RF TEST REPORT

Report No.:	20241017G21082X-W3
Product Name:	GNSS/INS SYSTEM
Model No.:	CGI-830
FCC ID:	SY4-A02060
Applicant:	Shanghai Huace Navigation Technology Ltd.
Address:	577 Songying Road, Qingpu District, 201706 Shanghai, China
Dates of Testing:	10/23/2024 - 11/18/2024
Issued by:	CCIC Southern Testing Co., Ltd.
Lab Location:	Electronic Testing Building, No.43, Shahe Road, Xili Street, Nanshan District, Shenzhen, Guangdong, China. **Tel：**86-755-26627338 **E-Mail：**manager@ccic-set.com

Test Report

Product.....:	GNSS/INS SYSTEM
Trade Name .....:	CHCNAV
Applicant.....:	Shanghai Huace Navigation Technology Ltd.
Applicant Address.....:	577 Songying Road, Qingpu District, 201706 Shanghai, China
Manufacturer.....:	Shanghai Huace Navigation Technology Ltd.
Manufacturer Address.....:	577 Songying Road, Qingpu District, 201706 Shanghai, China
Test Standards.....:	47 CFR Part 2/22/24/27
Test Result.....:	Pass

Tested by .....: Chuiwang Zhang 2024.11.18

Chuiwang Zhang, Test Engineer

Reviewed by.....: Sun Jiaohui 2024.11.18

Sun Jiaohui, Senior Engineer

Approved by.....: Chris You 2024.11.18

Chris You, Manager

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Change History		
Issue	Date	Reason for change
1.0	2024.11.18	First edition

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	GNSS/INS SYSTEM		
Model No.	CGI-830		
EUT supports Radios application	GPRS/EDGE/WCDMA/HSPA		
Frequency Range	GSM 850:	UL: 824.2 - 848.8MHz (at intervals of 200kHz); DL: 869.2 - 893.8MHz (at intervals of 200kHz)	
	PCS 1900:	UL: 1850.2 - 1909.8MHz (at intervals of 200kHz); DL: 1930.2 - 1989.8MHz (at intervals of 200kHz)	
	WCDMA 850:	UL: 826.4 - 846.6MHz (at intervals of 200kHz); DL: 871.4 - 891.6MHz (at intervals of 200kHz)	
	WCDMA 1700:	UL: 1712.4 - 1752.6MHz (at intervals of 200kHz); DL: 2112.4 - 2152.6MHz (at intervals of 200kHz)	
	WCDMA 1900:	UL: 1852.4 - 1907.6MHz (at intervals of 200kHz); DL: 1932.4 - 1987.6MHz (at intervals of 200kHz)	
Maximum ERP/EIRP	GPRS 850: 29.36dBm, EDGE 850: 22.76dBm GPRS 1900: 29.54dBm, EDGE 1900: 26.12dBm		WCDMA 850: 18.69dBm WCDMA 1700: 22.03dBm WCDMA 1900: 22.28dBm
Type of Modulation	GPRS: GMSK EDGE: GMSK / 8PSK		WCDMA: QPSK(Uplink) HSDPA: QPSK(Uplink) HSUPA: QPSK(Uplink)
Antenna Type	External Antenna		
Antenna Gain	GSM 850: -2.49dBi PCS 1900: -1.63dBi WCDMA 850: -2.49dBi WCDMA 1700: -1.63dBi WCDMA 1900: -1.63dBi		
Power supply	9 to 32V DC input (Standard Adaptation 12V DC)		

Note 1: The information of antenna gain and cable loss is provided by the manufacturer and our lab is not responsible for the accuracy of the antenna gain and cable loss information.

1.2. Maximum ERP/EIRP, Frequency Tolerance and Emission Designator

System	Type of Modulation	Emission Designator	Frequency Tolerance (ppm)	Maximum ERP (W)
GPRS 850	GMSK	247KGXW	0.037939	0.863
EDGE 850	8PSK	246KG7W	0.032991	0.189
WCDMA 850	QPSK	4M13F9W	-0.001363	0.074

System	Type of Modulation	Emission Designator	Frequency Tolerance (ppm)	Maximum EIRP (W)
GPRS 1900	GMSK	245KGXW	0.012090	0.899
EDGE 1900	8PSK	244KG7W	0.013378	0.409
WCDMA 1900	QPSK	4M12F9W	-0.001989	0.169
WCDMA 1700	QPSK	4M13F9W	-0.001449	0.160

1.3. Test Standards and Results

The purpose of the report is to conduct testing according to the following FCC certification standards:

No.	Identity	Document Title
1	47 CFR Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	47 CFR Part 22	Public Mobile Services
3	47 CFR Part 24	Personal Communications Services
4	47 CFR Part 27	Miscellaneous Wireless Communications Services
5	KDB 971168 D01 Power Meas License Digital Systems v03r01	Measurement Guidance For Certification of Licensed Digital Transmitters
6	KDB 412172 D01 Determining ERP and EIRP v01r01	Guidelines for Determining the Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) of an RF Transmitting Systems
7	ANSI/TIA-603-E-2016	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
8	ANSI C63.26-2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

Test detailed items/section required by FCC rules and results are as below:

No.	FCC Rule	Description	Limit	Result
1	2.1046	Conducted Output Power	Reporting Only	PASS
2	22.913(a)(5)	Effective Radiated Power (GSM850/W850)	ERP < 7Watts	PASS
	24.232 (c)	Equivalent Isotropic Radiated Power (GSM1900/W1900)	EIRP < 2Watts	PASS
	27.50(d)(4)	Equivalent Isotropic Radiated Power(W1700)	EIRP < 1Watts	PASS
3	22.913(d) 24.232(d) 27.50(d)(5)	Peak to Average Radio	< 13dBm	PASS
4	2.1049	Occupied Bandwidth	Reporting Only	PASS
5	2.1055 22.355 24.235 27.54	Frequency Stability (GSM850/W850)	< ±2.5ppm	PASS
		Frequency Stability (PCS1900/W1700/W1900)	Within the Authorized Band	PASS
6	2.1051 22.917 24.238 27.53	Conducted Spurious Emission and Conducted Band Edge	< $43+10\log_{10}$(P[Watts])	PASS
7	2.1053 22.917 24.238 27.53	Radiated Spurious Emissions	< $43+10\log_{10}$(P[Watts])	PASS

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.

1.4. Test Configuration of Equipment Under Test

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

Radiated measurements are performed by rotating the EUT in three(X: flat, Y: portrait, Z: landscape) different orthogonal test planes to find the maximum emission.

Radiated emissions were investigated as following frequency range:

1. 30 MHz to 9000 MHz for GSM 850 and WCDMA Band V.
2. 30 MHz to 20000 MHz for PCS 1900 and WCDMA Band II.
3. 30 MHz to 18000 MHz for WCDMA Band IV.

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 Link, EDGE Link	GPRS Link, EDGE Link
PCS 1900	GPRS Link, EDGE Link	GPRS Link, EDGE 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

Note: The maximum power levels are chosen to test as the worst case configuration as follows:

GPRS mode for GMSK modulation,

EDGE multi-slot class 8 mode for 8PSK modulation,

RMC 12.2kbps mode for WCDMA band V,

RMC 12.2kbps mode for WCDMA band II,

RMC 12.2kbps mode for WCDMA band IV, only these modes were used for all tests.

1.5. Laboratory Facilities

FCC-Registration No.: CN1283

CCIC Southern Testing Co., Ltd 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 our files. Designation Number: CN1283, valid time is until Jun. 30th, 2025.

ISED Registration: 11185A

CCIC Southern Testing Co., Ltd. EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 11185A on Aug. 04, 2016, valid time is until Jun. 30th, 2025.

CAB number: CN0064

A2LA Code: 5721.01

CCIC-SET is a third party testing organization accredited by A2LA according to ISO/IEC 17025. The accreditation certificate number is 5721.01.

1.6. Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15℃- 35℃
Relative Humidity (%):	30% -60%
Atmospheric Pressure (kPa):	86kPa-106kPa

2. 47 CFR Part 2 Requirements

2.1. Conducted Output Power and ERP/EIRP

2.1.1. Requirement

According to FCC section 2.1046(a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

The EIRP of mobile transmitters must not exceed 2 Watts for PCS1900 and W1900.

The EIRP of mobile transmitters must not exceed 1 Watts for W1700.

The ERP of mobile transmitters must not exceed 7 Watts for GSM850 and W850.

According to KDB 412172 D01 Determining ERP and EIRP v01r01.

EIRP = P_T + $_{GT}$ - 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.

2.1.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.1.3. Test Setup

2.1.4. Test Procedures

1. The transmitter output port was connected to the system simulator.

2. Set EUT at maximum power through system simulator.

3. Select lowest, middle, and highest channels for each band and different modulation.

4. Measure and record the power level from the system simulator.

2.1.5. Test Results of Conducted Output Power and ERP/EIRP

GSM 850							
EUT Mode		Average power (dBm)			Ant. Gain (dBi)	Max. ERP (dBm)	ERP Limit (dBm)
		128	190	251			
		824.2MHz	836.6MHz	848.8MHz			
GSM	Voice	/	/	/	-2.49	29.36	38.45
GPRS	Slot 1	33.76	33.71	34.00			
	Slot 2	32.39	32.33	31.83			
	Slot 3	30.75	30.41	30.44			
	Slot 4	29.48	29.37	29.34			
EGPRS	Slot 1	27.40	27.21	27.29		22.76	
	Slot 2	26.29	26.10	26.02			
	Slot 3	24.59	24.40	24.44			
	Slot 4	23.47	23.34	23.33			

PCS 1900							
EUT Mode		Average power (dBm)			Ant. Gain (dBi)	Max. ERP (dBm)	ERP Limit (dBm)
		512	661	810			
		1850.2MHz	1880.0MHz	1909.8MHz			
GSM	Voice	/	/	/	-1.63	29.54	33.00
GPRS	Slot 1	31.12	31.12	31.17			
	Slot 2	29.90	29.87	29.87			
	Slot 3	28.09	28.04	27.97			
	Slot 4	26.73	26.65	26.61			
EGPRS	Slot 1	27.75	27.73	27.73		26.12	
	Slot 2	26.88	26.85	26.86			
	Slot 3	25.49	25.42	25.46			
	Slot 4	24.28	24.17	24.11			

WCDMA 850							
EUT Mode		Average power (dBm)			Ant. Gain (dBi)	Max. ERP (dBm)	ERP Limit (dBm)
		4132	4183	4233			
		826.4MHz	836.6MHz	846.6MHz			
RMC	12.2 kbps	23.25	23.22	23.33	-2.49	18.69	38.45
AMR	12.2 kbps	/	/	/			
HSDPA	Subtest 1	22.46	22.39	22.52			
	Subtest 2	21.88	21.80	21.91			
	Subtest 3	21.89	21.80	21.92			
	Subtest 4	21.92	21.82	21.94			
HSUPA	Subtest 1	21.88	21.60	21.85			
	Subtest 2	21.37	20.88	21.22			
	Subtest 3	21.06	20.87	21.14			
	Subtest 4	21.43	21.36	21.51			
	Subtest 5	22.46	22.38	22.50			

WCDMA 1700							
EUT Mode		Average power (dBm)			Ant. Gain (dBi)	Max. EIRP (dBm)	EIRP Limit (dBm)
		1312	1413	1513			
		1712.4MHz	1732.6MHz	1752.6MHz			
RMC	12.2 kbps	23.41	23.66	23.55	-1.63	22.03	30.00
AMR	12.2 kbps	/	/	/			
HSDPA	Subtest 1	22.45	22.70	22.54			
	Subtest 2	21.88	22.13	21.99			
	Subtest 3	21.91	22.17	22.01			
	Subtest 4	21.92	22.19	22.05			
HSUPA	Subtest 1	22.40	22.62	21.78			
	Subtest 2	21.18	21.22	21.30			
	Subtest 3	20.73	21.51	21.02			
	Subtest 4	21.89	22.14	21.43			
	Subtest 5	22.46	22.67	22.56			

WCDMA 1900							
EUT Mode		Average power (dBm)			Ant. Gain (dBi)	Max. EIRP (dBm)	EIRP Limit (dBm)
		9262	9400	9538			
		1852.4MHz	1880.0MHz	1907.6MHz			
RMC	12.2 kbps	23.81	23.91	23.70	-1.63	22.28	33
AMR	12.2 kbps	/	/	/			
HSDPA	Subtest 1	22.85	22.83	22.67			
	Subtest 2	22.21	22.25	22.03			
	Subtest 3	23.13	22.86	22.64			
	Subtest 4	21.89	22.23	21.99			
HSUPA	Subtest 1	22.26	22.43	21.87			
	Subtest 2	21.61	21.50	21.42			
	Subtest 3	20.96	21.23	21.05			
	Subtest 4	21.81	21.68	21.87			
	Subtest 5	22.78	22.77	22.56			

2.2. Peak-to-average power ratio (PAPR)

2.2.1. Requirement

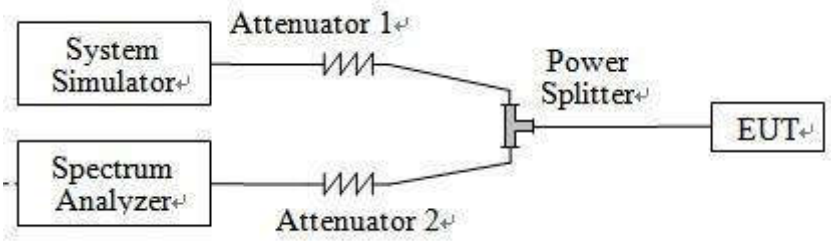
Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement 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 power ratio (PAPR) of the transmission may not exceed 13 dB.

2.2.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.2.3. Test Description



2.2.4. Test Procedures

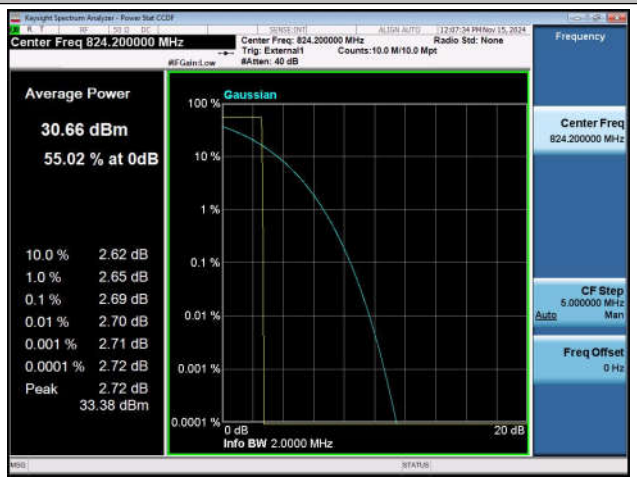
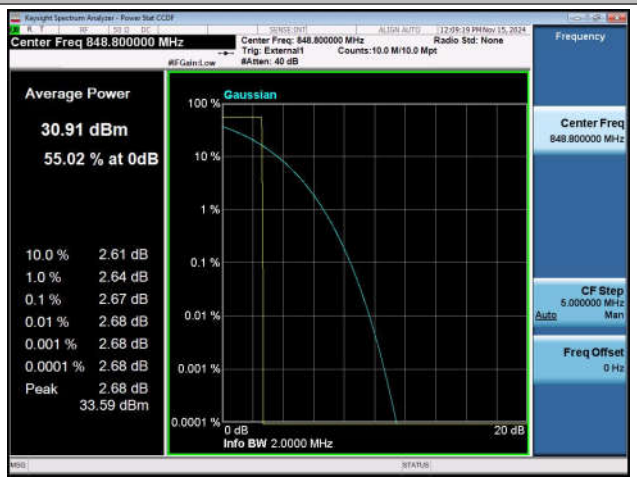
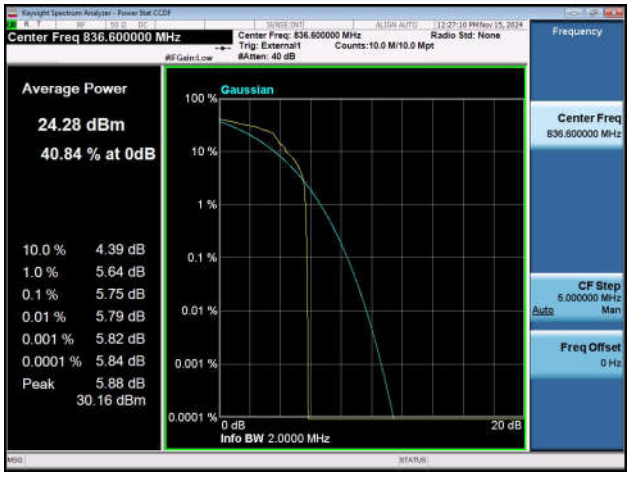
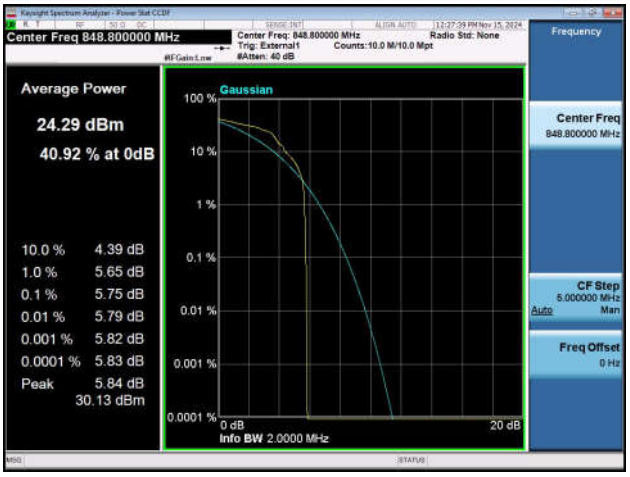
1. The testing follows the of KDB 971168 D01 v03r01 Section 5.7.2 and ANSI C63.26-2015 Section 5.2.3.4.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider, Path loss compensation is then performed on the spectrum analyzer and the system simulator respectively.
3. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
4. Set resolution/measurement bandwidth ≥ OBW or specified reference bandwidth.
5. Set the number of counts to a value that stabilizes the measured CCDF curve.
6. Set the EUT working in highest power level, measured and recorded the 0.1% as PAPR level.
7. Repeat step 3~6 at other frequency and modulations.

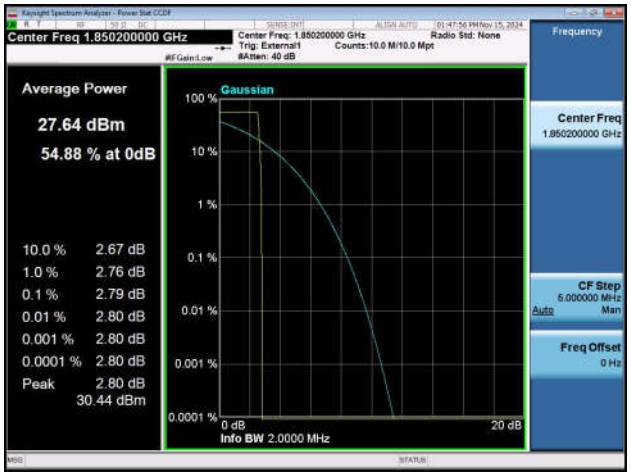
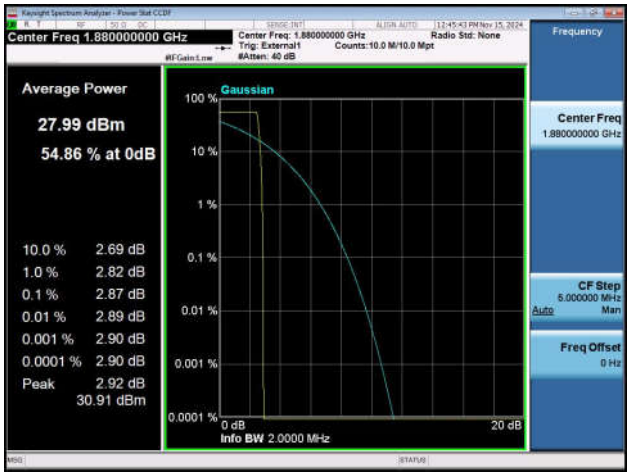
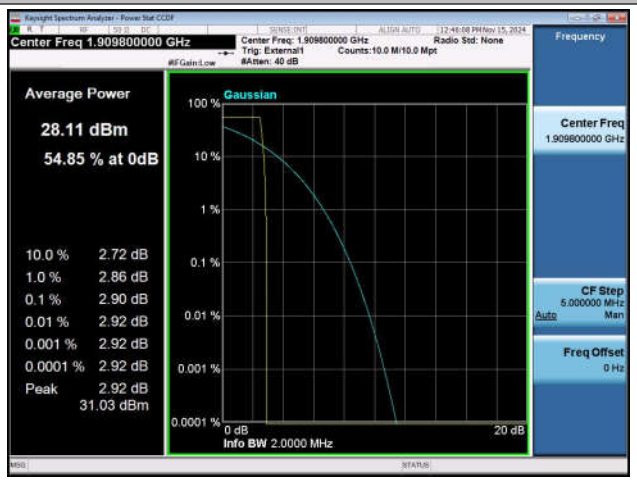
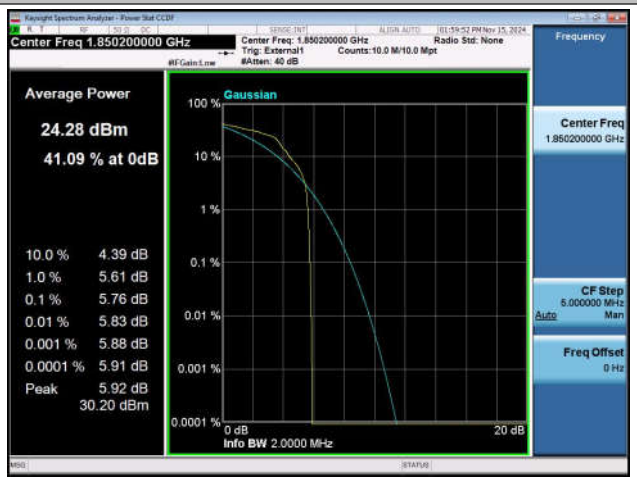
2.2.5. Test Results of Peak-to-average power ratio (PAPR)

Band	Channel	Peak-to-Average Ratio(dB)	Limit(dB)	Verdict
GPRS850	128	2.69	13	PASS
GPRS850	190	2.67	13	PASS
GPRS850	251	2.67	13	PASS
EGPRS850	128	5.77	13	PASS
EGPRS850	190	5.75	13	PASS
EGPRS850	251	5.75	13	PASS
GPRS1900	512	2.79	13	PASS
GPRS1900	661	2.87	13	PASS
GPRS1900	810	2.90	13	PASS
EGPRS1900	512	5.76	13	PASS
EGPRS1900	661	5.83	13	PASS
EGPRS1900	810	5.89	13	PASS

Band	Channel	Peak-to-Average Ratio(dB)	Limit(dB)	Verdict
Band2	9262	3.14	13	PASS
Band2	9400	3.14	13	PASS
Band2	9538	3.14	13	PASS
Band4	1312	3.26	13	PASS
Band4	1413	3.29	13	PASS
Band4	1513	3.22	13	PASS
Band5	4132	3.29	13	PASS
Band5	4183	3.15	13	PASS
Band5	4233	3.13	13	PASS

Test Graphs

GPRS850-128-5-PASS	GPRS850-190-5-PASS
	
GPRS850-251-5-PASS	**EGPRS850-128-8-PASS**
	
EGPRS850-190-8-PASS	**EGPRS850-251-8-PASS**
	

GPRS1900-512-0-PASS	GPRS1900-661-0-PASS
	
GPRS1900-810-0-PASS	**EGPRS1900-512-2-PASS**
	
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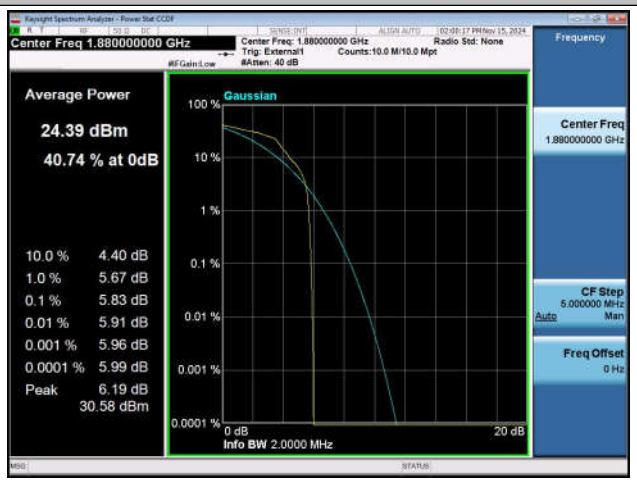
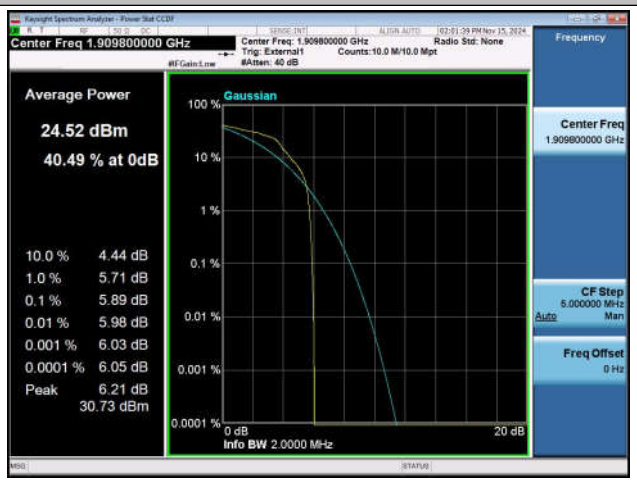
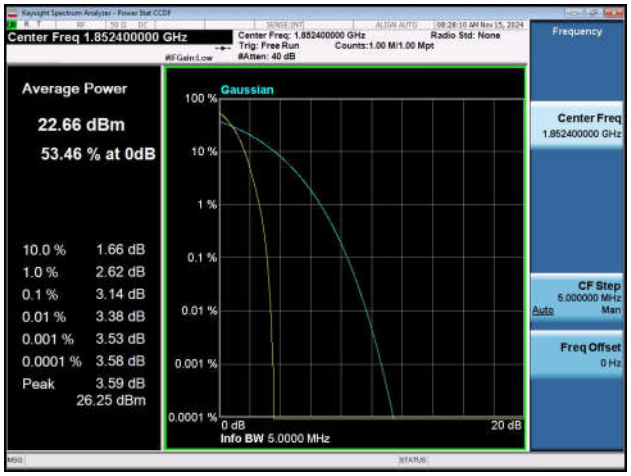
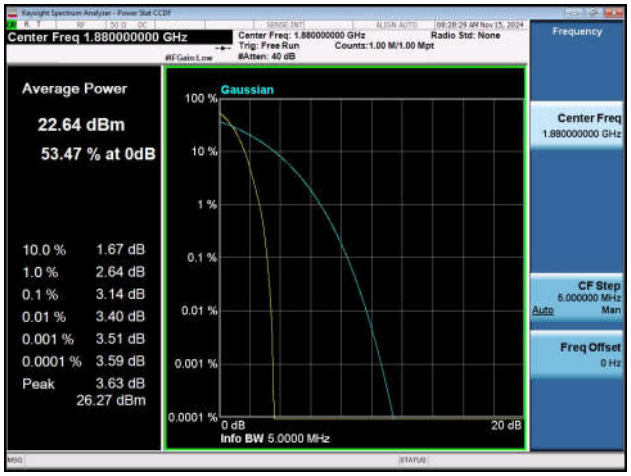
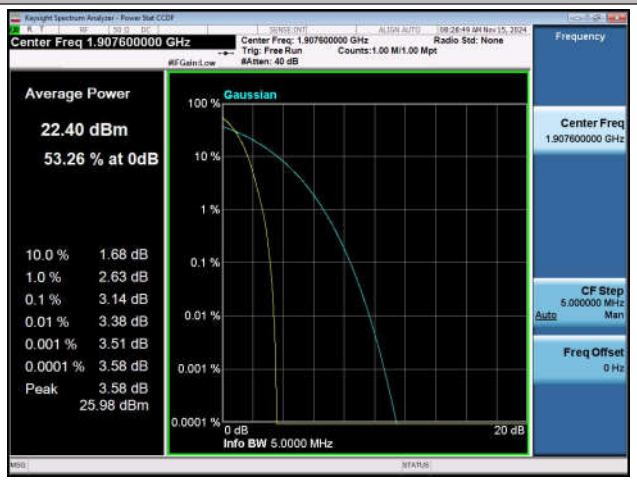
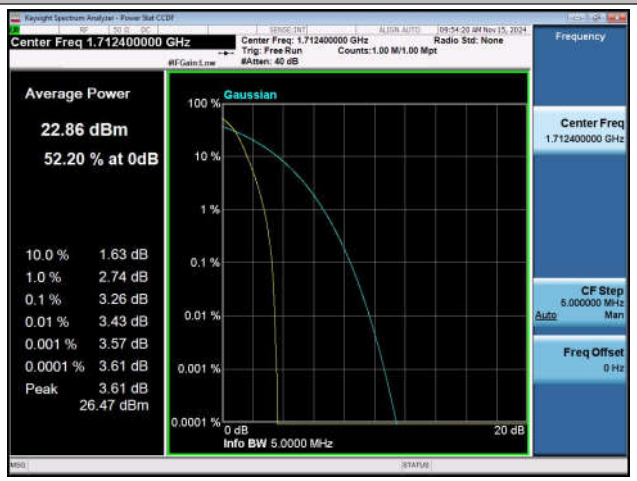
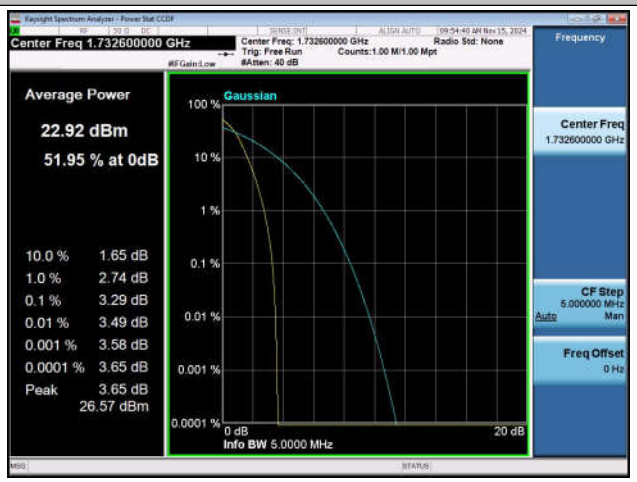
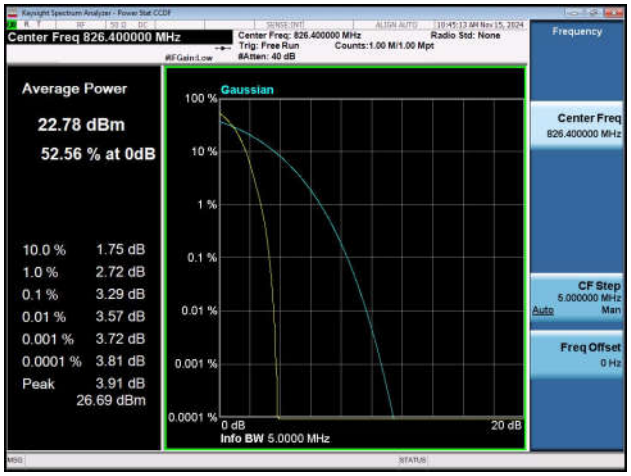
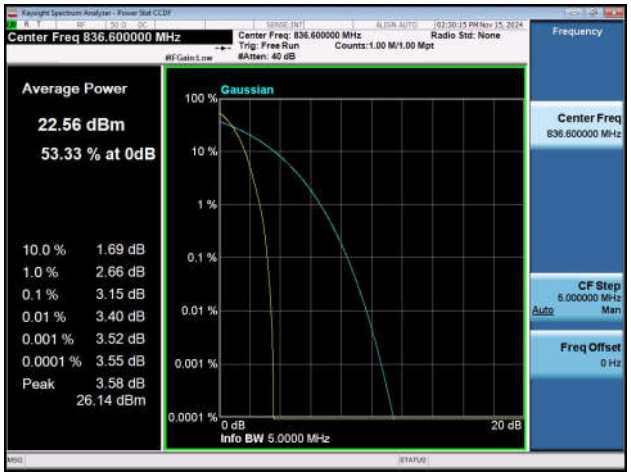
	

Band2-9262-PASS	Band2-9400-PASS
	
Band2-9538-PASS	**Band4-1312-PASS**
	
Band4-1413-PASS	**Band4-1513-PASS**
	

Band5-4132-PASS	Band5-4183-PASS
	
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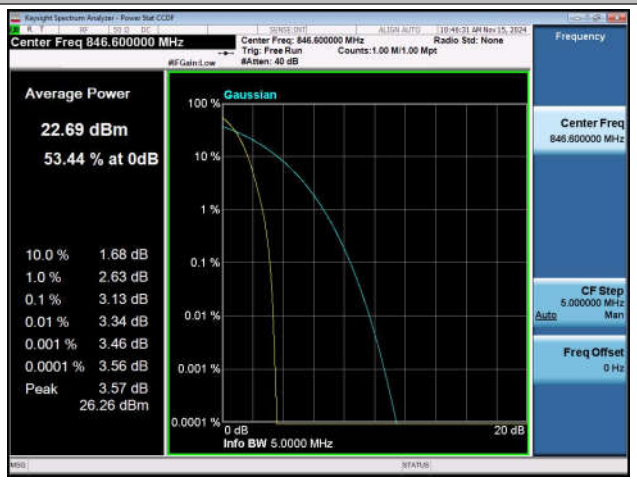
	

2.3. 99% Occupied Bandwidth and 26dB Emission Bandwidth

2.3.1. Requirement

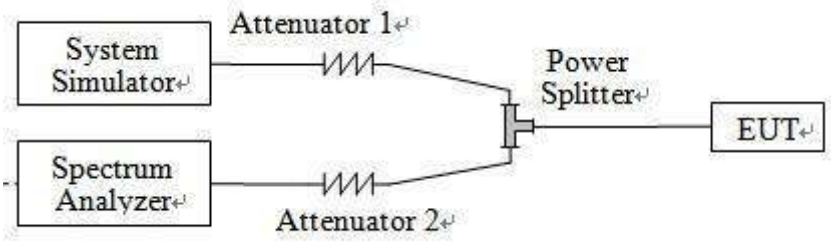
The Occupied Bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission.

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.

2.3.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.3.3. Test Setup



2.3.4. Test Procedures

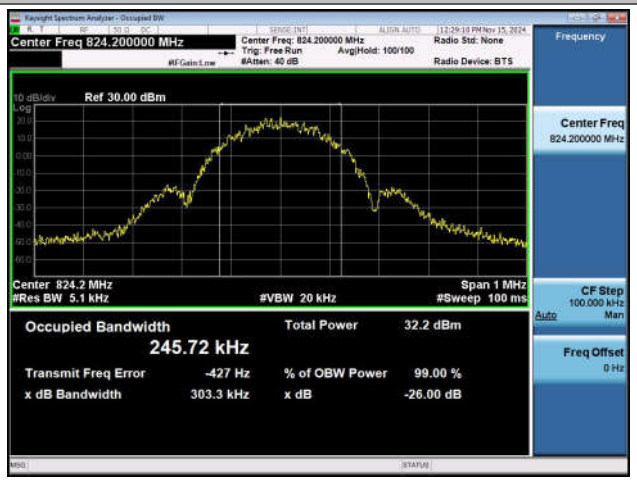
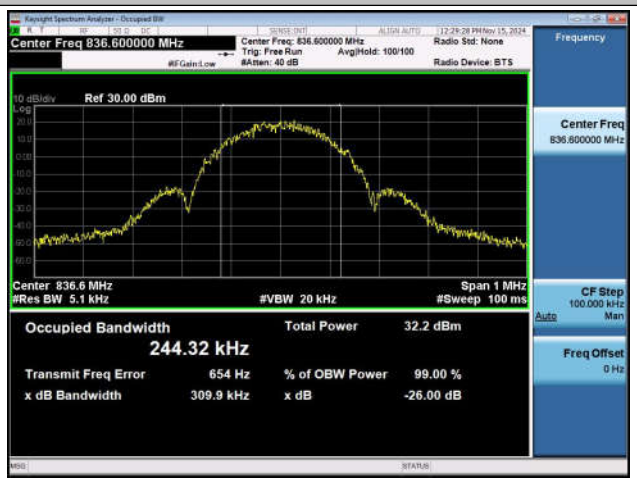
1. The testing follows the of KDB 971168 D01 v03r01 Section 4 and ANSI C63.26-2015 Section 5.4.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider, Path loss compensation is then performed on the spectrum analyzer and the system simulator respectively.
3. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency.
4. Set span to be approximately 1.5 to 5 times the OBW.
5. The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW.
6. Set VBW ≥ 3 × RBW.
7. Set Detection mode = peak.
8. Set Trace mode = max hold.
9. Allow trace to stabilize.
10. Repeat step 3~9 at other frequency and modulations.

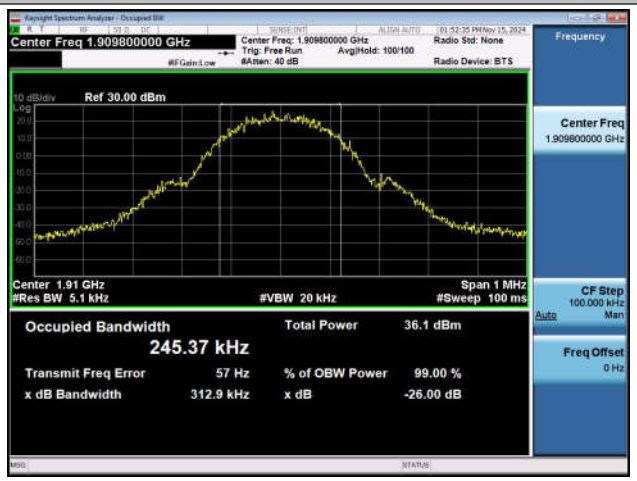
2.3.5. Test Result of 99% Occupied Bandwidth and 26dB Emission Bandwidth

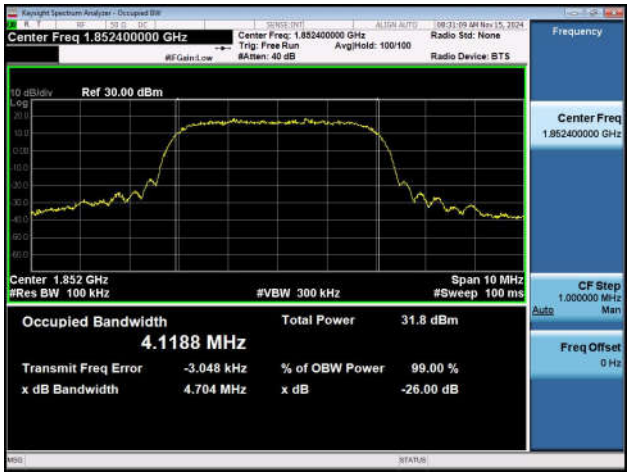
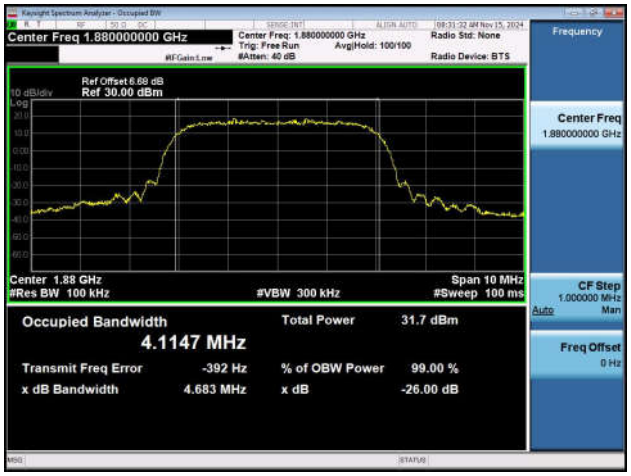
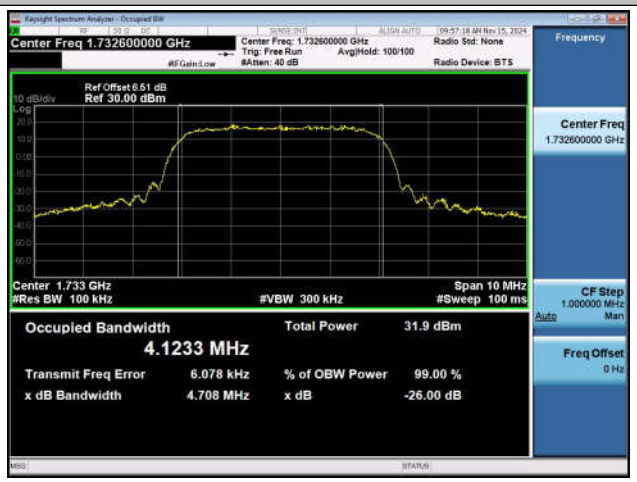
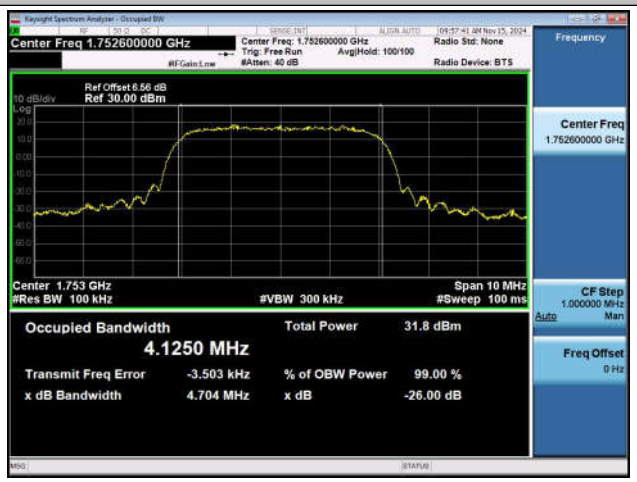
Band	Channel	26dB EBW(MHz)	99% OBW(MHz)	Limit(MHz)	Verdict
GPRS850	128	0.3116	0.24592	---	PASS
GPRS850	190	0.3120	0.24731	---	PASS
GPRS850	251	0.3037	0.24530	---	PASS
EGPRS850	128	0.3033	0.24572	---	PASS
EGPRS850	190	0.3099	0.24432	---	PASS
EGPRS850	251	0.3023	0.24571	---	PASS
GPRS1900	512	0.3166	0.24529	---	PASS
GPRS1900	661	0.3181	0.24435	---	PASS
GPRS1900	810	0.3129	0.24537	---	PASS
EGPRS1900	512	0.3072	0.24366	---	PASS
EGPRS1900	661	0.3023	0.23996	---	PASS
EGPRS1900	810	0.3052	0.24360	---	PASS

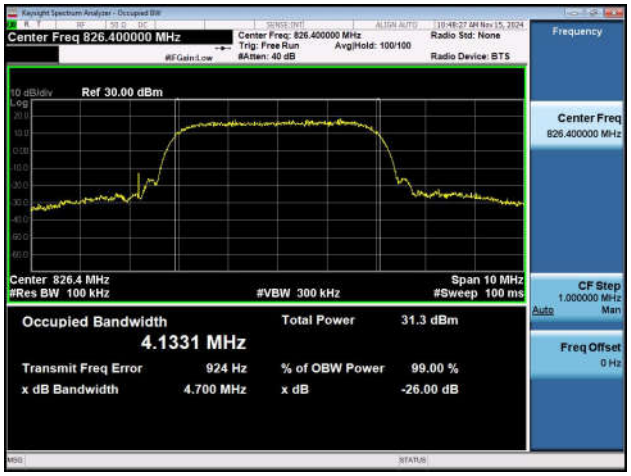
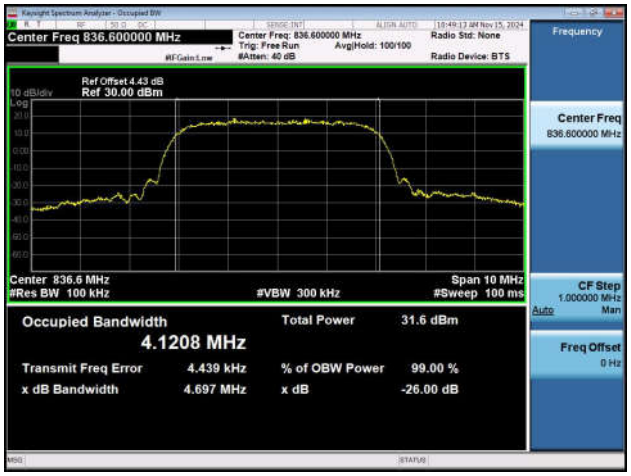
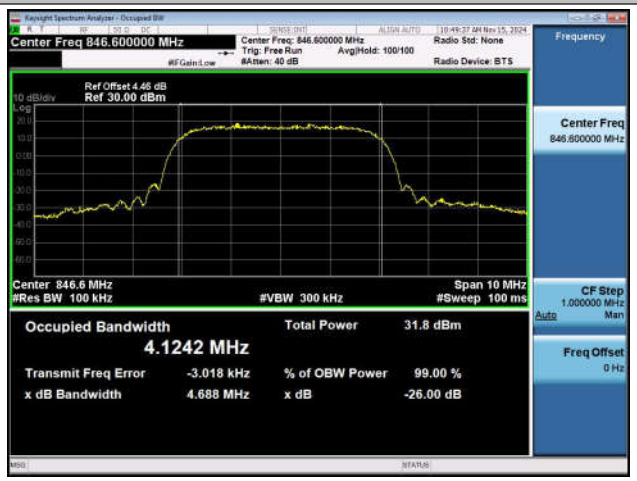
Band	Channel	26dB EBW(MHz)	99% OBW(MHz)	Limit(MHz)	Verdict
Band2	9262	4.704	4.1188	---	PASS
Band2	9400	4.683	4.1147	---	PASS
Band2	9538	4.696	4.1146	---	PASS
Band4	1312	4.698	4.1181	---	PASS
Band4	1413	4.708	4.1233	---	PASS
Band4	1513	4.704	4.1250	---	PASS
Band5	4132	4.700	4.1331	---	PASS
Band5	4183	4.697	4.1208	---	PASS
Band5	4233	4.688	4.1242	---	PASS

Test Graphs

GPRS850-128-5-PASS	GPRS850-190-5-PASS
	
GPRS850-251-5-PASS	**EGPRS850-128-8-PASS**
	
EGPRS850-190-8-PASS	**EGPRS850-251-8-PASS**
	

GPRS1900-512-0-PASS	GPRS1900-661-0-PASS
	
GPRS1900-810-0-PASS	**EGPRS1900-512-2-PASS**
	
EGPRS1900-661-2-PASS	**EGPRS1900-810-2-PASS**
	

Band2-9262-PASS	Band2-9400-PASS
	
Band2-9538-PASS	**Band4-1312-PASS**
	
Band4-1413-PASS	**Band4-1513-PASS**
	

Band5-4132-PASS	Band5-4183-PASS
	
Band5-4233-PASS	
	

2.4. Conducted Band Edge

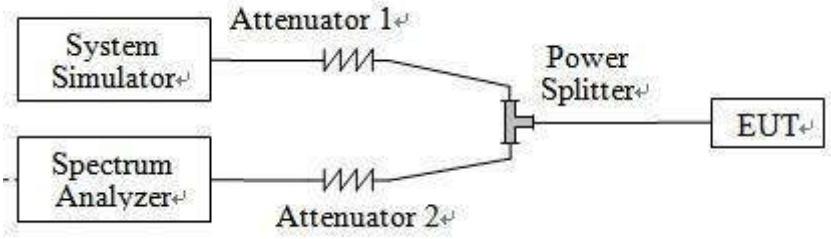
2.4.1. Requirement

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.

2.4.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.4.3. Test Setup



2.4.4. Test Procedures

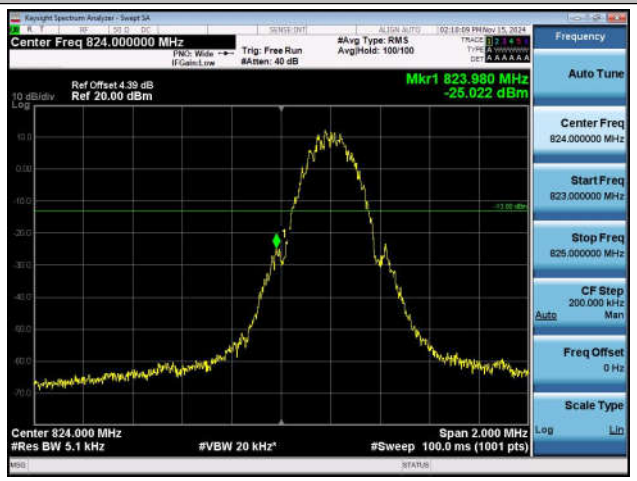
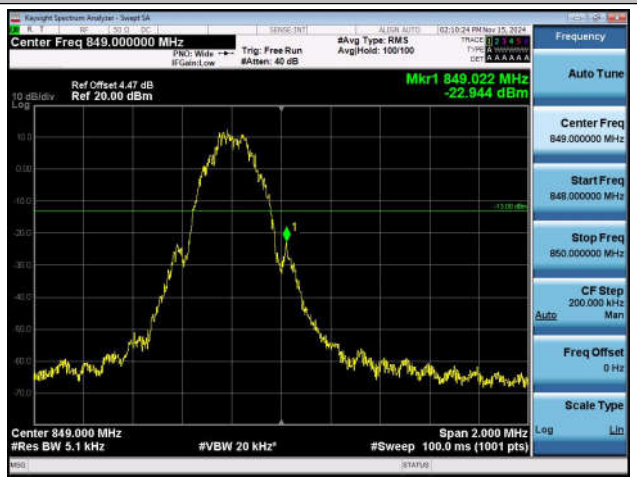
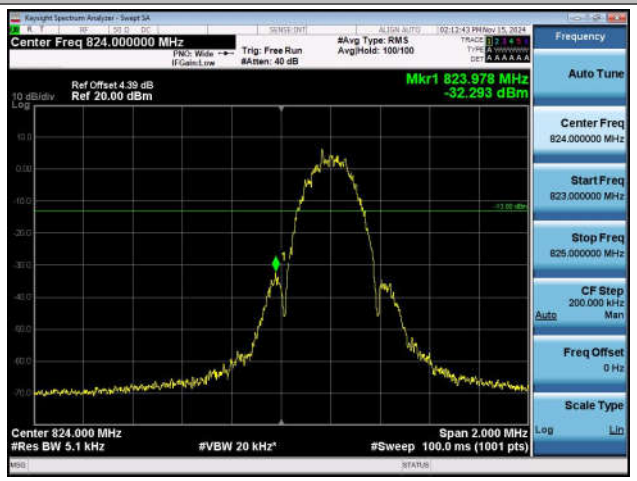
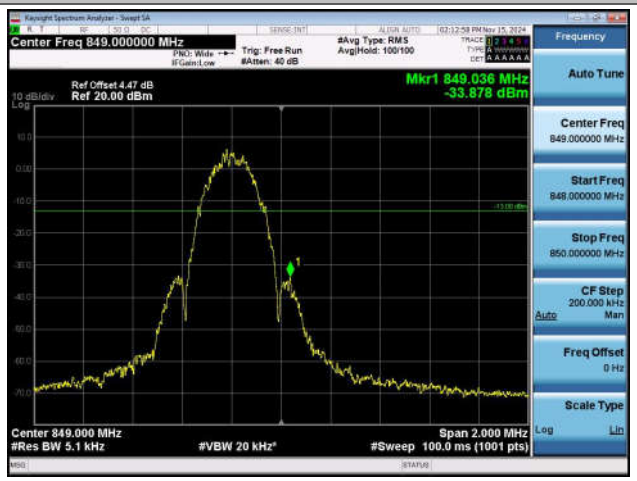
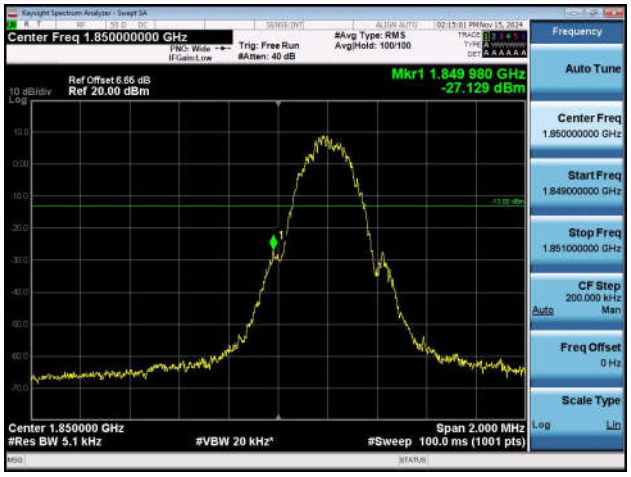
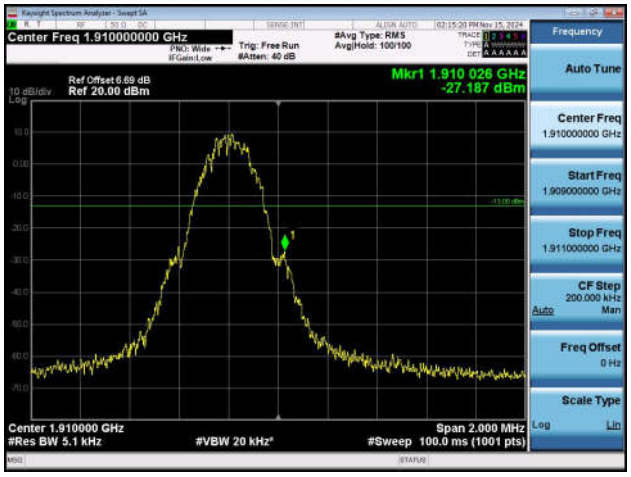
1. The testing follows the of KDB 971168 D01 v03r01 Section 6 and ANSI C63.26-2015 Section 5.7.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider, Path loss compensation is then performed on the spectrum analyzer and the system simulator respectively.
3. Span was set large enough so as to capture all out of band emissions near the Channel Edge.
4. Use RBW ≥ 1% EBW in the 1 megahertz bands immediately outside and adjacent to the licensee's authorized frequency channel, and use RBW = 1 MHz outside 1 MHz of the authorized frequency channel.
5. Set VBW ≥ 3 × RBW
6. Set Detector = power averaging (rms).
7. Set the number of points in sweep ≥ 2 × span / RBW.
8. Set sweep trigger to “free run.”
9. Set the Sweep time > (number of points in sweep) × (transmitter period) (i.e., the transmit on-time + the off-time).
10. Perform a trace average of at least 100 traces.
11. Repeat step 3~10 at other frequency and modulations.

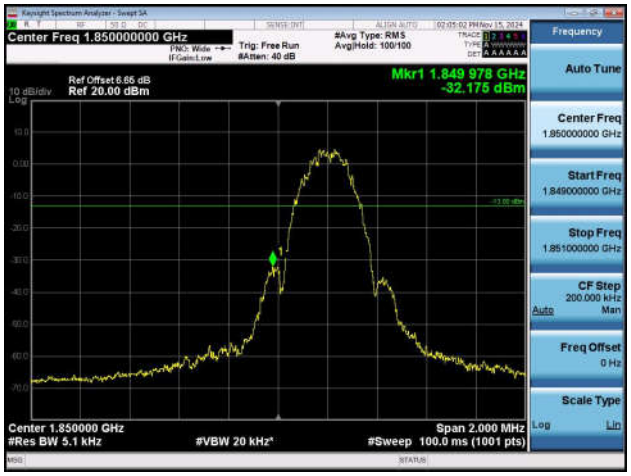
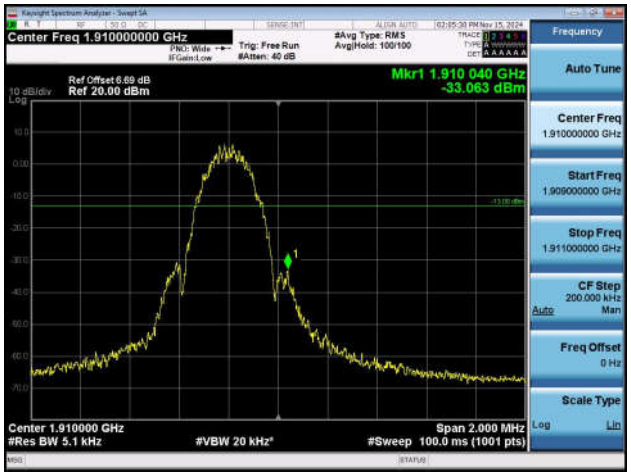
2.4.5. Test Result of Conducted Band Edge

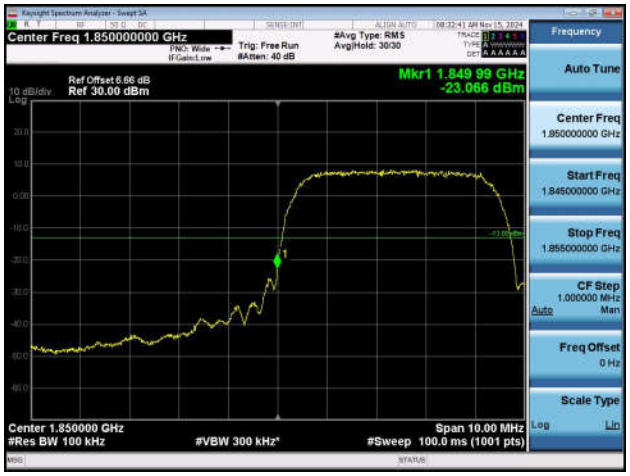
Band	Channel	Frequency (MHz)	Result (dBm)	Limit(dBm)	Verdict
GPRS850	128	823.98	-25.02	-13	PASS
GPRS850	251	849.02	-22.94	-13	PASS
EGPRS850	128	823.98	-32.29	-13	PASS
EGPRS850	251	849.04	-33.88	-13	PASS
GPRS1900	512	1849.98	-27.13	-13	PASS
GPRS1900	810	1910.03	-27.19	-13	PASS
EGPRS1900	512	1849.98	-32.18	-13	PASS
EGPRS1900	810	1910.04	-33.06	-13	PASS

Band	Channel	Frequency (MHz)	Result (dBm)	Limit(dBm)	Verdict
Band2	9262	1849.99	-23.07	-13	PASS
Band2	9538	1910.01	-24.26	-13	PASS
Band4	1312	1709.99	-23.59	-13	PASS
Band4	1513	1755.01	-23.34	-13	PASS
Band5	4132	823.99	-24.37	-13	PASS
Band5	4233	849.01	-23.85	-13	PASS

Test Graphs

GPRS850-128-5-PASS	GPRS850-251-5-PASS
	
EGPRS850-128-8-PASS	**EGPRS850-251-8-PASS**
	
GPRS1900-512-0-PASS	**GPRS1900-810-0-PASS**
	

EGPRS1900-512-2-PASS	EGPRS1900-810-2-PASS
	

Band2-9262-PASS	Band2-9538-PASS
	
Band4-1312-PASS	Band4-1513-PASS
	
Band5-4132-PASS	Band5-4233-PASS
	

2.5. Conducted Spurious Emission

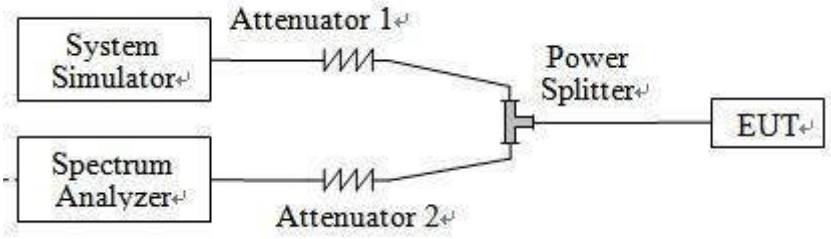
2.5.1. Requirement

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.

2.5.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.5.3. Test Setup



2.5.4. Test Procedures

1. The testing follows the of KDB 971168 D01 v03r01 Section 6 and ANSI C63.26-2015 Section 5.7.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider, Path loss compensation is then performed on the spectrum analyzer and the system simulator respectively.
3. Set the spectrum analyzer start frequency to 9kHz and stop frequency to the tenth harmonic of the highest fundamental frequency.
4. Set RBW = 1kHz (9kHz~150kHz), 10kHz (150kHz~30MHz),100kHz (30MHz~1GHz), 1MHz (Above 1 GHz), VBW ≥ 3 × RBW
5. Set Detector = RMS, Trace mode = Averaging.
6. For duty cycle ≥ 98%, set Sweep time = (number of points in sweep) × (symbol period).
7. For duty cycle < 98%, set Sweep time = (number of points in sweep) × (transmitter period).
8. Identify and measure the highest spurious emission levels in each frequency range.
9. Compare the results with the corresponding limit in the applicable regulation.
10. Repeat step 3~9 at other frequency and modulations.

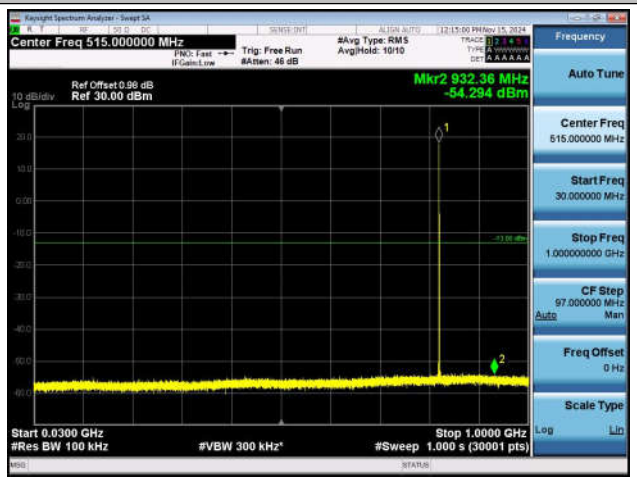
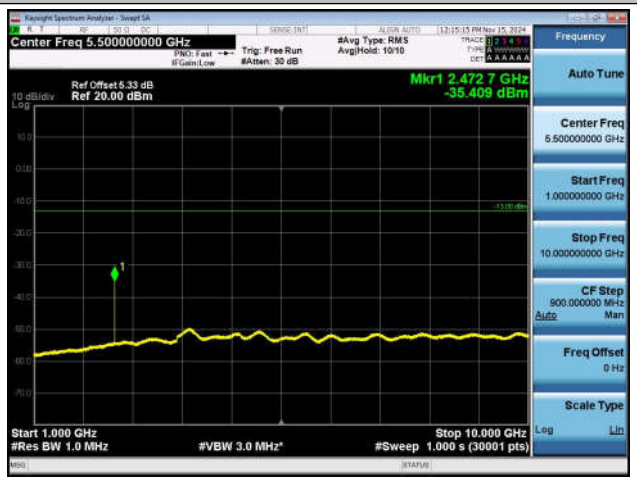
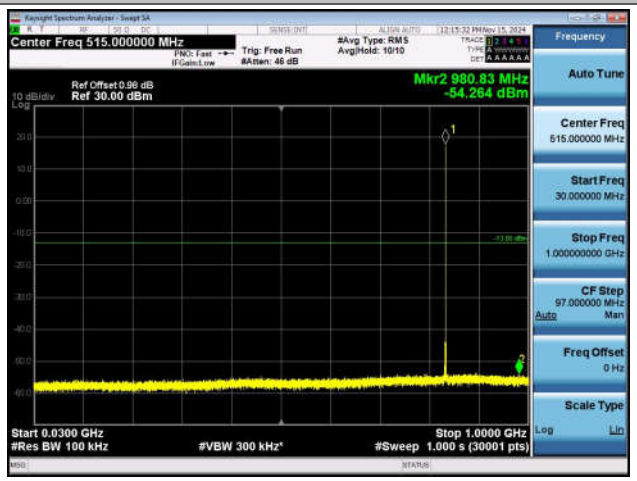
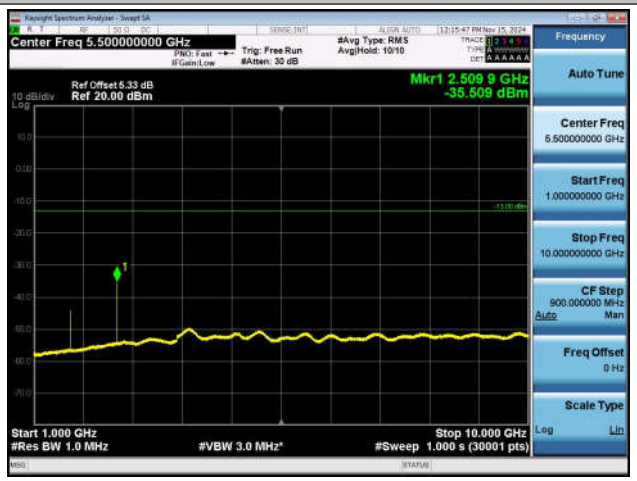
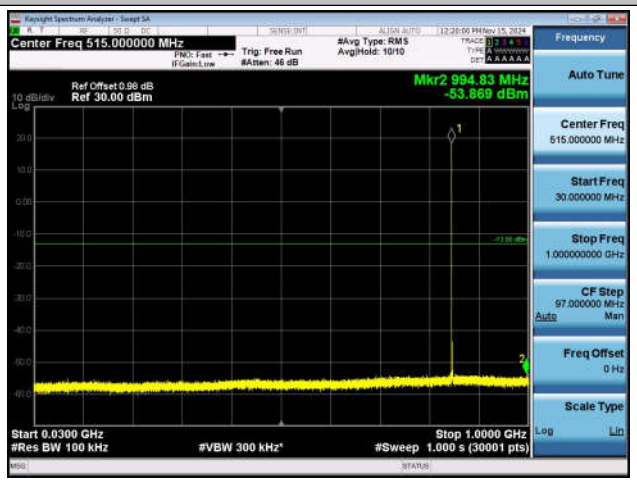
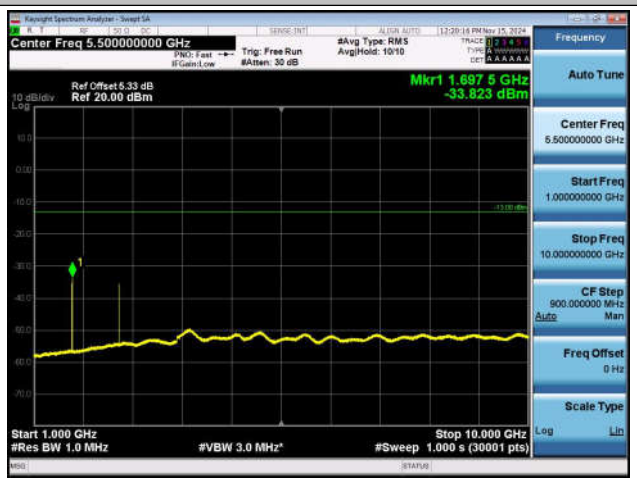
Note: For 9 kHz to 30MHz: the amplitude of spurious emissions is attenuated by more than 20dB below the permissible value, so we not provide the test result here.

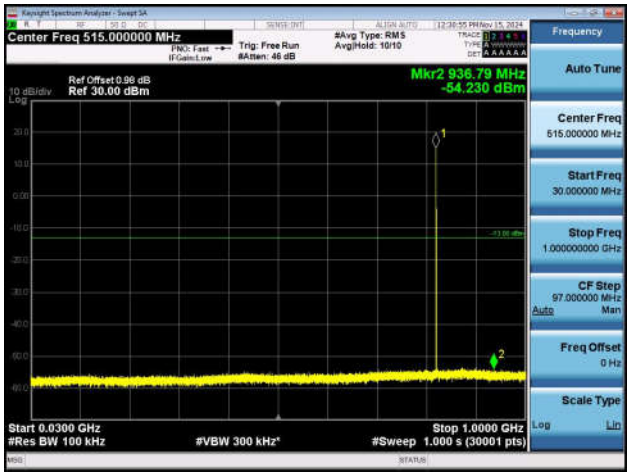
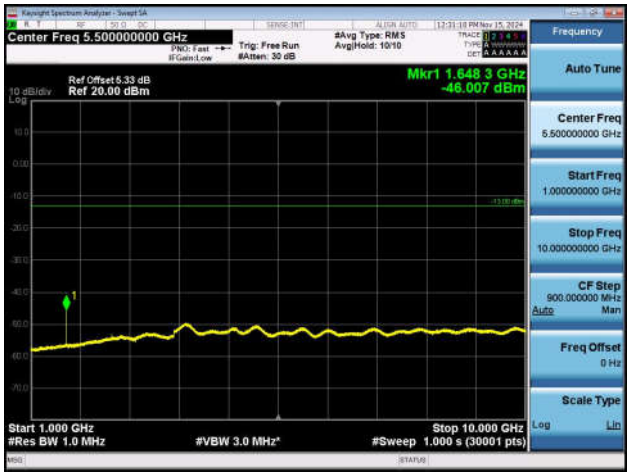
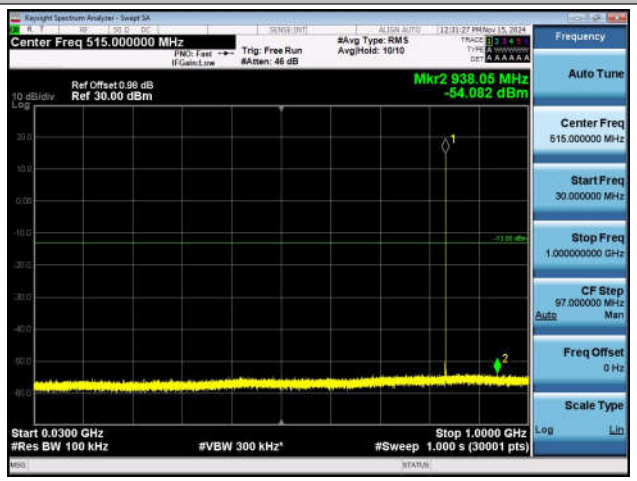
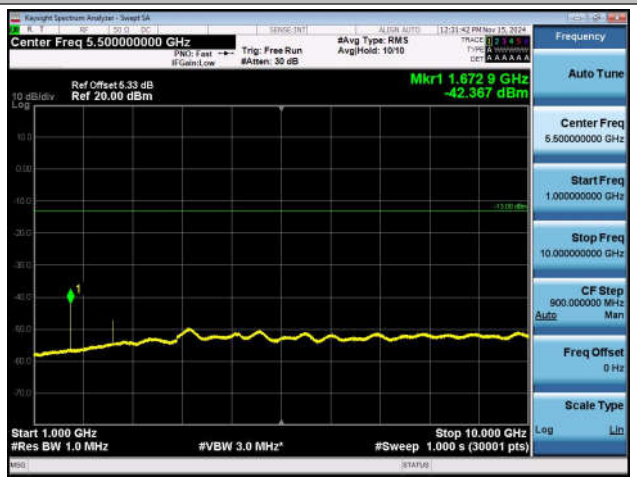
2.5.5. Test Result of Conducted Spurious Emission

Band	Channel	Frequency Range(MHz)	Frequency (dBm)	Result (dBm)	Limit(dBm)	Verdict
GPRS850	128	30~1000MHz	932.36	-54.29	-13	PASS
GPRS850	128	1000~10000MHz	2472.7	-35.41	-13	PASS
GPRS850	190	30~1000MHz	980.83	-54.26	-13	PASS
GPRS850	190	1000~10000MHz	2509.9	-35.51	-13	PASS
GPRS850	251	30~1000MHz	994.83	-53.87	-13	PASS
GPRS850	251	1000~10000MHz	1697.5	-33.82	-13	PASS
EGPRS850	128	30~1000MHz	936.79	-54.23	-13	PASS
EGPRS850	128	1000~10000MHz	1648.3	-46.01	-13	PASS
EGPRS850	190	30~1000MHz	938.05	-54.08	-13	PASS
EGPRS850	190	1000~10000MHz	1672.9	-42.37	-13	PASS
EGPRS850	251	30~1000MHz	720.67	-54.09	-13	PASS
EGPRS850	251	1000~10000MHz	1697.8	-47.1	-13	PASS
GPRS1900	512	30~1000MHz	878.62	-50.42	-13	PASS
GPRS1900	512	1000~3000MHz	2998.73	-37.26	-13	PASS
GPRS1900	512	3000~18000MHz	3816.5	-46.98	-13	PASS
GPRS1900	661	30~1000MHz	888.16	-50.43	-13	PASS
GPRS1900	661	1000~3000MHz	2983.07	-37.58	-13	PASS
GPRS1900	661	3000~18000MHz	3848.5	-46.96	-13	PASS
GPRS1900	810	30~1000MHz	872.22	-50.47	-13	PASS
GPRS1900	810	1000~3000MHz	2993.67	-37.48	-13	PASS
GPRS1900	810	3000~18000MHz	3819.5	-45.82	-13	PASS
EGPRS1900	512	30~1000MHz	886.28	-50.55	-13	PASS
EGPRS1900	512	1000~3000MHz	2989.33	-37.41	-13	PASS
EGPRS1900	512	3000~18000MHz	3798	-47.03	-13	PASS
EGPRS1900	661	30~1000MHz	889.68	-50.53	-13	PASS
EGPRS1900	661	1000~3000MHz	2979.8	-37.42	-13	PASS
EGPRS1900	661	3000~18000MHz	3854	-46.96	-13	PASS
EGPRS1900	810	30~1000MHz	886.22	-50.82	-13	PASS
EGPRS1900	810	1000~3000MHz	3000	-37.34	-13	PASS
EGPRS1900	810	3000~18000MHz	3834	-47.09	-13	PASS

Band	Channel	Frequency Range(MHz)	Frequency (dBm)	Result (dBm)	Limit(dBm)	Verdict
Band2	9262	30~1000MHz	878.27	-61.64	-13	PASS
Band2	9262	1000~20000MHz	3837.65	-49.38	-13	PASS
Band2	9400	30~1000MHz	894.27	-61.46	-13	PASS
Band2	9400	1000~20000MHz	3826.73	-49.36	-13	PASS
Band2	9538	30~1000MHz	887.97	-61.55	-13	PASS
Band2	9538	1000~20000MHz	3815.8	-49.39	-13	PASS
Band4	1312	30~1000MHz	884.09	-61.1	-13	PASS
Band4	1312	1000~20000MHz	18880.43	-48.52	-13	PASS
Band4	1413	30~1000MHz	886.51	-61.04	-13	PASS
Band4	1413	1000~20000MHz	3790.15	-48.32	-13	PASS
Band4	1513	30~1000MHz	877.3	-61.1	-13	PASS
Band4	1513	1000~20000MHz	3803.93	-48.1	-13	PASS
Band5	4132	30~1000MHz	977.69	-70.28	-13	PASS
Band5	4132	1000~10000MHz	3828.7	-48.52	-13	PASS
Band5	4183	30~1000MHz	943.26	-70.65	-13	PASS
Band5	4183	1000~10000MHz	1674.55	-48.8	-13	PASS
Band5	4233	30~1000MHz	990.79	-70.8	-13	PASS
Band5	4233	1000~10000MHz	1695.25	-48.64	-13	PASS

Test Graphs

GPRS850-128-5-30~1000MHz-PASS	GPRS850-128-5-1000~10000MHz-PASS
	
GPRS850-190-5-30~1000MHz-PASS	**GPRS850-190-5-1000~10000MHz-PASS**
	
GPRS850-251-5-30~1000MHz-PASS	**GPRS850-251-5-1000~10000MHz-PASS**
	

EGPRS850-128-8-30~1000MHz-PASS	EGPRS850-128-8-1000~10000MHz-PASS
	
EGPRS850-190-8-30~1000MHz-PASS	EGPRS850-190-8-1000~10000MHz-PASS
	
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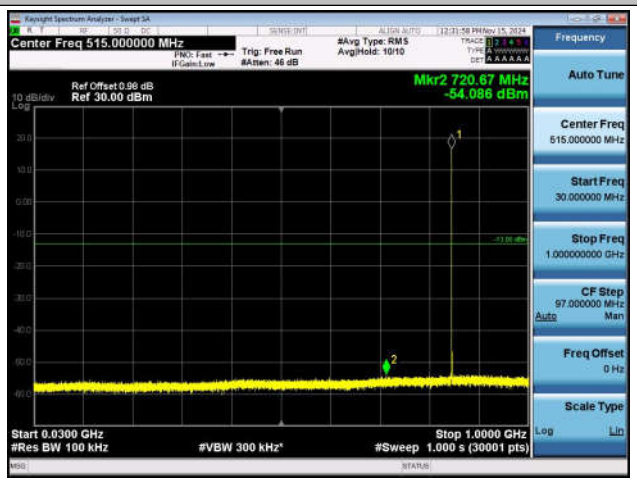
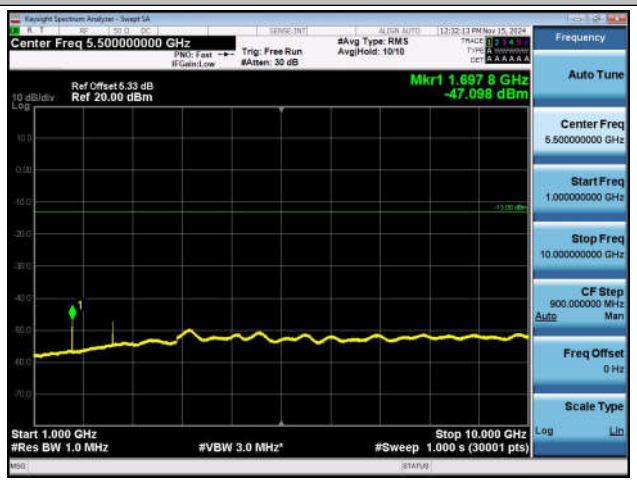
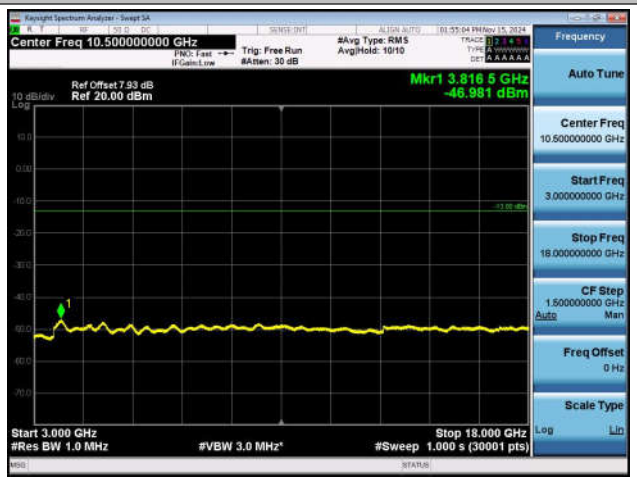
	

GPRS1900-512-0-30~1000MHz-PASS	GPRS1900-512-0-1000~3000MHz-PASS
	
GPRS1900-512-0-3000~18000MHz-PASS	**GPRS1900-661-0-30~1000MHz-PASS**
	
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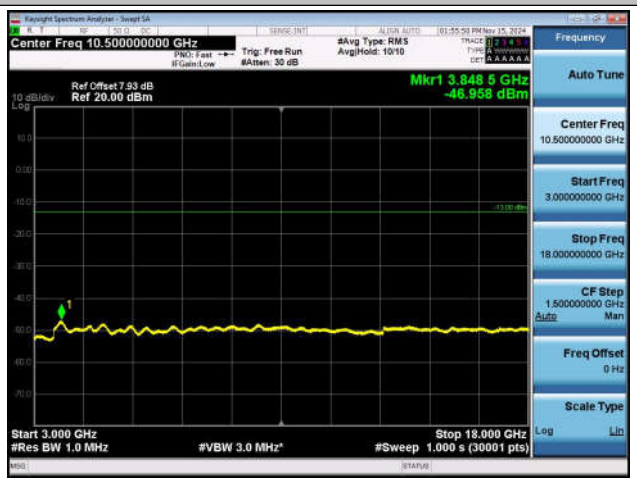
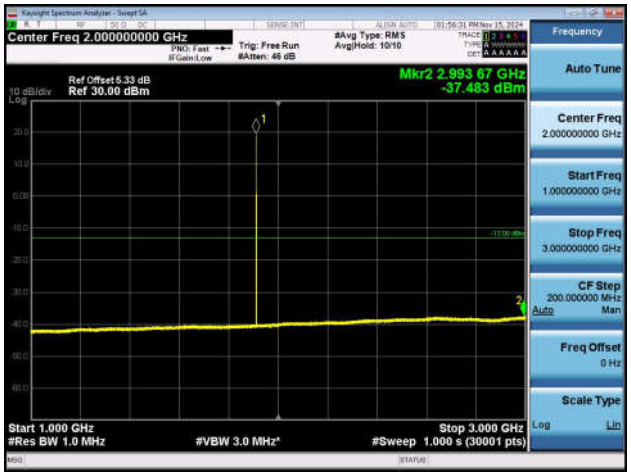
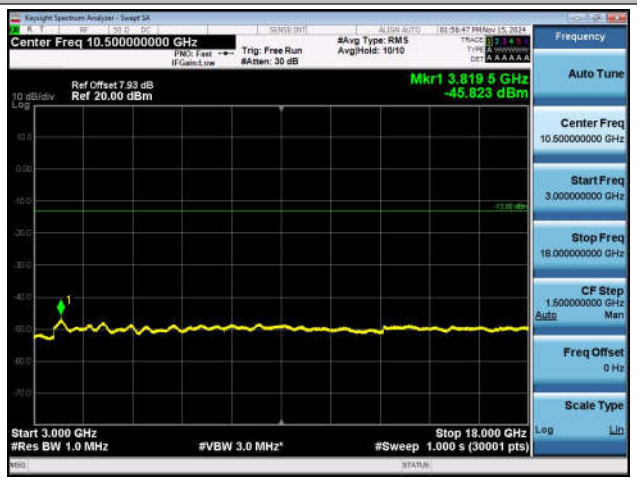
	

GPRS1900-810-0-30~1000MHz-PASS	GPRS1900-810-0-1000~3000MHz-PASS
	
GPRS1900-810-0-3000~18000MHz-PASS	**EGPRS1900-512-2-30~1000MHz-PASS**
	
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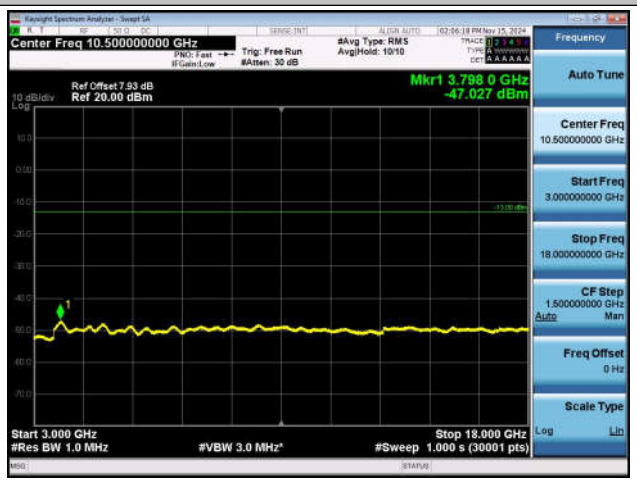
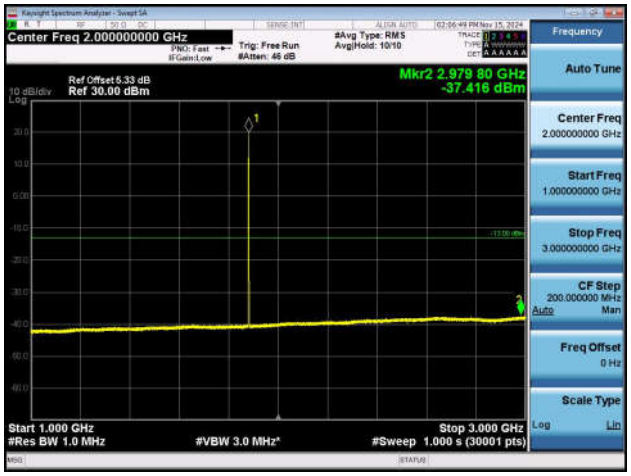
	

EGPRS1900-661-2-30~1000MHz-PASS

EGPRS1900-661-2-1000~3000MHz-PASS



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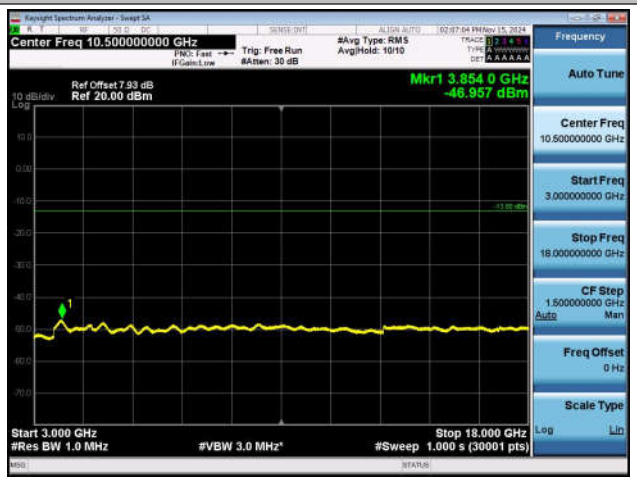
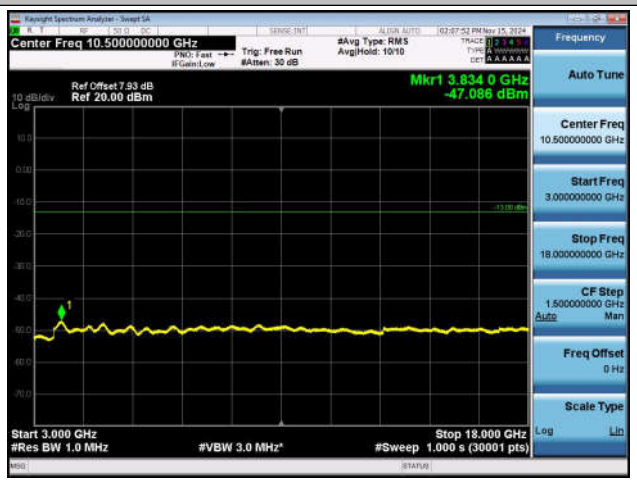
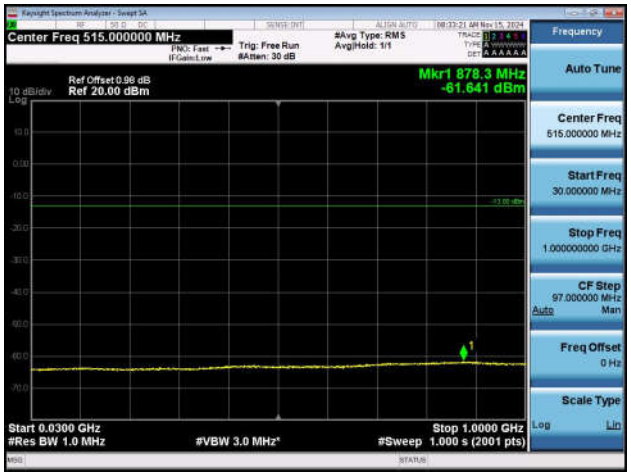
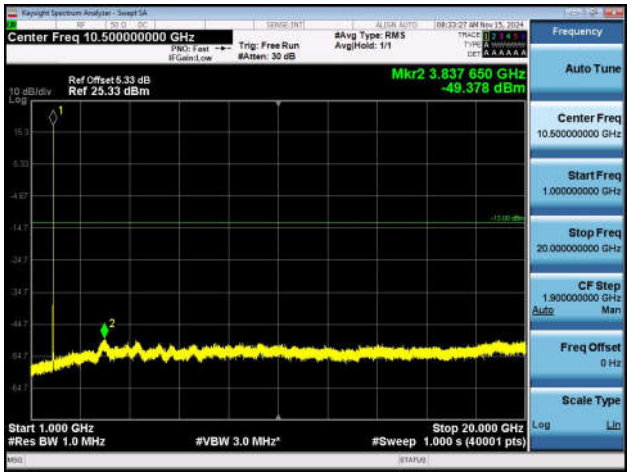


EGPRS1900-810-2-30~1000MHz-PASS

EGPRS1900-810-2-1000~3000MHz-PASS

EGPRS1900-810-2-3000~18000MHz-PASS



Band2-9262-30~1000MHz-PASS	Band2-9262-1000~20000MHz-PASS
	
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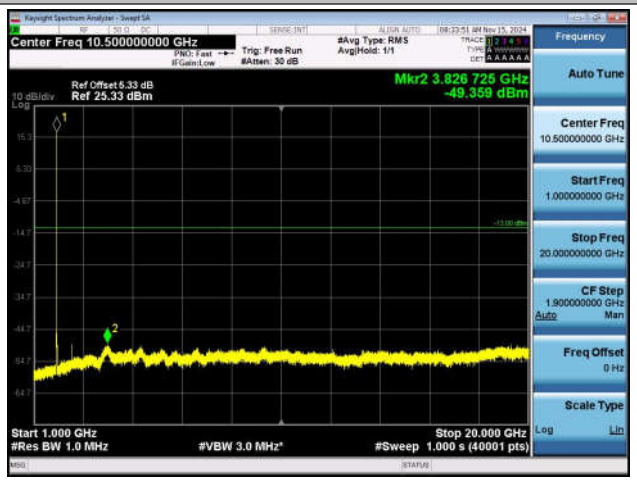
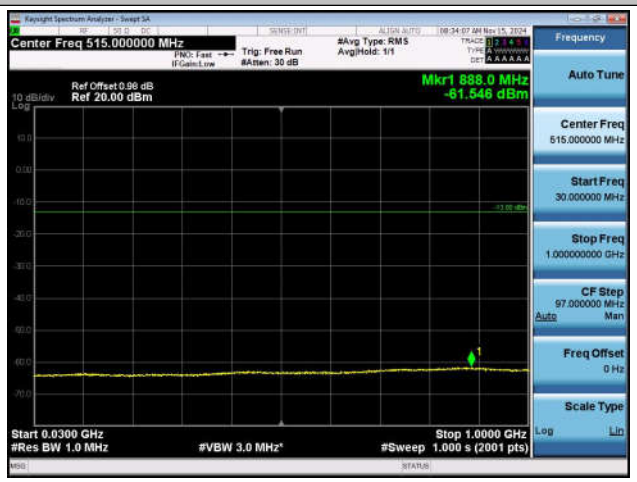
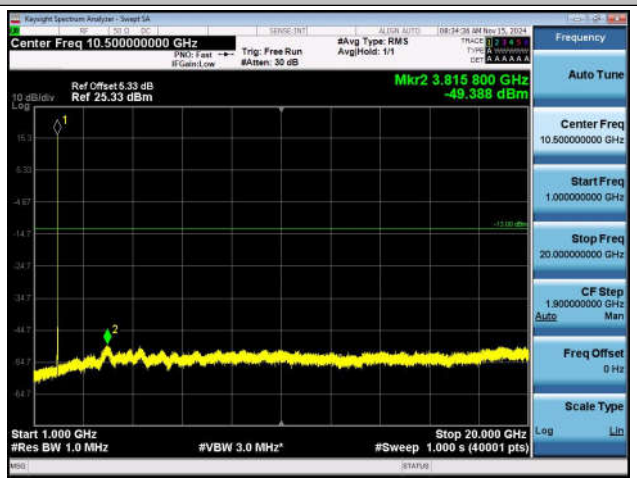
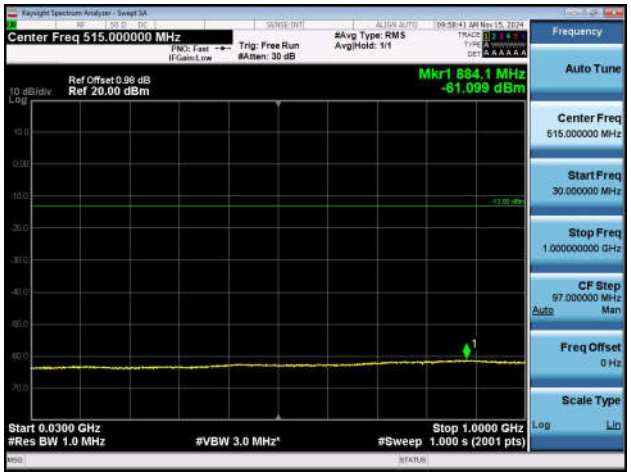
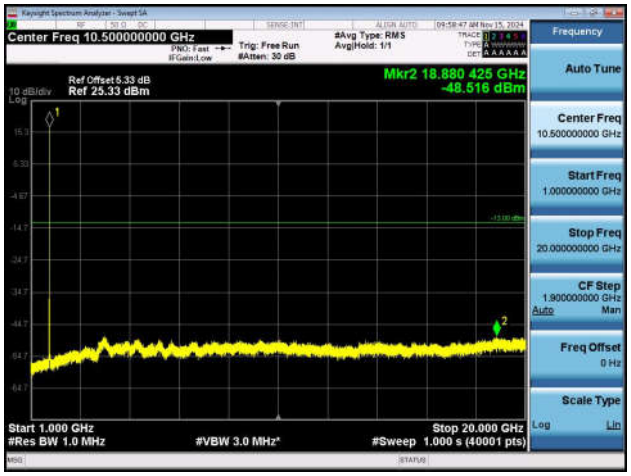
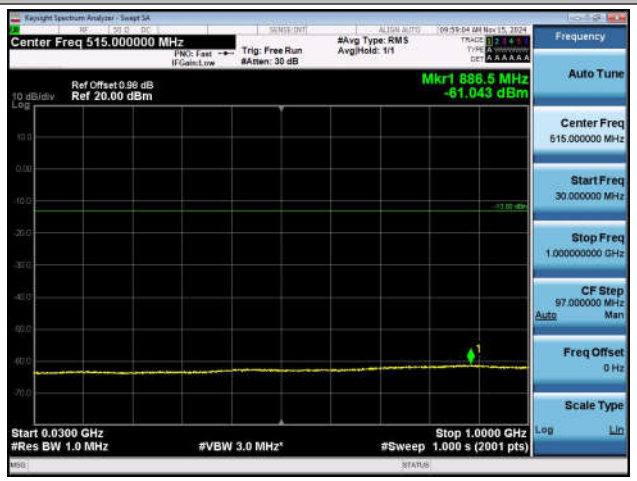
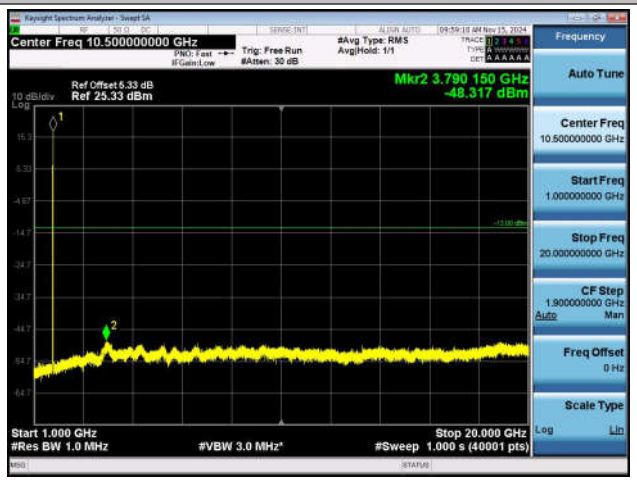
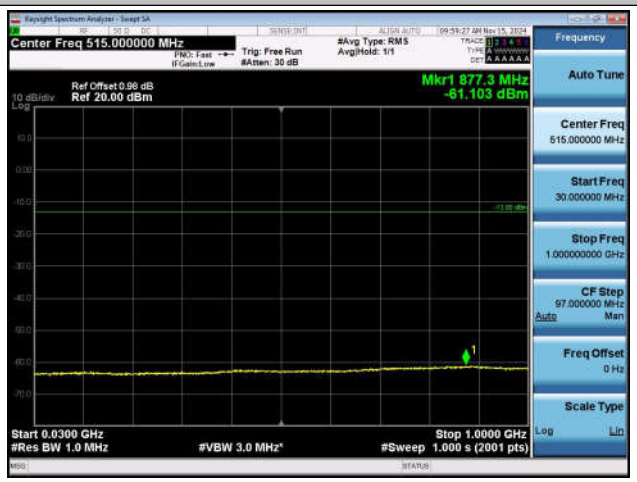
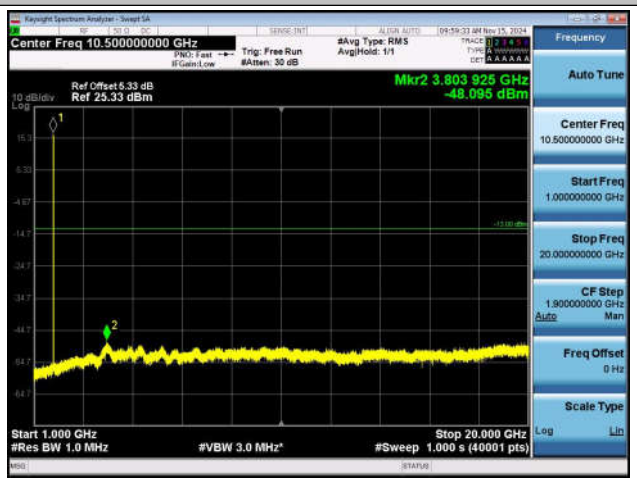
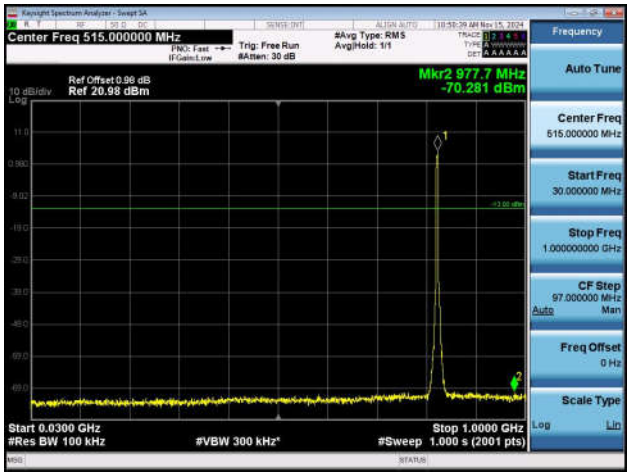
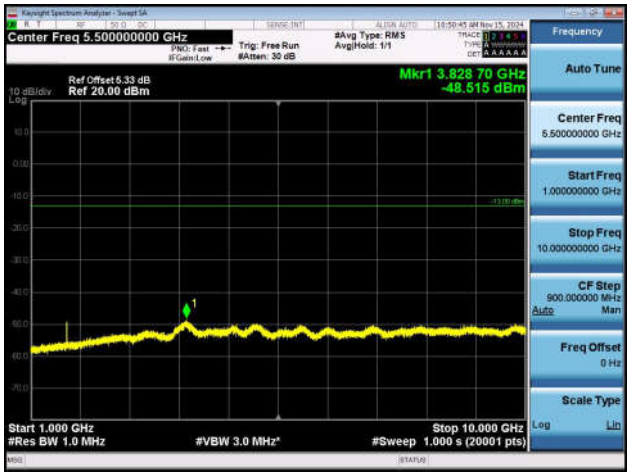
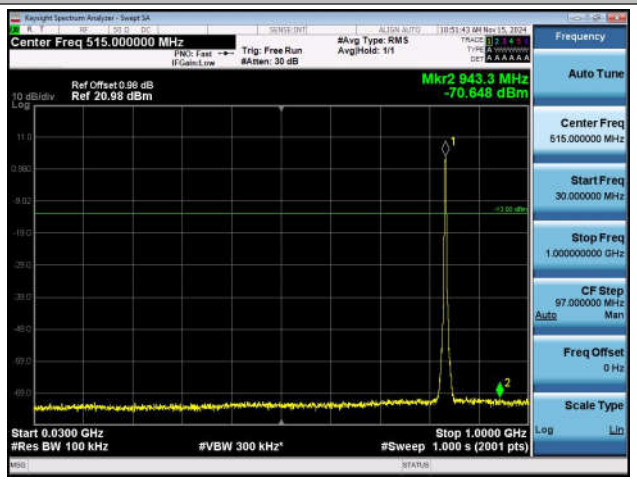
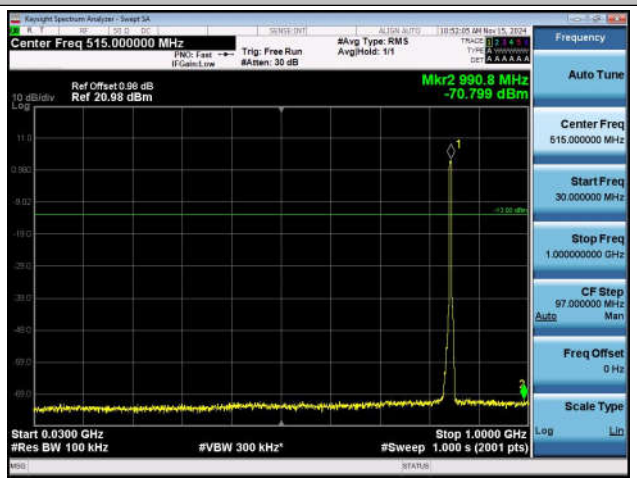
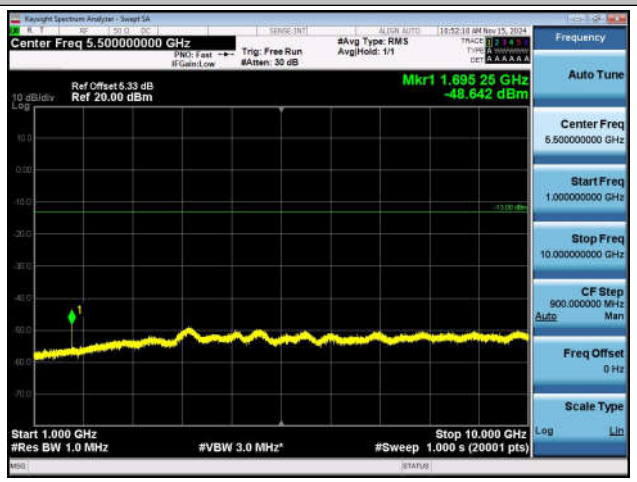
	
Band2-9538-30~1000MHz-PASS	Band2-9538-1000~20000MHz-PASS
	

Band4-1312-30~1000MHz-PASS	Band4-1312-1000~20000MHz-PASS
	
Band4-1413-30~1000MHz-PASS	Band4-1413-1000~20000MHz-PASS
	
Band4-1513-30~1000MHz-PASS	Band4-1513-1000~20000MHz-PASS
	

Band5-4132-30~1000MHz-PASS	Band5-4132-1000~10000MHz-PASS
	
Band5-4183-30~1000MHz-PASS	Band5-4183-1000~10000MHz-PASS
	
Band5-4233-30~1000MHz-PASS	Band5-4233-1000~10000MHz-PASS
	

2.6. Radiated Spurious Emission

2.6.1. Requirement

The radiated spurious emission was measured by substitution method according to ANSI/TIA-603-E-2016.

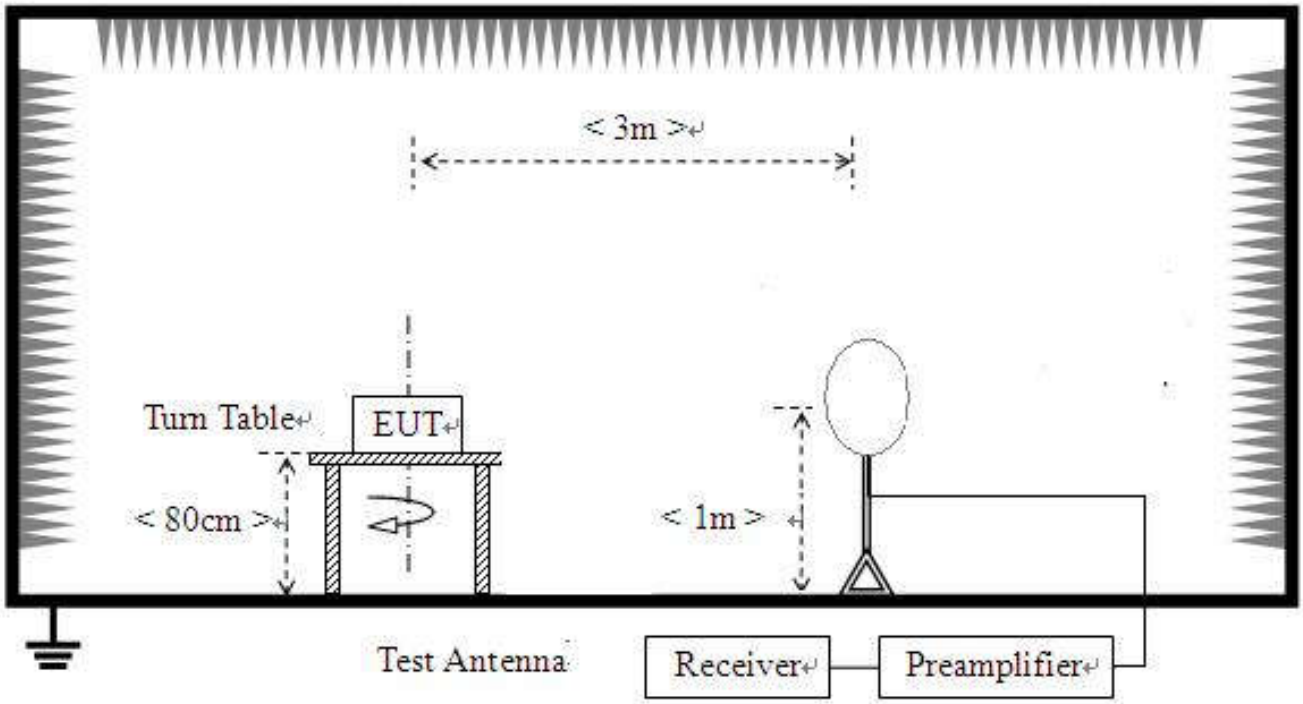
The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

2.6.2. Measuring Instruments

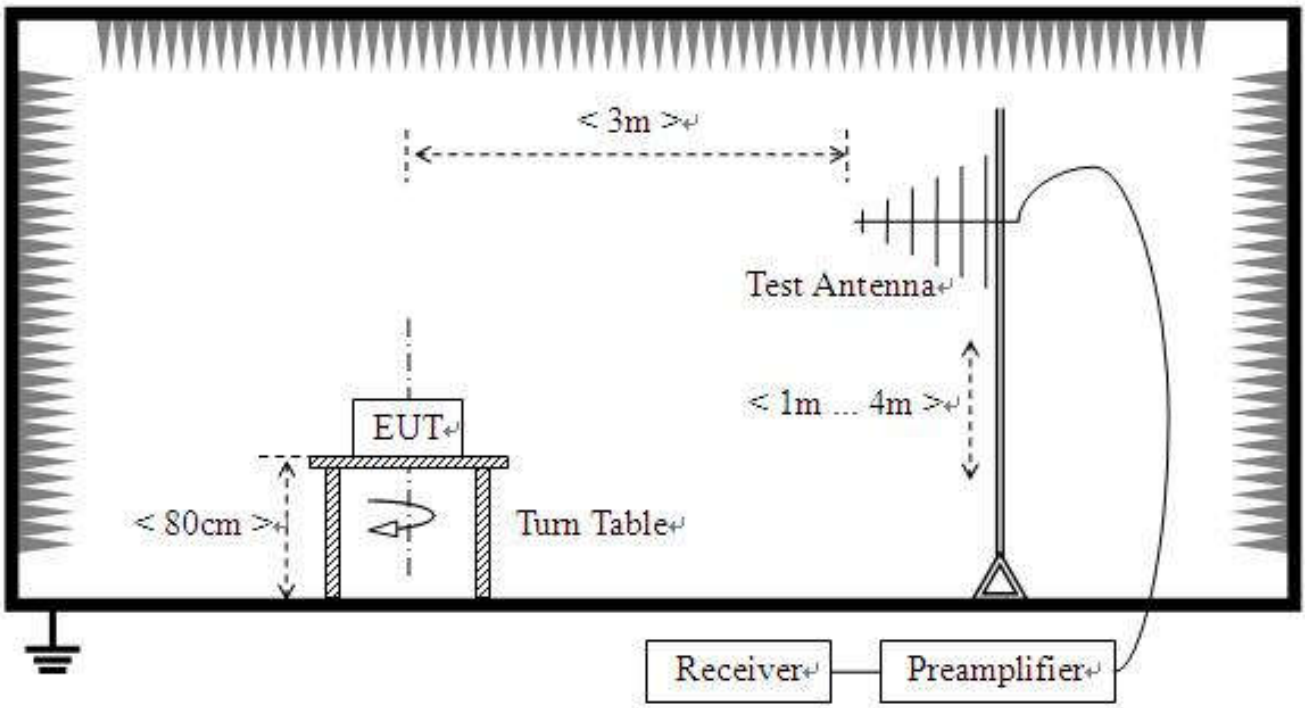
The measuring equipment is listed in the section 3 of this test report.

2.6.3. Test Setup

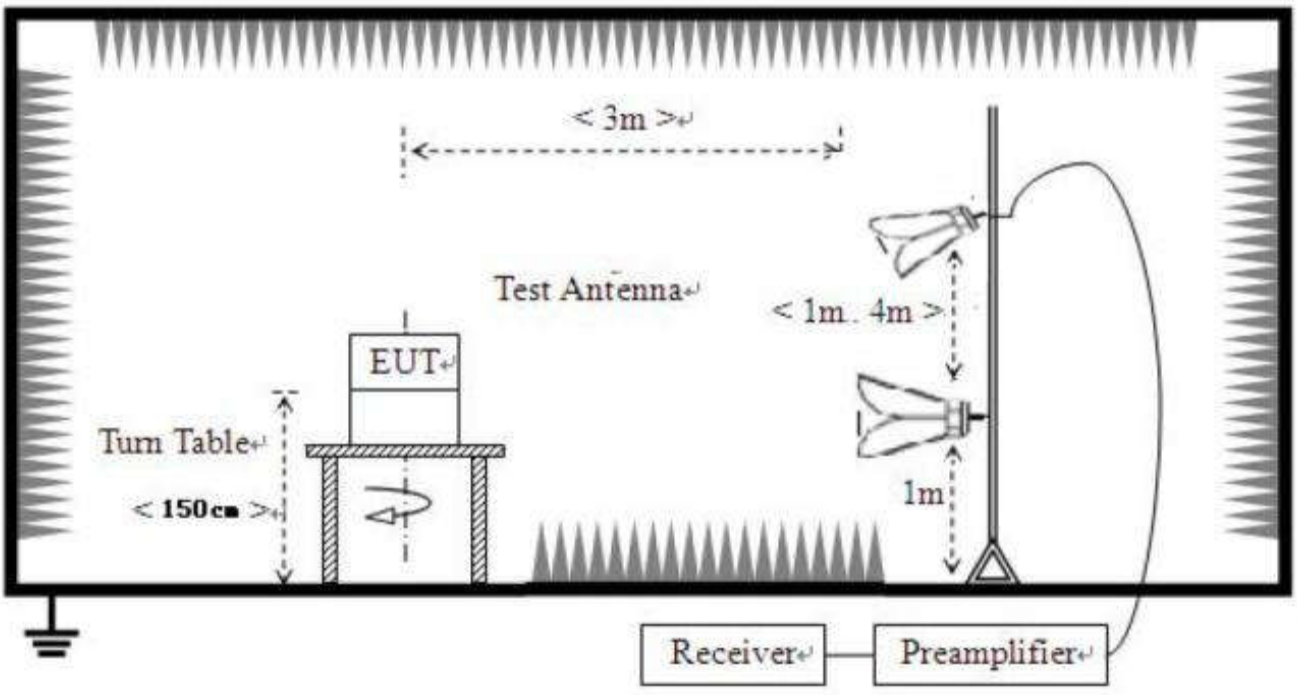
For radiated emissions from 9kHz to 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



2.6.4. Test Procedures

1. The EUT was placed on a rotatable wooden table with 0.8 meter (for below 1GHz) / 1.5 meters (for above 1GHz) above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
11. This device employs GMSK and 8PSK technology with GSM, GPRS and EGPRS capabilities. All configurations were investigated and the worst case emissions were found in GSM mode.
12. This device employs UMTS technology with WCDMA (AMR/RMC), HSDPA, HSUPA capabilities. All configurations were investigated and the worst case UMTS emissions were found in RMC WCDMA mode at 12.2Kbps.
13. All Spurious Emission tests were performed in X, Y, Z axis direction and low, middle, high channel. And only the worst axis test condition was recorded in this test report.
14. The spectrum is measured from 9 kHz to the 10^{th} harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. The worst case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.

2.6.5. Test Result of Radiated Spurious Emission

Note: 1. The emission levels of above 18GHz are lower than the limit 20dB and not show in test report.

Note: 2. Absolute Level = Reading Level + Factor.

Note: 3. Worst-Case test data provide as below.

30MHz~18GHz: GSM 850 Middle Channel							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	62.67	-97.62	-78.09	-13.00	65.09	19.53	Horizontal
2	137.06	-105.55	-84.72	-13.00	71.72	20.83	Horizontal
3	493.49	-104.69	-72.02	-13.00	59.02	32.67	Horizontal
4	1672.34	-50.11	-50.91	-13.00	37.91	-0.80	Horizontal
5	2832.92	-58.23	-52.67	-13.00	39.67	5.56	Horizontal
6	5066.03	-58.95	-44.15	-13.00	31.15	14.80	Horizontal
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	71.08	-96.96	-75.50	-13.00	62.50	21.46	Vertical
2	114.09	-102.24	-78.80	-13.00	65.80	23.44	Vertical
3	600.23	-104.40	-70.67	-13.00	57.67	33.73	Vertical
4	1672.34	-53.71	-54.51	-13.00	41.51	-0.80	Vertical
5	3453.23	-58.29	-51.35	-13.00	38.35	6.94	Vertical
6	7467.23	-60.29	-40.23	-13.00	27.23	20.06	Vertical

30MHz~18GHz: PCS 1900 Middle Channel							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	71.25	-98.03	-78.70	-13.00	65.70	19.33	Horizontal
2	350.26	-105.36	-76.33	-13.00	63.33	29.03	Horizontal
3	670.04	-104.38	-69.68	-13.00	56.68	34.70	Horizontal
4	2463.15	-53.81	-46.46	-13.00	33.46	7.35	Horizontal
5	8792.90	-59.50	-40.17	-13.00	27.17	19.33	Horizontal
6	13467.7	-63.05	-34.77	-13.00	21.77	28.28	Horizontal
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	90.17	-101.88	-78.56	-13.00	65.56	23.32	Vertical
2	441.49	-105.61	-76.46	-13.00	63.46	29.15	Vertical
3	1252.08	-56.80	-57.33	-13.00	44.33	-0.53	Vertical
4	4800.90	-59.07	-44.33	-13.00	31.33	14.74	Vertical
5	7502.25	-60.15	-40.02	-13.00	27.02	20.13	Vertical
6	14795.9	-67.71	-33.15	-13.00	20.15	34.56	Vertical

30MHz~18GHz: WCDMA 850 Middle Channel							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	133.36	-91.32	-70.89	-13.00	57.89	20.43	Horizontal
2	189.64	-93.78	-70.88	-13.00	57.88	22.90	Horizontal
3	708.37	-102.08	-67.78	-13.00	54.78	34.30	Horizontal
4	3149.81	-57.72	-50.51	-13.00	37.51	7.21	Horizontal
5	7809.92	-60.15	-40.89	-13.00	27.89	19.26	Horizontal
6	17364.0	-65.66	-36.50	-13.00	23.50	29.16	Horizontal
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	77.07	-95.09	-73.26	-13.00	60.26	21.83	Vertical
2	182.85	-88.85	-68.83	-13.00	55.83	20.02	Vertical
3	500.20	-100.48	-69.98	-13.00	56.98	30.50	Vertical
4	2282.26	-57.42	-54.63	-13.00	41.63	2.79	Vertical
5	5089.08	-58.96	-44.39	-13.00	31.39	14.57	Vertical
6	17404.8	-65.56	-36.27	-13.00	23.27	29.29	Vertical

30MHz~18GHz: WCDMA 1900 Middle Channel							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	35.34	-104.42	-81.71	-13.00	68.71	22.71	Horizontal
2	500.69	-105.90	-73.26	-13.00	60.26	32.64	Horizontal
3	845.69	-104.00	-66.86	-13.00	53.86	37.14	Horizontal
4	2454.77	-52.58	-49.12	-13.00	36.12	3.46	Horizontal
5	4811.52	-59.81	-45.08	-13.00	32.08	14.73	Horizontal
6	17374.9	-65.94	-36.72	-13.00	23.72	29.22	Horizontal
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	95.51	-105.80	-81.87	-13.00	68.87	23.93	Vertical
2	761.75	-104.64	-68.78	-13.00	55.78	35.86	Vertical
3	1170.21	-57.24	-59.45	-13.00	46.45	-2.21	Vertical
4	4792.96	-58.64	-44.00	-13.00	31.00	14.64	Vertical
5	10586.7	-61.17	-38.51	-13.00	25.51	22.66	Vertical
6	17381.8	-65.73	-36.47	-13.00	23.47	29.26	Vertical

30MHz~18GHz: WCDMA 1700 Middle Channel							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	72.70	-98.86	-79.57	-13.00	66.57	19.29	Horizontal
2	335.70	-106.14	-77.96	-13.00	64.96	28.18	Horizontal
3	827.25	-104.82	-67.78	-13.00	54.78	37.04	Horizontal
4	1085.20	-56.29	-58.26	-13.00	45.26	-1.97	Horizontal
5	5100.46	-58.54	-43.92	-13.00	30.92	14.62	Horizontal
6	17358.8	-65.52	-36.39	-13.00	23.39	29.13	Horizontal
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	72.22	-100.04	-78.64	-13.00	65.64	21.40	Vertical
2	751.56	-105.03	-69.11	-13.00	56.11	35.92	Vertical
3	949.05	-99.02	-60.93	-13.00	47.93	38.09	Vertical
4	3015.93	-58.02	-50.67	-13.00	37.67	7.35	Vertical
5	7374.04	-60.10	-40.65	-13.00	27.65	19.45	Vertical
6	17408.3	-66.19	-36.95	-13.00	23.95	29.24	Vertical

2.7. Frequency Stability

2.7.1. Requirement

According to FCC requirement, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. 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. According to FCC section 2.1055, the test conditions are:

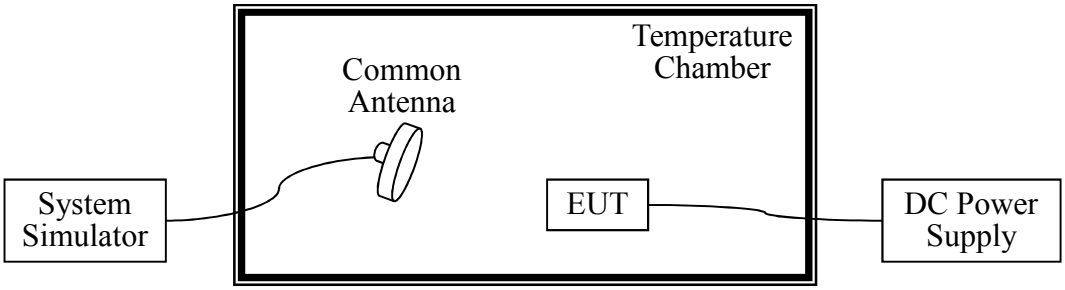
(1) The temperature is varied from -30° C to +50°C at intervals of not more than 10°C.

(2) For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

2.7.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.7.3. Test Setup



2.7.4. Test Procedures

1. The EUT was set up in the thermal chamber and connected with the system simulator.
2. 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.
3. 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.
4. The nominal, highest and lowest extreme voltages were tested, which are specified by the applicant; the normal temperature here used is 20°C.
5. The variation in frequency was measured for the worst case.

2.7.5. Test Result of Frequency Stability

Voltage							
Band	Channel	Voltage (Vdc)	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
GPRS850	190	VN	NT	28.31	0.033839	±2.5	PASS
GPRS850	190	VL	NT	30.03	0.035895	±2.5	PASS
GPRS850	190	VH	NT	27.67	0.033074	±2.5	PASS
EGPRS850	190	VN	NT	26.35	0.031497	±2.5	PASS
EGPRS850	190	VL	NT	25.96	0.031030	±2.5	PASS
EGPRS850	190	VH	NT	25.15	0.030062	±2.5	PASS
GPRS1900	661	VN	NT	19.05	0.010133	/	PASS
GPRS1900	661	VL	NT	21.92	0.011660	/	PASS
GPRS1900	661	VH	NT	18.82	0.010011	/	PASS
EGPRS1900	661	VN	NT	20.28	0.010787	/	PASS
EGPRS1900	661	VL	NT	24.67	0.013122	/	PASS
EGPRS1900	661	VH	NT	20.40	0.010851	/	PASS

Voltage							
Band	Channel	Voltage (Vdc)	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
Band2	9400	VN	NT	-0.42	-0.000223	/	PASS
Band2	9400	VL	NT	-2.35	-0.001250	/	PASS
Band2	9400	VH	NT	-0.29	-0.000154	/	PASS
Band4	1413	VN	NT	-2.57	-0.001483	/	PASS
Band4	1413	VL	NT	-2.51	-0.001449	/	PASS
Band4	1413	VH	NT	-1.42	-0.000820	/	PASS
Band5	4183	VN	NT	-0.97	-0.001159	±2.5	PASS
Band5	4183	VL	NT	-0.99	-0.001183	±2.5	PASS
Band5	4183	VH	NT	-0.54	-0.000645	±2.5	PASS

Temperature							
Band	Channel	Voltage (Vdc)	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
GPRS850	190	NV	-30	30.03	0.035895	±2.5	PASS
GPRS850	190	NV	-20	30.74	0.036744	±2.5	PASS
GPRS850	190	NV	-10	30.15	0.036039	±2.5	PASS
GPRS850	190	NV	0	31.06	0.037126	±2.5	PASS
GPRS850	190	NV	10	31.74	0.037939	±2.5	PASS
GPRS850	190	NV	20	29.64	0.035429	±2.5	PASS
GPRS850	190	NV	30	30.74	0.036744	±2.5	PASS
GPRS850	190	NV	40	30.22	0.036122	±2.5	PASS
GPRS850	190	NV	50	29.77	0.035585	±2.5	PASS
EGPRS850	190	NV	-30	24.70	0.029524	±2.5	PASS
EGPRS850	190	NV	-20	24.09	0.028795	±2.5	PASS
EGPRS850	190	NV	-10	25.99	0.031066	±2.5	PASS
EGPRS850	190	NV	0	25.73	0.030755	±2.5	PASS
EGPRS850	190	NV	10	27.60	0.032991	±2.5	PASS
EGPRS850	190	NV	20	26.57	0.031760	±2.5	PASS
EGPRS850	190	NV	30	25.31	0.030253	±2.5	PASS
EGPRS850	190	NV	40	25.57	0.030564	±2.5	PASS
EGPRS850	190	NV	50	25.57	0.030564	±2.5	PASS
GPRS1900	661	NV	-30	21.92	0.011660	/	PASS
GPRS1900	661	NV	-20	18.18	0.009670	/	PASS
GPRS1900	661	NV	-10	22.66	0.012053	/	PASS
GPRS1900	661	NV	0	22.31	0.011867	/	PASS
GPRS1900	661	NV	10	20.89	0.011112	/	PASS
GPRS1900	661	NV	20	22.05	0.011729	/	PASS
GPRS1900	661	NV	30	21.02	0.011181	/	PASS
GPRS1900	661	NV	40	22.34	0.011883	/	PASS
GPRS1900	661	NV	50	22.73	0.012090	/	PASS
EGPRS1900	661	NV	-30	25.15	0.013378	/	PASS
EGPRS1900	661	NV	-20	25.12	0.013362	/	PASS
EGPRS1900	661	NV	-10	20.76	0.011043	/	PASS
EGPRS1900	661	NV	0	19.73	0.010495	/	PASS
EGPRS1900	661	NV	10	21.79	0.011590	/	PASS
EGPRS1900	661	NV	20	22.15	0.011782	/	PASS
EGPRS1900	661	NV	30	24.12	0.012830	/	PASS
EGPRS1900	661	NV	40	24.60	0.013085	/	PASS
EGPRS1900	661	NV	50	20.11	0.010697	/	PASS

Temperature							
Band	Channel	Voltage (Vdc)	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
Band2	9400	NV	-30	-1.47	-0.000782	/	PASS
Band2	9400	NV	-20	-2.22	-0.001181	/	PASS
Band2	9400	NV	-10	-3.58	-0.001904	/	PASS
Band2	9400	NV	0	-2.82	-0.001500	/	PASS
Band2	9400	NV	10	-2.47	-0.001314	/	PASS
Band2	9400	NV	20	-3.22	-0.001713	/	PASS
Band2	9400	NV	30	-3.00	-0.001596	/	PASS
Band2	9400	NV	40	-3.74	-0.001989	/	PASS
Band2	9400	NV	50	-1.99	-0.001059	/	PASS
Band4	1413	NV	-30	-1.69	-0.000975	/	PASS
Band4	1413	NV	-20	-0.97	-0.000560	/	PASS
Band4	1413	NV	-10	-1.24	-0.000716	/	PASS
Band4	1413	NV	0	-0.74	-0.000427	/	PASS
Band4	1413	NV	10	-1.24	-0.000716	/	PASS
Band4	1413	NV	20	-0.39	-0.000225	/	PASS
Band4	1413	NV	30	-1.02	-0.000589	/	PASS
Band4	1413	NV	40	-2.45	-0.001414	/	PASS
Band4	1413	NV	50	-1.14	-0.000658	/	PASS
Band5	4183	NV	-30	-0.91	-0.001088	±2.5	PASS
Band5	4183	NV	-20	-0.65	-0.000777	±2.5	PASS
Band5	4183	NV	-10	-1.14	-0.001363	±2.5	PASS
Band5	4183	NV	0	-1.02	-0.001219	±2.5	PASS
Band5	4183	NV	10	-0.86	-0.001028	±2.5	PASS
Band5	4183	NV	20	-0.77	-0.000920	±2.5	PASS
Band5	4183	NV	30	-0.58	-0.000693	±2.5	PASS
Band5	4183	NV	40	-0.62	-0.000741	±2.5	PASS
Band5	4183	NV	50	-0.26	-0.000311	±2.5	PASS

Note 1: Normal Voltage = 12V, Low Voltage = 10.2V, High Voltage = 13.8V, Normal Temperature = 20℃.

Note 2: Judge based on the measured frequency error result, the fundamental wave emission of GSM 1900, WCDMA Band 2/4 is kept within the authorized frequency band.

3. List of measuring equipment

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Receiver	ROHDE&SCHWARZ	ESW26	A180502935	2024.05.23	2025.05.22
2	5M Anechoic Chamber	Albatross	SAC-5MAC 12.8x6.8x6.4m	A0304210	2022.06.09	2026.06.08
3	Loop Antenna	Schwarz beck	HFH2-Z2	A0304220	2022.05.02	2025.05.01
4	Broadband antenna (30MHz~1GHz)	R&S	HL562	A0304224	2023.06.08	2026.06.07
5	EMI Horn Ant. (1-18G)	ETC	MCTD-1209	A150402241	2023.05.16	2026.05.15
6	Horn antenna (18GHz~26.5GHz)	AR	AT4510	A0804450	2023.06.01	2026.05.31
7	Amplifier 30M~1GHz	MILMEGA	80RF1000-1000	A140101634	2023.11.27	2024.11.26
8	Amplifier 1G~18GHz	MILMEGA	AS0104R-800/400	A160302517	2024.05.25	2025.05.24
9	Spectrum Analyzer	KEYSIGHT	N9030A	A160702554	2024.01.18	2025.01.17
10	Test Receiver	R&S	ESIB7	A0501375	2024.02.28	2025.02.27
11	Broadband Ant.	ETC	MCTD 2786	A150402240	2023.05.22	2026.05.21
12	3M Anechoic Chamber	Albatross	SAC-3MAC 9*6*6m	A0412375	2024.02.27	2027.02.26
13	Constant Temperature Humidity Chamber	ESPEC	SU-642	A150802409	2024.02.22	2025.02.21
14	Wideband Radio Communication tester	R&S	CMW500	A130101034	2024.06.18	2025.06.17
15	Wideband Radio Communication tester	R&S	CMW500	A150802214	2024.03.27	2025.03.26
16	Power Supply	R&S	WYJ-60100	A141102031	2023.07.12	2026.07.11

4. Uncertainty of Evaluation

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.26-2015. 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 Emission Measurement (150kHz~30MHz)

Measuring Uncertainty for a level of confidence of 95%(U=2Uc(y))	2.8dB

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

Measuring Uncertainty for a level of confidence of 95%(U=2Uc(y))	3.5dB

Uncertainty of Radiated Emission Measurement (30MHz~1GHz)

Measuring Uncertainty for a level of confidence of 95%(U=2Uc(y))	3.91dB

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

Measuring Uncertainty for a level of confidence of 95%(U=2Uc(y))	4.5dB

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

Measuring Uncertainty for a level of confidence of 95%(U=2Uc(y))	4.9dB

Uncertainty of RF Conducted Measurement (9kHz~40GHz)

Measuring Uncertainty for a level of confidence of 95%(U=2Uc(y))	1.2dB

** END OF REPORT **