ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

OF

2.4GHz AV Sender

MODEL No.: TD-2400

BRAND NAME: Lawmate

FCC ID: QV8TD2400

REPORT NO: 030016-RF-ID

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Prepared for

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1. GENERAL INFORMATION

1.1 Product Description

The LawMate Technology Co., Ltd. Model: TD-2400 (referred to as the EUT in this report) The EUT is an short range, lower power, designed as an " wireless video sender device". It is designed by way of utilizing the FM modulation achieves the system operating.

A major technical descriptions of EUT is described as following:

A). Operation Frequency: 2413/2432/2451/2470 MHz, 4 channel.
B). Modulation: Frequency Modulation (FM)
C). Antenna Designation: A revised SMA connector provided, Non -User Replaceable.
D). Power Supply: 12 Vdc by a AC/DC Power adaptor.

1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **QV8TD2400** filing to comply with Section 15.249 of the FCC Part 15, Subpart C Rules. The composite system (Digital Device) is compliance with Subpart B is authorized under a DoC procedure.

1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (1992). Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the address of C&C Laboratory, Co., Ltd. No. 81-1, 210 Lane, Pa-de 2nd Road, Lu-Chu Hsiang, Taoyuan, Taiwan, R.O.C.. The Open Area Test Sites and the Line Conducted labs are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 1992 and CISPR 22/EN 55022 requirements.

1.5 Special Accessories

Not available for this EUT intended for grant.

1.6 Equipment Modifications

Not available for this EUT intended for grant.

2. System Test Configuration

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The Transmitter was operated in the normal operating mode. the Tx frequency was fixed which was for the purpose of the measurements.

2.3 Test Procedure

2.3.1Conducted Emissions

The EUT is a placed on a table which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4-1992.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak detector mode.

2.3.2Radiated Emissions

The EUT is a placed on a turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission,according to the requirements in Section 13.1.4.1 of ANSI C63.4-1992.

2.4 Limitation

(1) Conducted Emission

According to section 15.207(a) Conducted Emission Limits is as following.

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 – 0.5	66 - 56	56 - 46
0.5 – 5	56	46
5 - 30	60	50

(2) Radiated Emission 15.249(a)

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following.

Frequency (MHz)	Field strength of Fundamental	Field strength of Harmonics	Distance(m)
902 - 928	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3
2400 – 2483.5	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3
5725 – 5875	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3
24.0 – 24.25 GHz	250 mV/m (107.95dBuV/m)	2500 uV/m (67.95dBuV/m)	3

(3) Radiated Emission15.249(d)

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

Frequency (MHz)	Field strength μV/m	Distance(m)	Field strength at 3m dBμV/m
1.705-30	30	30	69.54
30-88	100	3	40
88-216	150	3	43.5
216-960	200	3	46
Above 960	500	3	54

(4) Radiated Emission 15.249(e)

For frequencies above 1000MHz, the above field strength limits are based on average limits. The peak filed strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20dB under any condition of modulation.

Remark: 1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of ξ 15.205
4. Emission spurious frequency which appearing within the Restricted Bands specified in provision of ξ15.205, then the general radiated emission limits in ξ 15.209 apply.

2.5 Configuration of Tested System

Fig. 2-1 Configuration of TX

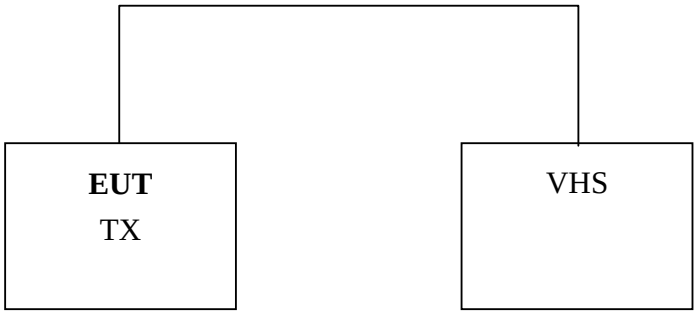


Table 2-1 Equipment Used in Tested System

No.	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
1.	2.4GHz AV Sender (TX)	Lawmate	TD-2400	QV8TD2400	N/A	***EUT***
2.	VHS	JVC	HR-S3600U	ASIP9K045	134E8484	

Note: All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.

Grounding: Grounding was in accordance with the manufacturer's requirements and conditions for the intended use.

3. Summary Of Test Results

FCC Rules	Description Of Test	Result
§15.207	Conducted Emission	Compliant
§15.249(a)(e)	Radiated Emission	Compliant
§15.249(d)	26dB band width Measurement	Compliant

Description of test modes

The EUT (2.4GHz AV Sender) has been tested under normal operating condition.
The EUT stay in continuous mode as below. The Frequency 2413 MHz , 2451 MHz and 2470 MHz were chosen for testing. The video signal is form VHS.

4. Conducted Emissions Test

4.1 Measurement Procedure:

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

4.2 Test SET-UP (Block Diagram of Configuration)

4.3 Measurement Equipment Used:

Conducted Emission Test Site # 3					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
EMI Test Receiver	R&S	ESCS30	847793/012	12/21/2002	12/20/2003
LISN	R&S	ESH2-Z5	843285/010	12/16/2002	12/15/2003
LISN	EMCO	3825/2	9003-1628	07/26/2002	07/25/2003
Spectrum Analyzer	ADVANTEST	R3261A	91720031	N/A	N/A
2X2 WIRE ISN	R&S	ENY22	100020	06/20/2002	06/19/2003
FOUR WIRE ISN	R&S	ENY41	100006	06/20/2002	06/19/2003
Thermo-Hygro Meter	TODAY	N/A	CE3	03/14/2003	03/13/2004

4.4 Measurement Result:

Operation Mode: TX
Fundamental Frequency: 2413 MHz
Temperature : 19 ℃
Test Date : March. 25, 2003
Test By: Robin
Humidity : 72 %
Judgement：Passed by -3.89 dB at 0.539 MHz At L1

Freq. (MHz)	Terminal L/N	Measured(dBuV) QP-Mode	Measured(dBuV) AV-Mode	Limits(dBuV) QP-Mode	Limits(dBuV) AV-Mode	Safe Margins (dBuV)	Note
0.228	L1	52.00	40.20	62.52	52.52	-10.52	(QP)
0.317	L1	51.40	43.50	59.79	49.79	-6.29	(AV)
0.426	L1	50.60	41.30	57.33	47.33	-6.03	(AV)
0.491	L1	51.00	41.64	56.15	46.15	-4.51	(AV)
0.539	L1	50.60	42.11	56.00	46.00	-3.89	(AV)
0.611	L1	48.40	39.65	56.00	46.00	-6.35	(AV)
0.150	L2	52.20	---	66.00	56.00	-13.80	(QP)
0.230	L2	50.20	---	62.45	52.45	-12.25	(QP)
0.291	L2	48.00	---	60.50	50.50	-12.50	(QP)
0.376	L2	46.20	---	58.37	48.37	-12.17	(QP)
0.431	L2	42.60	---	57.23	47.23	-14.63	(QP)
0.500	L2	40.60	---	56.00	46.00	-15.40	(QP)

Remark：

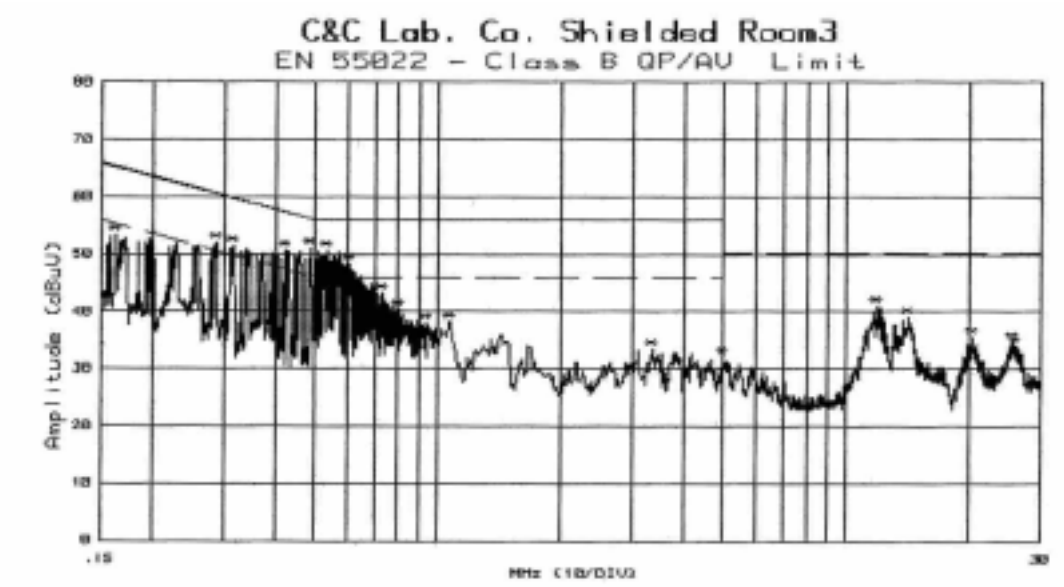
(1) Measuring frequencies from 0.15 MHz to 30MHz。

(2) The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Qusia-Peak detector and Average detector.

(3) **"**---" denotes the emission level was or more than 2dB below the Average limit, so no re-check anymore.

(4) The IF bandwidth of SPA between 0.15MHz to 30MHz was 10KHz;
The IF bandwidth of Test Receiver between 0.15MHz to 30MHz was 9KHz;

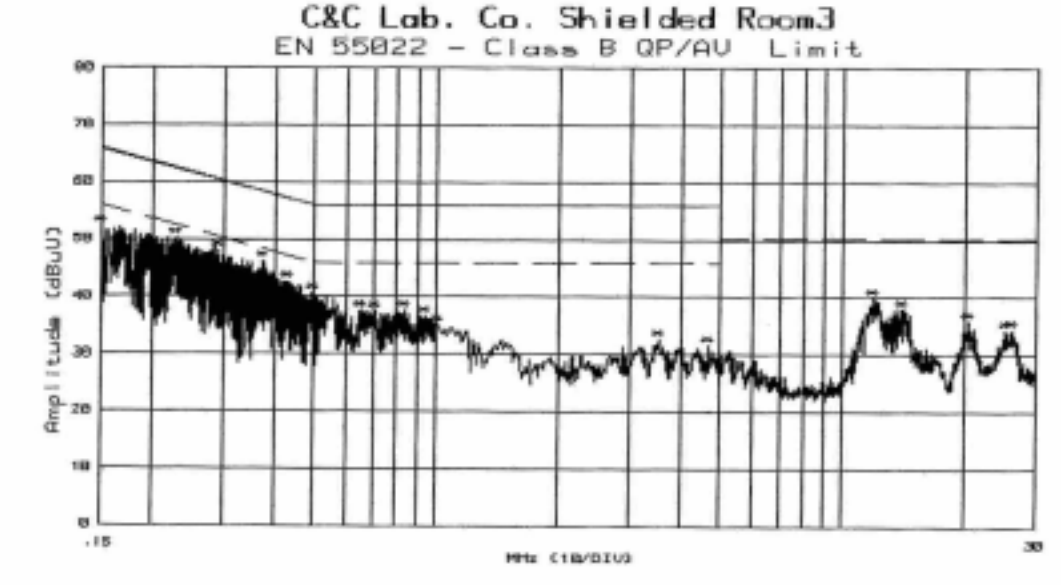
Conducted Emission. Test data Plot



Customer:Lawmate
Model :TD-2400
Mode :TX
Reading :Peak(R3261C SPA)
Remark :AC110V

File#: 1994
Humd.:72 (%)
Port :L1

Date :25 Mar 2003 22:27:56
Temp. :19 (C)
Tested by:Robin



Customer:Lawmate
Model :TD-2400
Mode :TX
Reading :Peak(R3261C SPA)
Remark :AC110V

File#: 1993
Humd.:72 (%)
Port :L2

Date :25 Mar 2003 21:17:30
Temp. :19 (C)
Tested by:Robin

5. Radiated Emission Test

5.1 Measurement Procedure

1.The EUT was placed on a turntable that is 0.8m above ground plane.

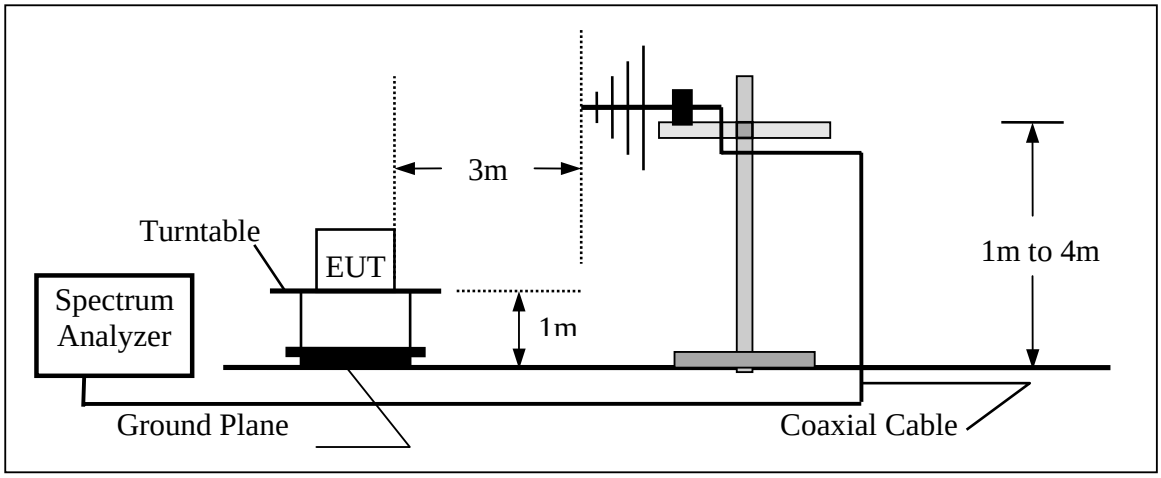
2.Maximum procedure was performed on the six highest emissions to ensure EUT compliance.

3.And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

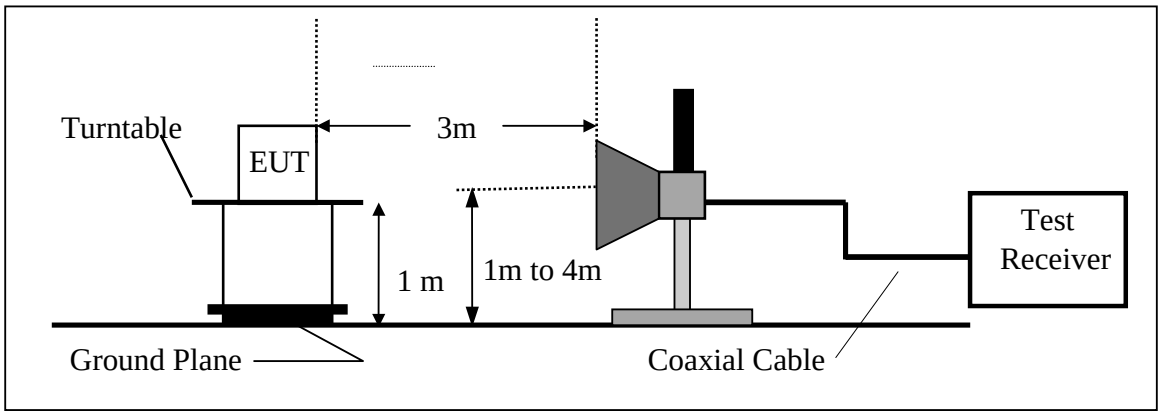
4.Repeat above procedures until all frequency measured were complete.

5.2 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



5.3 Measurement Equipment Used:

Open Area Test Site # 3					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	ADVANTEST	R3261A	N/A	N/A	N/A
Spectrum Analyzer	R&S	FSP 30	1093.4495.30	07/23/2002	07/22/2003
EMI Test Receiver	R&S	ESVS20	838804/004	01/09/2003	01/08/2004
Pre-Amplifier	HP	8447D	2944A09173	03/03/2003	03/02/2004
Bilog Antenna	SCHWAZBECK	VULB9163	145	07/06/2002	07/05/2003
Horn Antenna	EMCO	3115	9602-4659	04/16/2002	04/15/2003
Turn Table	EMCO	2081-1.21	9709-1885	N.C.R	N.C.R
Antenna Tower	EMCO	2075-2	9707-2060	N.C.R	N.C.R
Controller	EMCO	2090	9709-1256	N.C.R	N.C.R
RF Switch	ANRITSU	MP59B	M53867	N.C.R	N.C.R
Site NSA	C&C	N/A	N/A	09/07/2002	09/06/2003
Horn antenna	SCHWAZBECK	BBHA 9120	D210	3/17/2003	3/16/2004
Thermo-Hygro Meter	SATO	N/A	SITE3	05/06/2002	05/05/2003
Pre-Amplifier	HP	8449B	3008B00965	10/01/2002	10/02/2003

5.4 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

5.5 Below 1GHz Measurement Result

Operation Mode: TX Mode
Fundamental Frequency: 2413 MHz
Temperature : 22 ℃
Humidity : 68 %
Test Date : March. 12, 2002
Test By: Robin
Pol: Vertical
Judgment：Passed by -9.77 dB at 948.67 MHz Ant.Pol. Ver. EUT Axis N/A

Freq. (MHz)	F/S	Peak Reading (dBuV)	CF (dB)	Actual Peak FS (dBuV/m)	Limit at 3m (dBuV/m)	Margin (dB)	Detector Mode (PK/QP)
264.90	S	4.05	15.90	19.95	46.00	-26.05	Peak
322.17	S	4.04	17.28	21.32	46.00	-24.68	Peak
446.67	S	4.10	21.89	25.99	46.00	-20.01	Peak
634.83	S	6.47	25.03	31.50	46.00	-14.50	Peak
791.16	S	5.45	26.09	31.54	46.00	-14.46	Peak
948.67	S	7.39	28.84	36.23	46.00	-9.77	Peak

Remark：

(1) + F/S F：denotes Fundamental Frequency；S： denotes Spurious Frequency
(2) Measuring frequencies from 30 MHz to the 26GHz。
(3) Datas of measurement within this frequency range shown〃-〃in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
(4) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。
(5) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。
(6) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms

Operation Mode: TX Mode
Fundamental Frequency: 2413 MHz
Temperature : 22 ℃
Humidity : 68 %
Test Date : March. 12, 2002
Test By: Robin
Pol: Horizontal
Judgement：Passed by -11.83 dB at 850.67 MHz Ant.Pol. Hor. EUT Axis N/A

Freq. (MHz)	F/S	Peak Reading (dBuV)	CF (dB)	Actual Peak FS (dBuV/m)	Limit at 3m (dBuV/m)	Margin (dB)	Detector Mode (PK/QP)
248.25	S	5.51	16.24	21.75	46.00	-24.25	Peak
478.50	S	5.51	21.50	27.01	46.00	-18.99	Peak
534.50	S	5.94	23.73	29.67	46.00	-16.33	Peak
640.67	S	6.45	24.97	31.42	46.00	-14.58	Peak
850.67	S	6.88	27.29	34.17	46.00	-11.83	Peak
974.30	S	7.74	29.32	37.06	54.00	-16.94	Peak

Remark：

(1) + F/S F：denotes Fundamental Frequency；S： denotes Spurious Frequency
(2) Measuring frequencies from 30 MHz to the 26GHz。
(3) Datas of measurement within this frequency range shown〃-〃in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
(4) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。
(5) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。
(6) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms

Operation Mode: TX Mode
Fundamental Frequency: 2451 MHz
Temperature : 22 ℃
Humidity : 68 %
Judgment：Passed by -13.82 dB at 804.00 MHz Ant.Pol. Ver. EUT Axis N/A

Test Date : March. 12, 2002
Test By: Robin
Pol: Vertical

Freq. (MHz)	F/S	Peak Reading (dBuV)	CF (dB)	Actual Peak FS (dBuV/m)	Limit at 3m (dBuV/m)	Margin (dB)	Detector Mode (PK/QP)
200.55	S	5.97	14.93	20.90	43.50	-22.60	Peak
236.55	S	5.63	15.78	21.41	46.00	-24.59	Peak
653.50	S	5.17	24.94	30.11	46.00	-15.89	Peak
721.17	S	5.86	25.82	31.68	46.00	-14.32	Peak
804.00	S	5.95	26.23	32.18	46.00	-13.82	Peak
970.83	S	7.99	29.25	37.24	54.00	-16.76	Peak

Remark：

(1) + F/S F：denotes Fundamental Frequency；S： denotes Spurious Frequency
(2) Measuring frequencies from 30 MHz to the 26GHz。
(3) Datas of measurement within this frequency range shown〃- 〃in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
(4) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。
(5) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。
(6) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms

Operation Mode: TX Mode
Fundamental Frequency: 2451 MHz
Temperature : 22 ℃
Humidity : 68 %
Test Date : March. 12, 2002
Test By: Robin
Pol: Horizontal
Judgement：Passed by -12.49 dB at 861.17 MHz Ant.Pol. Hor. EUT Axis N/A

Freq. (MHz)	F/S	Peak Reading (dBuV)	CF (dB)	Actual Peak FS (dBuV/m)	Limit at 3m (dBuV/m)	Margin (dB)	Detector Mode (PK/QP)
110.10	S	6.42	12.84	19.26	43.50	-24.24	Peak
454.00	S	4.53	20.36	24.89	46.00	-21.11	Peak
522.83	S	5.52	23.32	28.84	46.00	-17.16	Peak
713.00	S	6.32	25.80	32.12	46.00	-13.88	Peak
861.17	S	6.04	27.47	33.51	46.00	-12.49	Peak
963.83	S	7.34	29.12	36.46	54.00	-17.54	Peak

Remark：

(1) + F/S F：denotes Fundamental Frequency；S： denotes Spurious Frequency
(2) Measuring frequencies from 30 MHz to the 26GHz。
(3) Datas of measurement within this frequency range shown〃- 〃in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
(4) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。
(5) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。
(6) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms

Operation Mode: TX Mode
Fundamental Frequency: 2470 MHz
Temperature : 22 ℃
Humidity : 68 %
Judgment：Passed by -10.14 dB at 919.50 MHz Ant.Pol. Ver. EUT Axis N/A

Test Date : March. 12, 2002
Test By: Robin
Pol: Vertical

Freq. (MHz)	F/S	Peak Reading (dBuV)	CF (dB)	Actual Peak FS (dBuV/m)	Limit at 3m (dBuV/m)	Margin (dB)	Detector Mode (PK/QP)
248.25	S	5.68	16.24	21.92	46.00	-24.08	Peak
501.83	S	6.25	22.57	28.82	46.00	-17.18	Peak
619.67	S	7.06	25.18	32.24	46.00	-13.76	Peak
693.16	S	6.32	25.65	31.97	46.00	-14.03	Peak
919.50	S	7.43	28.43	35.86	46.00	-10.14	Peak
970.83	S	7.16	29.25	36.41	54.00	-17.59	Peak

Remark：

(1) + F/S F：denotes Fundamental Frequency；S： denotes Spurious Frequency
(2) Measuring frequencies from 30 MHz to the 26GHz。
(3) Datas of measurement within this frequency range shown〃- 〃in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
(4) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。
(5) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。
(6) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms

Operation Mode: TX Mode
Fundamental Frequency: 2470 MHz
Temperature : 22 ℃
Humidity : 68 %
Test Date : March. 12, 2002
Test By: Robin
Pol: Horizontal
Judgement：Passed by -10.33 dB at 937.00 MHz Ant.Pol. Hor. EUT Axis N/A

Freq. (MHz)	F/S	Peak Reading (dBuV)	CF (dB)	Actual Peak FS (dBuV/m)	Limit at 3m (dBuV/m)	Margin (dB)	Detector Mode (PK/QP)
279.75	S	4.73	15.89	20.62	46.00	-25.38	Peak
645.33	S	4.95	24.93	29.88	46.00	-16.12	Peak
710.67	S	6.51	25.79	32.30	46.00	-13.70	Peak
822.67	S	6.95	26.66	33.61	46.00	-12.39	Peak
937.00	S	6.99	28.68	35.67	46.00	-10.33	Peak
966.16	S	7.72	29.16	36.88	54.00	-17.12	Peak

Remark：

(1) + F/S F：denotes Fundamental Frequency；S： denotes Spurious Frequency
(2) Measuring frequencies from 30 MHz to the 26GHz。
(3) Datas of measurement within this frequency range shown〃- 〃in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
(4) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。
(5) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。
(6) Spectrum Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms

5.6 Above 1GHz Measurement Result

Operation Mode: TX Mode
Fundamental Frequency: 2413 MHz
Temperature : 22 ℃
Humidity : 68 %
Test Date : March. 12, 2002
Test By: Robin
Pol: Vertical
Judgment：Passed by -4.98 dB at 2413.0 MHz Ant.Pol. Ver. EUT Axis N/A

Freq. (MHz)	F/S	Peak Reading (dBuV)	AV Reading (dBuV)	CF (dB)	Actual Peak FS (dBuV/m)	Actual AV FS (dBuV/m)	Peak Limit at 3m (dBuV/m)	AV Limit at 3m (dBuV/m)	Margin (dB)	Detector Mode (PK/AV)
2413.0	F	95.34	--	-6.32	89.02	--	114.00	94.00	-4.98	Peak
4826.0	S	44.50	--	-0.12	44.38	--	74.00	54.00	-9.62	Peak
7239.0	S	--	--	--	--	--	74.00	54.00	--	--
9652.0	S	--	--	--	--	--	74.00	54.00	--	--
12065.0	S	--	--	--	--	--	74.00	54.00	--	--
14478.0	S	--	--	--	--	--	74.00	54.00	--	--
16891.0	S	--	--	--	--	--	74.00	54.00	--	--
19304.0	S	--	--	--	--	--	74.00	54.00	--	--
21717.0	S	--	--	--	--	--	74.00	54.00	--	--
24130.0	S	--	--	--	--	--	74.00	54.00	--	--

Remark：

(1) + F/S F：denotes Fundamental Frequency；S： denotes Spurious Frequency
(2) Measuring frequencies from 30 MHz to the 26GHz。
(3) Datas of measurement within this frequency range shown〃- 〃in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
(4) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。
(5) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。
(6) Spectrum Peak Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms
(7) Spectrum Average Setting :1G – 26GHz ,RBW= 1MHz, VBW=10Hz, Sweep time =Auto.

Operation Mode: TX Mode
Fundamental Frequency: 2413 MHz
Temperature : 22 ℃
Humidity : 68 %
Test Date : March. 12, 2002
Test By: Robin
Pol: Horizontal
Judgement：Passed by -16.15 dB at 2413.0 MHz Ant.Pol. Hor. EUT Axis N/A

Freq. (MHz)	F/S	Peak Reading (dBuV)	AV Reading (dBuV)	CF (dB)	Actual Peak FS (dBuV/m)	Actual AV FS (dBuV/m)	Peak Limit at 3m (dBuV/m)	AV Limit at 3m (dBuV/m)	Margin (dB)	Detector Mode (PK/AV)
2413.0	F	84.17	--	-6.32	77.85	--	114.00	94.00	-16.15	Peak
4826.0	S	--	--	--	--	--	74.00	54.00	--	--
7239.0	S	--	--	--	--	--	74.00	54.00	--	--
9652.0	S	--	--	--	--	--	74.00	54.00	--	--
12065.0	S	--	--	--	--	--	74.00	54.00	--	--
14478.0	S	--	--	--	--	--	74.00	54.00	--	--
16891.0	S	--	--	--	--	--	74.00	54.00	--	--
19304.0	S	--	--	--	--	--	74.00	54.00	--	--
21717.0	S	--	--	--	--	--	74.00	54.00	--	--
24130.0	S	--	--	--	--	--	74.00	54.00	--	--

Remark：

(1) + F/S F：denotes Fundamental Frequency；S： denotes Spurious Frequency
(2) Measuring frequencies from 30 MHz to the 26GHz。
(3) Datas of measurement within this frequency range shown〃-〃in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
(4) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。
(5) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。
(6) Spectrum Peak Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms
(7) Spectrum Average Setting :1G – 26GHz ,RBW= 1MHz, VBW=10Hz, Sweep time =Auto.

Operation Mode: TX Mode
Fundamental Frequency: 2451 MHz
Temperature : 22 ℃
Humidity : 68 %
Judgment：Passed by -1.51 dB at 2446.0 MHz Ant.Pol. Ver. EUT Axis N/A

Test Date : March. 12, 2002
Test By: Robin
Pol: Vertical

Freq. (MHz)	F/S	Peak Reading (dBuV)	AV Reading (dBuV)	CF (dB)	Actual Peak FS (dBuV/m)	Actual AV FS (dBuV/m)	Peak Limit at 3m (dBuV/m)	AV Limit at 3m (dBuV/m)	Margin (dB)	Detector Mode (PK/AV)
2450.0	F	98.66		-6.17	92.49	--	114.00	94.00	-1.51	Peak
4900.0	S	47.84	--	0.05	47.89	--	74.00	54.00	-6.11	Peak
7350.0	S	--	--	--	--	--	74.00	54.00	--	--
9800.0	S	42.67	--	9.77	52.44	--	74.00	54.00	-1.56	Peak
12250.0	S	--	--	--	--	--	74.00	54.00	--	--
14700.0	S	--	--	--	--	--	74.00	54.00	--	--
17150.0	S	--	--	--	--	--	74.00	54.00	--	--
19600.0	S	--	--	--	--	--	74.00	54.00	--	--
22050.0	S	--	--	--	--	--	74.00	54.00	--	--
24500.0	S	--	--	--	--	--	74.00	54.00	--	--

Remark：

(1) + F/S F：denotes Fundamental Frequency；S： denotes Spurious Frequency
(2) Measuring frequencies from 30 MHz to the 26GHz。
(3) Datas of measurement within this frequency range shown 〃- 〃 in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
(4) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。
(5) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。
(6) Spectrum Peak Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms
(7) Spectrum Average Setting :1G – 26GHz ,RBW= 1MHz, VBW=10Hz, Sweep time =Auto.

Operation Mode: TX Mode Test Date: March. 12, 2002
Fundamental Frequency: 2451 MHz Test By: Robin
Temperature : 22 ℃ Pol: Horizontal
Humidity : 68 %
Judgement：Passed by -12.48 dB at 2470.0 MHz Ant.Pol. Hor. EUT Axis N/A

Freq. (MHz)	F/S	Peak Reading (dBuV)	AV Reading (dBuV)	CF (dB)	Actual Peak FS (dBuV/m)	Actual AV FS (dBuV/m)	Peak Limit at 3m (dBuV/m)	AV Limit at 3m (dBuV/m)	Margin (dB)	Detector Mode (PK/AV)
2450.0	F	87.67	--	-6.15	81.52	--	114.00	94.00	-12.48	Peak
4900.0	S	--	--	--	--	--	74.00	54.00	--	--
7350.0	S	--	--	--	--	--	74.00	54.00	--	--
9800.0	S	--	--	--	--	--	74.00	54.00	--	--
12250.0	S	--	--	--	--	--	74.00	54.00	--	--
14700.0	S	--	--	--	--	--	74.00	54.00	--	--
17150.0	S	--	--	--	--	--	74.00	54.00	--	--
19600.0	S	--	--	--	--	--	74.00	54.00	--	--
22050.0	S	--	--	--	--	--	74.00	54.00	--	--
24500.0	S	--	--	--	--	--	74.00	54.00	--	--

Remark：

(1) + F/S F：denotes Fundamental Frequency；S： denotes Spurious Frequency
(2) Measuring frequencies from 30 MHz to the 26GHz。
(3) Datas of measurement within this frequency range shown〃- 〃in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
(4) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。
(5) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。
(6) Spectrum Peak Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms
(7) Spectrum Average Setting :1G – 26GHz ,RBW= 1MHz, VBW=10Hz, Sweep time =Auto.

Operation Mode: TX Mode
Fundamental Frequency: 2470 MHz
Temperature : 22 ℃
Humidity : 68 %
Judgment：Passed by -0.92 dB at 2470.0 MHz Ant.Pol. Ver. EUT Axis N/A

Test Date : March. 12, 2002
Test By: Robin
Pol: Vertical

Freq. (MHz)	F/S	Peak Reading (dBuV)	AV Reading (dBuV)	CF (dB)	Actual Peak FS (dBuV/m)	Actual AV FS (dBuV/m)	Peak Limit at 3m (dBuV/m)	AV Limit at 3m (dBuV/m)	Margin (dB)	Detector Mode (PK/AV)
2470.0	F	100.34	99.17	-6.09	94.25	93.08	114.00	94.00	-0.92	AV
4940.0	S	49.50	--	0.13	49.63	--	74.00	54.00	-4.37	Peak
7410.0	S	--	--	--	--	--	74.00	54.00	--	--
9880.0	S	46.00	42.17	9.77	55.77	51.94	74.00	54.00	-2.06	AV
12350.0	S	--	--	--	--	--	74.00	54.00	--	--
14820.0	S	--	--	--	--	--	74.00	54.00	--	--
17290.0	S	--	--	--	--	--	74.00	54.00	--	--
19760.0	S	--	--	--	--	--	74.00	54.00	--	--
22230.0	S	--	--	--	--	--	74.00	54.00	--	--
24700.0	S	--	--	--	--	--	74.00	54.00	--	--

Remark：

(1) + F/S F：denotes Fundamental Frequency；S： denotes Spurious Frequency
(2) Measuring frequencies from 30 MHz to the 26GHz。
(3) Datas of measurement within this frequency range shown 〃- 〃 in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
(4) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。
(5) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。
(6) Spectrum Peak Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms
(7) Spectrum Average Setting :1G – 26GHz ,RBW= 1MHz, VBW=10Hz, Sweep time =Auto.

Operation Mode: TX Mode Test Date : March. 12, 2002
Fundamental Frequency: 2470 MHz Test By: Robin
Temperature : 22 ℃ Pol: Horizontal
Humidity : 68 %
Judgement：Passed by -2.06 dB at 850.67 MHz Ant.Pol. Hor. EUT Axis N/A

Freq. (MHz)	F/S	Peak Reading (dBuV)	AV Reading (dBuV)	CF (dB)	Actual Peak FS (dBuV/m)	Actual AV FS (dBuV/m)	Peak Limit at 3m (dBuV/m)	AV Limit at 3m (dBuV/m)	Margin (dB)	Detector Mode (PK/AV)
2470.0	F	89.67	--	-6.09	83.58	--	114.00	94.00	-10.42	Peak
4940.0	S	--	--	--	--	--	74.00	54.00	--	--
7410.0	S	--	--	--	--	--	74.00	54.00	--	--
9880.0	S	--	--	--	--	--	74.00	54.00	--	--
12350.0	S	--	--	--	--	--	74.00	54.00	--	--
14820.0	S	--	--	--	--	--	74.00	54.00	--	--
17290.0	S	--	--	--	--	--	74.00	54.00	--	--
19760.0	S	--	--	--	--	--	74.00	54.00	--	--
22230.0	S	--	--	--	--	--	74.00	54.00	--	--
24700.0	S	--	--	--	--	--	74.00	54.00	--	--

Remark：

(1) + F/S F：denotes Fundamental Frequency；S： denotes Spurious Frequency
(2) Measuring frequencies from 30 MHz to the 26GHz。
(3) Datas of measurement within this frequency range shown〃- 〃in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
(4) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。
(5) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column。
(6) Spectrum Peak Setting : 30MHz – 1000MHz , RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms. 1GHz- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms
(7) Spectrum Average Setting :1G – 26GHz ,RBW= 1MHz, VBW=10Hz, Sweep time =Auto.

6 26 dB Band Width Measuremnet

6.1 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set ETU normal operating mode.
3. Set SPA Center Frequency = fundamental frequency , RBW,VBW= 100KHz, Span =20MHz.
4. Set SPA Max hold. Mark peak, -26dB.

6.2 Test SET-UP (Block Diagram of Configuration)

Same as 4.2 Radiated Emission Measurement.

6.3 Measurement Equipment Used:

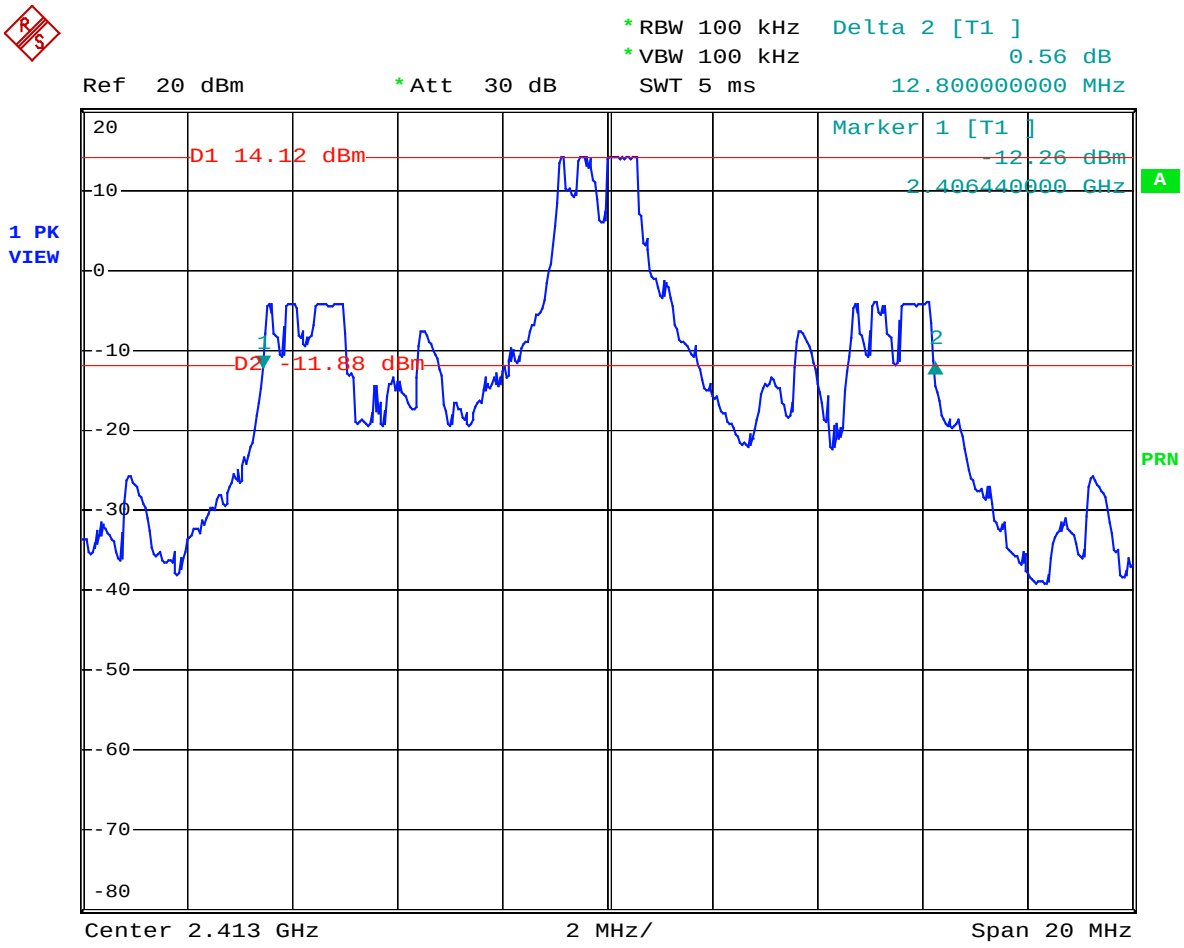
Same as 4.2 Radiated Emission Measurement.

6.4 Measurement Results:

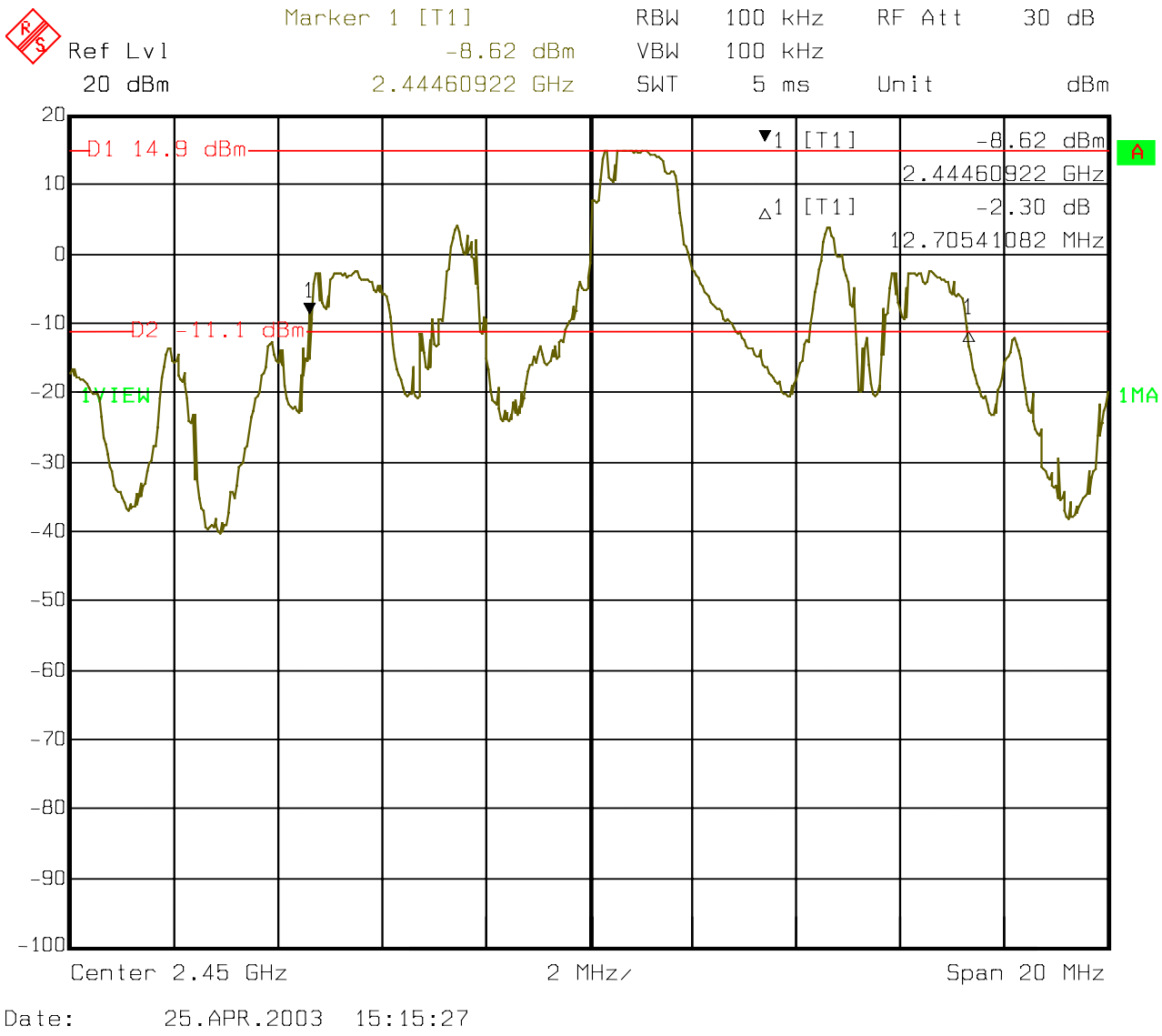
CH1 26dB Bandwidth = 12.80 MHz
CH3 26dB Bandwidth = 12.70 MHz
CH4 26dB Bandwidth = 12.90 MHz

Refer to attached data chart.

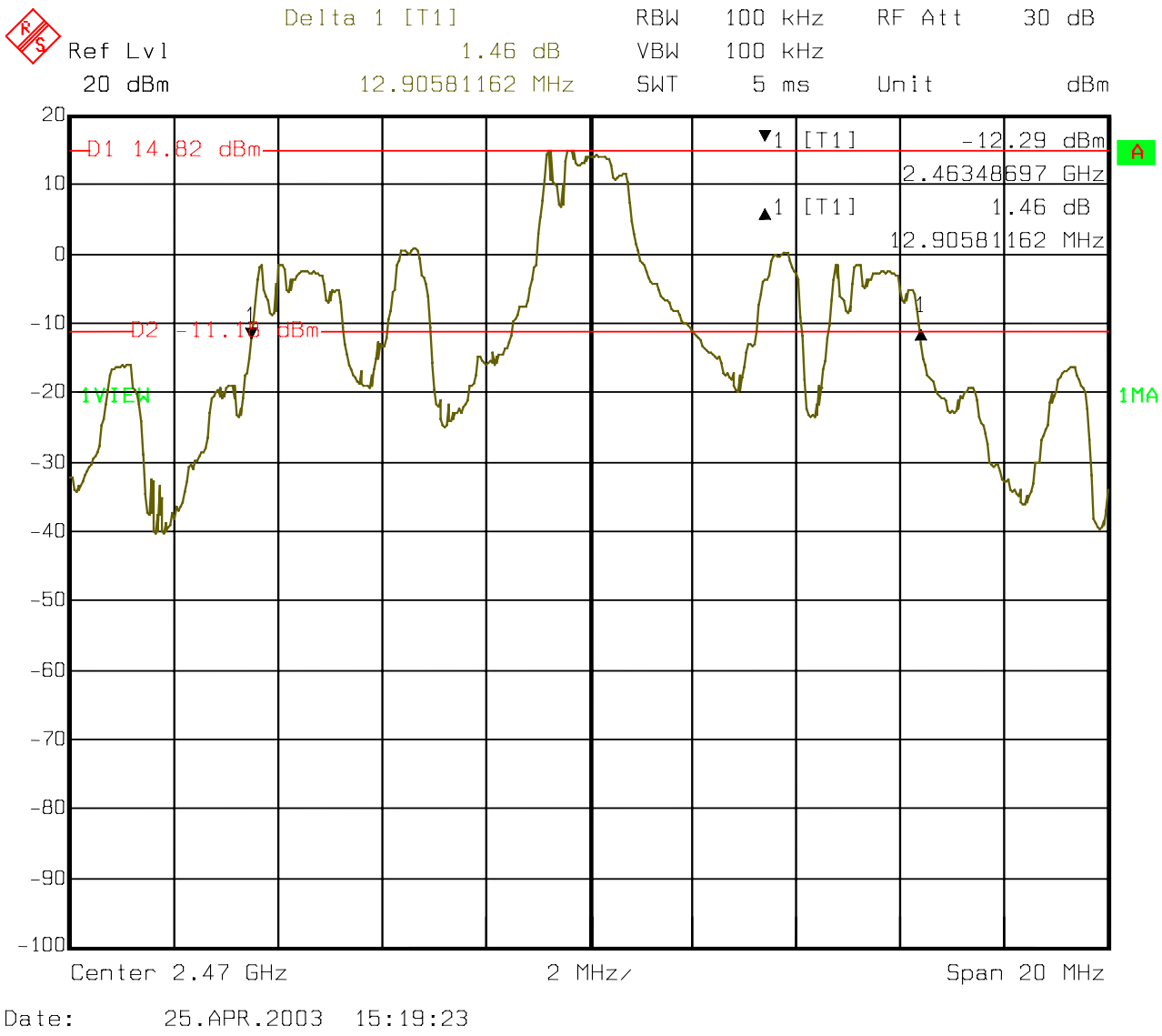
CH1:


*RBW 100 kHz
*VBW 100 kHz
SWT 5 ms
Delta 2 [T1]
0.56 dB
12.800000000 MHz
Ref 20 dBm
*Att 30 dB
Marker 1 [T1]
-12.26 dBm
2.406440000 GHz
D1 14.12 dBm
D2 -11.88 dBm
1 PK
VIEW
A
PRN
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.413 GHz
2 MHz/
Span 20 MHz
Date: 4.APR.2003 05:43:08

CH3:


Marker 1 [T1]
RBW 100 kHz
RF Att 30 dB
Ref Lvl
-8.62 dBm
VBW 100 kHz
20 dBm
2.44460922 GHz
SWT 5 ms
Unit dBm
D1 14.9 dBm
D2 -11.1 dBm
1 [T1]
-8.62 dBm
2.44460922 GHz
Δ1 [T1]
-2.30 dB
12.70541082 MHz
1VIEW
A
1MA
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
Center 2.45 GHz
2 MHz/
Span 20 MHz
Date: 25.APR.2003 15:15:27

CH4:


Delta 1 [T1]
RBW 100 kHz
RF Att 30 dB
Ref Lvl
1.46 dB
VBW 100 kHz
20 dBm
12.90581162 MHz
SWT 5 ms
Unit dBm
D1 14.82 dBm
D2 -11.18 dBm
1 [T1] -12.29 dBm
2.46348697 GHz
1 [T1] 1.46 dB
12.90581162 MHz
1VIEW
A
1MA
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
Center 2.47 GHz
2 MHz/
Span 20 MHz
Date: 25.APR.2003 15:19:23