Certificate Number: 5055.02

TEST REPORT FOR GSM TESTING

Report No.: SRTC2021-9004(F)-21082502(A)

Product Name: Mobile Phone

Applicant: Sharp Corporation

Manufacturer: Sharp Corporation

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

FCC ID: APYHRO00302

The State Radio_monitoring_center Testing Center (SRTC)

15th Building, No.30 Shixing Street, Shijingshan District, Beijing, P.R.China

Tel: 86-10-57996183 Fax: 86-10-57996388

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1. GENERAL INFORMATION

1.1 Notes of the test report

The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written permission of The State Radio_monitoring_center Testing Center (SRTC).The test results relate only to individual items of the samples which have been tested. The certification and accreditation identifiers used in this report shall not be applicable to the tested or calibrated samples thereof. The manufacturer shall not mark the tested samples or items (or a separate part of the item) with the identifiers of certification and accreditation to mislead relevant parties about the tested samples or items.

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
City:	Beijing
Country or Region:	P.R.China
Contacted person:	Liu Jia
Tel:	+86 10 57996183
Fax:	+86 10 57996388
Email:	liujiaf@srtc.org.cn
Designation Number:	CN1267
Registration number:	239125

1.3 Applicant's details

Company:	Sharp Corporation
Address:	1 Takumi-cho, Sakai-ku, Sakai City, Osaka 590-8522, Japan

1.4 Manufacturer's details

Company:	Sharp Corporation
Address:	1 Takumi-cho, Sakai-ku, Sakai City, Osaka 590-8522, Japan

1.5 Factory's details

Company:	Futaijing Precision Electronics (Yantai) Co., Ltd.
Address:	No. 50-50, Beijingzhong Road, Yantai Economic & Technological Development Area, Shandong Province, P.R. China

1.6 Test Environment

Date of Receipt of test sample at SRTC:	2021-08-25
Testing Start Date:	2021-08-27
Testing End Date:	2021-10-08

Environmental Data:	Temperature (°C)	Humidity (%)
Ambient:	25	40
Maximum Extreme:	55	---
Minimum Extreme:	-10	---

Normal Supply Voltage (V d.c.):	4.0
Maximum Extreme Supply Voltage (V d.c.):	4.0
Minimum Extreme Supply Voltage (V d.c.):	3.7

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:	PIFA
Antenna Gain:	GSM850: -6.0dBi/PCS1900: -1.6dBi ERP = EIRP(Power+Gain) – 2.15 (dB)
Power Supply:	Charger
Software Revision:	A806M
Hardware Revision:	DVT(Remodeled to the equivalent of MP products)
IMEI:	004401230422665 004401230421055

2.2 Support Equipment

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

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	2020	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

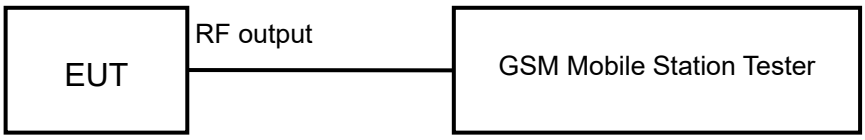
This Test Report Is Issued by: Mr. Peng Zhen	Checked by: Mr. Li Bin
Tested by: Mr. Liu Ce	Issued date: 20211008

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)

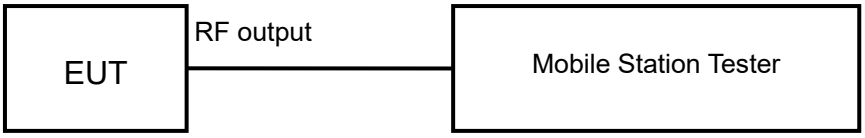
Limits: No specific conduct power requirements in part 2.1046.

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 = PMeas – LC + GT
Where:
ERP/EIRP = effective or equivalen radiated power, respectively (expressed in the same units as PMeas, typically dBW or dBm)
PMeas = 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:

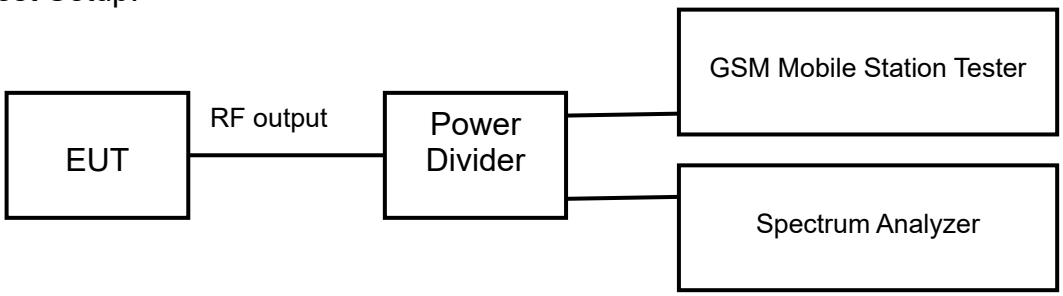
Operation Mode	Power Step	E.I.R.P. (dBm)
GSM	0	≤33
GPRS	3	≤33
EDGE	5	≤33

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 ≥ 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

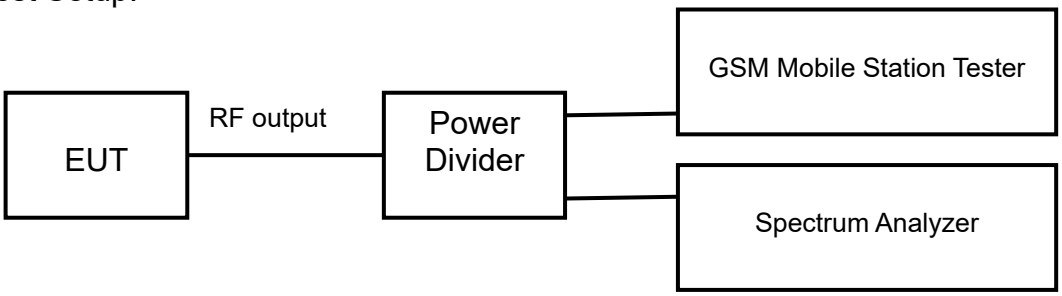
Limits: No specific occupied bandwidth requirements in part 2.1049

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 ≥ 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

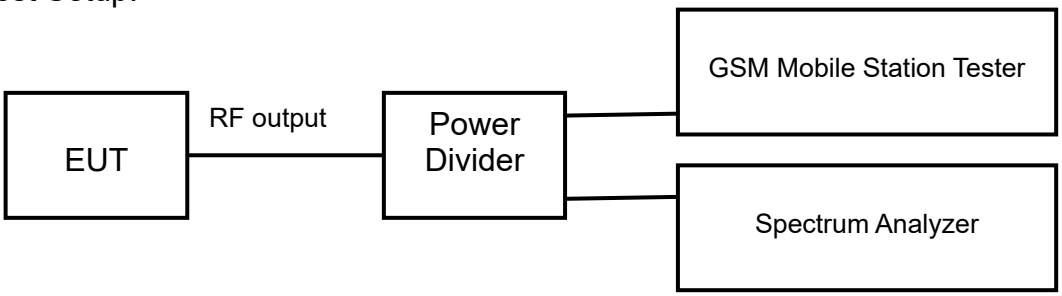
Limits: No specific occupied bandwidth requirements in part 2.1049

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 ≥ 3 x 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

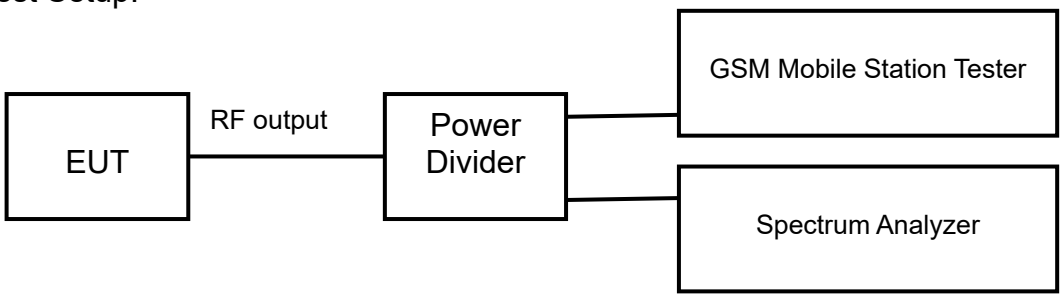
Limits:
The minimum permissible attenuation level of any spurious emission is $43+\log_{10}(P_{[Watts]})$, where P is the transmitter power in Watts.

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 ≥ 2 x Span/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

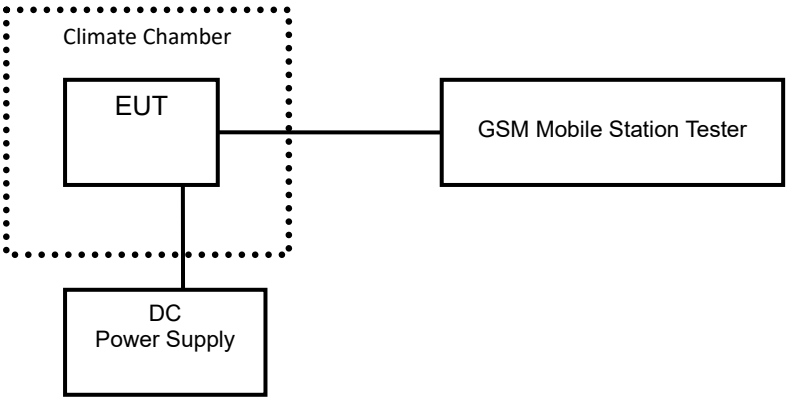
Limit: The minimum permissible attenuation level of any spurious emission is $43+\log_{10}(P_{[Watts]})$, where P is the transmitter power in Watts.

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.

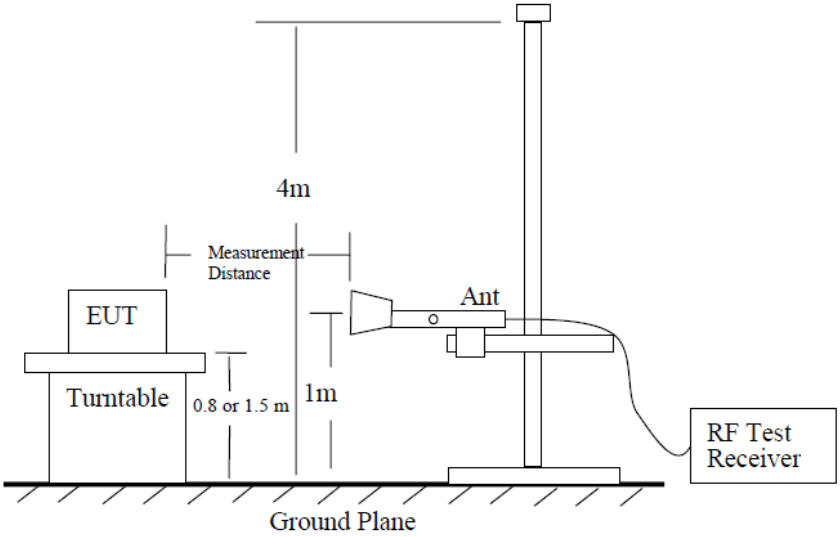
Limits: For Part 22, the frequency stability of the transmitter shall be maintained within±0.00025% (±2.5 ppm) of the center frequency. For Part 24, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test result:
The test results are shown in Appendix A.

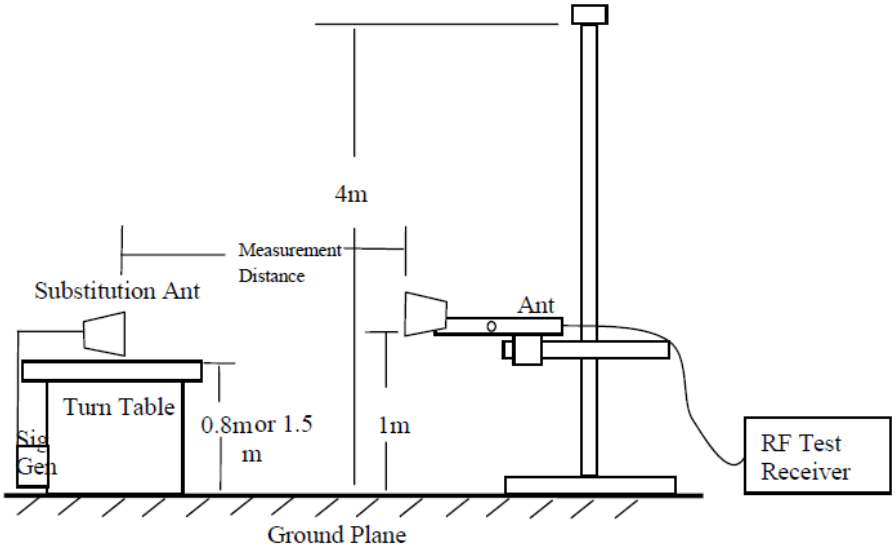
6.8 Radiated Spurious Emissions

Rule Part(s)
FCC Part2.1053/ 22.917(a)/Part 24.238(a)

Test Setup:



Step 1



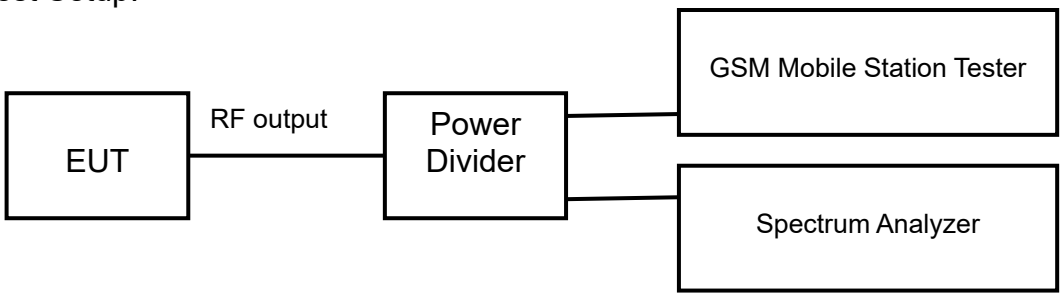
Step 2

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<1GHz)/ 1.5m (f>1GHz) 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<1GHz)/1MHz (f>1GHz). 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 (Pmea) 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 (Pr). The power of signal source (Pmea) 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 (Pca) and the Substitution Antenna Gain (Ga).
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:
Power (EIRP) = Pmea+ Pca + Ga
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, ERP = EIRP – 2.15 (dB).
Assumed the power of signal source record is -20dBm. A cable loss of -30dB, and an antenna gain of 11dB are added.
P=Pmea+Pca+Ga=(-20dBm)+(-30dB)+(11dB)= -39dBm
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	Mobile Station Tester / MT8820C	Anritsu	6201300660	2021.06.21	2022.06.20
2	Radio Communication Station / CMW500	R&S	161702	2021.06.21	2022.06.20
3	Spectrum Analyzer / FSV40	R&S	101065	2021.06.21	2022.06.20
4	Spectrum Analyzer / N9020A	Agilent	MY48010771	2021.05.18	2022.05.17
5	Power Divider / 11667A	HP	19632	2021.06.21	2022.06.20
6	DC Power Supply / E3645A	Agilent	MY40000741	2021.04.22	2022.04.21
7	Temperature chamber / SH241	ESPEC	92013758	2021.06.21	2022.06.20
8	Fully-Anechoic Chamber / 12.65m×8.03m×7.50m	FRANKONIA	-----	-----	-----
9	Semi-Anechoic/Chamber / 23.18m×16.88m×9.60m	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	Shielding room / 9.080m×5.255m×3.525m	FRANKONIA	-----	-----	-----
15	Double-Ridged Waveguide Horn Antenna / HF 907	R&S	100512	2021.06.21	2022.06.20
16	Double-Ridged Waveguide Horn Antenna / HF 907	R&S	100513	2021.06.21	2022.06.20
17	Ultra log antenna / HL562	R&S	100016	2021.06.21	2022.06.20
18	Receive antenna /3160-09	SCHWARZ-BECK	002058-002	2021.06.21	2022.06.20
19	EMI test receiver / ESI 40	R&S	100015	2021.06.21	2022.06.20
20	EMI test receiver / ESCS30	R&S	100029	2021.06.21	2022.06.20
21	Receive antenna / HL562	R&S	100167	2021.06.21	2022.06.20
22	AMN / ENV216	R&S	3560.6550.12	2021.06.21	2022.06.20

APPENDIX A – TEST DATA OF CONDUCTED EMISSION

GSM850 Result:

1. RF Power Output

GSM850

GSM Measured Power:

Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
824.2	128	32.41
836.4	189	32.41
848.8	251	32.32

GPRS Measured Power:

Carrier frequency (MHz)	Channel No.	TX Mode	RF Power Output (dBm)
824.2	128	4Downlink1uplink	32.67
836.4	189		32.56
848.8	251		32.35
824.2	128	3Downlink2uplink	30.23
836.4	189		30.11
848.8	251		30.14
824.2	128	2Downlink3uplink	28.36
836.4	189		28.23
848.8	251		28.34
824.2	128	1Downlink4uplink	27.11
836.4	189		27.09
848.8	251		27.19

2. Occupied Bandwidth

GSM850

GSM MODE:

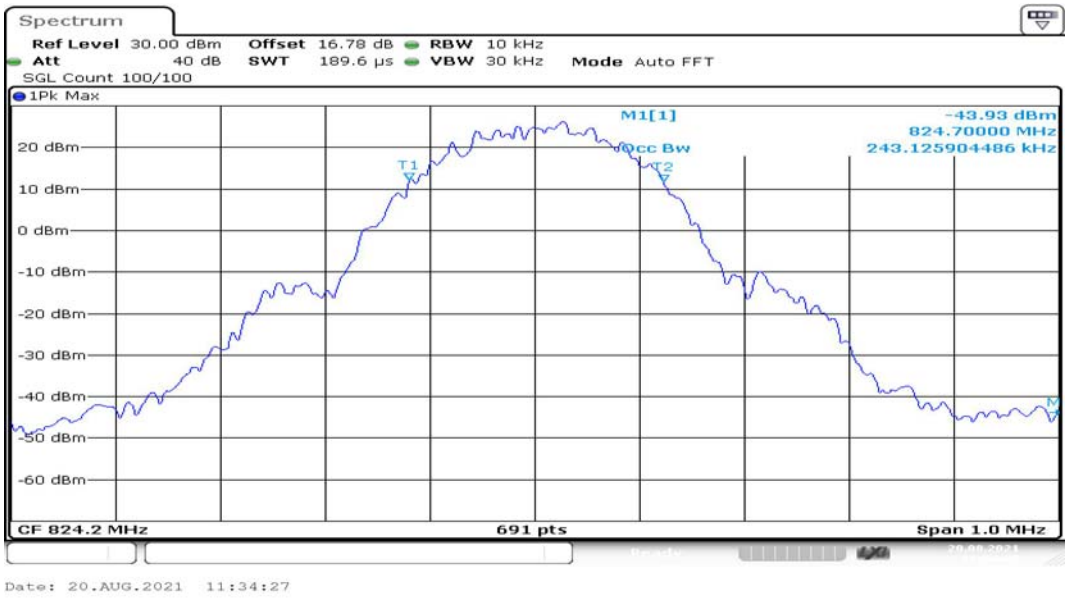
Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (kHz)
824.2	128	243.13
836.4	189	248.91
848.8	251	240.23

GPRS MODE:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (kHz)
824.2	128	244.57
836.4	189	243.13
848.8	251	246.02

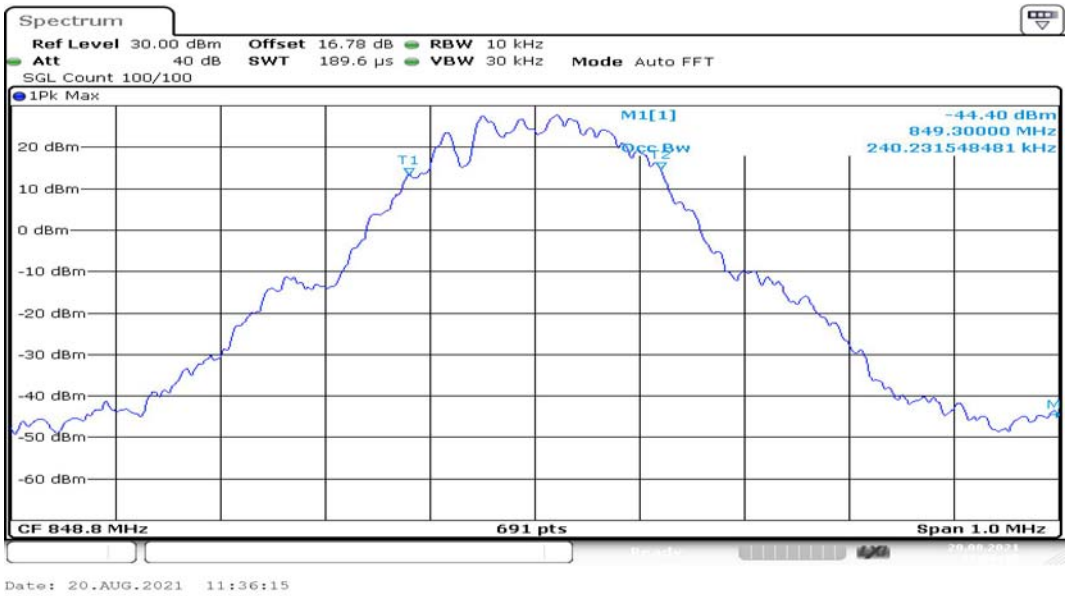
GSM850

GSM MODE:



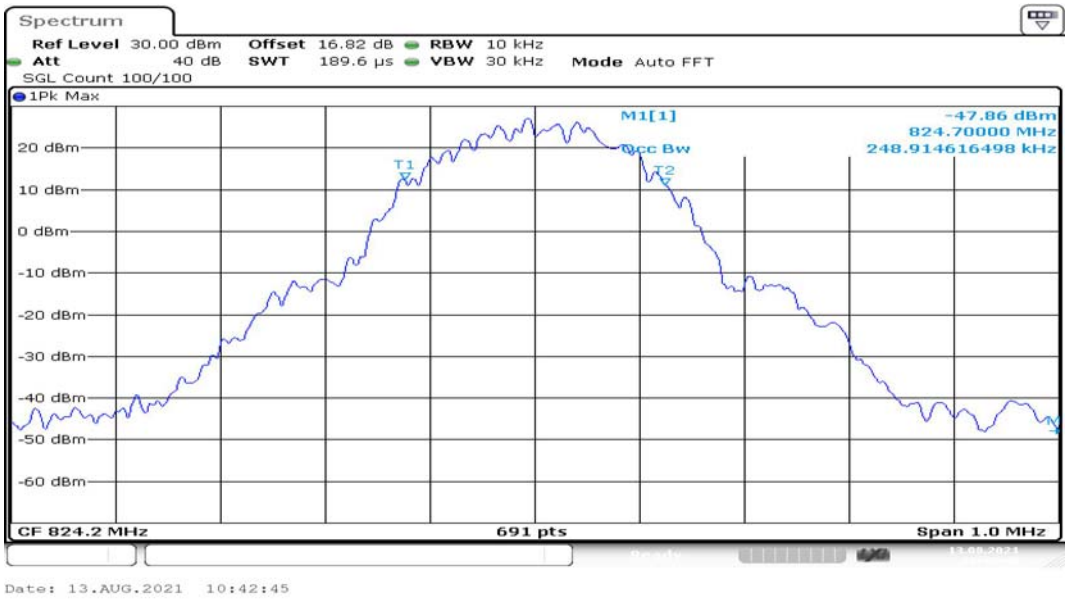
Channel 128

Channel 189



Channel 251

GPRS MODE:



Channel 128

Channel 189

Spectrum
Ref Level 30.00 dBm Offset 16.78 dB RBW 10 kHz
Att 40 dB SWT 189.6 µs VBW 30 kHz Mode Auto FFT
SGL Count 100/100
1Pk Max
M1[1] -47.13 dBm
849.30000 MHz
246.020260492 kHz
Occ Bw
T1
T2
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
CF 848.8 MHz
691 pts
Span 1.0 MHz
Date: 20.AUG.2021 11:40:51

Channel 251

3. Emission Bandwidth

GSM850

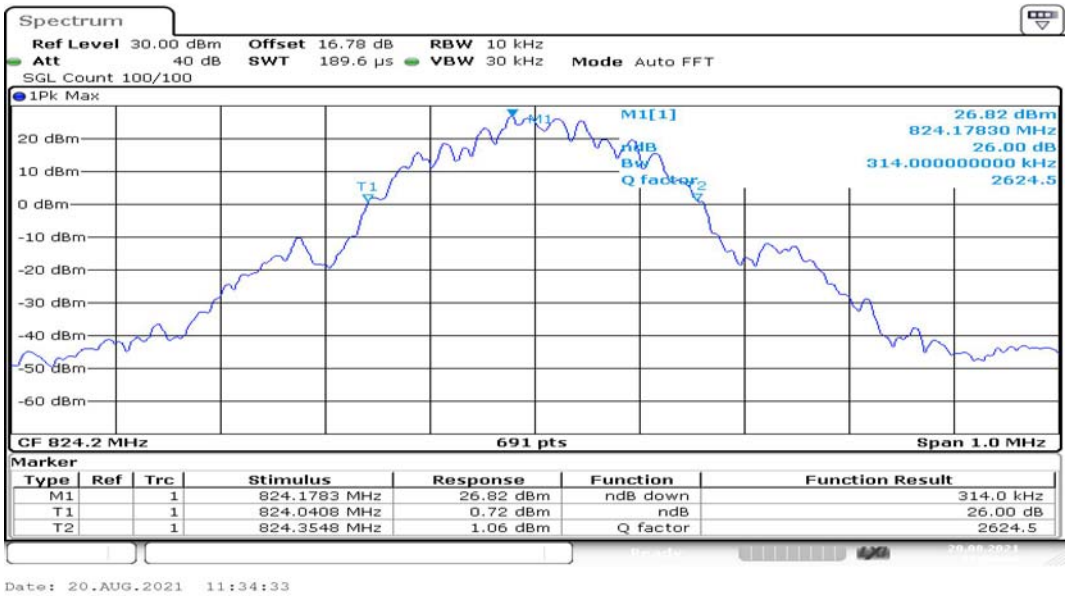
GSM MODE:

Carrier frequency (MHz)	Channel No.	Bandwidth of -26dB transmitter power(kHz)
824.2	128	314.00
836.4	189	293.80
848.8	251	308.20

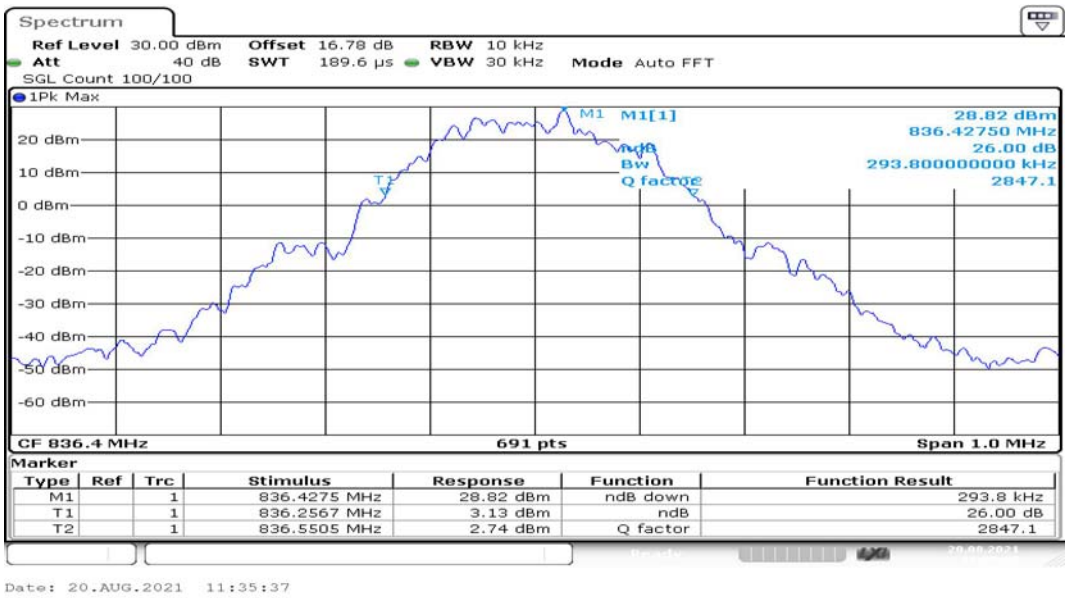
GPRS MODE:

Carrier frequency (MHz)	Channel No.	Bandwidth of -26dB (kHz)
824.2	128	311.10
836.4	189	312.60
848.8	251	318.40

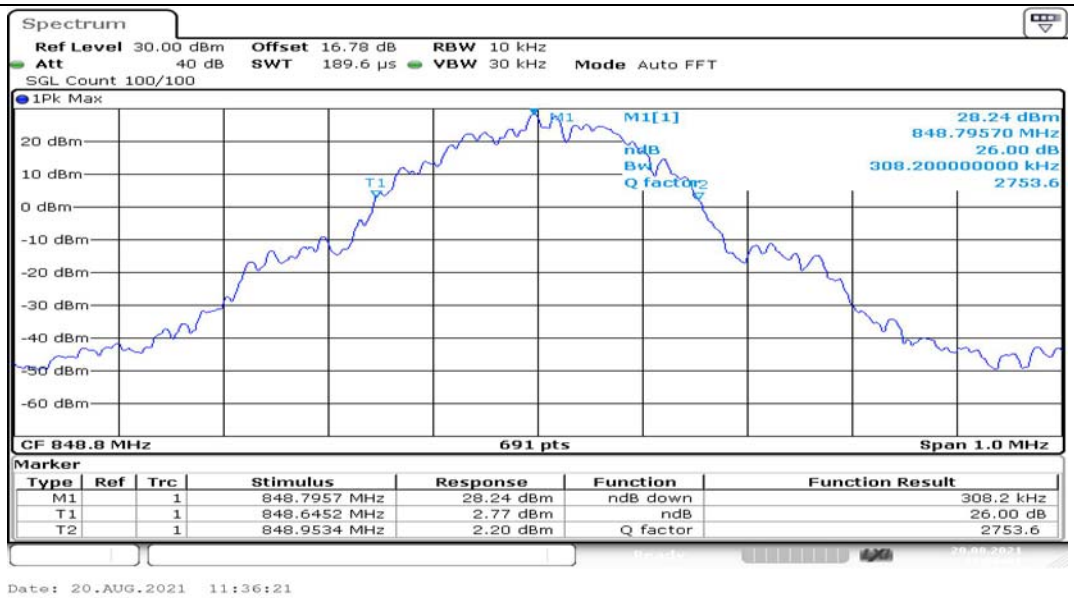
GSM850
GSM MODE:



Channel 128



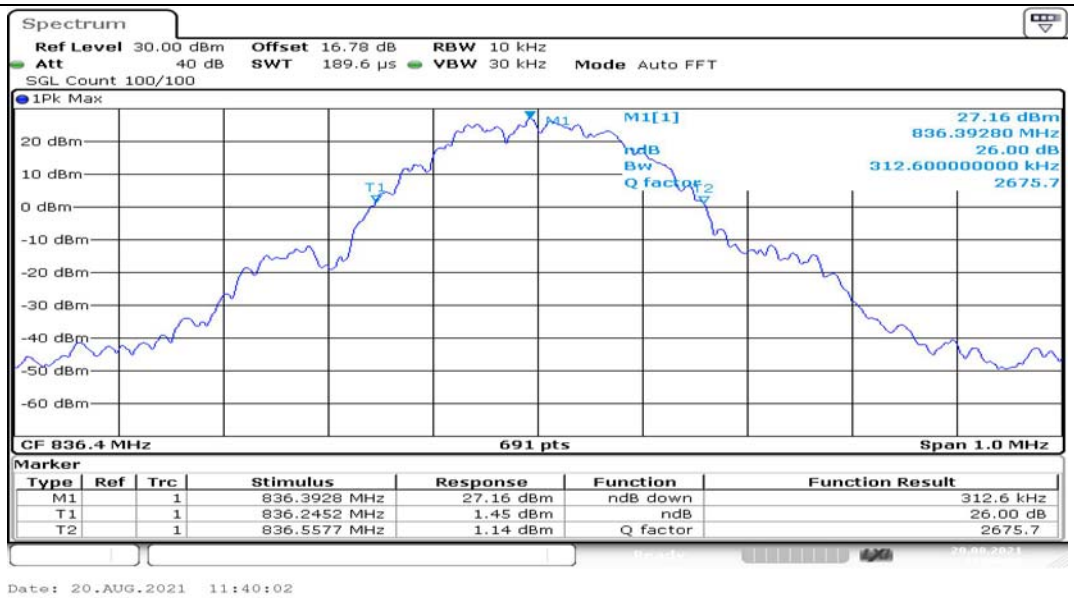
Channel 189



Channel 251

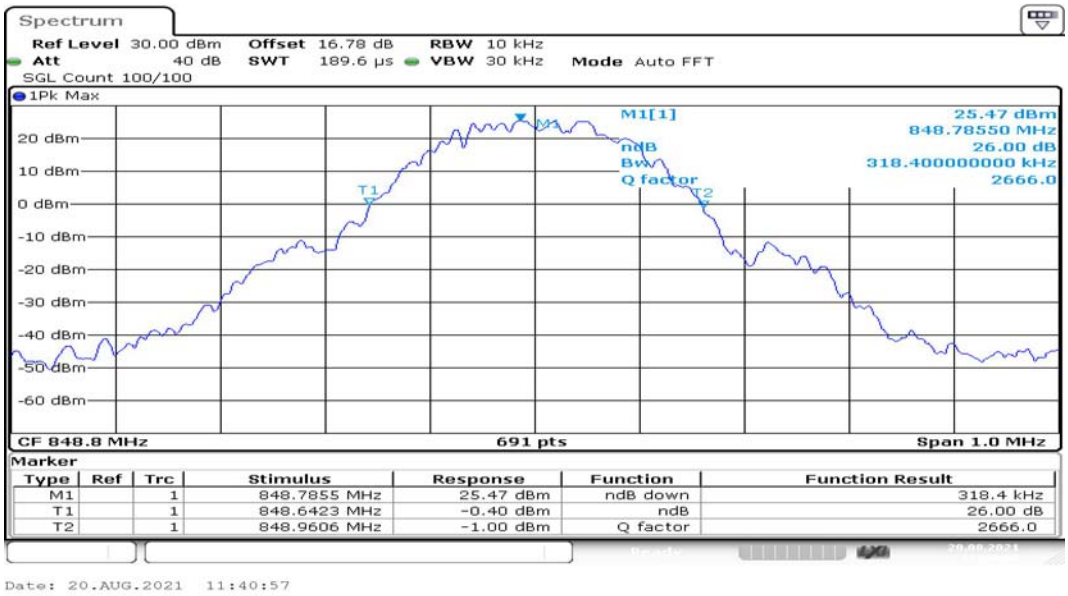
GPRS MODE:

Channel 128



Date: 20.AUG.2021 11:40:02

Channel 189



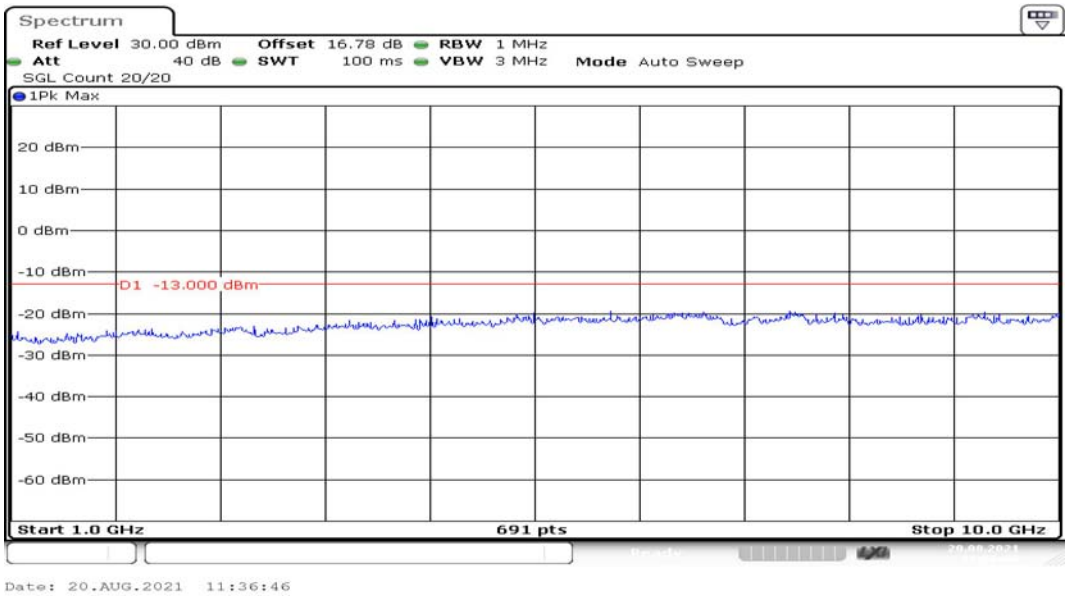
Date: 20.AUG.2021 11:40:57

Channel 251

4. Spurious Emissions at antenna terminal

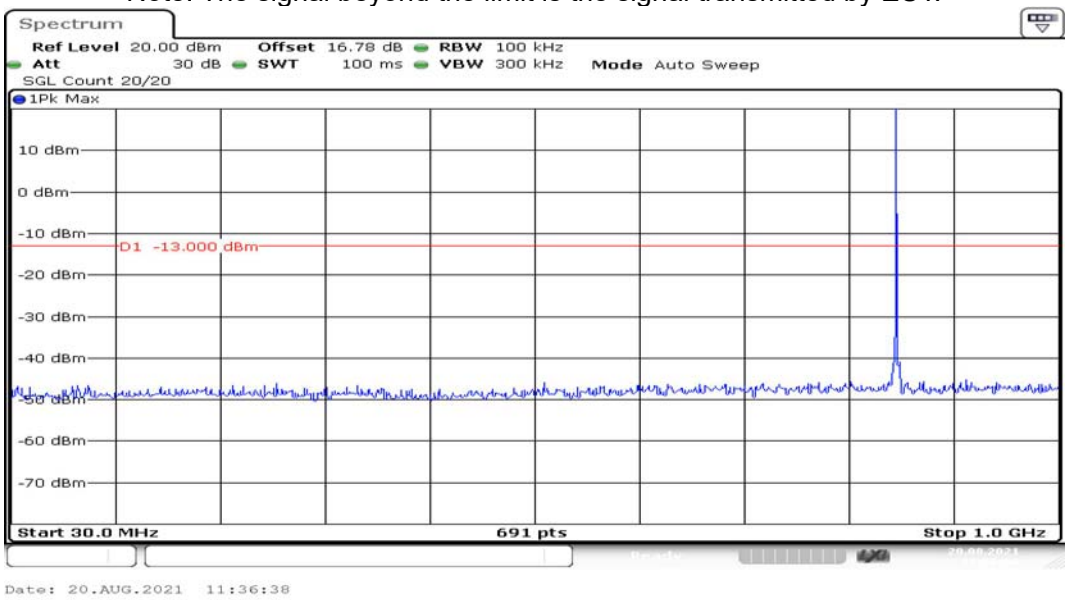
GSM850

GSM MODE:



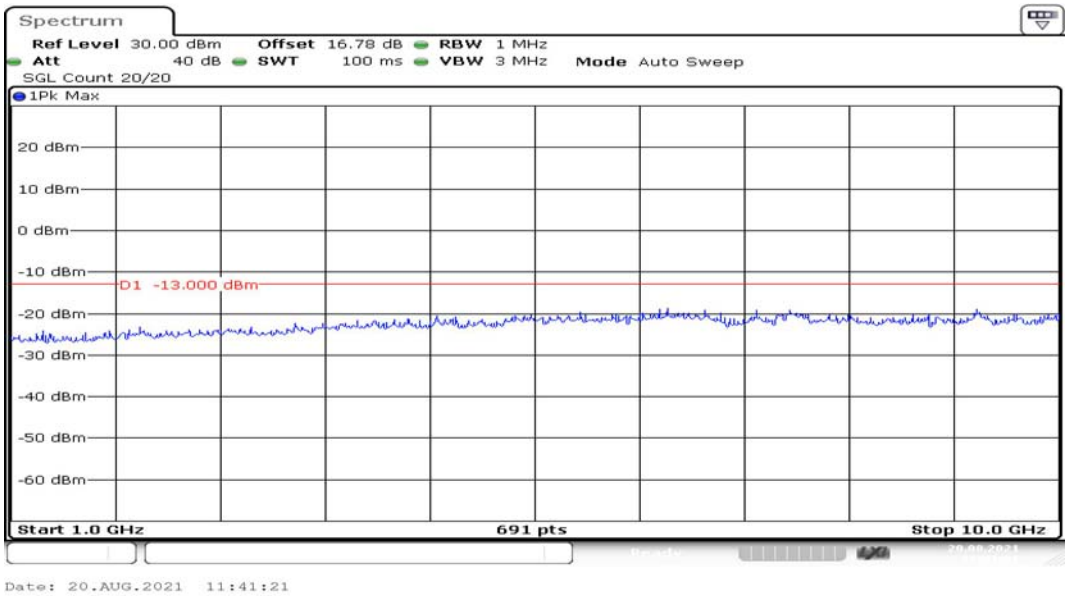
Channel 189 1GHz~10GHz(dBm)

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



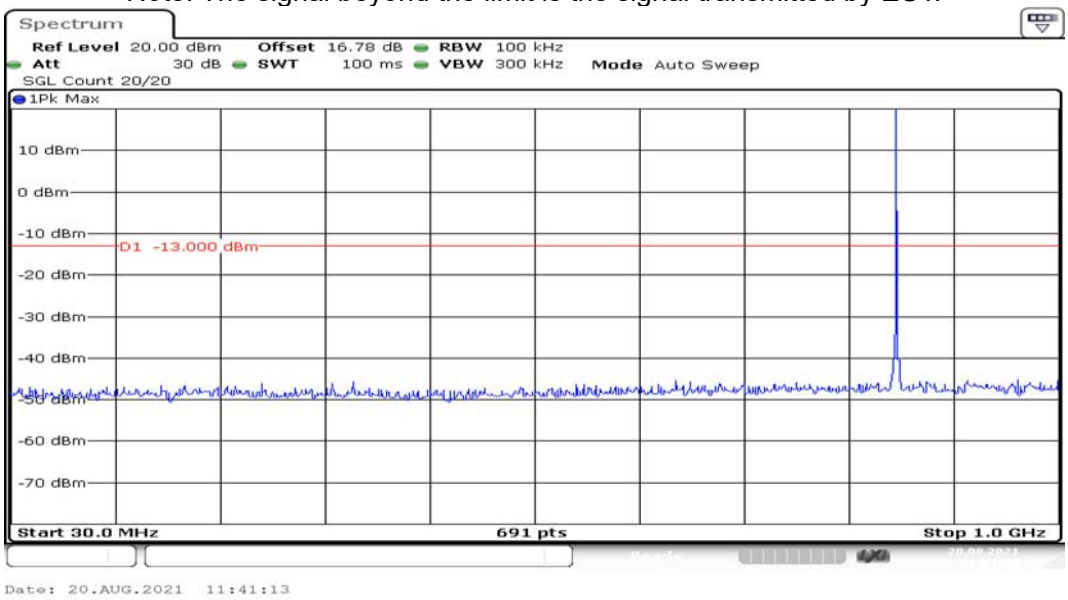
Channel 189 30MHz~1GHz(dBm)

GPRS MODE:



Channel 189 1GHz~10GHz(dBm)

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

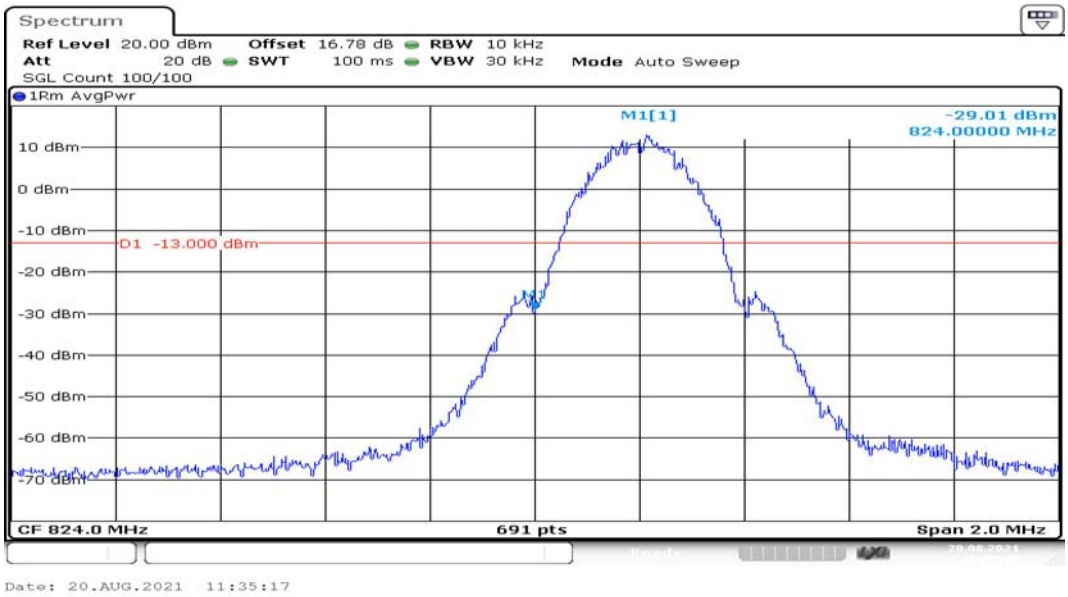


Channel 189 30MHz~1GHz(dBm)

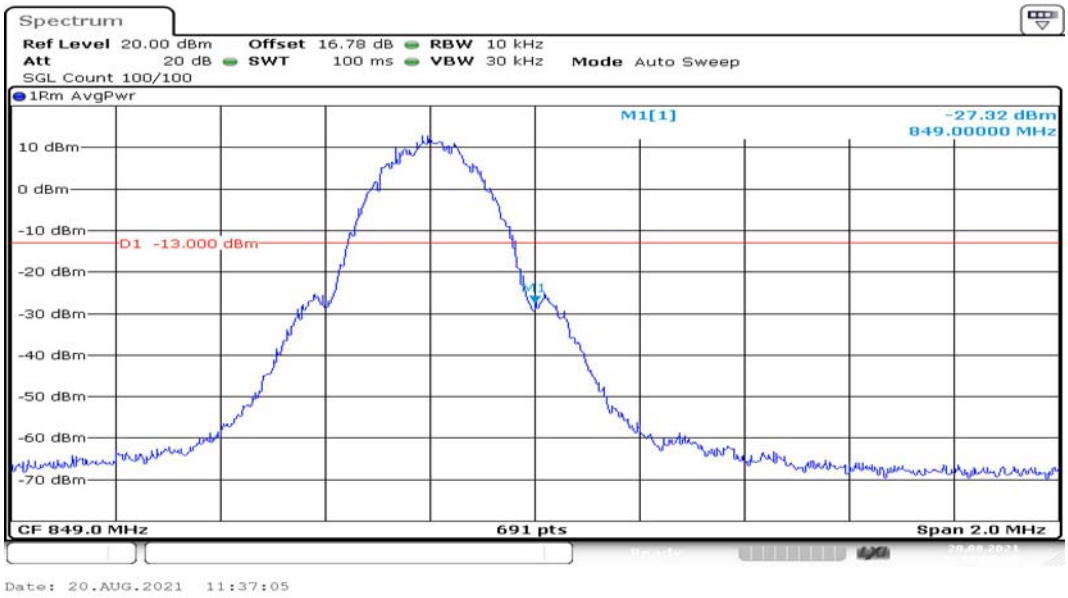
5. Band Edges Compliance

GSM850

GSM MODE:

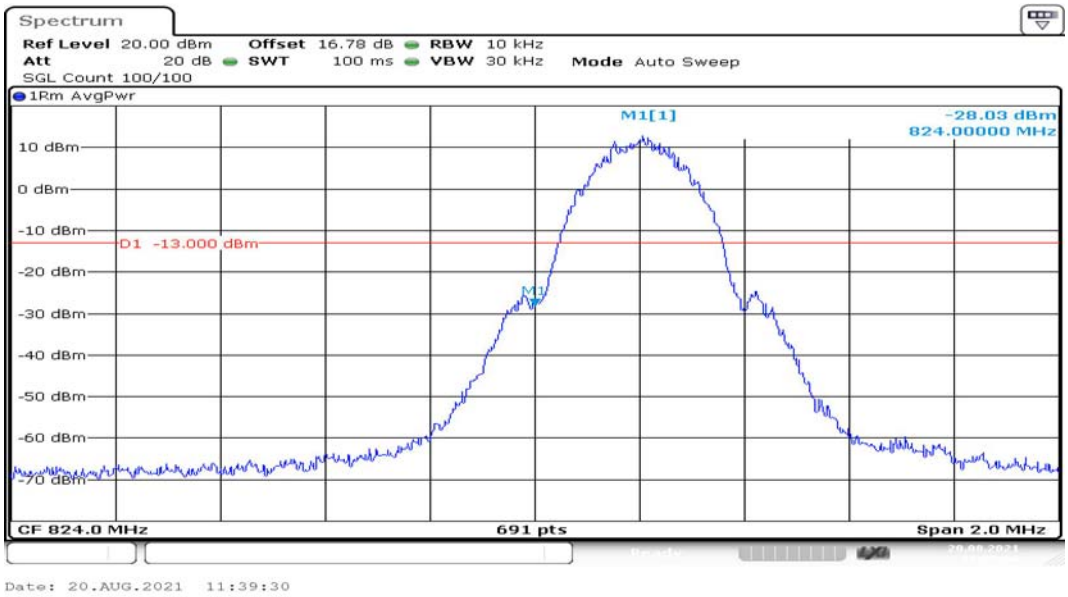


Channel 128

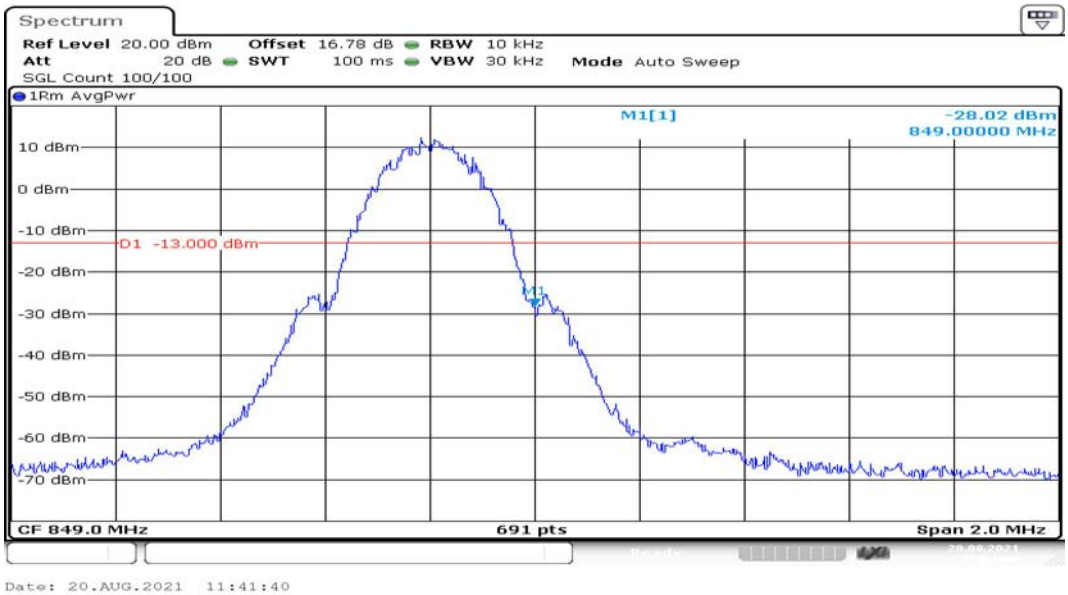


Channel 251

GPRS MODE:



Channel 128



Channel 251

6. Frequency Stability

GSM850

GSM MODE:

Temperature(°C)	Test Result (ppm)@NV		
	Channel 128	Channel 189	Channel 251
-30	-0.015	-0.014	-0.006
-20	-0.013	-0.009	-0.003
-10	-0.009	-0.014	0.001
0	-0.009	-0.005	0.006
+10	-0.010	-0.007	-0.001
+20	0.000	0.000	0.000
+30	-0.013	-0.011	0.000
+40	0.016	-0.004	-0.001
+50	-0.007	-0.010	-0.001
Voltage	Test Result (ppm)@NT		
	Channel 128	Channel 189	Channel 251
LV	-0.016	-0.016	-0.013
HV	-0.009	-0.006	0.004

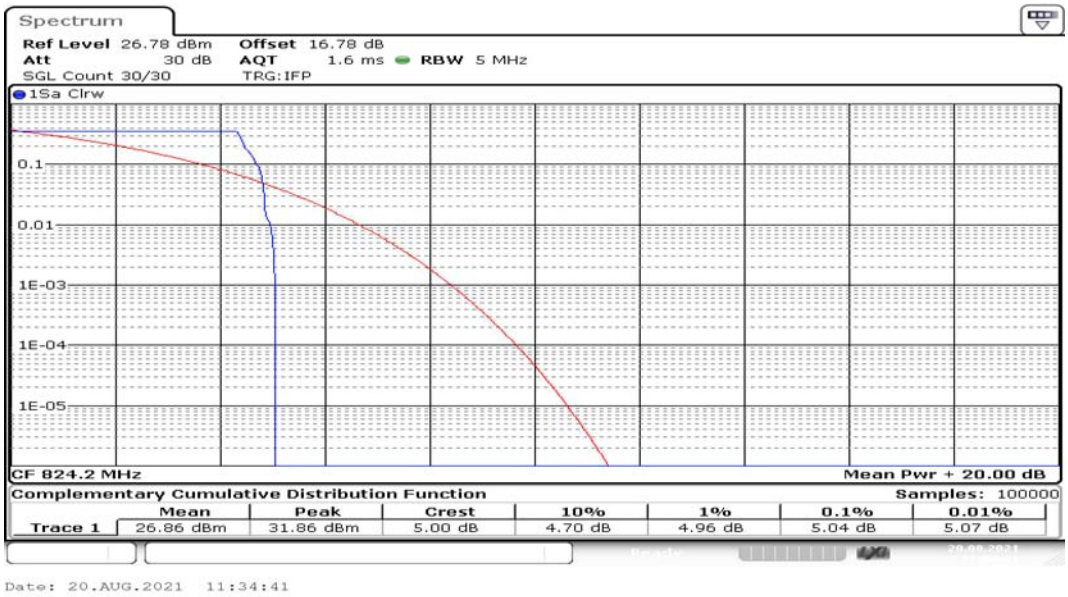
GPRS MODE:

Temperature(°C)	Test Result (ppm)@NV		
	Channel 128	Channel 189	Channel 251
-30	0.000	-0.012	-0.011
-20	-0.011	0.002	0.001
-10	0.008	0.004	-0.003
0	-0.002	-0.007	-0.010
+10	0.006	-0.002	-0.009
+20	0.000	0.000	0.000
+30	0.018	0.013	0.003
+40	0.013	0.015	0.010
+50	0.021	0.017	0.011
Voltage	Test Result (ppm)@NT		
	Channel 128	Channel 189	Channel 251
LV	0.006	-0.003	-0.012
HV	0.000	-0.006	-0.011

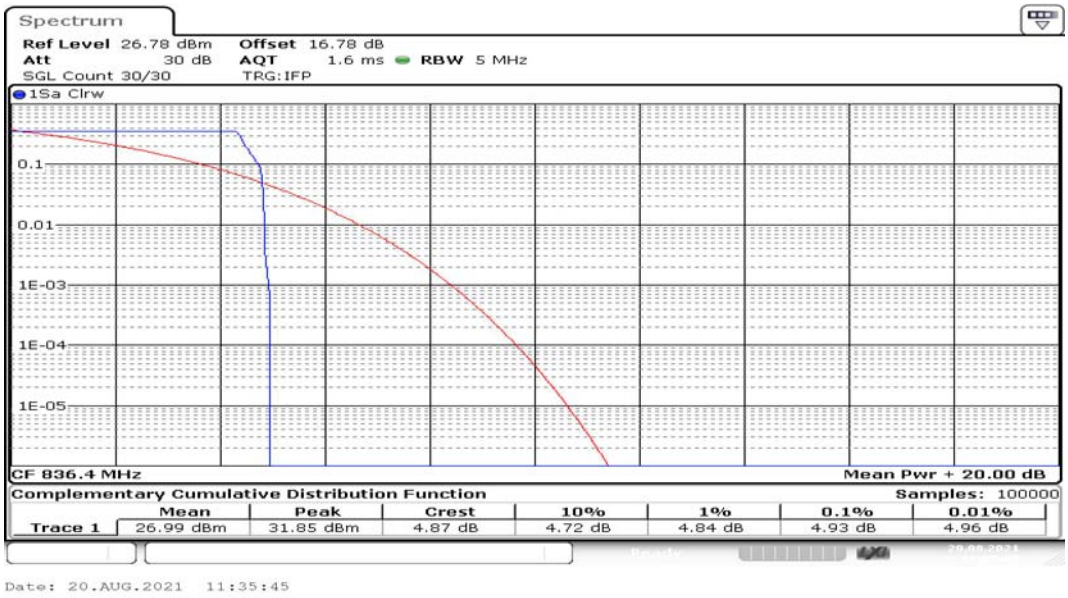
7. Peak-Average Ratio

GSM850

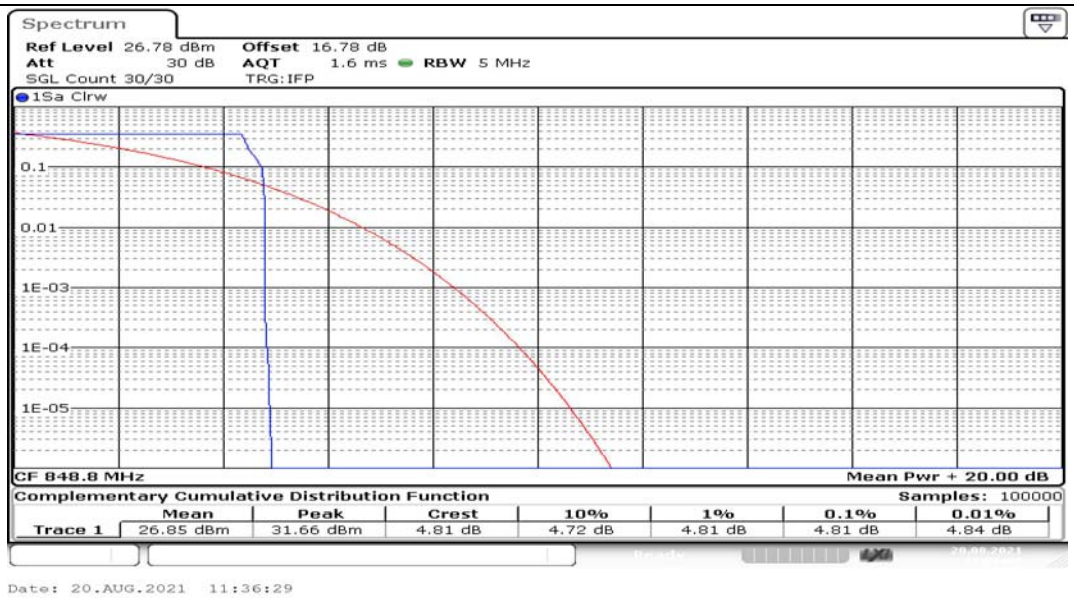
GSM MODE:



Channel 128

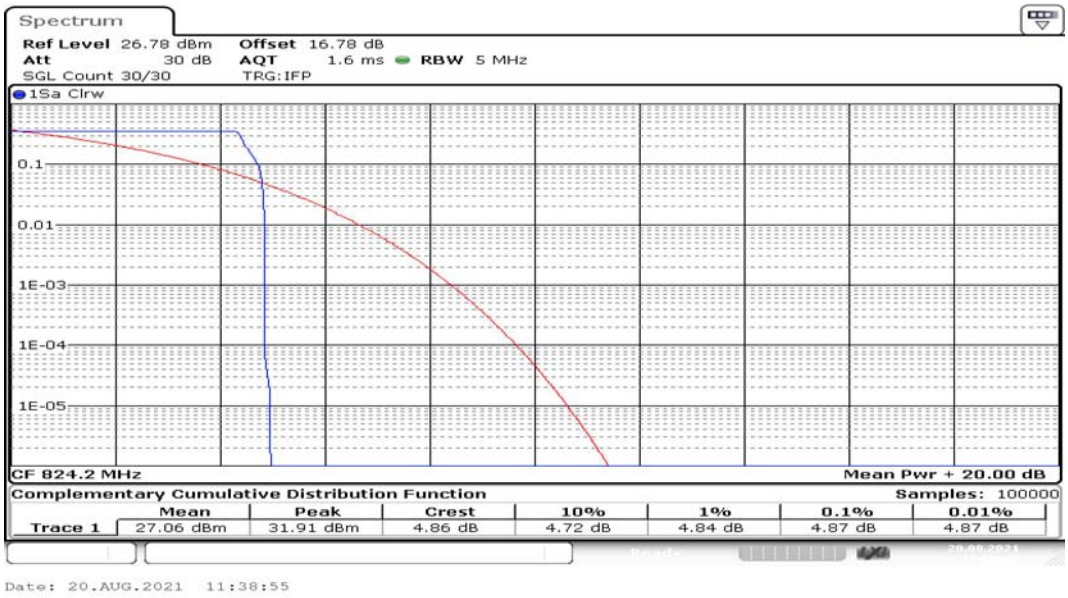


Channel 189

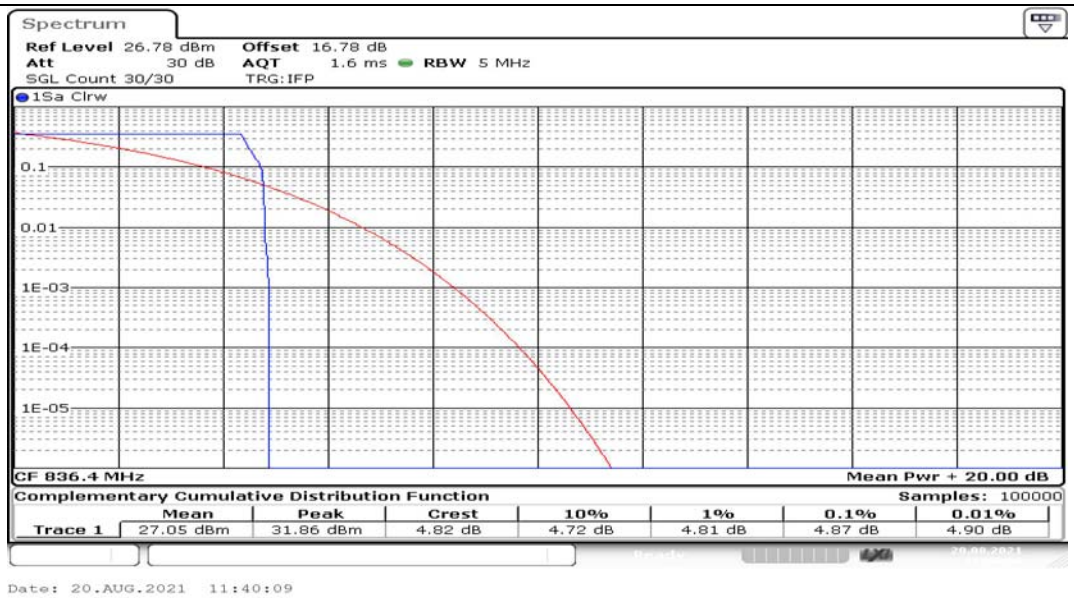


Channel 251

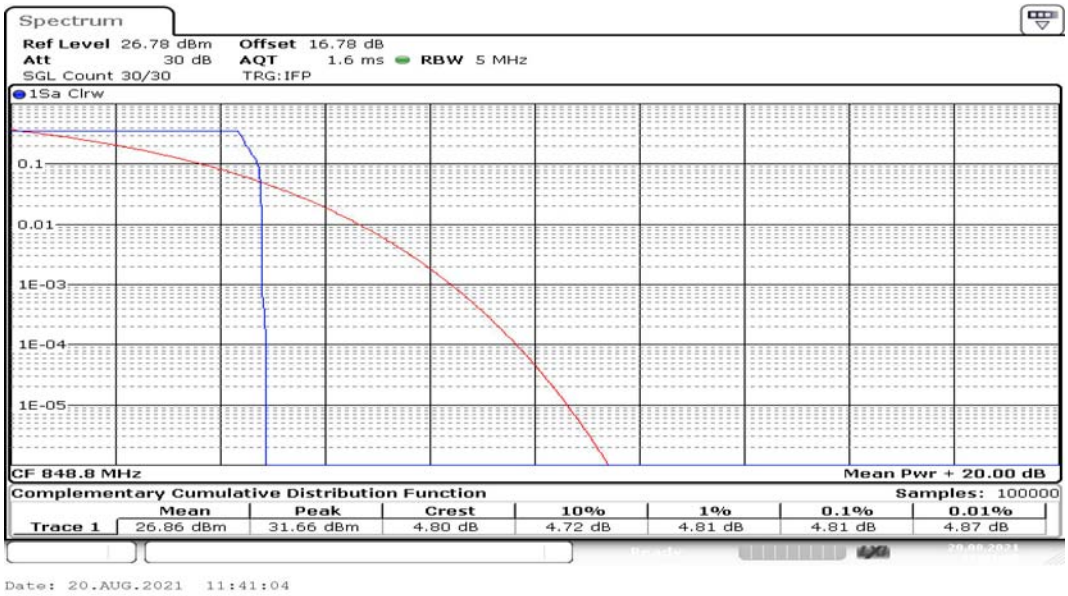
GPRS MODE:



Channel 128



Channel 189



Channel 251

8. Effective Radiated Power and Effective Isotropic Radiated Power

GSM850

GSM Measured Power:

Carrier frequency (MHz)	Channel No.	Conducted Power (dBm)	ERP/EIRP (dBm)	ERP/EIRP (W)
824.2	128	32.41	24.26	0.27
836.4	189	32.41	24.26	0.27
848.8	251	32.32	24.17	0.26

GPRS Measured Power:

Carrier frequency (MHz)	Channel No.	TX Mode	Conducted Power (dBm)	ERP/EIRP (dBm)	ERP/EIRP (W)
824.2	128	4Downlink1uplink	32.67	24.52	0.283
836.4	189		32.56	24.41	0.276
848.8	251		32.35	24.20	0.263
824.2	128	3Downlink2uplink	30.23	22.08	0.161
836.4	189		30.11	21.96	0.157
848.8	251		30.14	21.99	0.158
824.2	128	2Downlink3uplink	28.36	20.21	0.105
836.4	189		28.23	20.08	0.102
848.8	251		28.34	20.19	0.104
824.2	128	1Downlink4uplink	27.11	18.96	0.079
836.4	189		27.09	18.94	0.078
848.8	251		27.19	19.04	0.080

GSM900 Result

1. RF Power Output

PCS1900

GSM Measured Power:

Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
1850.2	512	29.48
1880	661	29.29
1909.8	810	29.46

GPRS Measured Power:

Carrier frequency (MHz)	Channel No.	TX Mode	RF Power Output (dBm)
1850.2	512	4Downlink1uplink	29.59
1880	661		29.22
1909.8	810		29.33
1850.2	512	3Downlink2uplink	26.81
1880	661		26.64
1909.8	810		27.00
1850.2	512	2Downlink3uplink	24.83
1880	661		24.54
1909.8	810		24.84
1850.2	512	1Downlink4uplink	23.88
1880	661		23.66
1909.8	810		23.91

2. Occupied Bandwidth

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	244.57

GPRS MODE:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (kHz)
1850.2	512	250.36
1880	661	235.89
1909.8	810	247.47

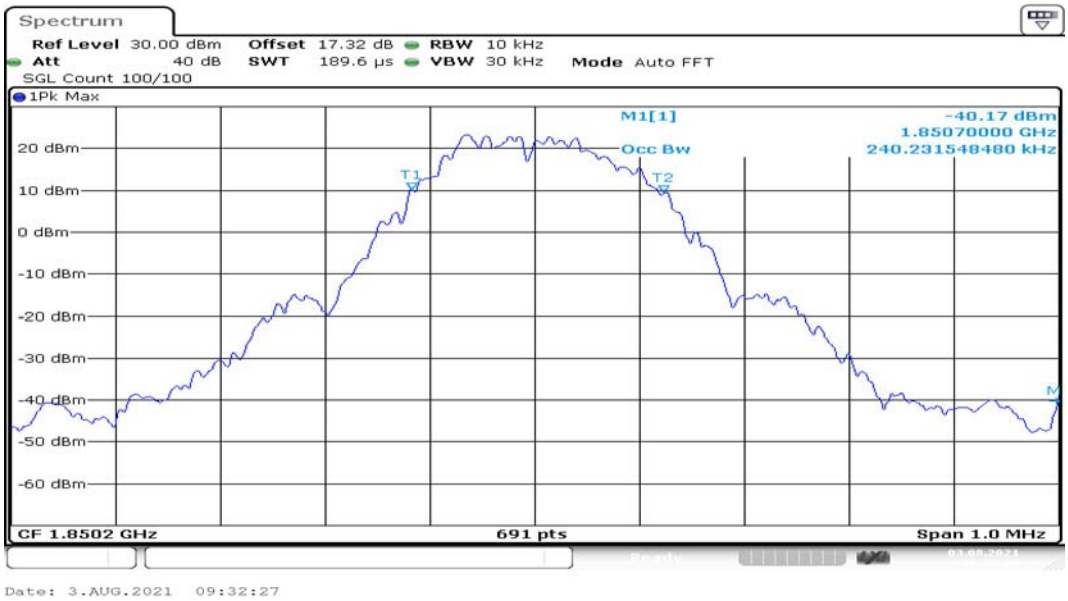
PCS1900
GSM MODE:

Channel 512

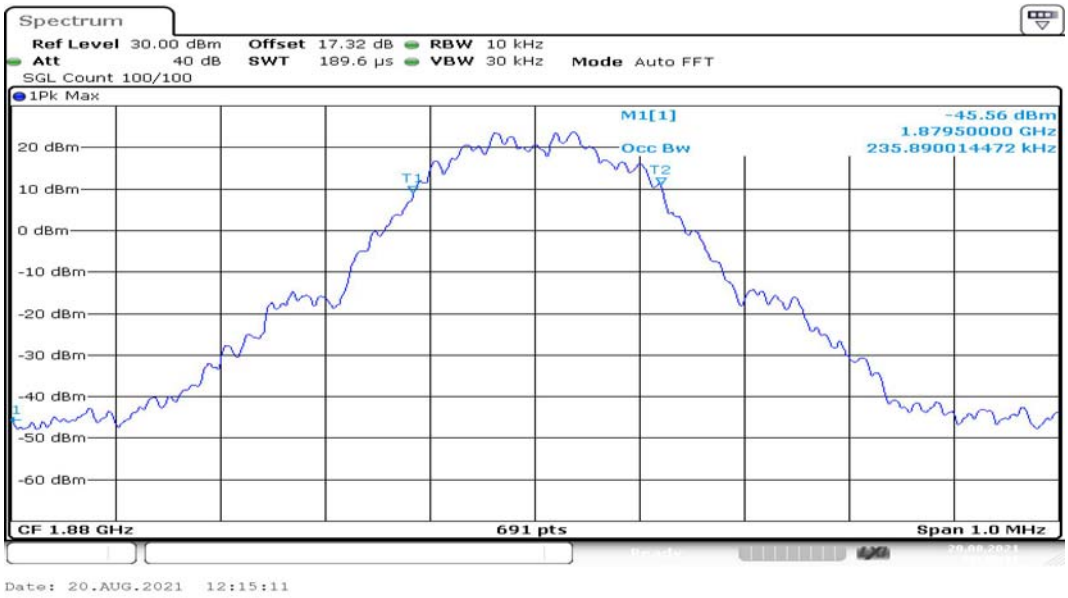
Channel 661

Channel 810

GPRS MODE:



Channel 512



Channel 661

Spectrum
Ref Level 30.00 dBm Offset 17.32 dB RBW 10 kHz
Att 40 dB SWT 189.6 µs VBW 30 kHz Mode Auto FFT
SGL Count 100/100
1Pk Max
M1[1] -46.84 dBm
1.91030000 GHz
247.467438495 kHz
Occ Bw
T1
T2
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
CF 1.9098 GHz
691 pts
Span 1.0 MHz
Date: 20.AUG.2021 12:16:08

Channel 810

3. Emission Bandwidth

PCS1900

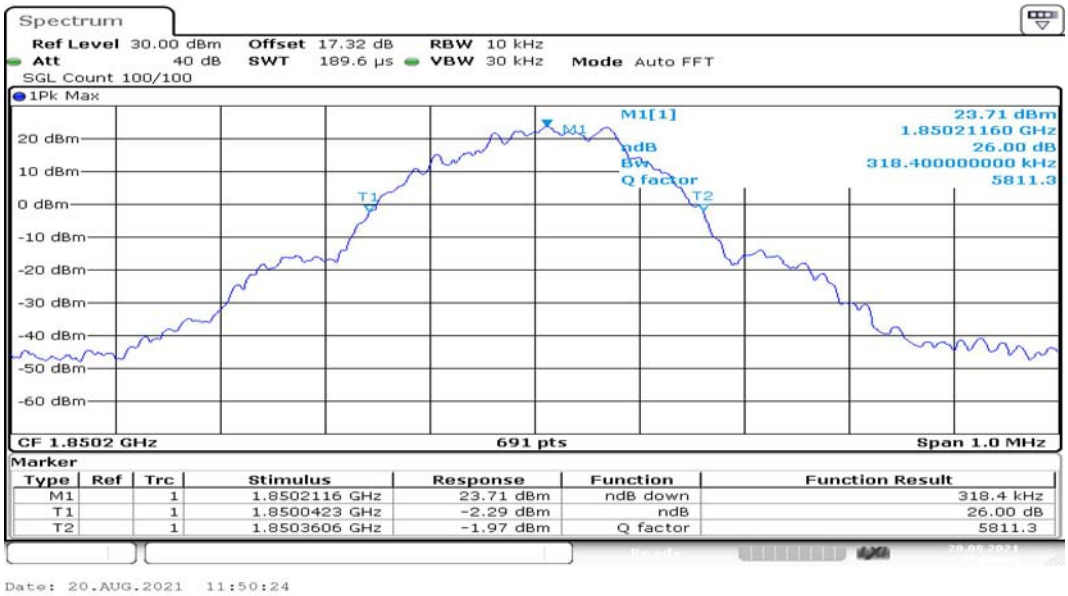
GSM MODE:

Carrier frequency (MHz)	Channel No.	Bandwidth of -26dB transmitter power(kHz)
1850.2	512	318.40
1880	661	312.60
1909.8	810	309.70

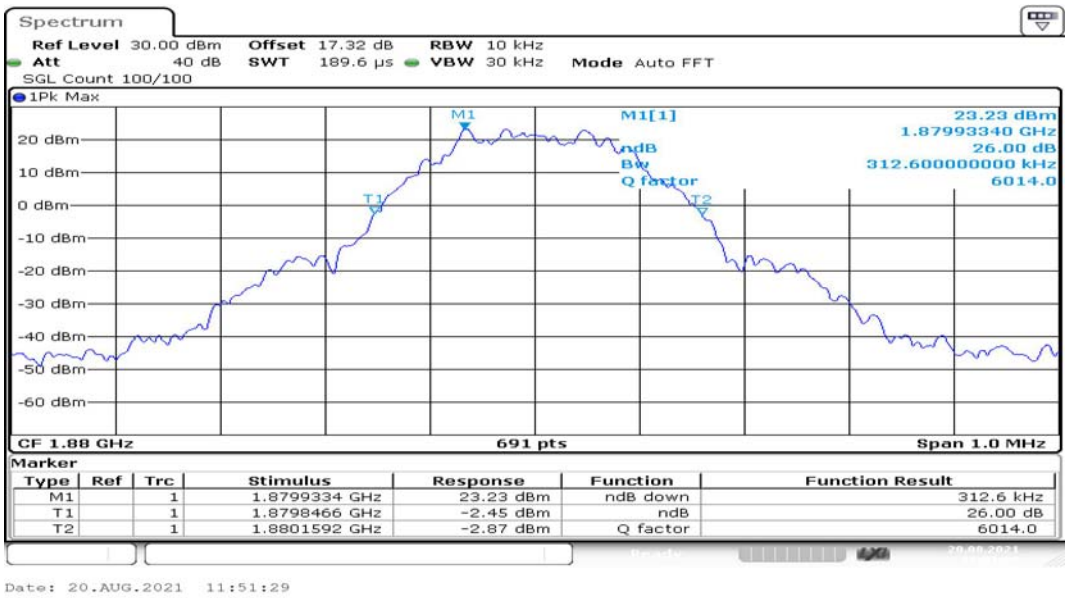
GPRS MODE:

Carrier frequency (MHz)	Channel No.	Bandwidth of -26dB (kHz)
1850.2	512	316.90
1880	661	312.60
1909.8	810	314.00

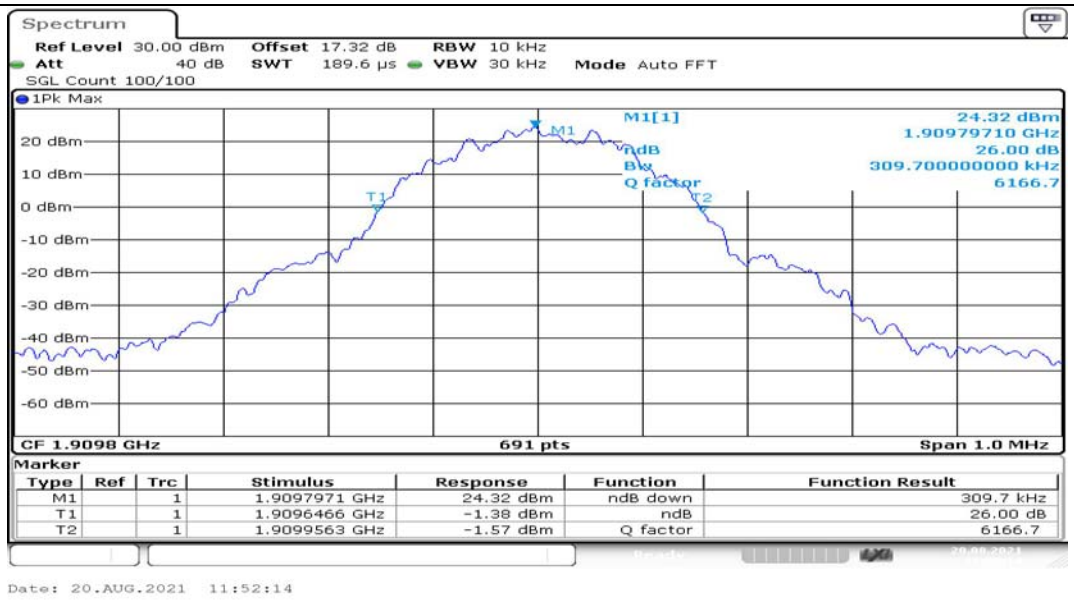
PCS1900
GSM MODE:



Channel 512

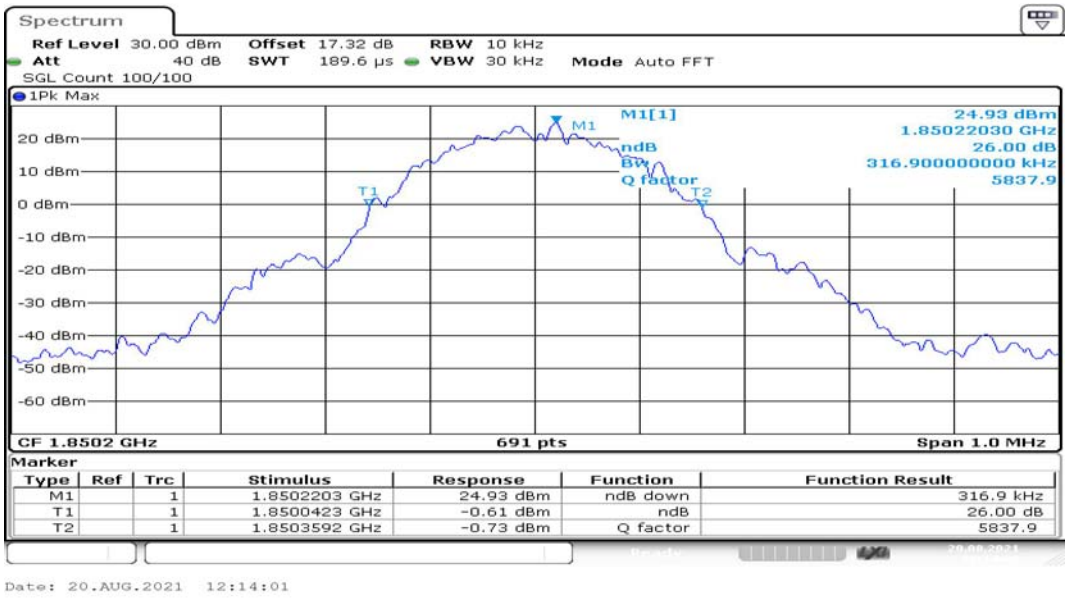


Channel 661

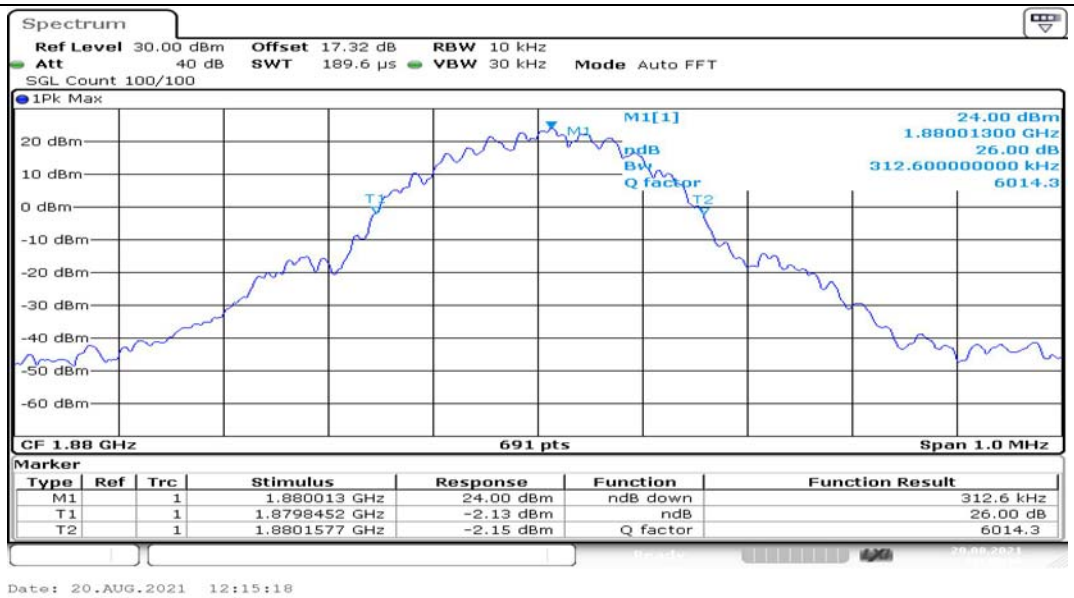


Channel 810

GPRS MODE:

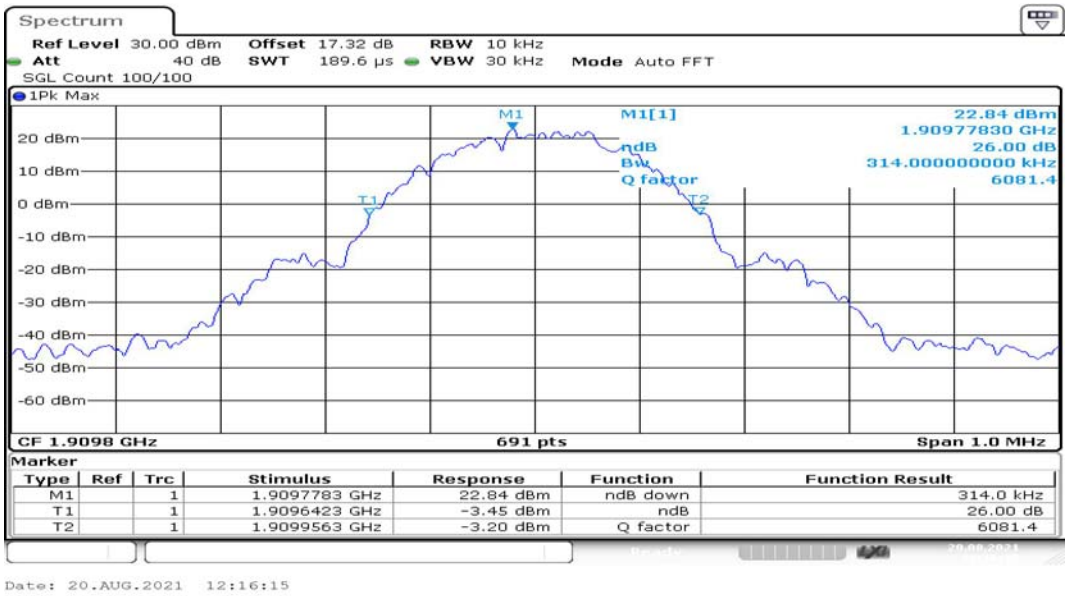


Channel 512



Date: 20.AUG.2021 12:15:18

Channel 661



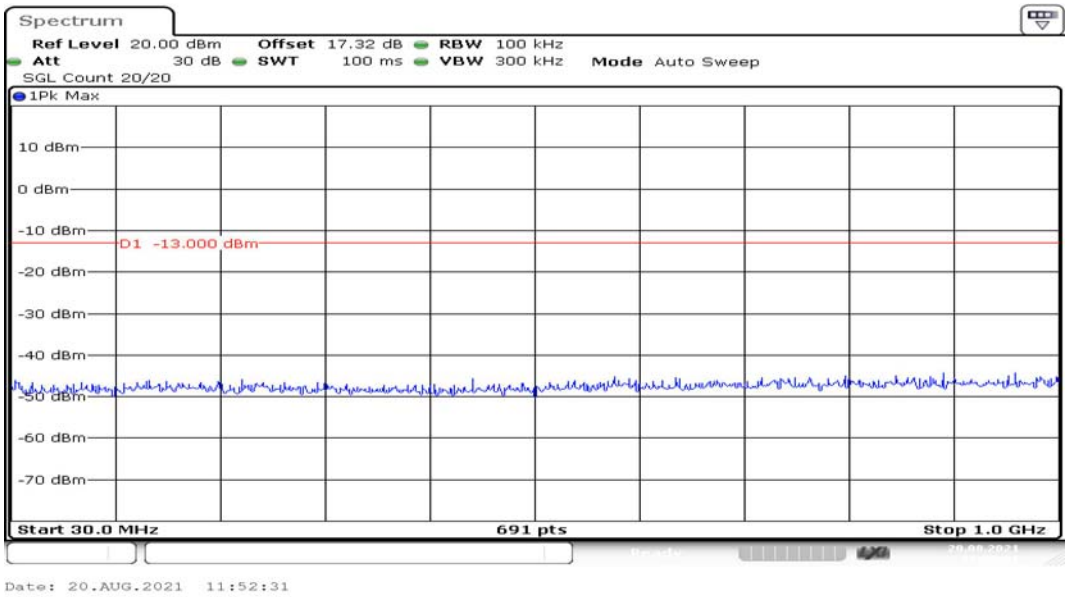
Date: 20.AUG.2021 12:16:15

Channel 810

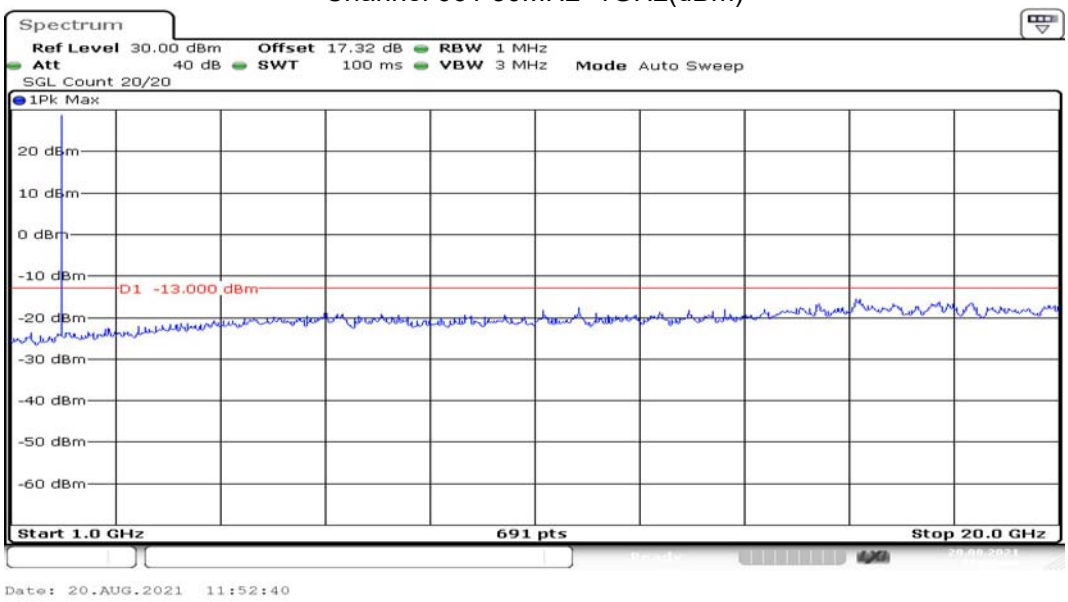
4. Spurious Emissions at antenna terminal

PCS1900

GSM MODE:



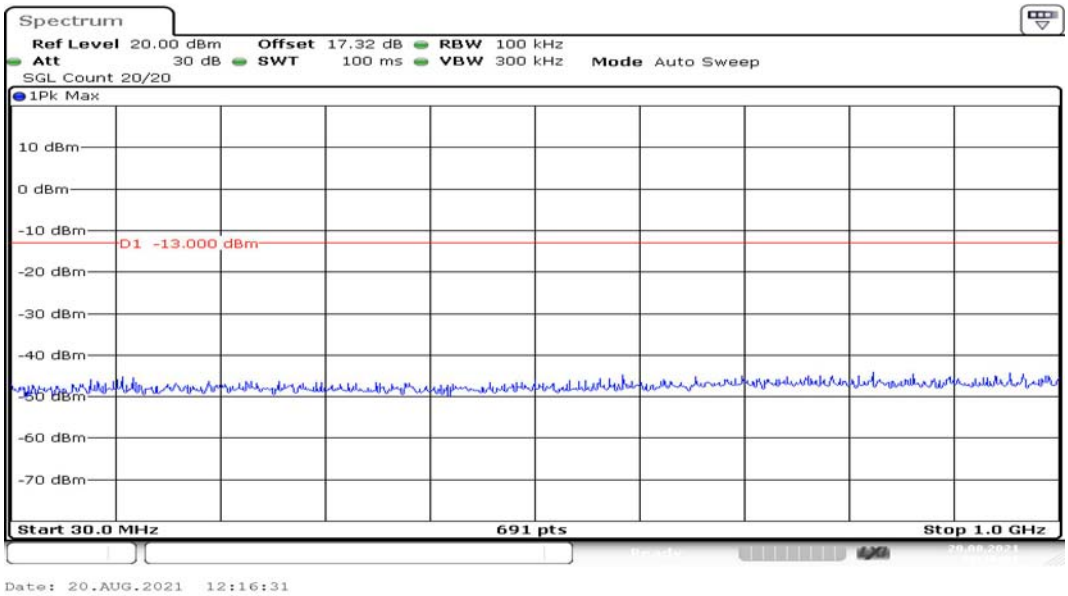
Channel 661 30MHz~1GHz(dBm)



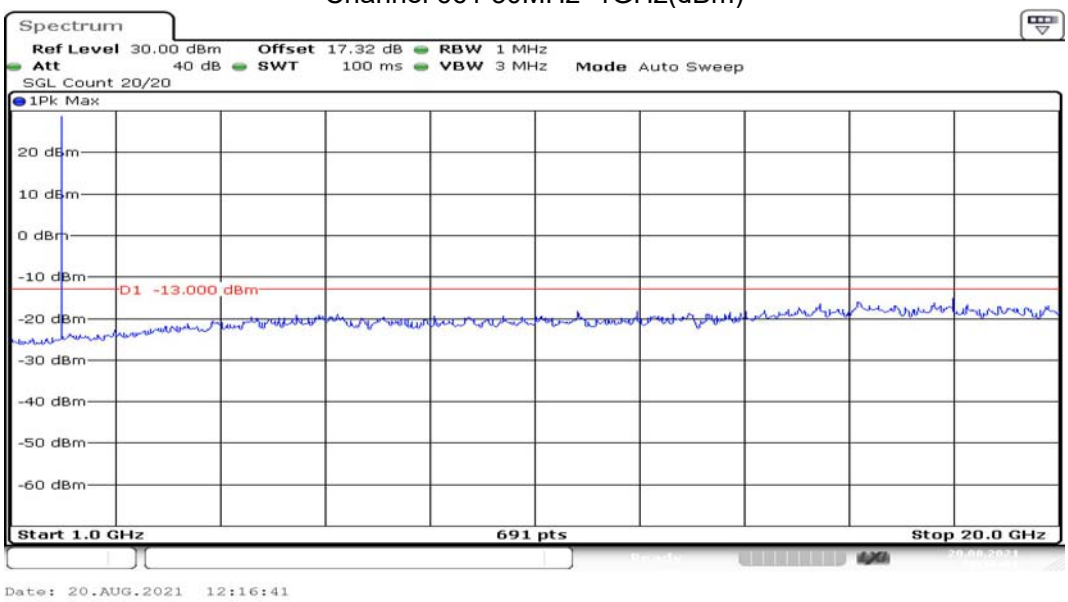
Channel 661 1GHz~20GHz(dBm)

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

GPRS MODE:



Channel 661 30MHz~1GHz(dBm)

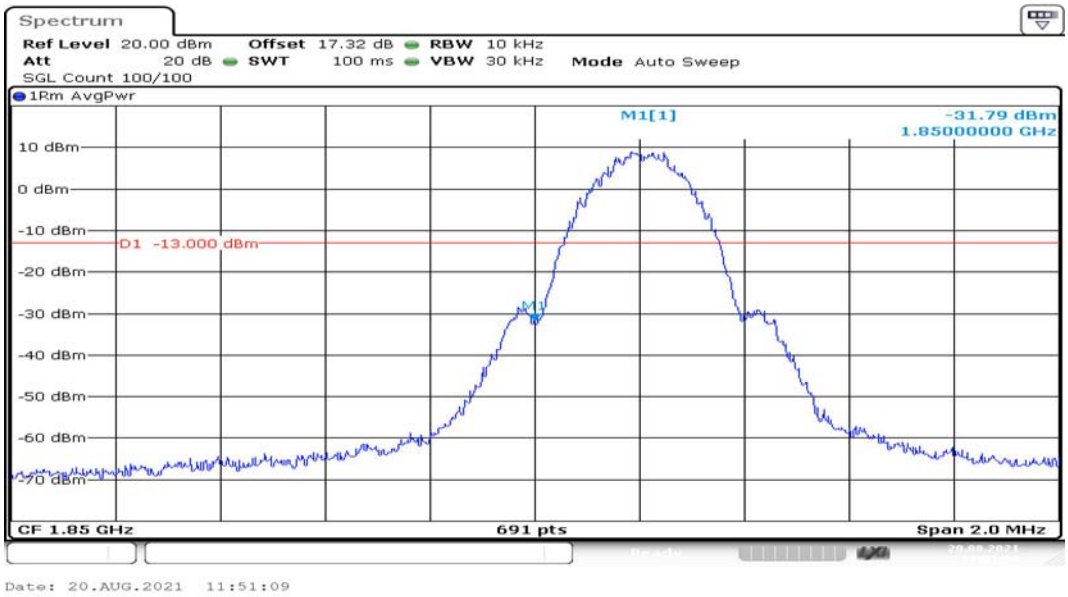


Channel 661 1GHz~20GHz(dBm)

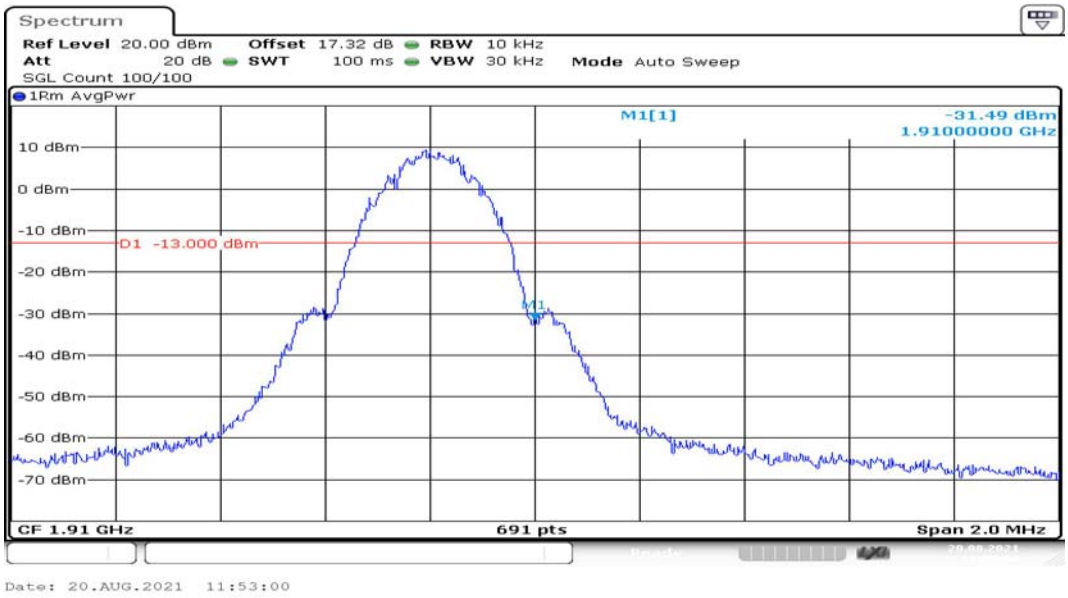
Note: The signal beyond the limit is the signal transmitted by EUT.

5. Band Edges Compliance

PCS1900
GSM MODE:

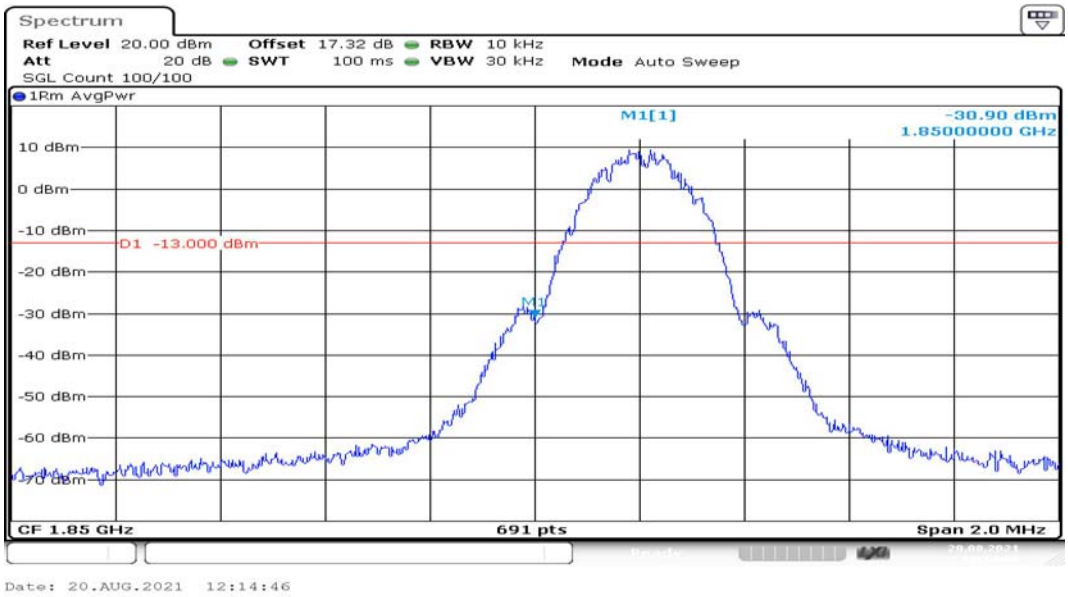


Channel 512

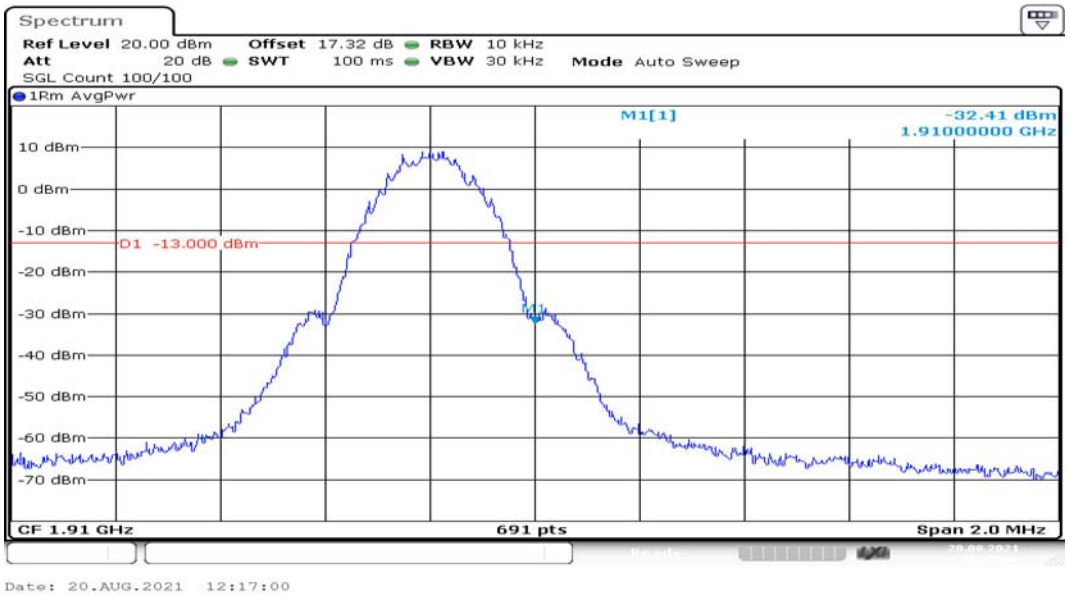


Channel 810

GPRS MODE:



Channel 512



Channel 810

6. Frequency Stability

PCS1900

GSM MODE:

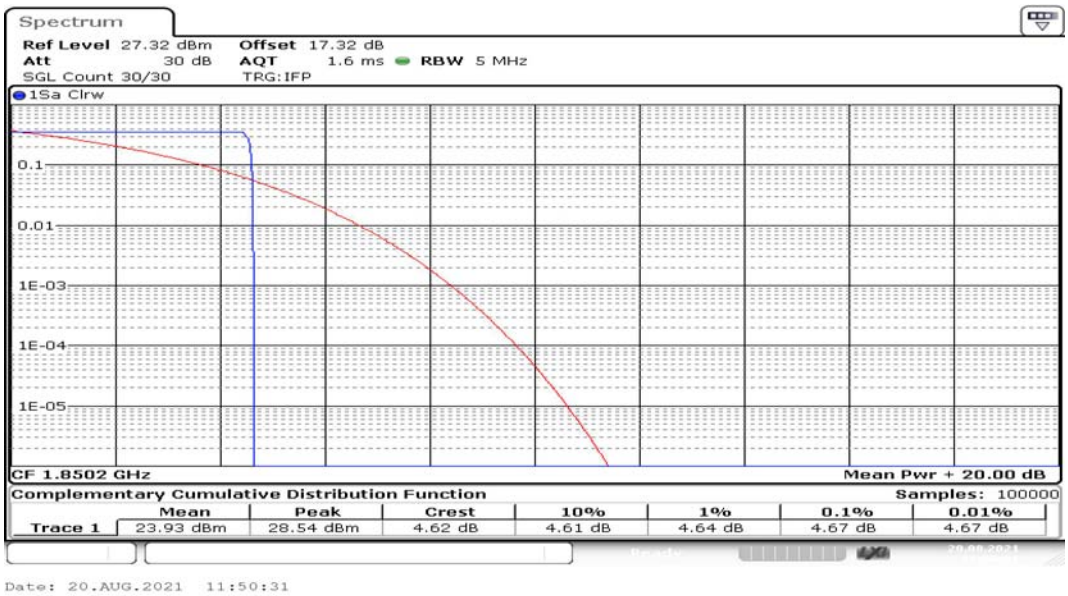
Temperature(°C)	Test Result (ppm)@NV		
	Channel 512	Channel 661	Channel 810
-30	0.004	0.000	-0.012
-20	0.001	0.000	-0.010
-10	-0.003	-0.002	-0.015
0	-0.004	-0.003	-0.008
+10	-0.009	-0.002	-0.015
+20	0.000	0.000	0.000
+30	-0.004	-0.004	-0.010
+40	-0.004	0.003	-0.009
+50	-0.006	0.000	-0.012
Voltage	Test Result (ppm)@NT		
	Channel 512	Channel 661	Channel 810
LV	-0.007	-0.001	-0.013
HV	-0.004	0.000	-0.010

GPRS MODE:

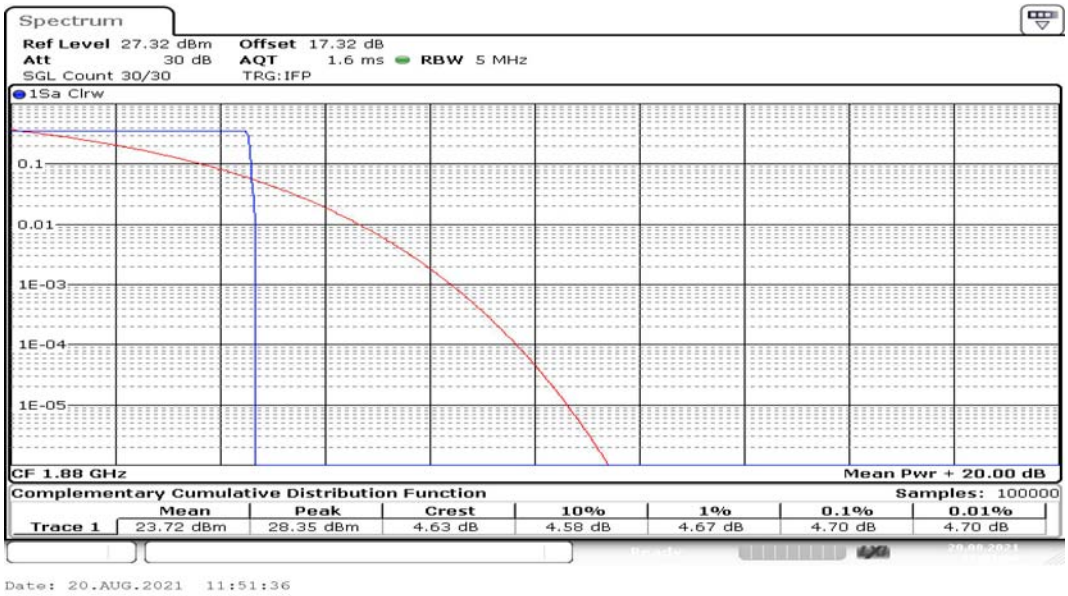
Temperature(°C)	Test Result (ppm)@NV		
	Channel 512	Channel 661	Channel 810
-30	-0.005	-0.004	0.000
-20	0.002	0.002	0.003
-10	0.002	0.001	0.000
0	0.002	-0.002	0.001
+10	0.001	-0.003	0.001
+20	0.000	0.000	0.000
+30	0.003	-0.003	0.002
+40	0.000	0.002	0.002
+50	0.001	-0.001	0.004
Voltage	Test Result (ppm)@NT		
	Channel 512	Channel 661	Channel 810
LV	-0.003	0.000	0.000
HV	0.003	-0.001	0.002

7. Peak-Average Ratio

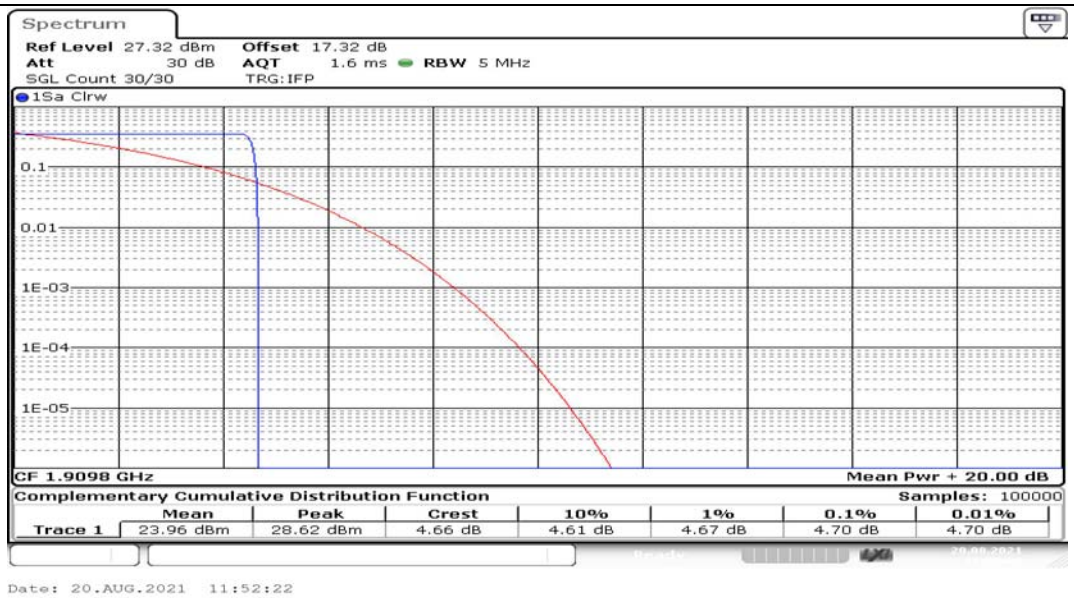
PCS1900
GSM MODE:



Channel 512

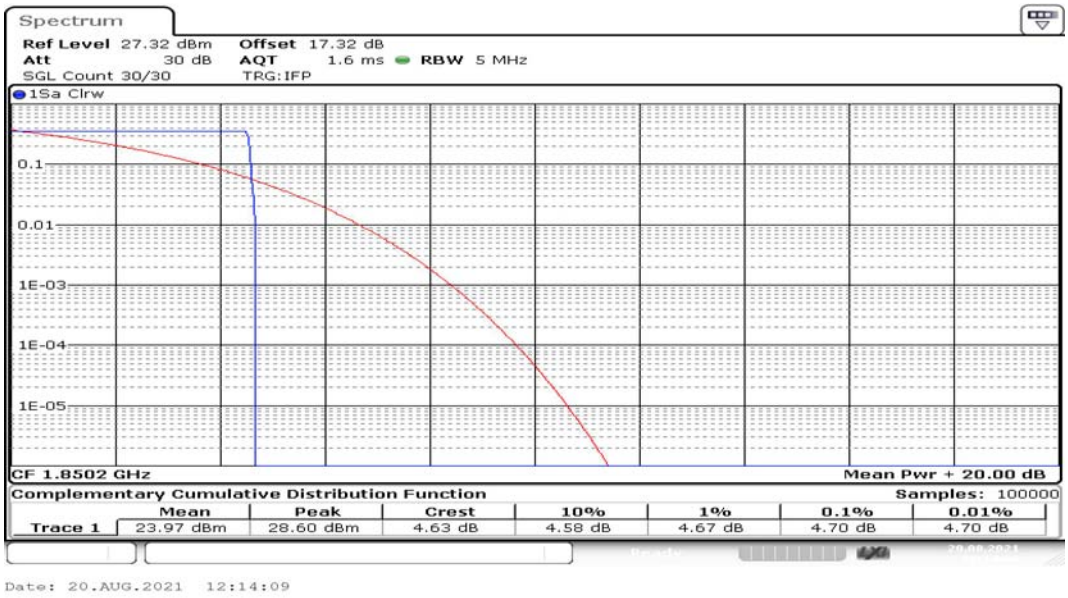


Channel 661

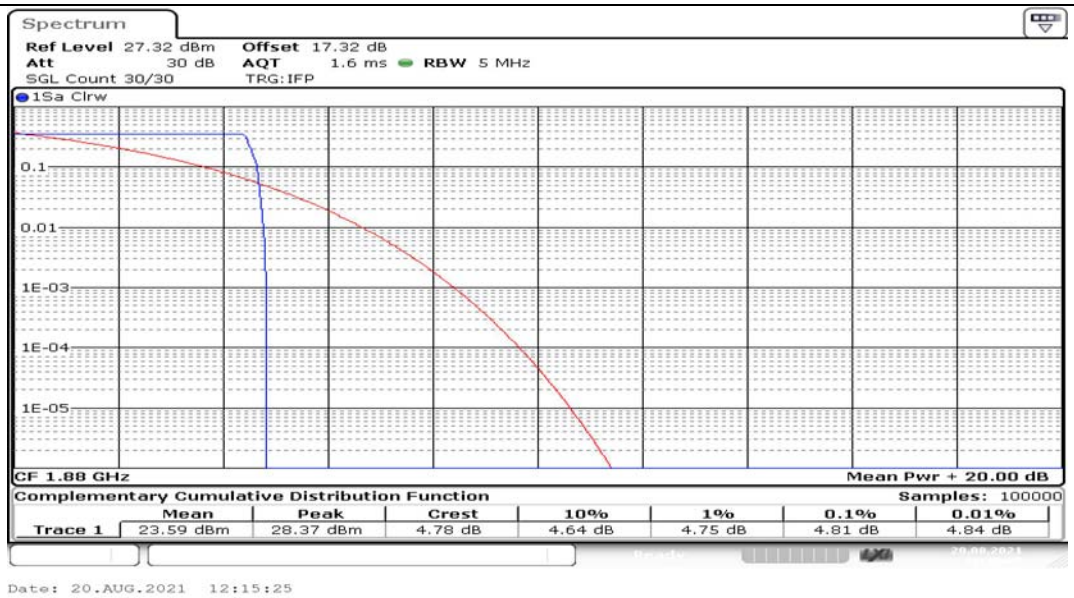


Channel 810

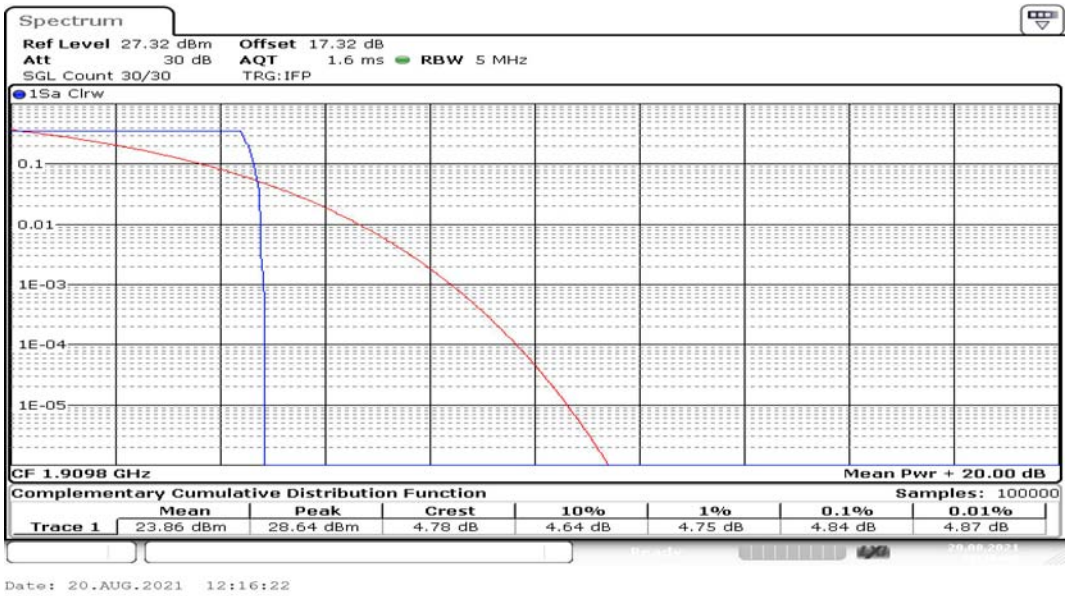
GPRS MODE:



Channel 512



Channel 661



Channel 810

8. Effective Radiated Power and Effective Isotropic Radiated Power

PCS1900

GSM Measured Power:

Carrier frequency (MHz)	Channel No.	Conducted Power (dBm)	ERP/EIRP (dBm)	ERP/EIRP (W)
1850.2	512	29.48	27.88	0.614
1880	661	29.29	27.69	0.587
1909.8	810	29.46	27.86	0.611

GPRS Measured Power:

Carrier frequency (MHz)	Channel No.	TX Moce	Conducted Power (dBm)	ERP/EIRP (dBm)	ERP/EIRP (W)
1850.2	512	4Downlink1uplink	29.59	27.99	0.629
1880	661		29.22	27.62	0.578
1909.8	810		29.33	27.73	0.593
1850.2	512	3Downlink2uplink	26.81	25.21	0.332
1880	661		26.64	25.04	0.319
1909.8	810		27.00	25.40	0.346
1850.2	512	2Downlink3uplink	24.83	23.23	0.210
1880	661		24.54	22.94	0.197
1909.8	810		24.84	23.24	0.211
1850.2	512	1Downlink4uplink	23.88	22.28	0.169
1880	661		23.66	22.06	0.161
1909.8	810		23.91	22.31	0.170

APPENDIX B – TEST DATA OF RADIATED EMISSION

Radiated Spurious Emissions

850 Test result:

GSM/GPRS MODE Channel 128:

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
1648.43	-52.89	-13	Vertical
1666.60	-51.32	-13	Vertical
2534.39	-44.29	-13	Vertical
2577.68	-43.83	-13	Vertical
8961.11	-39.30	-13	Vertical
9970.91	-36.84	-13	Vertical

GSM/GPRS MODE Channel 189:

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
1648.65	-53.02	-13	Vertical
1666.65	-51.17	-13	Vertical
2533.20	-44.59	-13	Vertical
2577.88	-44.07	-13	Vertical
8962.51	-39.29	-13	Vertical
9970.51	-36.77	-13	Vertical

GSM/GPRS MODE Channel 251:

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
1647.34	-52.58	-13	Vertical
1666.16	-50.98	-13	Vertical
2536.06	-44.79	-13	Vertical
2576.44	-43.72	-13	Vertical
8963.41	-39.24	-13	Vertical
9972.54	-36.43	-13	Vertical

1900 Test result:

GSM/GPRS MODE Channel 512

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2459.61	-49.32	-13	Vertical
2781.58	-47.00	-13	Vertical
3726.68	-40.35	-13	Vertical
6678.81	-39.22	-13	Vertical
9962.88	-36.92	-13	Vertical
17821.25	-33.87	-13	Vertical

GSM/GPRS MODE Channel 661:

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2460.50	-49.21	-13	Vertical
2778.50	-47.80	-13	Vertical
3727.61	-40.42	-13	Vertical
6676.03	-39.23	-13	Vertical
9961.32	-37.38	-13	Vertical
17819.74	-33.58	-13	Vertical

GSM/GPRS MODE Channel 810:

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
2458.67	-49.02	-13	Vertical
2778.58	-47.15	-13	Vertical
3725.43	-41.15	-13	Vertical
6677.44	-39.94	-13	Vertical
9960.10	-37.60	-13	Vertical
17818.50	-33.90	-13	Vertical

---End of Test Report---