Elliott

EMC Test Data

Client:	Neptune	Job Number:	J44044
Model:	Pocket ProReader RF	T-Log Number:	T44045
		Proj Eng:	Mark Briggs
Contact:	Mohammed Ali		
Emissions Spec:	FCC 15.249	Class:	-
Immunity Spec:	-	Environment:	-

EMC Test Data

For The

Neptune

Model

Pocket ProReader RF

Client:	Neptune	Job Number:	J44044
Model:	Pocket ProReader RF	T-Log Number:	T44045
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Emissions Spec:	FCC 15.249	Class:	-
Immunity Spec:	-	Environment:	-

EUT INFORMATION

General Description

The EUT is a transmitter that operates at 914 MHz and which is designed to read utility meters remotely. Normally, the EUT would be handheld during operation. The EUT was, therefore, placed in three orientations, front, side, and back to simulate the end user environment. The electrical rating of the EUT is 3.65Vdc.

Equipment Under Test

Manufacturer	Model	Description	Serial Number	FCC ID
Neptune	Pocket ProReader RF	Transmitter	PRF000298	P2SNTGPKT1101

Other EUT Details

EUT Enclosure

The EUT enclosure is primarily constructed of fabricated plastic. It measures approximately 6.9 cm wide by 4 cm deep by 15.5 cm high.

Modification History

Mod. #	Test	Date	Modification
1	-	-	None

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Immunity Spec:	-	Environment:	-

Test Configuration #1

Local Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
None	-	-	-	-

Remote Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
None	-	-	-	-

EUT Interface Ports

		Cable(s)		
EUT Port	Connected To	Description	Shielded or Unshielded	Length(m)
Power	Not connected			

Note: Power port is used for charging the internal batteries only. The device cannot operate while being charged.

EUT Operation During Emissions

The unit was transmitting continuously during testing.

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Spec:	FCC 15.249	Class:	-

Radiated Emissions

Test Specifics

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test:	8/27/2001 & 8/28/2001	Config. Used:	1
Test Engineer:	Rafael & Jmartinez	Config Change:	None
Test Location:	SVOATS #3 & SVOATS #4	EUT Voltage:	3.65Vdc

General Test Configuration

The EUT was located on the turntable for radiated emissions testing.
On the OATS, the measurement antenna was located 3m from the EUT for the frequency range 1 - 10 GHz.
Note, **preliminary** testing indicates that the emissions were maximized by orientation of the EUT and elevation of the measurement antenna. **Maximized** testing indicated that the emissions were maximized by orientation of the EUT, elevation of the measurement antenna, and manipulation of the EUT's interface cables.
Note, for testing above 1 GHz, the FCC specifies the limit as an average measurement. In addition, the FCC states that the peak reading of any emission above 1 GHz, can not exceed the average limit by more than 20 dB. A 1MHz Resolultion and Video Bandwidth was used.
For handheld or bodyworn transmitters, the EUT was tested in three orthogonal axes to determine worst case orientation, that produce the highest emission level closest to the limit The worst case orientation was then used for final measurements of the fundamental and spurious emissions. (ANSI C63.4-1992 (Section 13.1.4.1)

Ambient Conditions:

Temperature: 16.7°C
Rel. Humidity: 77%

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	RE, Fundamental	15.249(a)	Pass	-14.8dB @ 914 MHz
2	RE, Harmonics	15.249(a)	Pass	-6.7dB @ 1828MHz
3	RE, Bandedge Measurement	15.249(c)	Pass	**Refer to Plot# 1**

Client:	Neptune	Job Number:	J44044
Model:	Pocket ProReader RF	T-Log Number:	T44045
		Proj Eng:	Mark Briggs
Contact:	Mohammed Ali		
Spec:	FCC 15.249	Class:	-

Modifications Made During Testing:

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Run #1: Fundamental Frequency

Tested @ 3m

Used 120KHz IF and Quasi detector

Frequency	Level	Pol	FCC 15.249		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
EUT Vertical								
914.000	75.3	v	94.0	-18.7	QP	275.0	1.1	
914.000	69.2	h	94.0	-24.8	QP	115.0	1.0	
EUT Horizontal								
914.000	70.3	v	94.0	-23.7	QP	75.0	1.0	
914.000	79.2	h	94.0	-14.8	QP	180.0	1.0	
EUT on its side								
914.000	69.9	v	94.0	-24.1	QP	230.0	1.2	
914.000	77.1	h	94.0	-16.9	QP	320.0	1.0	

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EMC Test Data

Client:	Neptune	Job Number:	J44044
Model:	Pocket ProReader RF	T-Log Number:	T44045
		Proj Eng:	Mark Briggs
Contact:	Mohammed Ali		
Spec:	FCC 15.249	Class:	-

Run #2: Harmonics

Measurements made at 3m per FCC requirements.

EUT was tested on Horizontal, since it was worst case

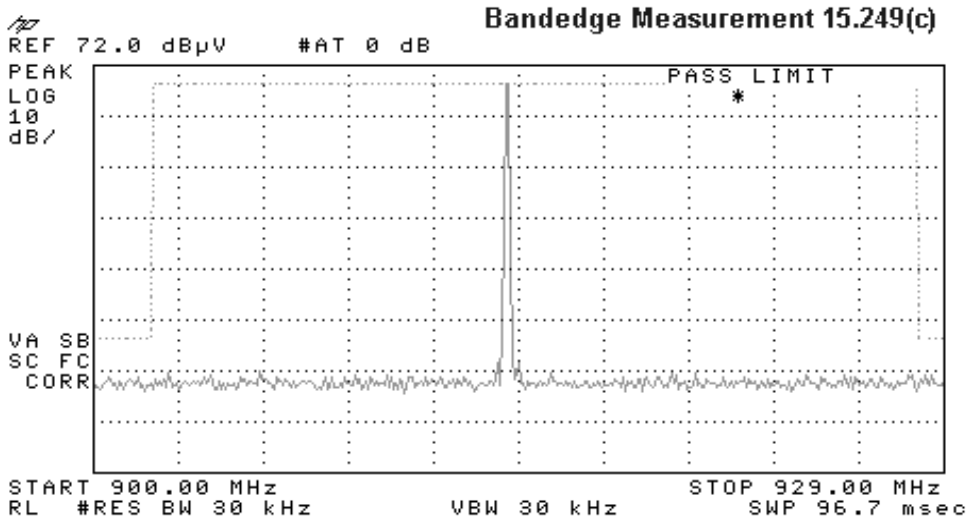
Frequency	Level	Pol	FCC 15.249		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1828.000	47.3	v	54.0	-6.7	Avg	250	1.0	
4570.000	45.4	h	54.0	-8.6	Avg	350	2.0	
1828.000	45.1	h	54.0	-8.9	Avg	160	1.0	
4570.000	43.7	v	54.0	-10.3	Avg	230	1.0	
2742.000	42.4	v	54.0	-11.6	Avg	265	1.0	
2742.000	42.0	h	54.0	-12.0	Avg	300	2.0	
4570.000	57.4	h	74.0	-16.6	Pk	350	2.0	
4570.000	56.3	v	74.0	-17.7	Pk	230	1.0	
1828.000	52.9	v	74.0	-21.1	Pk	250	1.0	
2742.000	52.8	h	74.0	-21.2	Pk	300	2.0	
2742.000	52.0	v	74.0	-22.0	Pk	265	1.0	
1828.000	51.6	h	74.0	-22.4	Pk	160	1.0	
3656.000		v	54.0	-54.0	Avg			Noise Floor
5484.000		v	54.0	-54.0	Avg			Noise Floor
3656.000		h	54.0	-54.0	Avg			Noise Floor
5484.000		h	54.0	-54.0	Avg			Noise Floor
3656.000		v	74.0	-74.0	Pk			Noise Floor
5484.000		v	74.0	-74.0	Pk			Noise Floor
3656.000		h	74.0	-74.0	Pk			Noise Floor
5484.000		h	74.0	-74.0	Pk			Noise Floor

Note 1: No harmonic emission detected, after the 6 harmonic, close to 20-dB of the limit.

Client:	Neptune	Job Number:	J44044
Model:	Pocket ProReader RF	T-Log Number:	T44045
		Proj Eng:	Mark Briggs
Contact:	Mohammed Ali		
Spec:	FCC 15.249	Class:	-

Run #3: Bandedge Measurement (15.249(c))
Measurements made at 3m per FCC requirements.

Plot# 1



Note 1:	No correction factors applied to measurement above. Maximized Fundamental signal. A lower Resolution and Video bandwidth was used to provide more dynamic range for the 50-dB attenuation requirement.

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EMC Test Data

Client:	Neptune	Job Number:	J44044
Model:	Pocket ProReader RF	T-Log Number:	T44045
		Proj Eng:	Mark Briggs
Contact:	Mohammed Ali		
Spec:	FCC 15.249	Class:	-

Radiated Emissions

Test Specifics

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 7/2/2001
Test Engineer: Rafael
Test Location: SVOATS #3

Config. Used: 1
Config Change:
EUT Voltage: 3.65Vdc

General Test Configuration

The EUT was located on the turntable for radiated emissions testing.
On the OATS, the measurement antenna was located 3m from the EUT for the frequency range 30-1000 MHz.
Note, **preliminary** testing indicates that the emissions were maximized by orientation of the EUT and elevation of the measurement antenna. **Maximized** testing indicated that the emissions were maximized by orientation of the EUT, elevation of the measurement antenna, and manipulation of the EUT's interface cables.

Ambient Conditions:

Temperature: 23°C
Rel. Humidity: 45%

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	RE, 30 - 1000MHz - Maximized Emissions	FCC B	Pass	-21.7dB @ 269.6MHz

Modifications Made During Testing:

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Elliott

EMC Test Data

Client:	Neptune	Job Number:	J44044
Model:	Pocket ProReader RF	T-Log Number:	T44045
		Proj Eng:	Mark Briggs
Contact:	Mohammed Ali		
Spec:	FCC 15.249	Class:	-

Run #1: Preliminary Radiated Emissions, 30-1000 MHz

EUT was placed vertical on the table

Frequency	Level	Pol	FCC B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
269.600	24.3	h	46.0	-21.7	QP	285	1.5	
263.600	24.2	h	46.0	-21.8	QP	125	1.7	
143.400	21.4	v	43.5	-22.1	QP	115	1.0	
476.800	23.8	h	46.0	-22.2	QP	125	1.8	
476.800	23.5	v	46.0	-22.5	QP	150	1.0	
83.300	17.5	v	40.0	-22.5	QP	300	1.0	
298.000	23.4	v	46.0	-22.6	QP	300	1.0	
396.300	22.8	h	46.0	-23.2	QP	50	1.8	
145.400	19.8	v	43.5	-23.7	QP	55	1.0	
396.300	22.1	v	46.0	-23.9	QP	100	1.0	
135.300	18.5	v	43.5	-25.0	QP	45	1.0	
127.200	18.5	h	43.5	-25.0	QP	150	1.9	
147.500	18.1	v	43.5	-25.4	QP	100	1.0	