



Report No.: TBR-C-202205-0225-12 Page: 1 of 48

Radio Test Report FCC ID: 2A2GJ-HTM2802

Report No.		TBR-C-202205-0225-12
Applicant		Heltec Automation Technology Co., Ltd
Equipment Under T	est (E	EUT)
EUT Name	1:	Heltec Indoor Hotspot
Model No.	:	HT-M2802
Series Model No.	:	The main and the
Brand Name	:	
Sample ID : RW-C-202205-0225-1-1# & RW-C-202205-0225-1-2#		
Receipt Date : 2022-05-18		
Test Date	R	2022-05-18 to 2022-05-24
Issue Date	:	2022-05-24
Standards	5	FCC Part 15 Subpart C 15.247
Test Method	:	ANSI C63.10: 2013
		KDB 558074 D01 15.247 Meas Guidance v05r02
Conclusions		PASS
		In the configuration tested, the EUT complied with the standards specified above.

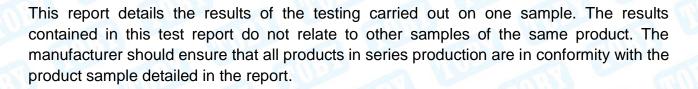
Wade W

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Witness Engineer

Engineer Supervisor

Engineer Manager



TB-RF-074-1.0



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Revision History

Report No.	Version	Description	Issued Date
TBR-C-202205-0225-12	Rev.01	Initial issue of report	2022-05-24
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1. General Information about EUT

1.1 Client Information

Applicant	-	Heltec Automation Technology Co., Ltd
Address	Address : 1st floor, No. 54, 56, 58 zirui North Street, High-tech Zone, Chengdu city, China	
Manufacturer	: Heltec Automation Technology Co., Ltd	
Address	:	1st floor, No. 54, 56, 58 zirui North Street, High-tech Zone, Chengdu city, China

1.2 General Description of EUT (Equipment Under Test)

EUT Name	:	Heltec Indoor Hotspot	Heltec Indoor Hotspot			
Models No.		HT-M2802	HT-M2802			
Model Different						
Product Description	0	Operation Frequency:	LoRa(500KHz): 923.3MHz-927.5MHz			
		Number of Channel:	8 channels			
		Antenna Gain:	3.0dBi Dipole Antenna			
TOBY	-	Bit Rate of Transmitter:	5.47kbps			
Adapter(DSS12D		Adapter(DSS12D-0502 Input: 100-240V~50/60 Output: 5V2A				
Software Version	: N/A					
Hardware Version	5	N/A				
Remark:	-					

Remark:

(1) The antenna gain and adapter provided by the applicant, the verified for the RF conduction test provided by TOBY test lab.

(2) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

(3) Antenna information provided by the applicant. And the type of antenna please see the external photos.

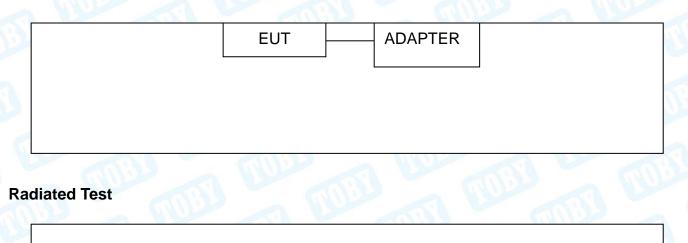


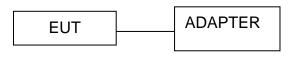
(4) Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	923.3	04	925.1	07	926.9
02	923.9	05	925.7	08	927.5
03	924.5	06	926.3		2

1.3 Block Diagram Showing the Configuration of System Tested

Conducted Test





1.4 Description of Support Units

	Equipment Information							
Name	Model	FCC ID/SDOC	Manufacturer	Used "√"				
Adapter	DSS12D-0502000-E		DSS	\checkmark				
		Cable Information						
Number	Shielded Type	Ferrite Core	Length	Note				
Cable 1	Yes	NO	1.0M	Accessory				
Note: The cable	es and adapter provided	by the Applicant						

1.5 Description of Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned follow was evaluated respectively.

	For	Conducted Test
	Final Test Mode	Description
1	Mode 1	TX Mode
Ś	For	Radiated Test
	Final Test Mode	Description
(Mode 2	TX Mode
	Mode 3	TX Mode (Channel 01/04/08)

Note:

(1) For all test, we have verified the construction and function in typical operation. And all the test modes were carried out with the EUT in transmitting operation in maximum power with all kinds of data rate.

According to ANSI C63.10 standards, the measurements are performed at the highest, middle, lowest available channels.

- (2) During the testing procedure, the continuously transmitting with the maximum power mode was programmed by the customer.
- (3) The EUT is considered a Mobile unit; in normal use it was positioned on X-plane. The worst case was found positioned on X-plane. Therefore only the test data of this X-plane was used for radiated emission measurement test.



1.6 Description of Test Software Setting

During testing channel& Power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of RF setting.

Test Software Version	COB)	SecureCRT.exe	
Frequency	923.3MHz	925.1MHz	927.5MHz
LoRa	DEF	DEF	DEF

1.7 Measurement Uncertainty

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

Test Item	Parameters	Expanded Uncertainty (U _{Lab})
Conducted Emission	Level Accuracy: 9kHz~150kHz 150kHz to 30MHz	±3.50 dB ±3.10 dB
Radiated Emission	Level Accuracy: 9kHz to 30 MHz	±4.60 dB
Radiated Emission	Level Accuracy: 30MHz to 1000 MHz	±4.50 dB
Radiated Emission	Level Accuracy: Above 1000MHz	±4.20 dB



1.8 Test Facility

The testing report were performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at 1/F.,Building 6, Rundongsheng Industrial Zone, Longzhu, Xixiang, Bao'an District, Shenzhen, Guangdong, China. At the time of testing, the following bodies accredited the Laboratory:

CNAS (L5813)

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

A2LA Certificate No.: 4750.01

The laboratory has been accredited by American Association for Laboratory Accreditation(A2LA) to ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories for the technical competence in the field of Electrical Testing. And the A2LA Certificate No.: 4750.01.FCC Accredited Test Site Number: 854351. Designation Number: CN1223.

IC Registration No.: (11950A)

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A. CAB identifier: CN0056.

2. Test Summary

Standard Section	Toot Itom	Test Semple(s)	lu damant.	Dement	
FCC		Test Sample(s)	Judgment	Remark	
FCC 15.207(a)	Conducted Emission	RW-C-202205-0225-1-1#	PASS	N/A	
FCC 15.209 & 15.247(d)	Radiated Unwanted Emissions	RW-C-202205-0225-1-1#	PASS	N/A	
FCC 15.203	Antenna Requirement	RW-C-202205-0225-1-2#	PASS	N/A	
FCC 15.247(a)(2)	6dB Bandwidth	RW-C-202205-0225-1-2#	PASS	N/A	
	99% Occupied bandwidth	RW-C-202205-0225-1-2#	PASS	N/A	
FCC 15.247(b)(3)	Peak Output Power and E.I.R.P	RW-C-202205-0225-1-2#	PASS	N/A	
FCC 15.247(e)	Power Spectral Density	RW-C-202205-0225-1-2#	PASS	N/A	
FCC 15.207	Conducted Unwanted Emissions	RW-C-202205-0225-1-2#	PASS	N/A	
FCC 15.247(d)	Emissions in nonrestricted frequency bands	RW-C-202205-0225-1-2#	PASS	N/A	
	On Time and Duty Cycle	RW-C-202205-0225-1-2#		N/A	

Note: N/A is an abbreviation for Not Applicable.

3. Test Software

Test Item	Test Software	Manufacturer	Version No.
Conducted Emission	EZ-EMC	EZ	CDI-03A2
Radiation Emission	EZ-EMC	EZ	FA-03A2RE
RF Conducted Measurement	MTS-8310	MWRFtest	V2.0.0.0
RF Test System	JS1120	Tonscend	V2.6.88.0336



4. Test Equipment

Conducted Emission	on Test				
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
EMI Test Receiver	Rohde & Schwarz	ESCI	100321	Jul. 02, 2021	Jul. 01, 2022
RF Switching Unit	Compliance Direction Systems Inc	RSU-A4	34403	Jul. 02, 2021	Jul. 01, 2022
AMN	SCHWARZBECK	NNBL 8226-2	8226-2/164	Jul. 02, 2021	Jul. 01, 2022
LISN	Rohde & Schwarz	ENV216	101131	Jul. 02, 2021	Jul. 01, 2022
Radiation Emission	n Test (A Site)	<u>.</u>			•
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Rohde & Schwarz	FSV40-N	102197	Jul. 02, 2021	Jul. 01, 2022
EMI Test Receiver	Rohde & Schwarz	ESPI	100010/007	Jul. 02, 2021	Jul. 01, 2022
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Feb. 27, 2022	Feb. 26, 2024
Horn Antenna	ETS-LINDGREN	3117	00143207	Feb. 26, 2022	Feb. 25, 2024
Horn Antenna	SCHWARZBECK	BBHA 9170	1118	Feb. 26, 2022	Feb. 25, 2024
Loop Antenna	SCHWARZBECK	FMZB 1519 B	1519B-059	Jul. 06, 2021	Jul. 05, 2022
Pre-amplifier	SONOMA	310N	185903	Feb. 26, 2022	Feb. 25, 2023
Pre-amplifier	HP	8449B	3008A00849	Feb. 26, 2022	Feb. 25, 2023
HF Amplifier	Tonscend	TAP0184050	AP21C806129	Sep. 03, 2021	Sep. 02, 2022
Radiation Emission	n Test (B Site)	<u> </u>	-	<u>.</u>	<u> </u>
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Rohde & Schwarz	FSV40-N	102197	Jul. 02, 2021	Jul. 01, 2022
MXA Signal Analyzer	Agilent	N9020A	MY47380425	Sep. 03, 2021	Sep. 02, 2022
EMI Test Receiver	Rohde & Schwarz	ESU-8	100472	Feb. 26, 2022	Feb. 25, 2023
Bilog Antenna	SCHWARZBECK	VULB 9168	1225	Dec. 05, 2021	Dec. 04, 2023
Horn Antenna	SCHWARZBECK	BBHA 9120 D	2463	May 20, 2021	May 19, 2022
Horn Antenna	SCHWARZBECK	BBHA 9170	1118	Feb. 26, 2022	Feb. 25, 2024
Loop Antenna	SCHWARZBECK	FMZB 1519 B	1519B-059	Jul. 06, 2021	Jul. 05, 2022
HF Amplifier	Tonscend	TAP9E6343	AP21C806117	Sep. 03, 2021	Sep. 02, 2022
HF Amplifier	Tonscend	TAP051845	AP21C806141	Sep. 03, 2021	Sep. 02, 2022
HF Amplifier	Tonscend	TAP0184050	AP21C806129	Sep. 03, 2021	Sep. 02, 2022
Antenna Conducte	d Emission				
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 02, 2021	Jul. 01, 2022
Spectrum Analyzer	Rohde & Schwarz	FSV40-N	102197	Jul. 02, 2021	Jul. 01, 2022
MXA Signal Analyzer	Agilent	N9020A	MY49100060	Sep. 03, 2021	Sep. 02, 2022
Spectrum Analyzer	KEYSIGT	N9020B	MY60110172	Sep. 03, 2021	Sep. 02, 2022
THE A	DARE!! Instruments	RadiPowerRPR3006W	17100015SNO26	Sep. 03, 2021	Sep. 02, 2022
	DARE!! Instruments	RadiPowerRPR3006W	17100015SNO29	Sep. 03, 2021	Sep. 02, 2022
RF Power Sensor	DARE!! Instruments	RadiPowerRPR3006W	17100015SNO31	Sep. 03, 2021	Sep. 02, 2022
	DARE!! Instruments	RadiPowerRPR3006W	17100015SNO33	Sep. 03, 2021	Sep. 02, 2022
RF Control Unit	Tonsced	JS0806-2	21F8060439	Sep. 03, 2021	Sep. 02, 2022



5. Conducted Emission

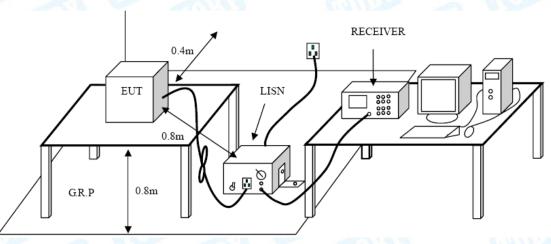
- 5.1 Test Standard and Limit
 - 5.1.1 Test Standard
 - FCC Part 15.207
 - 5.1.2 Test Limit

Frequency	Maximum RF Line Voltage (dBμV)			
Frequency	Quasi-peak Level	Average Level		
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *		
500kHz~5MHz	56	46		
5MHz~30MHz	60	50		

Notes:

- (1) *Decreasing linearly with logarithm of the frequency.
- (2) The lower limit shall apply at the transition frequencies.
- (3) The limit decrease in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

5.2 Test Setup



5.3 Test Procedure

● The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50 uH of coupling impedance for the measuring instrument.

● Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

●I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

●LISN at least 80 cm from nearest part of EUT chassis.

●The bandwidth of EMI test receiver is set at 9 kHz, and the test frequency band is from 0.15MHz to 30MHz.



5.4 Deviation From Test Standard

No deviation

5.5 EUT Operating Mode

Please refer to the description of test mode.

5.6 Test Data

Please refer to the Attachment A.



6. Radiated and Conducted Unwanted Emissions

- 6.1 Test Standard and Limit
 - 6.1.1 Test Standard

FCC Part 15.209 & FCC Part 15.247(d)

6.1.2 Test Limit

General field strength limits at frequencies Below 30MHz					
Frequency	Field Strength	Field Strength	Measurement		
(MHz)	(µA/m)*	(microvolt/meter)**	Distance (meters)		
0.009~0.490	6.37/F (F in kHz)	2400/F(KHz)	300		
0.490~1.705	63.7/F (F in kHz)	24000/F(KHz)	30		
1.705~30.0	0.08	30	30		

Note: 1, The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.

2, *is for RSS Standard, **is for FCC Standard.

General field strength limits at frequencies above 30 MHz					
FrequencyField strengthMeasurement(MHz)(μV/m at 3 m)(meters)					
30~88	100	3			
88~216	150	3			
216~960	200	3			
Above 960	500	3			

General field strength limits at frequencies Above 1000MHz				
Frequency	Distance of 3m (dBuV/m)			
(MHz)	Peak	Average		
Above 1000	74	54		

Note:

(1) The tighter limit applies at the band edges.

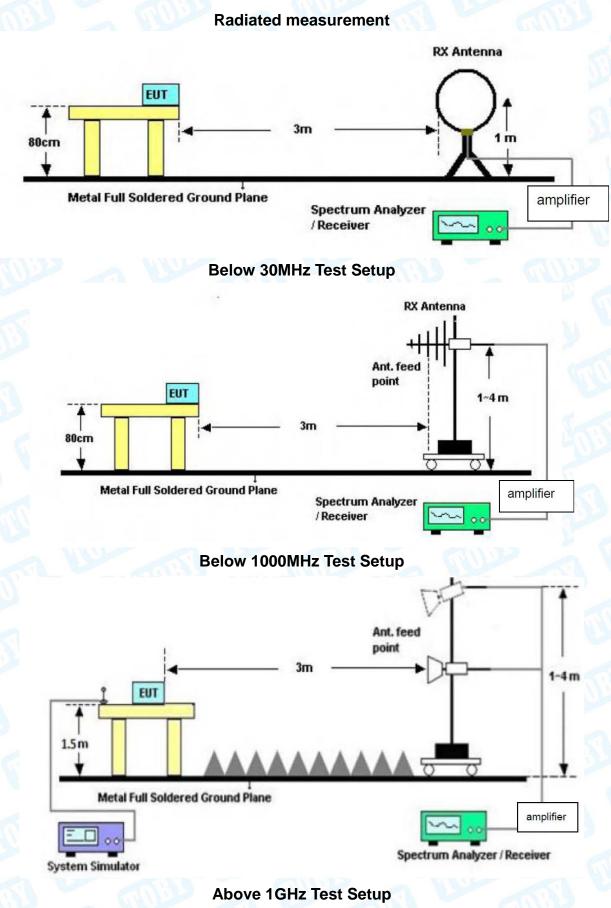
(2) Emission Level(dBuV/m)=20log Emission Level(uV/m)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.



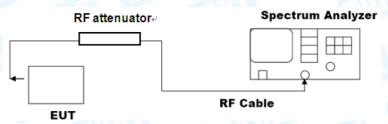
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6.2 Test Setup





Conducted measurement



6.3 Test Procedure

---Radiated measurement

● The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above ground, the table was rotated 360 degrees to determine the position of the highest radiation.

• Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.

• The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.

• The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

● If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Below 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.

● Testing frequency range 30MHz-1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection. Testing frequency range 9KHz-150Hz the measuring instrument use VBW=200Hz with Quasi-peak detection. Testing frequency range 9KHz-30MHz the measuring instrument use VBW=9kHz with Quasi-peak detection.

● Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.

•For the actual test configuration, please see the test setup photo.

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--- Conducted measurement

•Reference level measurement

- Establish a reference level by using the following procedure:
- a) Set instrument center frequency to DTS channel center frequency.
- b) Set the span to≥1.5 times the DTS bandwidth.
- c) Set the RBW = 100 kHz.
- d) Set the VBW≥[3*RBW].
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum PSD level.

Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

• Emission level measurement

Establish an emission level by using the following procedure:

- a) Set the center frequency and span to encompass frequency range to be measured.
- b) Set the RBW = 100 kHz.
- c) Set the VBW≥[3*RBW].
- d) Detector = peak.
- e) Sweep time = auto couple.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.

h) Use the peak marker function to determine the maximum amplitude level. Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified in 11.11. Report the three highest emissions relative to the limit.

6.4 Deviation From Test Standard

No deviation

6.5 EUT Operating Mode

Please refer to the description of test mode.

6.6 Test Data

Please refer to the Attachment B.



7. Emissions in nonrestricted frequency bands

7.1 Test Standard and Limit

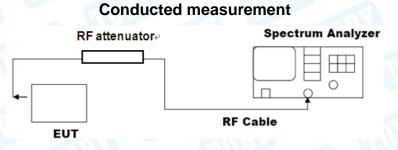
7.1.1 Test Standard

FCC Part 15.205 & FCC Part 15.247(d)

7.1.2 Test Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

7.2 Test Setup



7.3 Test Procedure

Reference level measurement

Establish a reference level by using the following procedure:

- a) Set instrument center frequency to DTS channel center frequency.
- b) Set the span to \geq 1.5 times the DTS bandwidth.
- c) Set the RBW = 100 kHz.
- d) Set the VBW≥[3*RBW].
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.

i) Use the peak marker function to determine the maximum PSD level.

Note that the channel found to contain the maximum PSD level can be used to establish the reference level.



Emission level measurement

- Establish an emission level by using the following procedure:
- a) Set the center frequency and span to encompass frequency range to be measured.
- b) Set the RBW = 100 kHz.
- c) Set the VBW \geq [3*RBW].
- d) Detector = peak.
- e) Sweep time = auto couple.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use the peak marker function to determine the maximum amplitude level.

7.4 Deviation From Test Standard

No deviation

7.5 EUT Operating Mode

Please refer to the description of test mode.

7.6 Test Data

Please refer to the Attachment C.



8. Bandwidth Test

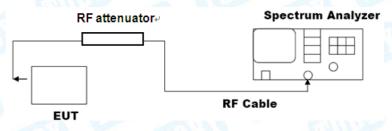
- 8.1 Test Standard and Limit
 - 8.1.1 Test Standard

FCC Part 15.205 & FCC Part 15.247(d)

8.1.2 Test Limit

Test Item	Limit
-6dB bandwidth (DTS bandwidth)	>=500 KHz
99% occupied bandwidth	

8.2 Test Setup



8.3 Test Procedure

---DTS bandwidth

- The steps for the first option are as follows:
- a) Set RBW = 100 kHz.
- b) Set the VBW≥[3*RBW].
- c) Detector = peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.

g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

---occupied bandwidth

• The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission. The following procedure shall be used for measuring 99% power bandwidth:

a) The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW.

b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW, unless otherwise specified by the applicable requirement.

c) Set the reference level of the instrument as required, keeping the signal from exceeding



the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2.

d) Step a) through step c) might require iteration to adjust within the specified range.

e) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.

f) Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.

g) If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequence between these two frequencies.

 h) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled.
 Tabular data may be reported in addition to the plot(s).

8.4 Deviation From Test Standard

No deviation

8.5 EUT Operating Mode

Please refer to the description of test mode.

8.6 Test Data

Please refer to the Attachment D.

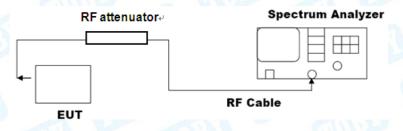


9. Peak Output Power

- 9.1 Test Standard and Limit
 - 9.1.1 Test Standard
 - FCC Part 15.247(b)(3)
 - 9.1.2 Test Limit

Test Item	Limit
Peak Output Power	not exceed 1 W or 30dBm
E.I.R.P	not exceed 4 W or 36dBm

9.2 Test Setup



9.3 Test Procedure

---RBW≥DTS bandwidth

• The following procedure shall be used when an instrument with a resolution bandwidth that is greater than

the DTS bandwidth is available to perform the measurement:

- a) Set the RBW≥DTS bandwidth.
- b) Set VBW≥[3*RBW].
- c) Set span≥[3*RBW].
- d) Sweep time = auto couple.
- e) Detector = peak.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use peak marker function to determine the peak amplitude level.

9.4 Deviation From Test Standard

No deviation

9.5 EUT Operating Mode

Please refer to the description of test mode.

9.6 Test Data

Please refer to the Attachment E.



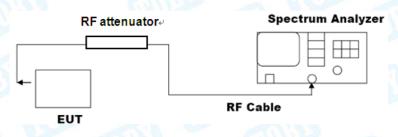
10. Power Spectral Density

10.1 Test Standard and Limit

10.1.1 Test Standard FCC Part 15.247(e) 10.1.2 Test Limit

Test Item	Limit
Power Spectral Density	8dBm(in any 3 kHz)

10.2 Test Setup



10.3 Test Procedure

• The following procedure shall be used if maximum peak conducted output power was used to determine compliance, and it is optional if the maximum conducted (average) output power was used to determine compliance:

- a) Set analyzer center frequency to DTS channel center frequency.
- b) Set the span to 1.5 times the DTS bandwidth.
- c) Set the RBW to 3 kHz≤RBW≤100 kHz.
- d) Set the VBW \geq [3*RBW].
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum amplitude level within the RBW.

j) If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.

10.4 Deviation From Test Standard

No deviation

10.5 Antenna Connected Construction

Please refer to the description of test mode.

10.6 Test Data

Please refer to the Attachment F.



11. Antenna Requirement

11.1 Test Standard and Limit

11.1.1 Test Standard FCC Part 15.203

11.1.2 Requirement

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

11.2 Deviation From Test Standard

No deviation

11.3 Antenna Connected Construction

The gains of the antenna used for transmitting is 3.0dBi, and the antenna de-signed with Unique connector antenna and consideration of replacement. Please see the EUT photo for details.

11.4 Test Data

The EUT antenna is a Dipole Antenna. It complies with the standard requirement.

	Antenna Type			
100	Permanent attached antenna			
a B	Unique connector antenna			
2	Professional installation antenna			



Attachment A--Conducted Emission Test Data

Temperat	ure:	24.2 ℃		R	elative Humi	dity: 4	43%	GUD
Test Volta	age:	AC 120	0V/60Hz		a			
Terminal:	;	Line					J. La	
Test Mod	e:	Mode 1	-		- AR			A.S.
Remark:		Only w	orse case	e is reported.				
80.0 dBuV	WWWW.	X WWW		Marghon Markov Marg				peak
-20 0.150		0.5	Reading	(MHz)	₅ Measure-			30.000
No. Mł	k. F	req.	Level	Factor	ment	Limit	Over	
	N	1Hz	dBuV	dB	dBuV	dBuV	dB	Detector
1 *	0.3	940	26.46	11.45	37.91	57.98	-20.07	QP
2	0.3	940	6.68	11.45	18.13	47.98	-29.85	AVG
3	0.9	340	13.31	11.23	24.54	56.00	-31.46	QP
4	0.9	340	-1.04	11.23	10.19	46.00	-35.81	AVG
5	1.1	100	11.38	11.12	22.50	56.00	-33.50	QP
6	1.1	100	-1.04	11.12	10.08	46.00	-35.92	AVG
7	2.3	500	9.13	10.44	19.57	56.00	-36.43	QP
1	0.0	500	-1.28	10.44	9.16	46.00	-36.84	AVG
8	2.3	000			24.42	60.00	-35.58	QP
		860	14.33	10.09				
8	5.5		14.33 1.05	10.09	11.14	50.00	-38.86	AVG
8 9	5.5 5.5	860					-38.86 -35.18	AVG QP

1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)

2. Margin (dB) =QuasiPeak/Average (dBuV)-Limit (dBuV)



Temperature:	24.2℃	Relative Humidity:	43%
Test Voltage:	AC 120V/60Hz		- MUF
Terminal:	Neutral	a	
Test Mode:	Mode 1		
Remark:	Only worse case is reported		GILD
80.0 dBw/ 30 -20			QP: AVG:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.3980	26.91	11.44	38.35	57.89	-19.54	QP
2	*	0.3980	18.57	11.44	30.01	47.89	-17.88	AVG
3		1.0220	16.18	11.18	27.36	56.00	-28.64	QP
4		1.0220	9.02	11.18	20.20	46.00	-25.80	AVG
5		1.6499	15.48	10.78	26.26	56.00	-29.74	QP
6		1.6499	8.76	10.78	19.54	46.00	-26.46	AVG
7		3.6619	11.77	10.18	21.95	56.00	-34.05	QP
8		3.6619	6.10	10.18	16.28	46.00	-29.72	AVG
9		5.0099	16.81	10.08	26.89	60.00	-33.11	QP
10		5.0099	4.66	10.08	14.74	50.00	-35.26	AVG
11		7.9778	15.95	10.14	26.09	60.00	-33.91	QP
12		7.9778	6.38	10.14	16.52	50.00	-33.48	AVG

Remark: 1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)

2. Margin (dB) =QuasiPeak/Average (dBuV)-Limit (dBuV)



Attachment B--Unwanted Emissions Data

---Radiated Unwanted Emissions

9 KHz~30 MHz

From 9 KHz to 30 MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB Below the permissible value has no need to be reported.

30MHz~1GHz

emperature:	24.3 ℃	Relative Humidity:	45%
est Voltage:	AC 120V/60Hz		
nt. Pol.	Horizontal		
est Mode:	Mode 2 (923.3MHz)		
Remark:	Only worse case is	reported.	NUL A
80.0 dBuV/m		Fundamental Frequency	
70		Fundamental Frequency	
60		(RF)FCC 15	iC 3M Radiation
50		Margin -6 d	
40		* 5 6X	
30		Marthulih	J. Handerly Marchelle W
10 when when the second	allering her word with and	pubritum and the provide a state of the second	
0			
-10			
-20	60.00	(MHz) 300.00	1000.00

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1!	82.9384	62.56	-26.64	35.92	40.00	-4.08	peak
2	125.0065	55.22	-22.97	32.25	43.50	-11.25	peak
3	175.0367	55.59	-22.69	32.90	43.50	-10.60	peak
4 *	250.3011	64.83	-22.34	42.49	46.00	-3.51	peak
5!	375.9385	60.70	-19.03	41.67	46.00	-4.33	peak
6 !	501.1790	57.15	-15.62	41.53	46.00	-4.47	peak

*:Maximum data x:Over limit !:over margin

- 1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
- 2. QuasiPeak (dBµV/m)= Corr. (dB/m)+ Read Level (dBµV)
- 3. Margin (dB) = QuasiPeak (dB μ V/m)-Limit QPK(dB μ V/m)

Ten	npera	ature:	23.5	C		R	elative Hu	midity:	46%	
Tes	t Vol	tage:	AC 1	20V/6	60Hz			133		aus
Ant	. Pol		Vertie	cal	AU		av	1		
Tes	t Mo	de:	Mode	e 2 (92	23.3MH	Hz)		19		1
Rer	nark	:	Only	worse	e case	is reported.	- OF		5	100
80.0)_dB	ıV/m								
70 60 50 40 30 20 10			Jonan J	Lunda	,	2 Myndunhadau	Fundamer	Intal Frequency (RFJFCC 1 Margin -6	5C 3M Radiatic	peak
-10										
-10 -20										
-20	30.000		60.00			(MHz)	300	0.00		1000.000
-20 3	30.000 NO.		60.00 Jency Hz)	1	ading BuV)	^(MH₂) Factor (dB/m)	Level	0.00 Limit (dBuV/m)	Margin (dB)	1000.000 Detector
-20 3			uency Hz)	(dE	U U	Factor	Level	Limit		
-20 3	lo.	(MI 67.6	uency Hz)	(dE 58	3uV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	(dB)	Detector
-20 3	10. 1 !	(MI 67.6	uency Hz) 3751 0065	(dE 58 61	3uV) 3.42	Factor (dB/m) -24.14	Level (dBuV/m) 34.28	Limit (dBuV/m) 40.00	(dB) -5.72	Detector peak

*:Maximum data !:over margin x:Over limit

501.1790

625.0780

Remark:

5 *

6!

- Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
 QuasiPeak (dBμV/m)= Corr. (dB/m)+ Read Level (dBμV)

57.18

53.54

-15.62

-12.86

41.56

40.68

46.00

46.00

-4.44

-5.32

peak

peak

3. Margin (dB) = QuasiPeak (dBµV/m)-Limit QPK(dBµV/m)

empera	ature:	23.5°	2		Relative Hu	imidity:	46%	
est Vol	ltage:	AC 12	20V/60Hz					au
nt. Pol	I.	Horizo	ontal		av		117	
est Mo	de:	Mode	2 (925.1MH	Hz)	12	A BK	1 de la	-
emark		Only	worse case	is reported.	100		5	A D
0.0dBu	JV/m							
0					Fundament	al Frequency		
0						(RF)FCC 15 Margin -6-dl	C 3M Radiatio	
o 🗕					4		5	⁸ X
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	New York Here	1444411V			300.		MAAM	
	Frequ (Mł	60.00	Reading (dBuV)	Walk and proportion in the	300. Level (dBuV/m)	00 Limit	Margin (dB)	1000.00
0	Frequ	60.00 iency Hz)	Reading	(мн _г) Factor	Level	00 Limit	Margin	1000.00 Detector
0 0 0 20 30.000 NO.	Frequ (Mł	60.00 lency Hz) 482	Reading (dBuV)	(мн₂) Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	1000.00
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Frequ (Mł 82.6	60.00 lency Hz) 482 0066	Reading (dBuV) 53.71	(мн _z) Factor (dB/m) -26.65	Level (dBuV/m) 27.06	00 Limit (dBuV/m) 40.00	Margin (dB) -12.94	1000.00 Detector
0 0 0 30.000 No. 1 2	Frequ (Mł 82.6 125.0	60.00 lency Hz) 482 0066 0368	Reading (dBuV) 53.71 46.62	(мнг) Factor (dB/m) -26.65 -22.97	Level (dBuV/m) 27.06 23.65	00 Limit (dBuV/m) 40.00 43.50	Margin (dB) -12.94 -19.85	1000.00 Detector peak peak
0 0 30.000 No. 1 2 3	Frequ (Mł 82.6 125.0 175.0	60.00 lency Hz) 482 0066 0368 3012	Reading (dBuV) 53.71 46.62 47.31	(мнг) Factor (dB/m) -26.65 -22.97 -22.69	Level (dBuV/m) 27.06 23.65 24.62	Decision of the second	Margin (dB) -12.94 -19.85 -18.88	Detector peak peak peak

*:Maximum data x:Over limit !:over margin

- Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
 QuasiPeak (dBμV/m)= Corr. (dB/m)+ Read Level (dBμV)
- 3. Margin (dB) = QuasiPeak (dBµV/m)-Limit QPK(dBµV/m)

empera	ature:	23.5°	0	R	elative Hun	nidity:	46%	
est Vol		AC 1	20V/60Hz					all
nt. Pol	•	Vertic	al		aV		120	6
est Mo	de:	Mode	2 (925.1MH	Hz)	12	119	192	1
emark	:	Only	worse case	is reported.			5	A D
0.0 dBu	V/m							
0					Fundamer	ntal Frequency		
0						(RF)FCC 15 Margin -6 d	5C 3M Radiatio	»"
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0 0 0 10 20 30.000	W Martin your	60.00	han the second s	(MHz)	3 3 300	halphalamad		
	U	60.00		(MHz)	1000 1000 1000 1000 1000 1000 1000 100	.00		
	Frequ (Mł	60.00 Iency	Reading (dBuV)	M Marala	nn yley al marke	.00 Limit	Margin	1000.0
	Frequ	60.00 iency Hz)	Reading	(MHz) Factor	300 Level	.00 Limit		
0 0 10 20 30.000	Frequ (Mł	60.00 iency Hz) 989	Reading (dBuV)	(мн₂) Factor (dB/m)	300 Level (dBuV/m)		(dB)	
0 0 10 20 30.000 NO. 1	Frequ (Mł	60.00 iency Hz) 989 0066	Reading (dBuV) 50.67	(мн₂) Factor (dB/m) -24.06	300 Level (dBuV/m) 26.61		(dB) -13.39	1000.0 Detector peak
0 0 10 20 30.000 NO. 1 2 1 2 1 2 1	Frequ (Mł 66.4 125.0	60.00 iency Hz) 989 0066 3012	Reading (dBuV) 50.67 61.54	(MHz) Factor (dB/m) -24.06 -22.97	300 Level (dBuV/m) 26.61 38.57	Limit (dBuV/m) 40.00 43.50	(dB) -13.39 -4.93	Detector peak peak
0 0 10 20 30.000 NO. 1 2 1 3	Frequ (MH 66.4 125.0 250.3	60.00 iency Hz) 989 0066 3012 9385	Reading (dBuV) 50.67 61.54 54.86	(мн₂) Factor (dB/m) -24.06 -22.97 -22.34	300 Level (dBuV/m) 26.61 38.57 32.52	Limit (dBuV/m) 40.00 43.50 46.00	(dB) -13.39 -4.93 -13.48	Totector peak peak peak

*:Maximum data x:Over limit !:over margin

- Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
 QuasiPeak (dBμV/m)= Corr. (dB/m)+ Read Level (dBμV)
- 3. Margin (dB) = QuasiPeak (dBµV/m)-Limit QPK(dBµV/m)

emp	erat	ure:	23.5	С			Relative Hu	umidity:	46%	
est V	/olta	age:	AC 12	20V/6	60Hz		611	132		UD
nt. P	Pol.		Horiz	ontal	an		av		120	
est N	Mod	e:	Mode	2 (92	27.5MH	lz)	32	NP A	1.16	
ema	ark:		Only	worse	e case i	s reported.	-		5	100
80.0	dBu∖	√/m								
70 -							Fundament	al Frequency		
60 -									iC 3M Radiatio	» _
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40 -								5		·
30 -				2	-			5 X		pea
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10 0 -10		huhward went	60.00			³ _{////////////////////////////////////}	1	1.00	Mar And	
10 0 -10 -20	000	Frequ (Mł	60.00 Jency	Rea	ading BuV)	³ (МН2) Factor (dB/m)	Level	Limit (dBuV/m)	Margin (dB)	
10 0 -10 -20 30.0	000	Frequ	60.00 Jency Hz)	Rea (dE	ading	Factor	Level	Limit		
10 0 -10 -20 30.0	000	Frequ (Mł	60.00 Jency Hz)	Rea (dE	ading BuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	(dB)	Detector
10 0 -10 -20 30.0 NO	000	Frequ (Mi 67.4	60.00 Jency Hz) 382 5482	Rea (dE 44	ading BuV) 4.53	Factor (dB/m) -24.12	Level (dBuV/m) 20.41	Limit (dBuV/m) 40.00	(dB) -19.59	Detector peak
10 -10 -20 30.0 NC 1 2	000	Frequ (MI 67.4 82.6	60.00 Jency Hz) 382 3482 0066	Rea (dE 44 54	ading BuV) 4.53 4.39	Factor (dB/m) -24.12 -26.65	Level (dBuV/m) 20.41 27.74	Limit (dBuV/m) 40.00 40.00	(dB) -19.59 -12.26	Detector peak peak
10 0 -10 -20 30.0 No 1 2 3 30.0	000	Frequ (MI 67.4 82.6 125.0	60.00 Jency Hz) 382 3482 0066 3012	Rea (dE 44 54 45 55	ading BuV) 4.53 4.39 5.57	Factor (dB/m) -24.12 -26.65 -22.97	Level (dBuV/m) 20.41 27.74 22.60	Limit (dBuV/m) 40.00 40.00 43.50	(dB) -19.59 -12.26 -20.90	Detector peak peak peak

*:Maximum data x:Over limit !:over margin

- Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
 QuasiPeak (dBμV/m)= Corr. (dB/m)+ Read Level (dBμV)
- 3. Margin (dB) = QuasiPeak (dBµV/m)-Limit QPK(dBµV/m)

emper	ature:	23.5°C	2		R	elative Hur	nidity:	46%	
est Vo	Itage:	AC 12	20V/60)Hz			RU I		(III)
nt. Po	I.	Vertic	al	AU		aV		110	
est Mo	ode:	Mode	2 (92	7.5MH	lz)	50			-
emark	:	Only	worse	case	is reported.	10		5	10
80.0 d	Bu¥/m								
70						Fundament	al Frequency		
60							(RF)FCC 15	C 3M Radiation	
50							Margin -6-dl	8	Š
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20 10 0 -10 -20	white				(MHz)		00		
20 10 0 -10 -20	Frequ (Mł	iency	Rea	ding uV)		300. Level (dBuV/m)	00 Limit	Margin	
20 10 -10 -20 30.000		iency Hz)	Rea	ding uV)	(мн₂) Factor	Level	00 Limit	Margin	1000.00
20 10 -10 -20 30.000	(Mł	iency Hz) 0385	Rea (dB	ding uV) .61	(мн₂) Factor (dB/m)	Level (dBuV/m)	00 Limit (dBuV/m)	Margin (dB)	1000.00
20 10 -10 -20 30.000 NO. 1	(MH 82.9	uency Hz) 0385 0066	Rea (dB	ding uV) .61 .12	(мн ₂) Factor (dB/m) -26.64	Level (dBuV/m) 27.97	00 Limit (dBuV/m) 40.00	Margin (dB) -12.03	1000.00 Detecto peak
20 10 -10 -20 30.000 NO. 1 2	(MH 82.9 125.0	uency Hz) 0385 0066 3080	Rea (dB 54. 60.	ding uV) .61 .12	(мн₂) Factor (dB/m) -26.64 -22.97	Level (dBuV/m) 27.97 37.15	00 Limit (dBuV/m) 40.00 43.50	Margin (dB) -12.03 -6.35	Detecto peak peak

43.07

46.00

-2.93

peak

-9.37

*:Maximum data !:over margin x:Over limit

842.1296

Remark:

6 *

- Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
 QuasiPeak (dBμV/m)= Corr. (dB/m)+ Read Level (dBμV)

52.44

3. Margin (dB) = QuasiPeak (dBµV/m)-Limit QPK(dBµV/m)

Above 1GHz

Temperature:	26 ℃	Relative Humidity:	54%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Horizontal		
Test Mode:	TX 923.3MHz		
Remark:	Only worse case is r	reported.	

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1 *	1846.781	51.80	-7.44	44.36	54.00	-9.64	AVG
2	1846.843	64.49	-7.44	57.05	74.00	-16.95	peak

Remark:

1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB) 2. Peak/AVG (dBμV/m)= Corr. (dB/m)+ Read Level (dBμV)

3. Margin (dB) = Peak/AVG (dBµV/m)-Limit PK/AVG(dBµV/m)

4. The tests evaluated1-10GHz, The testing has been conformed to the 10th harmonic of the highest fundamental frequency.

5. No report for the emission which more than 20dB below the prescribed limit.

Temperature:	26 ℃	Relative Humidity:	54%
Test Voltage:	AC 120V/60Hz	anits a	
Ant. Pol.	Vertical	Con Bu	CUL)
Test Mode:	TX 923.3MHz		

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1	1846.720	64.75	-7.44	57.31	74.00	-16.69	peak
2 *	1846.981	51.28	-7.44	43.84	54.00	-10.16	AVG

Remark:

1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)

2. Peak/AVG (dBµV/m)= Corr. (dB/m)+ Read Level (dBµV)

3. Margin (dB) = Peak/AVG (dB μ V/m)-Limit PK/AVG(dB μ V/m)

4. The tests evaluated1-10GHz, The testing has been conformed to the 10th harmonic of the highest fundamental frequency.

5. No report for the emission which more than 20dB below the prescribed limit.



Temperature:	26 ℃	Relative Humidity:	54%
Test Voltage:	AC 120V/60Hz	THUR A	200
Ant. Pol.	Horizontal		
Test Mode:	TX 925.1MHz		
Remark:	Only worse case is rep	oorted.	

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1 *	1850.487	51.65	-7.40	44.25	54.00	-9.75	AVG
2	1850.581	64.74	-7.40	57.34	74.00	-16.66	peak

Remark:

- 1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB) 2. Peak/AVG (dBμV/m)= Corr. (dB/m)+ Read Level (dBμV)
- 3. Margin (dB) = Peak/AVG (dBµV/m)-Limit PK/AVG(dBµV/m)
- 4. The tests evaluated1-10GHz, The testing has been conformed to the 10th harmonic of the highest fundamental frequency.

5. No report for the emission which more than 20dB below the prescribed limit.

Temperature:	26 ℃	Relative Humidity:	54%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Vertical	CORU.	
Test Mode:	TX 925.1MHz		

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1	1850.487	63.74	-7.40	56.34	74.00	-17.66	peak
2 *	1850.531	50.68	-7.40	43.28	54.00	-10.72	AVG

Remark:

- 1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
- 2. Peak/AVG (dBµV/m)= Corr. (dB/m)+ Read Level (dBµV)
- 3. Margin (dB) = Peak/AVG (dB μ V/m)-Limit PK/AVG(dB μ V/m)

4. The tests evaluated1-10GHz, The testing has been conformed to the 10th harmonic of the highest fundamental frequency.

5. No report for the emission which more than 20dB below the prescribed limit.



Temperature:	26 ℃	Relative Humidity:	54%
Test Voltage:	AC 120V/60Hz	TUP	
Ant. Pol.	Horizontal		
Test Mode:	TX 927.5MHz		
Remark:	Only worse case is re	ported.	

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1 *	1855.257	51.05	-7.37	43.68	54.00	-10.32	AVG
2	1855.384	64.30	-7.36	56.94	74.00	-17.06	peak

Remark:

- 1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB) 2. Peak/AVG (dBμV/m)= Corr. (dB/m)+ Read Level (dBμV)
- 3. Margin (dB) = Peak/AVG (dBµV/m)-Limit PK/AVG(dBµV/m)
- 4. The tests evaluated1-10GHz, The testing has been conformed to the 10th harmonic of the highest fundamental frequency.

5. No report for the emission which more than 20dB below the prescribed limit.

Temperature:	26 ℃	Relative Humidity:	54%
Test Voltage:	AC 120V/60Hz		
Ant. Pol.	Vertical	CORU.	
Test Mode:	TX 927.5MHz		E I

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1 *	1855.347	52.19	-7.37	44.82	54.00	-9.18	AVG
2	1855.587	64.67	-7.36	57.31	74.00	-16.69	peak

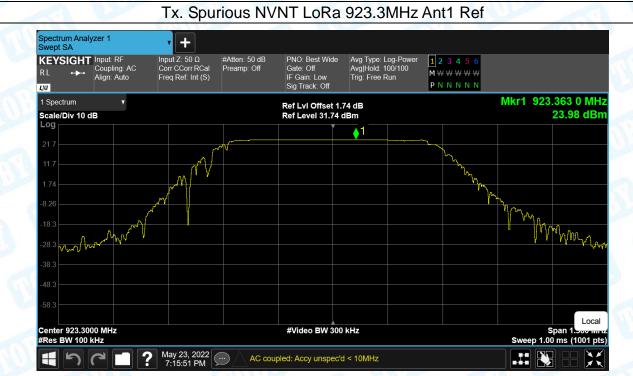
Remark:

- 1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
- 2. Peak/AVG (dBµV/m)= Corr. (dB/m)+ Read Level (dBµV)
- 3. Margin (dB) = Peak/AVG (dB μ V/m)-Limit PK/AVG(dB μ V/m)
- 4. The tests evaluated1-10GHz, The testing has been conformed to the 10th harmonic of the highest fundamental frequency.

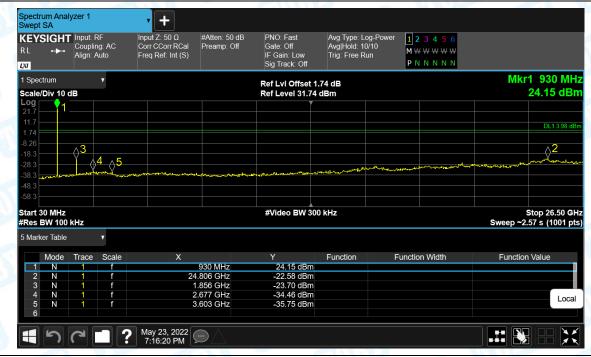
5. No report for the emission which more than 20dB below the prescribed limit.



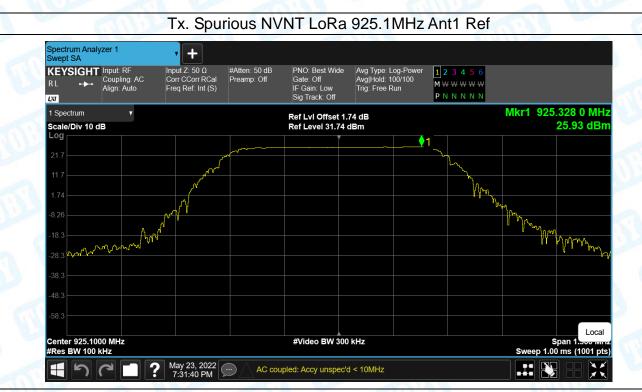
---Conduction Unwanted Emissions



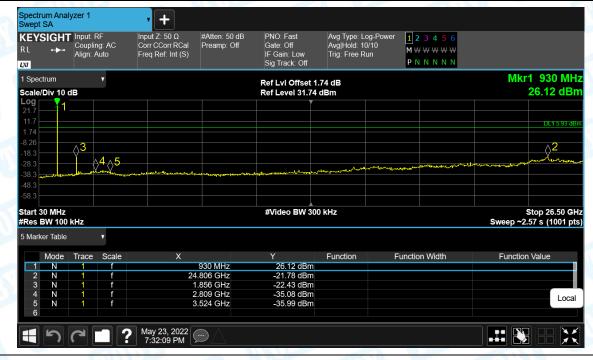
Tx. Spurious NVNT LoRa 923.3MHz Ant1 Emission



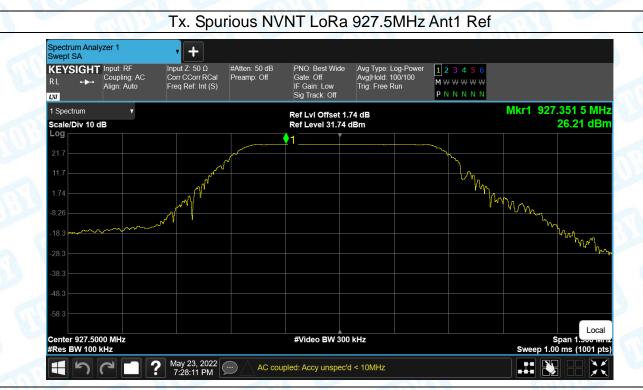




Tx. Spurious NVNT LoRa 925.1MHz Ant1 Emission







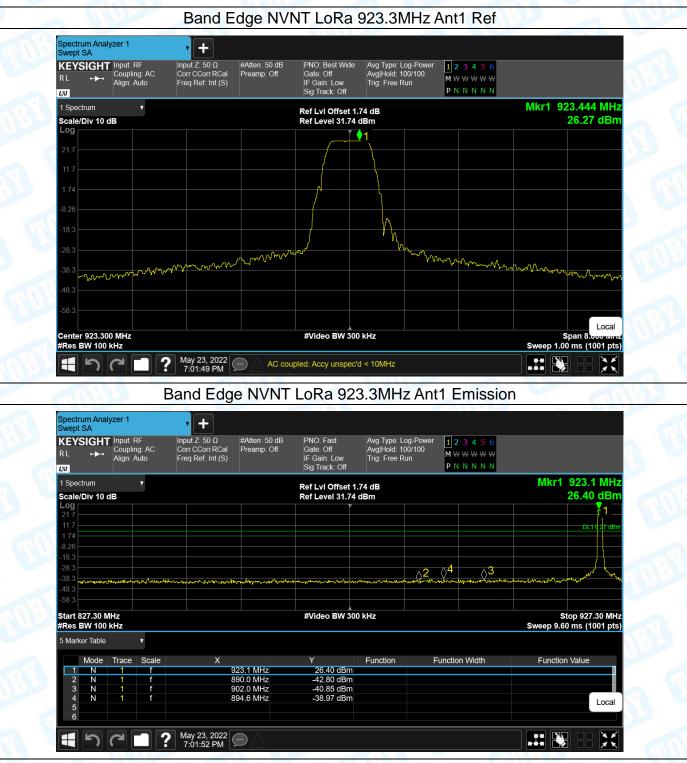
Tx. Spurious NVNT LoRa 927.5MHz Ant1 Emission

			A		
Input: RF Coupling: AC					
Align: Auto	Freq Ref: Int (S)	IF Gain: Lo	w Trig: Free Run	M ** ** ** **	
		Sig Track: (Off	PNNNN	
•		Ref Lvi Off	set 1.74 dB		Mkr1 930 M
dB		Ref Level 3	31.74 dBm		26.31 dB
			Y		
					DL1 6.21 c
					DL10.210
					in and a second se
{405			and the second state of th	mand and the second sec	and a start and a
and a state of the second	ر	and and an and and a second			
k Ha		#Video B	W 300 kHz		Stop 26.50 G Sweep ~2.57 s (1001 p
					Sweep -2.57 S (1001)
V					
Trace Scale	Х	Y	Function	Function Width	Function Value
1 f	930) MHz 26.31 c	dBm	Function Width	Function Value
1 f 1 f	930	0 MHz 26.31 c 6 GHz -21.72 c	dBm dBm	Function Width	Function Value
1 f 1 f 1 f	930 1.856 1.856	MHz 26.31 c 5 GHz -21.72 c 5 GHz -21.72 c	dBm dBm dBm	Function Width	
1 f 1 f 1 f	930 1.850 1.856 2.703	0 MHz 26.31 c 6 GHz -21.72 c	dBm dBm dBm dBm	Function Width	Function Value
1 f 1 f 1 f 1 f	930 1.850 1.856 2.703	O MHz 26.31 c 6 GHz -21.72 c 6 GHz -21.72 c 6 GHz -21.72 c 6 GHz -21.72 c 7 GHz -21.72 c	dBm dBm dBm dBm	Function Width	
	Coupling: AC Align: Auto	Coupling: AC Align: Auto Corr CCorr RCal Freq Ref: Int (S) Corr CCorr RCal Corr CCorr RCal Freq Ref: Int (S) Corr CCO Freq Ref: Int (S) Freq Ref: Int	Coupling: AC Align: Auto Corr CCorr RCal Freq Ref: Int (S) Ref Lvi Off Ref Level 3 Align: Auto Sig Track Ref Lvi Off Ref Level 3 Align: Auto Ref Lvi Off Ref Level 3 Align: Auto Ref Lvi Off Ref Level 3 Align: Auto Ref Lvi Off Ref Level 3	Coupling: AC Align: Auto Corr CCorr RCal Freq Ref: Int (S) Preamp: Off Gate: Off Avg Hold: 10/11 IF Gain: Low Sig Track: Off Trig: Free Run Sig Trig: Free Run Sig Track: Off Trig: Free Run Sig Trig: Free	Coupling: AC Align: Auto Corr CCorr RCal Freq Ref: Int (S) Preamp: Off Gale: Off IF Gain: Low Sig Track: Off Avg[Hold: 10/10 Trig: Free Run Image: Corr W w w w w M w w w w w P N N N N dB Ref Lvl Offset 1.74 dB Ref Level 31.74 dBm d2 Add a state of trig: Trig: Free Run Image: Corr W w w w w P N N N N dB Ref Lvl Offset 1.74 dB Ref Level 31.74 dBm d4 State of trig: Corr W w w w w w w w w w w w w w w w w w w

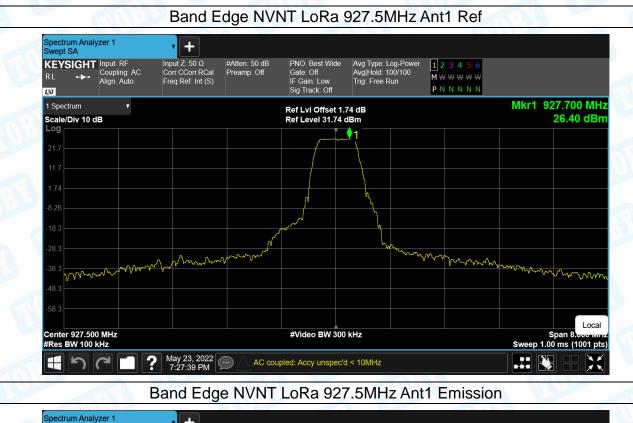


Attachment C--Emissions In Nonrestricted Frequency

Bands Data







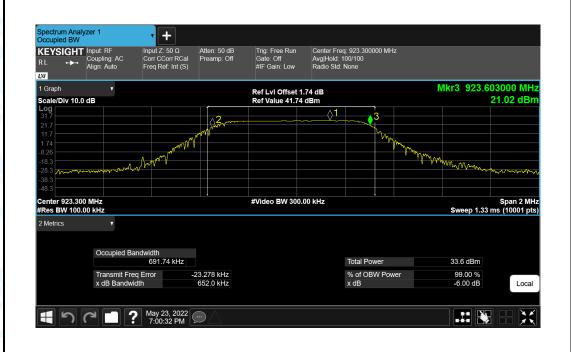
Swept				• +							
KEYS RL LM	SIGH1 .≁•	Input: F Couplir Align: A	ng: AC	Input Ζ: 50 Ω Corr CCorr RCal Freq Ref: Int (S)	#Atten: 50 dB Preamp: Off	PNO: Fast Gate: Off IF Gain: Low Sig Track: Off	Avg Type: Lo Avg Hold: 10 Trig: Free Ri	00/100	1 2 3 4 5 6 M \vee vee vee vee vee vee vee vee vee ve		
1 Spect	trum		v			Ref LvI Offset	1.74 dB			Mkr1	927.4 MH
Scale/	Div 10 (dB				Ref Level 31.74					26.52 dBr
Log	71					Ĭ					
21.7	٦ľ										
1 74	0	2									DL1 6.40 dB
-8.26	ŢΥ										
-18.3	\rightarrow										
-28.3		h									
-38.3	, I ^{UD}	" where the	- - -	marthan the offer and your	manufally	Jon Marine marge	W. W Marcaralyma	A. M. Mary	mpanyonstan	unter montante	hand a love by the mark
-48.3											
-58.3											
	.92350 3W 100					#Video BW 30	0 kHz				top 1.02350 GH 50 ms (1001 pt
	er Table		•								
	Mode	Trace	Scale	Х		Y	Function	Eu	nction Width	Functio	n Value
1	N	1	f		27.4 MHz	26.52 dBm	1 unction	- Tu			
2	Ν	1	f	9	28.0 MHz	-2.507 dBm					
3	Ν	1	f		60.0 MHz	-42.96 dBm					
4 5	Ν	1	f	9	28.0 MHz	-2.507 dBm					Local
5 6											
	5			May 23, 2022 7:27:42 PM	\frown						
		<u> </u>		7:27:42 PM							



Attachment D--Bandwidth Data

Temperature:	25 ℃	C Relative Humidity:		55%	600	
Test Voltage:	DC 5\		000			
Test Mode:	TX Mo	ode		132 - 61	UP	-
Channel freque	ncy		6dB Bai	ndwidth		Limit
(MHz) (kHz)		łz)		(kHz)		
923.3			652	2.0		
925.1 629.3		9.3		>=500		
927.5		609.8				

923.3MHz

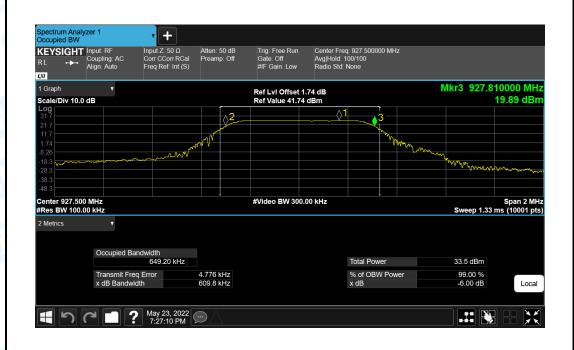




925.1MHz



927.5MHz

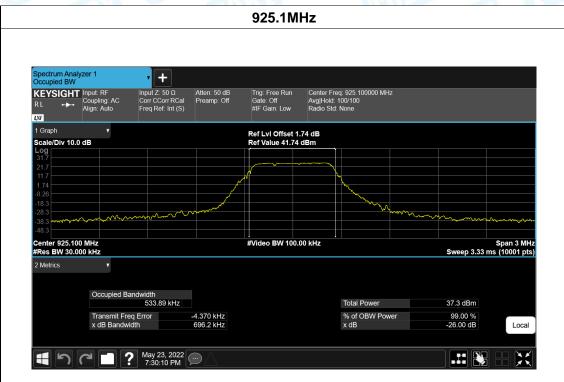




Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 5V	MILLON ALLON	
Test Mode:	TX Mode		U.L.
Channel freque	ency	99% Bandwidth	Limit
(MHz)		(kHz)	(kHz)
923.3	923.3 551.26		
925.1		533.89	/
927.5		514.83	
		923.3MHz	







927.5MHz





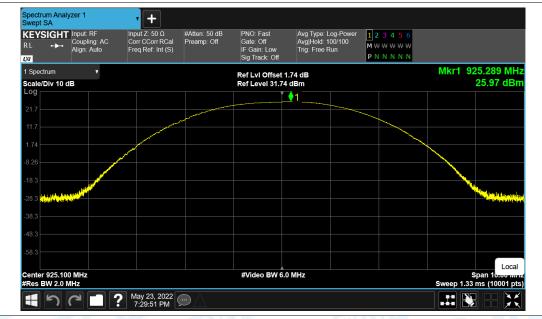
Attachment E—Peak Output Power Data

Temperature:	perature: 25°C Relative Humidity:		idity: 5	55%	
Test Voltage:	DC 5V				
Test Mode:	TX Mode			in a	
Channel frequen	cy (MHz)	Test Result (dBm)	Li	mit (dBm)	
923.3		26.80			
925.1		25.97		30	
927.5		27.39			

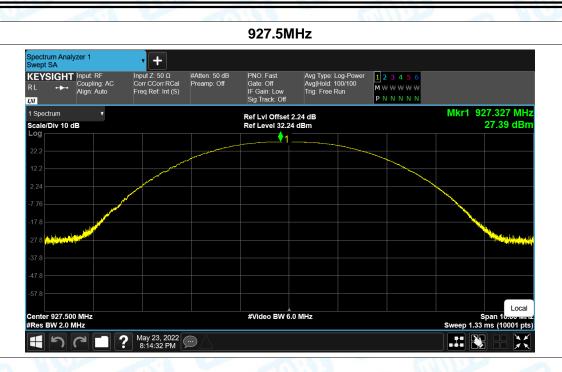
923.3MHz









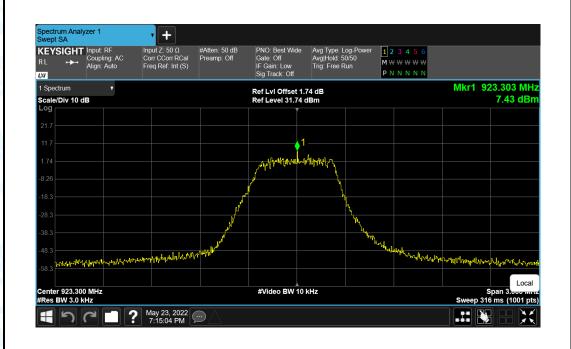




Attachment F—Power Spectral Density Data

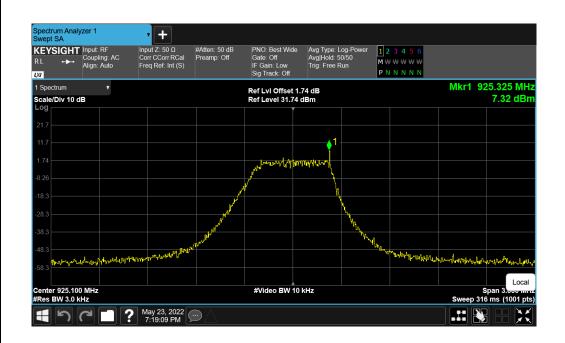
Temperature:	25℃ Relative H		midity:	55%
Test Voltage:	DC 5V			
Test Mode:	TX Mode	anis)		L'E A
Channel Frequency		Power Density	Limit	Popult
(MHz)		(dBm/3kHz)	(dBm/3k	Hz) Result
923.3		7.43		
925.1		7.32	8	PASS
927.5		7.55		

923.3MHz

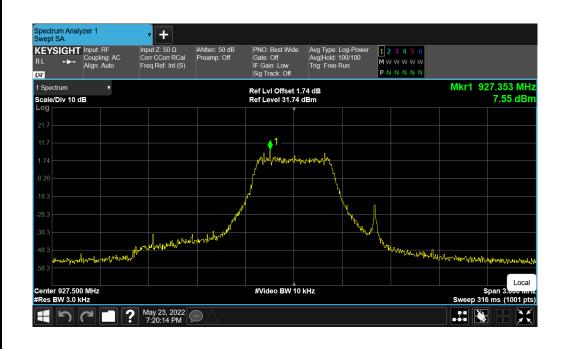




925.1MHz



927.5MHz



-----END OF REPORT-----