FCC TEST REPORT

for

47 CFR, Part 15, Subpart C

Equipment	:	**Wireless Remote Control Door Chime (Transmitter)**
Model No.	:	RF-1000T, RF-1000
FCC ID	:	QOZRF-1000T
Filing Type	:	Certification
Applicant	:	**International Sales Corporation** Room 604, 6/F, Fibres & Fabrics Industrial Centre, 7 Shing Yip Street, Kwun Tong, Kowloon, Hong Kong

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- **Certificate or Test Report must not be used by the applicant to claim the product in this test report endorsement by NVLAP or any agency of U.S. government.**

SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Ta ipei Hsien, Taiwan, R.O.C.

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Appendix A. Photographs of EUT ..... **A1 ~ A3**

History of this test report

Original Report Issue Date: Nov. 11, 2002

■ No additional attachment.

☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

Certificate No. : F2O0108

CERTIFICATE OF COMPLIANCE

for

47 CFR, Part 15, Subpart C

Equipment	:	**Wireless Remote Control Door Chime (Transmitter)**
Model No.	:	**RF-1000T, RF-1000**
FCC ID	:	QOZRF-1000T
Filing Type	:	Certification
Applicant	:	**International Sales Corporation** Room 604, 6/F, Fibres & Fabrics Industrial Centre, 7 Shing Yip Street, Kwun Tong, Kowloon, Hong Kong

I **HEREBY** CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **ANSI C63.4 - 1992** and the energy emitted by this equipment was ***passed*** both radiated and conducted emission limits. Testing was carried out on Nov. 4, 2002 at **SPORTON International Inc.** LAB.

K. J. Lin Dec. 09, 2002

K. J. Lin
Manager

SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

1. General Description of Equipment under Test

1.1. Applicant

International Sales Corporation
Room 604, 6/F, Fibres & Fabrics Industrial Centre,
7 Shing Yip Street, Kwun Tong, Kowloon, Hong Kong

1.2. Manufacturer

Same as 1.1.

1.3. Basic Description of Equipment under Test

Equipment	: Wireless Remote Control Door Chime (Transmitter)
Model No.	: **RF-1000T**, RF-1000
FCC ID	: QOZRF-1000**T**
Trade Name	: **N/A**
Power Supply Type	: From Battery (12 VDC)

1.4. Feature of Equipment under Test

- Easy to install or carry around the house.
- Range up to 150 feet.
- Two chimes to differential the front and rear door.
- Changeable codes to prevent any interference with other devices
- FCC compliant
- 313MHz transmitting frequency.
- Transmitter required 1x23A-12 volt battery.

2. Test Configuration of Equipment under Test

2.1. Test Manner

a. The EUT has been associated with peripherals pursuant to ANSI C63.4-1992 and configuration operated in a manner which tended to maximize its emission characteristics in a typical application.
b. Frequency range investigated: conduction 150 KHz to 30 MHz, radiation 30 MHz to 3130 MHz.
c. The radiated emissions testing was made by rotating three orthogonal axes.
d. The EUT employs a switch that will automatically deactivate the transmitter within no more than 5 seconds of being released.
e. The EUT has no periodic transmission at regular predetermined interval.
f. Pursuant to 15.231(c) of Part 15. Subpart C, the bandwidth of the emission at the 20dB point shall be no wider than 0.25% of the center frequency for EUT.
The carrier frequency of EUT is 312.908MHz
312.908MHz * 0.25% = 782.27KHz
The test result is 460KHz (as shown in section 2.4 of this test report), which is less than 782.27KHz.
The EUT meet the 20dB point bandwidth requirement.

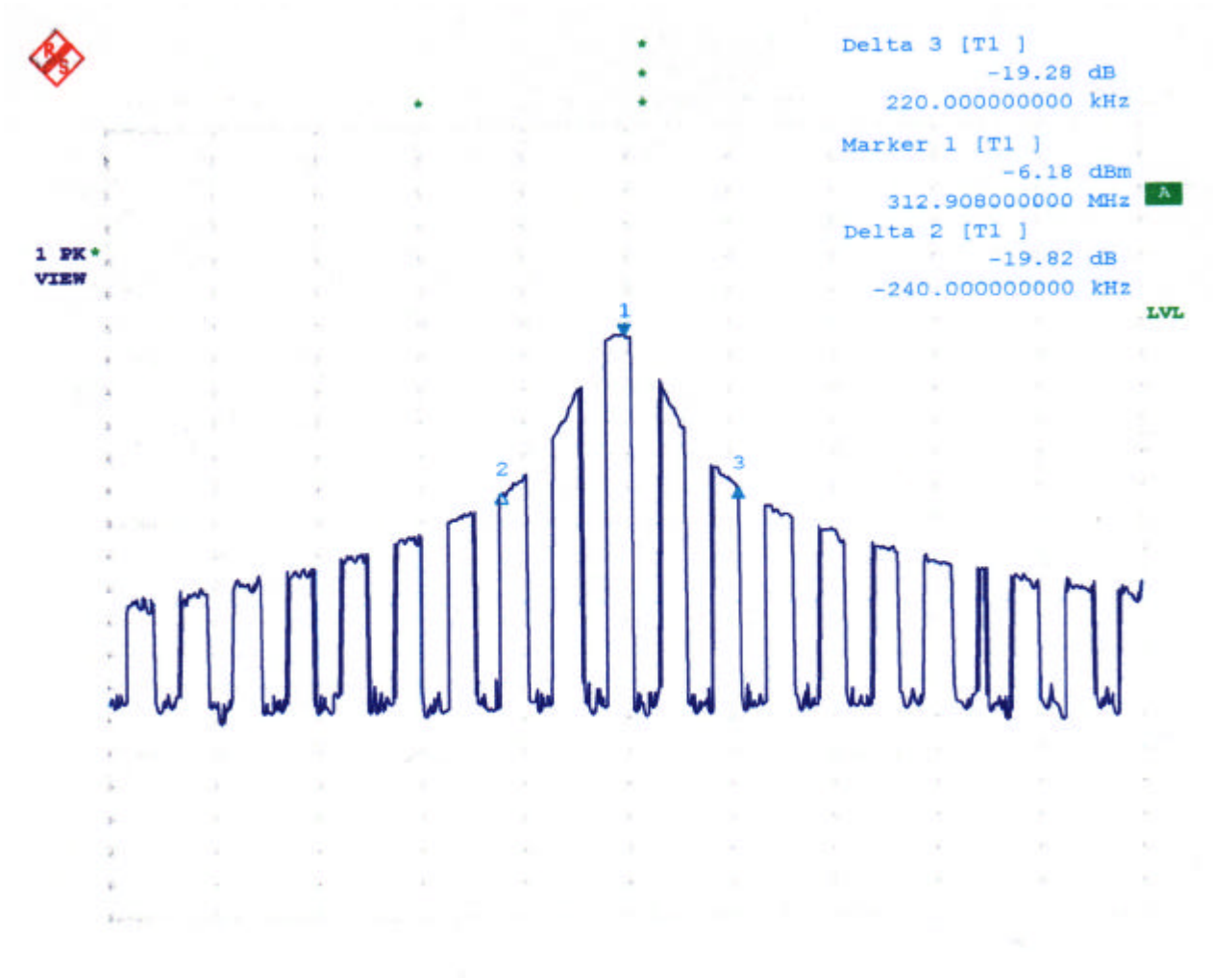
2.2. Description of Test System

The EUT was tested alone. No support device is needed for testing.

2.3. Connection Diagram of Test System

EUT

2.4. A plot shows the EUT meet the requirement of 15.231(c)



2.4.1 Test Procedures and Result

a. User the Radiated method
b. Set RBW of spectrum analyzer to 100KHz and VBW to 100KHz.
c. The 20 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20 dB.
d. 20dB bandwidth= 220-(-240)= 460 KHz

3. Test Software

No test software was used during testing.

4. General Information of Test

4.1. Test Facility

This test was carried out by SPORTON International Inc.

Test Site Location	:	No. 52, Hwa Ya 1St Road, Hwa Ya Technology Park, Kwei-Shan Hsiang, TaoYuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-327-0973
Test Site No.	:	SH03

4.2. Standard for Methods of Measurement

ANSI C63.4-1992

4.3. Test in Compliance with

FCC Part 15, Subpart C

4.4. Frequency Range Investigated

a. Conduction: from 150KHz to 30 MHz
b. Radiation: from 30 MHz to 3130 MHz

4.5. Test Distance

The test distance of radiated emission from antenna to EUT is 3 M.

5. Test of Conducted Powerline

The power supply of EUT is from DC voltage.
Conduction Powerline test is not applicable for this EUT.

6. Test of Radiated Emission

Radiated emissions from 30 MHz to 3130 MHz were measured with a bandwidth of 120 kHz for 30MHz to 1 GHz and 1MHz for above 1GHz according to the methods defines in ANSI C63.4-1992. The EUT was placed on a nonmetallic stand in the open-field site, 0.8 meter above the ground plane, as shown in section 6.3. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

6.1. Major Measuring Instruments

6.1.1. from 30MHz to 1GHz

- Amplifier (ADVANTEST BB525C)

RF Gain	30 dB
Signal Input	9 KHz to 3 GHz

- Spectrum Analyzer (ROHDE&SCHEARZ FSP7)

Attenuation	10 dB
Start Frequency	30 MHz
Stop Frequency	1000 MHz
Resolution Bandwidth	120 kHz
Signal Input	9KHz – 7GHz

6.1.2. from 1GHz to 3.13GHz

- Amplifier (MITEQ 805858)

RF Gain	30 dB
Signal Input	100KHz – 26.5GHz

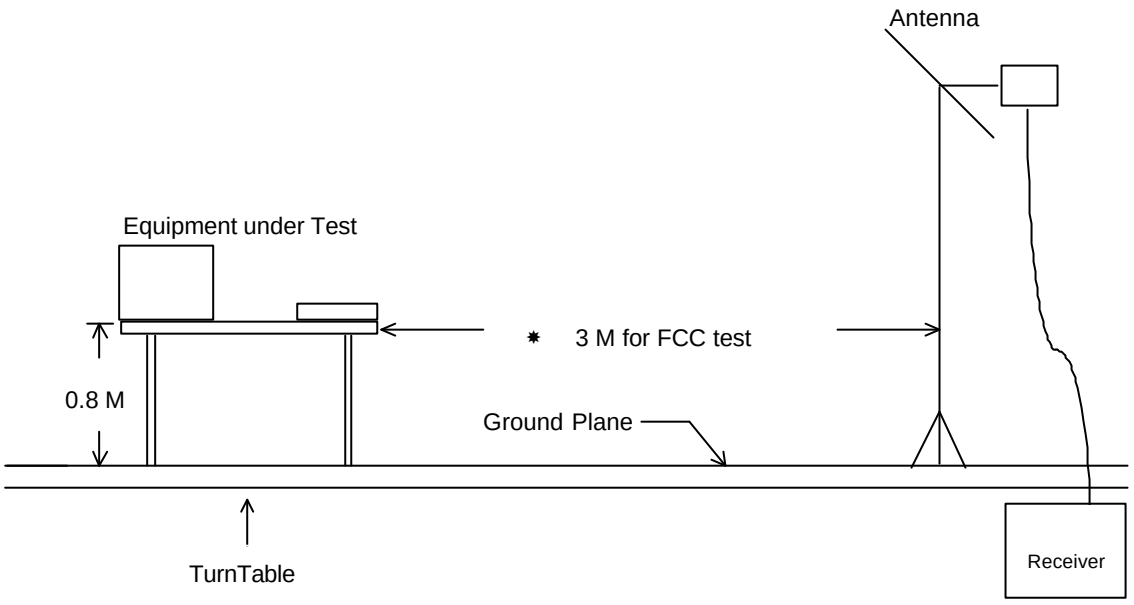
- Spectrum Analyzer (ROHDE&SCHEARZ FSP)

Attenuation	10 dB
Start Frequency	1000 MHz
Stop Frequency	3130 MHz
Resolution Bandwidth	1 MHz
Signal Input	9 KHz to 7 GHz

6.2. Test Procedures

a. The EUT was placed on a rotatable table top 0.8 meter above ground.
b. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
c. The table was rotated 360 degrees to determine the position of the highest radiation.
d. The antenna is a half wave dipole and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
f. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
g. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.
h. For testing above 1GHz, the emission level of the EUT in peak mode was more 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

6.3. Typical Test Setup Layout of Radiated Emission



6.4. Test Result of Radiated Emission

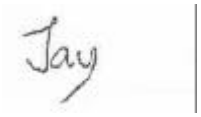
6.4.1. Orthogonal axes: **X**

- Frequency range: 30 ~ 3130 MHz
- Test Distance : 3 M
- Temperature : 22°C Relative Humidity : 54 %
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Antenna Factor + Cable Loss + Reading = Emission

937.70/ 53.88 (HORIZONTAL) Antenna Height 1.1 Meter, Turntable Degree 360 ^{o}.

- **Spurious Emission**

Frequency (MHz)	Polarity	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Limits (dBuV/m)	Limits (uV/m)	Emission Level (dBuV/m)	Emission Level (uV/m)	Margin (dB)	Detect Mode
107.49	H	11.11	1.83	11.17	43.50	150.00	24.11	16.05	-19.39	Peak
215.49	H	8.62	2.73	5.37	43.50	149.60	16.72	6.90	-26.78	Peak
238.98	H	10.70	2.83	5.53	46.00	199.50	19.06	9.00	-26.94	Peak
1742.00	H	26.93	4.36	18.46	74.00	5012	49.75	307.26	-24.25	Peak
1844.00	V	28.61	4.50	11.83	74.00	5012	44.94	176.60	-29.06	Peak

Test Engineer : 

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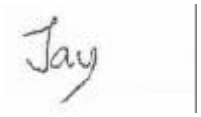
- **Field strength of fundamental and harmonics**

Frequency (MHz)	Polarity	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Limits (dBuV/m)	Limits (uV/m)	Emission Level (dBuV/m)	Emission Level (uV/m)	Margin (dB)	Detect Mode
312.900	H	13.25	3.11	55.95	95.48	59429	72.31	4125.72	-23.17	Peak
312.900	H	13.25	3.11	43.91	75.48	5943	60.27	1031.57	-15.21	A.V.
624.100	H	18.84	4.94	33.47	75.48	5943	57.25	728.62	-18.23	Peak
624.100	H	18.84	4.94	21.43	55.48	594	45.21	182.18	-10.27	A.V.
937.700	H	20.40	5.55	40.95	75.48	5943	66.90	2213.09	-8.58	Peak
937.700	H	20.40	5.55	28.91	55.48	594	54.86	553.35	-0.62	A.V.
1246.00	H	26.29	3.66	19.79	75.48	5943	49.74	306.90	-25.74	Peak
312.900	V	13.25	3.11	41.68	95.48	59429	58.04	797.99	-37.44	Peak
312.900	V	13.25	3.11	29.64	75.48	5943	46.00	199.53	-29.48	A.V.
624.100	V	18.84	4.94	26.07	75.48	5943	49.85	310.81	-25.63	Peak
624.100	V	18.84	4.94	14.03	55.48	594	37.81	77.71	-17.67	A.V.
937.700	V	20.40	5.55	30.56	75.48	5943	56.51	669.11	-18.97	Peak
937.700	V	20.40	5.55	18.52	55.48	594	44.47	167.30	-11.01	A.V.
1246.00	V	26.29	3.66	12.4	75.48	5943	42.35	131.07	-31.65	Peak

Test Engineer : 

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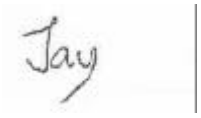
6.4.2. Orthogonal axes: **Y**

- Frequency range: 30 ~ 3130 MHz
- Test Distance : 3 M
- Temperature : 22°C Relative Humidity : 54 %
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Antenna Factor + Cable Loss + Reading = Emission

937.70MHz/54.43dBuV (Horizontal) Antenna Height 2.34 Meter, Turntable Degree 0 ^{o}.

- **Spurious Emission**

Frequency (MHz)	Polarity	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Limits (dBuV/m)	Limits (uV/m)	Emission Level (dBuV/m)	Emission Level (uV/m)	Margin (dB)	Detect Mode
120.45	H	11.59	1.93	9.41	43.50	150.00	22.93	14.01	-20.57	Peak
1998.00	H	31.10	4.71	5.93	74.00	5012	41.74	122.18	-32.26	Peak
2910.00	H	29.67	5.77	7.27	74.00	5012	42.71	136.62	-31.29	Peak
122.61	V	11.55	1.97	3.84	43.50	150.00	17.36	7.38	-26.14	Peak
1246.00	V	26.29	3.66	15.35	74.00	5012	45.30	184.08	-28.70	Peak
2116.00	V	30.83	4.85	6.77	74.00	5012	42.45	132.59	-31.55	Peak

Test Engineer : 

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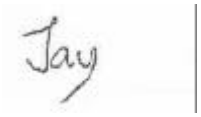
- **Field strength of fundamental and harmonics**

Frequency (MHz)	Polarity	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Limits (dBuV/m)	Limits (uV/m)	Emission Level (dBuV/m)	Emission Level (uV/m)	Margin (dB)	Detect Mode
312.600	H	13.32	3.20	52.71	95.48	59429	69.23	2894.01	-26.25	Peak
312.600	H	13.32	3.20	40.67	75.48	5943	57.19	723.60	-18.29	A.V.
624.100	H	18.84	4.94	35.15	75.48	5943	58.93	884.10	-16.55	Peak
624.100	H	18.84	4.94	23.11	55.48	594	46.89	221.05	-8.59	A.V.
937.700	H	20.40	5.55	41.50	75.48	5943	67.45	2357.76	-8.03	Peak
937.700	H	20.40	5.55	29.46	55.48	594	55.41	589.52	-0.07	A.V.
1246.00	H	26.29	3.66	15.12	75.48	5943	45.07	179.27	-30.41	Peak
312.600	V	13.32	3.20	50.82	95.48	59429	67.34	2328.09	-28.14	Peak
312.600	V	13.32	3.20	38.78	75.48	5943	55.30	582.10	-20.18	A.V.
626.200	V	18.87	4.87	27.73	75.48	5943	51.47	374.54	-24.01	Peak
626.200	V	18.87	4.87	15.67	55.48	594	39.41	93.43	-16.07	A.V.
937.700	V	20.50	6.14	35.82	75.48	5943	62.46	1327.39	-13.02	Peak
937.700	V	20.50	6.14	23.78	55.48	594	50.42	331.89	-5.06	A.V.
1246.00	V	26.29	3.66	15.35	75.48	5943	45.3	184.08	-30.18	Peak

Test Engineer : 

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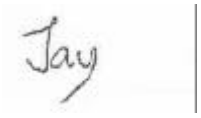
6.4.3. Orthogonal axes: **Z**

- Frequency range: 30 ~ 3130 MHz
- Test Distance : 3 M
- Temperature : 22°C Relative Humidity :54 %
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Antenna Factor + Cable Loss + Reading = Emission

624.10 MHz / 49.11 dBuV (VERTICAL) Antenna Height 1 Meter, Turntable Degree 14 ^{o}.

- **Spurious Emission**

Frequency (MHz)	Polarity	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Limits (dBuV/m)	Limits (uV/m)	Emission Level (dBuV/m)	Emission Level (uV/m)	Margin (dB)	Detect Mode
242.22	H	11.80	2.83	5.22	46.00	200.00	19.85	9.83	-26.15	Peak
1964	H	30.58	4.67	6.43	74.00	5012	41.68	121.34	-32.32	Peak
2646	H	29.88	5.46	7.11	74.00	5012	42.45	132.59	-31.55	Peak
2262	V	30.51	5.02	7.01	74.00	5012	42.54	133.97	-31.46	Peak
2374	V	30.26	5.15	7.51	74.00	5012	42.92	139.96	-31.08	Peak

Test Engineer : 

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- **Field strength of fundamental and harmonics**

Frequency (MHz)	Polarity	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Limits (dBuV/m)	Limits (uV/m)	Emission Level (dBuV/m)	Emission Level (uV/m)	Margin (dB)	Detect Mode
312.600	H	13.32	3.20	44.05	95.48	59429	60.57	1067.82	-34.91	Peak
312.600	H	13.32	3.20	32.01	75.48	5943	48.53	266.99	-26.95	A.V.
624.100	H	18.84	4.94	21.79	75.48	5943	45.57	189.89	-29.91	Peak
624.100	H	18.84	4.94	9.93	55.48	594	33.71	48.47	-21.77	A.V.
937.700	H	20.40	5.55	22.93	75.48	5943	48.88	277.97	-26.60	Peak
937.700	H	20.40	5.55	10.89	55.48	594	36.84	69.50	-18.64	A.V.
1246	H	26.29	3.66	10.00	75.48	5943	39.95	99.43	-35.53	Peak
312.600	H	13.32	3.20	51.28	95.48	59429	67.80	2454.71	-27.68	Peak
312.600	H	13.32	3.20	39.24	75.48	5943	55.76	613.76	-19.72	A.V.
624.100	H	18.84	4.94	38.35	75.48	5943	62.13	1277.91	-13.35	Peak
624.100	H	18.84	4.94	26.31	55.48	594	50.09	319.52	-5.39	A.V.
937.700	H	20.40	5.55	30.61	75.48	5943	56.56	672.98	-18.92	Peak
937.700	H	20.40	5.55	18.57	55.48	594	44.52	168.27	-10.96	A.V.
1246	V	26.29	3.66	12.59	75.48	5943	42.54	133.97	-32.94	Peak

Test Engineer : Jay

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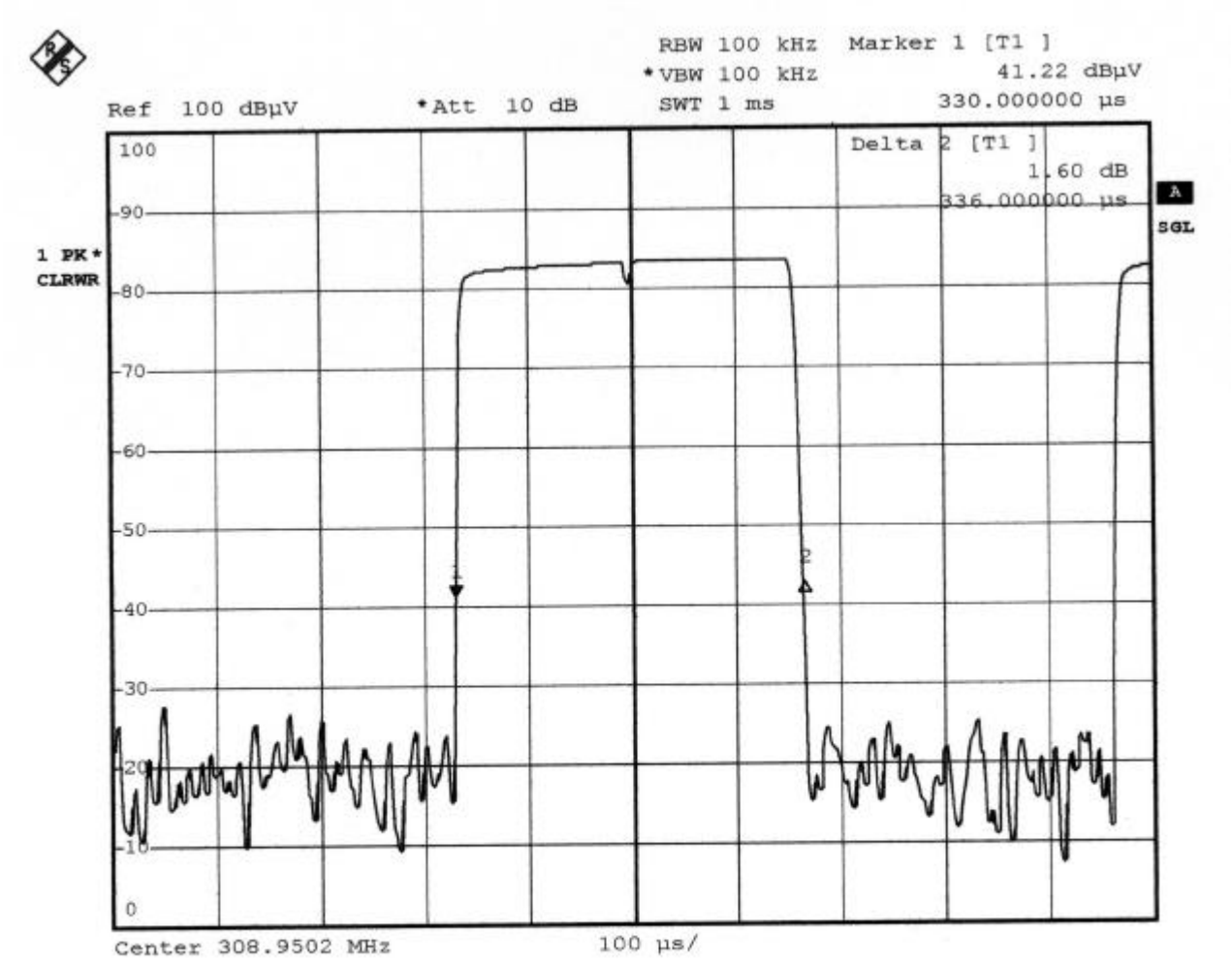
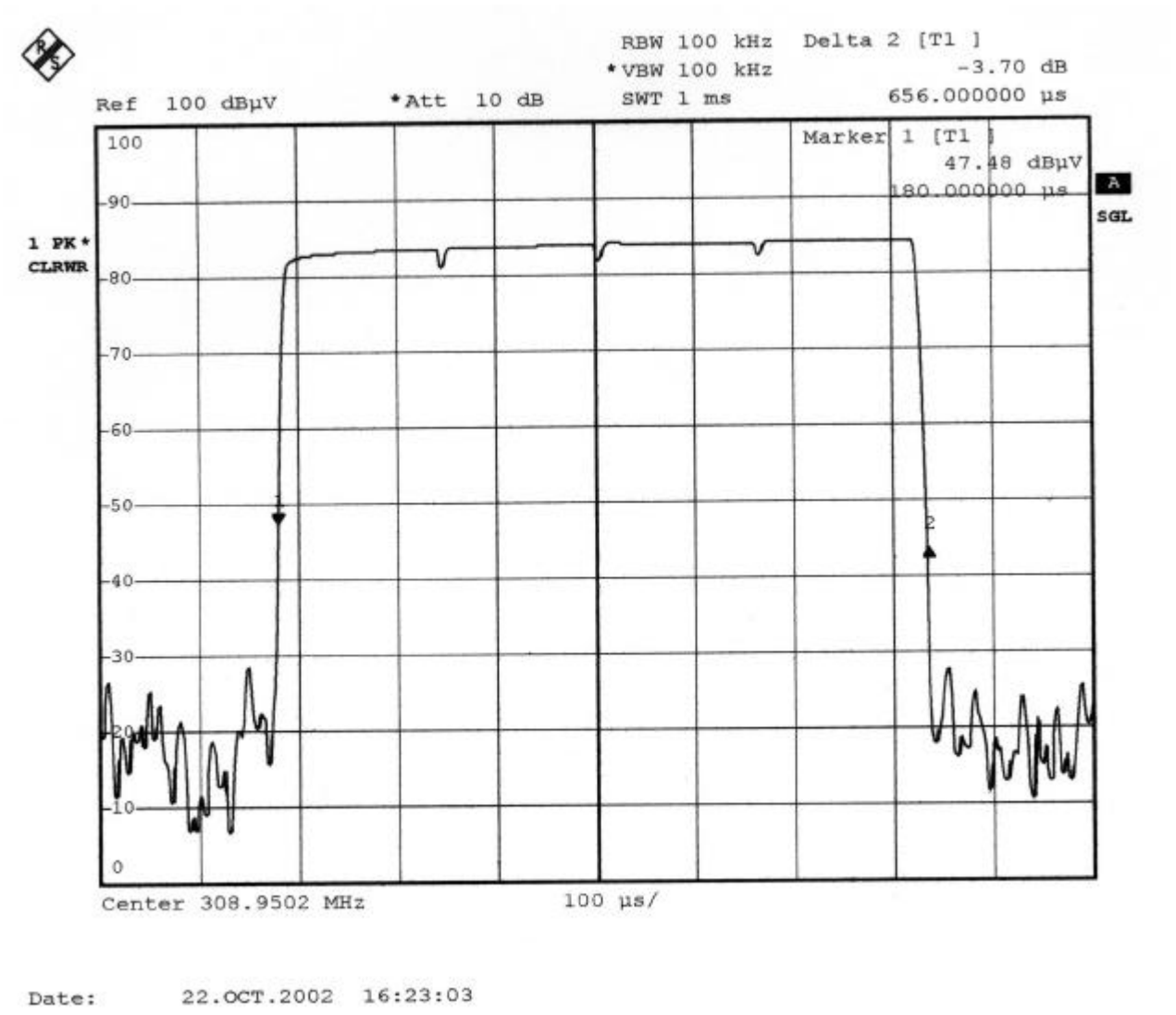
6.5. Figure of Duty Cycle

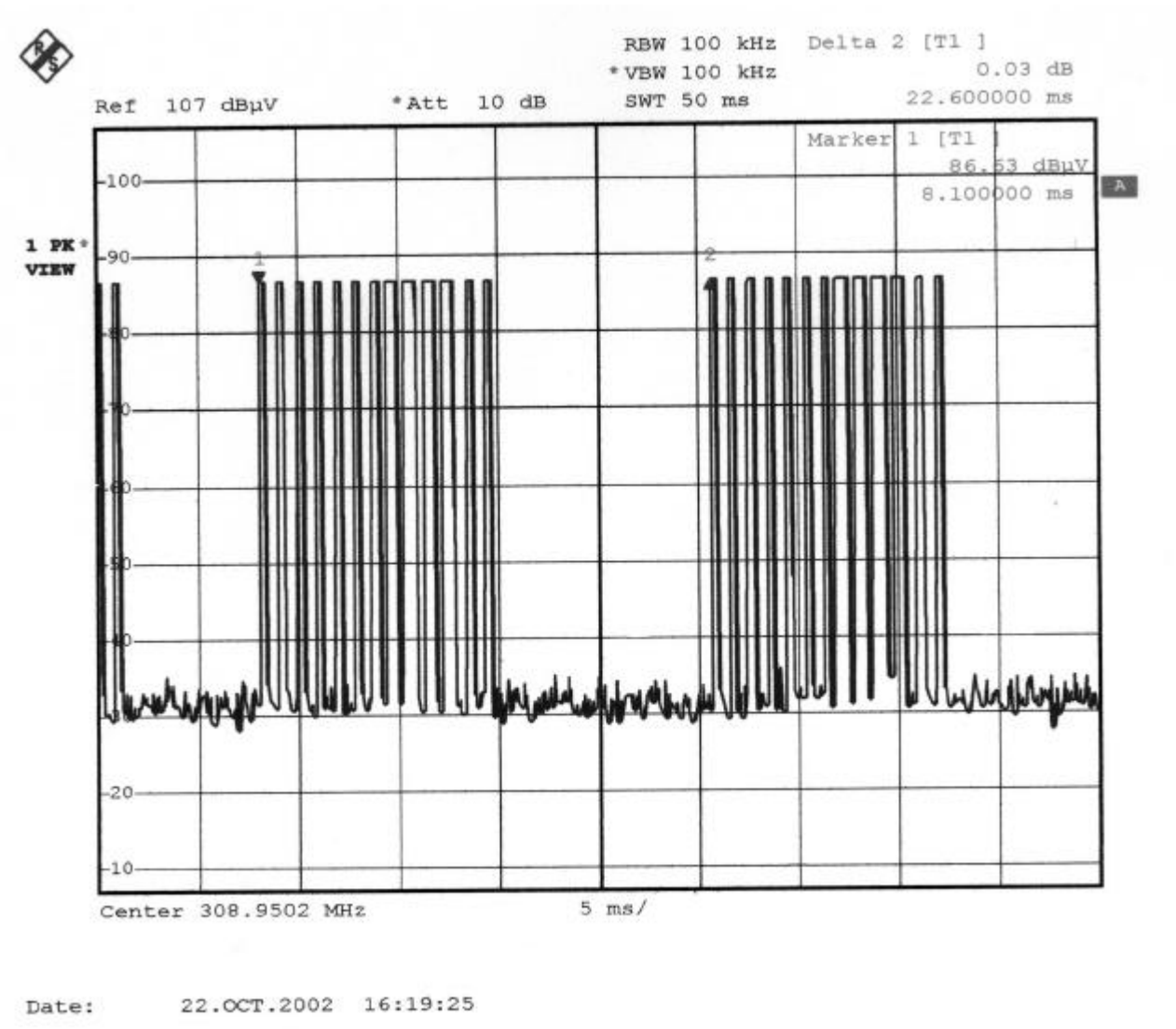
6.5.1. Short Duty



6.5.2. Long Duty



6.5.3. Total Cycle



Duty Cycle : (0.656*4+0.336*9)/22.6= 25%

Duty Factor : 20 log(25%)= -12.04

7. Antenna Factor & Cable Loss

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)
30	18.10	0.75
35	16.00	0.73
40	13.29	0.84
45	10.75	0.93
50	8.10	1.09
55	6.40	1.10
60	5.36	1.21
65	4.94	1.37
70	5.19	1.40
75	6.05	1.53
80	6.96	1.65
85	8.04	1.75
90	8.76	1.66
95	9.70	1.63
100	10.30	1.64
110	11.17	1.88
120	11.60	1.91
130	11.23	1.93
140	10.61	1.93
150	10.10	2.15
160	9.20	2.21
170	9.01	2.27
180	8.71	2.32
190	8.80	2.45
200	8.24	2.54
220	8.80	2.77
240	10.72	2.81
260	13.20	2.90
280	12.50	3.59
300	12.96	3.12
320	13.50	3.53
340	13.93	3.47
360	14.39	3.64
380	14.70	3.72
400	15.76	3.67
450	16.35	4.09
500	17.29	4.28
550	18.50	4.46
600	18.43	4.07
650	18.85	4.86
700	18.93	5.30
750	19.75	5.22
800	19.92	5.51
850	20.24	5.83
900	20.30	5.07
950	20.46	5.87
1000	20.80	5.99
1000	24.30	3.28
2000	31.10	4.69
3000	29.60	5.84
4000	30.80	6.87

8. EMI Suppression Component List

No EMI suppression components.

9. List of Measuring Equipments Used

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSP7	838858/039	9KHz – 7GHz	Jan. 07, 2002	Radiation (SH03)
Amplifier	ADVANTEST	BB525C	CH300001	9KHz – 3GHz	Nov. 15, 2001	Radiation (SH03)
Bilog Antenna	SCHAFFNER	CBL61128	2681	30MHz –2GHz	Dec. 23, 2001	Radiation (SH03)
Turn Table	HD	DS 420	420/649/00	0 ~ 360 degree	N/A	Radiation (SH03)
Antenna Mast	HD	MA 240	240/559/00	1 m - 4 m	N/A	Radiation (SH03)
Half-wave dipole antenna	R&S	HZ12 HZ13	83924403 83924503	30MHz - 1GHz	Sep. 23, 2002	Radiation (SH03)
Amplifier	MITEQ	NSP2650-NF	805858	100MHz~26.5GHz	Jul. 11, 2002	Radiation (SH03)

Calibration Interval of instruments listed above is one year.

10. Uncertainty of Test Site

Uncertainty of Radiated Emission Measurement

Contribution	Probability Distribution	3m
Antenna factor calibration	normal(k=2)	±1
cable loss calibration	normal(k=2)	±0.3
RCV/SPA specification	rectangular	±2
Antenna Directivity	rectangular	±3
Antenna Factor V.S. Height	rectangular	±2
Antenna Factor Interpolation for Frequency	rectangular	±0.25
site imperfection	rectangular	±2
Mismatch Receiver VSWR Γ1=0.09 Antenna VSWR Γ2=0.67 Uncertainty=20log(1-Γ1*Γ2)	U-shaped	±0.54
combined standard uncertainty Ue(y)	normal	±2.7
Measuring uncertainty for a level of confidence of 95% U=2Ue(y)	normal (k=2)	±5.4

$U=\sqrt{\{(1/2)^2+(0.3/2)^2+(2^2+0.5^2+2^2+0.25^2+2^2)/3+(0.54)^2/2\}}=2.2$ for 10m test distance

$U=\sqrt{\{(1/2)^2+(0.3/2)^2+(2^2+3^2+2^2+0.25^2+2^2)/3+(0.54)^2/2\}}=2.7$ for 3m test distance

Uncertainty of Conducted Emission Measurement

Contribution	Probability Distribution	150KHz – 30MHz
Cable and I/P attenuator calibration	normal(k=2)	±0.3
RCV/SPA specification	rectangular	±2
LISN coupling specification	rectangular	±1.5
Transducer factor frequency interpolation	rectangular	±0.2
Mismatch Receiver VSWR Γ1=0.09 LISN VSWR Γ2=0.33 Uncertainty=20log(1-Γ1*Γ2)	U-shaped	0.2
combined standard uncertainty Ue(y)	normal	±1.66
Measuring uncertainty for a level of confidence of 95% U=2Ue(y)	normal (k=2)	±3.32

$U=\sqrt{\{(0.3/2)^2+(2^2+1.5^2+0.2^2)/3+(0.2)^2/2\}}=1.66$