FCC Part 15 Subpart C

EMI TEST REPORT

of

E.U.T. : MOUSE

FCC ID. : FSUGMZFP

MODEL : NewScroll Wireless

Working Frequency : CH1: 27.045 MHz
CH2: 27.145 MHz

for

APPLICANT : KYE SYSTEMS CORP.
ADDRESS : NO. 492, SEC. 2, CHUNG HSIN RD., SAN CHUNG, TAIPEI HSIN, 241, TAIWAN, R.O.C.

Test Performed by

ELECTRONICS TESTING CENTER, TAIWAN
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Report Number : ET87R-09-099-01

EXHIBIT C

TEST REPORT CERTIFICATION

Applicant : KYE SYSTEMS CORP.
NO. 492, SEC. 5, CHUNG HSIN RD., SAN CHUNG, TAIPEI HSIN, 241, TAIWAN, R.O.C.

Manufacturer : KYE SYSTEMS CORP.
NO. 492, SEC. 5, CHUNG HSIN RD., SAN CHUNG, TAIPEI HSIN, 241, TAIWAN, R.O.C.

Description of EUT :

a) Type of EUT	: MOUSE
b) Trade Name	: KYE SYSTEMS CORP.
c) Model No.	: NewScroll Wireless
d) FCC ID	: FSUGMZFP
e) Working Frequencies	: CH1: 27.045 MHz CH2: 27.145 MHz
f) Power Supply	: DC 3V Batteries

Regulation Applied : FCC Rules and Regulations Part 15 Subpart C (1996)

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.

Issued Date : OCT. 19, 1998

Test Engineer : Tien Lu Liau
(Tien Lu Liau)

Approve & Authorized Signer : Will Yauo
Will Yauo, Supervisor
EMI Test Site of ELECTRONICS TESTING CENTER, TAIWAN

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1 GENERAL INFORMATION

1.1 Product Description

a) Type of EUT : MOUSE
b) Trade Name : KYE SYSTEMS CORP.
c) Model No. : NewScroll Wireless
d) FCC ID : FSUGMZFP
e) Working Frequency : CH1: 27.045 MHz CH2: 27.145 MHz
f) Power Supply : DC 3V Batteries

1.2 Characteristics of Device:

The EUT is the transmitter portion of wireless Mouse. The EUT can transmit 27MHz RF signal to the receiver portion of wireless Mouse which is connected to a personal computer. The whole wireless Mouse system can perform all functions that a traditional keyboard can do.

1.3 Tested System Details

The Tested System Detail equipment, plus description of all cables used in the tested system are :

Description	Model No.	FCC ID.	Manufacturer	Cable
Mouse *1	NewScroll Wireless	FSUGMZFP	KYE SYSTEMS CORP.	----
PC	VL5/133	DTPC-01	Hewlett-Packard	Unshielded AC Power Cord
Monitor	JC-1743UMA	A3DJC-1743UMA	NEC	1.6m Shielded Cable
Modem	1200AT	EF56A51200AT	Smar TEAM Co..	2.0m Shielded Cable
Printer	2225C+	DSI6XU2225	Hewlett-Packard	1.2m Shielded Cable
Keyboard	E03786USRETI	CIGE03786	Microsoft	1.8m Unshielded Cable
Mouse	NewScroll Wireless	FSUGMZFQ	KYE SYSTEMS CORP.	1.5m Shielded Cable

*1 EUT submitted for test.

1.4 Test Methodology

Both conducted and radiated testing were performed according to the procedures in chapter 13 of ANSI C63.4.

The MOUSE under test was operated in its normal operating mode for the purpose of the measurements.

The receiving antenna polarized horizontally was varied from 1 to 4 meters and the wooden turntable was rotated through 360 degrees to obtain the highest reading on the field strength meter or on the display of the spectrum analyzer. And also, each emission was to be maximized by changing the orientation of the MOUSE under test.

1.5 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the roof top of Building at No.34, 5 Lirn, Din Fu Tsun, Lin Kou, Taipei, Taiwan, R.O.C.

This site has been fully described in a report submitted to your office, and accepted in a letter dated Feb. 10 , 1997.

2 DEFINITION AND LIMITS

2.1 Definition

Intentional radiator:
A device that intentionally generates and emits radio frequency energy by radiation or induction.

2.2 Restricted Bands of Operation

Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42-16.423	399.9-410	4.5-5.25
0.495 - 0.505 **	16.69475 - 16.69525	608-614	5.35-5.46
2.1735 - 2.1905	16.80425 - 16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475 - 156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2655-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3360-4400	Above 38.6
13.36-13.41			

Remark "**" : Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

2.3 Limitation

(1) Conducted Emission Limits :

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the conducted limit is the following:

Frequency (MHz)	Emission (μV)	Emission (dBμV)
0.45 - 30.0	250	48.0

(2) Radiated Emission Limits :

According to 15.227the field strength of emissions from intentional radiators operated under these frequency bands shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental	
	μV/meter	dBμV/meter
26.96-27.28	10000	80

Field strength limits are at the distance of 3 meters, emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209,as following table:

Other Frequencies (MHz)	Field Strength of Fundamental	
	μV/meter	dBμV/meter
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0

As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

2.4 Labeling Requirement

The device shall bear the following statement in a conspicuous location on the device :

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

2.5 User Information

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

3 RADIATED EMISSION MEASUREMENT

3.1 Applicable Standard

1. The field strength of any emission within this band shall not exceed 10,000 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in Section 15.35 for limiting peak emissions apply.

2. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209.

3.2 Measurement Procedure

1. Setup the configuration per figure 1 and 2 for frequencies measured below and above 1 GHz respectively. Turn on EUT and make sure that it is in normal function.

2. For emission frequencies measured below 1 GHz, a pre-scan is performed in a shielded chamber to determine the accurate frequencies of higher emissions will be checked on a open test site. As the same purpose, for emission frequencies measured above 1 GHz, a pre-scan also be performed with a 1 meter measuring distance before final test.

3. For emission frequencies measured below and above 1 GHz, set the spectrum analyzer on a 100 kHz and 1 MHz resolution bandwidth respectively for each frequency measured in step 2.

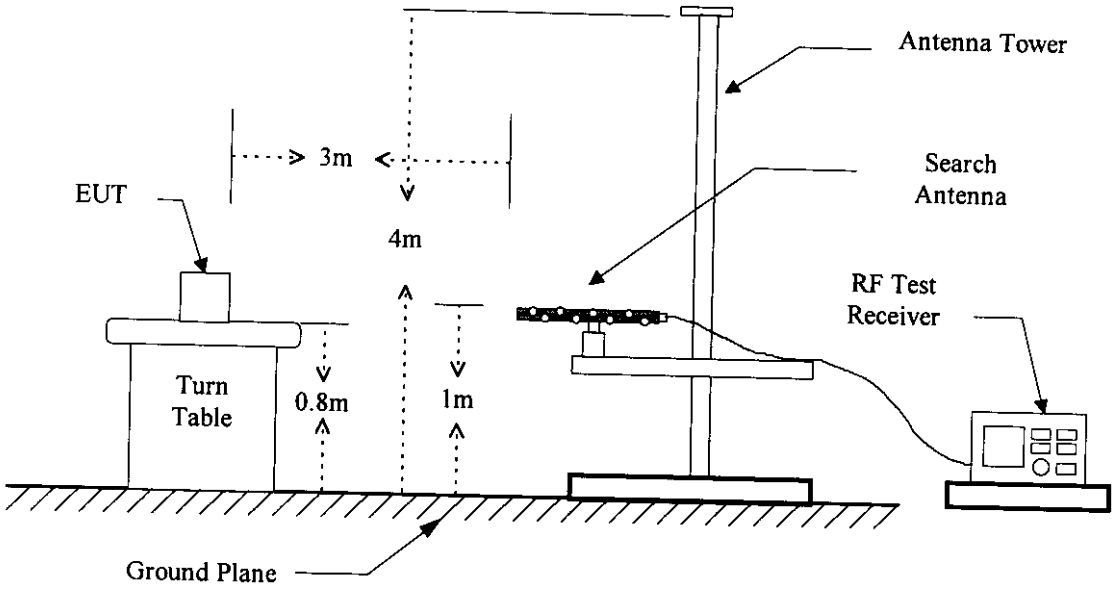
4. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0 ° to 360 ° with a speed as slow as possible, and keep the azimuth that highest emission is indicated on the spectrum analyzer. Vary the antenna position again and record the highest value as a final reading. A RF test receiver is also used to confirm emissions measured.

5. Repeat step 4 until all frequencies need to be measured were complete.

6. Repeat step 5 with search antenna in vertical polarized orientations.

7. Check the three frequencies of highest emission with varying the placement of cables (if any) associated with EUT to obtain the worse case and record the result.

Figure 1 : Open Field Test Site Setup Diagram



3.3 Test Data

3.2.1 Fundamental Frequency

a.

Temperature : 21 ℃ Humidity : 63 %
Operated mode : Transmitting (CH1) Test Date : OCT. 03, 1998

Polarity : Horizontal

Frequency (MHz)	Reading Value (dB μV)		Correction Factor (dB)	Result Value (dB μV/m)		Limit (dB μV/m)		Table Degree (Deg.)	Ant. High (m)
	Peak	Ave.		Peak	Ave.	Peak	Ave.		
27.047	64.7	64.0	-8.3	56.4	55.7	100.0	80.0	90	4.00

Polarity : Vertical

Frequency (MHz)	Reading Value (dB μV)		Correction Factor (dB)	Result Value (dB μV/m)		Limit (dB μV/m)		Table Degree (Deg.)	Ant. High (m)
	Peak	Ave.		Peak	Ave.	Peak	Ave.		
27.047	58.5	58.0	-8.3	50.2	49.7	100.0	80.0	326	1.00

b.

Temperature : 21 ℃ Humidity : 63 %
Operated mode : Transmitting (CH2) Test Date : OCT. 03, 1998

Polarity : Horizontal

Frequency (MHz)	Reading Value (dB μV)		Correction Factor (dB)	Result Value (dB μV/m)		Limit (dB μV/m)		Table Degree (Deg.)	Ant. High (m)
	Peak	Ave.		Peak	Ave.	Peak	Ave.		
27.145	63.8	63.1	-8.3	55.5	54.8	100.0	80.0	90	4.00

Polarity : Vertical

Frequency (MHz)	Reading Value (dB μV)		Correction Factor (dB)	Result Value (dB μV/m)		Limit (dB μV/m)		Table Degree (Deg.)	Ant. High (m)
	Peak	Ave.		Peak	Ave.	Peak	Ave.		
27.145	55.7	54.8	-8.3	47.4	46.5	100.0	80.0	326	1.00

3.2.2 Harmonics and Spurious

a.

Temperature : 21 ℃ Humidity : 63 %
Operated mode : Transmitting (CH1) Test Date : OCT. 03, 1998

Frequency (MHz)	Ant-Pol H/V	Meter Reading (dBuV)	Corrected Factor (dB)	Result @3m (dBuV/m)	Limit @3m (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (m)
81.141	V	37.0	-14.9	22.1	40.0	-17.9	180	4.00
189.328	H	26.6	-8.4	18.2	43.5	-25.3	270	3.30
216.375	H	24.7	-6.1	18.6	46.0	-27.4	90	3.20
297.516	V	25.8	-1.1	24.7	46.0	-21.3	326	1.00
324.563	H	29.1	-6.7	22.4	46.0	-23.6	90	1.00
405.704	H	26.2	-6.2	20.0	46.0	-26.0	270	1.00

Note: All test values in harmonics and spurious are Quasi Peak.

b.

Temperature : 21 ℃ Humidity : 63 %
Operated mode : Transmitting (CH2) Test Date : OCT. 03, 1998

Frequency (MHz)	Ant-Pol H/V	Meter Reading (dBuV)	Corrected Factor (dB)	Result @3m (dBuV/m)	Limit @3m (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (m)
81.435	V	38.5	-14.9	23.6	40.0	-16.4	180	1.00
244.305	V	30.9	-4.2	26.7	46.0	-19.3	0	1.00
271.450	V	27.3	-3.5	23.8	46.0	-22.2	180	1.00
298.595	V	26.9	-1.0	25.9	46.0	-20.1	326	1.00
325.740	H	30.5	-6.8	23.7	46.0	-22.3	90	1.00
380.030	H	27.3	-6.0	21.3	46.0	-24.7	270	1.00

Note: All test values in harmonics and spurious are Quasi Peak.

3.3 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. For the limit is employed average value, therefore the peak value can be transferred to average value by subtracting the duty factor. The basic equation with a sample calculation is as follows:

Peak = Reading + Corrected Factor

where

Corr. Factor = Antenna Factor + Cable Factor - Amplifier Gain (if any)

3.4 Radiated Test Equipment

Equipment	Manufacturer	Model No.	Next Cal. Date
Spectrum Analyzer	Hewlett-Packard	8568B	10/16/1999
Pre-selector	Hewlett-Packard	85685A	10/16/1999
Quasi Peak Detector	Hewlett-Packard	85650A	10/07/1999
RF Test Receiver	Rohde & Schwarz	ESVS 30	12/10/1998
Log periodic Antenna	EMCO	3146	12/10/1999
Biconical Antenna	EMCO	3110	08/05/1999
Preamplifier	Hewlett-Packard	8447D	12/23/1998

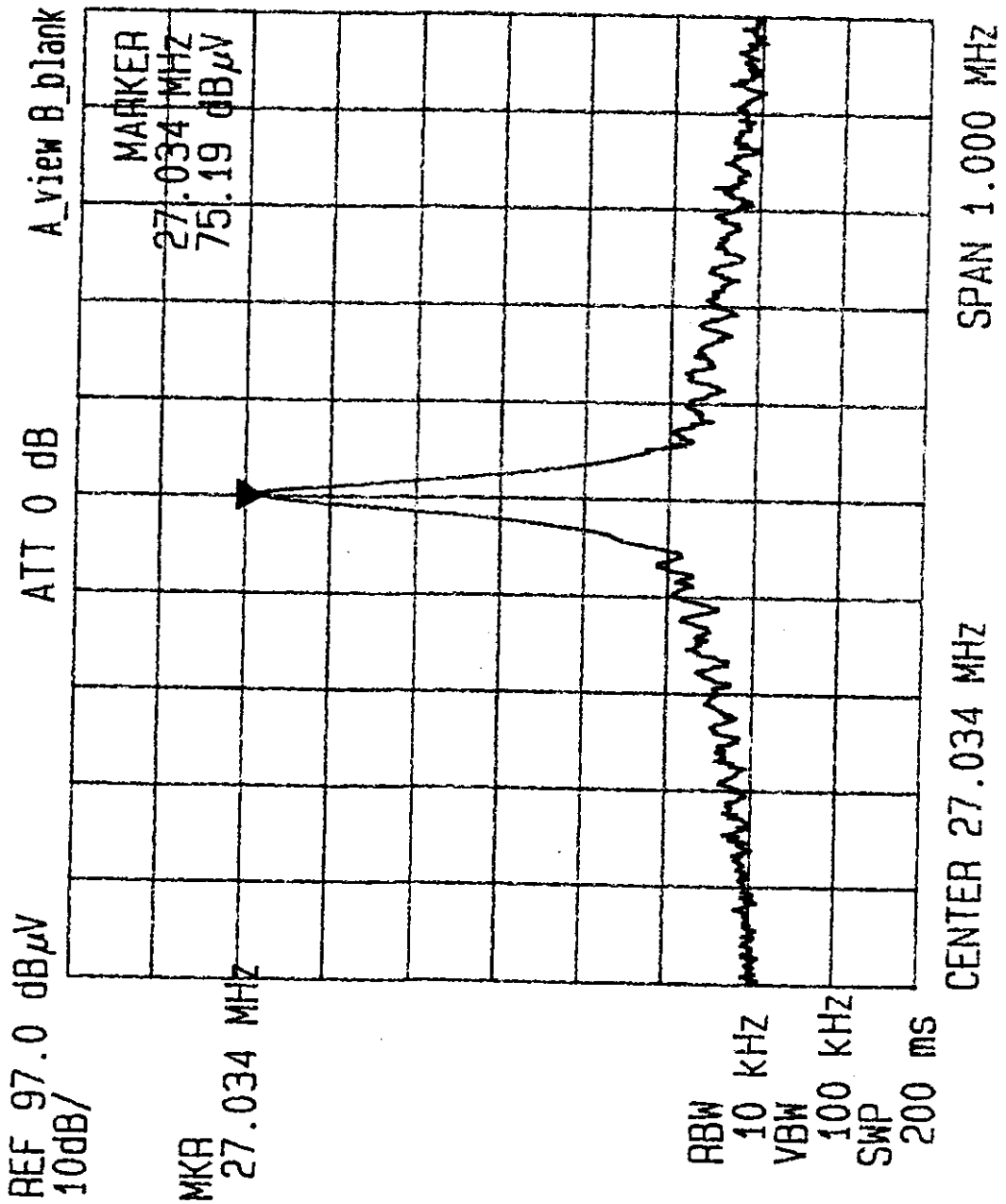
3.5 Measuring Instrument Setup

Explanation of measuring instrument setup in frequency band measured is as following :

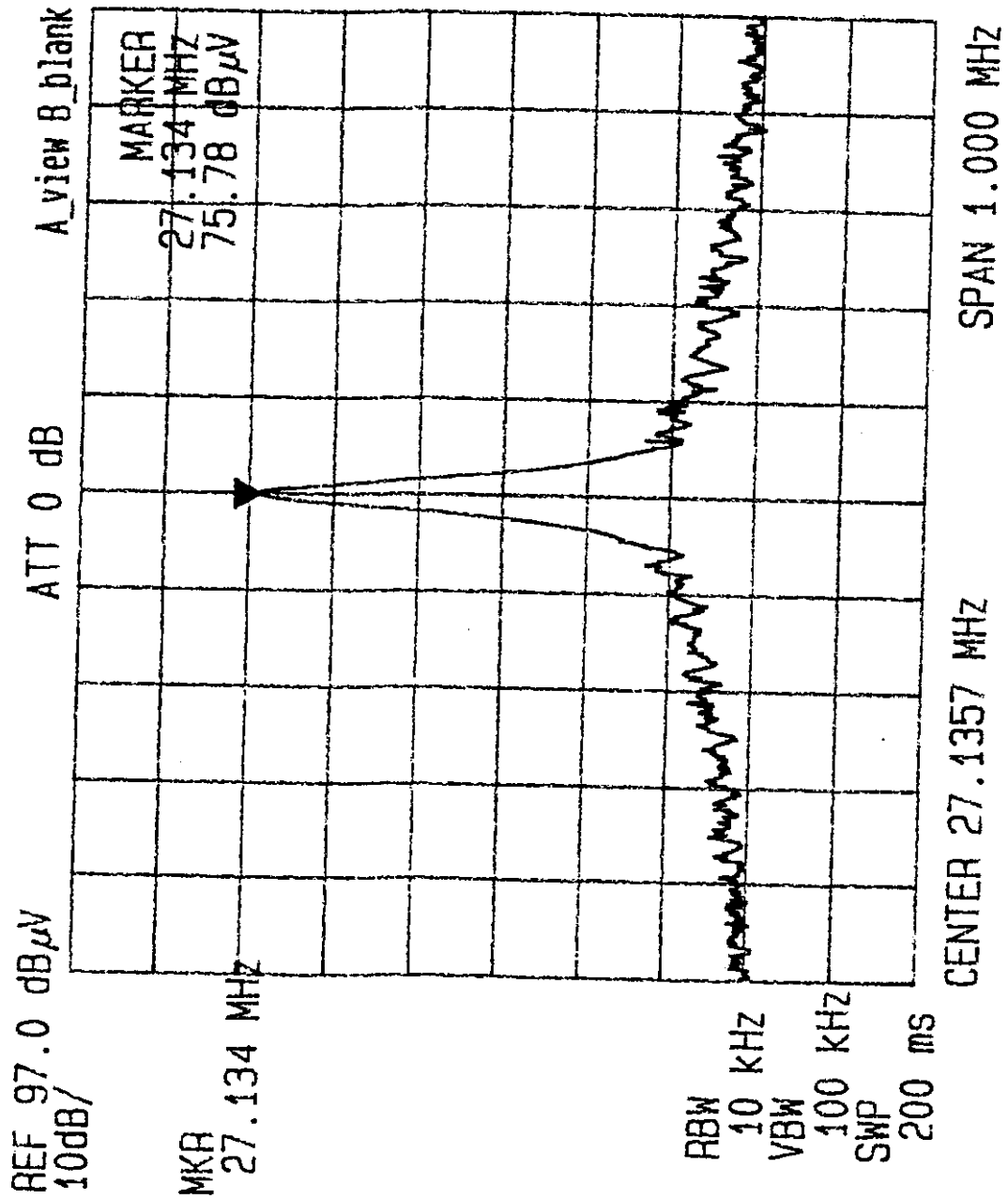
Frequency Band (MHz)	Instrument	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	RF Test Receiver	Quasi Peak	120 kHz	N/A
	Spectrum Analyzer	Peak	100 kHz	100 kHz

4 CONFORMATION OF THE FUNDAMENTAL FREQUECNY

Operation within the band 26.96-27.28MHz (CH1)



CH2


A_view B_blank
MARKER
27.134 MHz
75.78 dBµV
ATT 0 dB
REF 97.0 dBµV
10dB/
MKR
27.134 MHz
RBW
10 kHz
VBW
100 kHz
SWP
200 ms
CENTER 27.1357 MHz
SPAN 1.000 MHz

5 CONDUCTED EMISSION MEASUREMENT

5.1 Standard Applicable

This EUT is excused from investigation of conducted emission, for it is powered by battery only. According to § 15.207 (d), measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines.