

RF TEST REPORT

Applicant : Shenzhen Gotron Electronic CO.,LTD.

Product Name : Smart Phone

Brand Name : ulefone

Model Name : GQ5012

Series Model : Armor 29 Pro, Armor 29 Ultra, Armor 29, Armor 29T
Ultra, Armor 29T Pro, Armor 29 Lite, Armor 29s,
Armor 29s Pro

FCC ID : 2AOWK-5012

Test Standard : 47 CFR Part 2, Part24E, Part22H

Date of Sample Arrival : 2025.02.11

Date of Test : 2025.02.11-2025.04.25

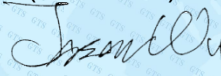
Issue Date : 2025.04.25

Report Prepared by :



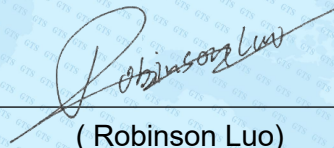
(Jacob Cai)

Report Approved by :



(Jason Wu)

Authorized Signatory :



(Robinson Luo)

Authorized Signature:

Robinson Luo

Laboratory Manager

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver

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REVISION HISTORY

Rev.	Issue Date	Revisions	Revised by
00	2025.04.25	Initial Release	N/A

DECLARATION OF REPORT

1. The device has been tested by GTS, and the test results show that the equipment under test (EUT) is in compliance with the requirements of 47 CFR Part 2, Part 24E, Part 22H. And it is applicable only to the tested sample identified in the report.
2. This report shall not be reproduced except in full, without the written approval of GTS, this document only be altered or revised by GTS, personal only, and shall be noted in the revision of the document.
3. The general information of EUT in this report is provided by the customer or manufacture, GTS is only responsible for the test data but not for the information provided by the customer or manufacture.
4. The results in this report is only apply to the sample as tested under conditions. The customer or manufacturer is responsible for ensuring that the additional production units of this model have the same electrical and mechanical components.

1. GENERAL DESCRIPTION

1.1. Applicant

Name : Shenzhen Gotron Electronic CO.,LTD.
Address : 7B01, Building A, Block 1, Anhongji Tianyao Plaza, Longhua District, Shenzhen City,
Guangdong Province China

1.2. Manufacturer

Name : Shenzhen Gotron Electronic CO.,LTD.
Address : 7B01, Building A, Block 1, Anhongji Tianyao Plaza, Longhua District, Shenzhen City,
Guangdong Province China

1.3. Factory

Name : Shenzhen Gotron Electronic CO.,LTD.
Address : 7B01, Building A, Block 1, Anhongji Tianyao Plaza, Longhua District, Shenzhen City,
Guangdong Province China

1.4. General Information of EUT

Product Designation:	Smart Phone	
Brand Name	ulefone	
Model Name	GQ5012	
Series Model	Armor 29 Pro, Armor 29 Ultra, Armor 29, Armor 29T Ultra, Armor 29T Pro, Armor 29 Lite, Armor 29s, Armor 29s Pro	
Model Difference	All the same except for model name	
Hardware Version:	N/A	
Software Version:	N/A	
Support Networks:	GSM, GPRS, EDGE	
Frequency Bands:	☒ GPRS 850 ☒ PCS1900 (U.S. Bands) ☐ GSM 900 ☐ DCS 1800 (Non-U.S. Bands)	
Type of Modulation:	GMSK,8PSK Modulation For GSM/GPRS/EDGE	
Frequency Range:	GSM/GPRS/EDGE 850: 824.2MHz-848.8 MHz	
	GSM/GPRS/EDGE 1900: 1850.2MHz-1909.8 MHz	
Emission Designator:	GSM/GPRS 850:	246KGXW
	EDGE 850:	243KG7W
	GSM/GPRS 1900:	249KGXW
	EDGE 1900:	246KG7W
AntennaType:	PIFAAntenna	
Antenna gain:	GSM850:-2.25dBi	PCS1900: 1.9dBi
Power Supply:	DC 7.74V For Battery	
Adapter:	Input:100-240V~50/60Hz 1.8AOutput:5.0V== 3.0A 15.0W OR 9.0V== 3.0A 27.0W OR 12.0V== 3.0A 36.0W OR 15.0V== 3.0A 45.0W OR 20.0V== 5.0A 100.0W MAX PPS:3.6V-20.0V== 6.0A 120.0W MAX	
Battery parameter:	Rated Voltage:7.74V Charge Limit Voltage:8.9V Capacity:10600mAh	
SIM Card Description:	The prototype supports dual cards	
Connecting I/O Port(s)	Refer to the remark below.	

Remark:

The above information of EUT was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.5. Environmental conditions

Temperature	Normal Temperature(NT):	25°C
	High Temperature(HT):	40°C
	Low Temperature(LT):	-10°C
Voltage	Normal Voltage(NV):	7.74V
	High Voltage(HV):	8.514V
	Low Voltage(LV):	7.353V
Other	Relative Humidity	55 %
	Air Pressure	101 kPa

1.6. Modification of EUT

No modifications are made to the EUT during all test items.

1.7. Laboratory Information

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC —Registration No.: 381383**

Designation Number: CN5029

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files.

- **ISED—Registration No.: 9079A**

CAB identifier: CN0091

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of ISED for radio equipment testing.

- **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

All tests were performed at:

Global United Technology Services Co., Ltd.

Address: No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

Tel: 0755-27798480

Fax: 0755-27798960

1.8. Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

47 CFR Part 2, 22(H), 24(E)

ANSI C63.26-2015

FCC KDB 971168 D01 Power Meas License Digital Systems v03r01

Remark:

All test items were verified and recorded according to the standards and without any deviation during the test.

2. TEST CONFIGURATION OF EQUIPMENT UNDER TEST

2.1. Test Mode

Bands	Tx/Rx Frequency	RF Channel		
		Low(L)	Middle(M)	High(H)
GSM/GPRS/ EDGE850	TX (824 MHz ~ 849 MHz)	Channel 128	Channel 190	Channel 251
		824.2 MHz	836.6 MHz	848.8 MHz

Bands	Tx/Rx Frequency	RFChannel		
		Low(L)	Middle(M)	High(H)
GSM/GPRS/ EDGE1900	TX (1850 MHz-1910 MHz)	Channel 512	Channel 661	Channel 810
		1850.2 MHz	1880.0 MHz	1909.8 MHz

Pre-scan all bandwidth and RB, find worse case mode are chosen to the report, the worse mode applicability and tested channel detail as below:

Band	Radiated	Conducted
GSM/GPRS/ EDGE850/1900	GSM (GMSK, 1Tx-slot)Link GPRS (GMSK, 1Tx-slot)Link EDGE (8PSK, 1Tx-slot)Link	GSM (GMSK, 1Tx-slot)Link GPRS (GMSK, 1Tx-slot)Link EDGE (8PSK, 1Tx-slot)Link

2.2. Summary of Test Results

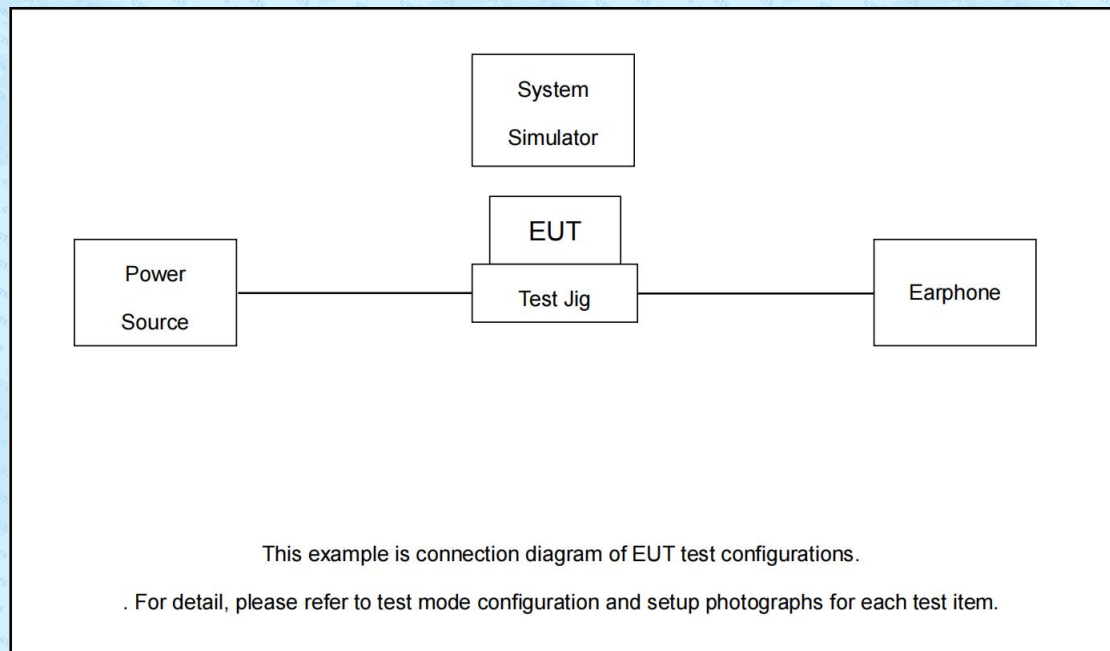
Conducted Test:

Item	Test Description	FCC Rules	Result
1	Occupied Bandwidth	§2.1049	Pass
2	Band Edge / Spurious and Harmonic Emissions at Antenna Terminal	§2.1051, §22.917(a), §24.238(a)	Pass
5	Conducted Output Power	§2.1046	Pass
6	Frequency stability / variation of ambient temperature	§2.1055, § 22.355, §24.235	Pass
7	Peak- to- Average Ratio	§24.232(d)	Pass

Radiated Test:

Item	Test Description	FCC Rules	Result
1	Effective Radiated Power	§22.913(a)(5)	Pass
2	Equivalent Isotropic Radiated Power	§24.232(c)	Pass
3	Radiated Spurious and Harmonic Emissions	§2.1053, §22.917(a), §24.238(a),	Pass

2.3. Connection Diagram of Test System



2.4. Support Unit used in test configuration and system

NO.	Unit	Brand	Model	Description
1	--	--	--	--
2	--	--	--	--

2.5. Equipment List

2.5.1. For Conducted Test

Conducted Test :						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
1	Spectrum Analyzer	R&S	FSV40-N	102126	2024-08-09	2025-08-08
2	Signal Generator	KEYSIGHT	N5173B	MY62220592	2024-08-09	2025-08-08
3	Vector Signal Generator	KEYSIGHT	N5182B	MY57301571	2024-08-09	2025-08-08
5	Wideband Radio CommunicAtion Tester	R&S	CMW500	1201.0002K50-147120-bM	2024-08-09	2025-08-08
6	Temperature/Humidity Meter	Bomfo	JR609	/	2024-08-09	2025-08-08
7	High and low temperature test chamber	Shanghai Xunpi Technology (Group) Co., Ltd	XP/GDWH-0.225-70	XP202306008	2024-08-09	2025-08-08
8	Cable	Lyle Microwave	SMAM	RG142	/	/
Test Software						
Name of Software:		WCS-LTE				
Version:		2023.09.01				

2.5.2. For Radiated Spurious Emission

Radiated Spurious Emission :						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
1	BiLog Antenna (25MHz-1GHz)	SCHAFFNER	CBL6112B	2740	2024-08-09	2025-08-08
2	Horn Antenna (1-18GHz)	Schwarzbeck	BBHA 9120D	2800	2024-08-09	2025-08-08
3	Amplifier (25MHz-1GHz)	Ce Shen	DLNA-20-10 00	CSKJLNA23 0822A	2024-08-09	2025-08-08
4	Amplifier (1-18GHz)	Ce Shen	DLNA-1000-18000	CSKJLNA23 0813B	2024-08-09	2025-08-08
5	Receiver	R&S	ESPI3	100440	2024-08-09	2025-08-08
6	Spectrum Analyzer	Agilent	N9020A	MY5128546 0	2024-08-09	2025-08-08
7	Filter Box	XingBo	EZSVFU1& EZSVFU2	N/A	N/A	N/A
8	Cable	Lyle Microwave	SMAM	RG142	/	/
9	Vector signal generator	Keysight	N5182B	MY5020081 1	2024.05.21	2025.05.20
10	Horn Antenna (1-18GHz)	Schwarzbeck	BBHA 9120D	2802	2024-08-11	2025-08-10
11	BiLog Antenna (25MHz-1GHz)	SCHAFFNER	CBL6112B	2797	2024-08-09	2025-08-08
Test software						
Name of Software:		WCS-RSE				
Version:		2021.11.04.01				

2.5.3. For AC Power-Line Conducted Emission

Item	Equipment Name	Manufacturer	Model	Serial No.	Calibration Date	Calibration Until
1	Test Receiver	R&S	ESPI	101679	2024.05.22	2025.05.21
2	LISN	R&S	ENV216	100300	2024.05.22	2025.05.21
3	LISN	R&S	ENV216	100333	2024.05.22	2025.05.21
4	Thermometer	DeLi	N/A	N/A	2024.09.22	2025.09.21
5	Test Software	FALA	EZ-EMC	N/A	N/A	N/A

2.6. Measurement Uncertainty

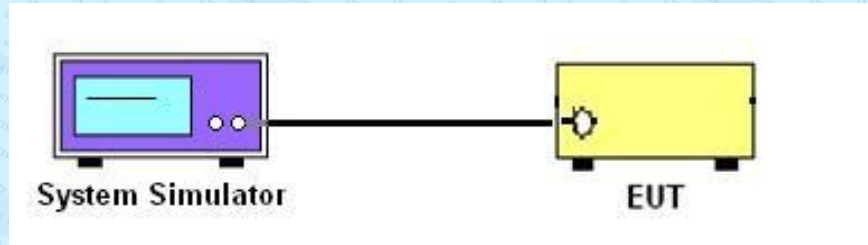
The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	Occupied Channel Bandwidth	$\pm 4\%$
2	Transmitter power conducted	± 0.56 dB
3	Transmitter power Radiated	± 2.20 dB
4	Conducted spurious emission	± 1.60 dB
5	Radiated spurious emission	± 2.20 dB
6	Temperature	$\pm 0.6^{\circ}\text{C}$
7	Humidity	$\pm 2\%$
8	DC and low frequency voltages	$\pm 0.05\%$
9	Radio frequency error	$\pm 3 \times 10^{-8}$

3. TEST RESULT

3.1. Conducted Output Power

3.1.1. Test Setup



3.1.2. Test Procedures

1. The testing follows ANSI C63.26 Section 5.2.
2. The transmitter output port was connected to the system simulator.
3. Set EUT at maximum power through the system simulator.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. Measure and record the power level from the system simulator.

3.1.3. Test Result

Please refer to the Appendix A1.

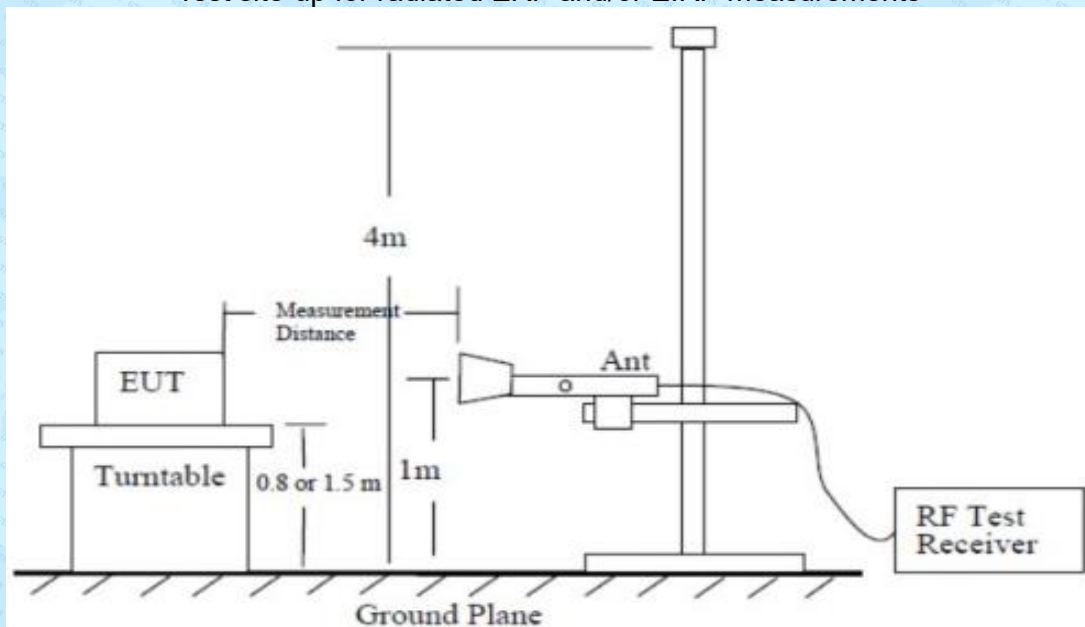
3.2. Effective Radiated Power and Effective Isotropic Radiated Power

3.2.1. Test Limit

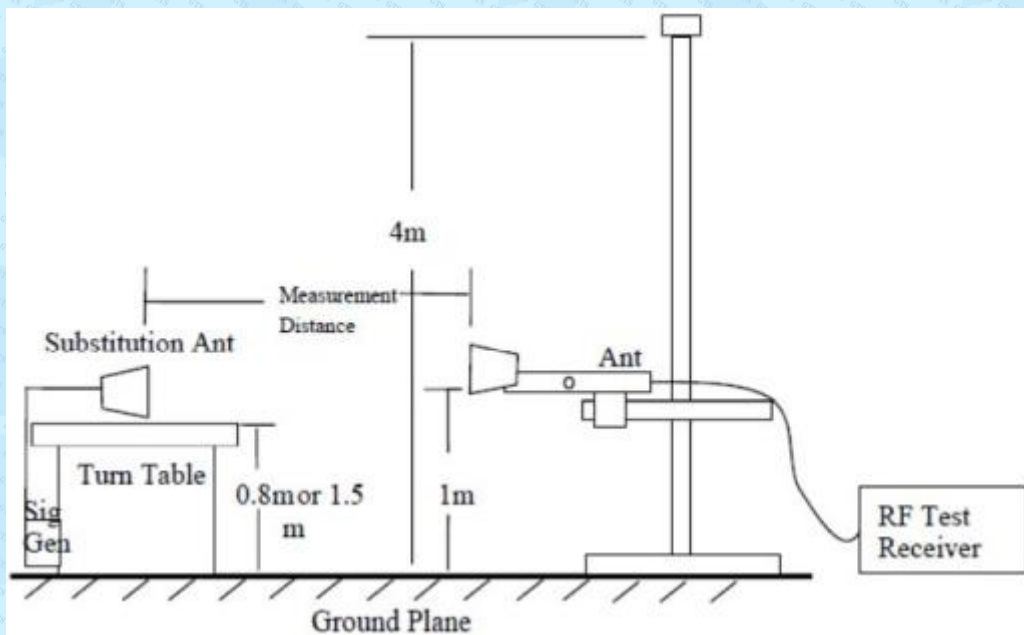
The substitution method, in ANSI/TIA-603-E-2016, was used for ERP/EIRP measurement, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v03. The ERP of mobile transmitters must not exceed 7 Watts (Cellular Band) and the EIRP of mobile transmitters are limited to 2 Watts (PCS Band).

3.2.2. Test Setup

Test site-up for radiated ERP and/or EIRP measurements



Substitution method set-up for radiated emission



3.2.3. Test Procedures

1. The measurements procedures specified in ANSI/TIA-603-E-2016 were applied.

In an anechoic antenna test chamber, a half-wave dipole antenna for the frequency band of interest is placed at the reference centre of the chamber. An RF Signal source for the frequency band of interest is connected to the dipole with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A known (measured) power (P_{in}) is applied to the input of the dipole, and the power received (P_r) at the chamber's probe antenna is recorded.

2. The relevant equation for determining the ERP or EIRP from the conducted RF output power measured using the guidance provided above is:

$$ERP/EIRP = SGLevel - P_{cl} + G_a$$

where:

ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as SGLevel, typically dBW or dBm);

SGLevel = Signal generator output power or PSD, in dBm or dBW;

G_a = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

P_{cl} = signal attenuation in the connecting cable between the transmitter and antenna.

The EUT is substituted for the dipole at the reference centre of the chamber and a scan is performed to obtain the radiation pattern.

From the radiation pattern, the co-ordinates where the maximum antenna gain occurs are identified.

3. The EUT is then put into continuously transmitting mode at its maximum power level. Power

mode measurements are performed with the receiving antenna placed at the coordinates determined in Step 3 to determine the output power as defined in Rule 24.232 (b) and (c). The "reference path loss" from Step1 is added to this result.

This value is EIRP since the measurement is calibrated using a half-wave dipole antenna of known gain (2.15 dBi) and known input power (Pin).

ERP can be calculated from EIRP by subtracting the gain of the dipole, $ERP = EIRP - 2.15\text{dBi}$.

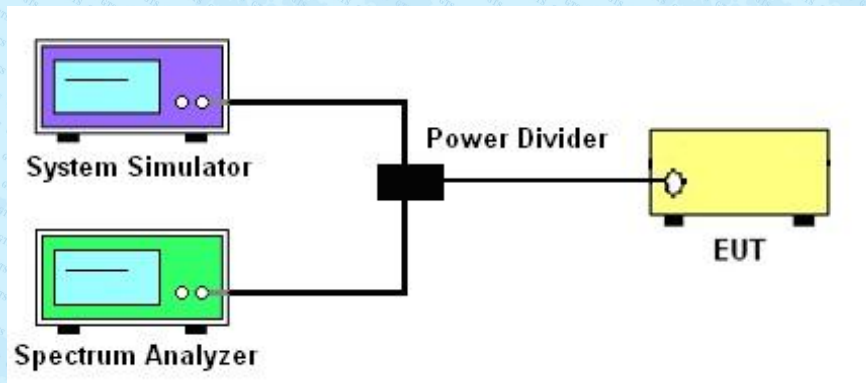
4. Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

3.2.4. Test Result

Please refer to the Appendix A1.

3.3. Peak-to-Average Ratio

3.3.1. Test Setup



3.3.2. Description of the PAR Measurement

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

3.3.3. Test Procedures

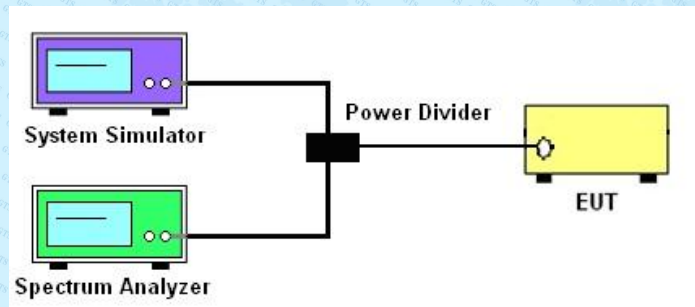
1. The testing follows ANSI C63.26 Section 5.2.3.4 (CCDF).
2. The EUT was connected to spectrum and system simulator via a power divider.
3. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
4. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
5. Record the deviation as Peak to Average Ratio.

3.3.4. Test Result of Peak-to-Average Ratio

Please refer to the Appendix A2.

3.4. Occupied Bandwidth

3.4.1. Test Setup



3.4.2. Description of Occupied Bandwidth Measurement

The occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

3.4.3. Test Procedures

1. The testing follows ANSI C63.26 Section 5.4.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be between two and five times the anticipated OBW.
4. The nominal resolution bandwidth (RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.
5. Set the detection mode to peak, and the trace mode to max hold.
6. Determine the reference value: Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace.(this is the reference value)
7. Determine the “-26 dB down amplitude” as equal to (Reference Value – X).
8. Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the “-X dB down amplitude” determined in step 6. If a marker is below this “-X dB down amplitude” value it shall be placed as close as possible to this value. The OBW is the positive frequency difference between

the two markers.

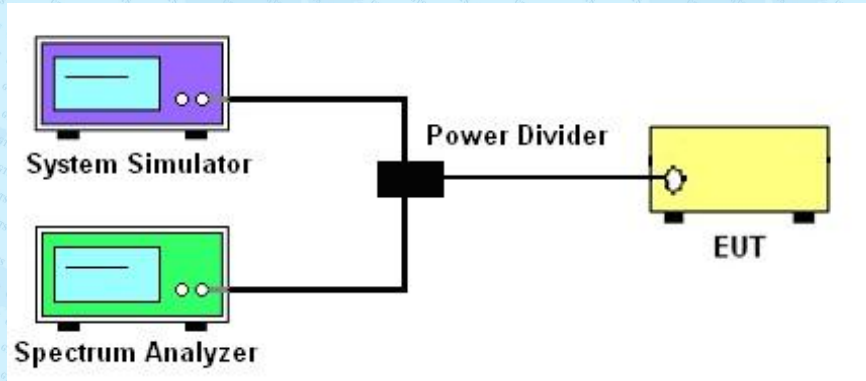
9. Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

3.4.4. Test Result of Occupied Bandwidth

Please refer to the Appendix A3.

3.5. Conducted Band Edge

3.5.1. Test Setup



3.5.2. Description of Conducted Band Edge Measurement

22.917(a):

For operations in the 824 – 849 MHz band, the FCC limit is $43 + 10\log_{10}(P[\text{Watts}])$ dB below the transmitter power $P(\text{Watts})$ in a 100kHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

24.238 (a):

For operations in the 1850-1910 and 1930-1990 MHz band, the FCC limit is $43 + 10\log_{10}(P[\text{Watts}])$ dB below the transmitter power $P(\text{Watts})$ in a 1MHz bandwidth. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

27.53 (g):

For operations in the 600MHz band and 698 -746 MHz band, the FCC limit is $43 + 10\log_{10}(P[\text{Watts}])$ dB below the transmitter power $P(\text{Watts})$ in a 100 kHz bandwidth. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

27.53 (h):

For operations in the 1710 – 1755 MHz and 1710 – 1780 MHz band, the FCC limit is $43 + 10\log_{10}(P[\text{Watts}])$ dB below the transmitter power $P(\text{Watts})$ in a 1 MHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental

emission of the transmitter may be employed.

3.5.3. Test Procedures

1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The band edges of low and high channels for the highest RF powers were measured.
4. Set RBW $\geq$ 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
5. Beyond the 1 MHz band from the band edge, RBW=1MHz was used or a narrower RBW was used and the measured power was integrated over the full required measurement bandwidth of 1 MHz.
6. Set spectrum analyzer with RMS detector.
7. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
8. Checked that all the results comply with the emission limit line.

Example:

The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)

$$= P(W) - [43 + 10\log(P)] \text{ (dB)}$$

$$= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)} = -13\text{dBm}$$

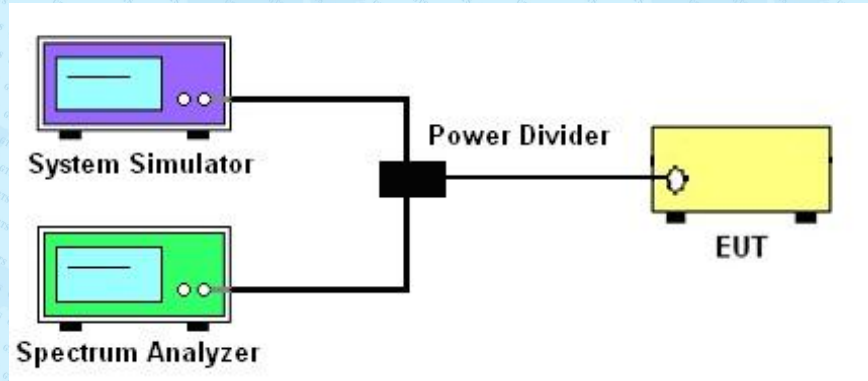
9. When using the integration method, the starting frequency of the integration shall be centered at one-half of the RBW away from the band edge.

3.5.4. Test Result of Conducted Band Edge

Please refer to the Appendix A4.

3.6. Conducted Spurious Emission

3.6.1. Test Setup



3.6.2. Description of Conducted Spurious Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

3.6.3. Test Procedures

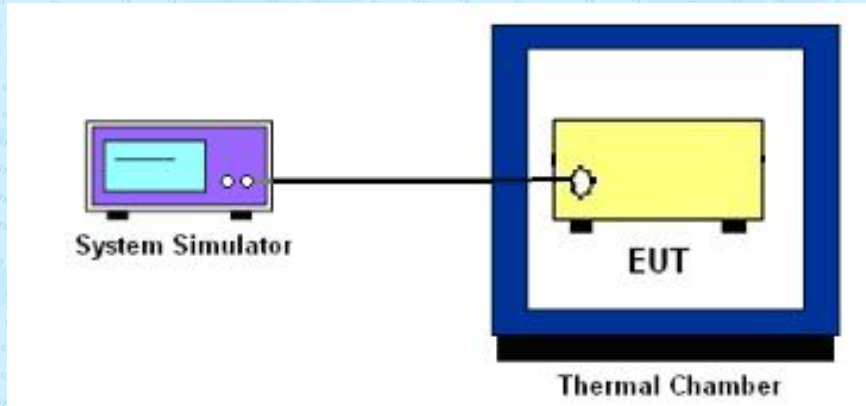
1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
4. The middle channel for the highest RF power within the transmitting frequency was measured.
5. The conducted spurious emission for the whole frequency range was taken.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz.
7. Set spectrum analyzer with RMS detector.
8. Taking the record of maximum spurious emission.
9. The RF fundamental frequency should be excluded against the limit line in the operating frequency band
10. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10\log(P)] \text{ (dB)} = [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)} = -13\text{dBm}.$

3.6.4. Test Result of Conducted Spurious Emission

Please refer to the Appendix A5.

3.7. Frequency Stability

3.7.1. Test Setup



3.7.2. Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ ($\pm 2.5\text{ppm}$) of the center frequency.

3.7.3. Test Procedures for Temperature Variation

1. The testing follows ANSI C63.26 section 5.6.4.
2. The EUT was set up in the thermal chamber and connected with the system simulator.
3. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
4. With power OFF, the temperature was raised in 10°C step up to 50°C . The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

3.7.4. Test Procedures for Voltage Variation

1. The testing follows ANSI C63.26 section 5.6.5
2. The EUT was placed in a temperature chamber at $20\pm 5^{\circ}\text{C}$ and connected with the system simulator.
3. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value for other than hand carried battery equipment.
4. For hand carried, battery powered equipment, reduce the primary ac or dc supply voltage to the battery operating end point, which shall be specified by the manufacturer.
5. The variation in frequency was measured for the worst case.

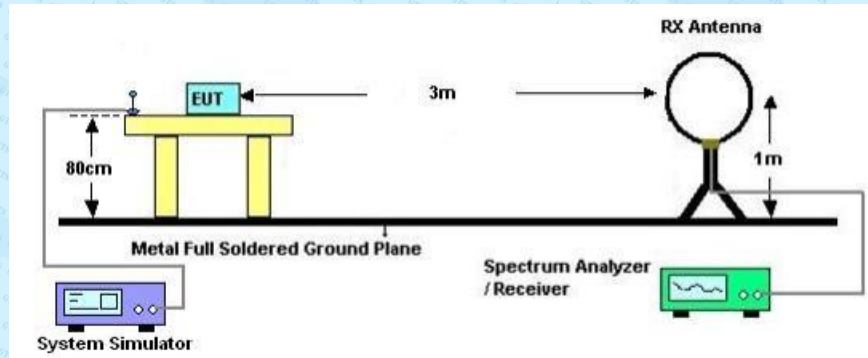
3.7.5. Test Result of Frequency Stability

Please refer to the Appendix A6.

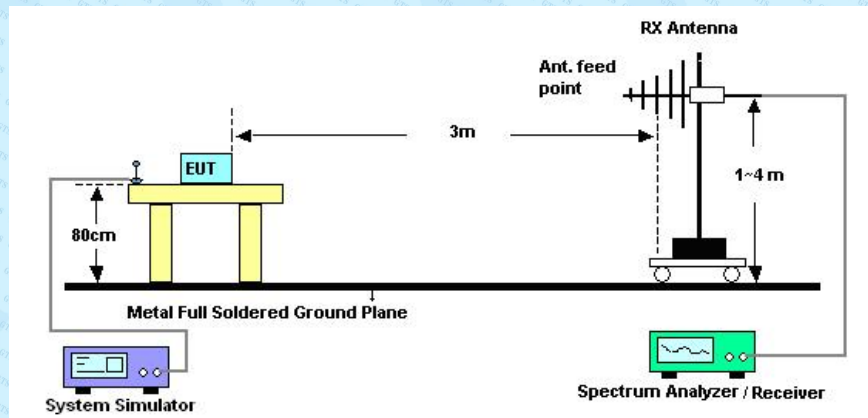
3.8. Radiated Spurious Emission

3.8.1. Test Setup

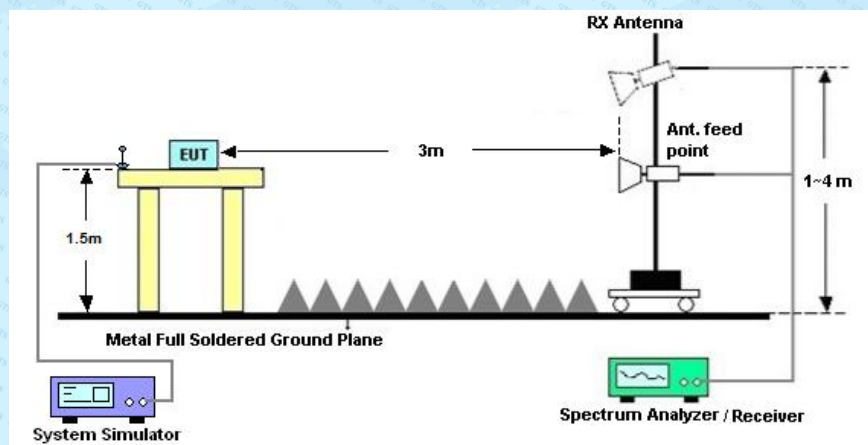
3.8.1.1. For radiated test below 30MHz



3.8.1.2. For radiated test from 30MHz to 1GHz



3.8.1.3. For radiated test above 1GHz



3.8.2. Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI C63.26.

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log(P)$ dB.

The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

3.8.3. Test Procedures

1. The testing follows ANSI C63.26 Section 5.5
2. The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. The height of the receiving antenna is varied between 1m to 4m to search the maximum spurious emission for both horizontal and vertical polarizations.
6. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power.
7. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
8. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
9. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
10. $EIRP \text{ (dBm)} = S.G. \text{ Power} - Tx \text{ Cable Loss} + Tx \text{ Antenna Gain}$
11. $ERP \text{ (dBm)} = EIRP - 2.15$
12. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10\log(P)] \text{ (dB)}$
 $= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$
 $= -13\text{dBm}.$

3.8.4. Test Result of Radiated Spurious Emission

The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

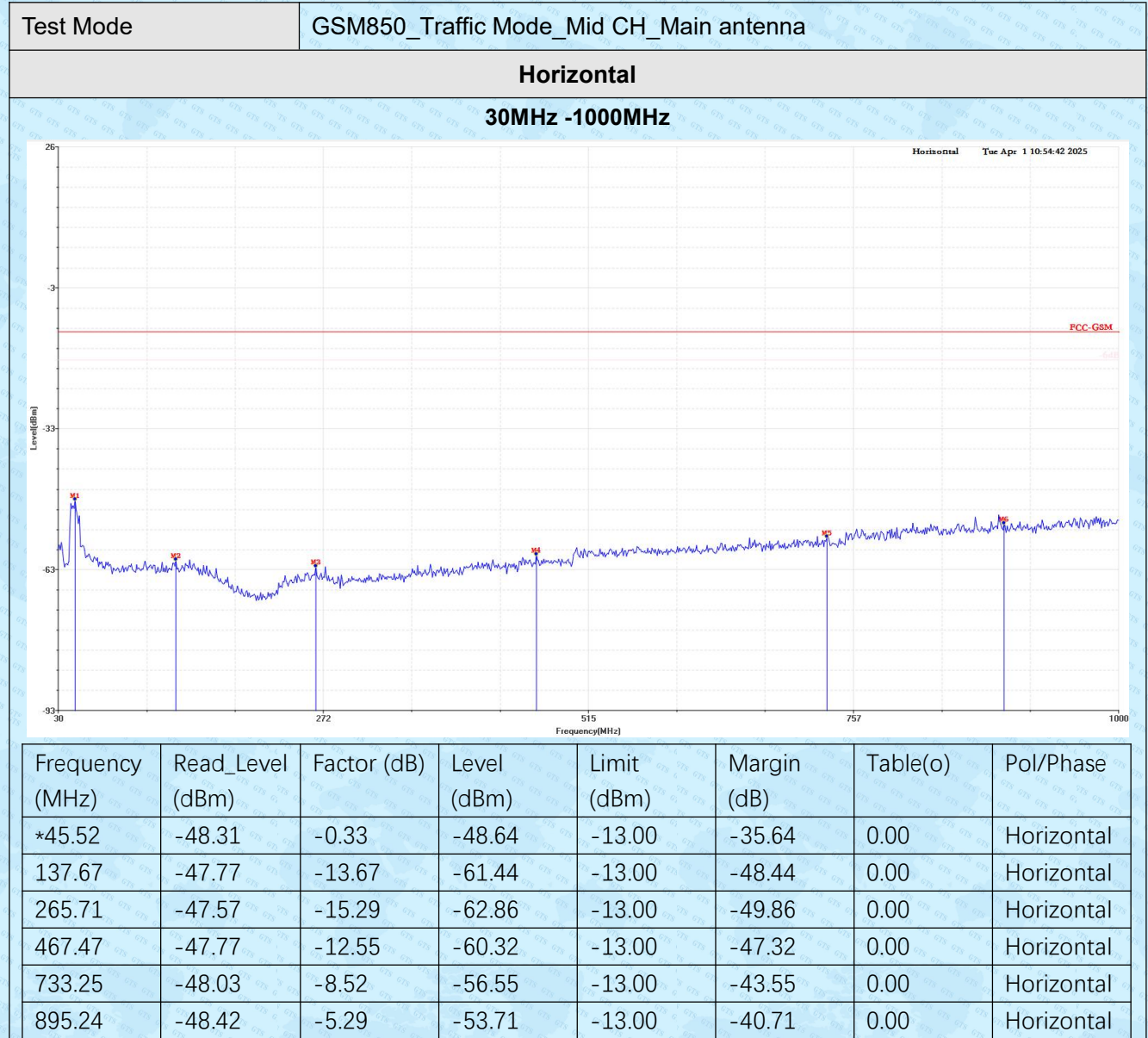
For frequencies above 30 MHz, the test results are as follows

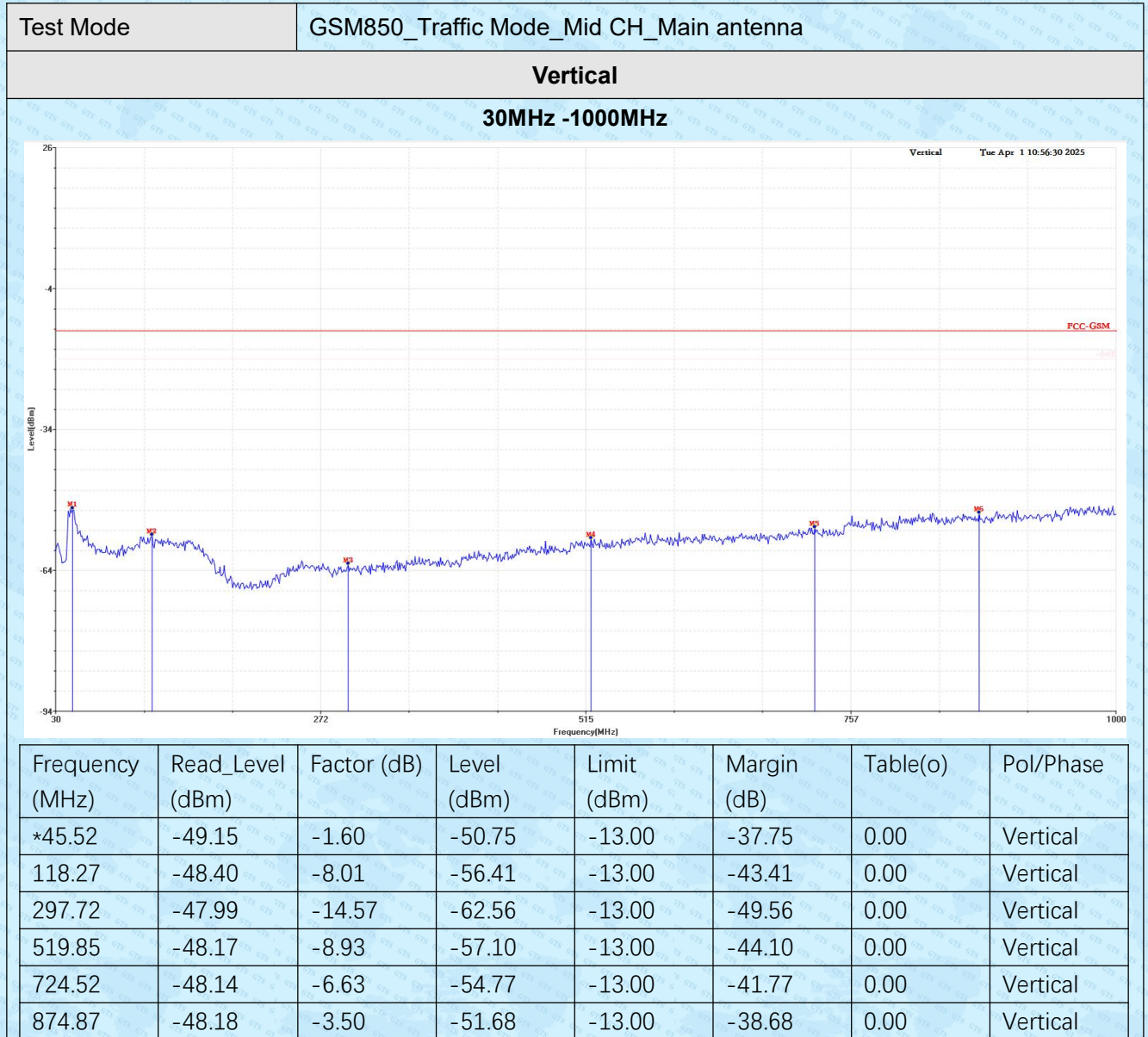
Test Results

Radiated spurious emissions - MS allocated a channel

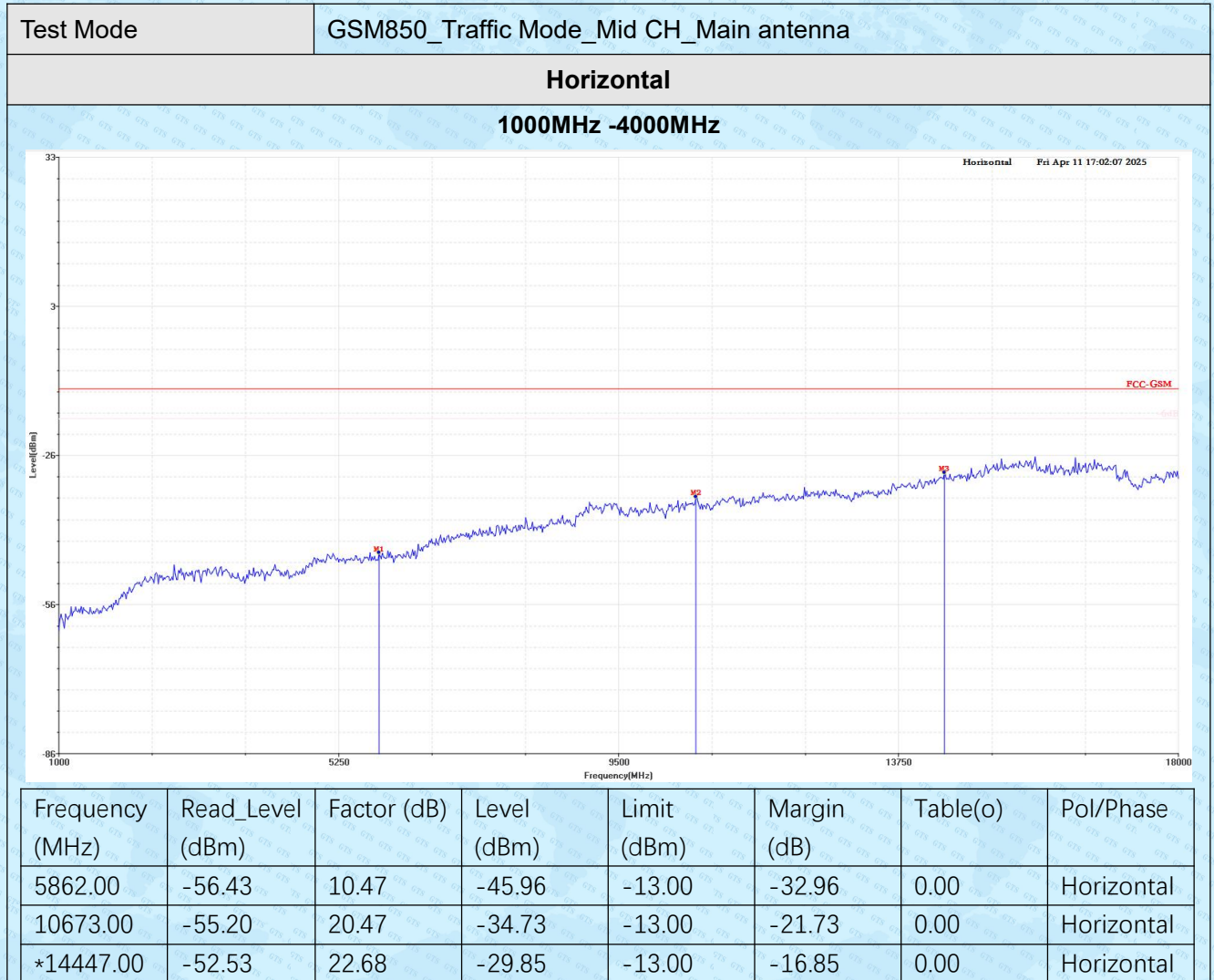
Below 1GHz:

Only the worst model is shown





Above1GHz:

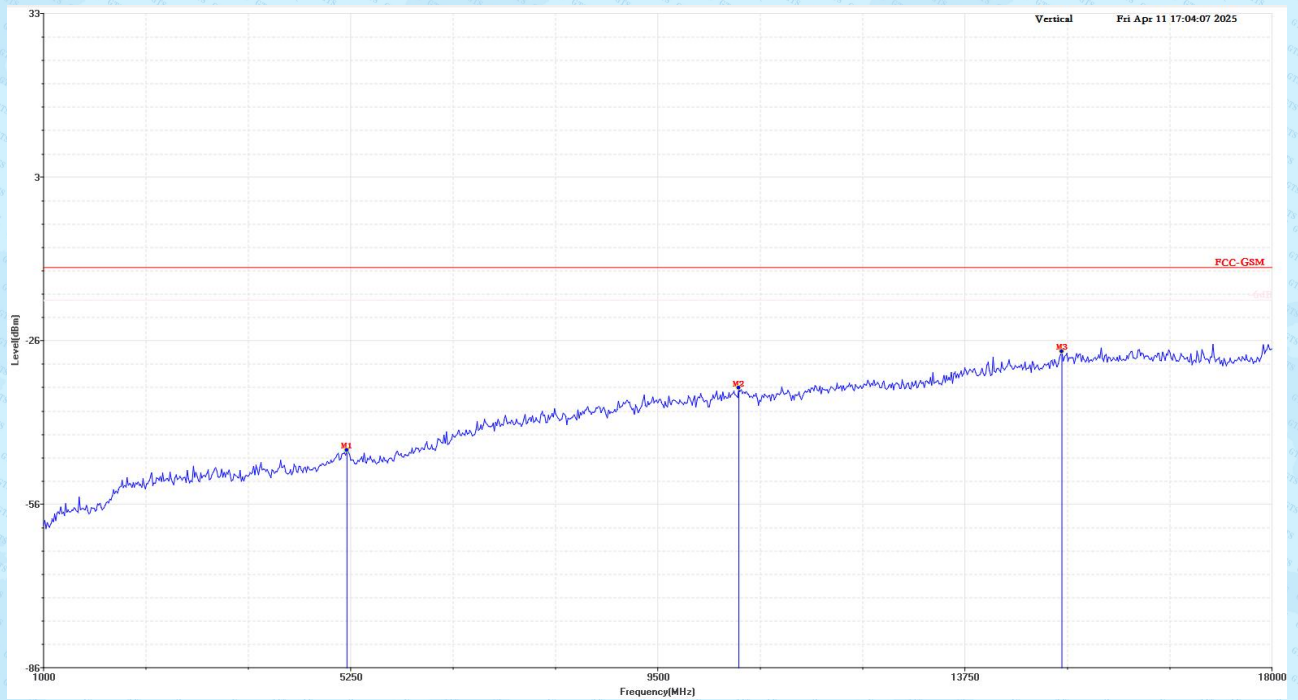


Test Mode

GSM850_Traffic Mode_Mid CH_Main antenna

Vertical

1000MHz -4000MHz



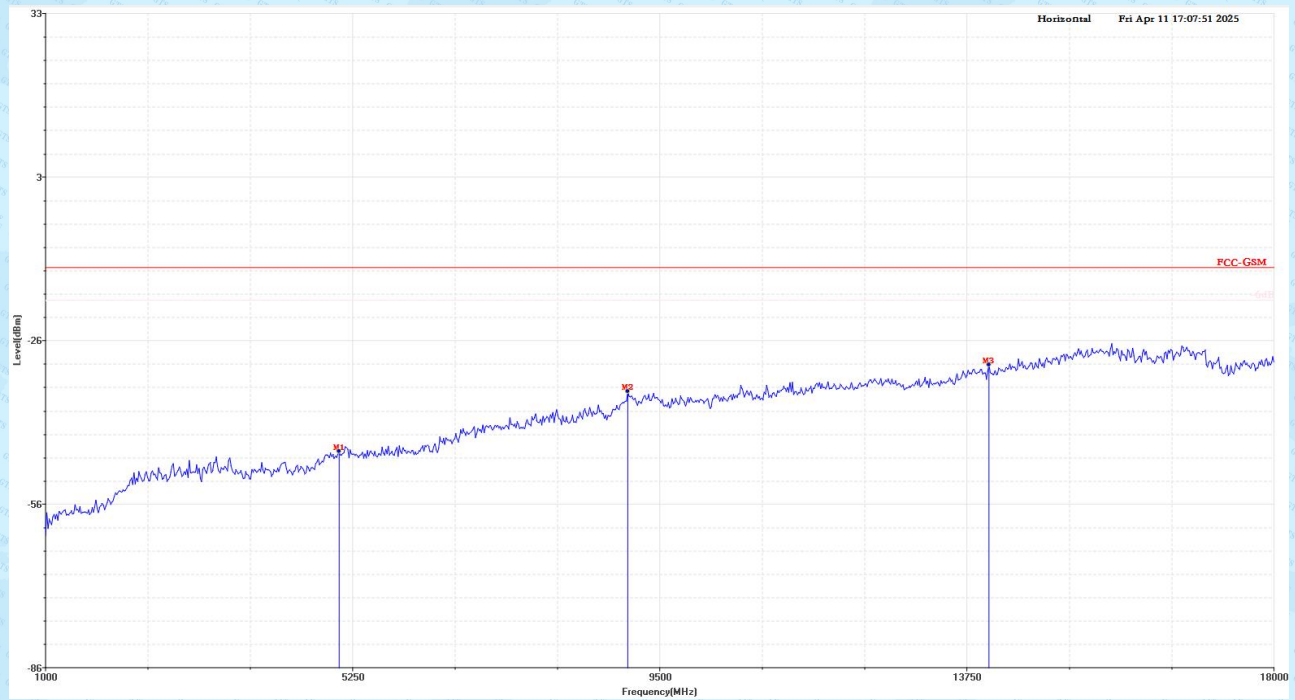
Frequency (MHz)	Read_Level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Table(o)	Pol/Phase
5199.00	-56.08	9.55	-46.53	-13.00	-33.53	0.00	Vertical
10622.00	-55.82	20.73	-35.09	-13.00	-22.09	0.00	Vertical
*15093.00	-52.09	23.67	-28.42	-13.00	-15.42	0.00	Vertical

Test Mode

GSM850_Traffic Mode_High CH_Main antenna

Horizontal

1000MHz -4000MHz



Test Summary Result

Frequency (MHz)	Read_Level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Table(o)	Pol/Phase
5063.00	-56.57	9.84	-46.73	-13.00	-33.73	0.00	Horizontal
9058.00	-55.62	19.89	-35.73	-13.00	-22.73	0.00	Horizontal
*14056.00	-53.25	22.39	-30.86	-13.00	-17.86	0.00	Horizontal

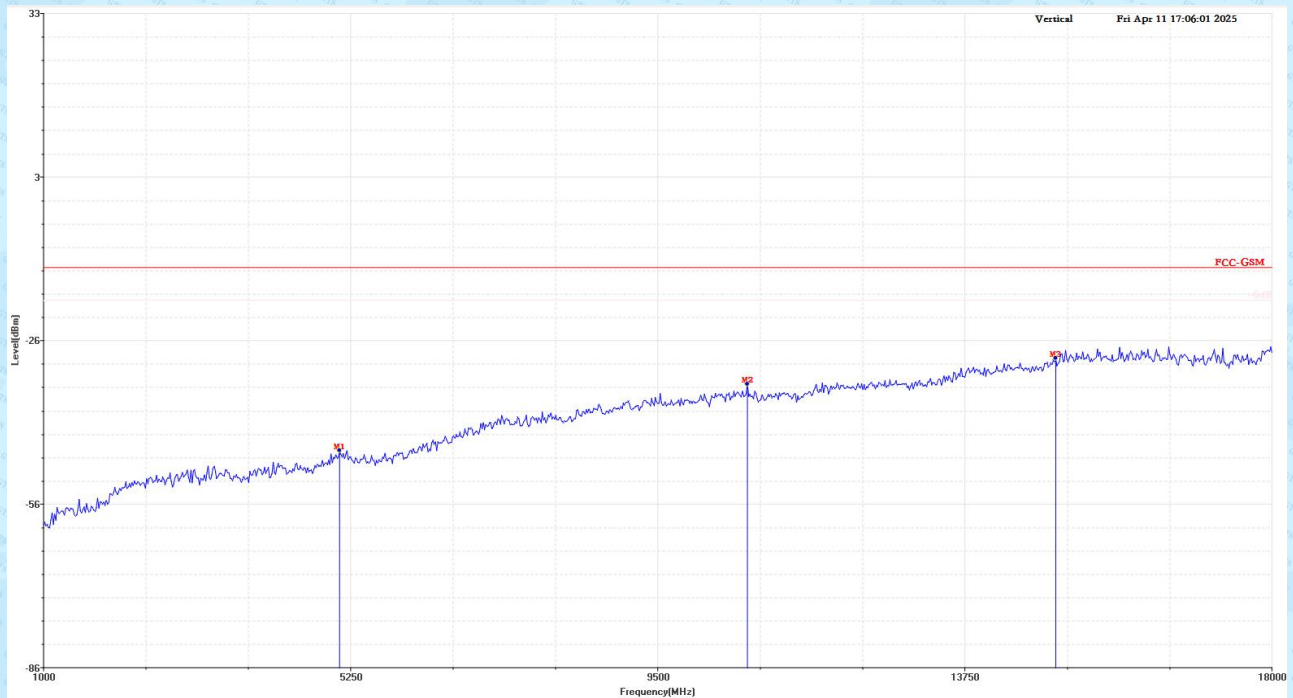
Note : The test worse case was marked with the " * " in front of frequency.

Test Mode

GSM850_Traffic Mode_High CH_Main antenna

Vertical

1000MHz -4000MHz



Test Summary Result

Frequency (MHz)	Read_Level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Table(o)	Pol/Phase
5097.00	-55.77	9.20	-46.57	-13.00	-33.57	0.00	Vertical
10741.00	-55.15	20.75	-34.40	-13.00	-21.40	0.00	Vertical
*15008.00	-52.78	23.13	-29.65	-13.00	-16.65	0.00	Vertical

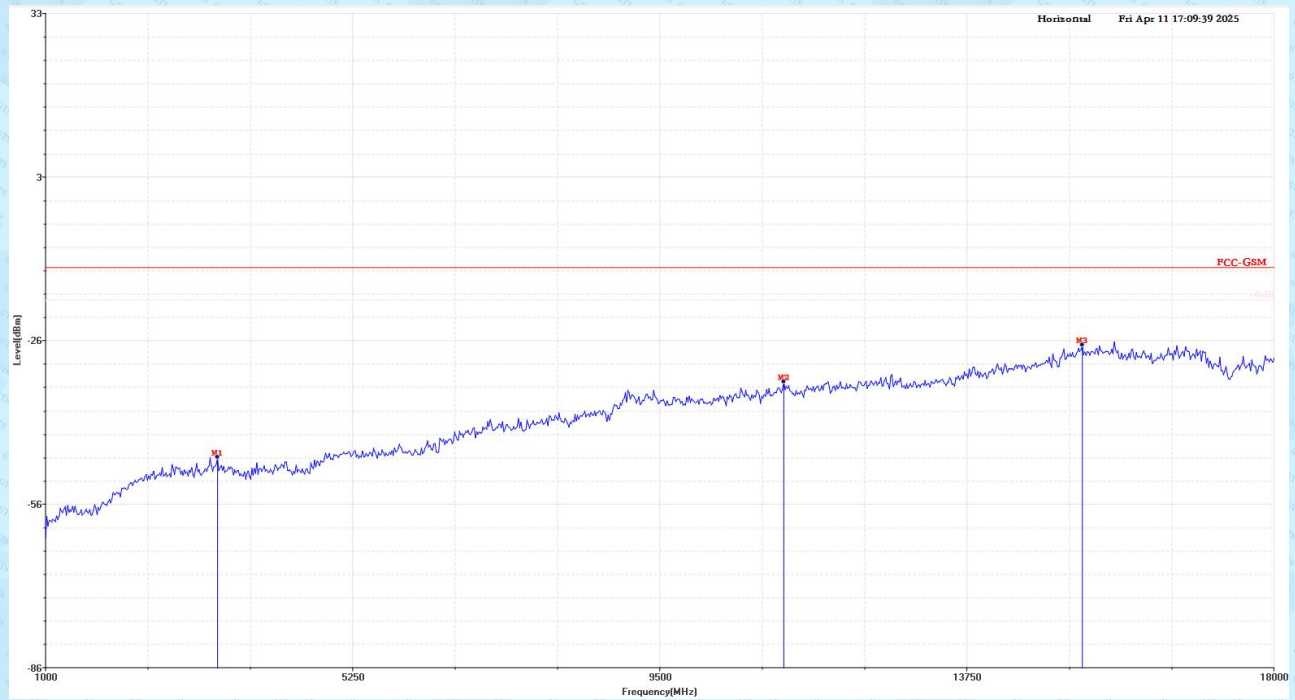
Note : The test worse case was marked with the " * " in front of frequency.

Test Mode

GSM850_Traffic Mode_Low CH_Main antenna

Horizontal

1000MHz -4000MHz



Test Summary Result

Frequency (MHz)	Read_Level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Table(o)	Pol/Phase
3380.00	-54.17	6.38	-47.79	-13.00	-34.79	0.00	Horizontal
11217.00	-54.40	20.44	-33.96	-13.00	-20.96	0.00	Horizontal
*15348.00	-51.81	24.60	-27.21	-13.00	-14.21	0.00	Horizontal

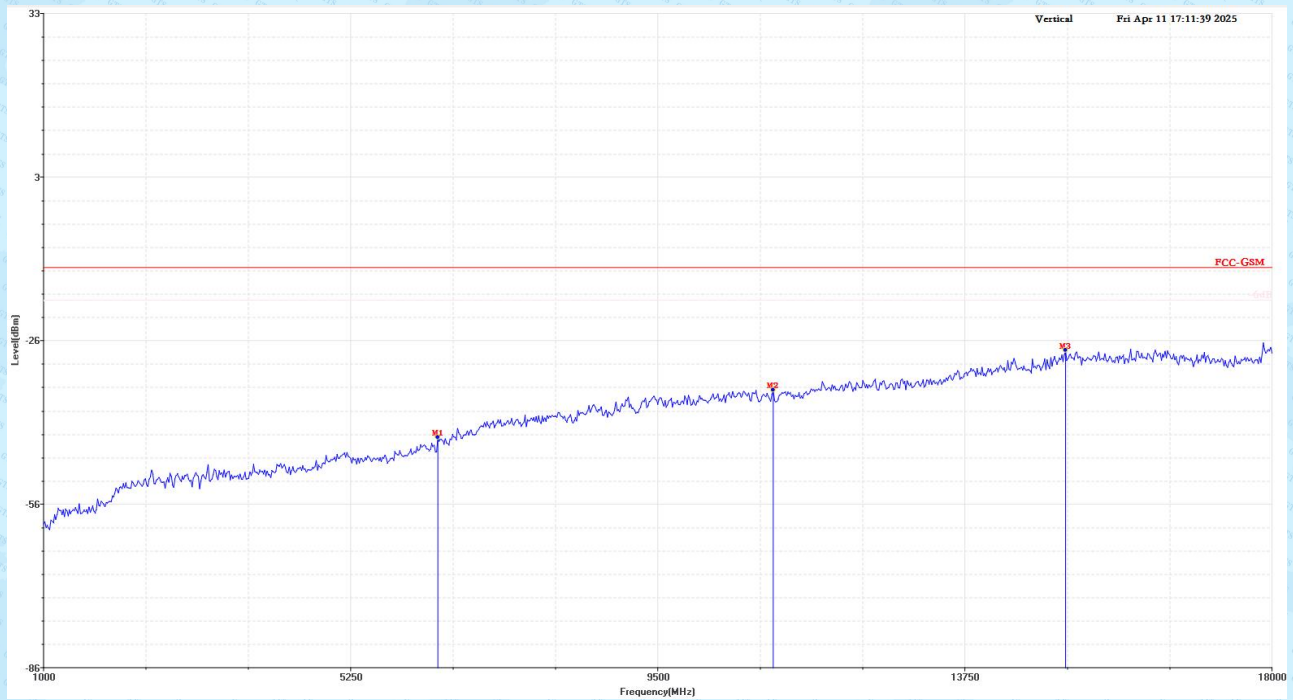
Note : The test worse case was marked with the " * " in front of frequency.

Test Mode

GSM850_Traffic Mode_Low CH_Main antenna

Vertical

1000MHz -4000MHz



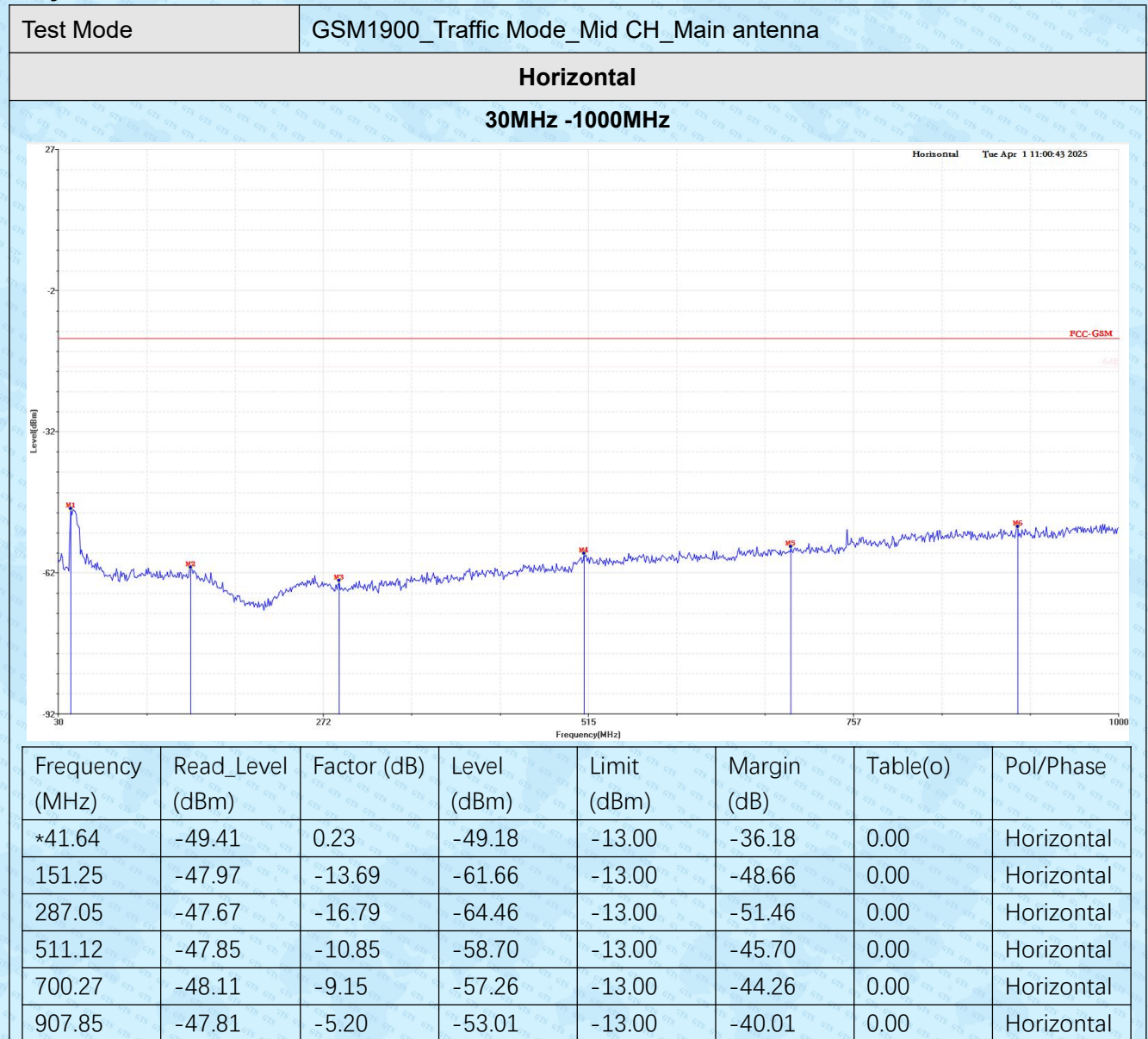
Test Summary Result

Frequency (MHz)	Read_Level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Table(o)	Pol/Phase
6457.00	-56.75	12.59	-44.16	-13.00	-31.16	0.00	Vertical
11098.00	-54.82	19.33	-35.49	-13.00	-22.49	0.00	Vertical
*15144.00	-51.85	23.67	-28.18	-13.00	-15.18	0.00	Vertical

Note : The test worse case was marked with the " * " in front of frequency.

Below 1GHz:

Only the worst model is shown

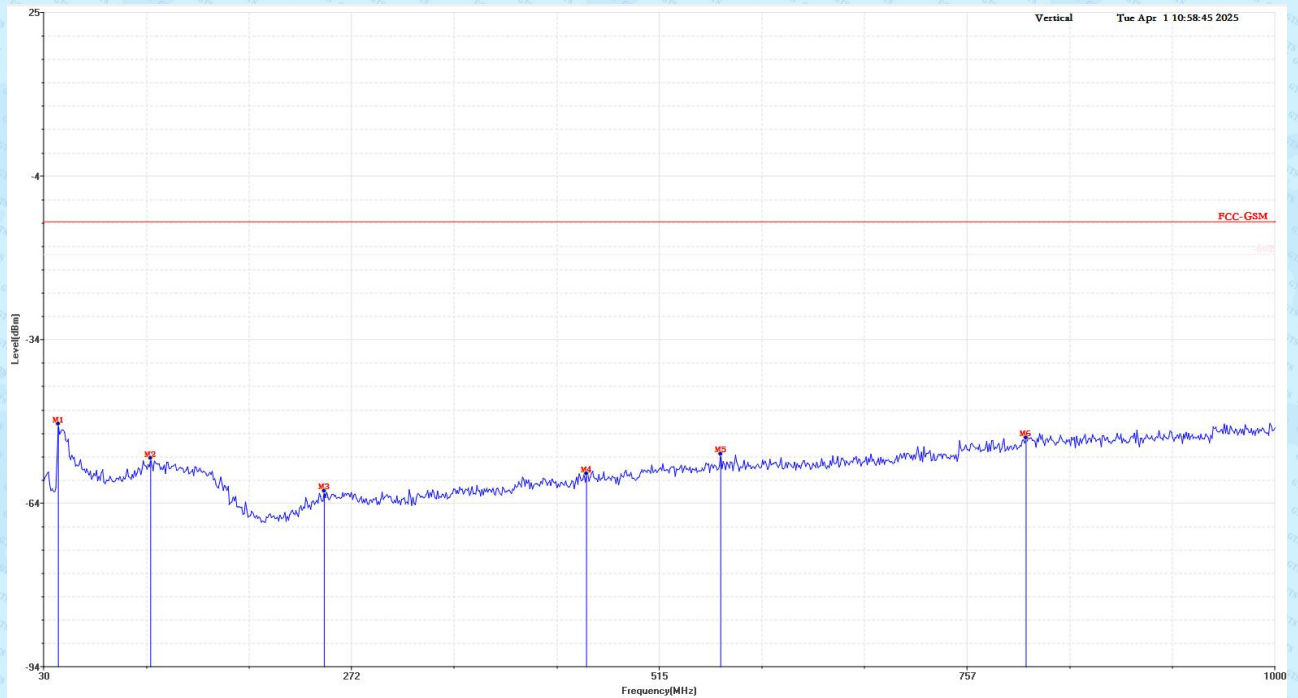


Test Mode

GSM1900_Traffic Mode_Mid CH_Main antenna

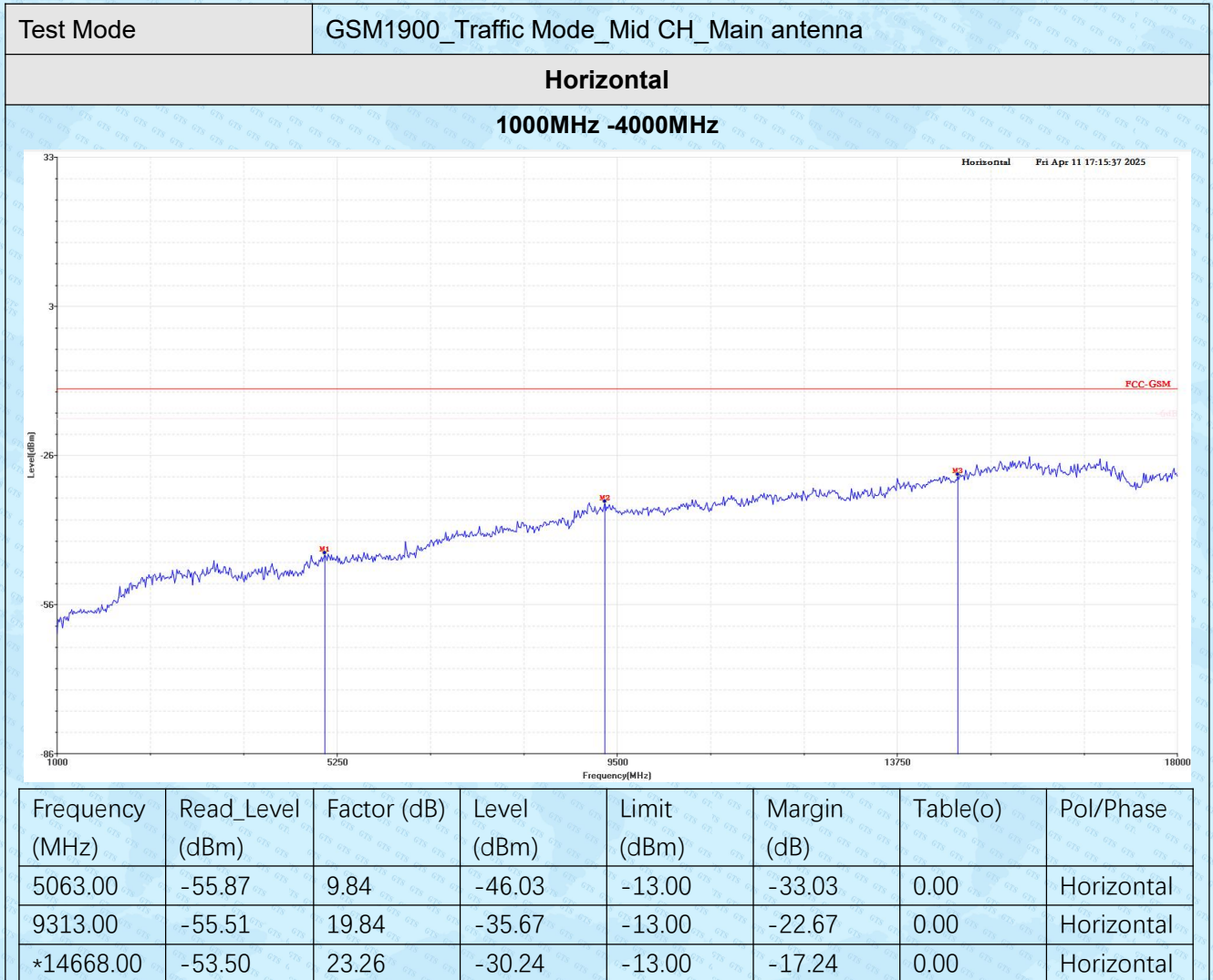
Vertical

30MHz -1000MHz



Frequency (MHz)	Read_Level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Table(o)	Pol/Phase
*41.64	-48.35	-1.73	-50.08	-13.00	-37.08	0.00	Vertical
114.39	-48.36	-8.01	-56.37	-13.00	-43.37	0.00	Vertical
251.16	-48.61	-13.78	-62.39	-13.00	-49.39	0.00	Vertical
457.77	-48.78	-10.43	-59.21	-13.00	-46.21	0.00	Vertical
563.50	-47.30	-8.31	-55.61	-13.00	-42.61	0.00	Vertical
804.06	-48.90	-3.74	-52.64	-13.00	-39.64	0.00	Vertical

Above1GHz:

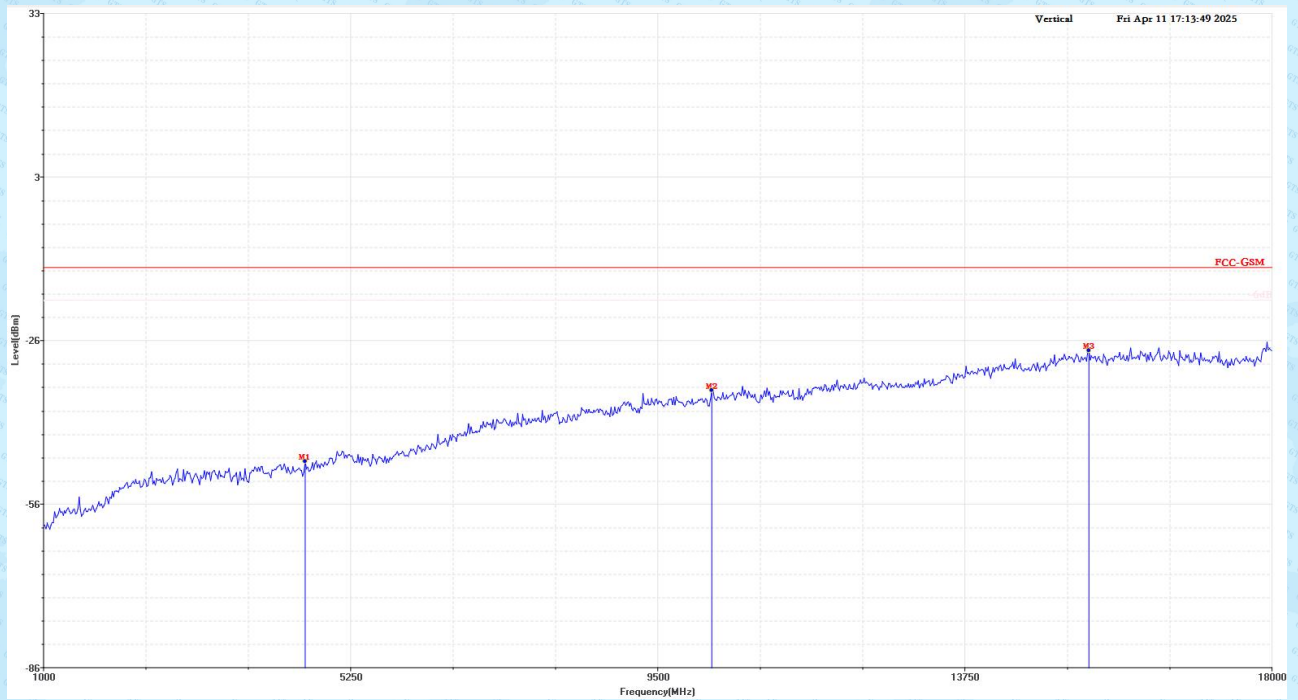


Test Mode

GSM1900_Traffic Mode_Mid CH_Main antenna

Vertical

1000MHz -4000MHz



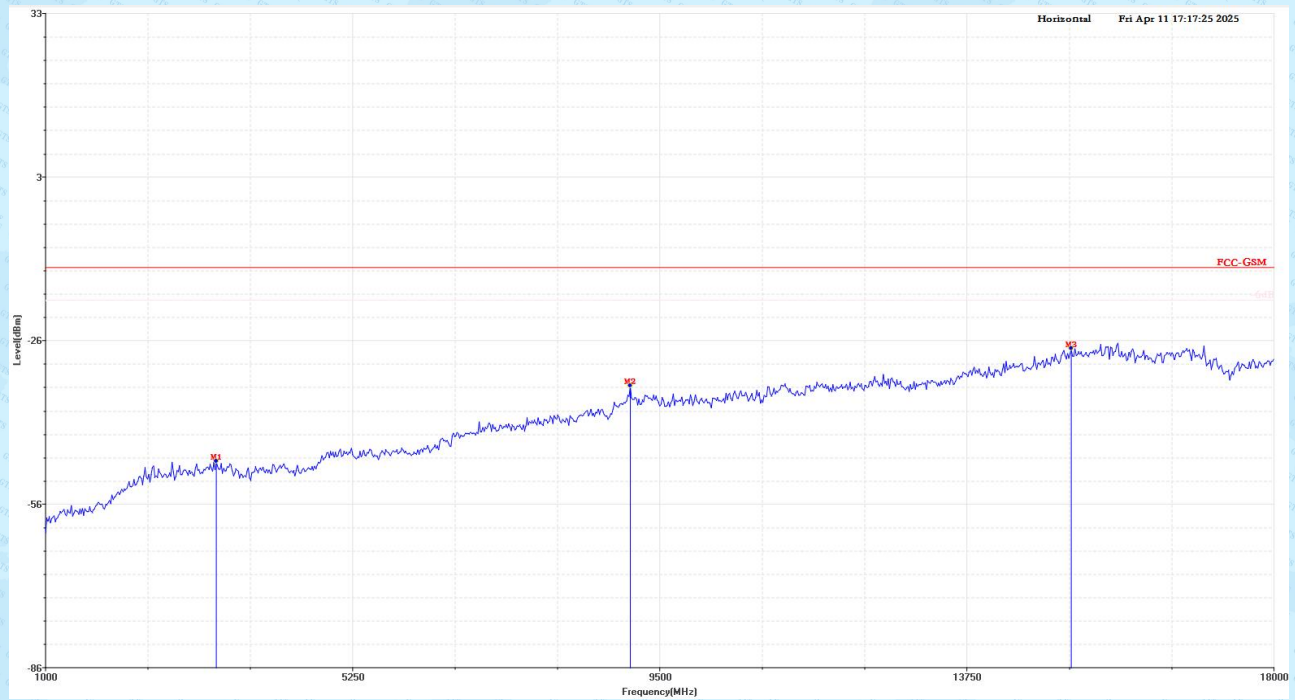
Frequency (MHz)	Read_Level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Table(o)	Pol/Phase
4621.00	-56.27	7.69	-48.58	-13.00	-35.58	0.00	Vertical
10248.00	-55.52	19.97	-35.55	-13.00	-22.55	0.00	Vertical
*15467.00	-51.73	23.49	-28.24	-13.00	-15.24	0.00	Vertical

Test Mode

GSM1900_Traffic Mode_High CH_Main antenna

Horizontal

1000MHz -4000MHz



Test Summary Result

Frequency (MHz)	Read_Level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Table(o)	Pol/Phase
3363.00	-54.91	6.38	-48.53	-13.00	-35.53	0.00	Horizontal
9092.00	-54.57	19.89	-34.68	-13.00	-21.68	0.00	Horizontal
*15195.00	-51.93	24.09	-27.84	-13.00	-14.84	0.00	Horizontal

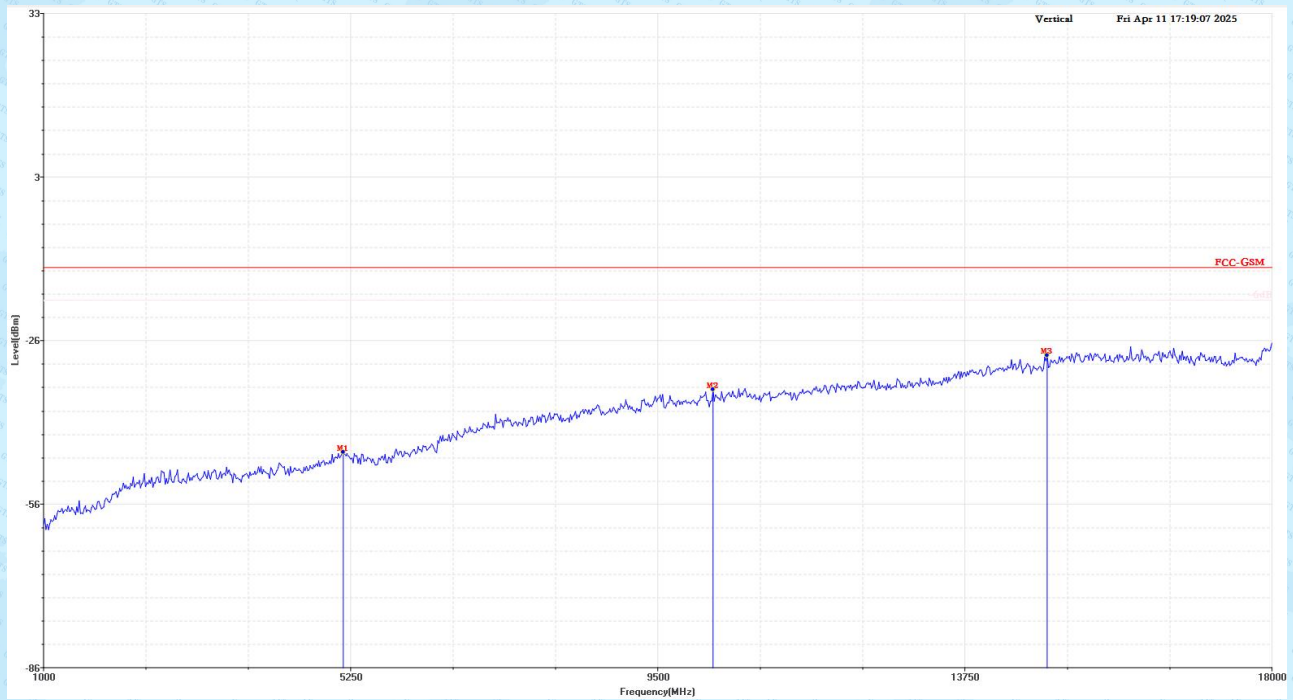
Note : The test worse case was marked with the " * " in front of frequency.

Test Mode

GSM1900_Traffic Mode_High CH_Main antenna

Vertical

1000MHz -4000MHz



Test Summary Result

Frequency (MHz)	Read_Level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Table(o)	Pol/Phase
5148.00	-56.44	9.55	-46.89	-13.00	-33.89	0.00	Vertical
10265.00	-55.94	20.55	-35.39	-13.00	-22.39	0.00	Vertical
*14889.00	-52.27	23.13	-29.14	-13.00	-16.14	0.00	Vertical

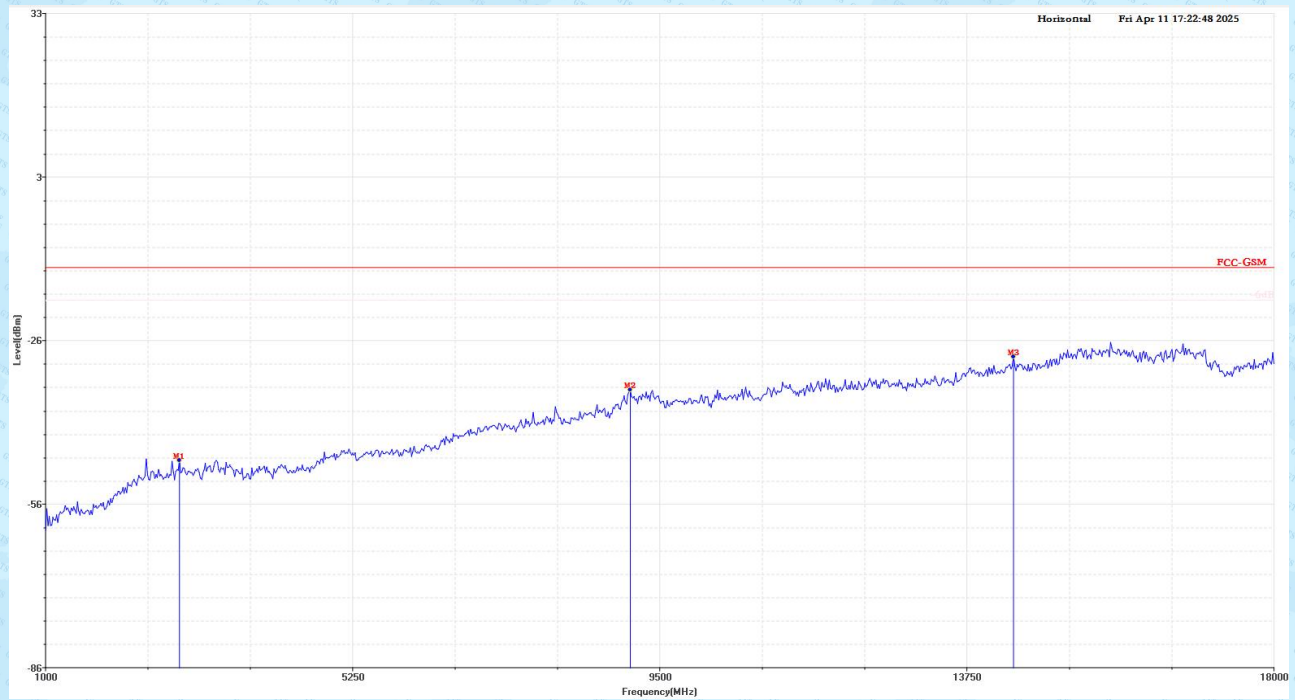
Note : The test worse case was marked with the " * " in front of frequency.

Test Mode

GSM1900_Traffic Mode_Low CH_Main antenna

Horizontal

1000MHz -4000MHz



Test Summary Result

Frequency (MHz)	Read_Level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Table(o)	Pol/Phase
2853.00	-53.93	5.54	-48.39	-13.00	-35.39	0.00	Horizontal
9092.00	-55.36	19.89	-35.47	-13.00	-22.47	0.00	Horizontal
*14396.00	-52.07	22.68	-29.39	-13.00	-16.39	0.00	Horizontal

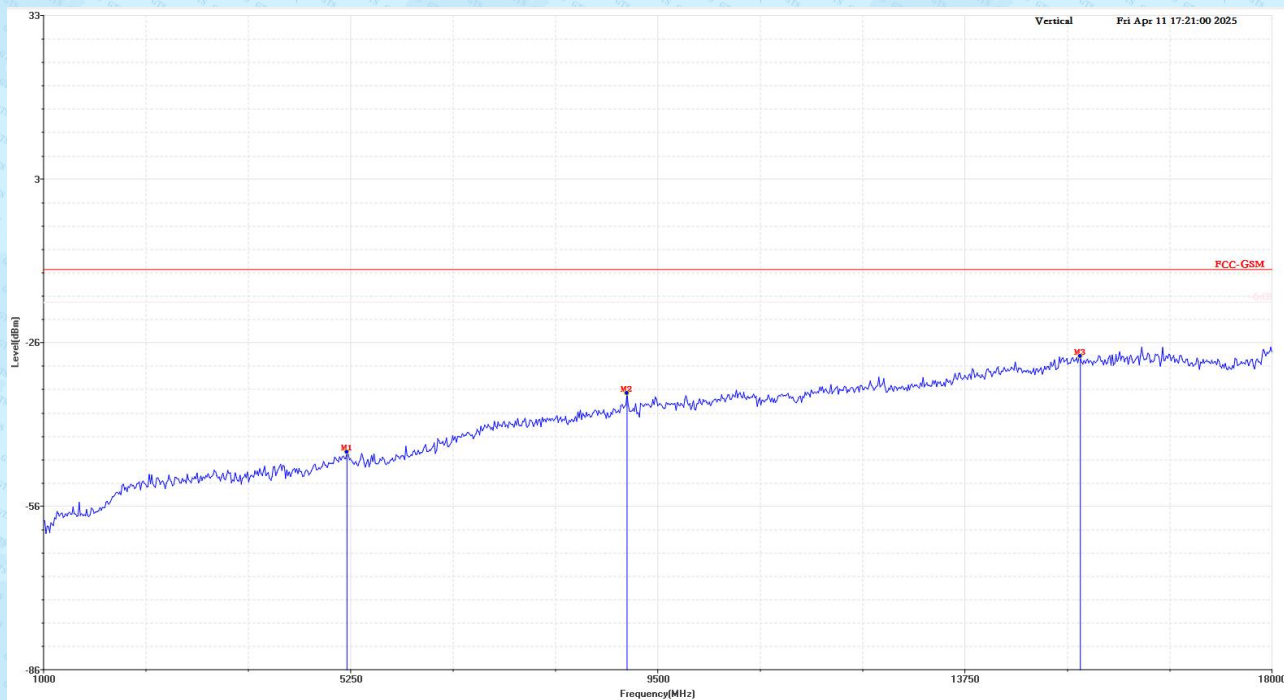
Note : The test worse case was marked with the " * " in front of frequency.

Test Mode

GSM1900_Traffic Mode_Low CH_Main antenna

Vertical

1000MHz -4000MHz



Test Summary Result

Frequency (MHz)	Read_Level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Table(o)	Pol/Phase
5199.00	-56.05	9.55	-46.50	-13.00	-33.50	0.00	Vertical
9075.00	-53.91	18.20	-35.71	-13.00	-22.71	0.00	Vertical
*15348.00	-52.58	23.65	-28.93	-13.00	-15.93	0.00	Vertical

Note : The test worse case was marked with the " * " in front of frequency.

4. TEST SETUP PHOTOGRAPHS

Please refer to the Appendix F.

5. EXTERNAL AND INTERNAL PHOTOS OF THE EUT

External Please refer to the Appendix G.

Internal Please refer to the Appendix H.

*****END OF THE REPORT*****