

# EMC TEST REPORT

**Report No.:** TS09110024-EME

**Model No.:** F5L075-USB-\*\*\*

**Issued Date:** Nov. 16, 2009

**Applicant:** Belkin International Inc.  
501 West Walnut Street Compton, CA 90220, USA

**Test Method/  
Standard:** FCC Part 15 Subpart C Section §15.205、§15.209、§15.227,  
and ANSI C63.4/2003.

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**Summary of Tests**

**Wireless optical mouse-Model: F5L075-USB-\*\*\*  
FCC ID: K7SF5L075USB**

Test	Reference	Results
Field strength of fundamental frequency	15.227(a)	Complies
Radiated emission	15.227(b), 15.209	Complies
Emission on the band edge	15.205	Complies

## 1. General information

### 1.1 Identification of the EUT

Product: Wireless optical mouse  
Model No.: F5L075-USB-BLK  
FCC ID.: K7SF5L075USB  
Frequency Range: 27.045 MHz  
Channel Number: Single channel  
Frequency of Each Channel: 27.045 MHz  
Type of Modulation: FSK  
Power Supply: DC 3V from battery  
Power Cord: N/A  
Sample Received: Nov. 4, 2009  
Test Date(s): Nov. 9, 2009

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Note 2: When determining the test conclusion, the Measurement Uncertainty of test has been considered.

## 1.2 Additional information about the EUT

The EUT is a Wireless optical mouse, and was defined as information technology equipment.

For model F5L075-USB-\*\*\*

The customer confirmed denote of "\*" in model number as 0~9, A~Z, or blank, the different model number for different brand serves as marketing strategy. These models are identical in hardware aspect.

The customer confirmed, F5L075-USB-ASH and F5L075-USB-RAS are series models to F5L075-USB-BLK (EUT), the different model numbers are served as marketing strategy.

For more detail features, please refer to Installation guide.pdf.

## 1.3 Antenna description

The EUT uses a permanently connected antenna.

Antenna Gain: -40dB

Antenna Type: PCB Printed

Connector Type: N/A

## **2. Test specifications**

### **2.1 Test standard**

The EUT was performed according to the procedures in FCC Part 15 Subpart C Paragraph 15.227.

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

### **2.2 Operation mode**

The EUT was supplied with DC 3V from battery and was tested in TX mode.

### 2.3 Test equipment

Equipment	Brand	Frequency range	Model No.
EMI Test Receiver	Rohde & Schwarz	9kHz~2.75GHz	ESCS 30
EMI Test Receiver	Rohde & Schwarz	20Hz~26.5GHz	ESMI
Spectrum Analyzer	Rohde & Schwarz	9kHz~30GHz	FSP 30
Bilog Antenna	SCHWARZBECK	25MHz~1.7GHz	VULB 9160

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

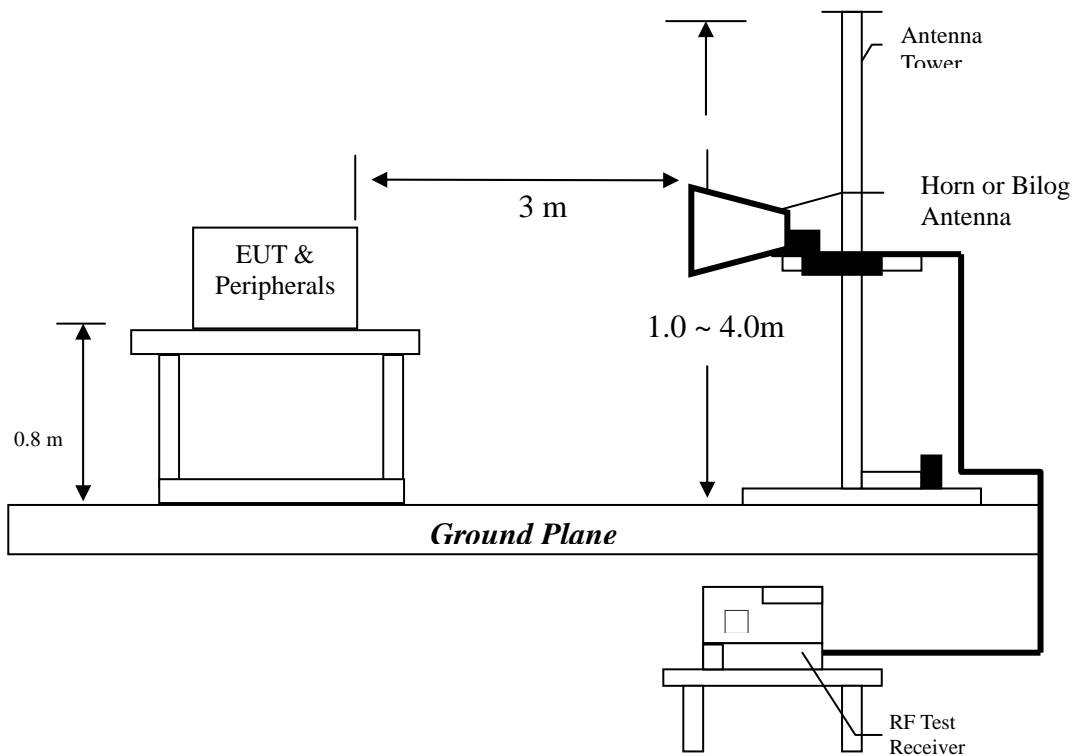
**3. Radiated emission test FCC 15.227 (a)/(b)**

**3.1 Operating environment**

Temperature: 22 °C  
Relative Humidity: 51 %  
Atmospheric Pressure 1023 hPa

**3.2 Test setup & procedure**

The Diagram below shows the test setup, which is utilized to make these measurements.



Radiated emissions were investigated cover the frequency range from 30MHz to 1000MHz using a receiver RBW of 120kHz record QP reading, and the frequency over 1GHz using a spectrum analyzer RBW of 1MHz and 10Hz VBW record Average reading. (15.209 paragraph), the Peak reading (1MHz RBW/VBW) recorded also on the report. 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 meters and down to 1 meter.



The measurement for radiated emission will be done at the distance of three meters unless the signal level is too low to measure at that distance. In the case of the reading under noise floor, a pre-amplifier is used and/or the test is conducted at a closer distance. And then all readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance.

The EUT configuration please refer to the “Spurious set-up photo.pdf”.

### 3.3 Emission limit

#### 3.3.1 Fundamental and harmonics emission limits

Frequency (MHz)	Field Strength of Fundamental	
	(uV/m@3m)	(dBuV/m@3m)
26.96-27.28	10000	80

The emission limit above is based on measurement instrumentation employing an average detector. The provisions in Section 15.35 for limiting peak emissions apply.

#### 3.3.2 General radiated emission limits

Frequency MHz	15.209 Limits (dB $\mu$ V/m@3m)
30-88	40
88-216	43.5
216-960	46
Above 960	54

Remark:

1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring antenna and the closed point of any part of the device or system

Measurement uncertainty was calculated in accordance with TR 100 028-1.

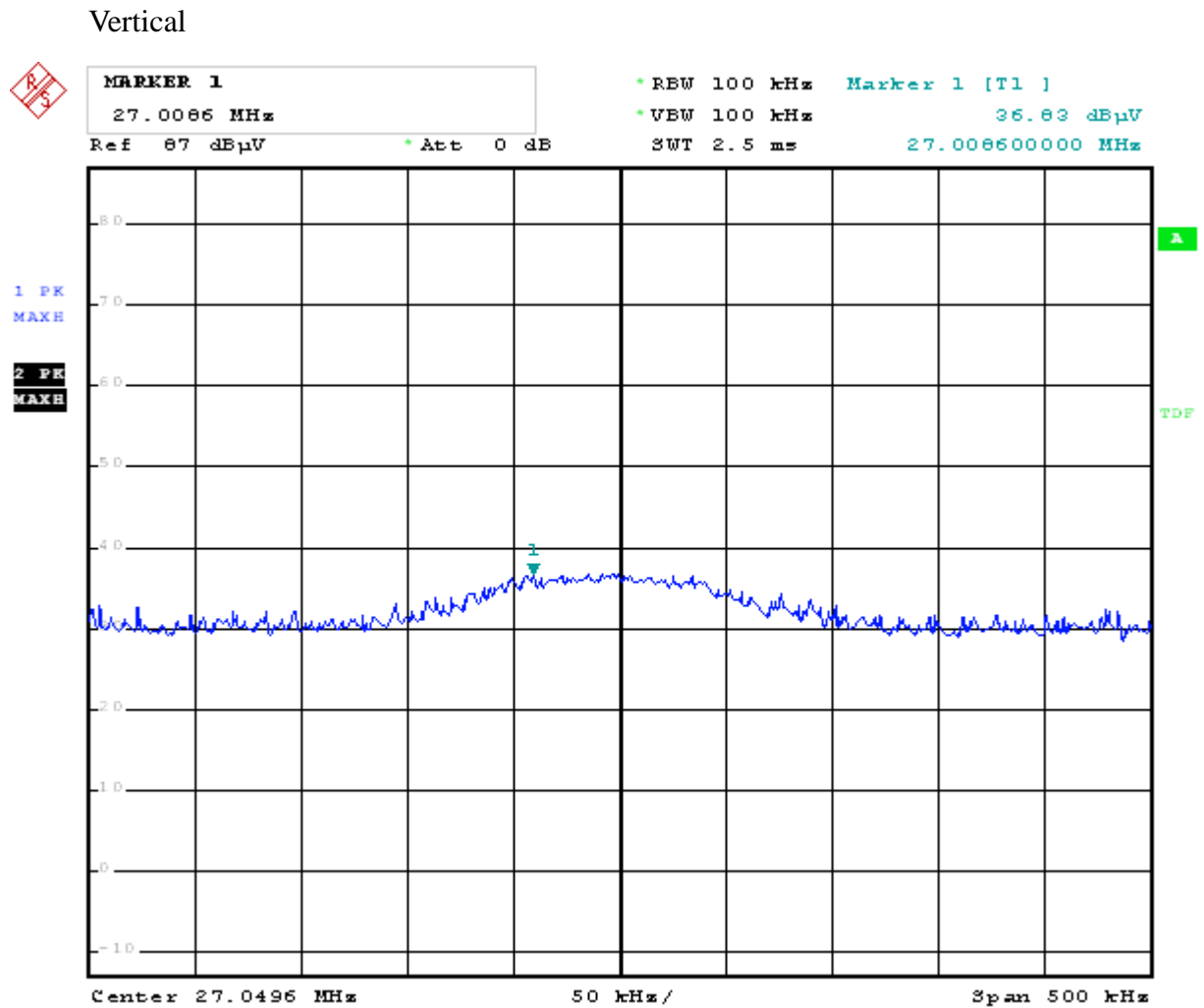
Parameter	Uncertainty
Radiated Emission	$\pm 5.056$ dB
Conducted Emission	$\pm 2.786$ dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of k=2.

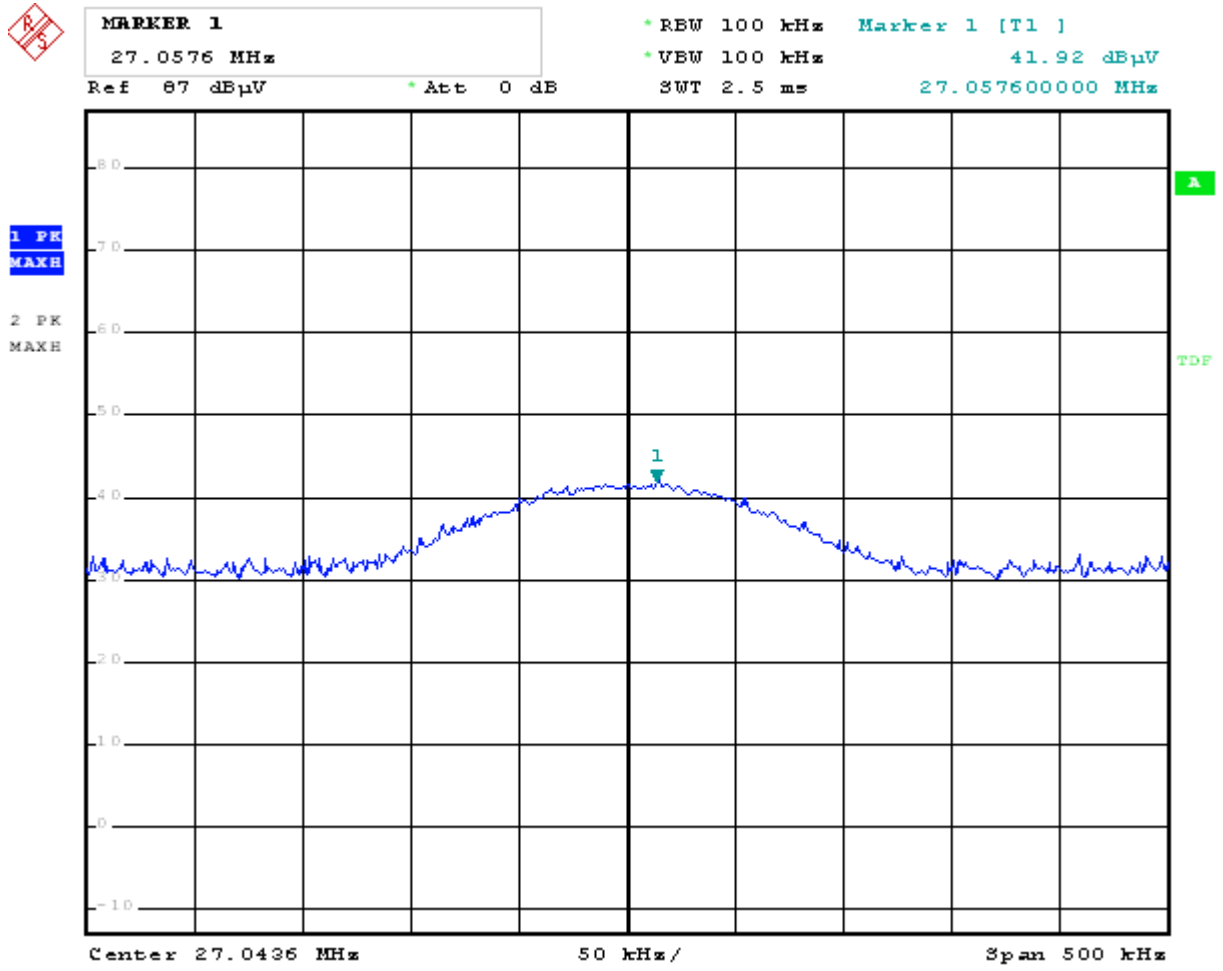
### 3.4 Radiated emission test data

#### 3.4.1 Fundamental emission

Please see the plot below.



## Horizontal



### 3.4.2 Harmonic Radiated Emission Data

EUT : F5L075-USB-BLK  
Worst Case : Tx mode

Antenna Polariz. (V/H)	Freq. (MHz)	Receiver Detector	Corr. Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
V	53.280	QP	12.90	10.09	22.98	40.00	-17.02
V	270.560	QP	13.24	15.04	28.27	46.00	-17.73
V	378.230	QP	16.40	12.94	29.34	46.00	-16.66
V	405.390	QP	16.47	14.49	30.96	46.00	-15.04
V	432.550	QP	17.64	13.48	31.12	46.00	-14.88
V	459.710	QP	17.68	12.17	29.85	46.00	-16.15
H	53.280	QP	14.11	9.29	23.39	40.00	-16.61
H	270.560	QP	13.21	15.50	28.70	46.00	-17.30
H	351.070	QP	15.48	11.89	27.36	46.00	-18.64
H	378.230	QP	16.74	13.49	30.23	46.00	-15.77
H	405.390	QP	16.81	12.64	29.45	46.00	-16.55
H	432.550	QP	18.12	14.38	32.50	46.00	-13.50
H	459.710	QP	18.16	12.05	30.21	46.00	-15.79

Remark:

1. Corr. Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Corr. Factor

#### 4. Emission on the band edge

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

#### 4.1 Operating environment

Temperature: 22 °C  
Relative Humidity: 53 %  
Atmospheric Pressure 1023 hPa

#### 4.2 Test Result

