

Prüfbericht-Nr.: <i>Test report no.:</i>	CN215UFK (P15C-2.4G) 001	Auftrags-Nr.: <i>Order no.:</i>	238511589	Seite 1 von 28 Page 1 of 28	
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2021-02-25		
Auftraggeber: <i>Client:</i>	Kingston Technology Company 17600 Newhope Street, Fountain Valley, California 92708, United States				
Prüfgegenstand: <i>Test item:</i>	HyperX Pulsefire Haste Wireless adapter				
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	PF002WA				
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>	2021-03-03				
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003009307-001 A003009307-002				
Prüfzeitraum: <i>Testing period:</i>	2021-03-05 - 2021-03-23				
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>reviewed by:</i>		genehmigt von: <i>authorized by:</i>			
Datum: <i>Date:</i>	2021-03-24	Ausstellungsdatum: <i>Issue date:</i>	2021-03-24		
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	5 = mangelhaft
* 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	5 = poor
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>					

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
CN215U FK (P15C-2.4G) 001	Original Release	2021-03-24

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)	± 1.15 dB
Radiated Emission (30 MHz ~ 200 MHz)	± 1.30 dB
Radiated Emission (200 MHz ~ 1 GHz)	± 1.30 dB
Radiated Emission (1 GHz ~ 18 GHz)	± 1.54 dB
Radiated Emission (18 GHz ~ 40 GHz)	± 2.52 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 Wireless adapter. It contains 2.4GHz compatible chip 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 Wireless adapter
Type Identification	PF002WA
FCC ID	JIC-PF002WA

Technical Specification of EUT

Item	EUT information
Operating Frequency	2402 ~ 2479 MHz
Operation Voltage	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		

4.3 Test Operation and Test Software

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

The samples were used as follows:

A003009307-001

A003009307-002

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. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when position on **Z-plane**.
2. "-" 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 ~ 2479	2402, 2441, 2479

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 ~ 2479	2402, 2441, 2479

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 ~ 2479	2479

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 ~ 2479	2402, 2441, 2479

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 ~ 2479	2479

Test Condition

Test Item	Ambient Temperature	Relative Humidity	Tested by
Radiated Spurious Emissions	18-22 °C	53.3-60.5 %	Simon Tsai
Field Strength of Fundamental Emissions	18-22 °C	53.3-60.5 %	Simon Tsai
20 dB Bandwidth	18-22 °C	53.3-60.5 %	Simon Tsai
Occupied Bandwidth	22.5 °C	66.5 %	Stanislas Charles
Mains Conducted Emission	26 °C	65 %	Johnson Chen

4.4 Special Accessories and Auxiliary Equipment

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

Accessory of EUT

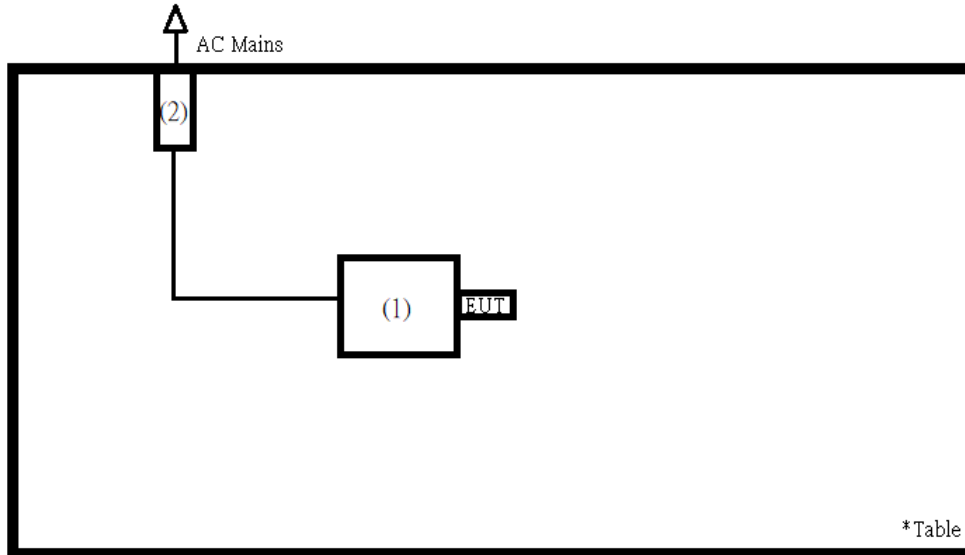
N/A

Support Unit

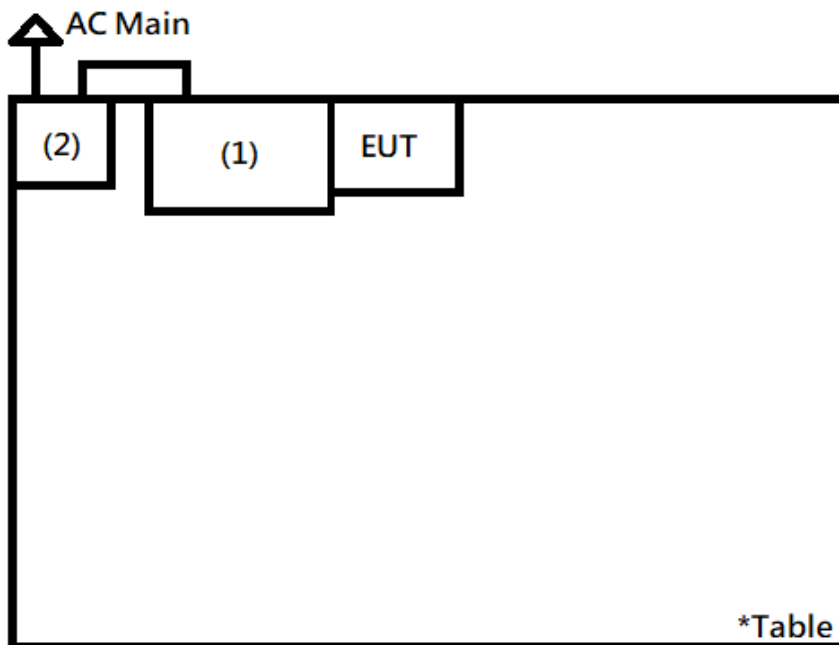
Radiated Emission							
No.	Description	Brand	Model	S/N	Shielded	Ferrite Core (Qty)	Length (cm)
1	Notebook	HP	15-da1046TX	CND911MY2	-	-	-
2	Adapter	HP	TPN-LA16	N/A	NO	NO	180
Mains Conducted							
No.	Description	Brand	Model	S/N	Shielded	Ferrite Core (Qty)	Length (cm)
1	Notebook	HP	15s-du0007TX	CND93662VF	-	-	-
2	Adapter	HP	TPN-DA17	N/A	YES	NO	180

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 2.14 dBi. The antenna is a printed PCB trace 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

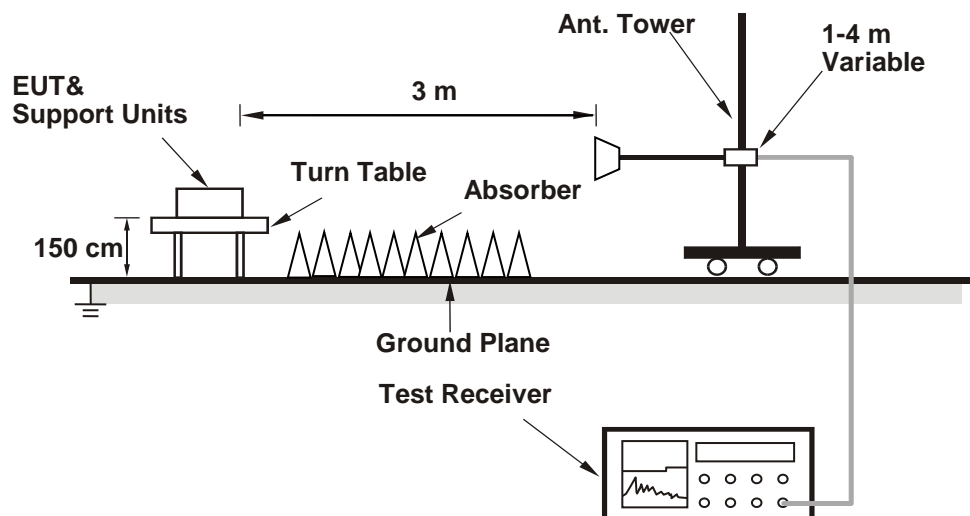
Limit

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
Signal Analyzer	R&S	FSV40	101508	2020/3/16	2021/3/15
Receiver	R&S	ESR7	102108	2020/4/22	2021/4/21
Bilog Antenna	SCHWARZBECK	VULB-9168	00951	2021/2/18	2022/2/17
Horn Antenna	ETS-Lindgren	3117	00218930	2020/12/1	2021/11/30
LF-AMP	Agilent	8447D	2944A10772	2021/2/18	2022/2/17
HF-AMP + AC source	EMCI	EMC051845SE	980633	2021/2/9	2022/2/8
HF-AMP + AC source	EMCI	EMC184045SE	980657	2021/2/1	2022/1/31
Horn Antenna	SCHWARZBECK	BBHA 9170	00887	2020/4/10	2021/4/9
Microwave Cable	HUBER+SUHNER	SUCOFLEX 104EA	800056/4EA	2020/3/25	2021/3/24
Microwave Cable	HUBER+SUHNER	SUCOFLEX 104	804680/4	2020/3/25	2021/3/24
Microwave Cable	HUBER+SUHNER	SUCOFLEX 104	MY37202/4	2020/3/25	2021/3/24
Microwave Cable	HUBER+SUHNER	SUCOFLEX 102EA	800898/2EA	2020/4/22	2021/4/21
Microwave Cable	HUBER+SUHNER	SUCOFLEX 102EA	800901/2EA	2020/4/22	2021/4/21
Microwave Cable	HUBER+SUHNER	SUCOFLEX 102EA	801027/2EA	2020/4/22	2021/4/21
Loop Antenna	Chance Most	EMCILPA600 +calibration	287	2020/6/17	2021/6/16

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, Y and Z 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	90.49	114.00	Pass
		Average	74.83	94.00	Pass
	Vertical	Peak	91.23	114.00	Pass
		Average	75.57	94.00	Pass
2441	Horizontal	Peak	91.88	114.00	Pass
		Average	76.21	94.00	Pass
	Vertical	Peak	92.07	114.00	Pass
		Average	76.40	94.00	Pass
2479	Horizontal	Peak	92.29	114.00	Pass
		Average	76.63	94.00	Pass
	Vertical	Peak	93.70	114.00	Pass
		Average	78.04	94.00	Pass

Please refer to Appendix A for the details.

5.1.3 Radiated Spurious Emissions

Limit

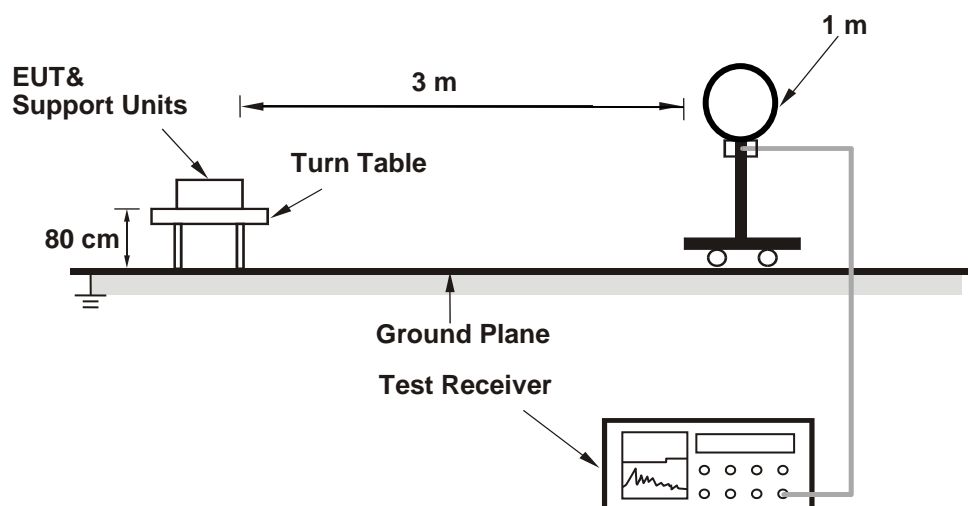
Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits as below table, whichever is the lesser attenuation.

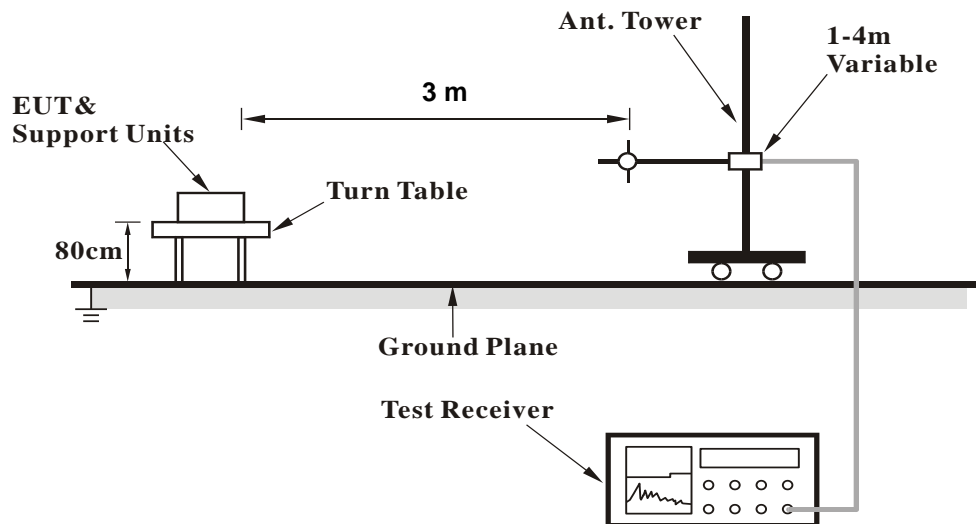
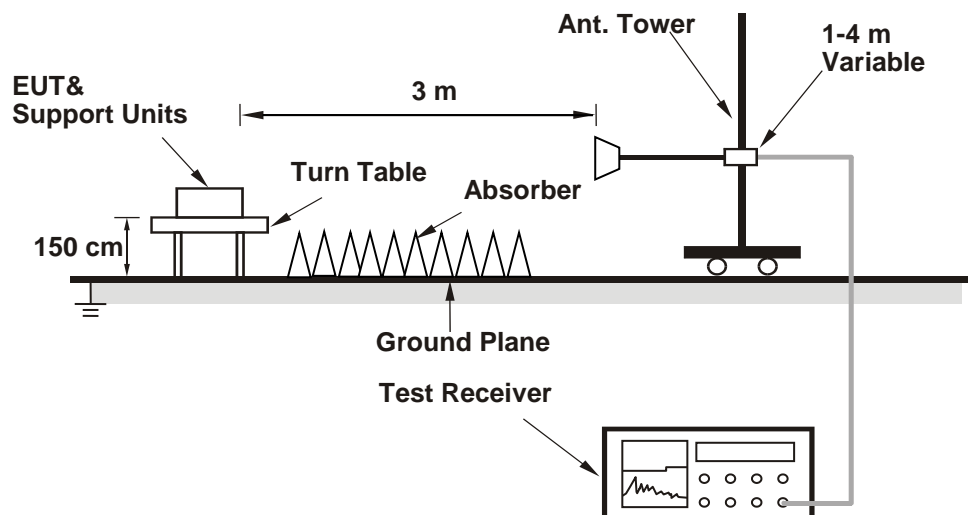
Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F (kHz)	300
0.490 ~ 1.705	24000/F (kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

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, Y and Z 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)

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Test Results

Please refer to Appendix A.

5.1.4 20 dB Bandwidth

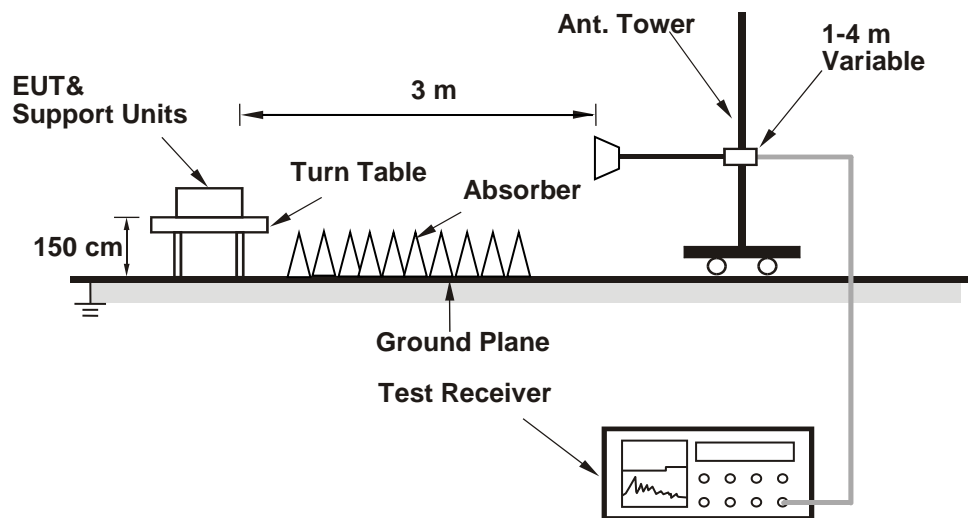
Limit

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

Kind of Test Site

3m Semi-Anechoic Chamber

Test Setup



Test Instruments

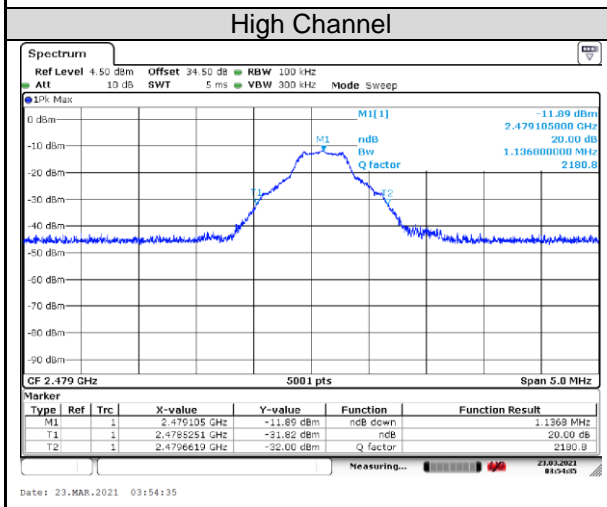
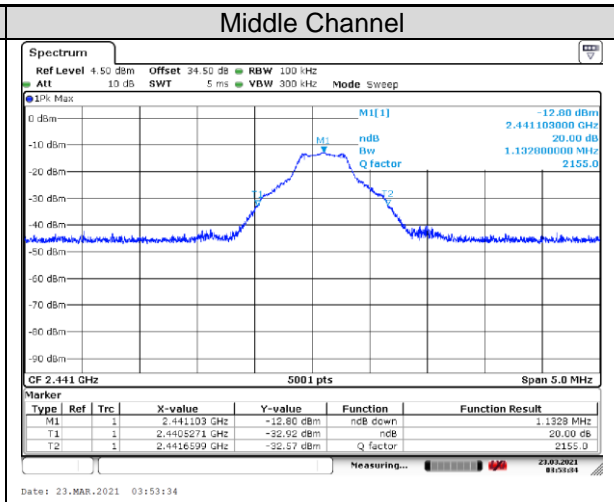
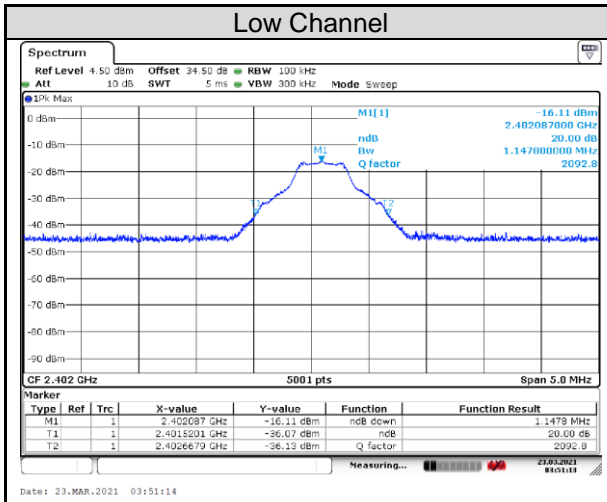
Please refer to 5.1.2 Instruments

Test Procedure

Please refer to 5.1.3 Test Procedure

Test Results

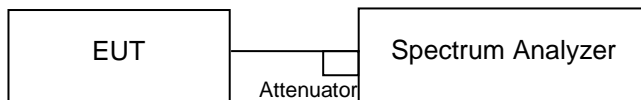
Channel	Channel Frequency (MHz)	20 dB Bandwidth (MHz)
Low Channel	2402	1.148
Middle Channel	2441	1.328
High Channel	2479	1.137



5.1.5 99% Occupied Bandwidth

Kind of Test Site Shielded room

Test Setup



Test Instruments

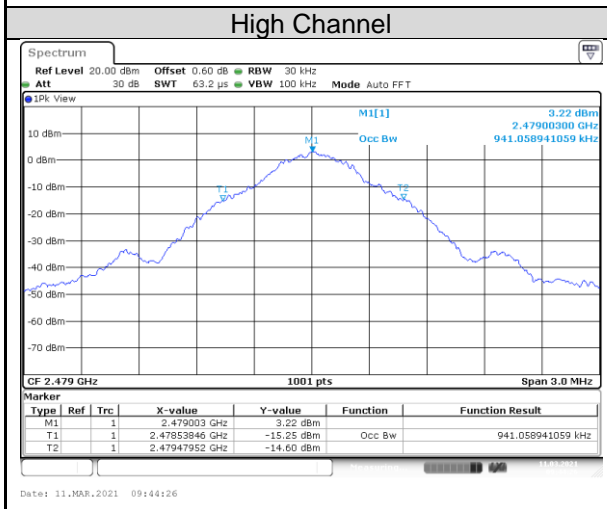
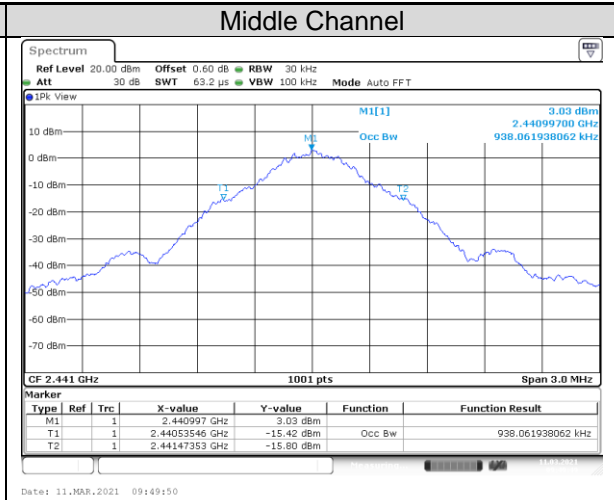
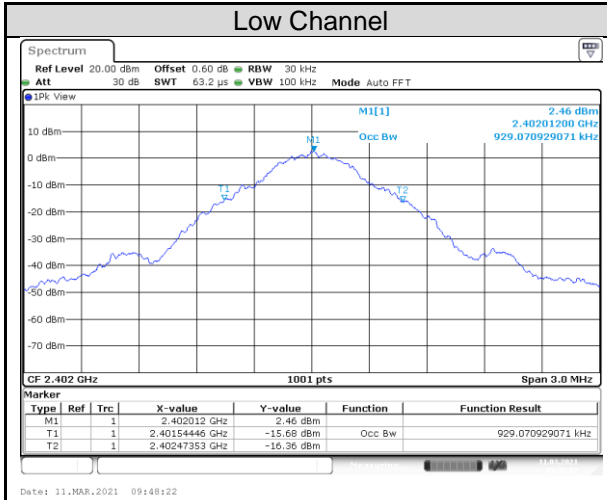
Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date	Test Date	
						From	Until
Spectrum Analyzer	R&S	FSV40	101512	2021/1/29	2022/1/28	2021/3/11	2021/3/11

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	929.07
Middle Channel	2441	938.06
High Channel	2479	941.06



5.2 Mains Emission

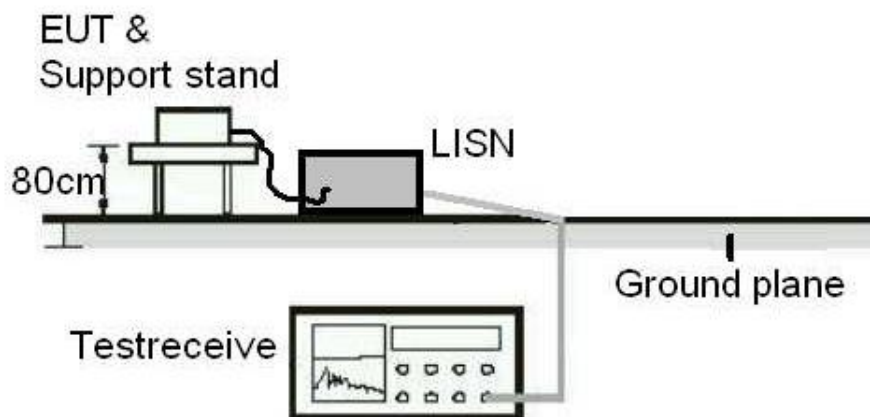
5.2.1 Mains Conducted Emission

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
EMI Test Receiver	Rohde & Schwarz	ESR 7	102114	2020/04/13	2021/04/13
Two-Line V-Network (for EUT)	Rohde & Schwarz	ENV216	1816064	2020/09/10	2021/09/10
Test Software	Audix	e3	Ver. 9	N/A	N/A

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.

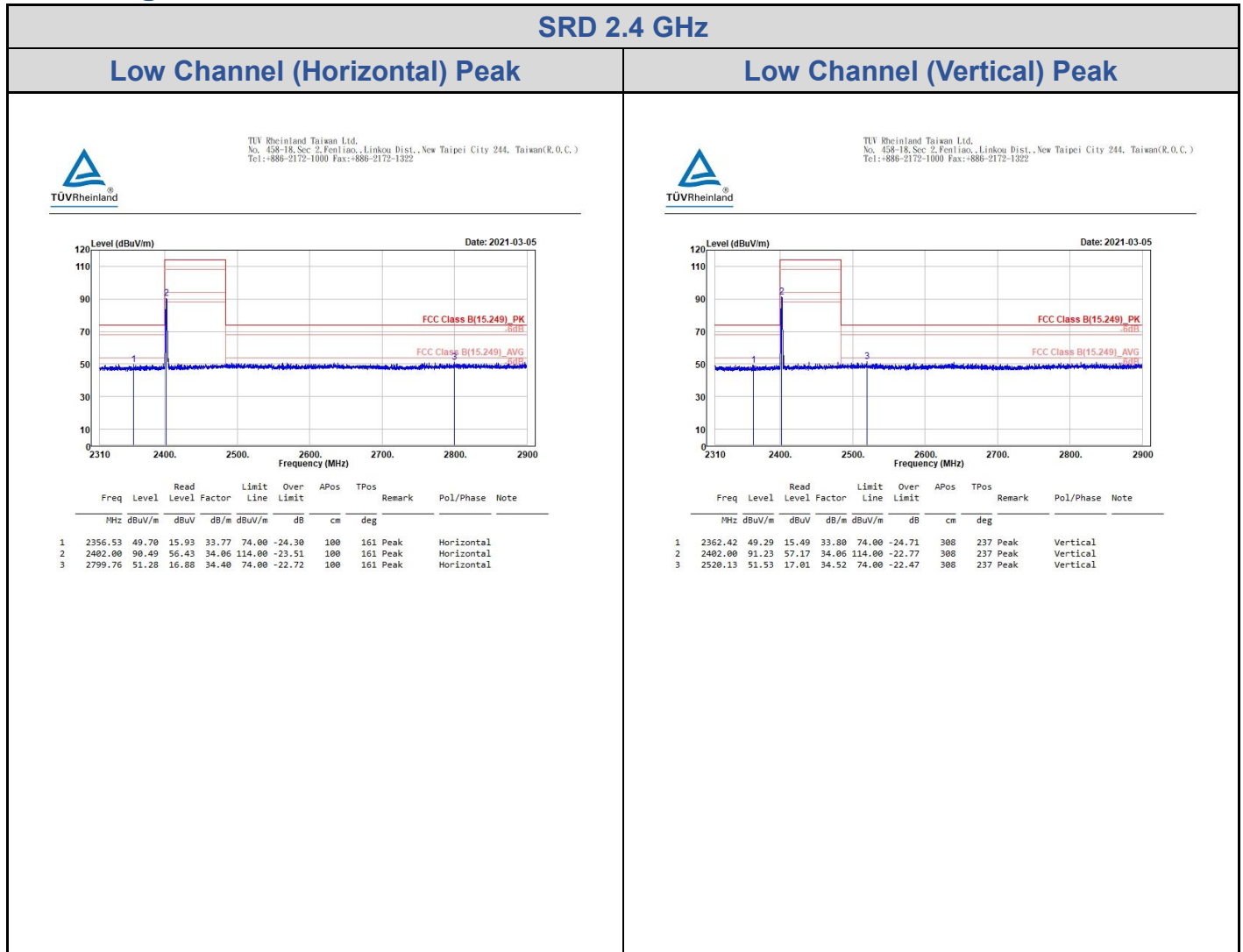
Test Results

Please refer to Appendix A.

Appendix A: Test Results of Radiated Spurious Emissions & Mains

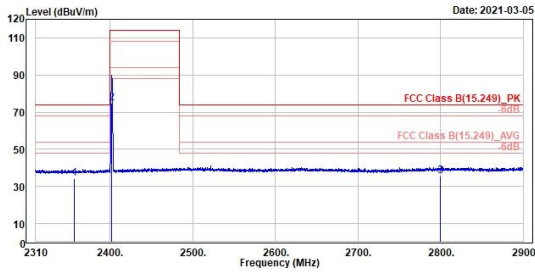
Conducted Emission Test

Band Edges, 2.31GHz ~ 2.9GHz



SRD 2.4 GHz
Low Channel (Horizontal) Average
Low Channel (Vertical) Average

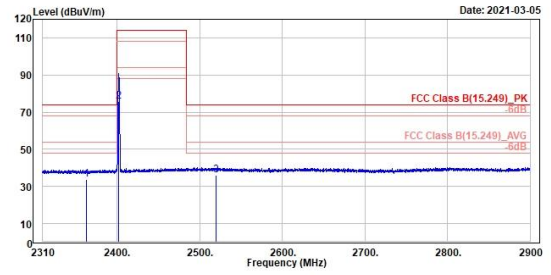

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Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2356.53	34.04	0.27	33.77	54.00	-19.96	100	161 Average	Horizontal	CF
2	2402.00	74.83	40.77	34.06	94.00	-19.17	100	161 Average	Horizontal	CF
3	2799.76	35.62	1.22	34.40	54.00	-18.38	100	161 Average	Horizontal	CF



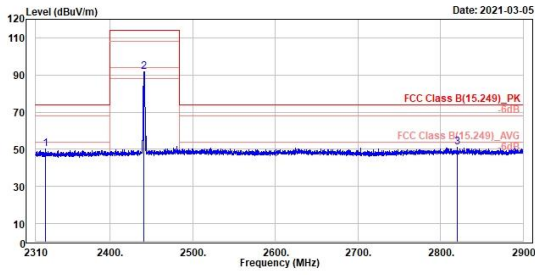
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Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2362.42	33.64	-0.16	33.00	54.00	-20.36	300	237 Average	Vertical	CF
2	2402.00	75.57	41.51	34.06	94.00	-18.43	300	237 Average	Vertical	CF
3	2520.13	35.87	1.35	34.52	54.00	-18.13	300	237 Average	Vertical	CF

SRD 2.4 GHz
Middle Channel (Horizontal) Peak
Middle Channel (Vertical) Peak

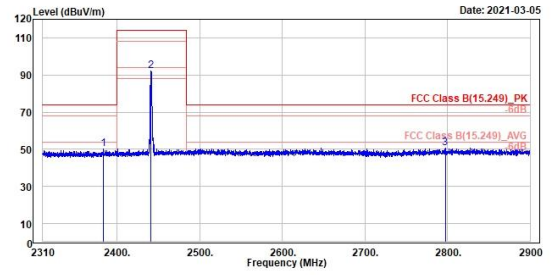

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Peak	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2321.90	50.02	16.36	33.66	74.00	-23.98	110	164	Peak	Horizontal	
2	2441.00	91.88	57.56	34.32	114.00	-22.12	110	164	Peak	Horizontal	
3	2820.61	50.93	16.52	34.41	74.00	-23.07	110	164	Peak	Horizontal	



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Peak	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	2383.15	50.02	16.08	33.94	74.00	-23.98	296	239	Peak	Vertical	
2	2441.00	92.07	57.75	34.32	114.00	-21.93	296	239	Peak	Vertical	
3	2797.41	50.60	16.21	34.39	74.00	-23.40	296	239	Peak	Vertical	

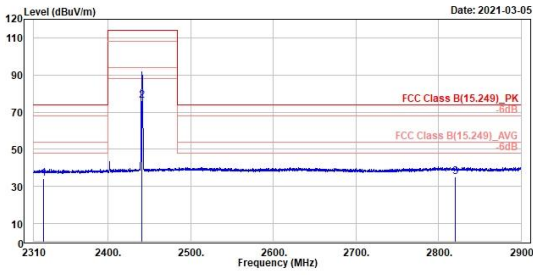
SRD 2.4 GHz

Middle Channel (Horizontal) Average

Middle Channel (Vertical) Average



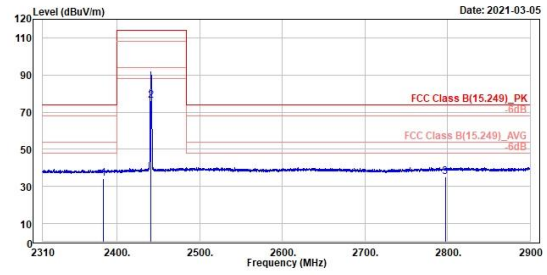
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1	2321.90	34.36	0.70	33.66	54.00	-19.64	110	164	Average	Horizontal	CF
2	2441.00	76.21	41.89	34.32	94.00	-17.79	110	164	Average	Horizontal	CF
3	2820.61	35.27	0.86	34.41	54.00	-18.73	110	164	Average	Horizontal	CF



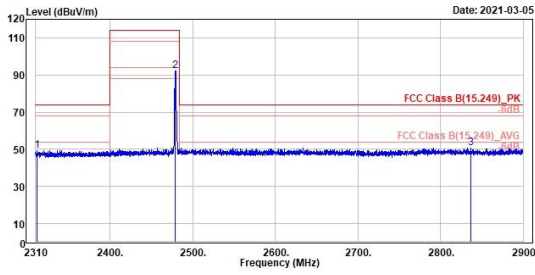
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1	2383.15	34.36	0.42	33.94	54.00	-19.64	296	239	Average	Vertical	CF
2	2441.00	76.40	42.08	34.32	94.00	-17.60	296	239	Average	Vertical	CF
3	2797.41	34.94	0.55	34.39	54.00	-19.06	296	239	Average	Vertical	CF

SRD 2.4 GHz
High Channel (Horizontal) Peak
High Channel (Vertical) Peak

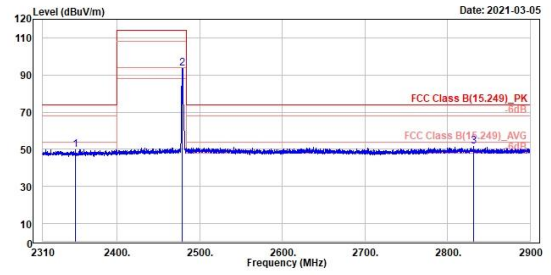

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Peak	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2311.77	49.38	15.75	33.63	74.00	-24.62	148	162	Peak	Horizontal	
2	2479.00	92.29	57.79	34.50	114.00	-21.71	148	162	Peak	Horizontal	
3	2836.63	50.87	16.46	34.41	74.00	-23.13	148	162	Peak	Horizontal	



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Peak	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	2349.46	49.77	16.04	33.73	74.00	-24.23	289	238	Peak	Vertical	
2	2479.00	93.70	59.20	34.50	114.00	-20.30	289	238	Peak	Vertical	
3	2832.15	51.72	17.31	34.41	74.00	-22.28	289	238	Peak	Vertical	

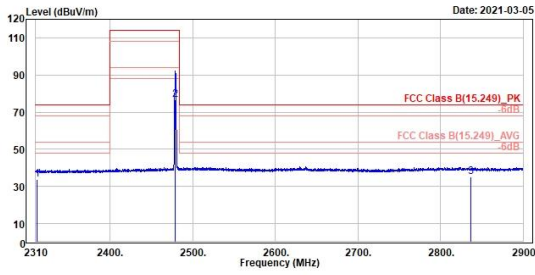
SRD 2.4 GHz

High Channel (Horizontal) Average

High Channel (Vertical) Average



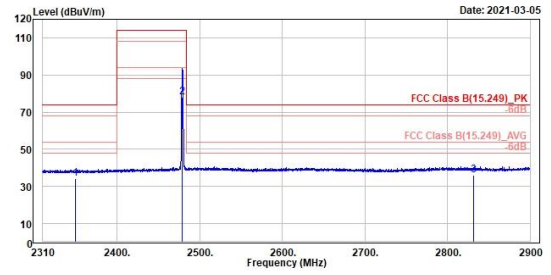
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Line	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2311.77	33.71	0.00	33.63	54.00	-20.29	148	162	Average	Horizontal	CF
2	2479.00	76.63	42.13	34.50	94.00	-17.37	148	162	Average	Horizontal	CF
3	2836.63	35.21	0.80	34.41	54.00	-18.79	148	162	Average	Horizontal	CF



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Line	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	2349.46	34.11	0.38	33.73	54.00	-19.89	289	238	Average	Vertical	CF
2	2479.00	78.04	43.54	34.50	94.00	-15.96	289	238	Average	Vertical	CF
3	2832.15	36.06	1.65	34.41	54.00	-17.94	289	238	Average	Vertical	CF

Spurious Emissions, Tx Mode, 9kHz ~ 30MHz

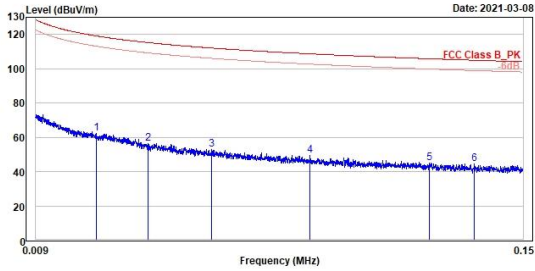
SRD 2.4 GHz

Low Channel (Open) 9kHz~150kHz

Low Channel (Open) 150kHz~30MHz



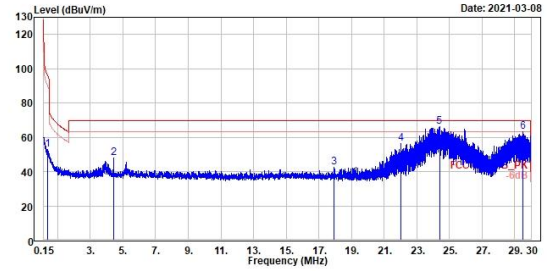
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Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	0.03	62.53	-8.84	71.37	119.12	-56.59	100	347 QP	Open
2	0.04	56.28	-10.87	67.15	115.21	-58.93	100	253 QP	Open
3	0.06	52.76	-10.90	63.66	112.84	-59.28	100	358 QP	Open
4	0.09	49.25	-11.34	60.59	108.67	-59.42	100	70 QP	Open
5	0.12	45.08	-12.85	57.93	105.81	-60.73	100	99 QP	Open
6	0.14	44.28	-12.90	57.18	104.93	-60.65	100	60 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	0.36	52.73	-3.56	49.17	96.43	-43.70	100	188 QP	Open
2	4.43	47.71	-9.25	38.36	69.50	-21.79	100	196 QP	Open
3	17.95	42.58	-5.70	36.88	69.50	-26.92	100	286 QP	Open
4	22.04	56.28	20.40	35.88	69.50	-13.22	100	303 QP	Open
5	24.39	66.36	31.80	34.56	69.50	-3.14	100	134 QP	Open
6	29.51	63.20	24.62	38.58	69.50	-6.30	100	168 QP	Open

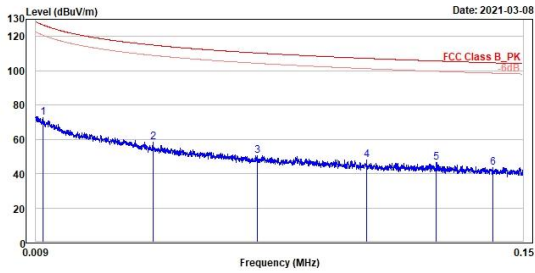
SRD 2.4 GHz

Low Channel (Close) 9kHz~150kHz

Low Channel (Close) 150kHz~30MHz



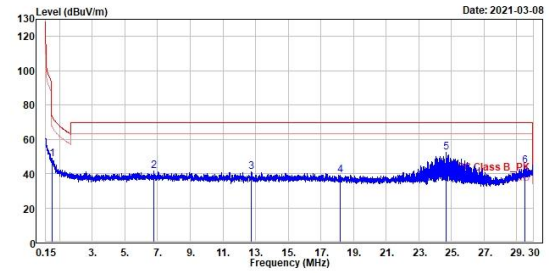
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Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	0.01	72.02	-5.36	78.18	126.72	-53.90	100	44 QP	Close
2	0.04	58.12	-8.70	66.82	114.94	-56.82	100	90 QP	Close
3	0.07	50.60	-11.40	62.00	110.31	-59.71	100	276 QP	Close
4	0.10	48.12	-10.87	58.99	107.19	-59.07	100	30 QP	Close
5	0.12	46.28	-11.53	57.81	105.66	-59.38	100	338 QP	Close
6	0.14	43.70	-13.17	56.87	104.60	-60.90	100	336 QP	Close



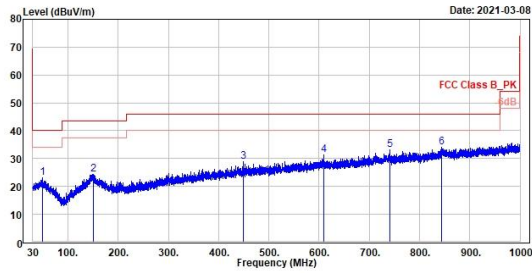
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Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	0.52	48.65	2.25	46.40	73.23	-24.58	100	347 QP	Close
2	6.78	41.57	3.19	38.38	69.50	-27.93	100	221 QP	Close
3	12.73	40.84	3.44	37.40	69.50	-28.66	100	72 QP	Close
4	18.21	39.07	2.28	36.79	69.50	-30.43	100	170 QP	Close
5	24.70	52.16	17.88	34.28	69.50	-17.34	100	358 QP	Close
6	29.51	44.31	5.73	38.58	69.50	-25.19	100	162 QP	Close

Spurious Emissions, Tx Mode, 30MHz ~ 1GHz
SRD 2.4 GHz
Low Channel (Horizontal)
Low Channel (Vertical)

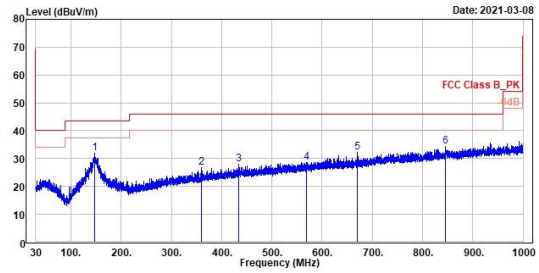

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Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	49.58	22.98	29.06	-6.08	46.00	-17.02	200	0 QP	horizontal
2	159.38	24.45	30.43	-5.98	43.50	-19.05	100	192 QP	horizontal
3	448.46	28.82	30.91	-2.09	46.00	-17.18	100	298 QP	horizontal
4	609.09	31.24	30.85	0.39	46.00	-14.76	200	249 QP	horizontal
5	740.72	33.03	30.64	2.39	46.00	-12.97	300	15 QP	horizontal
6	844.12	33.99	30.04	3.95	46.00	-12.01	200	32 QP	horizontal



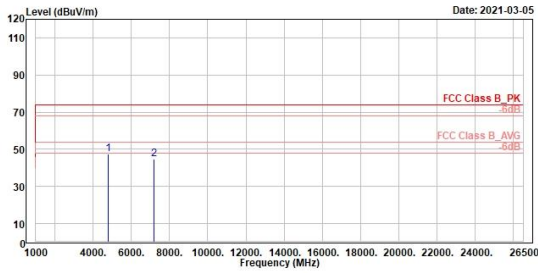
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Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	147.37	31.88	37.83	-5.95	43.50	-11.62	100	360 QP	vertical
2	359.09	26.62	30.37	-3.75	46.00	-19.38	194	360 QP	vertical
3	433.71	28.13	30.46	-2.33	46.00	-17.87	300	203 QP	vertical
4	569.32	28.74	29.21	-0.47	46.00	-17.26	136	360 QP	vertical
5	678.39	32.13	31.03	1.10	46.00	-13.87	100	280 QP	vertical
6	845.48	34.23	30.26	3.97	46.00	-11.77	300	327 QP	vertical

Spurious Emissions, Tx Mode, 1GHz ~ 26.5GHz
SRD 2.4 GHz
Low Channel (Horizontal)
Low Channel (Vertical)

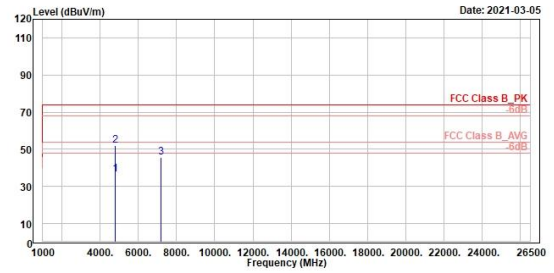

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Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	4894.00	47.27	57.07	-9.80	74.00	-26.73	300	37 Peak	Horizontal	
2	7286.00	44.52	51.31	-6.79	74.00	-29.48	100	69 Peak	Horizontal	



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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	4894.00	36.30	46.10	-9.80	54.00	-17.70	282	195 Average	Vertical	CF
2	4894.00	51.96	61.76	-9.80	74.00	-22.04	282	195 Peak	Vertical	
3	7286.00	45.81	52.60	-6.79	74.00	-28.19	400	127 Peak	Vertical	

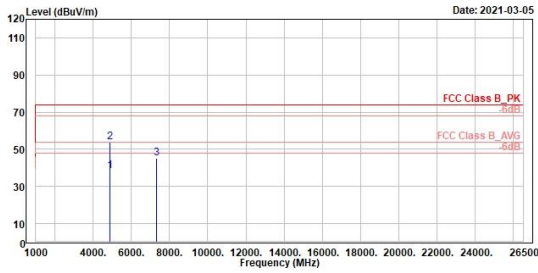
SRD 2.4 GHz

Middle Channel (Horizontal)

Middle Channel (Vertical)



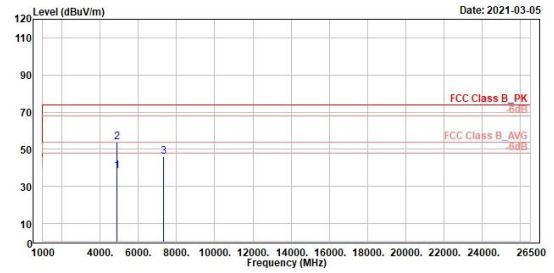
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1	2	3
Level	Level	Level
Factor	Factor	Factor
Line	Line	Line
Limit	Limit	Limit
cm	cm	cm
deg	deg	deg
4882.00	38.28	47.97
4882.00	53.93	63.62
7323.00	45.08	52.12



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1	2	3
Level	Level	Level
Factor	Factor	Factor
Line	Line	Line
Limit	Limit	Limit
cm	cm	cm
deg	deg	deg
4882.00	38.39	48.08
4882.00	54.05	63.74
7323.00	45.96	53.00

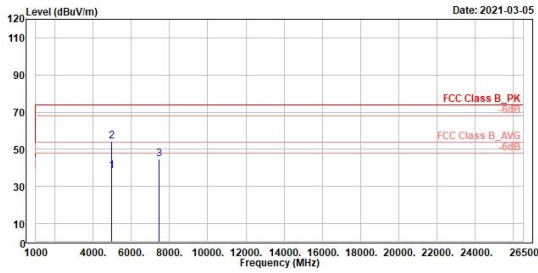
SRD 2.4 GHz

High Channel (Horizontal)

High Channel (Vertical)



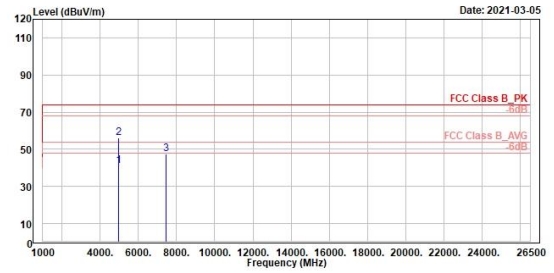
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1	2	3							
Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
38.51	48.00	-9.49	54.00	-15.49	192	120	Average	Horizontal	CF
54.17	63.66	-9.49	74.00	-19.83	192	120	Peak	Horizontal	
44.52	51.75	-7.23	74.00	-29.48	300	76	Peak	Horizontal	



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1	2	3							
Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
41.25	50.74	-9.49	54.00	-12.75	279	193	Average	Vertical	CF
56.24	65.73	-9.49	74.00	-17.76	300	205	Peak	Vertical	
47.59	54.82	-7.23	74.00	-26.41	300	110	Peak	Vertical	

Mains Conducted Emission, 150kHz ~ 30MHz

Worst Band

(Line)

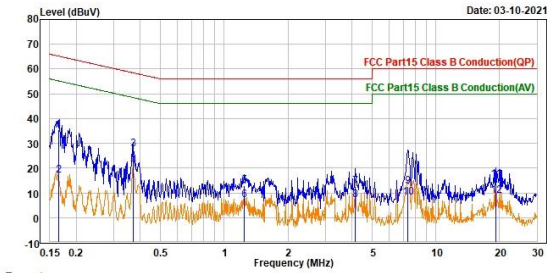
(Neutral)



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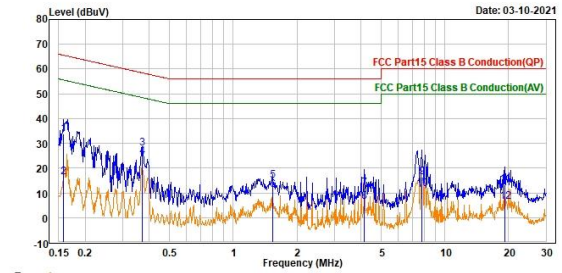


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Trace: 1

	Read Freq	Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase	Note
	MHz	dBuV	dB	dBuV	dBuV	dB			
1	0.165	35.38	0.05	35.43	65.21	-29.78	QP	line1	
2	0.165	16.85	0.05	16.90	55.21	-38.31	Average	line1	
3	0.372	27.64	0.06	27.70	58.47	-30.77	QP	line1	
4	0.372	20.83	0.06	20.89	48.47	-27.58	Average	line1	
5	1.248	12.95	0.09	13.04	56.00	-42.96	QP	line1	
6	1.248	7.05	0.09	7.14	46.00	-38.86	Average	line1	
7	4.168	12.53	0.15	12.68	56.00	-43.32	QP	line1	
8	4.168	6.81	0.15	6.96	46.00	-39.04	Average	line1	
9	7.357	12.33	0.24	12.57	60.00	-47.43	QP	line1	
10	7.357	7.95	0.24	8.19	50.00	-41.81	Average	line1	
11	19.156	14.95	0.47	15.42	60.00	-44.58	QP	line1	
12	19.156	8.50	0.47	8.97	50.00	-41.03	Average	line1	



Trace: 1

	Read Freq	Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase	Note
	MHz	dBuV	dB	dBuV	dBuV	dB			
1	0.158	33.91	0.05	33.96	65.54	-31.58	QP	neutral	
2	0.158	16.17	0.05	16.22	55.54	-39.32	Average	neutral	
3	0.372	27.99	0.05	28.04	58.47	-30.43	QP	neutral	
4	0.372	24.39	0.05	24.44	48.47	-24.03	Average	neutral	
5	1.530	14.84	0.10	14.94	56.00	-41.06	QP	neutral	
6	1.530	10.99	0.10	11.09	46.00	-34.91	Average	neutral	
7	4.168	11.77	0.15	11.92	56.00	-44.08	QP	neutral	
8	4.168	6.19	0.15	6.34	46.00	-39.66	Average	neutral	
9	7.771	15.96	0.25	16.21	60.00	-43.79	QP	neutral	
10	7.771	11.31	0.25	11.56	50.00	-38.44	Average	neutral	
11	19.156	12.62	0.49	13.11	60.00	-46.89	QP	neutral	
12	19.156	6.03	0.49	6.52	50.00	-43.48	Average	neutral	