

FCC UNII RF TEST REPORT



Test Report Number.....	WAP-19052921-LC-FCC-UNII-G4L
Applicant.....	Ford Motor Company
Applicant Address.....	Building 5, 20300 Rotunda Dr., Dearborn, Michigan, United States 48124
Product Name.....	Vehicle Infotainment System
Model Number.....	SYNC-G4L
Family Product/Model.....	N/A
FCC ID.....	KMH-SYNCG4L
ISED ID.....	1422A-SYNCG4L
Date of EUT received.....	06/12/2019
Date of Test.....	06/12/2019 – 07/29/2019
Report Issue Date.....	08/02/2019
Test Standards.....	47CFR Part 15.407
Test Result.....	Pass

Issued By:

Vista Laboratories

1261 Puerta Del Sol, San Clemente, CA 92673 USA

www.vista-compliance.com

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Tested by:

Bruce Li/Test Engineer

Approved By:

David Zhang/Technical Manager

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Product:	Vehicle Infotainment System
Model Number:	SYNC-G4L



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Laboratory Introduction

Vista Labs is an A2LA accredited 17025 compliant regulatory compliance testing laboratories (Cert. number: 4848-01) strategically located in Orange County, providing services in the electrical and telecommunication industries. Vista labs is also recognized testing facility for Australia (ACMA), Chinese Taipei (BSMI), Chinese Taipei (NCC), Hong Kong (OFCA), Israel (MOC), Korea (RRA), Singapore (IMDA), Vietnam (MIC), etc.

Our comprehensive testing services include safety testing, EMC emission and susceptibility testing, RF and wireless testing (including DFS).

As your partner, Vista investigates appropriate test standards, develops test plans, performs troubleshooting & failure analysis, reviews documentation, and provides test reports for a complete compliance testing and certification package.



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Model Number:	SYNC-G4L



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REVISION HISTORY

Revision	Issue Date	Description	Note
Original	08/06/2019	Original release	N/A

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Model Number:	SYNC-G4L



1 General Information

1.1 Applicant

Applicant:	Ford Motor Company
Applicant address:	Building 5, 20300 Rotunda Dr., Dearborn, Michigan, United States 48124
Manufacturer:	Ford Motor Company
Manufacturer Address:	Building 5, 20300 Rotunda Dr., Dearborn, Michigan, United States 48124

1.2 Product information

Product Name	Vehicle Infotainment System
Model Number	SYNC-G4L
Family Model Number	N/A
Serial Number	1SN003G5 (Conducted), 1SN003GV (Radiated)
Frequency Band	BLE: 2402-2480MHz 802.11b/g/n-20MHz: 2412-2462MHz 802.11a/n-20MHz: 5180-5320MHz, 5500-5720MHz, 5725-5825MHz 802.11n-40MHz: 5190-5310MHz, 5510-5710MHz, 5755-5795MHz 802.11ac: 5210-5290MHz, 5530-5690MHz, 5775MHz
Type of modulation	BLE: GFSK 802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g: OFDM-CCK (BPSK, QPSK, 16QAM, 64QAM) 802.11a/n/ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
Equipment Class/ Category	DSS, DTS, UNII
Maximum output power	See test result
Antenna Information	PCB trace antenna (WiFi1 Antenna, WiFi2 Antenna, Bluetooth Antenna) Peak Gain: WiFi1 Antenna: 3.29 dBi @2.4GHz, 8.09 dBi @5GHz WiFi2 Antenna: 0.84 dBi @2.4GHz, 5.68 dBi @5GHz Bluetooth Antenna: 3.02 dBi @2.4GHz Directional Gain: WiFi1 & WiFi2 Antenna: 5.16 dBi @2.4GHz, 9.98 dBi @5GHz
Clock Frequencies	N/A
Port/Connectors	Micro USB, CAN bus
Input Power	Vehicle Battery powered: 12VDC
Power Adapter Manu/Model	N/A
Power Adapter SN	N/A
Hardware version	N/A
Software version	N/A
Simultaneous Transmission	BLE and WLAN can transmit simultaneously
Additional Info	N/A

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1.3 Test standard and method

Test standard	47CFR Part 15.407
Test method	ANSI C63.10: 2013 789033 D02 General UNII Test Procedures New Rules v02r01

1.4 Test Purpose and statement

The purpose of this test report is intended to demonstrate the compliance of product listed in section 1.2, received from company listed in section 1.1, to the requirements of standard and method listed in section 1.3. Based on our test results, we conclude that the product tested complies with the requirements of the standards indicated.

2 Test site information

Lab performing tests	Vista Laboratories
Lab Address	1261 Puerta Del Sol, San Clemente, CA 92673 USA
Phone Number	+1 (949) 393-1123
Website	www.Vista-compliance.com

Test condition	Test Engineer	Test Environment	Test Date
RF conducted	Bruce Li	23.5°C / 58.2%/996 mbar	06/12/2019 – 07/29/2019
Radiated	Cameron Wu	23.5°C / 58.2%/996 mbar	06/12/2019 – 07/29/2019

3 Modification of EUT

The EUT is an engineering test sample loaded with RF testing firmware specifically designed to support the RF TX/RX measurement in different aspects.

4 Test configuration and operation

4.1 EUT test configuration

EUT is powered by external DC power supply for testing purpose. EUT's RF antenna port is connected to spectrum analyzer through RF test cable for measurement. The test software is used to set EUT to different transmission mode in terms of radio mode (WLAN, BLE), test channel, data rate, etc.

4.2 EUT test channel

Radio	Channel	Radio	Channel
802.11-a	5180	802.11-a	5260
802.11-a	5200	802.11-a	5280
802.11-a	5240	802.11-a	5320
802.11-n-20	5180	802.11-n-20	5260
802.11-n-20	5200	802.11-n-20	5280
802.11-n-20	5240	802.11-n-20	5320
802.11-n-40	5190	802.11-n-40	5270
802.11-n-40	5230	802.11-n-40	5310
802.11-ac-80	5210	802.11-ac-80	5290

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Radio	Channel	Radio	Channel
802.11-a	5500	802.11-a	5745
802.11-a	5600	802.11-a	5785
802.11-a	5700	802.11-a	5825
802.11-n-20	5500	802.11-n-20	5745
802.11-n-20	5600	802.11-n-20	5785
802.11-n-20	5700	802.11-n-20	5825
802.11-n-40	5510	802.11-n-40	5755
802.11-n-40	5590	802.11-n-40	5795
802.11-n-40	5670	802.11-ac-80	5775
802.11-ac-80	5530		

Radio	Channel		
802.11-a	5720		
802.11-n-20	5720		
802.11-n-40	5710		
802.11-ac-80	5690		

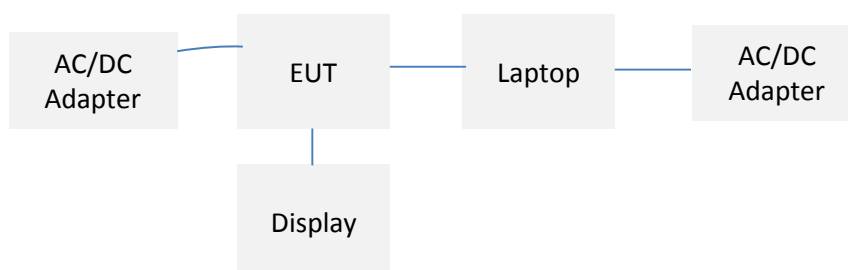
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Model Number:	SYNC-G4L



4.3 Supporting Equipment

Index	Description	Model	S/N	Brand	Remark
1	AC/DC Adapter	HA45NM140	00285K	DELL	-
2	Laptop	Inspiron 15	245S2F2	DELL	-
3	Display	-	84007293	Ford	-
4	AC/DC Adapter	GST 60A12-P15	EB74QB1066	MEAN WELL	-

4.4 EUT setup diagram



4.5 EUT operation

The test software is used to set EUT to different transmission mode in terms of radio mode (WLAN, BLE), test channel, data rate, etc.

4.6 Test software

Index	Description	Remark
1	Diagnostic Engineering Tool V8.4.0	Load test firmware to EUT and provide basic control
2	PuTTY V0.70	Establish communication to EUT radio module
3	EMISoft Vasona 6.0049	EMC/Spurious emission test software used during testing

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5 EUT and test setup pictures

[See associated filing](#)

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6 Test Summary

FCC Rules	Test Item	Section	Verdict
§15.203	Antenna Requirement	8.1	Pass
§15.407(e)	6 dB Bandwidth	8.2	Pass
§15.407(a)	26 dB Bandwidth	8.3	Pass
§15.407(a)	Conducted Maximum Output Power	8.5	Pass
§15.407(a)	Power Spectral Density	8.6	Pass
§15.407(c)	Automatically Discontinue Transmission	8.7	Pass
§15.205, §15.209, §15.407(b)	Radiated Emissions & Unwanted Emissions into Restricted Frequency Bands	8.8	Pass
§15.207 (a)	AC Power Line Conducted Emissions	8.9	N/A

Note1: EUT is powered by Vehicle mains. It does not connect to public AC mains. This item is not applicable.

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7 Uncertainty of Measurement

Test item	Measurement Uncertainty (dB)
RF Output Power (Conducted)	±1.2 dB
Power Spectral Density	±0.9 dB
Unwanted Emission (conducted)	±2.6 dB
Occupied Channel Bandwidth	±5 %
Radiated Emission (9KHz-30MHz)	±3.5 dB
Radiated Emission (30MHz-1GHz)	±4.6 dB
Radiated Emission (1-18GHz)	±4.9 dB
Radiated Emission (18-40GHz)	±3.5 dB

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8 Test summary and result

8.1 Antenna Requirement

8.1.1 Requirement

Per § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall 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 manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

8.1.2 Result

Analysis:

- EUT uses PCB trace antenna. No standard RF connector or coupling is used.

Conclusion:

EUT complies with antenna requirement in § 15.203.

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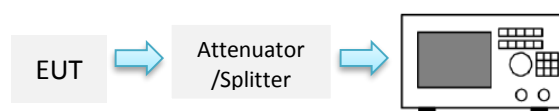
8.2 6 d Bandwidth

8.2.1 Requirement

§ 15.407 (e)

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

8.2.2 Test setup



8.2.3 Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v01, Section C) Emission bandwidth.

The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described above (i.e., RBW = 100 kHz, VBW $\geq 3 \times$ RBW, peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Use automatic bandwidth measurement capability on instrument to obtain BW result.

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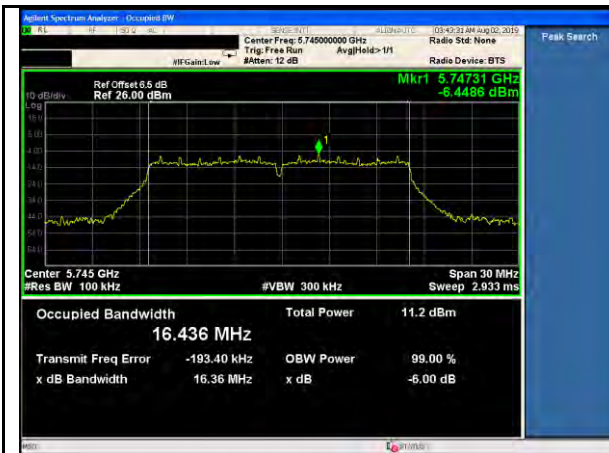


8.2.4 Test Result

For U-NII-3 band

Mode/ Bandwidth	Channel	Frequency (MHz)	Data rate	Measured Bandwidth (KHz)	Minimum Bandwidth (KHz)	Result
11a	149	5745	6Mbps	16360	500	Pass
11a	157	5785	6Mbps	16410	500	Pass
11a	165	5825	6Mbps	16380	500	Pass
11n-20M	149	5745	MCS0	17010	500	Pass
11n-20M	157	5785	MCS0	16950	500	Pass
11n-20M	165	5825	MCS0	16700	500	Pass
11n-40M	155	5755	MCS0	33250	500	Pass
11n-40M	159	5795	MCS0	34470	500	Pass
11ac-80M	155	5775	VHC-MCS0	16540	500	Pass

8.2.5 Test Plots



6dB BW 802.11a 5745MHz



6dB BW 802.11a 5785MHz



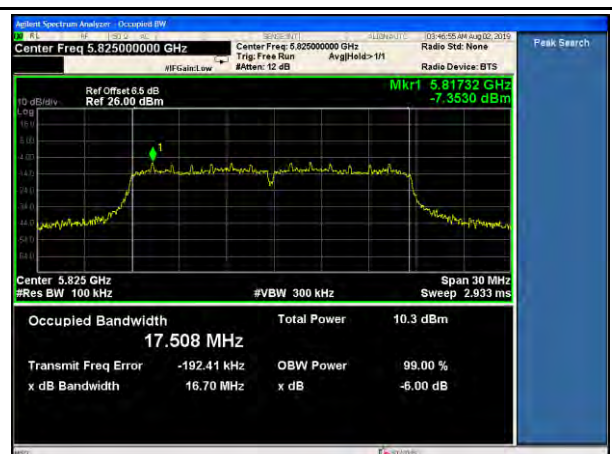
6dB BW 802.11a 5825MHz



6dB BW 802.11n-20M 5745MHz



6dB BW 802.11n-20M 5785MHz



6dB BW 802.11n-20M 5825MHz

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6dB BW 802.11n-40M 5755MHz



6dB BW 802.11n-40M 5795MHz



6dB BW 802.11ac-80M 5775MHz

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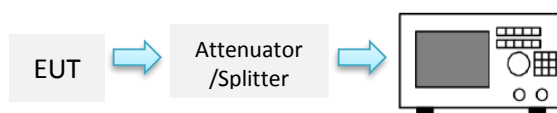
8.3 26 d Bandwidth

8.3.1 Requirement

§ 15.407 (a)

This section is for reporting purpose only. There are no restriction limits for bandwidth.

8.3.2 Test setup



8.3.3 Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v01, Section C) Emission bandwidth.

The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 26 dB, if the functionality described above (i.e., RBW , VBW $\geq 3 \times$ RBW, peak detector with maximum hold) is implemented by the instrumentation function.

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Use automatic bandwidth measurement capability on instrument to obtain BW result.

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8.3.4 Test Result

For U-NII-1 band

Mode/ Bandwidth	Channel	Frequency (MHz)	Data rate	Measured 26 dB Bandwidth (KHz)	Minimum Bandwidth (KHz)	Result
11a	36	5180	6Mbps	20040	N/A	N/A
11a	44	5220	6Mbps	19450	N/A	N/A
11a	48	5240	6Mbps	20400	N/A	N/A
11n-20M	36	5180	MCS0	19920	N/A	N/A
11n-20M	44	5220	MCS0	19950	N/A	N/A
11n-20M	48	5240	MCS0	19850	N/A	N/A
11n-40M	38	5190	MCS0	40400	N/A	N/A
11n-40M	46	5230	MCS0	40510	N/A	N/A
11ac-80M	42	5210	VHC-MCS0	82110	N/A	N/A

For U-NII-2A band

Mode/ Bandwidth	Channel	Frequency (MHz)	Data rate	Measured 26 dB Bandwidth (KHz)	Minimum Bandwidth (KHz)	Result
11a	52	5260	6Mbps	19540	N/A	N/A
11a	60	5300	6Mbps	20570	N/A	N/A
11a	64	5320	6Mbps	19590	N/A	N/A
11n-20M	52	5260	MCS0	20090	N/A	N/A
11n-20M	60	5300	MCS0	19980	N/A	N/A
11n-20M	64	5320	MCS0	20080	N/A	N/A
11n-40M	54	5270	MCS0	40720	N/A	N/A
11n-40M	62	5310	MCS0	40710	N/A	N/A
11ac-80M	58	5290	VHC-MCS0	113000	N/A	N/A

For U-NII-2C band

Mode/ Bandwidth	Channel	Frequency (MHz)	Data rate	Measured 26 dB Bandwidth (KHz)	Minimum Bandwidth (KHz)	Result
11a	100	5500	6Mbps	19920	N/A	N/A
11a	120	5600	6Mbps	20620	N/A	N/A
11a	140	5700	6Mbps	19770	N/A	N/A
11n-20M	100	5500	MCS0	19970	N/A	N/A
11n-20M	120	5600	MCS0	19830	N/A	N/A
11n-20M	140	5700	MCS0	19920	N/A	N/A
11n-40M	102	5510	MCS0	39790	N/A	N/A
11n-40M	110	5590	MCS0	39930	N/A	N/A
11n-40M	134	5670	MCS0	39660	N/A	N/A
11ac-80M	106	5530	VHC-MCS0	81500	N/A	N/A
11ac-80M	136	5610	VHC-MCS0	82410	N/A	N/A

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For U-NII-2C band Cross-band channel

Mode/ Bandwidth	Channel	Frequency (MHz)	Data rate	Measured 26 dB Bandwidth (KHz)	Minimum Bandwidth (KHz)	Result
11a	144	5720	6Mbps	19400	N/A	N/A
11n	144	5720	MCS0	19940	N/A	N/A
11n-40M	144	5710	MCS0	39780	N/A	N/A
11ac-80M	136	5690	VHC-MCS0	81560	N/A	N/A

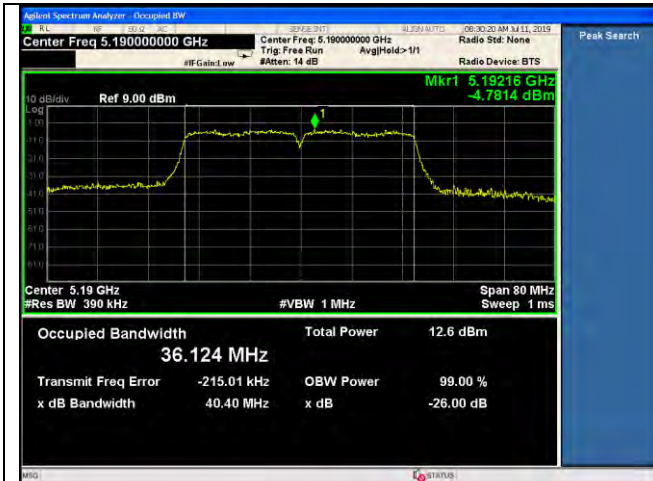
8.3.5 Test Plots



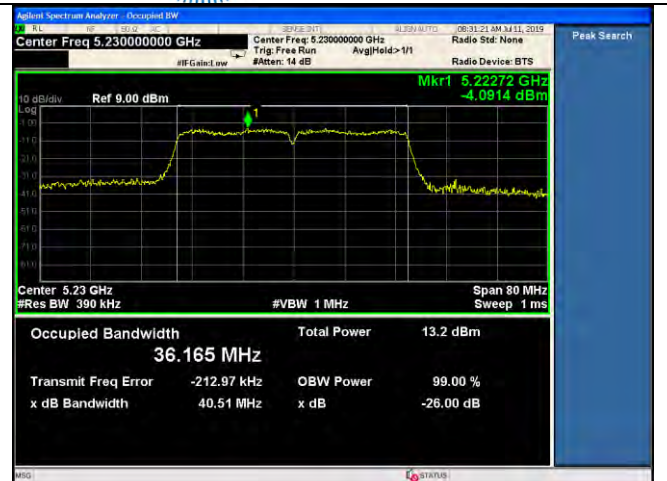
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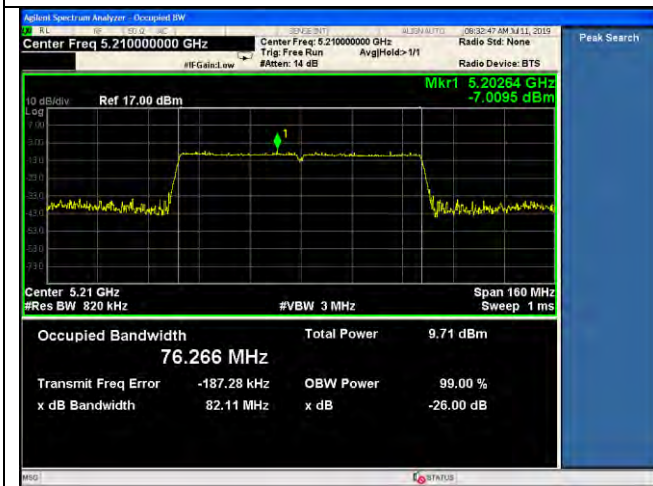
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26dB BW - 802.11n-40M 5190MHz



26dB BW - 802.11n-40M 5230MHz



26dB BW - 802.11ac-80M 5210MHz



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26dB BW -802.11a 5260MHz



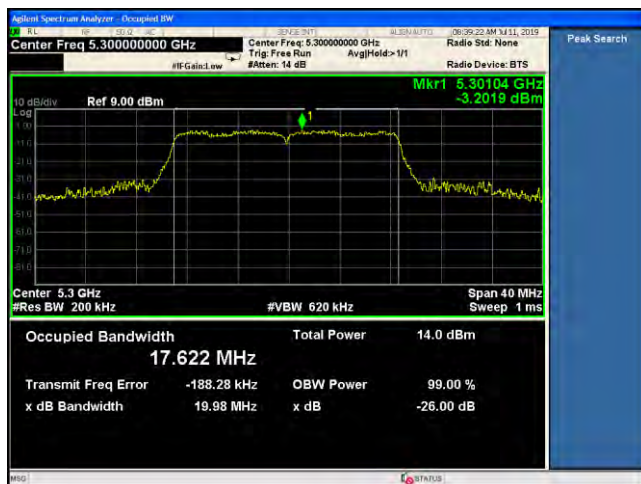
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26dB BW -802.11a 5320MHz



26dB BW -802.11n-20M 5260MHz



26dB BW -802.11n-20M 5300MHz

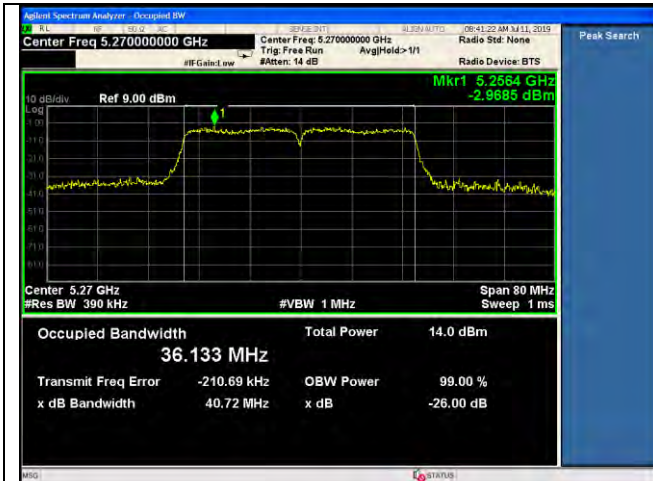


26dB BW -802.11n-20M 5320MHz

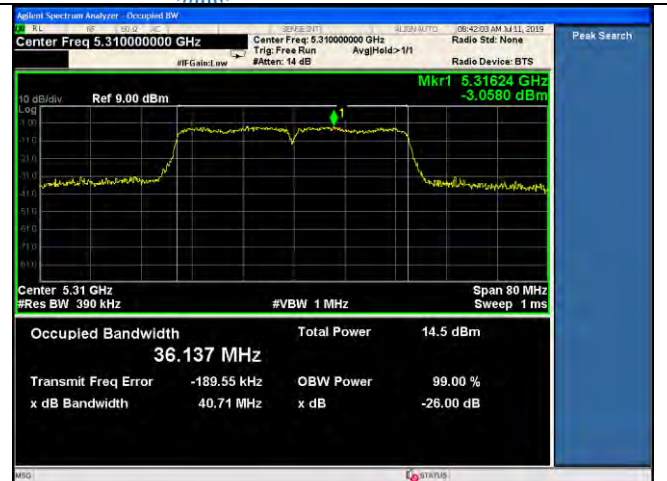
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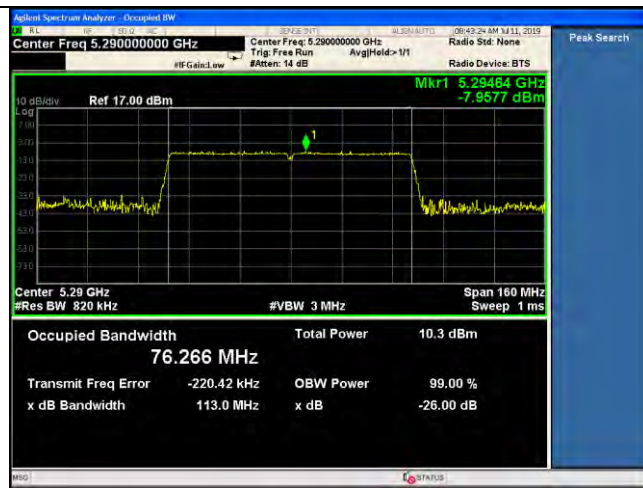
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26dB BW -802.11n-40M 5270MHz



26dB BW -802.11n-40M 5310MHz



26dB BW -802.11ac-80M 5290MHz



26dB BW -802.11a 5500MHz



26dB BW -802.11a 5600MHz



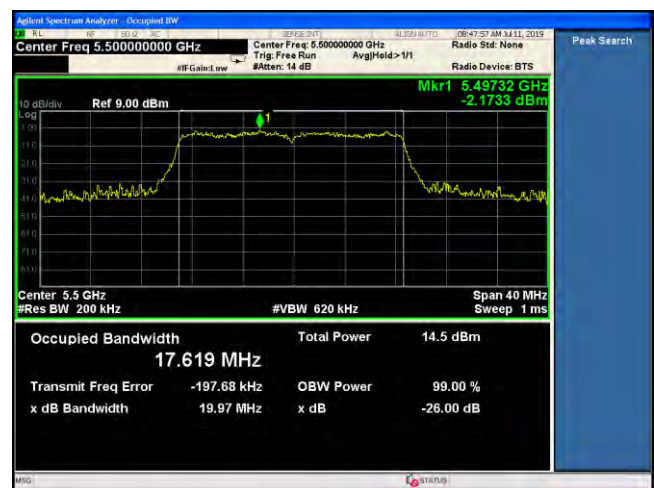
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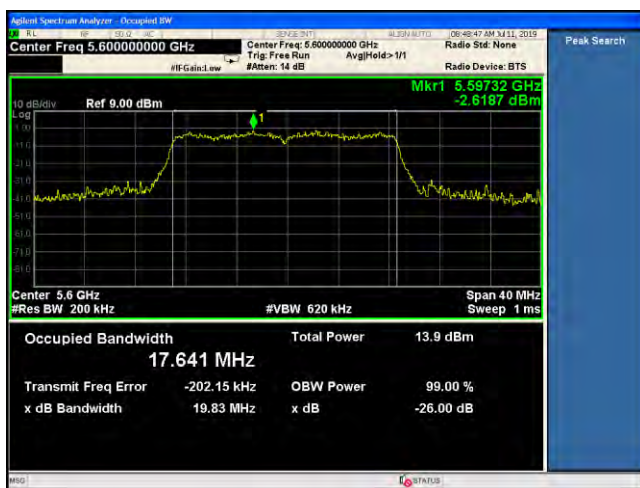
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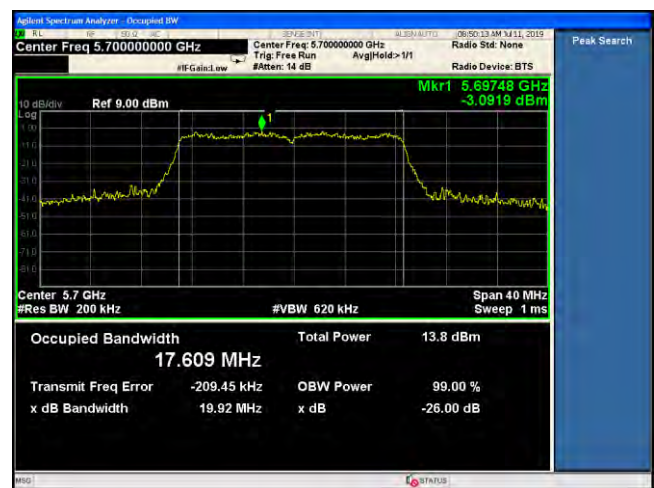
26dB BW -802.11a 5700MHz



26dB BW -802.11n-20M 5500MHz



26dB BW -802.11n-20M 5600MHz



26dB BW -802.11n-20M 5700MHz



26dB BW -802.11n-40M 5510MHz



26dB BW -802.11n-40M 5590MHz



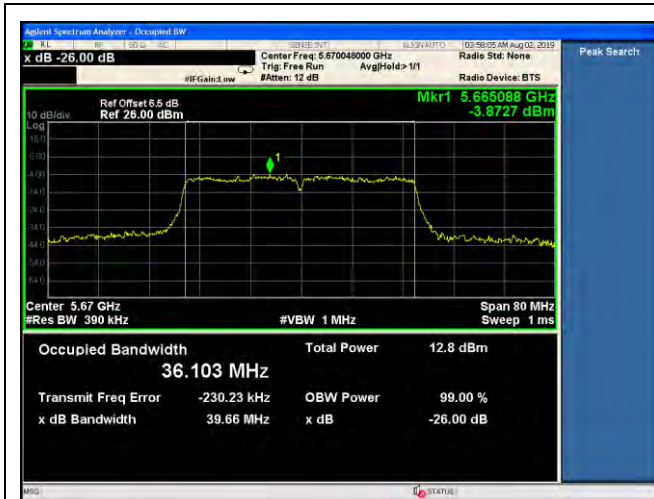
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Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



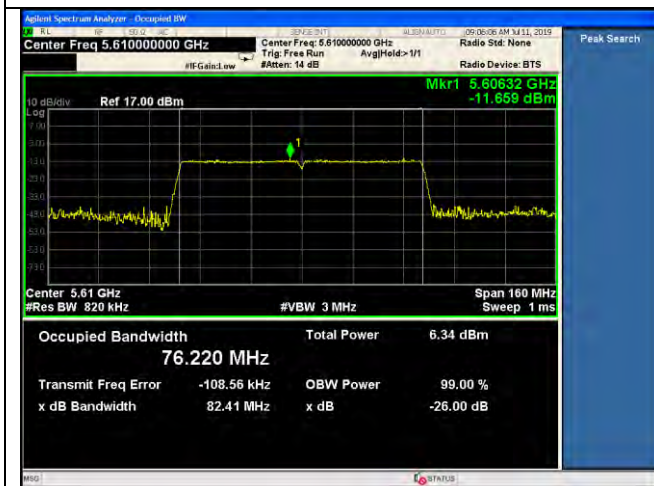
Testing Cert #4848-01



26dB BW -802.11n-40M 5670MHz



26dB BW -802.11ac-80M 5530MHz



26dB BW -802.11ac-80M 5610MHz



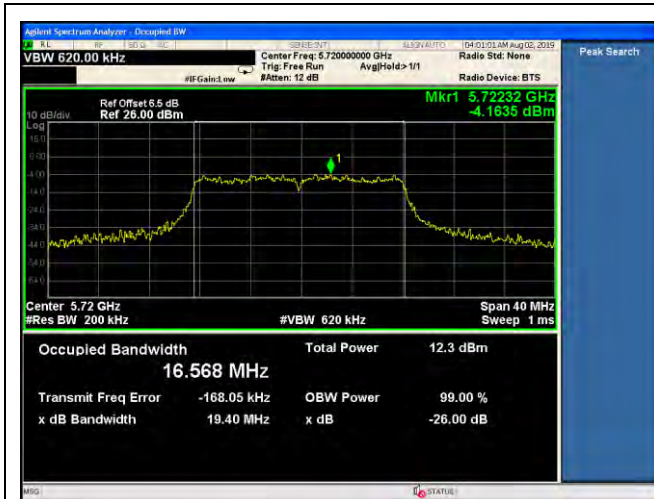
Electromagnetic Compatibility
Radio Frequency
Product Certification
International Approval

1261 Puerta Del Sol
San Clemente, CA, 92673
+1 (949) 393-1123
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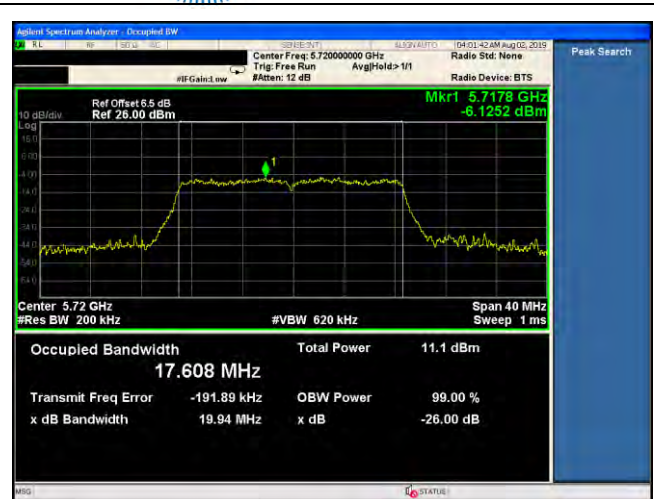
Report Number: WAP-19052921-LC-FCC-UNII-G4L
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26dB BW -802.11a-20M 5720MHz



26dB BW -802.11n-20M 5720MHz



26dB BW -802.11n-40M 5710MHz



26dB BW -802.11ac-80M 5690MHz

Report Number:	WAP-19052921-LC-FCC-UNII-G4L
Product:	Vehicle Infotainment System
Model Number:	SYNC-G4L



8.4 Maximum Output Power

8.4.1 Requirement

§ 15.407 (a)

For the 5.15–5.25 GHz bands:

For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25–5.725 GHz bands:

The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz.

For Straddle Channel, according to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, if the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Note that U-NII-2 band, devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

For the band 5.725-5.85 GHz:

The maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

8.4.2 Test setup



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8.4.3 Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v01, Section E) Maximum conducted output power, 2, b), method SA-1

1. Set span to encompass the entire emission bandwidth (EBW)(or, alternatively, the entire 99% occupied bandwidth) of the signal.
2. Set RBW=1MHz
3. Set VBW $\geq 3 \times$ RBW
4. Number of points in sweep $\geq 2 \times$ span/ RBW. (This ensures that bin-to-bin spacing is $\leq$ RBW/2, so that narrowband signals are not lost between frequency bins.)
5. Sweep time = auto couple.
6. Detector = Power averaging (RMS)
7. Trace average at least 100 traces in power averaging(rms)mode.
8. Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges.

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8.4.4 Test Result

For U-NII-1 band

Mode/ Bandwidth	Frequency (MHz)	Data rate	TX1 power (dBm)	TX2 power (dBm)	Highest or Total power (dBm)	Max Output Power (dBm)	Result
11a	5180	6Mbps	8.90	8.68	8.90	24	Pass
11a	5220	6Mbps	8.23	8.00	8.23	24	Pass
11a	5240	6Mbps	8.48	8.54	8.54	24	Pass
11n-20M	5180	MCS0	9.43	8.42	11.96	20.02	Pass
11n-20M	5220	MCS0	8.91	7.04	11.09	20.02	Pass
11n-20M	5240	MCS0	8.49	7.83	11.18	20.02	Pass
11n-40M	5190	MCS0	8.06	7.06	10.60	20.02	Pass
11n-40M	5230	MCS0	10.15	8.74	12.51	20.02	Pass
11ac-80M	5210	VHC-MCS0	6.12	3.95	8.18	20.02	Pass

For U-NII-2A band

Mode/ Bandwidth	Frequency (MHz)	Data rate	TX1 power (dBm)	TX2 power (dBm)	Highest or Total power (dBm)	Max Output Power (dBm)	Result
11a	5260	6Mbps	8.61	8.98	8.98	23.91	Pass
11a	5300	6Mbps	9.80	8.72	9.80	24.13	Pass
11a	5320	6Mbps	9.99	8.40	9.99	23.92	Pass
11n-20M	5260	MCS0	9.32	8.49	11.94	20.02	Pass
11n-20M	5300	MCS0	10.56	8.55	12.68	20.02	Pass
11n-20M	5320	MCS0	10.86	8.67	12.91	20.02	Pass
11n-40M	5270	MCS0	11.50	8.75	13.35	20.02	Pass
11n-40M	5310	MCS0	11.39	9.07	13.39	20.02	Pass
11ac-80M	5290	VHC-MCS0	5.89	3.50	7.87	20.02	Pass

For U-NII-2C band

Mode/ Bandwidth	Frequency (MHz)	Data rate	TX1 power (dBm)	TX2 power (dBm)	Highest or Total power (dBm)	Max Output Power (dBm)	Result
11a	5500	6Mbps	9.14	6.01	9.14	23.99	Pass
11a	5600	6Mbps	8.97	7.72	8.97	24	Pass
11a	5700	6Mbps	10.03	8.71	10.03	23.96	Pass
11n-20M	5500	MCS0	10.32	6.77	11.91	20.02	Pass
11n-20M	5600	MCS0	9.84	6.50	11.49	19.99	Pass
11n-20M	5700	MCS0	11.52	6.99	12.83	20.01	Pass
11n-40M	5510	MCS0	6.34	4.84	8.66	20.02	Pass
11n-40M	5590	MCS0	5.73	5.14	8.46	20.02	Pass
11n-40M	5670	MCS0	7.20	6.22	9.75	20.02	Pass
11ac-80M	5530	VHC-MCS0	5.73	5.14	8.46	20.02	Pass
11ac-80M	5610	VHC-MCS0	8.13	7.59	10.88	20.02	Pass

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For U-NII-3 band

Mode/ Bandwidth	Frequency (MHz)	Data rate	TX1 power (dBm)	TX2 power (dBm)	Highest or Total power (dBm)	Max Output Power (dBm)	Result
11a	5745	6Mbps	11.88	8.30	11.88	30	Pass
11a	5785	6Mbps	11.21	7.73	11.21	30	Pass
11a	5825	6Mbps	13.42	7.34	13.42	30	Pass
11n-20M	5745	MCS0	12.35	9.15	14.05	26.02	Pass
11n-20M	5785	MCS0	11.80	7.79	13.25	26.02	Pass
11n-20M	5825	MCS0	10.55	7.09	12.17	26.02	Pass
11n-40M	5755	MCS0	10.66	9.10	12.96	26.02	Pass
11n-40M	5795	MCS0	11.25	8.68	13.16	26.02	Pass
11ac-80M	5775	VHC-MCS0	8.60	3.52	9.77	26.02	Pass

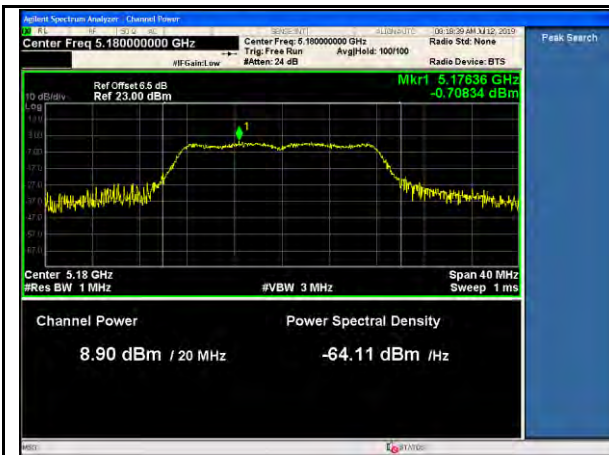
For U-NII-2C band Cross-band channel

Mode/ Bandwidth	Frequency (MHz)	Data rate	TX1 power (dBm)	TX2 power (dBm)	Highest or Total power (dBm)	Max Output Power (dBm)	Result
11a	5720	6Mbps	11.94	6.67	11.94	23.88	Pass
11n	5720	MCS0	11.26	5.94	12.38	20.02	Pass
11n-40M	5710	MCS0	10.04	7.81	12.08	20.02	Pass
11ac-80M	5690	VHC-MCS0	6.08	6.65	9.38	20.02	Pass

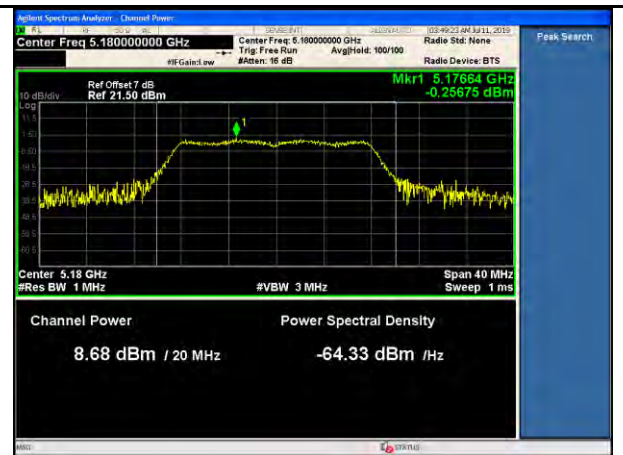
Note:

- 1) For 802.11a, the highest output power is recorded.
- 2) For 5GHz non-11a mode, it's under 2x2 MIMO mode, the output power is combined together to compare to limit.
- 3) For 5GHz non-11a mode, directional gain is calculated per KDB 662911 D01. For 5GHz WiFi non-11a mode, directional gain = 9.98 dBi, exceeding 6 dBi. The power and PSD limit will be reduced by the amount that it exceeds 6 dBi.

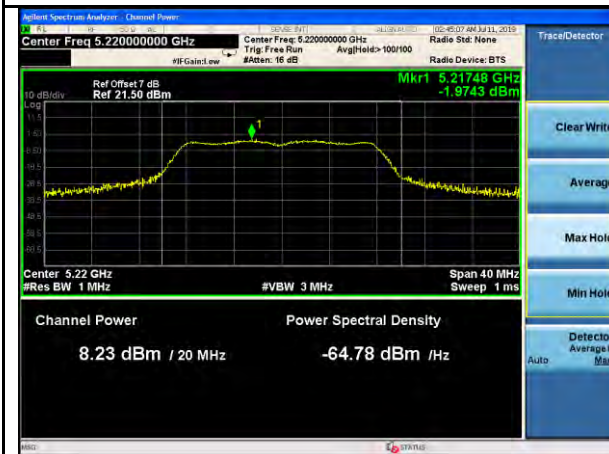
8.4.5 Test Plots



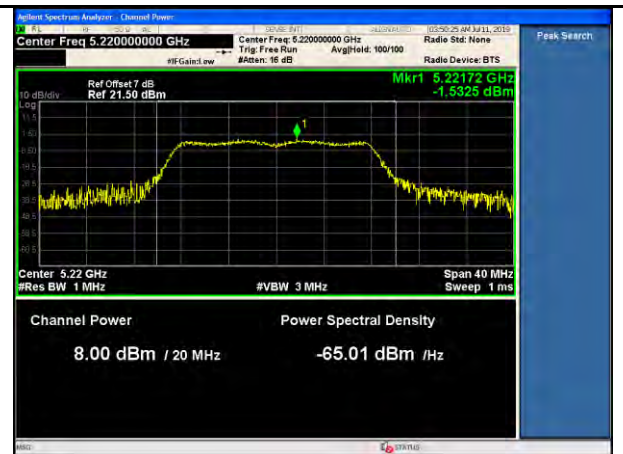
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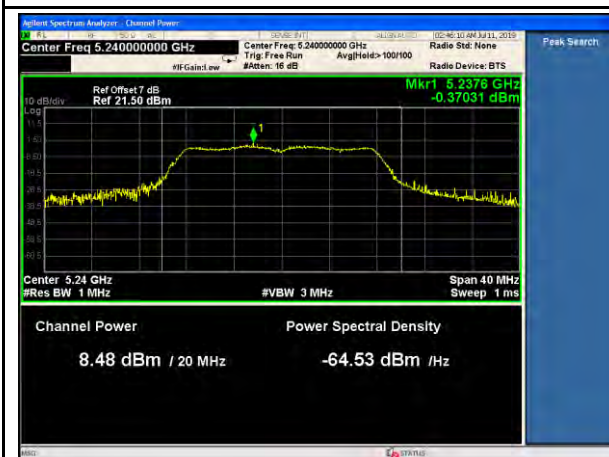
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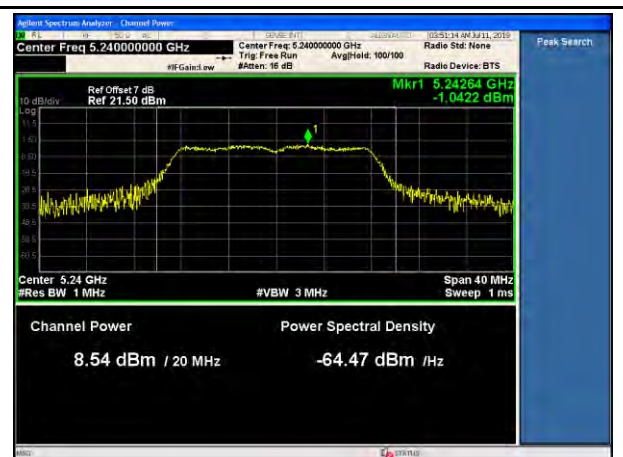
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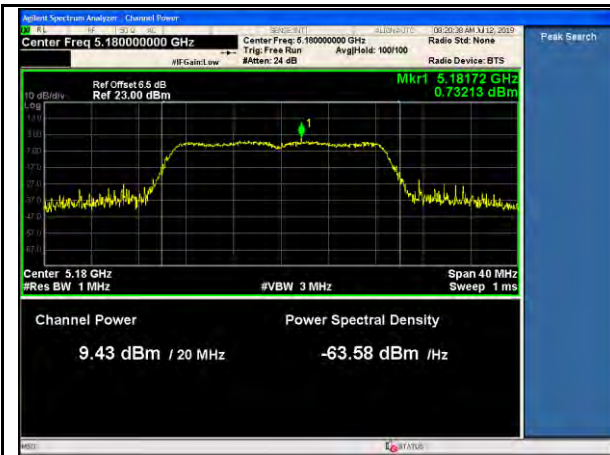
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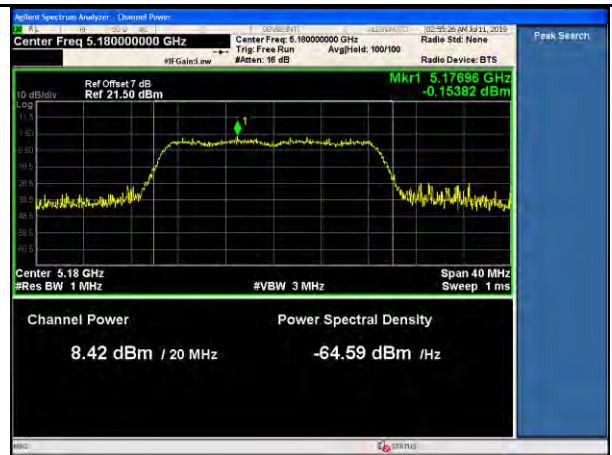
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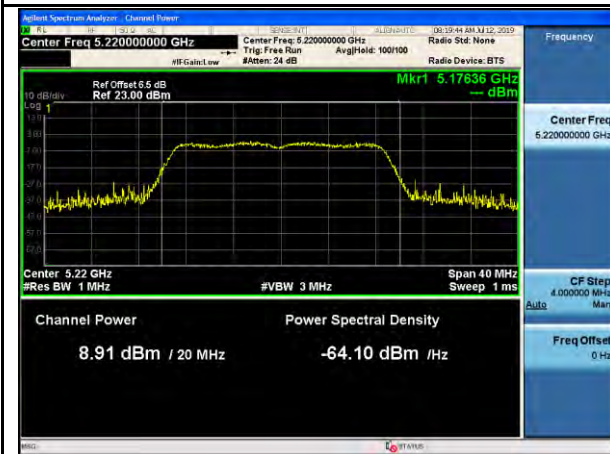
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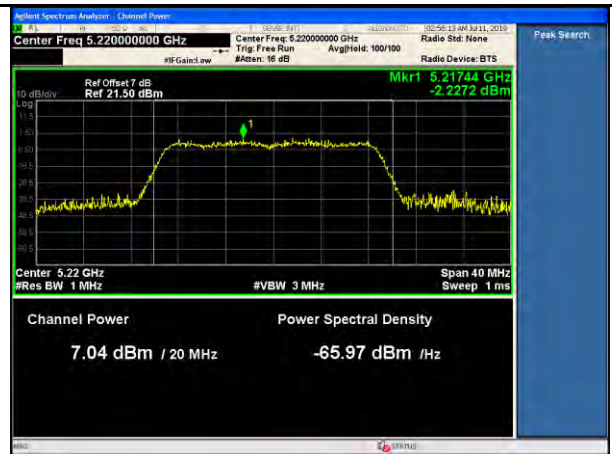
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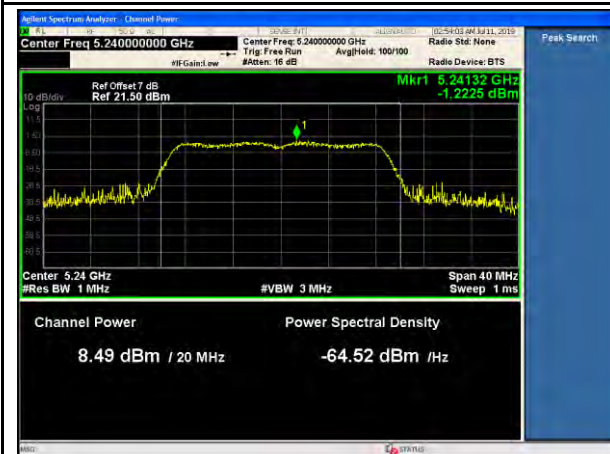
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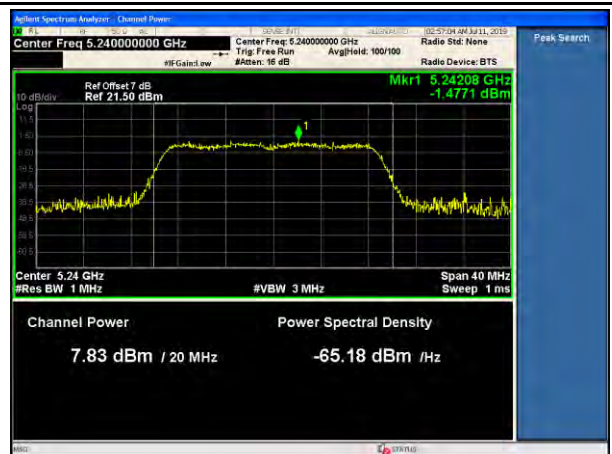
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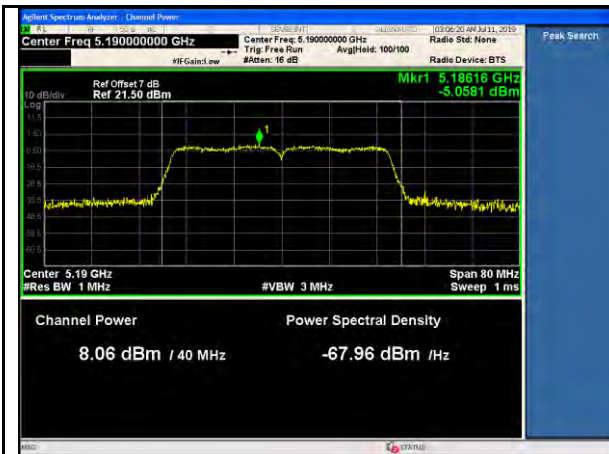
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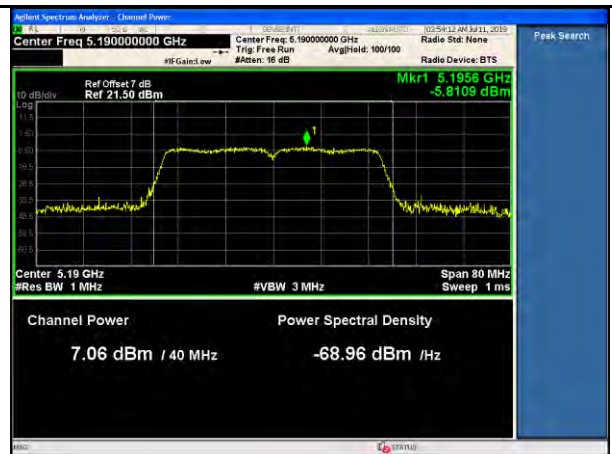
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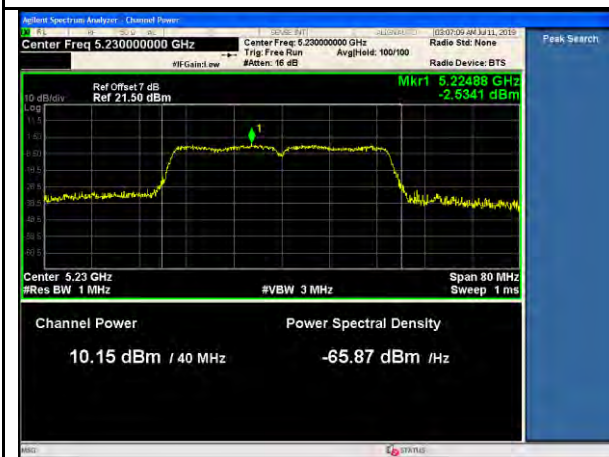
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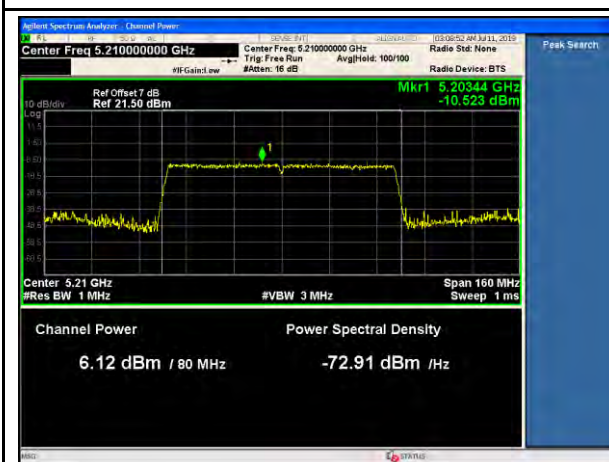
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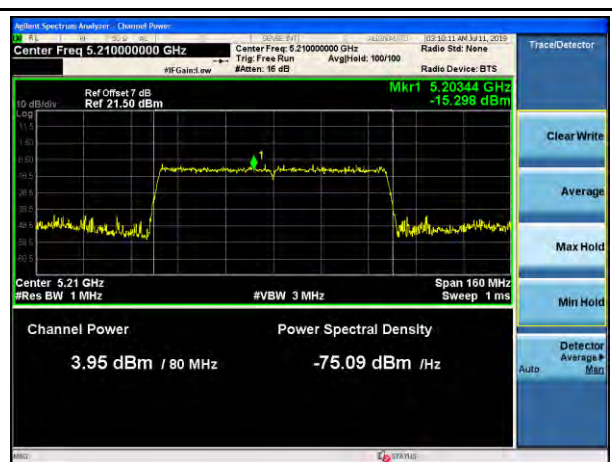
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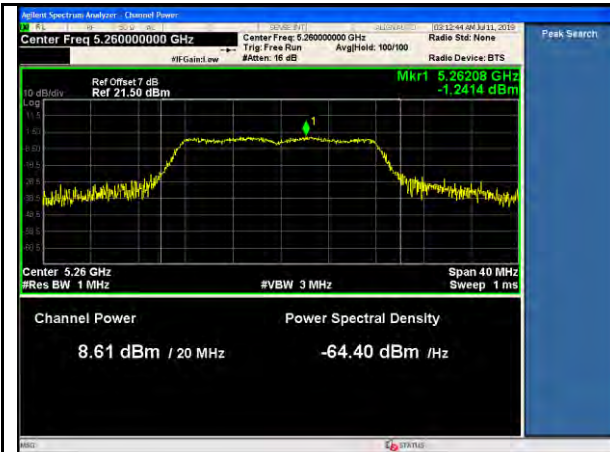
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802.11ac-80MHz- 5210MHz-PWR-TX1



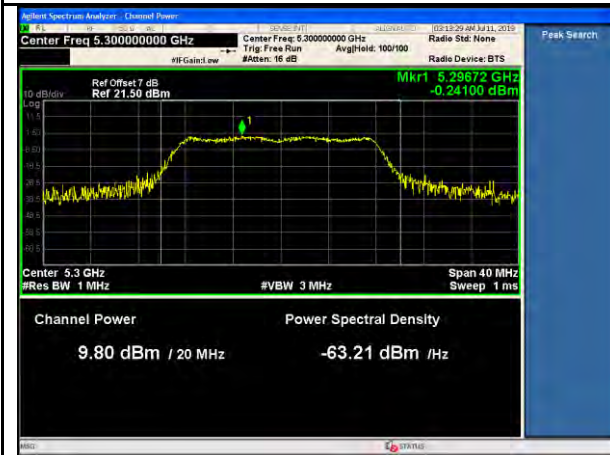
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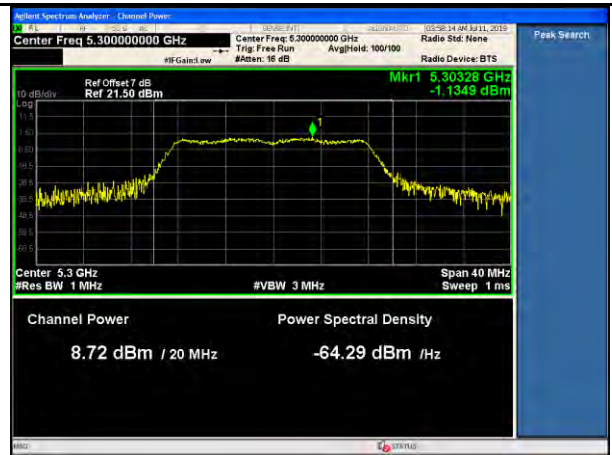
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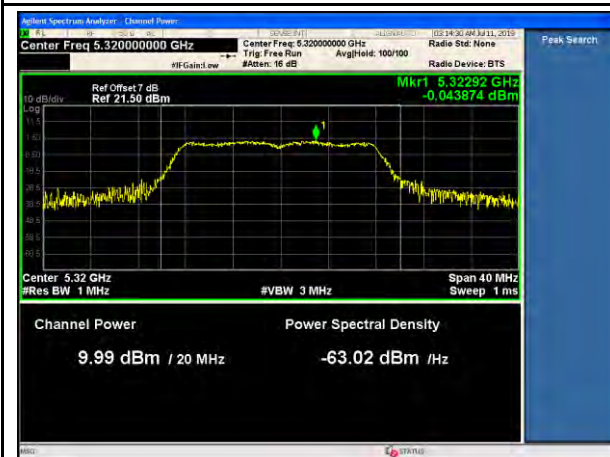
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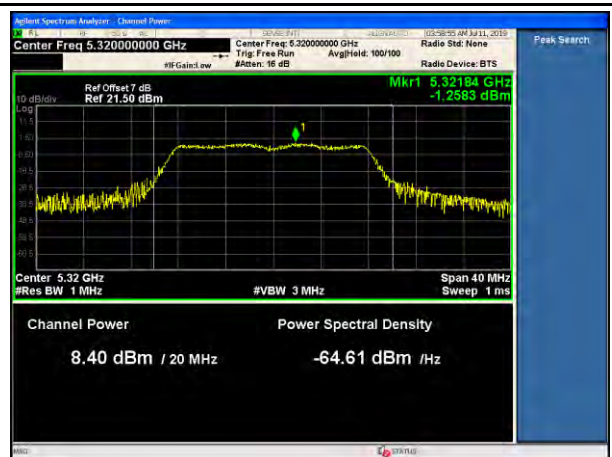
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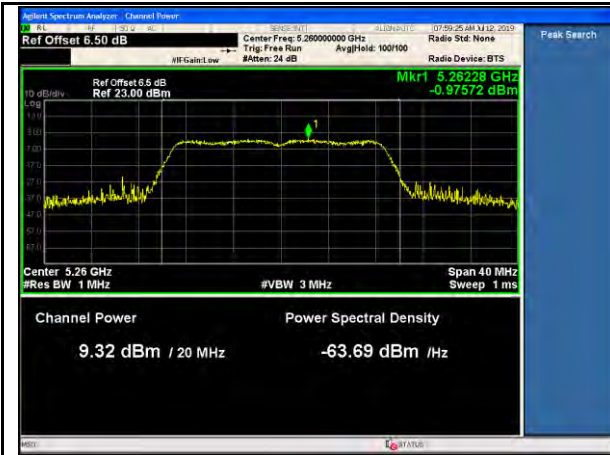


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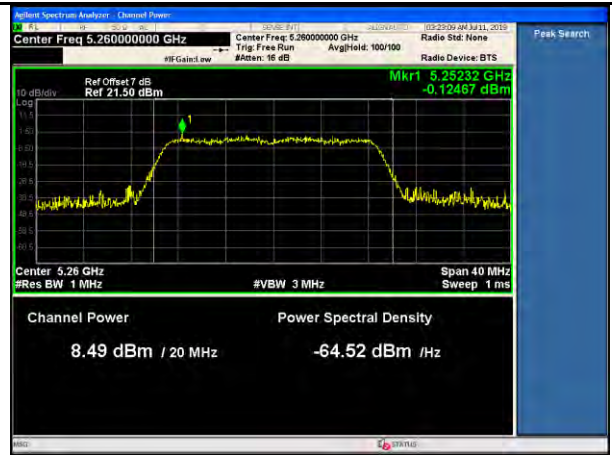


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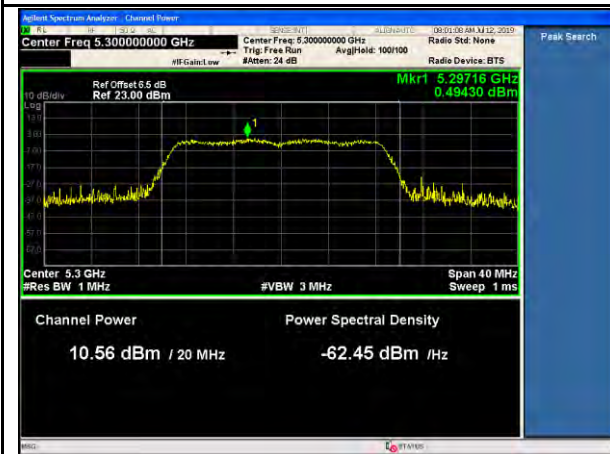
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 Product: Vehicle Infotainment System
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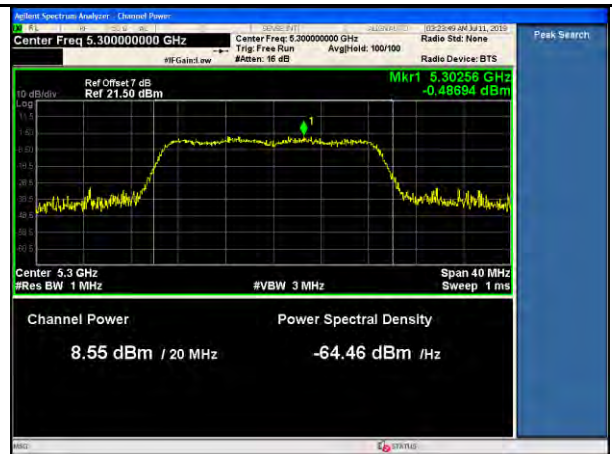
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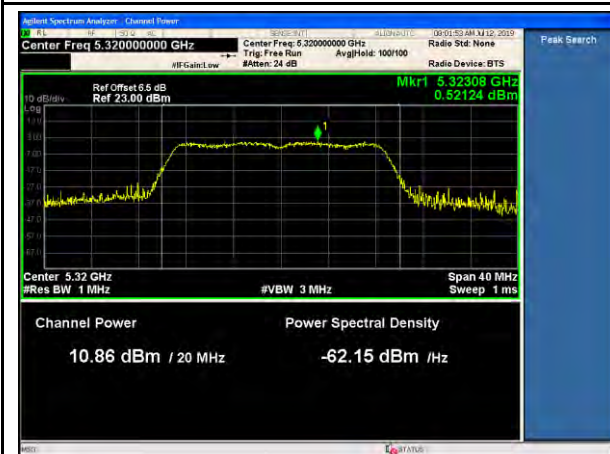
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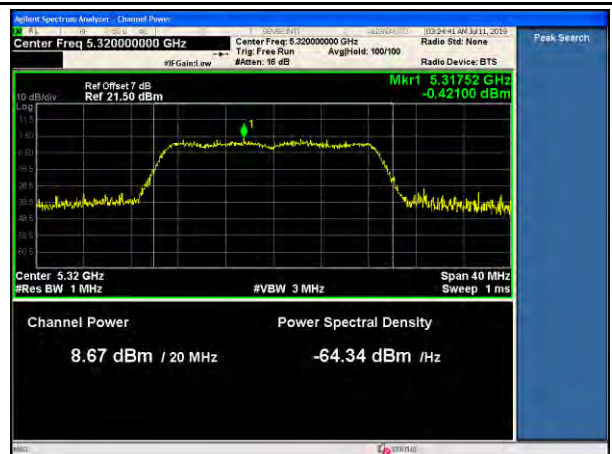
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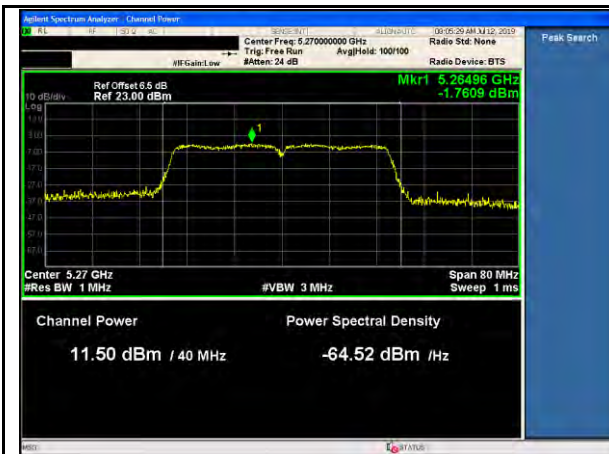
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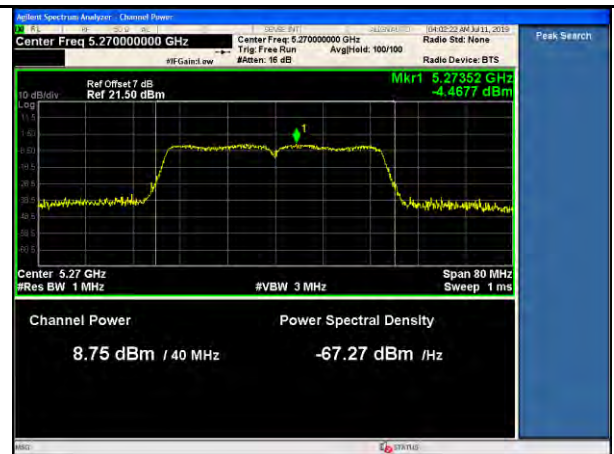
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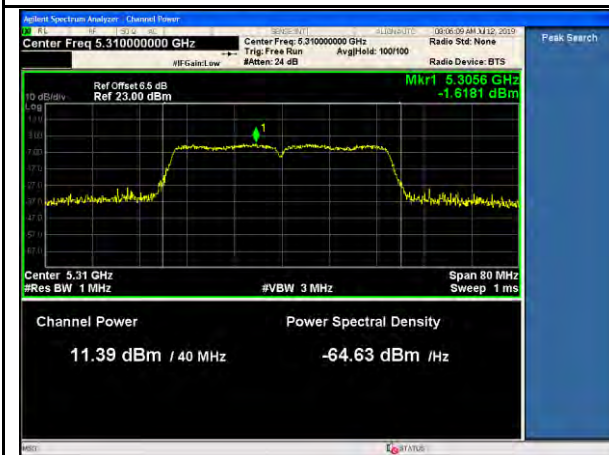
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802.11n-40MHz- 5270MHz-PWR-TX1



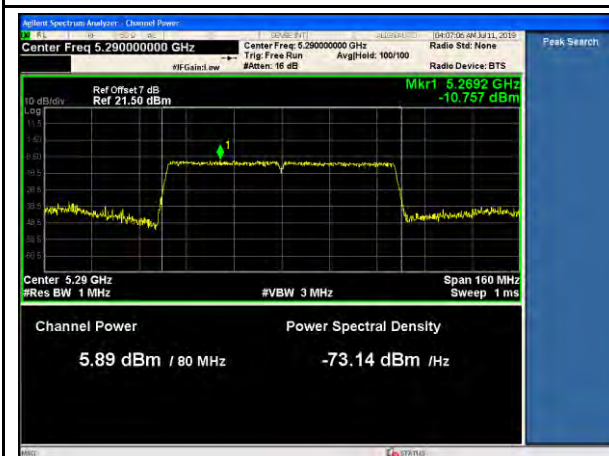
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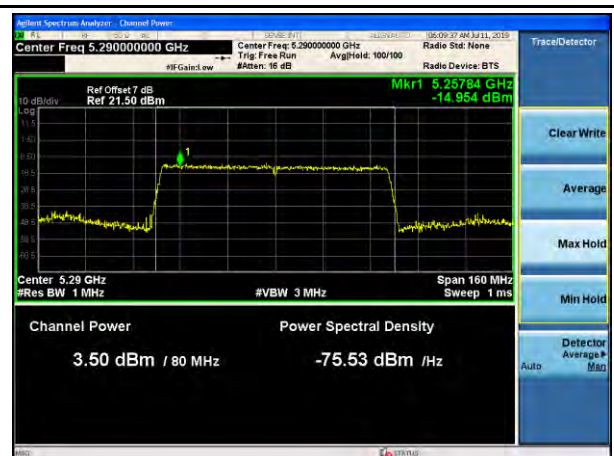
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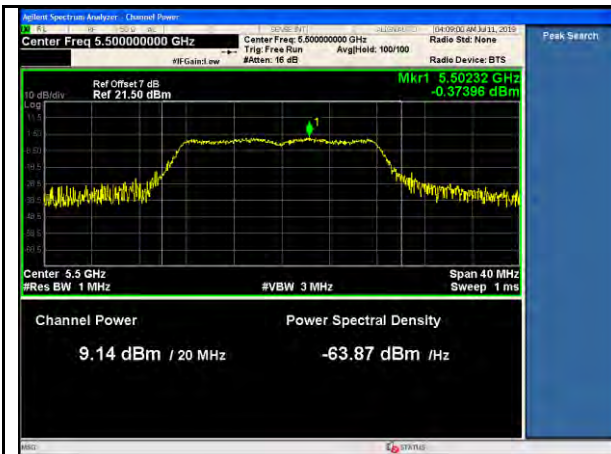
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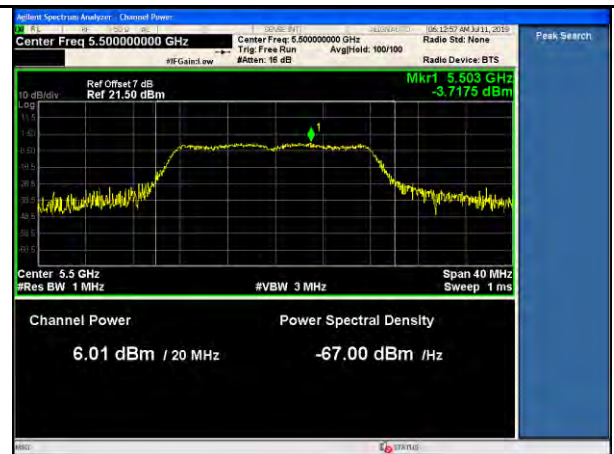
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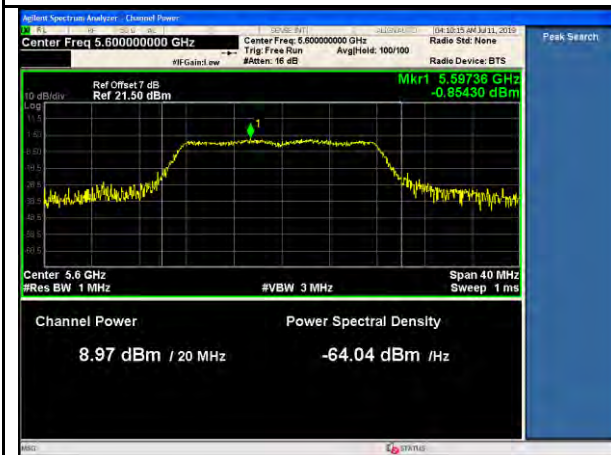
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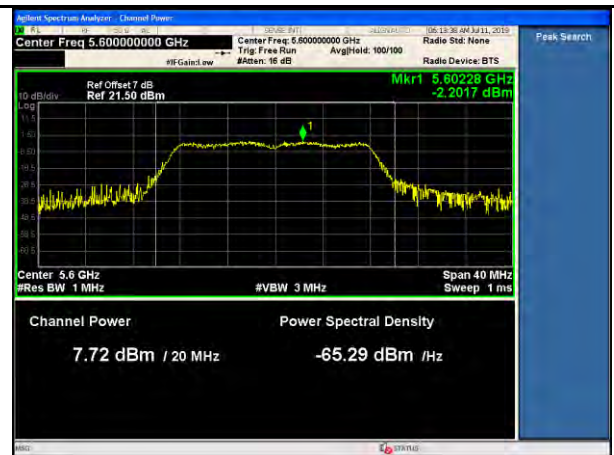
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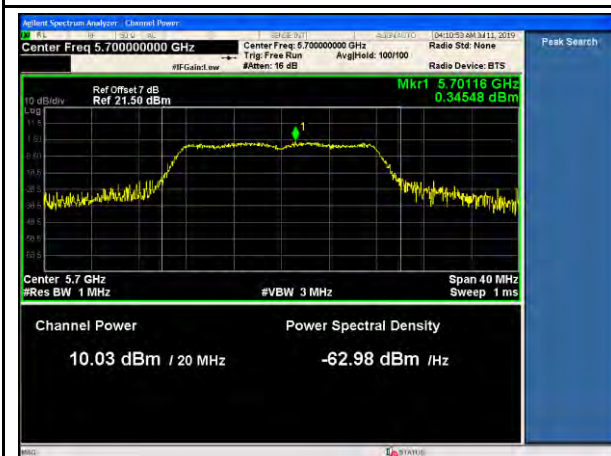
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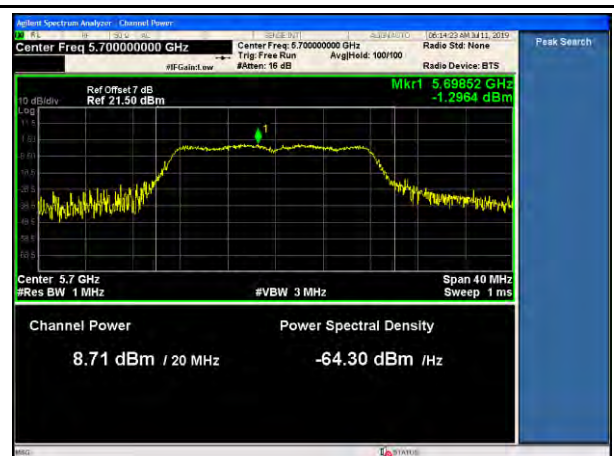
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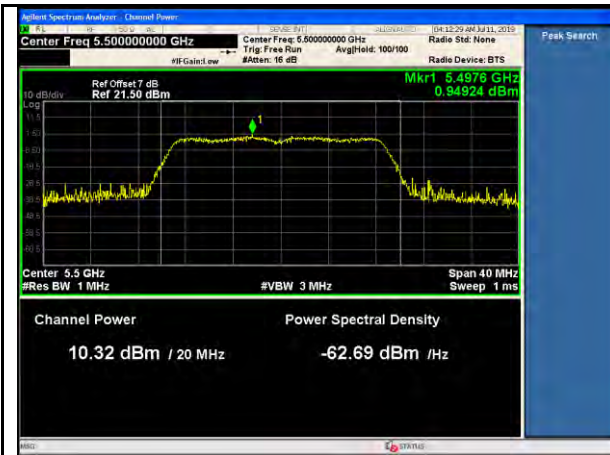


802.11a 5700MHz-PWR-TX1

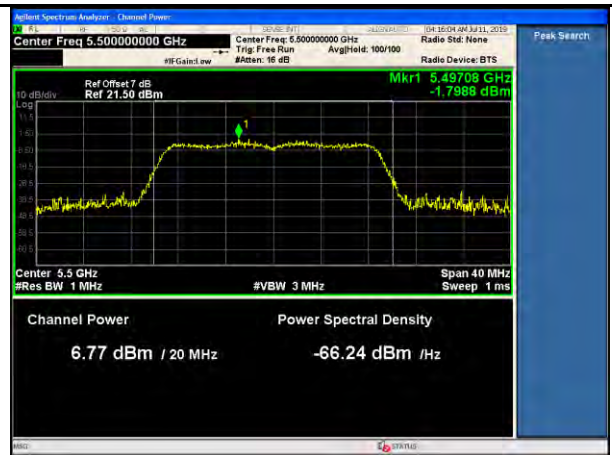


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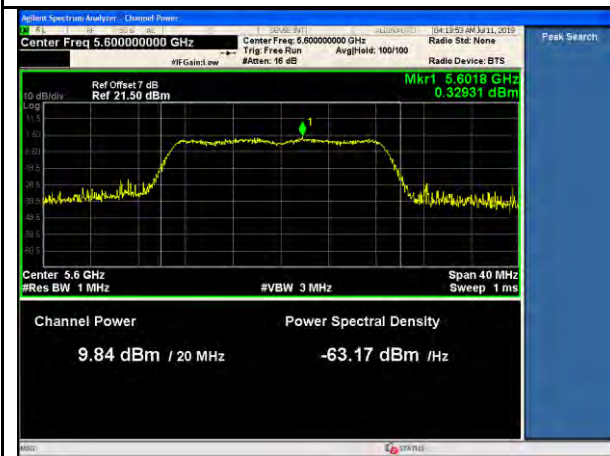
Report Number: WAP-19052921-LC-FCC-UNII-G4L
 Product: Vehicle Infotainment System
 Model Number: SYNC-G4L



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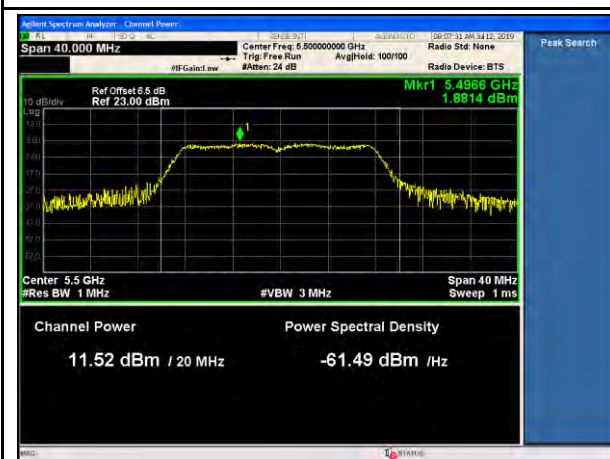
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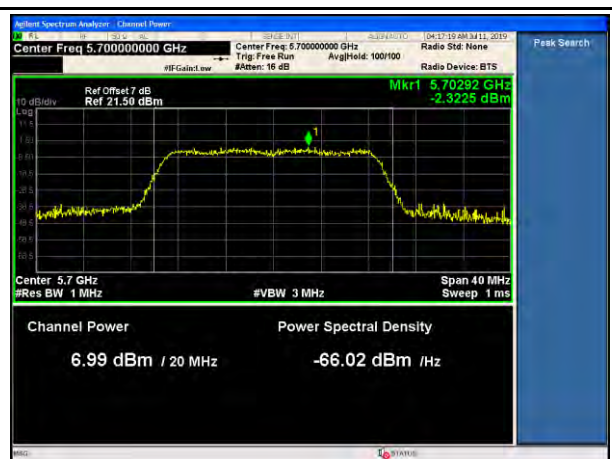
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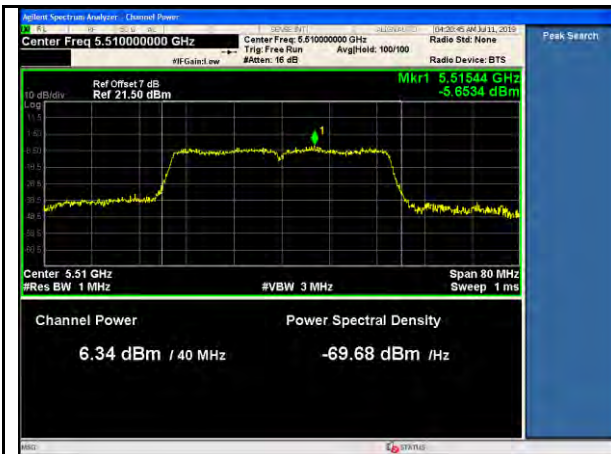
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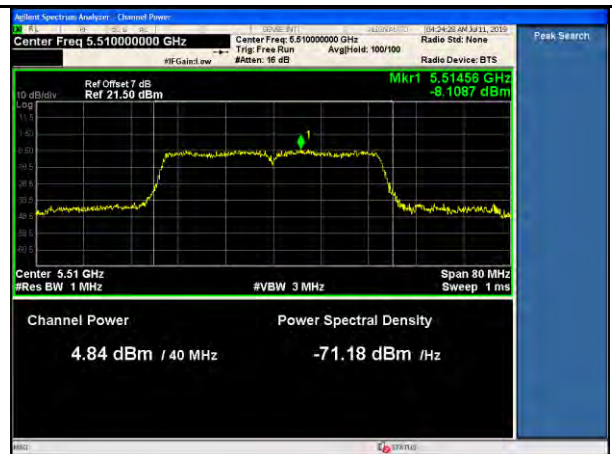
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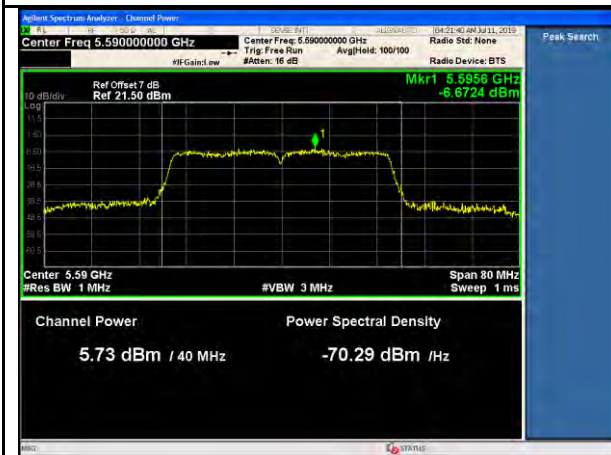
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802.11n-40MHz- 5510MHz-PWR-TX1



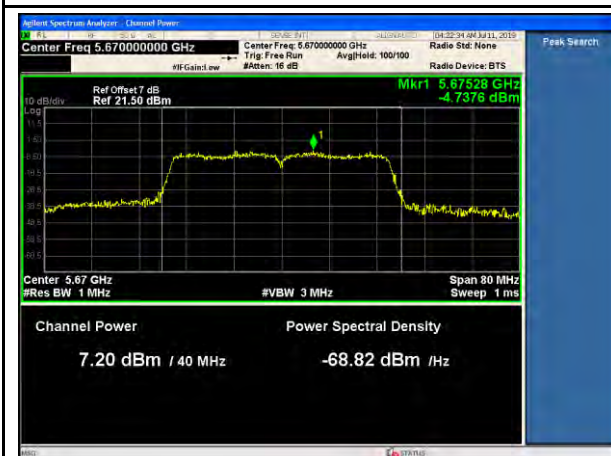
802.11n-40MHz- 5510MHz-PWR-TX2



802.11n-40MHz- 5590MHz-PWR-TX1



802.11n-40MHz- 5590MHz-PWR-TX2

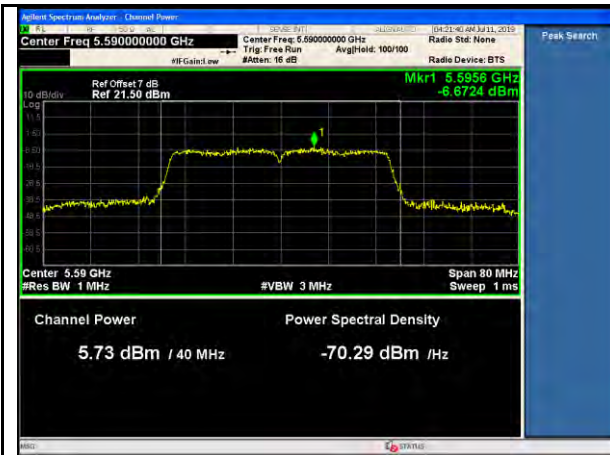


802.11n-40MHz- 5670MHz-PWR-TX1

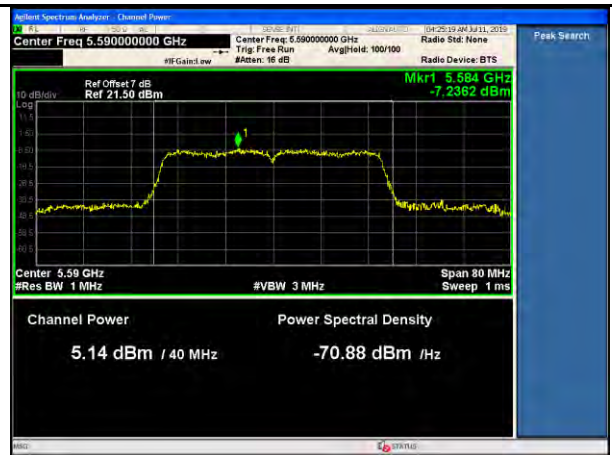


802.11n-40MHz- 5670MHz-PWR-TX2

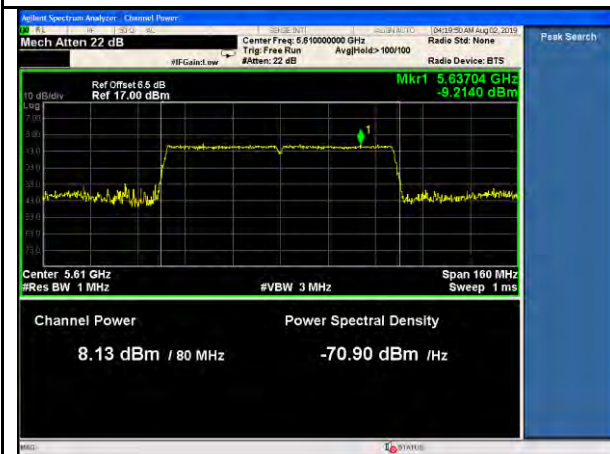
Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



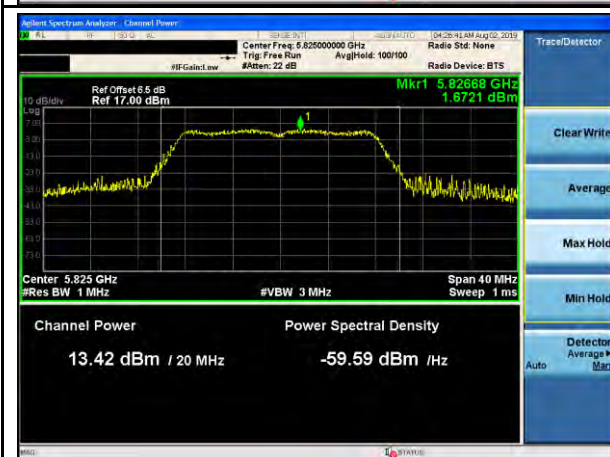
802.11n-40MHz- 5590MHz-PWR-TX1



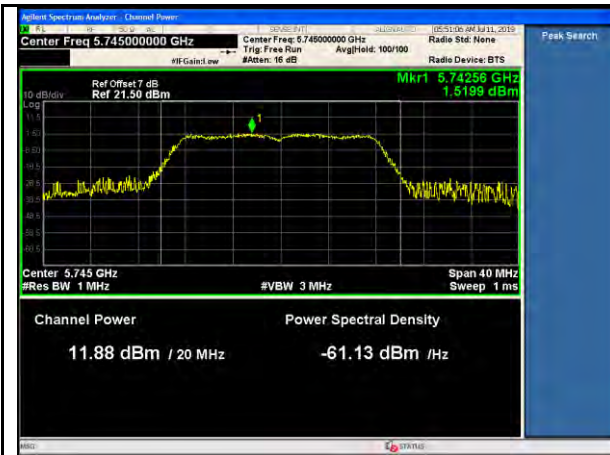
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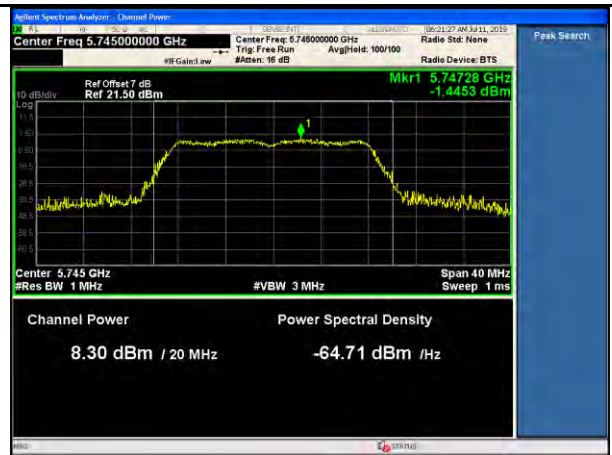
802.11ac-80MHz - 5610MHz-PWR-TX2



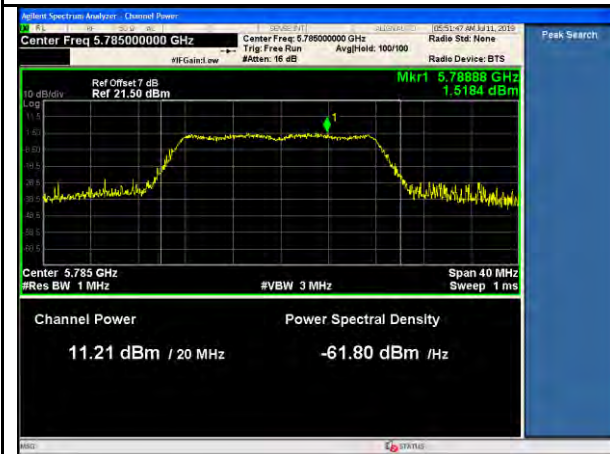
802.11ac-80MHz- 5610MHz-PWR-TX1



802.11a 5745MHz-PWR-TX1



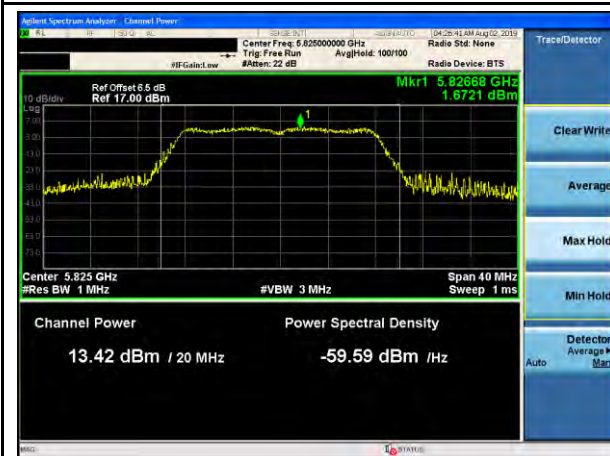
802.11a 5745MHz-PWR-TX2



802.11a 5785MHz-PWR-TX1



802.11a 5785MHz-PWR-TX2

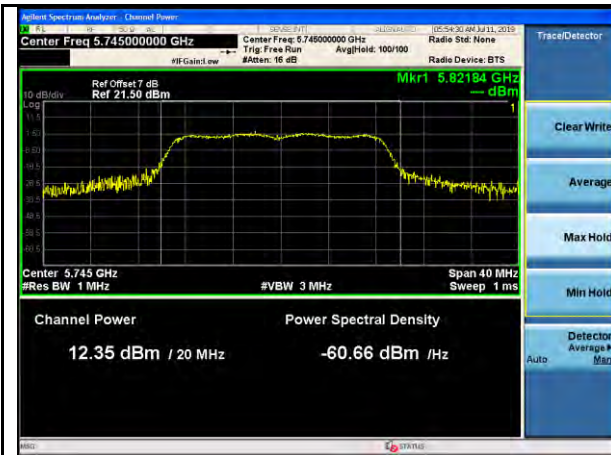


802.11a 5825MHz-PWR-TX1

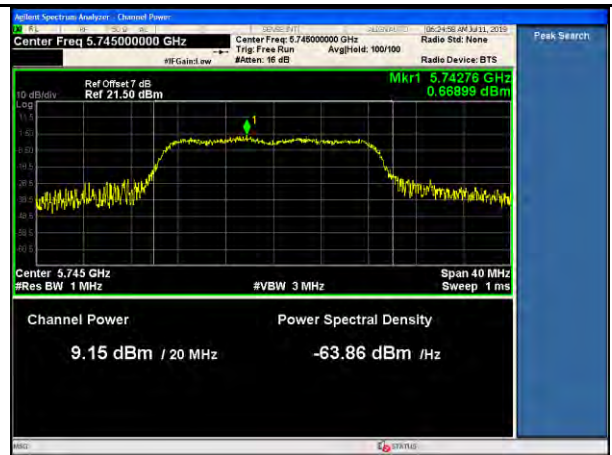


802.11a 5825MHz-PWR-TX2

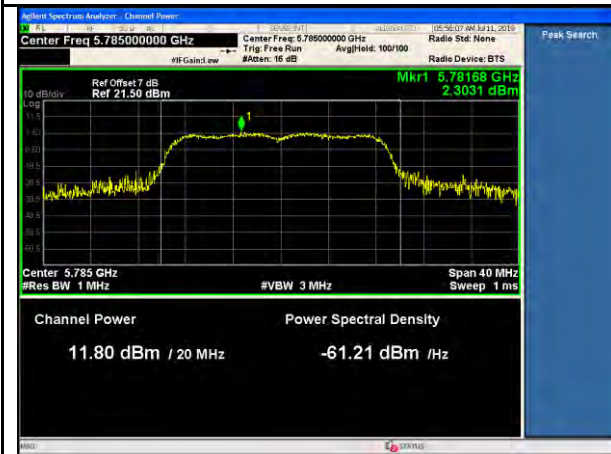
Report Number: WAP-19052921-LC-FCC-UNII-G4L
 Product: Vehicle Infotainment System
 Model Number: SYNC-G4L



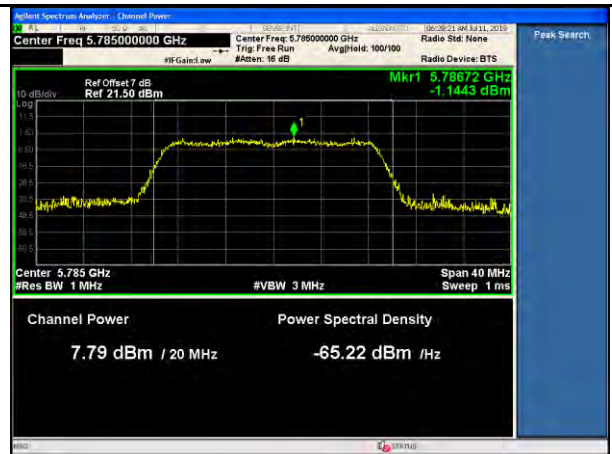
802.11n-20MHz- 5745MHz-PWR-TX1



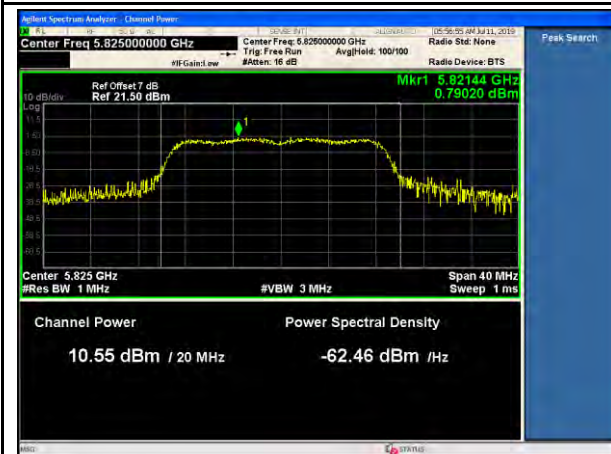
802.11n-20MHz- 5745MHz-PWR-TX2



802.11n-20MHz- 5785MHz-PWR-TX1



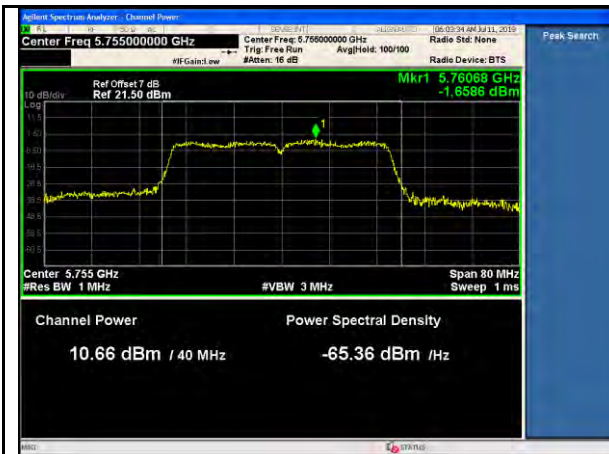
802.11n-20MHz- 5785MHz-PWR-TX2



802.11n-20MHz- 5825MHz-PWR-TX1



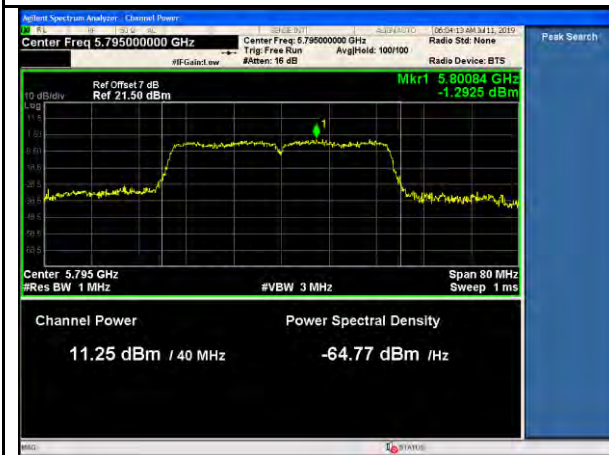
802.11n-20MHz- 5825MHz-PWR-TX2



802.11n-40MHz- 5755MHz-PWR-TX1



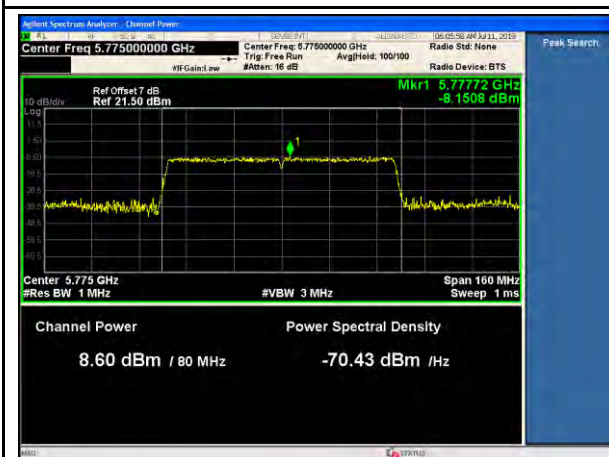
802.11n-40MHz- 5755MHz-PWR-TX2



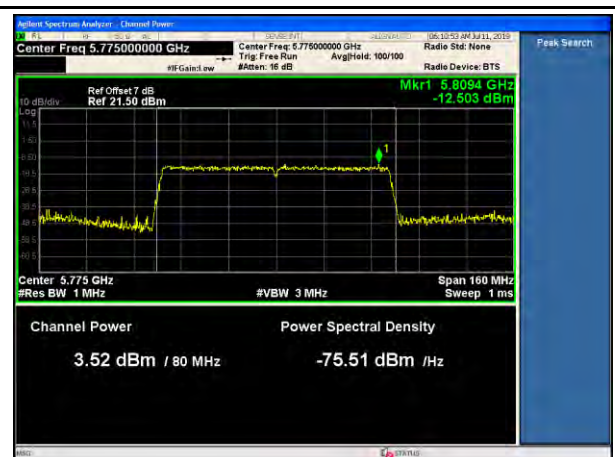
802.11n-40MHz- 5795MHz-PWR-TX1



802.11n-40MHz- 5795MHz-PWR-TX2

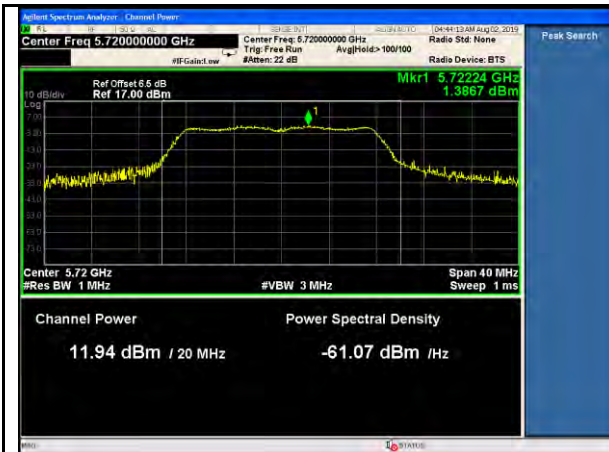


802.11ac-80MHz- 5775MHz-PWR-TX1

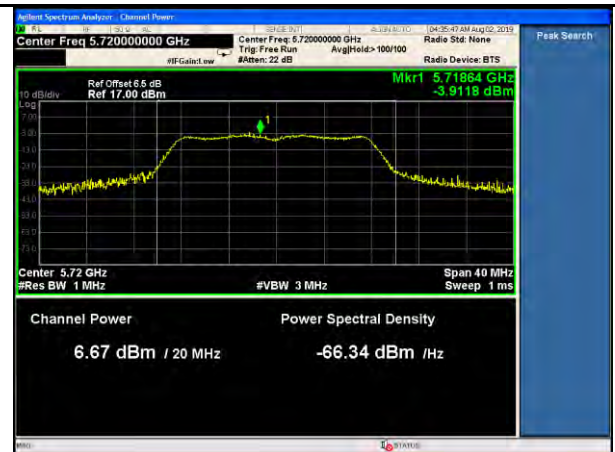


802.11ac-80MHz- 5775MHz-PWR-TX2

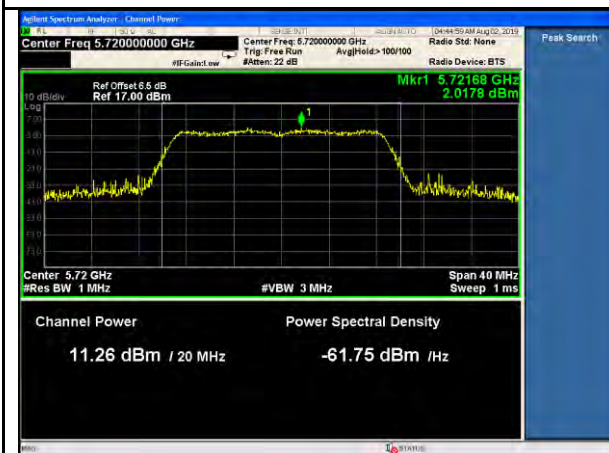
Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



802.11a-20MHz- 5720MHz-PWR-TX1



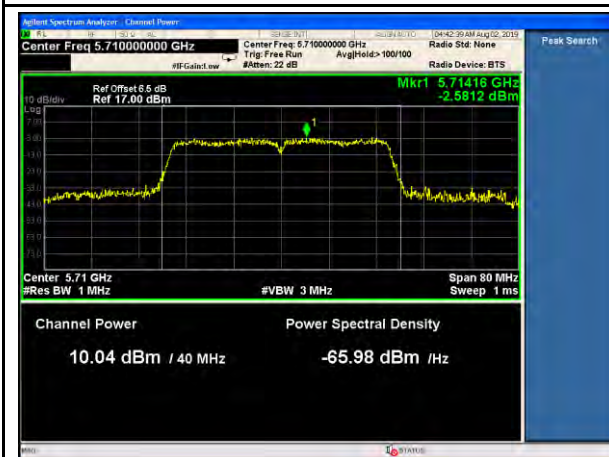
802.11a-20MHz- 5720MHz-PWR-TX2



802.11n-20MHz- 5720MHz-PWR-TX1



802.11n-20MHz- 5720MHz-PWR-TX2

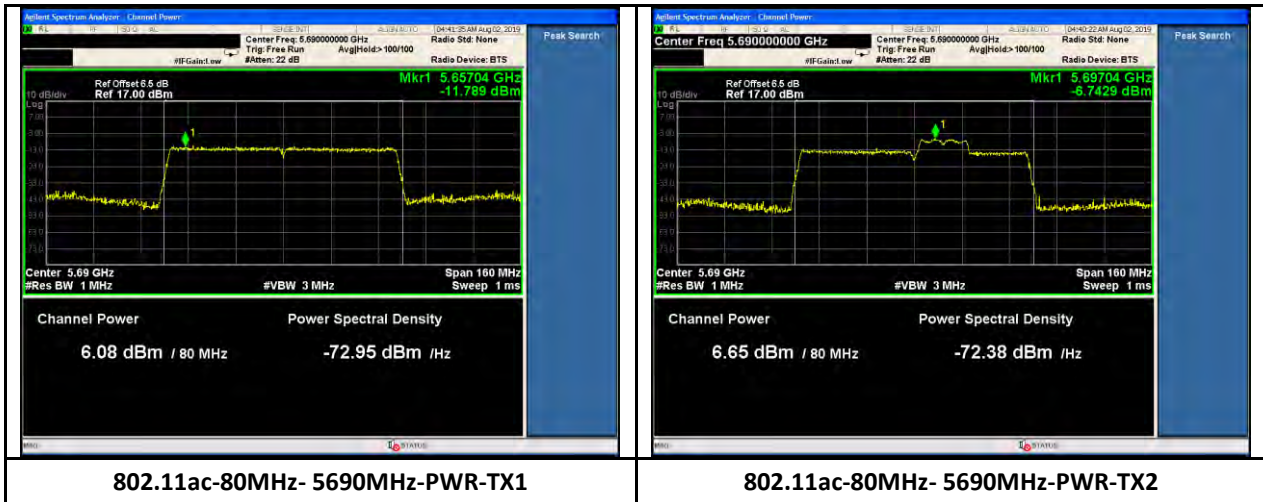


802.11n-40MHz- 5710MHz-PWR-TX1



802.11n-40MHz- 5710MHz-PWR-TX2

Report Number:	WAP-19052921-LC-FCC-UNII-G4L
Product:	Vehicle Infotainment System
Model Number:	SYNC-G4L



Report Number:	WAP-19052921-LC-FCC-UNII-G4L
Product:	Vehicle Infotainment System
Model Number:	SYNC-G4L



8.5 Power Spectral Density

8.5.1 Requirement

§ 15.407 (a)

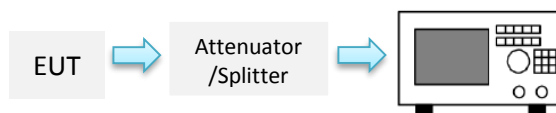
For mobile and portable client devices in the 5.15–5.25 GHz band, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band.

For the 5.25–5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

For Straddle Channel, According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, If the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

8.5.2 Test setup



8.5.3 Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, section F) Maximum power spectral density. Method SA-1

1. Set span to encompass the entire emission bandwidth (EBW)(or, alternatively, the entire 99% occupied bandwidth)of the signal.
2. Set RBW=1MHz
3. Set VBW $\geq 3 \times$ RBW
4. Number of points in sweep $\geq 2 \times$ span/ RBW. (This ensures that bin-to-bin spacing is $\leq$ RBW/2, so that narrowband signals are not lost between frequency bins.)
5. Sweep time = auto couple.
6. Detector = Power averaging (RMS)
7. Trace average at least 100 traces in power averaging(rms)mode.
8. Use the peak marker function to determine the maximum amplitude level within the RBW.

Report Number:	WAP-19052921-LC-FCC-UNII-G4L
Product:	Vehicle Infotainment System
Model Number:	SYNC-G4L



8.5.4 Test Result

For U-NII-1 band

Mode/ Bandwidth	Frequency (MHz)	Data rate	TX1 PSD (dBm/MHz)	TX2 PSD (dBm/MHz)	Highest or Total PSD (dBm/MHz)	Max PSD (dBm/MHz)	Result
11a	5180	6Mbps	-0.708	-0.257	-0.257	11	Pass
11a	5220	6Mbps	-1.974	-1.533	-1.533	11	Pass
11a	5240	6Mbps	-0.370	-1.042	-0.370	11	Pass
11n-20M	5180	MCS0	0.732	-0.154	3.32	7.02	Pass
11n-20M	5220	MCS0	-1.500	-2.223	1.16	7.02	Pass
11n-20M	5240	MCS0	-1.223	-1.477	1.66	7.02	Pass
11n-40M	5190	MCS0	-5.058	-5.811	-2.41	7.02	Pass
11n-40M	5230	MCS0	-2.534	-3.593	-0.02	7.02	Pass
11ac-80M	5210	VHC-MCS0	-10.523	-15.298	-9.27	7.02	Pass

For U-NII-2A band

Mode/ Bandwidth	Frequency (MHz)	Data rate	TX1 PSD (dBm/MHz)	TX2 PSD (dBm/MHz)	Highest or Total PSD (dBm/MHz)	Max PSD (dBm/MHz)	Result
11a	5260	6Mbps	-1.241	-1.058	-1.058	11	Pass
11a	5300	6Mbps	-0.241	-1.135	-0.241	11	Pass
11a	5320	6Mbps	-0.044	-1.258	-0.044	11	Pass
11n-20M	5260	MCS0	-0.976	-0.125	2.48	7.02	Pass
11n-20M	5300	MCS0	0.494	-0.487	3.04	7.02	Pass
11n-20M	5320	MCS0	0.521	-0.421	3.09	7.02	Pass
11n-40M	5270	MCS0	-1.761	-4.468	0.10	7.02	Pass
11n-40M	5310	MCS0	-1.618	-3.867	0.41	7.02	Pass
11ac-80M	5290	VHC-MCS0	-10.757	-14.954	-9.36	7.02	Pass

For U-NII-2C band

Mode/ Bandwidth	Frequency (MHz)	Data rate	TX1 PSD (dBm/MHz)	TX2 PSD (dBm/MHz)	Highest or Total PSD (dBm/MHz)	Max PSD (dBm/MHz)	Result
11a	5500	6Mbps	-0.374	-3.718	-0.374	11	Pass
11a	5600	6Mbps	-0.854	-2.202	-0.854	11	Pass
11a	5700	6Mbps	0.345	-1.296	0.345	11	Pass
11n-20M	5500	MCS0	0.949	-1.799	2.80	7.02	Pass
11n-20M	5600	MCS0	0.329	-3.082	1.96	7.02	Pass
11n-20M	5700	MCS0	1.881	-2.323	3.28	7.02	Pass
11n-40M	5510	MCS0	-5.653	-8.109	-3.70	7.02	Pass
11n-40M	5590	MCS0	-6.672	-7.236	-3.93	7.02	Pass
11n-40M	5670	MCS0	-4.738	-6.856	-2.66	7.02	Pass
11ac-80M	5530	VHC-MCS0	-6.672	-7.236	-3.93	7.02	Pass
11ac-80M	5610	VHC-MCS0	-9.214	-9.769	-6.47	7.02	Pass

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For U-NII-3 band

Mode/ Bandwidth	Frequency (MHz)	Data rate	TX1 PSD (dBm/MHz)	TX2 PSD (dBm/MHz)	Highest or Total PSD (dBm/MHz)	Corrected PSD (dBm/500KHz)	Max PSD (dBm/500KHz)	Result
11a	5745	6Mbps	1.520	-1.445	1.520	-1.48	30	Pass
11a	5785	6Mbps	1.518	-2.183	1.518	-1.482	30	Pass
11a	5825	6Mbps	1.672	-2.672	1.672	-1.328	30	Pass
11n-20M	5745	MCS0	1.800	0.669	4.28	1.28	26.02	Pass
11n-20M	5785	MCS0	2.303	-1.144	3.92	0.92	26.02	Pass
11n-20M	5825	MCS0	0.790	-2.227	2.55	-0.45	26.02	Pass
11n-40M	5755	MCS0	-1.659	-3.694	0.45	-2.55	26.02	Pass
11n-40M	5795	MCS0	-1.293	-3.733	0.67	-2.33	26.02	Pass
11ac-80M	5775	VHC-MCS0	-8.151	-12.503	-6.79	-9.79	26.02	Pass

Note: If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10 log (1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.

For U-NII-2C band Cross-band channel

Mode/ Bandwidth	Frequency (MHz)	Data rate	TX1 PSD (dBm/MHz)	TX2 PSD (dBm/MHz)	Highest or Total PSD (dBm/MHz)	Max PSD (dBm/MHz)	Result
11a	5720	6Mbps	1.387	-3.912	1.387	11	Pass
11n	5720	MCS0	2.018	-5.437	2.74	7.02	Pass
11n-40M	5710	MCS0	-2.581	-2.870	0.29	7.02	Pass
11ac-80M	5690	VHC-MCS0	-11.789	-6.743	-5.56	7.02	Pass

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Product:	Vehicle Infotainment System
Model Number:	SYNC-G4L



8.5.5 Test Plots

Refer to test plots in conducted peak output power

Report Number:	WAP-19052921-LC-FCC-UNII-G4L
Product:	Vehicle Infotainment System
Model Number:	SYNC-G4L



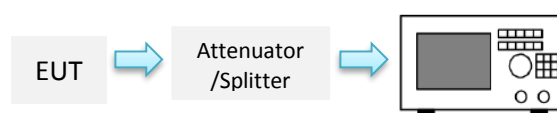
8.6 Automatically Discontinue Transmission

8.6.1 Requirement

§ 15.407 (c)

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signalling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

8.6.2 Test setup



8.6.3 Test Result

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

8.7 Radiated Spurious Emissions into Restricted Frequency Bands

8.7.1 Requirement

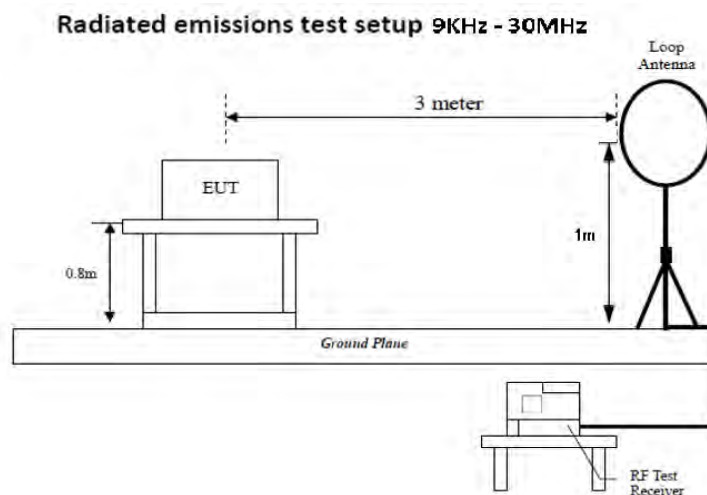
§ 15.205, 15.209, 15.407(b)

- (1) For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.
- (3) For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.
- (4) For transmitters operating in the 5.725-5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz.
- (5) Restricted band, emission must also comply with the radiated emission limits specified in 15.209

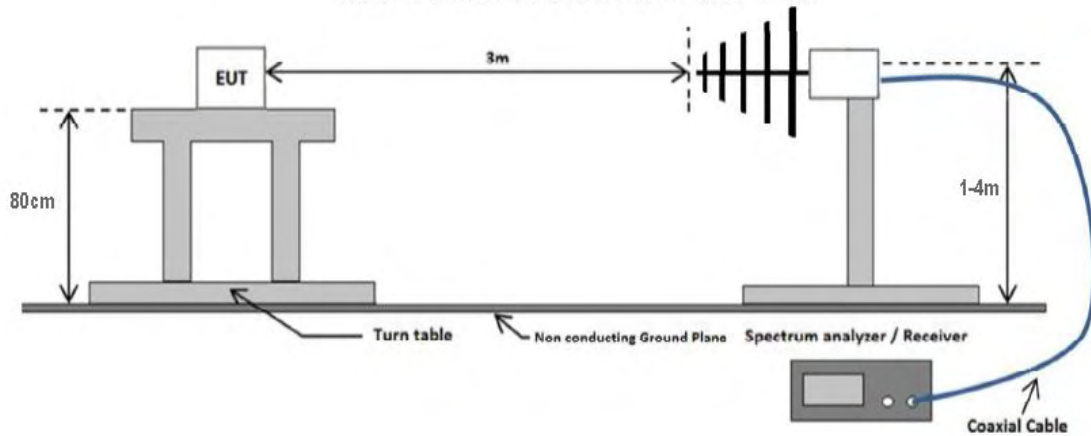
Attenuation below the general limits specified in §15.209(a) and RSS-Gen is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Frequency range (MHz)	Field Strength ($\mu\text{V/m}$)
0.009~0.490	2400/F(KHz)
0.490~1.705	24000/F(KHz)
1.705~30.0	30
30 – 88	100
88 – 216	150
216 960	200
Above 960	500

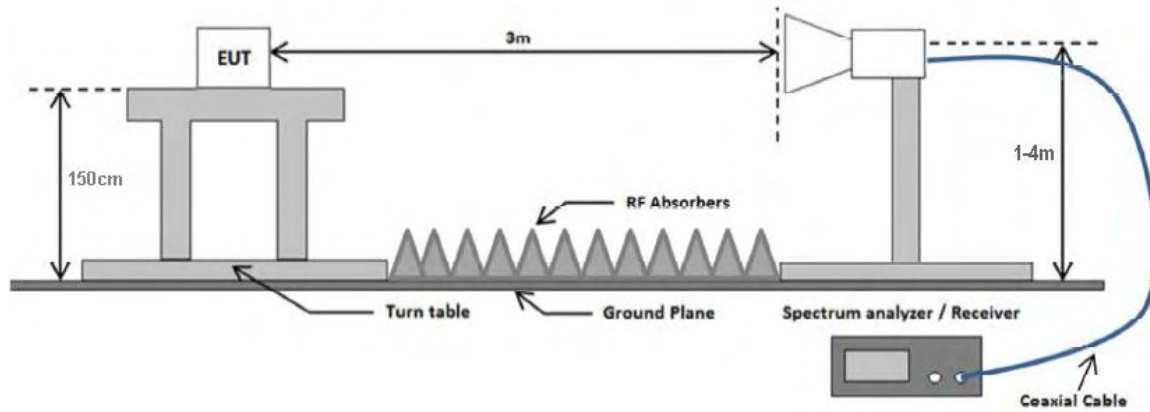
8.7.2 Test setup



Radiated emissions test setup 30 MHz - 1 GHz



Radiated emissions test setup above 1 GHz



Report Number:	WAP-19052921-LC-FCC-UNII-G4L
Product:	Vehicle Infotainment System
Model Number:	SYNC-G4L



8.7.3 Test Procedure

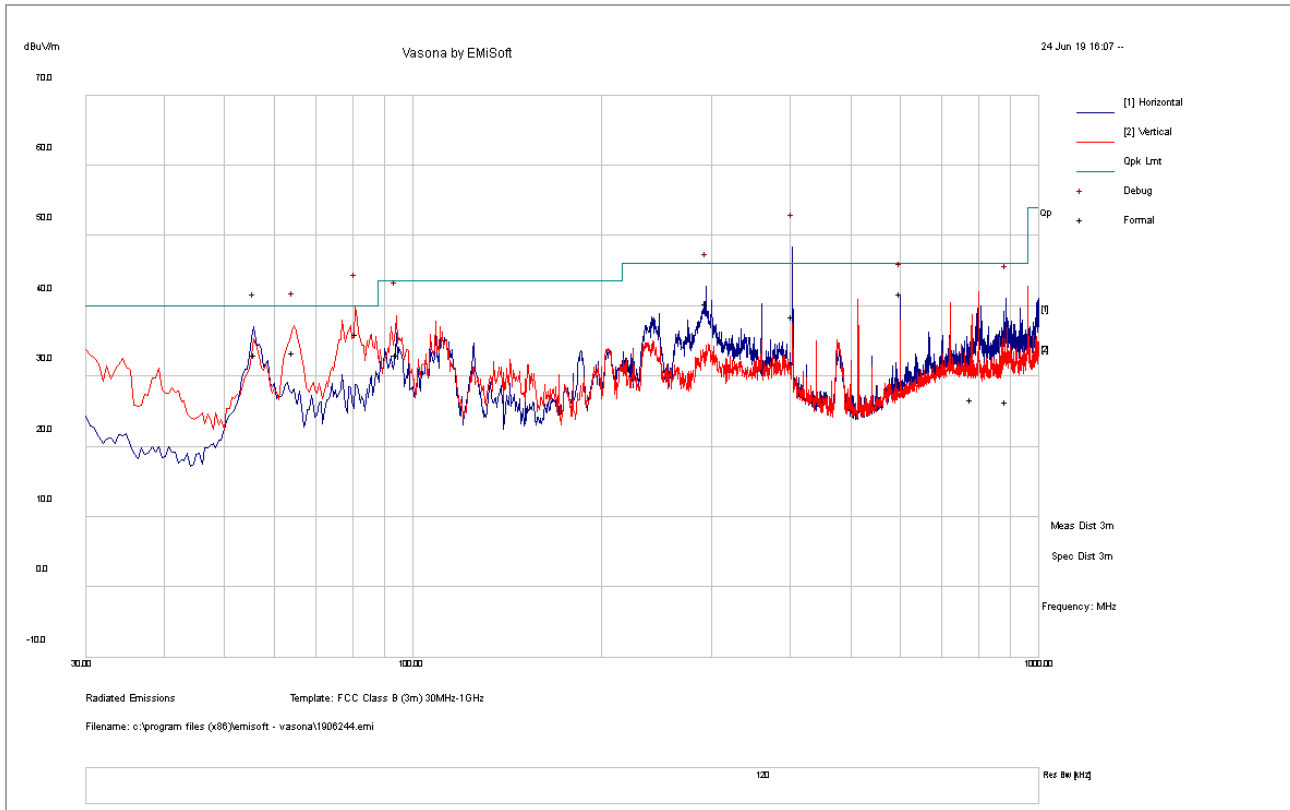
According to FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section G) Unwanted emissions measurement. And subclause 12.7 Radiated spurious emission measurements in ANSI C62.10-2013 as well as the procedures for maximizing and measuring radiated emissions that are described in ANSI C63.10 was followed. Boresight antenna mast was used during the scanning to point to EUT to maximize the emission. The process will be repeated in 3 EUT orientations.

1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. The test was carried out at the selected frequency points obtained from the EUT characterization. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:
 - a. Vertical or horizontal polarization (whichever gave the higher emission level over a full rotation of the EUT) was chosen.
 - b. The EUT was then rotated to the direction that gave the maximum emission.
 - c. Finally, the antenna height was adjusted to the height that gave the maximum emission.
3. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 300 Hz for frequency below 150KHz.
4. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 10 kHz for frequency between 150KHz – 30MHz.
5. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-Peak detection at frequency between 30MHz - 1GHz.
6. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz with Peak detection for Peak and average measurement at frequency above 1GHz.
7. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.

8.7.4 Test Result

30-1000MHz test result

Test Standard:	15.209	Mode:	11a-5180MHz
Frequency Range:	30-1000MHz	Test Date:	06/24/2019
Antenna Type/Polarity:	Bi-Log/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
780.01	26.11	7.26	-6.70	26.67	QP	V	181	54	46.00	-19.33
403.91	45.63	6.36	-13.48	38.50	QP	H	271	328	46.00	-7.50
81.17	57.37	3.33	-24.61	36.09	QP	V	100	28	40.00	-3.91
64.33	54.78	3.07	-24.46	33.39	QP	V	197	47	40.00	-6.61
55.85	54.92	2.92	-24.72	33.12	QP	H	205	228	40.00	-6.88
293.69	53.49	5.63	-18.79	40.34	QP	H	124	201	46.00	-5.66
599.99	44.53	7.16	-9.91	41.78	QP	H	108	58	46.00	-4.22
94.15	53.87	3.50	-24.21	33.15	QP	V	133	68	43.50	-10.35
885.36	26.07	7.56	-7.17	26.47	QP	H	362	287	46.00	-19.53

Note:

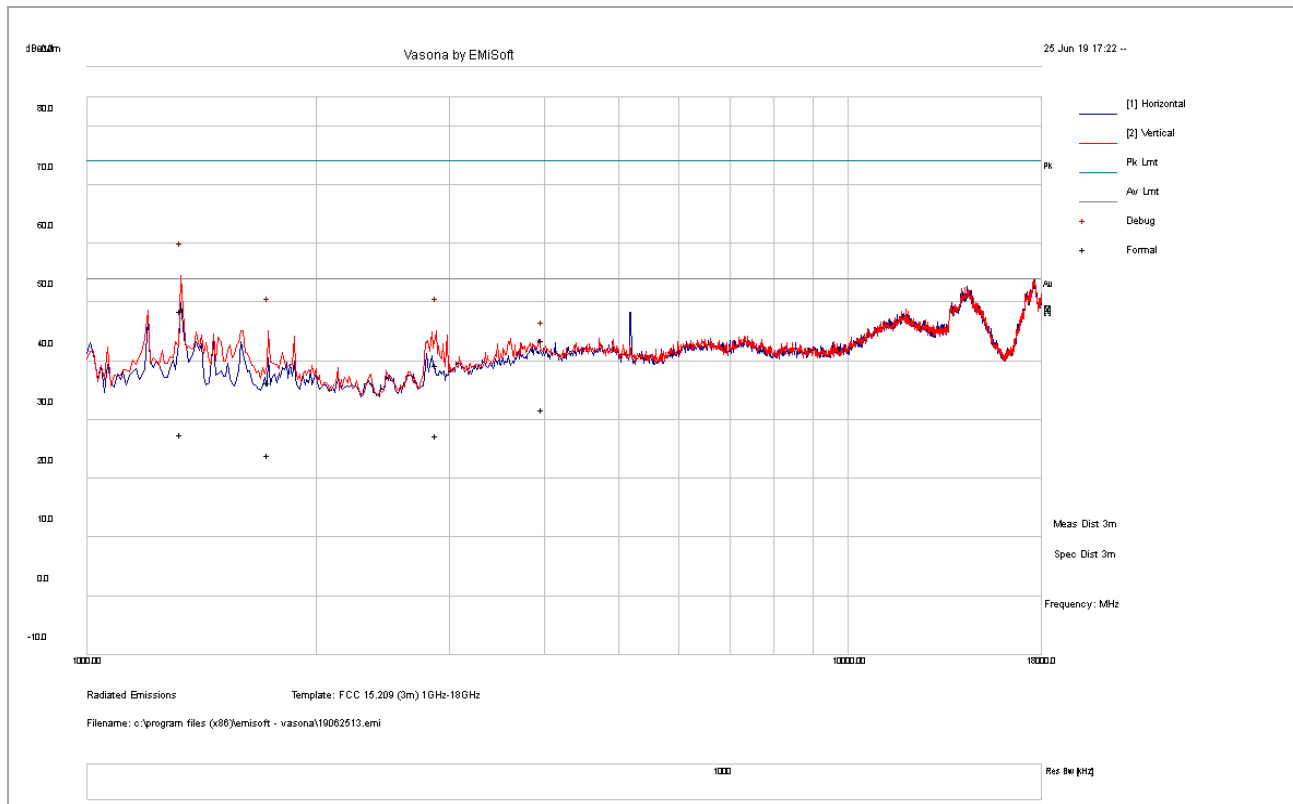
- 1) For below 1GHz, all different channel and modes were verified but only the worst case result is shown here.

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11a-5180MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



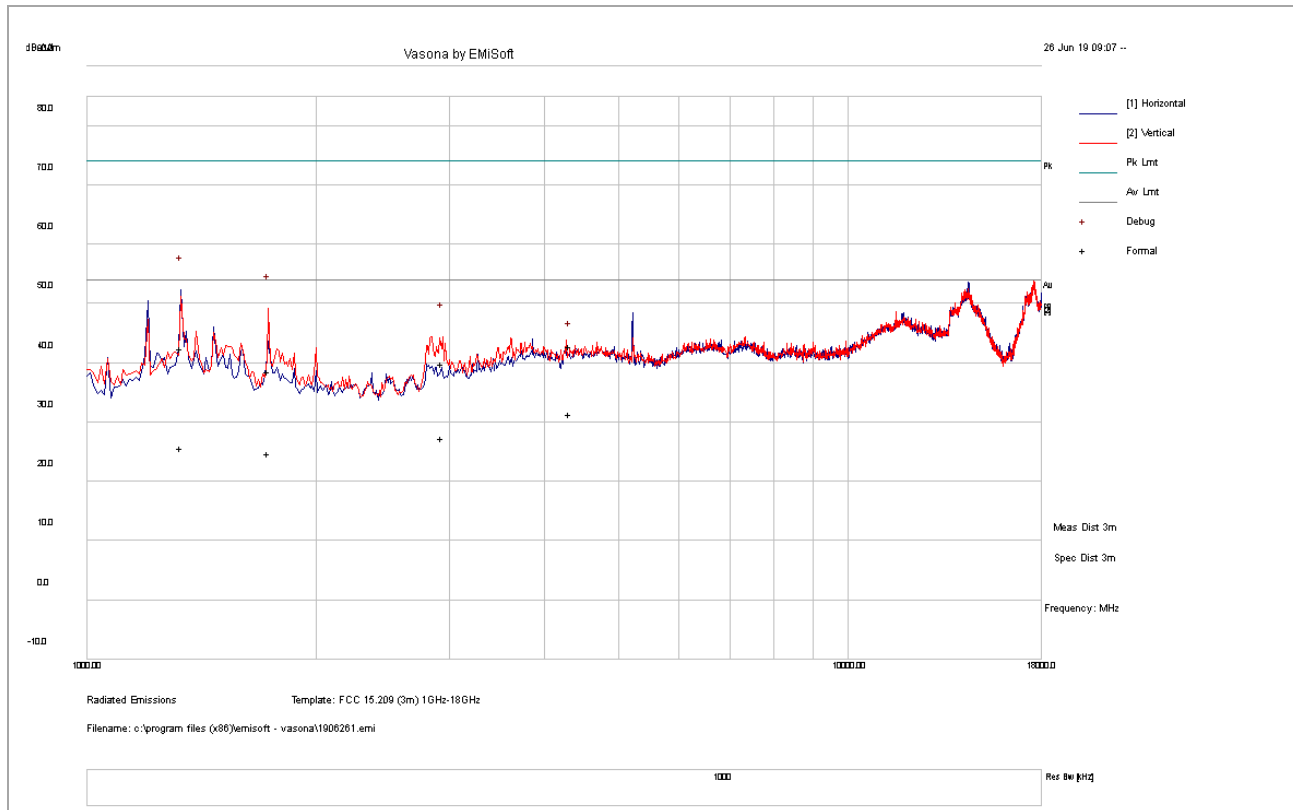
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1330.42	41.87	10.56	-3.82	48.62	PK	V	234	254	74	-25.38
2880.26	25.78	11.20	2.33	39.32	PK	H	161	311	74	-34.68
1734.84	28.53	10.56	-2.66	36.42	PK	V	400	268	74	-37.58
3970.53	22.49	12.70	8.33	43.52	PK	V	245	357	74	-30.48
1330.42	20.73	10.56	-3.82	27.47	AV	V	234	254	54	-26.53
2880.26	13.74	11.20	2.33	27.28	AV	H	161	311	54	-26.72
1734.84	16.06	10.56	-2.66	23.96	AV	V	400	268	54	-30.04
3970.53	10.76	12.70	8.33	31.79	AV	V	245	357	54	-22.21

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11a-5220MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



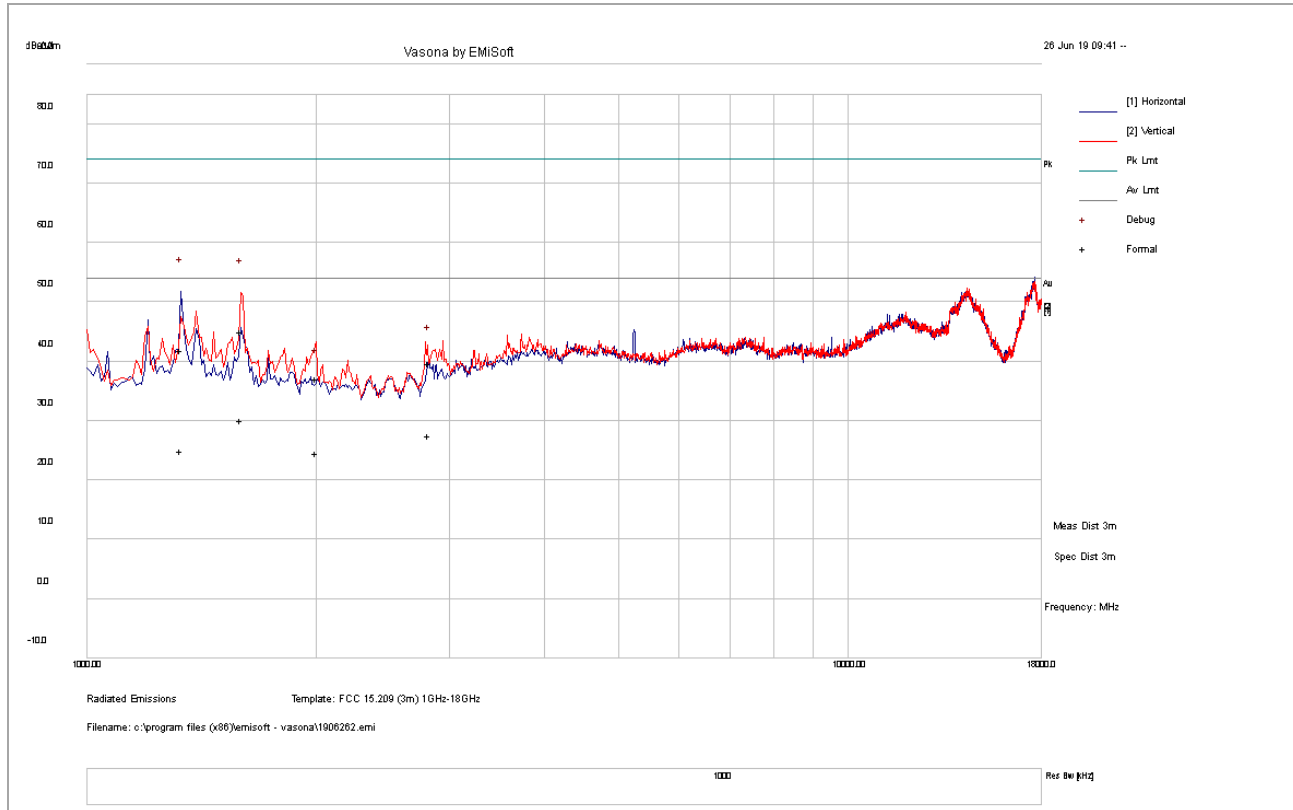
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1328.96	35.74	10.56	-3.81	42.49	PK	H	322	331	74	-31.51
1731.13	30.81	10.56	-2.70	38.67	PK	V	172	296	74	-35.33
2934.41	25.88	11.26	2.71	39.84	PK	V	197	174	74	-34.16
4311.70	21.23	13.08	8.62	42.93	PK	V	201	256	74	-31.07
1328.96	18.87	10.56	-3.81	25.62	AV	H	322	331	54	-28.39
1731.13	16.93	10.56	-2.70	24.79	AV	V	172	296	54	-29.21
2934.41	13.38	11.26	2.71	27.35	AV	V	197	174	54	-26.65
4311.70	9.76	13.08	8.62	31.46	AV	V	201	256	54	-22.54

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11a-5240MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



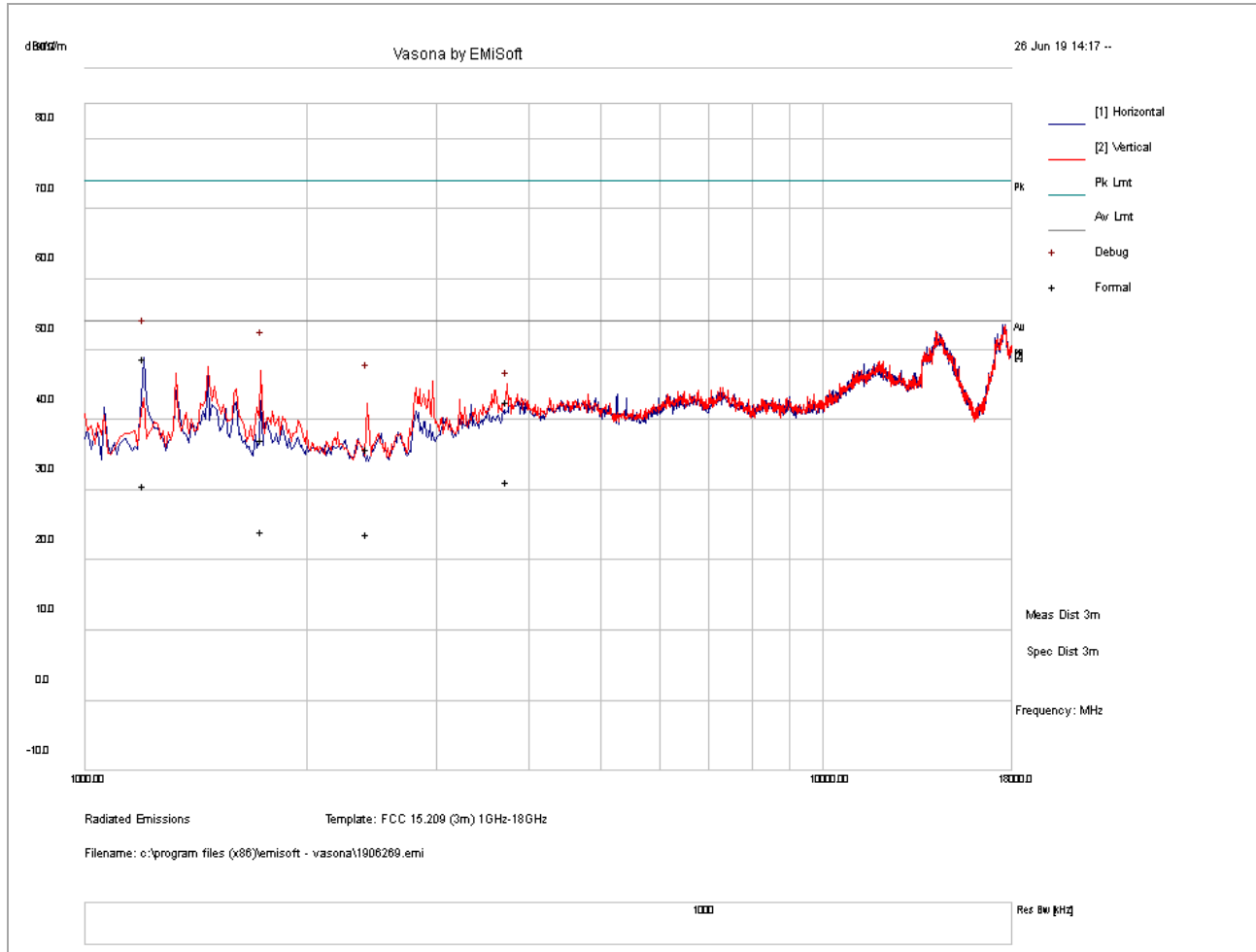
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1329.09	35.23	10.56	-3.81	41.98	PK	H	131	281	74	-32.02
1594.02	37.64	10.74	-3.38	45.00	PK	V	170	287	74	-29.00
2815.49	26.65	11.14	1.89	39.68	PK	V	153	343	74	-34.32
2002.86	27.57	10.26	-0.73	37.09	PK	V	162	22	74	-36.91
1329.09	18.29	10.56	-3.81	25.04	AV	H	131	281	54	-28.97
1594.02	22.84	10.74	-3.38	30.20	AV	V	170	287	54	-23.80
2815.49	14.43	11.14	1.89	27.47	AV	V	153	343	54	-26.53
2002.86	15.04	10.26	-0.73	24.56	AV	V	162	22	54	-29.44

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11a-5260MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



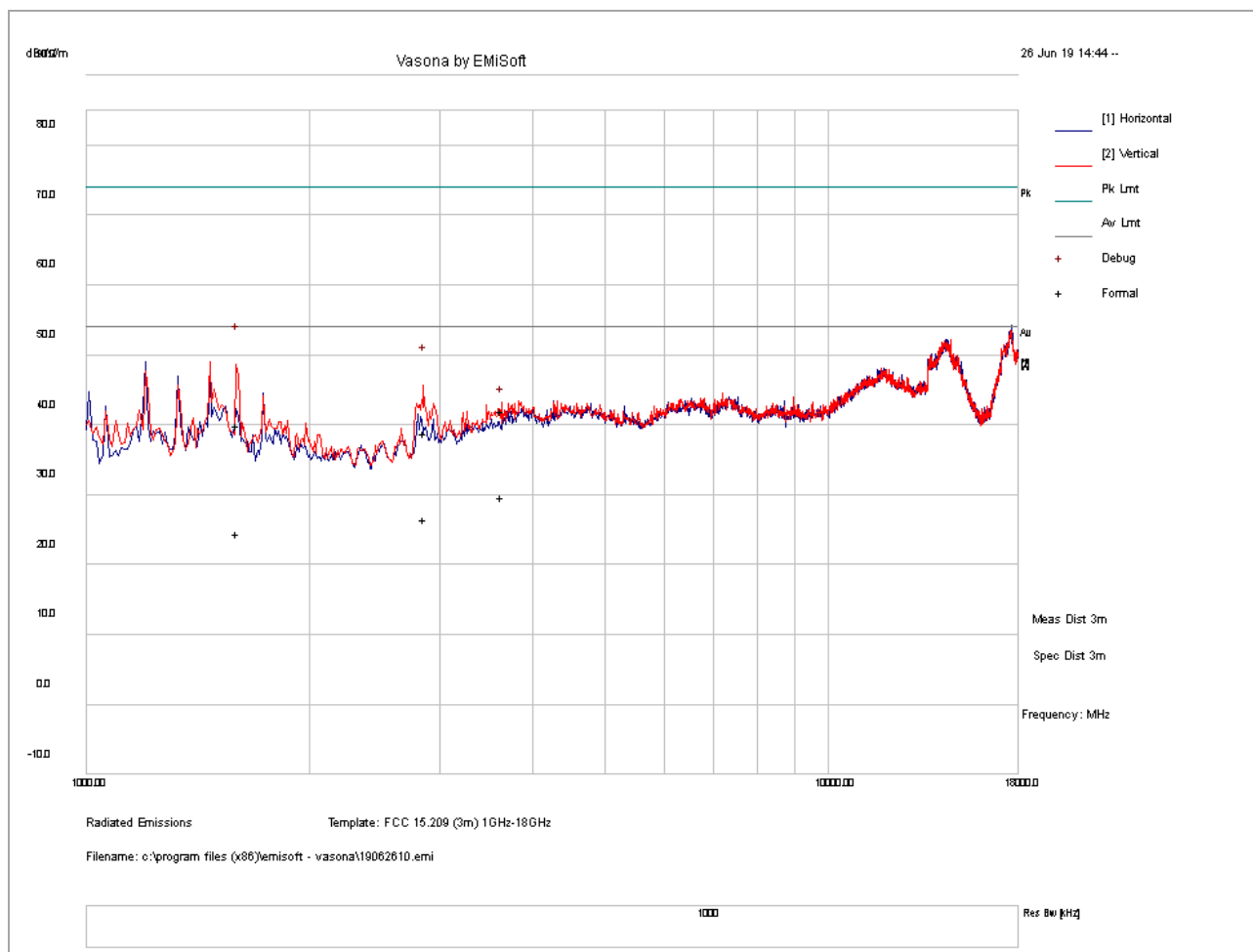
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1200.09	42.69	10.30	-4.18	48.81	PK	H	232	311	74	-25.19
1732.90	29.40	10.56	-2.68	37.28	PK	V	317	220	74	-36.72
2411.77	25.12	10.73	0.06	35.91	PK	V	288	153	74	-38.09
3730.52	23.31	12.30	7.00	42.62	PK	V	157	341	74	-31.38
1200.09	24.64	10.30	-4.18	30.76	AV	H	232	311	54	-23.24
1732.90	16.34	10.56	-2.68	24.22	AV	V	317	220	54	-29.78
2411.77	12.93	10.73	0.06	23.72	AV	V	288	153	54	-30.28
3730.52	11.89	12.30	7.00	31.19	AV	V	157	341	54	-22.81

Report Number:	WAP-19052921-LC-FCC-UNII-G4L
Product:	Vehicle Infotainment System
Model Number:	SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11a-5300MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



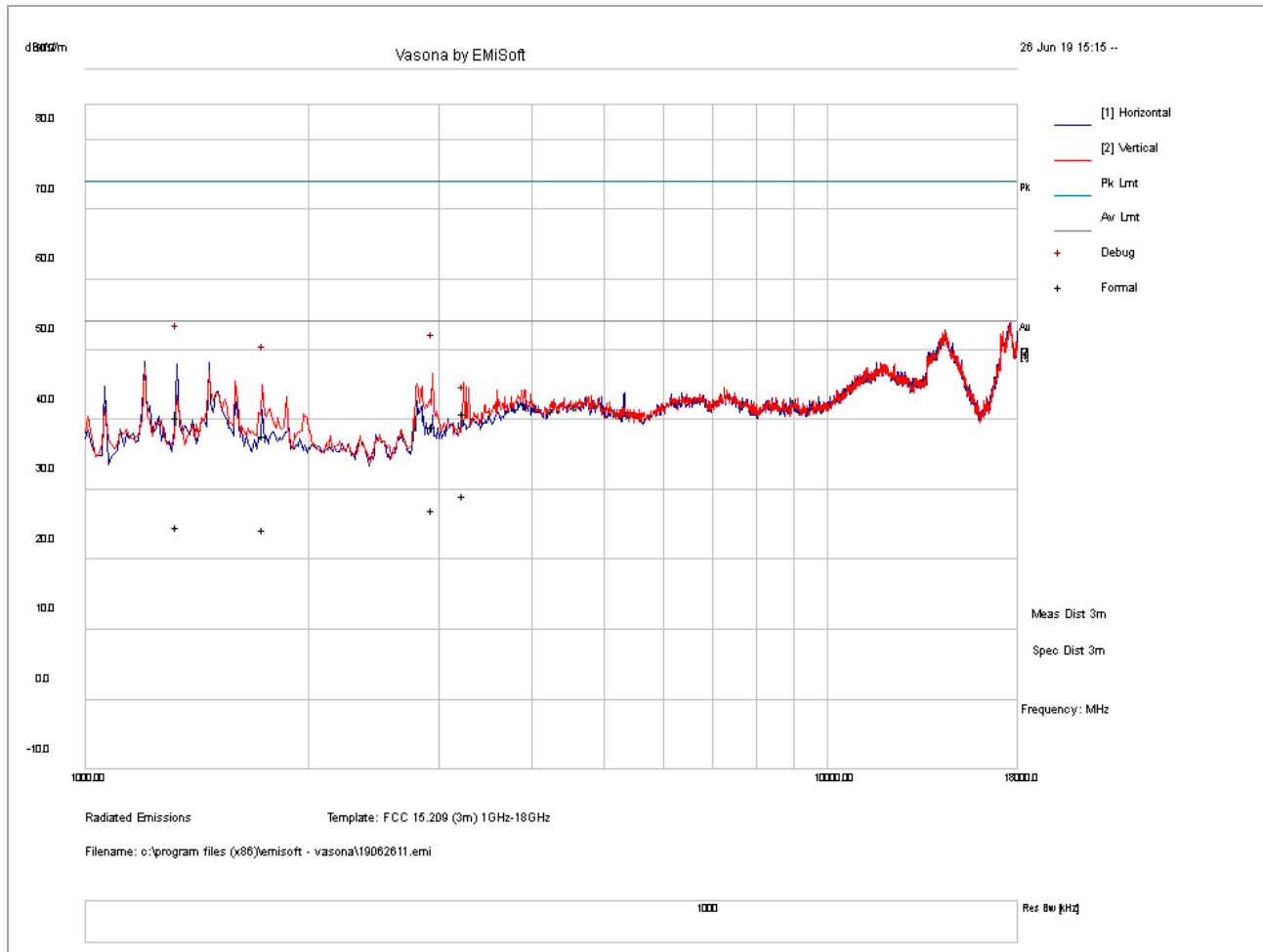
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1593.22	32.57	10.74	-3.38	39.93	PK	V	134	154	74	-34.07
2850.71	25.60	11.18	2.12	38.90	PK	V	400	309	74	-35.10
3628.24	23.65	12.12	6.28	42.06	PK	V	390	224	74	-31.95
1593.22	17.17	10.74	-3.38	24.52	AV	V	134	154	54	-29.48
2850.71	13.32	11.18	2.12	26.62	AV	V	400	309	54	-27.38
3628.24	11.38	12.12	6.28	29.78	AV	V	390	224	54	-24.22

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11a-5320MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



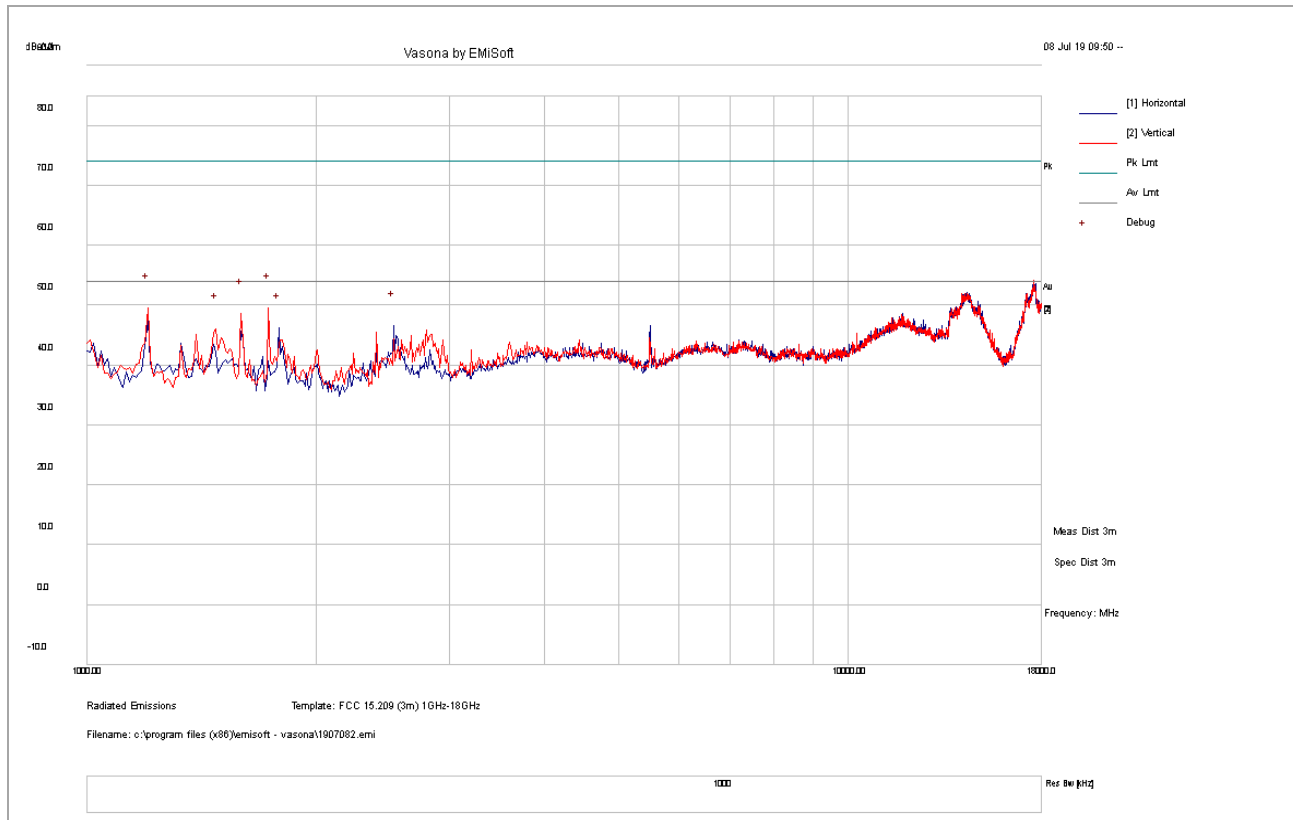
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1329.17	33.71	10.56	-3.81	40.46	PK	H	100	301	74	-33.55
2935.49	25.08	11.26	2.72	39.06	PK	V	200	211	74	-34.94
1733.74	29.93	10.56	-2.67	37.81	PK	V	260	330	74	-36.19
3232.68	25.32	11.59	3.98	40.90	PK	V	148	299	74	-33.10
1329.17	18.02	10.56	-3.81	24.77	AV	H	100	301	54	-29.23
2935.49	13.12	11.26	2.72	27.09	AV	V	200	211	54	-26.91
1733.74	16.53	10.56	-2.67	24.42	AV	V	260	330	54	-29.58
3232.68	13.58	11.59	3.98	29.16	AV	V	148	299	54	-24.84

Report Number:	WAP-19052921-LC-FCC-UNII-G4L
Product:	Vehicle Infotainment System
Model Number:	SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11a-5500MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



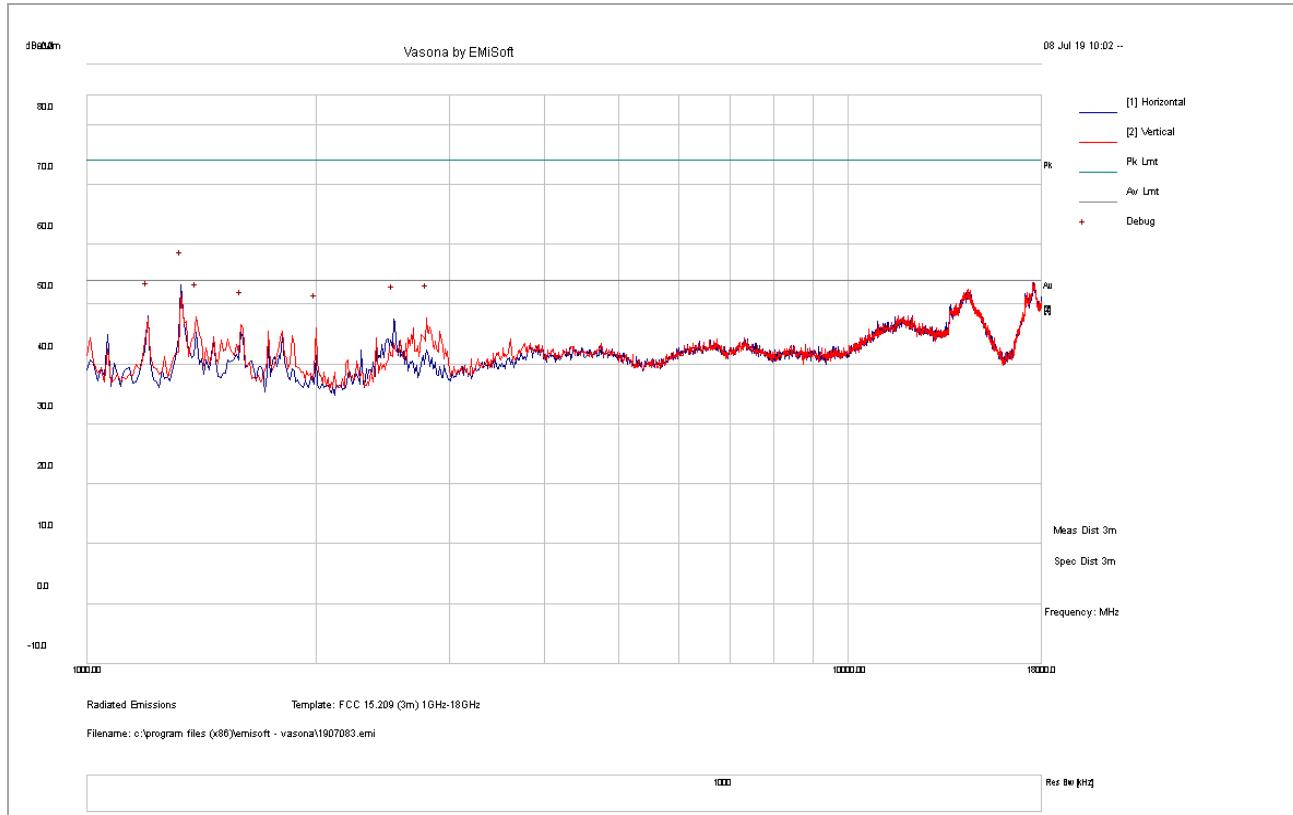
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1201.88	43.40	10.31	-4.18	49.53	PK	V	102	309	54	-4.47
1478.13	39.02	10.83	-3.76	46.09	PK	V	112	183	54	-7.91
1595.00	41.18	10.73	-3.37	48.54	PK	V	128	281	54	-5.46
1733.13	41.59	10.56	-2.68	49.47	PK	V	171	31	54	-4.53
1786.25	37.67	10.49	-1.91	46.26	PK	H	192	36	54	-7.74
2530.00	34.99	10.85	0.76	46.60	PK	H	102	310	54	-7.40

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11a-5600MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



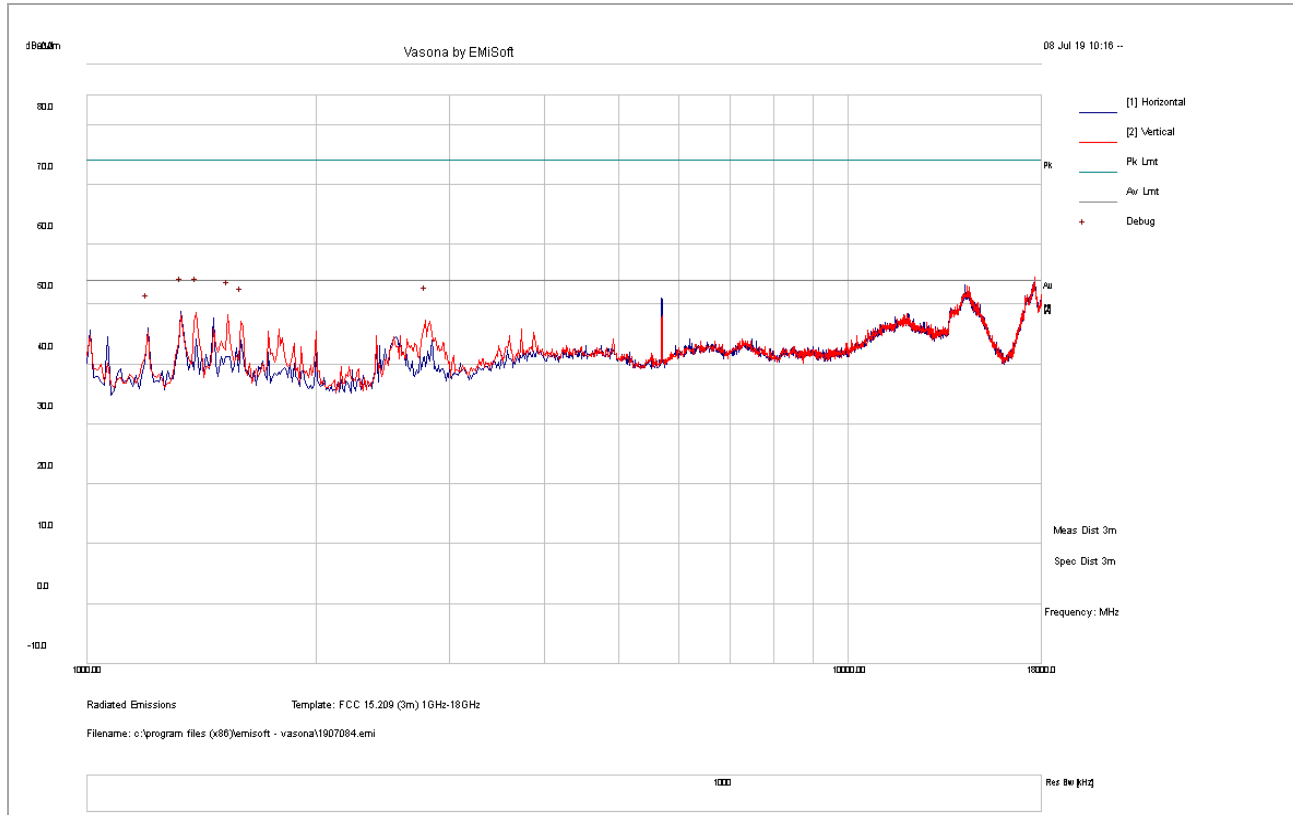
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1201.88	41.95	10.31	-4.18	48.09	PK	H	156	130	54	-5.92
1329.38	44.50	10.56	-3.81	51.25	PK	H	113	98	54	-2.75
1393.13	40.75	10.68	-3.55	47.87	PK	V	112	36	54	-6.13
1595.00	39.17	10.73	-3.37	46.53	PK	V	120	160	54	-7.47
1998.75	36.41	10.25	-0.73	45.94	PK	V	172	31	54	-8.06
2530.00	35.92	10.85	0.76	47.53	PK	H	109	92	54	-6.47
2795.63	34.73	11.12	1.77	47.63	PK	V	122	182	54	-6.37

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11a-5700MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



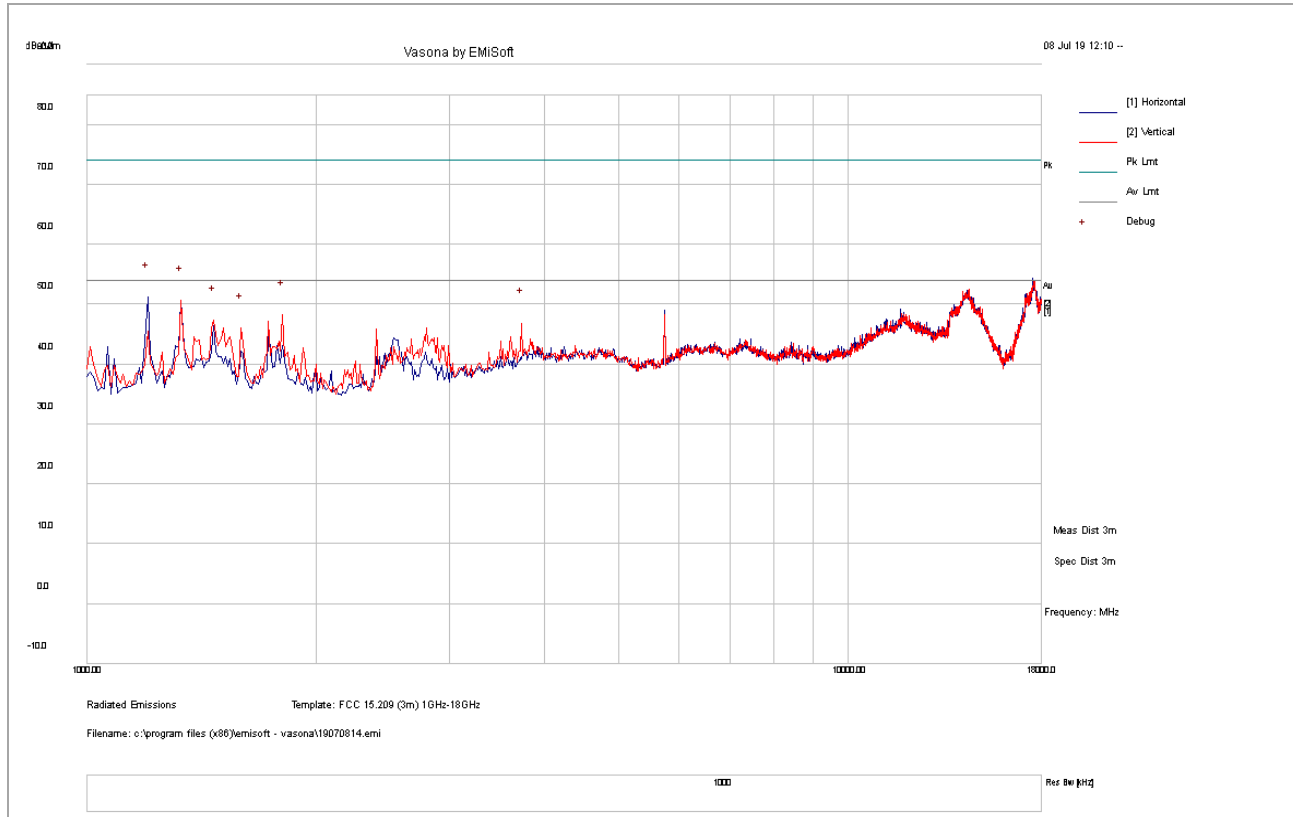
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1201.88	39.86	10.31	-4.18	45.99	PK	H	209	98	54	-8.01
1329.38	42.07	10.56	-3.81	48.82	PK	H	173	260	54	-5.18
1393.13	41.54	10.68	-3.55	48.67	PK	V	162	0	54	-5.33
1531.25	41.08	10.82	-3.68	48.21	PK	V	124	20	54	-5.79
1595.00	39.72	10.73	-3.37	47.08	PK	V	182	321	54	-6.92
2785.00	34.42	11.11	1.72	47.25	PK	V	109	309	54	-6.76

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11a-5745MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



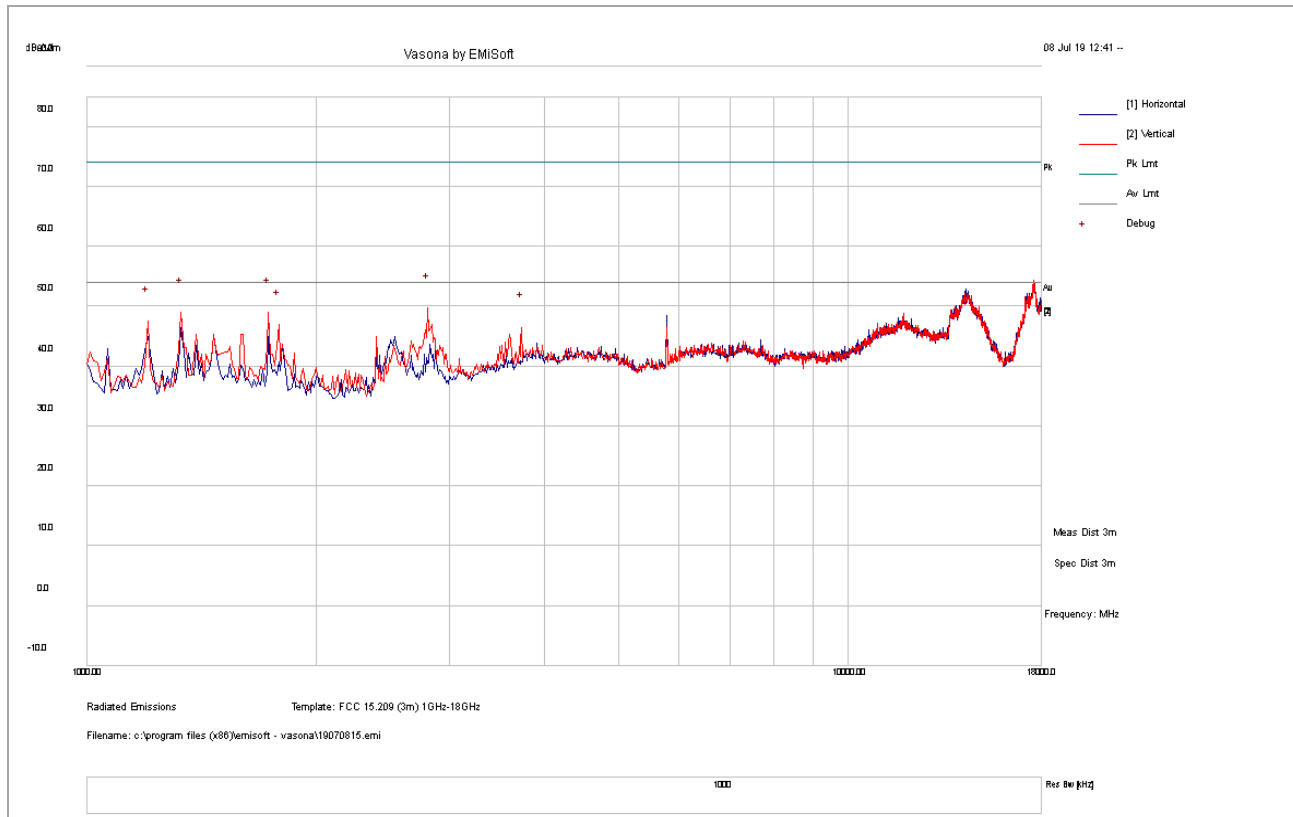
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1201.88	45.07	10.31	-4.18	51.21	PK	H	113	317	54	-2.79
1329.38	43.88	10.56	-3.81	50.63	PK	H	182	182	54	-3.37
1467.50	40.17	10.81	-3.75	47.23	PK	V	126	33	54	-6.77
1595.00	38.68	10.73	-3.37	46.04	PK	V	109	0	54	-7.96
1807.50	39.32	10.47	-1.57	48.22	PK	V	122	88	54	-5.78
3730.63	27.53	12.30	7.01	46.83	PK	V	291	310	54	-7.17

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11a-5785MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



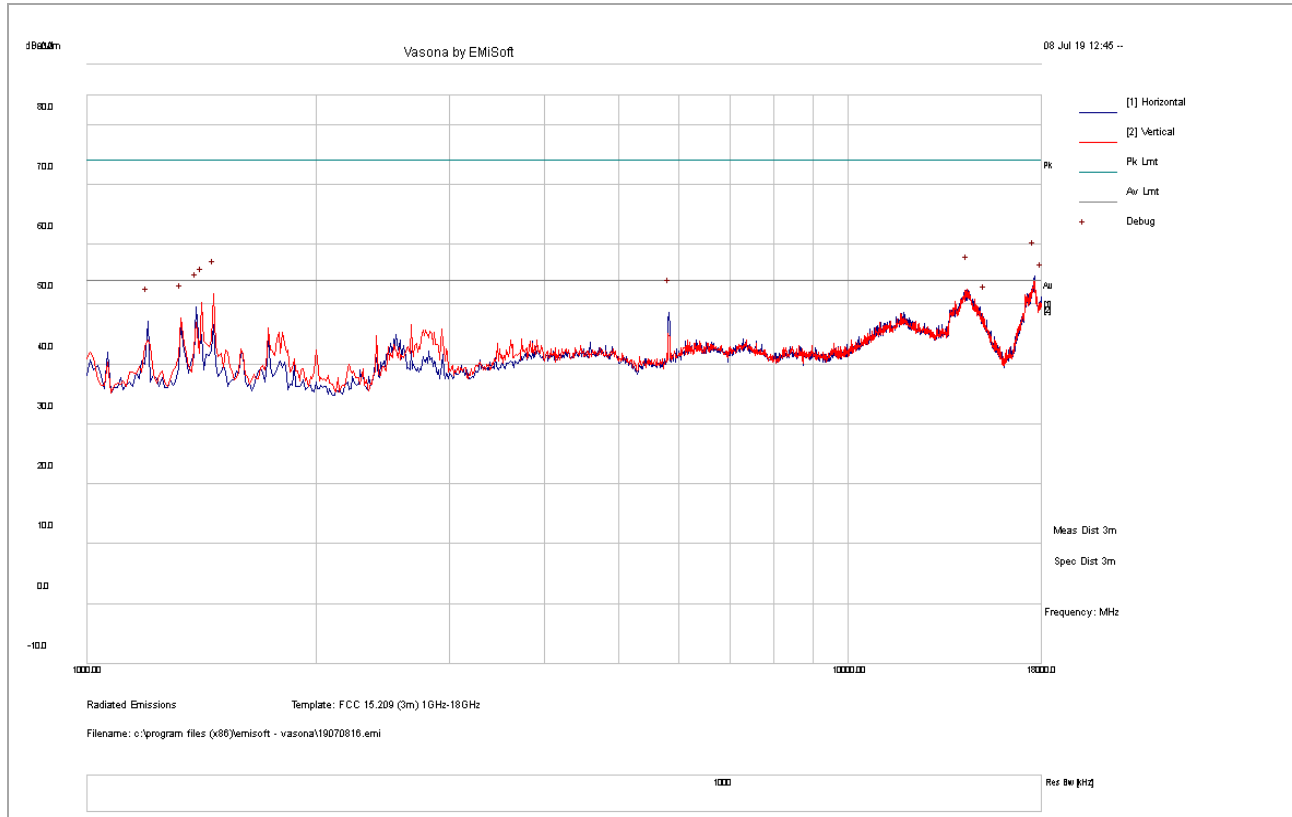
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1201.88	41.32	10.31	-4.18	47.46	PK	V	182	290	54	-6.54
1329.38	42.22	10.56	-3.81	48.97	PK	V	101	102	54	-5.03
1733.13	41.05	10.56	-2.68	48.93	PK	V	134	36	54	-5.07
1786.25	38.32	10.49	-1.91	46.90	PK	V	109	33	54	-7.10
2806.25	36.76	11.13	1.83	49.73	PK	V	281	98	54	-4.27
3730.63	27.15	12.30	7.01	46.46	PK	V	173	192	54	-7.55

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11a-5825MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



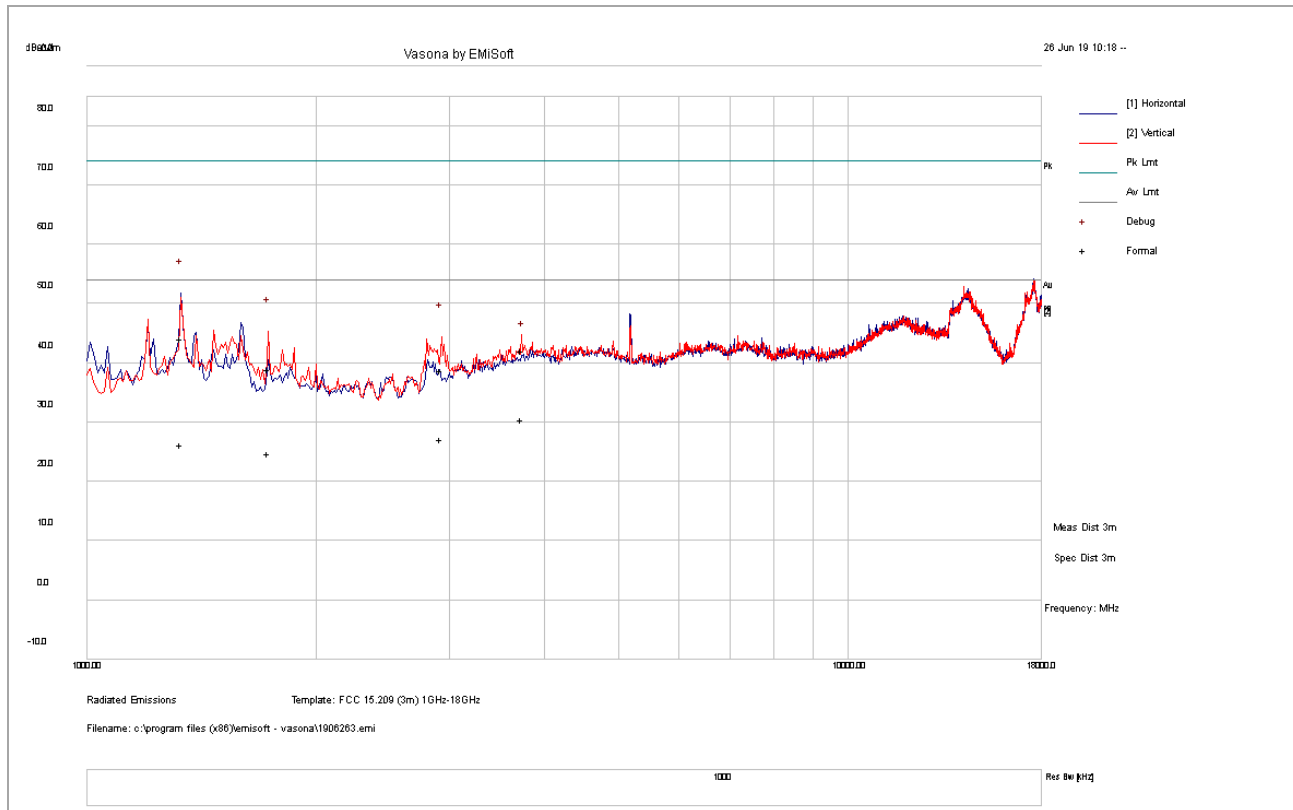
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
17606.88	11.54	25.30	14.92	51.75	PK	H	314	27	54	-2.25
14376.88	13.21	22.67	14.56	50.43	PK	V	157	221	54	-3.57
1467.50	44.61	10.81	-3.75	51.67	PK	V	113	98	54	-2.33
17978.75	12.62	25.78	12.70	51.10	PK	H	271	72	54	-2.90
1414.38	43.18	10.72	-3.57	50.33	PK	V	328	306	54	-3.67
1393.13	42.40	10.68	-3.55	49.53	PK	H	169	129	54	-4.48
5823.75	23.91	14.39	10.28	48.58	PK	H	291	29	54	-5.43
1329.38	40.96	10.56	-3.81	47.71	PK	V	118	113	54	-6.29
15152.50	13.71	24.39	9.35	47.45	PK	V	141	304	54	-6.55
1201.88	40.91	10.31	-4.18	47.05	PK	H	336	235	54	-6.96

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n-5180MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



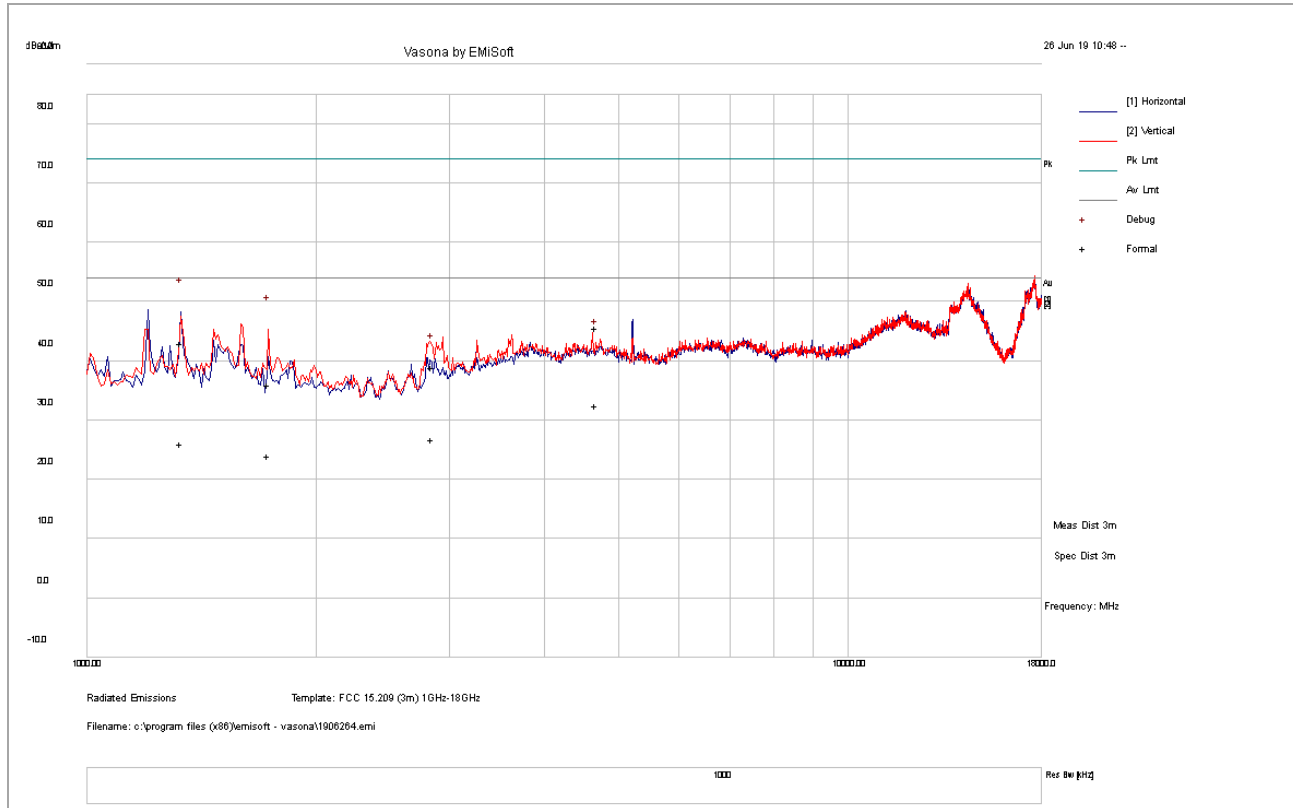
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1331.37	37.46	10.56	-3.82	44.21	PK	H	148	242	74	-29.79
1731.75	31.03	10.56	-2.70	38.89	PK	V	100	205	74	-35.11
2923.48	24.91	11.25	2.64	38.79	PK	V	342	64	74	-35.21
3737.16	22.66	12.31	7.05	42.02	PK	V	216	0	74	-31.98
1331.37	19.54	10.56	-3.82	26.29	AV	H	148	242	54	-27.71
1731.75	16.96	10.56	-2.70	24.82	AV	V	100	205	54	-29.18
2923.48	13.22	11.25	2.64	27.10	AV	V	342	64	54	-26.90
3737.16	11.21	12.31	7.05	30.58	AV	V	216	0	54	-23.42

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n-5220MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



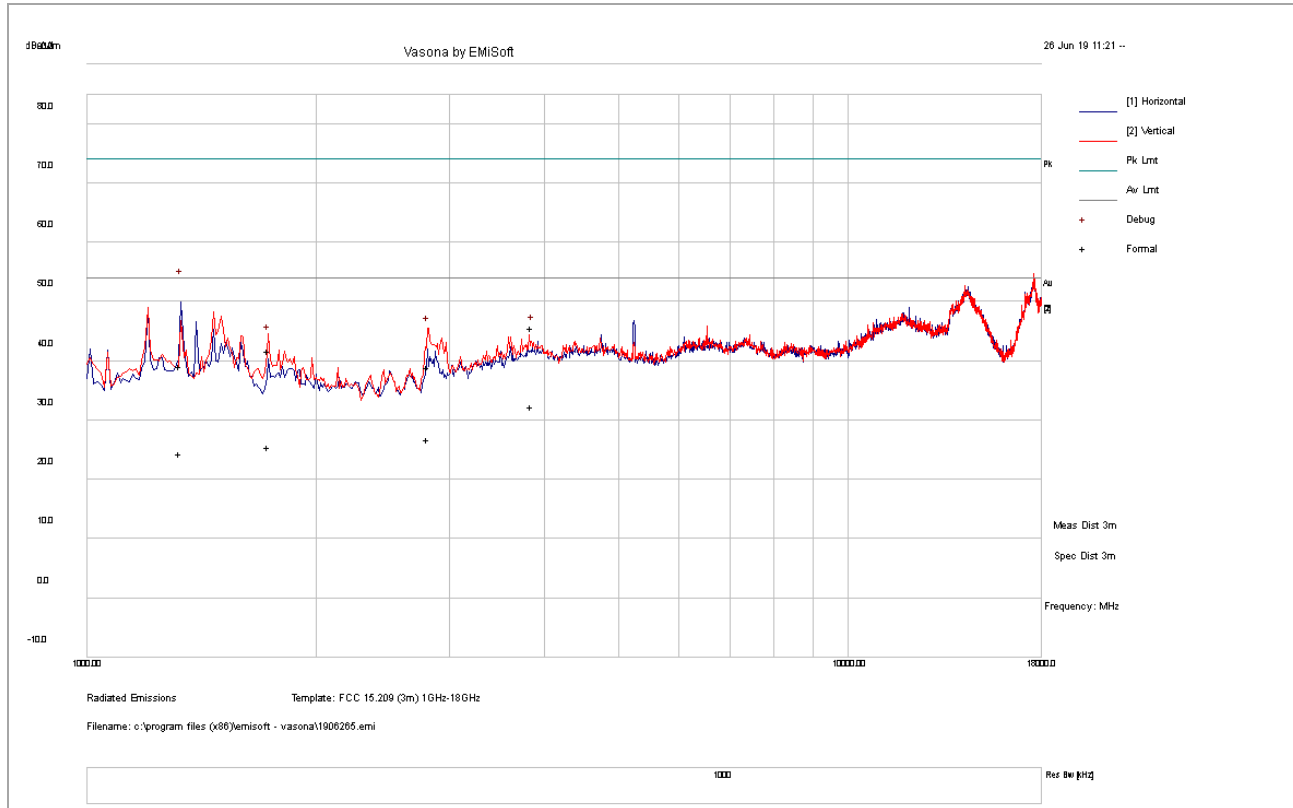
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1329.33	36.34	10.56	-3.81	43.09	PK	H	343	277	74	-30.92
1732.21	28.17	10.56	-2.69	36.03	PK	V	123	334	74	-37.97
4665.56	22.38	13.32	9.88	45.58	PK	V	182	323	74	-28.42
2843.15	25.79	11.17	2.07	39.04	PK	V	155	149	74	-34.96
1329.33	19.34	10.56	-3.81	26.09	AV	H	343	277	54	-27.91
1732.21	16.13	10.56	-2.69	24.00	AV	V	123	334	54	-30.00
4665.56	9.29	13.32	9.88	32.49	AV	V	182	323	54	-21.51
2843.15	13.48	11.17	2.07	26.72	AV	V	155	149	54	-27.28

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n-5240MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



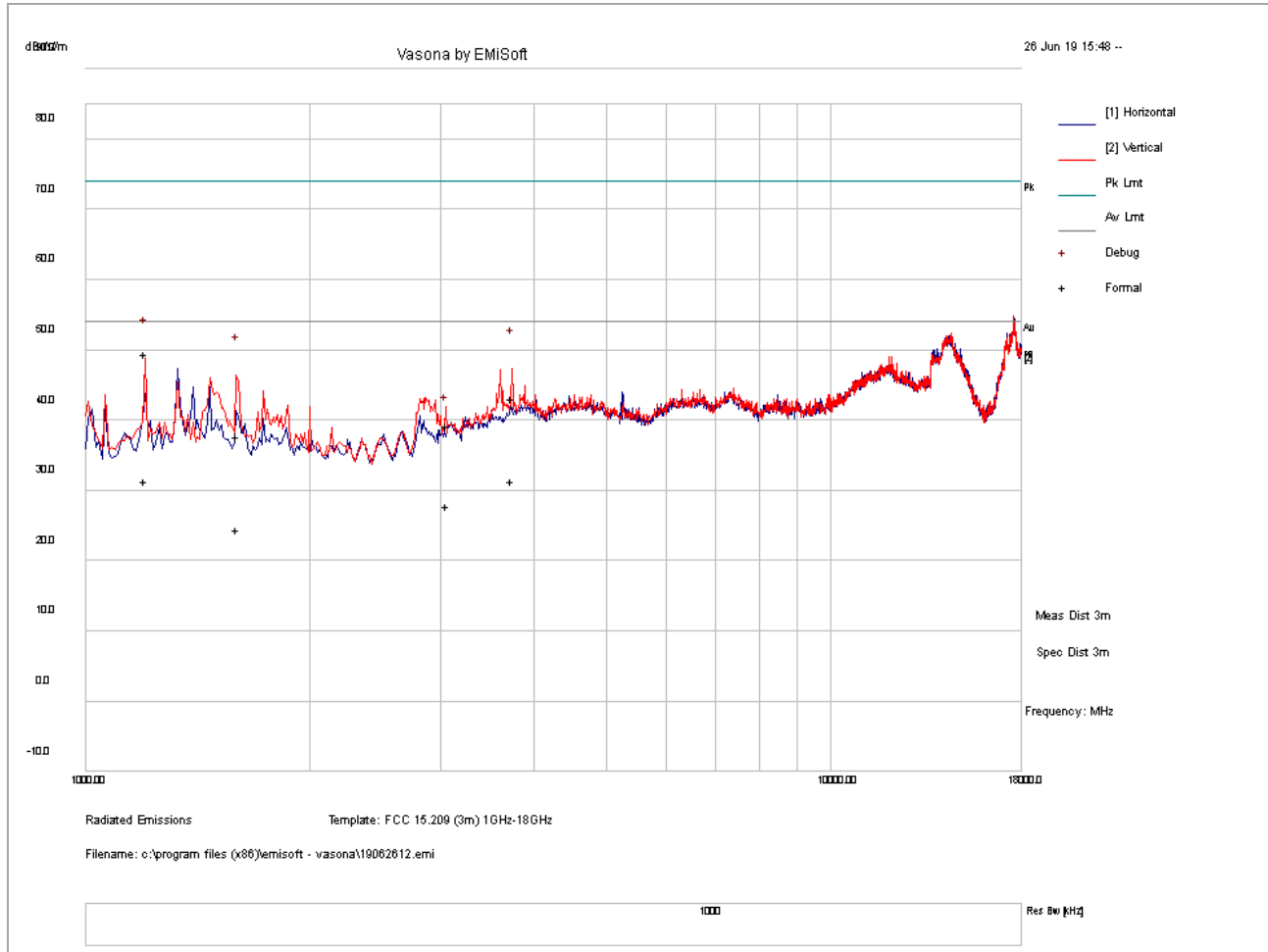
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1327.72	32.35	10.56	-3.81	39.10	PK	V	207	206	74	-34.90
3849.82	25.07	12.50	8.05	45.62	PK	V	123	42	74	-28.38
2807.42	25.93	11.13	1.84	38.91	PK	V	262	334	74	-35.09
1732.79	33.89	10.56	-2.68	41.76	PK	V	183	317	74	-32.24
1327.72	17.66	10.56	-3.81	24.41	AV	V	207	206	54	-29.59
3849.82	11.79	12.50	8.05	32.34	AV	V	123	42	54	-21.67
2807.42	13.89	11.13	1.84	26.87	AV	V	262	334	54	-27.13
1732.79	17.70	10.56	-2.68	25.58	AV	V	183	317	54	-28.42

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n-5260MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



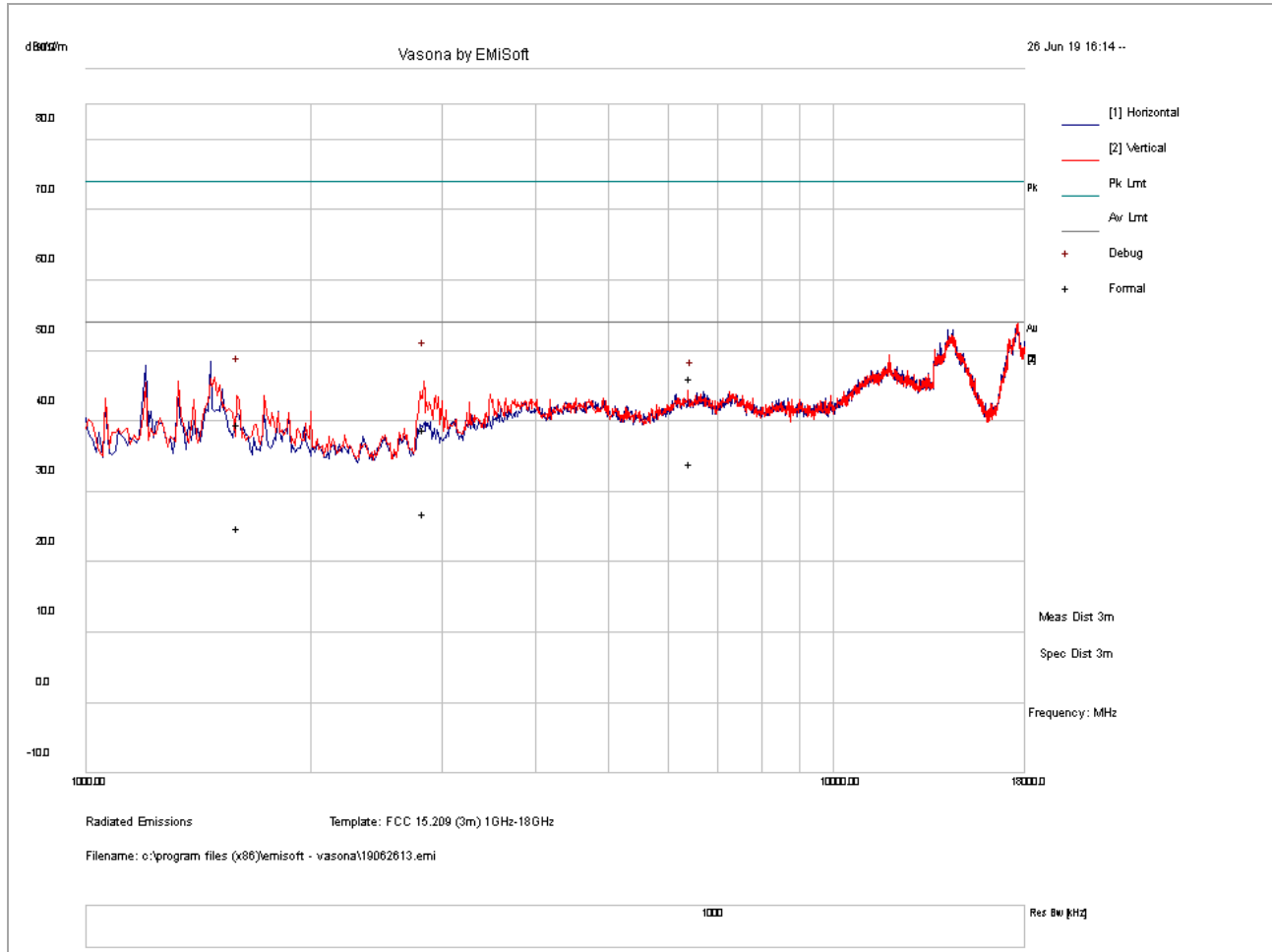
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1200.01	43.46	10.30	-4.18	49.58	PK	V	225	0	74	-24.42
3728.65	23.91	12.30	6.99	43.20	PK	V	100	300	74	-30.80
1596.60	30.37	10.73	-3.36	37.74	PK	V	103	165	74	-36.26
3045.04	24.41	11.37	3.50	39.28	PK	V	400	169	74	-34.72
1200.01	25.38	10.30	-4.18	31.50	AV	V	225	0	54	-22.50
3728.65	12.22	12.30	6.99	31.51	AV	V	100	300	54	-22.49
1596.60	17.20	10.73	-3.36	24.57	AV	V	103	165	54	-29.43
3045.04	12.94	11.37	3.50	27.81	AV	V	400	169	54	-26.19

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n-5300MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



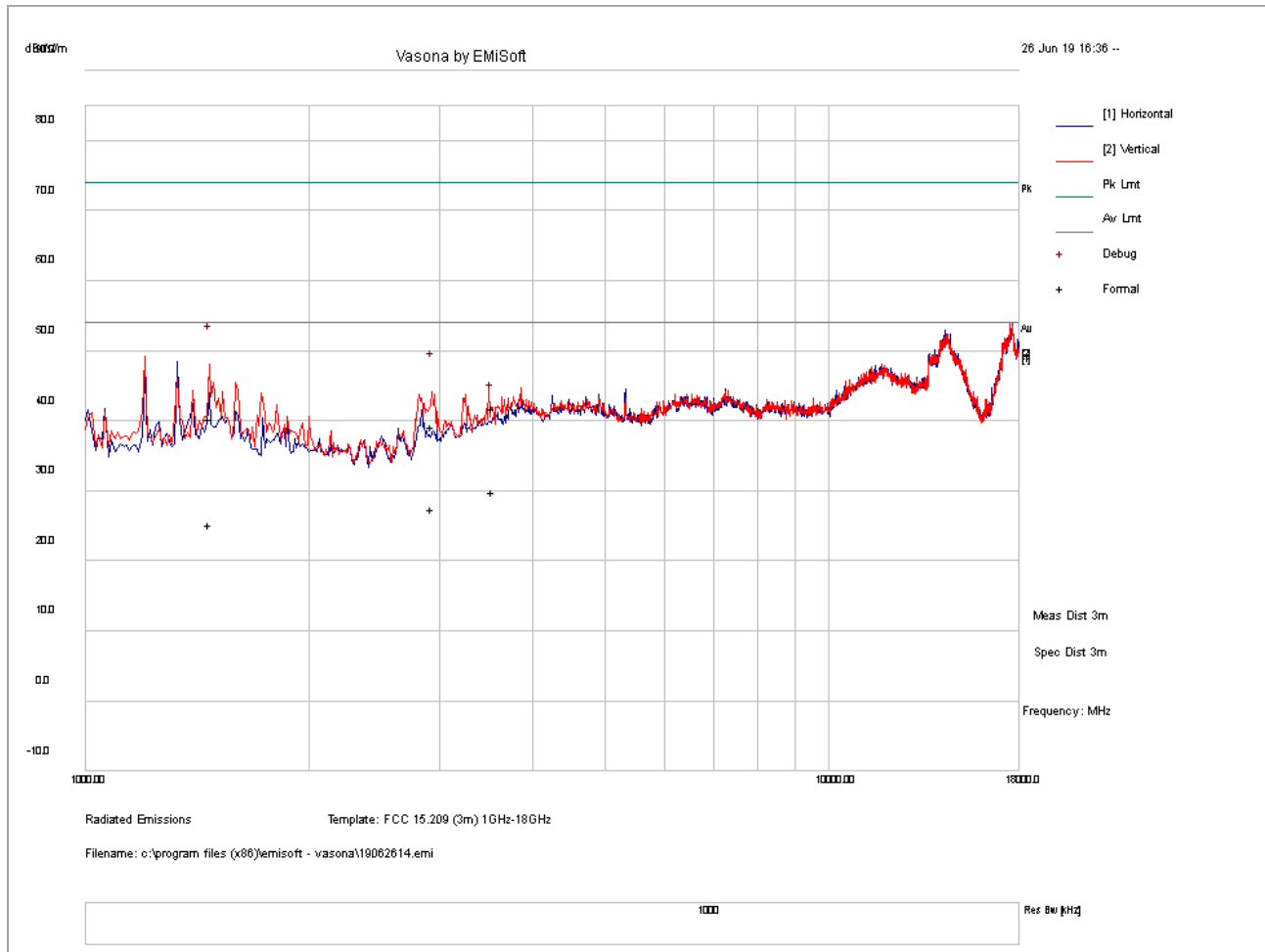
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
2826.21	25.75	11.15	1.96	38.87	PK	V	140	14	74	-35.14
1596.80	32.30	10.73	-3.36	39.68	PK	V	159	0	74	-34.33
6431.39	19.62	14.99	11.58	46.19	PK	V	252	323	74	-27.81
2826.21	13.77	11.15	1.96	26.88	AV	V	140	14	54	-27.12
1596.80	17.47	10.73	-3.36	24.84	AV	V	159	0	54	-29.16
6431.39	7.57	14.99	11.58	34.14	AV	V	252	323	54	-19.86

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n-5320MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



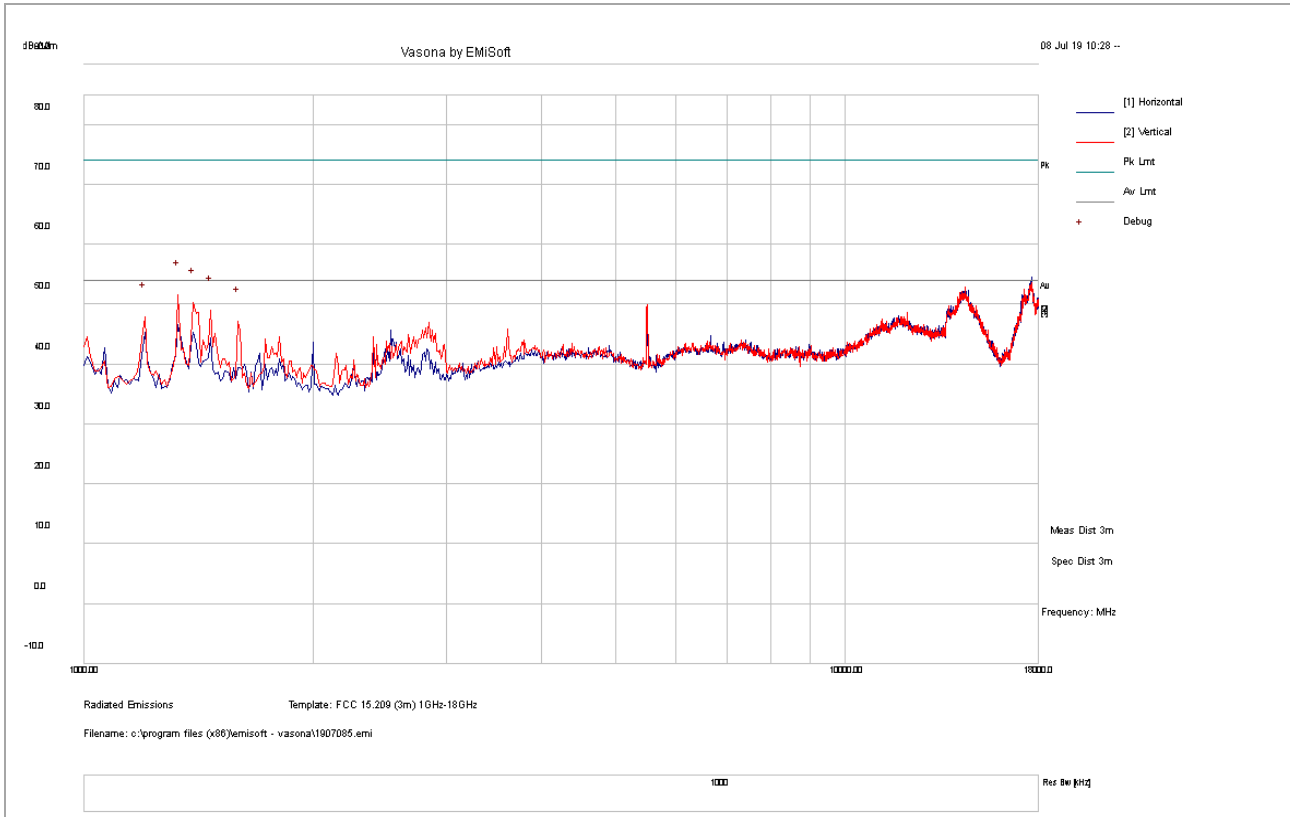
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1468.71	33.40	10.81	-3.75	40.46	PK	V	306	290	74	-33.54
2922.90	25.32	11.24	2.63	39.19	PK	V	100	241	74	-34.81
3516.49	24.40	11.92	5.62	41.94	PK	V	333	241	74	-32.06
1468.71	18.27	10.81	-3.75	25.33	AV	V	306	290	54	-28.67
2922.90	13.59	11.24	2.63	27.46	AV	V	100	241	54	-26.54
3516.49	12.40	11.92	5.62	29.94	AV	V	333	241	54	-24.06

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n-5500MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



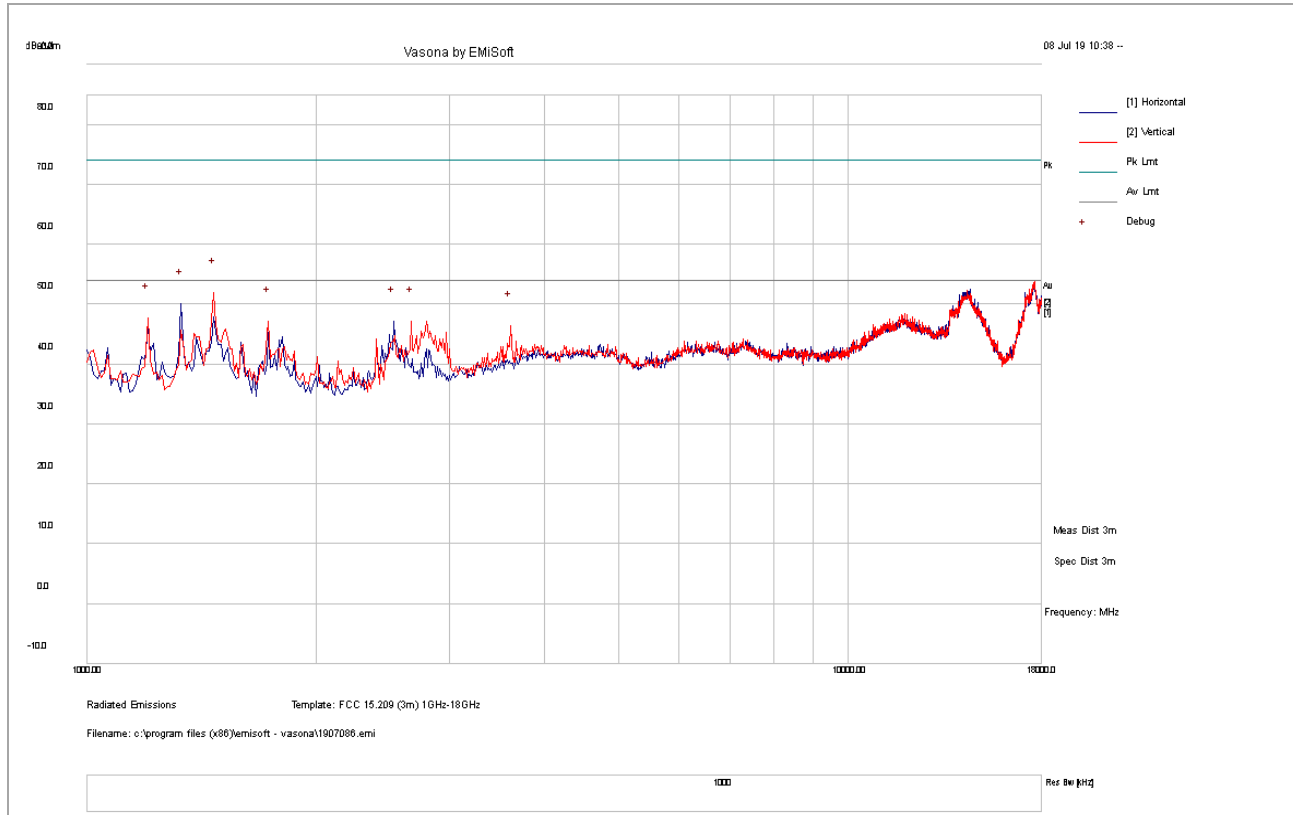
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1201.88	41.76	10.31	-4.18	47.89	PK	V	314	27	54	-6.11
1329.38	44.78	10.56	-3.81	51.52	PK	V	157	221	54	-2.48
1393.13	43.06	10.68	-3.55	50.18	PK	V	113	98	54	-3.82
1467.50	41.90	10.81	-3.75	48.96	PK	V	271	72	54	-5.04
1595.00	39.67	10.73	-3.37	47.04	PK	V	221	76	54	-6.97

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n-5600MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



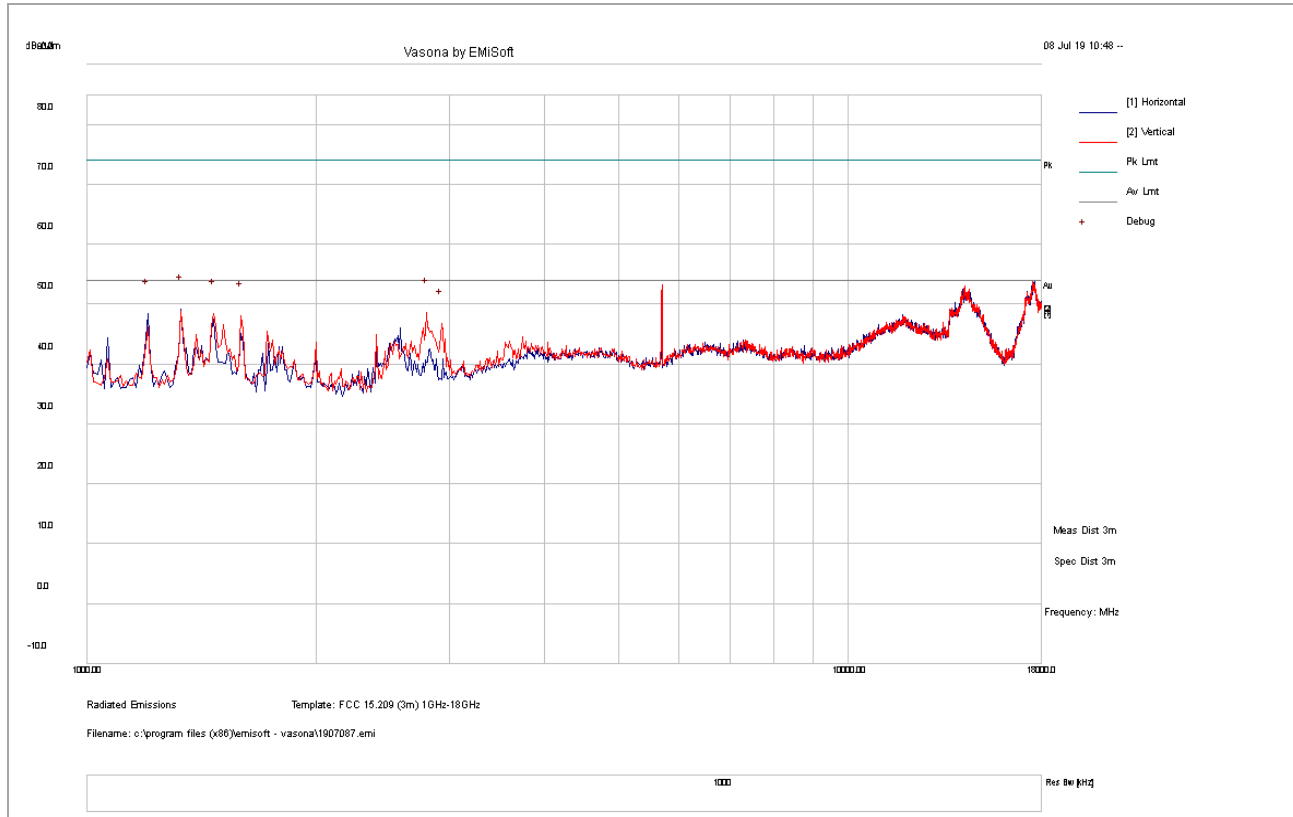
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1201.88	41.59	10.31	-4.18	47.73	PK	V	328	306	54	-6.27
1329.38	43.26	10.56	-3.81	50.01	PK	H	169	129	54	-3.99
1467.50	44.77	10.81	-3.75	51.83	PK	V	291	29	54	-2.17
1733.13	39.29	10.56	-2.68	47.17	PK	V	118	113	54	-6.83
2530.00	35.50	10.85	0.76	47.12	PK	H	141	304	54	-6.88
2668.13	34.88	10.99	1.30	47.18	PK	V	336	235	54	-6.82
3603.13	28.07	12.08	6.18	46.33	PK	V	192	92	54	-7.67

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n-5700MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



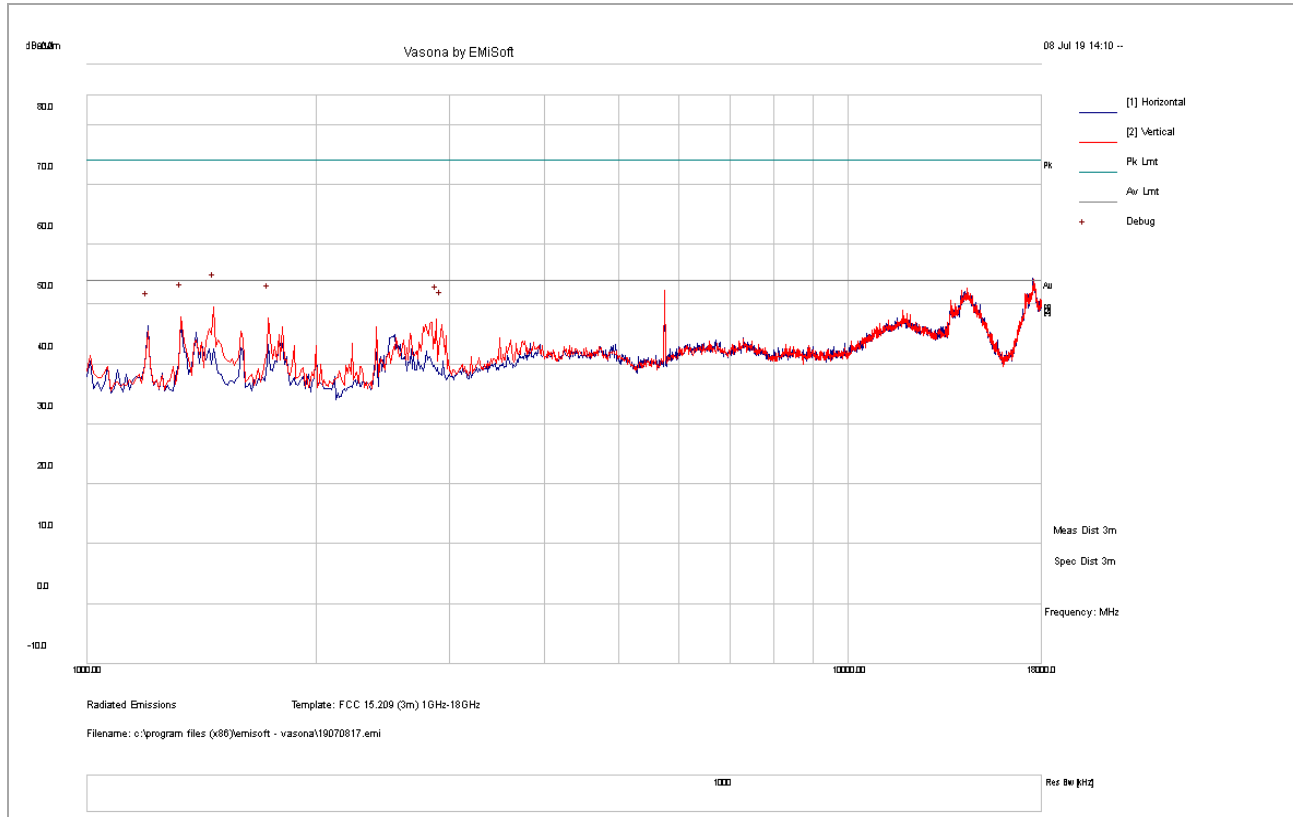
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1201.88	42.26	10.31	-4.18	48.39	PK	H	294	149	54	-5.61
1329.38	42.45	10.56	-3.81	49.19	PK	H	235	97	54	-4.81
1467.50	41.28	10.81	-3.75	48.35	PK	V	133	14	54	-5.66
1595.00	40.74	10.73	-3.37	48.10	PK	V	124	192	54	-5.90
2795.63	35.66	11.12	1.77	48.56	PK	V	297	14	54	-5.44
2923.13	32.86	11.24	2.63	46.74	PK	V	170	280	54	-7.26

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n-5745MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



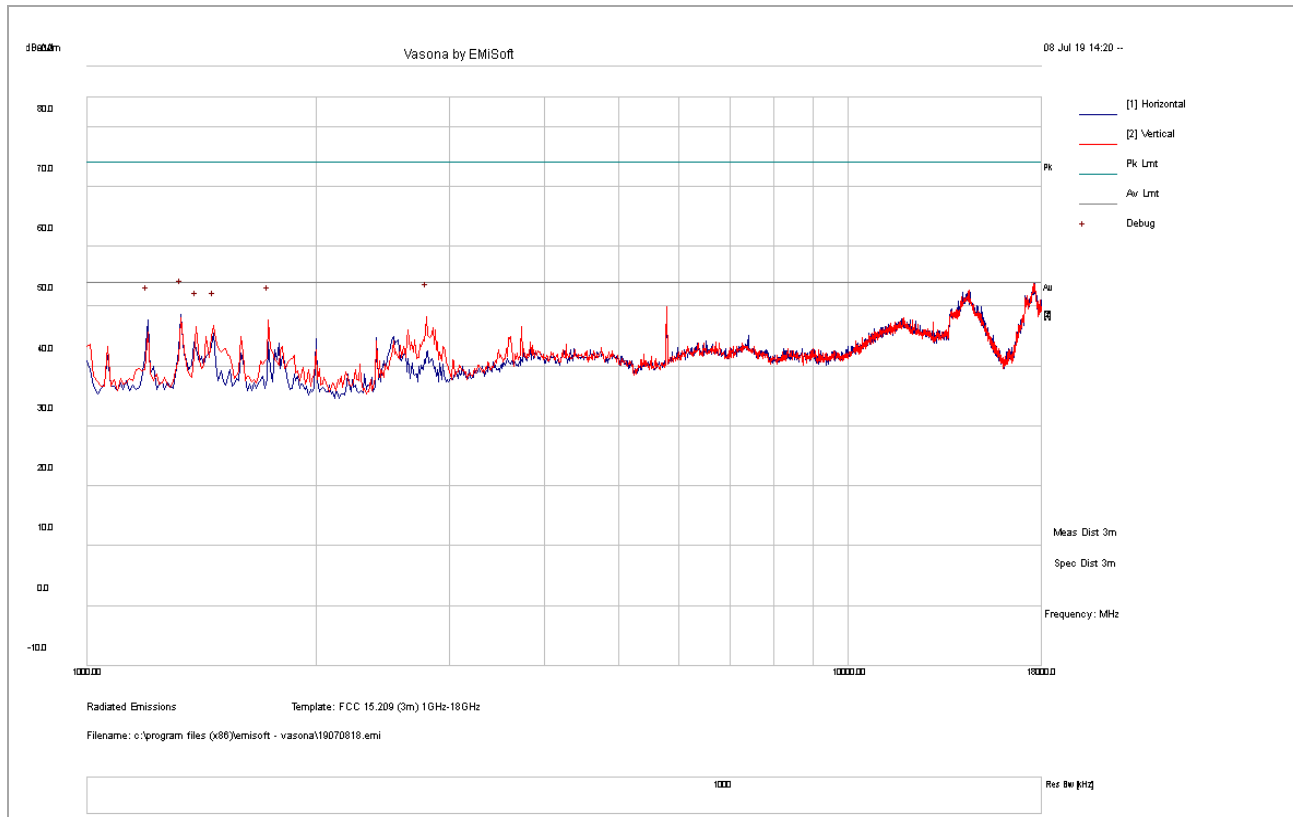
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1201.88	40.19	10.31	-4.18	46.32	PK	H	192	81	54	-7.68
1329.38	41.15	10.56	-3.81	47.90	PK	V	227	109	54	-6.10
1467.50	42.41	10.81	-3.75	49.47	PK	V	199	196	54	-4.53
1733.13	39.71	10.56	-2.68	47.58	PK	V	131	44	54	-6.42
2880.63	33.88	11.20	2.34	47.42	PK	V	291	213	54	-6.58
2923.13	32.68	11.24	2.63	46.56	PK	V	112	98	54	-7.44

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n-5785MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



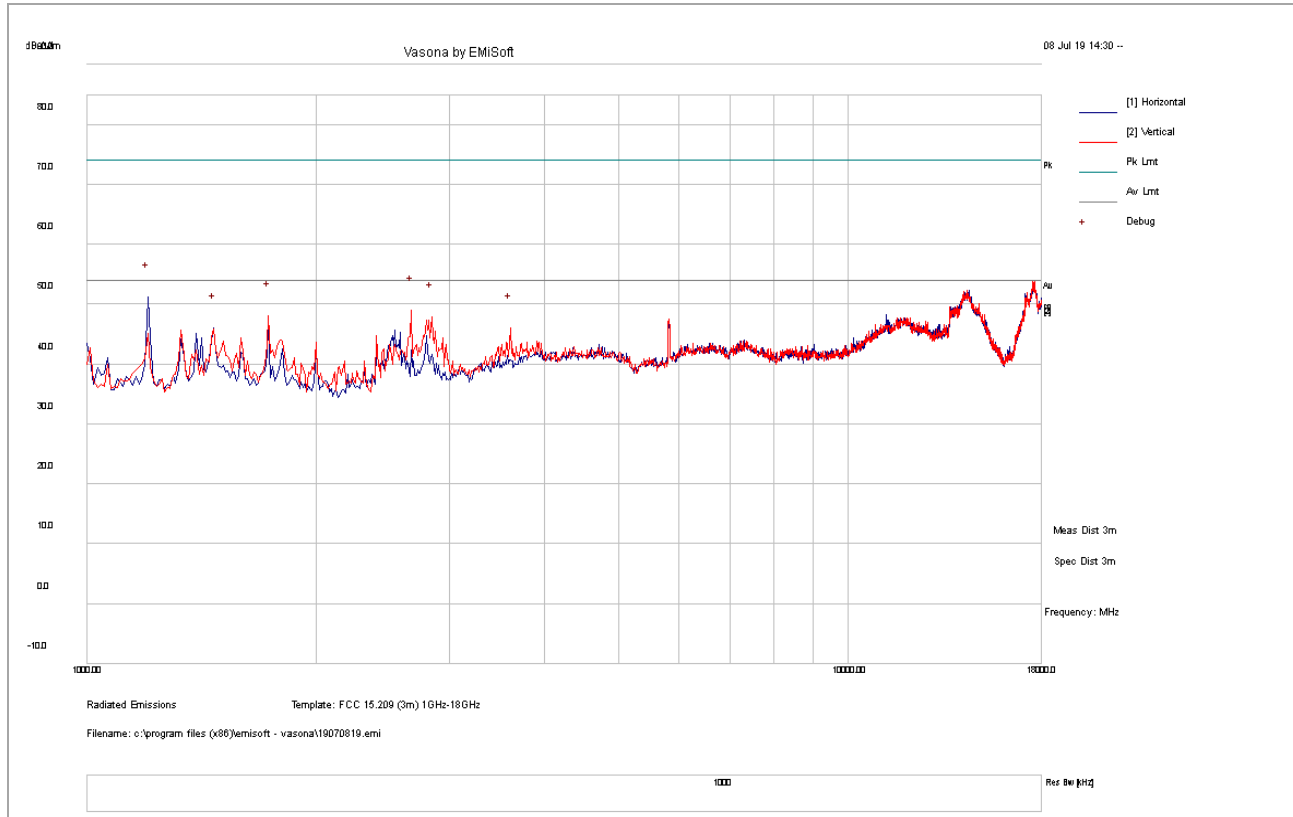
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1201.88	41.58	10.31	-4.18	47.71	PK	H	274	181	54	-6.29
1329.38	41.93	10.56	-3.81	48.68	PK	H	233	233	54	-5.32
1393.13	39.52	10.68	-3.55	46.64	PK	V	192	13	54	-7.36
1467.50	39.69	10.81	-3.75	46.75	PK	V	113	82	54	-7.25
1733.13	39.77	10.56	-2.68	47.64	PK	V	193	71	54	-6.36
2795.63	35.33	11.12	1.77	48.23	PK	V	254	278	54	-5.77

Report Number:	WAP-19052921-LC-FCC-UNII-G4L
Product:	Vehicle Infotainment System
Model Number:	SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n-5825MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



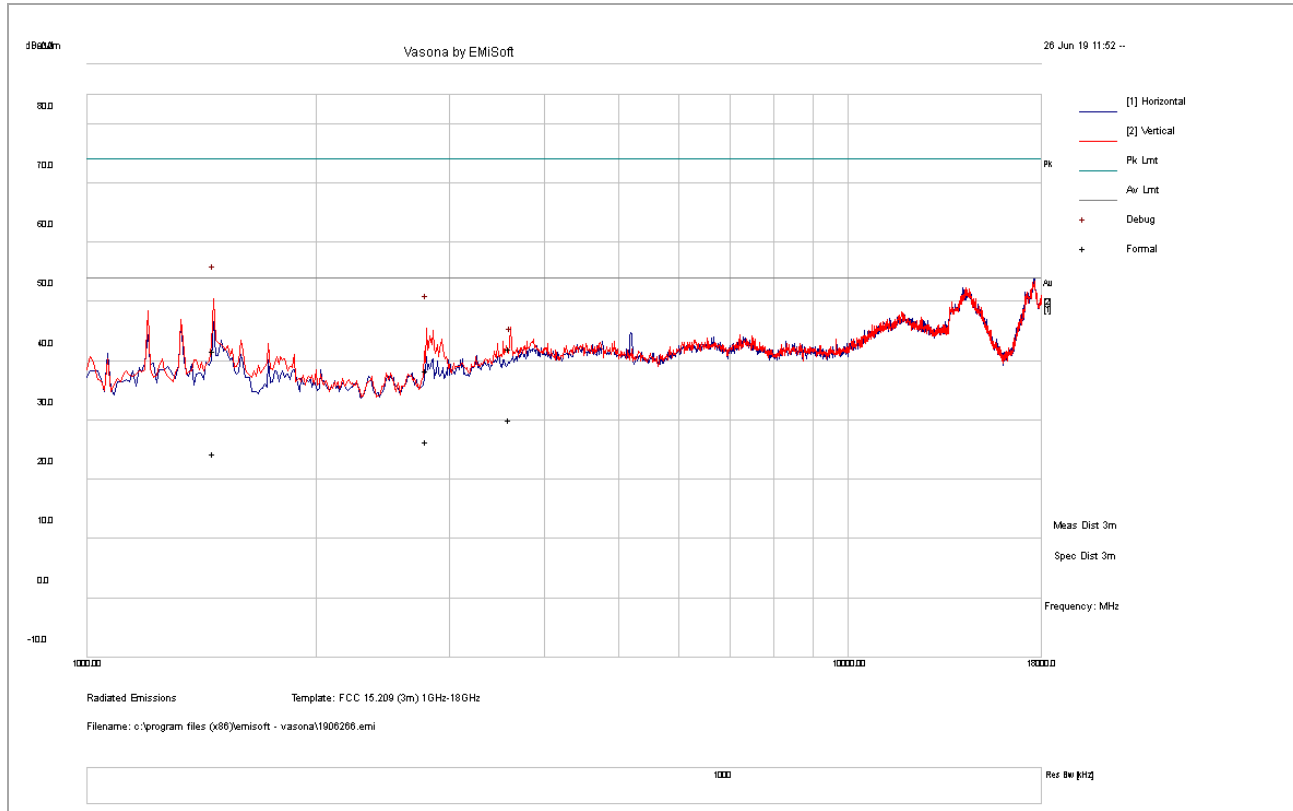
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1201.88	44.98	10.31	-4.18	51.11	PK	H	109	13	54	-2.89
1467.50	38.86	10.81	-3.75	45.92	PK	H	112	51	54	-8.08
1733.13	40.22	10.56	-2.68	48.09	PK	V	179	115	54	-5.91
2668.13	36.59	10.99	1.30	48.88	PK	V	183	351	54	-5.12
2838.13	34.65	11.16	2.04	47.86	PK	V	118	98	54	-6.14
3603.13	27.73	12.08	6.18	45.99	PK	V	172	281	54	-8.01

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n40-5190MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



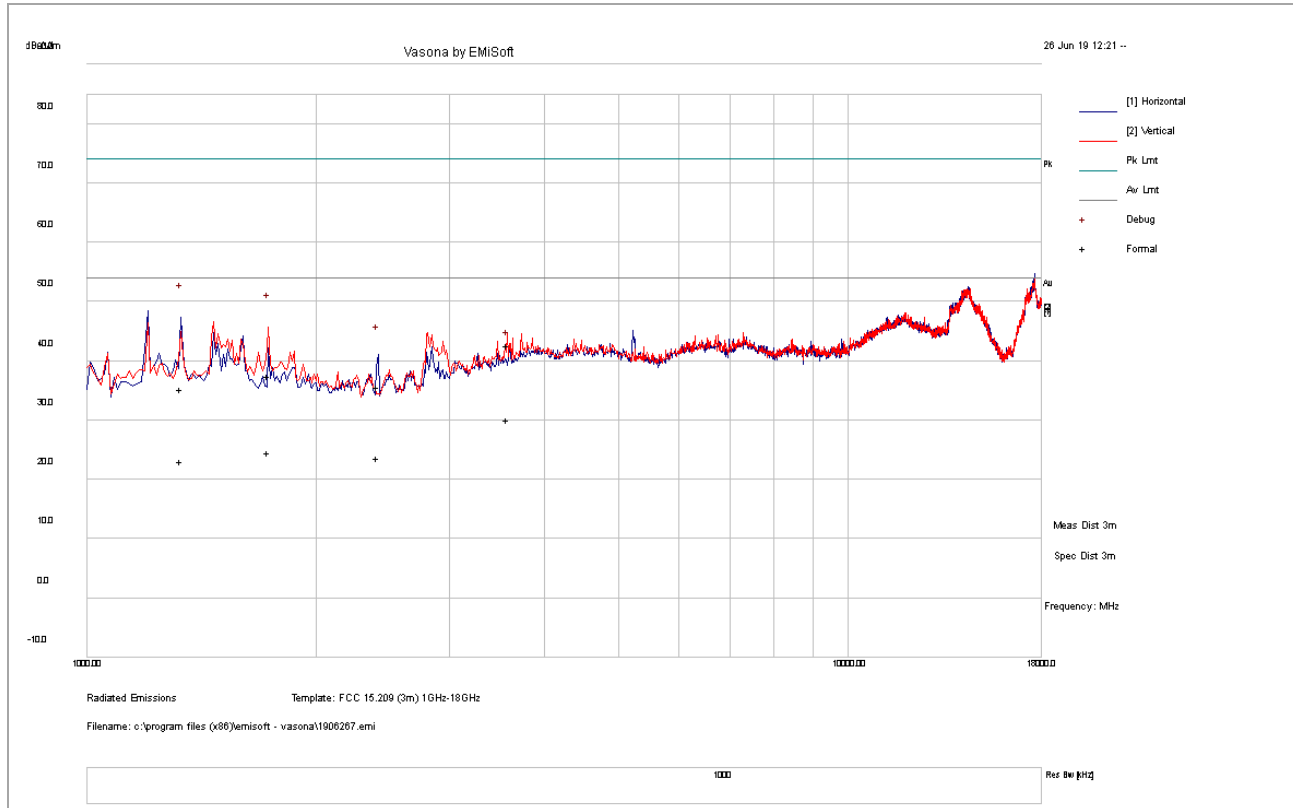
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1467.02	34.68	10.81	-3.75	41.74	PK	V	100	195	74	-32.26
2796.92	25.57	11.12	1.78	38.47	PK	V	387	276	74	-35.53
3603.58	23.82	12.08	6.19	42.08	PK	V	208	264	74	-31.92
1467.02	17.36	10.81	-3.75	24.42	AV	V	100	195	54	-29.58
2796.92	13.60	11.12	1.78	26.50	AV	V	387	276	54	-27.50
3603.58	11.82	12.08	6.19	30.09	AV	V	208	264	54	-23.92

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n40-5230MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



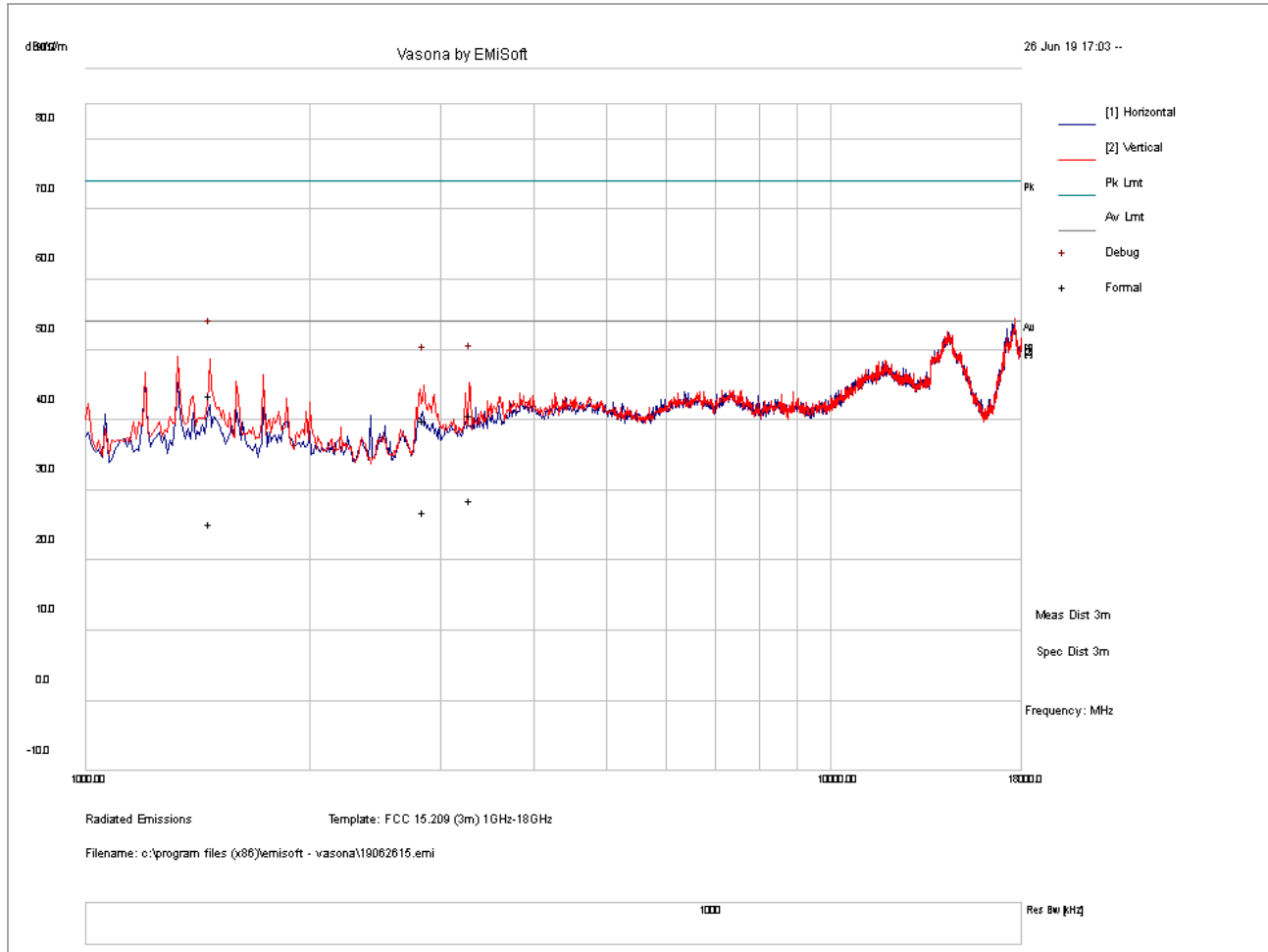
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1329.11	28.61	10.56	-3.81	35.36	PK	H	370	92	74	-38.64
1734.99	29.62	10.55	-2.66	37.51	PK	V	116	305	74	-36.49
2412.58	24.85	10.73	0.07	35.64	PK	V	156	161	74	-38.36
3571.55	24.54	12.02	6.02	42.58	PK	V	302	271	74	-31.42
1329.11	16.32	10.56	-3.81	23.07	AV	H	370	92	54	-30.93
1734.99	16.77	10.55	-2.66	24.67	AV	V	116	305	54	-29.33
2412.58	12.91	10.73	0.07	23.71	AV	V	156	161	54	-30.29
3571.55	12.15	12.02	6.02	30.19	AV	V	302	271	54	-23.81

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n40-5270MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



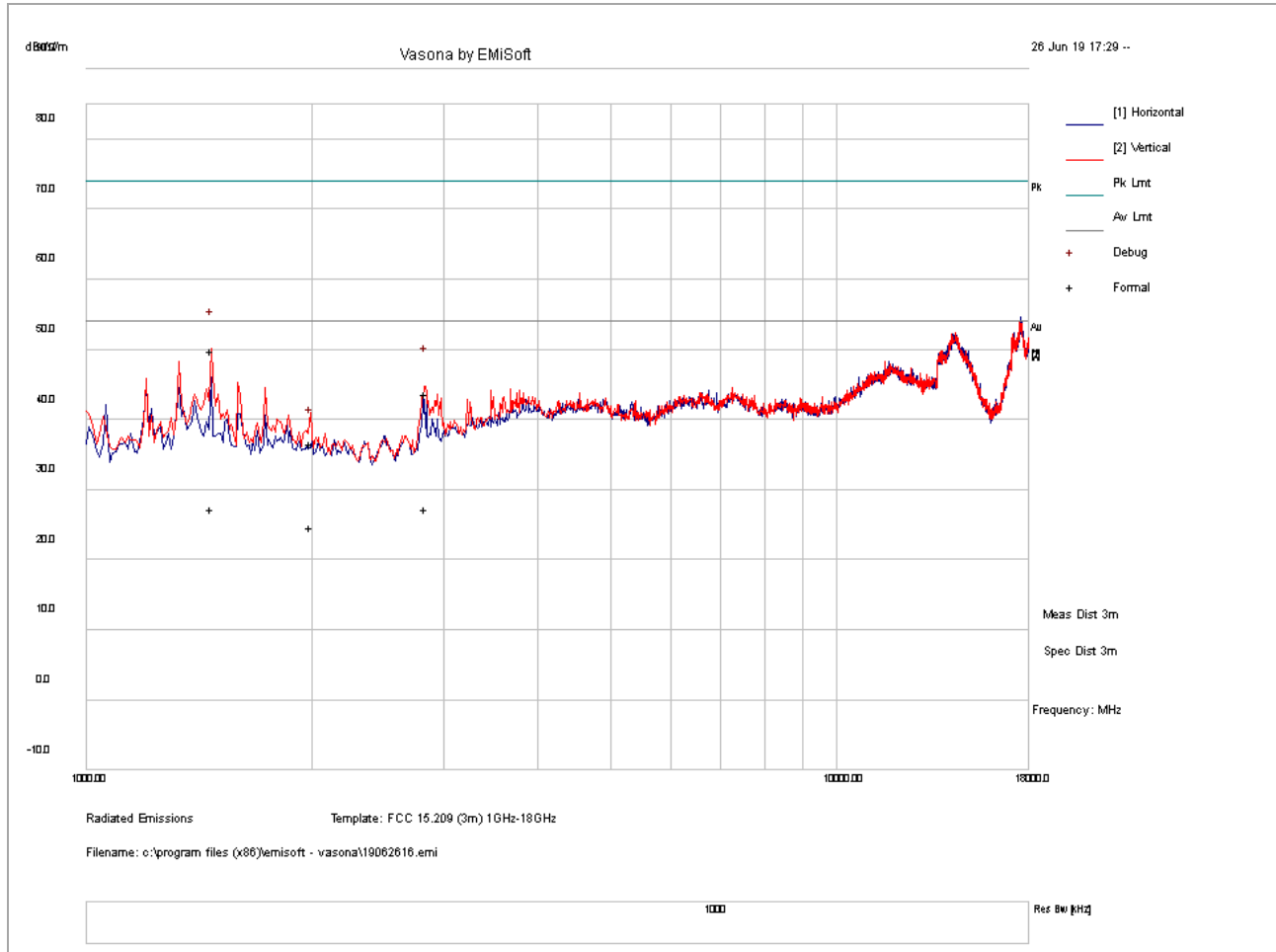
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1466.62	36.43	10.81	-3.75	43.50	PK	V	326	302	74	-30.51
3273.95	24.85	11.64	4.24	40.74	PK	V	285	186	74	-33.26
2837.00	26.86	11.16	2.03	40.06	PK	V	213	351	74	-33.94
1466.62	18.19	10.81	-3.75	25.25	AV	V	326	302	54	-28.75
3273.95	12.79	11.64	4.24	28.68	AV	V	285	186	54	-25.32
2837.00	13.86	11.16	2.03	27.06	AV	V	213	351	54	-26.94

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n40-5310MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



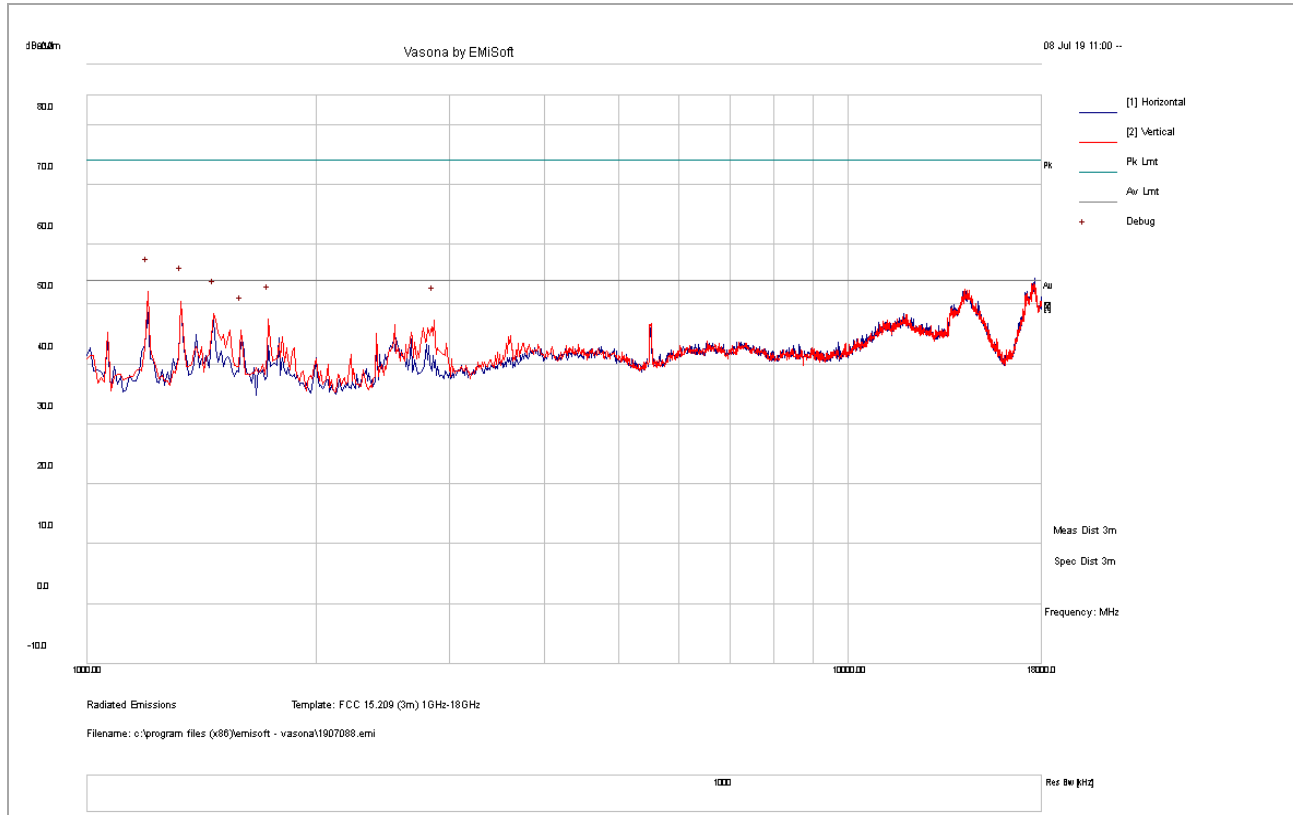
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1466.68	42.76	10.81	-3.75	49.82	PK	V	246	296	74	-24.18
2829.35	30.62	11.16	1.99	43.77	PK	V	119	166	74	-30.24
1988.90	27.11	10.26	-0.75	36.62	PK	V	250	312	74	-37.38
1466.68	20.24	10.81	-3.75	27.30	AV	V	246	296	54	-26.70
2829.35	14.24	11.16	1.99	27.38	AV	V	119	166	54	-26.62
1988.90	15.21	10.26	-0.75	24.72	AV	V	250	312	54	-29.29

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n40-5510MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



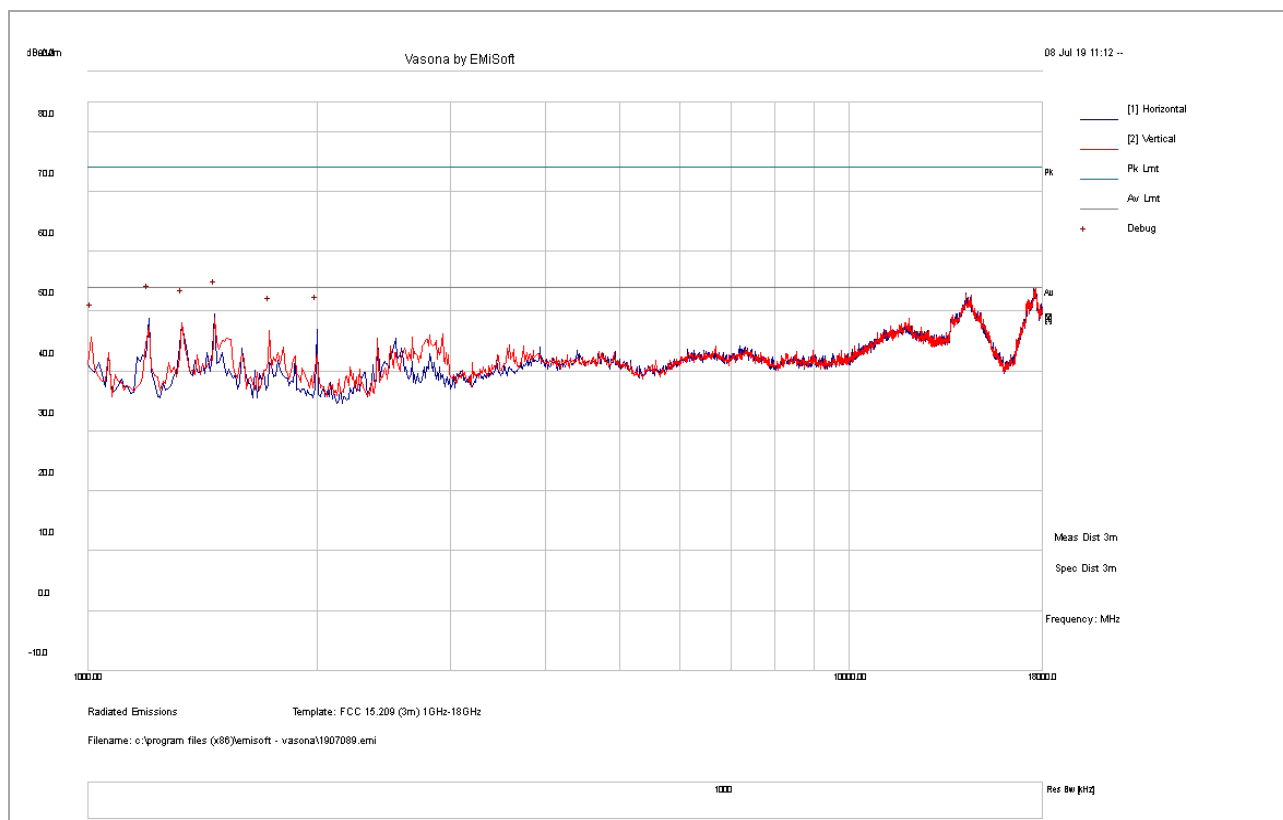
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1201.88	45.93	10.31	-4.18	52.06	PK	V	279	321	54	-1.94
1329.38	43.77	10.56	-3.81	50.52	PK	V	160	93	54	-3.48
1467.50	41.35	10.81	-3.75	48.41	PK	V	171	12	54	-5.59
1595.00	38.29	10.73	-3.37	45.66	PK	V	113	118	54	-8.34
1733.13	39.56	10.56	-2.68	47.43	PK	V	247	315	54	-6.57
2859.38	33.90	11.18	2.19	47.27	PK	V	223	256	54	-6.73

Report Number:	WAP-19052921-LC-FCC-UNII-G4L
Product:	Vehicle Infotainment System
Model Number:	SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n40-5590MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



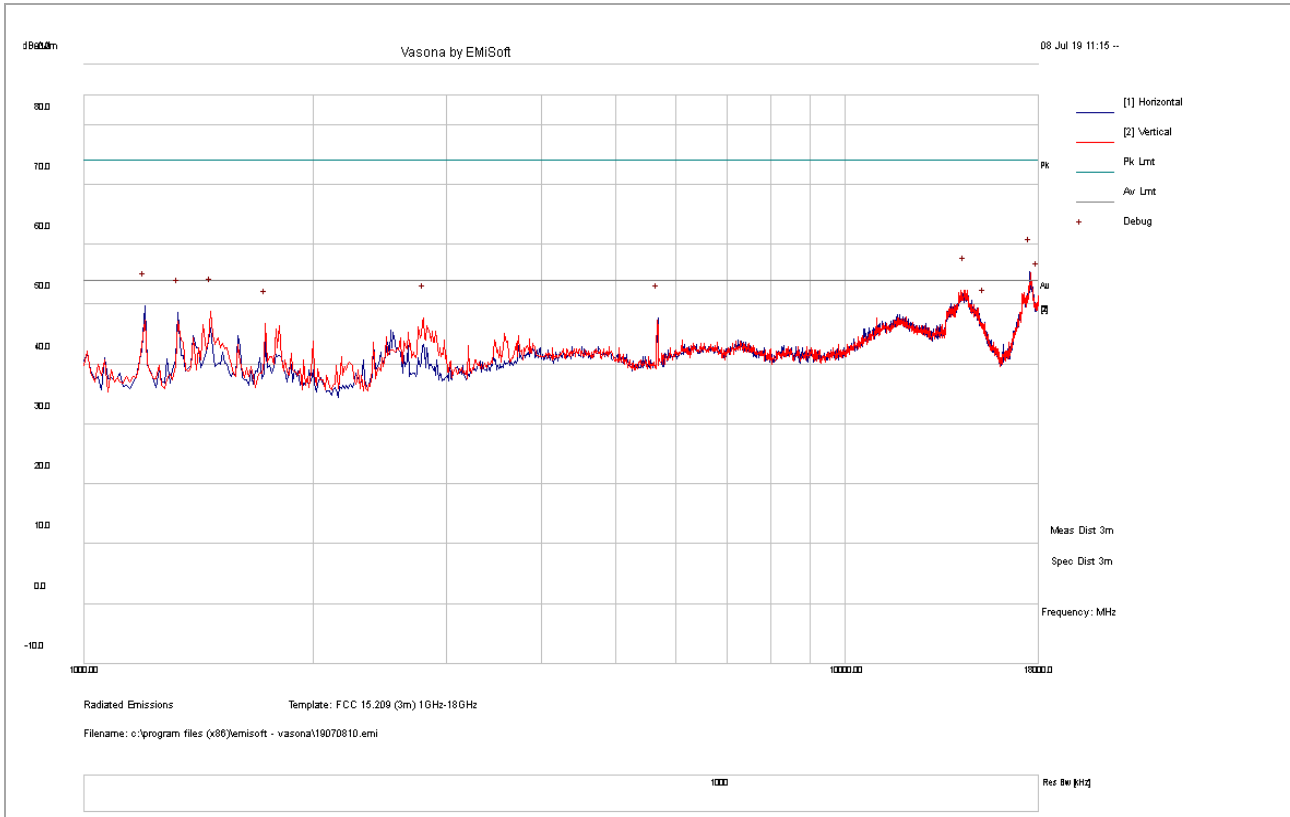
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1010.63	41.31	9.87	-5.57	45.61	PK	V	192	22	54	-8.39
1201.88	42.69	10.31	-4.18	48.82	PK	H	177	142	54	-5.18
1329.38	41.31	10.56	-3.81	48.05	PK	V	110	28	54	-5.95
1467.50	42.43	10.81	-3.75	49.50	PK	H	108	349	54	-4.51
1733.13	38.82	10.56	-2.68	46.69	PK	V	113	134	54	-7.31
1998.75	37.37	10.25	-0.73	46.89	PK	H	198	52	54	-7.11

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n40-5670MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



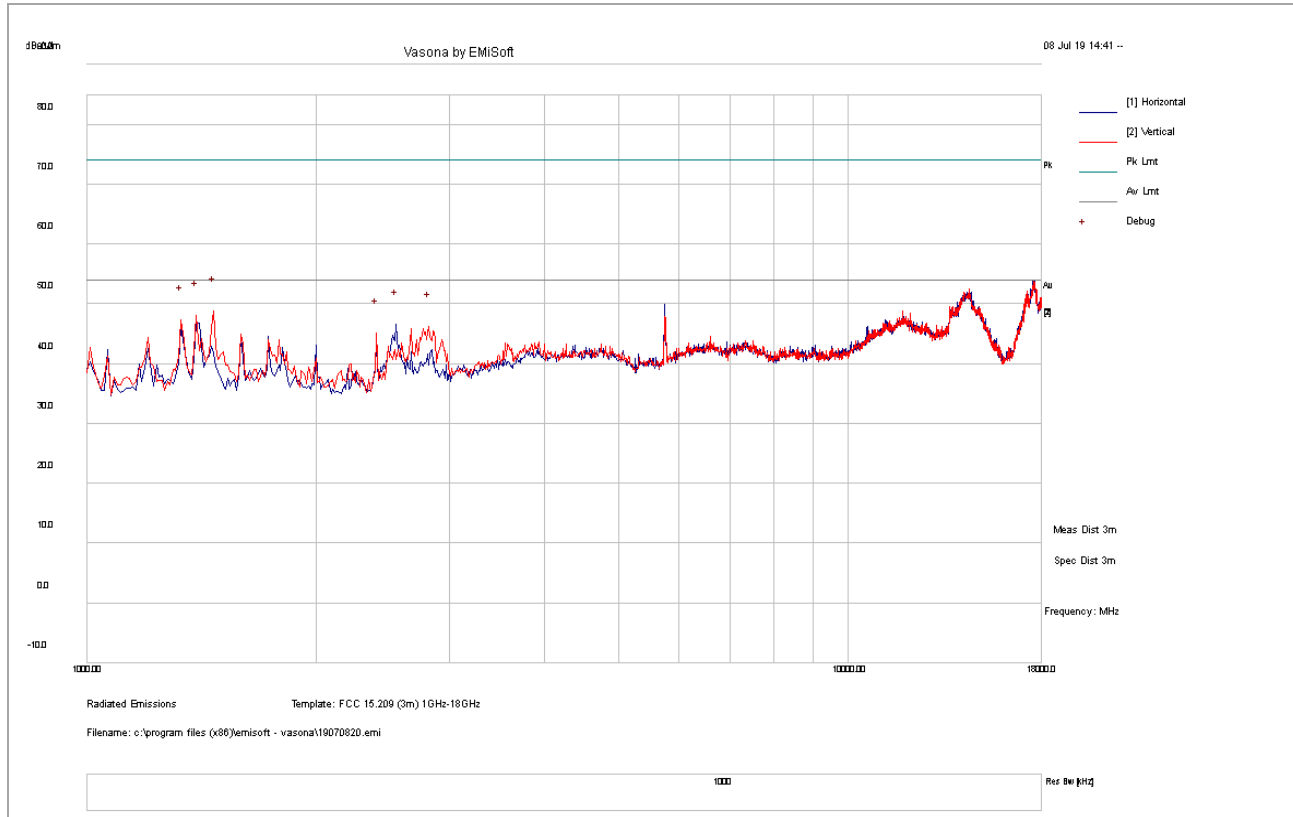
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1201.88	43.48	10.31	-4.18	49.61	PK	H	158	118	54	-4.39
1329.38	41.80	10.56	-3.81	48.55	PK	H	133	22	54	-5.46
1467.50	41.70	10.81	-3.75	48.76	PK	V	281	109	54	-5.24
1733.13	38.94	10.56	-2.68	46.81	PK	V	173	87	54	-7.19
2795.63	34.77	11.12	1.77	47.67	PK	V	113	42	54	-6.33

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n40-5755MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



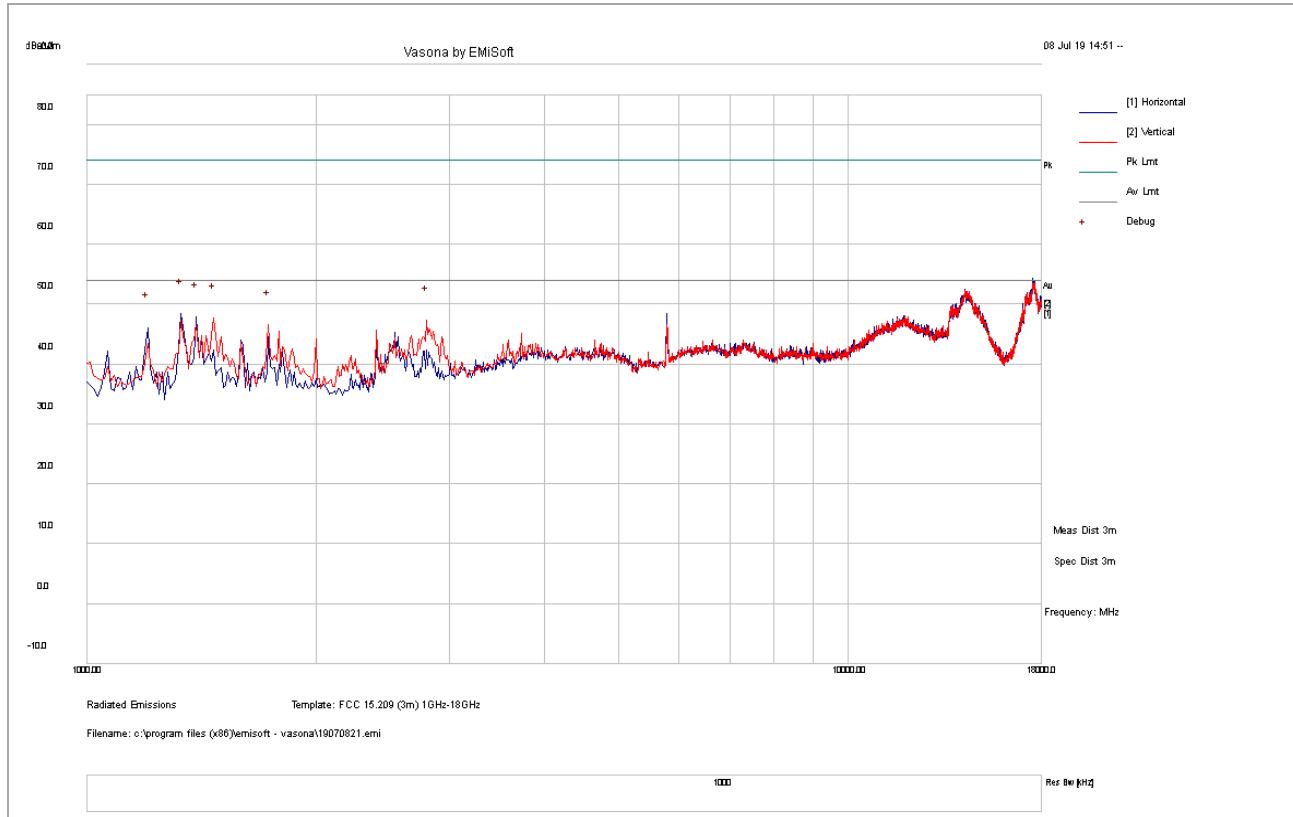
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1329.38	40.48	10.56	-3.81	47.23	PK	V	134	66	54	-6.77
1393.13	40.92	10.68	-3.55	48.05	PK	V	140	245	54	-5.95
1467.50	41.63	10.81	-3.75	48.69	PK	V	158	343	54	-5.31
2402.50	34.35	10.72	0.04	45.11	PK	V	371	74	54	-8.89
2551.25	34.82	10.87	0.92	46.61	PK	H	163	199	54	-7.39
2816.88	33.06	11.14	1.90	46.11	PK	V	134	24	54	-7.89

Report Number:	WAP-19052921-LC-FCC-UNII-G4L
Product:	Vehicle Infotainment System
Model Number:	SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n40-5795MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



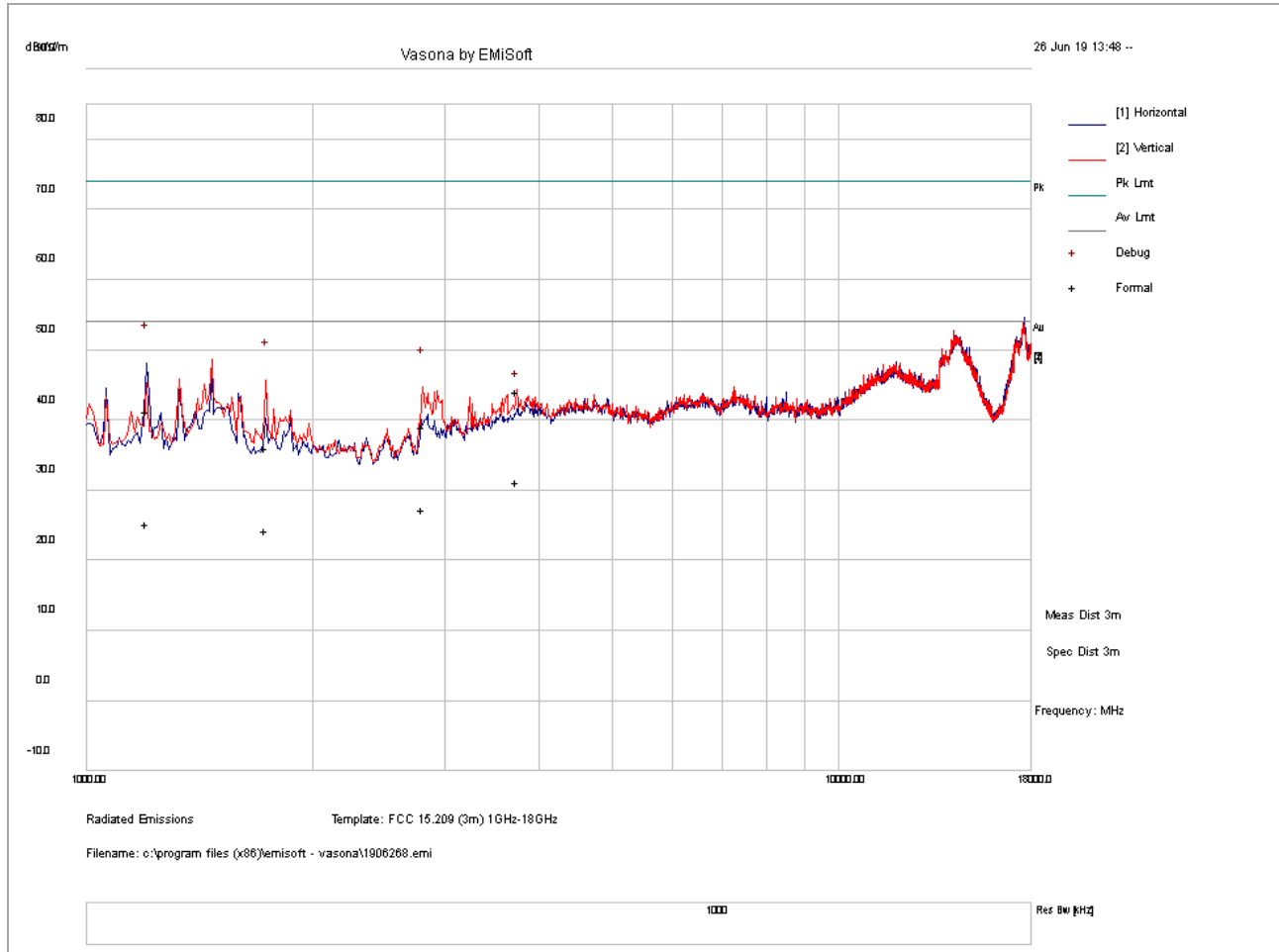
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1201.88	39.96	10.31	-4.18	46.09	PK	H	134	268	54	-7.91
1329.38	41.71	10.56	-3.81	48.45	PK	H	227	20	54	-5.55
1393.13	40.78	10.68	-3.55	47.90	PK	H	248	108	54	-6.10
1467.50	40.66	10.81	-3.75	47.72	PK	V	110	246	54	-6.28
1733.13	38.59	10.56	-2.68	46.47	PK	V	110	11	54	-7.53
2795.63	34.39	11.12	1.77	47.29	PK	V	202	113	54	-6.71

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11ac80-5210MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



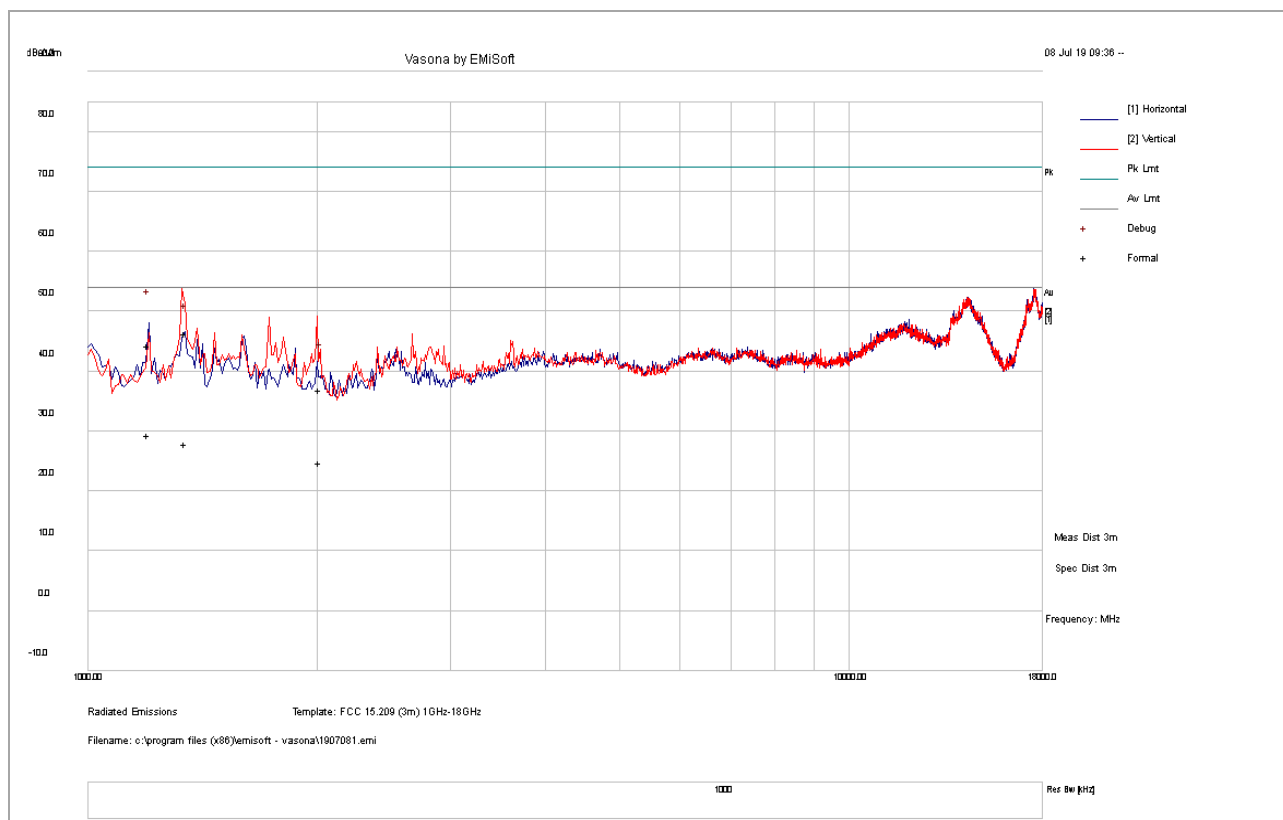
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1199.94	35.16	10.30	-4.18	41.28	PK	H	117	45	74	-32.72
1731.82	28.18	10.56	-2.70	36.05	PK	V	325	0	74	-37.95
2794.79	26.24	11.12	1.77	39.13	PK	V	206	0	74	-34.87
3730.86	24.89	12.30	7.01	44.20	PK	V	100	230	74	-29.80
1199.94	19.21	10.30	-4.18	25.33	AV	H	117	45	54	-28.67
1731.82	16.43	10.56	-2.70	24.29	AV	V	325	0	54	-29.71
2794.79	14.43	11.12	1.77	27.32	AV	V	206	0	54	-26.68
3730.86	11.89	12.30	7.01	31.19	AV	V	100	230	54	-22.81

Report Number:	WAP-19052921-LC-FCC-UNII-G4L
Product:	Vehicle Infotainment System
Model Number:	SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11ac80-5290MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



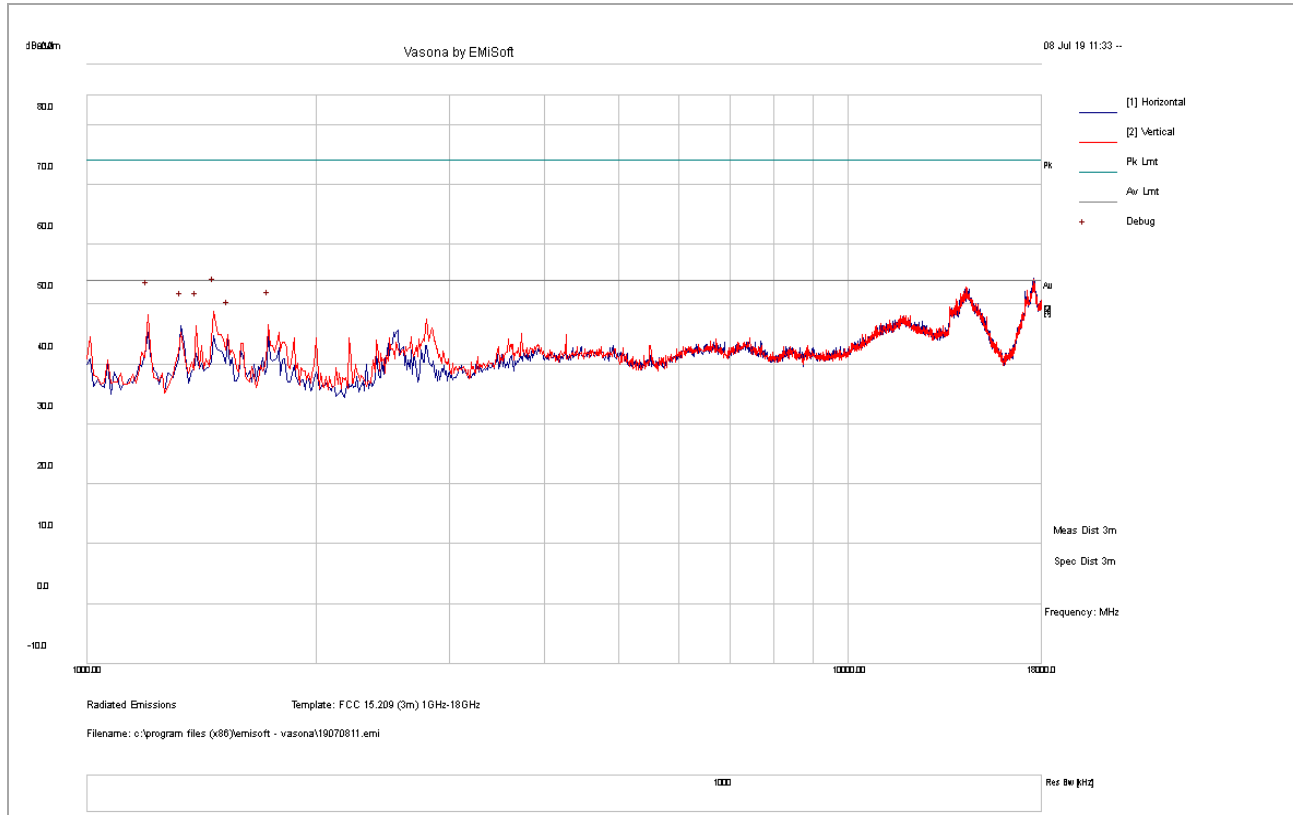
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1199.84	38.23	10.30	-4.19	44.35	PK	V	164	178	74	-29.65
1343.53	39.64	10.59	-3.84	46.39	PK	V	101	98	74	-27.61
2019.88	27.46	10.28	-0.79	36.95	PK	V	370	286	74	-37.05
1199.84	23.27	10.30	-4.19	29.38	AV	V	164	178	54	-24.62
1343.53	21.15	10.59	-3.84	27.90	AV	V	101	98	54	-26.10
2019.88	15.34	10.28	-0.79	24.83	AV	V	370	286	54	-29.17

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11ac80-5530MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



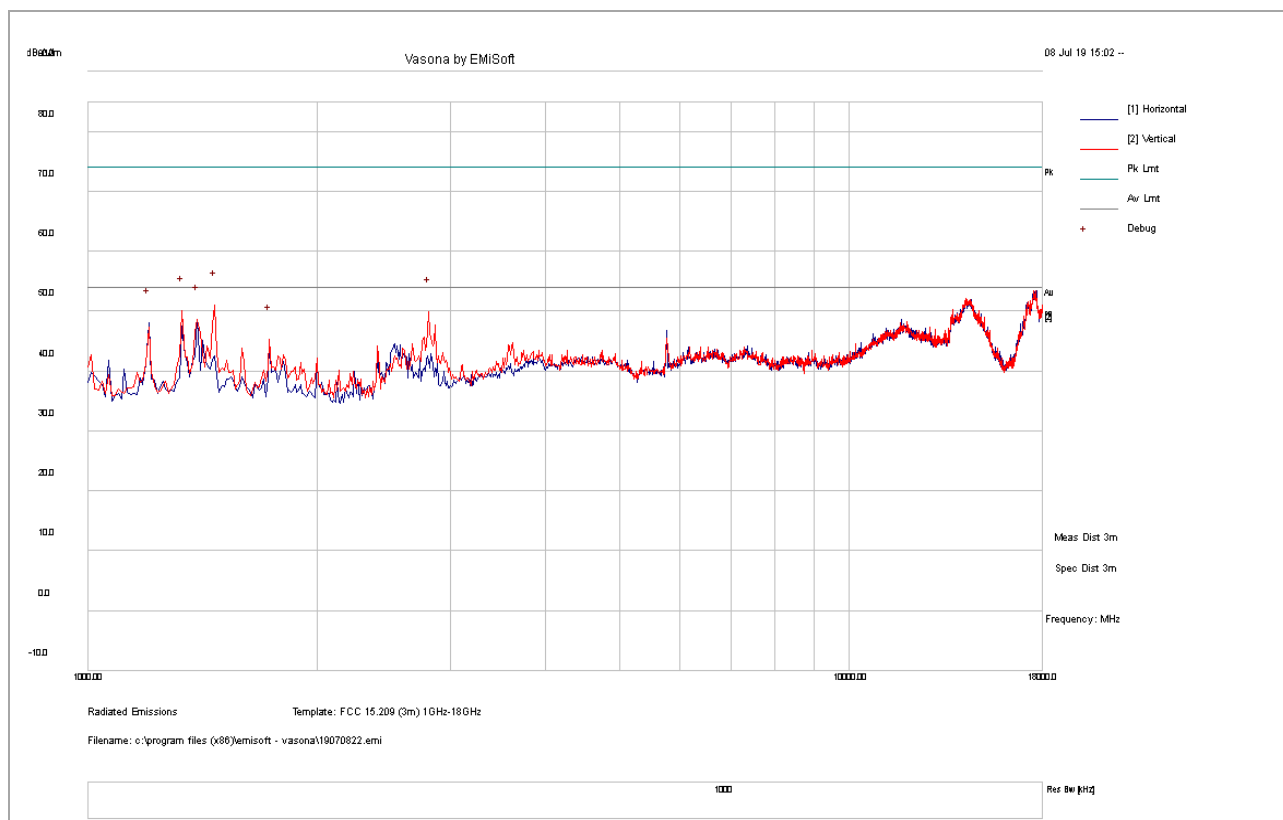
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1201.88	42.15	10.31	-4.18	48.28	PK	V	178	98	54	-5.72
1329.38	39.55	10.56	-3.81	46.30	PK	H	209	96	54	-7.70
1393.13	39.21	10.68	-3.55	46.34	PK	V	257	340	54	-7.66
1467.50	41.75	10.81	-3.75	48.82	PK	V	155	116	54	-5.19
1531.25	37.83	10.82	-3.68	44.97	PK	V	251	98	54	-9.04
1733.13	38.65	10.56	-2.68	46.53	PK	V	214	5	54	-7.47

Report Number:	WAP-19052921-LC-FCC-UNII-G4L
Product:	Vehicle Infotainment System
Model Number:	SYNC-G4L



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11ac80-5775MHz
Frequency Range:	1GHz-18GHz	Test Date:	06/25/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Cameron Wu
Remark:	N/A	Test Result:	Pass



Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
1201.88	41.89	10.31	-4.18	48.02	PK	H	174	70	54	-5.98
1329.38	43.37	10.56	-3.81	50.12	PK	V	232	104	54	-3.88
1393.13	41.43	10.68	-3.55	48.56	PK	V	382	154	54	-5.44
1467.50	43.88	10.81	-3.75	50.94	PK	V	101	143	54	-3.06
1733.13	37.41	10.56	-2.68	45.29	PK	H	204	113	54	-8.71
2806.25	36.98	11.13	1.83	49.95	PK	V	326	41	54	-4.05

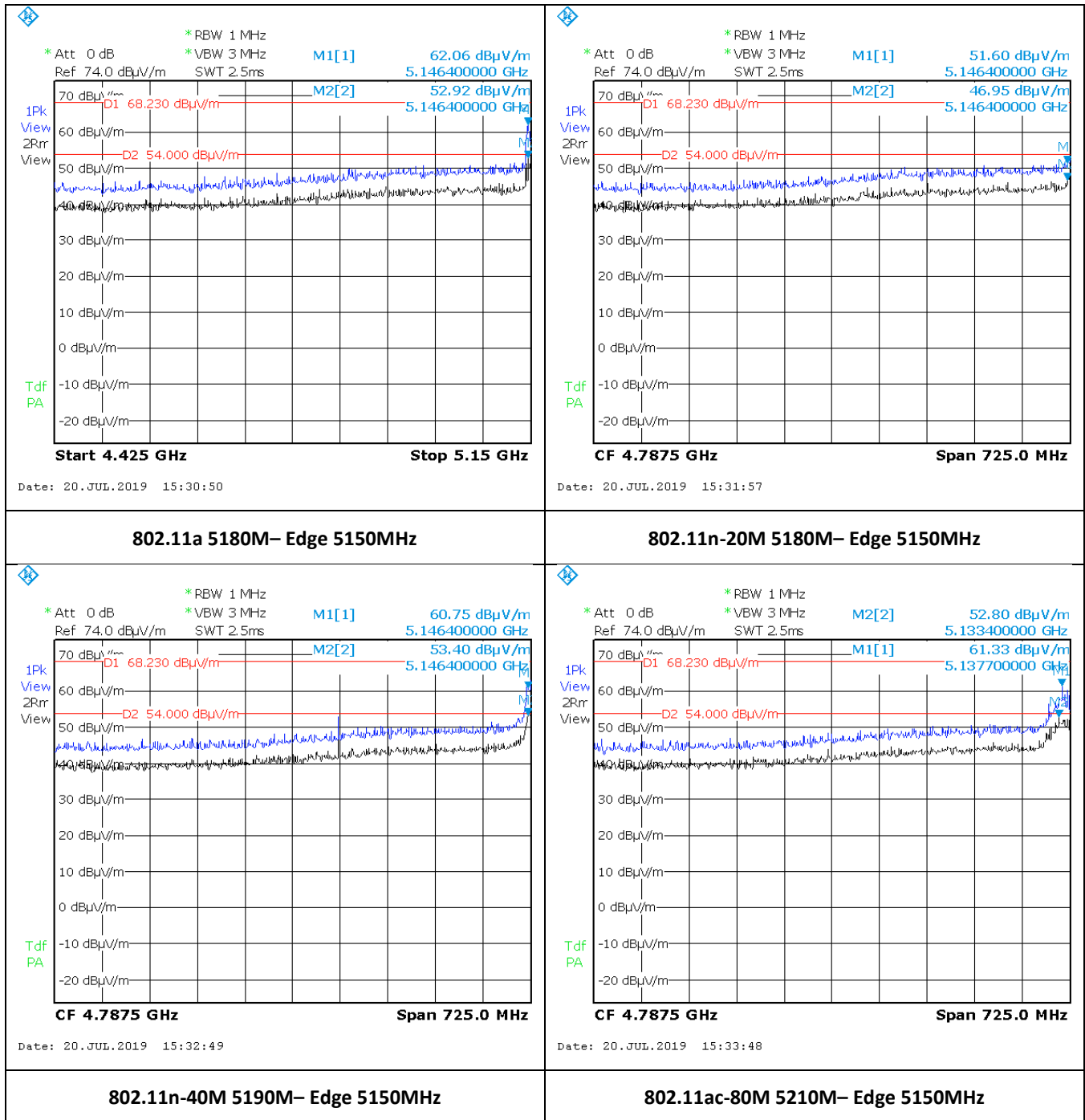
Report Number:	WAP-19052921-LC-FCC-UNII-G4L
Product:	Vehicle Infotainment System
Model Number:	SYNC-G4L



18GHz – 40GHz test result

Note: no substantial emission is found other than the noise floor.

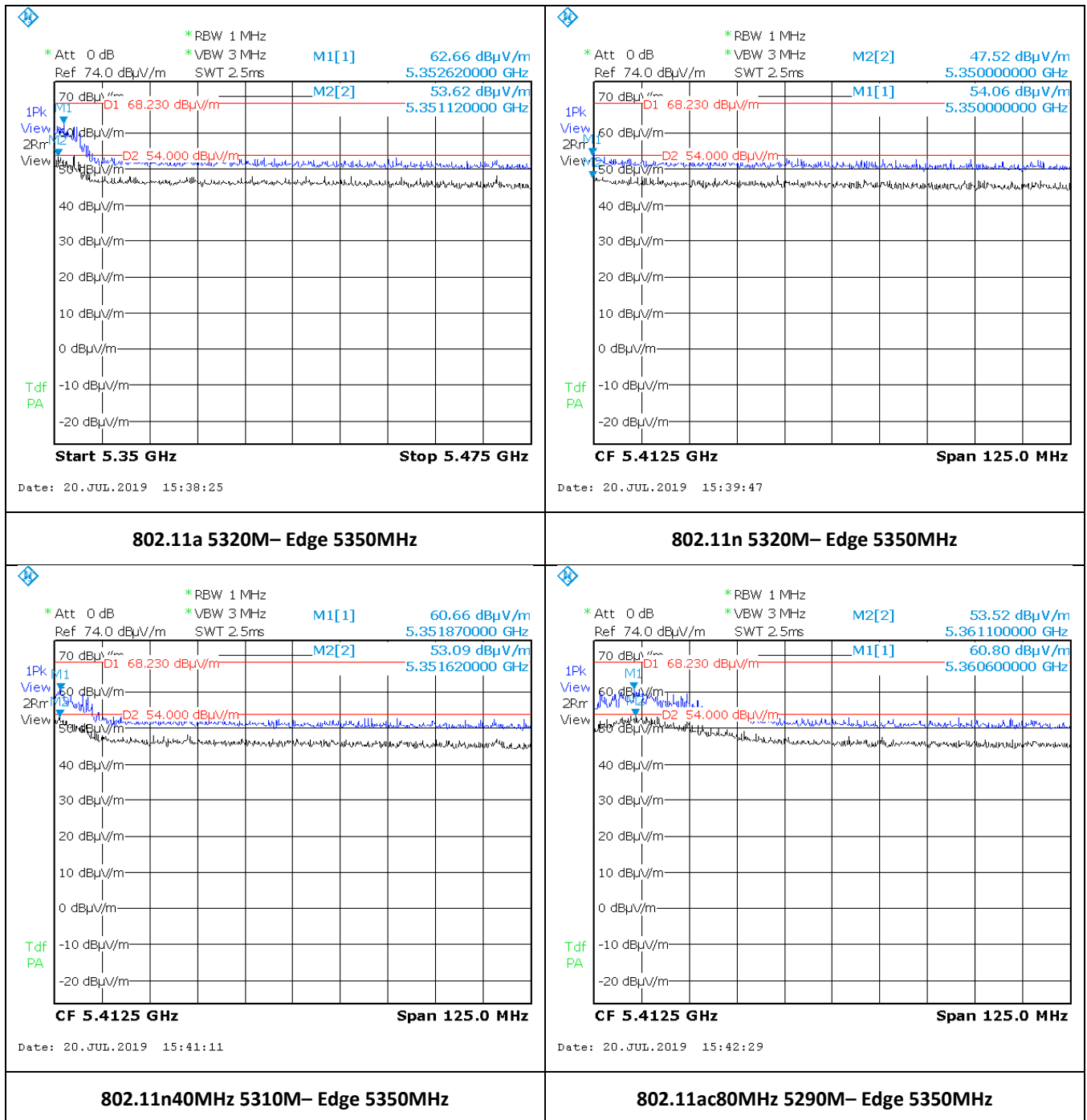
Radiated Band Edge measurement result



Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



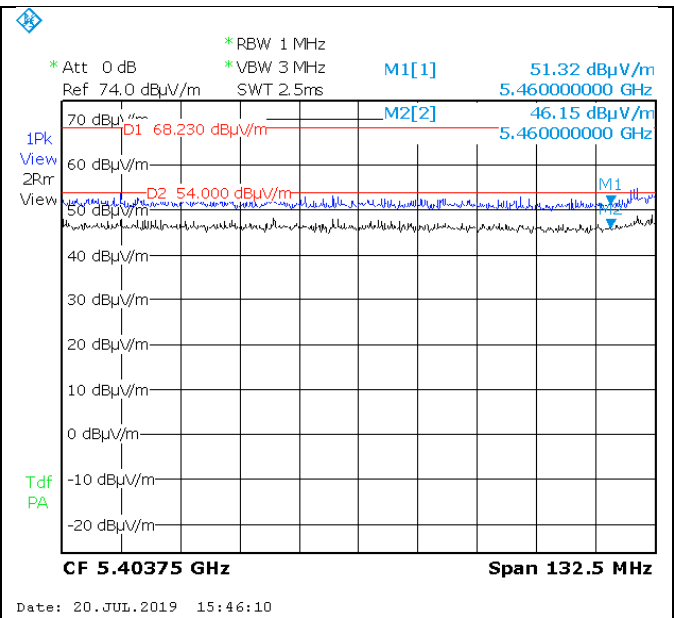
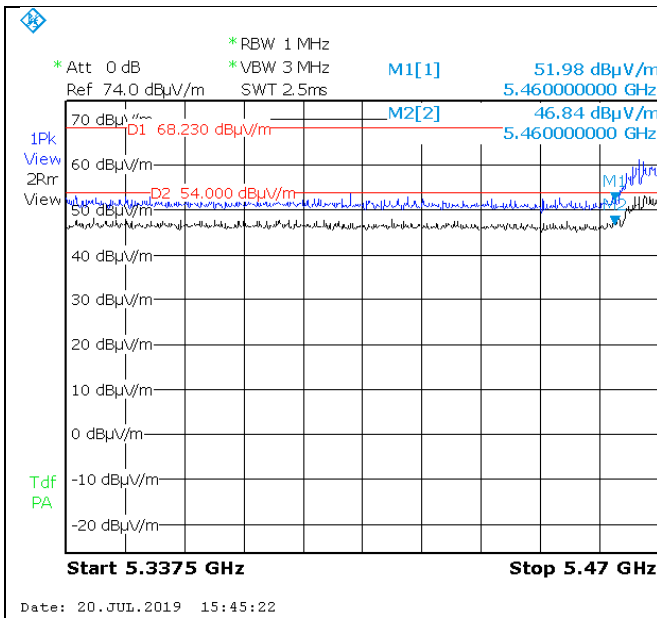
Page 95 of 100



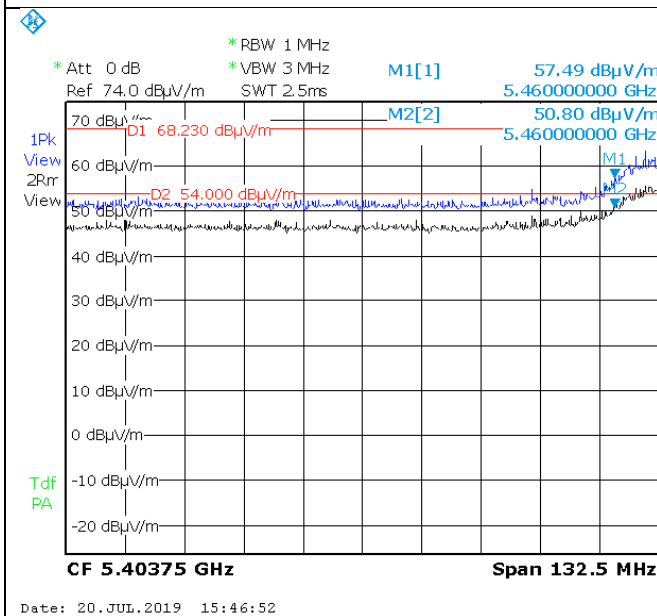
Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



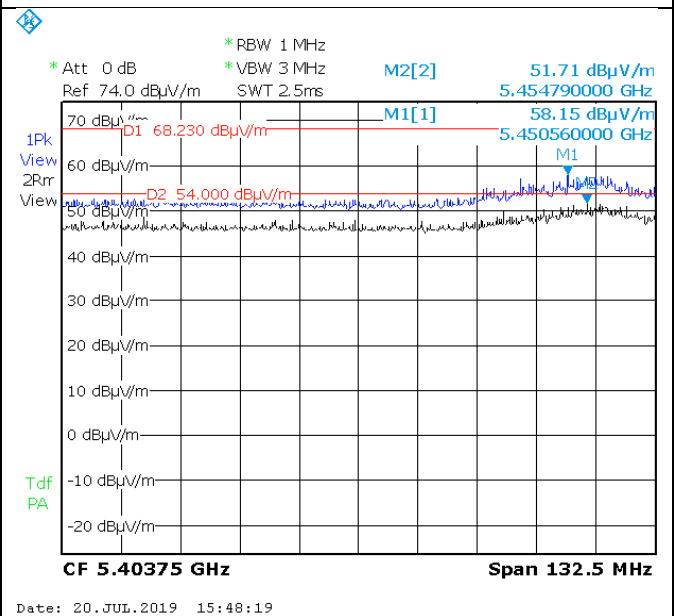
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802.11a 5500M– Edge 5470MHz



802.11n 5500M– Edge 5470MHz



802.11n40MHz 5510M– Edge 5470MHz

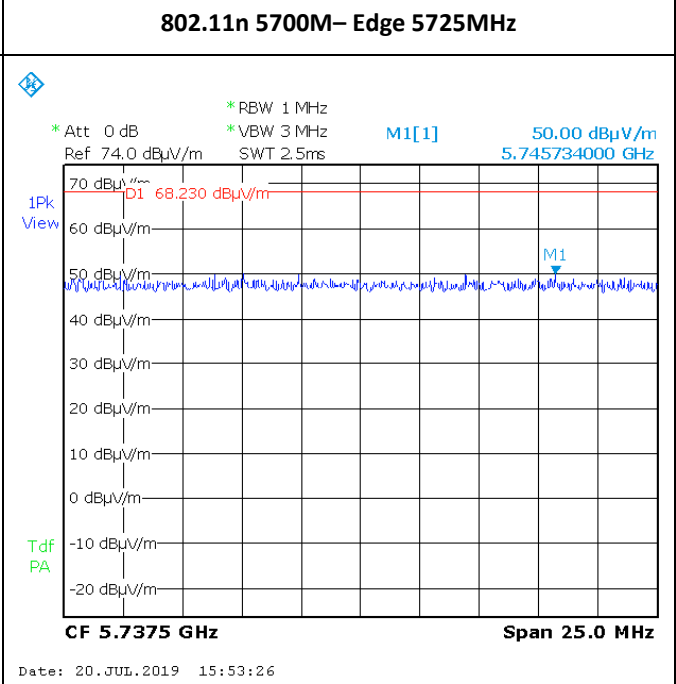
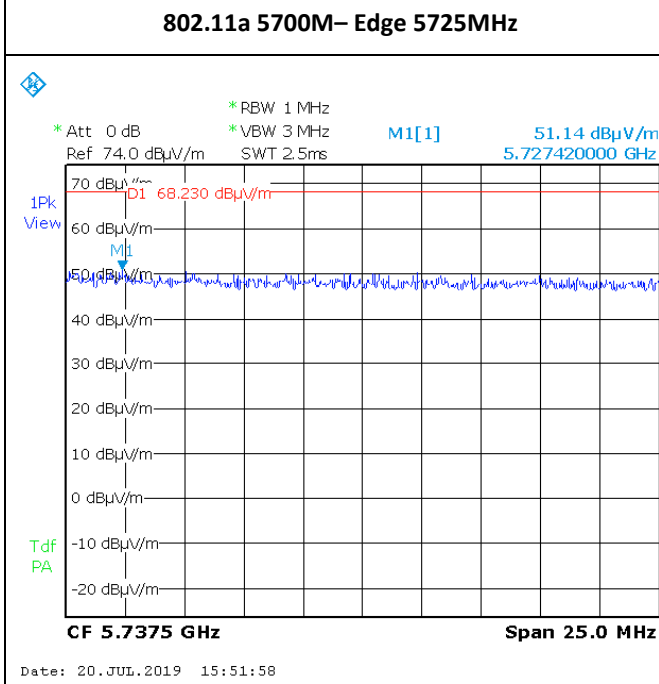
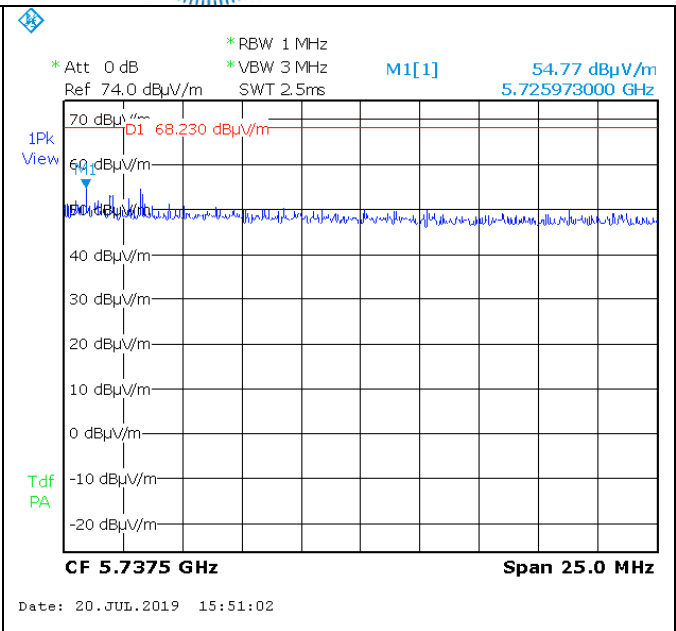
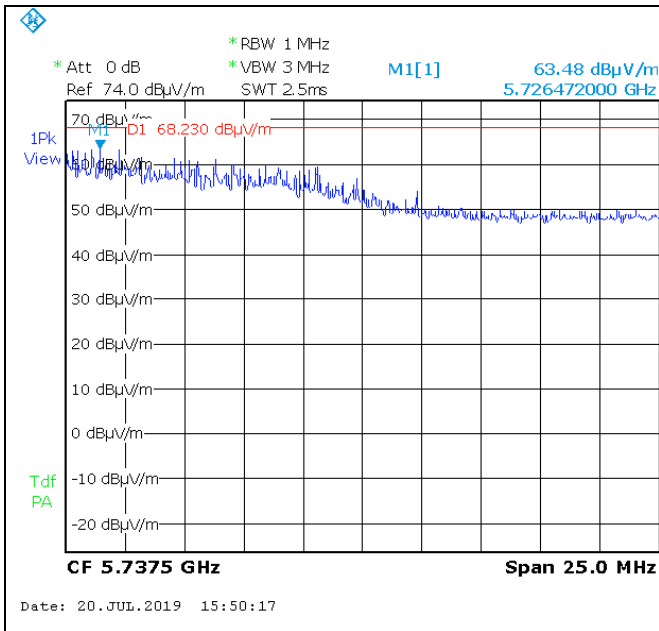
802.11ac40MHz 5530M– Edge 5470MHz



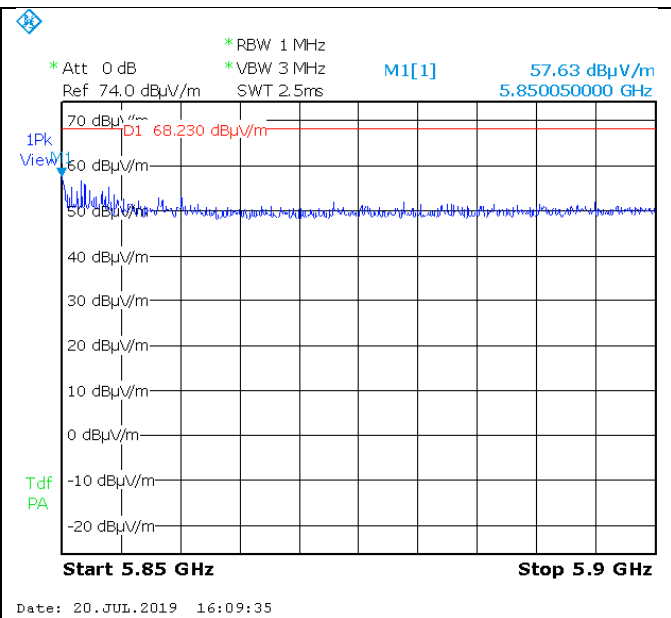
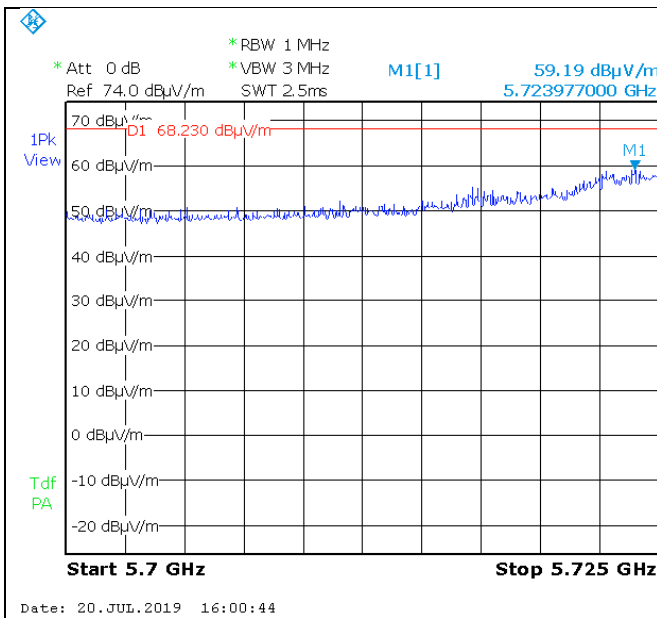
Electromagnetic Compatibility
Radio Frequency
Product Certification
International Approval

1261 Puerta Del Sol
San Clemente, CA, 92673
+1 (949) 393-1123
www.vista-compliance.com

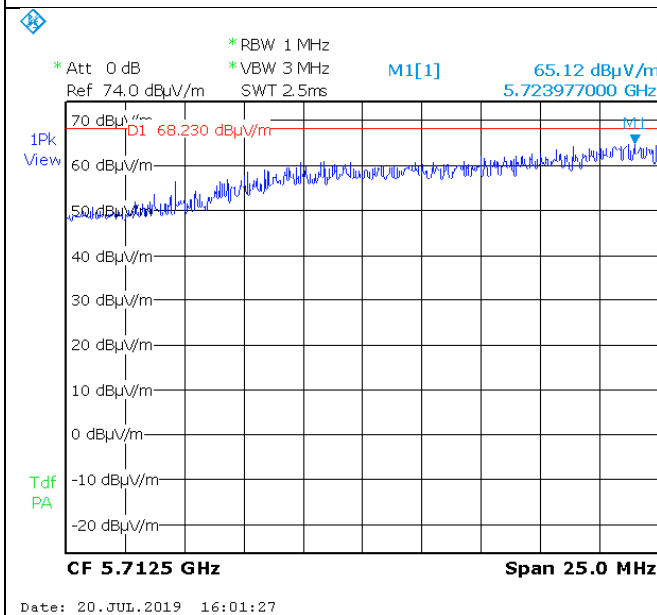
Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



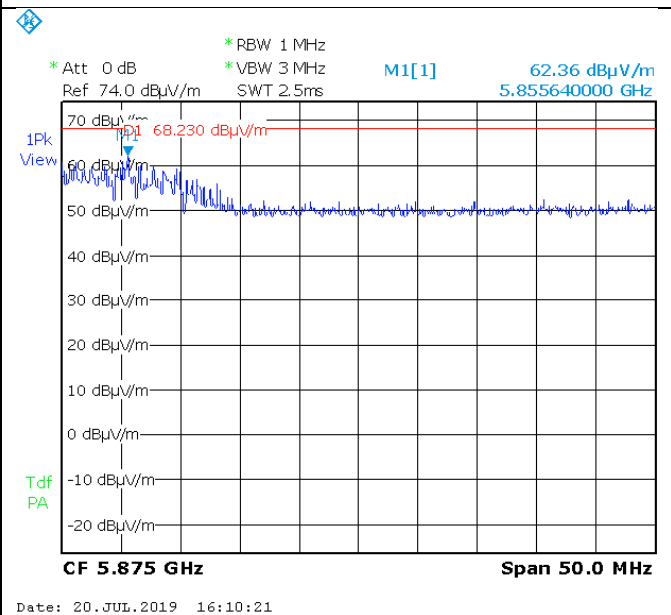
Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



Radiated Band Edge-802.11a 5745M– Edge 5725MHz



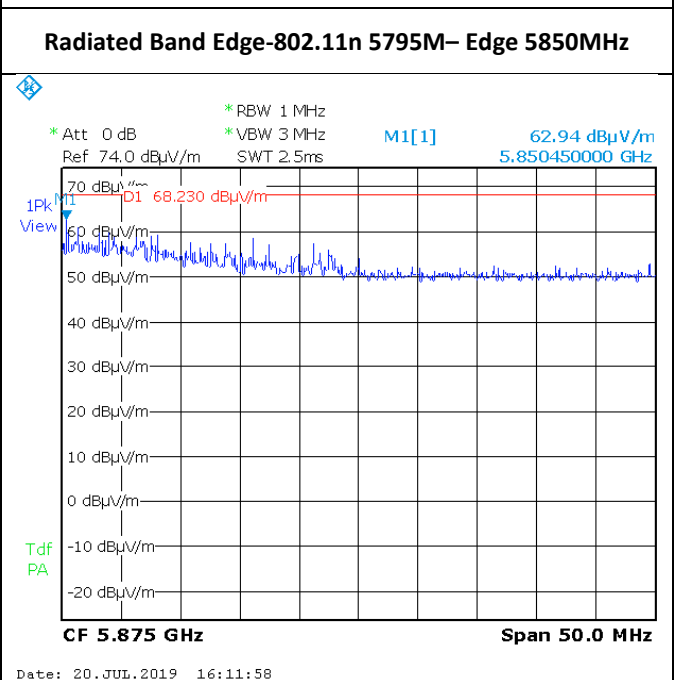
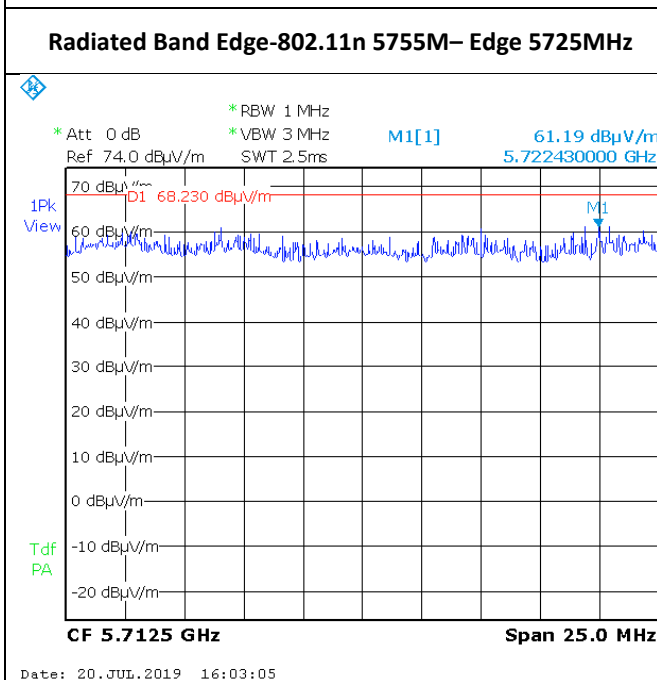
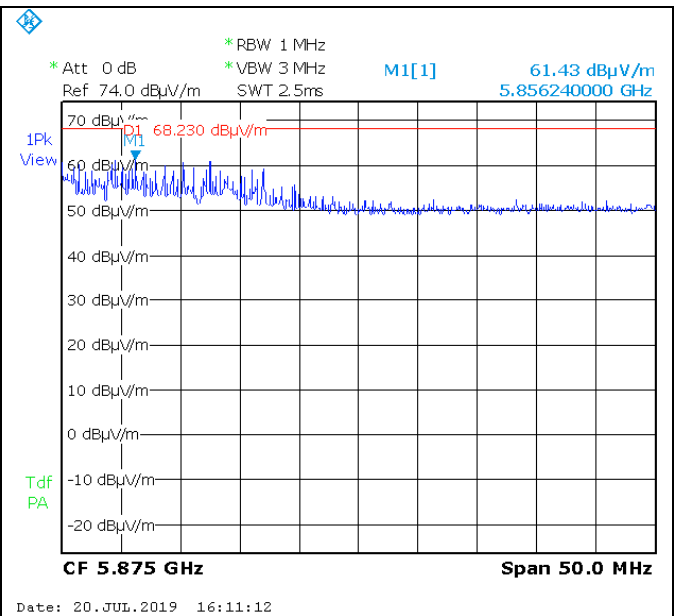
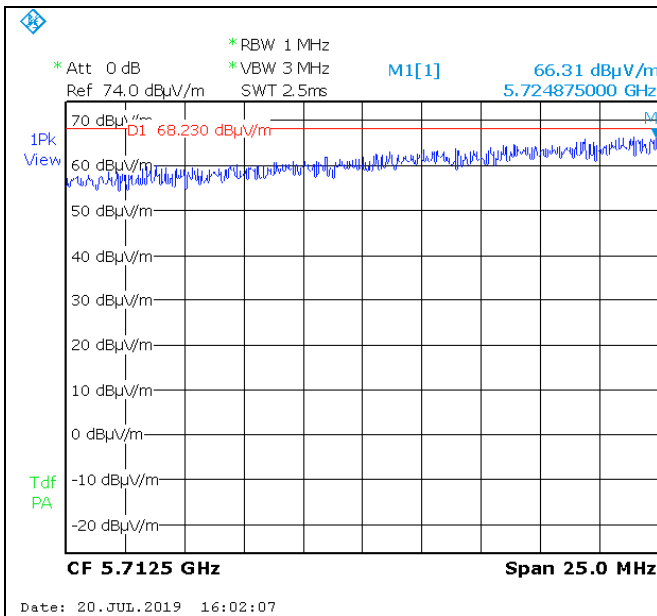
Radiated Band Edge-802.11a 5825M– Edge 5850MHz



Radiated Band Edge-802.11n 5745M– Edge 5725MHz

Radiated Band Edge-802.11n 5825M– Edge 5850MHz

Report Number: WAP-19052921-LC-FCC-UNII-G4L
Product: Vehicle Infotainment System
Model Number: SYNC-G4L



Report Number:	WAP-19052921-LC-FCC-UNII-G4L
Product:	Vehicle Infotainment System
Model Number:	SYNC-G4L



9 Test instrument list

Equipment	Manufacturer	Model	Serial Number	Cal. Date	Cal. Due
Semi-Anechoic Chamber	ETS-Lindgren	10M	VL001	5/11/2018	5/11/2019
Shielding Control Room	ETS-Lindgren	Series 81	VL006	N/A	N/A
Spectrum Analyzer	Keysight	N9020A	MY50110074	5/4/2018	5/4/2019
EMC Test Receiver	R&S	ESL6	100230	5/7/2018	5/7/2019
LISN (9KHz – 30MHz)	EMCO	3816/2	9705-1066	5/4/2018	5/4/2019
Bi-Log Antenna	ETS-Lindgren	3142E	217921	11/15/2018	11/15/2019
Horn Antenna (1-18GHz)	Electro-Metrics	EM-6961	6292	5/2/2018	5/2/2019
Horn Antenna (18-40GHz)	Com-Power	AH-840	101109	5/2/2018	5/2/2019
Preamplifier	RF Bay, Inc.	LPA-10-20	11180621	5/10/2018	5/10/2019
True RMS Multi-meter	UNI-T	UT181A	C173014829	5/10/2018	5/10/2019
Temp / Humidity / Pressure Meter	PCE Instruments	PCE-THB 40	R062028	5/9/2018	5/9/2019
RF Attenuator	Pasternack	PE7005-3	VL061	5/10/2018	5/10/2019
Preamplifier 100KHz - 40GHz	Aeroflex	33711-392- 77150-11	064	5/10/2018	5/10/2019
EM Center Control	ETS-Lindgren	7006-001	160136	N/A	N/A
Turn Table	ETS-Lindgren	2181-3.03	VL002	N/A	N/A
Boresight Antenna Tower	ETS-Lindgren	2171B	VL003	N/A	N/A
Loop Antenna (9k-30MHz)	Com-Power	AL-130	121012	5/9/2018	5/9/2019
RE test cable(below 6GHz)	Vista	RE-6GHz-01	RE-6GHz-01	5/10/2018	5/10/2019
RE test cable (1-18GHz)	PhaseTrack	II-240	RE-18GHz-01	5/10/2018	5/10/2019
RE test cable (>18GHz)	Sucoflex	104	344903/4	5/10/2018	5/10/2019
Pulse limiter	Com-Power	LIT-930A	531727	5/15/2018	5/15/2019
CE test cable #1	FIRST RF	FRF-C-1002-001	CE-6GHz-01	5/10/2018	5/10/2019
CE test cable#2	FIRST RF	FRF-C-1002-001	CE-6GHz-02	5/9/2018	5/9/2019