

FCC Radio Test Report

FCC ID: 2APRZ-MAXWELL-TX

Report No. Equipment Model Name Brand Name Applicant Address	BTL-FCCP-1-2209T131 Maxwell Dongle Maxwell-X, Maxwell-P Audeze LLC Audeze LLC 3410 S Susan St, Santa Ana, CA 92704 USA	
Radio Function	Bluetooth BR/EDR	
FCC Rule Part(s) Measurement Procedure(s)	FCC CFR Title 47, Part 15, Subpart C (15.247) ANSI C63.10-2013	
Date of Receipt Date of Test Issued Date	2022/10/4 2022/10/4 ~ 2022/11/9 2022/11/30	

The above equipment has been tested and found in compliance with the requirement of the above standards by BTL Inc.

Prepared by

NC.

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Approved by

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Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

This report is the confidential property of the client. As a mutual protection to the clients, the public and ourselves, the test report shall not be reproduced, except in full, without our written approval.

BTL's laboratory quality assurance procedures are in compliance with the ISO/IEC 17025 requirements, and accredited by the conformity assessment authorities listed in this test report.

BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.



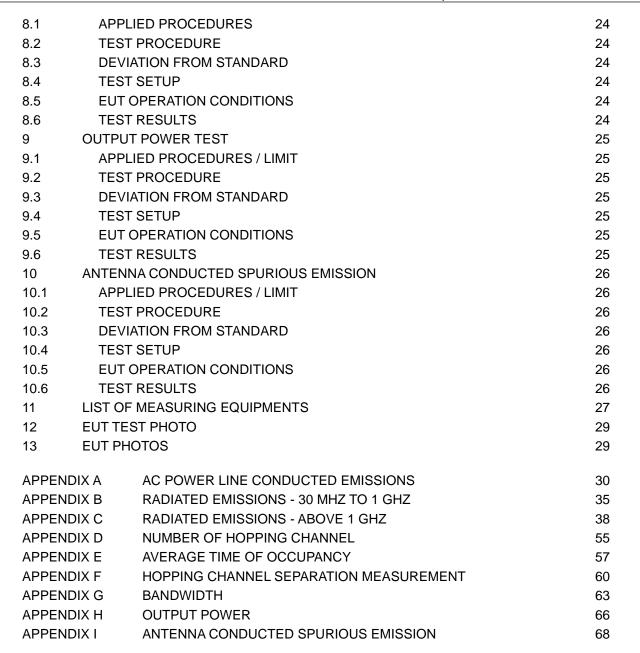
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BIL



REVISION HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCCP-1-2209T131	R00	Original Report.	2022/11/30	Valid

1 SUMMARY OF TEST RESULTS

Test procedures according to the technical standards.

Standard(s) Section	Description	Test Result	Judgement	Remark
15.207	AC Power Line Conducted Emissions	APPENDIX A	Pass	
15.205 15.209 15.247(d)	Radiated Emissions	APPENDIX B APPENDIX C	Pass	
15.247 (a)(1)(iii)	Number of Hopping Frequency	APPENDIX D	Pass	
15.247 (a)(1)(iii)	Average Time of Occupancy	APPENDIX E	Pass	
15.247 (a)(1)	Hopping Channel Separation	APPENDIX F	Pass	
15.247 (a)(1)	Bandwidth	APPENDIX G	Pass	
15.247 (b)(1)	Output Power	APPENDIX H	Pass	
15.247(d)	Antenna conducted Spurious Emission	APPENDIX I	Pass	
15.203	Antenna Requirement		Pass	

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report.

(2) The report format version is TP.1.1.1.



1.1 TEST FACILITY

Test Firm Location: No.18, Ln. 171, Sec. 2, Jiuzong Rd., Neihu Dist., Taipei City 114, Taiwan.TAF Accreditation Number is 0659; FCC Designation Number is TW0659.The satellite facilities under the test firm used to collect the test data in this report are:No. 68-2, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, TaiwanCB12CB17SR01SR02SR05

□ SR06
□ SR09
No. 72, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan
⊠ C06
⊠ CB21
□ CB22

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $\mathbf{y} \pm \mathbf{U}$, where expanded uncertainty \mathbf{U} is based on a standard uncertainty multiplied by a coverage factor of $\mathbf{k} = 2$, providing a level of confidence of approximately **95**%. The measurement instrumentation uncertainty considerations contained in CISPR 16-4-2. The BTL measurement uncertainty is less than the CISPR 16-4-2 U_{cispr} requirement.

A. AC power line conducted emissions test:

Test Site	Method	Measurement Frequency Range	U (dB)
C06	CISPR	150 kHz ~ 30 MHz	3.44

B. Radiated emissions test:

Test Site	Measurement Frequency Range	U,(dB)
	0.03 GHz ~ 0.2 GHz	4.17
	0.2 GHz ~ 1 GHz	4.72
CB21	1 GHz ~ 6 GHz	5.21
CB21	6 GHz ~ 18 GHz	5.51
	18 GHz ~ 26 GHz	3.69
	26 GHz ~ 40 GHz	4.23

C. Conducted test:

Test Item	U,(dB)
Occupied Bandwidth	0.5338
Output power	0.3659
Conducted Spurious emissions	0.5416
Conducted Band edges	0.5348
Dwell time	0.6606
Channel separation	0.6606
Channel numbers	0.6606

NOTE:

Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Environment Condition	Test Voltage	Tested by
AC Power Line Conducted Emissions	21 °C, 58 %	AC 120V	Jay Tien
Radiated emissions below 1 GHz	23 °C, 59 %	AC 120V	Eddie Lee
Radiated emissions above 1 GHz	23 °C, 59 %	AC 120V	Eddie Lee
Number of Hopping Frequency	22.6 °C, 51 %	AC 120V	Angela Wang
Average Time of Occupancy	22.6 °C, 51 %	AC 120V	Angela Wang
Hopping Channel Separation	22.6 °C, 51 %	AC 120V	Angela Wang
Bandwidth	22.6 °C, 51 %	AC 120V	Angela Wang
Output Power	23.6 °C, 54 %	AC 120V	Tim Lee
Antenna conducted Spurious Emission	22.6 °C, 51 %	AC 120V	Angela Wang

1.4 TABLE OF PARAMETERS OF TEST SOFTWARE SETTING

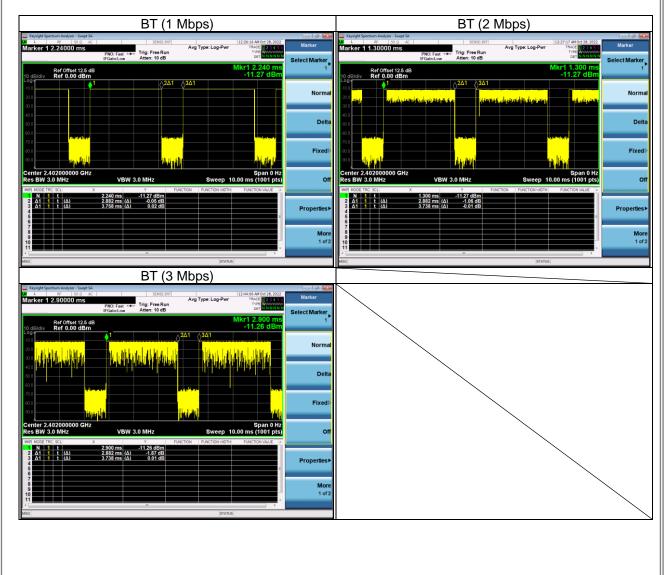
Test Software	AB1565/68 Lab Test Tool-3.2.2				
Modulation Mode	2402 MHz	2441 MHz	2480 MHz	Data Rate	
GFSK	48	48	48	1 Mbps	
π/4-DQPSK	53	53	53	2 Mbps	
8DPSK	53	53	53	3 Mbps	



1.5 DUTY CYCLE

If duty cycle is \geq 98 %, duty factor is not required. If duty cycle is < 98 %, duty factor shall be considered.

Remark	Delta 1			Delta 2	On Time/Period	10 log(1/Duty Cycle)
Mode	ON	Numbers	On Time (B)	Period (ON+OFF)	Duty Cycle	Duty Factor
Wode	(ms)	(ON)	(ms)	(ms)	(%)	(dB)
BT (1 Mbps)	2.882	1	2.882	3.758	76.69%	1.15
BT (2 Mbps)	2.882	1	2.882	3.738	77.10%	1.13
BT (3 Mbps)	2.882	1	2.882	3.738	77.10%	1.13



2 GENERAL INFORMATION

2.1 DESCRIPTION OF EUT

Equipment	Maxwell Dongle			
Model Name	Maxwell-X, Maxwell-P			
Brand Name	Audeze LLC			
	Model Name	Toggle XBOX function		
Model Difference	Maxwell-X	0		
	Maxwell-P	Х		
Power Source	DC voltage supplied	from host system.		
Power Rating	5V0.5A			
Products Covered	1 * USB C to A Cable			
Operation Band	2400 MHz ~ 2483.5 MHz			
Operation Frequency	2402 MHz ~ 2480 M	Hz		
Modulation Type	GFSK, π/4-DQPSK,	8DPSK		
Modulation Technology	FHSS			
Transfer Rate	1 Mbps, 2 Mbps, 3M	bps		
	1 Mbps: 4.38 dBm (0			
Output Power Max.	2 Mbps: 6.72 dBm (0			
	3 Mbps: 7.06 dBm (0.0051 W)			
Test Model	Maxwell-X			
Sample Status	Engineering Sample			
EUT Modification(s)	N/A			

NOTE:

(1) The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

(2) 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) Table for Filed Antenna:

Ant.	Manufacturer	Model number	Туре	Connector	Frequency (MHz)	Gain (dBi)
1	Unictron	CW324S	Chip Antenna	N/A	2400-2485	-0.4

(4) The above Antenna information are derived from the antenna data sheet provided by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.



2.2 TEST MODES

Test Items	Test mode	Channel	Note
AC power line conducted emissions	Normal/Idle	-	-
Transmitter Radiated Emissions (below 1GHz)	1 Mbps	39	-
Transmitter Radiated Emissions	1/3 Mbps	00/78	Bandedge
(above 1GHz)	1/3 Mbps	00/39/78	Harmonic
Number of Hopping Frequency	1/3 Mbps	00~78	-
Average Time of Occupancy	1/3 Mbps	00/39/78	-
Hopping Channel Separation	1/3 Mbps	00/39/78	-
Bandwidth	1/3 Mbps	00/39/78	-
Peak Output Power	1/2/3 Mbps	00/39/78	-
Antenna conducted Spurious Emission	1/3 Mbps	00/39/78	-

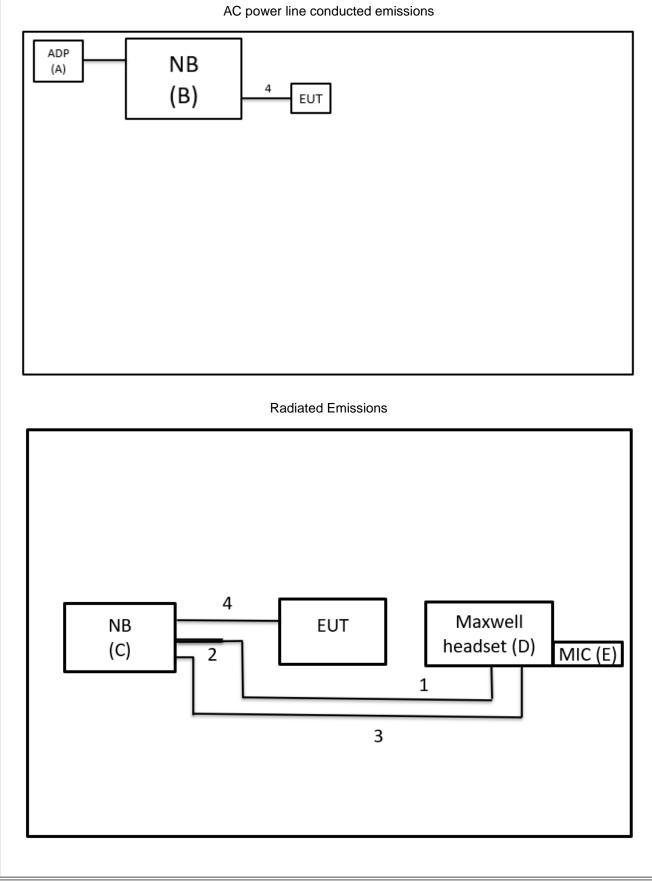
NOTE:

(1) For radiated emission band edge test, both Vertical and Horizontal are evaluated, but only the worst case (Horizontal) is recorded.



2.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Equipment letters and Cable numbers refer to item numbers described in the tables of clause 2.4.



2.4 SUPPORT UNITS

Item	Equipment	Brand	Model No.	Series No.	Remarks
А	ADP	HP	HSINN-CA40	N/A	Furnished by test lab.
В	NB	HP	TPN-I119	N/A	Furnished by test lab.
С	NB	acer	TMP446-M-50L4	N/A	Furnished by test lab.
D	Maxwell headset	Audeze LLC	Maxwell	N/A	Supplied by test requester.
Е	MIC	Primo	EM271Y	N/A	Supplied by test requester.
Item	Shielded	Ferrite Core	Length	Cable Type	Remarks
1	N/A	N/A	1.55m	USB Type-C Cable	Supplied by test requester.
2	N/A	N/A	0.315m	USB C to A Cable	Supplied by test requester.
3	N/A	N/A	1.27m	3.5mm Cable	Supplied by test requester.
4	N/A	N/A	0.315m	USB C to A Cable	Supplied by test requester.



3 AC POWER LINE CONDUCTED EMISSIONS TEST

3.1 LIMIT

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

NOTE:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.
- (3) The test result calculated as following:
 - Measurement Value = Reading Level + Correct Factor

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Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor (if use)
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Margin Level = Measurement Value - Limit Value

Calculation example:

Reading Level		Correct Factor		Measurement Value
38.22	+	3.45	Π	41.67

Measurement Value		Limit Value		Margin Level
41.67	-	60	=	-18.33

The following table is the setting of the receiver.

Receiver Parameter	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 KHz

3.2 TEST PROCEDURE

a. The EUT was placed 0.8 m above the horizontal ground plane with the EUT being connected to the power mains through a line impedance stabilization network (LISN).

All other support equipment were powered from an additional LISN(s).

The LISN provides 50 Ohm/50uH of impedance for the measuring instrument.

- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle to keep the cable above 40 cm.
- Excess I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable will be terminated, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. The LISN is spaced at least 80 cm from the nearest part of the EUT chassis.
- e. For the actual test configuration, please refer to the related Item EUT TEST PHOTO.

NOTE:

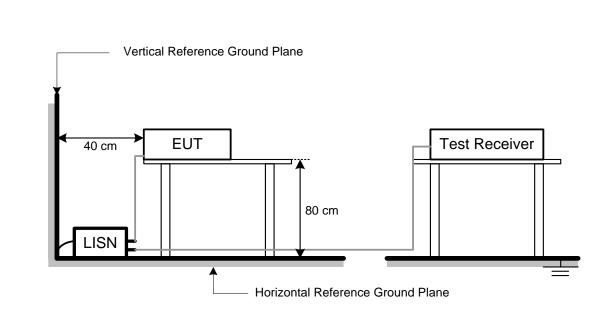
- In the results, each reading is marked as Peak, QP or AVG per the detector used. BW=9 kHz (6 dB Bandwidth)
- (2) All readings are Peak unless otherwise stated QP or AVG in column of Note. Both the QP and the AVG readings must be less than the limit for compliance.

3.3 DEVIATION FROM TEST STANDARD

No deviation.

BTL

3.4 TEST SETUP



3.5 TEST RESULT

Please refer to the APPENDIX A.



4 RADIATED EMISSIONS TEST

4.1 LIMIT

In case the emission fall within the restricted band specified on 15.205, then the 15.209 limit in the table below has to be followed.

LIMITS OF RADIATED EMISSIONS MEASUREMENT (9 kHz to 1000 MHz) Frequency Field Strength Measurement Distance (microvolts/meter) (MHz) (meters) 300 0.009~0.490 2400/F(KHz) 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 3 960~1000 500 3 LIMITS OF RADIATED EMISSIONS MEASUREMENT (Above 1000 MHz) **Radiated Emissions** Frequency Measurement Distance (dBuV/m) (MHz) (meters) Peak Average Above 1000 3 74 54 NOTE: (1) The limit for radiated test was performed according to FCC CFR Title 47, Part 15, Subpart C. (2) The tighter limit applies at the band edges. (3) Emission level (dBuV/m)=20log Emission level (uV/m). (4) The test result calculated as following: Measurement Value = Reading Level + Correct Factor Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use) Margin Level = Measurement Value - Limit Value Calculation example: Reading Level Correct Factor Measurement Value 35.45 + -11.37 24.08 = Measurement Value Limit Value Margin Level 24.08 40 -15.92 -= **Spectrum Parameter** Setting Attenuation Auto Start Frequency 1000 MHz Stop Frequency 10th carrier harmonic **RBW / VBW** 1MHz / 3MHz for Peak, (Emission in restricted band) 1MHz / 1/T for Average **Spectrum Parameter** Setting Attenuation Auto Start ~ Stop Frequency 9KHz~90KHz for PK/AVG detector Start ~ Stop Frequency 90KHz~110KHz for QP detector Start ~ Stop Frequency 110KHz~490KHz for PK/AVG detector Start ~ Stop Frequency 490KHz~30MHz for QP detector Start ~ Stop Frequency 30MHz~1000MHz for QP detector



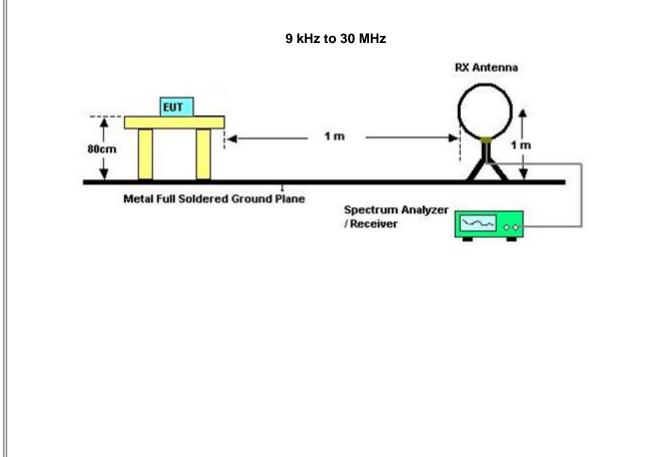
4.2 TEST PROCEDURE

- a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- b. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
- c. The height of the equipment or of the substitution antenna shall be 0.8 m or 1.5 m, the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights find the maximum reading (used Bore sight function).
- e. The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1GHz.
- f. The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- g. All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform. (below 1GHz)
- All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform. (above 1GHz)
- i. For the actual test configuration, please refer to the related Item EUT TEST PHOTO.

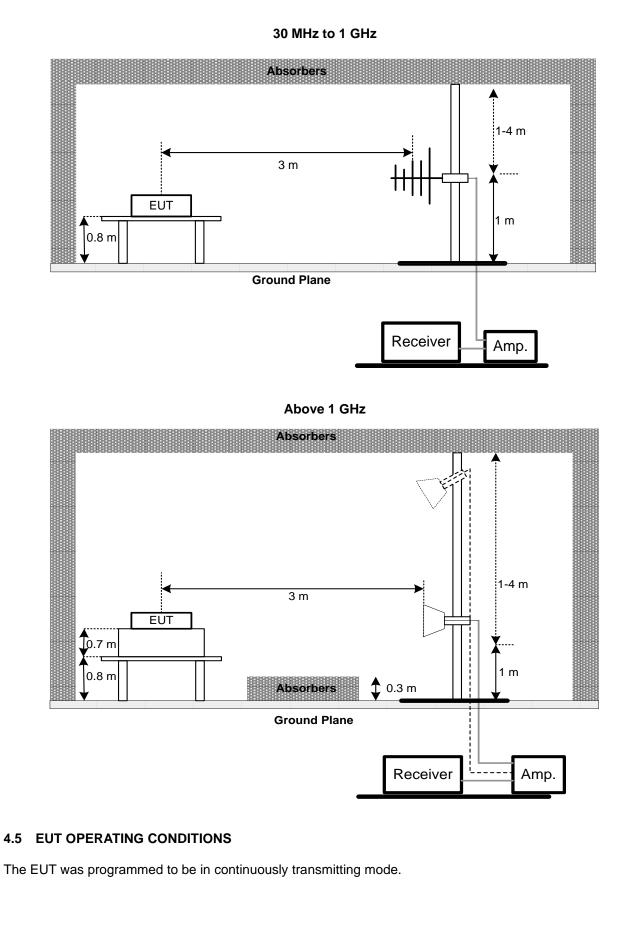
4.3 DEVIATION FROM TEST STANDARD

No deviation.

4.4 TEST SETUP









4.6 TEST RESULT – BELOW 30 MHZ

There were no emissions found below 30 MHz within 20 dB of the limit.

4.7 TEST RESULT – 30 MHZ TO 1 GHZ

Please refer to the APPENDIX B.

4.8 TEST RESULT – ABOVE 1 GHZ

Please refer to the APPENDIX C.

NOTE:

(1) No limit: This is fundamental signal, the judgment is not applicable. For fundamental signal judgment was referred to Peak output test.

5 NUMBER OF HOPPING CHANNEL

5.1 APPLIED PROCEDURES

Section	Test Item	Frequency Range (MHz)	Result
15.247(a)(1)(iii)	Number of Hopping Channel	2400-2483.5	PASS

Spectrum Parameters	Setting	
Attenuation	Auto	
Span Frequency	> Operating Frequency Range	
RBW	100 KHz	
VBW	100 KHz	
Detector	Peak	
Trace	Max Hold	
Sweep Time	Auto	

5.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting: RBW=100KHz, VBW=100KHz, Sweep time = Auto.

5.3 DEVIATION FROM STANDARD

No deviation.

5.4 TEST SETUP



5.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

5.6 TEST RESULTS

Please refer to the APPENDIX D.



6 AVERAGE TIME OF OCCUPANCY

6.1 APPLIED PROCEDURES / LIMIT

Section	Test Item	Limit	Frequency Range (MHz)	Result	
15.247(a)(1)(iii)	Average Time of Occupancy	0.4sec	2400-2483.5	PASS	

6.2 TEST PROCEDURE

- a. The transmitter output (antenna port) was connected to the spectrum analyzer
- b. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
- c. Use a video trigger with the trigger level set to enable triggering only on full pulses.
- d. Sweep Time is more than once pulse time.
- e. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
- f. Measure the maximum time duration of one single pulse.
- g. Set the EUT for DH5, DH3 and DH1 packet transmitting.
- h. Measure the maximum time duration of one single pulse.
- i. Measure the maximum time duration of one single pulse.
 - A Period Time = (channel number) * 0.4

For Non-AFH Mode (79 Channel):

DH1 Time Solt: Reading * (1600/2)/79 * (0.4 * 79) DH3 Time Solt: Reading * (1600/4)/79 * (0.4 * 79) DH5 Time Solt: Reading * (1600/6)/79 * (0.4 * 79)

For AFH Mode (20 Channel):

DH1 Time Solt: Reading * (800/2)/20 * (0.4 * 20) DH3 Time Solt: Reading * (800/4)/20 * (0.4 * 20) DH5 Time Solt: Reading * (800/6)/20 * (0.4 * 20)

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP



6.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

6.6 TEST RESULTS

Please refer to the APPENDIX E.



7 HOPPING CHANNEL SEPARATION MEASUREMENT

7.1 APPLIED PROCEDURES / LIMIT

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 KHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

Spectrum Parameter	Setting	
Attenuation	Auto	
Span Frequency	> Measurement Bandwidth or Channel Separation	
RBW	30 KHz	
VBW	100 KHz	
Detector	Peak	
Trace	Max Hold	
Sweep Time	Auto	

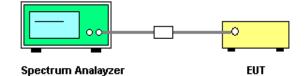
7.2 TEST PROCEDURE

- a. The EUT must have its hopping function enabled
- b. Span = wide enough to capture the peaks of two adjacent channels Resolution (or IF) Bandwidth (RBW) ≥ 1% of the span Video (or Average) Bandwidth (VBW) ≥ RBW Sweep = Auto Detector function = Peak Trace = Max Hold

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP



7.5 TEST RESULTS

Please refer to the APPENDIX F.



8 BANDWIDTH TEST

8.1 APPLIED PROCEDURES

Section	Test Item	Frequency Range (MHz)
15.247(a)(1)	Bandwidth	2400-2483.5

Spectrum Parameter	Setting		
Attenuation	Auto		
Span Frequency	> Measurement Bandwidth or Channel Separation		
RBW	30 KHz (20dB Bandwidth) / 30 KHz (Channel Separation)		
VBW	100 KHz (20dB Bandwidth) / 100 KHz (Channel Separation)		
Detector	Peak		
Trace	Max Hold		
Sweep Time	Auto		

8.2 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,

b. Spectrum Setting: RBW= 30KHz, VBW=100KHz, Sweep Time = Auto.

8.3 DEVIATION FROM STANDARD

No deviation.

8.4 TEST SETUP



8.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

8.6 TEST RESULTS

Please refer to the APPENDIX G.



9 OUTPUT POWER TEST

9.1 APPLIED PROCEDURES / LIMIT

Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(1)	Peak Output Power	0.125Watt or 21dBm	2400-2483.5	PASS

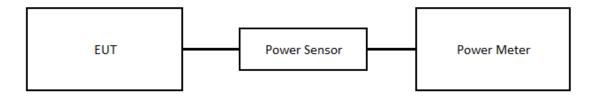
9.2 TEST PROCEDURE

- a. The EUT was directly connected to the power meter and antenna output port as show in the block diagram below.
- b. Spectrum Setting: RBW= 3MHz, VBW= 3MHz, Sweep time = Auto.

9.3 DEVIATION FROM STANDARD

No deviation.

9.4 TEST SETUP



9.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

9.6 TEST RESULTS

Please refer to the APPENDIX H.



10 ANTENNA CONDUCTED SPURIOUS EMISSION

10.1 APPLIED PROCEDURES / 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.

10.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting: RBW= 100KHz, VBW=100KHz, Sweep time = Auto.
- c. Offset=antenna gain+cable loss

10.3 DEVIATION FROM STANDARD

No deviation.

10.4 TEST SETUP



10.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

10.6 TEST RESULTS

Please refer to the APPENDIX I.

		AC Pow	er Line Conducted	d Emissions		
ltem	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	TWO-LINE V-NETWORK	R&S	ENV216	101497	2022/5/13	2023/5/12
2	Test Cable	EMCI	EMCCFD300-BM -BMR-5000	170501	2022/8/3	2023/8/2
3	EMI Test Receiver	R&S	ESR3	102950	2022/4/12	2023/4/11
4	Measurement Software	EZ	EZ_EMC (Version NB-03A1-01)	N/A	N/A	N/A
	Kind of		Radiated Emission	ons	Calibrated	Calibrated
Item	Equipment	Manufacturer	Type No.	Serial No.	Date	Until
1	Preamplifier	EMCI	EMC330N	980850	2022/9/19	2023/9/18
2	Preamplifier	EMCI	EMC118A45SE	980819	2022/3/8	2023/3/7
3	Preamplifier	EMCI	EMC184045SE	980882	2022/2/9	2023/2/8
4 5	Preamplifier Test Cable	EMCI EMCI	EMC001340 EMC104-SM-SM- 1000	980555 220319	2022/4/6 2022/3/15	2023/4/5 2023/3/14
6	Test Cable	EMCI	EMC104-SM-SM- 3000	220322	2022/3/15	2023/3/14
7	Test Cable	EMCI	EMC104-SM-SM- 7000	220324	2022/3/15	2023/3/14
8	EXA Signal Analyzer	keysight	N9020B	MY57120120	2022/3/7	2023/3/6
9	Loop Ant	Electro-Metrics	EMCI-LPA600	274	2022/6/16	2023/6/15
10	Horn Antenna	RFSPIN	DRH18-E	211202A18EN	2022/5/18	2023/5/17 2023/5/17
11	Horn Ant	Schwarzbeck	BBHA 9170D	1136	2022/5/18	
12	Log-bicon Antenna	Schwarzbeck	VULB9168	1369	2022/5/20	2023/5/19
13	6dB Attenuator	EMCI	EMCI-N-6-06	AT-N0625	2022/5/20	2023/5/19
14	Measurement Software	EZ	EZ_EMC (Version NB-03A1-01)	N/A	N/A	N/A
		Nerma	her of Henring Fr			
	Kind of	Num	ber of Hopping Fr	equency	Calibrated	Calibrated
ltem	Equipment	Manufacturer	Type No.	Serial No.	Date	Until
1	Spectrum Analyzer	Keysight	N9010A	MY54200240	2022/6/9	2023/6/8
		Δνα	erage Time of Occ	upancy		
ltem	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Spectrum Analyzer	Keysight	N9010A	MY54200240	2022/6/9	2023/6/8
	· · · · · · · · · · · · · · · · · · ·					
		Нор	pping Channel Sep	aration		
ltem	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Spectrum Analyzer	Keysight	N9010A	MY54200240	2022/6/9	2023/6/8



			Bandwidth			
Iten	n Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Spectrum Analyzer	Keysight	N9010A	MY54200240	2022/6/9	2023/6/8

	Output Power												
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until							
1	Power Meter	Anritsu	ML2495A	1128008	2022/6/1	2023/5/31							
2	Power Sensor	Anritsu	MA2411B	1126001	2022/6/1	2023/5/31							

Antenna conducted Spurious Emission												
ltem	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until						
1	Spectrum Analyzer	Keysight	N9010A	MY54200240	2022/6/9	2023/6/8						

Remark: "N/A" denotes no model name, no serial no. or no calibration specified. All calibration period of equipment list is one year.



12 EUT TEST PHOTO

Please refer to document Appendix No.: TP-2209T131-FCCP-1 (APPENDIX-TEST PHOTOS).

13 EUT PHOTOS

Please refer to document Appendix No.: EP-2209T131-1 (APPENDIX-EUT PHOTOS).



APPENDIX A AC POWER LINE CONDUCTED EMISSIONS



	Normal						Tested Date	2022/10/24
quency	-			Phase	Line			
dBuV								
×								
		5						
2 X	X	6		7	9 X		11	
	4 ×	×		8 X	10 X		12	
150						5		30.000
. Freq.	Level	Factor	ment	Limit	Margin			
							Comment	
0.5054	14.45	9.69	24.14	46.00	-21.86	AVG		
2.2402	13.72	9.75	23.47	56.00	-32.53	QP		
2.2402	6.44	9.75	16.19	46.00	-29.81	AVG		
3.6532	16.80	9.79	26.59	56.00	-29.41	QP		
3.6532	6.01	9.79	15.80	46.00	-30.20	AVG		
9.8946	12.22	9.88	22.10	60.00	-37.90	QP		
	x 2x 2x 2x 2x 2x 2x 2x 2x 2x 2x 2x 2x 2x	Image: Constraint of the sector of the se	Image: state stat	Image: state in the state	Image: second condition of the second condition	Image: Second	Image: Sector of the	Image: Second control of the second

(1) Measurement Value = Reading Level + Correct Factor.(2) Margin Level = Measurement Value - Limit Value.



st Mo	ode N	Normal						Tested Date	2022/10/24	
st Fre	equency -							Phase	Neutral	
80.0	dBu¥									
70										
60										
50	1 X									
40			5 ×							
30	2 X	3 X	6 ×			7 X		9 ×		
20		4 X				8 X		10 X	11 ×	
10									12 X	
0.0										
0	.150		0.5		(MHz)		5		30.000	
No. M		Reading Level	Correct Factor	Measure- ment	Limit	Margin				
	MHz	dBu∨	dB	dBu∨	dBu∨	dB	Detector	Comment		
1 *	0.1950	38.41	9.69	48.10	63.82	-15.72	QP			
2	0.1950	19.11	9.69	28.80	53.82	-25.02	AVG			
3	0.3300	21.01	9.68	30.69	59.45	-28.76	QP			
4	0.3300	7.56	9.68	17.24	49.45	-32.21	AVG			
5	0.5370	26.14	9.69	35.83	56.00	-20.17	QP			
6	0.5370	18.88	9.69	28.57	46.00	-17.43	AVG			
7	3.6825	14.11	9.79	23.90	56.00	-32.10	QP			
8	3.6825	5.03	9.79	14.82	46.00	-31.18	AVG			
9	7.7798	13.56	9.87	23.43	60.00	-36.57	QP			
10	7.7798	7.62	9.87	17.49	50.00	-32.51	AVG			
11	23.4487	7.71	10.03	17.74	60.00	-42.26	QP			
12	23.4487	-0.94	10.03	9.09	50.00	-40.91	AVG			

(1) Measurement Value = Reading Level + Correct Factor.(2) Margin Level = Measurement Value - Limit Value.



est Mo	ode	Idle						Tested Date	2022/10/24
est Fre	equency	-						Phase	Line
80.0) dBu¥								
70									
60	1								
50	×								
40	2	3 ×	5 X						
30	×	4	6 ×			7 X		9 × 10	11 X
20		×				8 X		×	12 X
10									
0.0									
U	.150		0.5		(MHz)		5		30.000
No. M		Reading Level	Factor	Measure- ment	Limit	Margin			
1 *	MHz	dBu∨	dB	dBu∨	dBuV	dB	Detector	Comment	
1 *	0.1860	42.79 22.20	9.69	52.48 31.89	64.21 54.21	-11.73	QP AVG		
3	0.1860	22.20	9.69	39.47	61.14	-22.52	QP		
4	0.2692		9.69	21.66	51.14	-29.48	AVG		
5	0.5302	26.81	9.69	36.50	56.00	-19.50	 		
6	0.5302	17.44	9.69	27.13	46.00	-18.87	AVG		
					56.00	-27.97	QP		
7	3.5475	18.25	9.78	28.03	00.00				
7 8	3.5475 3.5475	18.25 9.61	9.78 9.78	19.39	46.00	-26.61	AVG		
		9.61				-26.61 -32.44	AVG QP		
8	3.5475	9.61 17.68	9.78	19.39	46.00				
8	3.5475 9.4808	9.61 17.68 10.82	9.78 9.88	19.39 27.56	46.00 60.00	-32.44	QP		

(1) Measurement Value = Reading Level + Correct Factor.(2) Margin Level = Measurement Value - Limit Value.



st Mo	de	Idle						Tested Date	2022/10/24
st Fre	quency	-						Phase	Neutral
									•
80.0	dBu¥								
70									
60									
50	1 X								
40	3 ×		5 X						
30	2 X 4		6 ×			7			
20	×					× 8 ×		9 X 10 X	11 X
10								^ 	12 X
0.0									
0.	150		0.5		(MHz)		5		30.000
lo. Mk			Factor	Measure- ment	Limit	Margin			
	MHz	dBu∨	dB	dBu∨	dBu∨	dB	Detector	Comment	
1	0.183		9.68	46.61	64.32	-17.71	QP		
2	0.183		9.68	30.94	54.32	-23.38	AVG QP		
3	0.237		9.69 9.69	39.47 23.62	62.18 52.18	-22.71	AVG		
4 5	0.237		9.69	36.16	56.00	-28.56	QP		
6 *	0.530		9.69	29.34	46.00	-19.04	AVG		
7	3.439		9.09	29.34	56.00	-33.85	 		
8	3.439		9.78	14.93	46.00	-31.07	AVG		
9	9.426		9.89	20.60	60.00	-39.40	QP		
10	9.426		9.89	13.87	50.00	-36.13	AVG		
	23.311		10.03	16.52	60.00	-43.48	QP		

23.3115

12

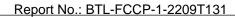
(1) Measurement Value = Reading Level + Correct Factor.(2) Margin Level = Measurement Value - Limit Value.

10.03

8.63

50.00 -41.37 AVG

-1.40





APPENDIX B RADIATED EMISSIONS - 30 MHZ TO 1 GHZ

BIL

	Test N				BT(1					Test Dat				2/11/5	
]	Fest Fre					1MH	Z			Polarizatio	on		Vertical		
	Ter	np			2	3°C			Hum.				5	9%	
80.0	dBu∀/m														
70															
60 —															
50 —															
40 —															
30		2 X					4 X					6 X			
20	X			З Х						5 X		×			
10															
0.0															
30.00	00 127	.00 224.	00	321.	00	418.	00	515.	00 E	512.00 7	709.00	80	6.00	1000.00) MHz
No.	Mk.	Freq		Rea Lev			orrect actor		easure- ment	Limit	C	Over			
		MHz	2	dB	uV		dB	d	3uV/m	dBuV/m	1	dB	Detector	Comm	ent
1		77.982	26	45.	66	-2	2.02		23.64	40.00	-1	6.36	peak		
2	*	145.44	21	47.	29	-1	8.50		28.79	43.50	-1	4.71	peak		
3		279.29	00	42.	13	-1	8.99		23.14	46.00	-2	2.86	peak		
4		458.41	66	42.	75	-1	4.15		28.60	46.00	-1	7.40	peak		
5		641.06	76	33.	37	-6	9.93		23.44	46.00	-2	2.56	peak		
6		742.72	36	33.	65	-8	3.05	2	25.60	46.00	-2	20.40	peak		

REMARKS:

Measurement Value = Reading Level + Correct Factor.
Margin Level = Measurement Value - Limit Value.



-	Test Mo	de		BT(1	Mbps)		Test Date	•	2022	2/11/5
Tes	st Frequ	lency			IMHz		Polarizatio	n	Horiz	zontal
	Temp)		23	3°C		Hum.		59	9%
80.0 dE	uV/m									
70										
60										
50										
40										
30	X		2 X	3 X	4 ×		5 X	6 X		
20										
10										
0.0										
30.000	127.00				418.00				5.00	1000.00 MH
No.	Mk.	Freq.	Le	ding vel	Correct Factor	Measure- ment		Over		
		MHz		ωV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	100.357		.06	-21.85	32.21	43.50	-11.29	peak	
2		279.451		.23	-18.99	28.24	46.00	-17.76	peak	
3		374.059		.15	-16.40	27.75	46.00	-18.25	peak	
4		457.382		.08	-14.16	26.92	46.00	-19.08	peak	
5		638.578		.94	-9.97	25.97	46.00	-20.03	peak	
6		774.151	<u>6</u> 34	.88	-7.45	27.43	46.00	-18.57	peak	



APPENDIX C RADIATED EMISSIONS - ABOVE 1 GHZ



	Test Mo	de	BT(1	Mbps)		Test Date		2022	2/11/5
Т	est Frequ		,	2MHz		Polarization	ı		zontal
	Temp		2	3°C		Hum.			9%
130.0	dBuV/m								
120									
110					3				
100									
90									
80									
70									
60									
50 	whentreshing	withmeters	and the second second second second	hapen on Myral	the heresting	wellow grandedo	which Harrison	negrossmanthe	5 XX
				2 X					6 X
30									
20									
10.0									
	.000 2322.0		2362.00	2382.00				2.00	2502.00 MHz
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2385.206	53.45	-5.77	47.68	74.00	-26.32	peak	
2		2385.206	41.45	-5.77	35.68	54.00	-18.32	AVG	
3	Х	2402.000	115.42	-5.75	109.67	74.00	35.67	peak	NoLimit
4	*	2402.000	114.87	-5.75	109.12	54.00	55.12	AVG	NoLimit
5		2487.136	53.26	-5.63	47.63	74.00	-26.37	peak	
6		2487.136	39.16	-5.63	33.53	54.00	-20.47	AVG	



	Test N	lodo	BT/	1Mbps)		Test Date		2022	2/11/5
	Test Fred			80MHz		Polarizatio			zontal
	Tem			23°C		Hum.			9%
130.0	dBu∀/m								
120									
110					*				
100									
90									
80									
70									
60									
50		and may many marked	Mr. I K. H. LOWING MARINE	Lash market water	with Xnowling	have a second	and the second	Autor Anna Allana	Marchenerman
40	2	an and the Male of		04141	6 X	in index.		We could be a construction	
30	x				^^				
20									
10.0	80.000 2400	.00 2420.00) 2440.00	2460.00	2480.00	2500.00 25	520.00 254	10.00	 2580.00 MHz
No		Freq.	Reading		Measure		Over	10.00	2300.00 MH2
110		ricq.	Level	Factor	ment	Linne	0,001		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2384.940		-5.78	46.53	74.00	-27.47	peak	
2		2384.940		-5.78	35.47	54.00	-18.53	AVG	
3	X *	2480.000		-5.65	106.55	74.00	32.55	peak	NoLimit
4 5	^	2480.000		-5.65 -5.65	106.04 47.67	54.00 74.00	52.04 -26.33	AVG	NoLimit
5 6		2484.393		-5.65	37.60	54.00	-26.33	peak AVG	
0		2404.030	, 40.24	-0.04	57.00	54.00	-10.40		



	Test Mo	do	BT	3Mbps)		Test Date		2020	2/11/5
Те	st Frequ			2MHz		Polarization	n		zontal
	Temp			3°C		Hum.			9%
130.0 d	BuV/m								
120									
110					3				
100									
90									
80					-1				
70									
60				_					
50 40	Mary Mary Marking	ward and a state warder	manapathanah		when have been up	age manual man	houndersteelingen		
30				2 X					6 ×
20									
10.0									
2302.0	00 2322.0	0 2342.00	2362.00	2382.00	2402.00 2	2422.00 24	42.00 246	52.00	2502.00 MH
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2374.120	53.82	-5.79	48.03	74.00	-25.97	peak	
2		2374.120	41.52	-5.79	35.73	54.00	-18.27	AVG	
3	Х	2402.000	116.68	-5.75	110.93	74.00	36.93	peak	NoLimit
4	*	2402.000	113.34	-5.75	107.59	54.00	53.59	AVG	NoLimit
5		2483.693	53.38	-5.65	47.73	74.00	-26.27	peak	
6		2483.693	41.18	-5.65	35.53	54.00	-18.47	AVG	



-	Test Mo Test Frequ			Mbps) 0MHz		Test Date Polarizatior	ר ר		2/11/5 contal
130.0	Temp dBuV/m		2	3°C		Hum.		59	9%
130.0									
120 🗕									
110 -					3				
100 -					Ä				
90 -									
80 –									
70					-				
50					1 2				
50 1					1 1				
		-manual material and a	North Market Mark	mysemment	× Workey	all the second of the second second	magan was a preserved	warded when the second	www.wew.en
40 2 X 30									
20									
10.0									
2380	0.000 2400.0	0 2420.00	2440.00	2460.00	2480.00 2	500.00 25	20.00 254	0.00	2580.00 MH
No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		N 41 1	Level	Factor	ment			Datastas	0
1		MHz 2382.384	dBuV 54.71	dB -5.78	dBuV/m 48.93	dBuV/m 74.00	dB -25.07	Detector peak	Comment
		2382.384	41.18	-5.78	35.40	54.00	-18.60	AVG	
- 2					106.26	74.00	32.26	peak	NoLimit
2 3	Х	2480.000	111.91	-5.65	100.20	74.00	02.20	pour	NOLINI
	X *	2480.000 2480.000	111.91 108.20	-5.65 -5.65	108.26	54.00	48.55	AVG	NoLimit
3									



	Test M					Mbps					Test Da					2/11/5	
les		uency				2MHz	2			P	olariza					tical	
130.0 dE	Tem	р			2	3°C					Hum	•			59	9%	
130.0 00	u v / III																
120																	
110																	
100																	
90																	
80																	
70																	
60																	-
50		1															
40		1 2 X															
30																	
20																	
10.0																	
1000.00	0 3550.	.00 6100).00	8650	.00	1120	0.00	1375	i0.00	163	00.00	188	50.00	214	00.00	26500.0	IO MH2
No.	Mk.	Freq		Rea Le			rrect ctor		easure ment	ə-	Limit	t	Ove	ər			
		MHz	2	dB			B		BuV/n	n	dBuV/	m	dE	3	Detector	Comm	ent
1		4804.0		44.			65		14.74		74.00		-29.		peak		
2	*	4804.0	000	38.	74	0.	65	3	39.39		54.00)	-14.	61	AVG		



	Test Mo t Frequ					lbps) MHz				Test Da plarizat				2/11/5 zontal
	Temp				23					Hum.				9%
130.0 dB	uV/m													
120														
110														
100														
90														
во														
70														
50														
50		ţ												
10 <u> </u>		1 2 X												
30														
20														
10.0														
	0 3550.0			8650.00		11200.00	1375			00.00			21400.00	26500.00 MH
No.	Mk.	Freq	•	Readir Leve		Correct Factor		asure- nent	•	Limit		Over		
		MHz		dBuV	/	dB	dE	3uV/m		dBuV/r	n	dB	Detector	Comment
1		4804.0	00	45.74	ŀ	0.65	2	6.39		74.00)	-27.61	peak	
2	*	4804.0	00	39.94	ŀ	0.65	4	0.59		54.00)	-13.41	AVG	



	Test Mo	ode			BT(1	Mbps)					Test D	ate			202	2/11/5	
Te	est Freq				244	1MHz					olariza				Ve	rtical	
	Tem	0			2	3°C					Hum	ı			5	9%	
130.0 c	lBu¥/m	i															_
120																	
110																	
100																	
90																	
80																	
70																	
60																	
50																	
40		1 2 X															
30		x															
20 10.0																	
)00 3550.	00 6100	.00	8650	.00	11200.	00	1375	0.00	16	300.00	188	50.00	21400.0	0	26500	 1.00 MHz
No.	Mk.	Freq		Read Lev		Corr Fac			easur nent		Limi		Ove	r			
		MHz		dB		dE			BuV/r		dBuV	/m	dB	D	etector	Comr	nent
1		4882.0		41.		0.9			1.95		74.0		-32.0		peak		
2	*	4882.0	00	35.	67	0.9	2	3	36.59		54.0	0	-17.4	1	AVG		



	Test Mo st Frequ					Mbps 1MHz					Test Da Polariza					2/11/5 zontal	
	Temp					3°C	_				Hum					9%	
130.0 dB	uV/m																
120																	
110																	
100																	
90																	
80																	
70																	
60																	
40		1 2 X															
30		Ŷ															
20																	
10.0																	
	0 3550.0			8650		1120			60.00		300.00		50.00		00.00	26500.0	0 MH:
No.	Mk.	Freq	•	Read Lev			rrect ctor		easure ment	Э-	Limit	t	Ove	er			
		MHz	2	dBu	uV	С	B	d	3uV/n	n	dBuV/	'n	dE	3	Detector	Comm	ent
1		4882.0		44.			92		15.20		74.00		-28.		peak		
2	*	4882.0	000	39.	85	0.	92	2	10.77		54.00)	-13.	23	AVG		



	Test Mo st Freq					Mbps) 0MHz					Test Da olariza					2/11/5 tical	
	Tem				23	3°C					Hum				59	9%	
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20																	1
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No.	0 3550. Mk.	Frec		8650.0 Read		Corr			easure		300.00 Limit		50.00 Ove		JU.UU	26500.0	UMH
INO.	IVIN.	TIEC	•	Lev		Fac			ment		LIIII	•	000	51			
		MHz	2	dBu		dE			BuV/m	۱	dBuV/	m	dE	3	Detector	Comm	ent
1		4960.0	000	41.8	37	1.1	8	Z	13.05		74.00)	-30.	95	peak		
2	*	4960.0	000	35.9	94	1.1	8	3	37.12		54.00)	-16.	88	AVG		



Te	Test Me est Freq					Mbps 0MHz					Test Da Polariza					2/11/5 zontal	
	Tem					3°C	-			<u> </u>	Hum					9%	
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120																	
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No.	Mk.	Freq	-	Read Lev			rect ctor		easur ment	e-	Limi	t	Ove	er			
		MHz	2	dBu	uV	d	IB	d	3uV/r	n	dBuV/	m	dE	}	Detector	Comme	ent
1		4960.0		42.			18		13.83		74.00		-30.		peak		
2	*	4960.0	00	37.	50	1.	18	3	38.68		54.00)	-15.3	32	AVG		



	Test Mo st Frequ					Mbps) 2MHz				Test Da olarizat				2/11/5 tical
	Temp					3°C				Hum.				9%
130.0 dB	uV/m													
120														
110														
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40 <u> </u>		2 X												
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10.0														
	0 3550.0			8650.00		11200.00		50.00		00.00			1400.00	26500.00 MH
No.	Mk.	Freq	•	Readii Leve		Correct Factor		easure ment	-	Limit		Over		
		MHz	2	dBu\	/	dB	dl	3uV/m		dBuV/ı	m	dB	Detector	Comment
1		4804.0		44.37		0.65		45.02		74.00		-28.98		
2	*	4804.0	000	38.01		0.65	3	38.66		54.00)	-15.34	AVG	



	Test Mo st Freq				Г(ЗМI 402IV					lest Da olarizat				2/11/5 zontal
	Tem				23°0					Hum.				9%
130.0 dE	uV/m													
120														
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50														
50														
10		X												
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20														
10.0 1000.00	0 3550.	00 610	n nn	8650.00	11	200.00	137	50.00	163	00.00	1885	0.00 21.	400.00	26500.00 MH
No.	Mk.	Frec		Readin Level	g (Correct Factor	Me	easure ment		Limit		Over		20000.00 Mil
		MH	Z	dBuV		dB		BuV/m		dBuV/r	m	dB	Detector	Comment
1	-	4804.0	000	38.11		0.65		38.76		74.00		-35.24	peak	
2	*	4804.0	000	35.36		0.65	3	36.01		54.00)	-17.99	AVG	



	Test M				BT(3	Mbp 1MH					Test Da Polariza					2/11/5 tical	
Tes	Tem	uency				<u>тип</u> 3°С	Z			F	Hum					<u>110ai</u> 9%	
130.0 dE	uV/m	þ			Ζ.	30					Hum	•			08	970	
120																	
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100																	-
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50		1 X															1
40		×															-
30																	
20																	
10.0	0 3550.	00 610	0.00	8650	00	1120	0.00	1376	50.00	16	300.00	199	50.00	21.4)0.00	26500.0	 10 M H -
No.	Mk.	Fred			ding		rrect		easur		Limit		Ove		0.00	20300.0	
			1.	Le			ctor		ment	-		•					
		MH	Z	dB	uV	(βB	d	BuV/r	n	dBuV/	m	dE	3	Detector	Comm	ent
1		4882.0			.83		.92		14.75		74.00		-29.		peak		
2	*	4882.0	000	39.	.72	0	.92	2	10.64		54.00)	-13.	36	AVG		



	Test Mo st Frequ				BT(3 244	Mbp 1MH					Test Da olariza					2/11/5 zontal	
	Temp					3°C					Hum					9%	
130.0 dB	uV/m																_
120																	
110																	
100																	
90																	-
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30																	
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10.0																	
	0 3550.0			8650		1120			50.00		300.00		50.00		DO.OO	26500.0	0 M H
No.	Mk.	Freq	•	Read Lev			rrect ctor		easure ment	9-	Limit		Ove	er			
		MHz	2	dBı	uV	(βB	d	3uV/n	า	dBuV/	m	dE	3	Detector	Comm	ent
1		4882.0		39.			.92		40.85		74.00		-33.		peak		
2	*	4882.0	000	37.	75	0	.92	3	38.67		54.00)	-15.3	33	AVG		



	Test Mo st Freq					Mbps 0MHz					Test Da olariza					2/11/5 tical	
	Tem				23	3°C					Hum				59	9%	
130.0 dl	3uV/m																
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)0 3550.			8650.		1120		1375			00.00		50.00		00.00	26500.0	IO MH:
No.	Mk.	Freq		Read Lev			rrect ctor		easure ment	9-	Limit		Ove	ər			
		MHz	2	dBu	١V	C	B	d	BuV/m	۱	dBuV/	m	dE	3	Detector	Comm	ent
1		4960.0	000	41.7	70	1.	18	Z	12.88		74.00)	-31.	12	peak		
2	*	4960.0	000	34.9	98	1.	18	3	36.16		54.00)	-17.	84	AVG		



	Test Mo	ode			BT(3						Test Da				2022	2/11/5	
Т	est Freq					OMH:	Z			F	Polariza					zontal	
100.0	Tem	р			23	3°C					Hum	l .			59	9%	
130.0	dBuV/m																
120																	
110																	
100																	
90																	
80																	
70																	-
60																	
50																	
40		1 2 X															
30		×															
20																	
10.0																	
1000.	000 3550.	00 6100	.00	8650	.00	1120	0.00	1375	50.00	16	300.00	188	50.00	2140	00.00	26500.0	0 MHz
No.	Mk.	Freq		Read Lev			rrect ctor		easur ment	e-	Limit	t	Ove	ər			
		MHz	_	dB			B		BuV/r	n	dBuV/	/m	dE	3	Detector	Comm	ent
1		4960.0	00	41.	52	1	.18		42.70		74.00		-31.3	30	peak		
2	*	4960.0	00	35.	27	1	.18	3	36.45		54.00	0	-17.	55	AVG		



APPENDIX D NUMBER OF HOPPING CHANNEL

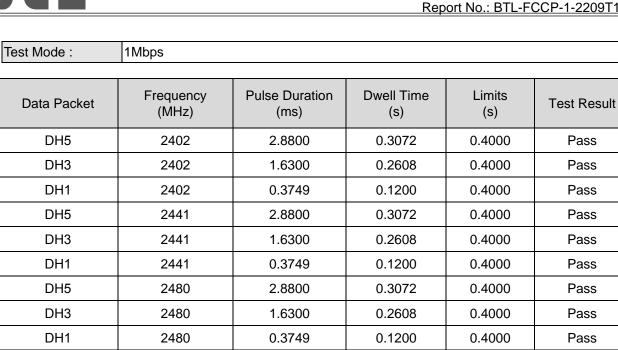


est Mode 1/	3Mbps		
Test Mode	Number of Hopping Channel	≥ Limit	Test Result
1 Mbps	79	15	Pass
3 Mbps	79	15	Pass
Specify Spectrum: Joseph Sa Rt Ref Offset 12:50 dB GERGIN: Ref 010:00 dBm O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O<	<u>аралика и на индеридария и на индеридария с Сепte</u> 2.44175000	Image: Sense of the s	Mkr2 2.480 130 0 GHz Frequence 1.55 dBm Auto 1.55 dBm 2- 1.55 dBm 2- 2.4175000 2.4175000
0 0 0	2.4000000	400 50 GHz 400 50 GHZ 50 GHZ 5	2.40000000
10 art 2.40000 GHz es BW 100 KHz W tool: THC tot N 1 7 2.402 130 0 GHz 2.472 1958 0 GHz 2.473 1958 0 GHz	Stop 2.48350 GHz 2.483500 GHz 100 kHz Sweep 10.13 ms (1001 pts) 8.36000 Y Function Function width Function width 1.0 GBm Function Function width Function width	Start 2.40000 GHz #VBW 100 KHz #Res BW 100 KHz #VBW 100 KHz Man 1 N f 2.401 955 0 GHz 1.11 dBm 2 N f 2.401 955 0 GHz 1.55 dBm	Stop 2.48350 GHz 2.48350000 Sweep 10.13 ms (1001 pts) CF FUNCTION FUNCTION VIGHT FUNCTION VIGHT FUNCTION FUNCTION VIGHT FUNCTION VIGHT



APPENDIX E AVERAGE TIME OF OCCUPANCY

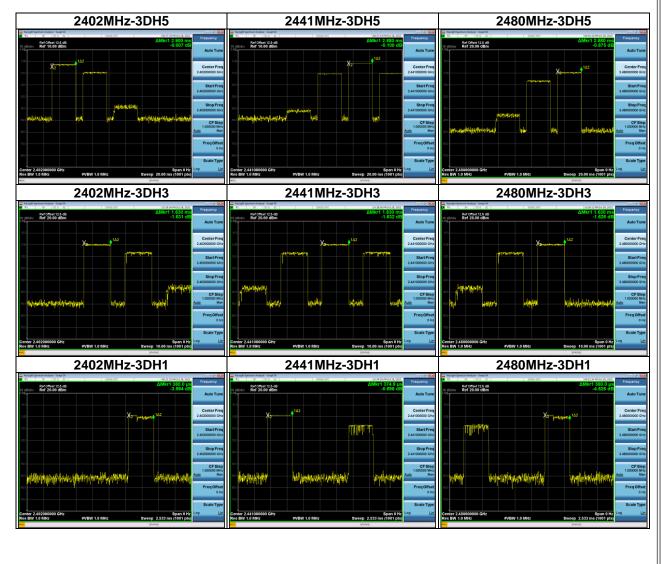








Test Mode :	3Mbps				
Data Packet	Frequency (MHz)	Pulse Duration(ms)	Dwell Time(s)	Limits(s)	Test Result
3DH5	2402	2.9000	0.3093	0.4000	Pass
3DH3	2402	1.6300	0.2608	0.4000	Pass
3DH1	2402	0.3800	0.1216	0.4000	Pass
3DH5	2441	2.8800	0.3072	0.4000	Pass
3DH3	2441	1.6300	0.2608	0.4000	Pass
3DH1	2441	0.3749	0.1200	0.4000	Pass
3DH5	2480	2.8800	0.3072	0.4000	Pass
3DH3	2480	1.6300	0.2608	0.4000	Pass
3DH1	2480	0.3800	0.1216	0.4000	Pass





APPENDIX F HOPPING CHANNEL SEPARATION MEASUREMENT



Test Mode :	Hopping on _1Mbps		
Frequency (MHz)	Channel Separation (MHz)	2/3 of 20dB Bandwidth (MHz)	Test Result
2402	0.999	0.638	Pass
2441	0.988	0.642	Pass
2480	1.005	0.640	Pass

2402 MHz	2441 MHz	2480 MHz
Bridgetamin Adapt Shart M Grid (a) (b) Fingure Anno (b) Fingure Annon (b) Fingure Anno (b) <	Tagging transmission Angue Sang La Links (M) Links (M) Links (M) Links (M) Links (M) Frequency Ref Of 50:12.5 db Add (T) Sign (H) 0.14 db) Frequency Links (M) Links (M) 0.14 db) Auto Tune 110	Registration Angle - Seg 12 Could be and a fill of a b and b f
The second secon	20 M Center Proc 2 Antonio Gre 20 M Antonio Gre	2 Cristin Fried 2.7500000 Grid 2.750000 Grid 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5
2 44100000 GPG 500 100 100 100 100 100 100 100	2 24000000 GHz 2000000 GHz 2000000 GHz 2 24000000 GHz	2.4700000 GHz
col Cf Step 2000 004-10 Adda Weining To Freq Offset	CF Step Add: Ware To Freq Offset	25 CF Step 20000 Min Man 75 Freq Offset
Center 2.402500 GHz 5oan 3.000 MHz 1.00 Lin	Center 2.411500 GHz Span 3.000 MHz	Center 2.473500 CHz Spain 3.000 I/Hz Log Lin
#Res BW 30 kHz #VBW 100 kHz Sweep 3.200 ms (1001 pts) status	#Res BW 30 KHZ #VBW 100 KHZ Sweep 3,200 ms (1001 pts)	#Res BW 30 kHz #VBW 100 kHz Sweep 3.200 ms (1001 pts)



Τe	Test Mode : Hopping on _3Mbps											
	Frequency (MHz)	Channel Separation (MHz)	2/3 of 20dB Bandwidth (MHz)	Test Result								
	2402	0.988	0.845	Pass								
	2441	0.998	0.846	Pass								
	2480	0.978	0.845	Pass								

2402 MHz		2441 N	ЛНz	2480 MHz
Reconcerto 24 dB Bit All Bit A	Auto Ture	Repair Spectrum Analysis Repair Spectrum Analysis Repair Spectrum Analysis Repair Spectrum Analysis Repair Spectrum Analysis Repair Spectrum Analysis Repair Spectrum Analysis Repair Spectrum Analysis Log Spectrum Analysis Repair Spectrum Analysis Repair Spectrum Analysis Repair Spectrum Analysis	108-45 02 74406 38, 2002 ΔΜΙΚΤΙ 998 ΚΗ2 -0.01 dB Auto Tune	December Adapt Sale Sale
	Center Freq 02500000 GHz		122 Center Freq 2.441500000 GHz	24750000 GHZ 24750000 GHZ 24750000 GHZ
220 Mar Man Mar Mar Mar Mar Mar Mar Mar Mar Mar 220	Start Freq 01000000 GHz		Start Freq 2.440000000 GHz	
	Stop Freq 04000000 GHz CF Step 300.000 kHz		Stop Freq 2.44300000 GHz CF Step 300.000 Hz	300 Stop Preg 2,48100000 GHz 401 C C C C C C C C C C C C C C C C C C C
	Freq Offset	500	Auto Man Freq Offset 0 Ha	600
Center 2.40/500 GHz Span 3.000 MHz L20 Revs BW 30 kHz #VBW 100 kHz Sweep 3.200 ms (1001 pts)	Scale Type Lin	700 Center 2.441500 GHz #Res BW 30 kHz #VBW 100 kHz	Span 3.000 MHz Log Lin Sweep 3.200 ms (1001 pts)	Center 2.479500 GHz Scale Type Res BW 30 HHz #VBW 100 HHz Sweep 3.200 ms (101 pts)
MSO STATUS		M35	status	MSC STATUS



APPENDIX G BANDWIDTH



Test Mode :	IMbps		
Frequency (MHz)	20dB Bandwidth (MHz)	99% Occupied BW (MHz)	Test Result
2402	0.958	0.883	Pass
2441	0.963	0.882	Pass
2480	0.960	0.881	Pass





Test Mode :	BMbps		
Frequency (MHz)	20dB Bandwidth (MHz)	99% Occupied BW (MHz)	Test Result
2402	1.267	1.157	Pass
2441	1.269	1.155	Pass
2480	1.268	1.155	Pass





APPENDIX H OUTPUT POWER



Test Mode :	1Mbps		Tested	d Date	2022/11/8
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	4.31	0.0027	21.00	0.1250	Pass
2441	4.38	0.0027	21.00	0.1250	Pass
2480	4.36	0.0027	21.00	0.1250	Pass
Test Mode :	2Mbps		Tested	d Date	2022/11/8
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	6.67	0.0046	21.00	0.1250	Pass
2441	6.72	0.0047	21.00	0.1250	Pass
2480	6.61	0.0046	21.00	0.1250	Pass
Test Mode :	3Mbps		Testeo	d Date	2022/11/8
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	7.02	0.0050	21.00	0.1250	Pass
2441	7.06	0.0051	21.00	0.1250	Pass
2480	6.99	0.0050	21.00	0.1250	Pass

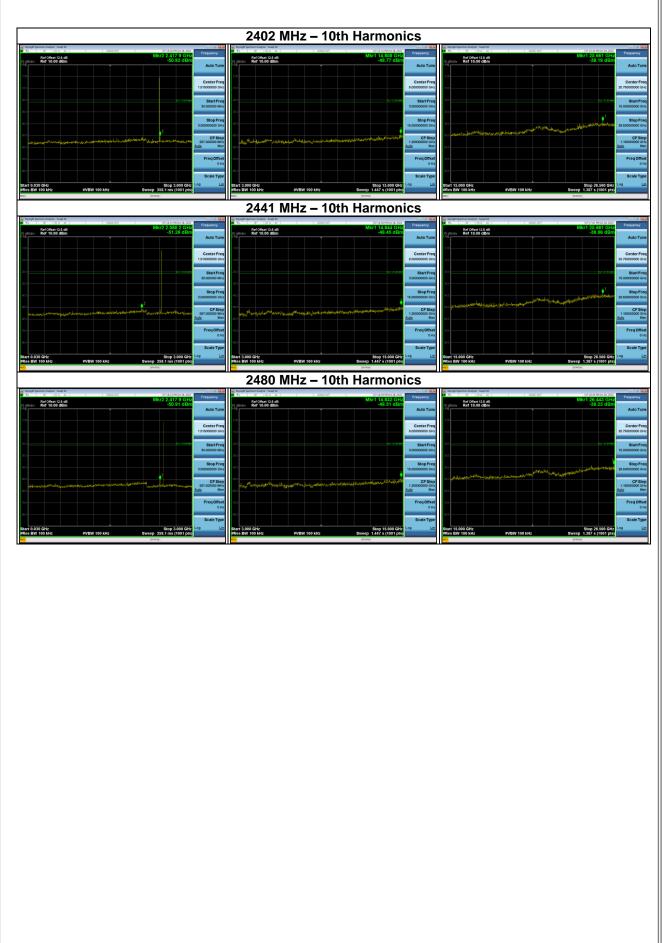


APPENDIX I ANTENNA CONDUCTED SPURIOUS EMISSION



				1
Keysight Spectrum Analyzer - Swept SA	2402 MHz_	Lower		2480 MHz_ Upper
RL RF 50 Q AC	SENSE:INT	07:15:11 PM Oct 28, 2022 Mkr4 2.327 4 GHz	Frequency	0 RL RF 50 Ω AC SENSE:INT 07:18:08 PM Oct 28, 2022 Frequency
dB/div Ref 10.00 dBm		-54.52 dBm	Auto Tune	Ref Offset 12.5 dB Mkr4 2.537 9 GHz 10 dB/div Ref 10.00 dBm -53.21 dBm 400 1
0		0.1-2 45 d0n	Center Freq 2.357000000 GHz	100 Center 200 2.52300000 2.52300000 2.52300000
0 0 0	ng, dagant fi Philipe on Administry of some dig fi Are I ag Maire		Start Freq 2.307000000 GHz	
			Stop Freq 2.407000000 GHz	400
art 2.30700 GHz es BW 100 kHz	#VBW 100 kHz	Stop 2.40700 GHz Sweep 12.07 ms (1001 pts)	CF Step 10.000000 MHz	Start 2.47300 GHz Stop 2.57300 GHz #Res BW 100 kHz #VBW 100 kHz Sweep 12.07 ms (1001 pts) 10000000
N 1 f 2.40211 N 1 f 2.4001 N 1 f 2.4001 N 1 f 2.39001 N 1 f 2.3274	GHz 165 dBm	PORCHONYWOTH PORCHONYWOOD	Auto Man Freq Offset 0 Hz	I N I C C480 2 GHz -1 09 dBm Forecomment Forecomment Auto 2 N I T 2 483 6 GHz -57 10 dBm Forecomment Forecom
			Scale Type	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
			Log <u>Lin</u>	
2402 MU	- Honning	on mode (Lowe		2480 MHz_ Hopping on mode (Upper)
Z4UZ IVIΠ Keysight Spectrum Analyzer - Swept SA RL RF 50 Ω AC	2_ nopping	•		🔤 Keysight Spectrum Analyzer - Swept SA 🛛 😡
REF 0ffset 12.5 dB	SENSE:INT	07:33:18 PM Oct 28, 2022 Mkr4 2.313 4 GHz -53.38 dBm	Frequency Auto Tune	2 AL #P [59.8 AC SENSE.INT (073435 Mod28, 2022) Frequence Ref Offset 12.5 dB Mkr4 2, 49.4 0 GHz GHz Frequence 10 dBrdw -52, 54 dBm Auto 10 dBrdw
		pc1 -2 44.000	Center Freq 2.357000000 GHz	400 0000000000000000000000000000000000
2 4 3 4 4 5 6 6 6 6 6 6 6 6 6 6 6 6 6	Annuality Lange Annual and the second line	nitanjanjan tertimen di sete	Start Freq 2.307000000 GHz	300 450 450 450 450 450 450 450 450 450 4
0			Stop Freq 2.407000000 GHz	400 700 800 2.57300000 2.57300000
art 2.30700 GHz es BW 100 kHz	#VBW 100 kHz	Stop 2.40700 GHz Sweep 12.07 ms (1001 pts)	CF Step	Start 2.47300 GHz Stop 2.57300 GHz #Res BW 100 kHz \$Weep 12.07 ms (1001 pts)
N 1 f 2.405 2 N 1 f 2.400 0 N 1 f 2.390 0 N 1 f 2.331 4	Y FUNCTIO	N FUNCTION WIDTH FUNCTION VALUE	10.000000 MHz <u>Auto</u> Man	Memory Text Sci. X Y Flaction Flaction worth Flact
N 1 f 2.313.4	GHz _53.38 dBm		Freq Offset 0 Hz	4 N 1 1 2494 0 GHz -52.54 dBm Freq 0







	2402 MHz	Lower			2480 MHz	_ Upper	
Segued Sector Analyses General Sec Bab P 30 0 4 CC Ref Office Ref 10.00 dBm 20 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		1001 45 0001 28, 2022 Mkr4 2.329 6 GHz -53, 97 dBm	Auto Tune Center Freq 2.35700000 GHz Start Freq 2.30700000 GHz Stop Freq	Property Spectrum Analyses - lawy 51 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12	55052307	9919-94 9900 28,2 Mkr4 2,536 9 Gi -53,80 dB	-Iz Frequency
	#VBW 100 kHz 2402 CHz 087 dBm 2400 CHz 087 dBm 3329 CHz 037 dBm 3329 CHz 0397 dBm	Stop 2.40700 CHz Sweep 12.07 ms (1001 pts) ON POLICION NOTH POLICION SULE	2.407000000 GHz CF Step 10.000000 MHz <u>Auto</u> Man Freq Offset 0 Hz Scale Type Log Lin	NO Xian 2.47300 GHz #Res BW 100 KHz X 1 N I 2 N I 3 N I 4 2.48 2.48 3 N I 4 I 2.48 5 I 2.48 6 I 2.48 1 I I 2 I I 1 I 2.48 1 I 2.48 1 I I 2 I I 1 I I 1 I I 1 I I 1 I I 1 I I 1 I I	#VBW 100 kHz PXIC 02 GHz 0.90 dBm PXIC 03 GHz 6.51 dBm PXIC 04 GHz 6.53 JdBm PXIC 05 GHz 6.53 JdBm PXIC	Stop 2.57300 C Sweep 12.07 ms (1001 p TON FUICTION WOTH FUNCTION NAULE	2.573000000
2402	MHz Hopping	on mode (Lowe	er)	2480 M	Hz Hopping	on mode (Upp	per)
Crystel Spectrum Analyzer - Swept SA. RL 8F 50 0 AC Ref Offset 12.5 dB dB/dlv Ref 20.00 dBm 0 0	SENSE:INT	(85.657 PM oc 28, 8322 Mkr4 2:353 3 GHz -52:59 dBm	Auto Tune Center Freq 2.35700000 GHz	Keysöld Spectrum Analyzer - Snept A K		(e.3) 22 PM 0218, Mkr4 2.499 4 G -52.14 dB	Frequency
			Start Freq 2.30700000 GHz Stop Freq 2.407000000 GHz	300 400 400 400 700	3 Japantetanajarta artesta artesta artesta artesta		Start 2.473000000 Stop 2.573000000
N 1 F N 1 F N N 1 F N N 1 T N N 1 T N	#VBW 100 kHz 24070 6Hz 0.76 dBm 24000 6Hz 55677 dBm 25900 6Hz 4257 dBm 25900 6Hz 4257 dBm 2593 3 GHz 4259 dBm	Stop 2.40700 GHz Sweep 12.07 ms (1001 pts)	CF Step 10.000000 MHz <u>Auto</u> Man Freq Offset 0 Hz Scale Type	Start 2.47300 GHz #Res BW 100 kHz Margin Mccelerci Scil X 1 N 1 7 247 3 N 1 7 247 4 N 1 7 247 5 1 7 248 6 7 249 249 7 1 7 249 8 1 7 249	#VBW 100 kHz 60 GHz 036 dBm 3 GHz 54.98 dBm 9 GHz 55.30 dBm 9 4 GHz 52.14 dBm	Stop 2.57300 G Sweep 12.07 ms (1001 p Function worki Function wulle	Freq Of Scale 1



