

Prüfbericht-Nr.: <i>Test report no.:</i>	CN22CWA7 (P15C-SRD) 001	Auftrags-Nr.: <i>Order no.:</i>	238546376	Seite 1 von 28 Page 1 of 28
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2022-08-05	
Auftraggeber: <i>Client:</i>	HP Inc. 3390 East Harmony Road, Fort Collins, CO 80528, USA			
Prüfgegenstand: <i>Test item:</i>	HyperX Pulsefire Haste 2 Wireless Gaming Mouse			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	PF009			
Auftrags-Inhalt: <i>Order content:</i>	FCC Part 15C Test report			
Prüfgrundlage: <i>Test specification:</i>	FCC 47CFR Part 15: Subpart C Section 15.249			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2022-07-27			
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003308509-007 A003308509-009			
Prüfzeitraum: <i>Testing period:</i>	2022-08-09 - 2022-08-29			
Ort der Prüfung: <i>Place of testing:</i>	EMC/RF Taipei Testing Site			
Prüflaboratorium: <i>Testing laboratory:</i>	Taipei Testing Laboratories			
Prüfergebnis*: <i>Test result*:</i>	Pass			
überprüft von: <i>compiled by:</i>		genehmigt von: <i>authorized by:</i>		
Datum: <i>Date:</i>	2022-09-02	Ausstellungsdatum: <i>Issue date:</i>	2022-09-02	
Stellung / Position:	Senior Project Manager	Stellung / Position:	Senior Project Manager	
Sonstiges / Other:				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>		Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
* Legende:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	3 = befriedigend N/A = nicht anwendbar	4 = ausreichend N/T = nicht getestet
* Legend:	1 = very good P(ass) = passed a.m. test specification(s)	2 = good F(ail) = failed a.m. test specification(s)	3 = satisfactory N/A = not applicable	4 = sufficient N/T = not tested
<p>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i></p>				

TEST SUMMARY

Report Section	FCC Clause	Test Item	Result
5.1.1	15.203	Antenna Requirement	Pass
5.1.2	15.249 (a)	Field Strength of Fundamental Emissions	Pass
5.1.3	15.249 (d)	Radiated Spurious Emissions	Pass
5.1.4	15.215 (c)	20 dB Bandwidth	Pass
5.1.5	2.1049	99% Occupied Bandwidth	Pass
5.2.1	15.207	Mains Conducted Emission	Pass

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

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APPENDIX A - TEST RESULT OF RADIATED EMISSIONS & MAINS CONDUCTED EMISSION

APPENDIX SP - PHOTOGRAPHS OF TEST SETUP

APPENDIX EP - PHOTOGRAPHS OF EUT

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HISTORY OF THIS TEST REPORT

Report No.	Description	Date Issued
CN22CWA7 (P15C-SRD) 001	Original Release	2022-09-02

1. General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A - Test Result of Radiated Emissions & Mains Conducted Emission

Appendix SP - Photographs of Test Setup

Appendix EP - Photographs of EUT

Applied Standard and Test Levels

Radio
FCC 47CFR Part 15: Subpart C Section 15.249
ANSI C63.10:2013

1.2 Decision Rule of Conformity

The decision rule of conformity of this test report is following the requirements of the requested standard in the quotation, and agreed among testing laboratory and manufacturer (applicant) to exclude the consideration of Measurement Uncertainty, unless it is required by the specific standard.

2. Test Sites

2.1 Test Laboratory

Taipei Testing Laboratories

11F. No.758, Sec. 4, Bade Rd., Songshan Dist.
Taipei City 105
Taiwan (R.O.C.)

2.2 Test Facility

Taipei Testing Laboratories

No.458-18, Sec. 2, Fenliao Rd., Linkou Dist.,
New Taipei City 244
Taiwan (R.O.C.)
FCC Registration No.: 226631
ISED Registration No.: 25563

2.3 Traceability

All measurement equipment calibrations are traceable to NML(Taiwan)/NIST(USA) or where calibration is performed outside Taiwan, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically in a suitably accredited Calibration Lab. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

All measurement uncertainty values are shown with a coverage factor of $k=2$ to indicate a 95% level of confidence.

Emission Measurement Uncertainty

Parameter	Uncertainty
Radiated Emission (9 kHz ~ 30 MHz)	± 4.40 dB
Radiated Emission (30 MHz ~ 200 MHz)	± 2.82 dB
Radiated Emission (200 MHz ~ 1 GHz)	± 2.82 dB
Radiated Emission (1 GHz ~ 18 GHz)	± 2.42 dB
Radiated Emission (18 GHz ~ 40 GHz)	± 2.42 dB
Mains Conducted Emission	± 1.65 dB

3. General Product Information

3.1 Product Function and Intended Use

The EUT is a HyperX Pulsefire Haste 2 Wireless Gaming Mouse. It contains a 2.4GHz compatible module enabling the user to communicate data through a wireless interface.

For details refer to the User Guide, Data Sheet and Circuit Diagram.

3.2 System Details and Ratings

Basic Information of EUT

Item	EUT information
Kind of Equipment/Test Item	HyperX Pulsefire Haste 2 Wireless Gaming Mouse
Type Identification	PF009
FCC ID	B94-PF009

Technical Specification of EUT

Item	EUT information
Operating Frequency	2402 ~ 2480 MHz
Operation Voltage	Battery: 3.7 Vdc USB: 5 Vdc
Modulation	FSK
Antenna Information	Refer to 5.1.1
Accessory Device	Refer to 4.4

3.3 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

3.4 Submitted Documents

- Circuit Diagram
- Instruction Manual
- Rating Label
- Technical Description

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its maximum emission level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Carrier Frequency and Channel

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
1	2402	11	2422	21	2443	31	2463
2	2404	12	2424	22	2445	32	2465
3	2406	13	2426	23	2447	33	2467
4	2408	14	2428	24	2449	34	2469
5	2410	15	2430	25	2451	35	2471
6	2412	16	2432	26	2453	36	2473
7	2414	17	2434	27	2455	37	2475
8	2416	18	2436	28	2457	38	2477
9	2418	19	2438	29	2459	39	2479
10	2420	20	2441	30	2461	40	2480

4.3 Test Operation and Test Software

Setup for testing: It was used to enable the operation modes through pressing button listed as below.

The samples were used as follows:

A003308509-007

A003308509-009

Full test was applied on all test modes, but only worst case was shown.

EUT Configure Mode	Applicable To				Description
	Field Strength of Fundamental Emissions	Radiated Spurious Emissions	20 dB Bandwidth & Occupied Bandwidth	Mains Conducted Emission	
-	√	√	√	√	-

Note:

1. "-" means no effect.

Field Strength of Fundamental Emissions

- Pre-Scan full test was applied on all test modes, but only worst case was shown.
- Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Frequency (MHz)	Tested Frequency (MHz)
-	2402 to 2480	2402, 2441, 2480

Radiated Spurious Emission above 1 GHz

- Pre-Scan full test was applied on all test modes, but only worst case was shown.
- Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Frequency (MHz)	Tested Frequency (MHz)
-	2402 to 2480	2402, 2441, 2480

Radiated Spurious Emission below 1 GHz

- Pre-Scan full test was applied on all test modes, but only worst case was shown.
- Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Frequency (MHz)	Tested Frequency (MHz)
-	2402 to 2480	2480

20 dB Bandwidth & Occupied Bandwidth

- Pre-Scan full test was applied on all test modes, but only worst case was shown.
- Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Frequency (MHz)	Tested Frequency (MHz)
-	2402 to 2480	2402, 2441, 2480

Mains Conducted Emission

- Pre-Scan full test was applied on all test modes, but only worst case was shown.
- Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Frequency (MHz)	Tested Frequency (MHz)
-	2402 to 2480	2480

Test Condition

Test Item	Ambient Temperature	Relative Humidity	Tested by
Radiated Spurious Emissions	25 °C	44 %	Kevin Kuo
Field Strength of Fundamental Emissions	25 °C	44 %	Kevin Kuo
20 dB Bandwidth & Occupied Bandwidth	24.2-25.9 °C	57.4-69.6 %	Andy Chen
Mains Conducted Emission	21.9 °C	59 %	Ray Huang

4.4 Special Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessories:

Accessory of EUT

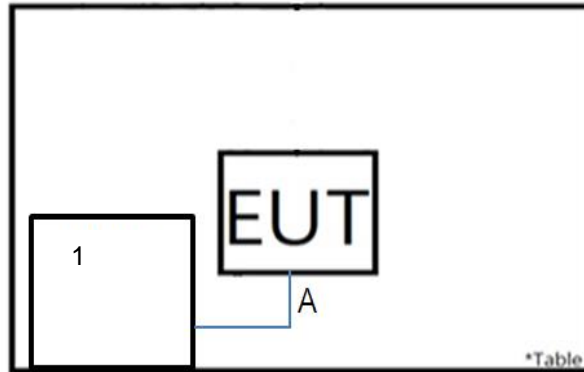
No.	Product	Brand	Model	Description
A	USB charge/data Cable	SIYOTO	640400189300	--
-	Polymer Li-ion Rechargeable Battery	Hangzhou Future Power Technology Co., Ltd.	FT442631P	--

Support Unit

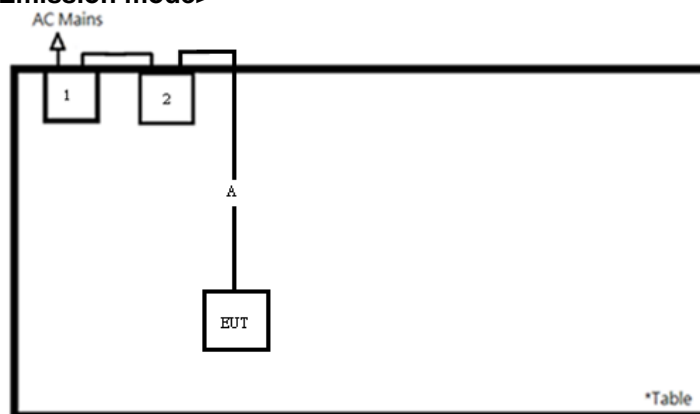
Support Unit								
No	Description	Brand	Model	S/N	Shielded	Ferrite Core (Qty)	Length (cm)	Remark
1	Notebook	Lenovo	E470	N/A	-	-	-	Radiated
1	Adapter	HP	PPP009D	N/A	YES	NO	179	Mains Conducted
2	Notebook	Lenovo	81BL	MP1DCD6Y	-	-	-	

4.5 Test Setup Diagram

<Radiated Spurious Emissions mode>



<Mains Conducted Emission mode>



5. Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

Requirement Use of approved antennas only

According to the manufacturer declaration, the EUT has an antenna with a directional gain of 2.79 dBi. The antenna is a PCB antenna with no possibility of replacement with a non-approved antenna by the end-user. Therefore, the EUT is considered to comply with this provision.

Refer to EUT photo for details.

5.1.2 Field Strength of Fundamental Emissions

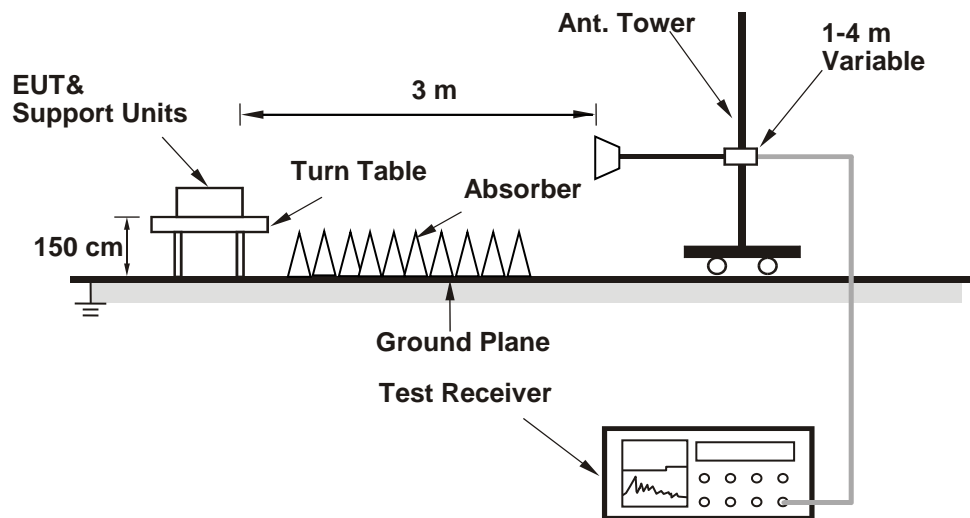
Limit

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field Strength of Fundamental (microvolts/meter)	Field Strength of Harmonics (microvolts/meters)
902 ~ 928 MHz	50	500
2400 ~ 2483.5 MHz	50	500
5725 ~ 5875 MHz	50	500
24 ~ 24.25 GHz	250	2500

Kind of Test Site 3m Semi-Anechoic Chamber

Test Setup



For the actual test configuration, please refer to the attached file (Test Setup Photo).

Test Instruments

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
Above 1 GHz					
Signal Analyzer	R&S	FSV40	100921	2022/7/7	2023/7/6
Horn Antenna	ETS-Lindgren	3117	00138160	2021/7/29	2022/11/24
HF-AMP + AC source	EM Electronics Corporation	EM01G18G	060558	2022/2/17	2023/2/16
HF-AMP + AC source	EMCI	EMC184045SE	980658	2022/4/9	2023/4/8
Horn Antenna	Com-Power Corp.	AH-840	101029	2022/3/29	2023/3/28
Test Software	Audix E3	20150914a	RK-001085	N/A	N/A
30 MHz ~ 1 GHz					
Receiver	R&S	ESR7	101549	2022/5/24	2023/5/23
Bilog Antenna	TESEQ	CBL 6111D	29803	2022/6/11	2023/6/10
LF-AMP	Agilent	8447D	2944A06641	2022/2/23	2023/2/22
Test Software	Audix E3	15914a_20191106 tuv	PK-001087	N/A	N/A
Receiver	R&S	ESR7	101549	2022/5/24	2023/5/23
Below 30 MHz					
Receiver	R&S	ESR7	101549	2022/5/24	2023/5/23
Loop Antenna	SCHWARZBECK	FMZB 1513	1513-076	2021/12/23	2022/12/22
Test Software	Audix E3	20150914a	RK-001085	N/A	N/A

Test Procedures

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30 MHz ~ 1 GHz) or 1.5 meters (for above 1 GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. 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 from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detected function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) or Peak detection (PK) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. All modes of operation were investigated and the worst-case emissions are reported.
4. The Radiated Emissions testing was performed in the X(E1), Y(H) and Z(E2) axis orientation. The worst-case Axis orientation is recorded in this test report.
5. The calculation formula is explained as follows:
 Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB)
 Level (dBuV/m) = Reading (dBuV) + Factor (dB/m)

Test Results

Fundamental Frequency	Antenna Orientation	Detector Mode	Peak Power Level (dBuV/m)	Limit (dBuV/m)	Result
2402	Horizontal	Peak	96.77	114.00	Pass
		Average	59.17	94.00	Pass
	Vertical	Peak	89.12	114.00	Pass
		Average	88.93	94.00	Pass
2441	Horizontal	Peak	94.92	114.00	Pass
		Average	57.31	94.00	Pass
	Vertical	Peak	87.84	114.00	Pass
		Average	87.62	94.00	Pass
2480	Horizontal	Peak	91.83	114.00	Pass
		Average	91.31	94.00	Pass
	Vertical	Peak	88.91	114.00	Pass
		Average	87.94	94.00	Pass

Please refer to Appendix A.

5.1.3 Radiated Spurious Emissions

Limit

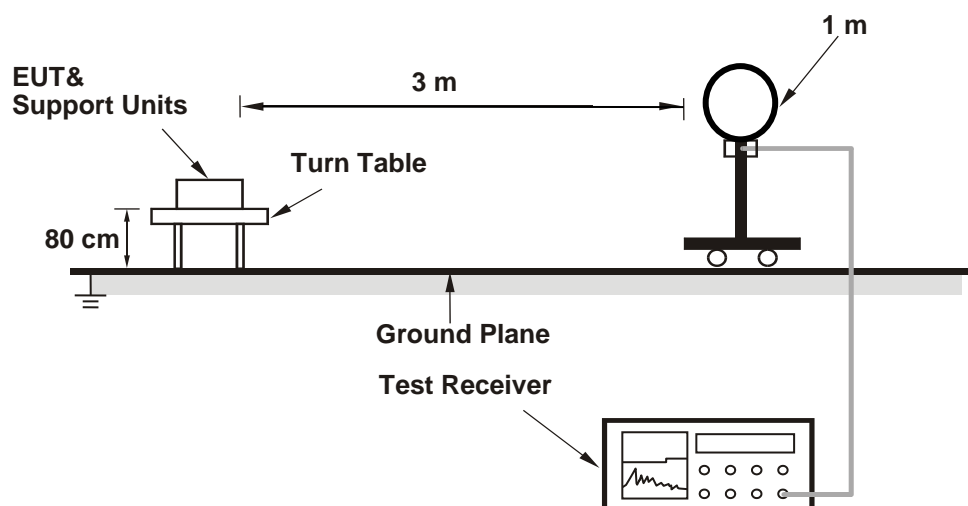
Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits as below table, whichever is the lesser attenuation.

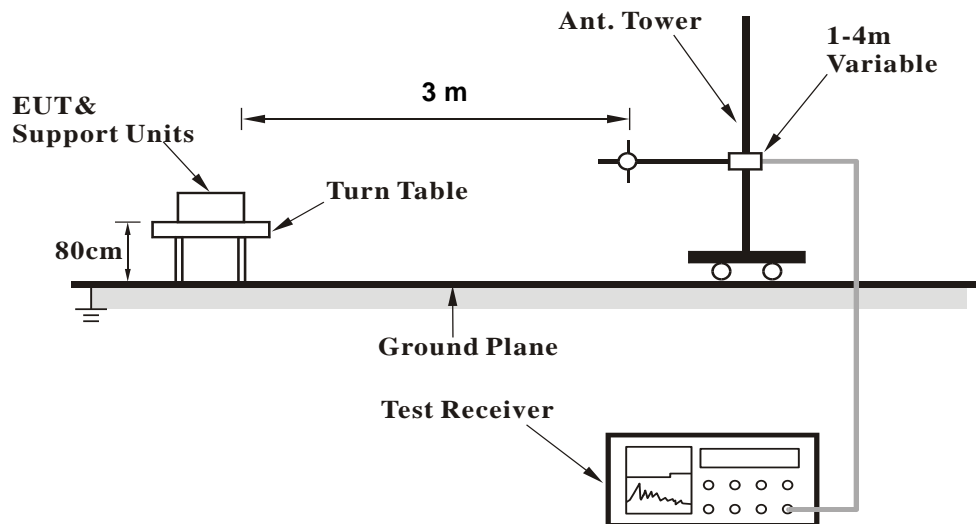
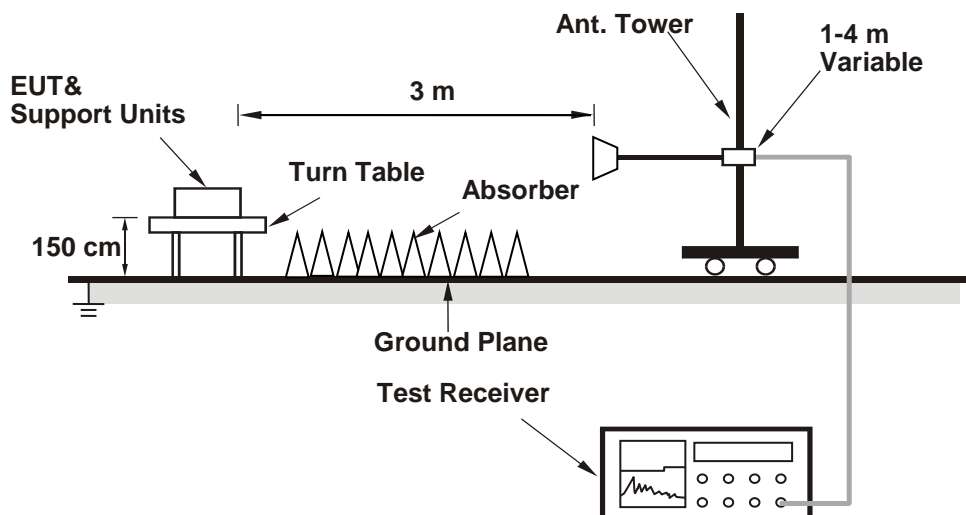
Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F (kHz)	300
0.490 ~ 1.705	24000/F (kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

Kind of Test Site 3m Semi-Anechoic Chamber

Test Setup

<Radiated Emissions below 30 MHz>



<Radiated Emissions 30 MHz to 1 GHz>

<Radiated Emission above 1 GHz>


For the actual test configuration, please refer to the attached file (Test Setup Photo).

Test Instruments

Please refer to 5.1.2 Instruments

Test Procedures**For Radiated Emissions below 30 MHz**

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Parallel (OPEN), perpendicular (CLOSE), and ground-parallel (GROUND) orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9 kHz at frequency below 30 MHz.
2. All modes of operation were investigated and the worst-case emissions are reported.

For Radiated Emissions above 30 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30 MHz ~ 1 GHz) / 1.5 meters (for above 1 GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. 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 from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detected function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) or Peak detection (PK) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. All modes of operation were investigated and the worst-case emissions are reported.
4. The Radiated Emissions testing was performed in the X(E1), Y(H) and Z(E2) axis orientation. The worst-case Axis orientation is recorded in this test report.

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Test Results

Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB)

Level (dBuV/m) = Reading (dBuV) + Factor (dB/m)

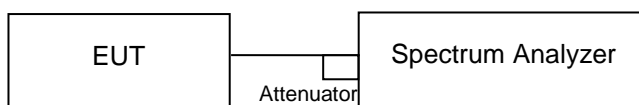
Please refer to Appendix A.

5.1.4 20 dB Bandwidth

Limit

The 20 dB bandwidth shall be specified in operating frequency band.

Kind of Test Site 3m Semi-Anechoic Chamber

Test Setup

Test Instruments

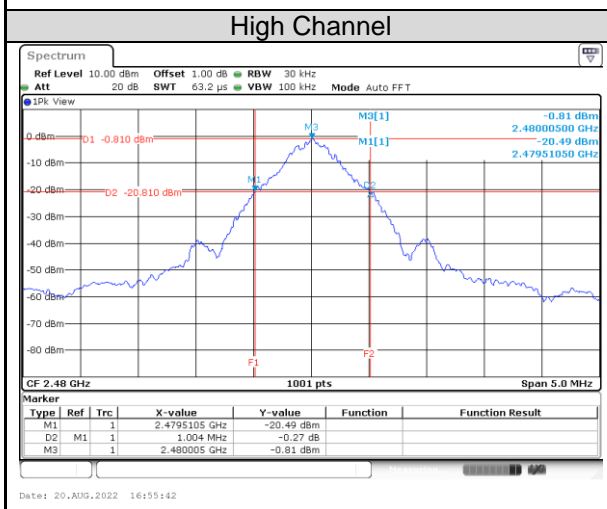
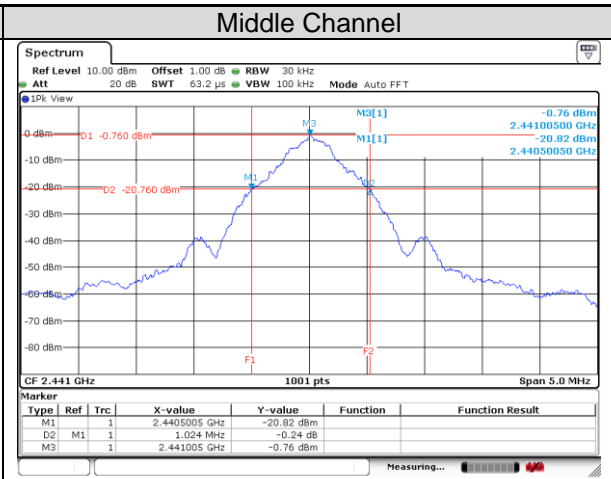
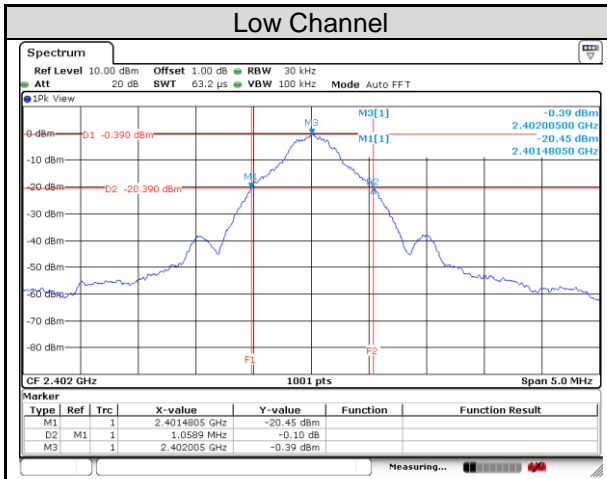
Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date	Test Date	
						From	Until
Spectrum Analyzer	R&S	FSV40	101512	2022/2/24	2023/2/23	2022/8/8	2022/8/20

Test Procedure

- Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
- Repeat above procedures until all frequencies measured were complete.

Test Results

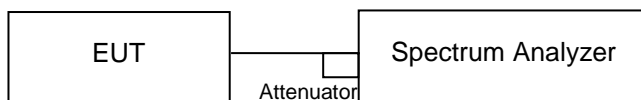
Channel	Channel Frequency (MHz)	20 dB Bandwidth (MHz)
Low Channel	2402	1.059
Middle Channel	2441	1.024
High Channel	2480	1.044



5.1.5 99% Occupied Bandwidth

Kind of Test Site Shielded room

Test Setup



Test Instruments

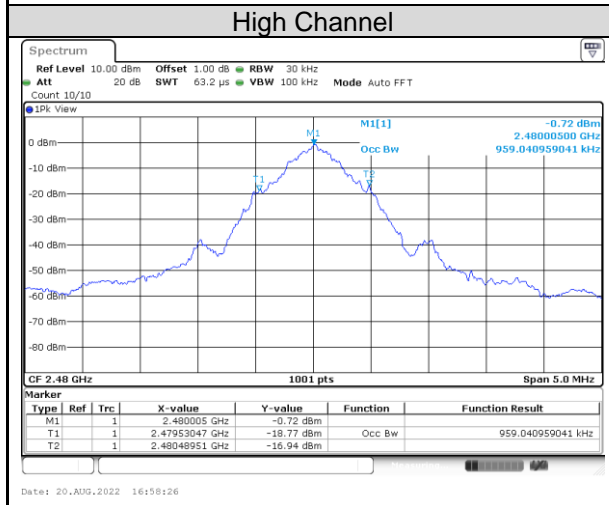
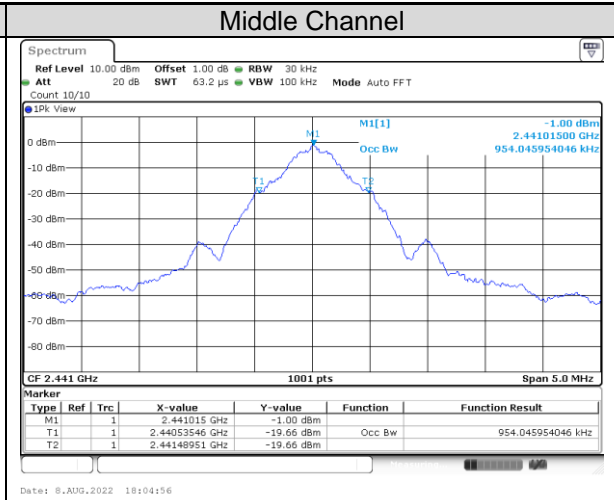
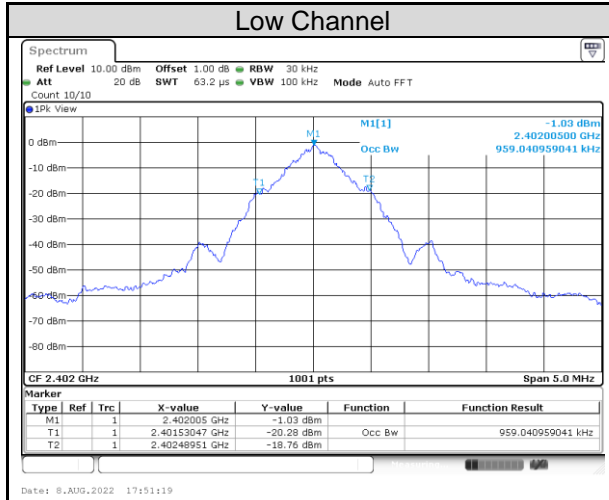
Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date	Test Date	
						From	Until
Spectrum Analyzer	R&S	FSV40	101512	2022/2/24	2023/2/23	2022/8/8	2022/8/20

Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1 % to 5 % of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to Sampling. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

Test Results

Channel	Channel Frequency (MHz)	99% Bandwidth (kHz)
Low Channel	2402	959.04
Middle Channel	2441	954.05
High Channel	2480	959.04



5.2 Mains Emission

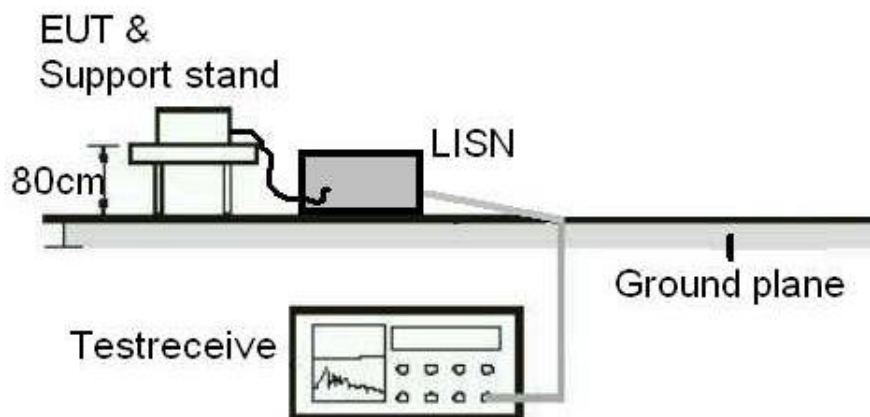
5.2.1 Mains Conducted Emission

Limit

Mains Conducted emissions as defined in §15.207 must comply with the mains conducted emission limits.

Kind of Test Site Shielded room

Test Setup



Test Instruments

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
Two-Line V-Network	Rohde & Schwarz	ENV216	101938	2021/9/23	2022/9/22
EMI Test Receiver	R&S	ESCI	1816063	2021/11/15	2022/11/14

Test Procedures

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50 uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20 dB) was not recorded.


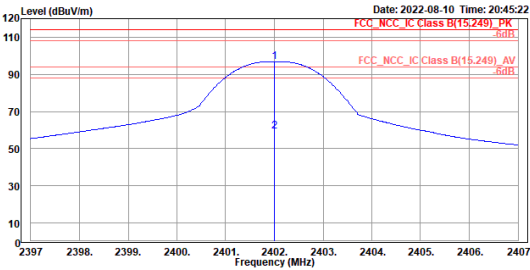

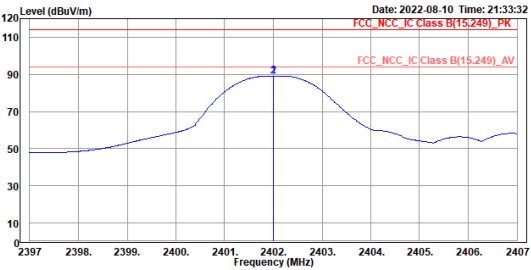
Note: The resolution bandwidth and video bandwidth of test receiver is 9 kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15 MHz – 30 MHz.

Test Results

Please refer to Appendix A.

Appendix A: Test Results of Radiated Spurious Emissions & Mains Conducted Emission Test

Fundamental

SRD																																																																																																	
Low Channel (Horizontal)	Low Channel (Vertical)																																																																																																
<div style="display: flex; justify-content: space-between;">  <div> <p>TUV Rheinland Taiwan Ltd. 11F., No. 758, Sec. 4 Bade Road, Songshan Dist, Taipei City 105 Tel:+886-2172-7000 Fax:+886-2528-0018</p> </div> </div> <div style="text-align: right; margin-top: 10px;"> <p>Date: 2022-08-10 Time: 20:45:22</p> <p>FCC_NCC_IC Class B(15,249)_PK</p> <p>FCC_NCC_IC Class B(15,249)_AV</p> </div>  <table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <thead> <tr> <th>Read</th> <th>Limit</th> <th>Over</th> <th>APos</th> <th>TPos</th> <th>Remark</th> <th>Pol/Phase</th> <th>Note</th> </tr> <tr> <th>Level</th> <th>Line</th> <th>Limit</th> <th></th> <th></th> <th></th> <th></th> <th></th> </tr> <tr> <th>Factor</th> <th>Level</th> <th>Level</th> <th></th> <th></th> <th></th> <th></th> <th></th> </tr> <tr> <th></th> <th>dB</th> <th>cm</th> <th>deg</th> <th></th> <th></th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>114.00</td> <td>-17.23</td> <td>203</td> <td>324</td> <td>Peak</td> <td>Horizontal</td> <td></td> </tr> <tr> <td>2</td> <td>94.00</td> <td>-34.83</td> <td>203</td> <td>324</td> <td>Average</td> <td>Horizontal</td> <td>CF</td> </tr> </tbody> </table>	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note	Level	Line	Limit						Factor	Level	Level							dB	cm	deg					1	114.00	-17.23	203	324	Peak	Horizontal		2	94.00	-34.83	203	324	Average	Horizontal	CF	<div style="display: flex; justify-content: space-between;">  <div> <p>TUV Rheinland Taiwan Ltd. 11F., No. 758, Sec. 4 Bade Road, Songshan Dist, Taipei City 105 Tel:+886-2172-7000 Fax:+886-2528-0018</p> </div> </div> <div style="text-align: right; margin-top: 10px;"> <p>Date: 2022-08-10 Time: 21:33:32</p> <p>FCC_NCC_IC Class B(15,249)_PK</p> <p>FCC_NCC_IC Class B(15,249)_AV</p> </div>  <table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <thead> <tr> <th>Read</th> <th>Limit</th> <th>Over</th> <th>APos</th> <th>TPos</th> <th>Remark</th> <th>Pol/Phase</th> <th>Note</th> </tr> <tr> <th>Level</th> <th>Line</th> <th>Limit</th> <th></th> <th></th> <th></th> <th></th> <th></th> </tr> <tr> <th>Factor</th> <th>Level</th> <th>Level</th> <th></th> <th></th> <th></th> <th></th> <th></th> </tr> <tr> <th></th> <th>dB</th> <th>cm</th> <th>deg</th> <th></th> <th></th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>114.00</td> <td>-24.88</td> <td>131</td> <td>238</td> <td>Peak</td> <td>Vertical</td> <td></td> </tr> <tr> <td>2</td> <td>94.00</td> <td>-5.07</td> <td>131</td> <td>238</td> <td>Average</td> <td>Vertical</td> <td></td> </tr> </tbody> </table>	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note	Level	Line	Limit						Factor	Level	Level							dB	cm	deg					1	114.00	-24.88	131	238	Peak	Vertical		2	94.00	-5.07	131	238	Average	Vertical	
Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note																																																																																										
Level	Line	Limit																																																																																															
Factor	Level	Level																																																																																															
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2	94.00	-5.07	131	238	Average	Vertical																																																																																											

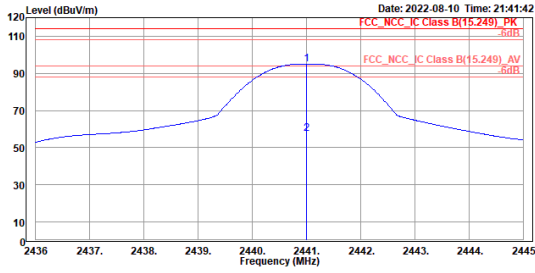
SRD

Middle Channel (Horizontal)

Middle Channel (Vertical)



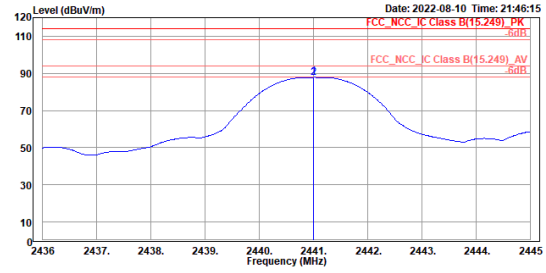
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	Read Freq	Level	Factor	Level	Limit Line	Over Limit	APos	TPos	Remark	Po1/Phase	Note
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	deg			
1	2441.000	100.65	-5.73	94.92	114.00	-19.08	140	196	Peak	Horizontal	
2	2441.000	63.04	-5.73	57.31	94.00	-36.69	140	196	Average	Horizontal	



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	Read Freq	Level	Factor	Level	Limit Line	Over Limit	APos	TPos	Remark	Po1/Phase	Note
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	deg			
1	2441.000	93.57	-5.73	87.84	114.00	-26.16	187	314	Peak	Vertical	
2	2441.000	93.35	-5.73	87.62	94.00	-6.38	187	314	Average	Vertical	

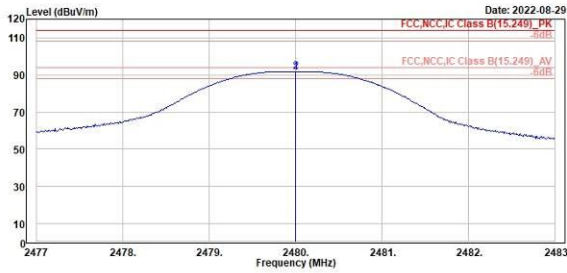
SRD

High Channel (Horizontal) Peak

High Channel (Vertical) Peak



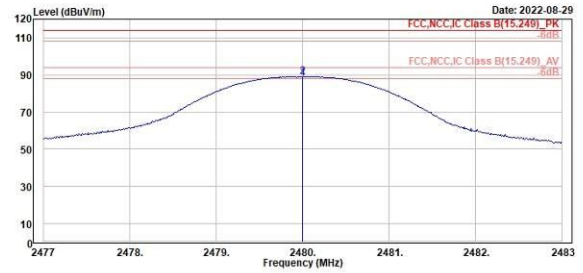
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1	2480.00	91.31	96.93	-5.62	94.00	-2.69	147	141	Average	Horizontal	
2	2480.00	91.83	97.45	-5.62	114.00	-22.17	147	141	Peak	Horizontal	



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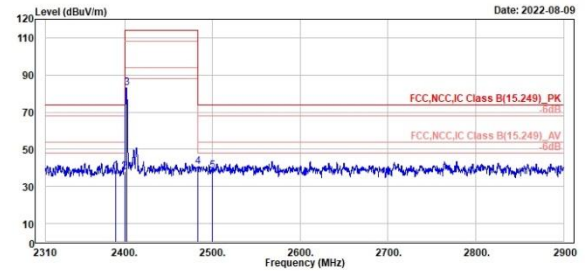
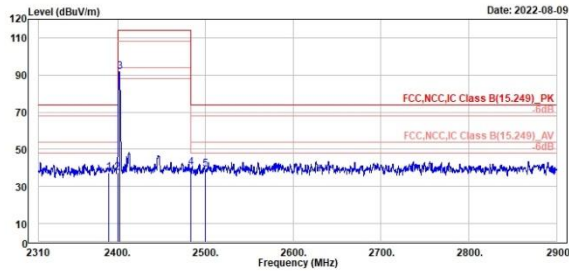
1	2480.00	87.94	93.56	-5.62	94.00	-6.06	242	266	Average	VERTICAL	
2	2480.00	88.91	94.53	-5.62	114.00	-25.09	242	266	Peak	VERTICAL	

Band Edges, 2.31GHz ~ 2.9GHz

SRD

Low Channel (Horizontal) Peak

Low Channel (Vertical) Peak



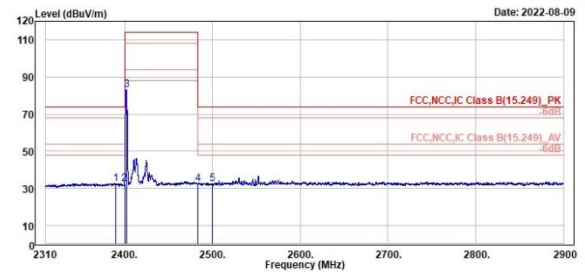
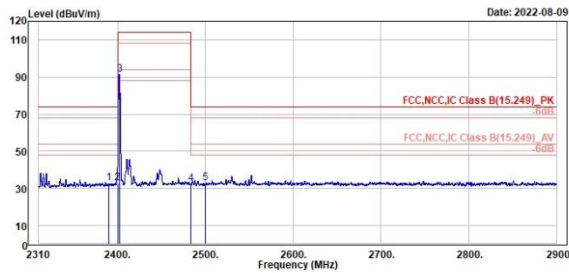
1	2	3	4	5
Peak	Peak	Peak	Peak	Peak
Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
2390.00	2400.00	2402.00	2483.50	2500.00
37.23	37.25	91.51	39.95	39.43
43.17	43.14	97.39	45.55	45.00
-5.94	-5.89	-5.68	-5.60	-5.57
74.00	74.00	114.00	74.00	74.00
-36.77	-36.75	-22.49	-34.05	-34.57
270	270	270	270	270
153	153	153	153	153
Peak	Peak	Peak	Peak	Peak
Horizontal	Horizontal	Horizontal	Horizontal	Horizontal

1	2	3	4	5
Peak	Peak	Peak	Peak	Peak
Vertical	Vertical	Vertical	Vertical	Vertical
2390.00	2400.00	2402.00	2483.50	2500.00
38.47	38.00	83.23	40.69	38.41
44.41	43.89	89.11	46.29	43.98
-5.94	-5.89	-5.88	-5.60	-5.57
74.00	74.00	114.00	74.00	74.00
-35.53	-36.00	-30.77	-33.31	-35.59
156	156	156	156	156
217	217	217	217	217
Peak	Peak	Peak	Peak	Peak
Vertical	Vertical	Vertical	Vertical	Vertical

SRD

Low Channel (Horizontal) Average

Low Channel (Vertical) Average



Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2390.00	33.07	39.81	-5.94	54.00	-20.93	270	153 Average	Horizontal
2	2400.00	33.07	38.96	-5.89	54.00	-20.93	270	153 Average	Horizontal
3	2402.00	91.34	97.22	-5.88	94.00	-2.66	270	153 Average	Horizontal
4	2483.50	32.44	38.04	-5.60	54.00	-21.56	270	153 Average	Horizontal
5	2500.00	32.89	38.46	-5.57	54.00	-21.11	270	153 Average	Horizontal

Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2390.00	32.19	38.13	-5.94	54.00	-21.81	156	217 Average	Vertical
2	2400.00	32.51	38.40	-5.89	54.00	-21.49	156	217 Average	Vertical
3	2402.00	82.96	88.84	-5.88	94.00	-11.04	156	217 Average	Vertical
4	2483.50	32.40	38.00	-5.60	54.00	-21.60	156	217 Average	Vertical
5	2500.00	32.54	38.11	-5.57	54.00	-21.46	156	217 Average	Vertical

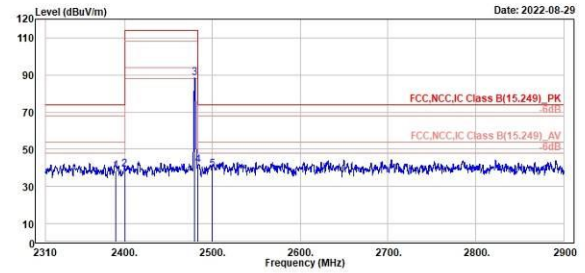
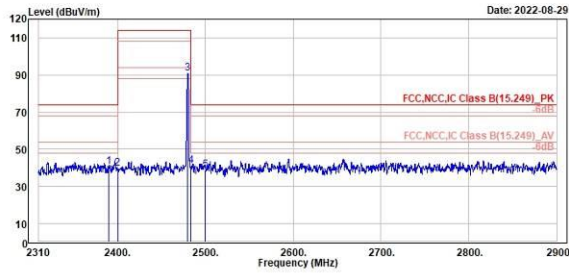
SRD

High Channel (Horizontal) Peak

High Channel (Vertical) Peak

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Peak	Freq	Level	Read	Limit	Over	Apos	Tpos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2390.00	40.63	46.57	-5.94	74.00	-33.37	184	89 Peak	HORIZONTAL	
2	2400.00	39.91	45.80	-5.89	74.00	-34.09	184	89 Peak	HORIZONTAL	
3	2480.00	91.02	96.64	-5.62	114.00	-22.98	184	89 Peak	HORIZONTAL	
4	2483.50	41.18	46.78	-5.60	74.00	-32.82	184	89 Peak	HORIZONTAL	
5	2500.00	38.85	44.42	-5.57	74.00	-35.15	184	89 Peak	HORIZONTAL	

Peak	Freq	Level	Read	Limit	Over	Apos	Tpos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2390.00	38.42	44.36	-5.94	74.00	-35.58	215	272 Peak	VERTICAL	
2	2400.00	39.20	45.09	-5.89	74.00	-34.80	215	272 Peak	VERTICAL	
3	2480.00	88.40	94.82	-5.62	114.00	-25.60	215	272 Peak	VERTICAL	
4	2483.50	41.49	47.09	-5.60	74.00	-32.51	215	272 Peak	VERTICAL	
5	2500.00	39.22	44.79	-5.57	74.00	-34.78	215	272 Peak	VERTICAL	

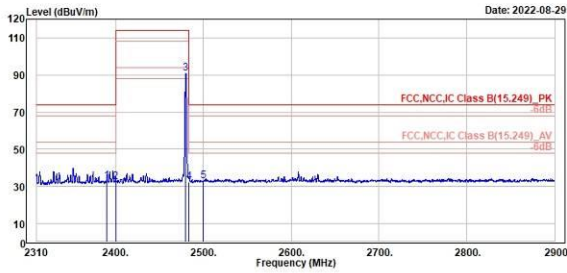
SRD

High Channel (Horizontal) Average

High Channel (Vertical) Average



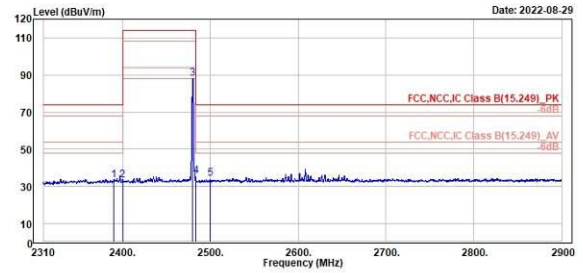
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Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2390.00	32.65	38.59	-5.94	54.00	-21.35	184	89 Average	HORIZONTAL
2	2400.00	32.54	38.43	-5.89	54.00	-21.46	184	89 Average	HORIZONTAL
3	2480.00	90.82	96.44	-5.62	94.00	-3.18	184	89 Average	HORIZONTAL
4	2483.50	32.54	38.14	-5.60	54.00	-21.46	184	89 Average	HORIZONTAL
5	2500.00	32.99	38.56	-5.57	54.00	-21.01	184	89 Average	HORIZONTAL



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Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2390.00	33.39	39.33	-5.94	54.00	-20.61	215	272 Average	VERTICAL
2	2400.00	33.49	39.38	-5.89	54.00	-20.51	215	272 Average	VERTICAL
3	2480.00	88.05	93.67	-5.62	94.00	-5.95	215	272 Average	VERTICAL
4	2483.50	35.44	41.04	-5.60	54.00	-18.56	215	272 Average	VERTICAL
5	2500.00	34.35	39.92	-5.57	54.00	-19.65	215	272 Average	VERTICAL

Spurious Emissions, Tx Mode, 9kHz ~ 30MHz

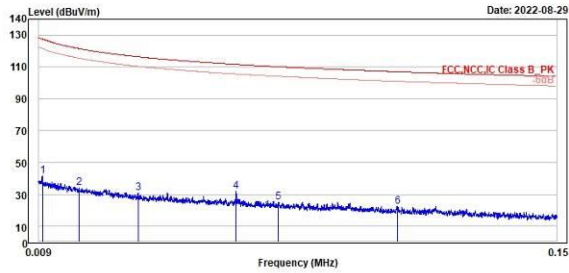
SRD

High Channel(Open) 9kHz~150kHz

High Channel(Open) 150kHz~30MHz



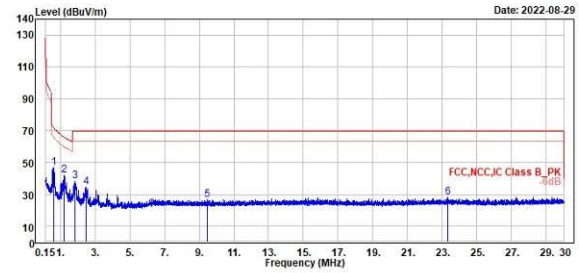
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Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	0.01	41.49	23.85	17.64	127.56	-86.07	100	167 QP	Open
2	0.02	33.82	15.30	18.52	121.59	-87.77	100	41 QP	Open
3	0.04	31.03	12.03	19.00	116.45	-85.42	100	72 QP	Open
4	0.06	31.90	13.29	18.61	111.65	-79.75	100	248 QP	Open
5	0.07	25.18	6.81	18.37	110.18	-85.00	100	183 QP	Open
6	0.11	22.40	4.41	17.99	107.03	-84.63	100	106 QP	Open



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Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	0.63	46.59	27.80	18.79	71.50	-24.99	100	178 QP	Open
2	1.23	42.13	23.04	19.09	65.79	-23.66	100	252 QP	Open
3	1.85	38.20	18.99	19.21	69.50	-31.30	100	197 QP	Open
4	2.46	34.75	15.44	19.31	69.50	-34.75	100	79 QP	Open
5	9.44	26.56	5.51	21.05	69.50	-42.94	100	203 QP	Open
6	23.30	28.10	6.23	21.87	69.50	-41.40	100	141 QP	Open

Spurious Emissions, Tx Mode, 1GHz ~ 26.5GHz

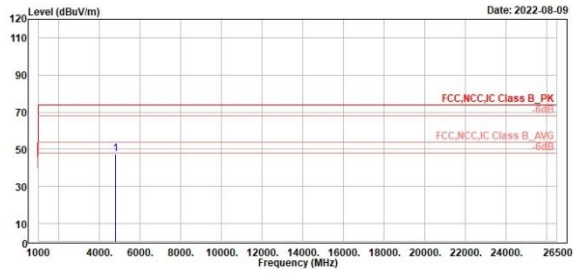
SRD

Low Channel (Horizontal)

Low Channel (Vertical)



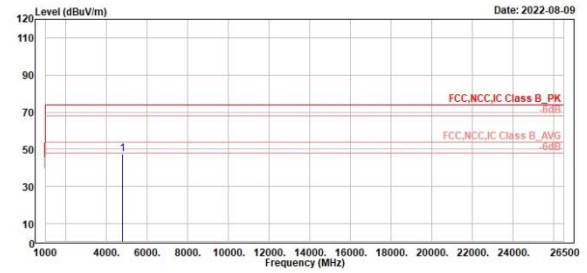
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Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	4884.00	47.44	47.69	-0.25	74.00	-26.56	288	113 Peak	Horizontal



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Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	4884.00	47.45	47.70	-0.25	74.00	-26.55	380	245 Peak	Vertical

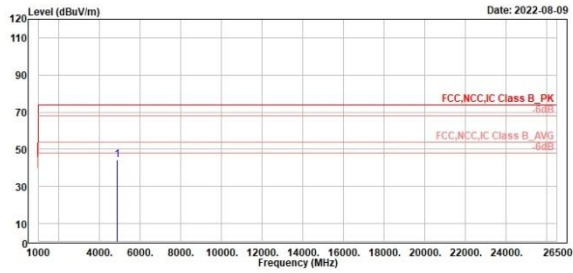
SRD

Middle Channel (Horizontal)

Middle Channel (Vertical)



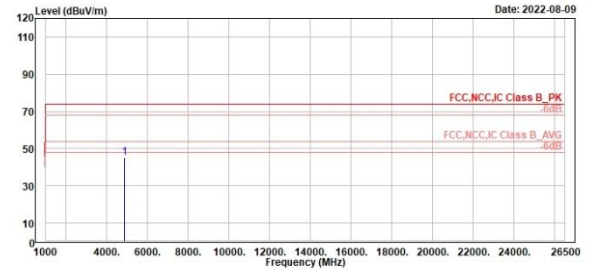
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No. 458-18, Sec. 2, Fenliao, Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1 4882.00	44.18	44.22	-0.04	74.00	-29.82	158	360	Peak	Horizontal	



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Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1 4882.00	45.10	45.14	-0.04	74.00	-28.90	200	178	Peak	Vertical	

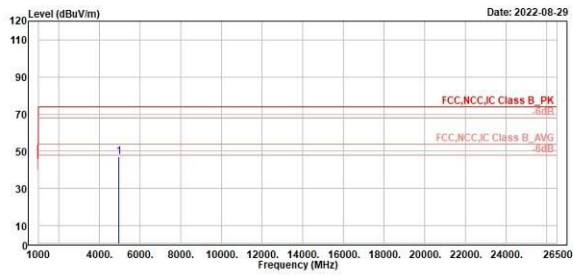
SRD

High Channel (Horizontal)

High Channel (Vertical)



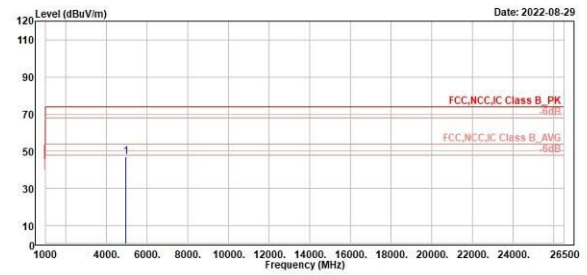
TUV Rheinland Taiwan Ltd.
No. 438-18, Sec 2, Fenliao, Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	4960.00	47.20	47.12	0.08	74.00	-26.80	200	232 Peak	Horizontal	



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Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	4960.00	46.91	46.83	0.08	74.00	-27.09	283	124 Peak	Vertical	

Mains Conducted Emission, TX Mode 150kHz ~ 30MHz

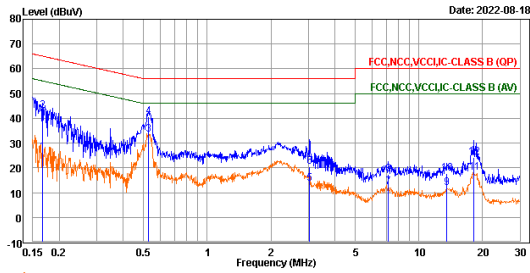
Worst Band

(Line)

(Neutral)



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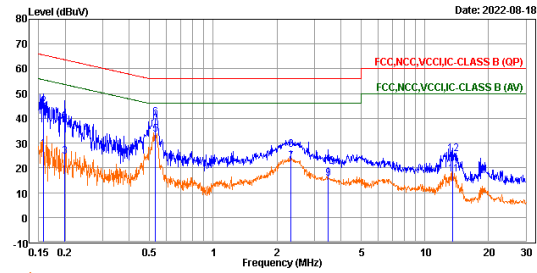


Trace: 1

Line	Freq	Level	Read Level	Factor	Limit	Over	Remark	Pol/Phase	Note
	MHz	dBuV	dBuV	dB	dBuV	dB			
1	0.17	26.35	16.74	9.61	55.09	-28.74	Average	line1	
2	0.17	42.94	33.33	9.61	65.09	-22.15	QP	line1	
3	0.53	33.45	23.83	9.62	46.00	-12.55	Average	line1	
4	0.53	40.71	31.09	9.62	56.00	-15.29	QP	line1	
5	3.04	13.72	4.05	9.67	46.00	-32.28	Average	line1	
6	3.04	20.63	10.96	9.67	56.00	-35.37	QP	line1	
7	7.18	12.40	2.69	9.71	50.00	-37.60	Average	line1	
8	7.18	17.32	7.61	9.71	60.00	-42.68	QP	line1	
9	13.58	11.75	2.02	9.73	50.00	-38.25	Average	line1	
10	13.58	17.84	8.11	9.73	60.00	-42.16	QP	line1	
11	18.22	18.03	8.30	9.73	50.00	-31.97	Average	line1	
12	18.22	24.23	14.50	9.73	60.00	-35.77	QP	line1	



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Trace: 1

Line	Freq	Level	Read Level	Factor	Limit	Over	Remark	Pol/Phase	Note
	MHz	dBuV	dBuV	dB	dBuV	dB			
1	0.16	27.67	18.08	9.59	55.54	-27.87	Average	neutral	
2	0.16	44.77	35.18	9.59	65.54	-20.77	QP	neutral	
3	0.20	24.49	14.90	9.59	53.64	-29.15	Average	neutral	
4	0.20	39.50	29.91	9.59	63.64	-24.14	QP	neutral	
5	0.53	33.40	23.80	9.60	46.00	-12.60	Average	neutral	
6	0.53	40.23	30.63	9.60	56.00	-15.77	QP	neutral	
7	2.33	22.34	12.71	9.63	46.00	-23.66	Average	neutral	
8	2.33	27.35	17.72	9.63	56.00	-28.65	QP	neutral	
9	3.50	15.61	5.95	9.66	46.00	-30.39	Average	neutral	
10	3.50	20.59	10.93	9.66	56.00	-35.41	QP	neutral	
11	13.58	17.42	7.65	9.77	50.00	-32.58	Average	neutral	
12	13.58	25.76	15.99	9.77	60.00	-34.24	QP	neutral	