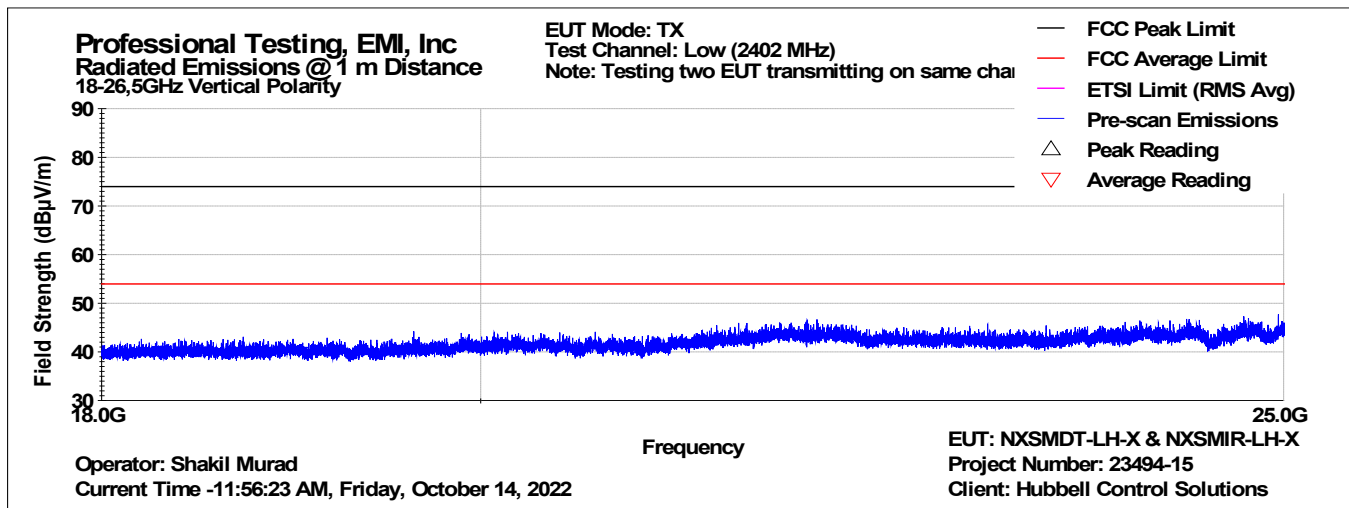
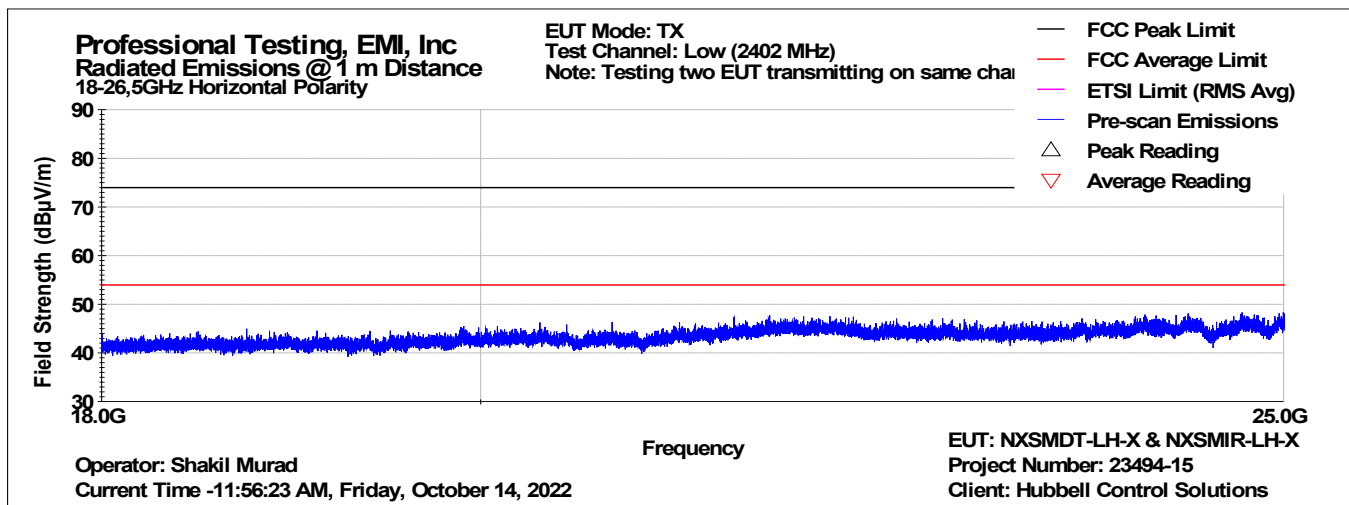


18GHz - 26.5GHz Vertical Polarity Emissions Data



Note: No emissions were observed.

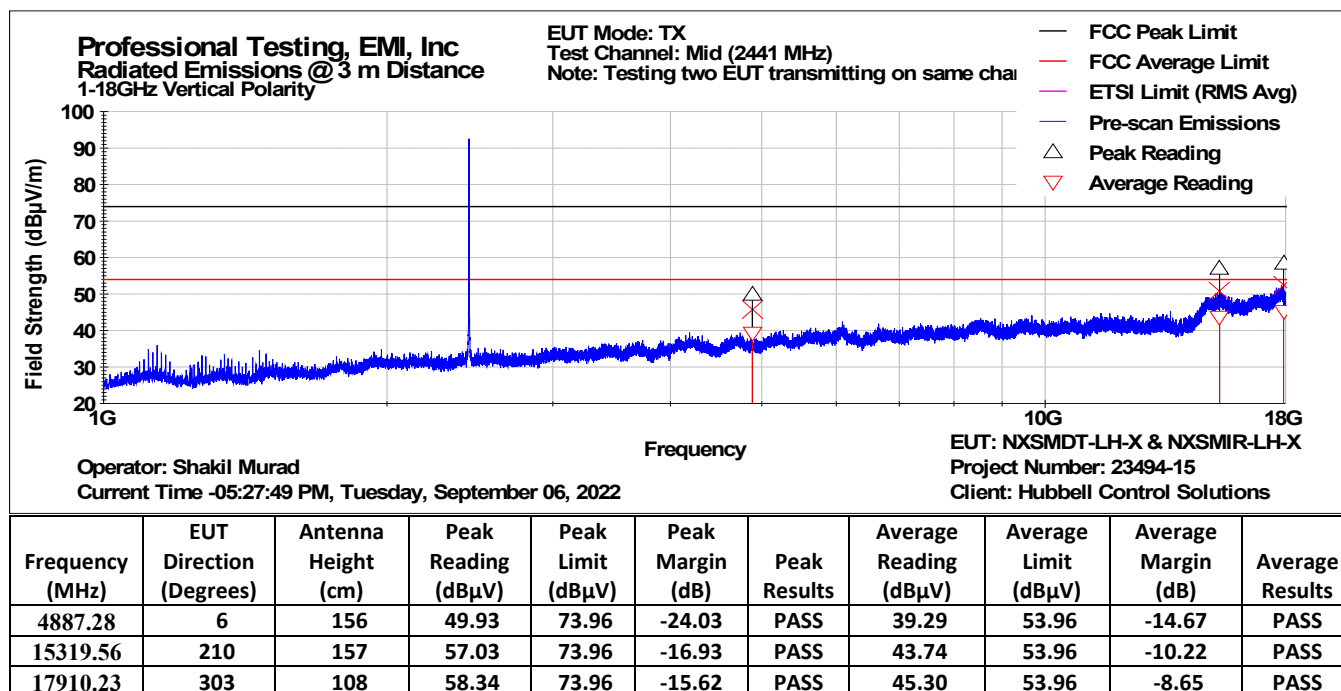
18GHz - 26.5GHz Horizontal Polarity Emissions Data



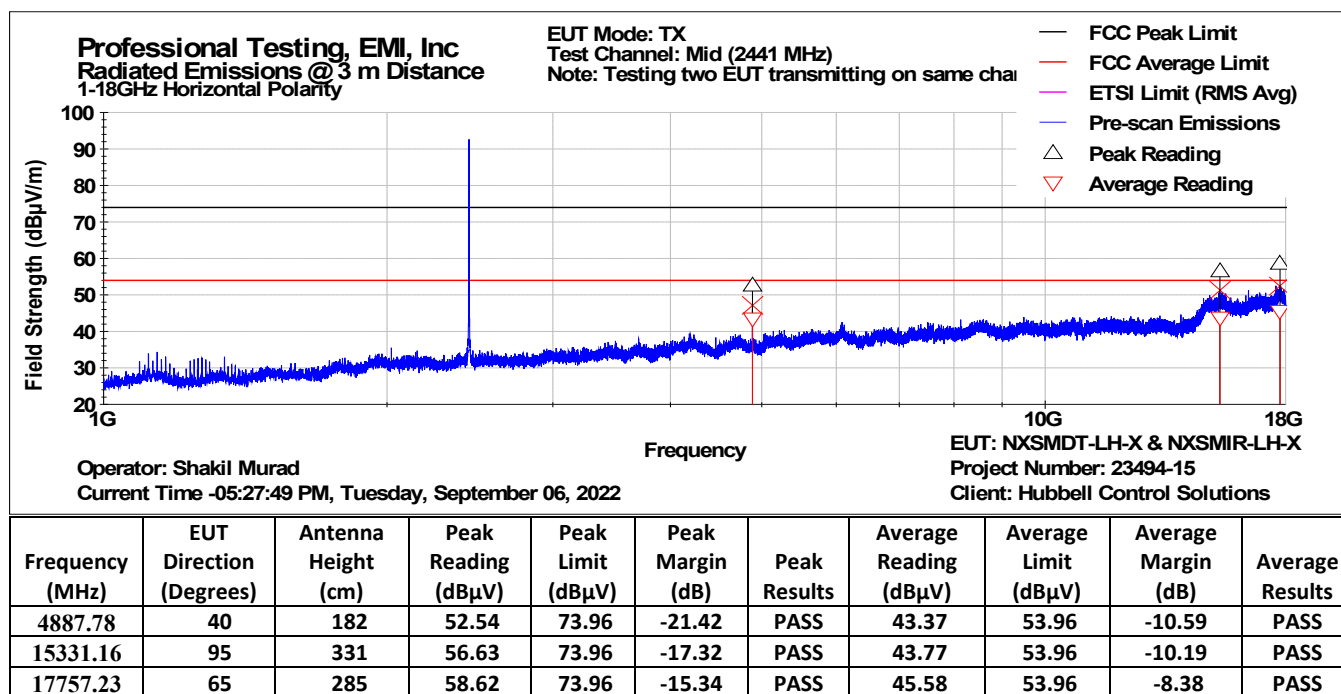
Note: No emissions were observed.

8.3.2 Middle Channel, 1 GHz to 26.5 GHz

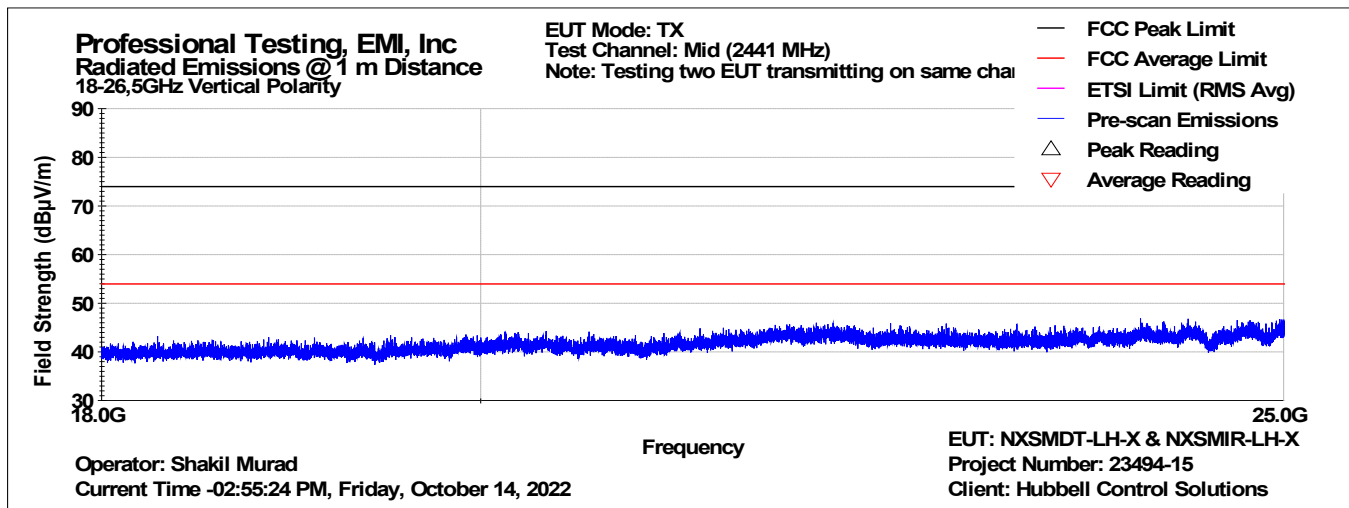
1GHz - 18GHz Vertical Polarity Emissions Data



1GHz - 18GHz Horizontal Polarity Emissions Data

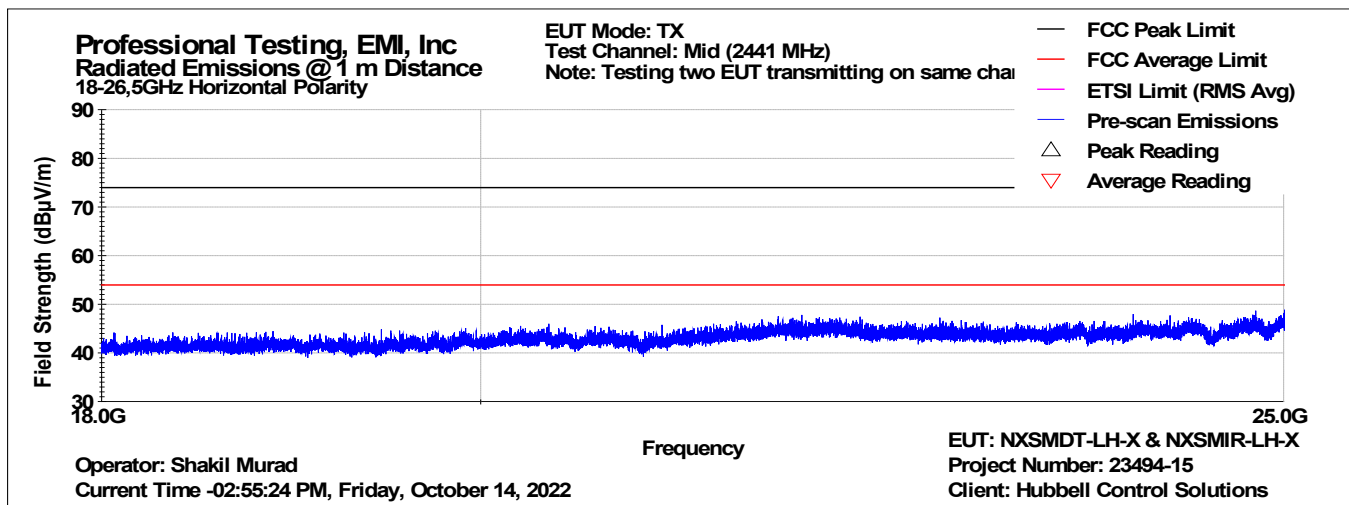


18GHz - 26.5GHz Vertical Polarity Emissions Data



Note: No emissions were observed.

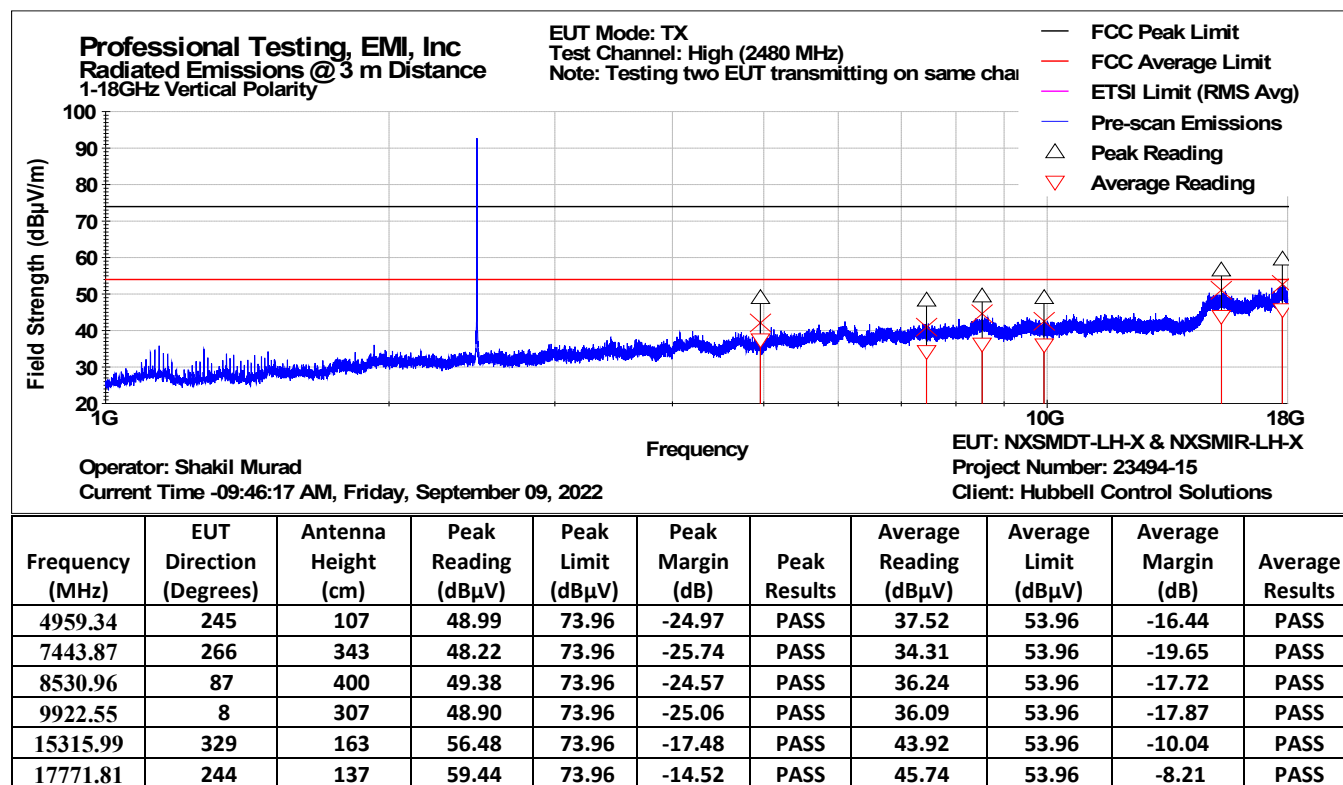
18GHz - 26.5GHz Horizontal Polarity Emissions Data



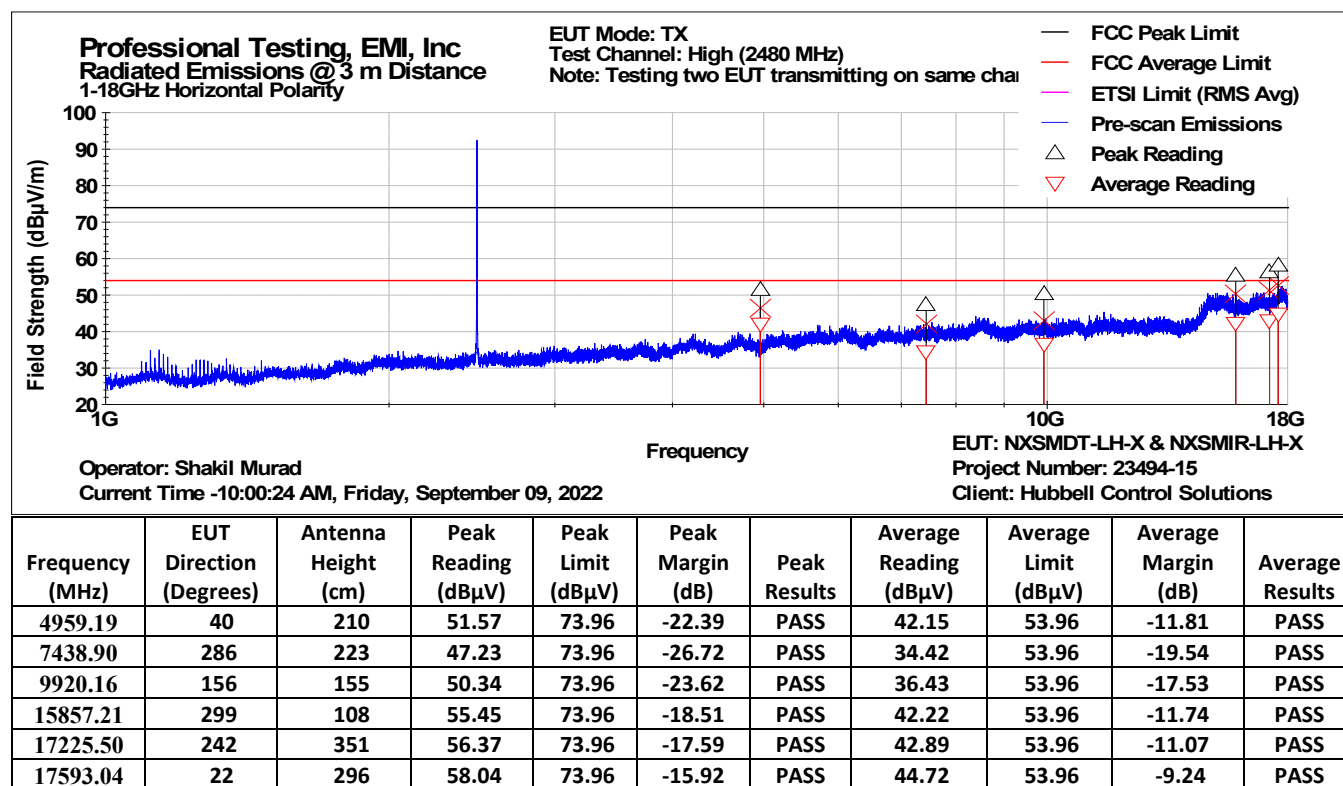
Note: No emissions were observed.

8.3.3 Top Channel, 1GHz to 26.5 GHz

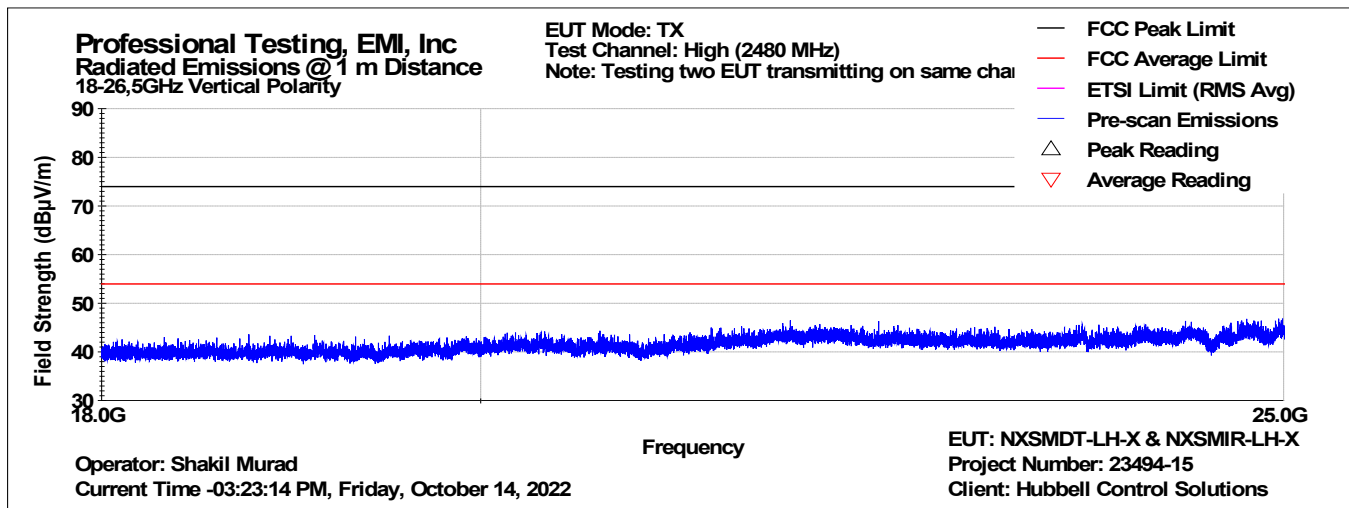
1GHz - 18GHz Vertical Polarity Emissions Data



1GHz - 18GHz Horizontal Polarity Emissions Data

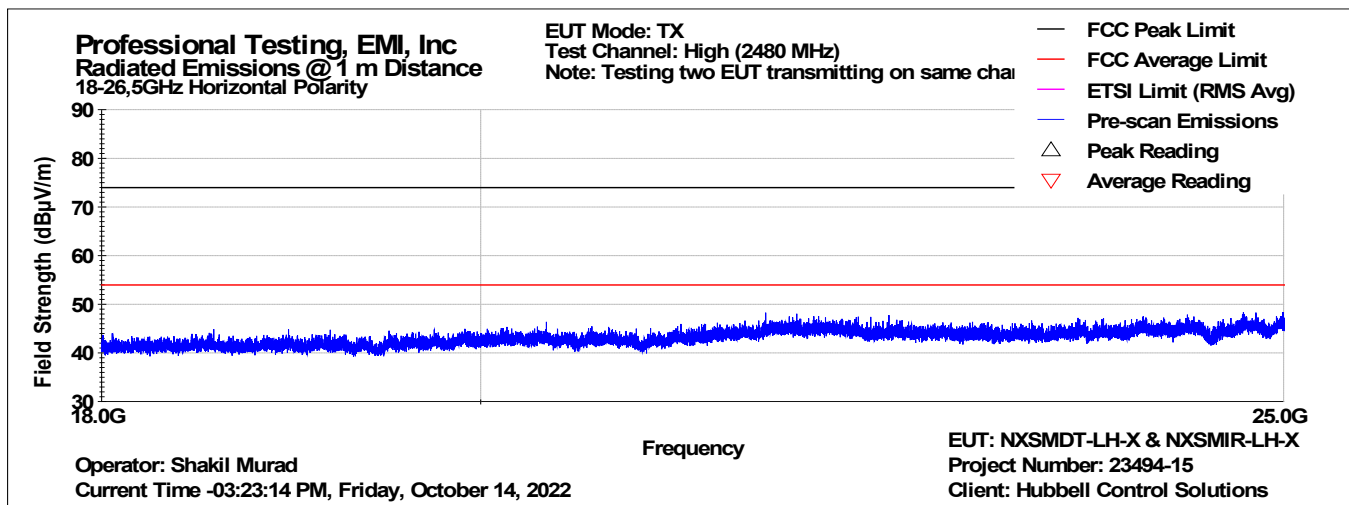


18GHz - 26.5GHz Vertical Polarity Emissions Data



Note: No emissions were observed.

18GHz - 26.5GHz Horizontal Polarity Emissions Data



Note: No emissions were observed.

9.0 Radiated Spurious Emissions, Receive Mode

9.1 Test Procedure

The EUT was in receive mode during these measurements. Both EUT models, NXSMDT-LH and NXSMIR-LH, were tested together.

Table 9.1.1: Test Distance, Table Height, and Detection Method

30 MHz to 1 GHz	1 GHz to 18 GHz	18 GHz to 25 GHz
10 m, 80 cm	3 m, 80 cm	1 m, 80 cm
Quasi-peak	Peak & Average	Peak & Average

9.2 Test Criteria

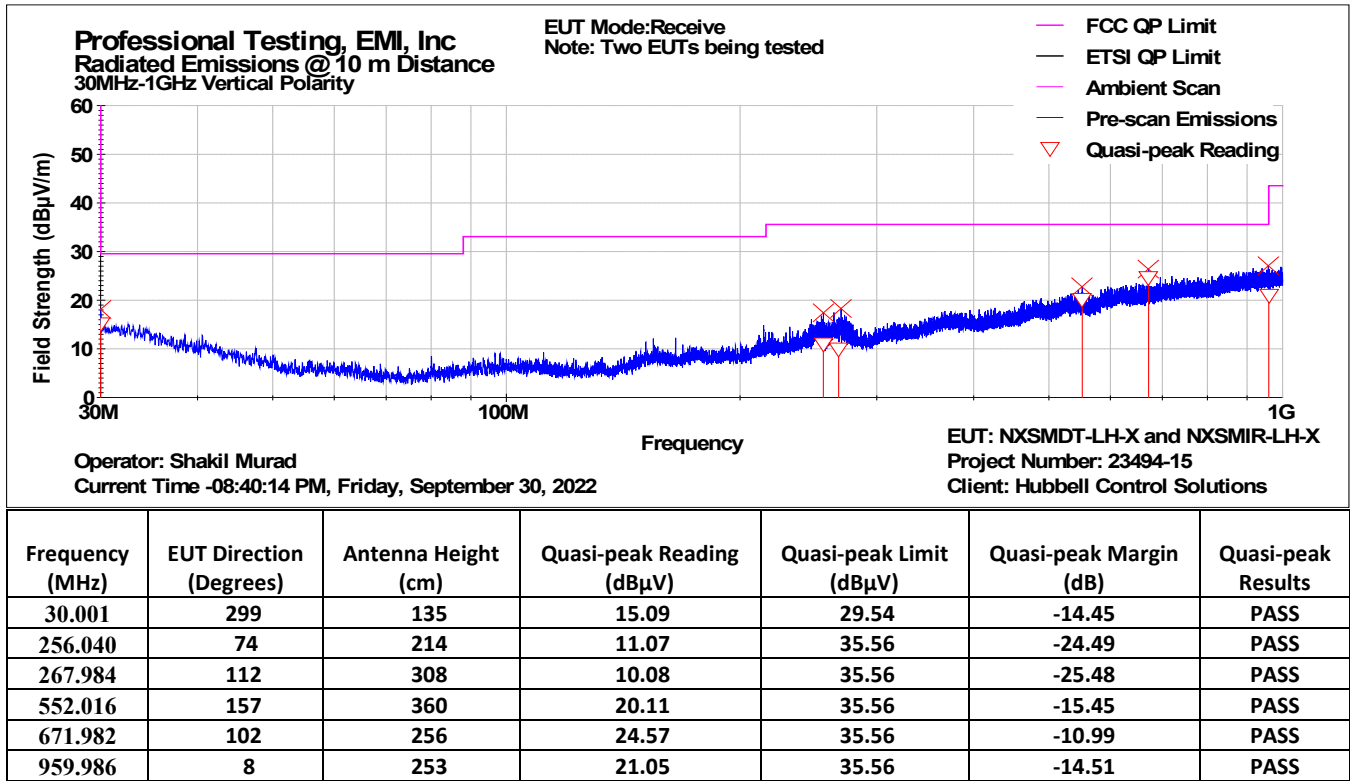
47 CFR (USA) // IC (Canada)	
Section Reference	Parameter
15.109 // RSS-Gen 7.3	Field Strength of Radiated Spurious/Harmonic Emissions Receive Mode

9.3 Test Results

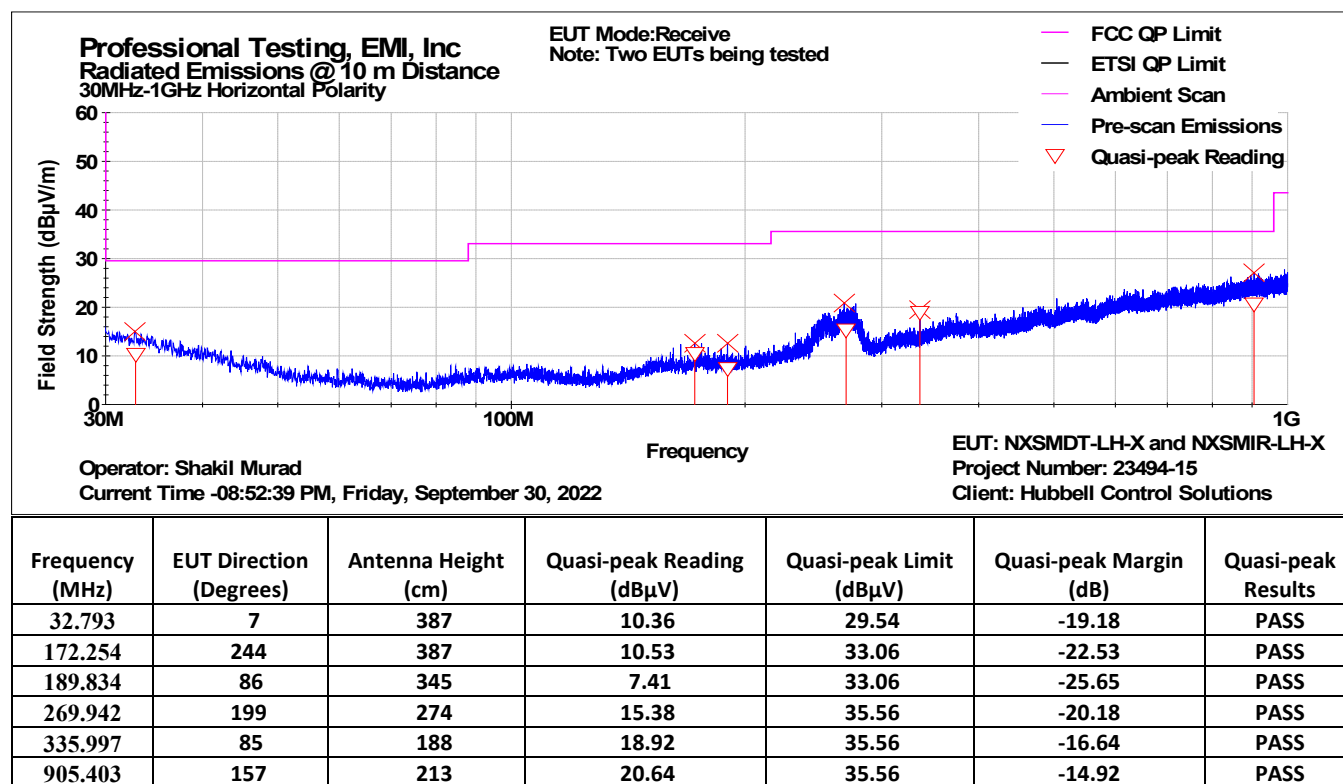
The requirement was satisfied. Graphical and tabular data appears below.

9.3.1 Middle Channel 30 MHz to 14 GHz

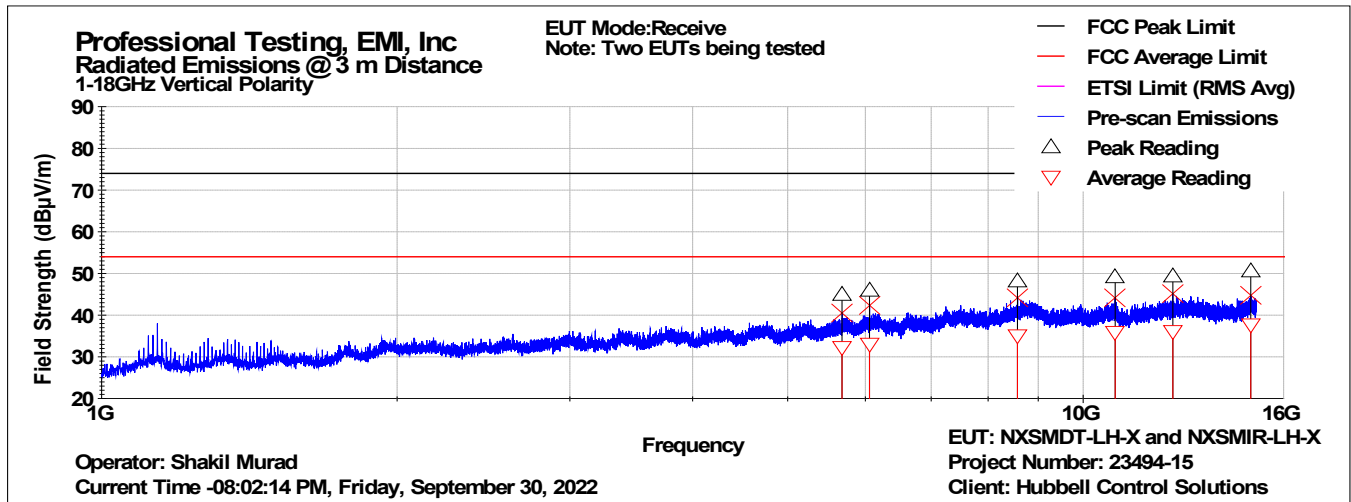
30MHz - 1GHz Vertical Polarity Emissions Data



30MHz - 1GHz Horizontal Polarity Emissions Data

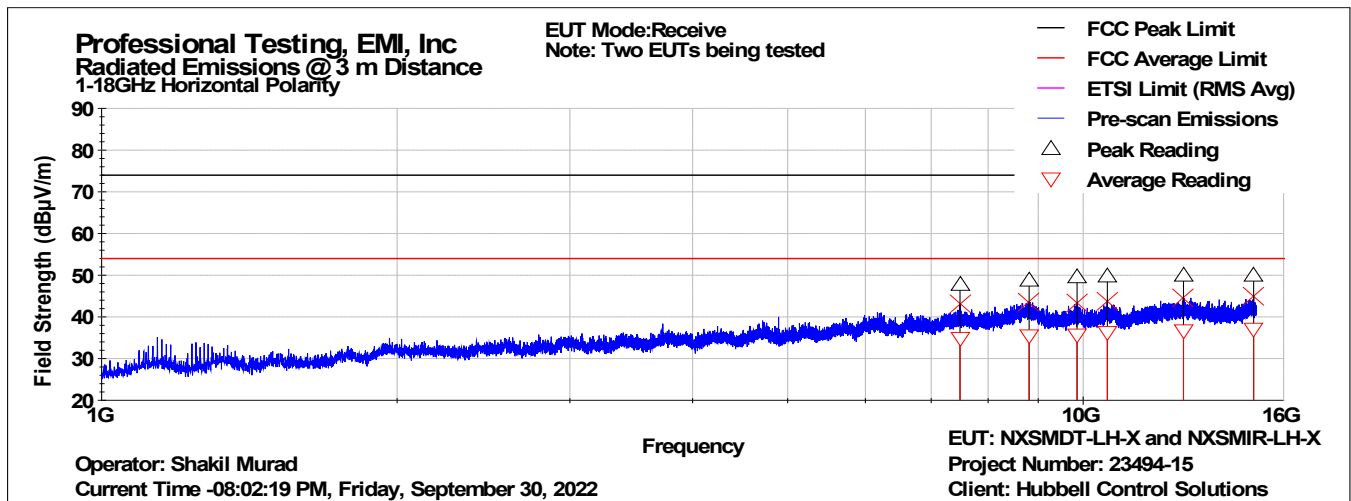


1GHz - 18GHz Vertical Polarity Emissions Data



Frequency (MHz)	EUT Direction (Degrees)	Antenna Height (cm)	Peak Reading (dBµV)	Peak Limit (dBµV)	Peak Margin (dB)	Peak Results	Average Reading (dBµV)	Average Limit (dBµV)	Average Margin (dB)	Average Results
5679.48	291	356	45.02	73.98	-28.96	PASS	32.25	53.98	-21.73	PASS
6057.66	266	199	46.02	73.98	-27.96	PASS	33.04	53.98	-20.94	PASS
8570.66	15	334	48.23	73.98	-25.75	PASS	35.01	53.98	-18.97	PASS
10780.04	296	108	49.18	73.98	-24.80	PASS	35.85	53.98	-18.13	PASS
12340.93	14	210	49.38	73.98	-24.60	PASS	36.17	53.98	-17.81	PASS
14813.78	16	302	50.49	73.98	-23.49	PASS	37.66	53.98	-16.32	PASS

1GHz - 18GHz Horizontal Polarity Emissions Data



Frequency (MHz)	EUT Direction (Degrees)	Antenna Height (cm)	Peak Reading (dBµV)	Peak Limit (dBµV)	Peak Margin (dB)	Peak Results	Average Reading (dBµV)	Average Limit (dBµV)	Average Margin (dB)	Average Results
7490.63	50	297	47.77	73.98	-26.21	PASS	34.85	53.98	-19.13	PASS
8809.12	297	330	48.68	73.98	-25.30	PASS	35.49	53.98	-18.49	PASS
9858.50	201	313	49.55	73.98	-24.43	PASS	35.75	53.98	-18.23	PASS
10582.99	313	202	49.70	73.98	-24.28	PASS	36.25	53.98	-17.73	PASS
12653.47	111	193	49.92	73.98	-24.06	PASS	36.64	53.98	-17.34	PASS
14916.01	113	108	49.93	73.98	-24.05	PASS	37.00	53.98	-16.98	PASS

10.0 Antenna Construction

10.1 Procedure

A direct examination of the antenna construction is performed and compared to rule criteria that prevent wireless device antennas from being modified by end users.

10.2 Criteria

47 CFR (USA) // IC (Canada)	
Section Reference	Antenna Construction
15.203 // RSS-Gen 6.8	Type of Antenna(s) Type of Connector Gain

10.3 Results

Table 8.3.1 Antenna Construction Details
Chip Antenna
Manufacturer: Pulse Model/PN: W3001 Antenna peak gain: 1.5 dBi Frequency Range: 2400-2483.5 MHz Connector Type: No connector. Chip is soldered to circuit board.

User cannot substitute antenna.

Gain is under maximum limit of 6 dBi.

The requirement was satisfied. Antenna datasheet is shown below.

Antenna Datasheet:

W3001 Datasheet version 1.0. 2.4 GHz WiFi Antenna. (04/08).

2.4 GHz WiFi Antenna

10 x 3.2 x 4.0 mm Ceramic Chip Antenna (On Ground type, Top surface ground removal area 10.80 x 6.25 mm).
Pulse Part Number: W3001

**Features**

- Omni directional radiation (Azimuthal plane)
- Low profile
- Compact size W x L x H (10 x 3.2 x 4 mm)
- Low weight (600 mg)
- Lead free materials
- Fully SMD compatible
- Lead free soldering compatible
- Tape and reel packing
- RoHS compliant product

Applications

- Bluetooth
- 2.4 GHz WLAN
- 2.4 GHz ISM Band System

Electrical specifications @ +25 °C

Note: Electrical characteristics depend on test board (GP) size and antenna positioning on GP and Ground Clearance area size.

WiFi 2.4 GHz

Typical performance

(Test board size 80 x 37 mm, PWB top surface ground removal area 10.80 x 6.25 mm, position 1 on PWB)

Frequency Range [MHz]	Max Gain [dBi]	Efficiency [%] / [dB]	Return loss min. [dB]	Impedance [Ω]	Operating Temperature [° C]
2400 – 2483.5	1.5 (Peak) 0.5 (Band edges)	75 / -1.25 (Peak) 60 / -2.25 (Band edges)	-6	50	-45 to +85

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11.0 Measurement Bandwidths

Radiated Emissions Spectrum Analyzer Bandwidth and Measurement Time - Peak Scan				
Frequency Band Start (MHz)	Frequency Band Stop (MHz)	6 dB Bandwidth (kHz)	Number of Ranges Used	Measurement Time per Range
0.009	0.15	0.3	2	Multiple Sweeps
0.15	30	9	6	Multiple Sweeps
30	1000	120	2	Multiple 800 mS Sweeps
1000	6000	1000	2	Multiple Sweeps
6000	18000	1000	2	Multiple Sweeps
18000	26500	1000	2	Multiple Sweeps
*Notes: 1. The settings above are specifically calculated for the E4440A series of spectrum analyzers, which have 8,000 data points per range. 2. The measurement receiver resolution bandwidth setting was 300 Hz for quasi-peak measurements from 9-150 kHz. 3. The measurement receiver resolution bandwidth setting was 9 kHz for quasi-peak measurements from 0.15-30 MHz. 4. The measurement receiver resolution bandwidth setting was 120 kHz for quasi-peak measurements from 30-1000 MHz. 5. The measurement receiver resolution bandwidth setting was 1 MHz for average measurements from 1-18 GHz.				

12.0 Test Equipment

12.1 Conducted Measurements at the Antenna Port

Asset#	Manufacturer	Model	Equipment Nomenclature	Serial Number	Calibration Due Date
2295	Keysight	E4440A-AYZ	PSA Spectrum Analyzer	MY46186204	8/25/2023
A118	Narda	768A-20	20 dB 20 W Attenuator, DC - 11GHz	105357	12/10/2022
1117	HP	6296A	Power Supply, DC, 60V 3A	1552A02489	N/A

12.2 Radiated Spurious Emissions

Tile! Software Version:			Version: 7.1.2.17 (Jan 08, 2016 - 02:12:48 PM) or 4.1.A.0, April 14, 2009, 11:01:00PM		
Test Profile:			2020_RE_Unintentional_TILE7_v4		
Asset #	Manufacturer	Model	Equipment Nomenclature	Serial Number	Calibration Due Date
1937	Agilent	E4440A - AYZ	PSA , 3 Hz - 26.5 GHz, Opt. AYZ	MY44808298	11/12/2022
1509A	Braden	TDK 10M	TDK 10M Chamber, NSA < 1 GHz	DAC-012915-005	4/9/2023
1969	HP	11713A	Attenuator/Switch Driver	3748A04113	N/A
942	EMCO	11968D	Turntable, 4ft.	9510-1835	N/A
1326	EMCO	1051-12	Controller, Antenna Mast	9101-1564	N/A
1244	EMCO	1050C	Controller, Antenna Mast	1100	N/A
C027	none	RG214	Cable Coax, N-N, 25m, 25MHz - 1GHz	None	9/9/2023
C233	EMCO	3115	Antenna, Horn, DRG, 1-18GHz	9010-3578	N/A
1926	ETS-Lindgren	3142D	Antenna, Biconilog, 26 MHz - 6 GHz	135454	7/15/2024
1425	Electro-Metrics	BPA-1000	Preamplifier, Broadband 10k-1GHz	123	3/23/2024
C289	Pasternack	PE354-24	Cable, N-SMA, 0.610m Blue	1310	9/9/2024
C030	none	none	Cable Coax, N-N, 30m, 1 - 18GHz	None	9/9/2023
C038	none	LMR-400	Cable Coax, N-N, 0.15m	None	N/A
1780	ETS-Lindgren	3117	Antenna, Double Ridged Guide Horn, 1 - 18 GHz	110313	4/16/2023
2004	Miteq	AFS44-00101800-2S-10P-44	Amplifier, 40dB, 100MHz-18GHz	None	1/14/2024
745	EMCO	6406	Helmholtz Coil	1003	N/A
1326	EMCO	1051-12	Controller, Antenna Mast	9101-1564	N/A
1542	A.H. Systems	SAS-572	Antenna, Horn 18-26.5GHz, 20dB gain	225	N/A
1973	Agilent	83017A	Amplifier, Microwave 0.5-26.5 GHz	MY39500497	11/10/2022

Appendix: Policy, Rationale, and Evaluation of EMC Measurement Uncertainty

All uncertainty calculations, estimates and expressions thereof shall be in accordance with ANAB policy. Since Nemko USA, Inc operates in accordance with ANAB Document Number AR 2250: 2021/06/16, all instrumentation having an effect on the accuracy or validity of tests shall be periodically calibrated or verified traceable to national standards by a competent calibration laboratory. The certificates of calibration or verification on this instrumentation shall include estimates of uncertainty as required by ANAB Document Number AR 2250.

1. Rationale and Summary of Expanded Uncertainty.

Each piece of instrumentation at Nemko USA that is used in making measurements for determining conformance to a standard (or limit), shall be assessed to evaluate its contribution to the overall uncertainty of the measurement in which it is used. The assessment of each item will be based on either a type A evaluation or a type B evaluation. Most of the evaluations will be type B, since they will be based on the manufacturer's statements or specifications of the calibration tolerances, or uncertainty will be stated along with a brief rationale for the type of evaluation and the resulting stated uncertainties.

The individual uncertainties included in the combined standard uncertainty for a specific test result will depend on the configuration in which the item of instrumentation is used. The combination will always be based on the law of propagation of uncertainty. Any systematic effects will be accommodated by including their uncertainties, in the calculation of the combined standard uncertainty; except that if the direction and amount of the systematic effect cannot be determined and separated from its uncertainty, the whole effect will be treated as uncertainty and combined along with the other elements of the test setup.

Type A evaluations of standard uncertainty will usually be based on calculating the standard deviation of the mean of a series of independent observations, but may be based on a least-squares curve fit or the analysis of variance for unusual situations. Type B evaluations of standard uncertainty will usually be based on manufacturer's specifications, data provided in calibration reports, and experience. The type of probability distribution used (normal, rectangular, a priori, or u-shaped) will be stated for each Type B evaluation.

In the evaluation of the uncertainty of each type of measurement, the uncertainty caused by the operator will be estimated. One notable operator contribution to measurement uncertainty is the manipulation of cables to maximize the measured values of radiated emissions. The operator contribution to measurement uncertainty is evaluated by having several operators independently repeat the same test. This results in a Type A evaluation of operator-contributed measurement uncertainty.

A summary of the expanded uncertainties of Nemko USA measurements is shown as Table 1. These are the worst-case uncertainties considering all operative influence factors.

Table 1: Summary of Measurement Uncertainties for Site 45

Type of Measurement	Frequency Range	Meas. Dist.	Expanded Uncertainty U, dB (k=2)
Mains Conducted Emissions	150 kHz to 30 MHz	N/A	2.9
Telecom Conducted Emissions	150 kHz to 30 MHz	N/A	2.8
Radiated Emissions	30 to 1,000 MHz	10 m	4.8
	1 to 18 GHz	3 m	5.7

End of Report