

# RADIO TEST REPORT

## FCC ID: 2AFNZ-EPL922A

**Product :** Rex Pen

**Trade Mark :** 

**Model Name :** EPL-922A

**Family Model :** N/A

**Report No. :** S19102901205001

### Prepared for

JING MOLD ELECTRONICS TECHNOLOGY(SHENZHEN)CO.,LTD.

Xinqiao,3rd Industrial Estate,Shajing Baoan,Shenzhen,China

### Prepared by

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## TEST RESULT CERTIFICATION

**Applicant's name** ..... : JING MOLD ELECTRONICS  
TECHNOLOGY(SHENZHEN)CO.,LTD.  
**Address** ..... : Xinqiao,3rd Industrial Estate,Shajing Baoan,Shenzhen,China  
**Manufacturer's Name** ..... : JING MOLD ELECTRONICS  
TECHNOLOGY(SHENZHEN)CO.,LTD.  
**Address** ..... : Xinqiao,3rd Industrial Estate,Shajing Baoan,Shenzhen,China

### Product description

**Product name** ..... : Rex Pen  
**Model and/or type reference** : EPL-922A  
**Family Model** : N/A  
**Rating(s)** ..... : DC 3.7V from battery

**Standards** ..... : FCC Part15.249

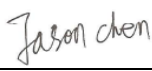
**Test procedure** ..... ANSI C63.10-2013

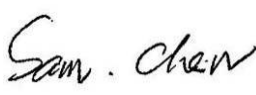
This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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**Date of Test** ..... :  
**Date (s) of performance of tests** ..... : 29 Oct. 2019 ~31 Dec. 2019  
**Date of Issue** ..... : 31 Dec. 2019  
**Test Result** ..... : **Pass**

**Testing Engineer** :   
\_\_\_\_\_  
(Allen Liu)

**Technical Manager** :   
\_\_\_\_\_  
(Jason Chen)

**Authorized Signatory** :   
\_\_\_\_\_  
(Sam Chen)

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## 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15, Subpart C (15.249)			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	Pass	
15.203	Antenna Requirement	Pass	
15.249 15.209	Radiated Spurious Emission	Pass	
15.249(2)	Frequency Tolerance	Pass	
15.249(a)	Fundamental Measurement	Pass	
15.205	Band Edge Emission	Pass	
15.215	Occupied Bandwidth	Pass	

## 1.1 TEST FACILITY

All measurement facilities used to collect the measurement data are located at  
1/F, Building E, Fenda Science Park Sanwei, Xixiang, Bao'an District  
Shenzhen, Guangdong, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

## LABORATORY ACCREDITATIONS AND LISTINGS

### Site Description

CNAS-Lab. : The Laboratory has been assessed and proved to be in compliance with  
CNAS-CL01:2006 (identical to ISO/IEC 17025:2005)  
The Certificate Registration Number is L5516.

IC-Registration : The Certificate Registration Number is 9270A.  
CAB identifier:CN0074

FCC- Accredited : Test Firm Registration Number: 463705.  
Designation Number: CN1184

A2LA-Lab. : The Certificate Registration Number is 4298.01  
This laboratory is accredited in accordance with the recognized  
International Standard ISO/IEC 17025:2005 General requirements for  
the competence of testing and calibration laboratories.  
This accreditation demonstrates technical competence for a defined  
scope and the operation of a laboratory quality management system  
(refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009).

Name of Firm : Shenzhen NTEK Testing Technology Co., Ltd.

Site Location : 1/F, Building E, Fenda Science Park Sanwei, Xixiang, Bao'an District  
Shenzhen, Guangdong, China


## 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	Rex Pen
Trade Mark	
Model Name	EPL-922A
Family Model	N/A
Model Difference	N/A
Product Description	The EUT is a Rex Pen
	Operation Frequency: 2405-2470MHz
	Modulation Type: GFSK
	Antenna Designation: PCB Antenna
	Antenna Gain(Peak) -3.02 dBi
Based on the application, features, or specification exhibited in User's Manual. More details of EUT technical specification, please refer to the User's Manual.	
Channel List	Please refer to the Note 2.
Adapter	N/A
Battery	DC 3.7V, 185mAh
HW Version	YJX-JM-PCB-Ver1.0
SW Version	YJX-JM-JGB- Ver1.0

Note:

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

2.

Channel	Frequency(MHz)
01	2405
02	2413
03	2422
04	2430
05	2440
06	2450
07	2460
08	2470

3.

Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	N/A	N/A	PCB Antenna	N/A	-3.02	Antenna

## 2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible 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	CH01
Mode 2	CH04
Mode 3	CH08
Mode 4	Normal link

For Radiated Spurious Emission	
Pretest Mode	Description
Mode 1	CH01
Mode 2	CH04
Mode 3	CH08

For Conducted Emission	
Final Test Mode	Description
Mode 1	CH01
Mode 2	CH04
Mode 3	CH08
Mode 4	Normal link

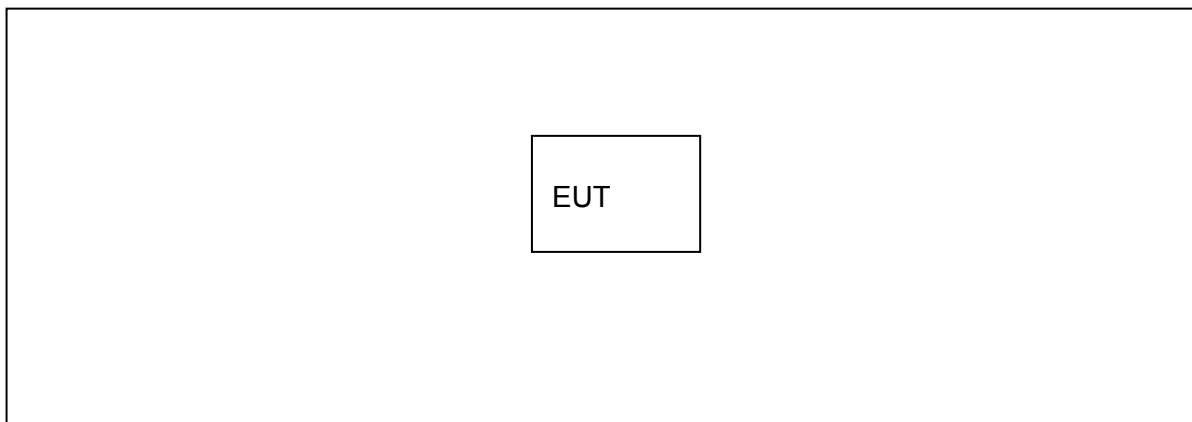
Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) For (BELOW 1000 MHz) radiated test cases, the worst mode Mode 3 was reported only, because this data rate has the highest RF output power at preliminary tests, and no other significantly frequencies found in conducted spurious emission.



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

Radiated Spurious Emission Test



**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

Item	Cable Type	Shielded Type	Ferrite Core	Length	Note

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.

## 2.4 EQUIPMENTS LIST FOR ALL TEST ITEMS

### Radiation& Conducted Test equipment

	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Spectrum Analyzer	Agilent	E4407B	MY45108040	2019.05.13	2020.05.12	1 year
2	Spectrum Analyzer	Agilent	N9020A	MY49100060	2019.08.28	2020.08.27	1 year
3	Spectrum Analyzer	R&S	FSV40	101417	2019.08.28	2020.08.27	1 year
4	Test Receiver	R&S	ESPI7	101318	2019.05.13	2020.05.12	1 year
5	Bilog Antenna	TESEQ	CBL6111D	31216	2019.04.15	2020.04.14	1 year
6	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2018.05.19	2020.05.18	2 year
7	Horn Antenna	EM	EM-AH-10180	2011071402	2019.04.15	2020.04.14	1 year
8	Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	803	2019.04.15	2020.04.14	1 year
9	Amplifier	EMC	EMC051835SE	980246	2019.08.06	2020.08.05	1 year
10	Active Loop Antenna	SCHWARZBECK	FMZB 1519B	055	2019.04.15	2020.04.14	1 year
11	Power Meter	DARE	RPR3006W	15100041SN084	2019.08.06	2020.08.05	1 year
12	Test Cable (9KHz-30MHz)	N/A	R-01	N/A	2017.04.21	2020.04.20	3 year
13	Test Cable (30MHz-1GHz)	N/A	R-02	N/A	2017.04.21	2020.04.20	3 year
14	High Test Cable(1G-40GHz)	N/A	R-03	N/A	2017.04.21	2020.04.20	3 year
15	High Test Cable(1G-40GHz)	N/A	R-04	N/A	2017.04.21	2020.04.20	3 year
16	Filter	TRILTHIC	2400MHz	29	2017.04.19	2020.04.18	3 year
17	temporary antenna connector (Note)	NTS	R001	N/A	N/A	N/A	N/A

**Note:**

We will use the temporary antenna connector (soldered on the PCB board) When conducted test  
And this temporary antenna connector is listed within the instrument list

### 3. ANTENNA REQUIREMENT

#### 3.1 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.

#### 3.2 EUT ANTENNA

The EUT antenna is permanent attached PCB antenna (Gain:-3.02dBi). It comply with the standard requirement.

### 3.3 CONDUCTED EMISSION MEASUREMENT

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

Frequency(MHz)	Conducted Emission Limit	
	Quasi-peak	Average
0.15-0.5	66-56*	56-46*
0.5-5.0	56	46
5.0-30.0	60	50

Note: 1. \*Decreases with the logarithm of the frequency  
 2. The lower limit shall apply at the transition frequencies  
 3. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

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

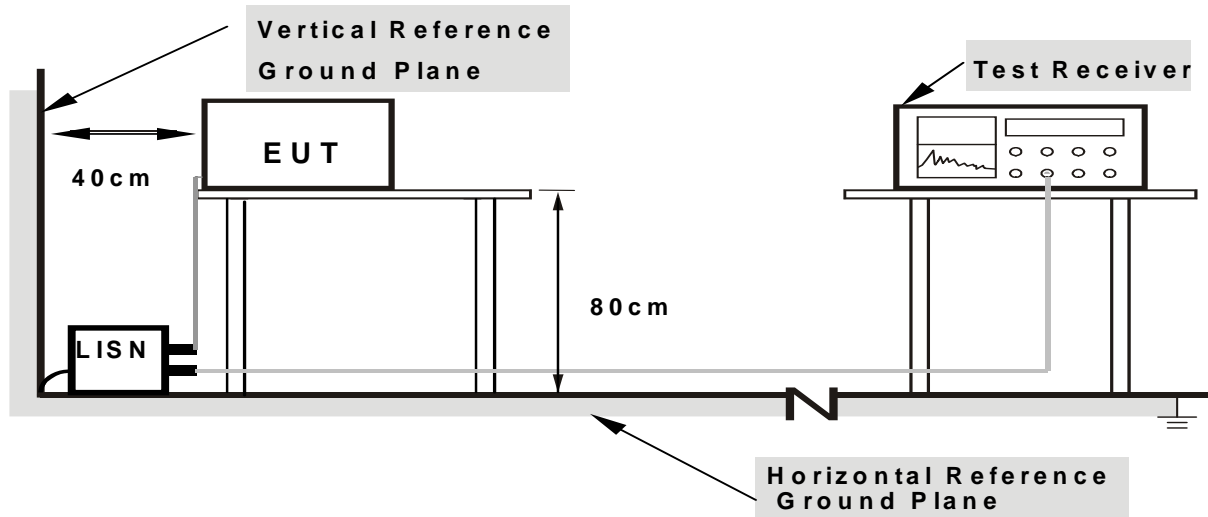
**3.3.2 TEST PROCEDURE**

- a. 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.
- b. 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.
- c. 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.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

**3.3.3 DEVIATION FROM TEST STANDARD**

No deviation

**3.3.4 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

**3.2.5 TEST RESULT**

EUT :	Rex Pen	Model Name. :	EPL-922A
Temperature :	25 °C	Relative Humidity :	55%
Pressure :	1010hPa	Phase :	L
Test Voltage :	N/A	Test Mode :	N/A

Note: this product is battery powered and not suitable for AC terminal conduction test

### 3.4 RADIATED EMISSION MEASUREMENT

#### 3.4.1 Radiated Emission Limits ( FCC 15.209 )

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
Frequency (MHz)	Limit (dBuV)	
30~88	40	3
88~216	43.5	3
216~960	46	3
960 -10000	54.00	3
*902 - 928	94.00	3

Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission level (dBuV/m)=20log Emission level (uV/m).
- (3) \*Note: This is the limit for the fundamental frequency.

#### LIMITS OF RADIATED EMISSION MEASUREMENT ( FCC 15.249)

Frequency of Emission (MHz)	Field Strength of fundamental ((millivolts /meter)	Field Strength of Harmonics (microvolts/meter)
2400-2483.5	50	500

Notes:

- (1) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

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

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



### 3.4.2 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 m for below 1GHz and 1.5m for above 1GHz the ground at a 3 meter. 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 for below 1GHz and 1.5m for above 1GHz; 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.

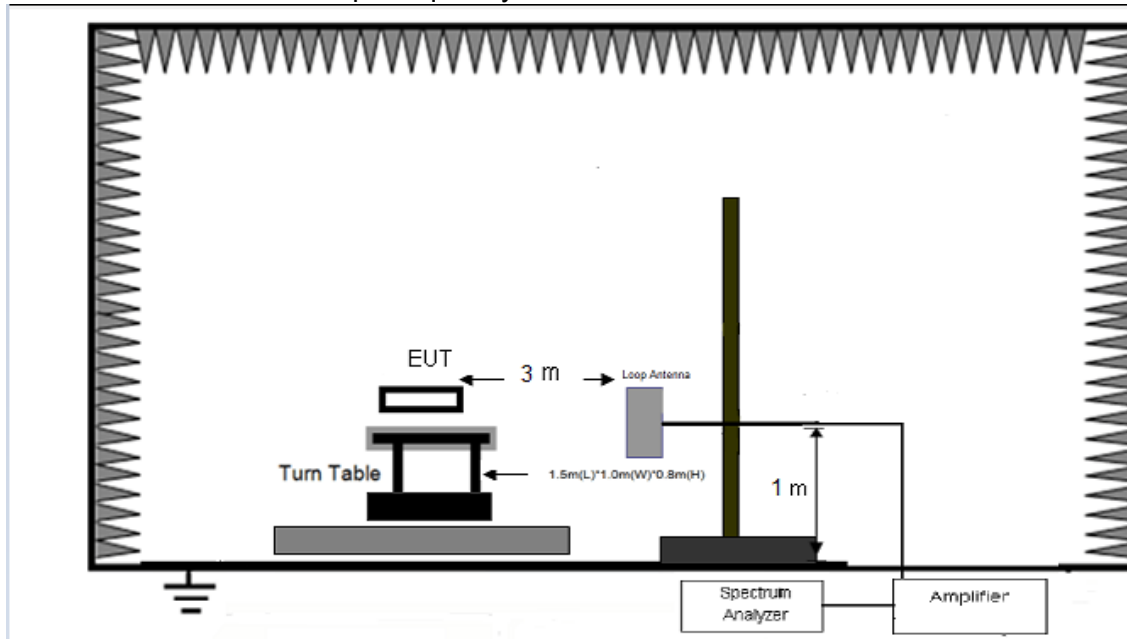
Note:

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

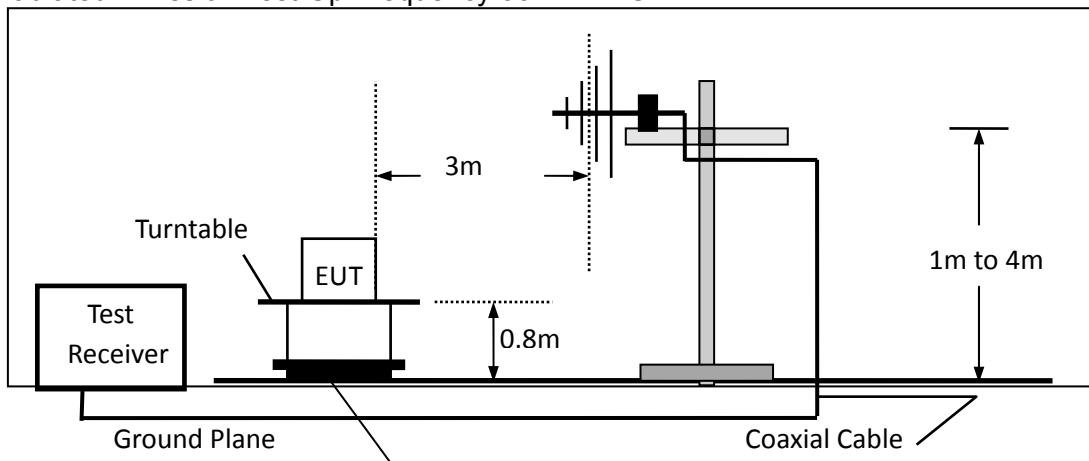
### 3.4.3 DEVIATION FROM TEST STANDARD

No deviation

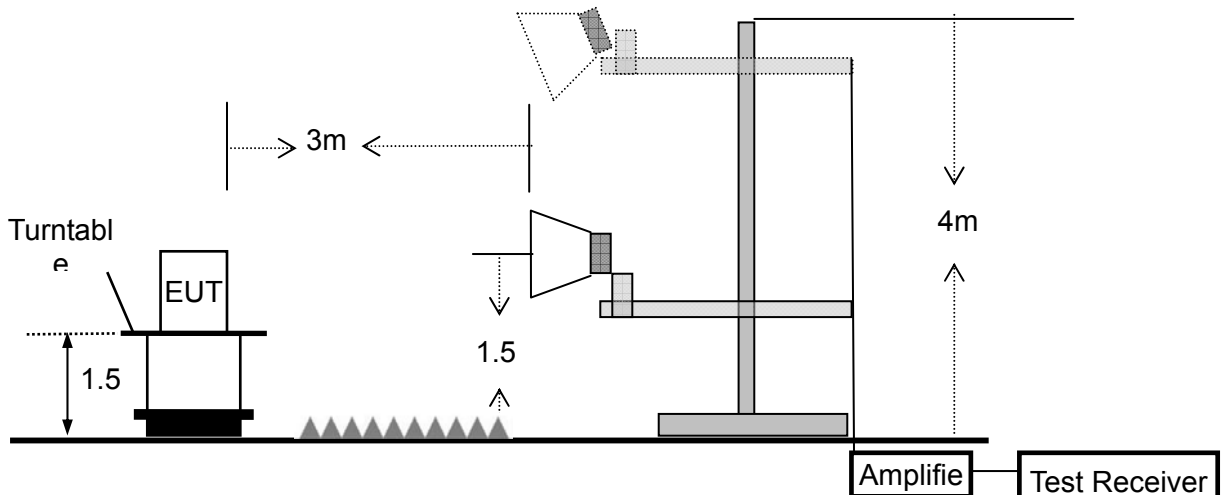
(A) Radiated Emission Test-Up Frequency Below 30MHz



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



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



### 3.4.4 TEST RESULTS (BELOW 30MHz)

EUT :	Rex Pen	Model Name. :	EPL-922A
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V from battery
Test Mode :	TX	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 =  $20 \log(\text{specific distance}/\text{test distance})$ (dB);

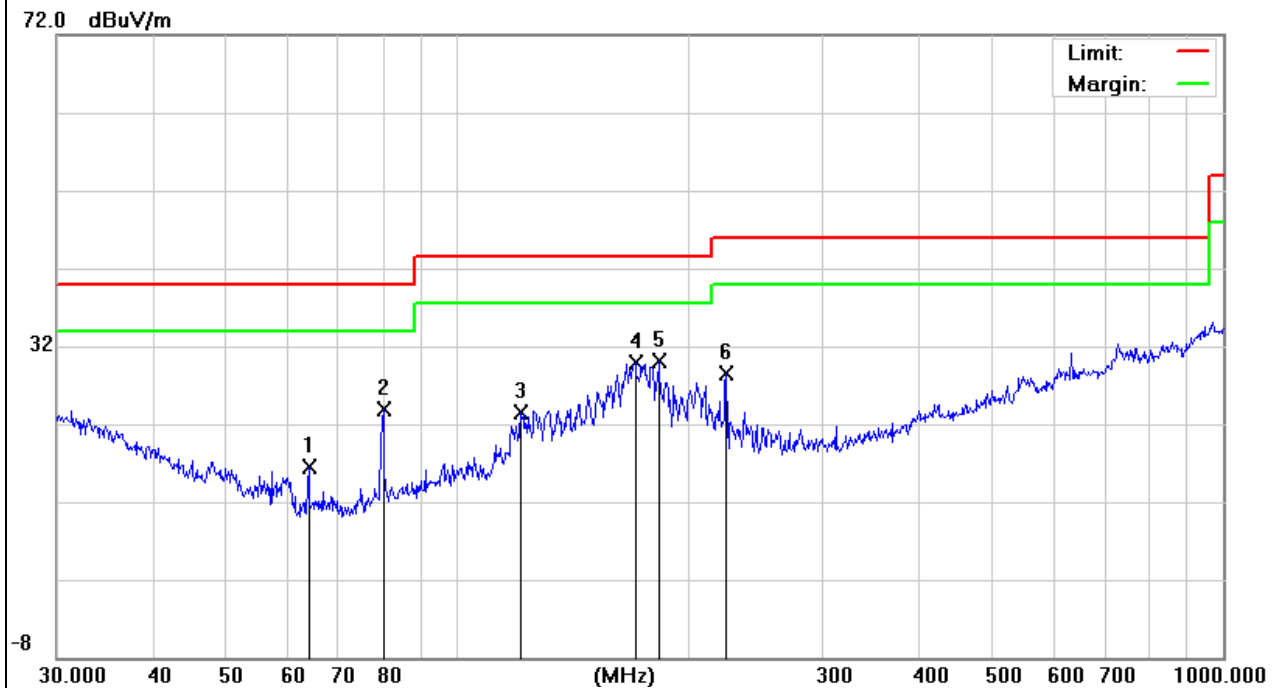
Limit line = specific limits(dBuv) + distance extrapolation factor.

**3.4.5 TEST RESULTS (BELOW 1000 MHz)**

EUT :	Rex Pen	Model Name :	EPL-922A
Temperature :	25 °C	Relative Humidity :	51%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V from battery
Test Mode :	Model 3	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBµV)	Factor (dB)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Detector Type
63.9827	10.44	6.01	16.45	40.00	-23.55	QP
80.0806	15.81	8.10	23.91	40.00	-16.09	QP
121.1230	11.20	12.34	23.54	43.50	-19.96	QP
170.7925	19.58	10.32	29.90	43.50	-13.60	QP
183.2005	20.46	9.61	30.07	43.50	-13.43	QP
224.5193	17.83	10.72	28.55	46.00	-17.45	QP

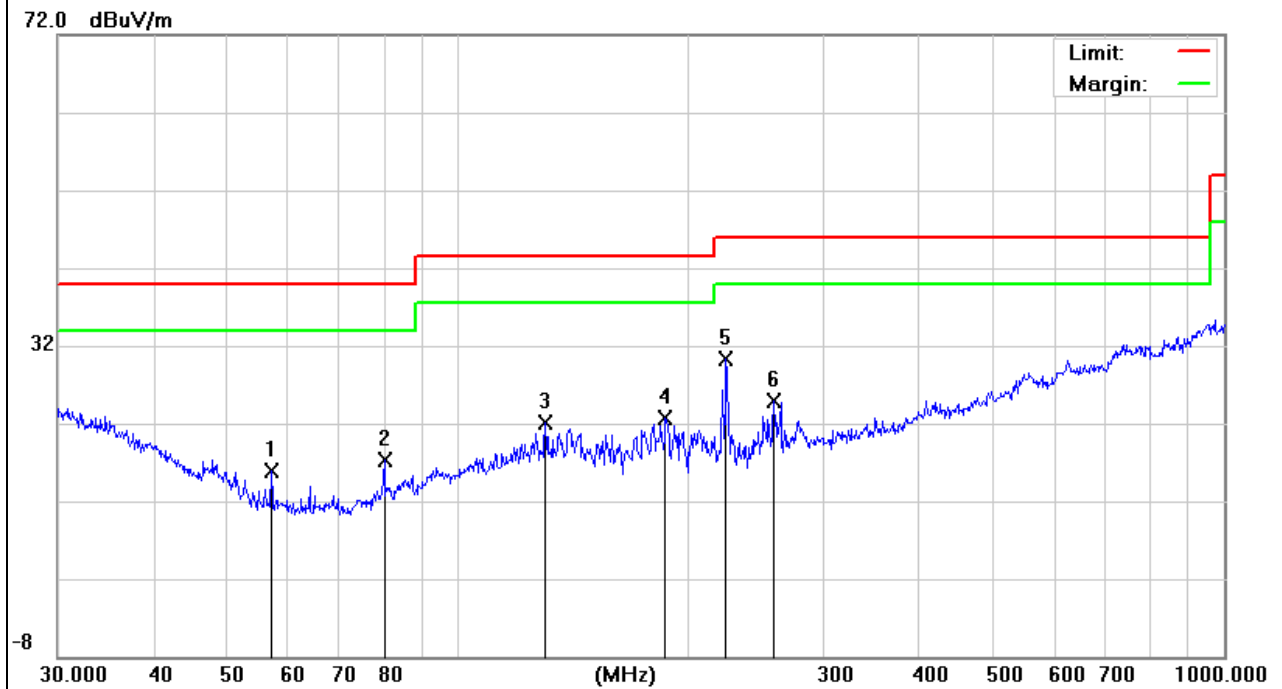
Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.  
Factor Including Cable loss and antenna coefficient



EUT :	Rex Pen	Model Name :	EPL-922A
Temperature :	25 °C	Relative Humidity :	51%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V from battery
Test Mode :	Model 3	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
56.9911	9.57	6.37	15.94	40.00	-24.06	QP
80.0806	9.25	8.10	17.35	40.00	-22.65	QP
129.9226	9.48	12.57	22.05	43.50	-21.45	QP
186.4408	13.24	9.40	22.64	43.50	-20.86	QP
223.7334	19.61	10.74	30.35	46.00	-15.65	QP
258.3264	10.37	14.62	24.99	46.00	-21.01	QP

Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.  
Factor Including Cable loss and antenna coefficient

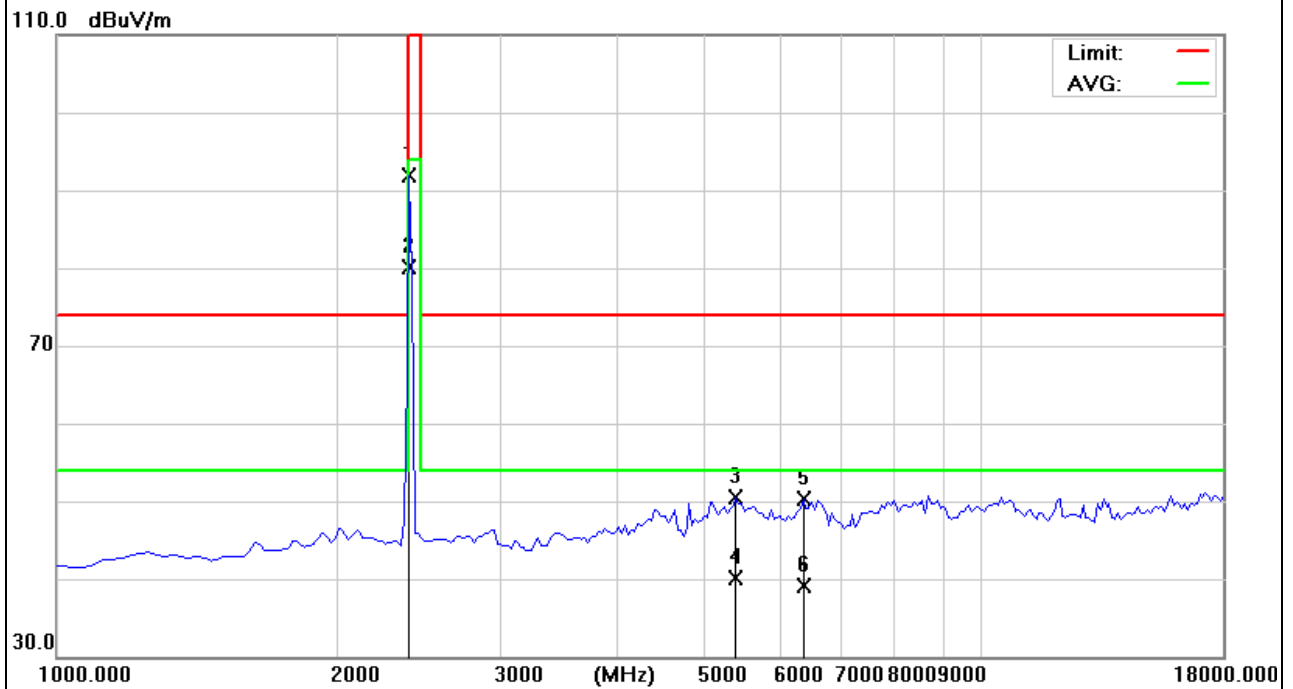


**3.4.6 TEST RESULTS (ABOVE 1000 MHZ)**

EUT :	Rex Pen	Model Name :	EPL-922A
Temperature :	25 °C	Relative Humidity :	51%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V from battery
Test Mode :	Model 1	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2402.500	87.36	4.53	91.89	114.0	-22.11	peak
2402.500	75.49	4.53	80.02	94.00	-13.98	AVG
5420.000	37.23	13.21	50.44	74.00	-23.56	peak
5420	26.91	13.21	40.12	54.00	-13.88	AVG
6397.500	35.61	14.79	50.40	74.00	-23.60	peak
6397.500	24.23	14.79	39.02	54.00	-14.98	AVG

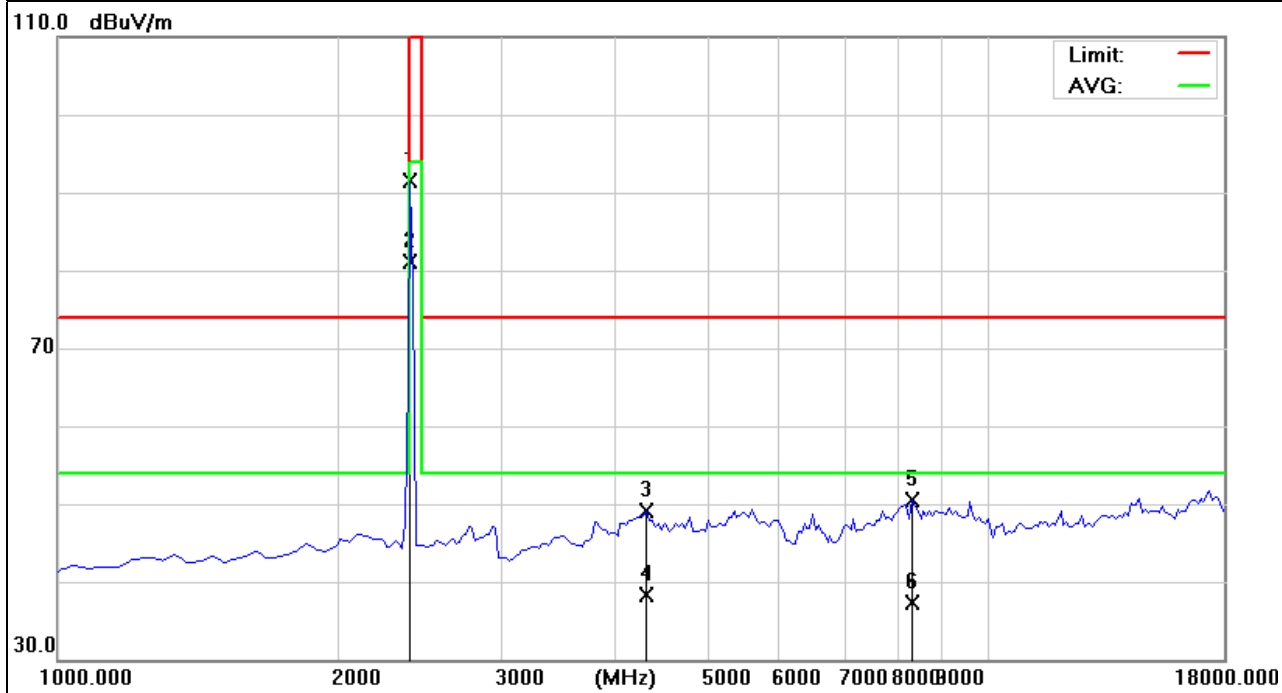
Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.  
No emission above 18GHz.



EUT :	Rex Pen	Model Name :	EPL-922A
Temperature :	25 °C	Relative Humidity :	51%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V from battery
Test Mode :	Model 1	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2402.500	86.88	4.53	91.41	114.0	-22.59	peak
2402.5	76.49	4.53	81.02	94.00	-12.98	AVG
4315.000	37.41	11.77	49.18	74.00	-24.82	peak
4315.000	26.59	11.77	38.36	54.00	-15.64	AVG
8352.500	32.03	18.44	50.47	74.00	-23.53	peak
8352.500	18.81	18.44	37.25	54.00	-16.75	AVG

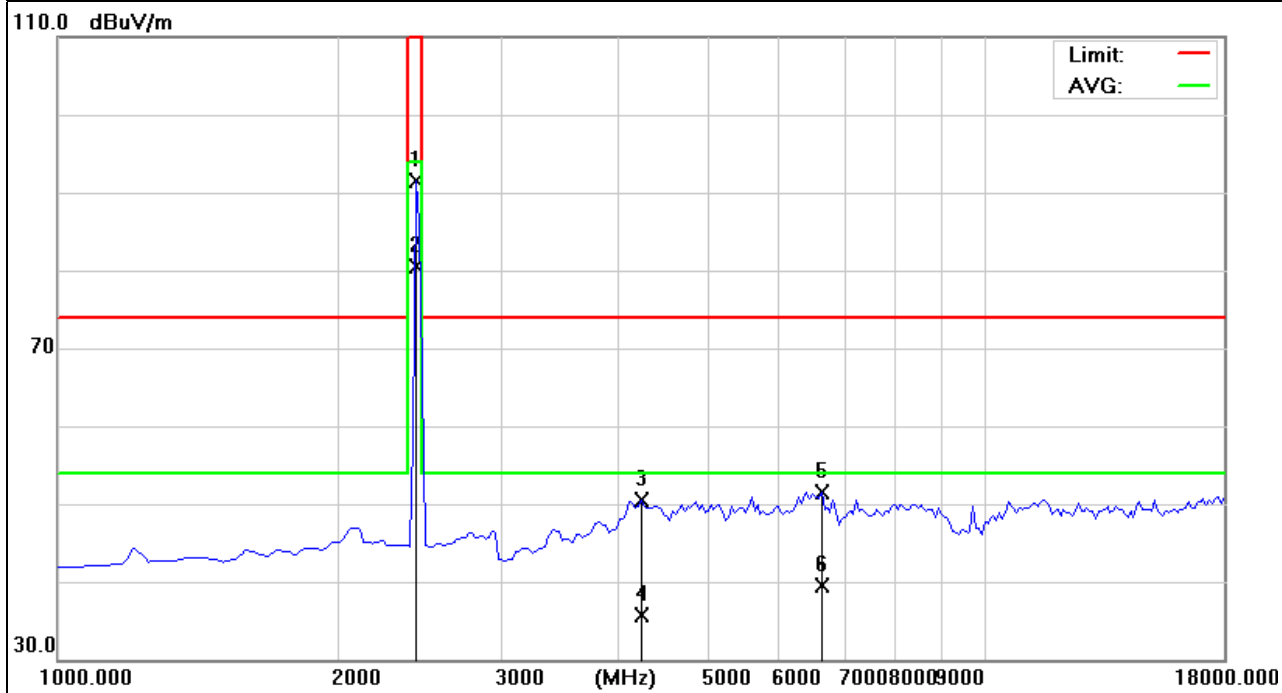
Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.  
No emission above 18GHz.



EUT :	Rex Pen	Model Name :	EPL-922A
Temperature :	25 °C	Relative Humidity :	51%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V from battery
Test Mode :	Model 2	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2445.000	86.79	4.66	91.45	114.0	-22.55	peak
2445.000	75.93	4.66	80.59	94.00	-13.41	AVG
4272.500	38.86	11.55	50.41	74.00	-23.59	peak
4272.500	24.11	11.55	35.66	54.00	-18.34	AVG
6652.500	35.94	15.65	51.59	74.00	-22.41	peak
6652.500	23.80	15.65	39.45	54.00	-14.55	AVG

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

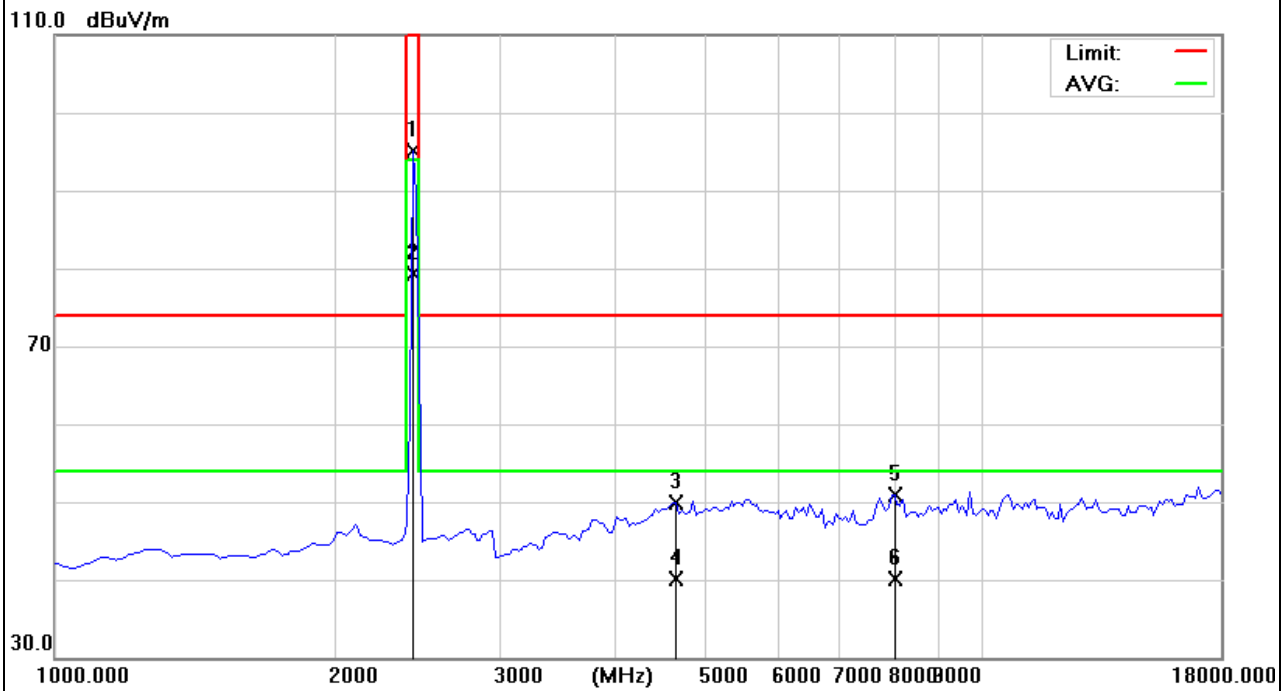




EUT :	Rex Pen	Model Name :	EPL-922A
Temperature :	25 °C	Relative Humidity :	51%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V from battery
Test Mode :	Model 2	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2445.000	90.54	4.66	95.20	114.0	-18.80	peak
2445.000	74.67	4.66	79.33	94.00	-14.67	AVG
4660.501	37.46	12.45	49.91	74.00	-24.09	peak
4660.501	27.57	12.45	40.02	54.00	-13.98	AVG
8055.000	33.05	17.87	50.92	74.00	-23.08	peak
8055	22.28	17.87	40.15	54.00	-13.85	AVG

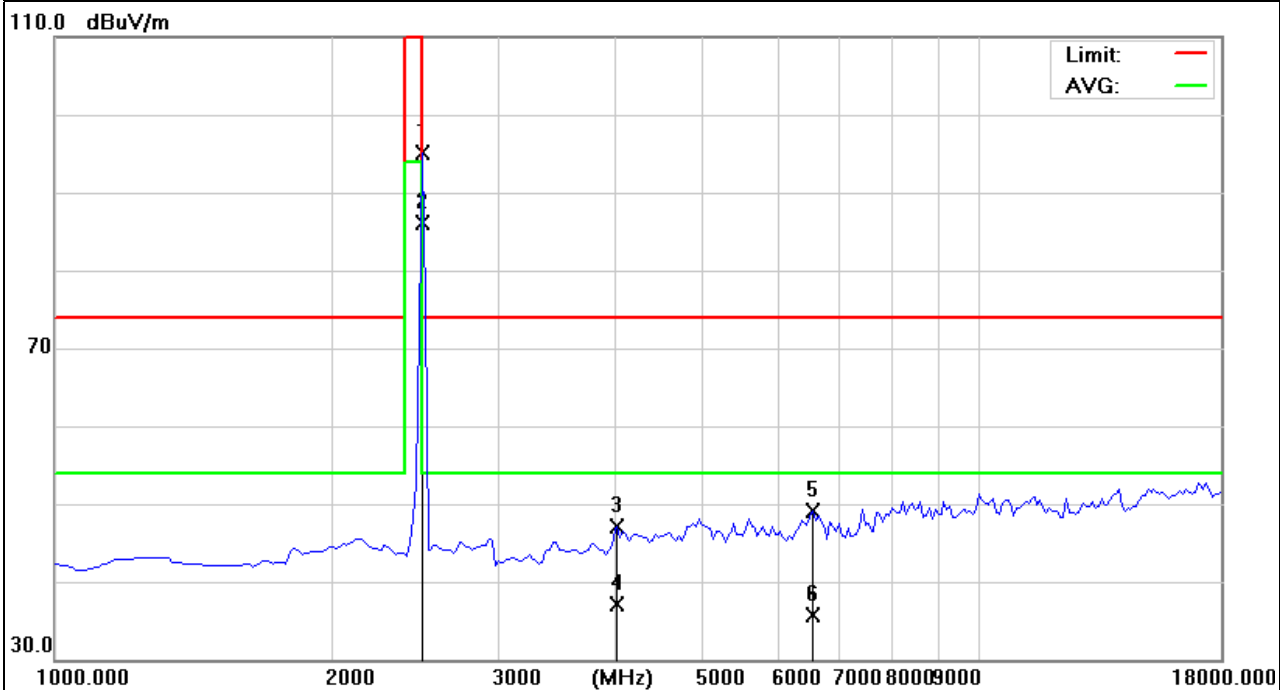
Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.  
No emission above 18GHz.



EUT :	Rex Pen	Model Name :	EPL-922A
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V from battery
Test Mode :	Model 3	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2487.500	90.25	4.77	95.02	74.00	21.02	peak
2487.500	81.25	4.77	86.02	54.00	32.02	AVG
4060.000	36.19	10.96	47.15	74.00	-26.85	peak
4060.000	26.16	10.96	37.12	54.00	-16.88	AVG
6567.500	33.51	15.57	49.08	74.00	-24.92	peak
6567.500	20.09	15.57	35.66	54.00	-18.34	AVG

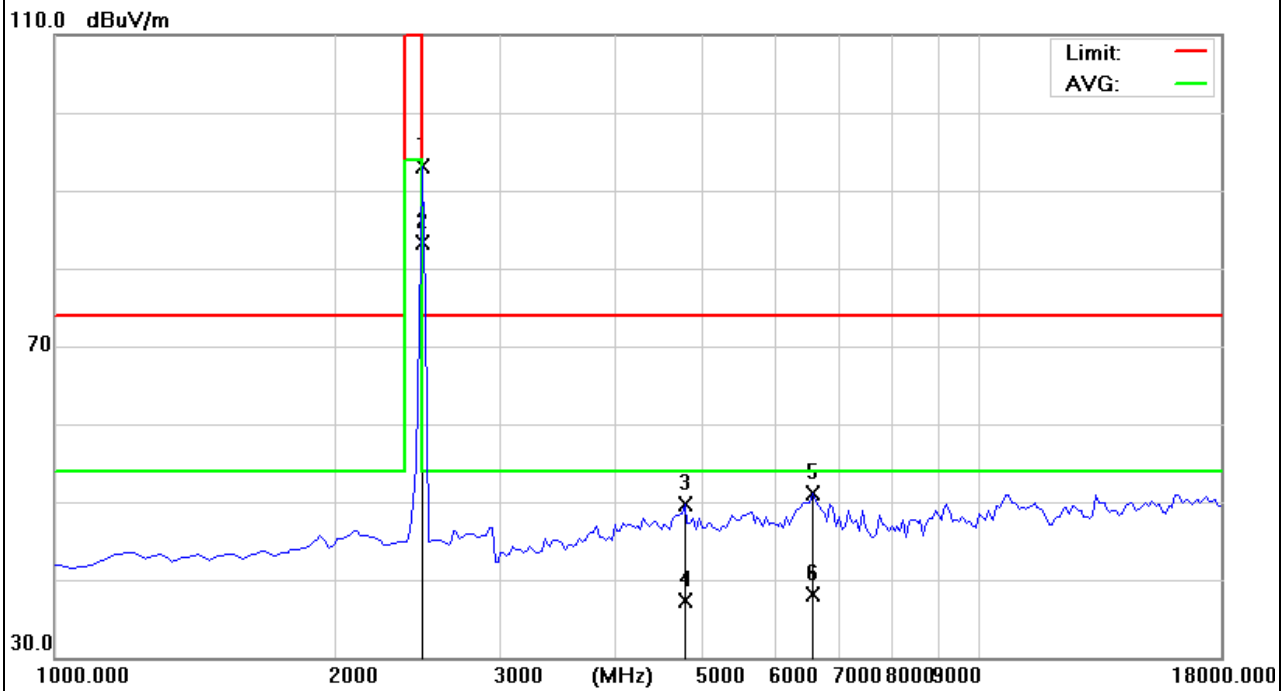
Remark:  
 Factor = Antenna Factor + Cable Loss – Pre-amplifier.  
 No emission above 18GHz.



EUT :	Rex Pen	Model Name :	EPL-922A
Temperature :	25 °C	Relative Humidity :	51%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V from battery
Test Mode :	Model 3	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2487.500	88.39	4.77	93.16	74.00	19.16	peak
2487.500	78.48	4.77	83.25	54.00	29.25	AVG
4782.500	36.27	13.37	49.64	74.00	-24.36	peak
4782.500	23.86	13.37	37.23	54.00	-16.77	AVG
6567.500	35.52	15.57	51.09	74.00	-22.91	peak
6567.500	22.48	15.57	38.05	54.00	-15.95	AVG

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



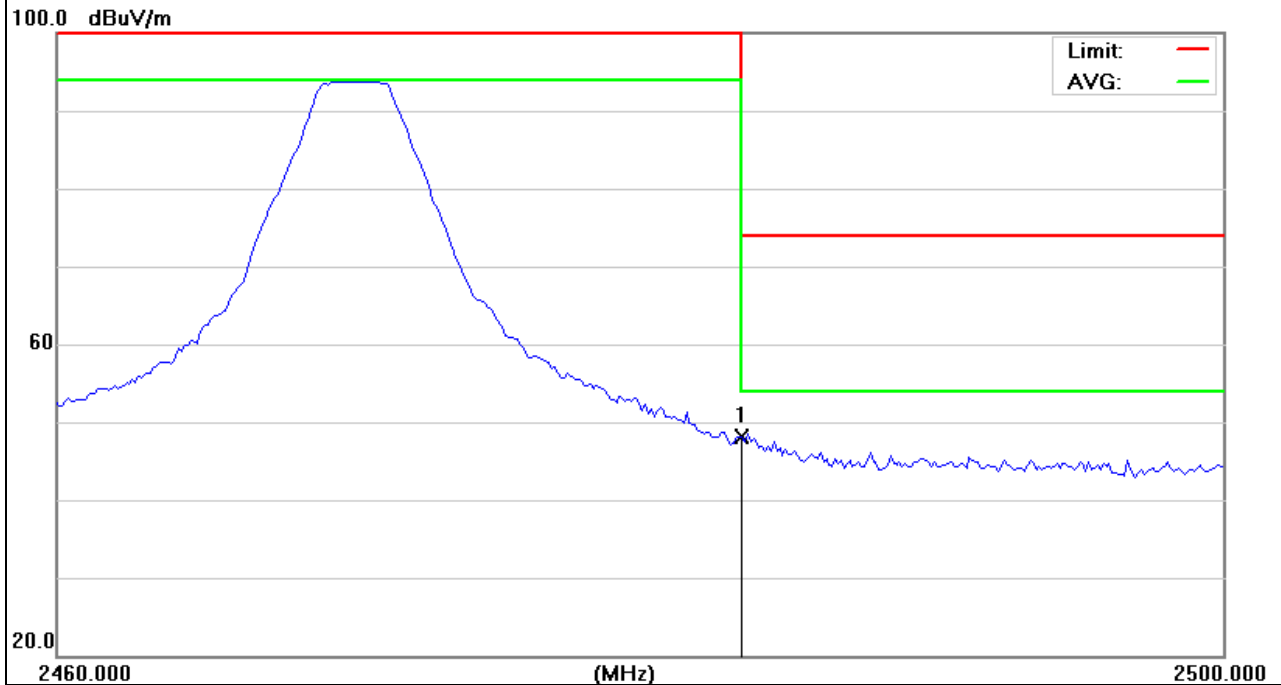
Note: EUT Pre-scan X/Y/Z orientation, only worst case is presented in the report(X orientation).

**3.4.7 TEST RESULTS (RESTRICTED BANDS REQUIREMENTS)**

EUT :	Rex Pen	Model Name :	EPL-922A
Temperature :	25 °C	Relative Humidity :	51%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V from battery
Test Mode :	TX-2470MHz	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.500	43.26	4.77	48.03	74.00	-25.97	peak

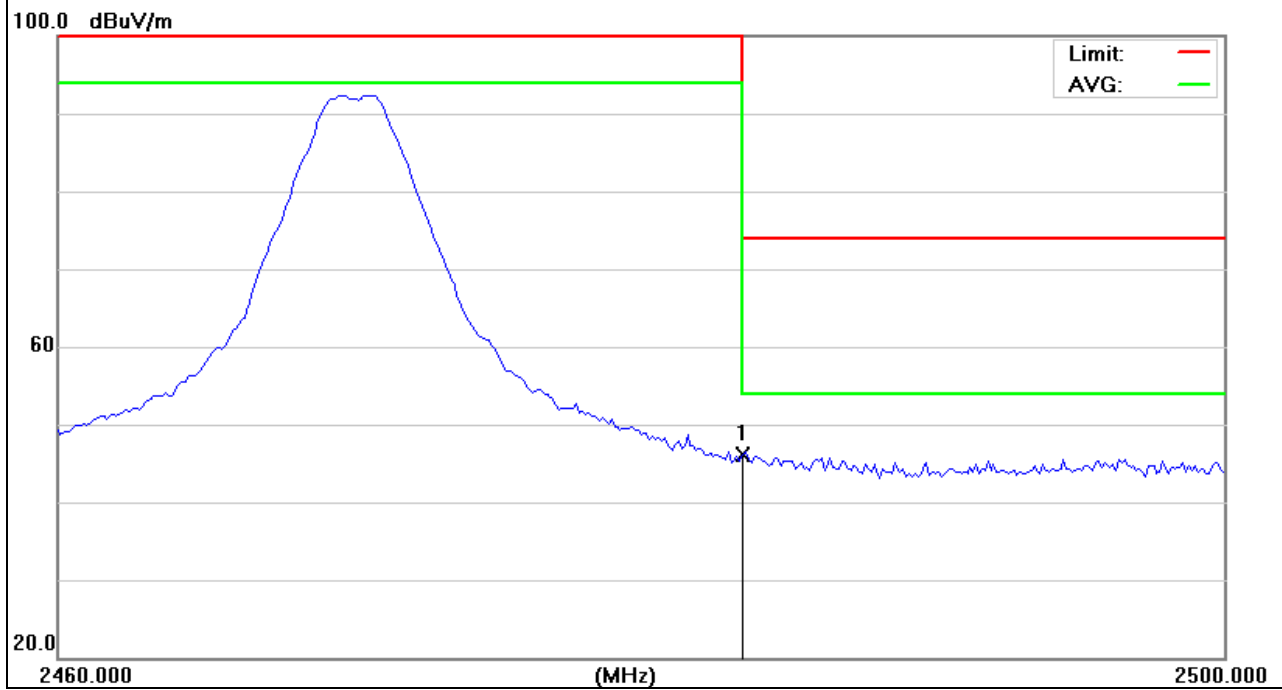
Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	Rex Pen	Model Name :	EPL-922A
Temperature :	25 °C	Relative Humidity :	51%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V from battery
Test Mode :	TX-2470MHz	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2483.500	41.43	4.77	46.20	74.00	-27.80	peak

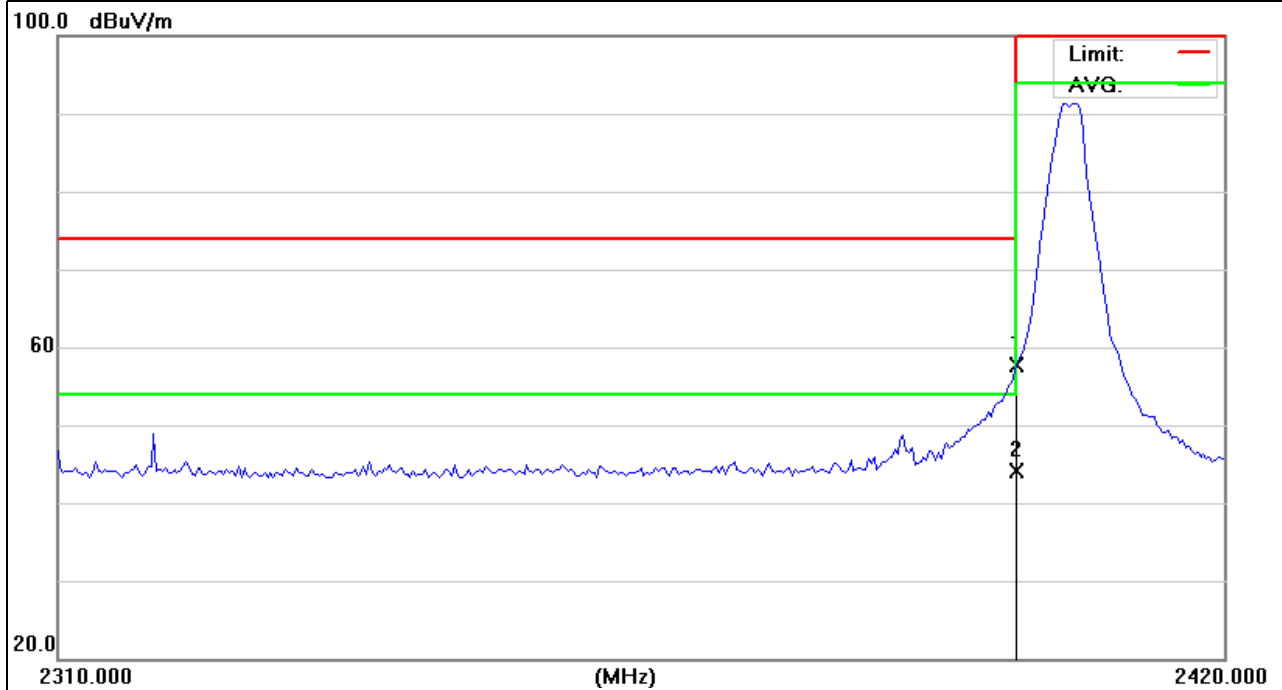
Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	Rex Pen	Model Name :	EPL-922A
Temperature :	25 °C	Relative Humidity :	51%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V from battery
Test Mode :	TX-2405MHz	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2400	49.73	4.53	54.26	74.00	-19.74	peak
2400	41.12	4.53	45.65	54.00	-8.35	AVG

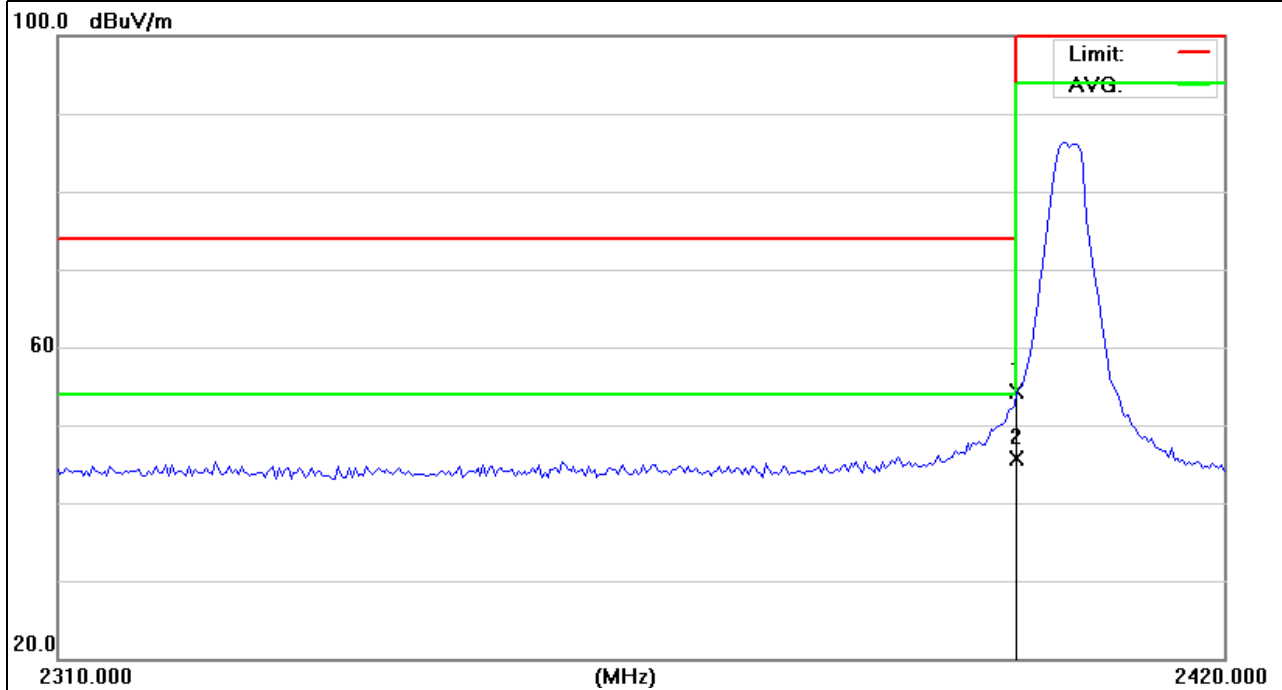
Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT :	Rex Pen	Model Name :	EPL-922A
Temperature :	25 °C	Relative Humidity :	51%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V from battery
Test Mode :	TX-2405MHz	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2400	49.73	4.53	54.26	74.00	-19.74	peak
2400	41.12	4.53	45.65	54.00	-8.35	AVG

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



#### 4. FREQUENCY TOLERANCE

##### 4.1 FREQUENCY TOLERANCE LIMITS

The frequency tolerance of the carrier signal shall be maintained within  $\pm 0.001\%$  of the operating frequency over a temperature variation of  $-20$  degrees to  $+50$  degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

##### 4.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting : RBW= 10KHz, VBW $\geq$ RBW, Sweep time = Auto.

##### 4.3 TEST SETUP



##### 4.4 TEST RESULTS

EUT :	Rex Pen	Model Name :	EPL-922A
Temperature :	26 °C	Relative Humidity :	53%
Pressure :	1020 hPa	Test Power :	DC 3.7V from battery
Test Mode :	Model 1/2/3		

##### 2405MHz

Voltage (V)	Frequency(MHz)	Reading(MHz)	Frequency Tolerance	LIMIT
3.145	2405	2405.001	0.000042%	$\pm 0.001\%$
3.7	2405	2405.002	0.000083%	$\pm 0.001\%$
4.255	2405	2405.004	0.000166%	$\pm 0.001\%$

Temperature (°C)	Frequency(MHz)	Reading(MHz)	Frequency Tolerance	LIMIT
-20	2405	2405.004	0.000166%	$\pm 0.001\%$
-10	2405	2405.006	0.000249%	$\pm 0.001\%$
0	2405	2405.002	0.000083%	$\pm 0.001\%$
10	2405	2405.004	0.000166%	$\pm 0.001\%$
20	2405	2405.003	0.000125%	$\pm 0.001\%$
30	2405	2405.006	0.000249%	$\pm 0.001\%$
40	2405	2405.008	0.000333%	$\pm 0.001\%$
50	2405	2405.003	0.000125%	$\pm 0.001\%$



**2430MHz**

Voltage (V)	Frequency(MHz)	Reading(MHz)	Frequency Tolerance	LIMIT
3.145	2430	2430.002	0.000082%	±0.001%
3.7	2430	2430.003	0.000123%	±0.001%
4.255	2430	2430.002	0.000082%	±0.001%

Temperature (°C)	Frequency(MHz)	Reading(MHz)	Frequency Tolerance	LIMIT
-20	2430	2430.002	0.000082%	±0.001%
-10	2430	2430.001	0.000041%	±0.001%
0	2430	2430.003	0.000123%	±0.001%
10	2430	2430.005	0.000206%	±0.001%
20	2430	2430.004	0.000165%	±0.001%
30	2430	2430.002	0.000082%	±0.001%
40	2430	2430.006	0.000247%	±0.001%
50	2430	2430.003	0.000123%	±0.001%

**2470MHz**

Voltage (V)	Frequency(MHz)	Reading(MHz)	Frequency Tolerance	LIMIT
3.145	2470	2470.006	0.000243%	±0.001%
3.7	2470	2470.004	0.000162%	±0.001%
4.255	2470	2470.002	0.000081%	±0.001%

Temperature (°C)	Frequency(MHz)	Reading(MHz)	Frequency Tolerance	LIMIT
-20	2470	2470.002	0.000081%	±0.001%
-10	2470	2470.003	0.000121%	±0.001%
0	2470	2470.004	0.000162%	±0.001%
10	2470	2470.007	0.000283%	±0.001%
20	2470	2470.003	0.000121%	±0.001%
30	2470	2470.002	0.000081%	±0.001%
40	2470	2470.004	0.000162%	±0.001%
50	2470	2470.005	0.000202%	±0.001%

## 5. BANDWIDTH TEST

### 5.1 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting : RBW= 100KHz, VBW $\geq$ RBW, Sweep time = Auto.

### 5.1 DEVIATION FROM STANDARD

No deviation.

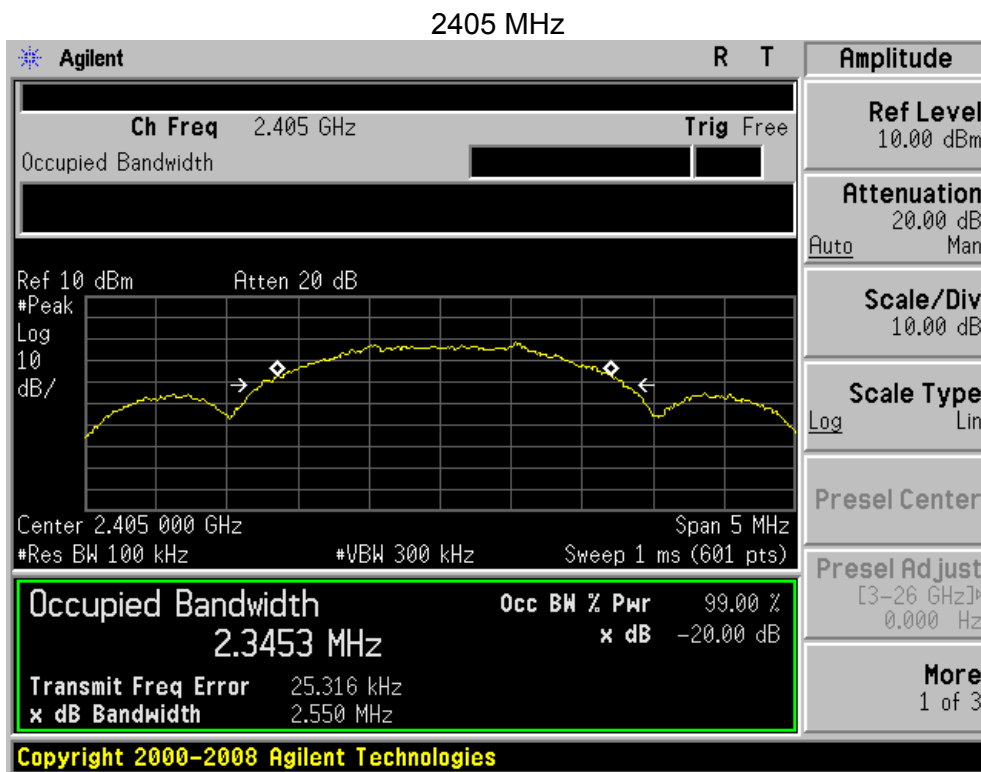
### 5.1 TEST SETUP



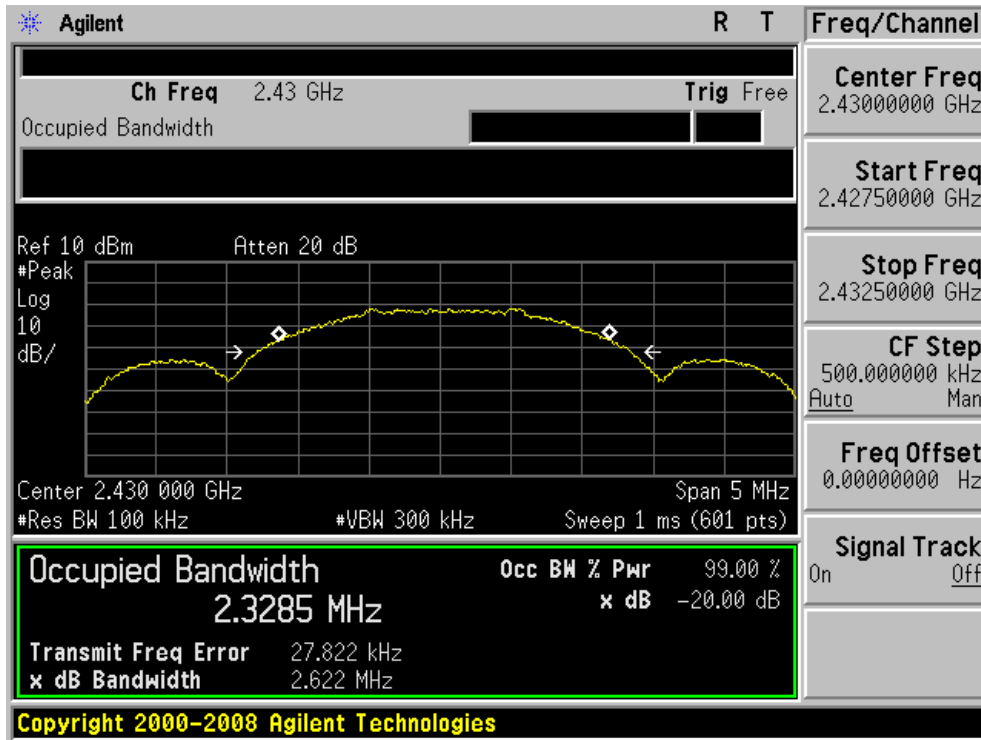
6. TEST RESULTS

EUT :	Rex Pen	Model Name :	EPL-922A
Temperature :	26 °C	Relative Humidity :	53%
Pressure :	1020 hPa	Test Power :	DC 3.7V from battery
Test Mode :	Model 1/2/3		

Test Channel	Frequency (MHz)	20 dBc Bandwidth (MHz)
CH01	2405	2.550
CH04	2430	2.622
CH08	2470	2.565



2430 MHz



2470 MHz

