RF TEST REPORT

FCC ID: 2A7DX-A200PRO

Product Name	:	Smart phone
Test Model	:	A200 Pro
Brand Name	:	Blackview
Applicant	:	DOKE COMMUNICATION (HK) LIMITED
Address	:	RM 1902 EASEY COMM BLDG 253-261 HENNESSY ROAD WANCHAI HK CHINA
Date of Receipt	:	2023.11.14
Date of Test	:	2023.11.14~2023.12.12
Issued Date	:	2023.12.18
Report Version	:	V1.0
Test Sample	:	Engineering Sample No.: AIT23111403-1
Standard(s)	:	FCC Part 22H & 24E Rules; ANSI C63.26:2015

Lab:Dongguan Yaxu (AiT) Technology Limited
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This device described above has been tested by Dongguan Yaxu (AiT) Technology Limited and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Reviewed by: Simba Huang

Simba huang

Approved by: Seal Chen

Seal Chen

REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	2023.12.18	Valid	Initial Release

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1. GENERAL INFORMATION

Manufacturer	Shenzhen DOKE Electronic Co., Ltd
Address	801, Building3, 7th Industrial Zone, Yulv Community, Yutang Road, Guangming District, Shenzhen, China.
Product Designation	Smart phone
Test Model	A200 Pro
Serial model	N/A
Model Different	N/A
Brand Name	Blackview
Deviation	No any deviation from the test method.
Condition of Test Sample	Normal
Test Result	Pass

Note:

For a more detailed features description, please refer to the manufacturer’s specifications or the User's Manual.

2. PRODUCT INFORMATION

2.1 PRODUCT TECHNICAL DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	Smart phone		
Hardware Version:	M186 V1.0		
Software Version:	A200_Pro_ NEU_ M9902A_ V1.0		
Support Networks:	GSM,GPRS, EDGE, WCDMA, HSDPA, HSUPA		
Frequency Bands:	☒GSM 850 ☒PCS1900 (U.S. Bands) ☐GSM 900 ☐DCS 1800 (Non-U.S. Bands) ☒UMTS FDD Band II ☐UMTS FDD Band IV ☒UMTS FDD Band V (U.S. Bands) ☐UMTS FDD Band I ☐UMTS FDD Band VIII (Non-U.S. Bands)		
Type of Modulation:	GMSK,8PSK Modulation For GSM/GPRS/EDGE		
	BPSK,QPSK Modulation For WCDMA/HSDPA/HSUPA		
Frequency Range:	GSM/GPRS/EDGE 850: 824.2MHz-848.8 MHz		
	GSM/GPRS/EDGE 1900: 1850.2MHz-1909.8 MHz		
	WCDMA Band II: 1852.4MHz-1907.6 MHz		
	WCDMA Band V: 826.4-846.6 MHz		
Antenna Type:	FPC Antenna		
Antenna gain:	GSM850:-1.29dBi	PCS1900:1.83dBi	
	WCDMA850:-1.29dBi	WCDMA 1900: 1.83dBi	
Power Supply:	DC 3.87V 5050mAh by Built-in Li-ion Battery		
Dual Card:	GSM /WCDMA Card Slot		
Extreme Vol. Limits:	DC 3.42V to 4.18V (Normal: DC 3.87V)		
Extreme Temp. Tolerance	-10 °C to +50 °C		
Temperature range:	0℃ to +30℃		

GSM/WCDMA SLOT 1:

	Maximum ERP/EIRP (dBm)	Max. Average Burst Power (dBm)
GSM850	29.19	32.63
PCS 1900	31.09	29.26
UMTS BAND V	19.55	22.99
UMTS BAND II	23.72	21.89

GSM/WCDMA SLOT 2:

	Maximum ERP/EIRP (dBm)	Max. Average Burst Power (dBm)
GSM 850	28.14	31.58
PCS 1900	30.79	28.96
UMTS BAND V	17.49	20.93
UMTS BAND II	25.37	25.37

2.2 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	ANSI C63.26-2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
5	ANSI/TIA-603-E-2016	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
6	KDB 971168	D01 v03r01 Measurement Guidance For Certification Of Licensed Digital Transmitters.

2.3 DEVICE CAPABILITIES

850/1900 GSM/GPRS/EGPRS,850/1900 WCDMA/HSPA, Multi-Band LTE,802.11 b/g/nfor WLAN,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.

2.4 SPECIAL ACCESSORIES

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

2.5 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

3.TEST ENVIRONMENT

3.1 ADDRESS OF THE TEST LABORATORY

Company:	Dongguan Yaxu (AiT) Technology Limited
Address:	No.22, Jinqianling 3rd Street, Jitigang, Huangjiang,Dongguan, Guangdong, China
CNAS Registration Number:	CNAS L14158
A2LA Registration Number:	6317.01
FCC Accredited Lab. Designation Number:	CN1313
FCC Test Firm Registration Number:	703111

3.3 ENVIRONMENTAL CONDITIONS

	NORMAL CONDITIONS	EXTREME CONDITIONS
Temperature range	15~35℃	-10℃~50℃
Humidty range	20 % to 75 %.	20 % to 75 %.
Pressure range	86-106kPa	86-106kPa
Power supply	**DC 3.87V**	DC 3.483V or 4.257V
Note: The Extreme Temperature and Extreme Voltages declared by the manufacturer.		

3.4 MEASUREMENT UNCERTAINTY

Test	Measurement Uncertainty	Notes
Transmitter power conducted	±0.57 dB	(1)
Transmitter power Radiated	±2.20 dB	(1)
Conducted spurious emission 9KHz-40 GHz	±2.20 dB	(1)
Occupied Bandwidth	±0.01ppm	(1)
Radiated Emission 30~1000MHz	±4.10dB	(1)
Radiated Emission Above 1GHz	±4.32dB	(1)
Conducted Disturbance0.15~30MHz	±3.20dB	(1)
Radio Frequency	± 6.5 x 10-8	(1)
RF Power, Conducted	± 0.9 dB	(1)

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

3.5 LIST OF TEST EQUIPMENT

No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	Spectrum Analyzer	R&S	FSV40	101470	2023.09.08	2024.09.07
2	EMI Measuring Receiver	R&S	ESR	101160	2023.09.08	2024.09.07
3	Low Noise Pre Amplifier	HP	HP8447E	AiT-F01319	2023.09.08	2024.09.07
4	Low Noise Pre Amplifier	Tsj	MLA-0120-A02-34	2648A04738	2023.09.08	2024.09.07
5	Passive Loop	ETS	6512	00165355	2022.09.04	2024.09.03
6	TRILOG Super Broadband test Antenna	SCHWARZBECK	VULB9160	9160-3206	2021.08.29	2024.08.28
7	Broadband Horn Antenna	SCHWARZBECK	BBHA9120D	452	2021.08.29	2024.08.28
8	SHF-EHF Horn Antenna 15-40GHz	SCHWARZBECK	BBHA9170	BBHA9170367d	2020.11.24	2023.11.23
9	EMI Test Receiver	R&S	ESCI	100124	2023.09.08	2024.09.07
10	LISN	Kyoritsu	KNW-242	8-837-4	2023.09.08	2024.09.07
11	LISN	R&S	ESH3-Z5	892785/016	2023.09.08	2024.09.07
12	Pro.Temp&Humi.chamber	MENTEK	MHP-150-1C	MAA08112501	2023.09.08	2024.09.07
13	RF Automatic Test system	MW	MW100-RFCB	21033016	2023.09.08	2024.09.07
14	Signal Generator	Agilent	N5182A	MY50143009	2023.09.08	2024.09.07
15	Wideband Radio communication tester	R&S	CMW500	1201.0002K50	2023.09.08	2024.09.07
16	RF Automatic Test system	MW	MW100-RFCB	21033016	2023.09.08	2024.09.07
17	DC power supply	ZHAOXIN	RXN-305D-2	28070002559	N/A	N/A
18	RE Software	EZ	EZ-EMC_RE	Ver.AIT-03A	N/A	N/A
19	CE Software	EZ	EZ-EMC_CE	Ver.AIT-03A	N/A	N/A
20	RF Software	MW	MTS 8310	2.0.0.0	N/A	N/A
21	temporary antenna	NTS	R001	N/A	N/A	N/A

	connector(Note)					
22	Pulse Limiter	R&S	ESH3-Z2	03578810.54	2023.09.08	2024.09.07
23	Switch	MFJ Rhinos	MFJ-2702	CZ3457	2023.09.08	2024.09.07
Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.						

4. SYSTEM TEST CONFIGURATION

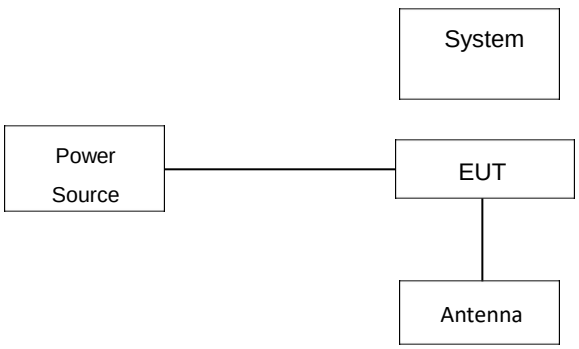
4.1 EUT CONFIGURATION

The EUTconfiguration 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



This example is connection diagram of EUT test configurations.

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

Item	Equipment	Model No.	Identifier	Note
1	Smart phone	A200 Pro	--	EUT
2	Adapter	N/A	N/A	EUT
3	USB Cable	N/A	N/A	AE

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 andHarmonic Emissions at Antenna Terminal	§2.1051, §22.917(a), §24.238(a)	Pass
5	Conducted Output Power	§2.1046	Pass
6	Frequency stability / variation of ambient temperature	§2.1055, § 22.355, §24.235	Pass
7	Peak- to- Average Ratio	§24.232(d)	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)	Pass
3	Radiated Spurious and Harmonic Emissions	§2.1053, §22.917(a), §24.238(a),	Pass

Note:

1.The measurement uncertainty is not included in the test result.

2.Antenna gain values are provided by the customer and are not claimed by the laboratory.

6. DESCRIPTION OF TEST MODES

Bands	Tx/Rx Frequency	RF Channel		
		Low(L)	Middle(M)	High(H)
GSM/GPRS/ EDGE850	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

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/V	RMC 12.2kbps Link	RMC 12.2kbps Link

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_ 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.

7. OUTPUT POWER

7.1 LIMIT

The substitution method, in ANSI/TIA-603-E-2016, was used for ERP/EIRP measurement, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v03. The ERP of mobile transmitters must not exceed 7 Watts (Cellular Band) and the EIRP of mobile transmitters are limited to 2 Watts (PCS Band).

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 V	< 7 Watts max. ERP (38.45dBm)

7.2 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)

7.3 MEASUREMENT METHOD

- 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 othermodulation 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.

The relevant equation for determining the ERP or EIRP from the conducted RF output power measured using the guidance provided above is:

ERP/EIRP = SGLevel -Pcl +Ga

where:

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

SGLevel = Signal generator output power or PSD, in dBm or dBW;

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

Pcl = signal attenuation in the connecting cable between the transmitter and antenna.

The EUT is substituted for the dipole at the reference centre of the chamber and a scan is performed to obtain the radiation pattern.

From the radiation pattern, the co-ordinates where the maximum antenna gain occurs are identified.

The EUT is then put into continuously transmitting mode at its maximum power level. Power mode measurements are performed with the receiving antenna placed at the coordinates determined in Step 3 to determine the output power as defined in Rule 24.232 (b) and (c). The "reference path loss" from Step1 is added to this result.

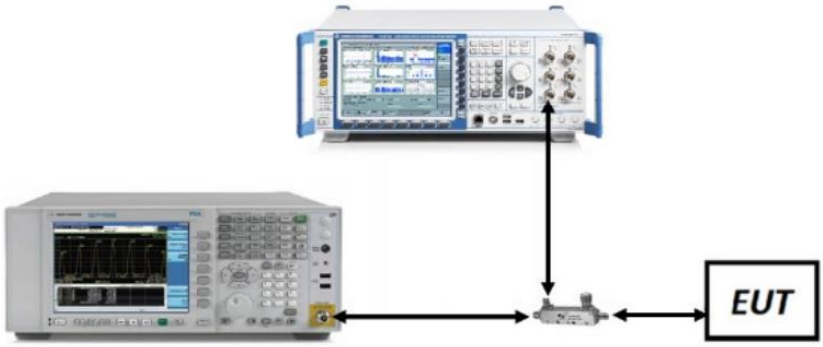
This value is EIRP since the measurement is calibrated using a half-wave dipole antenna of known gain (2.15 dBi) and known input power (Pin).

ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi.

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

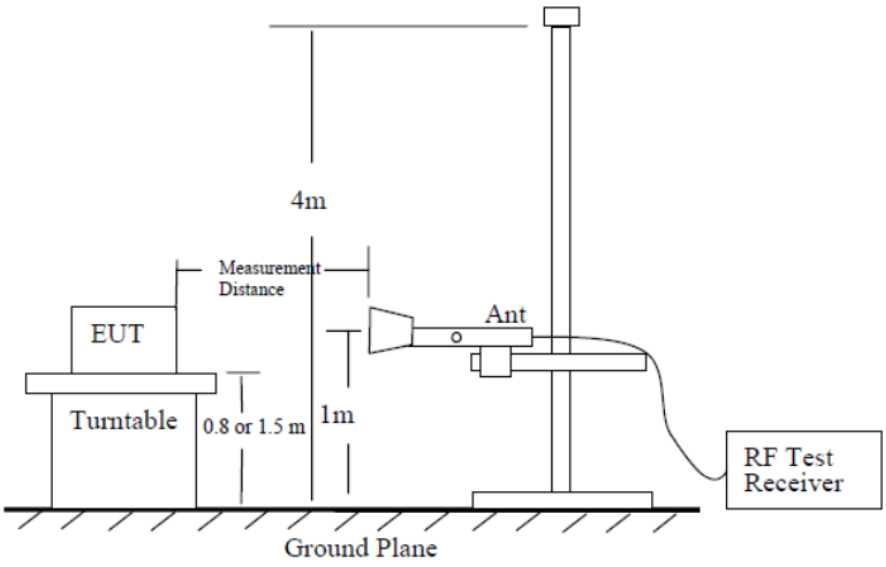
7.4 MEASUREMENT SETUP

Conducted method:

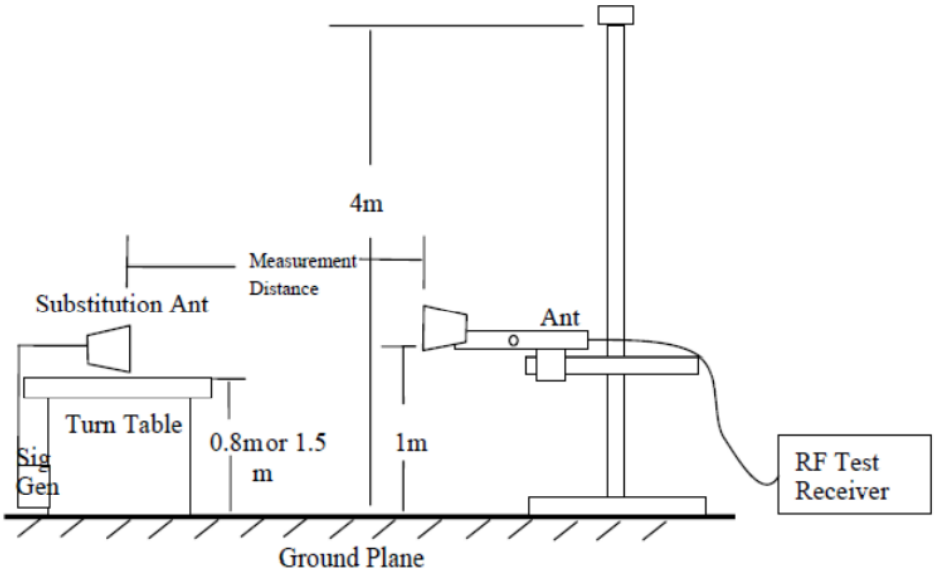


Radiated method:

Test site-up for radiated ERP and/or EIRP measurements



Substitution method set-up for radiated emission



7.5 MEASUREMENT RESULT

GSM850		Tune-up	Conducted Power (dBm)			ERP (dBm)		
			Channel 128	Channel 190	Channel 251	Channel 128	Channel 190	Channel 251
			824.2 MHz	836.6 MHz	848.8 MHz	824.2 MHz	836.6 MHz	848.8 MHz
GSM		**32±2dB**	32.56	32.61	32.63	29.12	29.17	29.19
GPRS (GMSK)	1 Tx Slot	34.00	32.59	32.64	32.72	29.15	29.2	29.28
	2 Tx Slot	32.00	30.53	30.53	30.60	27.09	27.09	27.16
	3 Tx Slot	31.00	28.48	28.49	28.65	25.04	25.05	25.21
	4 Tx Slot	30.00	26.21	26.24	26.43	22.77	22.8	22.99
EDGE (8PSK)	1 Tx Slot	29.00	24.87	24.89	25.10	21.43	21.45	21.66
	2 Tx Slot	28.00	23.66	23.69	23.93	20.22	20.25	20.49
	3 Tx Slot	26.00	21.54	21.74	21.93	18.1	18.3	18.49
	4 Tx Slot	25.00	19.23	19.43	19.65	15.79	15.99	16.21

GSM1900		Tune-up	Conducted Power (dBm)			EIRP (dBm)		
			Channel 512	Channel 661	Channel 810	Channel 512	Channel 661	Channel 810
			1850.2 (MHz)	1880 (MHz)	1909.8 (MHz)	1850.2 (MHz)	1880 (MHz)	1909.8 (MHz)
GSM		**30±2dB**	28.9	29.13	29.26	30.73	30.96	31.09
GPRS (GMSK)	1 Tx Slot	31.00	28.65	28.89	29.02	30.48	30.72	30.85
	2 Tx Slot	29.00	26.43	26.64	26.58	28.26	28.47	28.41
	3 Tx Slot	28.00	24.82	25.03	24.92	26.65	26.86	26.75
	4 Tx Slot	27.00	22.76	22.96	22.82	24.59	24.79	24.65
EDGE (8PSK)	1 Tx Slot	26.00	26.85	26.42	26.24	28.68	28.25	28.07
	2 Tx Slot	25.00	25.20	24.90	24.65	27.03	26.73	26.48
	3 Tx Slot	24.00	23.40	23.06	22.84	25.23	24.89	24.67
	4 Tx Slot	23.00	21.17	20.96	20.73	23.00	22.79	22.56

WCDMA Band II	Max.	Conducted power			EIRP		
Tx Channel	Tune-up	9262	9400	9538	9262	9400	9538
Frequency	Power	1852.4MHz	1880MHz	1907.6MHz	1852.4MHz	1880MHz	1907.6MHz
RMC 12.2K	24+1/-3	21.89	21.85	21.77	23.72	23.68	23.6
HSDPA+ Subtest-1	24+1/-3	21.55	21.59	21.82	23.38	23.42	23.65
HSDPA+ Subtest-2	24+1/-3	21.72	21.66	21.74	23.55	23.49	23.57
HSDPA+ Subtest-3	24+1/-3	21.76	21.53	21.82	23.59	23.36	23.65
HSDPA+ Subtest-4	24+1/-3	21.61	21.63	21.66	23.44	23.46	23.49
HSUPA Subtest-1	24+1/-3	21.59	21.29	21.39	23.42	23.12	23.22
HSUPA Subtest-2	24+1/-3	21.48	21.44	21.40	23.31	23.27	23.23
HSUPA Subtest-3	24+1/-3	21.62	21.48	21.51	23.45	23.31	23.34
HSUPA Subtest-4	24+1/-3	21.44	21.60	21.31	23.27	23.43	23.14
HSUPA Subtest-5	24+1/-3	21.24	21.46	21.33	23.07	23.29	23.16

WCDMA Band V	Max.	Conducted power			ERP		
Tx Channel	Tune-up	4132	4182	4233	4132	4182	4233
Frequency	Power	826.4 MHz	836.4MHz	846.6 MHz	826.4 MHz	836.4MHz	846.6 MHz
RMC 12.2K	24+1/-3	22.99	22.53	22.24	19.55	19.09	18.8
HSDPA+ Subtest-1	24+1/-3	22.77	22.77	23.03	19.33	19.33	19.59
HSDPA+ Subtest-2	24+1/-3	22.84	23.01	22.84	19.4	19.57	19.4
HSDPA+ Subtest-3	24+1/-3	22.93	23.00	23.01	19.49	19.56	19.57
HSDPA+ Subtest-4	24+1/-3	22.97	23.06	23.05	19.53	19.62	19.61
HSUPA Subtest-1	24+1/-3	22.62	22.73	22.86	19.18	19.29	19.42
HSUPA Subtest-2	24+1/-3	22.97	22.64	22.74	19.53	19.2	19.3
HSUPA Subtest-3	24+1/-3	22.80	22.80	22.83	19.36	19.36	19.39
HSUPA Subtest-4	24+1/-3	22.66	22.62	22.81	19.22	19.18	19.37
HSUPA Subtest-5	24+1/-3	22.67	22.68	22.60	19.23	19.24	19.16

8. PEAK-TO-AVERAGE RATIO

8.1 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.

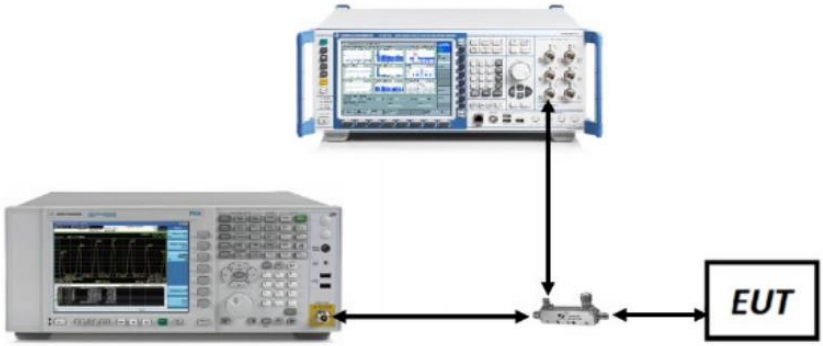
8.2 MEASUREMENT METHOD

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) = PPk (dBm) – PAvg (dBm) (PAvg = Average Power + Duty cycle Factor)

8.3 MEASUREMENT SETUP



8.4 MEASUREMENT RESULT

Bands	Modulation	Peak-to-average ratio (dB)			Limit	Result
		Lowest	Middle	Highest	(dB)	
GSM 850	GSM	2.00	2.15	2.00	13	Pass
	EDGE	4.61	5.21	4.61	13	Pass
PCS 1900	GSM	1.97	1.50	1.97	13	Pass
	EDGE	4.36	3.90	4.36	13	Pass
WCDMA Band II	RMC 12.2kbps	2.16	2.31	2.16	13	Pass
WCDMA Band II	HSUPA	3.79	3.44	3.79	13	Pass
WCDMA Band II	HSDPA	2.07	2.45	2.07	13	Pass
WCDMA Band V	RMC 12.2kbps	2.13	1.74	2.13	13	Pass
WCDMA Band V	HSUPA	2.65	2.65	2.65	13	Pass
WCDMA Band V	HSDPA	1.25	2.17	1.25	13	Pass

9. OCCUPIED BANDWIDTH

9.1 PROVISIONS APPLICABLE

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emittedare 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.

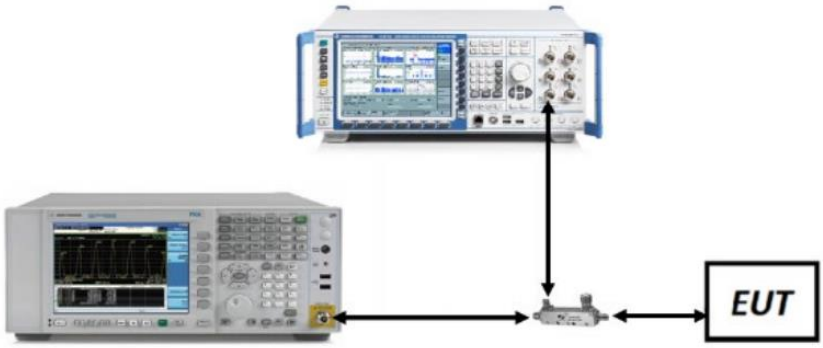
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base stationand spectrum analyzer.

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

9.2 MEASUREMENT METHOD

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

9.3 MEASUREMENT SETUP



9.4 MEASUREMENT RESULT

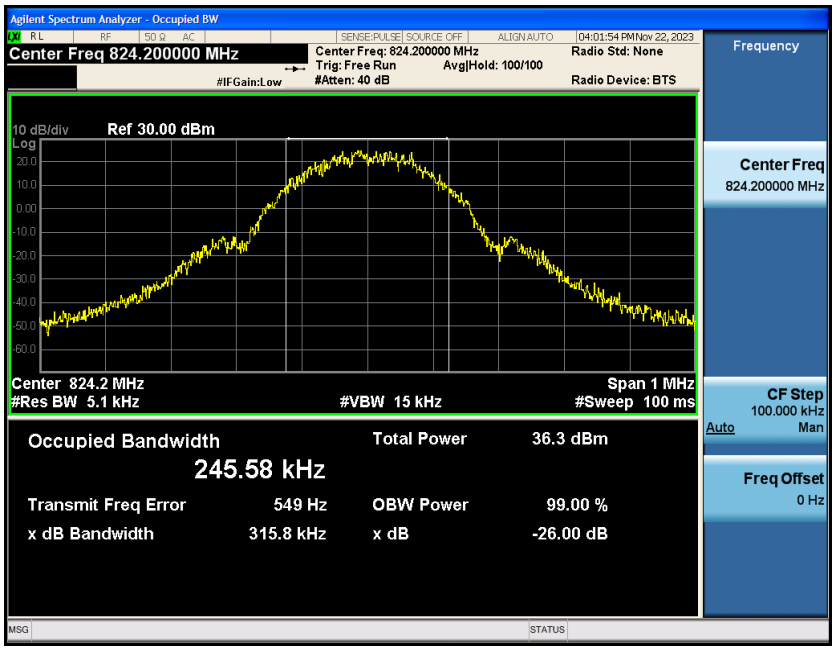
Band	Channel	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Limit (MHz)	Verdict
GSM850	128	0.24558	0.3158	---	PASS
GSM850	190	0.24547	0.3104	---	PASS
GSM850	251	0.24498	0.3083	---	PASS
GPRS850	128	0.24246	0.3157	---	PASS
GPRS850	190	0.24563	0.3149	---	PASS
GPRS850	251	0.24310	0.3118	---	PASS
EGPRS850	128	0.24774	0.3107	---	PASS
EGPRS850	190	0.25032	0.3199	---	PASS
EGPRS850	251	0.25070	0.3143	---	PASS
GSM1900	512	0.24699	0.3144	---	PASS
GSM1900	661	0.24532	0.2961	---	PASS
GSM1900	810	0.24551	0.3123	---	PASS
GPRS1900	512	0.24618	0.3056	---	PASS
GPRS1900	661	0.24387	0.3131	---	PASS
GPRS1900	810	0.24433	0.3072	---	PASS
EGPRS1900	512	0.24751	0.3106	---	PASS
EGPRS1900	661	0.24883	0.3193	---	PASS
EGPRS1900	810	0.24721	0.3177	---	PASS

Band	Channel	Occupied Bandwidth (kHz)	26dB Bandwidth (kHz)	Limit(kHz)	Verdict
Band II	9262	4.1636	4.689	---	PASS
Band II	9400	4.1613	4.703	---	PASS
Band II	9538	4.1631	4.693	---	PASS
Band V	4132	4.1769	4.692	---	PASS
Band V	4182	4.1632	4.684	---	PASS
Band V	4233	4.1601	4.681	---	PASS

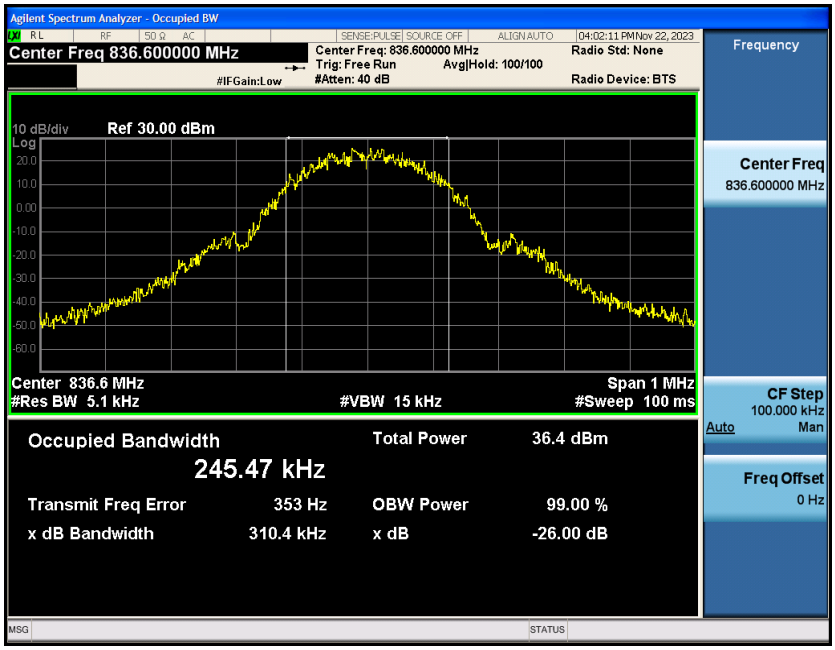
Test Graphs

GSM

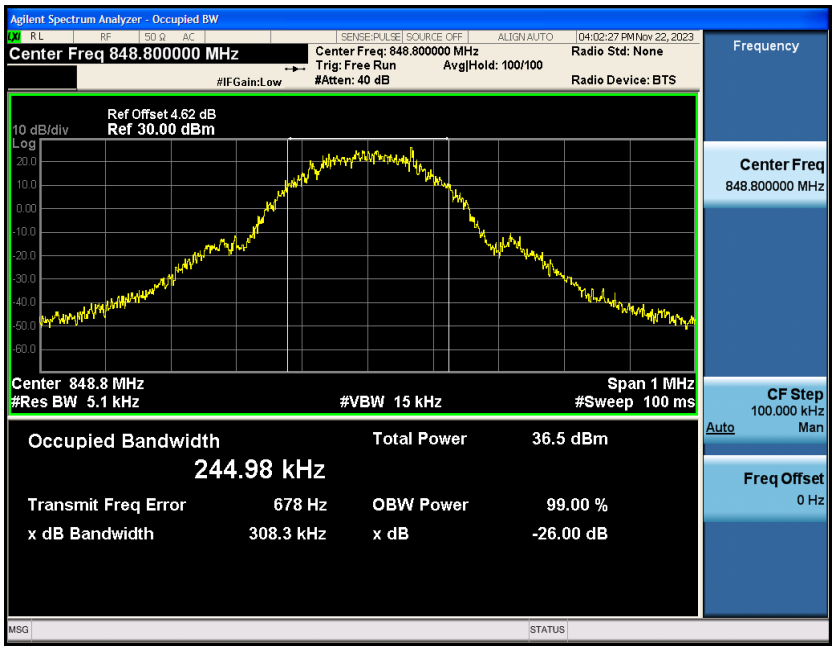
GSM850-128



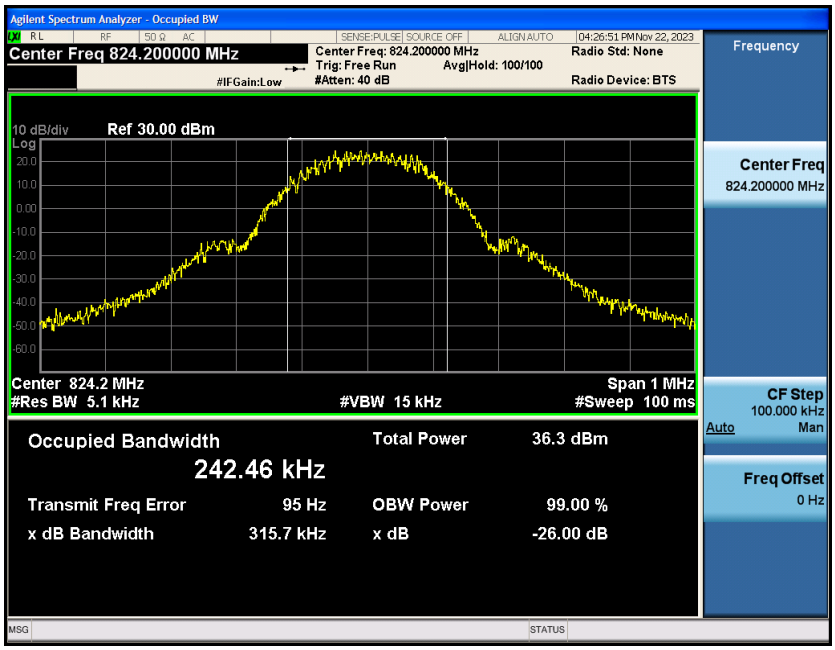
GSM850-190



GSM850-251



GPRS850-128



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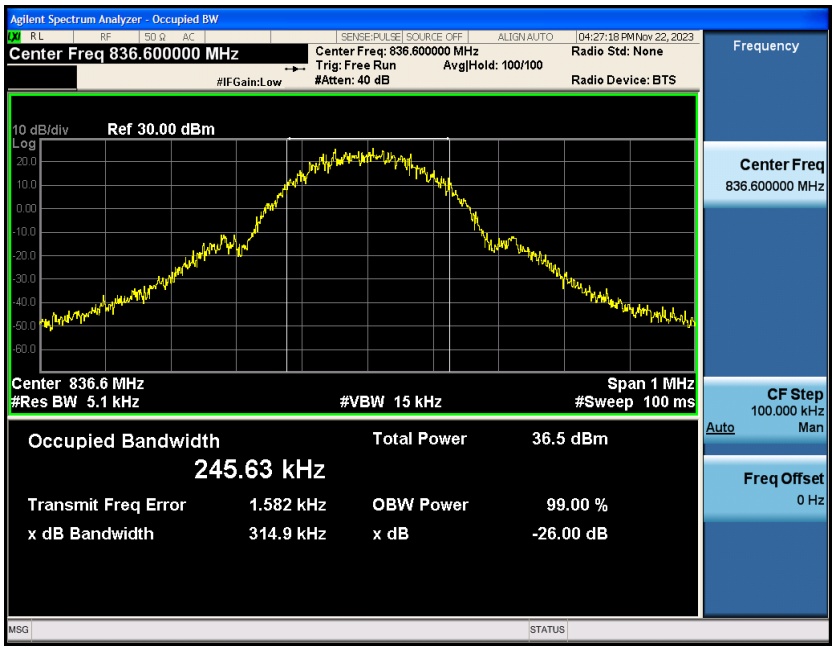

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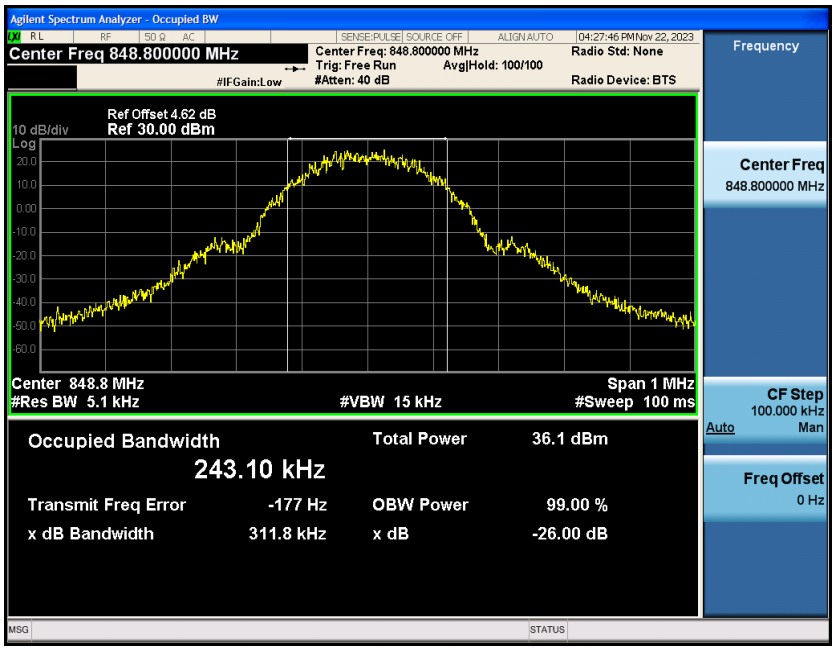

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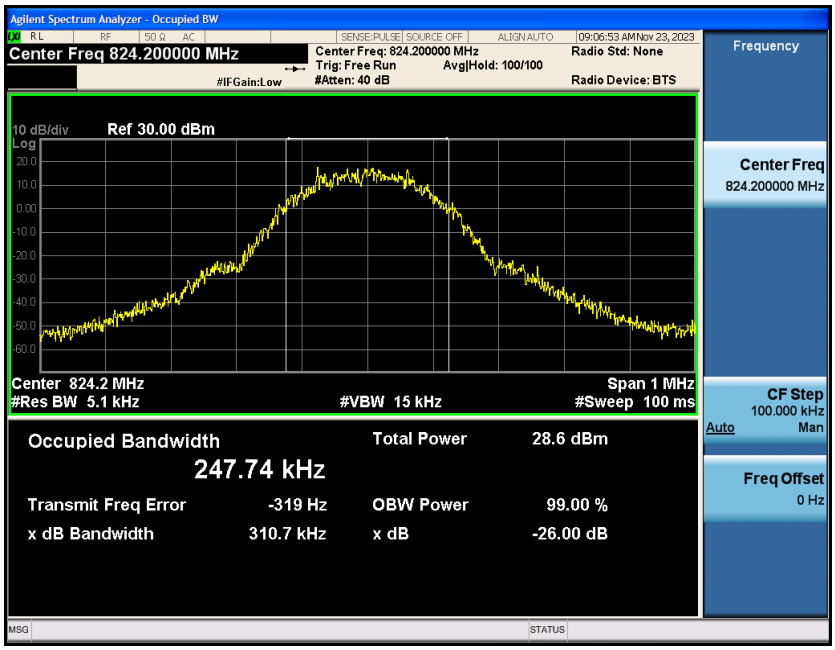

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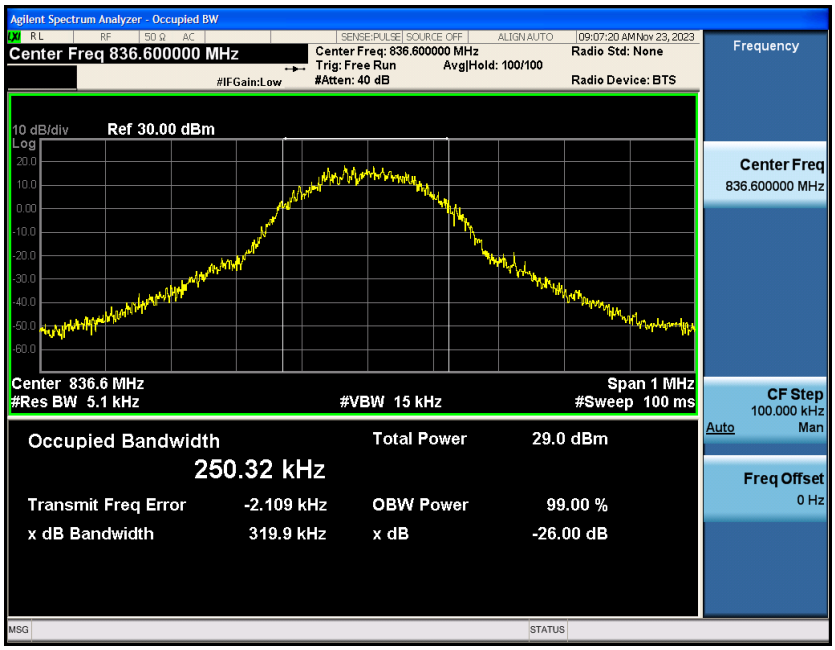

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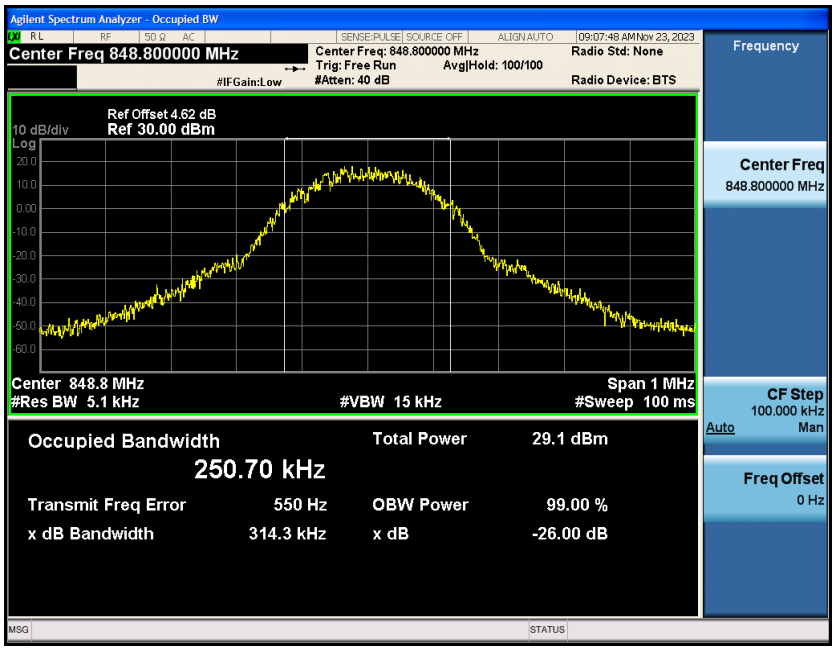
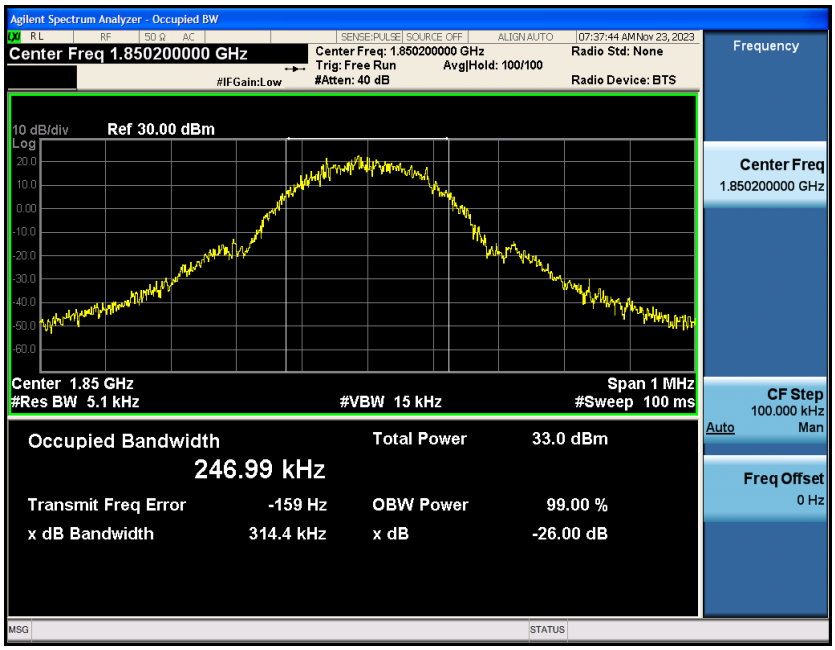
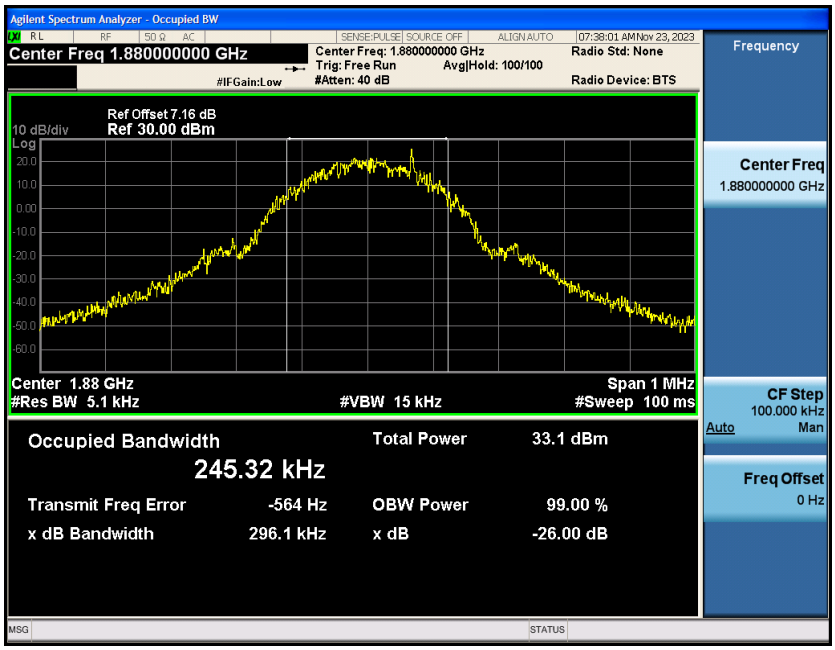


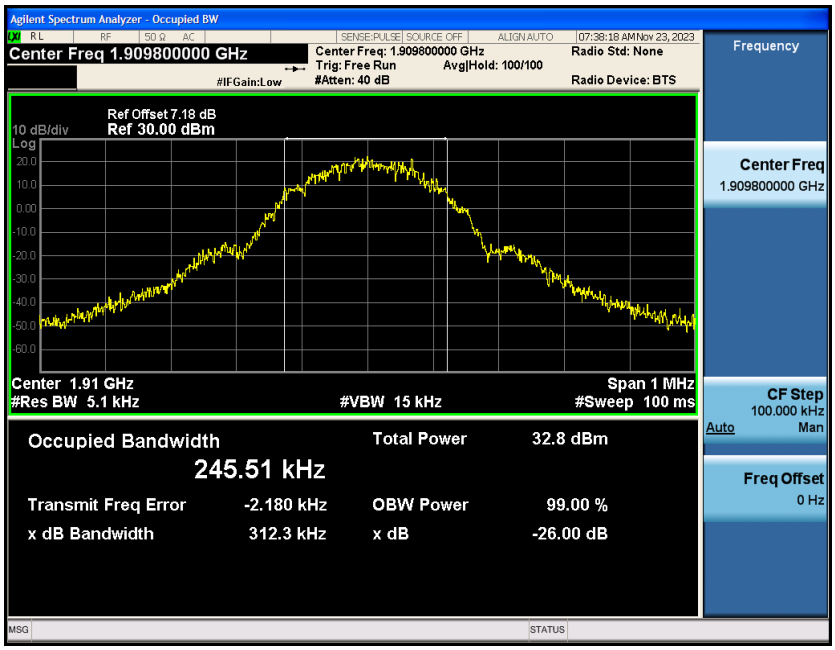
GSM1900-512



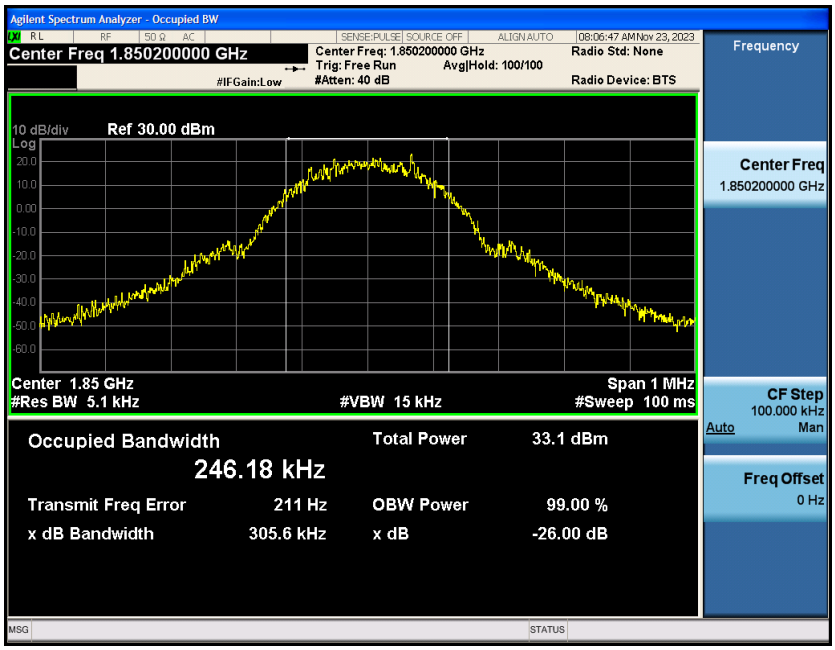
GSM1900-661



GSM1900-810



GPRS1900-512



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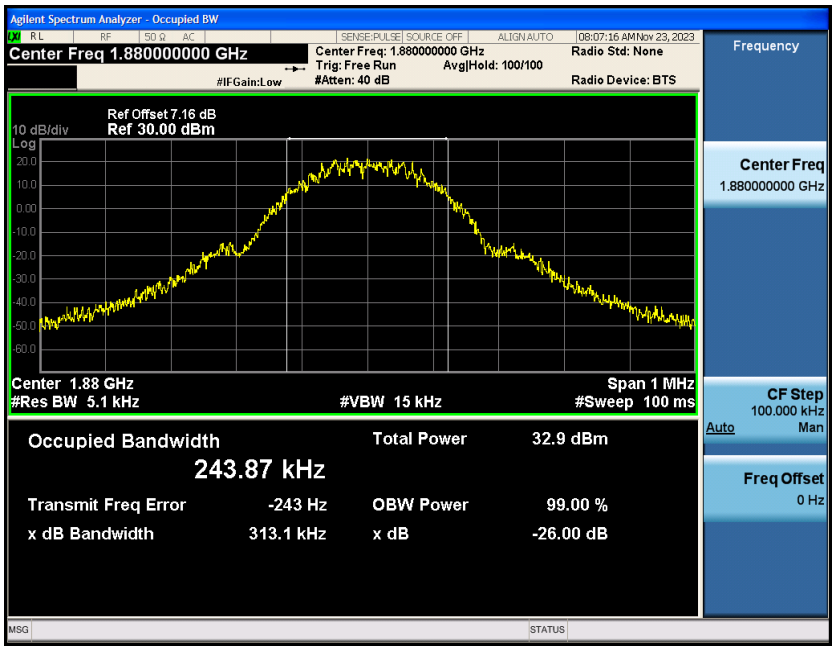

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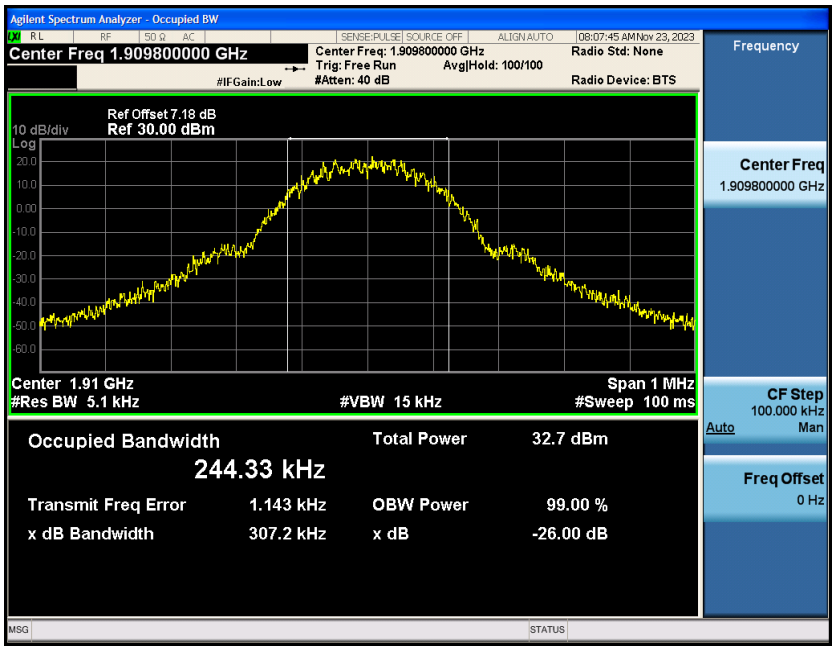

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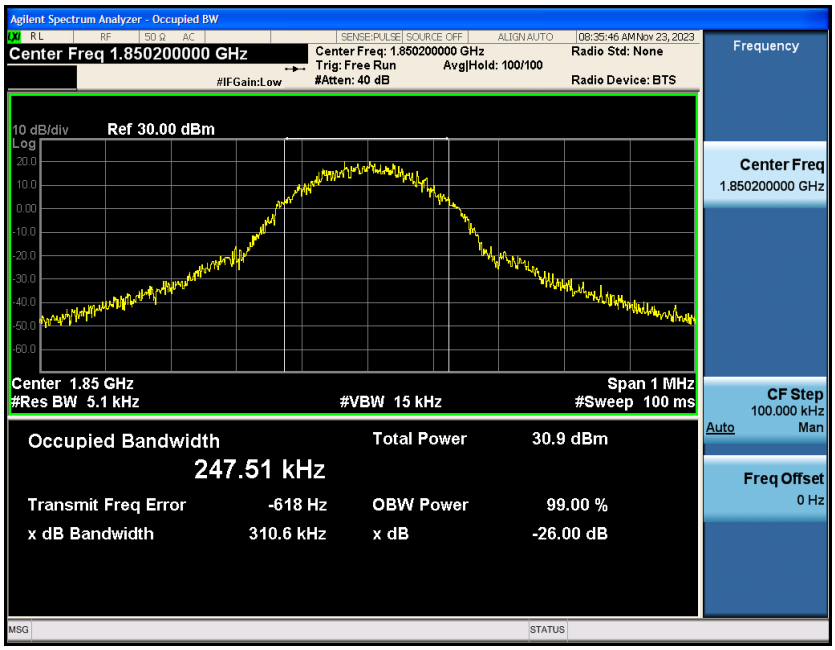

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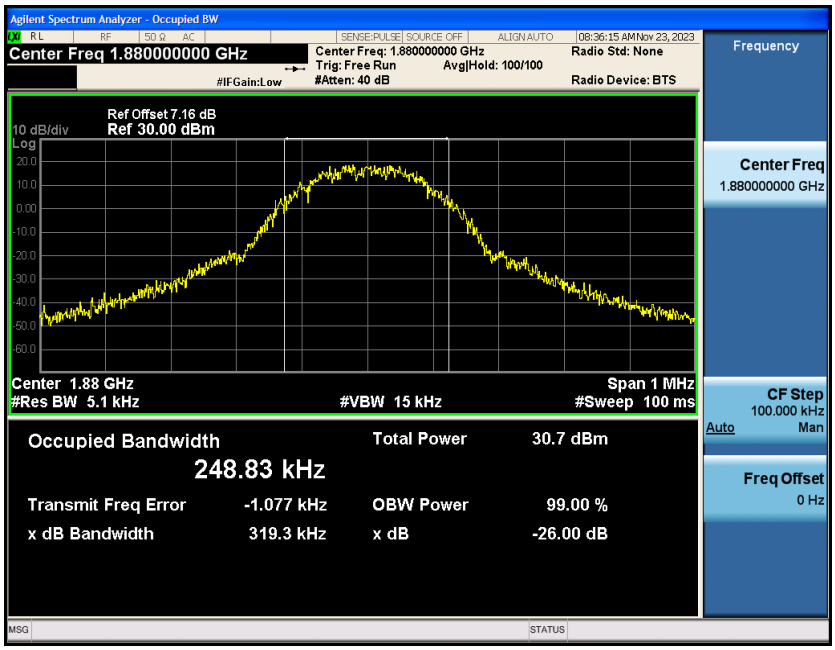

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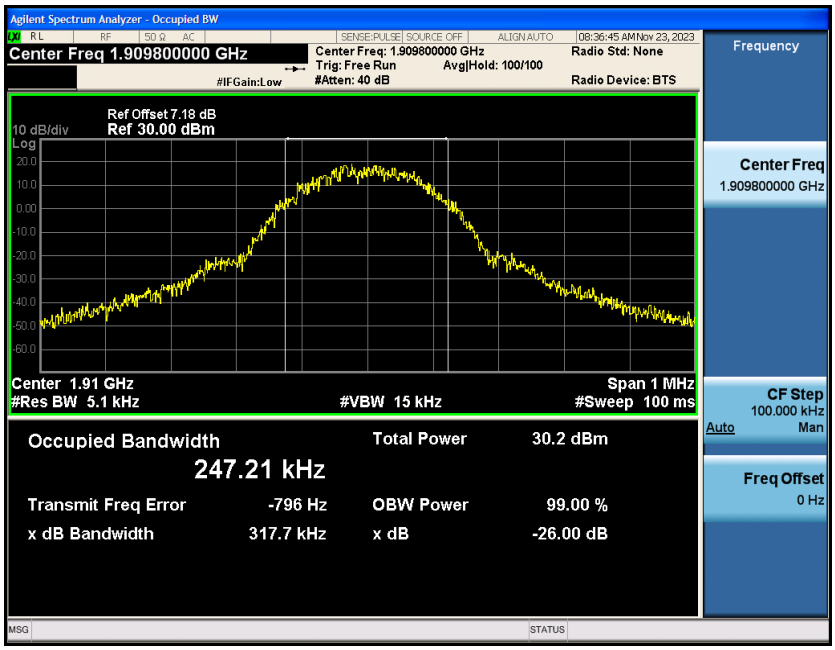
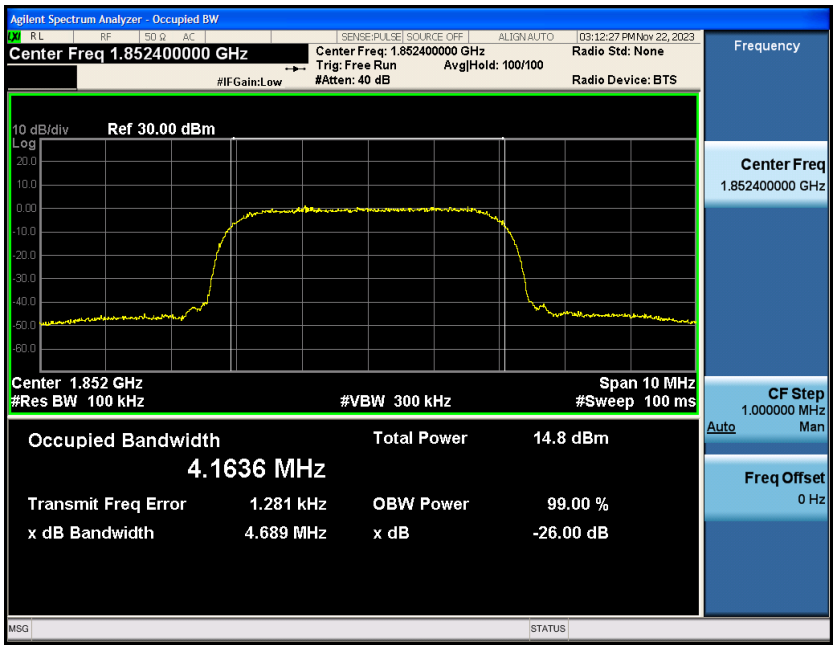
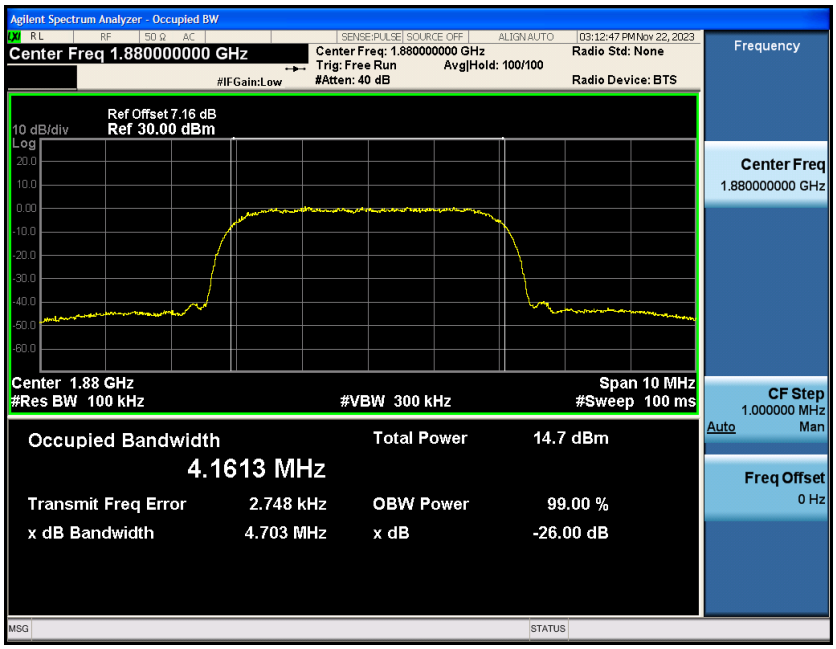
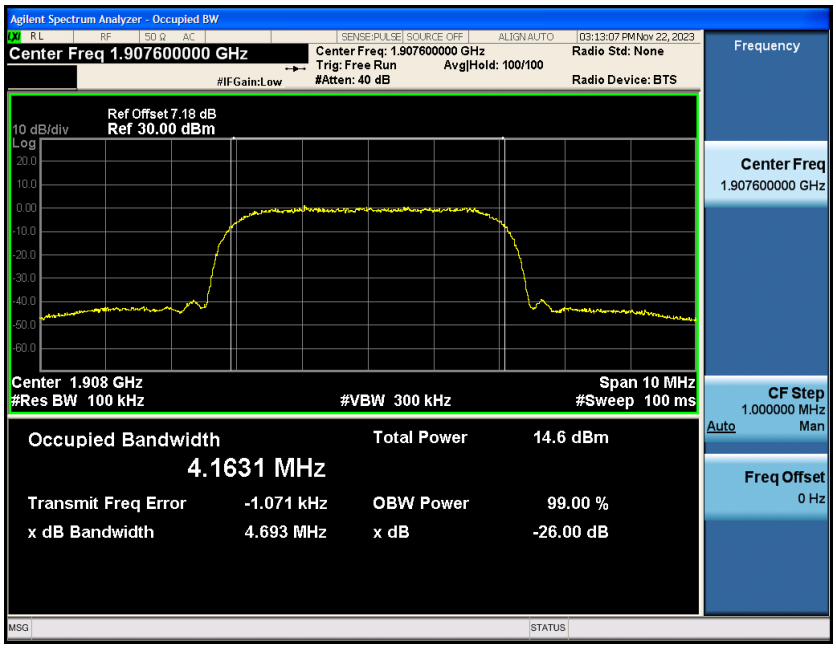


WCDMA

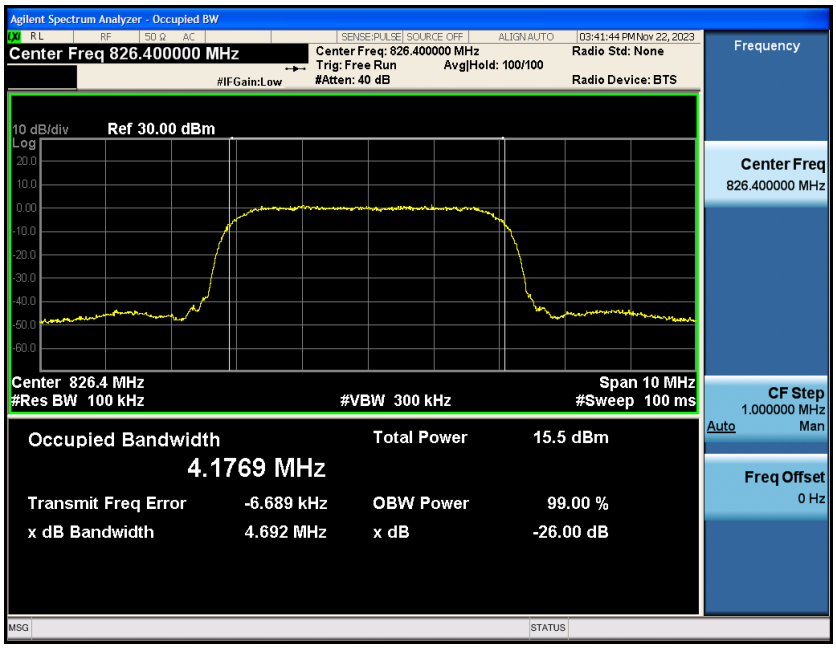
Band2-9262


Band2-9400


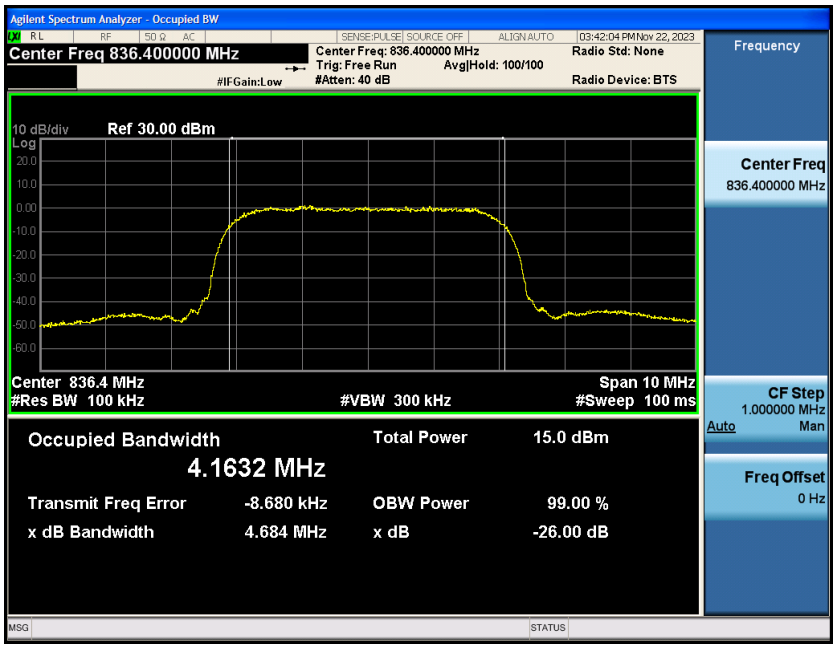
Band2-9538



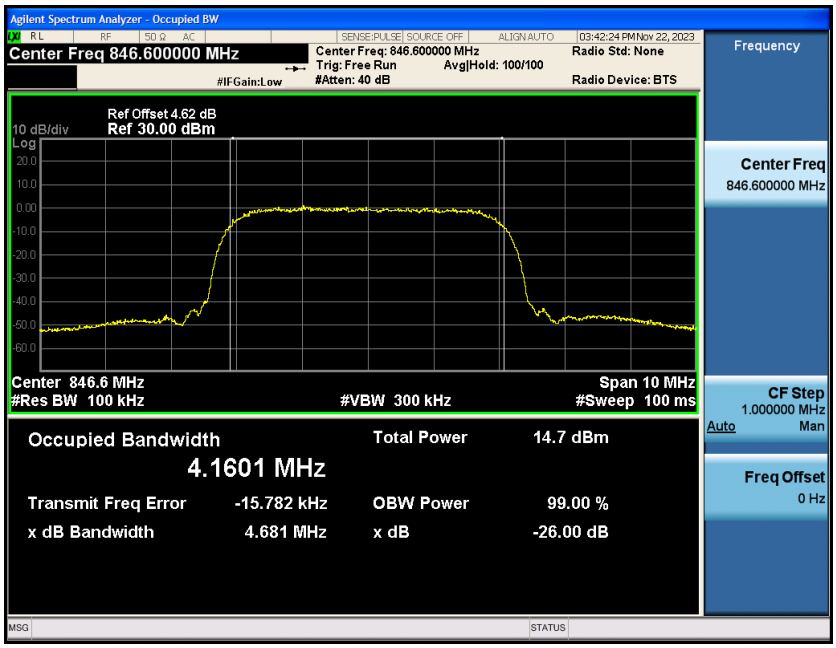
Band5-4132



Band5-4182


Agilent Spectrum Analyzer - Occupied BW
Center Freq 836.400000 MHz
Center Freq: 836.400000 MHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 40 dB
Radio Std: None
Radio Device: BTS
03:42:04 PM Nov 22, 2023
Frequency
10 dB/div
Ref 30.00 dBm
Center 836.4 MHz
#Res BW 100 kHz
#VBW 300 kHz
Span 10 MHz
#Sweep 100 ms
Occupied Bandwidth
4.1632 MHz
Total Power 15.0 dBm
Transmit Freq Error -8.680 kHz
OBW Power 99.00 %
x dB Bandwidth 4.684 MHz
x dB -26.00 dB
Center Freq
836.400000 MHz
CF Step
1.000000 MHz
Auto Man
Freq Offset
0 Hz

Band5-4233


Agilent Spectrum Analyzer - Occupied BW
Center Freq 846.600000 MHz
Center Freq: 846.600000 MHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 40 dB
Radio Std: None
Radio Device: BTS
03:42:24 PM Nov 22, 2023
Frequency
Ref Offset 4.62 dB
10 dB/div
Ref 30.00 dBm
Center 846.6 MHz
#Res BW 100 kHz
#VBW 300 kHz
Span 10 MHz
#Sweep 100 ms
Occupied Bandwidth
4.1601 MHz
Total Power 14.7 dBm
Transmit Freq Error -15.782 kHz
OBW Power 99.00 %
x dB Bandwidth 4.681 MHz
x dB -26.00 dB
Center Freq
846.600000 MHz
CF Step
1.000000 MHz
Auto Man
Freq Offset
0 Hz

10. BAND EDGEEMISSIONSAT ANTENNA TERMINAL

10.1 MEASUREMENT OVERVIEW

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

10.2 MEASUREMENT METHOD

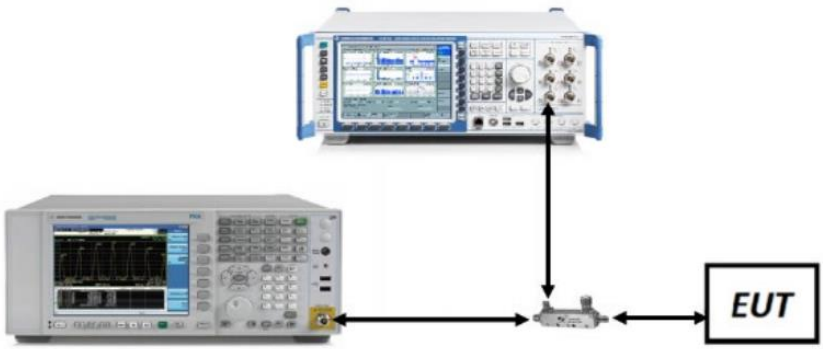
1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW > 1% of the emission bandwidth
4. VBW > 3 x RBW
5. Detector = RMS
6. Number of sweep points ≥ 2 x Span/RBW
7. Trace mode = Max Hold
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 operatingfrequency 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 percentof 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 andspectrum analyzer.

10.3 MEASUREMENT METHOD



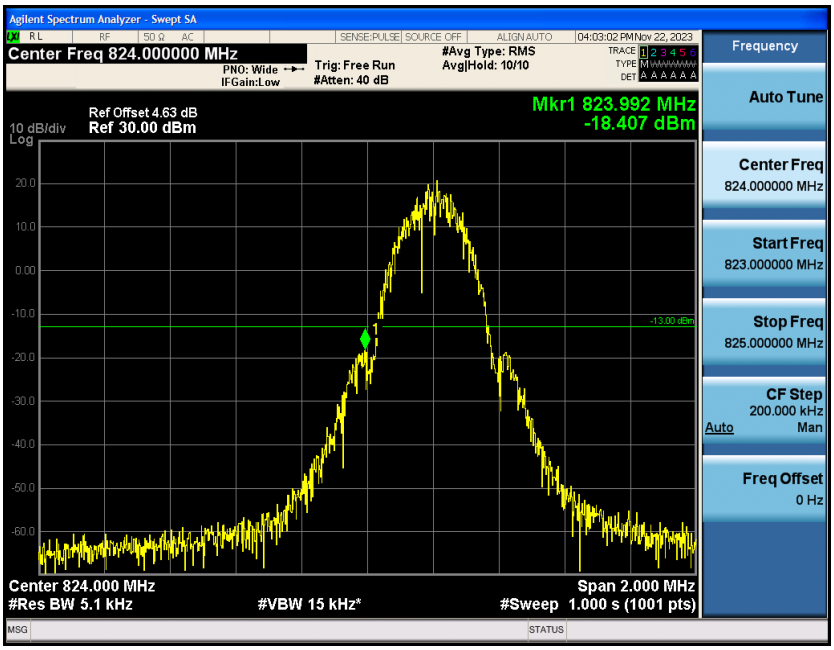
10.4 MEASUREMENT RESULT

Band	Channel	Freq (MHz)	Result (dBm)	Limit(dBm)	Verdict
GSM850	128	823.99	-18.41	-13	PASS
GSM850	251	849.02	-15.02	-13	PASS
GPRS850	128	823.97	-17.26	-13	PASS
GPRS850	251	849.02	-17.17	-13	PASS
EGPRS850	128	823.99	-28.42	-13	PASS
EGPRS850	251	849.00	-24.53	-13	PASS
GSM1900	512	1850.00	-20.39	-13	PASS
GSM1900	810	1910.02	-20.84	-13	PASS
GPRS1900	512	1850.00	-20.20	-13	PASS
GPRS1900	810	1910.02	-19.14	-13	PASS
EGPRS1900	512	1849.98	-24.81	-13	PASS
EGPRS1900	810	1910.03	-26.19	-13	PASS

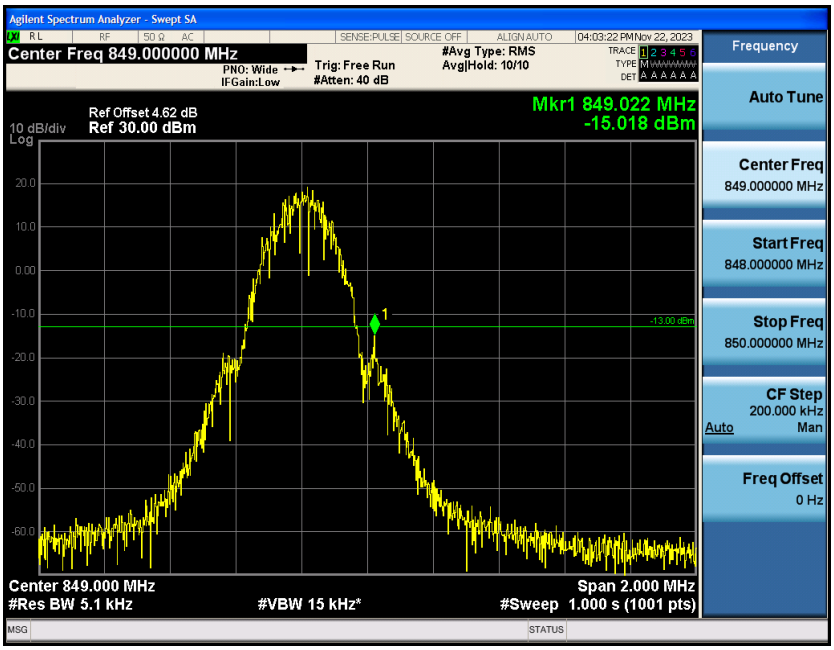
Band	Channel	Frequency (MHz)	Result (dBm)	Limit(dBm)	Verdict
Band2	9262	1850.00	-43.85	-13	PASS
Band2	9538	1910.00	-41.75	-13	PASS
Band5	4132	823.93	-39.90	-13	PASS
Band5	4233	849.04	-42.79	-13	PASS

Test Graphs

GSM850-128



GSM850-251



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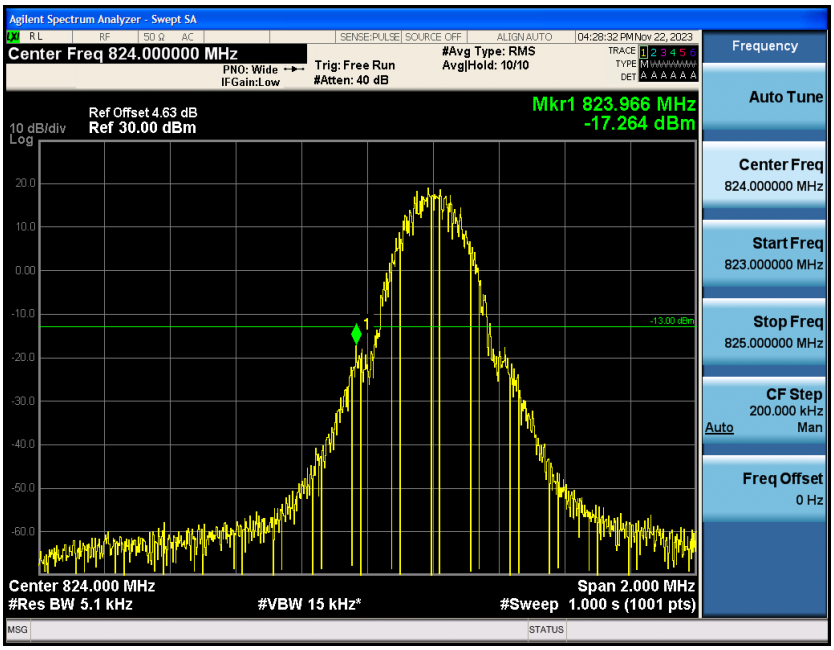

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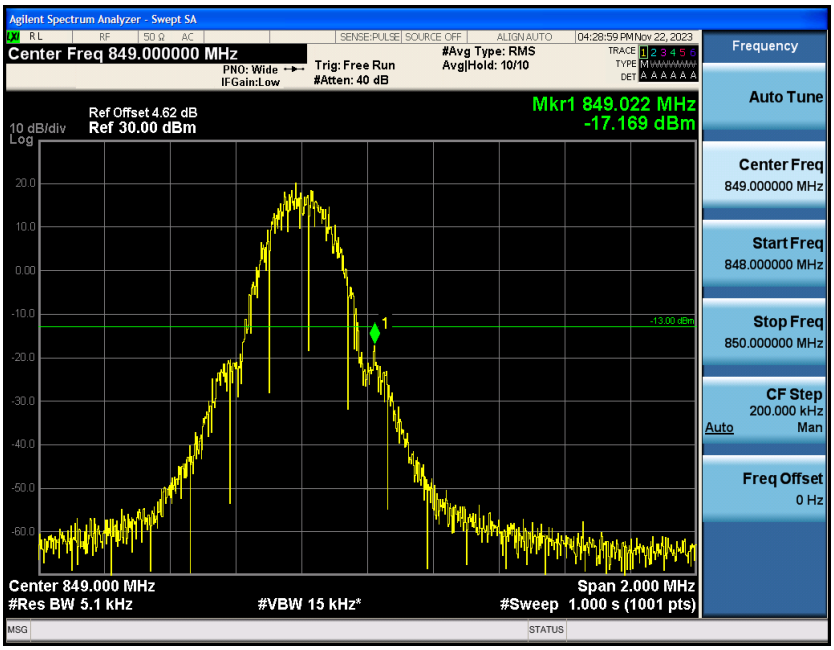

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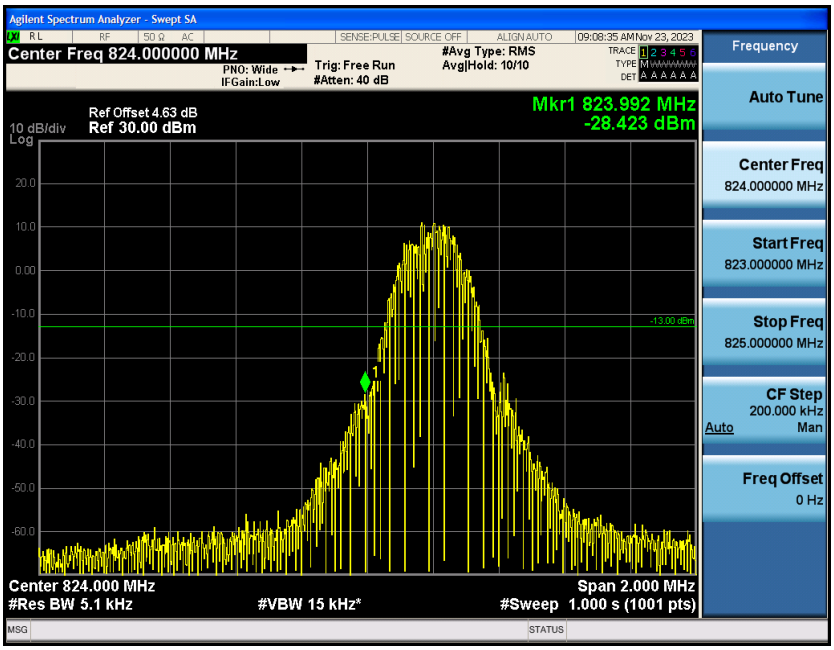
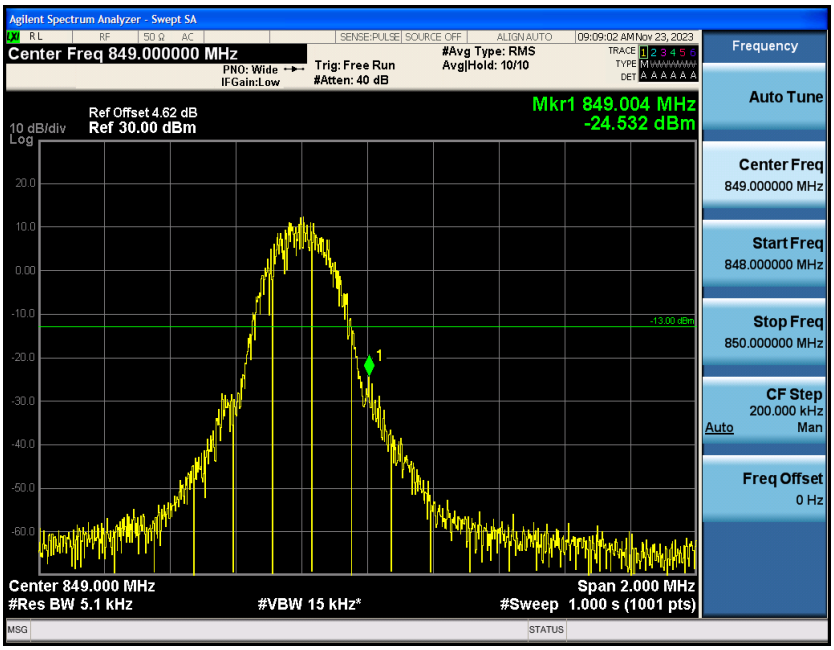
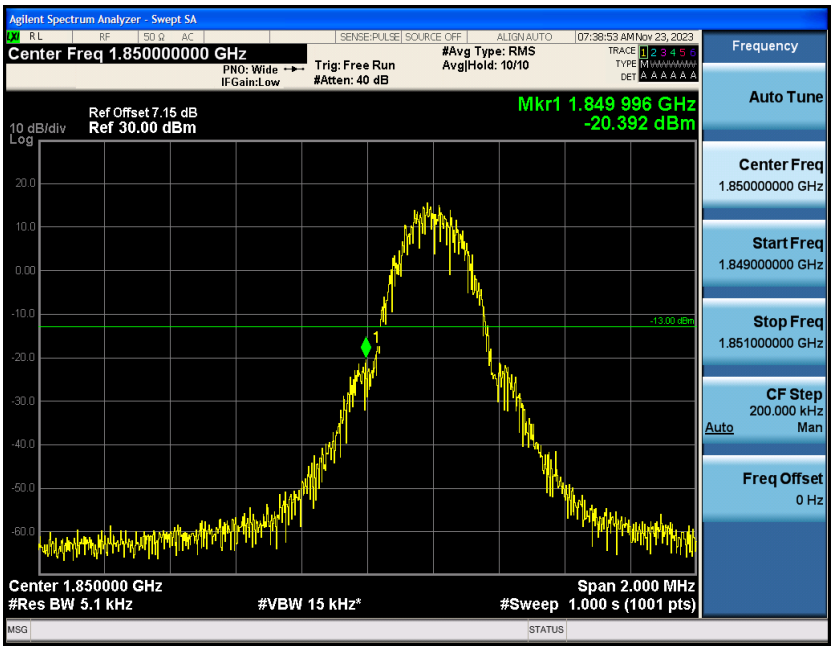


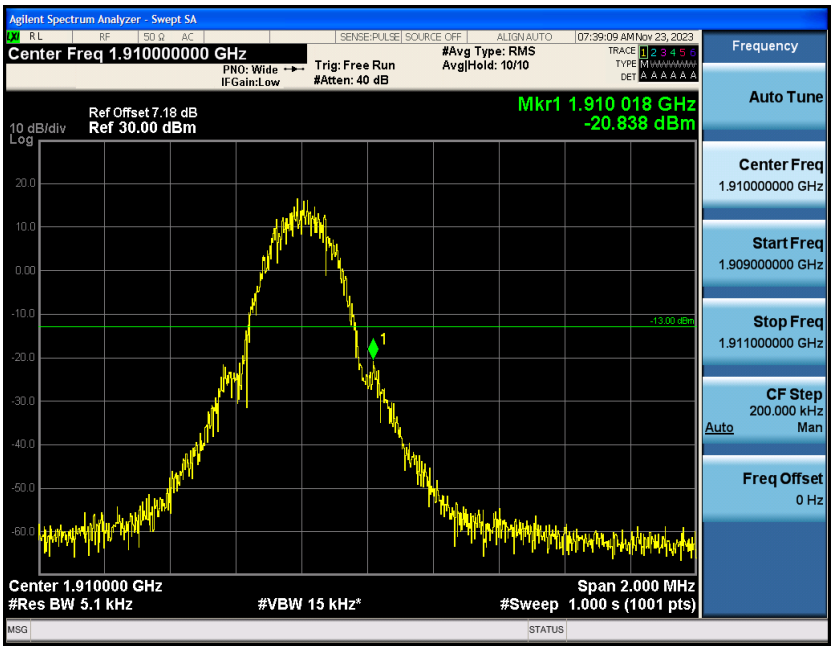
EGPRS850-251



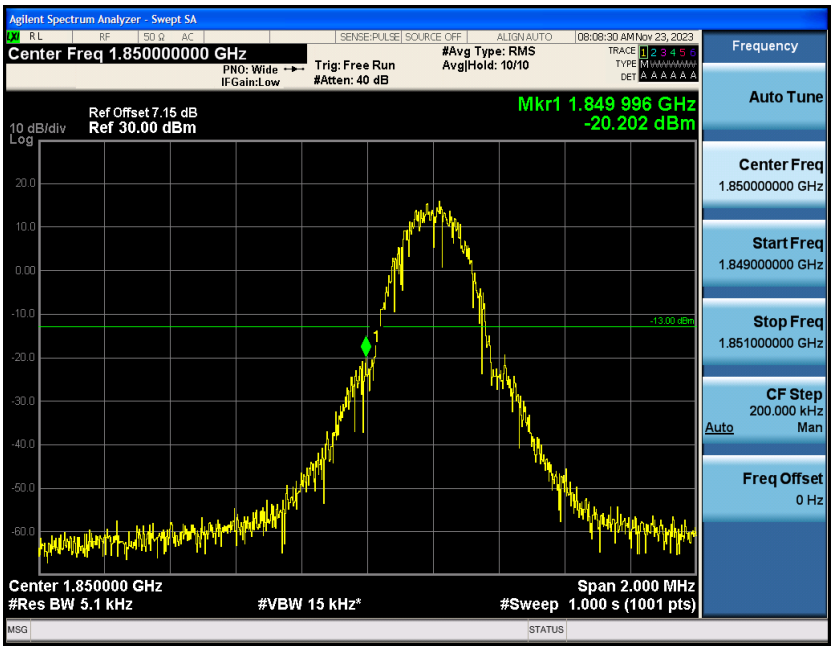
GSM1900-512



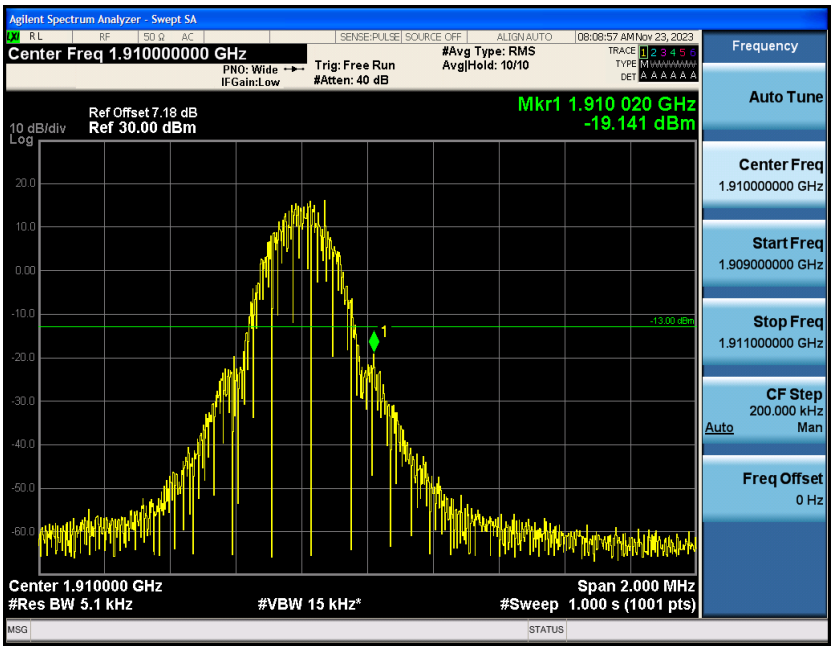
GSM1900-810



GPRS1900-512



GPRS1900-810



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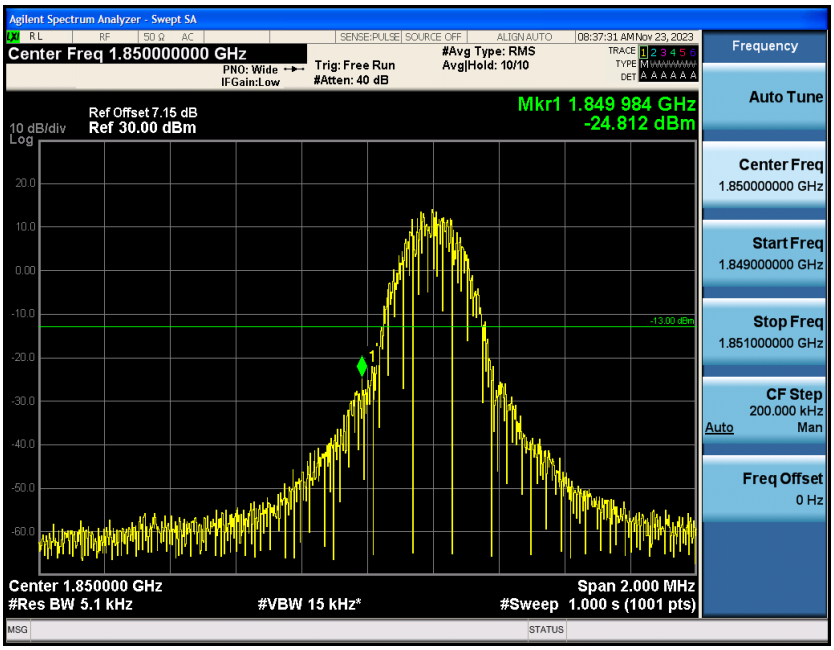
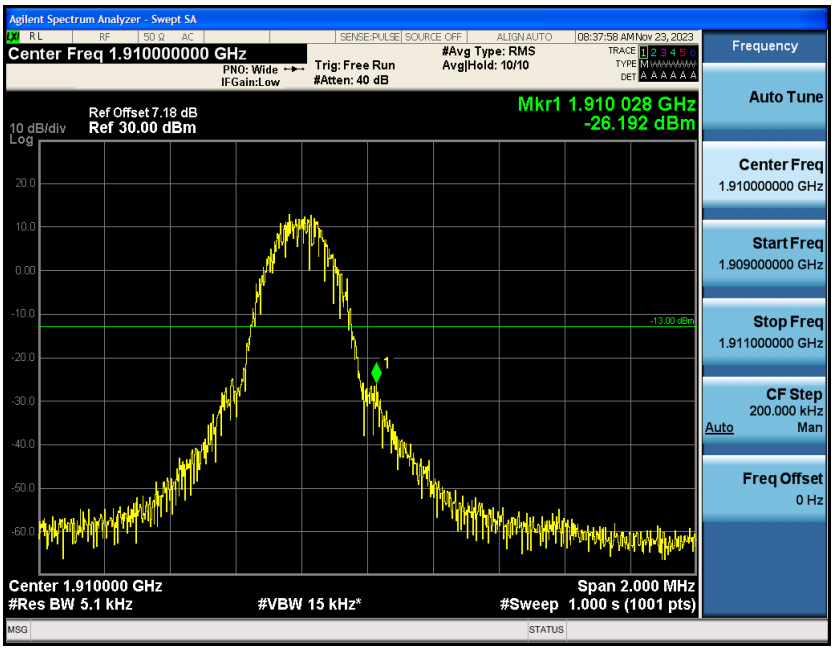
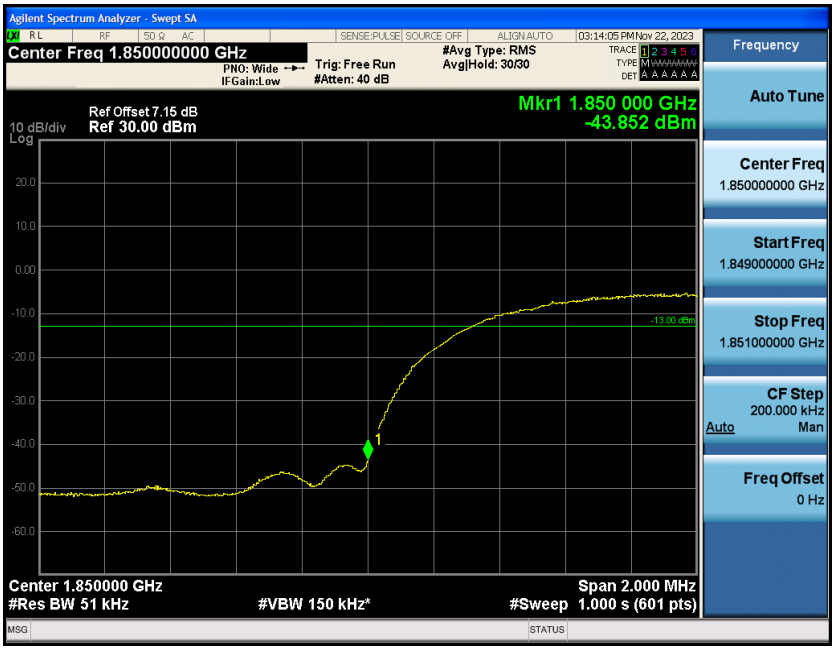


EGPRS1900-810



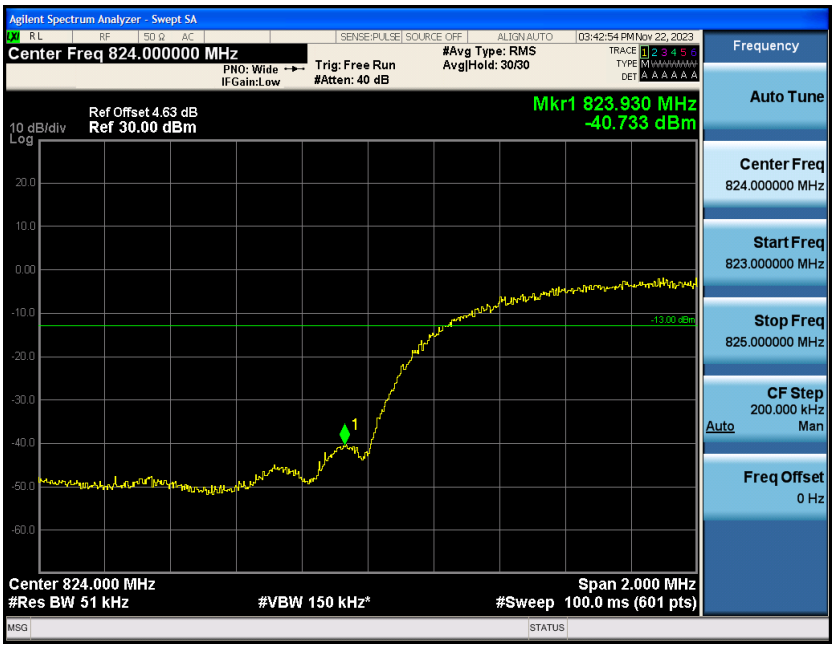
WCDMA:

Band2-9262



Band2-9538

Band5-4132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Center Freq 824.000000 MHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 30/30
03:42:54 PM Nov 22, 2023
Ref Offset 4.63 dB
10 dB/div
Ref 30.00 dBm
Mkr1 823.930 MHz
-40.733 dBm
-13.00 dBm
Center 824.000 MHz
#Res BW 51 kHz
#VBW 150 kHz*
Span 2.000 MHz
#Sweep 100.0 ms (601 pts)
Frequency
Auto Tune
Center Freq
824.000000 MHz
Start Freq
823.000000 MHz
Stop Freq
825.000000 MHz
CF Step
200.000 kHz
Auto
Man
Freq Offset
0 Hz

Band5-4233

Agilent Spectrum Analyzer - Swept SA
Center Freq 849.000000 MHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 30/30
03:43:05 PM Nov 22, 2023
Ref Offset 4.62 dB
10 dB/div
Ref 30.00 dBm
Mkr1 849.040 MHz
-42.788 dBm
-13.00 dBm
Center 849.000 MHz
#Res BW 51 kHz
#VBW 150 kHz*
Span 2.000 MHz
#Sweep 100.0 ms (601 pts)
Frequency
Auto Tune
Center Freq
849.000000 MHz
Start Freq
848.000000 MHz
Stop Freq
850.000000 MHz
CF Step
200.000 kHz
Auto
Man
Freq Offset
0 Hz

11. SPURIOUS EMISSIONSAT ANTENNA TERMINAL

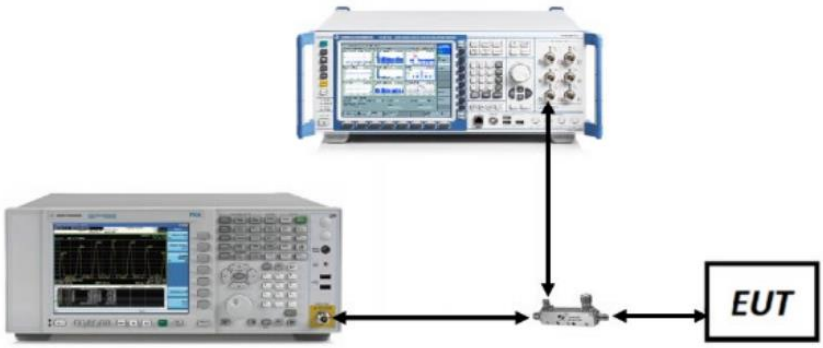
11.1 PROVISIONS APPLICABLE

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. 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 METHOD

1. RBW = 1 MHz
2. VBW ≥ 3 MHz
3. Detector = Peak
4. Trace Mode = max hold
5. Sweep time = auto
6. Number of points in sweep ≥ 2 x Span / RBW

12.3 MEASUREMENT SETUP



11.4 MEASUREMENT RESULT

GSM

Band	Channel	Frequency Range(MHz)	Max.Freq. (MHz)	Result (dBm)	Limit (dBm)	Verdict
GSM850	128	0.009~0.15MHz	0.01	-51.36	-33	PASS
GSM850	128	0.15~30MHz	0.16	-44.34	-13	PASS
GSM850	128	30~1000MHz	961.94	-48.75	-13	PASS

GSM850	128	1000~10000MHz	2472.4	-24	-13	PASS
GSM850	190	0.009~0.15MHz	0.01	-49.84	-33	PASS
GSM850	190	0.15~30MHz	0.15	-44.31	-13	PASS
GSM850	190	30~1000MHz	665.09	-49.18	-13	PASS
GSM850	190	1000~10000MHz	2509.9	-23.15	-13	PASS
GSM850	251	0.009~0.15MHz	0.01	-51.82	-33	PASS
GSM850	251	0.15~30MHz	0.15	-44.08	-13	PASS
GSM850	251	30~1000MHz	726.72	-48.44	-13	PASS
GSM850	251	1000~10000MHz	2546.5	-23.66	-13	PASS
GPRS850	128	0.009~0.15MHz	0.01	-49.2	-33	PASS
GPRS850	128	0.15~30MHz	0.16	-44.99	-13	PASS
GPRS850	128	30~1000MHz	699.79	-49.33	-13	PASS
GPRS850	128	1000~10000MHz	2472.7	-24.05	-13	PASS
GPRS850	190	0.009~0.15MHz	0.01	-51.04	-33	PASS
GPRS850	190	0.15~30MHz	0.15	-42.96	-13	PASS
GPRS850	190	30~1000MHz	735.93	-49.63	-13	PASS
GPRS850	190	1000~10000MHz	2509.6	-23.27	-13	PASS
GPRS850	251	0.009~0.15MHz	0.01	-50.51	-33	PASS
GPRS850	251	0.15~30MHz	0.15	-44.14	-13	PASS
GPRS850	251	30~1000MHz	590.37	-49.49	-13	PASS
GPRS850	251	1000~10000MHz	2546.5	-23.88	-13	PASS
EGPRS850	128	0.009~0.15MHz	0.01	-53.59	-33	PASS
EGPRS850	128	0.15~30MHz	0.15	-40.83	-13	PASS
EGPRS850	128	30~1000MHz	416.03	-41.15	-13	PASS
EGPRS850	128	1000~10000MHz	2472.7	-38.4	-13	PASS
EGPRS850	190	0.009~0.15MHz	0.01	-51.74	-33	PASS
EGPRS850	190	0.15~30MHz	0.15	-43.78	-13	PASS
EGPRS850	190	30~1000MHz	416.03	-37.92	-13	PASS
EGPRS850	190	1000~10000MHz	2509.9	-36.75	-13	PASS
EGPRS850	251	0.009~0.15MHz	0.01	-54.53	-33	PASS
EGPRS850	251	0.15~30MHz	0.15	-43.49	-13	PASS
EGPRS850	251	30~1000MHz	737.49	-49.89	-13	PASS
EGPRS850	251	1000~10000MHz	2546.2	-35.68	-13	PASS
GSM1900	512	0.009~0.15MHz	0.01	-54.68	-43	PASS

GSM1900	512	0.15~30MHz	0.15	-43.9	-23	PASS
GSM1900	512	30~1000MHz	995.54	-50.02	-13	PASS
GSM1900	512	1000~18000MHz	17612.4	-37.54	-13	PASS
GSM1900	661	0.009~0.15MHz	0.01	-53.93	-43	PASS
GSM1900	661	0.15~30MHz	0.15	-44.45	-23	PASS
GSM1900	661	30~1000MHz	932.16	-49.14	-13	PASS
GSM1900	661	1000~18000MHz	16532.33	-37.45	-13	PASS
GSM1900	810	0.009~0.15MHz	0.01	-52.78	-43	PASS
GSM1900	810	0.15~30MHz	0.16	-42.38	-23	PASS
GSM1900	810	30~1000MHz	633.11	-50.25	-13	PASS
GSM1900	810	1000~18000MHz	17087.67	-36.58	-13	PASS
GPRS1900	512	0.009~0.15MHz	0.01	-50.6	-43	PASS
GPRS1900	512	0.15~30MHz	0.15	-44.12	-23	PASS
GPRS1900	512	30~1000MHz	784.08	-49.68	-13	PASS
GPRS1900	512	1000~18000MHz	17550.63	-36.55	-13	PASS
GPRS1900	661	0.009~0.15MHz	0.01	-54.15	-43	PASS
GPRS1900	661	0.15~30MHz	0.15	-43.45	-23	PASS
GPRS1900	661	30~1000MHz	937.24	-49.79	-13	PASS
GPRS1900	661	1000~18000MHz	16434.87	-35.7	-13	PASS
GPRS1900	810	0.009~0.15MHz	0.01	-54.18	-43	PASS
GPRS1900	810	0.15~30MHz	0.15	-44.07	-23	PASS
GPRS1900	810	30~1000MHz	906.94	-49.95	-13	PASS
GPRS1900	810	1000~18000MHz	16479.07	-36.74	-13	PASS
EGPRS1900	512	0.009~0.15MHz	0.01	-54.9	-43	PASS
EGPRS1900	512	0.15~30MHz	0.15	-43.49	-23	PASS
EGPRS1900	512	30~1000MHz	484.57	-49.74	-13	PASS
EGPRS1900	512	1000~18000MHz	16887.63	-36.69	-13	PASS
EGPRS1900	661	0.009~0.15MHz	0.01	-55.17	-43	PASS
EGPRS1900	661	0.15~30MHz	0.15	-42.96	-23	PASS
EGPRS1900	661	30~1000MHz	794.39	-50.75	-13	PASS
EGPRS1900	661	1000~18000MHz	16369.7	-37.04	-13	PASS
EGPRS1900	810	0.009~0.15MHz	0.01	-54.29	-43	PASS
EGPRS1900	810	0.15~30MHz	0.15	-42.9	-23	PASS
EGPRS1900	810	30~1000MHz	811.79	-49.1	-13	PASS

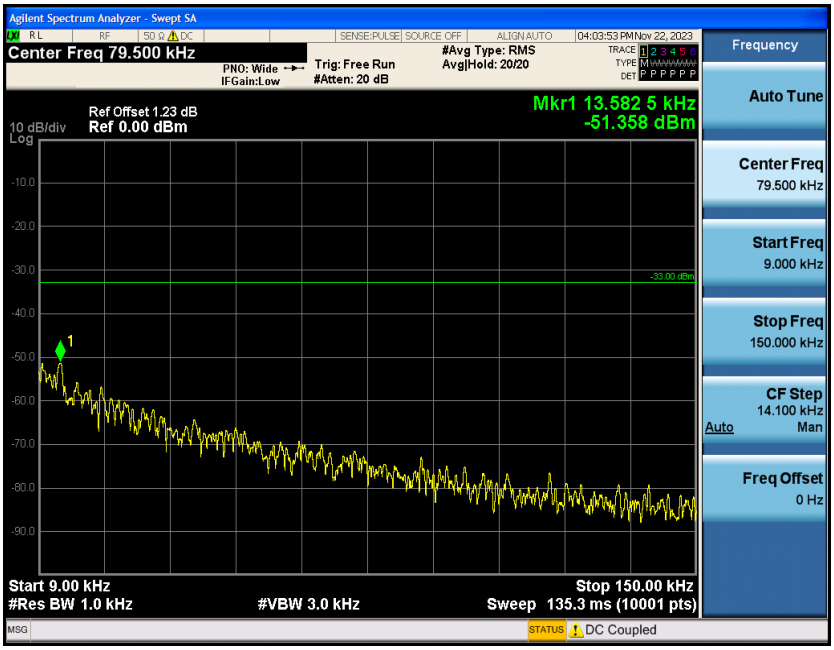
EGPRS1900	810	1000~18000MHz	16411.07	-36.86	-13	PASS

WCDMA

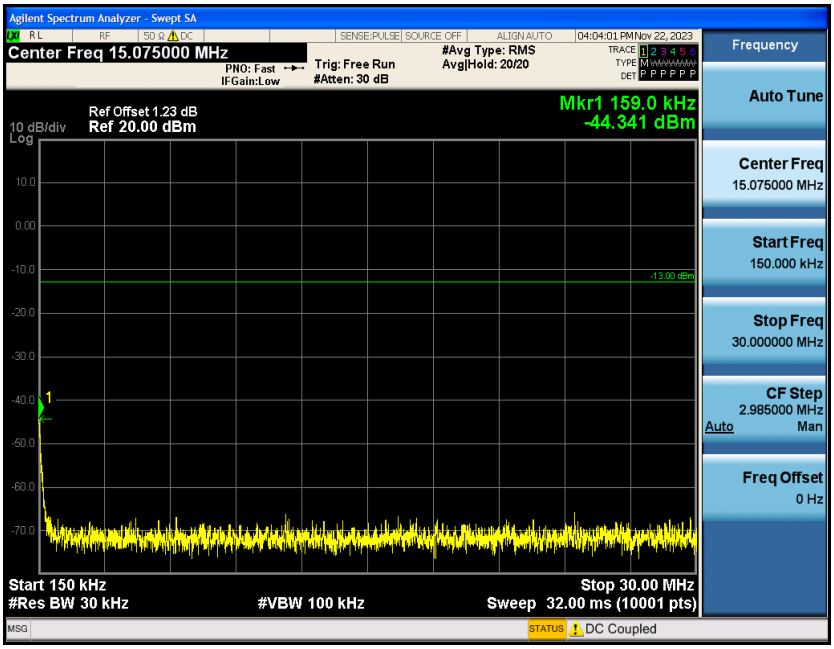
Band	Channel	Frequency Range (Mhz)	Frequency (dBm)	Result (dBm)	Limit (dBm)	Verdict
Band2	9262	0.009~0.15MHz	0.01	-55.19	-43	PASS
Band2	9262	0.15~30MHz	0.15	-47.78	-23	PASS
Band2	9262	30~1000MHz	425.4	-50.15	-13	PASS
Band2	9262	1000~20000MHz	19075.33	-35.34	-13	PASS
Band2	9400	0.009~0.15MHz	0.01	-54.29	-43	PASS
Band2	9400	0.15~30MHz	0.15	-47.05	-23	PASS
Band2	9400	30~1000MHz	428.77	-49.92	-13	PASS
Band2	9400	1000~20000MHz	19176.03	-35.08	-13	PASS
Band2	9538	0.009~0.15MHz	0.01	-53.39	-43	PASS
Band2	9538	0.15~30MHz	0.15	-45.73	-23	PASS
Band2	9538	30~1000MHz	954.38	-50.47	-13	PASS
Band2	9538	1000~20000MHz	19046.83	-35.15	-13	PASS
Band5	4132	0.009~0.15MHz	0.01	-53.74	-33	PASS
Band5	4132	0.15~30MHz	0.16	-48.09	-13	PASS
Band5	4132	30~1000MHz	934.27	-58.55	-13	PASS
Band5	4132	1000~10000MHz	6752.2	-40.64	-13	PASS
Band5	4182	0.009~0.15MHz	0.01	-54.26	-33	PASS
Band5	4182	0.15~30MHz	0.15	-46.63	-13	PASS
Band5	4182	30~1000MHz	419.03	-59.09	-13	PASS
Band5	4182	1000~10000MHz	5884	-40.25	-13	PASS
Band5	4233	0.009~0.15MHz	0.01	-53.68	-33	PASS
Band5	4233	0.15~30MHz	0.16	-47.2	-13	PASS
Band5	4233	30~1000MHz	998.16	-59.56	-13	PASS
Band5	4233	1000~10000MHz	5993.8	-40.29	-13	PASS

Test Graphs for GSM

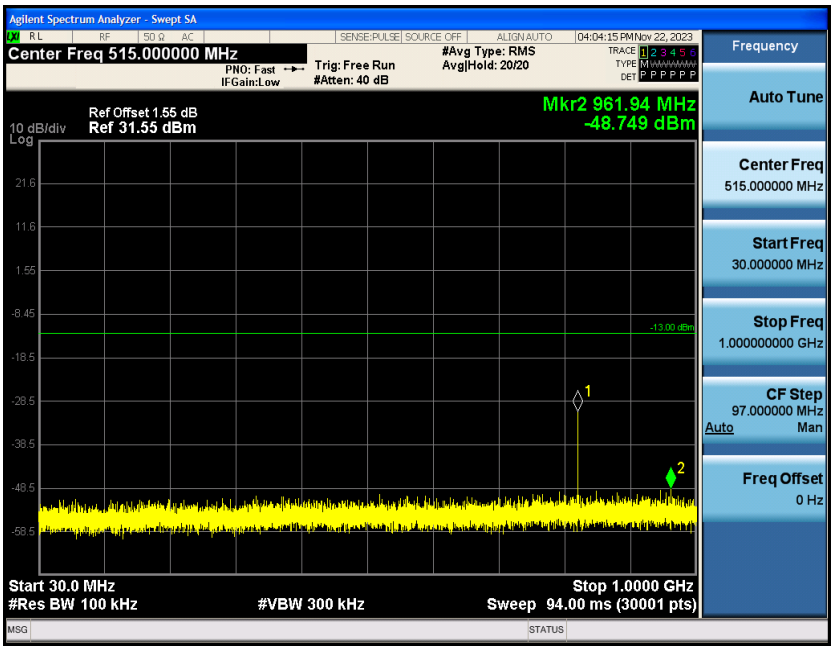
GSM850-128-0.009~0.15MHz



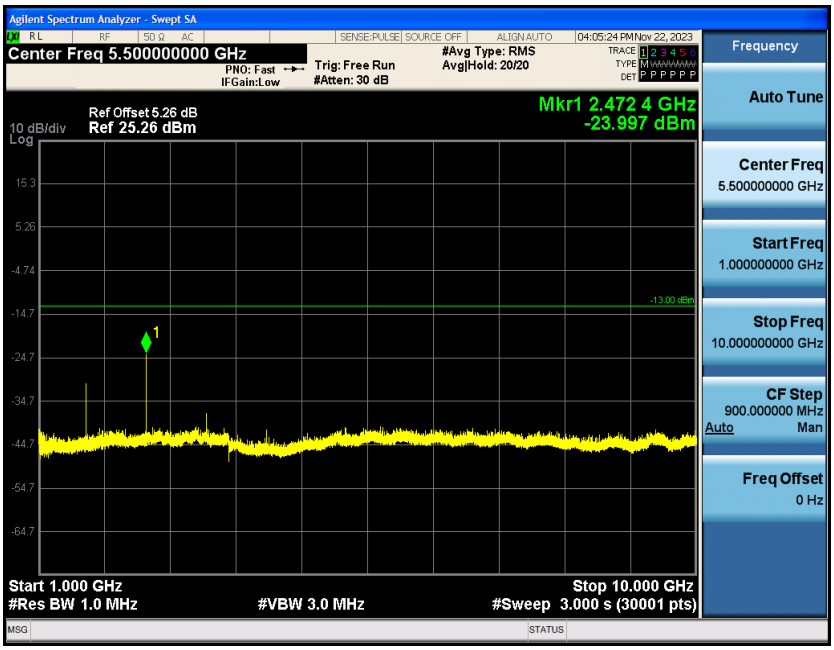
GSM850-128-0.15~30MHz



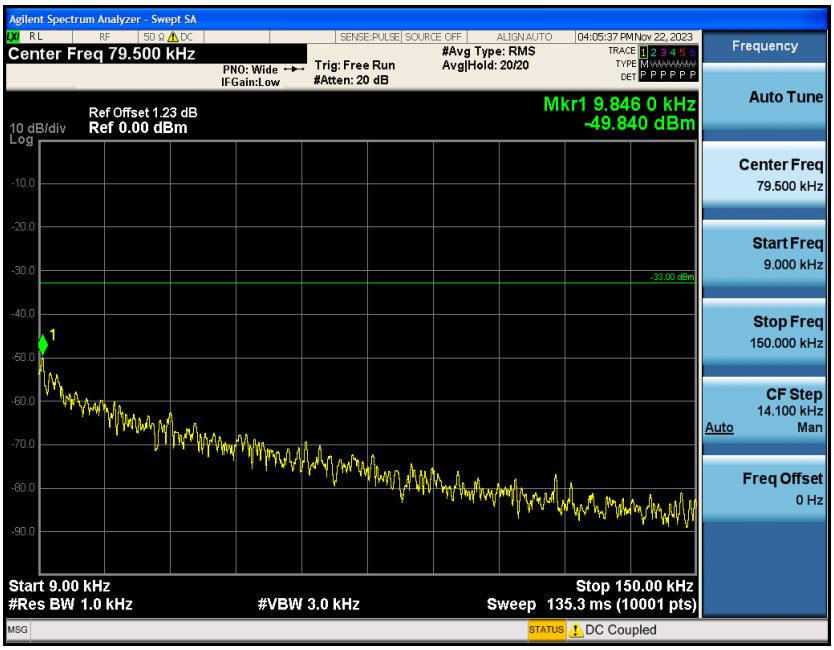
GSM850-128-30~1000MHz



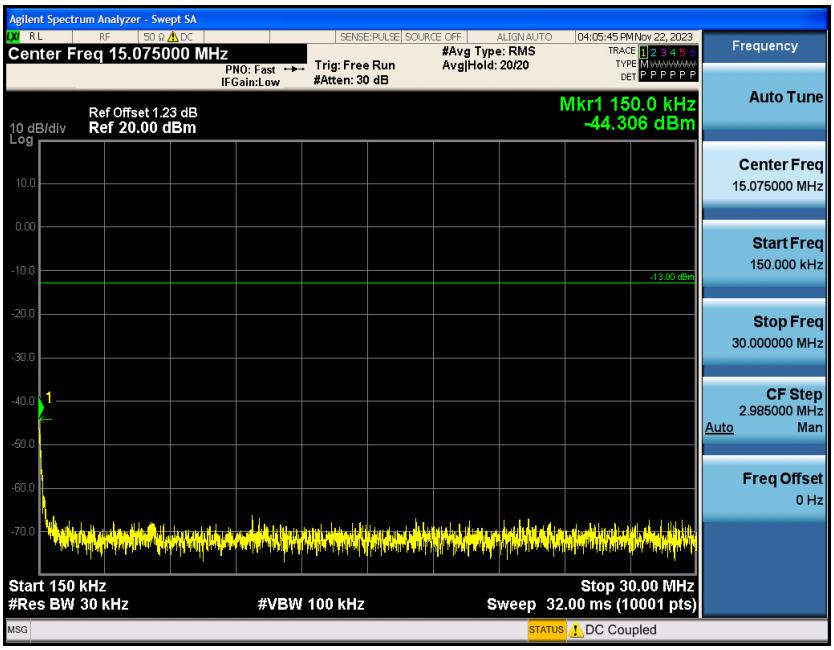
GSM850-128-1000~10000MHz



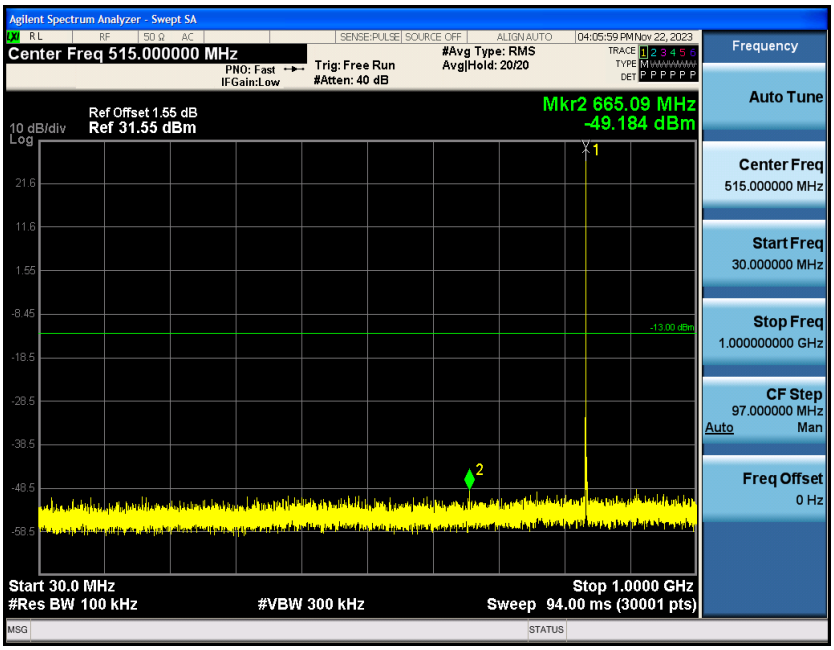
GSM850-190-0.009~0.15MHz



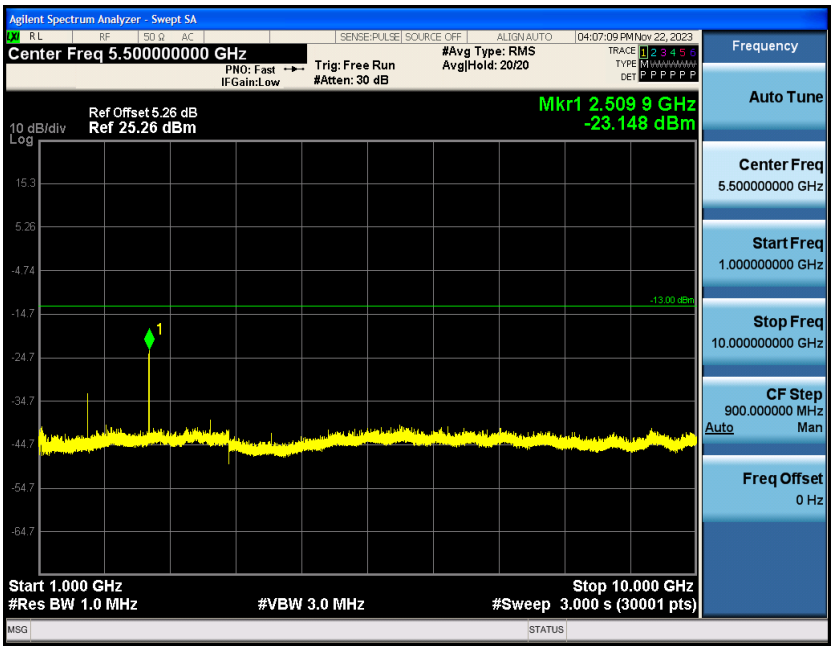
GSM850-190-0.15~30MHz



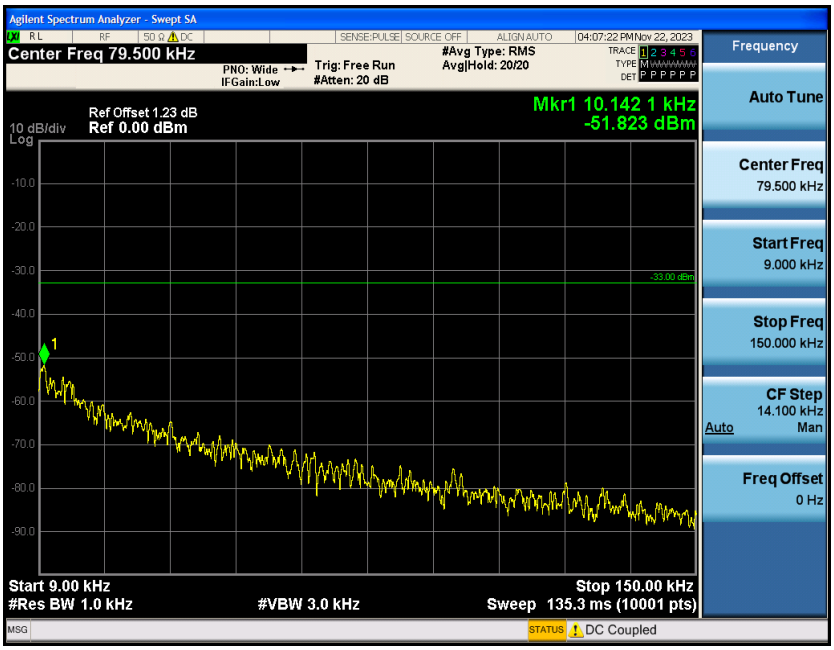
GSM850-190-30~1000MHz



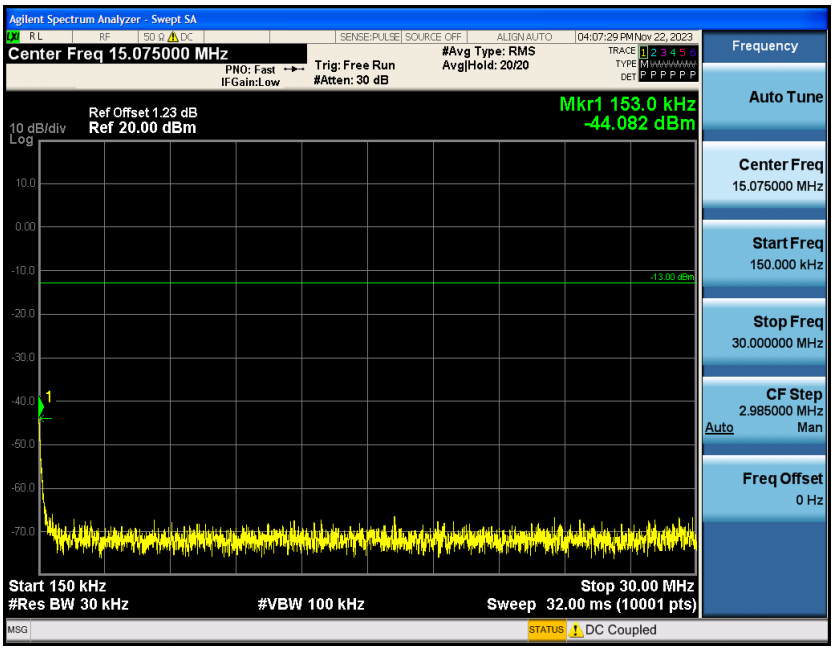
GSM850-190-1000~10000MHz



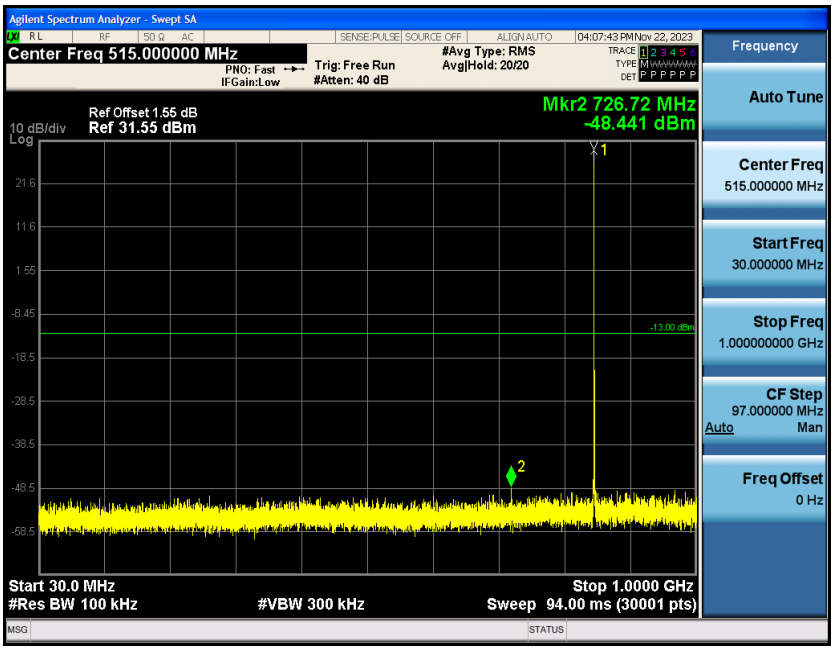
GSM850-251-0.009~0.15MHz



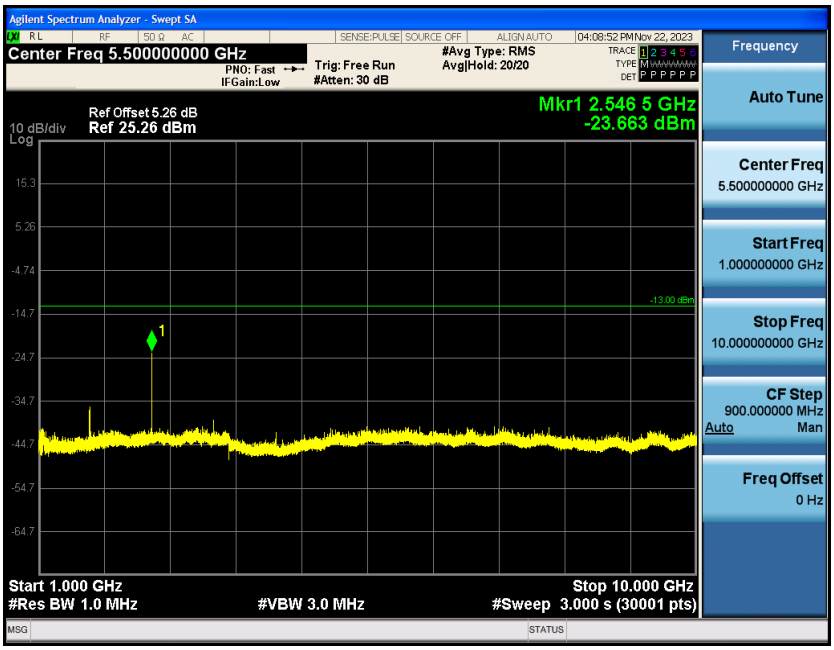
GSM850-251-0.15~30MHz



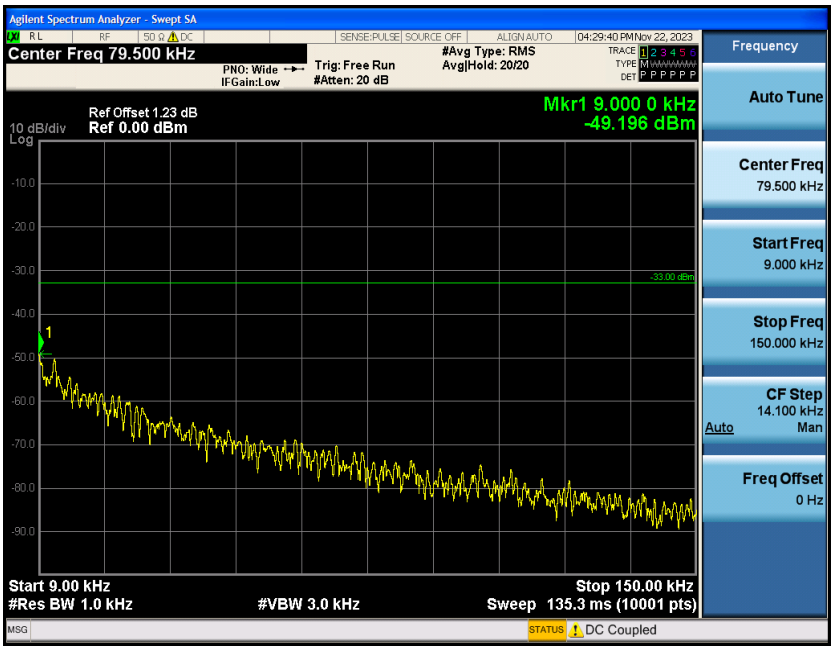
GSM850-251-30~1000MHz



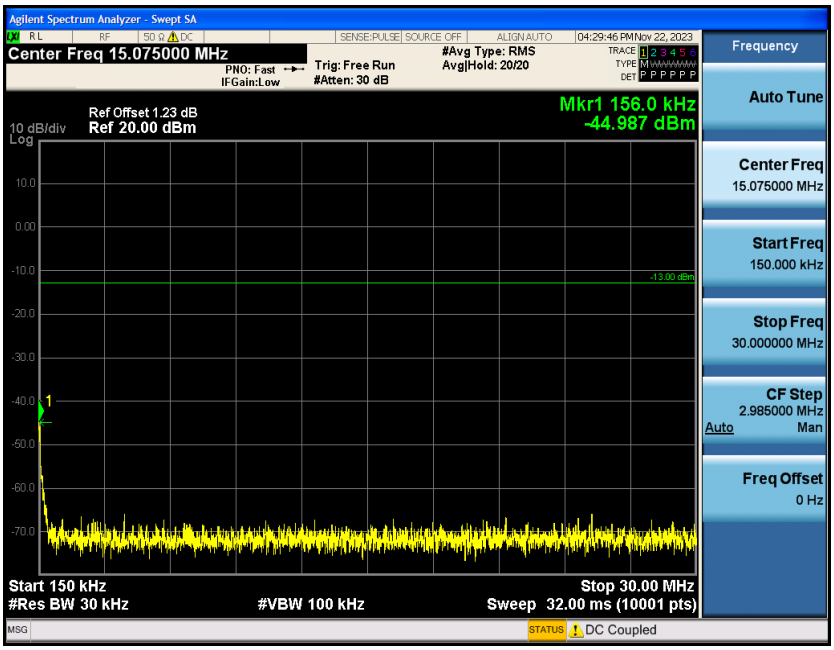
GSM850-251-1000~10000MHz



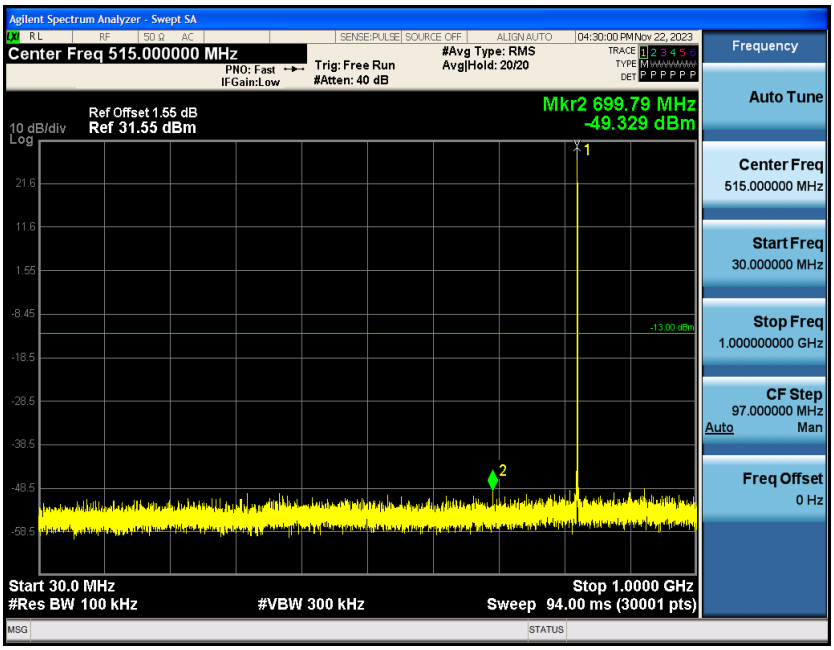
GPRS850-128-0.009~0.15MHz



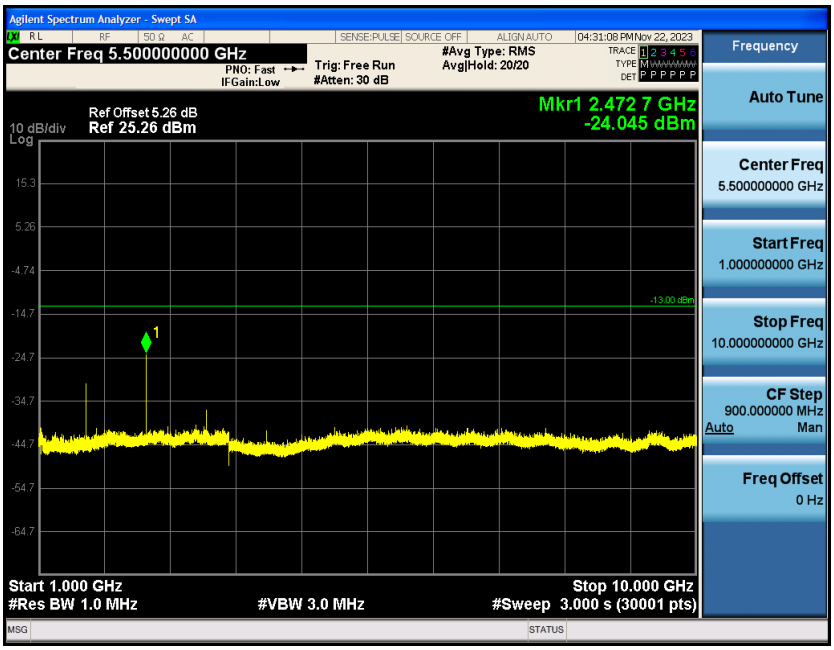
GPRS850-128-0.15~30MHz



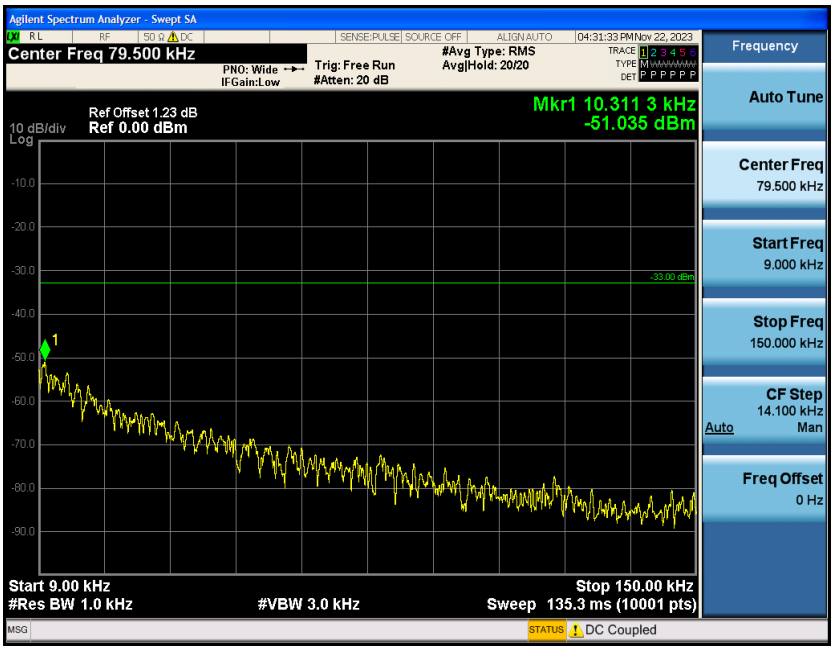
GPRS850-128-30~1000MHz



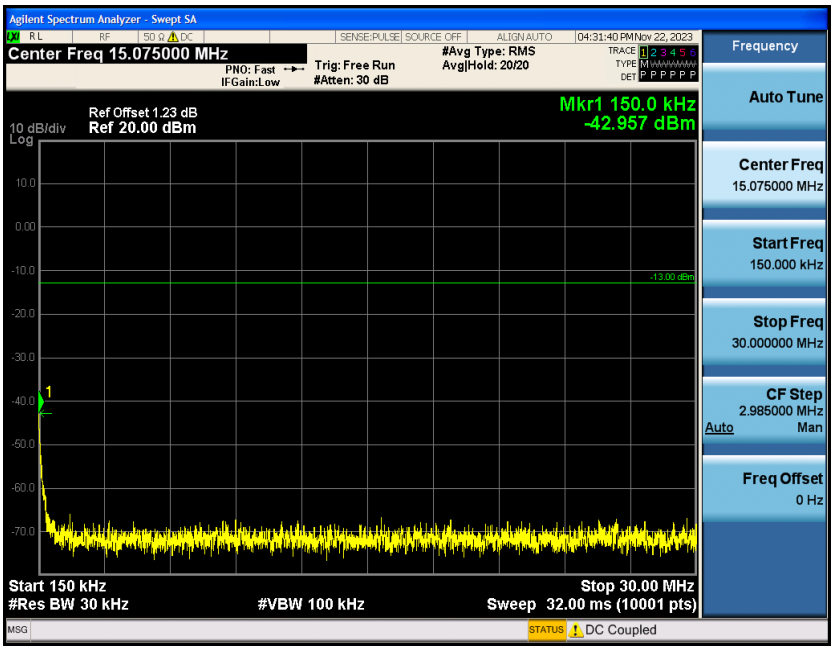
GPRS850-128-1000~10000MHz



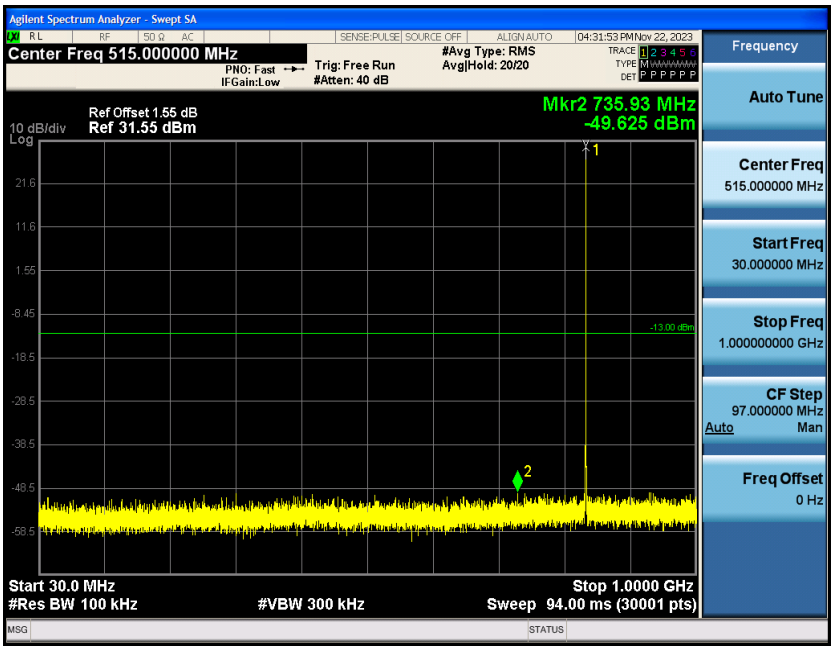
GPRS850-190-0.009~0.15MHz



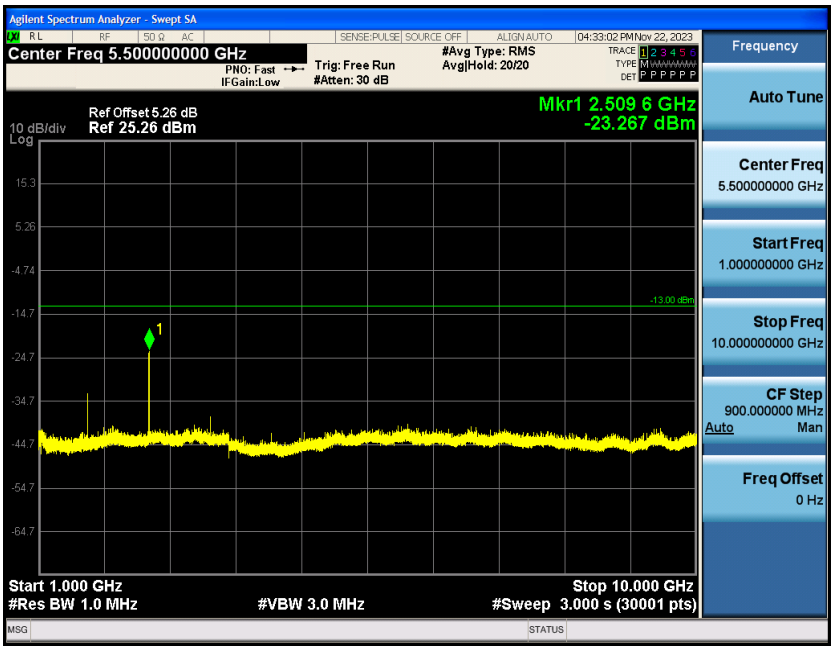
GPRS850-190-0.15~30MHz



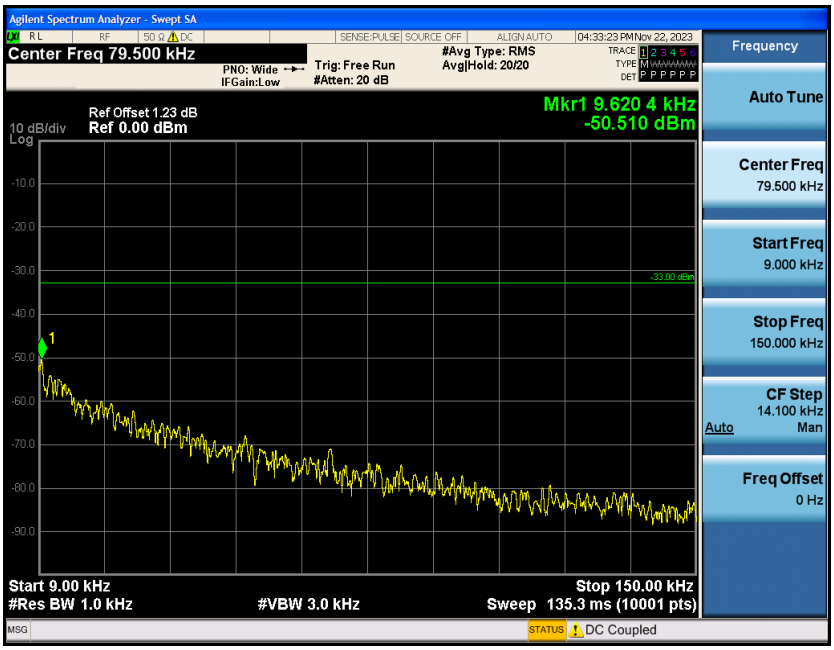
GPRS850-190-30~1000MHz



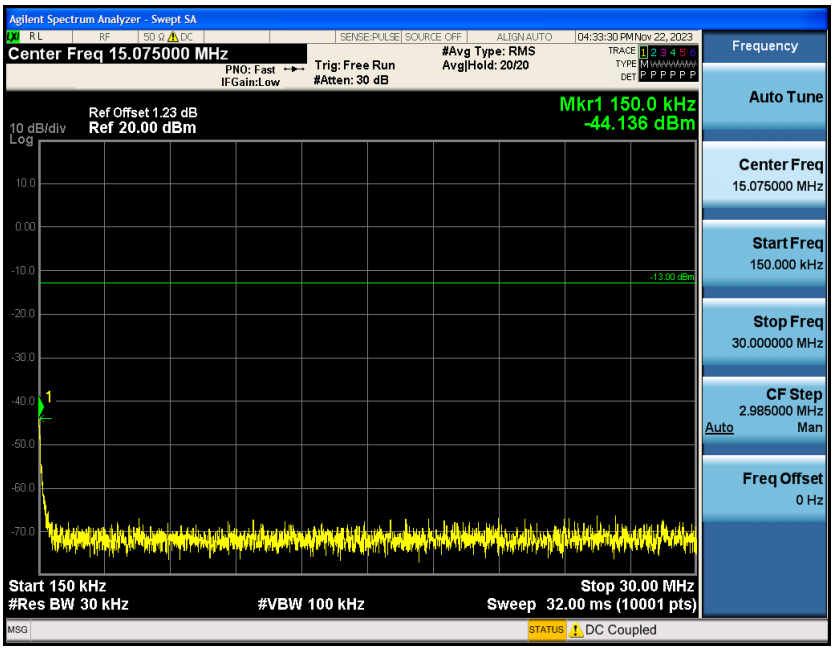
GPRS850-190-1000~10000MHz



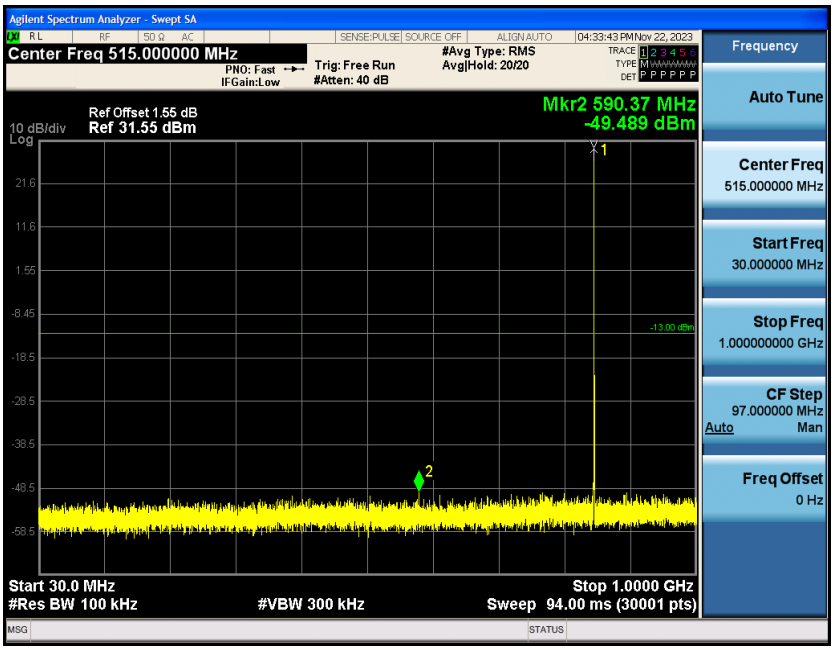
GPRS850-251-0.009~0.15MHz



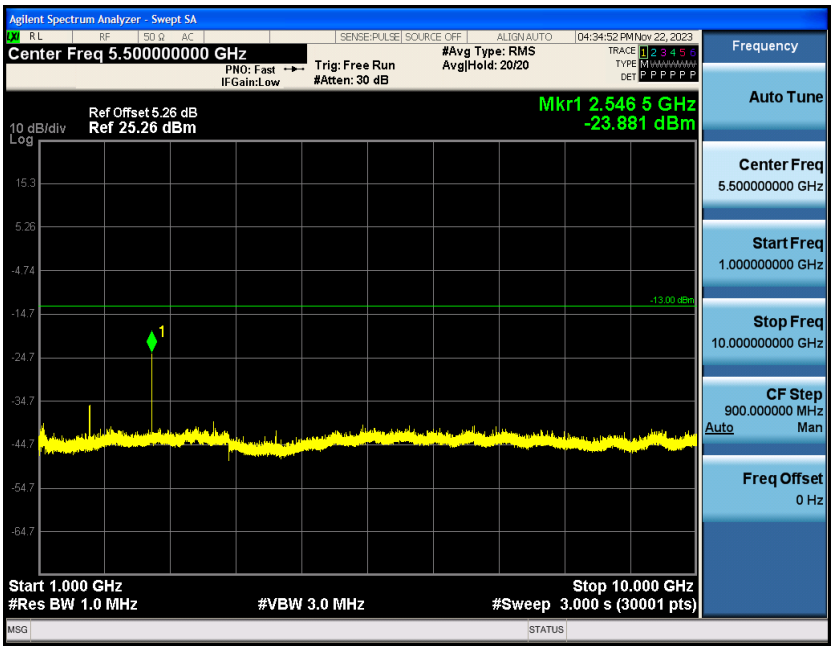
GPRS850-251-0.15~30MHz



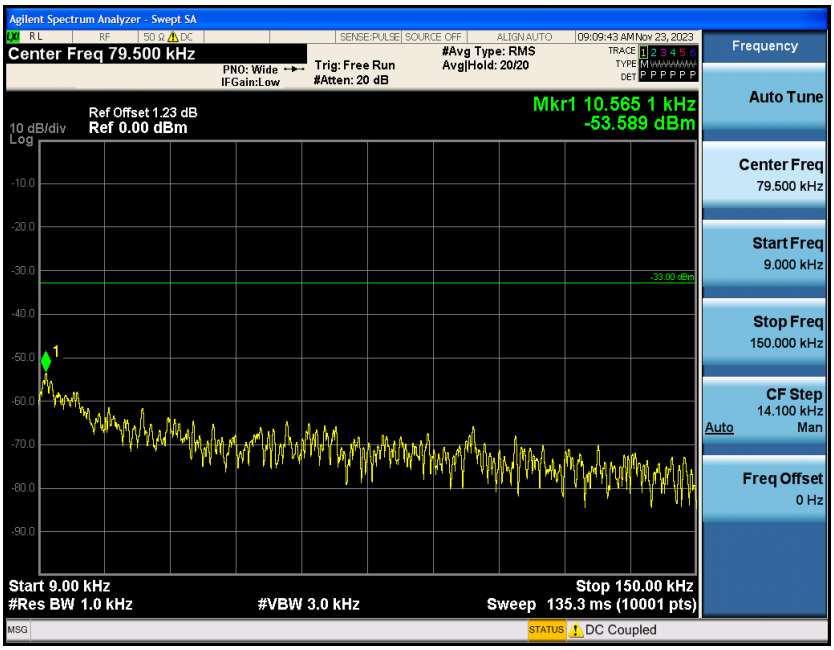
GPRS850-251-30~1000MHz



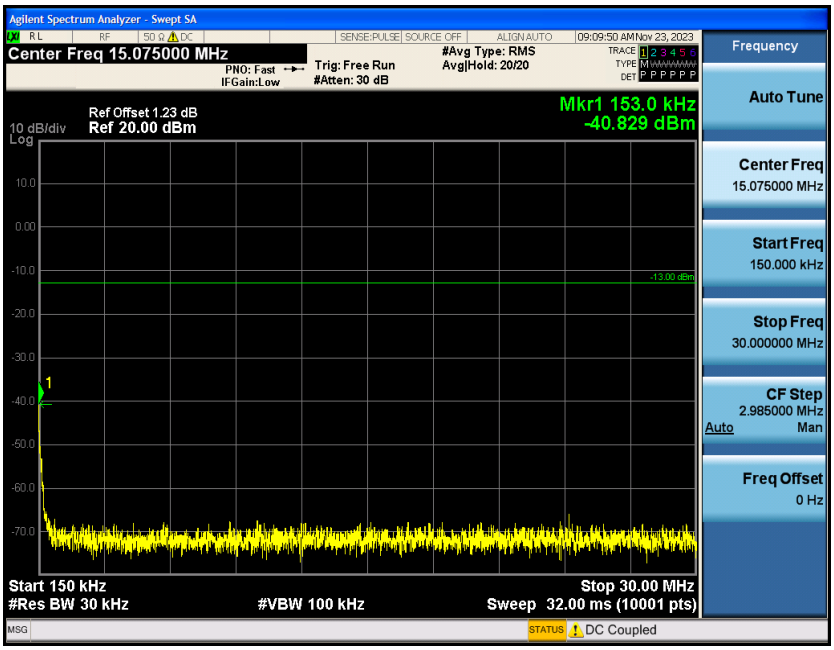
GPRS850-251-1000~10000MHz



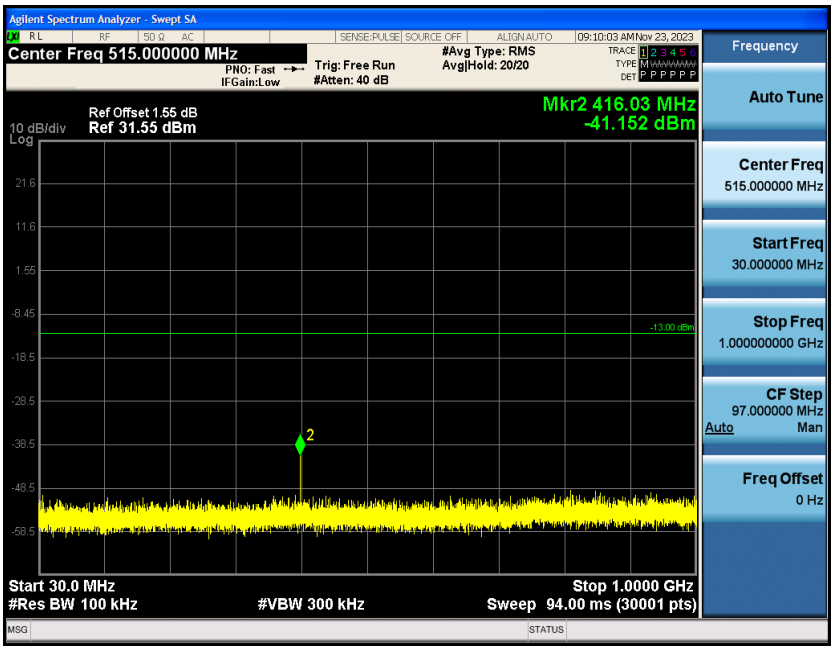
EGPRS850-128-0.009~0.15MHz



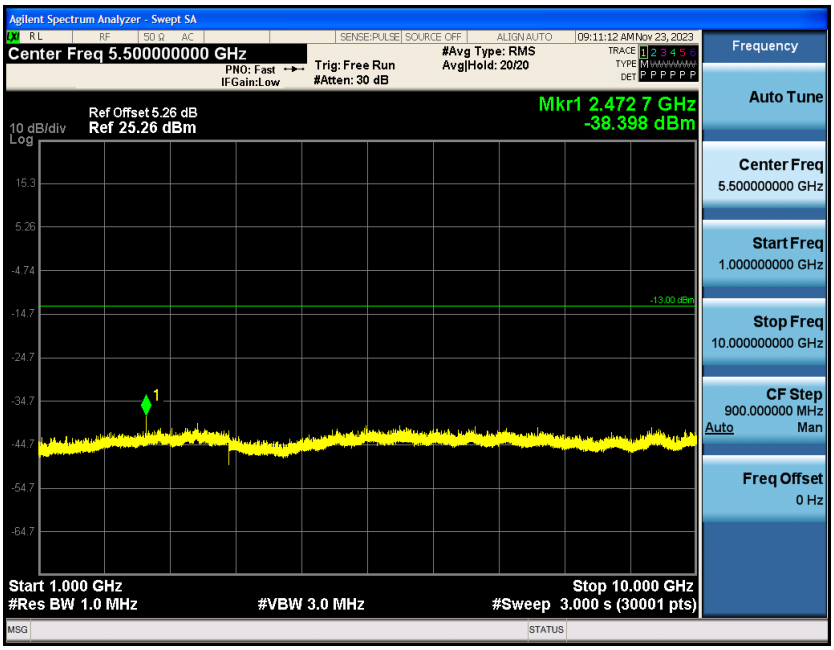
EGPRS850-128-0.15~30MHz



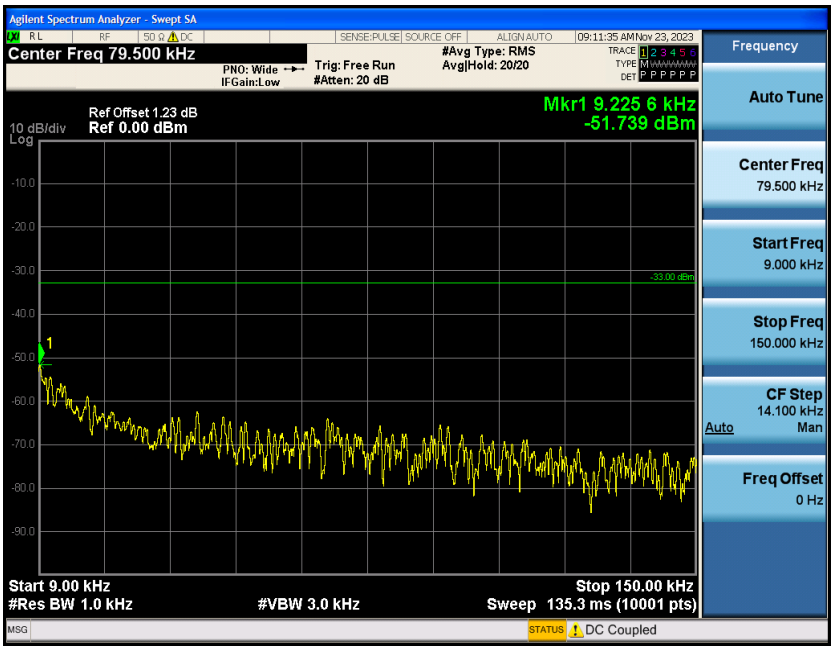
EGPRS850-128-30~1000MHz



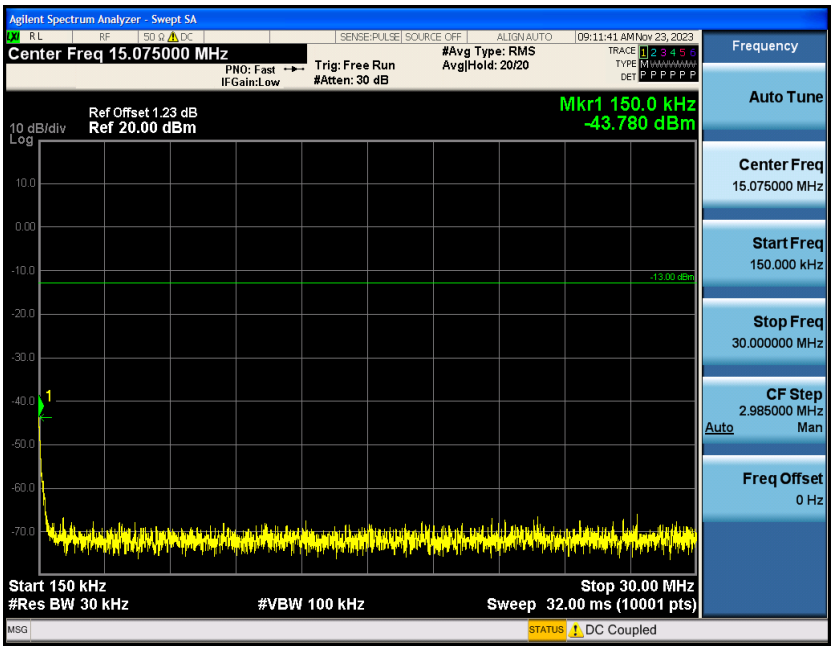
EGPRS850-128-1000~10000MHz



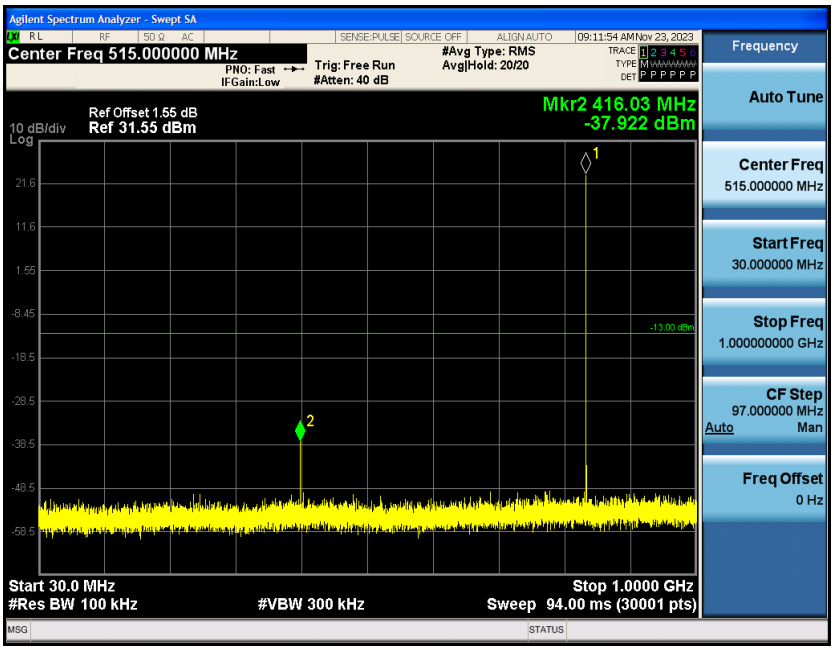
EGPRS850-190-0.009~0.15MHz



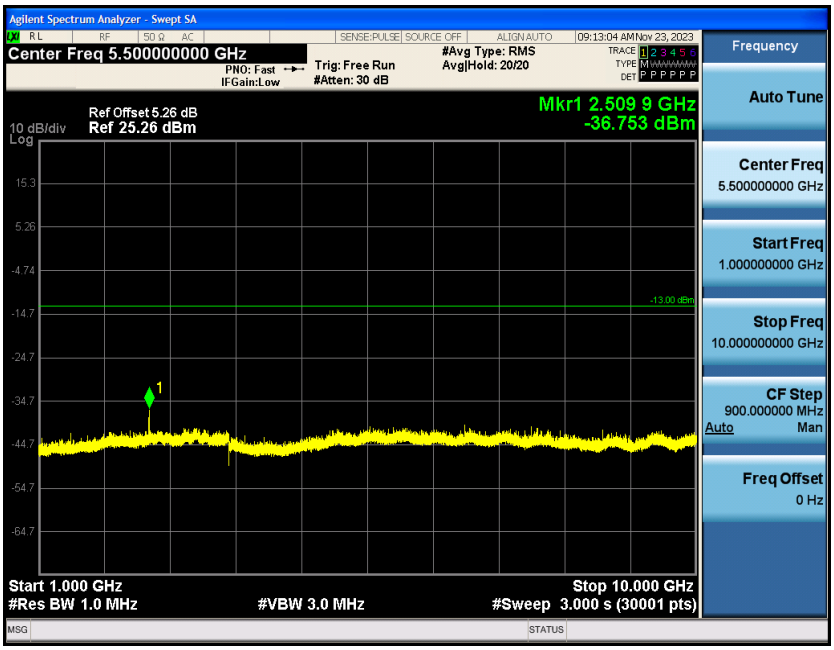
EGPRS850-190-0.15~30MHz



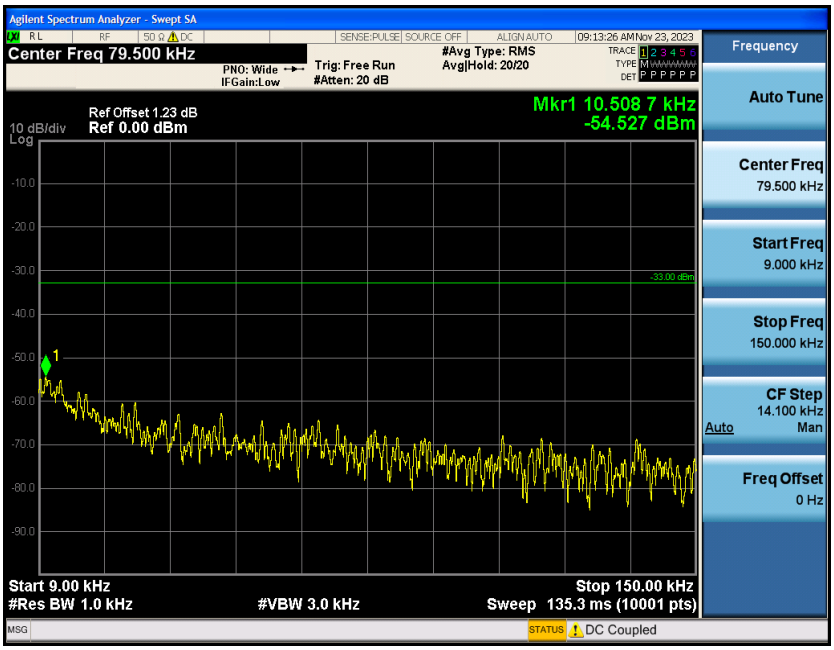
EGPRS850-190-30~1000MHz



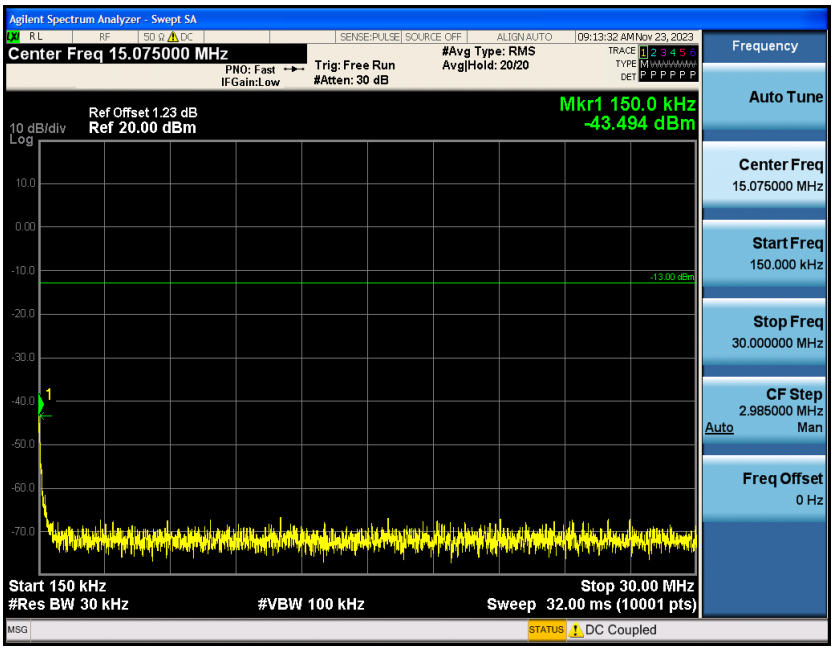
EGPRS850-190-1000~10000MHz



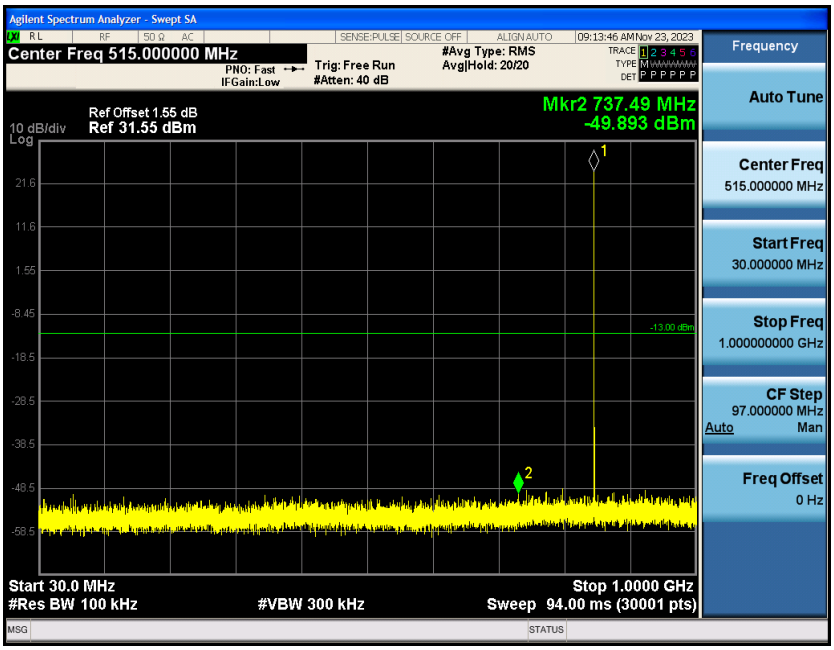
EGPRS850-251-0.009~0.15MHz



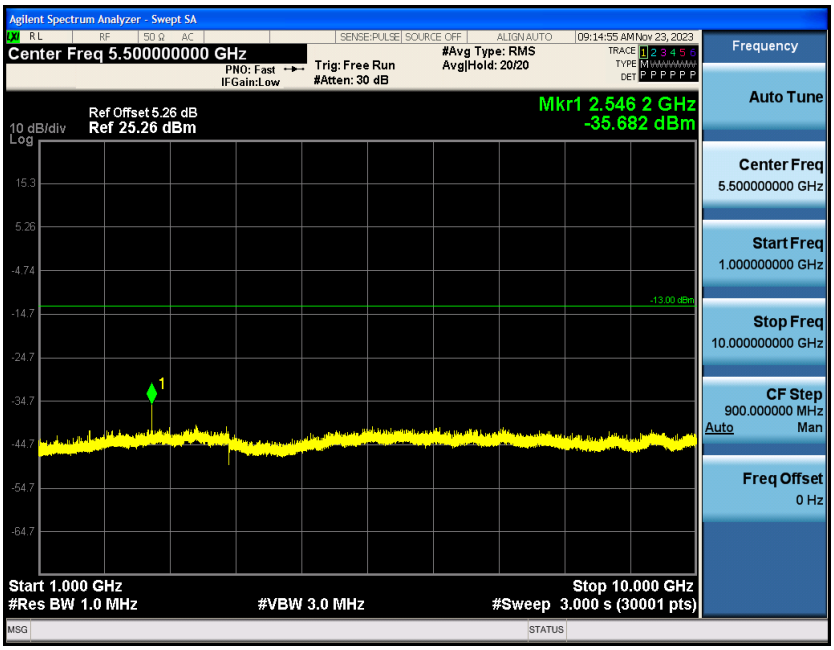
EGPRS850-251-0.15~30MHz



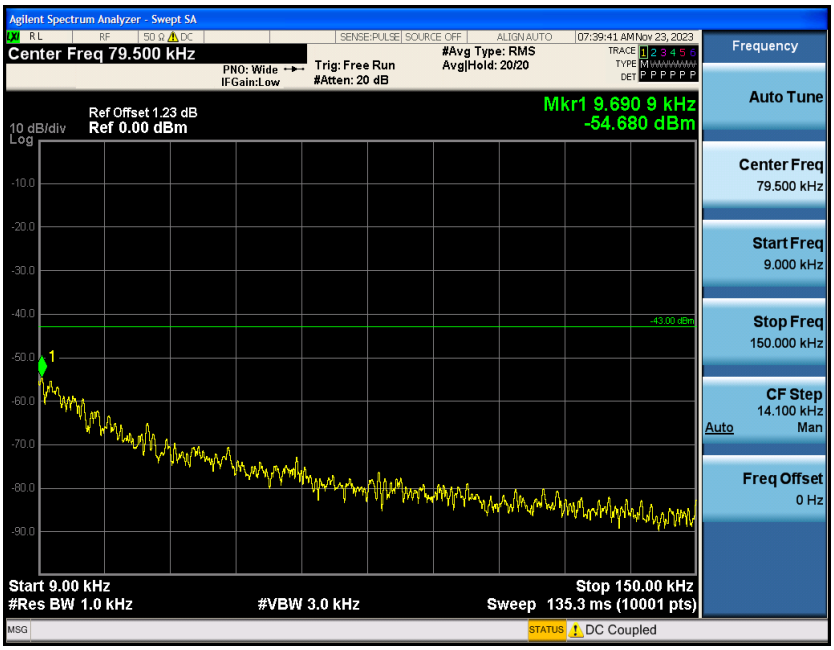
EGPRS850-251-30~1000MHz



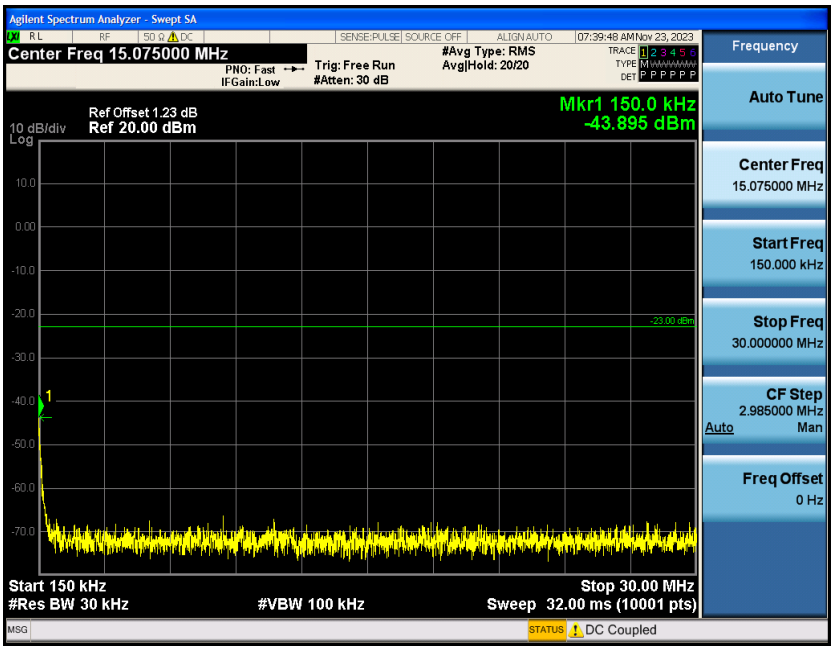
EGPRS850-251-1000~10000MHz



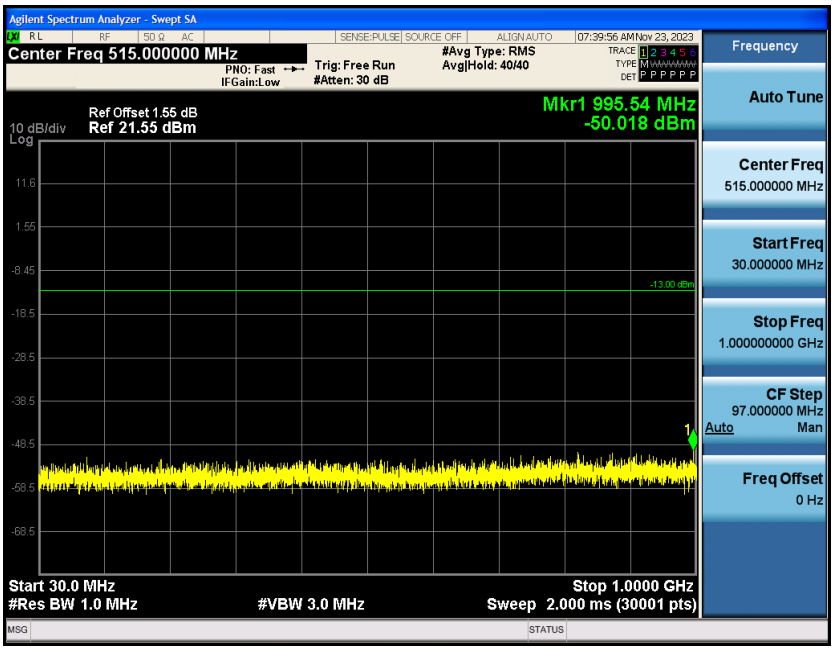
GSM1900-512-0.009~0.15MHz



GSM1900-512-0.15~30MHz

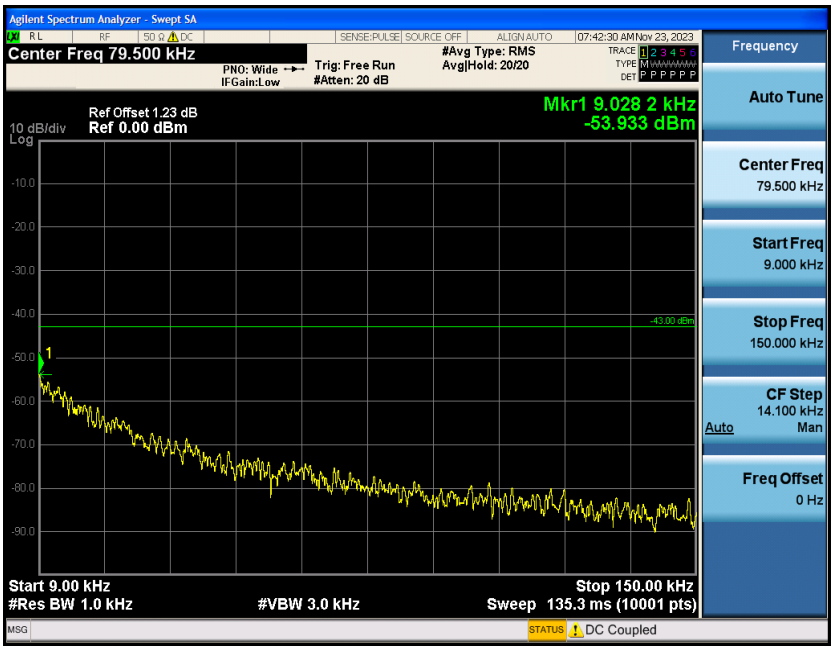


GSM1900-512-30~1000MHz

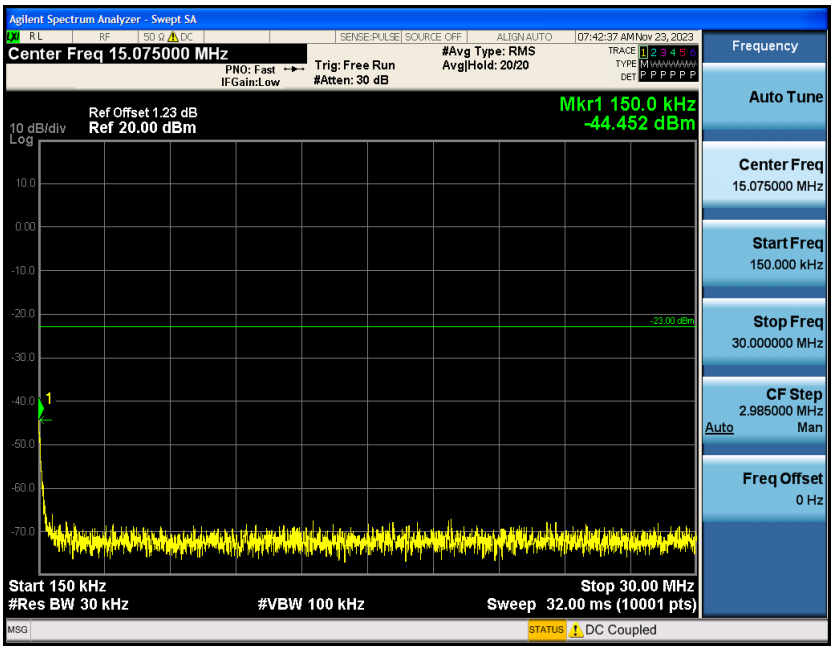


GSM1900-512-1000~18000MHz

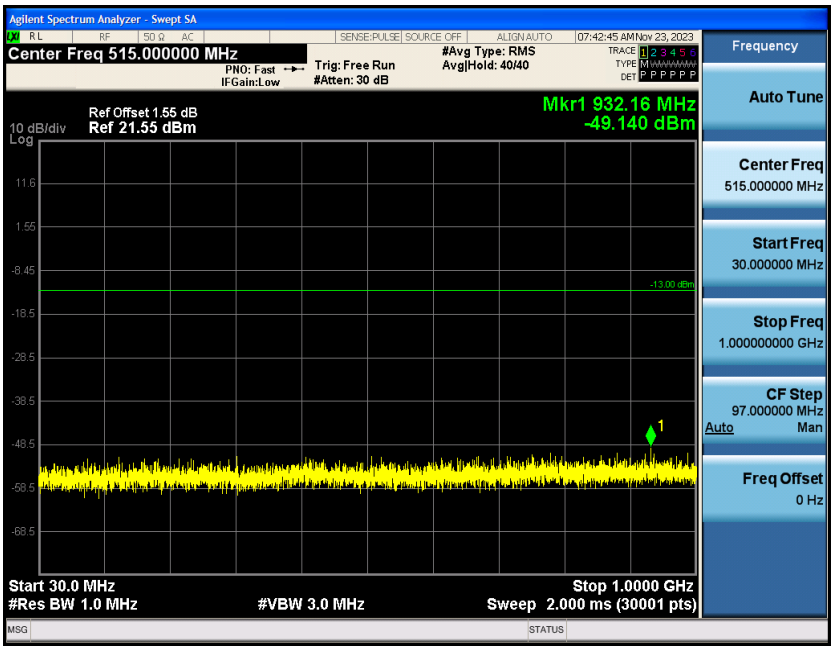
GSM1900-661-0.009~0.15MHz



GSM1900-661-0.15~30MHz



GSM1900-661-30~1000MHz



GSM1900-661-1000~18000MHz

GSM1900-810-0.009~0.15MHz