RF TEST REPORT
FCC ID: 2BACG-SP7200

Equipment	:	SMARTPHONE
Brand Name	:	SIRAGON
Test Model	:	SP-7200
Applicant	:	Siragon Corporate
Address	:	CR MANZANA A LOCAL SHED NRO 1-4 VALLE ALTO GUAYABAL, NAGUANAGUA CARABOBO ZIP 2005. IVORY STORE
Date of Receipt	:	2023.02.17
Date of Test	:	2023.02.18~2023.03.01
Issued Date	:	2023.03.01
Report Version	:	V1.0
Test Sample	:	Engineering Sample No.: AIT23021702-1
Standard(s)	:	FCC Part 22H & 24E Rules; ANSI C63.26:2015

Lab:Dongguan Yaxu (AiT) Technology Limited
Add:No.22,Jinqianling3rd Street,Jitigang,Huangjiang,Dongguan, Guangdong,China
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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

Approved by: Seal Chen

REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	2023.03.01	Valid	Initial Release

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1. GENERAL INFORMATION

Applicant	Siragon Corporate
Address	CR MANZANA A LOCAL SHED NRO 1-4 VALLE ALTO GUAYABAL, NAGUANAGUA CARABOBO ZIP 2005. IVORY STORE
Manufacturer	Shenzhen KEP Technology CO., LTD
Address	Room 101, 201 and 301, Plant B, 1-3F of Plant A,FenghuangGang First Industrial Area, FenghuangGang Community, Xixiang Street, Bao' an District, Shenzhen City,Guangdong Province,China
Factory	Shenzhen KEP Technology CO., LTD
Address	Room 101, 201 and 301, Plant B, 1-3F of Plant A,FenghuangGang First Industrial Area, FenghuangGang Community, Xixiang Street, Bao' an District, Shenzhen City,Guangdong Province,China
Product Designation	SMARTPHONE
Brand Name	SIRAGON
Test Model	SP-7200
Deviation	No any deviation from the test method.
Condition of Test Sample	Normal
Test Result	Pass

2. PRODUCT INFORMATION

2.1 PRODUCT TECHNICAL DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	SP-7200		
Hardware Version:	S680_V1		
Software Version:	SP_7200_V6		
Support Networks:	GSM, GPRS, EDGE, WCDMA, HSDPA, HSUPA		
Frequency Bands:	☒ GPRS 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		
Emission Designator:	GSM/GPRS 850:	244KGXW	
	EDGE 850:	249KG7W	
	GSM/GPRS 1900:	245KGXW	
	EDGE 1900:	251KG7W	
	WCDMA Band II:	4M17F9W	
	WCDMA Band V:	4M17F9W	
Antenna Type:	FPC Antenna		
Antenna gain:	GSM850:-0.95dBi	PCS1900: 1.08dBi	
	WCDMA850:-0.98dBi	WCDMA1900:1.08dBi	
Power Supply:	DC 3.85V by Built-in Li-ion Battery		
Battery parameter:	DC 3.85V 4900mAh		
Dual Card:	GSM /WCDMA Card Slot		
Extreme Vol. Limits:	DC3.465V to 4.235V (Normal: DC 3.85V)		
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)
GSM 850	32.97	32.55
PCS 1900	30.58	29.50
EDGE 850	23.68	26.51
EDGE 1900	27.86	26.78
UMTS BAND V	19.97	23.10
UMTS BAND II	24.96	23.88

GSM/WCDMA SLOT 2:

	Maximum ERP/EIRP (dBm)	Max. Average Burst Power (dBm)
GSM 850	28.18	31.28
PCS 1900	29.11	28.03
EDGE 850	23.93	27.03
EDGE 1900	24.99	23.91
UMTS BAND V	13.76	16.86
UMTS BAND II	26.08	25.00

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 DigitalTransmitters.

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.

2.7 EMISSION DESIGNATOR

GSM Emission Designator

Emission Designator = 249KGXW

GSM BW = 249 kHz

G = Phase Modulation

X = Cases not otherwise covered

W = Combination (Audio/Data)

EDGE Emission Designator

Emission Designator = 249KG7W

GSM BW = 249 kHz

G = Phase Modulation

7 = Quantized/Digital Info

W = Combination (Audio/Data)

WCDMA Emission Designator

Emission Designator = 4M17F9W

WCDMA BW = 4.17 MHz

F = Frequency Modulation

9 = Composite Digital Info

W = Combination (Audio/Data)

QPSK Modulation

Emission Designator = 4M48G7D

LTE BW = 4.48 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

QAM Modulation

Emission Designator = 4M48W7D

LTE BW = 4.48 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

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 L 6177
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℃~55℃
Humidty range	20 % to 75 %.	20 % to 75 %.
Pressure range	86-106kPa	86-106kPa
Power supply	**DC 3.85V**	DC 3.465V or 4.235V
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	2022.09.02	2023.09.01
2	EMI Measuring Receiver	R&S	ESR	101660	2022.09.02	2023.09.01
3	Low Noise Pre Amplifier	HP	HP8447E	1937A01855	2022.09.02	2023.09.01
4	Low Noise Pre Amplifier	Tsj	MLA-0120-A02-34	2648A04738	2022.09.02	2023.09.01
5	Passive Loop	ETS	6512	00165355	2020.09.05	2022.09.04
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	2022.09.02	2023.09.01
10	LISN	Kyoritsu	KNW-242	8-837-4	2022.09.02	2023.09.01
11	LISN	R&S	ESH3-Z2	0357.8810.54-101161-S2	2022.09.02	2023.09.01
12	Pro.Temp&Humi.chamber	MENTEK	MHP-150-1C	MAA08112501	2022.09.02	2023.09.01
13	RF Automatic Test system	MW	MW100-RFCB	21033016	2022.09.02	2023.09.01
14	Signal Generator	Agilent	N5182A	MY501430009	2022.09.02	2023.09.01
15	Wideband Radio communication tester	R&S	CMW500	1201.0002K50	2022.09.02	2023.09.01
16	RF Automatic Test system	MW	MW100-RFCB	21033016	2022.09.02	2023.09.01
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 connector(Note)	NTS	R001	N/A	N/A	N/A
22	Spectrum Analyzer	Agilent	N9020A	MT21033052	2022.09.02	2023.09.01
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

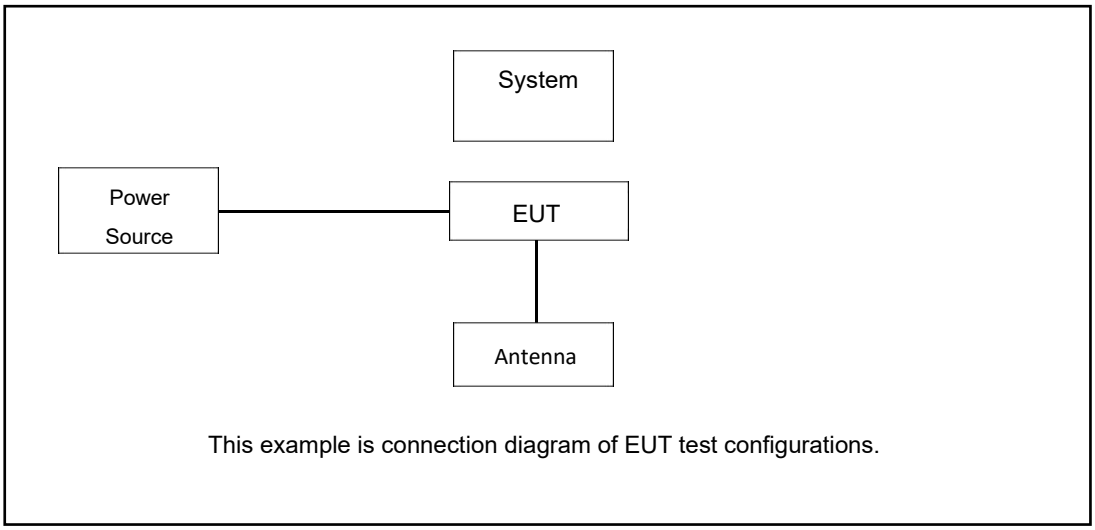
4.1 EUT CONFIGURATION

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	SMARTPHONE	SP-7200	--	EUT
2	Adapter	PG-QC18W-U	Input: AC 50/60Hz, 0.3A Output: DC 5.0V 2A	AE
3	Battery	--	DC 3.85V 4900mAh	AE
4	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

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.

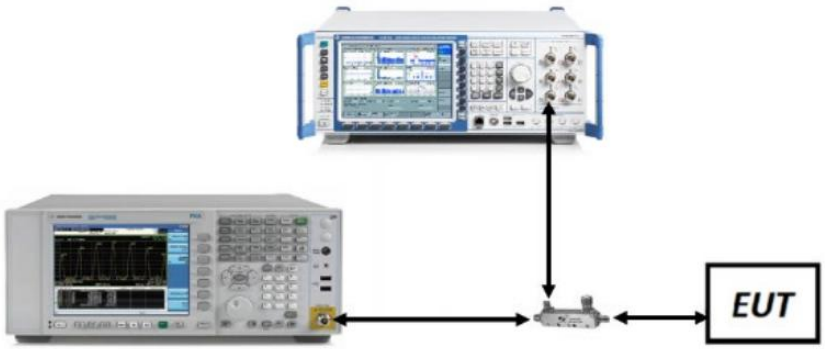
The EUT is substituted for the dipole at the reference centre of the chamber and a scan is performed to obtain

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.

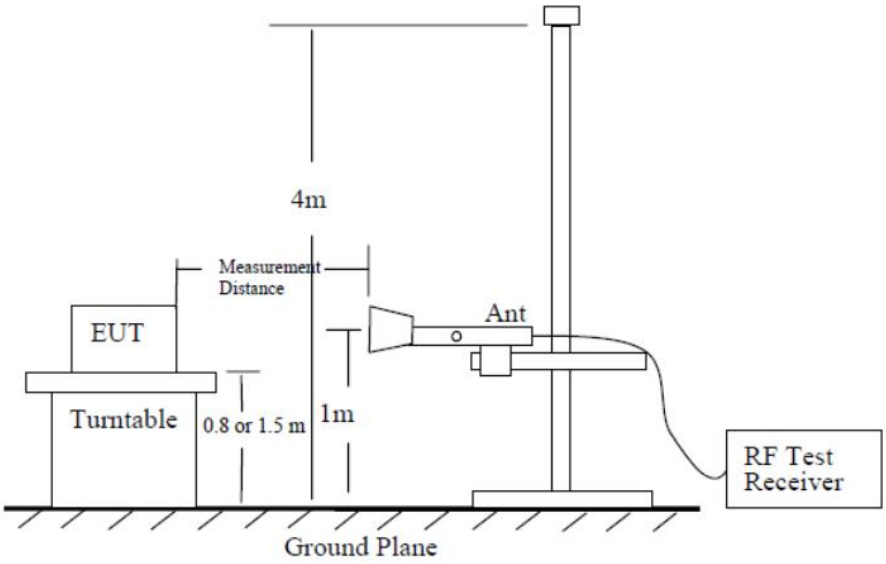
7.4 MEASUREMENT SETUP

Conducted method:

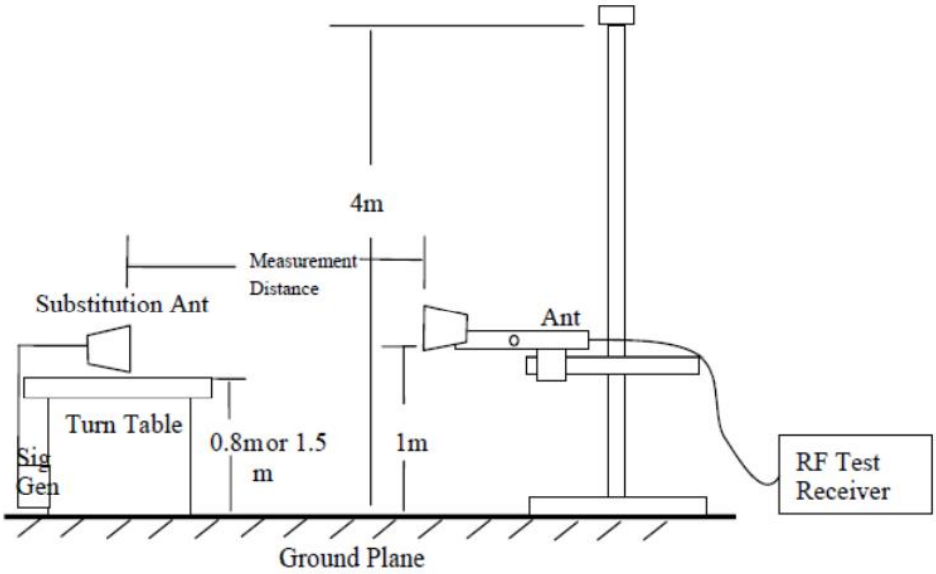


Radiated method:

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**	32.55	32.6	32.52	**32.97**	32.79	32.58
GPRS (GMSK)	1 Tx Slot	34.00	32.91	32.83	32.63	26.34	26.39	26.31
	2 Tx Slot	32.00	30.94	30.78	30.58	25.33	25.09	24.9
	3 Tx Slot	31.00	28.91	28.75	28.56	22.7	22.46	22.26
	4 Tx Slot	30.00	26.85	26.72	26.55	20.75	20.47	20.24
EDGE (8PSK)	1 Tx Slot	29.00	**26.51**	26.51	26.30	**23.68**	23.08	22.59
	2 Tx Slot	28.00	25.27	25.43	25.13	21.65	21.35	20.85
	3 Tx Slot	26.00	23.08	23.21	22.91	20	19.63	19.41
	4 Tx Slot	25.00	20.47	20.56	20.34	18.01	17.75	17.34

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**	29.45	**29.50**	29.42	30.53	**30.58**	30.5
GPRS (GMSK)	1 Tx Slot	31.00	29.44	29.49	29.41	30.52	30.57	30.49
	2 Tx Slot	29.00	27.48	27.24	27.05	28.56	28.32	28.13
	3 Tx Slot	28.00	25.80	25.56	25.36	26.88	26.64	26.44
	4 Tx Slot	27.00	23.85	23.57	23.34	24.93	24.65	24.42
EDGE (8PSK)	1 Tx Slot	26.00	**26.78**	26.18	25.69	**27.86**	27.26	26.77
	2 Tx Slot	25.00	24.75	24.45	23.95	25.83	25.53	25.03
	3 Tx Slot	24.00	23.10	22.73	22.51	24.18	23.81	23.59
	4 Tx Slot	23.00	21.11	20.85	20.44	22.19	21.93	21.52

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	**23.88**	23.89	23.84	**24.96**	24.97	24.92
RMC 64K	24+1/-3	22.6	22.95	22.93	23.68	24.03	24.01
RMC 144K	24+1/-3	22.59	22.94	22.9	23.67	24.02	23.98
RMC 384K	24+1/-3	22.6	22.93	22.95	23.68	24.01	24.03
HSDPA+ Subtest-1	24+1/-3	22.76	23.54	23.20	23.84	24.62	24.28
HSDPA+ Subtest-2	24+1/-3	23.22	23.51	23.22	24.3	24.59	24.3
HSDPA+ Subtest-3	24+1/-3	23.20	23.49	23.20	24.28	24.57	24.28
HSDPA+ Subtest-4	24+1/-3	23.19	23.54	23.20	24.27	24.62	24.28
HSUPA Subtest-1	24+1/-3	22.93	22.92	23.65	24.01	24.00	24.73
HSUPA Subtest-2	24+1/-3	20.98	21.45	23.02	22.06	22.53	24.10
HSUPA Subtest-3	24+1/-3	21.40	21.68	21.34	22.48	22.76	22.42
HSUPA Subtest-4	24+1/-3	21.38	21.67	21.38	22.46	22.75	22.46
HSUPA Subtest-5	24+1/-3	22.94	22.92	21.35	24.02	24.00	22.43

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	**23.10**	22.99	22.83	**19.97**	19.86	19.7
RMC 64K	24+1/-3	22.6	22.52	22.14	19.47	19.39	19.01
RMC 144K	24+1/-3	22.54	22.5	22.78	19.41	19.37	19.65
RMC 384K	24+1/-3	21.98	22.13	21.99	18.85	19.00	18.86
HSDPA+ Subtest-1	24+1/-3	22.09	21.61	21.66	18.96	18.48	18.53
HSDPA+ Subtest-2	24+1/-3	21.71	21.60	21.70	18.58	18.47	18.57
HSDPA+ Subtest-3	24+1/-3	21.70	21.67	21.70	18.57	18.54	18.57
HSDPA+ Subtest-4	24+1/-3	21.68	21.64	21.69	18.55	18.51	18.56
HSUPA Subtest-1	24+1/-3	19.68	19.73	19.6	16.55	16.60	16.47
HSUPA Subtest-2	24+1/-3	19.73	19.71	19.7	16.6	16.58	16.57
HSUPA Subtest-3	24+1/-3	20.68	20.67	20.63	17.55	17.54	17.50
HSUPA Subtest-4	24+1/-3	19.28	19.22	19.16	16.15	16.09	16.03
HSUPA Subtest-5	24+1/-3	18.61	18.68	18.9	15.48	15.55	15.77

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

① CCDF Procedure for PAPR :

1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Set the measurement interval as follows:

-for continuous transmissions, set to 1 ms,

-or burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time

that is less than or equal to the burst duration.

4. Record the maximum PAPR level associated with a probability of 0.1%.

②Alternate 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)

Allow trace to fully stabilize.

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

Test Settings(Peak Power):

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

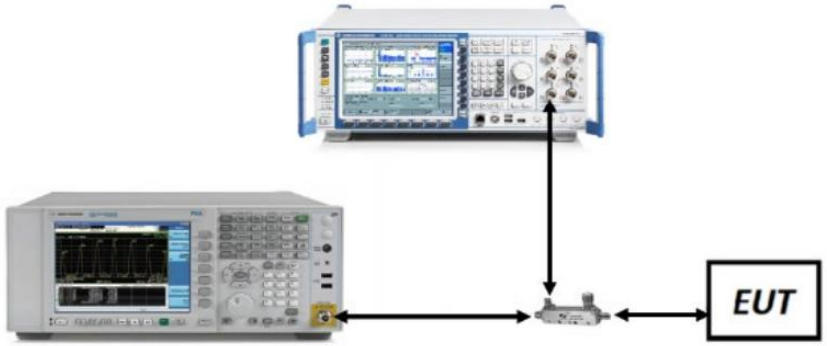
1. Set the RBW ≥ OBW.
2. Set VBW ≥ 3 × RBW.

3. Set span ≥ 2 × OBW.
4. Sweep time ≥ 10 × (number of points in sweep) × (transmission symbol period).
5. Detector = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the peak amplitude level.

Test Settings(Average Power)

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

8.3 MEASUREMENT SETUP



8.4 MEASUREMENT RESULT

Bands	Modulation	Peak-to-average ratio (dB)			Limit	Result
		Lowest	Middle	Highest	(dB)	
GSM 850	GSM	2.61	2.61	2.62	13	Pass
	EDGE	5.55	5.53	5.54	13	Pass
PCS 1900	GSM	2.63	2.64	2.62	13	Pass
	EDGE	5.19	5.19	5.28	13	Pass
WCDMA Band II	RMC 12.2kbps	2.92	2.95	2.82	13	Pass
WCDMA Band II	HSUPA	4.55	4.53	4.49	13	Pass
WCDMA Band II	HSDPA	3.20	3.22	3.19	13	Pass
WCDMA Band V	RMC 12.2kbps	2.99	3.06	3.07	13	Pass
WCDMA Band V	HSUPA	4.31	4.32	4.21	13	Pass
WCDMA Band V	HSDPA	2.83	2.82	2.74	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.

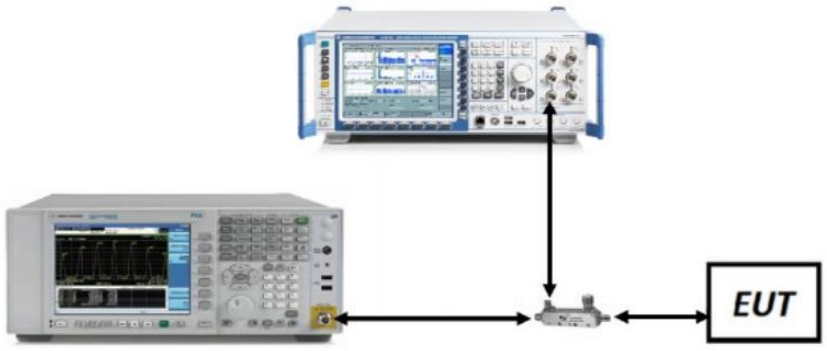
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base stationand spectrum analyzer.

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

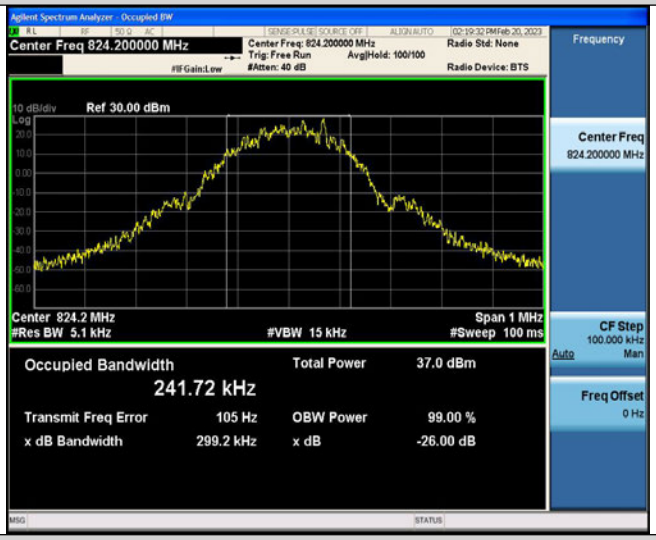


9.4 MEASUREMENT RESULT

Band	Channel	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Limit (MHz)	Verdict
GSM850	128	0.24172	0.2992	---	PASS
GSM850	190	0.24408	0.3081	---	PASS
GSM850	251	0.24065	0.2991	---	PASS
GPRS850	128	0.24338	0.3067	---	PASS
GPRS850	190	0.24296	0.3075	---	PASS
GPRS850	251	0.24200	0.3085	---	PASS
EGPRS850	128	0.24812	0.3089	---	PASS
EGPRS850	190	0.24911	0.3083	---	PASS
EGPRS850	251	0.24653	0.3094	---	PASS
GSM1900	512	0.24369	0.3026	---	PASS
GSM1900	661	0.24327	0.3004	---	PASS
GSM1900	810	0.24562	0.3085	---	PASS
GPRS1900	512	0.24302	0.3095	---	PASS
GPRS1900	661	0.24196	0.3084	---	PASS
GPRS1900	810	0.24230	0.3104	---	PASS
EGPRS1900	512	0.25101	0.3107	---	PASS
EGPRS1900	661	0.25143	0.3116	---	PASS
EGPRS1900	810	0.24661	0.3083	---	PASS

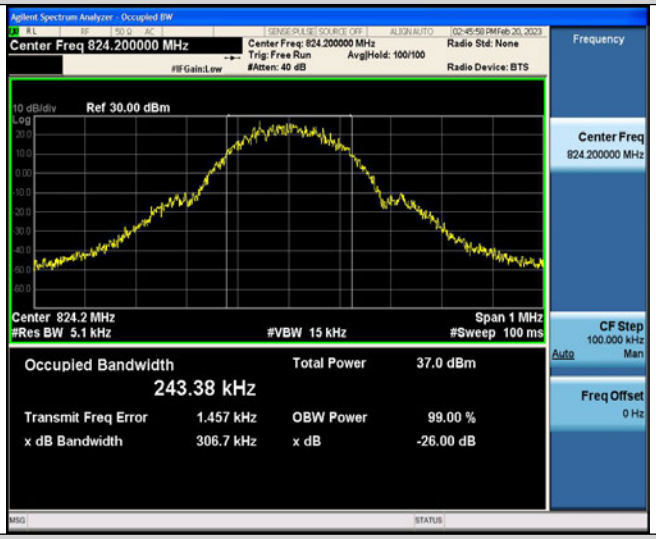
Band	Channel	Occupied Bandwidth (kHz)	26dB Bandwidth (kHz)	Limit(kHz)	Verdict
Band II	9262	4.1664	4.696	---	PASS
Band II	9400	4.1628	4.699	---	PASS
Band II	9538	4.1684	4.694	---	PASS
Band V	4132	4.1623	4.693	---	PASS
Band V	4182	4.1713	4.694	---	PASS
Band V	4233	4.1727	4.681	---	PASS

Test Graphs

GSM850-128

GSM850-190

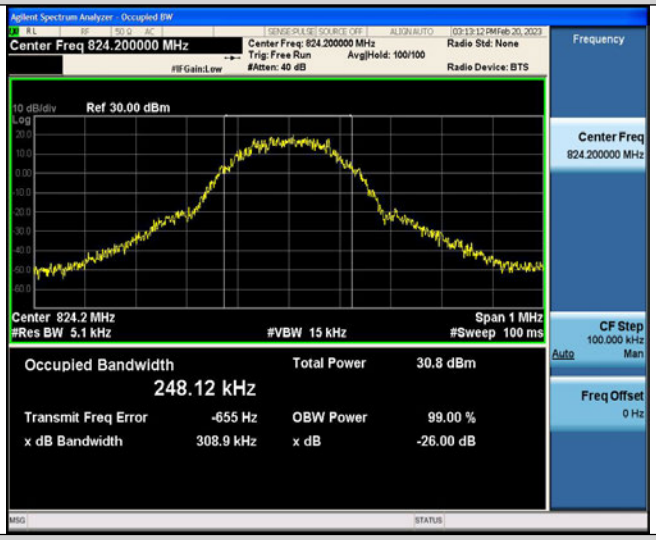
GSM850-251

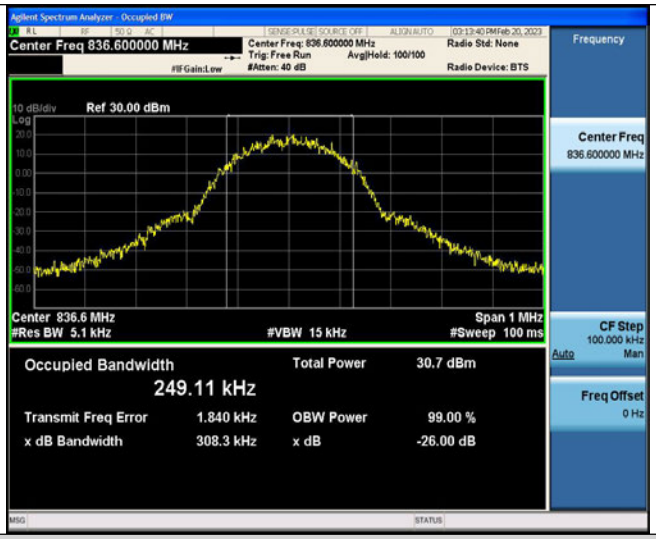
GPRS850-128



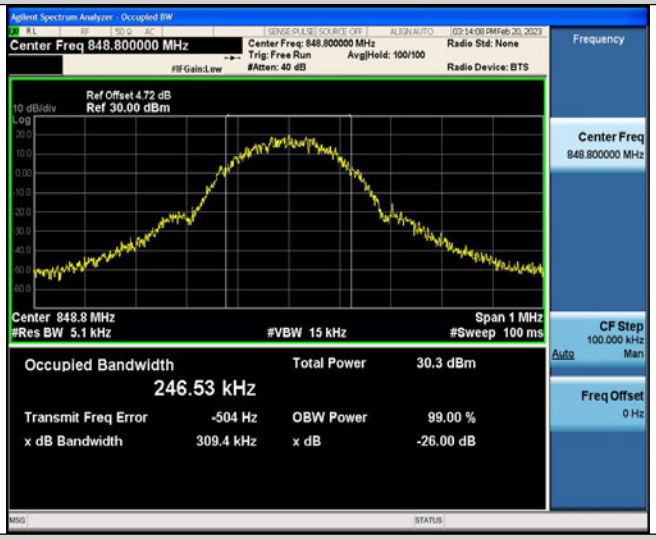
GPRS850-190

GPRS850-251

EGPRS850-128

EGPRS850-190



EGPRS850-251

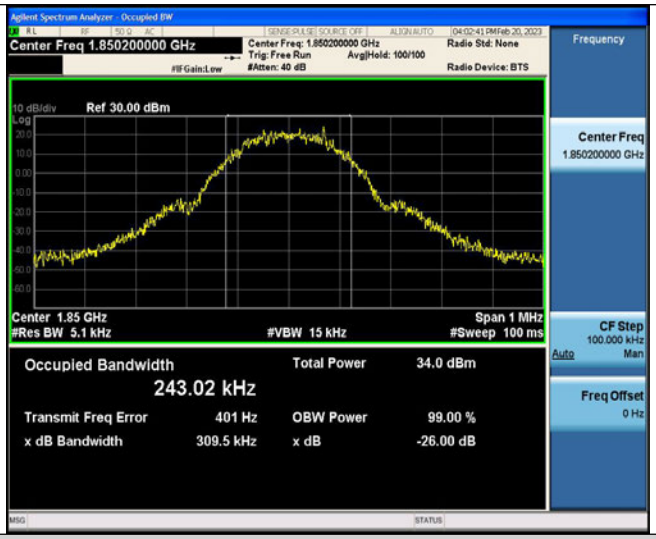


GSM1900-512

GSM1900-661

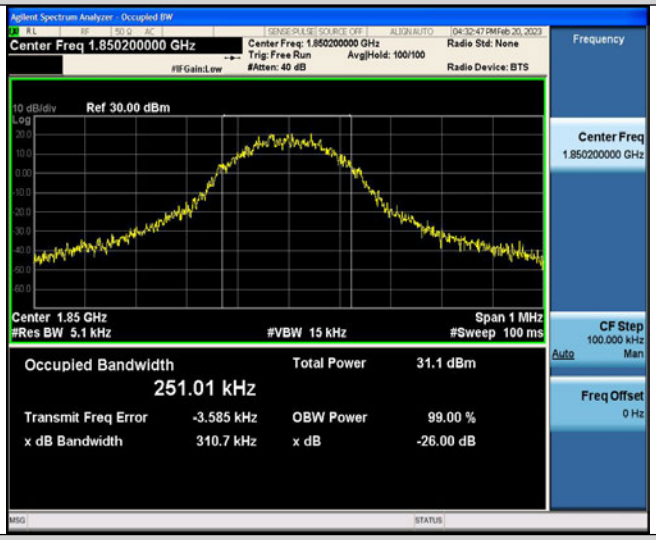
GSM1900-810

GPRS1900-512



GPRS1900-661

GPRS1900-810

EGPRS1900-512

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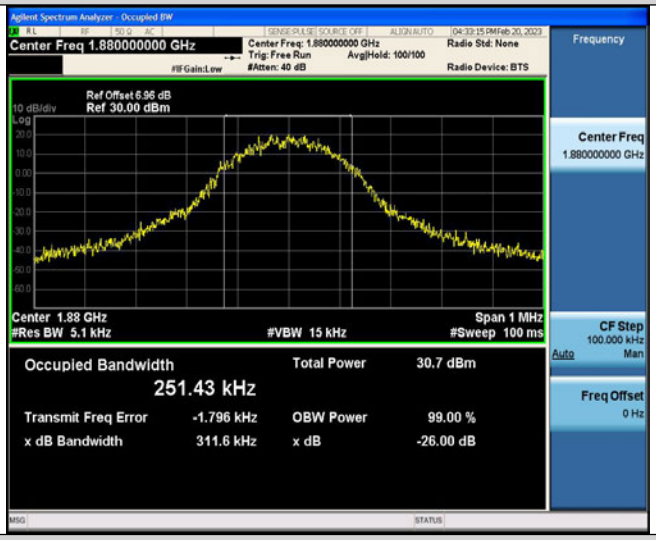
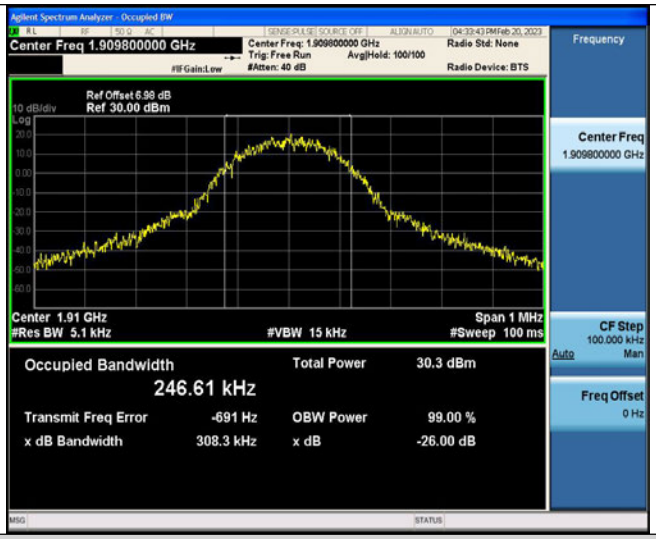

EGPRS1900-810



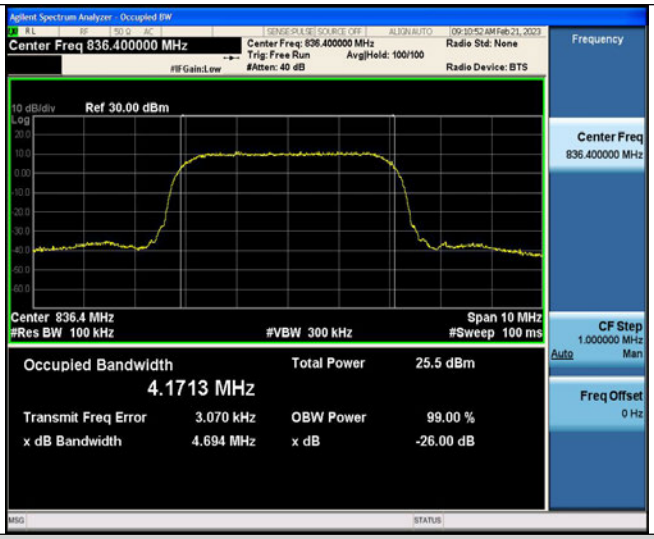
Band2-9262

Band2-9400

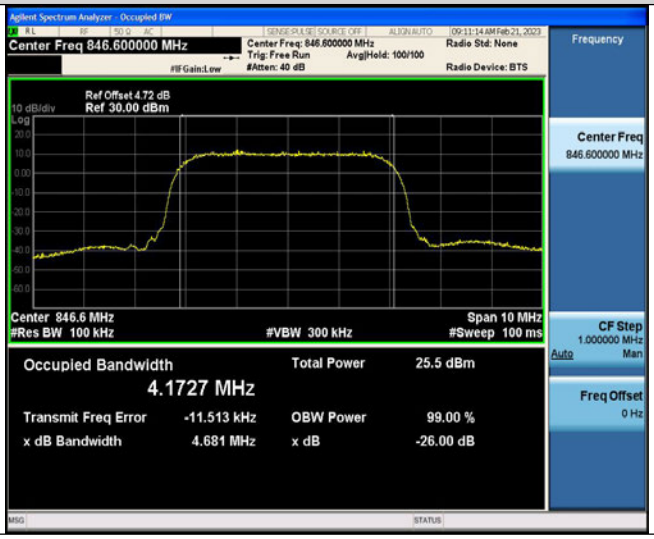
Band2-9538

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
Frequency
10 dB/div
Ref 30.00 dBm
Log
Center Freq
836.400000 MHz
Center 836.4 MHz
#Res BW 100 kHz
#VBW 300 kHz
Span 10 MHz
#Sweep 100 ms
CF Step
1.000000 MHz
Auto
Man
Occupied Bandwidth
4.1713 MHz
Total Power
25.5 dBm
Transmit Freq Error
3.070 kHz
OBW Power
99.00 %
x dB Bandwidth
4.694 MHz
x dB
-26.00 dB
Freq Offset
0 Hz
MSG
STATUS

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
Frequency
Ref Offset 4.72 dB
10 dB/div
Ref 30.00 dBm
Log
Center Freq
846.600000 MHz
Center 846.6 MHz
#Res BW 100 kHz
#VBW 300 kHz
Span 10 MHz
#Sweep 100 ms
CF Step
1.000000 MHz
Auto
Man
Occupied Bandwidth
4.1727 MHz
Total Power
25.5 dBm
Transmit Freq Error
-11.513 kHz
OBW Power
99.00 %
x dB Bandwidth
4.681 MHz
x dB
-26.00 dB
Freq Offset
0 Hz
MSG
STATUS

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.

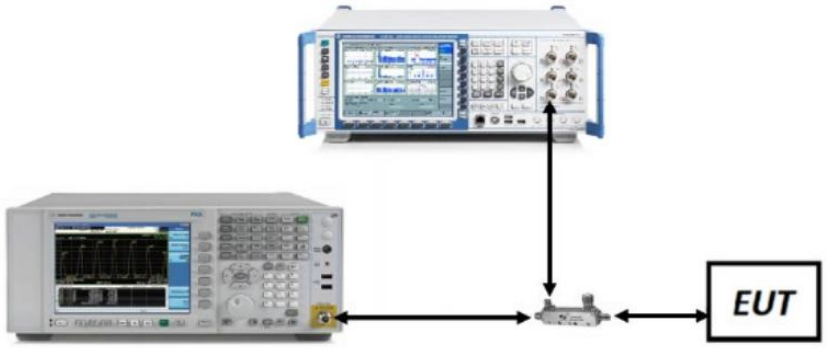
10.2 MEASUREMENT METHOD

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 = trace average
8. Sweep time = auto couple
9. The trace was allowed to stabilize

TEST NOTE

According to FCC 22.917, 24.238, 27.53 specified that power of any emission outside of The authorized 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

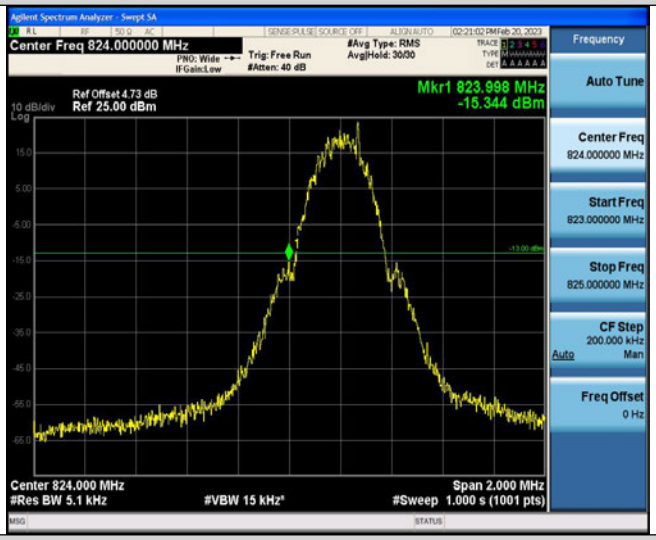
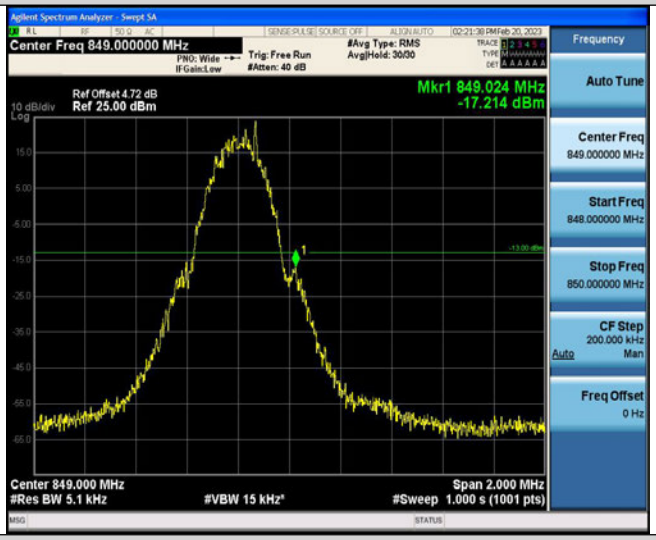


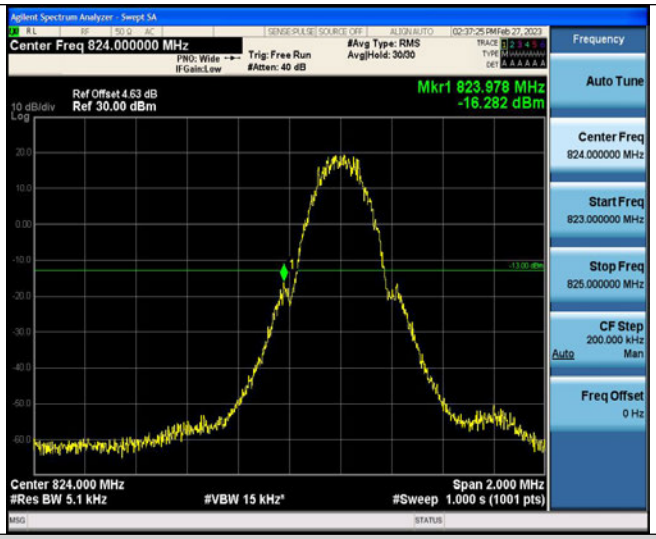
10.4 MEASUREMENT RESULT

Band	Channel	Freq (MHz)	Result (dBm)	Limit(dBm)	Verdict
GSM850	128	824.00	-15.34	-13	PASS
GSM850	251	849.02	-17.21	-13	PASS
GPRS850	128	823.98	-16.28	-13	PASS
GPRS850	251	849.02	-16.78	-13	PASS
EGPRS850	128	823.98	-25.80	-13	PASS
EGPRS850	251	849.00	-25.96	-13	PASS
GSM1900	512	1850.00	-16.71	-13	PASS
GSM1900	810	1910.02	-20.01	-13	PASS
GPRS1900	512	1849.98	-19.45	-13	PASS
GPRS1900	810	1910.02	-18.02	-13	PASS
EGPRS1900	512	1849.99	-23.13	-13	PASS
EGPRS1900	810	1910.01	-23.49	-13	PASS

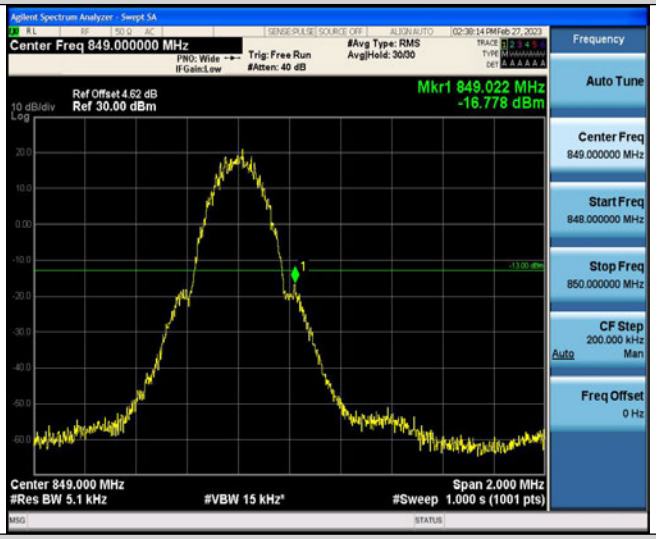
Band	Channel	Frequency (MHz)	Result (dBm)	Limit(dBm)	Verdict
Band2	9262	1849.95	-30.56	-13	PASS
Band2	9538	1910.00	-28.20	-13	PASS
Band5	4132	823.92	-31.53	-13	PASS
Band5	4233	849.07	-28.99	-13	PASS

Test Graphs

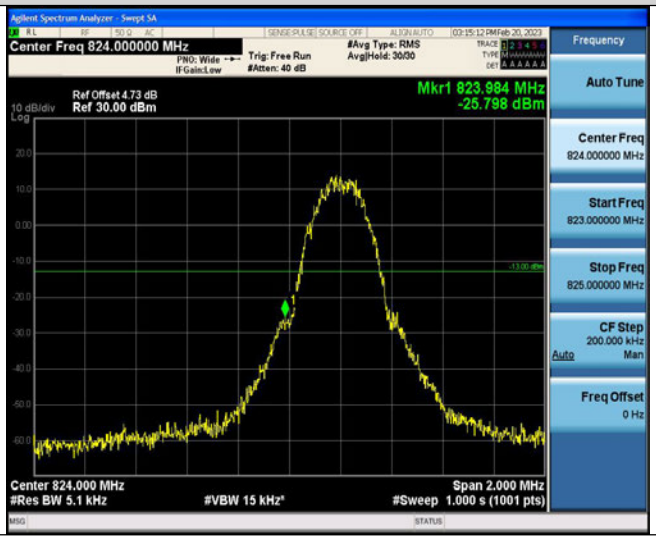
GSM850-128

GSM850-251

GPRS850-128



GPRS850-251



EGPRS850-128



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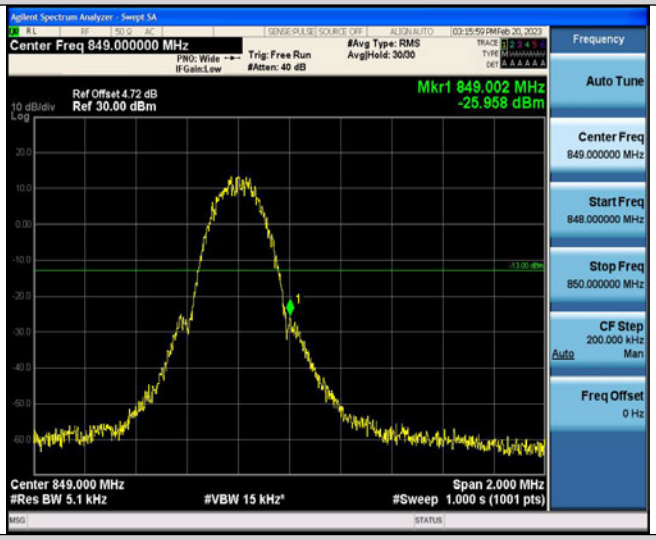
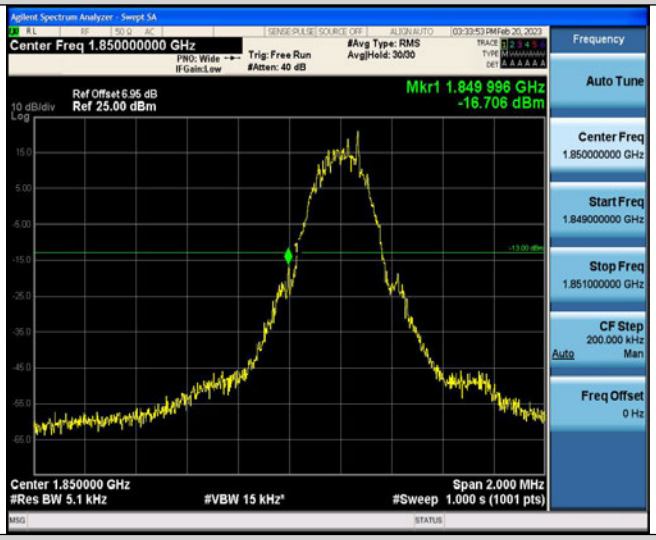
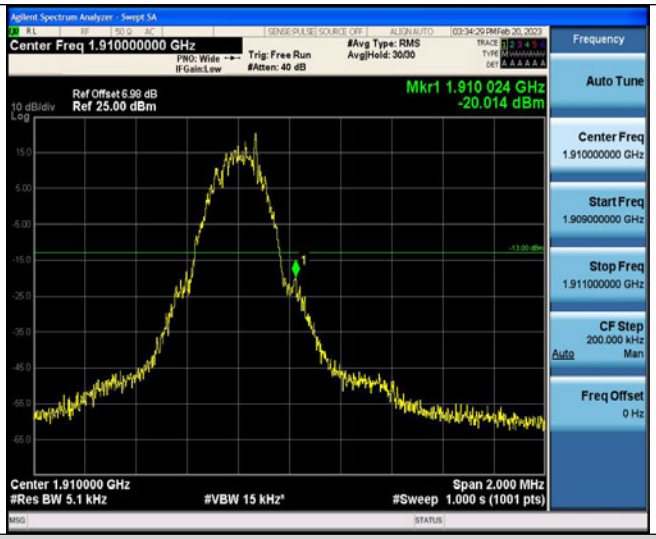
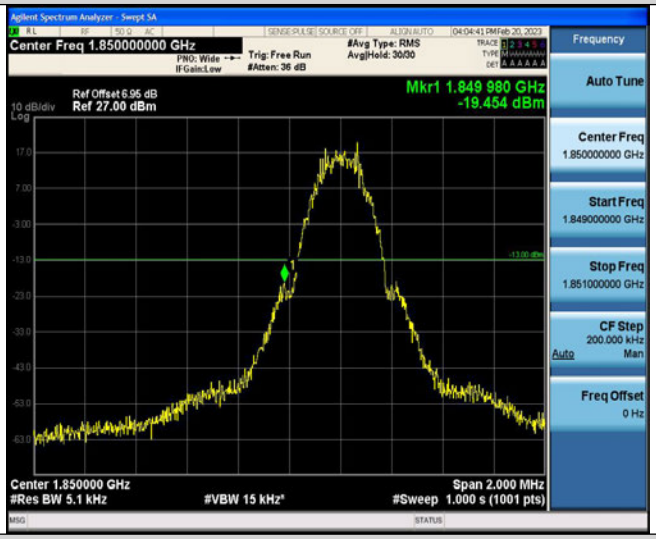
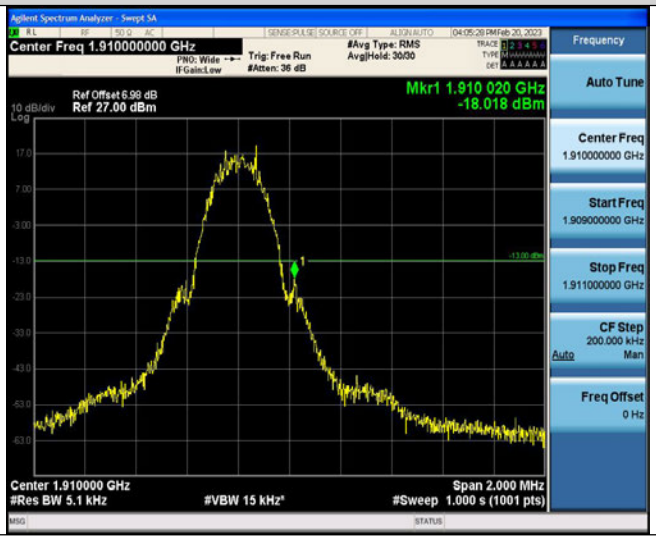

GSM1900-512

GSM1900-810

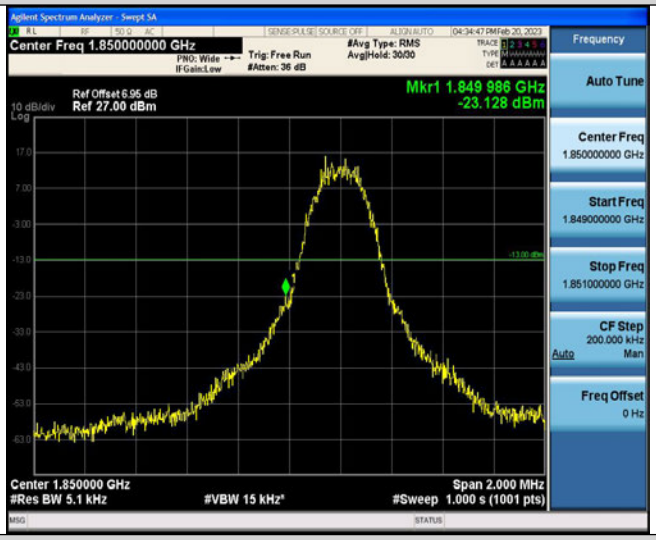
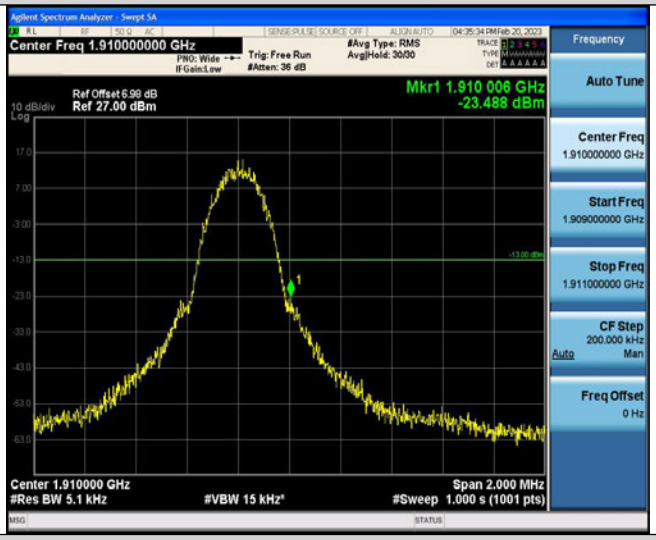


GPRS1900-512



GPRS1900-810



EGPRS1900-512

EGPRS1900-810

Band2-9262

Band2-9538

Band5-4132

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
Ref Offset 4.72 dB
10 dB/div Ref 30.00 dBm
Log
Mkr1 849.070 MHz
-28.991 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

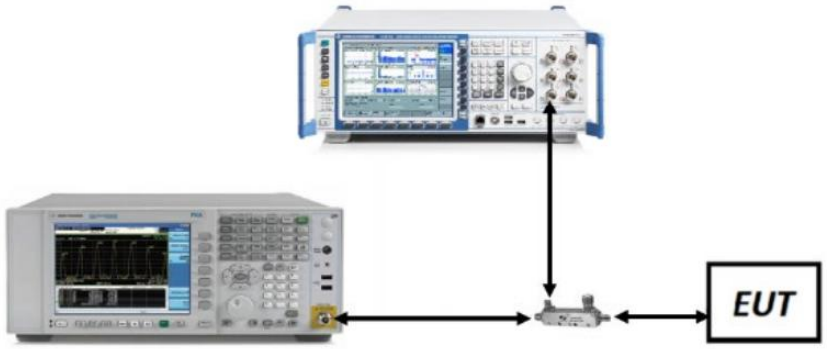
Test Settings (GSM)

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

Test Settings (WCDMA)

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

12.3 MEASUREMENT SETUP



11.4 MEASUREMENT RESULT

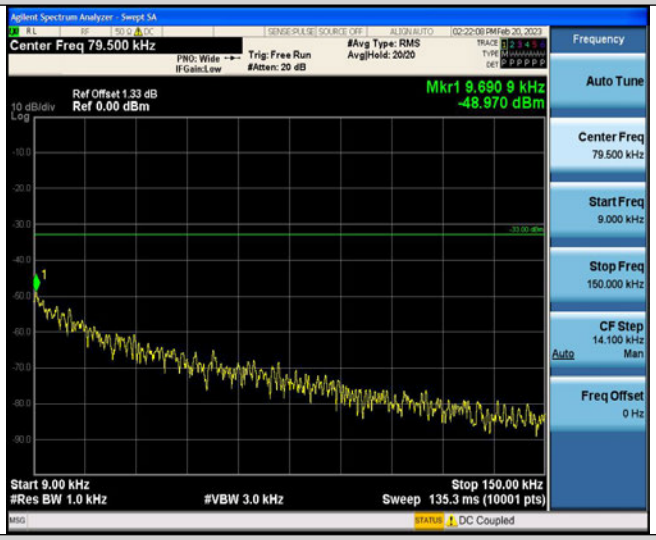
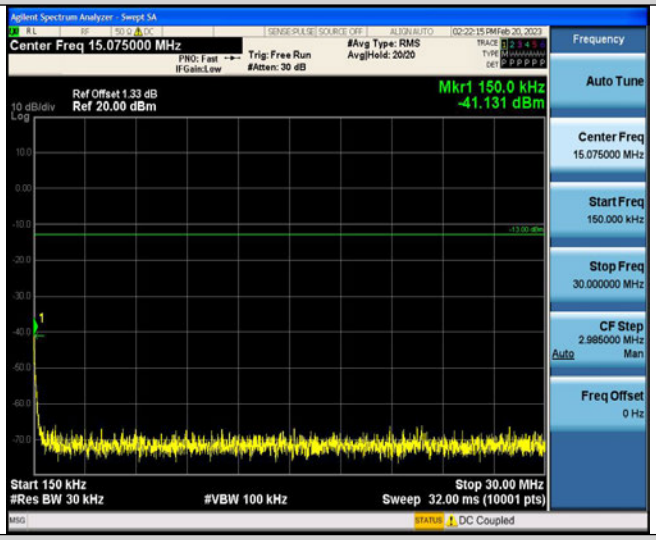
Band	Channel	Frequency Range(MHz)	Max.Freq. (MHz)	Result (dBm)	Limit (dBm)	Verdict
GSM850	128	0.009~0.15MHz	0.01	-48.97	-33	PASS
GSM850	128	0.15~30MHz	0.15	-41.13	-13	PASS
GSM850	128	30~1000MHz	992.66	-49.13	-13	PASS
GSM850	128	1000~10000MHz	2472.4	-21.93	-13	PASS
GSM850	190	0.009~0.15MHz	0.01	-50.84	-33	PASS
GSM850	190	0.15~30MHz	0.15	-41.81	-13	PASS
GSM850	190	30~1000MHz	120.99	-49.28	-13	PASS
GSM850	190	1000~10000MHz	2509.9	-23.08	-13	PASS
GSM850	251	0.009~0.15MHz	0.01	-50.02	-33	PASS
GSM850	251	0.15~30MHz	0.15	-41.57	-13	PASS
GSM850	251	30~1000MHz	241.62	-49.45	-13	PASS
GSM850	251	1000~10000MHz	2546.5	-22.35	-13	PASS
GPRS850	128	0.009~0.15MHz	0.01	-47.11	-33	PASS
GPRS850	128	0.15~30MHz	0.16	-41.93	-13	PASS
GPRS850	128	30~1000MHz	424.76	-48.28	-13	PASS
GPRS850	128	1000~10000MHz	2472.7	-21.99	-13	PASS
GPRS850	190	0.009~0.15MHz	0.01	-51.97	-33	PASS
GPRS850	190	0.15~30MHz	0.17	-41.89	-13	PASS
GPRS850	190	30~1000MHz	698.2	-49.45	-13	PASS
GPRS850	190	1000~10000MHz	2509.9	-23.03	-13	PASS
GPRS850	251	0.009~0.15MHz	0.01	-50.74	-33	PASS
GPRS850	251	0.15~30MHz	0.15	-39.92	-13	PASS
GPRS850	251	30~1000MHz	720.22	-49.23	-13	PASS
GPRS850	251	1000~10000MHz	2546.5	-22.55	-13	PASS
EGPRS850	128	0.009~0.15MHz	0.01	-53.62	-33	PASS
EGPRS850	128	0.15~30MHz	0.15	-43.28	-13	PASS
EGPRS850	128	30~1000MHz	973.1	-49.92	-13	PASS
EGPRS850	128	1000~10000MHz	2472.7	-32.74	-13	PASS
EGPRS850	190	0.009~0.15MHz	0.01	-54.95	-33	PASS
EGPRS850	190	0.15~30MHz	0.15	-41.53	-13	PASS
EGPRS850	190	30~1000MHz	978.98	-49.54	-13	PASS

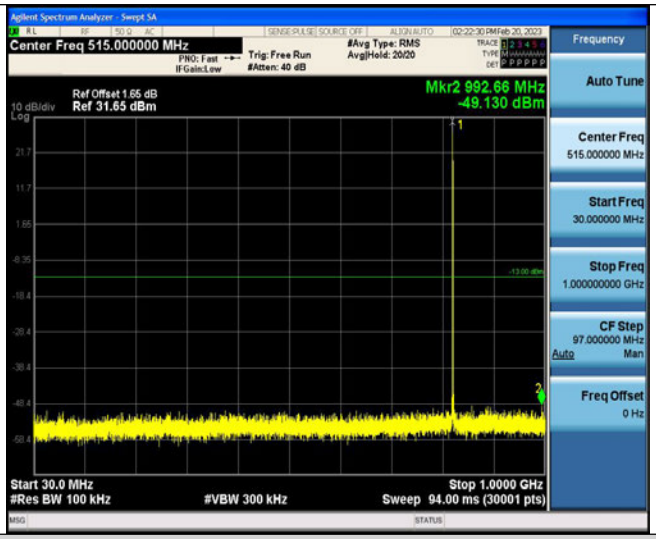
EGPRS850	190	1000~10000MHz	2509.6	-31.9	-13	PASS
EGPRS850	251	0.009~0.15MHz	0.01	-54.21	-33	PASS
EGPRS850	251	0.15~30MHz	0.15	-40.35	-13	PASS
EGPRS850	251	30~1000MHz	742.08	-49.76	-13	PASS
EGPRS850	251	1000~10000MHz	2546.5	-33.01	-13	PASS
GSM1900	512	0.009~0.15MHz	0.01	-54.04	-43	PASS
GSM1900	512	0.15~30MHz	0.15	-43.95	-23	PASS
GSM1900	512	30~1000MHz	988.91	-49.93	-13	PASS
GSM1900	512	1000~18000MHz	16532.9	-37.31	-13	PASS
GSM1900	661	0.009~0.15MHz	0.01	-52.67	-43	PASS
GSM1900	661	0.15~30MHz	0.15	-42.3	-23	PASS
GSM1900	661	30~1000MHz	922.76	-49.01	-13	PASS
GSM1900	661	1000~18000MHz	5639.87	-36.26	-13	PASS
GSM1900	810	0.009~0.15MHz	0.01	-53.49	-43	PASS
GSM1900	810	0.15~30MHz	0.16	-42.81	-23	PASS
GSM1900	810	30~1000MHz	872.28	-50.24	-13	PASS
GSM1900	810	1000~18000MHz	5729.4	-34.23	-13	PASS
GPRS1900	512	0.009~0.15MHz	0.01	-54.15	-43	PASS
GPRS1900	512	0.15~30MHz	0.17	-42.97	-23	PASS
GPRS1900	512	30~1000MHz	857.99	-49.61	-13	PASS
GPRS1900	512	1000~18000MHz	16502.87	-36.51	-13	PASS
GPRS1900	661	0.009~0.15MHz	0.01	-54.13	-43	PASS
GPRS1900	661	0.15~30MHz	0.15	-42.71	-23	PASS
GPRS1900	661	30~1000MHz	861.84	-50.13	-13	PASS
GPRS1900	661	1000~18000MHz	5639.87	-36.05	-13	PASS
GPRS1900	810	0.009~0.15MHz	0.01	-52.85	-43	PASS
GPRS1900	810	0.15~30MHz	0.16	-42.93	-23	PASS
GPRS1900	810	30~1000MHz	820.52	-49.02	-13	PASS
GPRS1900	810	1000~18000MHz	5729.4	-33.83	-13	PASS
EGPRS1900	512	0.009~0.15MHz	0.01	-54	-43	PASS
EGPRS1900	512	0.15~30MHz	0.16	-42.67	-23	PASS
EGPRS1900	512	30~1000MHz	986.45	-49.66	-13	PASS
EGPRS1900	512	1000~18000MHz	17471.87	-37.01	-13	PASS
EGPRS1900	661	0.009~0.15MHz	0.01	-54.83	-43	PASS

EGPRS1900	661	0.15~30MHz	0.15	-40.65	-23	PASS
EGPRS1900	661	30~1000MHz	996.64	-49.16	-13	PASS
EGPRS1900	661	1000~18000MHz	16467.17	-36.86	-13	PASS
EGPRS1900	810	0.009~0.15MHz	0.01	-53.51	-43	PASS
EGPRS1900	810	0.15~30MHz	0.15	-43.76	-23	PASS
EGPRS1900	810	30~1000MHz	449.49	-49.26	-13	PASS
EGPRS1900	810	1000~18000MHz	17616.37	-36.53	-13	PASS

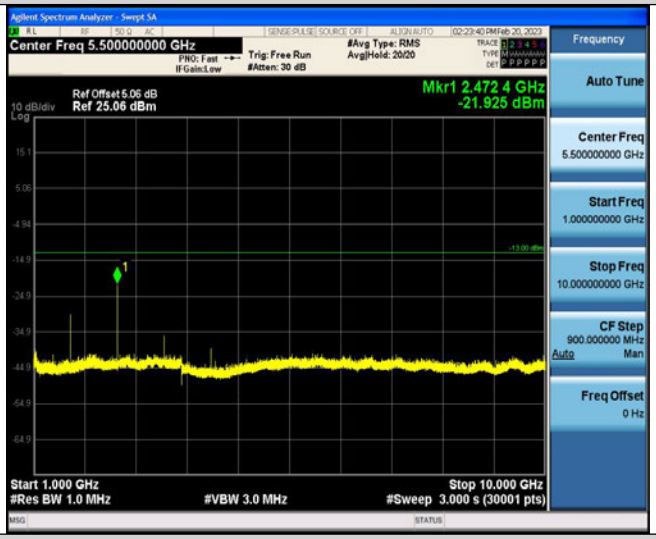
Band	Channel	Frequency Range (Mhz)	Frequency (dBm)	Result (dBm)	Limit (dBm)	Verdict
Band2	9262	0.009~0.15MHz	0.01	-54.54	-43	PASS
Band2	9262	0.15~30MHz	0.16	-47.07	-23	PASS
Band2	9262	30~1000MHz	838.43	-50.31	-13	PASS
Band2	9262	1000~20000MHz	19165.27	-35.27	-13	PASS
Band2	9400	0.009~0.15MHz	0.01	-53.17	-43	PASS
Band2	9400	0.15~30MHz	0.16	-46.9	-23	PASS
Band2	9400	30~1000MHz	880.75	-49.99	-13	PASS
Band2	9400	1000~20000MHz	19648.5	-35.59	-13	PASS
Band2	9538	0.009~0.15MHz	0.01	-53.97	-43	PASS
Band2	9538	0.15~30MHz	0.15	-44.76	-23	PASS
Band2	9538	30~1000MHz	732.64	-50.64	-13	PASS
Band2	9538	1000~20000MHz	19252.67	-35.28	-13	PASS
Band5	4132	0.009~0.15MHz	0.01	-54.3	-33	PASS
Band5	4132	0.15~30MHz	0.16	-47.93	-13	PASS
Band5	4132	30~1000MHz	440.44	-59.04	-13	PASS
Band5	4132	1000~10000MHz	2648.2	-40.35	-13	PASS
Band5	4182	0.009~0.15MHz	0.01	-52.88	-33	PASS
Band5	4182	0.15~30MHz	0.16	-45.68	-13	PASS
Band5	4182	30~1000MHz	965.24	-58.84	-13	PASS
Band5	4182	1000~10000MHz	5459.8	-39.69	-13	PASS
Band5	4233	0.009~0.15MHz	0.01	-55.71	-33	PASS
Band5	4233	0.15~30MHz	0.17	-46.44	-13	PASS
Band5	4233	30~1000MHz	574.91	-58.74	-13	PASS
Band5	4233	1000~10000MHz	3133.3	-40.14	-13	PASS

Test Graphs

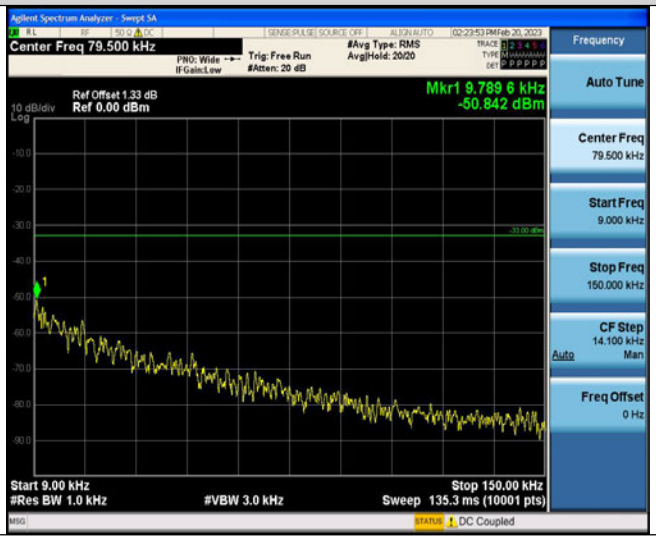
GSM850-128-0.009~0.15MHz

GSM850-128-0.15~30MHz

GSM850-128-30~1000MHz

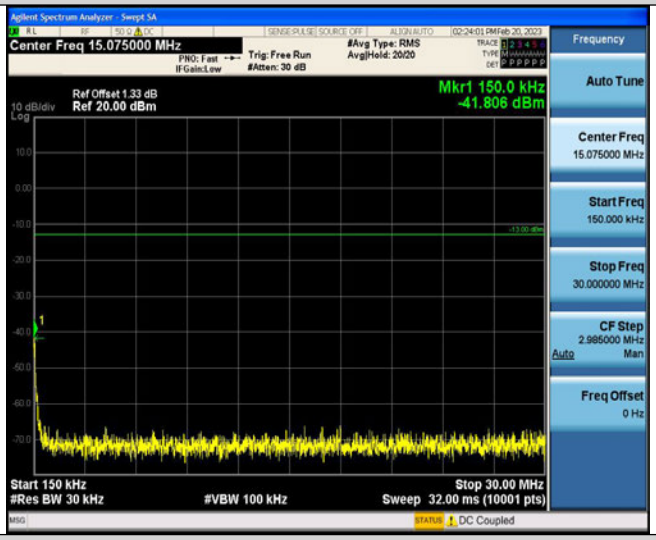
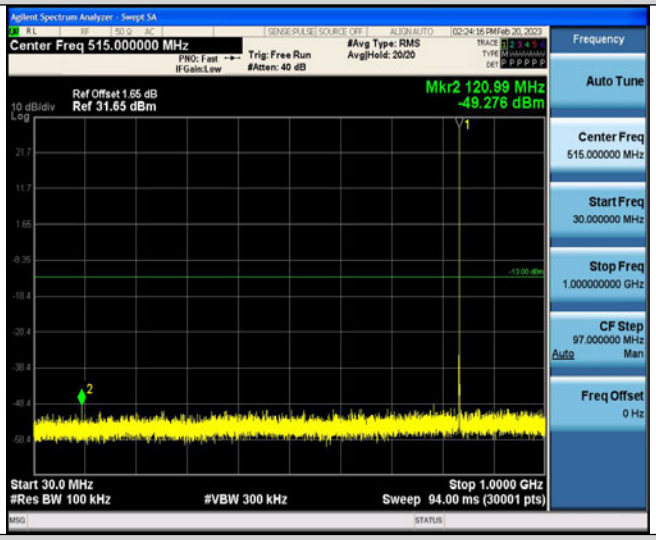


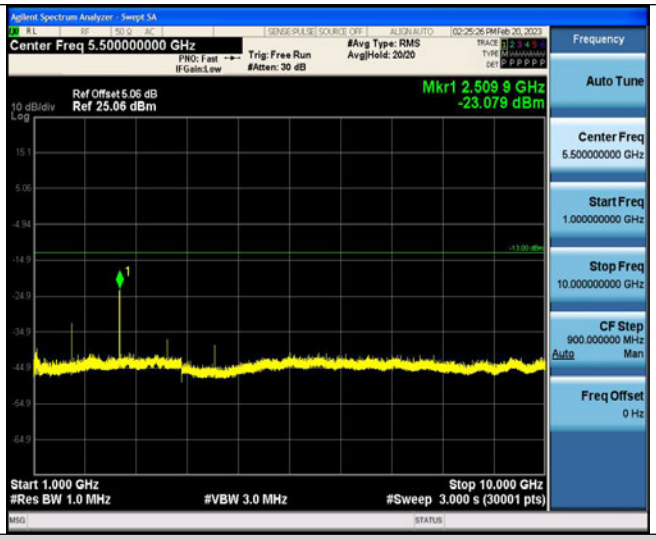
GSM850-128-1000~10000MHz



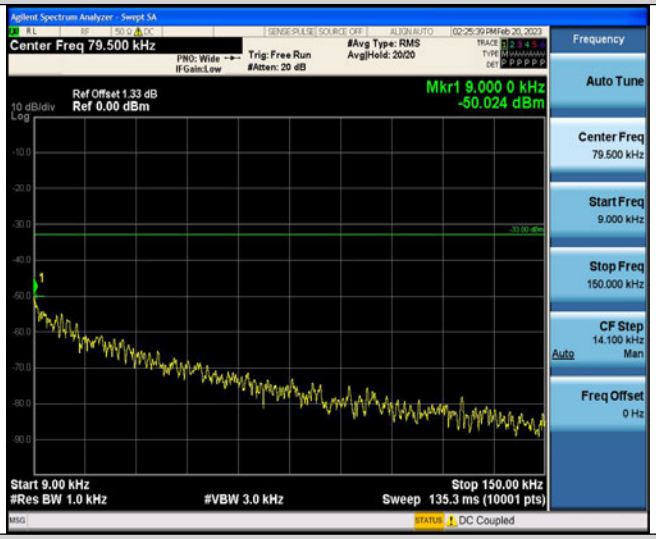
GSM850-190-0.009~0.15MHz



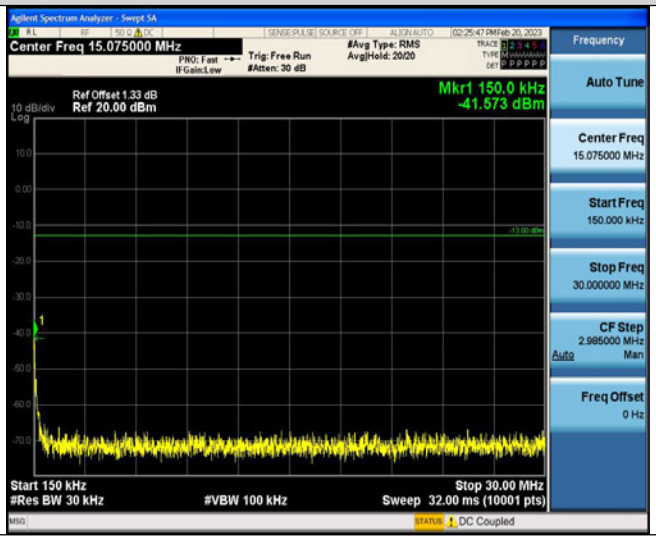
GSM850-190-0.15~30MHz

GSM850-190-30~1000MHz

GSM850-190-1000~10000MHz

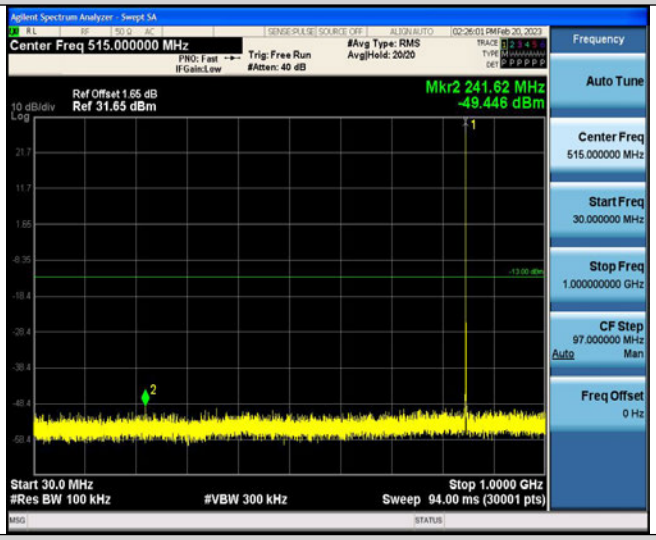
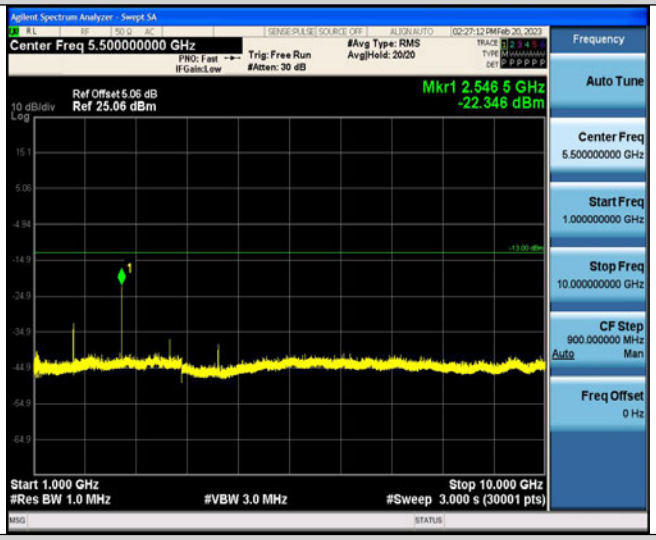


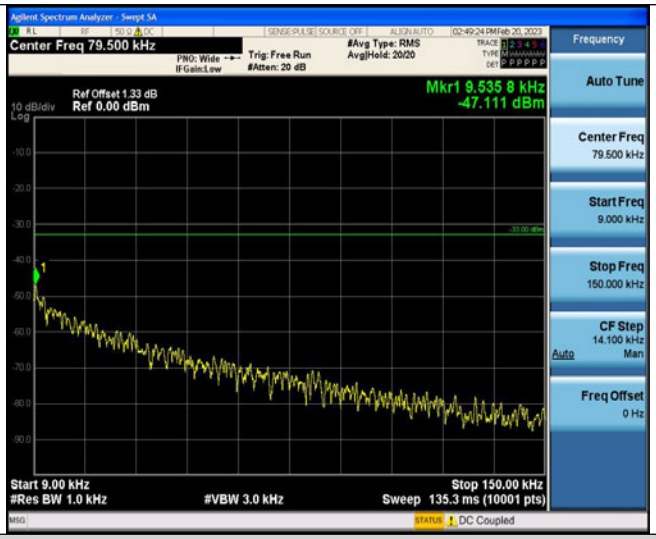
GSM850-251-0.009~0.15MHz



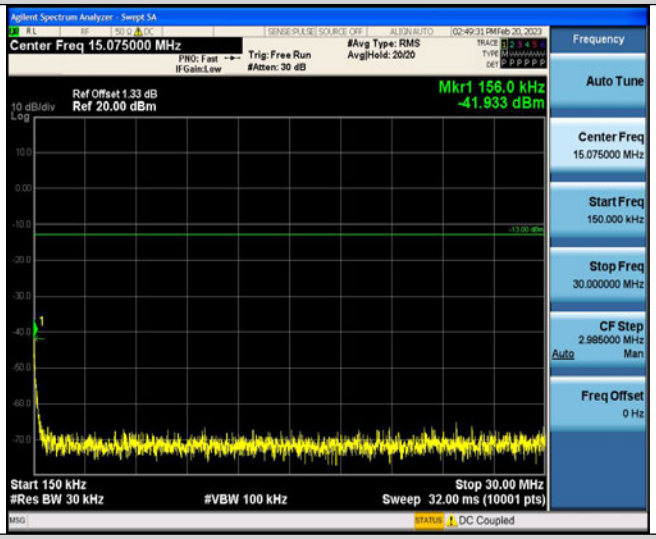
GSM850-251-0.15~30MHz



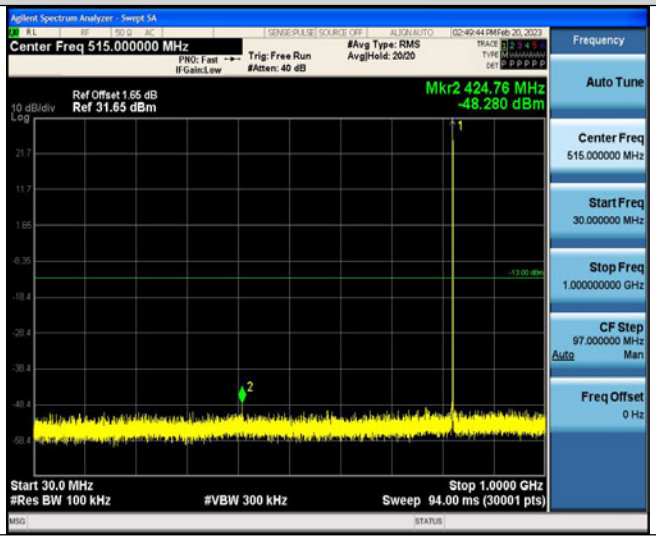
GSM850-251-30~1000MHz

GSM850-251-1000~10000MHz

GPRS850-128-0.009~0.15MHz

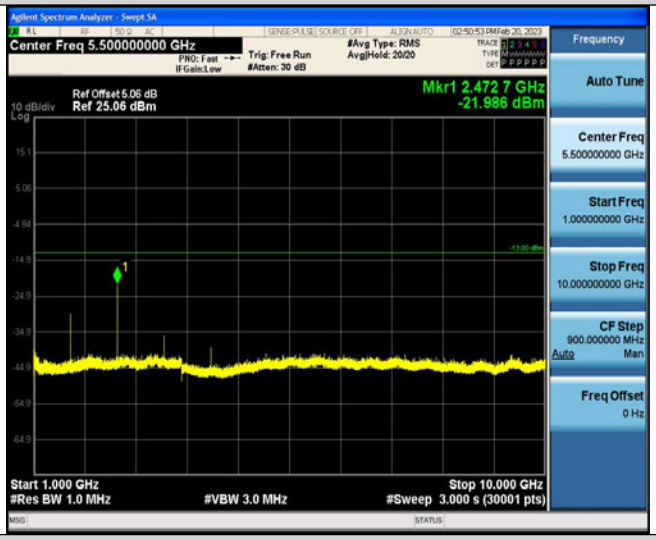
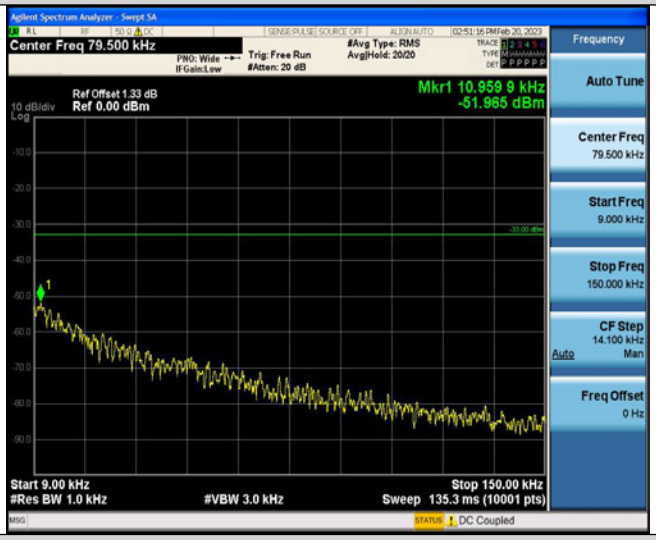


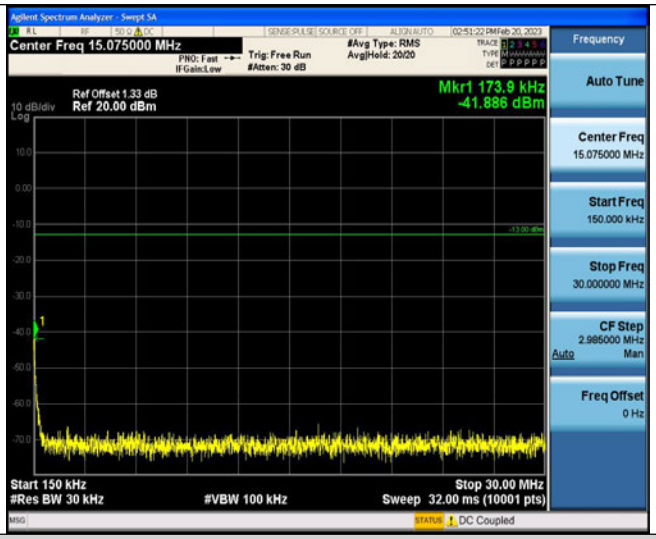
GPRS850-128-0.15~30MHz



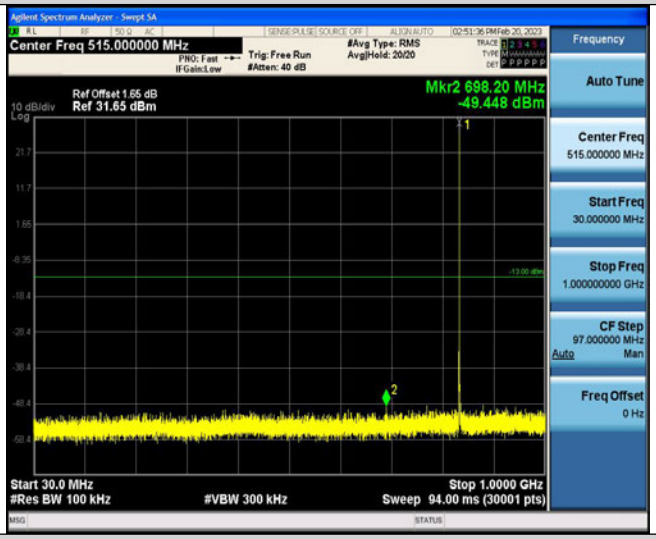
GPRS850-128-30~1000MHz



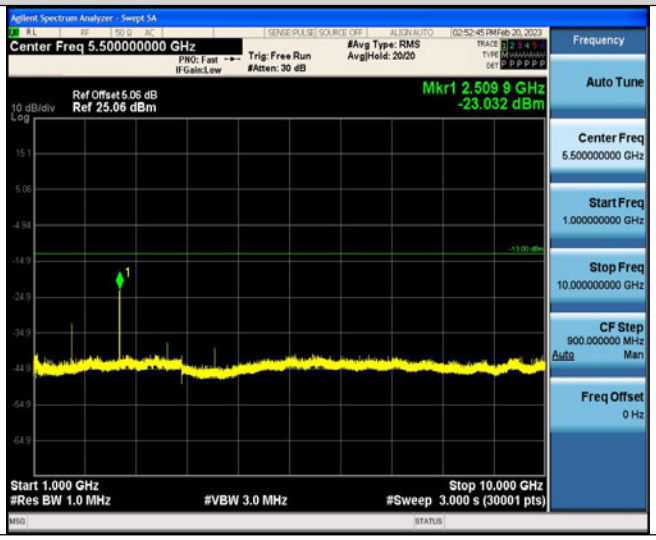
GPRS850-128-1000~10000MHz

GPRS850-190-0.009~0.15MHz

GPRS850-190-0.15~30MHz

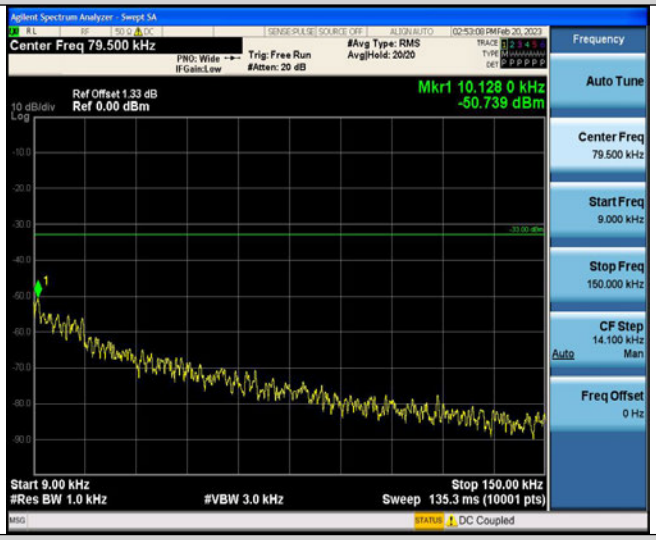


GPRS850-190-30~1000MHz



GPRS850-190-1000~10000MHz



GPRS850-251-0.009~0.15MHz

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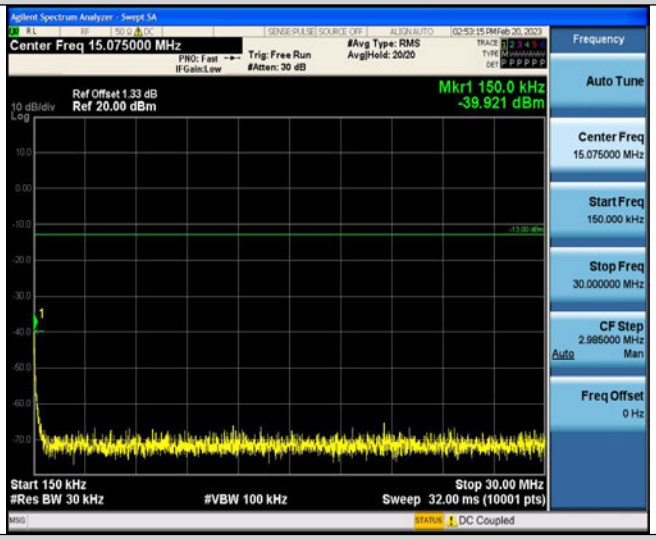
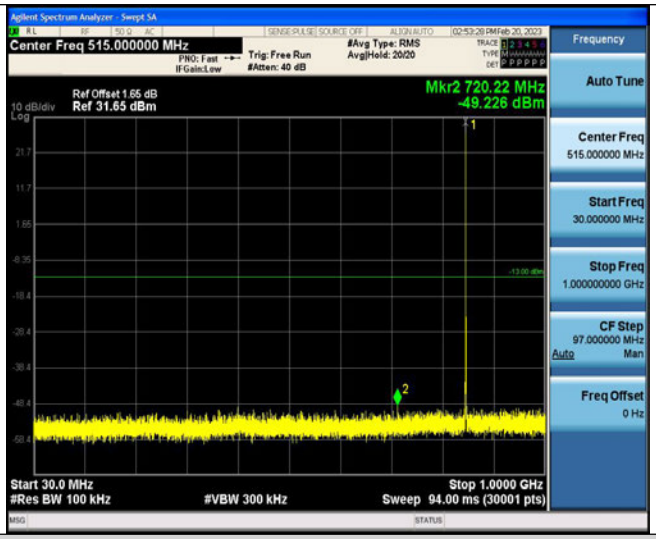
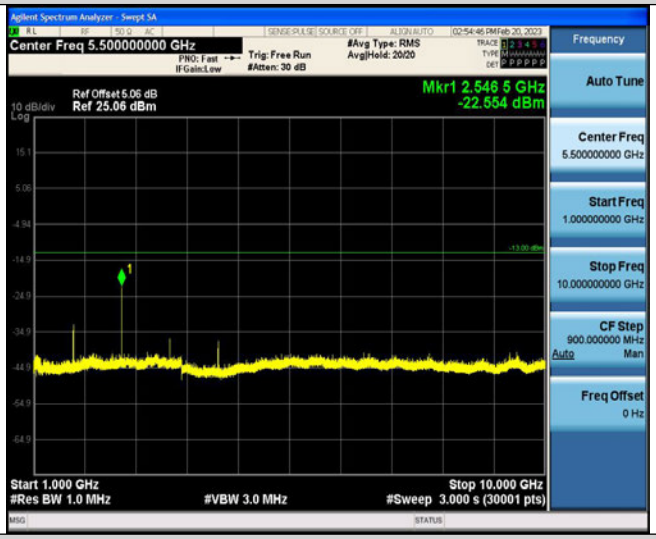
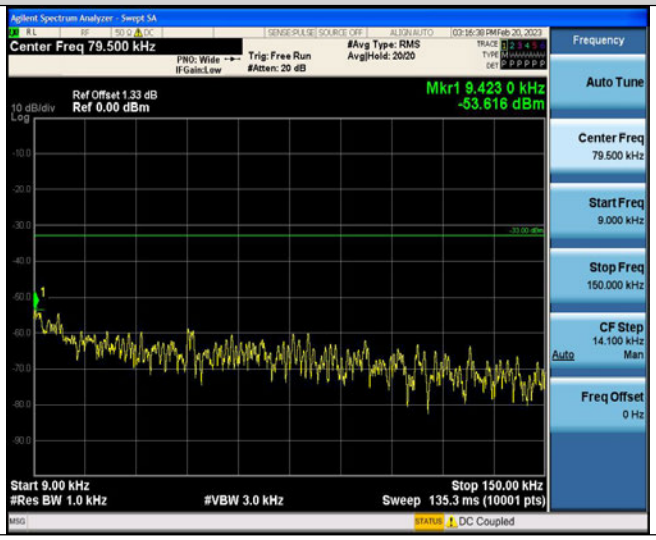

GPRS850-251-30~1000MHz

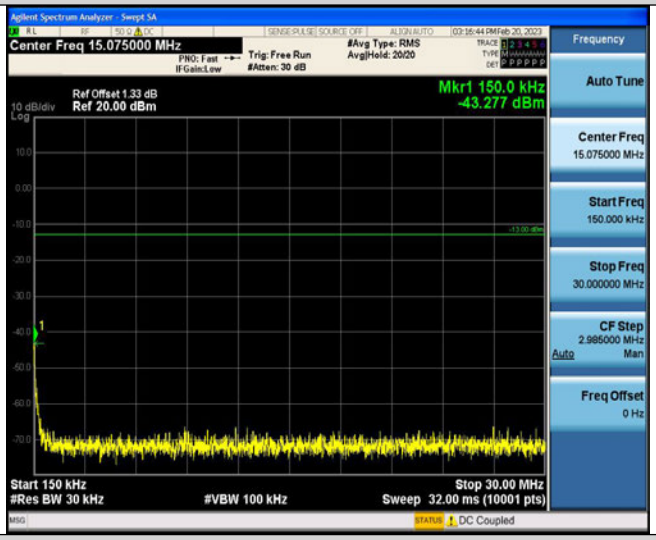


GPRS850-251-1000~10000MHz



EGPRS850-128-0.009~0.15MHz



EGPRS850-128-0.15~30MHz

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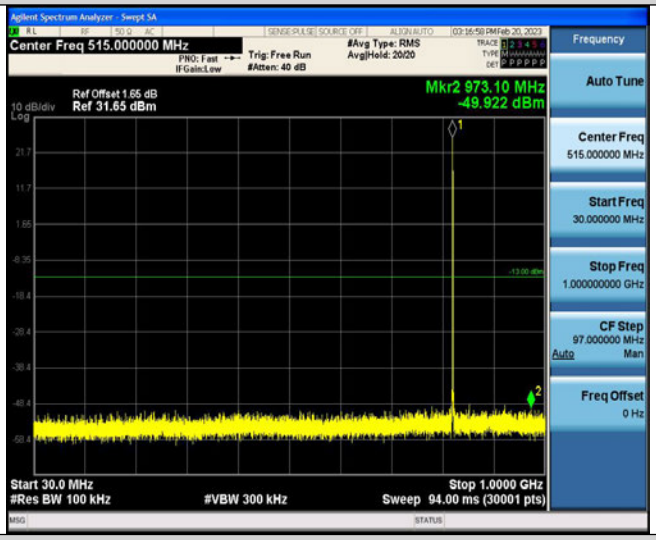
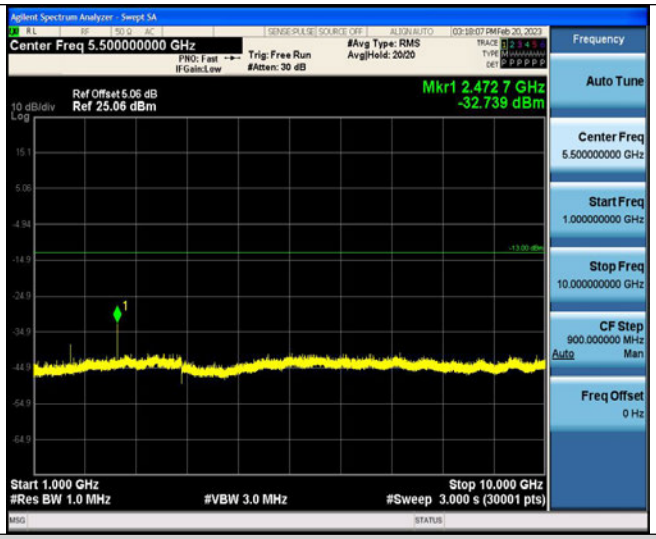
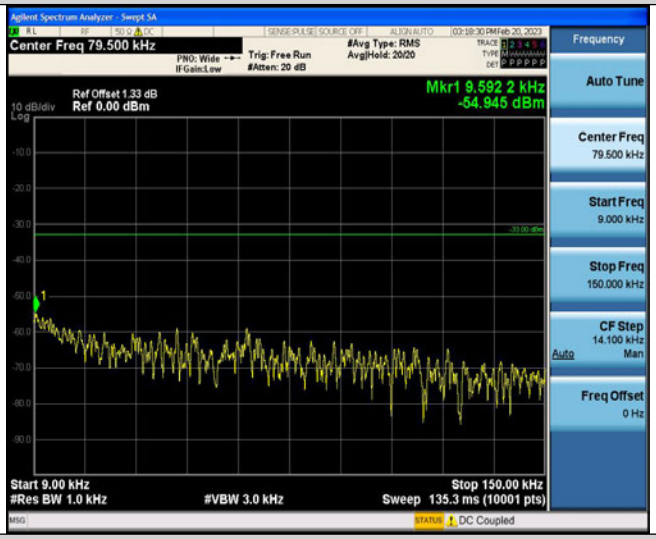
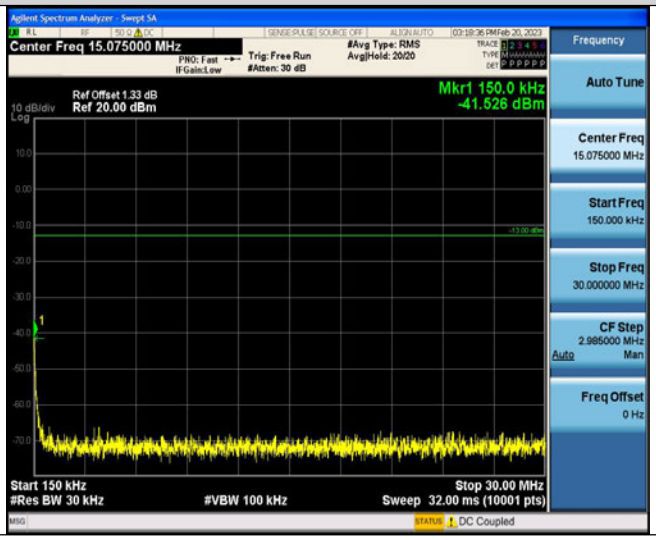

EGPRS850-128-1000~10000MHz

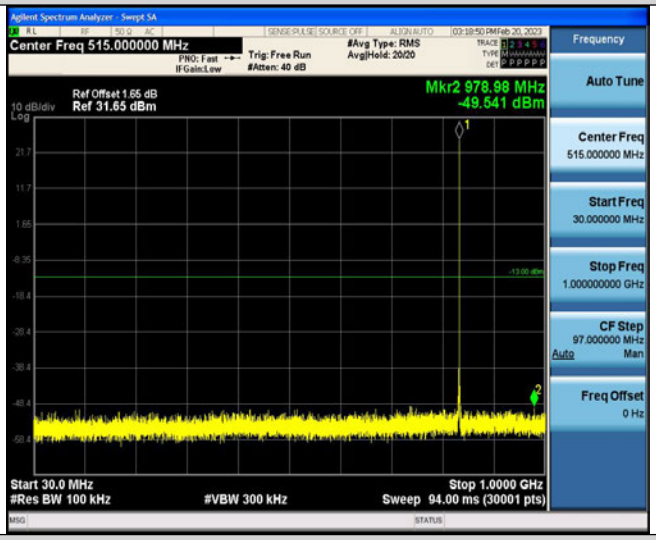
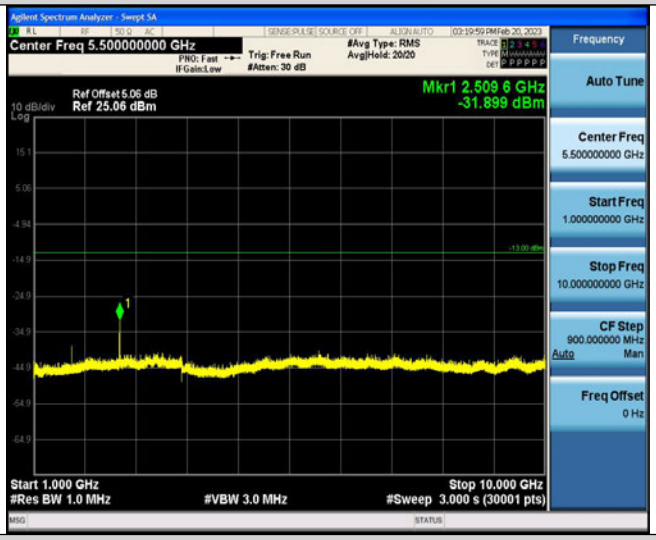


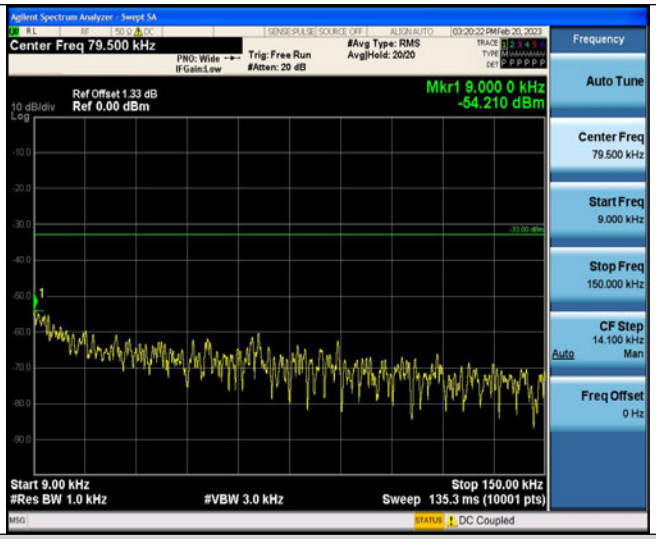
EGPRS850-190-0.009~0.15MHz



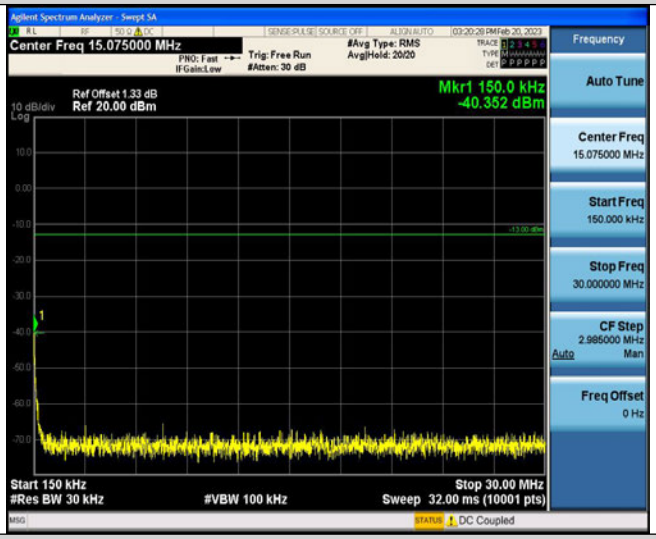
EGPRS850-190-0.15~30MHz



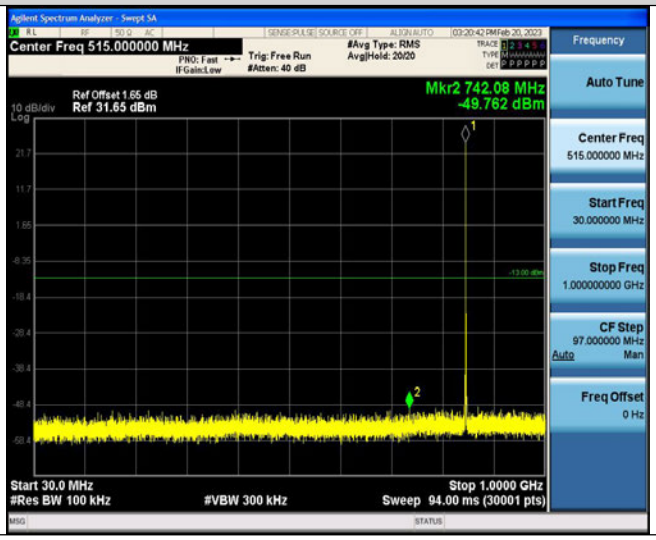
EGPRS850-190-30~1000MHz

EGPRS850-190-1000~10000MHz

EGPRS850-251-0.009~0.15MHz

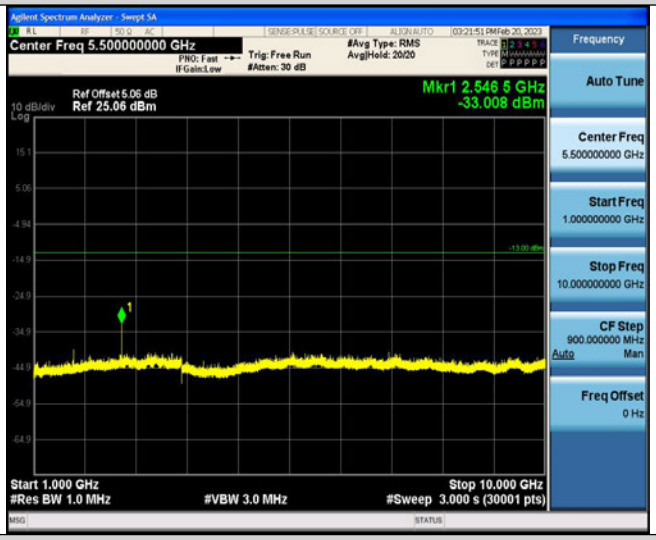
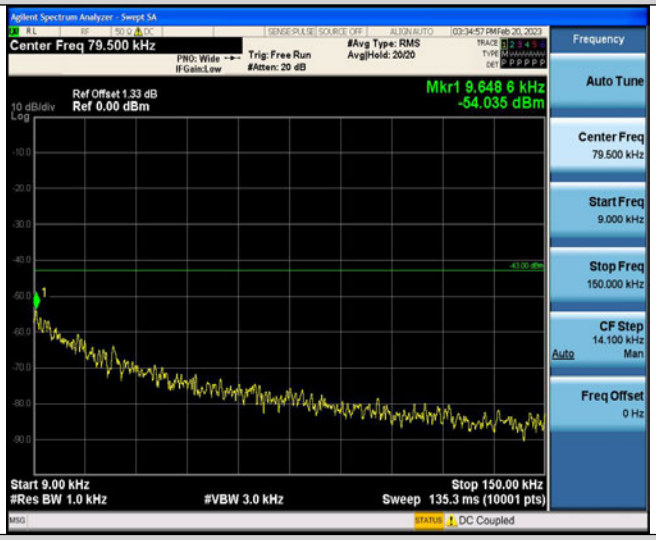


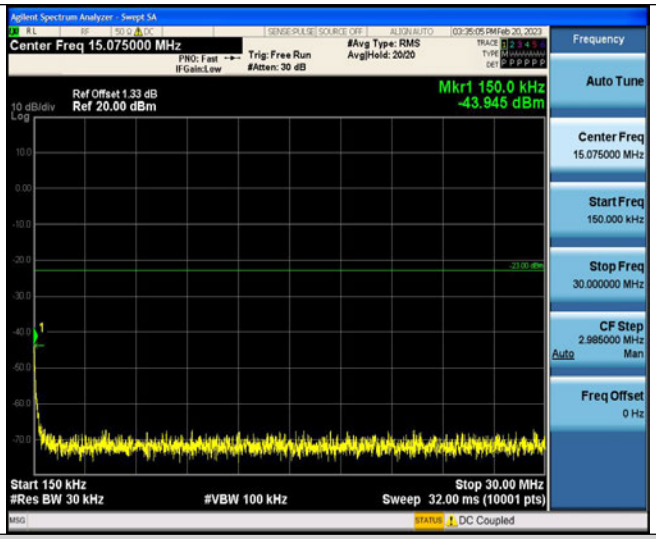
EGPRS850-251-0.15~30MHz



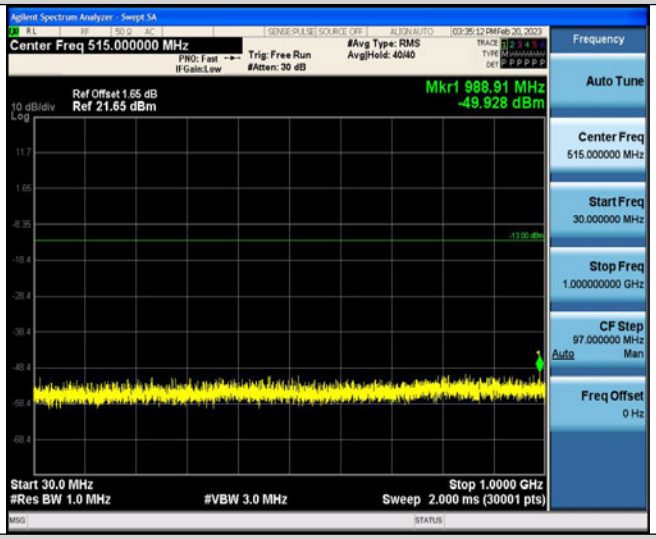
EGPRS850-251-30~1000MHz



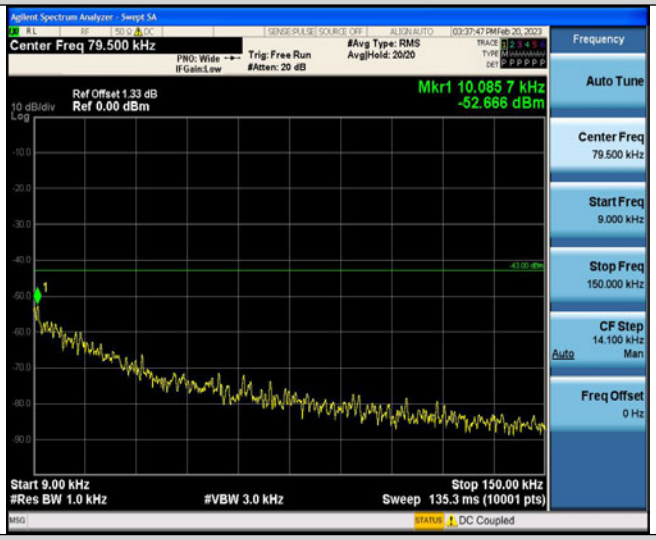
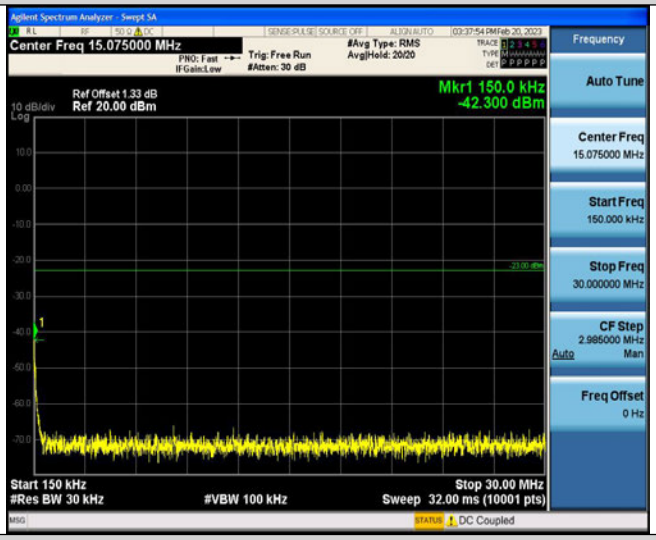
EGPRS850-251-1000~10000MHz

GSM1900-512-0.009~0.15MHz

GSM1900-512-0.15~30MHz

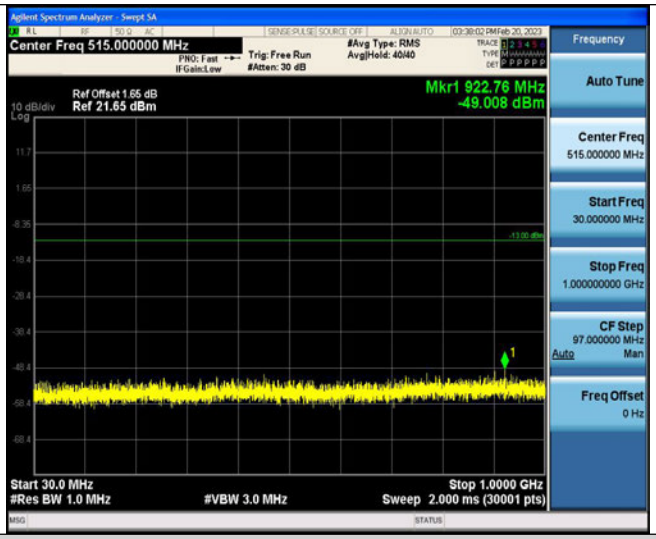


GSM1900-512-30~1000MHz

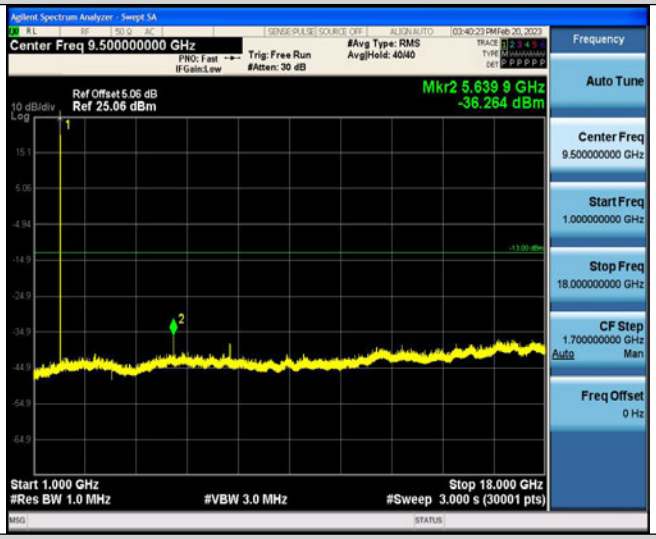


GSM1900-512-1000~18000MHz

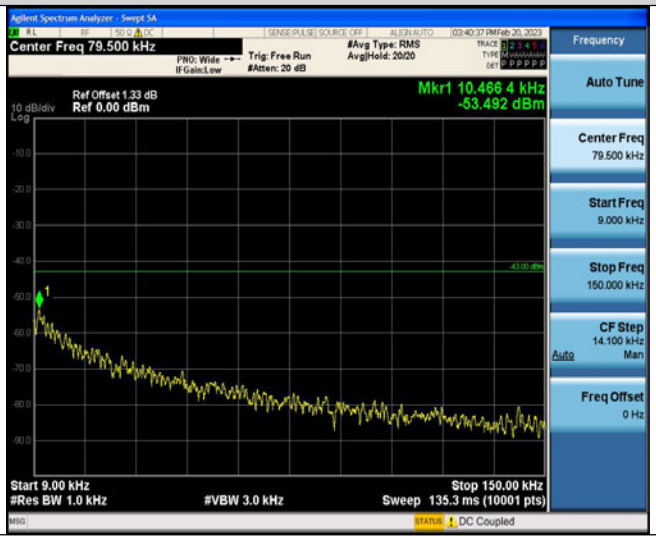
GSM1900-661-0.009~0.15MHz

GSM1900-661-0.15~30MHz

GSM1900-661-30~1000MHz

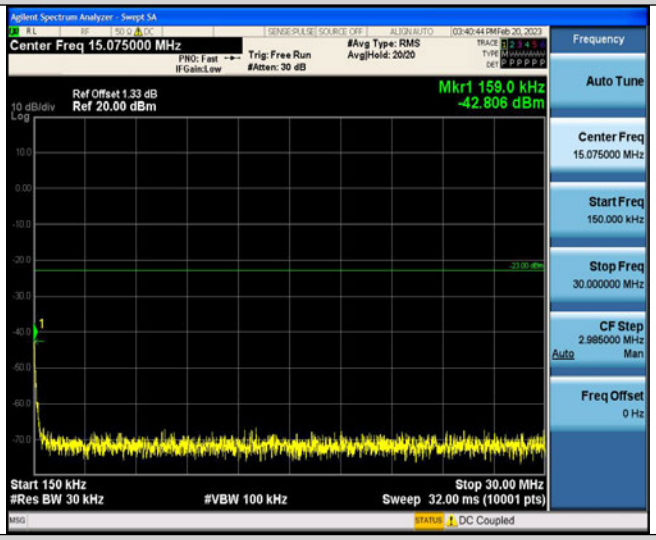
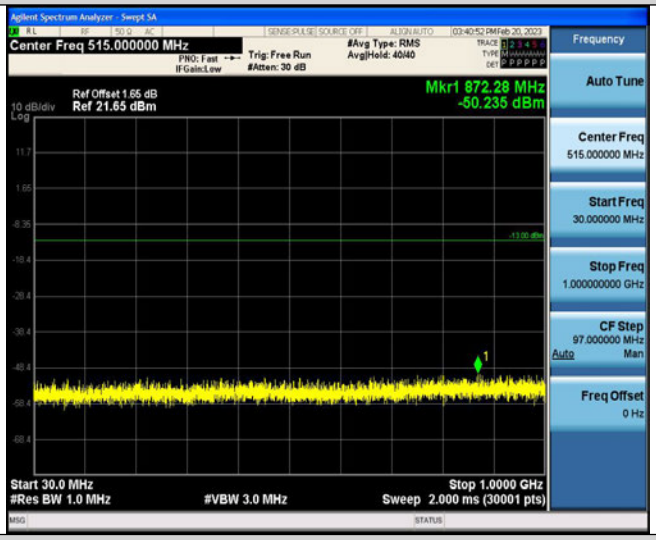


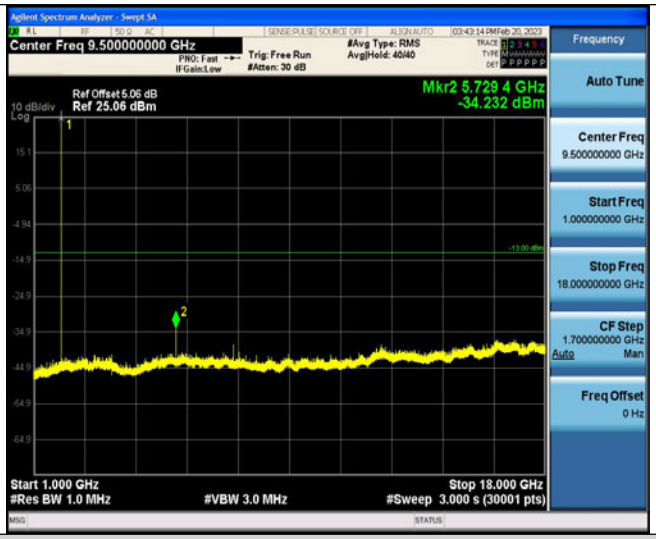
GSM1900-661-1000~18000MHz



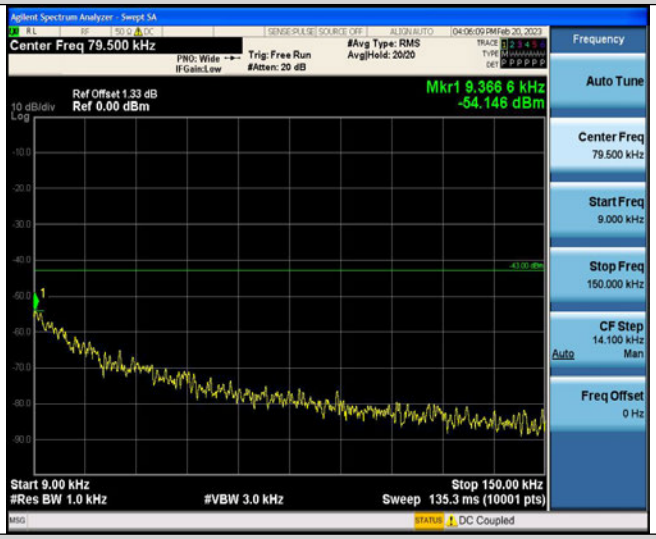
GSM1900-810-0.009~0.15MHz



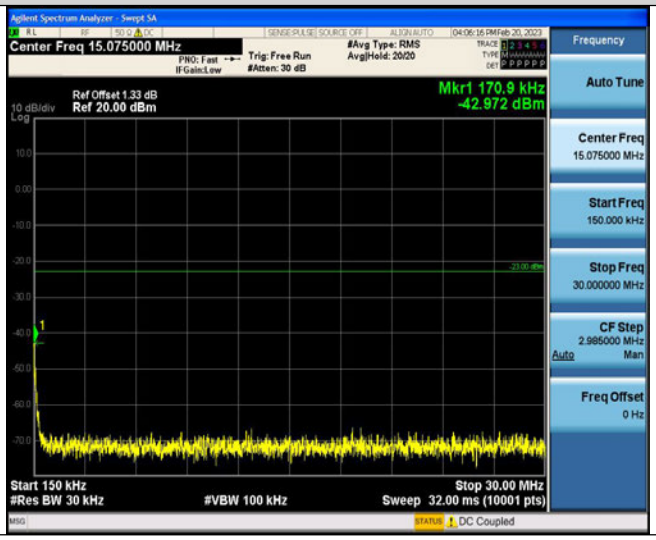
GSM1900-810-0.15~30MHz

GSM1900-810-30~1000MHz

GSM1900-810-1000~18000MHz

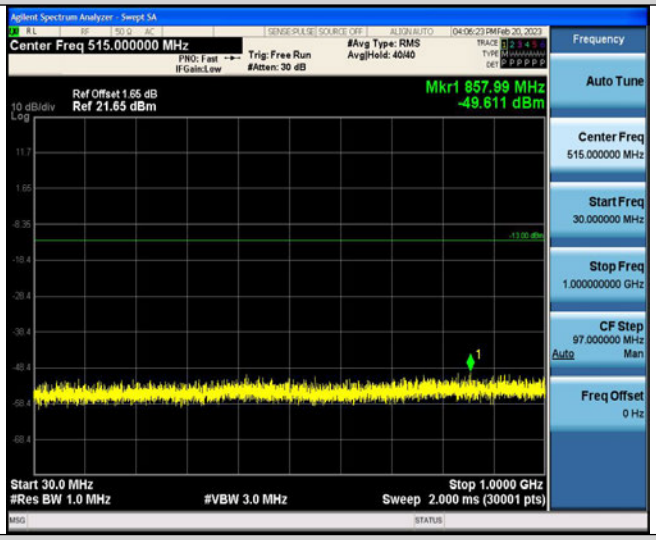


GPRS1900-512-0.009~0.15MHz



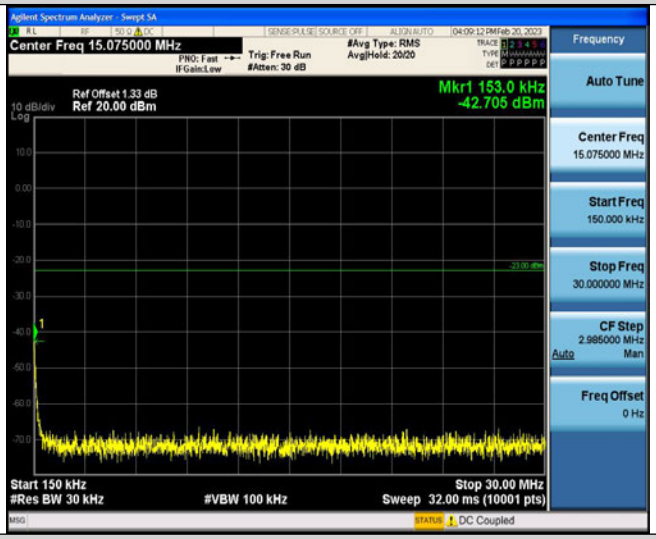
GPRS1900-512-0.15~30MHz



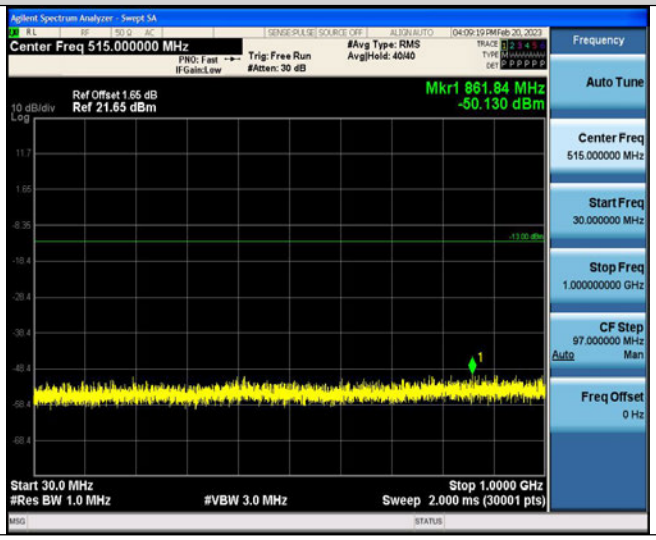
GPRS1900-512-30~1000MHz

GPRS1900-512-1000~18000MHz

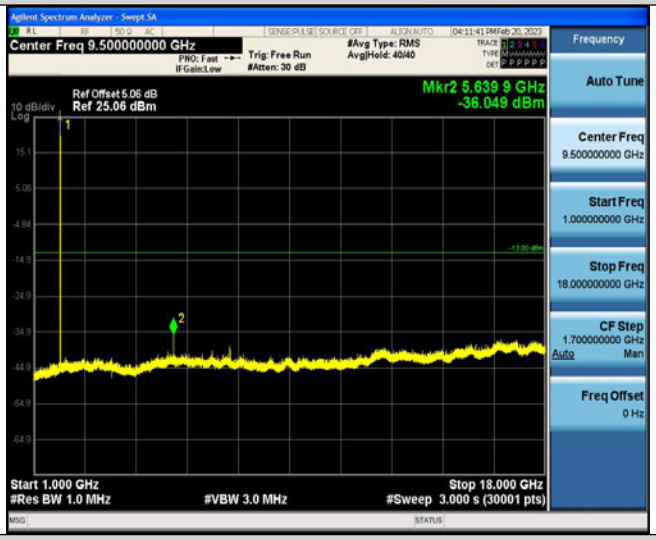
GPRS1900-661-0.009~0.15MHz

GPRS1900-661-0.15~30MHz



GPRS1900-661-30~1000MHz



GPRS1900-661-1000~18000MHz

GPRS1900-810-0.009~0.15MHz

GPRS1900-810-0.15~30MHz