



Project No.: TM-2310000293P
Report No.: TMWK2310003859KR

FCC ID: KA2G403A3

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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 15, 2023

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	December 8, 2023	Initial Issue	ALL	Peggy Tsai
01	December 15, 2023	See the following Note Rev. (01)	P. 5 , 14	Peggy Tsai

Rev. (01):

1. Modify Emission Designator in section 2.
2. Modify ERP & EIRP MEASUREMENTNFC test result in section 8.1.



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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	Compliance

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 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.

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

Approved by:

Shawn Wu
Supervisor



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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
Frequency Range	GPRS / EDGE: 850: 824.2 ~ 848.8 MHz GPRS / EDGE: 1900: 1850.2 ~ 1909.8 MHz
Cellular Phone Protocol	GPRS: GMSK EDGE: 8PSK
Antenna Gain	Dipole Antenna Chain 0. INPAQ / RFDPA191723IMTB301 GPRS / EDGE: 850: 0.59 dBi GPRS / EDGE: 1900: 4.27 dBi Chain 1. INPAQ / RFDPA191708IMTB301 GPRS / EDGE: 850: 2.15 dBi GPRS / EDGE: 1900: 4.35 dBi

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			
Band	Frequency Range(MHz)	Emission Designator (99% OBW)	Maximum ERP/EIRP (W)
GPRS 850	824.2 MHz ~ 848.8 MHz	248kGXW	1.972
GPRS 1900	1850.2 MHz ~ 1909.8 MHz	249kGXW	2.576



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3. TEST METHODOLOGY

Both conducted and radiated testing were performed according to FCC CFR 47, Part 2, Part 22 Subpart H and 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 had been tested under operating condition.

The EUT be set in maximum power transmission via call box during testing.

EUT staying in continuous transmitting mode was programmed.

GPRS / EDGE 850:

Channel Low (CH128), Channel Mid (CH190) and Channel High (CH251) were chosen for full testing.

GPRS / EDGE 1900:

Channel Low (CH512), Channel Mid (CH661) and Channel High (CH810) were chosen for full testing.

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	<input checked="" type="checkbox"/> Mode 1 <input type="checkbox"/> Mode 2 <input type="checkbox"/> Mode 3 <input type="checkbox"/> Mode 4
Worst Position	<input type="checkbox"/> Placed in fixed position. <input checked="" type="checkbox"/> Placed in fixed position at X-Plane (E2-Plane) <input type="checkbox"/> Placed in fixed position at Y-Plane (E1-Plane) <input type="checkbox"/> 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	<input checked="" type="checkbox"/> Mode 1 <input type="checkbox"/> Mode 2 <input type="checkbox"/> Mode 3 <input type="checkbox"/> 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



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4. TEST SUMMARY

FCC Standard Section	Report Section	Test Item	Result
-	2	Antenna Requirement	Pass
22.913(a), 24.232(c)	8.1	ERP and EIRP Measurement	Pass
2.1049	8.2	Occupied Bandwidth Measurement	Pass
22.913(d), 24.232(d)	8.3	Peak to Average Ratio	Pass
22.917(a), 24.238(a)	8.4	Out of Band Emission at Antenna Terminals	Pass
22.917(a), 24.238(a)	8.5	Spurious Radiation Measurement	Pass
2.1055, 22.355, 24.235	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	2024-10-12
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:

- Each piece of equipment is scheduled for calibration once a year.
- N.C.R. = No Calibration Required.



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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	2023-06-17	2024-06-16
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.



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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 A 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 REQUIREMENTS

8.1 ERP & EIRP MEASUREMENT

LIMIT

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.

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°C

Test date: October 24 ~ 27, 2023

Humidity: 55 ~ 57% RH

Tested by: David Lee

Band	Ch	Frequency (MHz)	Output Power (dBm)	Output Power (W)	ERP/EIRP (dBm)	Output Power (W)
GPRS 850	128	824.2	30.27	1.064	30.27	1.064
	190	836.6	31.80	1.514	31.80	1.514
	251	848.8	32.95	1.972	32.95	1.972
GPRS 1900	512	1850.2	29.76	0.946	34.11	2.576
	661	1880.0	29.59	0.910	33.94	2.477
	810	1909.8	28.87	0.771	33.22	2.099



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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 $\geq 3 \times$ RBW
4. Detector = Peak
5. Trace mode = max. hold

TEST RESULTS

Compliance.

Temperature: 22.3 ~ 25.6°C

Test date: October 24 ~ 27, 2023

Humidity: 55 ~ 57% RH

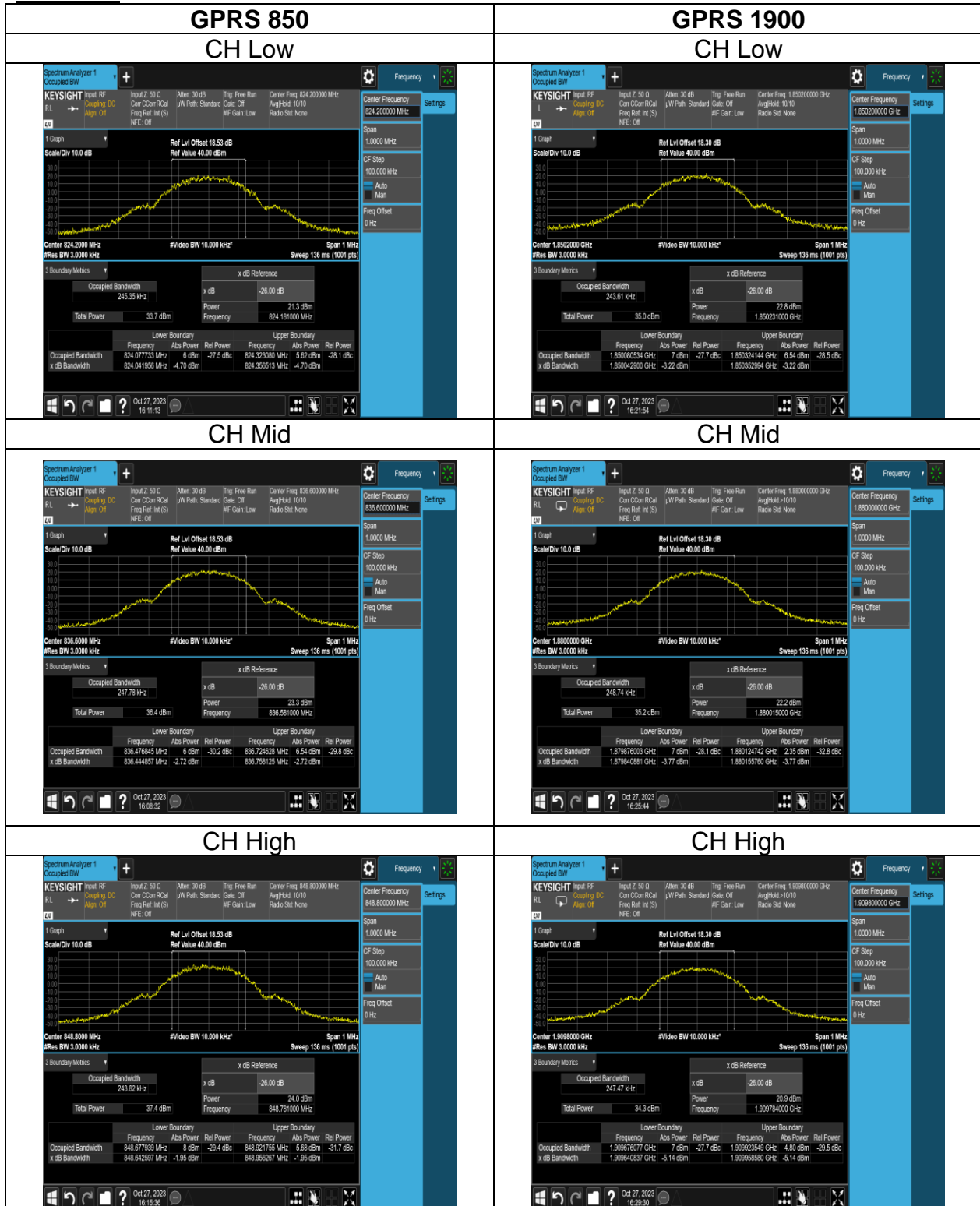
Tested by: David Lee

Test Data

GPRS 850			
Freq. (MHz)	CH	99% BW (MHz)	26 dB BW (MHz)
824.2	128	0.24535	0.3146
836.6	190	0.24778	0.3133
848.8	251	0.24382	0.3137

GPRS 1900			
Freq. (MHz)	CH	99% BW (MHz)	26 dB BW (MHz)
1850.2	512	0.24361	0.3101
1880.0	661	0.24874	0.3149
1909.8	810	0.24747	0.3177

Test Plot



8.3 PEAK TO AVERAGE RATIO

Limit

FCC §22.913(d)

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 §24.232(d)

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. Set resolution/measurement bandwidth \geq signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

TEST RESULTS

Compliance.

Temperature: 22.3 ~ 25.6°C

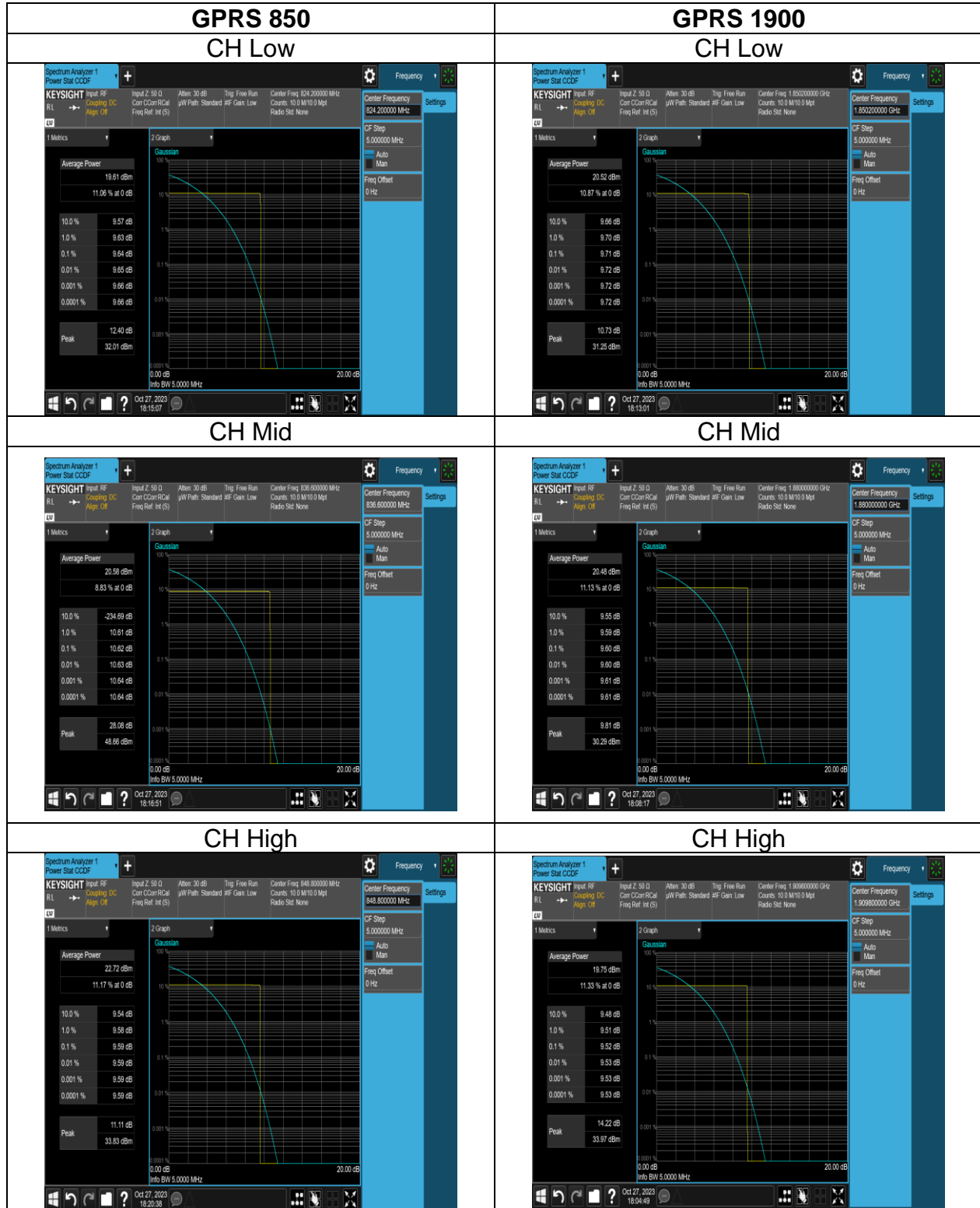
Test date: October 24 ~ 27, 2023

Humidity: 55 ~ 57% RH

Tested by: David Lee

GPRS 850			
Freq. (MHz)	CH	PAPR (dB)	Limit
824.2	128	9.64	13
836.6	190	10.62	13
848.8	251	9.59	13

GPRS 1900			
Freq. (MHz)	CH	PAPR (dB)	Limit
1850.2	512	9.71	13
1880.0	661	9.60	13
1909.8	810	9.52	13



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8.4 OUT OF BAND EMISSION AT ANTENNA TERMINALS

Limit

FCC §22.917(a)

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.

FCC §24.238(a)

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.

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 \geq 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°C

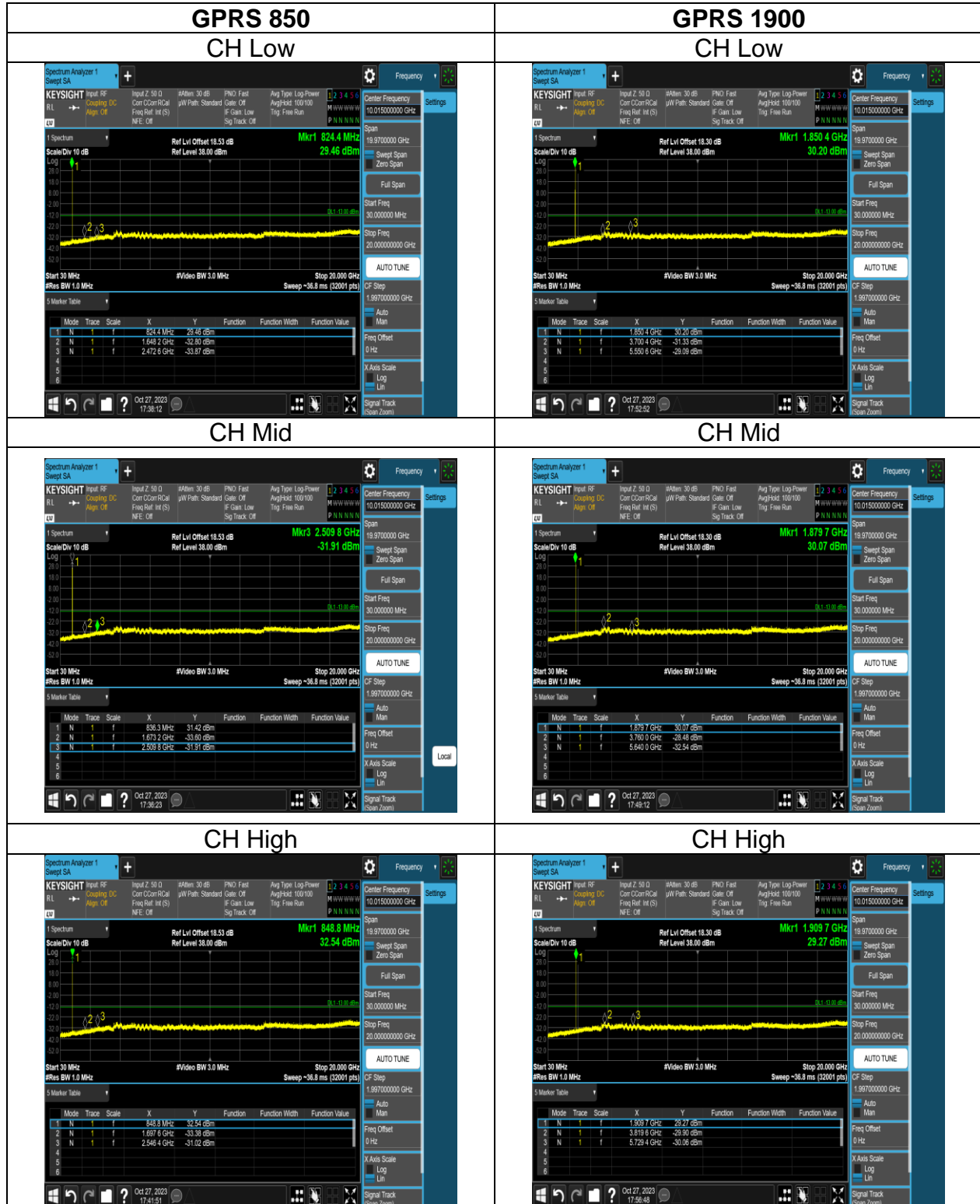
Test date: October 24 ~ 27, 2023

Humidity: 55 ~ 57% RH

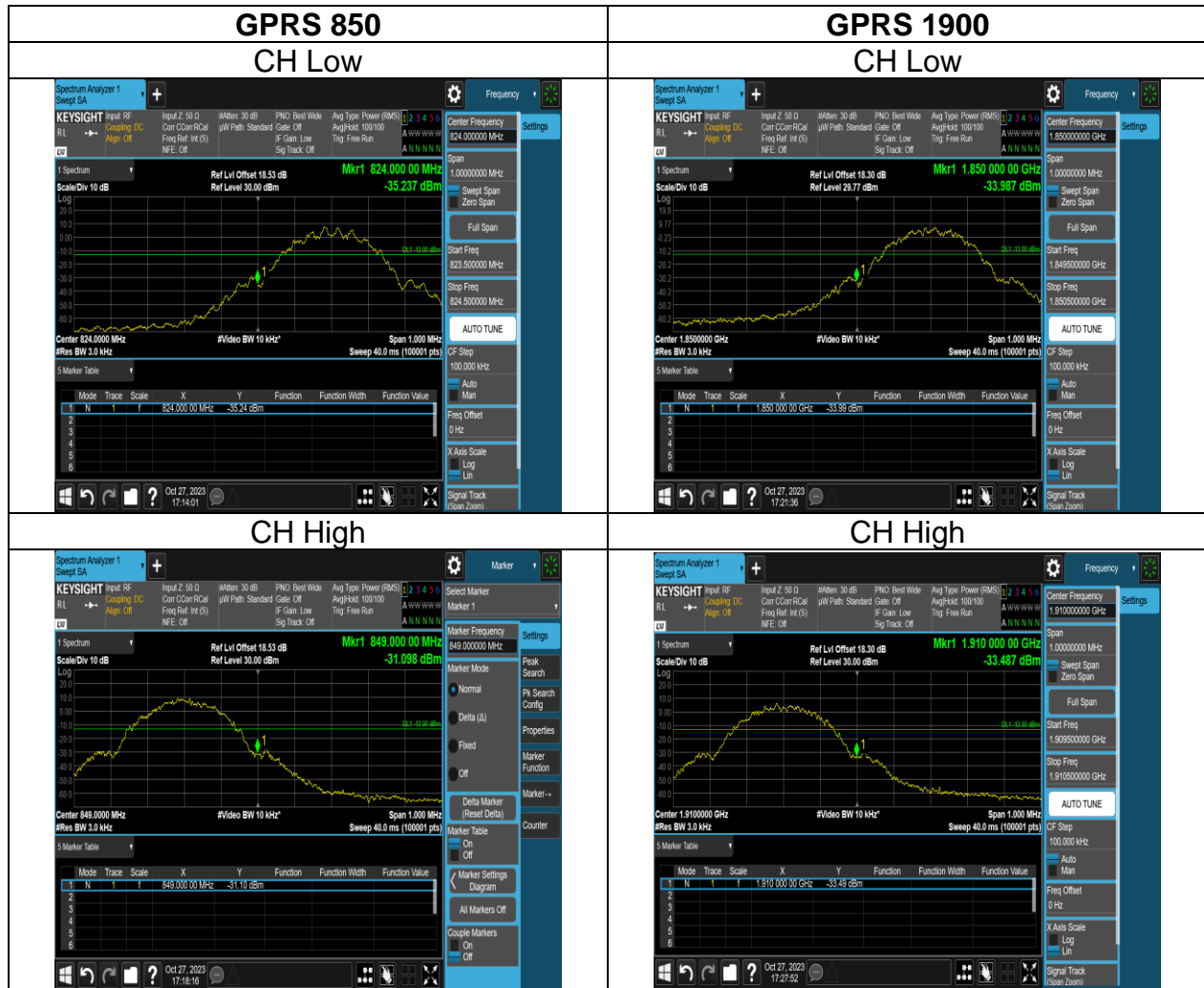
Tested by: David Lee

Report No.: TMWK2310003859KR

Conducted Emission



Band Edge





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8.5 SPURIOUS RADIATION MEASUREMENT

Limit

FCC §22.917(a)

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.

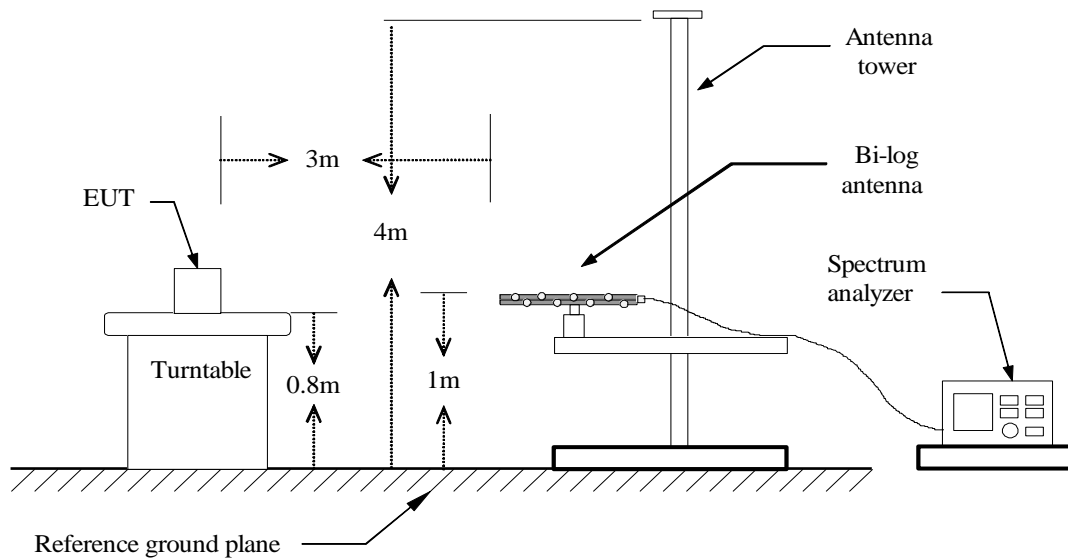
FCC §24.238(a)

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.

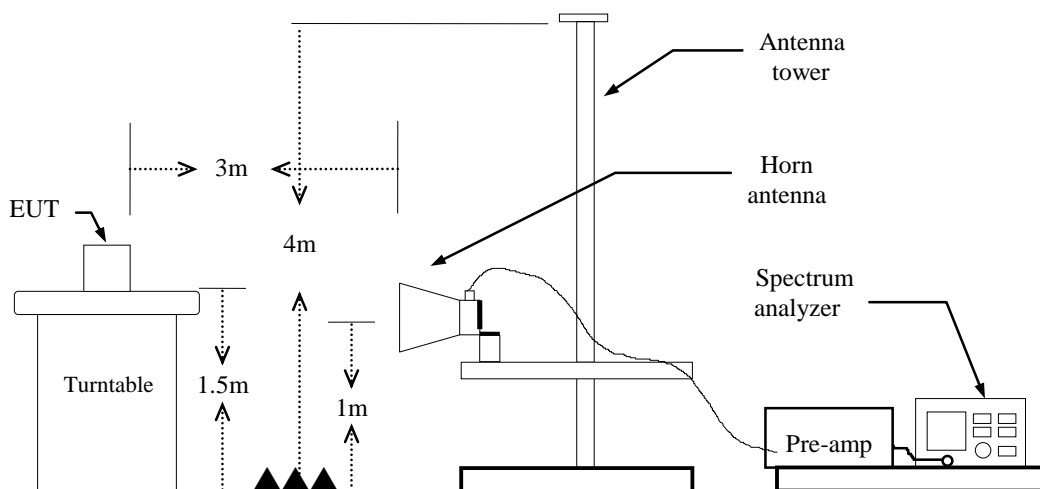
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Test Configuration

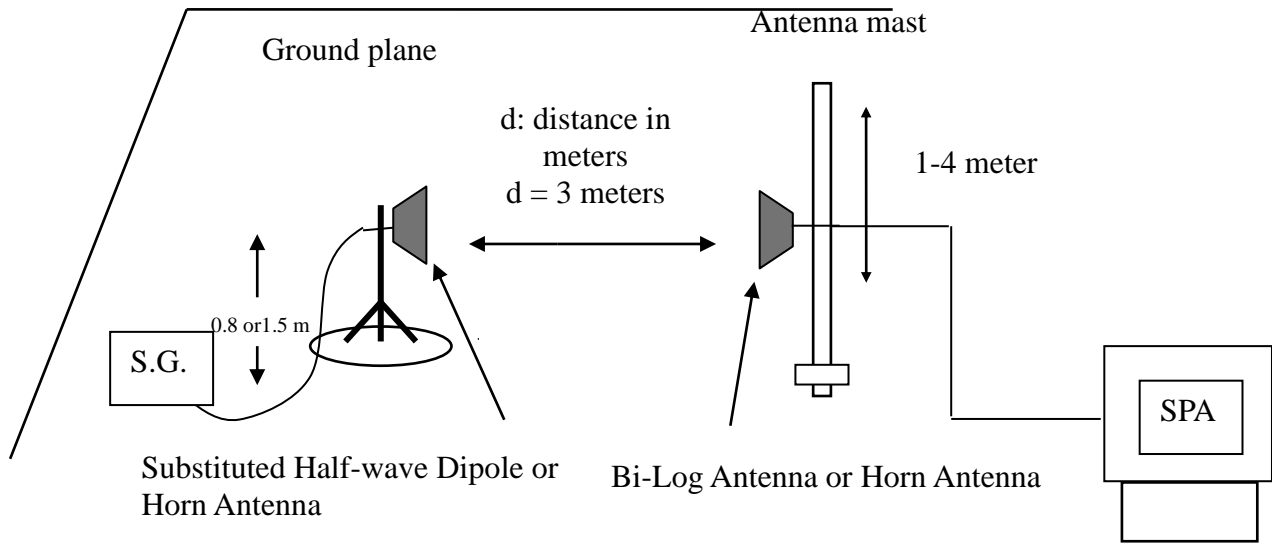
Below 1 GHz



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

$$\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBd)} - \text{Cable (dB)}$$

$$\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable (dB)}$$

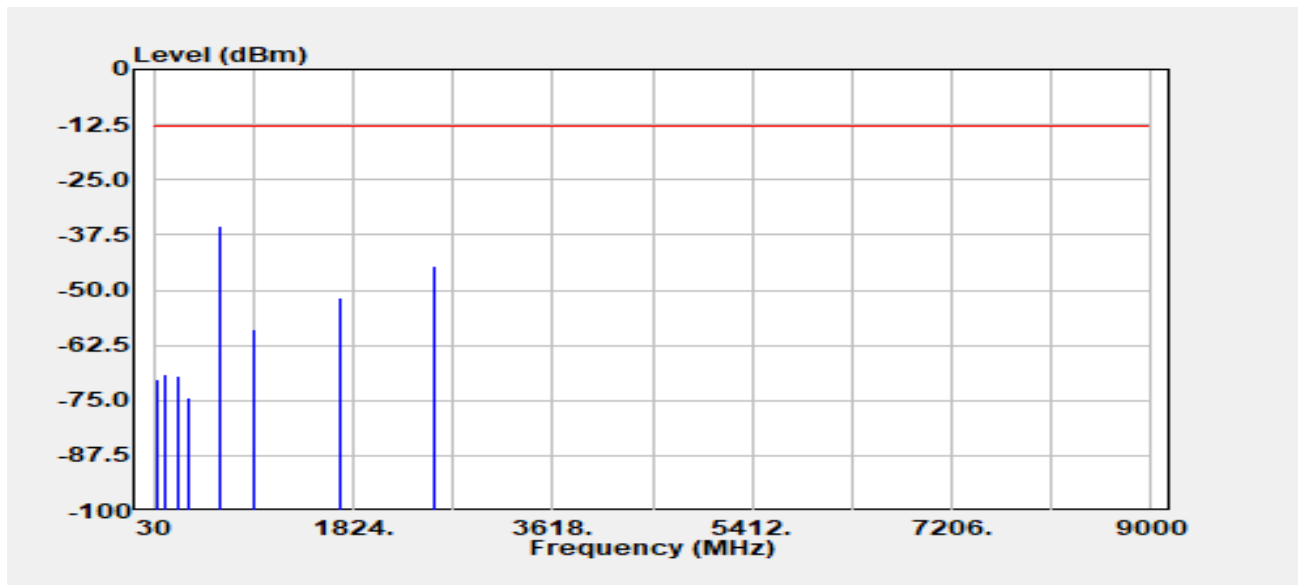
TEST RESULTS

Refer to the attached tabular data sheets.

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Project No	:TM-2310000293P	Test Date	:2023-10-30
Operation Band	:GPRS 850	Temp./Humi.	:24.8/64
Frequency	:251	Antenna Pol.	:VERTICAL
Operation Mode	:TX	Engineer	:Czerny.Lin
EUT Pol	:E2	Test Chamber	: 966A
Setting	:		



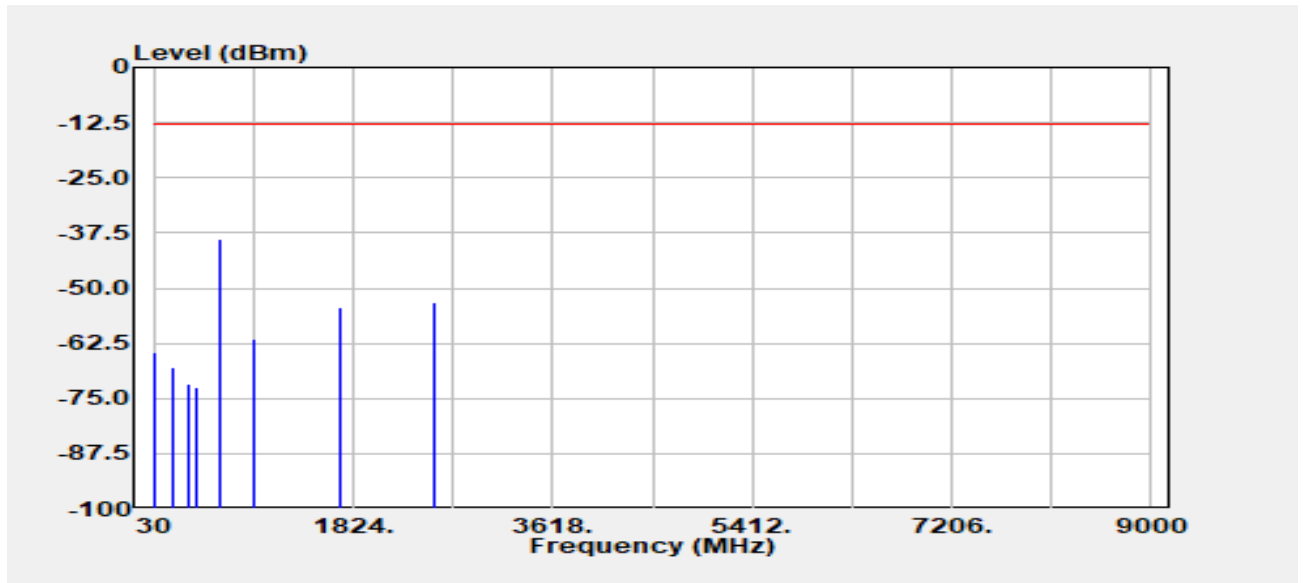
Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
63.37	-70.08	-62.44	-7.51	0.13	-13.00	-57.08
142.62	-69.07	-63.20	-5.66	0.20	-13.00	-56.07
253.20	-69.57	-70.01	0.73	0.29	-13.00	-56.57
355.34	-74.22	-74.72	0.86	0.36	-13.00	-61.22
626.55	-35.40	-35.76	0.87	0.51	-13.00	-22.40
931.71	-58.73	-59.26	1.18	0.64	-13.00	-45.73
1697.60	-51.57	-56.24	5.51	0.85	-13.00	-38.57
2546.40	-44.39	-49.24	5.88	1.03	-13.00	-31.39

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Project No :TM-2310000293P
Operation Band :GPRS 850
Frequency :251
Operation Mode :TX
EUT Pol :E2
Setting :

Test Date :2023-10-30
Temp./Humi. :24.8/64
Antenna Pol. :HORIZONTAL
Engineer :Czerny.Lin
Test Chamber : 966A



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
31.65	-64.69	-39.08	-25.52	0.09	-13.00	-51.69
193.83	-67.94	-66.02	-1.68	0.25	-13.00	-54.94
355.34	-71.67	-72.17	0.86	0.36	-13.00	-58.67
424.40	-72.31	-72.43	0.53	0.40	-13.00	-59.31
626.45	-38.99	-39.34	0.87	0.51	-13.00	-25.99
931.71	-61.39	-61.93	1.18	0.64	-13.00	-48.39
1697.60	-54.41	-59.08	5.51	0.85	-13.00	-41.41
2546.40	-53.02	-57.87	5.88	1.03	-13.00	-40.02

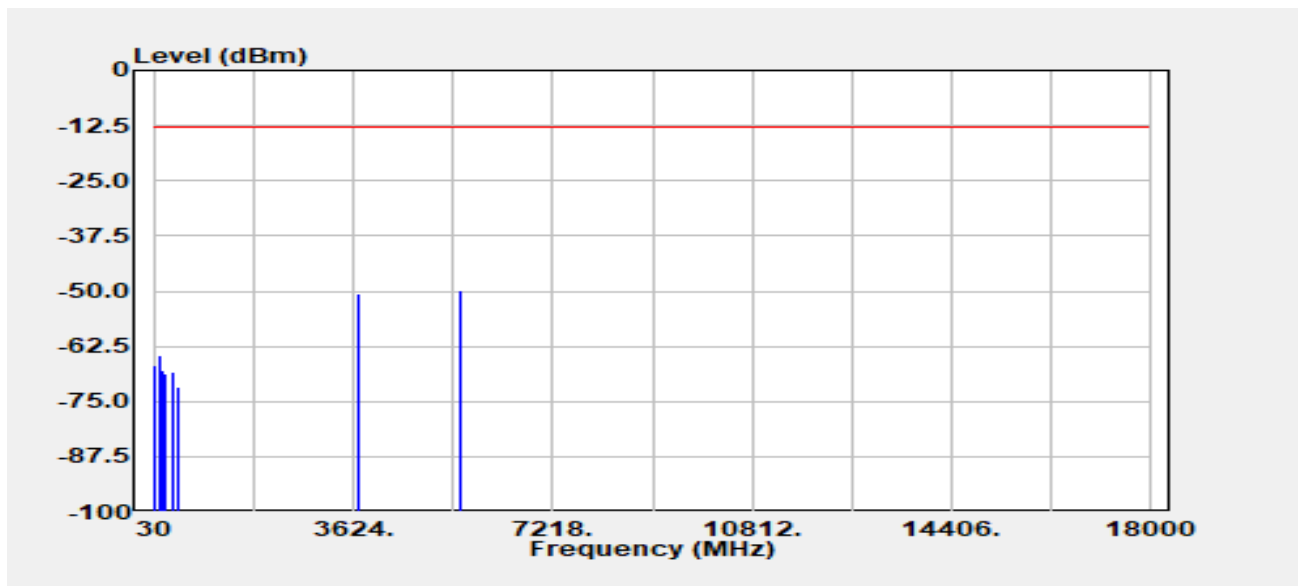


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Project No :TM-2310000293P
Operation Band :GPRS 1900
Frequency :512
Operation Mode :TX
EUT Pol :E2
Setting :

Test Date :2023-10-30
Temp./Humi. :24.8/64
Antenna Pol. :VERTICAL
Engineer :Czerny.Lin
Test Chamber : 966A

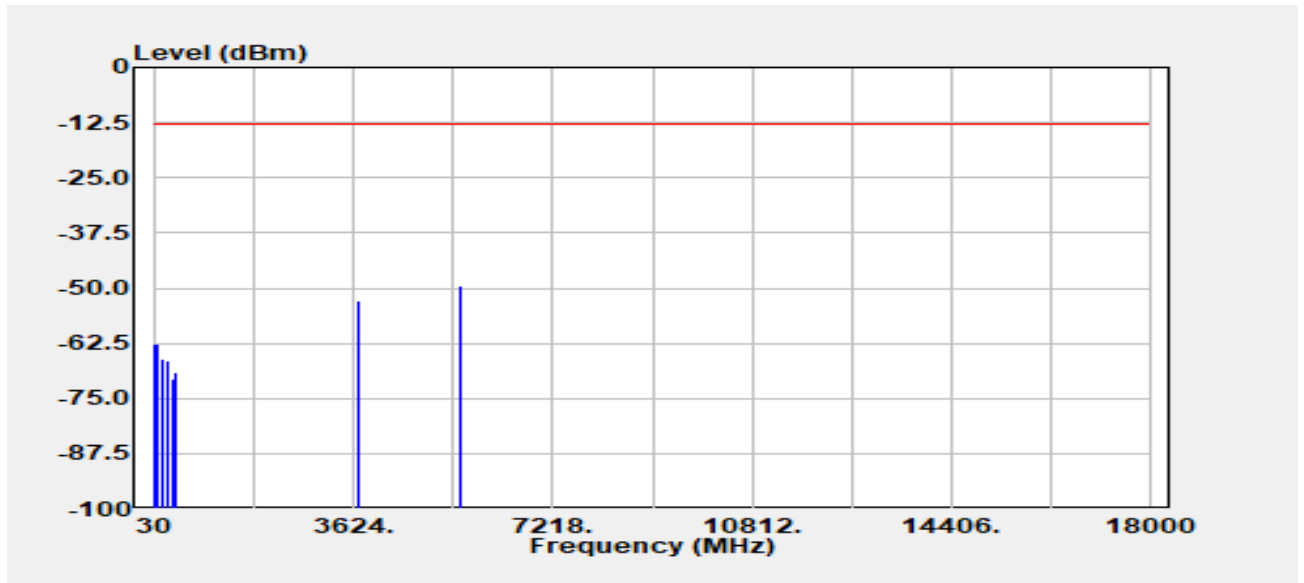


Freq.	EIRP/ERP	SG	Antenna	Cable	Limit	Margin
MHz	dBm	Output Level	Gain	Loss	dBm	dB
35.04	-66.96	-44.64	-22.23	0.10	-13.00	-53.96
137.28	-64.55	-58.04	-6.32	0.20	-13.00	-51.55
193.35	-67.92	-66.02	-1.65	0.24	-13.00	-54.92
246.41	-68.66	-68.72	0.35	0.28	-13.00	-55.66
355.34	-68.16	-68.66	0.86	0.36	-13.00	-55.16
474.45	-71.58	-71.44	0.30	0.43	-13.00	-58.58
3700.40	-50.41	-56.98	7.80	1.23	-13.00	-37.41
5550.60	-49.63	-58.36	10.20	1.48	-13.00	-36.63

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Project No :TM-2310000293P
Operation Band :GPRS 1900
Frequency :512
Operation Mode :TX
EUT Pol :E2
Setting :

Test Date :2023-10-30
Temp./Humi. :24.8/64
Antenna Pol. :HORIZONTAL
Engineer :Czerny.Lin
Test Chamber : 966A



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
30.68	-62.69	-36.03	-26.57	0.09	-13.00	-49.69
106.15	-62.77	-55.50	-7.10	0.17	-13.00	-49.77
196.55	-66.06	-63.79	-2.03	0.25	-13.00	-53.06
259.99	-66.40	-66.57	0.46	0.29	-13.00	-53.40
355.34	-70.69	-71.19	0.86	0.36	-13.00	-57.69
409.56	-69.06	-69.28	0.62	0.40	-13.00	-56.06
3700.40	-52.88	-59.45	7.80	1.23	-13.00	-39.88
5550.60	-49.36	-58.08	10.20	1.48	-13.00	-36.36



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8.6 FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

LIMIT

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

Test Procedure

Use Anritsu 8820 with frequency Error measurement capability.

Temp = -30 to +50°C , 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.*



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TEST RESULTS

Compliance.

Temperature: 22.3 ~ 25.6°C

Test date: October 24 ~ 27, 2023

Humidity: 55 ~ 57% RH

Tested by: David Lee

GPRS 850

Reference Frequency : GPRS 850			836.6	MHz
Limit: +/- 2.5 ppm =			2091.5	Hz
Power Supply	Environment	Frequency Error	Frequency Error	Limit
Vdc	Temperature (°C)	(Hz)	(ppm)	(ppm)
110	45	1.00000	0.001195	2.5
110	40	13.60000	0.016256	2.5
110	30	2.20000	0.002630	2.5
110	20	-15.40000	-0.018408	2.5
110	10	-15.80000	-0.018886	2.5
110	0	-10.80000	-0.012909	2.5

Reference Frequency : GPRS 850			836.6	MHz
Limit: +/- 2.5 ppm =			2091.5	Hz
Vdc	Temperature (°C)	(Hz)	(ppm)	(ppm)
93.5	20	2.10000	0.002510	2.5
110	20	-18.50000	-0.022113	2.5
126.5	20	-10.70000	-0.012790	2.5



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GPRS 1900

Reference Frequency : GPRS 1900			1880.0	MHz
Limit: +/- 2.5 ppm =			4700	Hz
Power Supply	Environment	Frequency Error	Frequency Error	Limit
Vdc	Temperature (°C)	(Hz)	(ppm)	(ppm)
110	50	-13.10000	-0.006968	2.500000
110	40	-11.90000	-0.006330	2.500000
110	30	18.70000	0.009947	2.500000
110	20	-23.70000	-0.012606	2.500000
110	10	2.60000	0.001383	2.500000
110	0	-9.00000	-0.004787	2.500000

Reference Frequency : GPRS 1900			1880.0	MHz
Limit: +/- 2.5 ppm =			4700	Hz
Vdc	Temperature (°C)	(Hz)	(ppm)	(ppm)
93.5	20	-13.30000	-0.007074	2.5
110	20	-44.50000	-0.023670	2.5
126.5	20	-6.90000	-0.003670	2.5