



CONFORMANCE TEST REPORT FOR FCC 47 CFR, Part 15 Subpart C

Report No.: **ET93S-12-237-02**

Client: Kwok's Winty Manufacturing Ltd.
Product: Play
Model: SO-60101
FCC ID: OGN60101TX27
Manufacturer/supplier: Kwok's Winty Manufacturing Ltd.

Date test item received: 2004/12/30
Date test campaign completed: 2005/02/22
Date of issue: 2005/02/23

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Setup photos 3 pages

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Manufacturer : Kwok's Winty Manufacturing Ltd.
Address : 45 Kut Shing St., 12/F., Block A Shing King Industrial Bldg., Chai Wan, Hong Kong
EUT : Play
Trade name : CYCLOPS
Model No. : SO-60101
Power Source : 12VDC
Regulations applied : FCC 47 CFR, Part 15 Subpart C (2004)

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- ⑤ FCC Registration Number: 90588, 91094, 91095



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1. GENERAL INFORMATION

1.1 Product Description

- a) Type of EUT : Play
- b) Model No. : SO-60101
- c) Trade Name : CYCLOPS
- d) FCC ID : OGN60101TX27
- e) Working Frequency : 27.145 MHz
- f) Power Supply : 12V DC

1.2 Characteristics of Device:

The EUT is a remote controller with LCD display. The remote controller will receive the 2.4 GHz audio and video signal (Channel 1: 2413.4 MHz, Channel 2: 2454.4 MHz) and transmit 27 MHz signal (two channels A/B, both are 27.145 MHz but with difference coding) to control the toy car.

1.3 Test Methodology

Both Conducted and radiated testing were performed according to the procedures in chapter 13 of ANSI C63.4 and FCC 47 CFR Part 15.

1.4 Test Facility

The semi-anechoic chamber and conducted measurement facility used to collect the radiated and conducted data are located inside the Building at No.8, Lane 29, Wen-ming Road, Lo-shan Tsun, Kweishan Hsiang, Taoyuan, Taiwan, R.O.C.
This site has been accreditation as a FCC filing site.

2. TEST SYSTEM AND LIMITATION

2.1 Device for Tested System

Device	Manufacture	Model No.	S/N No.	Cable Description
Play*	CYCLOPS	SO-60101	----	----
Earphone	N/A	N/A	----	1.2m*1 Unshielded Signal Line
TV	Haier	TN131AUV	----	1.8m*1 Unshielded Power Line 1.5m*1 Unshielded AV Cable

Remark “*” means equipment under test.

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	3600-4400	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 :

According to §15.207 Conducted 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	Quasi Peak dB μ V	Average dB μ V
0.15 - 0.5	66-56	56-46
0.5 - 5.0	56	46
5.0 - 30.0	60	50

(2) Radiated Emission Limits :

According to §15.227 Operation within the band 26.96 – 27.28 MHz.

(a) The field strength of any emissions 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.

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

According to § 15.209 Radiated emission limits, general requirements.

(a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100 **	3
88 – 216	150 **	3
216 – 960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

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. To comply with the FCC RF exposure compliance requirement, the device and its antenna must not be co-located or operating to conjunction with any other antenna or transmitter.

3. RADIATED EMISSION MEASUREMENT

3.1 Applicable Standard

According to §15.227 Operation within the band 26.96 – 27.28 MHz.

- (a) The field strength of any emissions 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.
- (b) The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209.

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1.705 – 30.0	30	30
30 – 88	100 **	3
88 – 216	150 **	3
216 – 960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

3.2 Measurement Procedure

A.Preliminary Measurement For Portable Devices.

For portable devices, the following procedure was performed to determine the maximum emission axis of EUT:

1. With the receiving antenna is H polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
2. With the receiving antennna is V polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
3. Compare the results derived from above two steps. So, the axis of maximum emission from EUT was determined and the configuration was used to perform the final measurement.

B. Final Measurement

1. Setup the configuration per figure 1 and 2 for frequencies measured below and above 30 MHz respectively. Turn on EUT and make sure that it is in continuous operating function.
2. For emission measured below 30 MHz, set the EMI Test Receiver on a 10 kHz and 30 kHz resolution bandwidth respectively for each frequency measured in step 2.
3. For emission measured above 30 MHz, set the EMI Test Receiver on a 120 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.

Figure 1 : Frequencies measured below 30 MHz configuration

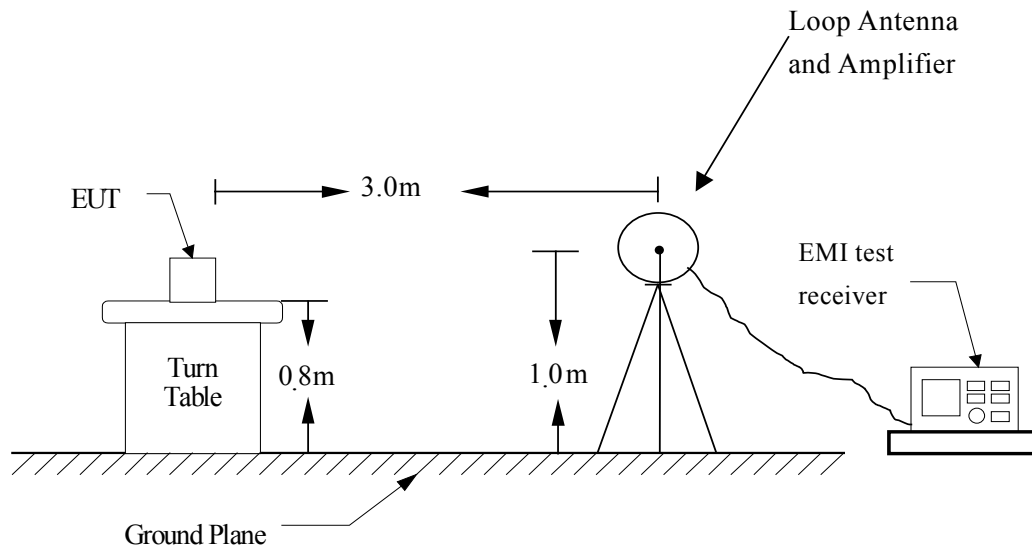
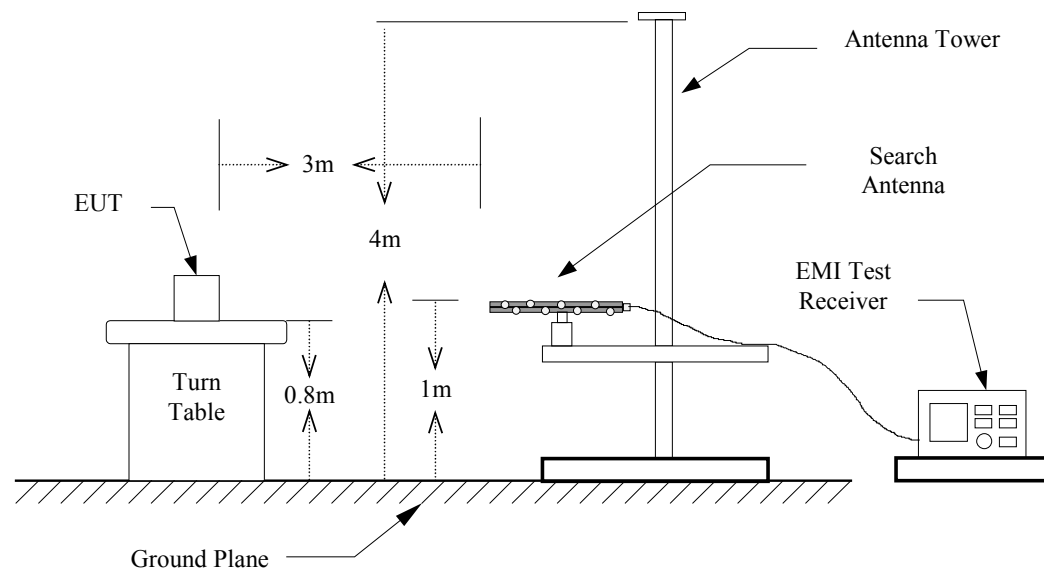


Figure 2 : Frequencies measured above 30 MHz configuration



3.3 Test Data

3.3.1 Test Frequency : Below 30 MHz

Operated mode : Continue TransmittingTest Date : Feb. 22, 2005 Temperature : 16 °C Humidity : 73 %

Frequency	Meter Reading (dBuV)		Corrected Factor	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin
(MHz)	PK	AV	(dB)	PK	AV	PK	AV	(dB)
27.145	54.6	-	0.2	54.8	-	100	80	-25.2

Note:

1. Place of Measurement: Measuring site of the ETC.
2. Test Result = Meter Reading + Correct Factor
3. If the result of peak value is under the limit of Average, the Average value doesn't need to be measured.
4. Item "Margin" referred to Average limit while there is only Peak result.

3.3.2 Bandedge Emission Measurement

Operated mode : Continue TransmittingTest Date : Feb. 22, 2005 Temperature : 16 °C Humidity : 73 %

Frequency (MHz)	Meter Reading (dBuV)		Corrected Factor (dB)	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin (dB)
	PK	AV		PK	AV	PK	AV	
26.960	20.4	-	0.2	20.6	-	89.5	69.5	-48.9
27.280	24.2	-	0.2	24.4	-	89.5	69.5	-45.1

Note:

1. Place of Measurement: Measuring site of the ETC.
2. Test Result = Meter Reading + Correct Factor
3. If the result of peak value is under the limit of Average, the Average value doesn't need to be measured.
4. Item "Margin" referred to Average limit while there is only Peak result.

With a distant extrapolation of $40\log(30\text{m}/3\text{m})$ on the offset level of receiver during the test.

Limit Calculation:

$$(\$15.215) : 20 \log (30) + 40 \log (30/3) = 69.5 \text{ dBuV/m}$$

3.3.3 Test Frequency : 30 MHz ~ 1 GHz

Operated mode : Continue TransmittingTest Date : Feb. 22, 2005 Temperature : 16 °C Humidity : 73 %

Frequency (MHz)	Ant-Pol H/V	Meter Reading (dBuV) Q.P.	Corrected Factor (dB)	Result @3m (dBuV/m) Q.P.	Limit @3m (dBuV/m) Q.P.	Margin (dB)
30.540	H	14.7	13.1	27.8	40.0	-12.2
30.540	V	21.9	13.1	35.0	40.0	-5.0
54.840	V	24.9	13.6	38.5	40.0	-1.5
81.840	V	22.2	9.9	32.1	40.0	-7.9
136.380	V	25.0	15.1	40.1	43.5	-3.4
163.380	H	12.4	14.9	27.3	43.5	-16.2
164.190	V	17.2	14.9	32.1	43.5	-11.4
191.190	H	11.0	13.1	24.1	43.5	-19.4
191.190	V	14.0	13.1	27.1	43.5	-16.4
272.190	H	13.4	15.7	29.1	46.0	-16.9
272.190	V	13.6	15.7	29.3	46.0	-16.7
327.300	H	15.6	17.5	33.1	46.0	-12.9
327.300	V	17.7	17.5	35.2	46.0	-10.8
381.900	H	15.4	18.8	34.2	46.0	-11.8
407.800	H	16.7	19.4	36.1	46.0	-9.9
435.800	H	12.0	20.1	32.1	46.0	-13.9

Note:

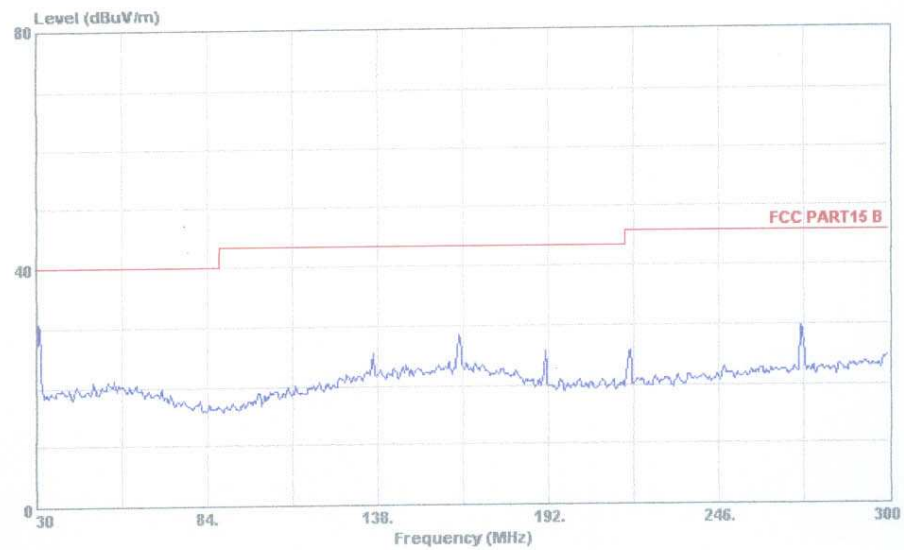
1. Place of Measurement: Measuring site of the ETC.
2. Peak Result = Peak Reading + Correct Factor
3. AVG Result = Peak Result + Duty Factor
4. If the result of peak value is under the limit of Quasi-Peak, the Quasi-Peak value doesn't need to be measured.
5. Please refer to page 14 to page 18 for chart

Horizontal



ETC TEST LABORTARY

Data#: 4252 File#: C:\Program Files\E3\MARK.emi



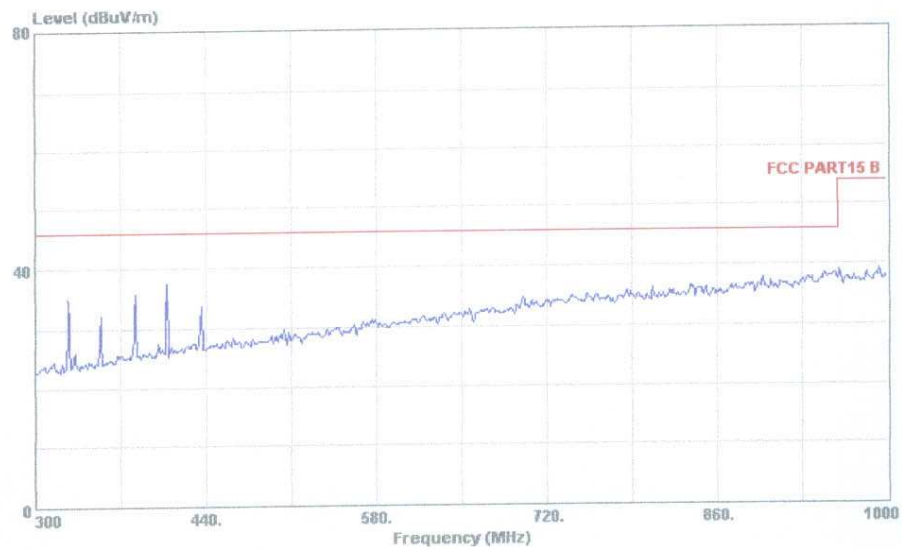
Site : HQ SITE
Condition : FCC PART15 B 3m HORIZONTAL
EUT : 27MHz TX
MODEL :
memo :

Horizontal



ETC TEST LABORTARY

Data#: 4251 File#: C:\Program Files\E3\MARK.emi



Site : M00 SITE
Condition : FCC PART15 B 3m HORIZONTAL
EUT : 27MHz TX
MODEL :
memo :

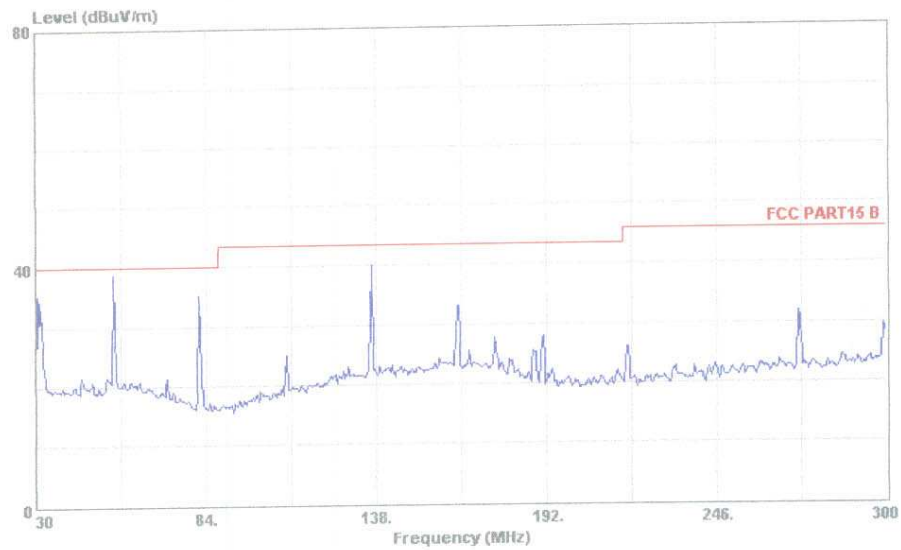
Vertical



ETC TEST LABORTARY

Data#: 4265

File#: C:\Program Files\E3\MARK.eml



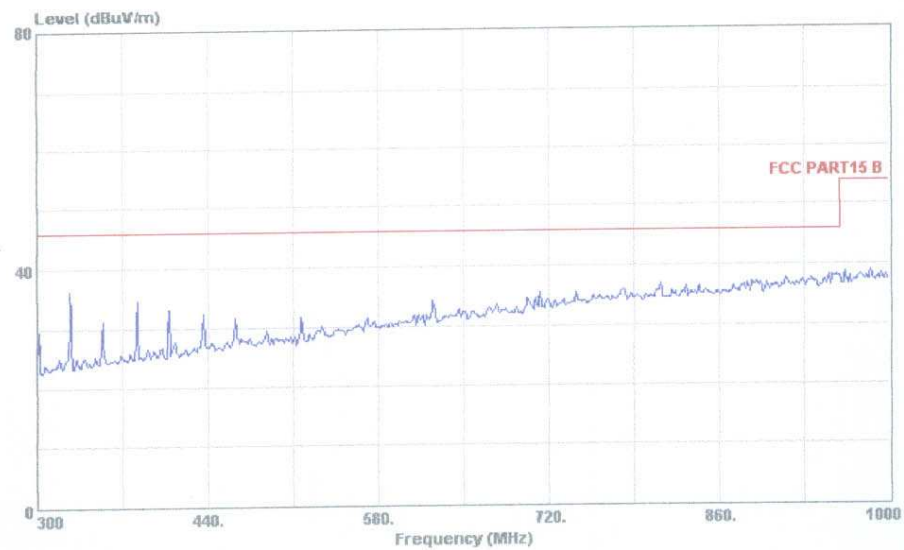
Site : M00 SITE
Condition : FCC PART15 B 3m VERTICAL
EUT : 27MHz TX
MODEL :
memo :

Vertical

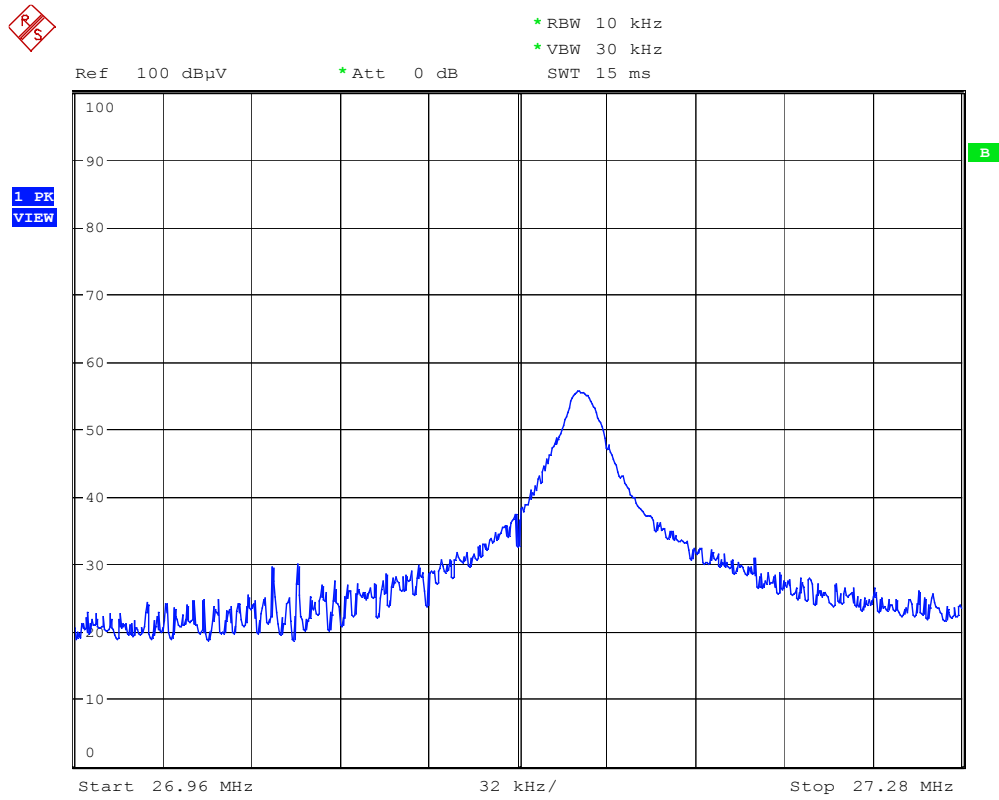


ETC TEST LABORATORY

Data#: 4250 File#: C:\Program Files\E3\MARK.emi



Site : MOO SITE
Condition : FCC PART15 B 3m VERTICAL
EUT : 27MHz TX
MODEL :
memo :



Date: 22.FEB.2005 21:33:05

3.3.4 Other emissions

Operated mode : Receiver (Channel 1)Test Date : Feb. 22, 2005 Temperature : 16 °C Humidity : 73 %

Frequency (MHz)	Ant-Pol H/V	Meter Reading (dBuV) Q.P.	Corrected Factor (dB)	Result @3m (dBuV/m) Q.P.	Limit @3m (dBuV/m) Q.P.	Margin (dB)
31.120	H	7.0#	13.1	20.1#	40.0	-19.9
31.930	V	7.1#	13.1	20.2#	40.0	-19.8
138.640	H	5.4#	15.1	20.5#	43.5	-23.0
139.120	V	5.3#	15.1	20.4#	43.5	-23.1
162.890	H	5.8#	14.9	20.7#	43.5	-22.8
193.120	V	7.7#	13.1	20.8#	43.5	-22.7
256.120	V	6.5#	14.6	21.1#	46.0	-24.9
264.740	H	4.6#	15.7	20.3#	46.0	-25.7
288.310	V	5.3#	16.8	22.1#	46.0	-23.9
291.900	H	4.5#	16.8	21.3#	46.0	-24.7
318.910	V	5.9#	17.5	23.4#	46.0	-22.6
336.520	H	5.7#	17.5	23.2#	46.0	-22.8

Note :

1. Place of Measurement: Measuring site of the ETC.
2. Remark “***” means that the emissions level is too low to be measured.
3. Remark “#” means the noise was low, so record the peak value.
4. Item “Margin” referred to Q.P. limit while there is only peak result.

3.3.5 Other emissions

Operated mode : Receiver (Channel 2)Test Date : Feb. 22, 2005 Temperature : 16 °C Humidity : 73 %

Frequency (MHz)	Ant-Pol H/V	Meter Reading (dBuV) Q.P.	Corrected Factor (dB)	Result @3m (dBuV/m) Q.P.	Limit @3m (dBuV/m) Q.P.	Margin (dB)
32.320	H	7.0#	13.1	20.1#	40.0	-19.9
33.120	V	7.1#	13.1	20.2#	40.0	-19.8
138.120	H	5.5#	15.1	20.6#	43.5	-22.9
139.380	V	5.5#	15.1	20.6#	43.5	-22.9
173.890	H	5.4#	15.4	20.8#	43.5	-22.7
183.120	V	6.8#	14.1	20.9#	43.5	-22.6
231.390	V	7.4#	13.7	21.1#	46.0	-24.9
241.180	H	6.6#	14.6	21.2#	46.0	-24.8
259.830	V	7.2#	14.6	21.8#	46.0	-24.2
269.320	H	5.4#	15.7	21.1#	46.0	-24.9
273.120	V	6.4#	15.7	22.1#	46.0	-23.9
318.890	H	5.3#	17.5	22.8#	46.0	-23.2

Note :

1. Place of Measurement: Measuring site of the ETC.
2. Remark “***” means that the emissions level is too low to be measured.
3. Remark “#” means the noise was low, so record the peak value.
4. Item “Margin” referred to Q.P. limit while there is only peak result.

3.4 Calculation

Field Strength:

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$\text{RESULT} = \text{READING} + \text{CORR. FACTOR}$$

where CORR. FACTOR = Antenna FACTOR + Cable FACTOR

Assume a receiver reading of 62.4 dB μ V is obtained. The Antenna Factor of 14.1 and a Cable Factor of 3.4 is added. The total of field strength is 79.9 dB μ V/m.

$$\text{RESULT} = 62.4 + 14.1 + 3.4 = 79.9 \text{ dB } \mu \text{ V/m}$$

$$\text{Level in } \mu \text{ V/m} = \text{Common Antilogarithm}[(79.9 \text{ dB } \mu \text{ V/m})/20] = 9885.5 \mu \text{ V/m}$$

3.5 Radiated Test Equipment

The following instrument are used for radiated emissions measurement :

Equipment	Manufacturer	Model No.	Calibrated until
EMI Test Receiver	HP	8546A	Sep. 06, 2005
Amplifier	ADVANTEST	BB525C	Aug. 17, 2005
BiconiLog Antenna	Schwarzbeck	VULB 9160	Nov. 24, 2005
Loop Antenna	EMCO	6512	Jul. 15, 2007
Spectrum Analyzer	Rohde & Schwarz	FSU46	Oct. 03, 2005

Note: The standards used to perform this calibration are traceable to NML/ROC, NIST/USA and NPL.

3.6 Measuring Instrument Setup

Measuring instrument setup in measured frequency band when specified detector function is used :

Frequency Band (MHz)	Instrument	Function	Resolution Bandwidth	Video Bandwidth
0.009 to 30	EMI Test Receiver	Peak	10 kHz	30 kHz
30 to 1000	EMI Test Receiver	Peak	120 kHz	300 kHz

4. CONDUCTED EMISSION MEASUREMENT

This EUT is excused from investigation of conducted emission, for it is powered by DC power 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.