FCC Test Report

FCC ID	:	**MXF-WMDD209A**
Equipment	:	**Lora module**
Model No.	:	**WMDD-209A**
Brand Name	:	**Gemtek**
Applicant	:	**Gemtek Technology Co., Ltd.**
Address	:	**No. 15-1 Zhonghua Road, Hsinchu Industrial Park, Hukou, Hsinchu, Taiwan, 30352.**
Standard	:	**47 CFR FCC Part 15.247**
Received Date	:	**Aug. 23, 2017**
Tested Date	:	**Aug. 23 ~ Sep. 01, 2017**

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by: **Approved by:**

Along Chen / Assistant Manager **Gary Chang / Manager**

Testing Laboratory 2732

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Release Record

Report No.	Version	Description	Issued Date
FR782804	Rev. 01	Initial issue	Oct. 13, 2017

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.486MHz 33.56 (Margin -12.67dB) - AV	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 9149.00MHz 52.99 (Margin -1.01dB) - AV	Pass
15.247(d)	Band Edge	Meet the requirement of limit	Pass
15.247(b)(2)(3)	Conducted Output Power	Power [dBm]: 19.01	Pass
15.247(a)(1)(i)	Number of Hopping Channels	Meet the requirement of limit	Pass
15.247(a)(1)	Hopping Channel Separation	Meet the requirement of limit	Pass
15.247(f)	Dwell Time	Meet the requirement of limit	Pass
15.247(f)	Power spectral density	Meet the requirement of limit	Pass
15.203	Antenna Requirement	Meet the requirement of limit	Pass

1 General Description

1.1 Information

1.1.1 Specification of the Equipment under Test (EUT)

RF General Information					
Frequency Range (MHz)	**Ch. Freq. (MHz)**	**Channel Number**	**Data Rate (bit/sec)**	**Spread Factor**	**Channel Bandwidth (kHz)**
902 ~ 928	902.3 ~ 914.9	1-64 [64]	977 ~ 5469	10 ~ 7	125
Note 1: RF output power specifies that Maximum Conducted (Average) Output Power. Note 2: The device uses CSS modulation. Note 3: The device supports hybrid mode.					

1.1.2 Antenna Details

Ant. No.	Type	Connector	Gain (dBi)	Remark
1	Dipole	IPEX	0	---

1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	5Vdc from host

1.1.4 Accessories

N/A

1.1.5 Channel List

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	902.3	17	905.5	33	908.7	49	911.9
2	902.5	18	905.7	34	908.9	50	912.1
3	902.7	19	905.9	35	909.1	51	912.3
4	902.9	20	906.1	36	909.3	52	912.5
5	903.1	21	906.3	37	909.5	53	912.7
6	903.3	22	906.5	38	909.7	54	912.9
7	903.5	23	906.7	39	909.9	55	913.1
8	903.7	24	906.9	40	910.1	56	913.3
9	903.9	25	907.1	41	910.3	57	913.5
10	904.1	26	907.3	42	910.5	58	913.7
11	904.3	27	907.5	43	910.7	59	913.9
12	904.5	28	907.7	44	910.9	60	914.1
13	904.7	29	907.9	45	911.1	61	914.3
14	904.9	30	908.1	46	911.3	62	914.5
15	905.1	31	908.3	47	911.5	63	914.7
16	905.3	32	908.5	48	911.7	64	914.9

1.1.6 Test Tool and Duty Cycle

Test Tool	HyperTerminal, version: 5.1.2600.0

1.1.7 Power Setting

Modulation Mode	Test Frequency (MHz)		
	902.3	**908.5**	**914.9**
CSS	20	20	20

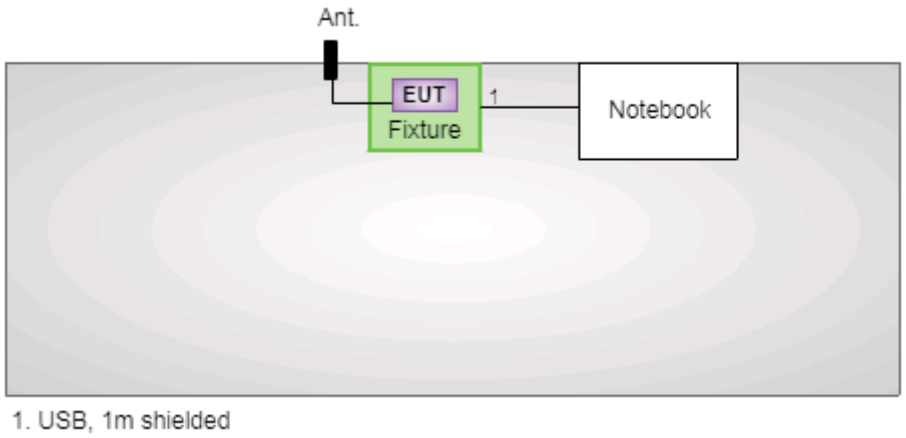
1.2 Local Support Equipment List

Support Equipment List					
No.	**Equipment**	**Brand**	**Model**	**FCC ID**	**Signal cable / Length (m)**
1	Notebook	DELL	Latitude E6430	DoC	USB, 1m shielded.
2	Fixture	---	---	---	---

Note: No. 2 was supplied by applicant.

1.3 Test Setup Chart

Test Setup Diagram



1. USB, 1m shielded

1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Receiver	R&S	ESR3	101657	Dec. 21, 2016	Dec. 20, 2017
LISN	SCHWARZBECK	Schwarzbeck 8127	8127-667	Nov. 08, 2016	Nov. 07, 2017
RF Cable-CON	EMC	EMCCFD300-BM-BM-6000	50821	Dec. 20, 2016	Dec. 19, 2017
Measurement Software	AUDIX	e3	6.120210k	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission				
Test Site	966 chamber 1 / (03CH01-WS)				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV40	101498	Nov. 25, 2016	Nov. 24, 2017
Receiver	R&S	ESR3	101658	Nov. 24, 2016	Nov. 23, 2017
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jul. 25, 2017	Jul. 24, 2018
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Dec. 21, 2016	Dec. 20, 2017
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Oct. 25, 2016	Oct. 24, 2017
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 10, 2016	Nov. 09, 2017
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Dec. 09, 2016	Dec. 08, 2017
Preamplifier	EMC	EMC02325	980225	Jul. 28, 2017	Jul. 27, 2018
Preamplifier	Agilent	83017A	MY39501308	Oct. 06, 2016	Oct. 05, 2017
Preamplifier	EMC	EMC184045B	980192	Aug. 22, 2017	Aug. 21, 2018
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16014/4	Dec. 09, 2016	Dec. 08, 2017
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Dec. 09, 2016	Dec. 08, 2017
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16139/4	Dec. 09, 2016	Dec. 08, 2017
LF cable 1M	EMC	EMCCFD400-NM-NM-1000	16052	Dec. 09, 2016	Dec. 08, 2017
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Dec. 09, 2016	Dec. 08, 2017
LF cable 10M	Woken	CFD400NL-LW	CFD400NL-002	Dec. 09, 2016	Dec. 08, 2017
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV40	101063	Mar. 15, 2017	Mar. 14, 2018
Power Meter	Anritsu	ML2495A	1241002	Oct. 06, 2016	Oct. 05, 2017
Power Sensor	Anritsu	MA2411B	1207366	Oct. 06, 2016	Oct. 05, 2017
DC POWER SOURCE	GW INSTEK	GPC-6030D	EM892433	Oct. 20, 2016	Oct. 19, 2017
Measurement Software	Sporton	Sporton_1	1.3.30	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

1.5 Test Standards

According to the specification of EUT, the EUT must comply with following standards and KDB documents.

47 CFR FCC Part 15.247
ANSI C63.10-2013
FCC KDB 558074 D01 DTS Meas Guidance v04
FCC KDB 453039

1.6 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Measurement Uncertainty	
Parameters	**Uncertainty**
Bandwidth	±34.134 Hz
Conducted power	±0.808 dB
Power density	±0.463 dB
Conducted emission	±2.670 dB
AC conducted emission	±2.90 dB
Radiated emission ≤ 1GHz	±3.72 dB
Radiated emission > 1GHz	±5.65 dB

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	23°C / 57%	Alex Tsai
Radiated Emissions	03CH01-WS	24°C / 62%	Aska Huang Vincent Yeh
RF Conducted	TH01-WS	23°C / 62%	Felix Sung

- FCC Designation No.: TW2732
- FCC site registration No.: 181692
- IC site registration No.: 10807A-1

2.2 The Worst Test Modes and Channel Details

Test item	Test Frequency (MHz)	Channel Bandwidth (kHz)	Modulation / SF
Conducted Emissions Radiated Emissions ≤ 1GHz Radiated Emissions > 1GHz Conducted Output Power Hopping Channel Separation 20dB and Occupied bandwidth Power Spectral Density	902.3 / 908.5 / 914.9	125	CSS / 10
Number of Hopping Channels	902.3 ~ 914.9	125	CSS / 10
Dwell Time	902.3	125	CSS: 10 / 9 / 8 / 7

NOTE:

1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **Z-plane** results were found as the worst case and were shown in this report.
2. Hopping channles supports 3 operation modes as below:
   1) 8 channels
   2) 16 channels
   3) 64 channels

3 Transmitter Test Results

3.1 Conducted Emissions

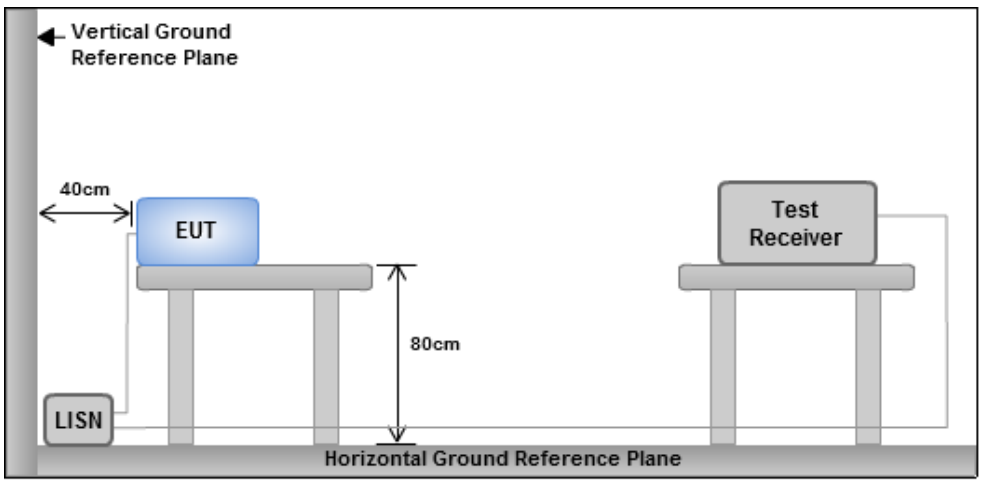
3.1.1 Limit of Conducted Emissions

Conducted Emissions Limit		
Frequency Emission (MHz)	**Quasi-Peak**	**Average**
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50
Note 1: * Decreases with the logarithm of the frequency.		

3.1.2 Test Procedures

1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50 Ω LISN port.
3. AC conducted emission measurements is made over frequency range from 150 kHz to 30 MHz.
4. This measurement was performed with AC 120V/60Hz

3.1.3 Test Setup

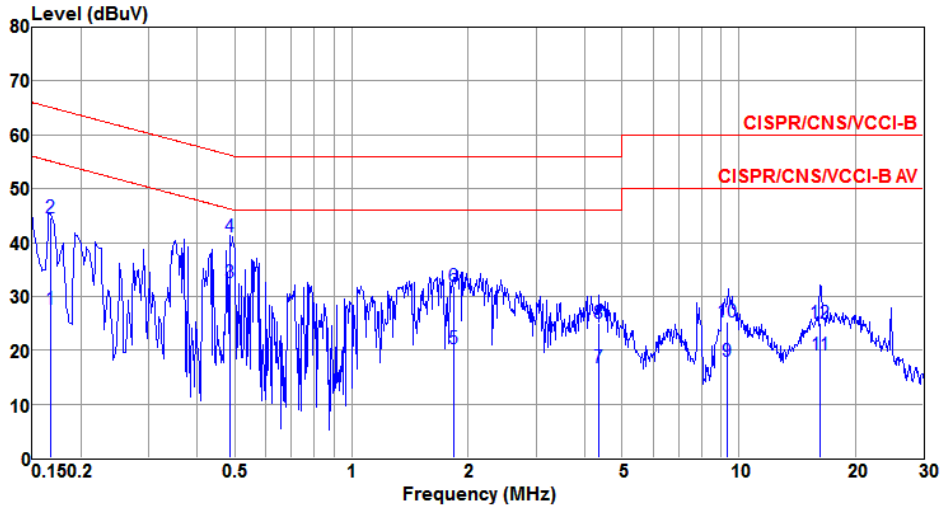


Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.4 Test Result of Conducted Emissions

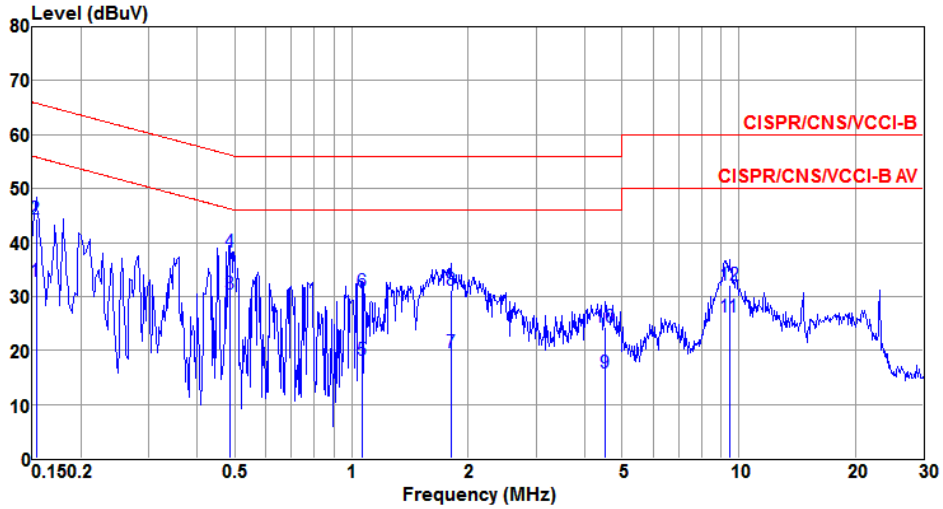
Modulation / SF	CSS / 10	Test Freq. (MHz)	902.3
Power Phase	Line		



	Freq	Level	Limit Line	Over Limit	Read Level	LISN factor	cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.168	27.68	55.08	-27.40	27.56	0.08	0.04	Average
2	0.168	44.61	65.08	-20.47	44.49	0.08	0.04	QP
3@	0.484	32.63	46.27	-13.64	32.53	0.06	0.04	Average
4	0.484	40.99	56.27	-15.28	40.89	0.06	0.04	QP
5	1.841	20.21	46.00	-25.79	20.05	0.12	0.04	Average
6	1.841	31.88	56.00	-24.12	31.72	0.12	0.04	QP
7	4.361	16.66	46.00	-29.34	16.32	0.17	0.17	Average
8	4.361	25.01	56.00	-30.99	24.67	0.17	0.17	QP
9	9.349	17.94	50.00	-32.06	17.52	0.20	0.22	Average
10	9.349	25.19	60.00	-34.81	24.77	0.20	0.22	QP
11	16.272	19.19	50.00	-30.81	18.61	0.34	0.24	Average
12	16.272	25.01	60.00	-34.99	24.43	0.34	0.24	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

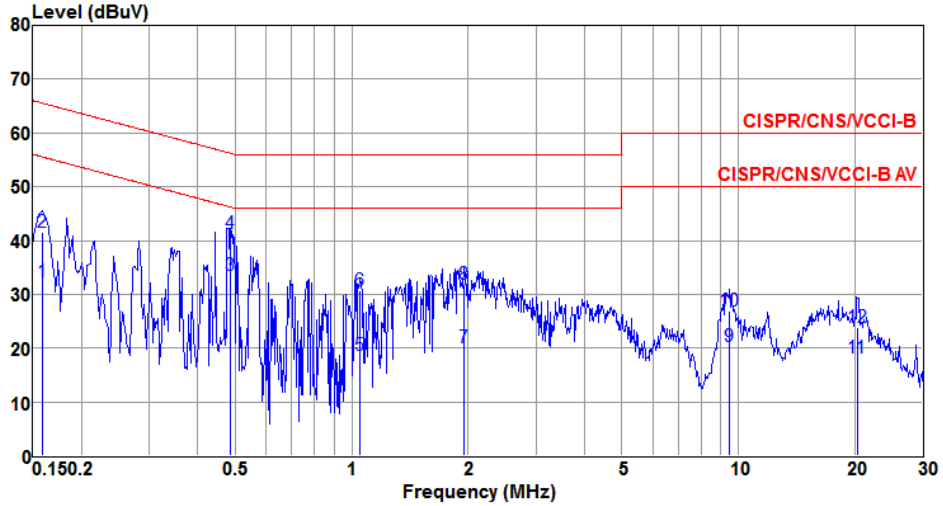
Modulation / SF	CSS / 10	Test Freq. (MHz)	902.3
Power Phase	Neutral		



	Freq	Level	Limit Line	Over Limit	Read Level	LISN factor	cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.153	32.76	55.82	-23.06	32.62	0.10	0.04	Average
2	0.153	44.48	65.82	-21.34	44.34	0.10	0.04	QP
3@	0.486	30.48	46.23	-15.75	30.32	0.12	0.04	Average
4	0.486	38.24	56.23	-17.99	38.08	0.12	0.04	QP
5	1.065	18.22	46.00	-27.78	18.08	0.10	0.04	Average
6	1.065	30.99	56.00	-25.01	30.85	0.10	0.04	QP
7	1.810	19.66	46.00	-26.34	19.47	0.15	0.04	Average
8	1.810	31.26	56.00	-24.74	31.07	0.15	0.04	QP
9	4.525	15.88	46.00	-30.12	15.55	0.16	0.17	Average
10	4.525	24.30	56.00	-31.70	23.97	0.16	0.17	QP
11	9.451	26.24	50.00	-23.76	25.72	0.30	0.22	Average
12	9.451	32.20	60.00	-27.80	31.68	0.30	0.22	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

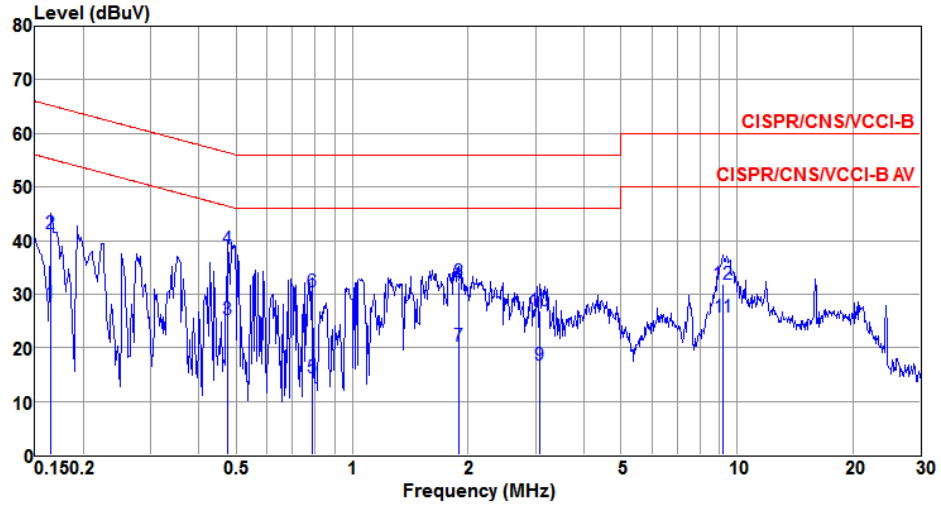
Modulation / SF	CSS / 10	Test Freq. (MHz)	908.5
Power Phase	Line		



	Freq	Level	Limit Line	Over Limit	Read Level	LISN factor	cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.159	32.37	55.52	-23.15	32.25	0.08	0.04	Average
2	0.159	41.66	65.52	-23.86	41.54	0.08	0.04	QP
3@	0.486	33.56	46.23	-12.67	33.46	0.06	0.04	Average
4	0.486	41.24	56.23	-14.99	41.14	0.06	0.04	QP
5	1.049	18.73	46.00	-27.27	18.62	0.07	0.04	Average
6	1.049	30.71	56.00	-25.29	30.60	0.07	0.04	QP
7	1.949	20.02	46.00	-25.98	19.85	0.13	0.04	Average
8	1.949	31.97	56.00	-24.03	31.80	0.13	0.04	QP
9	9.502	20.35	50.00	-29.65	19.93	0.20	0.22	Average
10	9.502	26.89	60.00	-33.11	26.47	0.20	0.22	QP
11	20.314	18.23	50.00	-31.77	17.57	0.40	0.26	Average
12	20.314	23.82	60.00	-36.18	23.16	0.40	0.26	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

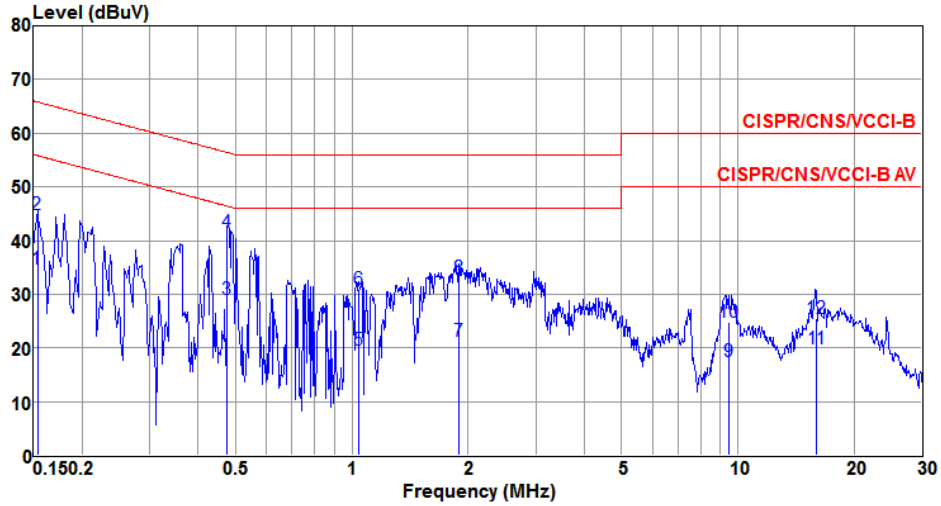
Modulation / SF	CSS / 10	Test Freq. (MHz)	908.5
Power Phase	Neutral		



	Freq	Level	Limit Line	Over Limit	Read Level	LISN factor	cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.165	28.42	55.21	-26.79	28.28	0.10	0.04	Average
2	0.165	41.25	65.21	-23.96	41.11	0.10	0.04	QP
3	0.476	25.17	46.41	-21.24	25.01	0.12	0.04	Average
4@	0.476	38.49	56.41	-17.92	38.33	0.12	0.04	QP
5	0.788	14.41	46.00	-31.59	14.27	0.10	0.04	Average
6	0.788	30.55	56.00	-25.45	30.41	0.10	0.04	QP
7	1.888	20.40	46.00	-25.60	20.21	0.15	0.04	Average
8	1.888	32.23	56.00	-23.77	32.04	0.15	0.04	QP
9	3.070	16.87	46.00	-29.13	16.61	0.15	0.11	Average
10	3.070	26.96	56.00	-29.04	26.70	0.15	0.11	QP
11	9.204	25.80	50.00	-24.20	25.30	0.29	0.21	Average
12	9.204	31.99	60.00	-28.01	31.49	0.29	0.21	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

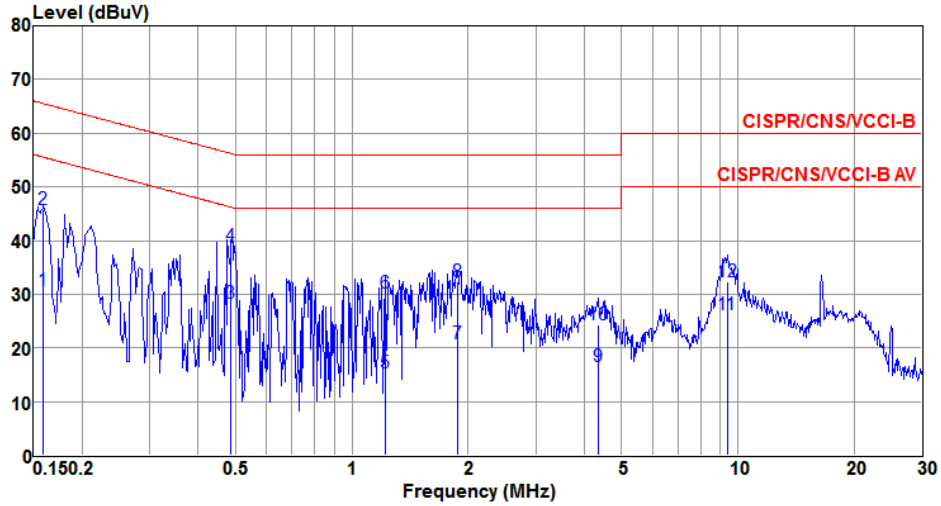
Modulation / SF	CSS / 10	Test Freq. (MHz)	914.9
Power Phase	Line		



	Freq	Level	Limit Line	Over Limit	Read Level	LISN factor	cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.153	34.71	55.82	-21.11	34.60	0.07	0.04	Average
2	0.153	44.89	65.82	-20.93	44.78	0.07	0.04	QP
3	0.476	29.14	46.41	-17.27	29.04	0.06	0.04	Average
4@	0.476	41.52	56.41	-14.89	41.42	0.06	0.04	QP
5	1.043	19.54	46.00	-26.46	19.43	0.07	0.04	Average
6	1.043	30.92	56.00	-25.08	30.81	0.07	0.04	QP
7	1.888	21.36	46.00	-24.64	21.19	0.13	0.04	Average
8	1.888	32.96	56.00	-23.04	32.79	0.13	0.04	QP
9	9.451	17.44	50.00	-32.56	17.02	0.20	0.22	Average
10	9.451	24.77	60.00	-35.23	24.35	0.20	0.22	QP
11	15.975	19.79	50.00	-30.21	19.22	0.33	0.24	Average
12	15.975	25.45	60.00	-34.55	24.88	0.33	0.24	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

Modulation / SF	CSS / 10	Test Freq. (MHz)	914.9
Power Phase	Neutral		



	Freq	Level	Limit Line	Over Limit	Read Level	LISN factor	cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.159	30.70	55.52	-24.82	30.56	0.10	0.04	Average
2	0.159	45.86	65.52	-19.66	45.72	0.10	0.04	QP
3	0.486	28.30	46.23	-17.93	28.14	0.12	0.04	Average
4@	0.486	38.97	56.23	-17.26	38.81	0.12	0.04	QP
5	1.223	15.36	46.00	-30.64	15.21	0.11	0.04	Average
6	1.223	30.14	56.00	-25.86	29.99	0.11	0.04	QP
7	1.878	20.85	46.00	-25.15	20.66	0.15	0.04	Average
8	1.878	32.38	56.00	-23.62	32.19	0.15	0.04	QP
9	4.361	16.53	46.00	-29.47	16.20	0.16	0.17	Average
10	4.361	24.33	56.00	-31.67	24.00	0.16	0.17	QP
11	9.401	26.21	50.00	-23.79	25.69	0.30	0.22	Average
12	9.401	32.22	60.00	-27.78	31.70	0.30	0.22	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

3.2 Unwanted Emissions into Restricted Frequency Bands

3.2.1 Limit of Unwanted Emissions into Restricted Frequency Bands

Restricted Band Emissions Limit			
Frequency Range (MHz)	**Field Strength (uV/m)**	**Field Strength (dBuV/m)**	**Measure Distance (m)**
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1:
Qusai-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit
Note 2:
Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

3.2.2 Test Procedures

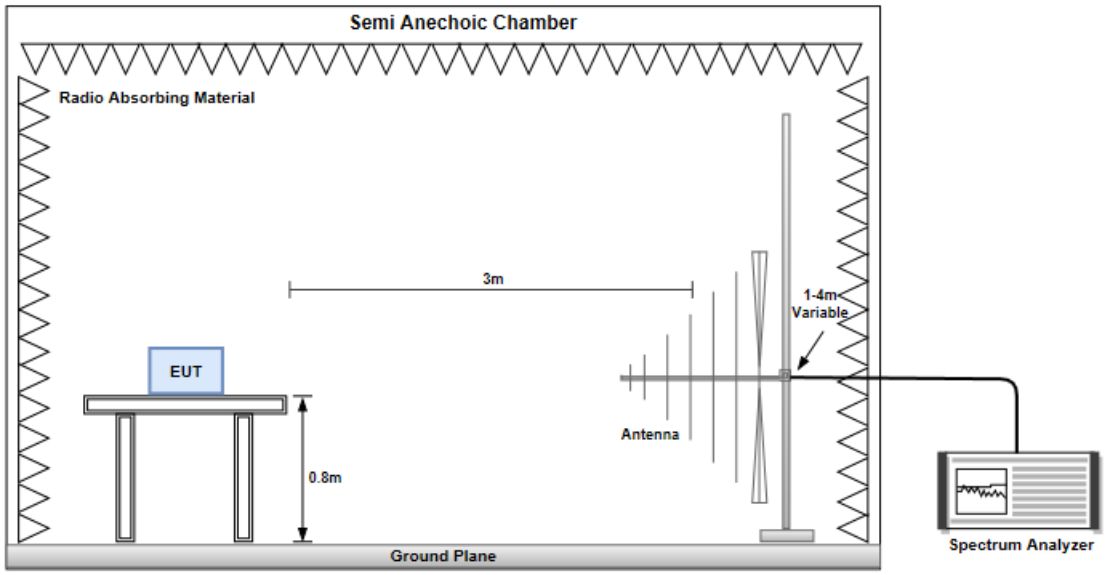
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at test table. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

Note:

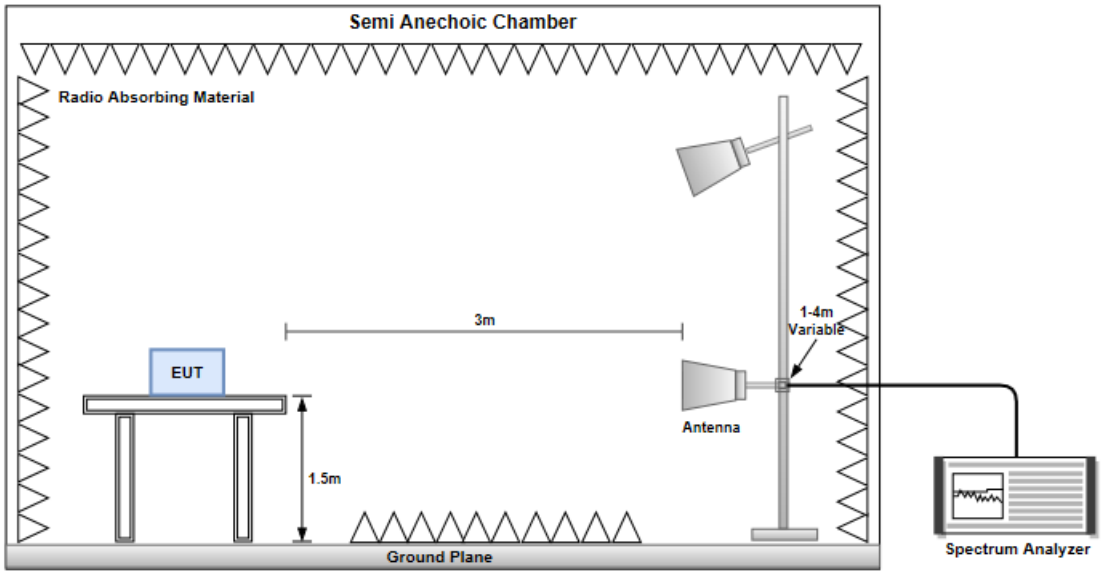
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above 1GHz.

3.2.3 Test Setup

Radiated Emissions below 1 GHz

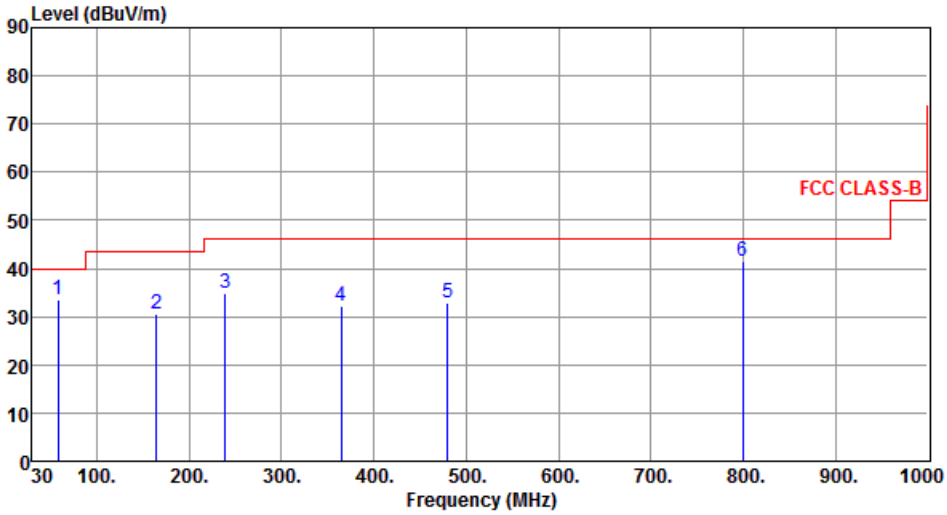


Radiated Emissions above 1 GHz



3.2.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

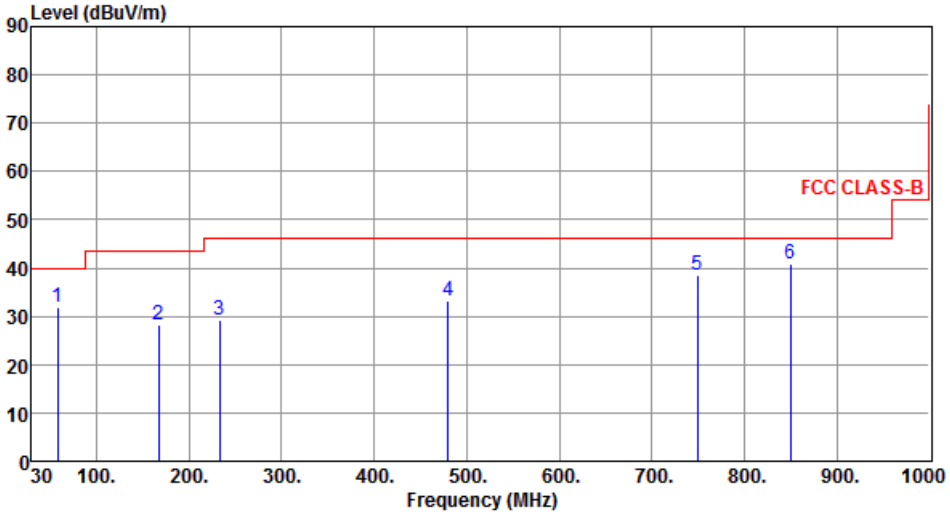
Modulation / SF	CSS / 10	Test Freq. (MHz)	902.3
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	58.13	33.48	40.00	-6.52	41.83	-8.35	Peak	---	---
2	164.83	30.45	43.50	-13.05	38.86	-8.41	Peak	---	---
3	239.52	34.83	46.00	-11.17	44.55	-9.72	Peak	---	---
4	364.65	32.20	46.00	-13.80	38.18	-5.98	Peak	---	---
5	480.08	32.93	46.00	-13.07	36.15	-3.22	Peak	---	---
6	799.21	41.65	46.00	-4.35	39.40	2.25	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

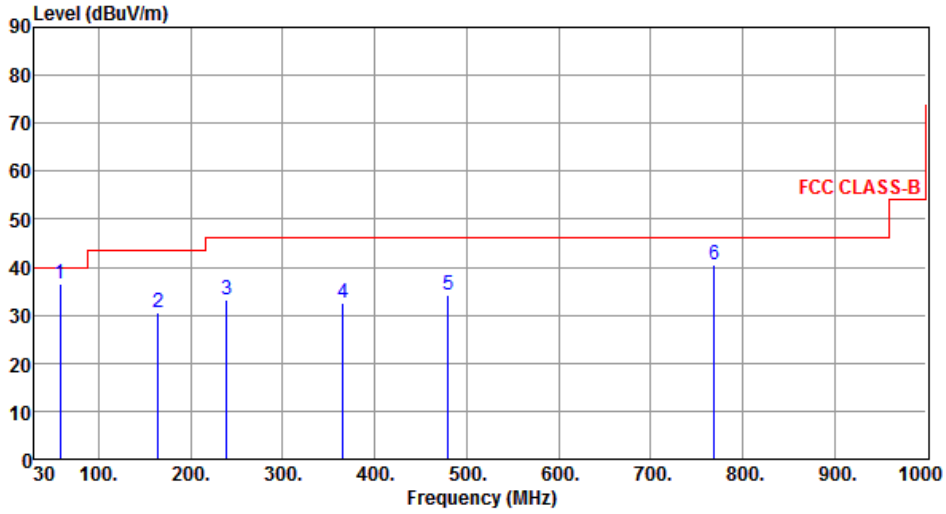
Modulation / SF	CSS / 10	Test Freq. (MHz)	902.3
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	58.13	31.83	40.00	-8.17	40.18	-8.35	Peak	---	---
2	166.77	28.30	43.50	-15.20	36.78	-8.48	Peak	---	---
3	232.73	29.11	46.00	-16.89	39.25	-10.14	Peak	---	---
4	480.08	33.25	46.00	-12.75	36.47	-3.22	Peak	---	---
5	749.74	38.59	46.00	-7.41	36.83	1.76	Peak	---	---
6	849.65	40.72	46.00	-5.28	37.59	3.13	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

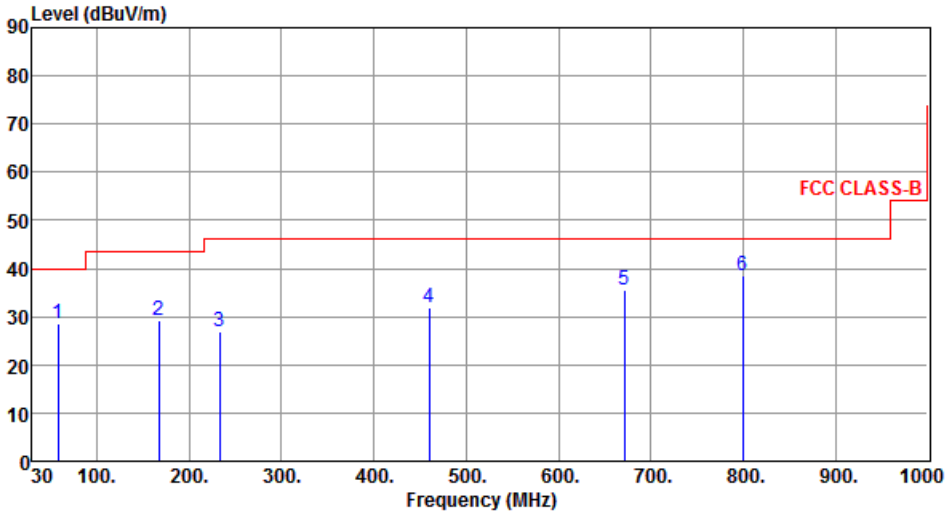
Modulation / SF	CSS / 10	Test Freq. (MHz)	908.5
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	58.13	36.62	40.00	-3.38	44.97	-8.35	Peak	---	---
2	164.83	30.67	43.50	-12.83	39.08	-8.41	Peak	---	---
3	239.52	33.06	46.00	-12.94	42.78	-9.72	Peak	---	---
4	365.62	32.59	46.00	-13.41	38.54	-5.95	Peak	---	---
5	480.08	34.26	46.00	-11.74	37.48	-3.22	Peak	---	---
6	769.14	40.45	46.00	-5.55	38.50	1.95	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

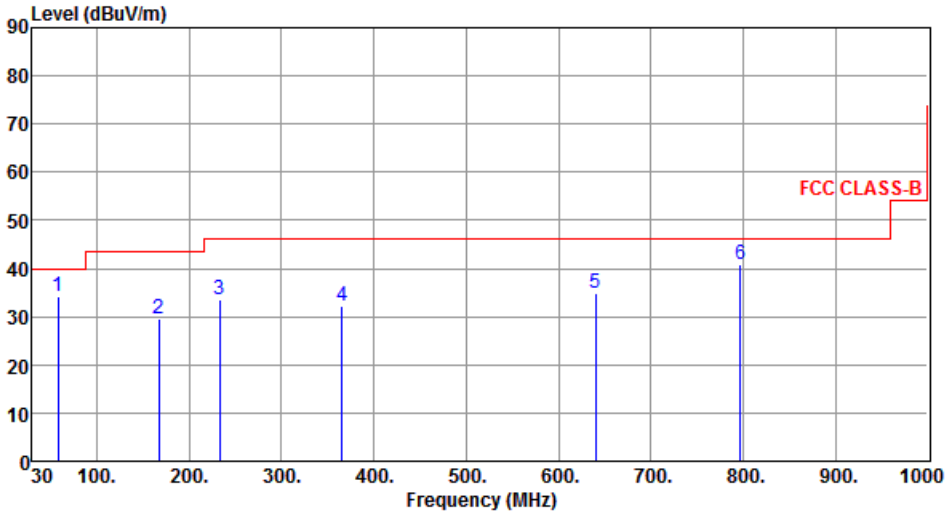
Modulation / SF	CSS / 10	Test Freq. (MHz)	908.5
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	58.13	28.46	40.00	-11.54	36.81	-8.35	Peak	---	---
2	166.77	29.20	43.50	-14.30	37.68	-8.48	Peak	---	---
3	232.73	27.06	46.00	-18.94	37.20	-10.14	Peak	---	---
4	459.71	31.96	46.00	-14.04	35.56	-3.60	Peak	---	---
5	671.17	35.61	46.00	-10.39	35.43	0.18	Peak	---	---
6	799.21	38.59	46.00	-7.41	36.34	2.25	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

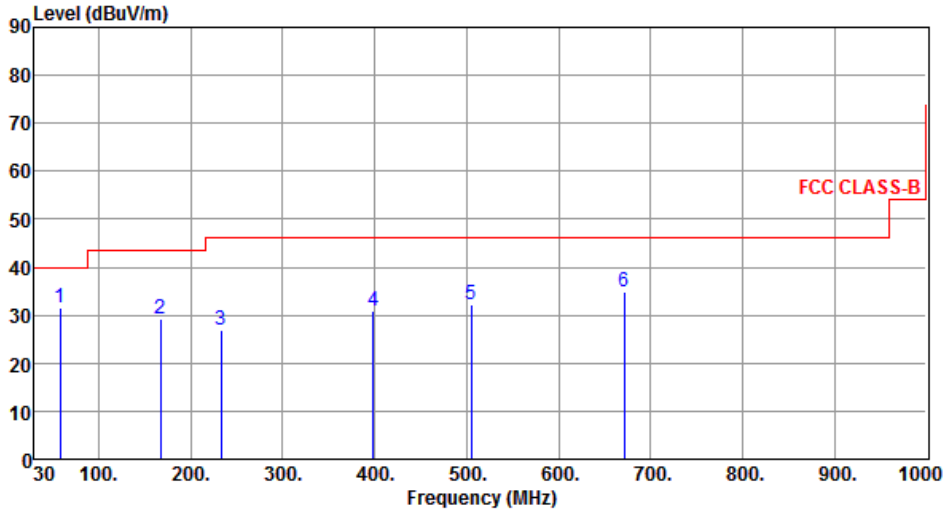
Modulation / SF	CSS / 10	Test Freq. (MHz)	914.9
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	58.13	34.10	40.00	-5.90	42.45	-8.35	Peak	---	---
2	166.77	29.72	43.50	-13.78	38.20	-8.48	Peak	---	---
3	232.73	33.67	46.00	-12.33	43.81	-10.14	Peak	---	---
4	365.62	32.23	46.00	-13.77	38.18	-5.95	Peak	---	---
5	640.13	34.87	46.00	-11.13	35.14	-0.27	Peak	---	---
6	797.27	40.81	46.00	-5.19	38.59	2.22	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Modulation / SF	CSS / 10	Test Freq. (MHz)	914.9
Polarization	Vertical		

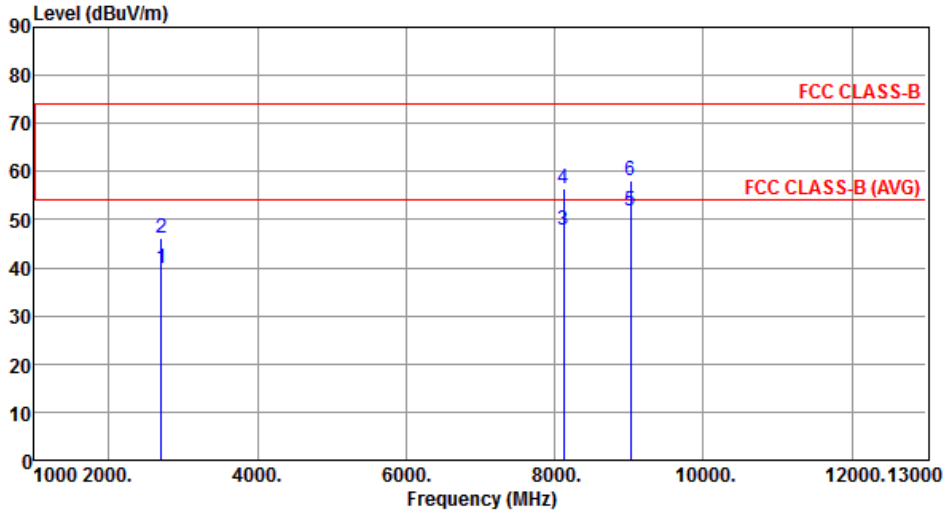


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	58.13	31.45	40.00	-8.55	39.80	-8.35	Peak	---	---
2	166.77	29.36	43.50	-14.14	37.84	-8.48	Peak	---	---
3	232.73	26.94	46.00	-19.06	37.08	-10.14	Peak	---	---
4	398.60	30.95	46.00	-15.05	35.94	-4.99	Peak	---	---
5	505.30	32.29	46.00	-13.71	35.01	-2.72	Peak	---	---
6	671.17	34.80	46.00	-11.20	34.62	0.18	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

3.2.5 Transmitter Radiated Unwanted Emissions (Above 1GHz)

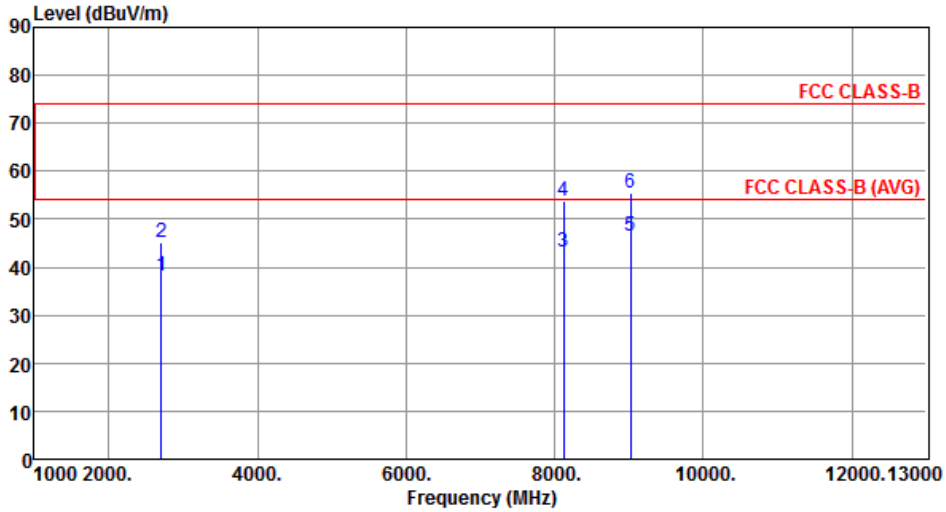
Modulation / SF	CSS / 10	Test Freq. (MHz)	902.3
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2706.90	39.80	54.00	-14.20	41.83	-2.03	Average	100	322
2	2706.90	46.06	74.00	-27.94	48.09	-2.03	Peak	100	322
3	8120.70	47.68	54.00	-6.32	38.30	9.38	Average	242	27
4	8120.70	56.31	74.00	-17.69	46.93	9.38	Peak	242	27
5	9023.00	51.96	54.00	-2.04	40.85	11.11	Average	208	312
6	9023.00	58.01	74.00	-15.99	46.90	11.11	Peak	208	312

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

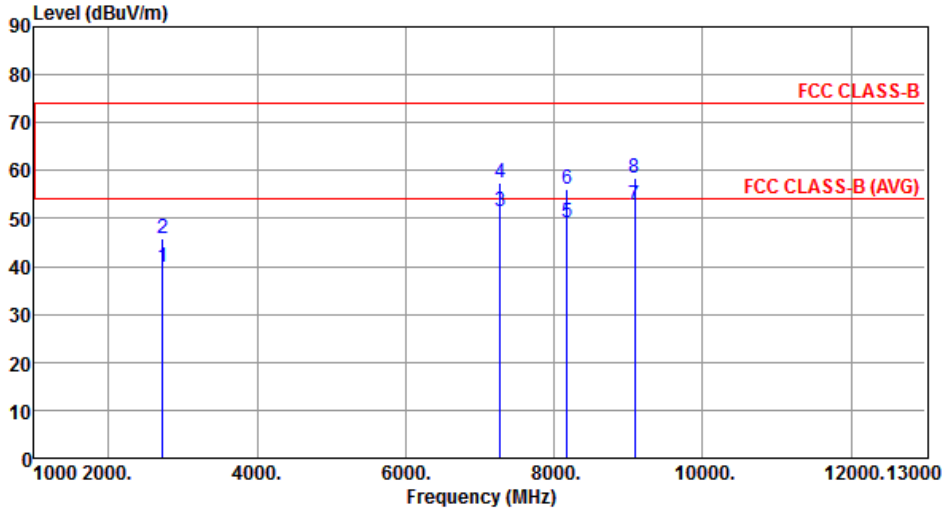
Modulation / SF	CSS / 10	Test Freq. (MHz)	902.3
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2706.90	38.20	54.00	-15.80	40.23	-2.03	Average	150	28
2	2706.90	45.07	74.00	-28.93	47.10	-2.03	Peak	150	28
3	8120.70	43.28	54.00	-10.72	33.90	9.38	Average	220	49
4	8120.70	53.91	74.00	-20.09	44.53	9.38	Peak	220	49
5	9023.00	46.54	54.00	-7.46	35.43	11.11	Average	100	350
6	9023.00	55.34	74.00	-18.66	44.23	11.11	Peak	100	350

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

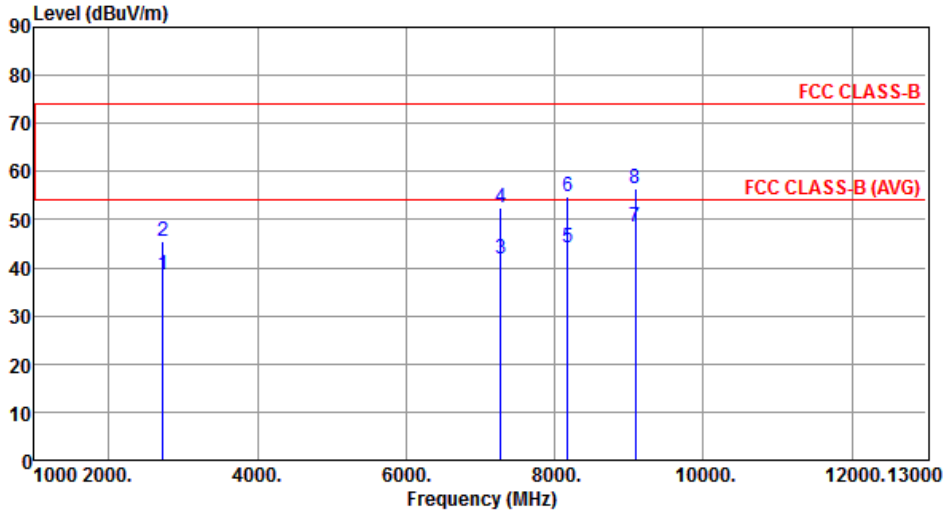
Modulation / SF	CSS / 10	Test Freq. (MHz)	908.5
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2725.50	39.75	54.00	-14.25	41.73	-1.98	Average	100	322
2	2725.50	45.71	74.00	-28.29	47.69	-1.98	Peak	100	322
3	7268.00	51.63	54.00	-2.37	43.23	8.40	Average	227	33
4	7268.00	57.41	74.00	-16.59	49.01	8.40	Peak	227	33
5	8176.50	49.12	54.00	-4.88	39.62	9.50	Average	263	29
6	8176.50	56.27	74.00	-17.73	46.77	9.50	Peak	263	29
7	9085.00	52.91	54.00	-1.09	41.59	11.32	Average	213	308
8	9085.00	58.51	74.00	-15.49	47.19	11.32	Peak	213	308

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

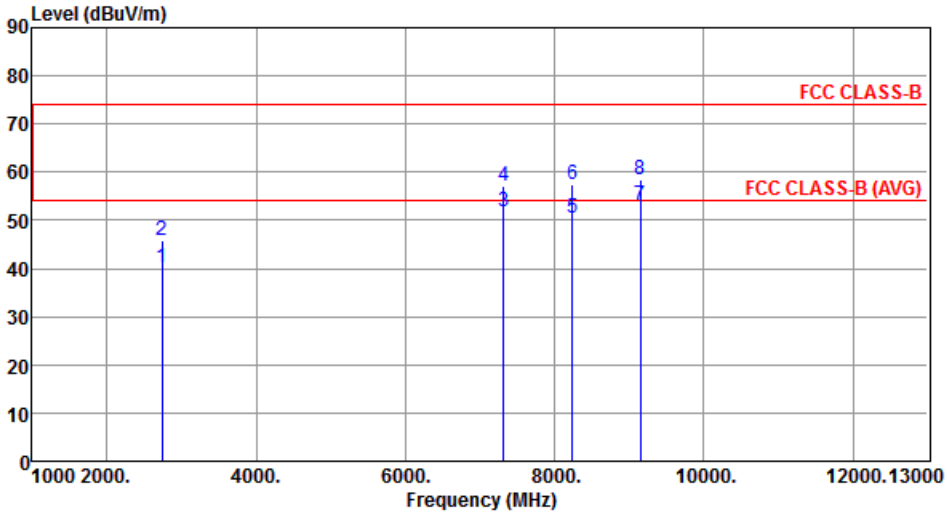
Modulation / SF	CSS / 10	**Test Freq. (MHz)**	908.5
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2725.50	38.39	54.00	-15.61	40.37	-1.98	Average	150	23
2	2725.50	45.39	74.00	-28.61	47.37	-1.98	Peak	150	23
3	7268.00	41.69	54.00	-12.31	33.29	8.40	Average	114	289
4	7268.00	52.57	74.00	-21.43	44.17	8.40	Peak	114	289
5	8176.50	44.13	54.00	-9.87	34.63	9.50	Average	214	45
6	8176.50	54.68	74.00	-19.32	45.18	9.50	Peak	214	45
7	9085.00	48.33	54.00	-5.67	37.01	11.32	Average	108	347
8	9085.00	56.44	74.00	-17.56	45.12	11.32	Peak	108	347

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

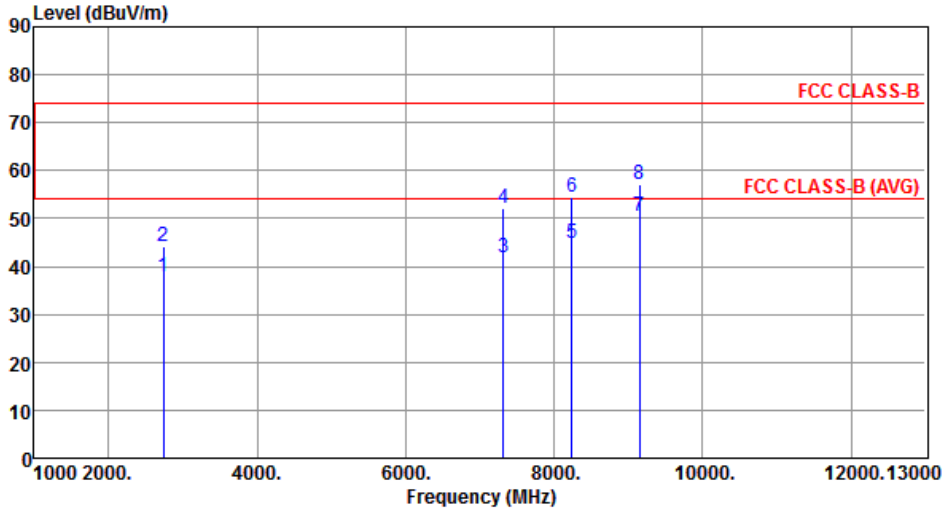
Modulation / SF	CSS / 10	Test Freq. (MHz)	914.9
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2744.70	40.24	54.00	-13.76	42.15	-1.91	Average	100	315
2	2744.70	45.83	74.00	-28.17	47.74	-1.91	Peak	100	315
3	7319.20	51.95	54.00	-2.05	43.54	8.41	Average	227	36
4	7319.20	57.05	74.00	-16.95	48.64	8.41	Peak	227	36
5	8234.10	50.57	54.00	-3.43	41.02	9.55	Average	233	30
6	8234.10	57.34	74.00	-16.66	47.79	9.55	Peak	233	30
7	9149.00	52.99	54.00	-1.01	41.47	11.52	Average	203	308
8	9149.00	58.58	74.00	-15.42	47.06	11.52	Peak	203	308

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation / SF	CSS / 10	Test Freq. (MHz)	914.9
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2744.70	38.00	54.00	-16.00	39.91	-1.91	Average	132	11
2	2744.70	44.16	74.00	-29.84	46.07	-1.91	Peak	132	11
3	7319.20	41.97	54.00	-12.03	33.56	8.41	Average	110	290
4	7319.20	52.06	74.00	-21.94	43.65	8.41	Peak	110	290
5	8234.10	44.88	54.00	-9.12	35.33	9.55	Average	233	47
6	8234.10	54.32	74.00	-19.68	44.77	9.55	Peak	233	47
7	9149.00	50.38	54.00	-3.62	38.86	11.52	Average	100	344
8	9149.00	57.28	74.00	-16.72	45.76	11.52	Peak	100	344

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

3.3 Unwanted Emissions into Non-Restricted Frequency Bands

3.3.1 Limit of Unwanted Emissions into Non-Restricted Frequency Bands

The peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz.

3.3.2 Test Procedures

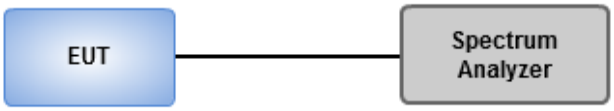
Reference Level Measurement

1. Set the RBW = 100 kHz, VBW = 300 kHz, Detector = peak.
2. Set Sweep time = auto couple, Trace mode = max hold.
3. Allow trace to fully stabilize.
4. Use the peak marker function to determine the maximum amplitude level.

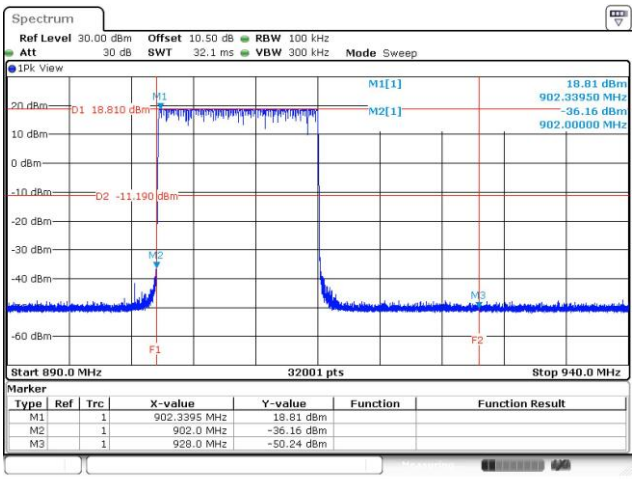
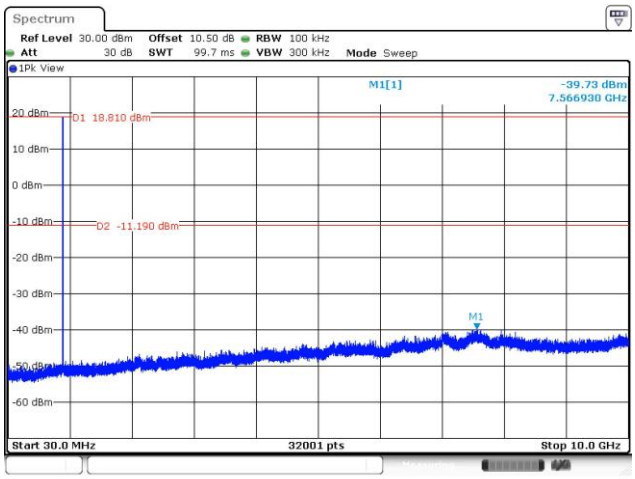
Unwanted Emissions Level Measurement

1. Set RBW = 100 kHz, VBW = 300 kHz, Detector = peak.
2. Trace Mode = max hold, Sweep = auto couple.
3. Allow the trace to stabilize.
4. Use peak marker function to determine maximum amplitude of all unwanted emissions within any 100 kHz bandwidth.

3.3.3 Test Setup

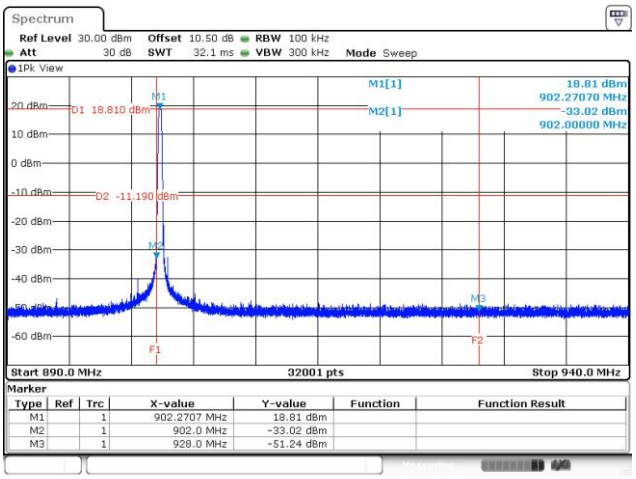


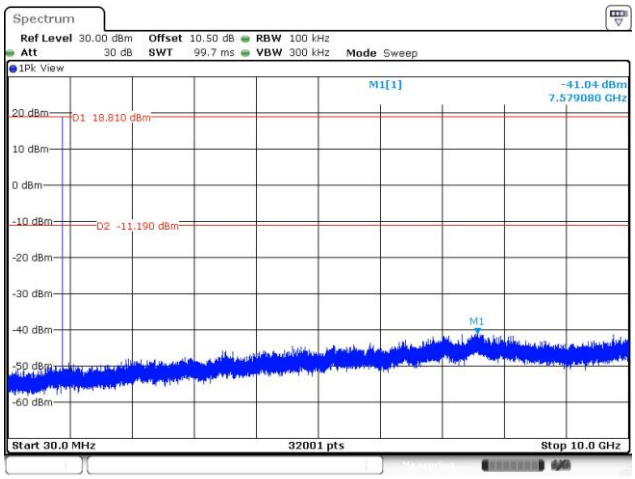
3.3.4 Unwanted Emissions into Non-Restricted Frequency Bands

Hopping on	
30MHz~10GHz (down 30dBc)	
	

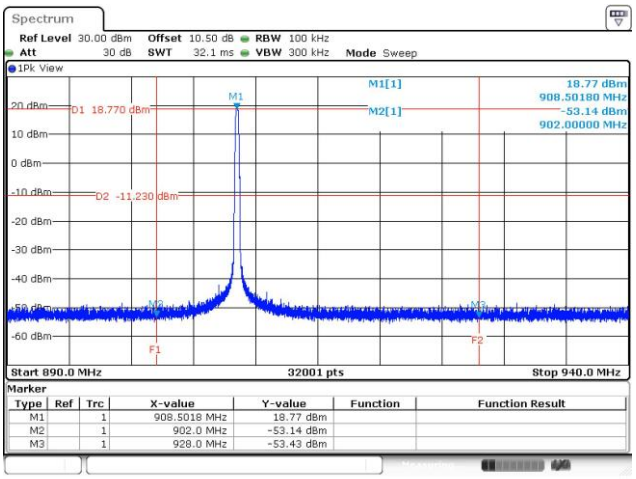
Hopping off

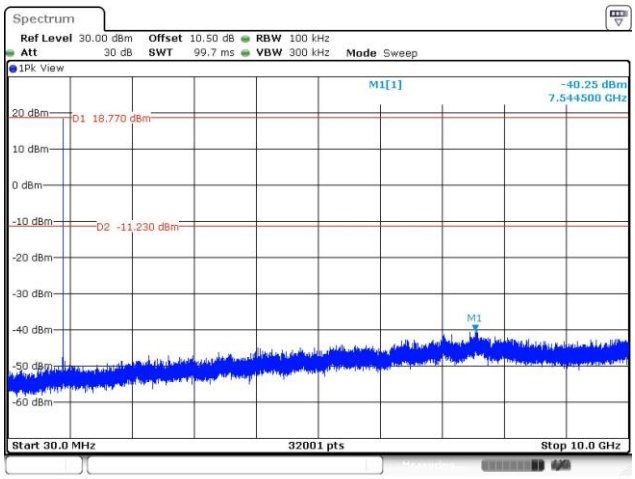
TX Frequency 902.3MHz / 30MHz~10GHz (down 30dBc)



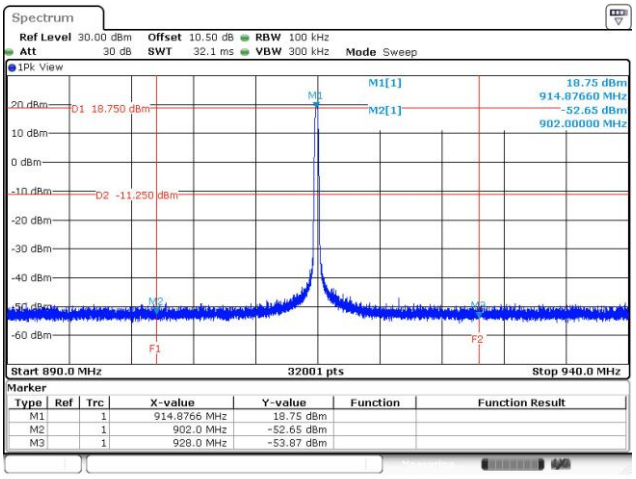


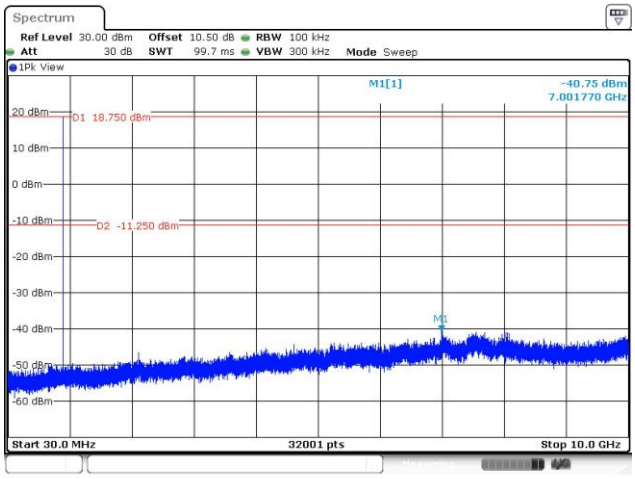
TX Frequency 908.5MHz / 30MHz~10GHz (down 30dBc)





TX Frequency 914.9MHz / 30MHz~10GHz (down 30dBc)





3.4 Conducted Output Power

3.4.1 Limit of Conducted Output Power

☒ 1 Watt, systems employing at least 50 hopping channels;

☐ 0.25 Watt, for systems employing less than 50 hopping channels, but at least 25 hopping channels,

3.4.2 Test Procedures

1. A wideband power meter is used for power measurement. Bandwidth of power senor and meter is 50MHz

2 If duty cycle of test signal is not 100 %, trigger and gating function of power meter will be enabled to capture transmission burst for measuring output power

3.4.3 Test Setup

3.4.4 Test Result of Conducted Output Power

Modulation / SF	Freq. (MHz)	Output Power (mW)	Output Power (dBm)	Limit (W)
CSS / 10	902.3	79.62	19.01	1
CSS / 10	908.5	78.70	18.96	1
CSS / 10	914.9	77.98	18.92	1

3.5 Number of Hopping Frequency

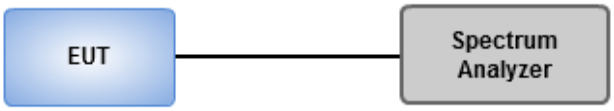
3.5.1 Limit of Number of Hopping Frequency

Number of Hopping Frequencies Limit for Frequency Hopping Systems		
☒	902-928 MHz Band:	
	☐	N ≥ 50, 20 dB bandwidth of the hopping channel is less than 250 kHz
	☐	N ≥ 25, 20 dB bandwidth of the hopping channel is 250 kHz or greater
	☒	Hybrid mode, No minimum number of hopping channels associated with hybrid system.
N: Number of Hopping Frequencies		

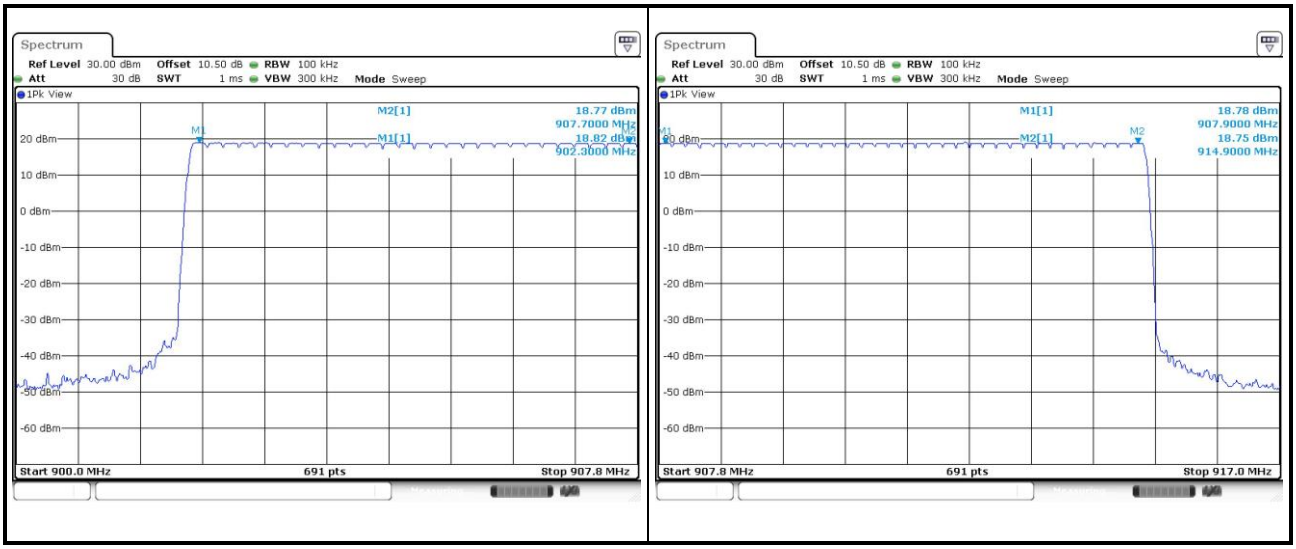
3.5.2 Test Procedures

1. Set RBW = 100kHz, VBW = 300kHz, Sweep time = Auto, Detector = Peak Trace max hold.
2 Allow trace to stabilize.

3.5.3 Test Setup



3.5.4 Test Result of Number of Hopping Frequency



3.6 20dB and Occupied Bandwidth

3.6.1 Test Procedures

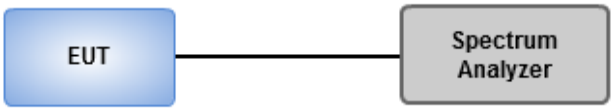
20dB Bandwidth

1. Set RBW=3kHz, VBW=10kHz, Sweep time=Auto, Detector=Peak Trace max hold.
2 Allow trace to stabilize.
3 Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

Occupied Bandwidth

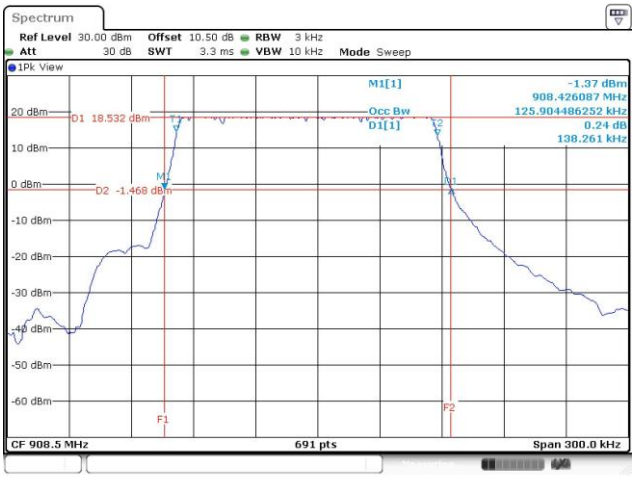
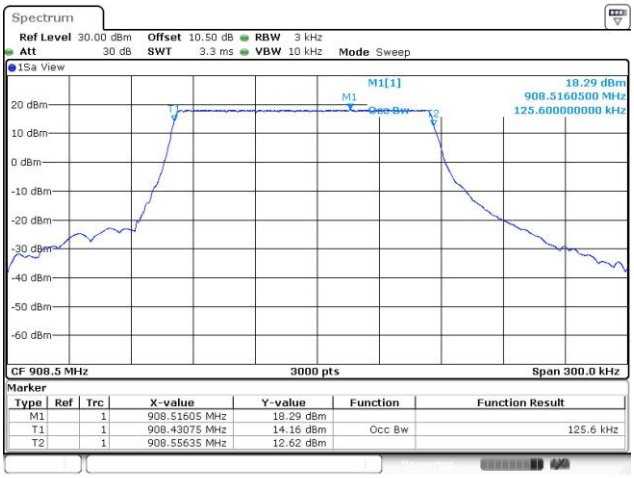
1. Set RBW=3kHz, VBW=10kHz,Sweep time = Auto, Detector=Sample, Trace max hold
2 Allow trace to stabilize
3. Use Occupied bandwidth function of spectrum analyzer to measuring 99% occupied bandwidth

3.6.2 Test Setup



3.6.3 Test result of 20dB and Occupied Bandwidth

Modulation / SF	Freq. (MHz)	20dB Bandwidth (kHz)	Occupied Bandwidth (kHz)
CSS / 10	902.3	137.83	125.60
CSS / 10	908.5	138.26	125.60
CSS / 10	914.9	137.83	125.30

Worst Plot of 20dB Bandwidth	Worst Plot of Occupied Bandwidth
	

3.7 Channel Separation

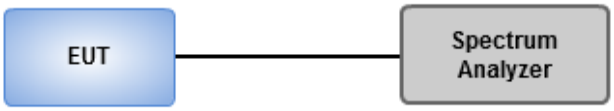
3.7.1 Limit of Channel Separation

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

3.7.2 Test Procedures

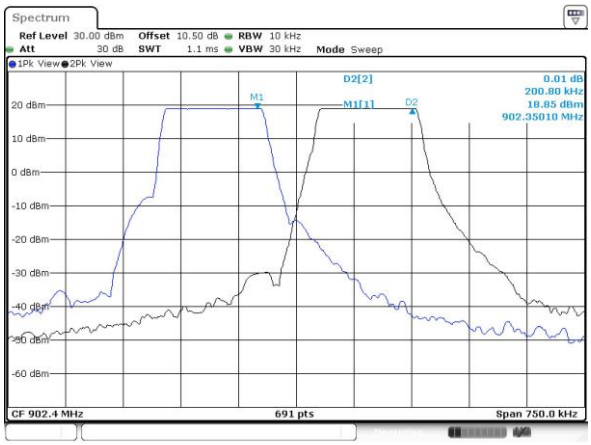
1. Set RBW=10kHz, VBW=30kHz, Sweep time=Auto, Detector=Peak Trace max hold.
2 Allow trace to stabilize.
3 Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The EUT shall show compliance with the appropriate regulatory limit

3.7.3 Test Setup



3.7.4 Test result of Channel Separation

Modulation / SF	Freq. (MHz)	Adjacent Channel Separation (kHz)	20dB Bandwidth (kHz)	Pass/Fail
CSS / 10	902.3	200.08	137.83	Pass
CSS / 10	908.5	200.08	138.26	Pass
CSS / 10	914.9	200.08	137.83	Pass

Worst Plot


3.8 Number of Dwell Time

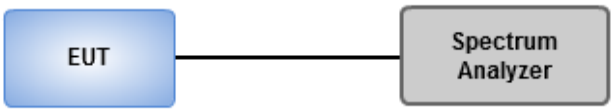
3.8.1 Limit of Dwell time

Time of Occupancy (Dwell Time) Limit for Frequency Hopping Systems		
☒	902-928 MHz Band:	
	☐	≤ 0.4 second within a 20 second period, 20 dB bandwidth of the hopping channel is less than 250 kHz
	☐	≤ 0.4 second within a 10 second period, 20 dB bandwidth of the hopping channel is 250 kHz or greater
	☒	Hybrid mode ,an average time of occupancy on any frequency not to exceed 0.4 seconds within a time period in seconds equal to the number of hopping frequencies employed multiplied by 0.4

3.8.2 Test Procedures

1. Set RBW=100kHz, VBW=300kHz, Sweep time= 1s / 3.2s / 6.4s / 25.6s , Detector=Peak, Span=0Hz, Trace max hold.
2. Measure and record the burst on time.

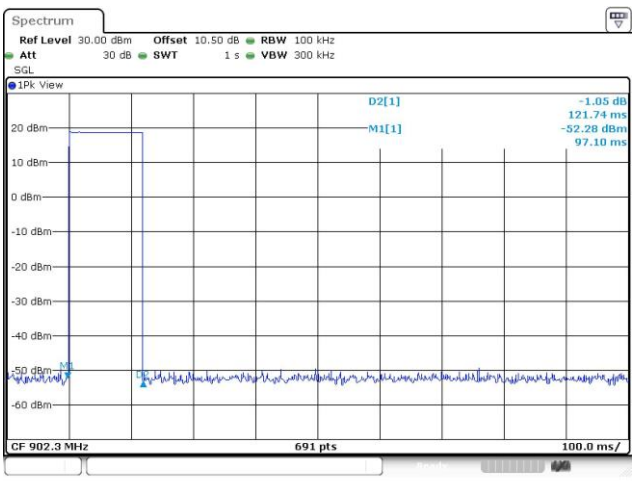
3.8.3 Test Setup

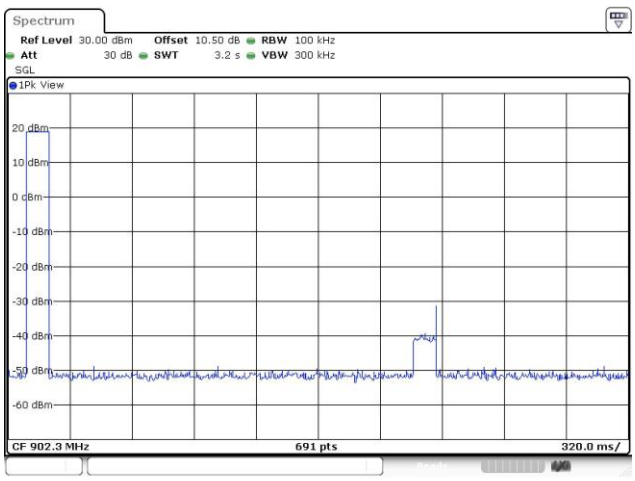


3.8.4 Test Result of Dwell Time

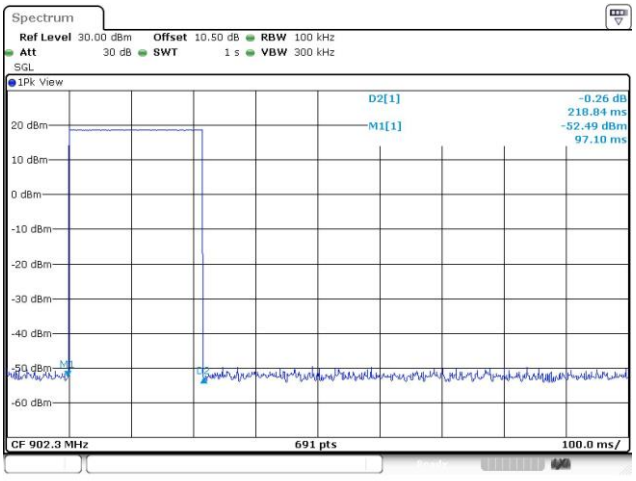
Modulation / SF	Freq. (MHz)	Length of Transmission Time (sec)	Number of Transmission in a 3.2 s (8 Hopping*0.4s)	Result (s)	Limit (s)
CSS / 7	902.3	0.121740	1	0.121740	0.4
CSS / 8	902.3	0.218840	1	0.218840	0.4
CSS / 9	902.3	0.394200	1	0.394200	0.4
CSS / 10	902.3	0.373910	1	0.373910	0.4

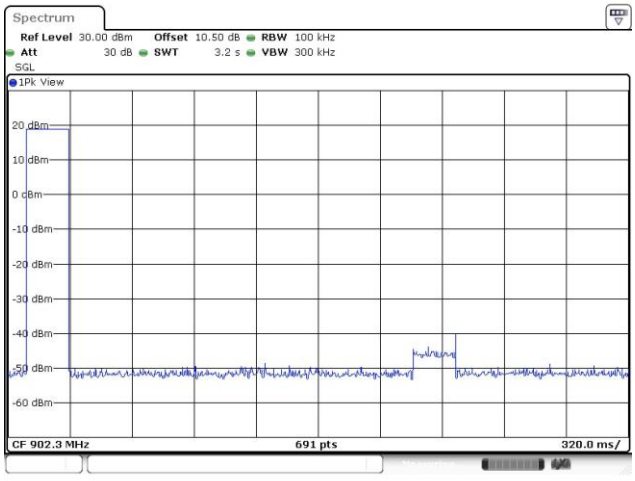
SF 7



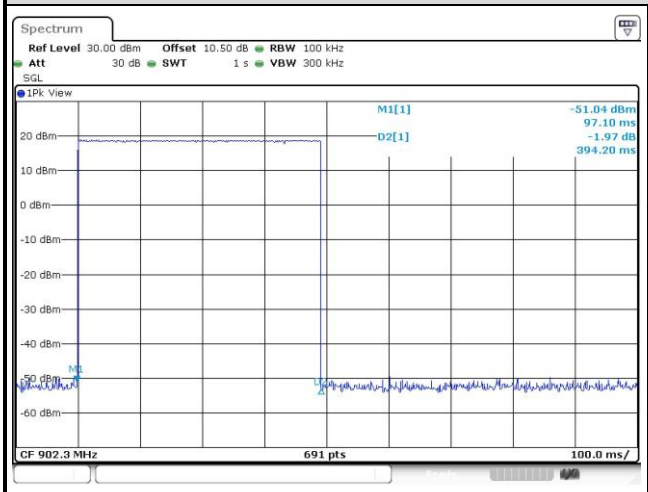


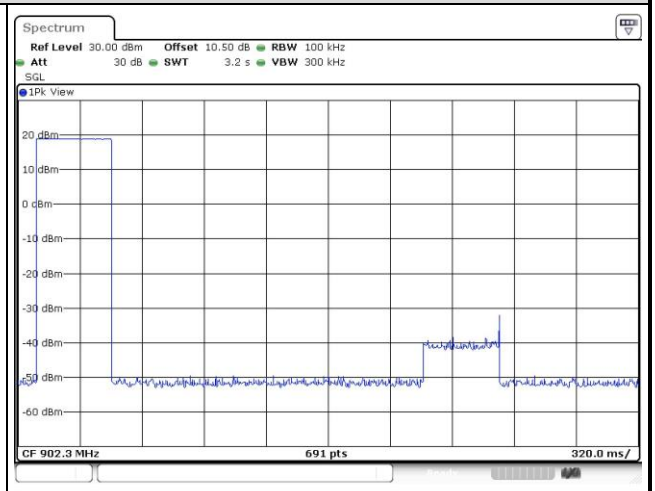
SF 8



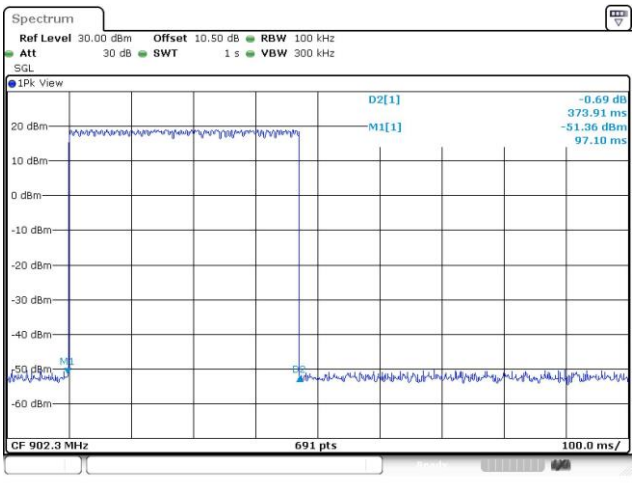


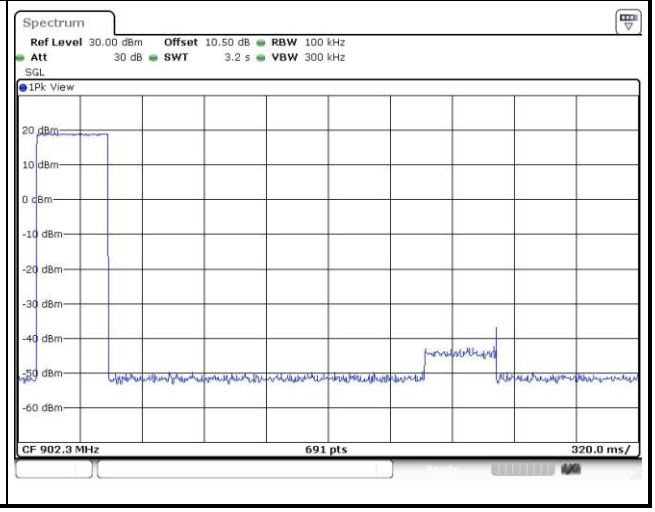
SF 9


Spectrum
Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz
Att 30 dB SWT 1 s VBW 300 kHz
SGL
1Pk View
M1[1] -51.04 dBm
97.10 ms
D2[1] -1.97 dB
394.20 ms
CF 902.3 MHz 691 pts 100.0 ms/


Spectrum
Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz
Att 30 dB SWT 3.2 s VBW 300 kHz
SGL
1Pk View
CF 902.3 MHz 691 pts 320.0 ms/

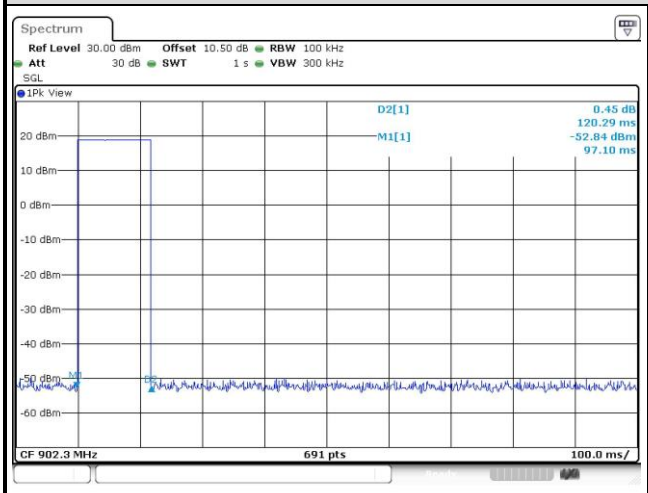
SF 10

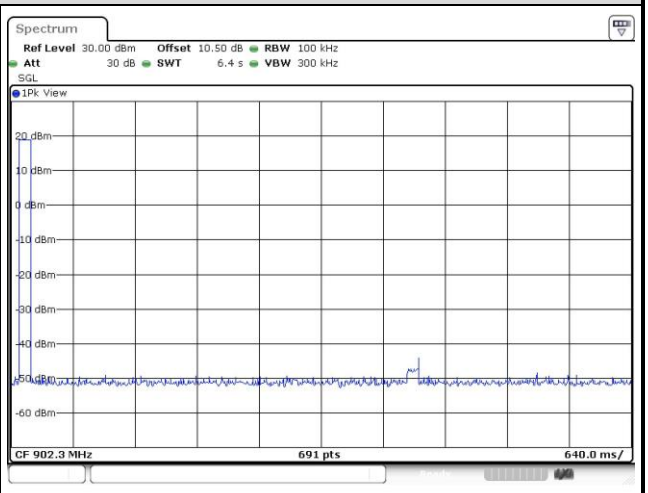

Spectrum
Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz
Att 30 dB SWT 1 s VBW 300 kHz
SGL
1Pk View
D2[1] -0.69 dB
373.91 ms
M1[1] -51.36 dBm
97.10 ms
CF 902.3 MHz 691 pts 100.0 ms/


Spectrum
Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz
Att 30 dB SWT 3.2 s VBW 300 kHz
SGL
1Pk View
CF 902.3 MHz 691 pts 320.0 ms/

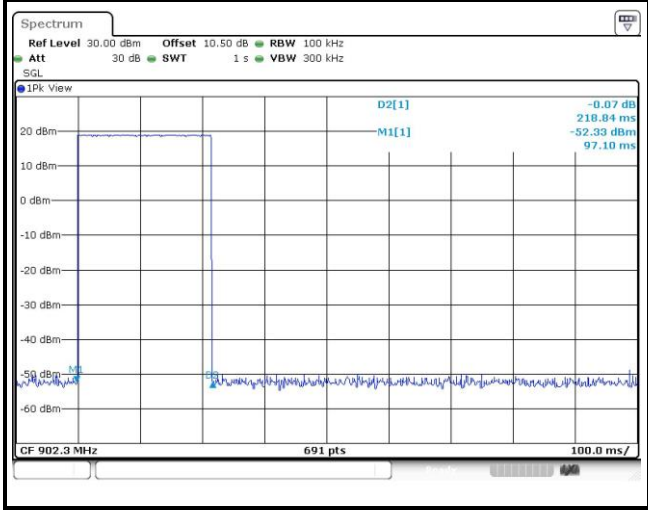
Modulation / SF	Freq. (MHz)	Length of Transmission Time (sec)	Number of Transmission in a 6.4 s (16 Hopping*0.4s)	Result (s)	Limit (s)
CSS / 7	902.3	0.120290	1	0.120290	0.4
CSS / 8	902.3	0.218840	1	0.218840	0.4
CSS / 9	902.3	0.394200	1	0.394200	0.4
CSS / 10	902.3	0.373910	1	0.373910	0.4

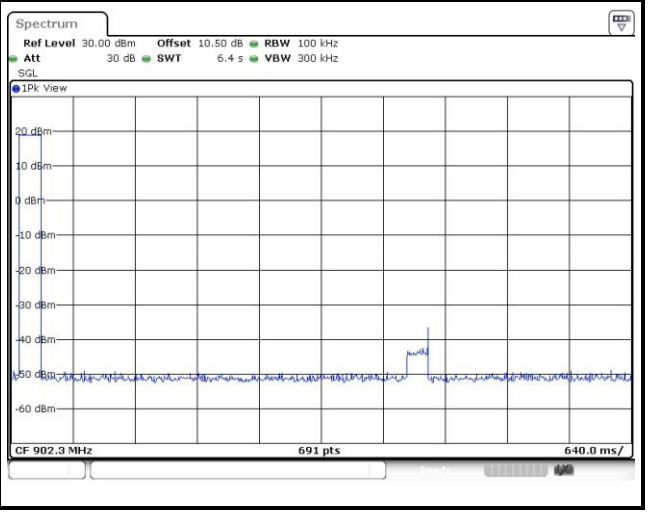
SF 7



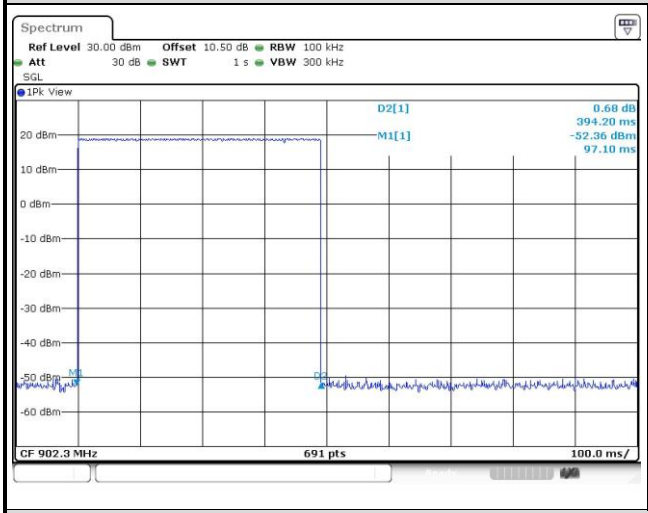


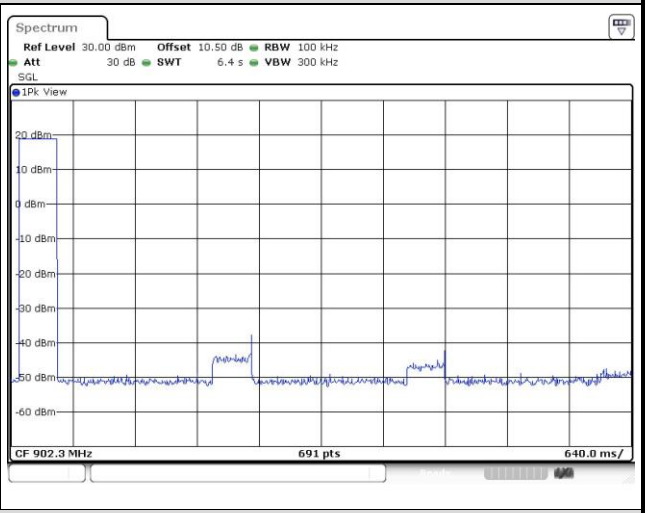
SF 8



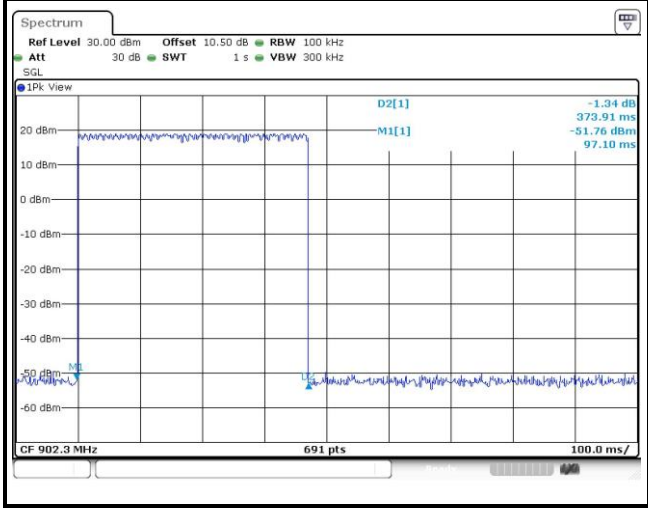


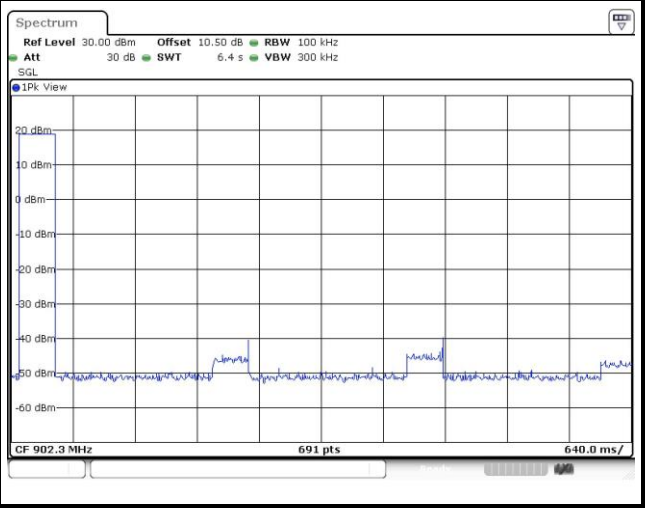
SF 9


Spectrum
Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz
Att 30 dB SWT 1 s VBW 300 kHz
SGL
1Pk View
D2[1] 0.68 dB
394.20 ms
M1[1] -52.36 dBm
97.10 ms
CF 902.3 MHz 691 pts 100.0 ms/


Spectrum
Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz
Att 30 dB SWT 6.4 s VBW 300 kHz
SGL
1Pk View
CF 902.3 MHz 691 pts 640.0 ms/

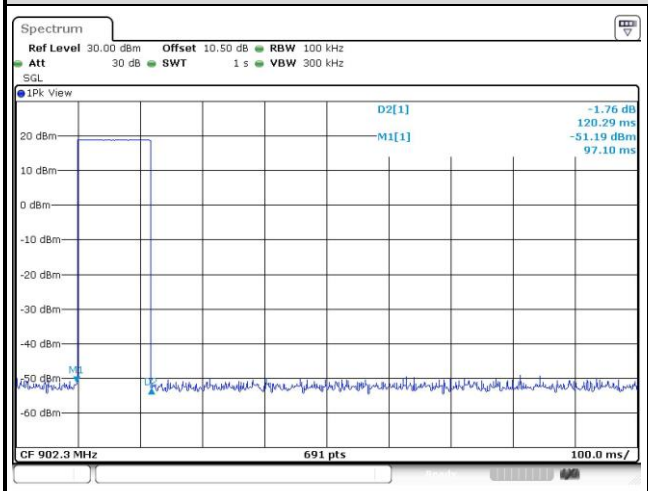
SF 10

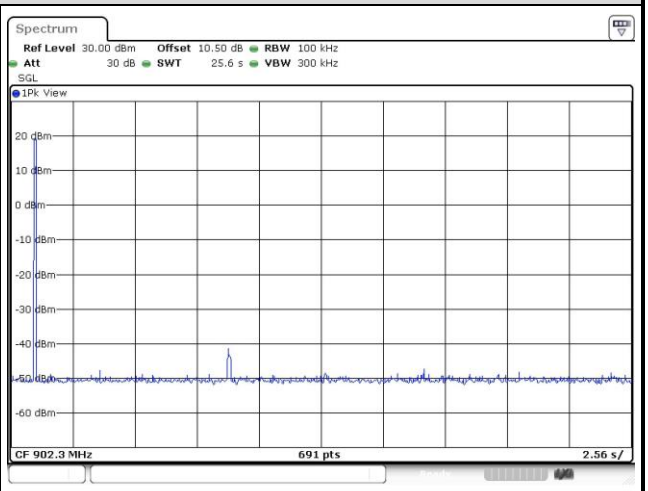

Spectrum
Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz
Att 30 dB SWT 1 s VBW 300 kHz
SGL
1Pk View
D2[1] -1.34 dB
373.91 ms
M1[1] -51.76 dBm
97.10 ms
CF 902.3 MHz 691 pts 100.0 ms/


Spectrum
Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz
Att 30 dB SWT 6.4 s VBW 300 kHz
SGL
1Pk View
CF 902.3 MHz 691 pts 640.0 ms/

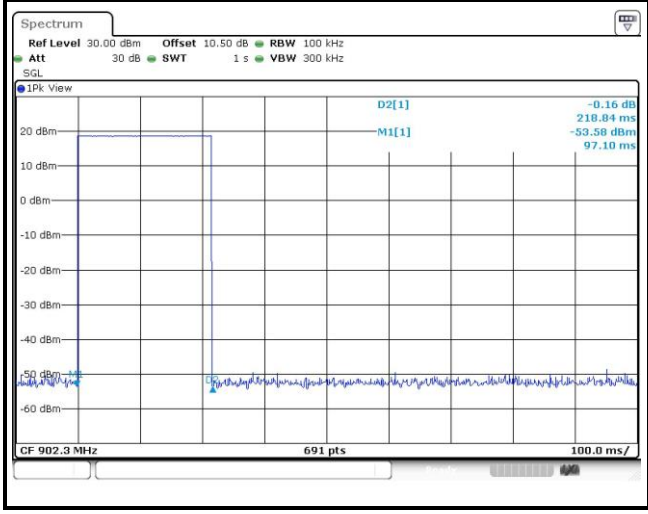
Modulation / SF	Freq. (MHz)	Length of Transmission Time (sec)	Number of Transmission in a 25.6 s (64 Hopping*0.4s)	Result (s)	Limit (s)
CSS / 7	902.3	0.120290	1	0.120290	0.4
CSS / 8	902.3	0.218840	1	0.218840	0.4
CSS / 9	902.3	0.392750	1	0.392750	0.4
CSS / 10	902.3	0.373910	1	0.373910	0.4

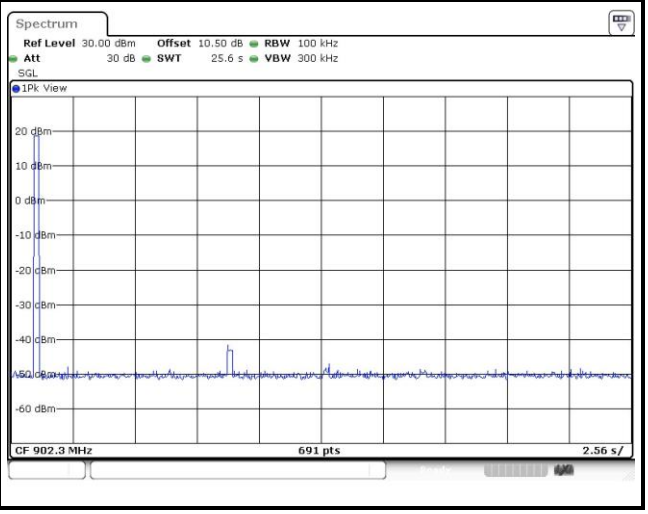
SF 7



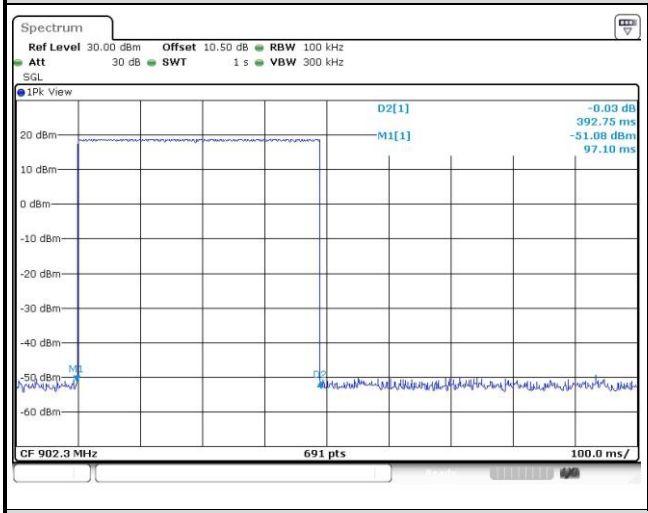


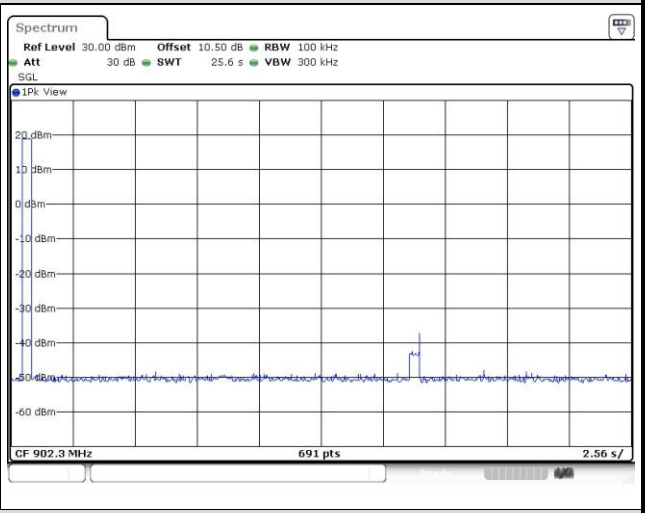
SF 8



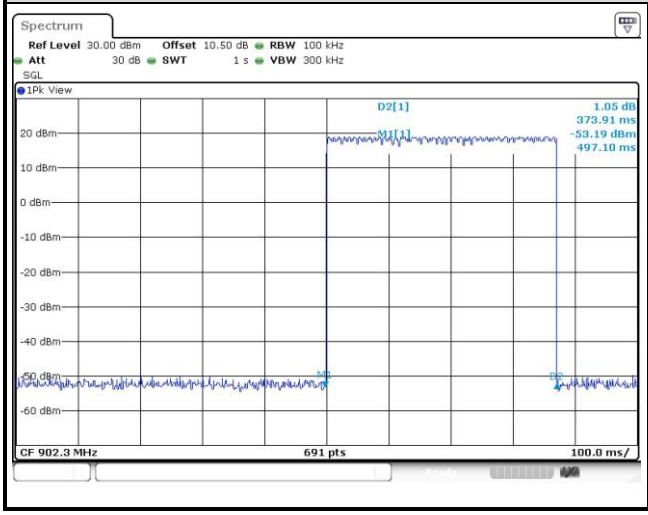


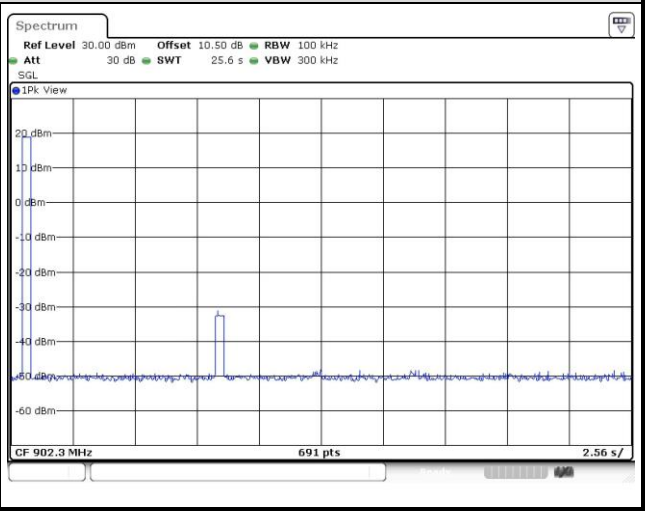
SF 9


Spectrum
Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz
Att 30 dB SWT 1 s VBW 300 kHz
SGL
1Pk View
D2[1] -0.03 dB
392.75 ms
M1[1] -51.08 dBm
97.10 ms
CF 902.3 MHz 691 pts 100.0 ms/


Spectrum
Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz
Att 30 dB SWT 25.6 s VBW 300 kHz
SGL
1Pk View
CF 902.3 MHz 691 pts 2.56 s/

SF 10


Spectrum
Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz
Att 30 dB SWT 1 s VBW 300 kHz
SGL
1Pk View
D2[1] 1.05 dB
373.91 ms
M1[1] -53.19 dBm
497.10 ms
CF 902.3 MHz 691 pts 100.0 ms/


Spectrum
Ref Level 30.00 dBm Offset 10.50 dB RBW 100 kHz
Att 30 dB SWT 25.6 s VBW 300 kHz
SGL
1Pk View
CF 902.3 MHz 691 pts 2.56 s/

3.9 Power Spectral Density

3.9.1 Limit of Power Spectral Density

Power spectral density shall not be greater than 8 dBm in any 3 kHz band. This item is for Hybrid mode.

3.9.2 Test Procedures

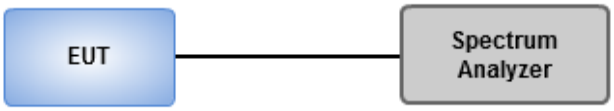
☐ Maximum peak conducted output power was used to demonstrate compliance to the fundamental output power limit.

1. Set the RBW = 3kHz, VBW = 10kHz.
2. Detector = Peak, Sweep time = auto couple.
3. Trace mode = max hold, allow trace to fully stabilize.
4. Use the peak marker function to determine the maximum amplitude level.

☒ Maximum (average) conducted output power was used to demonstrate compliance to the fundamental output power limit.

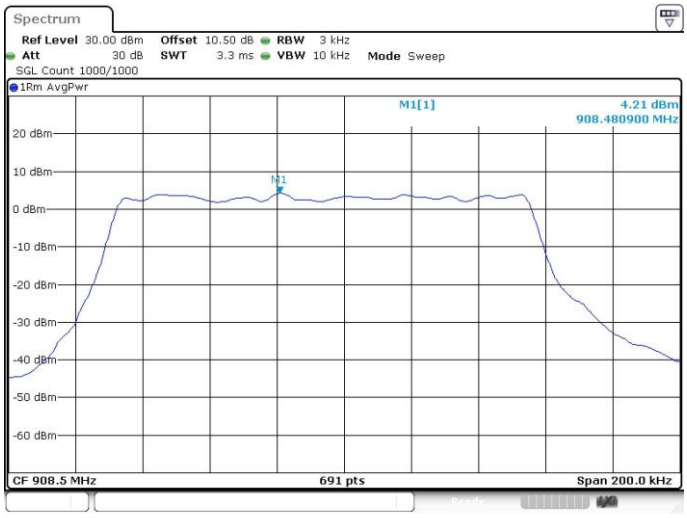
1. Set the RBW = 3kHz, VBW = 10 kHz.
2. Detector = RMS, Sweep time = auto couple.
3. Employ trace averaging (RMS) mode over a minimum of 100 traces
4. Use the peak marker function to determine the maximum amplitude level.

3.9.3 Test Setup



3.9.4 Test Result of Power Spectral Density

Modulation / SF	Freq. (MHz)	Total Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
CSS / 10	902.3	4.15	8.00
CSS / 10	908.5	4.21	8.00
CSS / 10	914.9	3.88	8.00

Worst Plot


4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website http://www.icertifi.com.tw.

Linkou	**Kwei Shan**	**Kwei Shan Site II**
Tel: 886-2-2601-1640	Tel: 886-3-271-8666	Tel: 886-3-271-8640
No. 30-2, Ding Fwu Tsuen, Lin Kou District, New Taipei City, Taiwan, R.O.C.	No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C.	No. 14-1, Lane 19, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C.

If you have any suggestion, please feel free to contact us as below information.

Tel: 886-3-271-8666
Fax: 886-3-318-0155
Email: ICC_Service@icertifi.com.tw

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