

FCC Radio Test Report FCC ID: XMF-MID8011

Original Grant

Report No.		TB-FCC171370
Applicant		Lightcomm Technology Co., Ltd.
Equipment Under Tes	t (El	
EUT Name	:	8"Tablet
Model No.	:	100003561
Series Model No.	1	MID8011
Brand Name	÷	onn
Receipt Date	1:8	2020-01-02
Test Date	:	2020-01-03 to 2020-01-14
Issue Date		2020-01-14
Standards	1	FCC Part 15, Subpart C 15.247
Test Method	:	ANSI C63.10: 2013
Conclusions	:	PASS
		In the configuration tested, the EUT complied with the standards specified above,

Jack

: INAN SU : fay tai.

The EUT technically complies with the FCC requirements

Test/Witness Engineer

Engineer Supervisor

Engineer Manager



This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.



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Revision History

Report No.	Version	Description	Issued Date
TB-FCC171370	Rev.01	Initial issue of report	2020-01-15
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1. General Information about EUT

1.1 Client Information

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Applicant	1	Lightcomm Technology Co., Ltd.	
Address	:	UNIT 1306 13/F ARION COMMERCIAL CENTRE, 2-12 QUEEN'S ROAD WEST, SHEUNG WAN HK	
Manufacturer	3	Huizhou Hengdu Electronics Co., Ltd.	
Address		No.8 Huitai Road, Huinan High-tech Industrial Park, Huiao Avenue, Huizhou, Guangdong, China	

1.2 General Description of EUT (Equipment Under Test)

EUT Name	:	8"Tablet		
Models No.		100003561, MID8011		
Model Difference	:	All these models are identical in the same PCB, layout and electrical circuit, The only difference is model name for commercial purpose.		
and a		Operation Frequency:	Bluetooth V5.0(BT): 2402~2480 MHz	
	5	Number of Channel:	Bluetooth: 79 Channels See Note 2	
Product		Max Peak Output Power:	Bluetooth: 3.743dBm(GFSK)	
Description		Antenna Gain:	2.92dBi FPC Antenna	
DI TODE		Modulation Type:	GFSK: 3.743dBm π /4-DQPSK:3.037dBm 8-DPSK: 3.088dBm	
Power Rating	:	Adapter(TEKA012-052000UK): Input: AC 100-240V, 50/60Hz, 0.35A Output: DC 5V 2A DC 3.8V by 4500mAh Li-ion battery		
Software Version	:	QP1A.190711.020 release-keys		
Hardware Version		MID8011MQ_MT8768_LPDDR4_DSP_MB-VER1.1		
Connecting I/O Port(S)		Please refer to the User's Manual		
Remark		The antenna gain and adapter provided by the applicant, the verified for the RF conduction test provided by TOBY test lab.		

Note:

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



(2) Channel List:

	Bluetooth Channel List					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	
00	2402	27	2429	54	2456	
01	2403	28	2430	55	2457	
02	2404	29	2431	56	2458	
03	2405	30	2432	57	2459	
04	2406	31	2433	58	2460	
05	2407	32	2434	59	2461	
06	2408	33	2435	60	2462	
07	2409	34	2436	61	2463	
08	2410	35	2437	62	2464	
09	2411	36	2438	63	2465	
10	2412	37	2439	64	2466	
11	2413	38	2440	65	2467	
12	2414	39	2441	66	2468	
13	2415	40	2442	67	2469	
14	2416	41	2443	68	2470	
15	2417	42	2444	69	2471	
16	2418	43	2445	70	2472	
17	2419	44	2446	71	2473	
18	2420	45	2447	72	2474	
19	2421	46	2448	73	2475	
20	2422	47	2449	74	2476	
21	2423	48	2450	75	2477	
22	2424	49	2451	76	2478	
23	2425	50	2452	77	2479	
24	2426	51	2453	78	2480	
25	2427	52	2454			
26	2428	53	2455			

(3) The Antenna information about the equipment is provided by the applicant

1.3 Block Diagram Showing the Configuration of System Tested

Charging + TX Mode

Adapter

Cable 1

EUT



TX Mode



1.4 Description of Support Units

Equipment Information						
Name	Model	FCC ID/VOC	Manufacturer	Used "√"		
	-40.00			an B		
Cable Information						
Number	Shielded Type	Ferrite Core	Length	Note		
Cable 1	Yes	NO	1.0M	Accessory		

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			
Mode 1 Charging + TX Mode Channel 00			
	For Radiated Test		
Final Test Mode	Description		
Mode 1 TX GFSK Mode Channel 00			
Mode 2 TX Mode(GFSK) Channel 00/39/78			
Mode 3	TX Mode(π /4-DQPSK) Channel 00/39/78		
Mode 4	TX Mode(8-DPSK) Channel 00/39/78		
Mode 5 Hopping Mode(GFSK)			
Mode 6 Hopping Mode(π/4-DQPSK)			
Mode 7 Hopping Mode(8-DPSK)			

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. We have pretested all the test modes above.

According to ANSI C63.10 standards, the measurements are performed at the highest, middle, lowest available channels, and the worst case data rate as follows:

TX Mode: GFSK (1 Mbps)

TX Mode: π /4-DQPSK (2 Mbps)

TX Mode: 8-DPSK (3Mbps)

(2) The EUT is considered a portable unit; it was pre-tested on the positioned of each 3 axis, X-plane, Y-plane and Z-plane. The worst case was found positioned on X-plane as the normal use. 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 Bluetooth mode.

Test Software Version		LaunchEngmode	
Frequency	2402 MHz	2441MHz	2480 MHz
GFSK	DEF	DEF	DEF
π /4-DQPSK	DEF	DEF	DEF
8-DPSK	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 1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, 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: 2005 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: 2005 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.

IC Registration No.: (11950A-1)

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A-1.



2. Test Summary

	FCC Part 15 Subpart C(15.247)/ RSS 247 Issue 2			
Standard S	ection	-		Burnel
FCC	IC	 Test Item 	Judgment	Remark
15.203	2	Antenna Requirement	PASS	N/A
15.207	RSS-GEN 7.2.2	Conducted Emission	PASS	N/A
15.205	RSS-Gen 7.2.3	Restricted Bands	PASS	N/A
15.247(a)(1)	RSS 247 5.1 (2)	Hopping Channel Separation	PASS	N/A
15.247(a)(1)	RSS 247 5.1 (4)	Dwell Time	PASS	N/A
15.247(b)(1)	RSS 247 5.4 (2)	Peak Output Power	PASS	N/A
15.247(b)(1)	RSS 247 5.1 (4)	Number of Hopping Frequency	PASS	N/A
15.247(d)	RSS 247 5.5	Band Edge	PASS	N/A
15.247(c)& 15.209	RSS 247 5.5	Radiated Spurious Emission	PASS	N/A
15.247(a)	RSS 247 5.1 (1)	99% Occupied Bandwidth & 20dB Bandwidth	PASS	N/A

3. Test Software

Test Item	Test Software	Manufacturer	Version No.
Conducted Emission	EZ-EMC	EZ	CDI-03A2
Radiation Emission	EZ-EMC	EZ	FA-03A2RE

4. Test Equipment

Conducted Emission	Test				
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
EMI Test Receiver	Rohde & Schwarz	ESCI	100321	Jul. 13, 2019	Jul. 12, 2020
RF Switching Unit	Compliance Direction Systems Inc	RSU-A4	34403	Jul. 13, 2019	Jul. 12, 2020
AMN	SCHWARZBECK	NNBL 8226-2	8226-2/164	Jul. 13, 2019	Jul. 12, 2020
LISN	Rohde & Schwarz	ENV216	101131	Jul. 13, 2019	Jul. 12, 2020
Radiation Emission 1	Test	-	-	-	-
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 13, 2019	Jul. 12, 2020
EMI Test Receiver	Rohde & Schwarz	ESPI	100010/007	Jul. 13, 2019	Jul. 12, 2020
Spectrum Analyzer	Rohde & Schwarz	FSV40-N	102197	Jan. 31, 2019	Jan. 30, 2020
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Jan. 27, 2019	Jan. 26, 2020
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar.03, 2019	Mar. 02, 2020
Horn Antenna	ETS-LINDGREN	BBHA 9170	BBHA9170582	Aug.07, 2019	Aug. 06, 2020
Loop Antenna	SCHWARZBECK	FMZB 1519 B	1519B-059	Jul. 13, 2019	Jul. 12, 2020
Pre-amplifier	Sonoma	310N	185903	Mar.04, 2019	Mar. 03, 2020
Pre-amplifier	HP	8449B	3008A00849	Mar.03, 2019	Mar. 02, 2020
Pre-amplifier	SKET	LNPA_1840G-50	SK201904032	Jul. 27, 2019	Jul. 26, 2020
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar.03, 2019	Mar. 02, 2020
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A
Antenna Conducted	Emission				
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 13, 2019	Jul. 12, 2020
Spectrum Analyzer	Rohde & Schwarz	ESCI	100010/007	Jul. 13, 2019	Jul. 12, 2020
MXA Signal Analyzer	Agilent	N9020A	MY49100060	Sep. 16, 2019	Sep. 15, 2020
Vector Signal Generator	Agilent	N5182A	MY50141294	Sep. 16, 2019	Sep. 15, 2020
Analog Signal Generator	Agilent	N5181A	MY50141953	Sep. 16, 2019	Sep. 15, 2020
	DARE!! Instruments	RadiPowerRPR3006W	17100015SNO26	Sep. 16, 2019	Sep. 15, 2020
	DARE!! Instruments	RadiPowerRPR3006W	17100015SNO29	Sep. 16, 2019	Sep. 15, 2020
RF Power Sensor	DARE!! Instruments	RadiPowerRPR3006W	17100015SNO31	Sep. 16, 2019	Sep. 15, 2020
	DARE!! Instruments	RadiPowerRPR3006W	17100015SNO33	Sep. 16, 2019	Sep. 15, 2020



5. Conducted Emission Test

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

oonat				
Eroquopoy	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		

Conducted Emission Test Limit

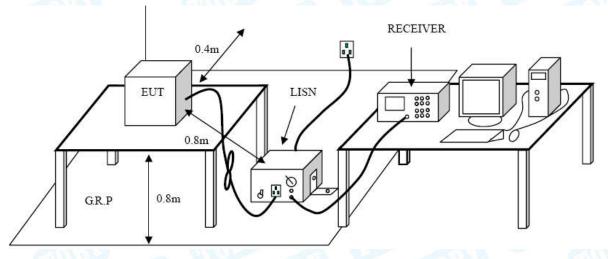
Notes:

(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/ 50uH 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 9kHz, 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 Emission Test

- 6.1 Test Standard and Limit
 - 6.1.1 Test Standard
 - FCC Part 15.209
 - 6.1.2 Test Limit

Radiated Emission Limit (9 kHz~1000MHz)

Frequency (MHz	Field Strength (microvolt/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

Frequency	Distance of 3m (dBuV/m)	
(MHz)	Peak	Average
bove 1000	74	54

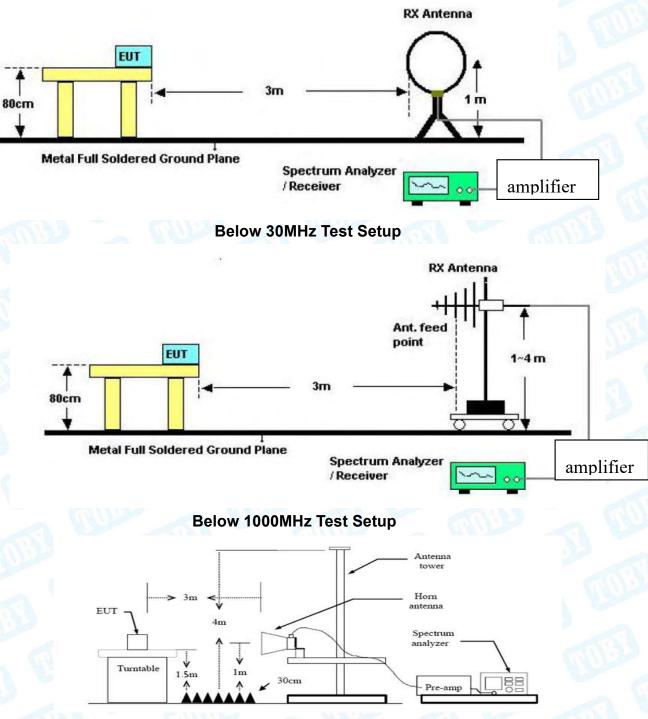
Note:

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

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



6.2 Test Setup



Above 1GHz Test Setup



6.3 Test Procedure

- (1) 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.
- (2) 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.
- (3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- (4) 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.
- (5) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 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.
- (6) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (7) 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.
- (8) For the actual test configuration, please see the test setup photo.

6.4 Deviation From Test Standard

No deviation

6.5 EUT Operating Condition

The Equipment Under Test was set to Continual Transmitting in maximum power in TX mode.

6.6 Test Data

Remark: During testing 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.

Please refer to the Attachment B.

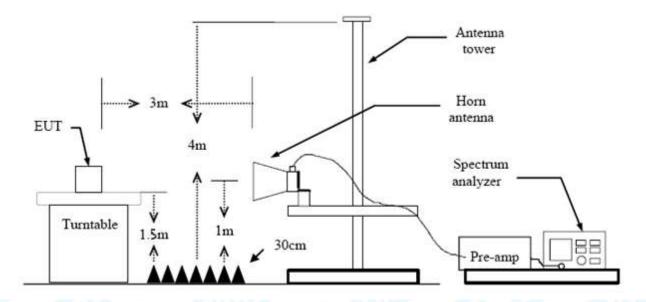


7. Restricted Bands Requirement

- 7.1 Test Standard and Limit
 - 7.1.1 Test Standard FCC Part 15.209 FCC Part 15.205
 - 7.1.2 Test Limit

Restricted Frequency	Distance of 3m (dBuV/m)	
Band (MHz)	Peak	Average
2310 ~2390	74	54
2483.5 ~2500	74	54

7.2 Test Setup



7.3 Test Procedure

- (1) 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.
- (2) 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.



- (3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- (4) 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.
- (5) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 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.
- (6) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (7) 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 AVG Detector for Average Values.
- (8) For the actual test configuration, please see the test setup photo.

7.4 Deviation From Test Standard

No deviation

7.5 EUT Operating Condition

The Equipment Under Test was set to Continual Transmitting in maximum power.

7.6 Test Data

Remark: During testing 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.

All restriction bands have been tested, only the worst case is reported. Please refer to the Attachment C.

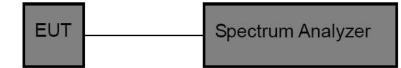
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8. Number of Hopping Channel

- 8.1 Test Standard and Limit
 - 8.1.1 Test Standard
 - FCC Part 15.247 (a)(1)
 - 8.1.2 Test Limit

Section	Test Item	Limit
15.247	Number of Hopping Channel	>15

8.2 Test Setup



8.3 Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting: RBW=100 KHz, VBW=100 KHz, Sweep time= Auto.
- 8.4 Deviation From Test Standard

No deviation

8.5 EUT Operating Condition

The EUT was set to the Hopping Mode by the Customer.

8.6 Test Data

Please refer to the Attachment D.

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9. Average Time of Occupancy

- 9.1 Test Standard and Limit
 - 9.1.1 Test Standard
 - FCC Part 15.247 (a)(1)
 - 9.1.2 Test Limit

Section	Test Item	Limit
15.247(a)(1)	Average Time of Occupancy	0.4 sec

9.2 Test Setup



9.3 Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting: RBW=1MHz, VBW=1MHz.
- (3) Use video trigger with the trigger level set to enable triggering only on full pulses.
- (4) Sweep Time is more than once pulse time.
- (5) Set the centre frequency on any frequency would be measure and set the frequency span to zero.
- (6) Measure the maximum time duration of one single pulse.
- (7) Set the EUT for packet transmitting.
- (8) Measure the maximum time duration of one single pulse.

9.4 EUT Operating Condition

The average time of occupancy on any channel within the Period can be calculated with formulas:

{Total of Dwell} = {Pulse Time} * (1600 / X) / {Number of Hopping Frequency} * {Period} {Period} = 0.4s * {Number of Hopping Frequency}

Note: X=2 or 4 or 6 (1DH1=2, 1DH3=4, 1DH5=6. 2DH1=2, 2DH3=4, 2DH5=6. 3DH1=2, 3DH3=4, 3DH5=6)

The lowest, middle and highest channels are selected to perform testing to record the dwell time of each occupation measured in this channel, which is called Pulse Time here.



9.4 Deviation From Test Standard

No deviation

9.5 EUT Operating Condition

The EUT was set to the Hopping Mode by the Customer.

9.6 Test Data

Please refer to the Attachment E.

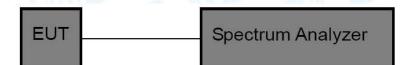


10. Channel Separation and Bandwidth Test

- 10.1 Test Standard and Limit
 - 10.1.1 Test Standard FCC Part 15.247
 - 10.1.2 Test Limit

Test Item	Limit	Frequency Range(MHz)
Bandwidth	<=1 MHz (20dB bandwidth)	2400~2483.5
Channel Separation	>25KHz or >two-thirds of the 20 dB bandwidth Which is greater	2400~2483.5

10.2 Test Setup



10.3 Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting:
 Channel Separation: RBW=100 kHz, VBW=100 kHz.
 Bandwidth: RBW=30 kHz, VBW=100 kHz.
- (3) The bandwidth is measured at an amplitude level reduced 20dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst –case (i.e the widest) bandwidth.
 - (4) Measure the channel separation the spectrum analyzer was set to Resolution Bandwidth:30 kHz, and Video Bandwidth:100 kHz. Sweep Time set auto.



10.4 Deviation From Test Standard

No deviation

10.5 EUT Operating Condition

The EUT was set to the Hopping Mode for Channel Separation Test and continuously transmitting for the Bandwidth Test.

10.6 Test Data

Please refer to the Attachment F.

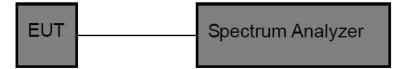


11. Peak Output Power Test

- 11.1 Test Standard and Limit
 - 11.1.1 Test Standard
 - FCC Part 15.247 (b) (1)
 - 11.1.2 Test Limit

Test Item	Limit	Frequency Range(MHz)
Peak Output Power	Hopping Channels>75 Power<1W(30dBm) Other <125 mW(21dBm)	2400~2483.5

11.2 Test Setup



11.3 Test Procedure

(1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.

(2) Spectrum Setting:

Peak Detector: RBW=1 MHz, VBW=3 MHz for bandwidth less than 1MHz. RBW=3 MHz, VBW \geq RBW for bandwidth more than 1MHz.

11.4 Deviation From Test Standard

No deviation

11.5 EUT Operating Condition

The EUT was set to continuously transmitting in the max power during the test.

11.6 Test Data

Please refer to the Attachment G.



12. Antenna Requirement

12.1 Standard Requirement

12.1.1 Standard

FCC Part 15.203

12.1.2 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.

12.2 Deviation From Test Standard

No deviation

12.3 Antenna Connected Construction

The gains of the antenna used for transmitting is 2.92dBi, and the antenna connector is de-signed with permanent attachment and no consideration of replacement. Please see the EUT photo for details.

12.4 Result

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

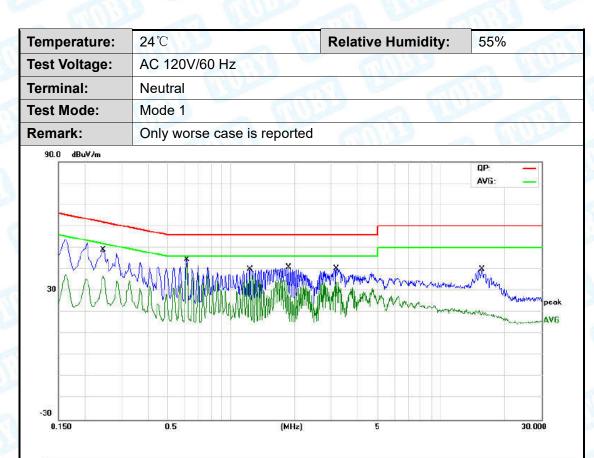
	Antenna Type	
A	Permanent attached antenna	
000	Unique connector antenna	
	Professional installation antenna	

Attachment A-- Conducted Emission Test Data

Temperature:	24 °C	Relative Humidity:	55%
Test Voltage:	AC 120V/60 Hz		
Terminal:	Line		
Test Mode:	Mode 1	- ann	64115
Remark:	Only worse case is reported	ed	
90.0 dBuV/m		W/MANTAN WALANA AND AND AND AND AND AND AND AND AND	whenthe
			AV

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector
1	*	0.1660	40.52	9.78	50.30	65.15	-14.85	QP
2		0.1660	23.63	9.78	33.41	55.15	-21.74	AVG
3		0.2900	33.95	9.84	43.79	60.52	-16.73	QP
4		0.2900	19.38	9.84	29.22	50.52	-21.30	AVG
5		0.5700	29.67	9.96	39.63	56.00	-16.37	QP
6		0.5700	15.03	9.96	24.99	46.00	-21.01	AVG
7		1.6420	21.07	9.85	30.92	56.00	-25.08	QP
8		1.6420	12.64	9.85	22.49	46.00	-23.51	AVG
9		2.1380	17.95	9.84	27.79	56.00	-28.21	QP
10		2.1380	8.70	9.84	18.54	46.00	-27.46	AVG
11		15.7100	22.38	9.83	32.21	60.00	-27.79	QP
12		15.7100	8.67	9.83	18.50	50.00	-31.50	AVG





No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector
1		0.2460	34.91	9.80	44.71	61.89	-17.18	QP
2		0.2460	26.44	9.80	36.24	51.89	-15.65	AVG
3		0.6140	32.98	9.94	42.92	56.00	-13.08	QP
4	*	0.6140	31.79	9.94	41.73	46.00	-4.27	AVG
5		1.2260	28.18	9.68	37.86	56.00	-18.14	QP
6		1.2260	26.66	9.68	36.34	46.00	- <mark>9.66</mark>	AVG
7		1.8780	27.88	9.85	37.73	56.00	-18.27	QP
8		1.8780	22.39	9.85	32.24	46.00	-13.76	AVG
9		3.1580	14.28	9.86	24.14	56.00	-31.86	QP
10		3.1580	8.12	9.86	17.98	46.00	-28.02	AVG
11		15.5980	22.14	9.83	31.97	60.00	-28.03	QP
12		15.5980	8.72	9.83	18.55	50.00	-31.45	AVG



Attachment B-- Radiated Emission Test Data

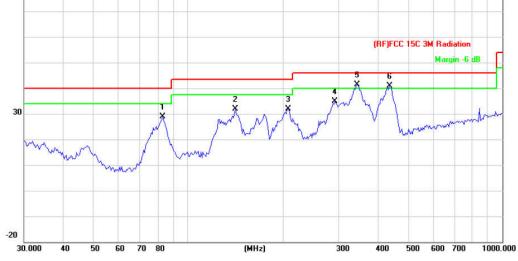
9KHz~30MHz

From 9KHz to 30MHz: 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

Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	AC 120V60HZ		A BAR
Ant. Pol.	Horizontal	alle	No.
Test Mode:	Mode 1 2402MHz		and and
Remark:	Only worse case is reported	ed	
80.0 dBuV/m			



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		82.9385	51.33	-22.40	28.93	40.00	-11.07	QP
2		141.3298	54.30	-22.35	31.95	43.50	-11.55	QP
3		207.8501	51.27	-19.45	31.82	43.50	-11.68	QP
4		293.0842	51.09	-16.14	34.95	46.00	-11.05	QP
5	*	344.3855	55.88	-14.57	41.31	46.00	-4.69	QP
6	ļ	437.1199	52.85	-11.86	40.99	46.00	-5.01	QP

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

emperature	: 25℃			Relative H	umidity:	55%	
est Voltage	AC 120	V60HZ				-	NUE
nt. Pol.	Vertical	ALC:			-		
est Mode:	Mode 1	2402MHz	SUM :		180		120
emark:	Only we	orse case is	reported	an P		64	1 and
80.0 dBuV/m							
					(RF)FCC 15C		
					<u>s</u>	Margin -6 d	
1	2	3	4	5	Ă		-
30 🔏	X	M	~ m	, AĂ			when
1mg		$\Gamma[\chi] = j$			VV Lun	when which	
W	Land Land	man					
	₩	- a space -				_	
-20 30.000 40	50 60 70	80	(MHz)	300	400 500	600 700	1000.000
<u>81</u>		Deedline	Coment	Managemen			
No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
NO. 1018.					1000000000	10 8 10 10 10 10 10 10 10 10 10 10 10 10 10	-
-	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detect
1	32.4059	46.38	-14.82	31.56	40.00	-8.44	QP
55 C			-22.56	31.37	40.00	-8.63	QP
2	47.6586	53.93	-22.00	51.57			
2 3	47.6586 82.9385	53.93 56.22	-22.56	33.82	40.00	-6.18	QP
	82.9385	56.22	-22.40	33.82	40.00		
3 4	82.9385 142.3243	56.22 56.67	-22.40 -22.24	33.82 34.43	40.00 43.50	-9.07	QP
3	82.9385	56.22	-22.40	33.82	40.00		

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

Above 1GHz(Only worse case is reported)

Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 3.8V	(ADD)					
Ant. Pol.	Horizontal						
Test Mode:	TX GFSK Mode 2402MHz						
Remark:	No report for the emission wh	No report for the emission which more than 20 dB below the					
	prescribed limit.	U.S.					

No.	Mk.	Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.394	38.86	13.47	52.33	74.00	-21.67	peak
2	*	4804.714	28.68	13.47	42.15	54.00	-11.85	AVG

Emission Level= Read Level+ Correct Factor

Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 3.8V						
Ant. Pol.	Vertical	autre a					
Test Mode:	TX GFSK Mode 2402MH	z					
Remark:	No report for the emissio	No report for the emission which more than 20 dB below the					
	prescribed limit.						

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4803.604	28.60	13.47	42.07	54.00	-11.93	AVG
2	Ì	4803.832	38.86	13.47	52.33	74.00	-21.67	peak



Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.8V	MUPP	
Ant. Pol.	Horizontal		
Test Mode:	TX GFSK Mode 2441N	1Hz	
Remark:	No report for the emiss prescribed limit.	ion which more than 20 d	3 below the

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4880.530	39.36	13.53	52.89	74.00	-21.11	peak
2	*	4882.708	28.69	13.54	42.23	54.00	-11.77	AVG

and the second s			
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.8V		THE CHAR
Ant. Pol.	Vertical		and the second s
Test Mode:	TX GFSK Mode 2441MHz	COLOR	A AUL
Remark:	No report for the emission whether the second secon	nich more than 20 dB be	elow the
	prescribed limit.		June of the second

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4882.066	40.46	13.54	54.00	74.00	-20.00	peak
2	*	4882.702	28.76	13.54	42.30	54.00	-11.70	AVG

Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.8V	CUP -	
Ant. Pol.	Horizontal		
Test Mode:	TX GFSK Mode 2480MHz		- SOL
Remark:	No report for the emission w prescribed limit.	hich more than 20 dB b	elow the

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4960.234	28.31	13.61	41.92	54.00	-12.08	AVG
2		4960.240	39.89	13.61	53.50	74.00	-20.50	peak

Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.8V		
Ant. Pol.	Vertical	Web a	Non and
Test Mode:	TX GFSK Mode 2480MHz	COLON S	
Remark:	No report for the emission w	which more than 20 dB	below the
	prescribed limit.		

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4958.956	38.35	13.62	51.97	74.00	-22.03	peak
2	×	4959.130	28.30	13.62	41.92	54.00	-12.08	AVG

Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 3.8V		- DU-				
Ant. Pol.	Horizontal	Horizontal					
Test Mode:	TX π /4-DQPSK M	lode 2402MHz	130				
Remark:	No report for the e	emission which more than 20 dB	below the				

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4802.902	38.18	13.47	51.65	74.00	-22.35	peak
2	*	4804.714	28.59	13.47	42.06	54.00	-11.94	AVG

	E. U.L. VER		
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.8V		
Ant. Pol.	Vertical		
Test Mode:	TX π /4-DQPSK Mod	e 2402MHz	
Remark:	No report for the em	ission which more than 20 d	3 below the
	prescribed limit.		

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4803.922	28.57	13.47	42.04	54.00	-11.96	AVG
2		4805.392	41.48	13.47	54.95	74.00	-19.05	peak

Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 3.8V	and					
Ant. Pol.	Horizontal	Horizontal					
Test Mode:	TX π /4-DQPSK Mode	2441MHz					
Remark:	No report for the emis prescribed limit.	sion which more than 20 dB	below the				

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4881.610	28.79	13.54	42.33	54.00	-11.67	AVG
2		4883.428	39.33	13.54	52.87	74.00	-21.13	peak

Temperature:	25 ℃	Relative Humidity:	55%		
Test Voltage:	DC 3.8V				
Ant. Pol.	Vertical	ALL ALL			
Test Mode:	TX π /4-DQPSK Mode 2441	MHz	A DU		
Remark:	No report for the emission which more than 20 dB below the				
	prescribed limit.				

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4881.436	39.57	13.54	53.11	74.00	-20.89	peak
2	*	4882.708	28.75	13.54	42.29	54.00	-11.71	AVG

25 ℃	Relative Humidity:	55%		
DC 3.8V	A COLOR	- THUS		
Horizontal				
TX π /4-DQPSK Mode 2480MHz				
No report for the emission which more than 20 dB below the				
	DC 3.8V Horizontal TX π /4-DQPSK Mo	DC 3.8V Horizontal TX π /4-DQPSK Mode 2480MHz No report for the emission which more than 20 dB b		

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4959.130	28.35	13.62	41.97	54.00	-12.03	AVG
2		4961.500	38.45	13.62	52.07	74.00	-21.93	peak

Temperature:	25 ℃	Relative Humidity:	55%		
Test Voltage:	DC 3.8V				
Ant. Pol.	Vertical				
Test Mode:	TX π /4-DQPSK Mode 2480M	/Hz	A AUL		
Remark:	No report for the emission which more than 20 dB below the				
	prescribed limit.				

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4959.610	28.29	13.61	41.90	54.00	-12.10	AVG
2		4961.020	39.34	13.61	52.95	74.00	-21.05	peak



Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 3.8V					
Ant. Pol.	Horizontal					
Test Mode:	TX 8-DPSK Mode	2402MHz				
Remark:	No report for the eprescribed limit.	mission which more than 20 dB	below the			

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	-	4803.292	28.57	13.46	52.03	74.00	-21.97	peak
2	*	4805.140	28.57	13.47	42.04	54.00	-11.96	AVG

Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.8V	- AL	
Ant. Pol.	Vertical	RULL A	
Test Mode:	TX 8-DPSK Mode 2402M	1Hz	
Remark:	No report for the emissio	n which more than 20 dE	3 below the
	prescribed limit.		

No	. Mk	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4805.116	39.48	13.47	52.95	74.00	-21.05	peak
2	*	4805.182	28.54	13.47	42.01	54.00	-11.99	AVG



Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 3.8V					
Ant. Pol.	Horizontal					
Test Mode:	TX 8-DPSK Mode	2441MHz	1200			
Remark:	No report for the eprescribed limit.	emission which more than 20 dB	below the			

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4880.656	28.74	13.54	42.28	54.00	-11.72	AVG
2		4881.574	38.80	13.54	52.34	74.00	-21.66	peak

Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.8V		
Ant. Pol.	Vertical	all and	
Test Mode:	TX 8-DPSK Mode 2441MH	z	
Remark:	No report for the emission w	which more than 20 dB	below the
	prescribed limit.		

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	4881.448	28.72	13.54	42.26	54.00	-11.74	AVG
2	1	4882.126	39.91	13.54	53.45	74.00	-20.55	peak



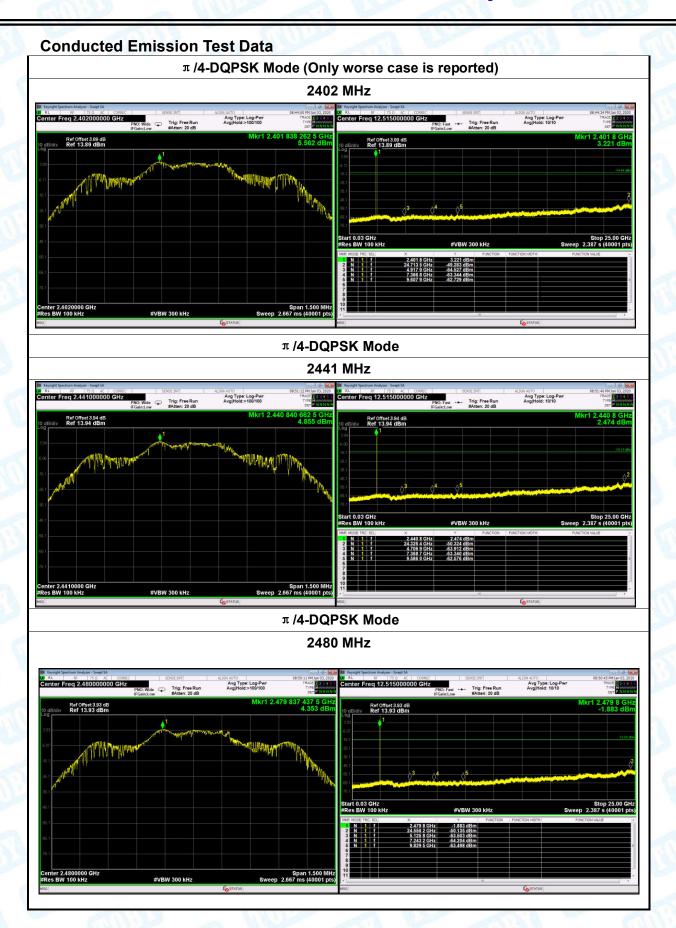
Temperature:	25℃	Relative Humidity:	55%
Test Voltage:	DC 3.8V	6000	- NU.2
Ant. Pol.	Horizontal		
Test Mode:	TX 8-DPSK Mode 2480MHz		
Remark:	No report for the emission where prescribed limit.	nich more than 20 dB b	elow the

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4958.776	39.24	13.62	52.86	74.00	-21.14	peak
2	*	4959.604	28.29	13.61	41.90	54.00	-12.10	AVG

Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.8V		
Ant. Pol.	Vertical		
Test Mode:	TX 8-DPSK Mode 2480MHz	CON'SS	
Remark:	No report for the emission wh	ich more than 20 dB be	elow the
	prescribed limit.		

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4958.632	38.74	13.62	52.36	74.00	-21.64	peak
2	*	4959.448	28.28	13.61	41.89	54.00	-12.11	AVG





TOBY

Attachment C-- Restricted Bands Requirement and Band

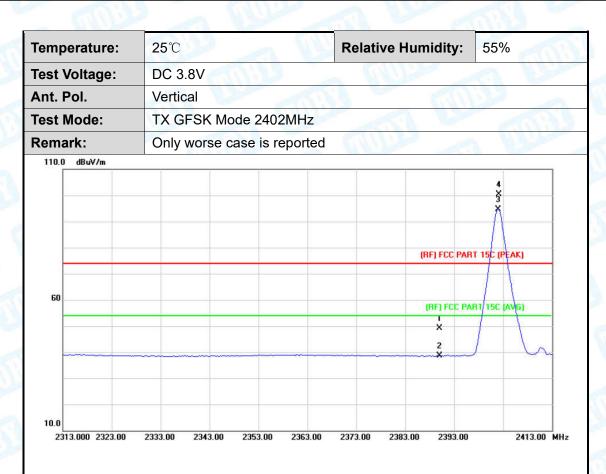
Edge Test Data

(1) Radiation Test

Temperature:	25 ℃	Relative Humidity:	55%
Fest Voltage:	DC 3.8V	WWW A	
Ant. Pol.	Horizontal		
fest Mode:	TX GFSK Mode 2402MHz		AND
Remark:	Only worse case is reporte	d	
120.0 dBuV/m			
70			4 3 X RT 15C (PEAK)
20.0		2 X	

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	44.18	5.53	49.71	74.00	-24.29	peak
2		2390.000	32.95	5.53	38.48	54.00	-15.52	AVG
3	*	2402.000	88.35	5.56	93.91	Fundamental Frequency		AVG
4	Х	2402.200	94.22	5.56	99.78	Fundamental Frequency		peak





No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	43.64	5.53	49.17	74.00	-24.83	peak
2		2390.000	33.03	5.53	38.56	54.00	-15.44	AVG
3	*	2402.000	89.06	5.56	94.62	Fundamental Frequency		AVG
4	Х	2402.200	94.85	5.56	100.41	Fundamental Frequency		peak



emŗ	perature:	25 ℃	Relative	Humidity:	55%
est '	Voltage:	DC 3.8V			AV
.nt.	Pol.	Horizontal			333
est	Mode:	TX GFSK Mode 248	80 MHz		-02
lem	ark:	Only worse case is	reported	V d	
100.0	0 dBuV/m				
	1				
	×			(RF) FCC PA	ART 15C (PEAK)
	Á				
				(RF) FCC F	PART 15C (AVG)
50					Internet in the second se
	× 4				
	└──/ ×				
0.0					

No	. Mk	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
2		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	Х	2479.800	78.08	2.07	80.15	Fundamental Frequency		peak
2	*	2479.800	67.68	2.07	69.75	Fundamental	Frequency	AVG
3		2483.500	43.98	2.10	46.08	74.00	-27.92	peak
4		2483.500	34.69	2.10	36.79	54.00	-17.21	AVG



emperature:	25 ℃			Relative	Humidity:	55%	
est Voltage:	DC 3.8	3V		220	64	-	NUE
nt. Pol.	Vertica	al	-		-		
est Mode:	TX GF	SK Mode 2	480 MHz				
emark:	Only v	vorse case i	s reported	600	3	See.	1 Por
110.0 dBuV/m							
60 60						RT 15C (PEAK) NRT 15C (AVG	
10.0 2470.000 2480.00	2490.00	2500.00 2510	0.00 2520.00	2530.00 25	540.00 2550.00	2!	570.00 MHz
No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
INO. IVIK.							
INO. IVIK.	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
		dBuV 90.81	dB/m 5.74	00.55	dBuV/m Fundamental F	12.023	Detector peak
1 X 24	MHz	Constantial		96.55	an charge the second of the	requency	1.0000.0000.000000
1 X 24 2 * 24	MHz 179.800	90.81	5.74	96.55	Fundamental F	requency	peak



Cemperature:	25 ℃	Relative Humidity:	55%				
Fest Voltage:	DC 3.8V	The second second					
Ant. Pol.	Horizontal		1012				
Fest Mode:	TX π /4-DQPSK Mod	de 2402MHz	-01				
Remark: Only worse case is reported							
110.0 dBuV/m							
			3				
			Λ				
-		(RF) FCC P	ART 15C (PEAK)				
60		(RF) FCC	PART 15C AVG)				
		X					
montesam		22 ***********************************	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				
10.0							

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	43.87	5.53	49.40	74.00	-24.60	peak
2		2390.000	34.05	5.53	39.58	54.00	-14.42	AVG
3	Х	2402.200	93.58	5.56	99.14	Fundamental Frequency Fundamental Frequency		peak
4	*	2402.200	93.20	5.56	98.76			AVG



emperature:	25 ℃		Relative H	lumidity:	55%
est Voltage:	DC 3.8V		(191)	20	ave
nt. Pol.	Vertical	Le A	100	60	33
est Mode:	TX π /4-D	QPSK Mode 24	402MHz		-
emark:	Only wor	se case is repo	rted	-	1 Bee
100.0 dBuV/m					
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				(RF) FCC PA	RT 15C (PEAK)
				(RF) FCC P	ART 15C (AVG)
50				×	
				2	
0.0					

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	43.84	5.53	49.37	74.00	-24.63	peak
2		2390.000	32.63	5.53	38.16	54.00	-15.84	AVG
3	Х	2402.200	88.97	5.56	94.53	Fundamental Frequency Fundamental Frequency		peak
4	*	2402.200	81.98	5.56	87.54			AVG



emper	ature:	25 ℃			Relative H	umidity:	55%
est Vo	Itage:	DC 3.8V		0	1199	20	A 10
nt. Po	Ι.	Horizonta	al			112	523
est Mo	de:	ТХ π /4-С	QPSK N	lode 2480M	IHz		100
Remark	:	Only wor	se case i	is reported	CARDE	1	
100.0 d	BuV/m						
	X						
	2					(RF) FCC PA	RT 15C (PEAK)
	Ň						
	-					(BF) FCC P	ART 15C (AVG)
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			-				
0.0							

No	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	Х	2479.800	84.72	2.07	86.79	Fundamental Frequency		peak
2	*	2479.800	69.25	2.07	71.32	Fundamental Frequency		AVG
3		2483.500	48.02	2.10	50.12	74.00	-23.88	peak
4		2483.500	35.78	2.10	37.88	54.00	-16.12	AVG



Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.8V	THUR T	
Ant. Pol.	Vertical		
Test Mode:	TX π /4-DQPSK Mode 2	2480MHz	- B
Remark:	Only worse case is repo	orted	a
110.0 dBu∀/m			
60 3 ×			C PART 15C (PEAK) CC PART 15C (AVG)
10.0			

No	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	Х	2480.000	90.11	5.74	95.85	Fundamenta	I Frequency	peak
2	*	2480.000	83.10	5.74	88.84	Fundamenta	I Frequency	AVG
3		2483.500	50.95	5.75	56.70	74.00	-17.30	peak
4		2483.500	44.94	5.75	50.69	54.00	-3.31	AVG



emperature:	25 ℃	Relative Humidit	t y: 55%			
est Voltage:	DC 3.8V	A CUP				
nt. Pol.	Horizontal		ANUL -			
est Mode:	ode: TX 8-DPSK Mode 2402MHz					
emark:	Only worse case is	reported	~ 12			
100.0 dBuV/m			3 ×			
			X			
			A			
		(RF)	FCC PART 15C (PEAK)			
		(Rf	F) FCC PART 15C (AVG)			
50			×			
			2			
			*			
2						
0.0						

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	44.01	5.53	49.54	74.00	-24.46	peak
2		2390.000	32.50	5.53	38.03	54.00	-15.97	AVG
3	Х	2402.000	93.73	5.56	99.29	Fundamental	Frequency	peak
4	*	2402.000	86.21	5.56	91.77	Fundamental	Frequency	AVG



emperature:	25 ℃	Relative Humidity:	55%
est Voltage:	DC 3.8V	AUT -	A V
nt. Pol.	Vertical		52
est Mode:	TX 8-DPSK Mode 2402	2MHz	-02
emark:	Only worse case is rep	orted	
100.0 dBu∀/m			3
			× 4
			Â
		(RF) FCC P/	ART 15C (PEAK)
		(RF) FCC I	PART 15C AVG)
50		×	
0.0			

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	}	2390.000	44.44	5.53	49.97	74.00	-24.03	peak
2		2390.000	32.53	5.53	38.06	54.00	-15.94	AVG
3	Х	2402.000	91.01	5.56	96.57	Fundamental	Frequency	peak
4	*	2402.200	83.96	5.56	89.52	Fundamental	Frequency	AVG



emperature:	25 ℃	Relative Humidity:	55%					
est Voltage:	DC 3.8V	MUL						
nt. Pol.	Horizontal		3.3					
est Mode:	TX 8-DPSK Mode 2480MHz		200					
emark:	Only worse case is reported	nly worse case is reported						
100.0 dBuV/m 2								
3			RT 15C (PEAK)					
50			ART 15C (AVG)					
0.0								

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	×	2480.000	85.30	5.74	91.04	Fundamental	Frequency	AVG
2	Х	2480.200	93.04	5.74	98.78	Fundamental	Frequency	peak
3		2483.500	53.17	5.75	58.92	74.00	-15.08	peak
4		2483.500	46.89	5.75	52.64	54.00	-1.36	AVG



emperature:	25℃	Relative Humidity:	55%
est Voltage:	DC 3.8V	MUP-	
nt. Pol.	Vertical		1973
est Mode:	TX 8-DPSK Mode 2480N	ИНz	-08
emark:	Only worse case is report	rted	2 194
100.0 dBu∀/m			
× 2 ×			PART 15C (PEAK)
50			
0.0			

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	Х	2479.800	88.75	5.74	94.49	Fundamenta	Frequency	peak
2	*	2480.000	81.71	5.74	87.45	Fundamenta	Frequency	AVG
3		2483.500	49.54	5.75	55.29	74.00	-18.71	peak
4		2483.500	42.98	5.75	48.73	54.00	-5.27	AVG

(2) Conducted Test

	Temperature:	25 ℃	Relative Humidity:	: 55%
	Test Voltage:	DC 3.8V		
2	Test Mode:	TX GFSK Mode 2402MHz/24	80 MHz	120
2	Remark:	Only worse case is reported	Can Linn	CTUDE -

	eq 2.35600 Ref Offset 2.9 Ref 22.95 d	PN IFG 5 dB		g: Free Run en: 30 dB	Avg Type Avg Hold		Т	ACE 1 2 3 4 5 YPE M WWWW DET P N N N N
10 dB/div Log 13.0						N	Aler4 0 40	
13.0								01 8 GH 777 dBr
2.95								1
								i i
7.05								
17.1								19.32 dE
-27.1								
37.1								
47.1							A3	2
57.1 manuter	monani	anternal management of the states of the		hander and and the second	al scalars the heap school	wand man darked with an	production the second	hum h
-67.1								
Start 2.306 #Res BW 1			#VBW 30	0 kHz		Sweep	Stop 2.4 9.600 ms	40600 GH (1001 pt:
MKR MODE TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUN	NCTION VALUE	
1 N 1	f	2.401 8 GHz 2.400 0 GHz	0.777 dBm -55.852 dBm					
3 N 1	f	2.390 0 GHz	-56.980 dBm					
4 N 1	f	2.389 4 GHz	-54.153 dBm					
6								
8								
9								
11								
•				m				

RL Center Fi	req 2	75 Ω AC .52600000	P	PNO: Fast	SENSE:INT Trig: Free Atten: 30 (ALIGN AUTO Avg Typ Avg Hold	e: Log-Pwr l:>100/100		29 PM Jan 03, 202 TRACE 1 2 3 4 1 TYPE M WWWW DET P N N N
0 dB/div		Offset 3.93 dE 23.93 dBm	;	Gam.Low						479 9 GH 5.396 dBr
13.9	1—									
6.1										-14.66 df
26.1										
6.1	2 nen	urrandra		๛ฅ๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛	eren and the	nandullu	-antorga por el contrar al	An March Lordon Source	workthrow	
66.1										
tart 2.47 Res BW				#VB	W 300 kHz			Swee	Stop: p 9.600 n	2.57600 GH 1s (1001 pt:
KR MODE TF	RC SCL		2.479 9 GHz 2.483 5 GHz	Y 5.396 -55.176	dBm	CTION	FUNCTION WIDTH		FUNCTION VALUE	
3 N 1 4 N 1 5	f		2.483 3 GHZ 2.500 0 GHZ 2.493 3 GHZ	-55.300 -53.248	dBm					
6 7 8										
9 0 1										
11				5	m		L STATUS			



perature:	25 ℃		Relative	Humidi	ty:	55%
Voltage:	DC 3.8V		1100	88		a l
Mode:	GFSK Hoppi	ing Mode		0	6	
ark:	Only worse of	case is reporte	d		19	
Keysight Spectrum /		CONCEANT			06-22-1	9 PM Jan 03, 2020
		SENSE:INT NO: Fast C Trig: Free Ru Gain: I ow Atten: 30 dE		og-Pwr 00/100	00:33:1 T	RACE 1 2 3 4 5 6 TYPE MWWWWW DET P NNNN
Ref	f Offset 3.89 dB	Gain:Low Atten: 30 dE		M	kr1 2.4	01 9 GHz .276 dBm
10 dB/div Re Log	f 23.89 dBm					.276 dBm
3.89						<u> </u>
-16.1						-13.73 utr
-26.1						
-46.1 -56.1	uthat the state of the second s	verlander Notragenskapertagestagestagestagestagest	u may dayligan ya anguntuta tayan wa	4	, 2 ³	at south and
-66.1						
Start 2.30600 #Res BW 100	kHz	#VBW 300 kHz			9.600 m	.40600 GHz s (1001 pts)
MKR MODE TRC SCL 1 N 1 f 2 N 1 f	2.401 9 GHz 2.400 0 GHz	Y FUNCT 6.276 dBm -54.438 dBm	ON FUNCTION WIDTH	FUNC	TION VALUE	
3 N 1 f 4 N 1 f 5	2.390 0 GHz 2.381 1 GHz	-54.907 dBm -53.332 dBm				E
6 7 8						
9 10 11						-
MSG			Ko status			
📜 Keysight Spectrum :						- 6 ×
LXI RL RF	75 Ω AC CORREC 2.526000000 GHz	SENSE:INT	ALIGN AUTO Avg Type: L In Avg Hold:>1	og-Pwr 00/100	06:31:4 T	2 PM Jan 03, 2020
Center Freq	E 75 Ω AC CORREC 2.526000000 GHz P IF		Avg Type: L an Avg Hold:>1	00/100	kr1 2.4	RACE 2 3 4 5 6 TYPE MWWWWW DET P NNNN
Center Freq	75 Ω AC CORREC 2.526000000 GHz P	NO: Fast 🖵 Trig: Free Ru	Avg Type: L an Avg Hold:>1	00/100	kr1 2.4	2 PM Jan 03, 2020 RACE 1 2 3 4 5 6 TYPE MWWWWW DET PNNNNN
Center Freq 2 Center Freq 2 10 dB/div Re 10 g 13.9 - 1	E 75 Ω AC CORREC 2.526000000 GHz P IF f Offset 3.93 dB	NO: Fast 🖵 Trig: Free Ru	Avg Type: L an Avg Hold:>1	00/100	kr1 2.4	RACE 2 3 4 5 6 TYPE MWWWWW DET P NNNN
Center Freq 1 Code de d	E 75 Ω AC CORREC 2.526000000 GHz P IF f Offset 3.93 dB	NO: Fast 🖵 Trig: Free Ru	Avg Type: L an Avg Hold:>1	00/100	kr1 2.4	RACE 2 3 4 5 6 TYPE MWWWW DET P NNNN
Center Freq 2 Center Freq 2 10 dB/div Re 10 g 13.9 13.9 13.9 14.0 10 dB/div Re	E 75 Ω AC CORREC 2.526000000 GHz P IF f Offset 3.93 dB	NO: Fast 🖵 Trig: Free Ru	Avg Type: L an Avg Hold:>1	00/100	kr1 2.4	12 PM Jan 03, 2020 RACE 1 2 3 4 5 6 12 3 4 5 6 DET P NNNN DET P NNNNN 77 9 GHz 400 dBm
XX RL RF Center Freq 1 Ref 1 1 10 dB/div Ref 1 1 1 13.9 1 1 1 1 1 13.9 1	E 75 9. AC CORREC 2.526000000 GHz P IF f Offset 3.93 dB f 23.93 dBm	NO: Fast 🖵 Trig: Free Ru	Avg Type: L an Avg Hold:>1	00/100	kr1 2.4	12 PM Jan 03, 2020 RACE 1 2 3 4 5 6 12 3 4 5 6 DET P NNNN DET P NNNNN 77 9 GHz 400 dBm
XX RL RF Center Freq 2 Ref 10 dB/div Ref 10 dB/div Ref 10 dB/div Ref 13.9 1 1 1 3.93 1 1 1 16.07 1 1 1 26.1 36.1 1 1	E 75 9. AC CORREC 2.526000000 GHz P IF f Offset 3.93 dB f 23.93 dBm	NO: Fast 🖵 Trig: Free Ru	Avg Type: L an Avg Hold:>1	00/100	kr1 2.4	12 PM Jan 03, 2020 RACE 1 2 3 4 5 6 12 3 4 5 6 DET P NNNN DET P NNNNN 77 9 GHz 400 dBm
XX RL RF Center Freq 1 Ref 10 dB/div Ref 10 dB/div Ref 10 dB/div Ref 13.9 1 1 1 3.93 1 1 1 16.07 1 1 1 26.1 1 2 1 36.1 2 2 1 46.1 2 2 2	E 75 92 AC CORPEC 2.526000000 GHz P F Offset 3.93 dB f 23.93 dBm 2 2 4 3 4 3 4 3 4 4 3 4 4 3 4 4 4 4 4 4 4 4 4 4 4 4 4	NO: Fast 🖵 Trig: Free Ru	Avg Type: L an Avg Hold:>1	90/100 M	kr1 2.4 5	12 PM Jan 03, 2020 RACE 1 2 3 4 5 6 12 3 4 5 6 DET P NNNN DET P NNNNN 77 9 GHz 400 dBm
OV/ R.L REF Center Freq Ref 10 dB/div Ref 13.9 1 393 -6.07 - - -16.1 - - -66.1 - - -66.1 - - 56.1 - - 56.1 - - 788 BW 1000 #Res #Res BW 1000 MRC SCL MR N 1 N	2.526000000 GHz P F Offset 3.93 dB f 23.93 dBm f 23.93 dBm GHz kHz 2.477 9 GHz 2.477 9 GHz	NO: Fast Trig: Free R Atten: 30 dE	Avg Type: L Avg Hold:>1	00/100 M	kr1 2.4 5	12 Mi an 03, 2020 TYPE 24 5 6 TYPE MANNAN 177 9 GHz 400 dBm 14 64 dBm 14 64 dBm 57600 GHz
Window Ref 10 dB/div Ref 26.1 dB/div dV 26.1 dB/div dV 26.1 dB/div dV 26.1 dB/div dV 3 Ref dV 1 Ref dV	E 7 29 20 AC CORPEC 2.526000000 GHz P F Offset 3.93 dB f 23.93 dBm f 23.93 dBm GHz kHz 2.477 9 GHz 2.483 5 GHz 2.500 0 GHz	NO: Fast Trig: Free R Atten: 30 dE	Avg Type: L Avg Hold:>1	00/100 M	kr1 2.4 5 Stop 2 9.600 m	12 Mi an 03, 2020 TYPE 24 5 6 TYPE MANNAN 177 9 GHz 400 dBm 14 64 dBm 14 64 dBm 57600 GHz
W/ RL RE Center Freq Ref 10 dB/div Ref 13.9 1 - 3.93 - - -6.07 - - -16.1 - - -6.1 - - -6.1 - - -6.1 - - -6.1 - - -6.1 - - -6.1 - - -6.1 - - -6.1 - - -6.1 - - -6.1 - - -6.1 - - -6.1 - - -6.1 - - -6.1 - - -6.1 - - -6.1 - - -7 - 1 - -7 - 1 - - <t< td=""><td>E 7 29 20 AC CORPEC 2.526000000 GHz P F Offset 3.93 dB f 23.93 dBm f 23.93 dBm GHz kHz 2.477 9 GHz 2.483 5 GHz 2.500 0 GHz</td><td>NO: Fast Gain:Low Trig: Free R Atten: 30 dE</td><td>Avg Type: L Avg Hold:>1</td><td>00/100 M</td><td>kr1 2.4 5 Stop 2 9.600 m</td><td>12 Mi an 03, 2020 TYPE 24 5 6 TYPE MANNAN 177 9 GHz 400 dBm 14 64 dBm 14 64 dBm 57600 GHz</td></t<>	E 7 29 20 AC CORPEC 2.526000000 GHz P F Offset 3.93 dB f 23.93 dBm f 23.93 dBm GHz kHz 2.477 9 GHz 2.483 5 GHz 2.500 0 GHz	NO: Fast Gain:Low Trig: Free R Atten: 30 dE	Avg Type: L Avg Hold:>1	00/100 M	kr1 2.4 5 Stop 2 9.600 m	12 Mi an 03, 2020 TYPE 24 5 6 TYPE MANNAN 177 9 GHz 400 dBm 14 64 dBm 14 64 dBm 57600 GHz
W RL RE Center Freq Ref 10 dB/div Ref 13.9 1 3.93 1 -6.07 1 -6.11 -6.11 -6.11 -6.11 -6.11 -6.11 -6.11 -6.11 -6.11 -6.11 -6.11 -6.11 -6.11 -6.11 -6.11 -6.11 -6.11 -6.11 -7.61 -7.611 -6.11 -7.611 -7.61 -7.611 -7.61 -7.611 -7.61 -7.611 -7.61 -7.611 -7.61 -7.611 -7.61 -7.611 -7.61 -7.611 -7.61 -7.611 -7.61 -7.611 -7.61 -7.611 -7.61 -7.611 -7.61 -7.611 -7.61 -7.611 -7.61 -7.611	E 7 29 20 AC CORPEC 2.526000000 GHz P F Offset 3.93 dB f 23.93 dBm f 23.93 dBm GHz kHz 2.477 9 GHz 2.483 5 GHz 2.500 0 GHz	NO: Fast Gain:Low Trig: Free R Atten: 30 dE	Avg Type: L Avg Hold:>1	00/100 M	kr1 2.4 5 Stop 2 9.600 m	12 Mi an 03, 2020 TYPE 24 5 6 TYPE MANNAN 177 9 GHz 400 dBm 14 64 dBm 14 64 dBm 57600 GHz



nperature:	25 ℃		Relative Humidity	/: 55%				
t Voltage:	DC 3.8V TX π /4-DQPSK Mode 2402MHz/2480 MHz							
t Mode:								
nark:	Only worse	case is reported	d					
Keysight Spectrum	Analyzer - Swept SA F 75 Ω AC CORREC	SENSE:INT	ALIGN AUTO	08:43:20 PM Jan 03, 2020				
	2.356000000 GHz	PNO: Fast 🖵 Trig: Free Ru IFGain:Low Atten: 30 dB	Avg Type: Log-Pwr n Avg Hold:>100/100	TRACE 1 2 3 4 5 6 TYPE M WWWWW DET P N N N N N				
10 dB/div Re	f Offset 3.89 dB ef 23.89 dBm		Mk	r1 2.402 0 GHz 5.799 dBm				
13.9				1				
3.89 -6.11				Å				
-16.1				-1+.34 dem				
-36.1	4			.3 .2				
-46.1) nipingananang kanalang berpanjak beranang sa	Parlage at the States of the second states of the second states in a second state of the second states in a second states of the second	ากสูงหมายสามหาราชสาวที่สาวทางสาวที่สาวทางสาวทางสาวทางสาวทางสาวทางสาวทางสาวทางสาวทางสาวทางสาวทางสาวทางสาวทางสาวท	3 2 ho				
Start 2.30600	GHz			Stop 2.40600 GHz				
#Res BW 100		#VBW 300 kHz	Sweep 9.	600 ms (1001 pts)				
1 N 1 f 2 N 1 f 3 N 1 f	2.400 0 GH 2.390 0 GH	z -54.506 dBm z -54.807 dBm						
4 N 1 f 5 6	2.313 8 GH	z -53.629 dBm		E				
8 9 10								
		m						
MSG			STATUS					
Keysight Spectrum	F 75Ω AC CORREC	SENSE:INT	ALIGN AUTO	08:50:00 PM Jan 03, 2020				
LXI RL R		PNO: Fast Free Ru IFGain:Low Atten: 30 dB	Avg Type: Log-Pwr in Avg Hold:>100/100	08:50:00 PM Jan 03, 2020 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P N N N N N				
Center Freq	F 75Ω AC CORREC	PNO: Fast 🖵 Trig: Free Ru	Avg Type: Log-Pwr in Avg Hold:>100/100	08:50:00 PM Jan 03, 2020				
Center Freq	F 75 Ω AC CORREC 2.526000000 GHz f Offset 3.93 dB	PNO: Fast 🖵 Trig: Free Ru	Avg Type: Log-Pwr in Avg Hold:>100/100	08:50:00 PMJan 03, 2020 TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P NNNNN r1 2.479 9 GHz				
Center Freq	F 75 Ω AC CORREC 2.526000000 GHz f Offset 3.93 dB	PNO: Fast 🖵 Trig: Free Ru	Avg Type: Log-Pwr in Avg Hold:>100/100	08:50:00 PM Jan 03, 2020 TRAE [] 2 3 4 5 6 TYPE HWWWWW DET P N N N N 4.646 dBm				
Center Freq	F 75 Ω AC CORREC 2.526000000 GHz f Offset 3.93 dB	PNO: Fast 🖵 Trig: Free Ru	Avg Type: Log-Pwr in Avg Hold:>100/100	08:50:00 PM Jan 03, 2020 TRACE 2 3 4 5 6 TYPE MWWWWW DET P NNNN r1 2.479 9 GHz				
M RL R Center Freq 1 1 10 dB/div Re 1 13 9 1 1 16.0 1 1 -6.07 1 1 -6.1 -6.1 1 -36.1 -6.1 -6.1	F 75 9. AC CORREC 2.526000000 GHz of Offset 3.93 dB of 23.93 dBm	PNO: Fast 🖵 Trig: Free Ru	Avg Type: Log-Pwr in Avg Hold:>100/100	08:50:00 PM Jan 03:202 Trace [] 23 4 5 6 Type P NNN N Der P NNN N 12.479 9 GHz 4.646 dBm				
M RL R Center Freq Re Re 10 dB/div Re 13.9 1 13.9 1 3.93 6.07 -16.1 -66.1 -66.1 -66.1	F 75 9. AC CORREC 2.526000000 GHz of Offset 3.93 dB of 23.93 dBm	PNO: Fast 🖵 Trig: Free Ru	Avg Type: Log-Pwr in Avg Hold:>100/100	08:50:00 PM Jan 03, 2020 TRAE [] 2 3 4 5 6 TYPE HWWWWW DET P N N N N 4.646 dBm				
M RL R Center Freq 10 dB/div Re 10 dB/div Re 13.9 13.9 -1 -3.61 -16.1 -26.1 -46.1 -66.1 -66.1 -66.1 -66.1 -66.1 -66.1 -66.1 -66.1 -66.1 -66.1 -66.1 -66.1 -66.1 -66.1 -66.1	E 75 9. AC CORFEC 2.526000000 GHz of Offset 3.93 dB of 23.93 dBm 2 4 3 4 3 0 GHz	PNO: Fast Trig: Free Rt Atten: 30 dB	n Avg Type: Log-Pwr Avg Hold:>100/100	08:50:00 PM Jan 03, 2020 TRACE TYPE MANNAN r1 2,479 9 GHz 4.646 dBm -15:44 dBm -15:44 dBm Stop 2.57600 GHz				
V RL R Center Freq 10 dB/div Re 10 dB/div Re 13 9 13 9 1 393 -6.07 -6.1 -6.1 -66.1 -66.1 -66.1 Start 2.47600 #Res BW 100 MKR MODE TRC ISC MKR MODE TRC ISC	F 75 Q. AC CORFEC 2.526000000 GHz of Offset 3.93 dB of 23.93 dBm 2 2 4 4 3 4 4 4 4 4 4 4 4 4 4 4 4 4	PNO: Fast Trig: Free Rt Atten: 30 dB	n Avg Type: Log-Pwr Avg Hold:>100/100 Mk	005:00:00 PM Jan 03, 2020 TRACE [] 2 8 4 5 6 TYPE [] NN NN PET P NN NN 12,479 9 GHz 4.646 dBm -15.44 dBm				
MR R 10 dB/div 13 9 13 9 13 9 13 9 13 9 13 9 13 9 140 1 26 1 26 1 26 1 26 1 26 1 26 1 26 1 26 1 26 1 26 1 26 1 26 1 26 1 26 1 26 1 26 1 26 1 27 1 38 1 39 1 30 1 30 1 30 1 30 1 30 1	F 75 Q. AC CORPEC 2.526000000 GHz of Offset 3.93 dB of 23.93 dBm 2 2 4 3 0 GHz 4 2.479 9 CH 2.479 9 CH 2.479 9 CH 2.479 9 CH 2.479 9 CH	PNO: Fast IFGain:Low Trig: Free Rt. Atten: 30 dB 4 4 4 4 4 4 4 4 4 4 4 4 4	n Avg Type: Log-Pwr Avg Hold:>100/100 Mk	005:50:00 PM Jan 03.2020 TRACE [] 2 8 4 5 6 TYPE [] NH NH NH r1 2.479 9 GHz 4.646 dBm -15:44 dBm Stop 2.57600 GHz 600 ms (1001 pts)				
V R.L R Center Freq Re R 10 dB/div Re 13 9 -1 393 -6.07 -16.1 -6.07 -6.1 -6.61 -6.61 -6.61 -6.61 Start 2.47600 #Res BW 100 MRR MODE TCL SC -1 -1 3 N 1 f 3 N 1 f 6 -1 -1 -1	F 75 Q. AC CORPEC 2.526000000 GHz of Offset 3.93 dB of 23.93 dBm 2 2 4 3 0 GHz 4 2.479 9 CH 2.479 9 CH 2.479 9 CH 2.479 9 CH 2.479 9 CH	PNO: Fast IFGain:Low Trig: Free Rt. Atten: 30 dB 4 4 4 4 4 4 4 4 4 4 4 4 4	n Avg Type: Log-Pwr Avg Hold:>100/100 Mk	005:00:00 PM Jan 03, 2020 TRACE [] 2 8 4 5 6 TYPE [] N N N N r1 2.479 9 GHz 4.646 dBm -15:44 dBm Stop 2.57600 GHz 600 ms (1001 pts)				
M RL R Center Freq Re Re 10 dB/div Re 13 3 3 -6.07 - - -16.1 - - -6.61 - - -6.1 - - -6.1 - - -6.1 - - -6.1 - - -6.1 - - -6.1 - - -6.1 - - -6.1 - - -6.1 - - -6.1 - - -6.1 - - -6.1 - - -6.1 - - -6.1 - - -6.1 - - -6.1 - - -7.1 - - -7.1 - - -7.1 -	F 75 Q. AC CORPEC 2.526000000 GHz of Offset 3.93 dB of 23.93 dBm 2 2 4 3 0 GHz 4 2.479 9 CH 2.479 9 CH 2.479 9 CH 2.479 9 CH 2.479 9 CH	PNO: Fast IFGain:Low Trig: Free Rt. Atten: 30 dB 4 4 4 4 4 4 4 4 4 4 4 4 4	n Avg Type: Log-Pwr Avg Hold:>100/100 Mk	005:50:00 PM Jan 03.2020 TRACE [] 2 8 4 5 6 TYPE [] NH NH NH r1 2.479 9 GHz 4.646 dBm -15:44 dBm Stop 2.57600 GHz 600 ms (1001 pts)				



perature:	25 ℃		Relative Humidi	ty: 55%			
Voltage:	DC 3.8V		Cel man				
Mode:	π /4-DQPSK Hopping Mode						
ark:	Only worse case is reported						
Keysight Spectrum A	nalyzer - Swept SA 75 Ω AC CORREC	SENSE:INT	ALIGN AUTO	09:13:46 PM Jan 03, 2020			
	.356000000 GHz	IO: Fast Trig: Free Ru Gain:Low Atten: 30 dB	Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE MWWWW DET P N N N N N			
Ref (Offset 3.89 dB 23.89 dBm		N	kr1 2.401 9 GHz 5.740 dBm			
10 dB/div Ref	23.89 UDIII			1_			
3.89 -6.11				Min			
-16.1				-16.24 dBm			
-36.1		A4					
-56,1 Anglo Barran	A. Rowing and the Propulsion in the Propulsion of the Propulsion o	heleitertin presentational former on all the spin of and	มา	3 2 2			
-66.1Start 2.30600 0	GHz			Stop 2.40600 GHz			
#Res BW 100 H		#VBW 300 kHz		9.600 ms (1001 pts)			
1 N 1 f 2 N 1 f 3 N 1 f	2.401 9 GHz 2.400 0 GHz 2.390 0 GHz	5.740 dBm -55.928 dBm -55.673 dBm					
4 N 1 f 5 6	2.346 9 GHz	-53.624 dBm		E			
7 8 9							
		m					
MSG			STATUS				
💓 Keysight Spectrum Ar	nalyzer - Swept SA 75 Ω AC CORREC	SENSE:INT	ALIGN AUTO	09:16:57 PM Jan 03, 2020			
Center Freq 2	.526000000 GHz	10: Fast 😱 Trig: Free Ru Gain:Low Atten: 30 dB	Avg Type: Log-Pwr n Avg Hold:>100/100	TRACE 123456 TYPE MWWWW DET PNNNN			
10 dB (div Dof	Offset 3.93 dB 23.93 dBm		M	kr1 2.479 9 GHz 4.519 dBm			
3.93							
-6.07				⊧15.99 dBm			
-6.07 -16.1 -26.1 -36.1				-15.99 dBm			
46.07 -16.1 -26.1 -36.1 -46.1 -66.1	A 3		na potencia de la constante de	-15.99 dBr			
-6.07 -16.1 -36.1 -46.1 -66.1	μετουνδήσουςδαγκήθωμα di Duvernaufledgeroffikierper	a Andrea a guad de costo que fa Maria a de co	and got a state to the second day of the state of the sta	مر میں			
-6.07 -16.1 -26.1 -36.1 -46.1 -66.1 -66.1 -66.1 -66.1 -7000 0 #Res BW 100 H	GHZ KHZ	#VBW 300 kHz		Stop 2.57600 GHz 9.600 ms (1001 pts)			
-6.07 -6.1 -26.1 -36.1 -67.1 -67.1 -67.1 -67.1 -67.1 -67.1 -67.1 -67.1 -67.1 -67.1 -67.1 -67.1 -67.1 -77	GHz (Hz 2.479 9 GHz	Y FUNCTIO 4.519 dBm -56.574 dBm		Stop 2.57600 GHz			
-6.07 -6.1 -36.1 -36.1 -46.1 -67.1 -67.1 -67.1 -67.1 -67.1 -67.1 -67.1 -67.1 -67.1 -77.000 C -77.1 -77.000 C -77.1 -7	GHz KHz	Y FUNCTIO 4.519 dBm		Stop 2.57600 GHz 9.600 ms (1001 pts)			
-6.07 -16.1 -26.1 -36.1 -46.1 -66.1 -66.1 -66.1 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7	SHZ (HZ 2.479 9 GHz 2.435 6 GHz 2.500 0 GHz	Y FUNCTIO 4.519 dBm -56.574 dBm -55.435 dBm		Stop 2.57600 GHz 9.600 ms (1001 pts)			
-6.07 -6.1 -26.1 -36.1 -66.1 -7.47600 C #Res BW 100 H MKR MODE TRCI SCLI -7.4	SHZ (HZ 2.479 9 GHz 2.435 6 GHz 2.500 0 GHz	Y FUNCTIO 4.519 dBm -56.574 dBm -55.435 dBm		Stop 2.57600 GHz 9.600 ms (1001 pts)			



perature:	25 ℃		Relative Humidity:	55%
t Voltage:	DC 3.8V	<u> </u>	6000	
t Mode:	TX 8-DPSK	Mode 2402MH	z/2480 MHz	
nark:	Only worse o	ase is reported		
LXI RL	um Analyzer - Swept SA RF 75 Ω AC CORREC Q 2.3560000000 GHz	SENSE:INT PNO: Fast - Trig: Free R Gain:Low Atten: 30 dB		09:49:51 PM Jan 03, 2020 TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P N N N N N
10 dB/div	Ref Offset 3.89 dB Ref 23.89 dBm		Mkr	1 2.402 0 GHz 5.800 dBm
13.9 3.89				11
-6.111				-1 # 28 dBm
-16.1				
-36.1				3
-56.1	on an harrow work have an art and the	แก้วลุสุญญาณิที่สระมีสมุณชีวิจุษณ์ กระเครื่อ	en yan den serie dan gelan yan yan yan de la bereken bertak meneran de bertak de serie dan bertak dan de serie An ingeneralise dan de serie dan d	userian and the
Start 2.3060 #Res BW 10		#VBW 300 kHz		top 2.40600 GHz 500 ms (1001 pts)
MKR MODE TRC	SCL X	Y FUNCT		
2 N 1 3 N 1 4 N 1	f 2.400 0 GHz f 2.390 0 GHz	5.800 dBm -52.226 dBm -53.867 dBm -53.172 dBm		
5 6 7				E
8 9 10				
11		m	To status	
	RF 75 Ω AC CORREC 2.526000000 GHz	SENSE:INT	Avg Type: Log-Pwr	09:49:51 PM Jan 03, 2020 TRACE 1 2 3 4 5 6
	IFG	IO: Fast Gain:Low Trig: Free Run Atten: 30 dB		2.479 8 GHz
10 dB/div R Log	ef Offset 3.03 dB ef 23.03 dBm			-0.142 dBm
13.0 3.03				
13.0				-20.17 dBm
13.0 3.03 -6.97 -17.0 -27.0				-20.17 uBm
	2			-20.17 uBu
13.0 3.03 -6.97 -17.0 -27.0 -37.0	2 2 3		allerances Summarian Solution Systems (Same Solution Soluti	-2017 uBu
130 303 6.97 17.0 27.0 37.0 47.0 57.0) GHz	#VBW 300 kHz		-2017 den
13 0 3.03 -6.97 -17.0 -7.0) GHz D GHz D KHz	Y FUNCTIO	Sweep 9.60	0 ms (1001 pts)
13 0 3 03 6.97 -17.0 -27 0 -37 0 -47 0 -57 0 W -67 0 Start 2.47600 #Res BW 100 MKR MODE TRCL SC 1 N 3 N 1 3 N 1 3 N 1	D GHz D KHz 2 479 8 GHz 2 433 5 GHz 2 500 0 GHz	Y FUNCTIO	Sweep 9.60	0 ms (1001 pts)
13.0 1 3.03 1 -6.97 - -7.0 - -27.0 - -37.0 - -67.0 - -7 - -7 - -7 - -7 - <tr td=""> <tr td=""></tr></tr>	D GHz D KHz 2 479 8 GHz 2 433 5 GHz 2 500 0 GHz	Y FUNCTIO -0.142 dBm -56.510 dBm -56.273 dBm	Sweep 9.60	0 ms (1001 pts)
13 0 3.03 6.97 -17.0 -27.0 -27.0 -37.0 -47.0 -57.0 Start 2.47600 #Res BW 100 MKR MOR TRC ISC 1 N 1 f 3 N 1 f 4 N 1 f 5 N 1 f 6	D GHz D KHz 2 479 8 GHz 2 433 5 GHz 2 500 0 GHz	Y FUNCTIO -0.142 dBm -56.510 dBm -56.273 dBm	Sweep 9.60	0 ms (1001 pts)

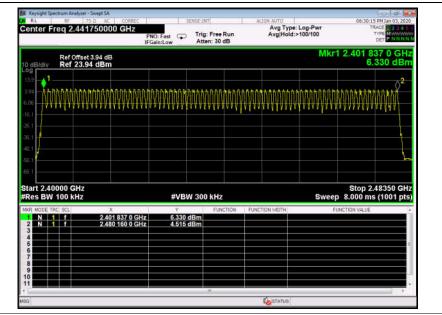


perature:	25 ℃		Relative Humidit	y: 55%				
Voltage:	DC 3.8V		- 61000					
Mode:	8-DPSK Hop	8-DPSK Hopping Mode						
ark:	Only worse of	ase is reported	d					
Keysight Spectrum	Analyzer - Swept SA F 75 Ω AC CORREC	SENSE:INT	ALIGN AUTO	10:04:20 PM Jan 03, 2020				
	2.356000000 GHz	IO: Fast 🖵 Trig: Free Ru Gain:Low Atten: 30 dB	Avg Type: Log-Pwr In Avg Hold:>100/100	TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P NNNN				
10 dB/div Re	f Offset 3.89 dB f 23.89 dBm		M	r1 2.403 0 GHz 5.475 dBm				
13.9				1-				
3.89 -6.11				MM				
-16.1				-18.48 V Bm				
-36.1			4	¢ ³ ↓ 2				
-56.1 44	entalenation and a feature and the flaten and an and the flaten an	hterener terrestation of the terrestation	ute enternante e altre entre production travel etc. sperie	Samuelanter				
Start 2.30600				Stop 2.40600 GHz				
#Res BW 100	L X	#VBW 300 kHz		.600 ms (1001 pts)				
2 N 1 f 3 N 1 f 4 N 1 f	2.400 0 GHz 2.390 0 GHz	5.475 dBm -54.804 dBm -54.431 dBm -52.912 dBm						
5 6 7				E				
8 9 10								
11		m	K ostatus	*				
			S					
Keysight Spectrum Center Freq	F 75 Ω AC CORREC 2.526000000 GHz	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr	10:36:11 PM Jan 03, 2020 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P N N N N N				
	IFG	IO: Fast Trig: Free Ru Gain:Low Atten: 30 dB						
			INIK	TI 2.480 0 GHZ				
10 dB/div Re	f Offset 3.93 dB ef 23.93 dBm			r1 2.480 0 GHz 4.327 dBm				
10 dB/div Re	f Offset 3.93 dB If 23.93 dBm							
10 dB/div Re Log 13.9 1-1	f Offset 3.93 dB							
10 dB/div Re 13.9 3.93 -6.07	f 23.93 dBm			4.327 dBm				
10 dB/div Re 13.9 -6.07 -16.1 -26.1 -36.1	f 23.93 dBm			4.327 dBm				
10 dB/div Re 13 9 1	f 23.93 dBm			4.327 dBm				
10 dB/div Re 13 9 1	ef 23.93 dBm	#VBW 300 kHz		4.327 dBm				
10 dB/div Re 139 399 -6.07 -16.1 -26.1 -46.1 -67.1 -67.1 -77.1	ef 23.93 dBm 2 4 3 6 Hz kHz 2.480 0 GHz 2.480 0 GHz	Y FUNCTIN 4.327 dBm	Sweep 9	4.327 dBm				
10 dB/div Re 0 dB/div Re 13	GHz 2.483 5 GHz 2.483 5 GHz	Y FUNCTION	Sweep 9	4.327 dBm				
10 dB/div Re 139 139 -6.07 -16.1 -6.5 -6.5 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7	GHz 2.483 5 GHz 2.483 5 GHz	Y FUNCTIN 4.327 dBm -54.406 dBm -54.184 dBm	Sweep 9	4.327 dBm				
10 dB/div Re log 13 3 -6 07 -16 1 -26 1 -26 1 -26 1 -36 1 -46 1 -56 1 -57 1 -56 1 -57 1	GHz 2.483 5 GHz 2.483 5 GHz	Y FUNCTIN 4.327 dBm -54.406 dBm -54.184 dBm	Sweep 9	4.327 dBm				

Attachment D-- Number of Hopping Channel Test Data

25℃	Relative Humidity:	55%
DC 3.8V		1313
Hopping Mode		- COL
ge Test Mod	de Quantity of Hopping Channel	Limit
GFSK	79	
Hz π/4-DQP	SK 79	>15
8-DPSk	K 79	
	DC 3.8V Hopping Mode ge Test Mod GFSK Hz π/4-DQP	DC 3.8V Hopping Mode Test Mode GFSK 79 Hz π/4-DQPSK 79

GFSK Mode



π /4-DQPSK Mode

enter Fr	eq 2.4417	750000 GHz	NO: Fast	Trig: Free Atten: 30	Run	Avg Type: L Avg Hold:>1	og-Pwr 00/100	TP	PM Jan 03, 20 IACE 1 2 3 4 TYPE M MMMM DET P N N N
dB/div	Ref Offset	3.94 dB	Gain:Low	Atten: 30	35		Mkr	1 2.402 0 3.	04 0 GH 548 dBr
99 3.9 3.4 3.4 3.4 4 4 4 4 4 5.1 5.1 5.1 5.1 5.1	awalaa	www.	nuthatata	AMAMATA	Militard		MMM	Anotha	
art 2.40	000 GHz 100 kHz	x	#VB	W 300 kHz		TION WIDTH		Stop 2. 8.000 ms	48350 GH (1001 pt
1 N 1		2.402 004 0 GHz 2.479 993 0 GHz	3,548	dBm	CHON FORC			AND FOR VALUE	



R Ergsight Spectrum Analyzer - Swigt SA RL RF 75 Gr AC CORREC Center Freq 2.441750000 GHz	PNO: East	ता ;: Free Run en: 30 dB	ALIGN AUTO Avg Type Avg Hold:	Log-Pwr	19 PM Jan 03, 2020 TRACE 2 2 4 1 10 TYPE M WWWWWW DET P M WWWWWW
Ref Offset 3.94 dB				Mkr1 2.402	004 0 GHz 1.817 dBm
133 1 334 ANNANYAYAYAYAYAYAYA 600 ANNAYAYAYAYAYAYAYA 161	Uption address	AN WAYN (ummutuntu	antan ana ana ana ana ana ana ana ana an	
Start 2.40000 GHz #Res BW 100 kHz	#VBW 300) kHz		Stop 2 Sweep 8.000 m	2.48350 GHz as (1001 pts)
MAR NODE TCC X 1 N 1 f 2.402.004.0 G 2 N 1 f 2.479.993.0 G 4 5 5 5 6 7 7 7 10 1 1 1	Y Hz 4,817 dBm Hz 4,591 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	A B