

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT  
CERTIFICATION TO FCC PART 15 REQUIREMENTS**

*for*

**INTENTIONAL RADIATOR**

**27 MHZ WIRELESS MOUSE**

**MODEL : FM500**

**FCC ID NO: FSQ011113MSTX5**

**REPORT NO: 01E9841**

**ISSUE DATE: February 07, 2002**

*Prepared for*

**FOCUS ELECTRONIC CO., LTD.  
5F., NO. 306, SEC. 4, CHENGTEH RD.,  
TAIPEI, TAIWAN, R. O. C.**

*Prepared by*

**COMPLIANCE ENGINEERING SERVICES, INC.  
NO. 199, CHUNG SHENG ROAD, HSIN TIEN CITY, TAIPEI,  
TAIWAN, R. O. C.**

*d.b.a.*

**COMPLIANCE CERTIFICATION SERVICES**



**FCC, VCCI, CISPR, CE  
UL, CSA, TÜV, VDE**

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**1. VERIFICATION OF COMPLIANCE**

COMPANY NAME: FOCUS ELECTRONIC CO., LTD.  
5F., NO. 306, SEC. 4, CHENGTEH RD.,  
TAIPEI, TAIWAN, R. O. C.

CONTACT PERSON: Magic Hwa / Manager

TELEPHONE NO.: 886-2-2880-5512

EUT DESCRIPTION: 27 MHZ WIRELESS MOUSE

MODEL NAME/NUMBER: FM500

FCC ID: FSQ011113MSTX5

DATE TESTED: January 23, 2001

REPORT NUMBER: 01E9841

TYPE OF EQUIPMENT	REMOTE CONTROL
EQUIPMENT TYPE	27 MHz WIRELESS MOUSE
MEASUREMENT PROCEDURE	ANSI C63.4 / 1992
LIMIT TYPE	CERTIFICATION
FCC RULE	CFR 47, PART 15

The above equipment was tested by Compliance Engineering Services, Inc. for compliance with the requirements set forth in the FCC CFR 47, PART 15. The results of testing in this report apply to the product/system which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties. **Warning** : This document reports conditions under which testing was conducted and results of tests performed. This document may not be altered or revised in any way unless done so by Compliance Engineering Services, Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Engineering Services, Inc. will constitute fraud and shall nullify the document.

  
RICK YEO / EMC MANAGER  
COMPLIANCE ENGINEERING SERVICES, INC.

## 2. PRODUCT DESCRIPTION

CHASSIS TYPE	<b>Plastic</b>
Fundamental Frequency	<b>27.045MHz ; 27.195MHz</b>
Power source	<b>3.0V Battery</b>
Transmitting Time	<b>Continuous</b>
Local Oscillators	<b>N/A</b>

## 3. TEST FACILITY

The open area test sites and conducted measurement facilities used to collect the radiated data are located at No. 199, Chung Sheng Road, Hsin Tien City, Taipei, Taiwan R.O.C. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

## 4. MEASUREMENT STANDARDS

The site is constructed and calibrated in conformance with the requirements of ANSI C63.4/1992.

## 5. TEST METHODOLOGY

For an intentional radiator, the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 KHz, up to at least the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower. (CFR 47 Section 15.33)

## 6. MEASUREMENT EQUIPMENT USED

Manufacturer	Model Number	Description	Cal Due Date
R & S	DSAI-D 804.8932.52	EMI Test Display (20Hz – 5GHz)	10/2002
R & S	ESBI- RF/1005.4300.52	EMI Test RF Unit (20Hz – 5GHz)	10/2002
EMCO	6502	Antenna (9KHz – 30MHz)	04/2002
SCHWARZBECK	VULB 9160	Antenna (30 - 2000 MHz)	05/2002
H.P.	8447D	Pre-Amplifier	05/2002
R & S	FSEB30	Spectrum Analyzer	11/2002
Agilent	E3640A	DC Power Supply	12/2002
HP	7475A	Plotter	N/A

**7. POWERLINE RFI LIMIT**

CONNECTED TO AC POWER LINE	SECTION 15.207
CARRIER CURRENT SYSTEM IN THE FREQUENCY RANGE OF 450 kHz TO 30 MHz	SECTION 15.205 AND SECTION 15.209, 15.221, 15.223, 15.225 OR 15.227, AS APPROPRIATE.
BATTERY POWER	NOT REQUIRED.

**8. RADIATED EMISSION LIMITS**

GENERAL REQUIREMENTS	SECTION 15.209
RESTRICTED BANDS OF OPERATION	SECTION 15.205
OPERATION WITHIN THE BAND 26.69 – 27.20MHz	SECTION 15.227

## 9. SYSTEM TEST CONFIGURATION

The EUT was configured for testing in a typical fashion ( as a customer would normally use it).



Radiated Open Site Test Set-up

## 10. SYSTEM TEST CONFIGURATION

To achieve compliance to FCC Section 15.227 technical limits, the following change(s) were made during compliance testing:

There is no modification on this EUT.

## 11. TEST PROCEDURE AND RESULT

Powerline RFI Limits	Eut	Radiated Emission Limits	Eut
SECTION 15.207		SECTION 15.209	X
SECTION 15.205, 15.209, 15.221, 15.223, x 15.225 OR 15.227		SECTION 15.205	X
BATTEY POWER	X	SECTION 15.227	X

### 11.1 Radiated Emission Test Procedure and Result

1. The EUT was placed on a wooden table on the outdoor ground plane. The search antenna was placed 3 meter from the EUT. The EUT antenna was mounted vertically was per normal installation.
2. The turntable was slowly rotated to locate the direction of maximum emission at each emission falling in the restricted bands of 15.205.
3. Once maximum direction was determined,, the search antenna was raised and lowered in both vertical and horizontal polarizations. The readings so obtained are recorded in data listed appendix.



*Project #:* 01E9841  
*Report #:* 9841D1  
*Date & Time:* 2002/1/23  
*Test Engr:* JAMES LIAO

NO. 199, CHUNG SHENG ROAD, HSIN TIEN CITY, TAIPEI, TAIWAN, R. O. C.  
 TEL: (02) 2217-0894 FAX: (02) 2217-1254

*Company:* FOCUS ELECTRONIC CO., LTD.  
*EUT Description:* FM500 (MOUSE TX / 27MHz)  
*Test Configuration :* EUT ONLY  
*Type of Test:* FCC 15.227/FCC 15.209  
*Mode of Operation:* TX CH1 27.045MHz

Freq. (MHz)	Reading (dBuV)	AF (dB)	Closs (dB)	Pre-amp (dB)	Level (dBuV/m)	Limit FCC_B	Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)	Mark (P/Q/A)
27.039	38.52	9.10	1.00	0.00	48.62	80.00	-31.38	3mV	270	1.3	P
54.097	32.37	12.44	1.05	21.11	24.75	40.00	-15.25	3mV	270	1.2	P
81.133	34.09	8.75	1.22	21.13	22.93	40.00	-17.07	3mV	270	1.5	P
108.189	42.42	10.90	1.43	21.05	33.70	43.50	-9.80	3mV	270	1.0	P
135.225	28.10	13.07	1.51	20.14	22.54	43.50	-20.96	3mV	270	1.0	P
162.268	24.55	13.72	1.64	20.04	19.87	43.50	-23.63	3mV	270	1.0	P
189.322	34.50	11.21	1.76	19.78	27.69	43.50	-15.81	3mV	270	1.0	P
216.358	25.89	10.68	1.88	19.76	18.69	46.00	-27.31	3mV	270	1.0	P
243.403	28.05	11.79	2.00	19.85	21.99	46.00	-24.01	3mV	270	1.0	P
270.448	24.93	12.47	2.11	19.97	19.54	46.00	-26.46	3mV	270	1.0	P
297.500	25.46	13.15	2.23	20.11	20.73	46.00	-25.27	3mV	270	1.0	P

Total data #: 11



**Project #:** 01E9841  
**Report #:** 9841D2  
**Date & Time:** 2002/1/23  
**Test Engr:** JAMES LIAO

NO. 199, CHUNG SHENG ROAD, HSIN TIEN CITY, TAIPEI, TAIWAN, R. O. C.  
 TEL: (02) 2217-0894 FAX: (02) 2217-1254

**Company:** FOCUS ELECTRONIC CO., LTD.  
**EUT Description:** FM500 (MOUSE TX / 27MHz)  
**Test Configuration :** EUT ONLY  
**Type of Test:** FCC 15.227/FCC 15.209  
**Mode of Operation:** TX CH1 27.045MHz

Freq. (MHz)	Reading (dBuV)	AF (dB)	Closs (dB)	Pre-amp (dB)	Level (dBuV/m)	Limit FCC_B	Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)	Mark (P/Q/A)
27.041	37.31	9.10	1.00	0.00	47.41	80.00	-32.59	3mH	270	1.3	P
54.097	30.87	12.44	1.05	21.11	23.25	40.00	-16.75	3mH	270	1.2	P
81.133	34.14	8.75	1.22	21.13	22.98	40.00	-17.02	3mH	270	1.5	P
108.160	39.12	10.90	1.43	21.05	30.40	43.50	-13.10	3mH	270	1.0	P
135.225	28.33	13.07	1.51	20.14	22.77	43.50	-20.73	3mH	270	1.0	P
162.266	24.85	13.72	1.64	20.04	20.17	43.50	-23.33	3mH	270	1.0	P
189.317	27.31	11.21	1.76	19.78	20.50	43.50	-23.00	3mH	270	1.0	P
216.353	25.56	10.68	1.88	19.76	18.36	46.00	-27.64	3mH	270	1.0	P
243.398	30.13	11.77	1.99	19.84	24.05	46.00	-21.95	3mH	270	1.0	P
270.443	23.30	12.47	2.11	19.97	17.91	46.00	-28.09	3mH	270	1.0	P
297.500	25.00	13.15	2.23	20.11	20.27	46.00	-25.73	3mH	270	1.0	P

Total data #: 11



*Project #:* 01E9841  
*Report #:* 9841D3  
*Date & Time:* 2002/1/23  
*Test Engr:* JAMES LIAO

NO. 199, CHUNG SHENG ROAD, HSIN TIEN CITY, TAIPEI, TAIWAN, R. O. C.  
 TEL: (02) 2217-0894 FAX: (02) 2217-1254

*Company:* FOCUS ELECTRONIC CO., LTD.  
*EUT Description:* FM500 (MOUSE TX / 27MHz)  
*Test Configuration :* EUT ONLY  
*Type of Test:* FCC 15.227/FCC 15.209  
*Mode of Operation:* TX CH2 27.195MHz



Freq. (MHz)	Reading (dBuV)	AF (dB)	Closs (dB)	Pre-amp (dB)	Level (dBuV/m)	Limit FCC_B	Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)	Mark (P/Q/A)
27.191	41.32	9.10	1.00	0.00	51.42	80.00	-28.58	3mV	270	1.3	P
54.310	33.37	12.40	1.05	21.11	25.71	40.00	-14.29	3mV	270	1.2	P
81.578	35.87	8.73	1.23	21.13	24.70	40.00	-15.30	3mV	270	1.5	P
108.179	43.45	10.90	1.43	21.05	34.73	43.50	-8.77	3mV	270	1.0	P
135.221	29.54	13.07	1.51	20.14	23.98	43.50	-19.52	3mV	270	1.0	P
163.172	25.98	13.66	1.65	20.03	21.26	43.50	-22.24	3mV	270	1.0	P
190.359	35.40	11.10	1.76	19.78	24.48	43.50	-19.02	3mV	270	1.0	P
217.571	27.41	10.70	1.88	19.76	20.23	46.00	-25.77	3mV	270	1.0	P
244.749	29.87	11.82	2.00	19.85	23.84	46.00	-22.16	3mV	270	1.0	P
271.980	25.79	12.54	2.12	19.98	20.47	46.00	-25.53	3mV	270	1.0	P

Total data #: 10



**Project #:** 01E9841  
**Report #:** 9841D4  
**Date & Time:** 2002/1/23  
**Test Engr:** JAMES LIAO

NO. 199, CHUNG SHENG ROAD, HSIN TIEN CITY, TAIPEI, TAIWAN, R. O. C.  
 TEL: (02) 2217-0894 FAX: (02) 2217-1254

**Company:** FOCUS ELECTRONIC CO., LTD.  
**EUT Description:** FM500 (MOUSE TX / 27MHz)  
**Test Configuration :** EUT ONLY  
**Type of Test:** FCC 15.227/FCC 15.209  
**Mode of Operation:** TX CH2 27.195MHz

Freq. (MHz)	Reading (dBuV)	AF (dB)	Closs (dB)	Pre-amp (dB)	Level (dBuV/m)	Limit FCC_B	Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)	Mark (P/Q/A)
27.191	38.74	9.10	1.00	0.00	48.84	80.00	-31.16	3mH	270	1.3	P
54.447	31.45	12.40	1.05	21.11	23.79	40.00	-16.21	3mH	270	1.2	P
81.599	35.97	8.73	1.23	21.13	24.80	40.00	-15.20	3mH	270	1.5	P
108.178	41.09	10.90	1.43	21.05	32.37	43.50	-11.13	3mH	270	1.0	P
135.274	30.10	13.07	1.51	20.14	24.54	43.50	-18.96	3mH	270	1.0	P
163.194	25.88	13.66	1.65	20.03	21.16	43.50	-22.34	3mH	270	1.0	P
190.449	28.97	11.10	1.76	19.78	22.05	43.50	-21.45	3mH	270	1.0	P
217.780	27.46	10.70	1.88	19.76	20.28	46.00	-25.72	3mH	270	1.0	P
244.875	31.99	11.82	2.00	19.85	25.96	46.00	-20.04	3mH	270	1.0	P
271.870	25.48	12.54	2.12	19.98	20.16	46.00	-25.84	3mH	270	1.0	P

Total data #: 10

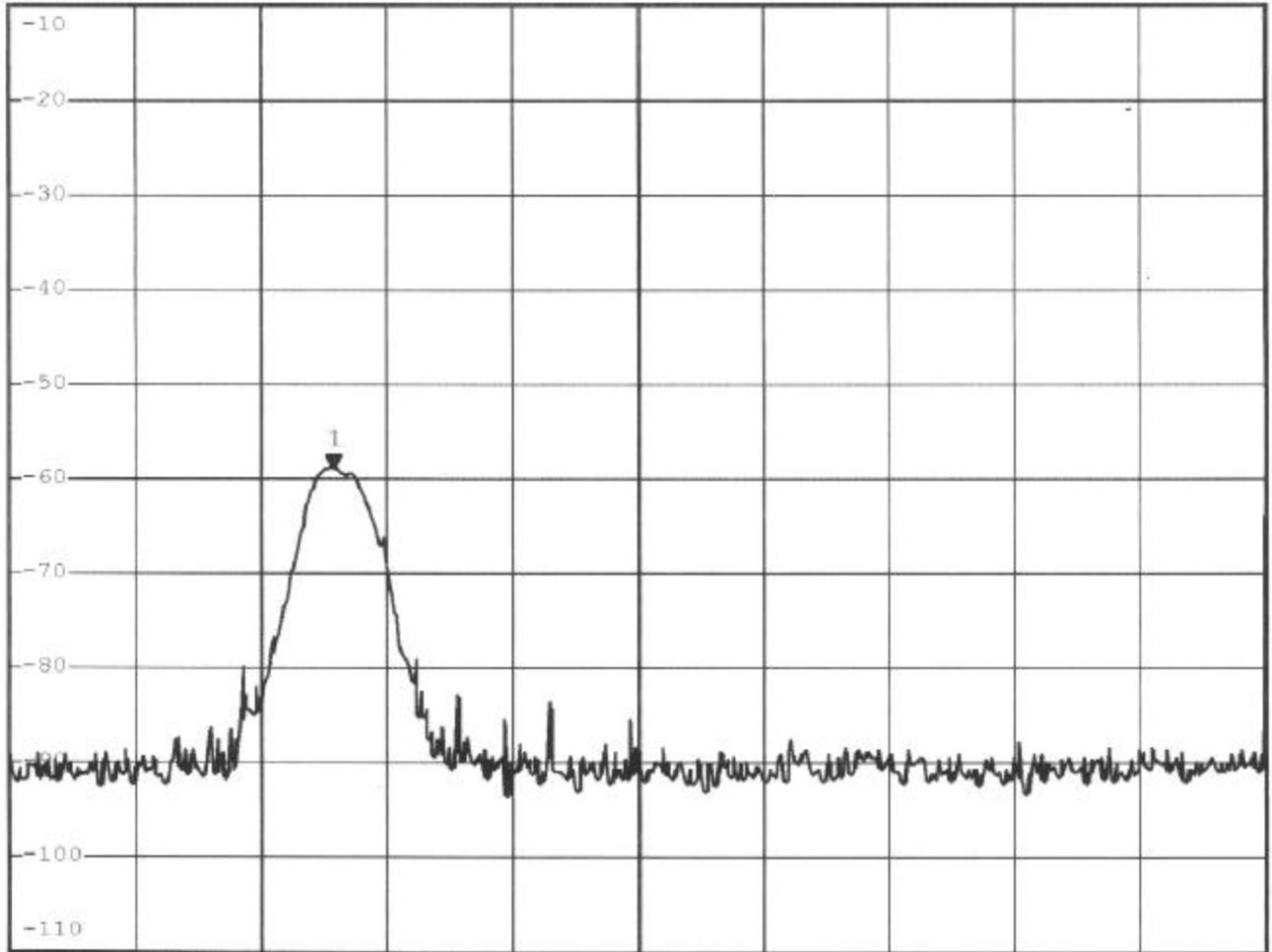


\*RBW 10 kHz    Marker 1 [T1]  
\*VBW 30 kHz                    -58.77 dBm  
\*SWT 50 ms                      27.042560000 MHz

Ref -10 dBm

\*Att 10 dB

1 PK  
VIEW



A

Start 26.96 MHz

32 kHz/

Stop 27.28 MHz

Comment A: FM500

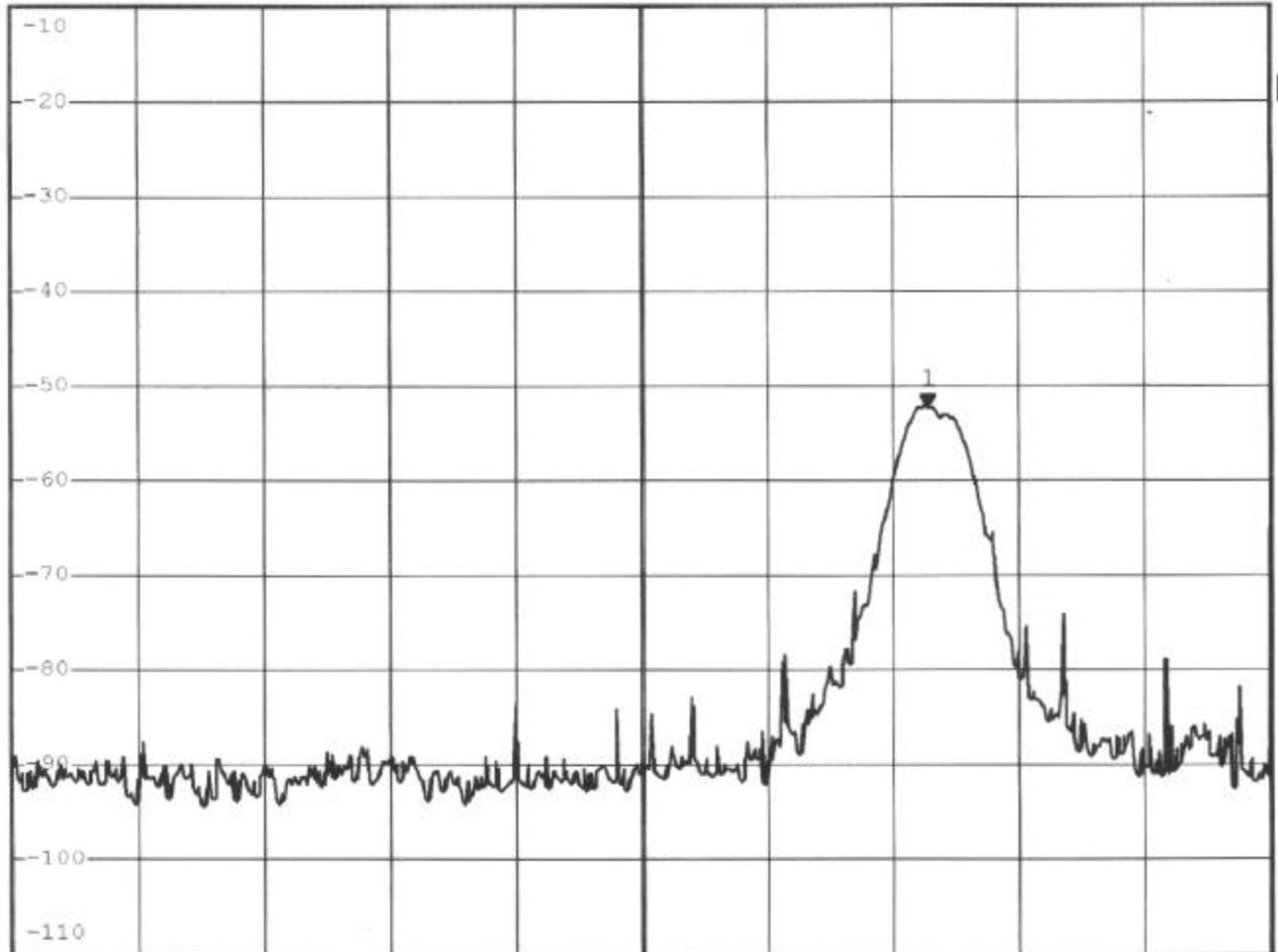


\*RBW 10 kHz      Marker 1 [T1]  
\*VBW 30 kHz      -52.25 dBm  
\*SWT 50 ms      27.192960000 MHz

Ref -10 dBm

\*Att 10 dB

1 PK  
VIEW



Start 26.96 MHz

32 kHz/

Stop 27.28 MHz

Comment A: FM500