



# FCC PART 15 TEST REPORT No.24T04Z200172-004

for

**Samsung Electronics Co., Ltd.**

**Multi-band GSM/WCDMA/LTE/5GNR Mobile Phone with Bluetooth, WLAN**

**SM-A166P/DS**

**FCC ID: ZCasma166P**

with

**Hardware Version: REV1.0**

**Software Version: A166P.001**

**Issued Date: 2024-08-26**

**Note:**

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

**Test Laboratory:**

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## **REPORT HISTORY**

| Report Number    | Revision | Description | Issue Date |
|------------------|----------|-------------|------------|
| 24T04Z200172-004 | Rev.0    | 1st edition | 2024-08-26 |
|                  |          |             |            |

Note: the latest revision of the test report supersedes all previous version.

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## 1. Test Laboratory

### 1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2017 accredited test laboratory under American Association for Laboratory Accreditation (A2LA) with lab code 7049.01, and is also an FCC accredited test laboratory (CN1349), and ISED accredited test laboratory (CAB identifier:CN0066). The detail accreditation scope can be found on A2LA website.

### 1.2. Testing Location

Conducted testing Location: CTTL(Huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing,  
P. R. China100191

### 1.3. Testing Environment

Normal Temperature: 15-35°C

Relative Humidity: 20-75%

### 1.4. Project date

Testing Start Date: 2024-07-16

Testing End Date: 2024-08-26

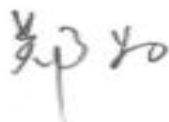
### 1.5. Signature



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Yao Xingyu

(Prepared this test report)



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Zheng Wei

(Reviewed this test report)



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Pang Shuai

(Approved this test report)

## **2. Client Information**

### **2.1. Applicant Information**

Company Name: Samsung Electronics Co., Ltd.  
Address: 19 Chapin Rd., Building D Pine Brook, NJ 07058  
Contact Person: Jenni Chun  
Contact Email: j1.chun@samsung.com  
Telephone: +1-201-937-4203

### **2.2. Manufacturer Information**

Company Name: Samsung Electronics Co., Ltd.  
Address: Samsung R5, Maetan dong 129, Samsung ro  
Youngtong gu, Suwon city 443 742, Korea  
Contact Person: 조성훈 (Sunghoon Cho)  
Contact Email: ggobi.cho@samsung.com  
Telephone: +82-10-2722-4159  
Fax: /

### **3. Equipment Under Test (EUT) and Ancillary Equipment (AE)**

#### **3.1. About EUT**

|                      |                                                                 |
|----------------------|-----------------------------------------------------------------|
| Description          | Multi-band GSM/WCDMA/LTE/5GNR Mobile Phone with Bluetooth, WLAN |
| Model name           | SM-A166P/DS                                                     |
| FCC ID               | ZCasma166P                                                      |
| WLAN Frequency Band  | ISM Band:<br>-5250MHz~5350MHz<br>-5470MHz~5725MHz               |
| Type of modulation   | OFDM                                                            |
| Antenna              | Integral Antenna                                                |
| Device Type (DFS)    | Client without radar detection(only support client mode)        |
| TPC mechanism        | Not support                                                     |
| Antenna gain         | -2.0dBi                                                         |
| Nominal Voltage      | 3.88V                                                           |
| Extreme High Voltage | 4.47V                                                           |
| Extreme Low Voltage  | 3.60V                                                           |

#### **3.2. Internal Identification of EUT used during the test**

| <b>EUT ID*</b> | <b>SN or IMEI</b> | <b>HW Version</b> | <b>SW Version</b> | <b>Date of receipt</b> |
|----------------|-------------------|-------------------|-------------------|------------------------|
| UT06a          | 2404200172UT06a   | REV1.0            | A166P.001         | 2024-07-17             |

\*EUT ID: is used to identify the test sample in the lab internally.

#### **3.3. General Description**

The Equipment Under Test (EUT) is a model of Multi-band GSM/WCDMA/LTE/5GNR Mobile Phone with Bluetooth, WLAN with integrated antenna. It consists of normal options: lithium battery, charger. Manual and specifications of the EUT were provided to fulfil the test.

## 4. Reference Documents

### 4.1. Documents supplied by applicant

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

### 4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

|                |                                                                                                                                   |      |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------|------|
| FCC Part15     | FCC CFR 47, Part 15, Subpart E:<br>15.407 General technical requirements.                                                         | 2021 |
| KDB 905462 D03 | UNII Clients Without Radar Detection New Rules v01r02<br>COMPLIANCE MEASUREMENT PROCEDURES FOR<br>UNLICENSED-NATIONAL INFORMATION | 2016 |
| KDB 905462 D02 | INFRASTRUCTURE DEVICES OPERATING IN THE<br>5250-5350 MHz AND 5470-5725 MHz BANDS<br>INCORPORATING DYNAMIC FREQUENCY SELECTION     | 2016 |

## 5. Laboratory Environment

Measurement is performed in shielding room.

## 6. Test Results

### 6.1. Summary of Test Results

| SUMMARY OF MEASUREMENT RESULTS                             | Sub-clause of<br>Part15E | Verdict |
|------------------------------------------------------------|--------------------------|---------|
| Channel move time and channel closing<br>transmission time | 15.407 (h)(2)(iii)       | P       |
| Non-Occupancy Period                                       | 15.407 (h)(2) (iv)       | P       |

Please refer to **ANNEX A** for detail.

Terms used in Verdict column

|    |                                                                               |
|----|-------------------------------------------------------------------------------|
| P  | Pass, The EUT complies with the essential requirements in the standard.       |
| NM | Not measured, The test was not measured by CTTL                               |
| NA | Not Applicable, The test was not applicable                                   |
| F  | Fail, The EUT does not comply with the essential requirements in the standard |

### 6.2. Statements

CTTL has evaluated the test cases as listed in section 6.1 of this report for the EUT specified in section 3 according to the standards or reference documents listed in section 4.

This report only deal with the UNII DFS functions among the features described in section 3, and The EUT met all requirements of the reference documents.

The end user is not available to get and modify the parameters of the detected Radar Waveforms in this product.

### 6.3. Test Conditions

For this report, all the test cases are tested under normal temperature and normal voltage, and also under norm humidity, the specific condition is shown as follows:

|             |       |
|-------------|-------|
| Temperature | 26°C  |
| Voltage     | 3.88V |
| Humidity    | 44%   |

## 7. Test Facilities Utilized

### Conducted test system

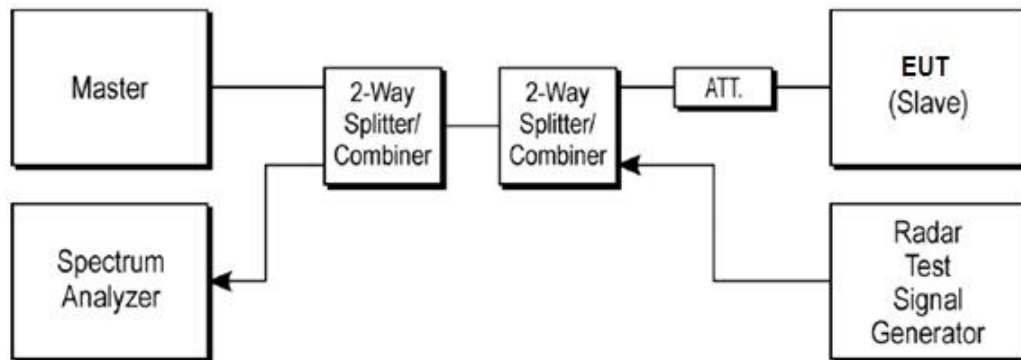
| No. | Equipment               | Model   | Serial Number | Manufacturer    | Calibration Period | Calibration Due Date |
|-----|-------------------------|---------|---------------|-----------------|--------------------|----------------------|
| 1   | Vector Signal Analyzer  | FSQ40   | 200089        | Rohde & Schwarz | 1 year             | 2025-08-12           |
| 2   | Vector Signal Generator | SMU200A | 103752        | Rohde & Schwarz | 1 year             | 2025-08-12           |
| 3   | Shielding Room          | S81     | /             | ETS-Lindgren    | /                  | /                    |

## **ANNEX A: Detailed Test Results**

### **A.1. Measurement Method**

#### **A.1.1. Conducted Measurements**

The below figure shows the DFS setup, where the EUT is a WLAN device operating in slave mode, without Radar Interference Detection function. This setup also contains a device operating in master mode. The radar test signals are injected into the master device. The EUT (slave device) is associated with the master device. WLAN traffic is generated by streaming the mpeg file from the master to the slave in full monitor video mode using the media player.



Note:

- 1) All Measurements are performed with the EUT's narrowest channel bandwidth.
- 2) The master device information is as follows  
Vendor: ASUS  
Model: GT-AXE11000  
FCC ID: MSQ-RTAXJF00
- 3) The software of radar signal generator (R&S SMU200A) is completely designed based on KDB 905462 requirement.

#### **A.1.2. Parameters of DFS test signal**

1). Interference threshold values, master or client incorporation in service monitoring. For device power less than 23dBm (E.I.R.P.), the threshold level is -62 dBm at the antenna port after correction for antenna gain and procedural adjustments.

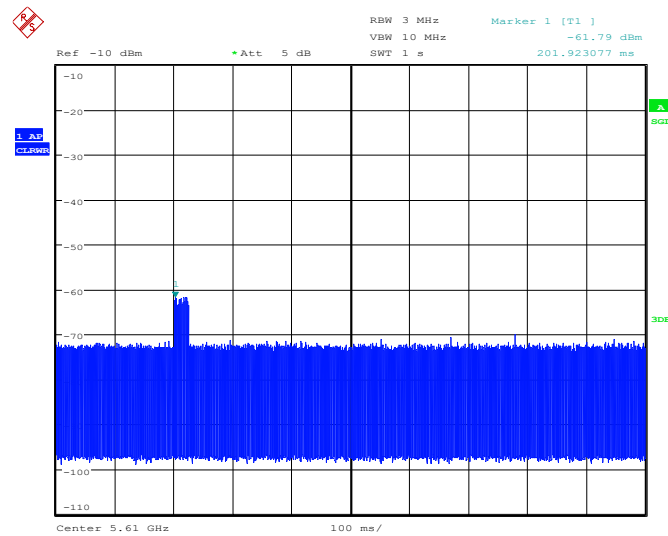
Because of conducted measurement performed, the calibration power from radar signal generator to antenna port of DFS test equipment is -62 dBm.

| Maximum Transmit Power | Value   |
|------------------------|---------|
| > 200 mW               | -64 dBm |
| < 200 mW               | -62 dBm |

The radar Detection Threshold, lowest antenna gain is the parameter of interference radar DFS detection threshold.

One 10 Second plot bee reported for the short Pulse Radar type 1-4 , the type 0 was be used, which was selected by auto test software.

Radar Waveform Calibration Result:



**Fig.A.1 80M Calibration Result**

## 2). DFS requirement values

The required values are as the following table.

| Parameter                         | Value                                               |
|-----------------------------------|-----------------------------------------------------|
| Non-occupancy                     | > 1800 s                                            |
| Channel Availability Check Time   | 60 s                                                |
| Channel Move Time                 | 10 s                                                |
| Channel Closing Transmission Time | 200 ms + 60 ms                                      |
| U-NII Detection Bandwidth         | Minimum 80% of the 99% transmission power bandwidth |

As the EUT is IP based system, the MPEG video file from NTIA website is used to steam to EUT via the Master device.

### A.1.3. Measurement Uncertainty

| Item  | Measurement Uncertainty |
|-------|-------------------------|
| Time  | 0.70 ms                 |
| Power | 0.75 dBm                |

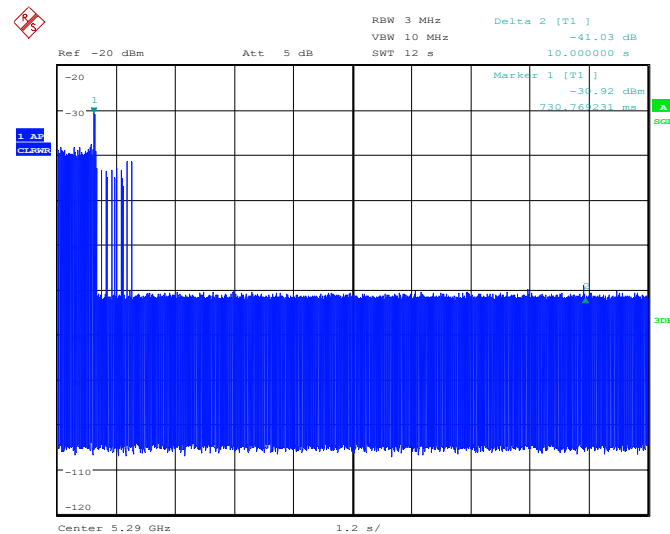
## A.2. Channel move time and channel closing transmission time

### Measurement Limit:

| Test Items                        | Limit            |
|-----------------------------------|------------------|
| channel closing transmission time | < 200 ms + 60 ms |
| Channel move time                 | < 10 s           |

### Measurement Results:

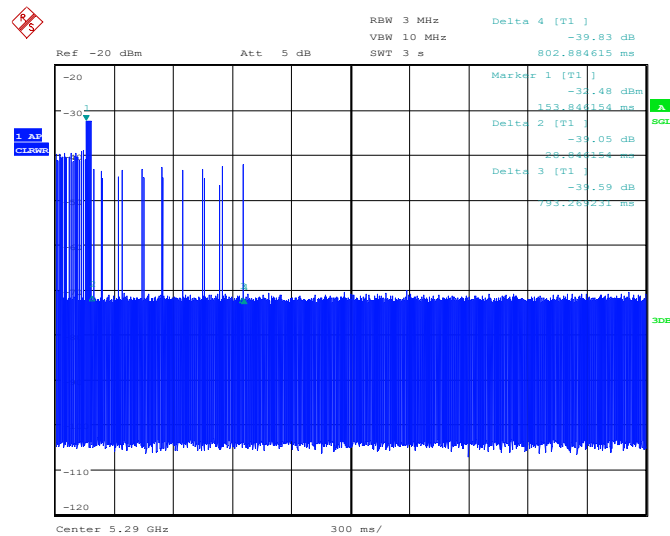
Frequency Band: 5250MHz ~ 5350MHz(80M-5290MHz)



Date: 18.JUL.2024 16:13:49

**Fig.A.2 Channel move time**

The channel move time is as the figure. It shows the time of the radar and the client pulses. The figure shows that the client stops transmission within 10 seconds, and no transmissions occur after 10 seconds later of the radar burst signal.



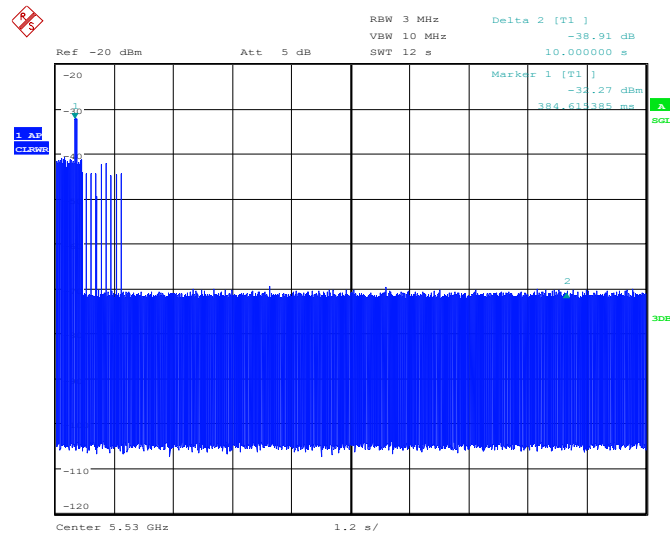
Date: 18.JUL.2024 15:44:07

**Fig.A.3 channel closing transmission time**

The closing transmission time is as the figure, and the result is  
 $173.00\text{ms} = \text{Delta}2 + (\text{Delta}4 - \text{Delta}3) * 15$ .

**Conclusion: PASS**

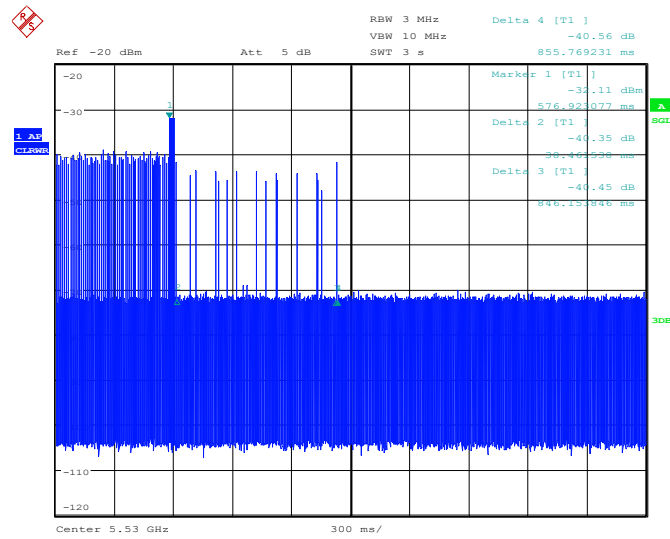
### Frequency Band 5470MHz ~ 5725MHz(80M-5530MHz)



Date: 19.JUL.2024 14:51:23

**Fig.A.4 Channel move time**

The channel move time is as the figure. It shows the time of the radar and the client pulses. The figure shows that the client stops transmission within 10 seconds, and no transmissions occur after 10 seconds later of the radar burst signal.



Date: 19.JUL.2024 11:20:50

**Fig.A.5 channel closing transmission time**

The closing transmission time is as the figure, and the result is  
 $182.69\text{ms} = \text{Delta}2 + (\text{Delta}4 - \text{Delta}3) * 15$ .

**Conclusion: PASS**

### A.3.Non-Occupancy Period

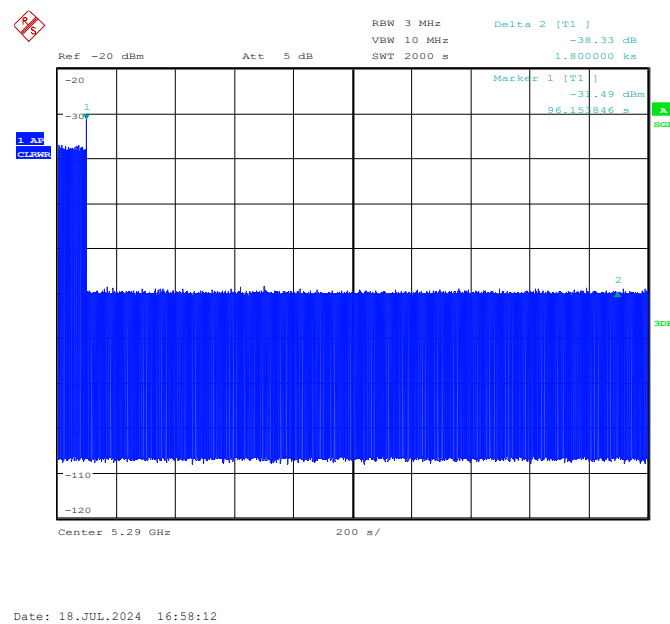
#### Measurement Limit:

| Test Items           | Limit    |
|----------------------|----------|
| Non-Occupancy Period | > 1800 s |

#### A3.1 Associated test

Associate the master and client, transmit specified stream between the master and client; monitor the analyzer on the operating frequency to make sure no beacons have been transmitted for 1800 seconds.

**Frequency Band: 5150MHz ~ 5350MHz(80M-5290MHz)**

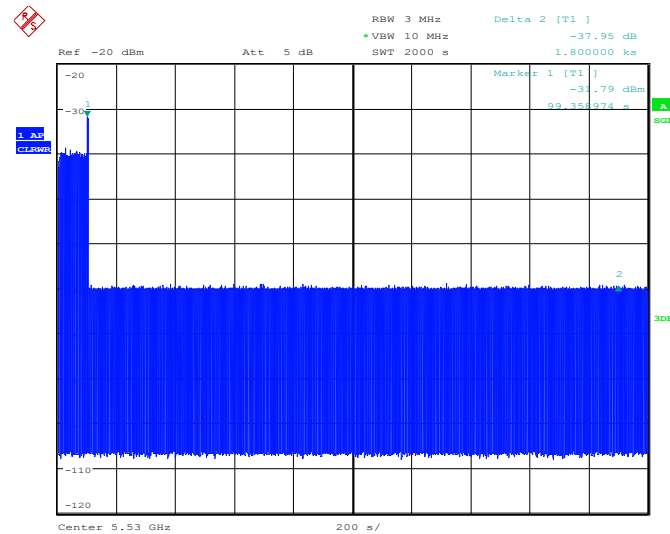


**Fig.A.6 Non-Occupancy Period**

The figure above shows that the client does not transmit any emission within 1800 seconds after getting the order of “stop transmits” from the DFS master (access point).

**Conclusion: PASS**

**Frequency Band: 5470MHz ~ 5725MHz(80M-5530MHz)**



Date: 22.JUL.2024 13:45:08

**Fig.A.7 Non-Occupancy Period**

The figure above shows that the client does not transmit any emission within 1800 seconds after getting the order of “stop transmits” from the DFS master (access point).

**Conclusion: PASS**

#### **A.4. Antenna Requirement**

The antenna of the device is permanently attached. There are no provisions for connection to an external antenna.

The unit complies with the requirement of FCC Part 15.203.

#### **ANNEX B: EUT parameters**

Disclaimer: The antenna gain provided by the client may affect the validity of the measurement results in this report, and the client shall bear the impact and consequences arising therefrom.

## **ANNEX C: Accreditation Certificate**



### **Accredited Laboratory**

A2LA has accredited

### **TELECOMMUNICATION TECHNOLOGY LABS, CAICT**

*Beijing, People's Republic of China*

for technical competence in the field of

### **Electrical Testing**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



Presented this 23<sup>rd</sup> day of July 2024.



Mr. Trace McInturf, Vice President, Accreditation Services  
For the Accreditation Council  
Certificate Number 7049.01  
Valid to July 31, 2026

*For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.*

**\*\*\* END OF REPORT BODY \*\*\***