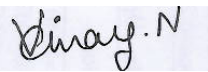



Produkte
Products

Prüfbericht - Nr.: 01200035 001		Seite 1 von 14			
<i>Test Report No.:</i>		<i>Page 1 of 14</i>			
Auftraggeber: <i>Client:</i>	Semnox Solution Private Limited, 2 nd Floor, ABCO Trade Center, Kottara Chowki, Mangalore, Karnataka, India. PIN: 575006.				
Gegenstand der Prüfung: <i>Test item:</i>	Parafait Reader Wireless				
Bezeichnung: <i>Identification:</i>	Parafait Reader	Serien-Nr.: <i>Serial No.</i>	Engineering Sample		
Wareneingangs-Nr.: <i>Receipt No.:</i>	1403018898	Eingangsdatum: <i>Date of receipt:</i>	14.05.2012		
Prüfört: <i>Testing location:</i>	Refer Page 4 of 14 for test facilities				
Prüfgrundlage: <i>Test specification:</i>	FCC 15, Subpart C				
Prüfergebnis: <i>Test Result:</i>	Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n). <i>The tests item passed the test specification(s).</i>				
Prüflaboratorium: <i>Testing Laboratory:</i>	TÜV Rheinland (India) Pvt. Ltd. 82/A, 3rd Main, West Wing, Electronic City Phase 1, Hosur Road Bangalore – 560 100.				
geprüft / tested by:		kontrolliert / reviewed by:			
17.05.2012	Vinay N Engineer	25.05.2012	Raghavendra Kulkarni Manager		
					
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>
Sonstiges / Other Aspects:		FCC ID : G7H-SPRW001 Contains approved Wi-Fi module with FCC ID: U3O-G2M5477			
Abkürzungen:	P(ass) = entspricht Prüfgrundlage F(ail) = entspricht nicht Prüfgrundlage N/A = nicht anwendbar N/T = nicht getestet	Abbreviations:	P(ass) = passed F(ail) = failed N/A = not applicable N/T = not tested		
<p>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.</p> <p><i>This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.</i></p>					

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Test Result Summary

Clause	Test Item	Result
15.215 (c)	Occupied Bandwidth	NA
15.209	Spurious Radiated Emissions	Pass

Note: The product has approved Wi-Fi Module. Hence, the module related tests are excluded.

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List of Test and Measurement Instruments

TUV Rheinland (India) Pvt. Ltd. , Bangalore

List of Test and Measurement Instruments

Equipment	Manufacturer	Model	S/N	Calibration Due Date
EMI Test Receiver	Rohde &Schwarz	ESU 40	100288	21.07.2012
Hybrid Log Periodic antenna	ETS Lindgren	3142D	00081354	26.07.2013
Double-Ridged Waveguide Horn Antenna	ETS Lindgren	116794	00133356	01-09-2013
Emission Horn Antenna	ETS Lindgren	116706	00107323	24-08-2013
Active Loop Antenna	Frankonia	LAX-10	LAX-10-800	11-04-2013
Spectrum Analyser	Agilent Technologies	E4407B	US41192772	17.03.2013

Testing Facilities:

- 1) TUV Rheinland (India) Private Limited
No. 108 , West Wing
Electronic city Phase I
Bangalore – 560100.

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General Product Information

Product Function and Intended Use

Parafait is wireless debit card system for complete automated operations in a Family Entertainment Center. Parafait can be used to manage all areas in a FEC like Games, attractions, food service, inventory and report management. Parafait wireless Tap Readers are installed in Game Machines to deduct the balance from the card and start the game.

Ratings and System Details

Operating Frequency	125 KHz
No. of channel	1
Antenna Type	Coil Antenna
Number of antenna	1
Supply Voltage	5 V dc
Dimensions of Product(L x W x H)	97.4mm x 102mm x 25.5mm
Environmental	Storage and operational conditions: -30° C to 80° C

Test Conditions:

Supply Voltage to the EUT: 12 V DC.

Environmental conditions:

Temperature: +23 ° C

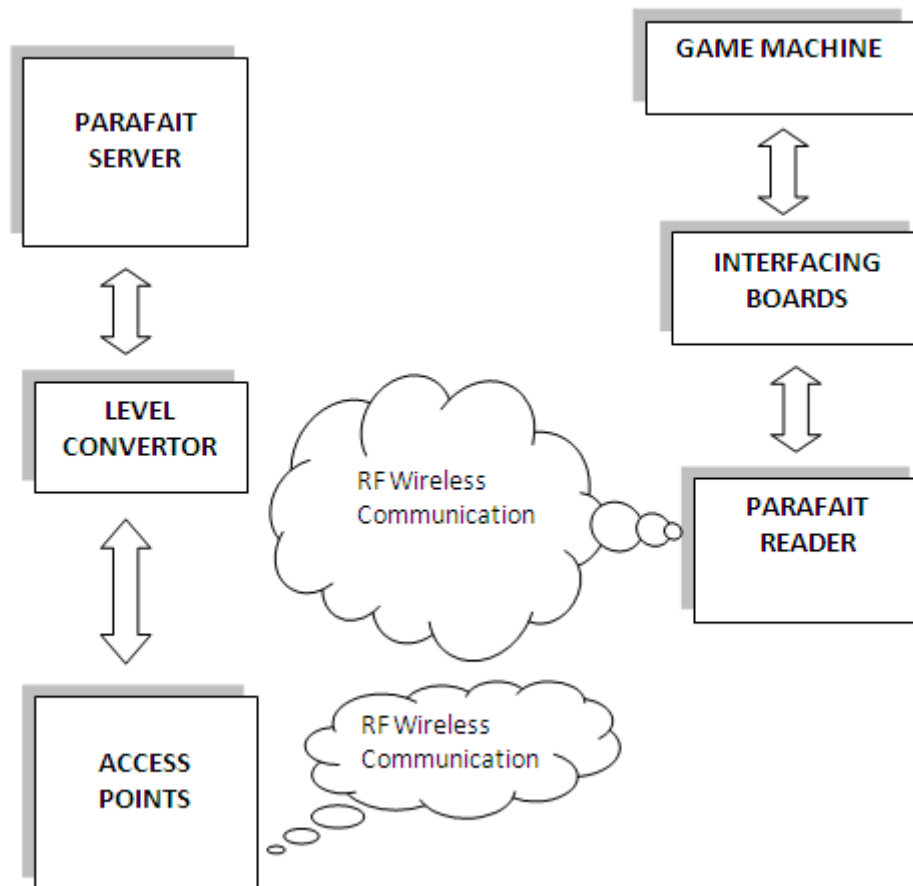
RH: 62%

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Operation Descriptions

Parafait tap readers are installed in the Game Machines. When the card is tapped, card number is wirelessly transmitted over Wi-Fi network to Server computer. In server card data is checked and verified if the card has minimum balance to start the game. If yes, acknowledgment is sent back to the reader to start the game. Once the game is over, number of tickets dispensing out of the machine is counted and transmitted to the server to update in game play details against the card number. Tap reader is connected to Parafait interface PCB installed in the machine using 10 pin Flat Ribbon Cable. Parafait Interface PCB is powered up using 12V smps power supply tapped from the machine.

Block Diagram



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Test Set-up and Operation Mode

Principle of Configuration Selection

The test was performed under continuous transmission to obtain the maximum emissions.

Test Operation and Test Software

Test software was used to enable the transmission with highest possible duty cycle and changing data rates and channels in 2.4 GHz band on the EUT for the tests in this report.

Special Accessories and Auxiliary Equipment

The EUT was tested together with the following additional accessory:

- A Ruckus Wireless Router and Notebook computer was used to configure the EUT in required channels and data rates.

Countermeasures to achieve EMC Compliance

- None

Carrier frequencies used for the Spurious Emission Testing

Frequency Band	Channel Number	Frequency (MHz)
2400 MHz- 2483.5 MHz	1	2412
	7	2442
	11	2462

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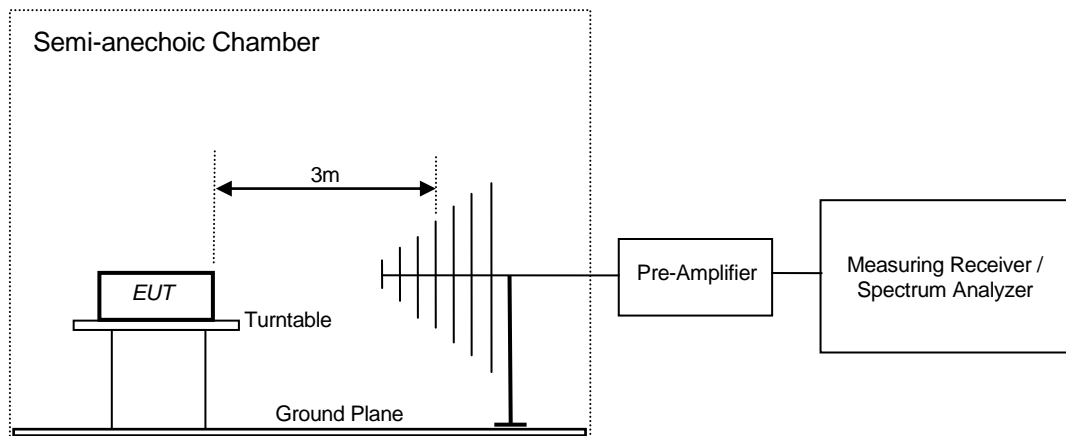
Test Methodology

Radiated Emission Test

The radiated emission measurement was performed according to the procedures in ANSI C63.4-2003. The equipment under test (EUT) was placed at the middle of the 80 cm high turntable, and the EUT is 3 meters far from the measuring antenna. The turntable was rotated 360° for obtaining the maximum emission. The height of the measuring antennas was scanned between 1m and 4m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations. Repeat the measurement steps until the maximum emissions were obtained. The measurement above 1000MHz was performed by horn antenna.

The measurement below 30MHz was performed by loop antenna.

The EUT was rotated around the X-, Y-, and Z-Axis and the results from worst case axis are recorded.



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Test Results

Occupied Bandwidth Measurement

Section 15.215 (c)

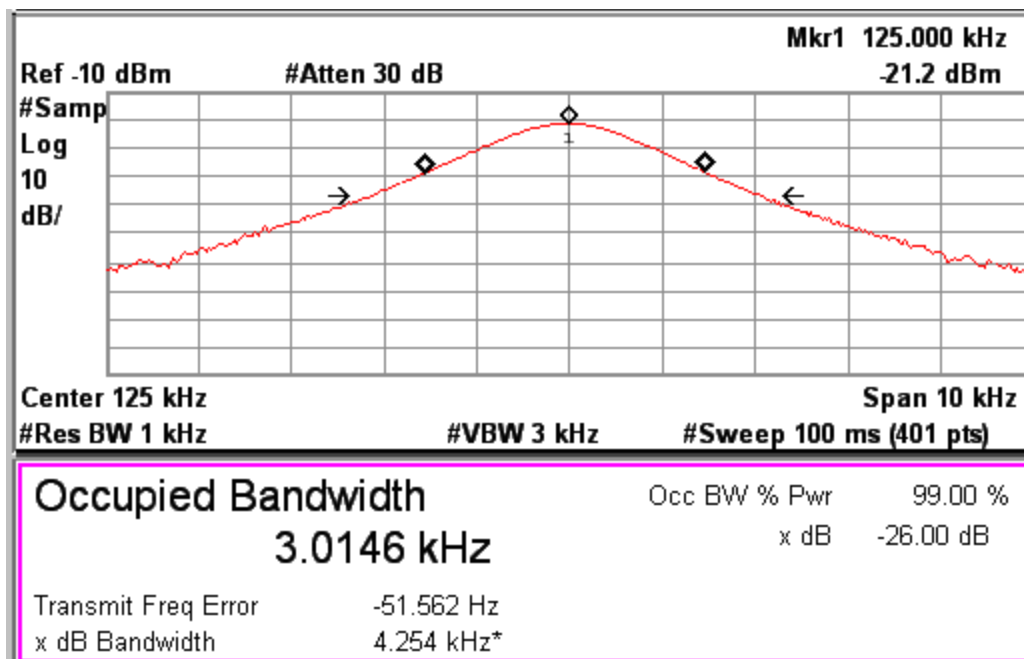
Measurement procedure

The 99% occupied bandwidth was measured with the spectrum analyzer span set to fully display the emission and approximately 20dB below the peak level. The occupied bandwidth measurement function of the analyzer was used to measure the 99% bandwidth

Measurement Result

Centre Frequency (kHz)	Occupied Bandwidth (KHz)
125.0	3.0146

Measurement Plot



Spurious Radiated Emissions
Section 15.209
Result
Pass

Test Specification	FCC 15.209
Test Method	ANSI C63.4-2003
Measurement Location	Semi Anechoic Chamber
Supply Voltage	12V DC
Measuring Frequency Range	9kHz to 26.5GHz(Up to 10 th harmonic of the highest fundamental frequency)
Measuring Distance	3m
Detection	QP for frequency below 1GHz, Peak and Average for frequency above 1GHz
Requirement	As per the limits mentioned in the bellow table

Limit for Radiated Emission of Section 15.209:

Frequency (MHz)	Field strength (μV/m)	Field strength (dBμV/m) at 3m range
0.009 – 0.490	2400/F(kHz) (300m range)	48.50 – 13.80 (300m range)*
0.490 – 1.705	24000/F(kHz) (30m range)	33.80 – 23.00 (30m range)*
1.705 -- 30	30	29.54 (30m range)*
30-88	100	40.0
88-216	150	43.5
216-960	200	46.0
Above 960	500	54.0

Remark: * Distance Correction for Measurements below 30 MHz – Part 15.31

Radiated measurements were performed at a distance closer than 300 meters and 30m as required, according to Part 15.209. Therefore a correction factor was applied to account for propagation loss at the specified distance. The propagation loss was determined by using the square of an inverse linear distance extrapolation factor (40dB/decade) according to 15.31. A sample calculation of the distance correction factor is shown below for limits expressed at a 300m measurement distance and a 30m measurement distance.

$$\begin{aligned} \text{Distance correction factor (300m Specified Test Distance)} &= 40 * \text{Log} (\text{Test Distance}/300) \\ &= 40 * \text{Log} (3/300) \\ &= - 80 \text{ dB} \end{aligned}$$

$$\begin{aligned} \text{Distance correction factor (30m Specified Test Distance)} &= 40 * \text{Log} (\text{Test Distance}/30) \\ &= 40 * \text{Log} (3/30) \\ &= - 40 \text{ dB} \end{aligned}$$

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

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Test Results

Results below 30 MHz

Antenna Polarization	Spurious Emission (kHz)	Field Strength (dBµV/m)	Limit (dBµV/m)	Margin(dB)
Parallel	125.10	52.55	105.66	-53.11
Perpendicular	125.00	49.85	105.66	-55.81

Results Above 30 MHz

802.11b Data Rate: 1Mbps

Channel	Antenna Polarization	Spurious Emission (MHz)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
Low	H	120.07	35.01	43.50	-8.49
		2390.70 (P)	47.73	74.00	-26.27
		2390.30 (Av)	34.46	54.00	-19.54
		2405.20 (P)	95.99	*	-
		2413.90 (Av)	87.72	*	-
		4821.00 (P)	59.37	74.00	-14.63
		4824.00. (Av)	44.65	54.00	-9.35
	V	120.27	27.75	43.50	-15.75
		2390.85 (P)	54.53	74.00	-19.47
		2390.70 (Av)	31.81	54.00	-22.19
		2410.65 (P)	98.62	*	-
		2410.30 (Av)	81.48	*	-
		4821.20 (P)	64.42	74.00	-9.58
		4827.00 (Av)	44.08	54.00	-9.92
Mid	H	120.17	35.23	43.50	-8.27
		2444.65 (P)	96.92	*	-
		2443.30 (Av)	86.20	*	-
		4881.20 (P)	57.32	74	-16.68
	V	4887.00 (Av)	48.56	54	-5.44
		120.01	34.82	43.50	-8.68
		2443.65 (P)	98.96	*	-
		2440.30 (Av)	80.21	*	-
		4879.20 (P)	65.44	74	-8.56
		4887.00 (Av)	44.32	54	-9.68
High	H	119.07	35.01	43.50	-8.49
		2483.55 (P)	58.40	74.00	-15.60
		2483.90 (Av)	39.28	54.00	-14.72
		2465.60 (P)	97.03	*	-
		2460.85 (Av)	86.42	*	-
		4919.45 (P)	55.02	74.00	-18.98
		4924.05 (Av)	44.91	54.00	-9.09
	V	119.27	27.75	43.50	-15.75
		2483.60 (P)	52.63	74.00	-21.37
		2483.89 (Av)	28.58	54.00	-25.42
		2460.65 (P)	98.29	*	-
		2464.95 (Av)	78.32	*	-
		4918.85 (P)	65.89	74.00	-8.11
		4926.85 (Av)	44.54	54.00	-9.46

P--> Peak Detector

Av--> Average Detector

* → Fundamental Frequency

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802.11b Data Rate: 11Mbps

Channel	Antenna Polarization	Spurious Emission (MHz)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
Low	H	120.07	35.01	43.50	-8.49
		2390.40 (P)	49.04	74.00	-24.96
		2390.65 (Av)	33.23	54.00	-20.77
		2412.35 (P)	99.11	*	-
		2411.25 (Av)	86.23	*	-
		4822.05 (P)	52.01	74.00	-21.99
		4822.25 (Av)	43.37	54.00	-10.63
	V	120.27	27.75	43.50	-15.75
		2390.90 (P)	54.81	74.00	-19.19
		2390.90 (Av)	32.30	54.00	-21.70
		2416.15 (P)	100.65	*	-
		2411.15 (Av)	87.25	*	-
		4819.90 (P)	59.42	74.00	-14.58
		4824.10 (Av)	51.00	54.00	-3.00
Mid	H	120.17	34.63	43.50	-8.87
		2443.65 (P)	96.92	*	-
		2440.30 (Av)	86.20	*	-
		4885.20 (P)	58.32	74	-15.68
	4882.00 (Av)	48.52	54	-5.48	
	V	120.01	34.82	43.50	-8.68
		2442.65 (P)	98.96	*	-
		2445.30 (Av)	80.51	*	-
		4879.20 (P)	65.04	74	-8.96
		4883.00 (Av)	45.32	54	-8.68
4883.00 (Av)		45.32	54	-8.68	
High	H	120.07	35.01	43.50	-8.49
		2483.80 (P)	55.62	74.00	-18.38
		2483.75 (Av)	36.46	54.00	-17.54
		2461.40 (P)	97.02	*	-
		2463.40 (Av)	81.67	*	-
		4919.35(P)	64.57	74.00	-9.43
		4924.05 (Av)	45.04	54.00	-8.96
	V	120.27	27.75	43.50	-15.75
		2483.60 (P)	58.07	74.00	-15.93
		2483.95 (Av)	31.93	54.00	-22.07
		2463.00 (P)	98.31	*	-
		2462.00 (Av)	84.16	*	-
		4922.10 (P)	65.65	74.00	-8.35
		4920.55 (Av)	44.22	54.00	-9.78

P--> Peak Detector

Av--> Average Detector

* → Fundamental Frequency

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802.11 g Data Rate: 6Mbps

Channel	Antenna Polarization	Spurious Emission (MHz)	Field strength (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
Low	H	120.07	35.01	43.50	-8.49
		2390.15 (P)	59.49	74.00	-14.51
		2390.85 (Av)	35.37	54.00	-18.63
		2407.15 (P)	96.25	*	-
		2415.30 (Av)	87.26	*	-
		4822.20 (P)	64.25	74.00	-9.75
		4823.42 (Av)	43.28	54.00	-10.72
	V	120.27	27.75	43.50	-15.75
		2390.25 (P)	54.67	74.00	-19.33
		2390.65 (Av)	33.26	54.00	-20.74
		2412.90 (P)	100.12	*	-
		2410.32 (Av)	82.52	*	-
		4818.35 (P)	60.12	74.00	-13.88
		4824.55 (Av)	50.40	54.00	-3.6
Mid	H	120.17	35.03	43.50	-8.47
		2443.65 (P)	97.52	*	-
		2444.30 (Av)	85.60	*	-
		4880.20 (P)	58.42	74	-15.58
		4887.00 (Av)	47.56	54	-6.44
	V	120.01	34.82	43.50	-8.68
		2443.65 (P)	98.16	*	-
		2440.90 (Av)	81.21	*	-
		4890.20 (P)	63.44	74	-10.56
		4886.46 (Av)	44.82	54	-9.18
High	H	120.07	35.01	43.50	-8.49
		2483.9 (P)	61.67	74.00	-12.33
		2483.6 (Av)	42.21	54.00	-11.79
		2459.65 (P)	97.39	*	-
		2466.70 (Av)	82.13	*	-
		4919.95 (P)	65.70	74.00	-8.30
		4928.35 (Av)	42.95	54.00	-11.05
	V	120.27	27.75	43.50	-15.75
		2483.60 (P)	56.84	74.00	-17.16
		2483.75 (Av)	30.08	54.00	-23.92
		2461.30 (P)	99.25	*	-
		2466.30 (Av)	74.18	*	-
		4920.45 (P)	55.08	74.00	-18.92
		4924.15 (Av)	44.36	54.00	-9.64

P--> Peak Detector

Av--> Average Detector

* → Fundamental Frequency

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802.11g Data Rate: 54 Mbps

Channel	Antenna Polarization	Spurious Emission (MHz)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
Low	H	120.07	35.01	43.50	-8.49
		2390.15 (P)	59.49	74.00	-14.51
		2390.65 (Av)	35.37	54.00	-18.63
		2406.15 (P)	98.85	*	-
		2415.30 (Av)	85.26	*	-
		4822.30 (P)	64.55	74.00	-9.75
		4823.23 (Av)	43.28	54.00	-10.72
	V	120.27	27.75	43.50	-15.75
		2390.25 (P)	54.67	74.00	-19.33
		2390.85 (Av)	33.26	54.00	-20.74
		2412.90 (P)	98.31	*	-
		2410.90 (Av)	82.81	*	-
		4819.30 (P)	60.52	74.00	-13.48
		4824.15 (Av)	50.48	54.00	-3.52
Mid	H	120.17	35.03	43.50	-8.47
		2444.65 (P)	96.92	*	-
		2443.30 (Av)	86.20	*	-
		4881.20 (P)	57.42	74	-16.58
	4887.00 (Av)	48.56	54	-5.44	
	V	120.01	34.82	43.50	-8.68
		2443.65 (P)	97.96	*	-
		2440.30 (Av)	80.21	*	-
		4889.20 (P)	64.44	74	-9.56
		4887.46 (Av)	44.02	54	-9.98
High	H	120.07	35.01	43.50	-8.49
		2483.9 (P)	60.67	74.00	-13.33
		2483.6 (Av)	43.21	54.00	-10.79
		2462.65 (P)	97.39	*	-
		2468.70 (Av)	82.13	*	-
		4915.95 (P)	65.70	74.00	-8.30
		4925.35 (Av)	42.95	54.00	-11.05
	V	120.27	27.75	43.50	-15.75
		2483.60 (P)	51.84	74.00	-22.16
		2483.75 (Av)	25.08	54.00	-28.92
		2463.30 (P)	99.25	*	-
		2466.30 (Av)	74.18	*	-
		4920.45 (P)	55.08	74.00	-18.92
		4924.15 (Av)	44.36	54.00	-9.64

P--> Peak Detector

Av--> Average Detector

* → Fundamental Frequency

Note: All other emissions were found to be 20 dB below the emission limits.