

# FCC Test Report

## E4273215901KY

Type / Model Name: 10441-0000

Product Description: iVAC Pro Remote

Applicant: MBright Tools Inc.

FCC ID: YCHIVACPRO

## FCC --- T E S T R E P O R T

<b>Test Report No. :</b>	<b>E4273215901KY</b>	April 26, 2011
<hr/>		Date of issue

Type / Model Name: 10441-0000

Product Description : iVAC Pro Remote

Applicant : MBright Tools Inc.

Address : Box 557, 5570 Jill Street,

Osgoode, Ontario,

K0A 2W0

Canada

<b>Test Result</b> according to the standards listed in clause 1 test standards:	<b>POSITIVE</b>
----------------------------------------------------------------------------------	-----------------

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test results without the written permission of the test laboratory.

File No. **E4273215901KY**

emitel (Shenzhen)Limited, Building 2, No.171 Meihua Road , Futian District, Shenzhen, P.R.China.

Phone: +86 (755) 8318 2012 Fax: +86 (755) 8312 3810 Email: info@emitel.com.cn

4\_F510\_25\_Rev2\_0 / Date of release: 05-01-2009 / Author: Kidd Yeung

Page 2 of 17

## Contents

<b>1 TEST STANDARDS</b>	<b>4</b>
<b>2 SUMMARY</b>	<b>5</b>
<b>3 EQUIPMENT UNDER TEST</b>	<b>6</b>
3.1 PHOTO DOCUMENTATION OF THE EUT	6
3.2 POWER SUPPLY SYSTEM UTILISED	7
3.3 SHORT DESCRIPTION OF THE EQUIPMENT UNDER TEST (EUT)	7
<b>4 TEST ENVIRONMENT</b>	<b>8</b>
4.1 ADDRESS OF THE TEST LABORATORY	8
4.2 ENVIRONMENTAL CONDITIONS	8
4.3 STATEMENT OF THE MEASUREMENT UNCERTAINTY	8
<b>5 TEST CONDITIONS AND RESULTS</b>	<b>9</b>
5.1 ANTENNA REQUIREMENT	9
5.2 AVERAGE FACTOR	10
5.3 RADIATED EMISSION	13
5.4 BANDWIDTH	15
5.5 PROVISION OF MOMENTARY OPERATION	16
<b>6 USED TEST EQUIPMENT AND ACCESSORIES</b>	<b>17</b>

File No. **E4273215901KY**

emitel (Shenzhen)Limited, Building 2, No.171 Meihua Road , Futian District, Shenzhen, P.R.China.

Phone: +86 (755) 8318 2012 Fax: +86 (755) 8312 3810 Email: info@emitel.com.cn

4\_F510\_25\_Rev2\_0 / Date of release: 05-01-2009 / Author: Kidd Yeung

Page 3 of 17

## **1 TEST STANDARDS**

The tests were performed according to following standards:

FCC Part 15:2009-10-01

Federal Communications Commission, Part 15 – Radio Frequency Device

ANSI C63.4:2003

Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

File No. **E4273215901KY**

emitel (Shenzhen)Limited, Building 2, No.171 Meihua Road , Futian District, Shenzhen, P.R.China.

Phone: +86 (755) 8318 2012 Fax: +86 (755) 8312 3810 Email: info@emitel.com.cn

4\_F510\_25\_Rev2\_0 / Date of release: 05-01-2009 / Author: Kidd Yeung

Page 4 of 17

## **2 SUMMARY**

### **GENERAL REMARKS:**

N/A

### **FINAL ASSESSMENT:**

The equipment under test fulfils the FCC requirements cited in test standard listed in section 1.

Date of receipt of test sample : April 08, 2011

Testing commenced on : April 08, 2011

Testing concluded on : April 26, 2011

Checked by:

---

Ivan Toa  
Technical Manager

Tested by:

---

Kidd Yang  
Engineer

File No. **E4273215901KY**

emitel (Shenzhen)Limited, Building 2, No.171 Meihua Road , Futian District, Shenzhen, P.R.China.

Phone: +86 (755) 8318 2012 Fax: +86 (755) 8312 3810 Email: info@emitel.com.cn

4\_F510\_25\_Rev2\_0 / Date of release: 05-01-2009 / Author: Kidd Yeung

Page 5 of 17

### **3 EQUIPMENT UNDER TEST**

#### **3.1 Photo documentation of the EuT**



File No. **E4273215901KY**

emitel (Shenzhen)Limited, Building 2, No.171 Meihua Road , Futian District, Shenzhen, P.R.China.

Phone: +86 (755) 8318 2012 Fax: +86 (755) 8312 3810 Email: info@emitel.com.cn

4\_F510\_25\_Rev2\_0 / Date of release: 05-01-2009 / Author: Kidd Yeung

Page 6 of 17

### 3.2 Power supply system utilised

Power supply voltage: DC 6V(2×CR2032 button cells)

### 3.3 Short description of the Equipment under Test (EuT)

The Equipment under test (EUT) is a 433.92MHz transmitter. When the buttons are pressed, the EuT will transmit the signal by on-off keying Modulation to corresponding receiver to change the status of the receiver.

Tested samples: One Set ( model: 10441-0000 )

Serial number: Not Labelled

Dimensions: L: 9.0 cm W: 7.0 cm H: 2.5 cm

#### **EuT operation mode:**

The equipment under test was operated during the measurement under the following conditions:

- Operation mode 1: Transmitting mode

---



---



---

#### **EuT configuration:**

**The following interface cables and peripheral devices were connected during the measurements:**

##### Interface cables:

Interface cable	Length	Type	Line		Line termination
	[m]		shielded	unshielded	
N/A					

##### Peripheral devices:

Kind of equipment		Model and/or Manufacturer
N/A		

File No. E4273215901KY

## **4 TEST ENVIRONMENT**

### **4.1 Address of the test laboratory**

emitel (Shenzhen) Limited  
Building 2, 171 Meihua Road,  
Futian District, Shenzhen,  
P.R. China

#### **Laboratory registration numbers:**

FCC Registration number: 746887

### **4.2 Environmental conditions**

During the measurement the environmental conditions were within the listed ranges:

Temperature: 15-35 ° C

Humidity: 30-60 %

Atmospheric pressure: 860-1060 mbar

### **4.3 Statement of the measurement uncertainty**

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16-4-2 /11.2003 "Uncertainties, statistics and limit modelling – Uncertainty in EMC measurements" and is documented in the quality system acc. to ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer does have the sole responsibility for the continued compliance of the device.

File No. **E4273215901KY**

emitel (Shenzhen)Limited, Building 2, No.171 Meihua Road , Futian District, Shenzhen, P.R.China.

Phone: +86 (755) 8318 2012 Fax: +86 (755) 8312 3810 Email: info@emitel.com.cn

4\_F510\_25\_Rev2\_0 / Date of release: 05-01-2009 / Author: Kidd Yeung

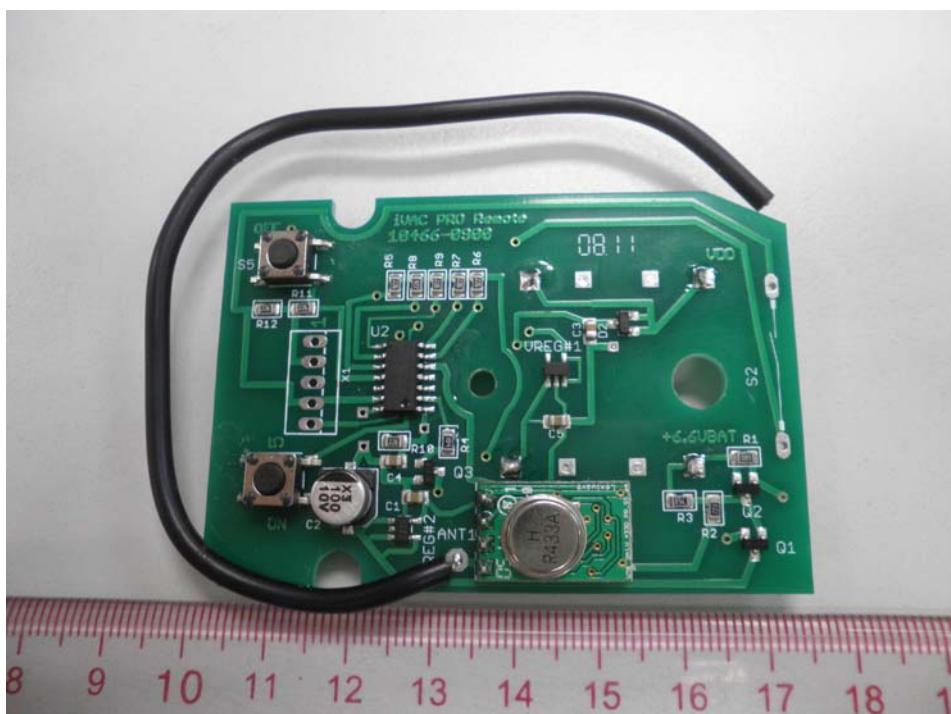
Page 8 of 17

## **5 TEST CONDITIONS AND RESULTS**

### **5.1 Antenna Requirement**

According to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

The EuT has component antenna, which accordance to the above sections, is considered sufficient to comply with the provisions of these sections. Please see EuT photo for details.



The requirements of section 15.203 are **FULFILLED**.

**Remarks:** \_\_\_\_\_

File No. **E4273215901KY**

emitel (Shenzhen)Limited, Building 2, No.171 Meihua Road , Futian District, Shenzhen, P.R.China.

Phone: +86 (755) 8318 2012 Fax: +86 (755) 8312 3810 Email: info@emitel.com.cn

4\_F510\_25\_Rev2\_0 / Date of release: 05-01-2009 / Author: Kidd Yeung

Page 9 of 17

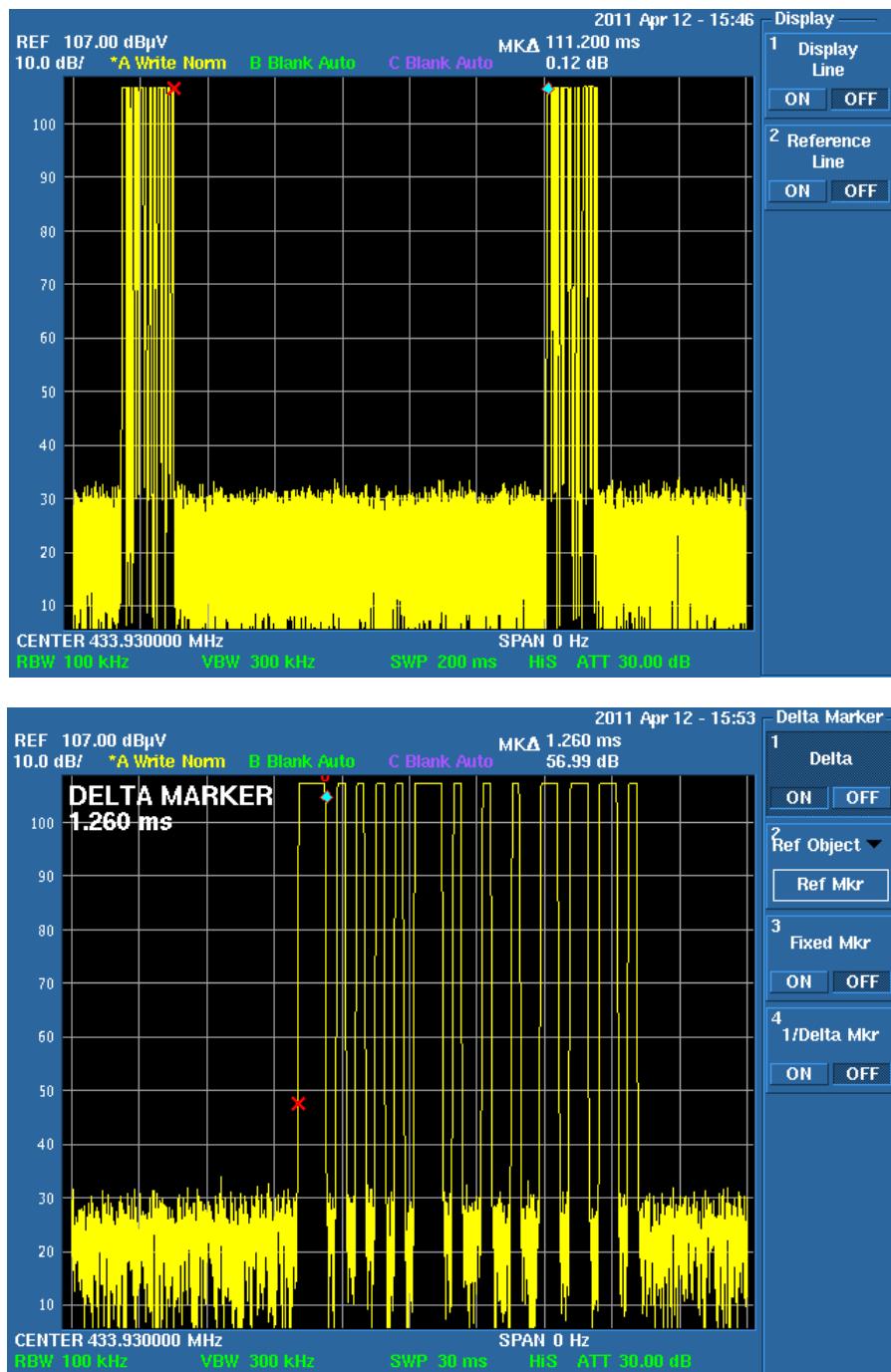
## 5.2 Average Factor

For test instruments and accessories used see section 6.

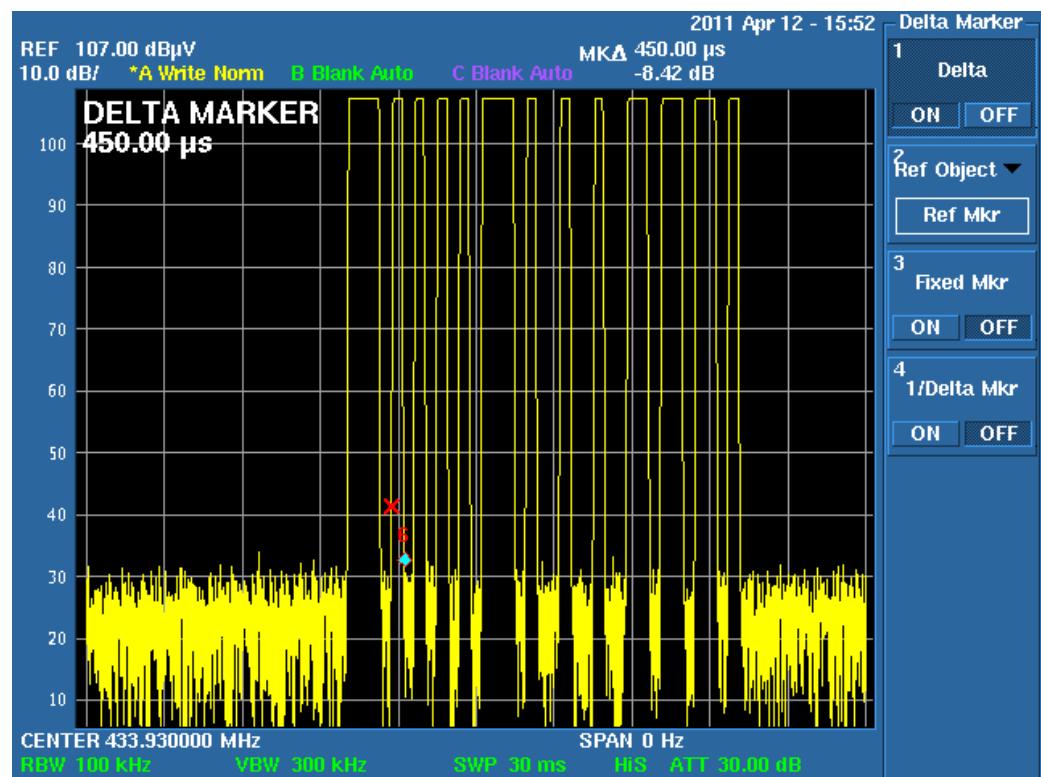
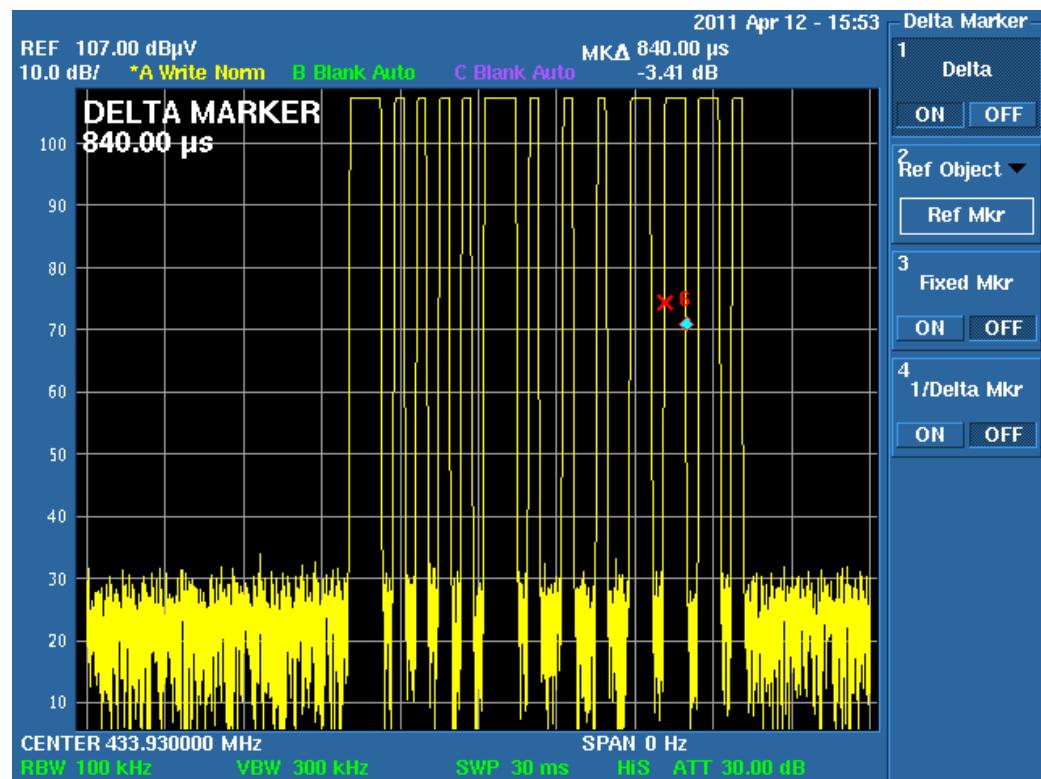
### 5.2.1 Description of the test location

Test location: Shield room

### 5.2.2 Photo documentation of test



File No. E4273215901KY



File No. E4273215901KY

emitel (Shenzhen)Limited, Building 2, No.171 Meihua Road , Futian District, Shenzhen, P.R.China.

Phone: +86 (755) 8318 2012 Fax: +86 (755) 8312 3810 Email: info@emitel.com.cn

4\_F510\_25\_Rev2\_0 / Date of release: 05-01-2009 / Author: Kidd Yeung

Page 11 of 17

### 5.2.3 Test result

whole period=111.20ms>100ms
Pulse 1= 1.26ms
Pulse 2= 0.84ms
Pulse 3= 0.45ms
$T_{on}=(1.26*2+0.84*3+0.45*8)\text{ms}=8.64\text{ms}$
Average factor= $20 \log(8.64\text{ms}/100\text{ms})=20 \log(0.0864)=-21.3\text{dB}$

**Remarks:** Average factor of 2 buttons are measured and worst case average factor is reported above.

---

---

---

---

File No. **E4273215901KY**

emitel (Shenzhen)Limited, Building 2, No.171 Meihua Road , Futian District, Shenzhen, P.R.China.

Phone: +86 (755) 8318 2012 Fax: +86 (755) 8312 3810 Email: info@emitel.com.cn

4\_F510\_25\_Rev2\_0 / Date of release: 05-01-2009 / Author: Kidd Yeung

Page 12 of 17

### 5.3 Radiated Emission

For test instruments and accessories used see section 6.

#### 5.3.1 Description of the test location

Test location: Semi-anechoic Chamber

Test distance: 3m

#### 5.3.2 Photo documentation of test



#### 5.3.3 Test result

Frequency range: 30MHz to 4340MHz

Min. limit margin: -18.3dB

The requirements of section 15.231(b) are **FULFILLED**.

**Remarks:**

---

1) The emissions lower than 20dB below the limit are not measured.

---

2) Testing is include the rotation of the EUT through three orthogonal axes to determine the maximum emission.

---

---

### 5.3.4 Test protocol

Product Description: iVAC Pro Remote  
 Worst Case Operation mode: Transmitting mode  
 Date: April 18, 2011  
 Tested by: Kidd Yang

Result: PASS

Start frequency [MHZ]	Stop frequency [MHZ]	Resolution bandwidth	Video bandwidth	step size	Measurement time	Detector
30	1000	120 KHz	1 MHz	40 KHz	100ms	Peak
1000	4340	1 MHz	3 MHz	400 KHz	100ms	Peak

Polarization	Frequency (MHz)	Read Value (dBuV/m)	Antenna Factor(dB)	Cable Loss(dB)	Measured Result (dBuV/m)	PK limit (dBuV/m)	margin (dB)
V	433.92	60.5	16.3	1.6	78.4	100.8	-22.4
H	433.92	61.8	16.6	1.6	80.0	100.8	-20.8
V	867.84	37.4	22.8	2.3	62.5	80.8	-18.3
H	867.84	30.5	22.7	2.3	55.5	80.8	-25.3
V	1301.76	32.2	25.0	2.8	60.0	80.8	-20.8
H	1301.76	29.5	25.8	2.8	58.1	80.8	-22.7
V	1735.68	19.1	27.9	3.2	50.2	80.8	-30.6
V	2169.62	16.6	30.0	3.9	50.5	80.8	-30.3

Polarization	Frequency (MHz)	Detector	Measured Result (dBuV/m)	Average Factor (dB)	Calculated Average Value (dBuV/m)	AV limit (dBuV/m)	margin (dB)
V	433.92	Peak	78.4	-21.3	57.1	80.8	-23.7
H	433.92	Peak	80.0	-21.3	58.7	80.8	-22.1
V	867.84	Peak	62.5	-21.3	41.2	60.8	-19.6
H	867.84	Peak	55.5	-21.3	34.2	60.8	-26.6
V	1301.77	Peak	60.0	-21.3	38.7	60.8	-22.1
H	1301.77	Peak	58.1	-21.3	36.8	60.8	-24.0
V	1735.70	Peak	50.2	-21.3	28.9	60.8	-31.9
V	2169.62	Peak	50.5	-21.3	29.2	60.8	-31.6

File No. E4273215901KY

emitel (Shenzhen)Limited, Building 2, No.171 Meihua Road , Futian District, Shenzhen, P.R.China.

Phone: +86 (755) 8318 2012 Fax: +86 (755) 8312 3810 Email: info@emitel.com.cn

4\_F510\_25\_Rev2\_0 / Date of release: 05-01-2009 / Author: Kidd Yeung

Page 14 of 17

## 5.4 Bandwidth

For test instruments and accessories used see section 6.

### 5.4.1 Description of the test location

Test location: Shielded Room

### 5.4.2 Photo documentation of the test



### 5.4.3 Test result

Measured Occupied Bandwidth (kHz)	Limit (kHz)
470.0	1084.8

The requirements of section 15.231(c) are **FULFILLED**

**Remarks:**

---



---



---



---

File No. E4273215901KY

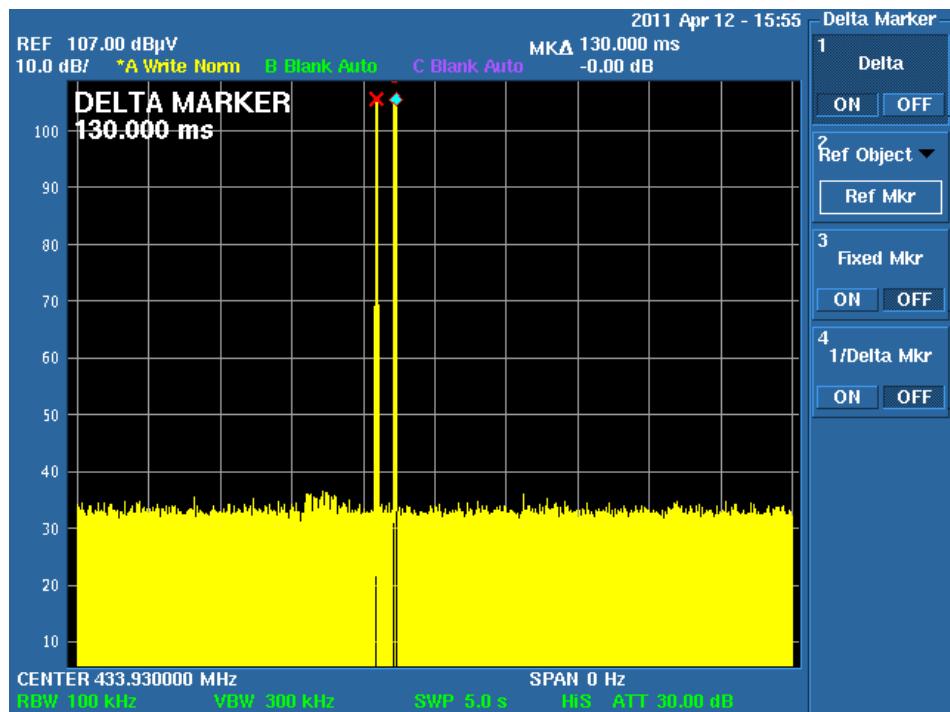
## 5.5 Provision of Momentary operation

For test instruments and accessories used see section 6.

### 5.5.1 Description of the test location

Test location: Shielded Room

### 5.5.2 Photo documentation of the test



### 5.5.3 Test result

The time of stopping transmission after switch releasing (s)	Limit (s)
0.13	5.00

The requirement of section 15.231(a)(1) is **FULFILLED**

Remarks: \_\_\_\_\_

\_\_\_\_\_

File No. E4273215901KY

## 6 USED TEST EQUIPMENT AND ACCESSORIES

All test instruments used, in addition to the test accessories, are calibrated and verified regularly.

Test Item	Model / Type	Kind of Equipment	Manufacturer	Next Cal. Date	Equipment No.
Radiated Emission	ESPI3	EMI Test Receiver	Rohde & Schwarz	Apr 26, 2012	04-02/03-06-002
	U3772	Spectrum Analyzer	Advantest	Apr 26, 2012	04-02/11-08-001
	3142C	Biconilog Antenna	EMCO	Mar 26,2013	04-02/24-06-001
	3117	Horn Antenna	ETS Lindgren	Mar 26,2013	04-02/24-07-001
Bandwidth	U3772	Spectrum Analyzer	Advantest	Apr 26, 2012	04-02/11-08-001
Momentary operation	U3772	Spectrum Analyzer	Advantest	Apr 26, 2012	04-02/11-08-001
Average Factor	U3772	Spectrum Analyzer	Advantest	Apr 26, 2012	04-02/11-08-001

File No. **E4273215901KY**

emitel (Shenzhen)Limited, Building 2, No.171 Meihua Road , Futian District, Shenzhen, P.R.China.

Phone: +86 (755) 8318 2012 Fax: +86 (755) 8312 3810 Email: info@emitel.com.cn

4\_F510\_25\_Rev2\_0 / Date of release: 05-01-2009 / Author: Kidd Yeung

Page 17 of 17