# PRODUCT SPECIFICATION

**TITLE**

**698MHZ-6GHZ WIDE BAND ANTENNA**

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# 698MHZ-6GHZ WIDE BAND ANTENNA

## 1.0 SCOPE

This Product Specification covers the mechanical, electrical and environmental performances requirements and test methods for 698MHz-6GHz Wide Band Antenna.

## 2.0 PRODUCT DESCRIPTION

### 2.1 PRODUCT NAME AND SERIES NUMBER (S)

Product name: 698MHz-6GHz Wide Band Antenna.

### 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 sales drawings SD of 1462340100.
b) Cable Line: Refer to sales drawings SD of 1462340100.
c) Connector: Refer to sales drawings SD of 1462340100.

## 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 TEMPERATU

Operating : -30℃ to 85℃
Storage : -40℃ to 95℃

### 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 (1462340050)

| DESCRIPTION | TEST CONDITION | REQUIREMENTS | | |
|---|---|---|---|---|
| Frequency Range | 698MHz-960MHz / 1.5GHz~6GHz | 698~960MHz | 1.5~2.7GHz | 2.7GHz~6GHz |
| Return Loss | Antenna with 100mm long,1.13mm diameter micro coaxial cable in free space Measured by VNA5071C | <-4dB | < -5 dB | |
| Peak Gain (Max) | Measure antenna in free space through OTA chamber | 1.9dBi | 2.85dBi | 5.2dBi |
| Total Efficiency | Measure antenna in free space through OTA chamber | >70% | >70% | >70% |
| Polarization | Measure antenna in free space through OTA chamber | Linear | | |
| Input Impedance | Measure antenna in free space through VNA E5071C | 50 Ohms | | |

### 5.2 ELECTRICAL REQUIREMENTS FOR CABLE LENGTH 100mm (1462340100)

| DESCRIPTION | TEST CONDITION | REQUIREMENTS | | |
|---|---|---|---|---|
| Frequency Range | 698MHz-960MHz / 1.5GHz~6GHz | 698~960MHz | 1.5~2.7GHz | 2.7GHz~6GHz |
| Return Loss | Antenna with 100mm long,1.13mm diameter micro coaxial cable in free space Measured by VNA5071C | < -4 dB | < -5 dB | |
| Peak Gain (Max) | Measure antenna in free space through OTA chamber | 1.8dBi | 2.8dBi | 5.0dBi |
| Total Efficiency | Measure antenna in free space through OTA chamber | >70% | >70% | >70% |
| Polarization | Measure antenna in free space through OTA chamber | Linear | | |
| Input Impedance | Measure antenna in free space through VNA E5071C | 50 Ohms | | |

### 5.3 ELECTRICAL REQUIREMENTS FOR CABLE LENGTH 150mm (1462340150)

| DESCRIPTION | TEST CONDITION | REQUIREMENTS | | |
|---|---|---|---|---|
| Frequency Range | 698MHz-960MHz / 1.5GHz~6GHz | 698~960MHz | 1.5~2.7GHz | 2.7GHz~6GHz |
| Return Loss | Antenna with 100mm long,1.13mm diameter micro coaxial cable in free space Measured by VNA5071C | < -4 dB | < -5 dB | |
| Peak Gain (Max) | Measure antenna in free space through OTA chamber | 1.7dBi | 2.65dBi | 4.8dBi |
| Total Efficiency | Measure antenna in free space through OTA chamber | >69% | >68% | >67% |
| Polarization | Measure antenna in free space through OTA chamber | Linear | | |
| Input Impedance | Measure antenna in free space through VNA E5071C | 50 Ohms | | |

### 5.4 ELECTRICAL REQUIREMENTS FOR CABLE LENGTH 200mm (1462340200)

| DESCRIPTION | TEST CONDITION | REQUIREMENTS | | |
|---|---|---|---|---|
| Frequency Range | 698MHz-960MHz / 1.5GHz~6GHz | 698~960MHz | 1.5~2.7GHz | 2.7GHz~6GHz |
| Return Loss | Antenna with 100mm long,1.13mm diameter micro coaxial cable in free space Measured by VNA5071C | < -4 dB | < -5 dB | |
| Peak Gain (Max) | Measure antenna in free space through OTA chamber | 1.6dBi | 2.5dBi | 4.6dBi |
| Total Efficiency | Measure antenna in free space through OTA chamber | >68% | >66% | >64% |
| Polarization | Measure antenna in free space through OTA chamber | Linear | | |
| Input Impedance | Measure antenna in free space through VNA E5071C | 50 Ohms | | |

### 5.5 ELECTRICAL REQUIREMENTS FOR CABLE LENGTH 250mm (1462340250)

| DESCRIPTION | TEST CONDITION | REQUIREMENTS | | |
|---|---|---|---|---|
| Frequency Range | 698MHz-960MHz / 1.5GHz~6GHz | 698~960MHz | 1.5~2.7GHz | 2.7GHz~6GHz |
| Return Loss | Antenna with 100mm long,1.13mm diameter micro coaxial cable in free space Measured by VNA5071C | < -4 dB | <-5 dB | |
| Peak Gain (Max) | Measure antenna in free space through OTA chamber | 1.5dBi | 2.35dBi | 4.4dBi |
| Total Efficiency | Measure antenna in free space through OTA chamber | >67% | >64% | >61% |
| Polarization | Measure antenna in free space through OTA chamber | Linear | | |
| Input Impedance | Measure antenna in free space through VNA E5071C | 50 Ohms | | |

### 5.6 ELECTRICAL REQUIREMENTS FOR CABLE LENGTH 300mm (1462340300)

| DESCRIPTION | TEST CONDITION | REQUIREMENTS | | |
|---|---|---|---|---|
| Frequency Range | 698MHz-960MHz / 1.5GHz~6GHz | 698~960MHz | 1.5~2.7GHz | 2.7GHz~6GHz |
| Return Loss | Antenna with 100mm long,1.13mm diameter micro coaxial cable in free space Measured by VNA5071C | < -4 dB | <-5 dB | |
| Peak Gain (Max) | Measure antenna in free space through OTA chamber | 1.4dBi | 2.2dBi | 4.2dBi |
| Total Efficiency | Measure antenna in free space through OTA chamber | >66% | >62% | >58% |
| Polarization | Measure antenna in free space through OTA chamber | Linear | | |
| Input Impedance | Measure antenna in free space through VNA E5071C | 50 Ohms | | |

### 5.7 CABLE LOSS

| ITEM | DESCRIPTION | TEST CONDITION | REQUIREMENTS | | | |
|---|---|---|---|---|---|---|
| 5.7.1 | Frequency Range | 698MHz~6GHz | 698MHz~960MHz | 1.5GHz~3GHz | 3GHz~5GHz | 5GHz~6 GHz |
| 5.7.2 | Attenuation | 1m cable measured by VNA5071C | ≤1.8dB/m | ≤3dB/m | ≤4dB/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<br>Stick the Flex antenna in a PC block, pull cable in horizontal direction. | Pull force >8N |

### 5.10 ENVIRONMENTAL REQUIREMENTS

| ITEM | DESCRIPTION | TEST CONDITION | REQUIREMENT |
|---|---|---|---|
| **5.10.1** | Temperature /Humidity cycling | Test condition:<br>1) The device under test is kept for 30 mins in an environment with a temperature of -40 ℃.<br>2) Kept for 4 Hours in an environment with a temperature of 85 degrees and a relative humidity of 95%.<br>3) Kept for 2 Hours in an environment with a temperature of 125 degrees and a relative humidity of 95%.<br>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.<br>2） No cosmetic problem |
| **5.10.2** | Temperature Shock | Test condition:<br>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.<br>2） No cosmetic problem |

| | | | |
|---|---|---|---|
| **5.10.3** | High Temperature | Test condition:<br>1) Temperature:125℃, time:1008hours<br>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.<br>2) No cosmetic problem |
| **5.10.4** | Salt mist test | 1.Test condition:<br>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.<br>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

## 6.0 TEST GROUPINGS

| Test Item | Description | Group1 | Group2 | Group3 | Group4 | Group5 |
|---|---|---|---|---|---|---|
| **5.9.1** | Pull test | X | | | | |
| **5.10.1** | Temperature /Humidity cycling | | X | | | |
| **5.10.2** | Temperature Shock | | | X | | |
| **5.10.3** | High Temperature | | | | X | |
| **5.10.4** | Salt mist test | | | | | X |
| | Sample Quantity | 5 | 5 | 5 | 5 | 5 |

## 7.0 PACKAGING

Refer to the Molex related packaging drawings of 1462340100.