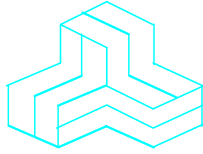


# ENGINEERING TEST REPORT



## Autoscope RTMS Sx-300 Model No.: Sx-300

**FCC ID: J7TSX300AN**

*Applicant:*

**Image Sensing Systems, Inc.**  
500 Spruce Tree Centre, 1600 University Ave W,  
St Paul, Minnesota  
USA, 55104-3825

*Tested in Accordance With*

**FCC Part 15, Subpart C, Section 15.245  
Field Disturbance Sensor  
Operating in the Frequency Band 24075-24175 MHz**

**UltraTech's File No.: EIS-041\_F15C245**

This Test report is issued under the Authority of  
Tri M. Luu, BAsC,  
Vice President of Engineering  
UltraTech Group of Labs

Date: May 05, 2014

Report Prepared by: Dharmajit Solanki

Tested by: Mr. Hung Trinh, EMC/RFI Technician

Issued Date: May 05, 2014

Test Dates: Feb 06 to Apr 01 & May 02, 2014

- *The results in this Test Report apply only to the sample(s) tested, and the sample tested is randomly selected.*
- *This report must not be used by the client to claim product endorsement by NVLAP or any agency of the US Government.*

## UltraTech

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NVLAP LAB  
CODE 200093-0



SL2-IN-E-  
1119R



CA2049



TL363\_B



TPTDP  
DA1300

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# EXHIBIT 1. INTRODUCTION

## 1.1. SCOPE

<b>Reference:</b>	FCC Part 15, Subpart C, Section 15.245
<b>Title:</b>	Code of Federal Regulations (CFR), Title 47 – Telecommunication, Part 15
<b>Purpose of Test:</b>	To gain FCC Certification Authorization for Field Disturbance Sensor operating in the Frequency Band 24075-24175 MHz.
<b>Test Procedures:</b>	Radiated emissions measurements were conducted in accordance with American National Standards Institute ANSI C63.4 - American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
<b>Environmental Classification:</b>	Commercial, industrial or business environment

## 1.2. RELATED SUBMITTAL(S)/GRANT(S)

None

## 1.3. NORMATIVE REFERENCES

Publication	Year	Title
FCC CFR Parts 0-19	2013	Code of Federal Regulations – Telecommunication
ANSI C63.4	2009	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
ANSI C63.10	2009	American National Standard for Testing Unlicensed Wireless Devices
CISPR 22 Edition 6.0 EN 55022	2008-09  2010	Information Technology Equipment - Radio Disturbance Characteristics - Limits and Methods of Measurement
CISPR 16-1-1 +A1 +A2	2006 2006 2007	Specification for radio disturbance and immunity measuring apparatus and methods. Part 1-1: Measuring Apparatus
CISPR 16-1-2 +A1 +A2	2003 2004 2006	Specification for radio disturbance and immunity measuring apparatus and methods. Part 1-2: Conducted disturbances

## EXHIBIT 2. PERFORMANCE ASSESSMENT

### 2.1. CLIENT INFORMATION

APPLICANT	
<b>Name:</b>	Image Sensing Systems, Inc.
<b>Address:</b>	500 Spruce Tree Centre, 1600 University Ave W St. Paul, Minnesota US 55104-3825
<b>Contact Person:</b>	Greg Carson Phone #: (651) 603-7724 Fax #: (651) 347-5506 Email Address: GCarson@imagesensing.com

MANUFACTURER	
<b>Name:</b>	Image Sensing Systems Canada Ltd.
<b>Address:</b>	150 Bridgeland Ave. Suite 204 Toronto, Ontario Canada, M6A 1Z5
<b>Contact Person:</b>	Leo Zhang Phone #: (416) 785-9248 Ext 238 Fax #: (416) 785-9332 Email Address: lzhang@imagesensing.com

### 2.2. EQUIPMENT UNDER TEST (EUT) INFORMATION

The following information (with the exception of the Date of Receipt) has been supplied by the applicant.

<b>Equipment Identification:</b>	Image Sensing Systems
<b>Brand or Trade Name:</b>	Autoscope RTMS Sx-300
<b>Model Name or Number:</b>	Sx-300
<b>Serial Number:</b>	Test Sample
<b>Type of Equipment:</b>	Field Disturbance Sensor
<b>Input Power Supply Type:</b>	12 to 24 VDC, 3W
<b>Primary User Functions of EUT:</b>	Radar based vehicular traffic detector

### 2.3. EUT’S TECHNICAL SPECIFICATIONS

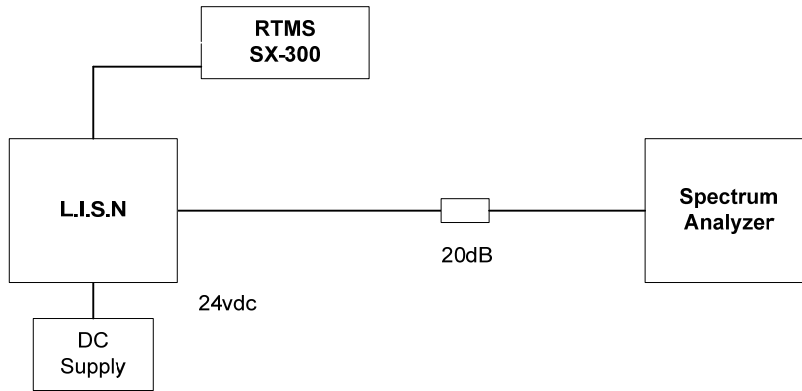
<b>TRANSMITTER</b>	
<b>Equipment Type:</b>	Transceiver
<b>Intended Operating Environment:</b>	Commercial, Industrial Outdoors
<b>Power Supply Requirement:</b>	12 to 24 VDC, 3W
<b>Operating Frequency:</b>	24125.5 MHz
<b>RF Output Power Rating:</b>	100 mW eirp
<b>Peak RF Field Strength @ 3m:</b>	108.9 dBuV/m (50 MHz) & 108.1 dBuV/m (75 MHz)
<b>RF Output Impedance:</b>	50 Ohms
<b>RF Bandwidth Types:</b>	50 MHz & 75 MHz Systems
<b>20 dB Bandwidth:</b>	54.6 MHz & 79.0 MHz
<b>Modulation Type:</b>	FMCW (Frequency Modulated Continuous Wave)
<b>Duty Cycle:</b>	7.16% (50 MHz) & 5.73% (75 MHz)
<b>Antenna Connector Type:</b>	Integral
<b>Antenna Description:</b>	Manufacturer: InnoSent GmbH, Germany Type: Phase array M/N: IVS-295 Frequency Range: 24.00 – 24.25 GHz Gain: 17 dBi

### 2.4. LIST OF EUT’S PORTS

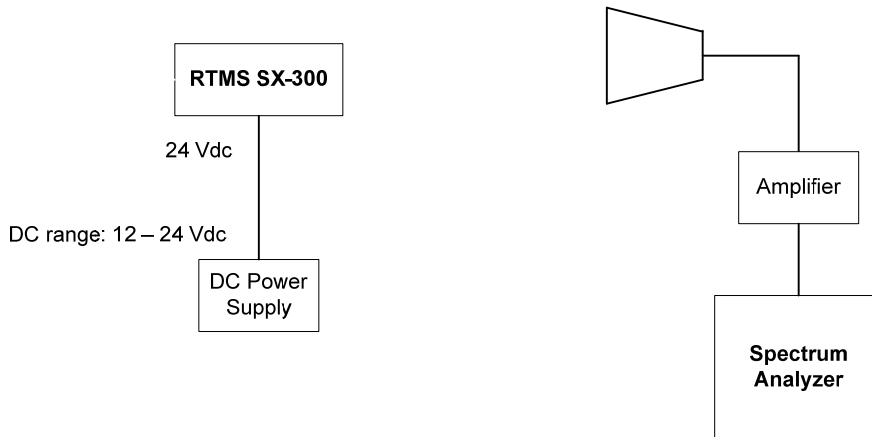
<b>Port Number</b>	<b>EUT’s Port Description</b>	<b>Number of Identical Ports</b>	<b>Connector Type</b>	<b>Cable Type (Shielded/Non-shielded)</b>
1	Power & Serial port RS232	1	MS 32-pins	Shielded

## 2.5. TEST SETUP

### Conducted Emissions:



### Radiated Emissions:



## EXHIBIT 3. EUT OPERATING CONDITIONS AND CONFIGURATIONS DURING TESTS

### 3.1. CLIMATE TEST CONDITIONS

The climate conditions of the test environment are as follows:

Temperature:	21°C to 24°C
Humidity:	40% to 51%
Pressure:	102 kPa
Power input source:	24V DC using Power Supply

### 3.2. OPERATIONAL TEST CONDITIONS & ARRANGEMENT FOR TESTS

<b>Operating Modes:</b>	EUT was configured and put into built-in RF test mode to transmit burst with the designated duty cycle for measurements.
<b>Special Test Software:</b>	None
<b>Special Hardware Used:</b>	None
<b>Transmitter Test Antenna:</b>	The EUT is tested with the antenna fitted in a manner typical of normal intended use as integral antenna equipment.

<b>Transmitter Test Signals:</b>	
<b>Frequency Band(s):</b>	24104 – 24156 MHz
<b>Test Frequency(ies):</b>	24125.5 MHz
<b>Transmitter Wanted Output Test Signals:</b>	
• Max. Field Strength @ 3 meters :	108.9 dBuV/m Peak
• Normal Test Modulation:	FMCW

## EXHIBIT 4. SUMMARY OF TEST RESULTS

### 4.1. LOCATION OF TESTS

- All of the measurements described in this report were performed at Ultratech Group of Labs located in the city of Oakville, Province of Ontario, Canada.
- AC Powerline Conducted Emissions were performed in UltraTech's shielded room, 24'(L) by 16'(W) by 8'(H).
- Radiated Emissions were performed at the Ultratech's 3-10 TDK Semi-Anechoic Chamber situated in the Town of Oakville, province of Ontario. This test site been calibrated in accordance with ANSI C63.4, and found to be in compliance with the requirements of Sec. 2.948 of the FCC Rules. The descriptions and site measurement data of the Oakville 3-10 TDK Semi-Anechoic Chamber has been filed with FCC office (FCC File No.: 31040/SIT 1300B3) and Industry Canada office (Industry Canada File No.: IC2049-1). Calibration Due date: April 02, 2017.

### 4.2. APPLICABILITY & SUMMARY OF EMC EMISSION TEST RESULTS

FCC Section(s)	Test Requirements	Compliance (Yes/No)
15.107(A) & 15.207	Power Line Conducted Emissions	Yes
--	20 dB & 99% Occupied Bandwidth	Yes
15.245, 15.209, 15.205	Transmitter Radiated Emissions, Harmonic Emissions and Band Edge Radiated Emissions	Yes
1.1307, 1.1310 & 2.1091	RF Exposure	Categorically Excluded

### 4.3. MODIFICATIONS INCORPORATED IN THE EUT FOR COMPLIANCE PURPOSES

The power-line I/O cable shall be looped 1 turn around Steward Ferrite type # 28A2029-0A2.



## **EXHIBIT 5. MEASUREMENTS, EXAMINATIONS & TEST DATA FOR EMC EMISSIONS**

### **5.1. TEST PROCEDURES**

The measurements were performed in accordance with Ultratech Test Procedures, File # ULTR P001-2004 and ANSI C63.4 & ANSI C63.10.

### **5.2. MEASUREMENT UNCERTAINTIES**

The measurement uncertainties stated were calculated in accordance with the requirements of CISPR 16-4-2 @ IEC:2003 and JCGM 100:2008 (GUM 1995) – Guide to the Expression of Uncertainty in Measurement.

### **5.3. MEASUREMENT EQUIPMENT USED**

The measurement equipment used complied with the requirements of the Standards referenced in the Methods & Procedures ANSI C63.4 and CISPR 16-1.

**5.4. POWER LINE CONDUCTED EMISSIONS [§ 15.107(A) & 15.207]**

**5.4.1. LIMITS**

The equipment shall meet the limits of the following table:

Test Frequency Range (MHz)	CLASS B LIMITS		Measuring Bandwidth
	Quasi-Peak (dBµV)	Average* (dBµV)	
0.15 to 0.5	66 to 56*	56 to 46*	RBW = 9 kHz VBW ≥ 9 kHz for QP VBW = 1 Hz for Average
0.5 to 5	56	46	RBW = 9 kHz VBW ≥ 9 kHz for QP VBW = 1 Hz for Average
5 to 30	60	50	RBW = 9 kHz VBW ≥ 9 kHz for QP VBW = 1 Hz for Average

- Decreasing linearly with logarithm of frequency

**5.4.2. METHOD OF MEASUREMENTS**

Refer to Ultratech Test Procedures ULTR-P001-2004 & ANSI C63.4 for method of measurements.

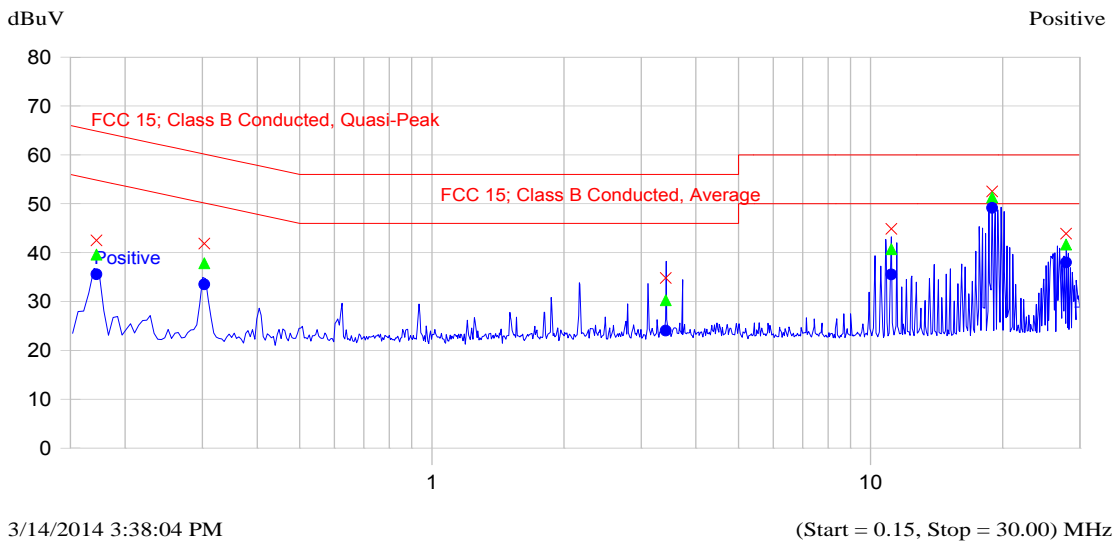
**5.4.3. TEST DATA**

Note: See the following test data plots for detailed measurements.

Plot 1:  
 DC Power Line Conducted Emissions  
 Test Configuration: Transmitter Mode, Line: Positive

Description: TX + RX  
 Setup Name: FCC 15 Class B  
 Customer Name: ISS Image Sensing System  
 Project Number: EIS-041Q  
 Operator Name: Hung  
 EUT Name: SX-300  
 Date Created: 3/14/2014

**Current Graph**



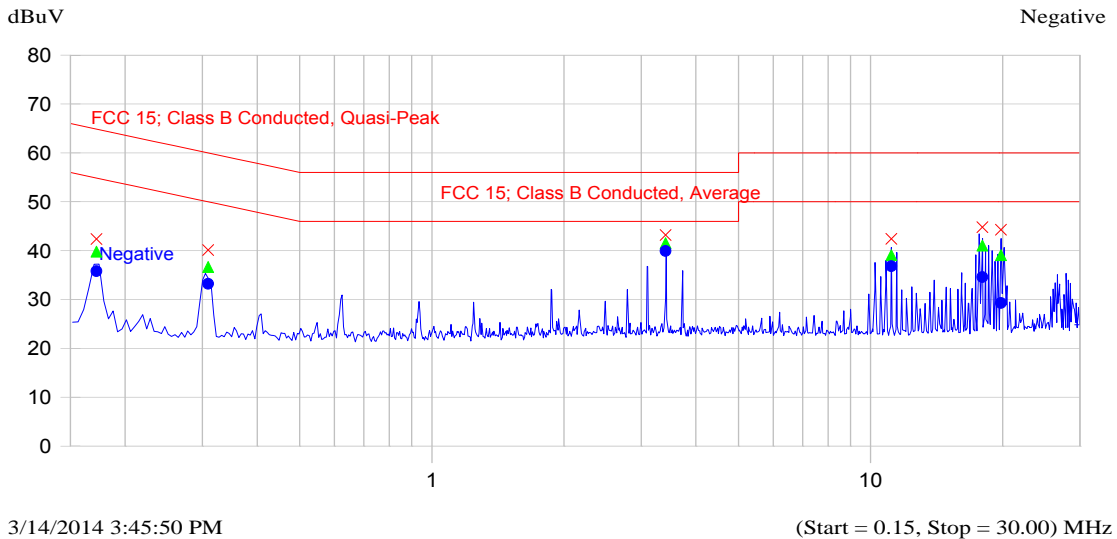
**Current List**

Frequency MHz	Peak dBuV	QP dBuV	Delta QP-QP Limit dB	Avg dBuV	Delta Avg-Avg Limit dB	Trace Name
0.172	42.5	39.6	-25.8	35.6	-19.8	Positive
0.303	41.9	37.8	-23.7	33.5	-18.0	Positive
3.411	34.8	30.3	-25.7	24.1	-21.9	Positive
11.154	44.9	40.7	-19.3	35.5	-14.5	Positive
18.907	52.5	51.3	-8.7	49.2	-0.8	Positive
27.895	43.9	41.7	-18.3	38.0	-12.0	Positive

Plot 2:  
 DC Power Line Conducted Emissions  
 Test Configuration: Transmitter Mode, Line: Neutral

Description: TX + RX  
 Setup Name: FCC 15 Class B  
 Customer Name: ISS Image Sensing System  
 Project Number: EIS-041Q  
 Operator Name: Hung  
 EUT Name: SX-300  
 Date Created: 3/14/2014

Current Graph



Current List

Frequency MHz	Peak dBuV	QP dBuV	Delta QP-QP dB	Limit dB	Avg dBuV	Delta Avg-Avg dB	Limit dB	Trace Name
0.172	42.4	39.8	-25.6		35.8	-19.5		Negative
0.309	40.1	36.6	-24.7		33.2	-18.2		Negative
3.409	43.2	41.5	-14.5		39.9	-6.1		Negative
11.155	42.4	39.1	-20.9		36.8	-13.2		Negative
17.979	44.8	41.1	-18.9		34.6	-15.4		Negative
19.825	44.3	39.1	-20.9		29.3	-20.7		Negative

## 5.5. 20 dB BANDWIDTH

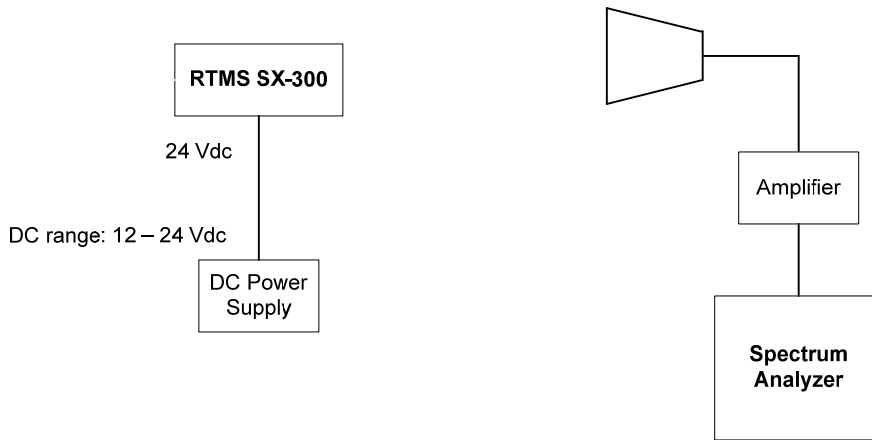
### 5.5.1. LIMITS

No limit. Test is performed for information only.

### 5.5.2. METHOD OF MEASUREMENTS

The transmitter output was loosely coupled to the spectrum analyzer through a receiving antenna and the bandwidth of the fundamental frequency was measured with the spectrum analyzer with the resolution bandwidth of the spectrum analyzer set per ANSI 63.4.

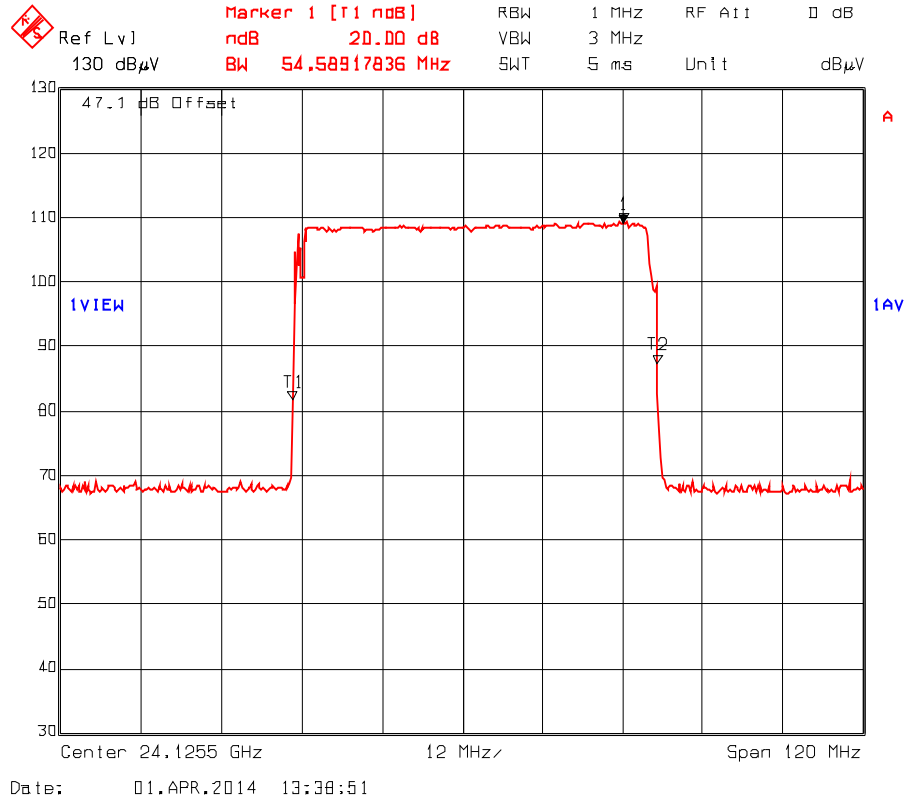
### 5.5.3. TEST ARRANGEMENT



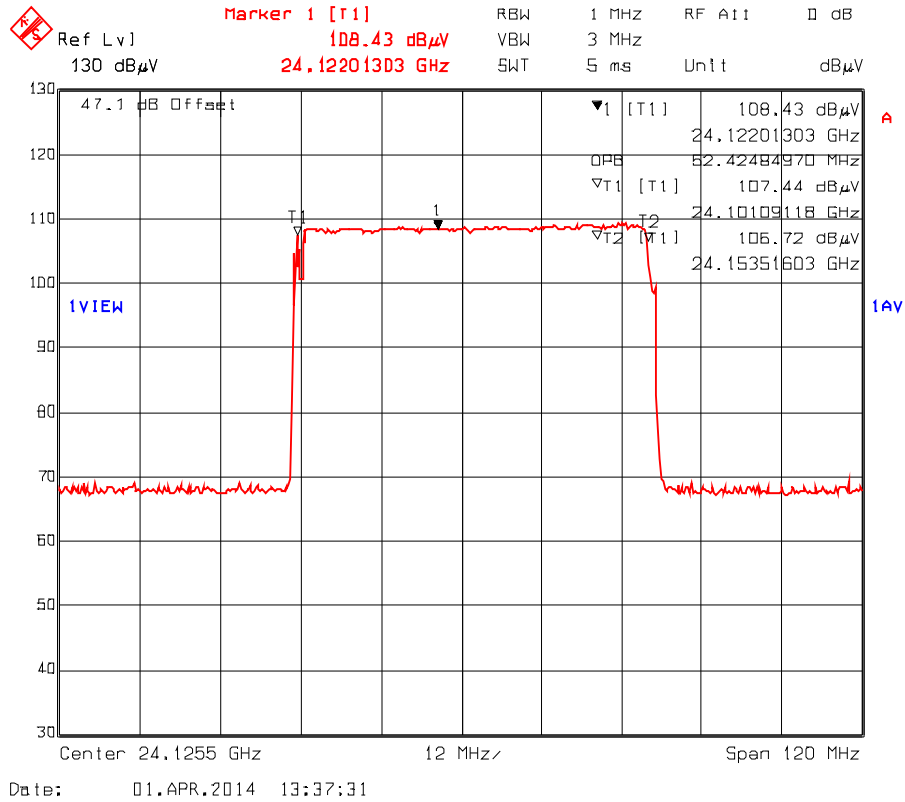
### 5.5.4. TEST DATA

Bandwidth	Centre Frequency (MHz)	(MHz)
20 dB (50 MHz)	24125.5	54.60
99% OBW (50 MHz)	24125.5	52.43
20 dB (75 MHz)	24125.5	78.99
99% OBW (75 MHz)	24125.5	76.11

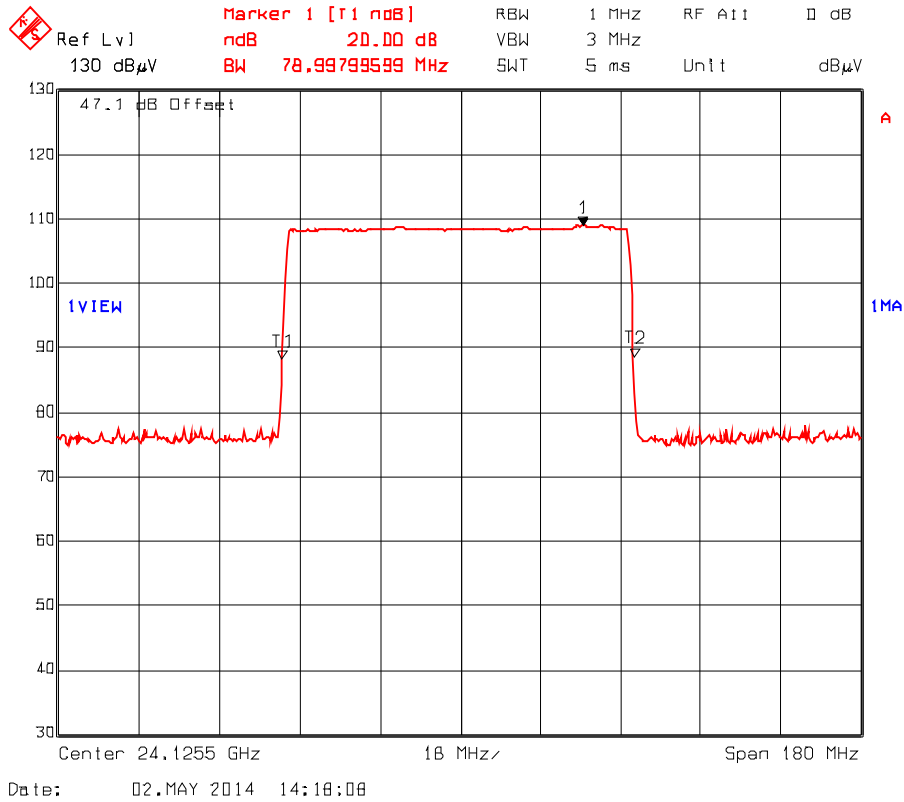
Plot 3: 20 dB Bandwidth (50 MHz)  
Test Frequency: 24125.5 MHz



Plot 4: 99% Occupied Bandwidth (50 MHz)  
 Test Frequency: 24125.5 MHz

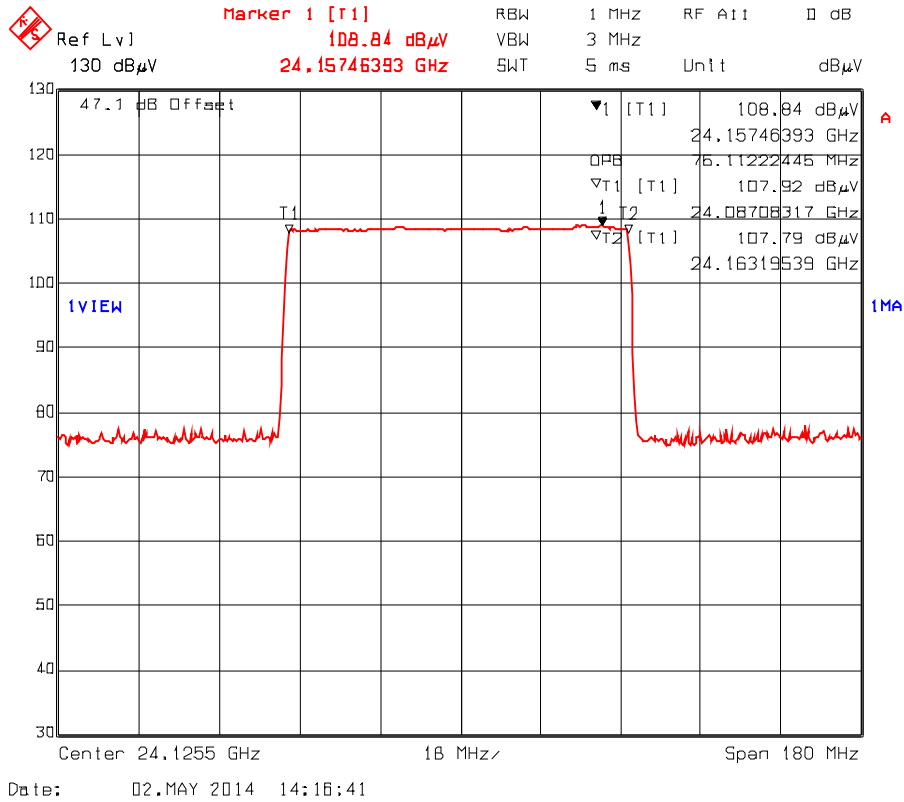


Plot 5: 20 dB Bandwidth (75 MHz)  
Test Frequency: 24125.5 MHz





Plot 6: 99% Occupied Bandwidth (75 MHz)  
 Test Frequency: 24125.5 MHz



**5.6. FUNDAMENTAL FIELD STRENGTH AND HARMONIC EMISSIONS AND BAND-EDGE RADIATED EMISSIONS (RADIATED @ 3 METERS) [§ 15.245, 15.209 & 15.205]**

**5.6.1. LIMITS**

- The Field Strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (mV/m)	Field Strength of Harmonics (mV/m)
24075-24175	2500	25

- Regardless of the limits shown in the above table, harmonic emissions in the restricted bands below 17.7 GHz, as specified in 15.205, shall not exceed the field strength limits shown in 15.209. Harmonic emissions in the restricted bands at and above 17.7 GHz shall not exceed the following field strength limits:

(i) For the second and third harmonics of field disturbance sensors operating in the 24075-24175 MHz band and for other field disturbance sensors designed for use only within a building or to open building doors, 25.0 mV/m.

- Field strength limits are specified at a distance of 3 meters.
- Emissions radiated outside of the specified frequency bands, except for the harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits specified in @ 15.209, whichever is the lesser attenuation.
- The emissions limits shown above are based on the measurement instrumentation employing an average detector. The provisions in Sec. 15.35 for limiting peak emissions apply.

**FCC 47 CFR 15.205(a)  
-- Restricted Frequency Bands --**

MHz	MHz	MHz	GHz
0.090 - 0.110	162.0125 - 167.17	2310 - 2390	9.3 - 9.5
0.49 - 0.51	167.72 - 173.2	2483.5 - 2500	10.6 - 12.7
2.1735 - 2.1905	240 - 285	2655 - 2900	13.25 - 13.4
8.362 - 8.366	322 - 335.4	3260 - 3267	14.47 - 14.5
13.36 - 13.41	399.9 - 410	3332 - 3339	14.35 - 16.2
25.5 - 25.67	608 - 614	3345.8 - 3358	17.7 - 21.4
37.5 - 38.25	960 - 1240	3600 - 4400	22.01 - 23.12
73 - 75.4	1300 - 1427	4500 - 5250	23.6 - 24.0
108 - 121.94	1435 - 1626.5	5350 - 5460	31.2 - 31.8
123 - 138	1660 - 1710	7250 - 7750	36.43 - 36.5
149.9 - 150.05	1718.8 - 1722.2	8025 - 8500	Above 38.6
156.7 - 156.9	2200 - 2300	9000 - 9200	

**FCC 47 CFR 15.209(a)**  
**-- Field Strength Limits within Restricted Frequency Bands --**

Frequency (MHz)	Field Strength Limits (µV/m)	Distance (Meters)
0.009 - 0.490	2,400 / F (KHz)	300
0.490 - 1.705	24,000 / 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

**5.6.2. METHOD OF MEASUREMENTS**

Refer to Ultratech Test Procedures, File # ULTR P001-2004 and ANSI C63.4 & ANSI C63.10 for measurement methods.

**5.6.3. TEST DATA**

**Fundamental, Harmonic & Spurious Emissions:-** The harmonics & spurious emissions measurements were performed with the integral Bluetooth modular transmitter turned ON transmitting continuously to see any inter-modulation components.

**(a) 50 MHz BW:**

Frequency (MHz)	Peak E-Field @3m (dBµV/m)	Average E-Field @3m (dBµV/m)	Antenna Plane (H/V)	Field Strength Limit for Fundamental (dBµV/m)	Field Strength Limit of § 15.209 (dBµV/m)	Margin (dB)
24125.5	108.88	108.64	V	127.96	--	-19.32
24125.5	108.85	108.02	H	127.96	--	-19.94

The emissions were scanned from 30 MHz to 100 GHz and no significant emission found. Hence all out of band emissions including harmonics were more than 20 dB below their respective limits.

**(b) 75 MHz BW:**

Frequency (MHz)	Peak E-Field @3m (dBµV/m)	Average E-Field @3m (dBµV/m)	Antenna Plane (H/V)	Field Strength Limit for Fundamental (dBµV/m)	Field Strength Limit of § 15.209 (dBµV/m)	Margin (dB)
24125.5	108.13	107.19	V	127.96	--	-20.77
24125.5	108.01	107.09	H	127.96	--	-20.87

The emissions were scanned from 30 MHz to 100 GHz and no significant emission found. Hence all out of band emissions including harmonics were more than 20 dB below their respective limits.

**Unintentional Radiated Emissions:-**

The emissions were scanned from 30 MHz to 100 GHz at 3 Meters distance and all emissions less than 20 dB below the limits were recorded.

FREQUENCY (MHz)	RF LEVEL (dBuV/m)	DETECTOR USED (PEAK/QP)	ANTENNA PLANE (H/V)	LIMIT (dBuV/m)	MARGIN (dB)	PASS/ FAIL
30.00	31.6	Peak	V	40.0	-8.4	PASS
30.00	23.6	Peak	H	40.0	-16.4	PASS
46.73	34.2	Peak	V	40.0	-5.8	PASS
46.73	19.2	Peak	H	40.0	-20.8	PASS
60.73	29.3	Peak	V	40.0	-10.7	PASS
73.07	23.8	Peak	V	40.0	-16.2	PASS
86.45	27.3	Peak	V	40.0	-12.7	PASS
86.45	18.9	Peak	H	40.0	-21.1	PASS

**5.7. RF EXPOSURE REQUIRMENTS [§ 1.1310 & 2.1091]**

The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation.

**FCC 47 CFR § 1.1310:**

**TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)**

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposures</b>				
0.3–3.0 .....	614	1.63	*(100)	6
3.0–30 .....	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30–300 .....	61.4	0.163	1.0	6
300–1500 .....	.....	.....	f/300	6
1500–100,000 .....	.....	.....	5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3–1.34 .....	614	1.63	*(100)	30
1.34–30 .....	824/f	2.19/f	*(180/f <sup>2</sup> )	30
30–300 .....	27.5	0.073	0.2	30
300–1500 .....	.....	.....	f/1500	30
1500–100,000 .....	.....	.....	1.0	30

f = frequency in MHz

\* = Plane-wave equivalent power density

NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

**5.7.1. METHOD OF MEASUREMENTS**

Refer to Sections 1.1310, 2.1091

In order to demonstrate compliance with MPE requirements (see Section 2.1091), the following information is typically needed:

- (1) Calculation that estimates the minimum separation distance (20 cm or more) between an antenna and persons required to satisfy power density limits defined for free space.
- (2) Antenna installation and device operating instructions for installers (professional/unskilled users), and the parties responsible for ensuring compliance with the RF exposure requirement
- (3) Any caution statements and/or warning labels that are necessary in order to comply with the exposure limits
- (4) Any other RF exposure related issues that may affect MPE compliance

## 5.7.2. RF EVALUATION

**Peak E-Field measured is 108.88dBuV/m at 3m distance.**

$$\begin{aligned} \text{EIRPdB}_{\text{mW}} &= E_{\text{dB}\mu\text{V}/\text{m}} - 95.2 \text{ dB at 3m distance.} \\ &= 108.88 - 95.2\text{dB} \\ &= 13.68 \text{ dBm or } 23.3 \text{ mW} \end{aligned}$$

The device highest output eirp power as calculated above from the measured field strength is 23.3 mW @ 24 GHz. The manufacturer has specified the maximum 100mW eirp power in the user manual, Routine environmental evaluation for RF exposure is not required since the maximum eirp is well below the 3W eirp limit specified by FCC. This device is categorically excluded from routine environmental evaluation for RF Exposure requirement as per section 2.1091.

Also the device will be installed at distance of more than 20 cm from the general public/users on a pole for monitoring vehicular traffic. The same is specified in the user manual.

## EXHIBIT 6. TEST EQUIPMENTS LIST

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range	Calibration Due Date
Spectrum Analyzer	Rohde & Schwarz	FSEK30	100077	20 Hz – 40 GHz	08 Nov 2014
RF Amplifier	Hewlett Packard	8447F	2805A03287	0.1 – 1300 MHz	15 Mar 2015
RF Amplifier	Hewlett Packard	84498	3008A00769	1 – 26.5 GHz	25 Jun 2014
Biconi-Log Antenna	ETS Lindgren	3142C	34792	26 – 3000 MHz	26 Jun 2014
Horn Antenna	Emco	3155	6570	1 – 18 GHz	07 Jun 2014
Horn Antenna	ETS Lindgren	3160-09	00118385	18 – 26.5 GHz	30 July 2014
Horn Antenna	ETS Lindgren	3160-10	00102686	26.5 - 40 GHz	30 July 2014
Horn Antenna	OML	M19HWD	U30625-1	40 – 60 GHz	-
Horn Antenna	OML	M12HWD	E30625-1	60 – 90 GHz	-
Horn Antenna	OML	M08HWD	F30625-1	90 – 110 GHz	-
DC Power Supply	Tenma	72-7295	490300297	1 – 40V DC	Cal on use
Spectrum Analyzer	Agilent	E7401A	US40240432	9 kHz–1.5 GHz	14 Mar 2015
Attenuator	Pasternack	PE7010-20	-	DC–2 GHz	Cal. On use
L.I.S.N	EMCO	3825/2	8907-1531	10 kHz -100 MHz	14 May 2014

## EXHIBIT 7. MEASUREMENT UNCERTAINTY

The measurement uncertainties stated were calculated in accordance with the requirements of CISPR 16-4-2 @ IEC:2003 and JCGM 100:2008 (GUM 1995) – Guide to the Expression of Uncertainty in Measurement.

### 7.1. LINE CONDUCTED EMISSION MEASUREMENT UNCERTAINTY (0.15-30 MHz)

	Line Conducted Emission Measurement Uncertainty (150 kHz – 30 MHz):	Measured	Limit
<b>u<sub>c</sub></b>	Combined standard uncertainty: $u_c(y) = \sqrt{\sum_{i=1}^m u_i^2(y)}$	± 1.57	± 1.8
<b>U</b>	Expanded uncertainty U: $U = 2u_c(y)$	± 3.14	± 3.6

### 7.2. RADIATED EMISSION MEASUREMENT UNCERTAINTY

	Radiated Emission Measurement Uncertainty @ 3m, Horizontal (30-1000 MHz):	Measured	Limit
<b>u<sub>c</sub></b>	Combined standard uncertainty: $u_c(y) = \sqrt{\sum_{i=1}^m u_i^2(y)}$	± 2.15	± 2.6
<b>U</b>	Expanded uncertainty U: $U = 2u_c(y)$	± 4.30	± 5.2

	Radiated Emission Measurement Uncertainty @ 3m, Vertical (30-1000 MHz):	Measured	Limit
<b>u<sub>c</sub></b>	Combined standard uncertainty: $u_c(y) = \sqrt{\sum_{i=1}^m u_i^2(y)}$	± 2.39	± 2.6
<b>U</b>	Expanded uncertainty U: $U = 2u_c(y)$	± 4.78	± 5.2

	Radiated Emission Measurement Uncertainty @ 3m, Horizontal & Vertical (1 – 18 GHz):	Measured	Limit
<b>u<sub>c</sub></b>	Combined standard uncertainty: $u_c(y) = \sqrt{\sum_{i=1}^m u_i^2(y)}$	± 1.87	Under consideration
<b>U</b>	Expanded uncertainty U: $U = 2u_c(y)$	± 3.75	Under consideration