

# TEST REPORT

Report No. : BT02015  
Report issue date : 25 July 2002  
Applicant : Microsoft Corporation  
One Microsoft Way  
Redmond, WA 98052-6399  
EUT : USB Dongle  
Model No. : EUYMF2CAxx  
Serial No. : 0217D  
Date of measurement : 12,15,22 July 2002  
Test location : TAIYO YUDEN Co.,Ltd. EMC CENTER  
4873-6,Nakaone,Nakamuroda,Haruna-machi,  
Gunma-Gun, Gunma, 370-3347, Japan  
Applied standard : FCC 15.247(Out-of-Band Spurious Emissions)  
IC RSS-210(o)(e1) (Out-of-Band Spurious Emissions)  
Test results : PASS

Head of EMC center

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## Contents

1. The agreement for test reports. ....	3
2. Summary of test results .....	3
3. Test conditions .....	3
3.1 EUT .....	3
3.2 Operation mode .....	3
3.3 Support equipment used .....	3
3.4 Cable used .....	3
3.5 Special test condition .....	3
4. Test Results .....	4
5. Measuring instrument list .....	6
6. Test Configuration .....	6
6.1 Figure of test configuration .....	6
6.2 Photo of test configuration .....	7

## 1. The agreement for test reports.

- (1) The results, which are stated in this document, are based on the items that have been tested.
- (2) We, TAIYO YUDEN.CO., LTD. EMC Center, must not copy any part of this document without any approval in writing.
- (3) We must not claim for use of this test report for the Accreditation of the products from FCC.

## 2. Summary of test results

FCC 15.247(Out-of-Band Spurious Emissions): PASS

IC RSS-210(o)(e1) (Out-of-Band Spurious Emissions) : PASS

## 3. Test conditions

### 3.1 EUT

Model No. : EUYMF2CAxx

Serial No. : 0217D

Power supply : DC 5V

### 3.2 Operation mode

	Mode	Explanation of the mode
1	TX mode	No hopping(Low-ch,Mid-ch,High-ch) , PRBS9 , DH1

### 3.3 Support equipment used

	Model No.	S/N	Manufacturer	Notes	
a	Personal Computer	PRESARIO 2554	1L86BXRVD96	Compaq Computer Corporation	-
b	Mouse	M-S34	LZA71316256	HEWLET PACKARD	-
c	Keyboard	SK-2700	B16000CDPGLCKA	Compaq Computer Corporation	-
d	CRT Display	D15A1	7572643QA	NEC	-

### 3.4 Cable used

	Model No.	Connection	Ferrite core	Shield	Material of connector	Length	Treatment for the extra length	Notes	
1	USB Cable	-	EUT - a	None	Yes	Metal	1.5m	The cable should be folded back at 40cm to the ground plane.	-
2	Video Cable	-	a - d	Yes	Yes	Metal	1.4m	The cable should be folded back at 40cm to the ground plane.	-
3	Mouse Cable	-	a - b	Yes	Yes	Metal	1.8m	-	-
4	Keyboard Cable	-	a - c	Yes	Yes	Metal	1.8m	-	-
5	AC Cable	-	a	None	None	Plastic	2.4m	-	for PC
6	AC Cable	-	d	None	None	Plastic	2.4m	-	for CRT Display

### 3.5 Special test condition

Nothing

## 4. Test Results

Standard : FCC 15.247, IC RSS-210(o)(e1)

Operation mode : TX mode

Date of measurement : 12 July 2002

Temperature : 29Deg C Humidity : 35% Atmospheric pressure : 968hPa

Date of measurement : 15 July 2002

Temperature : 28Deg C Humidity : 32% Atmospheric pressure : 971hPa

Measurement distance : 3m (30MHz – 18GHz) , 1m (18GHz – 25GHz)

As for the chart of the observed RF profiles, refer to Annex A

	Frequency (MHz)	Ant. Factor (dB/m)	Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
H	128.9	13.4	-21.5	37.9	29.8	43.5	13.7
V	128.9	13.4	-21.5	36.1	28.0	43.5	15.5
H	143.2	14.3	-21.3	35.5	28.5	43.5	15.0
V	157.6	14.8	-21.3	36.8	30.3	43.5	13.2
H	466.2	17.7	-20.6	38.0	35.1	46.0	10.9
V	466.2	17.7	-20.6	35.0	32.1	46.0	13.9

Emission Level(dBuV/m) = Reading(dBuV)+Antenna Factor(dB/m)+Factor(dB)

Factor(dB) = Cable Loss(dB) - Pre-amplifier Gain(dB)

	Freq. (MHz)	Ant. Factor (dB/m)	Factor (dB)	Reading (dBuV)		Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
				Peak	AV	Peak	AV	Peak	AV	Peak	AV
H	1165	26.0	-36.9	58.7	-	47.8	-	74.0	54.0	26.2	-
V	1165	26.0	-36.9	60.5	-	49.6	-	74.0	54.0	24.4	-
H	1220	26.1	-36.7	49.9	-	39.3	-	74.0	54.0	34.7	-
V	1220	26.1	-36.7	50.0	-	39.4	-	74.0	54.0	34.6	-
V	1240	26.2	-36.7	49.0	-	38.5	-	74.0	54.0	35.5	-
V	1332	26.4	-36.4	53.5	-	43.5	-	74.0	54.0	30.5	-
H	1398	26.5	-36.2	59.3	-	49.6	-	74.0	54.0	24.4	-
V	1398	26.5	-36.2	61.3	-	51.6	-	74.0	54.0	22.4	-
H	1631	27.3	-35.5	55.3	-	47.0	-	74.0	54.0	27.0	-
V	1631	27.3	-35.5	57.3	-	49.0	-	74.0	54.0	25.0	-
H	2399	28.6	-33.8	70.8	46.8	65.6	41.6	74.0	54.0	8.4	12.4
V	2399	28.6	-33.8	76.6	44.9	71.5	39.8	74.0	54.0	2.5	14.3
H	2484	28.6	-33.7	51.0	-	46.0	-	74.0	54.0	28.0	-
V	2484	28.6	-33.7	54.1	-	49.0	-	74.0	54.0	25.0	-
H	4804	34.5	-30.4	47.3	-	51.3	-	74.0	54.0	22.7	-
V	4804	34.5	-30.4	45.6	-	49.7	-	74.0	54.0	24.4	-
H	4882	34.7	-30.4	47.3	-	51.6	-	74.0	54.0	22.4	-
V	4882	34.7	-30.4	45.0	-	49.3	-	74.0	54.0	24.7	-
H	4960	34.9	-30.3	47.0	-	51.6	-	74.0	54.0	22.4	-
V	4960	34.9	-30.3	45.7	-	50.3	-	74.0	54.0	23.7	-

Emission Level(dBuV/m) = Reading(dBuV)+Antenna Factor(dB/m)+Factor(dB)

Factor(dB) = Cable Loss(dB) - Pre-amplifier Gain(dB)

The Spectrum Analyzer was setup using

Peak mode : RBW=1MHz , VBW=1MHz

Average mode : RBW=1MHz , VBW=10Hz

All spurious emissions were more than 20dB below a carrier.

Standard : IC RSS-210(o)(e1)

Operation mode : RX mode

Date of measurement : 22 July 2002

Temperature : 26Deg C Humidity : 37% Atmospheric pressure : 978hPa

Measurement distance : 3m

	Frequency (MHz)	Ant. Factor (dB/m)	Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
H	128.9	13.4	-21.52	39.6	31.48	43.5	12.02
V	128.9	13.4	-21.52	39.2	31.08	43.5	12.42
H	143.2	14.3	-21.34	37.1	30.06	43.5	13.44
V	199.8	16.2	-20.71	37.6	33.09	43.5	10.41
H	466.2	17.7	-20.64	36.6	33.66	46.0	12.34
V	466.2	17.7	-20.64	34.5	31.56	46.0	14.44

Emission Level(dBuV/m) = Reading(dBuV)+Antenna Factor(dB/m)+Factor(dB)

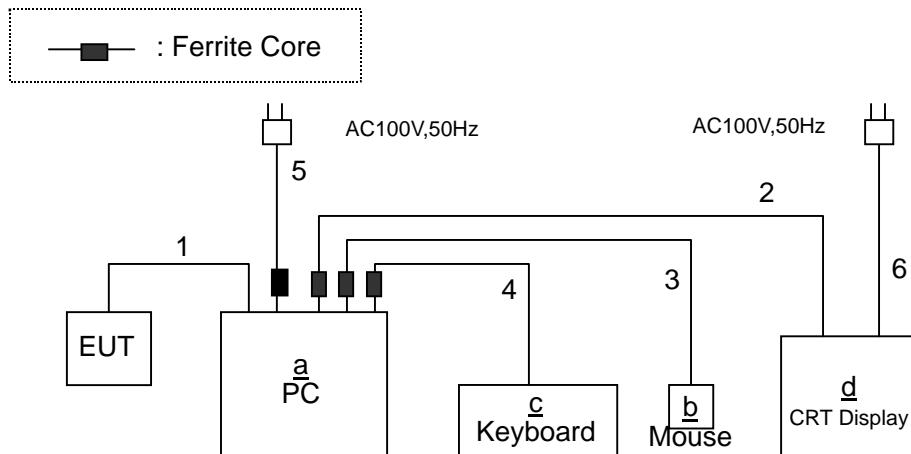
Factor(dB) = Cable Loss(dB) - Pre-amplifier Gain(dB)

### 5. Measuring instrument list

	Manufacturer	Model No.	Serial No.	Notes
EMI Receiver	R&S	ESV	894983/006	30 - 1000MHz
Spectrum Analyzer	Agilent Technologies	8563E	3416A02230	1 - 26.5GHz
		8567A	3001A00673	30 - 1000MHz
Signal Generator		8657A	3012A02011	30 - 1000MHz
Tracking Generator		65645A	3407A00192	1 - 26.5GHz
Amplifier		8449B	3008A00571	1 - 26.5GHz
		8447D	2944A06815	30 - 1000MHz
Antenna	Schwarzbeck	BBA9106	No.4	30 - 300MHz
		UHALP9108-A	0160	300 - 1000MHz
		VHA 9105	No.4.1	30 - 300MHz
		UHA 9103	No.4.2	300 - 1000MHz
	EMCO	3115	9504-4502	1 - 18GHz
		3115	9403-4232	1 - 18GHz
		3116	9311-2227	18 - 40GHz
Fran-microwave	17240-25	63	9.84 - 15GHz	
High-pass Filter	Taiyo Yuden	HPF	No.1	

### 6. Test Configuration

#### 6.1 Figure of test configuration



These numbers and the marks in the picture above are corresponding to the numbers and the mark in Figure 3.3 and 3.4 on page 3.

## 6.2 Photo of test configuration



This photo shows the instruments arrangement under testing, which records the maximum level of the radiation noise level.