Test report

369352 - 2TRFEMC

Date of issue: March 11, 2019

Applicant:
Xplore Technologies

Product:
Rugged Tablet PC

Model
iX125R2

Derivative model
N/A

Specifications:

- FCC 47 CFR Part 15, Subpart C – §15.207
- FCC 47 CFR Part 15, Subpart C – §15.209

Lab and test locations

Company name	Nemko USA Inc.
Address	2210 Faraday Ave, Suite 150
City	Carlsbad
State	California
Postal code	92008
Country	USA
Telephone	+1 760 444 3500
Website	www.nemko.com
FCC Site Number	Test Firm Registration Number: 392943 Designation Number: US5058
ISED Test Site	2040B-3

Tested by	Andres Martinez, Wireless Engineer
Reviewed by	Chip Fleury, Wireless and Certification Supervisor
Review date	March 11, 2019
Reviewer signature	

Limits of responsibility

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.
This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko USA's ISO/IEC 17025 accreditation.

Copyright notification

Table of Contents

Section 1 Report summary

1.1 Test specifications

FCC 47 CFR Part 15, Subpart C – §15.207	Conducted emission limits; general requirements.
FCC 47 CFR Part 15, Subpart C – §15.209	Radiated emission limits; general requirements.

1.2 Test methods

ANSI C64.10-2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

1.3 Exclusions

None

1.4 Statement of compliance

In the configuration tested, the EUT was found compliant.

Testing was performed against all relevant requirements of the test standard. Results obtained indicate that the product under test complies in full with the requirements tested. The test results relate only to the items tested.

See "Summary of test results" for full details.

1.5 Test report revision history

Table 1.5-1: Test report revision history

Revision #	Details of changes made to test report
TRF	Original report issued

Notes:

Section 2 Summary of test results

2.1 Radiated Emissions in simultaneous transmission.

Table 2.1-1: FCC 47 CFR Part 15, Subpart C §15.207 & §15.209

Test description	Verdict
FCC 15.209 - Radiated disturbance	Pass
FCC 15.109 - Conducted disturbance	Pass

Notes: Class B Multi-Transmitter testing.

Section 3 Equipment under test (EUT) details

3.1 Applicant

Company name	Xplore Technologies Corp. of America
Address	14000 Summit Drive Suite 900
City	Austin
State	TX
Postal/Zip code	78728
Country	U.S.A.

3.2 Manufacturer

Company name	Xplore Technologies Corp. of America
Address	14000 Summit Drive Suite 900
City	Austin
State	TX
Postal/Zip code	78728
Country	U.S.A.

3.3 Sample information

Receipt date	January 18, 2019
Nemko sample ID number	369352

3.4 EUT information

Product name	Rugged Tablet PC
Model	iX125R2
Model variant	N/A
Serial number	JCJKG00962
Power requirements	12VDC, 2Amps Switch Mode Power Supply.
Description/theory of operation	The iX125R2 is portable rugged Tablet PCs. Utilizing the Intel 7600U series (Core i5/i7) CPU chip sets. (Model: 8260 | FCC PD98260NG | IC: 1000M-8260NG) Dual Band Wi-Fi b/g/n 2.4 GHz and Wi-Fi a/n/ac 5Ghz (FCC: PD98260NG, IC: 1000M-8260NG) Bluetooth (BLE/BDR/EDR2.1) and a certified Sierra Wireless Air Prime (Model: EM7511 | FCC ID: N7NEM75S | IC: 2417C-EM75S) with LTE/WCDMA, GNSS and an integrated RFID Scanner (FCC ID: QV5MERCIRY6E-M)
Operational frequencies	Dual Band Wi-Fi b/g/n 2.4 GHz - Wi-Fi a/n/ac 5Ghz - Bluetooth (BLE/BDR/EDR2.1) LTE: B1-5, B7, B8, B9, B12, B13, B18, B19, B20, B26, B28, B29, B30, B32, B41, B42, B43, B46, B48, B66 WCDMA: B1-6, B8, B9 & B19 RFID: Lower Freq. 865MHz, Upper Freq. 928MHz
Software details	Default production V1.0

3.5 EUT exercise and monitoring details

For intentional Multi-Transmitter emissions, the EUT was tested under the worst-case scenario under the following frequencies ranges: 30MHz-1GHz, 1GHz-18GHz, 18GHz-26GHz and 26GHz to 40GHz.
The following modes were set and tested.
Mode 1: Wi-Fi 802.11n20 (MIMO) HT8 CH157 5785, LTE Band 7 Channel 3100, 20MHz BW
Mode 2: HSPA+ Band 2 Channel 9662 and Bluetooth at 2440MHz)

3.6 EUT setup details

Table 3.6-1: EUT sub assemblies

Description	Brand name	Model/Part number	Serial number
EUT Tablet	Xplore	iX125R2	JCJKG00962

Table 3.6-2: EUT interface ports

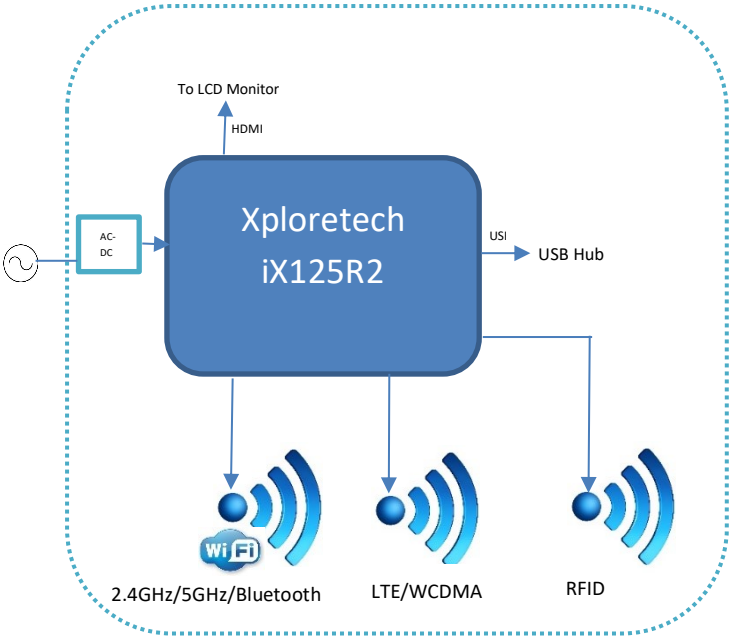
Description	Qty.
USB 2.0	1
HDMI	1
Headphone Jack	1

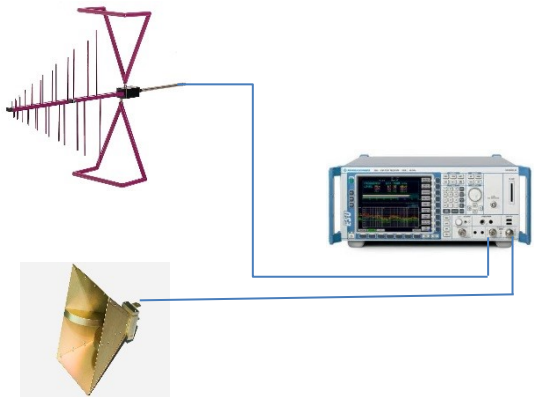
Table 3.6-3: Support equipment

Description	Brand name	Model/Part number	Serial number	Rev.
Mouse	Dell	MOC5UO	-----	N/A
Keyboard	TG3 Electronics	KBA-TG82-LTUUS	Y1403880099168	N/A
LCD Monitor	Dell	S2319Nc	CN-oX5V51-TV200-8CR	
USB Hub	N/A	N/A	N/A	N/A
HDMI to USB Converter	Samsung	EE-HG950	R37K20023S2LU3	

Table 3.6-4: Inter-connection cables

Cable description	From	To	Length (m)
HDMI	EUT	LCD Monitor	3





Section 4 Engineering considerations

4.1 Modifications incorporated in the EUT

There were no modifications performed to the EUT during this assessment.

4.2 Technical judgment

None

4.3 Deviations from laboratory tests procedures

No deviations were made from laboratory procedures.

Section 5 Test conditions

5.1 Atmospheric conditions

Temperature	21.2 °C
Relative humidity	58.7 %
Air pressure	86–106 kPa

When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

5.2 Power supply range

The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages ±5 %, for which the equipment was designed.

Section 6 Measurement uncertainty

6.1 Uncertainty of measurement

Nemko USA Inc. has calculated measurement uncertainty and is documented in EMC/MUC/001 “Uncertainty in EMC measurements.” Measurement uncertainty was calculated using the methods described in CISPR 16-4 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC measurements; as well as described in UKAS LAB34: The expression of Uncertainty in EMC Testing. Measurement uncertainty calculations assume a coverage factor of K=2 with 95% certainty.

Section 7 Terms and definitions

7.1.1 Equipment type

Multimedia Equipment (MME)	Equipment that is information technology equipment, audio equipment, video equipment, broadcast receiver equipment, entertainment lighting control equipment or combinations of these.
Information technology equipment [ITE]	Equipment having a primary function of either (or a combination of) entry, storage, display, retrieval, transmission, processing, switching, or control of data and/or telecommunication messages and which may be equipped with one or more ports typically for information transfer. - Examples include data processing equipment, office machines, electronic business equipment and telecommunication equipment.
Audio equipment	Equipment which has a primary function of either (or a combination of) generation, input, storage, play, retrieval, transmission, reception, amplification, processing, switching or control of audio signals
Video equipment	Equipment which has a primary function of either (or a combination of) generation, input, storage, display, play, retrieval, transmission, reception, amplification, processing, switching, or control of video signals.
Broadcast receiver equipment	Equipment containing a tuner that is intended for the reception of broadcast services - These broadcast services are typically television and radio services, including terrestrial broadcast, satellite broadcast and/or cable transmission.
Entertainment lighting control equipment	Equipment generating or processing electrical signals for controlling the intensity, color, nature or direction of the light from a luminaire, where the intention is to create artistic effects in theatrical, televisual or musical productions and visual presentations.

7.2 General definitions continued

7.1.2 Port type

AC mains power port	Port used to connect to the mains supply network - Equipment with a DC power port which is powered by a dedicated AC/DC power converter is defined as AC mains powered equipment
Antenna port	Port, other than a broadcast receiver tuner port (3.1.8), for connection of an antenna used for intentional transmission and/or reception of radiated RF energy.
Broadcast receiver tuner port	Port intended for the reception of a modulated RF signal carrying terrestrial, satellite and/or cable transmissions of audio and/or video broadcast and similar services - This port may be connected to an antenna, a cable distribution system, a VCR or similar device.
DC network power port	Port, not powered by a dedicated AC/DC power converter and not supporting communication, that connects to a DC supply network. - Equipment with a DC power port which is powered by a dedicated AC/DC power converter is considered to be AC mains powered equipment. - DC power ports supporting communications are considered to be wired networks ports, for example Ethernet ports which include Power Over Ethernet (POE).
Enclosure port	Physical boundary of the EUT through which electromagnetic fields may radiate.
Optical fiber port	Port at which an optical fiber is connected to an equipment.
RF modulator output port	Port intended to be connected to a broadcast receiver tuner port to transmit a signal to the broadcast receiver.
Signal/control port	Port intended for the interconnection of components of an equipment under test, or between an equipment under test and local associated equipment and used in accordance with relevant functional specifications (for example for the maximum length of cable connected to it) - Examples include RS-232, Universal Serial Bus (USB), High-Definition Multimedia Interface (HDMI), IEEE Standard 1394 (“Fire Wire”)
Wired network port	Point of connection for voice, data and signaling transfers intended to interconnect widely-dispersed systems by direct connection to a single-user of multi-user communication network (for example CATV, PSTN, ISDN, xDSL, LAN and similar networks) - These ports may support screened or unscreened cables and may also carry AC or DC power where this is an integral part of the telecommunication specification.

Section 8 Testing data

8.1 Radiated emission limits; Intentional Radiators.

8.1.1 References

Title 47 → Chapter I → Subchapter A → Part 15 → Subpart C → §15.209 / ANSI C63.4: 2014

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

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§15.231 and 15.241.

(b) In the emission table above, the tighter limit applies at the band edges.

(c) The level of any unwanted emissions from an intentional radiator operating under these general provisions shall not exceed the level of the fundamental emission. For intentional radiators which operate under the provisions of other sections within this part and which are required to reduce their unwanted emissions to the limits specified in this table, the limits in this table are based on the frequency of the unwanted emission and not the fundamental frequency. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.

(d) The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

(e) The provisions in §§15.31, 15.33, and 15.35 for measuring emissions at distances other than the distances specified in the above table, determining the frequency range over which radiated emissions are to be measured, and limiting peak emissions apply to all devices operated under this part.

(f) In accordance with §15.33(a), in some cases the emissions from an intentional radiator must be measured to beyond the tenth harmonic of the highest fundamental frequency designed to be emitted by the intentional radiator because of the incorporation of a digital device. If measurements above the tenth harmonic are so required, the radiated emissions above the tenth harmonic shall comply with the general radiated emission limits applicable to the incorporated digital device, as shown in §15.109 and as based on the frequency of the emission being measured, or, except for emissions contained in the restricted frequency bands shown in §15.205, the limit on spurious emissions specified for the intentional radiator, whichever is the higher limit. Emissions which must be measured above the tenth harmonic of the highest fundamental frequency designed to be emitted by the intentional radiator and which fall within the restricted bands shall comply with the general radiated emission limits in §15.109 that are applicable to the incorporated digital device.

8.1.2 Test summary

Verdict	Pass		
Test date	March 4, 2019	Temperature	19.9°C
Test engineer	Andres Martinez, Wireless Engineer	Air pressure	1001 mbar
Test location	10m semi anechoic chamber	Relative humidity	56 %

8.1.3 Notes

A 2.4GHz and 5GHz Notch filter was used.

8.1.4 Setup details

EUT setup configuration	Table top
Test facility	3 m Semi anechoic chamber
Measuring distance	3 m
Antenna height variation	1–4 m
Turn table position	0–360°
Measurement details	A preview measurement was generated with receiver in continuous scan or sweep mode while the EUT was rotated and antenna adjusted to maximize radiated emission. Emissions detected within 6 dB or above limit were re-measured with the appropriate detector against the correlating limit and recorded as the final measurement.

Receiver/spectrum analyzer settings for frequencies below 1 GHz:

Resolution bandwidth	120 kHz
Video bandwidth	300 kHz
Detector mode	– Peak (Preview measurement) – Quasi-peak (Final measurement)
Trace mode	Max Hold
Measurement time	– 100 ms (Peak preview measurement) – 1000 ms (Quasi-peak final measurement)

Receiver/spectrum analyzer settings for frequencies above 1 GHz:

Resolution bandwidth	1 MHz
Video bandwidth	3 MHz
Detector mode	Peak (Preview measurement) Peak and CAverage (Final measurement)
Trace mode	Max Hold
Measurement time	– 100 ms (Peak preview measurement) – 100 ms (Peak and CAverage final measurement)

8.1.4 Setup details continued

Table 8.1-1: Radiated disturbance equipment list

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
EMC Test Receiver	Rohde & Schwarz	ESU 40	E1131	2 yr.	08-14-2019
Antenna, Bilog	Schaffner-Chase	CBL6111C	1763	2 yr.	11-28-2019
Antenna, Horn	ETS	3117-PA	E1139	2 yr.	01-25-2020
Antenna, Horn	Sage	SAR-2309-42-S2	E1143	2 yr	03-05-2020
Antenna, Horn	Sage	SAR-2309-28-S2	E1148	2 yr.	03-13-2020
2.4GHz Notch Filter	Micro-Tonics	HPM50110-01	E1142	NCR	NCR
5GHz Notch Filter	Micro-Tonics	BRM50716-01	E1140	NCR	NCR

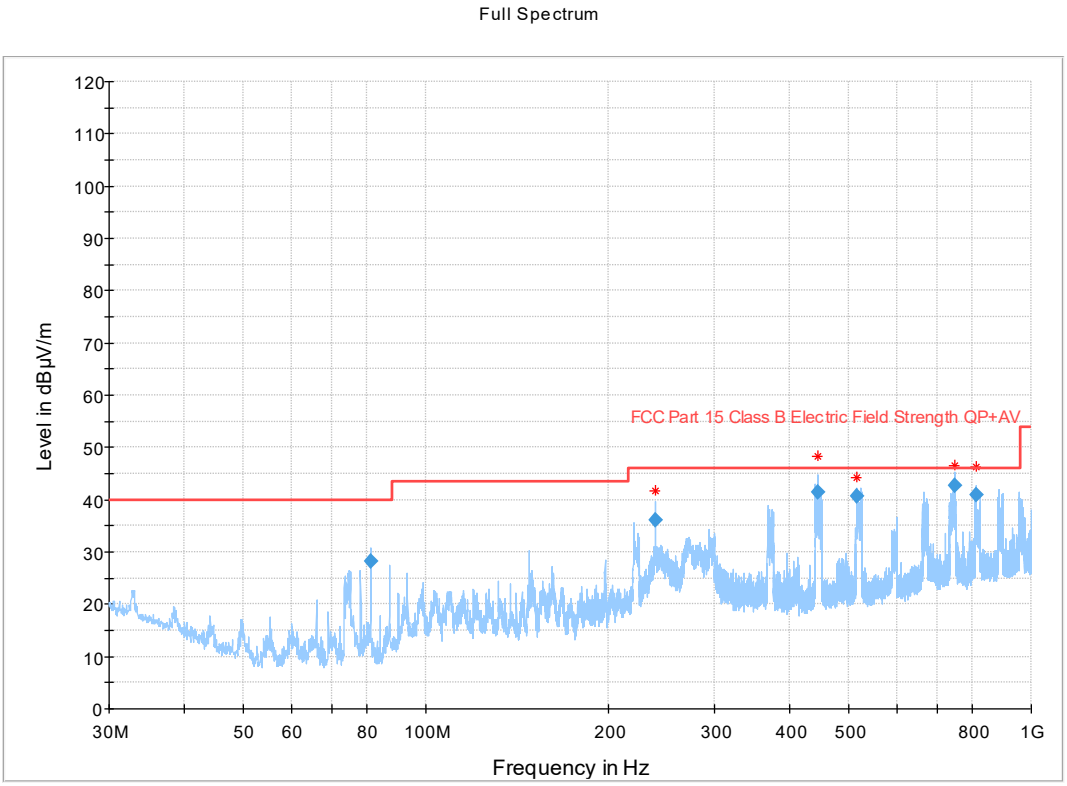
Notes: NCR - no calibration required

Table 8.1-2: Radiated disturbance test software details

Manufacturer of Software	Details
R&S	EMC32 V10.00.00

Notes: None

8.1.5 Test data Radiated Emissions 30Mhz-1GHz (Wi-Fi 802.11n20 (MIMO) HT8 CH157 5785, LTE Band 7 Channel 3100, 20MHz BW)



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators.

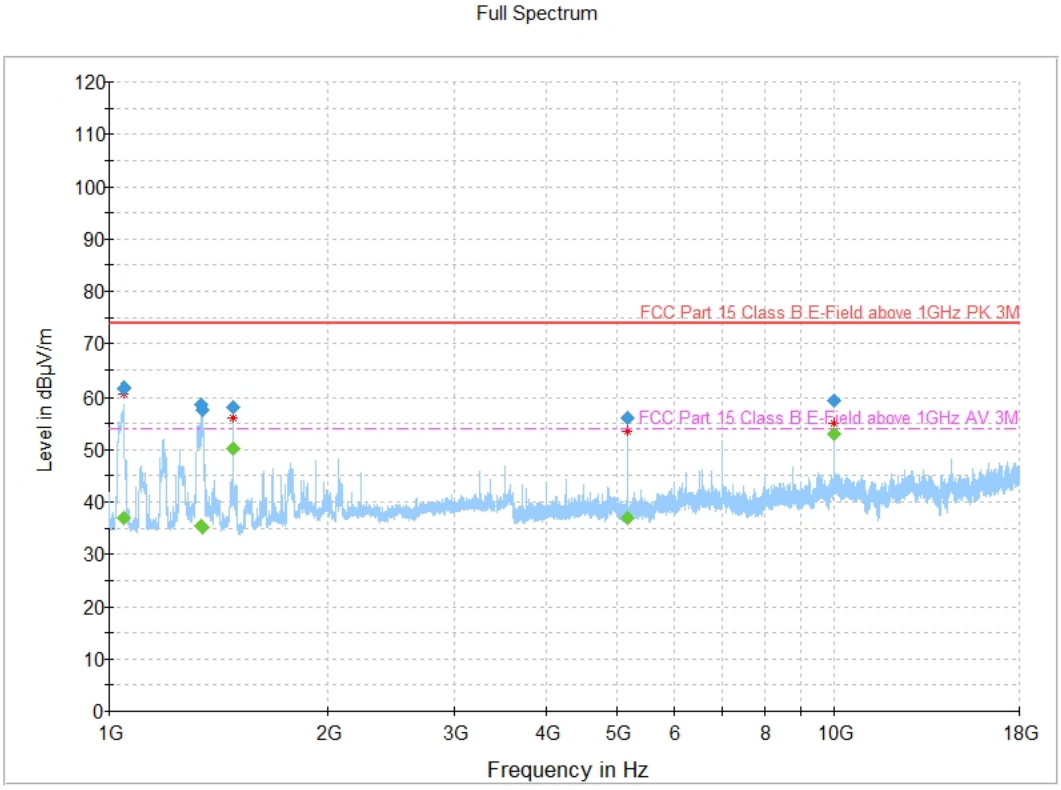
Radiated disturbance spectral plot 3m (30MHz to 1GHz) 120VAC 60Hz

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
81.110500	28.16	40.00	11.84	5000.0	120.000	337.1	H	34.0	9.2
240.005000	36.21	46.00	9.79	5000.0	120.000	113.5	H	17.0	13.9
445.043000	41.32	46.00	4.68	5000.0	120.000	115.0	V	182.0	20.0
514.580000	40.65	46.00	5.35	5000.0	120.000	209.6	V	193.0	21.4
749.023500	42.63	46.00	3.37	5000.0	120.000	162.5	H	223.0	25.6
809.181000	41.04	46.00	4.96	5000.0	120.000	177.8	V	206.0	25.9

Radiated disturbance (Quasi-Peak) 3m results 120VAC 60Hz

Notes: [1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)

8.1.6 Test data Radiated Emissions 1GHz-18GHz (Wi-Fi 802.11n20 (MIMO) HT8 CH157 5785, LTE Band 7 Channel 3100, 20MHz BW)



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators. A 2.4GHz Notch filter was used.

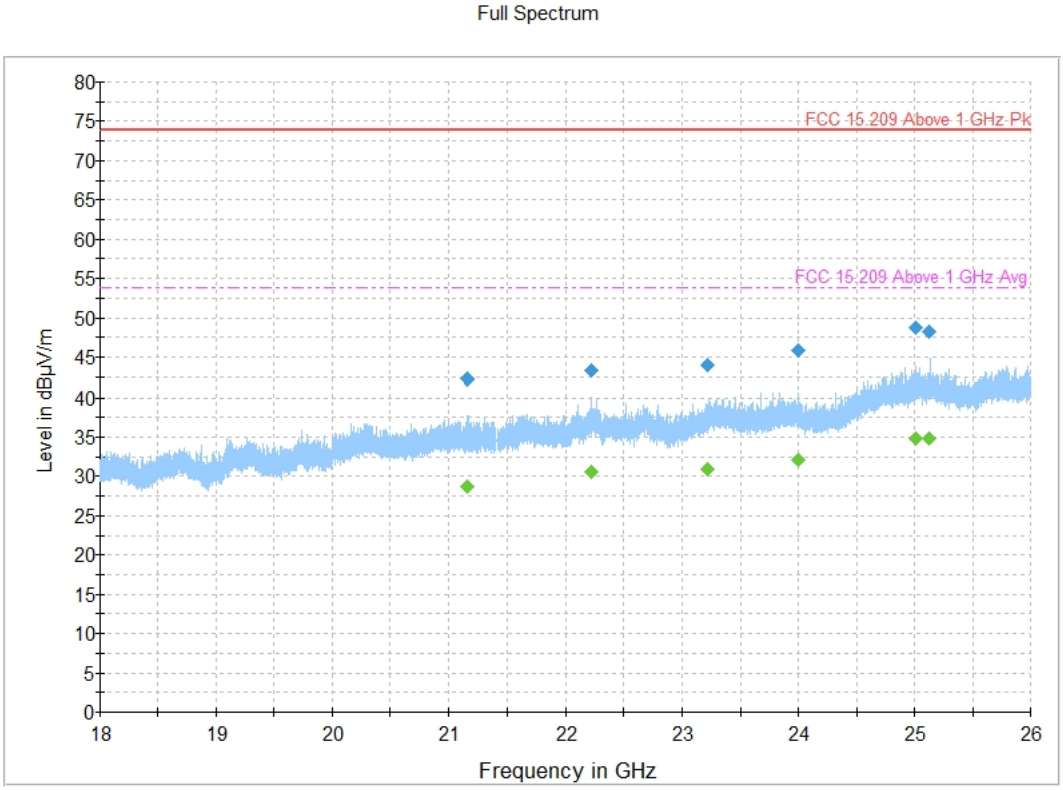
Radiated disturbance spectral plot 3m (1GHz to 18GHz) 120VAC 60Hz

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1048.533333	61.58	---	73.90	12.32	5000.0	1000.000	147.0	V	222.0	-14.7
1048.533333	---	37.07	53.90	16.83	5000.0	1000.000	147.0	V	222.0	-14.7
1340.733333	58.52	---	73.90	15.38	5000.0	1000.000	105.0	V	223.0	-13.8
1340.733333	---	35.33	53.90	18.57	5000.0	1000.000	105.0	V	223.0	-13.8
1343.533333	57.45	---	73.90	16.45	5000.0	1000.000	103.0	V	234.0	-13.8
1343.533333	---	35.12	53.90	18.78	5000.0	1000.000	103.0	V	234.0	-13.8
1483.566667	58.04	---	73.90	15.86	5000.0	1000.000	104.0	V	139.0	-13.6
1483.566667	---	50.32	53.90	3.58	5000.0	1000.000	104.0	V	139.0	-13.6
5175.633333	56.05	---	73.90	17.85	5000.0	1000.000	98.0	V	193.0	-1.7
5175.633333	---	36.89	53.90	17.01	5000.0	1000.000	98.0	V	193.0	-1.7
10000.000000	59.28	---	73.90	14.62	5000.0	1000.000	98.0	H	19.0	7.6
10000.000000	---	53.09	53.90	0.81	5000.0	1000.000	98.0	H	19.0	7.6

Table 8.1-2: Radiated disturbance 3m results 120VAC 60Hz

Notes: [1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)

8.1.7 Test data Radiated Emissions 18GHz-26GHz (Wi-Fi 802.11n20 (MIMO) HT8 CH157 5785, LTE Band 7 Channel 3100, 20MHz BW)



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators. A 2.4GHz Notch filter was used.

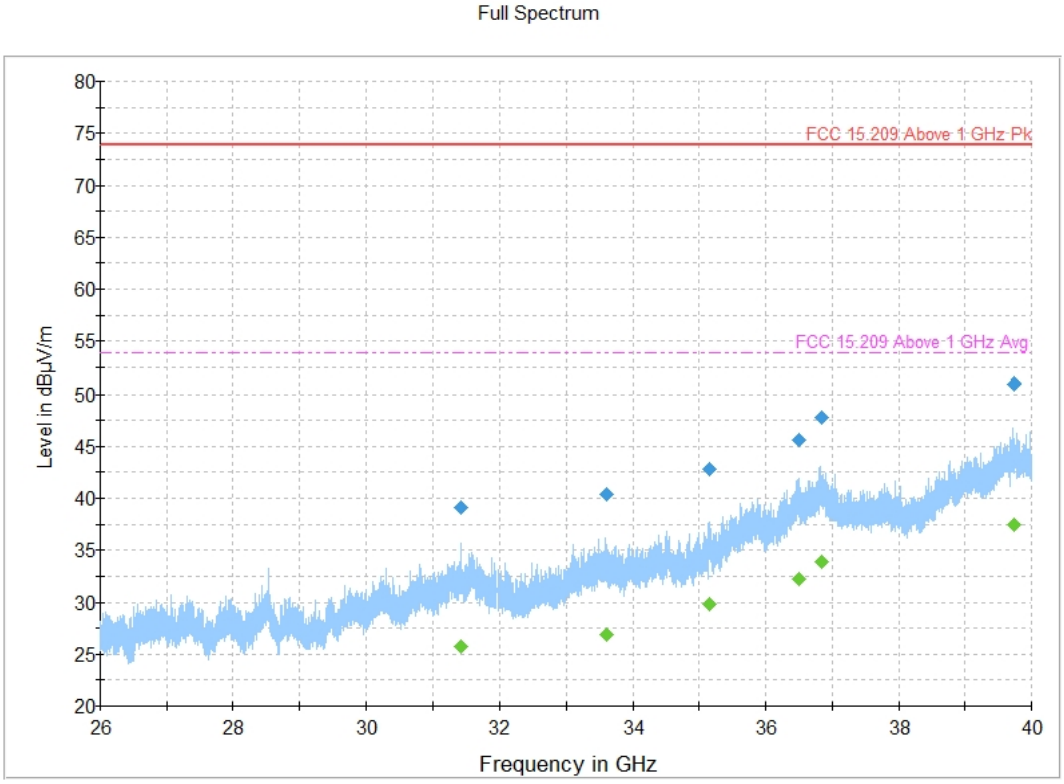
Radiated disturbance spectral plot 3m (18GHz to 26GHz) 120VAC 60Hz

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
21162.333333	---	28.78	53.90	25.12	5000.0	1000.000	161.0	H	151.0	18.9
21162.333333	42.34	---	73.90	31.56	5000.0	1000.000	161.0	H	151.0	18.9
22215.000000	---	30.59	53.90	23.31	5000.0	1000.000	189.0	H	266.0	20.3
22215.000000	43.23	---	73.90	30.67	5000.0	1000.000	189.0	H	266.0	20.3
23217.666667	---	30.91	53.90	22.99	5000.0	1000.000	125.0	H	153.0	20.1
23217.666667	43.98	---	73.90	29.92	5000.0	1000.000	125.0	H	153.0	20.1
24004.733333	---	32.02	53.90	21.88	5000.0	1000.000	216.0	H	4.0	20.3
24004.733333	45.82	---	73.90	28.08	5000.0	1000.000	216.0	H	4.0	20.3
25011.533333	48.67	---	73.90	25.23	5000.0	1000.000	130.0	H	41.0	23.1
25011.533333	---	34.83	53.90	19.07	5000.0	1000.000	130.0	H	41.0	23.1
25127.933333	48.20	---	73.90	25.70	5000.0	1000.000	118.0	H	2.0	23.0
25127.933333	---	34.90	53.90	19.00	5000.0	1000.000	118.0	H	2.0	23.0

Table 8.1-2: Radiated disturbance 3m results 120VAC 60Hz

Notes: [1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)

8.1.8 Test data Radiated Emissions 26GHz-40GHz (Wi-Fi 802.11n20 (MIMO) HT8 CH157 5785, LTE Band 7 Channel 3100, 20MHz BW)



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators. A 2.4GHz Notch filter was used.

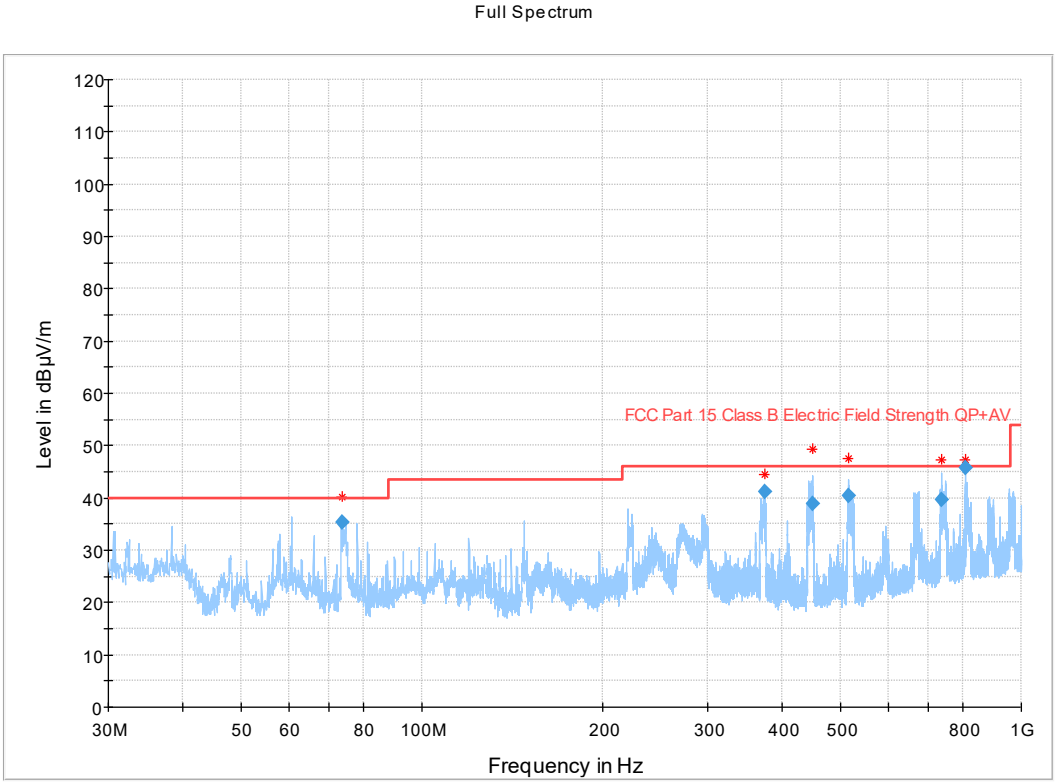
Radiated disturbance spectral plot 3m (26GHz to 40GHz) 120VAC 60Hz

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
31429.200000	39.13	---	73.90	34.77	5000.0	1000.000	106.0	V	87.0	12.2
31429.200000	---	25.77	53.90	28.13	5000.0	1000.000	106.0	V	87.0	12.2
33597.533333	40.43	---	73.90	33.47	5000.0	1000.000	112.0	V	10.0	12.6
33597.533333	---	26.89	53.90	27.01	5000.0	1000.000	112.0	V	10.0	12.6
35154.600000	42.77	---	73.90	31.13	5000.0	1000.000	175.0	H	346.0	13.8
35154.600000	---	29.81	53.90	24.09	5000.0	1000.000	175.0	H	346.0	13.8
36490.133333	45.56	---	73.90	28.34	5000.0	1000.000	188.0	V	242.0	15.1
36490.133333	---	32.27	53.90	21.63	5000.0	1000.000	188.0	V	242.0	15.1
36840.600000	---	33.84	53.90	20.06	5000.0	1000.000	129.0	V	251.0	16.5
36840.600000	47.72	---	73.90	26.18	5000.0	1000.000	129.0	V	251.0	16.5
39735.733333	---	37.43	53.90	16.47	5000.0	1000.000	138.0	H	52.0	18.9
39735.733333	50.91	---	73.90	22.99	5000.0	1000.000	138.0	H	52.0	18.9

Table 8.1-2: Radiated disturbance) 3m results 120VAC 60Hz

Notes: [1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)

8.1.9 Test data Radiated Emissions 30Mhz-1GHz (HSPA+ Band 2 Channel 9662 and Bluetooth at 2440MHz)



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators.

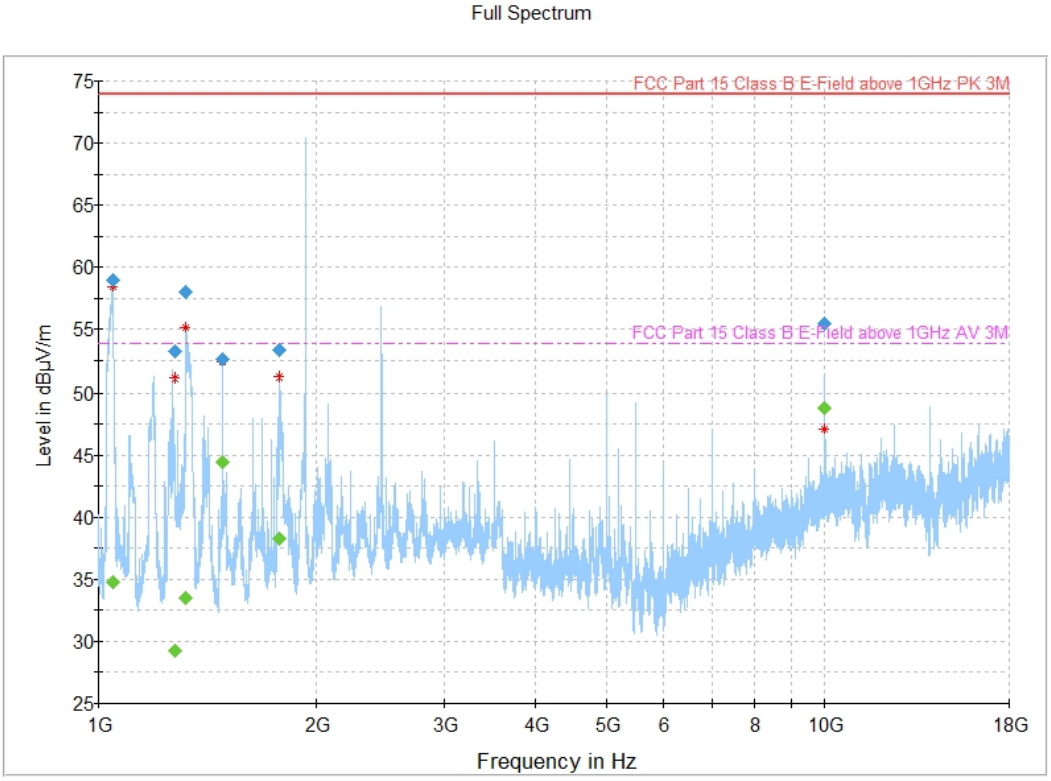
Radiated disturbance spectral plot 3m (30MHz to 1GHz) 120VAC 60Hz

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
73.524500	35.23	40.00	4.77	5000.0	120.000	115.0	V	238.0	8.3
373.990500	41.29	46.00	4.71	5000.0	120.000	112.5	V	254.0	18.2
449.428500	39.00	46.00	7.00	5000.0	120.000	170.5	V	250.0	20.0
514.641500	40.52	46.00	5.48	5000.0	120.000	111.2	V	186.0	21.4
735.348500	39.75	46.00	6.25	5000.0	120.000	111.2	H	236.0	25.3
807.726000	45.80	46.00	0.20	5000.0	120.000	177.3	V	203.0	25.9

Radiated disturbance (Quasi-Peak) 10m results 120VAC 60Hz

Notes: [1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)

8.1.10 Test data Radiated Emissions 1GHz-18GHz (HSPA+ Band 2 Channel 9662 and Bluetooth at 2440MHz)



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators. A 2.4GHz Notch filter was used.

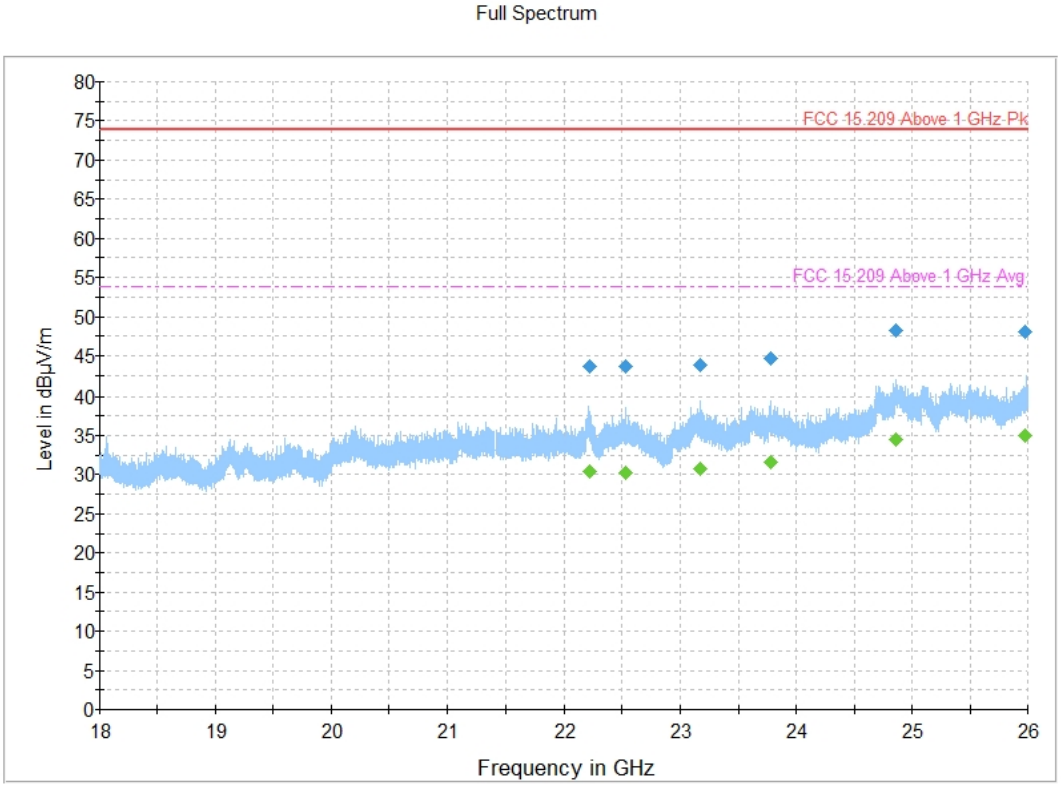
Radiated disturbance spectral plot 3m (1GHz to 18GHz) 120VAC 60Hz

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1046.633333	58.95	---	73.90	14.95	5000.0	1000.000	200.0	V	245.0	-14.7
1046.633333	---	34.72	53.90	19.18	5000.0	1000.000	200.0	V	245.0	-14.7
1272.966667	---	29.20	53.90	24.70	5000.0	1000.000	151.0	V	221.0	-14.0
1272.966667	53.28	---	73.90	20.62	5000.0	1000.000	151.0	V	221.0	-14.0
1321.500000	---	33.50	53.90	20.40	5000.0	1000.000	109.0	V	238.0	-13.9
1321.500000	58.02	---	73.90	15.88	5000.0	1000.000	109.0	V	238.0	-13.9
1483.166667	---	44.47	53.90	9.43	5000.0	1000.000	102.0	V	170.0	-13.6
1483.166667	52.55	---	73.90	21.35	5000.0	1000.000	102.0	V	170.0	-13.6
1779.933333	---	38.26	53.90	15.64	5000.0	1000.000	102.0	V	221.0	-10.8
1779.933333	53.35	---	73.90	20.55	5000.0	1000.000	102.0	V	221.0	-10.8
10000.000000	55.47	---	73.90	18.43	5000.0	1000.000	115.0	H	108.0	7.6
10000.000000	---	48.81	53.90	5.09	5000.0	1000.000	115.0	H	108.0	7.6

Table 8.1-2: Radiated disturbance 3m results 120VAC 60Hz

Notes: [1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)

8.1.11 Test data Radiated Emissions 18GHz-26GHz (HSPA+ Band 2 Channel 9662 and Bluetooth at 2440MHz)



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators. A 2.4GHz Notch filter was used.

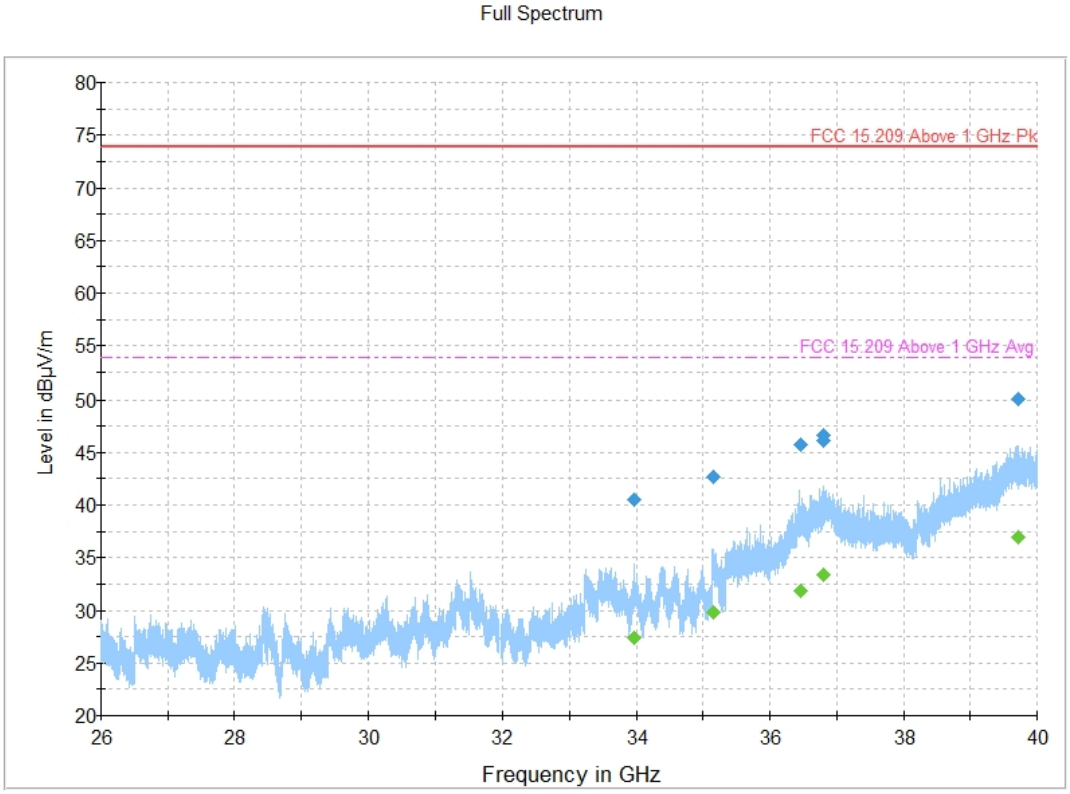
Radiated disturbance spectral plot 3m (18GHz to 26GHz) 120VAC 60Hz

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
22214.600000	---	30.41	53.90	23.49	5000.0	1000.000	102.0	H	0.0	20.3
22214.600000	43.58	---	73.90	30.32	5000.0	1000.000	102.0	H	0.0	20.3
22529.800000	---	30.19	53.90	23.71	5000.0	1000.000	182.0	H	46.0	19.9
22529.800000	43.63	---	73.90	30.27	5000.0	1000.000	182.0	H	46.0	19.9
23168.600000	43.89	---	73.90	30.01	5000.0	1000.000	139.0	H	5.0	20.1
23168.600000	---	30.66	53.90	23.24	5000.0	1000.000	139.0	H	5.0	20.1
23778.066667	---	31.53	53.90	22.37	5000.0	1000.000	130.0	H	-6.0	20.0
23778.066667	44.74	---	73.90	29.16	5000.0	1000.000	130.0	H	-6.0	20.0
24858.066667	48.21	---	73.90	25.69	5000.0	1000.000	223.0	V	273.0	23.2
24858.066667	---	34.55	53.90	19.35	5000.0	1000.000	223.0	V	273.0	23.2
25979.666667	---	34.92	53.90	18.98	5000.0	1000.000	175.0	H	-4.0	23.3
25979.666667	48.00	---	73.90	25.90	5000.0	1000.000	175.0	H	-4.0	23.3

Table 8.1-2: Radiated disturbance 3m results 120VAC 60Hz

Notes: [1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)

8.1.12 Test data Radiated Emissions 26GHz-40GHz (HSPA+ Band 2 Channel 9662 and Bluetooth at 2440MHz)



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators. A 2.4GHz Notch filter was used.

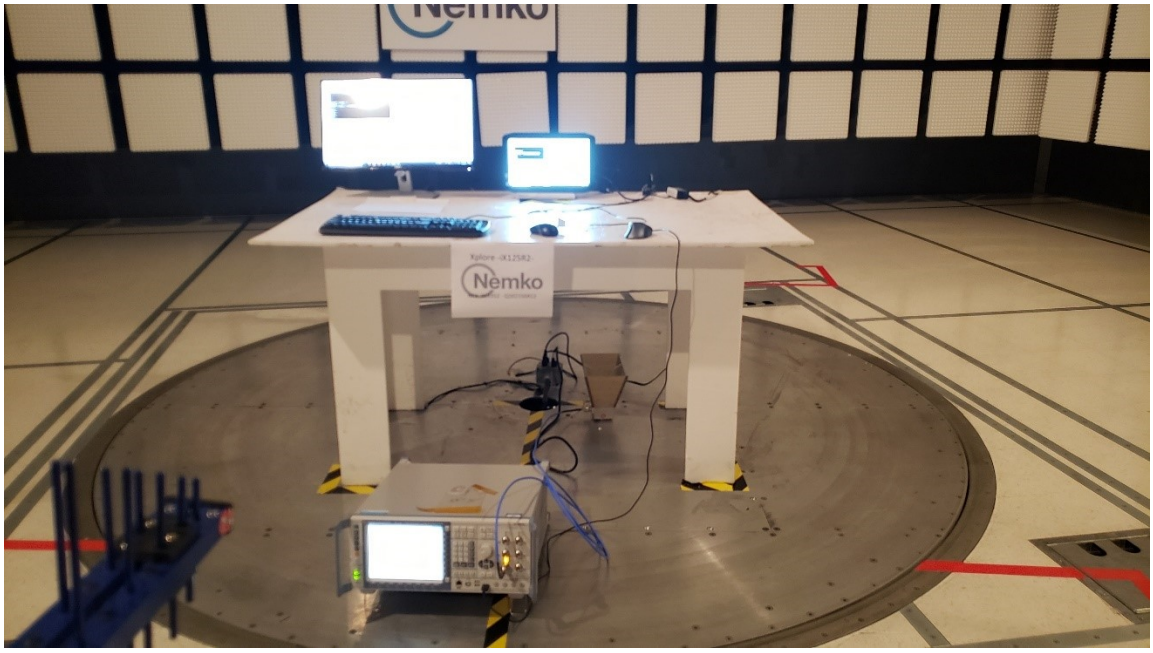
Radiated disturbance spectral plot 3m (26GHz to 40GHz) 120VAC 60Hz

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
33965.600000	40.47	---	73.90	33.43	5000.0	1000.000	188.0	V	144.0	12.7
33965.600000	---	27.44	53.90	26.46	5000.0	1000.000	188.0	V	144.0	12.7
35143.866667	---	29.82	53.90	24.08	5000.0	1000.000	99.0	V	45.0	13.8
35143.866667	42.64	---	73.90	31.26	5000.0	1000.000	99.0	V	45.0	13.8
36457.000000	---	31.83	53.90	22.07	5000.0	1000.000	163.0	H	118.0	15.0
36457.000000	45.69	---	73.90	28.21	5000.0	1000.000	163.0	H	118.0	15.0
36802.666667	---	33.35	53.90	20.55	5000.0	1000.000	175.0	V	191.0	16.3
36802.666667	46.56	---	73.90	27.34	5000.0	1000.000	175.0	V	191.0	16.3
36811.066667	---	33.40	53.90	20.50	5000.0	1000.000	203.0	V	184.0	16.4
36811.066667	46.07	---	73.90	27.83	5000.0	1000.000	203.0	V	184.0	16.4
39712.600000	50.04	---	73.90	23.86	5000.0	1000.000	188.0	V	8.0	18.9
39712.600000	---	36.93	53.90	16.97	5000.0	1000.000	188.0	V	8.0	18.9

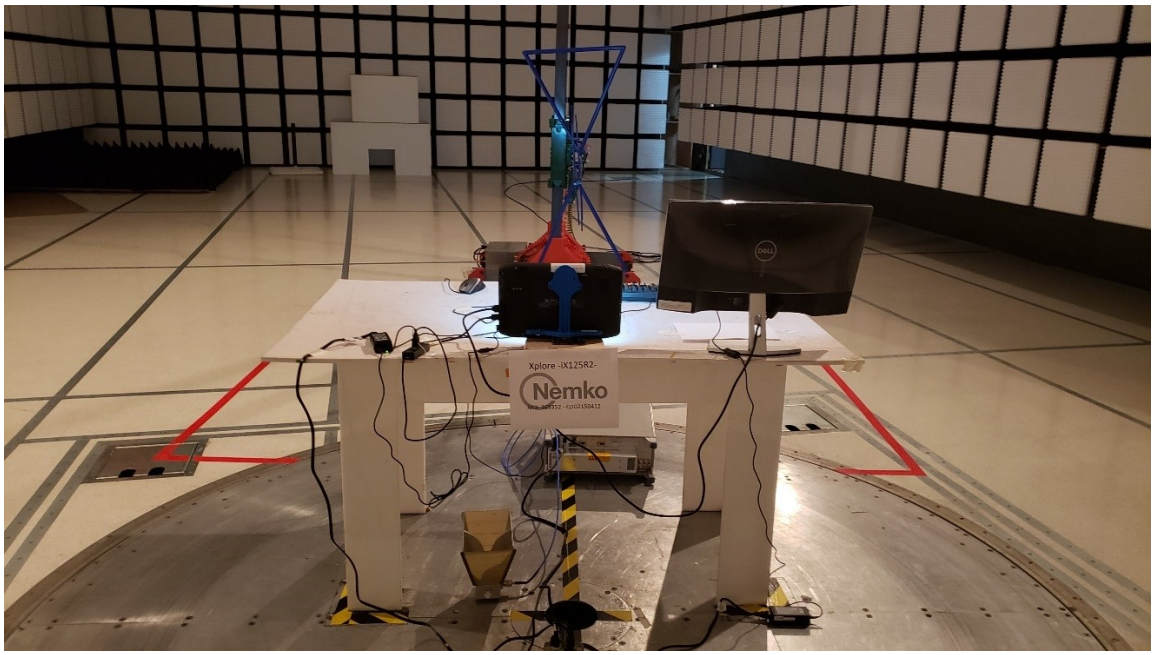
Table 8.1-2: Radiated disturbance 3m results 120VAC 60Hz

Notes: [1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factors = antenna factor ACF (dB) + cable loss (dB)

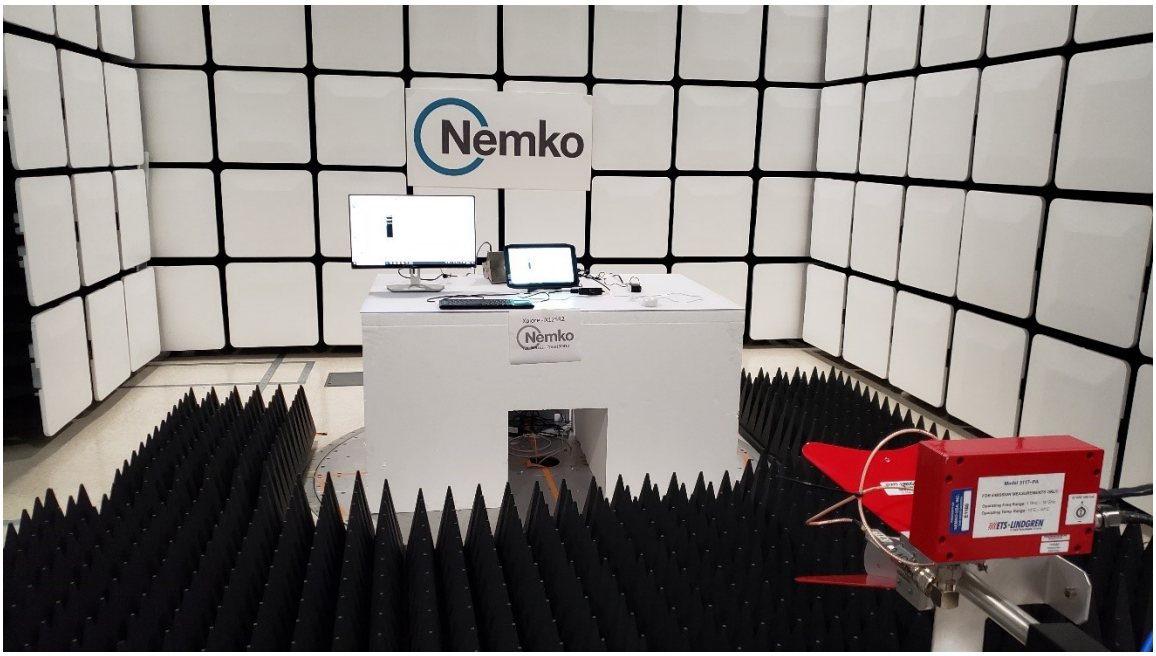
8.1.13 Radiated Emissions Setup photos



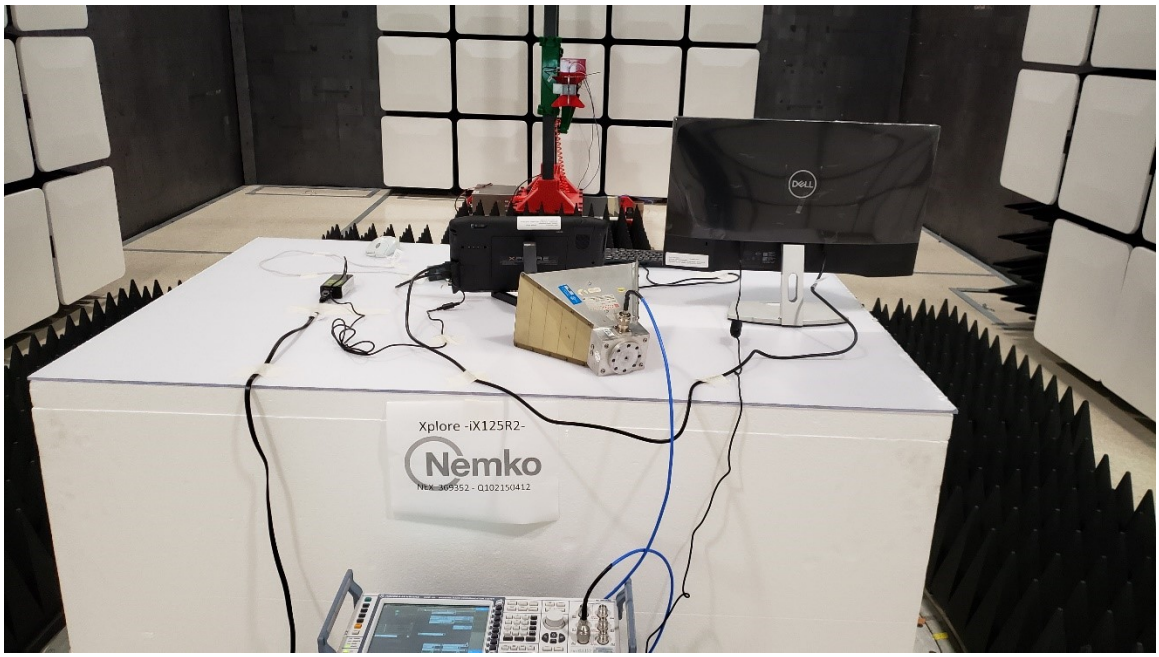
Front Radiated disturbance 30MHz - 1GHz



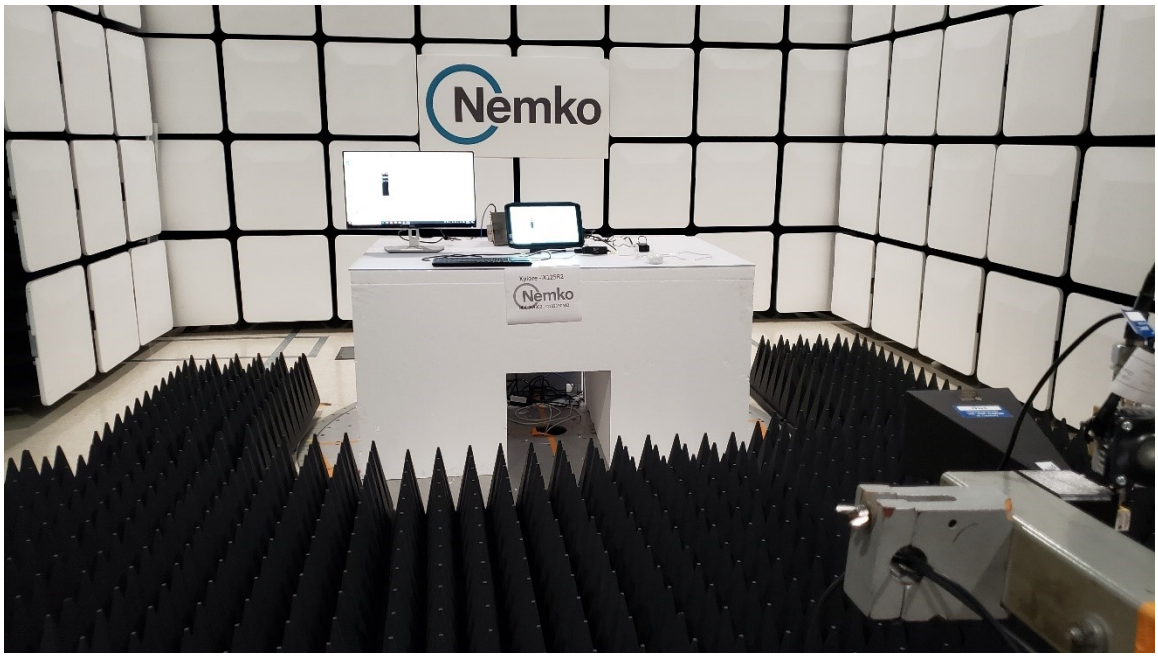
Back Radiated disturbance 30MHz - 1GHz



Front Radiated disturbance 1GHz - 18GHz

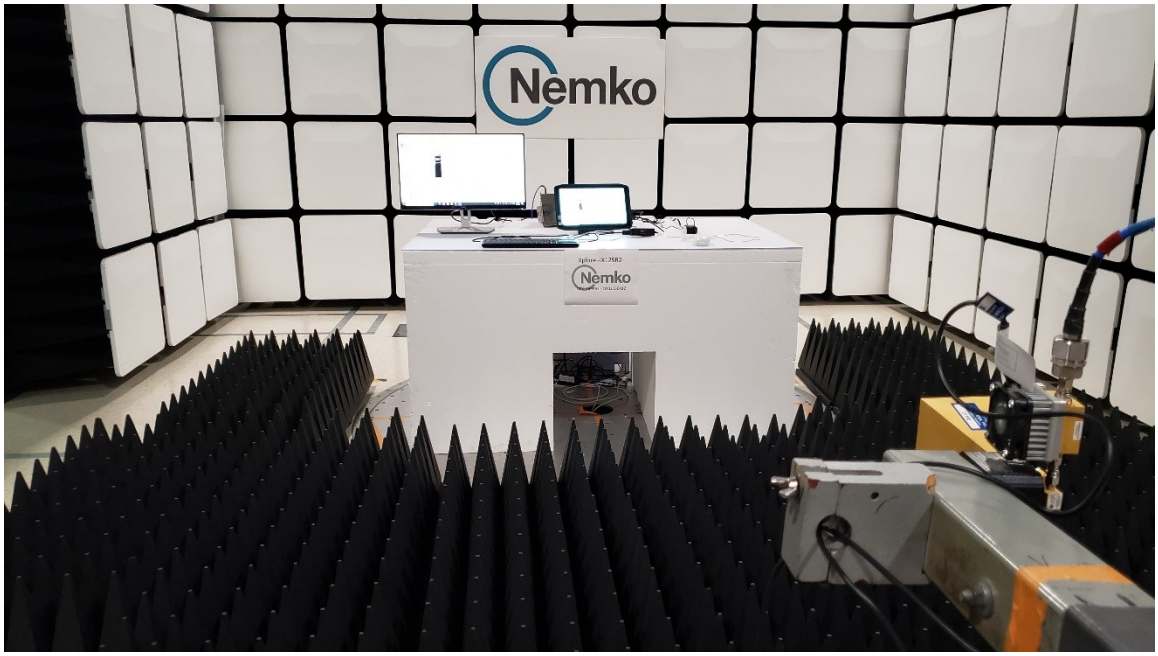


Back Radiated disturbance 1GHz - 18GHz

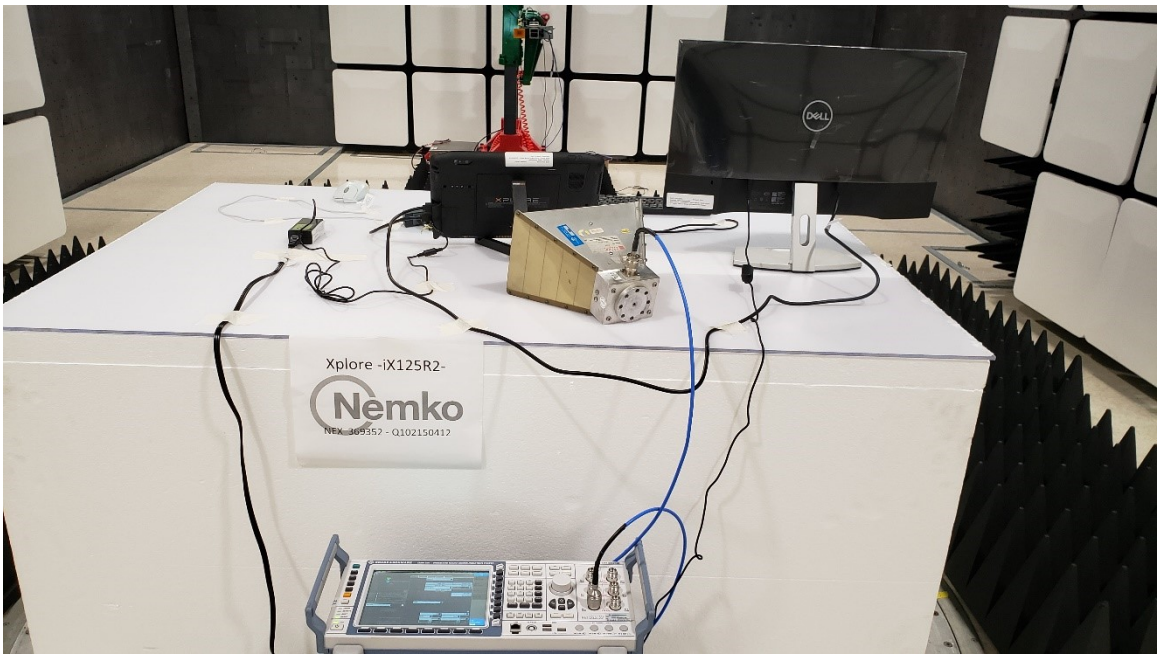


Front Radiated disturbance 18GHz - 26GHz

Back Radiated disturbance 18GHz - 26GHz



Front Radiated disturbance 26GHz - 40GHz



Back Radiated disturbance 26GHz - 40GHz

8.2 Conducted emission limits; Intentional Radiators.

8.2.1 References

Title 47 → Chapter I → Subchapter A → Part 15 → Subpart C → §15.207 / ANSI C63.4: 2014

(a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (MHz)	Conducted limit (dBµV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

b) The limit shown in paragraph (a) of this section shall not apply to carrier current systems operating as intentional radiators on frequencies below 30 MHz. In lieu thereof, these carrier current systems shall be subject to the following standards:

(1) For carrier current system containing their fundamental emission within the frequency band 535-1705 kHz and intended to be received using a standard AM broadcast receiver: no limit on conducted emissions.

(2) For all other carrier current systems: 1000 µV within the frequency band 535-1705 kHz, as measured using a 50 µH/50 ohms LISN.

(3) Carrier current systems operating below 30 MHz are also subject to the radiated emission limits in §15.205, §15.209, §15.221, §15.223, or §15.227, as appropriate.

(c) Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Devices that include, or make provisions for, the use of battery chargers which permit operating while charging, AC adapters or battery eliminators or that connect to the AC power lines indirectly, obtaining their power through another device which is connected to the AC power lines, shall be tested to demonstrate compliance with the conducted limits.

8.2.2 8.2.2 Conducted Emissions Test summary

Verdict	Pass		
Test date	March 7, 2019	Temperature	19.9 °C
Test engineer	Andres Martinez, Test Engineer	Air pressure	1001 mbar
Test location	Ground Plane	Relative humidity	56

8.2.3 Notes

None

8.2.4 Setup details

Port under test	AC Mains Input
EUT setup configuration	Floor standing
Measurement details	A preview measurement was generated with the receiver in continuous scan mode. Emissions detected within 6 dB or above limit were re-measured with the appropriate detector against the correlating limit and recorded as the final measurement.

Receiver settings:

Resolution bandwidth	9 kHz
Video bandwidth	30 kHz
Detector mode	– Peak and Average (Preview measurement) – Quasi-peak and CAverage (Final measurement)
Trace mode	Max Hold
Measurement time	– 100 ms (Peak and Average preview measurement) – 1000 ms (Quasi-peak final measurement) – 160 ms (CAverage final measurement)

Table 8.2-1: Conducted disturbance at mains port equipment list

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
EMI Test Receiver 9kHz to 7GHz	Rohde & Schwarz	ESCI 7	E1026	5/23/2017	5/23/2019
Two Line V-Network	Rohde & Schwarz	ENV216	E1019	6/27/2017	6/27/2019

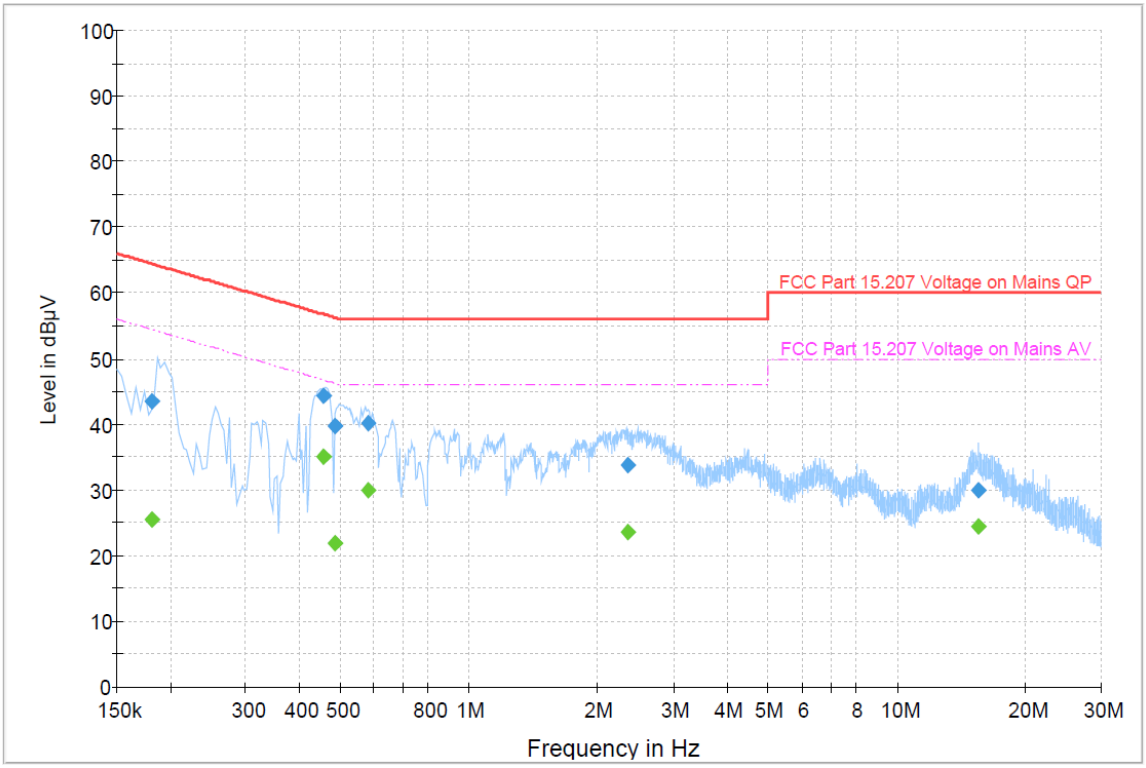
Notes: None

Table 8.2-2: Conducted disturbance at mains port test software details

Manufacturer of Software	Details
Rohde-Schwarz	EMC 32 V10.0

Notes: None

8.2.5 Conducted Emissions Test data (Wi-Fi 802.11n20 (MIMO) HT8 CH157 5785, LTE Band 7 Channel 3100, 20MHz BW)



The spectral plot has been corrected with transducer factors. (i.e. cable loss, LISN factors, and attenuators)

Conducted disturbance at mains port spectral plot on phase and neutral line

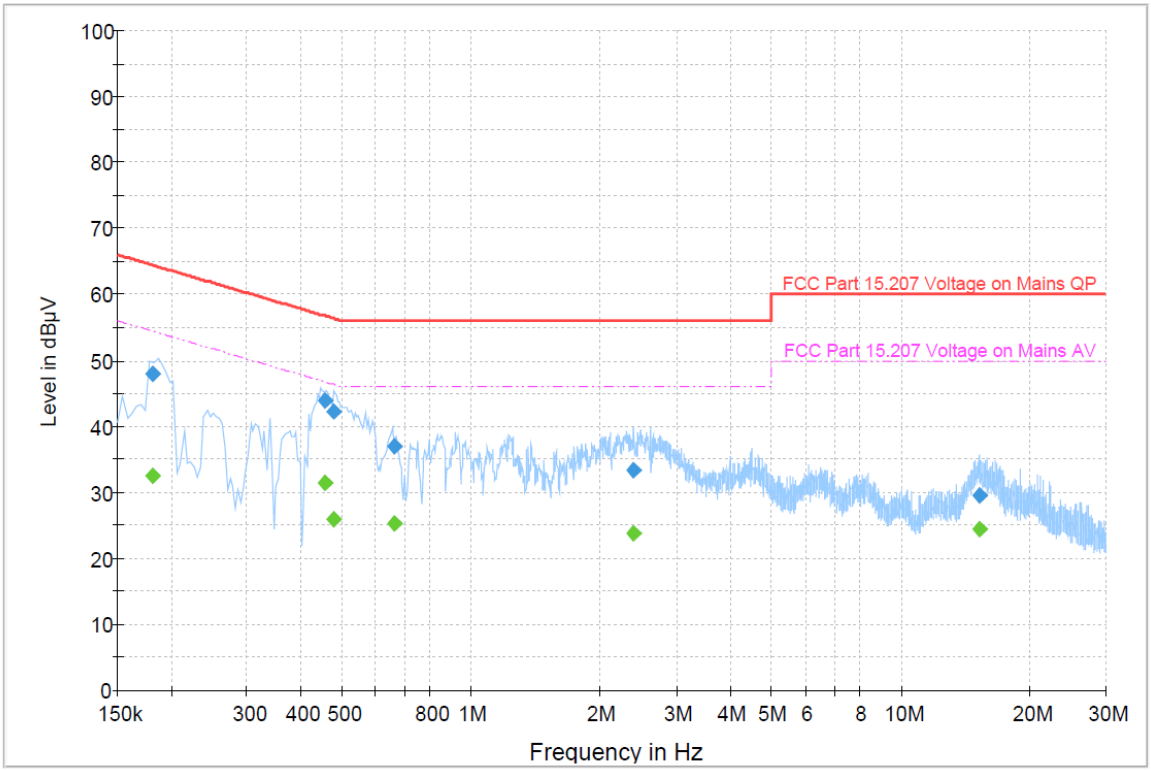
Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.180500	---	25.42	54.46	29.04	5000.0	9.000	L1	ON	19.6
0.180500	43.56	---	64.46	20.91	5000.0	9.000	L1	ON	19.6
0.456500	---	34.95	46.76	11.80	5000.0	9.000	L1	ON	19.5
0.456500	44.44	---	56.76	12.31	5000.0	9.000	L1	ON	19.5
0.484500	39.79	---	56.26	16.47	5000.0	9.000	N	ON	19.4
0.484500	---	21.82	46.26	24.44	5000.0	9.000	N	ON	19.4
0.580500	40.19	---	56.00	15.81	5000.0	9.000	L1	ON	19.5
0.580500	---	29.98	46.00	16.02	5000.0	9.000	L1	ON	19.5
2.348500	---	23.63	46.00	22.37	5000.0	9.000	N	ON	19.5
2.348500	33.66	---	56.00	22.34	5000.0	9.000	N	ON	19.5
15.472500	---	24.49	50.00	25.51	5000.0	9.000	N	ON	20.5
15.472500	29.84	---	60.00	30.16	5000.0	9.000	N	ON	20.5

Conducted disturbance at mains port (Quasi-Peak and Average) results for AC Power Main

Notes:
[1] Result (dBµV) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor (dB) = LISN factor IL (dB) + cable loss (dB) + attenuator (dB)
[3] The maximum measured value observed over a period of 15 seconds was recorded.

Sample calculation: 63.5 dBµV (result) = 44 dBµV (receiver reading) + 19.5 dB (Correction factor)

8.2.6 Conducted Emissions Test data (HSPA+ Band 2 Channel 9662 and Bluetooth at 2440MHz)



The spectral plot has been corrected with transducer factors. (i.e. cable loss, LISN factors, and attenuators)

Conducted disturbance at mains port spectral plot on phase and neutral line

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.180500	---	32.57	54.46	21.89	5000.0	9.000	L1	ON	19.6
0.180500	48.02	---	64.46	16.44	5000.0	9.000	L1	ON	19.6
0.456500	---	31.36	46.76	15.39	5000.0	9.000	L1	ON	19.5
0.456500	44.04	---	56.76	12.72	5000.0	9.000	L1	ON	19.5
0.476500	42.26	---	56.40	14.14	5000.0	9.000	N	ON	19.4
0.476500	---	25.81	46.40	20.59	5000.0	9.000	N	ON	19.4
0.660500	---	25.34	46.00	20.66	5000.0	9.000	L1	ON	19.5
0.660500	36.88	---	56.00	19.12	5000.0	9.000	L1	ON	19.5
2.388500	33.42	---	56.00	22.58	5000.0	9.000	N	ON	19.5
2.388500	---	23.75	46.00	22.25	5000.0	9.000	N	ON	19.5
15.208500	---	24.49	50.00	25.51	5000.0	9.000	L1	ON	20.5
15.208500	29.59	---	60.00	30.41	5000.0	9.000	L1	ON	20.5

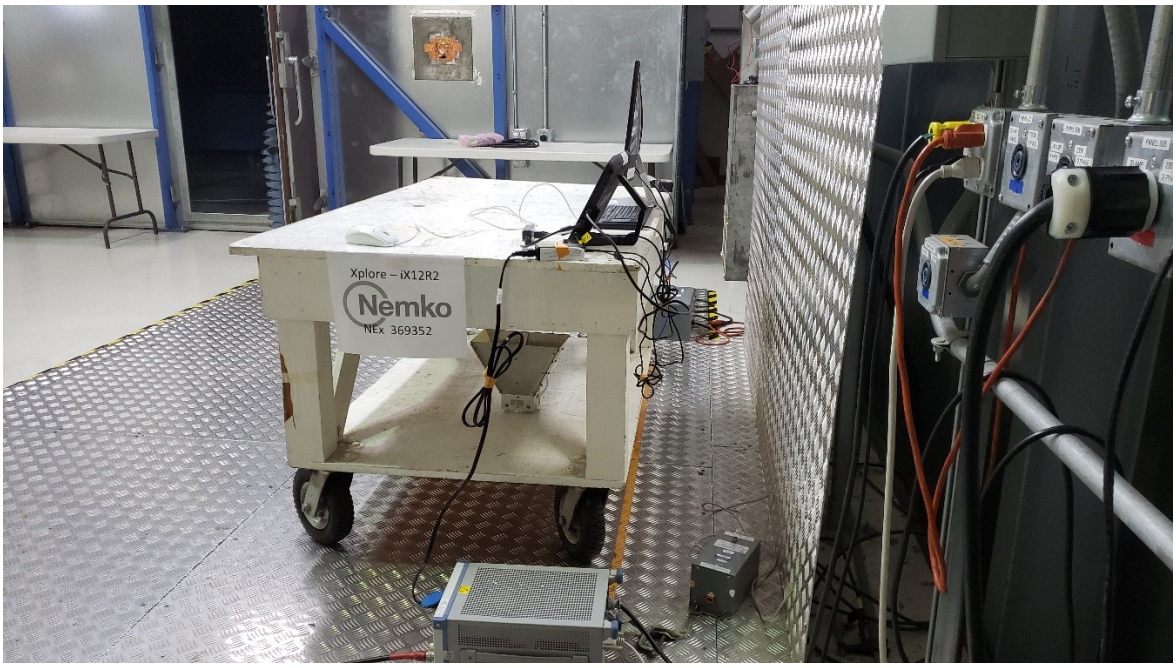
Conducted disturbance at mains port (Quasi-Peak and Average) results for AC Power Main

Notes:
[1] Result (dBµV) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor (dB) = LISN factor IL (dB) + cable loss (dB) + attenuator (dB)
[3] The maximum measured value observed over a period of 15 seconds was recorded.

Sample calculation: 63.5 dBµV (result) = 44 dBµV (receiver reading) + 19.5 dB (Correction factor)

8.2.7 Conducted Emissions Setup photos

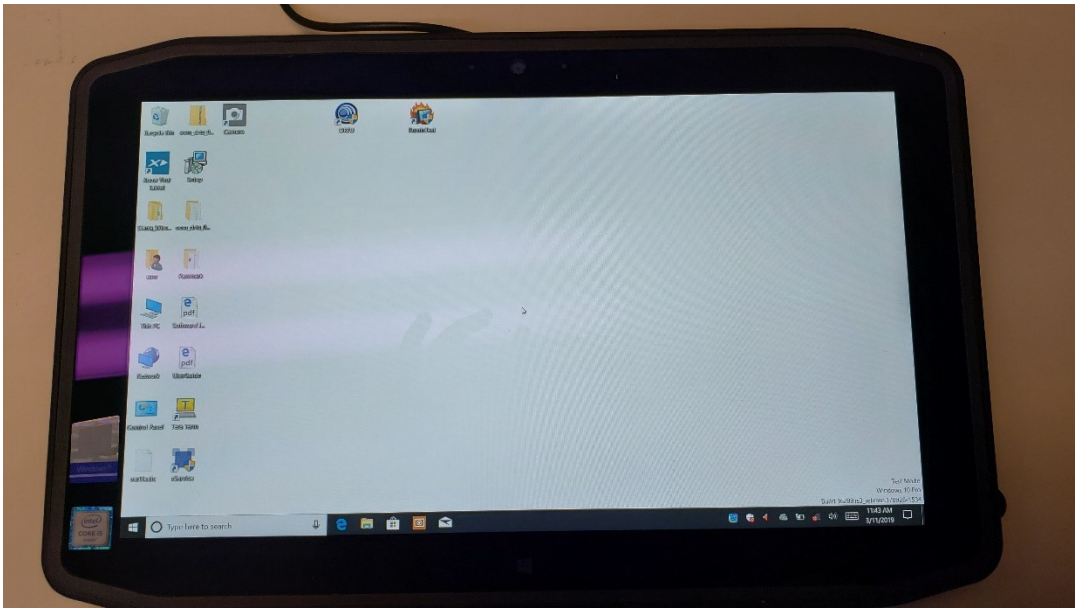
Front Conducted disturbance at mains port setup photo



Back Conducted disturbance at mains port setup photo

Section 9 EUT photos

9.1 External photos

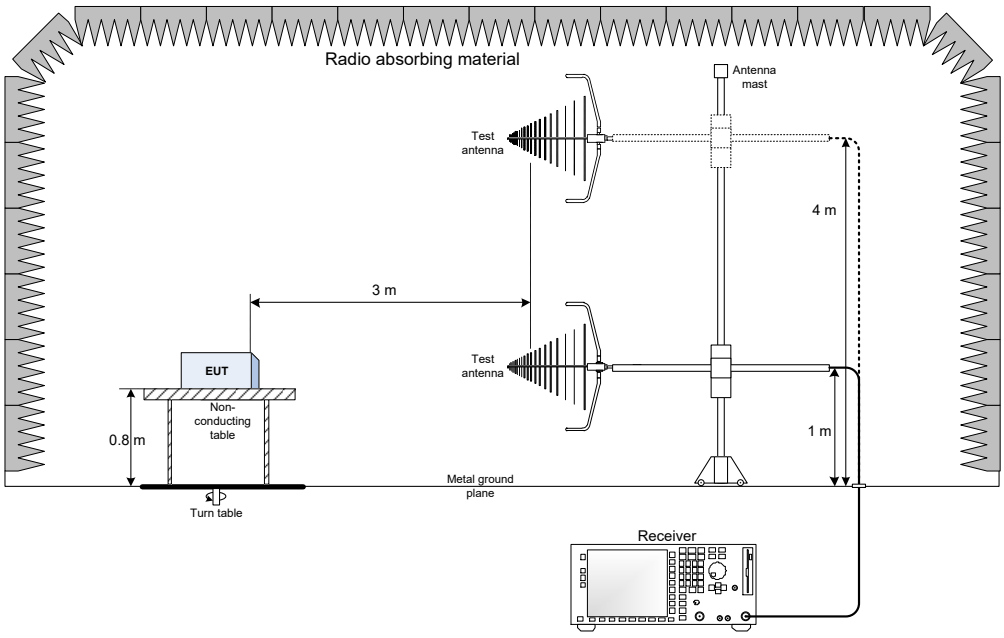


Xplore – Front Picture

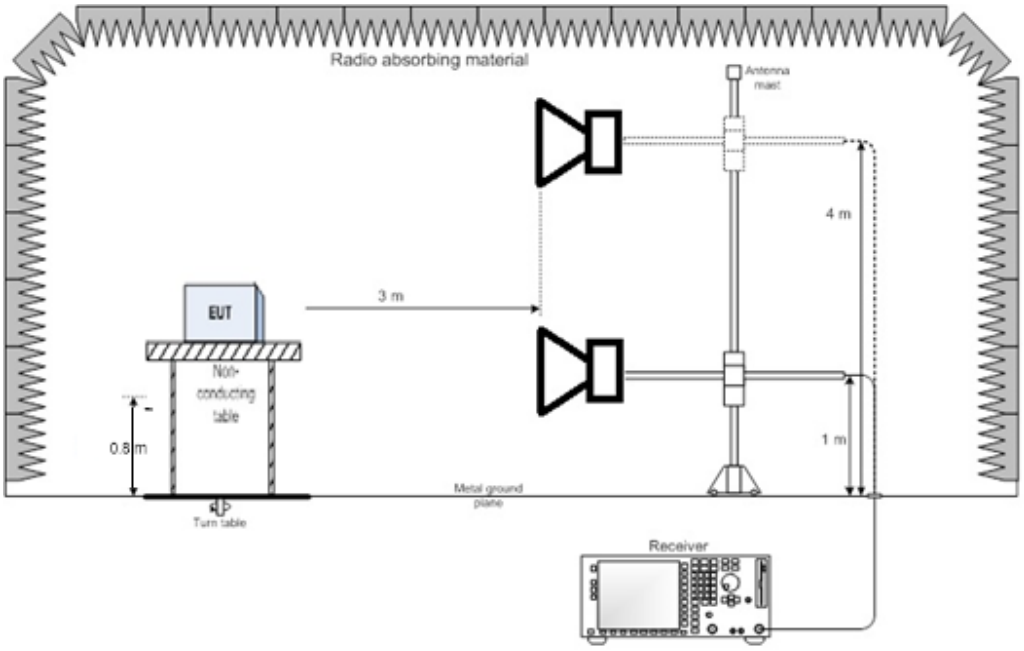
Xplore – Back Picture

Power Charger for Xplore

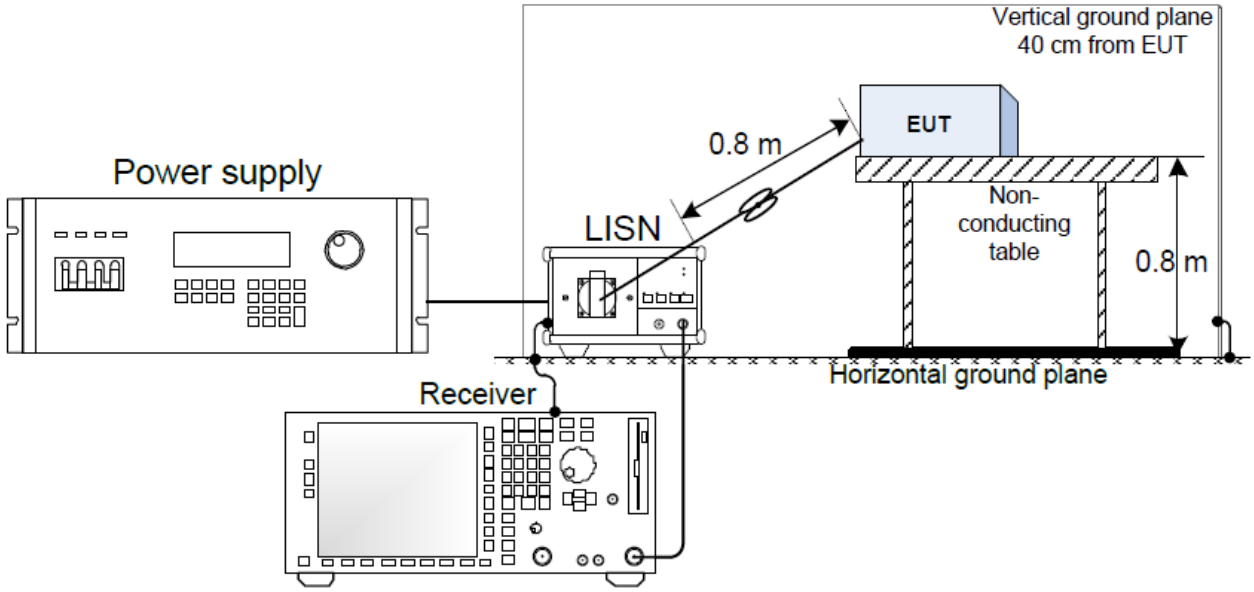
Section 10 Block diagrams of test set-ups



30-1000MHz Setup



Above 1GHz Setup


Vertical ground plane
40 cm from EUT
EUT
0.8 m
Power supply
LISN
Non-
conducting
table
0.8 m
Horizontal ground plane
Receiver

Thank you for choosing