



PRODUCT SPECIFICATION

TITLE

2IN1 (4G/GPS&BD) EXTERNAL ANTENNA

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REVISION: A	ECR/ECN INFORMATION: EC No: 610960 DATE: 2019/01/30	TITLE: 2IN1(4G/GPS&BD) EXTERNAL ANTENNA PRODUCT SPECIFICATION	SHEET No. 1 of 7
DOCUMENT NUMBER: PS-2112973000	CREATED / REVISED BY: Kang Cheng 2019/01/24	CHECKED BY: Cooper Zhou 2019/01/24	APPROVED BY: Stary Song 2019/01/24

2IN1 (4G/GPS&BD) EXTERNAL ANTENNA

1.0 SCOPE

This product specification covers the mechanical, electrical and environmental performances specification for 2in1 (4G/GPS&BD) external antenna.

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAME AND SERIES NUMBER (S)

Product name: 2in1 (4G/GPS&BD) external antenna
Series Number: 2112973000

2.2 DESCRIPTION

211297 is 4G/GPS&BD 2in1 external antenna for use in Automotive Telematics, Transportation and remote monitoring applications.

2.3 FEATURES

- Product size: Ø77*15mm
- Cable type: RG174(4G/GPS&BD)
- Cable Length:3m
- Two Fakra connector (Model C/D)
- 3M Adhesive
- IP66 Waterproof
- Operation Temperature: -40°C to 85°C
- Storage Temperature: -40°C to 85°C
- Cable and connector can be customized
- RoHS Compliant



Molex 2112973000 2in1 (4G/GPS&BD) EXTERNAL ANTENNA 3D VIEW

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2.4 PRODUCT STRUCTURE INFORMATION

P/N	2112973000
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3M GLUE THIS SIDE TO THE SKY

FAKRA

MOLEX LOGO

GPS/BD COLOR:BLUE(FAKRA-C)

4G COLOR:PURPLE(FAKRA-D)

TABLE A		
ITE	MATERIAL	DESCRIPTION
1	ANTENNA	DIELECTRIC CERAMIC
2	PLASTIC CASE	ABS
3	PCB	FR4
4	SHIELDING CASE	TINPLATE
5	CABLE	RG174
6	GPS/BD CONNECTOR	FAKRA-C
7	4G CONNECTOR	FAKRA-D
8	Alnico	NONE
9	ADHSIVE	3M

NOTE:

1. CABLE LENGTH:L1=3000±100mm;L2=3000±100mm;
2. MATERIAL PLEAES REFER TO TABLE A.
3. PRODUCT NEED TO PASS HALOGEN-FREE AND ROHS TESTS.

Mechanical Structure Information for 2112973000

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3.0 APPLICABLE DOCUMENTS

Document	Number	Description
Sale Drawing(SD)	SD-2112973000	Mechanical Dimension of the product
Application Guide(AS)	AS-2112973000	Antenna Application and surrounding
Packing Drawing(PK)	PK-2112973000	Product packaging specifications

4.0 GENERAL SPECIFICATION

4.1.1 GPS ANTENNA

DESCRIPTION	EQUIPMENT	REQUIREMENT	
Frequency Range	VNA E5071C	1561.098±2.046 MHz	1575.42±1.023 MHz
VSWR	VNA E5071C	≤2	
Average Total Efficiency	OTA Chamber	22.3%	22.1%
Peak Gain (Max)	OTA Chamber	-2.1dBi	-2.1dBi
Polarization	OTA Chamber	RHCP	
Input Impedance	VNA E5071C	50 ohms	

4.1.2 GPS LNA

DESCRIPTION	EQUIPMENT	REQUIREMENT
Frequency Range	VNA E5071C	1575.42±1.023 MHz
DC Voltage	DC Supplier	3V
Gain	VNA E5071C	25±3dB
VSWR	VNA E5071C	≤2.0
Noise Figure	VNA E5071C	≤1.5dB
DC Current	DC Supplier	11±3m A (at 3.3V)

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PRODUCT SPECIFICATION

4.1.3 4G ANTENNA

DESCRIPTION	EQUIPMENT	REQUIREMENT	
Frequency Range	VNA E5071C	824-960MHz	1710-2690MHz
Average Total Efficiency	OTA Chamber	33.6%	26.8%
Peak Gain (Max)	OTA Chamber	-0.8dBi type	0.4dBi type
polarization	OTA Chamber	Linear	
VSWR	VNA E5071C	≤2.5	
Input Impedance	VNA E5071C	50 ohms	

5.0 ENVIRONMENTAL SPECIFICATION

DESCRIPTION	SPECIFICATION
Sine Vibration	<ol style="list-style-type: none"> Vibration frequency: 10 Hz~1000 Hz. Vibration direction: X、Y、Z. Vibration acceleration: 27.8m/s². Time: 8 hours. Antenna in non-working state, all the experimental samples were fixed on the shaking table. Parts should meet RF spec before and after test. No cosmetic problem (No bubble issue、No plating peeling off issue、No mechanical damage.)
Low Temperature	<ol style="list-style-type: none"> Temperature:-40°C±2°C, time:24 hours. There is no substantial obstruction to air flow across and around the samples, and the samples are not touching each other Parts should meet RF spec before and after test. No cosmetic problem (No bubble issue、No plating peeling off issue、No mechanical damage.)
High Temperature	<ol style="list-style-type: none"> Temperature:85°C±2°C, time:96 hours. There is no substantial obstruction to air flow across and around the samples, and the samples are not touching each other Parts should meet RF spec before and after test. No cosmetic problem (No bubble issue、No plating peeling off issue、No mechanical damage.)

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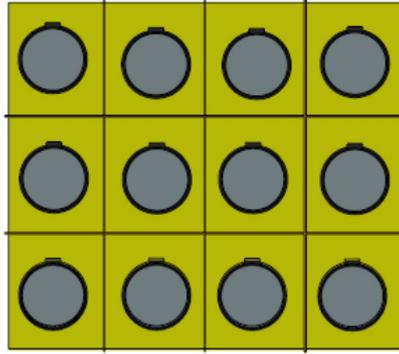


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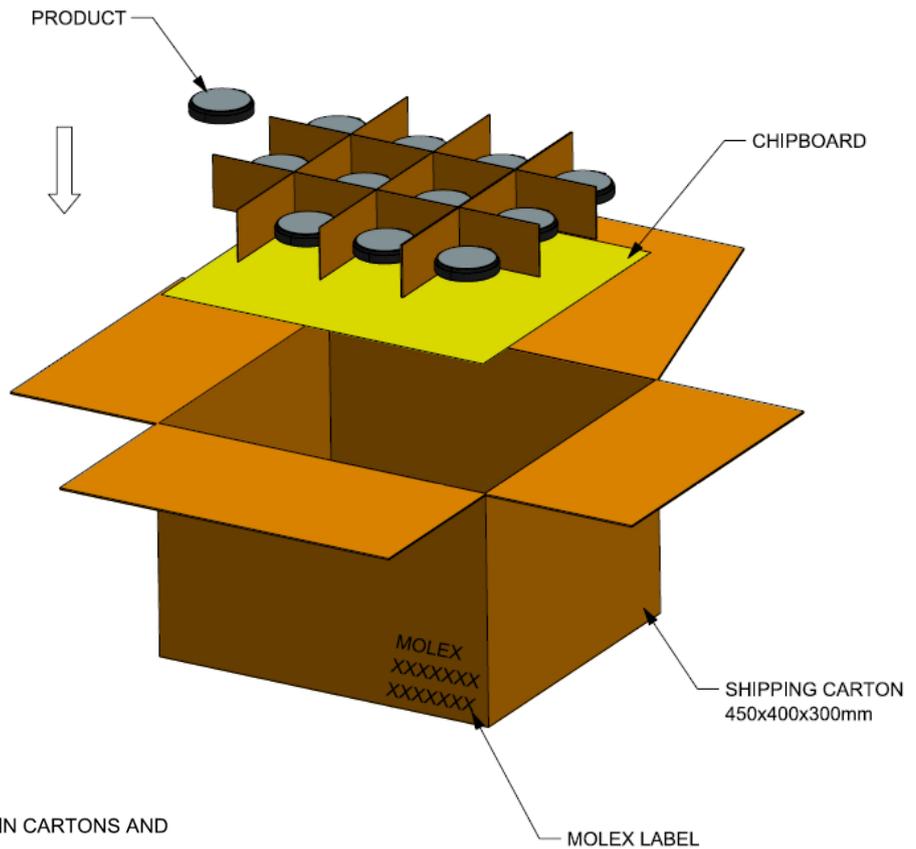
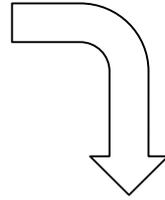
Pull Test	<ol style="list-style-type: none"> The antenna is fixed on the fixture, the cable pulled to the axial direction. Pull force $\geq 15N$
Electrostatic ESD	<ol style="list-style-type: none"> Antenna in working condition, $\pm 8KV$ Air discharge test: Plastic shell surface height of 15 mm at any position, the discharge interval is greater than 5s, the number of positive and negative 3 times; $\pm 6KV$ Contact Experiment: Metal connector shell contact discharge, discharge interval greater than 5s, the number of positive and negative 3 times Parts should meet RF spec before and after test. No cosmetic problem (No bubble issue、No plating peeling off issue、No mechanical damage.)
Connector Salt Mist Test	<ol style="list-style-type: none"> Concentration of salt solution: $5\% \pm 1\%$, Temperature range: $35 \pm 2^{\circ}C$, PH value range: 6.5-7.2, Settling amount of salt fog: 1-2ml/(80cm²·h), Test time: 48h Parts should meet RF spec before and after test. No visible corrosion. Discoloration is acceptable.
Temperature Cycle	<ol style="list-style-type: none"> In an environment of $20^{\circ}C$, the temperature reached $-40^{\circ}C$ within 60 min, and the test device was stored for 90 min. The temperature reached $20^{\circ}C$ in 60 minutes. In an environment of $20^{\circ}C$, the temperature reached $85^{\circ}C$ within 90 min, and the test device was stored for 110 min. The temperature reached $20^{\circ}C$ in 70 minutes. The cycle is repeated until a total of 40 cycles have been completed. Cycle time: 8 hours Parts should meet RF spec before and after test. No visible corrosion. Discoloration is acceptable.
Temperature Shock	<ol style="list-style-type: none"> 1.The device under test at $-30^{\circ}C \leftrightarrow 70^{\circ}C$ by 100 cycles, Dwell of 30 mins, transition time between Dwell 10 secs (45 mins / cycle) Parts should meet RF spec before and after test. No cosmetic problem (No soldering problem; No adhesion problem of glue)
Constant Damp Heat	<ol style="list-style-type: none"> Test temperature: $40 \pm 2^{\circ}C$, test humidity: 95%, storage time: 504h Parts should meet RF spec before and after test. No cosmetic problem (No soldering problem; No adhesion problem of glue)
Mechanical Shock	<ol style="list-style-type: none"> Impact acceleration: $a=500 \pm 10\%$ m/S², Enter the time: $t = 6$ m/s, each space axis (six axis) each test 10 times.。 Parts should meet RF spec before and after test. No cosmetic problem (No soldering problem; No adhesion problem of glue)

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6.0 PACKING



PCS/LAYER



- 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.EACH LAYER IS SEPARATED BY CHIPBOARD.
 - 5.THIS PACKAGINGSPECIFICATION TO BE USED FOR "2IN1 (4G/GPS&BD) EXTERNAL ANTENNA".

P/N	PCS/LAYER	LAYER/CARTON	PCS/CARTON
2112973000	12	5	60

Packaging information for 2112973000

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