

## Project Report

Customer name: DECARD                      Project name: P18Q\_X1

Project NO. :/                                  Version NO. : V1.0

Structural Engineer: Tang Hailin   R&D Engineer: Qin Linshu

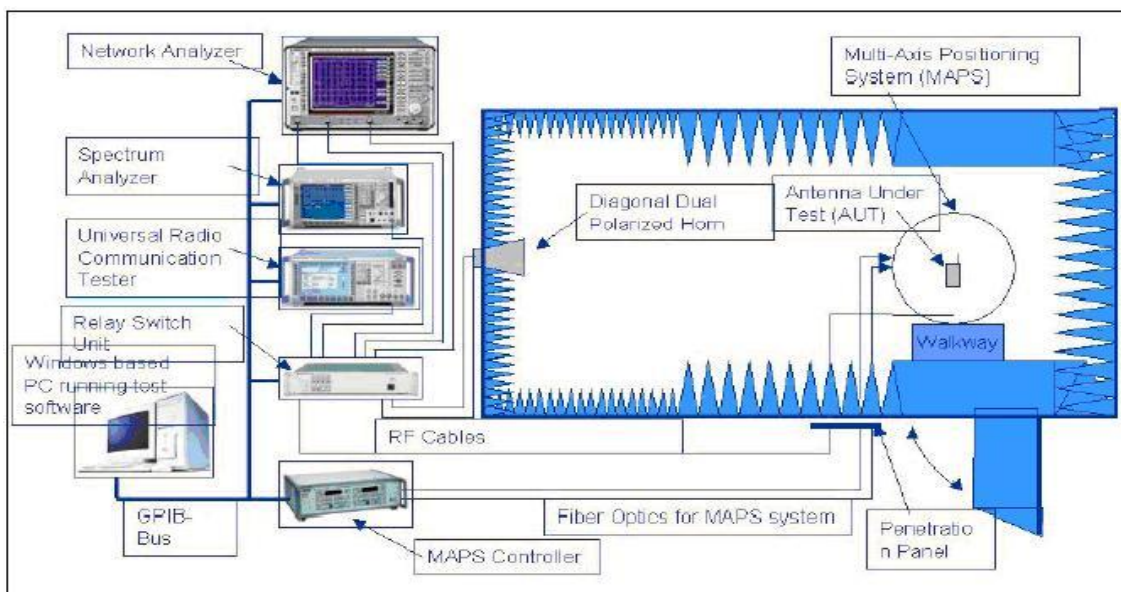
Approver: Liu Lihua                      Production date: 20250610

| Revision date | Revised content | Reviser    | Original<br>version |
|---------------|-----------------|------------|---------------------|
| 20250610      | Initial version | Qin Linshu | V1.0                |
|               |                 |            |                     |
|               |                 |            |                     |
|               |                 |            |                     |
|               |                 |            |                     |

## 一、Explanation

The report summarizes the electrical performance results of the P18Q\_X1 antenna project ,including the S11 parameters,efficiency,gain,and corresponding conclusions of the antenna.

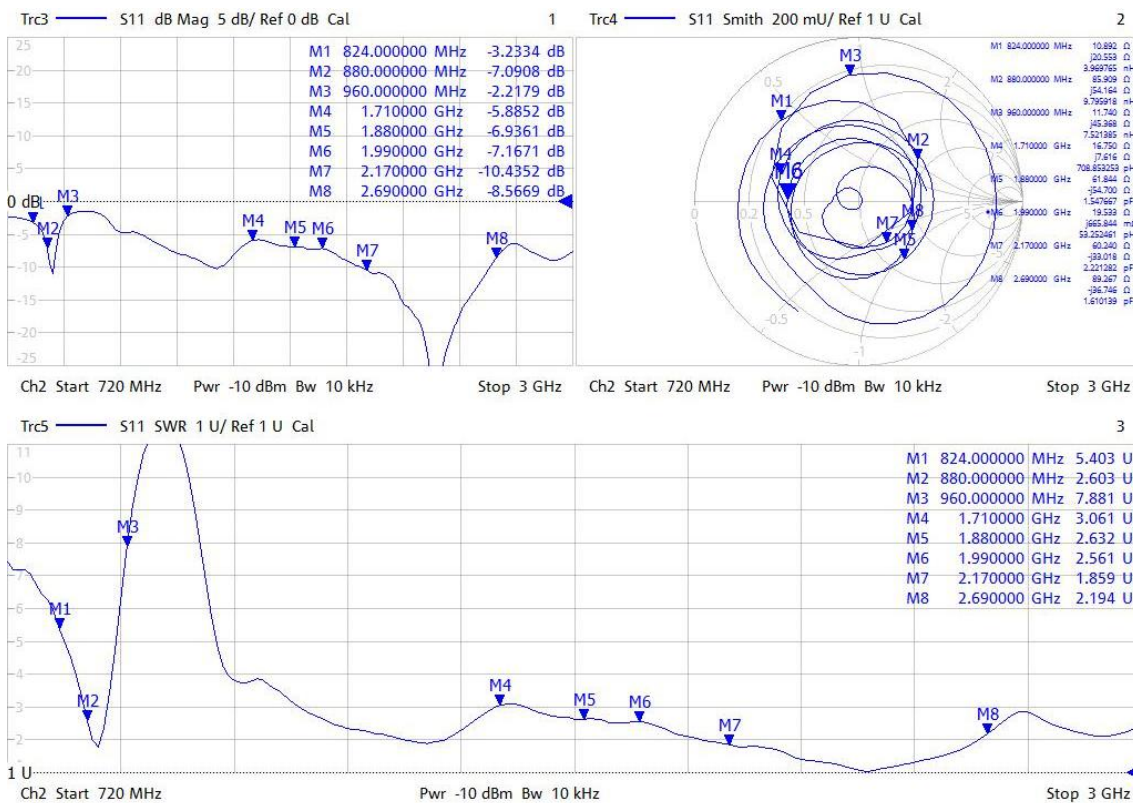
## 三、Testing principle diagram of antenna testing darkroom



## 五、Passive antenna test data

(Confirm: ☒ Whole machine testing ☐ Single antenna testing)

### ➤ Antenna S11 parameter diagram



➤ Standing wave ratio data

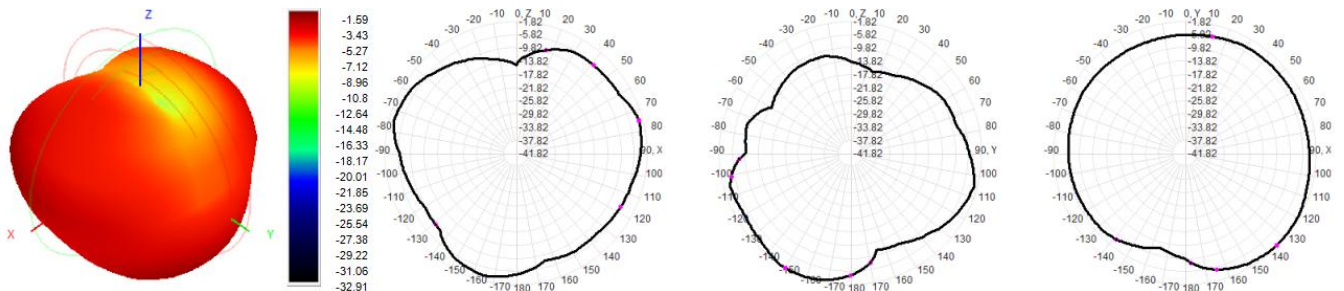
| Freq/MHz | 824  | 880  | 960  | 1710 | 1880 | 1990 | 2170 | 2690 |
|----------|------|------|------|------|------|------|------|------|
| VSWR     | 5.40 | 2.60 | 7.88 | 3.06 | 2.63 | 2.56 | 1.86 | 2.19 |

➤ Antenna darkroom test data

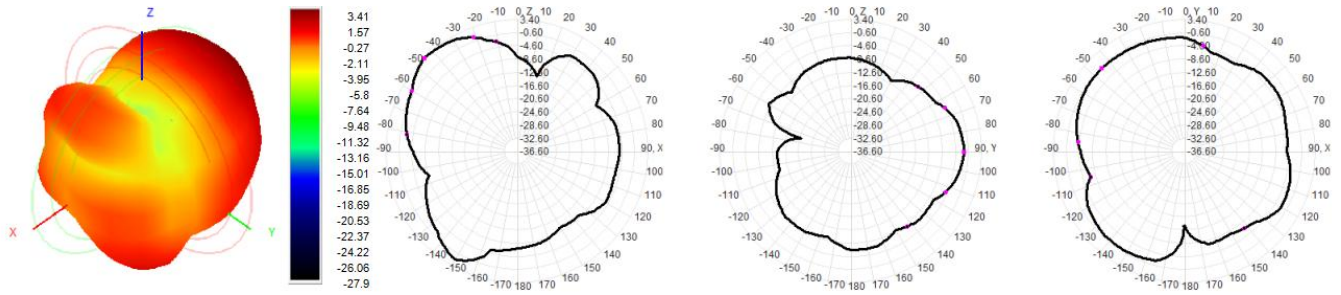
| Frequency (MHz) | Gain (dBi) | Efficiency (%) |
|-----------------|------------|----------------|
| 820             | -2.87      | 16.36          |
| 840             | -2.35      | 19.32          |
| 860             | -1.91      | 22.82          |
| 880             | -1.59      | 26.28          |
| 900             | -1.00      | 28.61          |
| 920             | -1.30      | 23.37          |
| 940             | -2.77      | 18.13          |
| 960             | -5.55      | 13.29          |
| 1700            | 3.24       | 42.35          |
| 1750            | 2.00       | 39.72          |
| 1800            | 1.82       | 43.92          |
| 1850            | 2.31       | 44.31          |
| 1900            | 2.84       | 48.09          |
| 1950            | 1.49       | 42.52          |
| 2000            | 1.84       | 41.75          |
| 2050            | 1.99       | 44.62          |
| 2100            | 2.82       | 46.64          |
| 2150            | 3.40       | 47.09          |
| 2200            | 3.41       | 47.99          |
| 2250            | 3.10       | 44.52          |
| 2300            | 3.20       | 47.43          |
| 2350            | 3.60       | 53.25          |
| 2400            | 3.63       | 55.64          |
| 2450            | 2.97       | 56.31          |
| 2500            | 2.84       | 58.41          |
| 2550            | 2.63       | 56.91          |
| 2600            | 2.53       | 53.38          |
| 2650            | 2.55       | 53.59          |
| 2700            | 1.29       | 42.58          |

➤ Antenna direction diagram

880MHz 3D-E1-E2-H



2200MHz 3D-E1-E2-H



### ➤ Active OTA test data

| DUT     | Equipment | Standard | Bandwidth (MHz) | Test Item | Frequency Band | Channel | Frequency (MHz) | Result (dBm) |
|---------|-----------|----------|-----------------|-----------|----------------|---------|-----------------|--------------|
| P18Q_X1 | CMW500    | FDD      | 10              | TRP       | band 1         | 18050   | 1925            | 18.41        |
|         |           |          |                 |           |                | 18300   | 1950            | 18.94        |
|         |           |          |                 |           |                | 18550   | 1975            | 18.54        |
|         |           |          |                 |           | band 2         | 18650   | 1855            | 22.15        |
|         |           |          |                 |           |                | 18900   | 1880            | 21.89        |
|         |           |          |                 |           |                | 19150   | 1905            | 20.72        |
|         |           |          |                 |           | band 3         | 19250   | 1715            | 18.89        |
|         |           |          |                 |           |                | 19575   | 1747.5          | 19.71        |
|         |           |          |                 |           |                | 19900   | 1780            | 20.3         |
|         |           |          |                 |           | band 4         | 20000   | 1715            | 18.24        |
|         |           |          |                 |           |                | 20175   | 1732.5          | 18.23        |
|         |           |          |                 |           |                | 20350   | 1750            | 18.7         |
|         |           |          |                 |           | band 5         | 20450   | 829             | 17.08        |
|         |           |          |                 |           |                | 20525   | 836.5           | 19.05        |
|         |           |          |                 |           |                | 20600   | 844             | 19.21        |
|         |           | TDD      | 10              | TRP       | band 7         | 20800   | 2505            | 21.56        |
|         |           |          |                 |           |                | 21100   | 2535            | 20.72        |
|         |           |          |                 |           |                | 21400   | 2565            | 20.57        |
|         |           |          |                 |           | band 8         | 21500   | 885             | 16.89        |
|         |           |          |                 |           |                | 21625   | 897.5           | 15.68        |
|         |           |          |                 |           |                | 21750   | 910             | 14.01        |
|         |           |          |                 |           | band 38        | 37850   | 2580            | 20.45        |
|         |           |          |                 |           |                | 38000   | 2595            | 20.66        |
|         |           |          |                 |           |                | 38150   | 2610            | 20.2         |
|         |           |          |                 |           | band 39        | 38350   | 1890            | 21.46        |
|         |           |          |                 |           |                | 38450   | 1900            | 21.17        |
|         |           |          |                 |           |                | 38550   | 1910            | 20.25        |
|         |           |          |                 |           | band 40        | 38750   | 2310            | 18.71        |
|         |           |          |                 |           |                | 39150   | 2350            | 19.84        |
|         |           |          |                 |           |                | 39550   | 2390            | 20.27        |
|         |           | FDD      | 10              | TIS       | band 41        | 40340   | 2565            | 20.62        |
|         |           |          |                 |           |                | 40620   | 2593            | 20.69        |
|         |           |          |                 |           |                | 41140   | 2645            | 20.22        |
|         |           |          |                 |           | band 1         | 550     | 2165            | -89.07       |
|         |           |          |                 |           | band 2         | 1150    | 1985            | -87.73       |
|         |           |          |                 |           | band 3         | 1900    | 1875            | -90.23       |
|         | TDD       | 10       | TIS             | TIS       | band 4         | 2350    | 2150            | -85.63       |
|         |           |          |                 |           | band 5         | 2600    | 889             | -77.83       |
|         |           |          |                 |           | band 7         | 3400    | 2685            | -88.34       |
|         |           |          |                 |           | band 8         | 3750    | 955             | -80.93       |
|         |           |          |                 |           | band 38        | 38150   | 2610            | -90.75       |
|         |           |          |                 |           | band 39        | 38550   | 1910            | -89.4        |
|         |           |          |                 |           | band 40        | 39550   | 2390            | -88.55       |
|         |           |          |                 |           | band 41        | 41140   | 2645            | -88.54       |



➤ Electrical performance parameter description

| Parameter Properties   | Parameter Name           | Required value           |
|------------------------|--------------------------|--------------------------|
| Electrical performance | Antenna frequency band   | 824MHz-2690MHz           |
|                        | frequency range          | 824~960MHz; 1710~2690MHz |
|                        | characteristic impedance | 50 Ω                     |
|                        | Standing wave ratio      | <8                       |
|                        | Power capacity           | <10w                     |
|                        | Polarization mode        | 线极化                      |
|                        | Radiation mode           | 全向                       |
|                        | Gain                     | ≥-6dBi, ≤4dBi            |
|                        | efficiency               | ≥13%, ≤59%               |

To sum up, the engineer concludes that it preliminarily matches the customer's requirements. ☒YES ☐NO