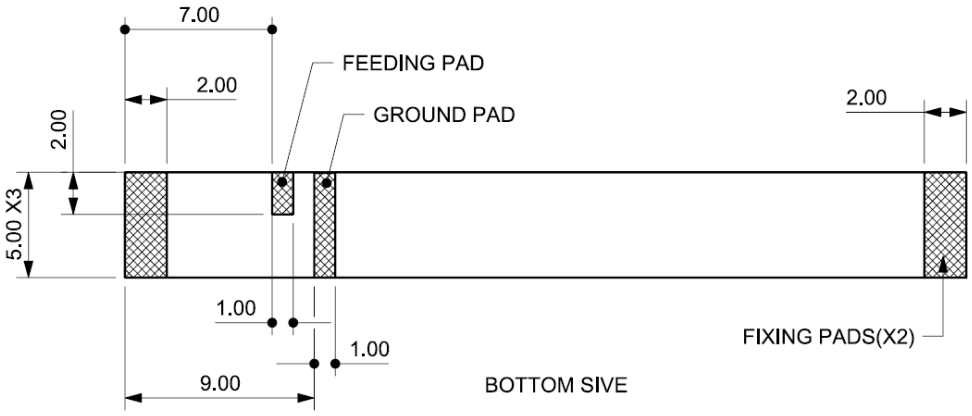
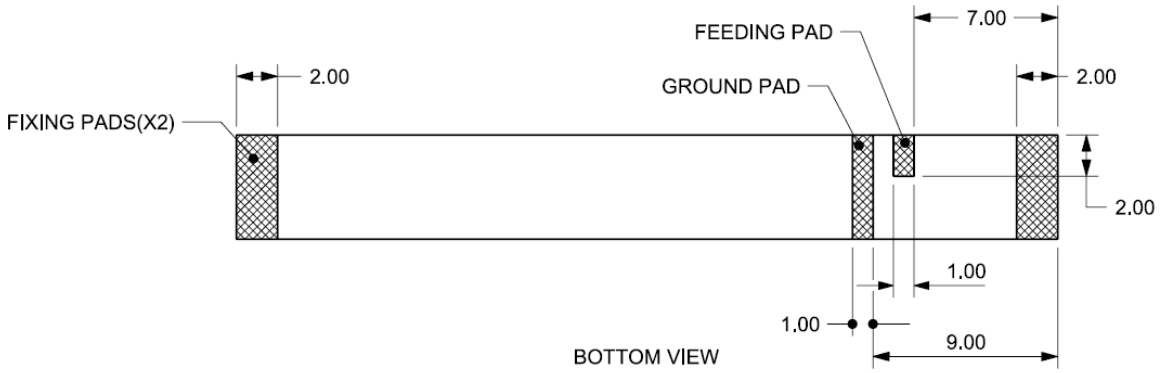


FIGURE 7.1 PCB BOARD SCHEMATIC PICTURE

8.0 PADS OF PRODUCT FOR SOLDERING



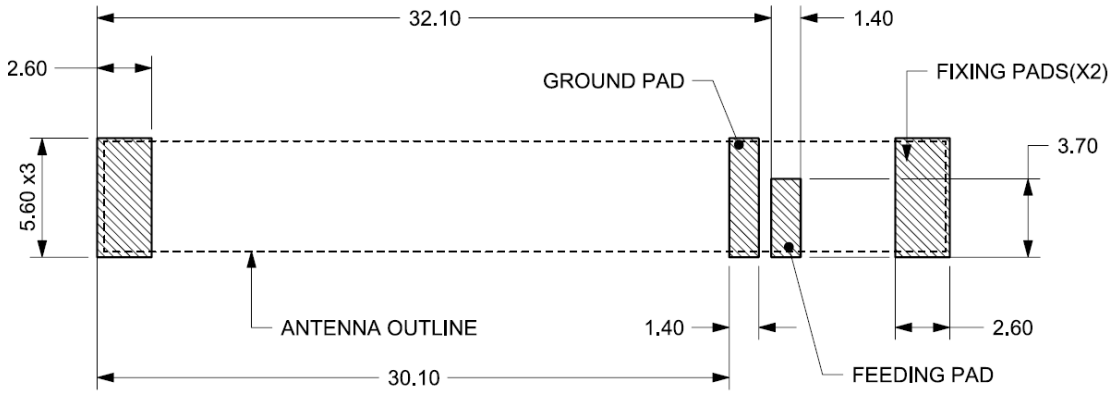
P/N:1462000001



P/N:1462000011

9.0 RECOMMENDED FOOTPRINT ON PCB FOR SOLDERING

9.1 RECOMMENDED PCB PADS AREA



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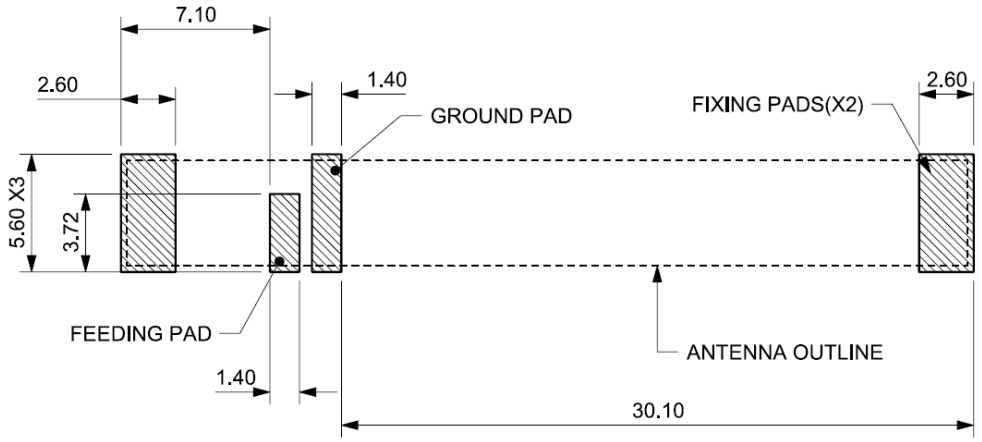
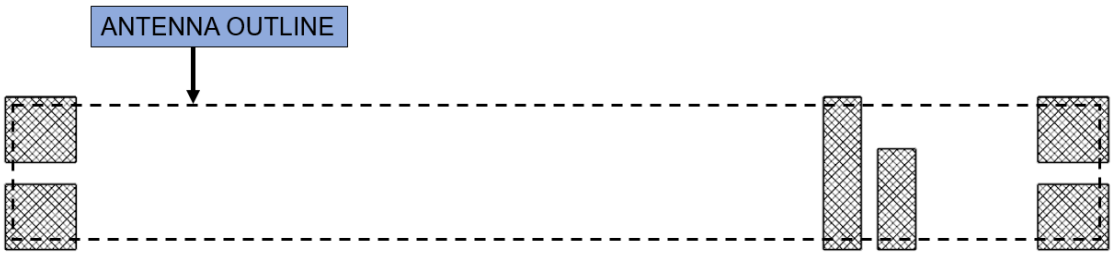


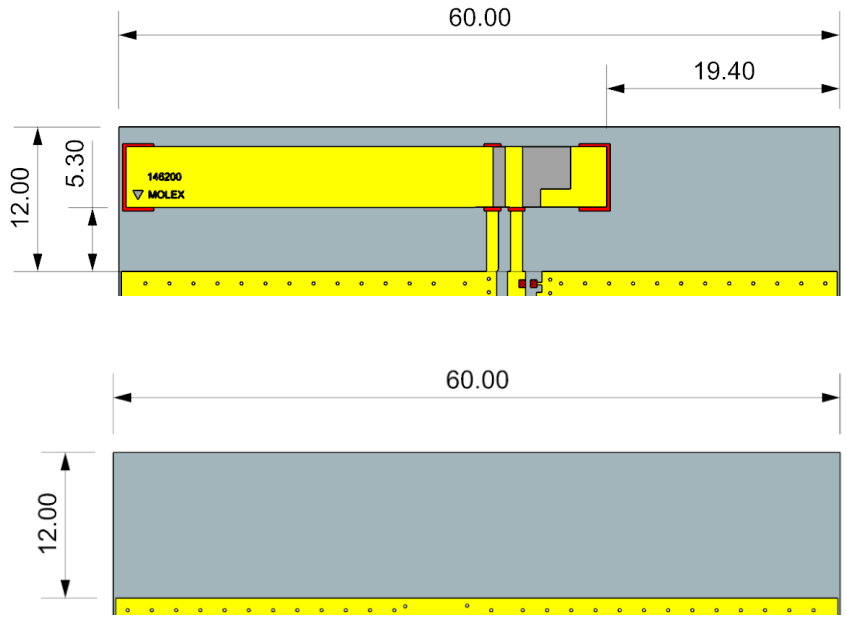
P/N:1462000011

9.2 RECOMMENDED STENCIL OPENING DESIGN

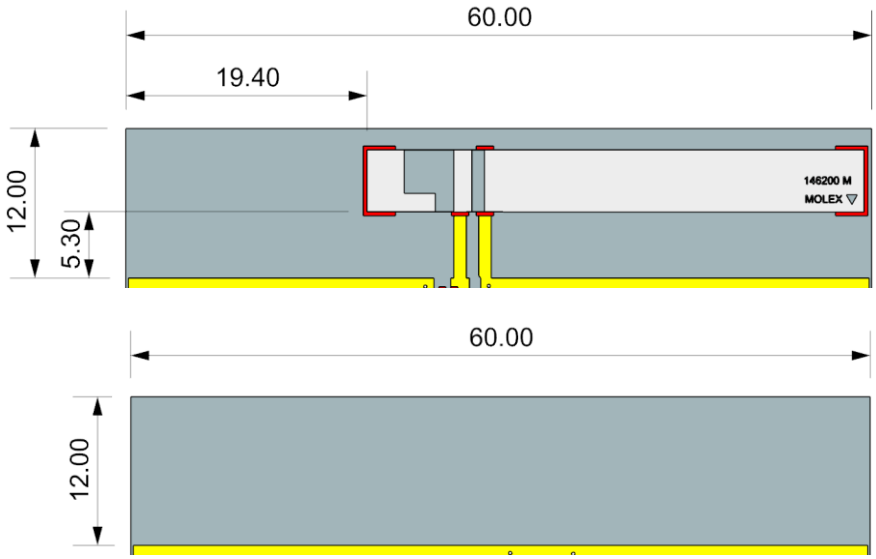


Recommended Stencil Thickness > 0.1mm

9.3 RECOMMENDED PCB CLEARANCE KEEP OUT AREA

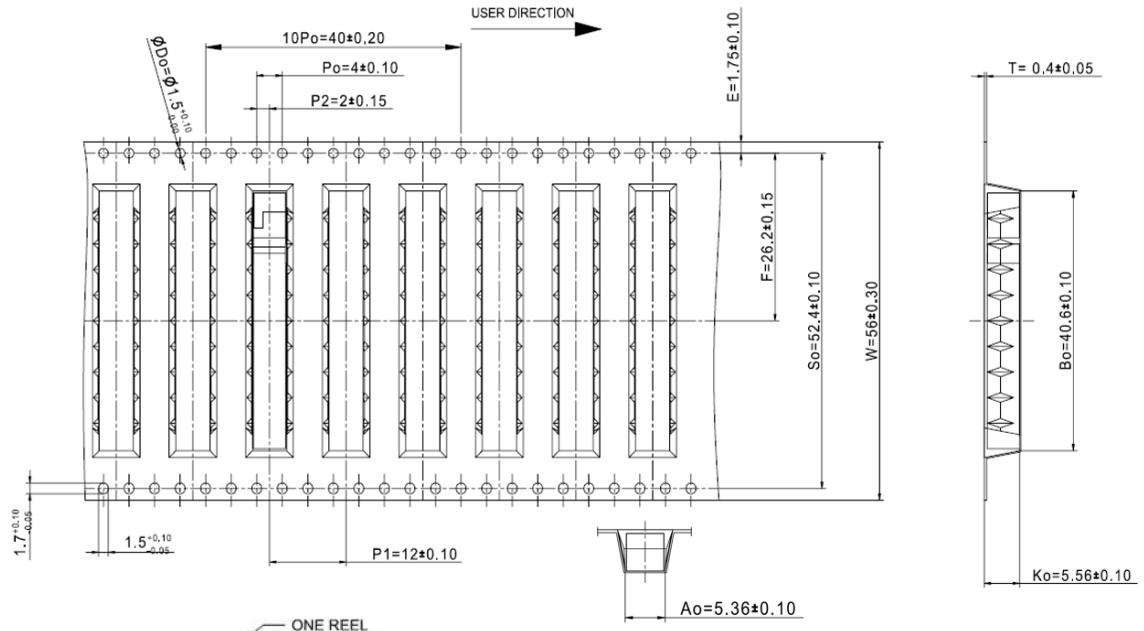


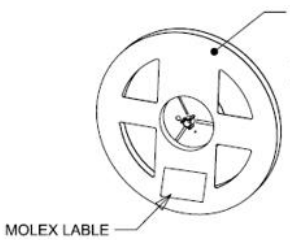
RECOMMENDED PCB CLEARANCE KEEP OUT AREA = 60X12mm
CLEARANCE AROUND THE PERIMETER OF THE ANTENNA FOOTPRINT = 19.4x5.3mm



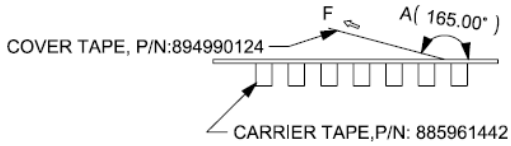
RECOMMENDED PCB CLEARANCE KEEP OUT AREA = 60X12mm
CLEARANCE AROUND THE PERIMETER OF THE ANTENNA FOOTPRINT = 19.4x5.3mm

10.0 PACKING

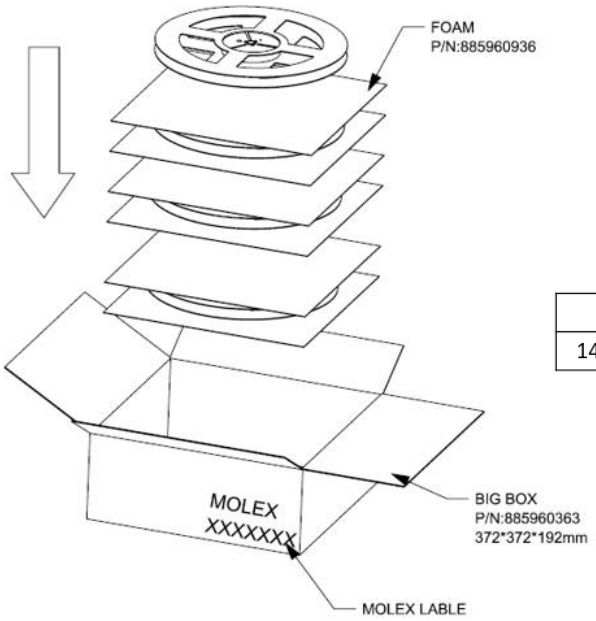




PEELING FORCE OF CARRIE TAPE:SEE TABLE BELOW;
PEELING SPEED 300M/MIN



A	165°~180°
F	0.1N~1.3N



P/N	PCS/REEL	REEL/BOX	PCS/BOX
1462000001/1462000011	500	2	1000

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 "FULL LTE CERAMIC MIRRORED ANTENNA".

PACKAGING INFORMATION FOR 146200 Series

CHANGE HISTORY		
REV	DATE	DESCRIPTION
A	2016/03/18	First Release
B	2017/01/12	Add Molex P/N:1462000011 information
C	2017/12/27	Add PCB keep out area information
D	2020/01/09	Update file layout