FCC TEST REPORT

Product Name:	Mobile Phone
Trade Mark:	BLU
Model No.:	TANK MINI
Report Number:	2209021318RFM-1
Test Standards:	FCC 47 CFR Part 22 Subpart H FCC 47 CFR Part 24 Subpart E
FCC ID:	YHLBLUTKMN652
Test Result:	PASS
Date of Issue:	October 9, 2022

Prepared for:

BLU Products, Inc.
10814 NW 33rd St # 100 Doral, FL 33172, USA

Prepared by:

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Date: October 9, 2022

Version

Version No.	Date	Description
V1.0	October 9, 2022	Original

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1. GENERAL INFORMATION

1.1 CLIENT INFORMATION

Applicant:	BLU Products, Inc.
Address of Applicant:	10814 NW 33rd St # 100 Doral, FL 33172, USA
Manufacturer:	Luzhou chiteng technology co.,LTD
Address of Manufacturer:	Building16, No.1, 6 Section of Wine Valley Avenue, Jiangyang District, Luzhou, Sichuan

1.2 EUT INFORMATION

1.2.1 General Description of EUT

Product Name:	Mobile Phone	
Model No.:	TANK MINI	
Trade Mark:	BLU	
DUT Stage:	Identical Prototype	
EUT Supports Function: (Provided by the customer)	GSM Bands:	GSM850/1900
	2.4 GHz ISM Band:	Bluetooth V2.1 + EDR
Sample Received Date:	September 1, 2022	
Sample Tested Date:	September 1, 2022 to September 15, 2022	

Remark: The above EUT's information was provided by customer. Please refer to the specifications or user's manual for more detailed description.

1.2.2 Description of Accessories

Adapter	
Model No.:	US-GL-0500
Input:	100-240 V~50/60 Hz 0.2 A
Output:	5.0 V ⎓ 500 mA
DC Cable:	1.0 Meter, Unshielded without ferrite

Battery	
Model No.:	N5C600T
Battery Type:	Lithium-ion
Rated Voltage:	3.7 Vdc
Limited Charge Voltage:	4.2 Vdc
Rated Capacity:	1000 mAh

1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

Support Networks:	GSM		
Type of Modulation:	GSM:	GMSK	
Frequency Range:	GSM 850:	824.2-848.8 MHz	
	GSM 1900:	1850.2-1909.8 MHz	
Max RF Output Power:	GSM 850:	29.80dBm	
	GSM 1900:	30.15dBm	
Emission Designator:	GSM 850:	243KGXW	
	GSM 1900:	239KGXW	
Antenna Type:	PIFA Antenna		
Antenna Gain: (Provided by the customer)	GSM 850:	0.46 dBi	
	PCS 1900:	0.85 dBi	
Normal Test Voltage:	3.7 Vdc		
Extreme Test Voltage:	3.4 to 4.2Vdc		
Extreme Test Temperature:	-30 °C to +50 °C		

1.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested with associated equipment below.

1) Support Cable

Cable No.	Description	Connector	Length	Supplied by
1	Antenna Cable	SMA	0.1 Meter	Applicant

1.5 TEST LOCATION

Shenzhen UnionTrust Quality and Technology Co., Ltd.

Address: Unit D/E of 9/F and 16/F, Block A, Building 6, Baoneng science and technology park, Longhua district, Shenzhen, China
Telephone: +86 (0) 755 2823 0888
Fax: +86 (0) 755 2823 0886

1.6 TEST FACILITY

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

CNAS-Lab Code: L9069

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

A2LA-Lab Certificate No.: 4312.01

Shenzhen UnionTrust Quality and Technology Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

ISED Wireless Device Testing Laboratories
CAB identifier: CN0032

FCC Accredited Lab.
Designation Number: CN1194
Test Firm Registration Number: 259480

1.7 DEVIATION FROM STANDARDS

None.

1.8 ABNORMALITIES FROM STANDARD CONDITIONS

None.

1.9 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

1.10 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

No.	Item	Measurement Uncertainty
1	Conducted emission 9kHz-150kHz	±3.2 dB
2	Conducted emission 150kHz-30MHz	±2.7 dB
3	Radiated spurious emissions 30MHz-1GHz	± 4.9 dB
4	Radiated spurious emissions 1GHz-18GHz	± 4.8 dB
5	Radiated spurious emissions 18GHz-40GHz	± 5.1 dB
6	Occupied Bandwidth	± 1.86 %
7	DC Supply Voltages	± 0.68 %
8	Temperature	± 0.62 °C
9	Humidity	± 3.9 %
10	Conducted spurious emissions	± 2.7 dB
11	DC Supply Voltages	± 0.68 %
12	AC Supply Voltages	± 1.2 %
13	Radio Frequency	± 6.5 x 10^{-8}
14	RF Power, Conducted	± 0.68 dB

2. TEST SUMMARY

FCC 47 CFR Part 22 Subpart H Test Cases			
Test Item	**Test Requirement**	**Test Method**	**Result**
Effective Radiated Power (ERP)	FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 22.913(a)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Conducted Output Power	FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 22.913(a)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Peak-to-average ratio	FCC 47 CFR Part 22.913(a)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
99%&26dB Bandwidth	FCC 47 CFR Part 2.1049(h)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Band Edge at antenna terminals	FCC 47 CFR Part 2.1051 & FCC 47 CFR Part 22.917(a)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Spurious emissions at antenna terminals	FCC 47 CFR Part 2.1051 & FCC 47 CFR Part 22.917(a)(b)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Field strength of spurious radiation	FCC 47 CFR Part 2.1053 & FCC 47 CFR Part 22.917(a)(b)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Frequency stability	FCC 47 CFR Part 2.1055 & FCC 47 CFR Part 22.355	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Disclaimer and Explanations: The declared of product specification and data (e.g. antenna gain, RF specification, etc) for EUT presented in the report are provided by the customer, and the customer takes all the responsibilities for the accuracy of product specification.			

FCC 47 CFR Part 24 Subpart E Test Cases			
Test Item	**Test Requirement**	**Test Method**	**Result**
Equivalent Isotropic Radiated Power (EIRP)	FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 24.232(c)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Conducted Output Power	FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 24.232(c)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Peak-to-average ratio	FCC 47 CFR Part 24.232(d)	KDB 971168 D01v03r01	PASS
99%&26dB Bandwidth	FCC 47 CFR Part 2.1049(h) & FCC 47 CFR Part 24.238(b)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Band Edge at antenna terminals	FCC 47 CFR Part 2.1051 & FCC 47 CFR Part 24.238(a)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Spurious emissions at antenna terminals	FCC 47 CFR Part 2.1051 & FCC 47 CFR Part 24.238(a)(b)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Field strength of spurious radiation	FCC 47 CFR Part 2.1053 & FCC 47 CFR Part 24.238(a)(b)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Frequency stability	FCC 47 CFR Part 2.1055 & FCC 47 CFR Part 24.235	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Disclaimer and Explanations: The declared of product specification and data (e.g. antenna gain, RF specification, etc) for EUT presented in the report are provided by the customer, and the customer takes all the responsibilities for the accuracy of product specification.			

3. EQUIPMENT LIST

Radiated Emission Test Equipment List						
Used	**Equipment**	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. date (mm dd, yyyy)**	**Cal. Due date (mm dd, yyyy)**
☒	3m SAC	ETS-LINDGREN	3m	Euroshiedpn-CT001270-1317	Jan. 22, 2021	Jan. 21, 2024
☒	Receiver	R&S	ESIB26	100114	Nov. 05, 2021	Nov. 04, 2022
☐	Loop Antenna	ETS-LINDGREN	6502	00202525	Nov. 11, 2021	Nov. 10, 2023
☒	Broadband Antenna	ETS-LINDGREN	3142E	00201566	Nov. 11, 2021	Nov. 10, 2023
☒	6dB Attenuator	Talent	RA6A5-N-18	18103001	Nov. 11, 2021	Nov. 10, 2023
☒	Double-Ridged Waveguide Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3117-PA	00201541	Apr. 17, 2022	Apr. 16, 2024
☒	Pre-amplifier	ETS-Lindgren	00118385	00201874	Nov. 06, 2021	Nov. 05, 2022
☒	Double-Ridged Waveguide Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3116C-PA	00202652	Nov. 14, 2020	Nov. 13, 2022
☒	Pre-amplifier	ETS-Lindgren	00118384	00202652	Nov. 17, 2020	Nov. 16, 2022
☒	Multi device Controller	ETS-LINDGREN	7006-001	00160105	N/A	N/A
☒	Test Software	Audix	e3	Software Version: 9.160323		

RF Test Equipment List						
Used	**Equipment**	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. date (mm dd, yyyy)**	**Cal. Due date (mm dd, yyyy)**
☒	Spectrum Analyzer	R&S	FSV40-N	101653	Apr. 15, 2022	Apr. 14, 2023
☒	EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY51440197	Apr. 15, 2022	Apr. 14, 2023
☒	Wideband Radio Communication Tester	R&S	CMW500	120932	Apr. 15, 2022	Apr. 14, 2023
☒	DC Source	KIKUSUI	PWR400L	LK003024	N/A	N/A
☒	Digital multimeter	FLUKE	15B+	30701460WS15	Nov. 12, 2021	Nov. 11, 2022
☒	Temp & Humidity chamber	Votisch	VT4002	58566133290020	Apr. 15, 2022	Apr. 14, 2023

4. TEST CONFIGURATION

4.1 ENVIRONMENTAL CONDITIONS FOR TESTING

Test Environment	Selected Values During Tests		
Test Condition	Ambient		
	Temperature (°C)	Voltage (V)	Relative Humidity (%)
TN/VN	+15 to +35	3.7	20 to 75
TL/VL	-30	3.4	20 to 75
TH/VL	+50	3.4	20 to 75
TL/VH	-30	4.2	20 to 75
TH/VH	+50	4.2	20 to 75

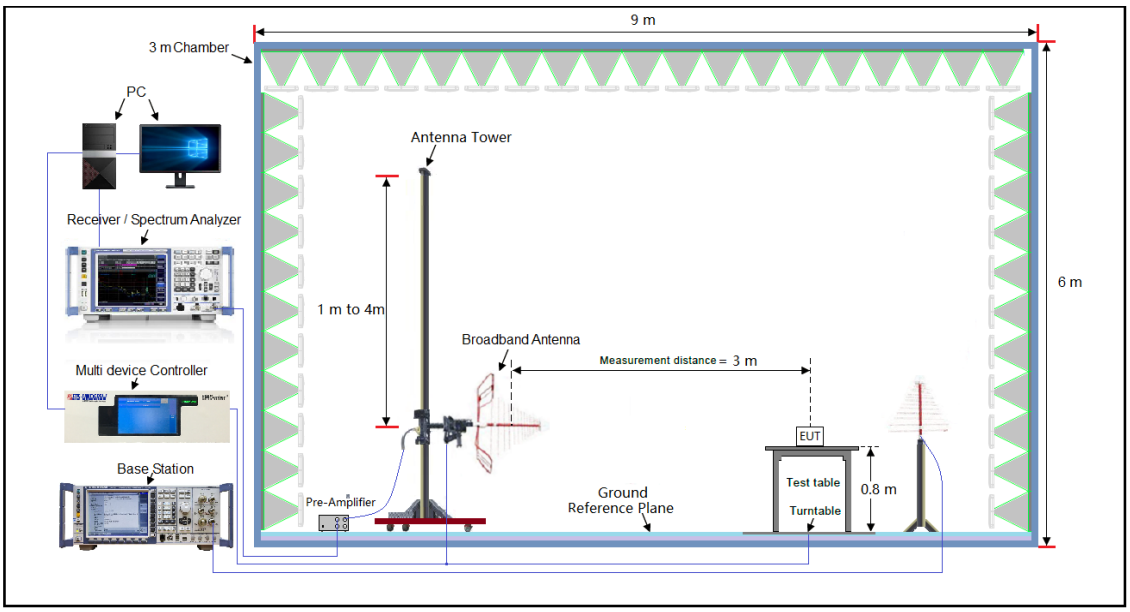
Remark:

1) The EUT just work in such extreme temperature of -30 °C to +50 °C and the extreme voltage of 3.4 V to 4.2 V, so here the EUT is tested in the temperature of -30 °C to +50 °C and the voltage of 3.4 V to 4.2 V.
2) VN: Normal Voltage; TN: Normal Temperature;
TL: Low Extreme Test Temperature; TH: High Extreme Test Temperature;
VL: Low Extreme Test Voltage; VH: High Extreme Test Voltage.

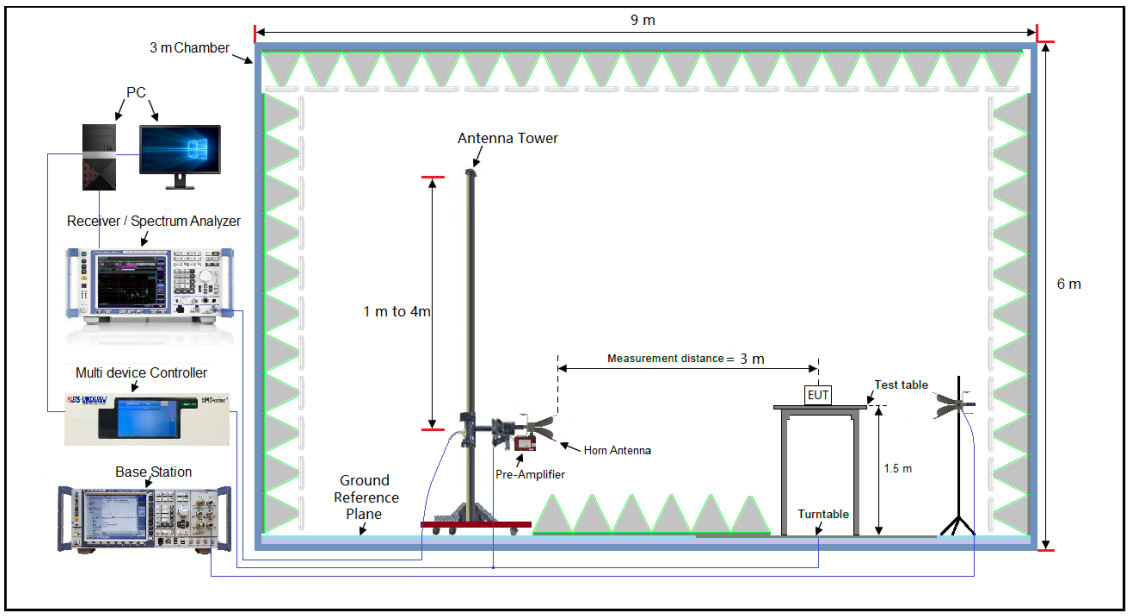
4.2 TEST SETUP

4.2.1 For Radiated Emissions test setup

Radiated Emissions 30MHz to 1GHz Test setup

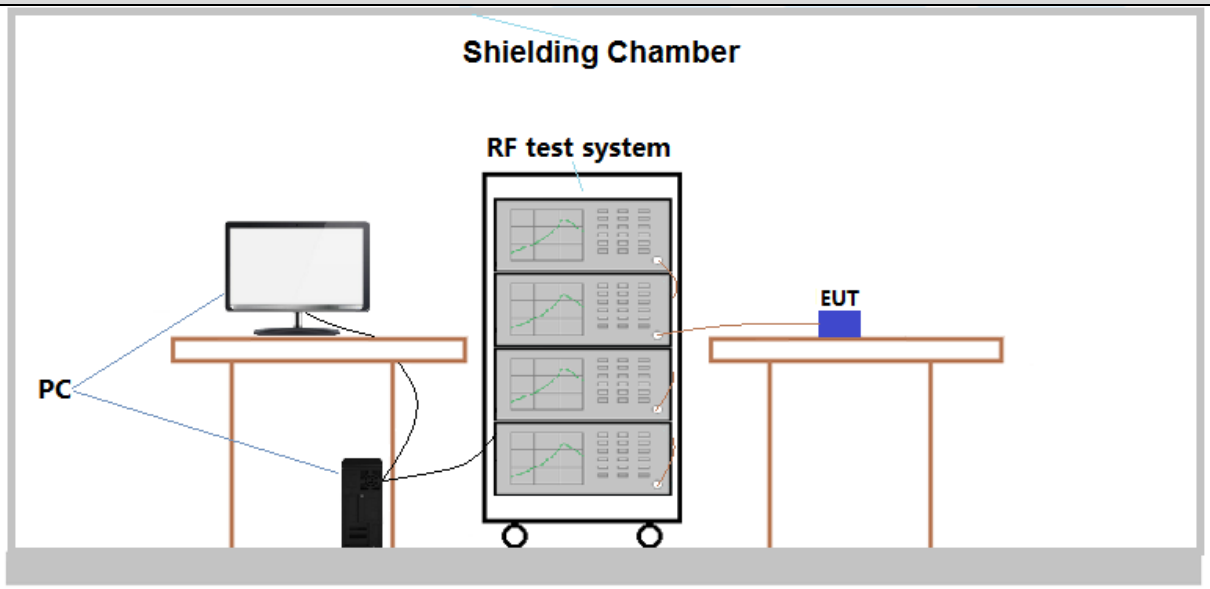


Radiated Emissions Above 1GHz Test setup

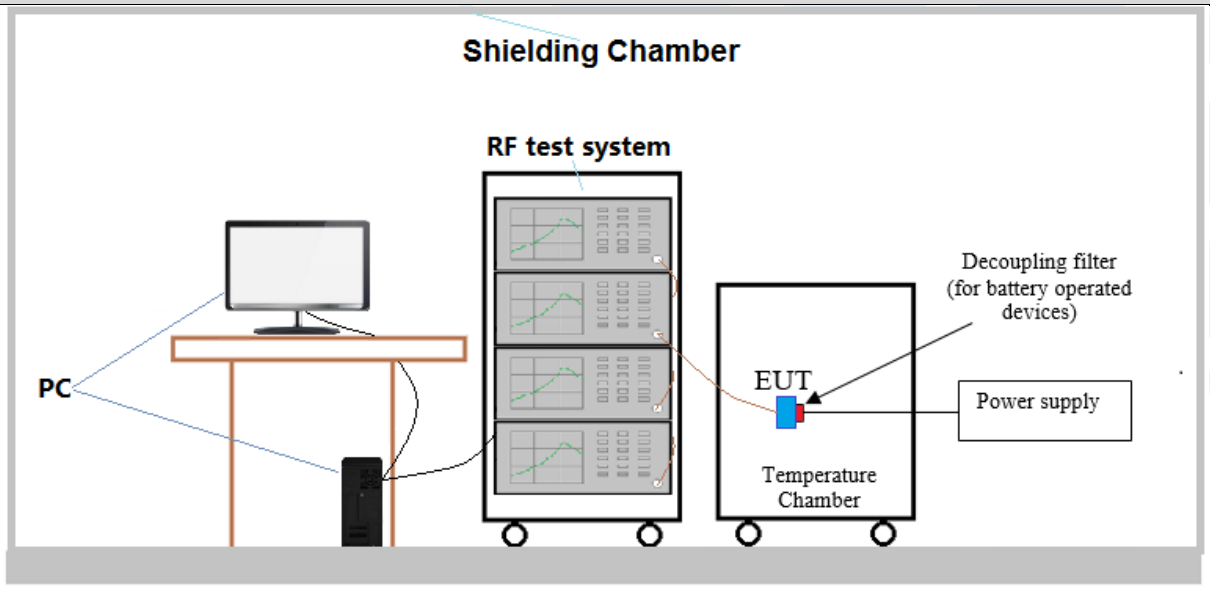


4.2.2 For Conducted RF test setup

Normal Environment



Extreme Environment



4.3 TEST CHANNELS

Bands	Tx/Rx Frequency	RF Channel		
		Low(L)	Middle(M)	High(H)
GSM 850	Tx (824 MHz ~ 849 MHz)	Channel 128	Channel 190	Channel 251
		824.2 MHz	836.6 MHz	848.8 MHz

Bands	Tx/Rx Frequency	RF Channel		
		Low(L)	Middle(M)	High(H)
GSM 1900	Tx (1850 MHz-1910 MHz)	Channel 512	Channel 661	Channel 810
		1850.2 MHz	1880.0 MHz	1909.8 MHz

4.4 SYSTEM TEST CONFIGURATION

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, radiated emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario. It was powered by a 3.7Vdc battery. Only the worst case data were recorded in this test report.

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, X/Y/Z axis, and antenna ports.
The worst case was found when positioned as the table below.

Bands	Mode	Antenna Port	Worst-case axis positioning
GSM 850	1TX	Chain 0	Y axis
PCS 1900	1TX	Chain 0	Y axis

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000MHz. The resolution is 1 MHz or greater for frequencies above 1000MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

Radiated emission measurement were performed from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

4.5 PRE-SCAN

Pre-scan under all rate at lowest middle and highest channel, find the transmitter power as below:
SIM 1 Card Conducted transmitter power measurement result.

GSM 850 Maximum Average Power (dBm)			
Channel	**128**	**190**	**251**
Frequency(MHz)	**824.2 MHz**	**836.6 MHz**	**848.8 MHz**
GSM (GMSK, 1Tx-slot)	31.32	31.43	**31.49**

PCS 1900 Maximum Average Power (dBm)			
Channel	**512**	**661**	**810**
Frequency(MHz)	**1850.2 MHz**	**1880.0 MHz**	**1909.8 MHz**
GSM (GMSK, 1Tx-slot)	**29.30**	29.09	29.19

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

Band	Radiated	Conducted
GSM 850/1900	1) GSM (GMSK, 1Tx-slot) Link	1) GSM (GMSK,1Tx-slot) Link

5. RADIO TECHNICAL REQUIREMENTS SPECIFICATION

5.1 REFERENCE DOCUMENTS FOR TESTING

No.	Identity	Document Title
1	FCC 47 CFR Part 2	Frequency allocations and radio treaty matters; general rules and regulations
2	FCC 47 CFR Part 22	Public Mobile Services
3	FCC 47 CFR Part 27	Miscellaneous Wireless Communications Services
4	FCC 47 CFR Part 24	Personal Communications Services
5	ANSI C63.26-2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
6	KDB 971168 D01	KDB 971168 D01 Power Meas License Digital Systems v03r01

5.2 MAXIMUM ERP/EIRP

Test Requirement: FCC 47 CFR Part 2.1046(a),
FCC 47 CFR Part 22.913(a),
FCC 47 CFR Part 24.232(c),

Test Method: KDB 971168 D01v03r01 Section 5.6 & ANSI C63.26-2015

Limit:

FCC 47 CFR Part 22.913(a)

The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

FCC 47 CFR Part 24.232(c)

Mobile and portable stations are limited to 2 watts EIRP.

Test Procedure:

$$\textbf{ERP or EIRP} = P_{Meas} + G_T - L_C$$

where:

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

P_{Meas} = measured transmitter output power or PSD, in dBm or dBW;

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

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

Test Setup: Refer to section 4.2.1 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Link mode

Test Results: Pass

Test Data: See table below

Bands	Modulation	Max.Conducted Avg. Power	Ant. Gain	Limit	ERP		Result
		(dBm)	(dBi)	(W)	(dBm)	(W)	
GSM 850 (824-849 MHz)	GMSK	31.49	0.46	7.0	29.80	0.9550	Pass

Bands	Modulation	Max.Conducted Avg. Power	Ant. Gain	Limit	EIRP		Result
		(dBm)	(dBi)	(W)	(dBm)	(W)	
PCS 1900 (1850-1910 MHz)	GMSK	29.30	0.85	2.0	30.15	1.0351	Pass

Note: The maximum ERP/EIRP is calculated from max output power and antenna gain, the antenna gain provided by the customer, and the customer takes all the responsibilities for the accuracy of antenna gain.

5.3 CONDUCTED OUTPUT POWER

Test Requirement: FCC 47 CFR Part 2.1046(a),
FCC 47 CFR Part 22.913(a),
FCC 47 CFR Part 24.232(c),

Test Method: KDB 971168 D01v03r01 & ANSI C63.26-2015

Limit:

FCC 47 CFR Part 22.913(a)

The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

FCC 47 CFR Part 24.232(c)

Mobile and portable stations are limited to 2 watts EIRP.

Test Procedure:

The EUT was set up for the maximum power with GSM, E, EDGE, WCDMA, CDMA2000, and LTE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.2.2 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Link mode

Test Results: Pass

Test Data: The full result refer to section 4.5 for details.

5.4 PEAK-TO-AVERAGE RATIO

Test Requirement: FCC 47 CFR Part 22.913(a),
FCC 47 CFR Part 24.232(c),

Test Method: KDB 971168 D01v03r01 Section 5.7

Limit: In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB

Test Procedure:

The EUT was connected to Spectrum Analyzer and Base Station via power divider. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.

Some regulatory requirements specify a PAPR limit when the output power limits are specified in terms of average power. If it becomes necessary to provide measurement data to demonstrate compliance to a PAPR limit, then the appropriate procedure from those provided in 5.2.3 shall be utilized to determine the peak power (or peak PSD) and the appropriate procedure from those provided in 5.2.4 shall be used to determine the average power (or average PSD). The data from these measurements is then used in Equation (2) to determine the PAPR of a narrowband CW-like signal. See 5.2.3.4 for guidance on determining the PAPR of a broadband noise-like signal.

PAPR (dB) = PPk (dBm or dBW)-PAvg (dBm or dBW)

where:

PAPR peak-to-average power ratio, in dB;

PPk measured peak power or peak PSD level, in dBm or dBW;

PAvg measured average power or average PSD level, in dBm or dBW.

OR

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer.

a) Set resolution/measurement bandwidth ≥ signal's occupied bandwidth
b) Set the number of counts to a value that stabilizes the measured CCDF curve
c) Record the maximum PAPR level associated with a probability of 0.1 %

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.2.2 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Link mode

Test Results: Pass

Test Data: See table below

Bands	Modulation	Peak-to-average ratio (dB)			Limit	Result
		Lowest	Middle	Highest	(dB)	
GSM 850	GSM	0.79	0.31	0.53	13	Pass
PCS 1900	GSM	0.28	0.37	0.30	13	Pass

The test plots as follows:

GSM 850	PCS 1900
GSM	
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

5.5 99%&26DB BANDWIDTH

Test Requirement: FCC 47 CFR Part 2.1049(h),
FCC 47 CFR Part 22.917(b),
FCC 47 CFR Part 24.238(b),
FCC 47 CFR Part 27.53(h)

Test Method: ANSI C63.26-2015 & KDB 971168 D01v03r01 Section 4

Limit: No Limit, for reporting purposes only.

Test Procedure:

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band. The 99% and -26dB bandwidths was also measured and recorded.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.2.2 for details.

Instruments Used: Refer to section 3 for details

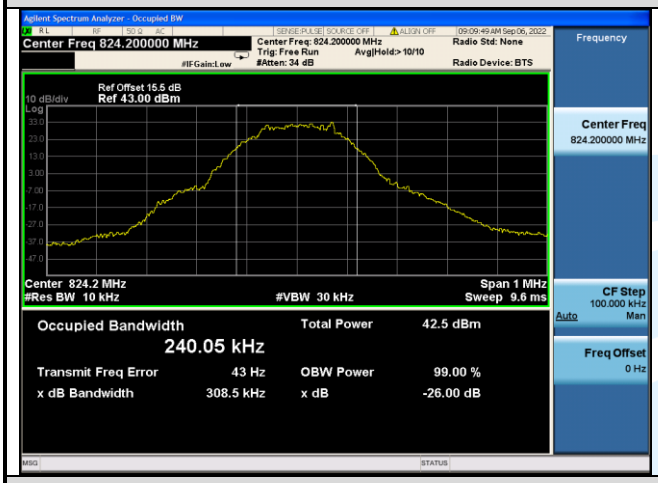
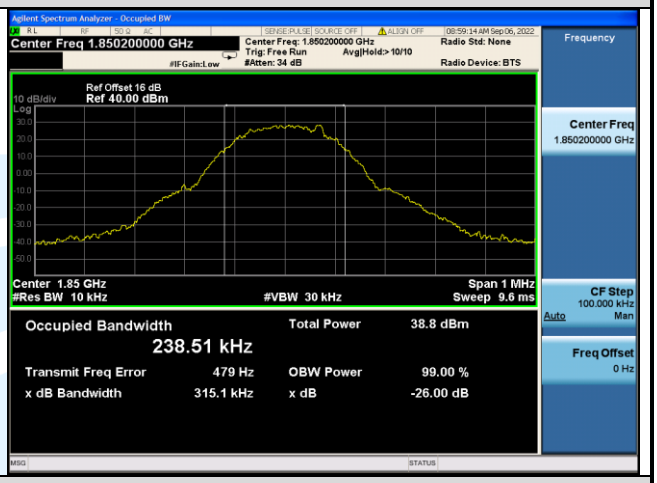
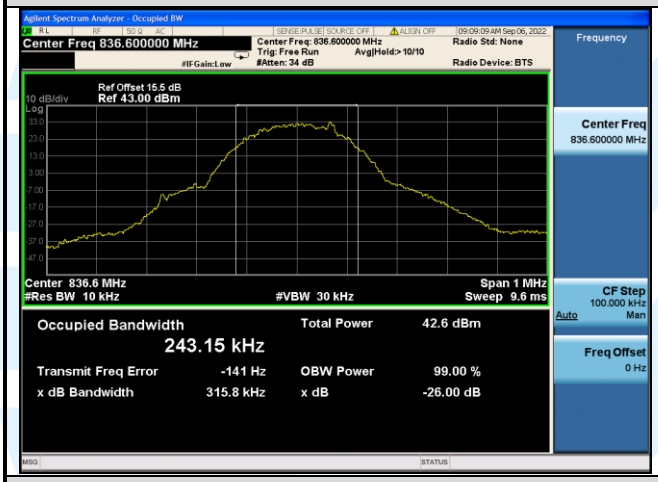
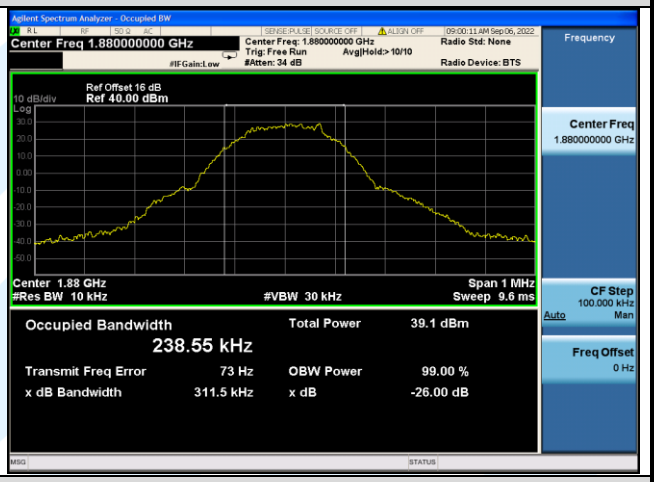
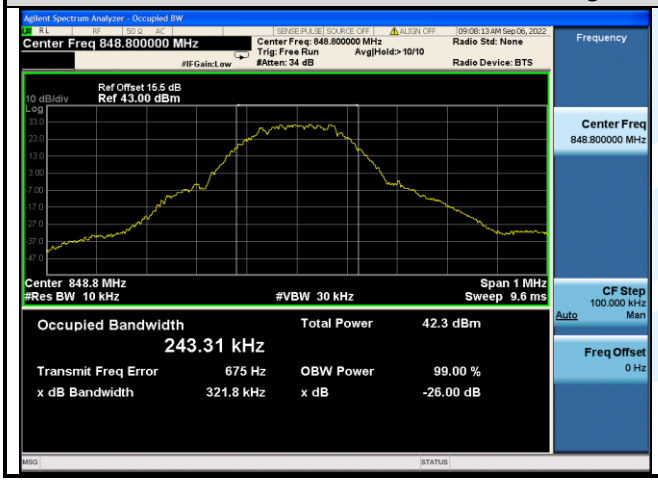
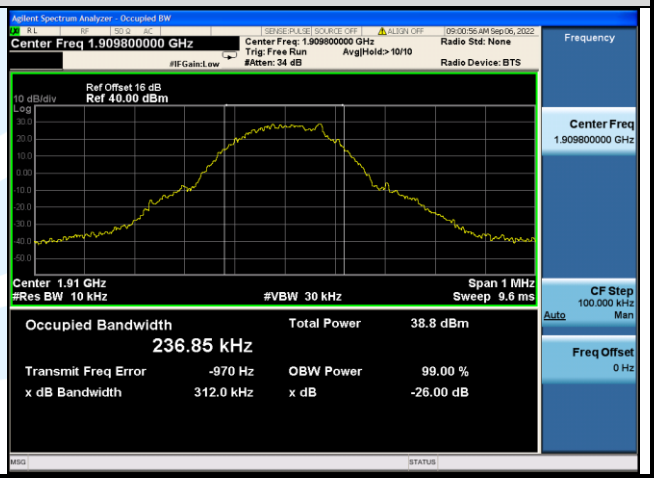
Test Mode: Link mode

Test Results: Pass

Test Data: See table below

Bands	Modulation	Channel	Frequency (MHz)	26 dB BW (kHz)	99% BW (kHz)
GSM 850	GSM	128	824.2	308.5	240.05
		190	836.6	315.8	243.15
		251	848.8	321.8	243.31
PCS 1900	GSM	512	1850.2	315.1	238.51
		661	1880.0	311.5	238.55
		810	1909.8	312.0	236.85

The test plots as follows:

GSM 850	PCS 1900
GSM	
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

5.6 BAND EDGE AT ANTENNA TERMINALS

Test Requirement:	FCC 47 CFR Part 2.1051, FCC 47 CFR Part 22.917(a), FCC 47 CFR Part 24.238(a), FCC 47 CFR Part 27.53(h)(1)
Test Method:	ANSI C63.26-2015 & KDB 971168 D01v03r01

Limit:

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to -13 dBm.

Test Procedure:

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer.

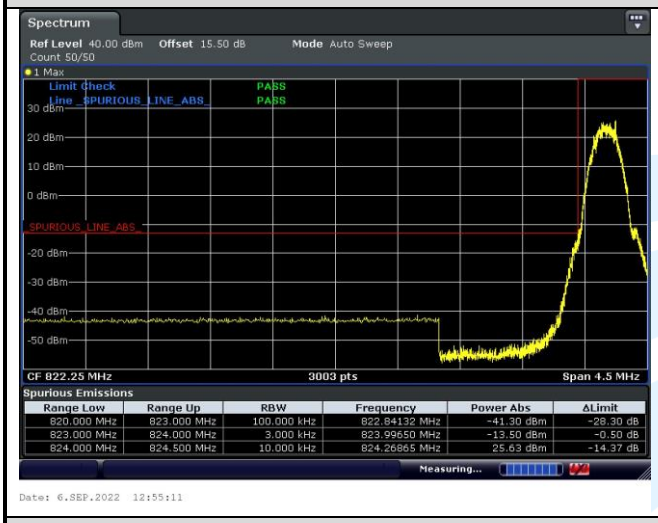
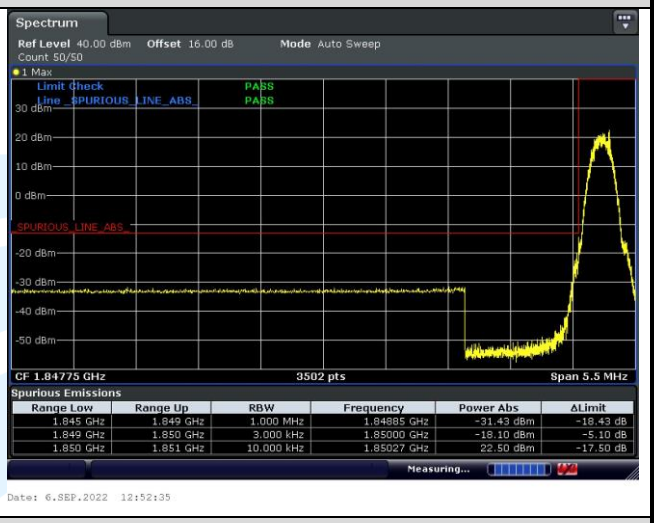
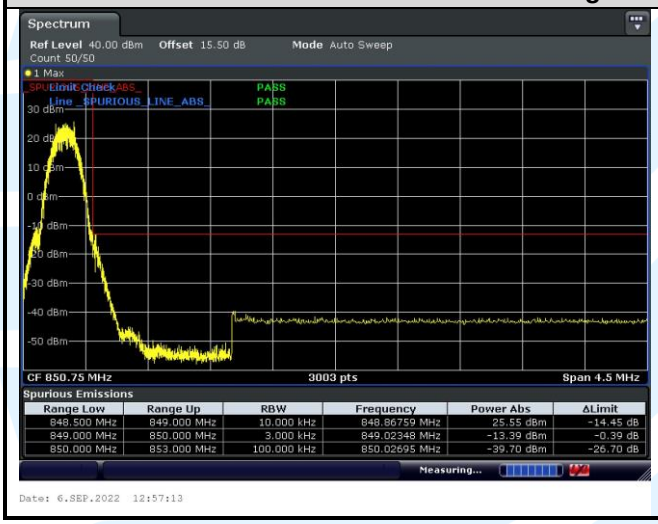
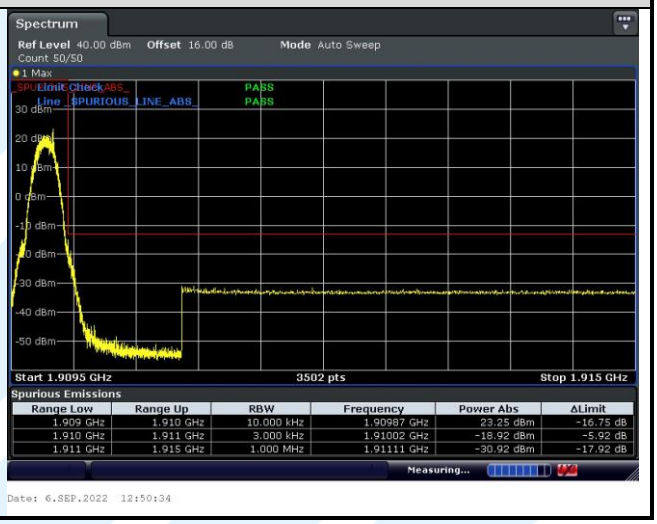
For each band edge measurement:

1) Set the spectrum analyzer span to include the block edge frequency.
2) Set a marker to point the corresponding band edge frequency in each test case.
3) Set display line at -13 dBm
4) Set resolution bandwidth to at least 1% of emission bandwidth.
5) Set spectrum analyzer with RMS detector.
6) Record the max trace plot into the test report

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup:	Refer to section 4.2.2 for details.
Instruments Used:	Refer to section 3 for details
Test Mode:	Link mode
Test Results:	Pass

The test plots as follows:

GSM 850	PCS 1900
GSM	
Lowest Channel	
	
Highest Channel	
	

5.7 SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Test Requirement:	FCC 47 CFR Part 2.1051, FCC 47 CFR Part 22.917(a)(b), FCC 47 CFR Part 24.238(a)(b), FCC 47 CFR Part 27.53(h)(1)
Test Method:	ANSI C63.26-2015 & KDB 971168 D01v03r01

Limit:

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to -13 dBm.

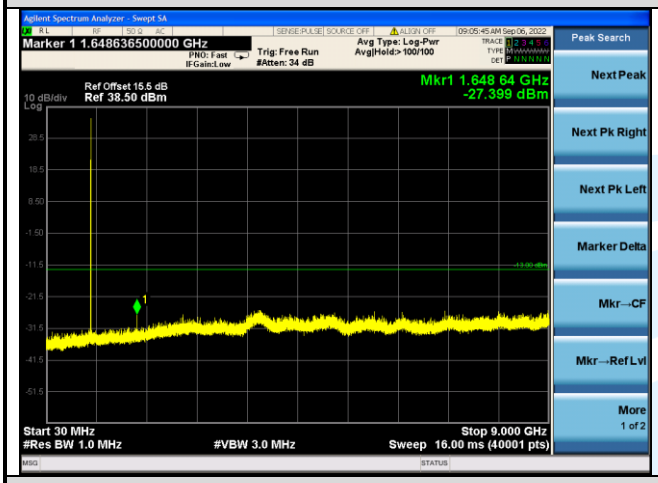
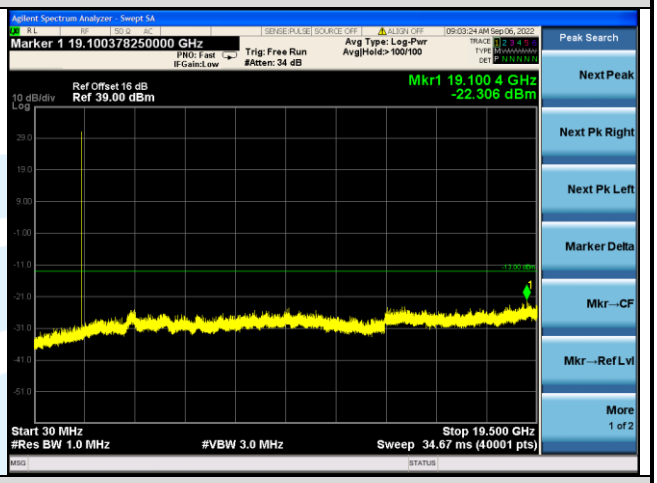
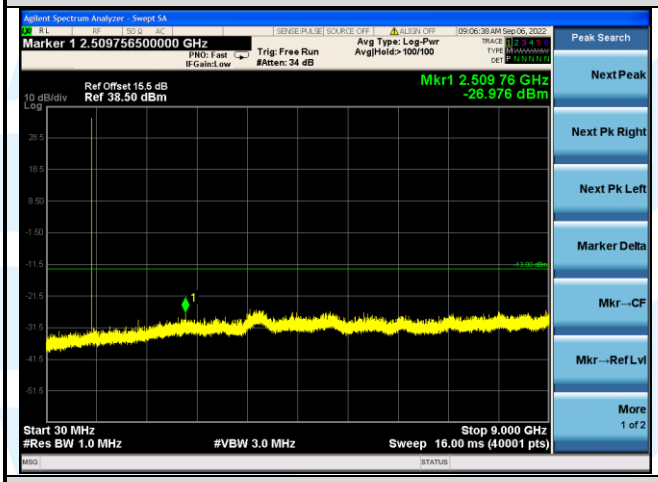
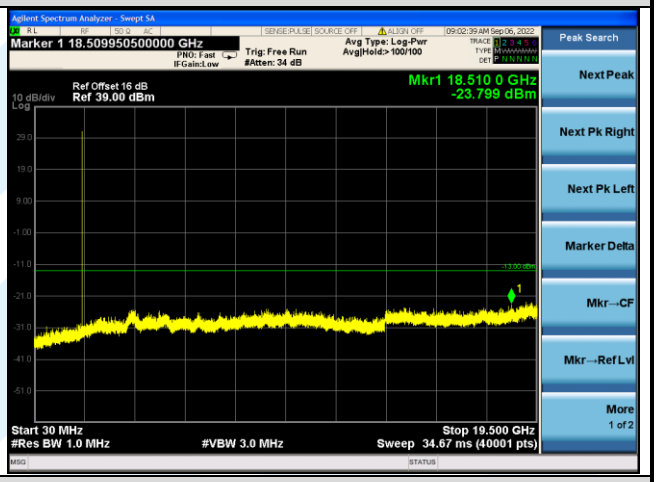
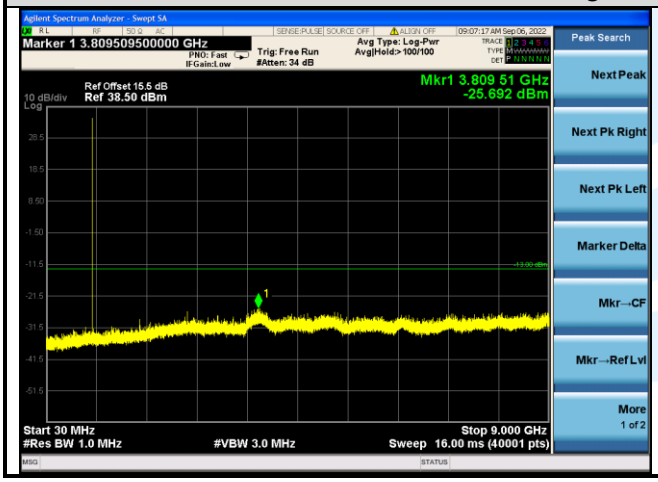
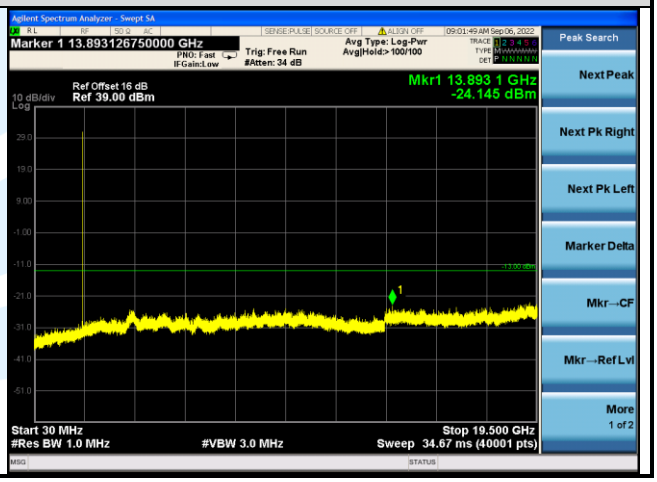
Test Procedure:

The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range. b. Measuring frequency range is from 30 MHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower. Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup:	Refer to section 4.2.2 for details.
Instruments Used:	Refer to section 3 for details
Test Mode:	Link mode
Test Results:	Pass

The test plots as follows:

GSM 850	PCS 1900
GSM	
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

Remark:

1) All the above radiation data, the fundamental frequency is not marked, it may exceed the limit, please ignore it.

5.8 FIELD STRENGTH OF SPURIOUS RADIATION

Test Requirement: FCC 47 CFR Part 2.1053,
FCC 47 CFR Part 22.917(a)(b),
FCC 47 CFR Part 24.238(a)(b),
FCC 47 CFR Part 27.53(h)(1)

Test Method: ANSI C63.26-2015 & KDB 971168 D01v03r01 Section 7

Limits:

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to -13 dBm.

Test Setup: Refer to section 4.2.1 for details.

Test Procedures: KDB 971168 D01v03r01 Section 7

Equipment Used: Refer to section 3 for details.

Test Result: Pass

The measurement data as follows:

GSM 850							
No.	Frequency (MHz)	SA Reading (dBm)	Correction factor (dB/m)	EIRP Result (dBm)	Limit (dBm)	Margin (dB)	Ant. Pol.
Lowest Channel							
1	734.037	-88.84	40.67	-48.17	-13.00	-35.17	Horizontal
2	793.028	-88.17	41.01	-47.16	-13.00	-34.16	Horizontal
3	938.714	-88.12	42.94	-45.18	-13.00	-32.18	Horizontal
4	1648.400	-69.16	0.20	-68.96	-13.00	-55.96	Horizontal
5	2472.600	-68.02	3.59	-64.43	-13.00	-51.43	Horizontal
1	637.795	-88.14	39.11	-49.03	-13.00	-36.03	Vertical
2	781.961	-88.75	40.84	-47.91	-13.00	-34.91	Vertical
3	972.283	-86.95	43.08	-43.87	-13.00	-30.87	Vertical
4	1648.400	-67.95	0.20	-67.75	-13.00	-54.75	Vertical
5	2472.600	-64.14	3.59	-60.55	-13.00	-47.55	Vertical
Middle Channel							
1	516.565	-88.60	36.45	-52.15	-13.00	-39.15	Horizontal
2	660.602	-89.32	39.56	-49.76	-13.00	-36.76	Horizontal
3	925.613	-87.34	42.88	-44.46	-13.00	-31.46	Horizontal
4	1673.200	-65.82	0.36	-65.46	-13.00	-52.46	Horizontal
5	2509.800	-65.02	3.71	-61.31	-13.00	-48.31	Horizontal
1	723.793	-89.14	40.71	-48.43	-13.00	-35.43	Vertical
2	793.028	-88.48	41.01	-47.47	-13.00	-34.47	Vertical
3	932.141	-88.26	42.91	-45.35	-13.00	-32.35	Vertical
4	1673.200	-66.89	0.36	-66.53	-13.00	-53.53	Vertical
5	2509.800	-65.88	3.71	-62.17	-13.00	-49.17	Vertical
Highest Channel							
1	558.079	-88.38	37.15	-51.23	-13.00	-38.23	Horizontal
2	684.226	-88.97	40.01	-48.96	-13.00	-35.96	Horizontal
3	781.961	-87.81	40.84	-46.97	-13.00	-33.97	Horizontal
4	1697.600	-66.07	0.52	-65.55	-13.00	-52.55	Horizontal
5	2546.400	-68.44	3.80	-64.64	-13.00	-51.64	Horizontal
1	542.610	-89.20	37.09	-52.11	-13.00	-39.11	Vertical
2	655.977	-88.66	39.52	-49.14	-13.00	-36.14	Vertical
3	713.692	-89.36	40.54	-48.82	-13.00	-35.82	Vertical
4	1697.600	-68.53	0.52	-68.01	-13.00	-55.01	Vertical
5	2546.400	-65.85	3.80	-62.05	-13.00	-49.05	Vertical

PCS 1900							
No.	Frequency (MHz)	SA Reading (dBm)	Correction factor (dB/m)	EIRP Result (dBm)	Limit (dBm)	Margin (dB)	Ant. Pol.
Lowest Channel							
1	637.795	-80.41	9.69	-70.72	-13.00	-57.72	Horizontal
2	776.485	-81.27	11.55	-69.72	-13.00	-56.72	Horizontal
3	912.695	-82.00	13.97	-68.03	-13.00	-55.03	Horizontal
4	3700.400	-61.71	7.58	-54.13	-13.00	-41.13	Horizontal
5	5550.600	-65.55	11.77	-53.78	-13.00	-40.78	Horizontal
1	554.171	-79.97	7.85	-72.12	-13.00	-59.12	Vertical
2	728.897	-81.51	11.48	-70.03	-13.00	-57.03	Vertical
3	815.635	-81.05	12.17	-68.88	-13.00	-55.88	Vertical
4	3700.400	-64.89	7.58	-57.31	-13.00	-44.31	Vertical
5	5550.600	-66.07	11.77	-54.30	-13.00	-41.30	Vertical
Middle Channel							
1	512.948	-80.08	7.16	-72.92	-13.00	-59.92	Horizontal
2	881.184	-81.25	13.59	-67.66	-13.00	-54.66	Horizontal
3	992.997	-83.04	14.78	-68.26	-13.00	-55.26	Horizontal
4	3760.000	-63.10	7.79	-55.31	-13.00	-42.31	Horizontal
5	5640.000	-64.95	11.56	-53.39	-13.00	-40.39	Horizontal
1	535.038	-80.60	7.67	-72.93	-13.00	-59.93	Vertical
2	893.656	-81.69	13.85	-67.84	-13.00	-54.84	Vertical
3	925.613	-81.64	14.06	-67.58	-13.00	-54.58	Vertical
4	3760.000	-64.72	7.79	-56.93	-13.00	-43.93	Vertical
5	5640.000	-66.56	11.56	-55.00	-13.00	-42.00	Vertical
Highest Channel							
1	838.887	-81.40	12.80	-68.60	-13.00	-55.60	Horizontal
2	912.695	-82.11	13.97	-68.14	-13.00	-55.14	Horizontal
3	992.997	-82.86	14.78	-68.08	-13.00	-55.08	Horizontal
4	3819.600	-64.88	8.01	-56.87	-13.00	-43.87	Horizontal
5	5729.400	-67.63	11.36	-56.27	-13.00	-43.27	Horizontal
1	718.725	-82.01	11.33	-70.68	-13.00	-57.68	Vertical
2	919.132	-82.58	14.01	-68.57	-13.00	-55.57	Vertical
3	992.997	-82.44	14.78	-67.66	-13.00	-54.66	Vertical
4	3819.600	-63.71	8.01	-55.70	-13.00	-42.70	Vertical
5	5729.400	-67.64	11.36	-56.28	-13.00	-43.28	Vertical

Remark:

1. Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result – Limit

5.9 FREQUENCY STABILITY

Test Requirement: FCC 47 CFR Part 2.1055 &
FCC 47 CFR Part 22.355 &
FCC 47 CFR Part 24.235 &
FCC 47 CFR Part 27.54

Test Method: ANSI C63.26-2015 & KDB 971168 D01v03r01

Limits:

FCC 47 CFR Part 22.355,

The carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm for mobile stations.

FCC 47 CFR Part 24.235, FCC 47 CFR Part 27.54

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Setup: Refer to section 4.2.2 for details.

Test Procedures:

1) Use CMW 500 with Frequency Error measurement capability.
   a) Temp. = −30° to + 50°C
   b) Voltage =low voltage, 3.4 Vdc, Normal, 3.7 Vdc and High voltage, 4.2 Vdc.
2) Frequency Stability vs Temperature:

The EUT is place inside a temperature chamber. The temperature is set to 20ºC and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until +50ºC is reached.

3) Frequency Stability vs Voltage:

The peak frequency error is recorded (worst-case).

Equipment Used: Refer to section 3 for details.

Test Result: Pass

Modulation	Channel/ Frequency (MHz)	Voltage (Vdc)	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Result
GSM 850							
GMSK	190 / 836.6	VL	TN	25	0.0299	± 2.5	Pass
		VN		24	0.0287	± 2.5	Pass
		VH		27	0.0323	± 2.5	Pass
		VN	50	32	0.0383	± 2.5	Pass
			40	26	0.0311	± 2.5	Pass
			30	19	0.0227	± 2.5	Pass
			20	22	0.0263	± 2.5	Pass
			10	37	0.0442	± 2.5	Pass
			0	29	0.0347	± 2.5	Pass
			-10	22	0.0263	± 2.5	Pass
			-20	33	0.0394	± 2.5	Pass
			-30	25	0.0299	± 2.5	Pass

Modulation	Channel/ Frequency (MHz)	Voltage (Vdc)	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Result
PCS 1900							
GMSK	661 / 1880.0	VL	TN	31	0.0165	N/A	Pass
		VN		24	0.0128		Pass
		VH		31	0.0165		Pass
		VN	50	24	0.0128		Pass
			40	32	0.0170		Pass
			30	25	0.0133		Pass
			20	27	0.0144		Pass
			10	24	0.0128		Pass
			0	22	0.0117		Pass
			-10	28	0.0149		Pass
			-20	27	0.0144		Pass
			-30	25	0.0133		Pass

APPENDIX 1 PHOTOS OF TEST SETUP

See test photos attached in Appendix 1 for the actual connections between Product and support equipment.

APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal photos.

*** End of Report ***
