

HCT CO., LTD.

Product Compliance Division, EMC Team
SAN 136-1, AMI-RI, BUBAL-EUP, ICHEON-SI, KYOUNKI-DO, 467-701, KOREA
TEL: +82 31 639 8518 FAX: +82 31 639 8525

TEST REPORT(DoC)

Manufacturer;

Enspert Inc.

2F, 7F Daehwa B/D., 169, Samseong-dong, Gangnam-gu,
135-090, Seoul, Korea

Date of Issue: November 10, 2010

Test Report No.: HCTE1011FE08

Test Site: HCT CO., LTD.

HCT FRN: 0005-8664-21

EUT TYPE :

MODEL :

**Tablet PC
ESP-E201U**

Rule Part(s):

Equipment Class:

Standard(s):

Model:

Part 15 Subpart B

Class B Personal Computers and Peripherals

FCC Class B: (CISPR 22)

ESP-E201U

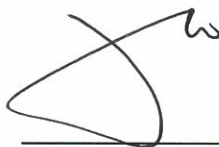
This equipment has been shown to be in compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2003

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.



**Report prepared by
: Kyoung Houn, Seo**

Test engineer of EMC Tech. Part



**Approved by
: Nam-Wook Kang**

Manager of EMC Tech. Part



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MEASUREMENT REPORT

1. Scope

Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission.

Applicant Name:	Enspert Inc.
Address:	2F, 7F Daehwa B/D., 169, Samseong-dong, Gangnam-gu, 135-090, Seoul, Korea

- **MODEL :** ESP-E201U
- **Equipment Class:** Class B Personal Computers and Peripherals
- **EUT Type:** Tablet PC
- **Rule Part(s):** FCC Part 15 Subpart B
- **Test Procedure(s):** ANSI C63.4 (2003)
- **Dates of Tests:** October 20, 2010
- **Place of Tests:**
254-1, MAEKOK-RI, HOBUP-MYUN, ICHON-SI, KYOUNGKI-DO, 467-701, KOREA
105-1, Jangam-Ri, Majang-Myeon, Icheon-Si, Kyongki-Do, 467-701, South Korea

2. Introduction

The measurement procedure described in American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz(ANSI C63.4-2003) was used in determining radiated and conducted emissions emanating from **Tablet PC**, manufactured by **Enspert Inc., MODEL: ESP-E201U**

The 10 m semi anechoic chamber used to collect the radiated data is located at the 105-1, Jangam-Ri, Majang-Myeon, Icheon-Si, Kyungki-Do, 467-701, South Korea, and the conducted measurement facility used to measure the conducted data are located at San 136-1, Ami-Ri Bubal-Eup, Icheon-Si, Kyungki-Do, 467-701, South Korea. Those measurement facilities are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. Detailed description of test facilities was submitted to the Commission and accepted dated Sep. 03, 2010 (Registration Number: 90661)

3. Product Information

3.1 Equipment Description

Equipment Under Test (EUT) is **Tablet PC**, manufactured by **Enspert Inc. (MODEL: ESP-E201U)**

Display:	7 inch, WVGA(800×480) TFT LCD /Capacitive Multi Touch Screen
CPU:	Samsung S5PC110 ARM Cortex-A8 1 GHz
OS:	Android Éclair (2.1)
Memory:	DDR2 MEMORY 512 MB (DDR2 Speed : 400 MHz) OneNAND FLASH 512 MB
Network:	WiFi 802.11 b/g/n Bluetooth 2.1 + EDR
Interface:	USB 2.0 Host (USB mini B type) USB 2.0 Client (USB mini B type) HDMI (micro HDMI) Ear/Mic Jack (3.5 Φ) SD Card Slot
GPS:	Standard Type GPS
Camera:	3M Pixel
Sensor:	G-Sensor, Geomagnetic-Sensor, Ambient Light-Sensor
Battery:	4100 mAh Li-polymer Battery - inner battery - Movie play time ≥3.5 hours - Standby time ≥72 hours
Adapter:	AC: 110 V ~ 220 V DC: 5 V / 2 A Adapter
Audio:	Stereo Speaker Microphone Support SRS WOW Sound
Key:	Power Key Home Key Menu Key Back Key Volume Up/Down Key
Dimension:	Color: Metal Silver Size: 191.2(W) × 130.5(L) × 14.6(H) Weight: 412 g

4. Description of Tests(Conducted)

Conducted Emissions

E.U.T was connected to LISN via EUT Adapter & Notebook PC Adapter.

Preliminary Power Line Conducted Emission tests were performed by using the procedure in ANSI C63.4/2003 7.2.3 to determine the worst operating conditions.

CONDUCTED EMISSIONS	CISPR 22 CLASS B Limits dB(μ V)	
	Quasi-Peak	Average
150 kHz - 0.5 MHz	66-56**	56-46**
0.5 MHz - 5 MHz	56	46
5 MHz - 30 MHz	60	50
**Limits decreases linearly with the logarithm of frequency		

Table 1. Conducted Limits

5. Description of Tests (Radiated)

Radiated Emissions

Preliminary Radiated Emission tests were performed by using the procedure in ANSI C63.4/2003 8.3.1.1 to determine the worst operating condition. Final Radiated Emission tests were performed at 10 m semi anechoic chamber

ITE Radiated Limits	
Frequency (MHz)	CISPR Limit @ 10 m. Quasi-Peak dB[μ V/m]
30-230	30.0
230-1000	37.0
> 1000	No Specified Limit
* Limit extrapolated 20 dB/decade	

Table 2. Radiated @ 10-meters

6. List of Peripheral Equipment

DEVICE TYPE	MANUFACTURER	MODEL NUMBER	FCC ID / DoC	CONNECTED TO
EUT (Tablet PC)	Enspert Inc.	ESP-E201U	-	-
EUT Adapter	WEHAI SUNLIN ELECTRONICS CO., LTD.	SA-A136LA	-	EUT
GPS Antenna	-	-	-	EUT
Notebook PC	H.P	Compaq 6730b	-	EUT
Notebook PC Adapter	H.P	Series PPP014H-S	-	Notebook PC
TV Monitor	LG	M1994D-PMJ AKRXLP	-	EUT
Mouse	Microsoft	Intellimouse optical USB and PS/2 compatible	-	Notebook PC

6.1 Cable Description

Product Name	Port	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (m)
EUT (Tablet PC) #1 Adapter	SD	Not Applicable	Not Applicable	-
	HDMI	Not Applicable	Y	2.0(D)
	USB	Not Applicable	Y	1.0(D)
	Audio	Not Applicable	N	1.2 (D)
	Antenna	Not Applicable	N	-
EUT (Tablet PC) #2 Notebook PC(USB)	SD	Not Applicable	N	-
	HDMI	Not Applicable	Y	2.0(D)
	USB	N	Not Applicable	3.0 (D)
	Audio	Not Applicable	N	1.2 (D)
	Antenna	Not Applicable	N	-

The marked "(D)" means the Data Cable and "(P)" means the Power Cable.

6.2 Noise Suppression Parts on Cable. (I/O CABLE)

Product Name	Port	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
EUT (Tablet PC) #1 Adapter	SD	N	Not Applicable	N	Not Applicable
	HDMI	Y	EUT END	Y	Both END
	USB	N	Not Applicable	Y	Both END
	Audio	N	Not Applicable	N	Not Applicable
	Antenna	N	Not Applicable	N	Not Applicable
EUT (Tablet PC) #2 Notebook PC (USB)	SD	N	Not Applicable	N	Not Applicable
	HDMI	Y	EUT END	Y	Both END
	USB	N	Not Applicable	Y	EUT END
	Audio	N	Not Applicable	Y	Not Applicable
	Antenna	N	Not Applicable	N	Not Applicable

7. Preliminary Test

Radiated Emission Test

Operation Mode	The worst operating condition
Normal Mode	O
Data Read /Write Mode	O

8. Conducted Test Data

#1 Adapter

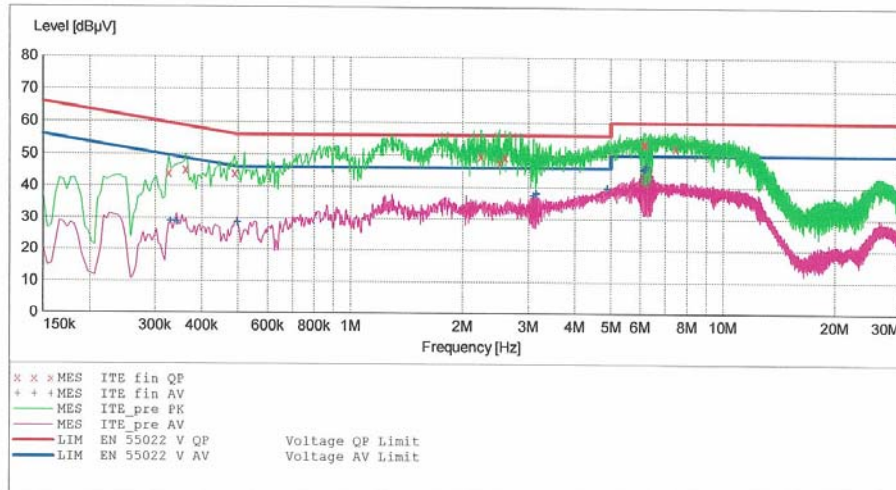
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EMC

EUT: ESP-E201U
Manufacturer: ENSPERT
Operating Condition: NORMAL
Test Site: SHIELD ROOM
Operator: KH-SEO
Test Specification: CISPR22 CLASS B
Comment: H

SCAN TABLE: "CISPR22 CLASS B"

Short Description:			CISPR 22 CLASS B			
Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			



MEASUREMENT RESULT: "ITE_fin QP"

10/20/2010 4:22PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.326000	44.00	10.1	60	15.5	---	---
0.362000	45.30	10.1	59	13.4	---	---
0.490000	44.10	10.1	56	12.1	---	---
2.244000	49.70	10.3	56	6.3	---	---
2.516000	47.70	10.3	56	8.3	---	---
2.604000	49.30	10.3	56	6.7	---	---
6.144000	53.50	10.5	60	6.5	---	---
6.200000	53.70	10.5	60	6.3	---	---
7.448000	52.40	10.6	60	7.6	---	---

MEASUREMENT RESULT: "ITE_fin AV"

10/20/2010 4:22PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.330000	28.90	10.1	50	20.6	---	---
0.342000	28.70	10.1	49	20.5	---	---
0.498000	28.60	10.1	46	17.5	---	---
3.104000	37.30	10.3	46	8.7	---	---
3.160000	38.00	10.3	46	8.0	---	---
4.908000	39.70	10.5	46	6.3	---	---
6.140000	45.60	10.5	50	4.4	---	---
6.204000	45.80	10.5	50	4.2	---	---
6.260000	46.50	10.5	50	3.5	---	---

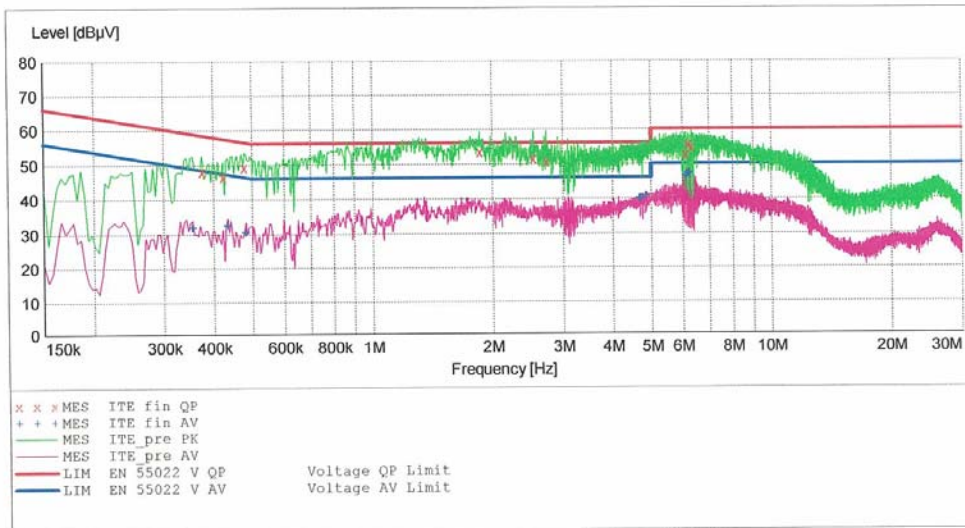
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EMC

EUT: ESP-E201U
Manufacturer: ENSPERT
Operating Condition: NORMAL
Test Site: SHIELD ROOM
Operator: KH-SEO
Test Specification: CISPR22 CLASS B
Comment: N

SCAN TABLE: "CISPR22 CLASS B"

Short Description:			CISPR 22 CLASS B			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
Frequency	Frequency	Width				
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			



MEASUREMENT RESULT: "ITE_fin QP"

10/20/2010 4:27PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.374000	48.10	10.1	58	10.3	---	---
0.422000	46.60	10.1	57	10.8	---	---
0.478000	49.10	10.1	56	7.3	---	---
1.860000	53.40	10.2	56	2.6	---	---
2.540000	51.50	10.3	56	4.5	---	---
2.732000	50.70	10.3	56	5.3	---	---
6.124000	52.60	10.5	60	7.4	---	---
6.196000	55.60	10.5	60	4.4	---	---
6.320000	54.50	10.5	60	5.5	---	---

MEASUREMENT RESULT: "ITE_fin AV"

10/20/2010 4:27PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.354000	31.90	10.1	49	16.9	---	---
0.434000	32.50	10.1	47	14.7	---	---
0.482000	30.60	10.1	46	15.8	---	---
4.684000	39.80	10.4	46	6.2	---	---
4.716000	40.10	10.4	46	5.9	---	---
4.852000	40.80	10.5	46	5.2	---	---
6.140000	46.20	10.5	50	3.8	---	---
6.196000	46.80	10.5	50	3.2	---	---
6.256000	47.20	10.5	50	2.8	---	---

#2 Notebook PC(USB)

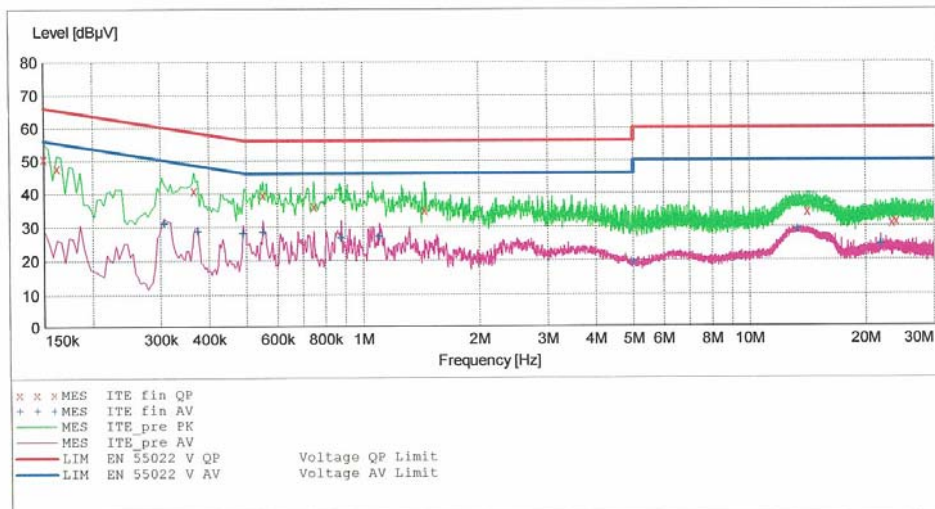
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EMC

EUT: ESP-E201U
Manufacturer: ENSPERT
Operating Condition: DATA
Test Site: SHIELD ROOM
Operator: KH-SEO
Test Specification: CISPR22 CLASS B
Comment: H

SCAN TABLE: "CISPR22 CLASS B"

Short Description:			CISPR 22 CLASS B			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
Frequency	Frequency	Width				
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			



MEASUREMENT RESULT: "ITE_fin QP"

10/20/2010 4:43PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.150000	50.60	10.1	66	15.4	---	---
0.162000	47.70	10.1	65	17.6	---	---
0.366000	40.90	10.1	59	17.7	---	---
0.552000	39.60	10.1	56	16.4	---	---
0.748000	36.10	10.1	56	19.9	---	---
1.448000	34.90	10.2	56	21.1	---	---
14.136000	34.30	10.8	60	25.7	---	---
23.356000	31.00	11.6	60	29.0	---	---
24.008000	31.40	11.6	60	28.6	---	---

MEASUREMENT RESULT: "ITE_fin AV"

10/20/2010 4:43PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.306000	31.00	10.1	50	19.1	---	---
0.374000	28.70	10.1	48	19.7	---	---
0.490000	28.00	10.1	46	18.2	---	---
0.552000	28.40	10.1	46	17.6	---	---
0.880000	26.70	10.1	46	19.3	---	---
1.104000	27.10	10.2	46	18.9	---	---
5.000000	19.30	10.5	46	26.7	---	---
13.328000	29.00	10.8	50	21.0	---	---
21.876000	24.60	11.6	50	25.4	---	---

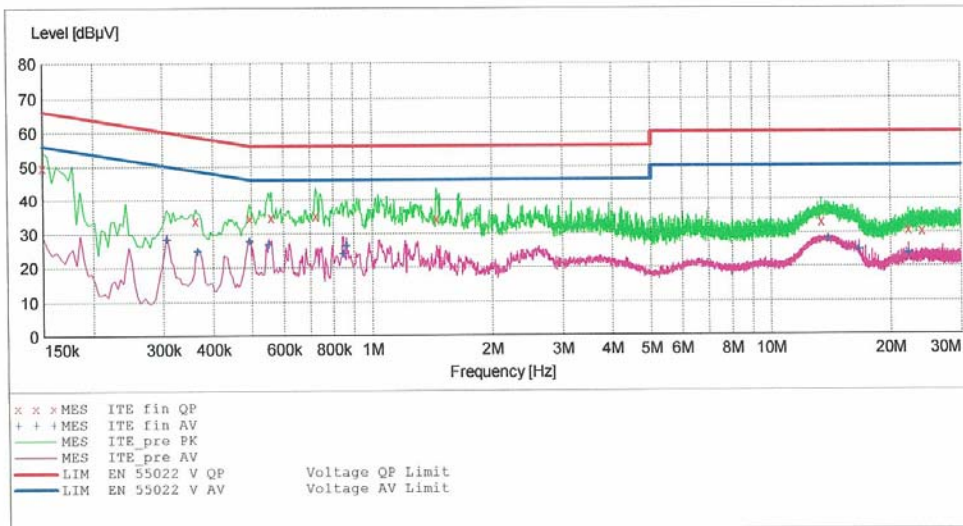
HCT

EMC

EUT: ESP-E201U
 Manufacturer: ENSPERT
 Operating Condition: DATA
 Test Site: SHIELD ROOM
 Operator: KH-SEO
 Test Specification: CISPR22 CLASS B
 Comment: N

SCAN TABLE: "CISPR22 CLASS B"

Short Description:			CISPR 22 CLASS B			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
Frequency	Frequency	Width				
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			



MEASUREMENT RESULT: "ITE_fin QP"

10/20/2010 4:39PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.150000	49.80	10.1	66	16.2	---	---
0.362000	33.90	10.1	59	24.8	---	---
0.494000	34.60	10.1	56	21.5	---	---
0.560000	34.80	10.1	56	21.2	---	---
0.724000	35.20	10.1	56	20.8	---	---
1.456000	34.30	10.2	56	21.7	---	---
13.424000	33.20	10.8	60	26.8	---	---
22.176000	30.80	11.6	60	29.2	---	---
23.996000	30.50	11.6	60	29.5	---	---

MEASUREMENT RESULT: "ITE_fin AV"

10/20/2010 4:39PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.306000	28.20	10.1	50	21.9	---	---
0.366000	24.70	10.1	49	23.9	---	---
0.494000	27.60	10.1	46	18.5	---	---
0.552000	26.60	10.1	46	19.4	---	---
0.848000	24.00	10.1	46	22.0	---	---
0.864000	26.40	10.1	46	19.6	---	---
13.988000	28.10	10.8	50	21.9	---	---
16.652000	24.90	11.1	50	25.1	---	---
22.176000	23.70	11.6	50	26.3	---	---

NOTES:

- 1. All modes of operation were investigated, and the worst-case emissions are reported.**
- 2. The conducted limits are listed on Table 1 (Page 6.)**
- 3. Line H = Hot Line N = Neutral**

**** Measurements using CISPR quasi-peak mode.**

9. Radiated Test Data

1.PRODUCT	: Tablet PC	6.TEST DATE	: 10.20.2010
2.MODEL	: ESP-E201U	7.TESTED BY	: Kyoung Houn, Seo
3.CLIENT	: Enspert Inc.	8.TEMPERATURE	: 20.1 °C
4.COMMENT	: Normal Mode	9.HUMIDITY	: 48.4 %
5.STANDARD	: CISPR22 Class B	10.ATMOSPHERE	: 100.9 kPa

#1 Adapter

Frequency MHz	Reading dB μ V	Ant. Factor dB/m	Cable Loss dB	Ant. POL (H/V)	Total dB μ V/m	Limit dB μ V/m	Margin dB
60.0	14.4	11.9	1.2	V	27.5	30.0	2.5
98.8	14.5	9.0	1.6	V	25.1	30.0	4.9
195.9	13.3	10.2	2.1	H	25.6	30.0	4.4
393.6	13.7	15.4	2.9	V	32.0	37.0	5.0
619.3	8.7	19.7	3.7	V	32.1	37.0	4.9
958.3	3.5	24.0	4.6	V	32.1	37.0	4.9

#2 Notebook PC (USB)

Frequency MHz	Reading dB μ V	Ant. Factor dB/m	Cable Loss dB	Ant. POL (H/V)	Total dB μ V/m	Limit dB μ V/m	Margin dB
30.0	12.6	11.4	0.8	V	24.8	30.0	5.2
104.2	10.9	9.7	1.5	V	22.1	30.0	7.9

Radiated Measurements at 10-meters.

NOTES:

1. All modes of operation were investigated, and the worst-case emissions are reported.
2. The radiated limits are listed on Table 2 (Page 7).
3. We have tested for above 1 GHz and margin was more than 10 dB.

*** Measurements using CISPR quasi-peak mode. Above 1 GHz, peak detector function mode is used using a resolution bandwidth of 1 MHz and a video bandwidth of 1 MHz. The peak level complies with the average limit. Peak mode is used with linearly polarized horn antenna and low-loss microwave cable.

10. Sample Calculations

$$\text{dB}\mu\text{V} = 20 \log 10 (\mu\text{V})$$

$$\text{dB}\mu\text{V} = \text{dBm} + 107$$

12.1 Example 1:

@ 1.860 MHz

Class B limit	=	56.0 dB μV
Reading	=	53.4 dB μV (calibrated level)
Margin	=	56.0 – 53.4 = 2.6 dB μV
	=	2.6 dB below limit

12.2 Example 2:

@ 60.0 MHz

Class B limit	=	30.0 dB $\mu\text{V}/\text{m}$
Reading	=	14.4 dB $\mu\text{V}/\text{m}$ (calibrated level)
Antenna Factor + Cable Loss	=	13.1 dB
Total	=	27.5 dB $\mu\text{V}/\text{m}$
Margin	=	30.0 – 27.5 = 2.5 dB $\mu\text{V}/\text{m}$
	=	2.5 dB below limit

11. Test Equipment

<u>Type</u>	<u>Manufacturer</u>	<u>Model Number</u>	<u>CAL Due Date</u>
Conducted Emission			
EMI Test Receiver	Rohde & Schwarz	ESCI	2011.02.19
LISN	Rohde & Schwarz	ESH3-Z5	2011.02.05
LISN	Rohde & Schwarz	ENV216	2011.04.06
Attenuator	Rohde & Schwarz	ESH3-Z2	2011.10.25
Radiated Emission			
EMI Test Receiver	Rohde & Schwarz	ESU 26	2011.04.29
TRILOG Antenna	Schwarzbeck	VULB9160	2012.07.22
Antenna Position Tower	INNCO systems	MA4000-EP	Not Applicable
Turn Table	INNCO systems	DT3000-3t	Not Applicable
Controller	HD GmbH	HD 100	Not Applicable
Slide Bar	HD GmbH	KMS 560	Not Applicable

12. Test Software Used

■ Normal Test Mode.

NOTE: This is a sample of the basic program used during the test. However, during testing, a different software program may be used; whichever determines the worst-case condition. In addition, the program used also depends on the number and type of devices being tested.

13. Conclusion

The data collected shows that **Tablet PC** , manufactured by **Enspert Inc., (MODEL: ESP-E201U)** complies with §15.107 and §15.109 of the FCC Rules.