

# TEST REPORT

Report No.: **BCTC2504920860-1EN1**

---

Applicant: **Shenzhen Zhong Xun Chuangzhi Technology Co.,Ltd**

---

Product Name: **GPS Tracker**

---

Test Model: **G51**

---

Tested Date: **2025-04-09 to 2025-04-28**

---

Issued Date: **2025-04-28**

---

**Shenzhen BCTC Testing Co., Ltd.**



## FCC ID: 2BO3V-G51

Product Name: GPS Tracker

Trademark: N/A

Model/Type reference: G51  
G50, G50L, G50S, G50M, G51L, G51S, G51M, G52, G53, G55, G56, G57, G58, G58L, G58S, G58M, G59, G60, G61, G61L, G61S, G61M, G62, G63, G65, G66, G67, G68, G68P, G68L, G68S, G68M, G69, GF01, GF02, GF03, GF05, GF06, GF07, GF08, GF09, GF10, GF11, GF12, GT01, GT02, GT03, GT05, GT06, ZX903, ZX905, ZX906, ZX907, ZX908, ZX909, ZX910, ZX911, ZX912, ZX913, ZX915, ZX916, ZX917, ZX918, ZX919

Prepared For: Shenzhen Zhong Xun Chuangzhi Technology Co.,Ltd

Address: 502D, Block B, Donglian Building, Chuangye 2nd Road, Area 23, Xinan Subdistrict, Baoan District, Shenzhen, Guangdong, China

Manufacturer: Shenzhen Zhong Xun Chuangzhi Technology Co.,Ltd

Address: 502D, Block B, Donglian Building, Chuangye 2nd Road, Area 23, Xinan Subdistrict, Baoan District, Shenzhen, Guangdong, China

Prepared By: Shenzhen BCTC Testing Co., Ltd.

Address: 1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China

Sample Received Date: 2025-04-09

Sample tested Date: 2025-04-09 to 2025-04-28

Issue Date: 2025-04-28

Report No.: BCTC2504920860-1EN1

Test Standards: CFR 47 FCC Parts 2  
CFR 47 FCC Parts 22  
CFR 47 FCC Parts 24

Test Results: PASS

Remark: This is GSM radio test report.

Tested by:



Brave Zeng/ Project Handler

Approved by:



Zero Zhou/Reviewer

The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen BCTC Testing Co., Ltd, this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client.

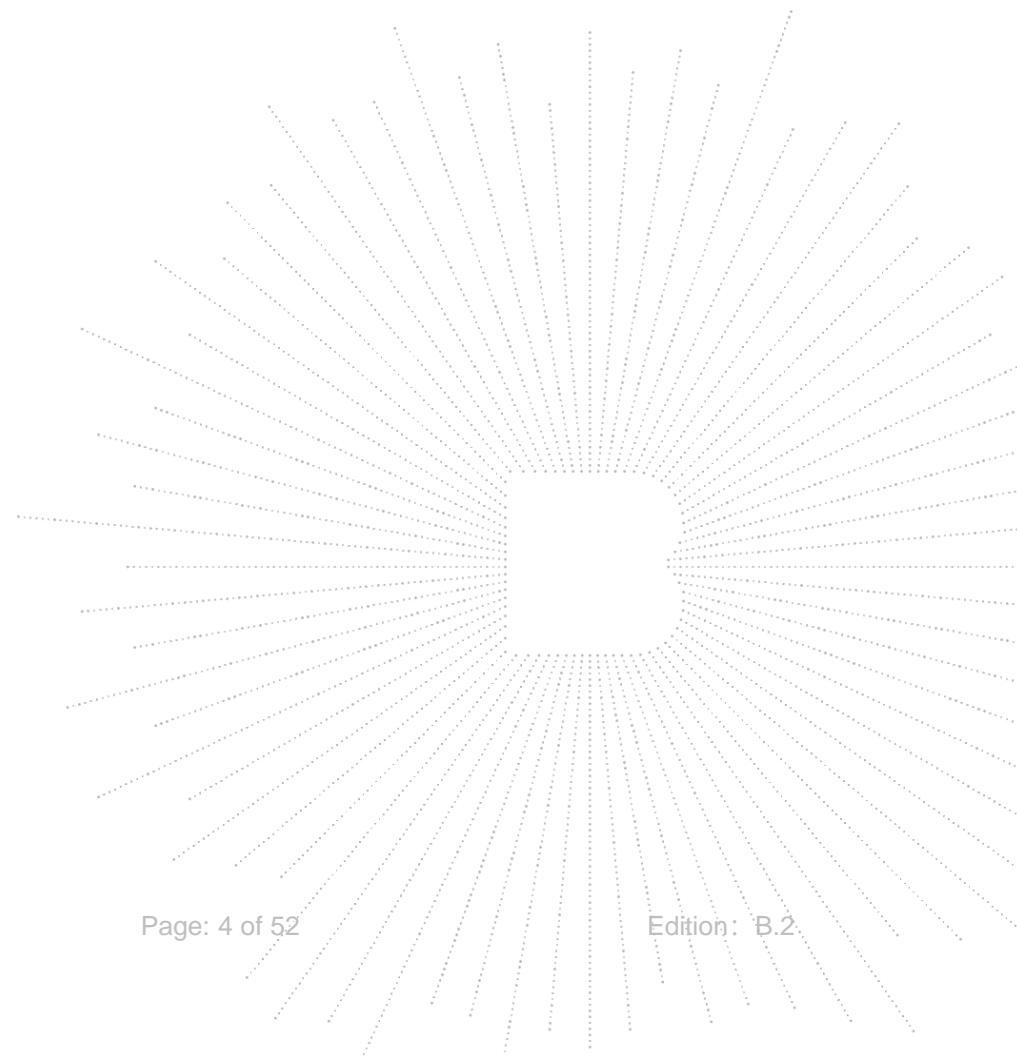
## Table Of Content

Test Report Declaration	Page
1. Version .....	4
2. Test Summary.....	5
3. Measurement Uncertainty .....	6
4. Product Information And Test Setup .....	7
4.1 Product Information.....	7
4.2 Test Setup Configuration .....	8
4.3 Support Equipment .....	8
4.5 Test Mode .....	9
5. Test Facility And Test Instrument Used.....	10
5.1 Test Facility.....	10
5.2 Test Instrument Used.....	10
6. RF Output Power.....	12
6.1 Block Diagram Of Test Setup.....	12
6.2 Limit .....	13
6.3 Test procedure.....	14
6.4 Test Result.....	14
7. Peak-to-average Ratio(PAR) of Transmitter.....	17
7.1 Block Diagram Of Test Setup.....	17
7.2 Limit .....	17
7.3 Test procedure.....	17
7.4 Test Result.....	18
8. Emission Bandwidth .....	25
8.1 Block Diagram Of Test Setup.....	25
8.2 Limit .....	25
8.3 Test procedure.....	25
8.4 Test Result.....	26
9. Out of Band Emissions at Antenna Terminal.....	33
9.1 Block Diagram Of Test Setup.....	33
9.2 Limit .....	33
9.3 Test procedure.....	33
9.4 Test Result.....	33
10. Spurious Radiated Emissions.....	44
10.1 Block Diagram Of Test Setup.....	44
10.2 Limit .....	45
10.3 Test procedure.....	45
10.4 Test Result.....	46
11. Frequency Stability.....	48
11.1 Block Diagram Of Test Setup.....	48
11.2 Limit .....	48
11.3 Test procedure.....	48
11.4 Test Result.....	49
12. EUT Photographs.....	50
13. EUT Test Setup Photographs.....	51

(Note: N/A Means Not Applicable)

## 1. Version

Report No.	Issue Date	Description	Approved
BCTC2504920860-1E	2025-04-28	Original	Invalid
BCTC2504920860-1EN1	2025-07-11	Revision	Valid



## 2. Test Summary

The Product has been tested according to the following specifications:

No.	Test Parameter	Clause No.	Results
1	RF Exposure	§1.1307, §2.1093	PASS
2	RF Output Power	§22.913 (a), §24.232 (c), §27.50, §2.1046	PASS
3	Peak-to-average Ratio(PAR) of Transmitter	§24.232(d), §22.913, §27.50, §2.1046	PASS
4	Emission Bandwidth	§22.917 (b), §24.238(b), §27.53, §2.1049	PASS
5	Spurious Emissions at Antenna Terminal	§22.917 (a), §24.238 (a), §27.53, §2.1051	PASS
6	Spurious Radiation Emissions	§22.917 (a), §24.238 (a), §27.53, §2.1051	PASS
7	Out of Band Emissions	§22.917 (a), §24.238 (a), §27.53, §2.1051	PASS
8	Frequency Stability	§22.355, §24.235, §27.54, §2.1055	PASS

### 3. Measurement Uncertainty

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

No.	Item	Uncertainty
1	3m chamber Radiated spurious emission(30MHz-1GHz)	U=4.3dB
2	3m chamber Radiated spurious emission(9KHz-30MHz)	U=3.7dB
3	3m chamber Radiated spurious emission(1GHz-18GHz)	U=4.5dB
4	3m chamber Radiated spurious emission(18GHz-40GHz)	U=3.34dB
5	Conducted Emission (150kHz-30MHz)	U=3.20dB
6	Conducted Adjacent channel power	U=1.38dB
7	Conducted output power uncertainty Above 1G	U=1.576dB
8	Conducted output power uncertainty below 1G	U=1.28dB
9	humidity uncertainty	U=5.3%
10	Temperature uncertainty	U=0.59°C

## 4. Product Information And Test Setup

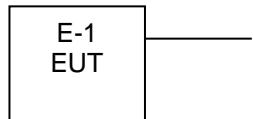
### 4.1 Product Information

Model/Type reference:	G51 G50, G50L, G50S, G50M, G51L, G51S, G51M, G52, G53, G55, G56, G57, G58, G58L, G58S, G58M, G59, G60, G61, G61L, G61S, G61M, G62, G63, G65, G66, G67, G68, G68P, G68L, G68S, G68M, G69, GF01, GF02, GF03, GF05, GF06, GF07, GF08, GF09, GF10, GF11, GF12, GT01, GT02, GT03, GT05, GT06, ZX903, ZX905, ZX906, ZX907, ZX908, ZX909, ZX910, ZX911, ZX912, ZX913, ZX915, ZX916, ZX917, ZX918, ZX919
Model differences:	All models have the same circuit and RF module, but the model names.
Hardware Version:	N/A
Software Version:	N/A
Operation Frequency:	GPRS/EGPRS 850: TX: 824~849MHz; RX: 869~894MHz; GPRS/EGPRS 1900: TX:1850~1910MHz; RX:1930~1990MHz;
GPRS Class:	Class 12
Max RF Output Power:	GPRS/EGPRS 850: 31.03 dBm, GPRS/EGPRS 1900: 27.91 dBm
Type of Modulation:	GSM Mode with GMSK,8PSK Modulation
Type of Emission:	GPRS 850: 248KGXW EGPRS 850:250KG7W GPRS 1900: 257KGXW EGPRS 1900:258KG7W
Antenna installation:	Internal antenna GSM850: 0.5 dBi GSM1900: 0.5 dBi
Antenna Gain:	Remark: <input type="checkbox"/> The antenna gain of the product comes from the antenna report provided by the customer, and the test data is affected by the customer information. <input checked="" type="checkbox"/> The antenna gain of the product is provided by the customer, and the test data is affected by the customer information.
Connecting I/O Port(s)	Please refer to the User's Manual
Ratings:	DC 5V from adapter/ DC 3.7V from battery

## 4.2 Test Setup Configuration

See test photographs attached in *EUT TEST SETUP PHOTOGRAPHS* for the actual connections between Product and support equipment.

Radiated Spurious Emission:



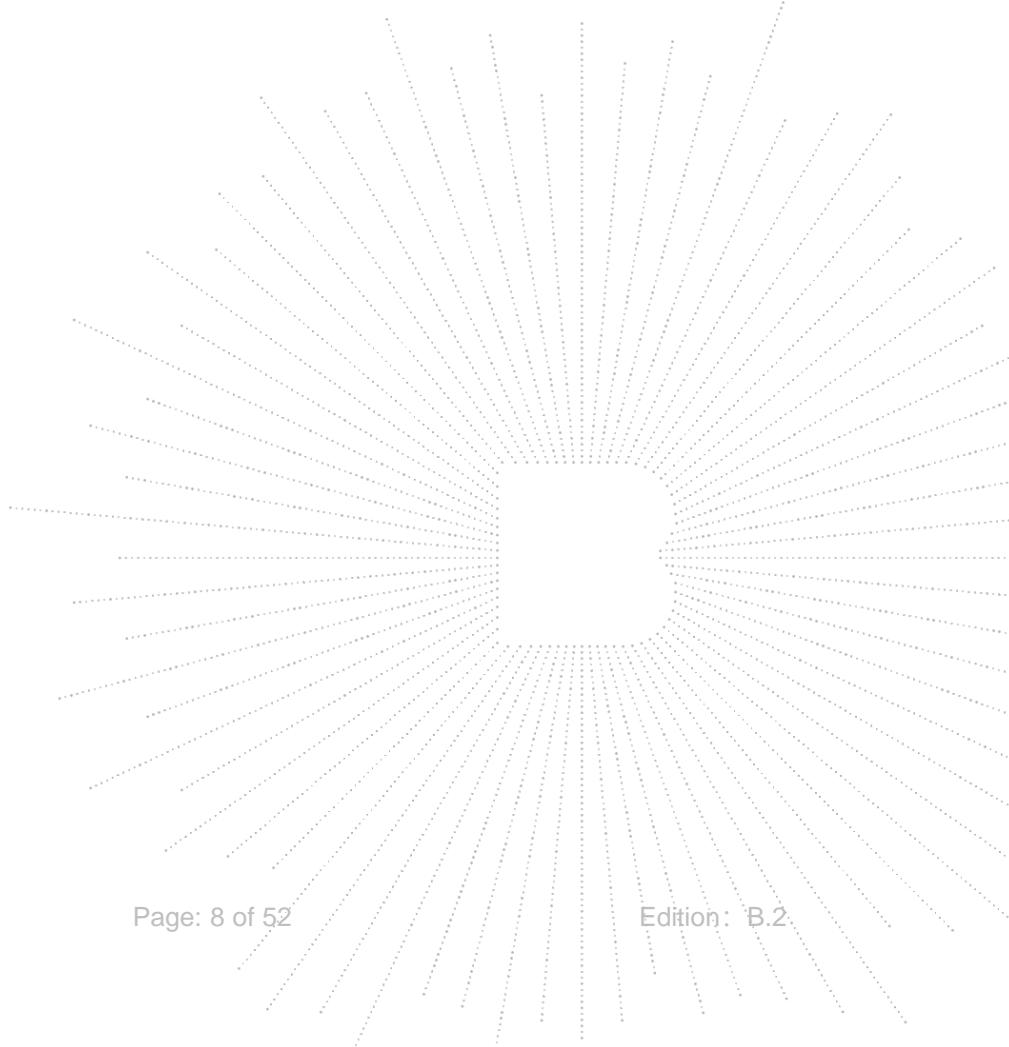
## 4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Note
E-1	GPS Tracker	N/A	G51	N/A	EUT
E-2	ADAPTER	Hoco.	N18	N/A	Auxiliary

Item	Shielded Type	Ferrite Core	Length	Note
C-1	N/A	N/A	0M	DC cable unshielded

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.



#### 4.5 Test Mode

Testing Configure			
Support Band	Support Standard	Channel Frequency	Channel Number
GSM 850	GPRS/EGPRS	824.2 MHz	128
		836.6 MHz	190
		848.8 MHz	251
PCS 1900	GPRS/EGPRS	1850.2 MHz	512
		1880.0 MHz	661
		1909.8 MHz	810

#### EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/ Without Core
/	/	/	/
/	/	/	/

#### Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
/	/	/	/

#### Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/ Without Core
/	/	/	/

## 5. Test Facility And Test Instrument Used

### 5.1 Test Facility

All measurement facilities used to collect the measurement data are located at Shenzhen BCTC Testing Co., Ltd. Address: 1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

FCC Test Firm Registration Number: 712850

A2LA certificate registration number is: CN1212

ISED Registered No.: 23583

ISED CAB identifier: CN0017

### 5.2 Test Instrument Used

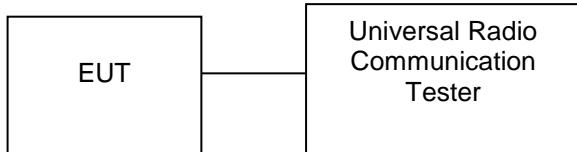
RF Conducted Test					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
Power meter	Keysight	E4419	\	May 16, 2024	May 15, 2025
Power Sensor (AV)	Keysight	E9300A	\	May 16, 2024	May 15, 2025
Signal Analyzer 20kHz - 26.5GHz	Keysight	N9020A	MY49100060	May 16, 2024	May 15, 2025
Spectrum Analyzer 9kHz - 40GHz	R&S	FSP40	100363	May 16, 2024	May 15, 2025
Communication test set	R&S	CMW500	126173	Nov 11, 2024	Nov 10, 2025
Radio frequency control box	MAIWEI	MW200-RFCB	\	\	\
Software	MAIWEI	MTS 8200	\	\	\

Radiated Emissions Test (966 Chamber01)					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
966 chamber	ChengYu	966 Room	966	May 15, 2023	May 14, 2026
Receiver	R&S	ESR	102075	May 16, 2024	May 15, 2025
Receiver	R&S	ESRP	101154	May 16, 2024	May 15, 2025
Amplifier	Schwarzbeck	BBV9744	9744-0037	May 16, 2024	May 15, 2025
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	942	May 21, 2024	May 20, 2025
Loop Antenna(9KHz -30MHz)	Schwarzbeck	FMZB1519B	00014	May 21, 2024	May 20, 2025
Amplifier	SKET	LAPA_01G18 G-45dB	SK202104090 1	May 16, 2024	May 15, 2025
Horn Antenna	Schwarzbeck	BBHA9120D	1541	May 21, 2024	May 20, 2025
Amplifier(18G Hz-40GHz)	MITEQ	TTA1840-35- HG	2034381	May 16, 2024	May 15, 2025
Horn Antenna(18G Hz-40GHz)	Schwarzbeck	BBHA9170	00822	May 21, 2024	May 20, 2025
Spectrum Analyzer9kHz- 40GHz	R&S	FSP40	100363	May 16, 2024	May 15, 2025
Communication test set	R&S	CMW500	126173	May 16, 2024	May 15, 2025
Software	Frad	EZ-EMC	FA-03A2 RE	\	\

## 6. RF Output Power

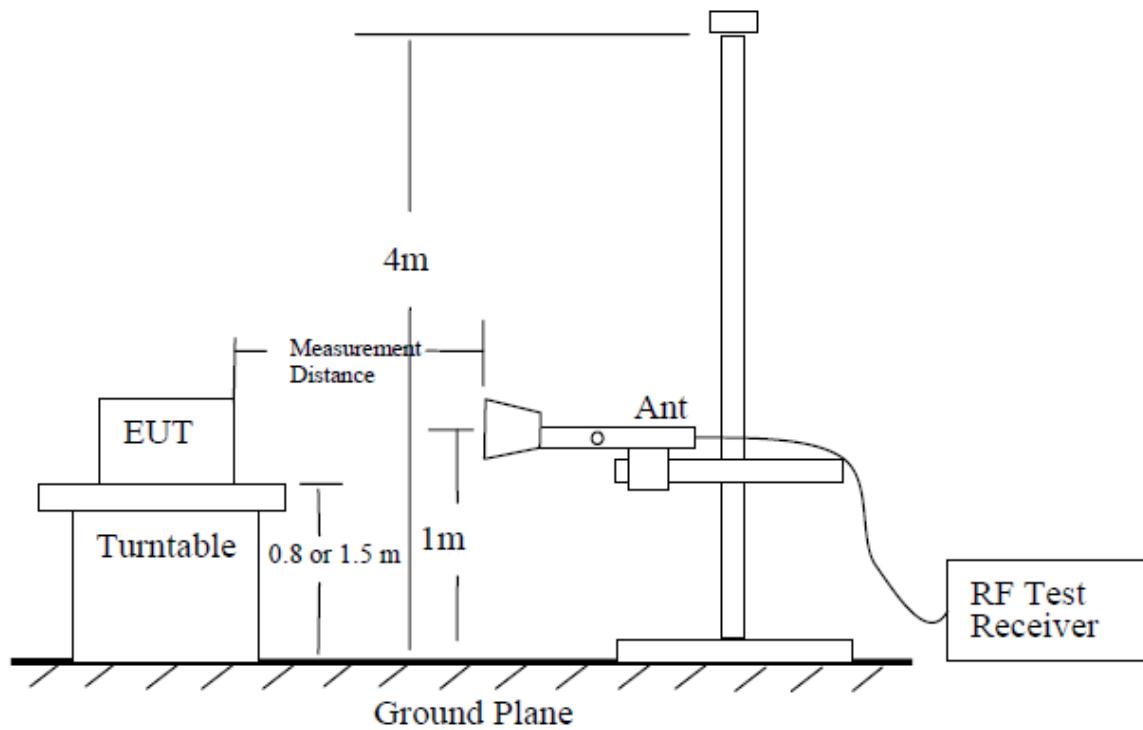
### 6.1 Block Diagram Of Test Setup

Conducted output power test method:

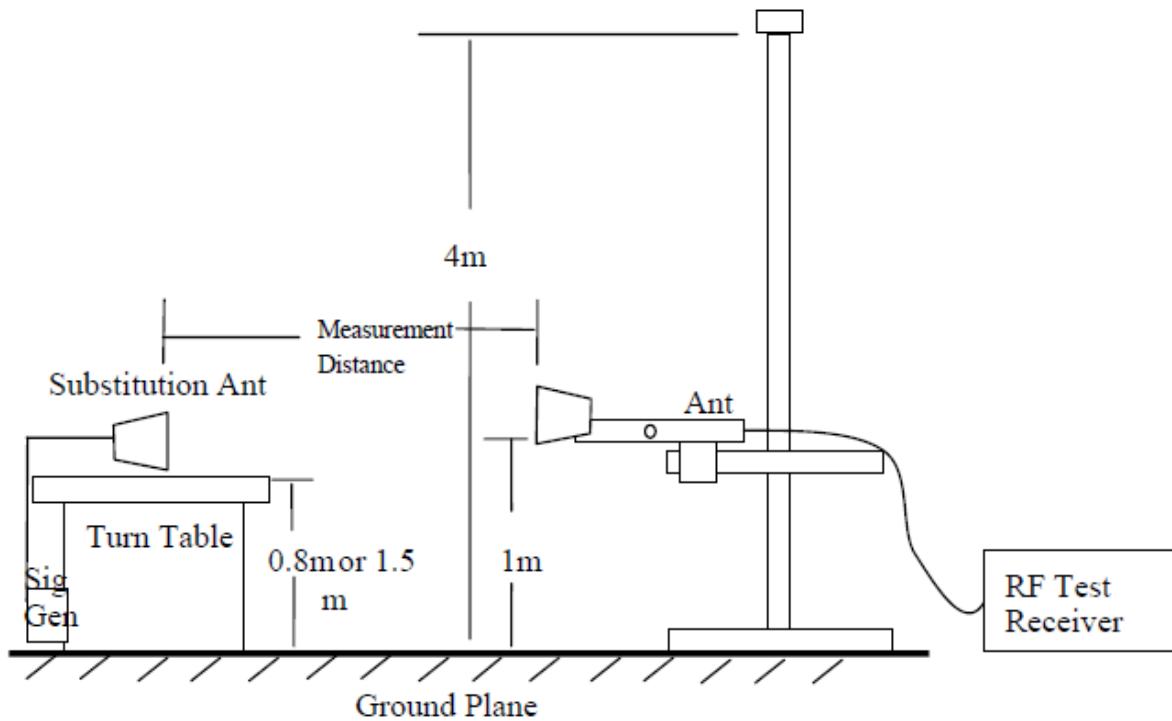


Radiated power test method:

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



## (B) Substitution method set-up for radiated emission



## 6.2 Limit

According to §22.913(a)(2), The ERP of mobile and portable stations transmitters and auxiliary test transmitters must not exceed 7 Watts.

According to §24.232 (c), Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

According to §27.50(d)(4), Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

### 6.3 Test procedure

Radiated power test method:

1. The setup of EUT is according with per ANSI/TIA-603-E-2016 and ANSI C63.26-2015 measurement procedure.
2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.
3. The frequency range up to tenth harmonic of the fundamental frequency was investigated.
4. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

### 6.4 Test Result

ERP For GPRS Mode GSM850

Frequency (MHz)	Polar (H/V)	Reading Level (dBm)	Correct Factor (dB)	Measurement (dBm)	FCC Part 22H Limits (dBm)	Result
Low Channel						
824.2	H	53.51	-26.29	27.22	38.45	PASS
824.2	V	53.35	-26.29	27.06	38.45	PASS
Middle Channel						
836.6	H	53.66	-26.35	27.31	38.45	PASS
836.6	V	53.89	-26.35	27.54	38.45	PASS
High Channel						
848.8	H	54.27	-26.42	27.85	38.45	PASS
848.8	V	54.21	-26.42	27.79	38.45	PASS

EIRP For GPRS Mode PCS1900

Frequency (MHz)	Polar (H/V)	Reading Level (dBm)	Correct Factor (dB)	Measurement (dBm)	FCC Part 24E Limits (dBm)	Result
Low Channel						
1850.2	H	54.37	-26.93	27.44	33.00	PASS
1850.2	V	54.27	-26.93	27.34	33.00	PASS
Middle Channel						
1880	H	54.58	-26.86	27.72	33.00	PASS
1880	V	53.92	-26.86	27.06	33.00	PASS
High Channel						
1909.8	H	54.35	-26.80	27.55	33.00	PASS
1909.8	V	53.97	-26.80	27.17	33.00	PASS

Note: All modes have been tested and only the worst mode is represented, with the worst data being Subtest1.

## ERP For EGPRS Mode GSM850

Frequency (MHz)	Polar (H/V)	Reading Level (dBm)	Correct Factor (dB)	Measurement (dBm)	FCC Part 22H Limits (dBm)	Result
Low Channel						
824.2	H	53.82	-26.29	27.53	38.45	PASS
824.2	V	53.42	-26.29	27.13	38.45	PASS
Middle Channel						
836.6	H	53.31	-26.35	26.96	38.45	PASS
836.6	V	52.89	-26.35	26.54	38.45	PASS
High Channel						
848.8	H	53.83	-26.42	27.41	38.45	PASS
848.8	V	53.87	-26.42	27.45	38.45	PASS

## EIRP For EGPRS Mode PCS1900

Frequency (MHz)	Polar (H/V)	Reading Level (dBm)	Correct Factor (dB)	Measurement (dBm)	FCC Part 24E Limits (dBm)	Result
Low Channel						
1850.2	H	54.32	-26.93	27.39	33.00	PASS
1850.2	V	54.18	-26.93	27.25	33.00	PASS
Middle Channel						
1880	H	54.27	-26.86	27.41	33.00	PASS
1880	V	54.26	-26.86	27.40	33.00	PASS
High Channel						
1909.8	H	54.45	-26.80	27.65	33.00	PASS
1909.8	V	54.26	-26.80	27.46	33.00	PASS

Note: All modes have been tested and only the worst mode is represented, with the worst data being Subtest1.

**Max. Conducted Output Power**

For Cellular Band (GSM850)

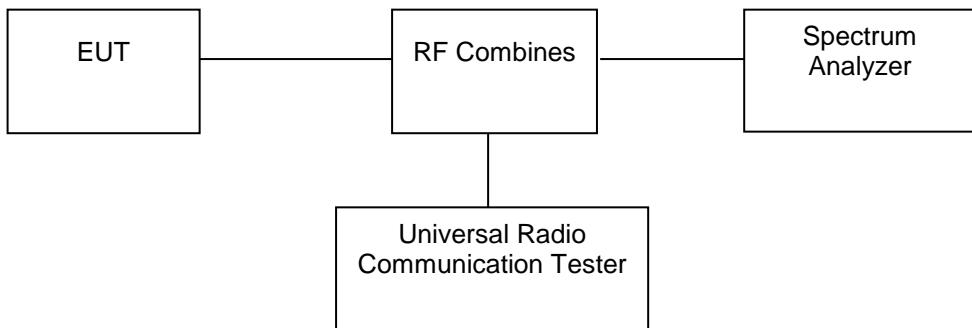
Band	GSM850		
<b>Channel</b>	<b>128</b>	<b>190</b>	<b>251</b>
<b>Frequency(MHz)</b>	<b>824.2</b>	<b>836.6</b>	<b>848.8</b>
GPRS Slot -1	30.63	<b>31.03</b>	30.98
GPRS Slot -2	30.62	31	30.97
GPRS Slot -3	28.8	29.26	29.24
GPRS Slot -4	26.85	27.3	27.24
EGPRS Slot -1	25.1	25.55	25.22
EGPRS Slot -2	23.34	24.09	23.94
EGPRS Slot -3	21.28	21.8	21.87
EGPRS Slot -4	19.46	20.17	19.84

For PCS Band (GSM1900)

Band	GSM1900		
<b>Channel</b>	<b>512</b>	<b>661</b>	<b>810</b>
<b>Frequency(MHz)</b>	<b>1850.2</b>	<b>1880</b>	<b>1909.8</b>
GPRS Slot -1	<b>27.91</b>	26.27	25.08
GPRS Slot -2	27.85	26.23	25.08
GPRS Slot -3	26.14	24.71	23.48
GPRS Slot -4	24.11	22.53	21.52
EGPRS Slot -1	24.88	23.72	22.82
EGPRS Slot -2	23.56	22.17	20.84
EGPRS Slot -3	21.27	19.54	18.57
EGPRS Slot -4	19.6	17.39	16.39

## 7. Peak-to-average Ratio(PAR) of Transmitter

### 7.1 Block Diagram Of Test Setup



### 7.2 Limit

According to §24.232(d), Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of §24.51. 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.

According to §27.50(B), the peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time or other Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.

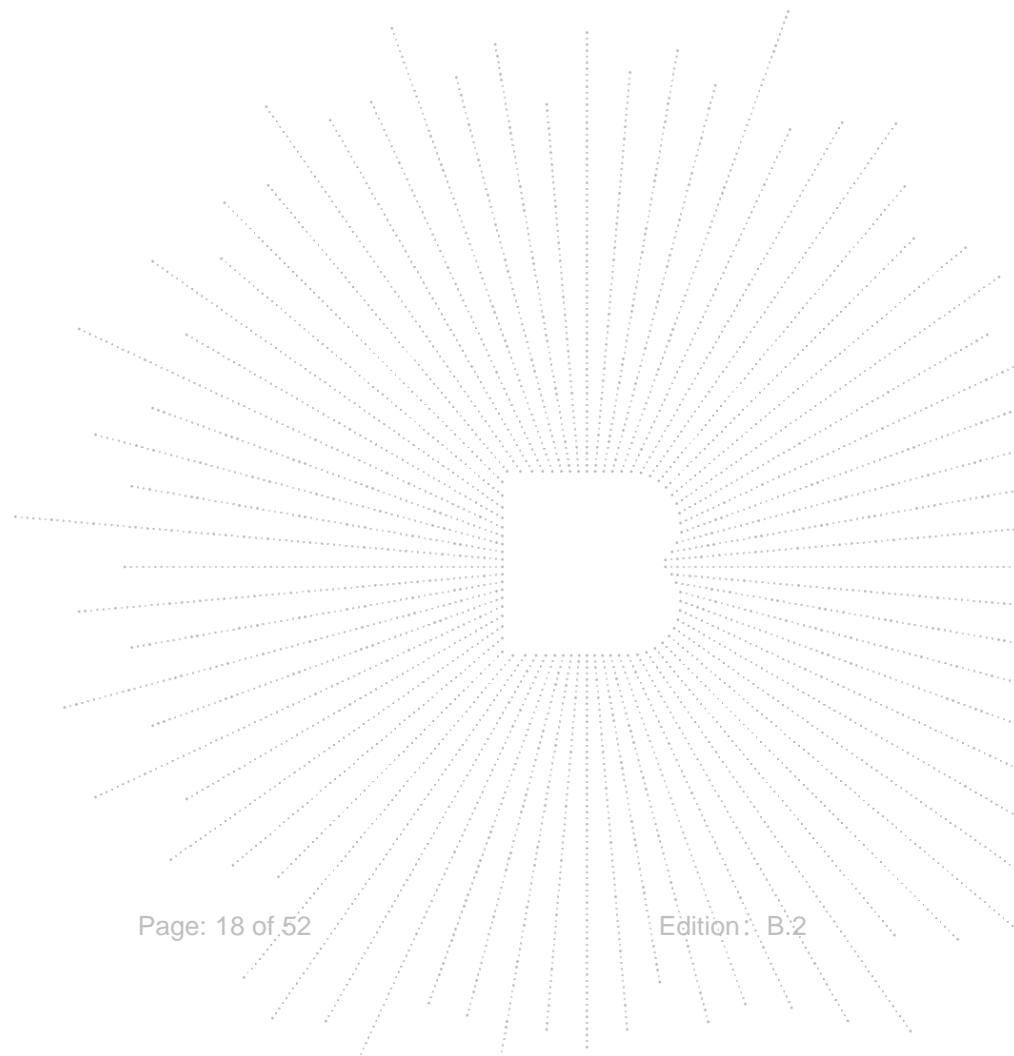
According to §22.913(d), The peak-to-average ratio (PAR) of the transmission must not exceed 13 dB.

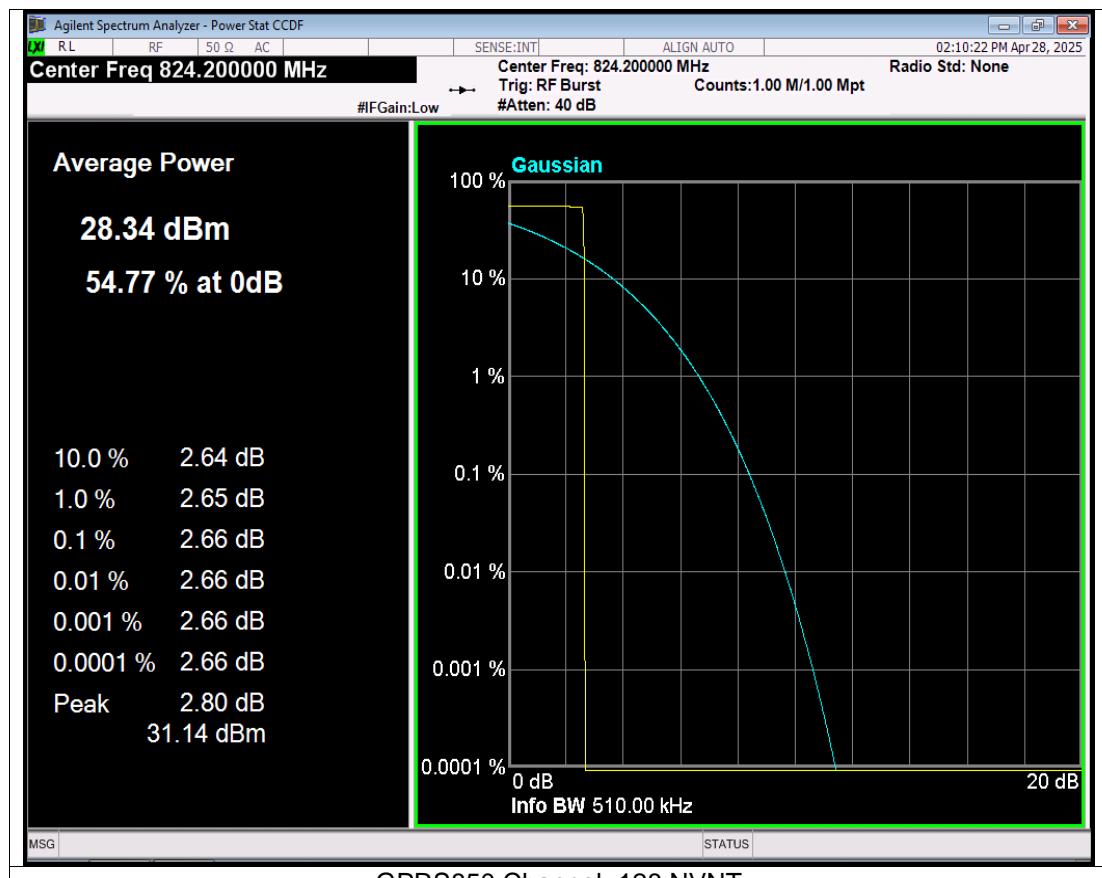
### 7.3 Test procedure

The RF output terminal of the transmitter was connected to the input of the spectrum analyzer via a suitable attenuation. The RBW of the spectrum analyzer was set to 30kHz and the peak-to-average ratio (PAR) of the transmission was recorded. Record the maximum PAPR level associated with a probability of 0.1%.

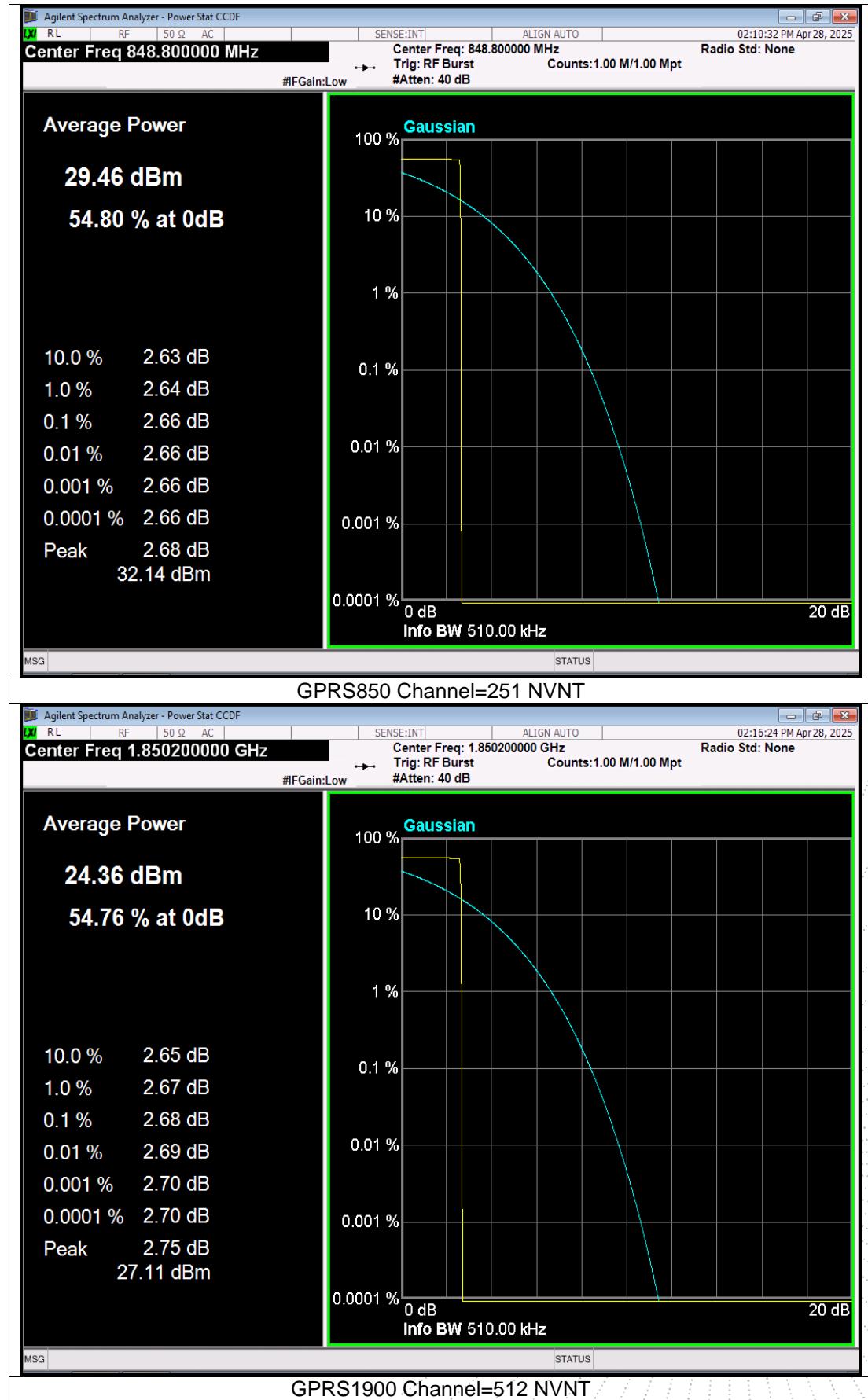
## 7.4 Test Result

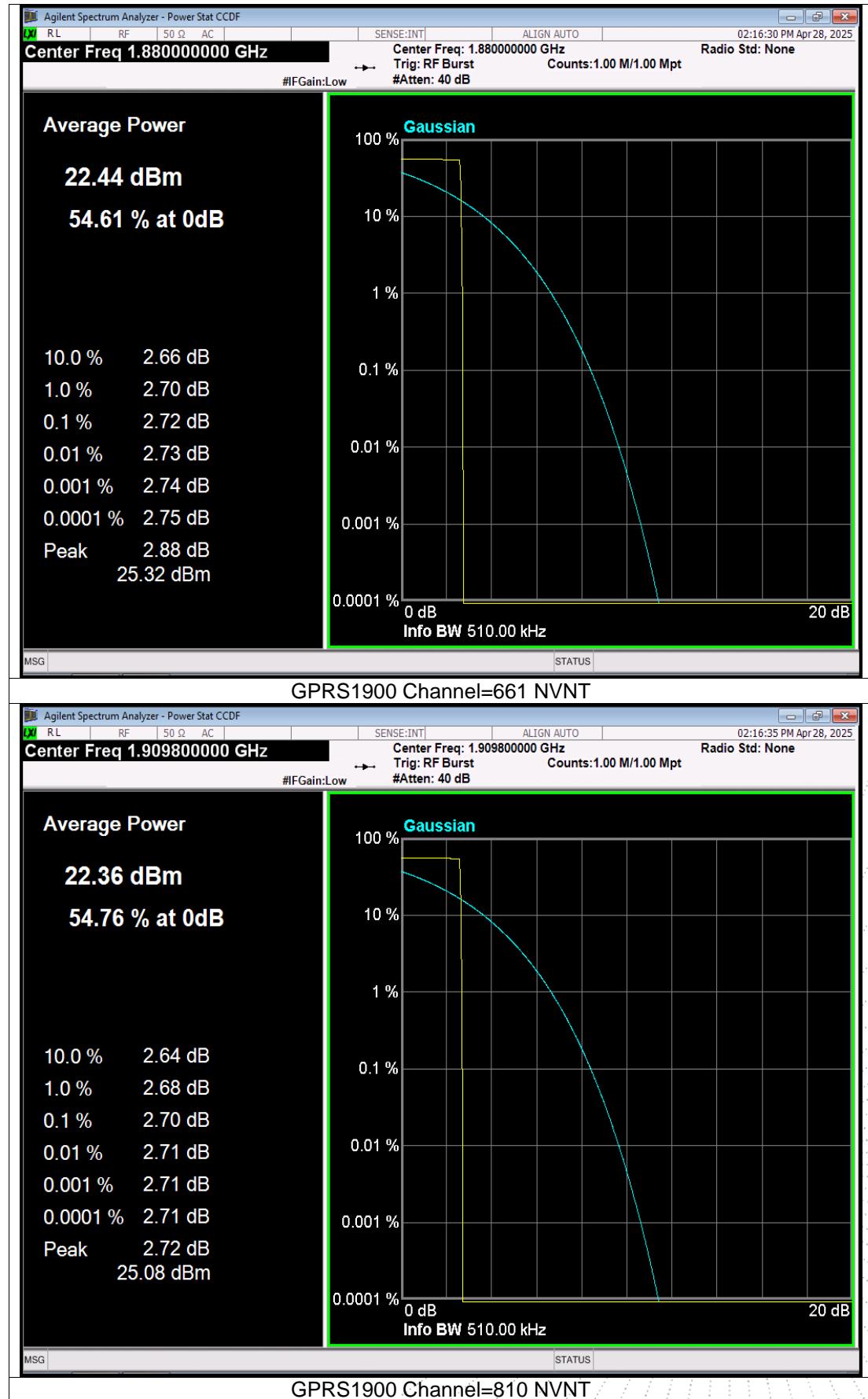
Condition	Band	Channel	Frequency (MHz)	Result (dB)	high Limit (dB)	Verdict
NVNT	GPRS850	128	824.2	2.66	13.00	PASS
NVNT	GPRS850	190	836.6	2.69	13.00	PASS
NVNT	GPRS850	251	848.8	2.66	13.00	PASS
NVNT	GPRS1900	512	1850.2	2.68	13.00	PASS
NVNT	GPRS1900	661	1880	2.72	13.00	PASS
NVNT	GPRS1900	810	1909.8	2.70	13.00	PASS
NVNT	EGPRS850	128	824.2	8.40	13.00	PASS
NVNT	EGPRS850	190	836.6	8.36	13.00	PASS
NVNT	EGPRS850	251	848.8	8.20	13.00	PASS
NVNT	EGPRS1900	512	1850.2	5.57	13.00	PASS
NVNT	EGPRS1900	661	1880	5.67	13.00	PASS
NVNT	EGPRS1900	810	1909.8	5.28	13.00	PASS



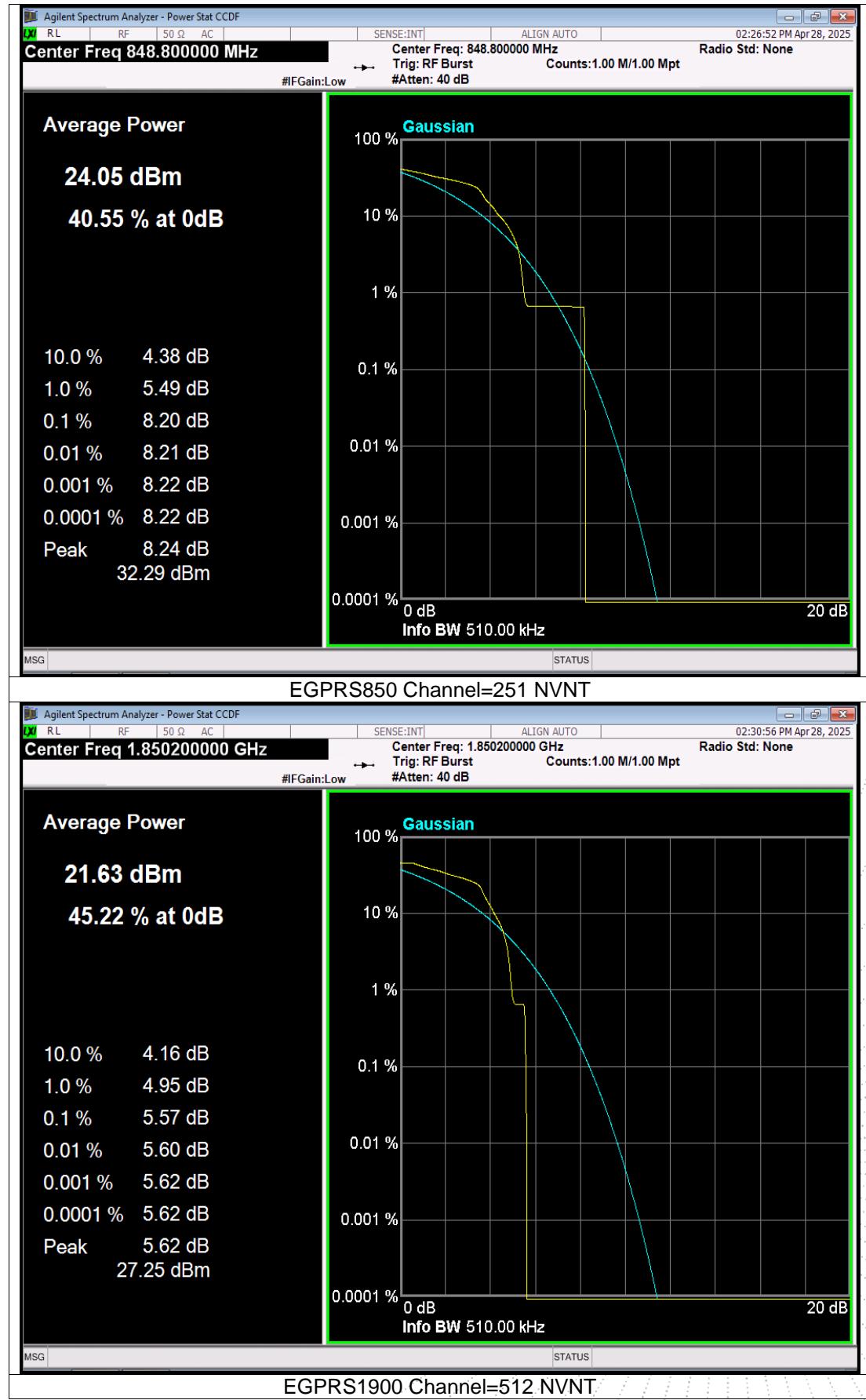


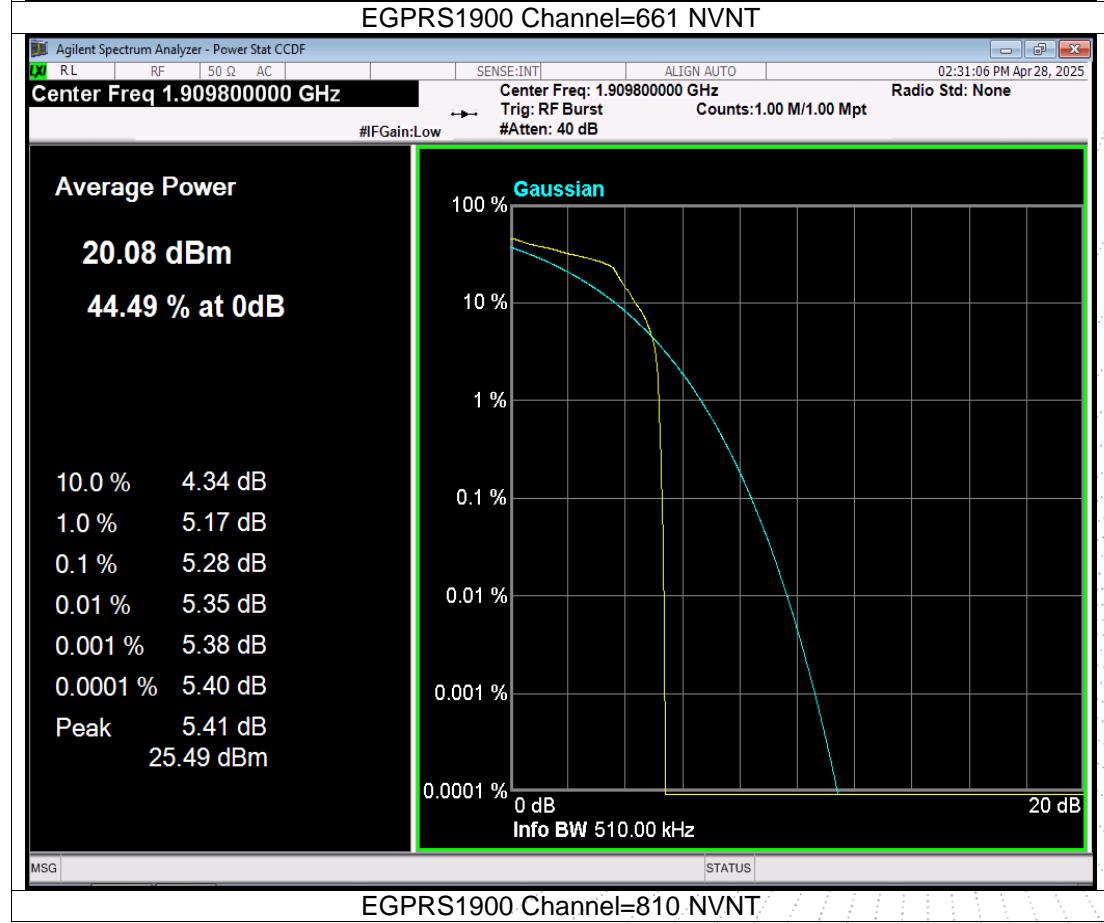
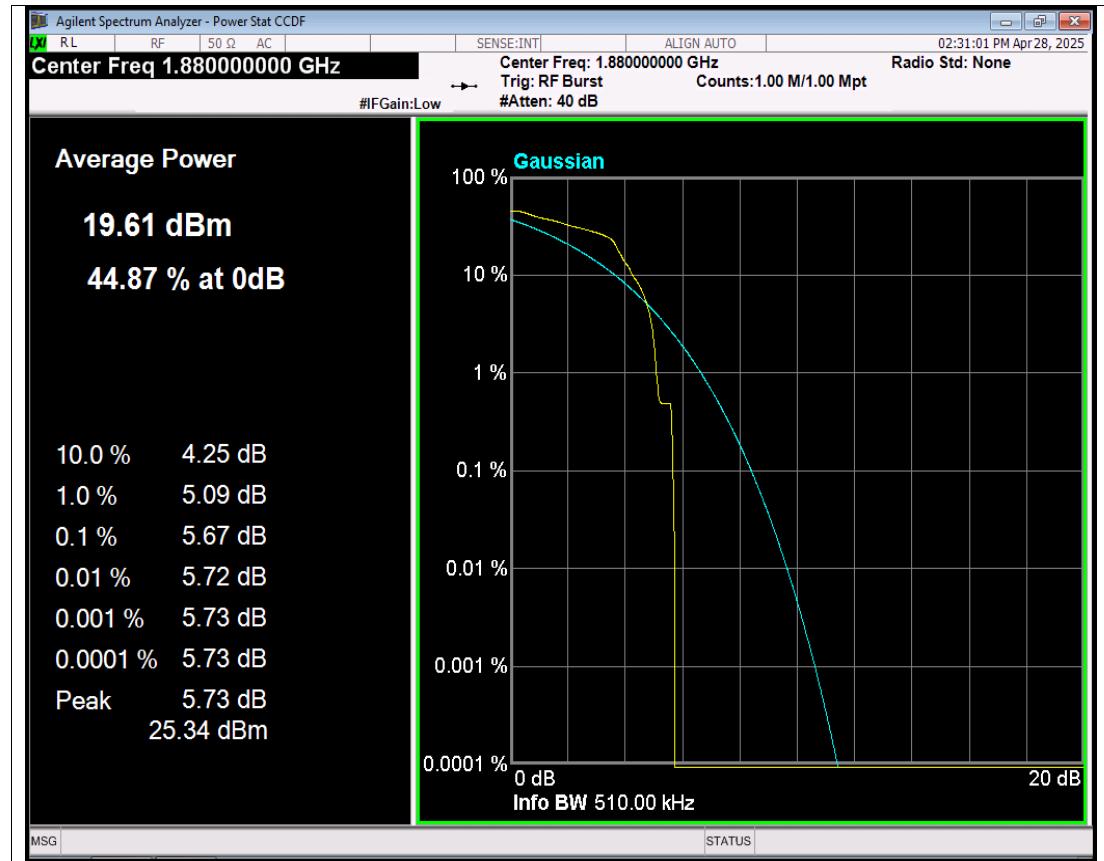
GPRS850 Channel=190 NVNT







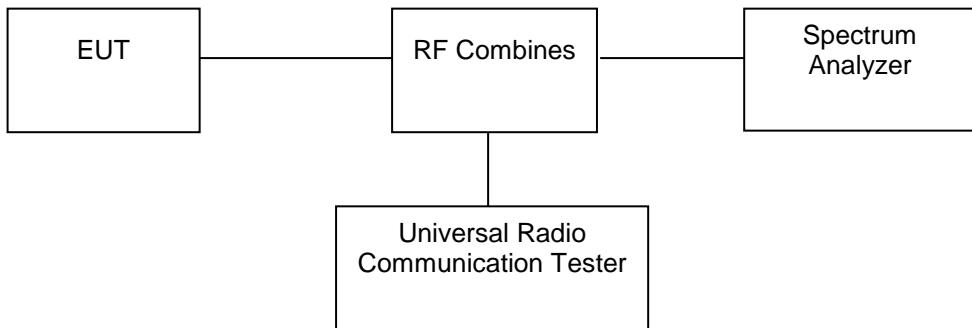




EGPRS1900 Channel=810 NVNT

## 8. Emission Bandwidth

### 8.1 Block Diagram Of Test Setup



### 8.2 Limit

According to §22.917(b), The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

According to §24.238(b), The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

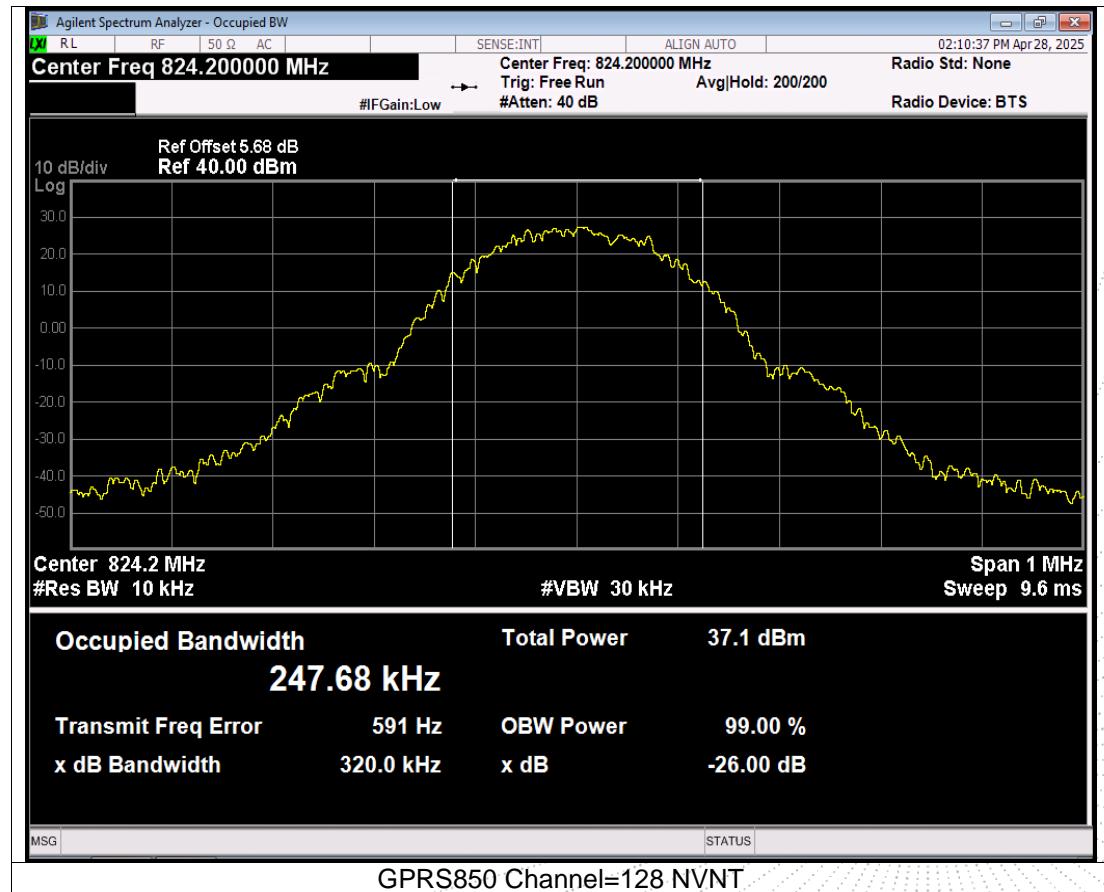
According to §27.53, The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

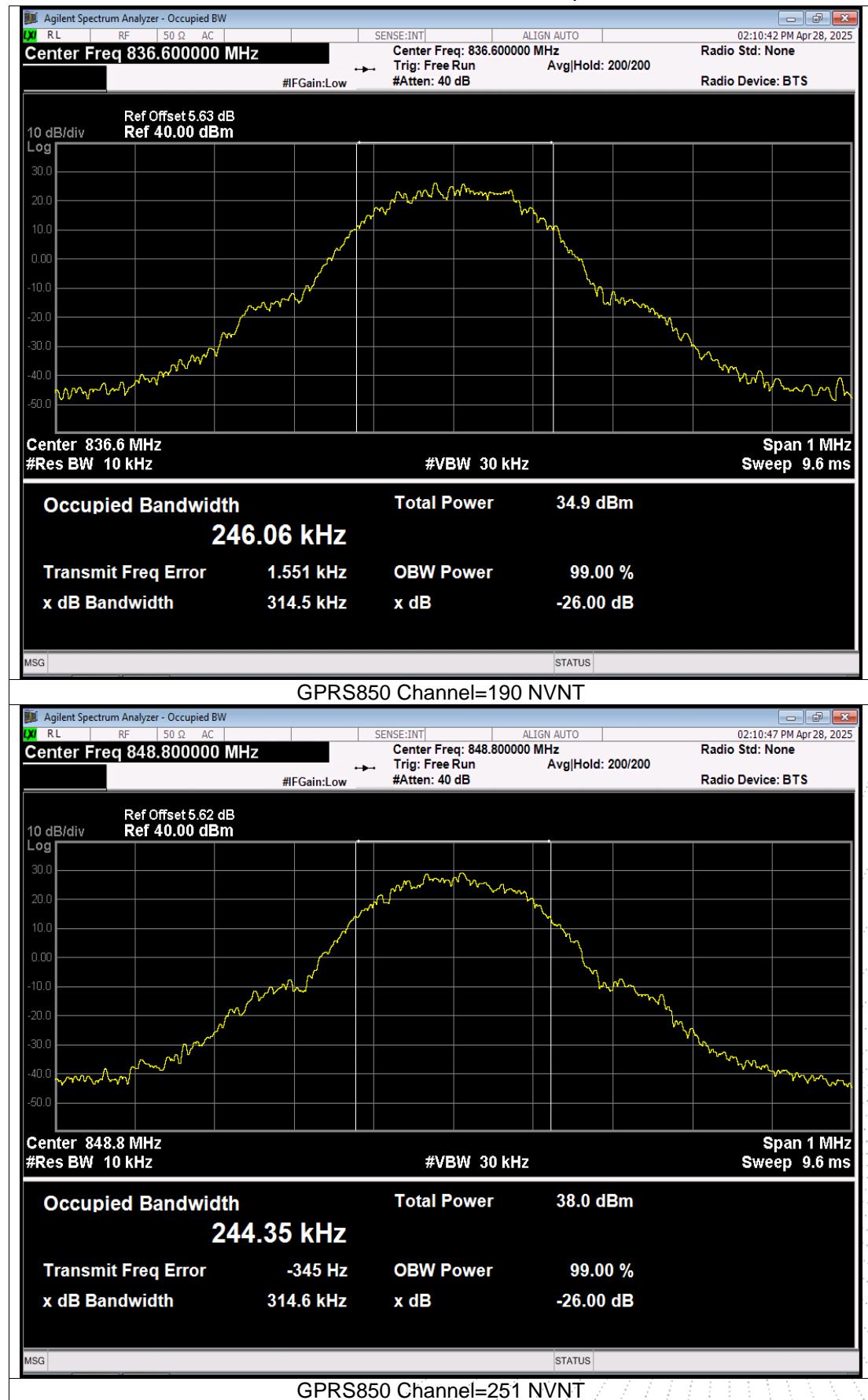
### 8.3 Test procedure

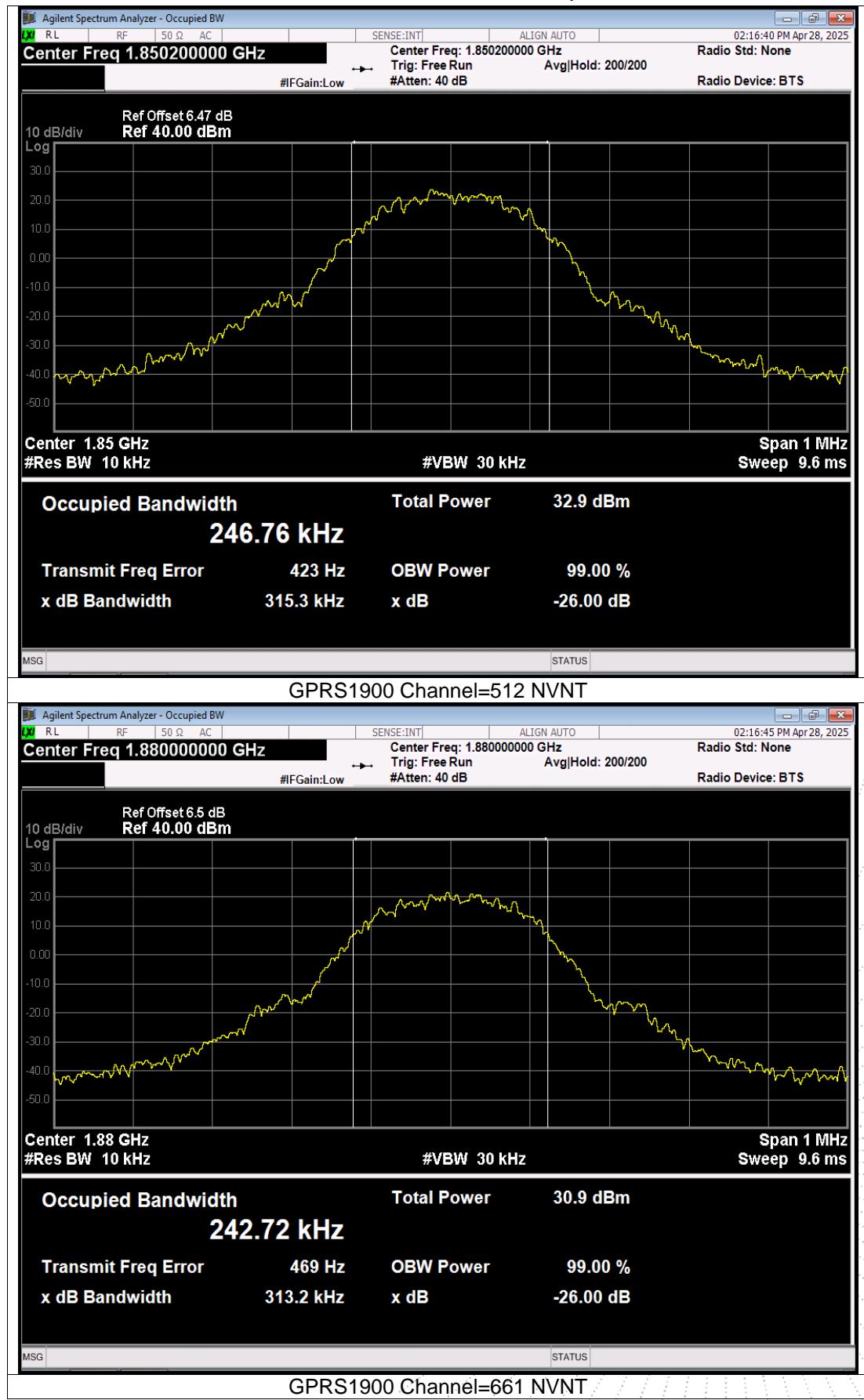
The RF output terminal of the transmitter was connected to the input of the spectrum analyzer via a suitable attenuation. The RBW of the spectrum analyzer was set to 10kHz for GSM mode and 100kHz for WCDMA mode, VBW shall be at least 3 times the RBW, and the 26dB bandwidth was recorded.

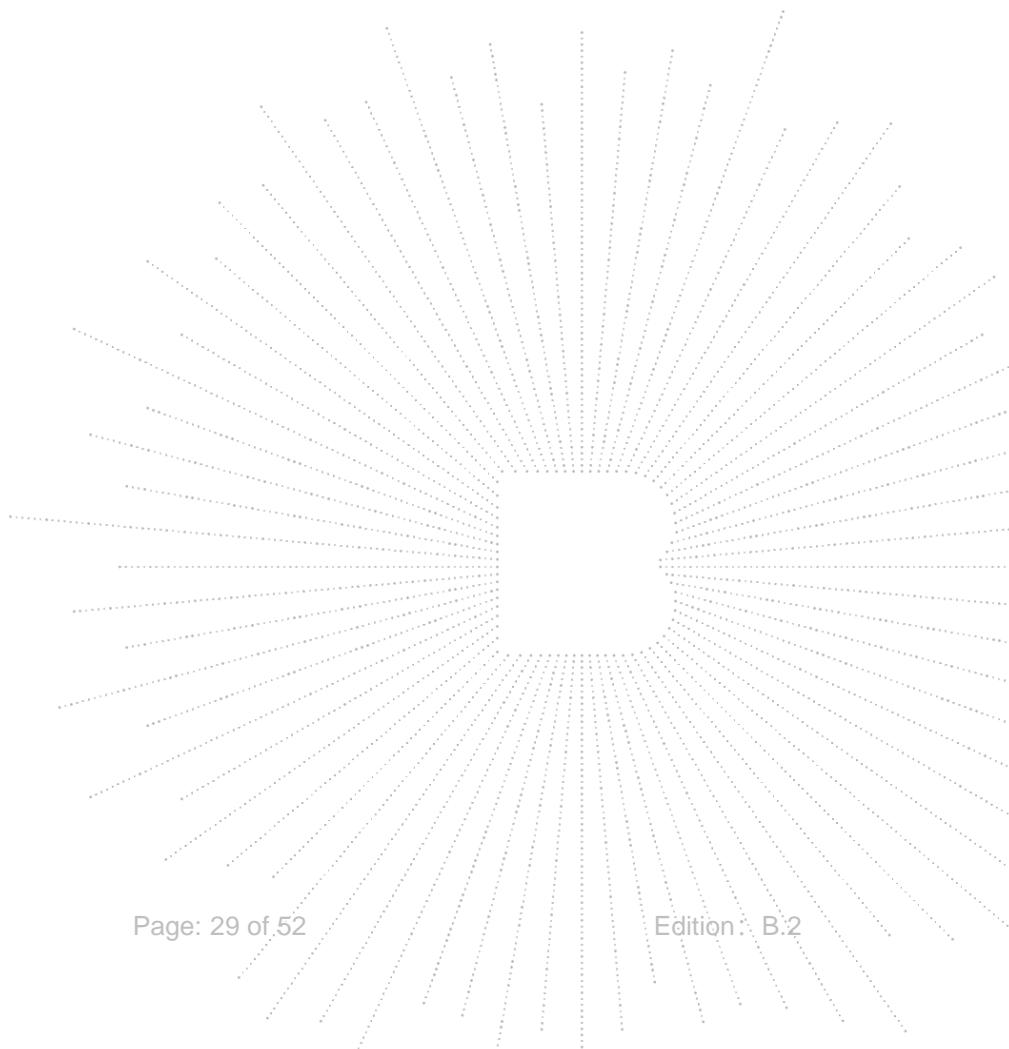
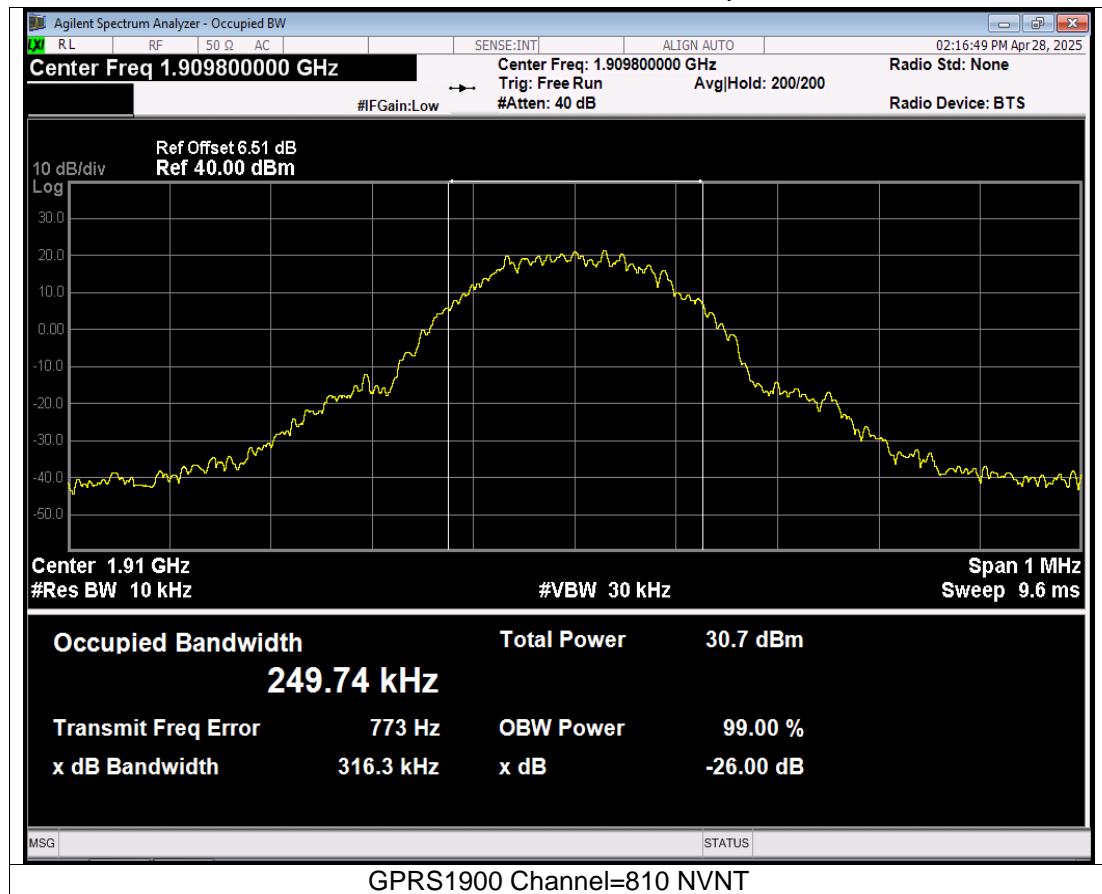
## 8.4 Test Result

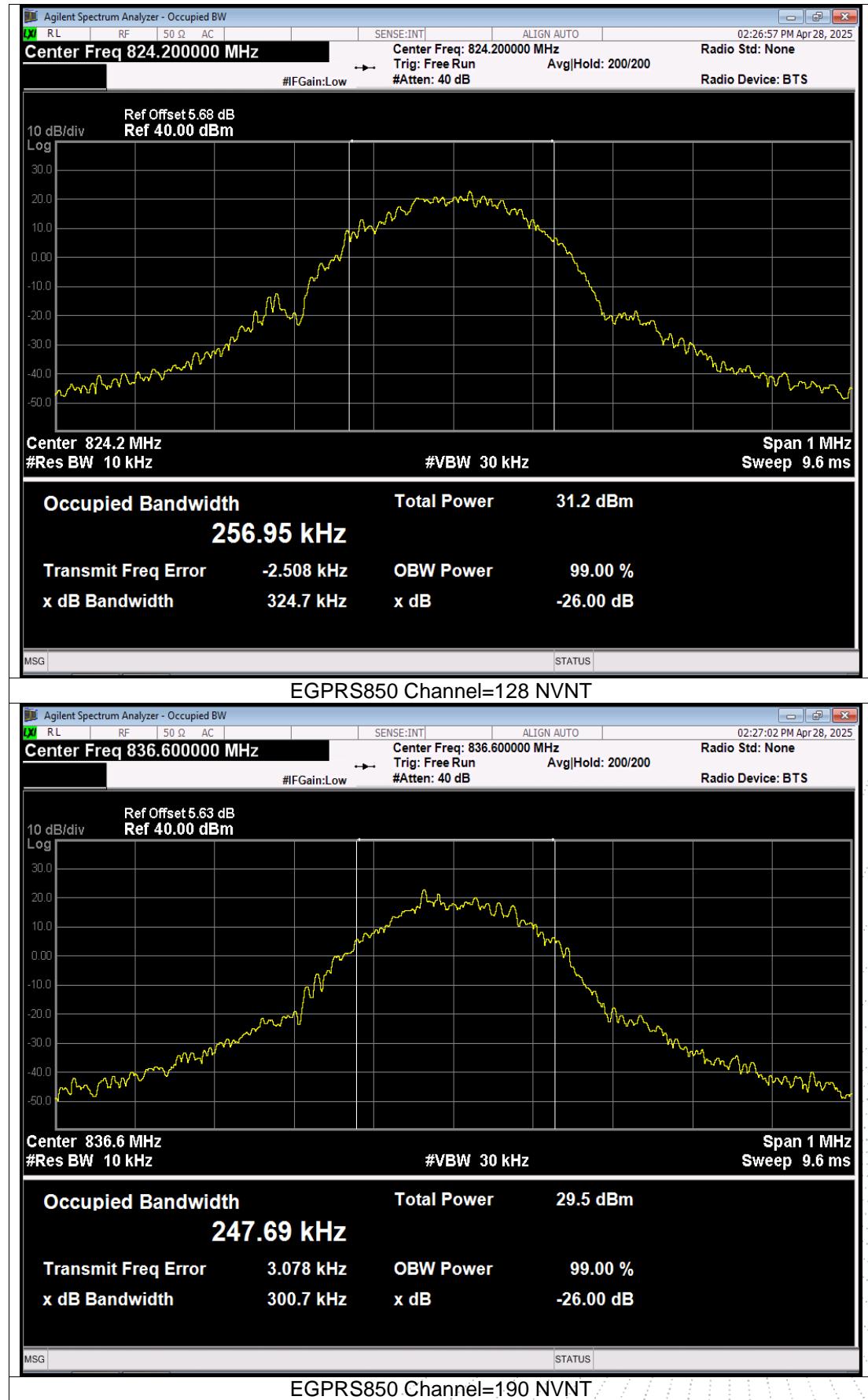
Condition	Band	Channel	Frequency (MHz)	99% OBW (kHz)	-26dB EBW (kHz)	Verdict
NVNT	GPRS850	128	824.2	247.682	320.032	PASS
NVNT	GPRS850	190	836.6	246.061	314.486	PASS
NVNT	GPRS850	251	848.8	244.346	314.641	PASS
NVNT	GPRS1900	512	1850.2	246.762	315.274	PASS
NVNT	GPRS1900	661	1880	242.718	313.238	PASS
NVNT	GPRS1900	810	1909.8	249.744	316.276	PASS
NVNT	EGPRS850	128	824.2	256.950	324.728	PASS
NVNT	EGPRS850	190	836.6	247.690	300.699	PASS
NVNT	EGPRS850	251	848.8	234.529	296.587	PASS
NVNT	EGPRS1900	512	1850.2	257.806	326.338	PASS
NVNT	EGPRS1900	661	1880	244.008	308.740	PASS
NVNT	EGPRS1900	810	1909.8	258.378	318.401	PASS

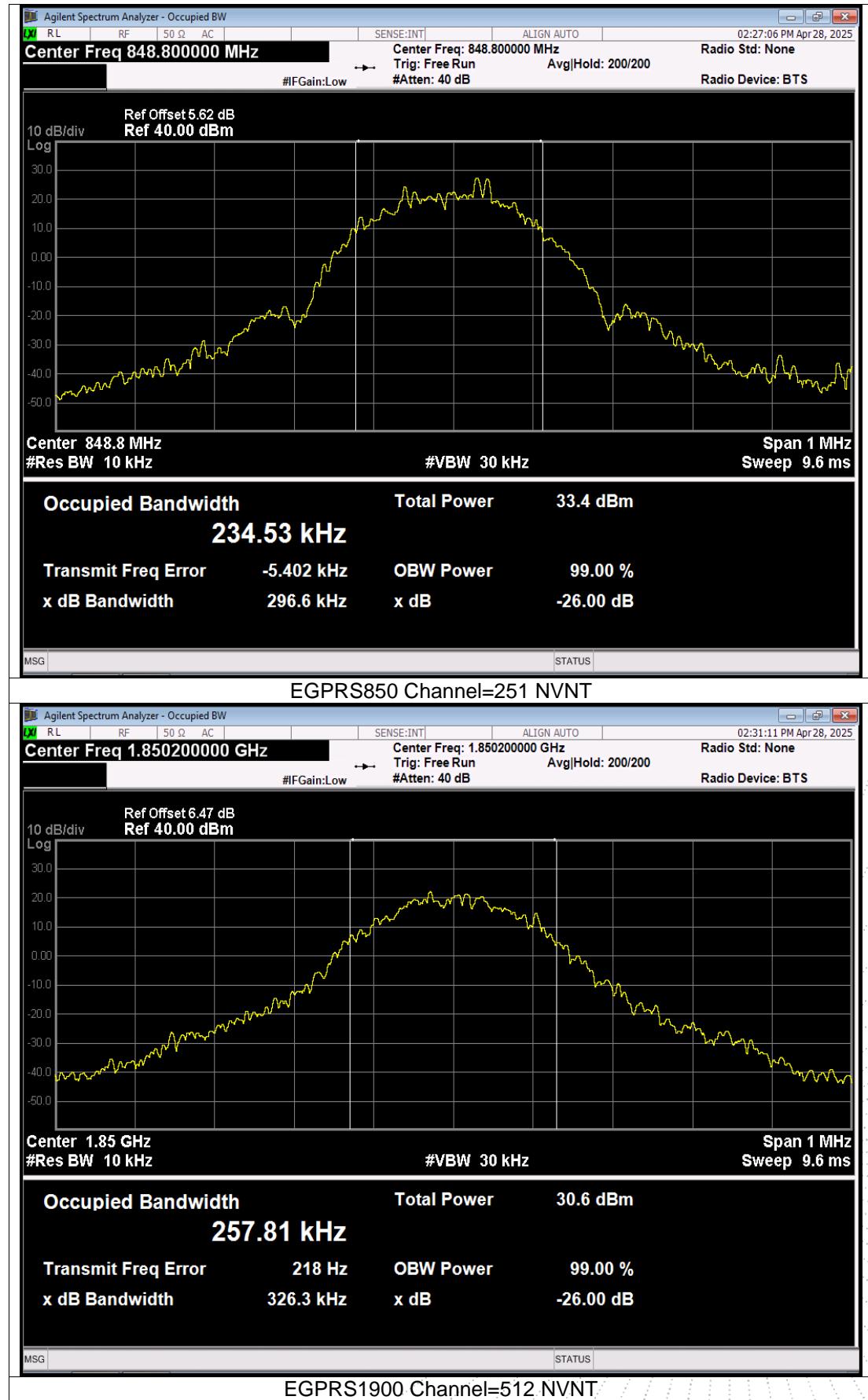


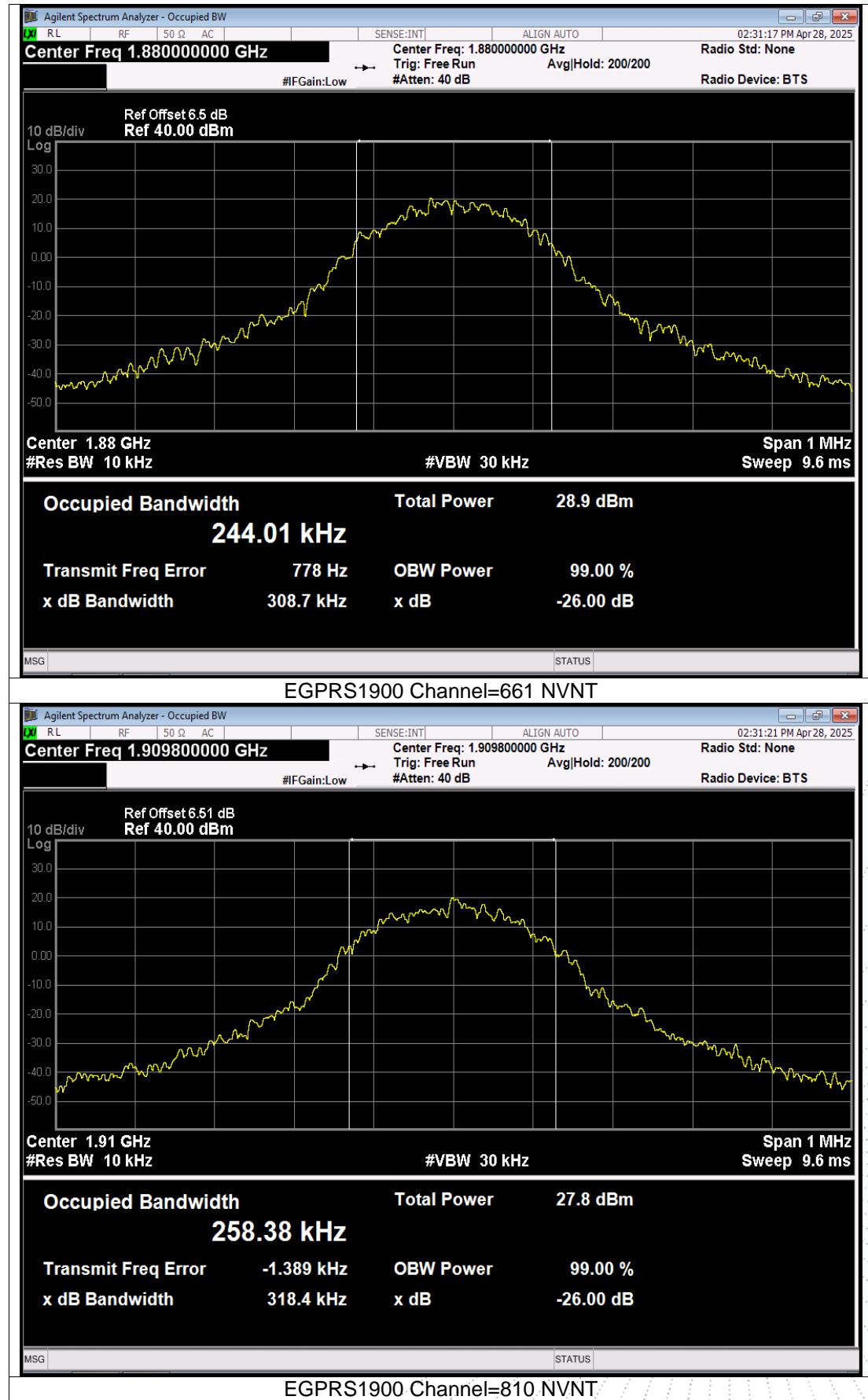






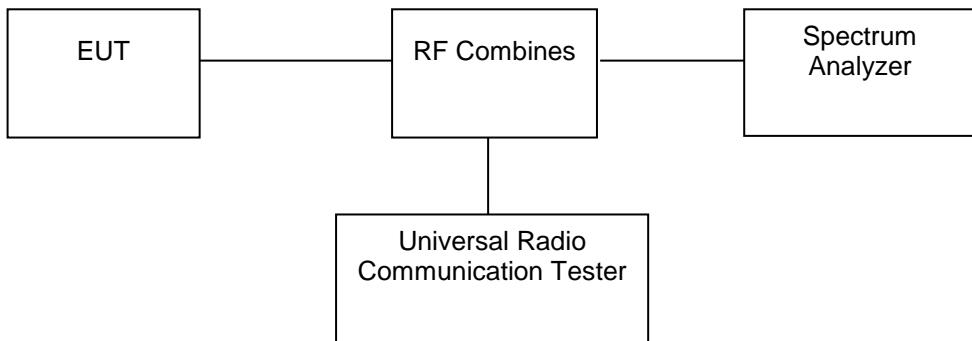






## 9. Out of Band Emissions at Antenna Terminal

### 9.1 Block Diagram Of Test Setup



### 9.2 Limit

According to §22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

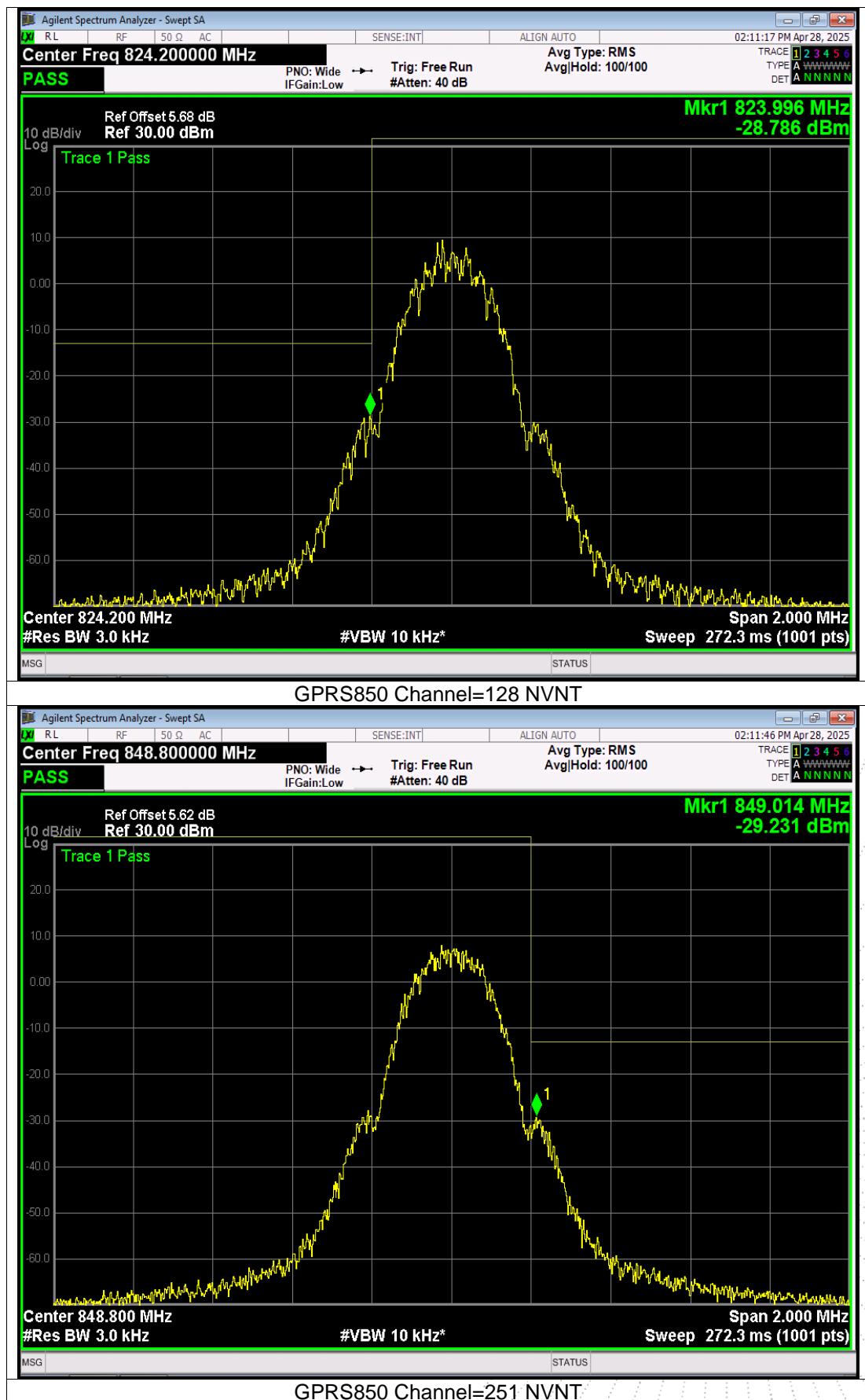
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

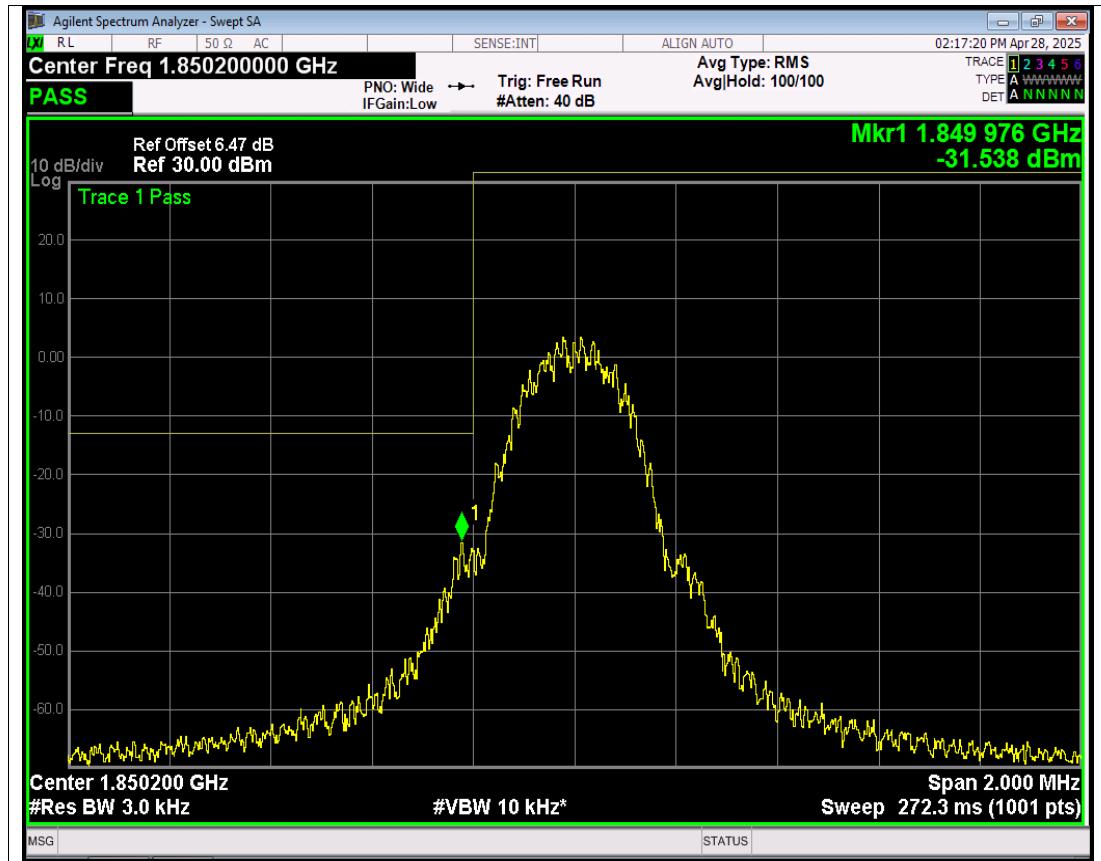
According to §27.53 (h), the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10} (P)$  dB.

### 9.3 Test procedure

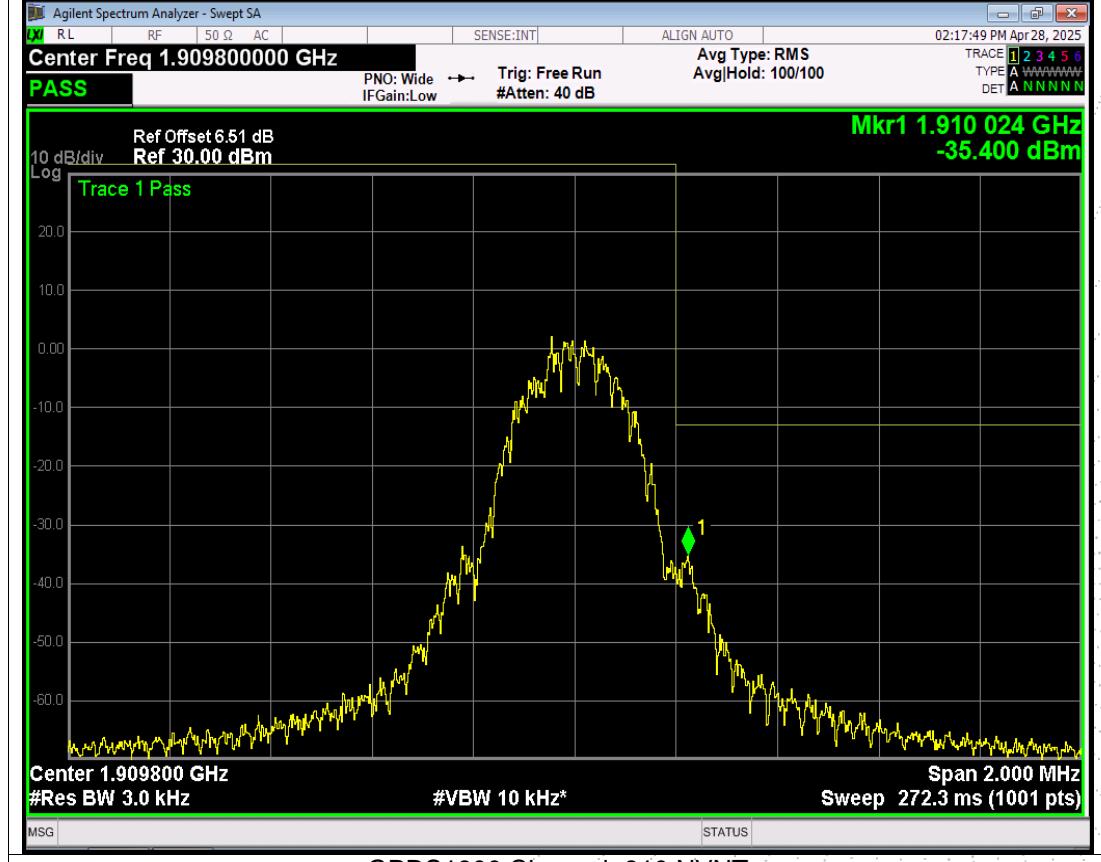
The RF output terminal of the transmitter was connected to the input of the spectrum analyzer via a suitable attenuation. The RBW of the spectrum analyzer was set to 100kHz and 1MHz for the scan frequency from 30MHz to 1GHz and the scan frequency from 1GHz to up to 10<sup>th</sup> harmonic. At the edge of the authorized Frequency block/band: RBW set 1%-5%OBW.

### 9.4 Test Result

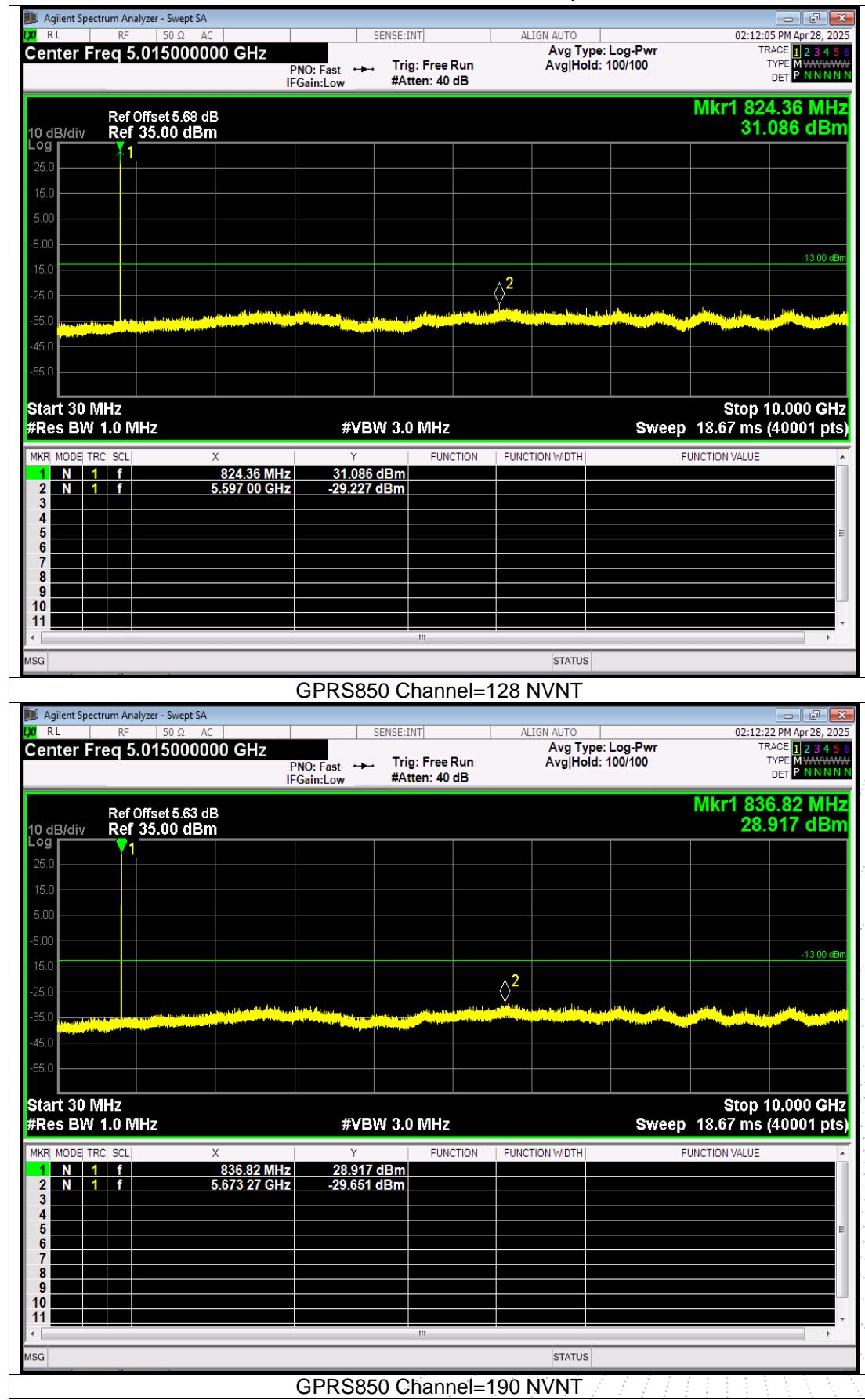


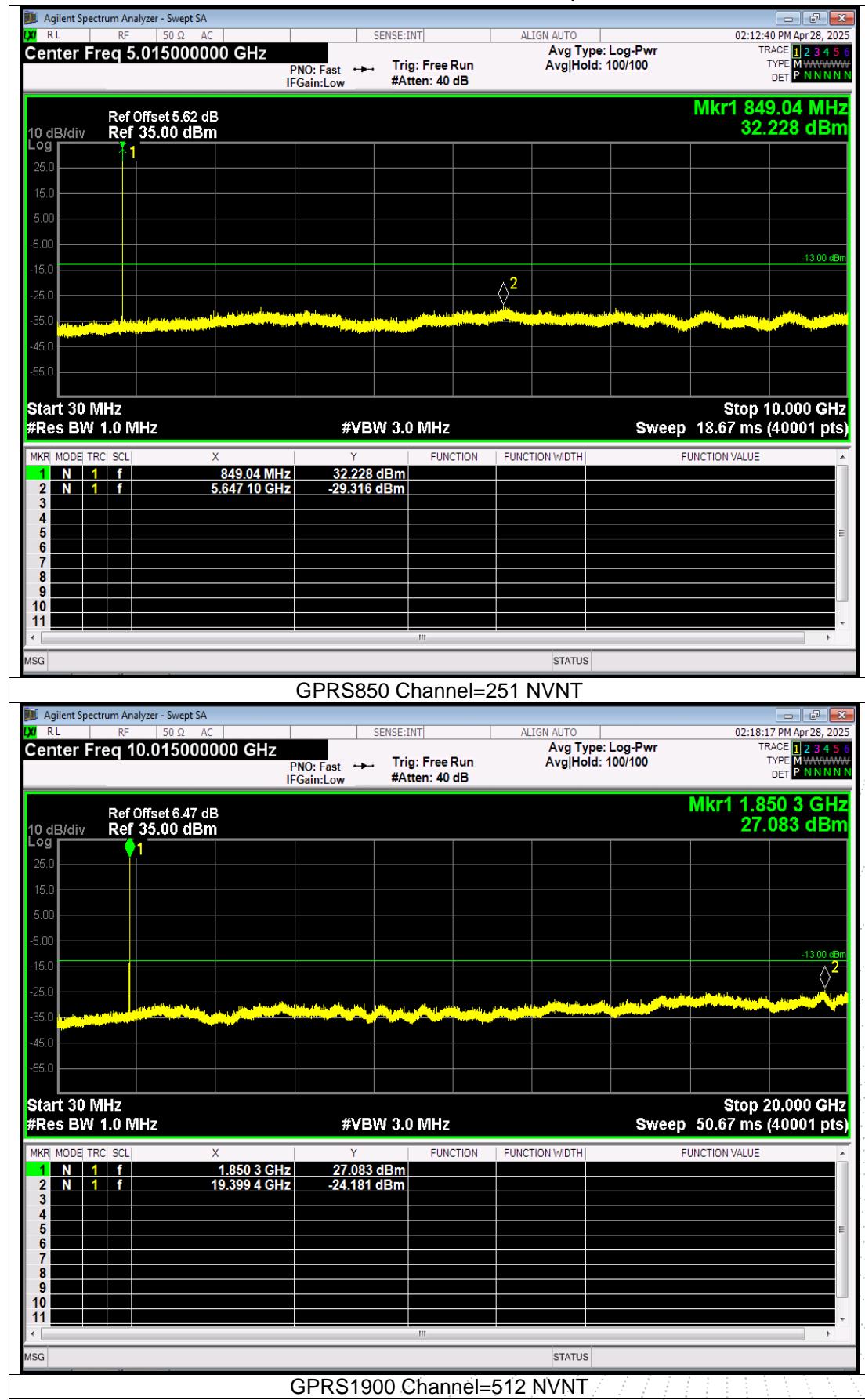


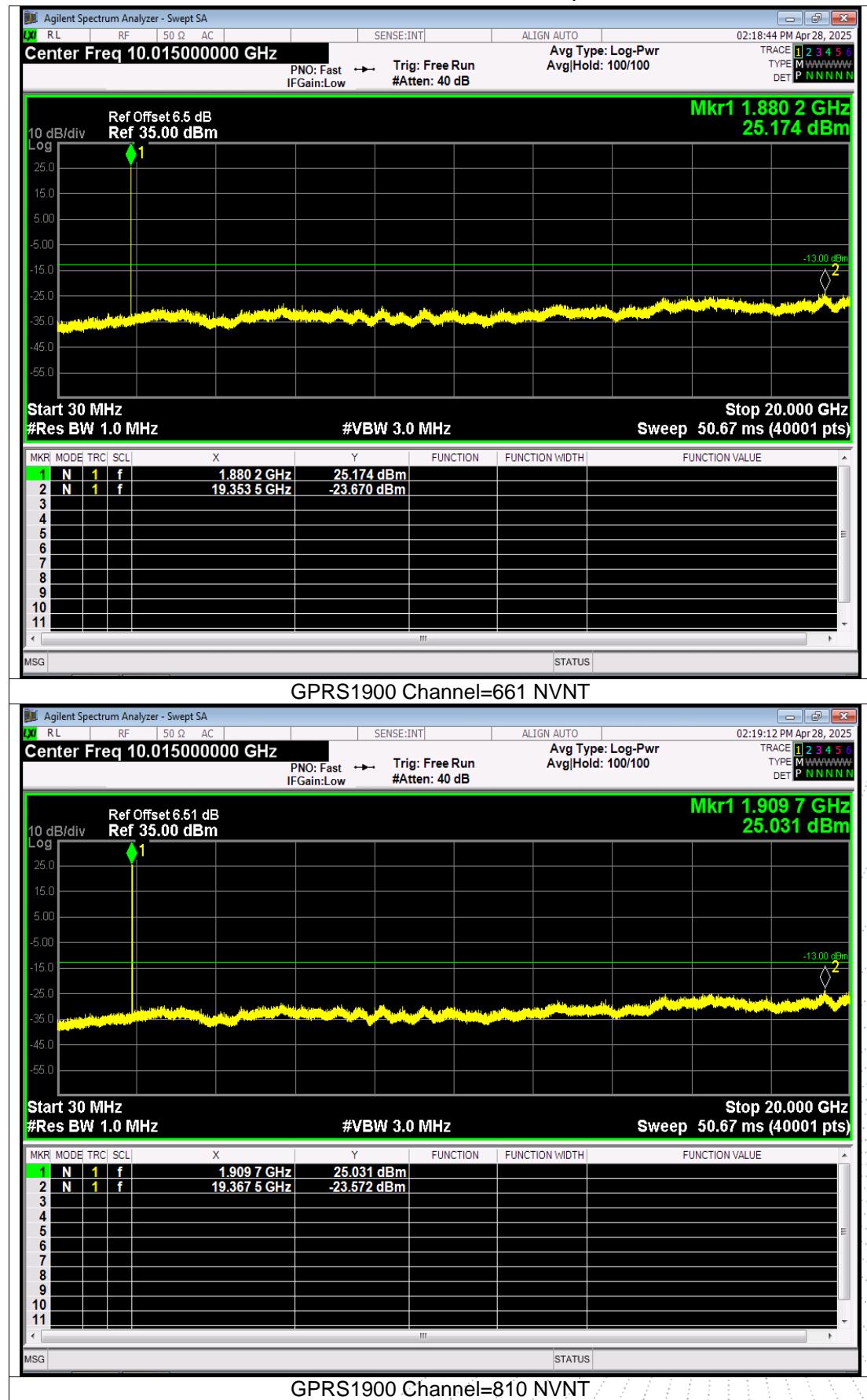
### GPRS1900 Channel=512 NVNT

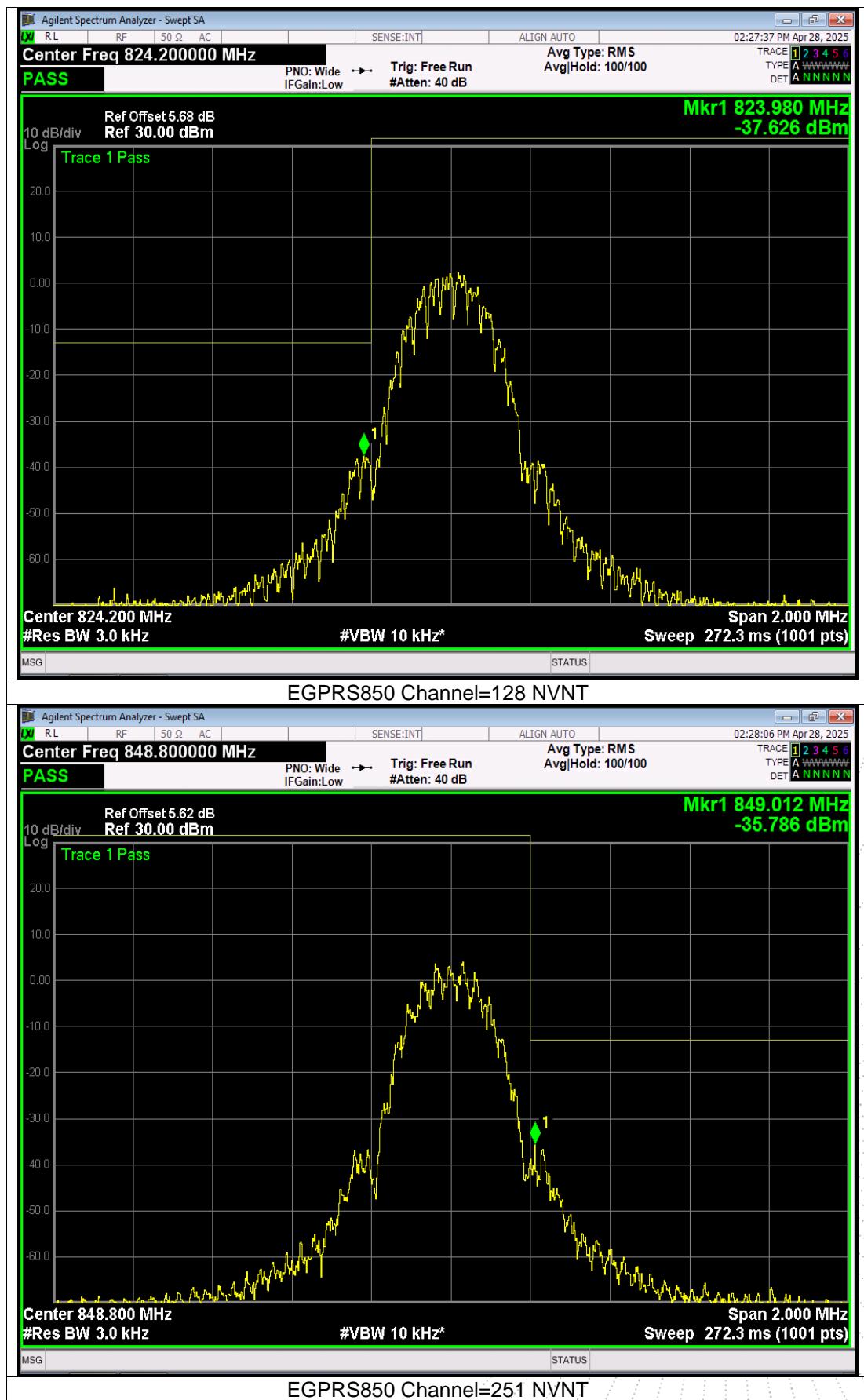


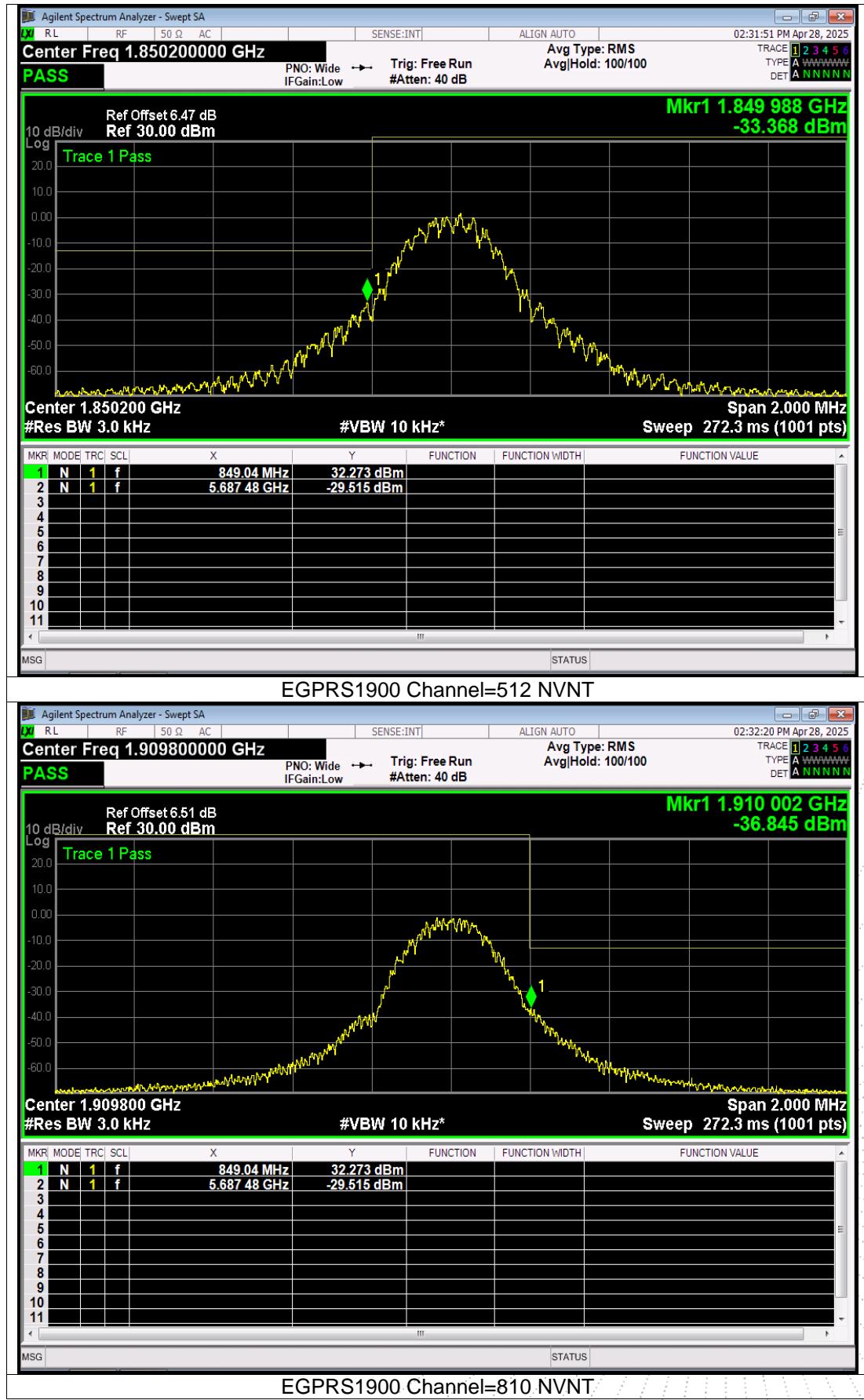
### GPRS1900 Channel=810 NVNT

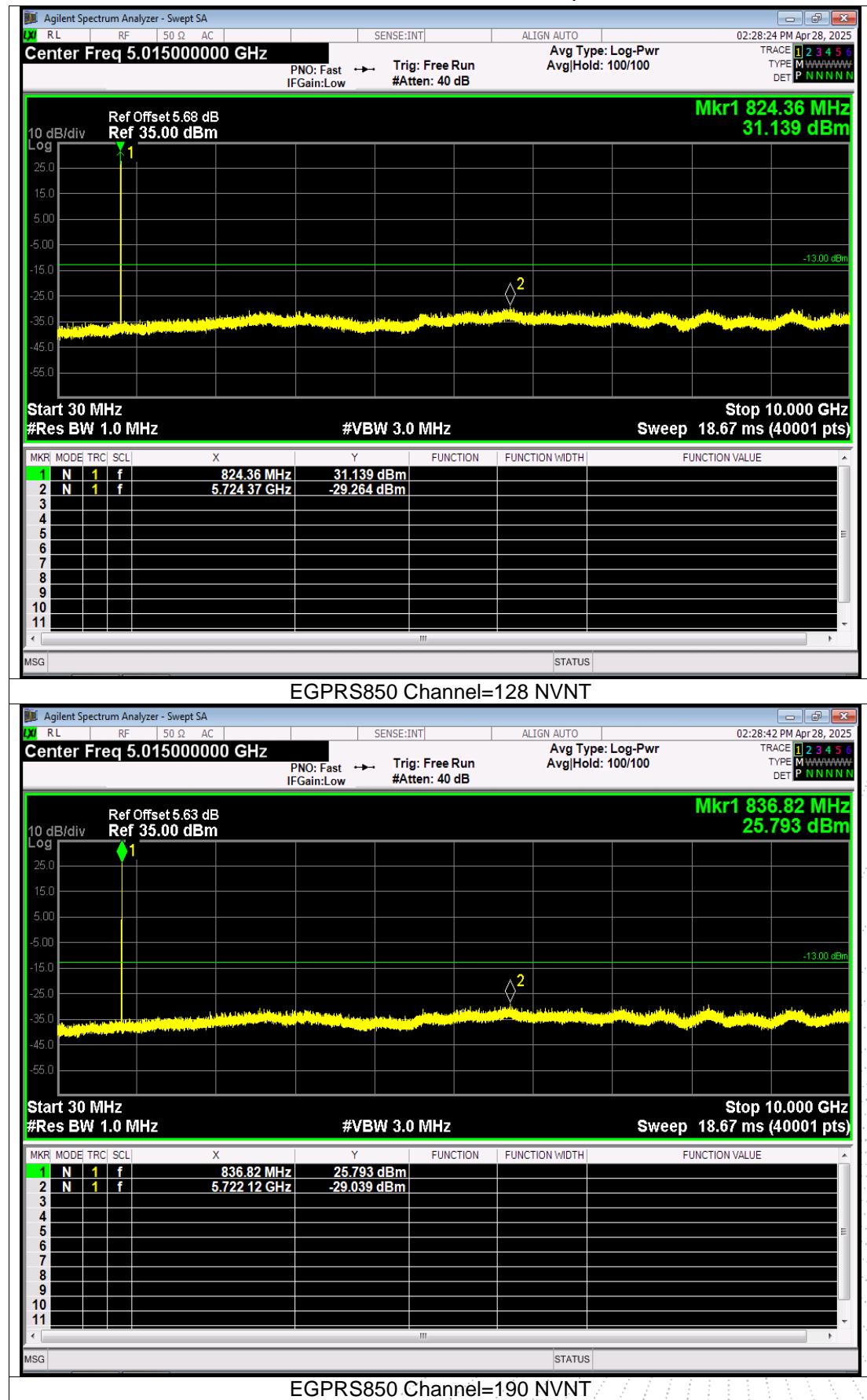


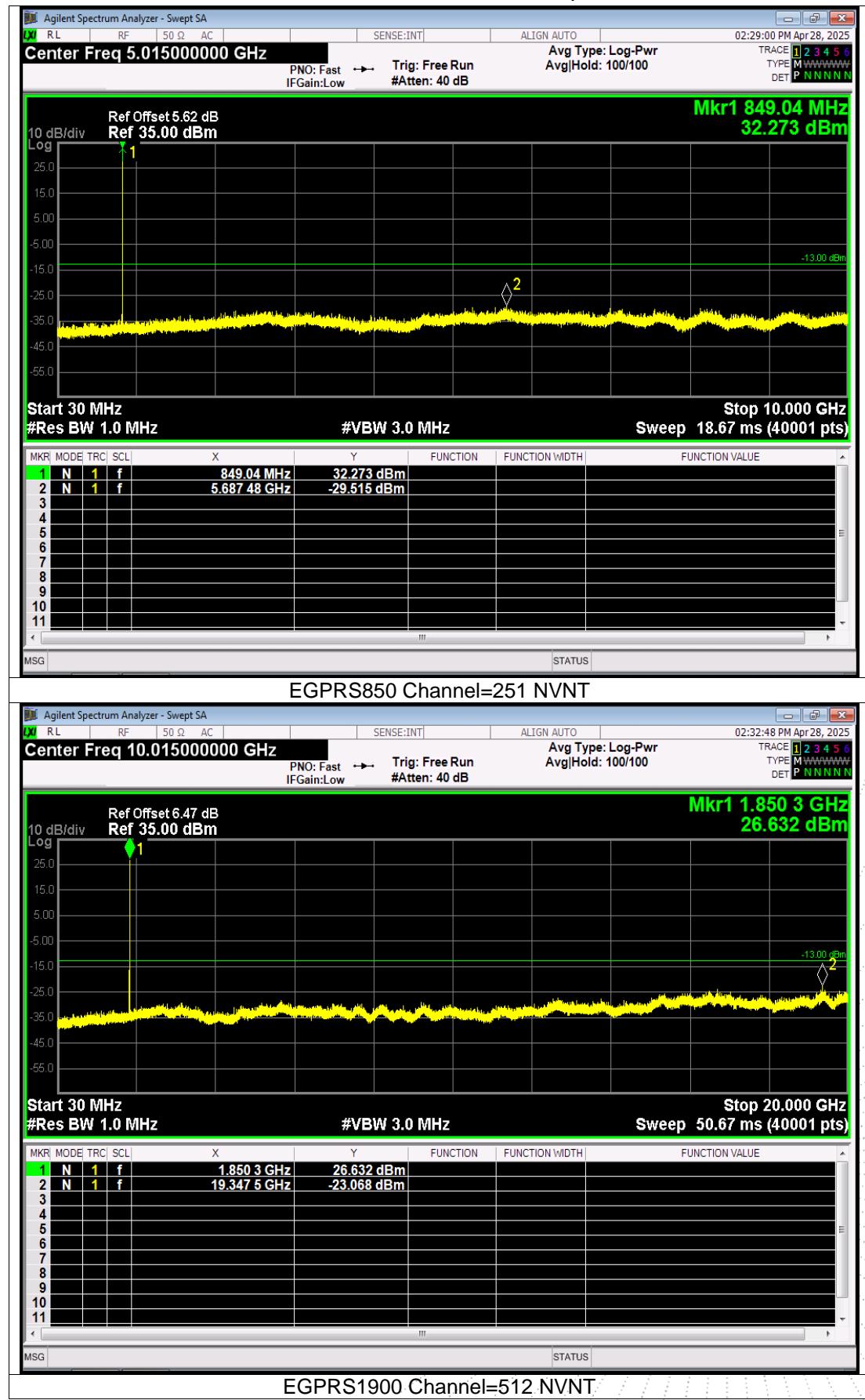


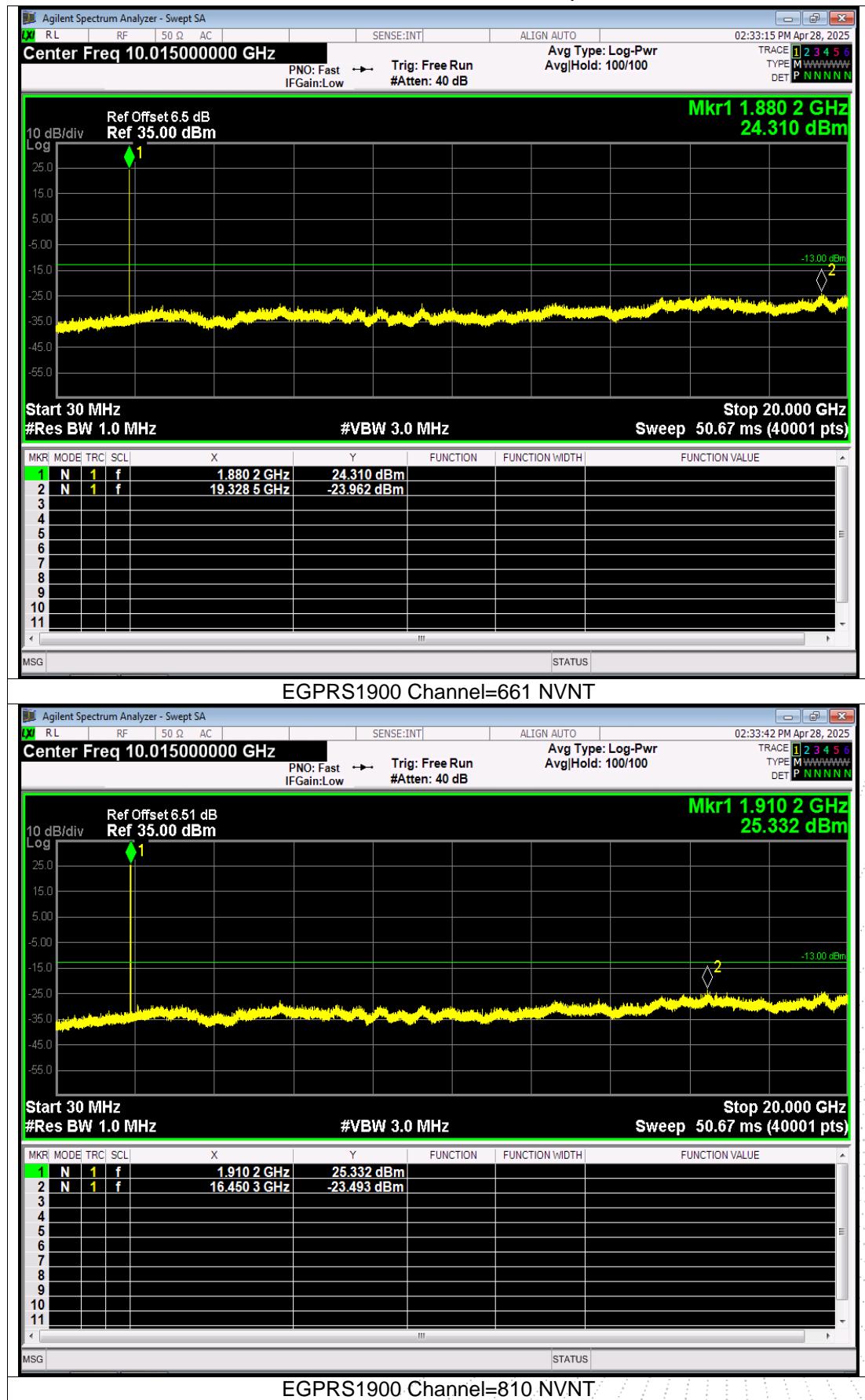








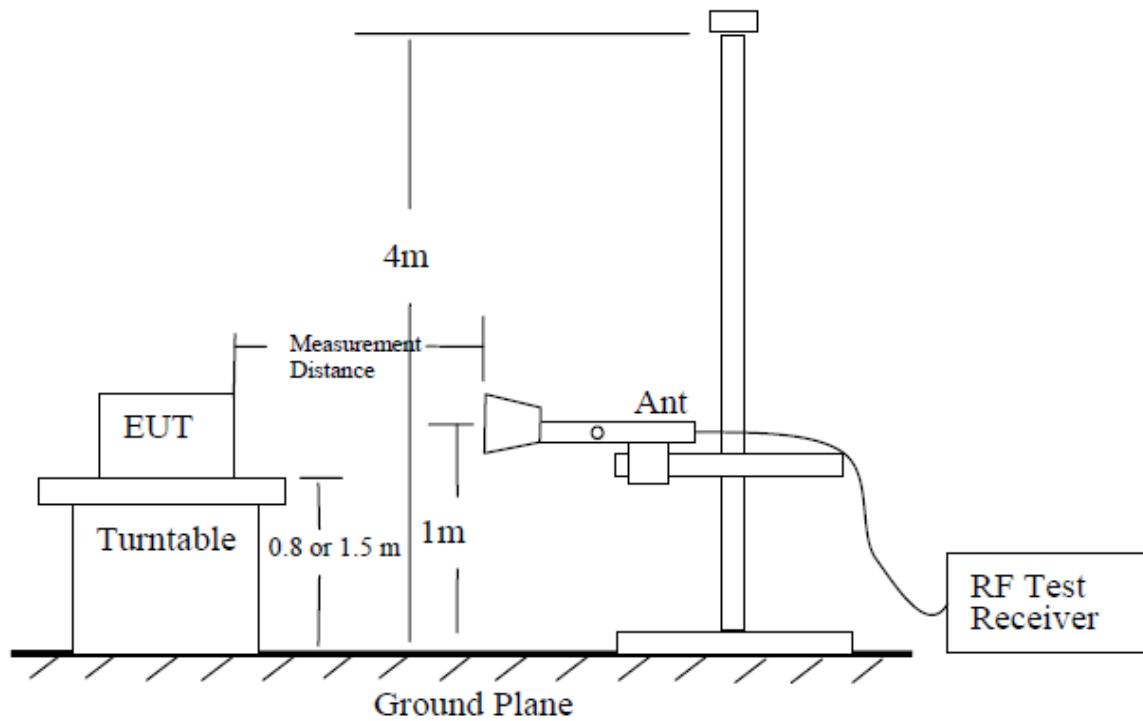




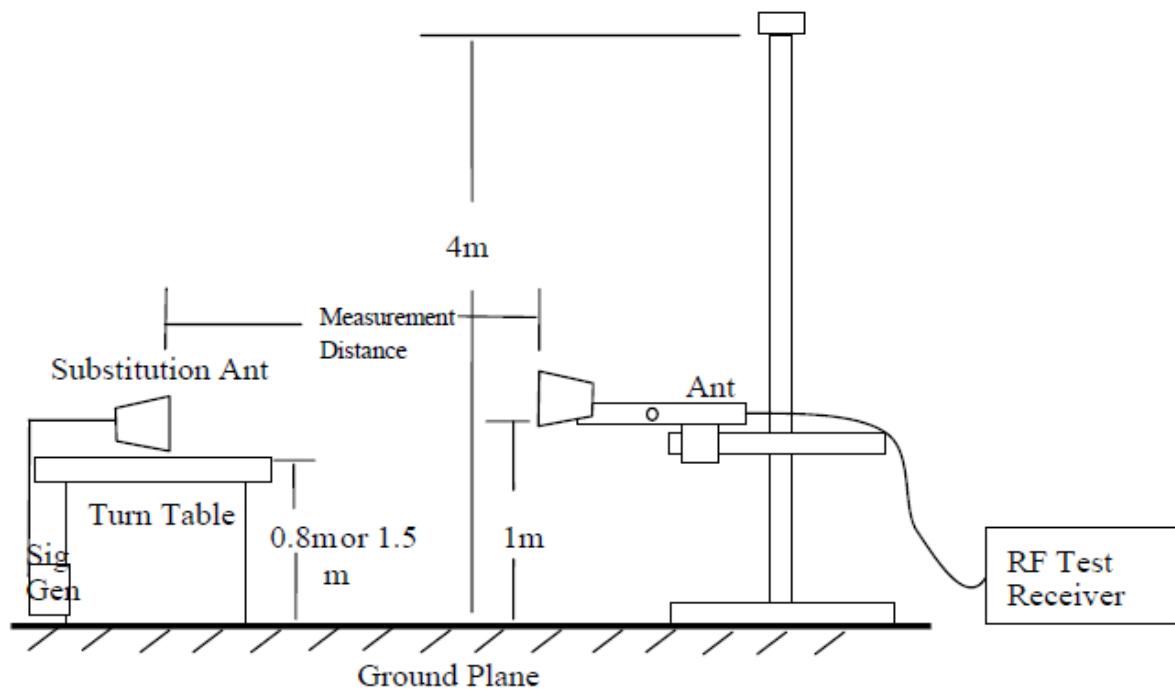
## 10. Spurious Radiated Emissions

### 10.1 Block Diagram Of Test Setup

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



(B) Substitution method set-up for radiated emission



## 10.2 Limit

According to §22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

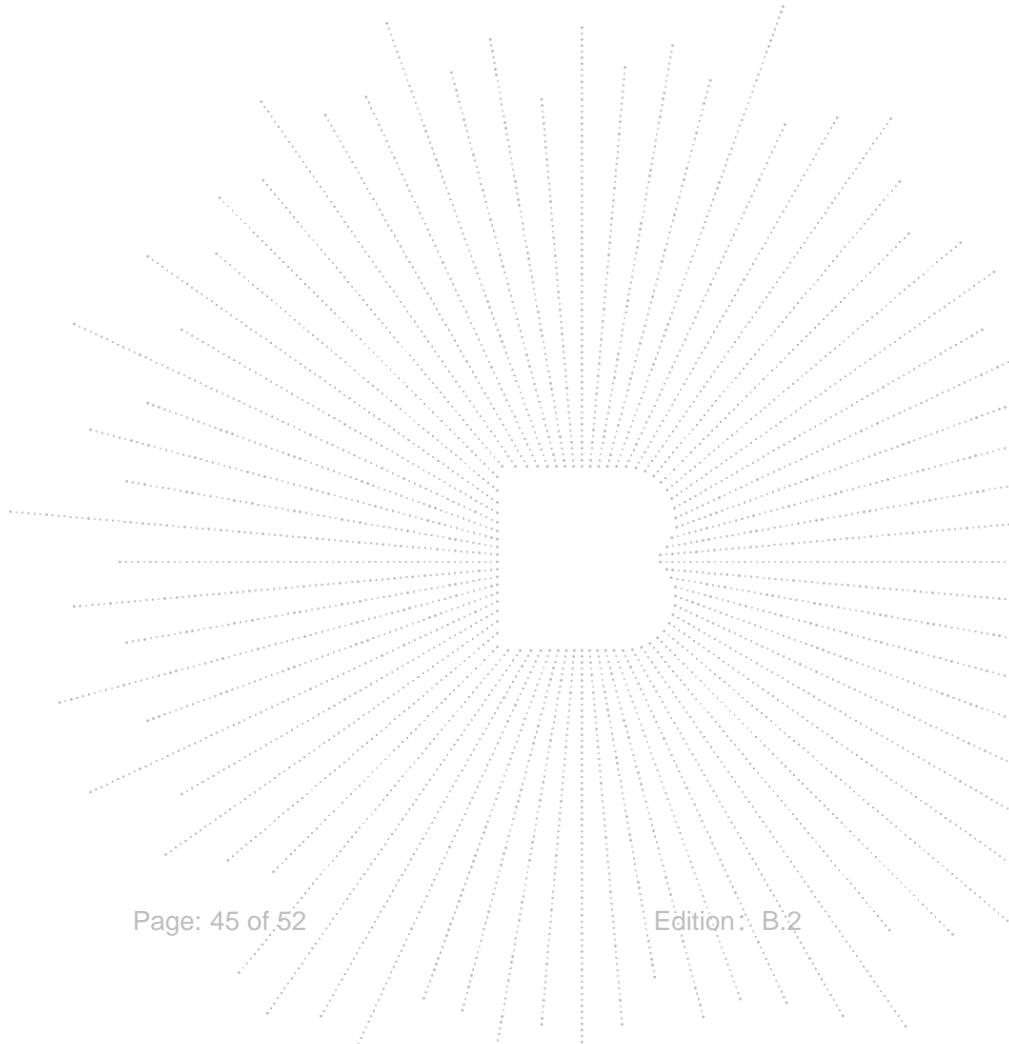
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

According to §27.53 (h), the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  dB.

## 10.3 Test procedure

1. The setup of EUT is according with per ANSI/TIA Standard 603D and ANSI C63.4-2014 measurement procedure.
2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.
3. The frequency range up to tenth harmonic of the fundamental frequency was investigated.
4. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious attenuation limit in dB = $43+10 \log_{10}$  (power out in Watts)



## 10.4 Test Result

For Cellular Band\_GPRS 850 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (824.2MHz)						
83.63	-14.05	-30.57	-44.62	-13.00	-31.62	H
1648.40	-14.22	-27.29	-41.51	-13.00	-28.51	H
2472.60	-14.79	-25.18	-39.97	-13.00	-26.97	H
83.63	-13.33	-30.57	-43.90	-13.00	-30.90	V
1648.40	-9.37	-27.29	-36.66	-13.00	-23.66	V
2472.60	-11.93	-25.18	-37.11	-13.00	-24.11	V
Middle Channel (836.6MHz)						
83.63	-11.97	-30.57	-42.54	-13.00	-29.54	H
1673.20	-11.08	-27.32	-38.40	-13.00	-25.40	H
2509.80	-13.64	-25.07	-38.71	-13.00	-25.71	H
83.63	-12.16	-30.57	-42.73	-13.00	-29.73	V
1673.20	-9.26	-27.32	-36.58	-13.00	-23.58	V
2509.80	-12.01	-25.07	-37.08	-13.00	-24.08	V
High Channel (848.8MHz)						
83.63	-14.02	-30.57	-44.59	-13.00	-31.59	H
1697.60	-14.52	-27.27	-41.79	-13.00	-28.79	H
2546.40	-11.50	-24.96	-36.46	-13.00	-23.46	H
83.63	-7.60	-30.57	-38.17	-13.00	-25.17	V
1697.60	-9.92	-27.27	-37.19	-13.00	-24.19	V
2546.40	-12.26	-24.96	-37.22	-13.00	-24.22	V

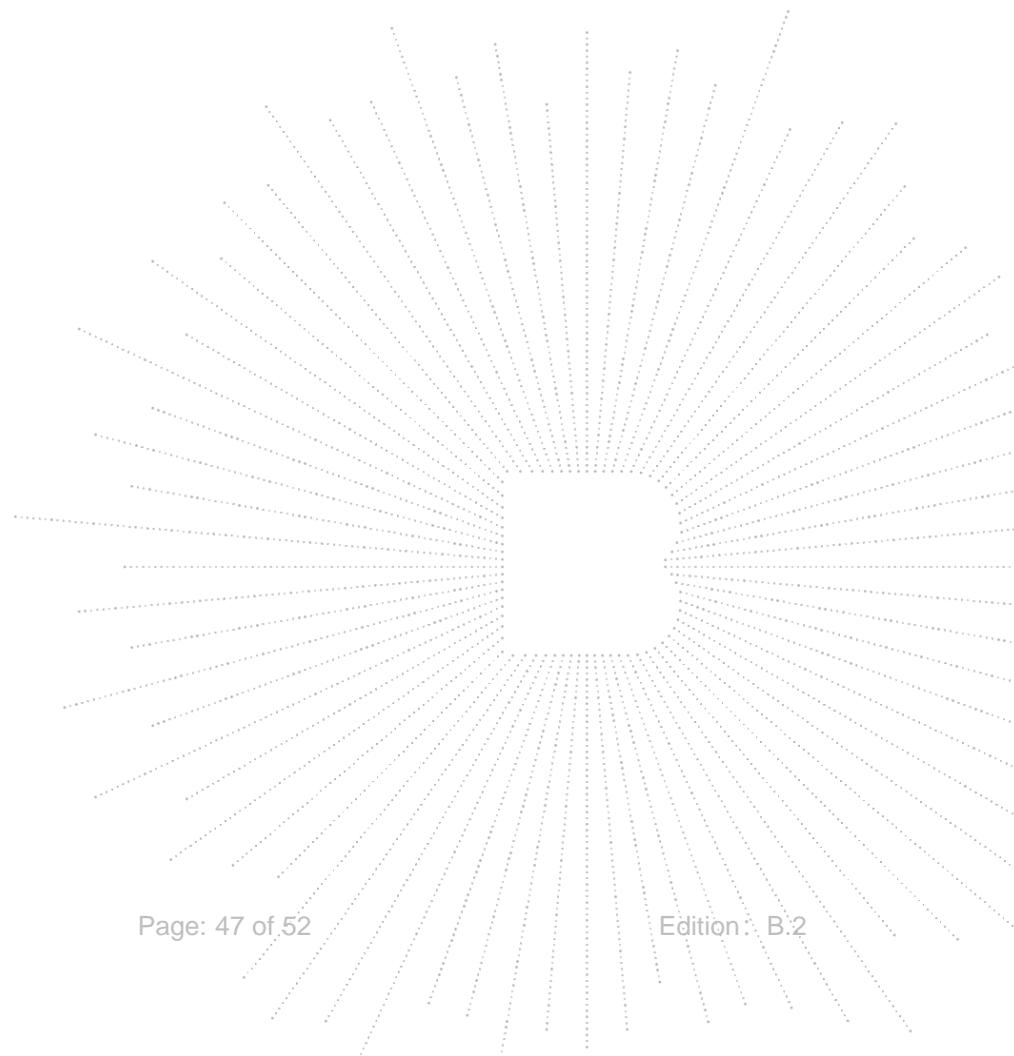
For PCS Band\_GPRS1900 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (1850.2MHz)						
83.63	-9.94	-30.57	-40.51	-13.00	-27.51	H
3700.40	-9.22	-22.20	-31.42	-13.00	-18.42	H
5550.60	-12.68	-19.32	-32.00	-13.00	-19.00	H
83.63	-13.25	-30.57	-43.82	-13.00	-30.82	V
3700.40	-9.98	-22.20	-32.18	-13.00	-19.18	V
5550.60	-11.91	-19.32	-31.23	-13.00	-18.23	V
Middle Channel (1880MHz)						
83.63	-9.95	-30.57	-40.52	-13.00	-27.52	H
3760.00	-13.21	-22.08	-35.29	-13.00	-22.29	H
5640.00	-9.67	-19.28	-28.95	-13.00	-15.95	H
83.63	-13.02	-30.57	-43.59	-13.00	-30.59	V
3760.00	-9.51	-22.08	-31.59	-13.00	-18.59	V
5640.00	-12.02	-19.28	-31.30	-13.00	-18.30	V
High Channel (1909.8MHz)						
83.63	-10.12	-30.57	-40.69	-13.00	-27.69	H
3819.60	-10.29	-21.96	-32.25	-13.00	-19.25	H
5729.40	-11.79	-19.24	-31.03	-13.00	-18.03	H
83.63	-8.76	-30.57	-39.33	-13.00	-26.33	V
3819.60	-9.66	-21.96	-31.62	-13.00	-18.62	V
5729.40	-11.68	-19.24	-30.92	-13.00	-17.92	V

Note: The worst data mode is GPRS..

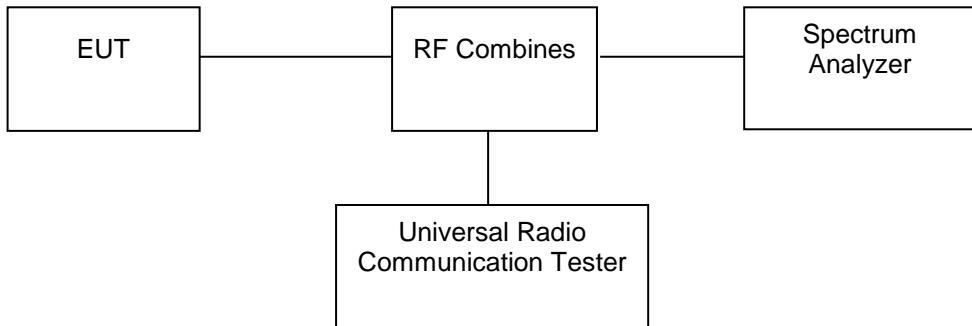
Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Note: All modes have been tested and only the worst mode is represented, with the worst data being Subtest1.



## 11. Frequency Stability

### 11.1 Block Diagram Of Test Setup



### 11.2 Limit

FCC Part 22.355:  $\pm 2.5$  ppm

FCC Part 24.235:

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

FCC Part 27.54

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

### 11.3 Test procedure

1. The testing follows FCC KDB 971168 D01v03r01 Section 9.0.
2. The EUT was set up in the thermal chamber and connected with the system simulator.
3. With power OFF, the temperature was decreased to  $-30^{\circ}\text{C}$  and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
4. With power OFF, the temperature was raised in  $10^{\circ}\text{C}$  steps up to  $50^{\circ}\text{C}$ . The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

#### Test Procedures for Voltage Variation

1. The testing follows FCC KDB 971168 D01v03r01 Section 9.0.
2. The EUT was placed in a temperature chamber at  $25 \pm 5^{\circ}\text{C}$  and connected with the system simulator.
3. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
4. The variation in frequency was measured for the worst case.

### 11.4 Test Result

Operation Mode	Channel Number	Test Condition		Channel Frequency (MHz)	Freq.Dev. (Hz)	Deviation (ppm)	Limit (ppm)
		Voltage (V)	Temp (°C)				
GSM850	190	VN	-30	836.60	7.24	0.0087	2.5
			-20	836.60	5.82	0.0070	2.5
			-10	836.60	0.22	0.0003	2.5
			0	836.60	7.35	0.0088	2.5
			10	836.60	7.96	0.0095	2.5
			20	836.60	1.23	0.0015	2.5
			30	836.60	4.92	0.0059	2.5
			40	836.60	5.19	0.0062	2.5
			50	836.60	7.80	0.0093	2.5
		VL	20	836.60	7.71	0.0092	2.5
		VH	20	836.60	-0.41	-0.0005	2.5
VERDICT				PASS			

Operation Mode	Channel Number	Test Condition		Channel Frequency (MHz)	Freq.Dev. (Hz)	Deviation (ppm)	Limit (ppm)
		Voltage (V)	Temp (°C)				
GSM1900	512	VN	-30	1850.20	19.31	0.0104	Note 3
			-20	1850.20	10.06	0.0054	Note 3
			-10	1850.20	18.54	0.0100	Note 3
			0	1850.20	16.14	0.0087	Note 3
			10	1850.20	17.38	0.0094	Note 3
			20	1850.20	15.14	0.0082	Note 3
			30	1850.20	10.46	0.0057	Note 3
			40	1850.20	16.69	0.0090	Note 3
			50	1850.20	10.32	0.0056	Note 3
		VL	20	1850.20	15.83	0.0086	Note 3
		VH	20	1850.20	18.41	0.0099	Note 3
VERDICT				PASS			

Note 1: All modes have been tested with GPRS.

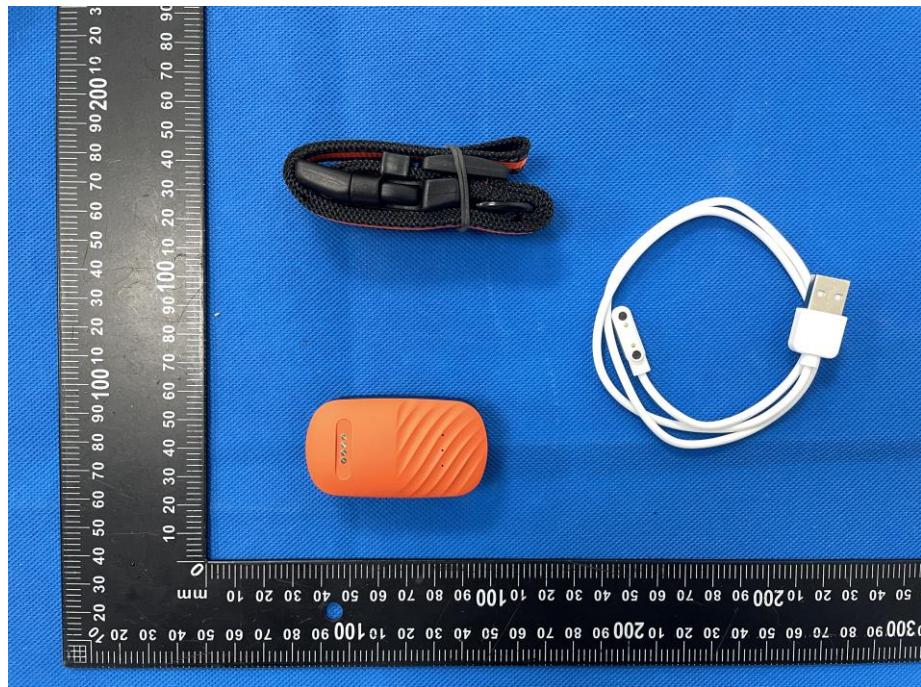
Note 2: All modes have been tested, and the worst result recorded was report as below

Note 3: The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Note 4: The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

## 12. EUT Photographs

**EUT Photo 1**



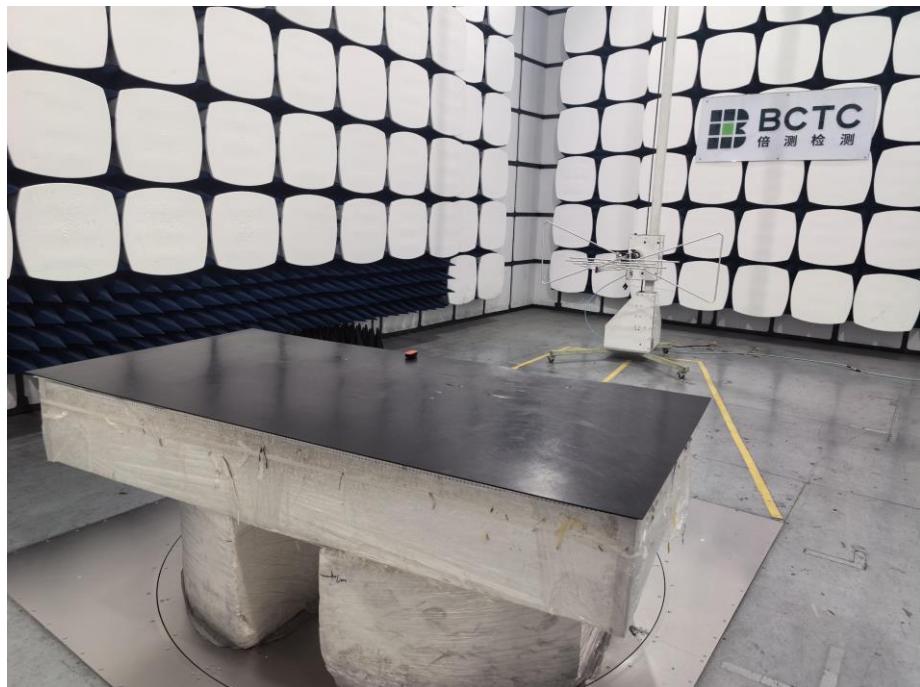
**EUT Photo 2**



NOTE: Appendix-Photographs Of EUT Constructional Details.

### 13. EUT Test Setup Photographs

#### Radiated Measurement Photos



## STATEMENT

1. The equipment lists are traceable to the national reference standards.
2. The test report can not be partially copied unless prior written approval is issued from our lab.
3. The test report is invalid without the "special seal for inspection and testing".
4. The test report is invalid without the signature of the approver.
5. The test process and test result is only related to the Unit Under Test.
6. Sample information is provided by the client and the laboratory is not responsible for its authenticity.
7. The quality system of our laboratory is in accordance with ISO/IEC17025.
8. If there is any objection to this test report, the client should inform issuing laboratory within 15 days from the date of receiving test report.

Address:

1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China

TEL: 400-788-9558

P.C.: 518103

FAX: 0755-33229357

Website: <http://www.chnbctc.com>

Consultation E-mail: [bctc@bctc-lab.com.cn](mailto:bctc@bctc-lab.com.cn)

Complaint/Advice E-mail: [advice@bctc-lab.com.cn](mailto:advice@bctc-lab.com.cn)

\*\*\*\*\* END \*\*\*\*\*