

FCC Test Report

Report No.: RFCJWN-WTW-P25110582-7

FCC ID: 2AEUP-5DFYA7

Test Model: 5DFYA7

Received Date: 2025/12/5

Test Date: 2025/12/11 ~ 2025/12/17

Issued Date: 2025/12/19

Applicant: Ring LLC

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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**FCC Registration /
Designation Number(1):** 788550 / TW0003

**FCC Registration /
Designation Number(2):** 281270 / TW0032



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Release Control Record

Issue No.	Description	Date Issued
RFCJWN-WTW-P25110582-7	Original Release	2025/12/19

1 Certificate of Conformity

Product: Video Doorbell

Brand: ring

Test Model: 5DFYA7

Sample Status: Engineering sample

Applicant: Ring LLC

Test Date: 2025/12/11 ~ 2025/12/17

Standards: 47 CFR FCC Part 15, Subpart C (Section 15.247)
ANSI C63.10-2020

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by :

Vera Huang

Date: 2025/12/19

Vera Huang / Specialist

Approved by :

Jeremy Lin

Date: 2025/12/19

Jeremy Lin / Project Engineer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -12.63dB at 0.38200MHz.
15.247(a)(1)(i)	Number of Hopping Frequency Used	Pass	Meet the requirement of limit.
15.247(a)(1)(i)	Dwell Time on Each Channel	Pass	Meet the requirement of limit.
15.247(a)(1)(i)	Spectrum Bandwidth of a Frequency Hopping Sequence Spread Spectrum System	Pass	Meet the requirement of limit.
15.247(b)(2)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
15.205 & 209	Radiated Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -3.0dB at 59.10MHz.
15.247(d)	Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -13.0dB at 928.00MHz.
15.247(d)	Antenna Port Emission	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	No antenna connector is used.

Note:

1. 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period.
2. 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period.
3. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) ($\pm$)
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.00 dB
	30 MHz ~ 1 GHz	2.93 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	1.76 dB
	18GHz ~ 40GHz	1.77 dB
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.88 dB
Dwell Time on Each Channel	-	0.0218
20 dB Bandwidth	-	206.5 Hz
Hopping Channel Separation	-	390 Hz
RF Output Power	-	1.371 dB
Conducted Out of Band Emissions	9 kHz ~ 40 GHz	2.79 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Video Doorbell
Brand	ring
Test Model	5DFYA7
Status of EUT	Engineering sample
Power Supply Rating	42.5-57Vdc, 0.6A
Modulation Type	LoRa 125kbps FHSS: LoRa FSK 50kbps FHSS: FSK FSK 150kbps FHSS: FSK FSK 250kbps FHSS: FSK
Operating Frequency	LoRa 125kbps FHSS: 902.2 ~ 927.8MHz FSK 50kbps FHSS: 902.2 ~ 927.8MHz FSK 150kbps FHSS: 902.4 ~ 927.6MHz FSK 250kbps FHSS: 902.5 ~ 927.5MHz
Number of Channel	LoRa 125kbps FHSS: 129 FSK 50kbps FHSS: 129 FSK 150kbps FHSS: 64 FSK 250kbps FHSS: 51
Output Power	LoRa 125kbps FHSS: 328.095mW FSK 50kbps FHSS: 297.167mW FSK 150kbps FHSS: 311.172mW FSK 250kbps FHSS: 315.5mW
Antenna Type	Refer to note
Antenna Connector	Refer to note
Accessory Device	NA
Cable Supplied	NA

Note:

1. The Antenna information is listed as below.

Antenna Gain (dBi)	Frequency Range	Antenna Type	Connector Type
2.5	LoRa 902~928MHz	IFA	N/A

*Detail antenna specification please refer to antenna datasheet and/or antenna measurement report.

3.2 Description of Test Modes

LoRa 125kbps FHSS

FSK 50kbps FHSS:

129 channels are provided to this EUT:

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	902.2	30	908.2	60	914.2	90	920.2	120	926.2
1	902.4	31	908.4	61	914.4	91	920.4	121	926.4
2	902.6	32	908.6	62	914.6	92	920.6	122	926.6
3	902.8	33	908.8	63	914.8	93	920.8	123	926.8
4	903.0	34	909.0	64	915.0	94	921.0	124	927.0
5	903.2	35	909.2	65	915.2	95	921.2	125	927.2
6	903.4	36	909.4	66	915.4	96	921.4	126	927.4
7	903.6	37	909.6	67	915.6	97	921.6	127	927.6
8	903.8	38	909.8	68	915.8	98	921.8	128	927.8
9	904.0	39	910.0	69	916.0	99	922.0		
10	904.2	40	910.2	70	916.2	100	922.2		
11	904.4	41	910.4	71	916.4	101	922.4		
12	904.6	42	910.6	72	916.6	102	922.6		
13	904.8	43	910.8	73	916.8	103	922.8		
14	905.0	44	911.0	74	917.0	104	923.0		
15	905.2	45	911.2	75	917.2	105	923.2		
16	905.4	46	911.4	76	917.4	106	923.4		
17	905.6	47	911.6	77	917.6	107	923.6		
18	905.8	48	911.8	78	917.8	108	923.8		
19	906.0	49	912.0	79	918.0	109	924.0		
20	906.2	50	912.2	80	918.2	110	924.2		
21	906.4	51	912.4	81	918.4	111	924.4		
22	906.6	52	912.6	82	918.6	112	924.6		
23	906.8	53	912.8	83	918.8	113	924.8		
24	907.0	54	913.0	84	919.0	114	925.0		
25	907.2	55	913.2	85	919.2	115	925.2		
26	907.4	56	913.4	86	919.4	116	925.4		
27	907.6	57	913.6	87	919.6	117	925.6		
28	907.8	58	913.8	88	919.8	118	925.8		
29	908.0	59	914.0	89	920.0	119	926.0		

FSK 150kbps FHSS:

64 channels are provided to this EUT:

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	902.4	20	910.4	40	918.4	60	926.4
1	902.8	21	910.8	41	918.8	61	926.8
2	903.2	22	911.2	42	919.2	62	927.2
3	903.6	23	911.6	43	919.6	63	927.6
4	904.0	24	912.0	44	920.0		
5	904.4	25	912.4	45	920.4		
6	904.8	26	912.8	46	920.8		
7	905.2	27	913.2	47	921.2		
8	905.6	28	913.6	48	921.6		
9	906.0	29	914.0	49	922.0		
10	906.4	30	914.4	50	922.4		
11	906.8	31	914.8	51	922.8		
12	907.2	32	915.2	52	923.2		
13	907.6	33	915.6	53	923.6		
14	908.0	34	916.0	54	924.0		
15	908.4	35	916.4	55	924.4		
16	908.8	36	916.8	56	924.8		
17	909.2	37	917.2	57	925.2		
18	909.6	38	917.6	58	925.6		
19	910.0	39	918.0	59	926.0		

FSK 250kbps FHSS:

51 channels are provided to this EUT:

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	902.5	15	910.0	30	917.5	45	925.0
1	903.0	16	910.5	31	918.0	46	925.5
2	903.5	17	911.0	32	918.5	47	926.0
3	904.0	18	911.5	33	919.0	48	926.5
4	904.5	19	912.0	34	919.5	49	927.0
5	905.0	20	912.5	35	920.0	50	927.5
6	905.5	21	913.0	36	920.5		
7	906.0	22	913.5	37	921.0		
8	906.5	23	914.0	38	921.5		
9	907.0	24	914.5	39	922.0		
10	907.5	25	915.0	40	922.5		
11	908.0	26	915.5	41	923.0		
12	908.5	27	916.0	42	923.5		
13	909.0	28	916.5	43	924.0		
14	909.5	29	917.0	44	924.5		

3.2.1 Test Mode Applicability and Tested Channel Detail

Pre-Scan:	1. EUT can be used in the following ways: X-axis/ Y-axis/ Z-axis. Pre-scan these ways and find the worst case as a representative test condition. 2. Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
Worst Case:	X-axis/ Y-axis/ Z-axis Worst Condition: Z-axis

EUT Configure Mode	Applicable to				Description
	RE $\geq$ 1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where RE $\geq$ 1G: Radiated Emission above 1GHz & Bandedge Measurement
PLC: Power Line Conducted Emission

RE<1G: Radiated Emission below 1GHz
APCM: Antenna Port Conducted Measurement

Radiated Emission Test (Above 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Remark
-	0 to 128	0, 64, 128	LoRa	LoRa 125kbps FHSS
-	0 to 128	0, 64, 128	FSK	FSK 50kbps FHSS
-	0 to 63	0, 32, 63	FSK	FSK 150kbps FHSS
-	0 to 50	0, 25, 50	FSK	FSK 250kbps FHSS

Radiated Emission Test (Below 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Remark
-	0 to 128	0	LoRa	LoRa 125kbps FHSS

Power Line Conducted Emission Test:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Remark
-	0 to 128	0	LoRa	LoRa 125kbps FHSS

Antenna Port Conducted Measurement:

- ☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

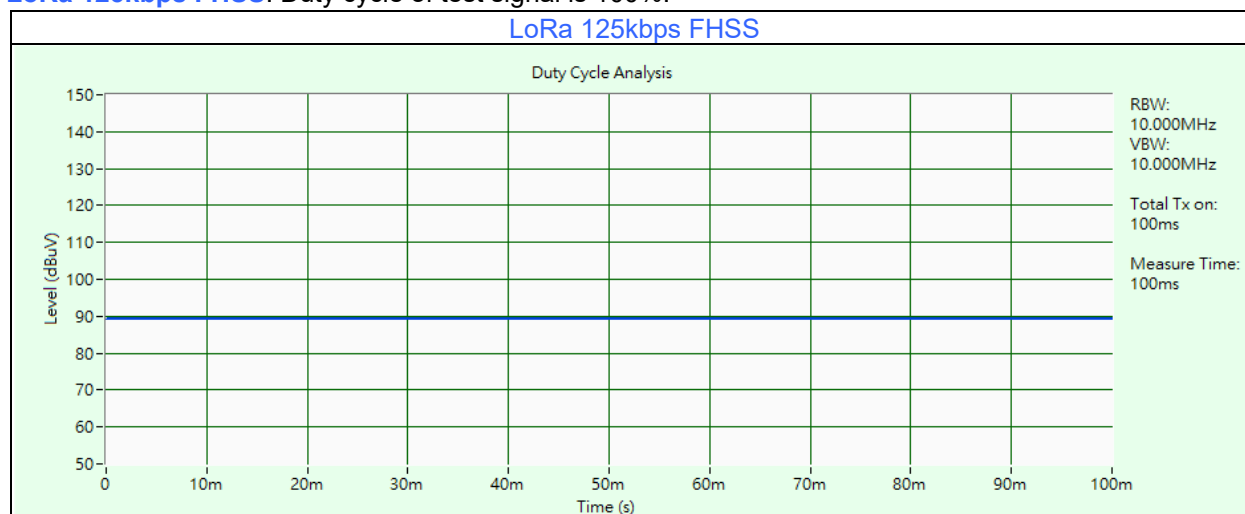
EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Remark
-	0 to 128	0, 64, 128	LoRa	LoRa 125kbps FHSS
-	0 to 128	0, 64, 128	FSK	FSK 50kbps FHSS
-	0 to 63	0, 32, 63	FSK	FSK 150kbps FHSS
-	0 to 50	0, 25, 50	FSK	FSK 250kbps FHSS

Test Condition:

Applicable to	Environmental Conditions	Input Power	Tested by
RE $\geq$ 1G	23 deg. C, 68% RH	120Vac, 60Hz	Edison Lee / Greg Lin
RE<1G	22 deg. C, 68% RH	120Vac, 60Hz	Greg Lin
PLC	25deg. C, 75%RH	120Vac, 60Hz	Greg Lin
APCM	25 deg. C, 60% RH	120Vac, 60Hz	Jisyong Wang

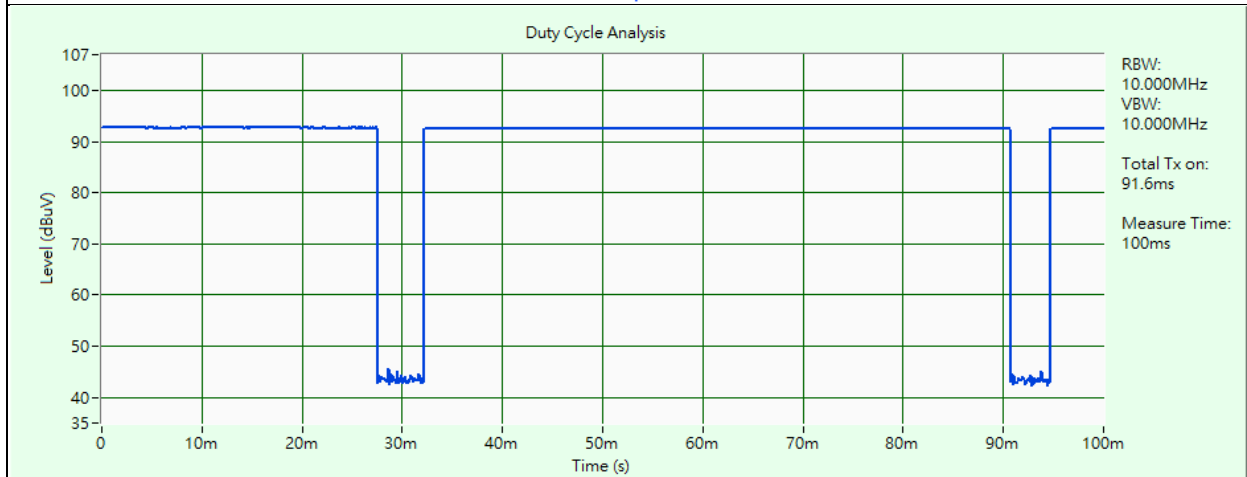
3.3 Duty Cycle of Test Signal

LoRa 125kbps FHSS: Duty cycle of test signal is 100%.

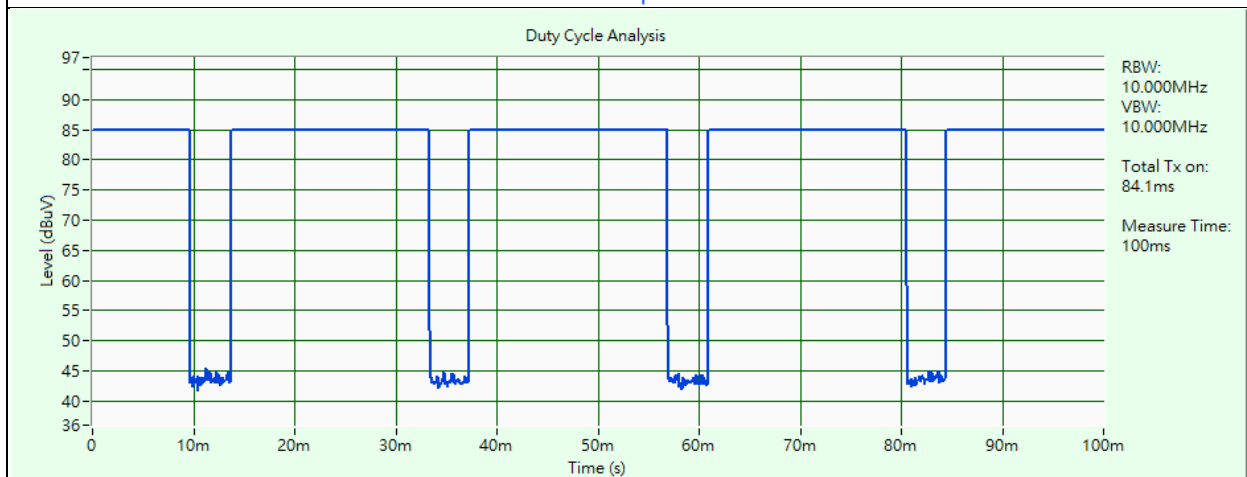


FSK 50kbps FHSS: Duty cycle = 91.6 ms / 100 ms x 100% = 91.6%
FSK 150kbps FHSS: Duty cycle = 84.1 ms / 100 ms x 100% = 84.1%
FSK 250kbps FHSS: Duty cycle = 73.5 ms / 100 ms x 100% = 73.5%

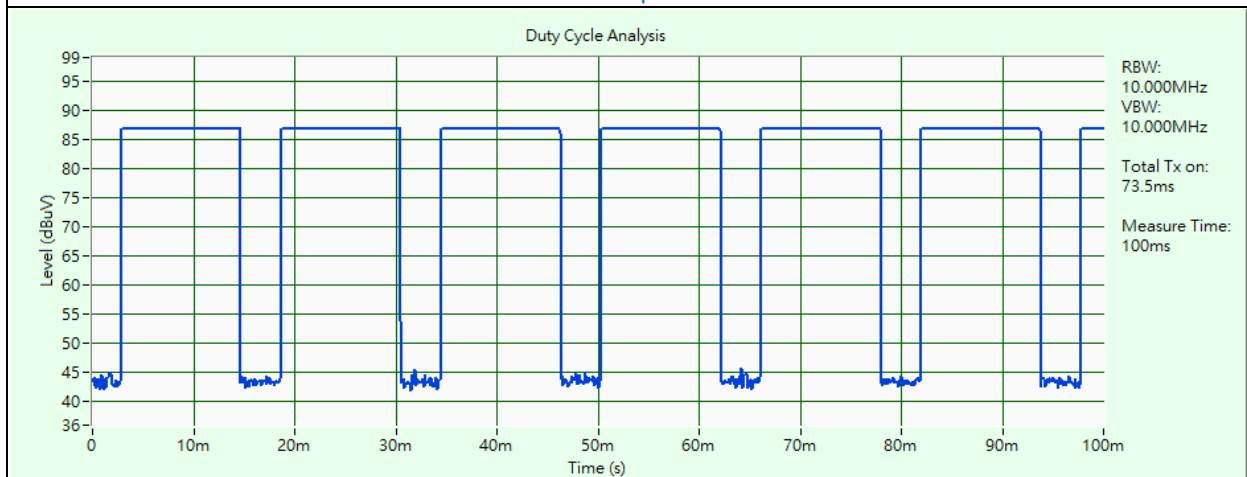
FSK 50kbps FHSS



FSK 150kbps FHSS



FSK 250kbps FHSS



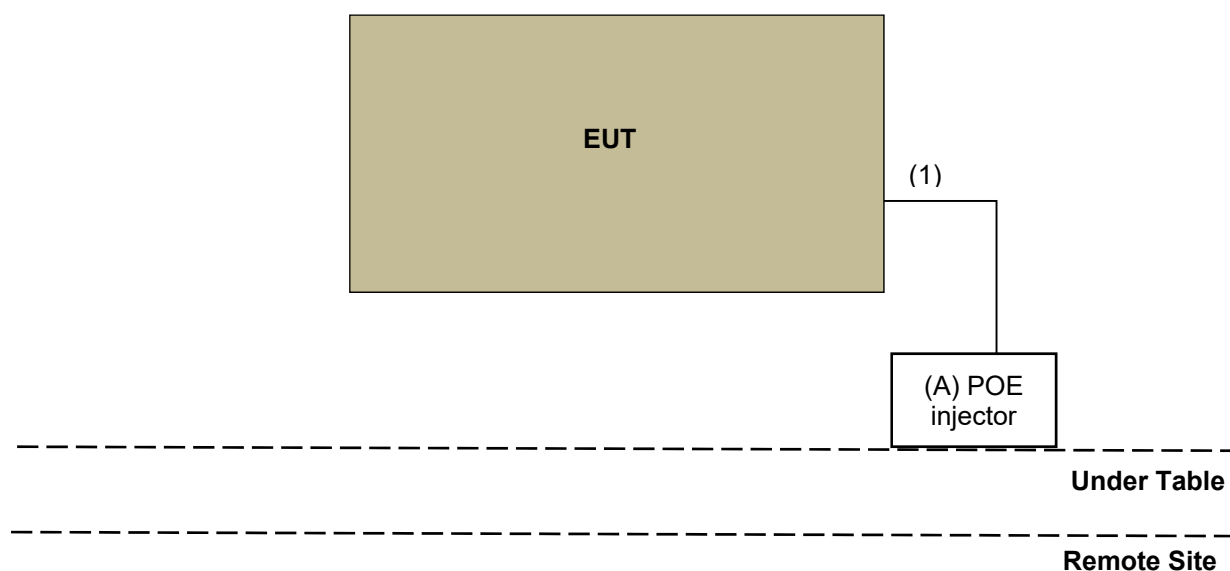
3.4 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	POE injector	LIANCUO	LG-BTG-N601 (2.5G)	N/A	N/A	Supplied by applicant (for RF Setup)

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	RJ-45 Cable	1	1.5	No	0	Provided by Lab (for RF Setup)

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards and References

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards and references:

FCC Part 15, Subpart C (15.247)
ANSI C63.10-2020

All test items have been performed and recorded as per the above standards.

References Test Guidance:

KDB 558074 D01 15.247 Meas Guidance v05r02

All test items have been performed as a reference to the above KDB test guidance.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Antenna Tower Max-Full	MFA-515BSN	N/A	N/A	N/A
Test Receiver Rohde & Schwarz	ESR3	102783	2024/12/17	2025/12/16
			2025/12/15	2026/12/14
Spectrum Analyzer KEYSIGHT	N9020B	MY60110513	2024/12/30	2025/12/29
BILOG Antenna SCHWARZBECK	VULB9168	9168-1214	2025/9/18	2026/9/17
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1170	2025/11/9	2026/11/8
Loop Antenna EMCI	HLA 6121	45745	2025/9/1	2026/8/31
Preamplifier EMCI	EMC330N	980798	2025/1/14	2026/1/13
Preamplifier EMCI	EMC118A45SE	980809	2025/4/24	2026/4/23
Preamplifier EMCI	EMC184045SE	980786	2025/1/14	2026/1/13
RF signal cable EMCI	EMCCFD400-NM- NM- (9000+300+500)	201251+ 201249+ 201248	2025/1/14	2026/1/13
RF signal cable EMCI	EMC101G-KM-KM- (5000+3000+2000)	201261+201258+20 1249	2025/1/14	2026/1/13
Software BV ADT	ADT_Radiated_V7. 7.1.1.1	NA	NA	NA
Antenna Tower Max-Full	MFA-515BSN	NA	NA	NA
Turn Table Max-Full	MFT-201SS	NA	NA	NA
Turn Table Controller Max-Full	MF-7802BS	MF780208676	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in WM Chamber 9.

4.1.3 Test Procedures

For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 200 Hz at frequency below 150 kHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9 kHz or 10 kHz at frequency (150 kHz to 30 MHz).
3. All modes of operation were investigated and the worst-case emissions are reported.

For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

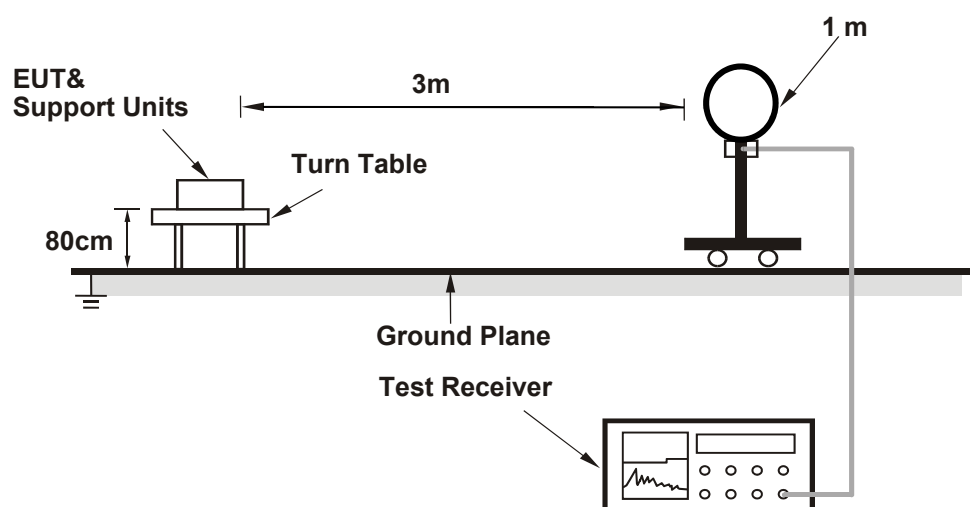
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequencies less than or equal to 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) and Average detection (AV) at frequency above 1 GHz.
(For LoRa 125kbps FHSS , FSK 50kbps FHSS)
3. The maximum dwell time per 1 MHz is determined as follows:
Maximum dwell time per 1 MHz = dwell time per 100 ms per channel × (channel separation correction + overlapping channel correction) where:
i) Channel separation correction = $[1 / \text{channel separation (MHz)}]$ for channel separation < 1 MHz, and = 1 for channel separation ≥ 1 MHz, as determined using the procedures of 7.8.2. If the average measurements are performed on the Nth harmonic, the channel separation value is N times the separation at the fundamental frequency.
ii) Overlapping channel correction = 0 when the 20 dB channel bandwidth < channel separation and 1 for when the 20 dB channel bandwidth > channel separation.
The average value may be determined as follows:
a) From the peak value of the emission: The measured peak value in dBuV/m is corrected by $20\log(\text{maximum dwell time in 100 ms} / 100)$.
b) From the average value of the emission: When the average value has been measured with the device continuously transmitting (100% duty cycle) the measured average value in dBuV/m is corrected by $X\log(\text{maximum dwell time in 100 ms} / 100)$ where X = 10 if using an rms-average power detector (with output data in power terms) and X = 20 if using a linear voltage average detector (with output data in voltage terms).
(For FSK 150kbps FHSS , FSK 250kbps FHSS)
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

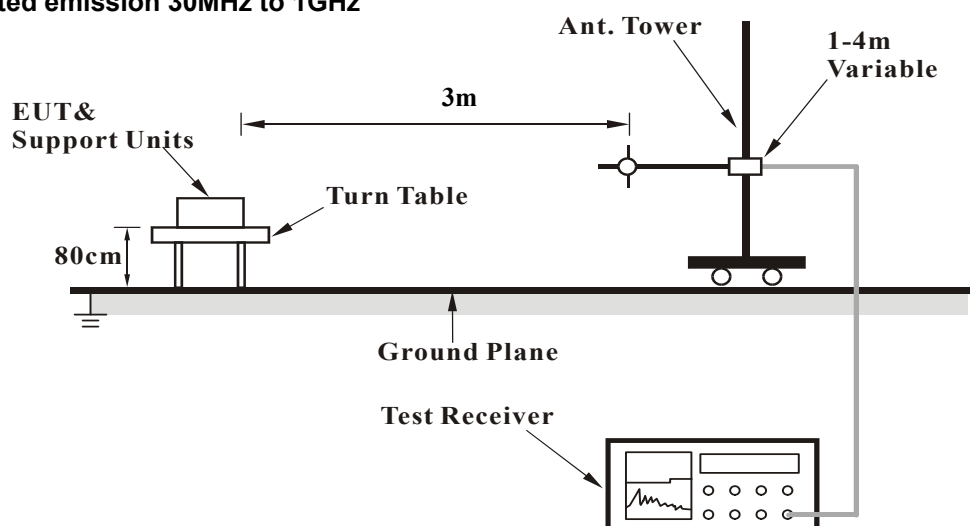
No deviation.

4.1.5 Test Setup

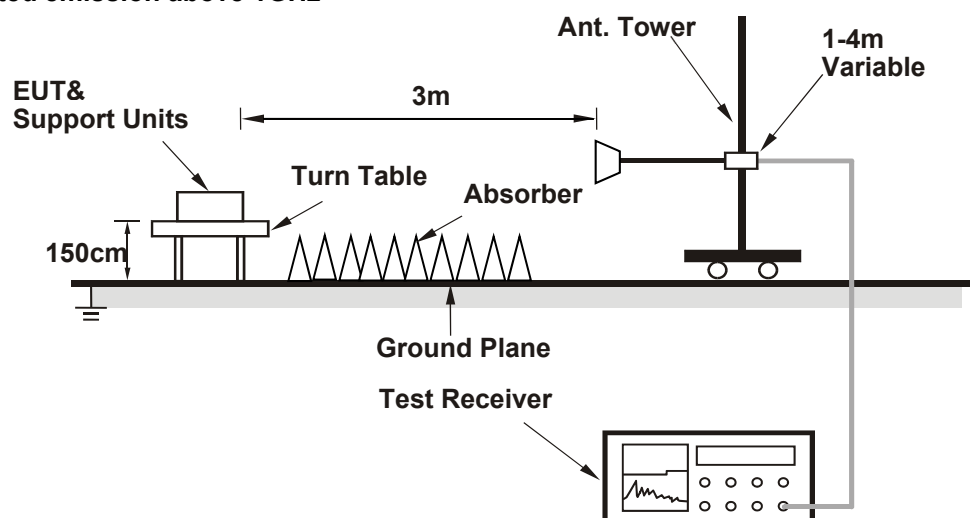
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Conditions

Set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

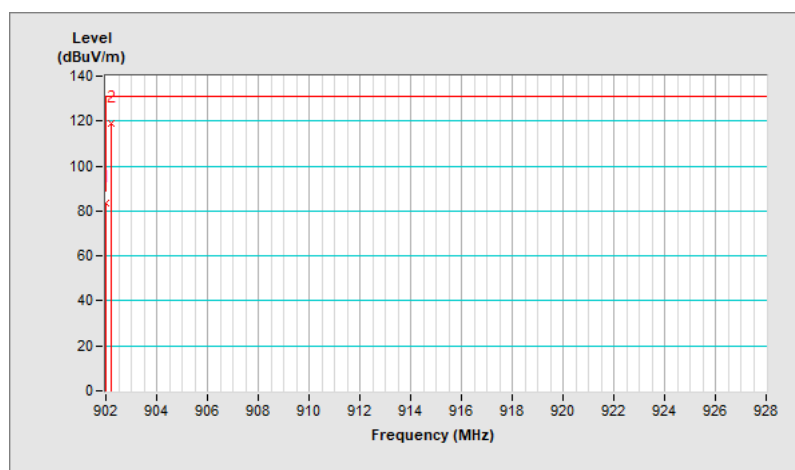
LoRa 125kbps FHSS

Channel	TX Channel 0	Detector Function	Quasi-Peak (QP)
Frequency Range	902MHz ~ 928MHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#902.00	83.4 QP	98.7	-15.3	1.55 H	120	52.8	30.6
2	*902.20	118.7 QP			1.55 H	120	88.1	30.6

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

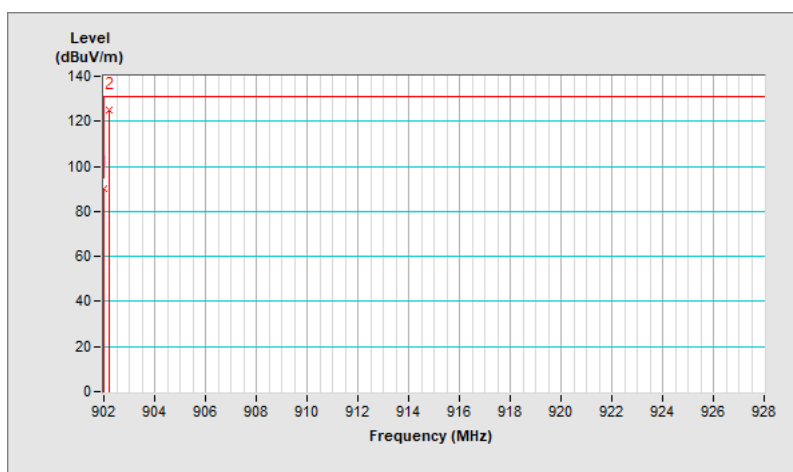


Channel	TX Channel 0	Detector Function	Quasi-Peak (QP)
Frequency Range	902MHz ~ 928MHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#902.00	90.0 QP	105.2	-15.2	1.18 V	119	59.4	30.6
2	*902.20	125.2 QP			1.18 V	119	94.6	30.6

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

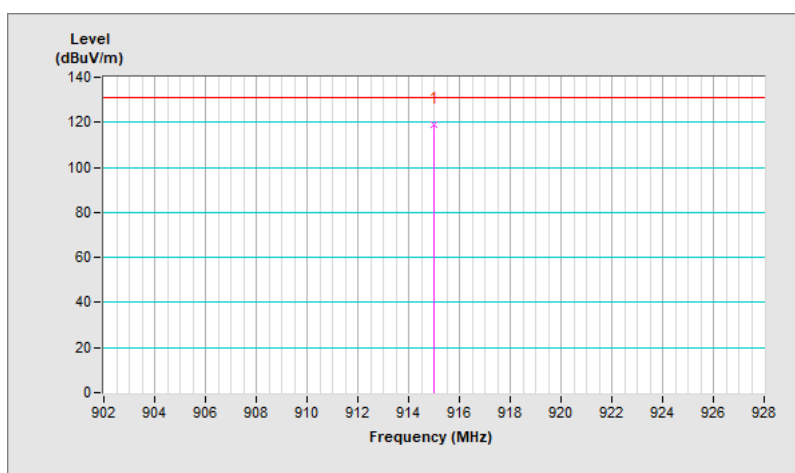


Channel	TX Channel 64	Detector Function	Quasi-Peak (QP)
Frequency Range	902MHz ~ 928MHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*915.00	118.7 QP			1.40 H	120	87.9	30.8

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

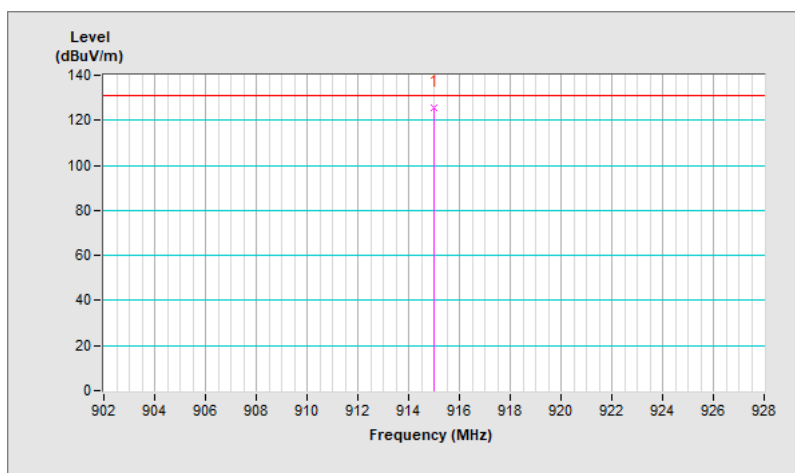


Channel	TX Channel 64	Detector Function	Quasi-Peak (QP)
Frequency Range	902MHz ~ 928MHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*915.00	125.7 QP			1.22 V	111	94.9	30.8

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

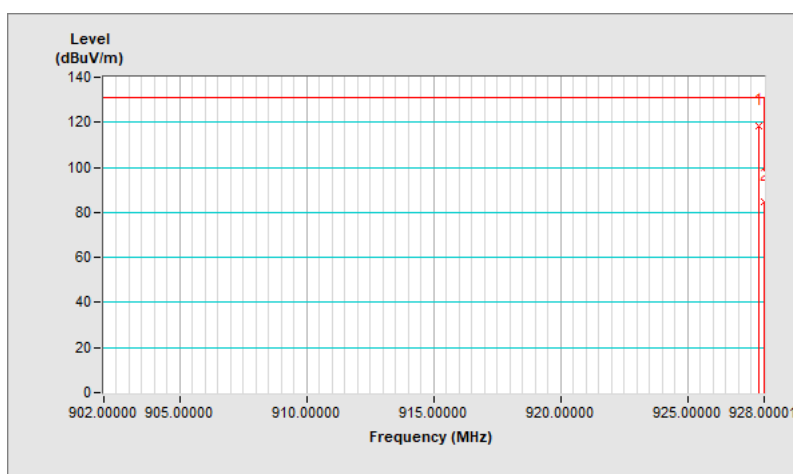


Channel	TX Channel 128	Detector Function	Quasi-Peak (QP)
Frequency Range	902MHz ~ 928MHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*927.80	118.5 QP			1.47 H	124	87.6	30.9
2	#928.00	84.9 QP	98.5	-13.6	1.47 H	127	54.0	30.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

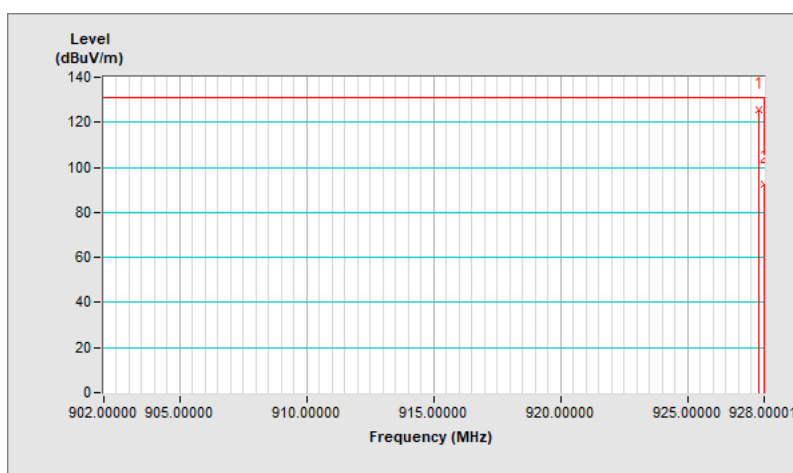


Channel	TX Channel 128	Detector Function	Quasi-Peak (QP)
Frequency Range	902MHz ~ 928MHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*927.80	125.5 QP			1.20 V	43	94.6	30.9
2	#928.00	92.5 QP	105.5	-13.0	1.20 V	43	61.6	30.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.



Above 1GHz Data:

Channel	TX Channel 0	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 10GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2706.60	48.3 PK	74.0	-25.7	3.98 H	357	50.7	-2.4
2	2706.60	42.4 AV	54.0	-11.6	3.98 H	357	44.8	-2.4
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2706.60	49.0 PK	74.0	-25.0	4.00 V	14	51.4	-2.4
2	2706.60	42.9 AV	54.0	-11.1	4.00 V	14	45.3	-2.4

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

Channel	TX Channel 64	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 10GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2745.00	48.9 PK	74.0	-25.1	3.99 H	354	51.1	-2.2
2	2745.00	42.9 AV	54.0	-11.1	3.99 H	354	45.1	-2.2
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2745.00	49.6 PK	74.0	-24.4	4.00 V	2	51.8	-2.2
2	2745.00	43.3 AV	54.0	-10.7	4.00 V	2	45.5	-2.2

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

Channel	TX Channel 128	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 10GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2783.40	50.1 PK	74.0	-23.9	3.95 H	352	52.2	-2.1
2	2783.40	45.0 AV	54.0	-9.0	3.95 H	352	47.1	-2.1
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2783.40	50.8 PK	74.0	-23.2	3.84 V	1	52.9	-2.1
2	2783.40	45.5 AV	54.0	-8.5	3.84 V	1	47.6	-2.1

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

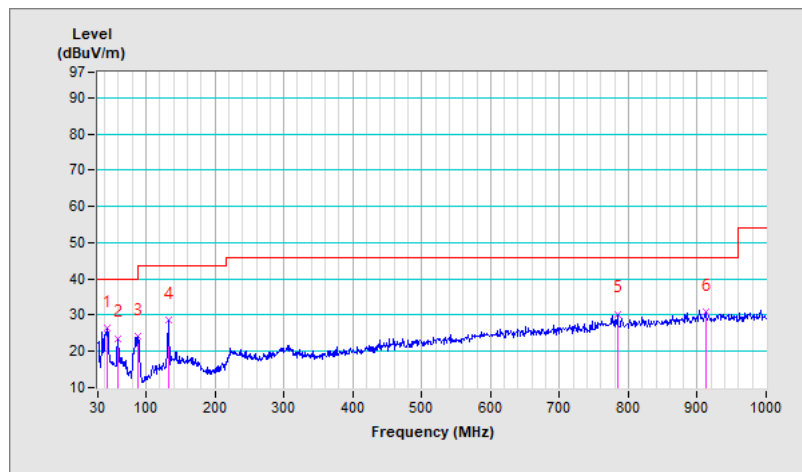
Below 1GHz data:

Channel	TX Channel 0	Detector Function	Quasi-Peak (QP)
Frequency Range	9kHz ~ 1GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	43.58	26.4 QP	40.0	-13.6	1.25 H	62	39.5	-13.1
2	58.13	23.7 QP	40.0	-16.3	1.50 H	16	37.2	-13.5
3	88.20	24.2 QP	43.5	-19.3	1.50 H	243	43.2	-19.0
4	132.82	28.8 QP	43.5	-14.7	1.25 H	258	42.6	-13.8
5	783.69	30.4 QP	46.0	-15.6	1.00 H	137	32.5	-2.1
6	911.73	30.9 QP	46.0	-15.1	1.00 H	112	31.3	-0.4

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.

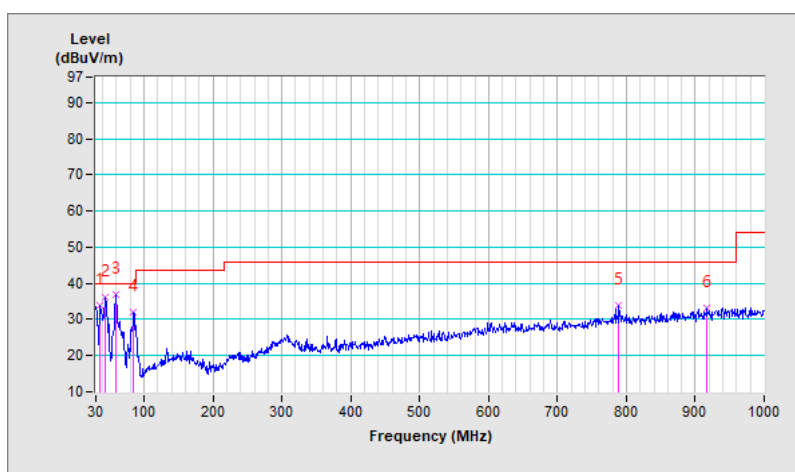


Channel	TX Channel 0	Detector Function	Quasi-Peak (QP)
Frequency Range	9kHz ~ 1GHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	34.85	34.0 QP	40.0	-6.0	1.25 V	73	47.9	-13.9
2	42.61	36.3 QP	40.0	-3.7	1.50 V	276	49.4	-13.1
3	59.10	37.0 QP	40.0	-3.0	1.25 V	314	50.5	-13.5
4	84.32	31.9 QP	40.0	-8.1	1.25 V	17	50.6	-18.7
5	789.51	34.0 QP	46.0	-12.0	1.25 V	243	36.2	-2.2
6	916.58	33.2 QP	46.0	-12.8	1.00 V	93	33.5	-0.3

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.



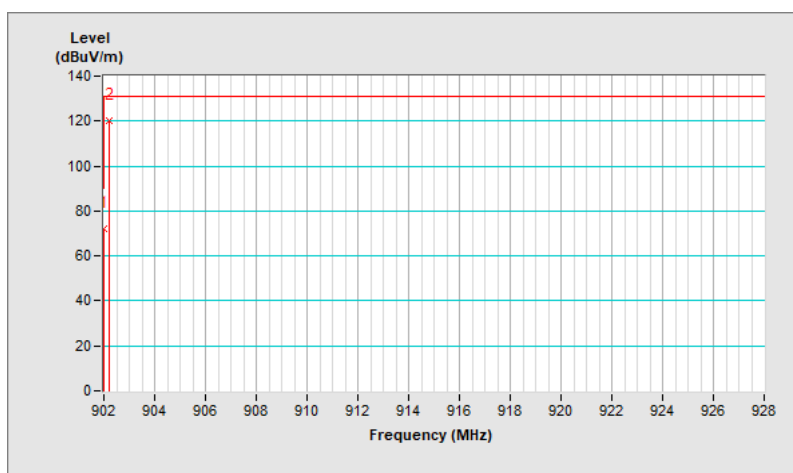
FSK 50kbps FHSS

Channel	TX Channel 0	Detector Function	Quasi-Peak (QP)
Frequency Range	902MHz ~ 928MHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#902.00	72.0 QP	100.4	-28.4	1.51 H	202	41.4	30.6
2	*902.20	120.4 QP			1.51 H	202	89.8	30.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

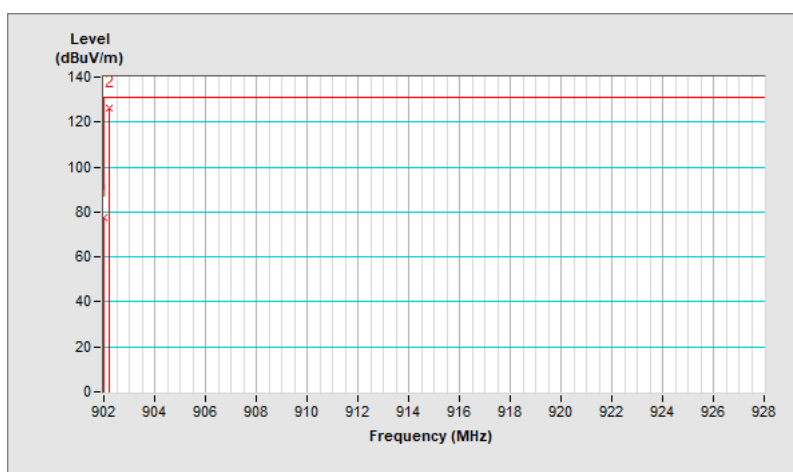


Channel	TX Channel 0	Detector Function	Quasi-Peak (QP)
Frequency Range	902MHz ~ 928MHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#902.00	77.5 QP	106.0	-28.5	1.26 V	157	46.9	30.6
2	*902.20	126.0 QP			1.26 V	157	95.4	30.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

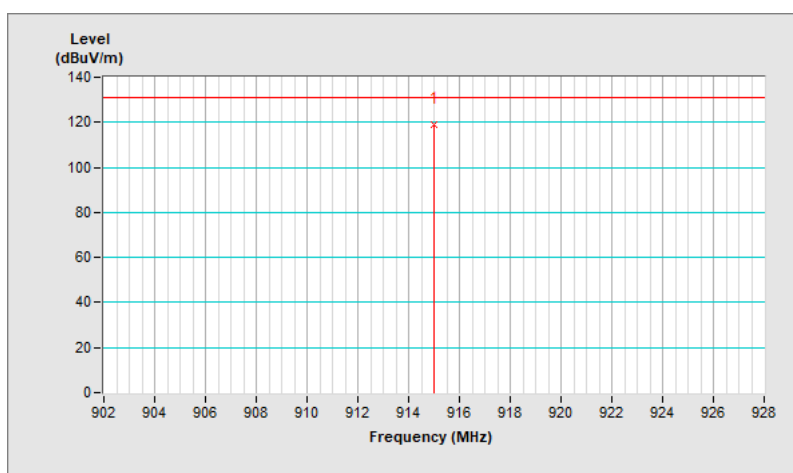


Channel	TX Channel 64	Detector Function	Quasi-Peak (QP)
Frequency Range	902MHz ~ 928MHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*915.00	118.8 QP			1.44 H	198	88.0	30.8

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

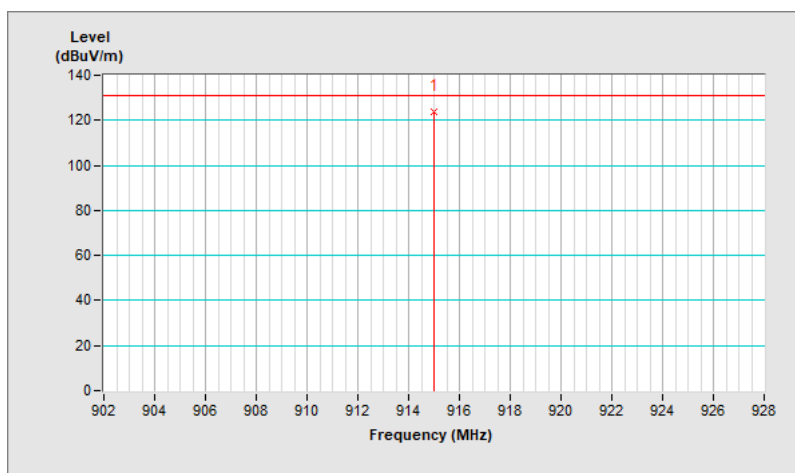


Channel	TX Channel 64	Detector Function	Quasi-Peak (QP)
Frequency Range	902MHz ~ 928MHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*915.00	123.8 QP			1.22 V	149	93.0	30.8

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

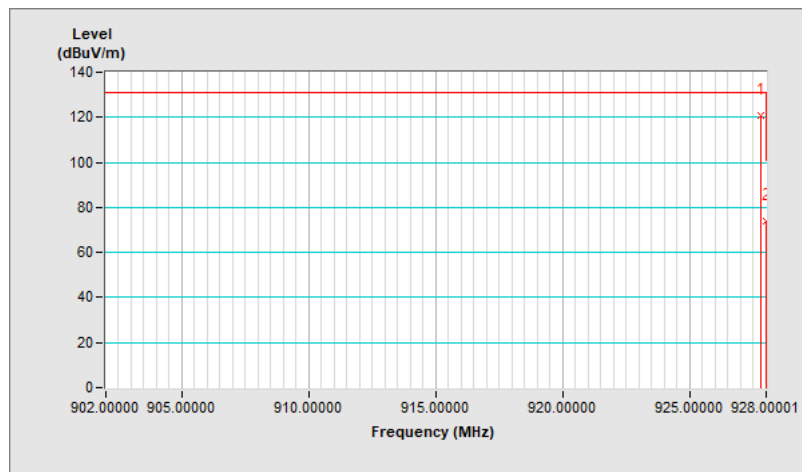


Channel	TX Channel 128	Detector Function	Quasi-Peak (QP)
Frequency Range	902MHz ~ 928MHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*927.80	120.8 QP			1.35 H	114	89.9	30.9
2	#928.00	74.2 QP	100.8	-26.6	1.35 H	114	43.3	30.9

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

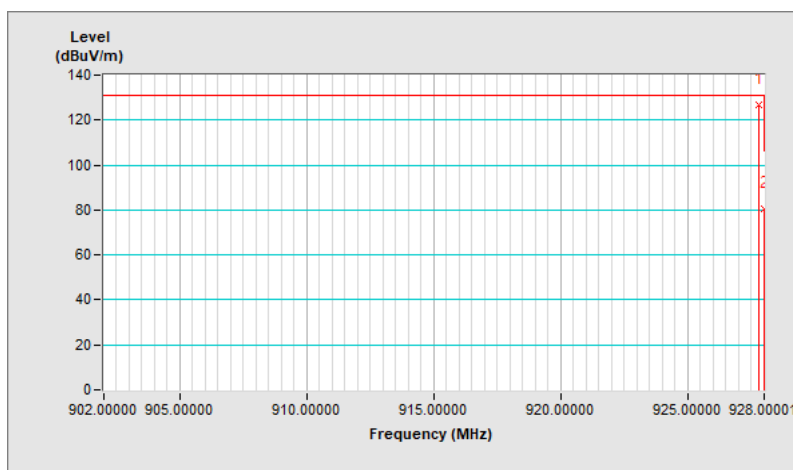


Channel	TX Channel 128	Detector Function	Quasi-Peak (QP)
Frequency Range	902MHz ~ 928MHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*927.80	126.5 QP			1.21 V	42	95.6	30.9
2	#928.00	80.3 QP	106.5	-26.2	1.21 V	42	49.4	30.9

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.



Above 1GHz Data:

Channel	TX Channel 0	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 10GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2706.60	45.0 PK	74.0	-29.0	4.00 H	345	47.4	-2.4
2	2706.60	39.4 AV	54.0	-14.6	4.00 H	345	41.8	-2.4
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2706.60	45.6 PK	74.0	-28.4	4.00 V	15	48.0	-2.4
2	2706.60	39.8 AV	54.0	-14.2	4.00 V	15	42.2	-2.4

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

Channel	TX Channel 64	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 10GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2745.00	47.8 PK	74.0	-26.2	4.00 H	354	50.0	-2.2
2	2745.00	41.3 AV	54.0	-12.7	4.00 H	354	43.5	-2.2
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2745.00	48.4 PK	74.0	-25.6	4.00 V	8	50.6	-2.2
2	2745.00	41.9 AV	54.0	-12.1	4.00 V	8	44.1	-2.2

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

Channel	TX Channel 128	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 10GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2783.40	47.4 PK	74.0	-26.6	3.81 H	1	49.5	-2.1
2	2783.40	41.5 AV	54.0	-12.5	3.81 H	1	43.6	-2.1
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2783.40	48.1 PK	74.0	-25.9	3.81 V	1	50.2	-2.1
2	2783.40	42.3 AV	54.0	-11.7	3.81 V	1	44.4	-2.1

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

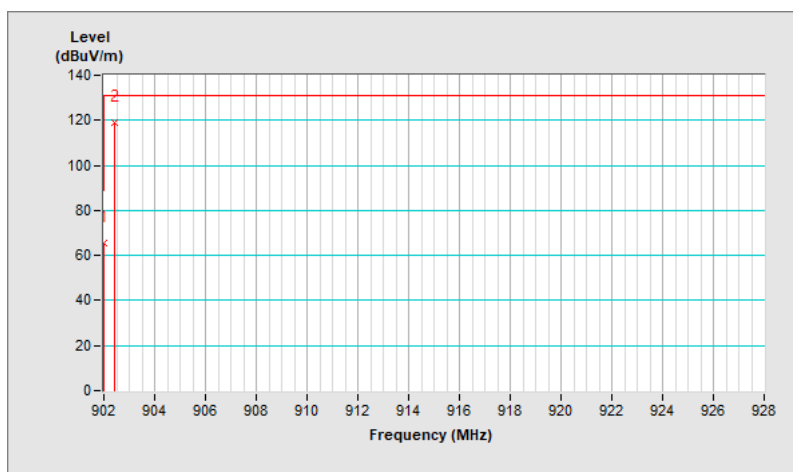
FSK 150kbps FHSS

Channel	TX Channel 0	Detector Function	Quasi-Peak (QP)
Frequency Range	902MHz ~ 928MHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#902.00	65.5 QP	99.2	-33.7	1.52 H	117	34.9	30.6
2	*902.40	119.2 QP			1.52 H	117	88.6	30.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

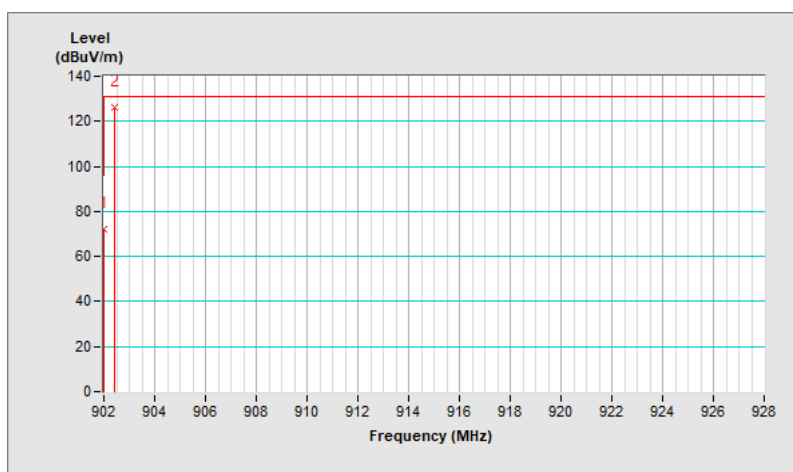


Channel	TX Channel 0	Detector Function	Quasi-Peak (QP)
Frequency Range	902MHz ~ 928MHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#902.00	72.4 QP	106.0	-33.6	1.13 V	124	41.8	30.6
2	*902.40	126.0 QP			1.13 V	124	95.4	30.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

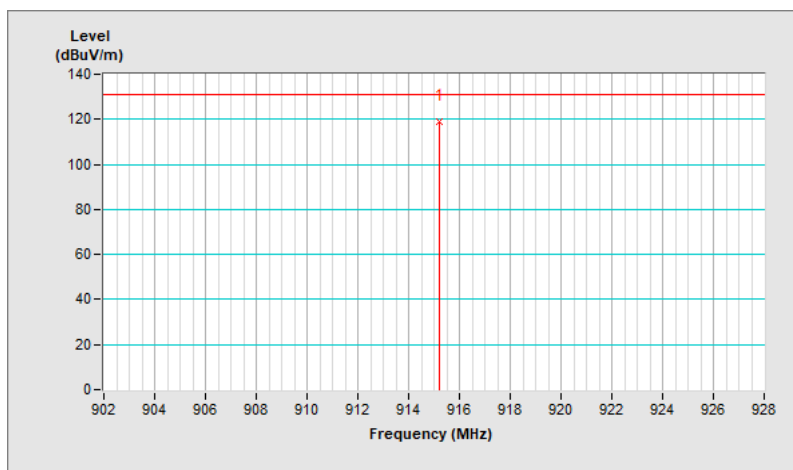


Channel	TX Channel 32	Detector Function	Quasi-Peak (QP)
Frequency Range	902MHz ~ 928MHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*915.20	118.8 QP			1.16 H	35	88.0	30.8

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

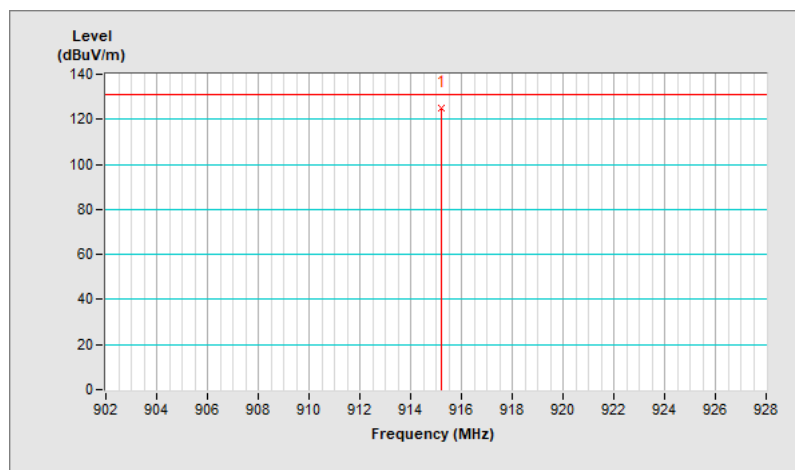


Channel	TX Channel 32	Detector Function	Quasi-Peak (QP)
Frequency Range	902MHz ~ 928MHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*915.20	125.2 QP			1.17 V	41	94.4	30.8

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

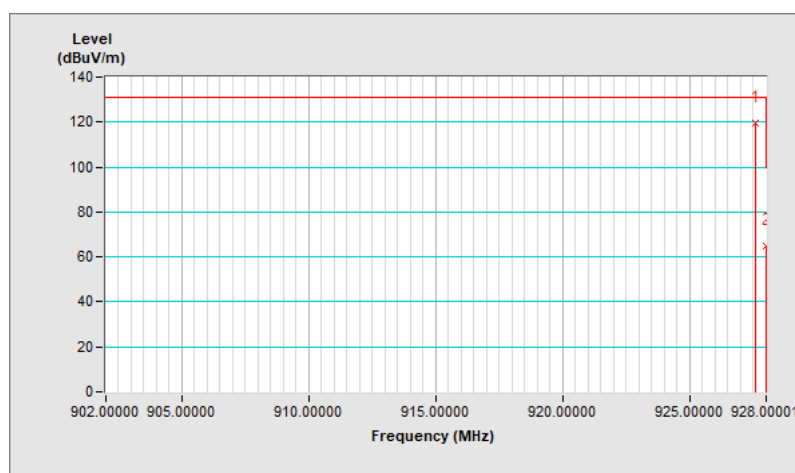


Channel	TX Channel 63	Detector Function	Quasi-Peak (QP)
Frequency Range	902MHz ~ 928MHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*927.60	119.6 QP			1.16 H	40	88.7	30.9
2	#928.00	64.7 QP	99.6	-34.9	1.16 H	40	33.8	30.9

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

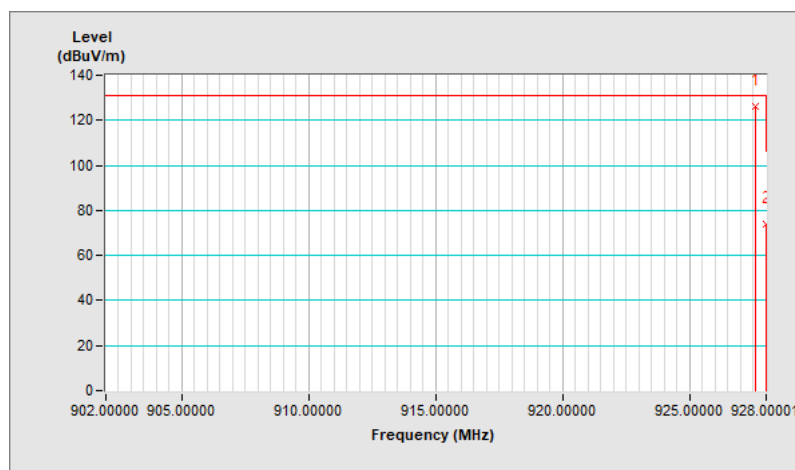


Channel	TX Channel 63	Detector Function	Quasi-Peak (QP)
Frequency Range	902MHz ~ 928MHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*927.60	126.1 QP			1.19 V	43	95.2	30.9
2	#928.00	73.7 QP	106.1	-32.4	1.19 V	43	42.8	30.9

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.



Above 1GHz Data:

Channel	TX Channel 0	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 10GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2707.20	49.4 PK	74.0	-24.6	3.99 H	356	51.8	-2.4
2	2707.20	47.9 AV	54.0	-6.1	3.99 H	356	50.3	-2.4
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2707.20	50.1 PK	74.0	-23.9	4.00 V	14	52.5	-2.4
2	2707.20	48.6 AV	54.0	-5.4	4.00 V	14	51.0	-2.4

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. The average value of 3rd harmonic frequency is: Average = Peak value + 20 log(dwell time per 100 ms per channel * (channel separation correction + overlapping channel correction))
Where the duty cycle correction factor is calculated from following formula:
20 log(dwell time per 100 ms per channel * (channel separation correction + overlapping channel correction)) = 20 log((84.1 ms) * (1+0))/100 = -1.5 dB

Channel	TX Channel 32	Detector Function	Quasi-Peak (QP)
Frequency Range	1GHz ~ 10GHz		Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2745.60	49.4 PK	74.0	-24.6	3.97 H	355	51.6	-2.2
2	2745.60	47.9 AV	54.0	-6.1	3.97 H	355	50.1	-2.2
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2745.60	49.9 PK	74.0	-24.1	4.00 V	11	52.1	-2.2
2	2745.60	48.4 AV	54.0	-5.6	4.00 V	11	50.6	-2.2

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. The average value of 3rd harmonic frequency is: Average = Peak value + 20 log(dwell time per 100 ms per channel * (channel separation correction + overlapping channel correction))
Where the duty cycle correction factor is calculated from following formula:
20 log(dwell time per 100 ms per channel * (channel separation correction + overlapping channel correction)) = 20 log((84.1 ms) * (1+0))/100 = -1.5 dB

Channel	TX Channel 63	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 10GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2782.80	49.8 PK	74.0	-24.2	3.94 H	353	51.9	-2.1
2	2782.80	48.3 AV	54.0	-5.7	3.94 H	353	50.4	-2.1
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2782.80	50.6 PK	74.0	-23.4	3.83 V	3	52.7	-2.1
2	2782.80	49.1 AV	54.0	-4.9	3.83 V	3	51.2	-2.1

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. The average value of 3rd harmonic frequency is: Average = Peak value + 20 log(dwell time per 100 ms per channel * (channel separation correction + overlapping channel correction))
Where the duty cycle correction factor is calculated from following formula:
20 log(dwell time per 100 ms per channel * (channel separation correction + overlapping channel correction)) = 20 log((84.1 ms) * (1+0))/100 = -1.5 dB

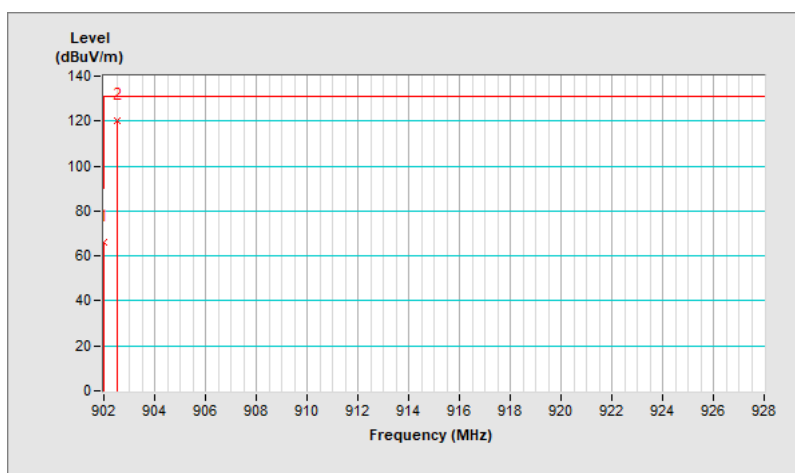
FSK 250kbps FHSS

Channel	TX Channel 0	Detector Function	Quasi-Peak (QP)
Frequency Range	902MHz ~ 928MHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#902.00	66.0 QP	99.9	-33.9	1.48 H	114	35.4	30.6
2	*902.50	119.9 QP			1.48 H	114	89.3	30.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

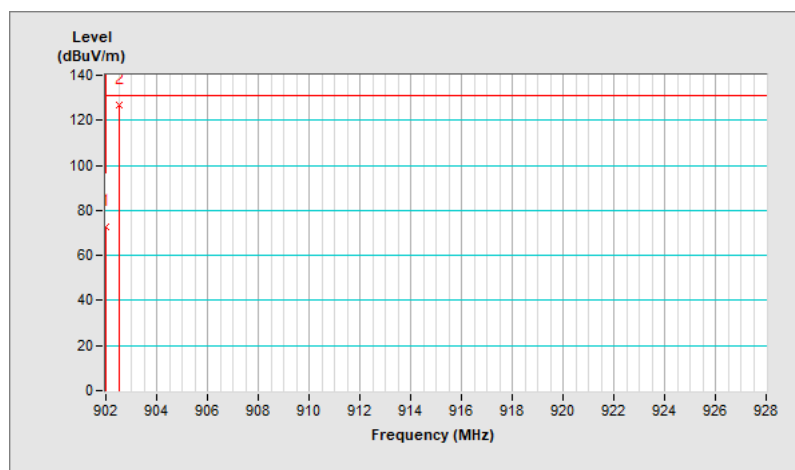


Channel	TX Channel 0	Detector Function	Quasi-Peak (QP)
Frequency Range	902MHz ~ 928MHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#902.00	72.9 QP	106.5	-33.6	1.24 V	113	42.3	30.6
2	*902.50	126.5 QP			1.24 V	113	95.9	30.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

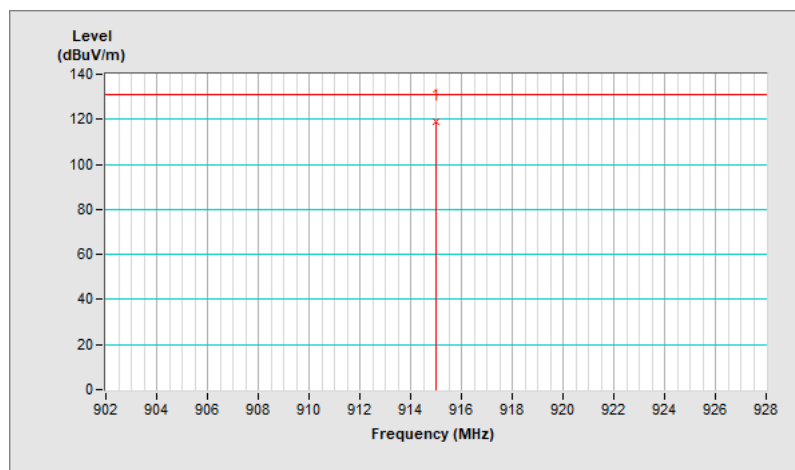


Channel	TX Channel 25	Detector Function	Quasi-Peak (QP)
Frequency Range	902MHz ~ 928MHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*915.00	118.7 QP			1.42 H	120	87.9	30.8

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

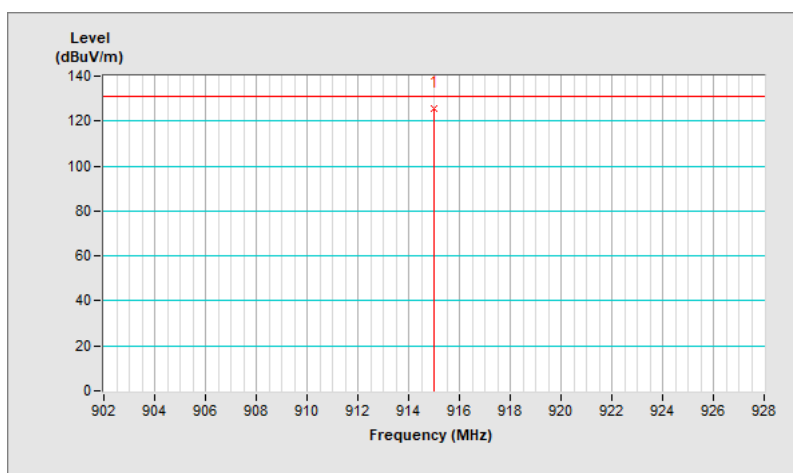


Channel	TX Channel 25	Detector Function	Quasi-Peak (QP)
Frequency Range	902MHz ~ 928MHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*915.00	125.3 QP			1.24 V	106	94.5	30.8

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

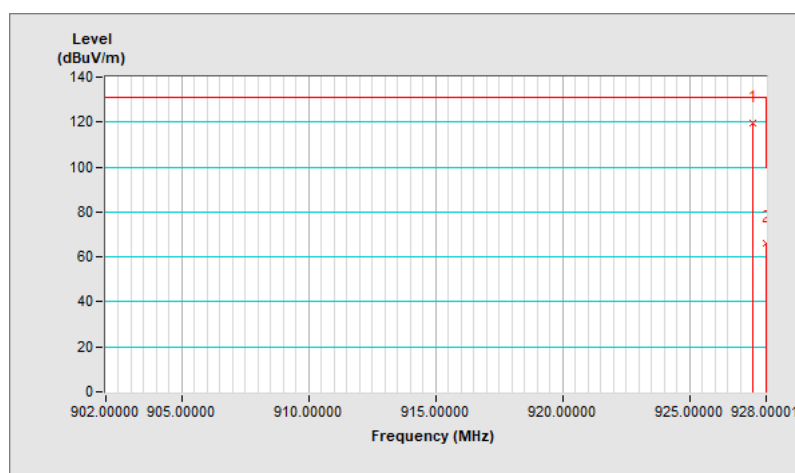


Channel	TX Channel 50	Detector Function	Quasi-Peak (QP)
Frequency Range	902MHz ~ 928MHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*927.50	119.8 QP			1.38 H	115	88.9	30.9
2	#928.00	66.2 QP	99.8	-33.6	1.38 H	115	35.3	30.9

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

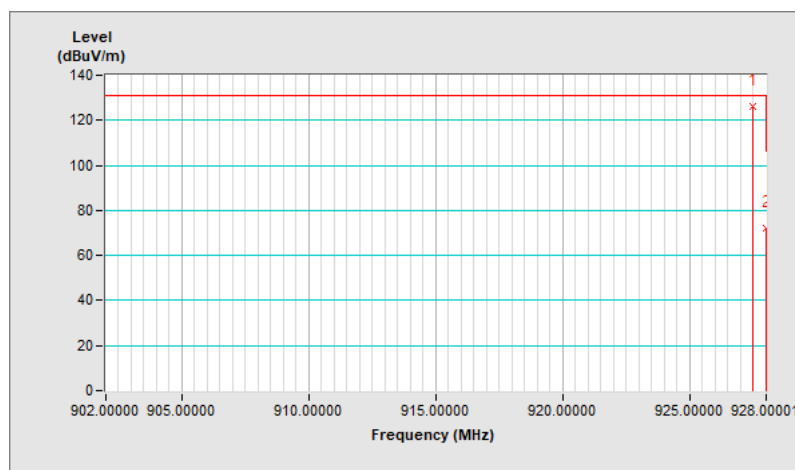


Channel	TX Channel 50	Detector Function	Quasi-Peak (QP)
Frequency Range	902MHz ~ 928MHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*927.50	126.4 QP			1.21 V	44	95.5	30.9
2	#928.00	72.2 QP	106.4	-34.2	1.21 V	44	41.3	30.9

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.



Above 1GHz Data:

Channel	TX Channel 0	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 10GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2707.50	47.8 PK	74.0	-26.2	3.96 H	354	50.2	-2.4
2	2707.50	45.1 AV	54.0	-8.9	3.96 H	354	47.5	-2.4
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2707.50	48.5 PK	74.0	-25.5	4.00 V	12	50.9	-2.4
2	2707.50	45.8 AV	54.0	-8.2	4.00 V	12	48.2	-2.4

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. The average value of 3rd harmonic frequency is: Average = Peak value + 20 log(dwell time per 100 ms per channel * (channel separation correction + overlapping channel correction))
Where the duty cycle correction factor is calculated from following formula:
20 log(dwell time per 100 ms per channel * (channel separation correction + overlapping channel correction)) = 20 log((73.5 ms) * (1+0))/100 = -2.7 dB

Channel	TX Channel 25	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 10GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2745.00	48.5 PK	74.0	-25.5	3.92 H	351	50.7	-2.2
2	2745.00	45.8 AV	54.0	-8.2	3.92 H	351	48.0	-2.2
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2745.00	49.4 PK	74.0	-24.6	4.00 V	4	51.6	-2.2
2	2745.00	46.7 AV	54.0	-7.3	4.00 V	4	48.9	-2.2

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. The average value of 3rd harmonic frequency is: Average = Peak value + 20 log(dwell time per 100 ms per channel * (channel separation correction + overlapping channel correction))
Where the duty cycle correction factor is calculated from following formula:
20 log(dwell time per 100 ms per channel * (channel separation correction + overlapping channel correction)) = 20 log((73.5 ms) * (1+0))/100 = -2.7 dB

Channel	TX Channel 50	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 10GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2782.50	49.6 PK	74.0	-24.4	3.96 H	356	51.7	-2.1
2	2782.50	46.9 AV	54.0	-7.1	3.96 H	356	49.0	-2.1
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2782.50	50.3 PK	74.0	-23.7	3.83 V	2	52.4	-2.1
2	2782.50	47.6 AV	54.0	-6.4	3.83 V	2	49.7	-2.1

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. The average value of 3rd harmonic frequency is: Average = Peak value + 20 log(dwell time per 100 ms per channel * (channel separation correction + overlapping channel correction))
Where the duty cycle correction factor is calculated from following formula:
20 log(dwell time per 100 ms per channel * (channel separation correction + overlapping channel correction)) = 20 log((73.5 ms) * (1+0))/100 = -2.7 dB

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies.
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100613	2025/11/27	2026/11/26
RF signal cable Woken	5D-FB	Cable-cond1-01	2025/1/5	2026/1/4
LISN ROHDE & SCHWARZ (EUT)	ENV216	101826	2025/3/24	2026/3/23
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	2025/8/28	2026/8/27
Software ADT	BVADT_Cond_ V7.4.1.0	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Shielded Room 1(Conduction 1).

4.2.3 Test Procedures

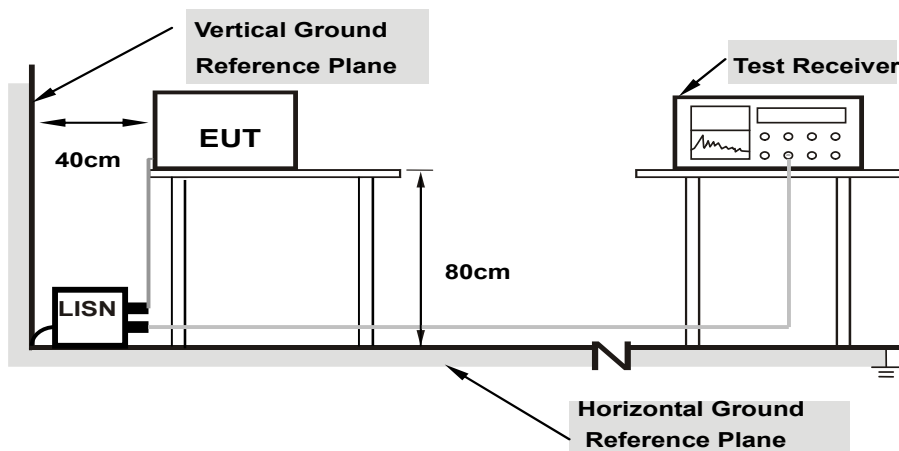
- Exploratory ac power-line conducted emission measurements: The EUT shall be operated on the mid channel and in the mode with highest output power unless the fundamental operates in the AC power-line emission test range then the EUT shall be operated in the range of typical modes of operation.
- The EUT was placed on a 0.8 meter to the top of table and placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50 uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20 dB) was not recorded.

Note: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

4.2.4 Deviation From Test Standard

No deviation.

4.2.5 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
from other units and other metal planes**

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT Operating Condition

Same as item 4.1.6.

4.2.7 Test Results

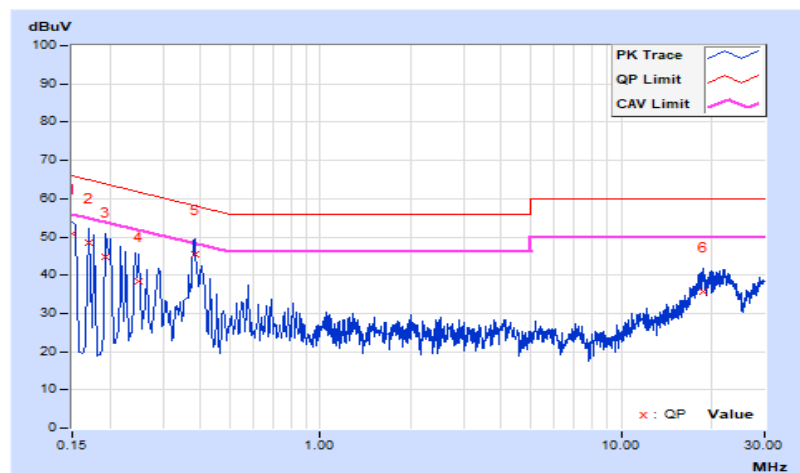
LoRa 125kbps FHSS

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Channel	TX Channel 0		

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.68	41.22	17.12	50.90	26.80	66.00	56.00	-15.10	-29.20
2	0.17000	9.69	38.63	14.80	48.32	24.49	64.96	54.96	-16.64	-30.47
3	0.19400	9.71	35.02	11.95	44.73	21.66	63.86	53.86	-19.13	-32.20
4	0.25000	9.71	28.80	7.52	38.51	17.23	61.76	51.76	-23.25	-34.53
5	0.38200	9.72	35.89	22.30	45.61	32.02	58.24	48.24	-12.63	-16.22
6	18.73400	10.06	25.77	11.41	35.83	21.47	60.00	50.00	-24.17	-28.53

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

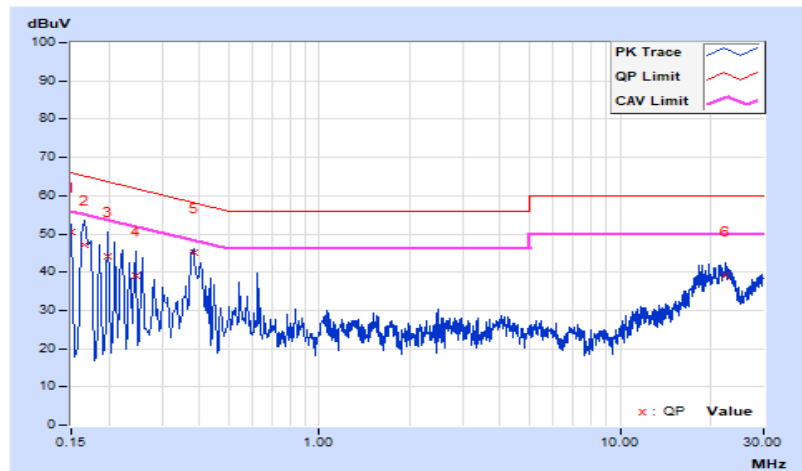


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Channel	TX Channel 0		

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.66	40.90	16.68	50.56	26.34	66.00	56.00	-15.44	-29.66
2	0.16600	9.66	37.41	13.48	47.07	23.14	65.16	55.16	-18.09	-32.02
3	0.19800	9.66	34.43	11.06	44.09	20.72	63.69	53.69	-19.60	-32.97
4	0.24600	9.68	29.33	7.07	39.01	16.75	61.89	51.89	-22.88	-35.14
5	0.38200	9.72	35.37	22.08	45.09	31.80	58.24	48.24	-13.15	-16.44
6	22.44600	10.31	28.79	11.76	39.10	22.07	60.00	50.00	-20.90	-27.93

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



4.3 Number of Hopping Frequency Used

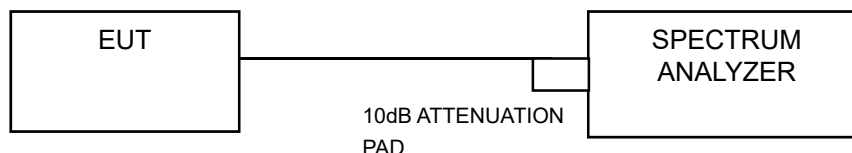
4.3.1 Limits of Hopping Frequency Used Measurement

For LoRa 125kbps FHSS, FSK 50kbps FHSS, FSK 150kbps FHSS:
At least 50 channels frequencies, and should be equally spaced.

For FSK 250kbps FHSS:

At least 25 channels frequencies, and should be equally spaced.

4.3.2 Test Setup



4.3.3 Test Instruments

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Fixed Attenuator Woken	00800A1K01A-10	00800A1K01A-10-01	2025/5/23	2026/5/22
Signal & Spectrum Analyzer R&S	FSV3044	101504	2025/6/18	2026/6/17
Software BV	ADT_RF Test Software V7.6.5.4	N/A	N/A	N/A

Notes:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Oven room.

4.3.4 Test Procedure

- a. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
- c. Set the SA on MaxHold Mode, and then keep the EUT in hopping mode. Record all the signals from each channel until each one has been recorded.
- d. Set the SA on View mode and then plot the result on SA screen.
- e. Repeat above procedures until all frequencies measured were complete.

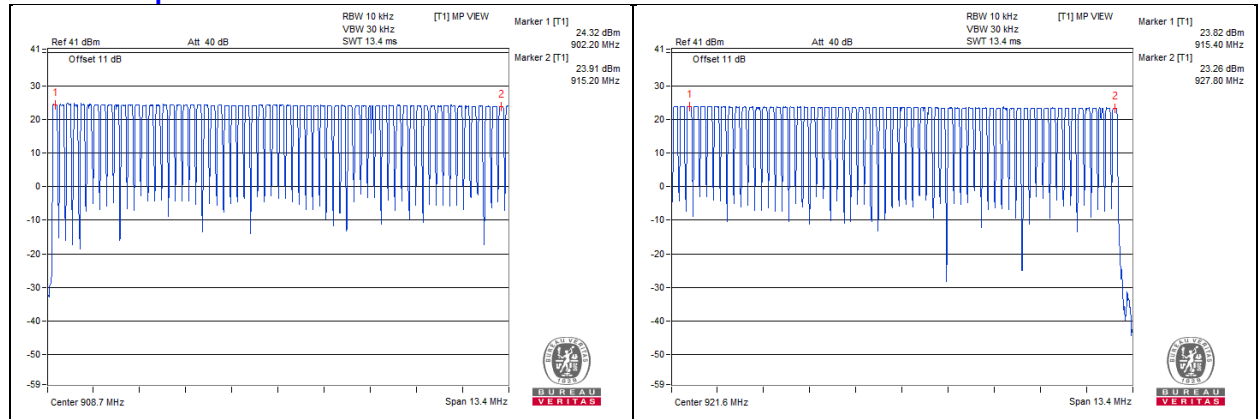
4.3.5 Deviation from Test Standard

No deviation.

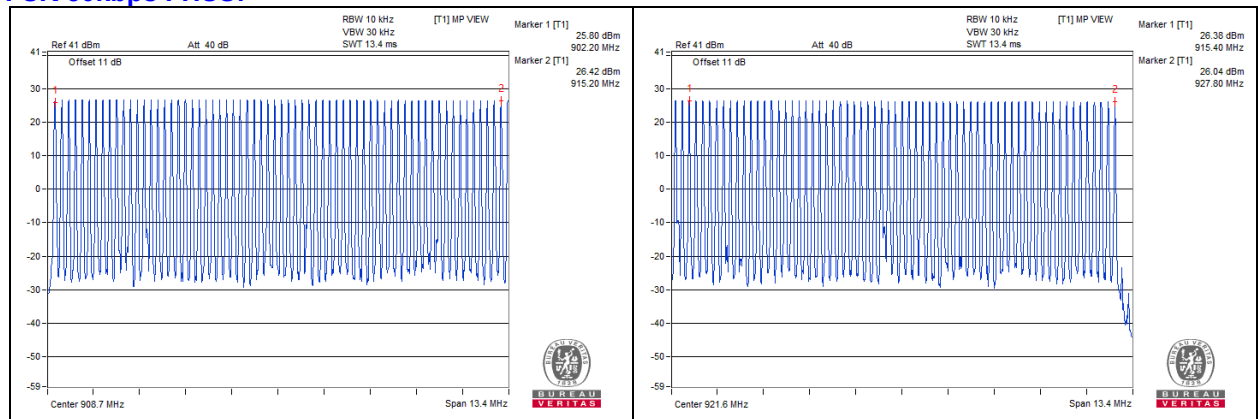
4.3.6 Test Results

There are 129 hopping frequencies in the hopping mode. On the plots, it shows that the hopping frequencies are equally spaced.

LoRa 125kbps FHSS

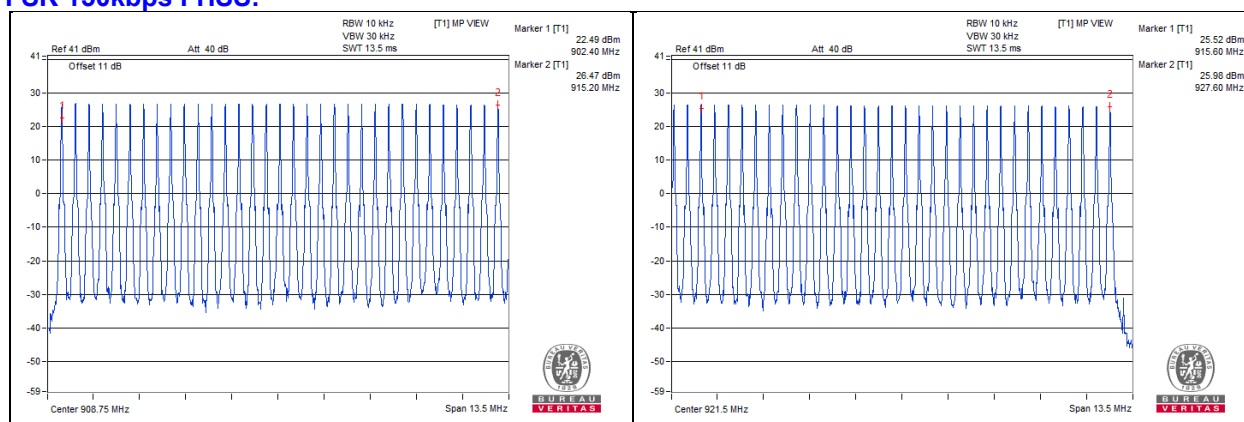


FSK 50kbps FHSS:



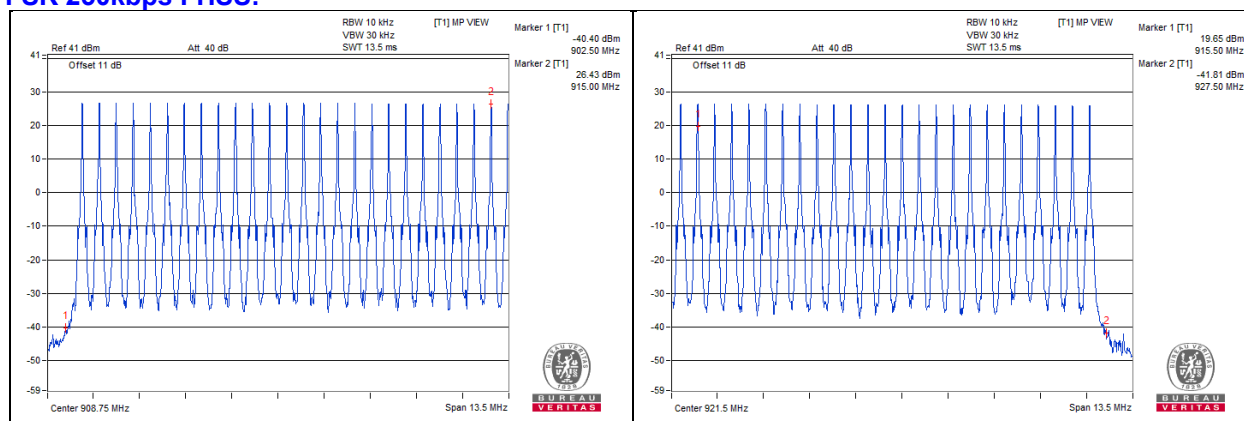
There are 64 hopping frequencies in the hopping mode. On the plots, it shows that the hopping frequencies are equally spaced.

FSK 150kbps FHSS:



There are 51 hopping frequencies in the hopping mode. On the plots, it shows that the hopping frequencies are equally spaced.

FSK 250kbps FHSS:

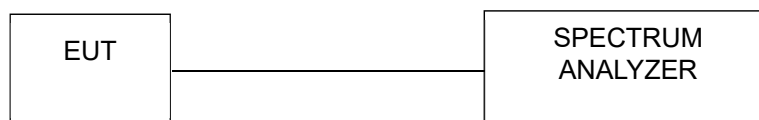


4.4 Dwell Time on Each Channel

4.4.1 Limits of Dwell Time on Each Channel Measurement

the 20 dB bandwidth less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period.

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.3.3 to get information of above instrument.

4.4.4 Test Procedures

- Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
- Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
- Span: Zero span, centered on a hopping channel.
- RBW shall be $\leq$ channel spacing and where possible RBW should be set $\gg 1 / T$, where T is the expected transmission time per hop.
- Sweep time: Set so that the start of the first transmission and end of the last transmission for the hop are clearly captured. Setting the sweep time to be slightly longer than the hopping period per channel (hopping period = $1/\text{hopping rate}$) should achieve this.
- Use a video trigger, where possible with a trigger delay, so that the start of the transmission is clearly observed. The trigger level might need adjustment to reduce the chance of triggering when the system hops on an adjacent channel.
- Detector function: Peak.
- Trace: Clear-write, single sweep.
- Place markers at the start of the first transmission on the channel and at the end of the last transmission. The dwell time per hop is the time between these two markers.

Note: Where the device shares the same hopping algorithms (dwell time, channel selection) across multiple data rates or modulation schemes then the time of occupancy need only be measured for one of those modulation schemes or data rates. If the dwell time value varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation in dwell time.

4.4.5 Deviation from Test Standard

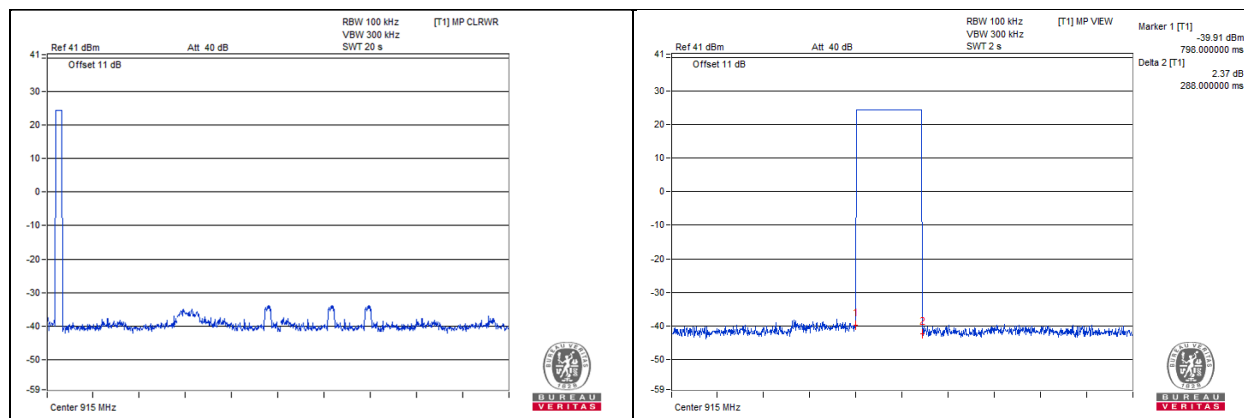
No deviation.

4.4.6 Test Results

LoRa 125kbps FHSS

Mode	Number of transmission in 20 Sec.	Length of transmission time (msec)	Dwell Time (msec)	Limit (msec)	Test Result
FHSS	1 times	288	288	400	Pass

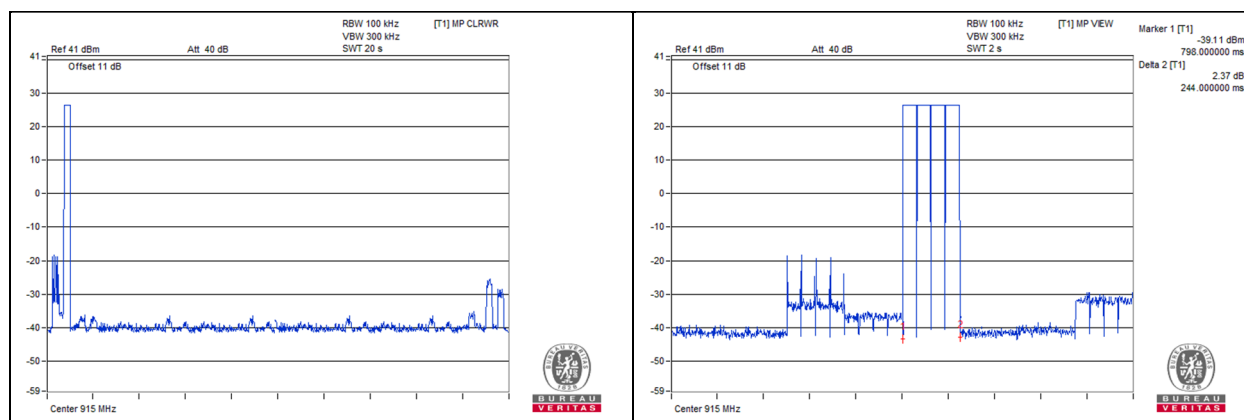
Note: Test plots of the transmitting time slot are shown as below.



FSK 50kbps FHSS:

Mode	Number of transmission in 20 Sec.	Length of transmission time (msec)	Dwell Time (msec)	Limit (msec)	Test Result
FHSS	1 times	244	244	400	Pass

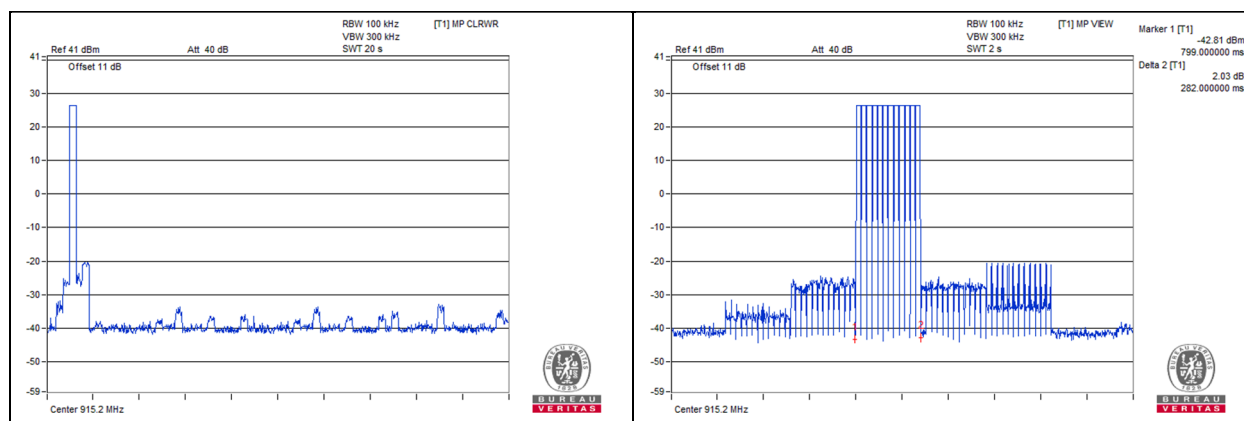
Note: Test plots of the transmitting time slot are shown as below.



FSK 150kbps FHSS:

Mode	Number of transmission in 20 Sec.	Length of transmission time (msec)	Dwell Time (msec)	Limit (msec)	Test Result
FHSS	1 times	282	282	400	Pass

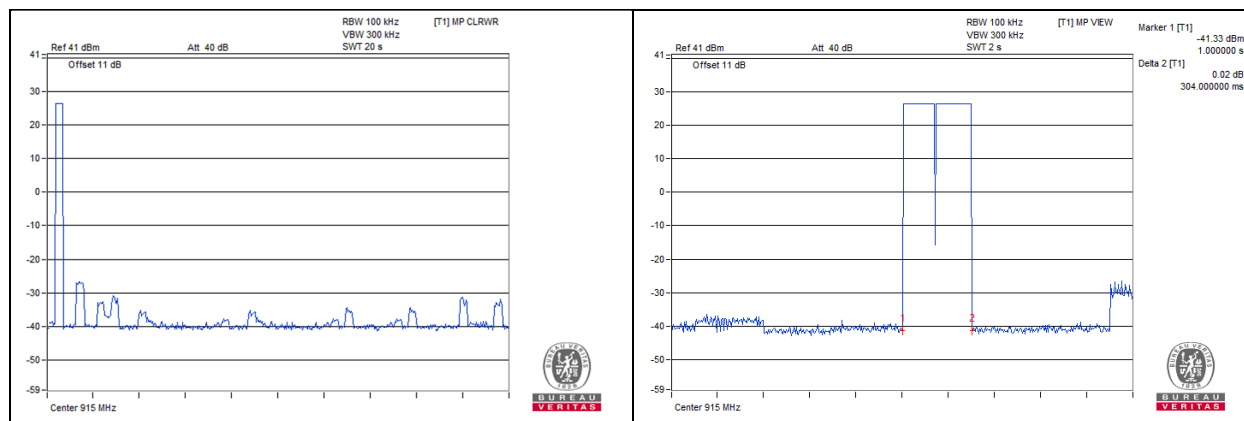
Note: Test plots of the transmitting time slot are shown as below.



FSK 250kbps FHSS:

Mode	Number of transmission in 20 Sec.	Length of transmission time (msec)	Dwell Time (msec)	Limit (msec)	Test Result
FHSS	1 times	304	304	400	Pass

Note: Test plots of the transmitting time slot are shown as below.

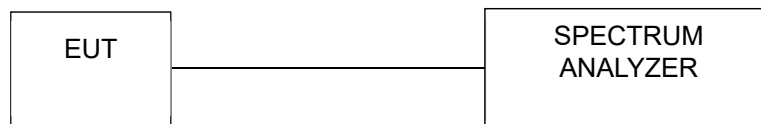


4.5 Channel Bandwidth

4.5.1 Limits of Channel Bandwidth Measurement

The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.3.3 to get information of above instrument.

4.5.4 Test Procedure

- Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
- Repeat above procedures until all frequencies measured were complete.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

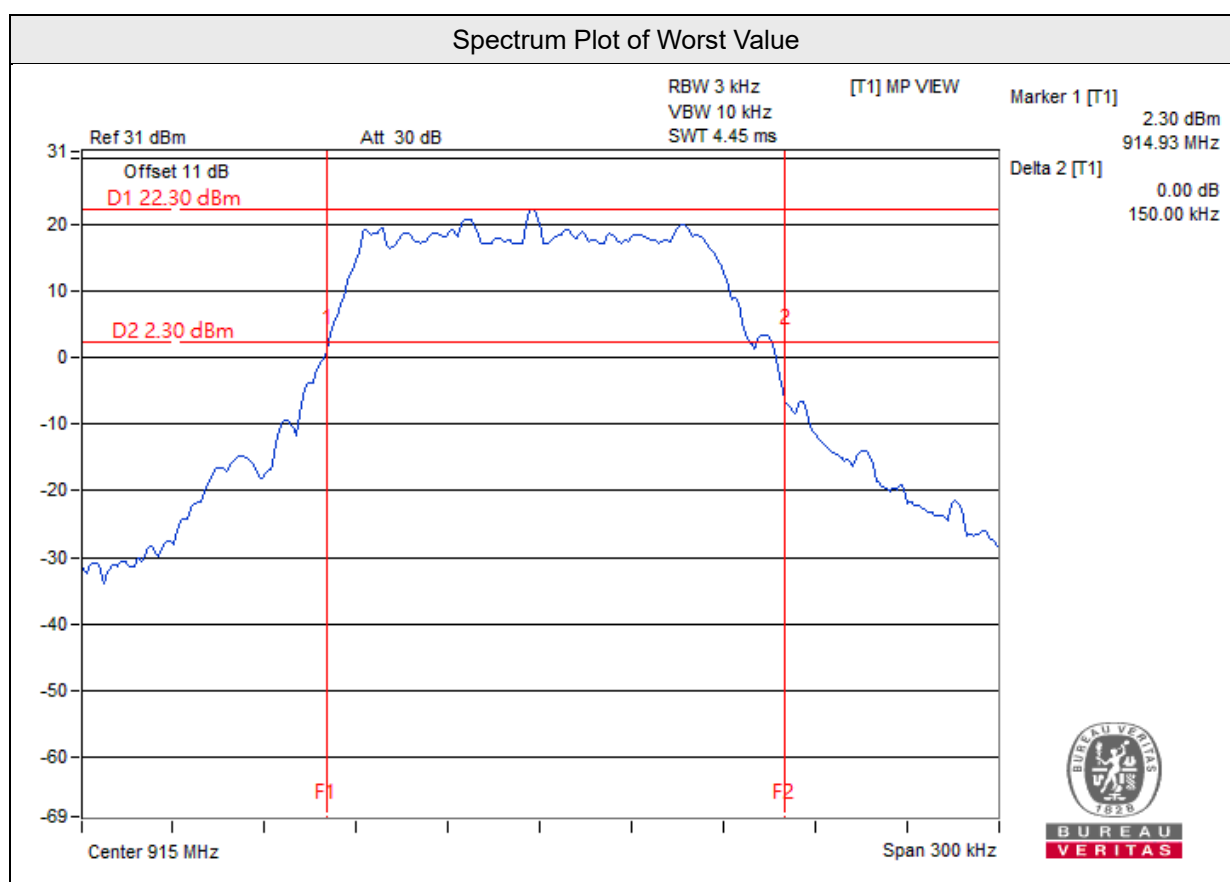
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

4.5.7 Test Results

LoRa 125kbps FHSS

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Limit (MHz)
0	902.2	0.13	0.5
64	915	0.15	0.5
128	927.8	0.14	0.5

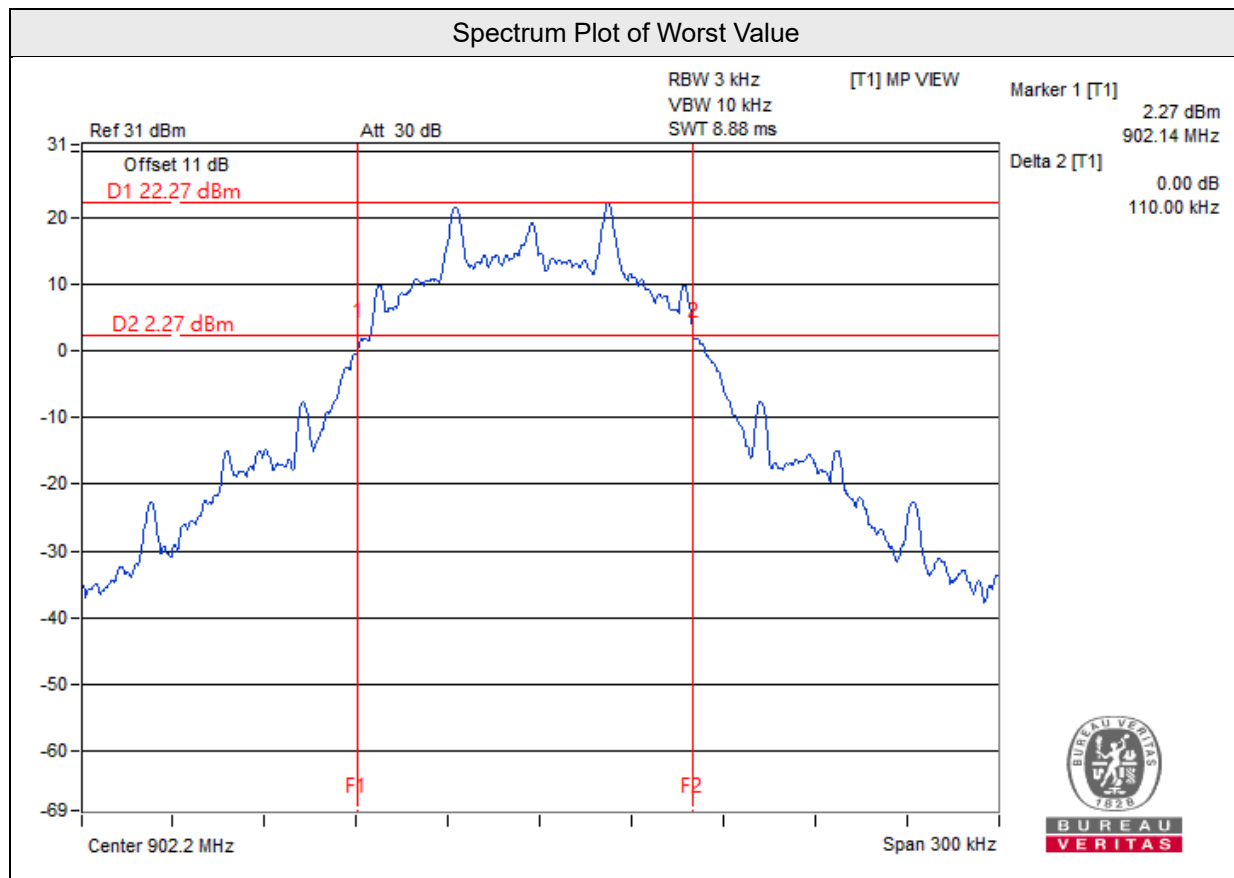
Note: 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period.



FSK 50kbps FHSS:

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Limit (MHz)
0	902.2	0.11	0.5
64	915	0.10	0.5
128	927.8	0.11	0.5

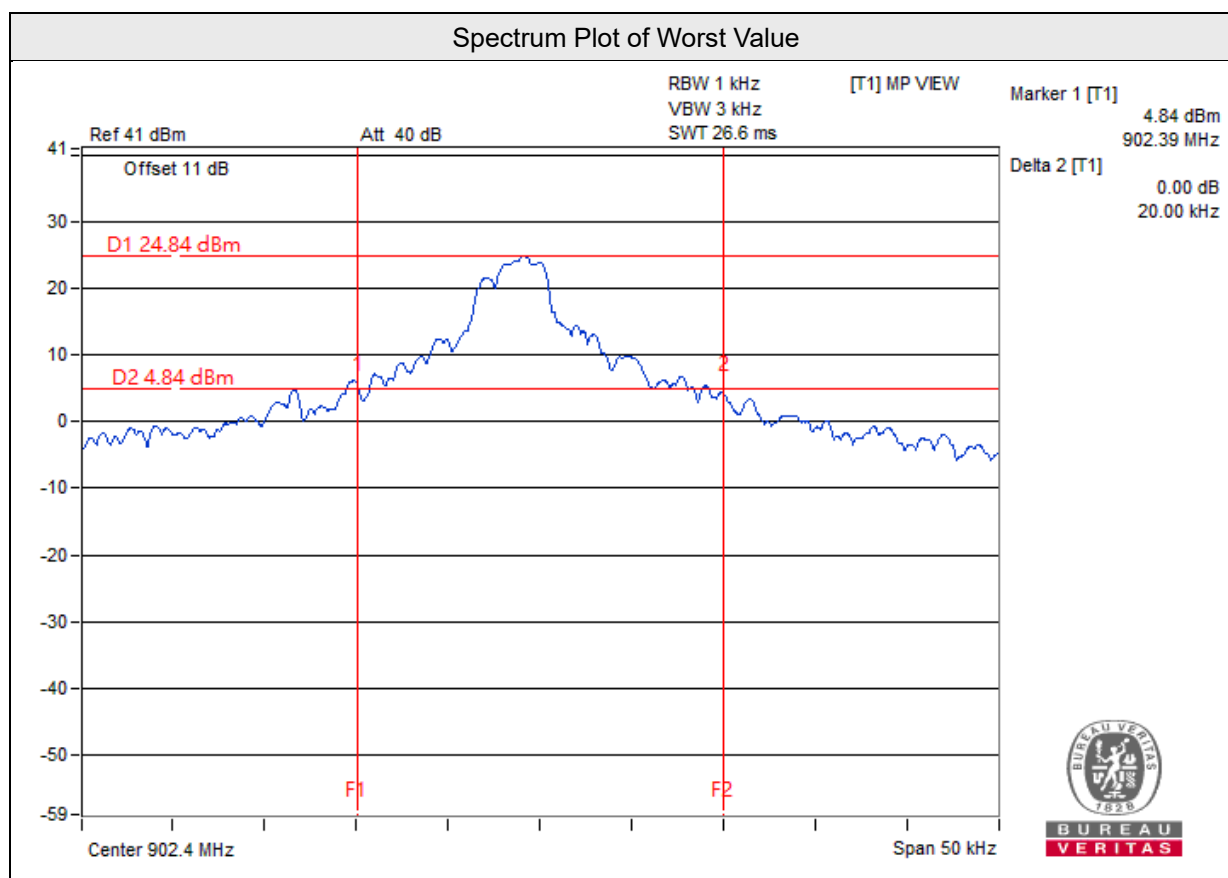
Note: 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period.



FSK 150kbps FHSS:

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Limit (MHz)
0	902.4	0.02	0.5
32	915.2	0.02	0.5
63	927.6	0.02	0.5

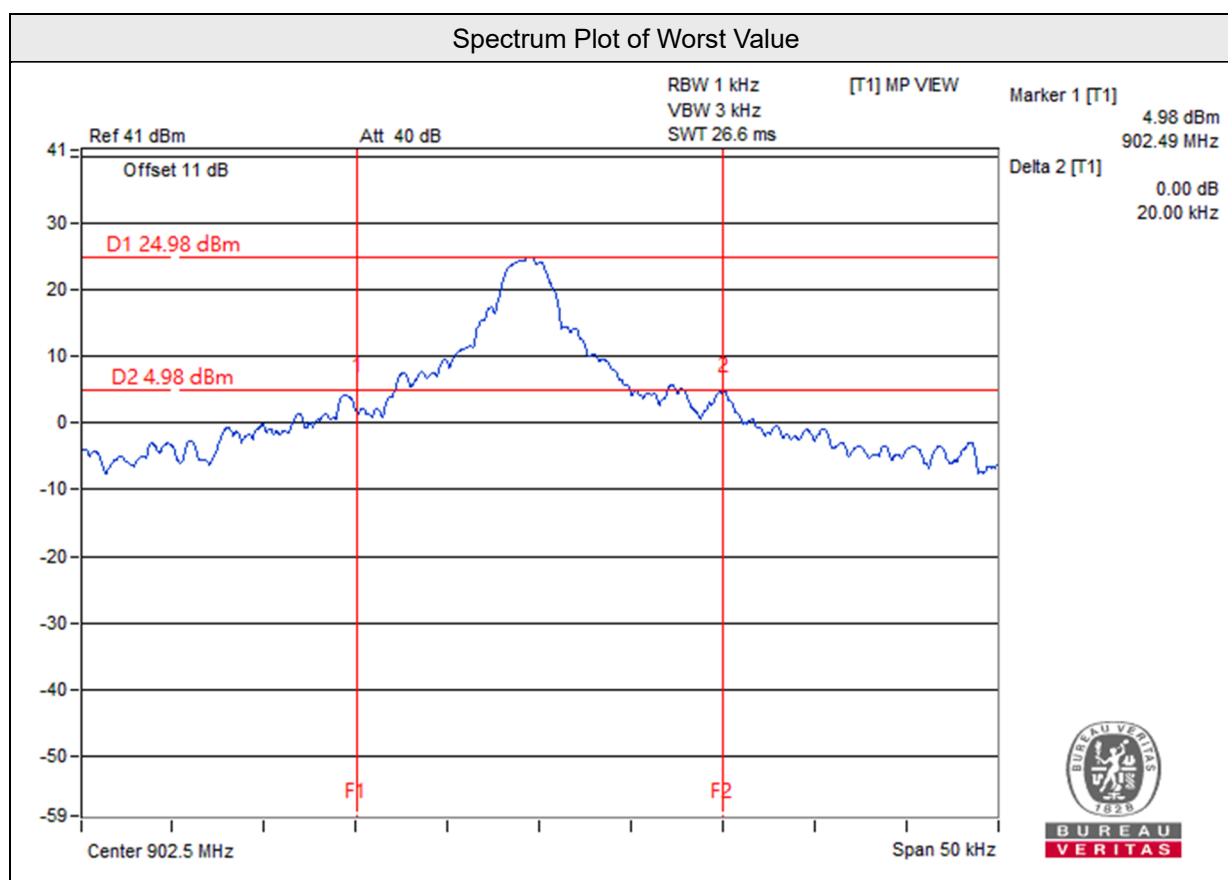
Note: 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period.



FSK 250kbps FHSS:

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Limit (MHz)
0	902.5	0.02	0.5
25	915	0.02	0.5
50	927.5	0.02	0.5

Note: 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period.

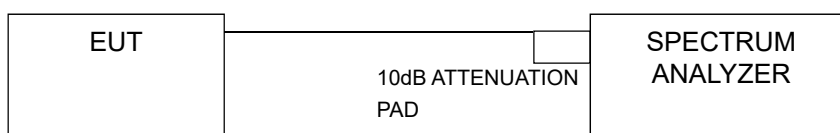


4.6 Hopping Channel Separation

4.6.1 Limits of Hopping Channel Separation Measurement

At least of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.3.3 to get information of above instrument.

4.6.4 Test Procedure

- Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range.
- Span: Wide enough to capture the peaks of two adjacent channels.
- RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.
- Video (or average) bandwidth (VBW) $\geq$ RBW.
- Sweep: No faster than coupled (auto) time.
- Detector function: Peak.
- Trace: Max-hold.
- Allow the trace to stabilize.

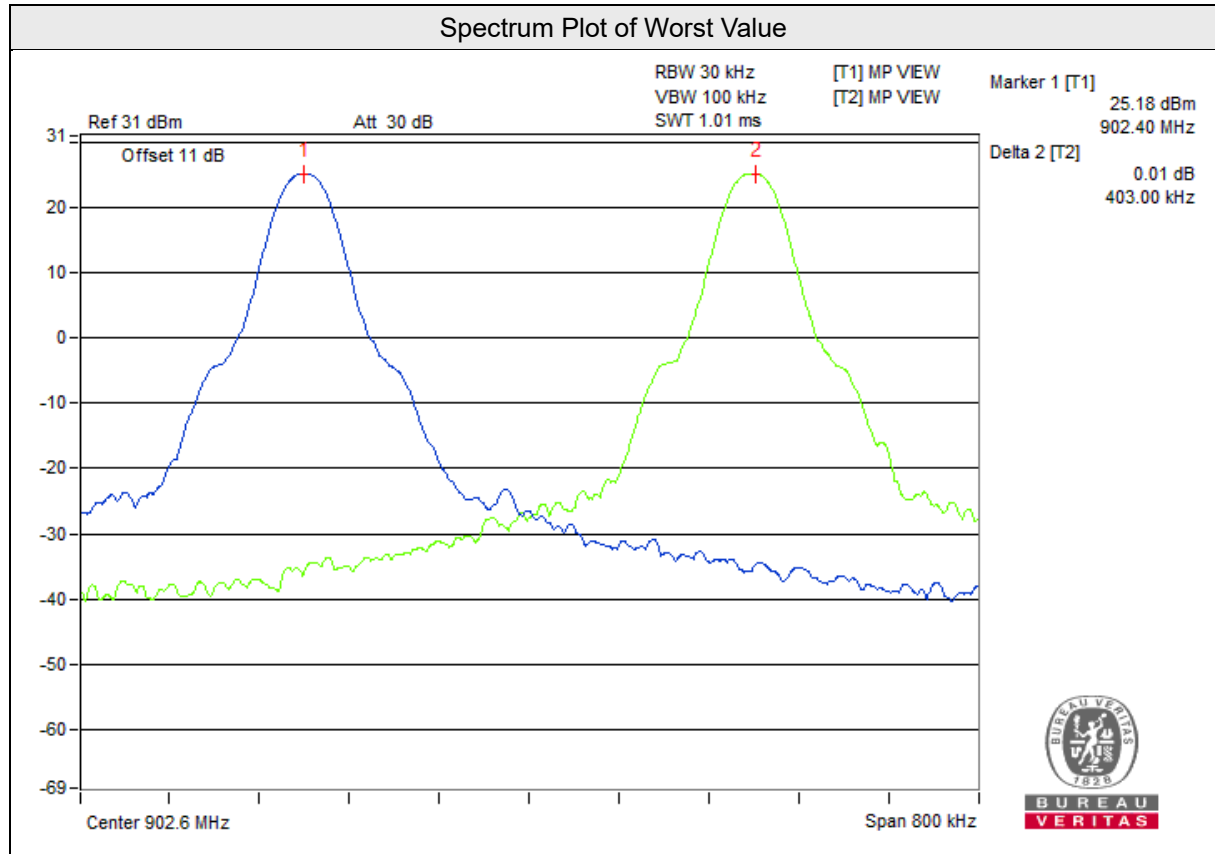
Note: Where the device shares the same channel plan (carrier frequencies and number of channels) across multiple data rates or modulation schemes then the carrier separation need only be measured for one of those modulation schemes or data rates.

4.6.5 Deviation from Test Standard

No deviation.

FSK 150kbps FHSS:

Channel	Frequency (MHz)	Adjacent Channel Separation (MHz)	Minimum Limit (MHz)	Pass / Fail
0	902.4	0.403	0.02	PASS
32	915.2	0.400	0.02	PASS
63	927.6	0.401	0.02	PASS

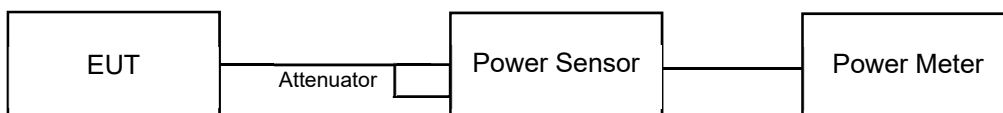


4.7 Maximum Output Power

4.7.1 Limits of Maximum Output Power Measurement

For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.3.3 to get information of above instrument.

4.7.4 Test Procedure

Peak Power:

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

The power meter video bandwidth is greater than or equal to the DTS bandwidth and use a fast responding diode detector

Average Power:

Average power sensor was used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

4.7.7 Test Results

Peak Power

LoRa 125kbps FHSS

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Power Limit (dBm)	Pass / Fail
0	902.2	328.095	25.16	30	PASS
64	915	306.196	24.86	30	PASS
128	927.8	313.329	24.96	30	PASS

FSK 50kbps FHSS:

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Power Limit (dBm)	Pass / Fail
0	902.2	297.167	24.73	30	PASS
64	915	294.442	24.69	30	PASS
128	927.8	289.068	24.61	30	PASS

FSK 150kbps FHSS:

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Power Limit (dBm)	Pass / Fail
0	902.4	296.483	24.72	30	PASS
32	915.2	311.172	24.93	30	PASS
63	927.6	293.765	24.68	30	PASS

FSK 250kbps FHSS:

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Power Limit (dBm)	Pass / Fail
0	902.5	297.167	24.73	30	PASS
25	915	315.5	24.99	30	PASS
50	927.5	294.442	24.69	30	PASS

Average Power
LoRa 125kbps FHSS

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
0	902.2	314.775	24.98
64	915	297.167	24.73
128	927.8	305.492	24.85

FSK 50kbps FHSS:

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
0	902.2	287.078	24.58
64	915	282.488	24.51
128	927.8	277.332	24.43

FSK 150kbps FHSS:

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
0	902.4	287.74	24.59
32	915.2	305.492	24.85
63	927.6	283.139	24.52

FSK 250kbps FHSS:

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
0	902.5	287.74	24.59
25	915	311.172	24.93
50	927.5	283.792	24.53

4.8 Conducted Out of Band Emission Measurement

4.8.1 Limits Of Conducted Out of Band Emission Measurement

Below -20dB of the highest emission level of operating band (in 100kHz RBW).

4.8.2 Test Instruments

Refer to section 4.3.3 to get information of above instrument.

4.8.3 Test Procedure

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 100 kHz and 300 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

4.8.4 Deviation from Test Standard

No deviation.

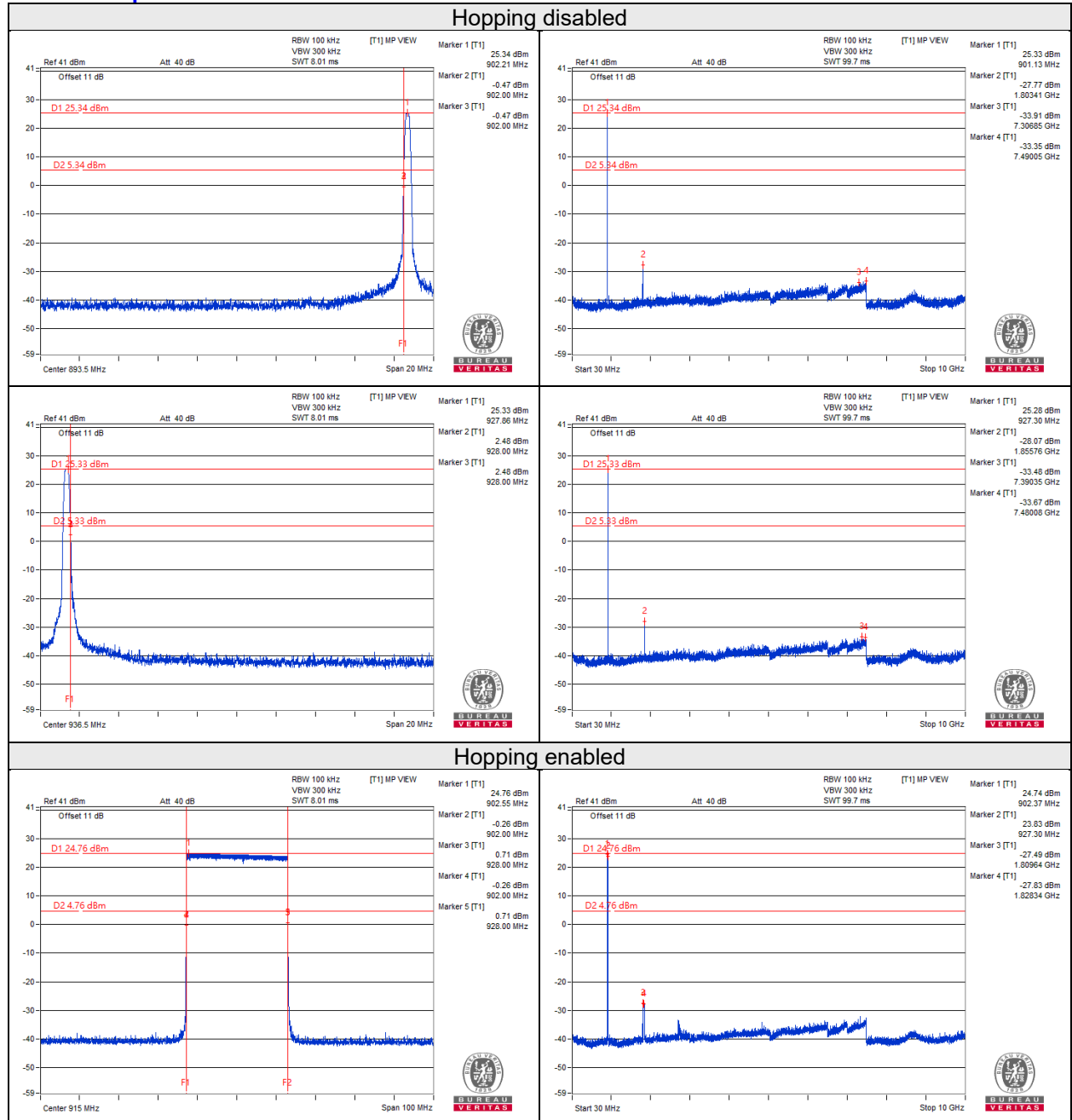
4.8.5 EUT Operating Condition

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

4.8.6 Test Results

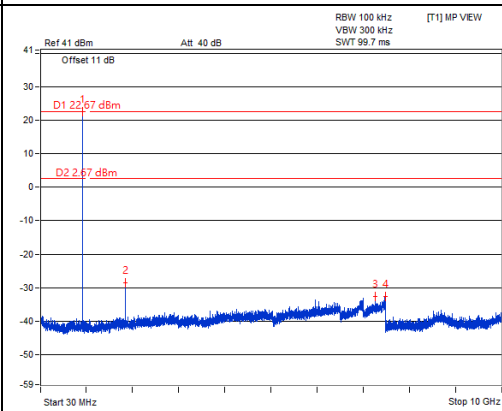
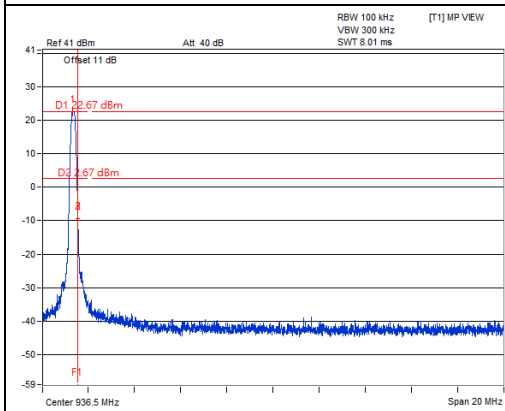
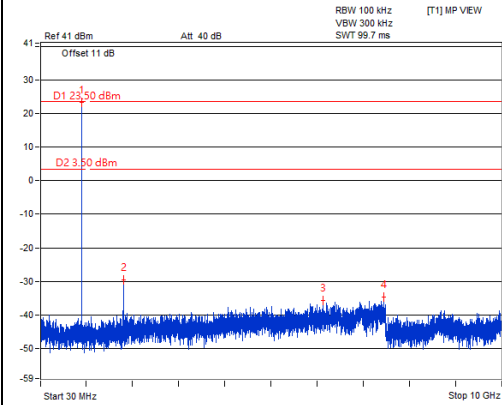
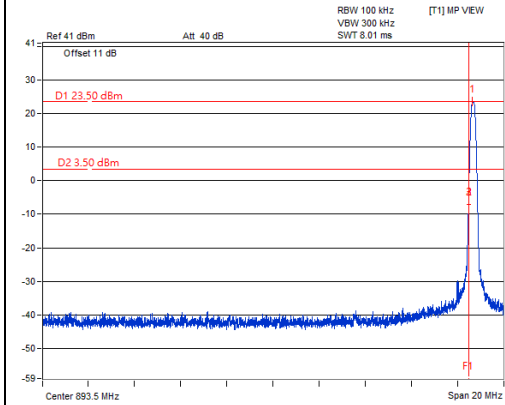
The spectrum plots are attached on the following images. D1 line indicates the highest level, D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

LoRa 125kbps FHSS

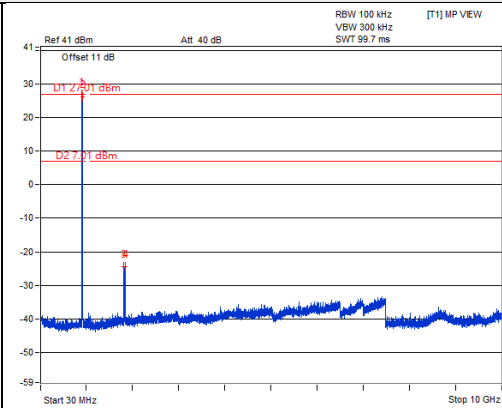
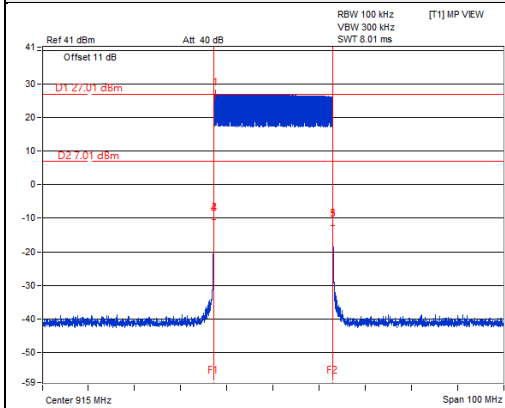


FSK 50kbps FHSS:

Hopping disabled

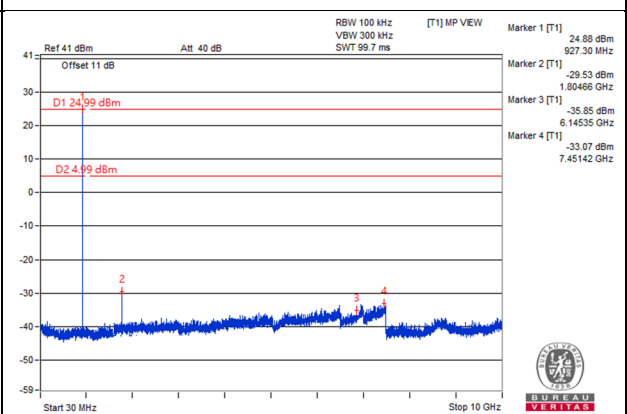
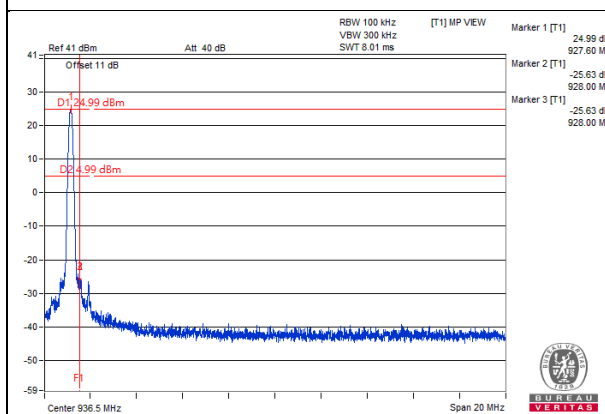
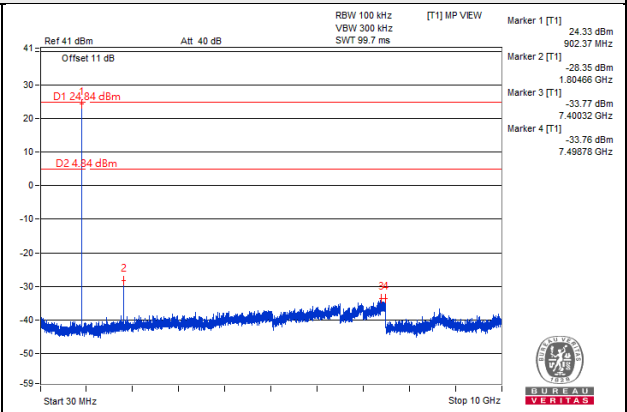
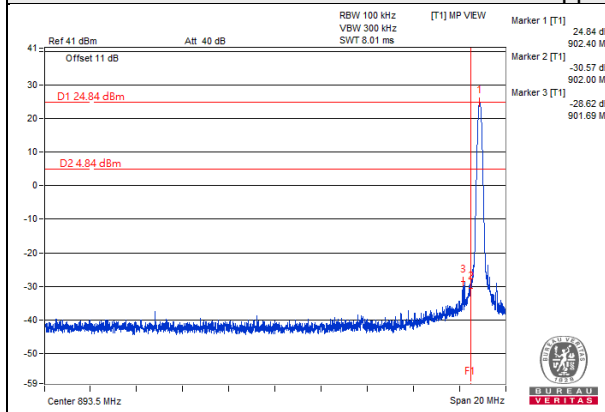


Hopping enabled

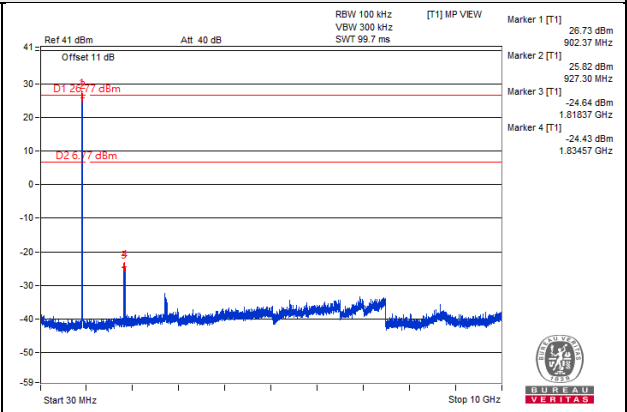
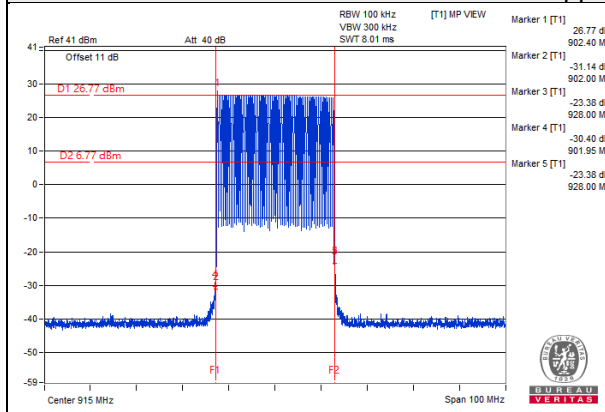


FSK 150kbps FHSS:

Hopping disabled

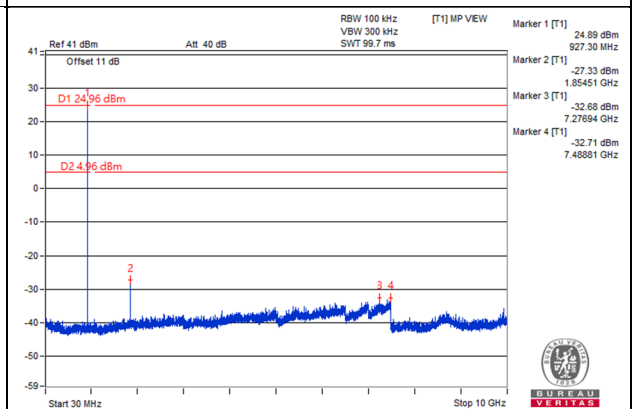
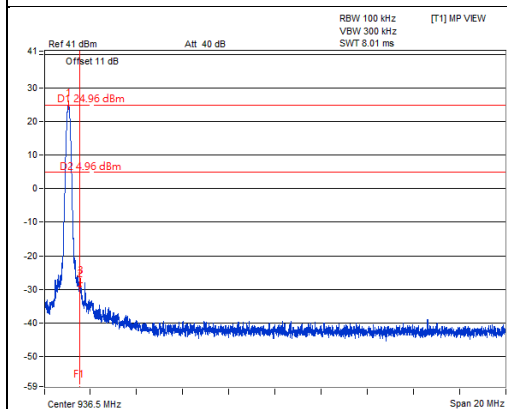
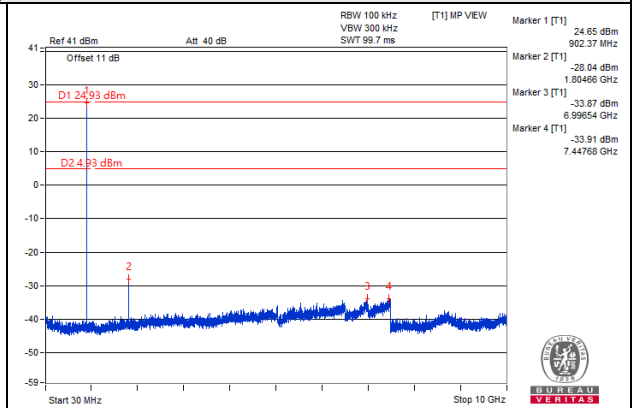
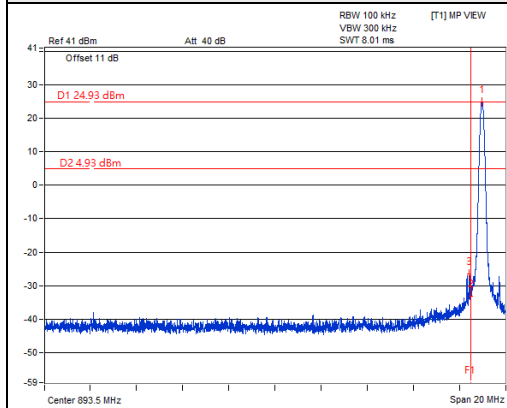


Hopping enabled

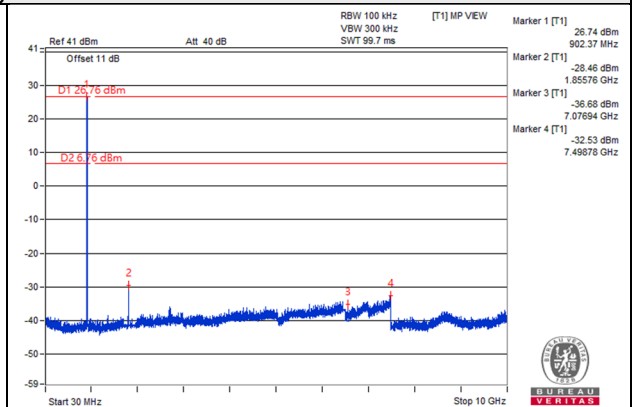
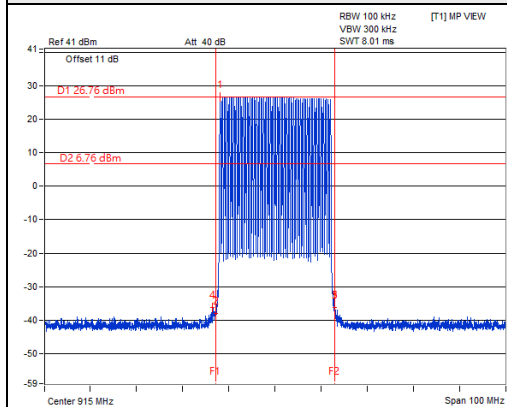


FSK 250kbps FHSS:

Hopping disabled



Hopping enabled



5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited and approved according to ISO/IEC 17025.

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