

Prüfbericht - Nr.: <i>Test Report No.:</i>	CN2175XY 001	Auftrags-Nr.: <i>Order No.:</i>	180209028	Seite 1 von 20 <i>Page 1 of 20</i>
Kunden-Referenz-Nr.: <i>Client Reference No.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2021.06.03	
Auftraggeber: <i>Client:</i>	Hubbell Incorporated (Delaware) Wiring Device-Kellems 40 Waterview Dr, PO Box 1000 Shelton CT 06484 USA			
Prüfgegenstand: <i>Test item:</i>	Jumpcharge mobile battery			
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	JCBATTERY-M			
Auftrags-Inhalt: <i>Order content:</i>	TÜV Rheinland – FCC Service			
Prüfgrundlage: <i>Test specification:</i>	FCC Part 15: Subpart B:2020 FCC Part 15: Subpart C:2020			
Wareneingangsdatum: <i>Date of receipt:</i>	2021.06.03	<i>Refer to attachment</i>		
Prüfmuster-Nr.: <i>Test sample No.:</i>	A003063371-001			
Prüfzeitraum: <i>Testing period:</i>	2021.06.10-2021.08.15			
Ort der Prüfung: <i>Place of testing:</i>	Refer to section 1.1.			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland / CCIC (Ningbo) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von / tested by:		kontrolliert von / reviewed by:		
2021.09.13 Season Yang/PE <i>Season Yang</i>		2021.09.13 Feng Liang/TC <i>Feng Liang</i>		
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>
Sonstiges/ Other: FCC ID: GX7JCBATTERY-M				
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 2 = gut 3= befriedigend 4= ausreichend 5 = mangelhaft P(ass) =entspricht o.g. Prüfgrundlage(n) F(ail)= entspricht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T =nicht getestet Legend: 1= very good 2 = good 3= satisfactory 4= sufficient 5 = poor P(ass) = passed a.m. test specification(s) F(ail)= failed a.m. test specification(s) N/A = not applicable N/T = not tested				
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 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 safety mark on this or similar products.</i>				

V04

Test Summary

4.1.1 ANTENNA REQUIREMENT

Result:

Pass

4.1.2 20DB BANDWIDTH MEASUREMENT

Result:

Pass

4.1.3 CONDUCTED EMISSION (AC POWER-LINE)

Result:

Pass

4.1.4 RADIATED EMISSION

Result:

Pass

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1 Test Sites

1.1 Test Facilities

Laboratory: TÜV Rheinland /CCIC(Ningbo) Co., Ltd.

**1st Floor, Building 11, Scholar Innovation Park, No.1188 Zhongguan Road,
Zhenhai District, Ningbo 315200 P.R. China.**

The used test equipment is in accordance with CISPR 16-1 series standards for measurement of radio interference.

1.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

No.	Equipment	Model	Inventory no.	Last cal. date	Cal. due date
1.	EMI test receiver	ESR7	101929	2020.11.25	2021.11.11
2.	Spectrum analyzer	FSV40	101412	2020.11.25	2021.11.11
3.	Bilog Antenna	CBL6112D	49033	2021.04.12	2024.03.15
4.	EMI receiver	ESR3	102331	2020.11.25	2021.11.11
5.	LISN	ENV216	102250	2020.11.25	2021.11.11

1.3 Measurement Uncertainty

Test Item	Expanded Measurement Uncertainty (k=2)
Conducted Emission (9-150kHz)	3.70dB
Conducted Emission (150k-30MHz)	3.30dB
Radiated Emission (30-1000MHz)	4.39dB
Radiated Emission (1-18GHz)	4.67dB

2 General Product Information

2.1 Product Function and Intended Use

The EUT(equipment under test) is a Jumpcharge mobile battery with Qi charging function operated at 110KHz-300KHz. For the further information, refer to the user's manual.

Model list:

Model name	Function
JCBATTERY-M	Qi charging at 0.115-0.205MHz

2.2 Ratings and System Details

Rated voltage	: DC 3.8V
Protection Class	: III
FCC ID	: GX7JCBATTERY-M

Technical Specification of EUT

Technical Specification	
Operating Frequency band	0.115-0.205MHz
Extreme Temperature Range	0°C ~ 40°C
Modulation	ASK
Antenna Type	Loop Antenna
USB output	DC 5V, 1.0A
Wireless output	DC 5V, 1.0A

2.3 Independent Operation Modes

The basic operation modes are:

Mode A: Qi charging for external device from Battery

1. 5W output power

Mode B: Charging for Battery from adaptor

1. DC 5V, 2A, input power

Mode C: USB output from Battery

1. DC 5V, 1A, output power

2.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit diagram for further information.

2.5 Submitted Documents

Circuit diagram, PCB layout, Labels, user's manual, etc.

3 Test Set-up and Operation Modes

3.1 Principle of Configuration Selection

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

3.2 Test Operation and Test Software

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power was selected according to the instruction given by the manufacturer. The setting of the RF output power expected by the customer shall be fixed on the firmware of the final end product.

All testing were performed according to the procedures in ANSI C63.10: 2013.

Test Software EMC32 V10.30 was used in the radiated emission test.

3.3 Special Accessories and Auxiliary Equipment

Description	Manufacturer	Model No.
Adaptor	Meizu	IP0520
Phone	Huawei	Mate30 Pro

3.4 Countermeasures to achieve EMC Compliance

The tested sample contained noise suppression components as specified in the circuit diagram. No special measure is employed to achieve the requirement.

3.5 Test set-up

Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

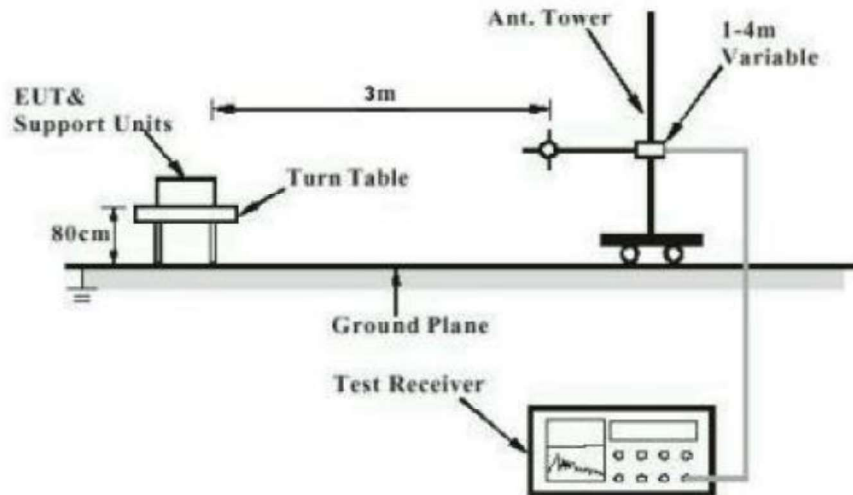
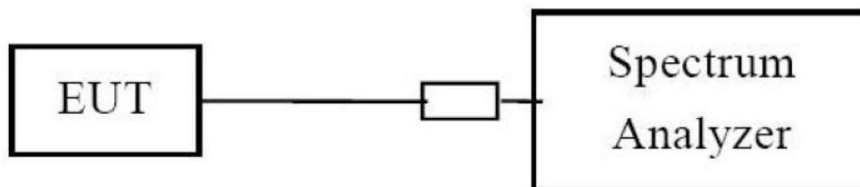


Diagram of Measurement Configuration for Conducted Transmitter Measurement



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4 Test Results

4.1 Transmitter Requirement & Test Suites

4.1.1 Antenna Requirement

Result:

Pass

Test Specification

Test standard : FCC Part 15.203

The EUT has an internal antennas, which permanently attached and no consideration of replacement. Therefore, the EUT is considered sufficient to comply with the provision.

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4.1.2 20dB Bandwidth Measurement

Result:

Pass

Test Specification

Test standard : FCC Part 15.215
Basic standard : ANSI C63.10: 2013, section 6.9.2
Limits : No limit
Kind of test site : Shielded Room

Test Setup

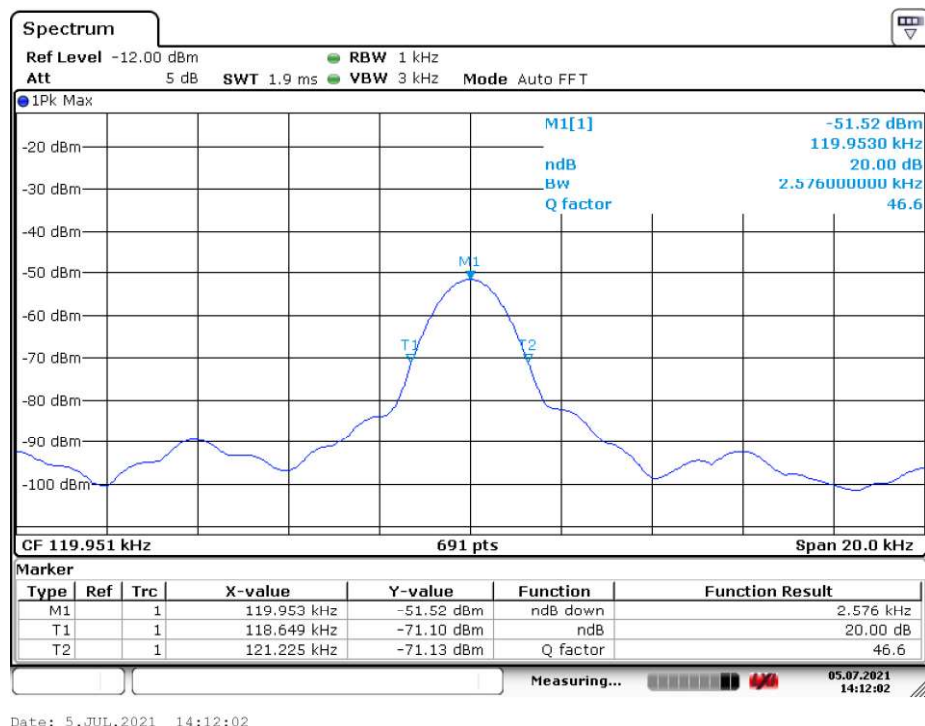
Date of testing : 2021.07.05
working voltage : DC 3.8V
Operational mode : A.1
Temperature : 23°C
Relative humidity : 56%
Atmospheric pressure : 101.2 kPa

Table 2: Test result of 20dB Bandwidth

Frequency	Bandwidth (KHz)	Limit (kHz)	Result
119.951KHz	2.576	N/A	Pass

Figure 1: 20dB Bandwidth Measurement

2.576KHz



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4.1.3 Conducted Emission (AC power-line)

Result:

Pass

Test Specification

Test standard : FCC Part 15.107
FCC Part 15.207
Basic standard : ANSI C63.10: 2013
ANSI C63.4:2014
Port : Mains
Frequency range : 0.15 – 30MHz
Limits : FCC part 15.207(a)
FCC part 15.107(a)
Kind of test site : 3m Semi-anechoic Chamber

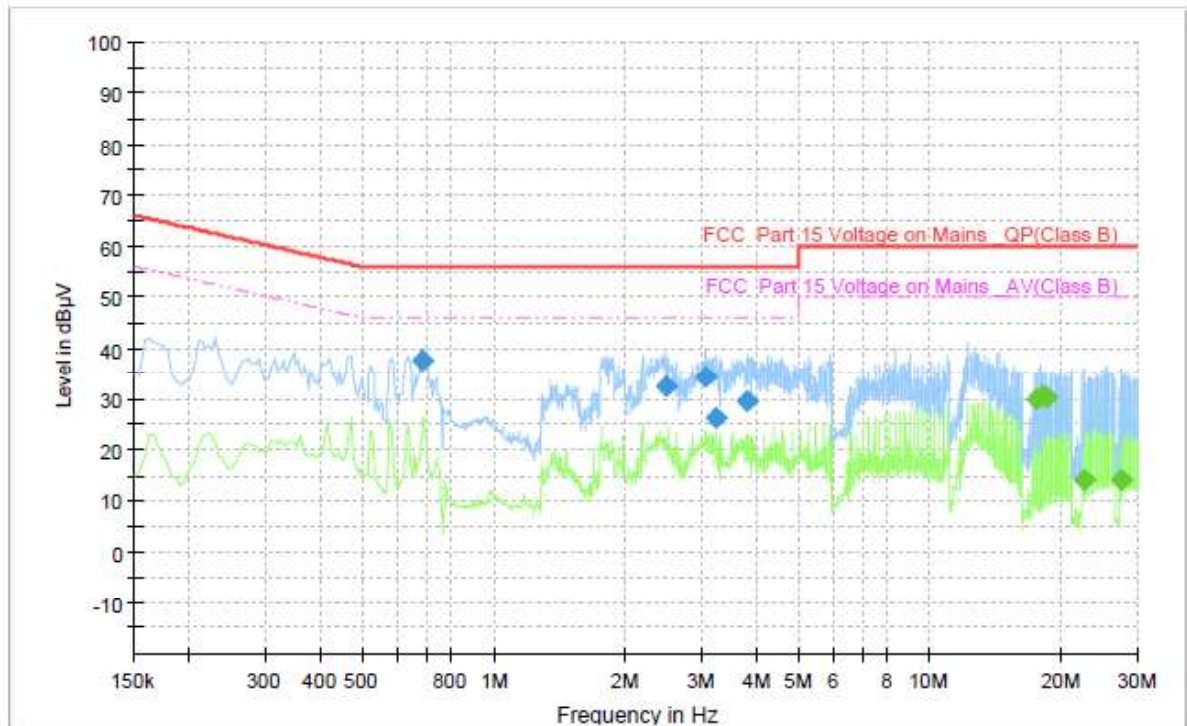
Test Setup

Date of testing : 2021.07.05
Input voltage from adaptor : DC 5V
Working voltage from battery : DC 3.8V
Voltage for adaptor : AC 120V, 60Hz
Operational mode : A.1+B.1+C.1, A.1+B.1
Temperature : 22°C
Relative humidity : 53%
Atmospheric pressure : 102.1 kPa

The measurement result is calculated based on the following formula by the test software:
Emission Level = Reading level + Correction (LISN factor + cable loss).

Figure 2: Spectral Diagrams, Conducted Emission, 150kHz - 30MHz, L, mode A.1+B.1+C.1

Full Spectrum

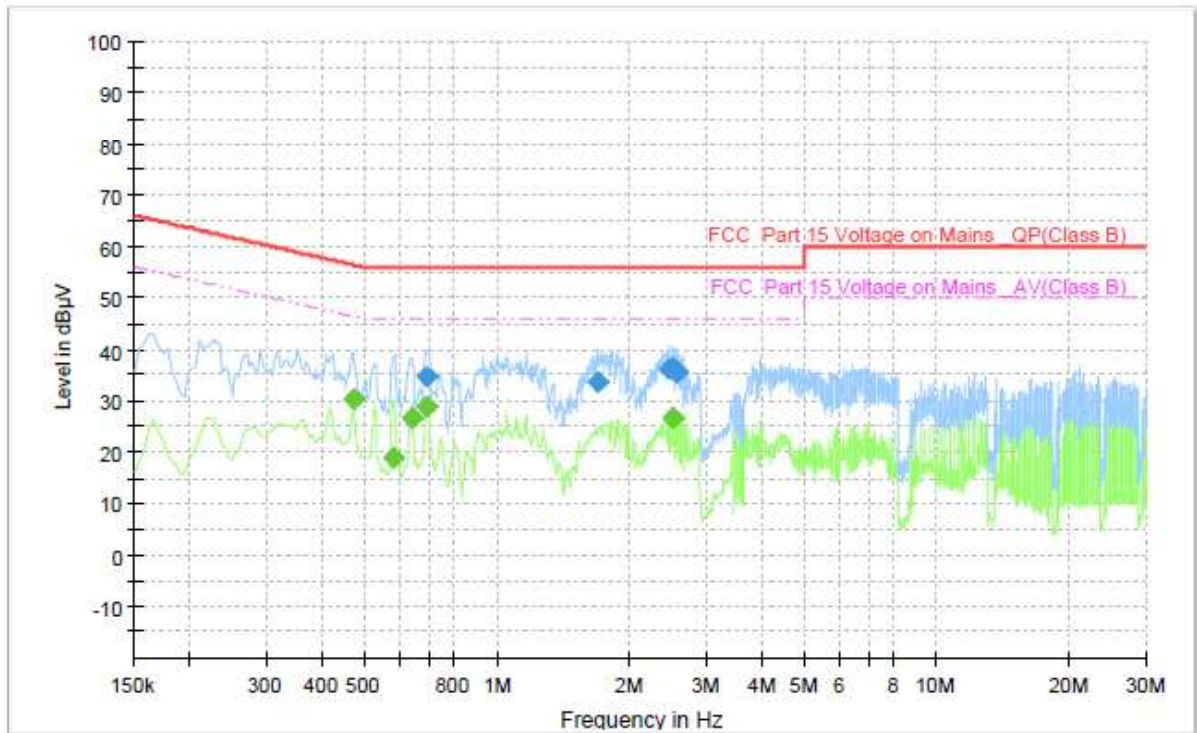


Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.686000	37.48	---	56.00	18.52	1000.0	9.000	L1	ON	9.7
2.490000	32.57	---	56.00	23.43	1000.0	9.000	L1	ON	9.7
3.070000	34.25	---	56.00	21.75	1000.0	9.000	L1	ON	9.8
3.226000	26.31	---	56.00	29.69	1000.0	9.000	L1	ON	9.8
3.822000	29.45	---	56.00	26.55	1000.0	9.000	L1	ON	9.8
17.546000	---	29.91	50.00	20.09	1000.0	9.000	L1	ON	10.3
18.202000	---	30.55	50.00	19.45	1000.0	9.000	L1	ON	10.3
18.642000	---	30.17	50.00	19.84	1000.0	9.000	L1	ON	10.3
22.462000	---	14.12	50.00	35.88	1000.0	9.000	L1	ON	10.4
27.438000	---	14.09	50.00	35.91	1000.0	9.000	L1	ON	10.3

Figure 3: Spectral Diagrams, Conducted Emission, 150kHz - 30MHz, N, mode A.1+B.1+C.1

Full Spectrum

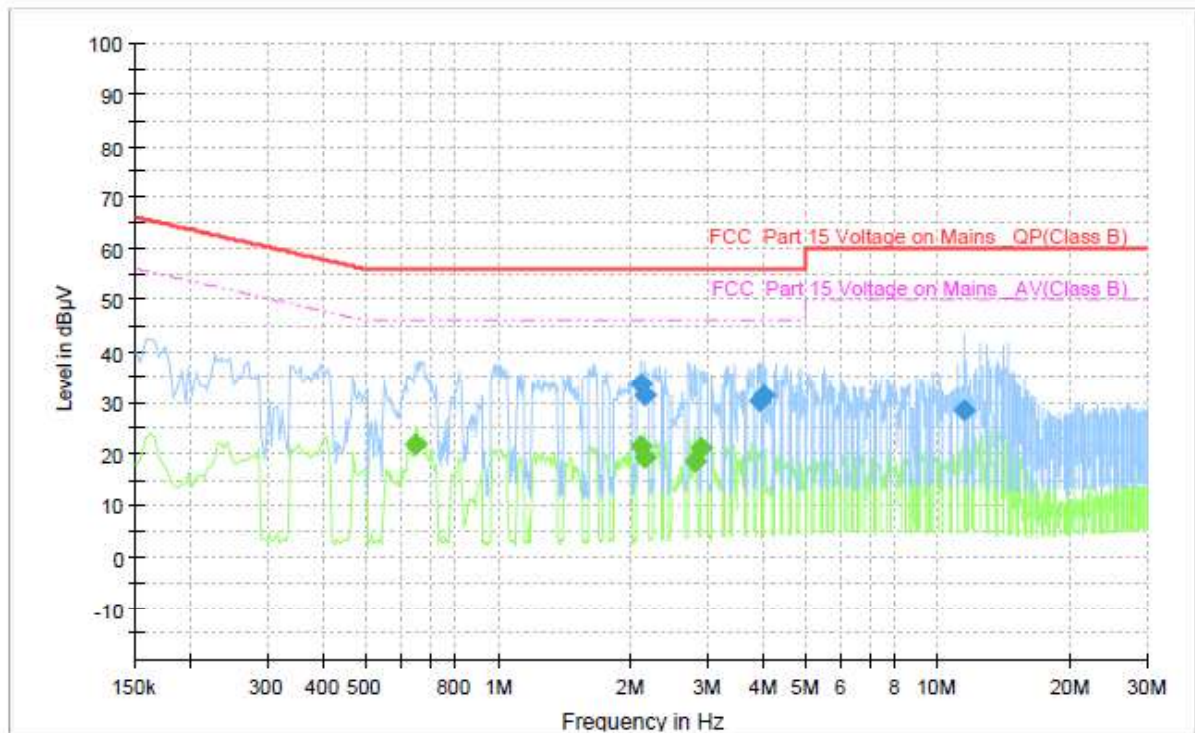


Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.470000	---	30.33	46.51	16.18	1000.0	9.000	N	ON	9.6
0.582000	---	18.99	46.00	27.01	1000.0	9.000	N	ON	9.6
0.638000	---	26.61	46.00	19.39	1000.0	9.000	N	ON	9.6
0.694000	---	28.77	46.00	17.23	1000.0	9.000	N	ON	9.7
0.694000	34.81	---	56.00	21.19	1000.0	9.000	N	ON	9.7
1.690000	33.66	---	56.00	22.34	1000.0	9.000	N	ON	9.7
2.458000	35.97	---	56.00	20.03	1000.0	9.000	N	ON	9.8
2.518000	36.43	---	56.00	19.57	1000.0	9.000	N	ON	9.8
2.518000	---	26.51	46.00	19.49	1000.0	9.000	N	ON	9.8
2.574000	35.43	---	56.00	20.57	1000.0	9.000	N	ON	9.8

Figure 4: Spectral Diagrams, Conducted Emission, 150kHz - 30MHz, L, mode A.1+B.1

Full Spectrum

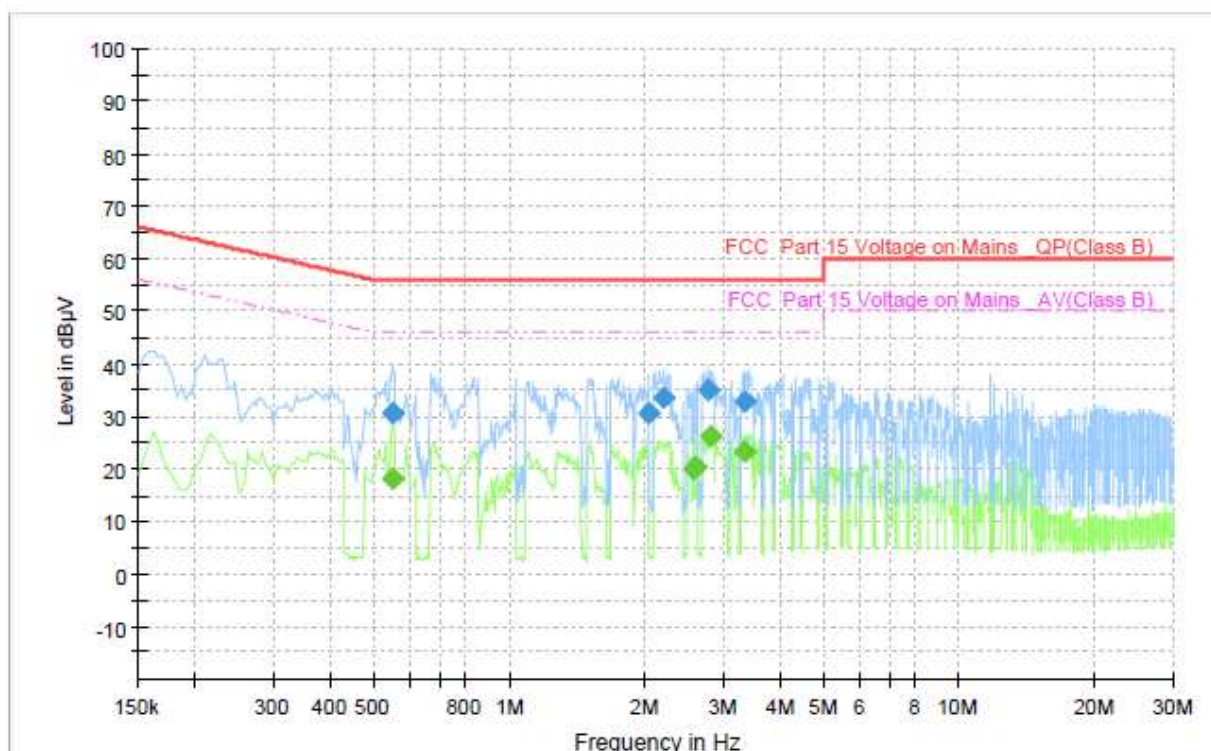


Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.650000	---	21.99	46.00	24.01	1000.0	9.000	L1	ON	9.6
2.110000	33.49	---	56.00	22.51	1000.0	9.000	L1	ON	9.7
2.114000	---	21.46	46.00	24.54	1000.0	9.000	L1	ON	9.7
2.162000	---	19.33	46.00	26.67	1000.0	9.000	L1	ON	9.7
2.162000	31.40	---	56.00	24.60	1000.0	9.000	L1	ON	9.7
2.802000	---	18.59	46.00	27.41	1000.0	9.000	L1	ON	9.8
2.898000	---	21.07	46.00	24.93	1000.0	9.000	L1	ON	9.8
3.946000	30.10	---	56.00	25.90	1000.0	9.000	L1	ON	9.8
4.034000	31.30	---	56.00	24.70	1000.0	9.000	L1	ON	9.8
11.498000	28.31	---	60.00	31.69	1000.0	9.000	L1	ON	10.0

Figure 5: Spectral Diagrams, Conducted Emission, 150kHz - 30MHz, N, mode A.1+B.1

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.550000	---	18.10	46.00	27.90	1000.0	9.000	N	ON	9.6
0.550000	30.68	---	56.00	25.32	1000.0	9.000	N	ON	9.6
2.038000	30.77	---	56.00	25.23	1000.0	9.000	N	ON	9.7
2.210000	33.65	---	56.00	22.35	1000.0	9.000	N	ON	9.7
2.570000	---	20.13	46.00	25.87	1000.0	9.000	N	ON	9.8
2.610000	---	20.36	46.00	25.64	1000.0	9.000	N	ON	9.8
2.774000	34.95	---	56.00	21.05	1000.0	9.000	N	ON	9.8
2.810000	---	26.36	46.00	19.64	1000.0	9.000	N	ON	9.8
3.334000	---	23.41	46.00	22.59	1000.0	9.000	N	ON	9.8
3.338000	32.68	---	56.00	23.32	1000.0	9.000	N	ON	9.8

4.1.4 Radiated Emission

Result:

Pass

Test Specification

Test standard : FCC Part 15.109
FCC Part 15.209
Basic standard : ANSI C63.10: 2013
ANSI C63.4:2014
Port : Enclosure
Frequency range : 30MHz-1000MHz
Limits : FCC part15.109(a)
FCC part15.209(a)
Kind of test site : 3m Semi-anechoic Chamber

Test Setup

Date of testing : 2021.06.29
Input voltage from adaptor : DC 5V
Working voltage from battery : DC 3.8V
Voltage for adaptor : AC 120V, 60Hz
Operational mode : A.1+B.1+C.1, A.1
Temperature : 24°C
Relative humidity : 59%
Atmospheric pressure : 101 kPa

Remark:

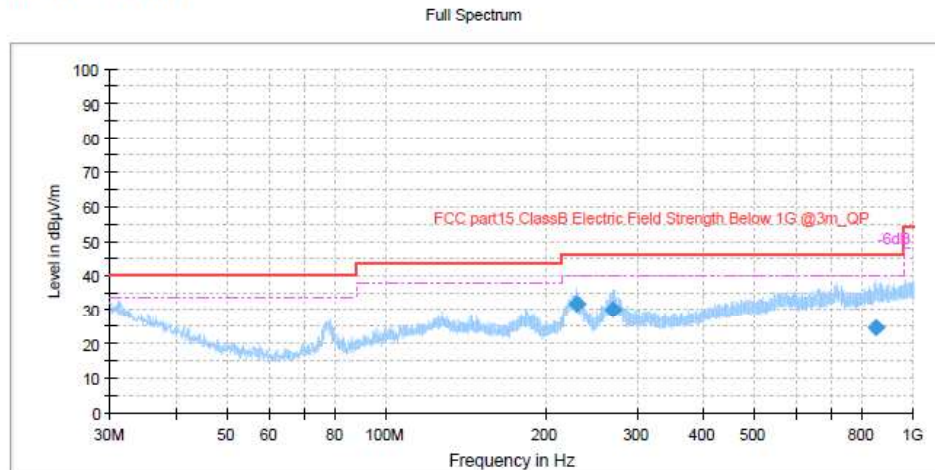
Testing was carried out within frequency range 9kHz to the tenth harmonics. Only the worst case emissions configuration of the each mode were reported.

The measurement result is calculated based on the following formula by the test software:
Emission Level = Reading level + Correction (Antenna factor + Cable loss – Preamplifier)

As for unwanted emissions in 9K-30MHz, please refer to report CN2175XY 002

Figure 6: Spectral Diagrams, Radiated Spurious Emission, 30MHz-1000MHz, Horizontal, mode A.1+B.1+C.1

Full Spectrum

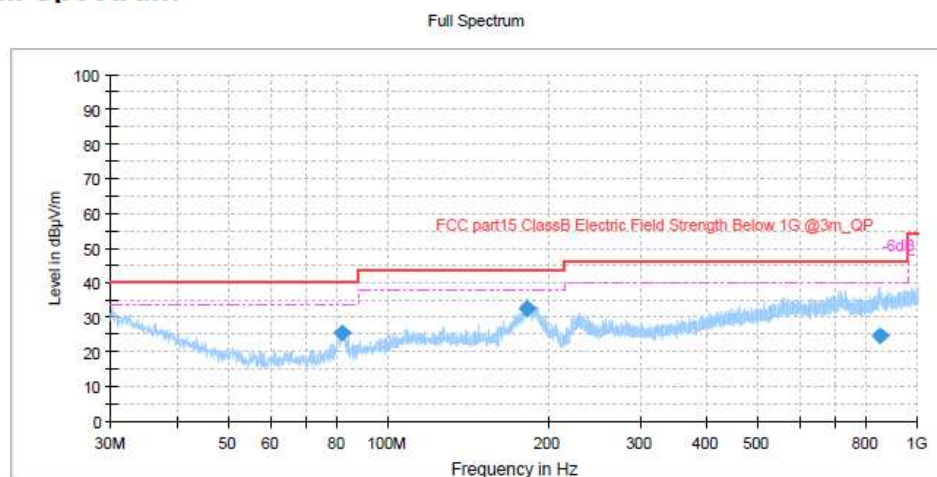


Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
229.473333	31.94	46.00	14.06	1000.0	120.000	117.0	H	339.0	17.7
269.218889	30.05	46.00	15.95	1000.0	120.000	158.0	H	176.0	20.6
845.332778	24.66	46.00	21.34	1000.0	120.000	133.0	H	300.0	29.3

Figure 7: Spectral Diagrams, Radiated Spurious Emission, 30MHz-1000MHz, Vertical, mode A.1+B.1+C.1

Full Spectrum

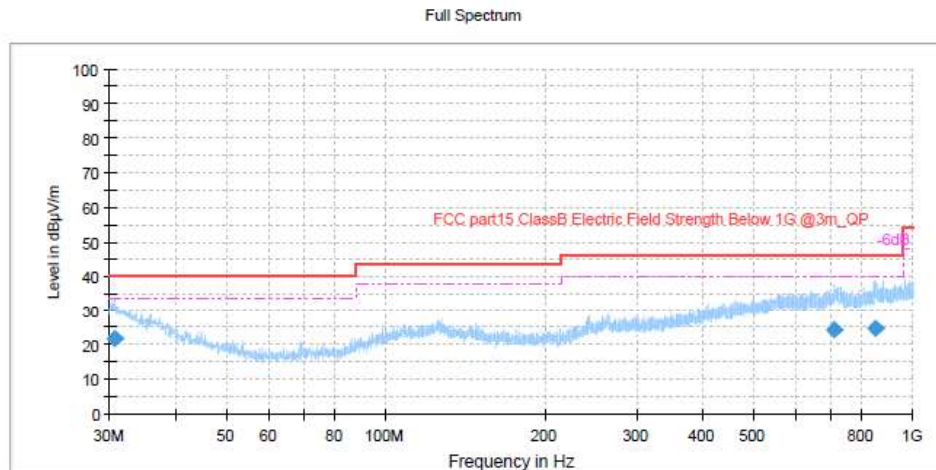


Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
81.796667	25.42	40.00	14.58	1000.0	120.000	100.0	V	68.0	14.2
182.753333	32.55	43.50	10.95	1000.0	120.000	100.0	V	4.0	16.4
845.385000	24.54	46.00	21.46	1000.0	120.000	261.0	V	249.0	29.3

Figure 8: Spectral Diagrams, Radiated Spurious Emission, 30MHz-1000MHz, Horizontal, mode A.1

Full Spectrum

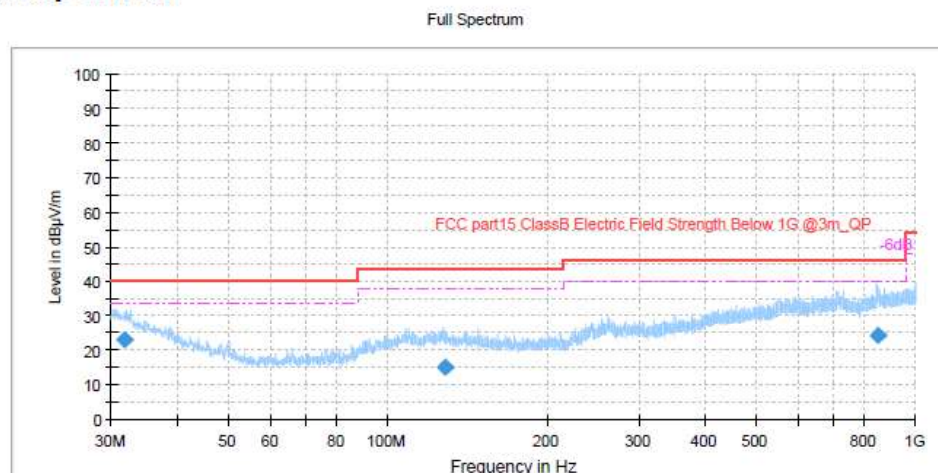


Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
30.680556	21.62	40.00	18.38	1000.0	120.000	100.0	H	280.0	25.5
709.569444	24.24	46.00	21.76	1000.0	120.000	133.0	H	138.0	27.8
845.654444	24.65	46.00	21.35	1000.0	120.000	174.0	H	71.0	29.3

Figure 9: Spectral Diagrams, Radiated Spurious Emission, 30MHz-1000MHz, Vertical, mode A.1

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
31.720000	22.87	40.00	17.13	1000.0	120.000	145.0	V	107.0	24.7
128.490556	15.13	43.50	28.37	1000.0	120.000	126.0	V	351.0	19.0
845.073889	24.33	46.00	21.67	1000.0	120.000	350.0	V	9.0	29.4

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