



FCC Radio Test Report

FCC ID: 2BH7FP316M

Report No. : BTL-FCCP-2-2412G027 Equipment : Smart Wi-Fi Power Strip Model Name : Tapo P316M, TPB65

Brand Name : tp-link

: TP-Link Systems Inc. Applicant

Address : 10 Mauchly, Irvine, CA 92618

: TP-Link Systems Inc. Manufacturer

Address : 10 Mauchly, Irvine, CA 92618

Radio Function : WLAN 2.4GHz

FCC Rule Part(s) : FCC CFR Title 47, Part 15, Subpart C (15.247)

Measurement : ANSI C63.10-2013

Procedure(s)

2024/12/27 Date of Receipt

Date of Test 2024/12/27 ~ 2025/1/14

Issued Date 2025/2/10

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

Prepared by Poken Huang, Engineer

Approved by Peter Chen, Manager

BTL Inc.

No.18, Ln. 171, Sec. 2, Jiuzong Rd., Neihu Dist., Taipei City 114, Taiwan



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.

Project No.: 2412G027 Page 2 of 71 Report Version: R00





Table of Contents	Page
REVISION HISTORY	6
1 . SUMMARY OF TEST RESULTS	7
1.1 TEST FACILITY	8
1.2 MEASUREMENT UNCERTAINTY	8
1.3 TEST ENVIRONMENT CONDITIONS	8
2 . GENERAL INFORMATION	9
2.1 GENERAL DESCRIPTION OF EUT	9
2.2 DESCRIPTION OF TEST MODES	10
2.3 PARAMETERS OF TEST SOFTWARE	10
2.4 DUTY CYCLE	11
2.5 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	12
2.6 SUPPORT UNITS	13
3 . AC POWER LINE CONDUCTED EMISSIONS	14
3.1 LIMIT	14
3.2 TEST PROCEDURE	14
3.3 DEVIATION FROM TEST STANDARD	14
3.4 TEST SETUP	15
3.5 EUT OPERATION CONDITIONS	15
3.6 TEST RESULTS	15
4 . RADIATED EMISSIONS	16
4.1 LIMIT	16
4.2 TEST PROCEDURE	17
4.3 DEVIATION FROM TEST STANDARD	18
4.4 TEST SETUP	18
4.5 EUT OPERATION CONDITIONS	20
4.6 TEST RESULTS - 9 KHZ TO 30 MHZ	20
4.7 TEST RESULTS - 30 MHZ TO 1000 MHZ	20
4.8 TEST RESULTS - ABOVE 1000 MHZ	20
5 . BANDWIDTH	21
5.1 LIMIT	21
5.2 TEST PROCEDURE	21
5.3 DEVIATION FROM STANDARD	21
5.4 TEST SETUP	21





Table of Contents	Page
5.5 EUT OPERATION CONDITIONS	21
5.6 TEST RESULTS	21
6 . MAXIMUM OUTPUT POWER	22
6.1 LIMIT	22
6.2 TEST PROCEDURE	22
6.3 DEVIATION FROM STANDARD	22
6.4 TEST SETUP	22
6.5 EUT OPERATION CONDITIONS	22
6.6 TEST RESULTS	22
7. CONDUCTED SPURIOUS EMISSIONS	23
7.1 LIMIT	23
7.2 TEST PROCEDURE	23
7.3 DEVIATION FROM STANDARD	23
7.4 TEST SETUP	23
7.5 EUT OPERATION CONDITIONS	23
7.6 TEST RESULTS	23
8 . POWER SPECTRAL DENSITY	24
8.1 LIMIT	24
8.2 TEST PROCEDURE	24
8.3 DEVIATION FROM STANDARD	24
8.4 TEST SETUP 8.5 EUT OPERATION CONDITIONS	24 24
8.6 TEST RESULTS	24
9 . MEASUREMENT INSTRUMENTS LIST	25
10 . EUT TEST PHOTO	27
11 . EUT PHOTOS	27
APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS	28
APPENDIX B - RADIATED EMISSION - 30 MHZ TO 1000 MHZ	31
APPENDIX D - RADIATED EMISSION- ABOVE 1000 MHZ	34
APPENDIX D - BANDWIDTH	59
APPENDIX E - MAXIMUM OUTPUT POWER	63
APPENDIX F - CONDUCTED SPURIOUS EMISSIONS	65



Table	e of Contents	Page
APPENDIX H - POWER SPECT	RAL DENSITY	69



REVISION HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCCP-2-2412G027	R00	Original Report.	2025/2/10	Valid

Project No.: 2412G027 Page 6 of 71 Report Version: R00



1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC CFR Title 47, Part 15, Subpart C					
Standard(s) Section	Test Item	Test Result	Judgment	Remark	
15.207	AC Power Line Conducted Emissions	APPENDIX A	PASS		
15.247(d) 15.205(a) 15.209(a)	Radiated Emissions	APPENDIX B APPENDIX C	PASS		
15.247(a)(2)	Bandwidth	APPENDIX D	PASS		
15.247(b)(3)	Maximum Output Power	APPENDIX E	PASS		
15.247(d)	Conducted Spurious Emission	APPENDIX F	PASS		
15.247(e)	Power Spectral Density	APPENDIX G	PASS		
15.203	Antenna Requirement		PASS	Note(2)	

Note:

- (1) "N/A" denotes test is not applicable to this device.
- (2) The device what use a permanently attached antenna were considered sufficient to comply with the provisions of 15.203.

Page 7 of 71 Report Version: R00 Project No.: 2412G027



1.1 TEST FACILITY

The test locations stated below are under the TAF Accreditation Number 0659. The test location(s) used to collect the test data in this report are: 2F, No. 91, Ln. 298, Wengong 1st Rd., Guishan Dist., Taoyuan City 333001, Taiwan (FCC DN: TW0659)

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 $\mathbf{k} = \mathbf{2}$, providing a level of confidence of approximately $\mathbf{95}$ %. The measurement instrumentation uncertainty considerations contained in CISPR 16-4-2. The BTL measurement uncertainty is less than the CISPR 16-4-2 \mathbf{U}_{cispr} requirement.

A. AC Power Line Conducted Emissions Measurement:

Test Site	Method	Measurement Frequency Range	U (dB)
C01	CISPR	150 kHz ~ 30MHz	3.44

B. Radiated emissions Measurement:

Test Site	Measurement Frequency Range (GHz)	U (dB)
	0.03~0.2	4.01
	0.02~1	4.64
CB02 (3m)	1 ~ 6	5.91
	6 ~ 18	6.24
	18 ~ 26	3.93
	26 ~ 40	4.06

C. Other Measurement:

Test Item	U
Occupied Bandwidth	0.83 %
Output power	0.4008 dB
Conducted Spurious emissions	1.8274 dB
Conducted Band edges	1.8353 dB
Dwell time	0.8830 dB
Channel separation	0.8830 dB
Channel numbers	0.9198 dB

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	20°C, 53%	AC 120V/60Hz	Nero Hsieh
Radiated Emissions-30 MHz to 1000 MHz	20°C, 57%	AC 120V/60Hz	Nero Hsieh
Radiated Emissions-Above 1000 MHz	20°C, 57%	AC 120V/60Hz	Nero Hsieh
Bandwidth	19°C, 46%	AC 120V/60Hz	Nero Hsieh
Maximum Output Power	19°C, 46%	AC 120V/60Hz	Nero Hsieh
Conducted Spurious Emission	19°C, 46%	AC 120V/60Hz	Nero Hsieh
Power Spectral Density	19°C, 46%	AC 120V/60Hz	Nero Hsieh



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Smart Wi-Fi Power Strip
Brand Name	tp-link
Model Name	Tapo P316M, TPB65
Model Difference(s)	Only differ in model name.
Software Version	1.X
Hardware Version	1.0
Power Source	AC Mains.
Power Rating	125V~ 60Hz 15A 1875W MAX
Operation Band	2400 MHz ~ 2483.5 MHz
Operation Frequency	2412 MHz ~ 2462 MHz
	IEEE 802.11b: DSSS
Modulation Type	IEEE 802.11g: OFDM
	IEEE 802.11n: OFDM
	IEEE 802.11b: 11/5.5/2/1 Mbps
Bit Rate of Transmitter	IEEE 802.11g: 54/48/36/24/18/12/9/6 Mbps
	IEEE 802.11n: up to 72.2 Mbps
Maximum Output Power	IEEE 802.11b: 23.88 dBm (0.2443 W)
Test Model	Tapo P316M

Note:

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

2. Channel List:

CH01 - CH11 for IEEE 802.11b, IEEE 802.11g, IEEE 802.11n(HT20)							
						Frequency (MHz)	
01	2412	04	2427	07	2442	10	2457
02	2417	05	2432	08	2447	11	2462
03	2422	06	2437	09	2452		

3. Antenna Specification:

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)
1	tp-link	Tapo P316M-ANT1	PIFA	N/A	3

Note: 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 DESCRIPTION OF TEST MODES

Test Items	Test mode	Channel	Note
AC power line conducted emissions	Normal	-	-
Transmitter Radiated Emissions (below 1GHz)	IEEE 802.11b	11	-
	IEEE 802.11b		
	IEEE 802.11g	01/11	Bandedge
Transmitter Radiated Emissions	IEEE 802.11n(HT20)		
(above 1GHz)	IEEE 802.11b		
	IEEE 802.11g	01/06/11	Harmonic
	IEEE 802.11n(HT20)		
Transmitter Radiated Emissions (above 18GHz)	IEEE 802.11b	11	-
Bandwidth &	IEEE 802.11b		
Output Power & Power Spectral Density &	IEEE 802.11g 01/06/		-
Conducted Spurious Emission	IEEE 802.11n (HT20)		

NOTE:

- (1) All the bit rate of transmitter have been tested and found the lowest rate is found to be the worst case and recorded.
- (2) For AC power line conducted emissions and radiated emission below 1 GHz test, the TX B Mode Channel 11 is found to be the worst case and recorded.
- (3) For radiated emission Harmonic 18-26.5GHz test, only tested the worst case and recorded.
- (4) For radiated emission band edge test, both Vertical and Horizontal are evaluated, but only the worst case (Horizontal) is recorded.

2.3 PARAMETERS OF TEST SOFTWARE

Test Software Version	UI_mptool.exe			
Frequency (MHz)	2412	2462		
IEEE 802.11b	110	110	110	
IEEE 802.11g	95	95	95	
IEEE 802.11n(HT20)	95	95	95	



2.4 DUTY CYCLE

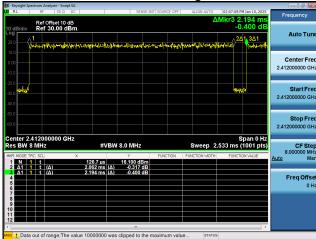
Ref Offset 10 dB Ref 30.00 dBm

If duty cycle is \geq 98 %, duty factor is not required. If duty cycle is < 98 %, duty factor shall be considered. The output power = measured power + duty factor.

IEEE 802.11b

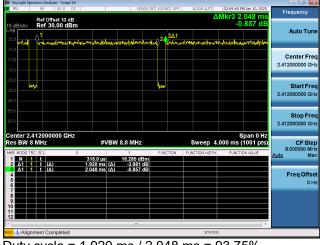


Duty cycle = 12.416 ms / 12.544 ms = 98.98% Duty Factor = 10 log(1/Duty cycle) = 0.00 IEEE 802.11g



Duty cycle = 2.062 ms / 2.194 ms = 94.00% Duty Factor = 10 log(1/Duty cycle) = 0.27

IEEE 802.11n(HT20)



Duty cycle = 1.920 ms / 2.048 ms = 93.75% Duty Factor = 10 log(1/Duty cycle) = 0.28

NOTE:

For IEEE 802.11b:

For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 1 kHz.

For IEEE 802.11g:

For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 485 Hz.

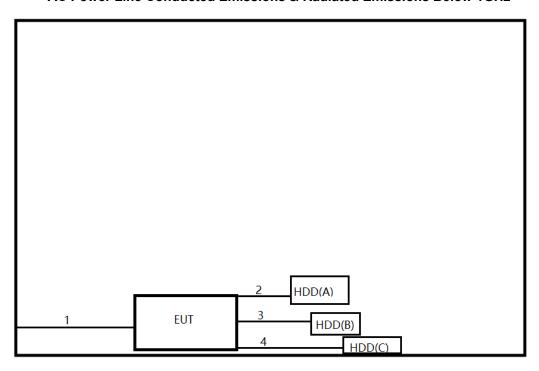
For IEEE 802.11n(HT20):

For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 521 Hz.

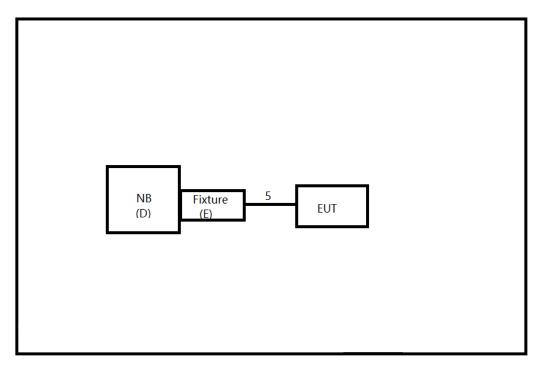


2.5 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

AC Power Line Conducted Emissions & Radiated Emissions Below 1GHz



Radiated Emissions Above 1GHz





2.6 SUPPORT UNITS

Item	Equipment	Brand	Brand Model No.		Remarks
Α				N/A	Furnished by test lab
В	HDD	WD	4219V	N/A	Furnished by test lab
С				N/A	Furnished by test lab
D	NB	dynabook	TECRA A40-J	N/A	Furnished by test lab
Е	Fixture	Risyn	CH340G	N/A	Furnished by test lab

Item	Cable Type	Shielded	Shielded Ferrite Core Le		Remarks
1	AC Cable	NO	NO	1m	Supplied by test requester
2					
3	USB-Type-C Cable	NO	NO	1.7m	Furnished by test lab
4					



3. AC POWER LINE CONDUCTED EMISSIONS

3.1 LIMIT

Frequency of Emission (MHz)	Limit (dl	ΒμV)
Frequency of Emission (MHZ)	Quasi-peak	Average
0.15 - 0.5	66 to 56*	56 to 46*
0.5 - 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
(dBuV)		(dB)		(dBuV)
38.22	+	3.45	=	41.67

Measurement Value		Limit Value		Margin Level
(dBuV)		(dBuV)		(dB)
41.67	-	60	=	-18.33

3.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling 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 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item -EUT Test Photos.

The following table is the setting of the receiver:

Receiver Parameters	Setting
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

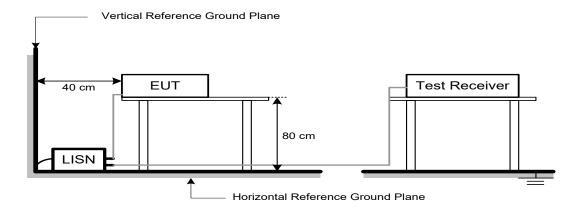
3.3 DEVIATION FROM TEST STANDARD

No deviation.

Project No.: 2412G027 Page 14 of 71 Report Version: R00



3.4 TEST SETUP



3.5 EUT OPERATION CONDITIONS

EUT was programmed to be in continuously transmitting mode.

3.6 TEST RESULTS

Please refer to the APPENDIX A.





4. RADIATED EMISSIONS

4.1 LIMIT

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

LIMITS OF RADIATED EMISSION MEASUREMENT (9 kHz-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
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000 MHz)

Frequency (MHz)	Band edge/ at 3m (dB		Harmonic at	1m (dBμV/m)
r requeries (iiii iz)	Peak	Average	Peak	Average
Above 1000	74	54	83.5 (Note 5)	63.5 (Note 5)

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
	(dBuV)		(dB/m)		(dBuV/m)
	19.11	+	2.11	=	21.22

Measurement Value		Limit Value		Margin Level
(dBuV/m)		(dBuV/m)		(dB)
21.22	-	54	=	-32.78

$$FS_{\text{limit}} = FS_{\text{max}} - 20\log\left(\frac{d_{\text{limit}}}{d_{\text{measure}}}\right)$$

 $20\log (d_{limit}/d_{measure})=20\log (3/1)=9.5 \text{ dB}.$

FS_{limit}: Harmonic at 3m Peak and Average limit.

FS_{max}: Harmonic at 1m Peak and Average Maximum value.

d_{limit}: Harmonic at 3m test distance. d_{measure}: Harmonic Actual test distance.

Project No.: 2412G027 Page 16 of 71 Report Version: R00





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 1 GHz)
- b. The measuring distance of 3 m or 1 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 1 GHz)
- c. The height of the equipment or of the substitution antenna shall be 0.8m or 1.5m; 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 1 GHz.
- 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 1 GHz)
- h. 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 1 GHz)
- i. For the actual test configuration, please refer to the related Item -EUT Test Photos.

The following table is the setting of the receiver:

Spectrum Parameters	Setting	
Start ~ Stop Frequency	9 kHz~150 kHz for RBW 200 Hz	
Start ~ Stop Frequency	0.15 MHz~30 MHz for RBW 9 kHz	
Start ~ Stop Frequency	30 MHz~1000 MHz for RBW 100 kHz	

Spectrum Parameters	Setting	
Start Frequency	1000 MHz	
Stop Frequency	10th carrier harmonic	
RBW / VBW	1 MHz / 3 MHz for PK value	
(Emission in restricted band)	1 MHz / 1/T Hz for AVG value	

Receiver Parameters	Setting	
Start ~ Stop Frequency	9 kHz~90 kHz for PK/AVG detector	
Start ~ Stop Frequency	90 kHz~110 kHz for QP detector	
Start ~ Stop Frequency	110 kHz~490 kHz for PK/AVG detector	
Start ~ Stop Frequency	490 kHz~30 MHz for QP detector	
Start ~ Stop Frequency	30 MHz~1000 MHz for QP detector	
Start ~ Stop Frequency	1 GHz~26.5 GHz for PK/AVG detector	

Project No.: 2412G027 Page 17 of 71 Report Version: R00

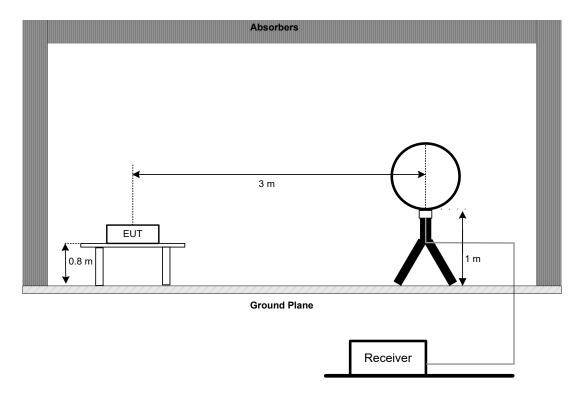


4.3 DEVIATION FROM TEST STANDARD

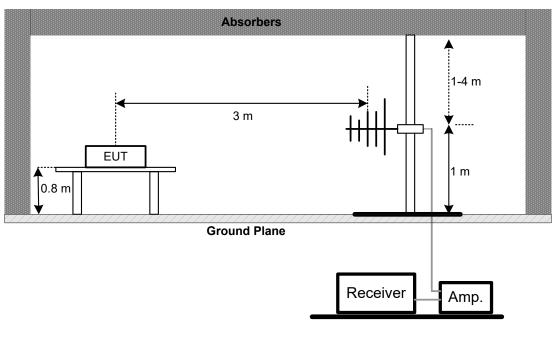
No deviation.

4.4 TEST SETUP

9 kHz to 30 MHz

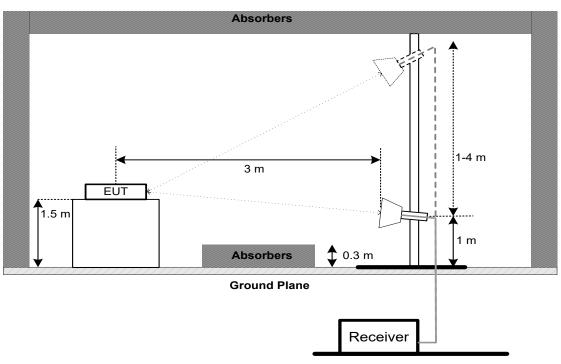


30 MHz to 1 GHz

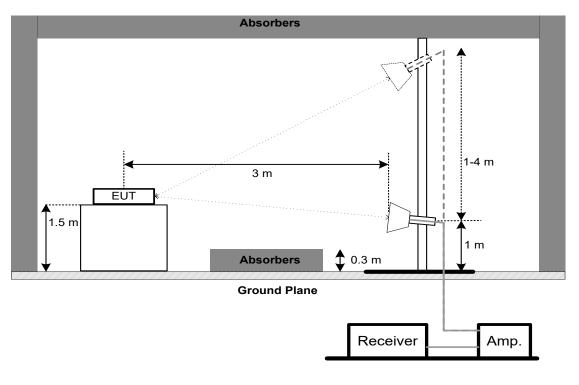




Above 1 GHz Band edge

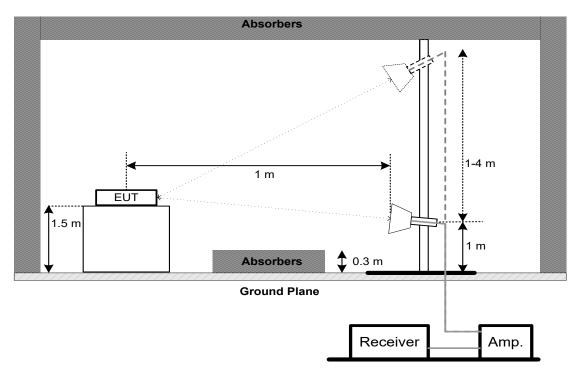


Harmonic(1 GHz to 18 GHz)





Harmonic(18 GHz to 26.5 GHz)



4.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

4.6 TEST RESULTS - 9 KHZ TO 30 MHZ

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

4.7 TEST RESULTS - 30 MHZ TO 1000 MHZ

Please refer to the APPENDIX B.

4.8 TEST RESULTS - ABOVE 1000 MHZ

Please refer to the APPENDIX C.

Remark:

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



5. BANDWIDTH

5.1 LIMIT

Section	Test Item	Limit
FCC 15.247(a)(2)	6 dB Bandwidth	Minimum 500 kHz
	99% Emission Bandwidth	-

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. The following table is the setting of the spectrum analyzer:

For 6 dB Bandwidth:

Spectrum Parameters	Setting
Span Frequency	> Measurement Bandwidth
RBW	100 kHz
VBW	300 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

For 99% Emission Bandwidth:

Of 0070 Effication Barrawian			
Spectrum Parameters	Setting		
Span Frequency	Between 1.5 times and 5.0 times the OBW		
RBW 300 kHz For 20MHz 1 MHz For 40MHz			
VBW	1 MHz For 20MHz 3 MHz For 40MHz		
Detector	Peak		
Trace	Max Hold		
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. MAXIMUM OUTPUT POWER

6.1 LIMIT

Section	Test Item	Limit
FCC 15.247(b)(3)	Maximum Output Power	1.0000 Watt or 30.00 dBm

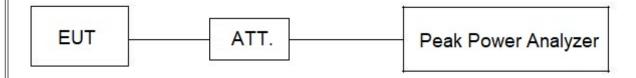
6.2 TEST PROCEDURE

- a. The EUT was directly connected to the peak power analyzer and antenna output port as show in the block diagram below.
- b. The maximum conducted output power was performed in accordance with method 11.9.2.3.1 of ANSI C63.10-2013.

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. CONDUCTED SPURIOUS EMISSIONS

7.1 LIMIT

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator 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 the transmitter demonstrates compliance with the peak Output Power limits. If the transmitter complies with the Output Power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required.

7.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- b. The following table is the setting of the spectrum analyzer:

0 1 5 1	0 "
Spectrum Parameters	Setting
Start Frequency	30 MHz
Stop Frequency	26.5 GHz
RBW	100 kHz
VBW	300 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP



7.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

7.6 TEST RESULTS

Please refer to the APPENDIX F.



8. POWER SPECTRAL DENSITY

8.1 LIMIT

Section	Test Item	Limit	
FCC 15.247(e)	Power Spectral Density	8 dBm (in any 3 kHz)	

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. The following table is the setting of the spectrum analyzer:

Spectrum Parameters	Setting
Span Frequency	25 MHz (20 MHz) / 60 MHz (40 MHz)
RBW	3 kHz
VBW	10 kHz
Detector	Peak
Trace	Max Hold
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. MEASUREMENT INSTRUMENTS LIST

	AC Power Line Conducted Emissions						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until	
1	TWO-LINE V-NETWORK	R&S	ENV216	101339	2024/3/28	2025/3/27	
2	Test Cable	EMCI	EMCRG142S-SM -SM-5000	230609	2024/8/10	2025/8/9	
3	Test Cable	EMCI	EMC104-SM-SM- 6000	240635	2024/7/15	2025/7/14	
4	Measurement Software	Farad	EZ_EMC (Ver.E-LAB-5A2.2 2021)	N/A	N/A	N/A	

	Radiated Emissions - Below 1GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Log-Bicon Antenna	Schwarzbeck	VULB 9168	01577	2024/7/17	2025/7/16
2	Attenuator	EMCI	EMCI-N-6-05	AT-N0575	2024/7/17	2025/7/16
3	Pre-Amplifier	EMCI	EMC001330	980909	2024/8/9	2025/8/8
4	Test Cable	EMCI	EMC104-SM-SM- 6000	230540	2024/8/10	2025/8/9
5	Test Cable	EMCI	EMC104-SM-SM- 2500	230541	2024/8/10	2025/8/9
6	Test Cable	EMCI	EMC104-SM-SM- 1000	230546	2024/8/10	2025/8/9
7	MXE EMI Receiver	Keysight	N9038A	MY50018009	2024/8/30	2025/8/29
7	Measurement Software	Farad	EZ_EMC (Ver. NB-03A1-01)	N/A	N/A	N/A

Radiated Emissions - Above 1GHz								
Item	Kind of Equipment	Manufacturer	Type No.	Type No. Serial No.		Calibrated Until		
1	Horn Antenna	RFSPIN	DRH18-E	KV2D02A18ES	2024/6/7	2025/6/6		
2	Pre-Amplifier	EMCI	EMC118A45SE	980962	2024/8/9	2025/8/8		
3	Test Cable	Cable EMCI EMC104-SM-S M-6000		230540	2024/8/10	2025/8/9		
4	Test Cable	EMCI	EMCI EMC104-SM-S M-2500		2024/8/10	2025/8/9		
5	Lest Cable LeMCI		EMC104-SM-S M-1000	230546	2024/8/10	2025/8/9		
6	MXE EMI Receiver	Keysight	N9038A	MY50018009	2024/8/30	2025/8/29		
7	Measurement Software	Farad	EZ_EMC (Ver. NB-03A1-01)	N/A	N/A	N/A		



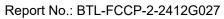


Radiated Emissions - Above 18GHz						
Item Kind of Equipment		Manufacturer Type No. Serial No.		Calibrated Date	Calibrated Until	
1	Horn Antenna	Schwarzbeck	BBHA 9170	01228	2024/6/12	2025/6/11
2	3 Test Cable EMCI		EMC184045SE	980918	2024/8/9	2025/8/8
3			EMC104-35M-35 M-1000	230547	2024/8/10	2025/8/9
4			EMC104-35M-35 M-4700	230548	2024/8/10	2025/8/9
5			N9038A	MY50018009	2024/8/30	2025/8/29
6			EZ_EMC (Ver. NB-03A1-01)	N/A	N/A	N/A

Bandwidth & Output Power & Conducted Spurious Emission & Power Spectral Density						
Item	Item Kind of Manufacture		Type No.	Serial No.	Calibrated Date	Calibrated Until
1	MXE EMI Receiver	Keysight	N9038A	MY55420127	2024/6/19	2025/6/18

Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of equipment list is one year.





10. EUT TEST PHOTO
Please refer to document Appendix No.: TP-2412G027-1 (APPENDIX-TEST PHOTOS).
11. EUT PHOTOS
Please refer to document Appendix No.: EP-2412G027-1 (APPENDIX-EUT PHOTOS).



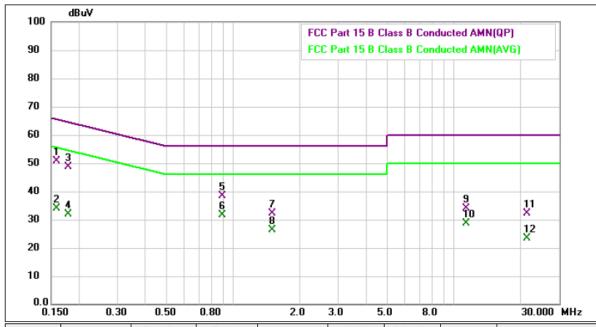


APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS

Project No.: 2412G027 Page 28 of 71 Report Version: R00



١.				
	Test Mode	Normal	Tested Date	2025/1/10
	Test Frequency	-	Phase	Line



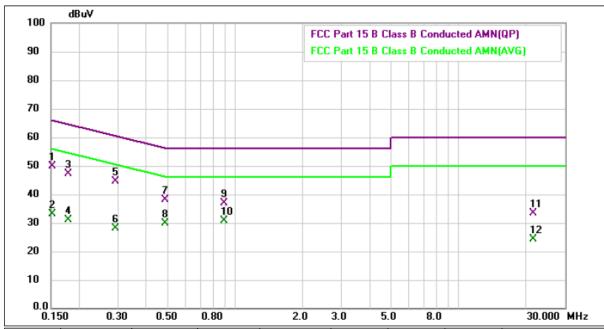
N	^	Freq.	Reading	Factor	Meas. Level	Limit	Margin	Detector	Comment
IN	0.	(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	Detector	Comment
1		0.159000	41.20	9.62	50.82	65.52	-14.70	QP	
2		0.159000	24.30	9.62	33.92	55.52	-21.60	AVG	
3		0.179250	38.90	9.63	48.53	64.52	-15.99	QP	
4		0.179250	22.20	9.63	31.83	54.52	-22.69	AVG	
5		0.890250	28.60	9.66	38.26	56.00	-17.74	QP	
6	*	0.890250	22.00	9.66	31.66	46.00	-14.34	AVG	
7		1.509000	22.40	9.68	32.08	56.00	-23.92	QP	
8		1.509000	16.60	9.68	26.28	46.00	-19.72	AVG	
9		11.366250	24.10	9.80	33.90	60.00	-26.10	QP	
10		11.366250	18.80	9.80	28.60	50.00	-21.40	AVG	
11		21.417000	22.40	9.80	32.20	60.00	-27.80	QP	
12		21.417000	13.50	9.80	23.30	50.00	-26.70	AVG	

REMARKS:

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



Ш				
		Normal	Tested Date	2025/1/10
	Test Frequency	-	Phase	Neutral



N	0.	Freq.	Reading	Factor	Meas. Level	Limit	Margin	Detector	Comment
IN	0.	(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	Detector	Comment
1		0.152250	40.10	9.62	49.72	65.88	-16.16	QP	
2		0.152250	23.60	9.62	33.22	55.88	-22.66	AVG	
3		0.179250	37.70	9.62	47.32	64.52	-17.20	QP	
4		0.179250	21.30	9.62	30.92	54.52	-23.60	AVG	
5		0.291750	35.00	9.63	44.63	60.47	-15.84	QP	
6		0.291750	18.50	9.63	28.13	50.47	-22.34	AVG	
7		0.485250	28.50	9.64	38.14	56.25	-18.11	QP	
8		0.485250	20.30	9.64	29.94	46.25	-16.31	AVG	
9		0.894750	27.40	9.65	37.05	56.00	-18.95	QP	
10	*	0.894750	21.10	9.65	30.75	46.00	-15.25	AVG	
11		21.743250	23.50	9.90	33.40	60.00	-26.60	QP	
12		21.743250	14.30	9.90	24.20	50.00	-25.80	AVG	

REMARKS:

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



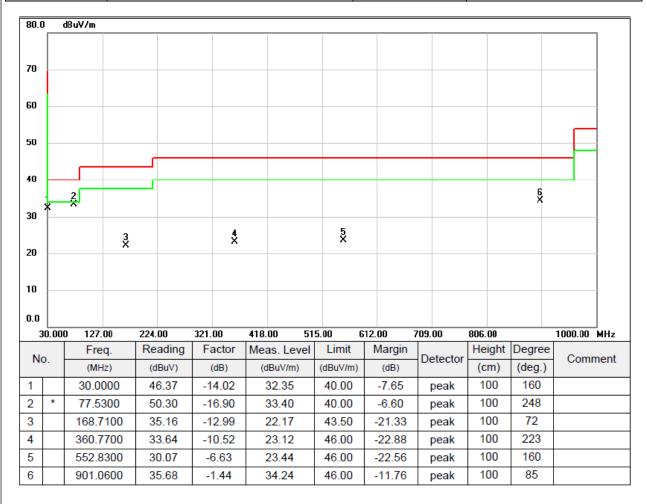


APPENDIX B - RADIATED EMISSION - 30 MHZ TO 1000 MHZ

Project No.: 2412G027 Page 31 of 71 Report Version: R00



Ш				
		TX B Mode	Test Date	2025/1/10
	Test Frequency	2462 MHz	Polarization	Vertical

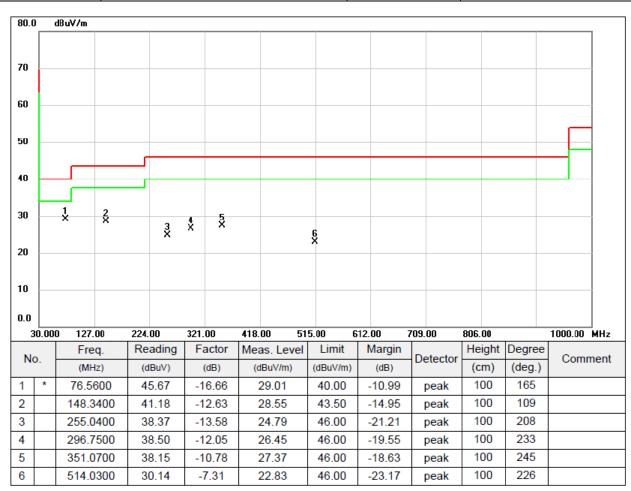


REMARKS:

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



Ш				
		TX B Mode	Test Date	2025/1/10
	Test Frequency	2462 MHz	Polarization	Horizontal



REMARKS:

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



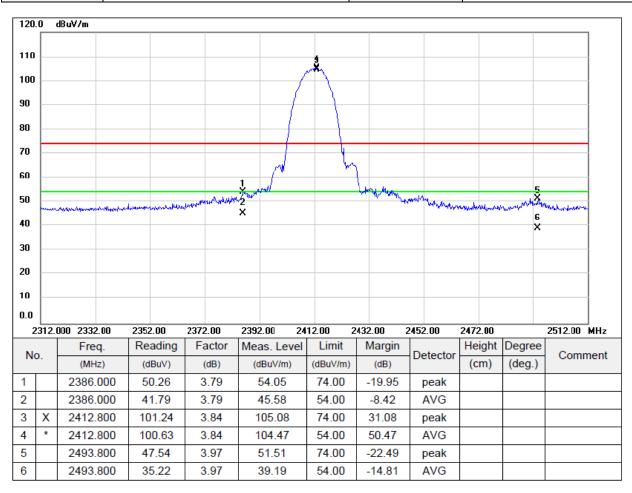


APPENDIX D - RADIATED EMISSION- ABOVE 1000 MHZ

Project No.: 2412G027 Page 34 of 71 Report Version: R00



Ш					
		TX B Mode	Test Date	2025/1/10	
	Test Frequency	2412 MHz	Polarization	Horizontal	

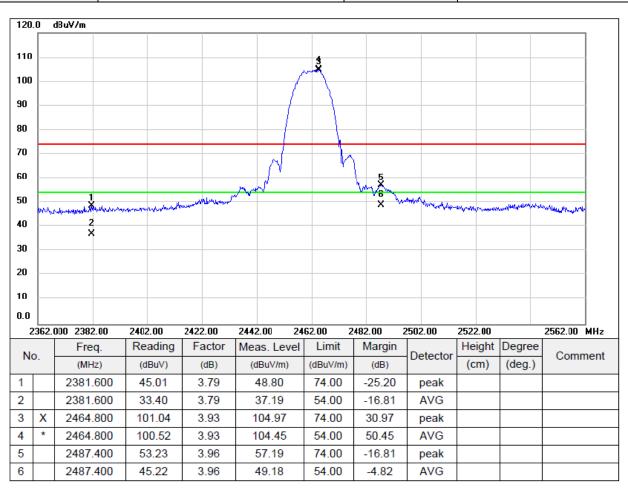


REMARKS:

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



Ш					
		TX B Mode	Test Date	2025/1/10	
	Test Frequency	2462 MHz	Polarization	Horizontal	

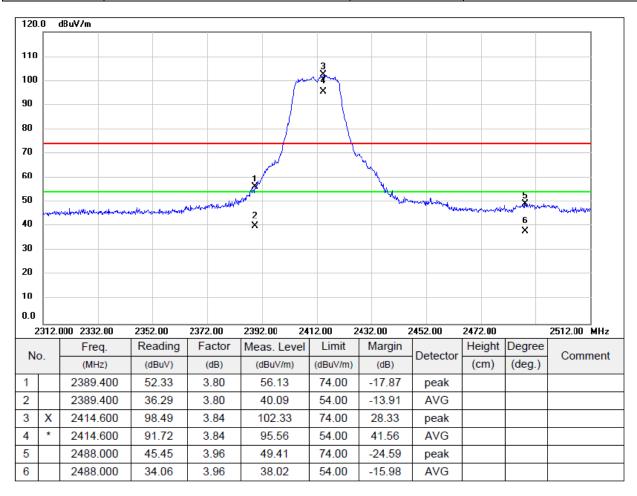


REMARKS:

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



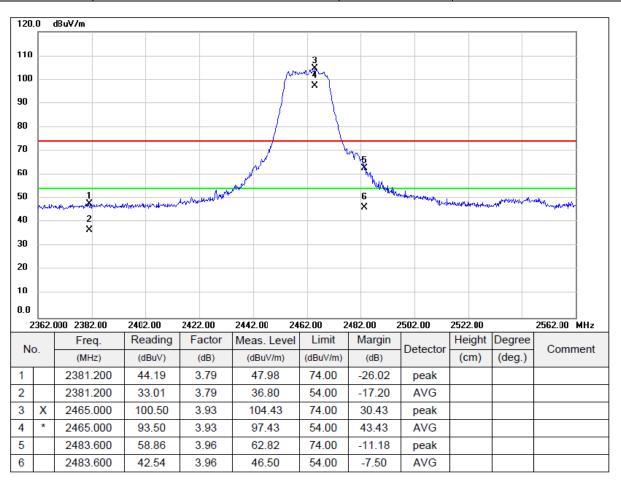
Ш				
		TX G Mode	Test Date	2025/1/10
	Test Frequency	2412 MHz	Polarization	Horizontal



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



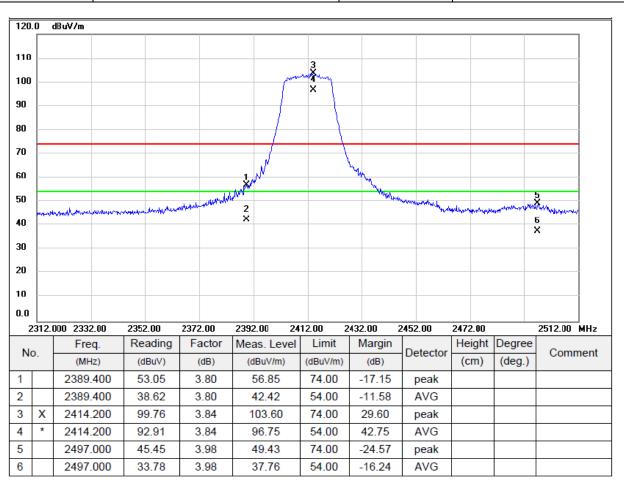
Ш				
		TX G Mode	Test Date	2025/1/10
	Test Frequency	2462 MHz	Polarization	Horizontal



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



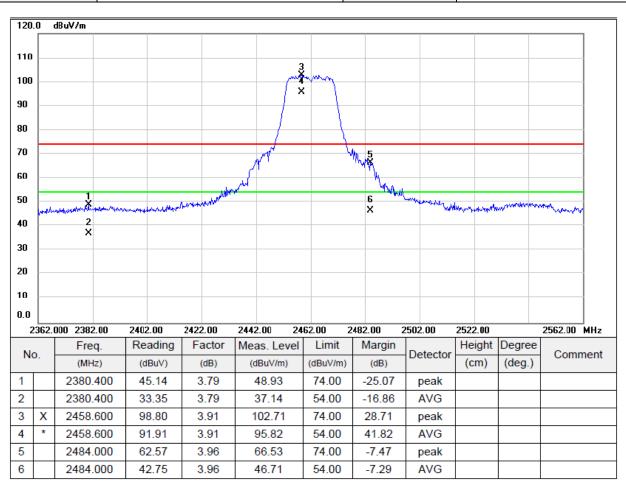
I	Test Mode	TX N(HT20) Mode	Test Date	2025/1/10
	Test Frequency	2412 MHz	Polarization	Horizontal



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



Ш				
		TX N(HT20) Mode	Test Date	2025/1/10
	Test Frequency	2462 MHz	Polarization	Horizontal



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



Ш				
		TX B Mode	Test Date	2025/1/10
	Test Frequency	2412 MHz	Polarization	Vertical



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



Ш				
		TX B Mode	Test Date	2025/1/10
	Test Frequency	2412 MHz	Polarization	Horizontal



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



Ш				
		TX B Mode	Test Date	2025/1/10
	Test Frequency	2437 MHz	Polarization	Vertical



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



Test Mode	TX B Mode	Test Date	2025/1/10
Test Frequency	2437 MHz	Polarization	Horizontal



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



Ш				
		TX B Mode	Test Date	2025/1/10
	Test Frequency	2462 MHz	Polarization	Vertical



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



Test Mode	TX B Mode	Test Date	2025/1/10
Test Frequency	2462 MHz	Polarization	Horizontal



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



Г	Test Mode	TX G Mode	Test Date	2025/1/10
ר	Test Frequency	2412 MHz	Polarization	Vertical



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



Ш				
	Test Mode	TX G Mode	Test Date	2025/1/10
	Test Frequency	2412 MHz	Polarization	Horizontal



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



ı.				
	Test Mode	TX G Mode	Test Date	2025/1/10
	Test Frequency	2437 MHz	Polarization	Vertical



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



Ш				
		TX G Mode	Test Date	2025/1/10
	Test Frequency	2437 MHz	Polarization	Horizontal



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



Ш				
		TX G Mode	Test Date	2025/1/10
	Test Frequency	2462 MHz	Polarization	Vertical



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



Ш				
		TX G Mode	Test Date	2025/1/10
	Test Frequency	2462 MHz	Polarization	Horizontal



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



ш				
		TX N(HT20) Mode	Test Date	2025/1/10
	Test Frequency	2412 MHz	Polarization	Vertical



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



Ш				
		TX N(HT20) Mode	Test Date	2025/1/10
	Test Frequency	2412 MHz	Polarization	Horizontal



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



l۱	T () 4	TV N///T00\ N4	T 10 1	0005/4/40
Ш	Test Mode	TX N(HT20) Mode	Test Date	2025/1/10
	Test Frequency	2437 MHz	Polarization	Vertical



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



Test Mode	TX N(HT20) Mode	Test Date	2025/1/10
Test Frequency	2437 MHz	Polarization	Horizontal



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



l۱	T 4 NA 1 .	TV N// ITOO NA - I -	T 1 D . 1.	0005/4/40
	Test Mode	TX N(HT20) Mode	Test Date	2025/1/10
	Test Frequency	2462 MHz	Polarization	Vertical



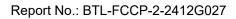
- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value Limit Value.



l				
	Test Mode	TX N(HT20) Mode	Test Date	2025/1/10
	Test Frequency	2462 MHz	Polarization	Horizontal



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



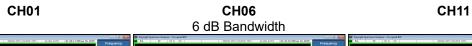


APPENDIX D - BANDWIDTH	



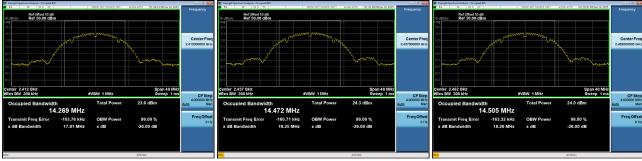
	Test Mode	TX B Mode
ı	100t Wiodo	I / C D IVIO GO

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	6 dB Bandwidth Min. Limit (MHz)	Result
01	2412	9.548	14.269	0.5	Complies
06	2437	9.552	14.472	0.5	Complies
11	2462	10.019	14.505	0.5	Complies





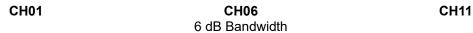
99 % Occupied Bandwidth

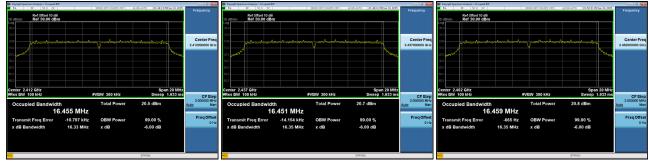




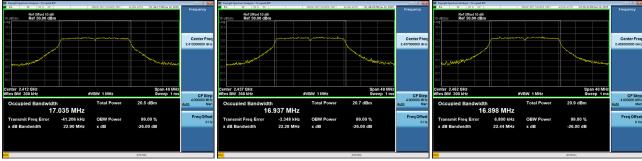
Test Mode	TX G Mode
TOOL WIGGO	I / C I WIO GO

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	6 dB Bandwidth Min. Limit (MHz)	Result
01	2412	16.328	17.035	0.5	Complies
06	2437	16.347	16.938	0.5	Complies
11	2462	16.346	16.898	0.5	Complies





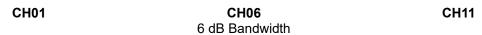
99 % Occupied Bandwidth

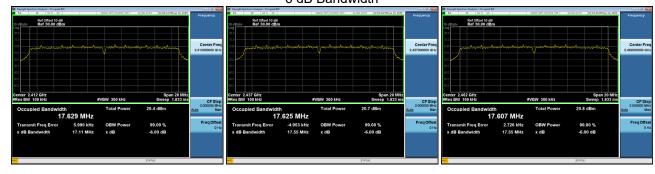




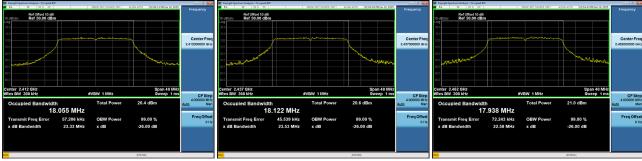
Test Mode	TX N(HT20)) Mode
163t Mode	17/11/11/20) IVIOUE

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	6 dB Bandwidth Min. Limit (MHz)	Result
01	2412	17.107	18.054	0.5	Complies
06	2437	17.547	18.123	0.5	Complies
11	2462	17.555	17.938	0.5	Complies





99 % Occupied Bandwidth







APPENDIX E - MAXIMUM OUTPUT POWER



Report No.: BTL-FCCP-2-2412G027

Test Mode	TX B Mode	Test Date	2025/1/10

Channel	Frequency (MHz)	Output Power (dBm)	Duty Factor	Output Power + Duty Factor (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result
01	2412	23.71	0.00	23.71	30.00	1.0000	Complies
06	2437	23.86	0.00	23.86	30.00	1.0000	Complies
11	2462	23.88	0.00	23.88	30.00	1.0000	Complies

Test Mode TX G Mode Test Date 2025/1/10	
---	--

Channel	Frequency (MHz)	Output Power (dBm)	Duty Factor	Output Power + Duty Factor (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result
01	2412	18.71	0.27	18.98	30.00	1.0000	Complies
06	2437	18.84	0.27	19.11	30.00	1.0000	Complies
11	2462	19.10	0.27	19.37	30.00	1.0000	Complies

	Test Mode	TX N(HT20) Mode	Test Date	2025/1/10
--	-----------	-----------------	-----------	-----------

Channel	Frequency (MHz)	Output Power (dBm)	Duty Factor	Output Power + Duty Factor (dBm)	Max. Limit (dBm)	Max. Limit (W)	Result
01	2412	18.71	0.28	18.99	30.00	1.0000	Complies
06	2437	18.99	0.28	19.27	30.00	1.0000	Complies
11	2462	18.91	0.28	19.19	30.00	1.0000	Complies





APPENDIX F - CONDUCTED SPURIOUS EMISSIONS

Project No.: 2412G027 Page 65 of 71 Report Version: R00



