

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

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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	1L86BXRDVD96	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)

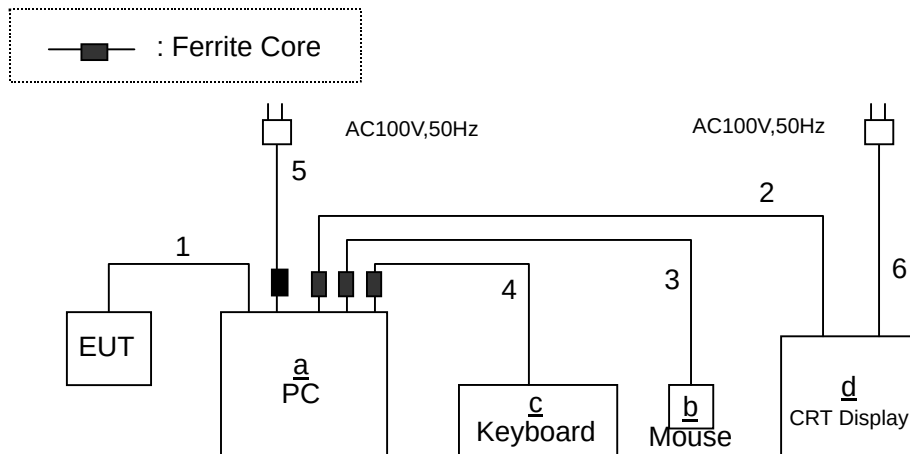
Factor(dB) = Cable Loss(dB) - Pre-amplifier Gain(dB)

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.