



# ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR LOW-POWER, NON-LICENSED TRANSMITTER

Test Report No. : E05OR-002

Applicant : Altgen Co., Ltd.

Address : 376-2, Seogyo-Dong, Mapo-Gu, Seoul Korea 121-869

Manufacturer : JAS Teletec

Address : 504-29, JAS B/D Younnam-Dong, Mapo-Gu, Seoul Korea

Type of Equipment : Bluetooth MP3 Phone

FCC ID. : TM8PAN300VT

Model Name : PAN-300VT

Serial number : None

Total page of Report : 14 pages (including this page)

Date of Incoming : July 14, 2005

Date of issuing : October 04, 2005


## SUMMARY

The equipment complies with the regulation; **FCC CFR 47 PART 15 SUBPART B, Class B.**


This test report only contains the result of a single test of the sample supplied for the examination.

It is not a generally valid assessment of the features of the respective products of the mass-production.

Prepared by:

  
Young-Min, Choi / Senior Engineer  
EMC Div.  
ONETECH Corp.

Reviewed by:

  
Y. K. Kwon / Director  
EMC Div.  
ONETECH Corp.



## CONTENTS

	PAGE
<b>1. VERIFICATION OF COMPLIANCE .....</b>	<b>3</b>
<b>2. GENERAL INFORMATION .....</b>	<b>4</b>
2.1 PRODUCT DESCRIPTION .....	4
2.2 ALTERNATIVE TYPE(S)/MODEL(S); ALSO COVERED BY THIS TEST REPORT. ....	4
2.3 RELATED SUBMITTAL(S) / GRANT(S) .....	4
2.4 TEST METHODOLOGY .....	4
2.5 TEST FACILITY .....	5
<b>3. EUT MODIFICATIONS .....</b>	<b>5</b>
<b>4. SYSTEM TEST CONFIGURATION .....</b>	<b>5</b>
4.1 JUSTIFICATION .....	5
4.2 PERIPHERAL EQUIPMENT .....	5
4.3 CABLE DESCRIPTION .....	6
4.4 NOISE SUPPRESSION PARTS ON CABLE .....	6
4.5 MODE OF OPERATION DURING THE TEST .....	6
4.5 CONFIGURATION OF TEST SYSTEM .....	7
<b>5. PRELIMINARY TEST .....</b>	<b>7</b>
5.1 AC POWER LINE CONDUCTED EMISSIONS TESTS .....	7
5.2 GENERAL RADIATED EMISSIONS TESTS .....	7
<b>6. FINAL RESULT OF MEASUREMENT .....</b>	<b>8</b>
6.1 CONDUCTED EMISSION TEST .....	8
6.2 RADIATED EMISSION TEST .....	10
6.2.1 TEST DATA FOR DATA READ & WRITTEN MODE .....	10
6.2.2 TEST DATA FOR FM RADIO RECEIVING MODE .....	11
6.2.3 TEST DATA FOR MP3 PLAYING MODE .....	12
<b>7. FIELD STRENGTH CALCULATION .....</b>	<b>13</b>
<b>8. LIST OF TEST EQUIPMENT .....</b>	<b>14</b>

**1. VERIFICATION OF COMPLIANCE**

APPLICANT : Altgen Co., Ltd.  
ADDRESS : 376-2, Seogyo-Dong, Mapo-Gu, Seoul Korea 121-869  
CONTACT PERSON : Mr.Davin Weon / Manager  
TELEPHONE NO : +82-2-325-4446  
FCC ID : TM8PAN300VT  
MODEL NAME : PAN-300VT  
SERIAL NUMBER : N/A  
DATE : October 04, 2005

EQUIPMENT CLASS	<i>JBP-Part 15 Class B Computing Device Peripheral</i>
KIND OF EQUIPMENT	Bluetooth MP3 Phone
THIS REPORT CONCERNS	ORIGINAL GRANT
MEASUREMENT PROCEDURES	ANSI C63.4: 2003
TYPE OF EQUIPMENT TESTED	PRE-PRODUCTION
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	CERTIFICATION
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC PART 15 SUBPART C Section 15.101
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	No
FINAL TEST WAS CONDUCTED ON	3/1 METER(S) OPEN AREA TEST SITE

- This device has shown compliance with the conducted emissions limits in 15.107 adopted under FCC 02-107 (ET Docket 98-80). The device may be marketed after July 11, 2005 and is not affected by the 15.37(j) transition provisions.
- The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

## 2. GENERAL INFORMATION

### 2.1 Product Description

The Altgen Co., Ltd., Model: PAN-300VT (referred to as the EUT in this report) is a Bluetooth MP3 Phone. The EUT has function for MP3 Playback, Phone, FM Radio Reception, and supports USB2.0. The device is composite device, which has function for DSS-Spread Spectrum Type and JBP- Part 15 Class B Computing Device peripheral. So the report for Equipment Type, DSS shall be issued another test report number. Product specification information described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	Portable Device
OPERATING FREQUENCY	2.402 ~ 2.4800 GHz
OUTPUT POWER	Typ. 1dBm
ANTENNA	Inserted into the main board
ANTENNA GAIN	9 dBi
CHANNEL	79 Channels
SPREAD SPECTRUM TYPE	FHSS
LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>=1MHz)	FHSS RF Module: 32, 12.288, 10 MHz Main Board and Core Board: 19.2MHz, 12MHz x 2
USED BOARD NAME	Main Board, Core Board, RF Module
NUMBER OF LAYER	Main Board: 4 Layers, Core Board: 6 Layers RF Module: 4 Layers
USED BLUETOOTH MODULE	Manufacturer: LG Innotek Co., Ltd, Model: LBMA-2T86A
POWER REQUIREMENT	3.7V Li-ion Battery
EXTERNAL CONNECTOR	USB, Audio IN/Out Port

### 2.2 Alternative type(s)/model(s); also covered by this test report.

No other model differences have been mentioned.

### 2.3 Related Submittal(s) / Grant(s)

Original submittal only

### 2.4 Test Methodology

Radiated testing was performed according to the procedures in ANSI C63.4/2003. Radiated testing was performed at a distance of 3 meters from EUT to the antenna.



## 2.5 Test Facility

The Electromagnetic compatibility measurement facilities are located on at 307-51 Daessangryung-Ri, Chowol-Eup, Kwangju-City, Kyeonggi-Do, 464-080, Korea. Description details of test facilities were submitted to the Federal Communications Commission on April 04, 2003 (Registration Number: 92819 and 340658), accredited by KOLAS (Korea Laboratory Accreditation Scheme, No: 85) and approved by TUV, DNV and MIC (Ministry of Information and Communications in Korea) according to the requirement of ISO17025.

## 3. EUT MODIFICATIONS

None

## 4. SYSTEM TEST CONFIGURATION

### 4.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
MAIN BOARD	Altgen Co., Ltd.	N/A	N/A
CORE BOARD	Altgen Co., Ltd.	N/A	N/A
LCD	N/A	N/A	N/A
RF MODULE	LG Innotek Co., Ltd	LBMA-2T86A	N/A

### 4.2 Peripheral equipment

Defined as equipment needed for correct operation of the EUT, but not considered as tested:

Model	Manufacturer	FCC ID	Description	Connected to
PAN-300VT	JAS Teletec	TM8PAN300VT	Bluetooth MP3 Phone (EUT)	HOST
PP05LC	DELL Computer Corp.	DoC	NOTEBOOK PC (HOST)	-
020-0470	Cardinal	GDE0196	MODEM	HOST
2225C	HP	DSI6XU2225	PRINTER	HOST

### 4.3 Cable Description

	Power Cord Shielded (Y/N)	I/O cable Shielded (Y/N)	Length (M)
Bluetooth MP3 Phone (EUT)	N/A	Y	1.2 (D)
NOTEBOOK PC (HOST)	N	-	1.5 (P)
AC/DC ADAPTER (Notebook PC)	N	N	1.6(P), 1.0(D)
MODEM	N	N	1.6(P), 1.2(D)
PRINTER	N	Y	1.8(P), 1.2(D)

\* The marked “(P)” means the Power Cable and “D” means the I/O Cable.

### 4.4 Noise Suppression Parts on Cable

	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
Bluetooth MP3 Phone (EUT)	N	N/A	Y	BOTH END
NOTEBOOK PC	-	-	-	-
AC/DC ADAPTER (Notebook PC)	Y	Notebook PC END	Y	Notebook PC END
MODEM	N	N/A	Y	BOTH END
PRINTER	N	N/A	Y	BOTH END

### 4.5 Mode of operation during the test

The EUT was connected with a laptop PC and then data was continuously read and written between the EUT and the PC by USB port.

Also the EUT has function for MP3 player and FM Radio receiver, so the test was performed at each function.



#### 4.5 Configuration of Test System

**Line Conducted Test:** The power cord of the HOST was connected to LISN. All supporting equipments were connected to another LISN. Preliminary Power lines Conducted Emission tests were performed by using the procedure in ANSI C63.4: 2003 7.2.3 to determine the worse operating conditions.

**Radiated Emission Test:** Preliminary radiated emissions test were conducted using the procedure in ANSI C63.4: 2003 8.3.1.1 and 13.1.4.1 to determine the worse operating conditions. Final radiated emission tests were conducted at 3meter open area test site.

The turntable was rotated through 360 degrees and the EUT was tested by positioned three orthogonal planes to obtain the highest reading on the field strength meter. Once maximum reading was determined, the search antenna was raised and lowered in both vertical and horizontal polarization.

### 5. PRELIMINARY TEST

#### 5.1 AC Power line Conducted Emissions Tests

During Preliminary Tests, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
Stand-by mode	
Data Read & Written Mode	
Battery Charging Mode	X

Remark: The EUT was tested at above each mode, but the worst emissions were collected in this report.

#### 5.2 General Radiated Emissions Tests

During Preliminary Tests, the following operating modes were investigated

Operation Mode	The Worse operating condition (Please check one only)
Data Read & Written Mode	X
FM Radio Receiver Mode	
MP3 Playing Mode	

**6. FINAL RESULT OF MEASUREMENT**

Preliminary test was done in normal operation mode. And the final measurement was selected for the maximized emission level

**6.1 Conducted Emission Test**

Humidity Level : 41 % Temperature: 21 °C  
 Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.107 (a)  
 Type of Test : TM8PAN300VT  
 Result : PASSED BY -6.61 dB at 2.035 MHz under average detector mode

EUT : Bluetooth MP3 Phone Date: September 06, 2005  
 Operating Condition : Data Read/Write, Stand-by and Battery charging Mode  
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

Frequency (MHz)	Line	Quasi-Peak (dBuV)			Margin (dB)	Average (dBuV)		Margin (dB)
		Emission level	Detect Mode	Limits		Emission level	Limits	
0.175	H	53.75	P	64.72	-10.97	-	-	-
0.955	H	41.20	P	56.00	-14.80	-	-	-
1.255	H	42.16	P	56.00	-13.84	-	-	-
1.735	H	44.76	P	56.00	-11.24	-	-	-
2.035	N	46.12	P	56.00	-9.88	39.39	46.00	-6.61
3.650	N	47.59	P	56.00	-8.41	39.00	46.00	-7.00

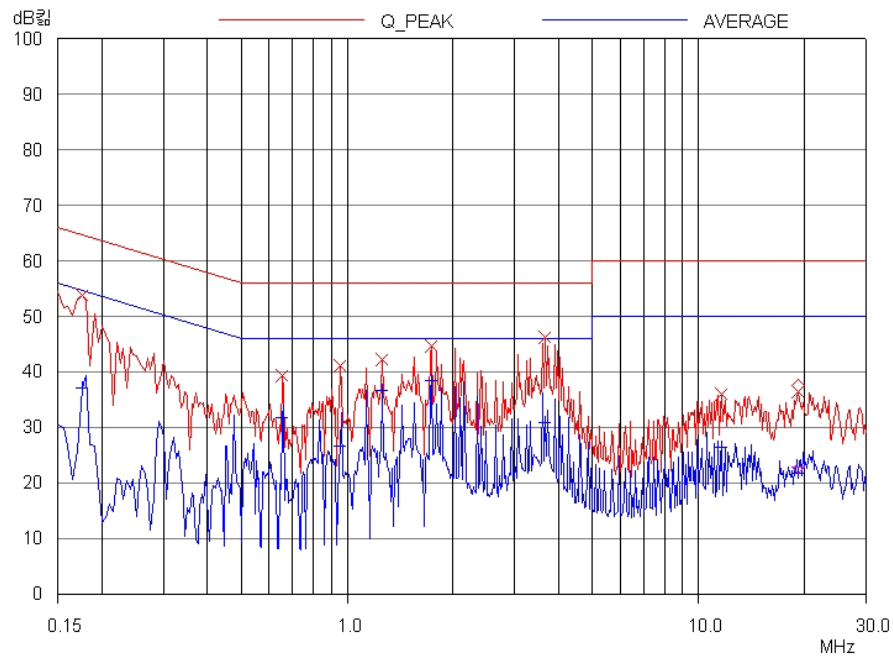
Line Conducted Emission Tabulated Data

Remark : "H": Hot Line, "N": Neutral line, "P": Peak detector.

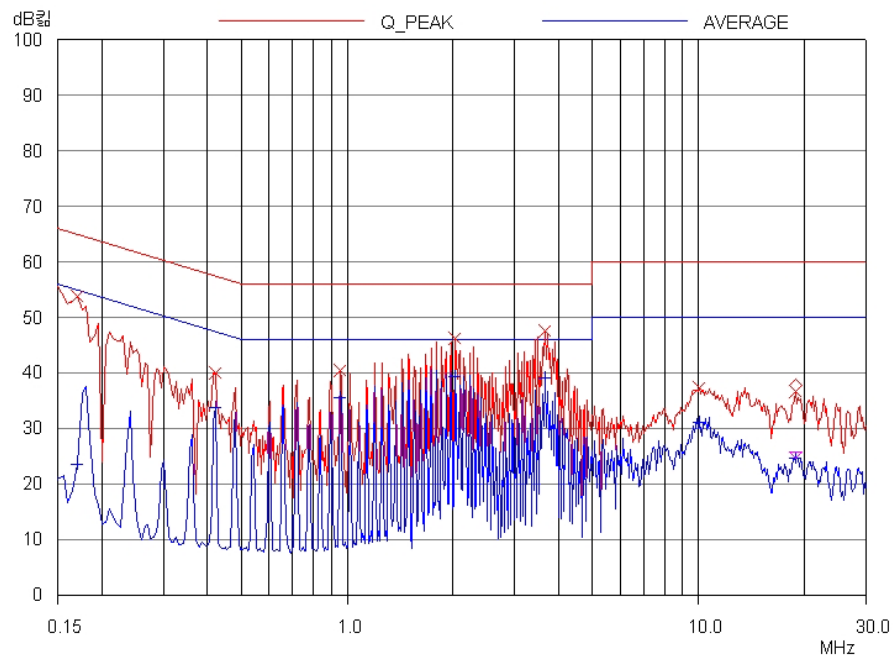
See next page for an overview sweep performed with peak and average detector.

Tested by: Ki-Hong, Nam / Test Engineer





## HOT LINE



## NEUTRAL LINE



## 6.2 Radiated Emission Test

The following table shows the highest levels of radiated emission on both polarizations of horizontal and vertical.

### 6.2.1 Test Data for Data Read & Written Mode

Humidity Level : 47 % Temperature: 24 °C  
 Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109 (a)  
 Type of Test : CLASS B  
 Result : PASSED BY -4.79 dB at 702.04 MHz

EUT : Bluetooth MP3 Phone Date: September 27, 2005  
 Operating Condition : Data Read/Write Mode.  
 Frequency range : 30MHz – 1000MHz  
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)  
 Distance : 3 Meter

Radiated Emissions		Ant	Correction Factors		Total	FCC CLASS B	
Freq. (MHz)	Amplitude (dBuV)	Pol.	Antenna (dB/m)	Cable (dB)	Amplitude (dBuV/m)	Limit (dBuV/m)	Margin (dB)
239.99	15.50	H	16.78	3.24	35.52	46.02	-10.50
392.23	17.40	V	15.31	4.37	37.08	46.02	-8.94
408.41	12.20	H	15.68	4.42	32.30	46.02	-13.72
419.15	16.30	V	15.96	4.44	36.70	46.02	-9.32
442.80	9.40	V	16.58	4.49	30.47	46.02	-15.55
702.04	13.80	V	20.83	6.60	41.23	46.02	-4.79

Radiated Emissions Tabulated Data

기홍

Tested by: Ki-Hong, Nam / Test Engineer

**6.2.2 Test Data for FM Radio Receiving Mode**

Humidity Level : 47 % Temperature: 24 °C  
 Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109 (a)  
 Type of Test : CLASS B  
 Result : PASSED BY -5.89 dB at 538.41 MHz

EUT : Bluetooth MP3 Phone Date: September 27, 2005  
 Operating Condition : FM Receiving Mode  
 Frequency range : 30MHz – 1000MHz  
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)  
 Distance : 3 Meter

Radiated Emissions		Ant	Correction Factors		Total	FCC CLASS B	
Freq. (MHz)	Amplitude (dBuV)	Pol.	Antenna (dB/m)	Cable (dB)	Amplitude (dBuV/m)	Limit (dBuV/m)	Margin (dB)
148.36	17.33	V	14.99	2.32	34.64	43.52	-8.88
164.36	16.70	V	15.45	2.40	34.55	43.52	-8.97
214.63	13.50	H	16.31	2.92	32.73	43.52	-10.79
298.63	15.43	V	20.04	3.78	39.25	46.02	-6.77
538.41	16.60	H	18.18	5.35	40.13	46.02	-5.89

Radiated Emissions Tabulated Data

Tested by: Ki-Hong, Nam / Test Engineer



## 6.2.3 Test Data for MP3 Playing Mode

Humidity Level : 47 % Temperature: 24 °C  
 Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109 (a)  
 Type of Test : CLASS B  
 Result : PASSED BY -5.05 dB at 538.47 MHz

EUT : Bluetooth MP3 Phone Date: September 27, 2005  
 Operating Condition : MP3 Playing Mode  
 Frequency range : 30MHz – 1000MHz  
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)  
 Distance : 3 Meter

Radiated Emissions		Ant	Correction Factors		Total	FCC CLASS B	
Freq. (MHz)	Amplitude (dBuV)	Pol.	Antenna (dB/m)	Cable (dB)	Amplitude (dBuV/m)	Limit (dBuV/m)	Margin (dB)
148.14	18.46	V	14.99	2.32	35.77	43.52	-7.75
161.87	16.46	V	15.37	2.40	34.23	43.52	-9.29
211.13	13.14	H	16.20	2.89	32.23	43.52	-11.29
298.14	15.46	V	20.04	3.78	39.28	46.02	-6.74
330.21	12.36	V	14.11	4.04	30.51	46.02	-15.51
538.47	17.44	H	18.18	5.35	40.97	46.02	-5.05

Radiated Emissions Tabulated Data

기홍

Tested by: Ki-Hong, Nam / Test Engineer



## 7. FIELD STRENGTH CALCULATION

Meter readings are compared to the specification limit correcting for antenna and cable losses

+ Meter reading (dBuV)

+ Cable Loss (dB)

+ Antenna Factor (Loss) (dB/meter)

---

= Corrected Reading (dBuV/meter)

- Specification Limit (dBuV/meter)

= dB Relative to Spec (+/- dB)

**8. LIST OF TEST EQUIPMENT**

No.	EQUIPMENTS	MFR.	MODEL	SER. NO.	LAST CAL	DUE CAL	USE
1.	Test receiver	R/S	ESVS10	827864/005	DEC/04	12MONTH	■
2.	Test receiver	R/S	ESHS 10	834467/007	MAY/05	12MONTH	■
3.	Spectrum analyzer	HP	8566B	3407A08547	JUL/05	12MONTH	
4.	Spectrum analyzer	HP	85680B	3001A04955	APR/05	12MONTH	■
5.	RF preselector	HP	85685A	3107A01264	APR/05	12MONTH	■
6.	Quasi-Peak Adapter	HP	8574B	2811A01432	APR/05	12MONTH	■
7.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	VULB9163 166	APR/05	12MONTH	
8.	Biconical antenna	EMCO	3110	9003-1121	FEB/05	12MONTH	
		Schwarzbeck	VHA9103	91031852	JAN/05		■
9.	Log Periodic antenna	EMCO	3146	9001-2614	FEB/05	12MONTH	
		Schwarzbeck	9108-A(494)	62281001	FEB/05		■
10.	LISN	EMCO	3825/2	9109-1867	JUL/05	12MONTH	
				9109-1869	JUL/05		■
		Schwarzbeck	NSLK 8128	8128-216	JUN/05		■
11.	Position Controller	HD GmbH	HD100	N/A	N/A	N/A	■
12.	Turn Table	HD GmbH	DS420S	N/A	N/A	N/A	■
13.	Antenna Master	HD GmbH	MA240	N/A	N/A	N/A	■