FCC RF Test Report

APPLICANT	:	Akteena
EQUIPMENT	:	Akteena LumosX AI Dashcam
BRAND NAME	:	Akteena
MODEL NAME	:	A9-2299D
FCC ID	:	2BL79-A922
STANDARD	:	47 CFR Part 22(H), 24(E), 27(L)
CLASSIFICATION	:	PCS Licensed Transmitter (PCB)
TEST DATE(S)	:	Mar. 19, 2025 ~ Apr. 28, 2025

We, Sporton International Inc. (Kunshan), would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.26-2015 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Kunshan), the test report shall not be reproduced except in full.

Jason Jia

Approved by: Jason Jia

ACCREDITED Cert #5145.02

Sporton International Inc. (Kunshan)
No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG4O2401A	Rev. 01	Initial issue of report	May 08, 2025

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1046	Conducted Output Power	-	Report Only	-
	§22.913(a)(5)	Effective Radiated Power	< 7 Watts	PASS	-
	§24.232(c)	Equivalent Isotropic Radiated Power	< 2 Watts	PASS	-
	§27.50(d)(4)	Equivalent Isotropic Radiated Power	< 1 Watts	PASS	-
3.5	§24.232(d)	Peak-to-Average Ratio	< 13 dB	PASS	-
3.6	§2.1049	Occupied Bandwidth	Reporting Only	PASS	-
3.7	§2.1051 §22.917(a) §24.238(a) §27.53(h)	Band Edge Measurement	< 43+10log10(P[Watts])	PASS	-
3.8	§2.1051 §22.917(a) §24.238(a) §27.53(h)	Conducted Emission	< 43+10log10(P[Watts])	PASS	-
3.9	§2.1055 §22.355	Frequency Stability for Temperature & Voltage	< 2.5 ppm for Part 22	PASS	-
	§2.1055 §24.235 §27.54		Within Authorized Band		
4.4	§2.1053; §22.917(a); §24.238(a); §27.53(h)	Field Strength of Spurious Radiation	< 43+10log10(P[Watts])	PASS	Under limit 12.78 dB at 1648.00 MHz

Conformity Assessment Condition:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the section “Measurement Uncertainty”

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

1 General Description

1.1 Applicant

Akteena

Akteena INC, 41369 Vincenti Ct., Novi Michigan 48375, U.S.A

1.2 Manufacturer

VVDN Technologies Pvt Ltd

Plot No: CP-07, Sector-8,IMT Manesar, Gurugram-122050,Haryana,INDIA

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Akteena LumosX AI Dashcam
Brand Name	Akteena
Model Name	A9-2299D
FCC ID	2BL79-A922
IMEI Code	Conducted: 357750172665241 Radiation: 357750172665239
HW Version	C1
SW Version	Thermal-DCV2.7
EUT Stage	Identical Prototype

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. The device supports Powered by 12Vdc and 24Vdc, for RF testing, we evaluate is not affect RF performance, so we choice 12Vdc power source to test.

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	**GPRS/EDGE:** 850: 824 MHz ~ 849 MHz 1900: 1850MHz ~ 1910MHz **WCDMA:** Band V: 824 MHz ~ 849 MHz Band II: 1850 MHz ~ 1910 MHz Band IV: 1710 MHz ~ 1755 MHz
Rx Frequency	**GPRS/EDGE:** 850: 869 MHz ~ 894 MHz 1900: 1930 MHz ~ 1990 MHz **WCDMA:**

	Band V: 869 MHz ~ 894 MHz Band II: 1930 MHz ~ 1990 MHz Band IV: 2110 MHz ~ 2155 MHz
Maximum Output Power to Antenna	**GPRS/EDGE:** 850: 34.00 dBm 1900: 30.24 dBm **WCDMA:** Band V: 22.41 dBm Band II: 22.47 dBm Band IV: 22.23 dBm
Antenna Type	FPC Antenna
Antenna Gain	Cellular Band: -2.2 dBi PCS Band: 1.6 dBi AWS Band: 2.1 dBi
Type of Modulation	GPRS: GMSK EDGE: GMSK / 8PSK WCDMA : BPSK HSPA : QPSK HSPA+ : 16QAM(16QAM not support uplink) DC-HSDPA : 64QAM

Note: There are Main Antenna (TX/RX) and Diversity Antenna (RX only), Main Antenna is provided antenna gain in the section 1.4. For Main antenna has four paths for each band, as below, we choice maximum conducted power of the path to test.

	Support Band	Ant. Type	Maximum power of the Path				Operating mode
			Path.1	Path.2	Path.3	Path.4	
Support Band	GSM850	FPC	v	-	-	-	SISO
	GSM1900	FPC	-	-	v	-	SISO
	WB2	FPC	-	-	v	-	SISO
	WB4	FPC	-	-	-	v	SISO
	WB5	FPC	-	v	-	-	SISO

Remark: “-” means, pre-test power. “v” means, the Maximum power

1.5 Modification of EUT

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

1.6 Maximum ERP/EIRP Power, and Emission Designator

FCC Rule	Frequency Band	Frequency Range (MHz)	Type of Modulation	Maximum ERP/EIRP (W)	Emission Designator
Part 22	GSM850 (GPRS)	824.2 ~ 848.8	GMSK	0.9226	242KGXW
Part 22	GSM850 (EDGE)	824.2 ~ 848.8	8PSK	0.2323	243KG7W
Part 22	WCDMA Band V	826.4 ~ 846.6	BPSK	0.0640	4M13F9W
Part 24	GSM1900 (GPRS)	1850.2 ~ 1909.8	GMSK	0.9311	245KGXW
Part 24	GSM1900 (EDGE)	1850.2 ~ 1909.8	8PSK	0.3855	245KG7W
Part 24	WCDMA Band II	1852.4 ~ 1907.6	BPSK	0.2553	4M12F9W
Part 27	WCDMA Band IV	1712.4 ~ 1752.6	BPSK	0.2710	4M13F9W

1.7 Testing Location

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	03CH04-KS TH01-KS	CN1257	314309

1.8 Test Software

Item	Site	Manufacturer	Name	Version
1.	TH01-KS	SPORTON	Part2224_Ver5.0 200330	5.0
2.	03CH04-KS	AUDIX	E3	210616

1.9 Applicable Standards

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

- 47 CFR Part 22(H), 24(E), 27(L)
- ANSI C63.26-2015
- FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- FCC KDB 412172 D01 Determining ERP and EIRP v01r01

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

2.1 Test Mode

Antenna port conducted and radiated test items were performed according to KDB 971168 D01 Power Meas. License Digital Systems v03r01 with maximum output power.

Radiated measurements were performed with rotating EUT in different three orthogonal test planes to find the maximum emission.

Radiated emissions were investigated as following frequency range:

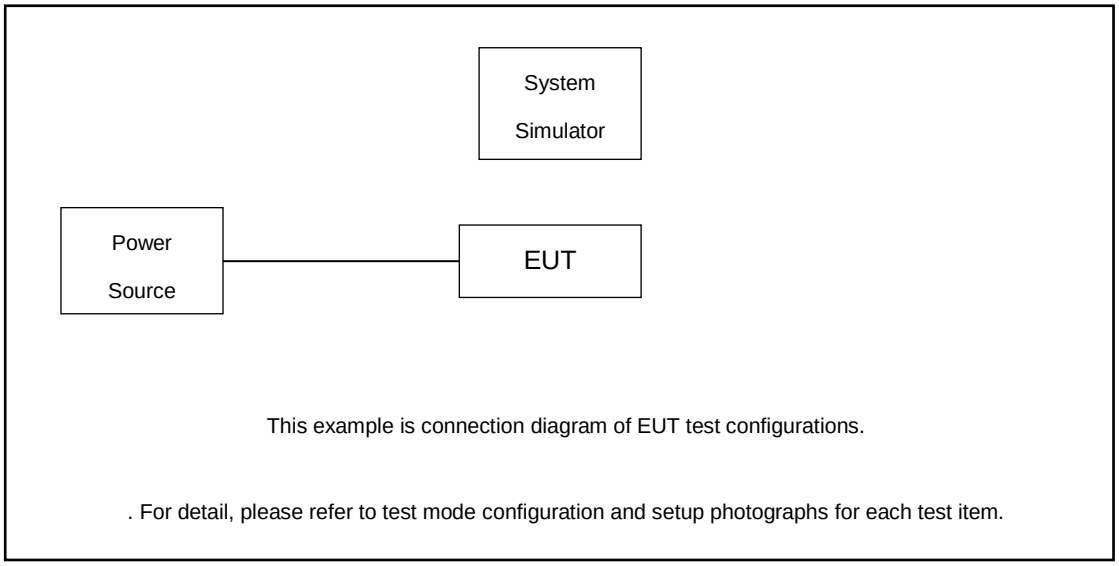
1. 30 MHz to 9000 MHz for GSM850 and WCDMA Band V.
2. 30 MHz to 18000 MHz for WCDMA Band IV.
3. 30 MHz to 19100 MHz for GSM1900 and WCDMA Band II.

All modes and data rates and positions were investigated.

Test modes are chosen to be reported as the worst case configuration below:

Test Modes		
Band	**Radiated TCs**	**Conducted TCs**
GSM 850	■ GPRS 1 Tx slots Link ■ EDGE 1 Tx slots Link	■ GPRS 1 Tx slots Link ■ EDGE 1 Tx slots Link
GSM 1900	■ GPRS 1 Tx slots Link ■ EDGE 1 Tx slots Link	■ GPRS 1 Tx slots Link ■ EDGE 1 Tx slots Link
WCDMA Band V	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link
WCDMA Band II	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link
WCDMA Band IV	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link

2.2 Connection Diagram of Test System



The EUT has been configuration operated in a manner tended to maximize its emission characteristics in a typical application.

2.3 Support Unit used in test configuration

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	Power Supply	GWINSTEK	PSS-2002	N/A	N/A	Unshielded, 1.8 m

2.4 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between RF conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level will be exactly the RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

The following shows an offset computation example with RF cable loss 4.6 dB and a 10dB attenuator.

Example :

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 4.6 + 10 = 14.6 (dB)

2.5 Frequency List of Low/Middle/High Channels

Frequency List				
Band	**Channel/Frequency(MHz)**	**Lowest**	**Middle**	**Highest**
GSM850	Channel	128	189	251
	Frequency	824.2	836.4	848.8
WCDMA Band V	Channel	4132	4182	4233
	Frequency	826.4	836.4	846.6
GSM1900	Channel	512	661	810
	Frequency	1850.2	1880.0	1909.8
WCDMA Band II	Channel	9262	9400	9538
	Frequency	1852.4	1880.0	1907.6
WCDMA Band IV	Channel	1312	1413	1513
	Frequency	1712.4	1732.6	1752.6

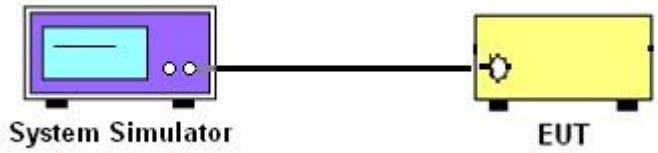
3 Conducted Test Result

3.1 Measuring Instruments

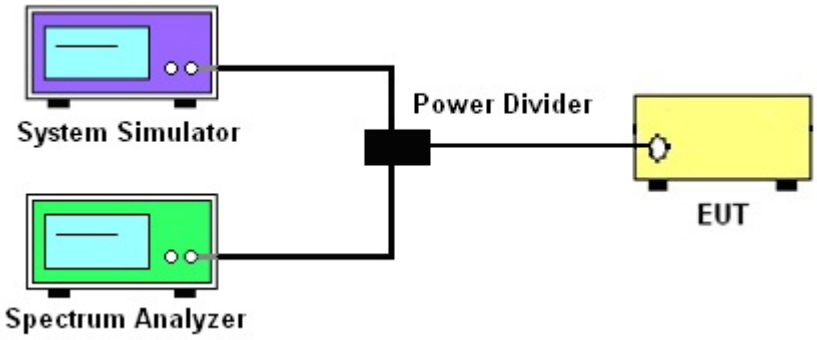
See list of measuring instruments of this test report.

3.2 Test Setup

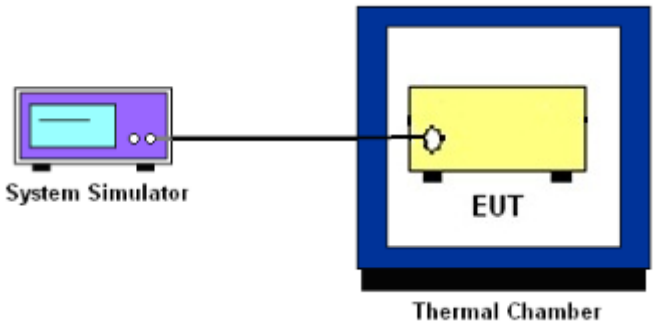
3.2.1 Conducted Output Power



3.2.2 Peak-to-Average Ratio, Occupied Bandwidth, Conducted Band-Edge and Conducted Spurious Emission



3.2.3 Frequency Stability



3.3 Test Result of Conducted Test

Please refer to Appendix A.

3.4 Conducted Output Power and ERP/EIRP

3.4.1 Description of the Conducted Output Power and ERP/EIRP

A system simulator was used to establish communication with the EUT. Its parameters were set to enforce EUT transmitting at the maximum power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

The ERP of mobile transmitters must not exceed 7 Watts for GSM850 and WCDMA Band V.

The EIRP of mobile transmitters must not exceed 2 Watts for GSM1900 and WCDMA Band II.

The EIRP of mobile transmitters must not exceed 1 Watts for WCDMA Band IV.

According to KDB 412172 D01 Power Approach,

$EIRP = P_T + G_T – L_C$, $ERP = EIRP - 2.15$, where

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

L_C = signal attenuation in the connecting cable between the transmitter and antenna in dB

3.4.2 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.

3.5 Peak-to-Average Ratio

3.5.1 Description of the PAR Measurement

The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

3.5.2 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.

3.6 99% Occupied Bandwidth and 26dB Bandwidth Measurement

3.6.1 Description of 99% Occupied Bandwidth and 26dB 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.

3.6.2 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.

3.7 Conducted Band Edge

3.7.1 Description of Conducted Band Edge 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.

3.7.2 Test Procedures

1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator. The path loss was compensated to the results for each measurement.
4. The band edges of low and high channels for the highest RF powers were measured.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)

3.8 Conducted Spurious Emission

3.8.1 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 10^{th} harmonic.

3.8.2 Test Procedures

1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to the 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 power divider. The path loss was compensated to the results for each measurement.
   Path Loss Factor = Cable + Power Divider, Where the cable and power divider are the total path loss for the system calibration.
4. The low/middle/high 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. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)

3.9 Frequency Stability

3.9.1 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 ±0.00025% (±2.5ppm) of the center frequency.

3.9.2 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.

3.9.3 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±5°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.

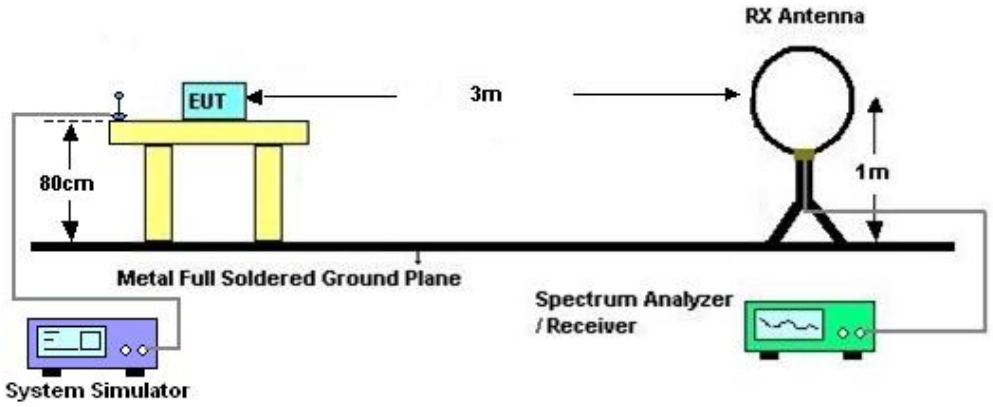
4 Radiated Test Items

4.1 Measuring Instruments

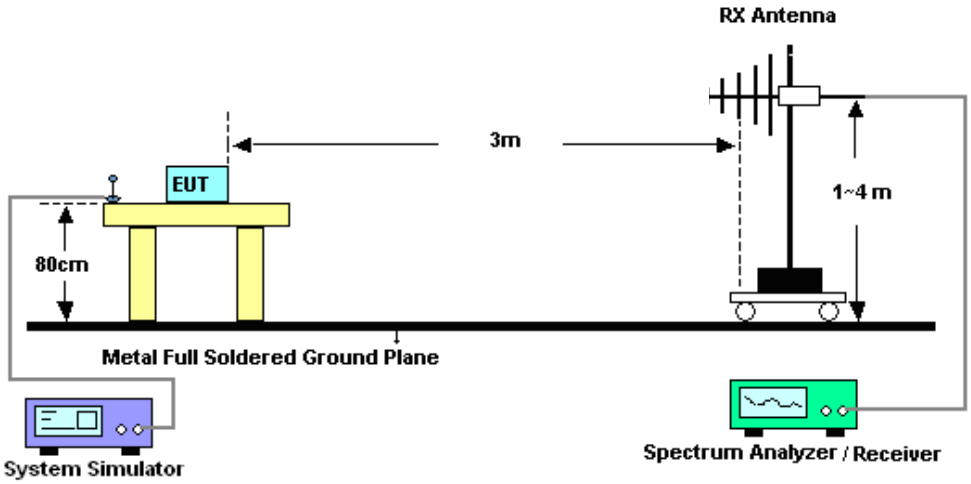
See list of measuring instruments of this test report.

4.2 Test Setup

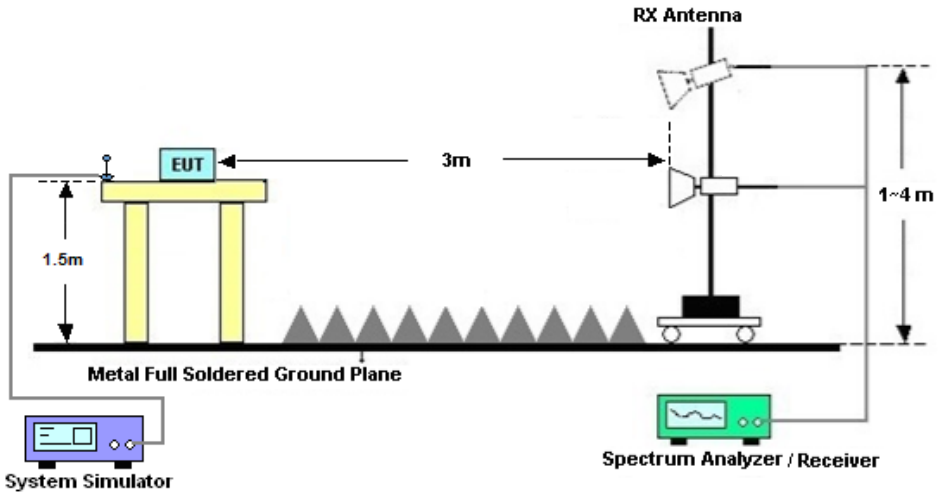
4.2.1 For radiated test below 30MHz



4.2.2 For radiated test from 30MHz to 1GHz



4.2.3 For radiated test above 1GHz



4.3 Test Result of Radiated Test

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

Please refer to Appendix B.

4.4 Field Strength of Spurious Radiation Measurement

4.4.1 Description of Field Strength of Spurious Radiated Measurement

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.

4.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.5
2. The EUT was placed on a rotatable wooden table 0.8 meters for frequency below 1GHz and 1.5 meter for frequency above 1GHz above the ground.
3. The EUT was set 3 meters from the receiving antenna, which was 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 one meter and four meters to search for the maximum spurious emission for both horizontal and vertical polarizations.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking record of maximum spurious emission.
7. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
8. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
9. Taking the record of output power at antenna port.
10. Repeat step 7 to step 8 for another polarization.
11. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
12. ERP (dBm) = EIRP - 2.15
13. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
14. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)

5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 10, 2024	Apr. 21, 2025~ Apr. 28, 2025	Oct. 09, 2025	Conducted (TH01-KS)
Power divider	STI	STI08-0055	-	0.5~40GHz	NCR	Apr. 21, 2025~ Apr. 28, 2025	NCR	Conducted (TH01-KS)
Temperature & humidity chamber	Hongzhan	LP-150U	H2014011440	-40~+150°C 20%~95%RH	Jul. 04, 2024	Apr. 21, 2025~ Apr. 28, 2025	Jul. 03, 2025	Conducted (TH01-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55370528	10Hz-44G,MAX 30dB	Oct. 11, 2024	Mar. 19, 2025	Oct. 10, 2025	Radiation (03CH04-KS)
Loop Antenna	R&S	HFH2-Z2E	101125	9kHz~30MHz	Sep. 08, 2024	Mar. 19, 2025	Sep. 07, 2025	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	44483	30MHz-1GHz	Nov. 23, 2024	Mar. 19, 2025	Nov. 22, 2025	Radiation (03CH04-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00227860	1GHz~18GHz	Aug. 16, 2024	Mar. 19, 2025	Aug. 15, 2025	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101116	18GHz~40GHz	Oct. 22, 2024	Mar. 19, 2025	Oct. 21, 2025	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	380826	9KHz-1GHz	Jul. 03, 2024	Mar. 19, 2025	Jul. 02, 2025	Radiation (03CH04-KS)
Amplifier	EM	EM18G40GA	060852	18~40GHz	Jan. 03, 2025	Mar. 19, 2025	Jan. 02, 2026	Radiation (03CH04-KS)
high gain Amplifier	EM	EM01G18GA	060840	1Ghz-18Ghz	Oct. 09, 2024	Mar. 19, 2025	Oct. 08, 2025	Radiation (03CH04-KS)
Amplifier	EM	EM01G18GA	060892	1Ghz-18Ghz	Oct. 09, 2024	Mar. 19, 2025	Oct. 08, 2025	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Mar. 19, 2025	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Mar. 19, 2025	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Mar. 19, 2025	NCR	Radiation (03CH04-KS)

NCR: No Calibration Required

6 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.26-2015. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

Uncertainty of Conducted Measurement

Test Item	Uncertainty
Conducted Spurious Emission & Bandedge	±2.22 dB
Occupied Channel Bandwidth	±0.1%
Conducted Power	±0.50 dB
Peak to Average Ratio	±0.46 dB
Frequency Stability	±0.4 Hz

Uncertainty of Radiated Emission Measurement (9 KHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.30dB

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.83dB

Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.83dB

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.82dB

---------- THE END ----------

Appendix A. Test Results of Conducted Test

Test Engineer :	Smile Wang	Temperature :	22~23℃
		Relative Humidity :	40~42%

Conducted Output Power(Average power) and ERP/EIRP

GSM850	Burst Average Power (dBm)			ERP		
TX Channel	128	189	251	128	189	251
Frequency (MHz)	824.2	836.4	848.8	824.2	836.4	848.8
GPRS 1 Tx slot	32.48	32.38	34.00	0.6501	0.6353	0.9226
GPRS 2 Tx slots	30.18	29.53	30.09	0.3828	0.3296	0.3750
GPRS 3 Tx slots	28.25	27.31	28.60	0.2455	0.1977	0.2661
GPRS 4 Tx slots	26.89	26.04	27.12	0.1795	0.1476	0.1892
EDGE 1 Tx slot	27.24	26.68	28.01	0.1945	0.1710	0.2323
EDGE 2 Tx slots	24.81	23.92	25.02	0.1112	0.0906	0.1167
EDGE 3 Tx slots	22.64	21.93	23.09	0.0675	0.0573	0.0748
EDGE 4 Tx slots	21.19	20.55	21.58	0.0483	0.0417	0.0528

GSM1900	Burst Average Power (dBm)			ERIP		
TX Channel	512	661	810	512	661	810
Frequency (MHz)	1850.2	1880	1909.8	1850.2	1880	1909.8
GPRS 1 Tx slot	30.24	21.01	28.93	0.9311	0.1112	0.6887
GPRS 2 Tx slots	27.93	28.45	26.40	0.5470	0.6166	0.3846
GPRS 3 Tx slots	26.16	26.62	24.60	0.3639	0.4046	0.2541
GPRS 4 Tx slots	24.50	25.41	23.26	0.2483	0.3062	0.1866
EDGE 1 Tx slot	25.75	26.41	24.52	0.3311	0.3855	0.2495
EDGE 2 Tx slots	23.17	23.71	23.71	0.1828	0.2070	0.2070
EDGE 3 Tx slots	21.76	21.94	21.94	0.1321	0.1377	0.1377
EDGE 4 Tx slots	20.56	21.04	21.04	0.1002	0.1119	0.1119

Band		WCDMA II			ERIP		
TX Channel		9262	9400	9538	9262	9400	9538
Rx Channel		9662	9800	9938	9662	9800	9938
Frequency (MHz)		1852.4	1880	1907.6	1852.4	1880	1907.6
3GPP Rel 99	RMC 12.2Kbps	22.47	22.22	21.98	0.2553	0.2410	0.2280
3GPP Rel 6	HSDPA Subtest-1	21.35	21.34	20.86	0.1972	0.1968	0.1762
3GPP Rel 6	HSDPA Subtest-2	20.84	20.82	20.51	0.1754	0.1746	0.1626
3GPP Rel 6	HSDPA Subtest-3	20.24	20.15	20.10	0.1528	0.1496	0.1479
3GPP Rel 6	HSDPA Subtest-4	20.45	20.47	20.04	0.1603	0.1611	0.1459
3GPP Rel 8	DC-HSDPA Subtest-1	21.32	21.35	20.78	0.1959	0.1972	0.1730
3GPP Rel 8	DC-HSDPA Subtest-2	20.71	20.89	20.44	0.1702	0.1774	0.1600
3GPP Rel 8	DC-HSDPA Subtest-3	20.33	20.23	20.23	0.1560	0.1524	0.1524
3GPP Rel 8	DC-HSDPA Subtest-4	20.31	20.51	20.11	0.1552	0.1626	0.1483
3GPP Rel 6	HSUPA Subtest-1	18.46	17.92	18.05	0.1014	0.0895	0.0923
3GPP Rel 6	HSUPA Subtest-2	18.89	18.96	18.86	0.1119	0.1138	0.1112
3GPP Rel 6	HSUPA Subtest-3	19.33	19.36	19.45	0.1239	0.1247	0.1274

3GPP Rel 6	HSUPA Subtest-4	19.15	19.20	19.11	0.1189	0.1202	0.1178
3GPP Rel 6	HSUPA Subtest-5	20.11	20.02	20.11	0.1483	0.1452	0.1483

Band		WCDMA IV			ERIP		
TX Channel		1312	1413	1513	1312	1413	1513
Rx Channel		1537	1638	1738	1537	1638	1738
Frequency (MHz)		1712.4	1732.6	1752.6	1712.4	1732.6	1752.6
3GPP Rel 99	RMC 12.2Kbps	22.23	22.12	22.23	0.2710	0.2642	0.2710
3GPP Rel 6	HSDPA Subtest-1	21.40	21.19	21.19	0.2239	0.2133	0.2133
3GPP Rel 6	HSDPA Subtest-2	21.10	20.80	20.97	0.2089	0.1950	0.2028
3GPP Rel 6	HSDPA Subtest-3	20.52	20.37	20.53	0.1828	0.1766	0.1832
3GPP Rel 6	HSDPA Subtest-4	20.46	20.47	20.31	0.1803	0.1807	0.1742
3GPP Rel 8	DC-HSDPA Subtest-1	21.45	21.23	21.18	0.2265	0.2153	0.2128
3GPP Rel 8	DC-HSDPA Subtest-2	21.14	20.89	20.90	0.2109	0.1991	0.1995
3GPP Rel 8	DC-HSDPA Subtest-3	20.56	20.41	20.59	0.1845	0.1782	0.1858
3GPP Rel 8	DC-HSDPA Subtest-4	20.51	20.52	20.36	0.1824	0.1828	0.1762
3GPP Rel 6	HSUPA Subtest-1	18.62	18.58	18.38	0.1180	0.1169	0.1117
3GPP Rel 6	HSUPA Subtest-2	18.87	18.76	18.96	0.1250	0.1219	0.1276
3GPP Rel 6	HSUPA Subtest-3	19.39	19.52	19.50	0.1409	0.1452	0.1445
3GPP Rel 6	HSUPA Subtest-4	19.06	19.02	19.06	0.1306	0.1294	0.1306
3GPP Rel 6	HSUPA Subtest-5	19.98	20.06	20.05	0.1614	0.1644	0.1641

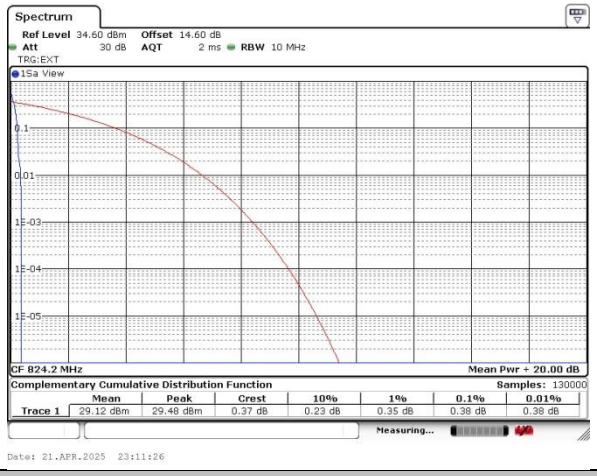
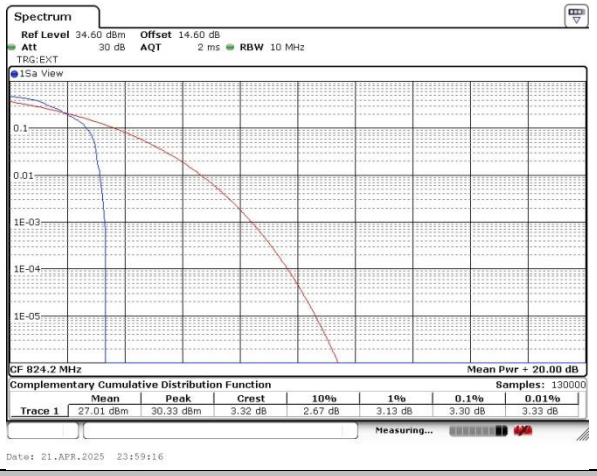
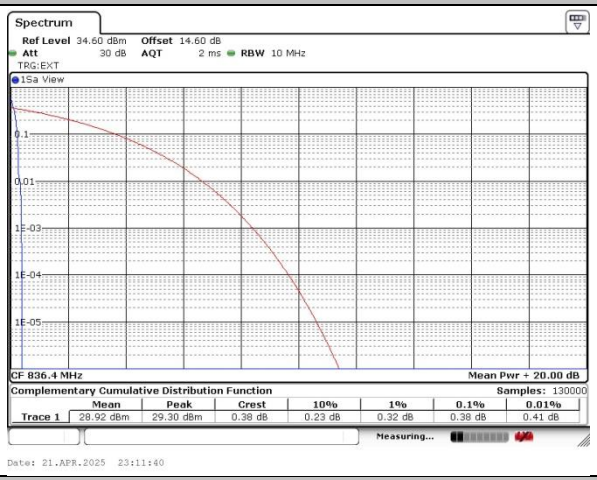
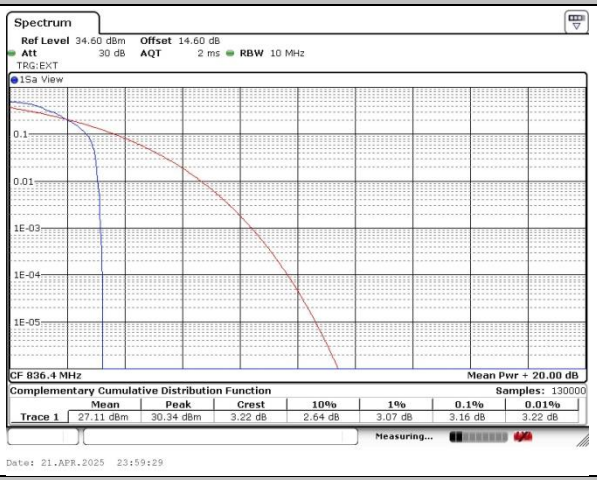
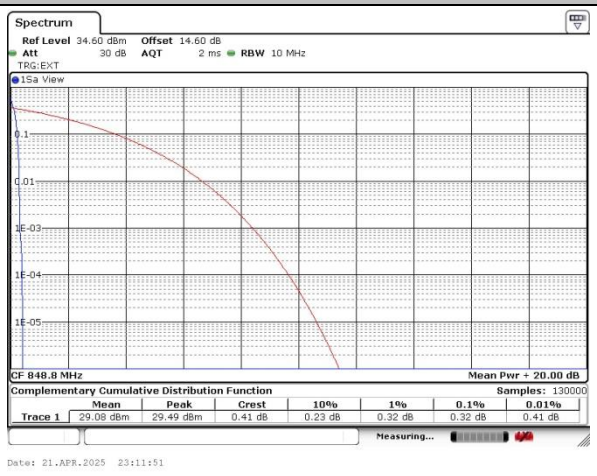
Band		WCDMA V			ERP		
TX Channel		4132	4182	4233	4132	4182	4233
Rx Channel		4357	4407	4458	4357	4407	4458
Frequency (MHz)		826.4	836.4	846.6	826.4	836.4	846.6
3GPP Rel 99	RMC 12.2Kbps	22.41	22.38	22.31	0.0640	0.0635	0.0625
3GPP Rel 6	HSDPA Subtest-1	21.45	21.08	21.25	0.0513	0.0471	0.0490
3GPP Rel 6	HSDPA Subtest-2	21.15	21.04	21.21	0.0479	0.0467	0.0485
3GPP Rel 6	HSDPA Subtest-3	20.51	20.61	20.71	0.0413	0.0423	0.0433
3GPP Rel 6	HSDPA Subtest-4	20.54	20.58	20.61	0.0416	0.0420	0.0423
3GPP Rel 8	DC-HSDPA Subtest-1	21.53	21.16	21.32	0.0522	0.0480	0.0498
3GPP Rel 8	DC-HSDPA Subtest-2	21.24	21.09	21.23	0.0489	0.0472	0.0488
3GPP Rel 8	DC-HSDPA Subtest-3	20.66	20.71	20.66	0.0428	0.0433	0.0428
3GPP Rel 8	DC-HSDPA Subtest-4	20.49	20.60	21.34	0.0411	0.0422	0.0500
3GPP Rel 6	HSUPA Subtest-1	18.44	19.44	17.59	0.0256	0.0323	0.0211
3GPP Rel 6	HSUPA Subtest-2	19.15	19.23	19.11	0.0302	0.0308	0.0299
3GPP Rel 6	HSUPA Subtest-3	19.50	19.43	19.40	0.0327	0.0322	0.0320
3GPP Rel 6	HSUPA Subtest-4	19.21	19.12	19.09	0.0306	0.0300	0.0298
3GPP Rel 6	HSUPA Subtest-5	20.11	20.01	20.13	0.0377	0.0368	0.0378

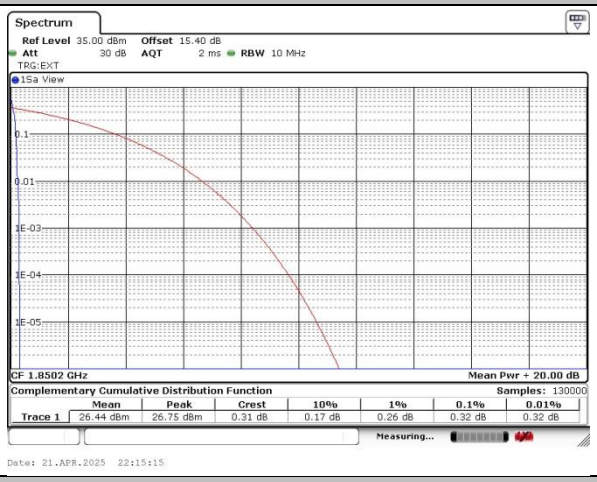
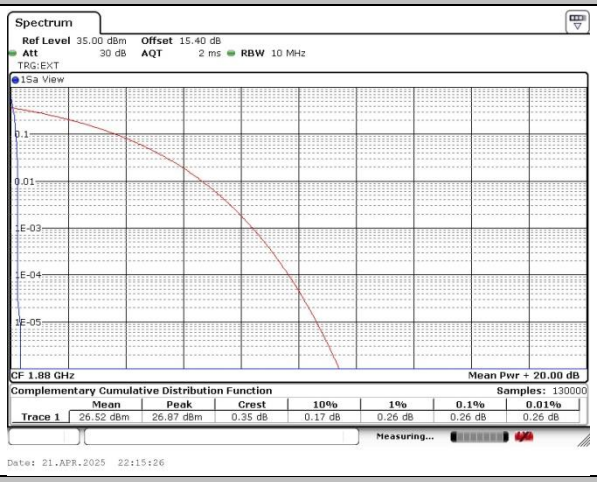
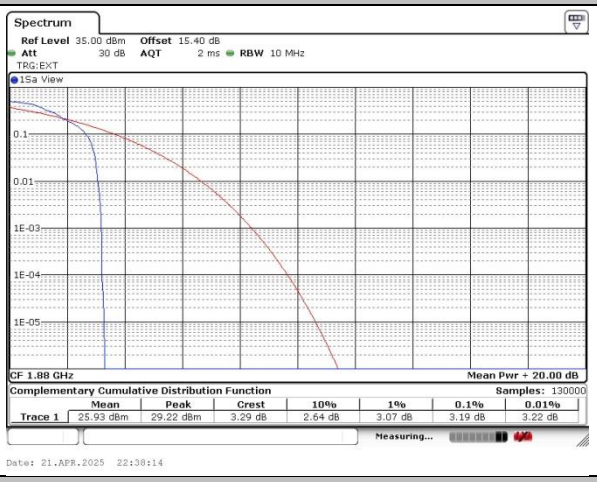
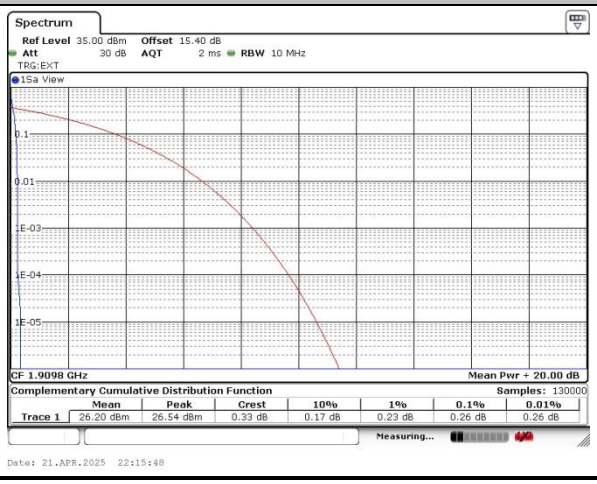
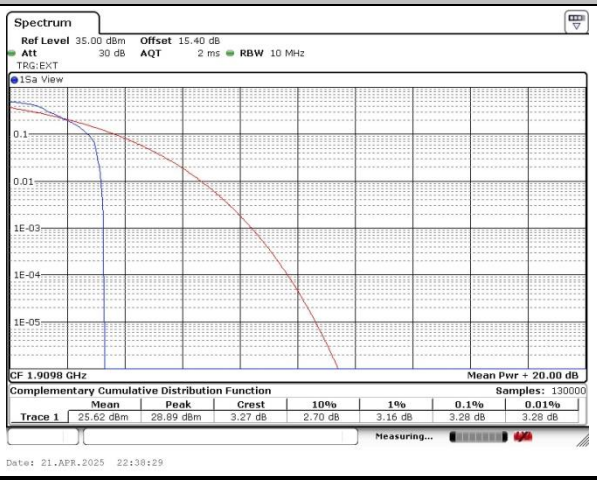
GSM

Peak-to-Average Ratio

Mode	GSM850		Limit: 13dB
Mod.	GPRS	EDGE	Result
Lowest CH	0.38	3.3	PASS
Middle CH	0.38	3.16	
Highest CH	0.32	3.16	

Mode	GSM1900		Limit: 13dB
Mod.	GPRS	EDGE	Result
Lowest CH	0.32	3.51	PASS
Middle CH	0.26	3.19	
Highest CH	0.26	3.28	

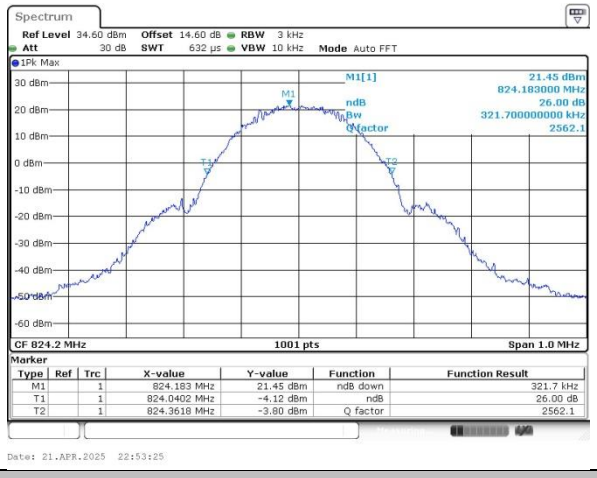
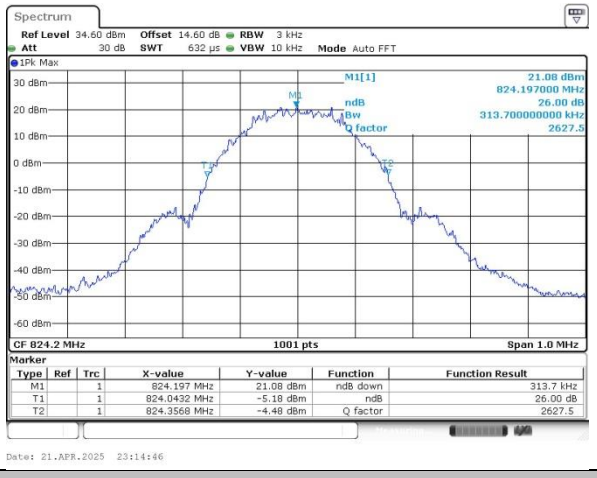
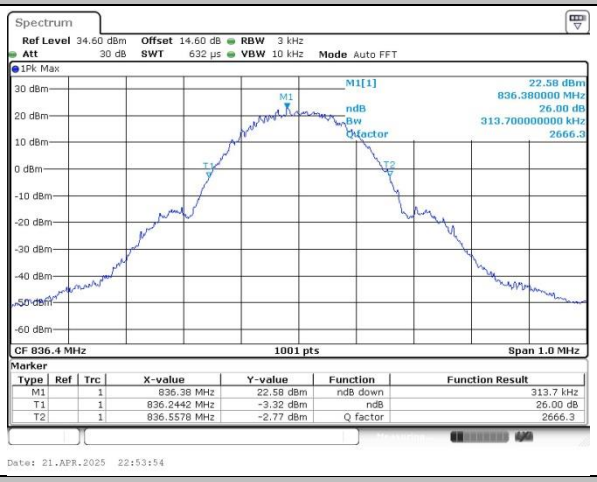
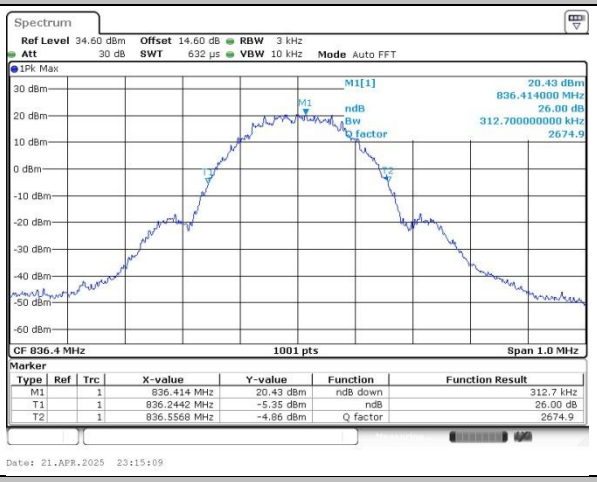
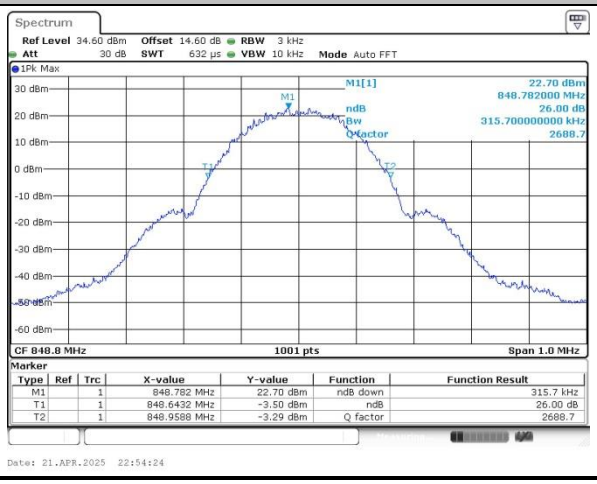
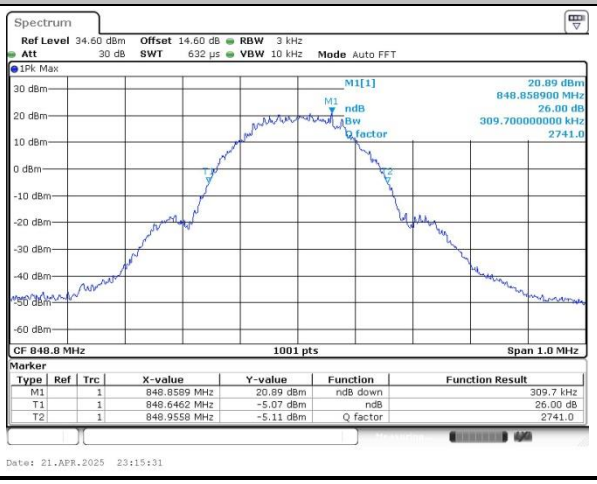
GSM850 (GPRS)	GSM850 (EDGE)
Lowest Channel	**Lowest Channel**
	
Middle Channel	**Middle Channel**
	
Highest Channel	**Highest Channel**
	

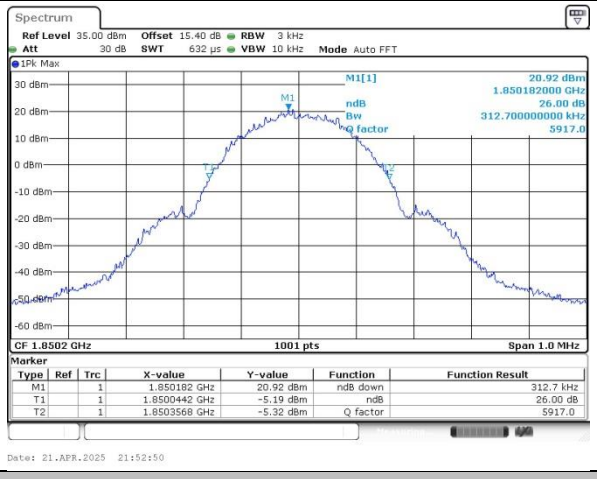
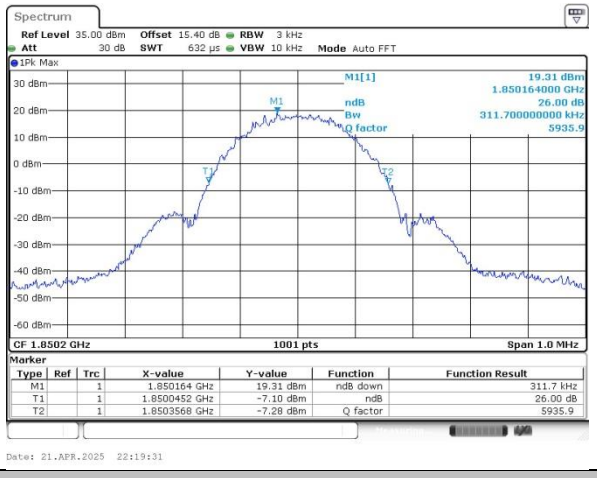
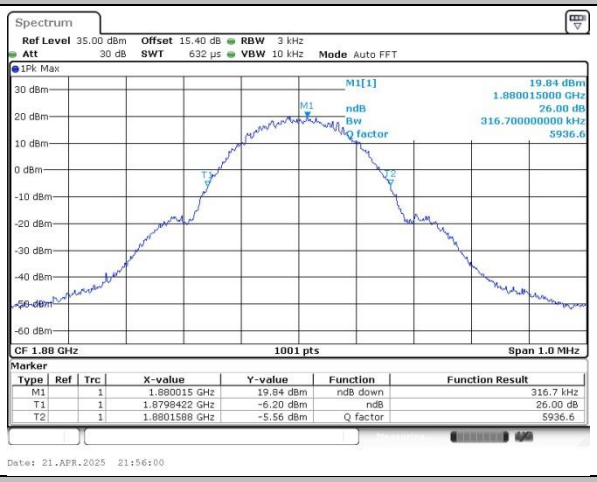
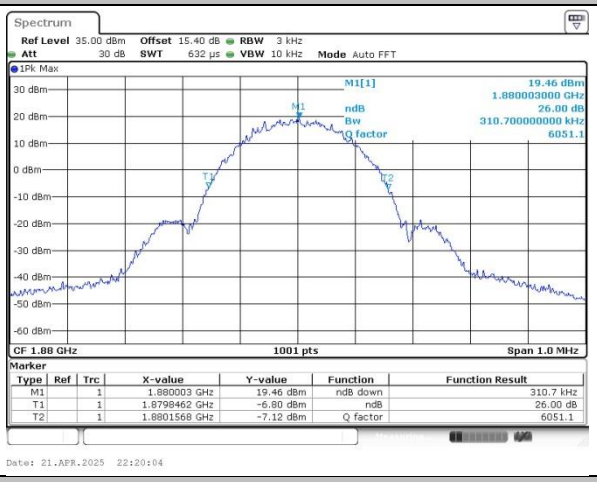
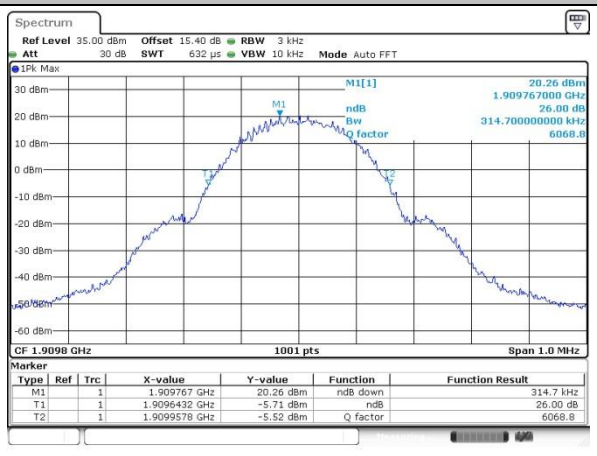
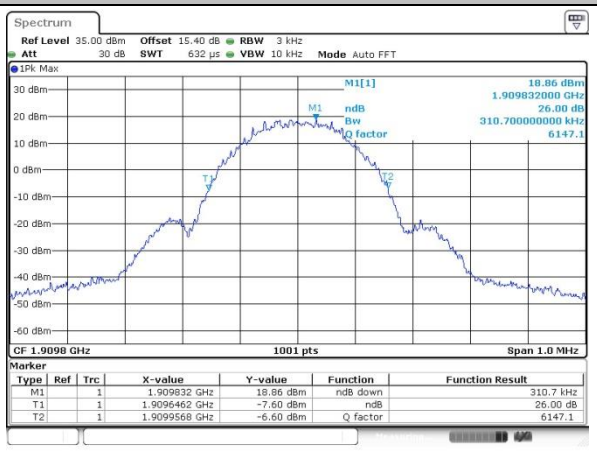
GSM1900 (GPRS)	GSM1900 (EDGE)
Lowest Channel	**Lowest Channel**
	
Middle Channel	**Middle Channel**
	
Highest Channel	**Highest Channel**
	

26dB Bandwidth

Mode	GSM850 (kHz)	
Mod.	GPRS	EDGE
Lowest CH	321.7	313.7
Middle CH	313.7	312.7
Highest CH	315.7	309.7

Mode	GSM1900 (kHz)	
Mod.	GPRS	EDGE
Lowest CH	312.7	311.7
Middle CH	316.7	310.7
Highest CH	314.7	310.7

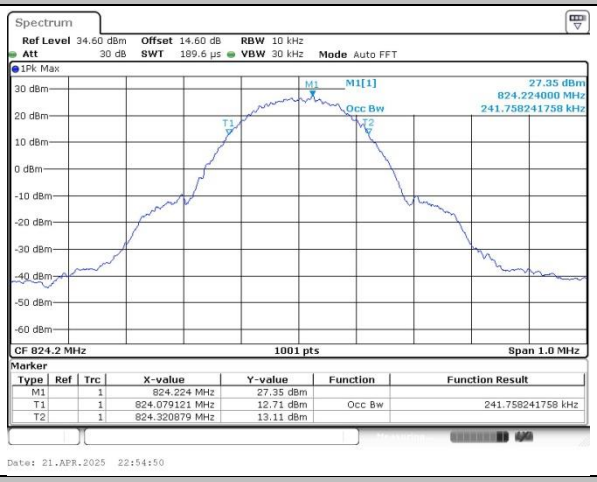
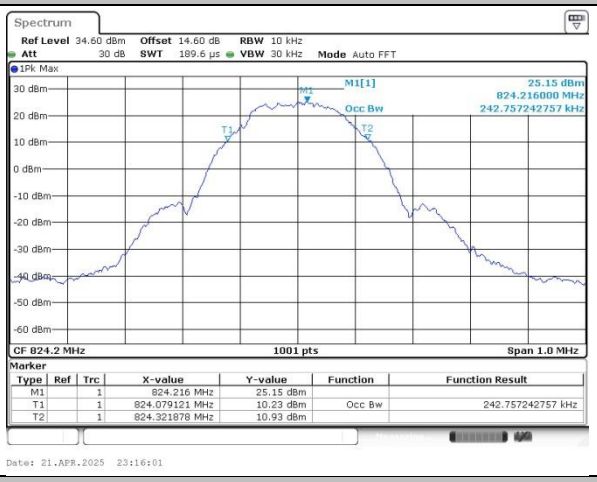
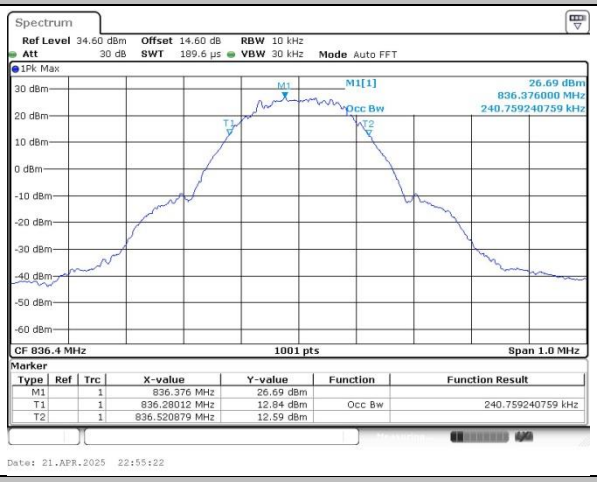
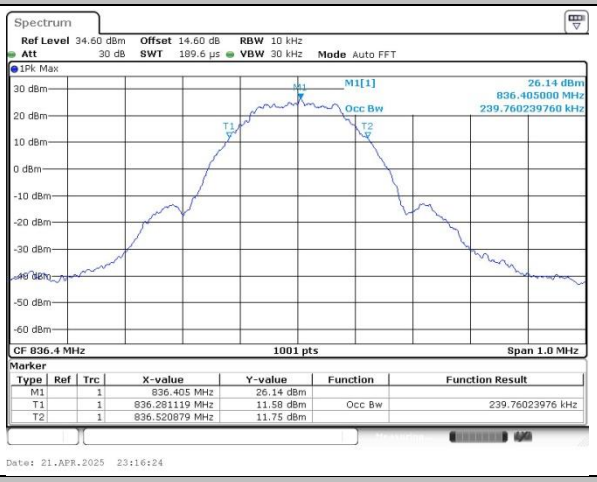
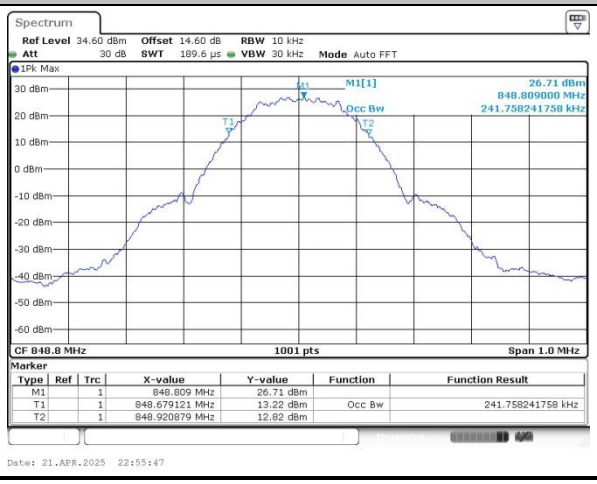
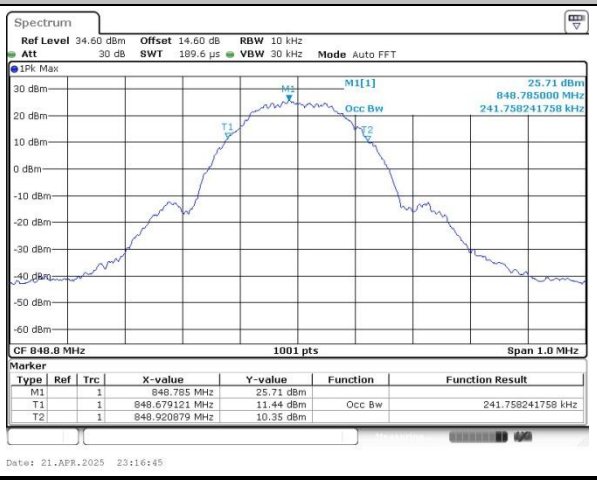
GSM850 (GPRS)	GSM850 (EDGE)
Lowest Channel	**Lowest Channel**
	
Middle Channel	**Middle Channel**
	
Highest Channel	**Highest Channel**
	

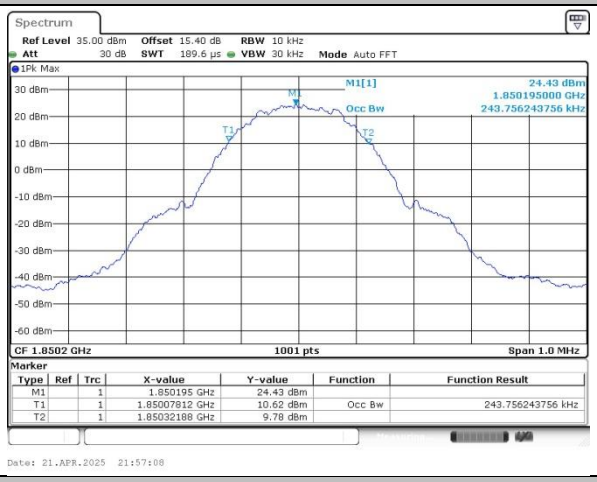
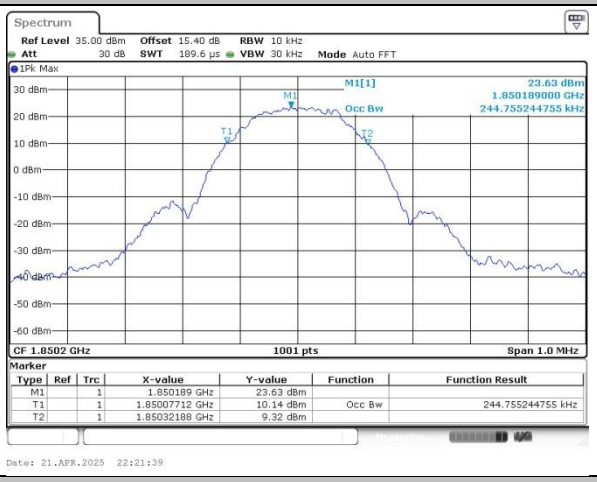
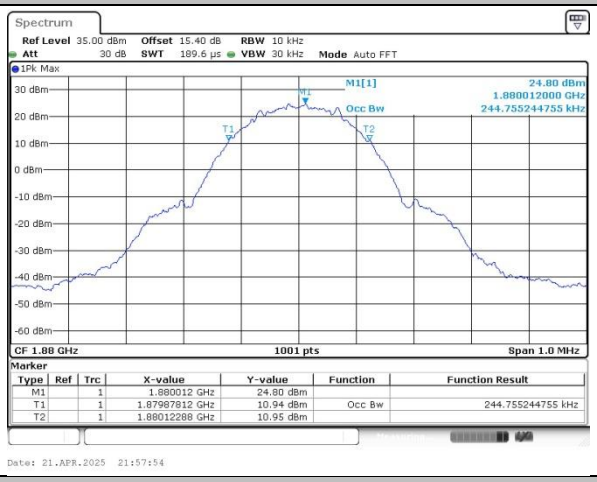
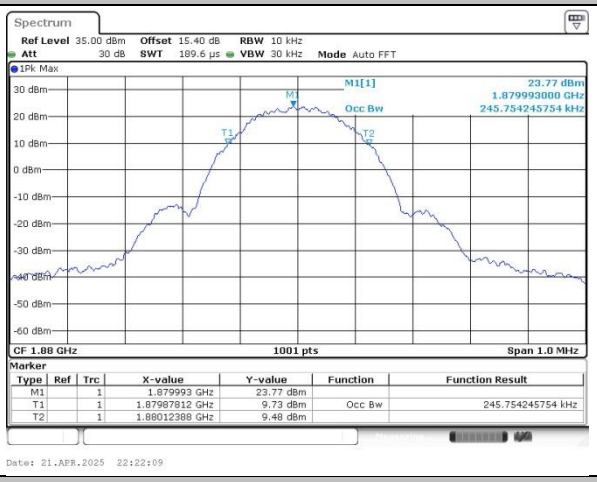
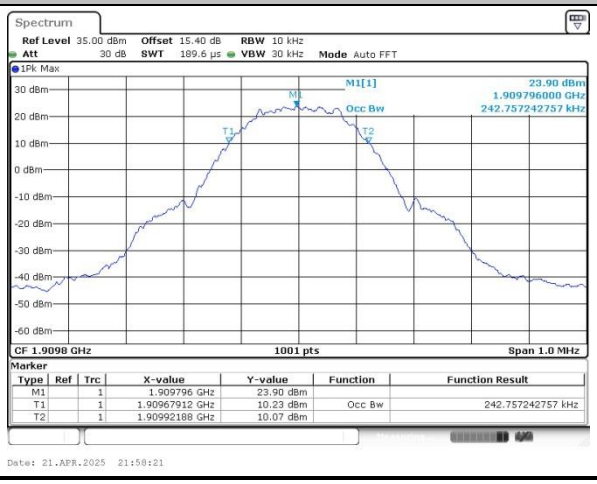
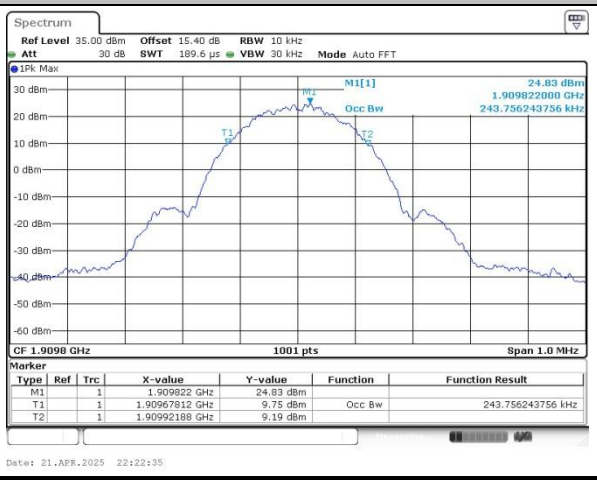
GSM1900 (GPRS)	GSM1900 (EDGE)
Lowest Channel	**Lowest Channel**
	
Middle Channel	**Middle Channel**
	
Highest Channel	**Highest Channel**
	

Occupied Bandwidth

Mode	GSM850 (kHz)	
Mod.	GPRS	EDGE
Lowest CH	241.758	242.757
Middle CH	240.759	239.760
Highest CH	241.758	241.758

Mode	GSM1900 (kHz)	
Mod.	GPRS	EDGE
Lowest CH	243.756	244.755
Middle CH	244.755	244.754
Highest CH	242.757	243.756

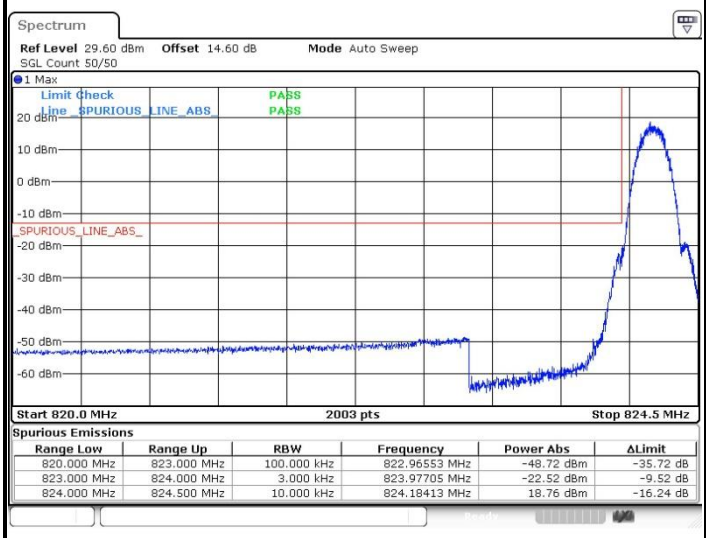
GSM850 (GPRS)	GSM850 (EDGE)
Lowest Channel	**Lowest Channel**
	
Middle Channel	**Middle Channel**
	
Highest Channel	**Highest Channel**
	

GSM1900 (GPRS)	GSM1900 (EDGE)
Lowest Channel	**Lowest Channel**
	
Middle Channel	**Middle Channel**
	
Highest Channel	**Highest Cannel**
	

Conducted Band Edge

GSM850 (GPRS)

Lowest Band Edge

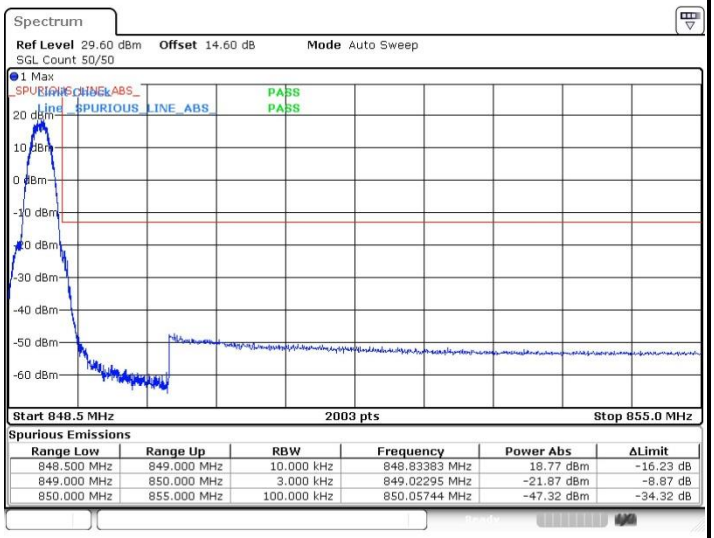


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
820.000 MHz	823.000 MHz	100.000 kHz	822.96553 MHz	-48.72 dBm	-35.72 dB
823.000 MHz	824.000 MHz	3.000 kHz	823.97705 MHz	-22.52 dBm	-9.52 dB
824.000 MHz	824.500 MHz	10.000 kHz	824.18413 MHz	18.76 dBm	-16.24 dB

Date: 21.APR.2025 23:00:20

Highest Band Edge



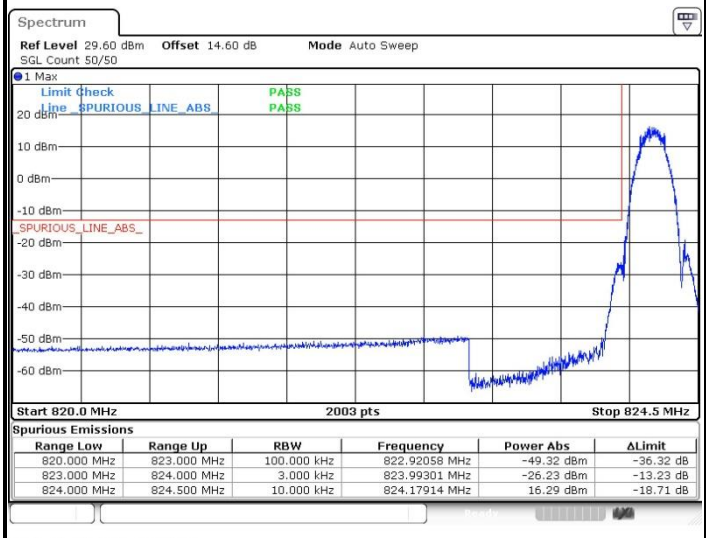
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
848.500 MHz	849.000 MHz	10.000 kHz	848.83383 MHz	18.77 dBm	-16.23 dB
849.000 MHz	850.000 MHz	3.000 kHz	849.02295 MHz	-21.87 dBm	-8.87 dB
850.000 MHz	855.000 MHz	100.000 kHz	850.05744 MHz	-47.32 dBm	-34.32 dB

Date: 21.APR.2025 23:02:45

GSM850 (EDGE)

Lowest Band Edge

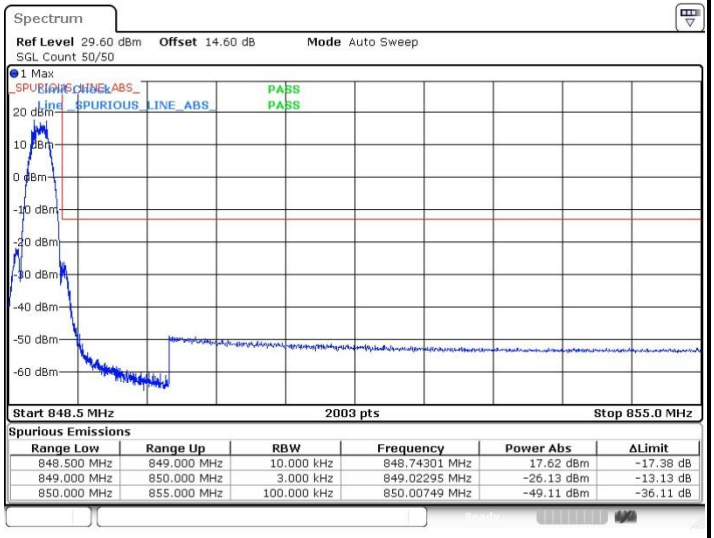


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
820.000 MHz	823.000 MHz	100.000 kHz	822.92058 MHz	-49.32 dBm	-36.32 dB
823.000 MHz	824.000 MHz	3.000 kHz	823.99301 MHz	-26.23 dBm	-13.23 dB
824.000 MHz	824.500 MHz	10.000 kHz	824.17914 MHz	16.29 dBm	-18.71 dB

Date: 21.APR.2025 23:20:41

Highest Band Edge

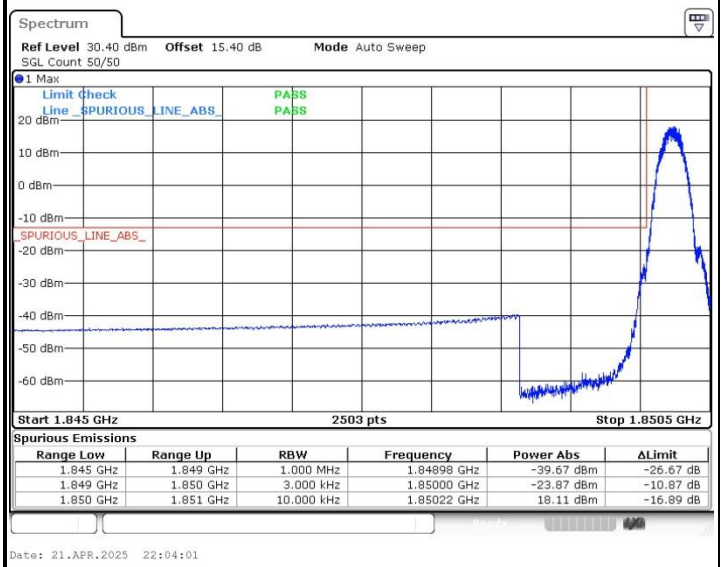


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
848.500 MHz	849.000 MHz	10.000 kHz	848.74301 MHz	17.62 dBm	-17.38 dB
849.000 MHz	850.000 MHz	3.000 kHz	849.02295 MHz	-26.13 dBm	-13.13 dB
850.000 MHz	855.000 MHz	100.000 kHz	850.00749 MHz	-49.11 dBm	-36.11 dB

Date: 21.APR.2025 23:47:44

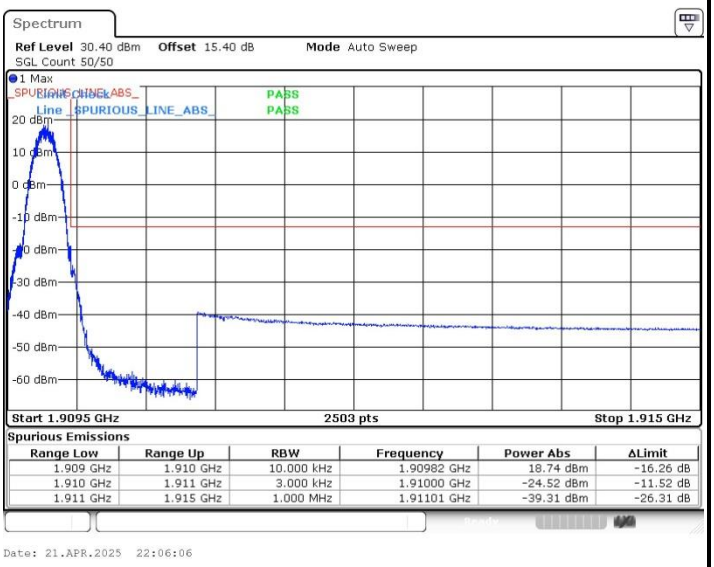
GSM1900 (GPRS)	
Lowest Band Edge	**Highest Band Edge**



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.845 GHz	1.849 GHz	1.000 MHz	1.84898 GHz	-39.67 dBm	-26.67 dB
1.849 GHz	1.850 GHz	3.000 kHz	1.85000 GHz	-23.87 dBm	-10.87 dB
1.850 GHz	1.851 GHz	10.000 kHz	1.85022 GHz	18.11 dBm	-16.89 dB

Date: 21.APR.2025 22:04:01

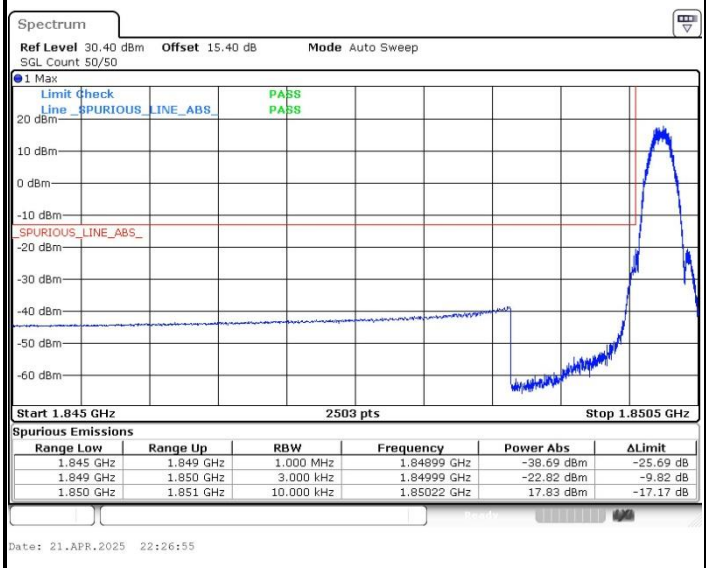


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.909 GHz	1.910 GHz	10.000 kHz	1.90982 GHz	18.74 dBm	-16.26 dB
1.910 GHz	1.911 GHz	3.000 kHz	1.91000 GHz	-24.52 dBm	-11.52 dB
1.911 GHz	1.915 GHz	1.000 MHz	1.91101 GHz	-39.31 dBm	-26.31 dB

Date: 21.APR.2025 22:06:06

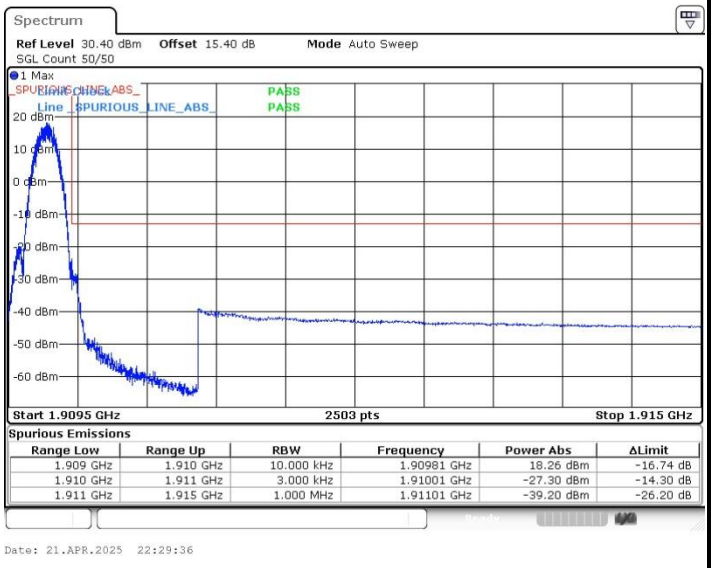
GSM1900 (EDGE)	
Lowest Band Edge	**Highest Band Edge**



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.845 GHz	1.849 GHz	1.000 MHz	1.84899 GHz	-38.69 dBm	-25.69 dB
1.849 GHz	1.850 GHz	3.000 kHz	1.84999 GHz	-22.82 dBm	-9.82 dB
1.850 GHz	1.851 GHz	10.000 kHz	1.85022 GHz	17.83 dBm	-17.17 dB

Date: 21.APR.2025 22:26:55

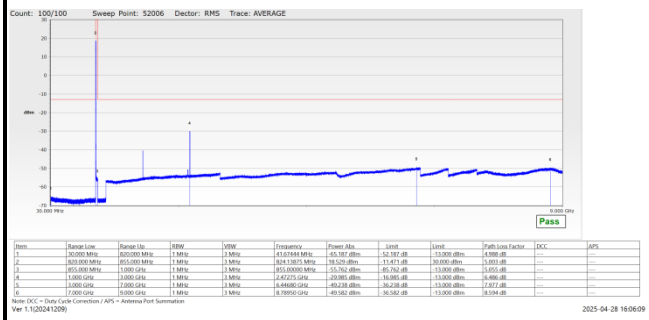
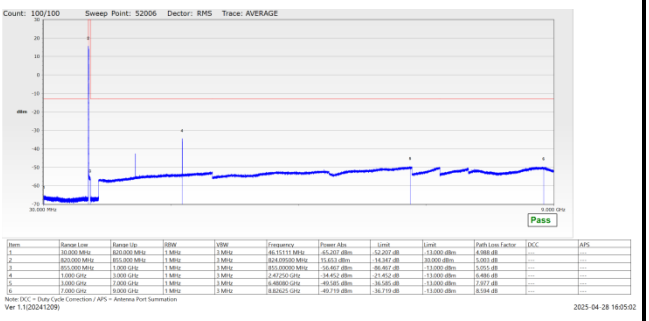
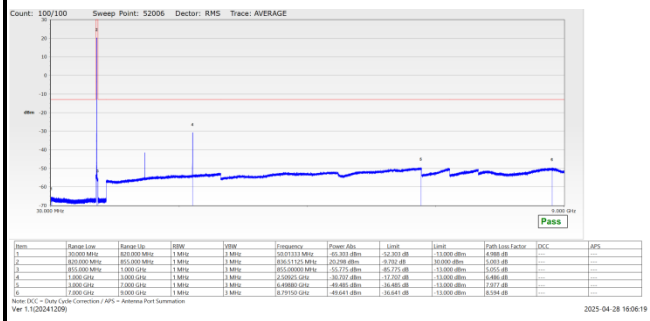
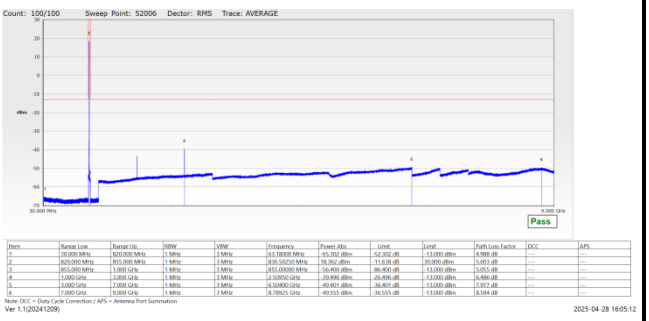
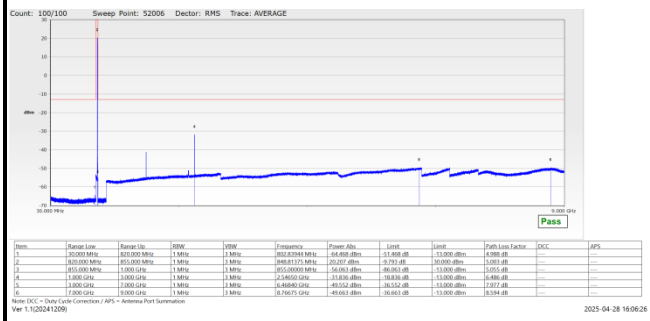
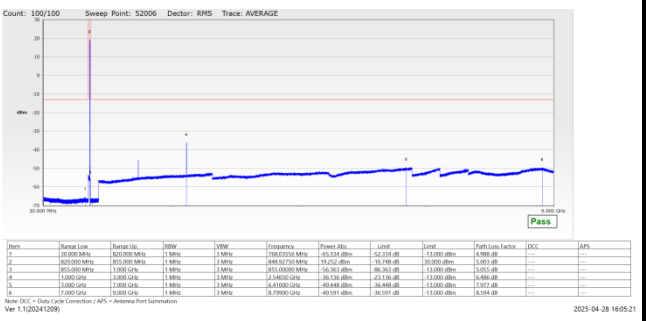


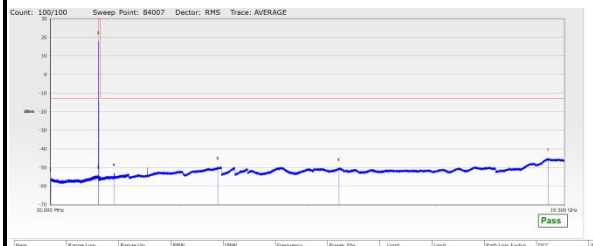
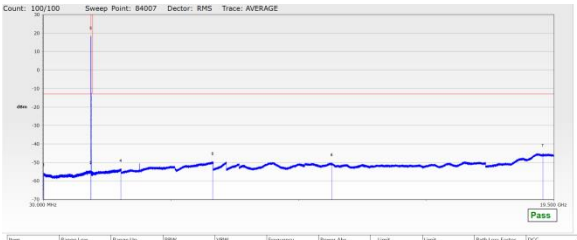
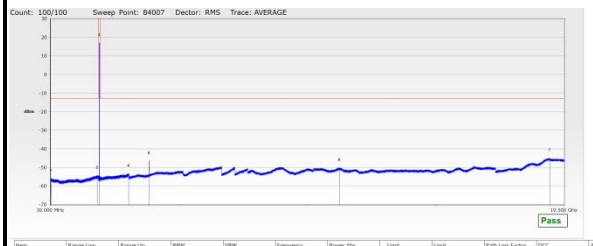
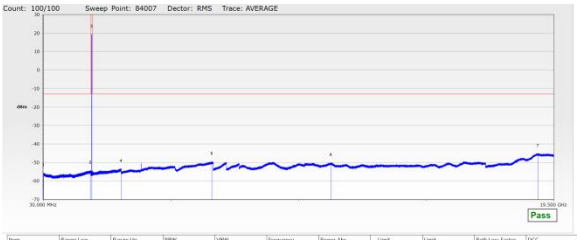
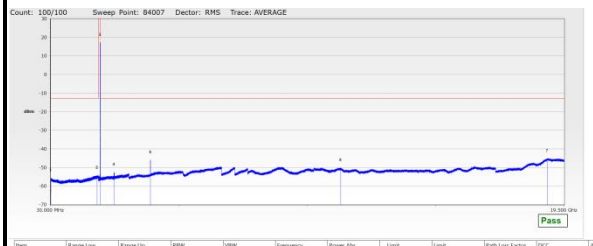
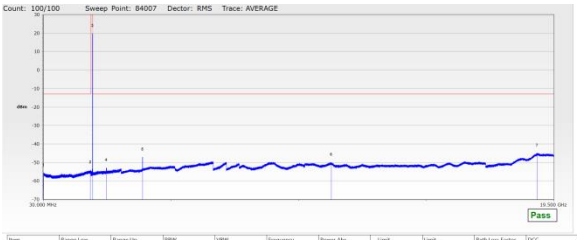
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.909 GHz	1.910 GHz	10.000 kHz	1.90981 GHz	18.26 dBm	-16.74 dB
1.910 GHz	1.911 GHz	3.000 kHz	1.91001 GHz	-27.30 dBm	-14.30 dB
1.911 GHz	1.915 GHz	1.000 MHz	1.91101 GHz	-39.20 dBm	-26.20 dB

Date: 21.APR.2025 22:29:36

Conducted Spurious Emission

GSM850 (GPRS)	GSM850 (EDGE)
Lowest Channel	**Lowest Channel**
	
Middle Channel	**Middle Channel**
	
Highest Channel	**Highest Channel**
	

GSM1900 (GPRS)	GSM1900 (EDGE)
Lowest Channel	**Lowest Channel**
	
Middle Channel	**Middle Channel**
	
Highest Channel	**Highest Channel**
	

Frequency Stability

Test Conditions	Middle Channel	GSM850 (GPRS)	GSM850 (EDGE)	Limit 2.5ppm
Temperature (°C)	Voltage (Volt)	Deviation (ppm)		Result
50	Normal Voltage	0.0039	0.0078	PASS
40	Normal Voltage	0.0422	0.0055	
30	Normal Voltage	0.0054	0.0077	
20(Ref.)	Normal Voltage	0.0000	0.0000	
10	Normal Voltage	0.0455	0.0095	
0	Normal Voltage	0.0241	0.0065	
-10	Normal Voltage	0.0089	0.0225	
-20	Normal Voltage	0.0155	0.0147	
-30	Normal Voltage	0.0125	0.0239	
20	Maximum Voltage	0.0322	0.0484	
20	Normal Voltage	0.0244	0.0197	
20	Minimum Voltage	0.0241	0.0212	

Test Conditions	Middle Channel	GSM1900 (GPRS)	GSM1900 (EDGE)	Limit Note 2.
Temperature (°C)	Voltage (Volt)	Deviation (ppm)		Result
50	Normal Voltage	0.0158	0.0241	PASS
40	Normal Voltage	0.0199	0.0085	
30	Normal Voltage	0.0066	0.0241	
20(Ref.)	Normal Voltage	0.0000	0.0000	
10	Normal Voltage	0.0207	0.0235	
0	Normal Voltage	0.0276	0.0158	
-10	Normal Voltage	0.0248	0.0075	
-20	Normal Voltage	0.0228	0.0335	
-30	Normal Voltage	0.0139	0.0385	
20	Maximum Voltage	0.0044	0.0174	
20	Normal Voltage	0.0176	0.0414	
20	Minimum Voltage	0.0126	0.0257	

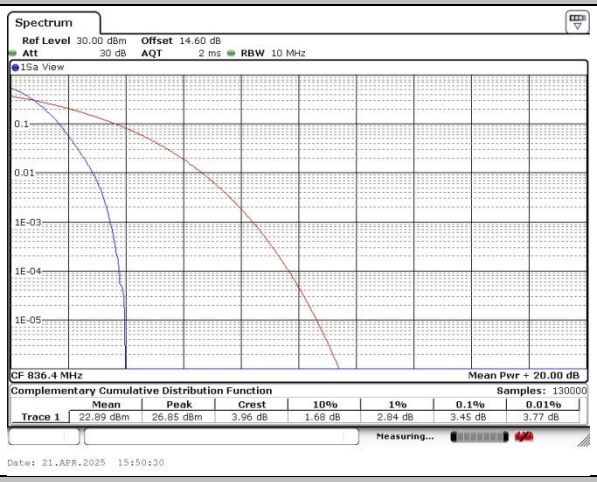
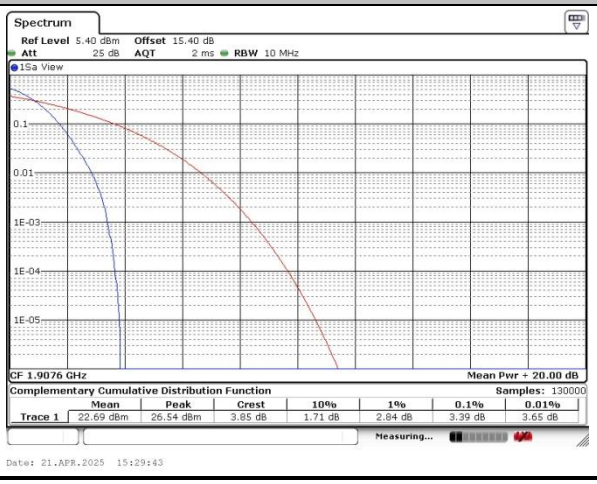
Note:

1. Normal Voltage = 12V；Minimum Voltage =10.8V.；Maximum Voltage =13.2V
2. The frequency fundamental emissions stay within the authorized frequency block based on the frequency deviation measured is small.

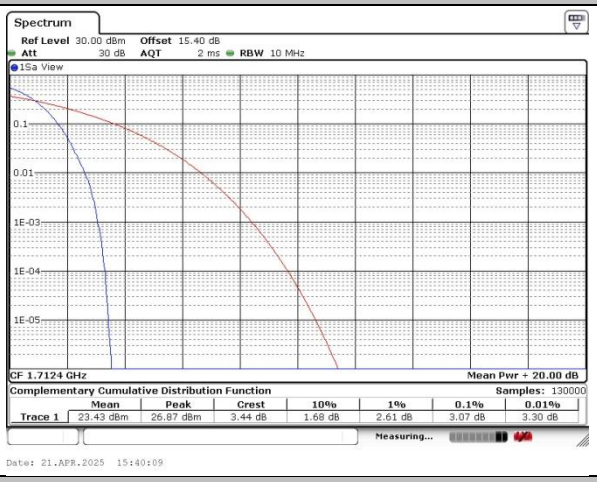
WCDMA

Peak-to-Average Ratio

Mode	WCDMA Band V	WCDMA Band II	WCDMA Band IV	Limit: 13dB
Mod.	RMC 12.2Kbps	RMC 12.2Kbps	RMC 12.2Kbps	Result
Lowest CH	3.45	3.22	3.07	PASS
Middle CH	3.45	3.33	3.04	
Highest CH	3.45	3.39	3.16	

WCDMA Band V (RMC 12.2Kbps)	WCDMA Band II (RMC 12.2Kbps)
Lowest Channel	**Lowest Channel**
	
Middle Channel	**Middle Channel**
	
Highest Channel	**Highest Channel**
	

WCDMA Band IV (RMC 12.2Kbps)
Lowest Channel

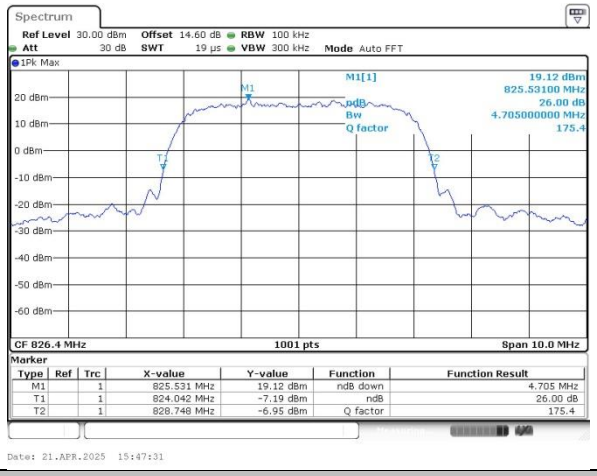
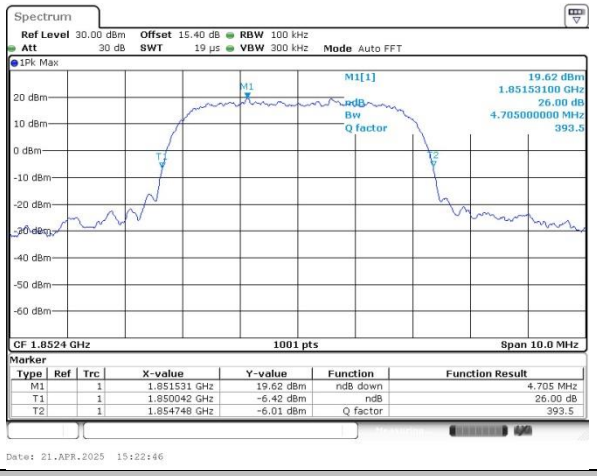
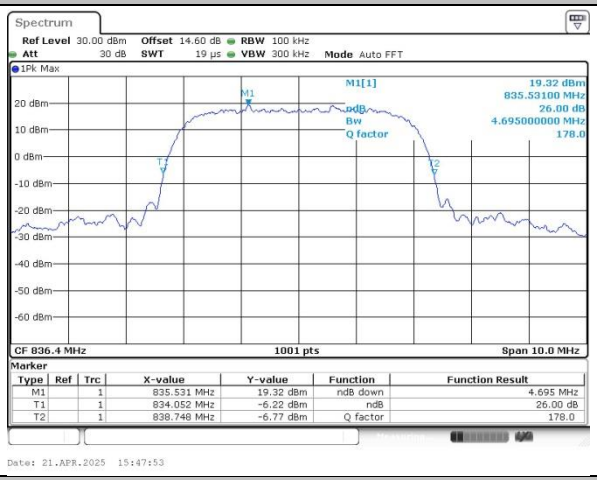
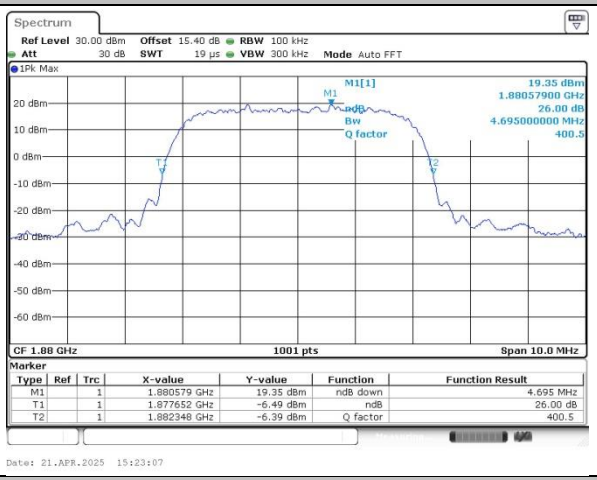
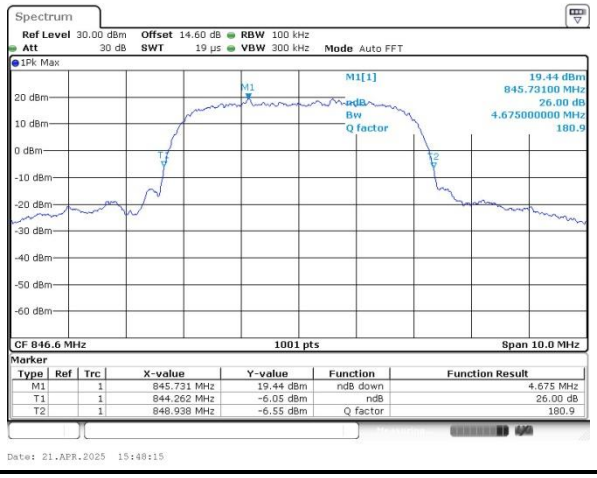
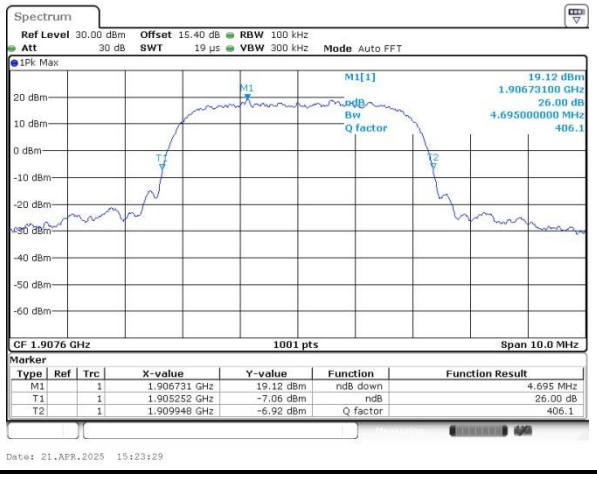


Middle Channel

Highest Channel

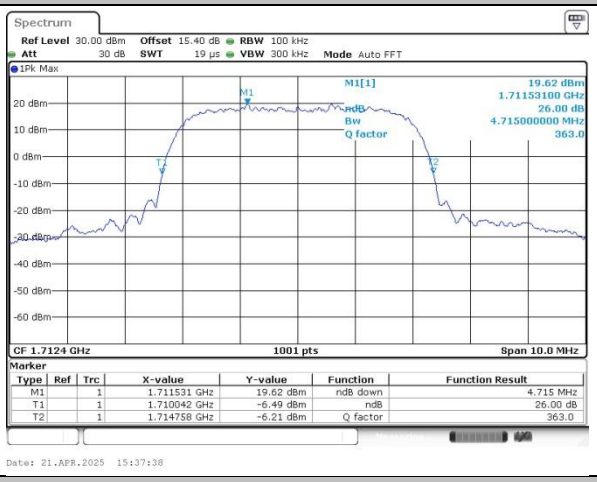
26dB Bandwidth

Mode	WCDMA Band V	WCDMA Band II	WCDMA Band IV
Mod.	RMC 12.2Kbps	RMC 12.2Kbps	RMC 12.2Kbps
Lowest CH	4.705MHz	4.705MHz	4.715MHz
Middle CH	4.695MHz	4.695MHz	4.715MHz
Highest CH	4.675MHz	4.695MHz	4.715MHz

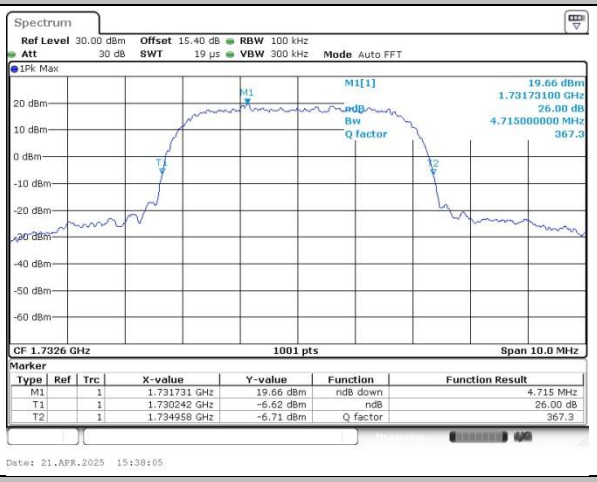
WCDMA Band V (RMC 12.2Kbps)	WCDMA Band II (RMC 12.2Kbps)
Lowest Channel	**Lowest Channel**
	
Middle Channl	**Middle Channel**
	
Highest Channel	**Highest Channel**
	

WCDMA Band IV (RMC 12.2Kbps)

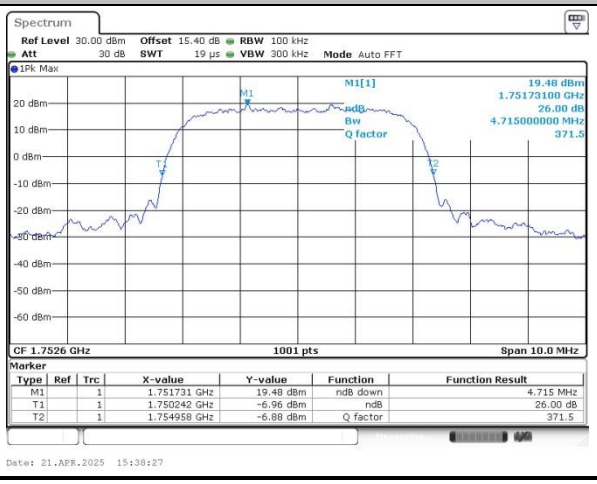
Lowest Channel



Middle Channel



Highest Channel



Occupied Bandwidth

Mode	WCDMA Band V	WCDMA Band II	WCDMA Band IV
Mod.	RMC 12.2Kbps	RMC 12.2Kbps	RMC 12.2Kbps
Lowest CH	4.126MHz	4.116MHz	4.126MHz
Middle CH	4.116MHz	4.106MHz	4.106MHz
Highest CH	4.106MHz	4.123MHz	4.116MHz