



FCC / ISED Test Report

For:
Hanchett Entry Systems, Inc.

Model:
KS210

Product Description:
Server cabinet lock

FCC ID: VC3-KS210
ISED ID: 7160A-KS210

Applied Rules and Standards:
47 CFR Part 15.247 (DTS)
RSS-247 Issue 2 (DTSs) & RSS-Gen Issue 5

REPORT #: EMC_HANC1-005-20001_15.247_BTLE_DTS_REV1

DATE: 2020-12-02



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IC recognized #
3462B-1

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1 Assessment

The following device was evaluated against the applicable radiated emissions criteria specified in FCC rules Parts 15.247 of Title 47 of the Code of Federal Regulations and the relevant ISED Canada standard RSS-247.

The data for evaluating the performance according to RSS-247 other than the radiated spurious emissions, is taken from SIEMIC, Inc. modular report # RF_SL14031801-HID-007_FCC-IC Rev1.0" from Apr 4th 2014. The test results in this report were evaluated and found to comply with the requirements in RSS-247 Issue 2.

No deviations were ascertained.

Company	Description	Model #
Hanchett Entry Systems, Inc.	Server cabinet lock	KS210

Responsible for Testing Laboratory:

2020-12-02	Compliance	Cindy Li (EMC Lab Manager)	
Date	Section	Name	Signature

Responsible for the Report:

2020-02-12	Compliance	Kris Lazarov (EMC Engineer)	
Date	Section	Name	Signature

The test results of this test report relate exclusively to the test item specified in Section 3.

CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of CETECOM Inc. USA.

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the EMC Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Street Address:	411 Dixon Landing Road
City/Zip Code	Milpitas, CA 95035
Country	USA
Telephone:	+1 (408) 586 6200
Fax:	+1 (408) 586 6299
EMC Lab Manager:	Cindy Li
Responsible Project Leader:	Palacios, Cathy

2.2 Identification of the Client

Client's Name:	Hanchett Entry Systems, Inc.
Street Address:	10027 S. 51st St., Suite 102
City/Zip Code	Phoenix, AZ 85044
Country	USA

2.3 Identification of the Manufacturer

Manufacturer's Name:	Same as Client
Manufacturers Address:	-
City/Zip Code	-
Country	-

3 Equipment Under Test (EUT)

3.1 EUT Specifications

Model No:	KS200 / KS210
HW Version :	Rev. X02.; SE32 RFID Module: Rev. B; BTSmart BLE Module: Rev. H
SW Version :	N/A.; SE32 RFID Module: 8.2.1.1; BTSmart BLE Module: 2.22
FCC-ID :	VC3-KS200 / VC3-KS210
ISED-ID:	7160A-KS200
FWIN:	N/A
HVIN:	KS210
PMN:	KS210
Product Description:	Server cabinet lock
Frequency Range / number of channels:	Nominal band: 2400 MHz – 2483.5 MHz; Center to center: 2402 MHz (ch 0) – 2480 MHz (ch 39), 40 channels
Radio Information:	Module Name: HID Global Module Number: BLEOSDP-UPG-A-900 Modulation: Bluetooth version 4.0, Low Energy, using Dynamic Sequence Spread Spectrum with GFSK modulation.
Modes of Operation:	Bluetooth LE in both advertising and connected mode of operation
Antenna Information as declared:	3dBi
Max. EIRP:	3.03 dBm
Power Supply/ Rated Operating Voltage Range:	12 VDC (min) / 24 VDC (max)
Operating Temperature Range	Tmin: 20 °C / Tmax: 27 °C
Other Radios included in the device:	RFID 125 kHz / NFC 13.56 MHz
Sample Revision	☐ Prototype Unit; ☐ Production Unit; ☒ Pre-Production

Note: The antenna info, and peak output power is taken from Siemic report "RF_SL14031801-HID-007_FCC-IC Rev1.0 listed in the FCC filing database

3.2 EUT Sample details

EUT #	Serial Number	HW Version	SW Version	Notes/Comments
1	BLE Engineering Sample	Rev. X02	N/A	-

3.3 Support Equipment (SE) details

SE #	Type	Model	Manufacturer	Serial Number
1	12 V Battery	24-72J	Ozark Automotive Distributors	N/A

3.4 Test Sample Configuration

EUT Set-up #	EUT / AE used for set-up	Comments
1	EUT#1 + SE#1	-

3.5 Mode of Operation details

Mode of Operation	Description	Details
Op. 1	Simultaneous Transmission	All radios transmit simultaneously. The BLE is set to low, mid, and high channel.

3.6 Justification for Worst Case Mode of Operation

During the testing process, the EUT was tested with transmitter sets on low, mid and high channels, and highest possible duty cycle possible. For radiated measurements, all data in this report shows the worst case between horizontal and vertical antenna polarizations and for all orientations of the EUT.

4 Subject of Investigation

The objective of the measurements done by CETECOM Inc. was to assess the performance of the EUT according to the relevant radiated emissions requirements specified in FCC rules Part 15.247 of Title 47 of the Code of Federal Regulations and Radio Standard Specification RSS-247 of ISED Canada. This test report is to support a request for new equipment authorization under the FCC ID: VC3-KS200 / VC3-KS210, and ISED ID: 7160A-KS210

Testing procedures are based on 558074 D01 15.247 Meas Guidance v05r02 – “GUIDANCE FOR COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEM, FREQUENCY HOPPING SPREAD SPECTRUM SYSTEM, AND HYBRID SYSTEM DEVICES OPERATING UNDER SECTION 15.247 OF THE FCC RULES” - April 2, 2019, by the Federal Communications Commission, Office of Engineering and Technology, Laboratory Division.

5 Measurement Results Summary

Test Specification	Test Case	Temperature and Voltage Conditions	Mode	Limit	Measured Value with least margin	Verdict
§15.247(d); §15.209 RSS-Gen 6.13	TX Spurious emissions- Radiated	Nominal	BTLE+ NFC/RFID	54 Avg, 74 PEAK in dBuV/m @ 3m	39.6 dBuV/m @3m @ 929.643 MHz with 6.33 dB margin	PASS
§15.247(a)(1) RSS-247 5.2(a)	Emission Bandwidth	Nominal	BTLE, 4 dBm, continuous duty cycle	500 kHz	1.038 MHz min* 1.326 MHz max*	PASS
§15.247(e) RSS-247 5.2(b)	Power Spectral Density	Nominal	BTLE	8 dBm / 3kHz	0.59 dBm / MHz*	PASS
§15.247(b)(1) RSS-247 5.4(d)	Maximum Conducted Output Power and EIRP	Nominal	BTLE	30 dBm conducted	98.26 dBuV/m @3m with 3 dBi antenna = 3.03 dBm EIRP = 0.03 dBm conducted*	PASS
§15.247(d) RSS-247 5.5	Band edge compliance Unrestricted Band Edges	Nominal	BTLE	<-20 dBC PEAK	-31.61 dB	PASS
§15.247; 15.209; 15.205 RSS-Gen 8.9; 8.10	Band edge compliance Restricted Band Edges	Nominal	BTLE	30 dB RMS 20 dB PEAK	2390 MHz with 50 dB margin RMS* 2483.5 MHz with 53.5 dB margin RMS*	PASS
§15.207(a) RSS Gen 8.8	AC Conducted Emissions				Device is not connected to AC mains.	NA

Note 1: NA= Not Applicable; NP= Not Performed.

Note 2: All radios were set to transmit continuously

*From RF_SL14031801-HID-007_FCC-IC Rev1.0

6 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus, with 95% confidence interval (in dB delta to result), based on a coverage factor $k=1$.

Radiated measurement

9 kHz to 30 MHz	± 2.5 dB (Magnetic Loop Antenna)
30 MHz to 1000 MHz	± 2.0 dB (Biconilog Antenna)
1 GHz to 40 GHz	± 2.3 dB (Horn Antenna)

According to TR 102 273 a multiplicative propagation of error is assumed for RF measurement systems. For this reason the RMS method is applied to dB values and not to linear values as appropriate for additive propagation of error. Also used: <http://physics.nist.gov/cuu/Uncertainty/typeb.html>. The above calculated uncertainties apply to direct application of the Substitution method. The Substitution method is always used when the EUT comes closer than 3 dB to the limit.

6.1 Environmental Conditions During Testing:

The following environmental conditions were maintained during the course of testing:

- Ambient Temperature: 20-25° C
- Relative humidity: 40-60%

6.2 Dates of Testing:

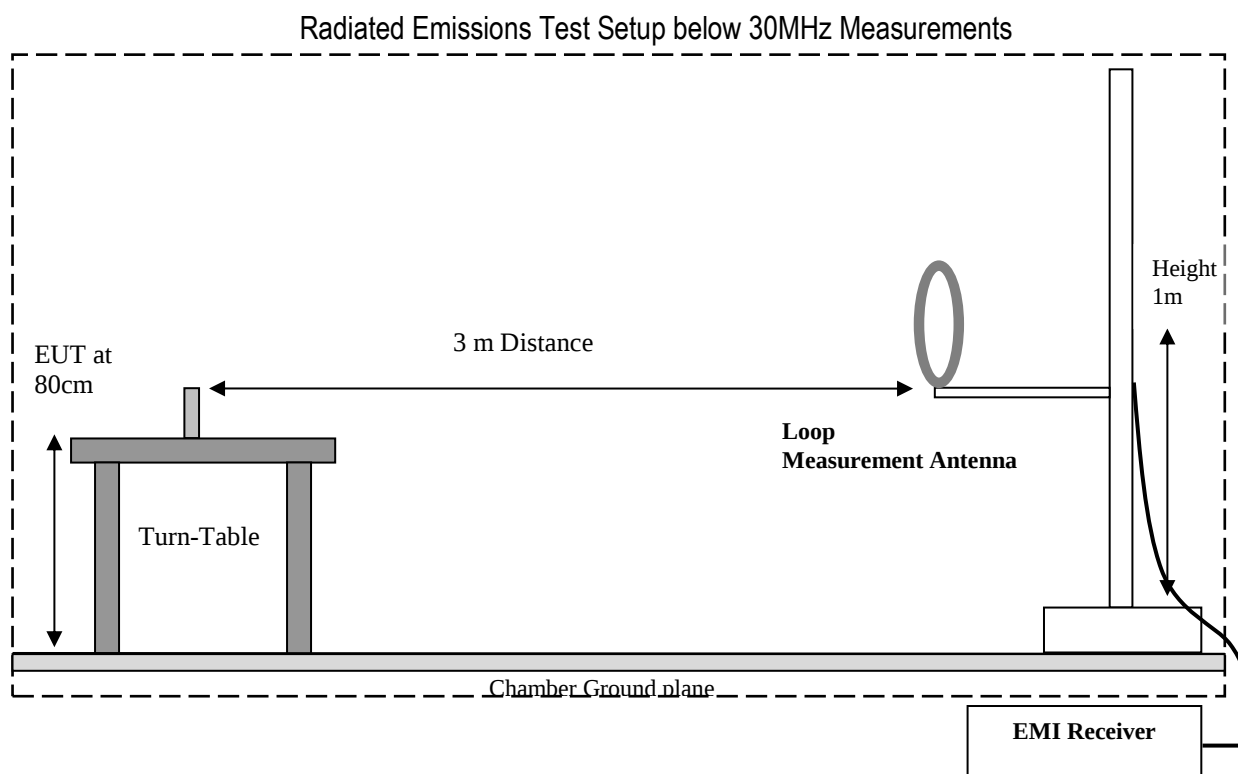
2020-10-13 – 2020-10-15

7 Measurement Procedures

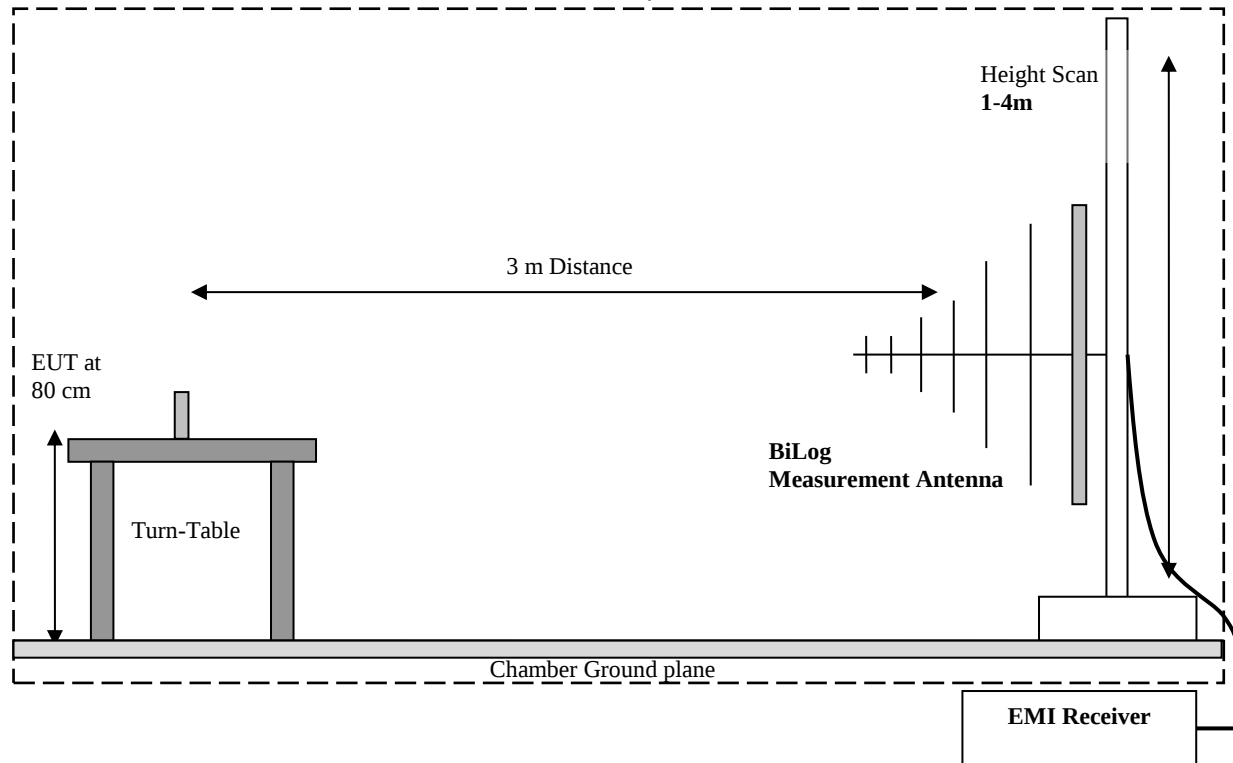
7.1 Radiated Measurement

The radiated measurement is performed according to ANSI C63.10 (2013)

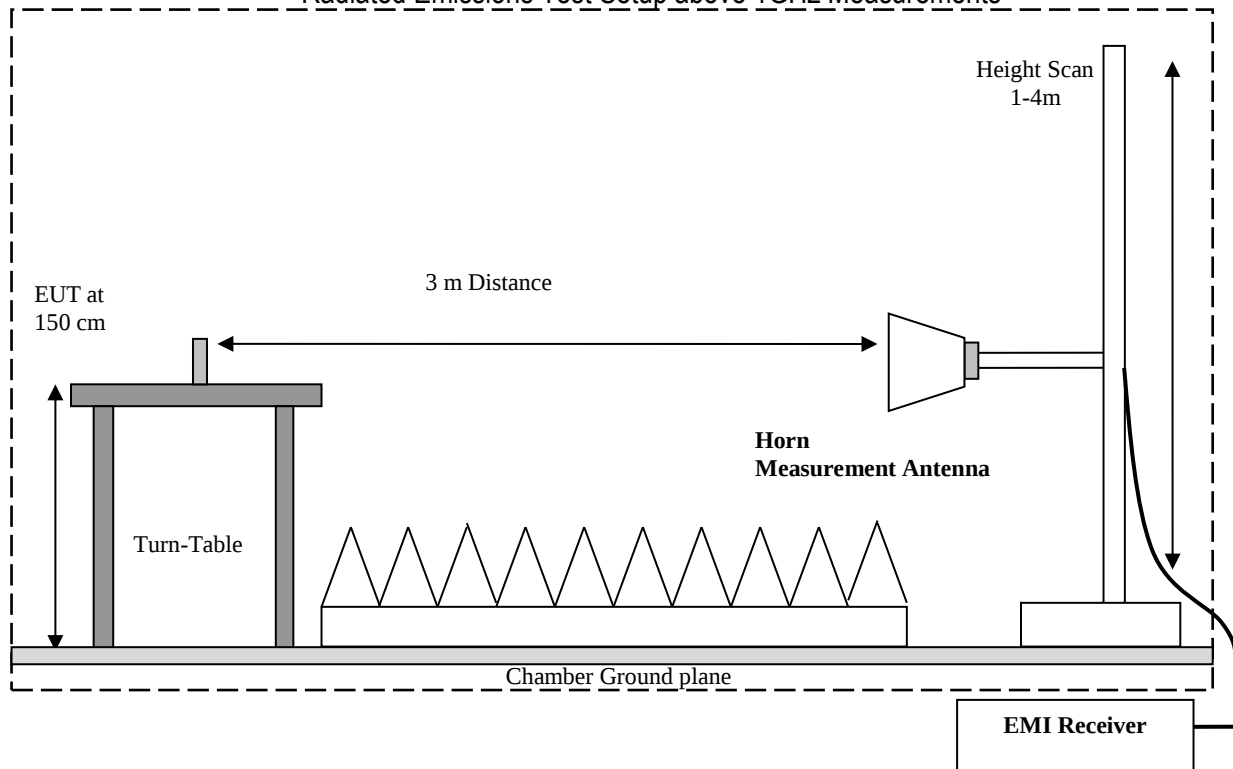
- The exploratory measurement is accomplished by running a matrix of 16 sweeps over the required frequency range with R&S Test-SW EMC32 for 4 positions of the turntable, two orthogonal positions of the EUT and both antenna polarizations. This procedure exceeds the requirement of the above standards to cover the 3 orthogonal axis of the EUT. A max peak detector is utilized during the exploratory measurement. The Test-SW creates an overall maximum trace for all 12 sweeps and saves the settings for each point of this trace. The maximum trace is part of the test report.
- The 10 highest emissions are selected with an automatic algorithm of EMC32 searching for peaks in the noise floor and ensuring that broadband signals are not selected multiple times.
- The maxima are then put through the final measurement and again maximized in a 90deg range of the turntable, fine search in frequency domain and height scan between 1m and 4m.
- The above procedure is repeated for all possible ways of power supply to EUT and for all supported modulations.
- In case there are no emissions above noise floor level only the maximum trace is reported as described above.
- The results are split up into up to 4 frequency ranges due to antenna bandwidth restrictions. A magnetic loop is used from 9 kHz to 30 MHz, a Biconilog antenna is used from 30 MHz to 1 GHz, and two different horn antennas are used to cover frequencies up to 40 GHz.



Radiated Emissions Test Setup 30MHz-1GHz Measurements



Radiated Emissions Test Setup above 1GHz Measurements



7.1.1 Sample Calculations for Field Strength Measurements

Field Strength is calculated from the Spectrum Analyzer/ Receiver readings, taking into account the following parameters:

1. Measured reading in dB μ V
2. Cable Loss between the receiving antenna and SA in dB and
3. Antenna Factor in dB/m

All radiated measurement plots in this report are taken from a test SW that calculates the Field Strength based on the following equation:

$$FS \text{ (dB}\mu\text{V/m)} = \text{Measured Value on SA (dB}\mu\text{V)} + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$$

Example:

Frequency (MHz)	Measured SA (dB μ V)	Cable Loss (dB)	Antenna Factor Correction (dB)	Field Strength Result (dB μ V/m)
1000	80.5	3.5	14	98.0

8 Test Result Data

8.1 Lower Band edge 2.39 GHz – 2.4 GHz non-restricted

8.1.1 Limits

FCC §15.247

- In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

8.1.2 Verdict

The below peak trace data shows that all trace points between 2.39 GHz and 2.4 GHz are attenuated by more than 30 dB from fundamental emission of 96.57 dBuV/m at 2402.3 MHz.. Lowest margin is 57.26 dBuV/m at 2399.6 MHz with 39.31 dB vs the 20 dB limit. The RBW of below trace is 1 MHz instead of the 100 kHz identified below. This will require an additional margin for the delta of power in 100 kHz vs power in 1 MHz bandwidth. The value at 2399.6 can be considered worst case as it will be higher than the corresponding value in 100 kHz. The value at 2402.3 MHz will be overestimated and needs to be corrected down. The 99% OBW plots from “RF_SL14031801-HID-007_FCC-IC Rev1.0” show that the power density / 30 kHz has an approximately triangular shape with range of 10 dB range over 1.2 MHz and maximum at center of channel. This results in the 1 MHz BW underestimating the 100 kHz BW result by a factor of 10 dB. This leaves a margin to the 30 dB limit of 39.31 dB - 20 dB – 10 dB = 9.31 dB.

8.1.3 Detailed Result

1 MHz RBW 3 MHz VBW peak detector trace data

2390	44.46200711
2390.142857	42.84636521
2390.285714	46.92012305
2390.428572	47.81245391
2390.571429	46.29161495
2390.714286	44.22188685
2390.857143	47.61815457
2391	48.31716432
2391.142857	44.81945016
2391.285714	44.55225055
2391.428572	46.68979799

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2391.571429	45.06326921
2391.714286	43.69410283
2391.857143	43.68111477
2392	42.66094747
2392.142857	47.22561906
2392.285714	45.69920334
2392.428572	48.76426409
2392.571429	50.91180626
2392.714286	48.47054229
2392.857143	47.78790721
2393	50.72416863
2393.142857	47.91633523
2393.285714	47.968327
2393.428572	48.41917591
2393.571429	48.35992352
2393.714286	45.30656106
2393.857143	46.93637277
2394	45.27037761
2394.142857	49.7290773
2394.285714	50.27917718
2394.428572	53.08237842
2394.571429	47.27941667
2394.714286	48.9601929
2394.857143	52.15380942
2395	45.77012494
2395.142857	45.60509131
2395.285714	51.59802433
2395.428572	45.7074277
2395.571429	51.21072912
2395.714286	48.84393626
2395.857143	50.7098476
2396	51.71550658
2396.142857	46.32272809
2396.285714	50.95755277
2396.428572	53.33325273
2396.571429	51.17032509
2396.714286	42.99320681
2396.857143	49.38716399
2397	44.54144377
2397.142857	52.28076082
2397.285714	49.92356604
2397.428572	46.64411483
2397.571429	48.12647395
2397.714286	46.03053261

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2397.857143	50.96722223
2398	50.5551341
2398.142857	49.9982401
2398.285714	47.45298095
2398.428572	52.63953716
2398.571429	51.13182613
2398.714286	50.62048735
2398.857143	51.86966953
2399	55.20610531
2399.142857	52.52427635
2399.285714	52.56313909
2399.428572	54.48972007
2399.571429	57.25822764
2399.714286	56.65160555
2399.857143	61.16942272
2400	59.68261651
2400.142857	61.21510506
2400.285714	63.70997691
2400.428572	66.53526888
2400.571429	65.9435004
2400.714286	67.8166977
2400.857143	72.83700496
2401	76.11853884
2401.142857	75.65846502
2401.285714	80.88631842
2401.428572	87.13178043
2401.571429	92.89625485
2401.714286	96.48072895
2401.857143	96.21531897
2402	96.35891318
2402.142857	96.53983798
2402.285714	96.56656506
2402.428572	95.25873553

8.2 Radiated Transmitter Spurious Emissions and Restricted Bands

8.2.1 Measurement according to ANSI C63.10 (2013)

Spectrum Analyzer Settings:

- Frequency = 9 KHz – 30 MHz
- RBW = 9 KHz
- Detector: Peak

- Frequency = 30 MHz – 1 GHz
- Detector = Peak / Quasi-Peak
- RBW= 120 KHz (<1GHz)

- Frequency > 1 GHz
- Detector = Peak / Average
- RBW = 1 MHz

- Radiated spurious emissions shall be measured for the transmit frequencies, transmit power, and data rate for the lowest, middle and highest channel in each frequency band of operation and for the highest gain antenna for each antenna type, and using the appropriate parameters and test requirements.
- The highest (or worst-case) data rate shall be recorded for each measurement.
- For testing frequencies below 30 MHz at distance other than the specified in the standard, the limit conversion is calculated by using the FCC materials for the ANSI 63 committee issued on January, 27 1991.

8.2.2 Limits:

FCC §15.247

- In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

FCC §15.209 & RSS-Gen 8.9

- Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency of emission (MHz)	Field strength (μV/m)	Measurement Distance (m)	Field strength @ 3m (dBμV/m)
0.009–0.490	2400/F(kHz) / -----	300	-
0.490–1.705	24000/F(kHz) / -----	30	-
1.705–30.0	30 / (29.5)	30	-
30–88	100	3	40 dBμV/m
88–216	150	3	43.5 dBμV/m
216–960	200	3	46 dBμV/m
Above 960	500	3	54 dBμV/m

FCC §15.205 & RSS-Gen 8.10

- Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

- Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

*PEAK LIMIT= 74 dBμV/m

*AVG. LIMIT= 54 dBμV/m

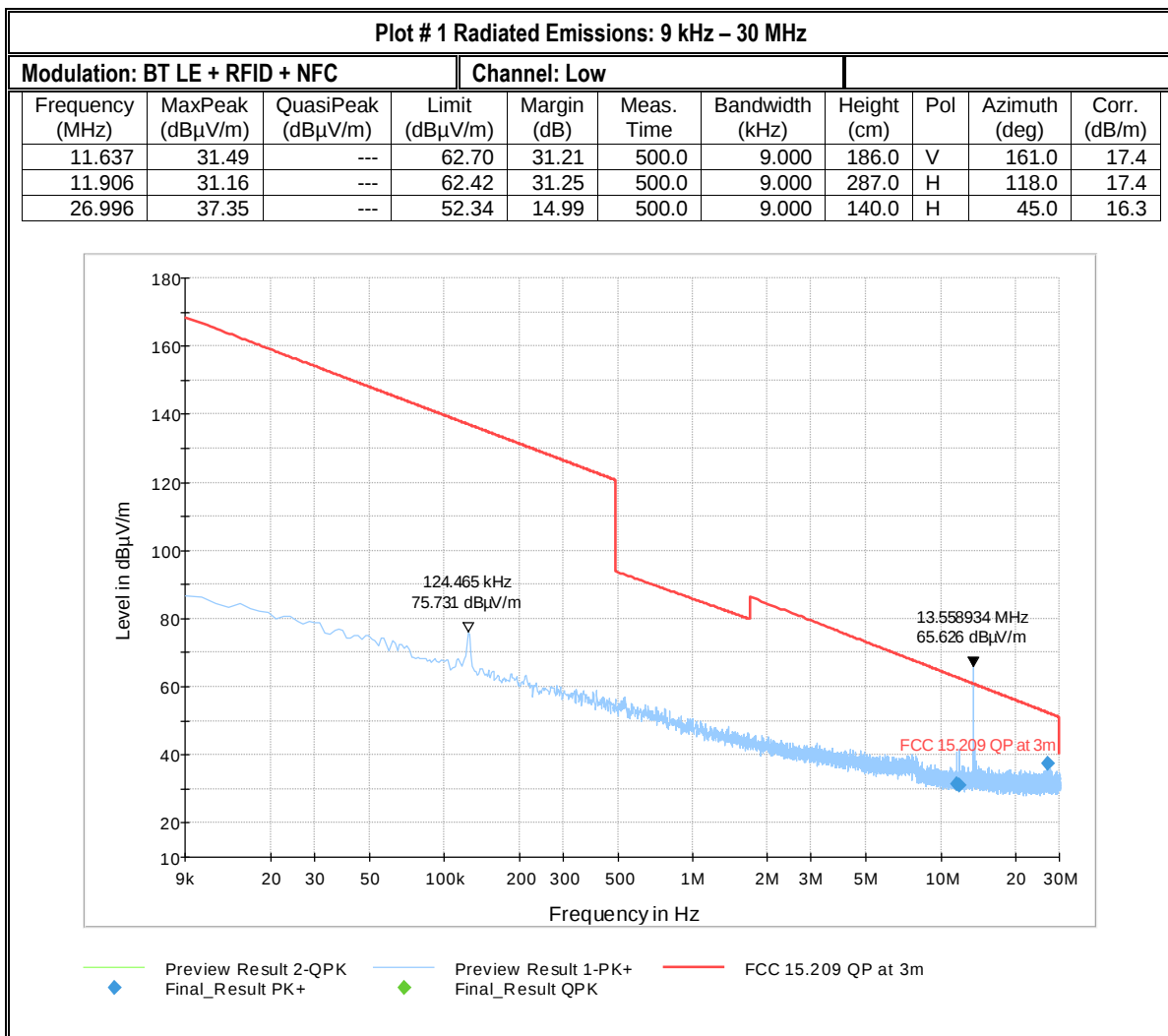
8.2.3 Test conditions and setup:

Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input
22° C	1	1 Simultaneous Transmission	12 VDC

8.2.4 Measurement result:

Plot #	BLE Channel #	Scan Frequency	Limit	Result
1-4	Low	9 kHz – 18 GHz	See section 8.1.2	Pass
5-8	Mid	9 kHz – 18 GHz	See section 8.1.2	Pass
9-12	High	9 kHz – 18 GHz	See section 8.1.2	Pass

8.2.5 Measurement Plots:



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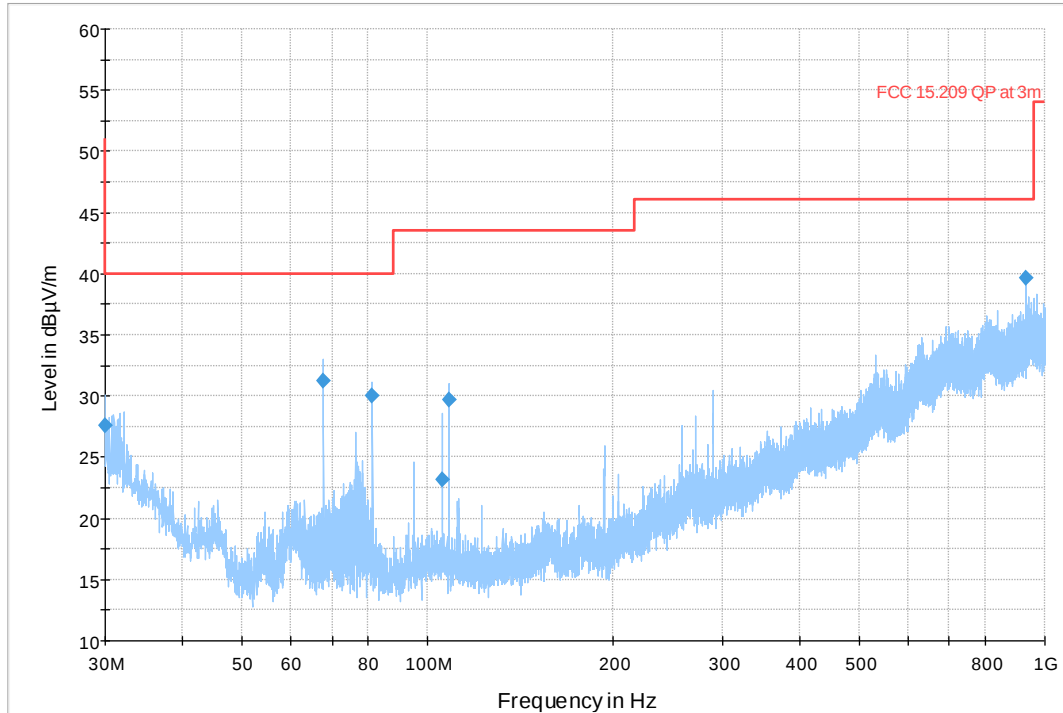
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Plot # 2 Radiated Emissions: 30 MHz – 1GHz

Modulation: BT LE + RFID + NFC

Channel: Low

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.000	27.61	---	40.00	12.39	500.0	120.000	176.0	V	-8.0	21.0
67.798	31.20	---	40.00	8.80	500.0	120.000	152.0	V	247.0	11.4
81.345	30.01	---	40.00	9.99	500.0	120.000	152.0	V	46.0	11.9
105.725	23.21	---	43.50	20.29	500.0	120.000	140.0	H	106.0	13.2
108.473	29.70	---	43.50	13.80	500.0	120.000	152.0	V	173.0	13.2
929.643	39.69	---	46.02	6.33	500.0	120.000	255.0	V	0.0	30.3



◆ Preview Result 2-RMS Final_Result QPK
 ◆ Preview Result 1-PK+ Final_Result PK+
 — FCC 15.209 QP at 3m

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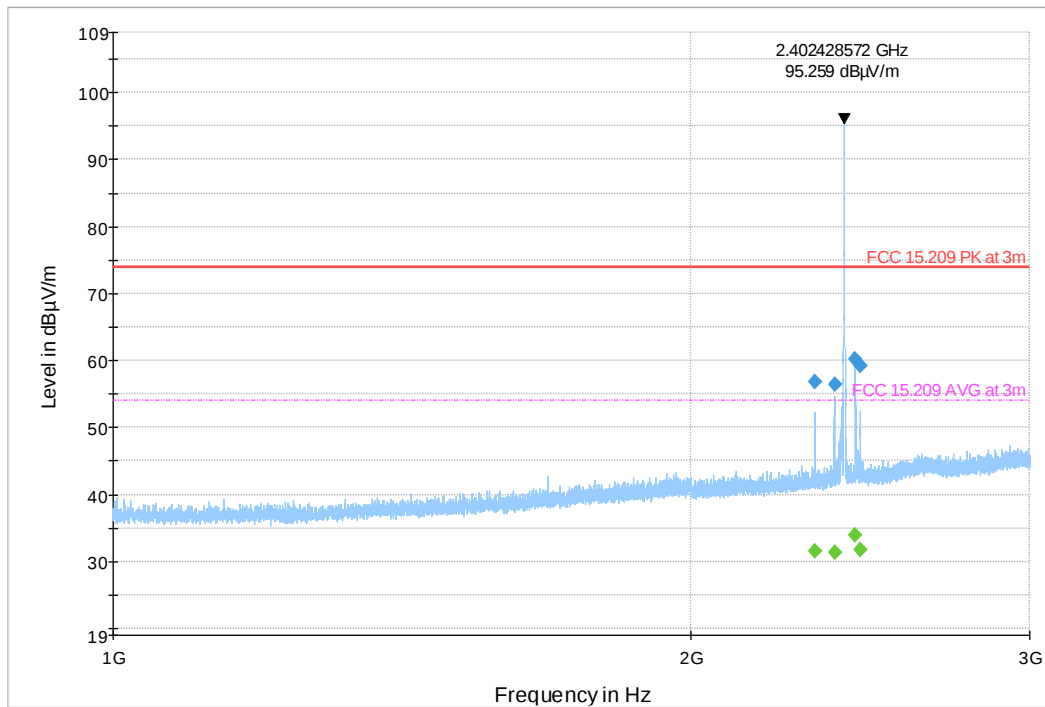
FCC ID: VC3-KS210
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Plot # 3 Radiated Emissions: 1-3 GHz

Modulation: BT LE + RFID + NFC

Channel: Low

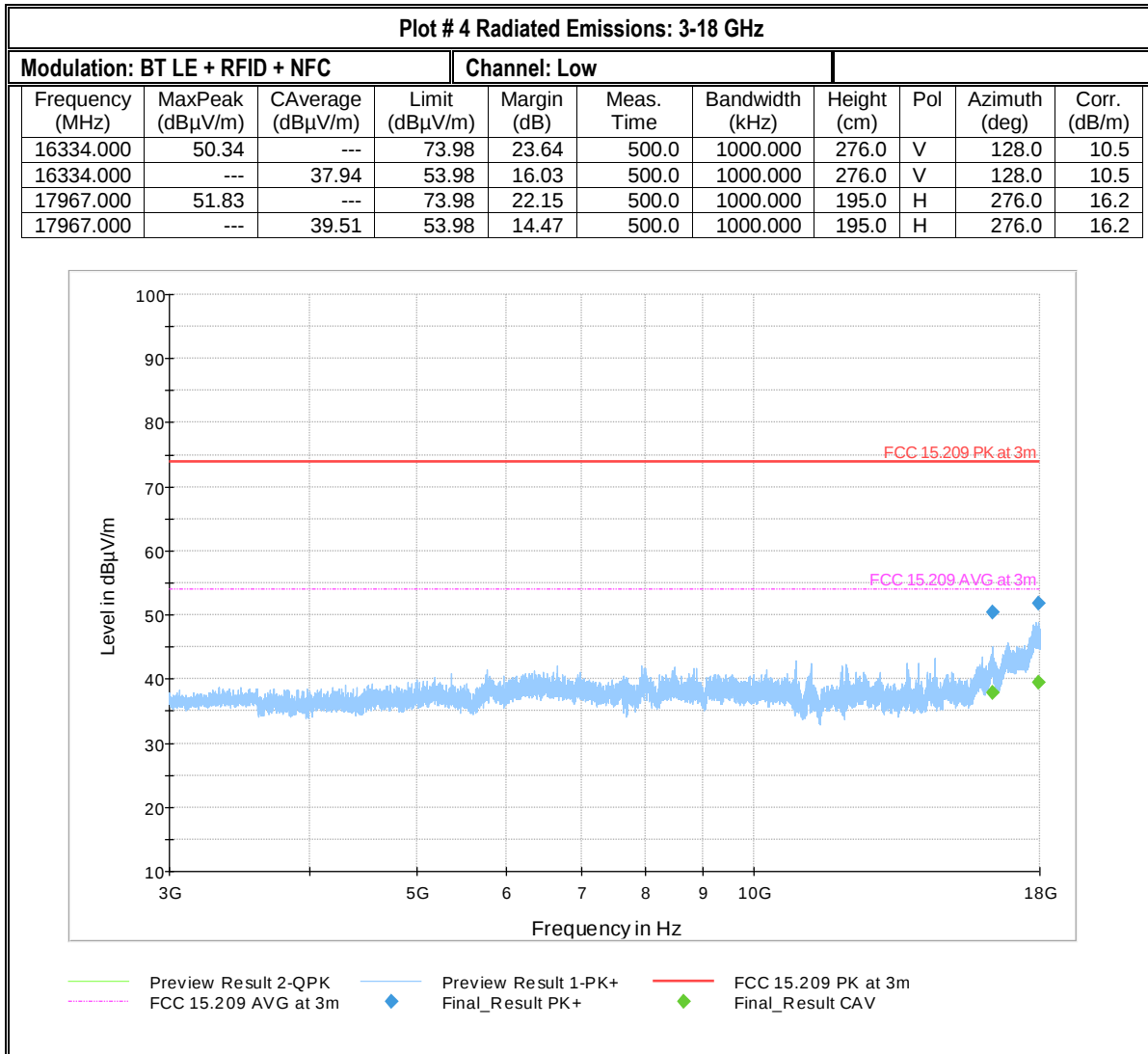
Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2318.571	56.80	---	73.98	17.18	500.0	1000.000	163.0	H	253.0	9.2
2318.571	---	31.45	53.98	22.53	500.0	1000.000	163.0	H	253.0	9.2
2373.857	56.34	---	73.98	17.64	500.0	1000.000	140.0	V	5.0	9.2
2373.857	---	31.28	53.98	22.70	500.0	1000.000	140.0	V	5.0	9.2
2434.571	60.22	---	73.98	13.76	500.0	1000.000	262.0	H	-5.0	9.4
2434.571	---	33.95	53.98	20.02	500.0	1000.000	262.0	H	-5.0	9.4
2449.571	59.31	---	73.98	14.67	500.0	1000.000	315.0	H	-13.0	9.5
2449.571	---	31.68	53.98	22.30	500.0	1000.000	315.0	H	-13.0	9.5

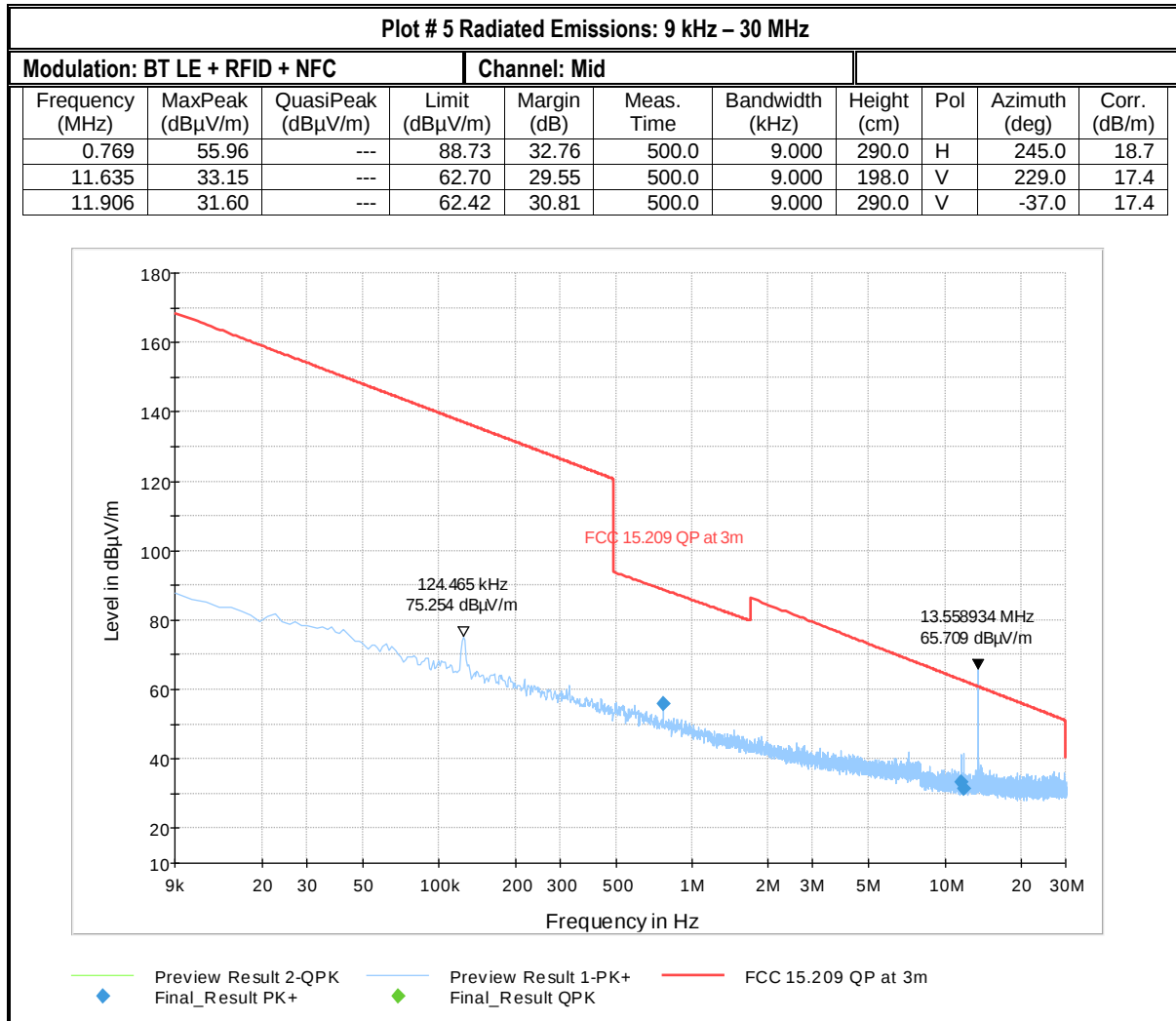


— Preview Result 2-QPK
 — Preview Result 1-PK+
 — FCC 15.209 PK at 3m
— FCC 15.209 AVG at 3m
◆ Final_Result PK+
◆ Final_Result CAV

Test Report #: EMC_HANC1-005-20001_15.247_BTLE_DTS
Date of Report: 2020-12-02

FCC ID: VC3-KS210
ISED ID: 7160A-KS210





Test Report #: EMC_HANC1-005-20001_15.247_BTLE_DTS
Date of Report: 2020-12-02

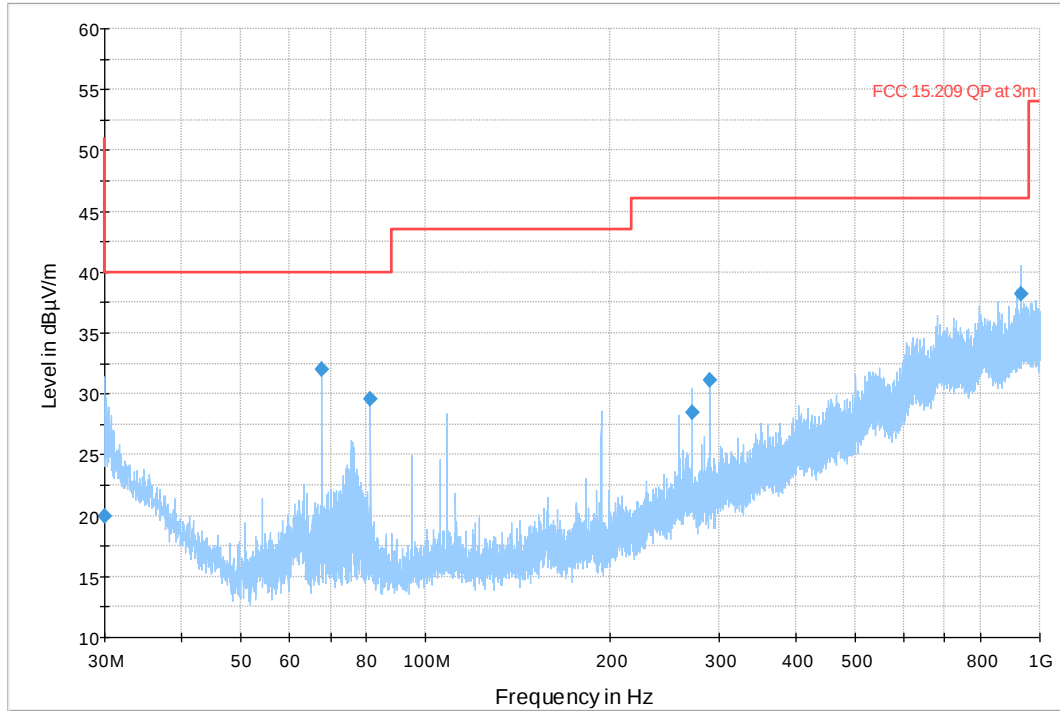
FCC ID: VC3-KS210
ISED ID: 7160A-KS210

Plot # 6 Radiated Emissions: 30 MHz – 1GHz

Modulation: BT LE + RFID + NFC

Channel: Mid

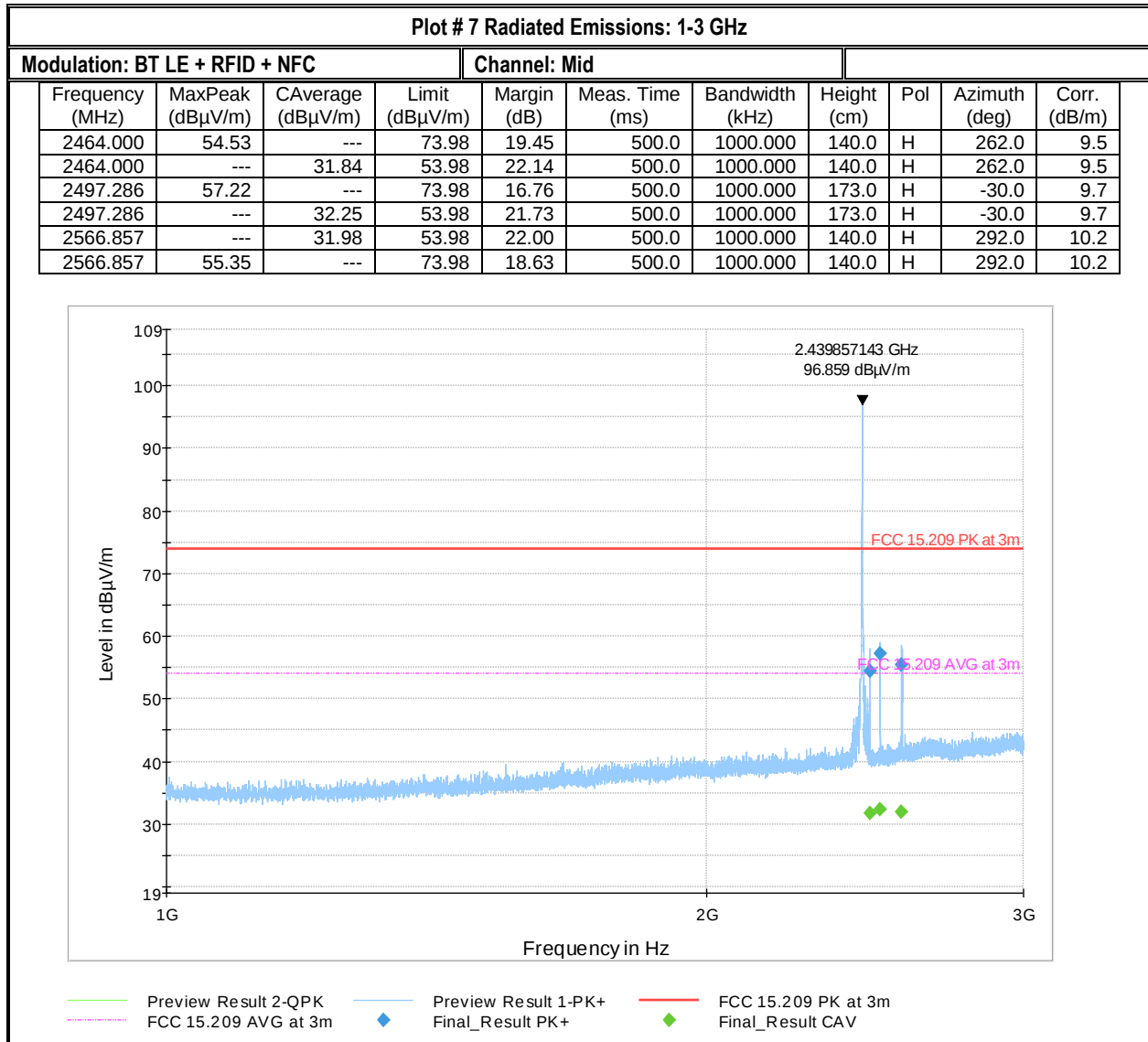
Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.000	19.96	---	40.00	20.04	500.0	120.000	221.0	V	191.0	21.0
67.798	32.02	---	40.00	7.98	500.0	120.000	152.0	V	195.0	11.4
81.345	29.59	---	40.00	10.41	500.0	120.000	140.0	V	350.0	11.9
271.174	28.43	---	46.02	17.59	500.0	120.000	210.0	V	280.0	18.3
289.701	31.10	---	46.02	14.92	500.0	120.000	208.0	V	178.0	18.0
929.610	38.15	---	46.02	7.87	500.0	120.000	315.0	V	141.0	30.3



◆ Preview Result 2-RMS Final_Result QPK
◆ Preview Result 1-PK+ Final_Result PK+
— FCC 15.209 QP at 3m

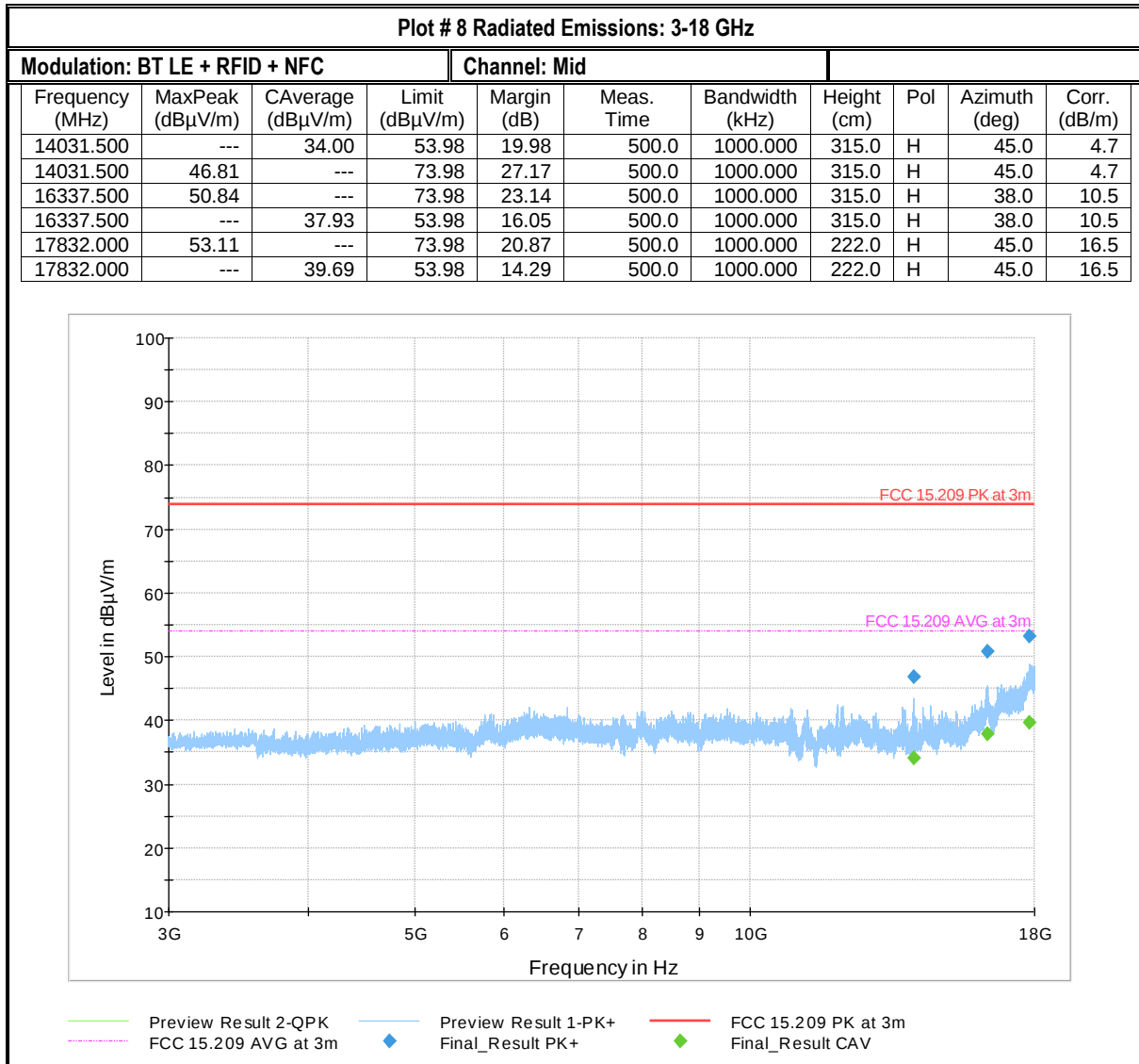
Test Report #: EMC_HANC1-005-20001_15.247_BTLE_DTS
Date of Report: 2020-12-02

FCC ID: VC3-KS210
ISED ID: 7160A-KS210



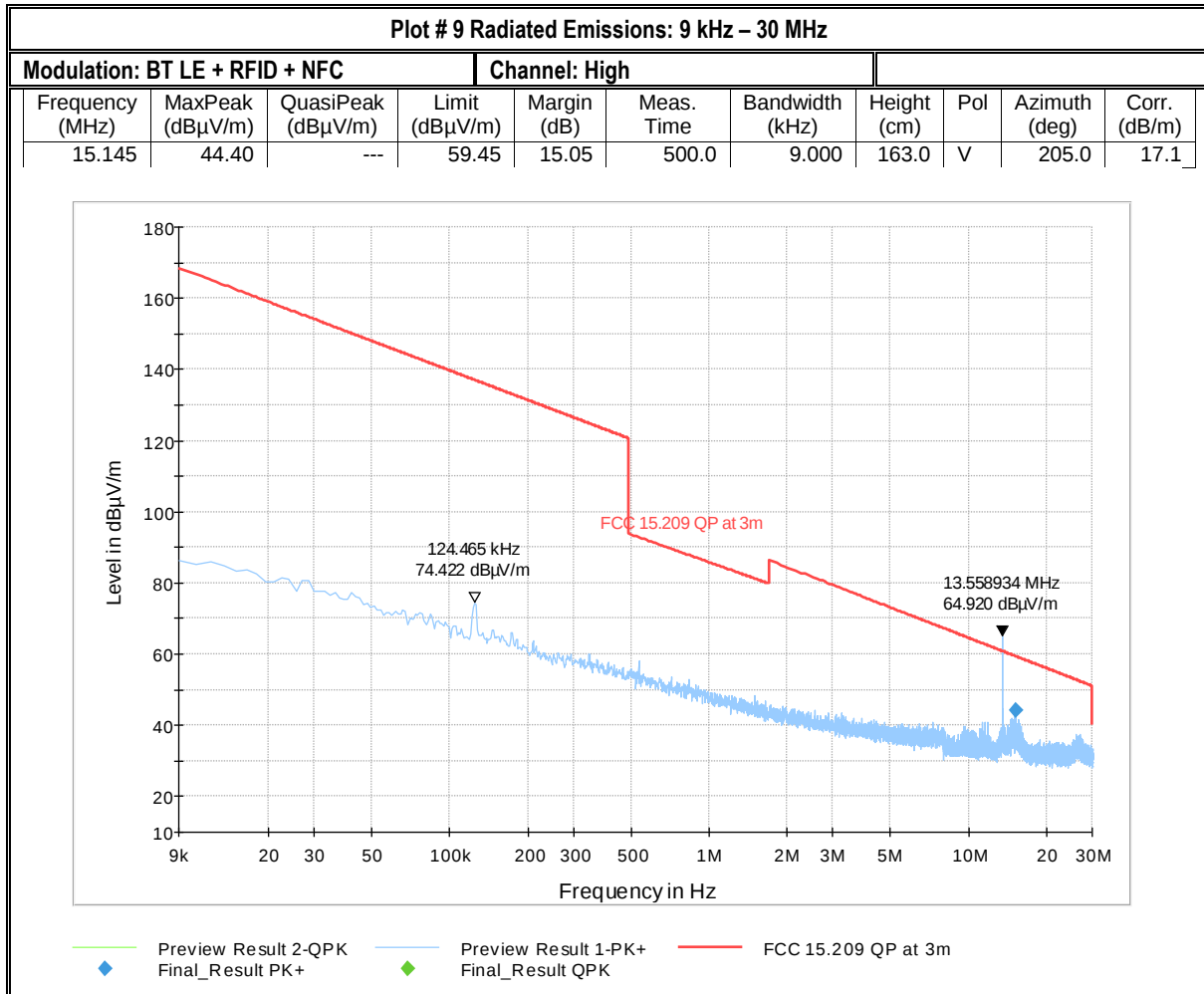
Test Report #: EMC_HANC1-005-20001_15.247_BTLE_DTS
Date of Report: 2020-12-02

FCC ID: VC3-KS210
ISED ID: 7160A-KS210



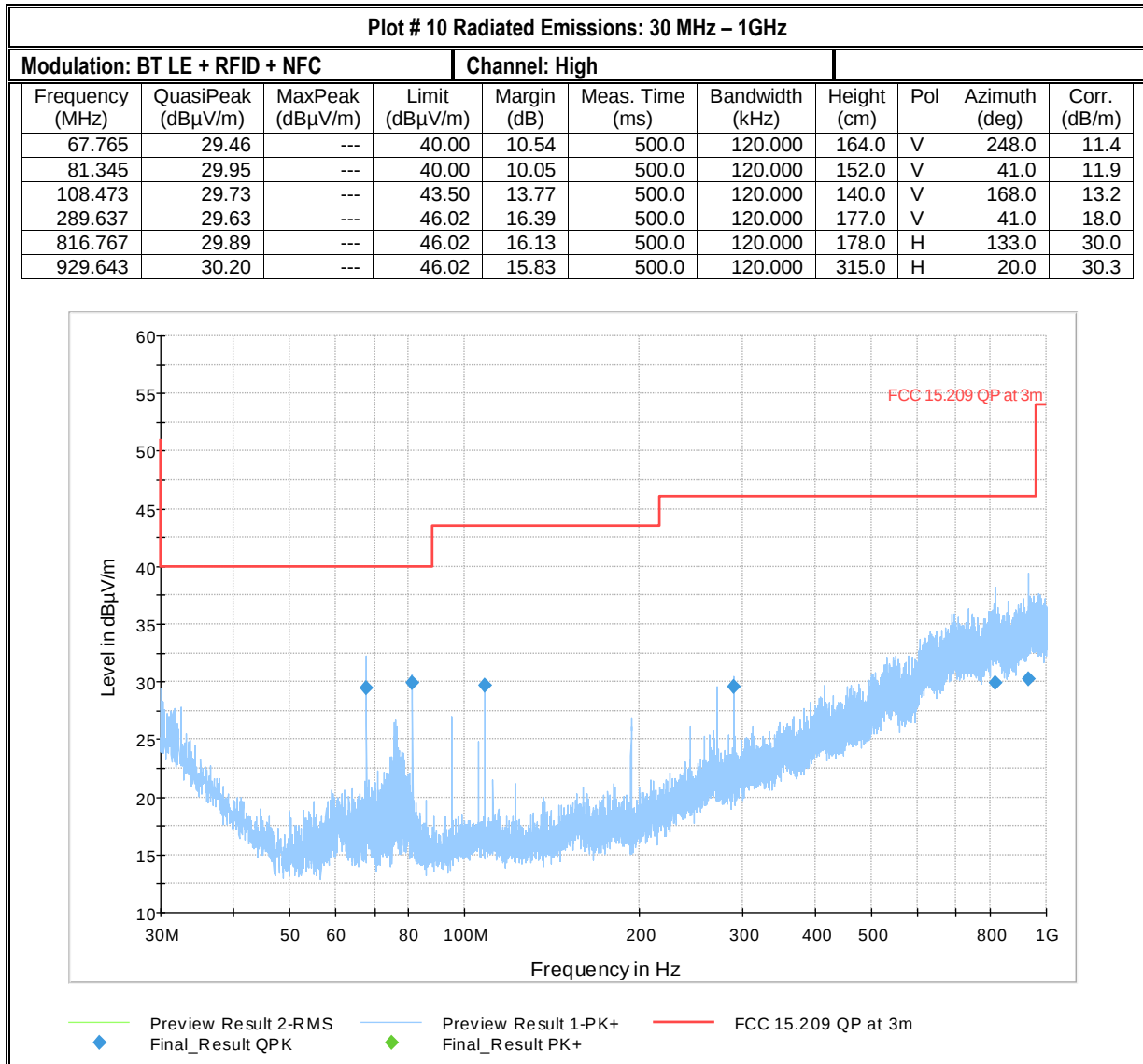
Test Report #: EMC_HANC1-005-20001_15.247_BTLE_DTS
Date of Report: 2020-12-02

FCC ID: VC3-KS210
ISED ID: 7160A-KS210



Test Report #: EMC_HANC1-005-20001_15.247_BTLE_DTS
Date of Report: 2020-12-02

FCC ID: VC3-KS210
ISED ID: 7160A-KS210



Test Report #: EMC_HANC1-005-20001_15.247_BTLE_DTS
Date of Report: 2020-12-02

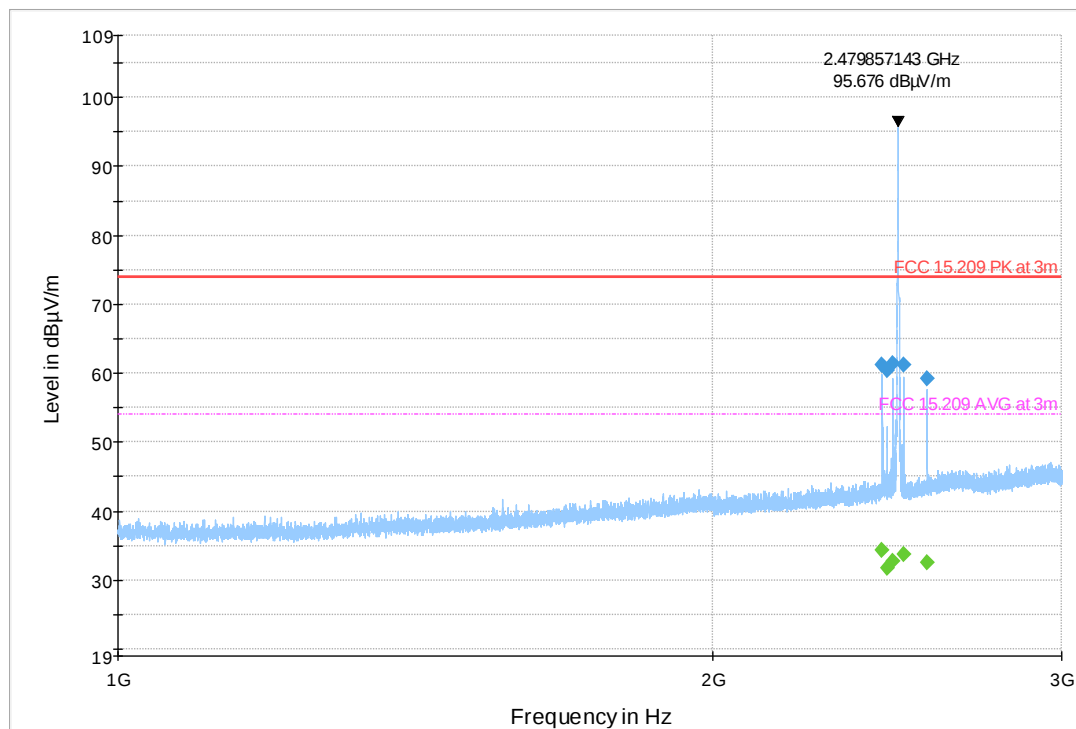
FCC ID: VC3-KS210
ISED ID: 7160A-KS210

Plot # 11 Radiated Emissions: 1-3 GHz

Modulation: BT LE + RFID + NFC

Channel: High

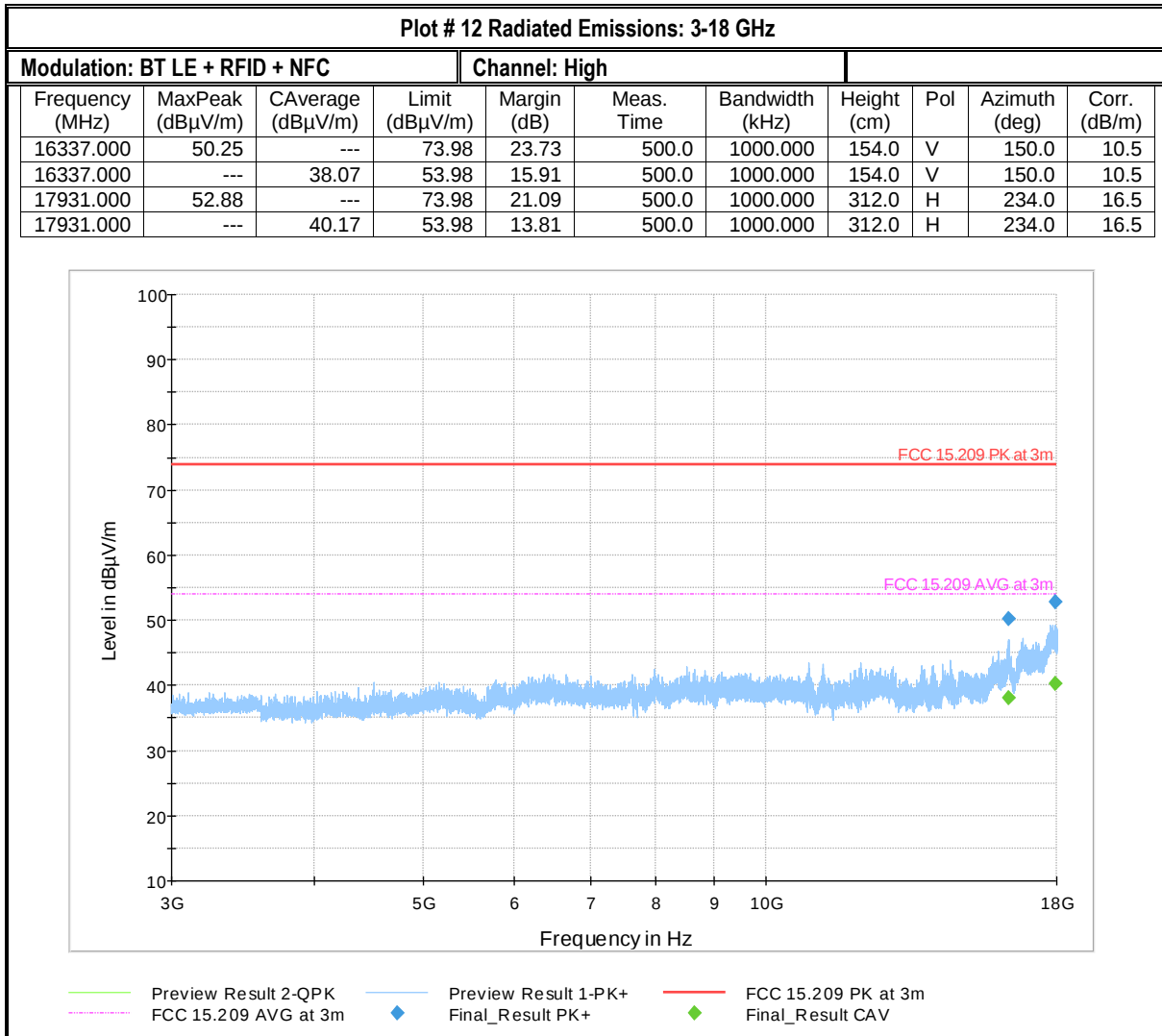
Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2434.429	61.27	---	73.98	12.71	500.0	1000.000	315.0	H	-17.0	9.4
2434.429	---	34.42	53.98	19.56	500.0	1000.000	315.0	H	-17.0	9.4
2449.143	---	31.72	53.98	22.26	500.0	1000.000	315.0	H	-14.0	9.5
2449.143	60.45	---	73.98	13.53	500.0	1000.000	315.0	H	-14.0	9.5
2463.143	61.38	---	73.98	12.60	500.0	1000.000	315.0	H	-12.0	9.5
2463.143	---	32.64	53.98	21.34	500.0	1000.000	315.0	H	-12.0	9.5
2496.571	---	33.64	53.98	20.34	500.0	1000.000	306.0	H	337.0	9.7
2496.571	61.14	---	73.98	12.84	500.0	1000.000	306.0	H	337.0	9.7
2566.143	---	32.45	53.98	21.53	500.0	1000.000	140.0	V	10.0	10.2
2566.143	59.21	---	73.98	14.77	500.0	1000.000	140.0	V	10.0	10.2



— Preview Result 2-QPK
 — Preview Result 1-PK+
 — FCC 15.209 PK at 3m
— FCC 15.209 AVG at 3m
 ◆ Final_Result PK+
 ◆ Final_Result CAV

Test Report #: EMC_HANC1-005-20001_15.247_BTLE_DTS
Date of Report: 2020-12-02

FCC ID: VC3-KS210
ISED ID: 7160A-KS210



Test Report #: EMC_HANC1-005-20001_15.247_BTLE_DTS
Date of Report 2020-12-02

FCC ID: VC3-KS210
ISED ID: 7160A-KS210

9 Test setup photos

Setup photos are included in supporting file name: "EMC_HANC1-005-20001_FCC_15C_Setup_Photos.pdf"

10 Test Equipment And Ancillaries Used For Testing

Equipment Name/Type	Manufacturer	Model	Serial #	Calibration Cycle	Last Calibration Date
EMI Receiver/Analyzer	Rohde&Schwarz	ESU 40	100251	3 Years	7/16/2019
Loop antenna	ETS Lindgren	6507	161344	3 Years	10/26/2017
Biconlog Antenna	EMCO	3142E	166067	3 years	3/12/2020
Horn Antenna	EMCO	3115	35111	3 years	4/17/2019
Horn Antenna	ETS Lindgren	Horn 3117-PA	215984	3 years	1/26/2018
Compact Digital Barometer	Control Company	D4540001	130070752	3 Years	4/13/2020

Note: Equipment used meets the measurement uncertainty requirements as required per applicable standards for 95% confidence levels.
Calibration due dates, unless defined specifically, falls on the last day of the month. Items indicated "N/A" for cal status either do not specifically require calibration or is internally characterized before use.

Test Report #: EMC_HANC1-005-20001_15.247_BTLE_DTS
Date of Report 2020-12-02

FCC ID: VC3-KS210
ISED ID: 7160A-KS210

11 History

Date	Template Revision	Changes to report	Prepared by	Approved by
2020-10-20	EMC_HANC1-005-20001_15.247_BTLE_DTS	Initial Version	Kris Lazarov	Cindy Li
2020-12-02	EMC_HANC1-005-20001_15.247_BTLE_DTS_REV1	Remove unused model and FCC ID KS200, Add complete evaluation for all requirements based on test data from module, add evaluation for non-restricted band 2.39 GHz to 2.4 GHz based on spurious emission trace data	Kris Lazarov	Cindy Li

<<< The End >>>