

Test Report of  
FCC Part 15B  
for FCC Certificate

On Behalf of

**Ningbo Putian Communication Technology Co., Ltd.**

**Product Description:** Auto Integrated Dialing Test Terminal

**Model No.:** DK-EM4PS

**Brand Name:** N/A

**FCC ID:** X7F-DK-EM4PS

**Prepared for:** Ningbo Putian Communication Technology Co., Ltd.

Yingchun Road No. 18, Industrial Park of Wangchun, Ningbo City,  
Zhejiang Province, P.R.China

**Prepared by:** Bontek Compliance Testing Laboratory Ltd

1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East  
Road, Nanshan, Shenzhen, China

Tel: 86-755-86337020

Fax: 86-755-86337028

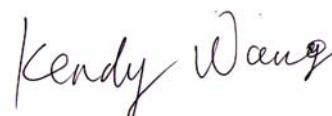
**Report No.:** BCT09LP-1302E

**Issue Date:** April 05, 2010

**Test Date:** February 01~March 26, 2010

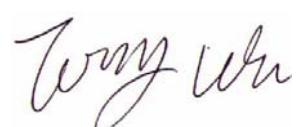


**Test by:**

Kandy Wang

Kandy Wang

**Reviewed By:**

Tony Wu

Tony Wu

## TABLE OF CONTENTS

<b>1. GENERAL INFORMATION .....</b>	<b>3</b>
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) .....	3
1.2 RELATED SUBMITTAL(S) / GRANT (S) .....	3
1.3 TEST METHODOLOGY .....	4
1.4 TEST FACILITY .....	4
<b>2. SYSTEM TEST CONFIGURATION .....</b>	<b>5</b>
2.1 EUT CONFIGURATION .....	5
2.2 EUT EXERCISE SOFTWARE .....	5
2.3 SPECIAL ACCESSORIES .....	5
2.4 EQUIPMENT MODIFICATIONS .....	5
2.5 CONFIGURATION OF TEST SYSTEM .....	5
2.6 TEST SETUP DIAGRAM .....	5
2.7 LIST OF MEASURING EQUIPMENTS USED .....	6
<b>3. TEST OF CONDUCTED EMISSION.....</b>	<b>7</b>
3.1 APPLICABLE STANDARD .....	7
3.2 TEST SETUP DIAGRAM .....	7
3.3 TEST RESULT.....	7
<b>4. TEST OF PEAK POWER.....</b>	<b>10</b>
4.1 MEASUREMENT UNCERTAINTY .....	10
4.2 LIMIT OF RADIATED DISTURBANCES .....	10
4.3 EUT SETUP .....	10
4.4 TEST RECEIVER SETUP .....	12
4.5 TEST PROCEDURE .....	12
4.6 CORRECTED AMPLITUDE & MARGIN CALCULATION .....	12
4.7 TEST RESULT.....	12

## 1. GENERAL INFORMATION

### 1.1 Product Description for Equipment Under Test (EUT)

Applicant:	Ningbo Putian Communication Technology Co., Ltd.
Address of Applicant:	Yingchun Road No. 18, Industrial Park of Wangchun, Ningbo City, Zhejiang Province, P.R.China
Manufacturer:	Ningbo Putian Communication Technology Co., Ltd.
Address of Manufacturer:	Yingchun Road No. 18, Industrial Park of Wangchun, Ningbo City, Zhejiang Province, P.R.China

Equipment Under Test:	Auto Integrated Dialing Test Terminal
Test Model Name:	DK-EM4PS
Supplementary Model No.:	N/A
Brand Name:	N/A
Series Mode:	N/A
Difference description:	N/A
EUT Frequency Bands:	GSM (PCS) Module Inside
Transmit Frequency for Test:	EGSM: 824 ~ 849 MHz, PCS: 1850 ~ 1910MHz
Receive Frequency for Test:	EGSM: 869 ~ 894 MHz, PCS: 1930 ~ 1990MHz
Type of Modulation:	GMSK for GSM
Channel Control:	Auto
Antenna Type:	Dedicated Antenna
Peak Antenna Gain:	0.84dBi for E-GSM900 1.26dBi for GSM1800
Power Supply:	Input: AC 100-240V, 50~60Hz,1.5A MAX; Output: DC12V, 4 A
Adaptor Cable:	1.50m, Unshielded, With Core

*Remark: \* The test data gathered are from the production sample provided by the manufacturer.*

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

This submittal(s) (test report) is intended to comply with FCC Rules and Regulations Part 15 Subpart B 2006 of the FCC 47 CFR Rules. It is a test report based on the Electromagnetic Interference (EMI) tests performed on the EUT. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4-2009.

### **1.3 Test Methodology**

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 - 2009 and FCC CFR 47, 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057.

### **1.4 Test Facility**

All measurement required was performed at laboratory of Bontek Compliance Testing Laboratory Ltd at 1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, China and Shenzhen Emtek Co., Ltd at Building 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China

The test facility is recognized, certified, or accredited by the following organizations:

#### **CNAS - Registration No.: L3923**

Bontek Compliance Testing Laboratory Ltd has been accredited by China National Accreditation Service for Conformity Assessment (CNAS) for the competence in the field of EMC and Safety testing with the Registration No.: L3923 on February, 2009.

#### **FCC – Registration No.: 338263**

Bontek Compliance Testing Laboratory Ltd EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 338263, March 24, 2008.

#### **IC Registration No.: 7631A**

The 3m alternate test site of Bontek Compliance Testing Laboratory Ltd EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 7631A on March, 2008.

## 2. SYSTEM TEST CONFIGURATION

The tests documented in this report were performed in accordance with ANSI C63.4-2009 and FCC CFR 47 Part 15B.

### 2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

### 2.2 EUT Exercise Software

The EUT exercising program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The software offered by manufacturer, can let the EUT being Normal operation.

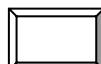
### 2.3 Special Accessories

As shown in section 2.5, interface cable used for compliance testing is shielded as Normal Operation only supplied by **Ningbo Putian Communication Technology Co., Ltd.** and its respective support equipment manufacturers.

### 2.4 Equipment Modifications

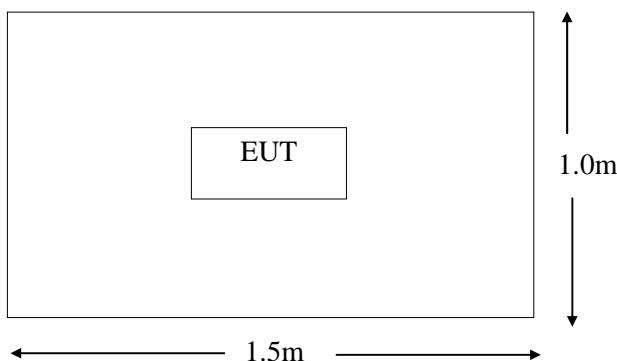
The EUT tested was not modified by BCT.

### 2.5 Configuration of Test System



EUT

### 2.6 Test Setup Diagram



## 2.7 List of Measuring Equipments Used

Items	Equipment	Manufacturer	Model No.	Serial No.	Calculator date	Calibration Period
1	Peak and Avg Power Sensor	Agilent	E9327A	US404417 88	07/30/2009	1 Year
2	EPM-P Series Power Meter	Agilent	E4416A	QB412927 14	07/30/2009	1 Year
3	Spectrum Analyzer	Agilent	E4446A	MY44020 154	08/16/2009	1 Year
4	Wireless communication test set	Agilent	8960	QB440516 95	10/06/2009	1 Year
5	Spectrum Analyzer	Agilent	E4446A	MY44020 154	08/16/2009	1 Year
6	EMI Test Receiver	R&S	ESPI3	101026	11/11/2009	1 Year
7	Pre-Amplifier	MINI-circuits	ZFL-1000VH2	d041703	12/13/2009	1 Year
8	Pre-Amplifier	Miteq	NSP4000-NF	870731	01/28/2009	1 Year
9	Bilog Antenna	Sunol	JB1	A110204-2	11/22/2009	1 Year
10	Horn-antenna	SCHWARZBECK	BBHA9120D	D:266	02/01/2009	1 Year
11	PSG Analog Signal Generator	Agilent	E8257C	MY43321 570	12/19/2009	1 Year
12	Wireless communication test set	Agilent	8960	QB440516 95	10/06/2009	1 Year
13	Turn Table	CT	CT123	4165	N.C.R	N.C.R
14	Antenna Tower	CT	CTERG23	3256	N.C.R	N.C.R
15	Controller	CT	CT100	95637	N.C.R	N.C.R
16	Site NSA	CCS	N/A	N/A	04/06/2009	1 Year
17	Temperature & Humidity Chamber	WUHUAN	HTP205	20021115	2009/11	1 Year
18	EMI Test Receiver	R&S	ESCI	100687	2009-4-14	2010-4-13
19	EMI Test Receiver	R&S	ESPI	100097	2009-4-14	2010-4-13
20	Amplifier	HP	8447D	1937A024 92	2009-4-14	2010-4-13

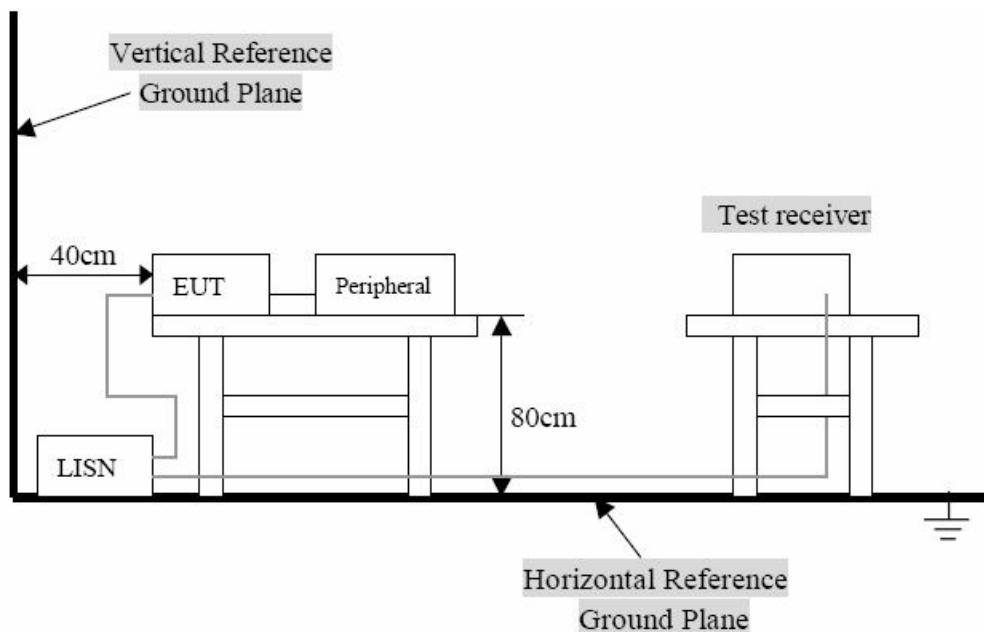
### 3. TEST OF CONDUCTED EMISSION

#### 3.1 Applicable Standard

Section 15.207: For a Low-power Radio-frequency Device is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Frequency Range (MHz)	Limits ( dBuV)	
	Quasi-Peak	Average
0.150~0.500	66~56	56~46
0.500~5.000	56	46
5.000~30.00	60	50

#### 3.2 Test Setup Diagram



Remark: 1. The setup of EUT is according with per ANSI C63.4-2009 measurement procedure.  
The specification used was with the FCC 15.207 limits.

2. The EUT was connected to a 120 VAC/ 60Hz power source.

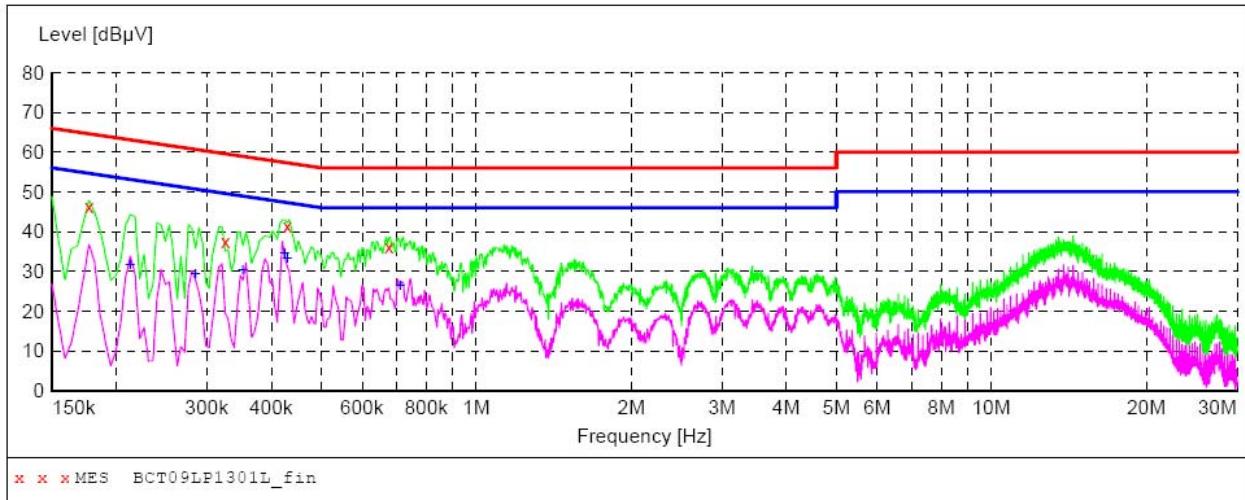
#### 3.3 Test Result

Temperature ( °C ) : 23~25	EUT: Auto Integrated Dialing Test Terminal
Humidity (%RH) : 45~58	M/N: DK-EM4PS
Barometric Pressure ( mbar ) : 950~1000	Operation Condition: Charging Mode

## Conducted Emission from AC/DC Adaptor:

EUT: Auto Integrated Dialing Test Terminal  
 Operating Condition: Charging Mode  
 Test Site: Shielded Room  
 Operator: Andy  
 Test Specification: DC 12V from AC/DC adapter (AC 120V/60Hz)  
 Comment: Live Line

**SCAN TABLE: "Voltage (150K-30M) FIN"**  
Short Description: 150K-30M Voltage



### MEASUREMENT RESULT: "BCT09LP1301L\_fin"

2/10/2010 11:13

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.177000	46.40	11.2	65	18.2	QP	L1	GND
0.325500	37.60	10.7	60	22.0	QP	L1	GND
0.429000	41.40	10.5	57	15.9	QP	L1	GND
0.676500	36.20	10.3	56	19.8	QP	L1	GND

### MEASUREMENT RESULT: "BCT09LP1301L\_fin2"

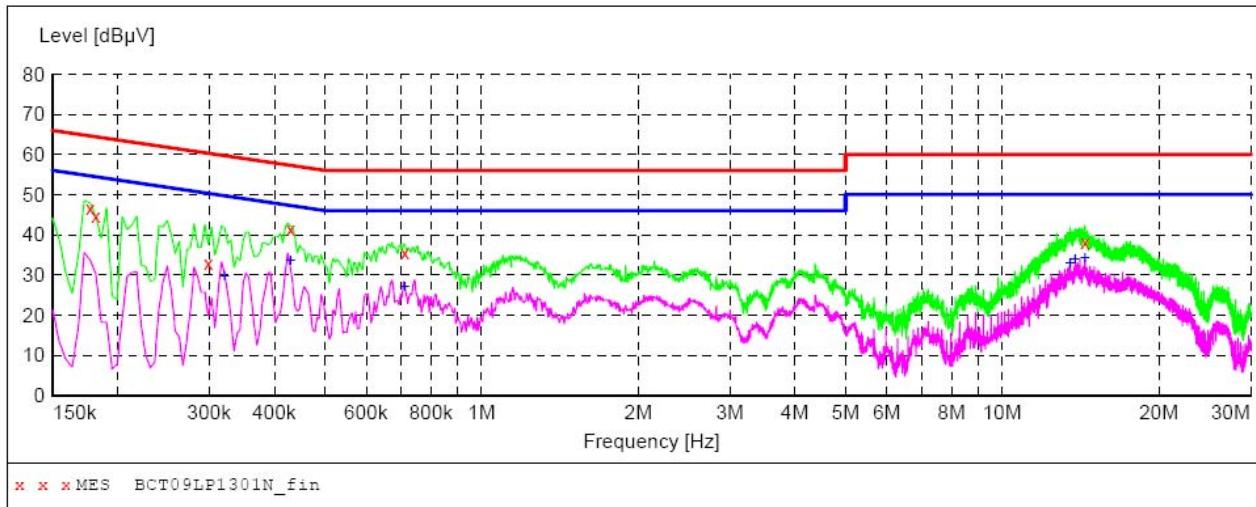
2/10/2010 11:13

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.213000	31.60	10.9	53	21.5	AV	L1	GND
0.285000	29.40	10.7	51	21.3	AV	L1	GND
0.352500	30.50	10.6	49	18.4	AV	L1	GND
0.424500	34.60	10.5	47	12.8	AV	L1	GND
0.429000	33.40	10.5	47	13.9	AV	L1	GND
0.712500	26.40	10.3	46	19.6	AV	L1	GND

## Conducted Emission from AC/DC Adaptor:

EUT: Auto Integrated Dialing Test Terminal  
 Operating Condition: Charging Mode  
 Test Site: Shielded Room  
 Operator: Andy  
 Test Specification: DC 12V from AC/DC adapter (AC 120V/60Hz)  
 Comment: Neutral Line

**SCAN TABLE: "Voltage (150K-30M) FIN"**  
 Short Description: 150K-30M Voltage



### MEASUREMENT RESULT: "BCT09LP1301N\_fin"

2/10/2010 11:10

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.177000	46.50	11.2	65	18.1	QP	N	GND
0.181500	44.70	11.1	64	19.7	QP	N	GND
0.298500	33.00	10.7	60	27.3	QP	N	GND
0.429000	41.30	10.5	57	16.0	QP	N	GND
0.712500	35.50	10.3	56	20.5	QP	N	GND
14.424000	38.10	10.6	60	21.9	QP	N	GND

### MEASUREMENT RESULT: "BCT09LP1301N\_fin2"

2/10/2010 11:10

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.321000	29.80	10.7	50	19.9	AV	N	GND
0.429000	33.80	10.5	47	13.5	AV	N	GND
0.712500	26.90	10.3	46	19.1	AV	N	GND
13.501500	33.10	10.6	50	16.9	AV	N	GND
13.807500	34.00	10.6	50	16.0	AV	N	GND
14.419500	34.20	10.6	50	15.8	AV	N	GND

## 4. TEST OF PEAK POWER

### 4.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement is 4.0 dB.

### 4.2 Limit of Radiated Disturbances

Frequency (MHz)	Distance (Meters)	Field Strengths Limits (dB $\mu$ V/m)
30 ~ 88	3	40
88~216	3	43.5
216 ~ 960	3	46
960 ~ 1000	3	54

Note: (1) The tighter limit shall apply at the edge between two frequency bands.  
(2) Distance refers to the distance in meters between the test instrument antenna and the closest point of any part of the E.U.T.

### 4.3 EUT Setup

The radiated emission tests were performed in the in the 3-meter anechoic chamber, using the setup accordance with the ANSI C63.4-2009. The specification used was the FCC Part 15 Subpart B limits.

The EUT was placed on the center of the test table.

Maximum emission emitted from EUT was determined by manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation and the levels in the final result of the test were recorded with the EUT running in the operating mode that maximum emission was emitted.

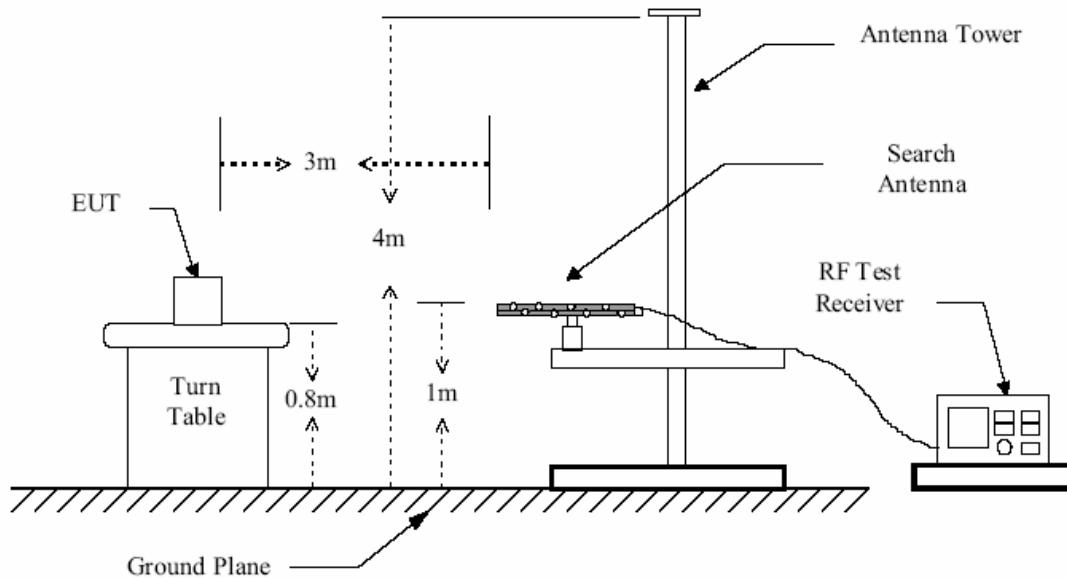


Figure 1 : Frequencies measured below 1 GHz configuration

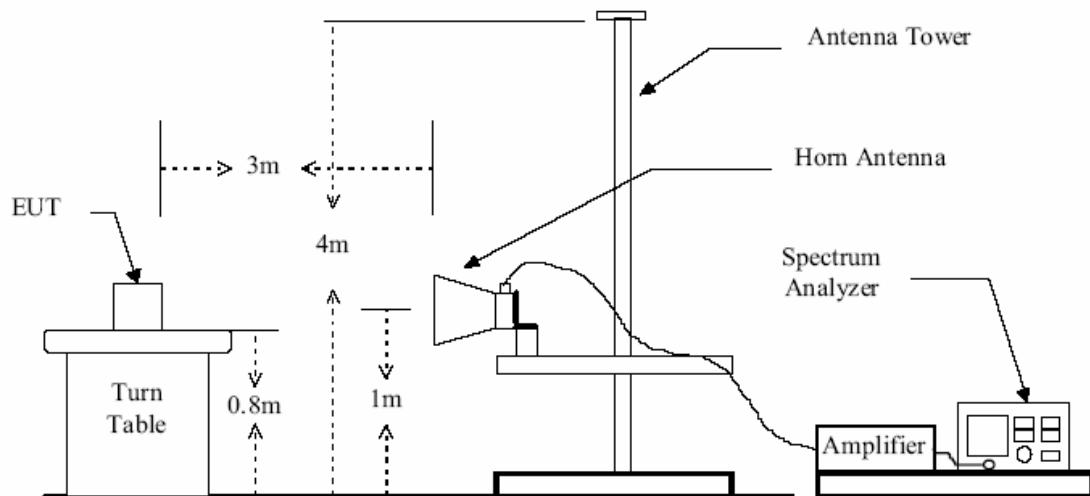


Figure 2 : Frequencies measured above 1 GHz configuration

#### 4.4 Test Receiver Setup

According to FCC Part 15 rule, the frequency was investigated from 30 to 1000 MHz. During the radiated emission test, the test receiver was set with the following configurations:

Test Receiver Setting:

Detector.....Peak & Quasi-Peak  
IF Band Width.....120KHz  
Frequency Range.....30MHz to 1000MHz  
Turntable Rotated.....0 to 360 degrees

Antenna Position:

Height.....1m to 4m  
Polarity.....Horizontal and Vertical

#### 4.5 Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the peak detection mode. Quasi-peak readings performed only when an emission was found to be marginal (within -10 dB $\mu$ V of specification limits), and are distinguished with a "QP" in the data table.

#### 4.6 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB $\mu$ V means the emission is 7dB $\mu$ V below the maximum limit for Subpart B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corr. Ampl.}$$

#### 4.7 Test Result

Temperature ( °C ) : 22~23	EUT: Auto Integrated Dialing Test Terminal
Humidity (%RH ) : 50~54	M/N: DK-EM4PS
Barometric Pressure ( mbar ) : 950~1000	Operation Condition: Charging Mode

Test data see following pages

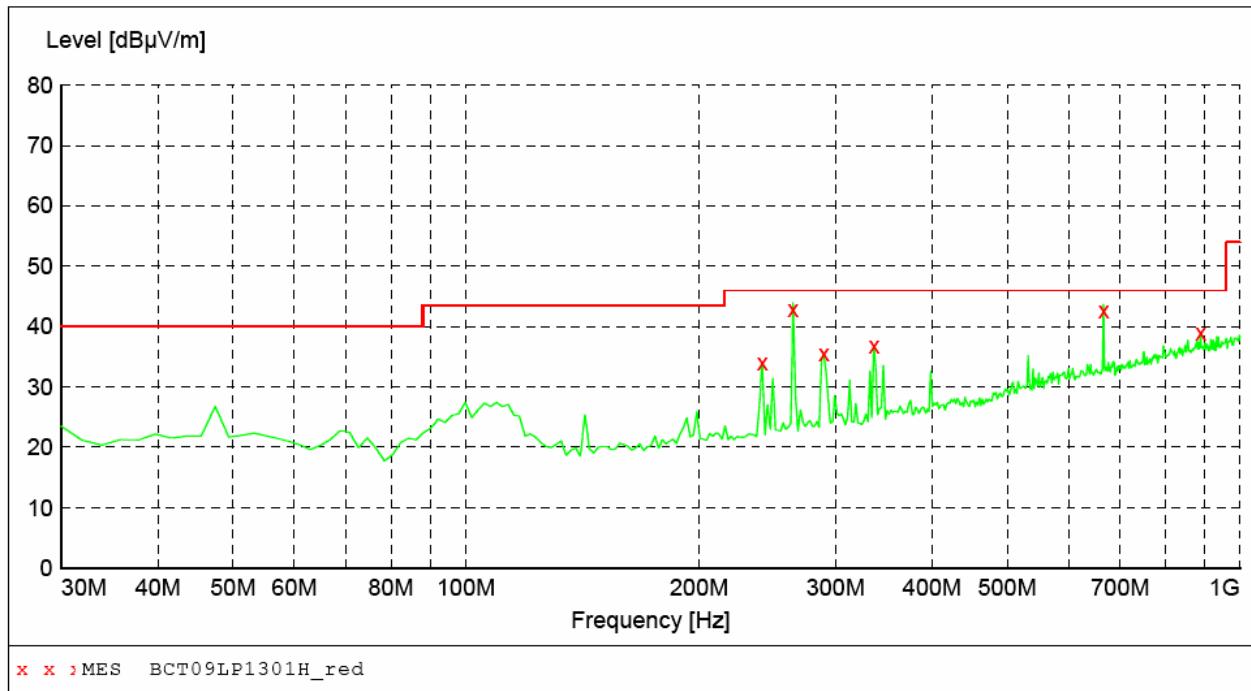
**Remark:** (1) When PK reading is less than relevant limit 20dB, the QP reading and AV reading will not be recorded.  
(2) Where QP reading is less than relevant AV limit, the AV reading will not be measured

## RADIATED EMISSION TEST DATA

EUT: Auto Integrated Dialing Test Terminal  
 Operating Condition: Charging mode  
 Test Site: 3m CHAMBER  
 Operator: Jimmy  
 Test Specification: AC 120V/60Hz from AC/DC adaptor  
 Comment: Polarisation:H

### ***SWEEP TABLE: "test (30M-1G)"***

Short Description:		Field Strength		
Start Frequency	Stop Frequency	Detector	Meas.	IF
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz
Transducer VULB9163 NEW				



### ***MEASUREMENT RESULT: "BCT09LP1301H\_red"***

2/10/2010 10:31

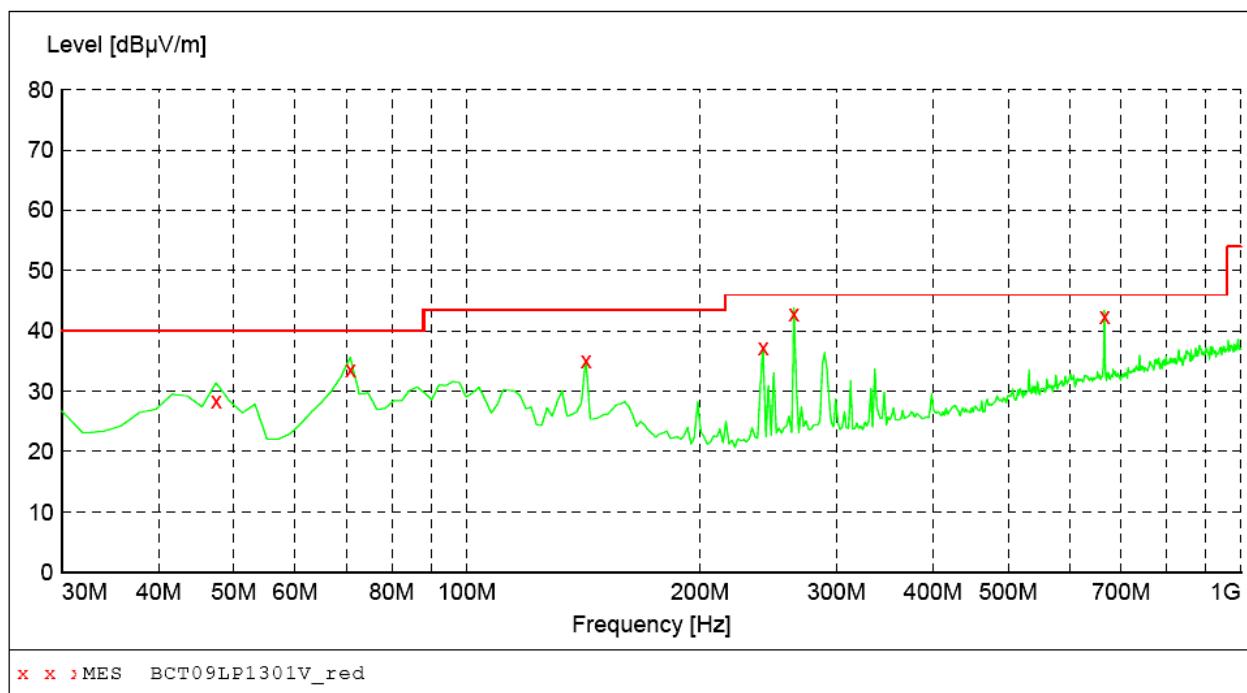
Frequency MHz	Level dB $\mu$ V/m	Transd dB	Limit dB $\mu$ V/m	Margin dB	Det. QP	Height cm	Azimuth deg	Polarization
241.460000	34.10	17.2	46.0	11.9	QP	100.0	0.00	HORIZONTAL
264.740000	42.90	17.5	46.0	3.1	QP	100.0	0.00	HORIZONTAL
289.960000	35.50	18.4	46.0	10.5	QP	100.0	0.00	HORIZONTAL
336.520000	36.90	20.0	46.0	9.1	QP	100.0	0.00	HORIZONTAL
666.320000	42.70	27.2	46.0	3.3	QP	300.0	0.00	HORIZONTAL
889.420000	39.00	31.0	46.0	7.0	QP	300.0	0.00	HORIZONTAL

## RADIATED EMISSION TEST DATA

EUT: Auto Integrated Dialing Test Terminal  
 Operating Condition: Charging mode  
 Test Site: 3m CHAMBER  
 Operator: Jimmy  
 Test Specification: AC 120V/60Hz from AC/DC adaptor  
 Comment: Polarisation:V

### ***SWEET TABLE: "test (30M-1G)"***

Short Description:		Field Strength		
Start Frequency	Stop Frequency	Detector	Meas.	IF
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz
Transducer VULB9163 NEW				



### ***MEASUREMENT RESULT: "BCT09LP1301V\_red"***

2/10/2010 10:34

Frequency MHz	Level dB $\mu$ V/m	Transd dB	Limit dB $\mu$ V/m	Margin dB	Det. QP	Height cm	Azimuth deg	Polarization
47.460000	28.40	15.8	40.0	11.6	QP	100.0	0.00	VERTICAL
70.740000	33.60	12.4	40.0	6.4	QP	100.0	0.00	VERTICAL
142.520000	35.20	13.1	43.5	8.3	QP	100.0	0.00	VERTICAL
241.460000	37.30	17.2	46.0	8.7	QP	100.0	0.00	VERTICAL
264.740000	42.80	17.5	46.0	3.2	QP	100.0	0.00	VERTICAL
666.320000	42.40	27.2	46.0	3.6	QP	100.0	0.00	VERTICAL