

FCC Radio Test Report

FCC ID: UFOOPN2002N

Report No. Equipment Model Name Brand Name Applicant Address Manufacturer Address	BTL-FCCP-1-2106T023 Laser Data Collector OPN-2002n OPTICON OPTOELECTRONICS Co., Ltd. 4-12-17, Tsukagoshi, Warabi-shi, Saitama Pref., 335-0002 Japan OPTOELECTRONICS Co., Ltd. 4-12-17, Tsukagoshi, Warabi-shi, Saitama Pref., 335-0002 Japan
Radio Function	Bluetooth EDR
FCC Rule Part(s) Measurement Procedure(s)	FCC Part15, Subpart C (15.247) ANSI C63.10-2013
Date of Receipt	2012/7/30 2021/6/22
Date of Test	2021/6/22 2012/7/30 ~ 2012/9/20 2021/6/22 ~ 2022/4/27
Issued Date	2022/5/19

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

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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.

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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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REVISION HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCCP-1-2106T023	R00	Original Report.	2021/10/5	Invalid
BTL-FCCP-1-2106T023	R01	Revised report to address TCB's comments.	2022/5/19	Valid

1 SUMMARY OF TEST RESULTS

Test procedures according to the technical standards.

FCC Part 15, Subpart C (15.247)								
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

The test facilities used to collect the test data in this report:

No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan The test sites and facilities are covered under FCC RN: 674415 and DN: TW0659.

\boxtimes	C05	CB08	CB11	\boxtimes	CB15	CB16
\boxtimes	SR05					

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)
C05	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
CB15	1 GHz ~ 6 GHz	5.21
CB15	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	23 °C, 70 %	AC 120V	Paul Shen
Radiated emissions below 1 GHz	23 °C, 57 %	AC 120V	Vincent Lee
Radiated emissions above 1 GHz	23 °C, 57 %	AC 120V	Vincent Lee
Number of Hopping Frequency	26 °C, 60 %	AC 120V	Rush
Average Time of Occupancy	26 °C, 60 %	AC 120V	Rush
Hopping Channel Separation	26 °C, 60 %	AC 120V	Rush
Bandwidth	26 °C, 60 %	AC 120V	Rush
Output Power	24.3 °C, 53 %	AC 120V	Angela Wang
Antenna conducted Spurious Emission	26 °C, 60 %	AC 120V	Rush

1.4 TABLE OF PARAMETERS OF TEST SOFTWARE SETTING

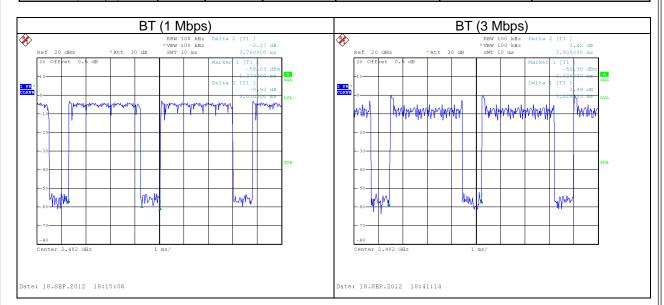
Test Software	CMD							
Modulation Mode	2402 MHz	2441 MHz	2480 MHz	Data Rate				
GFSK	PM2E	PM2E	PM2E	1 Mbps				
π/4-DQPSK	PM2E	PM2E	PM2E	2 Mbps				
8DPSK	PM2E	PM2E	PM2E	3 Mbps				



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)	3.010	1	3.010	3.760	80.05%	0.97
BT (3 Mbps)	3.025	1	3.025	3.805	79.50%	1.00



2 GENERAL INFORMATION

2.1 DESCRIPTION OF EUT

Equipment	Laser Data Collector
Model Name	OPN-2002n
Brand Name	OPTICON
Model Difference	N/A
Dower Source	#1 DC voltage supplied from USB Port.
Power Source	#2 Supplied from battery.
Power Pating	#1 I/P: DC 5V
Power Rating	#2 3.7Vdc 230mAh
Products Covered	N/A
Operation Band	2400 MHz ~ 2483.5 MHz
Operation Frequency	2402 MHz ~ 2480 MHz
Modulation Type	GFSK, π/4-DQPSK, 8DPSK
Modulation Technology	FHSS
Transfer Rate	1 Mbps, 2 Mbps, 3Mbps
	1 Mbps: 0.13 dBm (0.0010 W)
Output Power Max.	2 Mbps: -0.85 dBm (0.0008 W)
	3 Mbps: -1.33 dBm (0.0007 W)
Test Model	OPN-2002n
Sample Status	Engineering Sample
EUT Modification(s)	N/A

NOTE:

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

(2) This is a supplement report of NEI-FCCP-2-1207180 report. The differences compared with original report are changed antenna and battery model. After evaluated, the changes with respect to the original one, only AC power line conducted emissions, radiated emissions and output power tests need to be verified.

(3) Channel List:

BIL

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		

(4) Table for Filed Antenna:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	OPTOELECTRO NICS CO., LTD.	2.4G PCB Antenna	PCB Layout	N/A	-0.86



2.2 TEST MODES

Test Items	Test mode	Channel	Note
AC power line conducted emissions	Normal/Idle	-	-
Transmitter Radiated Emissions (below 1GHz)	1 Mbps	78	-
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:

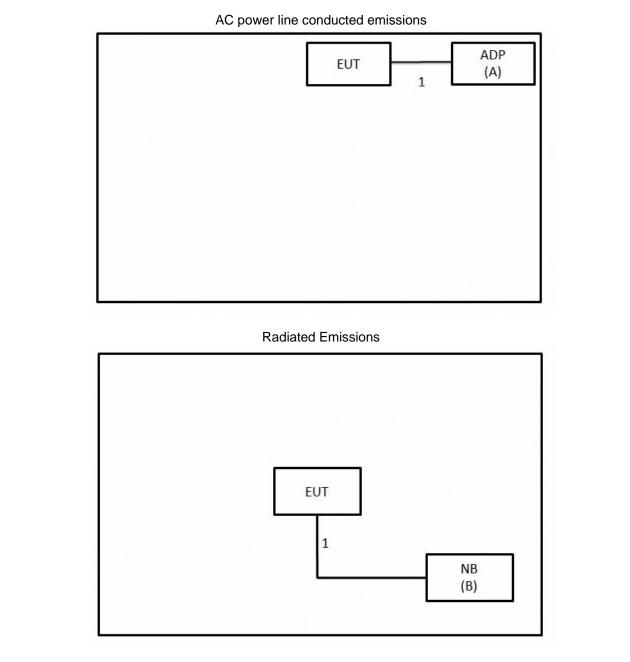
(1) For radiated emission band edge test, both Vertical and Horizontal are evaluated, but only the worst case (Horizontal) is recorded.

(2) All X, Y and Z axes are evaluated, but only the worst case (X axis) 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
A	Adapter	GARMIN	TC U250	N/A	Furnished by test lab.
В	NB	Acer	MS2351	N/A	Furnished by test lab.
Item	Shielded	Ferrite Core	Length	Cable Type	Remarks
1	N/A	N/A	1m	Mini USB Cable	Supplied by test requester



3 AC POWER LINE CONDUCTED EMISSIONS TEST

3.1 LIMIT

Frequency	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
 - Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor (if use)

Margin Level = Measurement Value - Limit Value

Calculation example:

Reading Level		Correct Factor		Measurement Value
38.22	+	3.45	Ι	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.
- c. 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.
- The LISN is spaced at least 80 cm from the nearest part of the EUT chassis. d
- e. For the actual test configuration, please refer to the related Item EUT TEST PHOTO.

NOTE:

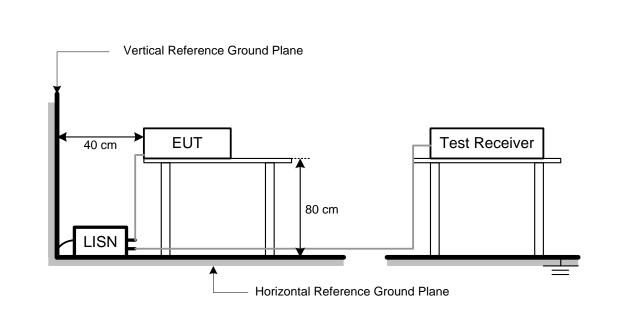
- (1) In the results, each reading is marked as Peak, QP or AVG per the detector used. BW=9 kHz (6 dB Bandwidth)
- (2) All readings are Peak unless otherwise stated QP or AVG in column of Note. Both the QP and the AVG readings must be less than the limit for compliance.

3.3 DEVIATION FROM TEST STANDARD

No deviation.



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
(MHz)	(microvolts/meter)	(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
960~1000	500	3

LIMITS OF RADIATED EMISSIONS MEASUREMENT (Above 1000 MHz)

Frequency	Radiated I (dBu	Measurement Distance	
(MHz)	Peak	Average	(meters)
Above 1000	74	54	3

NOTE:

(1) The limit for radiated test was performed according to FCC 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:

ouloulation oxample.				
Reading Level		Correct Factor		Measurement Value
35.45	+	-11.37	Ш	24.08

Measurement Value		Limit Value		Margin Level
24.08	-	40	Ι	-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	
Attenuation Start ~ Stop Frequency	Auto 9KHz~90KHz for PK/AVG detector	
Start ~ Stop Frequency	9KHz~90KHz for PK/AVG detector	
Start ~ Stop Frequency Start ~ Stop Frequency	9KHz~90KHz for PK/AVG detector 90KHz~110KHz for QP detector	



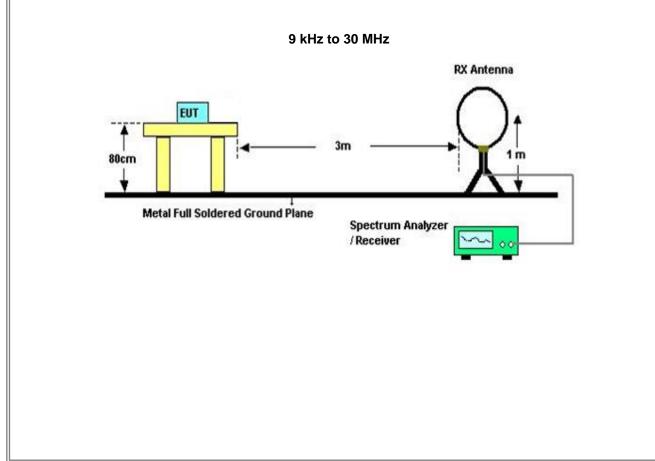
4.2 TEST PROCEDURE

- 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.

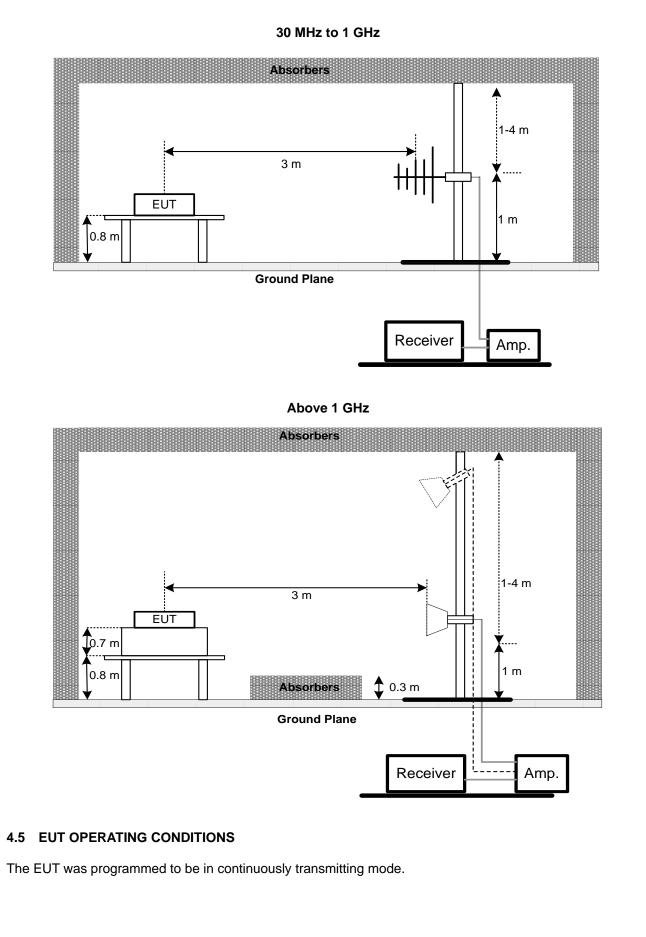
4.3 DEVIATION FROM TEST STANDARD

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

FCC Part15 (15.247) , Subpart C				
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

EUT	SPECTRUM		
	ANALYZER		

5.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 3.5 unless otherwise a special operating condition is specified in the follows during the testing.

5.6 TEST RESULTS

Please refer to the APPENDIX D.



6 AVERAGE TIME OF OCCUPANCY

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
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 * (1600/6)/79 * (0.4 * 79) DH3 Time Solt: Reading * (1600/6)/79 * (0.4 * 79) DH5 Time Solt: Reading * (1600/6)/79 * (0.4 * 79)

For AFH Mode (20 Channel): DH1 Time Solt: Reading * (800/6)/20 * (0.4 * 20) DH3 Time Solt: Reading * (800/6)/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 tested system was configured as the statements of 3.5 unless otherwise a special operating condition is specified in the follows during the testing.

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	

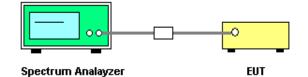
7.2 TEST PROCEDURE

- 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

FCC Part15 (15.247), Subpart C				
Section	Test Item	Frequency Range (MHz)		
15.247(a)(2)	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 tested system was configured as the statements of 3.5 unless otherwise a special operating condition is specified in the follows during the testing.

8.6 TEST RESULTS

Please refer to the APPENDIX G.



9 OUTPUT POWER TEST

9.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247), Subpart C				
Section Test Item Limit Frequency Range (MHz) Result				
15.247(b)(1)	Peak Output Power	0.125Watt or 21dBm	2400-2483.5	PASS

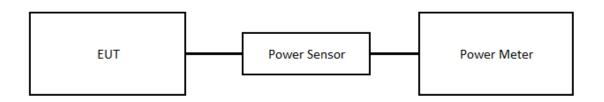
9.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer 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 tested system was configured as the statements of 3.5 unless otherwise a special operating condition is specified in the follows during the testing.

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 tested system was configured as the statements of 3.5 unless otherwise a special operating condition is specified in the follows during the testing.

10.6 TEST RESULTS

Please refer to the APPENDIX I.

11 LIST OF MEASURING EQUIPMENTS						
		AC Pow	er Line Conducted	d Emissions		
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	TWO-LINE V-NETWORK	R&S	ENV216	101339	2021/3/10	2022/3/9
2	Test Cable	EMCI	EMCRG58-BM-B M-9000	210501	2021/5/3	2022/5/2
3	EMI Test Receiver	R&S	ESR 7	101433	2020/12/11	2021/12/10
4	Measurement Software	EZ	EZ_EMC (Version NB-03A1-01)	N/A	N/A	N/A
			Radiated Emissio	ons		
	Kind of				Calibrated	Calibrated
Item	Equipment	Manufacturer	Type No.	Serial No.	Date	Until
1	Preamplifier	EMCI	EMC02325B	980217	2021/4/8	2022/4/7
2	Preamplifier	EMCI	EMC012645B	980267	2021/4/8	2022/4/7
3	Preamplifier	EMCI	EMC001340	980555	2021/4/8	2022/4/7
4	Test Cable	EMCI	EMC-SM-SM-100 0	180809	2021/4/8	2022/4/7
5	Test Cable	EMCI	EMC104-SM-SM- 3000	151205	2021/4/8	2022/4/7
6	Test Cable	EMCI	EMC-SM-SM-700 0	180408	2021/4/8	2022/4/7
7	MXE EMI Receiver	Agilent	N9038A	MY554200087	2021/5/27	2022/5/26
8	Signal Analyzer	Agilent	N9010A	MY52220990	2021/8/18	2022/8/17
9	Loop Ant	Electro-Metrics	EMCI-LPA600	274	2021/6/1	2022/5/31
10	Horn Ant	SCHWARZBECK	BBHA 9120D	9120D-1342	2021/6/2	2022/6/1
11	Horn Ant	Schwarzbeck	BBHA 9170	BBHA 9170340	2021/7/9	2022/7/8
12	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	VULB 9168-352	2021/8/11	2022/8/10
13	5dB Attenuator	EMCI	EMCI-N-6-05	AT-N0625	2021/8/11	2022/8/10
14	Measurement Software	EZ	EZ_EMC (Version NB-03A1-01)	N/A	N/A	N/A
		Num	ber of Hopping Fr	Adriancy		
	Kind of					
Item	Equipment	Manufacturer	Type No.	Serial No.	Calibrat	ed Until
1	Spectrum Analyzer	R&S	FSP-40	100129	Oct. 06	6, 2012
Average Time of Occupancy						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrat	ed Until
1	Spectrum Analyzer	R&S	FSP-40	100129	Oct. 06	6, 2012
	- -					
Hopping Channel Separation						

		Hopping Channel Separation						
	Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Until		
	1	Spectrum Analyzer	R&S	FSP-40	100129	Oct. 06, 2012		
1								



			Bandwidth		
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Until
1	Spectrum Analyzer	R&S	FSP-40	100129	Oct. 06, 2012

			Output Power	•		
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Power Meter	Anritsu	ML2495A	1128008	2021/5/26	2022/5/25
2	Power Sensor	Anritsu	MA2411B	1126001	2021/5/26	2022/5/25

		Antenna	conducted Spuric	ous Emission	
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Until
1	Spectrum Analyzer	R&S	FSP-40	100129	Oct. 06, 2012

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-2106T023-FCCP-1 (APPENDIX-TEST PHOTOS).

13 EUT PHOTOS

Please refer to document Appendix No.: EP-2106T023-2 (APPENDIX-EUT PHOTOS).



APPENDIX A AC POWER LINE CONDUCTED EMISSIONS



	-	N 1					-	ente d Dete	0004/7/00
est Mod		Normal						ested Date	2021/7/23
est Fred	quency	-					P	hase	Line
80.0	dBu¥								
70 -									
60									
ŀ			3						
50			¥ 4 ×	7					
40		1 X	5 ×	8 8	9 X	11 X			
30		2 X	6 ×	×	10 X	12			
20		^				×			
10									
0									
-10									
-20.0 0.1	E0		0.5		(MHz)		5		30.000
0.1	50	Deedie					5		30.000
No. Mk	. Freq	Reading Level) Correct Factor	Measure ment	- Limit	Over			
	MHz	dBu∨	dB	dBu∨	dBu∨	dB	Detector	Comment	
1	0.3277	24.75	9.70	34.45	59.51	-25.06	QP		
2	0.3277	7 16.17	9.70	25.87	49.51	-23.64	AVG		
3	0.5010) 39.80	9.71	49.51	56.00	-6.49	QP		
4 *	0.5010		9.71	43.83	46.00	-2.17	AVG		
5	0.7035		9.71	36.87	56.00	-19.13	QP		
6	0.7035	5 17.89	9.71	27.60	46.00	-18.40	AVG		
7	1.0050		9.72	40.34	56.00	-15.66	QP		
8	1.0050) 22.32	9.72	32.04	46.00	-13.96	AVG		
9	1.9590		9.76	38.50	56.00	-17.50	QP		
10	1.9590		9.76	29.23	46.00	-16.77	AVG		
11	3.7433		9.86	34.52	56.00	-21.48	QP		
12	3.7433	3 15.34	9.86	25.20	46.00	-20.80	AVG		



est Mod	1e	Normal					Τa	ested Date	2021/7/23
est Fred		-						hase	Neutral
0011100	queriey								Noutrai
80.0	dBuV								
70	••••								
60									
50									
		3 × 4							
40		×		7 5 X	9 ×				
30		1 X 2		5 × × 8 × 6	1	0	11 X		
20		×		×	×		12		
10							×		
0									
-10									
-20.0									
0.1	150	0.5			(MHz)		5		30.000
No. Mk	. Freq.		Correct Factor	Measure- ment	Limit	Over			
	MHz	dBuV	dB	dBuV	dBu∨	dB	Detector	Comment	
1	0.4065	17.90	9.71	27.61	57.72	-30.11	QP		
2	0.4065	11.51	9.71	21.22	47.72	-26.50	AVG		
3	0.5010	33.94	9.71	43.65	56.00	-12.35	QP		
4 *	0.5010	27.56	9.71	37.27	46.00	-8.73	AVG		
5	0.9060	20.47	9.73	30.20	56.00	-25.80	QP		
6	0.9060	11.99	9.73	21.72	46.00	-24.28	AVG		
7	1.0072		9.73	34.64	56.00	-21.36	QP		
8	1.0072		9.73	27.39	46.00	-18.61	AVG		
9	2.4157		9.76	32.02	56.00	-23.98	QP		
10	2.4157		9.76	24.21	46.00	-21.79	AVG		
11	5.9618		10.01	26.68	60.00	-33.32	QP		
12	5.9618	6.88	10.01	16.89	50.00	-33.11	AVG		



est Mod	to	Idle					-	Tested Date	2021/7/23
		lule						Phase	Line
est Fred	quency	-					ľ	Thase	Line
80.0	dBuV					1			
70									
60									
ŀ			3						
50			X 4 X	7					
40		1 X	5 X	7 × 8	9 X		11		
30		2 X	6 ×	×	10 X		×		
20		^					12 X		
10									
0									
-10									
-20.0	150		0.5		(MHz)		5		30.000
0.1	150	Reading	Correct	Measure			J		30.000
No. Mk	. Freq.	Level	Factor	ment	Limit	Over			
	MHz	dBu∨	dB	dBu∨	dBu∨	dB	Detector	Comment	
1	0.3525	24.86	9.70	34.56	58.90	-24.34	QP		
2	0.3525	16.36	9.70	26.06	48.90	-22.84	AVG		
3	0.5032	40.13	9.71	49.84	56.00	-6.16	QP		
4 *	0.5032	34.16	9.71	43.87	46.00	-2.13	AVG		
5	0.7035	27.62	9.71	37.33	56.00	-18.67	QP		
6	0.7035	17.53	9.71	27.24	46.00	-18.76	AVG		
7	1.0050	30.47	9.72	40.19	56.00	-15.81	QP		
8	1.0050	22.02	9.72	31.74	46.00	-14.26	AVG		
9	1.9590	26.56	9.76	36.32	56.00	-19.68	QP		
10	1.9590	17.40	9.76	27.16	46.00	-18.84	AVG		
11	5.0235	21.61	9.98	31.59	60.00	-28.41	QP		
12	5.0235	11.76	9.98	21.74	50.00	-28.26	AVG		



est Mod	le	Idle					т	ested Date	2021/7/23
est Fre		-						hase	Neutral
001110	queriey	l						11450	Noulia
80.0	dBuV								
70	••••								
60									
50									
			3 X 4						
40		:	×	7 5 × 5 8	9				
30		1 X		5 × × 8 × × 6	×			11	
20		2 X		×	1 X			12	
10								X	
0									
-10									
-20.0									
0.1	150	0.5			(MHz)		5		30.000
No. Mk	. Freq	Reading Level	Correct Factor	Measure ment	- Limit	Over			
	MHz	dBuV	dB	dBu∨	dBu∨	dB	Detector	Comment	
1	0.3840) 18.40	9.70	28.10	58.19	-30.09	QP		
2	0.3840		9.70	20.41	48.19	-27.78	AVG		
3	0.5010		9.71	43.45	56.00	-12.55	QP		
4 *	0.5010		9.71	37.07	46.00	-8.93	AVG		
5	0.9060		9.73	29.96	56.00	-26.04	QP		
6	0.9060		9.73	21.49	46.00	-24.51	AVG		
7	1.0072		9.73	34.79	56.00 46.00	-21.21			
8	1.0072 2.4113		9.73	27.86 30.82	46.00	-18.14 -25.18	AVG QP		
10	2.4113		9.76	20.64	46.00	-25.36	AVG		
10	8.2230		10.08	22.19	60.00	-37.81	QP		
12	8.2230		10.08	13.09	50.00	-36.91	AVG		





APPENDIX B RADIATED EMISSIONS - 30 MHZ TO 1 GHZ



	Т	est N	lode				BT(1	Mbr	os)			Te	st Date	Э			202	1/8/26	
		t Free						OMH					arizatio					rtical	
		Ten	np				2	3°C			Hum.					57%			
80.0	dB	uV/m																	
70																			
60 -																			
50 -																		ſ	-
30				-															
40 -																			
			2			2											5 X	6 X	
30 -	1 X		2 X			З Х							4 X						
20																			
10																			
0.0 30.1	000	127.	00	224.	00	321.	00	418.	00	515.	00 0	512.00	70	09.00	000	5.00		1000	.00 MI
No		Mk.	00	Freq			ding		orrect		easure-		imit		Jver	5.00		1000.	.UU MI
INU	•	IVIR.		печ	•		vel		actor		ment	L			2001				
				MHz	2	dB			dB		3uV/m	dE	3uV/m		dB	De	tector	Com	ment
1			6	6.56	90	38	.26	-6	9.93	2	28.33	4	0.00	- ^	11.67	р	eak		
2			1	40.15	97	38	.86	-{	8.63	3	30.23	4	3.50	-1	13.27	р	eak		
3			2	99.85	640	37	.58	-7	7.34	3	30.24	4	6.00	-1	15.76	р	eak		
4				65.38		30		C	.31		30.45	4	6.00	-1	15.55	р	eak		
5				79.49		29		3	.80	3	33.35	4	6.00		12.65	р	eak		
6		*	9	55.28	30	29	.59	5	.04	3	34.63	4	6.00	- '	11.37	р	eak		



	Test M	lada				Mbp	2)			т	est Da	to		202	1/8/26	
		quency				0MHz					larizat				izontal	
	Tem					3°C	-				Hum.				57%	
30.0 d	BuV/m	· [-													. , .	
70																
60																
50																
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30	↓ <							4 X				5 X			×	
20																
10																
D.O																
30.000	127.0	00 224.	00	321.0)0	418.0	0	515.	00 0	612.0	0	709.	00 806	.00	1000.00	л мн
No.	Mk.	Freq	•	Read Lev			rect ctor		easure- ment		Limit		Over			
		MHz		dB	uV	d	В	dl	BuV/m	d	lBuV/n	n	dB	Detector	Comm	nent
1		66.569	90	41.	45	-9	93	3	31.52		40.00		-8.48	peak		
2	*	154.96	82	45.		-8	40	3	37.16		43.50		-6.34	peak		
3		299.88		45.			34		38.62		46.00		-7.38	peak		
4		497.99		31.		-2	87		28.31		46.00		-17.69	peak		
5		699.84	96	31.	97	0.	78	:	32.75		46.00		-13.25	peak		
6		965.30	63	29.	09	5.	15		34.24		54.00		-19.76 peak			



APPENDIX C RADIATED EMISSIONS - ABOVE 1 GHZ



	Test Mo	de		BT(1 Mbr	ns)			Te	est Date	ż		202	1/8/26	
Т	est Frequ			,	02MH	,			-	arizatio	-			zontal	
	Temp				23°C					Hum.				7%	
130.0	dBu¥/m														
120															
110															
100 -															
90 -															
80															
70															
60	and the Advantage of	uh and marked	tale de deba	1 X	le be recence	whether	m	In which	al-culler.	Vinter contract	undhanan	سامساهب	la and a start and the start of	5	
50	a sayayay ye waasaan	ar sy taken and an ar	ar south the	THE PERSON OF											
40				2 X										6 X	
30 -															
20															
10.0															
2302.	.000 2322.0	0 2342.	00	2362.00	2382	2.00	2402	2.00	2422.0	00 24	442.00	246	2.00	2502.00	(H)
No.	Mk.	Freq.		Reading Level		orrect actor		easure∙ ment	-	Limit	Ov	er			
		MHz		dBuV	(dB	d	3uV/m	d	BuV/m	dE	3	Detector	Commen	nt
1		2356.66	67	26.75	3	1.11	Į	57.86		74.00	-16.	14	peak		
2		2356.66	67	7.09	3	1.11		38.20	ę	54.00	-15.	80	AVG		
3	Х	2402.00		63.45		1.26		94.71		74.00	20.		peak	NoLimit	
4	*	2402.00		63.13		1.26		94.39		54.00	40.		AVG	NoLimit	
5		2491.54		25.90		1.54		57.44		74.00	-16.		peak		
6		2491.54	47	2.80	3	1.54	:	34.34	Ę	54.00	-19.	66	AVG		



	Test Mo			Mbps)		Test Date			1/8/26
	Test Frequ			OMHz		Polarization	า		zontal
	Temp)	2	3°C		Hum.		57	7%
130.0	dBu¥/m					1	1	1	
120 -									
110 -									
100 -					4				
90 -					Ň				
80 -									
70									
60	1 Lang Merenangan	and the and the one has	holower and she	-	and monthly	5	аки ласы.Менени	and the second second	un and and a second
50						6			
40 -	2					×			
30 -	×								
20									
10.0									
	.000 2400.0		2440.00	2460.00				0.00	2580.00 MH
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2389.687	25.99	31.21	57.20	74.00	-16.80	peak	
2		2389.687	3.16	31.21	34.37	54.00	-19.63	AVG	
3	Х	2480.000	62.55	31.51	94.06	74.00	20.06	peak	NoLimit
4	*	2480.000	62.25	31.51	93.76	54.00	39.76	AVG	NoLimit
5		2516.980	26.02	31.61	57.63	74.00	-16.37	peak	
6		2516.980	12.10	31.61	43.71	54.00	-10.29	AVG	



-	Test Mo			Mbps)		Test Date	_		1/8/26
	Test Frequ			<u>2MHz</u> 3°C		Polarization Hum.	1		zontal 7%
30.0	Temp dBuV/m)	Ζ	30		Hum.		C	1%
20									
10									
00 -					2				
0					*				
30 –									
70 -									
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40 -	2								6
30 -	×								×
20 -									
10.0									
2302	2.000 2322.0	0 2342.00	2362.00	2382.00	2402.00 24	422.00 244	12.00 246	2.00	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		2309.567	26.06	30.94	57.00	74.00	-17.00	peak	
2		2309.567	4.11	30.94	35.05	54.00	-18.95	AVG	
3	Х	2402.000	61.66	31.26	92.92	74.00	18.92	peak	NoLimit
4	*	2402.000	57.97	31.26	89.23	54.00	35.23	AVG	NoLimit
5		2485.387	25.91	31.52	57.43	74.00	-16.57	peak	
6		2485.387	2.80	31.52	34.32	54.00	-19.68	AVG	



	Te	Test Mo st Frequ			3 Mbps) 80MHz		Test Date Polarizatio		-	1/8/26 zontal
	10	Temp			23°C		Hum.			7%
30.0	0 d	BuV/m								. , 0
20										
10										
00										
0						3				
						X				
0										
0										
0										5
U	1	an wan handi	mounderstander	mandeline	homestar have been and	ward Moorauter	and market and the second s	Antonia	the spector all and the person with	www.www.att
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0.0										
		00 2400.0	0 2420.00	2440.00	2460.00	2480.00	2500.00 25	20.00 254	0.00	2580.00 MH
No		Mk.	Freq.	Reading				Over		
				Level	Factor	ment				
			MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	1		2383.287	25.16	31.19	56.35	74.00	-17.65	peak	
2	2		2383.287	2.61	31.19	33.80	54.00	-20.20	AVG	
3	3	Х	2480.000	57.86	31.51	89.37	74.00	15.37	peak	NoLimit
4	-	*	2480.000	54.28	31.51	85.79	54.00	31.79	AVG	NoLimit
5			2578.480	26.59	31.80	58.39	74.00	-15.61	peak	
6	5		2578.480	10.90	31.80	42.70	54.00	-11.30	AVG	



	est Mo t Freq				Mbps) 2MHz		Test Date Polarizatior	1		1/8/26 tical
	Tem				3°C		Hum.			7%
130.0 dB	uV/m									
120										
110										
100										
90										
80										
70										
60		1								
50		Ř.								
40										
30										
20										
10.0										
1000.000) 3550.1	00 6100.	00	8650.00	11200.00	13750.00	16300.00 188	50.00 214	00.00	26500.00 MHz
No.	Mk.	Freq.		Reading Level	Correct Factor	Measure- ment	- Limit	Over		
	-	MHz		dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4804.00		61.35	-9.84	51.51	74.00	-22.49	peak	
2	*	4804.00	00	58.26	-9.84	48.42	54.00	-5.58	AVG	



	Test Mo			Mbps)		Test Date			1/8/26
Tes	st Frequ Temp			2MHz 3°C		Polarization Hum.	1		zontal 7%
130.0 dB	uV/m	,	Z	50		Tium.		5	1 70
120									
110									
100									
90									
80									
70									
60									
		3							
50		X							
40									
30									
20									
10.0									
1000.00	0 3550.0	0 6100.00	8650.00	11200.00	13750.00 1	6300.00 188	50.00 214	00.00	26500.00 MHz
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4804.000	63.35	-9.84	53.51	74.00	-20.49	peak	
2	*	4804.000	61.07	-9.84	51.23	54.00	-2.77	AVG	



Te	Test Mo est Frequ			I Mbps) I1MHz		Test Date Polarization			1/8/26 rtical
	Temp		2	3°C		Hum.		5	7%
130.0 d	lBu¥/m								
120									
10									
100									
90 —									
80									
70									
60			1 ×						
50			x						
40 <u> </u>									
30									
20									
10.0	00 2550 0	0 0100.00	0050.00	11200.00	10750.00 1	C200.00 10	00 00 014	00.00	20500.00 MIL
No.	100 3550.0 Mk.	o 6100.00 Freq.	8650.00 Reading	11200.00 Correct	13750.00 1 Measure-	6300.00 189 Limit	850.00 214 Over	00.00	26500.00 MH
NU.		Fieq.	Level	Factor	ment		Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		7323.000) 58.76	-2.75	56.01	74.00	-17.99	peak	
2	*	7323.000	53.40	-2.75	50.65	54.00	-3.35	AVG	



Т	Test Mo est Frequ			Mbps) 1MHz		Test Date Polarization	n		1/8/26 zontal
	Temp			3°C		Hum.			7%
130.0	dBuV/m								
120									
110 -									
100 -									
90 -									
80 -									
70 📃									
60 —			1 x ×						
50			X						
40									
30 -									
20									
10.0									
	000 3550.0			11200.00				00.00	26500.00 MHz
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		7323.000	58.43	-2.75	55.68	74.00	-18.32	peak	
2	*	7323.000	54.60	-2.75	51.85	54.00	-2.15	AVG	



Те	Test Mo est Frequ			Mbps) 80MHz		Test Date Polarizatio			I/8/26 rtical
	Temp			3°C		Hum.			7%
30.0 d	BuV/m		i i			1			
20									
10									
00									
0									
80									
0									
0			1						
i0			×						
0									
:0									
20									
0.0									
	00 3550.0			11200.00				00.00	26500.00 MH
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		7440.000	56.74	-2.19	54.55	74.00	-19.45	peak	
2	*	7440.000	52.75	-2.19	50.56	54.00	-3.44	AVG	



	Test M			1 Mbps)		Test Date			/8/26
I	est Freq Tem			80MHz 23°C		Polarization Hum.	1		zontal 7%
130.0	dBuV/m	ρ		23 0		num.		5	70
120									
110									
100									
90									
80									
70									
70									
60			1						
50			X						
30									
40									
30									
20									
10.0									
1000.	000 3550.) 8650.00	11200.00	13750.00 1		350.00 214	00.00	26500.00 MHz
No.	Mk.	Freq.	Reading		Measure-	Limit	Over		
			Level	Factor	ment				
<u> </u>		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		7440.000		-2.19	55.95	74.00	-18.05	peak	
2	*	7440.000) 53.81	-2.19	51.62	54.00	-2.38	AVG	



-	Test Mo Test Frequ	lency	240	8 Mbps) 92MHz		Test Date Polarizatior	٦	Vei	I/8/26 tical
_	Temp)	2	3°C		Hum.		5	7%
130.0	dBu¥/m		1						
120									
110									
100									
90 -									
80									
70									
60 —									
50		1 X							
40		2 X							
30									
20 — 10.0									
).000 3550.0	0 6100.00	8650.00	11200.00	13750.00 1	6300.00 188	50.00 214	00.00	26500.00 MHz
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4804.000	55.63	-9.84	45.79	74.00	-28.21	peak	
2	*	4804.000	45.27	-9.84	35.43	54.00	-18.57	AVG	



	est Mo				3 Mbps)		Test Date			1/8/26
Tes	t Frequ Temp				02MHz 23°C		Polarizatior Hum.	1		zontal 7%
130.0 dB		•		2	.50		num.		5	70
120										
110										
100										
90										
80										
70										
60										
50		1								
40		1 × 2 ×								
30		0								
20										
10.0		0 0100	00	0050.00	11000.00	10750.00	10000 00 100	F0 00 014	00.00	20500.00 1411
1000.000 No.	Mk.	0 6100. Freq.	00	8650.00 Reading	11200.00 Correct	13750.00 Measure-		50.00 214 Over	00.00	26500.00 MHz
				Level	Factor	ment				
		MHz		dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4804.00		53.39	-9.84	43.55	74.00	-30.45	peak	
2	*	4804.00	00	45.31	-9.84	35.47	54.00	-18.53	AVG	



	Test Mo Test Frequ	uency	244	3 Mbps) 1MHz		Test Date Polarizatior	۱	Vei	I/8/26 tical
	Temp)	2	3°C		Hum.		5	7%
130.0	dBuV/m							1	
120									
110 -									
100 -									
90 –									
80 -									
70									
60 -									
50									
40		1 2 X							
30		x							
20									
10.0									
	0.000 3550.0	0 6100.00	8650.00	11200.00				00.00	26500.00 MHz
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4882.000	52.16	-9.77	42.39	74.00	-31.61	peak	
2	*	4882.000	45.49	-9.77	35.72	54.00	-18.28	AVG	



	est Mo	ode uency				Mbp 1MH:					Test D Polariz		<u> </u>			1/8/26 zontal	
163	Tem					3°C	<u> </u>			<u> </u>	Hun		1	_		7%	
130.0 dB	.₩/m	-			_											. ,0	
120																	
110																	-
100																	
90																	-
80																	
70																	
60																	
50		-															1
40		1 X 2															
30		2 X															
20																	
10.0																	
1000.000	3550.	DO 6100	.00	8650	.00	1120	D. OO	137	50.00	16	300.00	188	50.00	2140	0.00	26500.00	D MHz
No.	Mk.	Freq		Rea Lev			rrect ctor		easur ment		Lim	it	Ove	er			
		MHz		dB		С	IB	d	BuV/ı	n	dBuV	'/m	dB		Detector	Comme	ent
1		4882.0		53.			.77		43.71		74.0		-30.2		peak		
2	*	4882.0	00	45.	12	-9	.77		35.35	;	54.0	0	-18.6	65	AVG		



T	Test Mo Fest Frequ	uency	248	3 Mbps) 30MHz		Test Date Polarizatior	1	Vei	1/8/26 rtical
130.0	Temp dBuV/m)	2	23°C		Hum.		5	7%
130.0	ana/w		1					1	
120									
110									
100 🗕									
90									
80 -									
70									
60									
50									
40		1 X							
10		2 X							
30									
20									
10.0									
1000.	.000 3550.0	0 6100.00	8650.00	11200.00	13750.00 1	6300.00 188	50.00 214	00.00	26500.00 MHz
No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4960.000		-9.68	44.12	74.00	-29.88	peak	
2	*	4960.000	43.67	-9.68	33.99	54.00	-20.01	AVG	



	est Mo t Frequ					Mbp 0MH:				[Test D Polariz					1/8/26 zontal	
165	Temp					3°C	۷			<u> </u>	Hun		1			7%	
130.0 dB	.₩/m				_						11011					. ,0	
120																	
110																	-
100																	
90																	-
80																	
70																	1
60																	
50																	1
40		1 X															
30		2 X															
20																	
10.0																	
1000.000	3550.0	0 6100	.00	8650	.00	1120	0.00	137	50.00	16	300.00	188	50.00	2140	0.00	26500.00	MHz
No.	Mk.	Freq		Read Lev			rrect ctor		easur ment		Lim	it	Ove	er			
		MHz		dB		С	B	d	BuV/ı	n	dBuV	'/m	dB		Detector	Comme	ent
1		4960.0		53.			.68		43.57		74.0		-30.4		peak		
2	*	4960.0	00	44.	04	-9	.68		34.36	;	54.0	0	-19.0	64	AVG		



APPENDIX D NUMBER OF HOPPING CHANNEL



st Date 201	Mbps 12/9/18								
Test Mode 1 Mbps	Number of Hopping Channel 79	≥ Limit 15	Test Result Pass						
3 Mbps	79	15	Pass						
Ref 10 dBm *Att	1 Mbps *RBW 100 kHz Marker 2 [T1] *VBW 100 kHz -1.98 dBm 20 dB SWT 10 ms 2.480159601 GHz	Ref 10 dBm *Att 20 dB	3 Mbps *RBW 100 kHz Marker 2 [T1] *UBW 100 kHz -4.16 dB Ref 10 dBm *Att 20 dB SWT 10 ms 2.4601646 GH						
10 Offset 0.5 dB	Marker 1 (T1 -3,85 dbm generalized and generalized and generaliz	10 Offset 0.5 dB 	Marker 1 [T1] -2 09 08 Marker 1 [T1] [T1] [T1] [T1] Imarker 1 [T1] [T1] [T1]						

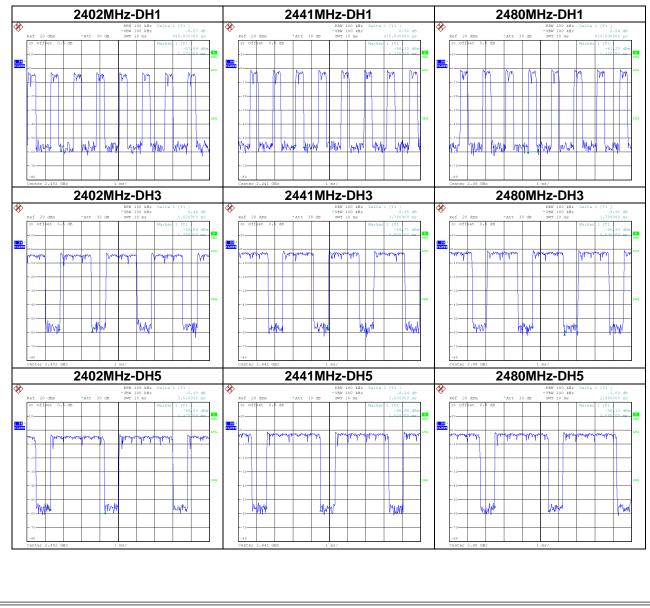


APPENDIX E AVERAGE TIME OF OCCUPANCY



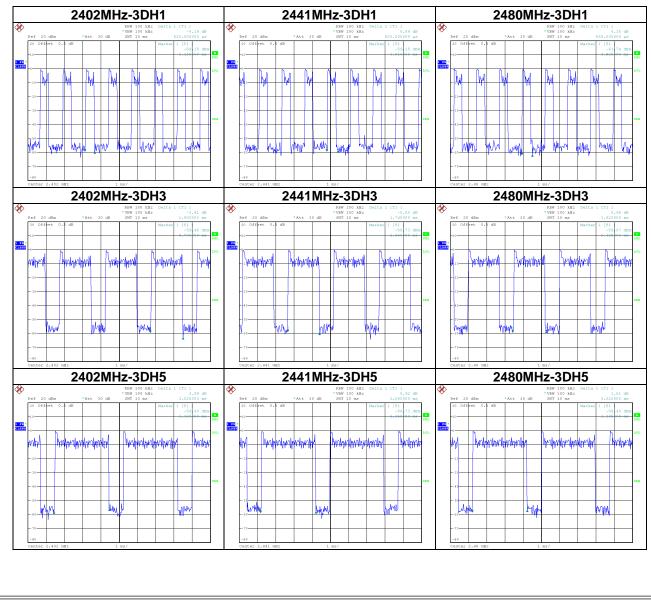
Test Mode	1Mbps
Test Date	2012/9/18

Data Packet	Frequency (MHz)	Pulse Duration (ms)	Dwell Time (s)	Limits (s)	Test Result
DH5	2402	3.0100	0.3211	0.4	Pass
DH3	2402	1.8200	0.2912	0.4	Pass
DH1	2402	0.5800	0.1856	0.4	Pass
DH5	2441	3.0000	0.3200	0.4	Pass
DH3	2441	1.7800	0.2848	0.4	Pass
DH1	2441	0.4750	0.1520	0.4	Pass
DH5	2480	2.9600	0.3157	0.4	Pass
DH3	2480	1.7800	0.2848	0.4	Pass
DH1	2480	0.5200	0.1664	0.4	Pass





Test Mode	3Mbps				
Test Date	2012/9/18				
					1
Data Packet	Frequency (MHz)	Pulse Duration(ms)	Dwell Time(s)	Limits(s)	Test Result
3DH5	2402	3.0250	0.3227	0.4	Pass
3DH3	2402	1.8000	0.2880	0.4	Pass
3DH1	2402	0.5200	0.1664	0.4	Pass
3DH5	2441	3.0600	0.3264	0.4	Pass
3DH3	2441	1.7400	0.2784	0.4	Pass
3DH1	2441	0.6200	0.1984	0.4	Pass
3DH5	2480	3.0200	0.3221	0.4	Pass
3DH3	2480	1.8200	0.2912	0.4	Pass
3DH1	2480	0.5800	0.1856	0.4	Pass

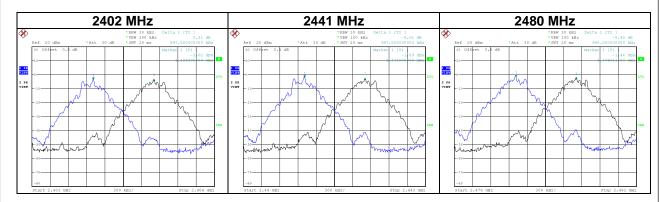




APPENDIX F HOPPING CHANNEL SEPARATION MEASUREMENT

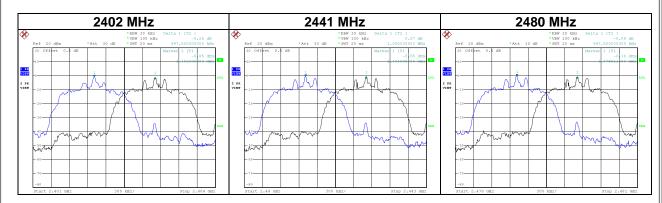


Test Mode Hopping on _1Mbps										
Test Date 2012/9/18										
Frequency Channel Separatio (MHz) (MHz)		2/3 of 20dB Bandwidth (MHz)	Test Result							
2402	1.00	0.650	Pass							
2441	1.00	0.632	Pass							
2480	0.99	0.629	Pass							





Test Mode	Hopping on _3Mbps						
Test Date 2012/9/18							
_							
Frequency (MHz)	Channel Separation (MHz)	2/3 of 20dB Bandwidth (MHz)	Test Result				
2402	1.00	0.844	Pass				
2441	1.01	0.838	Pass				
2480	1.00	0.851	Pass				





BIL



Test Mode	1Mbps				
Test Date	2012/9/18				
Frequency (MHz)		Bandwidth (MHz)	99% Occu (MH	•	Test Result
2402		0.975	0.8	75	Pass
2441		0.948	0.87	75	Pass
2480		0.943	0.87	75	Pass
2402 M		2444			400 MUL-
2402 M	HZ	2441	*RBW 30 kHz Delta 1 [T1]	24	480 MHz

	2402 MHz				2441	MHz			2480 MHz	
Ś	*REW 30 KHz Delta 1 [T1] *VDW 300 kHz -0.36 dB Ref 10 dBm *Att 20 dB SWT 2.5 ms 947.639922650 kHz	*	Ref 10 dB		*Att 20 dB	*RBW 30 kHz *VBW 300 kHz SWT 2.5 ms	Delta 1 [T1] -0.48 dB 947.630922650 kHz	<	*REW 30 kHz Delta 1 [T1] *VEW 300 kHz -0.46 dB Ref 10 dBm *Att 20 dB 597 2.5 ms 942.643391470 kHz	
	10 Offset 0.6 dB OB/875.00000000 AHz Naker 1 [7]		10 Offset	0.5 dB					10 Offeet 0.6 dB offeet 0.6 dB	
1 PK VIEW	-101.57 dtm	1 PK VIEW			- And and	m L	2.440538553 GHz Temp 1 (T1 08%) -20.72 Gam 1 2.440560100 GHz	v	247953853 000 Temp 1 (T1 004) -10 -10 -10 -10 -10 -10 -10 -10	LVL
	-20 T (1.084) -21.05 mm -2.3.05 mm -2.4024.000 OHz		-20	02 -21.93			Zemp 2 [T1 084] 20 77 dBm 2.441435100 GHz		- 22 C1.7.7 dlm 22.460.430 00 dllz	
			-10	~						
	-30		~ <u>~</u>				· · · · · · · · · · · · · · · · · · ·	DB .		308
			60						- 60	ĺ
	- 70 - 80		80				¥2		- 10	
	-90 21 200 kHz/ Span 2 MHz		-90 Center 2.4	41 GHz	200	kHz/	Span 2 MHz		-90 2.48 GHZ 200 kHZ/ Span 2 MHZ	



Test Mode	3Mbps							
Test Date	2012/9/18							
Frequency (MHz)		Bandwidth (MHz)	99% Occu (MF	•	Test Result			
2402		1.266	1.18	Pass				
2441		1.257	1.1	75	Pass			
2480		1.277	1.1	75	Pass			
2402 N	Hz	2441	MHz	2	480 MHz			
• VE	7 30 kHz Dolta 1 [T1] 300 kHz Dolta 1 [T1] 2.5 me 1.266022910 KHz GBW 1.160000[00 KHz Marker 1 [T1] 2.403349 [27 GHz Temp 1 [T1] CBH] 7.60 GHZ Temp 1 [T1] CBH 7.60 GHZ 1.60 GHZ	× ·	ANN 30 ANT 0-315 (17) WW 300 ANT 0-35 GB SMT 2-5 mo 1.256657855 MHz Narker 1 (71 - 246036415 GHz - 246036415 GHz - 246036415 GHz - 26603090 GHz - 27400 (17) GHZ - 274000 (17) GHZ - 27400 (17) GHZ - 2	Ref 10 dBm *Att	* 1889 30 kHz * 000 30 kHz 20 db 9947 2.5 ms 10 50 kHz 907 2.5 ms 10 500 000 10 500 00000 10 500 000 10 500 00000 10 500 000000 10 500 00000000000000000000000000000000			



APPENDIX H OUTPUT POWER



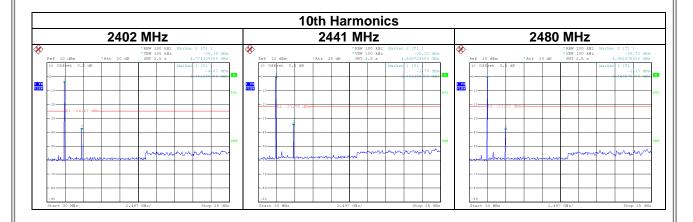
Test Mode	1Mbps		Testeo	d Date	2022/4/27		
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result		
2402	0.13	0.0010	21.00	0.1259	Pass		
2441	0.02	0.0010	21.00	0.1259	Pass		
2480	-0.06	0.0010	21.00	0.1259	Pass		
Test Mode	2Mbps		Tested	d Date	2022/4/27		
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result		
2402	-0.85	0.0008	21.00	0.1259	Pass		
2441	-1.28	0.0007	21.00	0.1259	Pass		
2480	-1.87	0.0007	21.00	0.1259	Pass		
Test Mode	3Mbps		Testeo	d Date	2022/4/27		
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result		
2402	-1.33	0.0007	21.00	0.1259	Pass		
2441	-1.47	0.0007	21.00	0.1259	Pass		
2480	-2.08	0.0006	21.00	0.1259	Pass		



APPENDIX I ANTENNA CONDUCTED SPURIOUS EMISSION

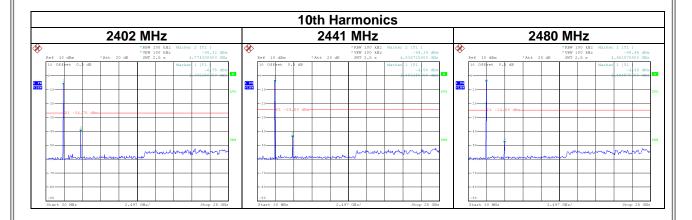


Test Mode 1Mbps																						
est Date 2012/9/18																						
				2402 N	IHz_	Lowe	r									24	80 M	Hz_	Uppe	er		
\$	Ref 10			*Att 20 dB	* VB	W 100 kHz W 100 kHz T 10 ms		-4] 9.74 dBm)000 GHz		*		10 dE				20 dB	* VE	W 100 kE W 100 kE T 10 ms			.09 dBm
		et 0.	5 dB				Marker Marker Marker 2 Marker	1 [T1 -1 -1 -2 2 [T1 -51 -51	2.58 dBm 900 3342 3.12 dBm 9900 642		<u>i pr</u> View)ffaet	-1.4		dBn				Marke	er 1 [T1 -1 2.480000 er 2 [T1 -48 2.483500	40 dBm 100 GHz .06 dBm 100 GHz
	40	hunn						n in the		3DB		-40 50 		*****		a u como		Angen		wizero catha	-th-galler out	warthin
	80				_			Fl	F2			80	F1		F	2	-					





Test Mode 3Mbps																							
Test Date 2012/9/18																							
2402 MHz_ Lower									2480 MHz_ Upper														
\$	Ref 10	dBm		*Att 20) dB	*RBW 10 *VBW 10 SWT 10	00 kHz	Marker 2	-4] 8.29 dBm 0000 GHz		×>	Def	10 d	Bm			20 dB	* RBW * VBW		Marker		51 dBm
	10 Off		5 dB	ACC 20	, œ	541 10	7 10.5	Marker	1 [T1	0.01 dBn	1				t 0.!	6 dB	AUC		0.01	10 110	Marker	1 [T1	33 dBm
PK EW	-10	Ð1 0.0	1 dBm					2 Marker	2 [T1 -5	9.65 diBn	ı.	1 PK VIEW			. 0 . 13	dKm-					Marker	-42	51 dBm
	20	D2	20.01	38 m				2 Marker 2	4 [T1 -4		LVL		-20-		_D2 -	19.67	dBm				Marker		77 dBm
	30												30-					_	_				
	4 0												40-					_					
	50							٨	,		3DB		50					-	_				
		Ann	n ywrddo	www.w	~~~~	and wa	www. tal	wawad	and the second	¥ —			-60-	1	424~	Ant	****	all for the second	Allongo an	Adverse the	Arean	www.www.www.	Marrie and
	70												70-										
	-90								F1	F2			-90	11		F	:						



End of Test Report