



# **FCC RADIO TEST REPORT**

## **FCC ID: 2ACJ8E110B**

**Product :** MorphoBT - Morpho Biometric Terminal

**Trade Name :** Morpho

**Model Name :** E110B

**Serial Model :** N/A

**Report No. :** BZT140712F03

### **Prepared for**

Morpho

11 boulevard Gallieni 92130 ISSY LES MOULINEAUX FRANCE

### **Prepared by**

BZT Testing Technology Co., Ltd

## TEST RESULT CERTIFICATION

**Applicant's name** .....: Morpho

Address .....: 11 boulevard Gallieni 92130 ISSY LES MOULINEAUX FRANCE

**Manufacture's Name** .....: WIATEC INTERNATIONAL LTD.

Address .....: Unit 601-605, TaoJinDi Electronic Commercial Plaza B,  
TengLong Road, LongHua, Shenzhen, China 518131

**Product description**

Product name.....: MorphoBT - Morpho Biometric Terminal

Model and/or type reference : E110B

Serial Model .....: N/A

DIFF .....: N/A

**Standards** .....: FCC Part15.247

Test procedure ..... ANSI C63.4-2009

This device described above has been tested by BZT, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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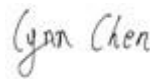
**Date of Test**.....:

Date (s) of performance of tests.....: May 11, 2014 ~ July 24, 2014

Date of Issue .....: July 25, 2014

Test Result .....: **Pass**

Testing Engineer :



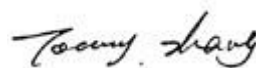
(Lynn Chen)

Technical Manager :



(Carlen Liu)

Authorized Signatory :



(Tommy zhang)

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## 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.247) , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.247 (a)(2)	6dB Bandwidth	PASS	
15.247 (b)	Peak Output Power	PASS	
15.247 (c)	Radiated Spurious Emission	PASS	
15.247 (d)	Power Spectral Density	PASS	
15.205	Band Edge Emission	PASS	
15.203	Antenna Requirement	PASS	

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report

## 1.1 TEST FACILITY

BZT Testing Technology Co., Ltd

Add.:1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.

FCC Registration No.: 701733

## 1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately **95 %**.

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 1.38\text{dB}$
2	RF power,conducted	$\pm 0.16\text{dB}$
3	Spurious emissions,conducted	$\pm 0.21\text{dB}$
4	All emissions,radiated(<1G)	$\pm 4.68\text{dB}$
5	All emissions,radiated(>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5^{\circ}\text{C}$
7	Humidity	$\pm 2\%$

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Equipment	MorphoBT - Morpho Biometric Terminal																						
Trade Name	Morpho																						
Model Name	E110B																						
Serial Model	N/A																						
Model Difference	N/A																						
Product Description	<p>The EUT is a MorphoBT - Morpho Biometric Terminal</p> <table border="1"> <tr> <td>Operation Frequency:</td><td>802.11b/g/n 20:2412~2462 MHz 802.11n 40: 2422~2452MHz</td></tr> <tr> <td>Modulation Type:</td><td>CCK/OFDM/DBPSK/DAPSK</td></tr> <tr> <td>Bit Rate of Transmitter</td><td>802.11b:11/5.5/2/1 Mbps 802.11g:54/48/36/24/18/12/9/6Mbps 802.11n(20/40MHz):300/150/144.44/130/117/115.56/104/86.67/78/52/6.5 Mbps</td></tr> <tr> <td>Number Of Channel</td><td>802.11b/g/n20: 11CH 802.11n 40: 7CH</td></tr> <tr> <td>Antenna Designation:</td><td>Please see Note 3.</td></tr> <tr> <td>Antenna Gain (dBi)</td><td>0.8 dBi</td></tr> </table> <table border="1"> <tr> <td>Operation Frequency:</td><td>2402~2480 MHz</td></tr> <tr> <td>Modulation Type:</td><td>FHSS</td></tr> <tr> <td>Bit Rate of Transmitter</td><td>GFSK+<math>\pi</math>/4DQPSK+8DPSK</td></tr> <tr> <td>Number Of Channel</td><td>79 CH</td></tr> <tr> <td>Antenna Gain(Peak)</td><td>0.8dBi</td></tr> </table> <p>Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.</p>	Operation Frequency:	802.11b/g/n 20:2412~2462 MHz 802.11n 40: 2422~2452MHz	Modulation Type:	CCK/OFDM/DBPSK/DAPSK	Bit Rate of Transmitter	802.11b:11/5.5/2/1 Mbps 802.11g:54/48/36/24/18/12/9/6Mbps 802.11n(20/40MHz):300/150/144.44/130/117/115.56/104/86.67/78/52/6.5 Mbps	Number Of Channel	802.11b/g/n20: 11CH 802.11n 40: 7CH	Antenna Designation:	Please see Note 3.	Antenna Gain (dBi)	0.8 dBi	Operation Frequency:	2402~2480 MHz	Modulation Type:	FHSS	Bit Rate of Transmitter	GFSK+ $\pi$ /4DQPSK+8DPSK	Number Of Channel	79 CH	Antenna Gain(Peak)	0.8dBi
Operation Frequency:	802.11b/g/n 20:2412~2462 MHz 802.11n 40: 2422~2452MHz																						
Modulation Type:	CCK/OFDM/DBPSK/DAPSK																						
Bit Rate of Transmitter	802.11b:11/5.5/2/1 Mbps 802.11g:54/48/36/24/18/12/9/6Mbps 802.11n(20/40MHz):300/150/144.44/130/117/115.56/104/86.67/78/52/6.5 Mbps																						
Number Of Channel	802.11b/g/n20: 11CH 802.11n 40: 7CH																						
Antenna Designation:	Please see Note 3.																						
Antenna Gain (dBi)	0.8 dBi																						
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Modulation Type:	FHSS																						
Bit Rate of Transmitter	GFSK+ $\pi$ /4DQPSK+8DPSK																						
Number Of Channel	79 CH																						
Antenna Gain(Peak)	0.8dBi																						
Channel List	Please refer to the Note 2.																						
Ratings	DC 3.7V from battery																						
Adapter	Power supply and ADP ( rating ) : Model No.: GFP121-0520BX-1 Input:100-240V AC,50/60Hz Output:5.0V,2.0A																						
Battery	3.7V 5400mAh																						
Connecting I/O Port(s)	Please refer to the User's Manual																						

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.

Channel List for 802.11b/g/n(20MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	04	2427	07	2442	10	2457
02	2417	05	2432	08	2447	11	2462
03	2422	06	2437	09	2452		

Channel List for 802.11n(40MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
03	2422	06	2437	09	2452		
04	2427	07	2442				
05	2432	08	2447				

3.

Table for Filed Antenna

Ant .	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
A	N/A	N/A	chip	N/A	0.8	N/A



## 2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possibly have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

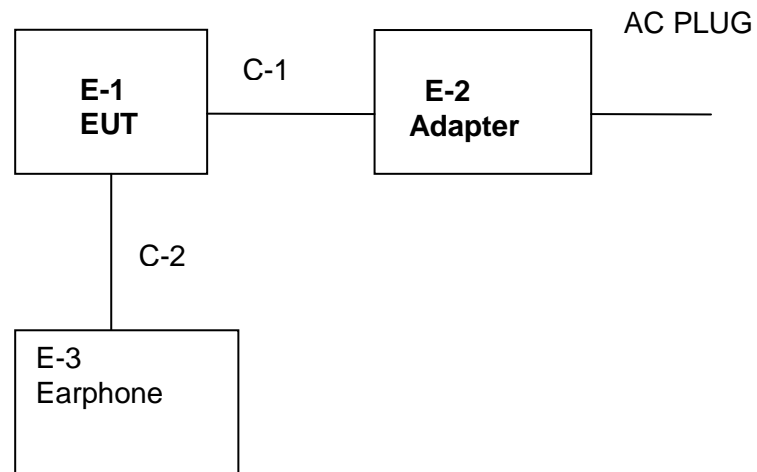
Pretest Mode	Description
Mode 1	802.11b CH1/ CH6/ CH11
Mode 2	802.11g CH1/ CH6/ CH11
Mode 3	802.11n(20)CH1/ CH6/ CH11
Mode 4	802.11n(40) CH3/ CH6/ CH9
Mode 5	Link Mode

For Conducted Emission	
Final Test Mode	Description
Mode 5	Link Mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11b CH1/ CH6/ CH11
Mode 2	802.11g CH1/ CH6/ CH11
Mode 3	802.11n CH1/ CH6/ CH11
Mode 4	802.11n(40) CH3/ CH6/ CH9
Mode 5	Link Mode

Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported

**2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED**

## 2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	MorphoBT - Morpho Biometric Terminal	Morpho	E110B	N/A	EUT
E-2	Adapter	GREPOW	GFP121-0520BX-1	N/A	
E-3	Earphone	N/A	N/A	N/A	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	YES	1.5m	
C-2	NO	NO	1.2m	

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

## 2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

### Radiation Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Spectrum Analyzer	Agilent	E4407B	MY45108040	2014.07.06	2015.07.05	1 year
2	Test Receiver	R&S	ESPI	101318	2014.06.07	2015.06.06	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2014.07.06	2015.07.05	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2014.06.07	2015.06.06	1 year
5	Spectrum Analyzer	ADVANTEST	R3132	150900201	2014.06.07	2015.06.06	1 year
6	Horn Antenna	EM	EM-AH-10180	2011071402	2014.07.06	2015.07.05	1 year
7	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2014.07.06	2015.07.05	1 year
8	Amplifier	EM	EM-30180	060538	2014.12.22	2015.12.21	1 year
9	Loop Antenna	ARA	PLA-1030/B	1029	2014.06.08	2015.06.07	1 year
10	Power Meter	R&S	NRVS	100696	2014.07.06	2015.07.05	1 year
11	Power Sensor	R&S	URV5-Z4	0395.1619.05	2014.07.06	2015.07.05	1 year

### Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Test Receiver	R&S	ESCI	101160	2014.06.06	2015.06.05	1 year
2	LISN	R&S	ENV216	101313	2014.08.24	2015.08.23	1 year
3	LISN	EMCO	3816/2	00042990	2014.08.24	2015.08.23	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2014.06.07	2015.06.06	1 year
5	Passive Voltage Probe	R&S	ESH2-Z3	100196	2014.06.07	2015.06.06	1 year
6	Absorbing clamp	R&S	MOS-21	100423	2014.06.08	2015.06.07	1 year

### 3. EMC EMISSION TEST

#### 3.1 CONDUCTED EMISSION MEASUREMENT

##### 3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	73.00	60.00	56.00	46.00	CISPR
5.0 -30.0	73.00	60.00	60.00	50.00	CISPR

0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

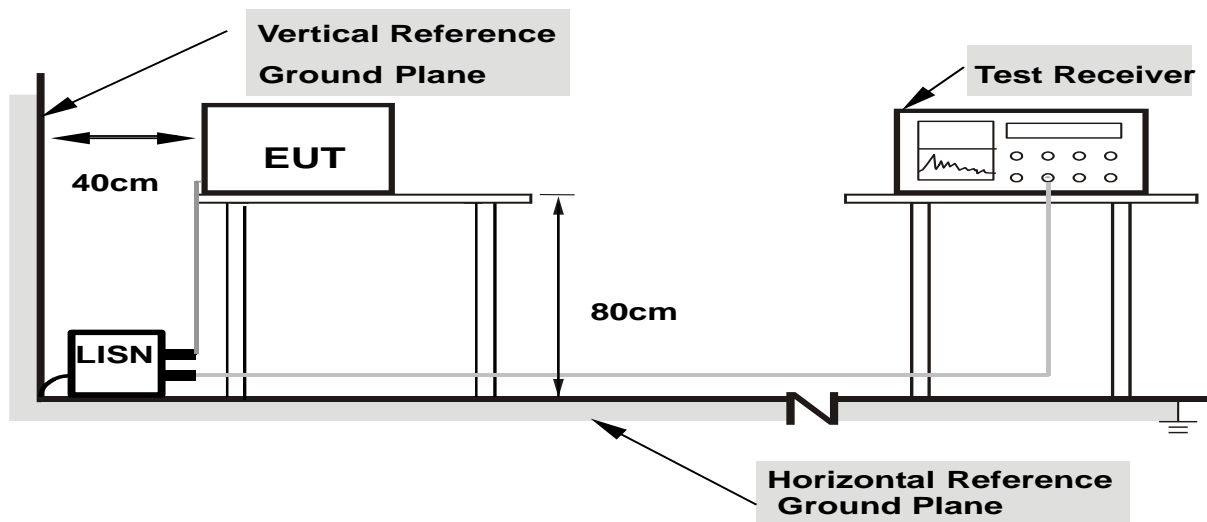
### 3.1.2 TEST PROCEDURE

- The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 3.1.3 DEVIATION FROM TEST STANDARD

No deviation

### 3.1.4 TEST SETUP



**Note: 1.Support units were connected to second LISN.**

**2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes**

### 3.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

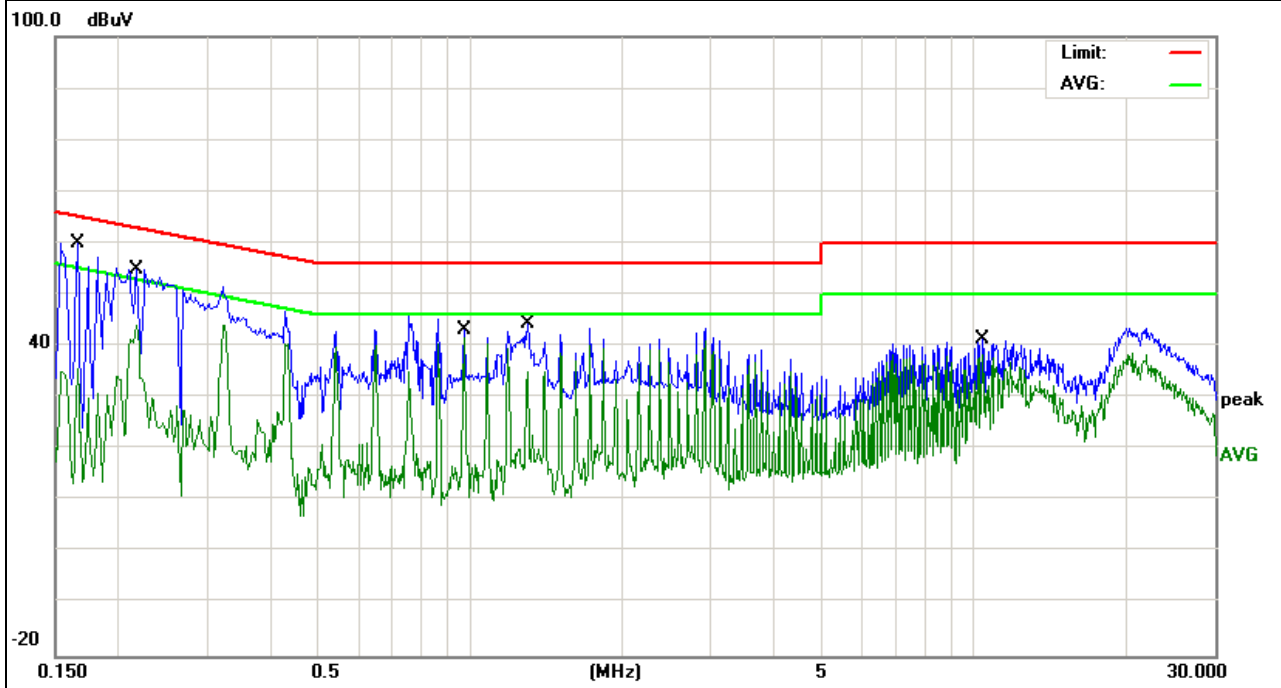
### 3.1.6 TEST RESULTS

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name. :	E110B
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	L
Test Voltage :	DC 5V from Adapter with AC 120V/60Hz	Test Mode :	Mode 5

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
0.1660	49.46	10.45	59.91	65.15	-5.24	QP
0.2180	33.76	10.44	44.20	52.89	-8.69	AVG
0.9700	31.25	10.41	41.66	46.00	-4.34	AVG
1.2980	33.85	10.41	44.26	56.00	-11.74	QP
10.3700	30.71	10.63	41.34	60.00	-18.66	QP
10.3700	27.68	10.63	38.31	50.00	-11.69	AVG

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

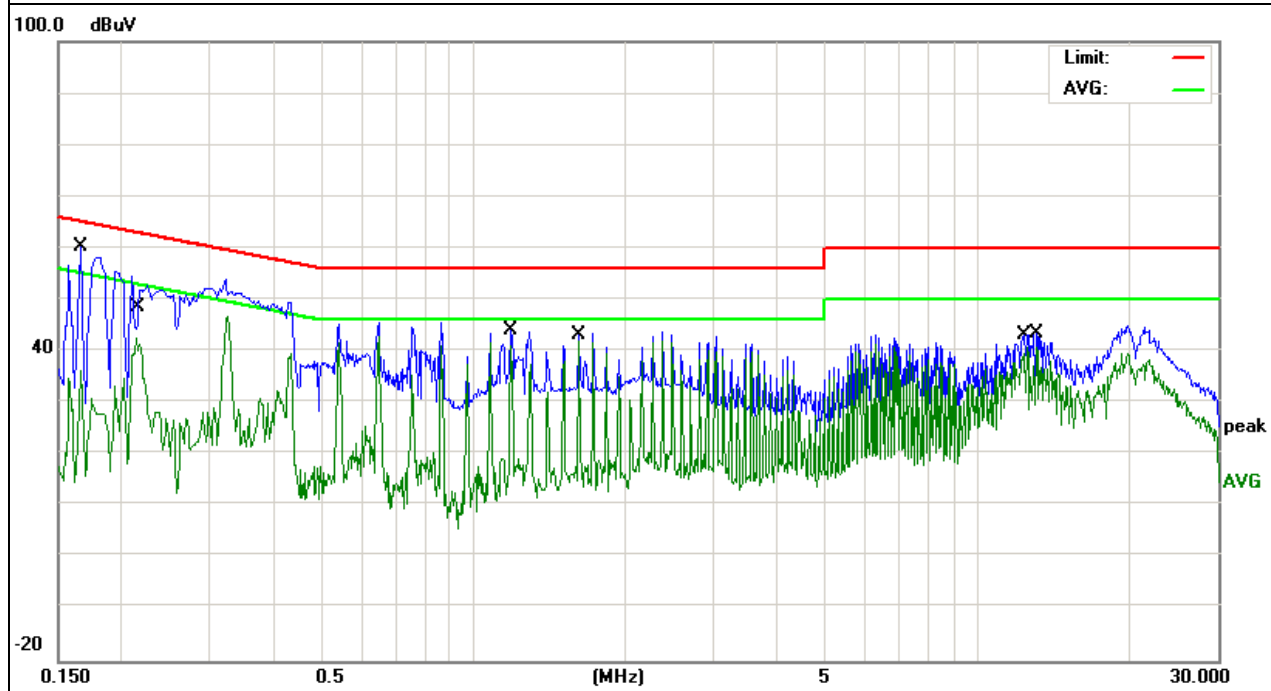


EUT :	MorphoBT - Morpho Biometric Terminal	Model Name. :	E110B
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	N
Test Voltage :	DC 5V from Adapter with AC 120V/60Hz	Test Mode :	Mode 5

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
0.1660	49.81	10.34	60.15	65.15	-5.00	QP
0.2140	32.17	10.43	42.60	53.04	-10.44	AVG
1.1900	33.68	10.45	44.13	56.00	-11.87	QP
1.6220	31.61	10.44	42.05	46.00	-3.95	AVG
12.5340	30.03	10.71	40.74	50.00	-9.26	AVG
13.0740	32.76	10.72	43.48	60.00	-16.52	QP

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.





### 3.2 RADIATED EMISSION MEASUREMENT

#### 3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/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

#### LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class A (dBuV/m) (at 3M)		Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE	PEAK	AVERAGE
Above 1000	80	60	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

### **3.2.2 TEST PROCEDURE**

- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

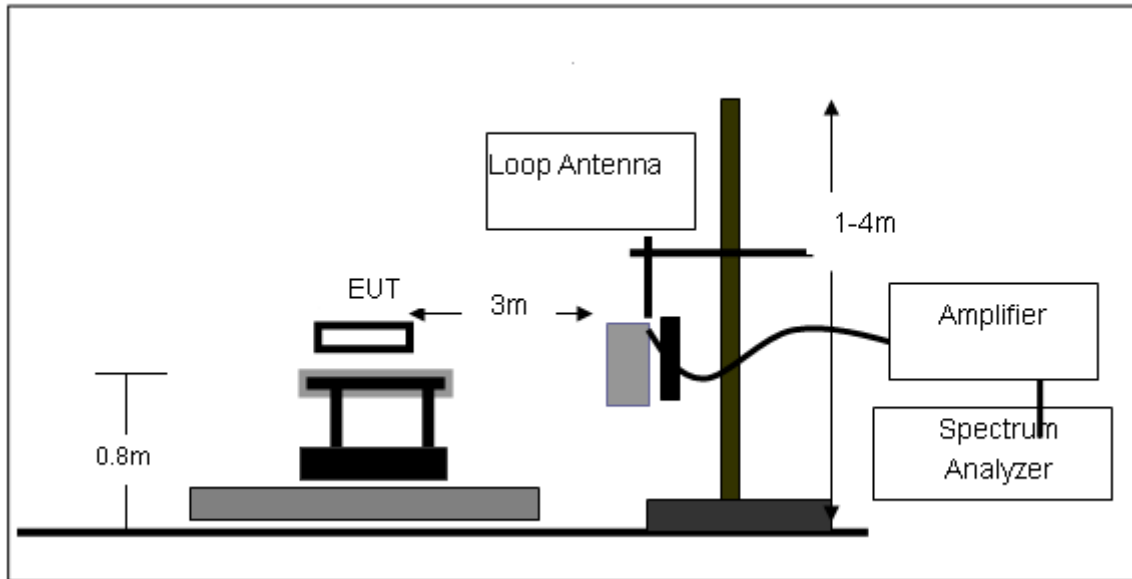
Both horizontal and vertical antenna polarities were tested  
and performed pretest to three orthogonal axis. The worst case emissions were reported

### **3.2.3 DEVIATION FROM TEST STANDARD**

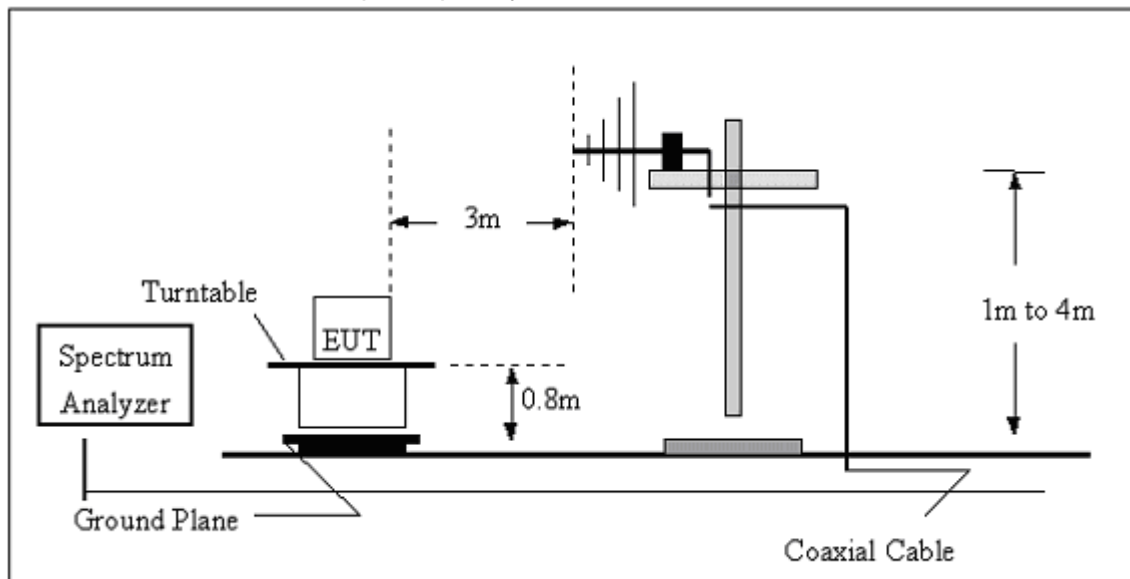
No deviation

### 3.2.4 TEST SETUP

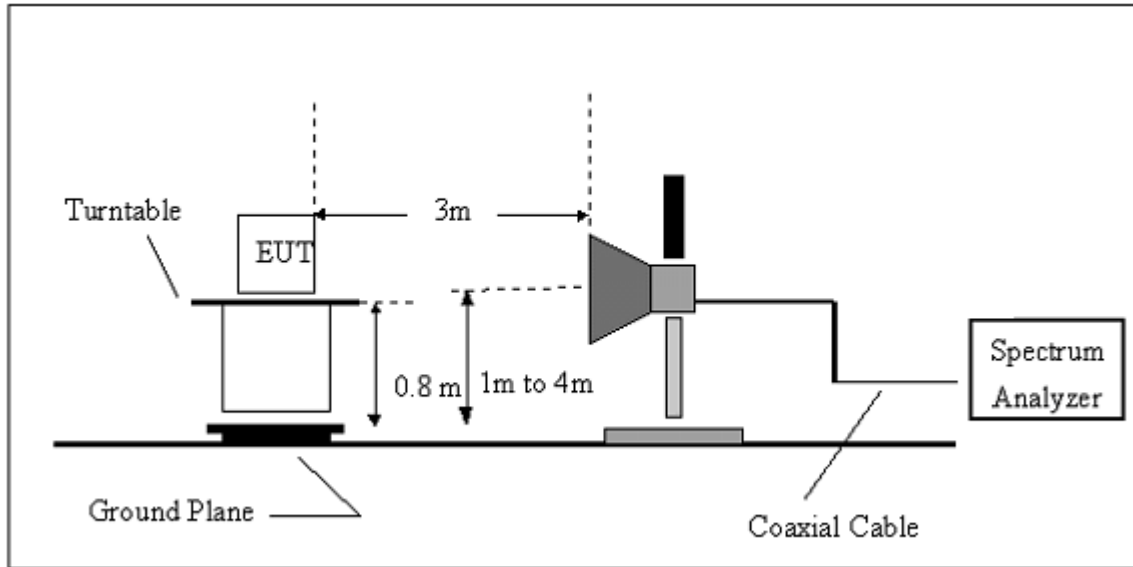
#### (A) Radiated Emission Test-Up Frequency Below 30MHz



#### (B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



### 3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

**3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)**

EUT:	MorphoBT - Morpho Biometric Terminal	Model Name. :	E110B
Temperature:	20 °C	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	Link mode	Polarization :	--

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

**NOTE:**

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor =  $40 \log (\text{specific distance/test distance})$ (dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.

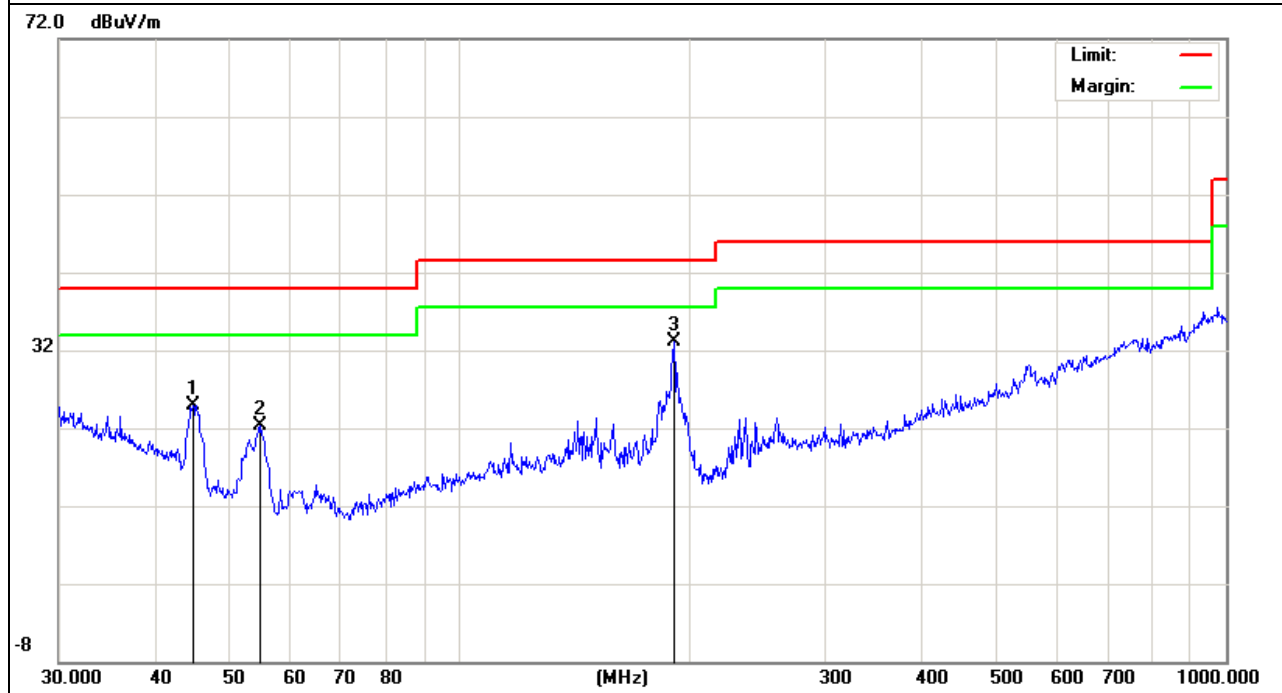
### 3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	Link mode	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
55.0274	10.47	6.27	16.74	40	-23.26	Peak
198.5879	19.23	8.99	28.22	43.5	-15.28	Peak
249.425	13.98	13.4	27.38	46	-18.62	Peak

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

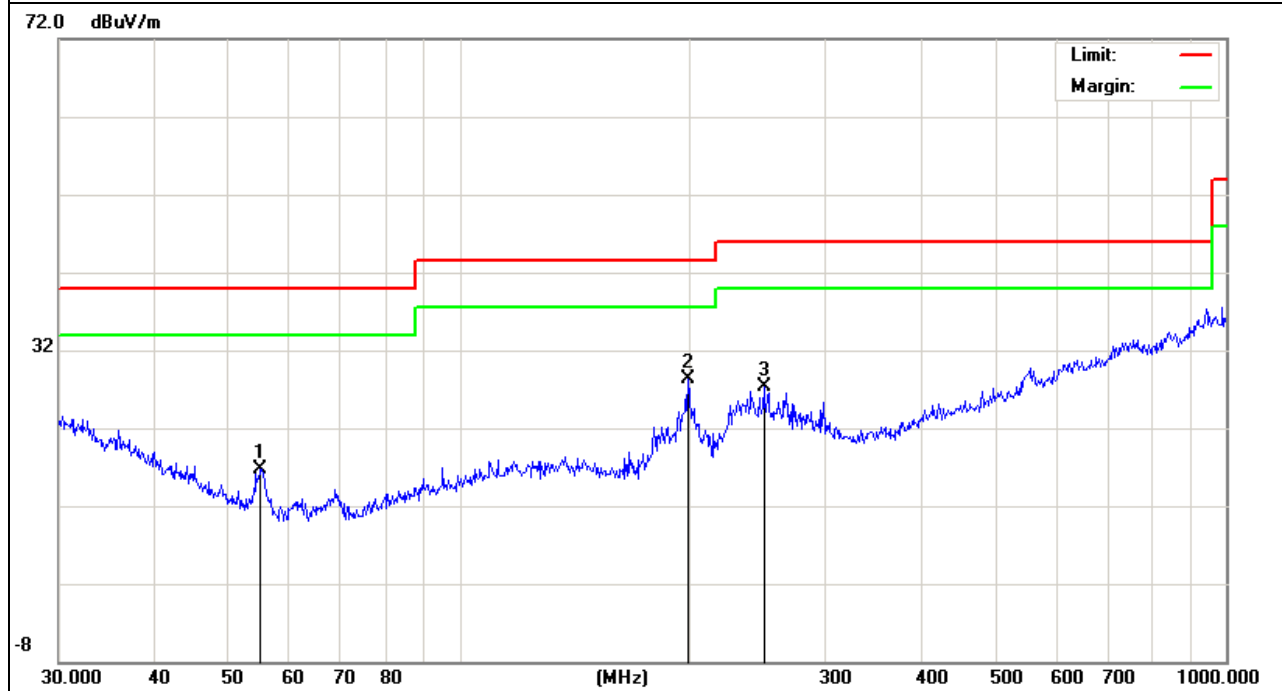


EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	Link mode	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
44.9004	14.27	10.63	24.9	40	-15.1	Peak
54.8348	16.01	6.33	22.34	40	-17.66	Peak
190.405	24.16	9.01	33.17	43.5	-10.33	Peak

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.



### 3.2.8 TEST RESULTS (ABOVE 1000 MHZ)

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	CH1 (802.11b Mode)/2412	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4824.15	46.52	10.44	56.96	74	-17.04	peak
4824.15	35.04	10.44	45.48	54	-8.52	AVG
7236.149	44.12	12.39	56.51	74	-17.49	peak
7236.149	33.85	12.39	46.24	54	-7.76	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	CH1 (802.11b Mode)/2412	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4874.145	55.8	10.4	66.2	74	-7.8	peak
4874.145	35.2	10.4	45.6	54	-8.4	AVG
7311.163	47.92	12.75	60.67	74	-13.33	peak
7311.163	31.93	12.75	44.68	54	-9.32	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	CH6 (802.11b Mode)/2437	Polarization :	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4874.159	46.84	10.4	57.24	74	-16.76	peak
4874.159	31.35	10.4	41.75	54	-12.25	AVG
7311.136	45.58	12.75	58.33	74	-15.67	peak
7311.136	31.67	12.75	44.42	54	-9.58	AVG

Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	CH6 (802.11b Mode)/2437	Polarization :	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4924.146	51.42	10.39	61.81	74	-12.19	peak
4934.146	32.53	10.44	42.97	54	-11.03	AVG
7386.143	47.28	12.68	59.96	74	-14.04	peak
7386.143	34.52	12.68	47.2	54	-6.8	AVG

Remark:  
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.  
2. No emission detected above 18GHz

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	CH11 (802.11b Mode)/2462	Polarization :	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4924.145	47.85	10.39	58.24	74	-15.76	peak
4924.145	32.73	10.39	43.12	54	-10.88	AVG
7386.142	48.27	12.68	60.95	74	-13.05	peak
7386.142	30.74	12.68	43.42	54	-10.58	AVG

Remark:

- Factor = Antenna Factor + Cable Loss – Pre-amplifier.
- No emission detected above 18GHz

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	CH11 (802.11b Mode)/2462	Polarization :	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4924.122	51.63	10.39	62.02	74	-11.98	peak
4924.122	36.16	10.39	46.55	54	-7.45	AVG
7386.143	42.52	12.68	55.2	74	-18.8	peak
7386.143	34.95	12.68	47.63	54	-6.37	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	CH1 (802.11g Mode)/2412	Polarization :	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4824.17	48.26	10.44	58.7	74	-15.3	peak
4824.17	32.85	10.44	43.29	54	-10.71	AVG
7236.224	47.84	12.39	60.23	74	-13.77	peak
7236.224	31.96	12.39	44.35	54	-9.65	AVG

Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	CH1 (802.11g Mode)/2412	Polarization :	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4824.155	54.84	10.44	65.28	74	-8.72	peak
4824.155	31.51	10.44	41.95	54	-12.05	AVG
7236.142	46.36	12.39	58.75	74	-15.25	peak
7236.142	28.64	12.39	41.03	54	-12.97	AVG

Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	CH6 (802.11g Mode)/2437	Polarization :	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4874.14	46.57	10.4	56.97	74	-17.03	peak
4874.14	26.63	10.4	37.03	54	-16.97	AVG
7311.17	44.72	12.75	57.47	74	-16.53	peak
7311.17	25.59	12.75	38.34	54	-15.66	AVG

Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	CH6 (802.11g Mode)/2437	Polarization :	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4874.158	46.74	10.4	57.14	74	-16.86	peak
4874.158	34.72	10.4	45.12	54	-8.88	AVG
7311.137	43.15	12.75	55.9	74	-18.1	peak
7311.137	34.38	12.75	47.13	54	-6.87	AVG

Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	CH11 (802.11g Mode)/2462	Polarization :	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4924.138	47.36	10.39	57.75	74	-16.25	peak
4924.138	34.52	10.39	44.91	54	-9.09	AVG
7386.149	46.14	12.68	58.82	74	-15.18	peak
7386.149	30.53	12.68	43.21	54	-10.79	AVG

Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	CH11(802.11g Mode)/2462	Polarization :	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4924.148	46.64	10.39	57.03	74	-16.97	peak
4924.148	29.62	10.39	40.01	54	-13.99	AVG
7386.13	43.84	12.68	56.52	74	-17.48	peak
7386.13	34.27	12.68	46.95	54	-7.05	AVG

Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	CH1(802.11n Mode)/20MHz	Polarization :	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4824.14	47.35	10.44	57.79	74	-16.21	peak
4824.14	37.35	10.44	47.79	54	-6.21	AVG
7236.122	44.12	12.39	56.51	74	-17.49	peak
7236.122	28.34	12.39	40.73	54	-13.27	AVG

Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	CH1(802.11n Mode)/20MHz	Polarization :	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4824.141	45.74	10.44	56.18	74	-17.82	peak
4824.141	38.37	10.44	48.81	54	-5.19	AVG
7236.145	52.35	12.39	64.74	74	-9.26	peak
7236.145	32.46	12.39	44.85	54	-9.15	AVG

Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	CH6(802.11n Mode)/20MHz	Polarization :	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4874.16	48.53	10.4	58.93	74	-15.07	peak
4874.16	32.64	10.4	43.04	54	-10.96	AVG
7311.128	45.21	12.75	57.96	74	-16.04	peak
7311.128	28.25	12.75	41	54	-13	AVG

Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	CH6(802.11n Mode)/20MHz	Polarization :	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4874.161	47.25	10.4	57.65	74	-16.35	peak
4874.161	31.56	10.4	41.96	54	-12.04	AVG
7311.166	43.62	12.75	56.37	74	-17.63	peak
7311.166	28.35	12.75	41.1	54	-12.9	AVG

Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	CH11(802.11n Mode)/20MHz	Polarization :	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4924.14	48.25	10.39	58.64	74	-15.36	peak
4924.14	33.46	10.39	43.85	54	-10.15	AVG
7386.183	45.14	12.68	57.82	74	-16.18	peak
7386.183	31.52	12.68	44.2	54	-9.8	AVG

Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	CH11(802.11n Mode)/20MHz	Polarization :	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4924.15	51.32	10.39	61.71	74	-12.29	peak
4924.15	34.37	10.39	44.76	54	-9.24	AVG
7386.167	42.85	12.68	55.53	74	-18.47	peak
7386.167	27.34	12.68	40.02	54	-13.98	AVG

Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	CH3(802.11n Mode)/40MHz	Polarization :	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4844.156	48.24	10.5	58.74	74	-15.26	peak
4844.156	30.64	10.5	41.14	54	-12.86	AVG
7266.319	41.28	12.5	53.78	74	-20.22	peak
7266.319	31.74	12.5	44.24	54	-9.76	AVG

Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	CH3(802.11n Mode)/40MHz	Polarization :	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4844.325	44.63	10.5	55.13	74	-18.87	peak
4844.325	28.64	10.5	39.14	54	-14.86	AVG
7266.258	44.64	12.5	57.14	74	-16.86	peak
7266.258	30.57	12.5	43.07	54	-10.93	AVG

Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	CH6(802.11n Mode)/40MHz	Polarization :	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4874.238	42.03	10.4	52.43	74	-21.57	peak
4874.238	28.48	10.4	38.88	54	-15.12	AVG
7311.159	41.63	12.75	54.38	74	-19.62	peak
7311.159	29.36	12.75	42.11	54	-11.89	AVG

Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	CH6(802.11n Mode)/40MHz	Polarization :	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4874.535	45.74	10.4	56.14	74	-17.86	peak
4874.535	32.37	10.4	42.77	54	-11.23	AVG
7311.633	41.74	12.75	54.49	74	-19.51	peak
7311.633	30.24	12.75	42.99	54	-11.01	AVG

Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	CH9(802.11n Mode)/40MHz	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4904.345	49.15	10.29	59.44	74	-14.56	peak
4904.345	31.83	10.29	42.12	54	-11.88	AVG
7356.247	44.52	12.79	57.31	74	-16.69	peak
7356.247	32.63	12.79	45.42	54	-8.58	AVG

Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	CH9(802.11n Mode)/40MHz	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4904.16	45.15	10.29	55.44	74	-18.56	peak
4904.16	36.11	10.29	46.4	54	-7.6	AVG
7356.423	43.63	12.79	56.42	74	-17.58	peak
7356.423	33.63	12.79	46.42	54	-7.58	AVG

Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

### 3.2.9 TEST RESULTS (RESTRICTED BANDS REQUIREMENTS)

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V FROM ADAPTER WITH AC 120V/60HZ
Test Mode :	CH1(802.11b Mode)	Polarization :	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2397.1	80.14	-13.02	67.12	74	-6.88	peak
2397.1	59.85	-13.02	46.83	54	-7.17	AVG
2400	81.46	-12.99	68.47	74	-5.53	peak
2400	60.35	-12.99	47.36	54	-6.64	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V FROM ADAPTER WITH AC 120V/60HZ
Test Mode :	CH1(802.11b Mode)	Polarization :	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2397.75	78.25	-13	65.25	74	-8.75	peak
2397.75	62.75	-13	49.75	54	-4.25	AVG
2400	74.25	-12.99	61.26	74	-12.74	peak
2400	59.84	-12.99	46.85	54	-7.15	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V FROM ADAPTER WITH AC 120V/60HZ
Test Mode :	CH11(802.11b Mode)	Polarization :	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	76.57	-12.78	63.79	74	-10.21	peak
2483.5	61.25	-12.78	48.47	54	-5.53	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V FROM ADAPTER WITH AC 120V/60HZ
Test Mode :	CH11(802.11b Mode)	Polarization :	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	75.55	-12.78	62.77	74	-11.23	peak
2483.5	61.53	-12.78	48.75	54	-5.25	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V FROM ADAPTER WITH AC 120V/60HZ
Test Mode :	CH1(802.11g Mode)	Polarization :	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2400	80.52	-12.99	67.53	74	-6.47	peak
2400	62.64	-12.99	49.65	54	-4.35	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V FROM ADAPTER WITH AC 120V/60HZ
Test Mode :	CH1(802.11gMode)	Polarization :	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2400	80.23	-12.99	67.24	74	-6.76	peak
2400	63.53	-12.99	50.54	54	-3.46	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V FROM ADAPTER WITH AC 120V/60HZ
Test Mode :	CH11(802.11g Mode)	Polarization :	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	60.23	-12.78	47.45	74	-26.55	peak

Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V FROM ADAPTER WITH AC 120V/60HZ
Test Mode :	CH11(802.11g Mode)	Polarization :	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	61.43	-12.78	48.65	74	-25.35	peak

Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V FROM ADAPTER WITH AC 120V/60HZ
Test Mode :	CH1(802.11n Mode)/20MHz	Polarization :	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2400	71.63	-12.99	58.64	74	-15.36	peak
2400	55.63	-12.99	42.64	54	-11.36	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V FROM ADAPTER WITH AC 120V/60HZ
Test Mode :	CH1(802.11n Mode)/20M	Polarization :	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2400	73.37	-12.99	60.38	74	-13.62	peak
2400	61.35	-12.99	48.36	54	-5.64	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V FROM ADAPTER WITH AC 120V/60HZ
Test Mode :	CH11(802.11n Mode)/20MHz	Polarization :	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	71.53	-12.78	58.75	74	-15.25	peak
2483.5	63.75	-12.78	50.97	54	-3.03	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V FROM ADAPTER WITH AC 120V/60HZ
Test Mode :	CH11(802.11n Mode)/20MHz	Polarization :	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	72.63	-12.78	59.85	74	-14.15	peak
2483.5	61.53	-12.78	48.75	54	-5.25	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V FROM ADAPTER WITH AC 120V/60HZ
Test Mode :	CH3(802.11n Mode)/40M	Polarization :	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2400	77.28	-12.99	64.29	74	-9.71	peak
2400	61.42	-12.99	48.43	54	-5.57	AVG

Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V FROM ADAPTER WITH AC 120V/60HZ
Test Mode :	CH3(802.11n Mode)/40MHz	Polarization :	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2400	69.53	-12.99	56.54	74	-17.46	peak
2400	54.45	-12.99	41.46	54	-12.54	AVG

Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V FROM ADAPTER WITH AC 120V/60HZ
Test Mode :	CH9(802.11n Mode)/40MHz	Polarization :	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	62.64	-12.78	49.86	74	-24.14	peak

Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 5V FROM ADAPTER WITH AC 120V/60HZ
Test Mode :	CH9(802.11n Mode)/40MHz	Polarization :	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	61.67	-12.78	48.89	74	-25.11	peak

Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

## 4. POWER SPECTRAL DENSITY TEST

### 4.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS

#### 4.1.1 TEST PROCEDURE

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.
3. Set the RBW  $\geq 3$  kHz.
4. Set the VBW  $\geq 3 \times$  RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

#### 4.1.2 DEVIATION FROM STANDARD

No deviation.

#### 4.1.3 TEST SETUP



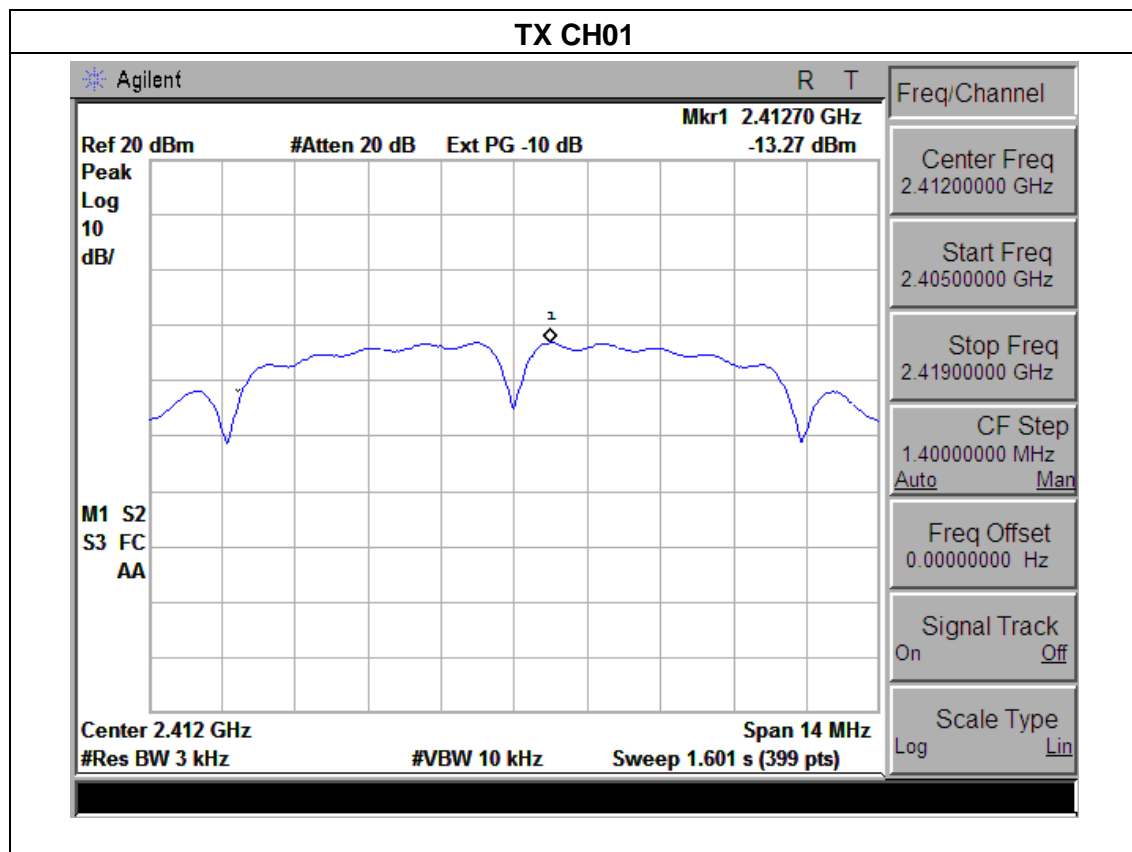
#### 4.1.4 EUT OPERATION CONDITIONS

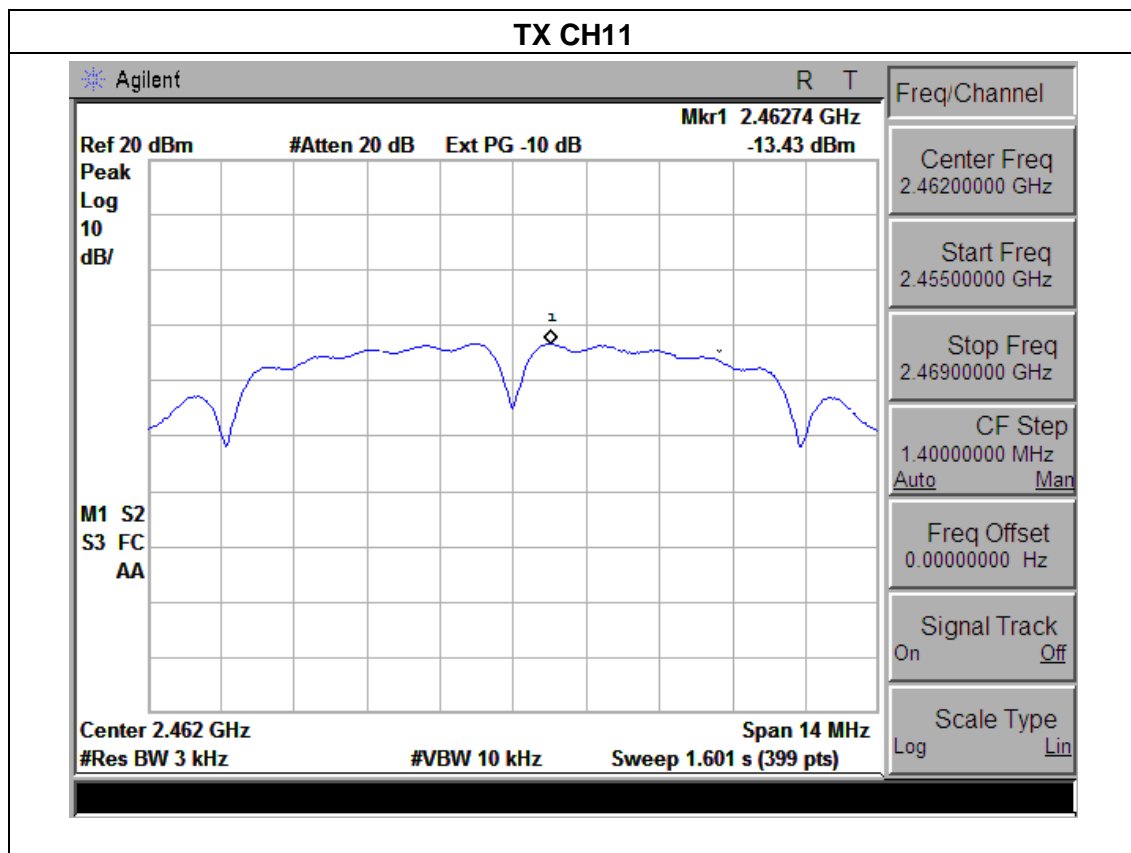
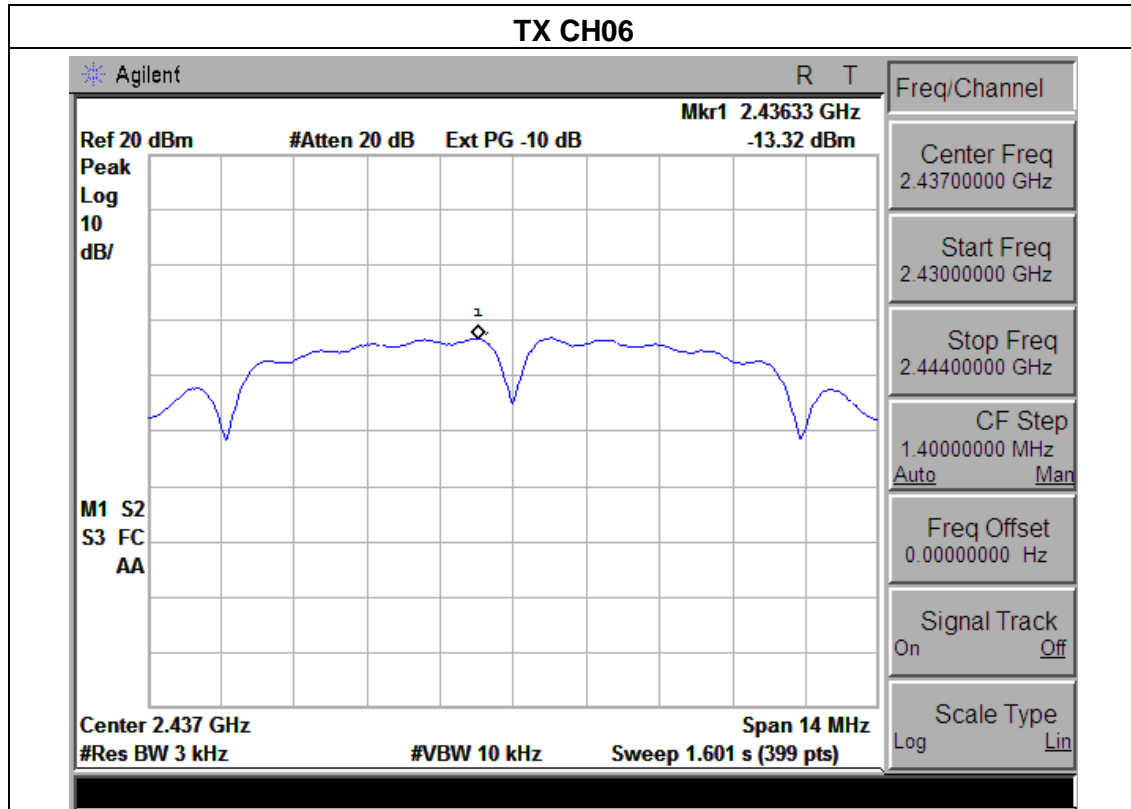
The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

#### 4.1.5 TEST RESULTS

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	TX b Mode /CH01, CH06, CH11		

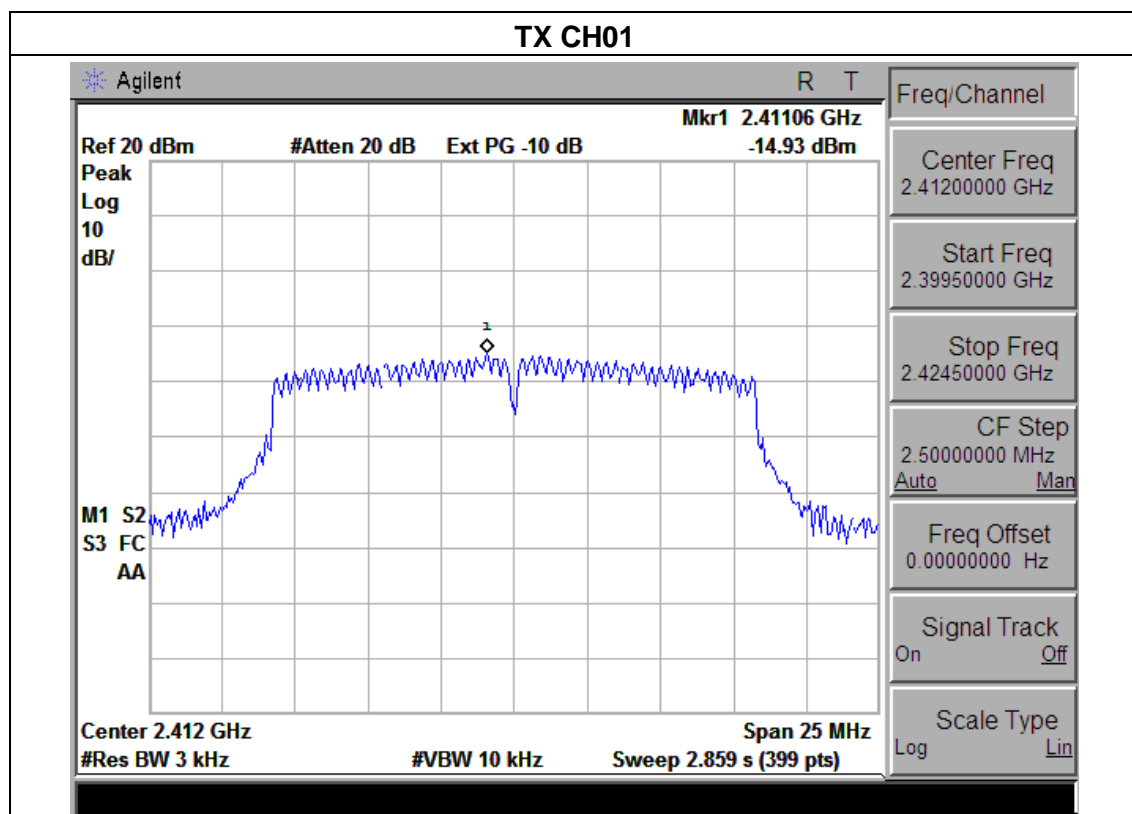
Frequency	Power Density (dBm)	Limit (dBm)	Result
2412 MHz	-12.27	8	PASS
2437 MHz	-13.32	8	PASS
2462 MHz	-13.43	8	PASS

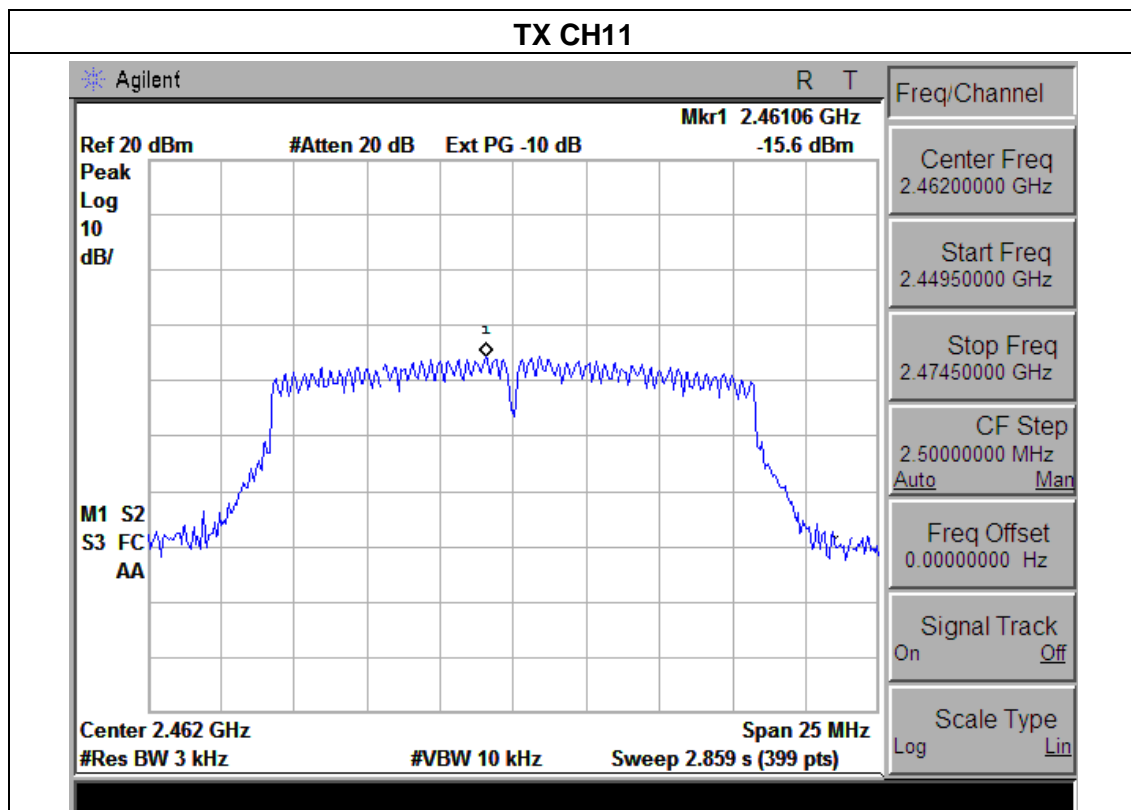
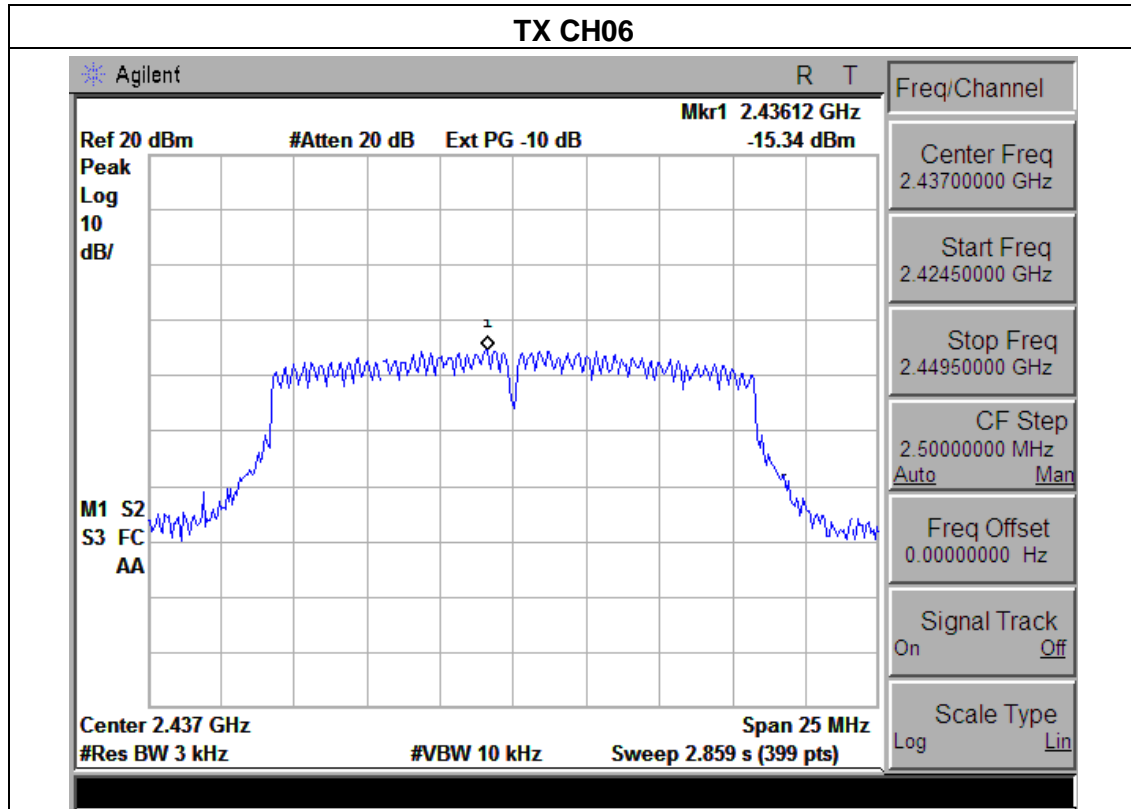




EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	TX g Mode /CH01, CH06, CH11		

Frequency	Power Density (dBm)	Limit (dBm)	Result
2412 MHz	-14.93	8	<b>PASS</b>
2437 MHz	-15.34	8	<b>PASS</b>
2462 MHz	-15.6	8	<b>PASS</b>

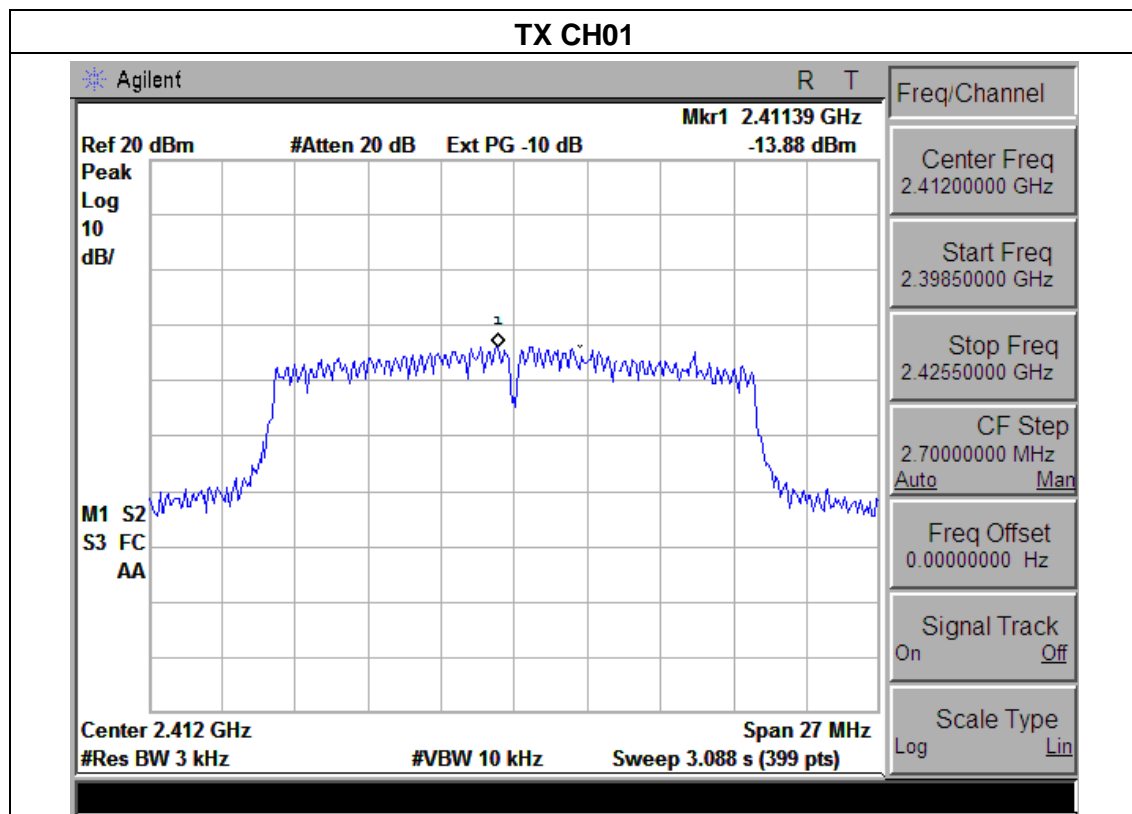


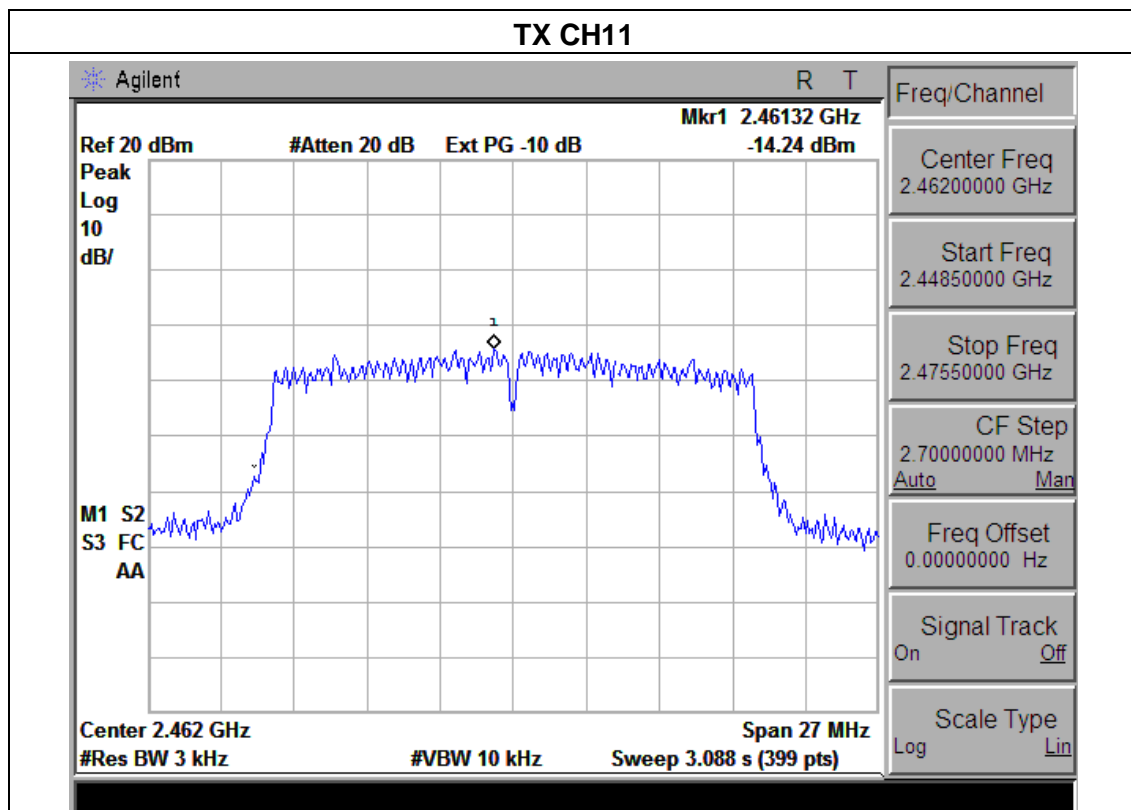
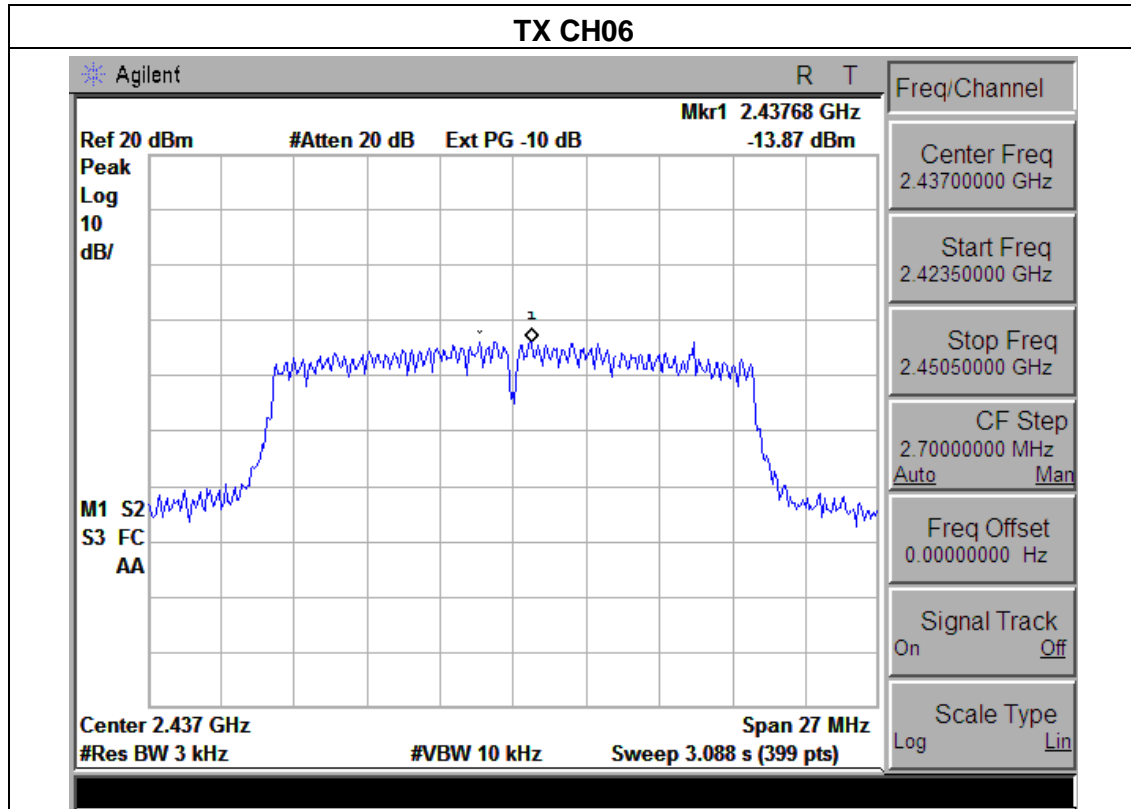




EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	TX n Mode(20M) /CH01, CH06, CH11		

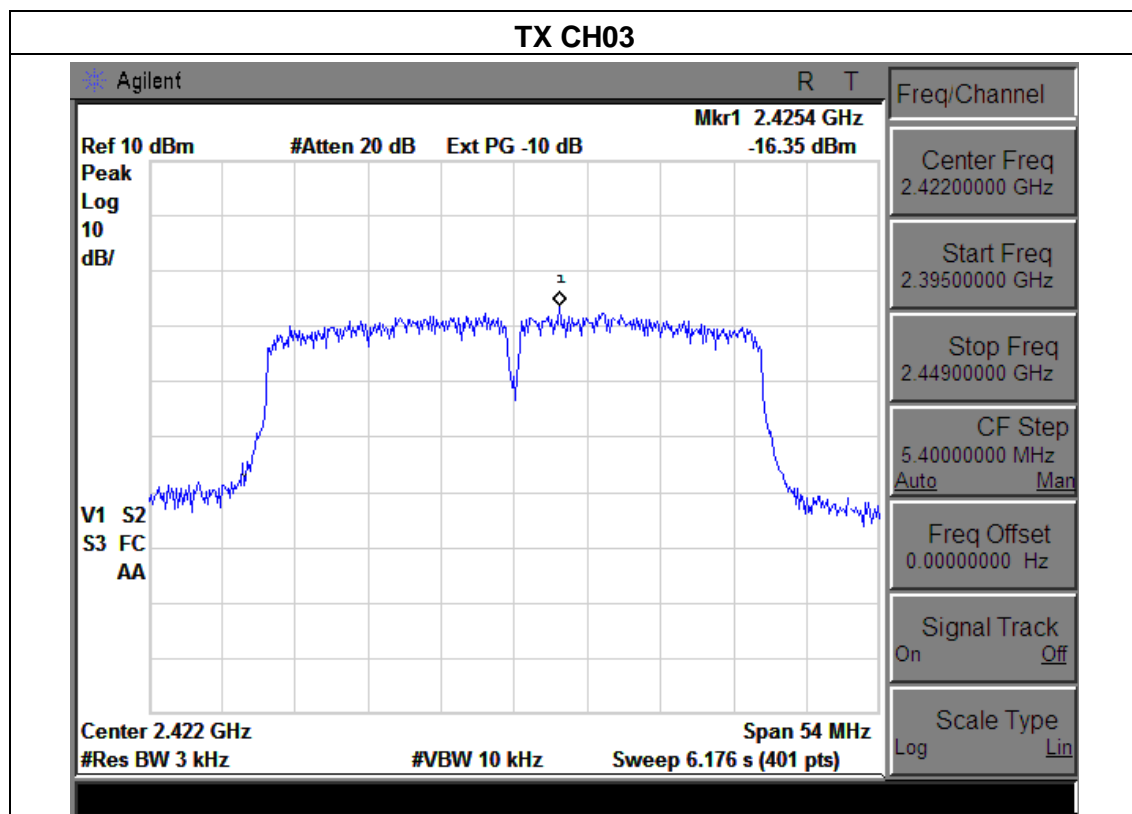
Frequency	Power Density (dBm)	Limit (dBm)	Result
2412 MHz	-13.88	8	<b>PASS</b>
2437 MHz	-13.87	8	<b>PASS</b>
2462 MHz	-14.24	8	<b>PASS</b>

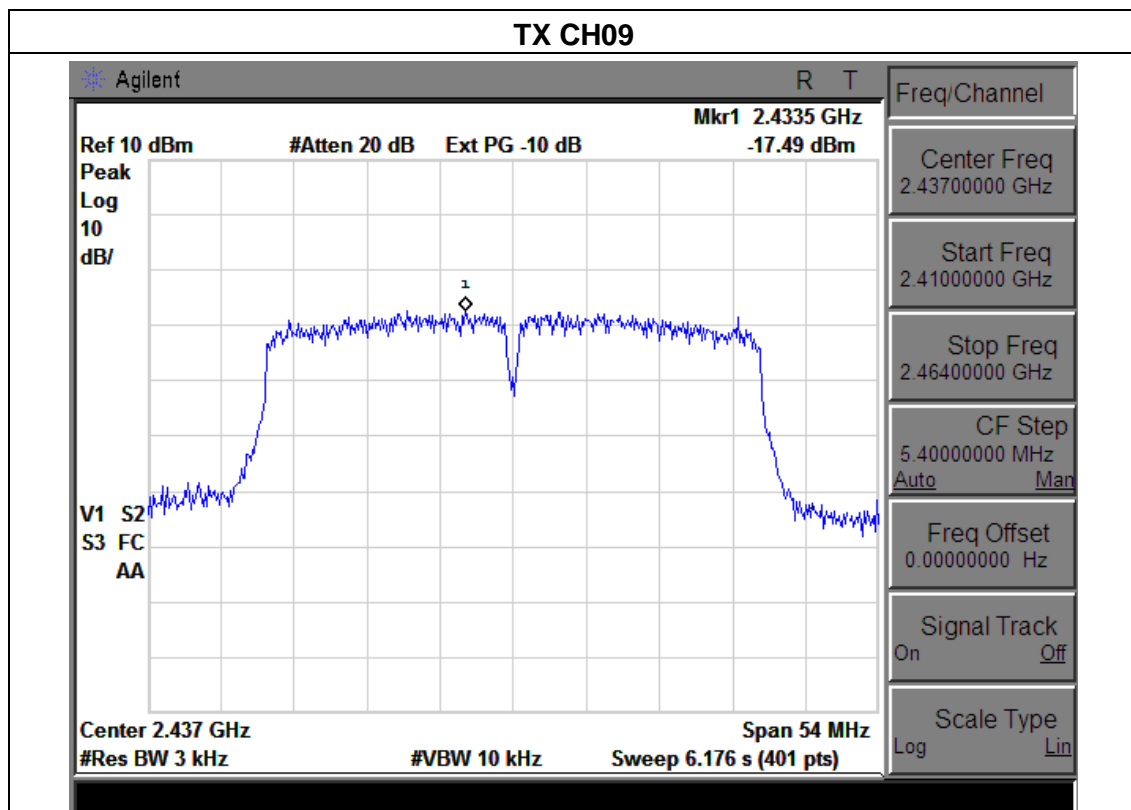
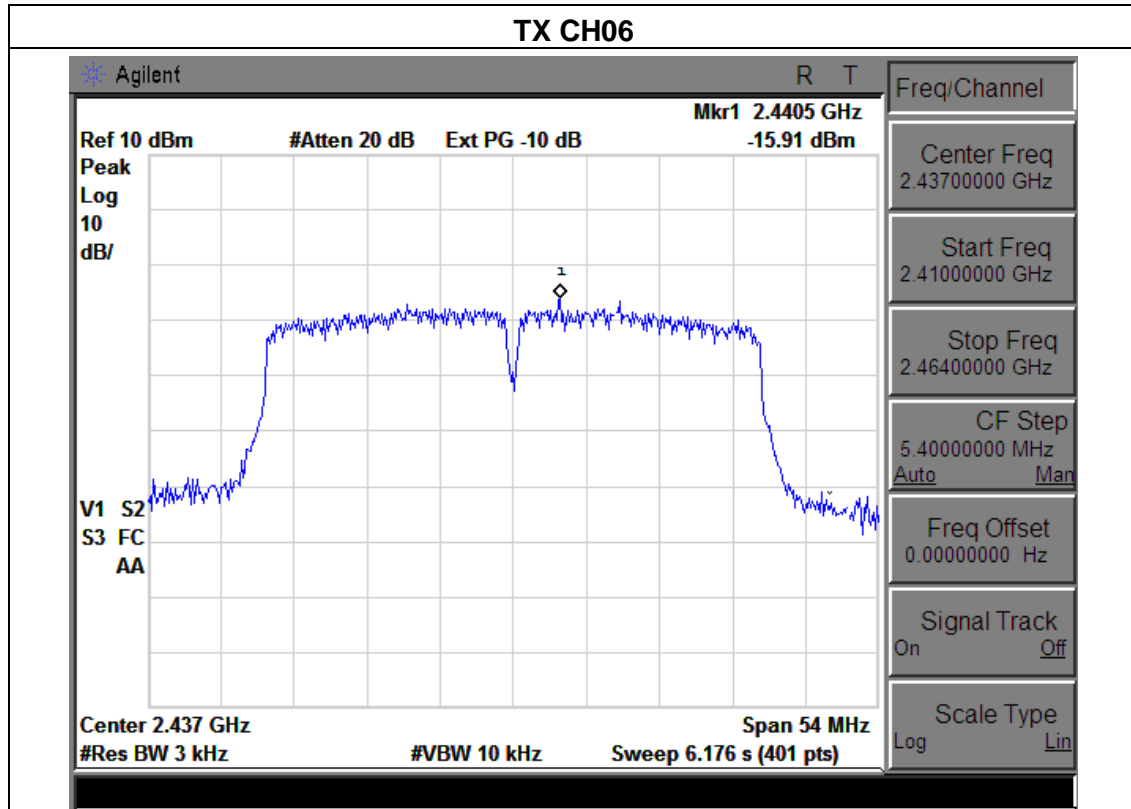




EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	TX n Mode(40M) /CH03, CH06, CH09		

Frequency	Power Density (dBm)	Limit (dBm)	Result
2422 MHz	-16.35	8	PASS
2437 MHz	-15.91	8	PASS
2452 MHz	-17.49	8	PASS





## 5. BANDWIDTH TEST

### 5.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2)	Bandwidth	$\geq 500\text{KHz}$ (6dB bandwidth)	2400-2483.5	PASS

#### 5.1.1 TEST PROCEDURE

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW)  $\geq 3 \times$  RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

#### 5.1.2 DEVIATION FROM STANDARD

No deviation.

#### 5.1.3 TEST SETUP



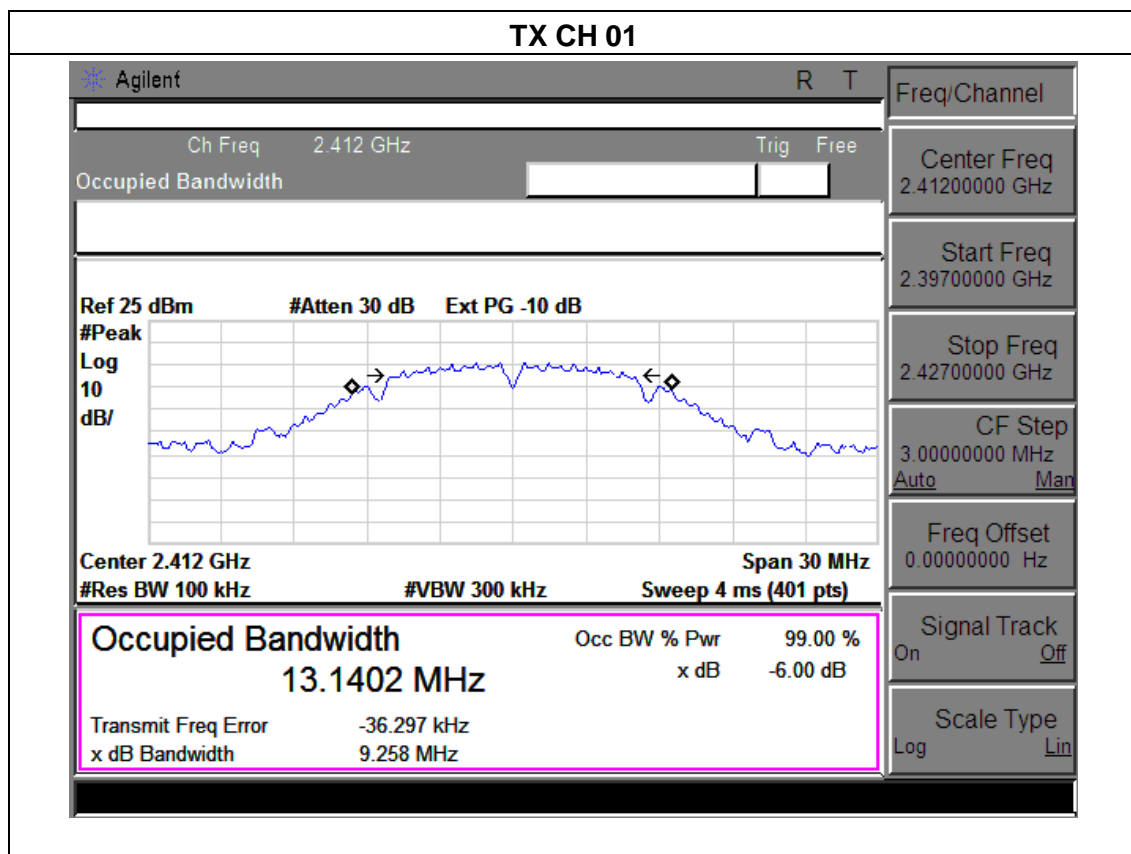
#### 5.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

### 5.1.5 TEST RESULTS

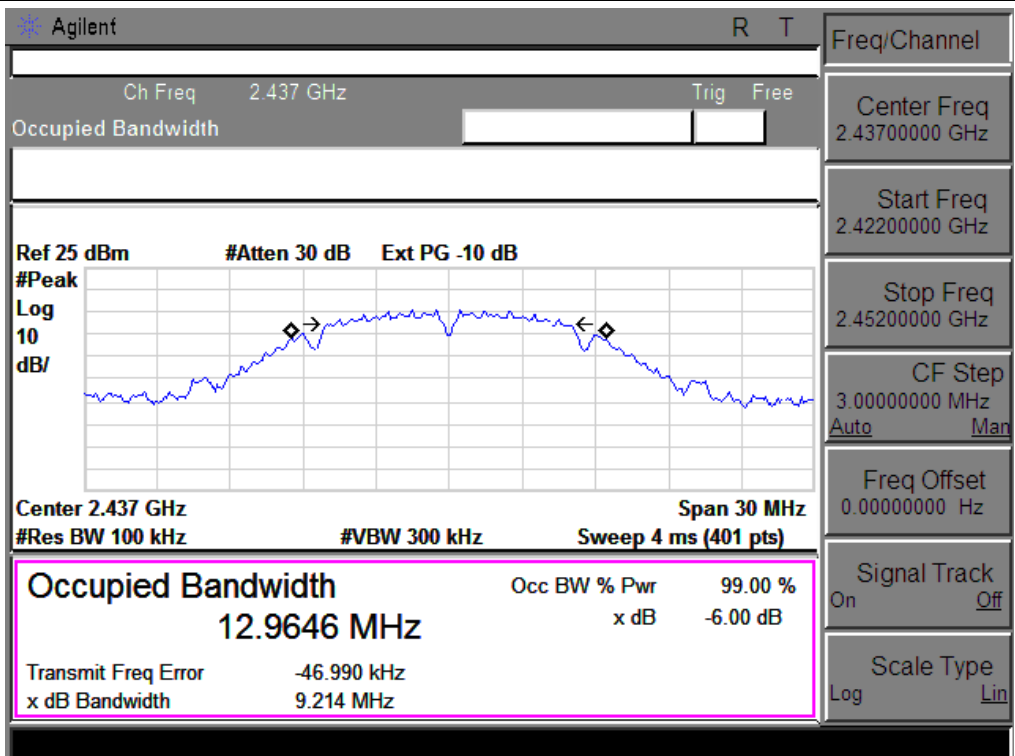
EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	TX b Mode /CH01, CH06, CH11		

Frequency	6dB Bandwidth (MHz)	Channel Separation (MHz)	Result
2412 MHz	9.258	>=500KHz	<b>PASS</b>
2437 MHz	9.214	>=500KHz	<b>PASS</b>
2462 MHz	9.238	>=500KHz	<b>PASS</b>

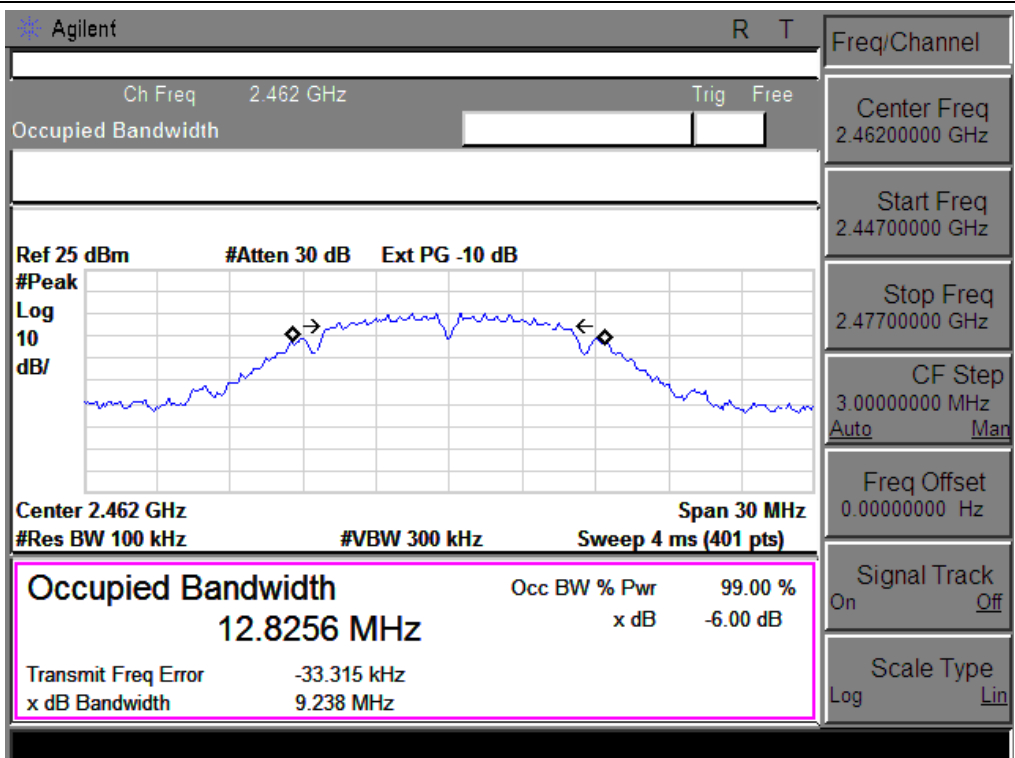




## TX CH 06

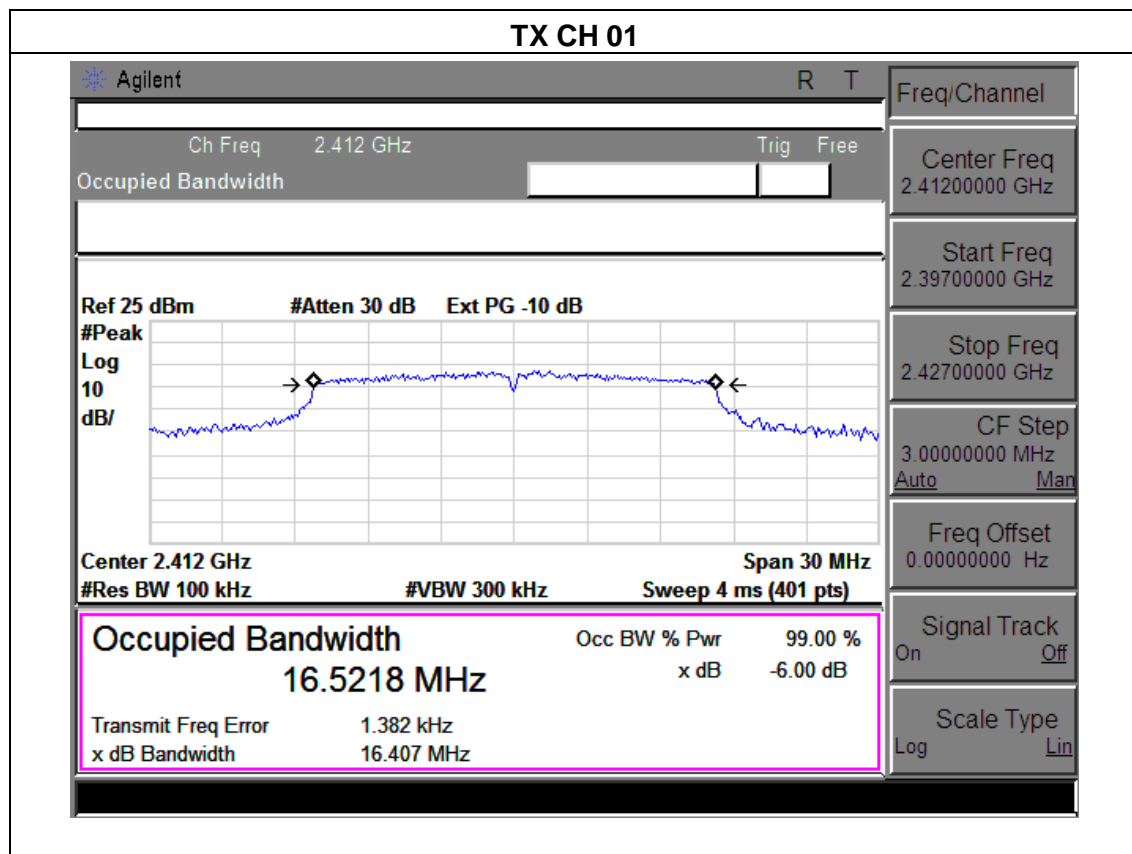


## TX CH 11

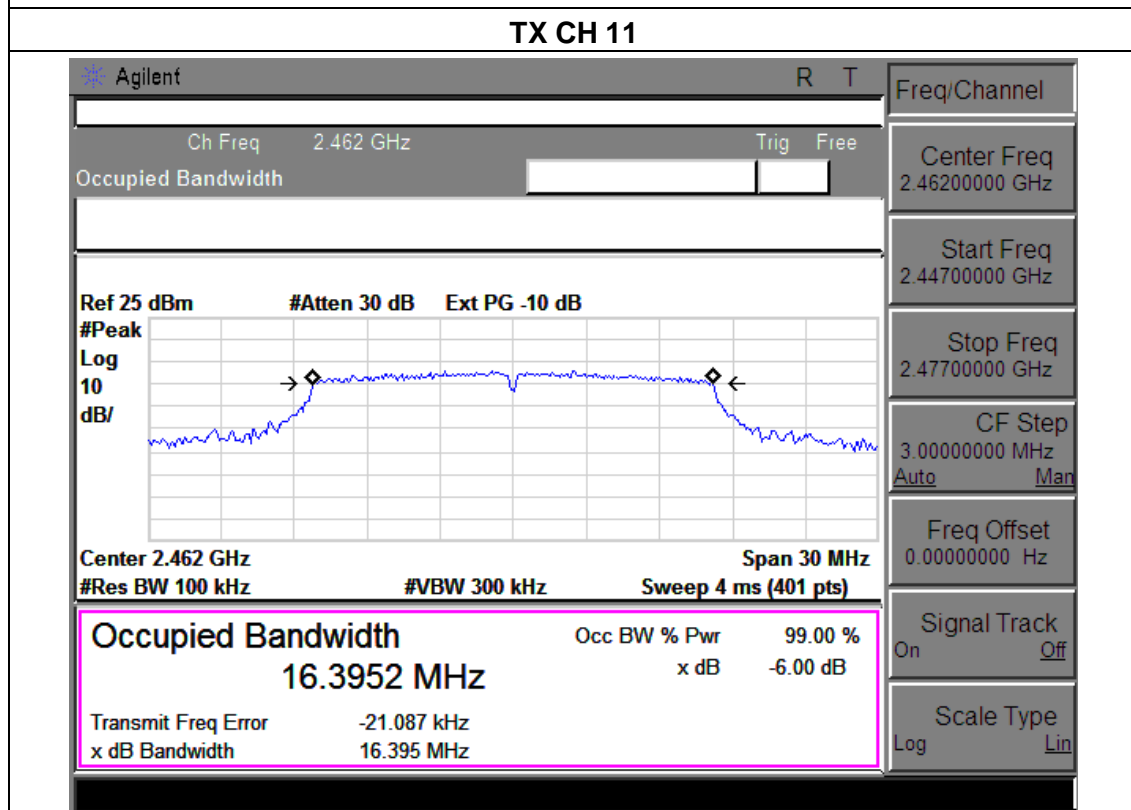
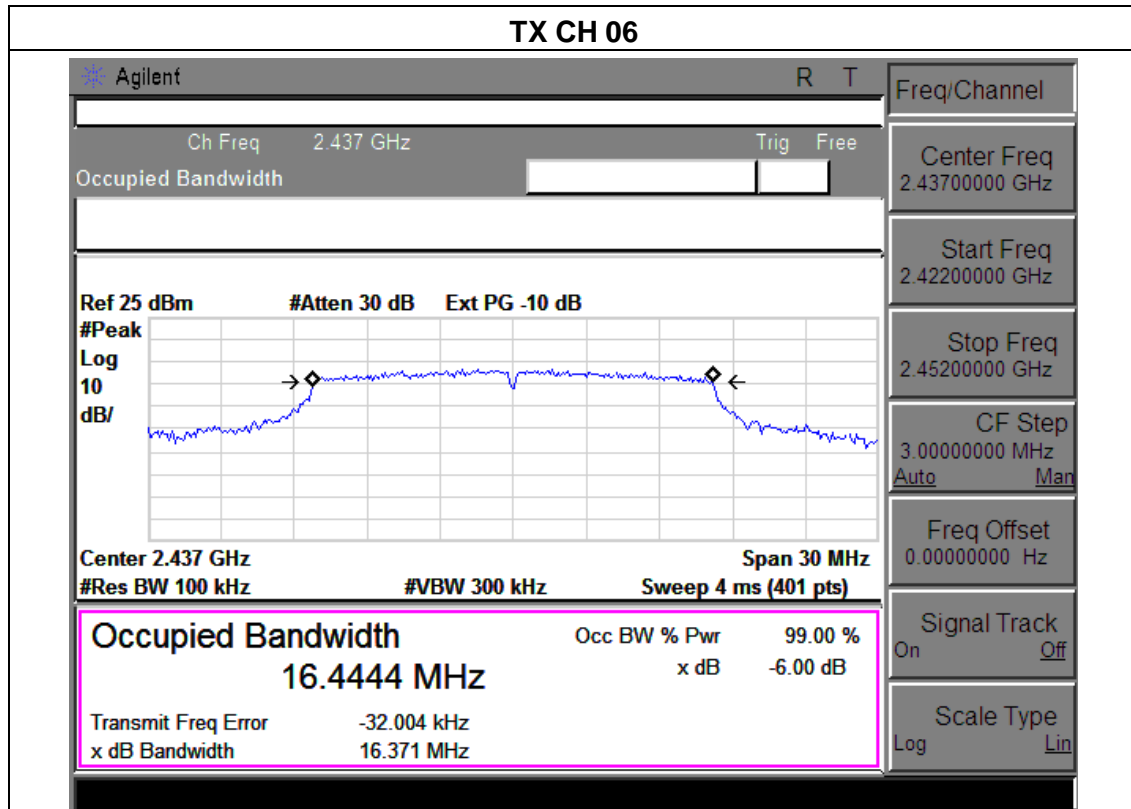


EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	TX g Mode /CH01, CH06, CH11		

Frequency	6dB Bandwidth (MHz)	Channel Separation (MHz)	Result
2412 MHz	16.407	>=500KHz	<b>PASS</b>
2437 MHz	16.371	>=500KHz	<b>PASS</b>
2462 MHz	16.395	>=500KHz	<b>PASS</b>

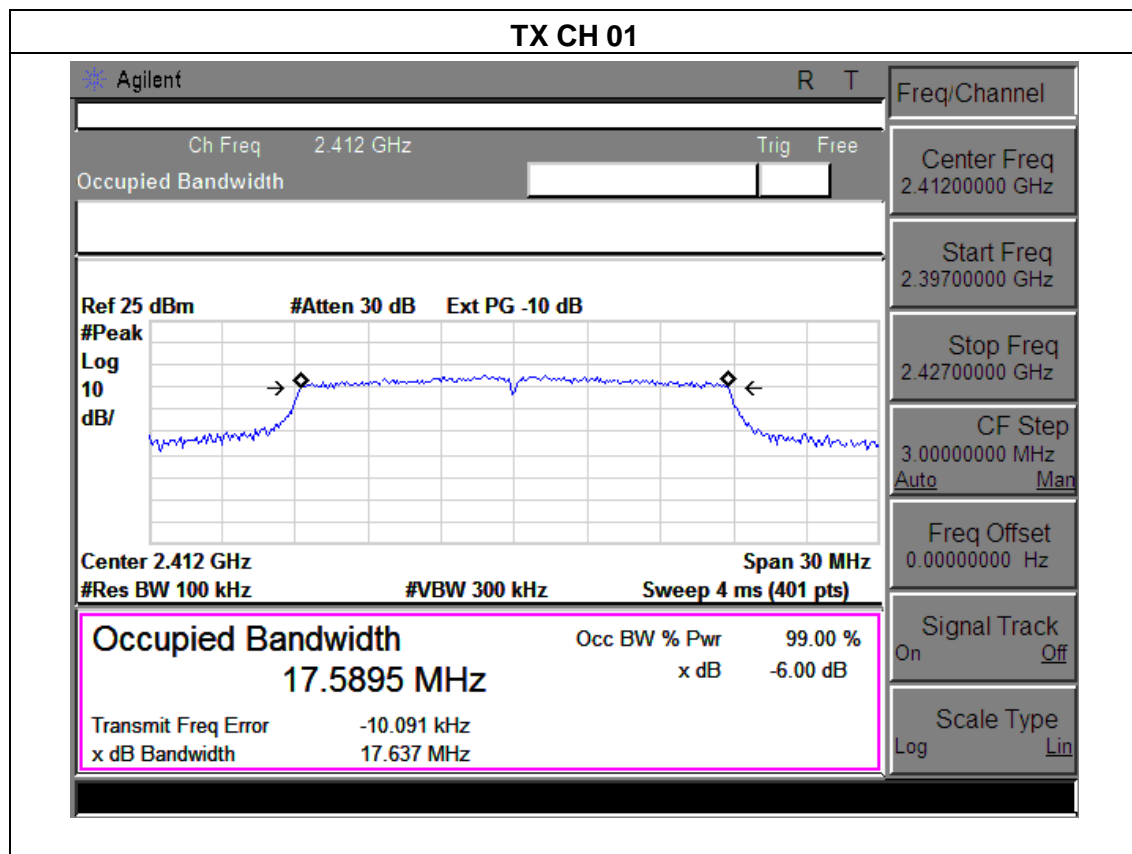


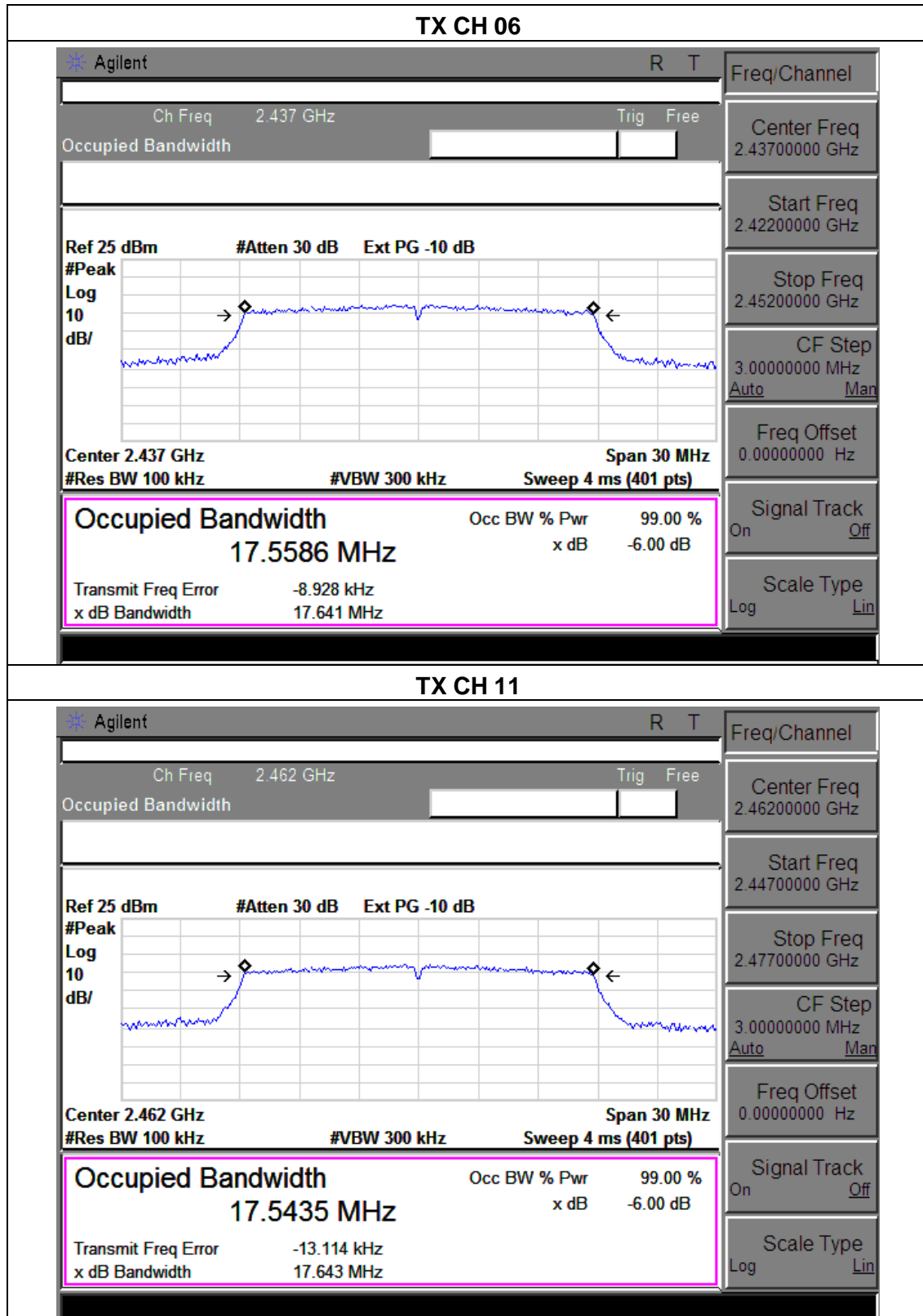




EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	TX n Mode(20M) /CH01, CH06, CH11		

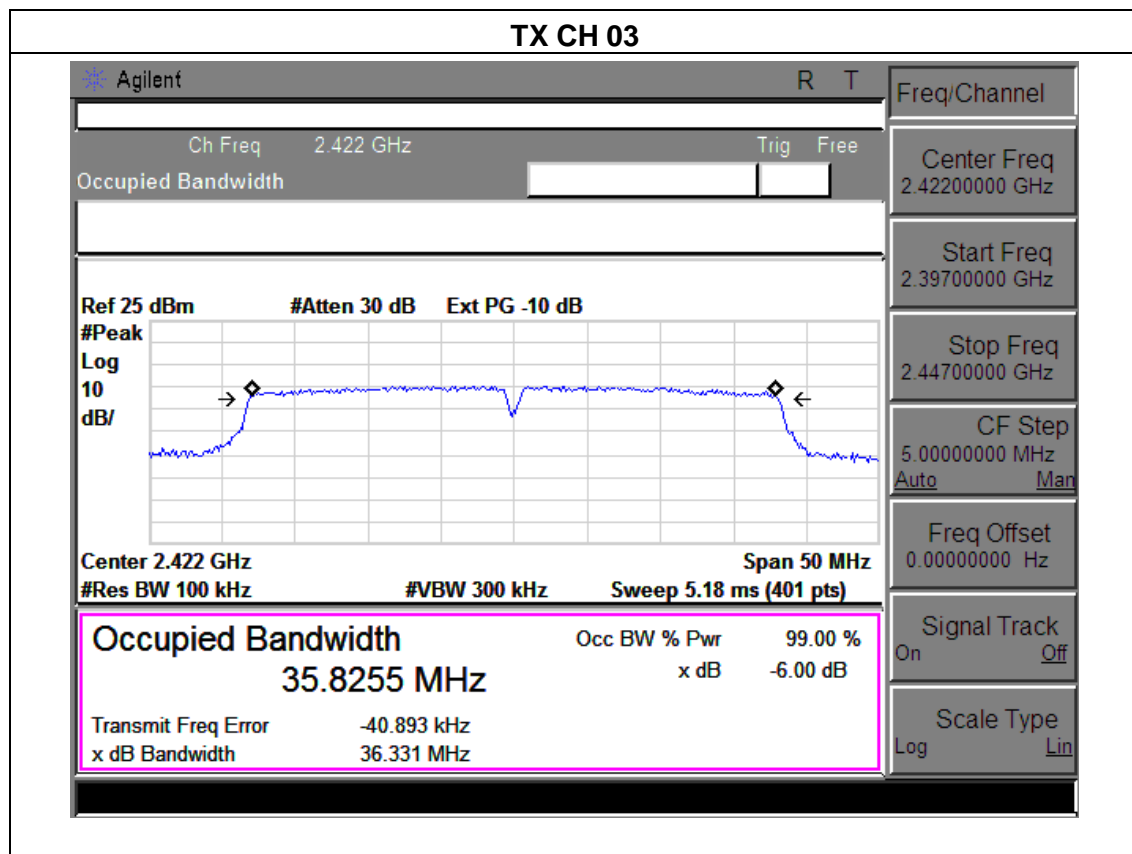
Frequency	6dB Bandwidth (MHz)	Channel Separation (MHz)	Result
2412 MHz	17.637	>=500KHz	<b>PASS</b>
2437 MHz	17.641	>=500KHz	<b>PASS</b>
2462 MHz	17.643	>=500KHz	<b>PASS</b>



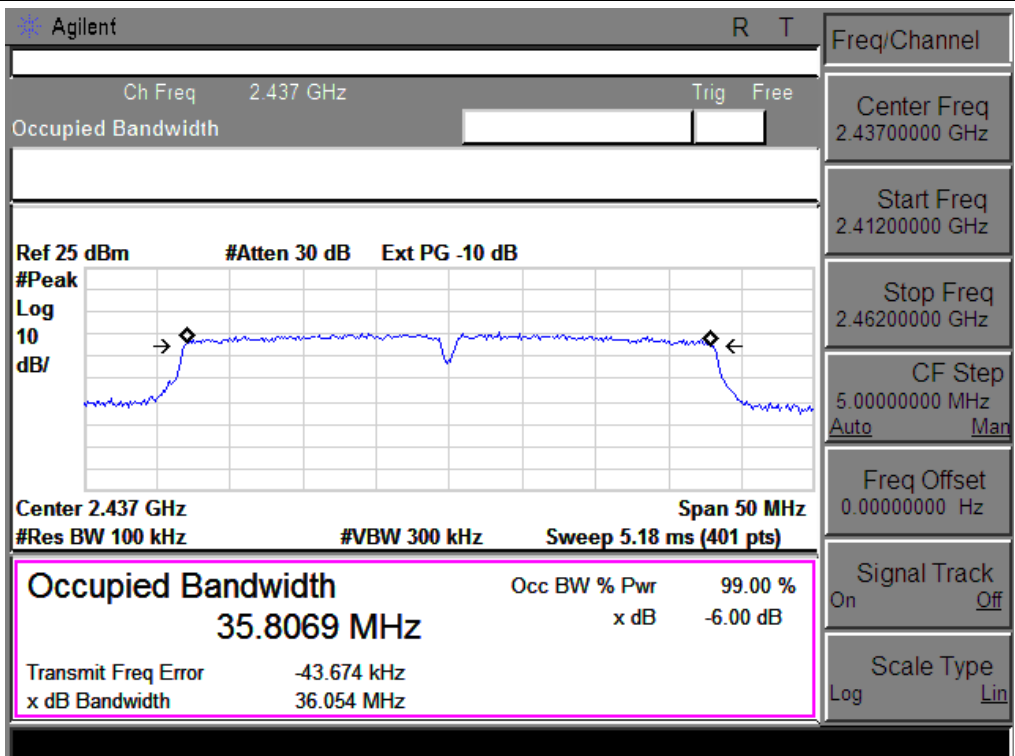


EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	TX n Mode(40M) /CH03, CH06, CH09		

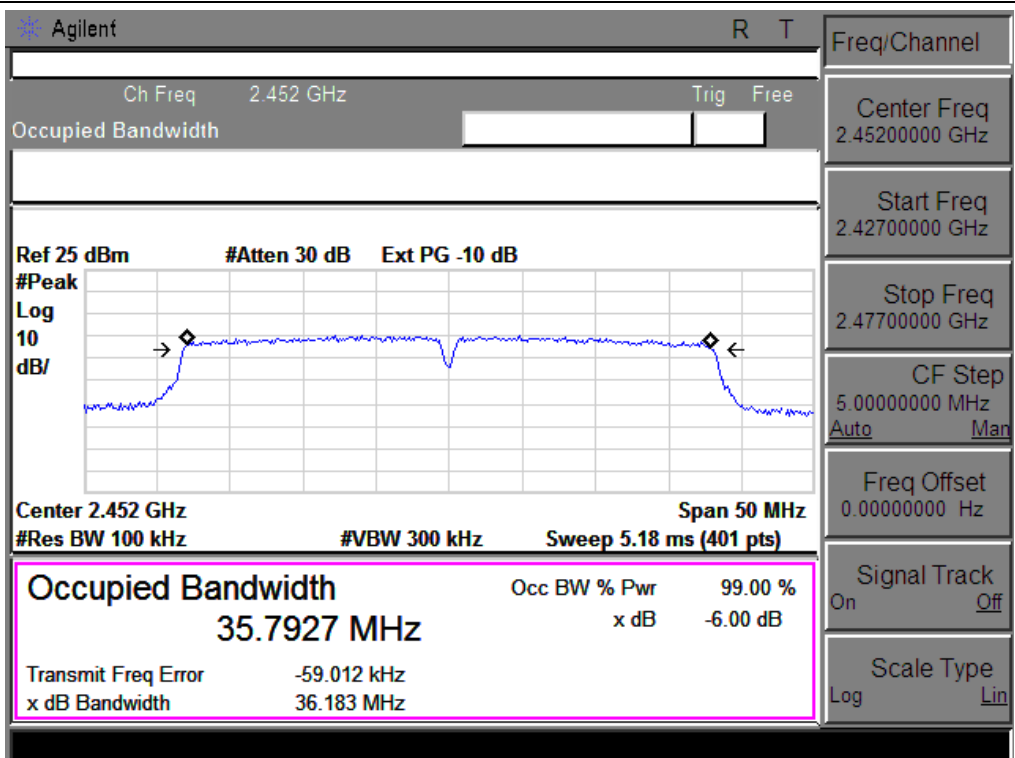
Frequency	6dB Bandwidth (MHz)	Channel Separation (MHz)	Result
2422 MHz	36.331	>=500KHz	<b>PASS</b>
2437 MHz	36.054	>=500KHz	<b>PASS</b>
2452 MHz	36.183	>=500KHz	<b>PASS</b>



### TX CH 06



### TX CH 09



## 6. PEAK OUTPUT POWER TEST

### 6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS

#### 6.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the Power meter

#### 6.1.2 DEVIATION FROM STANDARD

No deviation.

#### 6.1.3 TEST SETUP



#### 6.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

### 6.1.5 TEST RESULTS

EUT :	MorphoBT - Morpho Biometric Terminal	Model Name :	E110B
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5V from Adapter with AC 120V/60Hz
Test Mode :	TX b/g/n(20M,40M) Mode /CH01, CH06, CH11		

TX 802.11b Mode			
Test Channe	Frequency	Peak Conducted Output Power	LIMIT
	(MHz)	(dBm)	dBm
CH01	2412	15.89	30
CH06	2437	15.48	30
CH11	2462	15.25	30
TX 802.11g Mode			
CH01	2412	13.71	30
CH06	2437	13.48	30
CH11	2462	13.51	30
TX 802.11n20 Mode			
CH01	2412	12.21	30
CH06	2437	12.81	30
CH11	2462	12.31	30
TX 802.11n40 Mode			
CH03	2422	12.88	30
CH06	2437	12.21	30
CH09	2452	12.67	30

## **7. ANTENNA REQUIREMENT**

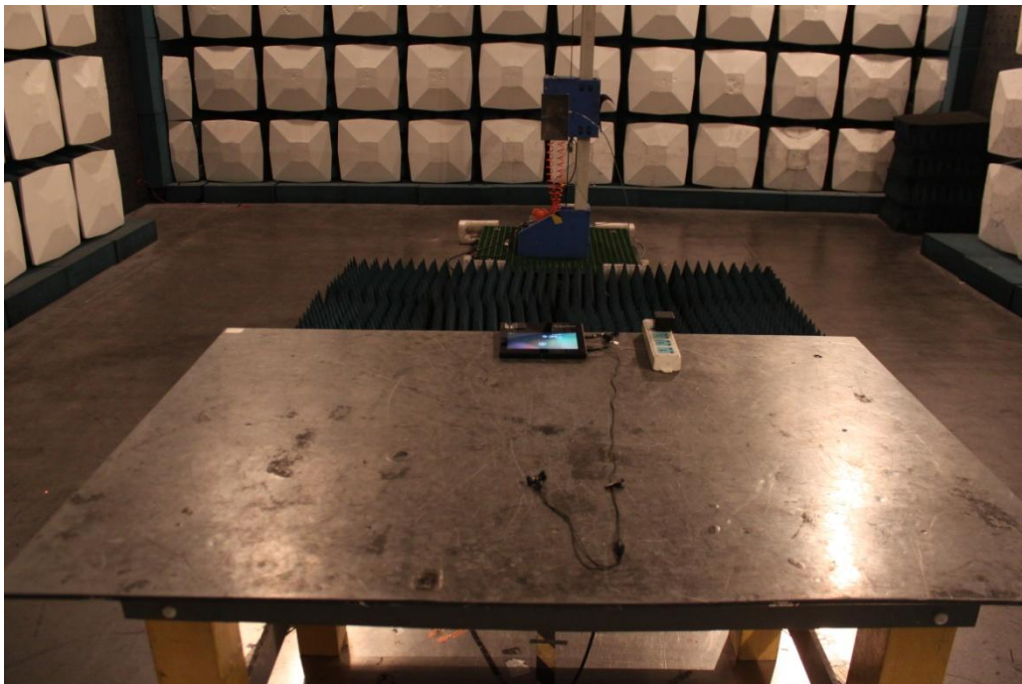
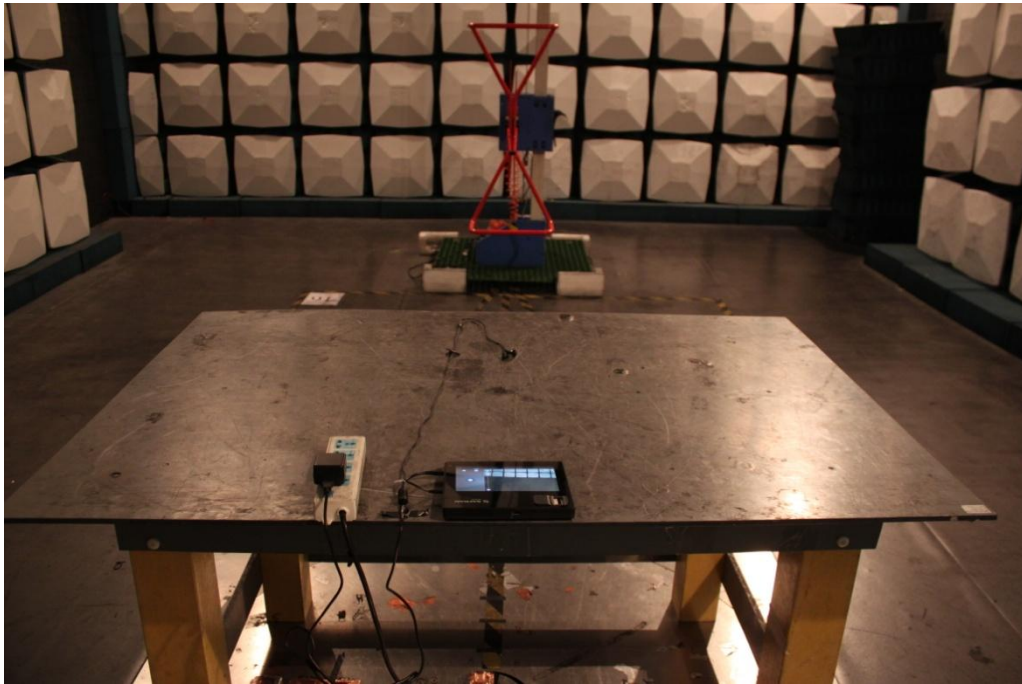
### **7.1 STANDARD REQUIREMENT**

15.203 requirement: For intentional device, 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.

### **7.2 EUT ANTENNA**

The EUT antenna is integral antenna . It comply with the standard requirement.



**8. EUT TEST PHOTO****Radiated Measurement Photos**

### Conducted Measurement Photos

