EMISSIONS TEST REPORT

Report Number: 3167233BOX-001
Project Number: 3167233

Testing performed on the

Mobile Speed Enforcement System

Model: MultaRadarC

To

CFR47 "Telecommunications" FCC Part 15 Subpart C 15.245

For

Traffipax, Inc.

Test Performed by:	Test Authorized by:
Intertek – ETL SEMKO	Traffipax, Inc.
70 Codman Hill Road	514 Progress Drive
Boxborough, MA 01719	Linthicum, MD 21090

Prepared by: _____ Date: 06/14/2010
Nicholas Abbondante

Reviewed by: _____ Date: 06/15/10
Jeff Goulet

1.0 Job Description

1.1 Client Information

This EUT has been tested at the request of:

Company:	Traffipax, Inc. 514 Progress Drive Linthicum, MD 21090
Contact:	Mr. Don Wood
Telephone:	443-367-0007
Fax:	443-367-0012
Email:	Don.wood@traffipaxinc.com

1.2 Equipment Under Test

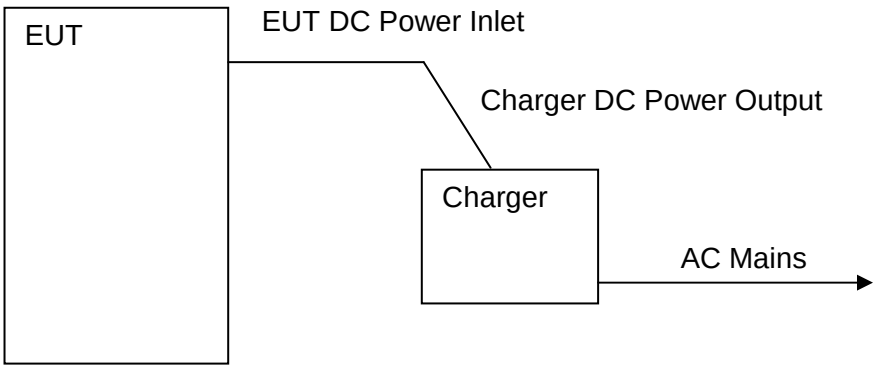
Equipment Type:	Mobile Speed Enforcement System
Model Number(s):	MultaRadarC
Serial number(s):	BOX0901200829-001 (Intertek Assigned)
Manufacturer:	Traffipax, Inc.
EUT receive date:	01/20/2009
EUT received condition:	Prototype in Good Condition
Test start date:	01/20/2009
Test end date:	01/22/2009

1.3 Test Plan Reference: Tested according to the standards listed and ANSI C63.4:2003

1.4 Test Configuration

The EUT is a field disturbance radar transmitter which when tested was operating at 24122.0 MHz. The EUT has an integral waveguide antenna.

1.4.1 Block Diagram



1.4.2. Cables:

Cable	Shielding	Connector	Length (m)	Qty.
AC Mains	None	Plastic IEEE	1.9	1
EUT DC Power Inlet	Braid	Metal/360	2.2	1
Charger DC Output	None	Wire	1.5	2

1.4.3. Support Equipment:

Name: Guest 10A Charger
Model No.: 2611A
Serial No.: DEC0606

1.5 Mode(s) of Operation:

During testing, the EUT was activated from 120V/60Hz AC power and was transmitting continuously in a normal fashion.

1.6 Floor Standing Equipment: Applicable: X Not Applicable:___

2.0 Test Summary

TEST STANDARD	RESULTS	
CFR47 FCC Part 15 Subpart C 15.245		
SUB-TEST	**TEST PARAMETER**	**COMMENT**
Fundamental Field Strength FCC 15.245	The fundamental field strength must not exceed 2500 mV/m (128 dBuV/m) at a distance of 3 meters using an average detector. Peak emissions must meet a limit that is 20 dB higher than the average limit.	Pass
Occupied Bandwidth FCC 15.215	The fundamental frequency must stay within the assigned band.	Pass
Radiated Emissions FCC 15.209, 15.245	Non-harmonic spurious emissions must be at least 50 dB down from the fundamental field strength or must meet the general limits of 15.209, whichever is the lesser attenuation. All limits are specified at a distance of 3 meters, using an average detector. Peak emissions must meet a limit that is 20 dB higher than the average limit.	Pass
Radiated Emissions Above 40 GHz FCC 15.209, 15.245	The 2nd and 3rd Harmonic emissions must not exceed 25.0 mV/m (88 dBuV/m), other harmonics must not exceed 7.5 mV/m (77.5 dBuV/m), and non-harmonic spurious emissions must be at least 50 dB down from the fundamental field strength or must meet the general limits of 15.209, whichever is the lesser attenuation. All limits are specified at a distance of 3 meters, using an average detector. Peak emissions must meet a limit that is 20 dB higher than the average limit.	Pass
AC Line-Conducted Emissions FCC 15.207	Emissions must be below the 15.207 limits.	Pass

REVISION SUMMARY – The following changes have been made to this Report:

Date	Project No.	Project Handler	Page(s)	Item	Description of Change

3.0 Sample Calculations

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG

Where FS = Field Strength in dBµV/m
RA = Receiver Amplitude (including preamplifier) in dBµV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dBµV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dBµV/m. This value in dBµV/m was converted to its corresponding level in µV/m.

RA = 52.0 dBµV
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
FS = 32 dBµV/m

Level in µV/m = [10(32 dBµV/m)/20] = 39.8 µV/m

The following is how net line-conducted readings were determined:

NF = RF + LF + CF + AF
Where NF = Net Reading in dBµV
RF = Reading from receiver in dBµV
LF = LISN Correction Factor in dB
CF = Cable Correction Factor in dB
AF = Attenuator Loss Factor in dB

To convert from dBµV to µV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in µV

Example:

NF = RF + LF + CF + AF = 28.5 + 0.2 + 0.4 + 20.0 = 49.1 dBµV
$UF = 10^{(48.1\ dB\mu V / 20)}$ = 254 µV/m

3.1 Measurement Uncertainty

Compliance of the product is based on the measured value. However, the measurement uncertainty is included for informational purposes.
The expanded uncertainty (k = 2) for radiated emissions from 30 to 1000 MHz has been determined to be:

±3.5 dB at 10m, ±3.8 dB at 3m

The expanded uncertainty (k = 2) for mains conducted emissions from 150 kHz to 30 MHz has been determined to be:

±2.6 dB

The expanded uncertainty (k = 2) for telecom port conducted emissions from 150 kHz to 30 MHz has been determined to be:

±3.2 for ISN and voltage probe measurements
±3.1 for current probe measurements

3.2 Site Description

Test Site(s): 2

Our OATS are 3m and 10m sheltered emissions measurement ranges located in a light commercial environment in Boxborough, Massachusetts. They meet the technical requirements of ANSI C63.4-2003 and CISPR 22:1993/EN 55022:1994 for radiated and conducted emission measurements. The shelter structure is entirely fiberglass and plastic, with outside dimensions of 33 ft x 57 ft. The structure resembles a quonset hut with a center ceiling height of 16.5 ft.

The testing floor is covered by a galvanized sheet metal groundplane that is earth-grounded via copper rods around the perimeter of the site. The joints between individual metal sheets are bridged with a 2 inch wide metal strips to provide low RF impedance contact throughout. The sheets are screwed in place with stainless steel, round-head screws every three inches. Site illumination and HVAC are provided from beneath the ground reference plane through flush entry ports, the port covers are electrically bonded to the ground plane.

A flush metal turntable with 12 ft. diameter and 5000 lb. load capacity (12,000 lb. in Site 3) is provided for floor-standing equipment. A wooden table 80 cm high is used for table-top equipment. The turntable is electrically connected to the ground plane with three copper straps. The straps are connected to the turntable at the center of it with ground braid. The copper strap is directly connected to the groundplane at the edges of the turntable. The turntable is located on the south end of the structure and the antennas are mounted 3 and 10 meters away to the north. The antenna mast is a non-conductive with remote control of antenna height and polarization. The antenna height is adjustable from 1 to 4 meters.

All final radiated emission measurements are performed with the testing personnel and measurement equipment located below the ground reference plane. The site has a full basement underneath the turntable where support equipment may be remotely located. Operation of the antenna, turntable and equipment under test is controlled by remote controls that manipulate the antenna height and polarization and with a turntable control. Test personnel are located below the ellipse when measurements are performed, however the site maintains the ability of having personnel manipulate cables while monitoring test equipment. Ambient radiated emissions are 6 dB or more below the relevant FCC emission limits.

AC mains power is brought to the equipment under test through a power line filter, to remove ambient conducted noise. 50 Hz (240 VAC single phase), 60 Hz power (120 VAC single phase, 208 VAC three phase), and 60 Hz (480 VAC three phase) are available. Conducted emission measurements are performed with a Line Impedance Stabilization Network (LISN) or Artificial Mains Network (AMN) bonded to the ground reference plane. A removable vertical groundplane (2 meter X 2 meter area) is used for line-conducted measurements for table top equipment. The vertical groundplane is electrically connected to the reference groundplane.

The EMC Lab has two Semi-anechoic Chambers and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference groundplanes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

Test Results: Pass

Test Standard: FCC Part 15 Subpart C

Test: Fundamental Field Strength

Performance Criterion: The fundamental field strength must not exceed 2500 mV/m (128 dBuV/m) at a distance of 3 meters using an average detector. Peak emissions must meet a limit that is 20 dB higher than the average limit.

Test Environment:

Environmental Conditions During Testing:		Ambient (°C):	22	Humidity (%):	32	Pressure (hPa):	997
Pretest Verification Performed		Yes		Equipment under Test:		MultaRadarC	
Test Engineer(s):	Nicholas Abbondante			EUT Serial Number:		BOX0901200829-001 (Intertek Assigned)	
Engineer's Initials:	NNA	Date Test Performed:	01/20/2009	Reviewer's Initials:		Date Reviewed:	01/30/09

Test Equipment Used:

TEST EQUIPMENT LIST					
Item	**Equipment Type**	**Make**	**Model No.**	**Serial No.**	**Next Cal. Due**
1	Digital 4 Line Barometer	Mannix	0ABA116	BAR1	06/01/2009
2	Spectrum Analyzer 20Hz - 40 GHz	Rohde & Schwartz	FSEK-30	100225	12/01/2009
3	ANTENNA, RIDGED GUIDE, 18-40 GHZ	EMCO	3116	2090	01/27/2010
4	40 GHz Cable	Megaphase	TM40-K1K1-80	7030802 002	06/05/2009

Software Utilized:

Name	Manufacturer	Version
EXCEL 2000	Microsoft Corporation	9.0.6926 SP-3
EMI BOXBOROUGH	Intertek	3/07/07 Revision

Test Details:

Notes: Peak was compared to the average limits.

Radiated Emissions

Company: Traffipax Inc. Antenna & Cables: SHF Bands: N, LF, HF, SHF
Model #: MultaRadarC Antenna: EMC04 V1m 01-27-2010.txt EMC04 H1m 01-27-2010.txt
Serial #: BOX0901200829-001 (Intertek Assigned) Cable(s): MEG004 06-05-09.txt NONE.
Engineers: Nicholas Abbondante Location: Site 2 Barometer: BAR1
Project #: 3167233 Date(s): 01/20/09
Standard: FCC Part 15 Subpart C 15.245 Temp/Humidity/Pressure: 22c 32% 997mB
Receiver: R&S FSEK-30 (ROS001) Limit Distance (m): 3
PreAmp: PRE9 03-27-09.txt Test Distance (m): 3
PreAmp Used? (Y or N): N Voltage/Frequency: Fresh 12VDC Battery Frequency Range: Frequencies Shown
Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC	IC
PK	V	24122.000	69.8	45.8	4.9	0.0	0.0	120.4	128.0	-7.6	1/3 MHz		
AVG	V	24122.000	69.8	45.8	4.9	0.0	0.0	120.4	128.0	-7.6	1/3 MHz		
PK	H	24122.000	62.2	45.7	4.9	0.0	0.0	112.9	128.0	-15.1	1/3 MHz		
AVG	H	24122.000	62.2	45.7	4.9	0.0	0.0	112.9	128.0	-15.1	1/3 MHz		

Test Results: Pass

Test Standard: FCC Part 15 Subpart C

Test: Occupied Bandwidth

Performance Criterion: The fundamental frequency must stay within the assigned band.

Test Environment:

Environmental Conditions During Testing:		Ambient (°C):	22	Humidity (%):	32	Pressure (hPa):	997
Pretest Verification Performed		Yes		Equipment under Test:		MultaRadarC	
Test Engineer(s):	Nicholas Abbondante			EUT Serial Number:		BOX0901200829-001 (Intertek Assigned)	
Engineer's Initials:	NNA	Date Test Performed:	01/20/2009	Reviewer's Initials:		Date Reviewed:	01/30/09

Test Equipment Used:

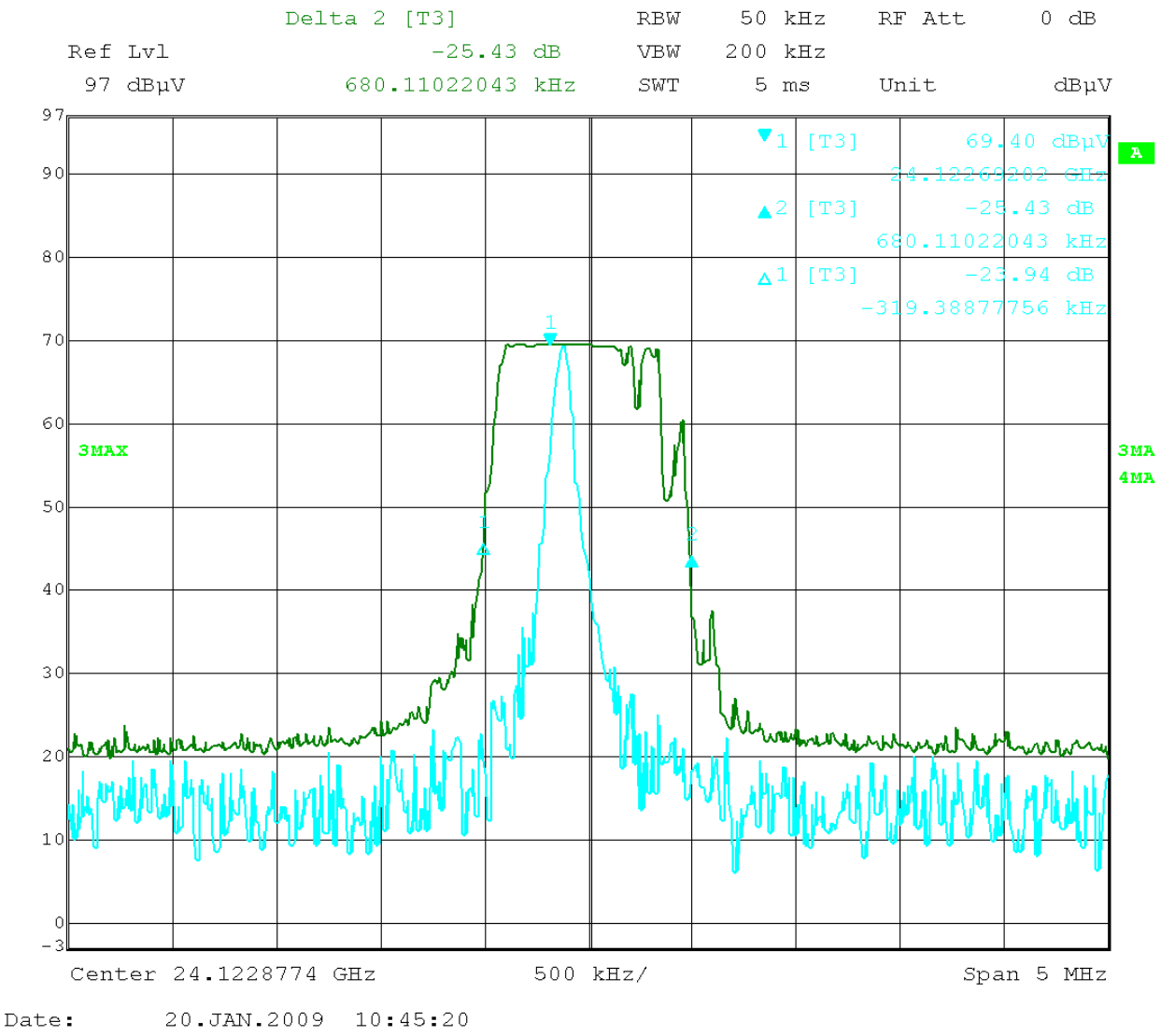
TEST EQUIPMENT LIST					
Item	**Equipment Type**	**Make**	**Model No.**	**Serial No.**	**Next Cal. Due**
1	Digital 4 Line Barometer	Mannix	0ABA116	BAR1	06/01/2009
2	Spectrum Analyzer 20Hz - 40 GHz	Rohde & Schwartz	FSEK-30	100225	12/01/2009
3	ANTENNA, RIDGED GUIDE, 18-40 GHZ	EMCO	3116	2090	01/27/2010
4	40 GHz Cable	Megaphase	TM40-K1K1-80	7030802 002	06/05/2009

Software Utilized:

Name	Manufacturer	Version
EXCEL 2000	Microsoft Corporation	9.0.6926 SP-3
EMI BOXBOROUGH	Intertek	3/07/07 Revision

Test Details:

Notes: The 20 dB bandwidth is 999.5 kHz.



Test Results: Pass

Test Standard: FCC Part 15 Subpart C

Test: Radiated Emissions

Performance Criterion: Non-harmonic spurious emissions must be at least 50 dB down from the fundamental field strength or must meet the general limits of 15.209, whichever is the lesser attenuation. All limits are specified at a distance of 3 meters, using an average detector. Peak emissions must meet a limit that is 20 dB higher than the average limit.

Test Environment:

Environmental Conditions During Testing:		Ambient (°C):	22 19 20	Humidity (%):	32 34 33	Pressure (hPa):	997 1000 1002
Pretest Verification Performed		Yes		Equipment under Test:		MultaRadarC	
Test Engineer(s):	Nicholas Abbondante			EUT Serial Number:		BOX0901200829-001 (Intertek Assigned)	
Engineer's Initials:	NNA	Date Test Performed:	01/20-22/2009	Reviewer's Initials:		Date Reviewed:	01/30/09

Test Equipment Used:

TEST EQUIPMENT LIST					
Item	**Equipment Type**	**Make**	**Model No.**	**Serial No.**	**Next Cal. Due**
1	Digital 4 Line Barometer	Mannix	0ABA116	BAR1	06/01/2009
2	Spectrum Analyzer 20Hz - 40 GHz	Rohde & Schwartz	FSEK-30	100225	12/01/2009
3	9kHz to 3GHz EMI Test Receiver	Rohde & Schwartz	ESCI 1166.5950K03	100067	01/25/2009
4	100MHz-40GHz Preamp	MITEQ	NSP4000-NFG	1260417	03/27/2009
5	ANTENNA	EMCO	3142	9711-1223	02/22/2009
6	HORN ANTENNA	EMCO	3115	9602-4675	10/13/2009
7	ANTENNA, RIDGED GUIDE, 18-40 GHZ	EMCO	3116	2090	01/27/2010
8	10 Meter in floor cable for site 2	ITS	RG214B/U	S2 10M FLR	09/23/2009
9	High Frequency Cable 40GHz	Megaphase	TM40 K1K1 80	CBL030	12/10/2009
10	40 GHz Cable	Megaphase	TM40-K1K1-80	7030802 002	06/05/2009
11	1GHz High Pass Filter	Reactel, Inc	7HS-1G/10G-S11	06-1	10/15/2009
12	3GHz High Pass Filter	Reactel, Inc	7HSX-3G/18G-S11	06-1	10/15/2009
13	18GHz High Pass Filter	Reactel, Inc	7HS-18G/40G K11	(06)1	04/11/2009

Software Utilized:

Name	Manufacturer	Version
EXCEL 2000	Microsoft Corporation	9.0.6926 SP-3
EMI BOXBOROUGH	Intertek	3/07/07 Revision

Test Results:

Notes: In some cases, peak is compared to the average limit. A ferrite, Wurth Elektronik #72471221 was placed on the AC input cable to the battery charger in a single pass configuration.

Special Radiated Emissions

Company: Traffipax Inc.
Model #: MultaRadarC
Serial #: BOX0901200829-001 (Intertek Assigned)
Engineers: Nicholas Abbondante Location: Site 2
Project #: 3167233 Date(s): 01/21/09 01/22/09
Standard: FCC Part 15 Subpart C 15.245
Receiver: R&S ESCI (ROS002) Limit Distance (m): 3
PreAmp: PRE9 03-27-09.txt Test Distance (m): 10
PreAmp Used? (Y or N): N Voltage/Frequency: Fresh 12V Battery Frequency Range: 30-1000 MHz

Antenna & Cables: N Bands: N, LF, HF, SHF
Antenna: LOG2 2-22-09 V10m.txt LOG2 2-22-09 H10m.txt
Cable(s): S2 10M FLR 09-23-09.txt NONE.
Barometer: BAR1
Temp/Humidity/Pressure: 19c 34% 1000mB
20c 33% 1002mB

Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC	IC
Note: with Wurth Elektronik ferrite #74271221 on AC input cable at battery charger in a single pass-through configuration													
PK	V	34.800	35.1	11.8	0.8	0.0	-10.5	58.1	69.9	-11.8	120/300 kHz		
PK	V	41.660	34.9	9.3	0.9	0.0	-10.5	55.5	69.9	-14.4	120/300 kHz		
PK	V	46.820	38.0	7.9	0.9	0.0	-10.5	57.2	69.9	-12.7	120/300 kHz		
PK	V	51.120	43.6	6.8	1.5	0.0	-10.5	62.3	69.9	-7.6	120/300 kHz		
Note: This point is the flash of the camera in charging mode (worst case)													
PK	V	62.652	41.8	6.7	1.6	0.0	-10.5	60.5	69.9	-9.4	120/300 kHz		
PK	V	85.706	41.8	7.5	1.8	0.0	-10.5	61.6	69.9	-8.3	120/300 kHz		
PK	V	122.240	27.3	8.2	2.1	0.0	-10.5	48.1	69.9	-21.8	120/300 kHz		RB
QP	V	136.336	19.2	8.5	2.3	0.0	-10.5	40.5	43.5	-3.0	120/300 kHz	RB	RB
PK	V	140.320	29.7	9.1	2.3	0.0	-10.5	51.6	69.9	-18.3	120/300 kHz		
QP	V	150.000	19.4	10.8	2.4	0.0	-10.5	43.1	43.5	-0.4	120/300 kHz	RB	
Note: This point is the flash of the camera in non-charging mode (not visible in charge mode)													
PK	V	153.800	26.3	11.3	2.4	0.0	-10.5	50.4	69.9	-19.5	120/300 kHz		
PK	V	154.072	29.2	11.3	2.4	0.0	-10.5	53.3	69.9	-16.6	120/300 kHz		
QP	V	164.900	18.4	11.8	2.5	0.0	-10.5	43.1	43.5	-0.4	120/300 kHz	RB	
PK	V	195.200	30.1	12.0	2.2	0.0	-10.5	54.8	69.9	-15.1	120/300 kHz		
PK	V	202.700	25.7	12.1	2.3	0.0	-10.5	50.6	69.9	-19.3	120/300 kHz		
PK	V	226.834	24.8	12.5	2.4	0.0	-10.5	50.1	69.9	-19.8	120/300 kHz		
PK	V	233.466	21.5	13.1	2.4	0.0	-10.5	47.5	69.9	-22.4	120/300 kHz		
Note: This is the flash of the camera in charging mode (worst case). Broadband was also observed here.													
QP	V	244.200	8.0	13.3	2.5	0.0	-10.5	34.2	46.0	-11.8	120/300 kHz	RB	RB
Note: This is the flash of the camera in charging mode (worst case). Broadband was also observed here.													
QP	V	252.000	11.8	13.3	2.5	0.0	-10.5	38.1	46.0	-7.9	120/300 kHz	RB	RB
QP	V	257.200	8.6	13.4	2.6	0.0	-10.5	35.0	46.0	-11.0	120/300 kHz	RB	RB
QP	V	270.400	13.9	13.7	2.7	0.0	-10.5	40.8	46.0	-5.2	120/300 kHz	RB	RB
PK	V	300.000	27.7	13.9	2.8	0.0	-10.5	54.9	69.9	-15.0	120/300 kHz		
PK	V	319.600	9.6	14.9	2.9	0.0	-10.5	37.8	69.9	-32.1	120/300 kHz		
QP	V	333.300	11.1	15.4	3.0	0.0	-10.5	40.0	46.0	-6.0	120/300 kHz	RB	RB
PK	V	344.200	23.5	15.8	3.0	0.0	-10.5	52.8	69.9	-17.1	120/300 kHz		
PK	V	350.000	24.0	16.1	3.0	0.0	-10.5	53.5	69.9	-16.4	120/300 kHz		
PK	V	366.657	15.3	16.8	3.1	0.0	-10.5	45.6	69.9	-24.3	120/300 kHz		
Note: This point is the flash of the camera in charging mode (worst case)													
PK	H	393.206	21.2	17.8	3.3	0.0	-10.5	52.7	69.9	-17.2	120/300 kHz		
PK	V	433.275	14.8	17.7	3.4	0.0	-10.5	46.4	69.9	-23.5	120/300 kHz		
Note: This point is the flash of the camera in charging mode (worst case)													
PK	V	441.257	33.0	17.9	3.4	0.0	-10.5	64.8	69.9	-5.1	120/300 kHz		
PK	H	491.520	12.2	18.5	3.7	0.0	-10.5	44.9	69.9	-25.0	120/300 kHz		
PK	H	666.600	10.2	21.4	4.3	0.0	-10.5	46.4	69.9	-23.5	120/300 kHz		
PK	H	833.400	12.2	22.4	4.9	0.0	-10.5	50.0	69.9	-19.9	120/300 kHz		

Special Radiated Emissions

Company: Traffipax Inc.
Model #: MultaRadarC
Serial #: BOX0901200829-001 (Intertek Assigned)
Engineers: Nicholas Abbondante Location: Site 2
Project #: 3167233 Date(s): 01/20/09 01/21/09
Standard: FCC Part 15 Subpart C 15.245
Receiver: R&S FSEK-30 (ROS001) Limit Distance (m): 3
PreAmp: PRE9 03-27-09.txt Test Distance (m): 1
PreAmp Used? (Y or N): Y Voltage/Frequency: Fresh 12VDC Battery Frequency Range: 1-18 GHz

Antenna & Cables: LF Bands: N, LF, HF, SHF
Antenna: Horn2 V1m 10-13-09.txt Horn2 H1m 10-13-09.txt
Cable(s): MEG004 06-05-09.txt CBL030 12-10-09.txt
Barometer: BAR1 Filters: REA003 REA004
Temp/Humidity/Pressure: 22c 32% 997mB
19c 34% 1000mB

Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC	IC
Note: Emissions are representative of both charging and non-charging mode													
PK	H	1000.000	51.7	24.2	1.4	29.1	9.5	38.7	54.0	-15.3	1/3 MHz	RB	RB
PK	H	1008.000	43.6	24.2	1.4	29.1	9.5	30.6	54.0	-23.4	1/3 MHz	RB	RB
PK	V	1033.300	49.2	24.1	1.5	29.1	9.5	36.1	54.0	-17.9	1/3 MHz	RB	RB
PK	V	1133.600	48.7	24.5	1.5	29.1	9.5	36.1	54.0	-17.9	1/3 MHz	RB	RB
PK	V	1166.300	44.3	24.6	1.6	29.1	9.5	31.8	54.0	-22.2	1/3 MHz	RB	RB
PK	H	1200.400	47.2	24.9	1.6	29.1	9.5	35.0	54.0	-19.0	1/3 MHz	RB	RB
PK	V	1266.500	50.6	25.0	1.6	29.1	9.5	38.6	69.9	-31.3	1/3 MHz		RB
PK	V	1333.000	55.9	25.3	1.7	29.1	9.5	44.2	54.0	-9.8	1/3 MHz	RB	RB
PK	V	1400.800	51.8	25.5	1.7	29.1	9.5	40.4	54.0	-13.6	1/3 MHz	RB	RB
PK	V	1433.000	44.2	25.6	1.8	29.1	9.5	32.9	69.9	-37.0	1/3 MHz		
PK	V	1466.400	48.3	25.8	1.8	29.1	9.5	37.2	54.0	-16.8	1/3 MHz	RB	RB
PK	H	1500.000	43.5	25.9	1.8	29.1	9.5	32.6	54.0	-21.4	1/3 MHz	RB	RB
PK	V	1666.400	48.2	26.5	1.9	29.1	9.5	38.0	54.0	-16.0	1/3 MHz	RB	RB
PK	V	1867.000	41.7	27.3	2.1	29.1	9.5	32.4	69.9	-37.5	1/3 MHz		
PK	V	2000.000	44.8	27.8	2.2	29.2	9.5	36.1	69.9	-33.8	1/3 MHz		
PK	V	2033.000	38.2	27.9	2.2	29.2	9.5	29.6	69.9	-40.3	1/3 MHz		
PK	V	2064.100	41.0	27.9	2.2	29.2	9.5	32.5	69.9	-37.4	1/3 MHz		
PK	V	2099.900	37.9	28.0	2.3	29.2	9.5	29.5	69.9	-40.4	1/3 MHz		
PK	V	2120.200	37.3	28.0	2.3	29.2	9.5	29.0	69.9	-40.9	1/3 MHz		
PK	V	2136.300	64.0	28.0	2.3	29.2	9.5	55.7	69.9	-14.2	1/3 MHz		
PK	V	2300.000	39.1	28.3	2.6	29.2	9.5	31.3	54.0	-22.7	1/3 MHz	RB	RB
PK	V	2598.200	39.7	29.1	2.9	29.2	9.5	32.9	69.9	-37.0	1/3 MHz		
PK	V	2666.500	37.8	29.3	2.9	29.2	9.5	31.2	69.9	-38.7	1/3 MHz		RB
PK	V	2869.500	46.5	30.0	2.9	29.2	9.5	40.6	54.0	-13.4	1/3 MHz	RB	RB
PK	V	2886.900	46.8	30.1	2.9	29.2	9.5	41.1	54.0	-12.9	1/3 MHz	RB	RB
PK	V	2903.400	46.8	30.2	2.9	29.2	9.5	41.1	69.9	-28.8	1/3 MHz		
PK	V	2914.000	45.6	30.2	2.9	29.2	9.5	39.9	69.9	-30.0	1/3 MHz		
PK	V	3800.000	44.8	32.4	3.1	29.2	9.5	41.5	54.0	-12.5	1/3 MHz	RB	RB
PK	V	3927.800	46.5	32.7	3.2	29.2	9.5	43.7	54.0	-10.3	1/3 MHz	RB	RB
Note: Noise Floor. Device was pre-scanned at a distance < 1m, with no emissions detected.													
PK	V	6721.000	39.0	35.4	4.4	28.6	9.5	40.7	69.9	-29.2	1/3 MHz		
PK	V	17803.600	35.7	46.6	7.9	28.3	9.5	52.3	54.0	-1.7	1/3 MHz	RB	RB

Special Radiated Emissions

Company: Traffipax Inc.
Model #: MultaRadarC
Serial #: BOX0901200829-001 (Intertek Assigned)
Engineers: Nicholas Abbondante Location: Site 2
Project #: 3167233 Date(s): 01/20/09
Standard: FCC Part 15 Subpart C 15.245
Receiver: R&S FSEK-30 (ROS001) Limit Distance (m): 3
PreAmp: PRE9 03-27-09.txt Test Distance (m): 0.1
PreAmp Used? (Y or N): Y Voltage/Frequency: Fresh 12VDC Battery Frequency Range: 18-40 GHz

Antenna & Cables: HF Bands: N, LF, HF, SHF
Antenna: EMC04 V1m 01-27-2010.txt EMC04 H1m 01-27-2010.txt
Cable(s): MEG004 06-05-09.txt CBL030 12-10-09.txt
Barometer: BAR1 Filter: REA006
Temp/Humidity/Pressure: 22c 32% 997mB

Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC	IC
Note: Noise Floor. Device was pre-scanned at a distance < 1m, with no emissions detected.													
PK	V	19142.300	35.8	45.5	8.3	28.7	29.5	31.4	74.0	-42.6	1/3 MHz	RB	RB
AVG	V	19142.300	35.8	45.5	8.3	28.7	29.5	31.4	54.0	-22.6	1/3 MHz	RB	RB
PK	V	25827.700	37.8	46.5	10.3	25.8	29.5	39.2	89.9	-50.7	1/3 MHz		
AVG	V	25827.700	37.8	46.5	10.3	25.8	29.5	39.2	69.9	-30.7	1/3 MHz		
PK	V	32368.700	43.5	48.5	12.6	26.0	29.5	49.0	89.9	-40.9	1/3 MHz		
AVG	V	32368.700	43.5	48.5	12.6	26.0	29.5	49.0	69.9	-20.9	1/3 MHz		
PK	V	39915.800	44.9	47.9	15.0	27.5	29.5	50.8	74.0	-23.2	1/3 MHz	RB	RB
AVG	V	39915.800	44.9	47.9	15.0	27.5	29.5	50.8	54.0	-3.2	1/3 MHz	RB	RB

Test Results: Pass

Test Standard: FCC Part 15 Subpart C

Test: Radiated Emissions Above 40 GHz

Performance Criterion: The 2nd and 3rd Harmonic emissions must not exceed 25.0 mV/m (88 dBuV/m), other harmonics must not exceed 7.5 mV/m (77.5 dBuV/m), and non-harmonic spurious emissions must be at least 50 dB down from the fundamental field strength or must meet the general limits of 15.209, whichever is the lesser attenuation. All limits are specified at a distance of 3 meters, using an average detector. Peak emissions must meet a limit that is 20 dB higher than the average limit.

Test Environment:

Environmental Conditions During Testing:		Ambient (°C):	20	Humidity (%):	33	Pressure (hPa):	1002
Pretest Verification Performed		Yes		Equipment under Test:		MultaRadarC	
Test Engineer(s):	Nicholas Abbondante			EUT Serial Number:		BOX0901200829-001 (Intertek Assigned)	
Engineer's Initials:	NNA	Date Test Performed:	01/22/2009	Reviewer's Initials:	JG	Date Reviewed:	01/30/09

Test Equipment Used:

TEST EQUIPMENT LIST					
Item	**Equipment Type**	**Make**	**Model No.**	**Serial No.**	**Next Cal. Due**
1	Digital 4 Line Barometer	Mannix	0ABA116	BAR1	06/01/2009
2	Mixer / Antenna	Oleson Microwave Lab	M08HWA	F21011-1	Verified
3	Mixer / Antenna	Oleson Microwave Lab	M12HWD	E21011-1	Verified
4	Mixer / Antenna	Oleson Microwave Lab	M19HWA	U21011-1	Verified
5	40GHz Cable	Megaphase	TM40-K1K1-197	7030801 001	06/05/2009
6	Spectrum Analyzer 20Hz - 40 GHz	Rohde & Schwartz	FSEK-30	100225	12/01/2009

Software Utilized:

Name	Manufacturer	Version
EXCEL 2000	Microsoft Corporation	9.0.6926 SP-3
EMI BOXBOROUGH	Intertek	3/07/07 Revision

Test Results:

Special Radiated Emissions

Company: Traffipax Inc.
Model #: MultaRadarC
Serial #: BOX0901200829-001 (Intertek Assigned)
Engineers: Nicholas Abbondante Location: Site 2
Project #: 3167233 Date(s): 01/22/09
Standard: FCC Part 15 Subpart C 15.245
Receiver: R&S FSEK-30 (ROS001) Limit Distance (m): 3
PreAmp: PRE9 03-27-09.txt Test Distance (m): 0.05
PreAmp Used? (Y or N): N Voltage/Frequency: 120V/60Hz or Fresh 12V Battery Frequency Range: 40-100 GHz

Antenna & Cables: N Bands: N, LF, HF, SHF
Antenna: OML2, OML3, OML4, 12-10-2009 NONE.
Cable(s): MEG001 06-05-09.txt NONE.
Barometer: BAR1
Temp/Humidity/Pressure: 20c 33% 1002mB

Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC	IC
Note: 40-60 GHz Range using mixer OML4													
PK	V	40000.000	42.1	38.2	1.6	0.0	35.6	46.3	74.0	-27.7	1/3 MHz	RB	RB
AVG	V	40000.000	29.3	38.2	1.6	0.0	35.6	33.6	54.0	-20.4	1/3 MHz	RB	RB
PK	V	48000.000	38.6	39.8	1.6	0.0	35.6	44.4	108.0	-63.6	1/3 MHz	RB	
AVG	V	48000.000	30.1	39.8	1.6	0.0	35.6	36.0	88.0	-52.0	1/3 MHz	RB	
PK	V	60000.000	49.2	41.7	1.6	0.0	35.6	57.0	74.0	-17.0	1/3 MHz	RB	
AVG	V	60000.000	37.1	41.7	1.6	0.0	35.6	44.8	54.0	-9.2	1/3 MHz	RB	
Note: 60-90 GHz Range using mixer OML3													
PK	V	60000.000	51.7	41.7	1.6	0.0	35.6	59.4	74.0	-14.6	1/3 MHz	RB	
AVG	V	60000.000	38.9	41.7	1.6	0.0	35.6	46.6	54.0	-7.4	1/3 MHz	RB	
PK	V	72000.000	51.8	43.3	1.6	0.0	35.6	61.1	108.0	-46.9	1/3 MHz	RB	
AVG	V	72000.000	39.6	43.3	1.6	0.0	35.6	48.9	88.0	-39.1	1/3 MHz	RB	
PK	V	90000.000	51.1	45.3	1.6	0.0	35.6	62.5	74.0	-11.5	1/3 MHz	RB	
AVG	V	90000.000	39.2	45.3	1.6	0.0	35.6	50.6	54.0	-3.4	1/3 MHz	RB	
Note: 90-100 GHz Range using mixer OML2													
PK	V	90000.000	53.1	45.3	1.6	0.0	35.6	64.4	74.0	-9.6	1/3 MHz	RB	
AVG	V	90000.000	41.3	45.3	1.6	0.0	35.6	52.7	54.0	-1.3	1/3 MHz	RB	
PK	V	96000.000	52.7	45.8	1.6	0.0	35.6	64.6	97.5	-32.9	1/3 MHz	RB	
AVG	V	96000.000	40.6	45.8	1.6	0.0	35.6	52.5	77.5	-25.0	1/3 MHz	RB	
PK	V	100000.000	53.3	46.2	1.6	0.0	35.6	65.5	74.0	-8.5	1/3 MHz	RB	
AVG	V	100000.000	41.0	46.2	1.6	0.0	35.6	53.2	54.0	-0.8	1/3 MHz	RB	

Test Results: Pass

Test Standard: FCC Part 15 Subpart C

Test: AC Line-Conducted Emissions

Performance Criterion: Emissions must be below the 15.207 limits:

Frequency of emission (MHz)	Conducted limit (dB[mu]V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

Test Environment:

Environmental Conditions During Testing:		Ambient (°C):	21	Humidity (%):	33	Pressure (hPa):	1001
Pretest Verification Performed		Yes		Equipment under Test:		MultaRadarC	
Test Engineer(s):	Nicholas Abbondante			EUT Serial Number:		BOX0901200829-001 (Intertek Assigned)	
Engineer's Initials:	NNA	Date Test Performed:	01/22/2009	Reviewer's Initials:	JG	Date Reviewed:	01/30/09

Test Equipment Used:

TEST EQUIPMENT LIST					
Item	**Equipment Type**	**Make**	**Model No.**	**Serial No.**	**Next Cal. Due**
1	Digital 4 Line Barometer	Mannix	0ABA116	BAR1	06/01/2009
2	9kHz to 3GHz EMI Test Receiver	Rohde & Schwartz	ESCI 1166.5950K03	100067	01/25/2009
3	Cable BNC/BNC, 30'	ITS	BNC-30	CBLBNC1	08/18/2009
4	LISN, 50uH, .01 - 50MHz, 24A	Solar Electronics	9252-50-R-24-BNC	941714	10/28/2009
5	Attenuator, 20dB	Mini Circuits	20dB, 50 ohm	DS29	03/05/2009

Software Utilized:

Name	Manufacturer	Version
EXCEL 2000	Microsoft Corporation	9.0.6926 SP-3
EMI BOXBOROUGH	Intertek	3/07/07 Revision

Test Results:

Conducted Emissions

Company: Traffipax Inc.
Model #: MultaRadarC
Serial #: BOX0901200829-001 (Intertek Assigned)
Engineer(s): Nicholas Abbondante
Project #: 3167233
Standard: FCC Part 15 Subpart C 15.207
Barometer: BAR1

Location: Site 2
Date: 01/22/09
Temp/Humidity/Pressure: 21c 33% 1001mB
Voltage/Frequency: 120V/60Hz

Receiver: R&S ESCI (ROS002)
Cable: CBLBNC1 8-18-09.txt
LISN 1: LISN12 [1] 10-26-09.txt
LISN 2: LISN12 [2] 10-26-09.txt
LISN 3: NONE.
LISN 4: NONE.
Attenuator: DS29 03-05-09.txt
Frequency Range: 150 kHz - 30 MHz

Net is the sum of worst-case lisn, cable, & attenuator losses, and initial reading, factors are not shown
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor; Bandwidth denoted as RBW/VBW

Detector Type	Frequency MHz	Reading Line 1 dB(uV)	Reading Line 2 dB(uV)	Reading Line 3 dB(uV)	Reading Line 4 dB(uV)	Net dB(uV)	QP Limit dB(uV)	Margin dB	Bandwidth
QP	0.188	33.6	35.5			56.8	64.1	-7.3	9/30 kHz
QP	0.251	35.4	36.9			58.2	61.7	-3.6	9/30 kHz
QP	0.312	30.6	30.4			51.7	59.9	-8.2	9/30 kHz
QP	0.564	22.1	22.3			43.3	56.0	-12.7	9/30 kHz
QP	0.689	23.9	24.0			44.9	56.0	-11.1	9/30 kHz
QP	5.100	34.0	33.8			54.7	60.0	-5.3	9/30 kHz
QP	13.324	30.2	30.6			51.6	60.0	-8.4	9/30 kHz
QP	18.473	34.1	34.8			55.9	60.0	-4.1	9/30 kHz
QP	22.084	29.8	31.2			52.4	60.0	-7.6	9/30 kHz

Detector Type	Frequency MHz	Reading Line 1 dB(uV)	Reading Line 2 dB(uV)	Reading Line 3 dB(uV)	Reading Line 4 dB(uV)	Net dB(uV)	Average Limit dB(uV)	Margin dB	Bandwidth
AVG	0.188	25.4	25.6			46.9	54.1	-7.2	9/30 kHz
AVG	0.251	24.9	25.9			47.2	51.7	-4.6	9/30 kHz
AVG	0.312	16.4	17.2			38.4	49.9	-11.5	9/30 kHz
AVG	0.564	19.0	18.6			39.9	46.0	-6.1	9/30 kHz
AVG	0.689	19.5	19.3			40.3	46.0	-5.7	9/30 kHz
AVG	5.100	20.5	20.8			41.7	50.0	-8.3	9/30 kHz
AVG	13.324	14.1	12.1			34.9	50.0	-15.1	9/30 kHz
AVG	18.473	19.1	19.3			40.4	50.0	-9.6	9/30 kHz
AVG	22.084	14.5	16.0			37.2	50.0	-12.8	9/30 kHz