

Test Report # 3516 A

Equipment Under Test:	InTouch DX G2 w/ HID Prox
Requirement(s):	FCC 15.207 FCC 15.209 RSS-210 RSS-GEN
Test Date(s):	September 21, 2021 – October 13, 2021 December 1-2, 2021
Prepared for:	Kronos Incorporated (UKG) Attn: Jigney Shah 300 Chelmsford St Lowell, MA 01851

Report Issued by: Alec Krabbe, EMC Engineer

Signature: 

Date: 4/8/2022

Report Reviewed by: Adam Alger, Laboratory Manager

Signature: 

Date: 4/8/2022

Report Constructed by: Alec Krabbe, EMC Engineer

Signature: 

Date: 10/12/2021

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Laird Connectivity Test Services in Review

The Laird Connectivity, Inc. laboratory located at W66 N220 Commerce Court Cedarburg, Wisconsin, 53012 USA is recognized through the following organizations:



A2LA – American Association for Laboratory Accreditation

Accreditation based on ISO/IEC 17025:2017 with Electrical (EMC) Scope

A2LA Certificate Number: 1255.01

Scope of accreditation includes all test methods listed herein unless otherwise noted



Federal Communications Commission (FCC) – USA

Accredited Test Firm Registration Number: 953492

Recognition of two 3 meter Semi-Anechoic Chambers



Innovation, Science and Economic Development Canada

Accredited U.S. Identification Number: US0218

Recognition of two 3 meter Semi-Anechoic Chambers

Company: Kronos Incorporated (UKG)	Page 3 of 36	Name: InTouch DX G2 w/ HID Prox
Report: TR 3516 A		Model: 8610000-013
Quote: NBO-07-2021-003937		Serial: 00J2054856

1 TEST REPORT SUMMARY

During **September 21, 2021 – October 13, 2021, & 1-2 December 2021** the Equipment Under Test (EUT), **InTouch DX G2 w/ HID Prox**, as provided by **Kronos Incorporated (UKG)** was tested to the following requirements:

FCC & ISED Canada

Requirements	Description	Specification	Method	Compliant
FCC: 15.207 IC: RSS-210	AC Power Line Conducted Emissions RFID	0.15 - 30 MHz	ANSI C63.10	Yes
FCC: 15.209 IC: RSS-210	Intentional Radiated Emissions RFID	9 kHz – 30 MHz 30 – 1000 MHz	ANSI C63.10	Yes
FCC: 15.209 IC: RSS-210	Simultaneous Transmissions RFID, WLAN, BT	9-150 kHz 0.15-30 MHz 30-1000 MHz 1-25 GHz	ANSI C63.10	Yes
FCC: 2.1049 IC: RSS-GEN (6.7)	Occupied Bandwidth RFID	Reported	ANSI C63.10	Reported

Notice:

The results relate only to the item tested as configured and described in this report. Any additional configurations, modes of operation, or modifications made to the equipment under test after the specified test date(s) are at the decision of the client and may not apply to the data seen in this test report.

The decision rule for Pass / Fail assessment to the specification or standard listed in this test report has been agreed upon by the client and laboratory to be as follows:

Measurement Type	Rule
Emissions – Amplitude	1 dB below specified limit
Emissions – Frequency	1% less than the specification
Immunity	Tested at specified level

2 CLIENT INFORMATION

Company Name	Kronos Incorporated (UKG)
Contact Person	Jigney Shah
Address	300 Chelmsford St Lowell, MA 01851

2.1 Equipment Under Test (EUT) Information

Product Name	InTouch DX G2 w/ HID Prox
Model Number	8610000-013
Serial Number	00J2054856
IEEE Address	004058116C0B1
IC ID	1416A-8610U003
FCC ID	P5W-8610U003

2.2 Product Description

The InTouch DX G2 timeclock is a data collection device that communicates with the UKG host applications. The timeclock collects information that employees enter using a badge reader, biometric device, or keypad. The host application software collects data from the timeclocks to track and process labor-related data, generate management reports, and transfer information to the payroll service.

2.3 Modifications Incorporated for Compliance

None noted at time of test

2.4 Deviations and Exclusions from Test Specifications

No test modes provided; device tested in its operational setup.

2.5 Additional Information

Device is powered by 120 VAC and has an ethernet cable protruding the back of the enclosure for LAN operation. All programing is done through end user, android interface. No additional programming control/test modes available at time of testing.

Simultaneous transmission testing done with EUT connected to WLAN via channel 6 (2437 MHz) and BT connected to headphones in hopping mode.

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3 REFERENCES

Publication	Edition	Date	AMD 1	AMD 2
FCC 2.1049	-	2021-10	-	-
FCC 15.207	-	2021-10	-	-
FCC 15.209	-	2021-10	-	-
ANSI C63.10	-	2013-06	-	-
RSS-GEN	5	2018-04	2019-03	2021-02
RSS-210	10	2019-12	2020-04	-

4 UNCERTAINTY SUMMARY

Using the guidance of the following publications the calculated measurement uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level, using a coverage factor of $k = 2$.

References	Version / Date
CISPR 16-4-1	Ed. 2 (2009-02)
CISPR 16-4-2	Ed. 2 (2011-06)
CISPR 32	Ed. 1 (2012-01)
ANSI C63.23	2012
A2LA P103	February 4, 2016
A2LA P103c	August 10, 2015
ETSI TR 100-028	V1.3.1 (2001-03)

Measurement Type	Configuration	Uncertainty $\pm$
Radiated Emissions	Biconical Antenna	5.0 dB
Radiated Emissions	Log Periodic Antenna	5.3 dB
Radiated Emissions	Horn Antenna	4.7 dB
AC Line Conducted Emissions	Artificial Mains Network	3.4 dB
Telecom Conducted Emissions	Asymmetric Artificial Network	4.9 dB
Disturbance Power Emissions	Absorbing Clamp	4.1 dB
Radiated Immunity	3 Volts/meter	2.2 dB
Conducted Immunity	CDN/EM/BCI	2.4/3.5/3.4 dB
EFT Burst/Surge	Peak pulse voltage	164 volts
ESD Immunity	15 kV level	1377 Volts

Parameter	ETSI U.C. $\pm$	U.C. $\pm$
Radio Frequency, from F0	1×10^{-7}	0.55×10^{-7}
Occupied Channel Bandwidth	5 %	2 %
RF conducted Power (Power Meter)	1.5 dB	1.2 dB
RF conducted emissions (Spectrum Analyzer)	3.0 dB	1.7 dB
All emissions, radiated	6.0 dB	5.3 dB
Temperature	1° C	0.65° C
Humidity	5 %	2.9 %
Supply voltages	3 %	1 %

5 TEST DATA

5.1 Radiated Emissions

Description of Measurement	The frequency spectrum is investigated for intentional and / or unintentional signals emanating from the EUT by use of a standardized test site and measurement antenna. The antenna, cable, pre-amp, and other necessary measurement system correction factors are loaded onto the EMI receiver / spectrum analyzer when the measurements are performed allowing the data to be gathered and reported as corrected values. The maximum emissions from the EUT are determined by turn-table azimuth rotation (360°) and scanning of the measurement antenna. Maximized levels are noted at degree values of azimuth, measurement antenna height, and measurement antenna polarity.
Example Calculations	Measurement (dBμV) + Cable factor (dB) + Other (dB) + Antenna Factor (dB/m) = Corrected Reading (dBμV/m) Margin (dB) = Limit (dBμV/m) - Corrected Reading (dBμV/m) Example at 4000 MHz: Reading = 40 dBμV + 3.4 dB + 0.9 dB + 6.5 dB/m = 50.8 dBμV/m Average Limit = 20 log (500) = 54 dBμV/m Margin = 54 dBμV/m - 50.8 dBμV/m = 3.2 dB

Block Diagram



5.1.1 RFID: 9 kHz – 30 MHz

Operator	Jon Dille	QA	Alec Krabbe
Temperature	23.4 °C	R.H. %	55.0 %
Test Date	9/29/2021	Location	Chamber 3
Requirement	FCC 15.209 RSS-210, RSS-GEN	Method	ANSI C63.10

FCC 15.209 Limits:

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m) (d_{limit})	Field Strength (dBμV/m) @ measurement distance
0.009-0.490	$2400/F(\text{kHz})^1$	300^3	Use F (kHz) 2
0.490-1.705	$24000/F(\text{kHz})^1$	30^3	Use F (kHz) 2
1.705-30	30	30^3	29.5

Note 1: F = measured frequency.

Note 2: Eq. 1 used to convert Field Strength (FS) to limit in dBμV/m.

Note 3: Conversion of measurement distance made using a combination of Eq. 2, Eq. 3, and Eq. 4.

ISED Limits:

Frequency (MHz)	Magnetic Field Strength (H-Field) (μA/m)	Measurement Distance (m)
0.009-0.490	$6.37/F(\text{kHz})$	300
0.490-1.705	$6.37/F(\text{kHz})$	30
1.705-30	0.08	30

Test Parameters

Frequency	9 kHz – 30 MHz	Distance	3 m ($d_{measure}$)
Detector(s)	Quasi-Peak, Average	Table height	80 cm
RBW	200 Hz, 9 kHz	VBW	2 kHz, 90 kHz
Example Calculations	Eq. 1 $d\mu V/m$ field strength conversion: $20 * \log \left(FS \left(\frac{\mu V}{m} \right) \right)$ Eq. 2 $d_{near\ field} = \frac{\lambda}{2\pi} distance = 47.77 / f_{MHz}$ If $d_{measure} < \frac{\lambda}{2\pi}$ and $d_{limit} > \frac{\lambda}{2\pi}$, the measurement shall be extrapolated using Eq. 3 Eq. 3 $FS_{limit} = FS - 40 * \log \left(\frac{d_{near\ field}}{d_{measure}} \right) - 20 * \log \left(\frac{d_{limit}}{d_{near\ field}} \right)$ If $d_{measure} \leq \frac{\lambda}{2\pi}$ and $d_{limit} \leq \frac{\lambda}{2\pi}$, the measurement shall be extrapolated using Eq. 4 Eq. 4 $FS_{limit} = FS - 40 * \log \left(\frac{d_{limit}}{d_{measure}} \right)$ Data Table: Peak Margin = Peak Limit – Corrected Peak Average Margin = Average Limit – Corrected Peak Common free space conversion: $dBuA/m = dBuV/m - 51.5$		

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960006	Antenna - Active Loop	EMCO	6502	9205-2753	8/26/2021	8/26/2023	Active Calibration
AA 960206	Antenna - Loop	A.H. Systems, Inc.	SAS-565-H	2758	9/3/2021	9/3/2023	Active Calibration
EE 960085	Analyzer - EMI Receiver	Agilent	N9038A	MY51210148	4/20/2021	4/20/2022	Active Calibration
LSC-300	Cable	Chamber 3 Emissions	-	-	4/15/2021	4/15/2022	Active Verification

EUT Parameters

Input Power	120 VAC / 60 Hz	Mode	Operational Mode
EUT	InTouch DX G2 w/ HID Prox	EUT	RFID Tx

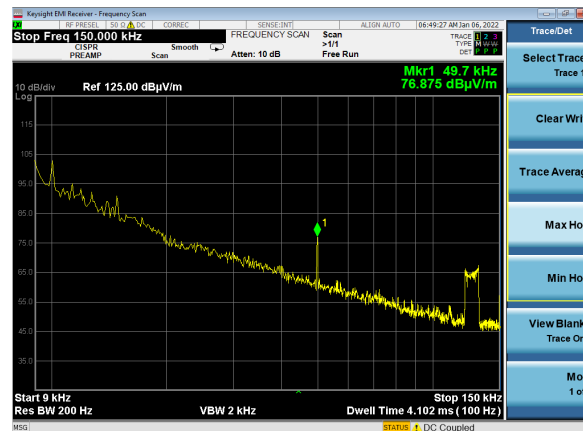
FCC Table

Frequency (MHz)	Antenna Polarity	Height (cm)	Azimuth (degree)	Peak Reading at 3m (dBμV/m)	Distance Correction to Peak Reading	Corrected Peak	Average Limit @ Limit Distance (dBμV/m)	Average Margin (dB)	Peak Limit @ Limit Distance (dBμV/m)	Peak Margin (dB)
0.1257	Parallel	100	165	86.0	-80	6.0	25.6	19.6	45.6	39.6
0.1257	Perpendicular	100	91	83.9	-80	3.9	25.6	21.7	45.6	41.7
0.1257	Skew	100	173	79.7	-80	-0.3	25.6	25.9	45.6	45.9

ISED Table

Frequency (MHz)	Antenna Polarity	Height (cm)	Azimuth (degree)	Peak Reading at 3m (dBμV/m)	Distance Correction to Peak Reading	H-Field Converted Reading (dBμA/m)	Average Limit @ Limit Distance (dBμA/m)	Average Margin (dB)	Peak Limit @ Limit Distance (dBμA/m)	Peak Margin (dB)
0.1257	Parallel	100	165	86.0	-80	-45.5	-25.9	19.6	-5.9	39.6
0.1257	Perpendicular	100	91	83.9	-80	-47.6	-25.9	21.7	-5.9	41.7
0.1257	Skew	100	173	79.7	-80	-51.8	-25.9	25.9	-5.9	45.9

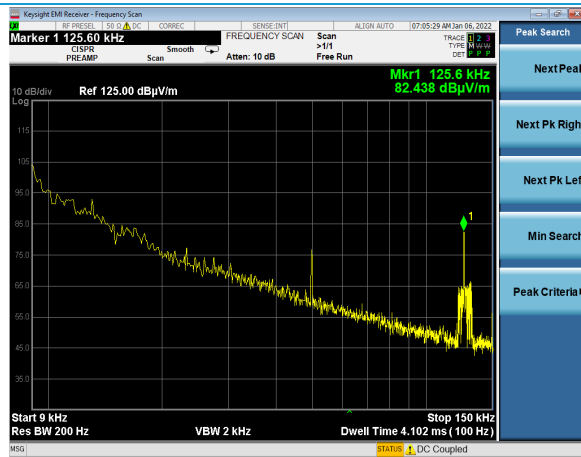
Plot: Baseline Noise Floor



9 – 150 kHz | Emissions present are ambient

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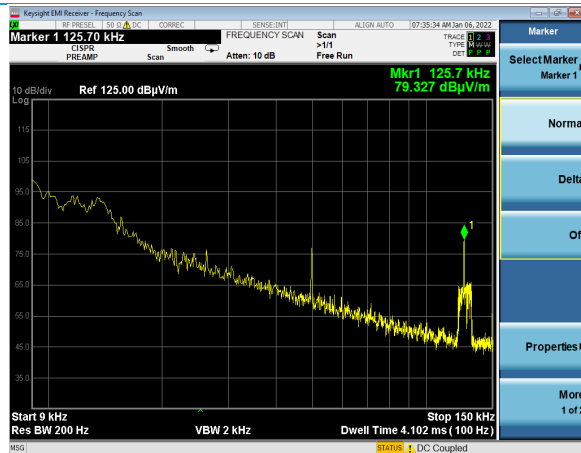
Plots



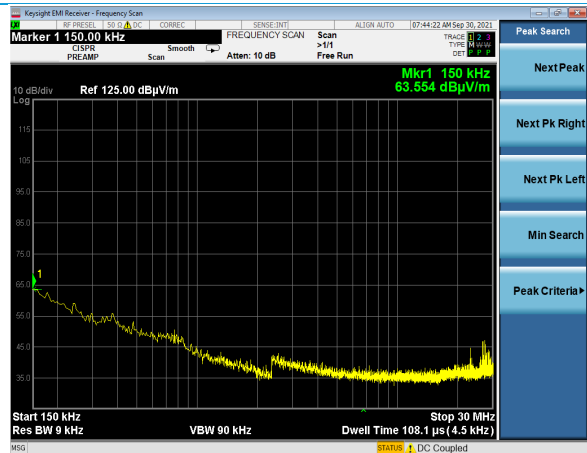
Parallel: 9 – 150 kHz



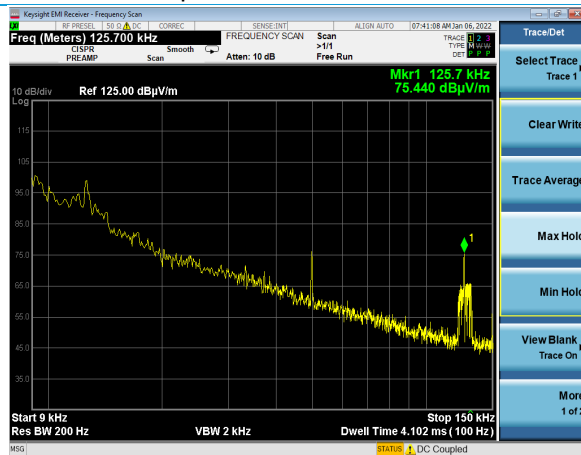
Parallel: 0.15 – 30 MHz



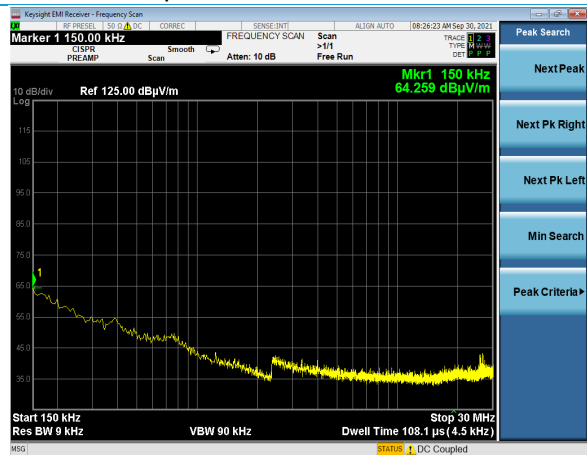
Perpendicular: 9 – 150 kHz



Perpendicular: 0.15 – 30 MHz



Skew: 9 – 150 kHz



Skew: 0.15 – 30 MHz

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5.1.2 RFID: 30 – 1000 MHz

Operator	Jon Dille	QA	Alec Krabbe
Temperature	23.0 °C	R.H. %	47.2 %
Test Date	9/22/2021	Location	Chamber 3
Requirement	FCC 15.209 RSS-210, RSS-GEN	Method	ANSI C63.10

Limits:

Frequency (MHz)	FCC 15.209	FCC 15.109 Class A
	Field Strength (dBμV/m)	
30 - 88	40	49.5
88 – 216	43.5	54
216 – 960	46	57
> 960	54	60

Test Parameters

Frequency	30 – 1000 MHz	Distance	3 m
Detector(s)	Quasi-Peak	Table height	80 cm
RBW	120 kHz	VBW	1.2 MHz
Notes	Emissions determined to not be a product of the transmitter. FCC 15.109 Class A limits applied to device.		

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960150	Antenna - Biconical	ETS Lindgren	3110B	0003-3346	10/7/2021	10/7/2022	Active Calibration
AA 960163	Antenna - Log Periodic	A.H. Systems, Inc.	SAS-512-2	500	7/29/2021	7/29/2022	Active Calibration
EE 960085	Analyzer - EMI Receiver	Agilent	N9038A	MY51210148	4/20/2021	4/20/2022	Active Calibration
LSC-300	Cable	Chamber 3 Emissions	-	-	4/15/2021	4/15/2022	Active Verification

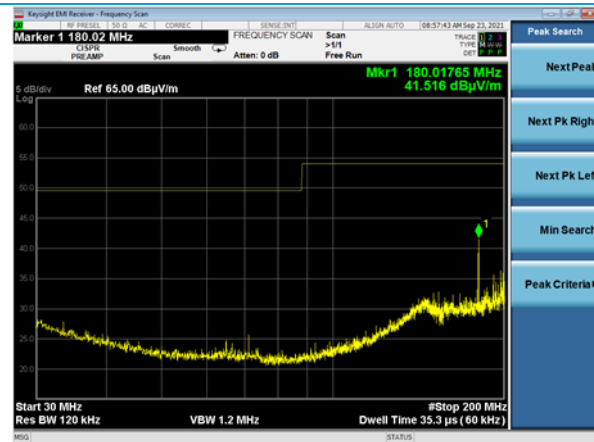
EUT Parameters

Input Power	120 VAC / 60 Hz	Mode	Operational Mode
EUT	InTouch DX G2 w/ HID Prox	EUT	Router connected
Notes	Continuous ping run to show device maintained connection to router via ethernet cable.		

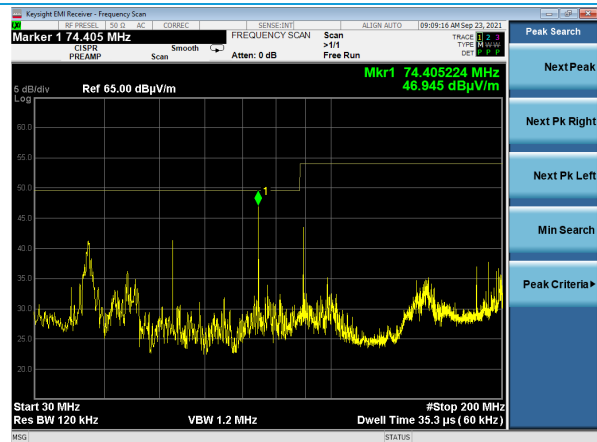
Table

Frequency (MHz)	Antenna Polarity	Height (cm)	Azimuth (degree)	Quasi-Peak Reading (dBμV/m)	FCC 15.109 Class A		FCC 15.209	
					Quasi-Peak Limit	Quasi-Peak Margin	Quasi-Peak Limit	Quasi-Peak Margin
37.4	Vertical	100	0	39.0	49.5	10.5	40.0	1.0
73.2	Vertical	100	160	35.6	49.5	13.9	40.0	4.4
180.0	Horizontal	100	203	39.6	54.0	14.4	43.5	3.9
800.0	Vertical	100	103	39.9	57.0	17.1	46.0	6.1
960.0	Vertical	160	29	51.2	57.0	5.8	54.0	2.8

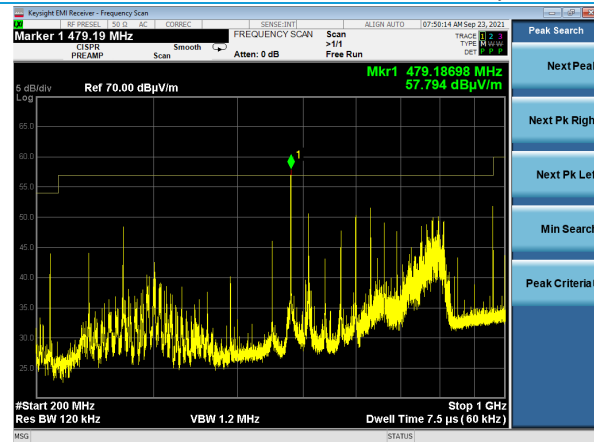
Plots



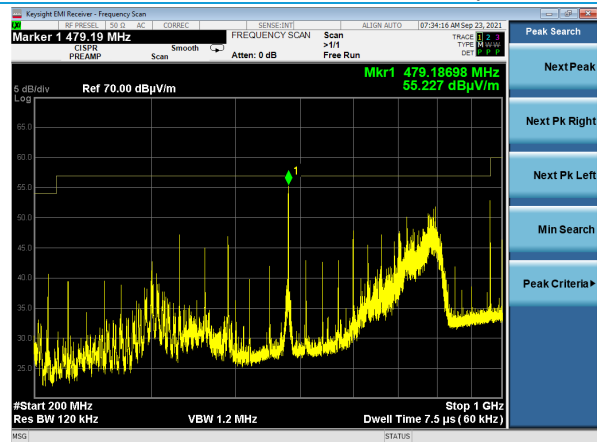
30 – 200 MHz: Horizontal Polarity



30 - 200 MHz: Vertical Polarity



200 – 1000 MHz: Horizontal Polarity



200 – 1000 MHz: Vertical Polarity

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5.1.3 Simultaneous Tx: 9 kHz-30 MHz

Operator	Jon Dille	QA	Alec Krabbe
Temperature	23.9 °C	R.H. %	52.0 %
Test Date	10/5/2021	Location	Chamber 3
Requirement	FCC: 15.209 IC: RSS-210	Method	ANSI C63.10

FCC 15.209 Limits

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m) (d_{limit})	Field Strength (dBμV/m) @ measurement distance
0.009-0.490	$2400/F(\text{kHz})^1$	300^3	Use F (kHz) ²
0.490-1.705	$24000/F(\text{kHz})^1$	30^3	Use F (kHz) ²
1.705-30	30	30^3	29.5

Note 1: F = measured frequency.

Note 2: Eq. 1 used to convert Field Strength (FS) to limit in dBμV/m.

Note 3: Conversion of measurement distance made using a combination of Eq. 2, Eq. 3, and Eq. 4.

Test Parameters

Frequency	9 kHz-30 MHz	Distance	3 m
Detector(s)	Average	Table height	80 cm
RBW	200 Hz 9 kHz	VBW	2 kHz 90 kHz
Example Calculations	Eq. 1 dBμV/m field strength conversion: $20 * \log \left(FS \left(\frac{\mu V}{m} \right) \right)$ Eq. 2 $d_{near\ field} = \frac{\lambda}{2\pi} distance = 47.77 / f_{MHz}$ If $d_{measure} < \frac{\lambda}{2\pi}$ and $d_{limit} > \frac{\lambda}{2\pi}$, the measurement shall be extrapolated using Eq. 3 Eq. 3 $FS_{limit} = FS - 40 * \log \left(\frac{d_{near\ field}}{d_{measure}} \right) - 20 * \log \left(\frac{d_{limit}}{d_{near\ field}} \right)$ If $d_{measure} \leq \frac{\lambda}{2\pi}$ and $d_{limit} \leq \frac{\lambda}{2\pi}$, the measurement shall be extrapolated using Eq. 4 Eq. 4 $FS_{limit} = FS - 40 * \log \left(\frac{d_{limit}}{d_{measure}} \right)$		

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960006	Antenna - Active Loop	EMCO	6502	9205-2753	8/26/2021	8/26/2023	Active Calibration
AA 960206	Antenna - Loop	A.H. Systems, Inc.	SAS-565-H	2758	9/3/2021	9/3/2023	Active Calibration
EE 960085	Analyzer - EMI Receiver	Agilent	N9038A	MY51210148	4/20/2021	4/20/2022	Active Calibration
LSC-300	Cable	Chamber 3 Emissions	-	-	4/15/2021	4/15/2022	Active Verification

EUT Parameters

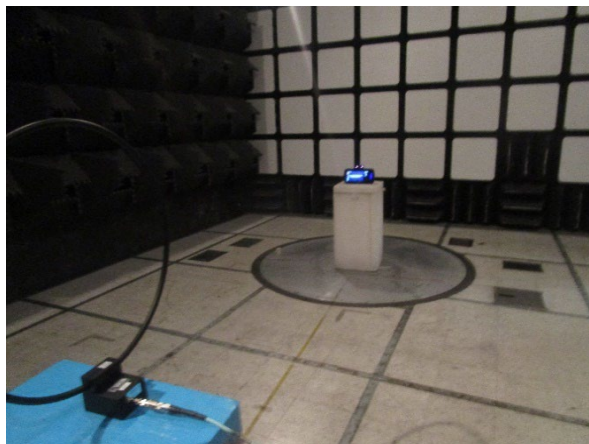
Input Power	120 VAC / 60 Hz	Mode	WLAN connected to router: Channel 6 (2437 MHz) BT connected to wireless headphones (Hopping)
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Setup Photos





Antenna: Parallel



Antenna: Perpendicular



Antenna: Skew

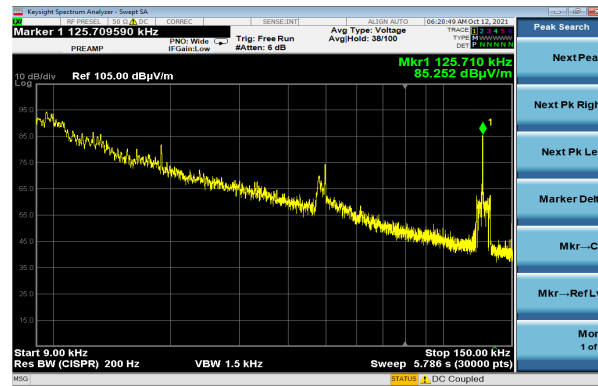
Table

Frequency (MHz)	Antenna Polarity	Height (cm)	Azimuth (degree)	Peak Reading @ 3m (dBμV/m)	Correction to Peak Reading (dBμV/m)	Corrected Peak (dBμV/m)	Average Limit @ Limit Distance (dBμV/m)	Margin (dB)
0.126	Parallel	100	0	85.3	-80.0	5.3	25.6	20.3
0.126	Perp.	100	0	82.5	-80.0	2.5	25.6	23.1
0.126	Skew	100	0	72.9	-80.0	-7.1	25.6	32.7
0.150	Parallel	100	0	69.1	-80.0	-10.9	24.1	35.0
0.150	Perp.	100	0	67.7	-80.0	-12.3	24.1	36.4
0.152	Skew	100	0	68.5	-80.0	-11.5	24.0	35.5

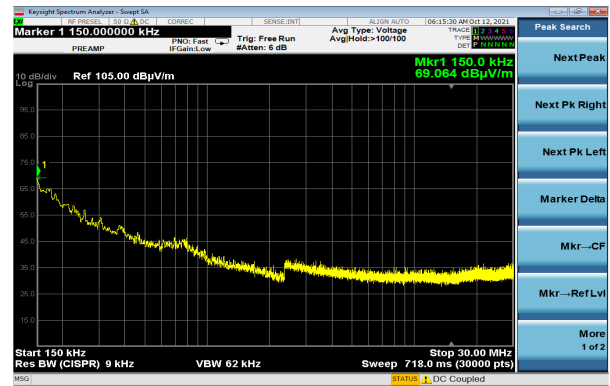
Note: Peak measurements are observed from plots and compared to the Average limits set by the requirement.

Plots

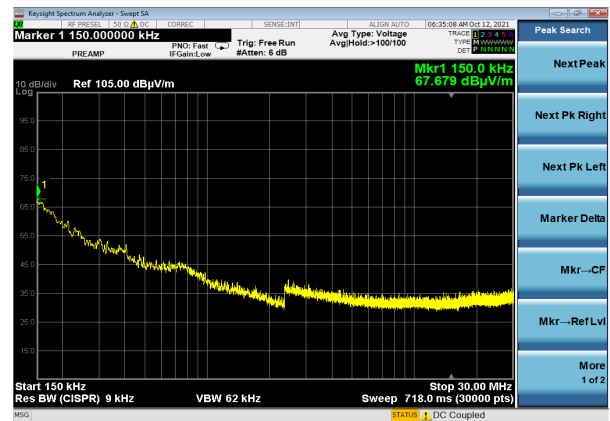
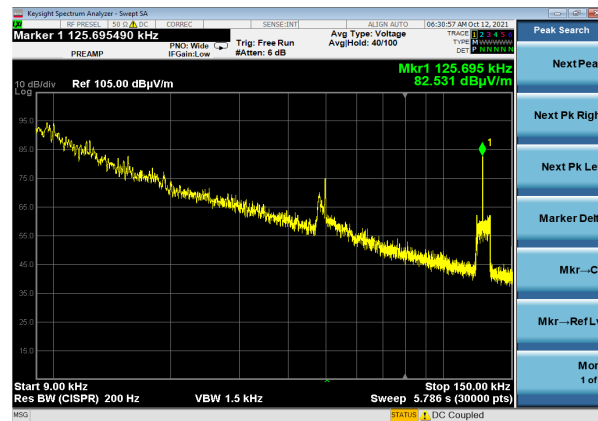
9-150 kHz



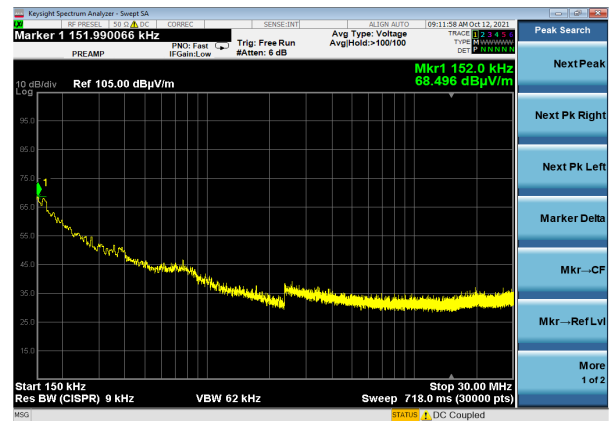
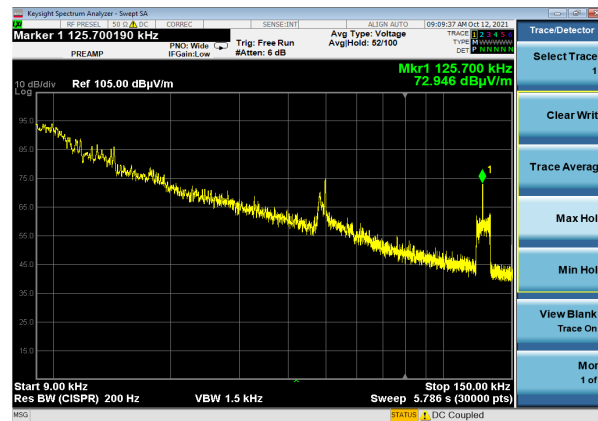
0.15-30 MHz



Antenna: Parallel



Antenna: Perpendicular



Antenna: Skew

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5.1.4 Simultaneous Tx: 30-1000 MHz

Operator	Jon Dille	QA	Alec Krabbe
Temperature	22.8 °C	R.H. %	33.3 %
Test Date	12/2/2021	Location	Chamber 3
Requirement	FCC: 15.209 IC: RSS-210	Method	ANSI C63.10

FCC 15.209 Limits

Frequency (MHz)	Quasi-Peak (dBμV/m)
30-88	40.0
88-216	43.5
216-960	46.0
960-1000	54.0

Test Parameters

Frequency	30-200 MHz 200-1000 MHz	Distance	3 m
Detector(s)	Quasi-Peak	Table height	150 cm
RBW	1 MHz	VBW	3 MHz (Peak)

Instrumentation

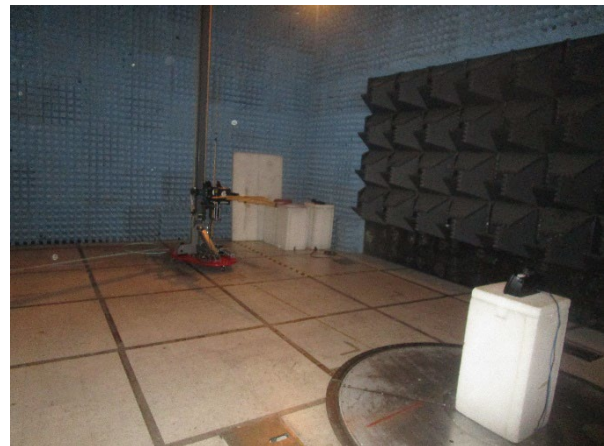
Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960150	Antenna - Biconical	ETS Lindgren	3110B	0003-3346	10/7/2021	10/7/2022	Active Calibration
AA 960163	Antenna - Log Periodic	A.H. Systems, Inc.	SAS-512-2	500	7/29/2021	7/29/2022	Active Calibration
EE 960085	Analyzer - EMI Receiver	Agilent	N9038A	MY51210148	4/20/2021	4/20/2022	Active Calibration
LSC-300	Cable	Chamber 3 Emissions	-	-	4/15/2021	4/15/2022	Active Verification

EUT Parameters

Input Power	120 VAC / 60 Hz	Mode	WLAN connected to router: Channel 6 (2437 MHz) BT connected to wireless headphones (Hopping)
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Company: Kronos Incorporated (UKG)	Page 20 of 36	Name: InTouch DX G2 w/ HID Prox
Report: TR 3516 A		Model: 8610000-013
Quote: NBO-07-2021-003937		Serial: 00J2054856

Setup Photos



Table

Frequency (MHz)	Antenna Polarity	Height (cm)	Azimuth (degree)	Quasi-Peak Reading (dB μ V/m)	Quasi-Peak Limit (dB μ V/m)	Quasi-Peak Margin (dB)
38.4	Horizontal	100	0	20.7	40.0	19.3
120.0	Vertical	100	0	29.8	43.5	13.7
153.7	Horizontal	113	135	29.6	43.5	13.9
298.8*	Horizontal	100	239	33.7	46.0	12.3
304.9*	Vertical	100	0	24.4	46.0	21.6
690.0*	Horizontal	100	0	44.8	46.0	1.2

Note: Not a function of the transmitter.

Plots

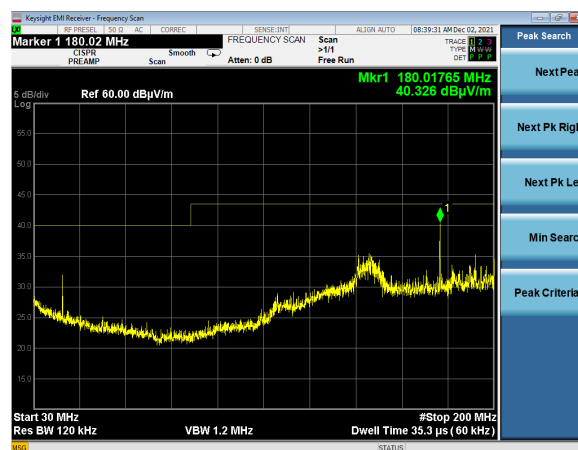
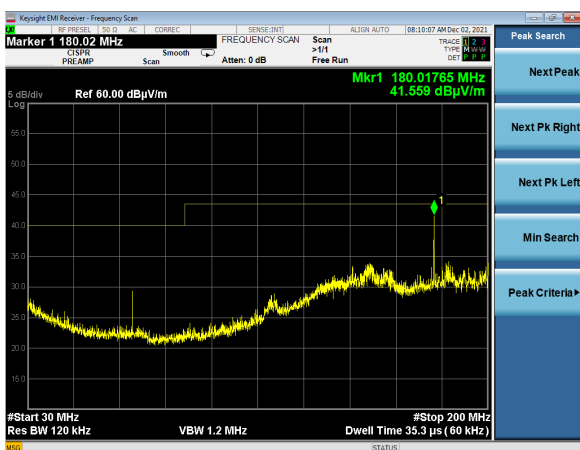
RFID

RFID | WLAN | BT

30-200 MHz



Antenna: Vertical



Antenna: Horizontal

Company: Kronos Incorporated (UKG)

Report: TR 3516 A

Quote: NBO-07-2021-003937

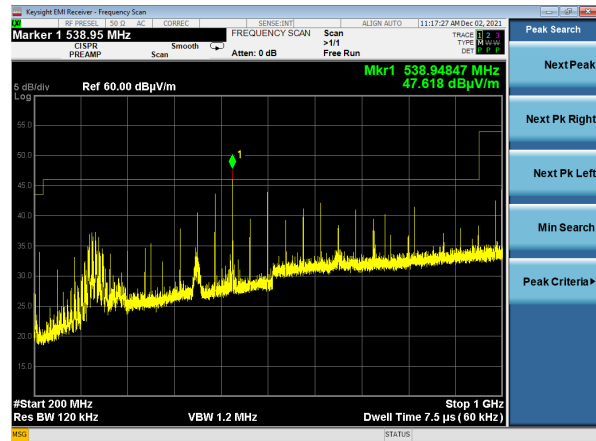
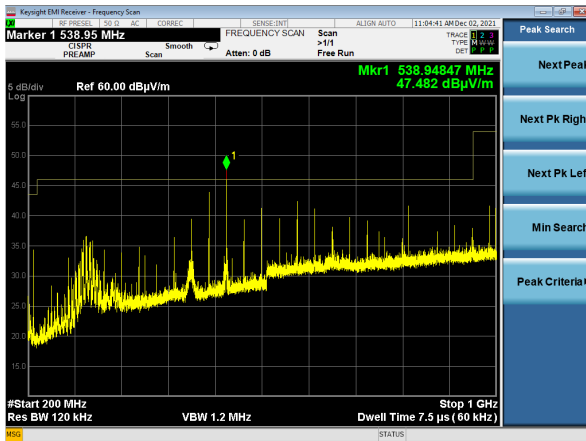
Page 23 of 36

Name: InTouch DX G2 w/ HID Prox

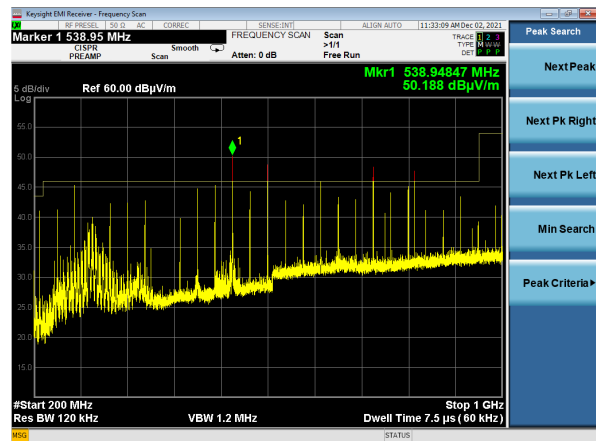
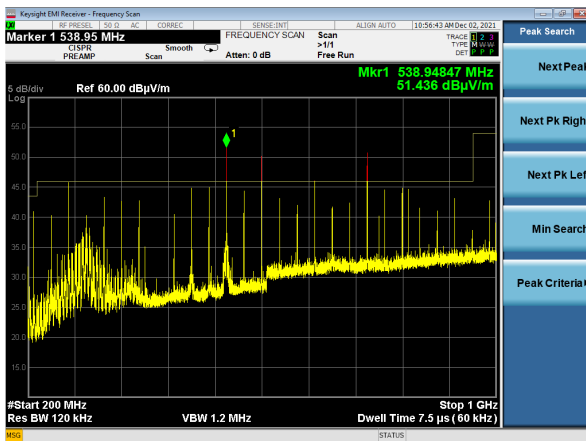
Model: 8610000-013

Serial: 00J2054856

200-1000 MHz



Antenna: Vertical



Antenna: Horizontal

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Report: TR 3516 A		Model: 8610000-013
Quote: NBO-07-2021-003937		Serial: 00J2054856

5.1.5 Simultaneous Tx: 1-2.39 & 2.4835-25 GHz

Operator	Jon Dille Braden Smith	QA	Alec Krabbe Ivan Alvarez
Temperature	23.9 °C	R.H. %	52.0 %
Test Date	12/1/2021	Location	Chamber 3
Requirement	FCC: 15.209 IC: RSS-210	Method	ANSI C63.10

FCC 15.209 Limits

Frequency (MHz)	Average (dBμV/m)	Peak (dBμV/m)
>1000	54.0	74.0

Test Parameters

Frequency	1-2.39 GHz 2.4835- 4GHz 4-25 GHz	Distance	3 m
Detector(s)	Average Peak	Table height	150 cm
RBW	1 MHz	VBW	3 MHz

Instrumentation

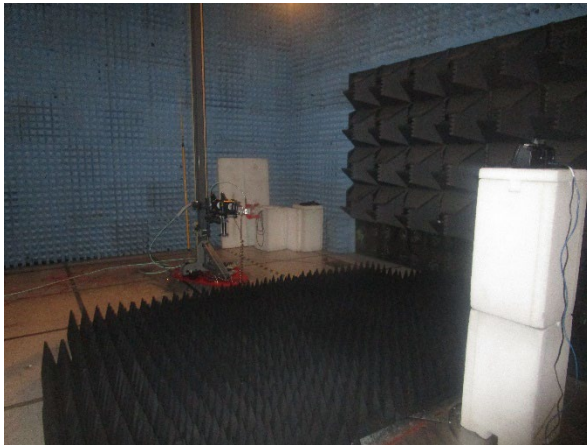
Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960153	Filter - High Pass 2.4 GHz	KWM	HPF-L-14186	7272-04	4/21/2021	4/21/2022	Active Calibration
AA 960158	Antenna - Double Ridge Horn	ETS Lindgren	3117	109300	9/27/2021	9/27/2022	Active Calibration
AA 960171	Cable	A.H. Systems, Inc.	SAC-26G-6	386	2/3/2021	2/3/2022	Active Verification
AA 960174	Antenna - Small Horn	ETS Lindgren	3116C-PA	00206880	9/1/2021	9/1/2022	Active Calibration
EE 960085	Analyzer - EMI Receiver	Agilent	N9038A	MY51210148	4/20/2021	4/20/2022	Active Calibration
LSC-300	Cable	Chamber 3 Emissions	-	-	4/15/2021	4/15/2022	Active Verification

EUT Parameters

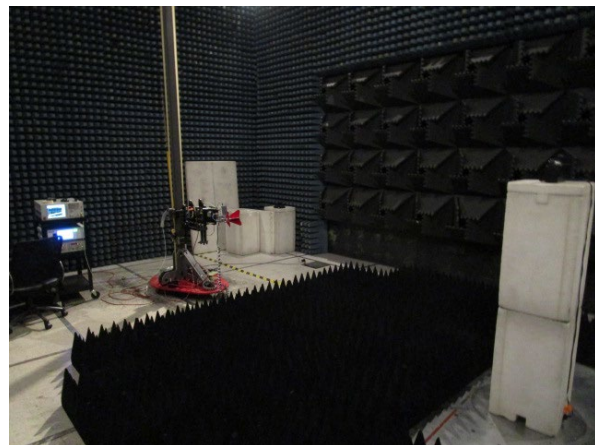
Input Power	120 VAC / 60 Hz	Mode	WLAN connected to router: Channel 6 (2437 MHz) BT connected to wireless headphones (Hopping)
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Setup Photos

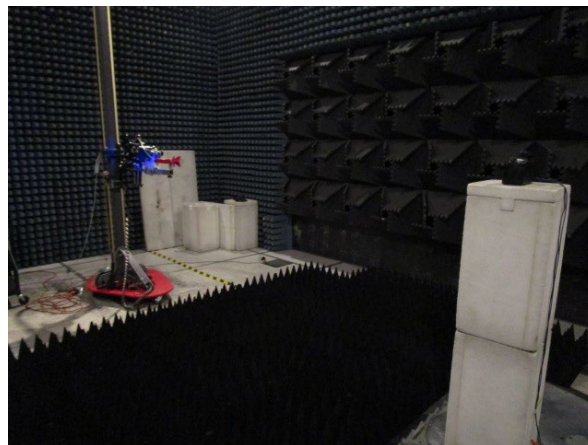
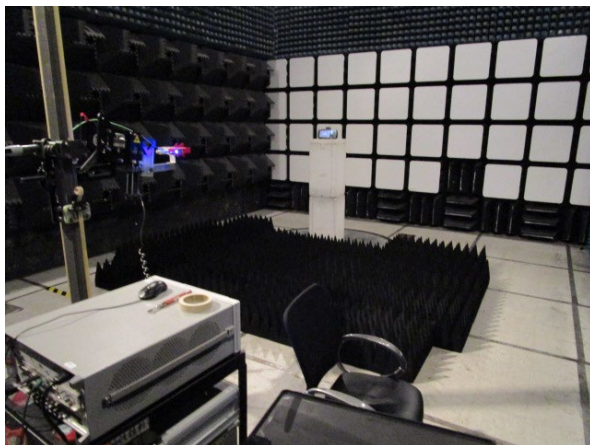
1-2.39 | 2.4835-4 GHz



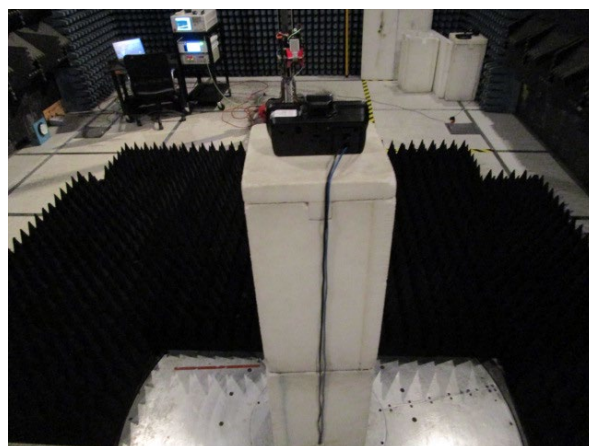
4-18 GHz



18-25 GHz



EUT Rear



Table

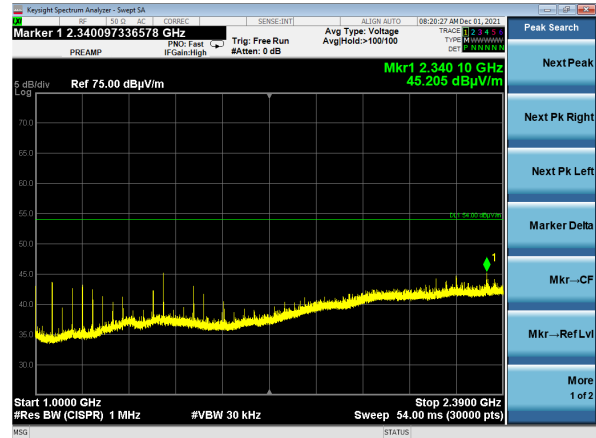
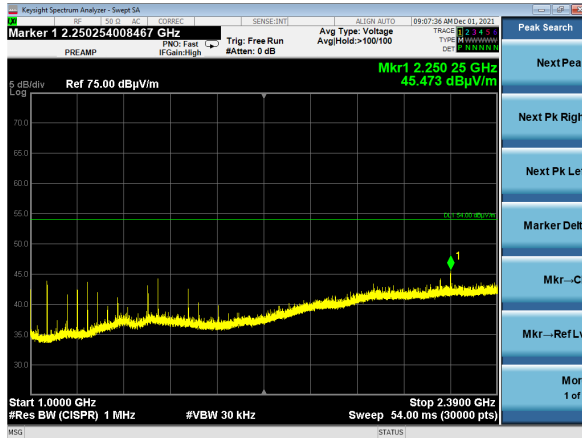
Frequency (MHz)	Antenna Polarity	Height (cm)	Azimuth (degree)	Average Reading (dBμV/m)	Average Limit (dBμV/m)	Average Margin (dB)	Peak Reading (dBμV/m)	Peak Limit (dBμV/m)	Peak Margin (dB)
2250.0	Horizontal	150	30	45.0	54.0	9.0	51.4	74.0	22.6
2364.1	Vertical	150	0	43.8	54.0	10.2	49.9	74.0	24.1
3580.0	Vertical	150	0	46.1	54.0	7.9	52.6	74.0	21.4
3598.6	Horizontal	150	0	42.2	54.0	11.8	49.9	74.0	24.1
7386.0	Vertical	150	199	43.6	54.0	10.4	47.8	74.0	26.2
7386.0	Horizontal	143	61	39.8	54.0	14.2	45.7	74.0	28.3
23911.9	Horizontal	150	0	41.4	54.0	12.6	53.5	74.0	20.5
24613.0	Vertical	150	0	41.0	54.0	13.0	53.0	74.0	21.0

Plots

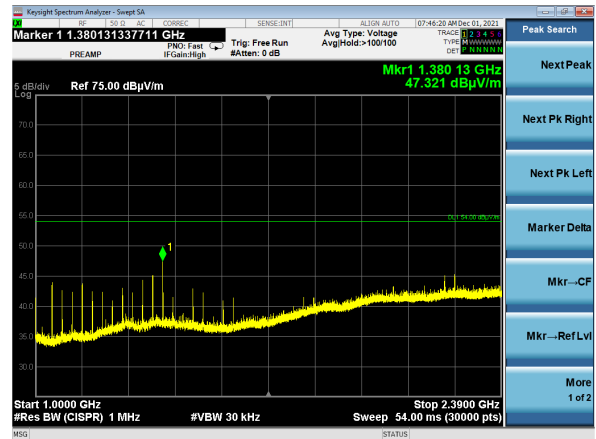
RFID

RFID | WLAN | BT

1-2.39 GHz



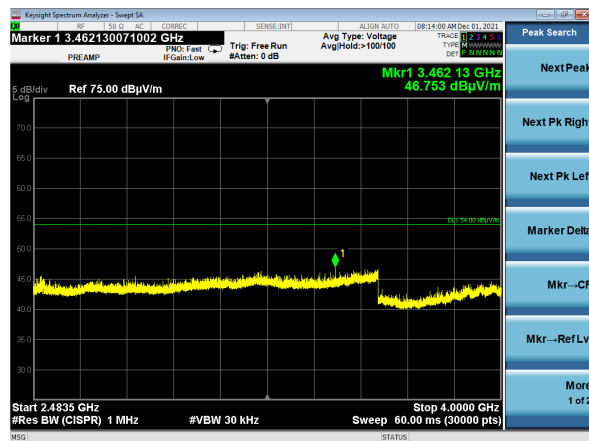
Antenna: Vertical



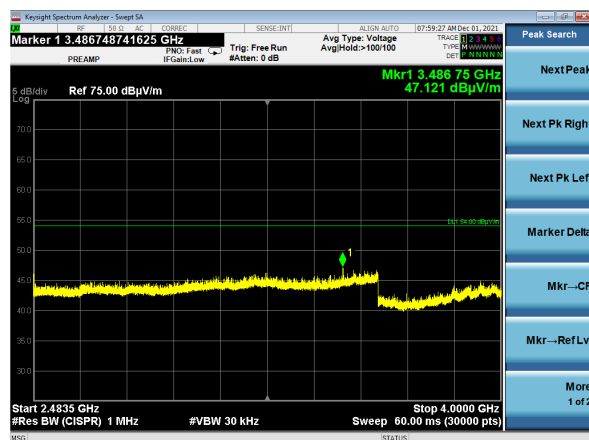
Antenna: Horizontal

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Quote: NBO-07-2021-003937		Serial: 00J2054856

2.4835-4 GHz

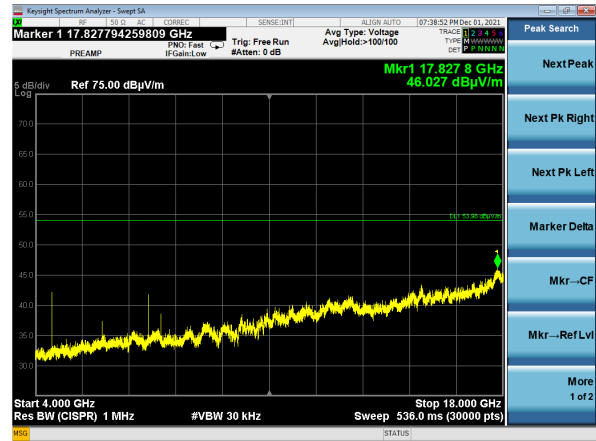
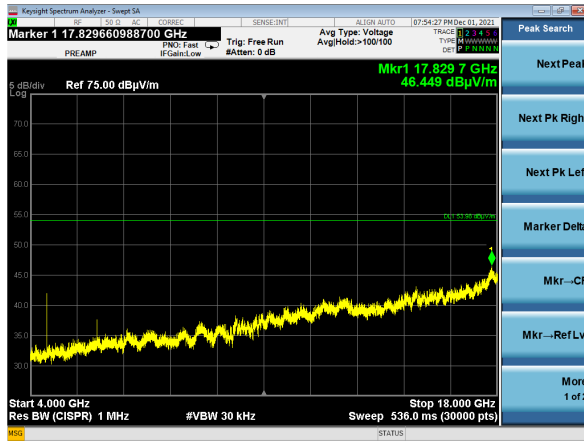


Antenna: Vertical

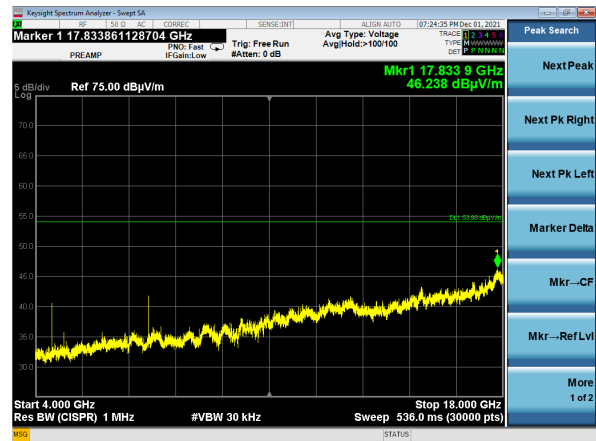
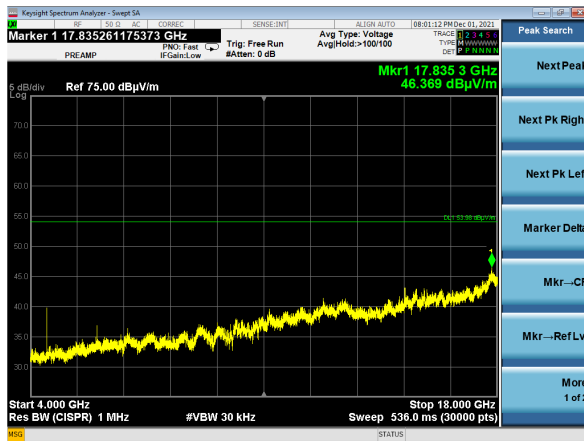


Antenna: Horizontal

4-18 GHz



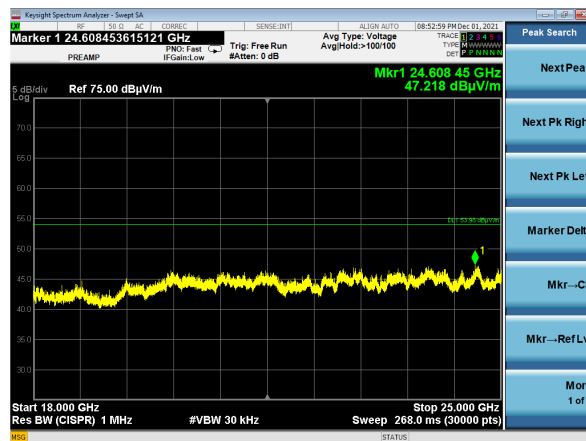
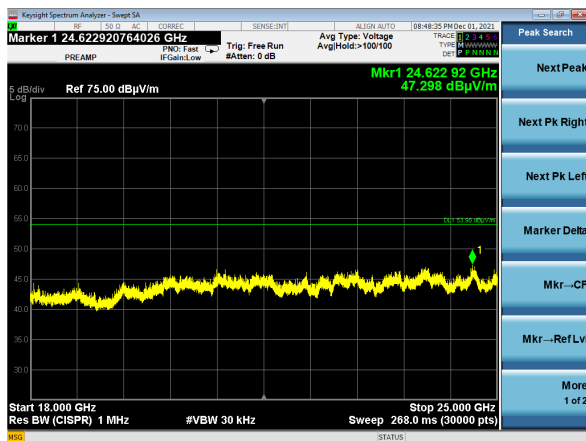
Antenna: Vertical



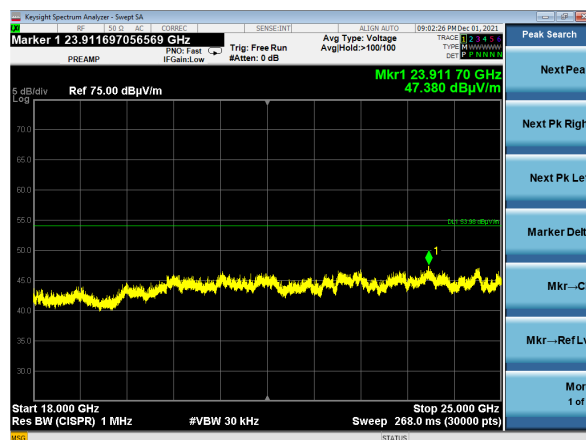
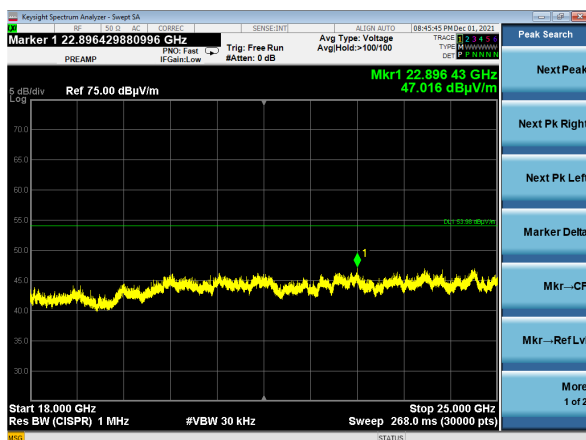
Antenna: Horizontal

Company: Kronos Incorporated (UKG)	Page 30 of 36	Name: InTouch DX G2 w/ HID Prox
Report: TR 3516 A		Model: 8610000-013
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18-25 GHz



Antenna: Vertical



Antenna: Horizontal

Company: Kronos Incorporated (UKG)	Page 31 of 36	Name: InTouch DX G2 w/ HID Prox
Report: TR 3516 A		Model: 8610000-013
Quote: NBO-07-2021-003937		Serial: 00J2054856

5.1.6 99% Occupied Bandwidth

Operator	Jon Dille	QA	Zach Wilson
Temperature	21.1 °C	R.H. %	59.1 %
Test Date	10/13/2021	Location	Conducted Bench
Requirement	FCC 2.1049 IC: RSS-GEN 6.7	Method	ANSI C63.10

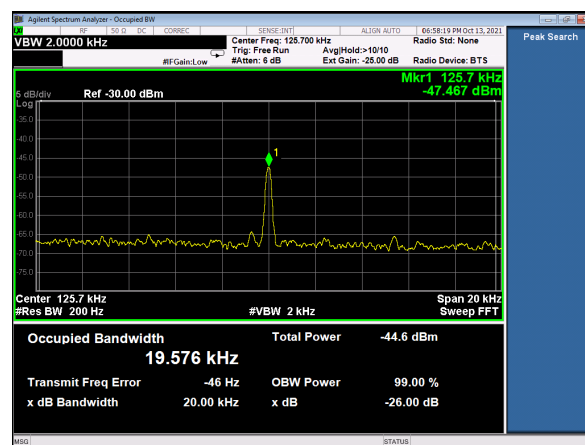
Test Parameters

Frequency	125.7 kHz	Detector(s)	Peak
RBW	200 Hz	VBW	2 kHz

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
AA 960030	Probe - Near Field Kit	EMCO	7405	9509/1152	XXX	XXX	Indication Only
EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY53400296	7/28/2021	7/28/2022	Active Calibration

Plot



Note: Measured Occupied Bandwidth is 19.576 kHz

EUT Parameters

Input Power	120 VAC / 60 Hz	Mode	Operational Mode
EUT	InTouch DX G2 w/ HID Prox	EUT	RFID Tx

Company: Kronos Incorporated (UKG)		Name: InTouch DX G2 w/ HID Prox
Report: TR 3516 A	Page 32 of 36	Model: 8610000-013
Quote: NBO-07-2021-003937		Serial: 00J2054856

5.2 AC Mains Conducted Emissions

A line impedance stabilization network (LISN) or artificial mains network (AMN) allows the emissions of the power supply conductors to be measured while isolating the EUT from the supply mains.

Description of Measurement

The AMN, cable, and other necessary measurement system correction factors are loaded onto the EMI receiver when the measurements are performed. The data is gathered and reported as the corrected values.

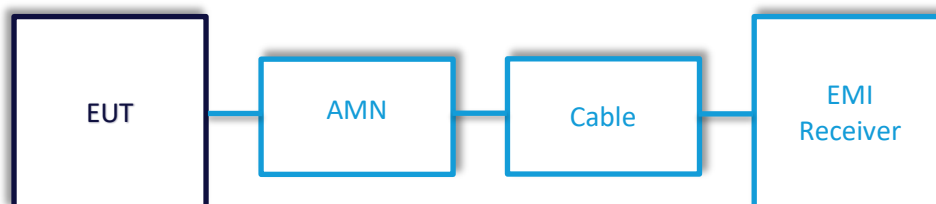
Maximum emissions are determined with a peak max hold trace then measurements at a selection of the highest points are made with quasi-peak and average detectors. Results are recorded and compared to limit for each line. (e.g. line and neutral)

Example Calculations

Measurement (dBμV) + Cable factor (dB) + Other (dB) = Corrected Reading (dBμV)

Margin (dB) = Limit (dBμV) - Corrected Reading (dBμV)

Block Diagram



5.2.1 RFID: 0.15 – 30 MHz

Operator	Jon Dille	QA	Braden Smith
Temperature	21.8 °C	R.H. %	50.1 %
Test Date	9/21/2021	Location	Conducted Bench
Requirement	FCC 15.207	Method	ANSI C63.10

FCC 15.207 Limits:

Frequency (MHz)	Conducted Limit (dBμV)	
	Quasi-Peak	Average
0.15 - 0.5	66 - 56*	56-46*
0.5 - 5	56	46
5 - 30	60	50

*Decreases with the logarithm of the frequency.

Test Parameters

Frequency	0.15 – 30 MHz	Distance	80 cm from LISN, 40 cm from wall
Detector(s)	Quasi-Peak, Average	Table height	80 cm
RBW	9 kHz	VBW	62 Hz

Instrumentation

Asset #	Description	Manufacturer	Model #	Serial #	Date	Due Date	Status
EE 960087	Analyzer - Spectrum	Agilent	N9010A	MY5340029 6	7/28/2021	7/28/2022	Active Calibration
EE 960162	LISN	COM-POWER	LI-215A	191969	4/19/2021	4/19/2022	Active Calibration
LSC-211	Cable	Micro-Coax	UFB311A- 0-1440- 70U70U	64639 224071-002	12/9/2019	12/9/2021	Active Verification

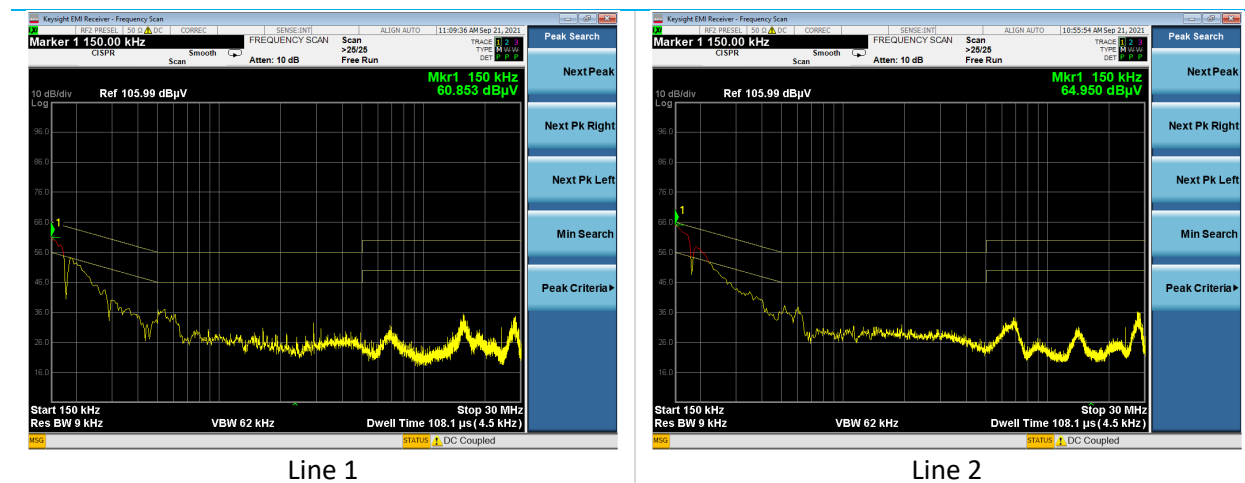
EUT Parameters

Input Power	120 VAC / 60 Hz	Mode	Operational Mode
EUT	InTouch DX G2 w/ HID Prox	EUT	RFID Tx

FCC 15.207 Table:

Line	Frequency (MHz)	Quasi-Peak Reading (dBμV)	Quasi-Peak Limit (dBμV)	Quasi-Peak Margin (dB)	Average Reading (dBμV)	Average Limit (dBμV)	Average Margin (dB)
1	0.15	59.5	66.0	6.5	44.5	56.0	11.5
1	0.53	34.6	56.0	21.4	23.2	46.0	22.8
1	27.83	29.7	60.0	30.3	22.4	50.0	27.6
2	0.15	61.7	66.0	4.3	46.8	56.0	9.2
2	0.59	33.5	56.0	22.6	21.9	46.0	24.1
2	27.42	31.9	60.0	28.1	21.4	50.0	28.6

Plots



6 REVISION HISTORY

Version	Date	Notes	Person
V0	10/12/2021	Initial Draft	Alec Krabbe
V1	10/22/2021	Final	Alec Krabbe
V2	1/14/2022	Addressed ACB Comments	Alec Krabbe
V3	4/7/2022	Added Sim Tx Data	Alec Krabbe
V3	4/8/2022	Revision Approved	Alec Krabbe

END OF REPORT