FCC / IC RF REPORT

Certification

Applicant Name:
Identiv, Inc.
Address:
2201 Walnut Avenue, Suite #100,
Fremont, CA 94538, USA

Date of Issue:
March 04, 2020
Test Site/Location:
EMCE Engineering
1726 Ringwood Avenue San Jose, California USA
Report No.: EMCE-R-2001-012-01

FCC ID:	**MBPUT3720F-01HF**
IC:	**7485A-3720F01HF**
APPLICANT:	**Identiv, Inc.**

Model:	uTrust 3720 F HF
EUT Type:	RFID Interface Reader
Frequency Range:	13.56 MHz
Modulation Type	ASK
FCC Classification:	Low Power Communication Device Transmitter
FCC Rule Part(s):	Part 15.225
IC Rule Part(s):	RSS-210 Issue 10 , RSS-Gen Issue 5

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

Steve In
Test Engineer
Certification Division

Sunwoo Kim
Technical Manager
Certification Division

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Report History

TEST REPORT NO.	DATE	DESCRIPTION
EMCE-R-2001-012	January 31, 2020	First Issue
EMCE-R-2001-012-01	March 04, 2020	-Revision due to Powerline coducted emissions test result added

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1. EUT DESCRIPTION

Model	uTrust 3720 F HF
EUT Type	RFID interface reader
Power Supply	DC 5V
Frequency Range	13.56 MHz
Modulation Type	ASK
Number of Channels	1 Channels
Antenna Specification	Antenna Type: loop type
Firmware Version	1.00.32
Hardware Version	0.1
Date(s) of Tests	December 12, 2019 ~ March 04, 2020
Derivative Model	uTrust 3721 F HF

* Firmware and Hardware Version are as received by the client.

* The base model is “uTrust 3720 F”. The derivative device “uTrust 3721 F” has the same hardware with enhanced firmware to include keyboard emulation feature.

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2. METHODOLOGY

The measurement procedure described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices (ANSI C63.10-2013) is used in the measurement of the test device.

EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.225 under the FCC Rules Part 15 Subpart C and RSS-210 Issue 10 , RSS-Gen Issue 5.

GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2 of ANSI C63.10. (Version :2013) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane below 1GHz. Above 1GHz with 1.5m using absorbers between the EUT and receive antenna. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3.75 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. Also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 8 of ANSI C63.10. (Version: 2013)

DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

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3. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment's, which is traceable to recognized national standards.
Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2017).

4. FACILITIES AND ACCREDITATIONS

FACILITIES

The SAC (Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at 1726 Ringwood Avenue, San Jose, California 95131, USA.
The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2014) and CISPR Publication 22.

EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.
Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.
All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

* The antennas of this E.U.T are permanently attached.
* The E.U.T Complies with the requirement of §15.203

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6. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013.

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

The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (±dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	2.55
Radiated Disturbance (9 kHz ~ 30 MHz)	3.20
Radiated Disturbance (30 MHz ~ 1 GHz)	4.73

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7. DESCRIPTION OF TESTS

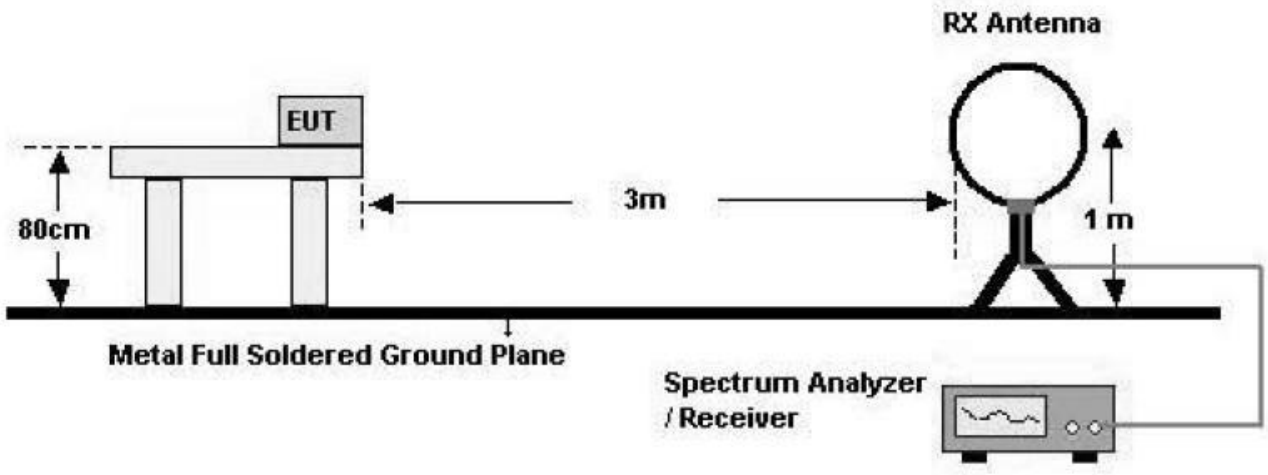
7.1. 20 dB Bandwidth

Limit

Test Requirements §15.215 (c)

The bandwidth at 20 dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the receive antenna while the EUT is operating in transmission mode at the appropriate frequencies.

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to

1) RBW = 1 kHz
2) VBW ≒ 3 x RBW
3) Detector = Peak
4) Trace mode = max hold
5) Sweep = auto couple
6) Allow the trace to stabilize
7) We tested 20 dB bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer, setting X dB as 20 dB.

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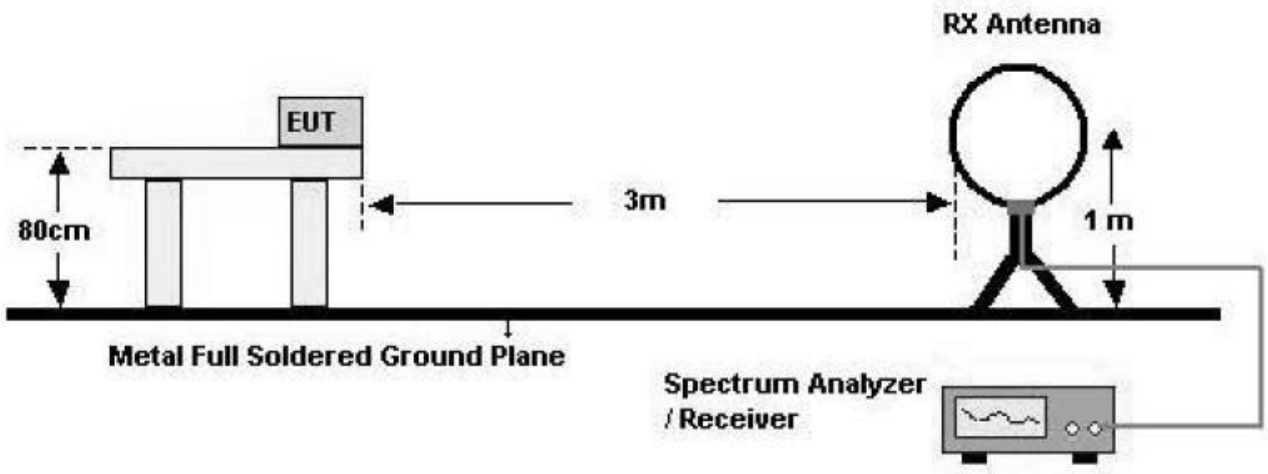
7.2. 99% Bandwidth

Test Requirements RSS-Gen(Issue 5) Section 6.7

The 99 % bandwidth is used to determine the conducted power limits.

▣ TEST CONFIGURATION



▣ TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer.

1) RBW = 1 kHz
2) VBW ≒ 3 x RBW
3) Detector = Peak
4) Trace mode = max hold
5) Sweep = auto couple
6) Allow the trace to stabilize

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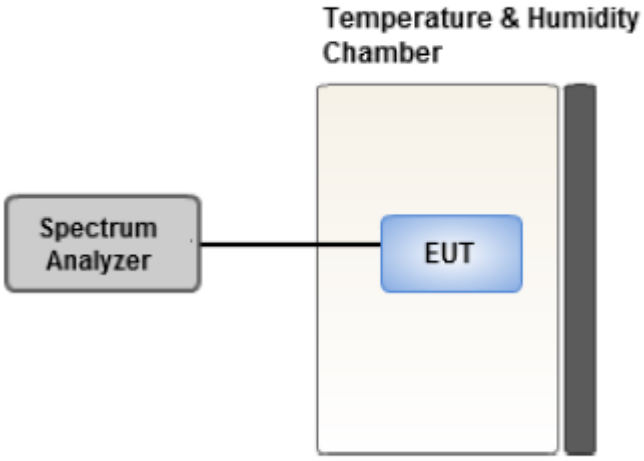
7.3. Frequency Stability

Test Requirements and limit §15.225 (e), RSS 210

The frequency tolerance of the carrier signal shall be maintained within ±0.01% of the operating frequency.

Test Configuration



Test Procedure.

For battery operated equipment, the equipment tests shall be performed using a new battery.

1) Turn the EUT OFF and place it inside the environmental temperature chamber. For devices that have oscillator heaters, energize only the heater circuit.
2) Set the temperature control on the chamber to the highest specified in the regulatory requirements for the type of device and allow the oscillator heater and the chamber temperature to stabilize.
3) While maintaining a constant temperature inside the environmental chamber, turn the EUT ON and record the operating frequency at startup, and at 2 minutes, 5 minutes, and 10 minutes after the EUT is energized. Four measurements in total are made.
4) The freque
5) ncy tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency.

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Note:

1) Temperature:

   The temperature is varied from -20°C to + 50°C using an environmental chamber.

2) Primary Supply Voltage :

   The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment.

   For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battety operating end point which shall be specified by the manufacturer.

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7.4. Radiated Test

Test Requirements and limit §15.225 (a), (b), (C), (d) and §15.209 and RSS-GEN , RSS 210

Limit (Operation within the band 13.110 MHz – 14.010 MHz)

Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
13.553 – 13.567	15,848	30
13.410 ≤ f ≤ 13.553 13.567 ≤ f ≤ 13.710	334	30
13.110 ≤ f ≤ 13.410 13.710 ≤ f ≤ 14.010	106	30

FCC

Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30

IC

Frequency (MHz)	Field Strength (uA/m)	Measurement Distance (m)
0.009 – 0.490	6.37/F(kHz)	300
0.490 – 1.705	63.7/F(kHz)	30
1.705 – 30	0.08	30

FCC & IC

Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

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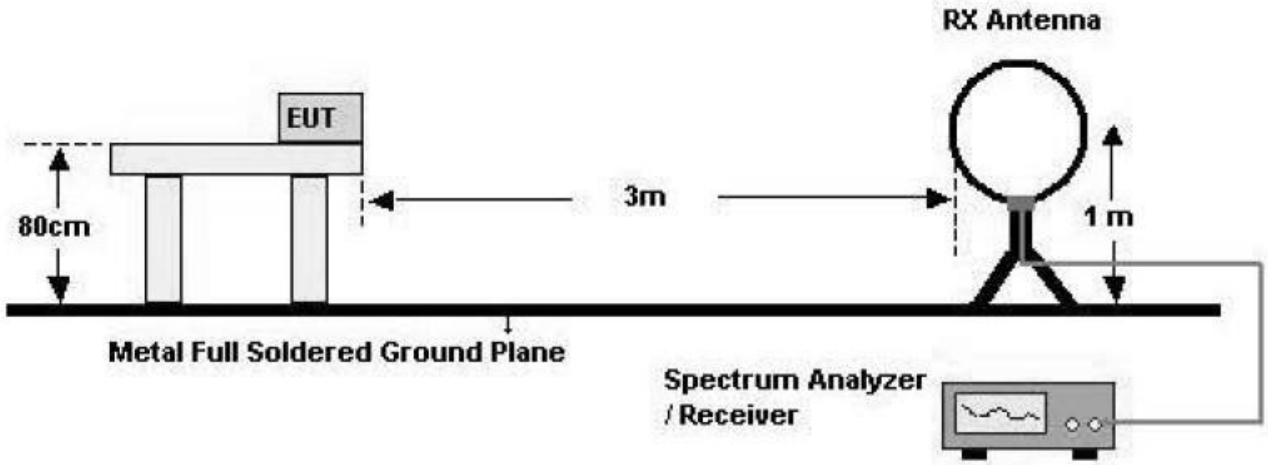
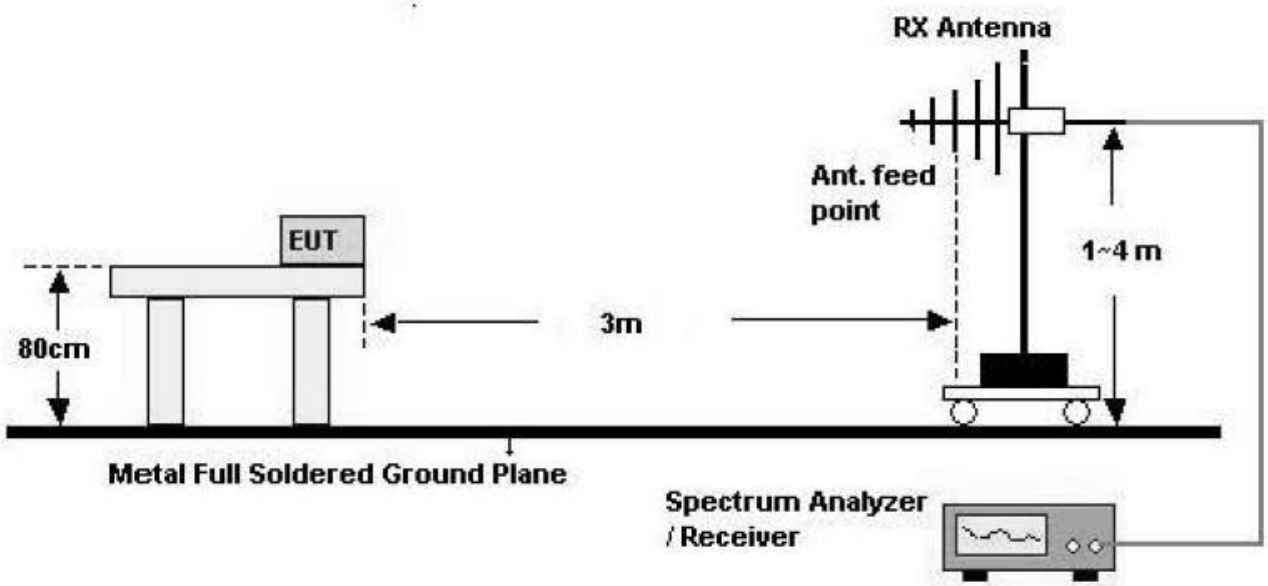
Test Configuration

Below 30 MHz



30 MHz - 1 GHz



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Test Procedure of Radiated spurious emissions (Below 30 MHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The loop antenna was placed at a location 3m from the EUT
3. The EUT is placed on a turntable, which is 0.8m above ground plane.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
6. Distance Correction Factor (0.009 MHz – 0.490 MHz) = 40*log(3 m/300 m) = - 80 dB
   Measurement Distance: 3 m
7. Distance Correction Factor (0.490 MHz – 30 MHz) = 40*log(3 m/30 m) = - 40 dB
   Measurement Distance: 3 m
8. Spectrum Setting
   - Frequency Range = 9 kHz ~ 30 MHz
   - Detector = Quasi-Peak
   - RBW = 9 kHz
   - VBW ≥ 3*RBW
9. Total = Reading Value + Antenna Factor (A.F) + Cable Loss (C.L) + Distance Factor (D.F)

10. There is a comparison data both open-field test site and alternative test site – semi-Anechoic chamber according to 414788 D01. And the results are properly calibrated.

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Test Procedure of Radiated spurious emissions (Below 1GHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The EUT is placed on a turntable, which is 0.8m above ground plane.
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
4. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
5. Spectrum Setting
   (1) Measurement Type (Peak):
      - Measured Frequency Range: 30 MHz – 1 GHz
      - Detector = Peak
      - Trace = Maxhold
      - RBW = 100 kHz
      - VBW ≥ 3*RBW
   (2) Measurement Type(Quasi-peak):
      - Measured Frequency Range: 30 MHz – 1 GHz
      - Detector = Quasi-Peak
      - RBW = 120 kHz
   *In general, (1) is used mainly
6. Total = Reading Value + Antenna Factor (A.F) + Cable Loss (C.L)

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7.5. AC Power line Conducted Emissions

Limit

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN).

Frequency Range (MHz)	Limits (dBµV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

*Decreases with the logarithm of the frequency.

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Configuration

See test photographs attached in Annex A for the actual connections between EUT and support equipment.

Test Procedure

1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors : Quasi Peak and Average Detector.

Sample Calculation

Quasi-peak(Final Result) = Reading Value + Correction Factor

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7.6. Worst case configuration and mode

Radiated test

1. All modes of operation were investigated and the worst case configuration results are reported.
   - Mode: Charging mode with Card , Charging mode without Card
   - Worst case: Charging mode with Card
2. EUT Axis
   - Radiated Spurious Emissions: Y
3. All packet length of operation were investigated and the test results are worst case in highest packet length.

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8. SUMMARY TEST OF RESULTS

Test Description	FCC Part Section(s)	IC Part Section(s)	Test Limit	Test Condition	Test Result
20 dB Bandwidth	§15.215 (c)	-	N/A	Radiated	PASS
Occupied Bandwidth	N/A	RSS-GEN, 6.7	N/A		PASS
Radiated Electric Field Emissions (13.553MHz to 13.567MHz)	§15.225 (a)	RSS-210 B.6	cf. Section 7.4		PASS
Radiated Electric Field Emissions (13.110 ≤ f ≤ 13.410, 13.710 ≤ f ≤ 14.010)	§15.225 (b), (c)	RSS-210 B.6	cf. Section 7.4		PASS
Radiated Spurious Emissions	§15.225(d) 15.209	RSS-210 B.6 RSS-GEN, 8.9	cf. Section 7.4		PASS
Frequency Stability	§15.225 (e)	RSS-210 B.6	cf. Section 7.3		PASS
AC power conducted emissions (150kHz to 30MHz)	§15.207	RSS-GEN, 8.8	cf. Section 7.5	AC Line Conducted	PASS

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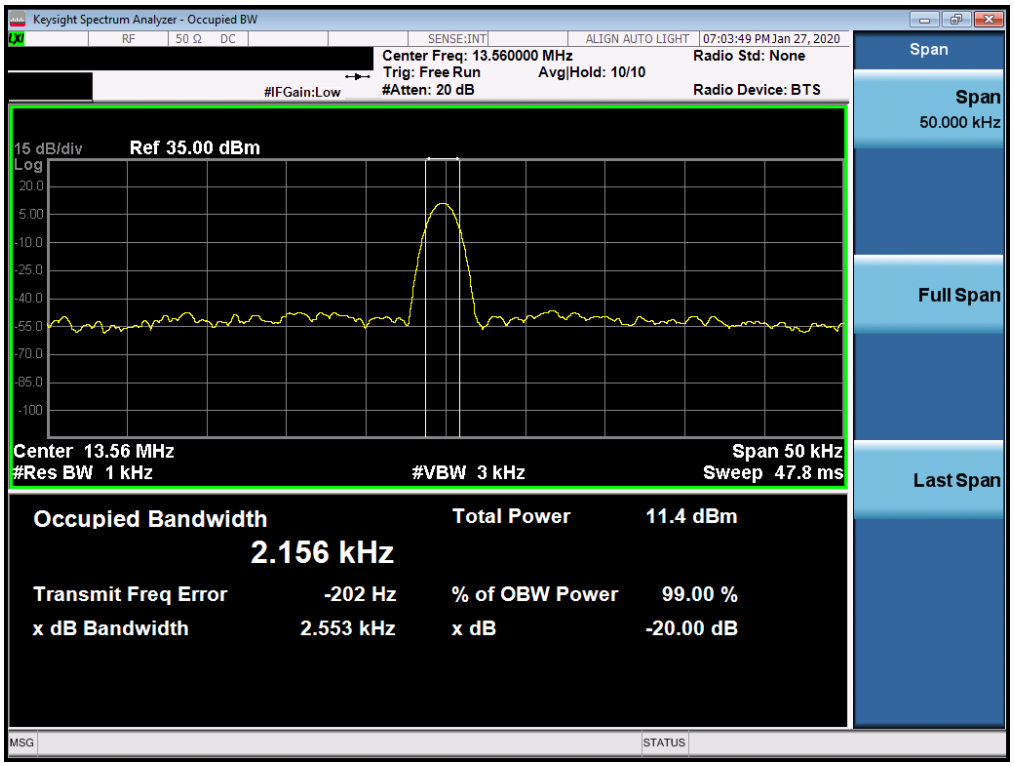
9. TEST RESULT

9.1 20dB & 99% BANDWIDTH MEASUREMENT

Frequency [MHz]	20 dB Bandwidth (kHz) Result	Limit (kHz)
13.56	2.553	N/A

Frequency [MHz]	99% Bandwidth (kHz) Result	Limit (kHz)
13.56	2.156	N/A

▣ Test Plots



Note

Operation within the band 13.110 MHz – 14.010 MHz

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9.2 Frequency Stability

PERATING FREQUENCY	13.56 MHz
REFERENCE VOLTAGE	5.0 VDC
DEVIATION LIMIT	100 PPM = 1356 Hz

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (MHz)	Frequency Dev. (Hz)	Frequency Dev (PPM)
100%	5.00	-20	13.559815	-185	-13.64
100%		-10	13.559822	-178	-13.13
100%		0	13.559831	-169	-12.46
100%		+10	13.559801	-199	-14.68
100%		+20(Ref.)	13.559785	-215	-15.86
100%		+30	13.559785	-215	-15.86
100%		+40	13.559790	-210	-15.49
100%		+50	13.559795	-205	-15.12
High	5.75	+20	13.559762	-205	-17.55
Low	4.25	+20	13.559755	-238	-18.07

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9.3 RADIATED SPURIOUS EMISSIONS

13.553 MHz-13.567 MHz

Frequency [kHz]	ANT. POL [H/V]	Reading [dBuV]	※A.F.+C.L. [dB]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
13.560	H	52.0	21.3	73.3	124.0	50.7	QP
13.560	V	54.5	21.3	75.8	124.0	48.2	QP

13.410 MHz-13.553 MHz and 13.567 MHz-13.710 MHz

Frequency [kHz]	ANT. POL [H/V]	Reading [dBuV]	※A.F.+C.L. [dB]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
13.454	V	36.6	21.3	57.9	90.5	32.6	QP
13.469	H	21.2	21.3	42.5	90.5	48.0	QP
13.666	V	34.7	21.3	56.0	90.5	34.5	QP
13.659	H	17.7	21.3	39.0	90.5	51.5	QP

13.110 MHz – 13.410 MHz and 13.710 MHz-14.010 MHz

Frequency [kHz]	ANT. POL [H/V]	Reading [dBuV]	※A.F.+C.L. [dB]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
13.348	V	37.0	21.3	58.3	80.5	22.2	QP
13.348	H	25.3	21.3	6.6	80.5	33.9	QP
13.772	V	33.3	21.4	54.7	80.5	25.8	QP
13.772	H	21.2	21.4	42.6	80.5	37.9	QP

Notes:

1. The measurement distance is 3 meters.
2. Distance extrapolation factor = 40 log (specific distance / test distance) (dB)
3. Limit line = specific Limits (dBuV) + Distance extrapolation factor
4. Corrected reading: Antenna Factor + Cable loss + Read Level

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Frequency Range : 9 kHz – 30 MHz

Frequency [MHz]	ANT. POL [H/V]	Reading [dBuV]	※A.F.+C.L. [dB]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
12.712	V	25.0	21.3	46.3	69.5	23.2	QP
12.714	H	12.9	21.3	34.2	69.5	35.3	QP

Frequency Range : 30 MHz – 1 GHz

Frequency [MHz]	ANT. POL [H/V]	Reading [dBuV]	※A.F.+C.L. [dB]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
39.161	H	40.5	-7.1	33.4	40	6.6	QP
39.037	V	46.0	-7.0	39.0	40	1.0	QP
67.805	H	41.7	-13.5	28.2	40	11.8	QP
67.805	V	52.4	-13.5	38.9	40	1.1	QP
176.293	V	49.8	-9.2	40.6	43.5	2.9	QP
176.293	H	41.9	-9.2	32.7	43.5	10.8	QP
366.111	V	50.4	-5.4	45.0	46	1.0	QP
366.127	H	37.7	-5.4	32.3	46	13.7	QP
962.739	V	42.1	2.9	45.0	54	9.0	QP
962.755	H	34.5	2.9	37.4	54	16.6	QP

Notes:

1. Corrected reading: Antenna Factor + Cable loss + Read Level

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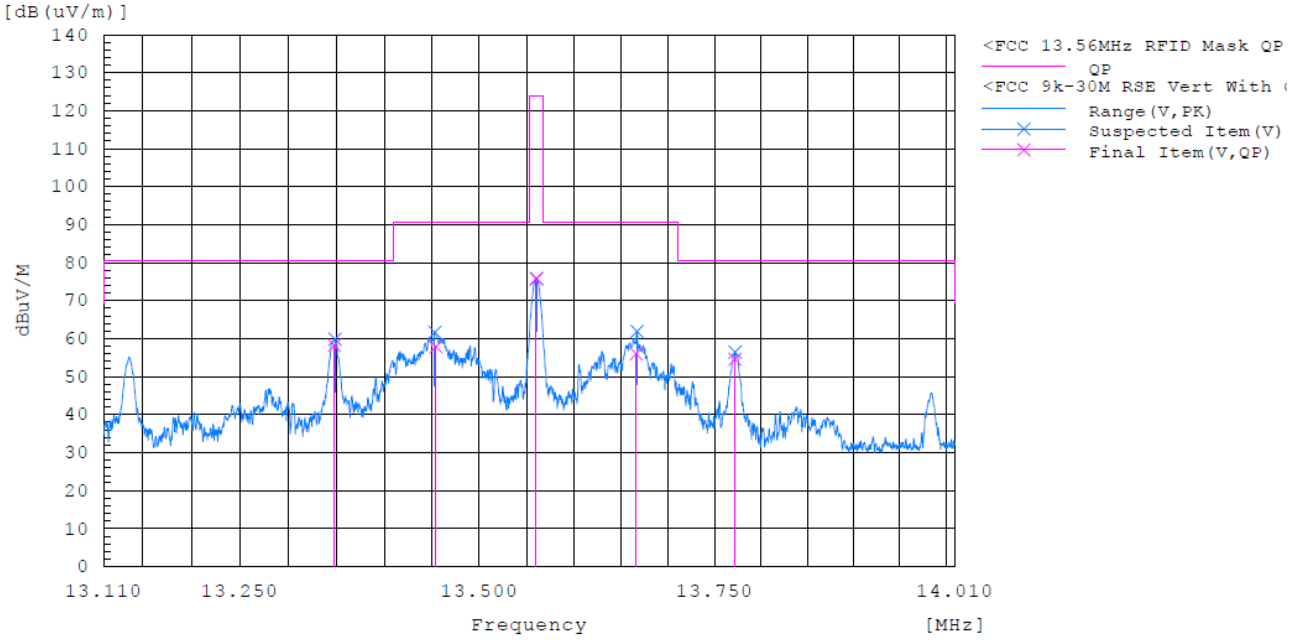
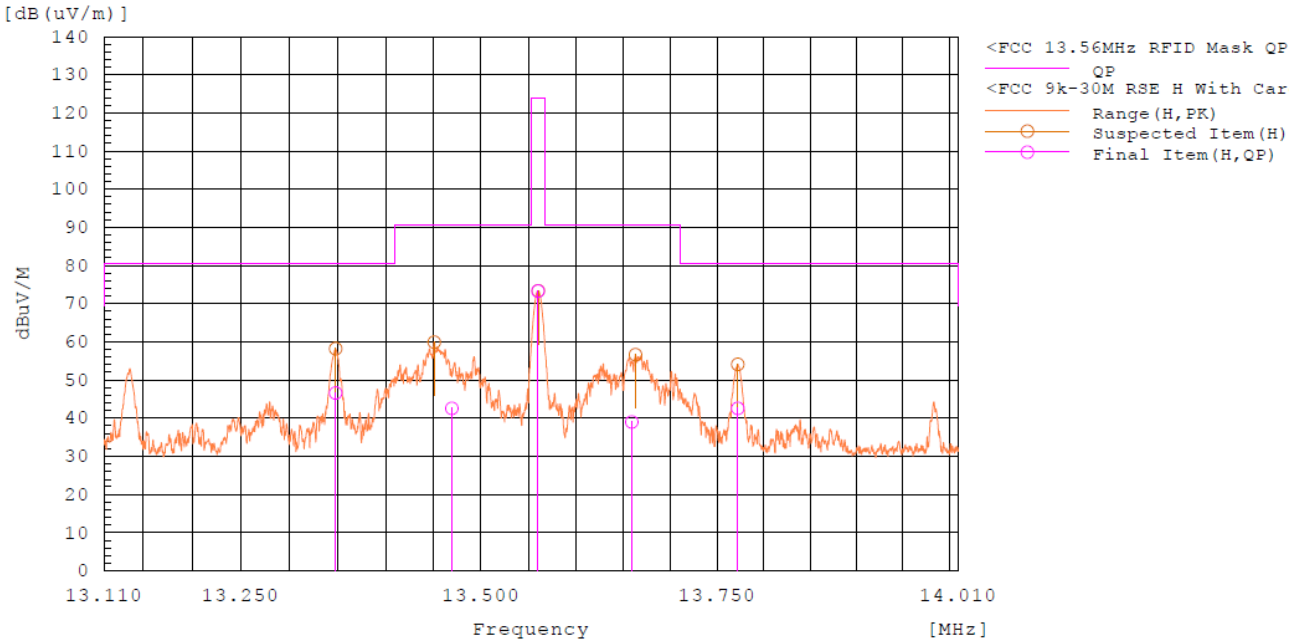
▣ Test Plots

Operation within the band 13.110 MHz – 14.010 MHz Vertical plot



Operation within the band 13.110 MHz – 14.010 MHz Horizontal plot



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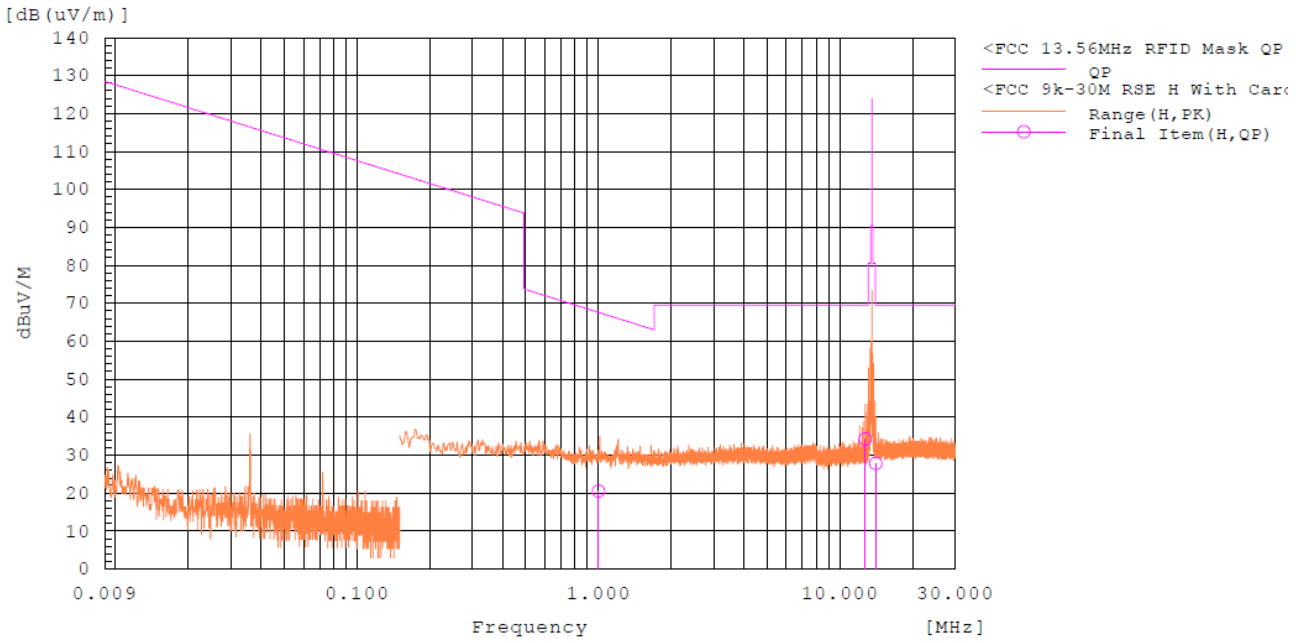
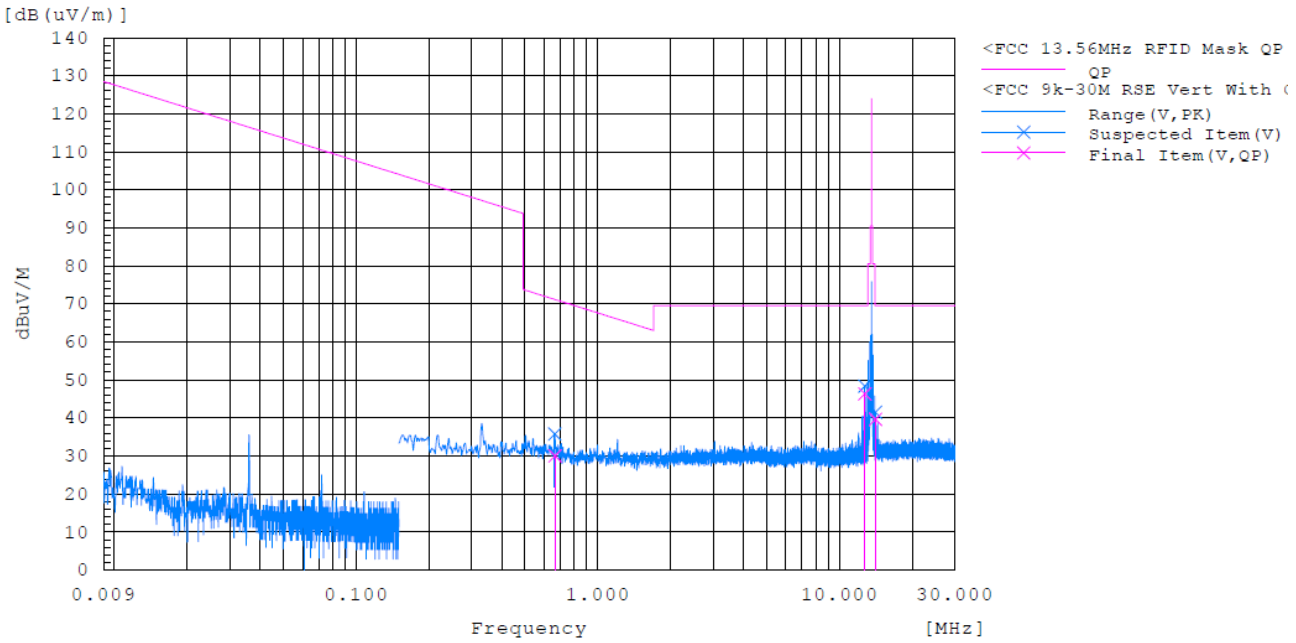
Radiated Spurious Emissions plot Below 30 MHz Horizontal plot



Radiated Spurious Emissions plot Below 30 MHz Vertical plot



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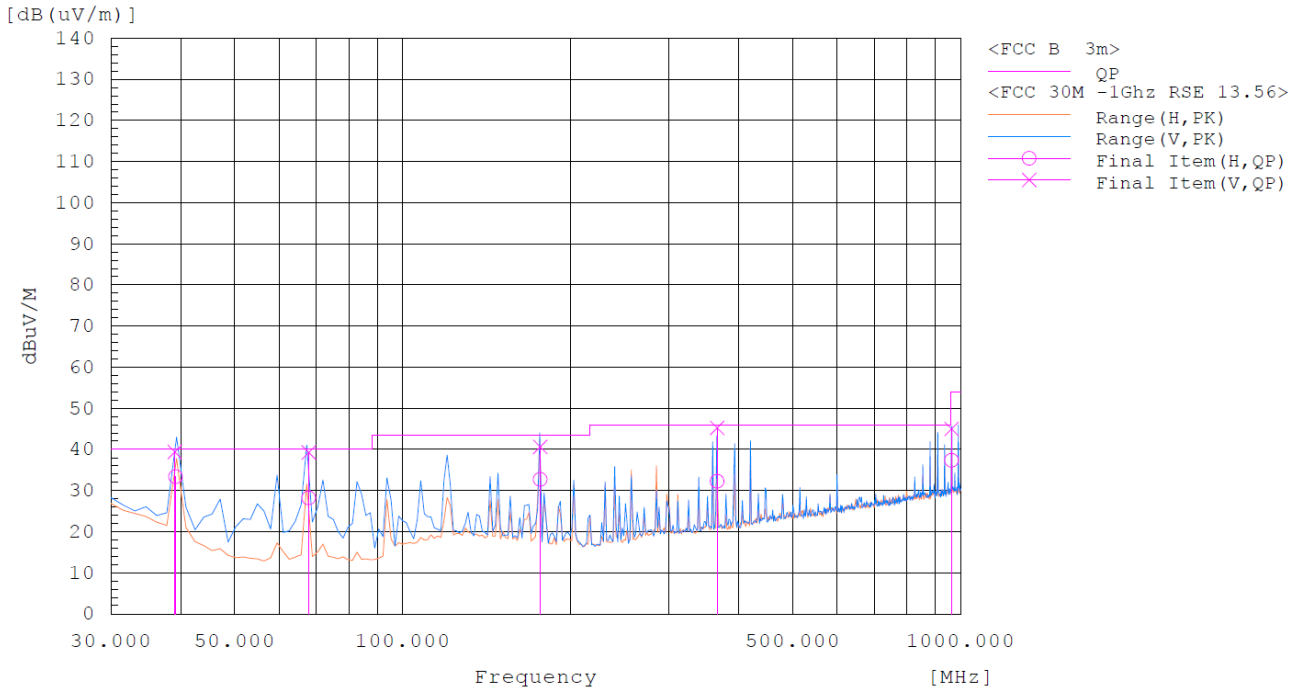
Radiated Spurious Emissions plot Below 1 GHz



Note:

Plot of worst case are only reported.

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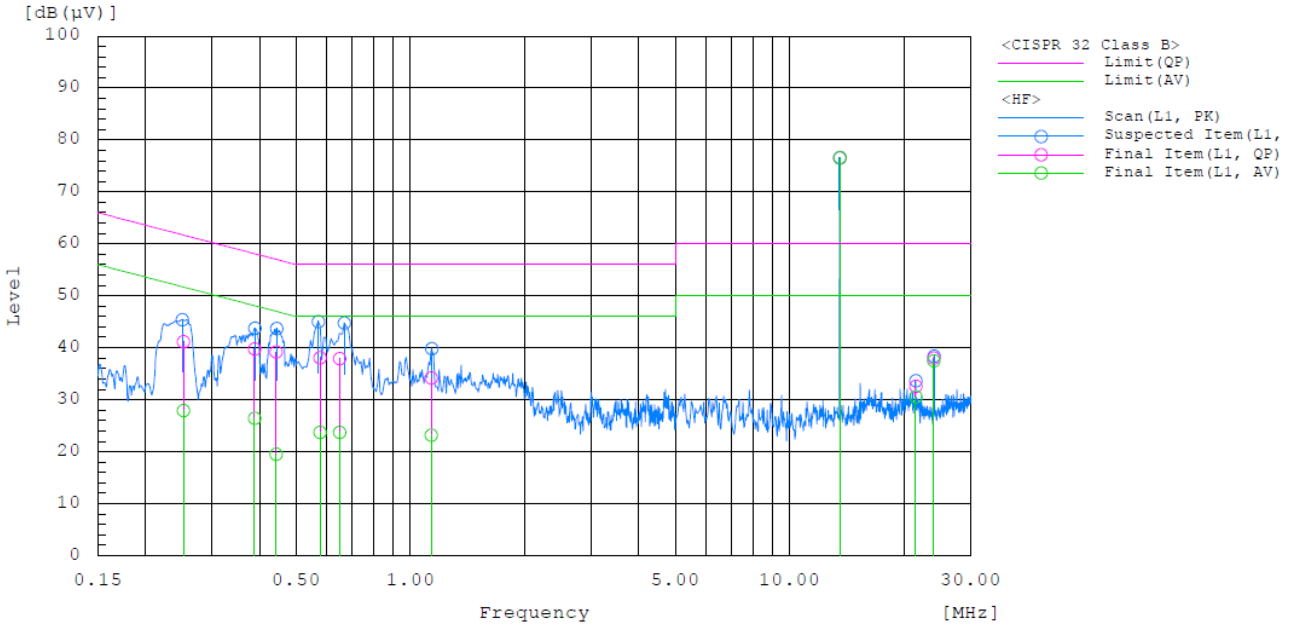
9.4 POWERLINE CONDUCTED EMISSIONS

[AC Mains (L1)]



[Final Results]

Frequency MHz	Line	Reading dB(µV)		Corr. dB	Level dB(µV)		Limit dB(µV)		Margin dB	
		QP	CAV		QP	CAV	QP	CAV	QP	CAV
0.442	L1	29.6	9.9	9.6	39.2	19.5	57	47	17.8	27.5
0.388	L1	30.2	16.9	9.6	39.8	26.5	58.1	48.1	18.3	21.6
0.252	L1	31.6	18.3	9.6	41.2	27.9	61.7	51.7	20.5	23.8
0.578	L1	28.5	14.1	9.6	38.1	23.7	56	46	17.9	22.3
0.651	L1	28.3	14.1	9.6	37.9	23.7	56	46	18.1	22.3
1.134	L1	24.5	13.5	9.7	34.2	23.2	56	46	21.8	22.8
24	L1	27.9	27.4	10.1	38	37.5	60	50	22	12.5
21.503	L1	22.5	20.5	10.1	32.6	30.6	60	50	27.4	19.4

Note : Quasi-peak(Final Result) = Reading Value + Correction Factor

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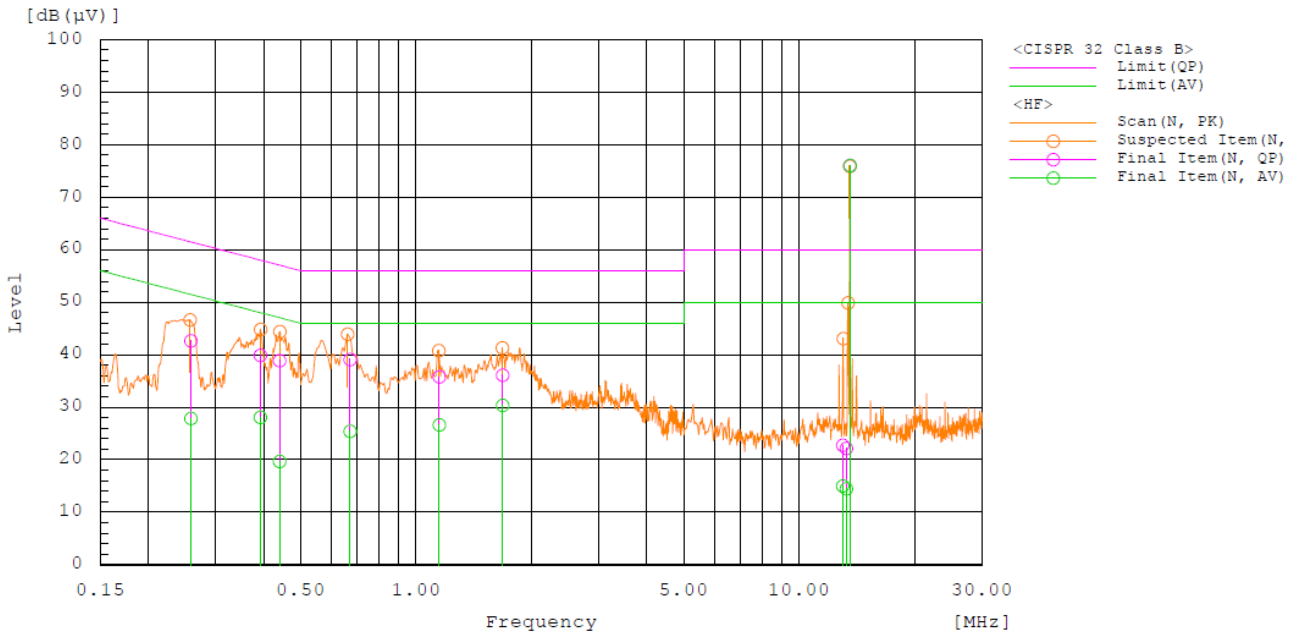
[AC Mains (N)]



[Final Results]

Frequency MHz	Line	Reading dB(µV)		Corr. dB	Level dB(µV)		Limit dB(µV)		Margin dB	
		QP	CAV		QP	CAV	QP	CAV	QP	CAV
0.44	N	29.3	10.1	9.6	38.9	19.7	57.1	47.1	18.2	27.4
0.392	N	30.3	18.5	9.6	39.9	28.1	58	48	18.1	19.9
0.258	N	33.1	18.3	9.6	42.7	27.9	61.5	51.5	18.8	23.6
0.672	N	29.5	15.8	9.6	39.1	25.4	56	46	16.9	20.6
1.682	N	26.4	20.7	9.7	36.1	30.4	56	46	19.9	15.6
1.149	N	26.1	16.9	9.7	35.8	26.6	56	46	20.2	19.4
13.281	N	12.2	4.5	10	22.2	14.5	60	50	37.8	35.5
12.983	N	12.8	5	10	22.8	15	60	50	37.2	35

Note : Quasi-peak(Final Result) = Reading Value + Correction Factor

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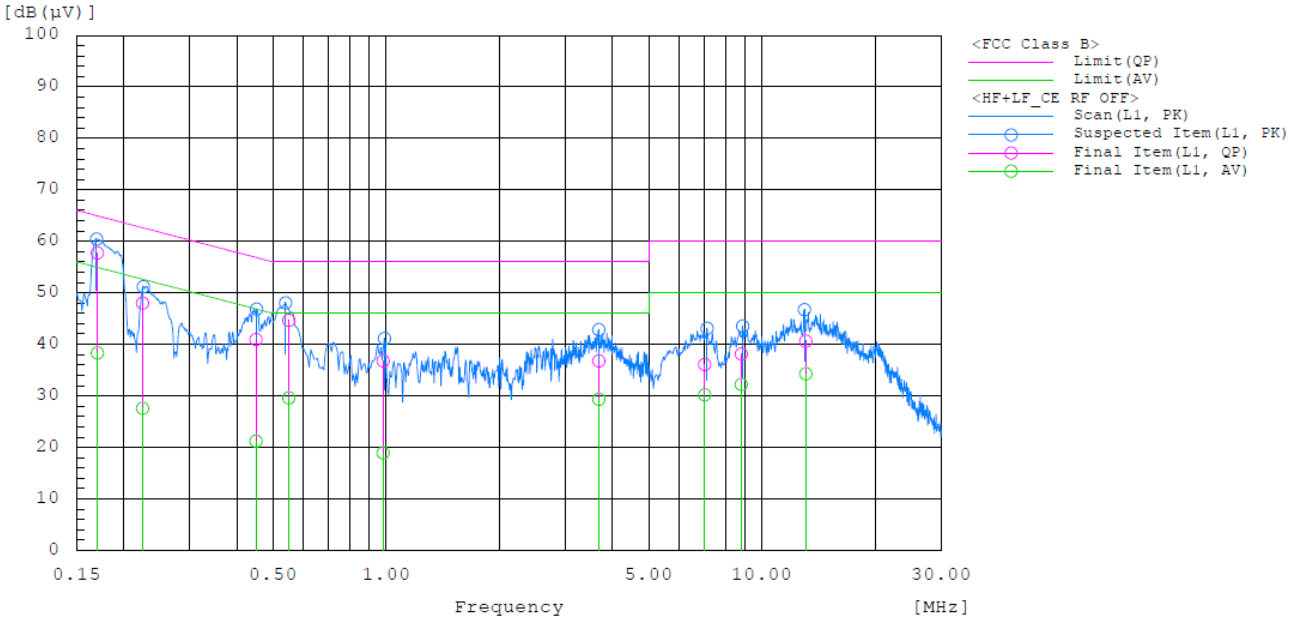
[AC Mains (L1)]



[Final Results]

Frequency MHz	Line	Reading dB(μV)		Corr. dB	Level dB(μV)		Limit dB(μV)		Margin dB	
		QP	CAV		QP	CAV	QP	CAV	QP	CAV
0.5	L1	34.2	23.3	9.7	43.9	33	56	46	12.1	13
0.151	L1	38.3	19	9.8	48.1	28.8	65.9	55.9	17.8	27.1
0.535	L1	35.9	24.6	9.7	45.6	34.3	56	46	10.4	11.7
12.951	L1	24.2	18.2	10.1	34.3	28.3	60	50	25.7	21.7
5.207	L1	20.7	15.4	9.9	30.6	25.3	60	50	29.4	24.7
20.622	L1	17.2	11.5	10.4	27.6	21.9	60	50	32.4	28.1

Note :

1. The EUT remove the antenna and terminate the RF output with network which simulates the antenna in the fundamental frequency band.

2.Quasi-peak(Final Result) = Reading Value + Correction Factor

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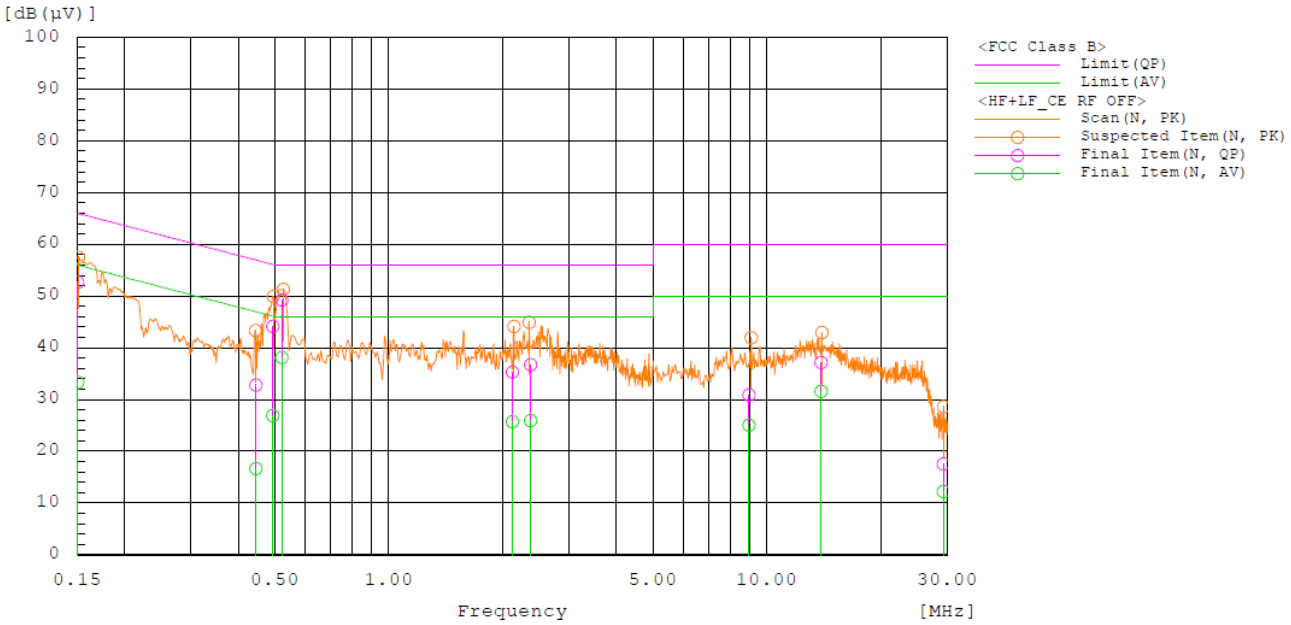
[AC Mains (N)]



[Final Results]

Frequency MHz	Line	Reading dB(µV)		Corr. dB	Level dB(µV)		Limit dB(µV)		Margin dB	
		QP	CAV		QP	CAV	QP	CAV	QP	CAV
0.5	N	36.9	24.3	9.7	46.6	34	56	46	9.4	12
0.155	N	43.1	22.1	9.8	52.9	31.9	65.7	55.7	12.8	23.8
0.528	N	36.9	23.2	9.7	46.6	32.9	56	46	9.4	13.1
2.45	N	30.4	16.8	9.7	40.1	26.5	56	46	15.9	19.5
2.571	N	29.8	17	9.8	39.6	26.8	56	46	16.4	19.2
16.847	N	24.6	18.7	10.2	34.8	28.9	60	50	25.2	21.1

Note :

1. The EUT remove the antenna and terminate the RF output with network which simulates the antenna in the fundamental frequency band.

2.Quasi-peak(Final Result) = Reading Value + Correction Factor

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10. LIST OF TEST EQUIPMENT

No.	Instrument	Model No.	Due to Calibration	Manufacture	Serial No.
☒	Signal Analyzer (20 Hz ~ 40.0 GHz)	ESU40	2020-12-20	ROHDE & SCHWARZ	100529
☒	Signal Analyzer (3 ㎐ ~ 26.5 ㎓)	N9020A	2020-11-08	Keysigt	MY52091291
☒	BI-LOG Antenna (30 MHz ~ 1 GHz)	JB6	2020-11-29	Sunol	A071116
☒	Attenuator (20 dB, DC ~ 26.5 GHz)	8493C	2020-12-13	HP	09072
☒	POWER AMP (0.3GHz ~ 1GHz)	8447D	2020-10-08	HP	2944
☒	Loop Antenna (0.009 ~ 30 MHz)	HLA 6121	2020-08-27	Teseq	43964
☒	EMI Test Receiver	ESR3	2020-12-20	Rohde & Schwarz	102363
☒	LISN	3816/2SH	2021-01-17	EMCO	00205729
☒	LISN	ENV216	2021-01-19	Rohde & Schwarz	101349
☒	Temp & Humidity Chamber	TH-ME	2020-09-05	JEIO TECH	5070515
☒	Frequency Counter	53181A	2020-08-02	AGILENT	MY40002090

Note:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date

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11. ANNEX A TEST SETUP PHOTO

The setup photo will be provided as a separate document

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