FCC TEST REPORT

For

N300 4G Smart Router

Trade Name: D-Link

Model: G403

Issued to

D-Link Corporation
14420 Myford Road Suite 100 Irvine California United States 92606

Issued by

Compliance Certification Services Inc.
Wugu Laboratory
No.11, Wugong 6th Rd., Wugu Dist.,
New Taipei City, Taiwan
Issued Date: December 8, 2023

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	December 8, 2023	Initial Issue	ALL	Peggy Tsai

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1. TEST RESULT CERTIFICATION

Applicant:	D-Link Corporation 14420 Myford Road Suite 100 Irvine California United States 92606
Manufacturer:	D-Link Corporation 14420 Myford Road Suite 100 Irvine California United States 92606
Equipment Under Test:	N300 4G Smart Router
Trade Name:	D-Link
Model Number:	G403
Date of Test:	October 24~30, 2023

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
FCC 47 CFR PART 22 SUBPART H & PART 24 SUBPART E & PART 27 SUBPART L	Compliance
Statements of Conformity	
Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.	

We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in TIA-603-E & ANSI C63.26-2015 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rule FCC PART 22 Subpart H and PART 24 Subpart E and PART 27 Subpart L.

The test results of this report relate only to the tested sample identified in this report.

Approved by:

Shawn Wu
Supervisor

2. EUT DESCRIPTION

Product	N300 4G Smart Router	
Trade Name	D-Link	
Model:	G403	
Model Discrepancy	N/A	
Received Date	October 18, 2023	
Power Supply	Power form Adapter AMIGO / AMS159A-1201000FU	
Antenna Specification	Antenna Type: Dipole Antenna Chain 0. INPAQ / RFDPA191723IMTB301 Band II: 4.27 dBi Band IV: 2.21 dBi Band V: 0.59 dBi Chain 1. INPAQ / RFDPA191708IMTB301 Band II: 4.35 dBi Band IV: 3.99 dBi Band V: 2.15 dBi	
Modulation Technique	WCDMA Band II	QPSK, 16QAM
	WCDMA Band IV	QPSK, 16QAM
	WCDMA Band V	QPSK, 16QAM
Frequency Range	WCDMA / HSDPA / HSUPA Band II: 1852.4MHz ~1907.6MHz	
	WCDMA / HSDPA / HSUPA Band IV: 1712.4MHz ~ 1752.6MHz	
	WCDMA / HSDPA / HSUPA Band V: 826.4 ~ 846.6MHz	

Remark:
1. For more details, please refer to the User's manual of the EUT.
2. Disclaimer: Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.

Emission Designator					
System	**Band**	**Frequency Range(MHz)**	**Emission Designator (99% OBW)**	**Maximum ERP (W)**	**Maximum EIRP (W)**
WCDMA 12.2K RMC	**II**	**1852.4MHz ~1907.6MHz**	**4M18F9W**	**N/A**	**0.6026**
	IV	**1712.4MHz ~1752.6MHz**	**4M17F9W**	**N/A**	**0.5383**
	V	**826.4MHz ~ 846.6MHz**	**4M17F9W**	**0.1521**	**N/A**

3. TEST METHODOLOGY

Both conducted and radiated testing were performed according to TIA -603-E, FCC CFR 47, Part 2 and Part 22 Subpart H & Part 24 Subpart E.

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 DESCRIPTION OF TEST MODES

The EUT (Model: G403) had been tested under operating condition.

Software used to control the EUT for staying in continuous transmitting mode was programmed.

WCDMA Band II: 1852.4MHz ~ 1907.6MHz

Channel Bandwidth	WCDMA Band II	
	Channel	Frequency (MHz)
Low channel (L)	9262	1852.4
Middle channel (M)	9400	1880
High channel (H)	9538	1907.6

WCDMA Band IV: 1712.4MHz ~ 1752.6MHz

Channel Bandwidth	WCDMA Band IV	
	Channel	Frequency (MHz)
Low channel (L)	1312	1712.4
Middle channel (M)	1412	1732.4
High channel (H)	1513	1752.6

WCDMA Band V: 826.4MHz ~ 846.6MHz

Channel Bandwidth	WCDMA Band V	
	Channel	Frequency (MHz)
Low channel (L)	4132	826.4
Middle channel (M)	4183	836.6
High channel (H)	4233	846.6

3.2.1 The worst mode of measurement

Radiated Emission Measurement Above 1G	
Test Condition	**Radiated Emission Above 1G**
Power supply Mode	**Mode 1: EUT power by Adapter**
Worst Mode	**☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4**
Worst Position	**☐ Placed in fixed position.** **☒ Placed in fixed position at X-Plane (E2-Plane)** **☐ Placed in fixed position at Y-Plane (E1-Plane)** **☐ Placed in fixed position at Z-Plane (H-Plane)**

Radiated Emission Measurement Below 1G	
Test Condition	**Radiated Emission Below 1G**
Power supply Mode	**Mode 1: EUT power by Adapter**
Worst Mode	**☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4**

Remark:
1. The worst mode was record in this test report.
2. EUT pre-scanned in three axis ,X,Y, Z and two polarity, for radiated measurement. The worst case(X-Plane) were recorded in this report

4. TEST SUMMARY

FCC Standard Section	Report Section	Test Item	Result
-	2	Antenna Requirement	Pass
22.913(a), 24.232(c) 27.50(d)	8.1	ERP and EIRP Measurement	Pass
2.1049	8.2	Occupied Bandwidth Measurement	Pass
22.913(d), 24.232(d) 27.50 (d)	8.3	Peak to Average Ratio	Pass
22.917(a), 24.238(a) 27.53(h)	8.4	Out of Band Emission at Antenna Terminals	Pass
22.917(a), 24.238(a) 27.53(h)	8.5	Spurious Radiation Measurement	Pass
2.1055, 22.355, 24.235, 27.54	8.6	Frequency Stability v.s. temperature measurement	Pass

5. INSTRUMENT CALIBRATION

5.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

5.2 MEASUREMENT EQUIPMENT USED

Equipment Used for Emissions Measurement

Conducted_FCC/IC/NCC (WWAN)					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
EXA Signal Analyzer	Keysight	N9030B	MY62291089	2023-10-13	2024-1012
Radio Communication Analyzer	Rohde& Schwarz	CMW500	116875	2023-06-08	2024-06-07
Cable	Woken	SUMITOMO	1	2023-03-02	2024-03-01
Software	Radio Test Software Ver. 21				

Remark:
1. Each piece of equipment is scheduled for calibration once a year.
2. N.C.R. = No Calibration Required.

966A_Radiated WWAN					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Loop Antenna	COM-POWER	AL-130	121051	2023-05-23	2024-05-22
Preamplifier	EMEC	EM330	060609	2023-02-22	2024-02-21
Thermo-Hygro Meter	WISEWIND	1206	D07	2022-12-19	2023-12-18
Signal Analyzer	KEYSIGHT	N9010A	MY54200716	2023-10-13	2024-10-12
Preamplifier	HP	8449B	3008A00965	2022-12-23	2023-12-22
Bi-Log Antenna	Sunol Sciences	JB1	A052609	2023-02-09	2024-02-08
Bi-Log Antenna	Sunol Sciences	JB3	A030105	2023-08-08	2024-08-07
Cable	Huber+Suhner	104PEA	20995+21000+ 182330	2023-02-22	2024-02-21
Cable	EMCI	EMC101G	221213+221011 +221012	2023-10-17	2024-10-16
Cable	EMCI	EMC104G	SN230204	2023-05-13	2024-05-12
Horn Antenna	ETS LINDGREN	3117	55165	2023-07-12	2024-07-11
Horn Antenna	ETC	MCTD 1209	DRH13M02003	2023-01-12	2024-01-11
Horn Antenna	SCHWARZBECK	BBHA9170	1047	2022-12-30	2023-12-29
Pre-Amplifier	EMCI	EMC184045SE	980860	2022-12-27	2023-12-26
Signal Generator	Agilent	E8257C	US42340383	2022-06-29	2023-06-28
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Software	e3 V9-210616c				

Remark:
1. Each piece of equipment is scheduled for calibration once a year.
2. N.C.R. = No Calibration Required.

5.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
RF Output Power	± 2.533 dB
Channel Bandwidth	± 2.532 MHz
Peak to average ratio	± 2.531 dB
Conducted Bandedge	± 2.532 dB
Conducted Unwanted Emissions	± 2.533 dB
Frequency Stability	± 2.579 Hz
Radiated Emission_9kHz-30MHz	± 3.778 dB
Radiated Emission_30MHz-200MHz	± 3.457 dB
Radiated Emission_200MHz-1GHz	± 3.962 dB
Radiated Emission_1GHz-6GHz	± 4.804 dB
Radiated Emission_6GHz-18GHz	± 4.781 dB
Radiated Emission_18GHz-26GHz	± 3.112 dB
Radiated Emission_26GHz-40GHz	± 3.314 dB

Remark: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

6. FACILITIES AND ACCREDITATIONS

6.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

☒ No.11, Wugong 6th Rd., Wugu Dist., New Taipei City, Taiwan.
Tel: 886-2-2299-9720 / Fax: 886-2-2299-9721

7. SETUP OF EQUIPMENT UNDER TEST

7.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix II for the actual connections between EUT and support equipment.

7.2 SUPPORT EQUIPMENT

Support Unit List					
N0	**Kind**	**Brand**	**Model**	**Core**	**Length**
A	Adapter	AMIGO	AMS159A-1201000FU	N/A	N/A

Remark:

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.

8. FCC PART 22 & 24 & 27 REQUIREMENTS

8.1 ERP & EIRP MEASUREMENT

LIMIT

Band II & V

According to FCC 22.913(a):

The Effective Radiated Power (ERP) of mobile transmitters must not exceed 7 Watts.

According to FCC 24.232(b):

The equivalent Isotropic Radiated Power (EIRP) must not exceed 2 Watts.

Band IV

FCC Part 27.50(d)(4)

Fixed, mobile, and portable (handheld) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

TEST PROCEDURES

CONDUCTED POWER MEASUREMENT:

1. The transmitter output power was connected to the call box.
2. Set EUT at maximum output power via call box.
3. Set Call box at lowest, middle and highest channels for each band and modulation.

TEST RESULTS

Compliance.

Temperature:	22.3 ~ 25.6℃	**Test date:**	October 24 ~ 27, 2023
Humidity:	55 ~ 57% RH	**Tested by:**	David Lee

WCDMA Band II:

Band	WCDMA II					
TX Channel	9262	9400	9538	9262	9400	9538
Frequency (MHz)	1852.4	1880	1907.6	1852.4	1880	1907.6
Output_Power	Conducted Average (dBm)			EIRP Average (dBm)		
RMC 12.2Kbps	23.45	22.04	21.69	27.80	26.39	26.04

WCDMA Band IV

Band	WCDMA IV					
TX Channel	1312	1412	1513	1312	1412	1513
Frequency (MHz)	1712.4	1732.4	1752.6	1712.4	1732.4	1752.6
Output_Power	Conducted Average (dBm)			EIRP Average (dBm)		
RMC 12.2Kbps	23.32	23.10	22.32	27.31	27.09	26.31

WCDMA Band V

Band	WCDMA V					
TX Channel	4132	4183	4233	4132	4183	4233
Frequency (MHz)	826.4	836.6	846.6	826.4	836.6	846.6
Output_Power	Conducted Average (dBm)			ERP Average (dBm)		
RMC 12.2Kbps	20.11	21.65	21.82	20.11	21.65	21.82

8.2 OCCUPIED BANDWIDTH MEASUREMENT

Limits

For Reporting purpose only.

TEST PROCEDURES

KDB 971168 D01

1. The occupied bandwidth was measured with the spectrum analyzer at the lowest, middle and highest channels in each band and different modulation. The 99% and -26dB bandwidth was measured and recorded.
2. RBW = 1-5% of the expected OBW
3. VBW ≥ 3 x RBW
4. Detector = Peak
5. Trace mode = max. hold

TEST RESULTS

Compliance

Test Data

Temperature: 22.3 ~ 25.6℃ **Test date:** October 24 ~ 27, 2023

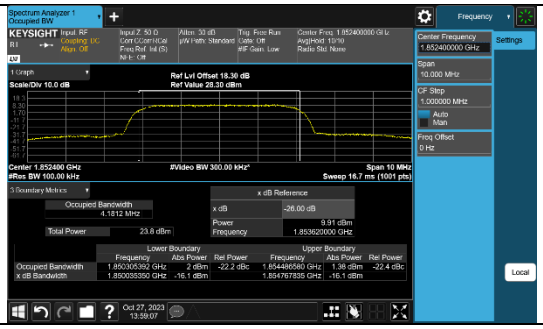
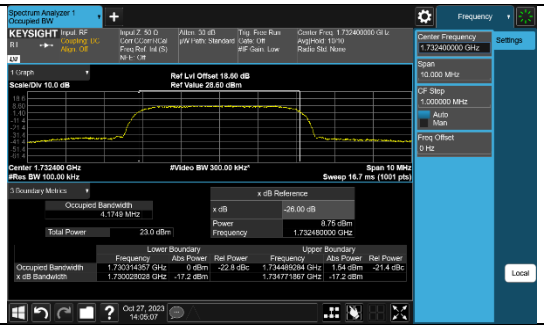
Humidity: 55 ~ 57% RH **Tested by:** David Lee

WCDMA II			
Freq. (MHz)	CH	99% BW (MHz)	26 dB BW (MHz)
1852.4	9262	**4.1812**	**4.7325**
1880.0	9400	4.1738	4.7212
1907.6	9538	4.1789	4.7283

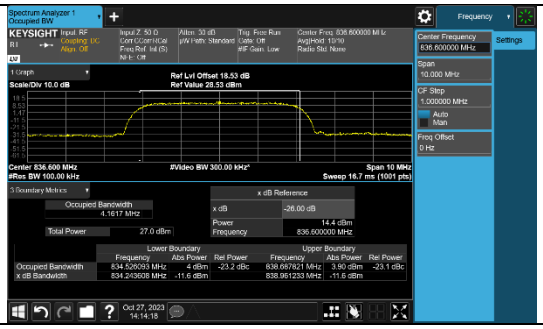
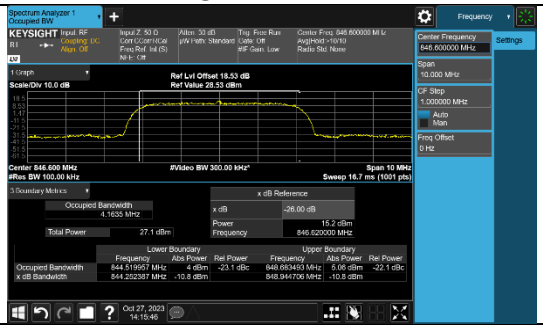
WCDMA IV			
Freq. (MHz)	CH	99% BW (MHz)	26 dB BW (MHz)
1712.4	1312	4.1650	4.7227
1732.4	1412	**4.1749**	**4.7438**
1752.6	1513	4.1639	4.6983

WCDMA II			
Freq. (MHz)	CH	99% BW (MHz)	26 dB BW (MHz)
826.4	4132	**4.1694**	4.6986
836.6	4183	4.1617	**4.7176**
846.6	4233	4.1635	4.6923

Test Plot(s)

WCDMA Band II	WCDMA Band IV
Low CH_9262	**Low CH_1312**
	
Mid CH_9400	**Mid CH_1412**
	
High CH_9538	**High CH_1513**
	

WCDMA Band V
Low CH_4132

Mid CH_4183

High CH_4233


8.3 PEAK TO AVERAGE POWER RATIO

Limit

FCC §24.232(d), Band II

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB

FCC §27.50(d), Band IV

In measuring transmissions in this band using an average power technique, peak-to-average power ratio (PAPR) of the transmission may not exceed 13 dB.

FCC §22.913(d), Band V

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB

Test Procedures

1. According to KDB 971168 D01.
2. The EUT was connect to spectrum analyzer and call box.
3. Set the CCDF function in spectrum analyzer.
4. The highest RF output power were measured and recorded the maximum PAPR level associated with a probability of 0.1%.
5. Record the Peak to Average Power Ratio.

TEST RESULTS

Compliance

Test Data

Temperature: 22.3 ~ 25.6℃ **Test date:** October 24 ~ 27, 2023

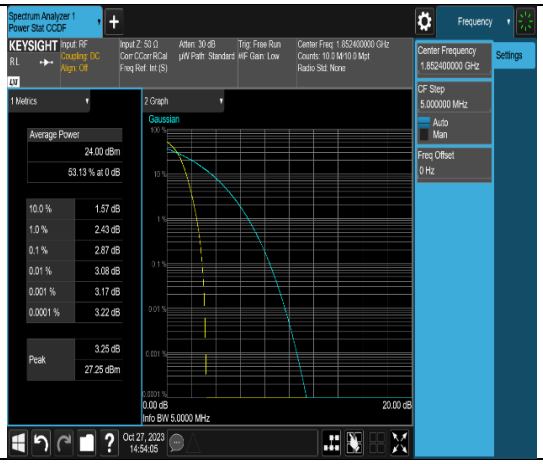
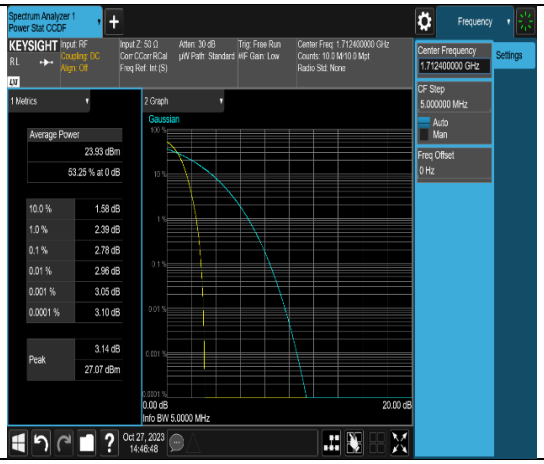
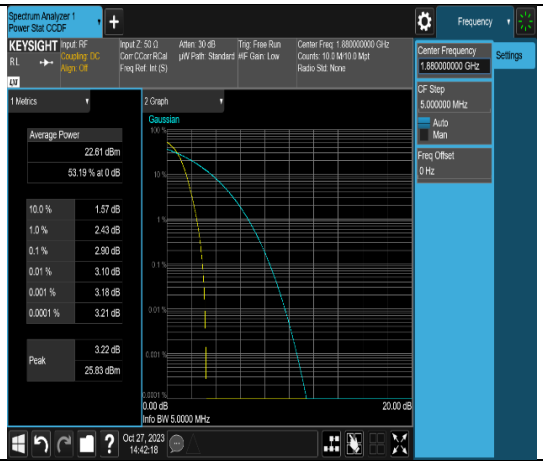
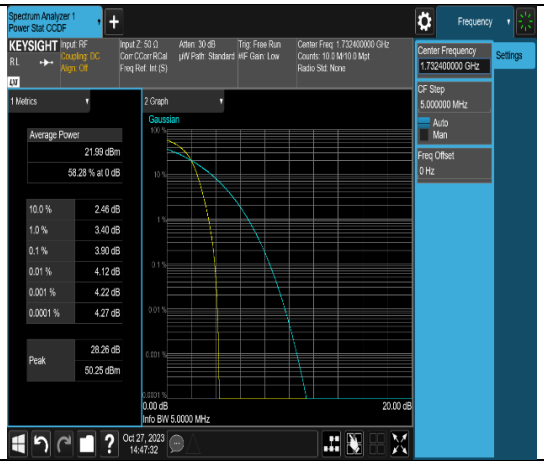
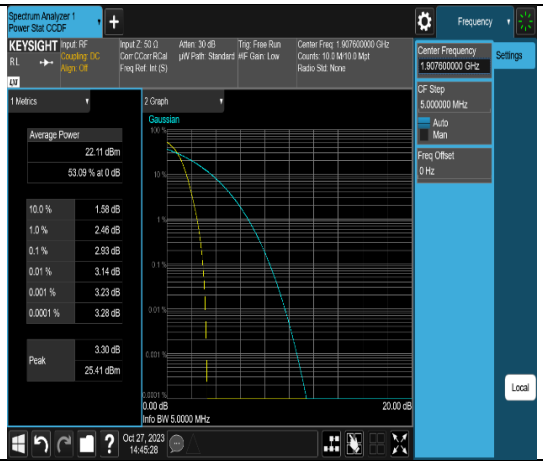
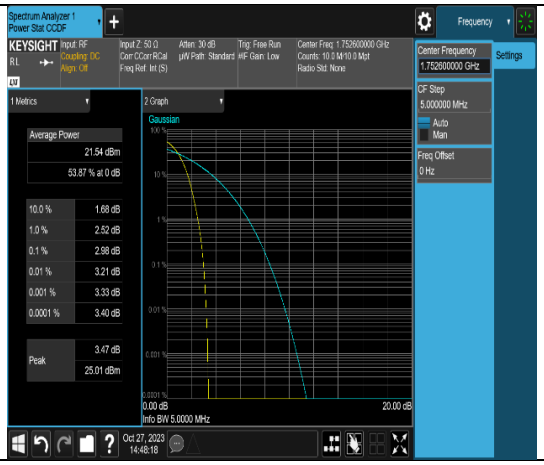
Humidity: 55 ~ 57% RH **Tested by:** David Lee

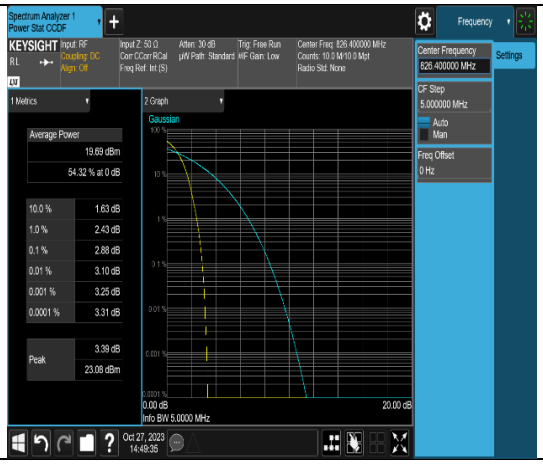
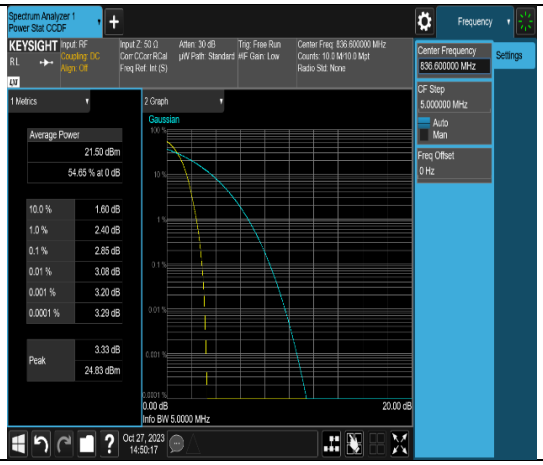
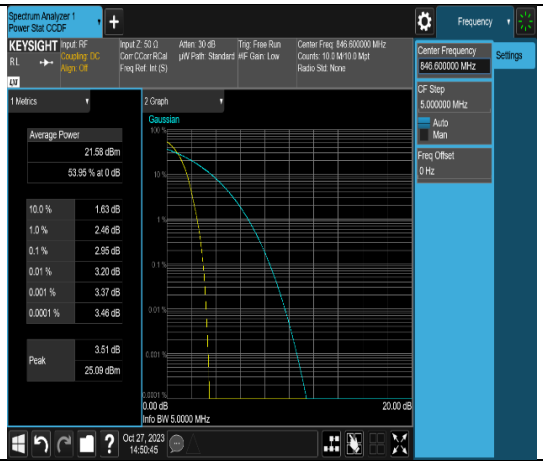
WCDMA II			
Freq. (MHz)	CH	PAPR (dB)	Limit
1852.4	9262	2.87	13
1880.0	9400	2.90	13
1907.6	9538	2.93	13

WCDMA IV			
Freq. (MHz)	CH	PAPR (dB)	Limit
1712.4	1312	2.78	13
1732.4	1412	3.90	13
1752.6	1513	2.98	13

WCDMA V			
Freq. (MHz)	CH	PAPR (dB)	Limit
826.4	4132	2.88	13
836.6	4183	2.85	13
846.6	4233	2.95	13

Test Plot(s)

WCDMA Band II	WCDMA Band IV
Low CH_9262	Low CH_1312
	
Mid CH_9400	Mid CH_1412
	
High CH_9538	High CH_1513
	

WCDMA Band V
Low CH_4132

Mid CH_4183

High CH_4233


8.4 OUT OF BAND EMISSION AT ANTENNA TERMINALS

Limit

FCC §24.238(a), Band II

For operations in the 1850-1910 and 1930-1950 MHz band, out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

FCC §27.53 (h), Band IV

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB.

FCC §22.917(a), Band V

For operations in the 824-849 MHz band, out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

TEST PROCEDURE

a) Conducted Emission
The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.
1. To connect Antenna Port of EUT to Spectrum.
2. Set RBW = 1MHz & VBW = 1MHz on Spectrum.
3. Allow trace to fully stabilize
4. Repeat above procedures until all default test channel measured were complete.

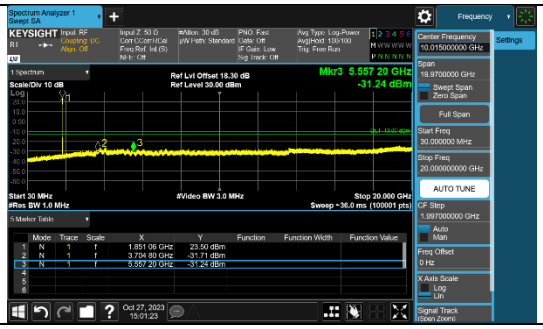
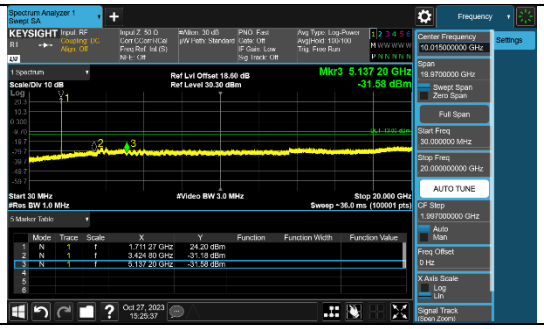
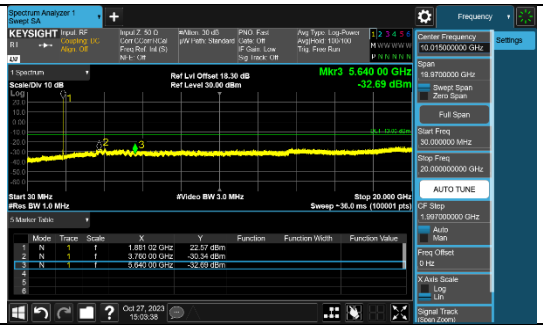
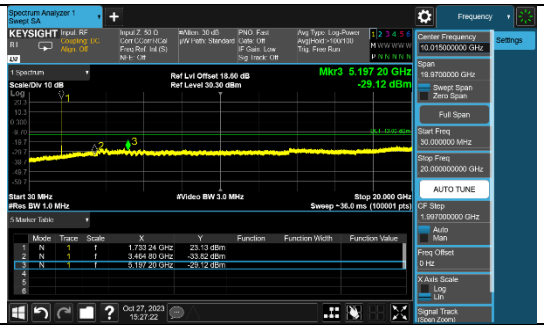
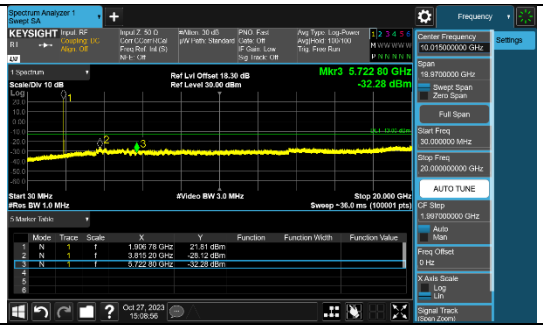
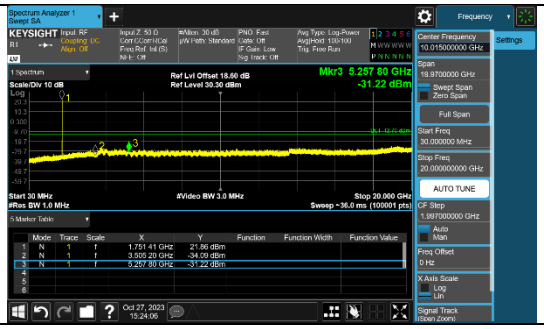
b) Band Edge
1. To connect Antenna Port of EUT to Spectrum.
2. The band edge of low and high channels for the highest RF powers was measured. Setting RBW ≥ 1% EBW.
3. Allow trace to fully stabilize
4. Repeat above procedures until all default test channel measured were complete.

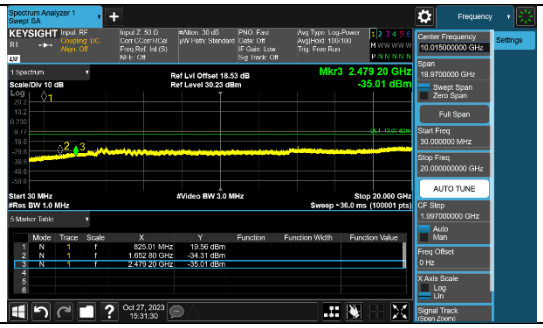
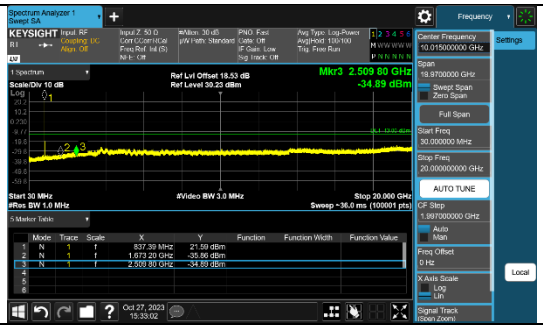
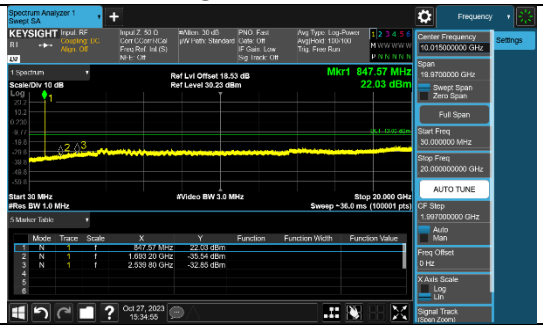
TEST RESULTS

Compliance

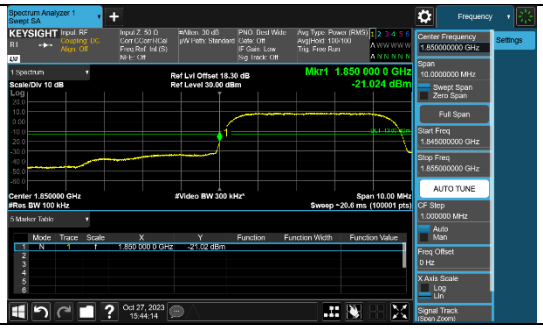
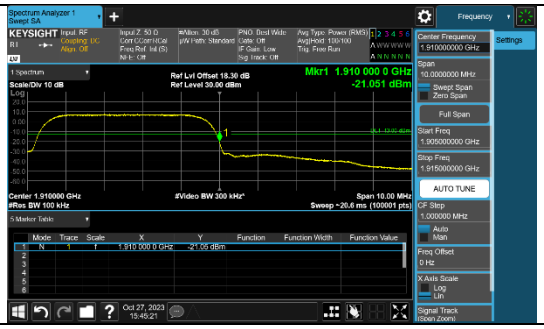
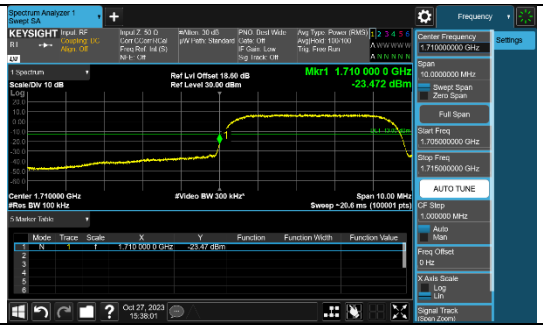
Temperature:	22.3 ~ 25.6℃	**Test date:**	October 24 ~ 27, 2023
Humidity:	55 ~ 57% RH	**Tested by:**	David Lee

Conducted Emission

WCDMA Band II	WCDMA Band IV
Low CH_9262	Low CH_1312
	
Mid CH_9400	Mid CH_1412
	
High CH_9538	High CH_1513
	

WCDMA Band V
Low CH_4132

Mid CH_4183

High CH_4233


Band Edge

WCDMA Band II	
Low CH_9262	High CH_9538
	
WCDMA Band IV	
Low CH_1312	High CH_1513
	
WCDMA Band V	
Low CH_4132	High CH_4233
	

8.5 SPURIOUS RADIATION MEASUREMENT

Limit

FCC §24.238(a), Band II

For operations in the 1850-1910 and 1930-1950 MHz band, out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

FCC §27.53 (h), Band IV

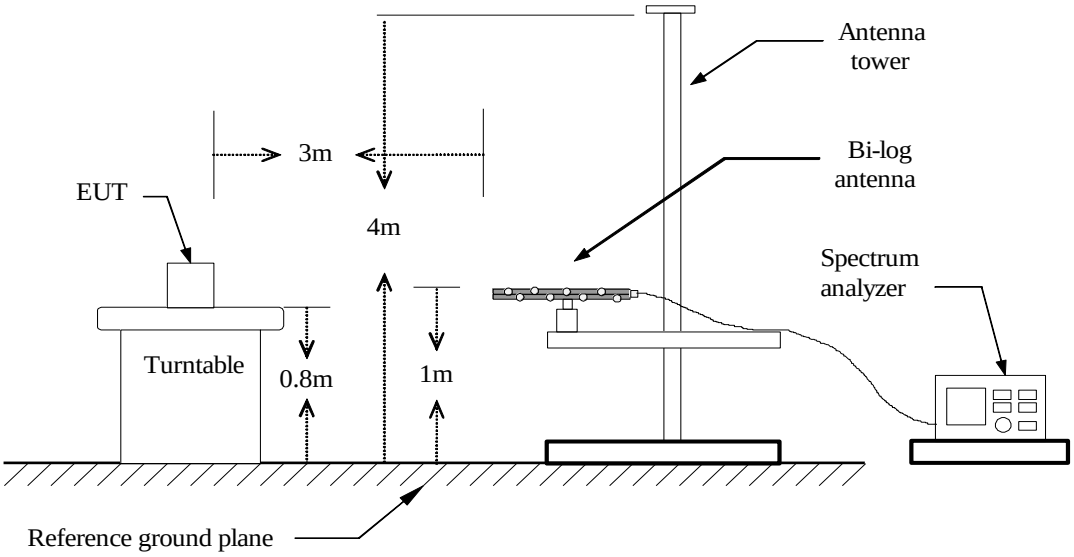
The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB.

FCC §22.917(a), Band V

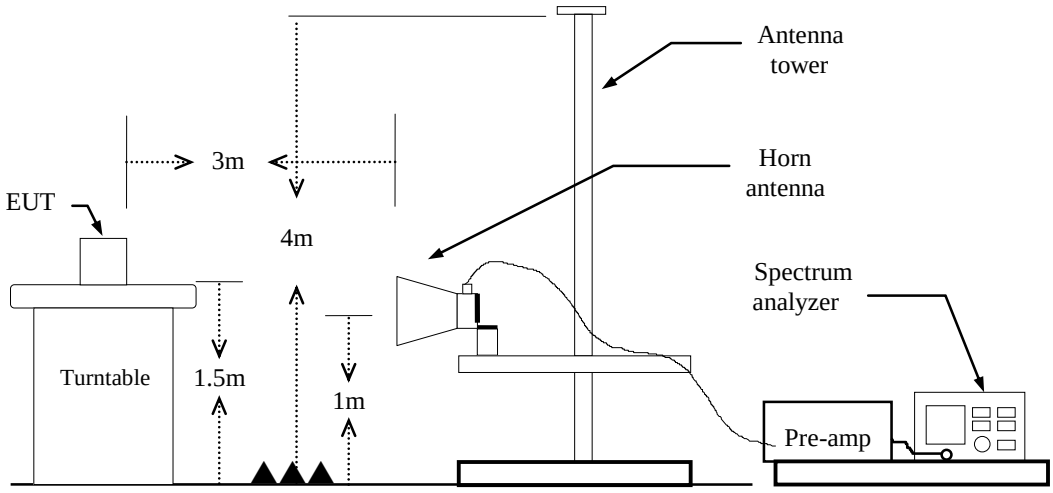
For operations in the 824-849 MHz band, out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

Test Configuration

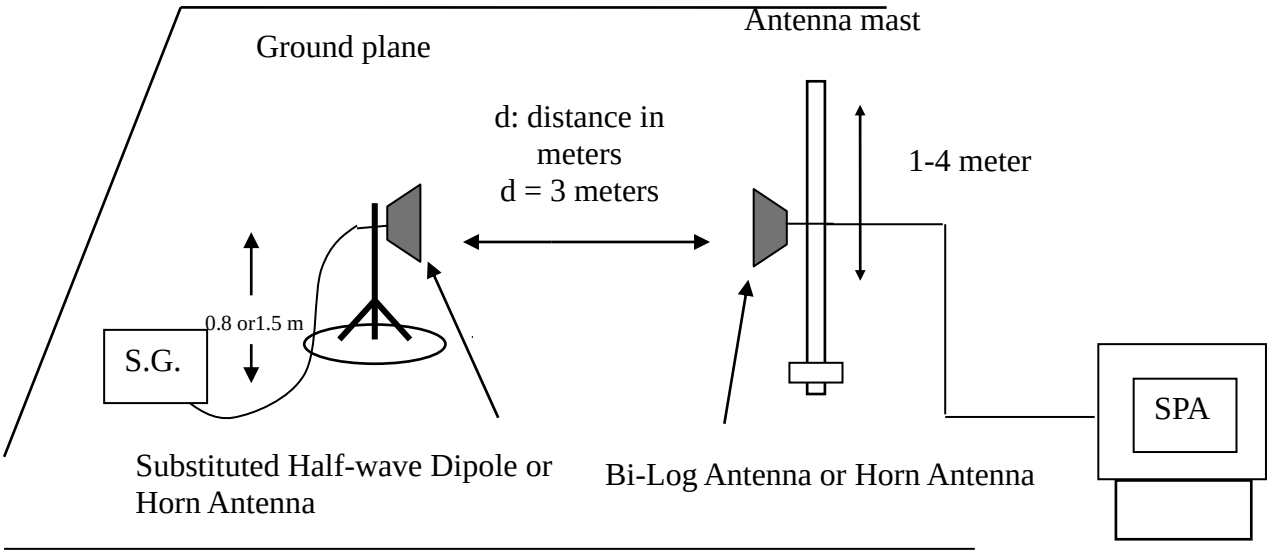
Below 1 GHz



Above 1 GHz



Substituted Method Test Set-up



TEST PROCEDURE

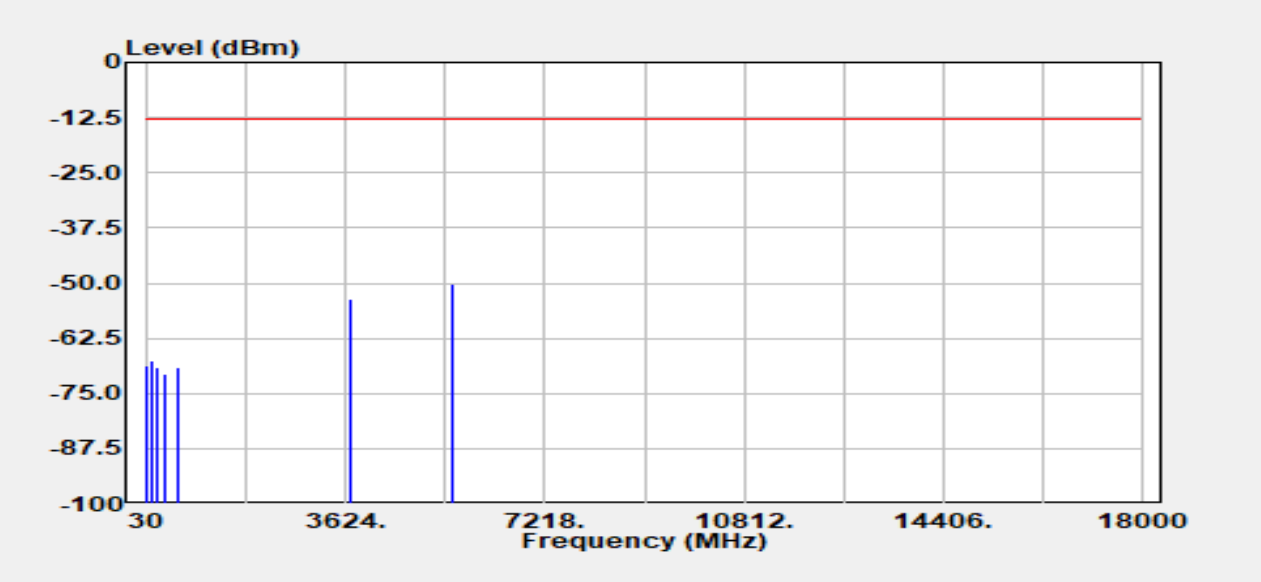
1. According to KDB 971168 D01.
2. The EUT was placed on a turntable
   (1) Below 1G : 0.8m
   (2) Above 1G : 1.5m
   (3) EUT set 3m from the receiving antenna
   (4) The table was rotated 360 degrees of the highest spurious emission to determine the position.
3. Set the spectrum analyzer , RBW=1MHz, VBW=3MHz.
4. A horn antenna was driven by a signal generator.
5. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission

ERP = S.G. output (dBm) + Antenna Gain (dBd) – Cable (dB)

EIRP = S.G. output (dBm) + Antenna Gain (dBi) – Cable (dB)

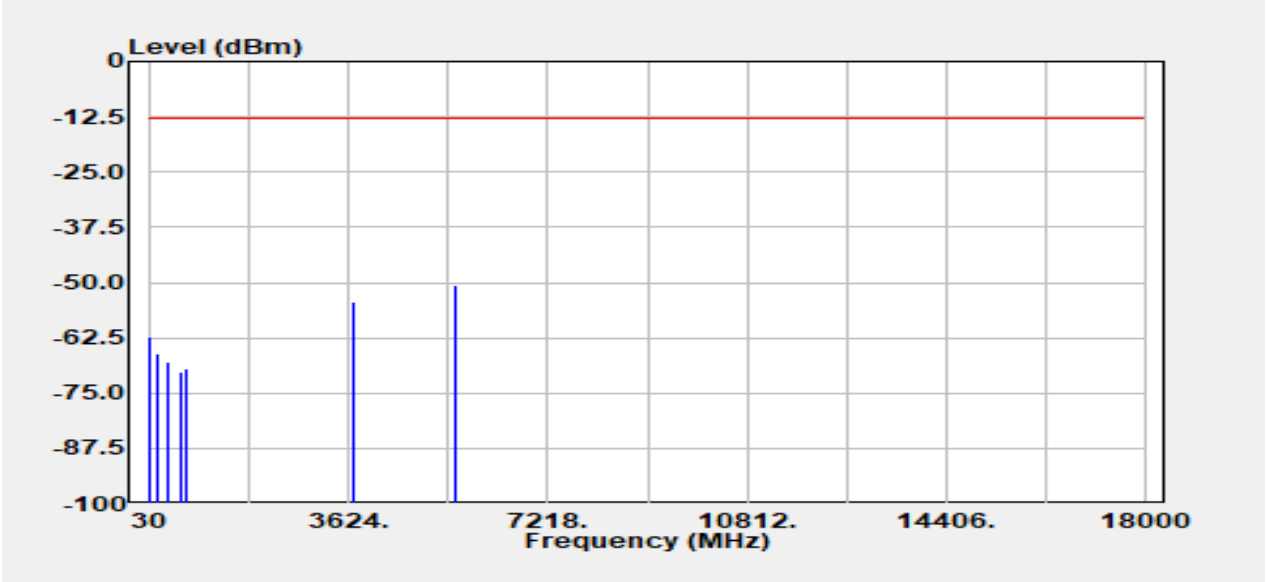
TEST RESULTS

Project No	:TM-2310000293P	Test Date	:2023-10-30
Operation Band	:WCDMA_Band2_CH9262	Temp./Humi.	:24.8/61
Frequency	:1852.4 MHz	Antenna Pol.	:VERTICAL
Operation Mode	:TX	Engineer	:Czerny.Lin
EUT Pol	:E2	Test Chamber	: 966A
Setting	:		



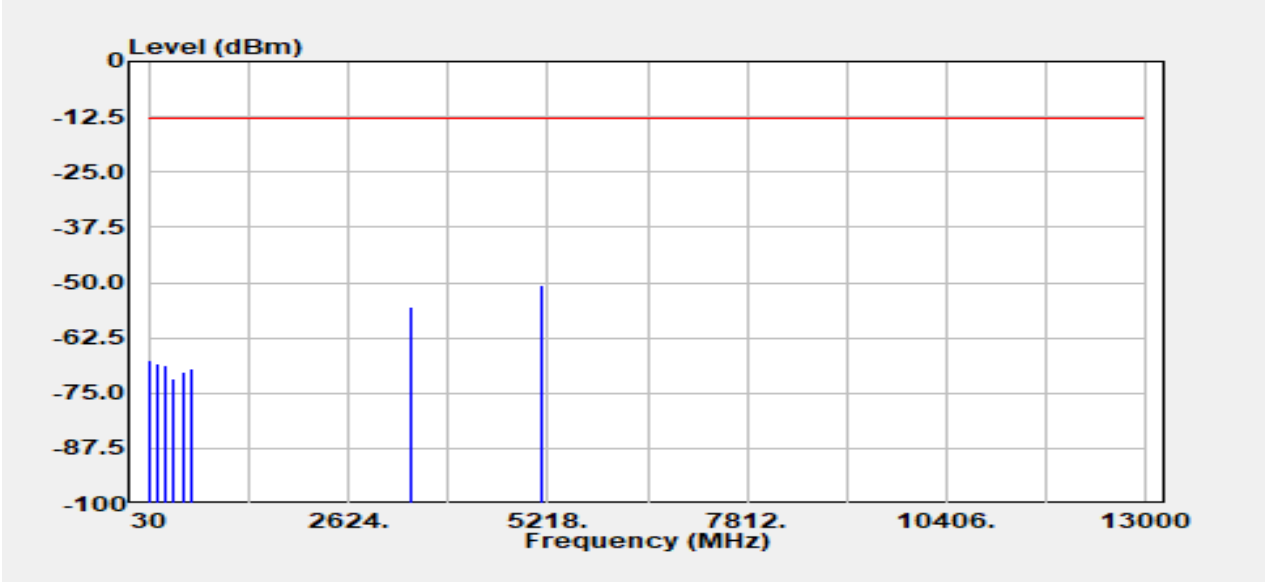
Freq.	EIRP/ERP	SG Output Level	Antenna Gain	Cable Loss	Limit	Margin
MHz	dBm	dBm	dBi/dBd	dB	dBm	dB
35.24	-68.85	-46.67	-22.08	0.10	-13.00	-55.85
65.21	-69.09	-61.82	-7.13	0.14	-13.00	-56.09
136.41	-67.66	-61.12	-6.35	0.20	-13.00	-54.66
248.74	-68.97	-69.21	0.52	0.28	-13.00	-55.97
355.34	-70.43	-70.94	0.86	0.36	-13.00	-57.43
606.96	-69.17	-70.03	1.36	0.50	-13.00	-56.17
3704.80	-53.58	-60.15	7.80	1.23	-13.00	-40.58
5557.20	-50.12	-58.86	10.21	1.48	-13.00	-37.12

Project No	:TM-2310000293P	Test Date	:2023-10-30
Operation Band	:WCDMA_Band2_CH9262	Temp./Humi.	:24.8/61
Frequency	:1852.4 MHz	Antenna Pol.	:HORIZONTAL
Operation Mode	:TX	Engineer	:Czerny.Lin
EUT Pol	:E2	Test Chamber	: 966A
Setting	:		



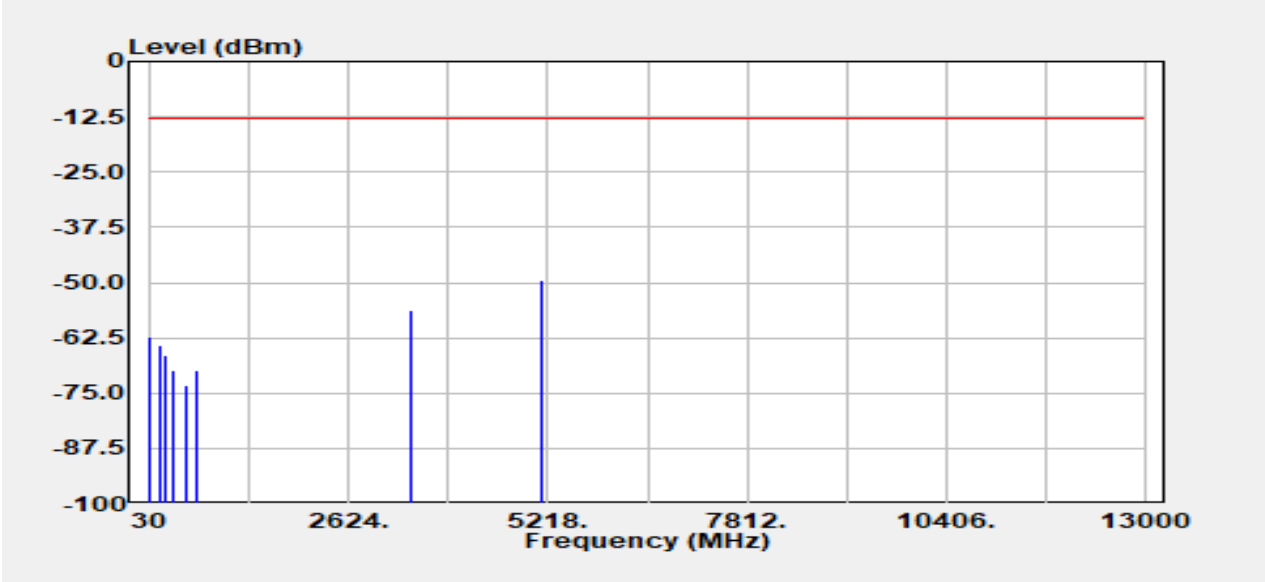
Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
30.29	-62.26	-35.19	-26.99	0.09	-13.00	-49.26
65.31	-67.85	-60.61	-7.11	0.14	-13.00	-54.85
194.90	-65.93	-63.85	-1.82	0.25	-13.00	-52.93
355.34	-67.74	-68.24	0.86	0.36	-13.00	-54.74
594.83	-70.22	-71.27	1.54	0.50	-13.00	-57.22
714.24	-69.33	-69.71	0.93	0.55	-13.00	-56.33
3704.80	-54.39	-60.96	7.80	1.23	-13.00	-41.39
5557.20	-50.50	-59.24	10.21	1.48	-13.00	-37.50

Project No	:TM-2310000293P	Test Date	:2023-10-30
Operation Band	:WCDMA_Band4_CH1312	Temp./Humi.	:24.8/61
Frequency	:1712.4 MHz	Antenna Pol.	:VERTICAL
Operation Mode	:TX	Engineer	:Czerny.Lin
EUT Pol	:E2	Test Chamber	: 966A
Setting	:		



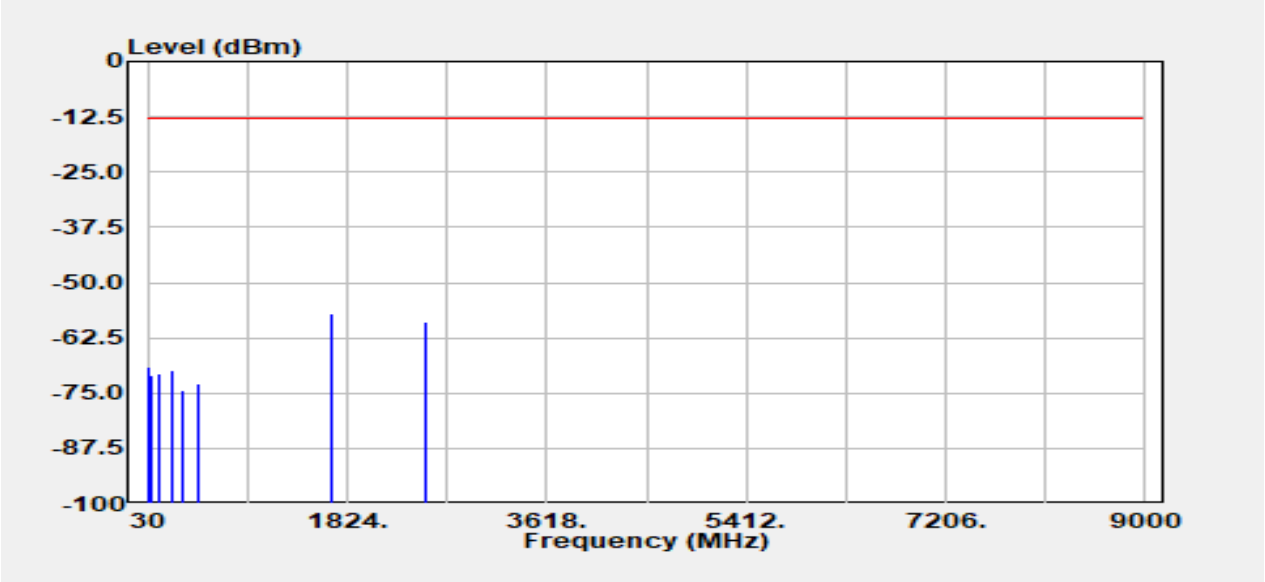
Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
35.43	-67.50	-45.47	-21.94	0.10	-13.00	-54.50
153.00	-68.27	-63.70	-4.35	0.21	-13.00	-55.27
250.68	-68.85	-69.20	0.64	0.29	-13.00	-55.85
355.34	-71.56	-72.06	0.86	0.36	-13.00	-58.56
479.11	-70.22	-69.98	0.20	0.44	-13.00	-57.22
571.45	-69.48	-69.70	0.70	0.49	-13.00	-56.48
3424.80	-55.51	-62.17	7.85	1.19	-13.00	-42.51
5137.20	-50.47	-59.07	10.03	1.43	-13.00	-37.47

Project No	:TM-2310000293P	Test Date	:2023-10-30
Operation Band	:WCDMA_Band4_CH1312	Temp./Humi.	:24.8/61
Frequency	:1712.4 MHz	Antenna Pol.	:HORIZONTAL
Operation Mode	:TX	Engineer	:Czerny.Lin
EUT Pol	:E2	Test Chamber	: 966A
Setting	:		



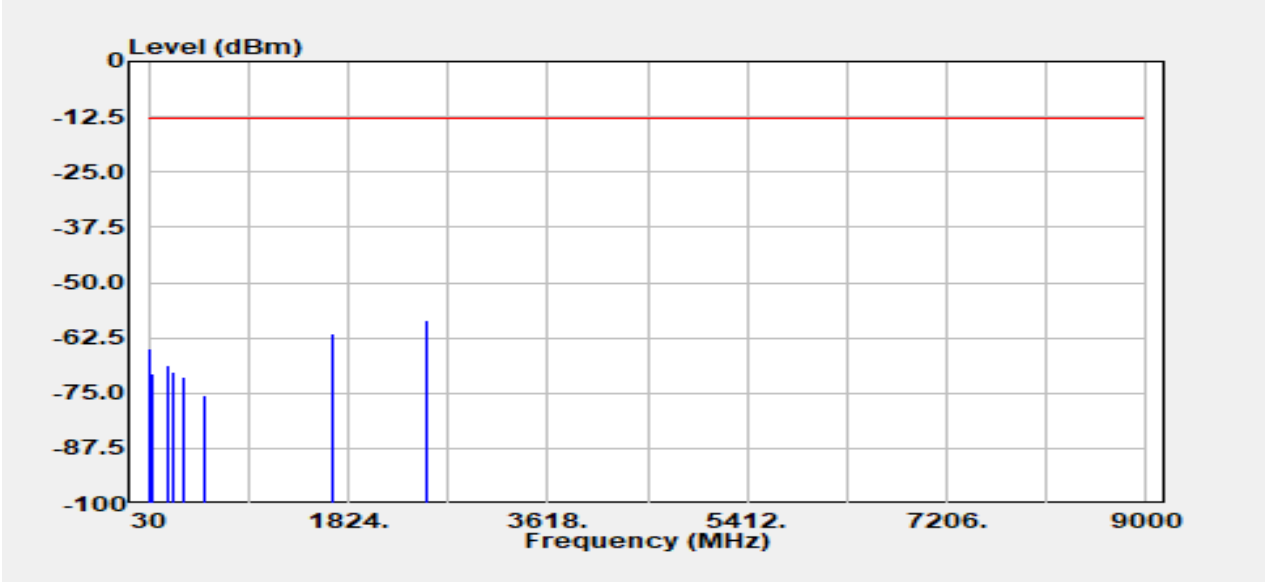
Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
30.39	-62.39	-35.42	-26.88	0.09	-13.00	-49.39
193.83	-64.21	-62.28	-1.68	0.25	-13.00	-51.21
259.89	-66.36	-66.53	0.47	0.29	-13.00	-53.36
355.34	-69.68	-70.18	0.86	0.36	-13.00	-56.68
526.35	-73.39	-73.88	0.95	0.46	-13.00	-60.39
648.47	-69.86	-70.17	0.83	0.52	-13.00	-56.86
3424.80	-56.10	-62.76	7.85	1.19	-13.00	-43.10
5137.20	-49.41	-58.01	10.03	1.43	-13.00	-36.41

Project No	:TM-2310000293P	Test Date	:2023-10-30
Operation Band	:WCDMA_Band5_CH4132	Temp./Humi.	:24.8/61
Frequency	:826.4 MHz	Antenna Pol.	:VERTICAL
Operation Mode	:TX	Engineer	:Czerny.Lin
EUT Pol	:E2	Test Chamber	: 966A
Setting	:		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
35.24	-68.92	-46.74	-22.08	0.10	-13.00	-55.92
65.21	-70.78	-63.52	-7.13	0.14	-13.00	-57.78
136.41	-70.40	-63.86	-6.35	0.20	-13.00	-57.40
246.99	-69.87	-69.98	0.39	0.28	-13.00	-56.87
355.34	-74.43	-74.93	0.86	0.36	-13.00	-61.43
475.52	-72.96	-72.81	0.28	0.44	-13.00	-59.96
1693.20	-56.94	-61.64	5.54	0.85	-13.00	-43.94
2539.80	-58.79	-63.60	5.84	1.03	-13.00	-45.79

Project No	:TM-2310000293P	Test Date	:2023-10-30
Operation Band	:WCDMA_Band5_CH4132	Temp./Humi.	:24.8/61
Frequency	:826.4 MHz	Antenna Pol.	:HORIZONTAL
Operation Mode	:TX	Engineer	:Czerny.Lin
EUT Pol	:E2	Test Chamber	: 966A
Setting	:		



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
30.29	-65.00	-37.92	-26.99	0.09	-13.00	-52.00
65.21	-70.47	-63.20	-7.13	0.14	-13.00	-57.47
195.97	-68.86	-66.62	-1.99	0.25	-13.00	-55.86
252.62	-70.20	-70.62	0.71	0.29	-13.00	-57.20
355.34	-71.29	-71.79	0.86	0.36	-13.00	-58.29
531.20	-75.65	-76.15	0.96	0.47	-13.00	-62.65
1693.20	-61.43	-66.12	5.54	0.85	-13.00	-48.43
2539.80	-58.46	-63.27	5.84	1.03	-13.00	-45.46

8.6 FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

LIMIT

According to the FCC part 27.54 shall be tested the frequency stability. The rule is defined that" The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

According to FCC §2.1055, FCC §22.355, .FCC §24.235.

Test Procedure

Band 2 & 5
Use Anritsu 8820 with frequency Error measurement capability.
Temp = -30 to +50℃ ,Voltage= 85% to 115% of the nominal value for AC powered equipment. Frequency Tolerance: +/-2.5 ppm
NOTE: *The frequency error was recorded frequency error from the communication simulator.*

Band 4
Use Anritsu 8820 with frequency Error measurement capability.
Temp = -30 to +50℃
Voltage= 85% to 115% of the nominal value for AC powered equipment.
NOTE: *The frequency error was recorded frequency error from the communication simulator.*

TEST RESULTS

Compliance

Temperature:	22.3 ~ 25.6℃	**Test date:**	October 24 ~ 27, 2023
Humidity:	55 ~ 57% RH	**Tested by:**	David Lee

FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT:

WCDMA Band II:

Reference Frequency: WCDMA Low Channel			1852.4	MHz
Limit: +/- 2.5 ppm =			4631	Hz
Power Supply	Environment	Frequency Error	Frequency Error	Limit
Vac	Temperature (℃)	(Hz)	(ppm)	(ppm)
12	65	1.100000	0.0006	2.5
12	50	-9.200000	-0.0050	2.5
12	40	-20.700000	-0.0112	2.5
12	30	-4.600000	-0.0025	2.5
12	20	-17.700000	-0.0096	2.5
12	10	16.200000	0.0087	2.5
12	0	6.000000	0.0032	2.5
12	-10	-7.000000	-0.0038	2.5
12	-20	-18.100000	-0.0098	2.5
12	-35	-21.800000	-0.0118	2.5

Reference Frequency: WCDMA Low Channel			1852.4	MHz
Limit: +/- 2.5 ppm =			4631	Hz
Vac	Temperature (℃)	(Hz)	(ppm)	(ppm)
10.2	20	-16.700000	-0.0090	2.5
12	20	-9.000000	-0.0049	2.5
13.8	20	-8.400000	-0.0045	2.5

Reference Frequency: WCDMA Mid Channel			1880	MHz
Limit: +/- 2.5 ppm =			4700	Hz
Power Supply	Environment	Frequency Error	Frequency Error	Limit
Vac	Temperature (℃)	(Hz)	(ppm)	(ppm)
12	65	16.0000000	0.0085	2.5
12	50	1.0000000	0.0005	2.5
12	40	25.6000000	0.0136	2.5
12	30	9.9000000	0.0053	2.5
12	20	16.9000000	0.0090	2.5
12	10	-1.8000000	-0.0010	2.5
12	0	-8.7000000	-0.0046	2.5
12	-10	5.0000000	0.0027	2.5
12	-20	3.8000000	0.0020	2.5
12	-35	-13.5000000	-0.0072	2.5

Reference Frequency: WCDMA Mid Channel			1880	MHz
Limit: +/- 2.5 ppm =			4700	Hz
Vac	Temperature (℃)	(Hz)	(ppm)	(ppm)
10.2	20	-9.5000000	-0.0051	2.5
12	20	4.0000000	0.0021	2.5
13.8	20	22.9000000	0.0122	2.5

Reference Frequency: WCDMA Band II High Channel		1907.6		MHz
Limit: +/- 2.5 ppm =			4769	Hz
Power Supply	Environment	Frequency Error	Frequency Error	Limit
Vac	Temperature (℃)	(Hz)	(ppm)	(ppm)
110	65	19.10	0.0100	2.5
110	50	-22.70	-0.0119	2.5
110	40	9.50	0.0050	2.5
110	30	8.40	0.0044	2.5
110	20	-6.70	-0.0035	2.5
110	10	-3.50	-0.0018	2.5
110	0	4.70	0.0025	2.5
110	-10	4.80	0.0025	2.5
110	-20	-3.20	-0.0017	2.5
110	-35	1.00	0.0005	2.5

Reference Frequency: WCDMA Band II High Channel		1907.6		MHz
Limit: +/- 2.5 ppm =			4769	Hz
Vac	Temperature (℃)	(Hz)	(ppm)	(ppm)
93.5	20	19.70	0.0103	2.5
110	20	7.80	0.0041	2.5
126.5	20	-2.54	-0.0013	2.5

WCDMA Band IV:

Reference Frequency: WCDMA Band IV Low Channel		1712.4		MHz
Limit: +/- 2.5 ppm =			4281	Hz
Power Supply	Environment	Frequency Error	Frequency Error	Limit
Vac	Temperature (℃)	(Hz)	(ppm)	(ppm)
110	65	18.80	0.0110	2.5
110	50	3.00	0.0018	2.5
110	40	3.10	0.0018	2.5
110	30	-16.30	-0.0095	2.5
110	20	1.70	0.0010	2.5
110	10	3.40	0.0020	2.5
110	0	-11.21	-0.0065	2.5
110	-10	-23.90	-0.0140	2.5
110	-20	3.20	0.0019	2.5
110	-35	6.90	0.0040	2.5

Reference Frequency: WCDMA Band IV Low Channel		1712.4		MHz
Limit: +/- 2.5 ppm =			4281	Hz
Vac	Temperature (℃)	(Hz)	(ppm)	(ppm)
93.5	20	-4.70	-0.0027	2.5
110	20	-17.50	-0.0102	2.5
126.5	20	2.50	0.0015	2.5

Reference Frequency: WCDMA Band IV Mid Channel		1732.6		MHz
Limit: +/- 2.5 ppm =			4331.5	Hz
Power Supply	Environment	Frequency Error	Frequency Error	Limit
Vac	Temperature (℃)	(Hz)	(ppm)	(ppm)
110	65	14.70	0.0085	2.5
110	50	-3.20	-0.0018	2.5
110	40	4.30	0.0025	2.5
110	30	-17.30	-0.0100	2.5
110	20	-4.30	-0.0025	2.5
110	10	1.50	0.0009	2.5
110	0	-14.60	-0.0084	2.5
110	-10	2.60	0.0015	2.5
110	-20	2.00	0.0012	2.5
110	-35	-2.70	-0.0016	2.5

Reference Frequency: WCDMA Band IV Mid Channel		1732.6		MHz
Limit: +/- 2.5 ppm =			4331.5	Hz
Vac	Temperature (℃)	(Hz)	(ppm)	(ppm)
93.5	20	-11.50	-0.0066	2.5
110	20	3.70	0.0021	2.5
126.5	20	-19.80	-0.0114	2.5

Reference Frequency: WCDMA Band IV Low Channel		1752.6		MHz
Limit: +/- 2.5 ppm =			4381.5	Hz
Power Supply	Environment	Frequency Error	Frequency Error	Limit
Vac	Temperature (℃)	(Hz)	(ppm)	(ppm)
110	65	9.20	0.0052	2.5
110	50	9.40	0.0054	2.5
110	40	-13.50	-0.0077	2.5
110	30	-8.20	-0.0047	2.5
110	20	-10.20	-0.0058	2.5
110	10	3.00	0.0017	2.5
110	0	2.40	0.0014	2.5
110	-10	-7.10	-0.0041	2.5
110	-20	-11.00	-0.0063	2.5
110	-35	-10.80	-0.0062	2.5

Reference Frequency: WCDMA Band IV Low Channel		1752.6		MHz
Limit: +/- 2.5 ppm =			4381.5	Hz
Vac	Temperature (℃)	(Hz)	(ppm)	(ppm)
93.5	20	-3.50	-0.0020	2.5
110	20	7.70	0.0044	2.5
126.5	20	-12.40	-0.0071	2.5

WCDMA Band V:

Reference Frequency: WCDMA_Band_V Low Channel			826.4	MHz
Limit: +/- 2.5 ppm =			2066	Hz
Power Supply	Environment	Frequency Error	Frequency Error	Limit
Vac	Temperature (℃)	(Hz)	(ppm)	(ppm)
110	65	5.00	0.0061	2.5
110	50	3.20	0.0039	2.5
110	40	7.00	0.0085	2.5
110	30	-12.00	-0.0145	2.5
110	20	-7.50	-0.0091	2.5
110	10	1.00	0.0012	2.5
110	0	-1.30	-0.0016	2.5
110	-10	-1.00	-0.0012	2.5
110	-20	-15.20	-0.0184	2.5
110	-35	4.90	0.0059	2.5

Reference Frequency: WCDMA_Band_V Low Channel			826.4	MHz
Limit: +/- 2.5 ppm =			2066	Hz
Vac	Temperature (℃)	(Hz)	(ppm)	(ppm)
93.5	20	6.60	0.0080	2.5
110	20	-10.40	-0.0126	2.5
126.5	20	-4.20	-0.0051	2.5

Reference Frequency: WCDMA_Band_V Mid Channel			836.4	MHz
Limit: +/- 2.5 ppm =			2091	Hz
Power Supply	Environment	Frequency Error	Frequency Error	Limit
Vac	Temperature (℃)	(Hz)	(ppm)	(ppm)
110	65	6.40	0.0077	2.5
110	50	8.00	0.0096	2.5
110	40	-4.00	-0.0048	3.5
110	30	4.90	0.0059	2.5
110	20	-6.00	-0.0072	2.5
110	10	4.50	0.0054	2.5
110	0	-9.00	-0.0108	2.5
110	-10	-9.40	-0.0112	2.5
110	-20	1.70	0.0020	2.5
110	-35	-5.70	-0.0068	2.5

Reference Frequency: WCDMA_Band_V Mid Channel			836.6	MHz
Limit: +/- 2.5 ppm =			2091	Hz
Vac	Temperature (℃)	(Hz)	(ppm)	(ppm)
93.5	20	-1.20	-0.0014	2.5
110	20	-4.60	-0.0055	2.5
126.5	20	-1.90	-0.0023	2.5

Reference Frequency: WCDMA_Band_V High Channel		846.6		MHz
Limit: +/- 2.5 ppm =			2116.5	Hz
Power Supply	Environment	Frequency Error	Frequency Error	Limit
Vac	Temperature (℃)	(Hz)	(ppm)	(ppm)
110	65	3.40	0.0040	2.5
110	50	14.60	0.0172	2.5
110	40	5.90	0.0070	2.5
110	30	2.10	0.0025	2.5
110	20	-4.30	-0.0051	2.5
110	10	3.00	0.0035	2.5
110	0	4.50	0.0053	2.5
110	-10	-4.00	-0.0047	2.5
110	-20	-3.70	-0.0044	2.5
110	-35	-5.20	-0.0061	2.5

Reference Frequency: WCDMA_Band_V High Channel		846.6		MHz
Limit: +/- 2.5 ppm =			2116.5	Hz
Vac	Temperature (℃)	(Hz)	(ppm)	(ppm)
93.5	20	-7.90	-0.0093	2.5
110	20	-2.60	-0.0031	2.5
126.5	20	-7.80	-0.0092	2.5