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# TEST REPORT FOR GSM TESTING

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Report No.: SRTC2021-9004(F)-21070201(A)

Product Name: LTE/WCDMA/GSM Multi-Mode Digital Mobile Phone

Product Model: Z5158

Marketing Name: ZTE Avid 589

Applicant: ZTE Corporation.

Manufacturer: ZTE Corporation.

Specification: FCC Part 24E, Part 22H, Part 2 (2020)

FCC ID: SRQ-Z5158

The State Radio\_monitoring\_center Testing Center (SRTC)  
15th Building, No.30 Shixing Street, Shijingshan District, Beijing, P.R.China

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## 1. GENERAL INFORMATION

### 1.1 Notes of the test report

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### 1.2 Information about the testing laboratory

Company:	The State Radio_monitoring_center Testing Center (SRTC)
Address:	15th Building, No.30 Shixing Street, Shijingshan District, P.R.China
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Registration number:	239125

### 1.3 Applicant's details

Company:	ZTE Corporation.
Address:	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, P.R.China
City:	Shenzhen
Country or Region:	China
Contacted person:	Gong Yu
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Fax:	---
Email:	gongyu@zte.com.cn

### 1.4 Manufacturer's details

Company:	ZTE Corporation.
Address:	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, P.R.China
City:	Shenzhen
Country or Region:	China
Contacted person:	Gong Yu
Tel:	021-68895397
Fax:	---
Email:	gongyu@zte.com.cn

## 1.5 Test Environment

Date of Receipt of test sample at SRTC:	2021-07-02
Testing Start Date:	2021-07-06
Testing End Date:	2021-07-13

Environmental Data:	Temperature (°C)	Humidity (%)
Ambient:	25	40
Maximum Extreme:	55	---
Minimum Extreme:	0	---

Normal Supply Voltage (V d.c.):	4.0
Maximum Extreme Supply Voltage (V d.c.):	4.3
Minimum Extreme Supply Voltage (V d.c.):	3.8

## 2 DESCRIPTION OF THE DEVICE UNDER TEST

### 2.1 Final Equipment Build Status

Frequency Range:	GSM850: Tx:824~849MHz Rx:869~894MHz PCS1900: Tx:1850~1910MHz Rx:1930~1990MHz
Modulation Type:	GPRS:GMSK
Emission Designator:	300KGXW/300KG7W
Duplex Mode:	FDD
Duplex Spacing:	GSM850:45MHz PCS1900:80MHz
Antenna Type:	FPC
Antenna Gain:	GSM850: -3.3dBi/PCS1900: -1.5dBi
Power Supply:	Battery or Charger
Hardware Version:	Z5158HW1.0
Software Version:	Z5158_CCv1.0.0B06
IMEI:	865748050003456

### 2.2 Support Equipment

The following support equipment was used to exercise the DUT during testing:

Equipment:	Battery
Manufacturer:	Jiade Energy Technology(zhuhai) CO., LTD
Model Number:	Li3830T43P8h486375

### **3 REFERENCE SPECIFICATION**

Specification	Version	Title
FCC Part2	2020	Frequency allocations and radio treaty matters; general rules and regulations
FCC Part22	2020	Public mobile services
FCC Part24	2020	Personal communications services
ANSI C63.26	2015	American national standard for compliance testing of transmitters used in licensed radio services
KDB 971168 D01	April 9, 2018	Measurement guidance for certification of licensed digital transmitters
TIA-603-E-2016	March 2016	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards



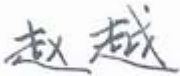
### **4 KEY TO NOTES AND RESULT CODES**

The following are the definition of the test result.

Code	Meaning
PASS	Test result shows that the requirements of the relevant specification have been met.
FAIL	Test result shows that the requirements of the relevant specification have not been met.
NT	Normal Temperature
NV	Nominal voltage
HV	High voltage
LV	Low voltage

## 5 RESULT SUMMARY

No.	Test case	FCC reference	Verdict
1	RF Power Output	2.1046	Pass
2	Effective Radiated Power and Effective Isotropic Radiated Power	22.913(a)(5)/24.232(c)	Pass
3	Occupied Bandwidth	2.1049	Pass
4	Emission Bandwidth	2.1049	Pass
5	Spurious Emissions at antenna terminals	2.1051/22.917(a)/24.238(a)	Pass
6	Band Edges Compliance	2.1051/22.917(a)/24.238(a)	Pass
7	Frequency Stability	2.1055/22.355/24.235	Pass
8	Radiated Spurious Emissions	2.1053/22.917(a)/24.238(a)	Pass
9	Peak-Average Ratio	24.232(d)	Pass

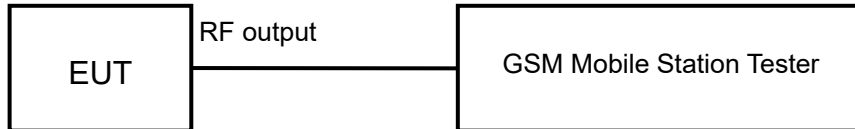
This Test Report Is Issued by: Mr. Peng Zhen 	Checked by: Mr. Li Bin 
Tested by: Mr. Zhao Yue 	Issued date:  20210720

## **6 TEST RESULT**

### **6.1 RF Power Output**

Rule Part(s)  
FCC Part 2.1046

Test Setup:



Test procedure:

After a radio link has been established between EUT and Tester, the output power of the cell signal of the testing equipment will be decreased until the output power of the EUT reach a maximum value. Then the test data can be read at the tester screen. The loss between RF output port of the EUT and the input port of the tester will be taken into consideration. The measurement will be conducted at three channels (Low, Middle and High channels)

Limits: No specific conduct power requirements in part 2.1046.

Test result:

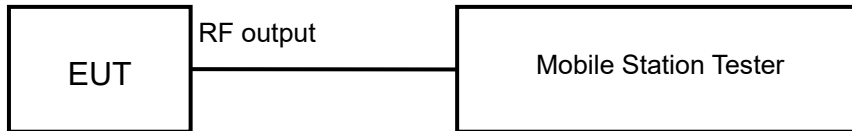
The test results are shown in Appendix A.



## 6.2 Effective Radiated Power and Effective Isotropic Radiated Power

Rule Part(s)  
FCC Part 22.913(a)(5)/Part 24.232(c)

Test setup:



Test procedure:  
KDB 971168 D01 v03r01 – Section 5.6

Test Settings

Subclause 5.2.5.5 of ANSI C63.26-2015 is applicable, along with the following provisions. For personal/portable radios utilizing an integral antenna, the factor LC is typically negligible. However, in a fixed station transmit system that utilizes a long cable run between the transmitter and the transmitting antenna, this factor can be significant. The minimum cable loss should be used in this equation.

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

$$ERP/EIRP = P_{Meas} - LC + GT$$

Where:

ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as P<sub>Meas</sub>, typically dBW or dBm)

P<sub>Meas</sub> = measured transmitter output power or PSD, in dBW or dBm

LC = signal attenuation in the connecting cable between the transmitter and antenna in dB

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

Limits for GSM850:

Operation Mode	Power Step	E.R.P. (dBm)
GSM	5	≤38.45
GPRS	3	≤38.45
EDGE	6	≤38.45

Limits for PCS1900:

Operation Mode	Power Step	E.I.R.P. (dBm)
GSM	0	≤33
GPRS	3	≤33
EDGE	5	≤33

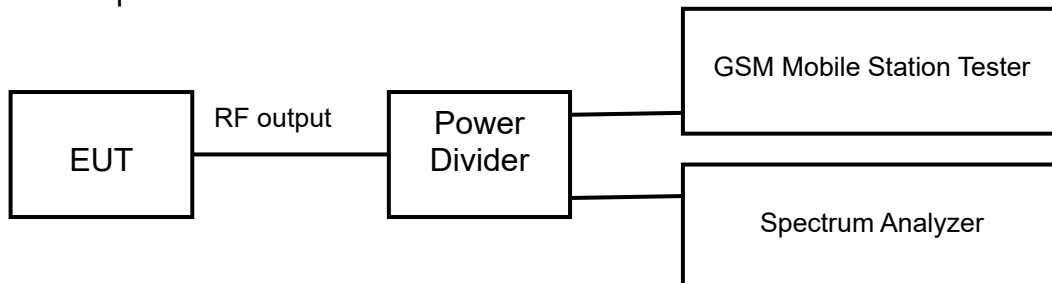
Test result:

The test results are shown in Appendix A.

### 6.3 Occupied Bandwidth

Rule Part(s)  
Part 2.1049

Test Setup:



Test procedure:  
KDB 971168 D01 v03r01 – Section 4.2

#### Test Settings

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  $\geq 3 \times$  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

Limits: No specific occupied bandwidth requirements in part 2.1049

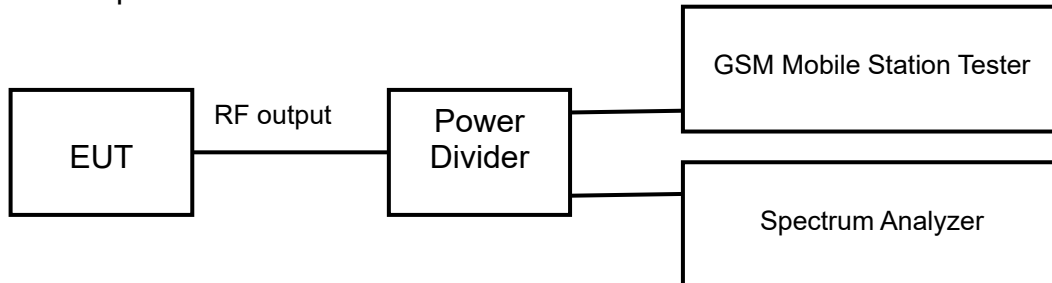
Test result:

The test results are shown in Appendix A.

## 6.4 Emission Bandwidth-

Rule Part(s)  
Part 2.1049

Test Setup:



Test procedure:  
KDB 971168 D01 v03r01 – Section 4.2

### Test Settings

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 26dB 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  $\geq$  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 emission bandwidth observed in Step 7

Limits: No specific occupied bandwidth requirements in part 2.1049

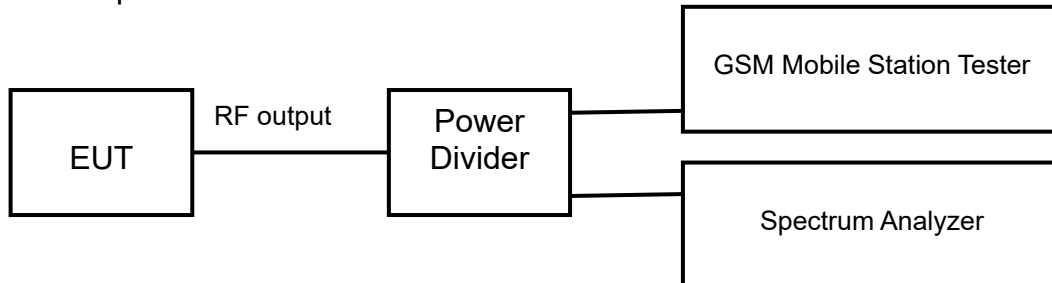
Test result:

The test results are shown in Appendix A.

## 6.5 Spurious Emissions at antenna terminal

Rule Part(s)  
FCC Part 2.1053/22.917 (a)/ 24.238(a)

Test Setup:



Test procedure:  
KDB 971168 D01 v03r01 – Section 6.0

### Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to 10GHz for Cell, 20GHz for PCS
2. RBW=100 kHz (For below 1GHz), 1MHz (For above 1GHz)
3. VBW  $\geq 3 \times$  RBW
4. Detector = RMS
5. Trace mode = trace average for continuous emissions, max hold for pulse emissions
6. Sweep time = auto couple
7. The trace was allowed to stabilize

### Limits:

The minimum permissible attenuation level of any spurious emission is  $43 + \log_{10}(P_{\text{[Watts]}})$ , where P is the transmitter power in Watts.

### Test result:

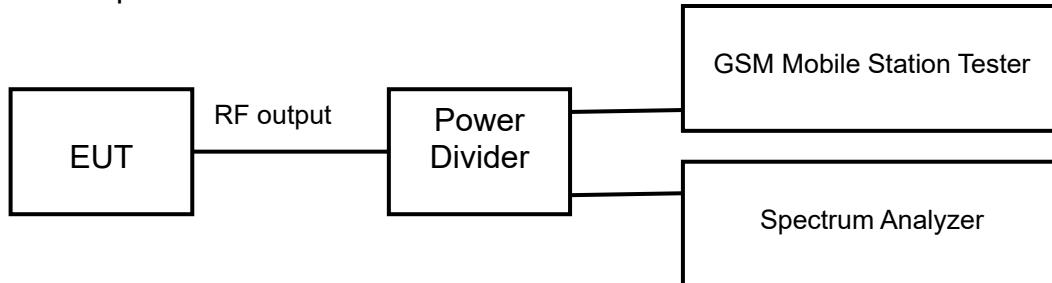
The test results are shown in Appendix A.

## 6.6 Band Edges Compliance

Rule Part (s)

FCC Part 2.1051/ 22.917(a) /Part 24.238(a)

Test Setup:



Test procedure:

KDB 971168 D01 v03r01 – Section 6.0

Test Settings

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span=2MHz
3. RBW > 1% of the emission bandwidth
4. VBW > 3 x RBW
5. Detector = RMS
6. Number of sweep points  $\geq 2 \times \text{Span}/\text{RBW}$
7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Limit: The minimum permissible attenuation level of any spurious emission is  $43 + \log_{10}(P)$  [Watts], where P is the transmitter power in Watts.

Test result:

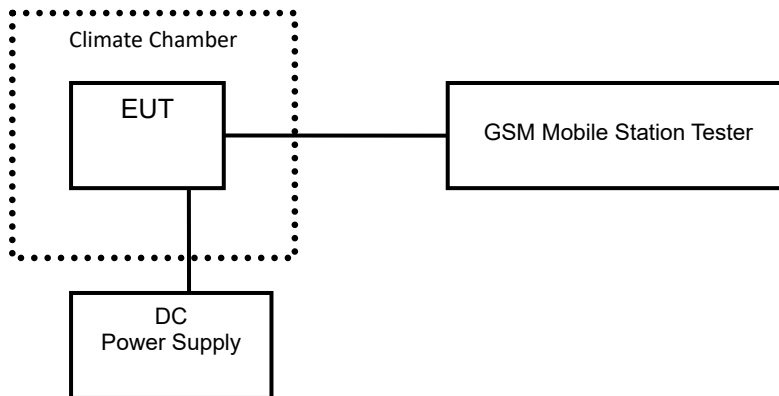
The test results are shown in Appendix A.

## 6.7 Frequency Stability

Rule Part(s)

FCC Part 2.1055/22.355 /Part 24.235

Test setup:



Test Procedure:

ANSI/TIA-603-E-2016

Test Settings

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a “standby” condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C (The temperature range can be declared by the manufacturer). A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

Limits: For Part 22, the frequency stability of the transmitter shall be maintained within  $\pm 0.00025\%$  ( $\pm 2.5$  ppm) of the center frequency. For Part 24, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test result:

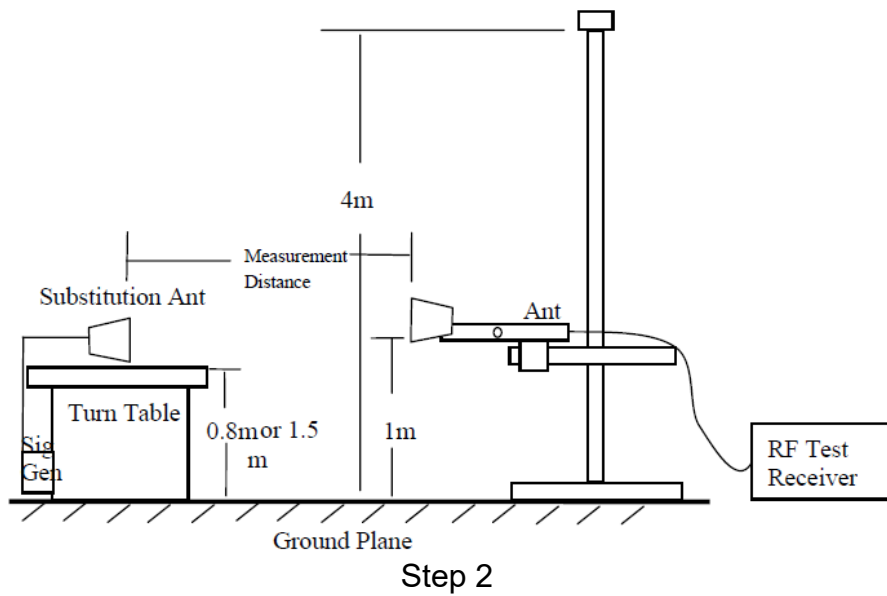
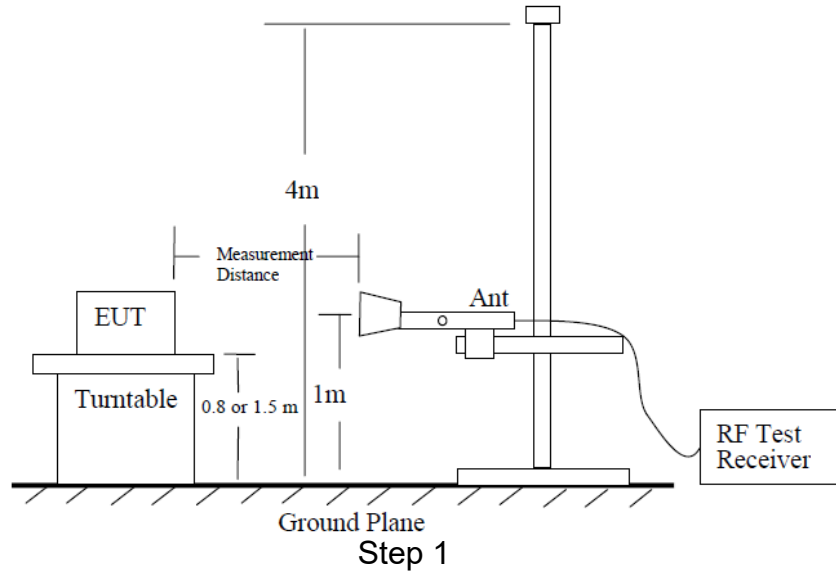
The test results are shown in Appendix A.

## 6.8 Radiated Spurious Emissions

Rule Part(s)

FCC Part 2.1053/ 22.917(a)/Part 24.238(a)

Test Setup:



**Test procedure:**

The measurements procedures in TIA-603-E-2016 are used.

The spectrum was scanned from 30MHz to the 10th harmonic of the highest frequency generated within the equipment.

**Step 1:**

The measurement is carried out in the chamber. EUT was placed on a 0.8m ( $f < 1\text{GHz}$ )/1.5m ( $f > 1\text{GHz}$ ) high non-conductive table at a 3 meters test distance from the test receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT. The height of receiving antenna from 1m to 4m and varies in certain range to find the maximum power value. A radio link shall be established between EUT and Tester. The output power of the cell signal of the tester will be decreased until the output power of the EUT reach a maximum value. A peak detector is used and RBW is set to 100 kHz ( $f < 1\text{GHz}$ )/1MHz ( $f > 1\text{GHz}$ ). The antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees for detecting the maximum power value on spectrum analyzer or receiver. The spectrum analyzer scans from 30MHz to 10th harmonic of the carrier. A notch filter is necessary in the band near to the carrier frequency. A high pass filter is needed to avoid the distortion of the testing equipment in the band above the carrier frequency.

**Step 2:**

A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.

A power ( $P_{mea}$ ) is applied to the input of the substitution antenna, and adjusts the level of the signal generator output until the value of the receiver reach the previously recorded ( $P_r$ ). The power of signal source ( $P_{mea}$ ) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

A "reference path loss" should be calculated after test. The attenuation of "reference path loss" is the cable loss between the Signal Source with the Substitution Antenna ( $P_{ca}$ ) and the Substitution Antenna Gain ( $G_a$ ).

**Calculation procedure:**

The data of cable loss and antenna gain has been calibrated in full testing frequency range before the testing.

The power of the Radiated Spurious Emissions is calculated by adding the cable loss and antenna gain. The basic equation with a sample calculation is as followed:

$$\text{Power (EIRP)} = P_{mea} + P_{ca} + G_a$$

This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15dB) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole,  $\text{ERP} = \text{EIRP} - 2.15 \text{ (dB)}$ .

Assumed the power of signal source record is -20dBm. A cable loss of -30dB, and an antenna gain of 11dB are added.

$$P = P_{mea} + P_{ca} + G_a = (-20\text{dBm}) + (-30\text{dB}) + (11\text{dB}) = -39\text{dBm}$$

Note: We tested both horizontal and vertical polarization, but only the largest numerical polarity of the two polarities was recorded in the final report.

**Test result:**

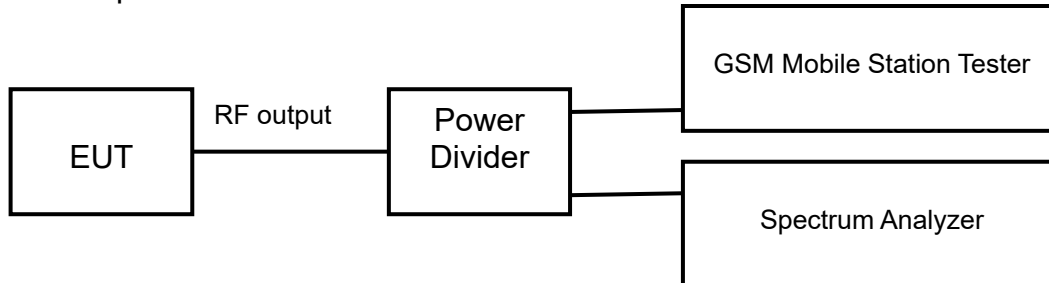
The test results are shown in Appendix B.



## 6.9 Peak-Average Ratio

Rule Part(s)  
FCC Part 24.232(d)

Test Setup:



Test procedure:  
KDB 971168 D01 v03r01 – Section 5.7.1

Test settings:

1. The signal analyzer's CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW > Emission bandwidth of signal
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

Limits: the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

Test result:

The test results are shown in Appendix A

## 7 MEASUREMENT UNCERTAINTIES

Items	Uncertainty	
RF Power Output	0.6 dB	
Effective Radiated Power and Effective Isotropic Radiated Power	0.6 dB	
Occupied Bandwidth	3kHz	
Emission Bandwidth	3kHz	
Peak-Average Ratio	0.8dB	
Frequency Stability	48Hz	
Band Edges Compliance	1.2dB	
Spurious Emissions at antenna terminal	9kHz~2GHz	1.2dB
	2G~3.6GHz	1.4dB
	3.6G~8GHz	2.2dB
	8G~12.75GHz	2.7dB
Radiated Emission Measurement	30MHz~200MHz	4.88dB
	200MHz~1GHz	4.87dB
	1GHz~18GHz	4.58dB
	18GHz~40GHz	4.35dB

## 8 TEST EQUIPMENTS

No.	Name/Model	Manufacturer	S/N	Calibration Date	Calibration Due Date
1	MT8820C Mobile Station Tester	Anritsu	6201300660	2020.08.20	2021.08.19
2	CMW500 Radio Communication Station	R&S	161702	2020.08.20	2021.08.19
3	FSV40 Spectrum Analyzer	R&S	101065	2020.08.20	2021.08.19
4	N9020A Spectrum Analyzer	Agilent	MY48010771	2020.08.20	2021.08.19
5	6007 Power Divider	Weinschel	6007-GJ-1	2020.08.20	2021.08.19
6	DC Power Supply E3645A	Agilent	MY40000741	2021.04.22	2022.04.21
7	Temperature chamber SH241	ESPEC	92013758	2020.08.20	2021.08.19
8	12.65m×8.03m×7.50m Fully-Anechoic Chamber	FRANKONIA	----	----	----
9	23.18m×16.88m×9.60m Semi-Anechoic Chamber	FRANKONIA	---	----	----
10	Turn table Diameter:1m	FRANKONIA	----	----	----
11	Turn table Diameter:5m	FRANKONIA	----	----	----
12	Antenna master FAC(MA4.0)	MATURO	----	----	----
13	Antenna master SAC(MA4.0)	MATURO	----	----	----
14	9.080m×5.255m×3.525m Shielding room	FRANKONIA	----	----	----
15	HF 907 Double-Ridged Waveguide Horn Antenna	R&S	100512	2020.08.20	2021.08.19
16	HF 907 Double-Ridged Waveguide Horn Antenna	R&S	100513	2020.08.20	2021.08.19
17	HL562 Ultra log antenna	R&S	100016	2020.08.20	2021.08.19
18	3160-09 Receive antenna	SCHWARZ-BECK	002058-002	2020.08.20	2021.08.19
19	ESI 40 EMI test receiver	R&S	100015	2020.08.20	2021.08.19
20	ESCS30 EMI test receiver	R&S	100029	2020.08.20	2021.08.19
21	HL562 Receive antenna	R&S	100167	2020.08.20	2021.08.19
22	ENV216 AMN	R&S	3560.6550.12	2020.08.20	2021.08.19

## **APPENDIX A – TEST DATA OF CONDUCTED EMISSION**

### **1. RF Power Output**

#### **GSM850**

GSM Measured Power:

Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
824.2	128	32.22
836.4	189	32.09
848.8	251	31.85

GPRS Measured Power:

Carrier frequency (MHz)	Channel No.	TX Mode	RF Power Output (dBm)
824.2	128	4Downlink1uplink	32.17
836.4	189		32.07
848.8	251		31.83
824.2	128	3Downlink2uplink	31.70
836.4	189		31.60
848.8	251		31.38
824.2	128	2Downlink3uplink	30.21
836.4	189		30.12
848.8	251		29.94
824.2	128	1Downlink4uplink	29.12
836.4	189		29.03
848.8	251		28.83

EGPRS (8PSK) Measured Power:

Carrier frequency (MHz)	Channel No.	TX Mode	RF Power Output (dBm)
824.2	128	8PSK 4Downlink1uplink	27.06
836.4	189		27.08
848.8	251		27.01
824.2	128	8PSK 3Downlink2uplink	25.85
836.4	189		25.84
848.8	251		25.75
824.2	128	8PSK 2Downlink3uplink	23.59
836.4	189		24.86
848.8	251		23.46
824.2	128	8PSK 1Downlink4uplink	22.43
836.4	189		22.40
848.8	251		23.46

### PCS1900

#### GSM Measured Power:

Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
1850.2	512	29.43
1880	661	29.03
1909.8	810	29.04

#### GPRS Measured Power:

Carrier frequency (MHz)	Channel No.	TX Mode	RF Power Output (dBm)
1850.2	512	4Downlink1uplink	29.43
1880	661		29.02
1909.8	810		29.04
1850.2	512	3Downlink2uplink	28.81
1880	661		28.38
1909.8	810		28.39
1850.2	512	2Downlink3uplink	27.06
1880	661		26.77
1909.8	810		26.84
1850.2	512	1Downlink4uplink	25.94
1880	661		25.68
1909.8	810		25.86

#### EGPRS (8PSK) Measured Power:

Carrier frequency (MHz)	Channel No.	TX Mode	RF Power Output (dBm)
1850.2	512	8PSK 4Downlink1uplink	26.24
1880	661		25.99
1909.8	810		26.05
1850.2	512	8PSK 3Downlink2uplink	25.05
1880	661		25.77
1909.8	810		24.88
1850.2	512	8PSK 2Downlink3uplink	22.94
1880	661		22.73
1909.8	810		22.83
1850.2	512	8PSK 1Downlink4uplink	22.00
1880	661		21.60
1909.8	810		21.67

## 2. Occupied Bandwidth

### GSM850

GSM MODE:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (kHz)
824.2	128	247.47
836.4	189	238.78
848.8	251	247.47

GPRS MODE:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (kHz)
824.2	128	248.91
836.4	189	241.68
848.8	251	241.68

EDGE (8PSK) MODE:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (kHz)
824.2	128	230.10
836.4	189	257.60
848.8	251	246.02

### PCS1900

GSM MODE:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (kHz)
1850.2	512	244.57
1880	661	241.68
1909.8	810	246.02

GPRS MODE:

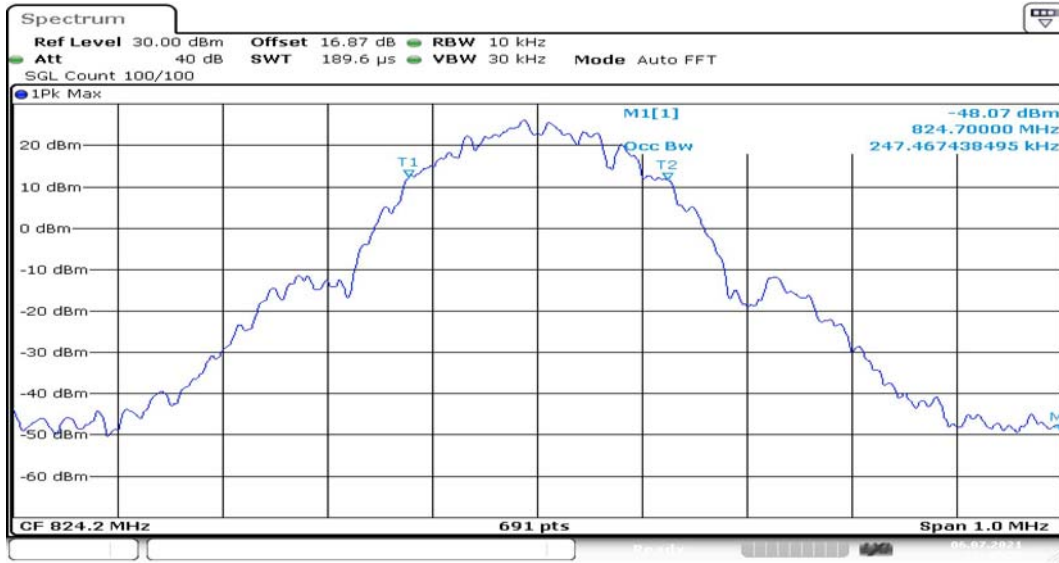
Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (kHz)
1850.2	512	241.68
1880	661	246.02
1909.8	810	248.91

EDGE (8PSK) MODE:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (kHz)
1850.2	512	251.81
1880	661	246.02
1909.8	810	241.68

**GSM850**

GSM MODE:



Date: 6.JUL.2021 12:47:56

Channel 128



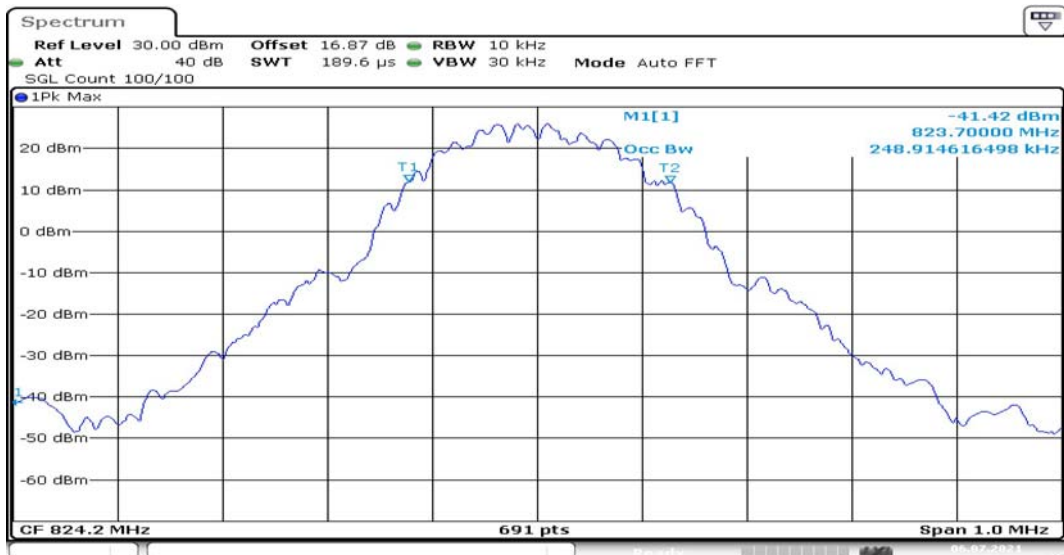
Date: 6.JUL.2021 12:49:00

Channel 189



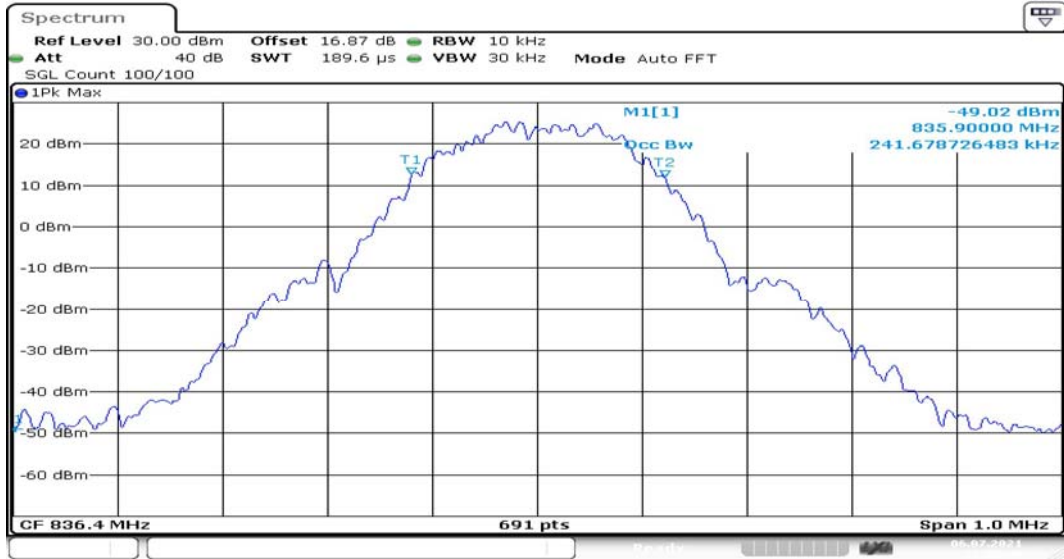
Channel 251

GPRS MODE:

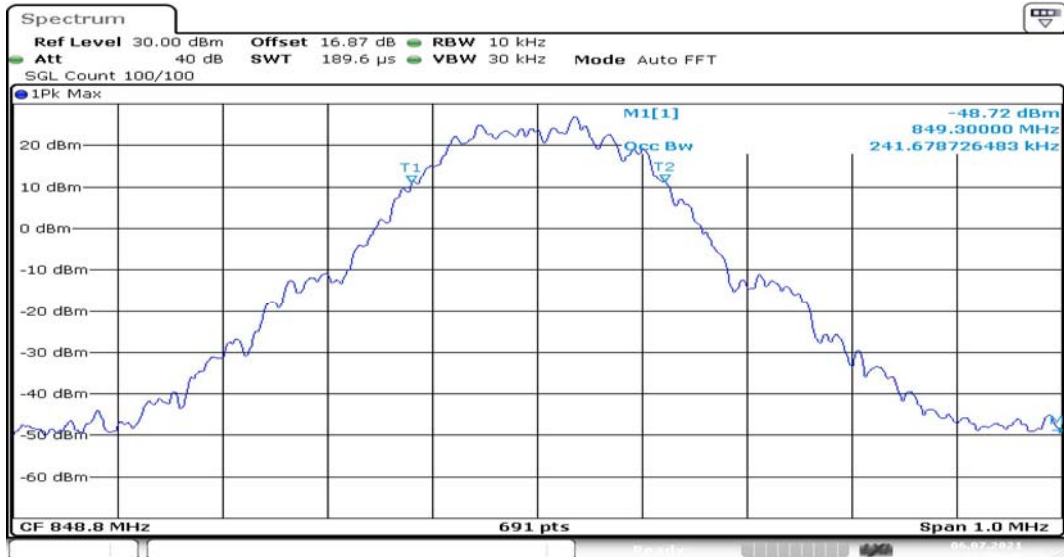


Channel 128





Channel 189



Channel 251

EDGE (8PSK) MODE:



Channel 128



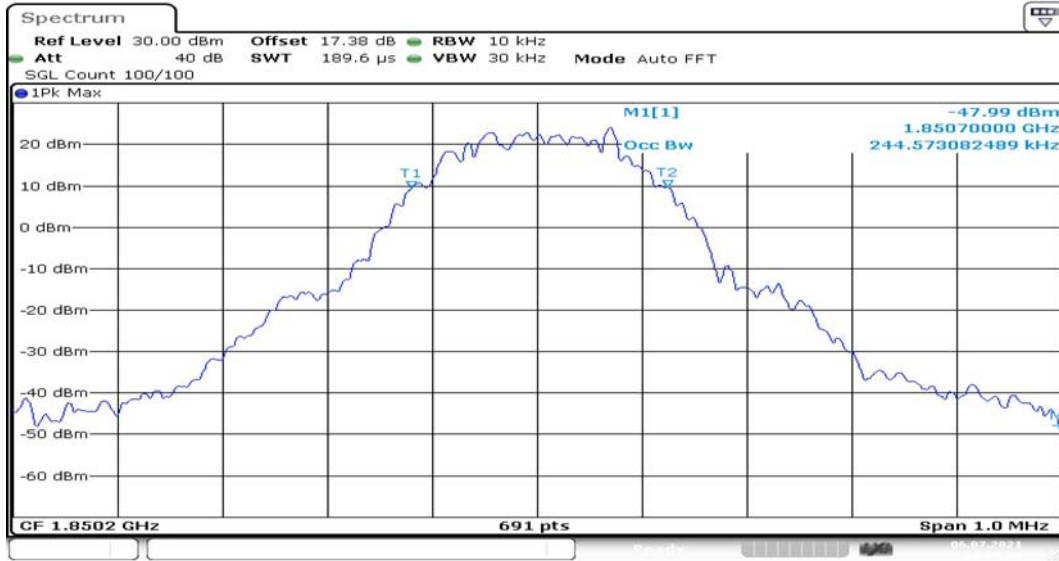
Channel 189



Date: 6.JUL.2021 12:57:38

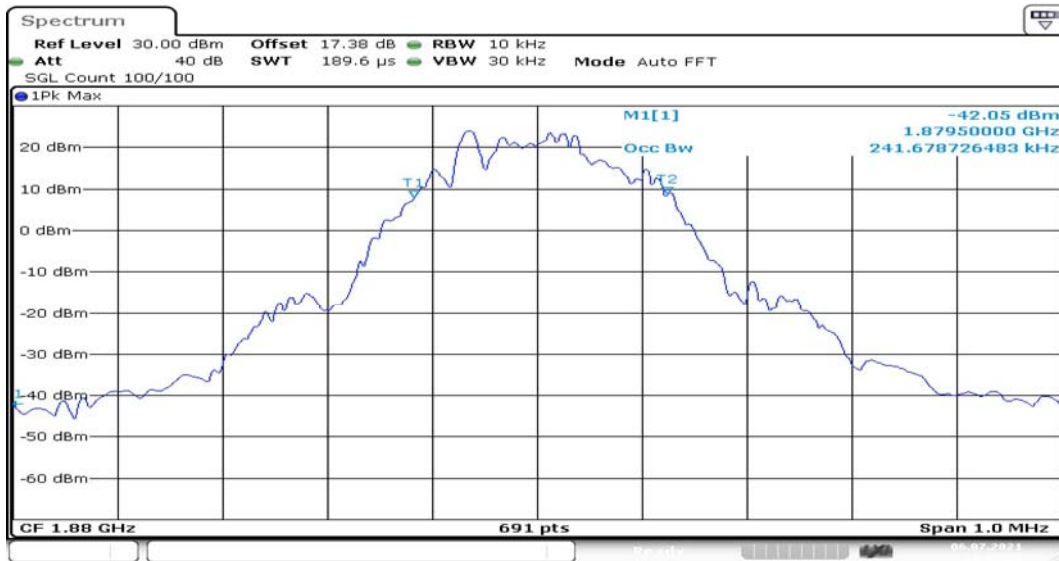
Channel 251

**PCS1900**  
**GSM MODE:**



Date: 6.JUL.2021 14:34:20

Channel 512



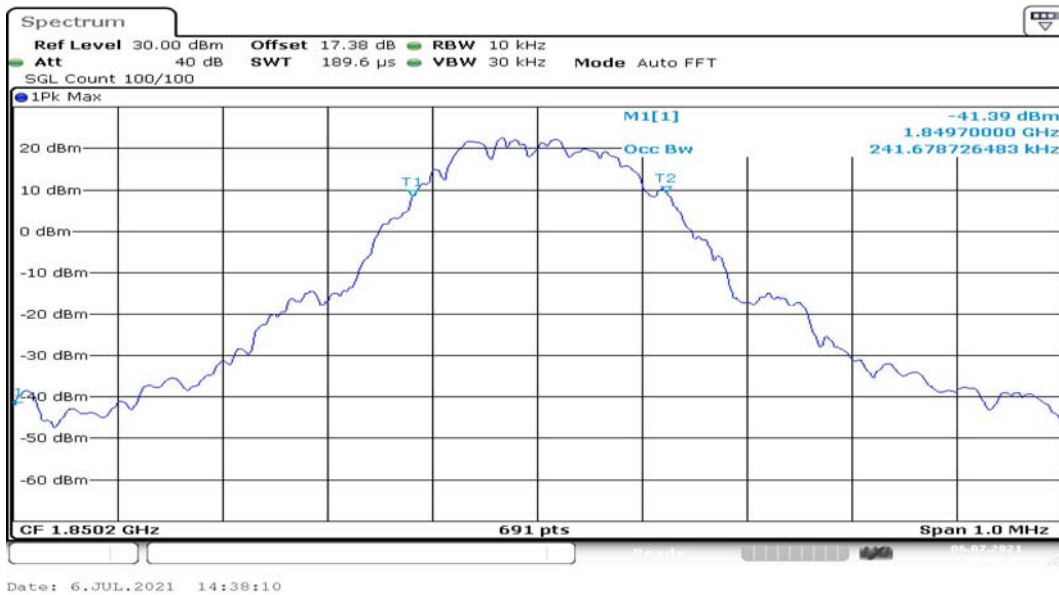
Date: 6.JUL.2021 14:35:25

Channel 661



Channel 810

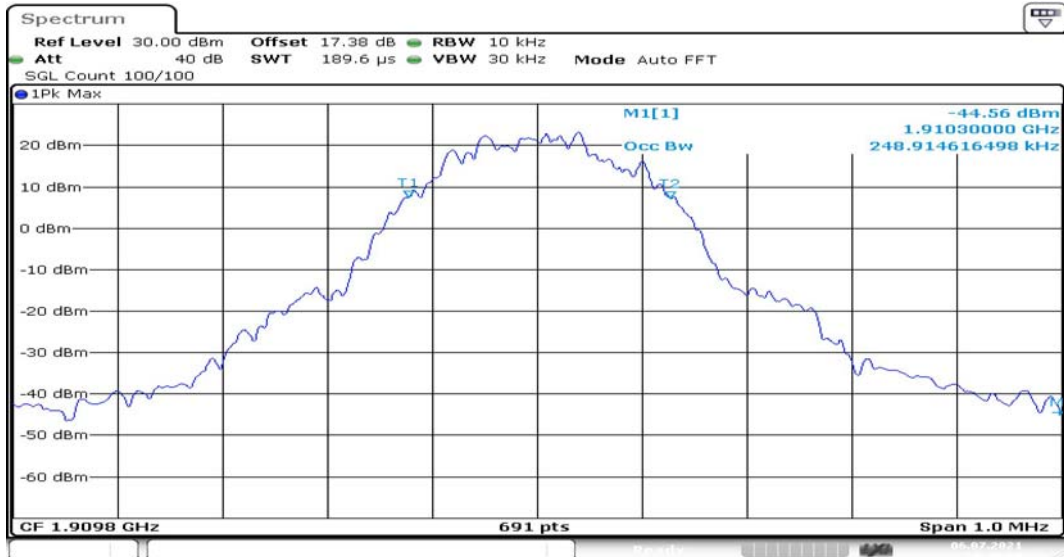
GPRS MODE:



Channel 512



Channel 661



Channel 810

EDGE (8PSK) MODE:



Channel 512



Channel 661



Date: 6.JUL.2021 14:44:23

Channel 810



### 3. Emission Bandwidth

#### GSM850

GSM MODE:

Carrier frequency (MHz)	Channel No.	Bandwidth of -26dB transmitter power(kHz)
824.2	128	309.70
836.4	189	305.40
848.8	251	305.40

GPRS MODE:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (kHz)
824.2	128	316.90
836.4	189	315.50
848.8	251	321.30

EDGE (8PSK) MODE:

Carrier frequency (MHz)	Channel No.	Bandwidth of -26dB transmitter power(kHz)
824.2	128	315.50
836.4	189	299.60
848.8	251	306.80

#### PCS1900

GSM MODE:

Carrier frequency (MHz)	Channel No.	Bandwidth of -26dB transmitter power(kHz)
1850.2	512	305.40
1880	661	318.40
1909.8	810	306.80

GPRS MODE:

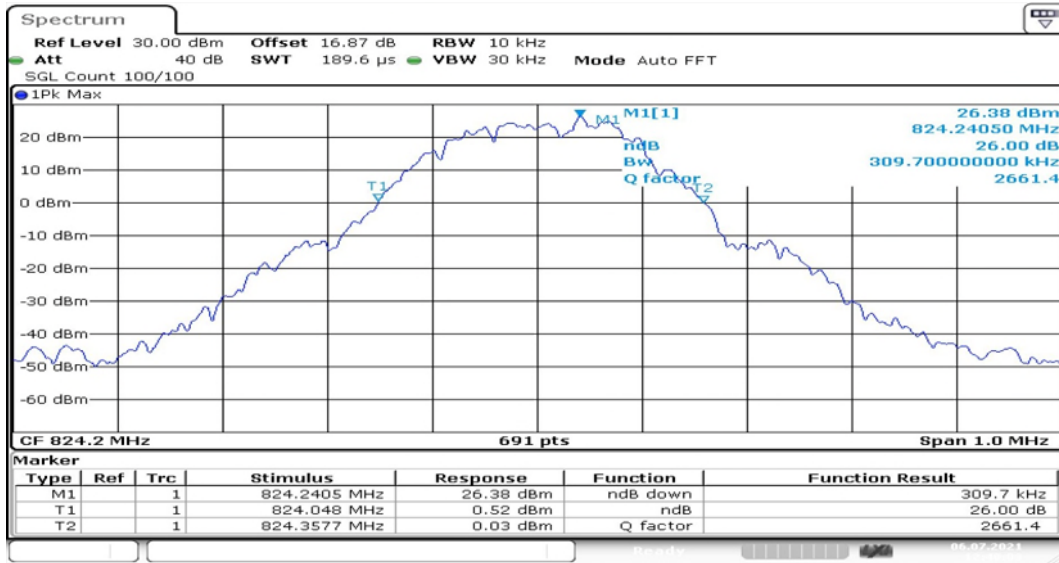
Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (kHz)
1850.2	512	314.00
1880	661	311.10
1909.8	810	305.40

EDGE (8PSK) MODE:

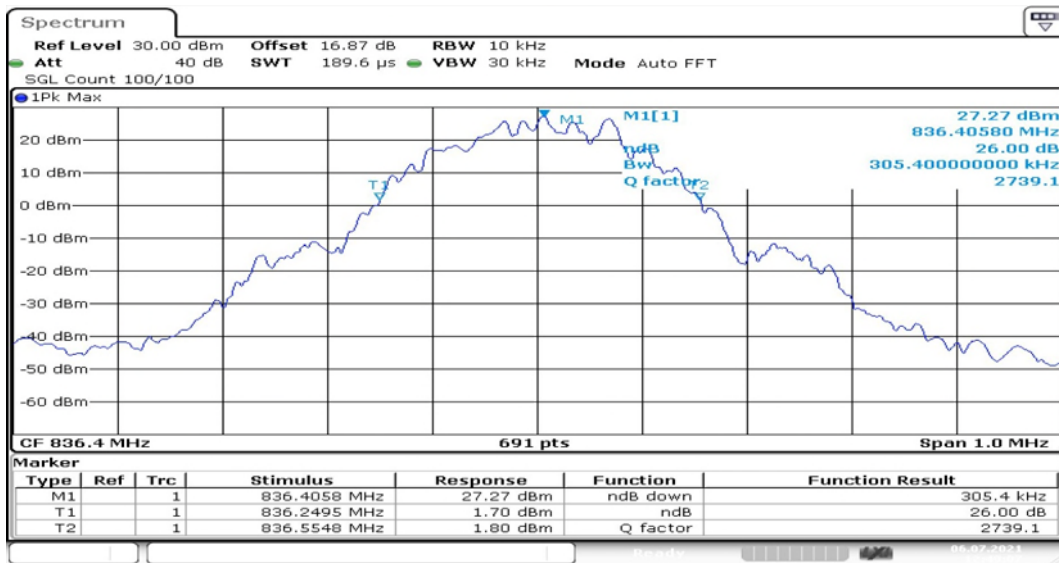
Carrier frequency (MHz)	Channel No.	Bandwidth of -26dB transmitter power(kHz)
1850.2	512	292.30
1880	661	328.50
1909.8	810	315.50

**GSM850**

GSM MODE:



Channel 128

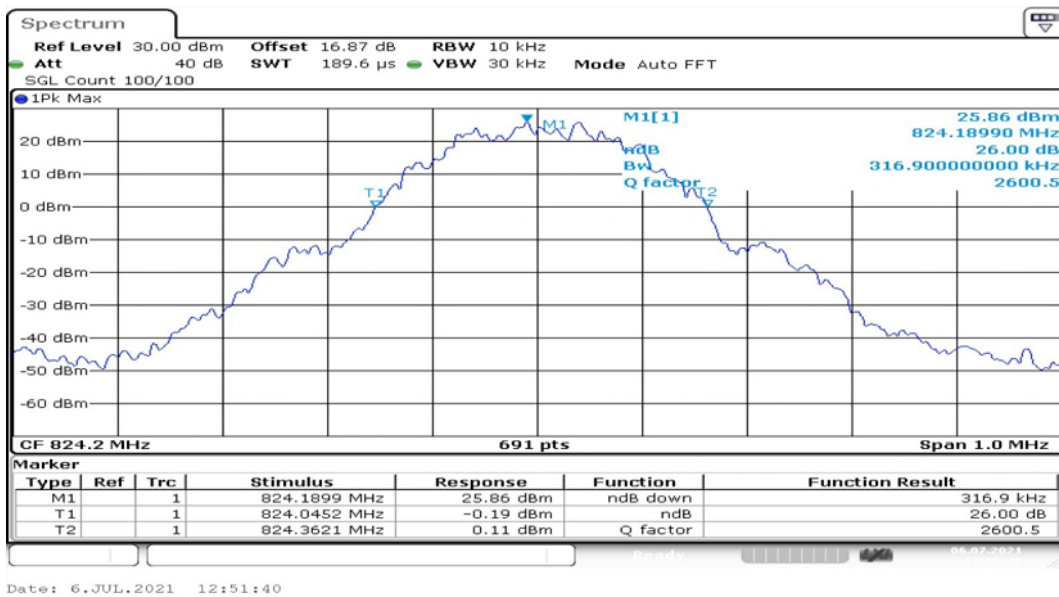


Channel 189

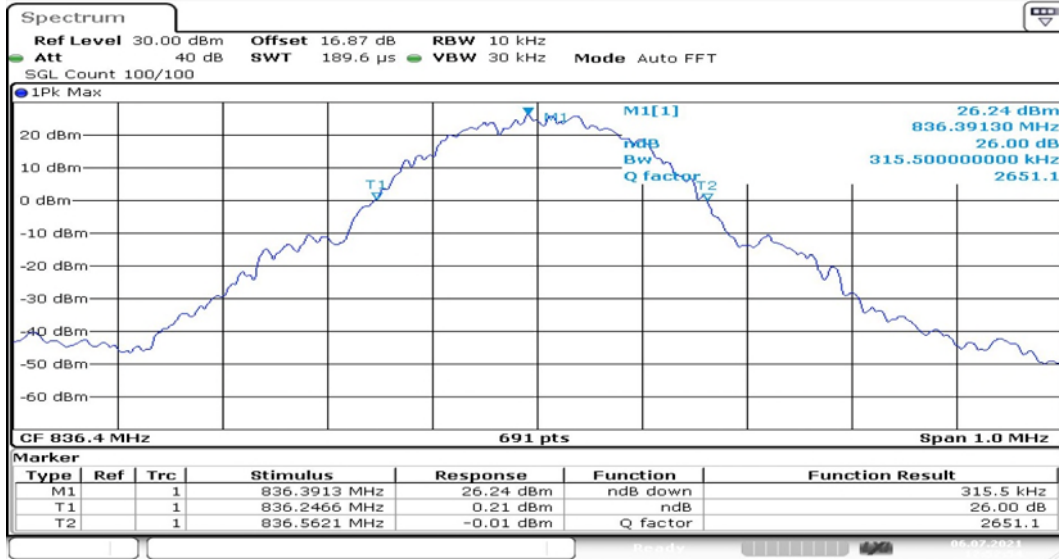


Channel 251

GPRS MODE:

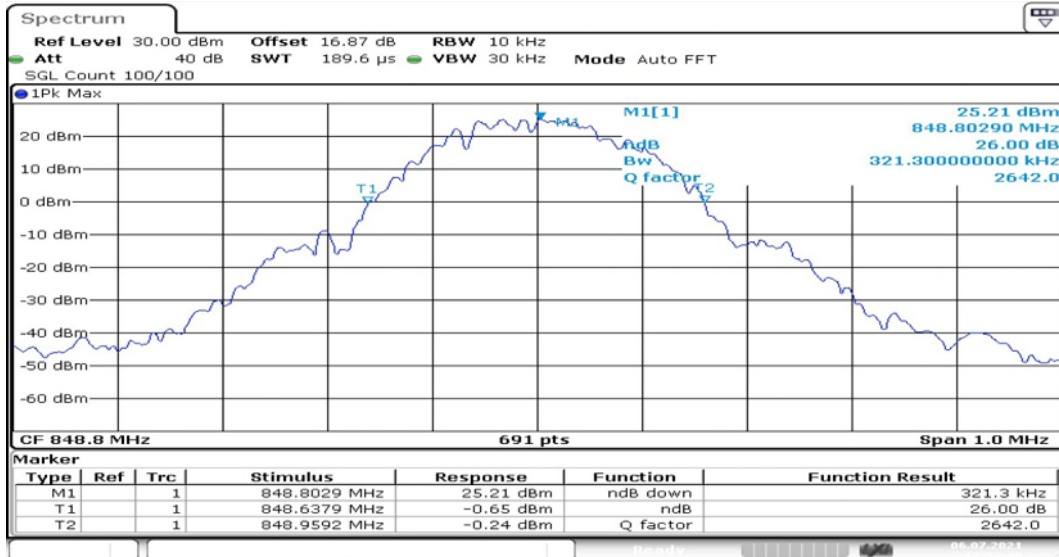


Channel 128



Date: 6.JUL.2021 12:52:54

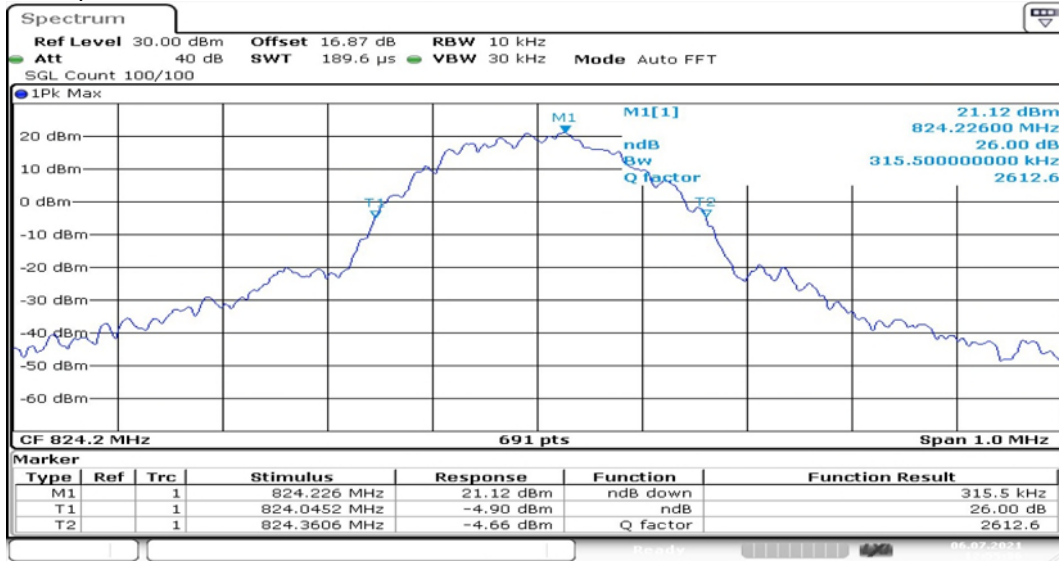
Channel 189



Date: 6.JUL.2021 12:53:49

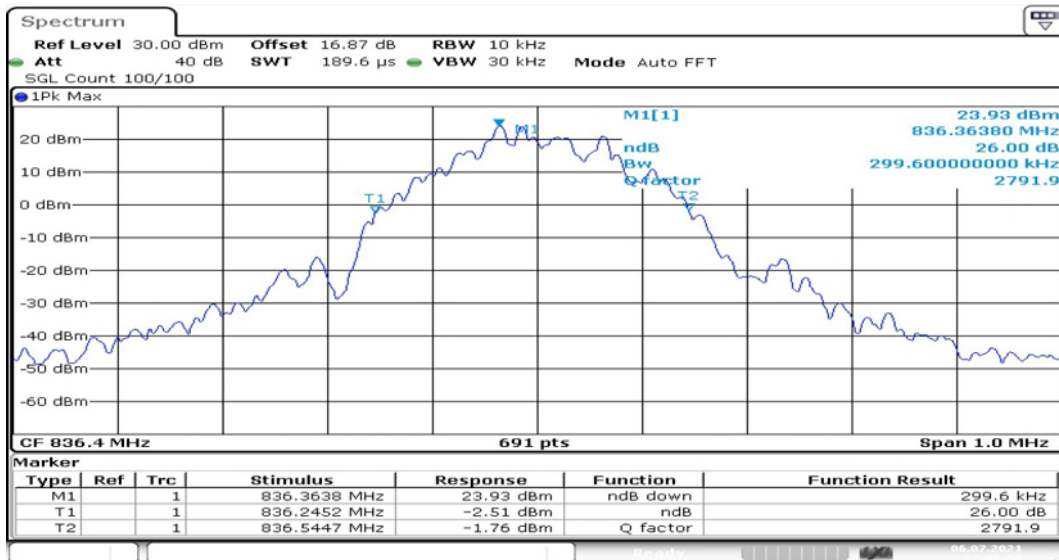
Channel 251

EDGE (8PSK) MODE:



Date: 6.JUL.2021 12:55:35

Channel 128



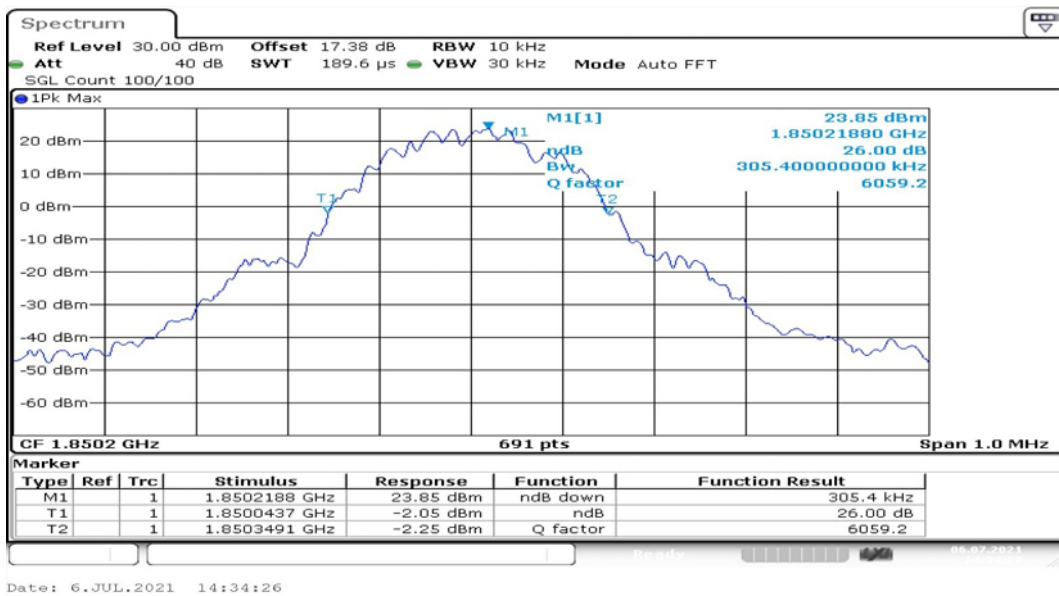
Date: 6.JUL.2021 12:56:49

Channel 189

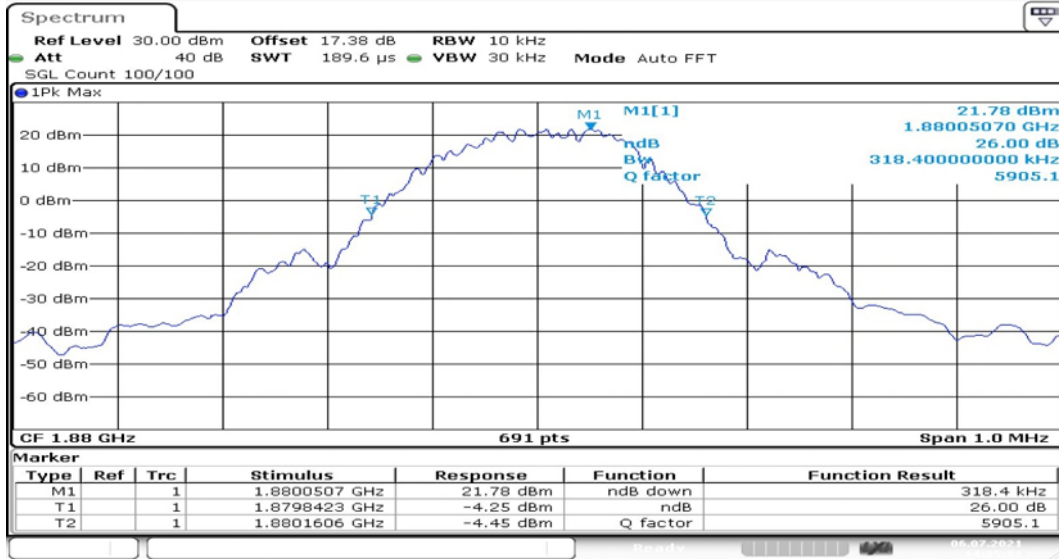


Channel 251

**PCS1900**  
GSM MODE:

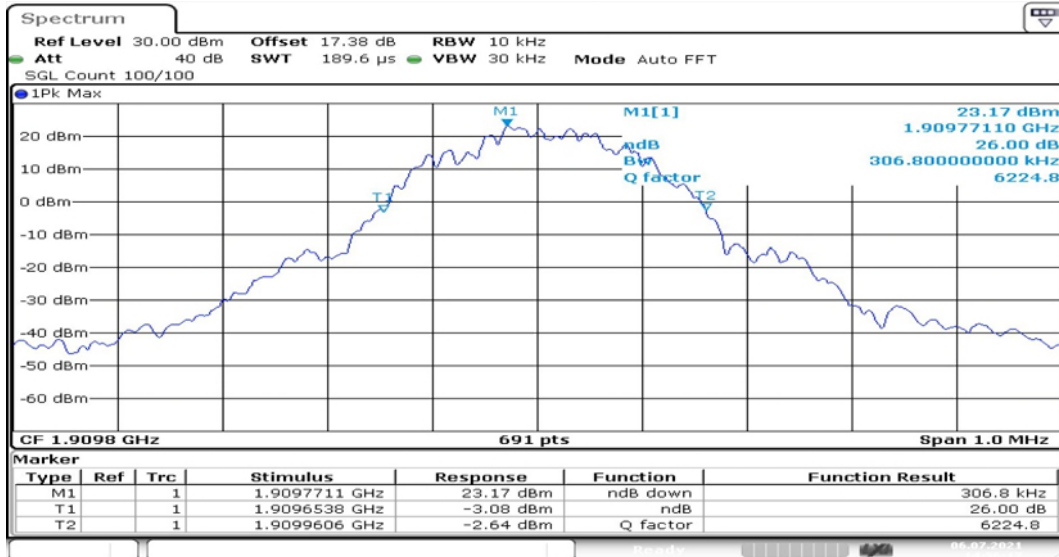


Channel 512



Date: 6.JUL.2021 14:35:31

Channel 661

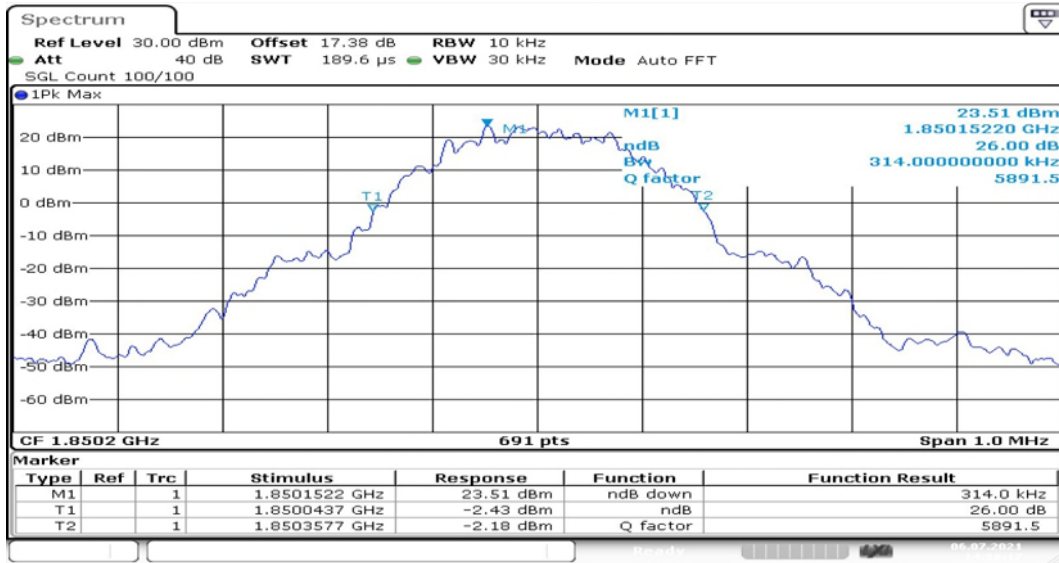


Date: 6.JUL.2021 14:36:17

Channel 810

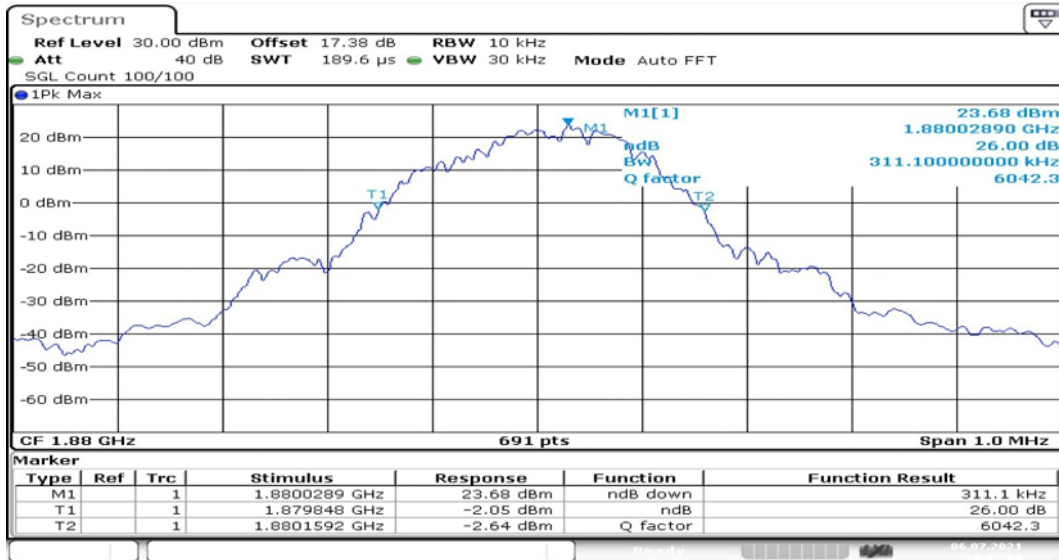


GPRS MODE:



Date: 6.JUL.2021 14:38:17

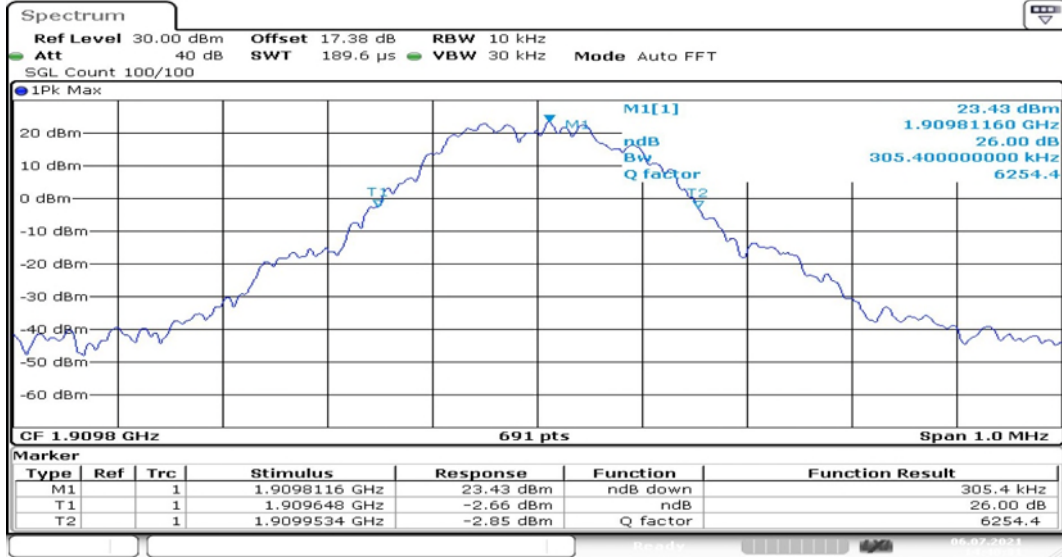
Channel 512



Date: 6.JUL.2021 14:39:33

Channel 661

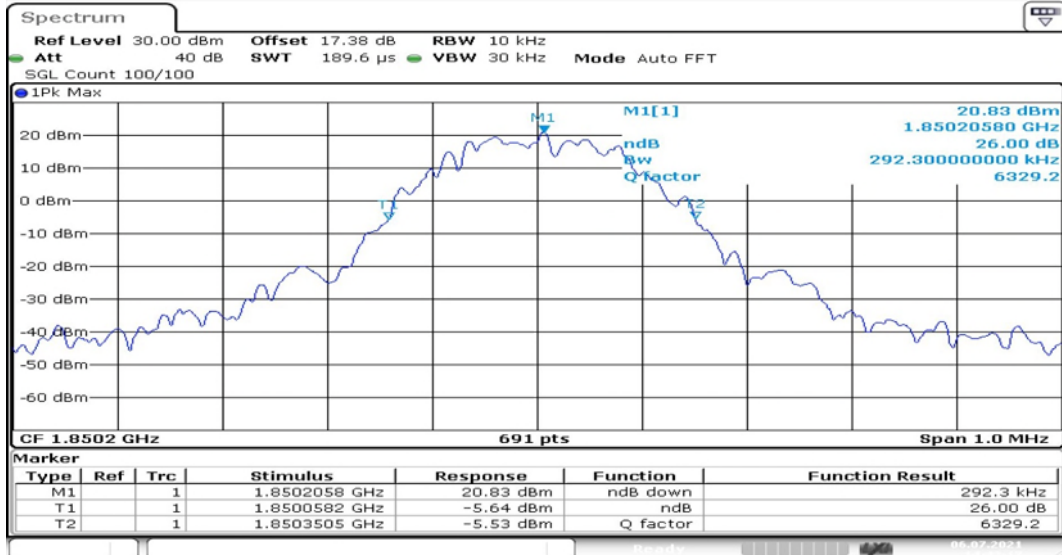




Date: 6.JUL.2021 14:40:30

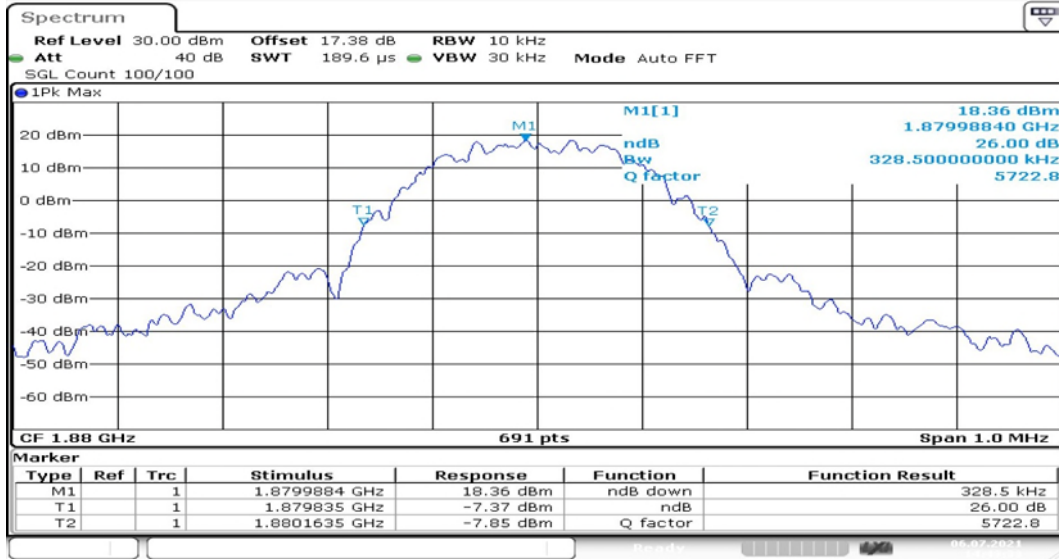
Channel 810

EDGE (8PSK) MODE:



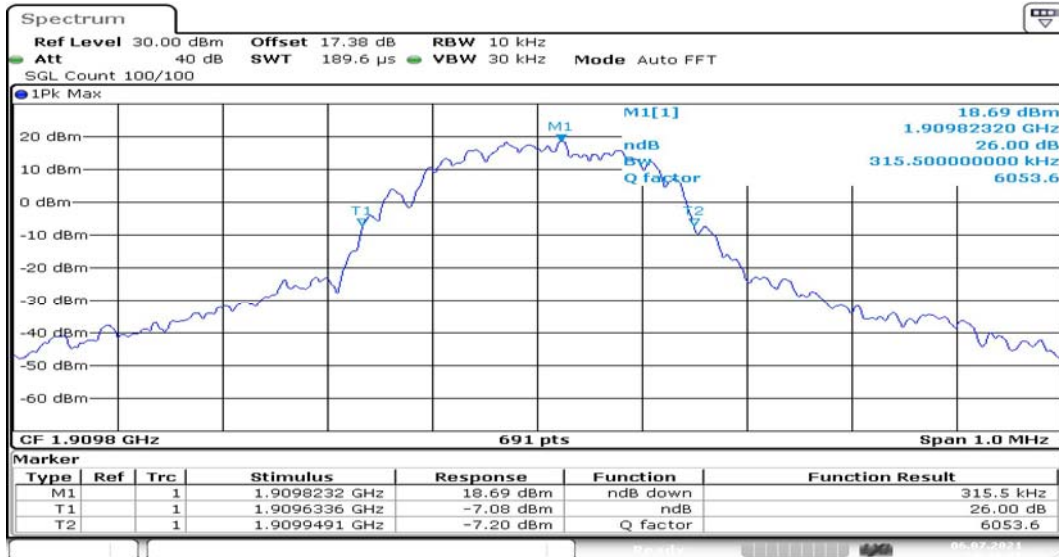
Date: 6.JUL.2021 14:42:17

Channel 512



Date: 6.JUL.2021 14:43:33

Channel 661



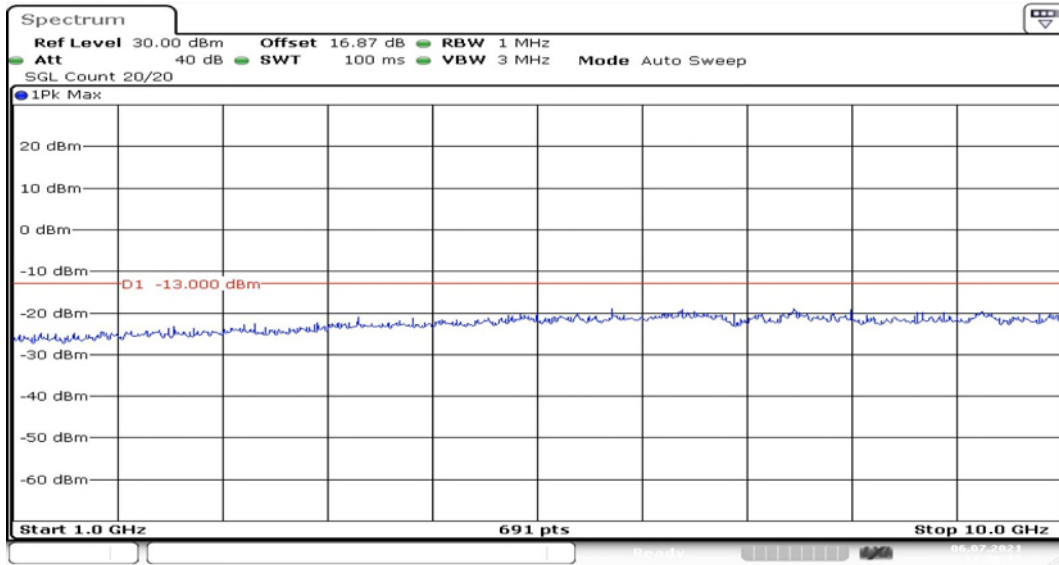
Date: 6.JUL.2021 14:44:30

Channel 810

#### 4. Spurious Emissions at antenna terminal

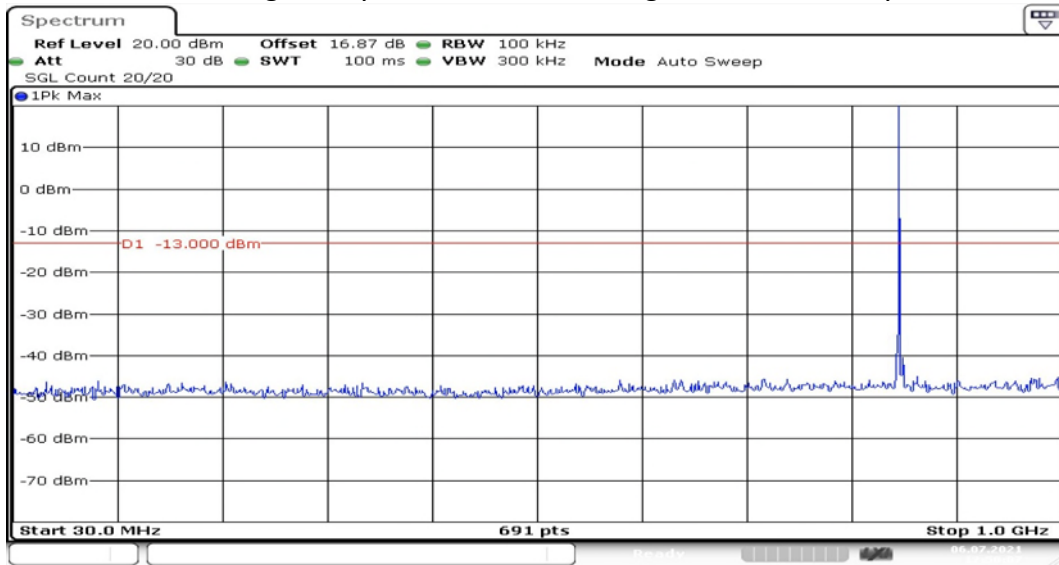
##### GSM850

GSM MODE:



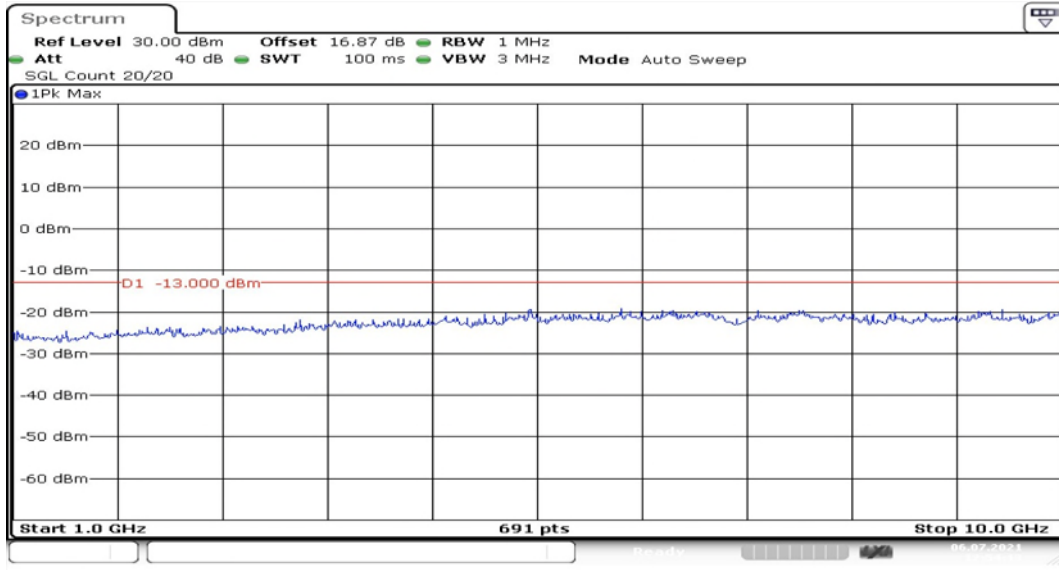
Channel 189 1GHz~10GHz(dBm)

Note: The signal beyond the limit is the signal transmitted by EUT.



Channel 189 30MHz~1GHz(dBm)

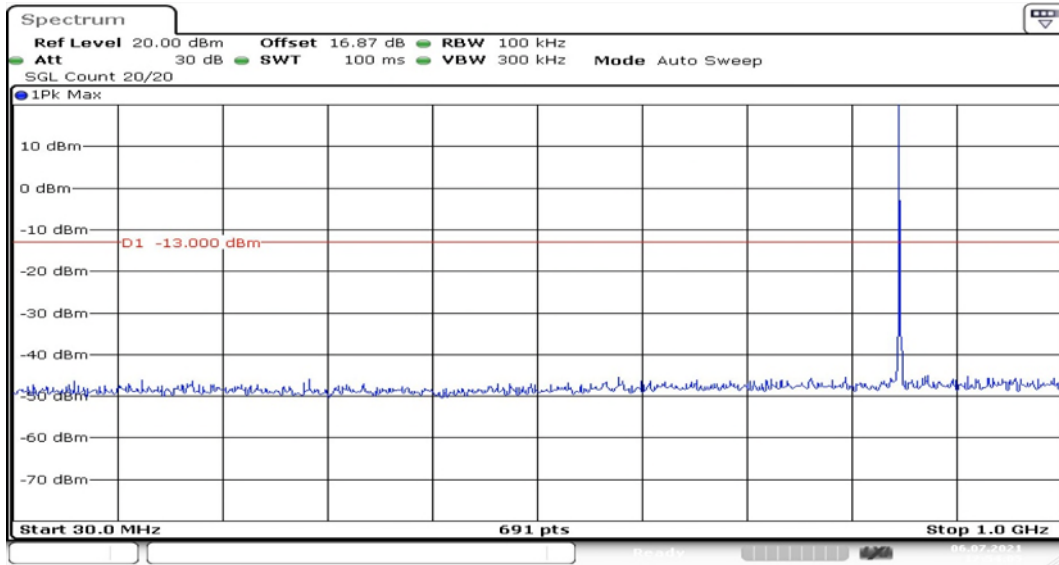
GPRS MODE:



Date: 6.JUL.2021 12:54:13

Channel 189 1GHz~10GHz(dBm)

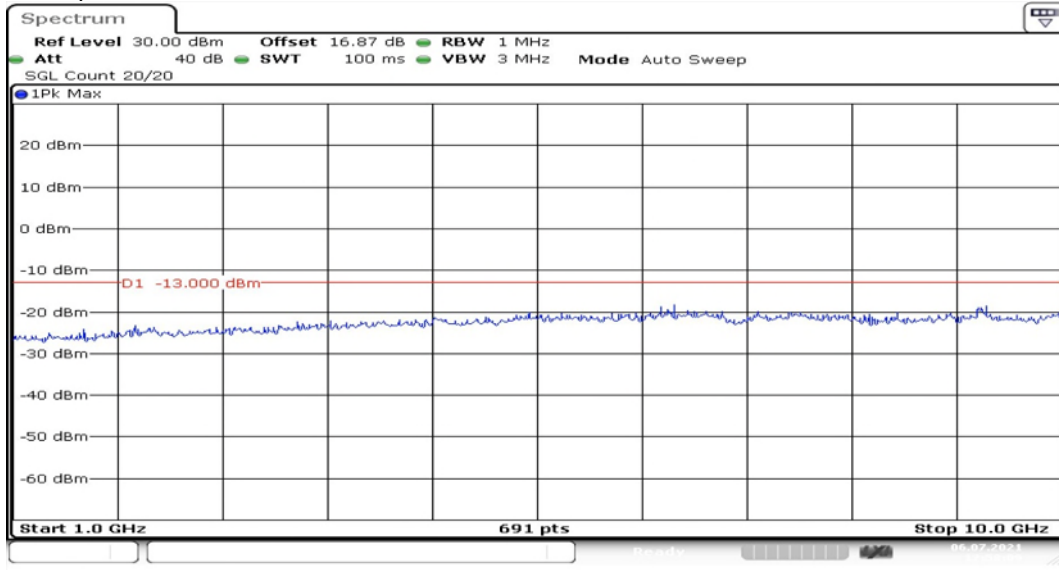
Note: The signal beyond the limit is the signal transmitted by EUT.



Date: 6.JUL.2021 12:54:05

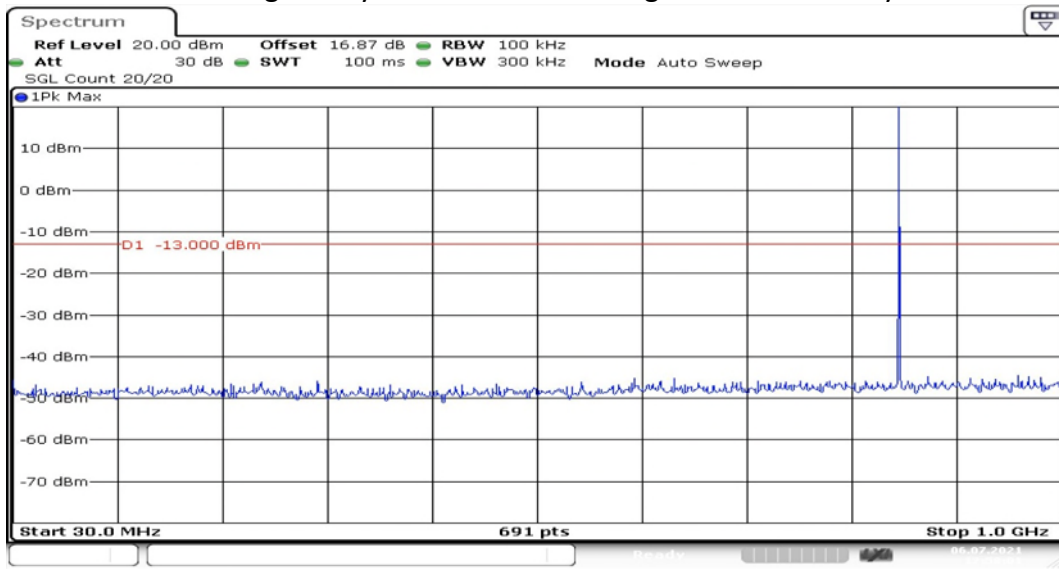
Channel 189 30MHz~1GHz(dBm)

EDGE (8PSK) MODE:



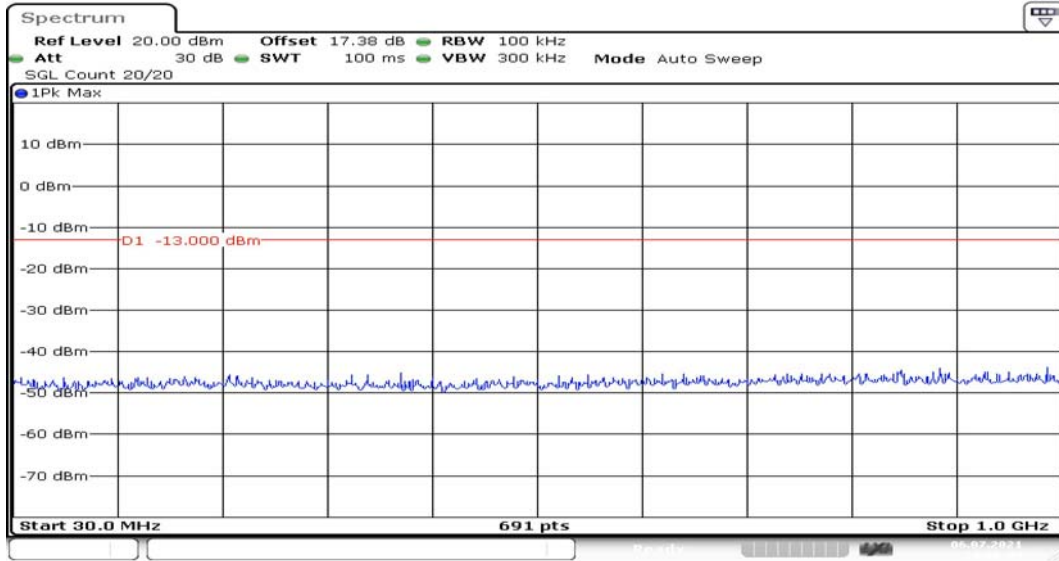
Channel 189 1GHz~10GHz(dBm)

Note: The signal beyond the limit is the signal transmitted by EUT.



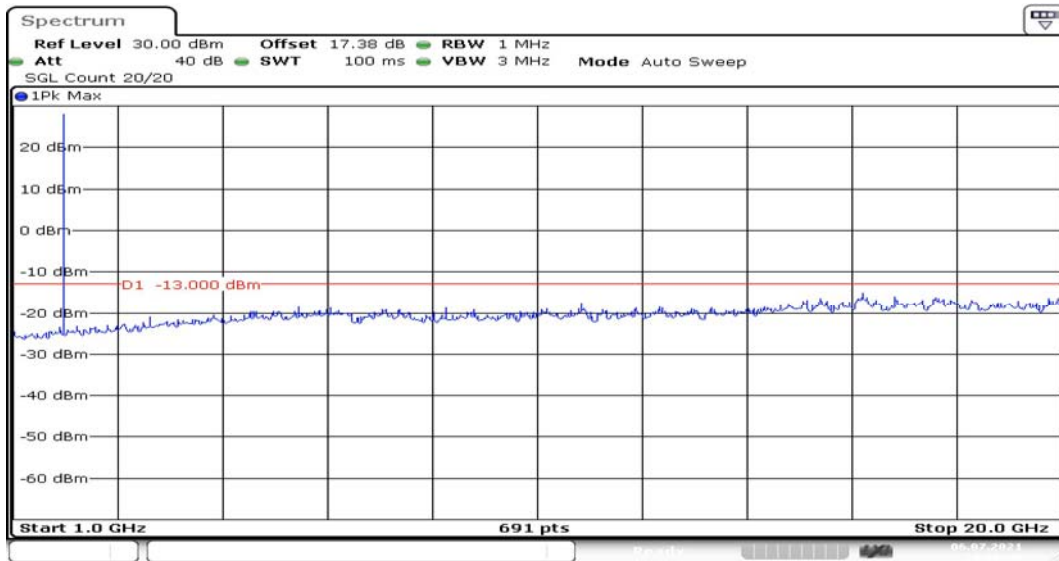
Channel 189 30MHz~1GHz(dBm)

**PCS1900**  
GSM MODE:



Date: 6.JUL.2021 14:36:33

Channel 661 30MHz~1GHz(dBm)

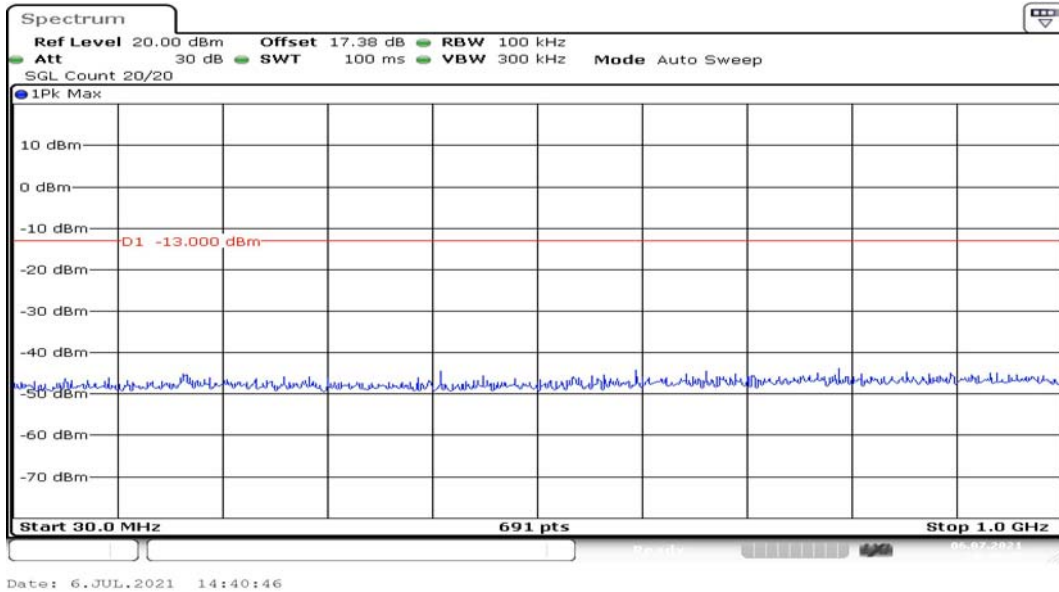


Date: 6.JUL.2021 14:36:43

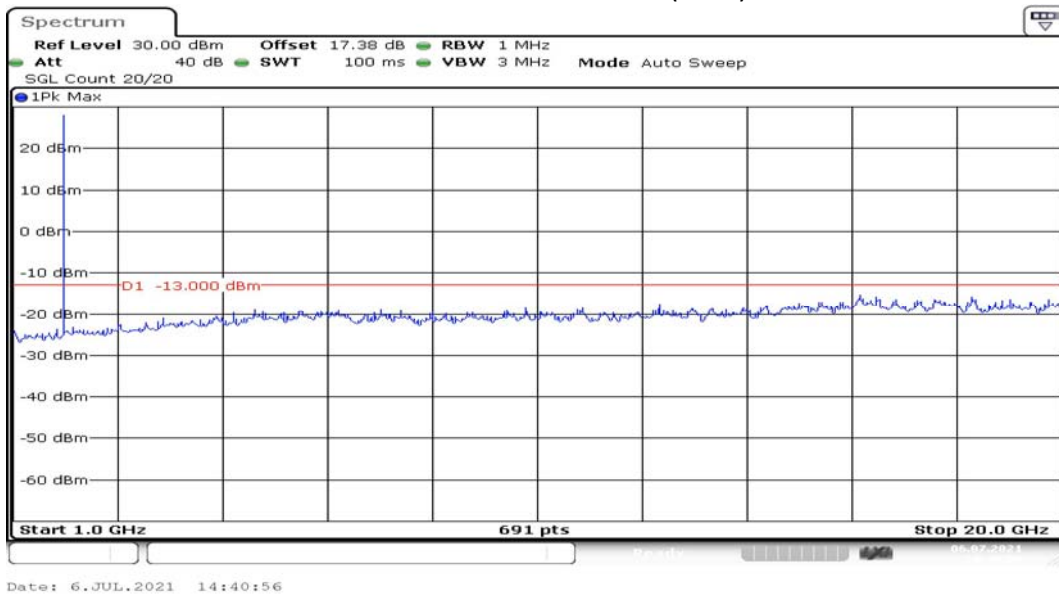
Channel 661 1GHz~20GHz(dBm)

Note: The signal beyond the limit is the signal transmitted by EUT.

GPRS MODE:



Channel 661 30MHz~1GHz(dBm)

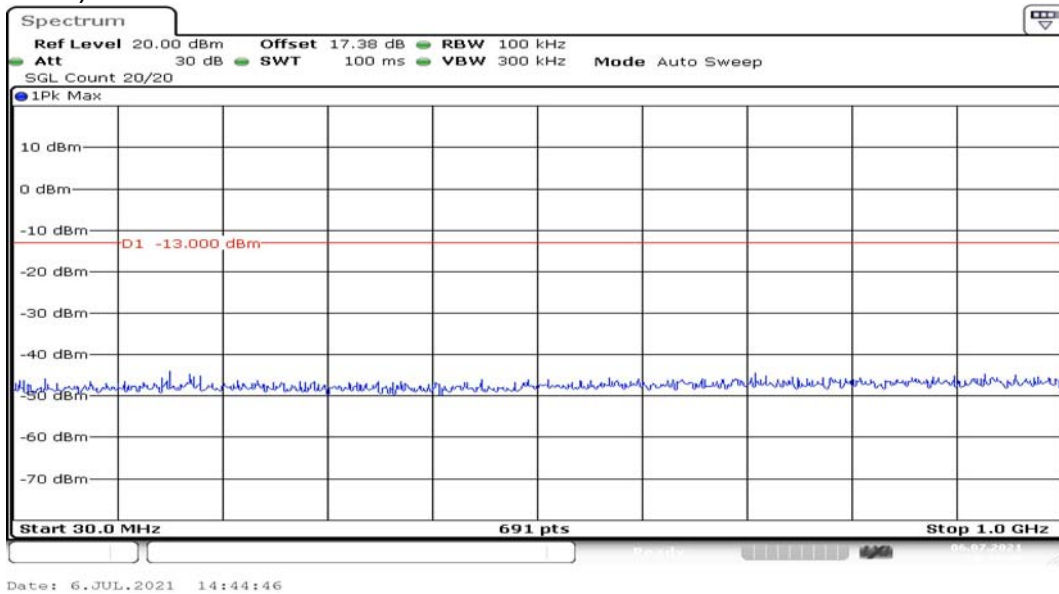


Channel 661 1GHz~20GHz(dBm)

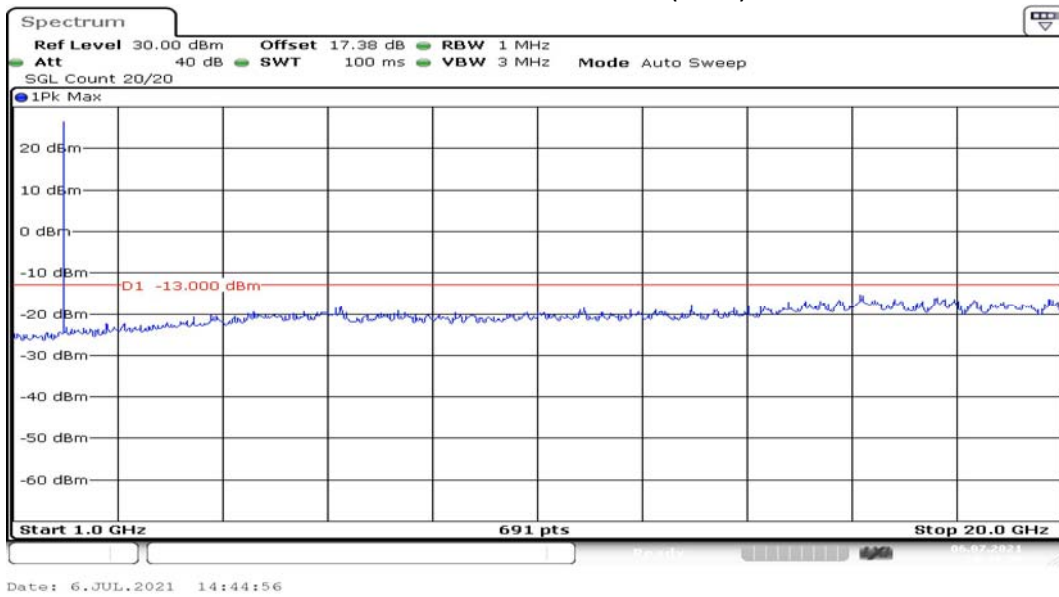
Note: The signal beyond the limit is the signal transmitted by EUT.



EDGE (8PSK) MODE:



Channel 661 30MHz~1GHz(dBm)



Channel 661 1GHz~20GHz(dBm)

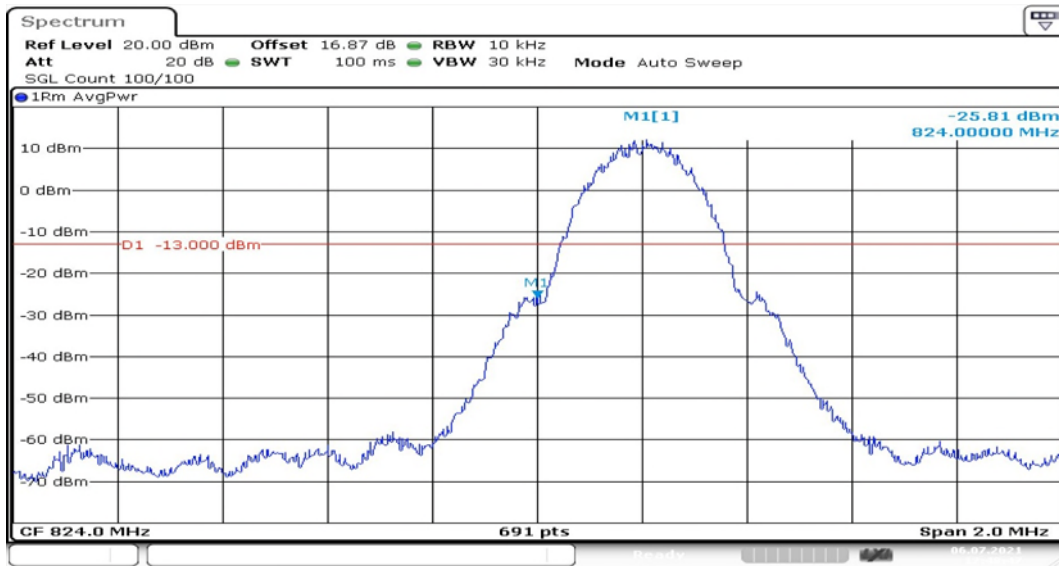
Note: The signal beyond the limit is the signal transmitted by EUT.



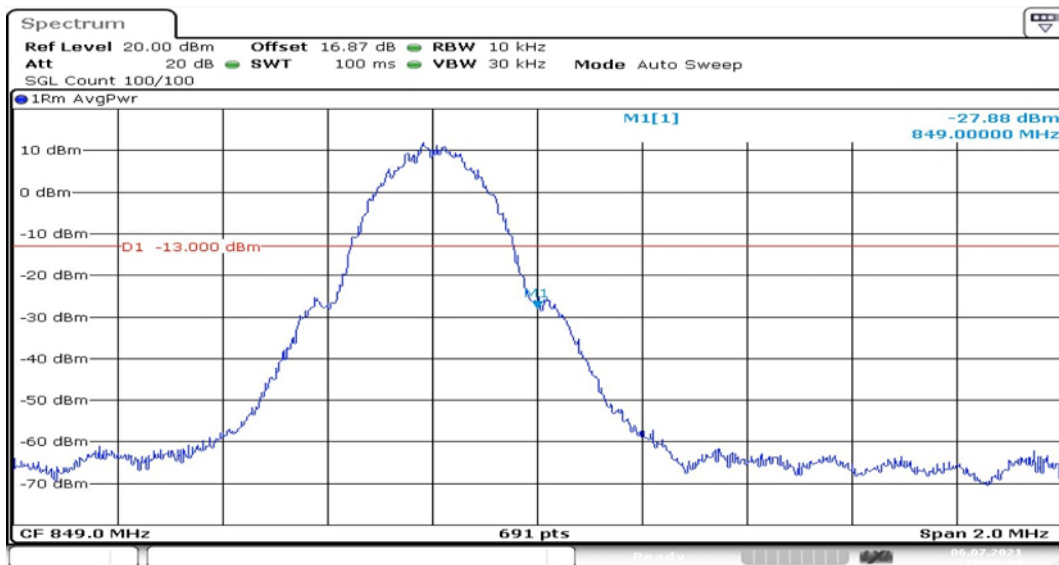
## 5. Band Edges Compliance

### GSM850

GSM MODE:

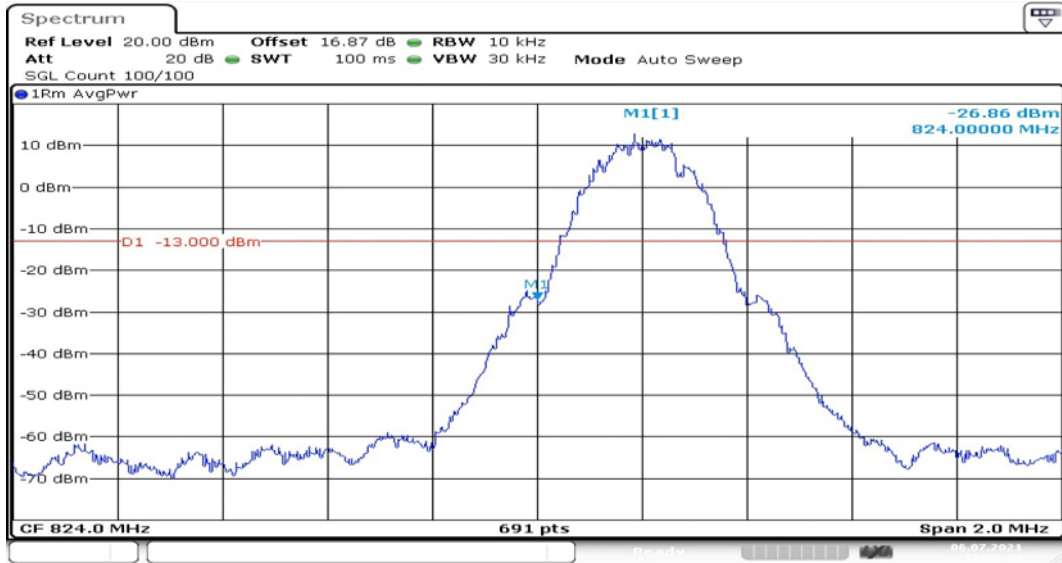


Channel 128

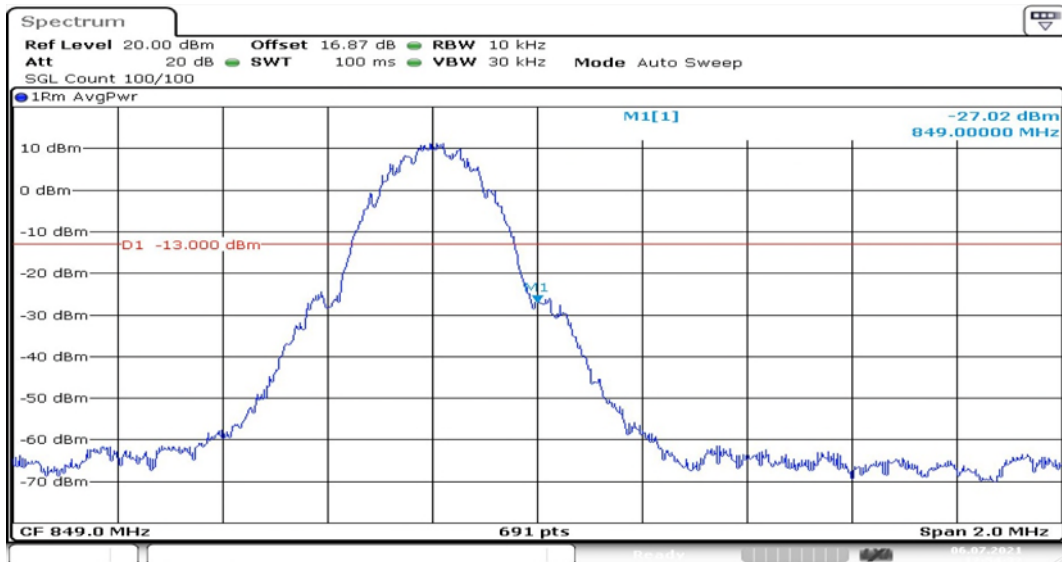


Channel 251

GPRS MODE:

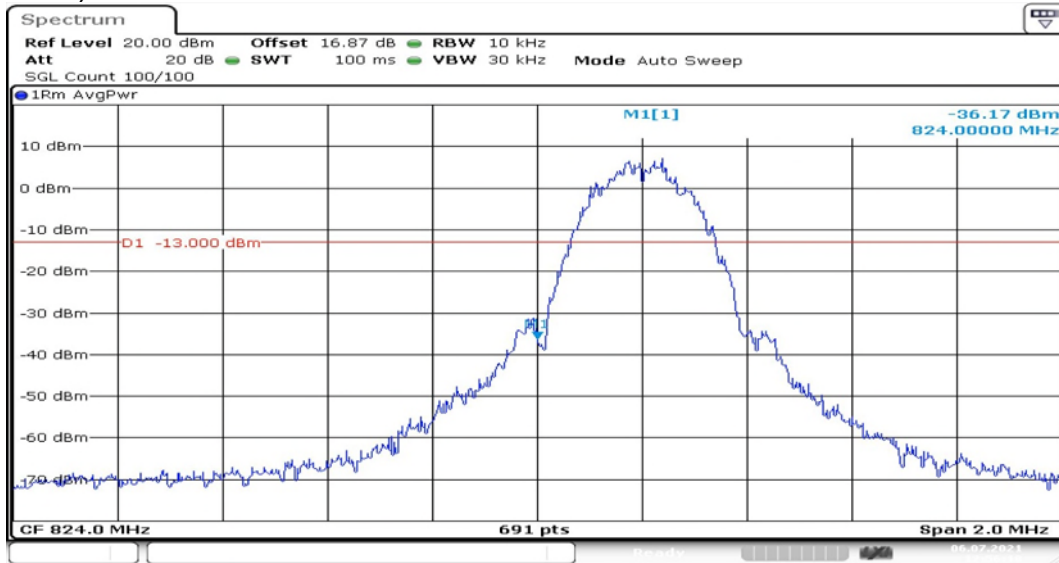


Channel 128



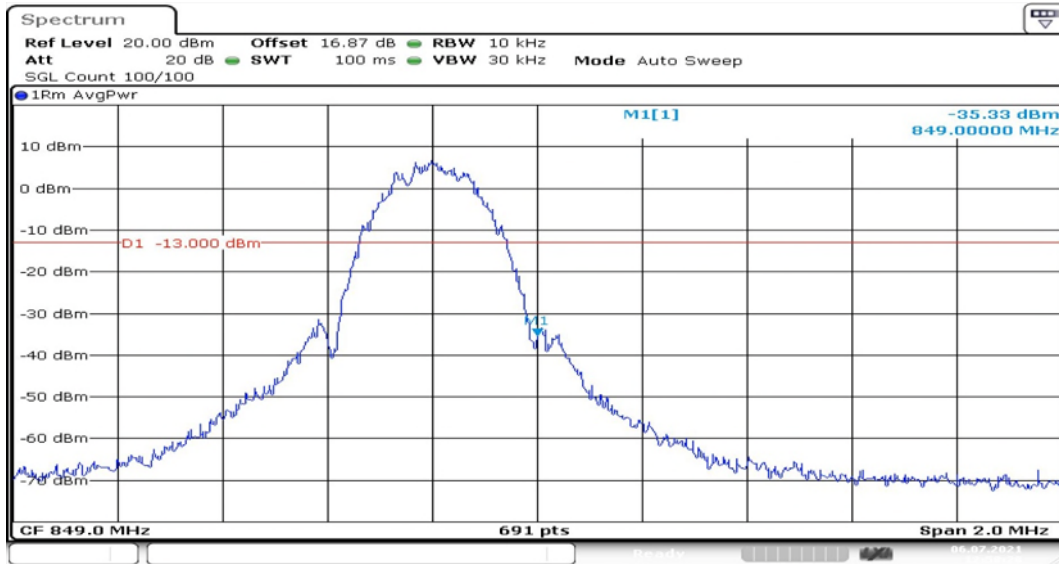
Channel 251

EDGE (8PSK) MODE:



Date: 6.JUL.2021 12:56:18

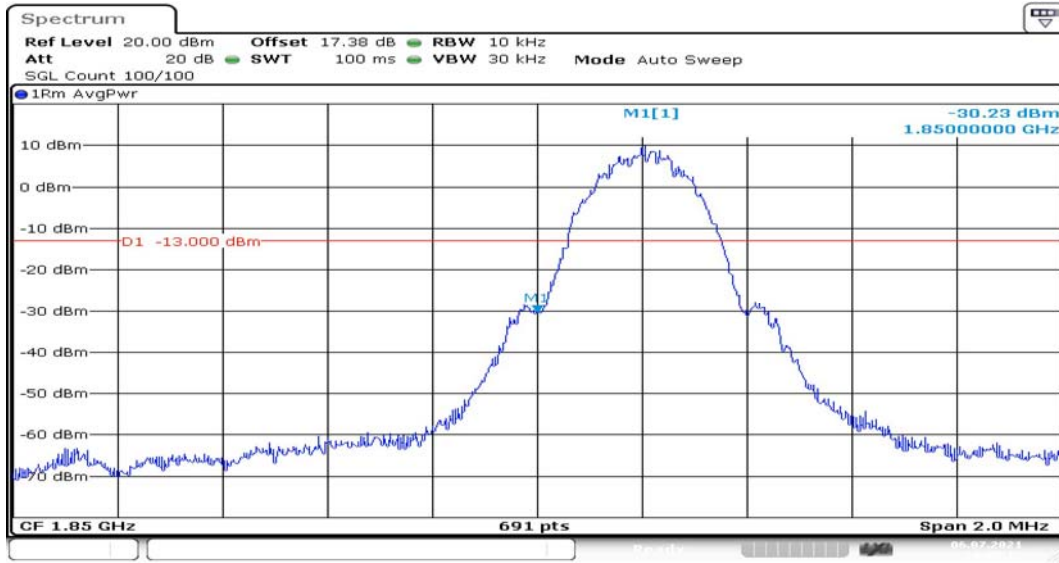
Channel 128



Date: 6.JUL.2021 12:58:28

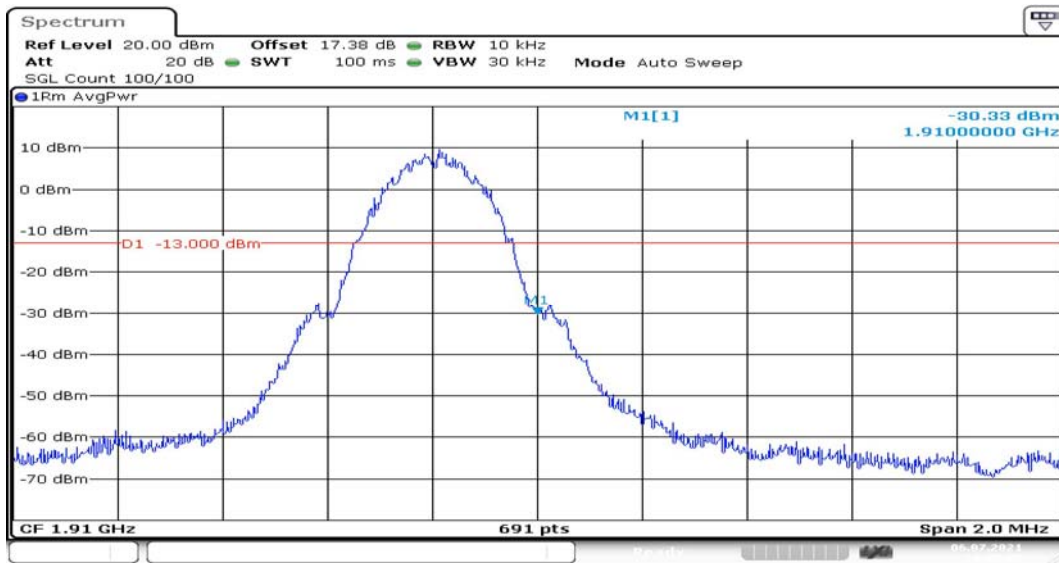
Channel 251

**PCS1900**  
**GSM MODE:**



Date: 6.JUL.2021 14:35:12

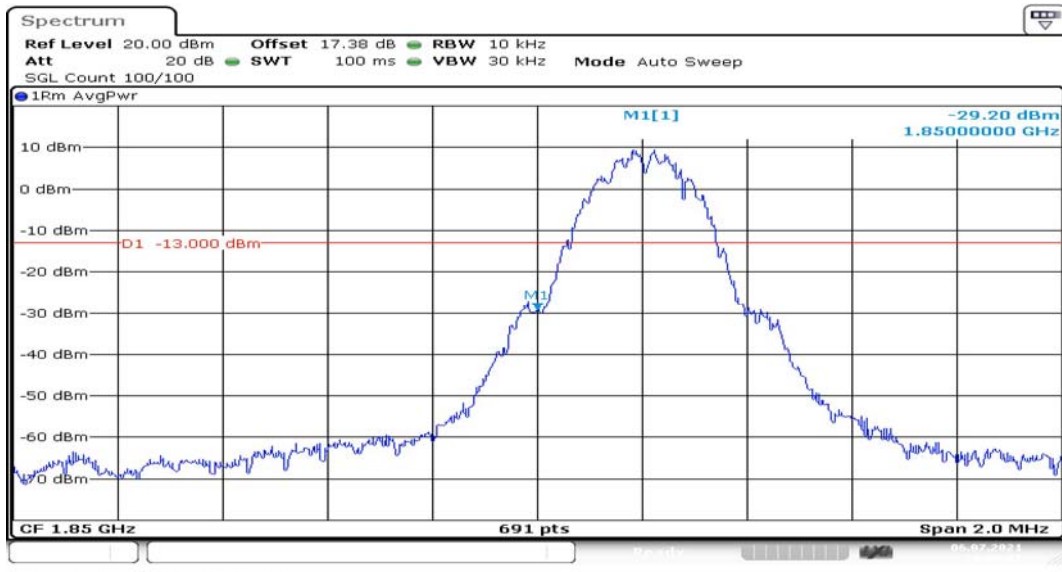
Channel 512



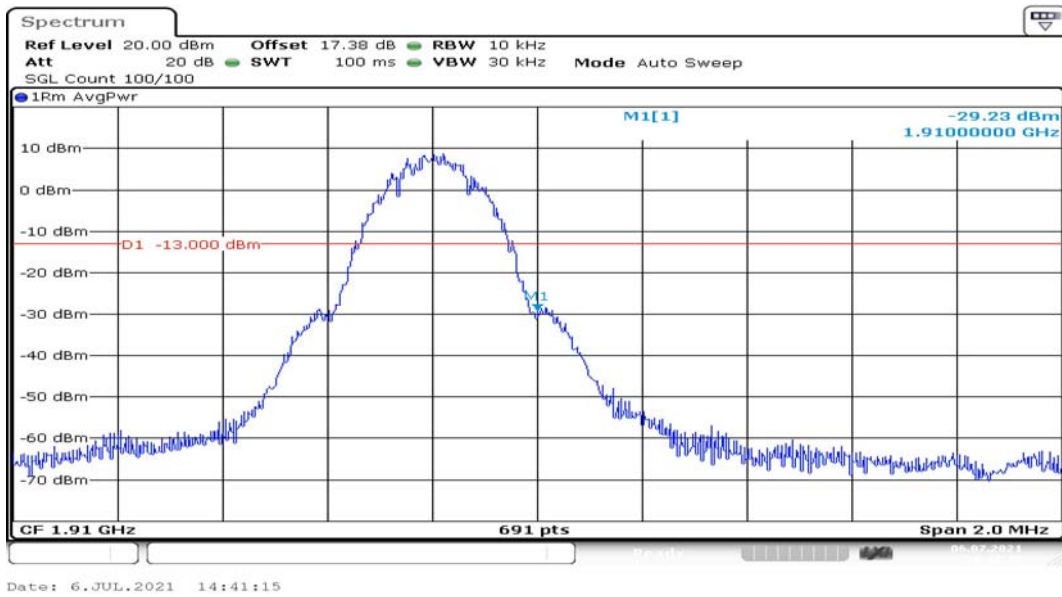
Date: 6.JUL.2021 14:37:02

Channel 810

GPRS MODE:

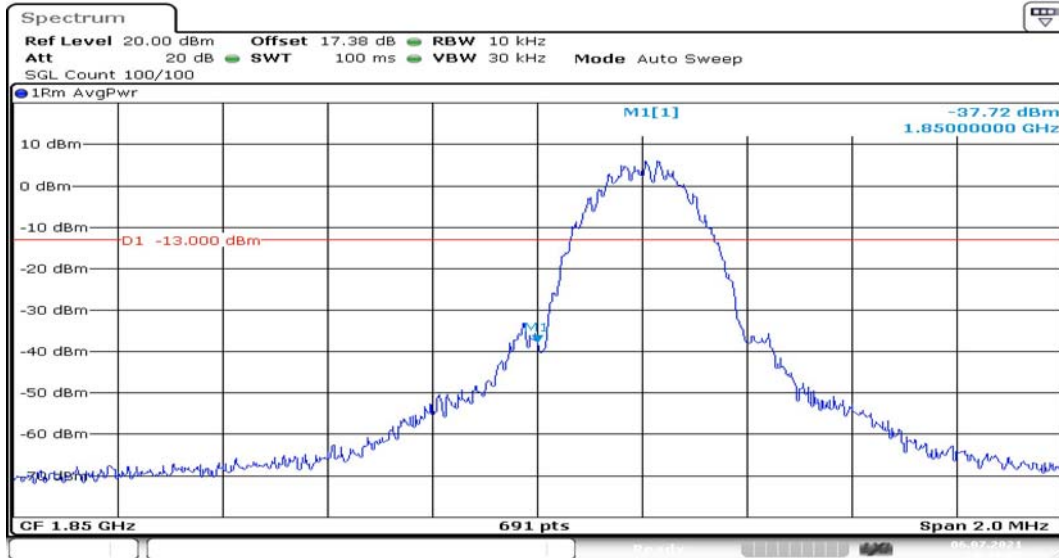


Channel 512



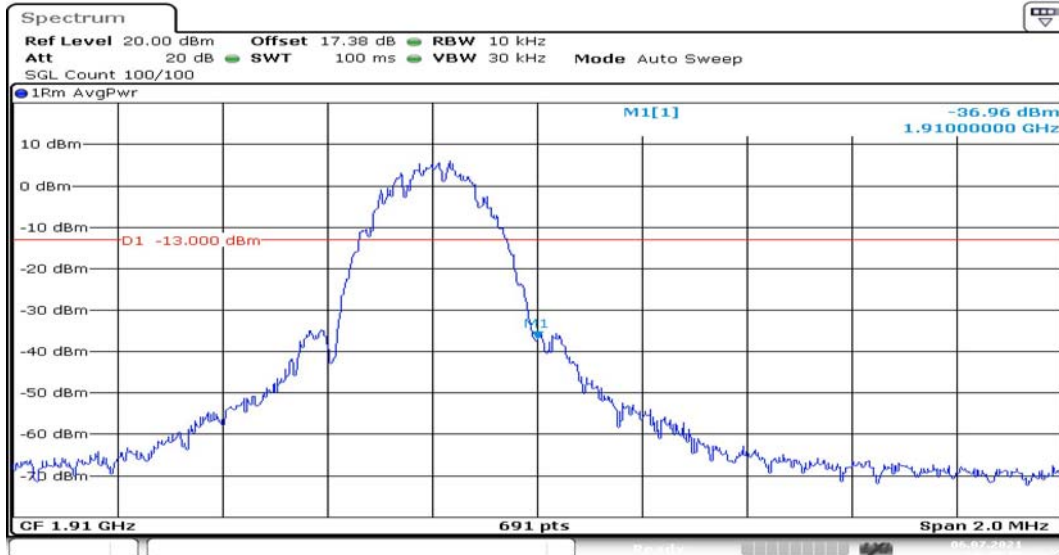
Channel 810

EDGE (8PSK) MODE:



Date: 6.JUL.2021 14:43:01

Channel 512



Date: 6.JUL.2021 14:45:15

Channel 810

## 6. Frequency Stability

### GSM850

GSM MODE:

Temperature(°C)	Test Result (ppm)@NV		
	Channel 128	Channel 189	Channel 251
0	-0.011	-0.007	-0.012
+10	-0.009	-0.006	-0.013
+20	0.000	0.000	0.000
+30	-0.008	0.000	-0.008
+40	0.008	0.006	-0.003
+55	-0.002	0.000	0.000
Voltage	Test Result (ppm)@NT		
	Channel 128	Channel 189	Channel 251
LV	0.001	0.001	0.004
HV	-0.003	0.002	-0.003

GPRS MODE:

Temperature(°C)	Test Result (ppm)@NV		
	Channel 128	Channel 189	Channel 251
0	0.000	-0.004	-0.005
+10	0.001	-0.002	0.005
+20	0.000	0.000	0.000
+30	0.001	0.002	0.001
+40	0.006	0.006	0.004
+55	0.005	0.007	0.007
Voltage	Test Result (ppm)@NT		
	Channel 128	Channel 189	Channel 251
LV	0.001	-0.002	0.001
HV	0.005	0.007	0.002

EDGE (8PSK) MODE:

Temperature(°C)	Test Result (ppm)@NV		
	Channel 128	Channel 189	Channel 251
0	-0.005	-0.005	-0.007
+10	-0.003	-0.003	-0.003
+20	0.000	0.000	0.000
+30	0.001	-0.003	0.000
+40	0.003	0.005	0.001
+55	0.004	0.003	0.002
Voltage	Test Result (ppm)@NT		
	Channel 128	Channel 189	Channel 251
LV	0.002	0.004	0.000
HV	0.000	-0.001	0.000



### PCS1900

#### GSM MODE:

Temperature(°C)	Test Result (ppm)@NV		
	Channel 512	Channel 661	Channel 810
0	-0.004	-0.003	-0.008
+10	0.005	0.002	0.000
+20	0.000	0.000	0.000
+30	0.001	-0.004	-0.004
+40	0.005	0.007	0.006
+55	0.005	0.007	-0.002
Voltage	Test Result (ppm)@NT		
	Channel 512	Channel 661	Channel 810
LV	0.005	0.006	0.001
HV	0.007	0.006	0.008

#### GPRS MODE:

Temperature(°C)	Test Result (ppm)@NV		
	Channel 512	Channel 661	Channel 810
0	-0.001	0.001	-0.004
+10	0.002	0.007	0.001
+20	0.000	0.000	0.000
+30	0.000	0.005	-0.001
+40	0.001	0.010	0.003
+55	0.010	0.007	0.006
Voltage	Test Result (ppm)@NT		
	Channel 512	Channel 661	Channel 810
LV	0.003	0.002	0.005
HV	0.005	0.011	0.007

#### EDGE (8PSK) MODE:

Temperature(°C)	Test Result (ppm)@NV		
	Channel 512	Channel 661	Channel 810
0	-0.003	-0.006	-0.006
+10	-0.001	-0.004	-0.004
+20	0.000	0.000	0.000
+30	0.000	-0.001	-0.006
+40	0.002	0.004	0.001
+55	0.004	0.001	0.001
Voltage	Test Result (ppm)@NT		
	Channel 512	Channel 661	Channel 810
LV	0.002	-0.003	0.000
HV	0.004	0.002	0.004