ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

FCC Applicant:	ASUSTeK COMPUTER INC. 1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan
FCC Manufacturer:	ASUSTeK COMPUTER INC. 1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan
Product Name:	ASUS Phone(Mobile Phone)
Brand Name:	ASUS
Model No.:	ASUSAI2501E
Family Model No.:	ASUSAI2501D
Model Difference:	Refer to section1.2
Report Number:	TERF2407002101ER
FCC ID	MSQAI2501
Date of EUT Received:	July 01, 2024
Date of Test:	July 17, 2024 ~ November 4, 2024
Issue Date:	November 13, 2024

Approved By Marcus Tseng

Marcus Tseng

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Central RF Lab The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI ANSI C63.26-2015 and the energy emitted by the sample EUT comply with FCC rule part 2, 22H & 24E & 27 C.

The results of this report relate only to the sample identified in this report.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.
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Revision History					
Report Number	**Revision**	**Description**	**Issue Date**	**Revised By**	**Remark**
TERF2407002101ER	00	Original	November 13, 2024	Yuri Tsai	

Note:

1、 The remark "*" indicates modification of the report upon requests from certification body.

2、 Variant information of model numbers is provided by the applicant, test results of this report are applicable to the sample EUT(s) received.
And are assessed as electrically identical in RF characteristics, therefore, no further assessment required for the variant(s).

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1 GENERAL PRODUCT INFORMATION

1.1 Product Description

Product Name:	ASUS Phone(Mobile Phone)
Brand Name:	ASUS
Model No.:	ASUSAI2501E
Family Model No.:	ASUSAI2501D
Hardware Version:	R2.0C
Firmware Version:	35.1400.1400.10
EUT Series No.:	S7AIOCN13359SCN
Power Supply:	7.8 Vdc from Battery
Test Software (Name/Version)	Connect with Callbox

1.2 Model Difference

Model Name	ASUSAI2501D	ASUSAI2501E
3rd Camera	5MP Macro	32 MP Tele
LED Light	mini LED (85 pcs)	mini LED (648 pcs)
Memory	12/256, 12/512, 16/512	16/512, 24/1TB
Side USB port	Y	
Air trigger	Y	
Power	5800mAh, 65W	
Refresh Rate	185Hz	

1.3 Operation Frequency Range

Operating Frequency (MHz)			
GSM/GPRS/EDGE 850	824.2	-	848.8
GSM/GPRS/EDGE 1900	1850.2	-	1909.8

Operating Frequency (MHz)			
WCDMA / HSPA+ Band II	1852.4	-	1907.6
WCDMA / HSPA+ Band IV	1712.4	-	1752.6
WCDMA / HSPA+ Band V	826.4	-	846.6

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1.4 Antenna Designation

Antenna Type	Antenna Model No.
PIFA	Ant0
	Ant1
	Ant2
Note: Transmission frequencies in this test report are only available by the above antenna(s).	

Modulation	Frequency (MHz)	Peak Antenna Gain (dBi)		
		Ant0	Ant1	Ant2
GSM/GPRS/EDGE 850	824.2 - 848.8	-2.4		
GSM/GPRS/EDGE 1900	1850.2 - 1909.8		-0.2	
WCDMA / HSPA+ Band II	1852.4 - 1907.6		-0.2	-1.9
WCDMA / HSPA+ Band IV	1712.4 - 1752.6		-1.5	-1.9
WCDMA / HSPA+ Band V	826.4 - 846.6	-2.4		-3.3

Note: Antenna information is provided by the applicant.

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1.5 Type of Emission & Max ERP/EIRP Power Measurement Result:

Mode	ERP / EIRP (dBm)		W	99%	Type of Emission
GSM 850	29.00	ERP	0.794	0.2447	245KGXW
GPRS 850	28.96	ERP	0.787	0.2458	246KGXW
EDGE 850	22.00	ERP	0.158	0.2481	248KG7W
GSM 1900	29.98	EIRP	0.995	0.2451	245KGXW
GPRS 1900	29.98	EIRP	0.995	0.2449	245KGXW
EDGE 1900	25.17	EIRP	0.329	0.2472	247KG7W
Mode	**ERP / EIRP (dBm)**		**W**	99%	**Type of Emission**
WCDMA Band II	25.13	EIRP	0.326	4.1535	4M15F9W
HSDPA Band II	24.92	EIRP	0.310	4.1534	4M15F9W
HSUPA Band II	24.92	EIRP	0.310	4.1471	4M15F9W
WCDMA Band IV	23.50	EIRP	0.224	4.1532	4M15F9W
HSDPA Band IV	23.41	EIRP	0.219	4.1498	4M15F9W
HSUPA Band IV	23.31	EIRP	0.214	4.1543	4M15F9W
WCDMA Band V	20.70	ERP	0.117	4.1380	4M14F9W
HSDPA Band V	20.51	ERP	0.112	4.1320	4M13F9W
HSUPA Band V	20.55	ERP	0.114	4.1382	4M14F9W

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1.6 Test Methodology of Applied Standards

FCC 47 CFR Part 2, 22H, 24E, 27C
ANSI C63.26-2015

KDB971168 D01 Power Meas license Digital System v03r01

KDB941225 D01 SAR test for 3G devices v03r01 (SAR Measurement Procedures for 3G Devices, WCDMA / HSPA) was used for EUT and Base station setting.

KDB412172 D01 Determining ERP and EIRP v01r01

TS 151 010-1 is used to set, and measure the output power.

1.7 Test Facility

Laboratory	Test Site Address	Test Site Name	FCC Designation number	IC CAB identifier
SGS Taiwan Ltd. Central RF Lab. (TAF code 3702)	No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan.	SAC 1	TW0027	TW3702
		SAC 2		
		SAC 3		
		Conduction 1		
		Conducted 1		
		Conducted 2		
		Conducted 3		
		Conducted 4		
		Conducted 5		
		Conducted 6		
	No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333	Conduction C	TW0028	
		SAC C		
		SAC D		
		SAC G		
		Conducted A		
		Conducted B		
		Conducted C		
		Conducted D		
		Conducted E		
		Conducted F		
		Conducted G		

Note: Test site name is remarked on the equipment list in each section of this report as an indication where measurements occurred in specific test site and address.

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1.8 Special Accessories

No special accessories were used during testing.

1.9 Equipment Modifications

There was no modifications incorporated into the EUT.

1.10 Radiated Emission Test Sites For Measurements From 9 kHz To 30 MHz

Radiated emission below 30MHz is measured in a 9m*6m*6m semi-anechoic chamber, the measurements correspond to those obtained at an open-field test site.
There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

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2 SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

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

2.2 EUT Exercise

The EUT (Transmitter) was operated in the continuous transmission mode employed with the simulator of the Base Station that fixates at test default channels to fix the Tx frequency which was for the purpose of the measurements.

2.3 Test Procedure

2.3.1 Conducted Measurement at Antenna Port

The EUT is placed on a table which is 0.8 m above ground plane. A low loss of RF cable was used to connect the antenna port of EUT to measurement equipment.

2.3.2 Radiated Emissions (ERP/EIRP)

The EUT is placed on a turn table, for emission measurements below 1 GHz is 0.8 m above ground plane, for emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both Horizontal and Vertical. In order to find out the max. emission, the relative positions of this transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made “while keeping the antenna in the ‘cone of radiation’ from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.” is still within the 3dB illumination BW of the measurement antenna.

2.4 Measurement Results Explanation Example

For all conducted test items:
The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.
Note:
The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

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2.5 Final Amplifier Voltage and Current Information:

Test mode	DC voltage (V)	DC current (mA)
GSM 850	7.8	**425**
GPRS 850	7.8	404
EDGE 850	7.8	411
GSM 1900	7.8	415
GPRS 1900	7.8	418
EDGE 1900	7.8	**422**
WCDMA B2	7.8	419
HSUPA B2	7.8	426
HSDPA B2	7.8	**430**
WCDMA B4	7.8	**424**
HSUPA B4	7.8	417
HSDPA B4	7.8	407
WCDMA B5	7.8	409
HSUPA B5	7.8	415
HSDPA B5	7.8	**422**

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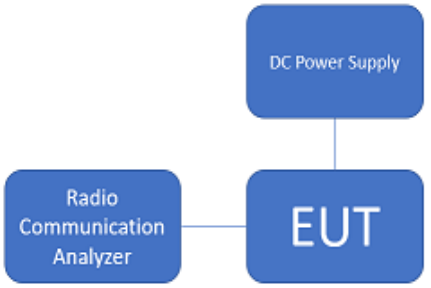
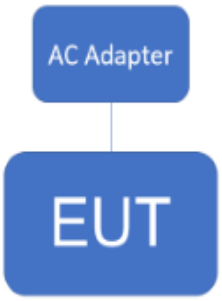
3 TEST CONFIGURATION

Conducted Setup	Radiated Setup
	

Note: Radio Communication Analyzer is placed in remote side for radiated test.

3.1 Control Unit(s)

Radiated Emission Test Site: SAC 3					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
AC Adapter	Shenzhen JingQuanHua & Everrise Intelligent Electric Co., Ltd.	NSA65EU-20032500	N/A	N/A	N/A
USB Cable	ASAP	LA9U2030-CS-H	N/A	N/A	N/A

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4 SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§2.1046(a)	RF Power Output	Compliant
§22.913(a)(5) §24.232(c) §27.50(d)(4)	ERP/ EIRP measurement	Compliant
§2.1049(h)	99% & 26dB Occupied Bandwidth	Compliant
§2.1051 §22.917(a) §24.238(a) §27.53(h)	Out of Band Emissions at Antenna Terminals and Band Edge / Emission mask requirements	Compliant
§2.1053 §22.917(a) §24.238(a) §27.53(h)	Field Strength of Spurious Radiation	Compliant
§22.913(d) §24.232(d) §27.50(d)(5)	Peak to Average Ratio	Compliant
§2.1055(a)(1) §22.355 §24.235 §27.54	Frequency Stability	Compliant

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5 DESCRIPTION OF TEST MODES

5.1 The Worst Test Modes and Channel Details

1. The EUT has been tested under operating condition.
2. The field strength of radiated emission was measured as the EUT positioned in different orthogonal planes (E1/E2/H) based on actual usage of the EUT to pre-scan the emissions for determining the worst case scenario.

5.2 Measurement Configuration

RADIATED EMISSION	GSM Bands	Test Channel		
		L	M	H
ERP	850	v	v	v
EIRP	1900	v	v	v
FREQUENCY STABILITY	850	-	v	-
	1900	-	v	-
OCCUPIED BANDWIDTH	850	v	v	v
	1900	v	v	v
PEAK TO AVERAGE RATIO	850	v	v	v
	1900	v	v	v
BAND EDGE	850	v	-	v
	1900	v	-	v
CONDCUDETED EMISSION	850	v	v	v
	1900	v	v	v
RADIATED EMISSION	850	v	v	v
	1900	v	v	v

Test Items	WCDMA / HSPA Bands	Test Channel		
		L	M	H
ERP	Band V	v	v	v
EIRP	Bnad II	v	v	v
	Band IV	v	v	v
FREQUENCY STABILITY	Bnad II	-	v	-
	Band IV	-	v	-
	Band V	-	v	-
OCCUPIED BANDWIDTH	Bnad II	v	v	v
	Band IV	v	v	v
	Band V	v	v	v
PEAK TO AVERAGE RATIO	Bnad II	v	v	v
	Band IV	v	v	v
	Band V	v	v	v
BAND EDGE	Bnad II	v	-	v
	Band IV	v	-	v
	Band V	v	-	v
CONDCUDETED EMISSION	Bnad II	v	v	v
	Band IV	v	v	v
	Band V	v	v	v
RADIATED EMISSION	Bnad II	v	v	v
	Band IV	v	v	v
	Band V	v	v	v

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6 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty		
Power Density	+/-	0.61	dB
RF Power Output	+/-	0.97	dB
ERP/ EIRP measurement	+/-	2.15	dB
	+/-	2.15	dB
Emission Bandwidth	+/-	1.38	Hz
Out of Band Emissions at Antenna Terminals and Band Edge	+/-	0.77	dB
Peak to Average Ratio	+/-	0.97	dB
Frequency Stability vs. Temperature	+/-	1.48	Hz
Frequency Stability vs. Voltage	+/-	1.48	Hz
Temperature	+/-	0.6	°C
Humidity	+/-	3	%
DC / AC Power Source	+/-	1	%

Radiated Spurious Emission Measurement Uncertainty				
Polarization: Vertical	**+/-**	**1.89**	**dB**	9kHz~30MHz
	+/-	**4.15**	**dB**	30MHz - 1000MHz
	+/-	**3.43**	**dB**	1GHz - 18GHz
	+/-	**3.86**	**dB**	18GHz - 40GHz
Polarization: Horizontal	**+/-**	**1.89**	**dB**	9kHz~30MHz
	+/-	**4.02**	**dB**	30MHz - 1000MHz
	+/-	**3.43**	**dB**	1GHz - 18GHz
	+/-	**3.86**	**dB**	18GHz - 40GHz
Radiated Spurious Emission	**+/-**	**2**	**dB**	33GHz-50GHz
	+/-	**1.59**	**dB**	50GHz-60GHz
	+/-	**1.7**	**dB**	60GHz-90GHz
	+/-	**1.64**	**dB**	90GHz-140GHz
	+/-	**3.83**	**dB**	140GHz-220GHz

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

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7 MEASUREMENT EQUIPMENT USED

7.1 Conducted Measurement

Conducted Emission Test Site: Conducted 3					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Attenuator	Mini-Circuits	BW-S10W2+	16	12/12/2023	12/11/2024
DC Block	Mini-Circuits	BLK-18-S+	11	12/12/2023	12/11/2024
DC Power Supply	Gwinstek	SPS-3610	GEV856733	12/04/2023	12/03/2024
PXA Spectrum Analyzer	Keysight	N9030B	MY61330494	03/22/2024	03/21/2025
Radio Communication Analyzer	Anritsu	MT8815B	6200711454	04/21/2024	04/20/2025
Radio Communication Analyzer	Anritsu	MT8820C	6201061014	09/23/2023	09/22/2024
Radio Communication Analyzer	Anritsu	MT8820C	6201061014	08/29/2024	08/28/2025
Splitter	Titan	T0510E2W118Q	22015158	12/12/2023	12/11/2024
Temperature Chamber	Giant Force	GTH-150-40-CP-AR	MAA0512-018	06/05/2024	06/04/2025
Test Software	SGS	Radio Test Software	Ver. 21	N.C.R	N.C.R

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7.2 Radiated Measurement

Radiated Emission Test Site: SAC 3					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
1G High Pass Filter	Micro-Tronics	HPM50108	32	12/12/2023	12/11/2024
2G High Pass Filter	Micro-Tronics	HPM50110	36	12/12/2023	12/11/2024
Attenuator	Mini-Circuits	BW-S10W2+	16	12/12/2023	12/11/2024
Band Reject Filter 1700-2000	EWT	EWT-54-0038	M1	12/12/2023	12/11/2024
Band Reject Filter 800-1000	EWT	EWT-54-0037	M3R	12/12/2023	12/11/2024
Bi-log Antenna	SCHWARZBECK	VULB9168	1208	07/17/2024	07/16/2025
Bi-log Antenna	SCHWARZBECK	VULB9168	378	08/09/2024	08/08/2025
Coaxial Cables	EMCI+Huber Suhner	EMC107-SM-SM-1000 +SUCOFLEX 104PEA +EMC107-SM-SM-1500 +SUCOFLEX 106	RX Cable 9K-18G (221110+MY4251/4 PEA+221106+76096 /6)	08/30/2024	08/29/2025
Coaxial Cables	Huber Suhner	SUCOFLEX 102	RX Cable 18G-40G MY2630/2+805062/ 2	08/30/2024	08/29/2025
Coaxial Cables	Huber Suhner	SUCOFLEX 102+SUCOFLEX 106	TX Cable 30M-40G 23051/2+76096/6+2 2962/2	08/30/2024	08/29/2025
EMI Test Receiver	R&S	ESCI 7	100759	08/28/2024	08/27/2025
EXA Spectrum Analyzer	KEYSIGHT	N9010B	MY63440386	02/06/2024	02/05/2025
Horn Antenna	RF SPIN	DRH0844	LE2D05A0844	07/10/2024	07/09/2025
Horn Antenna	SCHWARZBECK	BBHA9120D	1441	09/23/2024	09/22/2025
Horn Antenna	SCHWARZBECK	BBHA9120D	603	05/15/2024	05/14/2025
Horn Antenna	SCHWARZBECK	BBHA9170	184	12/28/2023	12/27/2024
Network Analyzer	R&S	ZNB 40	101842	05/16/2024	05/15/2025
Pre-Amplifier	EMCI	EMC118A45SEE	980868	08/30/2024	08/29/2025
Pre-Amplifier	EMCI	EMC184045SEE	9080939	08/30/2024	08/29/2025
Pre-Amplifier	HP	8447D	2944A07676	08/30/2024	08/29/2025
Radio Communication Analyzer	Anritsu	MT8820C	6201465317	03/26/2024	03/25/2025
Radio Communication Analyzer	Anritsu	MT8815B	6200711454	04/21/2024	04/20/2025
Site Cal	SGS	SAC 3	N/A	08/30/2024	08/29/2025
Test Software	Audix	e3	Ver. 9.210616	N.C.R	N.C.R

NOTE: *N.C.R refers to Not Calibrated Required.*

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8 MAXIMUM OUTPUT POWER

8.1 Standard Applicable

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals.

According to FCC §2.1046

FCC 22.913(a)

(5) mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

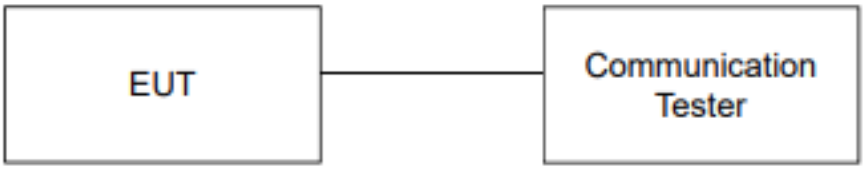
FCC 24.232(c)

Mobile and portable stations are limited to 2 W EIRP.

FCC 27.50(d)

(4) Mobile, and portable (hand-held) stations operating in the 1710-1755 MHz, 1695-1710 MHz and 1755-1780 MHz bands are limited to 1W EIRP.

8.2 Test Set-up



Note: *Measurement setup for testing on Antenna connector*

8.3 Output Power Measurement Applicable Guideance

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a communication tester.

Transmitter output was read off the communication tester in dBm.

The power output at the transmitter antenna port was determined by adding the value of the attenuator to the communication tester reading.

TS 151 010-1 is reference to conduct the test measurement of output power.

The Procedure of KDB941225 (SAR Measurement Procedures for 3G devices, (WCDMA/HSPA) was used for EUT and RMC 12.2kps is used for Base station setting.

KDB 971168 D01 Power Meas License Digital System as the supplemental test methodology to adjust the proper setting obtaining the measurement results.

Conducted average power is obtained from the simulator telecommunication test set.

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8.4 Determining ERP and/or EIRP from conducted RF output power measurements

According to KDB 412172 D01 Power Approach,

$EIRP = P_T + G_T - L_C$,

$ERP = EIRP - 2.15$,

Where:

ERP or EIRP = effective radiated power or equivalent isotropically radiated power (expressed in the same units as PT, typically dBW, dBm, or power spectral density (PSD)2), relative to either a dipole antenna (ERP) or an isotropic antenna (EIRP);

P_T = transmitter output power, expressed in dBW, dBm, or PSD;

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.

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8.5 Measurement Results

8.5.1 GSM

GSM/GPRS/EDGE (GMSK; 8-PSK) Result:

EUT Mode	Freq. (MHz)	CH	Conducted Avg. Power (dBm)	Antenna Gain (dBi)	ERP (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
GSM 850	824.2	128	33.00	-2.40	28.45	30.60	38.50	-7.90
	836.6	190	33.55	-2.40	29.00	31.15	38.50	-7.35
	848.8	251	33.37	-2.40	28.82	30.97	38.50	-7.53
GSM 1900	1850.2	512	30.18	-0.20	27.83	29.98	33.00	-3.02
	1880.0	661	30.00	-0.20	27.65	29.80	33.00	-3.20
	1909.8	810	30.18	-0.20	27.83	29.98	33.00	-3.02
GPRS 850	824.2	128	32.97	-2.40	28.42	30.57	38.50	-7.93
	836.6	190	33.51	-2.40	28.96	31.11	38.50	-7.39
	848.8	251	33.35	-2.40	28.80	30.95	38.50	-7.55
GPRS 1900	1850.2	512	30.15	-0.20	27.80	29.95	33.00	-3.05
	1880.0	661	29.99	-0.20	27.64	29.79	33.00	-3.21
	1909.8	810	30.18	-0.20	27.83	29.98	33.00	-3.02
EDGE 850	824.2	128	26.22	-2.40	21.67	23.82	38.50	-14.68
	836.6	190	26.41	-2.40	21.86	24.01	38.50	-14.49
	848.8	251	26.55	-2.40	22.00	24.15	38.50	-14.35
EDGE 1900	1850.2	512	25.37	-0.20	23.02	25.17	33.00	-7.83
	1880.0	661	25.32	-0.20	22.97	25.12	33.00	-7.88
	1909.8	810	25.34	-0.20	22.99	25.14	33.00	-7.86

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EUT Mode	Frequency (MHz)	CH	Average Burst Power (1DN 1UP) Class 8 (dBm)	Average Burst Power (1DN 2UP) Class 10 (dBm)
GPRS 850	824.2	128	32.97	32.68
	836.6	190	33.51	33.30
	848.8	251	33.35	33.15
GPRS 1900	1850.2	512	30.15	29.74
	1880.0	661	29.99	29.61
	1909.8	810	30.18	29.83
EDGE 850	824.2	128	26.22	26.04
	836.6	190	26.41	26.22
	848.8	251	26.55	26.37
EDGE 1900	1850.2	512	25.37	25.18
	1880.0	661	25.32	25.24
	1909.8	810	25.34	25.02

8.5.2 WCDMA & HSPA Measurement Results:

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The EUT supports power Class 3, which has a nominal maximum output power of 24 dBm. RMC 12.2kps is used for this testing.

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WCDMA/HSUPA/HSDPA Band II Result:

EUT Mode	Freq. (MHz)	CH	Conducted Avg. Power (dBm)	Antenna Gain (dBi)	ERP (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
WCDMA	1852.4	**9262**	25.33	-0.20	22.98	**25.13**	33.00	-7.87
	1880.0	**9400**	24.52	-0.20	22.17	24.32	33.00	-8.68
	1907.6	**9538**	24.17	-0.20	21.82	23.97	33.00	-9.03
HSDPA	1852.4	**9262**	25.12	-0.20	22.77	**24.92**	33.00	-8.08
	1880.0	**9400**	24.38	-0.20	22.03	24.18	33.00	-8.82
	1907.6	**9538**	24.02	-0.20	21.67	23.82	33.00	-9.18
HSUPA	1852.4	**9262**	25.12	-0.20	22.77	**24.92**	33.00	-8.08
	1880.0	**9400**	24.37	-0.20	22.02	24.17	33.00	-8.83
	1907.6	**9538**	24.00	-0.20	21.65	23.80	33.00	-9.20

WCDMA/HSUPA/HSDPA Band IV Result:

EUT Mode	Freq. (MHz)	CH	Conducted Avg. Power (dBm)	Antenna Gain (dBi)	ERP (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
WCDMA	1712.4	1312	24.79	-1.50	21.14	23.29	30.00	-6.71
	1732.6	1413	25.00	-1.50	21.35	**23.50**	30.00	-6.50
	1752.6	1513	24.46	-1.50	20.81	22.96	30.00	-7.04
HSDPA	1712.4	1312	24.64	-1.50	20.99	23.14	30.00	-6.86
	1732.6	1413	24.91	-1.50	21.26	**23.41**	30.00	-6.59
	1752.6	1513	24.36	-1.50	20.71	22.86	30.00	-7.14
HSUPA	1712.4	1312	24.67	-1.50	21.02	23.17	30.00	-6.83
	1732.6	1413	24.81	-1.50	21.16	**23.31**	30.00	-6.69
	1752.6	1513	24.29	-1.50	20.64	22.79	30.00	-7.21

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WCDMA/HSUPA/HSDPA Band V Result:

EUT Mode	Freq. (MHz)	CH	Conducted Avg. Power (dBm)	Antenna Gain (dBi)	ERP (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
WCDMA	826.4	4132	25.09	-2.40	20.54	22.69	38.50	-15.81
	836.6	4183	25.15	-2.40	20.60	22.75	38.50	-15.75
	846.6	4233	25.25	-2.40	20.70	**22.85**	38.50	-15.65
HSDPA	826.4	4132	24.97	-2.40	20.42	22.57	38.50	-15.93
	836.6	4183	24.99	-2.40	20.44	22.59	38.50	-15.91
	846.6	4233	25.06	-2.40	20.51	**22.66**	38.50	-15.84
HSUPA	826.4	4132	24.95	-2.40	20.40	22.55	38.50	-15.95
	836.6	4183	24.99	-2.40	20.44	22.59	38.50	-15.91
	846.6	4233	25.10	-2.40	20.55	**22.70**	38.50	-15.80

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8.5.3 HSPA (HSDPA & HSUPA) Release 6:

The following 4 Sub-Tests were completed according to the test requirements outlined in section 5.2A of the 3GPP TS34.121-1 specification. All TX RMS power requirements for Power Class 3 were met according to table 5.2AA.5 and 5.2B.5 All UE channels and power ratio's are set according to table C10.1.4 & C11.1.3 in the 3GPP TS34.121-1. RMC 12.2kps is used for this testing.

8.5.4 HSDPA SUB-TEST Setting

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH(FOR HSDPA)

Sub-test	β_c	β_d	β_d *(SF)*	β_c/β_d	β_{HS} (*Note1, Note 2*)	CM (dB) *(Note 3)*	MPR (dB) *(Note 3)*	RMC (Kbps)
1	2/15	15/15	64	2/15	4/15	0.0	0.0	12.2
2	12/15 *(Note 4)*	15/15 *(Note 4)*	64	12/15 *(Note 4)*	24/15	1.0	0.0	12.2
3	15/15	8/15	64	15/8	30/15	1.5	0.5	12.2
4	15/15	4/15	64	15/4	30/15	1.5	0.5	12.2

Note: *The recommended HSDPA MPRs are implemented as per following sub-tests.*

Mode	Sub test	Avg. Power (dBm) Channel		
		9262	9400	9538
HSDPA II	1	25.12	24.38	24.02
	2	25.24	24.34	24.00
	3	24.68	23.88	23.52
	4	24.63	23.87	23.57
Mode	**Sub test**	**Avg. Power (dBm) Channel**		
		1312	**1413**	**1513**
HSDPA IV	1	24.64	24.91	24.36
	2	24.63	24.77	24.30
	3	24.11	24.33	23.86
	4	24.07	24.29	23.81

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Mode	Sub test	Avg. Power (dBm) Channel		
		4132	4183	4233
HSDPA V	1	24.97	24.99	25.06
	2	24.88	24.92	25.06
	3	24.47	24.48	24.51
	4	24.44	24.51	24.54

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8.5.5 HSPA SUB-TEST Setting

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH(FOR HSUPA)

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS}	β_{ec}	β_{ed}	β_{ed} (SF)	β_{ed} (Codes)	CM (dB)	MPR (dB)	AG Index	E-TFCI	RMC (Kbps)
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75	12.2
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67	12.2
3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{ed}1$: 47/15 $\beta_{ed}2$: 47/15	4 4	2	2.0	1.0	15	92	12.2
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71	12.2
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81	12.2

Note: *The recommended HSUPA MPRs are implemented as per following sub-tests.*

Mode	Sub test	Avg. Power (dBm) Channel		
		9262	9400	9538
HSUPA II	1	25.12	24.37	24.00
	2	23.26	22.43	22.05
	3	24.13	23.38	23.02
	4	23.23	22.39	22.03
	5	25.17	24.36	24.03
Mode	**Sub test**	**Avg. Power (dBm) Channel**		
		1312	**1413**	**1513**
HSUPA IV	1	24.67	24.81	24.29
	2	22.65	22.94	22.28
	3	23.63	23.86	23.30
	4	22.66	22.86	22.30
	5	24.63	24.84	24.32

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Mode	Sub test	Avg. Power (dBm) Channel		
		4132	4183	4233
HSUPA V	1	24.95	24.99	25.10
	2	23.02	23.00	23.07
	3	24.00	23.96	24.12
	4	22.93	22.97	23.11
	5	24.93	24.99	25.11

8.5.6 WCDMA/HSDPA/HSUPA band II, IV, V

The EUT output power was controlled by simulator and enter max rated power 24dBm. The EUT is going to be set to max output power to 24dBm then record the read. The min. power was measures by a function key “minimum power” then record the read. It is -52.3dBm. The power variation can be 0.1dB step by setting.

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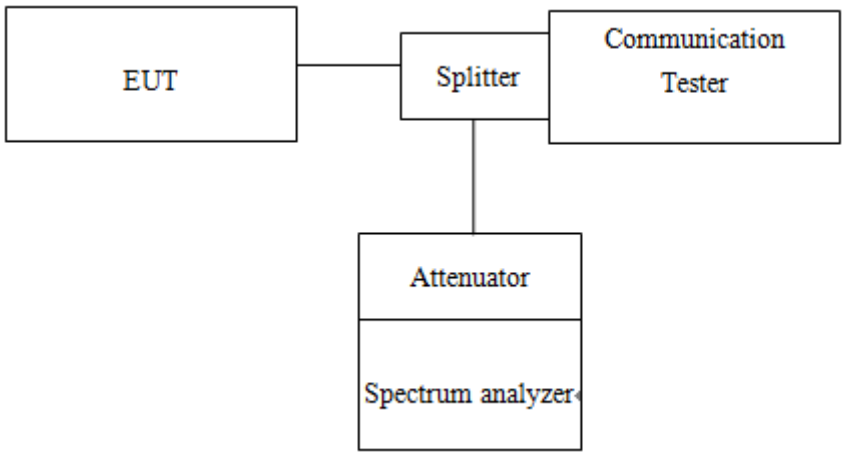
9 OCCUPIED BANDWIDTH MEASUREMENT

9.1 Standard Applicable

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power.

9.2 Test Set-up



9.3 Measurement Procedure

99% &26dB Bandwidth with detector peak

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW was set to about 1% of emission BW, VBW= 3 times RBW, -26dBc display line was placed on the screen (or 26dB bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace. Then set RBW to 99% bandwidth, RBW= 1%, VBW= 3 * RBW, with span > 2 * Signal BW, set % Power = 99%.

99% Bandwidth with detector sample

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW was set to about 1% ~ 5% of emission BW, VBW= 3 times RBW.
Set RBW= 1% ~ 5%, VBW= 3 * RBW, with span > 2 * Signal BW, set % Power = 99%.

9.4 Measurement Result

Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		GSM 850	GPRS 850	EDGE 850	GSM 850	GPRS 850	EDGE 850
824.2	128	0.24383	0.24405	0.23762	**0.3187**	0.3181	0.3045
836.6	190	**0.24467**	**0.24584**	0.23970	0.3155	0.3184	0.3035
848.8	251	0.24457	0.24324	**0.24811**	0.3138	**0.3194**	**0.3080**

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Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		GSM 1900	GPRS 1900	EDGE 1900	GSM 1900	GPRS 1900	EDGE 1900
1850.2	512	0.24345	0.24263	0.24422	0.3167	**0.3203**	**0.3141**
1880.0	661	0.24508	**0.24490**	0.24320	**0.3171**	0.3161	0.3101
1909.8	810	**0.24764**	0.24196	**0.24724**	0.3157	0.3124	0.3059

Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		WCDMA II	HSDPA II	HSUPA II	WCDMA II	HSDPA II	HSUPA II
1852.40	9262	4.14350	4.13880	4.13970	4.670	4.685	4.687
1880.00	9400	**4.15350**	4.14400	**4.14710**	4.664	**4.690**	4.685
1907.60	9538	4.14230	**4.15340**	4.14120	**4.684**	4.683	**4.706**

Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		WCDMA IV	HSDPA IV	HSUPA IV	WCDMA IV	HSDPA IV	HSUPA IV
1712.40	1312	4.15270	4.14490	4.14520	4.712	4.697	4.698
1732.60	1413	**4.15320**	**4.14980**	4.14950	**4.713**	**4.707**	4.691
1752.60	1513	4.14980	4.14330	**4.15430**	4.693	4.685	**4.700**

Freq. (MHz)	CH	99% BW (MHz)			26 dB BW (MHz)		
		WCDMA V	HSDPA V	HSUPA V	WCDMA V	HSDPA V	HSUPA V
826.40	4132	4.13050	4.13000	4.13540	4.673	4.667	**4.684**
836.60	4183	**4.13800**	4.12150	4.13060	**4.684**	**4.685**	4.672
846.60	4233	4.12990	**4.13200**	**4.13820**	4.682	4.675	4.670

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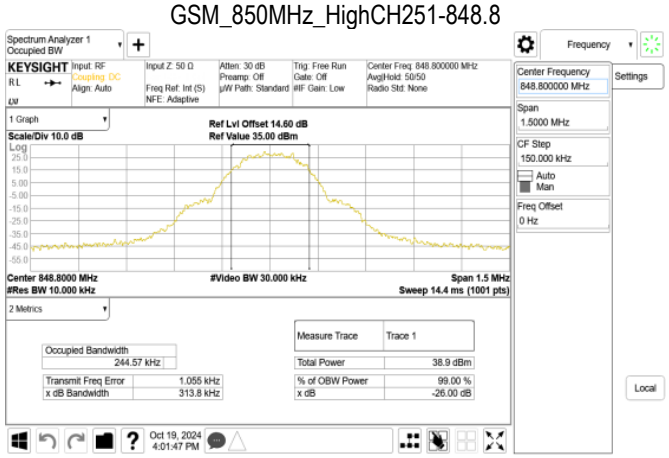
GSM_850MHz_HighCH251-848.8



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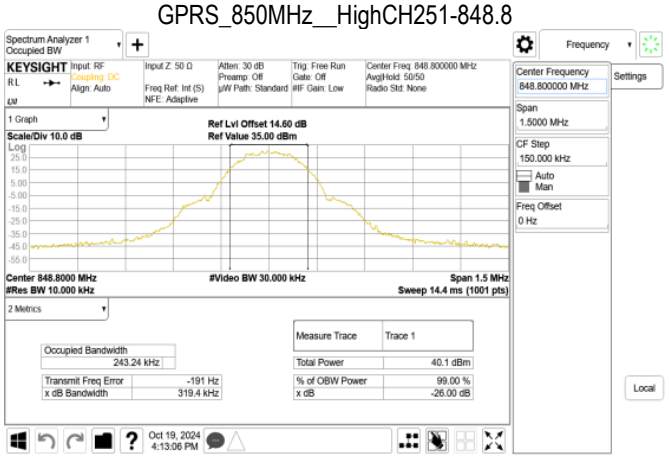

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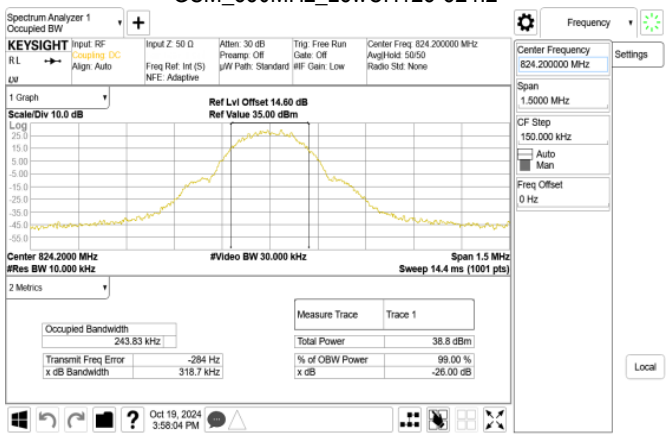

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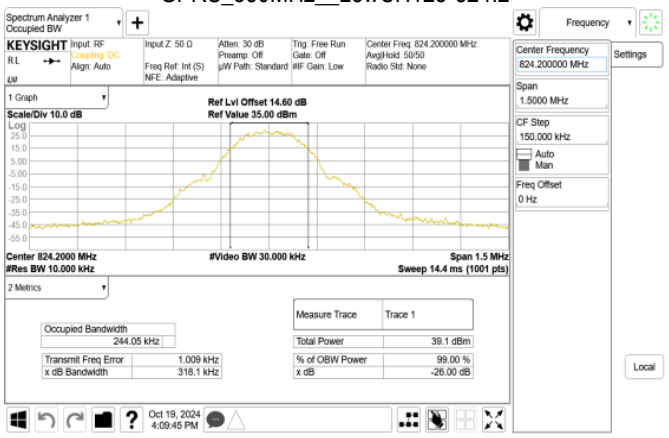
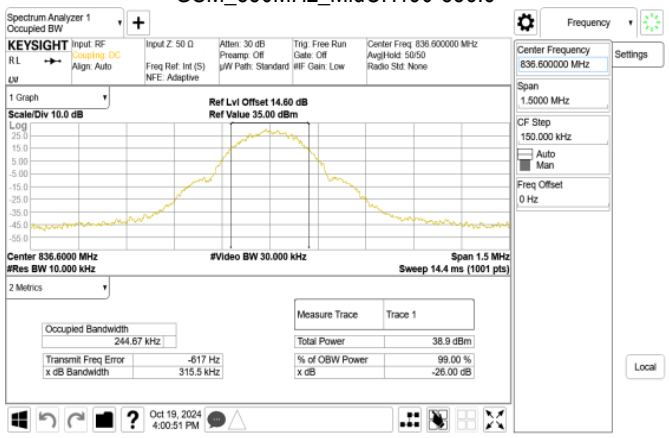


GSM_850MHz_MidCH190-836.6



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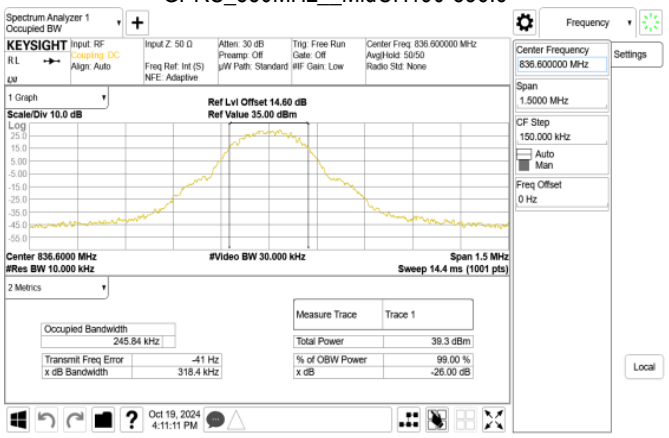

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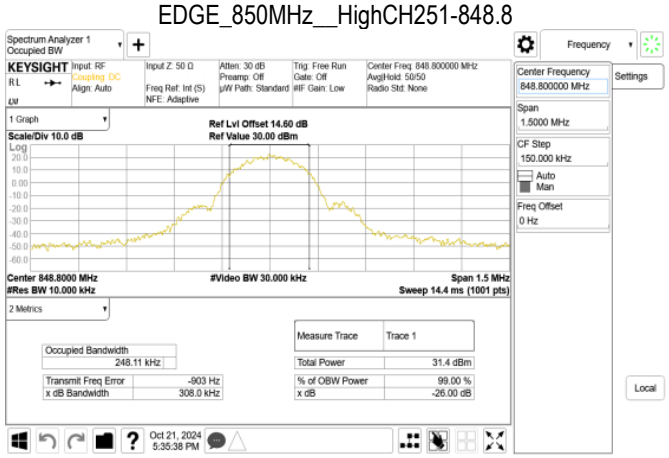
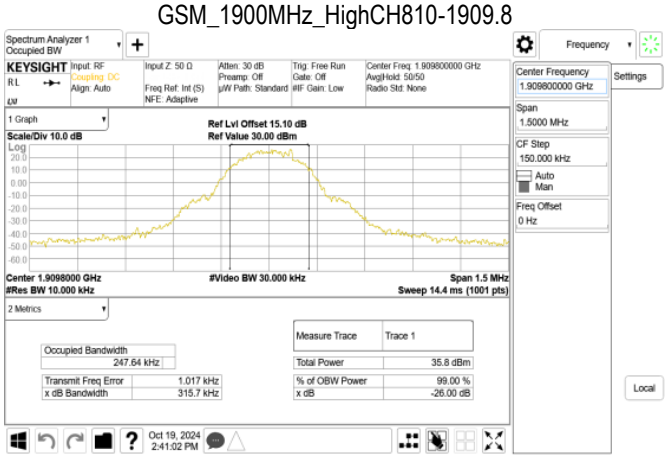
EDGE_850MHz__HighCH251-848.8



GSM_1900MHz_HighCH810-1909.8



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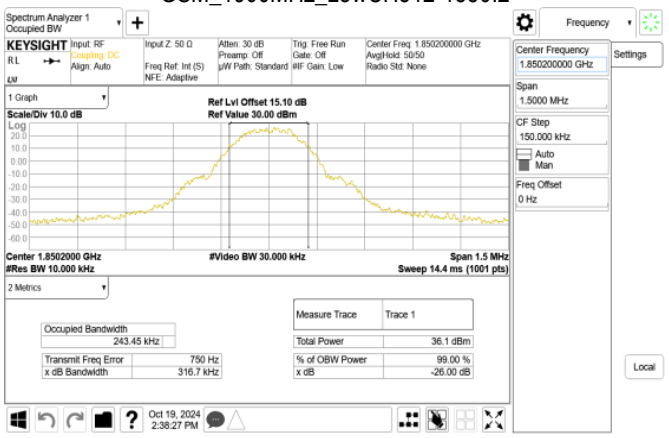
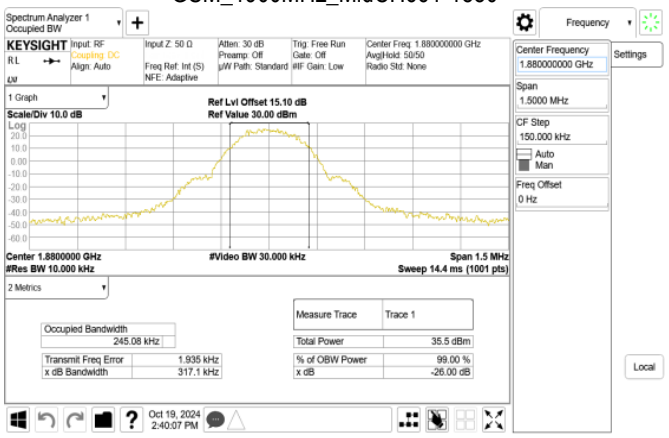
GSM_1900MHz_LowCH512-1850.2



EDGE_850MHz__MidCH190-836.6

GSM_1900MHz_MidCH661-1880



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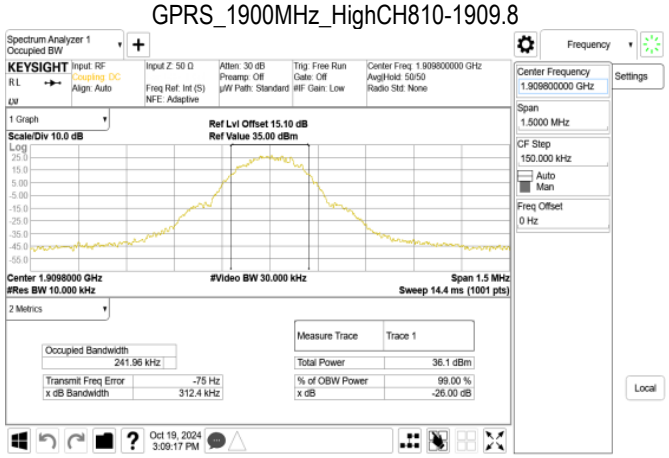
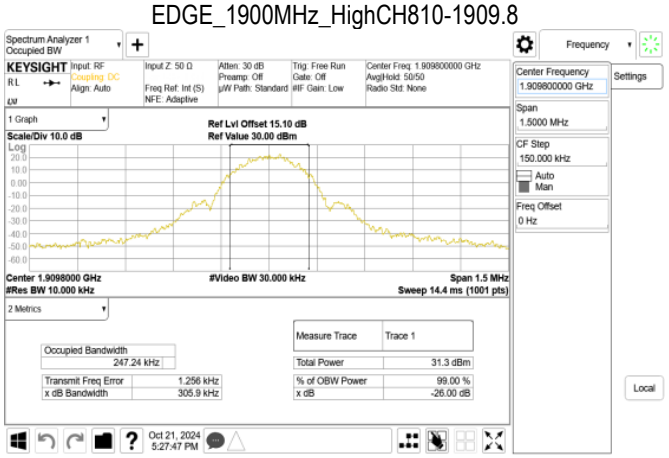
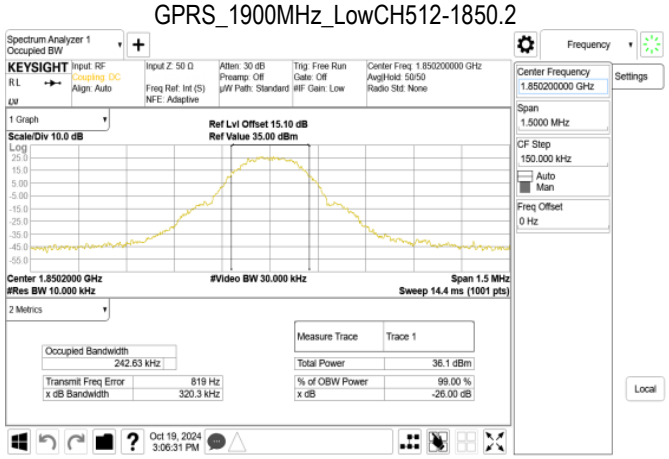
GPRS_1900MHz_HighCH810-1909.8



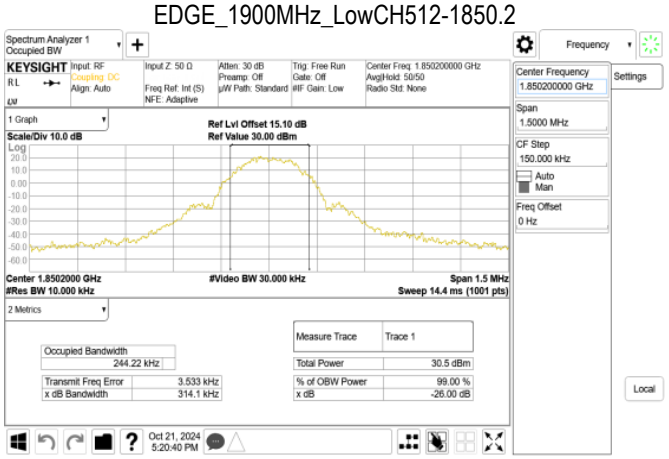
EDGE_1900MHz_HighCH810-1909.8



GPRS_1900MHz_LowCH512-1850.2

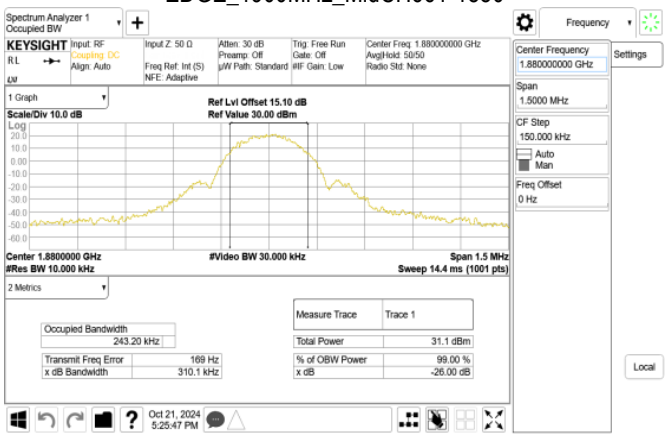


EDGE_1900MHz_LowCH512-1850.2



GPRS_1900MHz_MidCH661-1880

EDGE_1900MHz_MidCH661-1880



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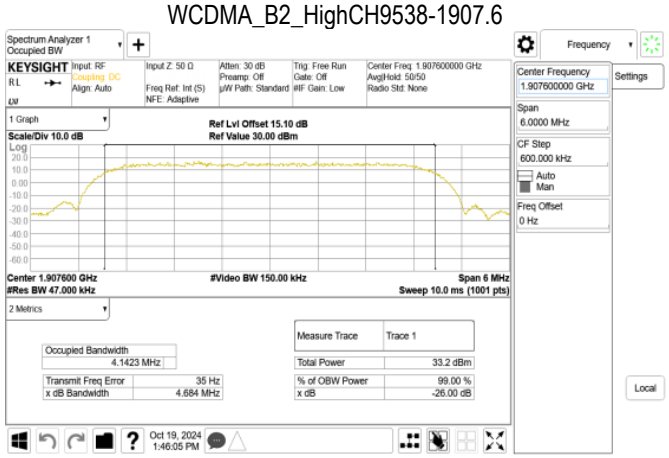
WCDMA_B2_HighCH9538-1907.6



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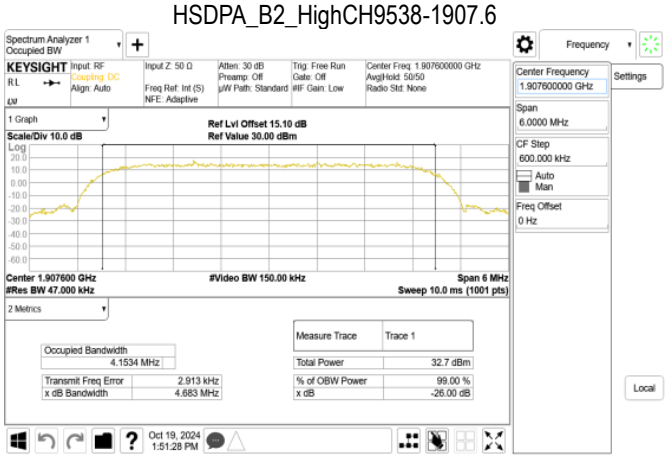

WCDMA_B2_LowCH9262-1852.4

HSDPA_B2_LowCH9262-1852.4

WCDMA_B2_MidCH9400-1880

HSDPA_B2_MidCH9400-1880

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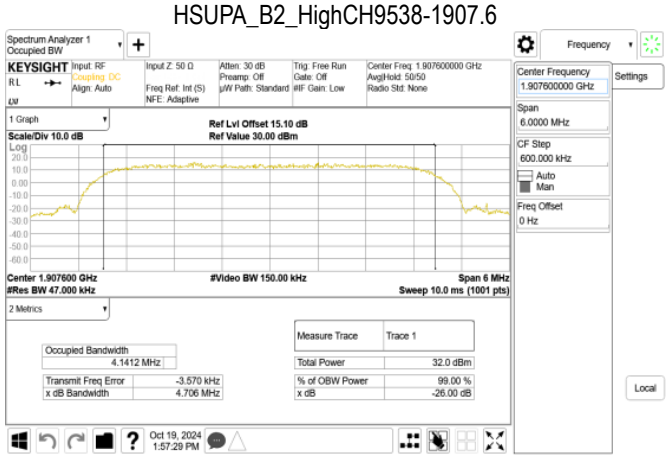
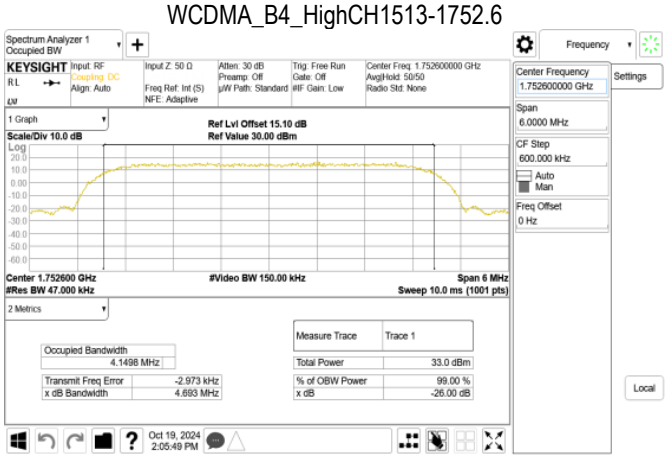
HSUPA_B2_HighCH9538-1907.6



WCDMA_B4_HighCH1513-1752.6



HSUPA_B2_LowCH9262-1852.4

WCDMA_B4_LowCH1312-1712.4

HSUPA_B2_MidCH9400-1880

WCDMA_B4_MidCH1413-1732.6

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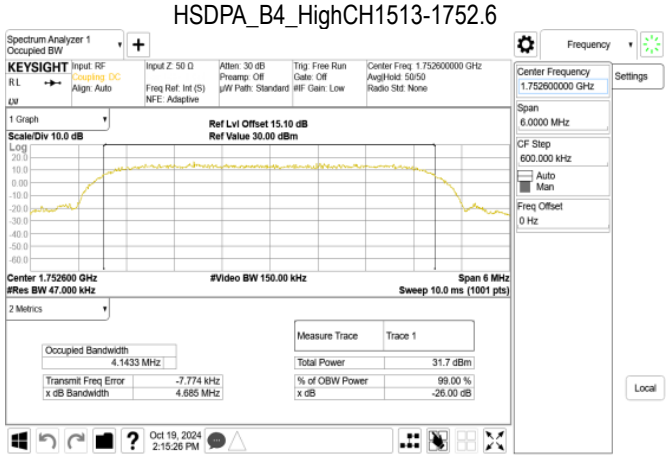
HSDPA_B4_HighCH1513-1752.6



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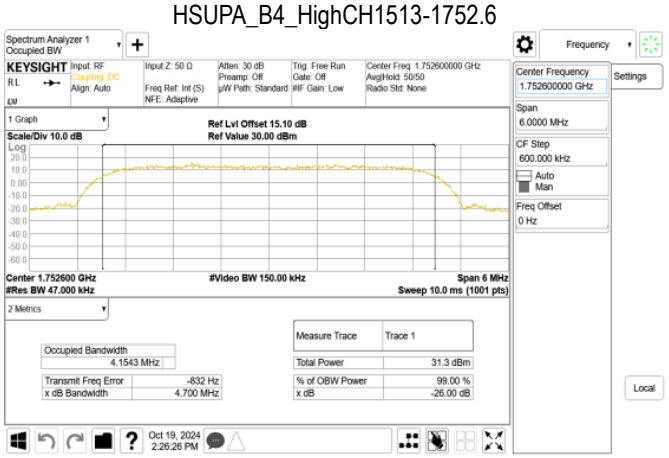

HSDPA_B4_LowCH1312-1712.4

HSUPA_B4_LowCH1312-1712.4

HSDPA_B4_MidCH1413-1732.6

HSUPA_B4_MidCH1413-1732.6

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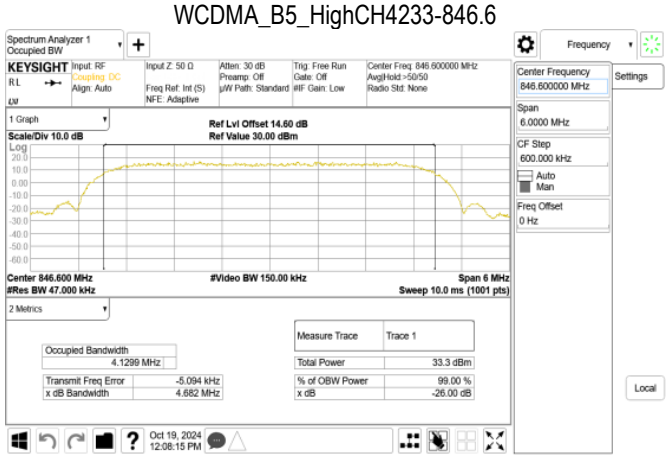
WCDMA_B5_HighCH4233-846.6



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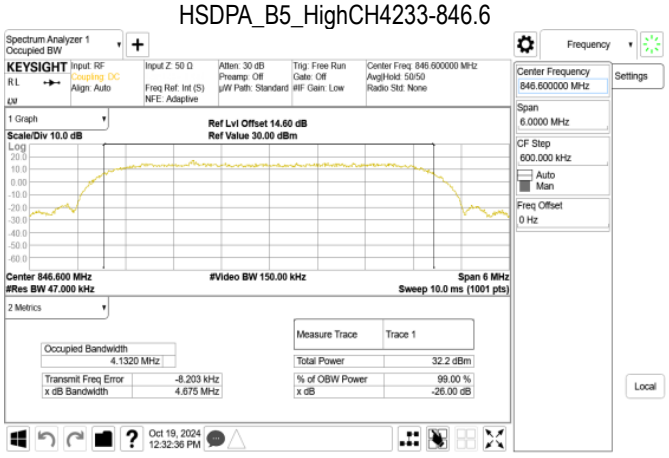

WCDMA_B5_LowCH4132-826.4

HSDPA_B5_LowCH4132-826.4

WCDMA_B5_MidCH4183-836.6

HSDPA_B5_MidCH4183-836.6

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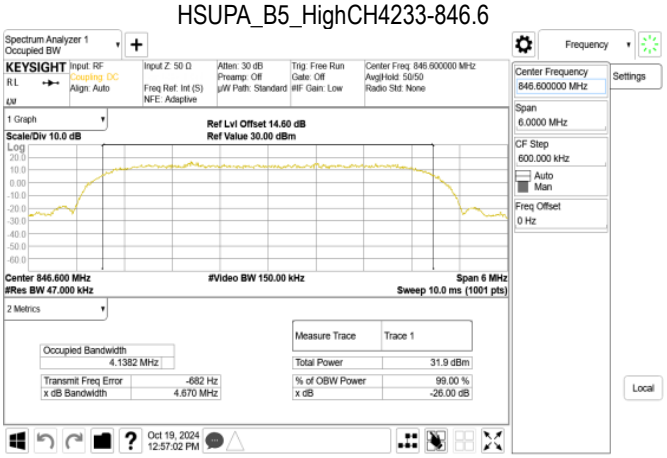
HSUPA_B5_HighCH4233-846.6



HSUPA_B5_LowCH4132-826.4

HSUPA_B5_MidCH4183-836.6

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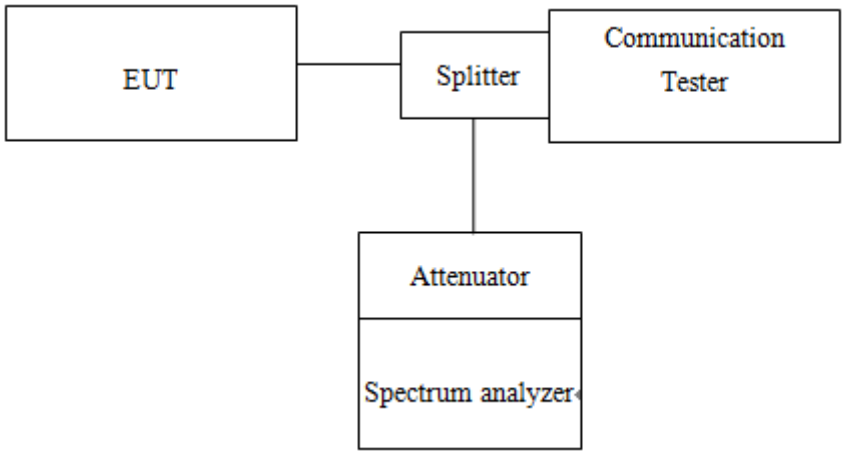
10 OUT OF BAND EMISSION AT ANTENNA TERMINALS

10.1 Standard Applicable

FCC §22.917(a), §24.238(a), §27.53(h)

Out of band emissions.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.

10.2 Test SET-UP



10.3 Measurement Procedure

10.3.1 Conducted Emission

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

1. To connect Antenna Port of EUT to Spectrum.
2. Set RBW = 1MHz & VBW = 1MHz on Spectrum.
3. Allow trace to fully stabilize
4. Repeat above procedures until all default test channel measured were complete.

10.3.2 Band Edge

1. To connect Antenna Port of EUT to Spectrum.
2. The band edge of low and high channels for the highest RF powers was measured. Setting RBW ≥ 1% EBW.
3. Allow trace to fully stabilize
4. Repeat above procedures until all default test channel measured were complete.

10.4 Measurement Result:

Refer to next pages.

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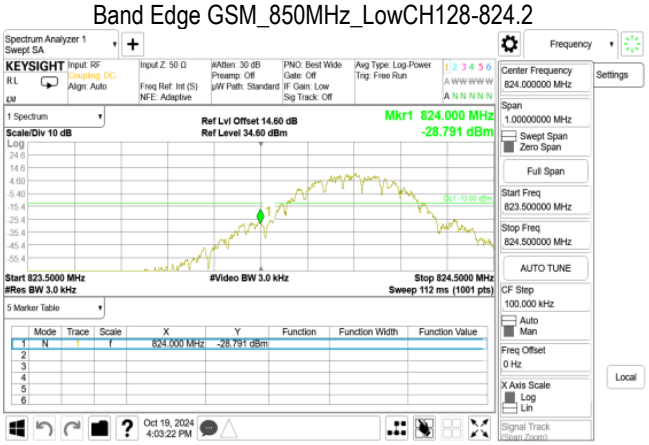
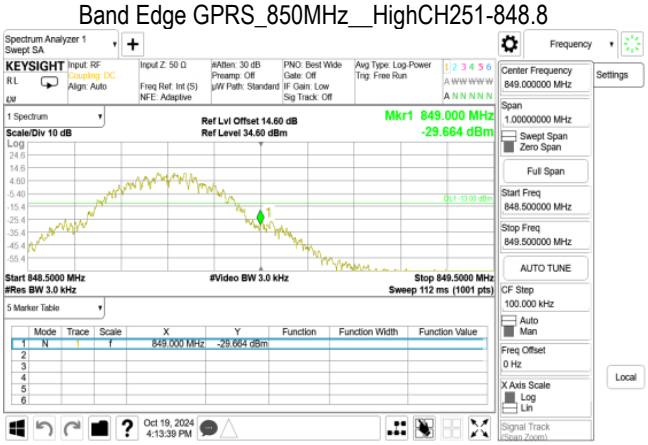
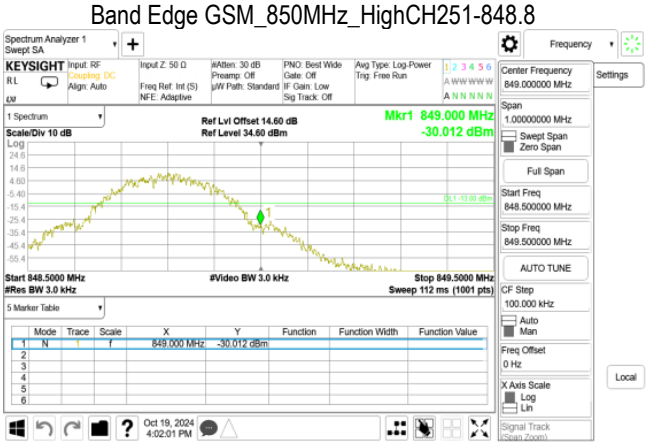
Band Edge GSM_850MHz_LowCH128-824.2



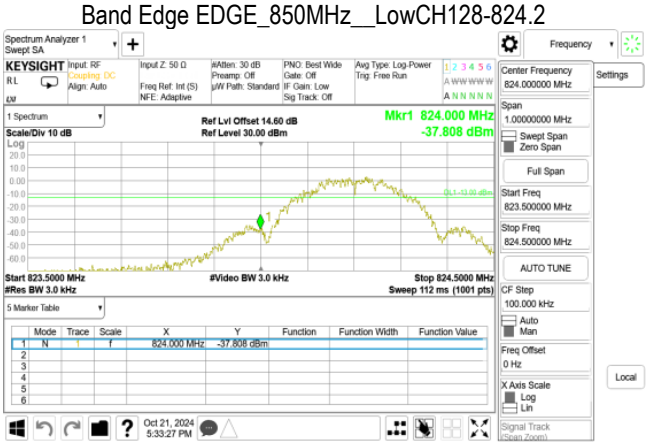
Band Edge GPRS_850MHz__HighCH251-848.8



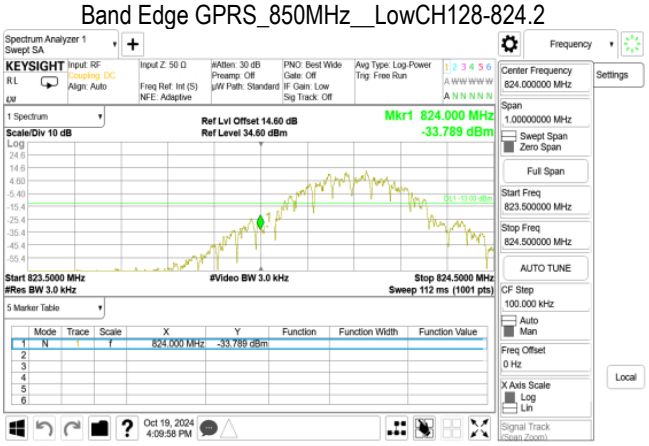
Band Edge GSM_850MHz_HighCH251-848.8



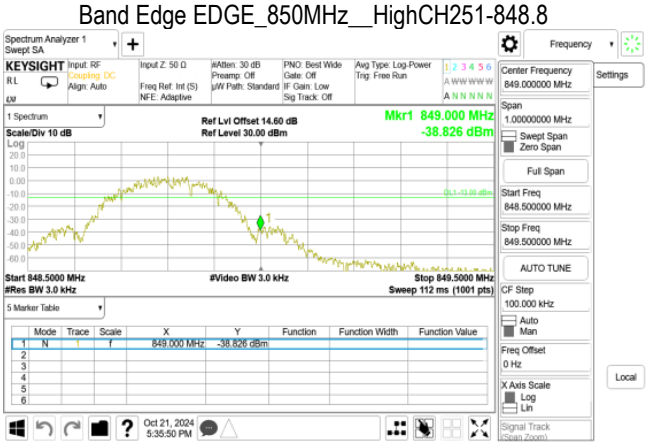
Band Edge EDGE_850MHz__LowCH128-824.2



Band Edge GPRS_850MHz__LowCH128-824.2



Band Edge EDGE_850MHz__HighCH251-848.8



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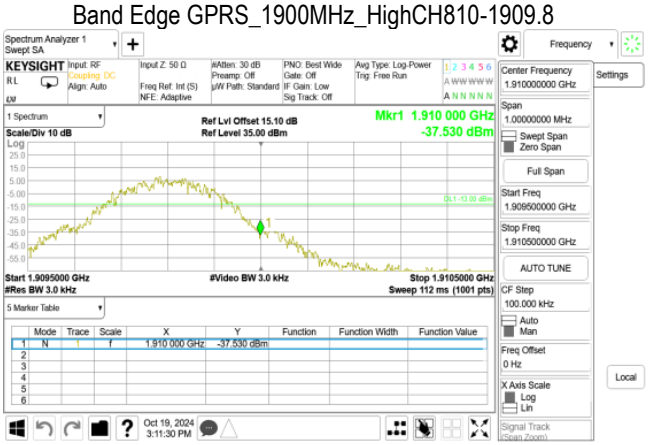
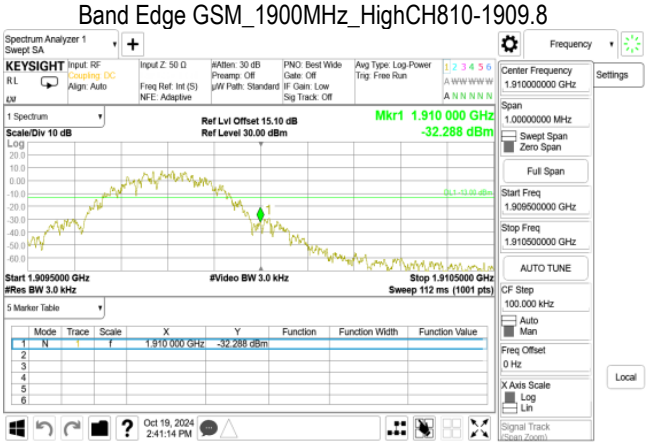
Band Edge GSM_1900MHz_LowCH512-1850.2

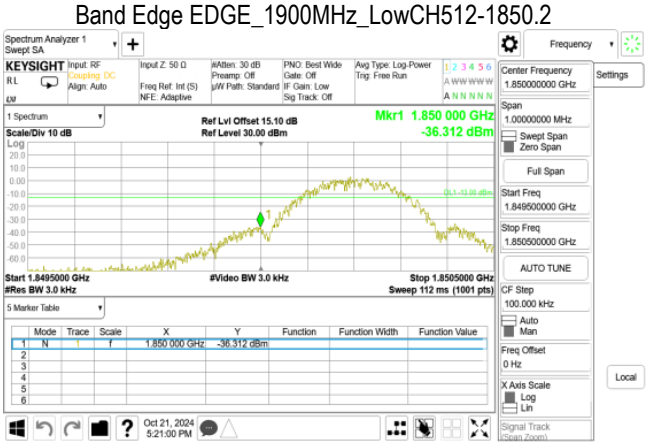
Band Edge GPRS_1900MHz_HighCH810-1909.8



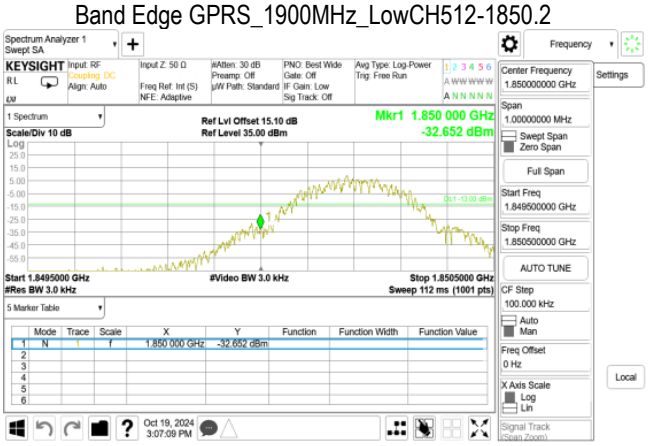
Band Edge GSM_1900MHz_HighCH810-1909.8



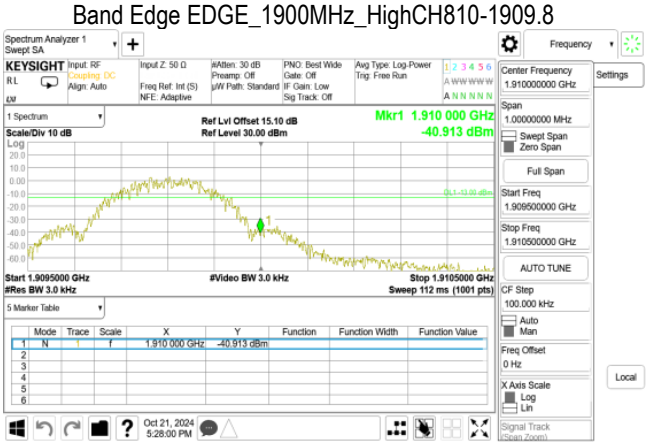
Band Edge EDGE_1900MHz_LowCH512-1850.2



Band Edge GPRS_1900MHz_LowCH512-1850.2



Band Edge EDGE_1900MHz_HighCH810-1909.8



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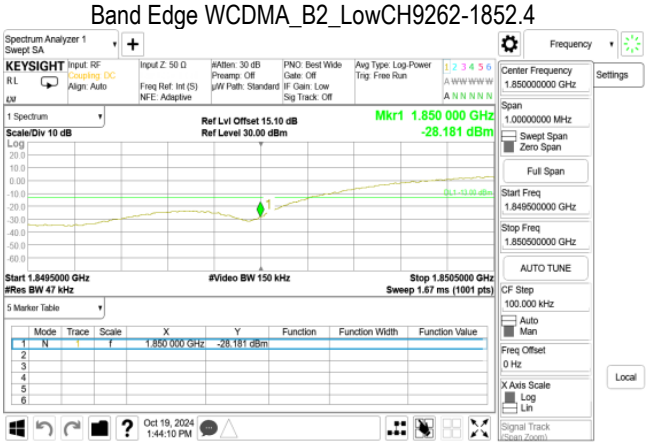
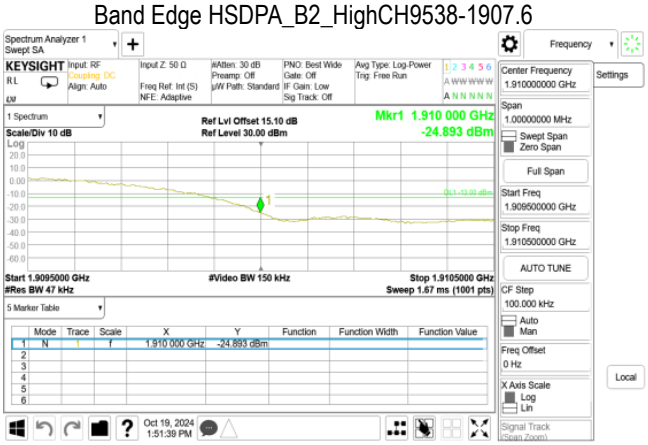
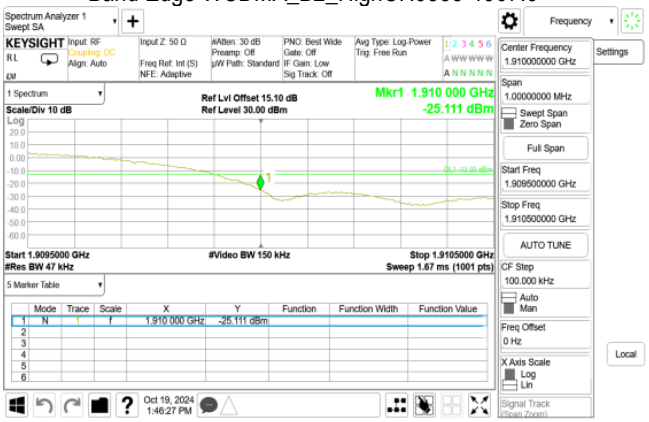
Band Edge WCDMA_B2_LowCH9262-1852.4



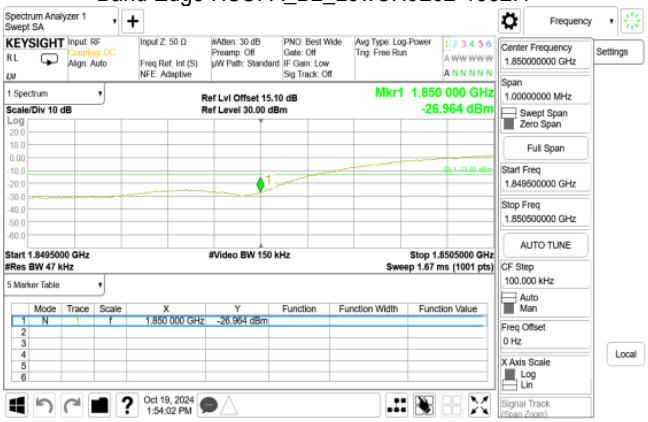
Band Edge HSDPA_B2_HighCH9538-1907.6



Band Edge WCDMA_B2_HighCH9538-1907.6



Band Edge HSUPA_B2_LowCH9262-1852.4



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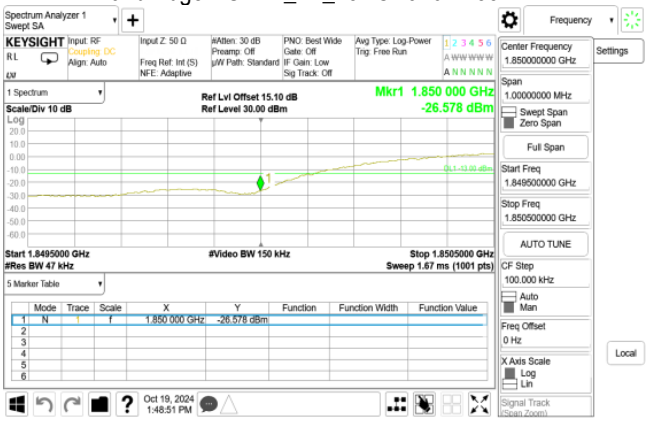

Band Edge HSUPA_B2_HighCH9538-1907.6

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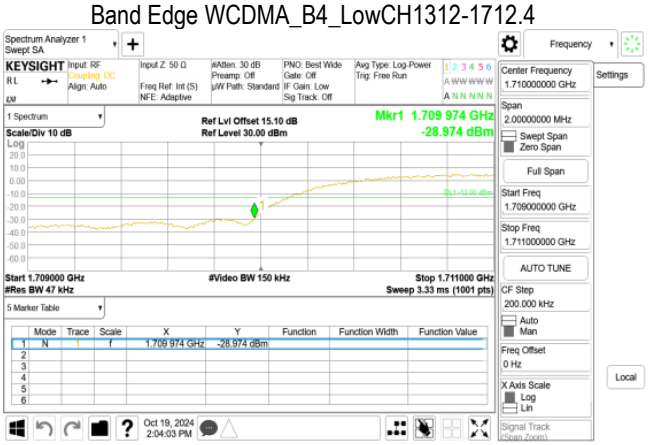
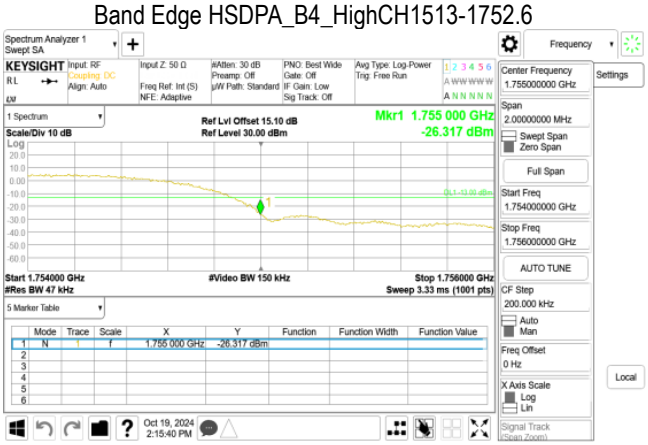
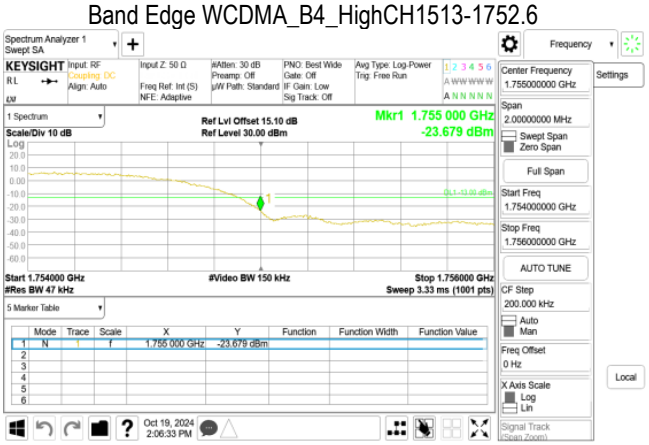
Band Edge WCDMA_B4_LowCH1312-1712.4



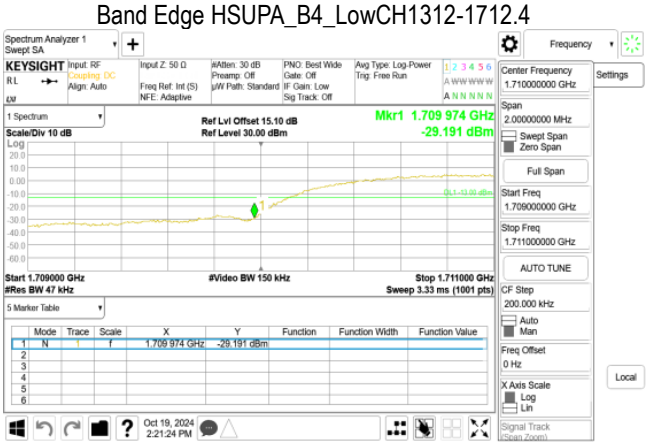
Band Edge HSDPA_B4_HighCH1513-1752.6



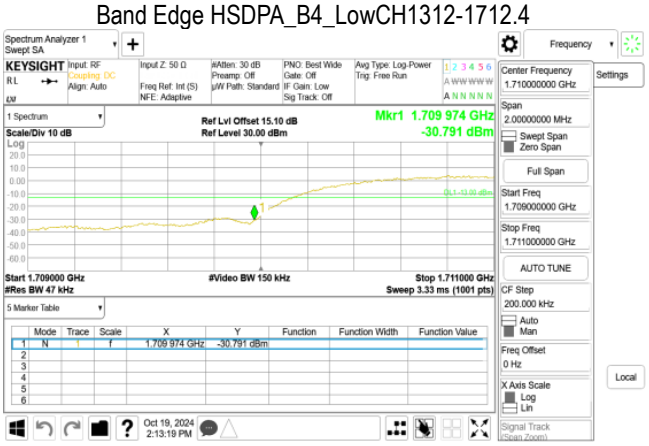
Band Edge WCDMA_B4_HighCH1513-1752.6



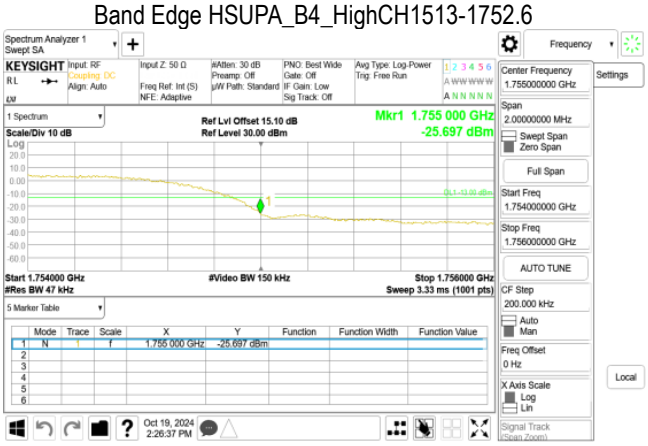
Band Edge HSUPA_B4_LowCH1312-1712.4



Band Edge HSDPA_B4_LowCH1312-1712.4



Band Edge HSUPA_B4_HighCH1513-1752.6



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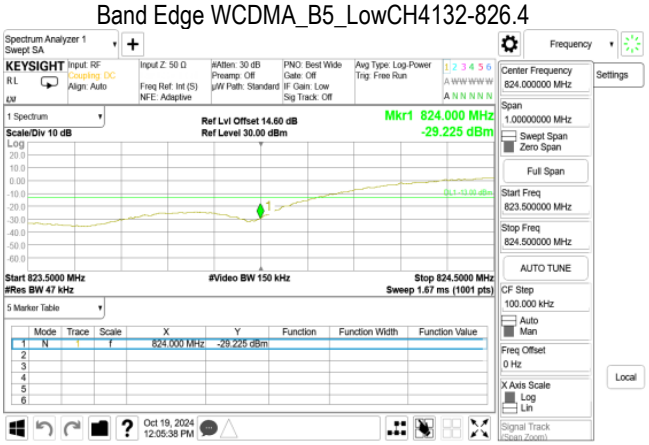
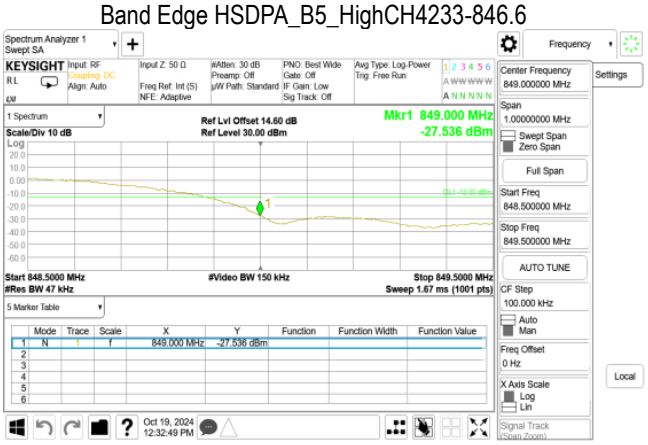
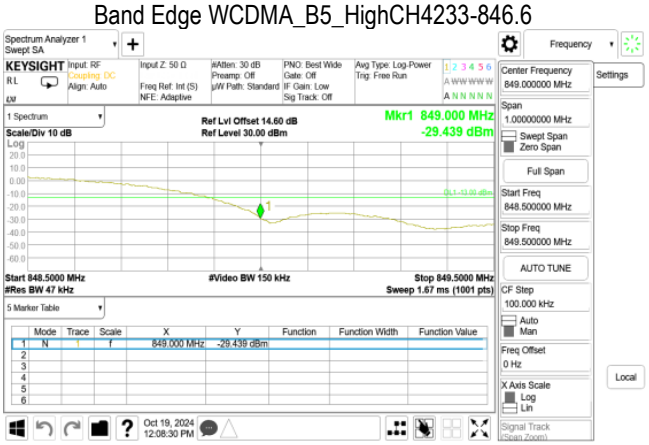
Band Edge WCDMA_B5_LowCH4132-826.4



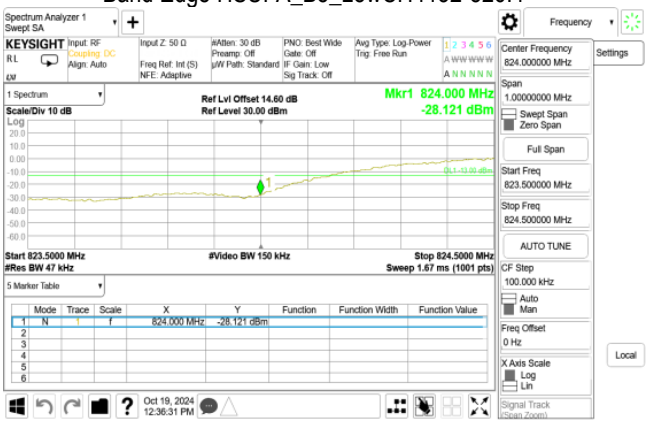
Band Edge HSDPA_B5_HighCH4233-846.6



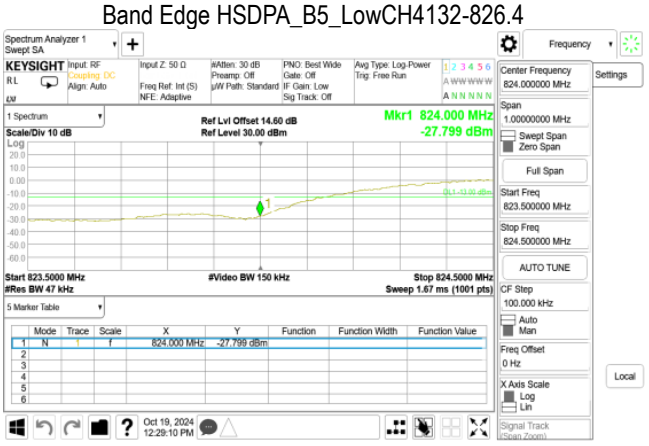
Band Edge WCDMA_B5_HighCH4233-846.6



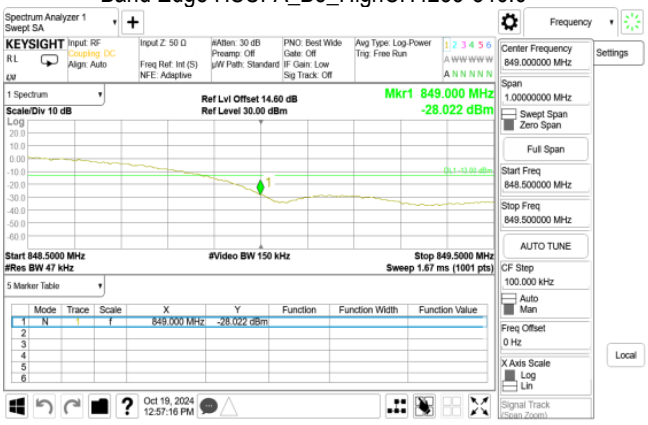
Band Edge HSUPA_B5_LowCH4132-826.4



Band Edge HSDPA_B5_LowCH4132-826.4



Band Edge HSUPA_B5_HighCH4233-846.6



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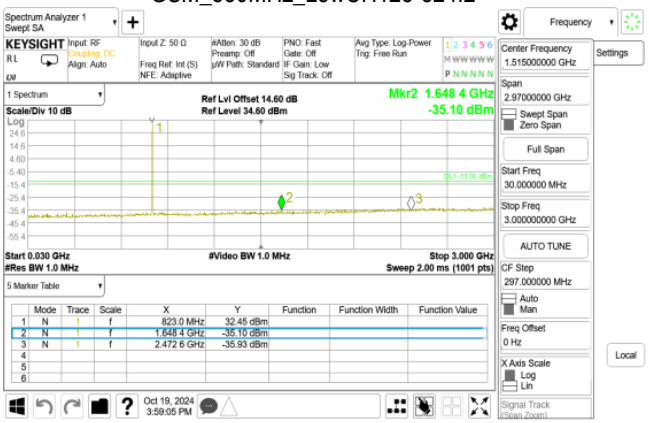
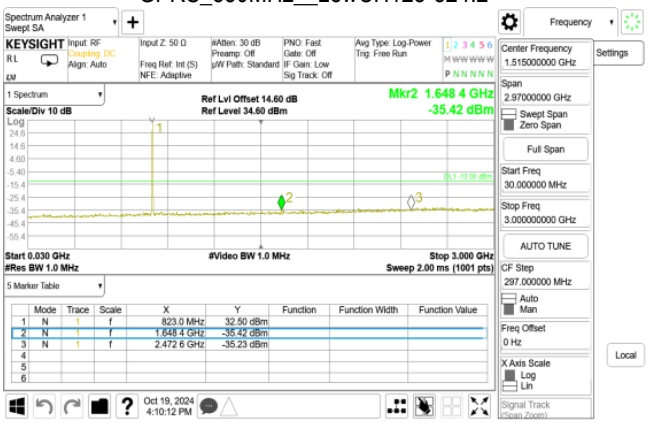
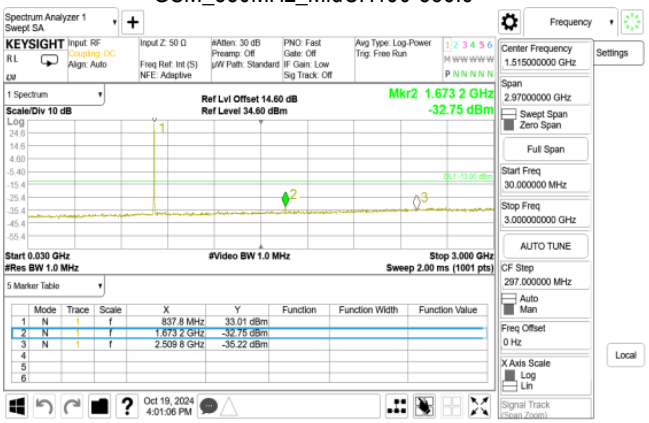
GSM_850MHz_LowCH128-824.2



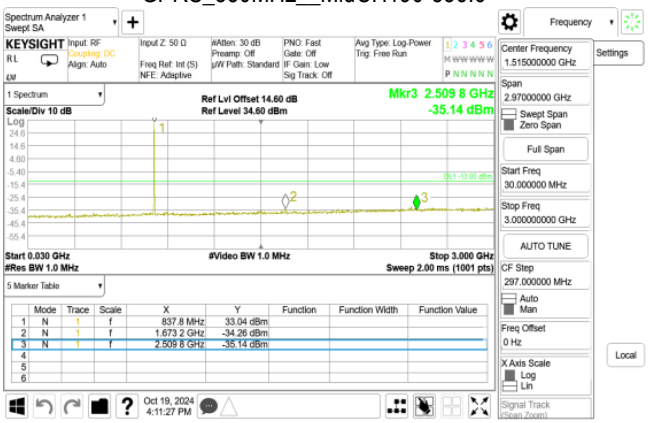
GPRS_850MHz__LowCH128-824.2



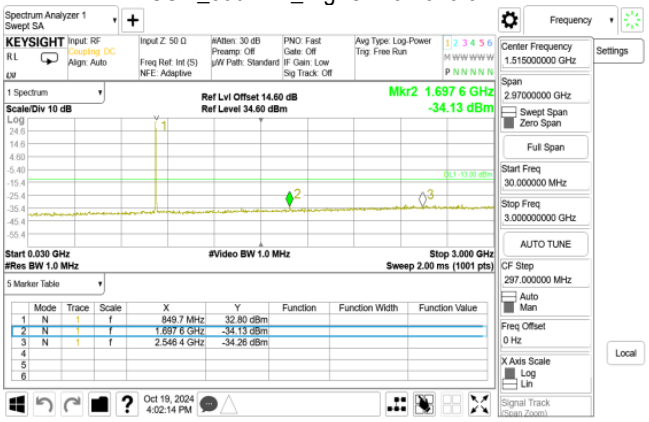
GSM_850MHz_MidCH190-836.6



GPRS_850MHz__MidCH190-836.6



GSM_850MHz_HighCH251-848.8



GPRS_850MHz__HighCH251-848.8

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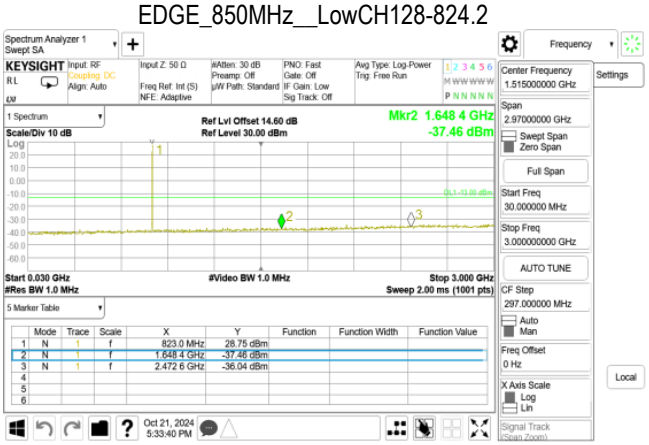
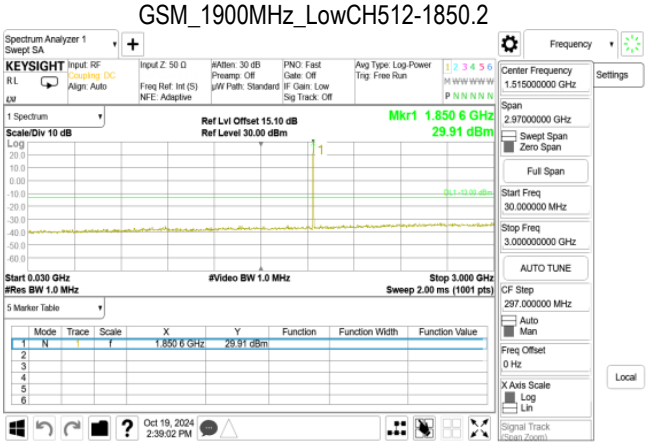
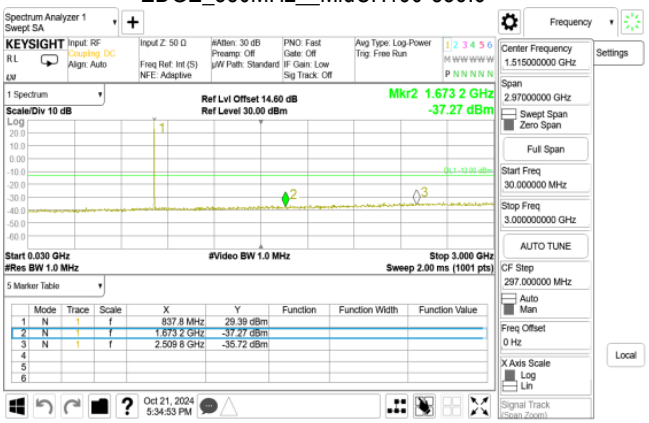
EDGE_850MHz__LowCH128-824.2



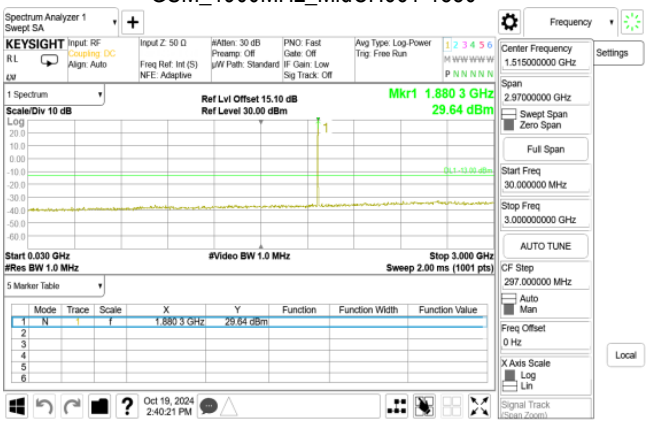
GSM_1900MHz_LowCH512-1850.2



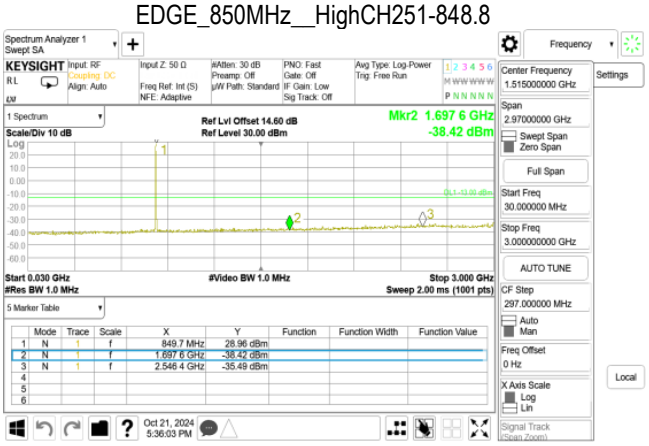
EDGE_850MHz__MidCH190-836.6



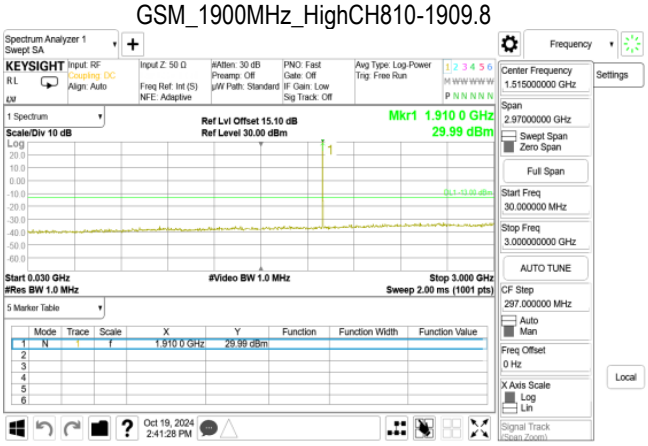
GSM_1900MHz_MidCH661-1880



EDGE_850MHz__HighCH251-848.8



GSM_1900MHz_HighCH810-1909.8



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