

CFR 47 FCC Part 15.249

TEST REPORT

Product : **Transmitter**

Trade Name : N/A

Model Number : SS91P

FCC ID : ELVATJC

Prepared for

Nutek Corporation

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Prepared by

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Remark:

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The test results in the report only to the tested sample.

Statement of Compliance

Applicant: Nutek Corporation

Manufacturer: Nutek Corporation

Product: Transmitter

Model No.: SS91P

Tested Power Supply: 3Vdc Battery

Date of Final Test: Oct. 26, 2010

Configuration of Measurements and Standards Used :

FCC Rules and Regulations Part 15 Subpart C

I HEREBY CERTIFY THAT: The data shown in this report were made in accordance with the procedures given in ANSI C63.4, and the energy emitted by the device was founded to be within the limits applicable. I assume full responsibility for accuracy and completeness of these data.

- Note:** 1. The result of the testing report relate only to the item tested.
2. The testing report shall not be reproduced expect in full, without the written approval of IETC

Report Issued: 2010/10/28

Project Engineer: *Elli Chang*
Elli Chang

Approved: *Jerry Liu*
Jerry Liu

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1 General Information

1.1 Description of Equipment Under Test

- Product** : Transmitter
- Model Number** : SS91P
- Applicant** : **Nutek Corporation**
NO.167, Lane 235, Bauchiau Rd., Shindian City, Taipei County
23145, Taiwan
- Manufacturer** : **Nutek Corporation**
NO. 167, Lane 235, Bauchiau Rd., Shindian City, Taipei County
23145, Taiwan
- Power Supply** : 3Vdc Battery
- Operating Frequency** : 909.6~919.024MHz
- Channel Number** : 25 channels frequency hopping
- Type of Modulation** : FSK
- Antenna description** : This device uses Helix antenna.
The antenna is integral to the device, thereby meeting the
requirement of FCC 15.203.
- Date of Receipt Sample** : Oct. 22, 2010
- Date of Test** : Oct. 22~26, 2010
- Additional Description** : 1) The Model Number “**SS91P**” is representative selected in the
test and included in this report.
2) For more detail specification about EUT, please refer to the
user’s manual.

1.2 Test Facility

- Site Description** : ☒OATS 2
- Name of Firm** : Interocean EMC Technology Corp.
- Company web** : <http://www.ietc.com.tw>
- Site 1, 2, 3 Location** : No.5-2, Lin 1, Tin-Fu Tsun, Lin-Kou Hsiang,
Taipei County, Taiwan, R.O.C.
- Site Filing** :
- Federal Communication Commissions – USA
Registration No.: 96399 (OATS 1 & 2)
Registration No.: 518958 (OATS 3)
Designation No.: TW1020
 - Voluntary Control Council for Interference by Information
Technology Equipment (VCCI) – Japan
Member No.: 1349
Registration No. (Conducted Room): C-1094
Registration No. (Conducted Room): T-1562
Registration No. (OATS 1): R-1040
Registration No. (OATS 2): R-1041
 - Industry Canada (IC)
OUR FILE: 46405-4437 Submission: 130946
Registration No. (OATS 1): 4437A-1
Registration No. (OATS 2): 4437A-2
Registration No. (OATS 3): 4437A-3
- Site Accreditation** :
- Bureau of Standards and Metrology and Inspection (BSMI) –
Taiwan, R.O.C.
Accreditation No.:
SL2-IN-E-0026 for CNS13438 / CISPR22
SL2-R1-E-0026 for CNS13439 / CISPR13
SL2-R2-E-0026 for CNS13439 / CISPR13
SL2-A1-E-0026 for CNS13783-1 / CISPR14-1
SL2-L1-E-0026 for CNS 14115 / CISPR 15
 - Taiwan Accreditation Foundation (TAF)
Accrditation No.: 1113
 - TÜV NORD
Certificate No: TNTW0801R-02

1.3 Test Equipment

Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
Spectrum Analyzer	R&S	FSP30	100002	2010/12/08
Spectrum Analyzer	R&S	FSP40	100478	2011/04/20
Preamplifier	Agilent	8449B	3008A01434	2011/04/20
Preamplifier	SCHAFFNER	CA30100	2	2010/11/03
Horn Antenna	Schwarzbeck	BBHA 9120	9120D-583	2011/02/09
Biconical Antenna	Schwarzbeck	VHA 9103	2484	2011/10/08
Log Antenna	Schwarzbeck	UHALP 9108	A 0765	2011/10/08

Note: The above equipments are within the valid calibration period.

1.4 Summary of Measurement

Report Clause	Test Parameter	Reference Document CFR47 Part15	Results
2	RF Radiated spurious emission test	§15.249(a)(c)(d)	Pass
3	Emission on the Band Edge	§15.249(d)	Pass
	AC Power Line Conducted Emission test	§15.207	Not applicable

1.5 Justification

The test of radiated measurements according to FCC Part15 Section 15.33(a) had been conducted and the field strength of the frequency band were all arrive limit requirement, thus we evaluate the EUT pass the specified test.

1.6 Operation mode

By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that “Z axis” position was the worst, then the final test was executed the worst condition and test data were recorded in this report

The EUT was operated in continuous transmission mode during all of the tests.



X axis mode



Y axis mode



Z axis mode

2 RF Radiated spurious emission test

2.1 Limits

According to §15.249 (a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

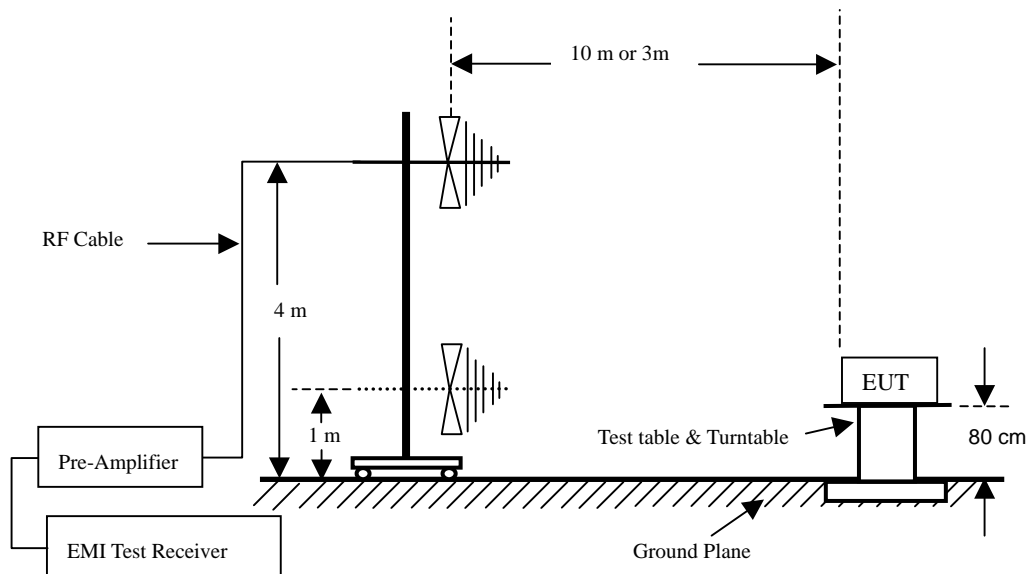
Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

For intentional radiator, the radiated emission shall comply with §15.209(a).

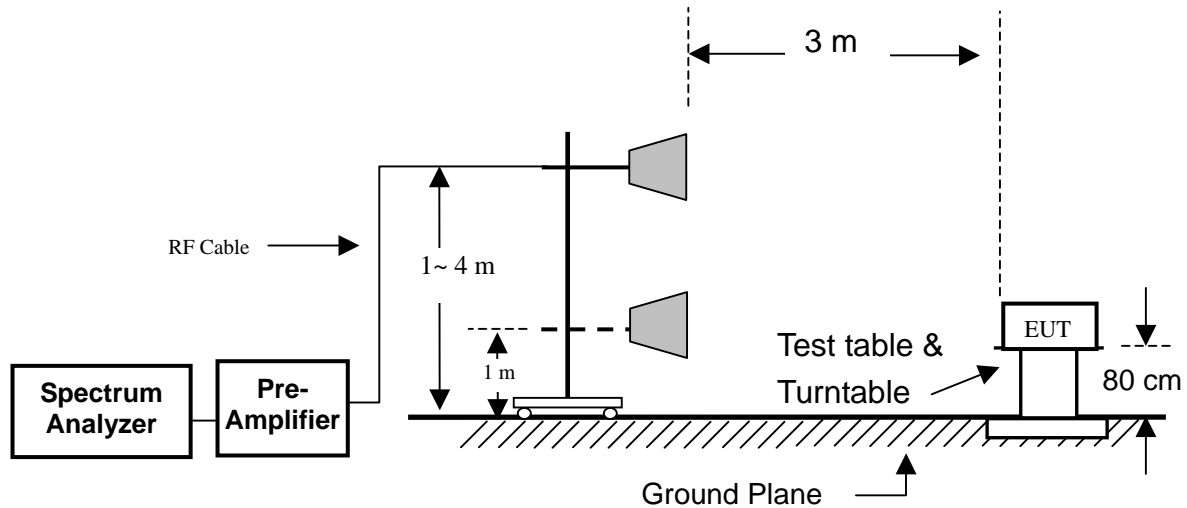
Frequency (MHz)	Field strength dB(μ V/m)	Measurement distance (meters)
1.705~30.0	29.5	30
30 ~ 88	40	3
88~216	43.5	3
216~960	46	3
Above 960	54	3

2.2 Configuration of Measurement

Measurement Frequency under 1GHz



Measurement Frequency above 1GHz



2.3 Test Procedure

The EUT was setup to ANSI C63.4, 2003.

Radiated emission measurements were performed from 30MHz to 25GHz. Spectrum Analyzer set as below: For frequency range from 30MHz to 1GHz: RBW=100kHz or greater. For frequencies above 1GHz: set RBW=VBW=1MHz for peak detector and RBW=1MHz, VBW=10Hz for average detector.

The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meter and down to 1 meter.

2.4 The description of operation mode

Setup EUT to continuously transmit signal with 100% duty cycle during the test period.

2.5 Test Result

PASS.

The final test data is shown as following pages.

Radiated spurious emission

Field Strength of Fundamental

CH	Frequency (MHz)	Antenna Polarization	Reading (dB μ V)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Det. Mode
0	909.600	H	99.06	33.80	28.05	93.31	94	-0.69	QP
0	909.600	V	99.70	33.80	27.35	93.25	94	-0.75	QP
12	914.759	H	98.23	33.80	28.06	92.49	94	-1.51	QP
12	914.759	V	98.73	33.80	27.41	92.34	94	-1.66	QP
24	919.024	H	97.72	33.80	28.07	91.99	94	-2.01	QP
24	919.024	V	98.60	33.80	27.46	92.26	94	-1.74	QP

Remark :

1. Corrected Level = Reading – Preamp + Correction Factor
2. Correction Factor = Antenna Factor + Cable Loss

Radiated spurious emission

Test Environment

Ambient temperature : 24.0°C
 Relative humidity : 65%

Radiated Emission below 1GHz

After verifying low, middle and high channel (909.6MHz, 914.759MHz and 919.024MHz) the worst case was found at Low channel 909.6MHz

Worst case: low channel								
Frequency (MHz)	Antenna Polarization	Reading (dB μ V)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Det. Mode
34.263	H	38.29	33.19	16.18	21.28	40.00	-18.72	QP
156.560	H	39.62	33.27	17.59	23.94	43.52	-19.58	QP
202.230	H	40.65	33.30	19.02	26.37	43.52	-17.15	QP
430.020	H	40.60	34.20	19.88	26.28	46.02	-19.74	QP
630.250	H	38.50	33.60	23.65	28.55	46.02	-17.47	QP
808.550	H	35.19	33.61	25.99	27.57	46.02	-18.45	QP
67.340	V	48.73	33.30	7.22	22.65	40.00	-17.35	QP
162.730	V	41.52	33.33	17.65	25.84	43.52	-17.68	QP
320.000	V	43.34	33.50	16.78	26.62	46.02	-19.40	QP
475.100	V	39.43	33.90	20.79	26.32	46.02	-19.70	QP
776.030	V	35.76	33.66	25.28	27.38	46.02	-18.64	QP
871.760	V	35.58	33.80	27.02	28.80	46.02	-17.22	QP

Remark : Corrected Level = Reading + Correction Factor – Preamp

Correction Factor = Antenna Factor + Cable Loss

The present spurious only show those points are above noise level and the frequency range test from 30MHz to 1GHz.

Radiated spurious emission

Radiated Emission above 1GHz

Channel 0								
Frequency (MHz)	Antenna Polarization	Reading (dB μ V)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Det. Mode
1819.200	H	70.02	26.17	28.79	72.64	74	-1.36	PK
1819.200	H	50.36	26.17	28.79	52.98	54	-1.02	AV
2728.800	H	50.36	26.23	32.14	56.27	74	-17.73	PK
2728.800	H	36.85	26.23	32.14	42.76	54	-11.24	AV
3638.400	H	49.00	26.29	33.81	56.52	74	-17.48	PK
3638.400	H	36.23	26.29	33.81	43.75	54	-10.25	AV
4548.000	H	43.15	26.08	37.05	54.12	74	-19.88	PK
4548.000	H	32.05	26.08	37.05	43.02	54	-10.98	AV
5457.600	H	*	*	*	*	54	*	PK
6367.200	H	*	*	*	*	54	*	PK
7276.800	H	*	*	*	*	54	*	PK
8486.400	H	*	*	*	*	54	*	PK
9096.000	H	*	*	*	*	54	*	PK
1819.200	V	68.56	26.17	28.79	71.18	74	-2.82	PK
1819.200	V	49.65	26.17	28.79	52.27	54	-1.73	AV
2728.800	V	48.93	26.23	32.14	54.84	74	-19.16	PK
2728.800	V	35.85	26.23	32.14	41.76	54	-12.24	AV
3638.400	V	48.63	26.29	33.81	56.15	74	-17.85	PK
3638.400	V	35.23	26.29	33.81	42.75	54	-11.25	AV
4548.000	V	42.23	26.08	37.05	53.20	74	-20.80	PK
4548.000	V	30.23	26.08	37.05	41.20	54	-12.80	AV
5457.600	V	*	*	*	*	54	*	PK
6367.200	V	*	*	*	*	54	*	PK
7276.800	V	*	*	*	*	54	*	PK
8486.400	V	*	*	*	*	54	*	PK
9096.000	V	*	*	*	*	54	*	PK

Remark : Corrected Level = Reading + Correction Factor – Preamp

Correction Factor = Antenna Factor + Cable Loss

* Mark indicated background noise level.

Radiated spurious emission

Radiated Emission above 1GHz

Channel 12								
Frequency (MHz)	Antenna Polarization	Reading (dB μ V)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Det. Mode
1829.518	H	70.28	26.18	28.85	72.95	74	-1.05	PK
1829.518	H	50.32	26.18	28.85	52.99	54	-1.01	AV
2744.277	H	48.95	26.23	32.17	54.89	74	-19.11	PK
2744.277	H	34.85	26.23	32.17	40.79	54	-13.21	AV
3659.036	H	49.21	26.28	33.88	56.81	74	-17.19	PK
3659.036	H	35.22	26.28	33.88	42.82	54	-11.18	AV
4573.795	H	42.52	26.07	37.09	53.54	74	-20.46	PK
4573.795	H	29.92	26.07	37.09	40.94	54	-13.06	AV
5488.554	H	*	*	*	*	54	*	PK
6403.313	H	*	*	*	*	54	*	PK
7318.072	H	*	*	*	*	54	*	PK
8232.831	H	*	*	*	*	54	*	PK
9147.590	H	*	*	*	*	54	*	PK
1829.518	V	70.27	26.18	28.85	72.94	74	-1.06	PK
1829.518	V	50.29	26.18	28.85	52.96	54	-1.04	AV
2744.277	V	49.52	26.23	32.17	55.46	74	-18.54	PK
2744.277	V	35.86	26.23	32.17	41.80	54	-12.20	AV
3659.036	V	48.53	26.28	33.88	56.13	74	-17.87	PK
3659.036	V	35.11	26.28	33.88	42.71	54	-11.29	AV
4573.795	V	42.52	26.07	37.09	53.54	74	-20.46	PK
4573.795	V	31.63	26.07	37.09	42.65	54	-11.35	AV
5488.554	V	*	*	*	*	54	*	PK
6403.313	V	*	*	*	*	54	*	PK
7318.072	V	*	*	*	*	54	*	PK
8232.831	V	*	*	*	*	54	*	PK
9147.590	V	*	*	*	*	54	*	PK

Remark : Corrected Level = Reading + Correction Factor – Preamp

Correction Factor = Antenna Factor + Cable Loss

* Mark indicated background noise level.

Radiated spurious emission

Radiated Emission above 1GHz

Channel 24								
Frequency (MHz)	Antenna Polarization	Reading (dB μ V)	Preamp (dB)	Correction Factor (dB/m)	Corrected Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Det. Mode
1838.048	H	70.20	26.18	28.90	72.92	74	-1.08	PK
1838.048	H	50.23	26.18	28.90	52.95	54	-1.05	AV
2757.072	H	47.62	26.23	32.20	53.59	74	-20.41	PK
2757.072	H	33.20	26.23	32.20	39.17	54	-14.83	AV
3676.096	H	47.16	26.28	33.94	54.82	74	-19.18	PK
3676.096	H	31.72	26.28	33.94	39.38	54	-14.62	AV
4595.120	H	42.52	26.07	37.13	53.58	74	-20.42	PK
4595.120	H	28.23	26.07	37.13	39.29	54	-14.71	AV
5514.144	H	*	*	*	*	54	*	PK
6433.168	H	*	*	*	*	54	*	PK
7352.192	H	*	*	*	*	54	*	PK
8271.216	H	*	*	*	*	54	*	PK
9190.240	H	*	*	*	*	54	*	PK
1838.048	V	69.82	26.18	28.90	72.54	74	-1.46	PK
1838.048	V	50.22	26.18	28.90	52.94	54	-1.06	AV
2757.072	V	47.21	26.23	32.20	53.18	74	-20.82	PK
2757.072	V	33.56	26.23	32.20	39.53	54	-14.47	AV
3676.096	V	46.35	26.28	33.94	54.01	74	-19.99	PK
3676.096	V	31.85	26.28	33.94	39.51	54	-14.49	AV
4595.120	V	44.40	26.07	37.13	55.46	74	-18.54	PK
4595.120	V	29.62	26.07	37.13	40.68	54	-13.32	AV
5514.144	V	*	*	*	*	54	*	PK
6433.168	V	*	*	*	*	54	*	PK
7352.192	V	*	*	*	*	54	*	PK
8271.216	V	*	*	*	*	54	*	PK
9190.240	V	*	*	*	*	54	*	PK

Remark : Corrected Level = Reading + Correction Factor – Preamp

Correction Factor = Antenna Factor + Cable Loss

* Mark indicated background noise level.

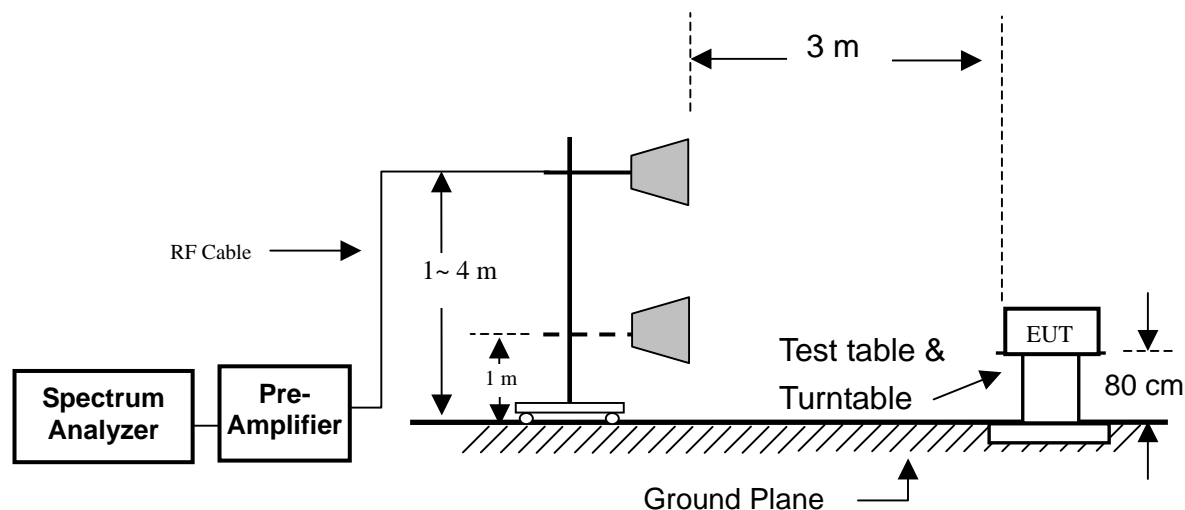
3 Emission on the Band Edge test

3.1 Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

3.2 Configuration of Measurement

Measurement Frequency above 1GHz



3.3 Test Procedure

The EUT was setup to ANSI C63.4, 2003.

Set RBW =1M, VBW= RBW for peak, and VBW=10Hz for average.

The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meter and down to 1 meter.

3.4 Test Result

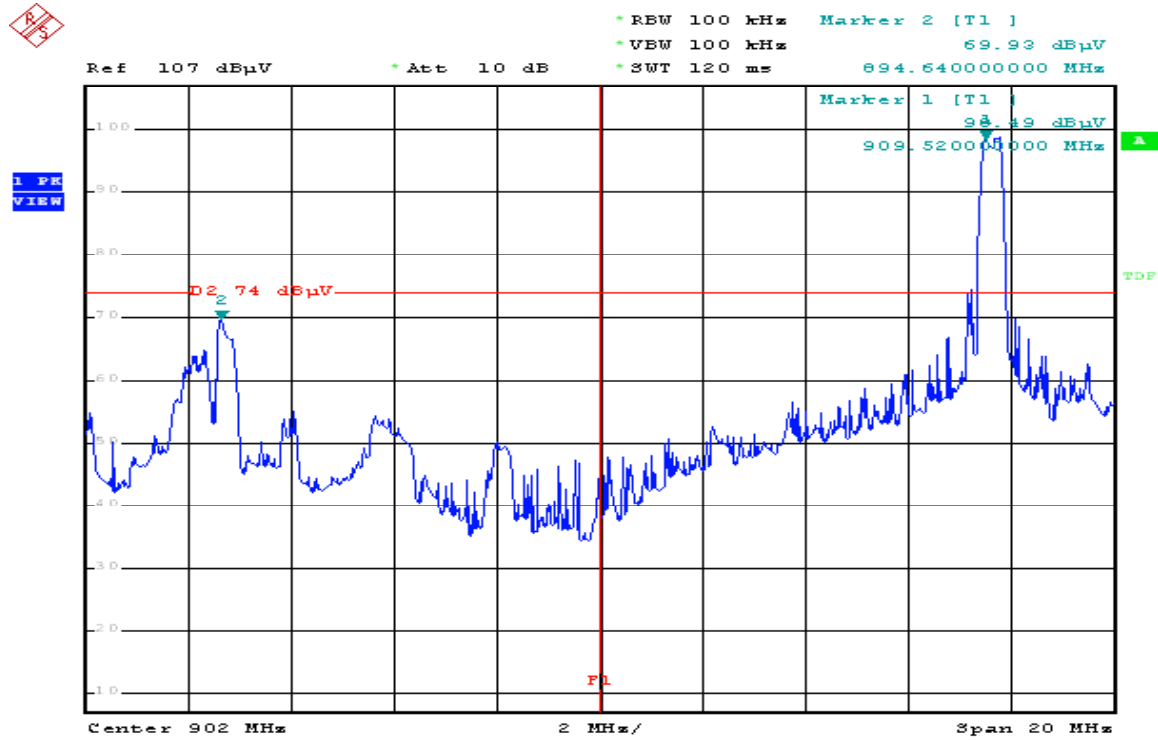
PASS.

The final test data is shown as following.

Band edge

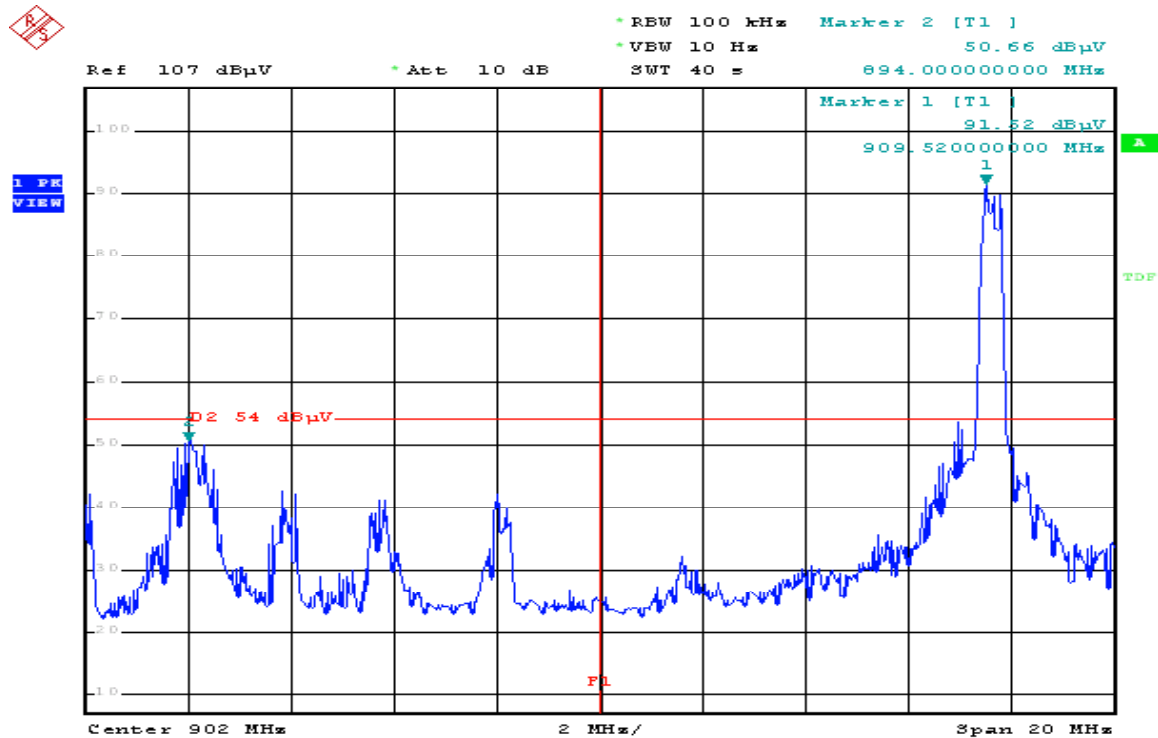
Frequency	Maximum level of Band-edge Emission (dBuV/m)	Limit (dBm)	Margin (dB)	Det mode
909.6	69.93	74	-4.07	PK
	50.66	54	-3.34	AV
919.024	63.68	74	-10.32	PK
	49.46	54	-4.54	AV

909.6MHz PK



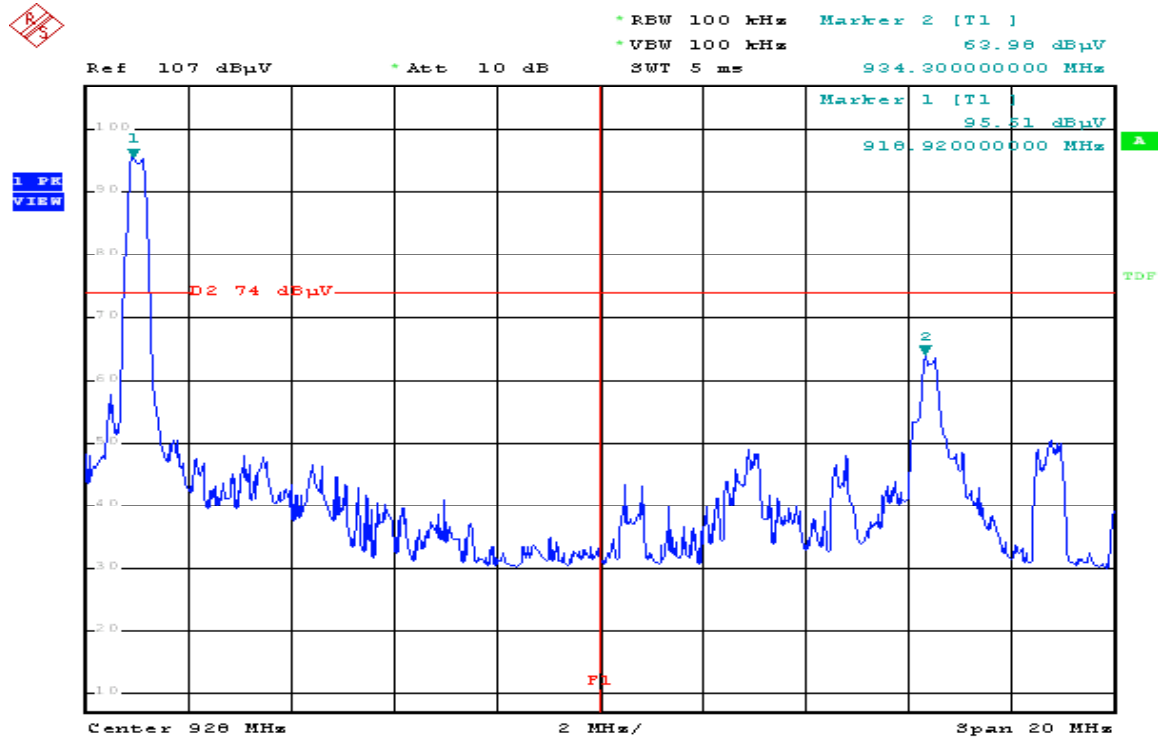
Comment :
Date : 26.OCT.2010 10:15:21

909.6MHz AV



Comment :
Date : 26.OCT.2010 10:20:29

919.024MHz PK



919.024MHz AV

