TCT 通测检测 TESTING CENTRE TECHNOLOGY

TEST REPORT

FCC ID. ..... :	2AQRM2022001
Test Report No..... :	TCT220118E033
Date of issue..... :	Feb. 16, 2022
Testing laboratory ..... :	SHENZHEN TONGCE TESTING LAB
Testing location/ address:	TCT Testing Industrial Park Fuqiao 5th Industrial Zone, Fuhai Street, Bao'an District Shenzhen, Guangdong, 518103, People's Republic of China
Applicant's name..... :	FOXX Development Inc.
Address..... :	101 E. Park Blvd., Plano, TX 75074, United States
Manufacturer's name ... :	SHENZHEN JREN TECHNOLOGY CO., LTD
Address..... :	B Area, 9/F, A4 Building, Tianrui Industrial Park, No. 35, Fuyuan 1st Road, Zhancheng, Fuhai, Baoan District, Shenzhen, China.
Standard(s) ..... :	FCC CFR Title 47 Part 2 FCC CFR Title 47 Part22 FCC CFR Title 47 Part24 FCC CFR Title 47 Part27
Test item description ..... :	Tablet PC
Trade Mark ..... :	N/A
Model/Type reference..... :	T8 PLUS, T8M, T8S
Rating(s)..... :	Rechargeable Li-ion Battery DC 3.8V
Date of receipt of test item ..... :	Jan. 18, 2022
Date (s) of performance of test..... :	Jan. 18, 2022 - Feb. 16, 2022
Tested by (+signature) ... :	Rleo LIU
Check by (+signature).... :	Beryl ZHAO
Approved by (+signature):	Tomsin

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1. General Product Information

1.1. EUT description

Test item description .....:	Tablet PC
Model/Type reference.....:	T8 PLUS
Sample Number.....:	TCT220118E015-0102
3G Version .....:	WCDMA: R99 HSDPA: Release 5 HSUPA: Release 6
Tx Frequency.....:	GPRS 850: 824.2MHz ~ 848.8MHz GPRS 1900: 1850.2MHz ~ 1909.8MHz WCDMA Band V: 826.4MHz ~ 846.6MHz WCDMA Band IV: 1712.4MHz ~ 1752.6MHz WCDMA Band II: 1852.4MHz ~ 1907.6MHz
Rx Frequency .....:	GPRS 850: 869.2MHz ~ 893.8MHz GPRS 1900: 1930.2MHz ~ 1989.8MHz WCDMA Band V: 871.4MHz ~ 891.6MHz WCDMA Band IV: 2112.4MHz ~ 2152.6MHz WCDMA Band II: 1932.4MHz ~ 1987.6MHz
Maximum Output Power to Antenna.....:	GPRS850: 32.63dBm GPRS1900: 29.73dBm WCDMA Band V: 23.26dBm WCDMA Band IV: 23.38dBm WCDMA Band II: 23.37dBm
99% Occupied Bandwidth.....:	GPRS850 Class 8: 247KGXW GPRS1900 Class 8: 245KGXW WCDMA Band V: 4M20F9W WCDMA Band IV: 4M21F9W WCDMA Band II: 4M18F9W
Type of Modulation.....:	GPRS: GMSK WCDMA/HSDPA/HSUPA: QPSK
Antenna Type.....:	Internal Antenna
Antenna Gain.....:	GPRS 850: -0.7dBi GPRS 1900: 1.2dBi WCDMA Band V: -0.7dBi WCDMA Band IV: 1.0dBi WCDMA Band II: 1.2dBi
Rating(s).....:	Rechargeable Li-ion Battery DC 3.8V

Note: The antenna gain listed in this report is provided by applicant, and the test laboratory is not responsible for this parameter.

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1.2. Model(s) list

No.	Model No.	Tested with
1	T8 PLUS	☒
Other models	T8M, T8S	☐

Note: T8 PLUS is tested model, other models are derivative models. The models are identical in circuit and PCB layout, only different on the model names. So the test data of T8 PLUS can represent the remaining models.

1.3. Operation Frequency

GSM 850		PCS1900	
Channel:	Frequency (MHz)	Channel:	Frequency (MHz)
128	824.20	512	1850.20
129	824.40	513	1850.40
….	….	….	….
190	836.40	660	1879.80
190	836.60	661	1880.00
191	836.80	662	1880.20
…	…	…	…
250	848.60	809	1909.60
251	848.80	810	1909.80

WCDMA Band IV		WCDMA Band V		WCDMA Band II	
Channel:	Frequency (MHz)	Channel:	Frequency (MHz)	Channel:	Frequency (MHz)
1312	1712.4	4132	826.40	9262	1852.40
….	….	4133	826.60	9263	1852.60
….	….	….	….	….	….
….	….	4182	836.40	9399	1879.80
1413	1732.6	4182	836.60	9400	1880.00
….	….	4184	836.80	9401	1880.20
….	….	…	…	…	…
1513	1752.6	4233	846.60	9538	1907.60

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2. Test Result Summary

Requirement	CFR 47 Section	Result
Conducted Output Power	§22.913; §2.1046 §24.232; §27.50(d)	PASS
Peak-to-Average Ratio	§2.1046; §24.232(d) §22.913; §27.50(d)	PASS
Effective Radiated Power	§2.1046; §22.913(a) §24.232; §27.50(d)	PASS
Equivalent Isotropic Radiated Power	§2.1046; §22.913(a) §24.232; §27.50(d)	PASS
Occupied Bandwidth	§2.1049	PASS
Band Edge	§2.1051 §22.917(a) §24.238(a) §27.53(g)	PASS
Conducted Spurious Emission	§2.1051; §22.917 §24.238; §27.53(h)	PASS
Field Strength of Spurious Radiation	§2.1053; §22.917(a) §24.238; §27.53(g)	PASS
Frequency Stability for Temperature & Voltage	§2.1055;§22.355 §24.235; ;§27.54	PASS

Note:

1. PASS: Test item meets the requirement.

2. Fail: Test item does not meet the requirement.

3. N/A: Test case does not apply to the test object.

4. The test result judgment is decided by the limit of test standard.

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3. General Information

3.1. Test environment and mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	56 % RH
Atmospheric Pressure:	1010 mbar
Remark: This product has a built-in rechargeable battery, so in an independent test, the EUT battery was fully-charged.	

Keep the EUT in communication with CMU200 and select channel with modulation
All modes and data rates and positions were investigated.
Test modes are chosen to be reported as the worst case configuration below:

Test Mode		
Band	**Radiated TCs**	**Conducted TCs**
GSM 850	GPRS class 12 Link	GPRS class 12 Link
PCS 1900	GPRS class 12 Link	GPRS class 12 Link
WCDMA Band V	RMC 12.2Kbps Link	RMC 12.2Kbps Link
WCDMA Band IV	RMC 12.2Kbps Link	RMC 12.2Kbps Link
WCDM Band II	RMC 12.2Kbps Link	RMC 12.2Kbps Link

Antenna port conducted and radiated test items were performed according to KDB 971168 D01 Power Meas. License Digital Systems v03r01 with maximum output power. Radiated measurements were performed with rotating EUT in different three orthogonal test planes to find the maximum emission. The sample was placed (0.8m below 1GHz, 1.5m above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarization. The emissions worst-case (Z axis)are shown in Test Results of the following pages.

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3.2. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
/	/	/	/	/

Note:

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.

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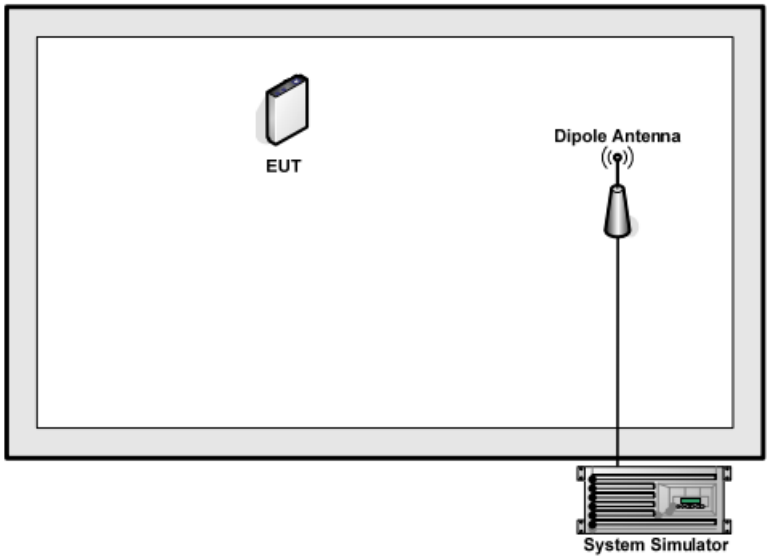
3.3. Configuration of Tested System



3.4. Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between RF conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level will be exactly the RF output level. The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

The following shows an offset computation example with RF cable loss 3 dB and a 5dB attenuator.

Example: *Offset (dB) = RF cable loss (dB) + attenuator factor (dB).*

= 8(dB)

4. Facilities and Accreditations

4.1. Facilities

The test facility is recognized, certified, or accredited by the following organizations:

- FCC - Registration No.: 645098

  SHENZHEN TONGCE TESTING LAB

  Designation Number: CN1205

  The testing lab has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC - Registration No.: 10668A-1

  SHENZHEN TONGCE TESTING LAB

  CAB identifier: CN0031

  The testing lab has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

4.2. Location

SHENZHEN TONGCE TESTING LAB

Address: TCT Testing Industrial Park Fuqiao 5th Industrial Zone, Fuhai Street, Bao'an District Shenzhen, Guangdong, 518103, People's Republic of China

TEL: +86-755-27673339

4.3. Measurement Uncertainty

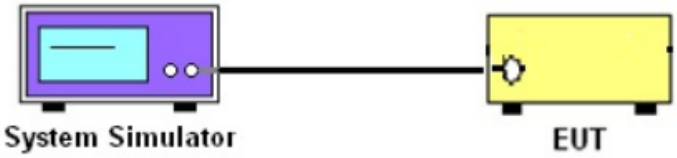
The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	± 3.10 dB
2	RF power, conducted	± 0.12 dB
3	Spurious emissions, conducted	± 0.11 dB
4	All emissions, radiated(<1 GHz)	± 4.56 dB
5	All emissions, radiated(1 GHz - 18 GHz)	± 4.22 dB
6	All emissions, radiated(18 GHz- 40 GHz)	± 4.36 dB
7	Temperature	± 0.1°C
8	Humidity	± 1.0%

5. Test Results and Measurement Data

5.1. Conducted Output Power Measurement

5.1.1. Test Specification

Test Requirement:	FCC part 22.913(a) and FCC part 24.232(b) FCC part 27.50(d);
Test Method:	FCC KDB 971168 D01 v03r01
Operation mode:	Refer to item 3.1
Limits:	GSM 850: 7W PCS 1900: 2W WCDMA Band V:7W WCDMA Band II: 2W WCDMA Band IV:1W
Test Setup:	
Test Procedure:	1. The transmitter output port was connected to the system simulator. 2. Set EUT at maximum power through system simulator. 3. Select lowest, middle, and highest channels for each band and different modulation. 4. Measure the maximum burst average power for GSM and maximum average power for other modulation signal.
Test Result:	PASS

5.1.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Universal Radio Communication Tester	R&S	CMU200	110188	Jul. 07, 2022
RF cable (9kHz-40GHz)	TCT	RE-05	N/A	Jul. 07, 2022
Antenna Connector	TCT	RFC-02	N/A	Jul. 07, 2022

5.1.3. Test data

Conducted Power Measurement Results:

Average Conducted Power (*Unit: dBm)						
Band	**GSM850**			**PCS 1900**		
Channel	128	190	251	512	661	810
Frequency(MHz)	824.2	836.6	848.8	1850.2	1880.0	1909.8
GPRS class8	32.46	32.59	32.63	29.67	29.59	29.73
GPRS class10	31.71	31.80	31.88	29.09	28.95	28.96
GPRS class11	29.63	29.67	29.73	27.15	27.02	27.08
GPRS class12	28.52	28.57	28.65	26.60	26.52	26.54

Average Conducted Power (*Unit: dBm)						
Band	**WCDMA Band V**			**WCDMA Band II**		
Channel	4132	4182	4233	9262	9400	9538
Frequency(MHz)	826.4	836.4	846.6	1852.4	1880.0	1907.6
WCDMA RMC 12.2K	23.19	23.19	23.26	23.14	23.37	23.32
HSDPA Subtest-1	22.23	22.20	22.29	22.13	22.41	22.35
HSDPA Subtest-2	20.05	20.06	19.95	20.24	20.56	20.57
HSDPA Subtest-3	19.34	19.27	19.48	19.27	19.71	19.54
HSDPA Subtest-4	18.97	18.90	19.05	19.18	19.29	19.07
HSUPA Subtest-1	22.22	22.19	22.29	22.15	22.39	22.37
HSUPA Subtest-2	21.62	20.26	21.76	21.50	21.82	21.66
HSUPA Subtest-3	20.19	20.22	20.41	20.20	20.48	20.45
HSUPA Subtest-4	19.51	19.38	19.59	19.34	19.54	19.47
HSUPA Subtest-5	18.98	18.96	18.93	18.85	19.09	18.96

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Conducted Power (*Unit: dBm)			
Band	WCDMA Band IV		
Channel	1312	1413	1513
Frequency(MHz)	1712.4	1732.6	1752.6
WCDMA RMC 12.2K	23.36	23.38	23.29
HSDPA Subtest-1	22.40	22.39	22.30
HSDPA Subtest-2	20.39	20.41	20.46
HSDPA Subtest-3	19.87	19.50	19.71
HSDPA Subtest-4	19.27	19.06	19.20
HSUPA Subtest-1	22.36	22.38	22.31
HSUPA Subtest-2	21.74	21.79	21.72
HSUPA Subtest-3	20.49	20.56	20.43
HSUPA Subtest-4	19.72	19.64	19.53
HSUPA Subtest-5	19.07	19.19	19.10

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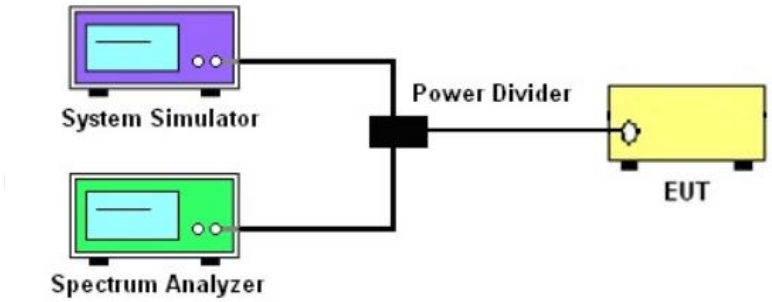
5.2. Peak to Average Ratio

5.2.1. Test Specification

Test Requirement:	FCC part 24.232(d) ; FCC part 22.913; FCC part 27.50(d);
Test Method:	ANSI C63.26:2013
Operation mode:	Refer to item 3.1
Limit:	The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.
Test Setup:	
Test Procedure:	1. The testing follows FCC KDB 971168 D01v03r01 Section 5.7.1. 2. The EUT was connected to spectrum analyzer and system simulator via a power divider. 3. Set EUT to transmit at maximum output power. 4. For GSM/EGPRS operating modes, signal gating is implemented on the spectrum analyzer by triggering from the system simulator. 5. Set the CCDF (Complementary Cumulative Distribution Function) option of the spectrum analyzer. Record the maximum PAPR level associated with a probability of 0.1%.
Test Result:	PASS

5.2.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Universal Radio Communication Tester	R&S	CMU200	110188	Jul. 07, 2022
Spectrum Analyzer	R&S	FSU	200054	Jul. 18, 2022
RF cable (9kHz-40GHz)	TCT	RE-05	N/A	Jul. 07, 2022
Antenna Connector	TCT	RFC-02	N/A	Jul. 07, 2022

5.2.3. Test Data

Cellular Band			
Mode	GSM 850		
Channel	128	190	251
Frequency (MHz)	824.2	836.6	848.8
Peak-to-Average Ratio (dB)	7.69	7.69	7.69

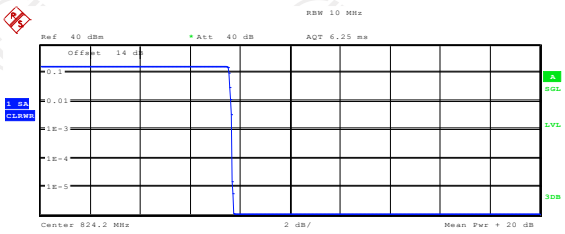
PCS Band			
Mode	GSM 1900		
Channel	512	661	810
Frequency (MHz)	1850.2	1880	1909.8
Peak-to-Average Ratio (dB)	7.82	7.66	7.82

Cellular Band									
Mode	WCDMA Band V (HSUPA)			WCDMA Band IV (HSUPA)			WCDMA Band II (HSUPA)		
Channel	4132	4182	4233	1312	1413	1513	9262	9400	9538
Frequency (MHz)	826.4	836.4	846.6	1712.4	1732.6	1752.6	1852.4	1880	1907.6
Peak-to-Average Ratio (dB)	3.11	3.21	3.01	2.34	3.04	1.89	3.08	2.95	3.04

Test plots as follows:

GSM 850

Peak-to-Average Ratio on Channel 128

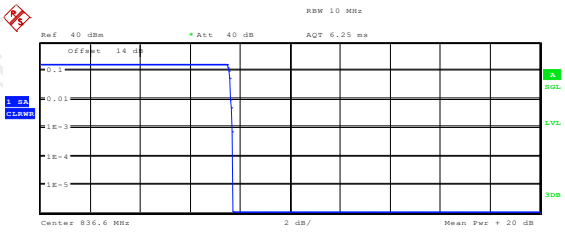


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	25.04 dBm
Peak	32.77 dBm
Crest	7.73 dB
10 %	7.56 dB
1 %	7.63 dB
.1 %	7.69 dB
.01 %	7.69 dB

Date: 14.FEB.2022 12:12:35

Peak-to-Average Ratio on Channel 190

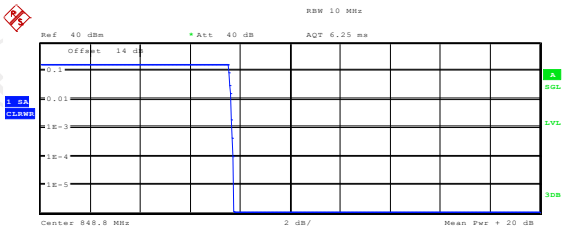


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	25.18 dBm
Peak	32.86 dBm
Crest	7.69 dB
10 %	7.56 dB
1 %	7.63 dB
.1 %	7.69 dB
.01 %	7.72 dB

Date: 14.FEB.2022 12:13:02

Peak-to-Average Ratio on Channel 251



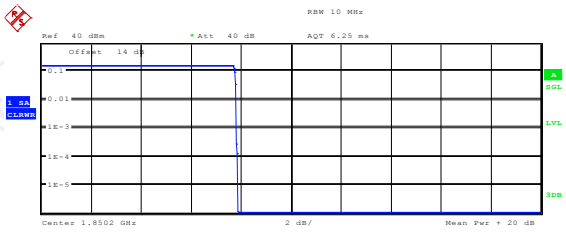
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	25.16 dBm
Peak	32.88 dBm
Crest	7.72 dB
10 %	7.56 dB
1 %	7.63 dB
.1 %	7.69 dB
.01 %	7.72 dB

Date: 14.FEB.2022 12:13:28

GSM 1900

Peak-to-Average Ratio on Channel 512

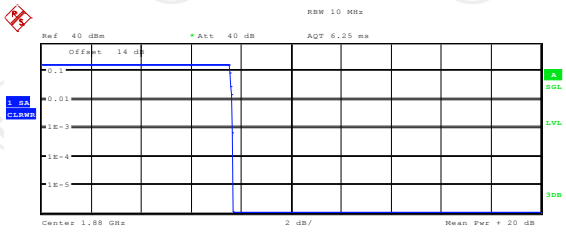


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	21.81 dBm
Peak	29.68 dBm
Crest	7.87 dB
10 %	7.76 dB
1 %	7.82 dB
.1 %	7.82 dB
.01 %	7.85 dB

Date: 14.FEB.2022 13:01:31

Peak-to-Average Ratio on Channel 661

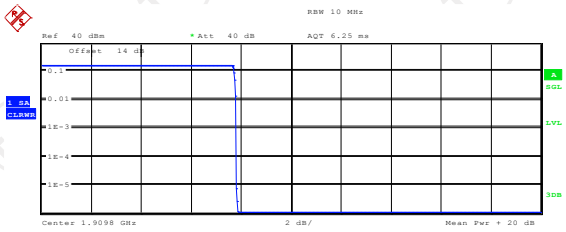


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	22.00 dBm
Peak	29.65 dBm
Crest	7.65 dB
10 %	7.56 dB
1 %	7.63 dB
.1 %	7.66 dB
.01 %	7.69 dB

Date: 14.FEB.2022 13:01:09

Peak-to-Average Ratio on Channel 810



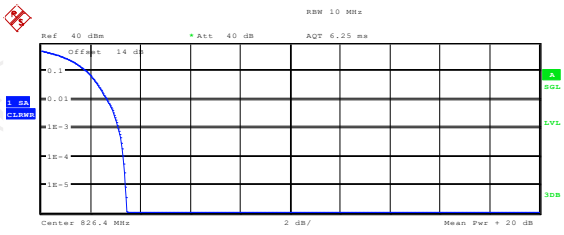
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	22.00 dBm
Peak	29.86 dBm
Crest	7.86 dB
10 %	7.72 dB
1 %	7.79 dB
.1 %	7.82 dB
.01 %	7.82 dB

Date: 14.FEB.2022 13:00:30

WCDMA Band V 12.2K

Peak-to-Average Ratio on Channel 4132

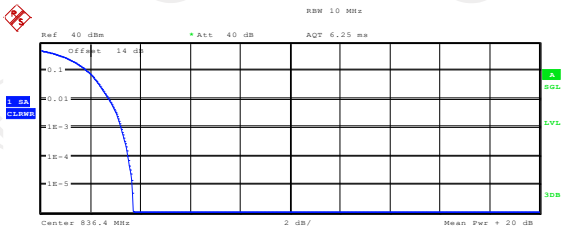


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	22.27 dBm
Peak	25.72 dBm
Crest	3.45 dB
10 %	1.83 dB
1 %	2.66 dB
.1 %	3.11 dB
.01 %	3.30 dB

Date: 14.FEB.2022 14:00:18

Peak-to-Average Ratio on Channel 4182

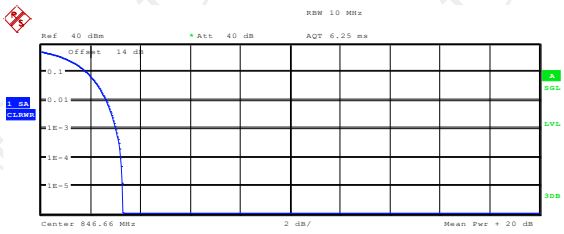


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	22.25 dBm
Peak	25.95 dBm
Crest	3.70 dB
10 %	1.86 dB
1 %	2.72 dB
.1 %	3.21 dB
.01 %	3.49 dB

Date: 14.FEB.2022 13:59:14

Peak-to-Average Ratio on Channel 4233



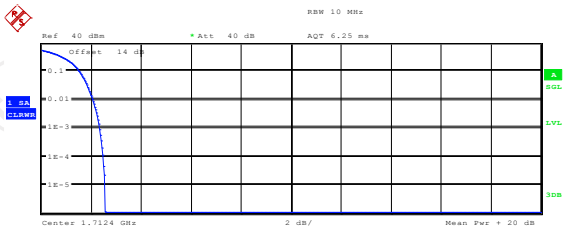
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	22.26 dBm
Peak	25.54 dBm
Crest	3.27 dB
10 %	1.83 dB
1 %	2.63 dB
.1 %	3.01 dB
.01 %	3.21 dB

Date: 14.FEB.2022 13:58:47

WCDMA Band IV 12.2Kbps

Peak-to-Average Ratio on Channel 1312

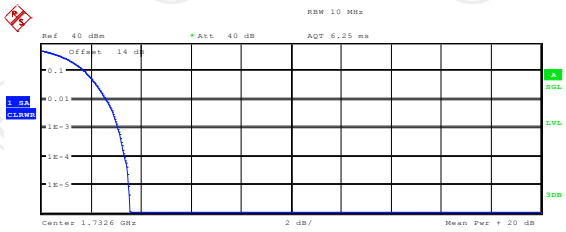


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	22.48 dBm
Peak	25.04 dBm
Crest	2.56 dB
10 %	1.51 dB
1 %	2.05 dB
.1 %	2.34 dB
.01 %	2.47 dB

Date: 14.FEB.2022 13:49:06

Peak-to-Average Ratio on Channel 1413

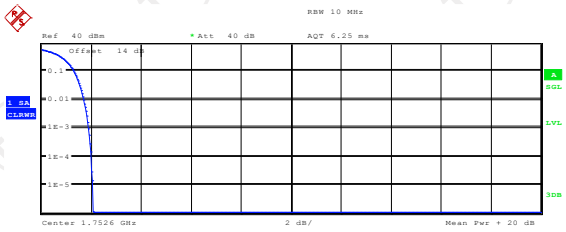


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	22.69 dBm
Peak	26.24 dBm
Crest	3.55 dB
10 %	1.73 dB
1 %	2.60 dB
.1 %	3.04 dB
.01 %	3.33 dB

Date: 14.FEB.2022 13:49:29

Peak-to-Average Ratio on Channel 1513



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	22.53 dBm
Peak	24.61 dBm
Crest	2.08 dB
10 %	1.28 dB
1 %	1.70 dB
.1 %	1.89 dB
.01 %	1.99 dB

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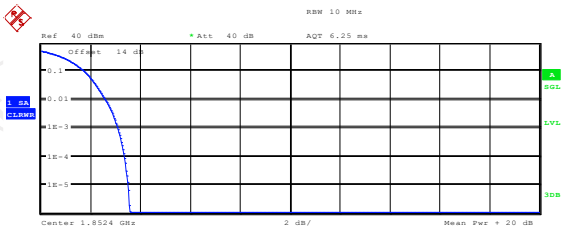
WCDMA Band II 12.2Kbps

Peak-to-Average Ratio on Channel 9262



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	21.81 dBm
Peak	25.38 dBm
Crest	3.57 dB
10 %	1.73 dB
1 %	2.60 dB
.1 %	3.08 dB
.01 %	3.37 dB

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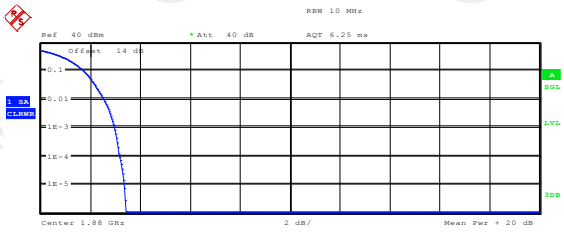
Peak-to-Average Ratio on Channel 9400

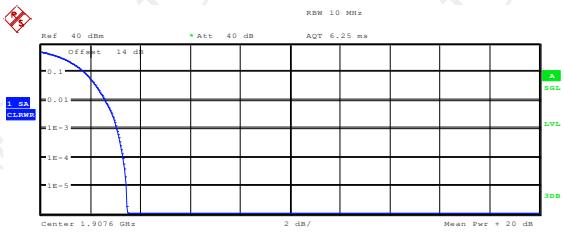


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	22.01 dBm
Peak	25.42 dBm
Crest	3.41 dB
10 %	1.70 dB
1 %	2.53 dB
.1 %	2.95 dB
.01 %	3.17 dB

Date: 14.FEB.2022 13:27:41

Peak-to-Average Ratio on Channel 9538



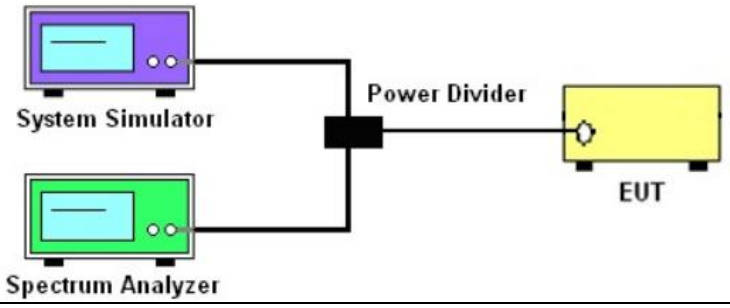
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	22.16 dBm
Peak	25.62 dBm
Crest	3.46 dB
10 %	1.73 dB
1 %	2.56 dB
.1 %	3.04 dB
.01 %	3.30 dB

Date: 14.FEB.2022 13:28:05

5.3. 99% Occupied Bandwidth and 26dB Bandwidth Measurement

5.3.1. Test Specification

Test Requirement:	FCC part 2.1049
Test Method:	FCC KDB 971168 D01v03r01
Operation mode:	Refer to item 3.1
Limit:	N/A
Test Setup:	
Test Procedure:	1. The testing follows FCC KDB 971168 D01v03r01 Section 4.2. 2. The EUT was connected to the spectrum analyzer and system simulator via a power divider. 3. The RF output of the EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. 4. The 99% occupied bandwidth were measured, set RBW= 1% of span, VBW= 3*RBW, sample detector, trace maximum hold. 5. The 26dB bandwidth were measured, set RBW= 1% of EBW, VBW= 3*RBW, peak detector, trace maximum hold.
Test Result:	PASS

5.3.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Universal Radio Communication Tester	R&S	CMU200	110188	Jul. 07, 2022
Spectrum Analyzer	R&S	FSU	200054	Jul. 18, 2022
RF cable (9kHz-40GHz)	TCT	RE-05	N/A	Jul. 07, 2022
Antenna Connector	TCT	RFC-02	N/A	Jul. 07, 2022

5.3.3. Test data

Cellular Band			
Mode	**GSM 850**		
Channel	**128**	**190**	**251**
Frequency (MHz)	**824.2**	**836.6**	**848.8**
99% OBW (kHz)	246.79	243.59	245.19
26dB BW (kHz)	336.54	336.54	338.14

Cellular Band			
Mode	**GSM 1900**		
Channel	**512**	**661**	**810**
Frequency (MHz)	**1850.2**	**1880.0**	**1909.8**
99% OBW (kHz)	245.00	244.00	245.00
26dB BW (kHz)	338.14	340.15	341.35

Cellular Band			
Mode	**WCDMA Band V (HSUPA)**		
Channel	**4132**	**4182**	**4233**
Frequency (MHz)	**826.4**	**836.4**	**846.6**
99% OBW (MHz)	4.20	4.18	4.17
26dB BW (MHz)	4.71	4.66	4.70

Cellular Band			
Mode	**WCDMA Band IV (HSUPA)**		
Channel	**1312**	**1413**	**1513**
Frequency (MHz)	1712.4	1732.6	1752.6
99% OBW (MHz)	4.17	4.17	4.21
26dB BW (MHz)	4.71	4.71	4.79

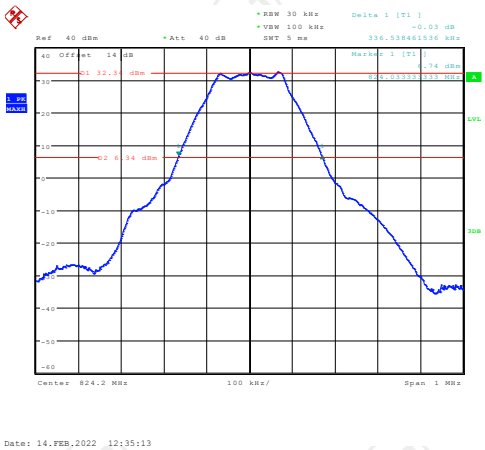
Cellular Band			
Mode	WCDMA Band II (HSUPA)		
Channel	9262	9400	9538
Frequency (MHz)	1852.4	1880	1907.6
99% OBW (MHz)	4.16	4.18	4.18
26dB BW (MHz)	4.70	4.70	4.70

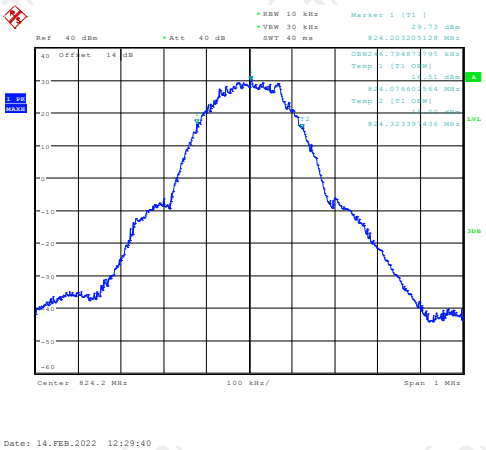
Test plots as follows:

Hotline: 400-6611-140 Tel: 86-755-27673339 Fax: 86-755-27673332 http://www.tct-lab.com

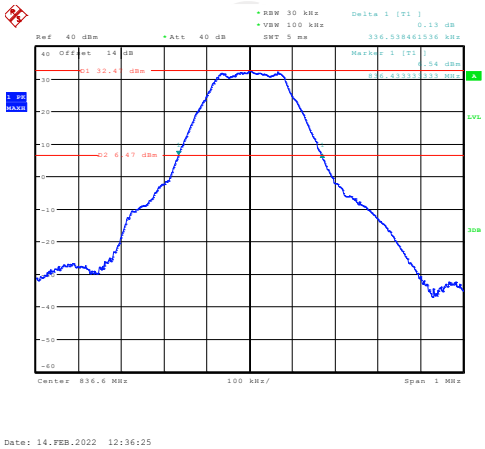
Band:	GSM 850	Test Mode:	GPRS Link (GMSK)

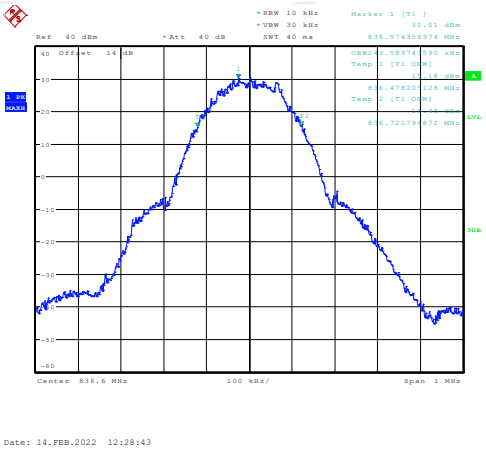
26dB&99% Occupied Bandwidth Plot on Channel 128



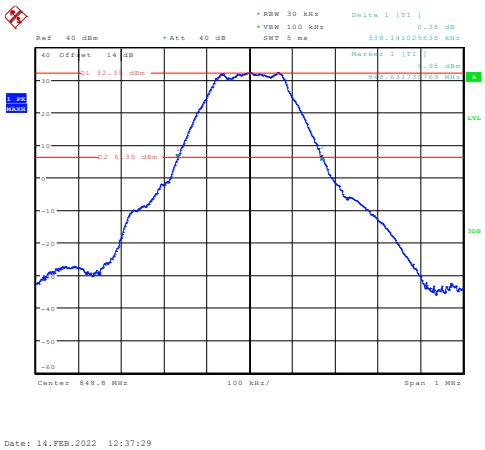


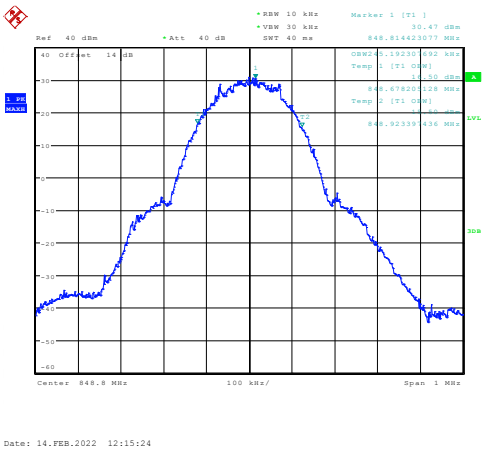
26dB&99% Occupied Bandwidth Plot on Channel 190





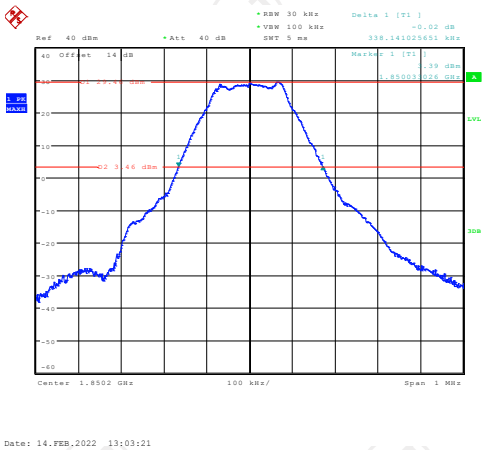
26dB&99% Occupied Bandwidth Plot on Channel 251

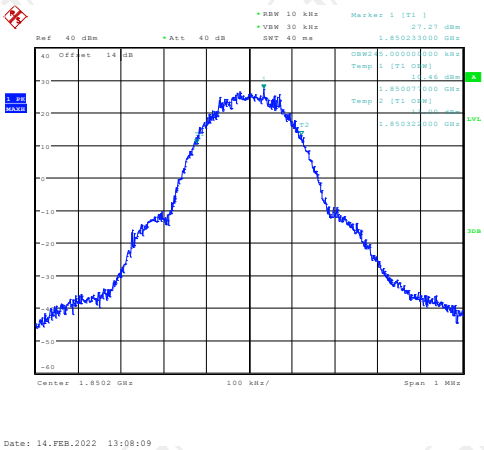




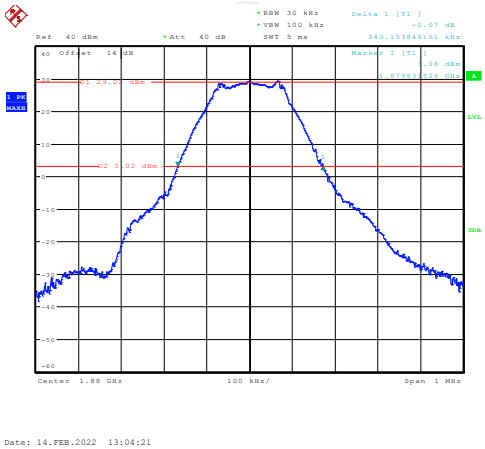
Band:	GSM 1900	Test Mode:	GPRS Link (GMSK)

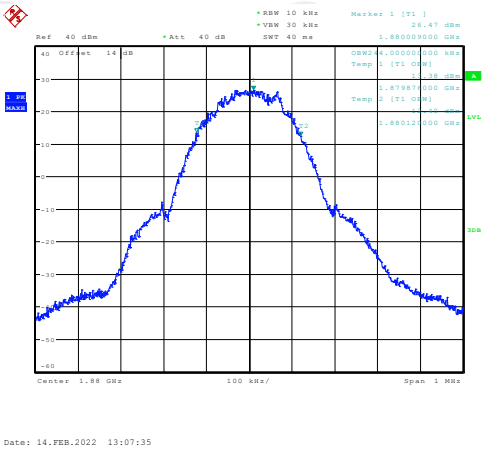
26dB&99% Occupied Bandwidth Plot on Channel 512



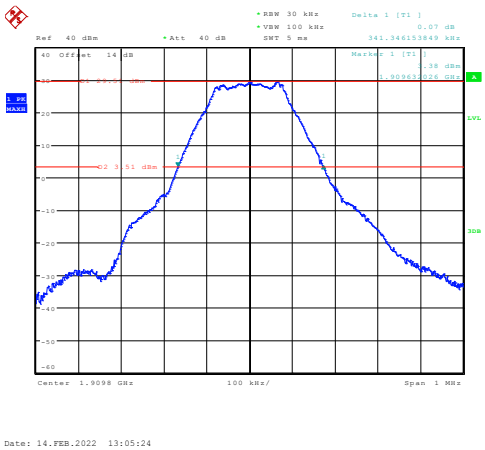


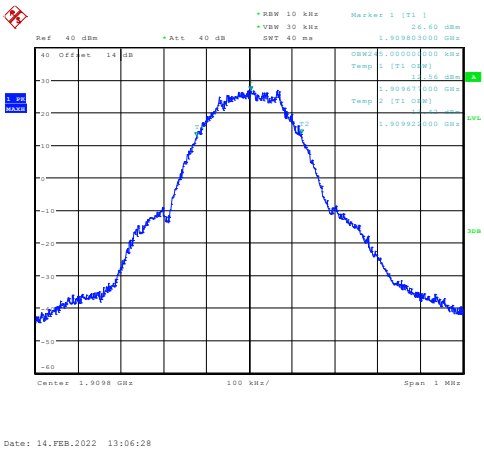
26dB&99% Occupied Bandwidth Plot on Channel 661





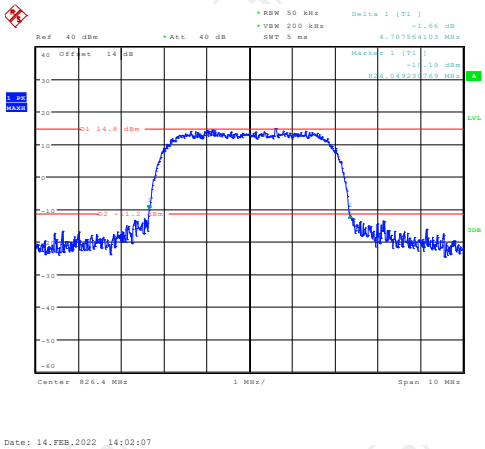
26dB&99% Occupied Bandwidth Plot on Channel 810

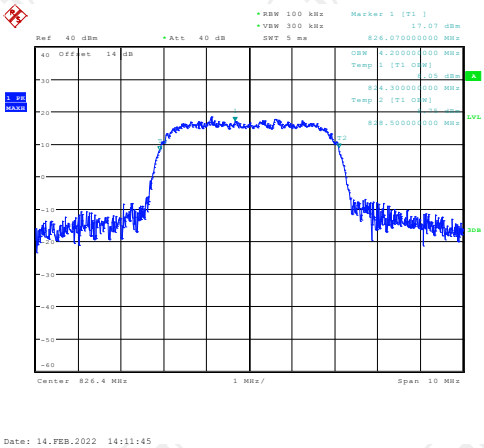




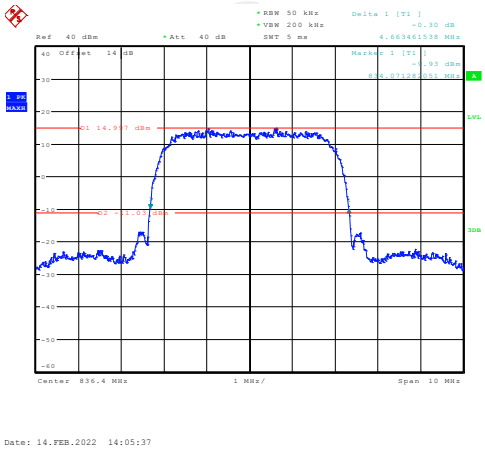
Band:	WCDMA Band V	Test Mode:	HSUPA Link (QPSK)

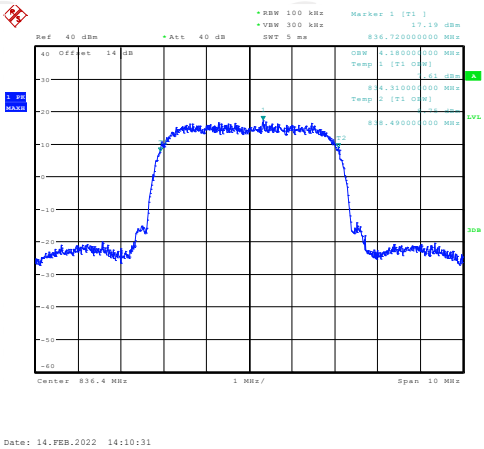
26dB&99% Occupied Bandwidth Plot on Channel 4132



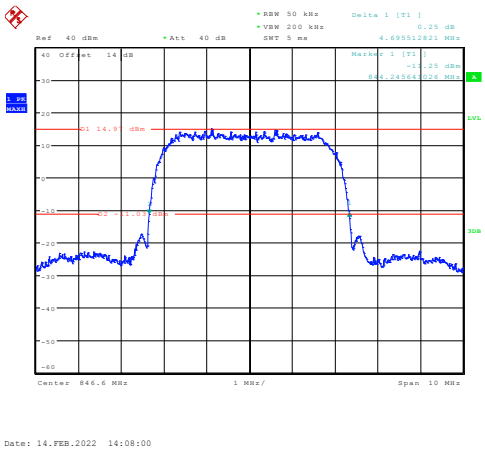


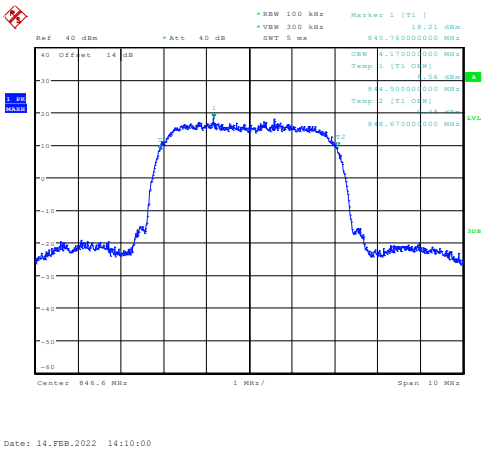
26dB&99% Occupied Bandwidth Plot on Channel 4182





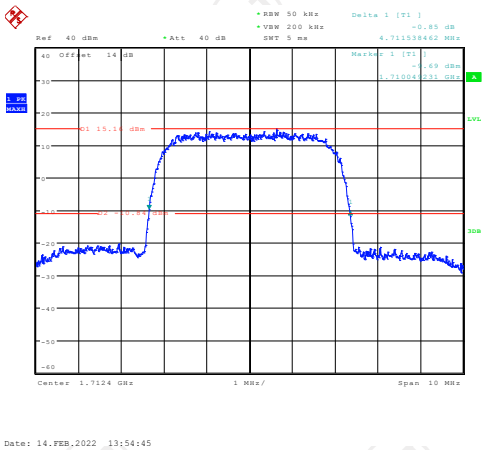
26dB&99% Occupied Bandwidth Plot on Channel 4233

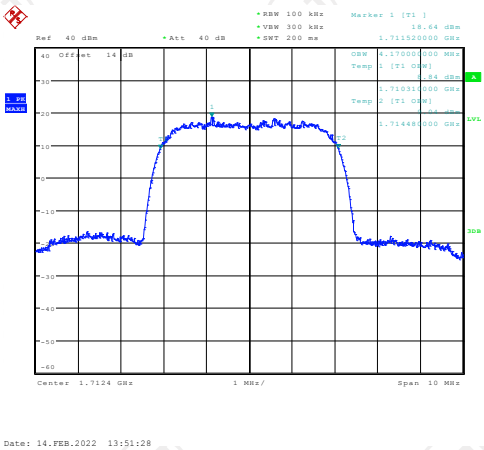




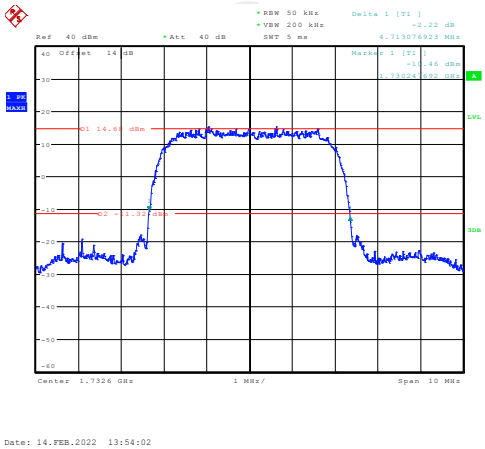
Band:	WCDMA Band IV	Test Mode:	HSUPA Link (QPSK)

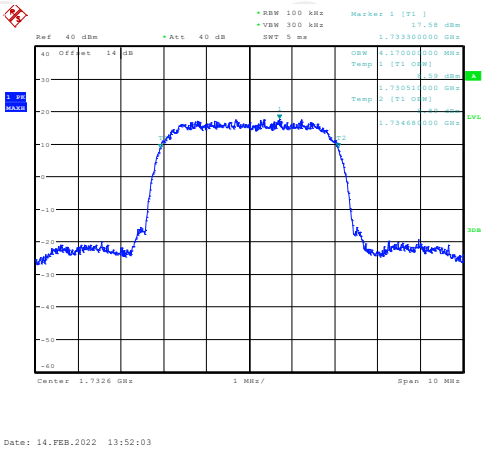
26dB&99% Occupied Bandwidth Plot on Channel 1312



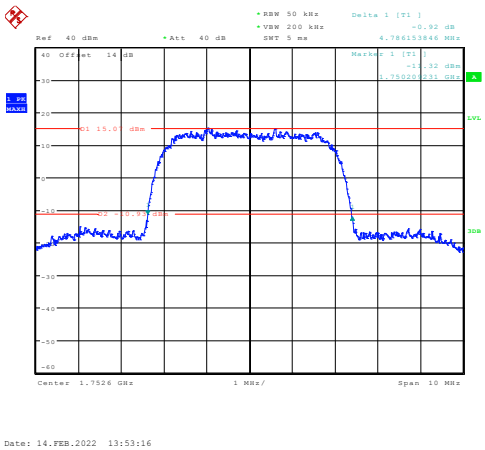


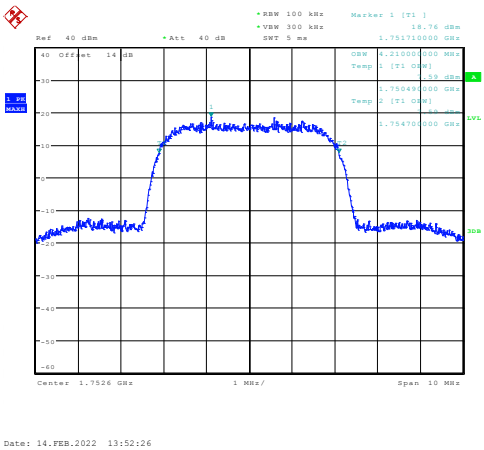
26dB&99% Occupied Bandwidth Plot on Channel 1413





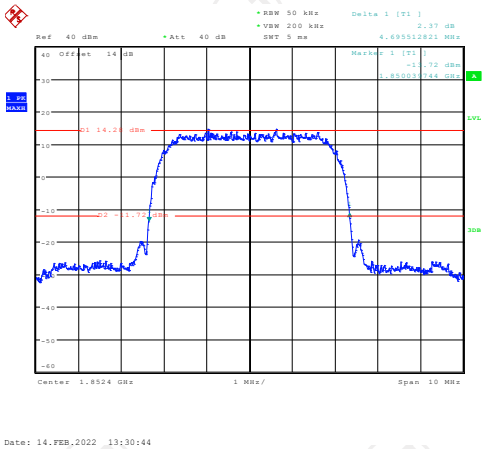
26dB&99% Occupied Bandwidth Plot on Channel 1513

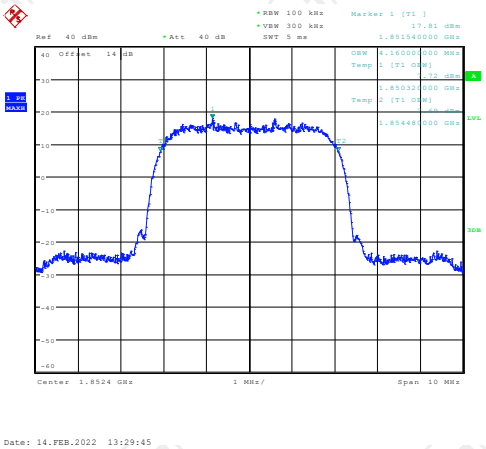




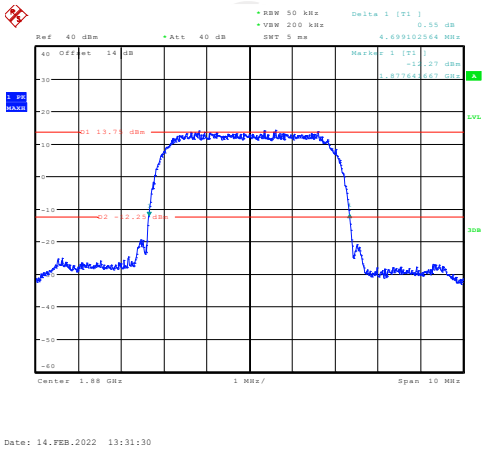
Band:	WCDMA Band II	Test Mode:	HSUPA Link (QPSK)

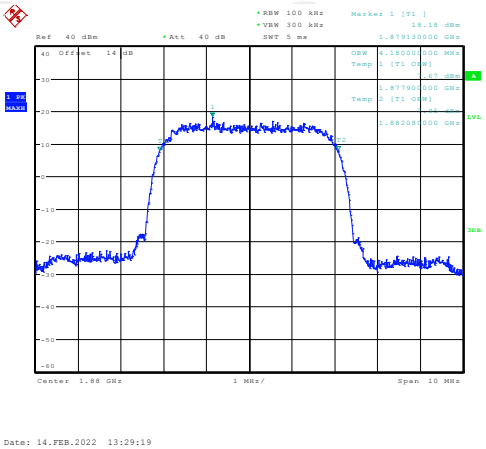
26dB&99% Occupied Bandwidth Plot on Channel 9262



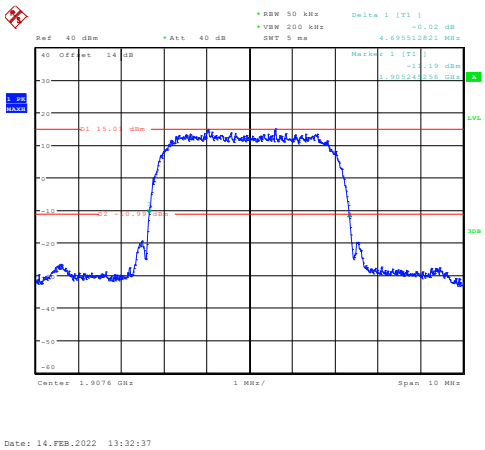


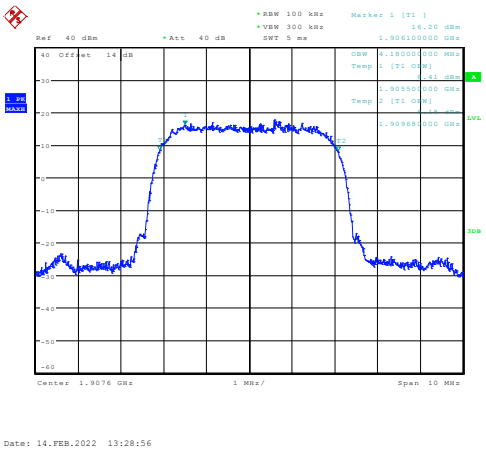
26dB&99% Occupied Bandwidth Plot on Channel 9400





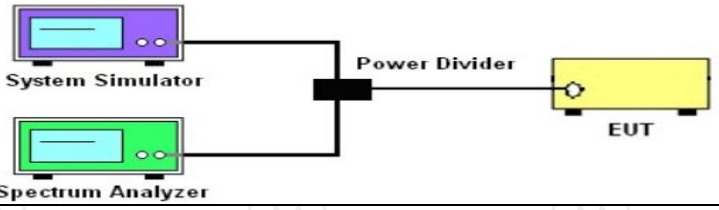
26dB&99% Occupied Bandwidth Plot on Channel 9538





5.4. Band Edge and Conducted Spurious Emission Measurement

5.4.1. Test Specification

Test Requirement:	FCC part22.917(a) and FCC part24.238(a) FCC part27.53(h)
Test Method:	FCC KDB 971168 D01v03r01
Operation mode:	Refer to item 3.1
Limit:	-13dBm
Test Setup:	
Test Procedure:	1. The testing follows FCC KDB 971168 D01v03r01 Section 6.0. 2. The EUT was connected to the spectrum analyzer and system simulator via a power divider. 3. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator. The path loss was compensated to the results for each measurement. 4. The band edges of low and high channels for the highest RF powers were measured. 5. The conducted spurious emission for the whole frequency range was taken. 6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band. 7. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts) = P(W) - [43 + 10log(P)] (dB) = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB) = -13dBm.
Test Result:	PASS

5.4.2. Test Instruments

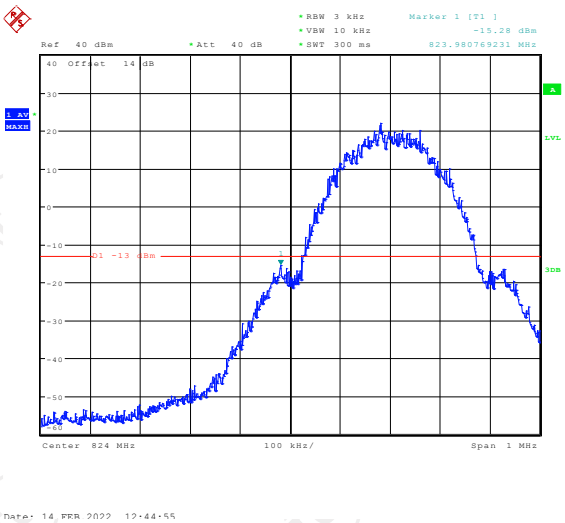
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Universal Radio Communication Tester	R&S	CMU200	110188	Jul. 07, 2022
Spectrum Analyzer	R&S	FSU	200054	Jul. 18, 2022
RF cable (9kHz-40GHz)	TCT	RE-05	N/A	Jul. 07, 2022
Antenna Connector	TCT	RFC-02	N/A	Jul. 07, 2022

5.4.3. Test data

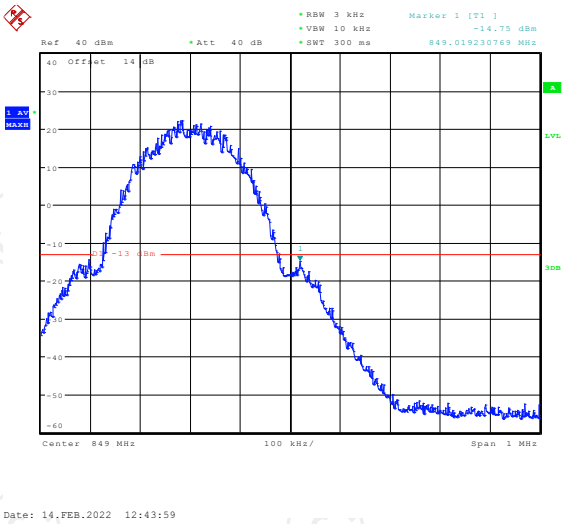
Test plots as follows:

Band:	GSM 850	Test Mode:	GPRS Link (GMSK)

Lower Band Edge Plot on Channel 128

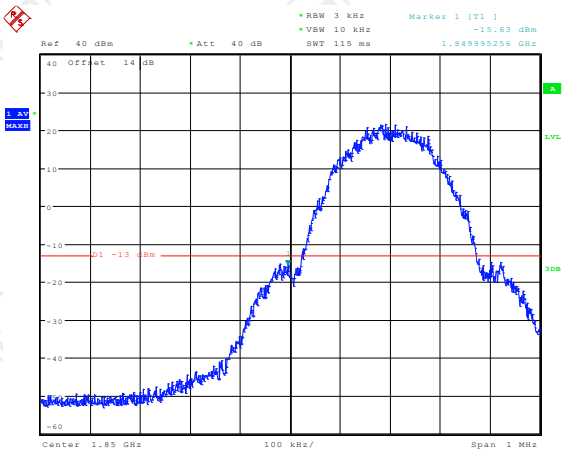


Higher Band Edge Plot on Channel 251



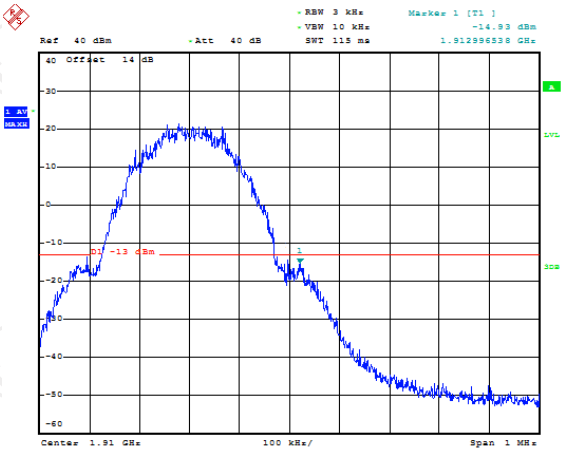
Band:	GSM 1900	Test Mode:	GPRS Link (GMSK)

Lower Band Edge Plot on Channel 512



Date: 14.FEB.2022 12:58:21

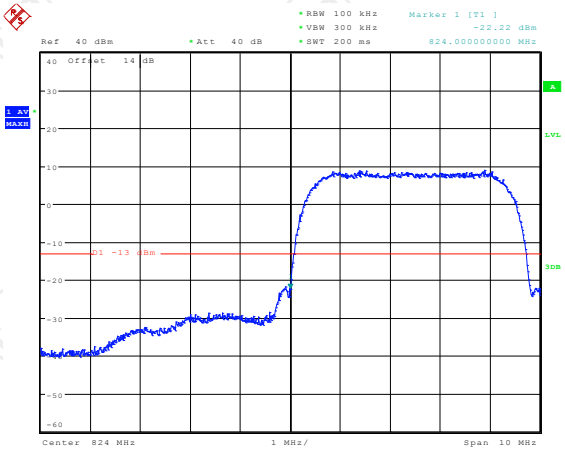
Higher Band Edge Plot on Channel 810



Date: 14.FEB.2022 12:59:35

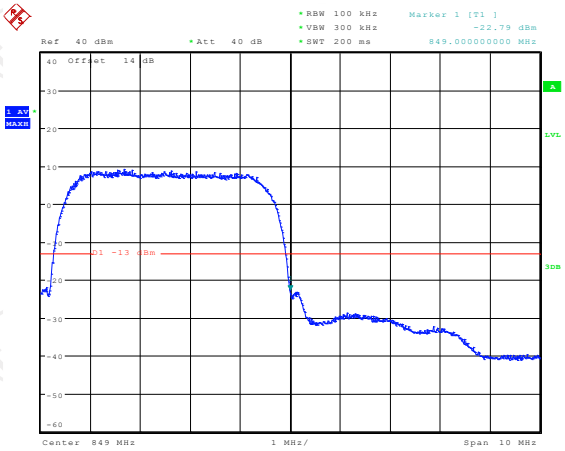
Band:	WCDMA Band V	Test Mode:	HSUPA Link (QPSK)

Lower Band Edge Plot on Channel 4132



Date: 14.FEB.2022 14:12:49

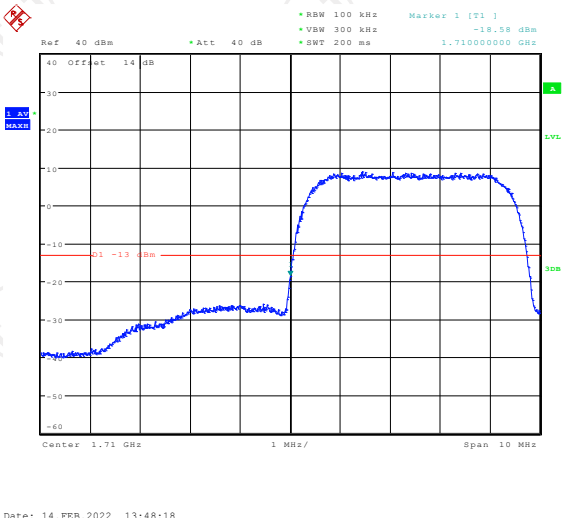
Higher Band Edge Plot on Channel 4233



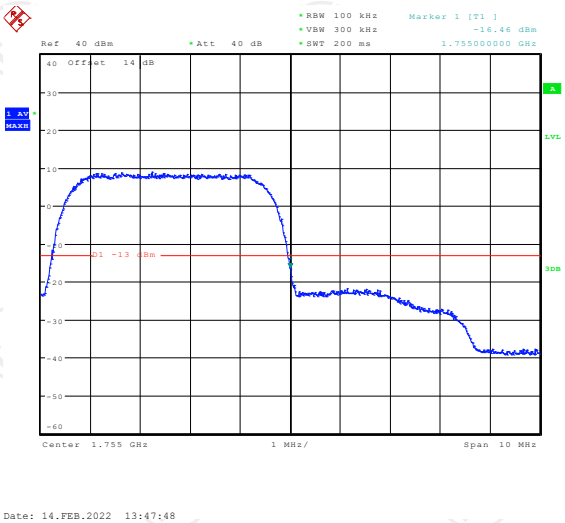
Date: 14.FEB.2022 14:13:24

Band:	WCDMA Band IV	Test Mode:	HSUPA Link (QPSK)

Lower Band Edge Plot on Channel 1312

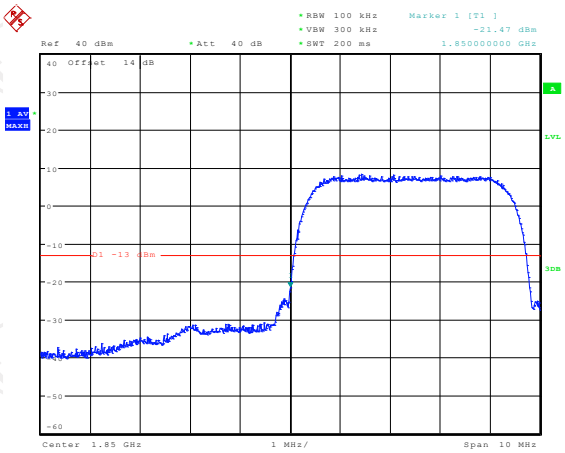


Higher Band Edge Plot on Channel 1513



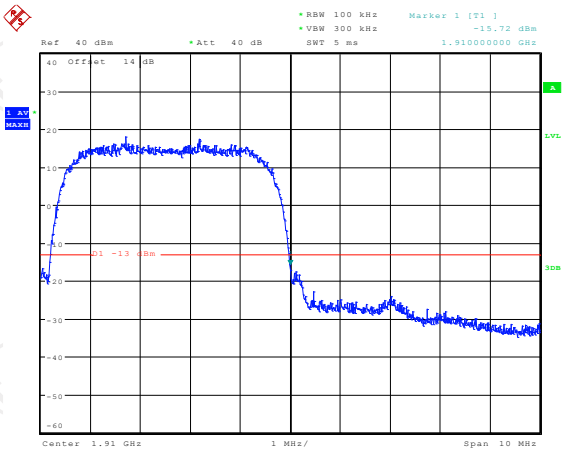
Band:	WCDMA Band II	Test Mode:	HSUPA Link (QPSK)

Lower Band Edge Plot on Channel 9262



Date: 14.FEB.2022 13:40:05

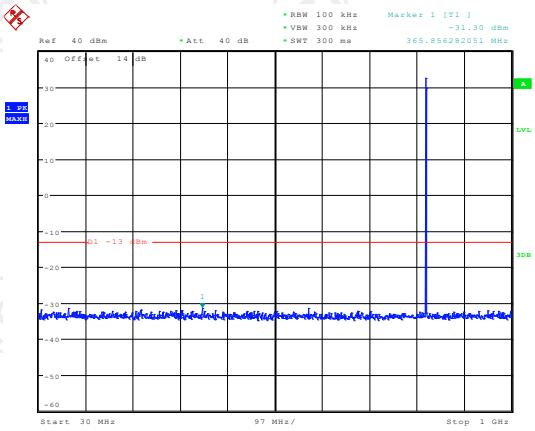
Higher Band Edge Plot on Channel 9538



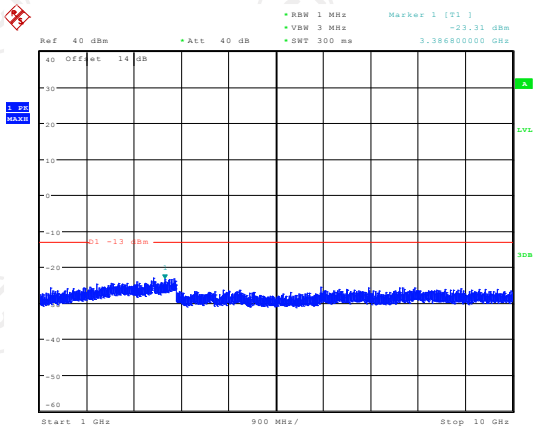
Date: 14.FEB.2022 13:36:09

Band:	GSM 850	Test Mode:	GPRS Link (GMSK)

Conducted Spurious Emission on Channel 128

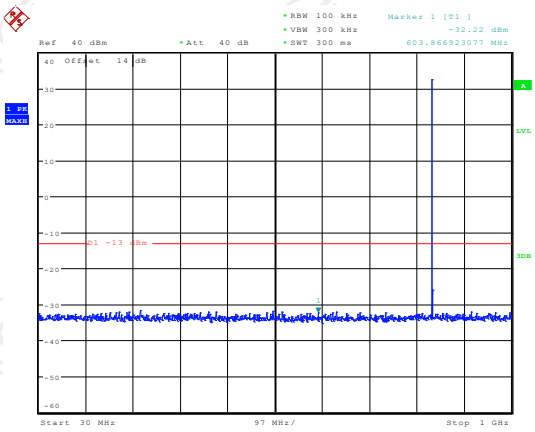


Date: 14.FEB.2022 12:46:46

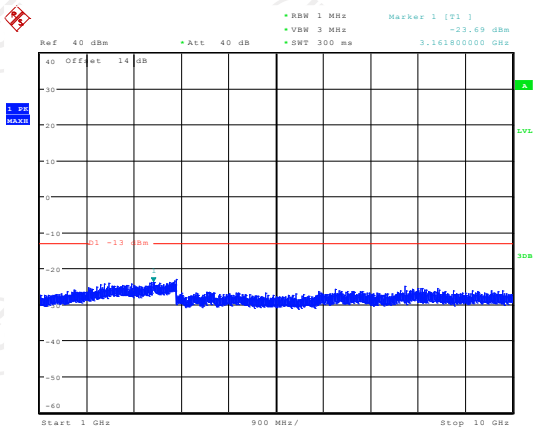


Date: 14.FEB.2022 12:47:24

Conducted Spurious Emission on Channel 190

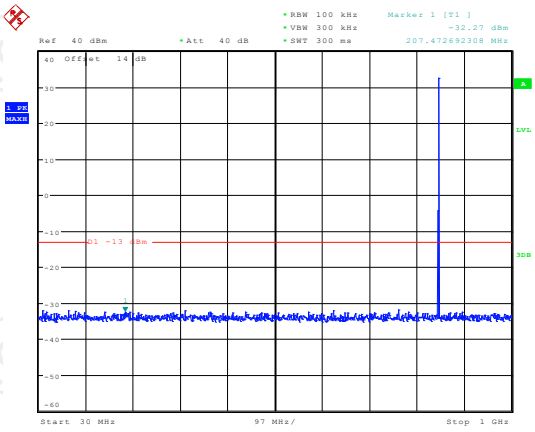


Date: 14.FEB.2022 12:48:40

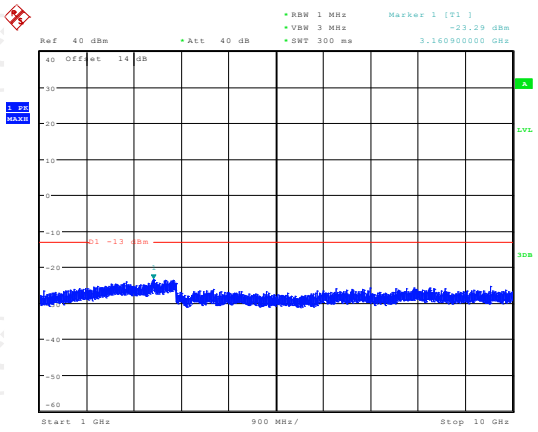


Date: 14.FEB.2022 12:47:48

Conducted Spurious Emission on Channel 251



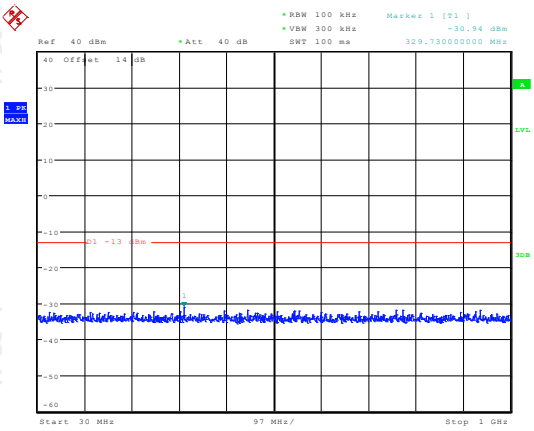
Date: 14.FEB.2022 12:49:09



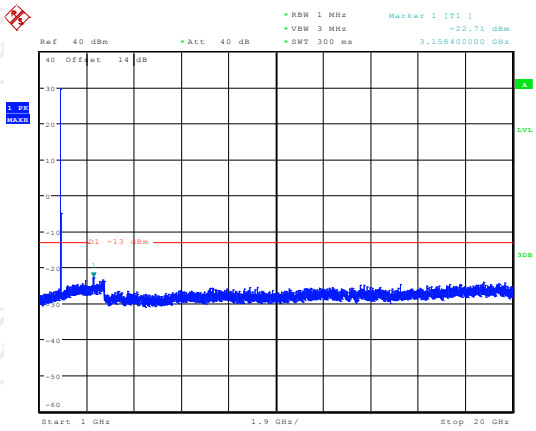
Date: 14.FEB.2022 12:49:40

Band:	GSM 1900	Test Mode:	GPRS Link (GMSK)

Conducted Spurious Emission on Channel 512

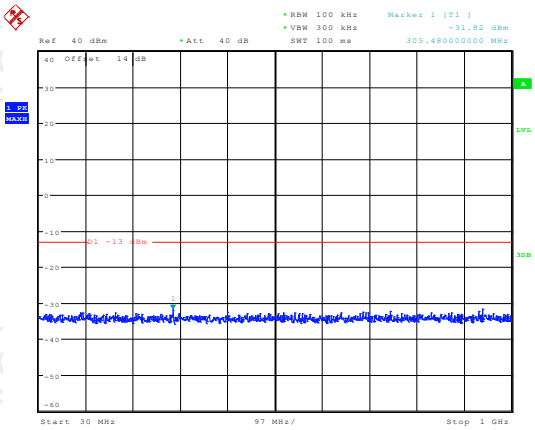


Date: 14.FEB.2022 12:56:28

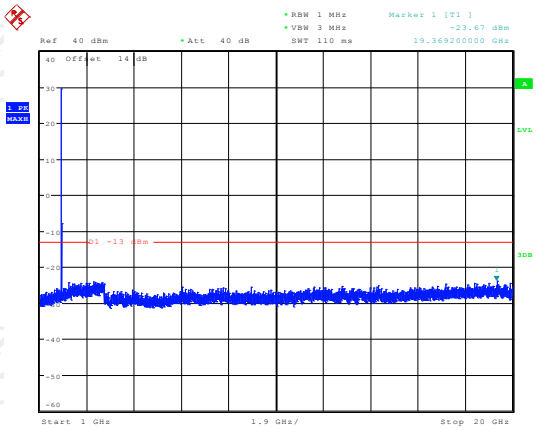


Date: 14.FEB.2022 12:53:58

Conducted Spurious Emission on Channel 661

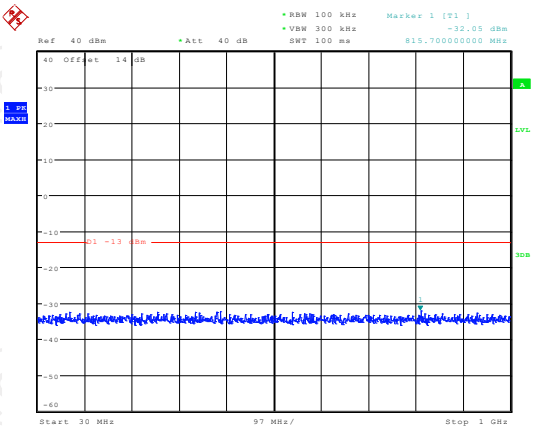


Date: 14.FEB.2022 12:56:03

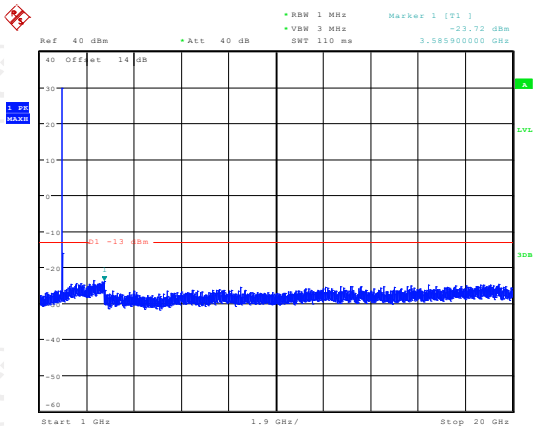


Date: 14.FEB.2022 12:54:38

Conducted Spurious Emission on Channel 810



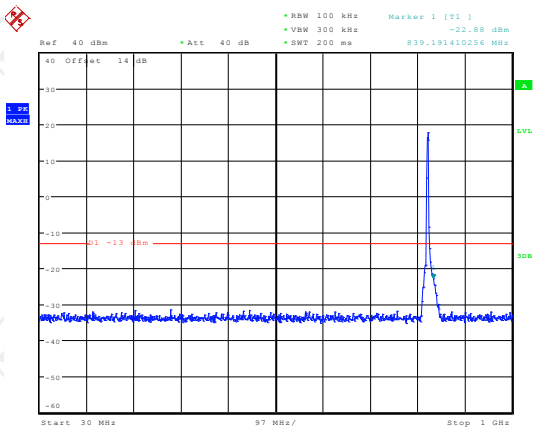
Date: 14.FEB.2022 12:55:33



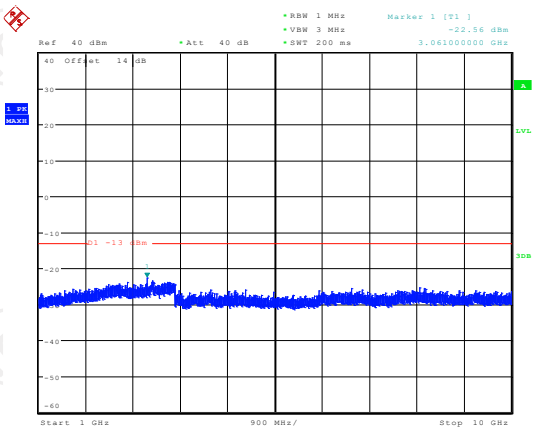
Date: 14.FEB.2022 12:55:10

Band:	WCDMA Band V	Test Mode:	HSUPA Link (QPSK)

Conducted Spurious Emission on Channel 4132

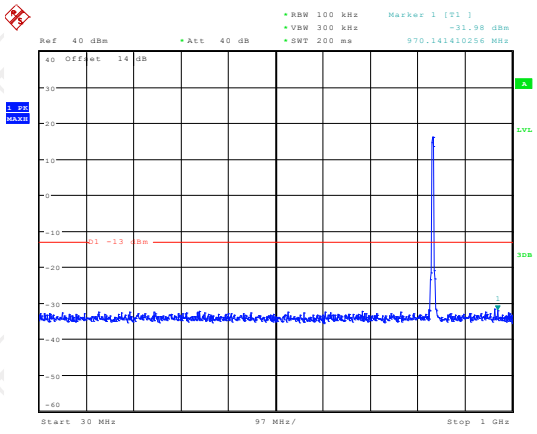


Date: 14.FEB.2022 14:16:14

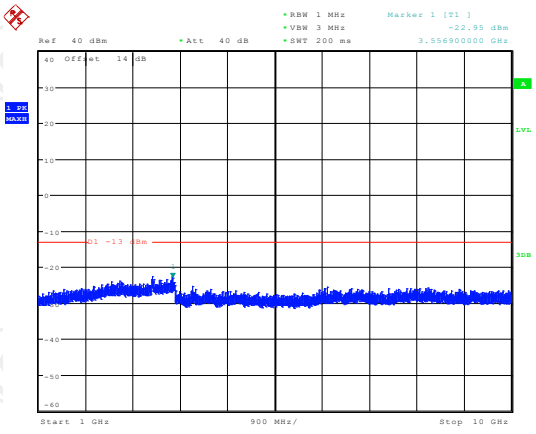


Date: 14.FEB.2022 14:17:19

Conducted Spurious Emission on Channel 4182

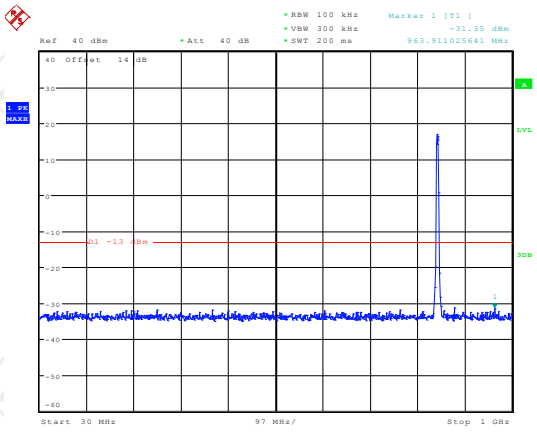


Date: 14.FEB.2022 14:15:13

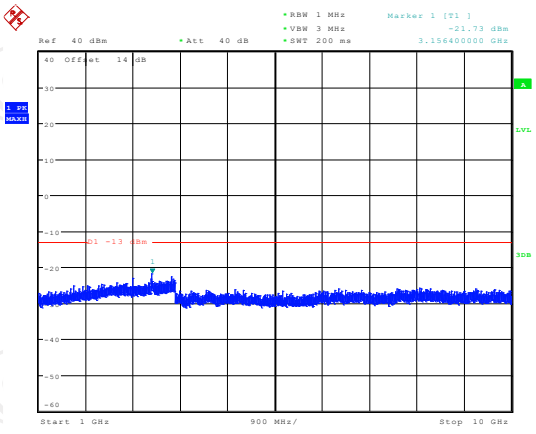


Date: 14.FEB.2022 14:17:40

Conducted Spurious Emission on Channel 4233



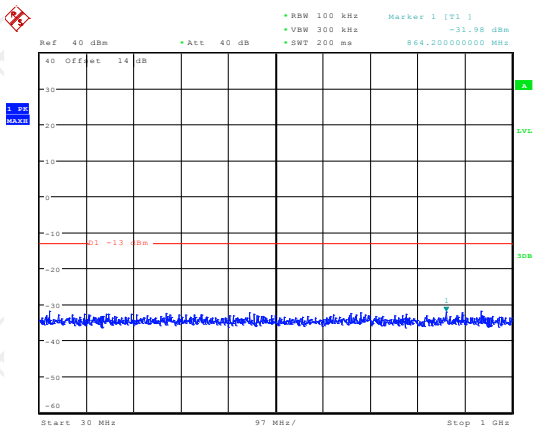
Date: 14.FEB.2022 14:14:49



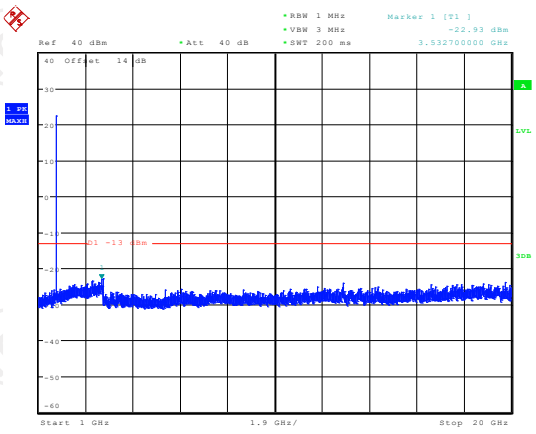
Date: 14.FEB.2022 14:18:04

Band:	WCDMA Band IV	Test Mode:	HSUPA Link (QPSK)

Conducted Spurious Emission on Channel 1312

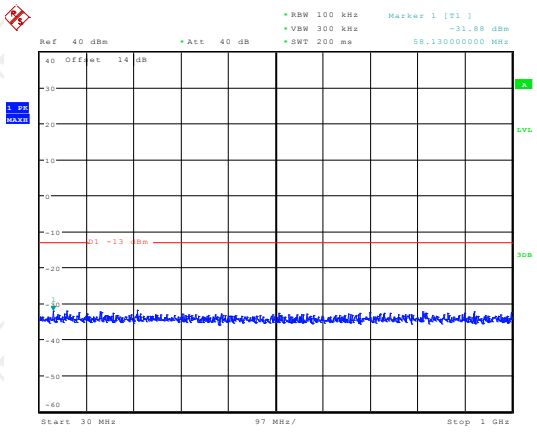


Date: 14.FEB.2022 13:46:20

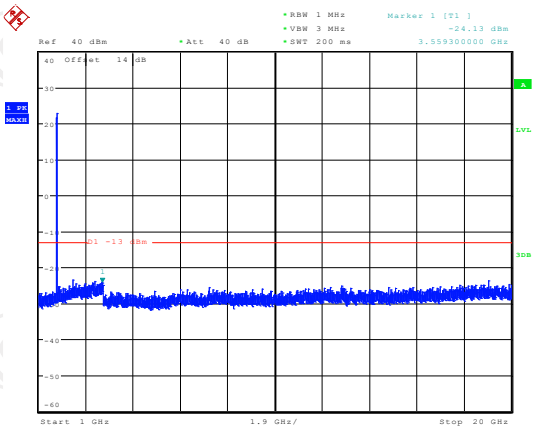


Date: 14.FEB.2022 13:46:00

Conducted Spurious Emission on Channel 1413

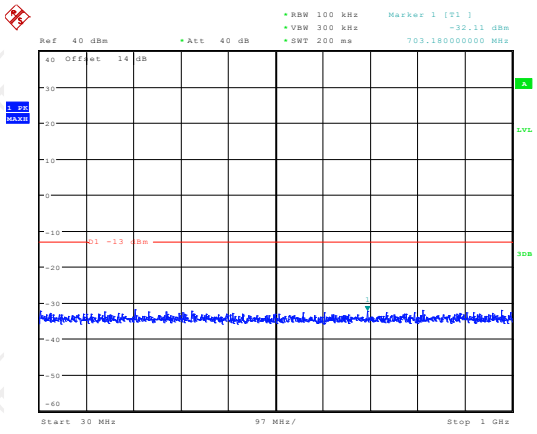


Date: 14.FEB.2022 13:46:37

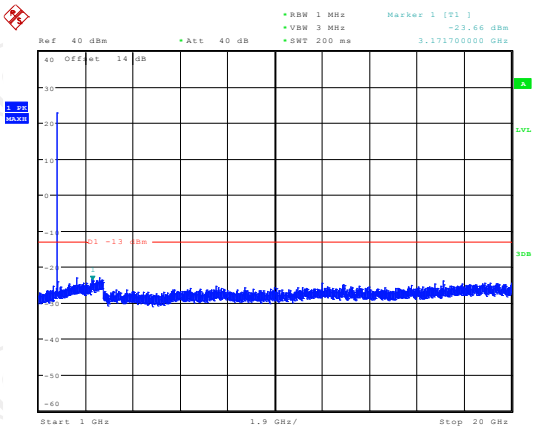


Date: 14.FEB.2022 13:45:37

Conducted Spurious Emission on Channel 1513



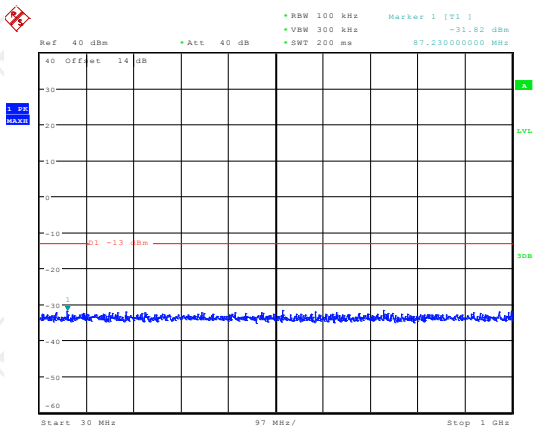
Date: 14.FEB.2022 13:46:53



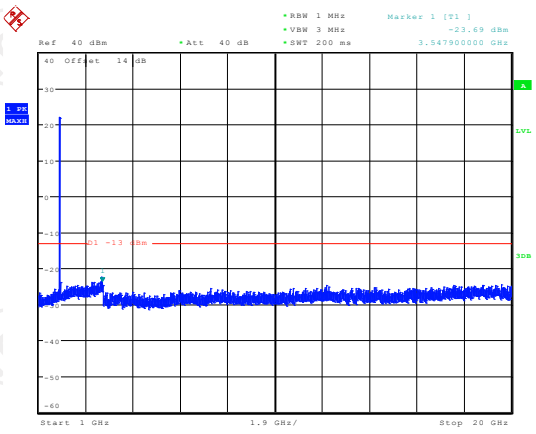
Date: 14.FEB.2022 13:45:18

Band:	WCDMA Band II	Test Mode:	HSUPA Link (QPSK)

Conducted Spurious Emission on Channel 9262

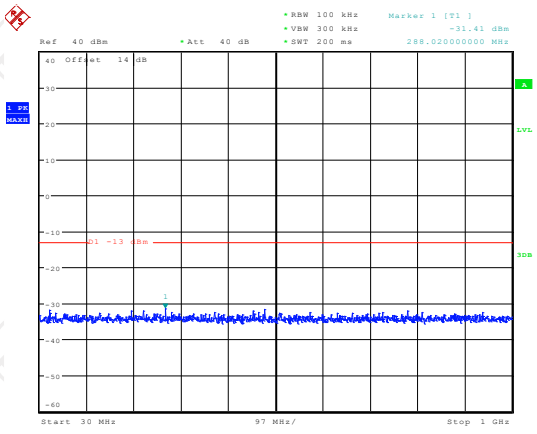


Date: 14.FEB.2022 13:40:51

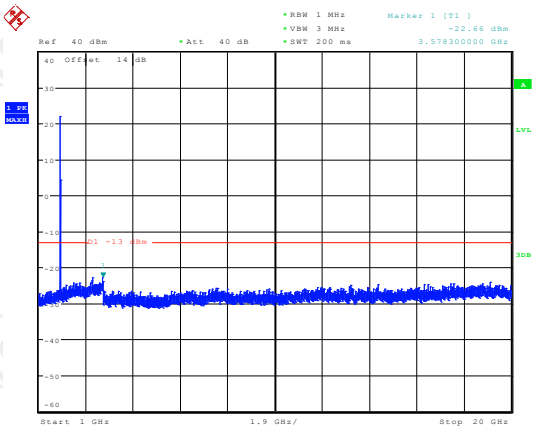


Date: 14.FEB.2022 13:43:03

Conducted Spurious Emission on Channel 9400

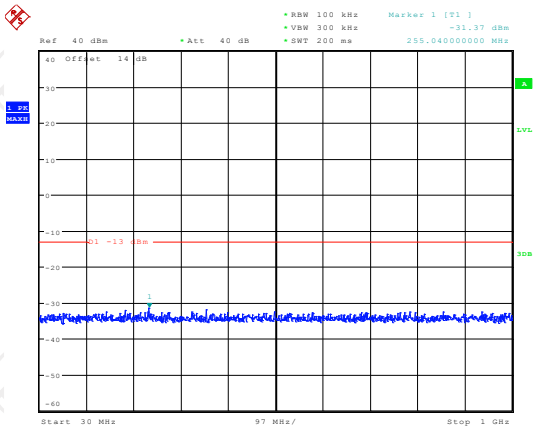


Date: 14.FEB.2022 13:41:16

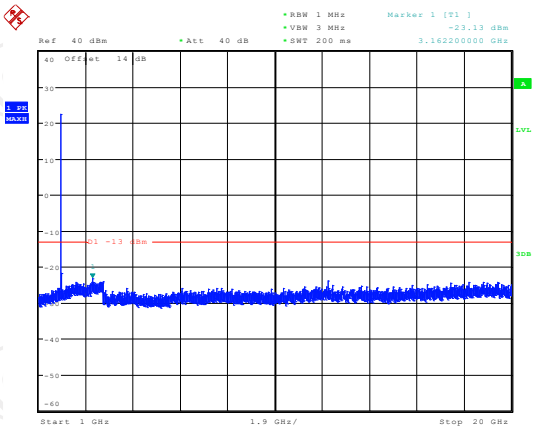


Date: 14.FEB.2022 13:42:34

Conducted Spurious Emission on Channel 9538



Date: 14.FEB.2022 13:41:35



Date: 14.FEB.2022 13:42:08

GSM 1900(GPRS) Conducted Spurious Emission for Below 1G					
Channel	**RBW (KHz)**	**Test result (dBm)**	**RBW (MHz)**	**Calculate result (dBm)**	**Limit (-13dBm)**
512	100	-30.94	1	-20.94	Pass
661	100	-31.82	1	-21.82	Pass
810	100	-32.05	1	-22.05	Pass
WCDMA Band II Conducted Spurious Emission for Below 1G					
Channel	**RBW (KHz)**	**Test result (dBm)**	**RBW (MHz)**	**Calculate result (dBm)**	**Limit (-13dBm)**
9262	100	-31.82	1	-21.82	Pass
9400	100	-31.41	1	-21.41	Pass
9538	100	-31.37	1	-21.37	Pass
WCDMA Band IV Conducted Spurious Emission for Below 1G					
Channel	**RBW (KHz)**	**Test result (dBm)**	**RBW (MHz)**	**Calculate result (dBm)**	**Limit (-13dBm)**
1312	100	-31.98	1	-21.98	Pass
1413	100	-31.88	1	-21.88	Pass
1513	100	-32.11	1	-22.11	Pass

Compensate 10dB is for Exchange rate of RBW
*Exchange rate of RBW = 10*log10(Reference bandwidth/RBW at measurement) =10[dB]*
where Reference bandwidth = 1 MHz

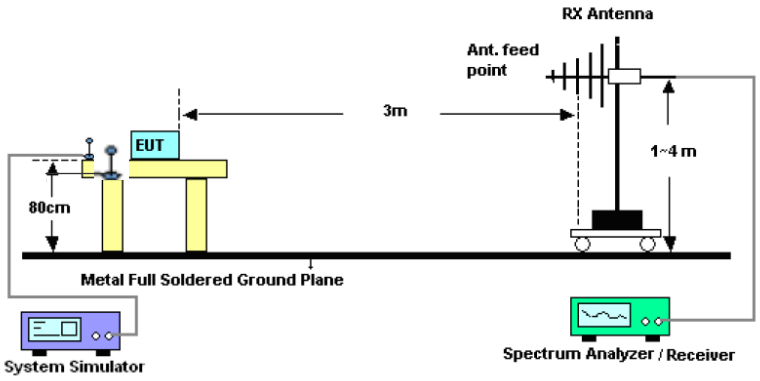
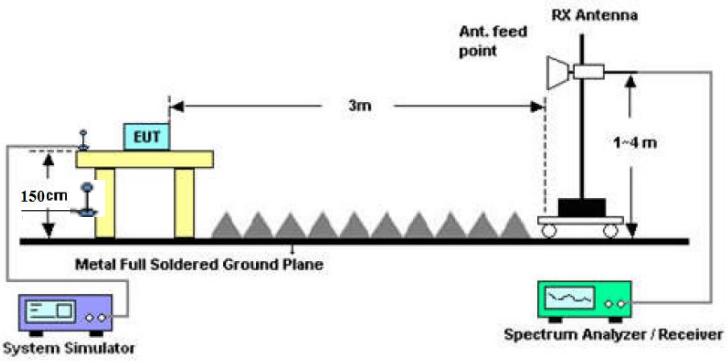
Hotline: 400-6611-140 Tel: 86-755-27673339 Fax: 86-755-27673332 http://www.tct-lab.com

5.5. Effective Radiated Power and Effective Isotropic Radiated Power Measurement

5.5.1. Test Specification

Test Requirement:	FCC part 22.913(a) and FCC part 24.232(c) FCC part 27.50(d)
Test Method:	FCC KDB 971168 D01v03r01
Receiver Setup:	

	GSM/GPRS/EDGE	WCDMA/HSPA
SPAN	500kHz	10MHz
RBW	10kHz	100kHz
VBW	30kHz	300kHz
Detector	RMS	RMS
Trace	Average	Average
Average Type	Power	Power
Sweep Count	100	100

Limit:	GSM850: 7W ERP PCS1900: 2W EIRP WCDMA Band V: 7W ERP WCDMA Band II: 2W EIRP WCDMA Band IV: 1W EIRP
Test Setup：	From 30MHz to 1GHz  Above 1GHz 

Test Procedure:	1. The testing follows FCC KDB 971168 D01v03r01 Section 5.8. and ANSI / TIA-603-D-2010 Section 2.2.17. 2. The EUT was placed on a non-conductive rotating platform 0.8 meters high in a semi-anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RMS detector per section 5. of KDB 971168 D01v03. 3. Key the transmitter, then rotate the EUT 360^{o} azimuthally and record spectrum analyzer power level (LVL) measurements at angular increments that are sufficiently small to permit resolution of all peaks. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading at each angular increment. 4. Replace the transmitter under test with a substitution antenna. The center of the antenna should be at the same location as the center of the antenna under test. 5. Connect the antenna to a signal generator with a known output power and record the path loss (in dB) as LOSS. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading. LOSS = Generator Output Power (dBm) – Analyzer reading (dBm) 6. Determine the effective radiated output power at each angular position from the readings in steps 3) and 5) using the following equation: ERP (dBm) = LVL (dBm) + LOSS (dB) 7. The maximum ERP is the maximum value determined in the preceding step. 8. Calculating ERP: ERP (dBm) = Output Power (dBm) - Losses (dB) + Antenna Gain (dBd) Antenna Gain (dBd) = Antenna Gain (dBi) - 2.15 EIRP = ERP + 2.15
Test results:	PASS

5.5.2. Test Instruments

Radiated Emission Test Site (966)				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Universal Radio Communication Tester	R&S	CMU200	110188	Jul. 07, 2022
Spectrum Analyzer	R&S	FSQ40	200061	Jul. 07, 2022
Signal Generator	HP	83623B	3614A00396	Jul. 18, 2022
Broadband Antenna	Schwarzbeck	VULB9163	340	Sep. 04, 2022
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Sep. 04, 2022
Broadband Antenna	Schwarzbeck	VULB9163	412	Sep. 04, 2022
Horn Antenna	Schwarzbeck	BBHA 9120D	1201	Sep. 04, 2022
Horn Antenna	Schwarzbeck	BBHA 9170	00956	Apr. 10, 2023
Coaxial cable	SKET	RC_DC18G-N	N/A	Apr. 08, 2022
Coaxial cable	SKET	RC-DC18G-N	N/A	Apr. 08, 2022
Coaxial cable	SKET	RC-DC40G-N	N/A	Jul. 07, 2022
Antenna Mast	Keleto	RE-AM	N/A	N/A
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

5.5.3. Test Data

Test Result of ERP

GPRS 850 (1-solt) Radiated Power ERP					
Horizontal Polarization (Antenna Pol.)					
Frequency (MHz)	**(EUT Pol.)**	**LVL (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (W)**
824.2	H	9.57	21.66	29.08	0.81
836.6	H	9.91	21.54	29.30	0.85
848.8	H	10.36	21.46	29.67	0.93
Vertical Polarization (Antenna Pol.)					
Frequency (MHz)	**(EUT Pol.)**	**LVL (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (W)**
824.2	H	9.65	21.66	29.16	0.82
836.6	H	9.97	21.54	29.36	0.86
848.8	H	10.41	21.46	29.72	0.94

***Note**: All GPRS slot have been tested, but only the worst GPRS 1-slot show in this test item.*

WCDMA Band V (HSUPA) Radiated Power ERP					
Horizontal Polarization (Antenna Pol.)					
Frequency (MHz)	**(EUT Pol.)**	**LVL (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (W)**
826.4	H	0.57	21.62	20.04	0.10
836.4	H	0.74	21.54	20.13	0.10
846.6	H	0.95	21.44	20.24	0.11
Vertical Polarization (Antenna Pol.)					
Frequency (MHz)	**(EUT Pol.)**	**LVL (dBm)**	**Correction Factor (dB)**	**ERP (dBm)**	**ERP (W)**
826.4	H	0.47	21.62	19.94	0.10
836.4	H	0.93	21.54	20.32	0.11
846.6	H	1.11	21.44	20.40	0.11

** ERP = LVL (dBm) + Correction Factor (dB) – 2.15*
Correction Factor= S.G. Power - Cable loss + Antenna Gain- SPA. Reading

Test Result of EIRP

GPRS1900 (1-solt) Radiated Power EIRP					
Horizontal Polarization (Antenna Pol.)					
Frequency (MHz)	**(EUT Pol.)**	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (W)**
1850.2	H	6.87	21.66	28.53	0.71
1880.0	H	6.95	21.54	28.49	0.71
1909.8	H	7.16	21.46	28.62	0.73
Vertical Polarization (Antenna Pol.)					
Frequency (MHz)	**(EUT Pol.)**	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (W)**
1850.2	H	6.79	21.66	28.45	0.70
1880.0	H	6.92	21.54	28.46	0.70
1909.8	H	7.05	21.46	28.51	0.71

***Note**: All GPRS slot have been tested, but only the worst GPRS 1-slot show in this test item*

WCDMA Band IV (HSUPA) Radiated Power EIRP					
Horizontal Polarization (Antenna Pol.)					
Frequency (MHz)	**(EUT Pol.)**	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (W)**
1712.4	H	3.95	18.33	22.28	0.17
1732.6	H	4.17	18.15	22.32	0.17
1752.6	H	4.23	18.24	22.47	0.18
Vertical Polarization (Antenna Pol.)					
Frequency (MHz)	**(EUT Pol.)**	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (W)**
1712.4	H	3.99	18.33	22.32	0.17
1732.6	H	4.27	18.15	22.42	0.17
1752.6	H	4.41	18.24	22.65	0.18

** EIRP = LVL (dBm) + Correction Factor (dB)*
Correction Factor= S.G. Power - Cable loss + Antenna Gain- SPA. Reading

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WCDMA Band II (HSUPA) Radiated Power EIRP					
Horizontal Polarization (Antenna Pol.)					
Frequency (MHz)	**(EUT Pol.)**	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (W)**
1852.4	H	1.03	21.62	22.65	0.18
1880.0	H	1.18	21.54	22.72	0.19
1907.6	H	1.25	21.48	22.73	0.19
Vertical Polarization (Antenna Pol.)					
Frequency (MHz)	**(EUT Pol.)**	**LVL (dBm)**	**Correction Factor (dB)**	**EIRP (dBm)**	**EIRP (W)**
1852.4	H	1.09	21.62	22.71	0.19
1880.0	H	1.25	21.54	22.79	0.19
1907.6	H	1.38	21.48	22.86	0.19

** EIRP = LVL (dBm) + Correction Factor (dB)*
Correction Factor= S.G. Power - Cable loss + Substitution Antenna Gain- SPA. Reading

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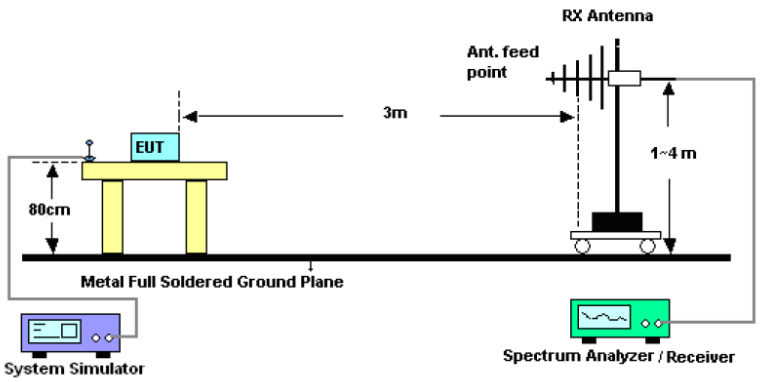
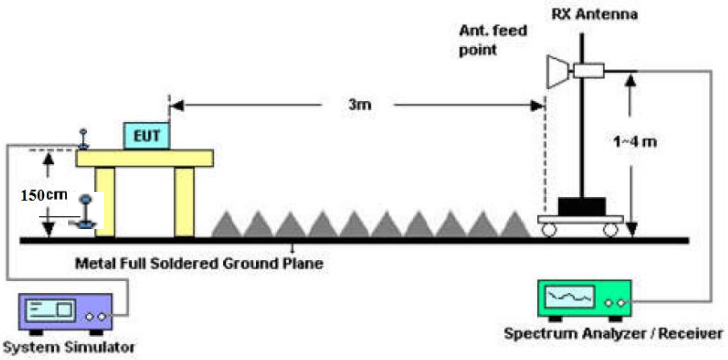
5.6. Field Strength of Spurious Radiation Measurement

5.6.1. Test Specification

Test Requirement:	FCC part 22.917(a) and FCC part 24.238(a) FCC part 27.53(h)
Test Method:	FCC KDB 971168 D01v03r01
Operation mode:	Refer to item 3.1
Limit:	-13dBm
Test setup:	For 30MHz~1GHz  Above 1GHz 
Test Procedure:	1. The testing follows FCC KDB 971168 D01v03r01 Section 6 and ANSI / TIA-603-D-2010 Section 2.2.12. 2. The EUT was placed on a rotatable wooden table 0.8 meters above the ground. 3. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower. 4. The table was rotated 360 degrees to determine the position of the highest spurious emission. 5. The height of the receiving antenna is varied between one meter and four meters to search for the maximum spurious emission for both horizontal and vertical polarizations. 6. Make the measurement with the spectrum analyzer's

	RBW = 1MHz, VBW = 3MHz, taking record of maximum spurious emission. 7. A horn antenna was substituted in place of the EUT and was driven by a signal generator. 8. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission. 9. Taking the record of output power at antenna port. 10. Repeat step 7 to step 8 for another polarization. 11. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain 12. ERP (dBm) = EIRP - 2.15 13. The RF fundamental frequency should be excluded against the limit line in the operating frequency band. 14. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts) = P(W) - [43 + 10log(P)] (dB) = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB) = -13dBm.
Test results:	PASS
Remark:	All modulations have been tested, but only the worst modulation show in this test item.

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5.6.2. Test Instruments

Radiated Emission Test Site (966)				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Universal Radio Communication Tester	R&S	CMU200	110188	Jul. 07, 2022
Spectrum Analyzer	R&S	FSQ40	200061	Jul. 07, 2022
Signal Generator	HP	83623B	3614A00396	Jul. 18, 2022
Broadband Antenna	Schwarzbeck	VULB9163	340	Sep. 04, 2022
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Sep. 04, 2022
Broadband Antenna	Schwarzbeck	VULB9163	412	Sep. 04, 2022
Horn Antenna	Schwarzbeck	BBHA 9120D	1201	Sep. 04, 2022
Horn Antenna	Schwarzbeck	BBHA 9170	00956	Apr. 10, 2023
Coaxial cable	SKET	RC_DC18G-N	N/A	Apr. 08, 2022
Coaxial cable	SKET	RC-DC18G-N	N/A	Apr. 08, 2022
Coaxial cable	SKET	RC-DC40G-N	N/A	Jul. 07, 2022
Antenna Mast	Keleto	RE-AM	N/A	N/A
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

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5.6.3. Test Data

Frequency Range (9 kHz-30MHz)

Frequency (MHz)	Level@3m (dBμV/m)	Limit@3m (dBμV/m)
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--	--	--
--	--	--
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Note: *1. Emission Level=Reading+ Cable loss+Antenna factor-Amp factor*

2. The emission levels are 20 dB below the limit value, which are not reported. It is deemed to comply with the requirement

Band	GSM 850	Test channel:	Lowest
Test mode:		Temperature :	25°C
		Relative Humidity:	56%

Note: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

Frequency (MHz)	Spurious Emission				Limit (dBm)	Result
	Polarization	Level (dBm)	Correction Factor (dB)	Spurious emissions (dBm)		
1648.4	Vertical	-57.53	23.12	-34.41	-13.00	PASS
2472.6	V	-62.61	23.20	-39.41		
3296.8	V	-76.71	23.28	-53.43		
1648.4	Horizontal	-55.34	23.12	-32.22		
2472.6	H	-62.47	23.20	-39.27		
3296.8	H	-74.41	23.28	-51.13		

Band	GSM 850	Test channel:	Middle
Test mode:		Temperature :	25°C
		Relative Humidity:	56%

Note: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

Frequency (MHz)	Spurious Emission				Limit (dBm)	Result
	Polarization	Level (dBm)	Correction Factor (dB)	Spurious emissions (dBm)		
1673.2	Vertical	-56.91	23.17	-33.74	-13.00	PASS
2509.8	V	-67.80	23.26	-44.54		
3346.4	V	-76.49	23.38	-53.11		
1673.2	Horizontal	-55.16	23.17	-31.99		
2509.8	H	-63.82	23.26	-40.56		
3346.4	H	-76.65	23.38	-53.27		

Band	GSM 850	Test channel:	Highest
Test mode:		Temperature :	25°C
		Relative Humidity:	56%

Note: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

Frequency (MHz)	Spurious Emission				Limit (dBm)	Result
	Polarization	Level (dBm)	Correction Factor (dB)	Spurious emissions (dBm)		
1697.6	Vertical	-59.68	23.23	-36.45	-13.00	PASS
2546.4	V	-68.33	23.32	-45.01		
3395.2	V	-76.90	23.44	-53.46		
1697.6	Horizontal	-55.68	23.23	-32.45		
2546.4	H	-64.11	23.32	-40.79		
3395.2	H	-78.49	23.44	-55.05		

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Band	PCS 1900	Test channel:	Lowest
Test mode:		Temperature :	25°C
		Relative Humidity:	56%

Note: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

Frequency (MHz)	Spurious Emission				Limit (dBm)	Result
	Polarization	Level (dBm)	Correction Factor (dB)	Spurious emissions (dBm)		
3700.4	Vertical	-63.70	23.49	-40.21	-13.00	PASS
5550.6	V	-72.20	23.75	-48.45		
7400.8	V	-77.93	23.89	-54.04		
3700.4	Horizontal	-59.83	23.49	-36.34		
5550.6	H	-67.47	23.75	-43.72		
7400.8	H	-76.61	23.89	-52.72		

Band	PCS 1900	Test channel:	Middle
Test mode:		Temperature :	25°C
		Relative Humidity:	56%

Note: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

Frequency (MHz)	Spurious Emission				Limit (dBm)	Result
	Polarization	Level (dBm)	Correction Factor (dB)	Spurious emissions (dBm)		
3760.0	Vertical	-63.40	23.58	-39.82	-13.00	PASS
5640.0	V	-73.24	23.85	-49.39		
7520.0	V	-72.21	23.99	-48.22		
3760.0	Horizontal	-60.59	23.58	-37.01		
5640.0	H	-73.84	23.85	-49.99		
7520.0	H	-77.96	23.99	-53.97		

Band	PCS 1900	Test channel:	Highest
Test mode:		Temperature :	25°C
		Relative Humidity:	56%

Note: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

Frequency (MHz)	Spurious Emission				Limit (dBm)	Result
	Polarization	Level (dBm)	Correction Factor (dB)	Spurious emissions (dBm)		
3819.6	Vertical	-61.47	23.64	-37.83	-13.00	PASS
5729.4	V	-71.36	23.93	-47.43		
7639.2	V	-78.08	24.08	-54.00		
3819.6	Horizontal	-58.33	23.64	-34.69		
5729.4	H	-67.23	23.93	-43.30		
7639.2	H	-78.26	24.08	-54.18		

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Band	WCDMA Band V				Test channel:	Lowest
Test mode:	RMC 12.2Kbps Link (QPSK)				Temperature :	25°C
					Relative Humidity:	56%
Note: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.						
Frequency (MHz)	Spurious Emission				Limit (dBm)	Result
	Polarization	Level (dBm)	Correction Factor (dB)	Spurious emissions (dBm)		
1652.8	Vertical	-67.81	23.14	-44.67	-13.00	PASS
2479.2	V	-77.17	23.23	-53.94		
3305.6	V	-76.42	23.34	-53.08		
1652.8	Horizontal	-66.55	23.14	-43.41		
2479.2	H	-76.05	23.23	-52.82		
3305.6	H	-78.21	23.34	-54.87		

Band	WCDMA Band V				Test channel:	Middle
Test mode:	RMC 12.2Kbps Link (QPSK)				Temperature :	25°C
					Relative Humidity:	56%
Note: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.						
Frequency (MHz)	Spurious Emission				Limit (dBm)	Result
	Polarization	Level (dBm)	Correction Factor (dB)	Spurious emissions (dBm)		
1673.2	Vertical	-67.47	23.17	-44.30	-13.00	PASS
2509.8	V	-75.90	23.26	-52.64		
3346.4	V	-77.32	23.38	-53.94		
1673.2	Horizontal	-65.02	23.17	-41.85		
2509.8	H	-79.43	23.26	-56.17		
3346.4	H	-76.91	23.38	-53.53		

Band	WCDMA Band V				Test channel:	Highest
Test mode:	RMC 12.2Kbps Link (QPSK)				Temperature :	25°C
					Relative Humidity:	56%
Note: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.						
Frequency (MHz)	Spurious Emission				Limit (dBm)	Result
	Polarization	Level (dBm)	Correction Factor (dB)	Spurious emissions (dBm)		
1693.2	Vertical	-70.53	23.20	-47.33	-13.00	PASS
2539.8	V	-76.93	23.29	-53.64		
3386.4	V	-80.46	23.42	-57.04		
1693.2	Horizontal	-66.86	23.20	-43.66		
2539.8	H	-76.79	23.29	-53.50		
3386.4	H	-79.69	23.42	-56.27		

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Band	WCDMA Band IV			Test channel:	Lowest
Test mode:	RMC 12.2Kbps Link (QPSK)			Temperature :	25°C
				Relative Humidity:	56%
Note: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.					
Frequency (MHz)	Spurious Emission			Limit (dBm)	Result
	Polarization	Level (dBm)	Correction Factor (dB)	Spurious emissions (dBm)	
2452.3	Vertical	-77.96	23.16	-54.80	-13.00 PASS
3424.8	V	-77.25	23.37	-53.88	
5137.2	V	-80.03	23.65	-56.38	
2452.3	Horizontal	-77.16	23.16	-54.00	
3424.8	H	-77.86	23.37	-54.49	
5137.2	H	-76.41	23.65	-52.76	

Band	WCDMA Band IV			Test channel:	Middle
Test mode:	RMC 12.2Kbps Link (QPSK)			Temperature :	25°C
				Relative Humidity:	56%
Note: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.					
Frequency (MHz)	Spurious Emission			Limit (dBm)	Result
	Polarization	Level (dBm)	Correction Factor (dB)	Spurious emissions (dBm)	
2641.3	Vertical	-78.66	23.30	-55.36	-13.00 PASS
3465.2	V	-75.49	23.42	-52.07	
5197.8	V	-79.55	23.73	-55.82	
2641.3	Horizontal	-76.22	23.30	-52.92	
3465.2	H	-79.60	23.42	-56.18	
5197.8	H	-78.71	23.73	-54.98	

Band	WCDMA Band IV			Test channel:	Highest
Test mode:	RMC 12.2Kbps Link (QPSK)			Temperature :	25°C
				Relative Humidity:	56%
Note: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.					
Frequency (MHz)	Spurious Emission			Limit (dBm)	Result
	Polarization	Level (dBm)	Correction Factor (dB)	Spurious emissions (dBm)	
3102.2	Vertical	-76.94	23.35	-53.59	-13.00 PASS
3505.2	V	-77.63	23.45	-54.18	
5257.8	V	-75.12	23.82	-51.30	
3102.2	Horizontal	-77.76	23.35	-54.41	
3505.2	H	-77.45	23.45	-54.00	
5257.8	H	-80.25	23.82	-56.43	

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Band	WCDMA Band II			Test channel:	Lowest
Test mode:	RMC 12.2Kbps Link (QPSK)			Temperature :	25°C
				Relative Humidity:	56%
Note: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.					
Frequency (MHz)	Spurious Emission			Limit (dBm)	Result
	Polarization	Level (dBm)	Correction Factor (dB)	Spurious emissions (dBm)	
3704.8	Vertical	-67.01	23.53	-43.48	-13.00 PASS
5557.2	V	-78.74	23.78	-54.96	
7409.6	V	-80.41	23.92	-56.49	
3704.8	Horizontal	-68.92	23.53	-45.39	
5557.2	H	-77.35	23.78	-53.57	
7409.6	H	-80.53	23.92	-56.61	

Band	WCDMA Band II			Test channel:	Middle
Test mode:	RMC 12.2Kbps Link (QPSK)			Temperature :	25°C
				Relative Humidity:	56%
Note: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.					
Frequency (MHz)	Spurious Emission			Limit (dBm)	Result
	Polarization	Level (dBm)	Correction Factor (dB)	Spurious emissions (dBm)	
3760.0	Vertical	-68.54	23.58	-44.96	-13.00 PASS
5640.0	V	-78.57	23.85	-54.72	
7520.0	V	-81.03	23.99	-57.04	
3760.0	Horizontal	-69.61	23.58	-46.03	
5640.0	H	-75.82	23.85	-51.97	
7520.0	H	-79.98	23.99	-55.99	

Band	WCDMA Band II			Test channel:	Highest
Test mode:	RMC 12.2Kbps Link (QPSK)			Temperature :	25°C
				Relative Humidity:	56%
Note: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.					
Frequency (MHz)	Spurious Emission			Limit (dBm)	Result
	Polarization	Level (dBm)	Correction Factor (dB)	Spurious emissions (dBm)	
3815.2	Vertical	-70.28	23.62	-46.66	-13.00 PASS
5722.8	V	-81.14	23.90	-57.24	
7630.4	V	-81.72	24.05	-57.67	
3815.2	Horizontal	-68.16	23.62	-44.54	
5722.8	H	-76.34	23.90	-52.44	
7630.4	H	-81.13	24.05	-57.08	

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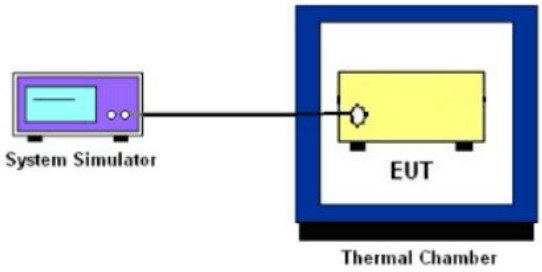
5.7. Frequency Stability Measurement

5.7.1. Test Specification

Test Requirement:	FCC Part 2.1055 ; FCC Part 22.355 ; FCC Part 24.235 FCC Part 27.54
Test Method:	FCC KDB 971168 D01v03r01
Operation mode:	Refer to item 3.1
Limit:	FCC Part 22.355 : ±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.
Test Setup:	
Test Procedure:	**Test Procedures for Temperature Variation** 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°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°C steps up to 50°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±5° 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.
Test Result:	PASS
Remark:	All three channels of all modulations have been tested, but only the worst channel and the worst modulation show in this test item.

5.7.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Universal Radio Communication Tester	R&S	CMU200	110188	Jul. 07, 2022
Programable tempratuce and humidity chamber	JQ	MHU-80L	N/A	Jul. 18, 2022
DC power supply	Kingrang	KR3005K	N/A	Jul. 18, 2022
RF cable (9kHz-40GHz)	TCT	RE-04	N/A	Jul. 18, 2022
Antenna Connector	TCT	RFC-03	N/A	Jul. 18, 2022

5.7.3. Test Data

Test Result of Temperature Variation

Band :	GSM 850	Channel:	190
Limit (ppm) :	2.5	Frequency:	836.6MHz

Temperature (°C)	Deviation (ppm)	Result
50	0.016	PASS
40	0.014	
30	0.011	
20	0.018	
10	0.019	
0	0.017	
-10	0.014	
-20	0.018	
-30	0.015	

Band :	GSM 1900	Channel:	661
Limit (ppm) :	Note	Frequency:	1880MHz

Temperature (°C)	Deviation (ppm)	Result
50	0.020	PASS
40	0.018	
30	0.019	
20	0.014	
10	0.017	
0	0.023	
-10	0.018	
-20	0.016	
-30	0.022	

Note: *The frequency fundamental emissions stay within the authorized frequency block based on the frequency deviation measured is small.*

Band :	WCDMA Band V	Channel:	4182
Limit (ppm) :	2.5ppm	Frequency:	836.4MHz

Temperature (°C)	HSUPA Deviation (ppm)	Result
50	0.015	PASS
40	0.013	
30	0.008	
20	0.016	
10	0.014	
0	0.012	
-10	0.018	
-20	0.016	
-30	0.013	

Band :	WCDMA Band IV	Channel:	1413
Limit (ppm) :	Note1	Frequency:	1732.6

Temperature (°C)	HSUPA Deviation (ppm)	Result
50	0.017	PASS
40	0.019	
30	0.021	
20	0.013	
10	0.010	
0	0.016	
-10	0.014	
-20	0.018	
-30	0.019	

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Band :	WCDMA Band II	Channel:	9400
Limit (ppm) :	Note1	Frequency:	1880MHz

Temperature (°C)	HSUPA Deviation (ppm)	Result
50	0.014	PASS
40	0.013	
30	0.015	
20	0.018	
10	0.020	
0	0.022	
-10	0.017	
-20	0.023	
-30	0.016	

Note1: *The frequency fundamental emissions stay within the authorized frequency block based on the frequency deviation measured is small.*

Test Result of Voltage Variation

Band & Channel	Mode	Voltage (Volt)	Deviation (ppm)	Limit (ppm)	Result
GSM 850 CH190	GPRS	4.2	+0.017	2.5	PASS
		3.8	+0.019		
		BEP	+0.013		
GSM 1900 CH661	GPRS	4.2	+0.023	(Note 3.)	
		3.8	+0.020		
		BEP	+0.016		
WCDMA Band IV CH1413	RMC 12.2Kbps	4.2	-0.009	2.5	
		3.8	-0.015		
		BEP	-0.011		
WCDMA Band V CH4182	RMC 12.2Kbps	4.2	-0.015		
		3.8	-0.017		
		BEP	-0.014		
WCDMA Band II CH9400	RMC 12.2Kbps	4.2	-0.021	(Note 3.)	
		3.8	-0.018		
		BEP	-0.023		

Note:

1. Normal Voltage = 3.8V.
2. Battery End Point (BEP) = 3.4V.
3. The frequency fundamental emissions stay within the authorized frequency block based on the frequency deviation measured is small.

Appendix A: Photographs of Test Setup

Refer to the test report No. TCT220118E015

Appendix B: Photographs of EUT

Refer to the test report No. TCT220118E015

*****END OF REPORT*****