FCC Test Report

Report No.: AGC00408240102FR05

FCC ID	:	2A3DR-AGMP2
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	4G smart PAD, Tablet
BRAND NAME	:	AGM
MODEL NAME	:	AGM_PAD_P2, AGM_PAD_P2W
APPLICANT	:	AGM MOBILE LIMITED
DATE OF ISSUE	:	Mar. 01, 2024
STANDARD(S)	:	FCC Part 22 Subpart H FCC Part 24 Subpart E FCC Part 27 Subpart L
REPORT VERSION	:	V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd.

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Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Mar. 01, 2024	Valid	Initial Release

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1. General Information

Applicant	AGM MOBILE LIMITED
Address	FLAT/RM 2253 22/F HOI TAI FACTORY ESTATE TSING YEUNG CIRCUIT TUEN MUN NT HONG KONG, CHINA
Manufacturer	Guangdong Aijiemo Electronic Industry Co., Ltd
Address	AGM Technology Park, No. 187 Lianfa Road, Tongqiao Town, Zhongkai High-tech District, Huizhou City, Guangdong, China
Factory	Guangdong Aijiemo Electronic Industry Co., Ltd
Address	AGM Technology Park, No. 187 Lianfa Road, Tongqiao Town, Zhongkai High-tech District, Huizhou City, Guangdong, China
Product Designation	4G smart PAD, Tablet
Brand Name	AGM
Test Model	AGM_PAD_P2
Series Model(s)	AGM_PAD_P2W
Difference Description	In addition to the different model names between the main test and the series, there are also different headphone plate layouts, and corresponding antenna types and gains. There are no differences in the other PCB layouts and RF parameters.
Date of receipt of test item	Jan. 22, 2024
Date of Test	Jan. 22, 2024~Feb. 27, 2024
Deviation from Standard	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Test Report Form No	AGCER-FCC-GSM&WCDMA-V1

Note: The test results of this report relate only to the tested sample identified in this report.

Prepared By	Bibo Zhang (Project Engineer)	Mar. 01, 2024
Reviewed By	Calvin Liu (Reviewer)	Mar. 01, 2024
Approved By	Max Zhang Authorized Officer	Mar. 01, 2024

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2. Product Information

2.1 Product Technical Description

Support Networks	GSM, GPRS, EDGE, WCDMA, HSDPA, HSUPA		
Hardware Version	V1.0		
Software Version	M193_P9901_V1		
Support Frequency Band	☒GSM 850	☒PCS1900	☒UMTS FDD Band II
	☒UMTS FDD Band IV	☒UMTS FDD Band V	(U.S. Bands)
	☒GSM 900	☒DCS 1800	☒UMTS FDD Band I
	☒UMTS FDD Band VIII	(Non-U.S. Bands)	
Frequency Range	824.2MHz-848.8MHz (GSM/GPRS/EDGE 850)		
	1850.2MHz-1909.8MHz (GSM/GPRS/EDGE 1900)		
	1852.4MHz-1907.6MHz (WCDMA Band II)		
	1712.4MHz-1752.6MHz (WCDMA Band IV)		
	826.4MHz-846.6 MHz (WCDMA Band V)		
Type of Modulation	GMSK/8PSK Modulation For GSM/GPRS/EDGE		
	BPSK/QPSK Modulation For WCDMA/HSDPA/HSUPA		
Emission Designator	GSM 850:	246KGXW	
	GPRS 850:	248KGXW	
	EDGE 850:	249KG7W	
	GSM 1900:	246KGXW	
	GPRS 1900:	247KGXW	
	EDGE 1900:	321KG7W	
	WCDMA Band II:	4M22F9W	
	WCDMA Band IV:	4M20F9W	
	WCDMA Band V:	5M30F9W	
Antenna Designation	Internal Antenna		
Antenna Gain AGM_PAD_P2	GSM850:0.29dBi	PCS1900: 0.16dBi	
	WCDMA850:0.29dBi	WCDMA1700:0.27dBi	WCDMA1900:0.16dBi
Antenna Gain AGM_PAD_P2W	GSM850:0.71dBi	PCS1900: 0.75dBi	
	WCDMA850:0.71dBi	WCDMA1700:1.66dBi	WCDMA1900:0.75dBi
Power Supply	DC 3.85V by Built-in Li-ion Battery		
Dual Card	GSM /WCDMA Card Slot		
Extreme Vol. Limits	DC3.27V to 4.40V (Normal: DC 3.85V)		
Extreme Temp. Tolerance	-30 °C to +50 °C		
Temperature Range	-20℃ to +50℃		

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GSM/WCDMA SLOT 1:

	Maximum ERP/EIRP (dBm)	Max. Average Burst Power (dBm)
GSM 850	32.56	34.31
PCS 1900	29.85	31.68
UMTS BAND V	21.78	23.55
UMTS BAND II	20.70	23.18
UMTS BAND IV	20.69	22.84

GSM/WCDMA SLOT 2:

	Maximum ERP/EIRP (dBm)	Max. Average Burst Power (dBm)
GSM 850	30.71	32.52
PCS 1900	27.23	29.85
UMTS BAND V	19.99	21.74
UMTS BAND II	19.74	21.99
UMTS BAND IV	18.54	20.58

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2.2 Related Submittal(S) / Grant (S)

This submittal(s) (test report) is intended for FCC ID: **2A3DR-AGMP2,** filing to comply with Part 2, Part 22/24/27 of the Federal Communication Commission rules.

2.3 Test Methodology

The tests were performed according to following standards:

No.	Identity	Document Title
1	47 CFR FCC Part 2	Frequency allocations and radio treaty matters, general rules and regulations.
2	47 CFR FCC Part 22	Public Mobile Services.
3	47 CFR FCC Part 24	Personal Communications Services.
4	47 CFR FCC Part 27	Miscellaneous Wireless Communications Services.
5	ANSI C63.26-2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
6	ANSI/TIA-603-E-2016	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
7	KDB 971168	D01 v03r01 Measurement Guidance For Certification Of Licensed Digital Transmitters.

2.4 Device Capabilities

850/1900 GSM/GPRS/EGPRS,850/1700/1900 WCDMA/HSPA, Multi-Band LTE,802.11 b/g/n for WLAN,802.11 a/n/ac for UNII, Bluetooth (1X,EDR,LE),GPS.

For emissions from 1GHz – 18GHz, low, mid, and high channels were tested with highest power and worst case configuration.

The emissions below 1GHz and above 18GHz were tested with the highest transmitting power channel and the worst case configuration.

The EUT was manipulated through three orthogonal planes of X-orientation (flatbed), Y-orientation (landscape),and Z-orientation (portrait) during the testing. Only the worst case emissions were reported in this test report.

This device supports dual-SIM communication, and only the data corresponding to the worst card slot (SIM Card 1) is reflected in the report.

2.5 Special Accessories

The battery was supplied by the applicant were used as accessories and being tested with EUT intended for FCC grant together.

2.6 Equipment Modifications

Not available for this EUT intended for grant.

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2.7 Emission Designator

GSM Emission Designator

Emission Designator = 249KGXW

GSM BW = 249 kHz

G = Phase Modulation

X = Cases not otherwise covered

W = Combination (Audio/Data)

EDGE Emission Designator

Emission Designator = 249KG7W

GSM BW = 249 kHz

G = Phase Modulation

7 = Quantized/Digital Info

W = Combination (Audio/Data)

WCDMA Emission Designator

Emission Designator = 4M17F9W

WCDMA BW = 4.17 MHz

F = Frequency Modulation

9 = Composite Digital Info

W = Combination (Audio/Data)

QPSK Modulation

Emission Designator = 4M48G7D

LTE BW = 4.48 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

QAM Modulation

Emission Designator = 4M48W7D

LTE BW = 4.48 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

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3. Test Environment

3.1 Address of The Test Laboratory

Laboratory: Attestation of Global Compliance (Shenzhen) Co., Ltd

Address: 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

3.2 Test Facility

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

CNAS-Lab Code: L5488

Attestation of Global Compliance (Shenzhen) Co., Ltd. has been assessed and proved to follow CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories).

A2LA-Lab Cert. No.: 5054.02

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to follow ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 975832

Attestation of Global Compliance (Shenzhen) 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 with Registration 975832.

IC-Registration No.: 24842 (CAB identifier: CN0063)

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Certification and Engineering Bureau of Industry Canada. The acceptance letter from the IC is maintained in our files with Registration 24842.

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3.3 Environmental Conditions

	Normal Conditions	Extreme Conditions
Temperature range	15~35℃	-20℃~50℃
Humidity range	20 % to 75 %.	20 % to 75 %.
Pressure range	86-106kPa	86-106kPa
Power supply	DC 3.85V	DC 3.27V or 4.40V
Note: The Extreme Temperature and Extreme Voltages declared by the manufacturer.		

3.4 Measurement Uncertainty

Test	Measurement Uncertainty
Transmitter power conducted	±0.57 dB
Transmitter power Radiated	±2.20 dB
Conducted spurious emission 9kHz-40 GHz	±2.20 dB
Occupied Bandwidth	±0.01ppm
Radiated Emission 30~1000MHz	±4.10dB
Radiated Emission Above 1GHz	±4.32dB
Conducted Disturbance:0.15~30MHz	±3.20dB
Radio Frequency	± 6.5 x 10-8
RF Power, Conducted	± 0.9 dB

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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3.5 List of Test Equipment

● Radiated Spurious Emission							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☒	AGC-EM-E046	EMI Test Receiver	R&S	ESCI	10096	2023-02-03	2024-02-02
☒	AGC-EM-E046	EMI Test Receiver	R&S	ESCI	10096	2024-02-01	2025-01-31
☒	AGC-EM-E061	Spectrum Analyzer	Agilent	N9010A	MY53470504	2023-06-01	2024-05-31
☒	AGC-ER-E032	Universal Radio Communication Tester	R&S	CMW500	120909	2023-07-05	2024-07-04
☐	AGC-EM-E086	Loop Antenna	ZHINAN	ZN30900C	18051	2022-03-12	2024-03-11
☒	AGC-EM-E001	Wideband Antenna	SCHWARZBECK	VULB9168	D69250	2023-05-11	2025-05-10
☒	AGC-EM-E005	Wideband Antenna	SCHWARZBECK	VULB9168	VULB9168-494	2023-01-05	2024-01-04
☒	AGC-EM-E029	Broadband Ridged Horn Antenna	ETS	3117	00034609	2023-03-23	2024-03-22
☒	AGC-EM-E102	Broadband Ridged Horn Antenna	ETS	3117	00154520	2023-06-03	2024-06-02
☒	AGC-EM-E082	Horn Antenna	SCHWARZBECK	BBHA 9170	#768	2023-09-24	2025-09-23
☒	AGC-EM-E146	Pre-amplifier	ETS	3117-PA	00246148	2022-08-04	2024-08-03
☐	AGC-EM-E021	Pre-amplifier	MITEQ	AM-4A-000115	1465421	2022-06-08	2024-06-07
☒	AGC-ER-E037	Signal Generator	Agilent	N5182A	MY50140530	2023-06-01	2024-05-31
☒	AGC-EM-A139	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-06-09	2024-06-08
☐	AGC-EM-A090	High Pass Filter 1 (2500-18000MHz)	N/A	N/A	N/A	2023-06-01	2024-05-31
☒	AGC-EM-A091	High Pass Filter 2 (1200-18000MHz)	N/A	N/A	N/A	2023-06-01	2024-05-31
☒	AGC-EM-A113	Band Stop Filter (825-850MHz)	MICRO-TRONICS	BRC50717	N/A	2023-06-01	2024-05-31
☐	AGC-EM-A114	Band Stop Filter (880-915MHz)	MICRO-TRONICS	BRC50718	N/A	2023-06-01	2024-05-31
☒	AGC-EM-A115	Band Stop Filter (1710-1785MHz)	MICRO-TRONICS	BRC50719	N/A	2023-06-01	2024-05-31
☒	AGC-EM-A116	Band Stop Filter (1850-1950MHz)	MICRO-TRONICS	BRC50720	N/A	2023-06-01	2024-05-31
☐	AGC-EM-A117	Band Stop Filter (1920-1980MHz)	MICRO-TRONICS	BRC50721	N/A	2023-06-01	2024-05-31

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● RF Conducted Test System							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☒	AGC-ER-E087	Spectrum Analyzer	KEYSIGHT	N9020B	MY56101792	2023-06-01	2024-05-31
☒	AGC-ER-E032	Universal Radio Communication Tester	R&S	CMW500	120909	2023-07-05	2024-07-04
☒	AGC-ER-E032	Universal Radio Communication Tester	R&S	CMU200	113939	2023-06-01	2024-05-31
☒	AGC-ER-E075	Small Environmental Tester	SH-242	ESPEC	93008290	2022-08-03	2024-08-02
☒	--	Universal Switch Control Unit	Tonscend	JS	N/A	N/A	N/A
☐	AGC-ER-E033	RF Test Plat (DECT)	RTX	RTX-2012-HS-RF	N/A	2022-08-04	2024-08-03
☒	--	RF Connection Cable	N/A	1#	N/A	Each time	N/A
☒	--	RF Connection Cable	N/A	2#	N/A	Each time	N/A

● Test Software					
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Version Information
☒	AGC-ER-S006	GSM Test System	Tonscend	JS1120-4	2.1.6.0
☒	AGC-ER-S007	WCDMA Test System	Tonscend	JS1120-3	2.1.5.10
☒	AGC-EM-S011	RSE Test System	Tonscend	TS^+ Ver2.1(JS36-RSE)	4.0.0.0

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4. System Test Configuration

4.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

4.2 EUT Exercise

The Transmitter was operated in the maximum output power mode through Communication Tester. The TX frequency was fixed which was for the purpose of the measurements.

4.3 Configuration of EUT System

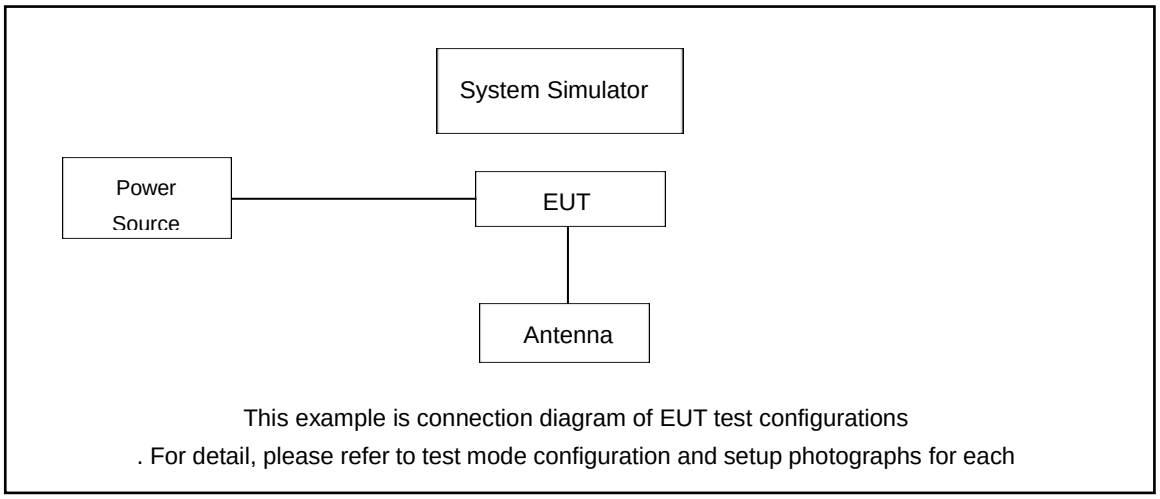

Table 2-1 Equipment Used in EUT System

4.4 Equipment Used in Tested System

The following peripheral devices and interface cables were connected during the measurement:

☐ Test Accessories Come From The Laboratory

☒ Test Accessories Come From The Manufacturer

No.	Equipment	Model No.	Manufacturer	Specification Information	Cable
1	Adapter	FX202E	HUNAN GAOYUAN BATTERY CO.,LTD	Input: AC 100-240V 50/60Hz, 0.7A DC: 5V3A 9V2.22A 12V1.67A	--
2	Battery	AGM_PAD_P2	SHENZHEN Fangxin Technology Co. ,Ltd	DC 3.85V 8000mAh	--
3	USB Cable	N/A	N/A	N/A	1.2m unshielded

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5. Summary of Test Results

5.1 Test Condition: Conducted Test

Item	Test Description	FCC Rules	Result
1	Occupied Bandwidth	§2.1049	Pass
2	Band Edge / Spurious and Harmonic Emissions at Antenna Terminal	§2.1051, §22.917(a), §24.238(a) §27.53(h)	Pass
3	Conducted Output Power	§2.1046	Pass
4	Frequency stability / variation of ambient temperature	§2.1055, § 22.355, §24.235, §27.54	Pass
5	Peak- to- Average Ratio	§24.232(d), §27.50(d)(5),	Pass

5.2 Test Condition: Radiated Test

Item	Test Description	FCC Rules	Result
1	Effective Radiated Power	§22.913(a)(5)	Pass
2	Equivalent Isotropic Radiated Power	§24.232(c), §27.50(d)(4)	Pass
3	Radiated Spurious and Harmonic Emissions	§2.1053, §22.917(a), §24.238(a), §27.53(h)	Pass

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6. Description of Test Modes

Bands	Tx/Rx Frequency	RF Channel		
		Low(L)	Middle(M)	High(H)
GSM/GPRS/ EDGE 850	TX (824 MHz ~ 849 MHz)	Channel 128	Channel 190	Channel 251
		824.2 MHz	836.6 MHz	848.8 MHz
WCDMA band V	TX (824 MHz ~ 849 MHz)	Channel 4132	Channel 4182	Channel 4233
		826.4 MHz	836.4 MHz	846.6 MHz

Bands	Tx/Rx Frequency	RF Channel		
		Low(L)	Middle(M)	High(H)
GSM/GPRS/ EDGE1900	TX (1850 MHz-1910 MHz)	Channel 512	Channel 661	Channel 810
		1850.2 MHz	1880.0 MHz	1909.8 MHz
WCDMA Band II	TX (1850 MHz-1910 MHz)	Channel 9262	Channel 9400	Channel 9538
		1852.4 MHz	1880.0 MHz	1907.6 MHz

Bands	Tx/Rx Frequency	RF Channel		
		Low(L)	Middle(M)	High(H)
WCDMA Band IV	TX (1710 MHz-1755 MHz)	Channel 1312	Channel 1412	Channel 1513
		1712.4 MHz	1732.4 MHz	1752.6 MHz

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

Band	Radiated	Conducted
GSM/GPRS/ EDGE 850/1900	GSM (GMSK, 1Tx-slot) Link GPRS (GMSK, 1Tx-slot) Link EDGE (8PSK, 1Tx-slot) Link	GSM (GMSK,1Tx-slot) Link GPRS (GMSK, 1Tx-slot) Link EDGE (8PSK, 1Tx-slot) Link
WCDMA Band II/IV/V	RMC 12.2kbps Link	RMC 12.2kbps Link

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According to 3GPP 25.101 sub-clause 6.2.2 , the maximum output power is allowed to be reduced by following the table.

Table 6.1aA: UE maximum output power with HS-DPCCH and E-DCH

UE Transmit Channel Configuration	CM(db)	MPR(db)
For all combinations of ,DPDCH,DPCCH HS-DPDCH,E-DPDCH and E-DPCCH	0≤ CM≤3.5	MAX(CM-1,0)
Note: CM=1 for β_c/β_d=12/15,β_{hs}/β_c=24/15.For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.		

The device supports MPR to solve linearity issues (ACLR or SEM) due to the higher peak-to average ratios (PAR) of the HSUPA signal. This prevents saturating the full range of the TX DAC inside of device and provides a reduced power output to the RF transceiver chip according to the Cubic Metric (a function of the combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH).

When E-DPDCH channels are present the beta gains on those channels are reduced firsts to try to get the power under the allowed limit. If the beta gains are lowered as far as possible, then a hard limiting is applied at the maximum allowed level.

The SW currently recalculates the cubic metric every time the beta gains on the E-DPDCH are reduced. The cubic metric will likely get lower each time this is done .However, there is no reported reduction of maximum output power in the HSUPA mode since the device also provides a compensate for the power back-off by increasing the gain of TX_AGC in the transceiver (PA) device.

The end effect is that the DUT output power is identical to the case where there is no MPR in the device.

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7. Conducted Output Power

7.1 Provisions Applicable

The conduction test is carried out in a shielded room. According to the test, connect the device under test to the antenna port on the non-conductive platform directly to the test device for evaluation and measurement (ANSI-C63.26-2015 Clause 5.4)

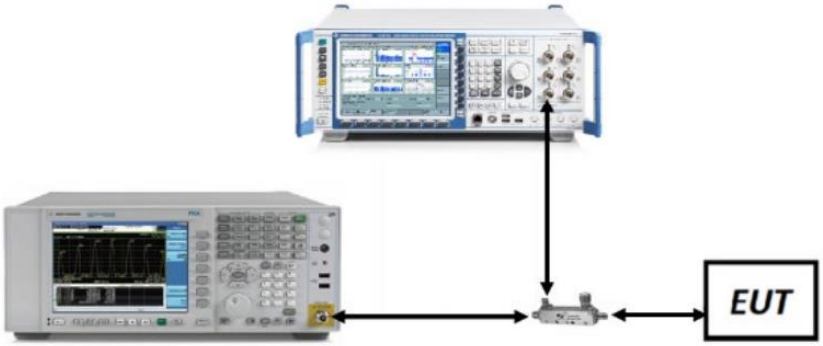
7.2 Measurement Procedure

- The transmitter output port was connected to base station.
- 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.

Measure the maximum burst average power and average power for other modulation signal.

The EUT was setup for the max output power with pseudo random data modulation. Power was measured with Spectrum Analyzer. The measurements were performed on all mode (GSM/EGPRS 850, GSM/EGPRS 1900, WCDMA/HSPA band II, WCDMA/HSPA band IV ,WCDMA/HSPA band V)at 3 typical channels(the Top Channel, the Middle Channel and the Bottom Channel) for each band.

7.3 Measurement Setup



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7.4 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)	34.27	33.83	33.96
GPRS (GMSK, 1Tx-slot)	**34.32**	33.83	34.01
GPRS (GMSK, 2Tx-slot)	32.55	31.43	31.49
GPRS (GMSK, 3Tx-slot)	30.29	29.78	29.81
GPRS (GMSK, 4Tx-slot)	28.53	27.67	27.55
EDGE (8PSK, 1Tx-slot)	27.93	27.01	27.09
EDGE (8PSK, 2Tx-slot)	25.36	25.12	25.34
EDGE (8PSK, 3Tx-slot)	23.78	23.63	23.71
EDGE (8PSK, 4Tx-slot)	21.55	21.77	21.13

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)	31.58	31.44	31.09
GPRS (GMSK, 1Tx-slot)	**31.68**	31.51	31.20
GPRS (GMSK, 2Tx-slot)	29.47	29.63	29.37
GPRS (GMSK, 3Tx-slot)	27.55	27.36	27.18
GPRS (GMSK, 4Tx-slot)	25.39	25.11	25.39
EDGE (8PSK, 1Tx-slot)	25.82	25.84	25.48
EDGE (8PSK, 2Tx-slot)	23.10	23.02	23.08
EDGE (8PSK, 3Tx-slot)	21.78	21.96	21.74
EDGE (8PSK, 4Tx-slot)	19.90	19.52	19.37

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WCDMA Band II Maximum Average Power (dBm)			
Channel	**9262**	**9400**	**9538**
Frequency (MHz)	**1852.4 MHz**	**1880.0 MHz**	**1907.6 MHz**
RMC 12.2kbps	23.17	23.13	**23.18**
HSDPA Subtest-1	22.26	22.11	22.16
HSDPA Subtest-2	21.69	21.63	21.65
HSDPA Subtest-3	21.73	21.63	21.67
HSDPA Subtest-4	21.72	21.62	21.67
HSUPA Subtest-1	20.24	20.15	20.20
HSUPA Subtest-2	20.76	20.69	20.66
HSUPA Subtest-3	21.21	21.16	21.19
HSUPA Subtest-4	20.25	20.14	20.18
HSUPA Subtest-5	22.27	22.15	22.19

WCDMA Band IV Maximum Average Power (dBm)			
Channel	**1312**	**1412**	**1513**
Frequency (MHz)	**1712.4 MHz**	**1732.4 MHz**	**1752.6 MHz**
RMC 12.2kbps	22.78	**22.84**	22.82
HSDPA Subtest-1	21.83	21.85	21.89
HSDPA Subtest-2	21.29	21.33	21.42
HSDPA Subtest-3	21.29	21.31	21.41
HSDPA Subtest-4	21.29	21.31	21.37
HSUPA Subtest-1	19.80	19.83	19.87
HSUPA Subtest-2	20.29	20.29	20.36
HSUPA Subtest-3	20.82	20.84	20.90
HSUPA Subtest-4	19.76	19.84	19.88
HSUPA Subtest-5	21.84	21.84	21.89

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WCDMA Band V Maximum Average Power (dBm)			
Channel	**4132**	**4182**	**4233**
Frequency(MHz)	**826.4 MHz**	**836.4 MHz**	**846.6 MHz**
RMC 12.2kbps	**23.55**	23.37	23.50
HSDPA Subtest-1	22.53	22.42	22.53
HSDPA Subtest-2	22.02	21.92	22.02
HSDPA Subtest-3	22.05	21.92	22.05
HSDPA Subtest-4	22.04	21.88	22.10
HSUPA Subtest-1	21.23	21.23	21.05
HSUPA Subtest-2	20.52	20.12	20.12
HSUPA Subtest-3	20.12	20.30	20.35
HSUPA Subtest-4	20.37	20.19	20.33
HSUPA Subtest-5	22.56	22.71	22.41

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8. Radiated Output Power

8.1 Provisions Applicable

The radiation test is carried out in a semi-anechoic chamber.

According to the test, put the device under test on a non-conductive platform 3 meters away from the receiving antenna (ANSI/TIA-603-E-2016 Article 2.2.17).

The following rules are for the maximum radiated power limit requirements of the product:

Mode	Nominal Peak Power
GSM 850	< 7 Watts max. ERP (38.45dBm)
PCS 1900	< 2 Watts max. EIRP (33dBm)
WCDMA Band II	< 2 Watts max. EIRP (33dBm)
WCDMA Band IV	< 1 Watts max. EIRP (30dBm)
WCDMA Band V	< 7 Watts max. ERP (38.45dBm)

8.2 Measurement Procedure

1. Radiated power measurements are performed using the signal analyzer's "channel power"
2. measurement capability for signals with continuous operation.
3. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
4. VBW ≥ 3 x RBW
5. Span = 1.5 times the OBW
6. No. of sweep points > 2 x span / RBW
7. Detector = RMS
8. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
9. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
10. Trace mode = trace averaging (RMS) over 100 sweeps
11. The trace was allowed to stabilize.

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- **Radiation Construction Method：**

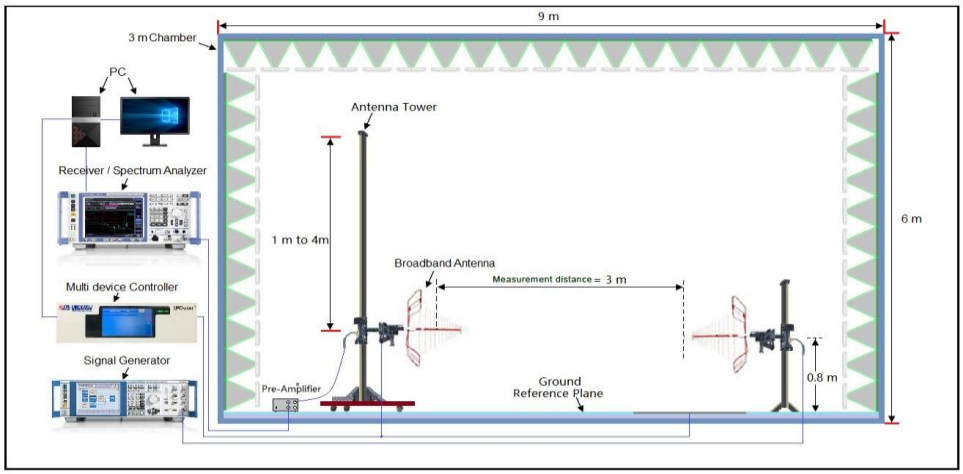
1. The turntable is rotated through 360 degrees, and the receiving antenna scans in order to determine the level of the maximized emission.
2. A half wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated.
3. The power is calculated by the following formula：

   Pd(dBm) = Pg(dBm) – cable loss (dB) + antenna gain (dB)

4. Where: Pd is the dipole equivalent power and Pg is the generator output power into the substitution antenna.
5. The maximum value is calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps are repeated with the receiving antenna in both vertical and horizontal polarization. the difference between the gain of the horn and an isotropic antenna are taken into consideration
6. The EUT was tested in three orthogonal planes (X, Y, Z) and in all possible test configurations and positioning.
7. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

8.3 Measurement Setup

Radiated Power 30MHz to 1GHz Test setup



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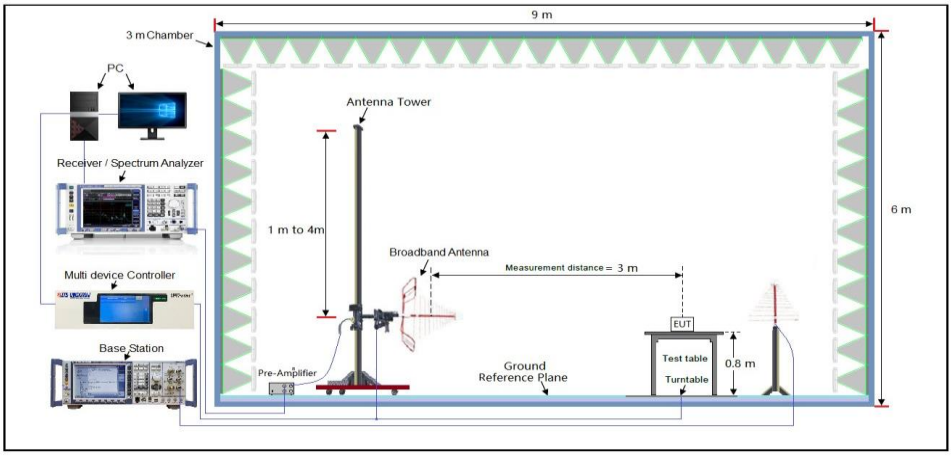
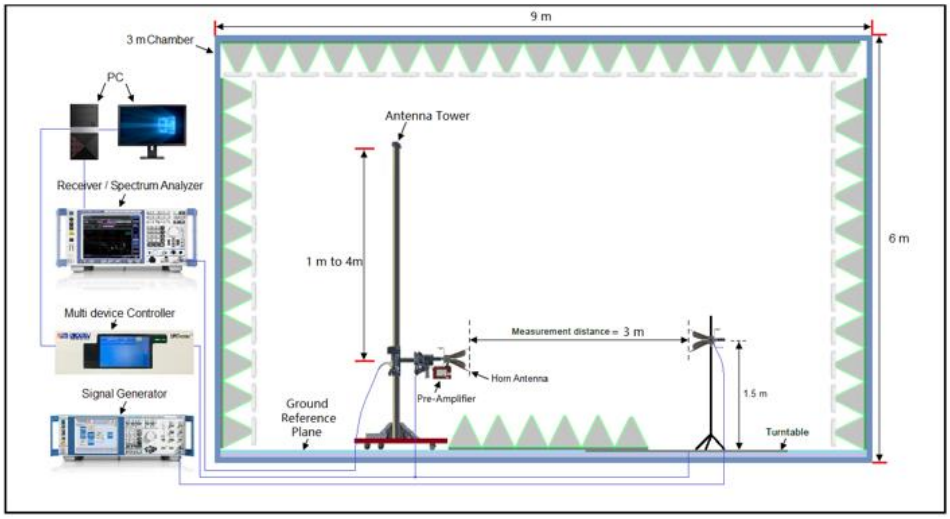
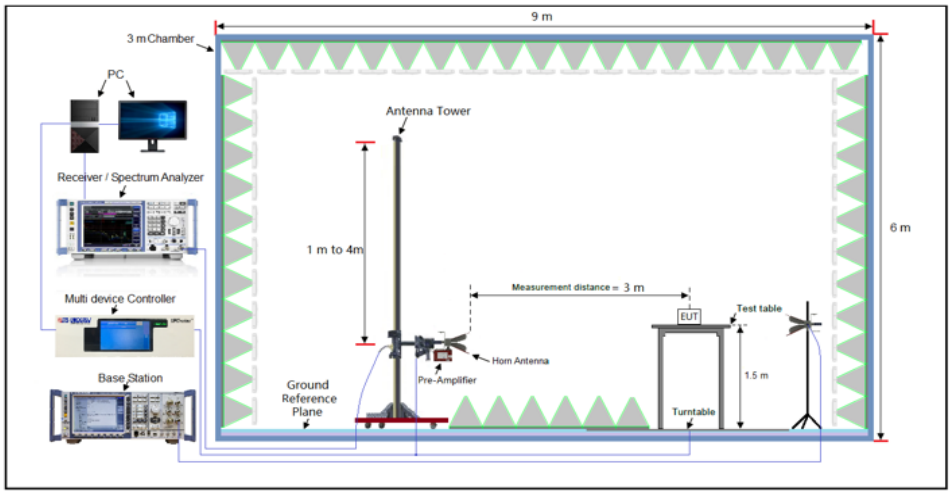


Radiated Power Above 1GHz Test setup





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8.4 Measurement Result

Mode	Ch./ Freq.		Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol.	Limit	ERP	
	channel	Freq. (MHz)					W	W	dBm
GSM850	128	824.2	27.86	5.90	1.21	H	< 7.00	1.799	32.55
	190	836.6	27.44	5.90	1.22	H		1.629	32.12
	251	848.8	27.91	5.90	1.25	H		1.803	**32.56**
GPRS	128	824.2	26.87	5.90	1.21	H		1.432	31.56
	190	836.6	27.35	5.90	1.22	H		1.596	32.03
	251	848.8	27.09	5.90	1.25	H		1.493	31.74
EDGE	128	824.2	20.65	5.90	1.21	H		0.342	25.34
	190	836.6	20.76	5.90	1.22	H		0.350	25.44
	251	848.8	21.95	5.90	1.25	H		0.457	26.60
WCDMA850	4132	826.4	16.67	5.90	1.21	H		0.137	21.36
	4183	836.6	17.13	5.90	1.25	H		0.151	**21.78**
	4233	846.6	16.89	5.90	1.24	H		0.143	21.55
HSDPA	4132	826.4	15.67	5.90	1.21	H		0.109	20.36
	4183	836.6	15.46	5.90	1.25	H		0.103	20.11
	4233	846.6	15.39	5.90	1.24	H		0.101	20.05
HSUPA	4132	826.4	14.46	5.90	1.21	H		0.082	19.15
	4183	836.6	14.66	5.90	1.25	H		0.085	19.31
	4233	846.6	14.45	5.90	1.24	H		0.081	19.11

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Mode	Ch./ Freq.		Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol.	Limit	EIRP	
	channel	Freq. (MHz)					W	W	dBm
PCS1900	512	1850.2	23.36	8.6	2.11	H	< 2.00	0.966	**29.85**
	661	1880.0	23.32	8.6	2.15	H		0.948	29.77
	810	1909.8	23.07	8.6	2.15	H		0.895	29.52
GPRS	512	1850.2	22.84	8.6	2.11	H		0.857	29.33
	661	1880.0	22.67	8.6	2.15	H		0.817	29.12
	810	1909.8	22.86	8.6	2.15	H		0.853	29.31
EDGE	512	1850.2	16.63	8.6	2.11	H		0.205	23.12
	661	1880.0	16.40	8.6	2.15	H		0.193	22.85
	810	1909.8	16.22	8.6	2.15	H		0.185	22.67
WCDMA 1900	9262	1852.4	13.63	8.6	2.11	H		0.103	20.12
	9400	1880.0	13.90	8.6	2.15	H		0.108	20.35
	9538	1907.6	14.25	8.6	2.15	H		0.117	**20.70**
HSDPA	9262	1852.4	12.07	8.6	2.11	H		0.072	18.56
	9400	1880.0	12.57	8.6	2.15	H		0.080	19.02
	9538	1907.6	12.32	8.6	2.15	H		0.075	18.77
HSUPA	9262	1852.4	12.89	8.6	2.11	H		0.086	19.34
	9400	1880.0	13.60	8.6	2.15	H		0.101	20.05
	9538	1907.6	13.67	8.6	2.15	H		0.103	20.12
WCDMA 1700	1312	1712.4	14.08	8.3	2.05	H	< 1.00	0.108	20.33
	1412	1732.4	14.44	8.3	2.05	H		0.117	**20.69**
	1513	1752.6	14.08	8.3	2.06	H		0.108	20.32
HSDPA	1312	1712.4	12.87	8.3	2.05	H		0.082	19.12
	1412	1732.4	12.80	8.3	2.05	H		0.080	19.05
	1513	1752.6	12.80	8.3	2.06	H		0.080	19.04
HSUPA	1312	1712.4	12.85	8.3	2.05	H		0.081	19.10
	1412	1732.4	12.81	8.3	2.05	H		0.081	19.06
	1513	1752.6	12.91	8.3	2.06	H		0.082	19.15

Note:

1. EIRP/ERP = Substitute Level (dBm) + Ant. Gain – C.L (Cable Loss)
2. All polarizations and modes have been tested, only the worst mode is recorded in the report

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9. Peak-to-Average Ratio

9.1 Provisions Applicable

This is the test for the Peak-to-Average Ratio from the EUT.

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

9.2 Measurement Procedure

- **CCDF Procedure for PAPR:**

1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Set the measurement interval as follows:
   - for continuous transmissions, set to 1 ms,
   - or burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time
4. that is less than or equal to the burst duration.
5. Record the maximum PAPR level associated with a probability of 0.1%.

- **Alternate Procedure for PAPR:**

Use one of the procedures presented in 5.2(ANSI C63.26-2015) to measure the total peak power and record as P_{Pk} Use one of the applicable procedures presented 5.2(ANSI C63.26-2015) to measure the total average power and recordas PAvg. Determine the P.A.R. from:

P.A.R(dB) = P_{Pk} (dBm) – P_{Avg} (dBm) (P_{Avg} = Average Power + Duty cycle Factor)

Allow trace to fully stabilize.

Use the peak marker function to determine the peak amplitude level.

■ **<u>Test Settings (Peak Power):</u>**

The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW ≥ 3 × RBW.

1. Set the RBW ≥ OBW.
2. Set VBW ≥ 3 × RBW.
3. Set span ≥ 2 × OBW.
4. Sweep time ≥ 10 × (number of points in sweep) × (transmission symbol period).

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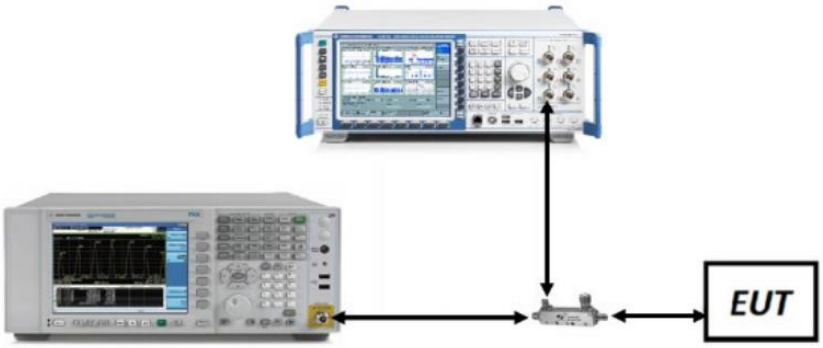
5. Detector = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the peak amplitude level.

■ **Test Settings (Average Power)**

1. Set span to 2 × to 3 × the OBW.
2. Set RBW ≥ OBW.
3. Set VBW ≥ 3 × RBW.
4. Set number of measurement points in sweep ≥ 2 × span / RBW.
5. Sweep time: Set ≥ [10 × (number of points in sweep) × (transmission period)] for single sweep (Automation-compatible) measurement. The transmission period is the (on + off) time.
6. Detector = power averaging (rms).
7. Set sweep trigger to “free run.”
8. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. (To accurately determine the average power over the on and off period of the transmitter, it can be necessary to increase the number of traces to be averaged above 100 or, if using a manually configured sweep time, increase the sweep time.)
9. Use the peak marker function to determine the maximum amplitude level.
10. Add [10 log (1/duty cycle)] to the measured maximum power level to compute the average power during continuous transmission. For example, add [10 log (1/0.25)] = 6 dB if the duty cycle is a constant 25%.

9.3 Measurement Setup



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9.4 Measurement Result

Bands	Modulation	Peak-to-average ratio (dB)			Limit	Result
		Lowest	Middle	Highest	(dB)	
GSM 850	GSM	3.04	3.04	3.04	13	Pass
	GPRS	3.04	3.03	3.03	13	Pass
	EDGE	5.92	5.88	5.90	13	Pass
PCS 1900	GSM	2.83	2.87	2.86	13	Pass
	GPRS	2.82	2.84	2.86	13	Pass
	EDGE	5.87	5.93	5.96	13	Pass
WCDMA Band II	RMC 12.2kbps	2.82	2.97	2.99	13	Pass
WCDMA Band II	HSUPA	3.01	3.12	3.13	13	Pass
WCDMA Band II	HSDPA	4.13	4.20	4.22	13	Pass
WCDMA Band IV	RMC 12.2kbps	3.63	3.00	3.21	13	Pass
WCDMA Band IV	HSUPA	3.62	3.66	3.57	13	Pass
WCDMA Band IV	HSDPA	5.09	5.32	5.36	13	Pass
WCDMA Band V	RMC 12.2kbps	3.04	3.00	2.99	13	Pass
WCDMA Band V	HSUPA	3.19	3.17	3.19	13	Pass
WCDMA Band V	HSDPA	4.36	4.23	4.24	13	Pass

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10. 99% Occupied Bandwidth and 26dB Emission Bandwidth

10.1 Provisions Applicable

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

The EUT makes a call to the communication simulator.

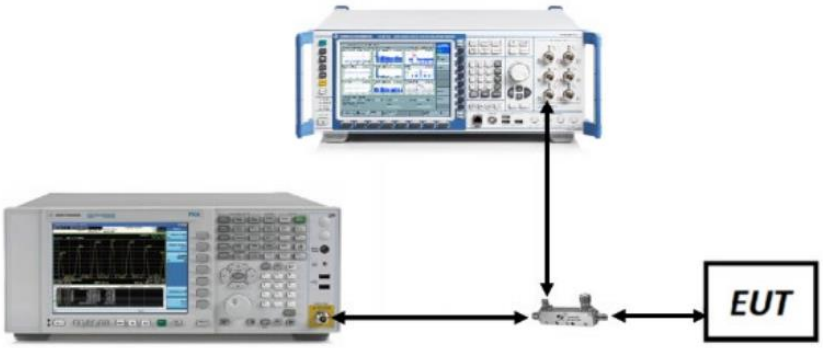
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth

10.2 Measurement Procedure

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99%
2. Occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by
3. any intermediate power nulls in the fundamental emission.
4. RBW = 1 – 5% of the expected OBW
5. VBW ≥ 3 x RBW
6. Detector = Peak
7. Trace mode = max hold
8. Sweep = auto couple
9. The trace was allowed to stabilize
10. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within
11. 1 – 5% of the 99% occupied bandwidth observed in Step 7

10.3 Measurement Setup



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10.4 Measurement Result

Test Band	Test Mode	Test Channel	Occupied Bandwidth (kHz)	Emission Bandwidth (kHz)	Verdict
GSM 850	GSM	128	245.9	317	Pass
		190	245.0	303	Pass
		251	244.5	318	Pass
	GPRS	128	244.7	316	Pass
		190	245.5	314	Pass
		251	247.5	315	Pass
	EDGE	128	247.1	313	Pass
		190	249.1	316	Pass
		251	246.7	311	Pass

Test Band	Test Mode	Test Channel	Occupied Bandwidth (kHz)	Emission Bandwidth (kHz)	Verdict
PCS 1900	GSM	512	244.7	315	Pass
		661	246.3	318	Pass
		810	244.4	312	Pass
	GPRS	512	243.9	309	Pass
		661	244.9	312	Pass
		810	247.0	306	Pass
	EDGE	512	320.9	489	Pass
		661	247.1	307	Pass
		810	248.0	300	Pass

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Test Band	Test Mode	Test Channel	Occupied Bandwidth (MHz)	Emission Bandwidth (MHz)	Verdict
WCDMA 850	RMC 12.2kbps	4132	4.5206	8.838	Pass
		4183	4.2016	4.764	Pass
		4233	5.3009	9.500	Pass
	HSDPA	4132	4.2595	4.906	Pass
		4183	4.1963	4.720	Pass
		4233	4.4105	7.050	Pass
	HSUPA	4132	4.1780	4.747	Pass
		4183	4.2013	4.723	Pass
		4233	4.4105	7.050	Pass

Test Band	Test Mode	Test Channel	Occupied Bandwidth (MHz)	Emission Bandwidth (MHz)	Verdict
WCDMA 1900	RMC 12.2kbps	9262	4.1752	4.713	Pass
		9400	4.1646	4.691	Pass
		9538	4.1765	4.731	Pass
	HSUPA	9262	4.1754	4.717	Pass
		9400	4.2185	4.707	Pass
		9538	4.2224	4.706	Pass
	HSDPA	9262	4.1793	4.711	Pass
		9400	4.1773	4.704	Pass
		9538	4.1751	4.701	Pass

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Test Band	Test Mode	Test Channel	Occupied Bandwidth (MHz)	Emission Bandwidth (MHz)	Verdict
WCDMA 1700	RMC 12.2kbps	1312	4.1611	4.687	Pass
		1412	4.1756	4.699	Pass
		1513	4.1735	4.697	Pass
	HSDPA	1312	4.1755	4.708	Pass
		1412	4.1776	4.712	Pass
		1513	4.1885	4.704	Pass
	HSUPA	1312	4.1814	4.714	Pass
		1412	4.1837	4.699	Pass
		1513	4.1959	4.697	Pass

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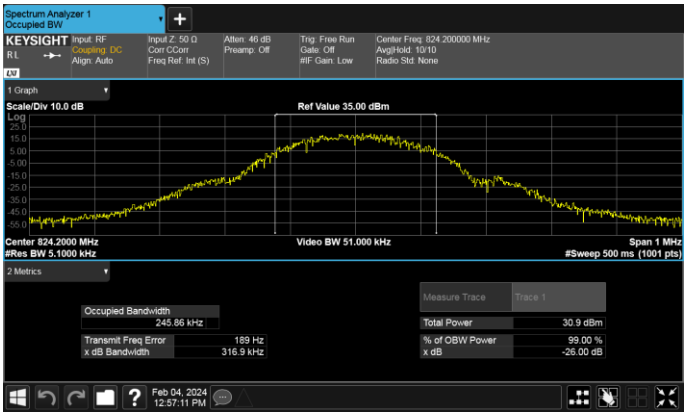
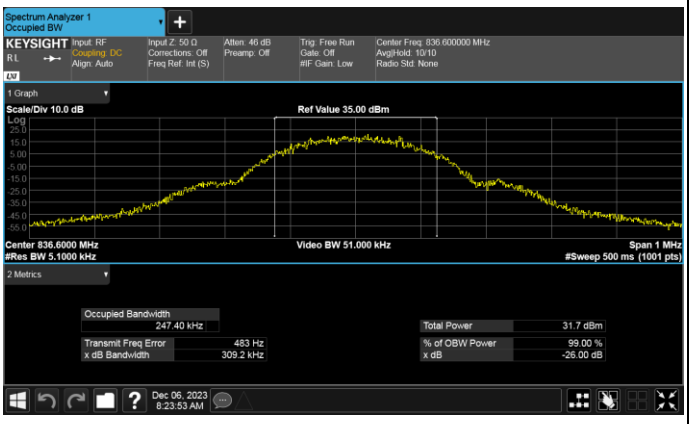
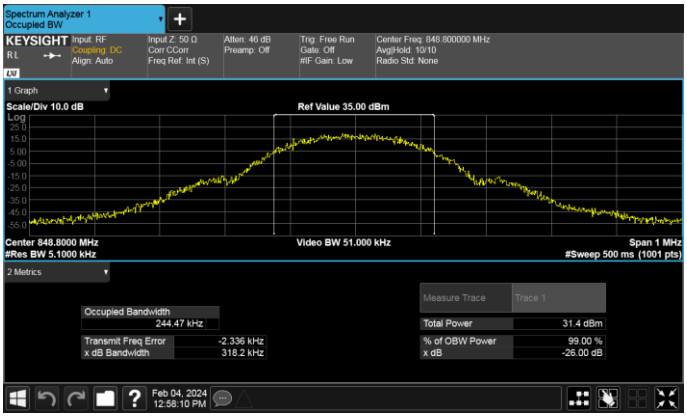
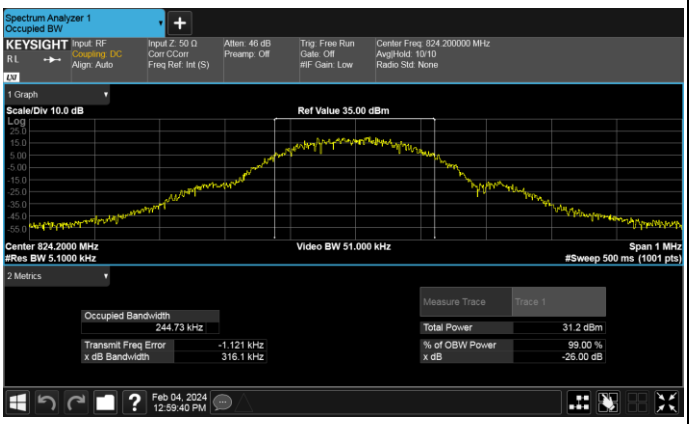
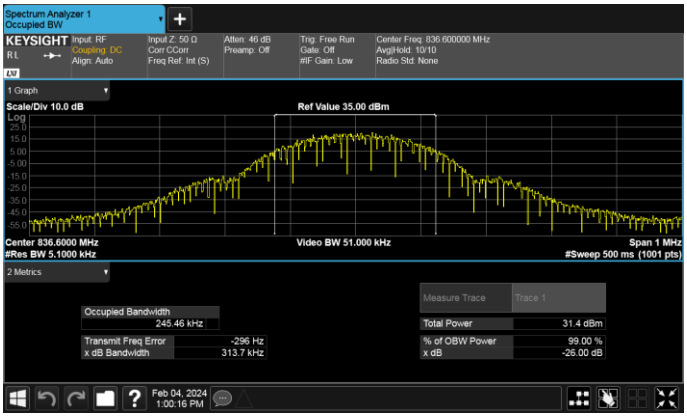
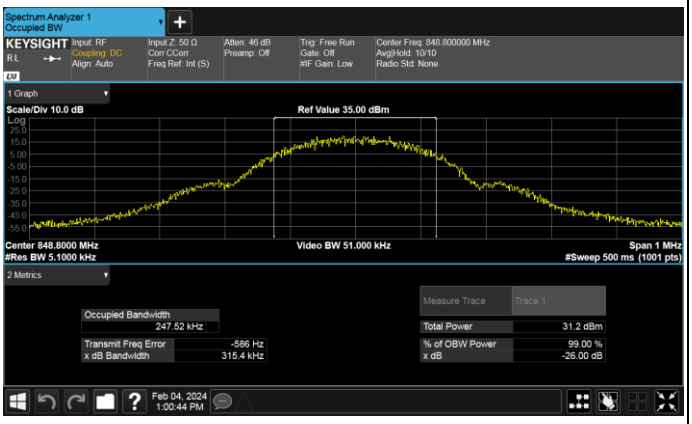
GSM 850_CH 128_GSM	GSM 850_CH 190_GSM
	
GSM 850_CH 251_GSM	**GSM 850_CH 128_GPRS**
	
GSM 850_CH 190_GPRS	**GSM 850_CH 251_GPRS**
	

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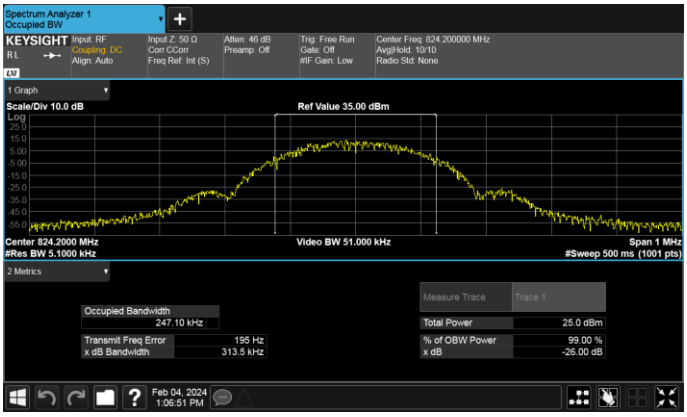
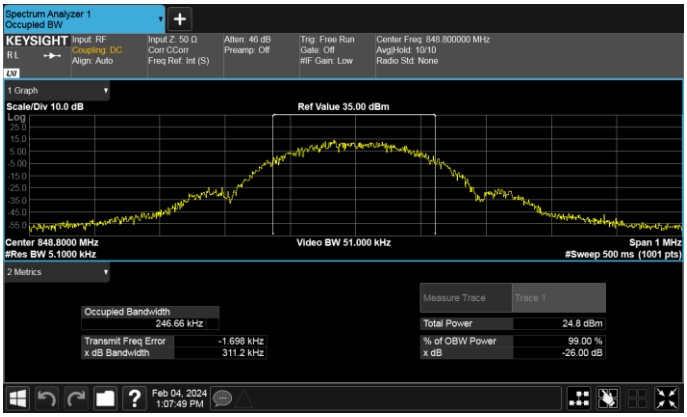
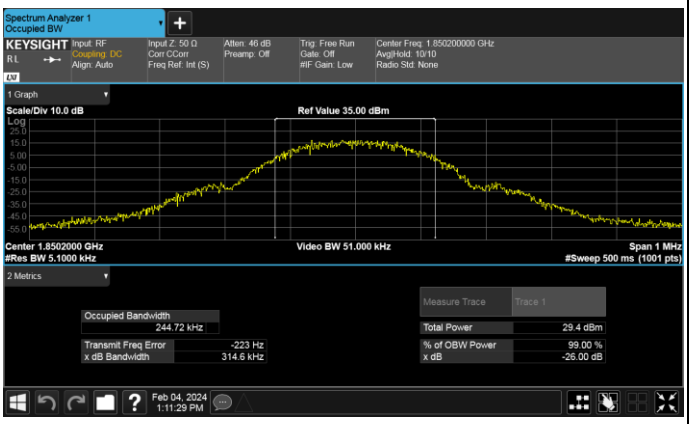
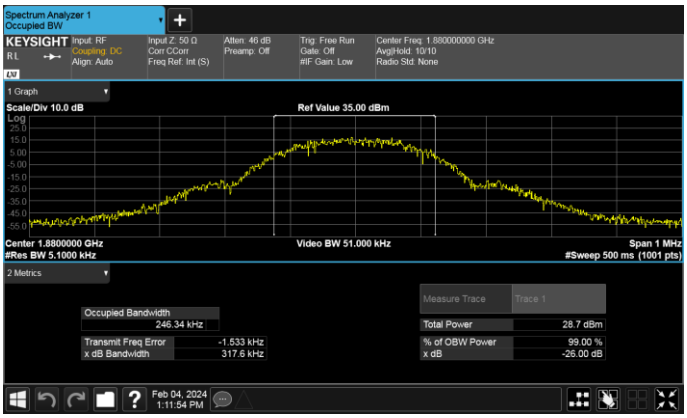
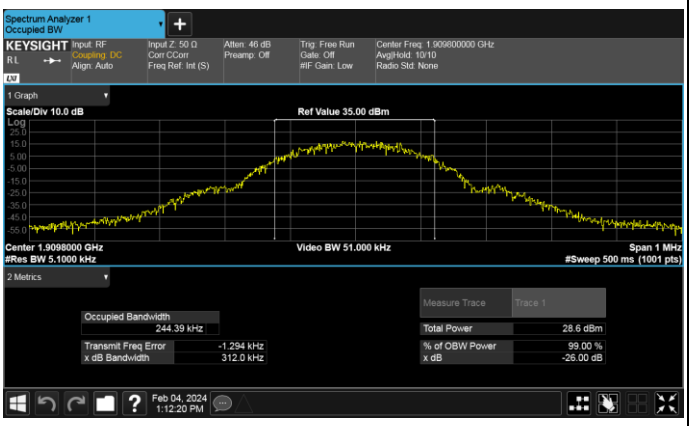
GSM 850_CH 128_EDGE	GSM 850_CH 190_EDGE
	
GSM 850_CH 251_EDGE	**PCS 1900_CH 512_GSM**
	
PCS 1900_CH 661_GSM	**PCS 1900_CH 810_GSM**
	

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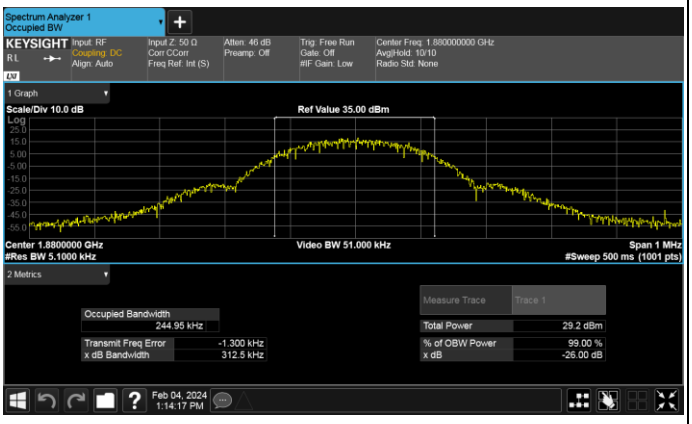
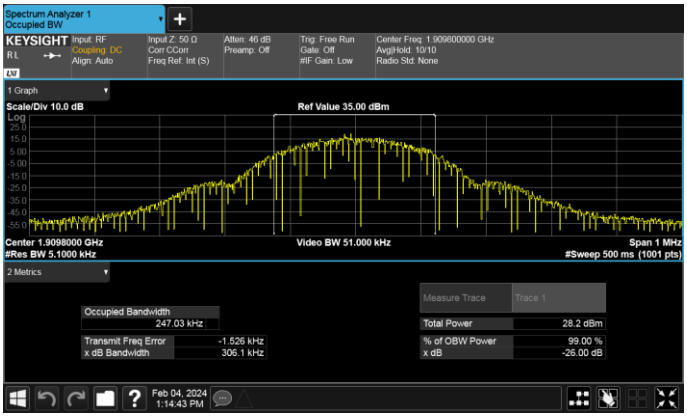
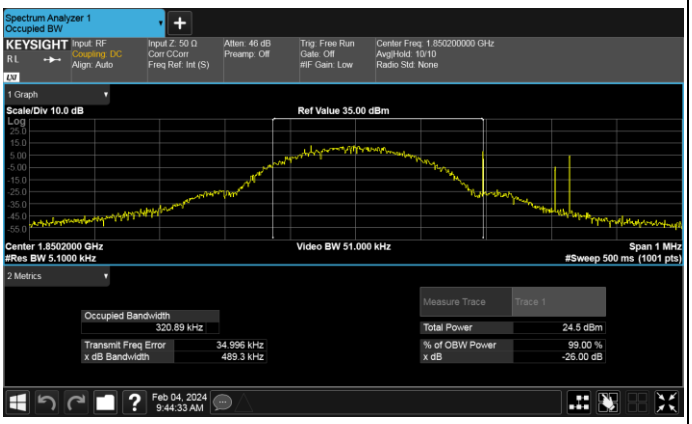
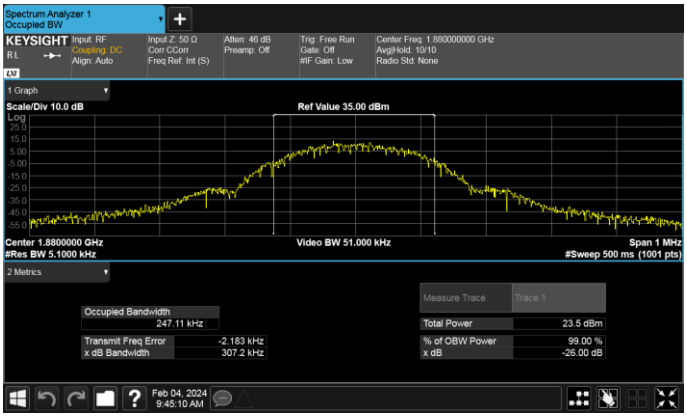
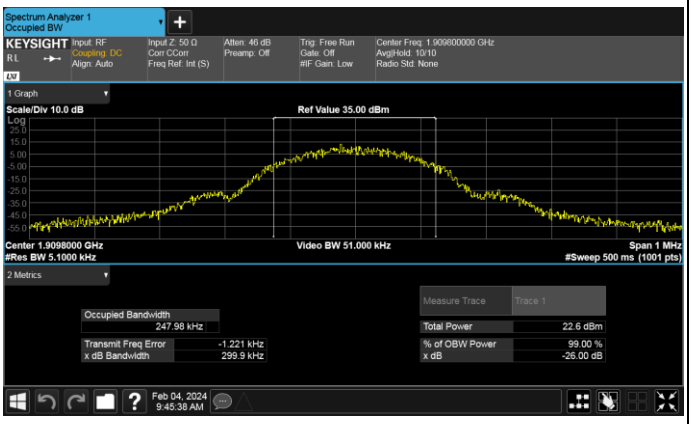
PCS 1900_CH 512_GPRS	PCS 1900_CH 661_GPRS
	
PCS 1900_CH 810_GPRS	**PCS 1900_CH 512_EDGE**
	
PCS 1900_CH 661_EDGE	**PCS 1900_CH 810_EDGE**
	

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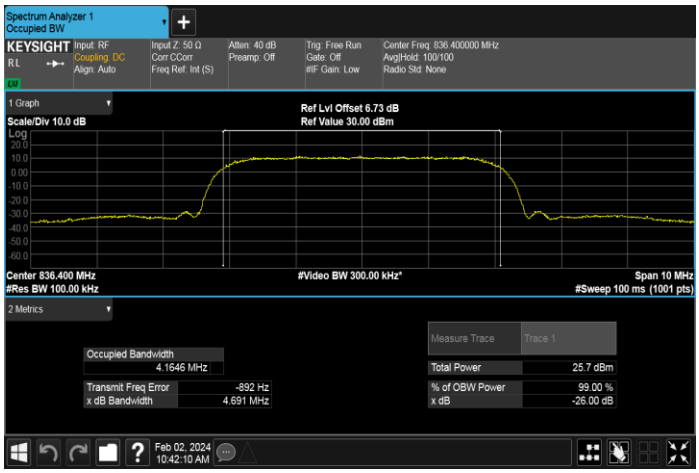
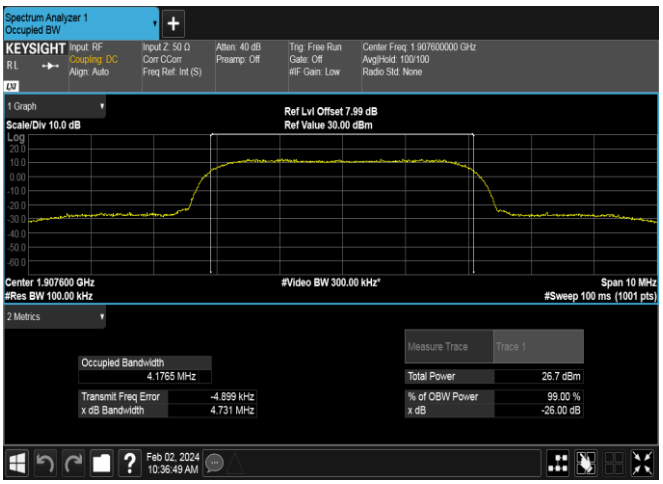
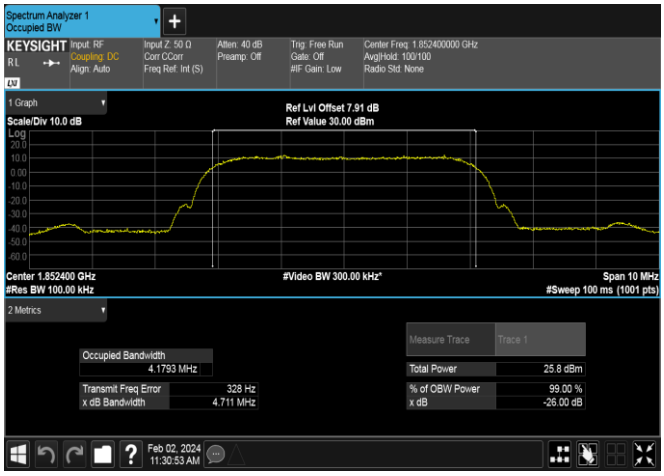
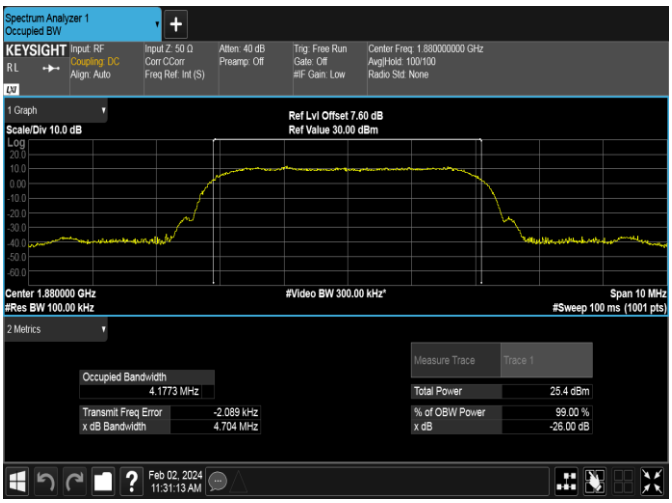
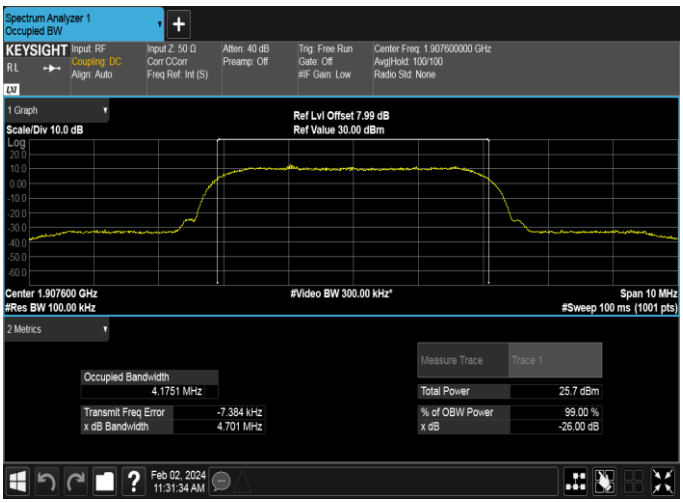
WCDMA 1900_CH 9262_ RMC 12.2kbps	WCDMA 1900_CH 9400_ RMC 12.2kbps
	
WCDMA 1900_CH 9538_ RMC 12.2kbps	**WCDMA 1900_CH 9262_HSDPA**
	
WCDMA 1900_CH 9400_HSDPA	**WCDMA 1900_CH 9538_HSDPA**
	

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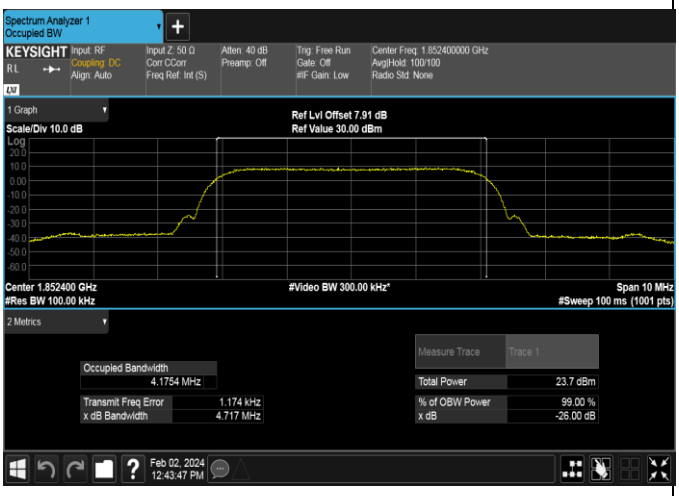
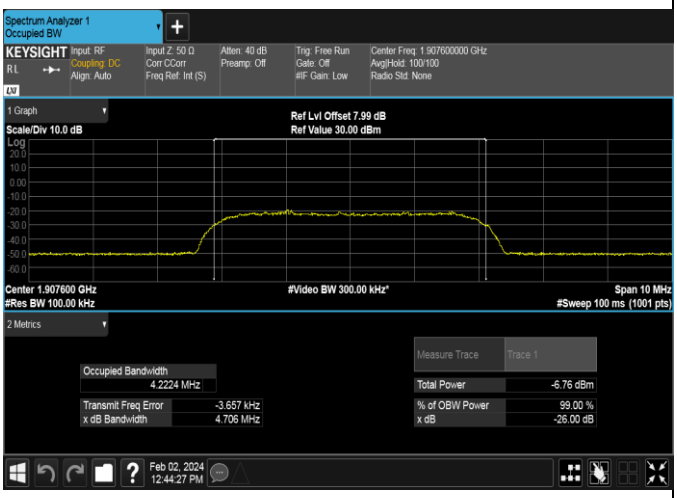
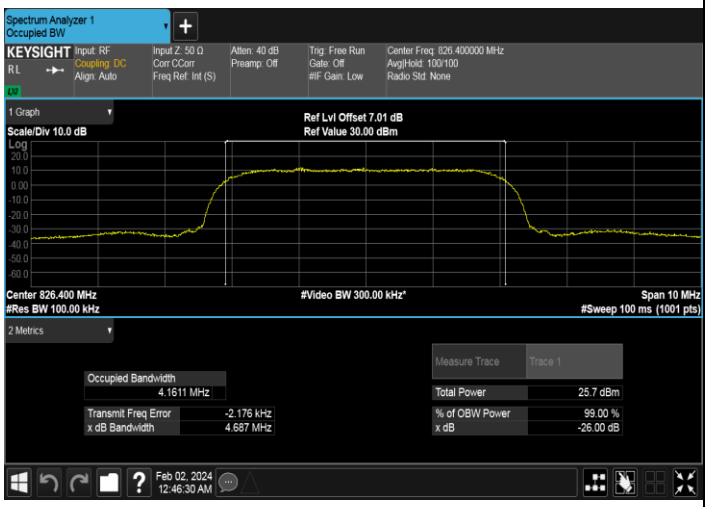
	
WCDMA 1900_CH 9538_HSUPA	WCDMA 1700_CH 1312_ RMC 12.2kbps
	
WCDMA 1700_CH 1412_RMC 12.2kbps	WCDMA 1700_CH 1513_RMC 12.2kbps

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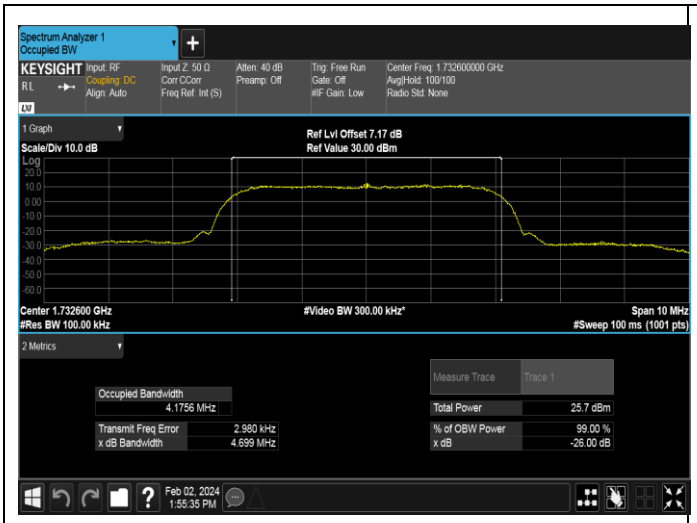
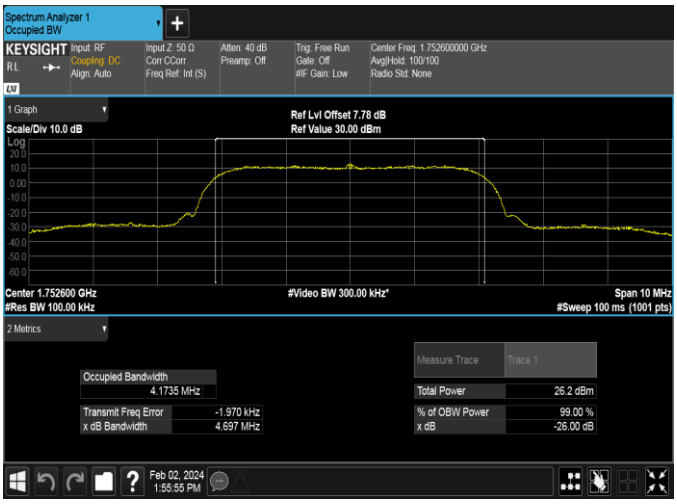
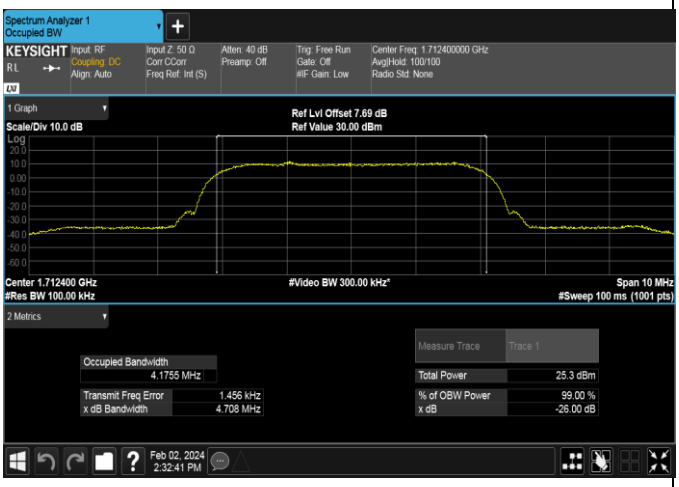


WCDMA 1700_CH 1312_HSDPA



WCDMA 1700_CH 1412_HSDPA



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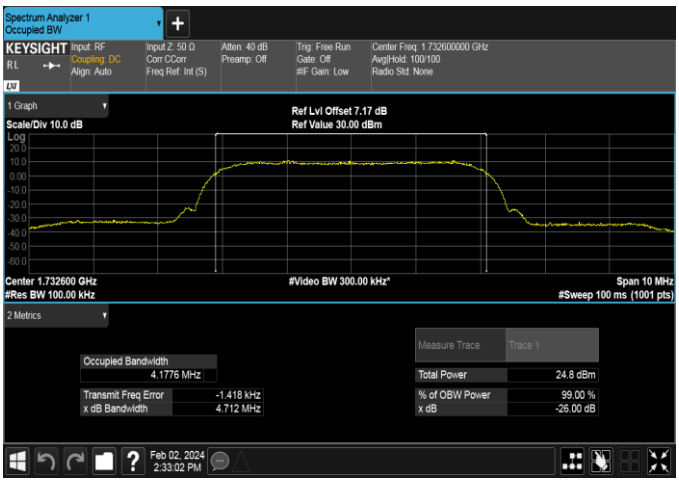

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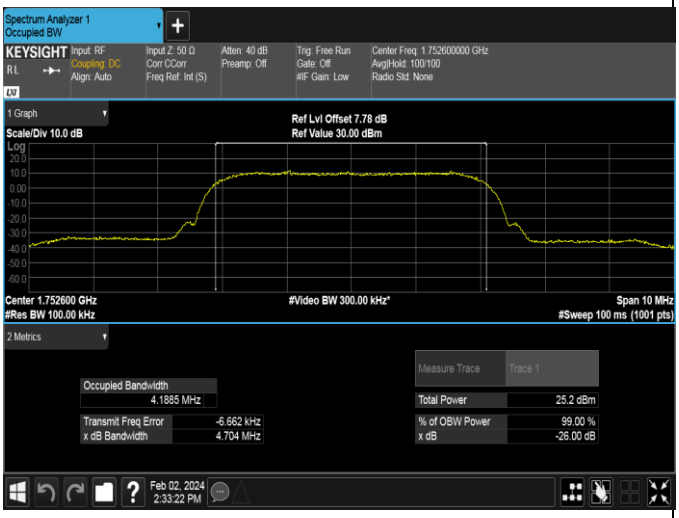

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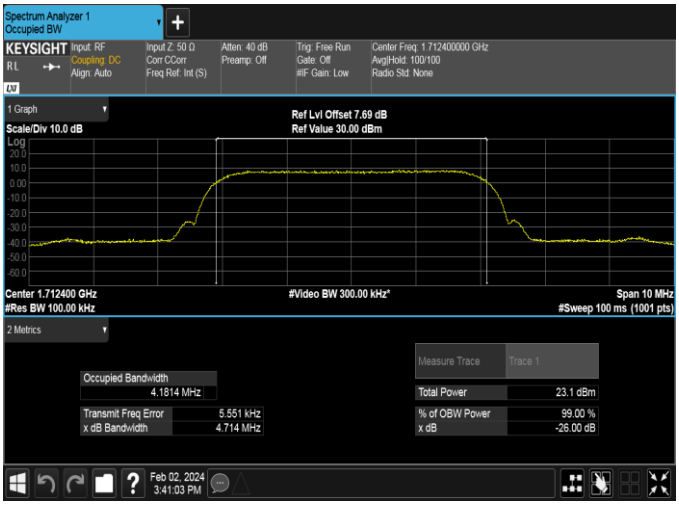

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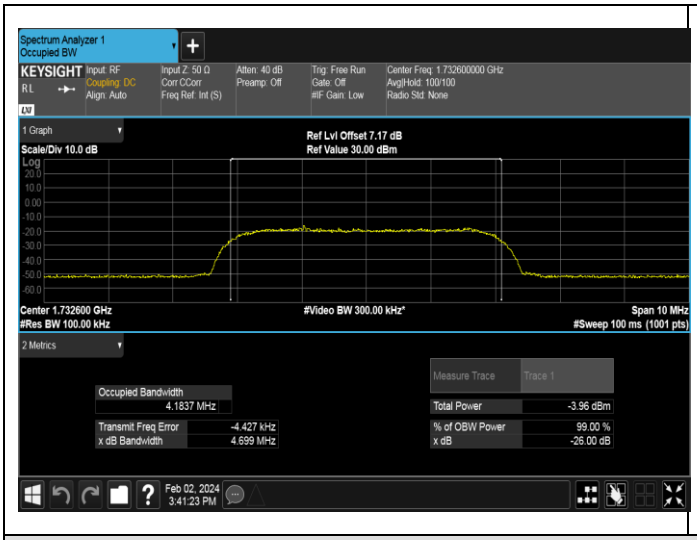
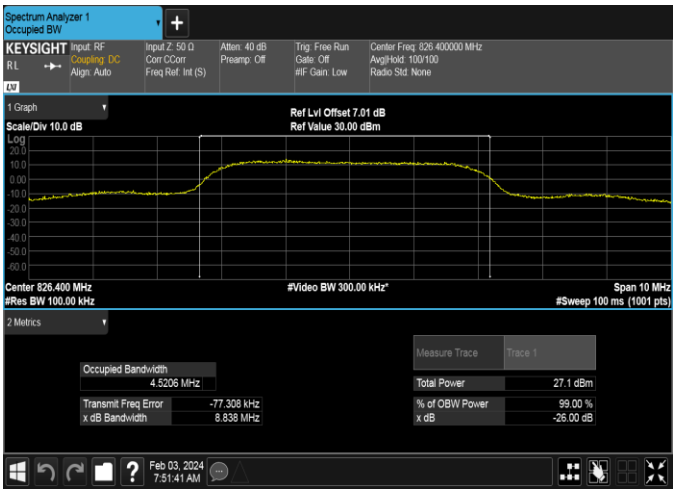
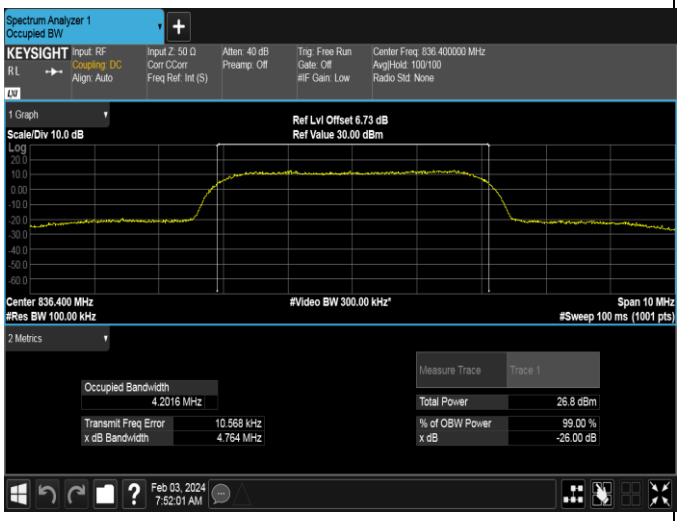


WCDMA 850_CH 4132_ RMC 12.2kbps

WCDMA 850_CH 4183_ RMC 12.2kbps





WCDMA 850_CH 4233_ RMC 12.2kbps

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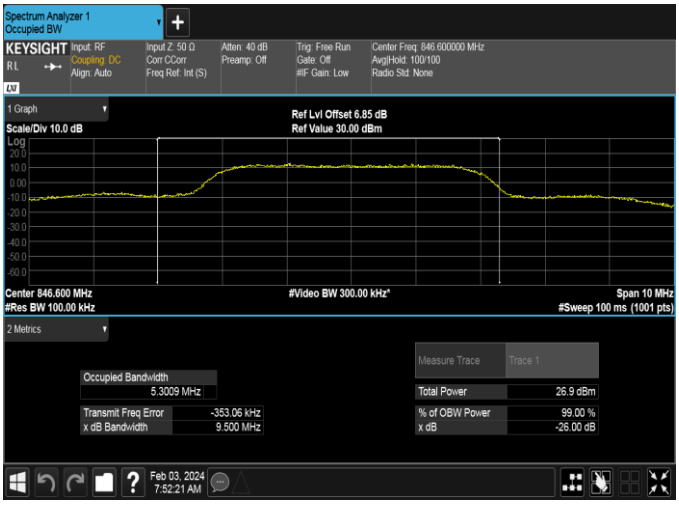

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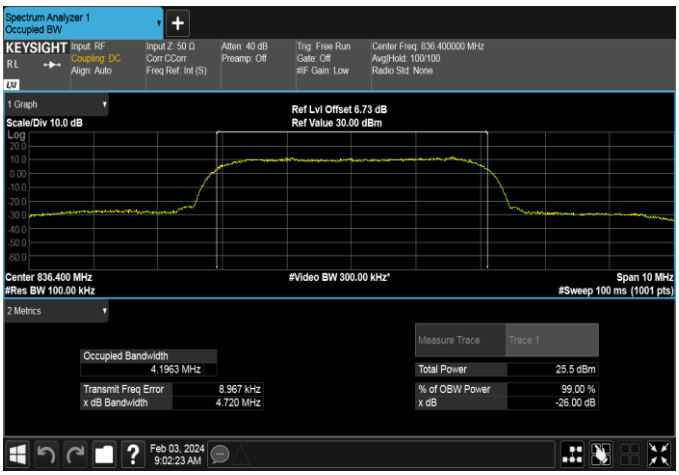
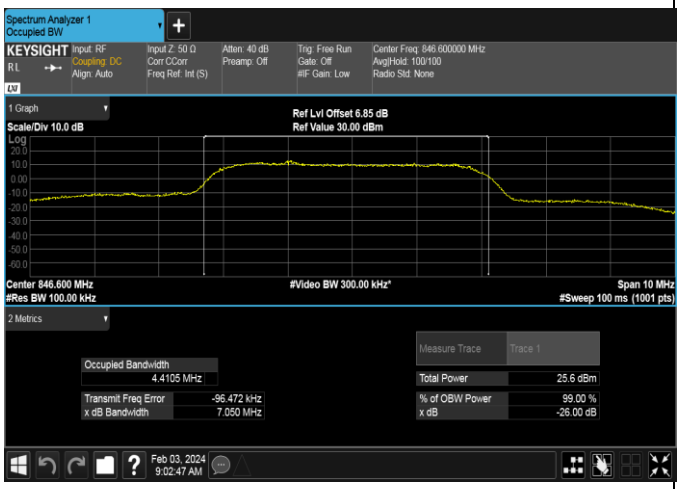
WCDMA 850_CH 4183_ HSDPA	WCDMA 850_CH 4233_ HSDPA
	
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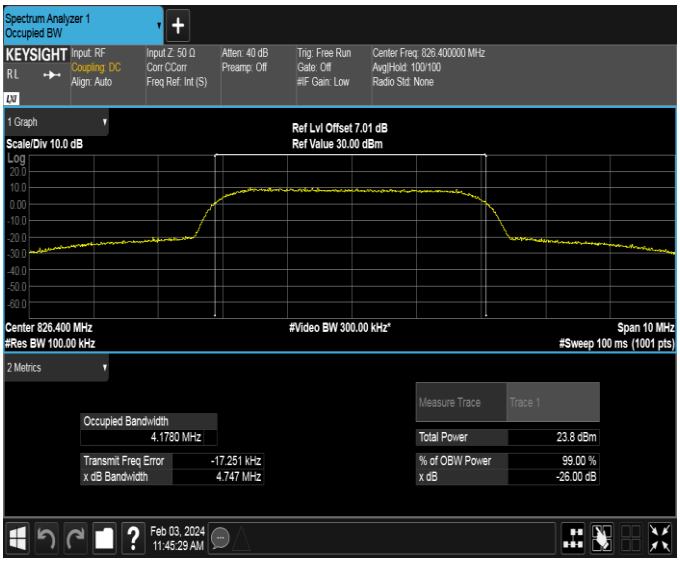	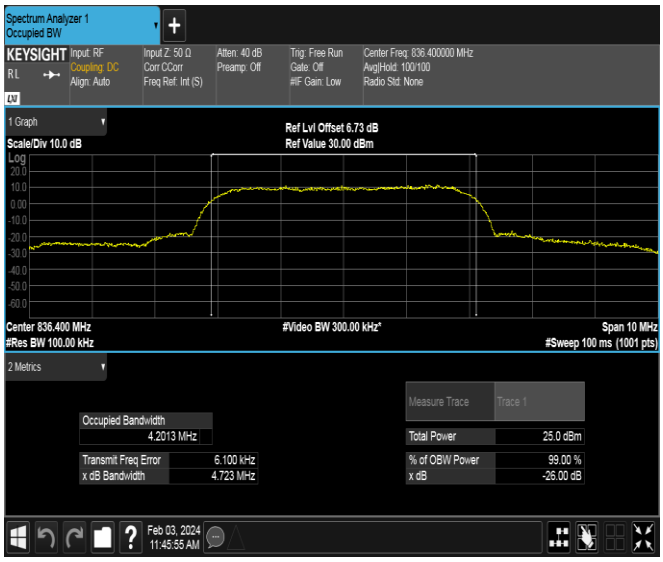
WCDMA 850_CH 4233_ HSUPA	/

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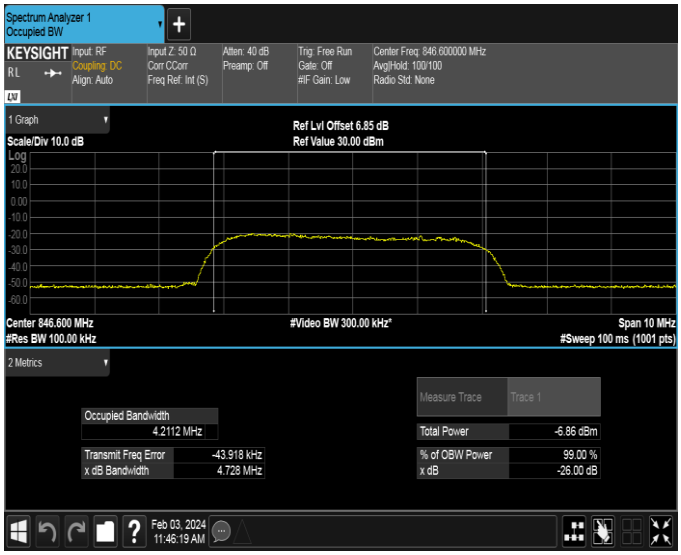	/

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11. Band Edge Emissions at Antenna Terminal

11.1 Provisions Applicable

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

11.2 Measurement Procedure

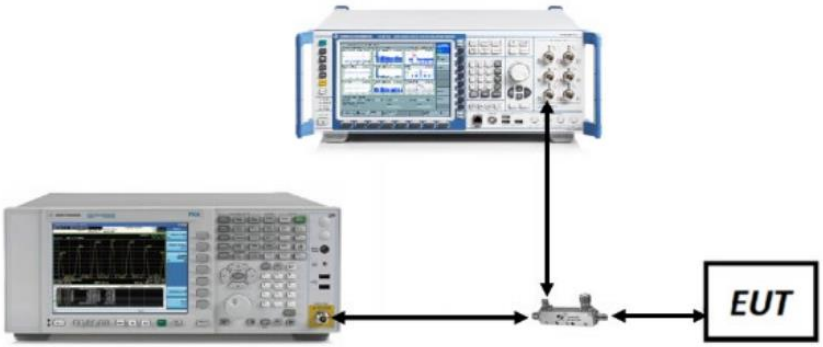
1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW > 1% of the emission bandwidth
4. VBW > 3 x RBW
5. Detector = RMS
6. Number of sweep points ≥ 2 x Span/RBW
7. Trace mode = trace average
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Test Note

According to FCC 22.917, 24.238, 27.53 specified that 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.In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. All measurements were done at 2 channels(low and high operational frequency range.)

The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

11.3 Measurement Setup



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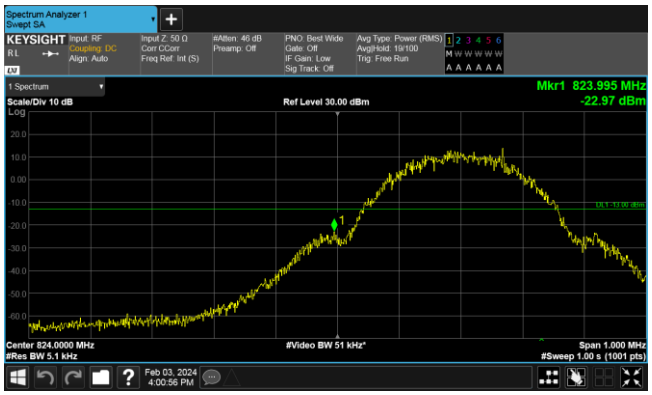
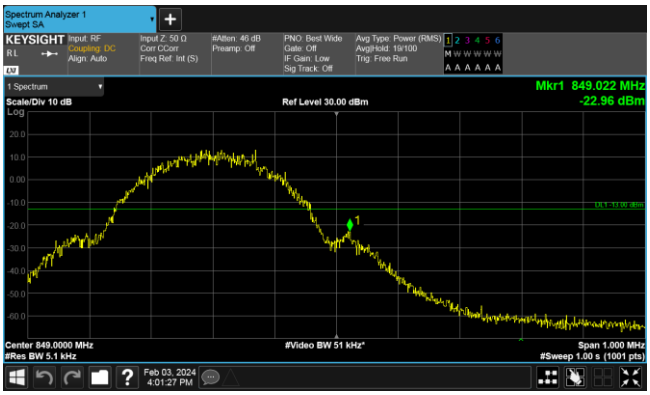
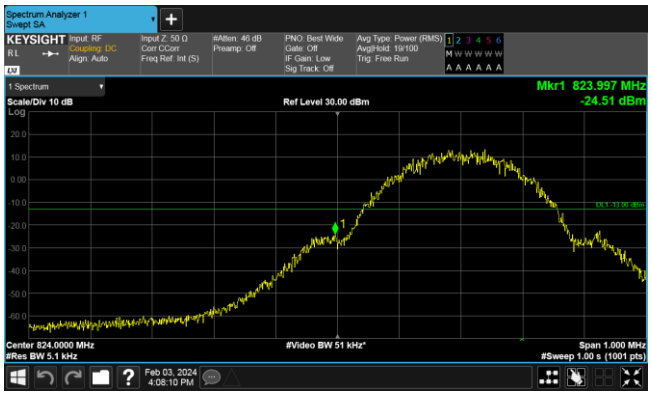
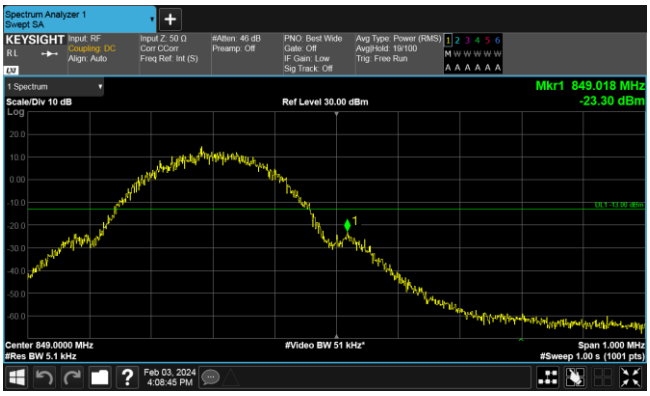
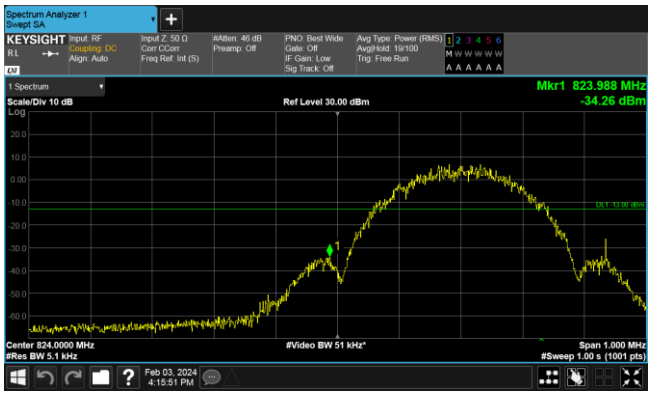
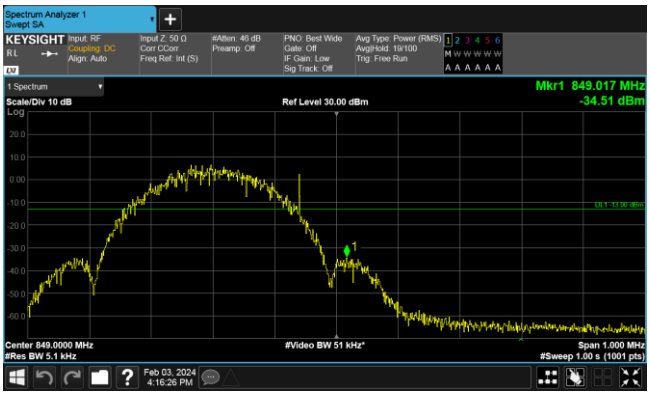
11.4 Measurement Result

GSM 850_ Lowest Channel	GSM 850_ Highest Channel
	
GPRS 850_ Lowest Channel	**GPRS 850_ Highest Channel**
	
EDGE 850_ Lowest Channel	**EDGE 850_ Highest Channel**
	

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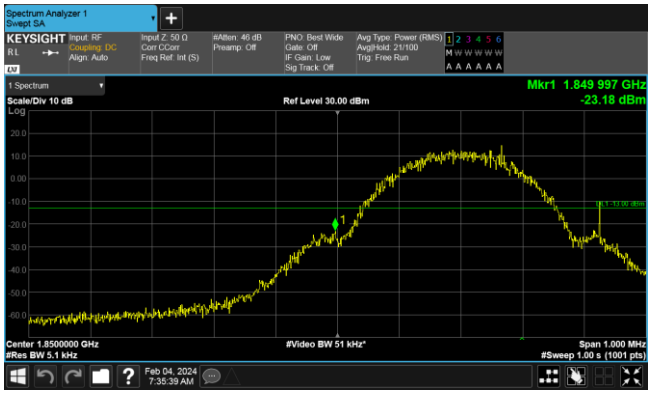
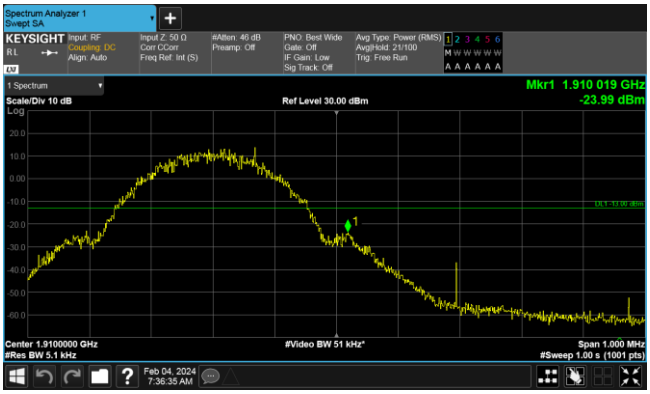
PCS 1900_ Lowest Channel	PCS 1900 _ Highest Channel
	
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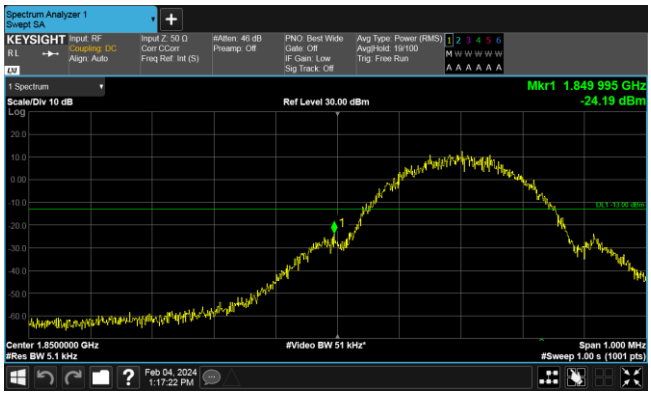
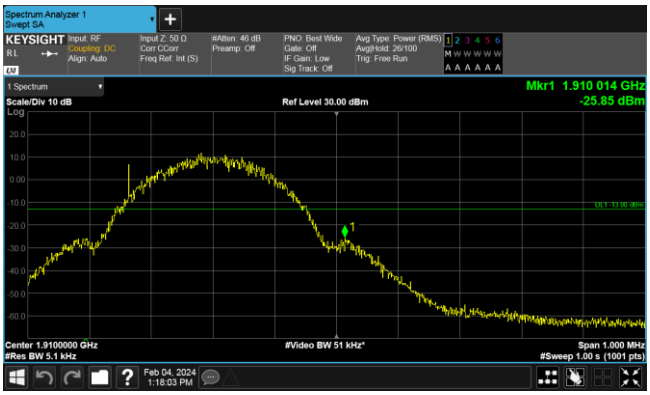
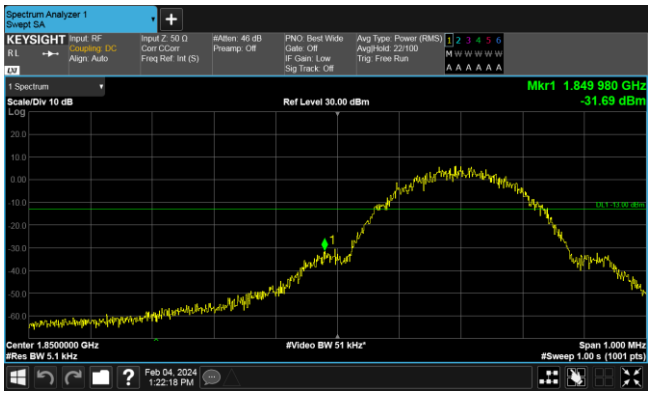
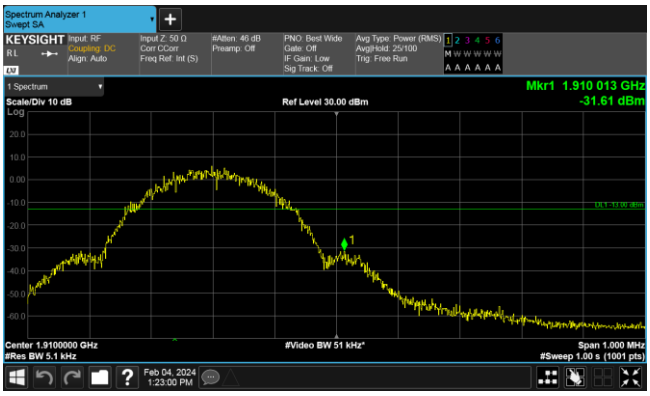
	
EDGE 1900_ Lowest Channel	**EDGE 1900_ Highest Channel**
	

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