

Test Report for Unlicensed Low Power Transmitter

FCC Applicable Rule Parts: 15.205, 15.207, 15.209

Applicant: Farpointe Data Inc.
2177 Leghorn Street
Mountain View, CA 94043

FCC ID: T8I-DELTA-USB
Model No.: Delta USB

Description of device:

The DELTA USB is part of a proximity card software developer kit using dual frequency, non-contact, identification system based upon the latest techniques in radio frequency identification (RFID). The Delta USB has a receiver circuit, a microprocessor, a 125 kHz pulsed exciter and a 13.56 MHz CW exciter circuit that includes a magnetic coil. The tags and cards that are read by the reader have a highly reliable radio frequency integrated circuit (RFIC), attached to a magnetic coil inside a durable, environmentally secure plastic housing.

TEST REQUIREMENTS

The referenced device is subject to certification under Part 2 of FCC Rules. The specific emissions limits and test requirements are found in Part 15 of FCC Rules. In addition to the device specific requirements listed in 15.225 (re-printed below), the following Part 15 requirements are universal to all unlicensed transmitters and would also apply:

- 15.19 Labeling requirements
- 15.20 Accessories
- 15.21 Information to user
- 15.31 Measurement standards
- 15.33 Frequency range of measurements
- 15.35 Measurement detector functions and bandwidths
- 15.109 Radiated Emissions (unintentional radiators)
- 15.203 Antenna requirement
- 15.204 External radio frequency power amplifiers and antenna modifications.
- 15.205 Restricted bands of operation.
- 15.207 Conducted limits
- 15.209 Radiated emission limits, general requirements.
- 15.225 Operation within the band 13.110 – 14.010 MHz

REVISION INFORMATION AND ATTESTATION OF RESULTS

Report No: 08PR003FCC

REV No.	Description	Revised By:	Date
-	Original Issue	T. Cokenias	3/5/2008

FCC ID: T8I-DELTA-USB meets all FCC requirements for a device of this type.

THOMAS N. COKENIAS

5 March 2008



EMC and Radio Regulatory Consultant
Agent for Farpointe Data Inc.

15.205 Restricted bands of operation.

Only spurious emissions are permitted in any of the frequency bands listed below: The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209.

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
10.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	
13.36 - 13.41			

15.209 Radiated emission limits, general requirements.

Except as provided elsewhere in this paragraph the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength uV/m	Measurement distance, m
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/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

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz.

15.225 Operation within the band 13.110 – 14.010 MHz.

(a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter (= 84 dBuV/m) at 30 meters.

(b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter (=50.5dBuV/m) at 30 meters.

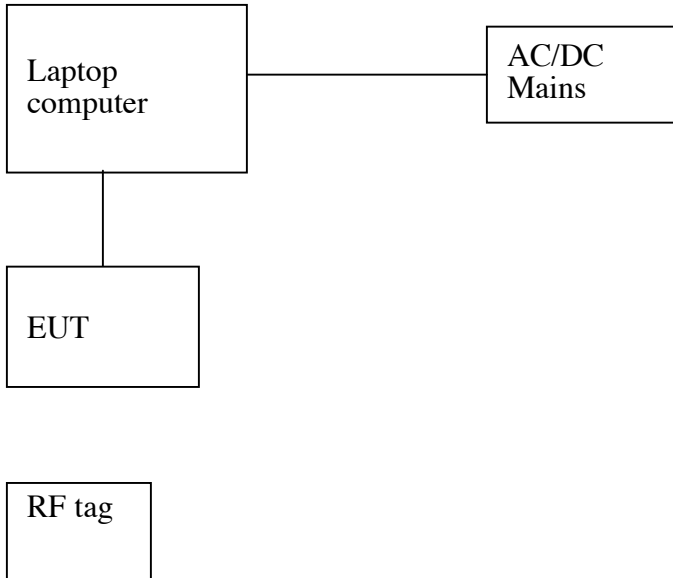
(c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter (=40.5 dBuV/m) at 30 meters.

(d) The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

(e) The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

(f) In the case of radio frequency powered tags designed to operate with a device authorized under this section, the tag may be approved with the device or be considered as a separate device subject to its own authorization. Powered tags approved with a device under a single application shall be labeled with the same identification number as the device.

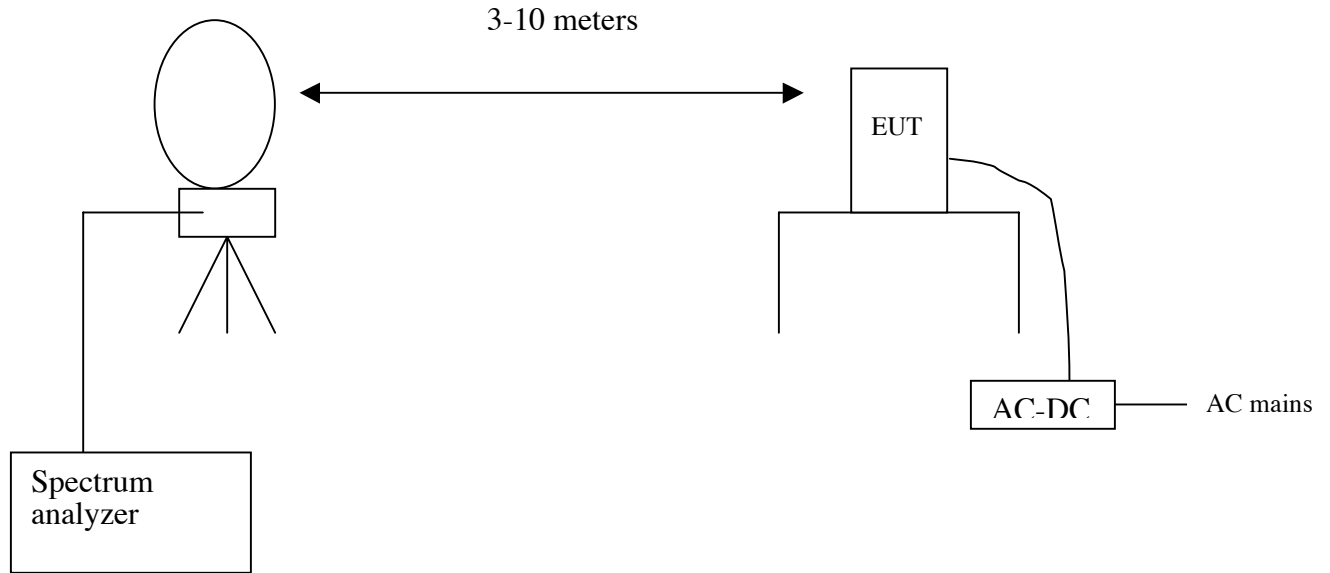
Test Set-up Diagram



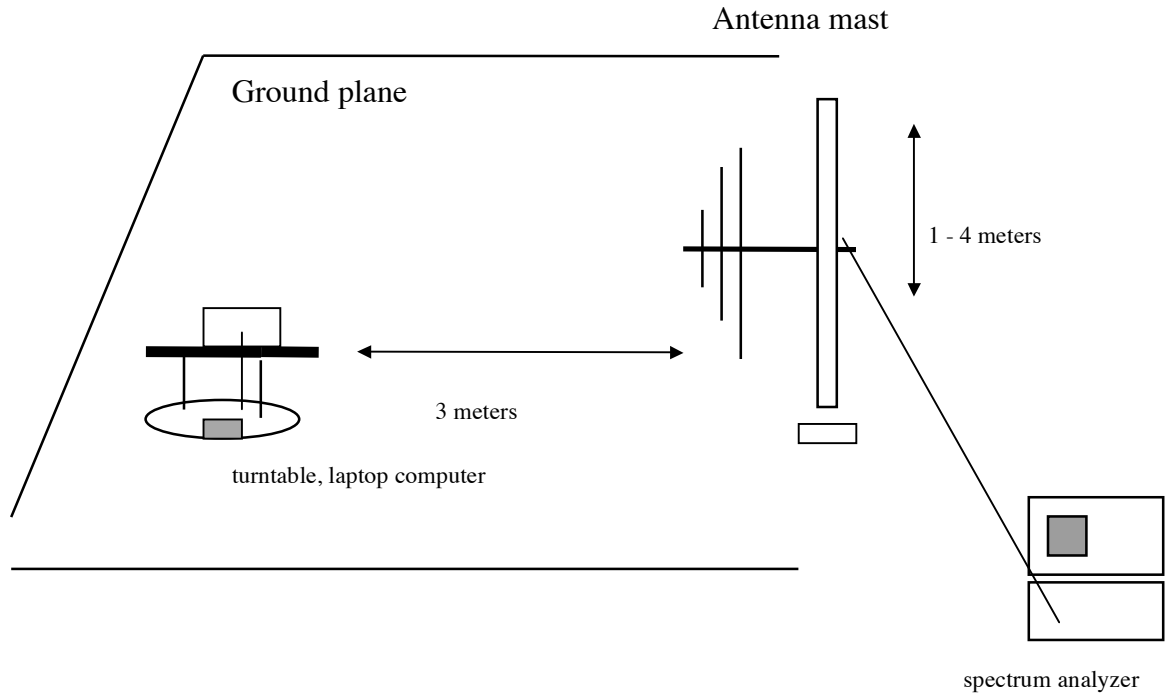
TEST EQUIPMENT

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	Cal Due
Antenna, Loop, 30 MHz	EMCO	6502	C00593	10/24/08
RF Filter Section, 2.9 GHz	Agilent / HP	85420E	C00958	06/12/08
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	10/13/08
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	03/18/08
Preamplifier, 1300 MHz	Agilent / HP	8447D	0	05/09/08

**15.205 and 15.209 Radiated Emissions
Radiated Test Set-up, 0.125 - 30MHz**



15.205 and 15.209 Radiated Emissions Radiated Test Set-up, 30 - 1000 MHz



Test Procedures, 0.125 – 30 MHz

The EUT was placed on a non-conductive table located on a large open area free of nearby metal obstructions. The loop antenna was placed at a location 10m from the EUT. Radiated emissions were measured with the loop antenna both parallel and perpendicular to the plane of the EUT loop antenna. For low level harmonic and band edge emissions, antenna distance was decreased to 3m

Test Procedures, 30 -1000 MHz

The EUT was placed on a turntable in a 5m anechoic chamber. The EUT was set to normal operating conditions (constantly transmitting). Radiated emissions from the EUT were measured according to the dictates of ANSI C63.4.

Test Results

The EUT emissions are below the limits in 15.209.

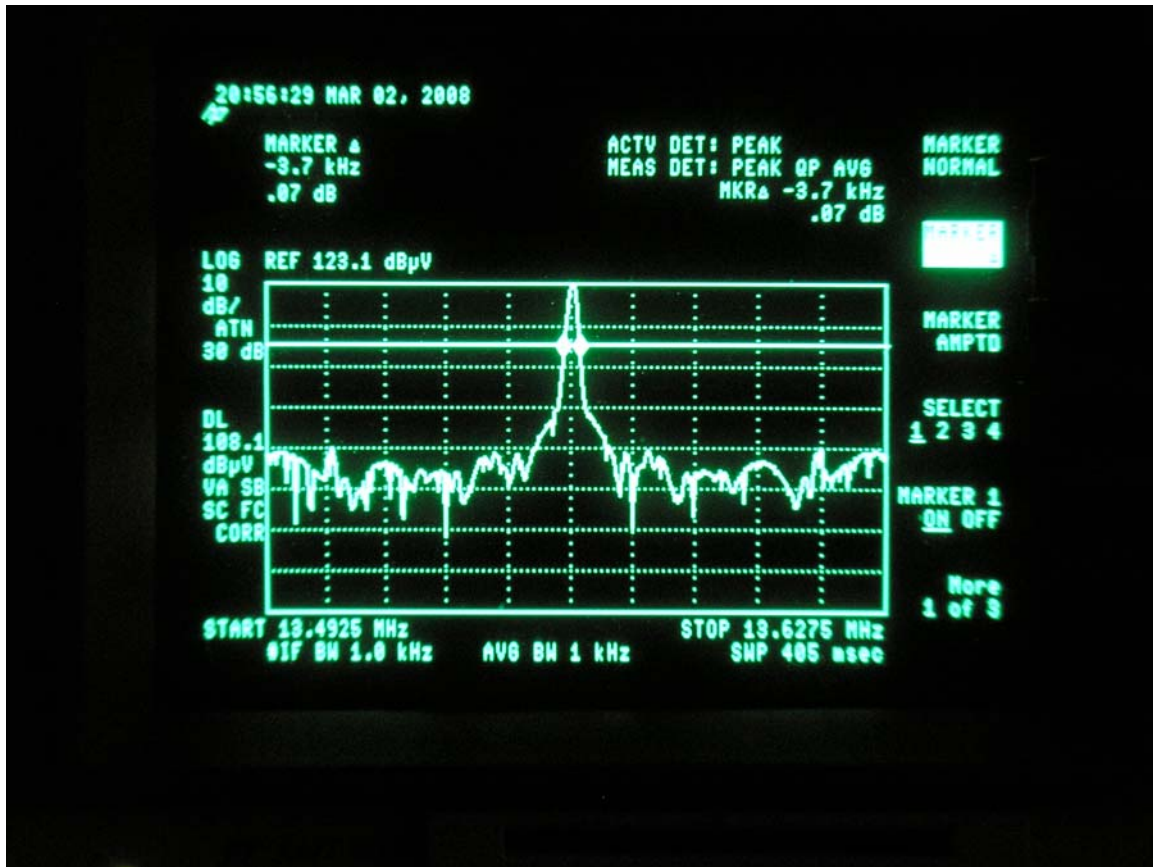
Radiated Emissions, 0.125 – 30 MHz

FCC Part 15, Subpart B & C		3 Meter Distance Measurement At Open Field						
Company: Farpointe Project #: 07U11358 Model #: Delta USB Tester: Tom Chen Date: 11-27-07								
Frequency (MHz)	PK (dBu/V)	QP (dBu/V)	AF (dB/m)	Distance Correction (dB)	PK Corrected Reading (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Notes
Loop Antenna Face On:								
0.125	64.37		10.481	-80.00	-5.15	25.67	-30.8	3m distance
0.25	41.8		10.388	-80.00	-27.81	19.65	-47.5	3m distance
0.375	46.87		10.294	-80.00	-22.84	16.12	-39.0	3m distance
0.5	36.6		10.2	-40.00	6.80	33.62	-26.8	3m distance
0.625	48.6		10.225	-40.00	18.83	31.69	-12.9	3m distance, AM radio
0.75	65.32		10.25	-40.00	35.57	30.10	5.5	3m distance, AM radio
0.875	77.94		10.275	-40.00	48.22	28.76	19.5	3m distance, AM radio
1	40		10.3	-40.00	10.30	27.60	-17.3	3m distance, AM radio
1.125	63.4		10.294	-40.00	33.69	26.58	7.1	3m distance, AM radio
Loop Antenna Face Off:								
0.125	58.2		10.481	-80.00	-11.32	25.67	-37.0	3mdistance
0.25	43.58		10.388	-80.00	-26.03	19.65	-45.7	3mdistance
0.375	42.3		10.294	-80.00	-27.41	16.12	-43.5	3mdistance
0.5	38.7		10.2	-40.00	8.90	33.62	-24.7	3mdistance
0.625	54.2		10.225	-40.00	24.43	31.69	-7.3	3m distance, AM radio
0.75	75.53		10.25	-40.00	45.78	30.10	15.7	3m distance, AM radio
0.875	65.5		10.275	-40.00	35.78	28.76	7.0	3m distance, AM radio
1	46.8		10.3	-40.00	17.10	27.60	-10.5	3m distance, AM radio
1.125	57.53		10.294	-40.00	27.82	26.58	1.2	3m distance, AM radio
* No more emissions were found up to 30MHz								
Note: The emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 30-100kHz and above 10000Mhz. Radiated emission limits in these three bands are based on measurements employing an average								
P.K. = Peak Q.P. = Quasi Peak Readings Below 150kHz => RBW=VBW=200 or 300Hz A.F. = Antenna factor Above 150kHz =>RBW=VBW=9 or 10kHz (Average => VBW=10Hz)								

Radiated Emissions, 13.56 – 30 MHz

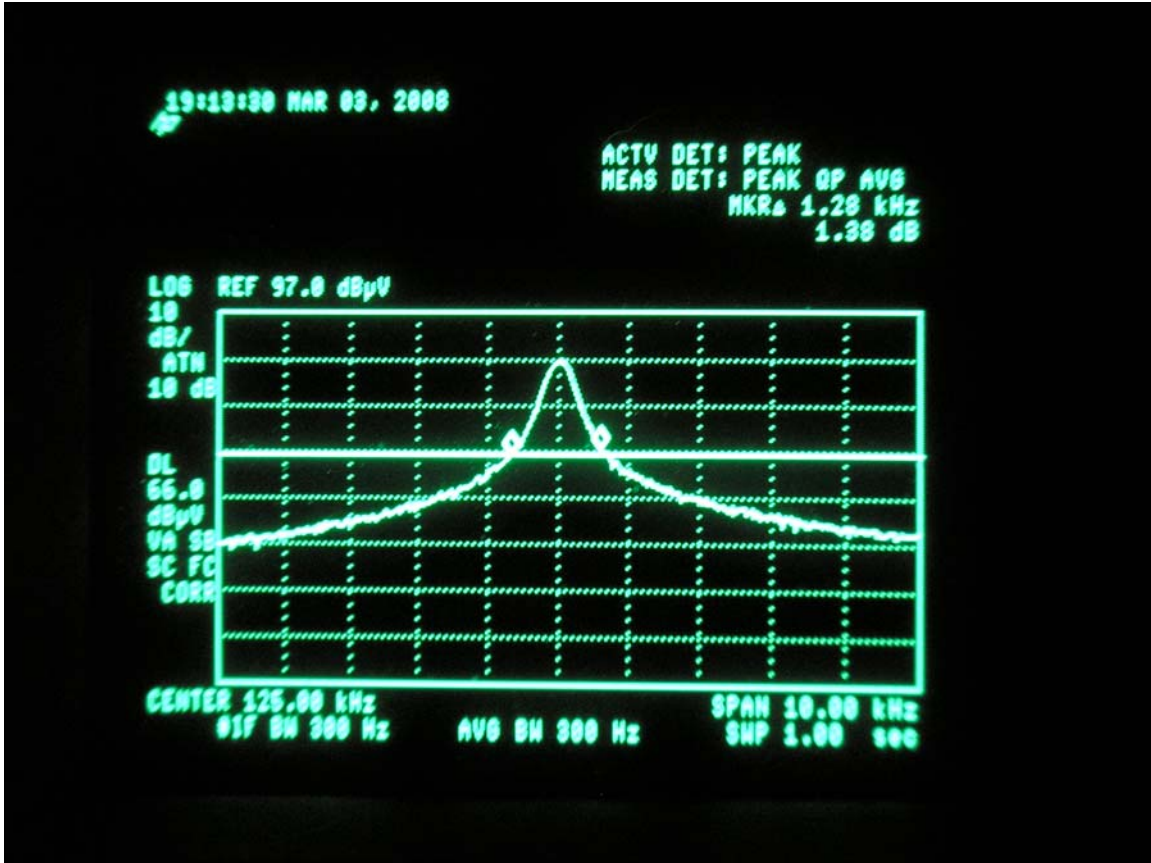
FCC Part 15, Subpart B & C		3 Meter Distance Measurement At Open Field						
Company: Farpointe								
Project #: 07U11358								
Model #: Delta USB								
Tester: Tom Chen								
Date: 11/27/07								
Frequency (MHz)	PK (dBu/V)	QP (dBu/V)	AF (dB/m)	Distance Correction (dB)	PK Corrected Reading (dBuV/m)	QP Limit (dBuV/m)	PK Margin (dB)	Notes
Loop Antenna Face On:								
13.56	77.23		10.556	-40.00	47.79	84.00	-36.2	Fundamental @ 3m Dist
13.41	52.41		10.541	-40.00	22.95	50.48	-27.5	13.41-13.553MHz Spurious @ 3m
13.553	71.34		10.555	-40.00	41.90	50.48	-8.6	13.41-13.553MHz Spurious @ 3m
13.567	62.55		10.557	-40.00	33.11	50.48	-17.4	13.567-13.710MHz Spurious @ 3m
13.71	53.62		10.571	-40.00	24.19	50.48	-26.3	13.567-13.710MHz Spurious @ 3m
13.11	33.83		10.511	-40.00	4.34	40.51	-36.2	13.110-13.410MHz Spurious @ 3m
13.41	52.41		10.541	-40.00	22.95	40.51	-17.6	13.110-13.410MHz Spurious @ 3m
13.71	53.62		10.571	-40.00	24.19	40.51	-16.3	13.710-14.010MHz Spurious @ 3m
14.01	31.76		10.601	-40.00	2.36	40.51	-38.1	13.710-14.010MHz Spurious @ 3m
27.145	26.08		9.0426	-40.00	-4.88	29.54	-34.4	14.010-30MHz Spurious @ 3m
Loop Antenna Face Off:								
13.56	67.94		10.556	-40.00	38.50	84.00	-45.5	Fundamental @ 3m Dist
13.41	42.23		10.541	-40.00	12.77	50.48	-37.7	13.41-13.553MHz Spurious @ 3m
13.553	39.36		10.555	-40.00	9.92	50.48	-40.6	13.41-13.553MHz Spurious @ 3m
13.567	65.36		10.557	-40.00	35.92	50.48	-14.6	13.567-13.710MHz Spurious @ 3m
13.71	44.72		10.571	-40.00	15.29	50.48	-35.2	13.567-13.710MHz Spurious @ 3m
13.11	22.65		10.511	-40.00	-6.84	40.51	-47.3	13.110-13.410MHz Spurious @ 3m
13.41	42.33		10.541	-40.00	12.87	40.51	-27.6	13.110-13.410MHz Spurious @ 3m
13.71	44.72		10.571	-40.00	15.29	40.51	-25.2	13.710-14.010MHz Spurious @ 3m
14.01	23.92		10.601	-40.00	-5.48	40.51	-46.0	13.710-14.010MHz Spurious @ 3m
27.145	22.1		9.0426	-40.00	-8.86	29.54	-38.4	14.010-30MHz Spurious @ 3m
* No more emissions were found up to 30MHz								
Note: The emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110– and above 10000Mhz. Radiated emission limits in these three bands are based on measurements employing an average detector.								
P.K. = Peak								
Q.P. = Quasi Peak Readings								
A.F. = Antenna factor								

Emission Bandwidth Plot, 13.56 MHz



Note: 13.56 MHz signal is CW, 125 kHz is pulsed on and off.

Emission Bandwidth Plot, 125 kHz MHz

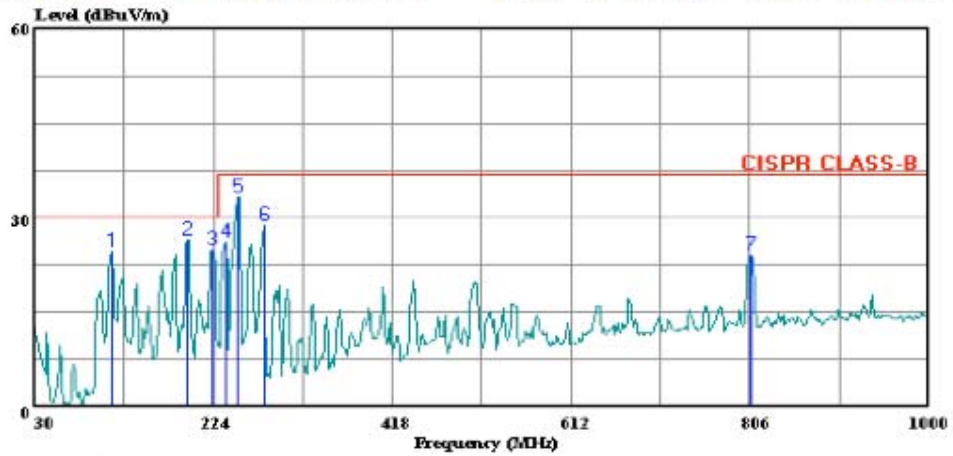


Out of Band emissions: 30-1000 MHz, Horizontal



Compliance Certification Services
 47173 Benicia Street
 Fremont, CA 94538
 Tel: (510) 771-1000
 Fax: (510) 661-0888

Data#: 14 File#: 07U11358.EMI Date: 11-16-2007 Time: 14:46:19



Trace: 13

Ref Trace:

Condition: CISPR CLASS-B HORIZONTAL
 Test Operator:: Chin Pang
 Project #: : 07U11358
 Company: : Farpointe
 Model : Delta USB
 Configuration:: EUT/Laptop
 Mode : : Continuous TX
 Target: : EN55022 Class B

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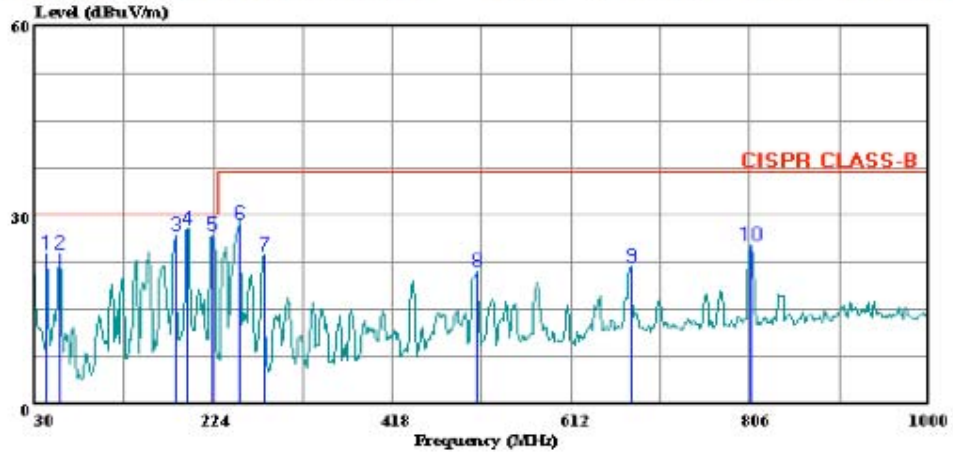
	Freq	Read Level	Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV/m	dB	dBuV/m	dB	
1	114.390	38.42	24.59	-13.84	30.00	-5.41	Peak
2	195.870	40.02	26.41	-13.61	30.00	-3.59	Peak
3	223.030	39.47	24.86	-14.61	30.00	-5.14	Peak
4	237.580	40.48	26.33	-14.15	37.00	-10.67	Peak
5	250.190	47.02	33.34	-13.68	37.00	-3.66	Peak
6	279.290	41.46	28.90	-12.56	37.00	-8.10	Peak
7	807.940	25.60	24.21	-1.39	37.00	-12.79	Peak

Out of Band emissions: 30-1000 MHz, Vertical



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Data#: 16 File#: 07U11358.EMI Date: 11-16-2007 Time: 14:58:37



Trace: 15

Ref Trace:

Condition: CISPR CLASS-B VERTICAL
 Test Operator:: Chin Pang
 Project #: : 07U11358
 Company: : Farpointe
 Model : Delta USB
 Configuration:: EUT/Laptop
 Mode : : Continuous TX
 Target: : EN55022 Class B

Page: 1

	Freq	Read Level	Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV/m	dB	dBuV/m	dB	
1	43.580	38.34	23.94	-14.40	30.00	-6.06	Peak
2	58.130	42.99	23.88	-19.12	30.00	-6.12	Peak
3	182.290	41.26	26.79	-14.47	30.00	-3.21	Peak
4	195.870	41.34	27.73	-13.61	30.00	-2.27	Peak
5	223.030	41.42	26.81	-14.61	30.00	-3.19	Peak
6	251.160	42.28	28.62	-13.66	37.00	-8.38	Peak
7	279.290	36.25	23.69	-12.56	37.00	-13.31	Peak
8	509.180	27.80	20.99	-6.81	37.00	-16.01	Peak
9	676.990	24.95	21.75	-3.20	37.00	-15.25	Peak

AC Line Conducted Emissions
Test Requirement: 15.107, 15.207

Test Set-up

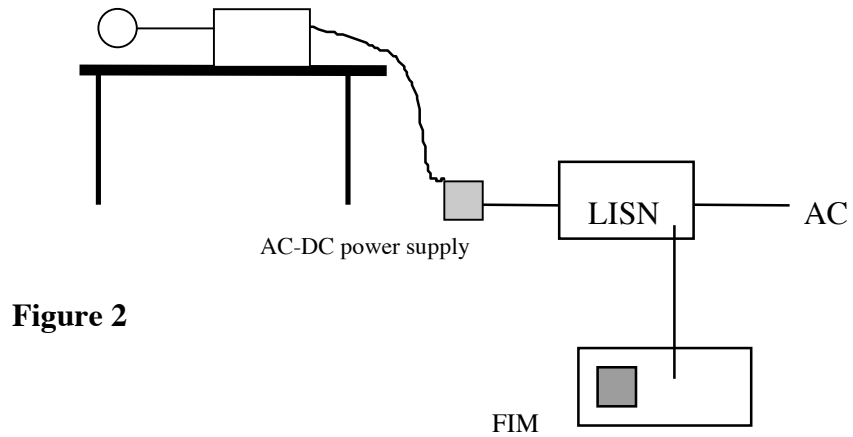


Figure 2

Test Procedure

1. The EUT was placed on a wooden table 40 cm from a vertical ground plane and approximately 80 cm above the horizontal ground plane on the floor. The EUT was set to transmit in normally.
2. Line conducted data was recorded for both NEUTRAL and HOT lines.

Test Results

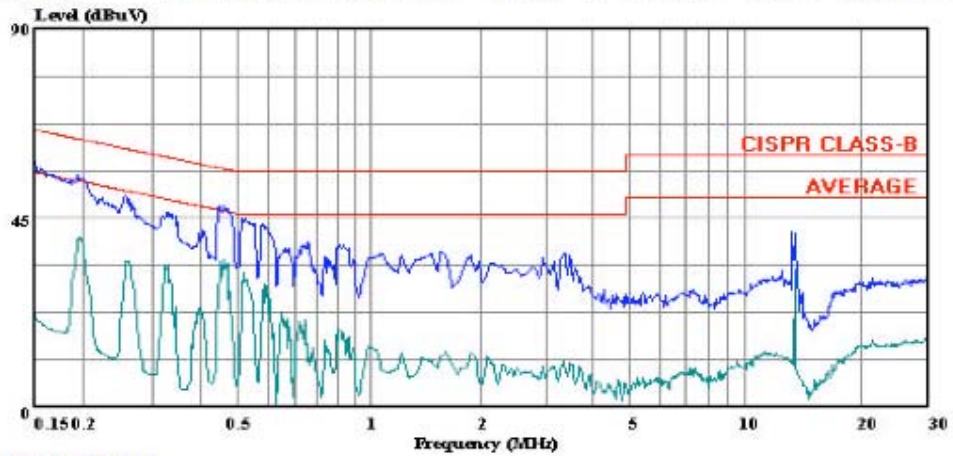
PASS. Refer to data plots below.

Line 1



Compliance Certification Services
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Fremont, CA 94538
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Data#: 7 File#: 07U11358LC.EMI Date: 11-16-2007 Time: 15:34:26



(Line Conduction)

Trace: 5

Ref Trace:

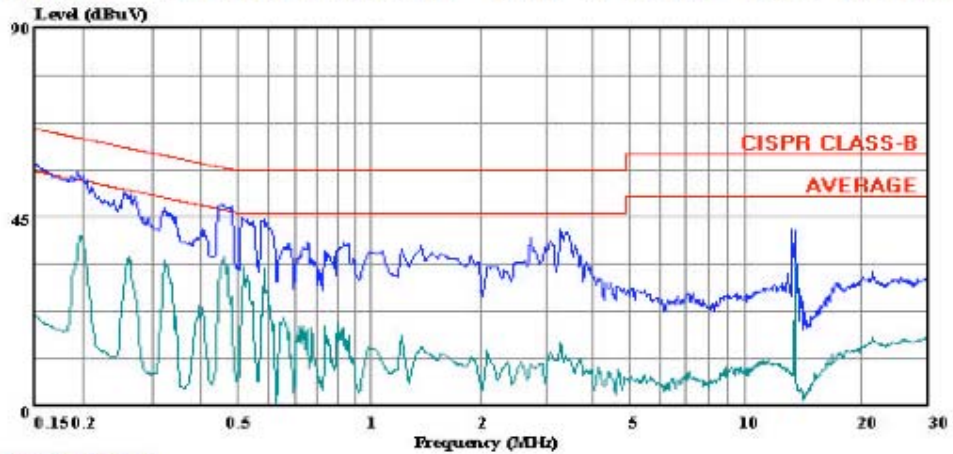
Condition: CISPR CLASS-B
Test Operator:: Chin Pang
Project #: : 07U11358
Company: : Farpointe
Configuration:: EUT/Laptop
Mode: : Continous TX
: Delta USB
Target: : FCC Class B
Voltage: : 115VAC/60Hz
: L21 Peak (Blue); Green (Average)

Line 2



Compliance Certification Services
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Data#: 14 File#: 07U11358LC.EMI Date: 11-16-2007 Time: 15:41:42



(Line Conduction)
Trace: 12

Ref Trace:

Condition: CISPR CLASS-B
Test Operator:: Chin Pang
Project #: : 07U11358
Company: : Farpointe
Configuration:: EUT/Laptop
Mode: : Continous TX
: Model: Delta USB
Target: : FCC Class B
Voltage: : 115VAC/60Hz
: L2: Peak (Blue); Green (Average)

Frequency Stability

Test Requirement 15.255(d)

Test Limits

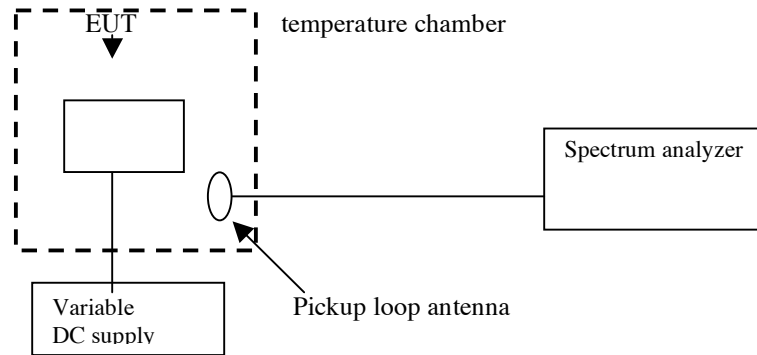
Within +/- 0.01% of fundamental from -20C to +50C.

Within +/- 0.01% of fundamental at 20C for supply voltage 85% and 115% of nominal

0.01% of 13.560 MHz = 1356 Hz maximum variation allowed

Allowed frequency variation: 13.558644MHz – 13.561356 MHz

Test Set-up



Test Procedures

1. Spectrum analyzer center frequency was set to 13.56 MHz operating frequency. Frequency was measured at +25C using spectrum analyzer marker function.
2. The transmitter was allowed to stabilize at every 10 degrees C from -20C to +50C and measurements were recorded at each temperature.

Test Results

Refer to table below. Frequency remains within 0.01% (100ppm) throughout all required temperature and supply voltage variations.

EUT: Delta USB

Reference Frequency: EUT Channel 13.56MHz @ 20°C				
		Limit: ± 100 ppm =		KHz
Power Supply (VAC)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
207.00	55	13.5603250	-0.111	± 100
253.00	55	13.5603000	-0.092	± 100
115.00	50	13.5602750	-0.074	± 100
115.00	40	13.5602500	-0.055	± 100
115.00	30	13.5602000	-0.018	± 100
115.00	22	13.5601750	0.000	± 100
115.00	20	13.5601500	0.018	± 100
115.00	10	13.5601500	0.018	± 100
207.00	0	13.5601500	0.018	± 100
253.00	0	13.5601500	0.018	± 100
115.00	-10	13.5601500	0.018	± 100
115.00	-20	13.5601500	0.018	± 100
230.00	-20	13.5601750	0.000	± 100

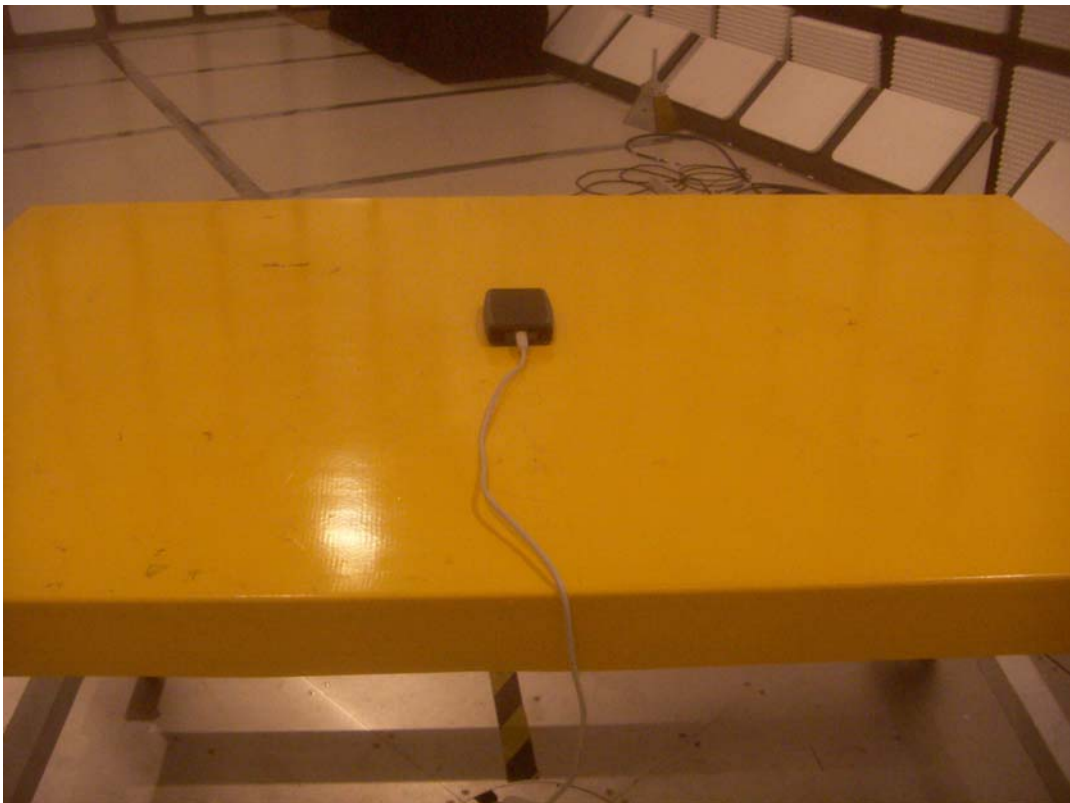
Reference Frequency: EUT Channel 125KHz @ 20°C				
		Limit: ± 100 ppm =		KHz
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(KHz)	Delta (ppm)	Limit (ppm)
207.00	55	125.0000000	0.000	± 100
253.00	55	125.0250000	-2.000	± 100
115.00	50	125.0000000	0.000	± 100
115.00	40	125.0250000	-2.000	± 100
115.00	30	125.0000000	0.000	± 100
115.00	22	125.0000000	0.000	± 100
115.00	20	125.0250000	-2.000	± 100
115.00	10	125.0000000	0.000	± 100
207.00	0	125.0000000	0.000	± 100
253.00	0	125.0250000	-2.000	± 100
115.00	-10	125.0250000	-2.000	± 100
115.00	-20	125.0250000	-2.000	± 100
230.00	-20	125.0250000	-2.000	± 100

Test Set-Up Photographs

Radiated emissions below 30 MHz, 3 separation



Radiated Emissions, 30 – 1000 MHz, Front View

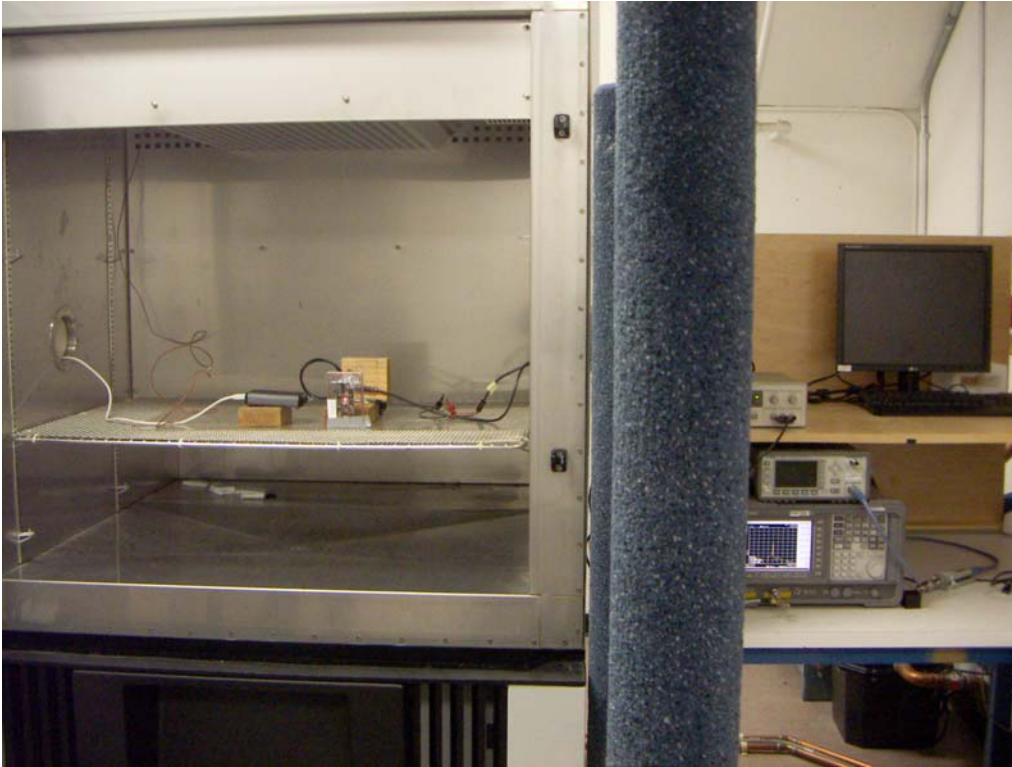


AC Line Conducted Emissions



Frequency Stability





END OF REPORT