EMC TEST REPORT

NVLAP Lab Code 200033-0

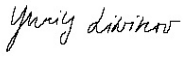
Standard(s):

47 CFR FCC Part 15.231
FCC Part 15B
FCC ID: DGF-TSSDW40143
IC:458A-TSSDW40143

Product: 3M Electronic Monitor - One-Piece Offender Tracking Device
Model: W40143
3M Division: TSSD

Report Number: RE1603003-1
Report Issue Date: July 1, 2016

Report Prepared By:

Signature: 

Yuriy Litvinov
Lead EMC Engineer

Tested By:
3M Regulatory Engineering
EMC Laboratory
410 E. Fillmore Avenue, Building 76-01-1
St. Paul, Minnesota 55107-1000

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1.0 Test Summary

Based on the results of our investigation, we have concluded the product tested complies with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested.

	Standard	Test Requirements	Result	Comments
4.1	§15.231(a)/ RSS 210 (A1.1.1)	Transmission Timing and Duty Cycle Correction Factor	pass	
4.2	§15.231(c)/ RSS 210(A1.1.3)	Occupied Bandwidth	pass	
4.3	§15.231(b)/ RSS 210(A.1.1.3)	Field Strength of Fundamental Emissions	pass	
4.4	§15.107/15.207/ RSS-Gen	Conducted Emissions	pass	
4.5	§15.209/15.231/ RSS 210(A.1.1.3)	Radiated Spurious Emissions	pass	

Note:	

1.1 Measurement Uncertainty

The measured value related to the corresponding limit will be used to decide whether the equipment meets the requirements. The measurement uncertainty figures were calculated and correspond to a coverage factor of k=2, providing a confidence level of respectively 95.45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian).

Radiated emissions	5.20 dB
Conducted emissions	3.60 dB
Harmonics and Flicker	3.32 dB

2.0 Equipment Description

2.1	Equipment Under Test		
Description:	The Wearable Miniature Tracking Device Generation 4 was designed to help probation and parole officers monitor offenders. It is attached to the offender's desired ankle using a rubber-like strap. It collects positional information and compares this data to rules that have been established by a probation or parole officer.		
Model(s):	W40143		
Serial number:	US1167000_AG01		
Client Contact:	Elizabeth A. Lienemann		
3M Division:	Traffic Safety and Security		
Modifications:	None		
Frequency Range (MHz) :	418MHz	433.92MHz	
Modulation Type:	ASK	ASK	
Channel No.:	N/A		
Maximum Output Power:	15dBm	15dBm	
Antenna Type :	☒ Internal (PCB) ☐ External		
Equipment Category:	☒ General ☐ Portable ☐ Indoor Use		
Rated Input Power:	Voltage: ☒ 120VAC ☐ 230VAC ☐ VDC Frequency: ☐ 50Hz ☒ 60Hz Current: ☒ 0.5A		
Test Dates:	06/28-06/30/2016		
Received Date:	06/28/2016		
Received Conditions:	☐ Poor ☒ Good ☒ Prototype ☐ Production		

3.0 EUT Configuration

3.1 Support Equipment

No.	Product Type	Manufacturer	Model	Comments
1	Battery Charger	3M	CPS024120200U	100-240/50-60 Hz/0.55A/ 12VDC/2000mA
2	IR wireless interface	ACTiSYS	ACT-IR224UN-LN57	

3.2 Cables/Ports

No.	Name	Type	Length	Shielding	Comments
1					
2					
3					

3.3 Operating Condition of EUT

	Operation Modes
☐	Stand by
☒	Tracking Device was programmed for continues operation using MTD_TERM V1.6.15 software via ACTiSYS IR USB to Serial Adapter
☒	Transmitting mode – 418MHz
☒	Transmitting mode - 433.92MHz
☐	
☐	

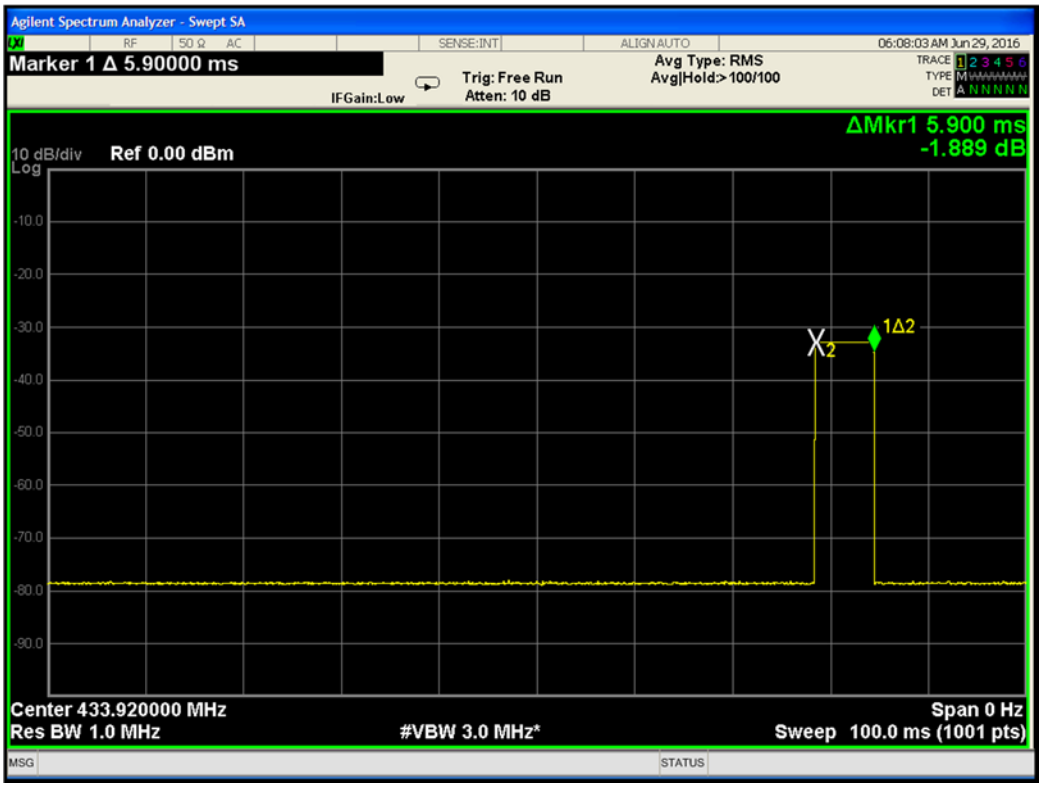
3.4 Exercising of EUT

No.	Description of EUT Exercising
1	Transmitting un-modulated carrier at the maximum rated RF output power
2	Transmitting modulated carrier with “Fast Packets” mode enabled
3	

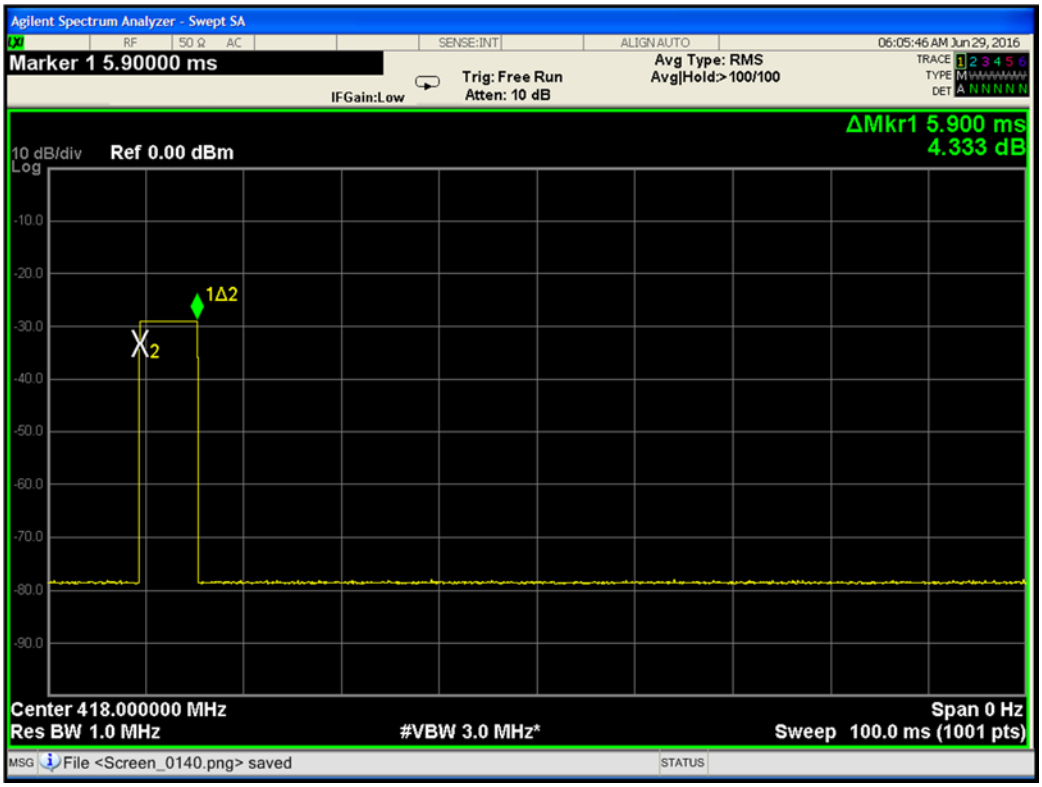
4.0 Test Conditions and Results

4.1	**Transmission Timing and Duty Cycle**		
Method:	The measurement field strength was determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 s (100 ms).		
	Laboratory Ambient Temperature		23°C
	Relative Humidity		55%
Reference Standard:	☒ ANSI C63.10:2013 ☐ ANSI C63.4:2014 ☒ FCC Part 15.231/RSS 210 ☐ FCC Part 15.209		**Measurement Point** ☐ Conducted ☒ Radiated ☐
Frequency Range:	☒ 418 MHz	☒ 433.92MHz	
Duration of Transmission	☒ < 2sec per hour		**Result**
Duty Cycle	☒ Pulse “On Time” = 5.9ms ☒ Total Time = 100ms		20 log (0.059) = -24.6dB
Nominal Voltage:	☒ 120VAC ☐ VDC		
Tested By:	Yuriy Litvinov		**Date:** 06/29/2016

Note:	Professional Installation. The device is intended for security applications. This device transmits at regular predetermined intervals. The total duration of transmission does not exceed more than two seconds per hour.



Duty Cycle 418MHz

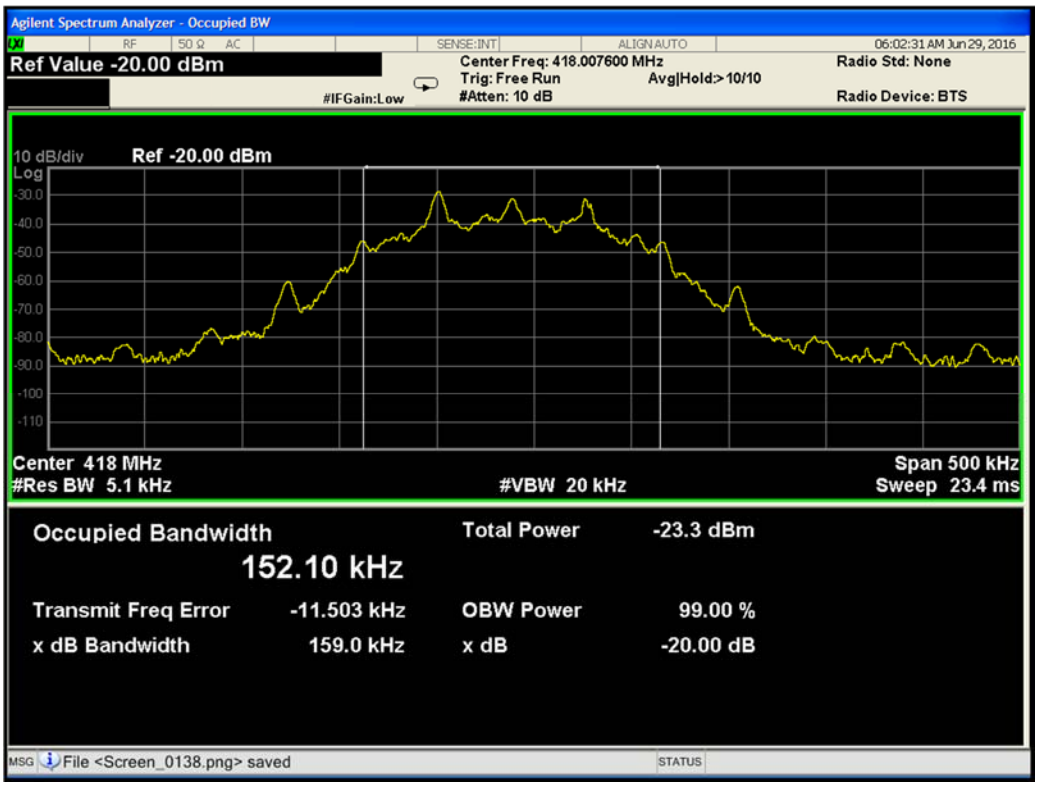


Duty Cycle 433.92 MHz

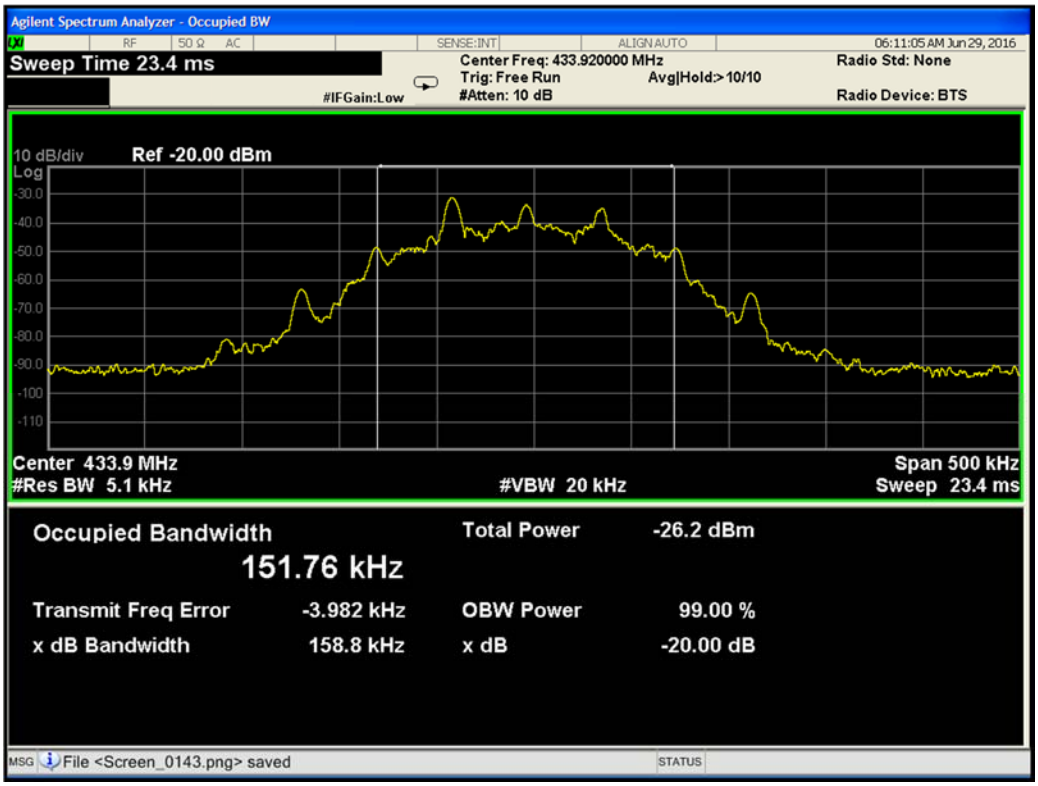
4.2	**Occupied Bandwidth**		
Method:	The measurements were made with transmitter set to transmit continuously modulated signal. The marker delta method was used to determine the 20dB bandwidth.		
	Laboratory Ambient Temperature		23°C
	Relative Humidity		35%
Reference Standard:	☐ ANSI C63.4:2014 ☒ ANSI C63.10:2013 ☒ FCC Part 15.231/RSS 210		**Measurement Point** ☐ Conducted ☒ Radiated ☐
Frequency Range:	☒ 418 MHz	☒ 433.92MHz	
Limit	☒ <0.25% of Center Frequency		RBW ≥ 1% of the 20 dB bandwidth VBW ≥ RBW
Nominal Voltage:	☒ 120VAC ☐ VDC		
Tested By:	Yuriy Litvinov		**Date:** 06/29/2016

Note:	

Frequency (MHz)	20 dB Bandwidth (KHz)	99% Bandwidth (KHz)	Limit (KHz)	Results
418	159	152.1	1045	**pass**
433.92	158.8	151.8	1085	**pass**



Occupied Bandwidth - 418 MHz



Occupied Bandwidth - 433.92 MHz

4.3	**Field Strength of Fundamental**	
Method:	Measurements was performed with un-modulated carrier at the highest power level at which the transmitter is intended to operate. The analyzer offset was adjusted to compensate for the attenuator and other losses. The preliminary measurements was performed to determine the worst-case EUT orientation for a specific frequency.	
	Laboratory Ambient Temperature	23°C
	Relative Humidity	55%
Reference Standard:	☐ ANSI C63.4:2014 ☒ ANSI C63.10:2013 ☒ FCC Part 15.2231/RSS 210	**Measurement Point** ☐ Conducted ☒ Radiated ☐
Frequency Range:	☒ 418 MHz ☒ 433.92MHz	
	Fundamental Frequency (MHz)	**Field Strength of Fundamental (mV/m)**
Limit	174-260	3,750
	260-470	3,750 to 12,500*
	Above 470	12,500*
Nominal Voltage:	☒ 120VAC ☐ VDC	
Tested By:	Mike Schultz MS	**Date:** 06/30/2016

Note:	*Linear interpolation

Pol.	Frequency (MHz)	Reading dBµV/m	Total CF dB	Net at 3 m dBµV/m.	Limit dBµV/m	Margin dB	Comments
V	418.00	70.9	21.0	91.9	100.28	-8.4	Peak
V	433.92	70.9	21.3	67.3	80.28	-12.9	Average DCF
V	433.92	73.1	21.3	94.4	100.83	-6.4	Peak
V	433.92	73.1	21.3	69.8	80.83	-11.0	Average DCF
Note:	DCF - Average readings include an additional -24.6dB duty cycle correction factor. 15dBm Power Settings						

4.4	**Conducted Emissions Data**
Method:	The AMN was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane. This distance was between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment were at least 0.8 m from the AMN. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN.

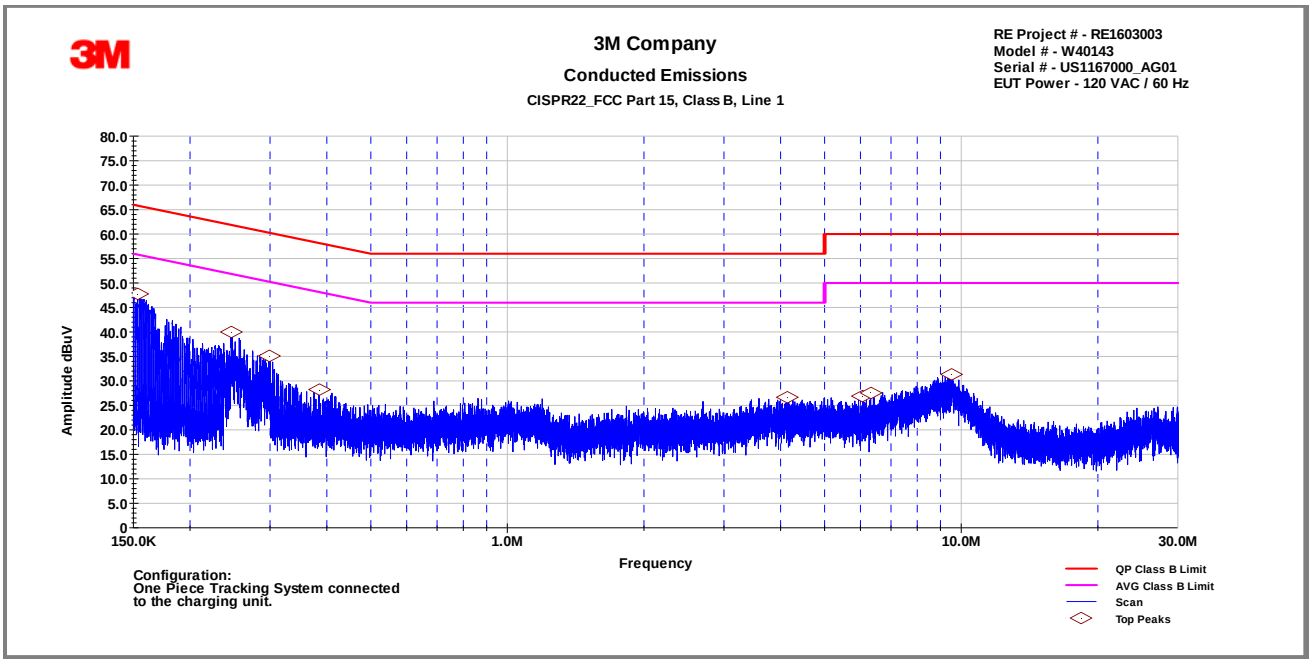
Test Verification: ☒	Laboratory Ambient Temperature	21°C
	Relative Humidity	55%
Reference Standard:	☒ ANSI C63.4:2014 ☐ ANSI C63.10:2013 ☒ FCC Part 15.207/RSS Gen ☐ FCC Part 15.231/RSS 210	**Measurement Point** ☒ Mains ☐ Telecommunication ports ☐
Frequency Range:	☒ 150KHz to 30KHz ☐	
Nominal Voltage:	☒ 120VAC ☐ 230VAC ☐	
Tested By:	Mike Schultz MS	**Date:** 06/29/2016

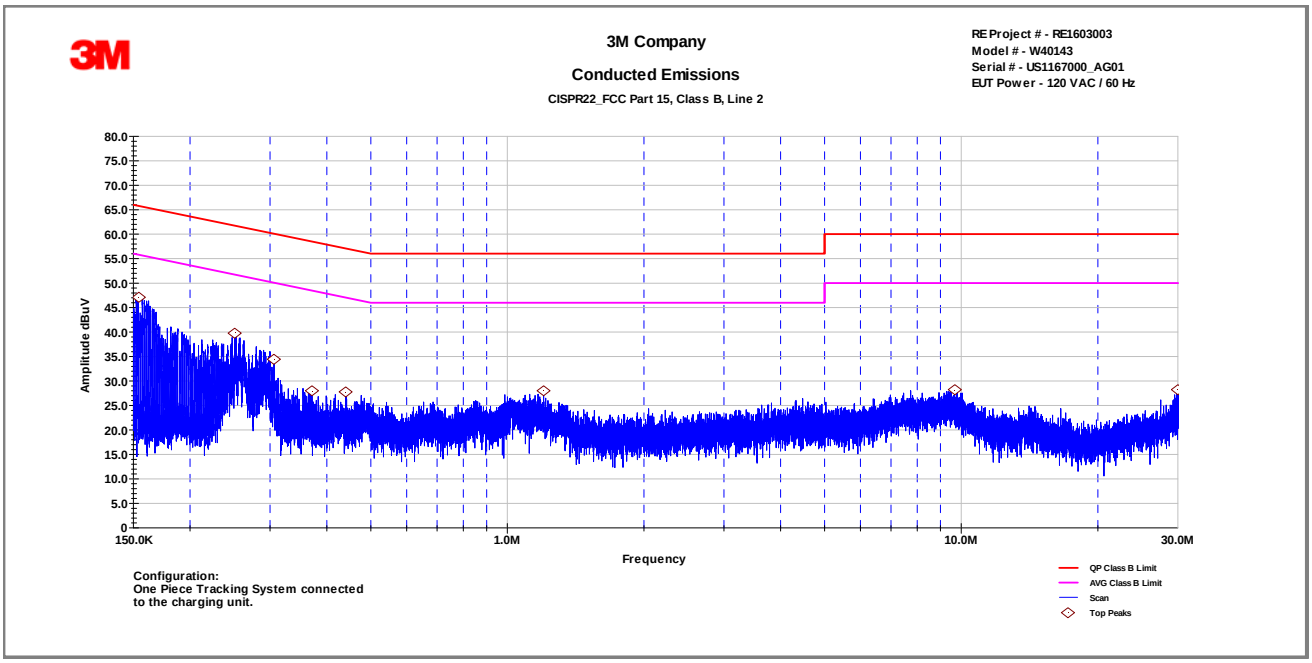
Limits

Frequency (MHz)	Limit dB (µV)			
	Quasi-Peak	Average	Result	Comments
0.15 to 0.50	66 to 56	56 to 46	**pass**	
0.50 to 5	56	46	**pass**	
5 to 30	60	50	**pass**	

Modifications:	
Note:	

Frequency (MHz)	QP Line 1 dB (µV)	AVG Line 1 dB (µV)	QP Limit dB (µV)	AVG Limit dB (µV)	QP Margin dB	AVG Margin dB
0.154	45.04	28.81	65.8	55.8	-20.76	-26.99
0.246	36.06	24.4	61.88	51.88	-25.82	-27.48
0.296	31.84	21.53	60.36	50.36	-28.51	-28.82
0.382	23.51	15.56	58.24	48.24	-34.73	-32.69
4.123	23.18	16.53	56	46	-32.82	-29.47
6.1	23.28	16.73	60	50	-36.72	-33.27
6.334	23.52	16.97	60	50	-36.48	-33.03
9.354	28.48	22.41	60	50	-31.52	-27.59
Frequency (MHz)	**QP Line 2 dB (µV)**	**AVG Line 2 dB (µV)**	**QP Limit dB (µV)**	**AVG Limit dB (µV)**	**QP Margin dB**	**AVG Margin dB**
0.154	44.64	28.62	65.81	55.81	-21.17	-27.19
0.252	36.71	26.53	61.68	51.68	-24.97	-25.15
0.302	31.5	21.88	60.19	50.19	-28.69	-28.31
0.366	24.1	16.21	58.58	48.58	-34.48	-32.37
0.437	22.01	14.96	57.12	47.12	-35.11	-32.15
1.202	24.72	34.69	56	46	-31.28	-11.31
9.619	25.25	19.02	60	50	-34.75	-30.98
29.968	25.01	18.57	60	50	-34.99	-31.43
Voltage		☒ 120VAC ☐ 230VAC ☐				
Notes						


3M Company
Conducted Emissions
CISPR22_FCC Part 15, Class B, Line 1
RE Project # - RE1603003
Model # - W40143
Serial # - US1167000_AG01
EUT Power - 120 VAC / 60 Hz
Amplitude dBuV
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0
150.0K
1.0M
10.0M
30.0M
Frequency
Configuration:
One Piece Tracking System connected
to the charging unit.
QP Class B Limit
AVG Class B Limit
Scan
Top Peaks


3M Company
Conducted Emissions
CISPR22_FCC Part 15, Class B, Line 2
RE Project # - RE1603003
Model # - W40143
Serial # - US1167000_AG01
EUT Power - 120 VAC / 60 Hz
Amplitude dBuV
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0
150.0K
1.0M
10.0M
30.0M
Frequency
Configuration:
One Piece Tracking System connected
to the charging unit.
QP Class B Limit
AVG Class B Limit
Scan
Top Peaks

.4.5	**Transmitter spurious emissions**	
Method:	The measurements were made with transmitter set to transmit continuously with un-modulated signal. EUT was rotated through three orthogonal axes to determine which attitude (orientation) and arrangement produces the highest emission relative to the limit; the attitude and headset arrangement that produces the highest emission relative to the limit was used in making final radiated emission measurements.	
	Laboratory Ambient Temperature	23°C
	Relative Humidity	55%
Reference Standard:	☐ ANSI C63.4:2014 ☒ ANSI C63.10:2013 ☐ FCC Part 15.109/ICES 003 ☒ FCC Part 15.231/RSS 210 ☒ FCC Part 15.209	**Measurement Point** ☐ Conducted ☒ Radiated
Frequency Range:	☒ 418MHz ☒ 433.92MHz	
Nominal Voltage:	☒ 120VAC ☐ VDC	
Tested By:	Mike Schultz MS	**Date:** 06/30/2016

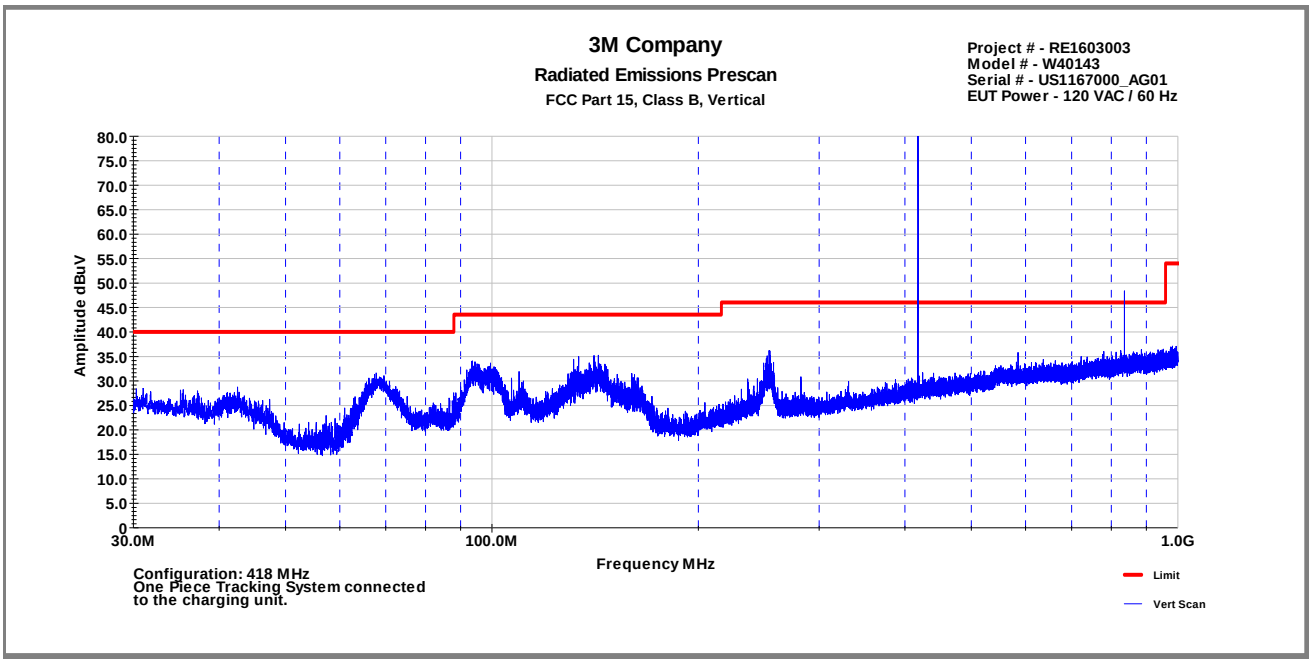
Limits – FCC Part 15.209

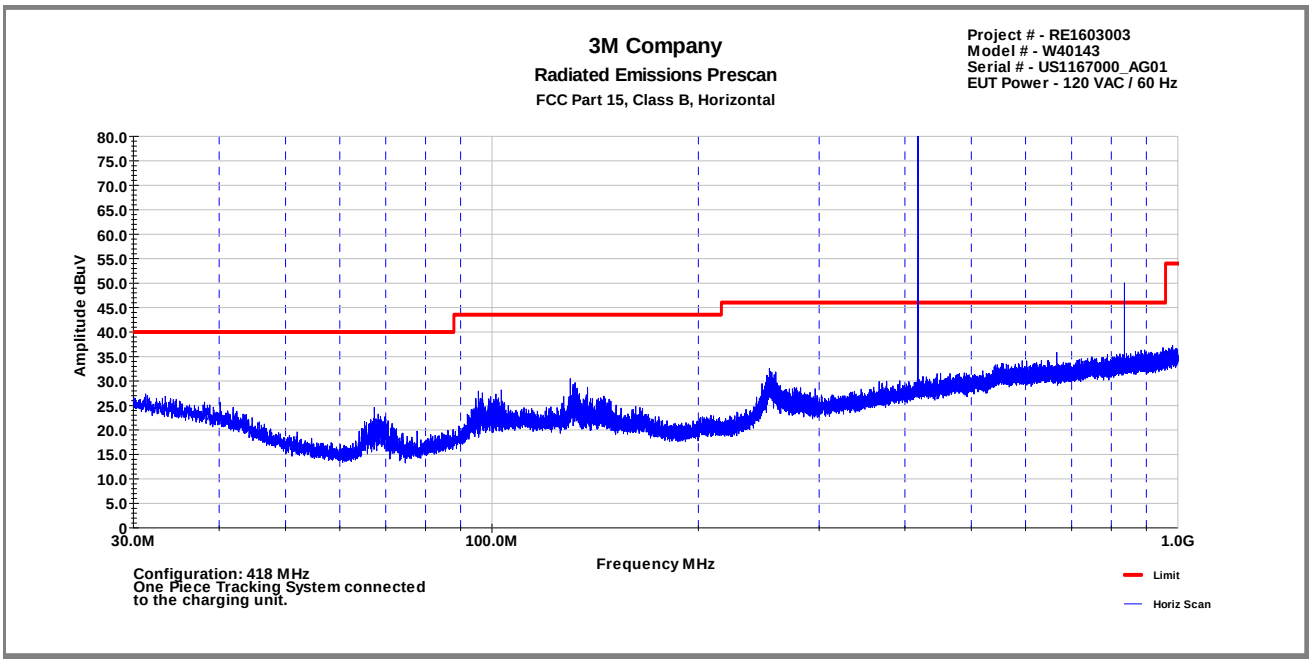
Frequency (MHz)	Limit dB (µV/m)			
	Quasi-Peak	Average	Distance	Results
0.009-0.490		2400/F(KHz)	300	**N/A**
0.490-1.705	24000/F(KHz)		30	**N/A**
1.705-30	29.5		30	**N/A**
30 to 88	40		3	**pass**
88-216	43.5		3	**pass**
216-960	46		3	**pass**
Above 960		54	3	**pass**
Limits – FCC Part 15.231				
260-470	*375 to 1250 (µV/m)		3	
418	80.28	60.28	3	**pass**
433.92	80.88	60.28	3	**pass**

Note:	*Linear interpolations The average value was calculated for fundamental frequency and spurious emissions from the device using the appropriate duty cycle correction factor. For emission in the restricted bands, the limit of 15.209 was used.

Frequency (MHz)	Pol.	Peak Reading dBµV/m	Total CF dB	Net at 3 m dBµV/m	Limit (dBµV/m)	Margin dB
68.414	V	17.7	9.4	27.1	80.28	-53.18
93.085	V	14.4	13.2	27.6	80.28	-52.68
99.361	V	13.7	14.5	28.3	80.28	-51.98
143.571	V	13.5	14.7	28.1	80.28	-52.18
253.994	V	15.9	16.7	32.6	80.28	-47.68
836.002	V	26.9	25.4	52.3	80.28	-27.98
Note:		**Transmitting mode 418MHz, 15dBm Power Settings** Total CF = Antenna Factor + Cable Factor - AMP Gain				

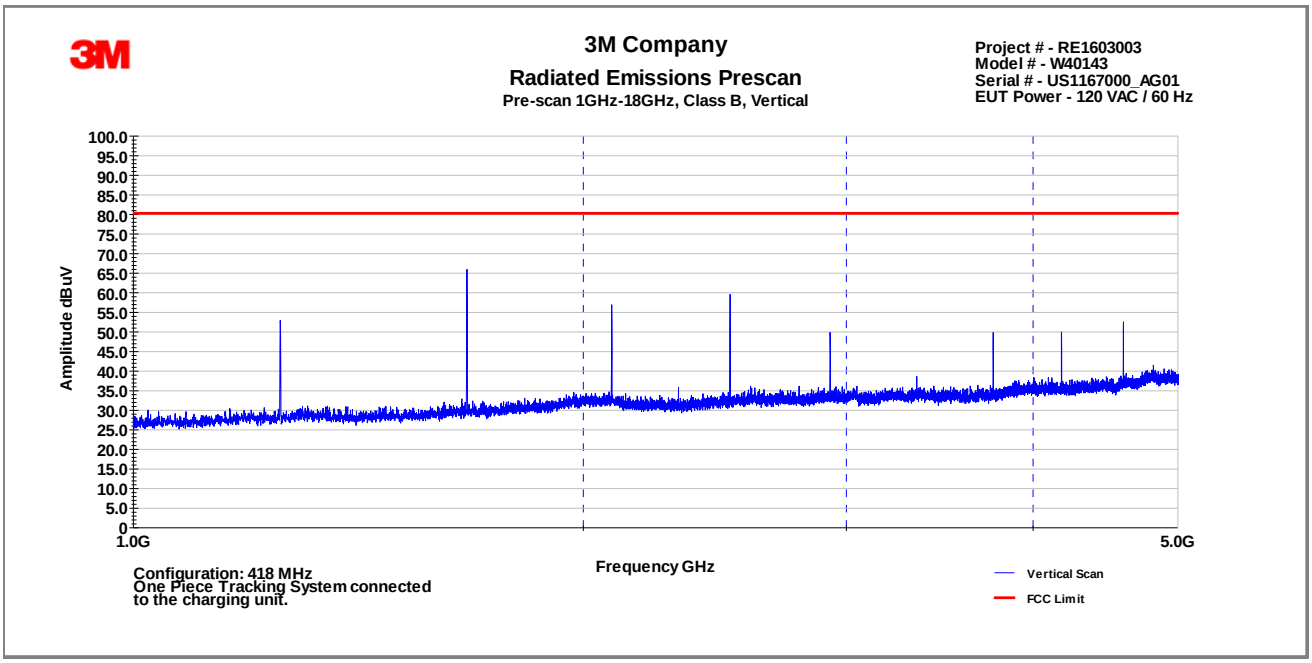
Frequency (MHz)	Pol.	Average Reading dBµV/m	Total CF dB	Net at 3 m * dBµV/m	Limit (dBµV/m)	Margin dB
68.414	V	17.7	9.4	2.5	60.28	-57.78
93.085	V	14.4	13.2	3	60.28	-57.28
99.361	V	13.7	14.5	3.7	60.28	-56.58
143.571	V	13.5	14.7	3.5	60.28	-56.78
253.994	V	15.9	16.7	8	60.28	-52.28
836.002	V	26.9	25.4	27.7	60.28	-32.58
Note:		Average readings include an additional -24.6dB duty cycle correction factor. **Transmitting mode 418MHz**, 15dBm Power Settings Total CF = Antenna Factor + Cable Factor - AMP Gain				

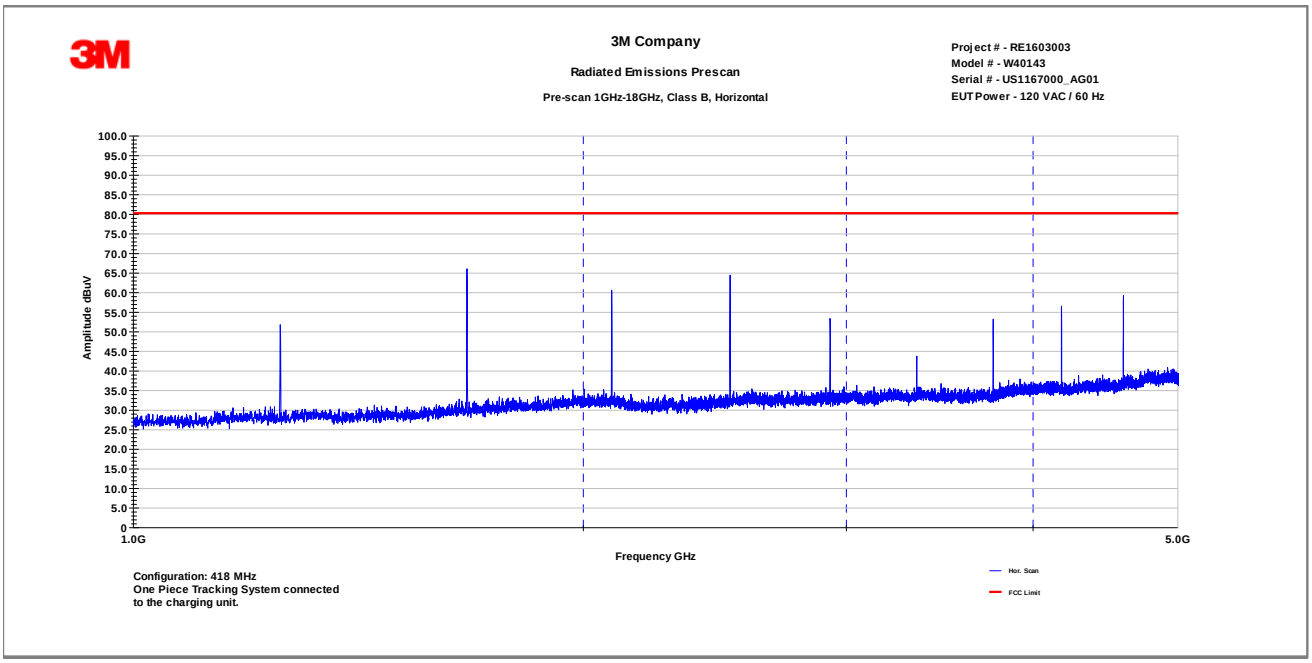

3M Company
Radiated Emissions Prescan
FCC Part 15, Class B, Vertical
Project # - RE1603003
Model # - W40143
Serial # - US1167000_AG01
EUT Power - 120 VAC / 60 Hz
Amplitude dBuV
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0
30.0M
100.0M
1.0G
Frequency MHz
Configuration: 418 MHz
One Piece Tracking System connected
to the charging unit.
Limit
Vert Scan


3M Company
Radiated Emissions Prescan
FCC Part 15, Class B, Horizontal
Project # - RE1603003
Model # - W40143
Serial # - US1167000_AG01
EUT Power - 120 VAC / 60 Hz
Amplitude dBuV
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0
30.0M
100.0M
1.0G
Frequency MHz
Configuration: 418 MHz
One Piece Tracking System connected
to the charging unit.
Limit
Horiz Scan

Pol.	Frequency (MHz)	Peak Reading dBµV/m	Total CF dB	Net at 3 m dBµV/m.	Limit dBµV/m	Margin dB	Comments
H	1253.90	70.0	-18.3	51.7	80.28	-28.6	
V	1253.90	71.2	-18.3	52.9	80.28	-27.4	
H	1672.00	82.2	-15.7	66.5	80.28	-13.8	
V	1672.00	82.7	-16.0	66.7	80.28	-13.6	
H	2090.0	73.8	-15.3	58.5	80.28	-21.8	
V	2090.0	71.0	-15.3	55.7	80.28	-24.6	
H	2507.0	77.8	-13.3	64.5	80.28	-15.8	
V	2507.0	72.9	-13.1	59.8	80.28	-20.5	
H	4597.0	66.5	-6.6	59.9	80.28	-20.4	
V	4597.0	60.8	-6.6	54.2	80.28	-26.1	
Note:		Transmitting mode 418MHz, 15dBm Power Settings Total CF = Antenna Factor + Cable Factor - AMP Gain					

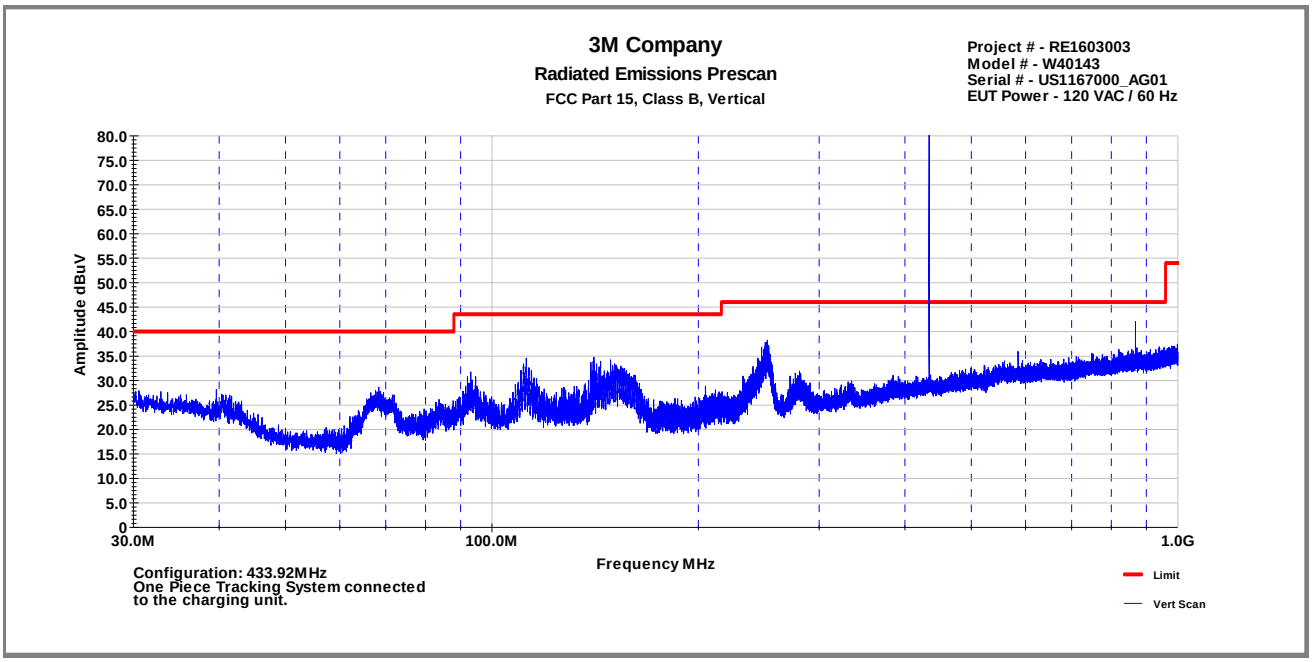
Pol.	Frequency (MHz)	Average Reading dBµV/m	Total CF dB	Net at 3 m * dBµV/m.	Limit dBµV/m	Margin dB	Comments
H	1253.9	70	-18.3	27.1	60.28	-33.18	
V	1253.9	71.2	-18.3	28.3	60.28	-31.98	
H	1672	82.2	-15.7	41.9	60.28	-18.38	
V	1672	82.7	-16	42.1	60.28	-18.18	
H	2090	73.8	-15.3	33.9	60.28	-26.38	
V	2090	71	-15.3	31.1	60.28	-29.18	
H	2507	77.8	-13.3	39.9	60.28	-20.38	
V	2507	72.9	-13.1	35.2	60.28	-25.08	
H	4597	66.5	-6.6	35.3	60.28	-24.98	
V	4597	60.8	-6.6	29.6	60.28	-30.68	
Note:		Average readings include an additional -24.6dB duty cycle correction factor. **Transmitting mode 418MHz**, 15dBm Power Settings Total CF = Antenna Factor + Cable Factor - AMP Gain					

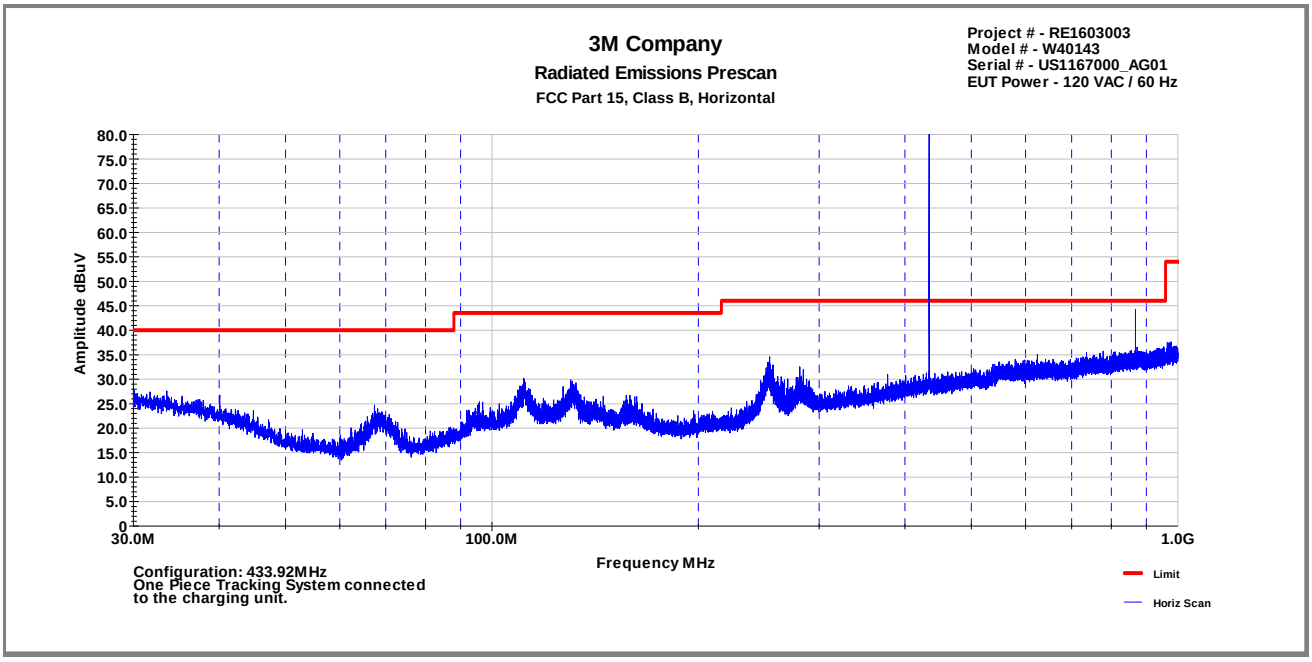

3M Company
Radiated Emissions Prescan
Pre-scan 1GHz-18GHz, Class B, Vertical
Project # - RE1603003
Model # - W40143
Serial # - US1167000_AG01
EUT Power - 120 VAC / 60 Hz
Amplitude dBuV
100.0
95.0
90.0
85.0
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0
1.0G
5.0G
Frequency GHz
Configuration: 418 MHz
One Piece Tracking System connected
to the charging unit.
Vertical Scan
FCC Limit


3M Company
Radiated Emissions Prescan
Pre-scan 1GHz-18GHz, Class B, Horizontal
Project # - RE1603003
Model # - W40143
Serial # - US1167000_AG01
EUT Power - 120 VAC / 60 Hz
Amplitude dBuV
100.0
95.0
90.0
85.0
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0
1.0G
5.0G
Frequency GHz
Configuration: 418 MHz
One Piece Tracking System connected
to the charging unit.
Hor. Scan
FCC Limit

Frequency (MHz)	Pol.	Peak Reading dBµV/m	Total CF dB	Net at 3 m dBµV/m	Limit (dBµV/m)	Margin dB
92.59	V	15.3	13.1	28.5	80.83	-52.33
112.41	V	10.3	15.7	26	80.83	-54.83
139.77	V	12.1	14.9	27	80.83	-53.83
147.56	V	12.4	14.4	26.8	80.83	-54.03
252.444	V	14.8	16.7	31.5	80.83	-54.03
867.816	V	18.7	25.6	44.4	80.83	-54.03
92.59	V	15.3	13.1	28.5	80.83	-52.33
Note:		**Transmitting mode 433.92, 15dBm Power Settings** Total CF = Antenna Factor + Cable Factor - AMP Gain				

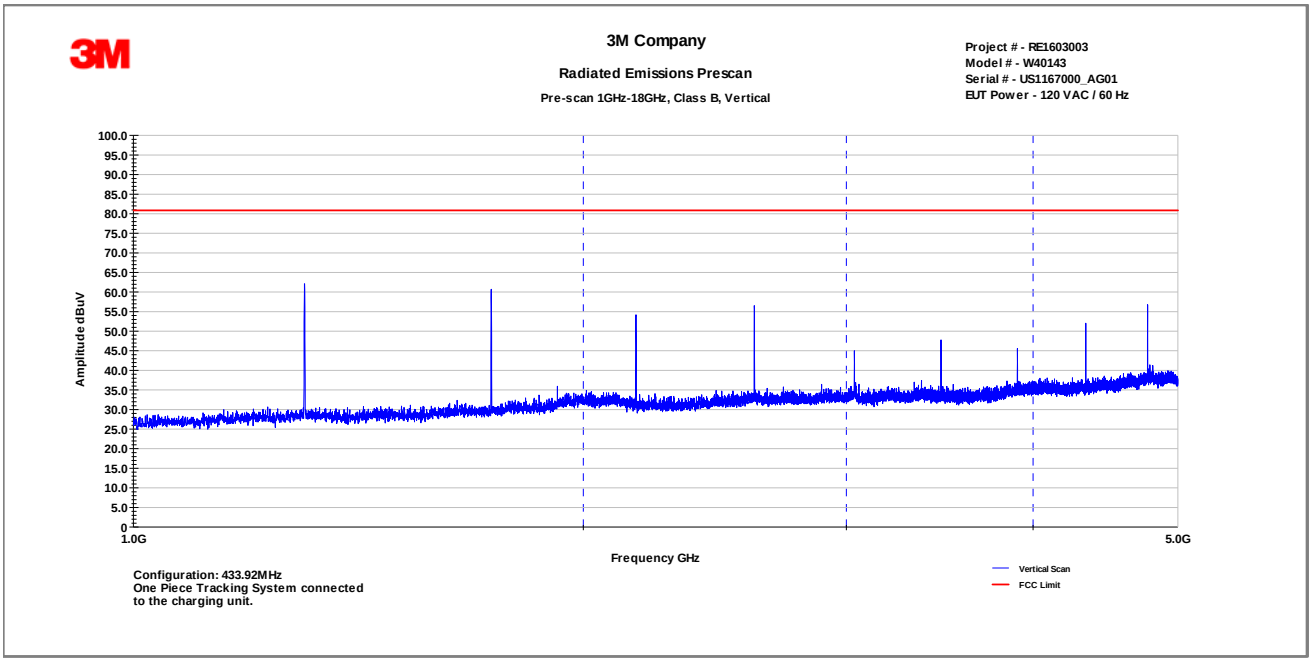
Frequency (MHz)	Pol.	Average Reading dBµV/m	Total CF dB	Net at 3 m * dBµV/m	Limit (dBµV/m)	Margin dB
92.59	V	15.3	13.1	3.9	60.83	-56.93
112.41	V	10.3	15.7	1.4	60.83	-59.43
139.77	V	12.1	14.9	2.4	60.83	-58.43
147.56	V	12.4	14.4	2.2	60.83	-58.63
252.444	V	14.8	16.7	6.9	60.83	-53.93
867.816	V	18.7	25.6	19.8	60.83	-41.03
Note:		Average readings include an additional -24.6dB duty cycle correction factor. **Transmitting mode 433.92MHz, 15dBm Power Settings** Total CF = Antenna Factor + Cable Factor - AMP Gain				

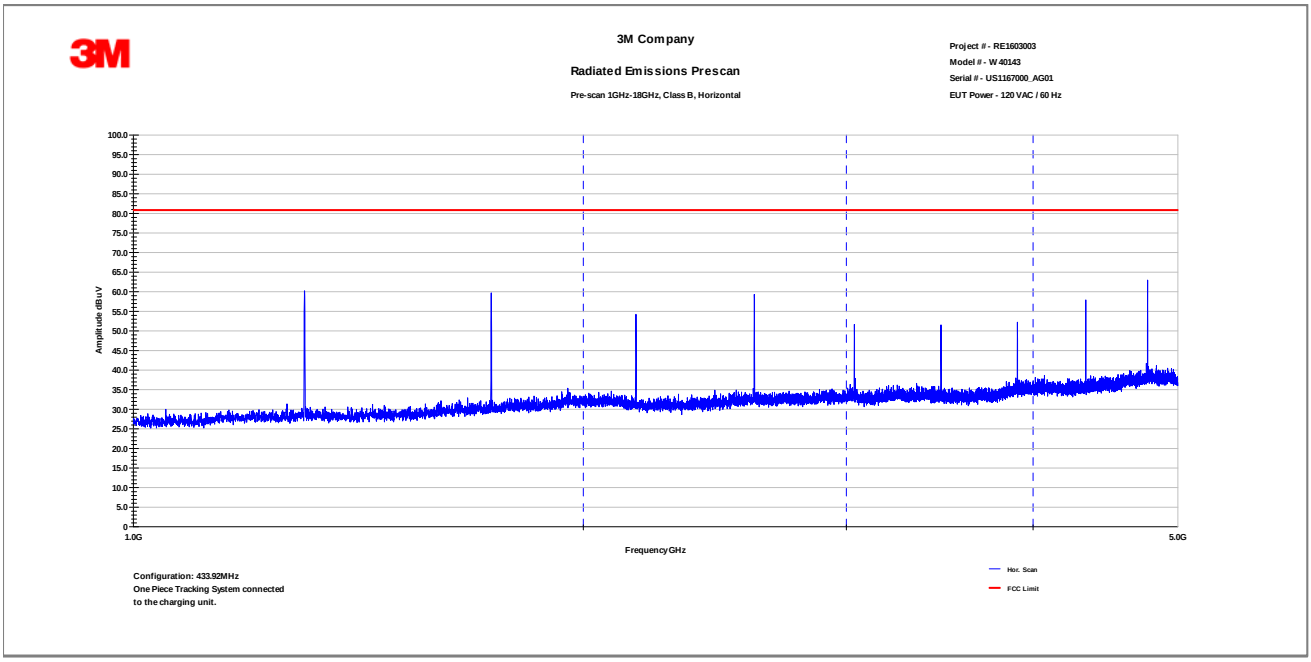

3M Company
Radiated Emissions Prescan
FCC Part 15, Class B, Vertical
Project # - RE1603003
Model # - W40143
Serial # - US1167000_AG01
EUT Power - 120 VAC / 60 Hz
Amplitude dBuV
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0
30.0M
100.0M
1.0G
Frequency MHz
Configuration: 433.92MHz
One Piece Tracking System connected
to the charging unit.
Limit
Vert Scan

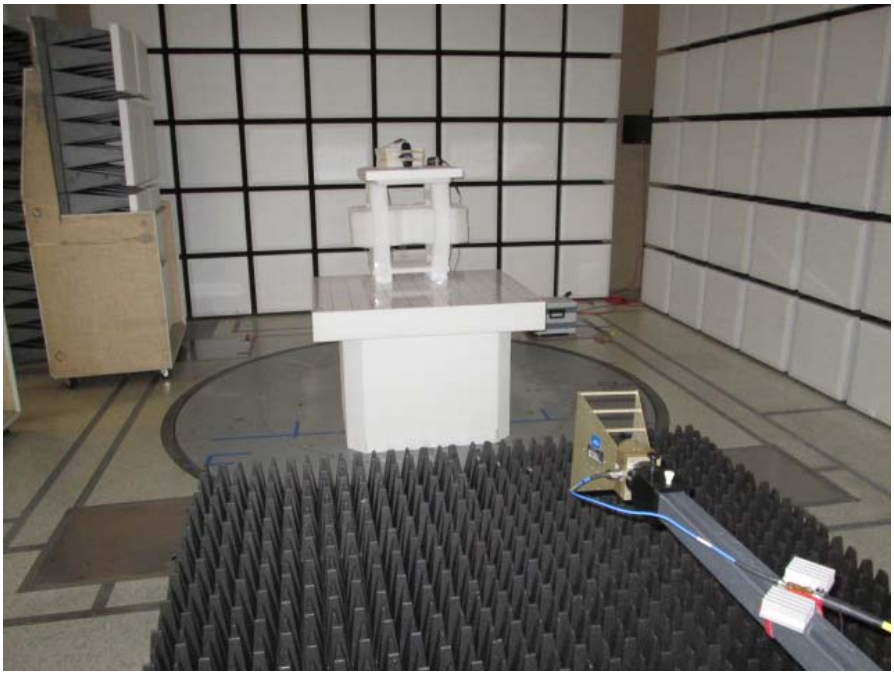

3M Company
Radiated Emissions Prescan
FCC Part 15, Class B, Horizontal
Project # - RE1603003
Model # - W40143
Serial # - US1167000_AG01
EUT Power - 120 VAC / 60 Hz
Amplitude dBuV
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0
30.0M
100.0M
1.0G
Frequency MHz
Configuration: 433.92MHz
One Piece Tracking System connected
to the charging unit.
Limit
Horiz Scan

Pol.	Frequency (MHz)	Peak Reading dBµV/m	Total CF dB	Net at 3 m dBµV/m.	Limit dBµV/m	Margin dB	Comments
V	1301.7	78.0	-17.6	60.4	80.83	-20.4	
H	1301.7	77.0	-17.4	59.6	80.83	-21.2	
V	1735.6	78.6	-15.6	63.0	80.83	-17.8	
H	1735.6	75.6	-16.2	59.4	80.83	-21.4	
V	2169.6	69.2	-14.5	54.7	80.83	-26.1	
H	2169.6	70.0	-14.6	55.4	80.83	-25.4	
V	2603.5	69.5	-12.0	57.5	80.83	-23.3	
H	2603.5	71.8	-12.0	59.8	80.83	-21.0	
V	4339.2	61.1	-7.6	53.5	80.83	-27.3	
H	4339.2	65.5	-7.6	57.9	80.83	-22.9	
V	4773.0	62.6	-5.2	57.4	80.83	-23.4	
H	4773.0	68.6	-5.2	63.4	80.83	-17.4	
Note:		**Transmitting mode 433.92MHz, 15dBm Power Settings** Total CF = Antenna Factor + Cable Factor - AMP Gain					

Pol.	Frequency (MHz)	Average Reading dBµV/m	Total CF dB	Net at 3 m * dBµV/m.	Limit dBµV/m	Margin dB	Comments
V	1301.7	78	-17.6	35.8	60.83	-25.03	
H	1301.7	77	-17.4	35	60.83	-25.83	
V	1735.6	78.6	-15.6	38.4	60.83	-22.43	
H	1735.6	75.6	-16.2	34.8	60.83	-26.03	
V	2169.6	69.2	-14.5	30.1	60.83	-30.73	
H	2169.6	70	-14.6	30.8	60.83	-30.03	
V	2603.5	69.5	-12	32.9	60.83	-27.93	
H	2603.5	71.8	-12	35.2	60.83	-25.63	
V	4339.2	61.1	-7.6	28.9	60.83	-31.93	
H	4339.2	65.5	-7.6	33.3	60.83	-27.53	
V	4773	62.6	-5.2	32.8	60.83	-28.03	
H	4773	68.6	-5.2	38.8	60.83	-22.03	
V	1301.7	78	-17.6	35.8	60.83	-25.03	
Note:		*Average readings include an additional -24.6dB duty cycle correction factor. **Transmitting mode 433.92MHz, 15dBm Power Settings** Total CF = Antenna Factor + Cable Factor - AMP Gain					


3M Company
Radiated Emissions Prescan
Pre-scan 1GHz-18GHz, Class B, Vertical
Project # - RE1603003
Model # - W40143
Serial # - US1167000_AG01
EUT Power - 120 VAC / 60 Hz
Amplitude dBuV
Frequency GHz
1.0G
5.0G
Configuration: 433.92MHz
One Piece Tracking System connected
to the charging unit.
Vertical Scan
FCC Limit


3M Company
Radiated Emissions Prescan
Pre-scan 1GHz-18GHz, Class B, Horizontal
Project # - RE1603003
Model # - W 40143
Serial # - US1167000_AG01
EUT Power - 120 VAC / 60 Hz
Amplitude dBuV
Frequency GHz
1.0G
5.0G
Configuration: 433.92MHz
One Piece Tracking System connected
to the charging unit.
Hor. Scan
FCC Limit



Test Set up Photos

5.0 Test Equipment

Test Equipment Used

Description	Manufacturer	Model	Identifier	Cal. Due	Check
Biconilog Antenna	Schaffner	CBL6112B	27491	10/2016	☒
Horn Antenna	AH Systems	SAS 571	1010	10/2016	☒
Loop Antenna	EMCO	ALR25M	1011	10/2016	☐
EMI Receiver	Rohde & Schwarz	ESIB 40	100235	10/2016	☐
EMI Receiver	Agilent	E4448A	1530975	10/2016	☒
Signal Analyzer	Agilent	N9000A	MY53031040	10/2016	☒
LISN	TESEQ	NNB51	1130	10/2016	☒
Harmonic/Flicker Source	Cal. Instruments	C4-5001iX	57162	10/2016	☐
Amplifier	AR	250W1000AM	14354	10/2016	☐
Amplifier	AR	25S1G4A	4003	10/2016	☐
Signal Generator	HP	8656A	2326A05125	10/2016	☐
Signal Generator	Agilent	E8257D	160895	10/2016	☐
Field Probe	AR	FL7006	25019	10/2016	☐
Field Monitor	AR	FM2000	14292	10/2016	☐
AC CDN	Schaffner	M316,	21937	10/2016	☐
AC CDN	Teseq	M016,	26131	10/2016	☐
ISN	Teseq	T4	25652	10/2016	☐
Current Injection Coil	A.H. Systems	ICP-200/521	149	10/2016	☐
RF Conducted System	TESEQ	NSG 4070-75	1141	10/2016	☐
ESD Generator	KeyTek	MZ-15/EC	609325	10/2016	☐
EFT/Surge Generator	ThermoFisher	EMC Pro Plus	1146	10/2016	☐
EMF Meter	NARDA	ELT400	1139	10/2016	☐
Absorbing Clamp	Rhode & Schwarz	MDS-21	1001	10/2016	☐
EMF Test Generator	FCC	F-1000-4-8-G	9940	10/2016	☐
AC Power System	Titan	MAC-03	6619921	10/2016	☐
EMC Software	ETS-Lindgren	TILE 7		10/2016	☒
Oscilloscope	Tektronix	DPO4104	1550	10/2016	☐

6.0 Report revision history

Revision Level	Date	Report Number	Notes
0	07/01/2016	RE1603003-1	Original Issue

Certificate of Conformity

3M EMC Laboratory

SEMS Global Regulatory Engineering
Building 76-01-01
St. Paul, MN 55144-1000, USA

MANUFACTURER'S NAME	**3M COMPANY**
NAME OF EQUIPMENT	**3M Electronic Monitor**
MODEL NUMBER(S)	**W40143**
TEST REPORT NUMBER	**RE1603003-1**
DATE OF ISSUE	**July 1, 2016**

Referring to the performance criteria and operating mode during the tests specified in this report the equipment complies with the essential requirements herein specified:

47 CFR Part 15 – Subpart C	**47 CFR, FCC Part 15.231**
Emissions	**47 CFR, FCC Parts 15.107 and 15.109**

Comments:

NVLAP®
NVLAP Lab Code 200033-0

Yuriy Litvinov

Yuriy Litvinov
Lead EMC Engineer