

## TEST REPORT FOR CERTIFICATION

On Behalf of

Powertech Industrial Co Ltd

USB Smart Surge Transmitter

Model No.: R9P008

FCC ID: NHS-R9P008

Prepared for: Powertech Industrial Co Ltd  
10F, No. 407, Chung Shan Rd., Sec 2  
Chung Ho City, Taipei Hsien, 235 Taiwan

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Date of Report : Sep. 28, 2010

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# TEST REPORT CERTIFICATION

Applicant : Powertech Industrial Co Ltd  
 EUT Description : USB Smart Surge Transmitter  
 (A) Model No. : R9P008  
 (B) Serial No. : N/A  
 (C) Power Supply : (1)Power by Notebook PC  
 (2)DC 3V

Measurement Procedure Used:

FCC RULES AND REGULATIONS PART 15 SUBPART C, October 2009  
 AND ANSI C63.4/2003

(FCC CFR 47 Part 15C, §15.207, §15.209 and §15.231)


The device described above was tested by AUDIX Technology Corporation to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 15 subpart C limits both radiated and conducted emissions.

The measurement results are contained in this test report and AUDIX Technology Corporation is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the FCC official limits.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of AUDIX Technology Corporation.

Date of Test : Jun. 24 ~ Jul. 09, 2010 Date of Report : Sep. 28, 2010

Producer :   
 (Julie Hsu/Administrator)

Review :   
 (Henning Chang/Supervisor)

Signatory:   
 (Ben Cheng/Manager)

# 1. GENERAL INFORMATION

## 1.1. Description of Device (EUT)

Description	:	USB Smart Surge Transmitter
Model Number	:	R9P008
FCC ID	:	NHS-R9P008
Applicant	:	Powertech Industrial Co Ltd 10F, No. 407, Chung Shan Rd., Sec 2 Chung Ho City, Taipei Hsien, 235 Taiwan
Fundamental Frequency	:	433.92MHz
Power Supply	:	DC 3V
Date of Receipt of Sample	:	Mar. 30, 2010
Date of Test	:	Jun. 24 ~ Jul. 09, 2010

### \*USB Smart Surge Transmitter with Receiver

#### Package No.:

- (1)R9P802P6XX {Transmitter : R9P008 + Receiver : R9P801P6XX (FCC by DoC)}
- (2)R9P807P6XX {Transmitter : R9P008 + Receiver : R9P806P6XX (FCC by DoC)}
- (3)R9P502O3XX {Transmitter : R9P008 + Receiver : R9P501O3XX (FCC by DoC)}
- (4)R9P605O3XX {Transmitter : R9P008 + Receiver : R9P604O3XX (FCC by DoC)}

### **Remark:**

Antenna requirement: This EUT's transmitter antenna is designed to be soldered on a printed circuit board, comply with §15.203 and inform to user that any change and modify is prohibited.



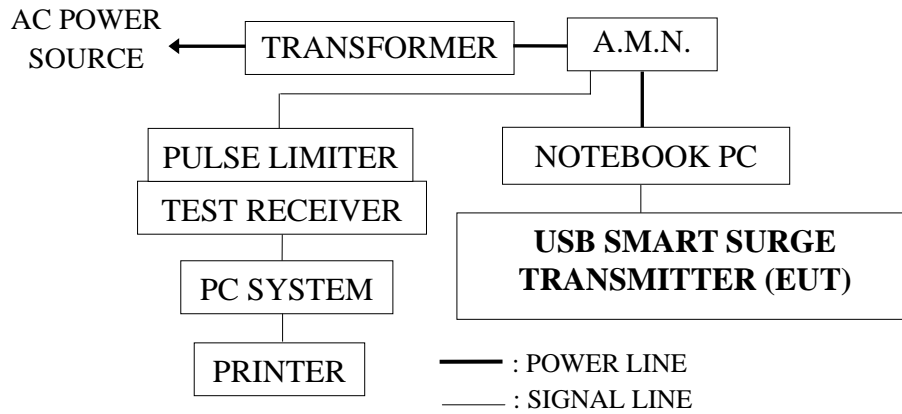
## 2. CONDUCTED EMISSION MEASUREMENT

### 2.1. Test Equipment

The following test equipment were used during the powerline conducted emission measurement: (No. 2 Shielded Room)

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R & S	ESCS30	100339	Mar. 10, 10'	Mar. 09, 11'
2.	A.M.N.	R & S	ESH2-Z5	890485/023	Jan. 15, 10'	Jan. 14, 11'
3.	Pulse Limiter	R & S	ESH3-Z2	001	Feb. 08, 10'	Feb. 07, 11'

### 2.2. Block Diagram of Test Setup



### 2.3. Powerline Conducted Emission Limit (§15.207)

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level	Average Level
150kHz ~ 500kHz	66 ~ 56 dB $\mu$ V	56 ~ 46 dB $\mu$ V
500kHz ~ 5MHz	56 dB $\mu$ V	46 dB $\mu$ V
5MHz ~ 30MHz	60 dB $\mu$ V	50 dB $\mu$ V

Remark1.: If the average limit is met when using a Quasi-Peak detector, the EUT shall be deemed to meet both limits and measurement with the average detector is unnecessary.

2.: The lower limit applies at the band edges.

## 2.4. Operating Condition of EUT

- 2.4.1. Set up the EUT (USB Smart Surge Transmitter) and simulator as shown on 2.2.
- 2.4.2. To turn on the power of all equipments.
- 2.4.3. The EUT (link to Notebook PC) was set to continuously transmit signals during the testing.

## 2.5. Test Procedure

The EUT (link to Notebook PC) was put on table which was above the ground by 80cm and Notebook PC's power supply connected to the AC mains through an Artificial Mains Network (A.M.N.). This provided a 50 ohm coupling impedance for the measuring equipment. (Please refer to the block diagram of the test setup and photographs.)

Both sides of A.C. line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions simulators of the interface cables should be manipulated according to FCC ANSI C63.4-2003 during conducted measurement.

The bandwidth of the R&S Test Receiver ESCS30 was set at 9kHz.

The frequency range from 150kHz to 30MHz was checked.

All the final readings from Test Receiver were measured with the Quasi-Peak detector and Average detector. (Remark: If the Average limit is met when using a Quasi-Peak detector, the Average detector is unnecessary)

## 2.6. Powerline Conducted Emission Measurement Results

### **PASSED.**

(All the emissions not reported below are too low against the prescribed limits.)

EUT (link to Notebook PC) was performed during this section testing and all the test results are attached in next pages.

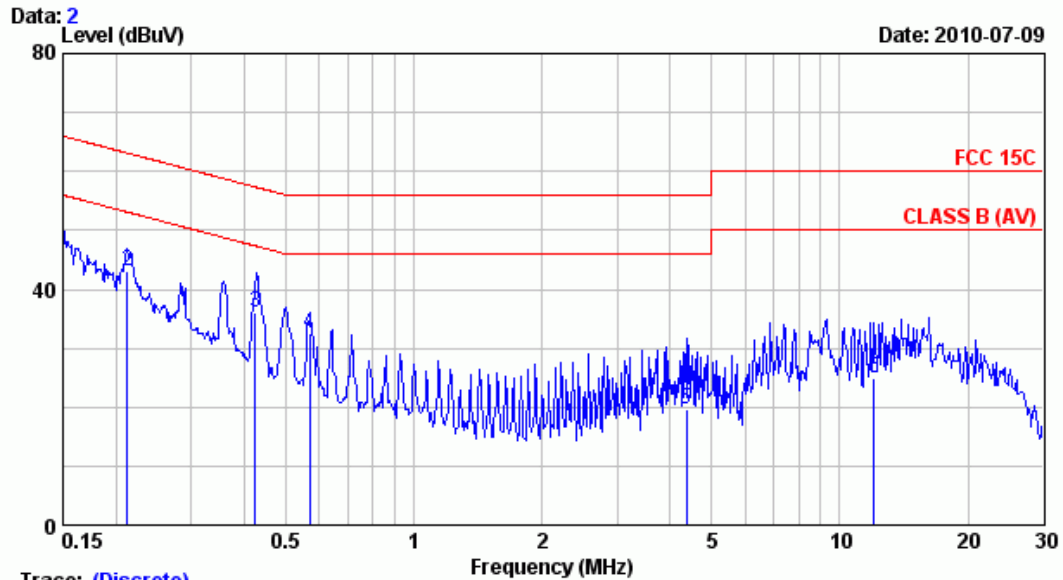
EUT : USB Smart Surge Transmitter                      M/N : R9P008

Test Date : Jul. 09, 2010      Temperature : 25°C      Humidity : 55%

Reference Test Data No.: Neutral: # 2 ; Line: # 1



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Trace: (Discrete)

Site	: No.2 Shielded room	Data	: 2
Condition	: ESH2-Z5	Phase	: NEUTRAL
Limit	: FCC 15C		
Env. / Ins.	: 25°C,55% / ESCS 30 (339)	Engineer:	Charles_Yuan
EUT	: USB Smart surge Transmitter		
Power Rating	: 120Vac/60Hz M/N:R9P008		
Test Mode	: OPERATING		

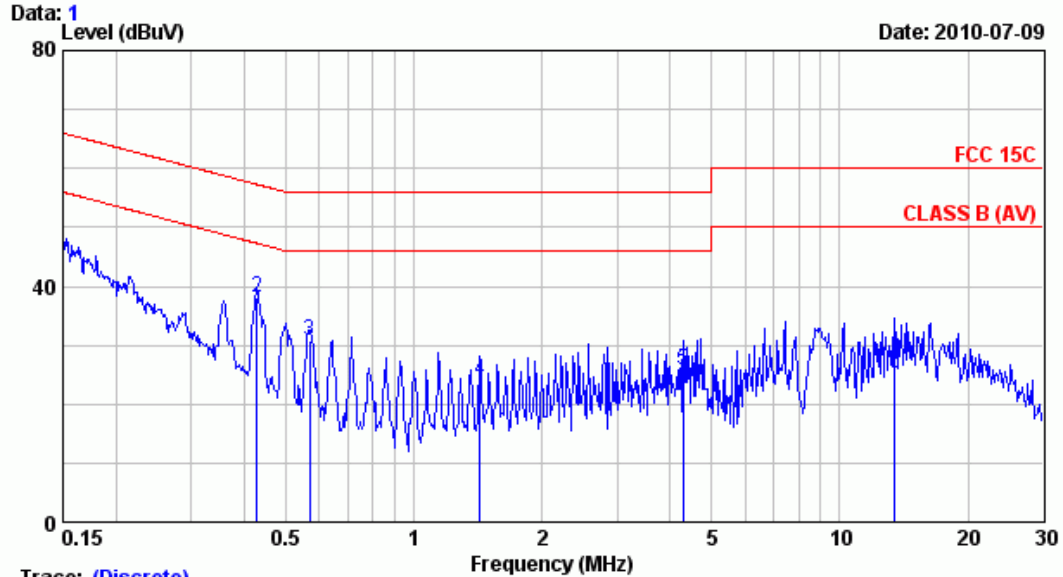
	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV)	Limits (dBµV)	Margin (dB)	Remark
1	0.150	0.10	0.24	40.23	40.57	66.00	25.43	QP
2	0.213	0.10	0.27	42.62	42.99	63.10	20.11	QP
3	0.425	0.11	0.33	35.53	35.96	57.35	21.39	QP
4	0.570	0.14	0.35	32.07	32.56	56.00	23.44	QP
5	4.360	0.21	0.43	19.02	19.66	56.00	36.34	QP
6	12.060	0.35	0.70	23.98	25.03	60.00	34.97	QP

Remarks: 1.Emission Level= AMN Factor + Cable Loss + Reading.  
 2.If the average limit is met when using a quasi-peak detector  
 ,the EUT shall be deemed to meet both limits and measurement  
 with average detector is unnecessary.





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Trace: (Discrete)  
 Site : No.2 Shielded room Data : 1  
 Condition : ESH2-Z5 Phase : LINE  
 Limit : FCC 15C  
 Env. / Ins. : 25°C,55% / ESCS 30 (339) Engineer: Charles\_Yuan  
 EUT : USB Smart surge Transmitter  
 Power Rating : 120Vac/60Hz M/N:R9P008  
 Test Mode : OPERATING

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV)	Limits (dBµV)	Margin (dB)	Remark
1	0.150	0.10	0.24	38.24	38.58	66.00	27.42	QP
2	0.428	0.11	0.33	37.72	38.15	57.29	19.13	QP
3	0.570	0.14	0.35	30.31	30.80	56.00	25.20	QP
4	1.430	0.20	0.40	23.30	23.90	56.00	32.10	QP
5	4.290	0.21	0.42	25.19	25.82	56.00	30.18	QP
6	13.480	0.37	0.70	24.02	25.09	60.00	34.91	QP

Remarks: 1.Emission Level= AMN Factor + Cable Loss + Reading.  
 2.If the average limit is met when using a quasi-peak detector  
 ,the EUT shall be deemed to meet both limits and measurement  
 with average detector is unnecessary.

### 3. RADIATED EMISSION MEASUREMENT

#### 3.1. Test Equipment

The following test equipment was used during the radiated emission test:

##### 3.1.1. For Frequency Range 30MHz~1000MHz (Semi-Anechoic Chamber)

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R & S	ESCS30	100339	Mar. 10, 10'	Mar. 09, 11'
2.	Spectrum Analyzer	HP	8593EM	3826A00272	Jun. 29, 10'	Jun. 28, 11'
3.	Pre-Amplifier	HP	8447D	2944A06305	Feb. 03, 10'	Feb. 02, 11'
4.	Biconical Antenna	CHASE	VBA6106A	1264	Mar. 13, 10'	Mar. 12, 11'
5.	Log Periodic Antenna	Schwarzbeck	UHALP 9108-A	0810	Mar. 13, 10'	Mar. 12, 11'

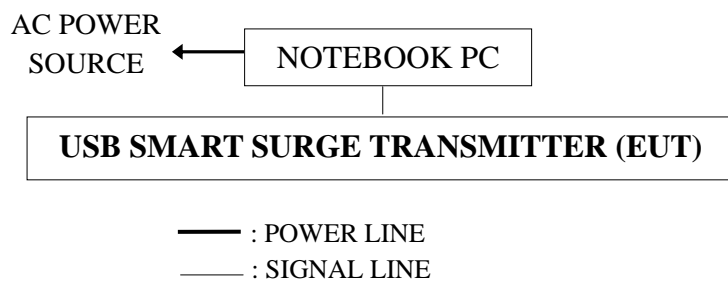
##### 3.1.2. For Frequency Range Above 1GHz (Semi-Anechoic Chamber)

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	HP	8593EM	3826A00272	Jun. 29, 10'	Jun. 28, 11'
2.	Amplifier	HP	8449B	3008A00529	Dec. 15, 09'	Dec. 14, 10'
3.	Horn Antenna	EMCO	3115	9112-3775	May 10, 10'	May 09, 11'

#### 3.2. Test Setup

##### 3.2.1. Block Diagram of connection between EUT and simulators

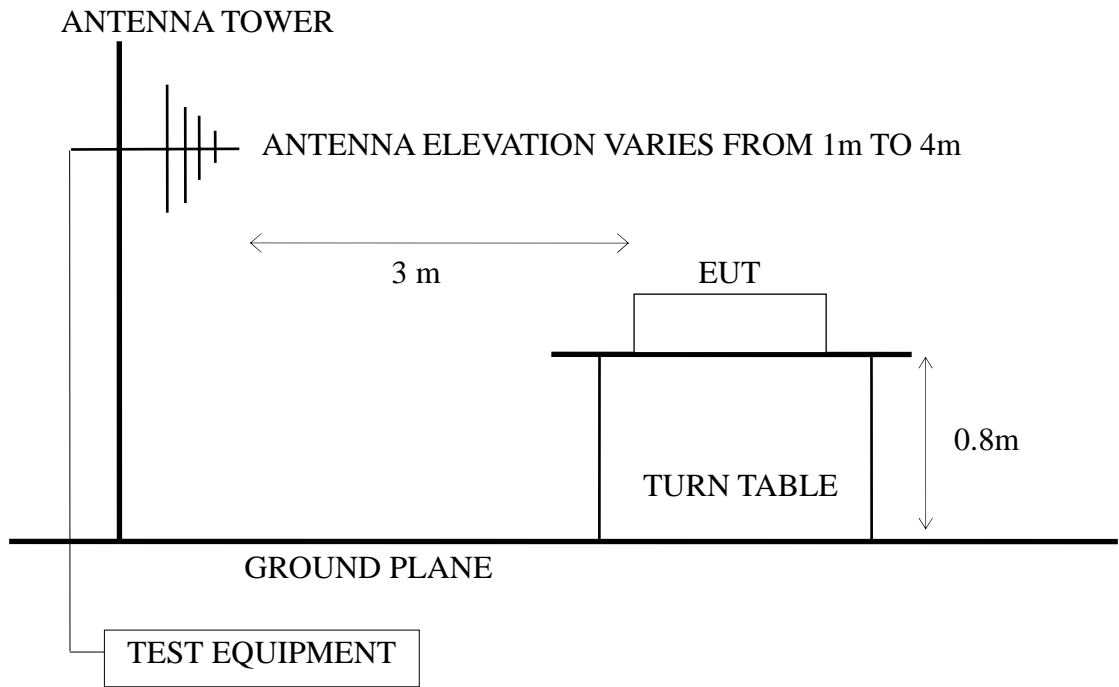
###### 3.2.1.1. EUT Link to Notebook PC Mode



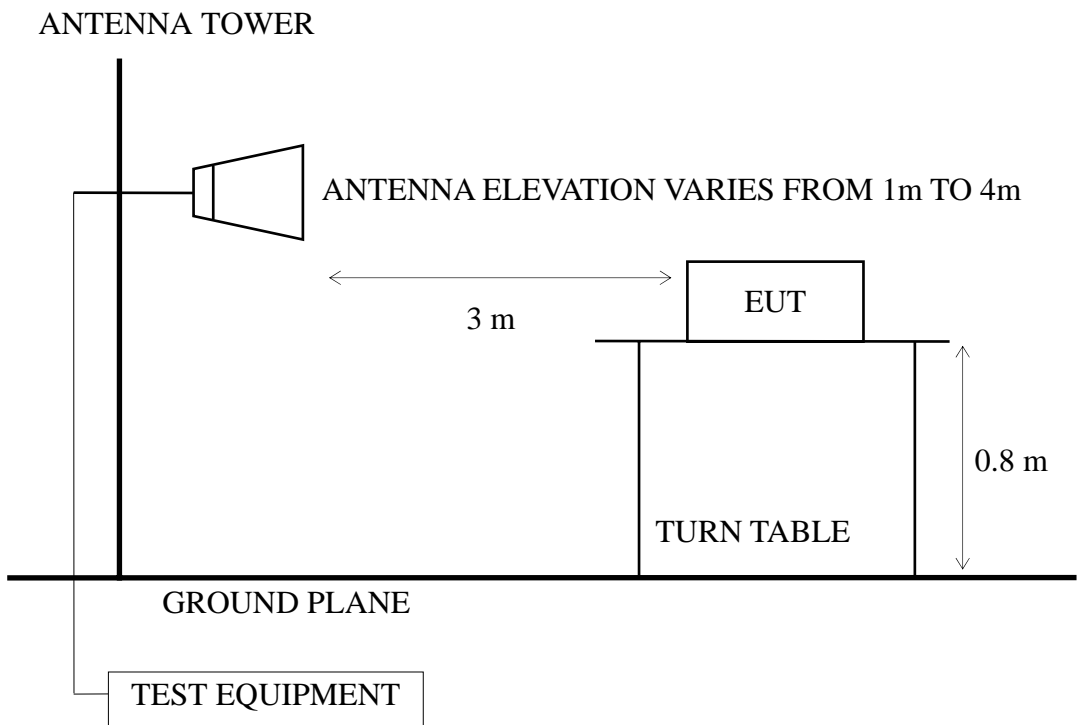
###### 3.2.1.2. EUT only (Battery Mode)



3.2.2. Semi-Anechoic Chamber (3m) Setup Diagram for 30-1000MHz



3.2.3. Semi-Anechoic Chamber (3m) Setup Diagram for above 1GHz



### 3.3. Radiation Emission Limits (§15.209 & 15.231)

#### 3.3.1. Spurious Emission Limit (§15.209)

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMITS	
		$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$
30 - 88	3	100	40.00
88 - 216	3	150	43.50
216 - 960	3	200	46.00
Above 960	3	500	54.00

- Remarks :
- (1) Emission level ( $\text{dB}\mu\text{V/m}$ ) = 20 log Emission level ( $\mu\text{V/m}$ )
  - (2) The tighter limit applies at the edge between two frequency bands.
  - (3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

#### 3.3.2. Fundamental Frequency Emission Limit (§15.231)

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMITS	
		$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$
Fundamental Frequency	3	10996.681164	80.82 (Average)

- Remarks :
- (1) Emission level ( $\text{dB}\mu\text{V/m}$ ) = 20 log Emission level ( $\mu\text{V/m}$ )
  - (2) The tighter limit applies at the edge between two frequency bands.
  - (3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
  - (4) Where limit of Fundamental Freq. is calculated by:  
 $41.6667 \times 433.92 - 7083.3333 = 10996.681164 \mu\text{V/m} = 80.82 \text{ dB}\mu\text{V/m}$
  - (5) The limits in this table are based on CFR 47 Part 15.231(b).

#### 3.3.3. Fundamental & Harmonic Frequency Emission Limit (§15.231(b))

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMITS	
		$\text{dB}\mu\text{V/m}$	
Fundamental Frequency	3	80.82 (Average)	
		100.82 (Peak)	
Harmonic	3	60.82 (Average)	
		80.82 (Peak)	

- Remarks :
- (1) Emission level ( $\text{dB}\mu\text{V/m}$ ) = 20 log Emission level ( $\mu\text{V/m}$ )
  - (2) The tighter limit applies at the edge between two frequency bands.
  - (3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
  - (5) Where limit of Fundamental Freq. is calculated by:  
 $41.6667 \times 433.92 - 7083.3333 = 10996.681164 \mu\text{V/m} = 80.82 \text{ dB}\mu\text{V/m}$
  - (6) The relaxation limits in this table are based on CFR 47 Part 15.231(b)-(2).  
 Relaxation limits is calculated by:  
 The average value is: Average=Peak value+PDCF  
 PDCF (Pulse desensitization correction factor)  
 $= 20\log(\text{TX on}/100\text{ms}) = 20\log(3 \times 19.13/100) = -4.82$

### 3.4. Operating Condition of EUT

- 3.4.1. Set up the EUT and simulator as shown on 3.2.
- 3.4.2. To turn on the power of all equipment.

**\*\*\* EUT Link to Notebook PC Mode \*\*\***

- 3.4.3. The EUT (USB Smart Surge Transmitter) was operated on maximum transmitting status during all testing.

**\*\*\* EUT only (Battery Mode) \*\*\***

- 3.4.4. The EUT [USB Smart Surge Transmitter] emitted the fundamental frequency with data code at the stand, side and Lie conditions. (worst mode is stand condition)
- 3.4.5. The EUT was operated on maximum transmitting status during all testing (stand condition).

### 3.5. Test Procedure

The EUT and its simulators were placed on a turn table which was 0.8 meter above the ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. For 30MHz to 1000MHz frequency ranges, EUT was set 3 meters and for above 1GHz frequency ranges, EUT was set at 3 meters away from the receiving antenna which was mounted on an antenna tower. The antenna moved up and down between 1 to 4 meters to find out the maximum emission level. Broadband antennas (bilog antenna or broadband and log periodical or horn antenna) were used as a receiving antenna. Both horizontal and vertical polarization of the antenna were set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to FCC ANSI C63.4 regulation.

The bandwidth of test receiver was set at 120kHz for frequencies below 1GHz and resolution bandwidth of spectrum analyzer was set at 1MHz for frequencies above 1GHz.

The frequency range from 30MHz to 1000MHz was measured with Quasi-Peak detector.

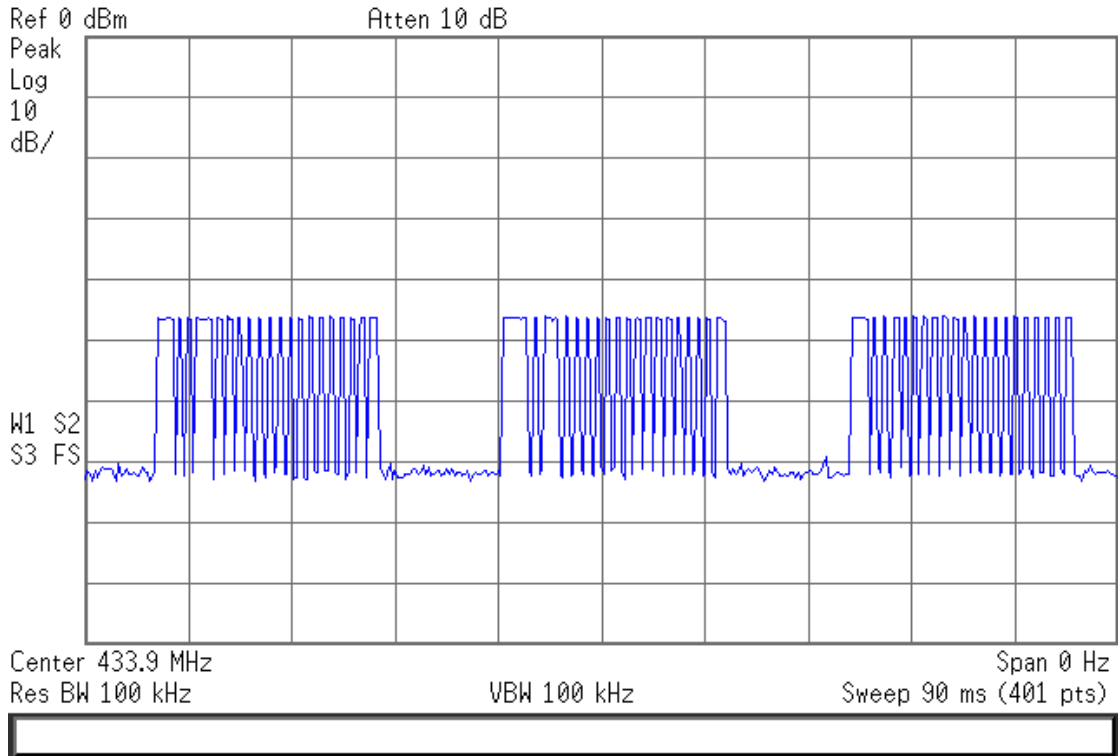
The frequency range from 1GHz to 4.5GHz was pre-scanned with Peak detector.

### 3.6. Radiated Emission Noise Measurement Results

\*\*\* EUT Link to Notebook PC Mode \*\*\*

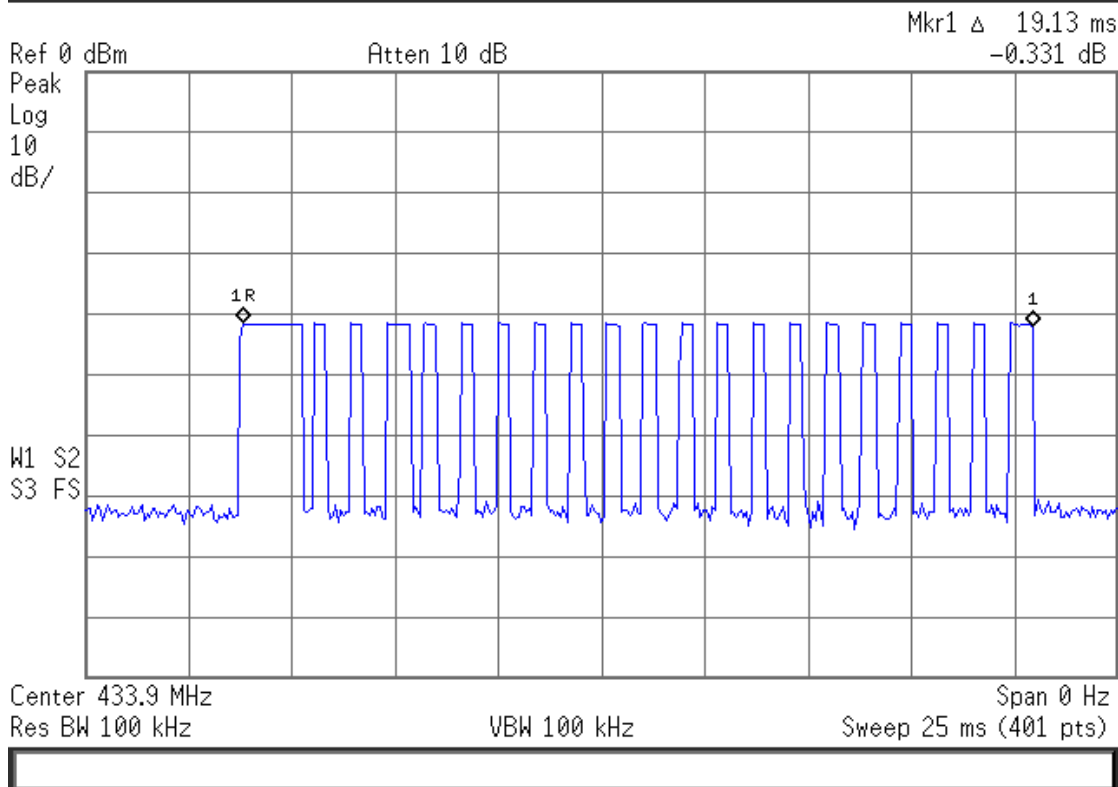
**PDCF:**

Agilent 10:48:32 Jun 25, 2010



**Per Envelope:**

Agilent 09:28:23 Jun 25, 2010



3.6.1. Frequency Range 30MHz to 1GHz Measurement Results: **PASSED.**

**\*\*\* EUT Link to Notebook PC Mode \*\*\***

All the emissions not reported below are too low against the FCC part 15 Subpart C limit.

Date of Test : Jul. 08, 2010 Temperature : 22°C  
 EUT : USB Smart Surge Transmitter Humidity : 42%  
 Test Mode : Operating (EUT Link to Notebook PC)

Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Horizontal dBμV	Emission Level Horizontal dBμV/m	Limits dBμV/m	Margin dB
-----						
Fundamental Frequency (Peak Value)						
434.490	17.36	5.24	57.00	79.60	100.82	21.22
Harmonic Freq. (Peak Value)						
868.080	25.89	7.20	30.41	63.50	80.82	17.32
Spurious Freq. (Quasi-Peak Value)						
301.600	14.59	3.90	17.33	35.82	46.00	10.18
399.570	17.69	4.80	13.67	36.16	46.00	9.84
534.400	19.57	7.00	10.40	36.97	46.00	9.03
702.210	23.53	6.50	10.82	40.85	46.00	5.15
796.300	24.04	6.90	8.28	39.22	46.00	6.78

Fundamental Freq. (Average Value)

Freq (MHz)	Peak value (dBμv/m)	PDCF	Average value (dBμv/m)	Average Limit (dBμv/m)	Margin (dBm)
433.92	79.60	-4.82	74.78	80.82	6.04

Harmonic Freq. (Average Value)

Freq (MHz)	Peak value (dBμv/m)	PDCF	Average value (dBμv/m)	Average Limit (dBμv/m)	Margin (dBm)
868.08	63.50	-4.82	58.68	60.82	2.14
1300.72	48.47	-4.82	43.65	54.00	10.35

- Remarks : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.  
 2. Measurement was up to 10th harmonics (~4.5GHz), but the emission levels were too low against the official limit and not report.

Date of Test : Jul. 08, 2010 Temperature : 22°C  
 EUT : USB Smart Surge Transmitter Humidity : 42%  
 Test Position : Operating (EUT Link to Notebook PC)

Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Vertical dB $\mu$ V	Emission Level Vertical dB $\mu$ V/m	Limits dB $\mu$ V/m	Margin dB
-----						
Fundamental Frequency (Peak Value)						
434.490	17.36	5.24	45.28	67.88	100.82	32.94
Harmonic Freq. (Peak Value)						
868.080	25.89	7.20	21.39	54.48	80.82	26.34
Spurious Freq. (Quasi-Peak Value)						
133.790	19.89	2.40	8.20	30.49	43.50	13.01
400.540	17.66	4.80	3.71	26.17	46.00	19.83
532.460	19.64	7.00	14.27	40.91	46.00	5.09
644.380	22.61	6.31	14.67	43.59	46.00	2.41
702.210	23.53	6.50	7.04	37.07	46.00	8.93

## Fundamental Freq. (Average Value)

Freq (MHz)	Peak value (dB $\mu$ v/m)	PDCF	Average value (dB $\mu$ v/m)	Average Limit (dB $\mu$ v/m)	Margin (dBm)
433.92	67.88	-4.82	63.06	80.82	17.76

## Harmonic Freq. (Average Value)

Freq (MHz)	Peak value (dB $\mu$ v/m)	PDCF	Average value (dB $\mu$ v/m)	Average Limit (dB $\mu$ v/m)	Margin (dBm)
868.08	54.48	-4.82	49.66	60.82	11.16
1305.76	48.78	-4.82	43.96	54.00	10.04

- Remarks : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.  
 2. Measurement was up to 10th harmonics (~4.5GHz), but the emission levels were too low against the official limit and not report.



**\*\*\* EUT only (Battery Mode) \*\*\***

All the emissions not reported below are too low against the FCC part 15 Subpart C limit.

Date of Test : Jul. 02, 2010 Temperature : 22°C

EUT : USB Smart Surge Transmitter Humidity : 42%

Test Mode : Operating (EUT only)

Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Horizontal dB $\mu$ V	Emission Level Horizontal dB $\mu$ V/m	Limits dB $\mu$ V/m	Margin dB
-----						
Fundamental Frequency (Peak Value)						
434.490	17.36	5.24	69.93	92.53	100.82	8.29
Harmonic Freq. (Peak Value)						
868.080	25.89	7.20	16.17	49.26	80.82	31.56
-----						

## Fundamental Freq. (Average Value)

Freq (MHz)	Peak value (dB $\mu$ v/m)	PDCF	Average value (dB $\mu$ v/m)	Average Limit (dB $\mu$ v/m)	Margin (dBm)
433.92	69.93	-4.82	65.11	80.82	15.71

## Harmonic Freq. (Average Value)

Freq (MHz)	Peak value (dB $\mu$ v/m)	PDCF	Average value (dB $\mu$ v/m)	Average Limit (dB $\mu$ v/m)	Margin (dBm)
868.08	49.26	-4.82	44.44	60.82	16.38
1300.72	43.52	-4.82	38.70	54.00	15.30

- Remarks : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.  
3. Measurement was up to 10th harmonics (~4.5GHz), but the emission levels were too low against the official limit and not report.

Date of Test : Jul. 02, 2010 Temperature : 22°C  
 EUT : USB Smart Surge Transmitter Humidity : 42%  
 Test Position : Operating (EUT only)

Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Vertical dB $\mu$ V	Emission Level Vertical dB $\mu$ V/m	Limits dB $\mu$ V/m	Margin dB
-----						
Fundamental Frequency (Peak Value)						
434.490	17.36	5.24	35.76	58.36	100.82	42.46
Harmonic Freq. (Peak Value)						
868.080	25.89	7.20	11.77	44.86	80.82	35.96

-----

Fundamental Freq. (Average Value)

Freq (MHz)	Peak value (dB $\mu$ v/m)	PDCF	Average value (dB $\mu$ v/m)	Average Limit (dB $\mu$ v/m)	Margin (dBm)
433.92	58.36	-4.82	53.54	80.82	27.28

Harmonic Freq. (Average Value)

Freq (MHz)	Peak value (dB $\mu$ v/m)	PDCF	Average value (dB $\mu$ v/m)	Average Limit (dB $\mu$ v/m)	Margin (dBm)
868.08	44.86	-4.82	40.04	60.82	20.78
1305.76	41.83	-4.82	37.01	54.00	16.99

- 
- Remarks : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.  
 2. Measurement was up to 10th harmonics (~4.5GHz), but the emission levels were too low against the official limit and not report.

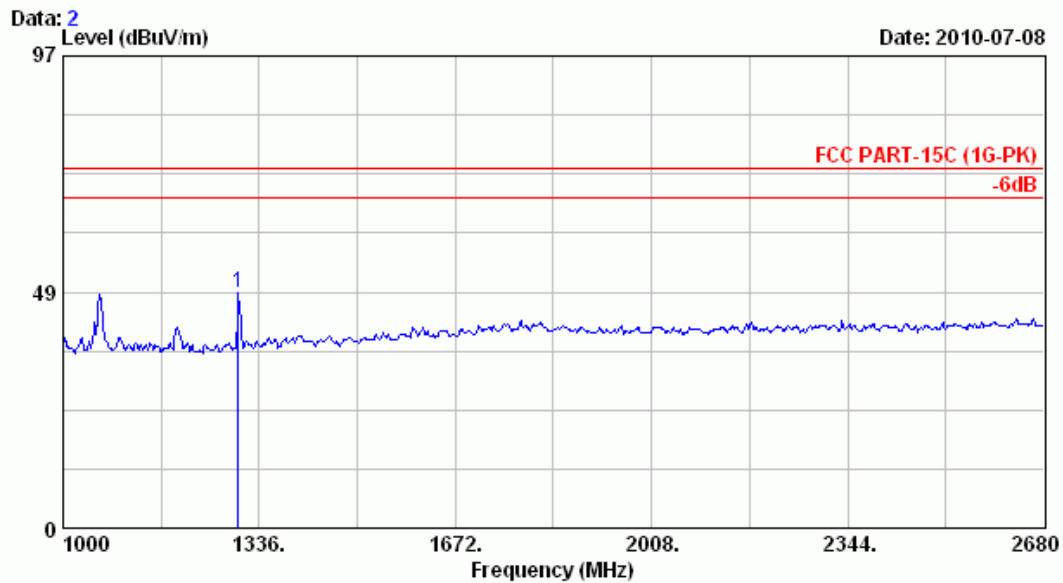
3.6.2. Frequency Range 1GHz to 4.5GHz Measurement Results: **PASSED.**

The frequency spectrum from 1GHz to 4.5GHz (up to 10<sup>th</sup> harmonics) was investigated. All the emissions not reported below are too low against the FCC part 15 Subpart C limit.

**\*\*\* EUT Link to Notebook PC Mode \*\*\***



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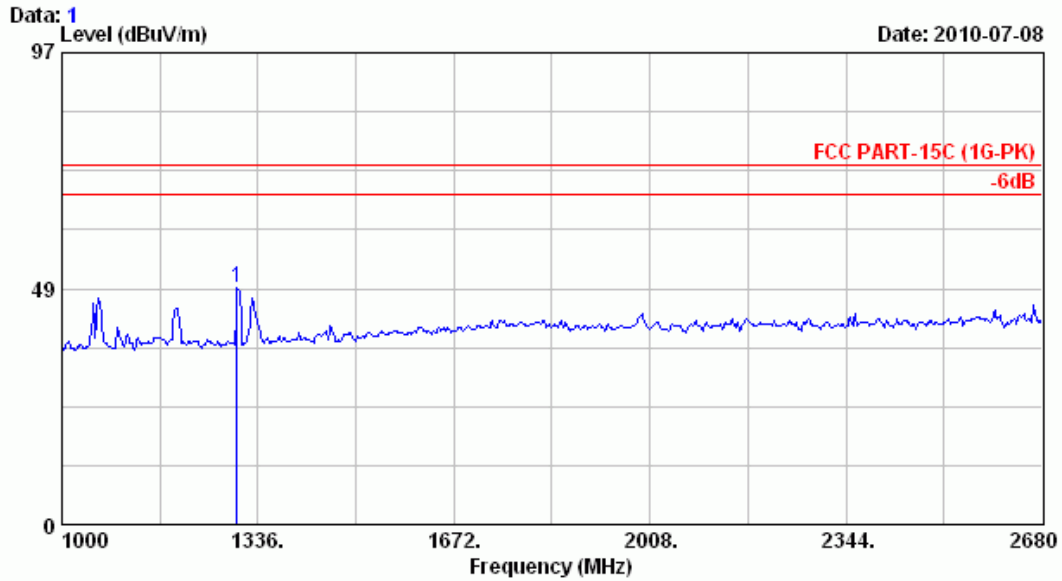
Site no. : A/C Chamber Data no. : 2  
 Dis. / Ant. : 3m 3115 (3775) Ant. pol. : HORIZONTAL  
 Limit : FCC PART-15C (1G-PK)  
 Env. / Ins. : 22°C / 42% 8593EM Engineer : Jarwei Wang  
 EUT : USB Smart Surge Transmitter M/N: R9P008  
 Power Rating : 120Vac/60Hz  
 Test Mode : operating

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	1300.720	25.17	4.84	18.46	48.47	74.00	25.53	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



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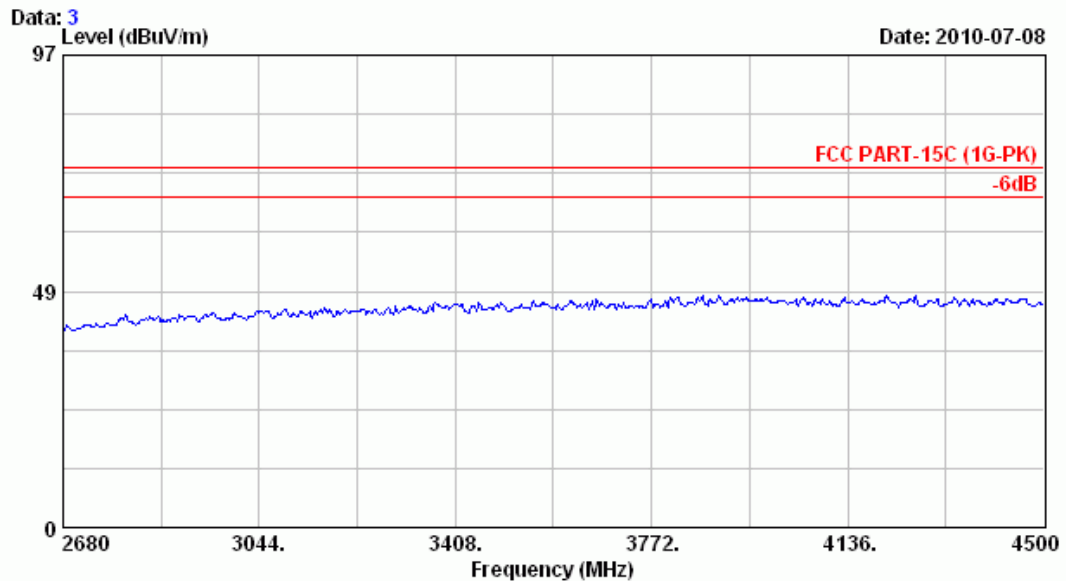
Site no. : A/C Chamber Data no. : 1  
 Dis. / Ant. : 3m 3115(3775) Ant. pol. : VERTICAL  
 Limit : FCC PART-15C (1G-PK)  
 Env. / Ins. : 22°C / 42% 8593EM Engineer : Jarwei Wang  
 EUT : USB Smart Surge Transmitter M/N: R9P008  
 Power Rating : 120Vac/60Hz  
 Test Mode : operating

Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission		Margin (dB)	Remark
				Level (dBµV/m)	Limits (dBµV/m)		
1 1300.720	25.17	4.84	18.77	48.78	74.00	25.22	Peak

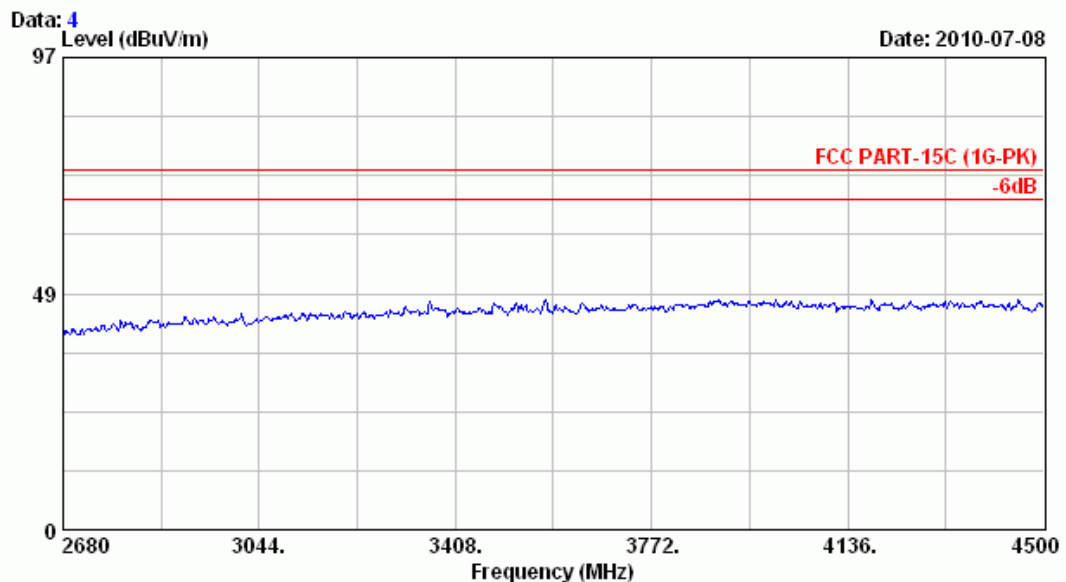
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



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Site no. : A/C Chamber Data no. : 3  
 Dis. / Ant. : 3m 3115(3775) Ant. pol. : HORIZONTAL  
 Limit : FCC PART-15C (1G-PK)  
 Env. / Ins. : 22°C / 42% 8593EM Engineer : Jarwei Wang  
 EUT : USB Smart Surge Transmitter M/N: R9P008  
 Power Rating : 120Vac/60Hz  
 Test Mode : operating

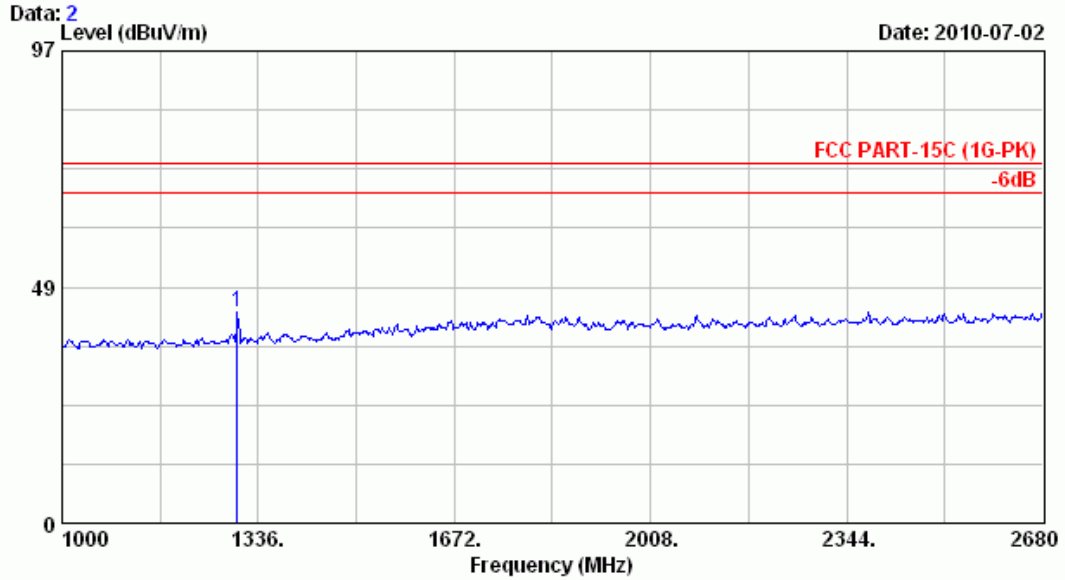


Site no. : A/C Chamber Data no. : 4  
 Dis. / Ant. : 3m 3115(3775) Ant. pol. : VERTICAL  
 Limit : FCC PART-15C (1G-PK)  
 Env. / Ins. : 22°C / 42% 8593EM Engineer : Jarwei Wang  
 EUT : USB Smart Surge Transmitter M/N: R9P008  
 Power Rating : 120Vac/60Hz  
 Test Mode : operating

\*\*\* EUT only (Battery Mode) \*\*\*



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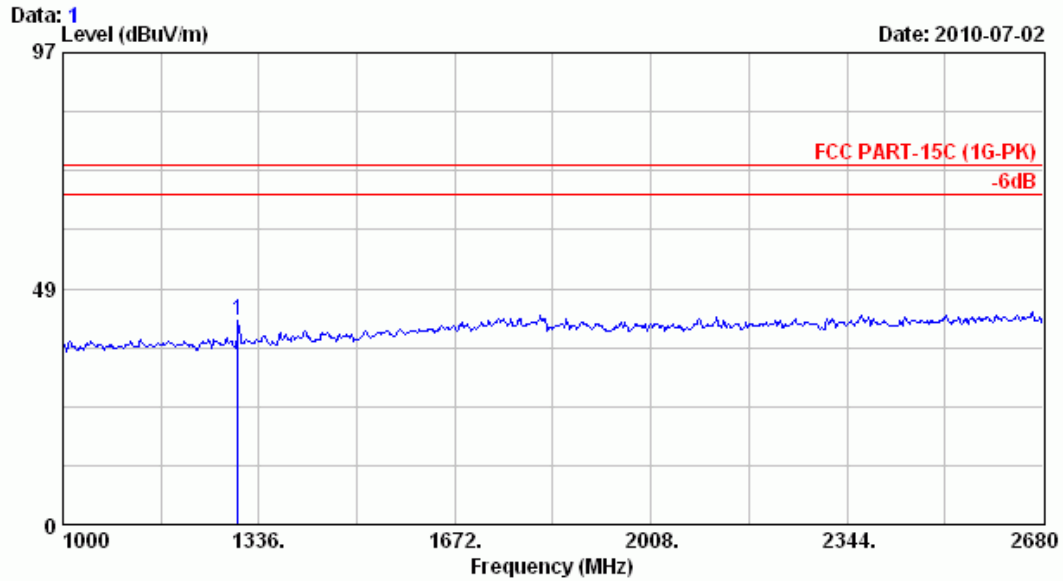
Site no. : A/C Chamber Data no. : 2  
 Dis. / Ant. : 3m 3115(3775) Ant. pol. : HORIZONTAL  
 Limit : FCC PART-15C (1G-PK)  
 Env. / Ins. : 22°C / 42% 8593EM Engineer : Jarwei Wang  
 EUT : USB Smart Surge Transmitter M/N: R9P008  
 Power Rating : DC 3V  
 Test Mode : operating(battery mode)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	1300.720	25.17	4.84	13.51	43.52	74.00	30.48	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



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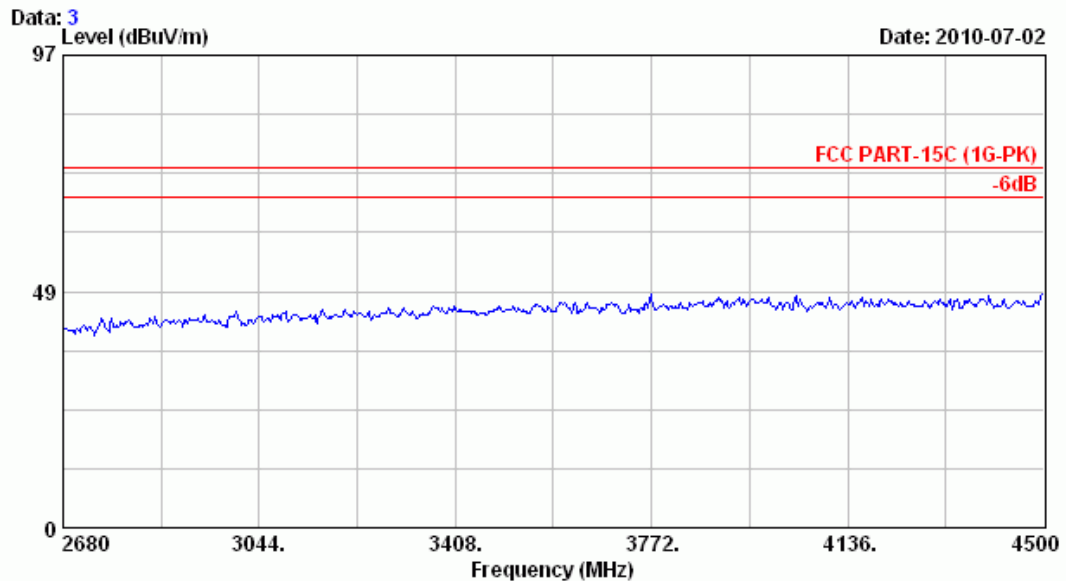
Site no. : A/C Chamber Data no. : 1  
 Dis. / Ant. : 3m 3115(3775) Ant. pol. : VERTICAL  
 Limit : FCC PART-15C (1G-PK)  
 Env. / Ins. : 22°C / 42% 8593EM Engineer : Jarwei Wang  
 EUT : USB Smart Surge Transmitter M/N: R9P008  
 Power Rating : DC 3V  
 Test Mode : operating(battery mode)

Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission			Remark
				Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	
1 1300.720	25.17	4.84	11.82	41.83	74.00	32.17	Peak

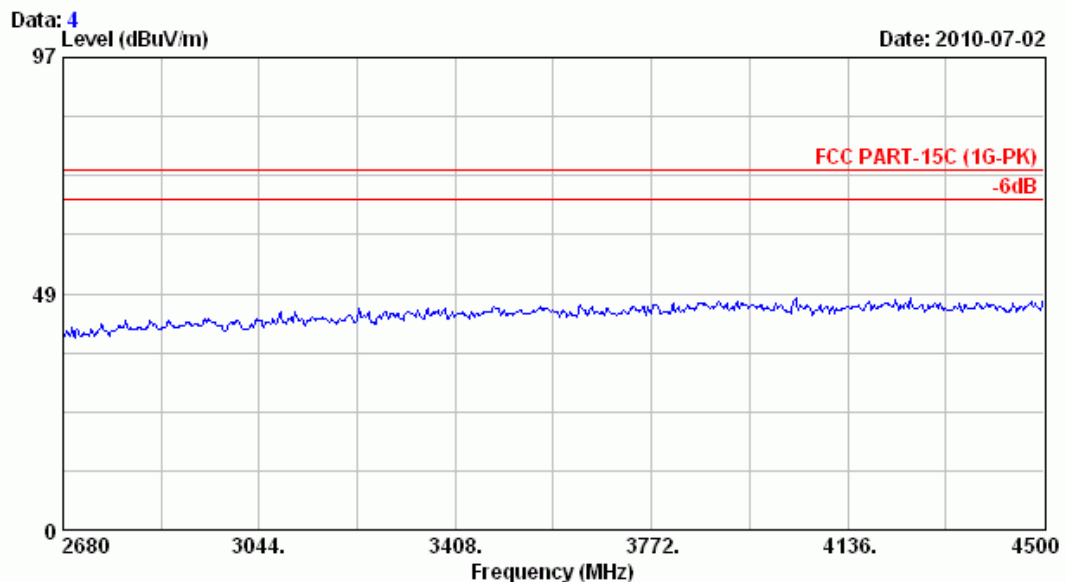
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



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Site no. : A/C Chamber Data no. : 3  
 Dis. / Ant. : 3m 3115(3775) Ant. pol. : HORIZONTAL  
 Limit : FCC PART-15C (1G-PK)  
 Env. / Ins. : 22°C / 42% 8593EM Engineer : Jarwei Wang  
 EUT : USB Smart Surge Transmitter M/N: R9P008  
 Power Rating : DC 3V  
 Test Mode : operating (battery mode)



Site no. : A/C Chamber Data no. : 4  
 Dis. / Ant. : 3m 3115(3775) Ant. pol. : VERTICAL  
 Limit : FCC PART-15C (1G-PK)  
 Env. / Ins. : 22°C / 42% 8593EM Engineer : Jarwei Wang  
 EUT : USB Smart Surge Transmitter M/N: R9P008  
 Power Rating : DC 3V  
 Test Mode : operating (battery mode)



## 4. EMISSION BANDWIDTH MEASUREMENT

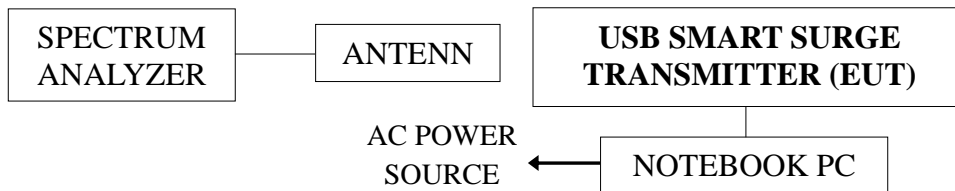
### 4.1. Test Equipment

The following test equipment was used during the emission bandwidth test :

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E4446A	US44300366	Aug. 04, 10'	Aug. 03, 11'
2.	Wide Band Antenna	Diamond	RH799	2944A06305	N.C.R.	N.C.R.

### 4.2. Block Diagram of Test Setup

#### 4.2.1. EUT Link to Notebook PC Mode



#### 4.2.1.1. EUT only (Battery Mode)



### 4.3. Specification Limits (§15.231-(c))

The bandwidth of emission shall be no wider than 0.25% of the center frequency for device operating above 70MHz and below 900MHz. Bandwidth is determined at the points 20dB down from the modulated carrier.

### 4.4.Emission Bandwidth Measurement Results

**\*\*\* EUT Link to Notebook PC Mode \*\*\***

**PASS.** (0.0106% < 0.25%)

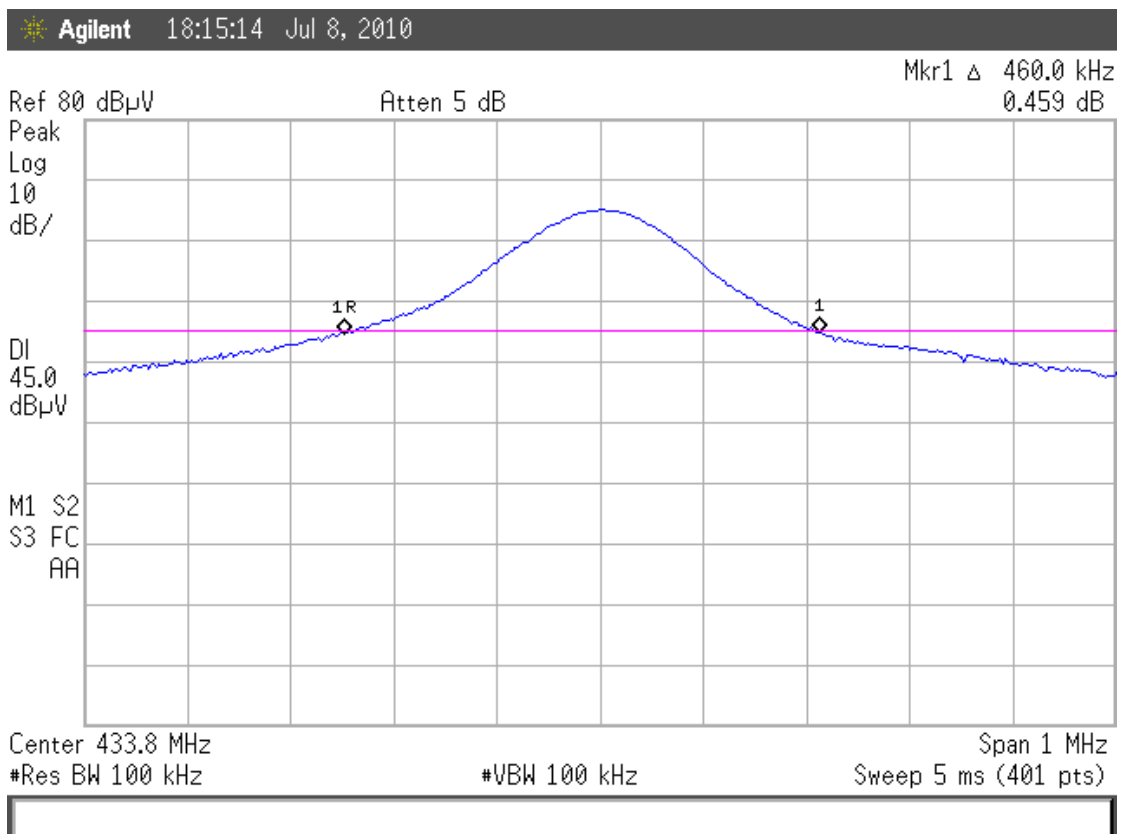
Fundamental Frequency: 433.8MHz

Test Date: Jul. 08, 2010      Temperature: 22°C      Humidity: 42%

No.	Center Frequency	Bandwidth	Tolerance (%)
1.	433.8MHz	<b>460.0kHz</b>	<b>0.0106%</b>

The bandwidth of emission was measured at the point 20dB down from the center frequency of modulated carrier.

### Graph of Bandwidth Measurement



Note: “◇” The line is 20dB from the modulated carrier.

\*\*\* EUT only (Battery Mode) \*\*\*

**PASS.** (0.0103% < 0.25%)

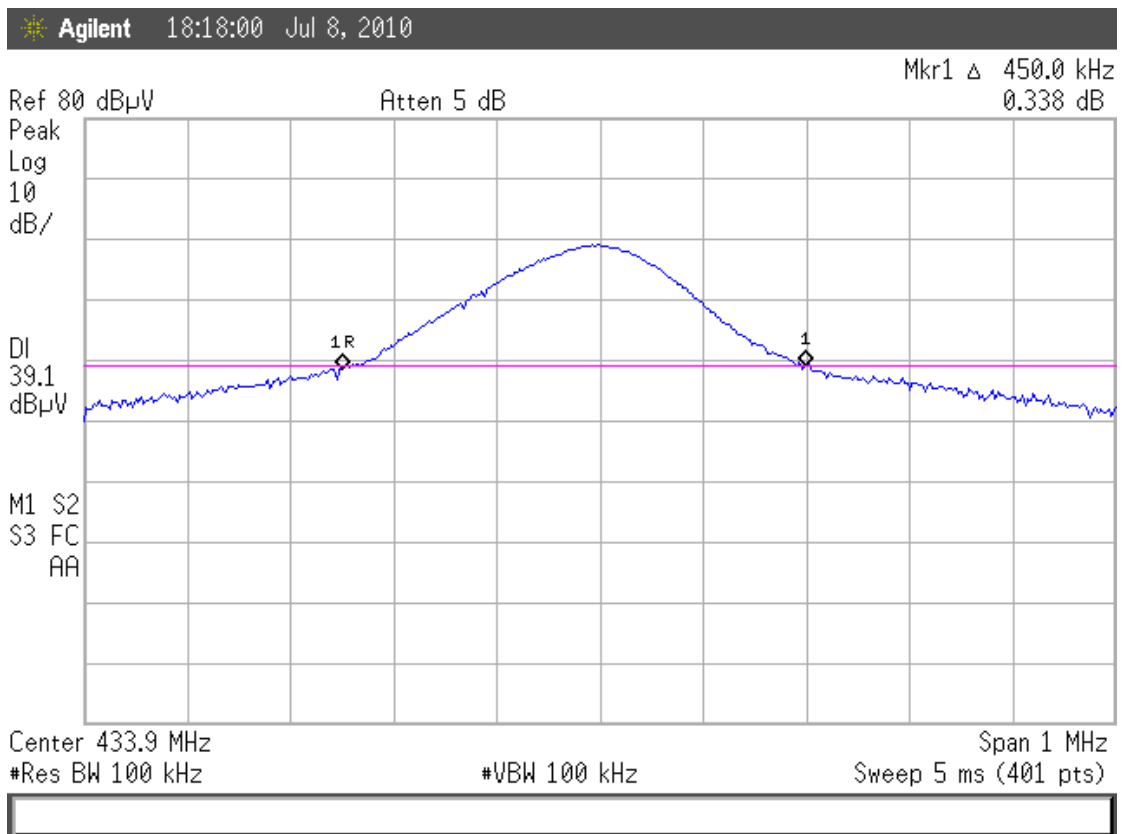
Fundamental Frequency: 433.9MHz

Test Date: Jul. 08, 2010      Temperature: 22°C      Humidity: 42%

No.	Center Frequency	Bandwidth	Tolerance (%)
1.	433.9MHz	<b>450.0kHz</b>	<b>0.0103%</b>

The bandwidth of emission was measured at the point 20dB down from the center frequency of modulated carrier.

### Graph of Bandwidth Measurement



Note: “◇” The line is 20dB from the modulated carrier.

## 5. PERIODIC OPERATED MEASUREMENT

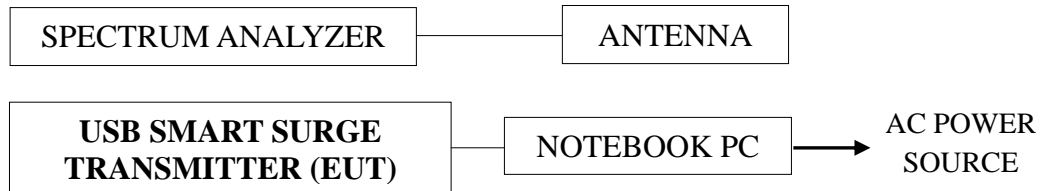
### 5.1. Test Equipment

The following test equipment was used during the periodic operated test :

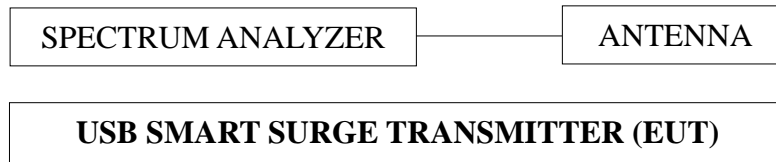
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E4446A	US44300366	Aug. 04, 10'	Aug. 03, 11'
2.	Wide Band Antenna	Diamond	RH799	2944A06305	N.C.R.	N.C.R.

### 5.2. Block Diagram of Test Setup

#### 5.2.1. EUT Link to Notebook PC Mode



#### 5.2.2. EUT only (Battery Mode)



### 5.3. Specification Limits [§15.231-(a)-(3) 、 §15.231-(a)-(1)]

#### \*\*\* EUT Link to Notebook PC Mode \*\*\*

The total duration of transmissions does not exceed more than two seconds per hour for each transmitter.

#### \*\*\* EUT only (Battery Mode) \*\*\*

The operation of this device is manually operated transmitter that is automatically deactivated the transmitter within not more than 5 seconds of being released, Compliance with §15.231 (a)- (1).

### 5.4.Periodic Operated Measurement Results

**\*\*\* EUT Link to Notebook PC Mode \*\*\***

**PASS.** T = 1.67sec. (< 2sec.)

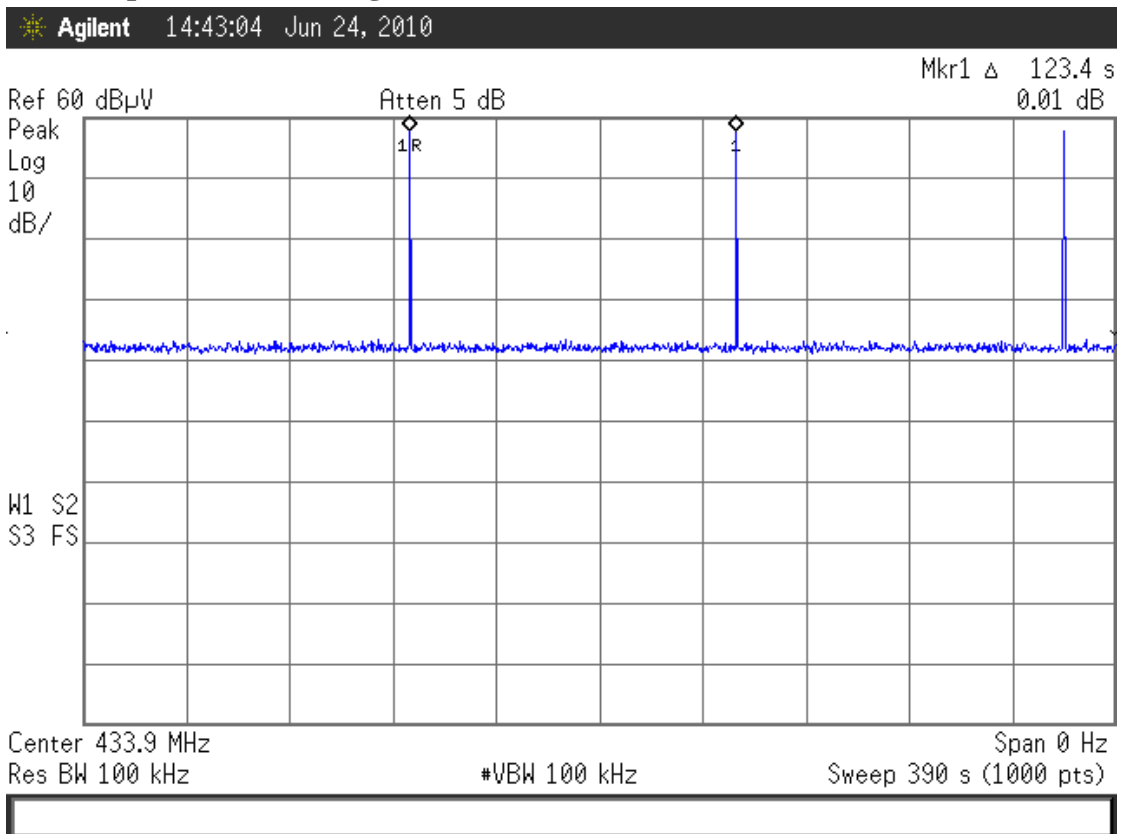
Fundamental Frequency: 433.9MHz

Test Date: Jun. 24~25, 2010      Temperature: 24°C      Humidity: 73%

The graph of testing is attached in next page.

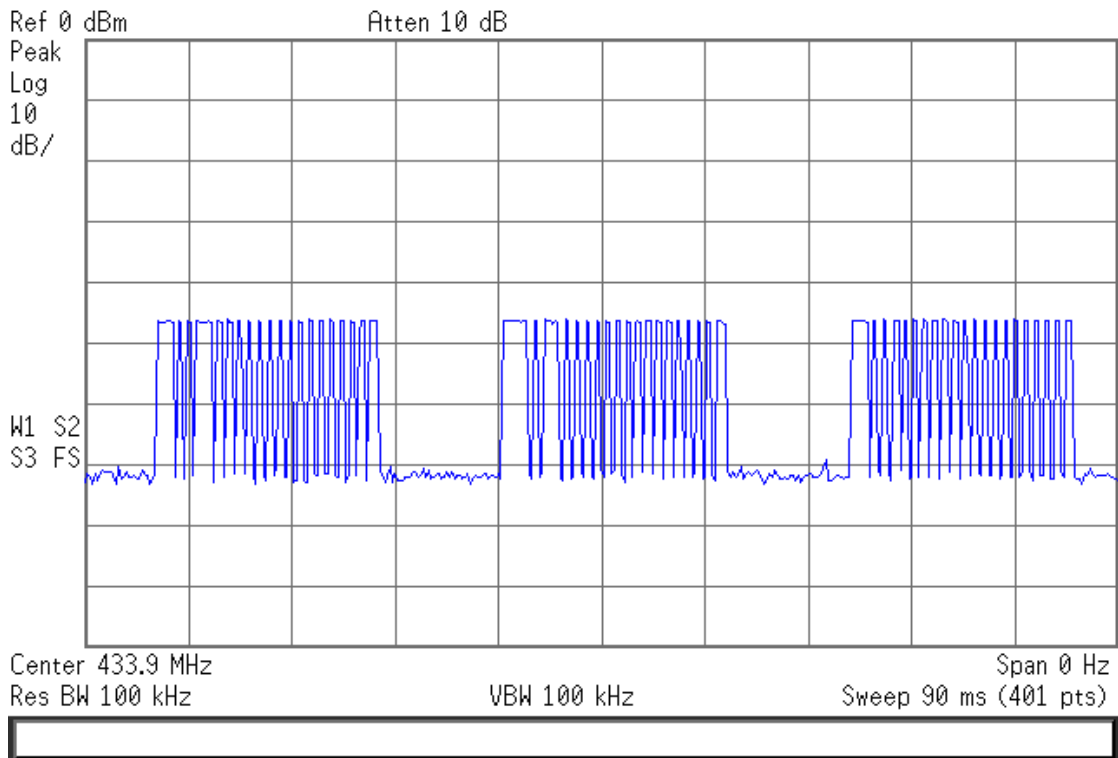
$$3600s/123.4*19.13*3 = 1674ms = 1.67sec.$$

#### Time Separation of Per Signal:



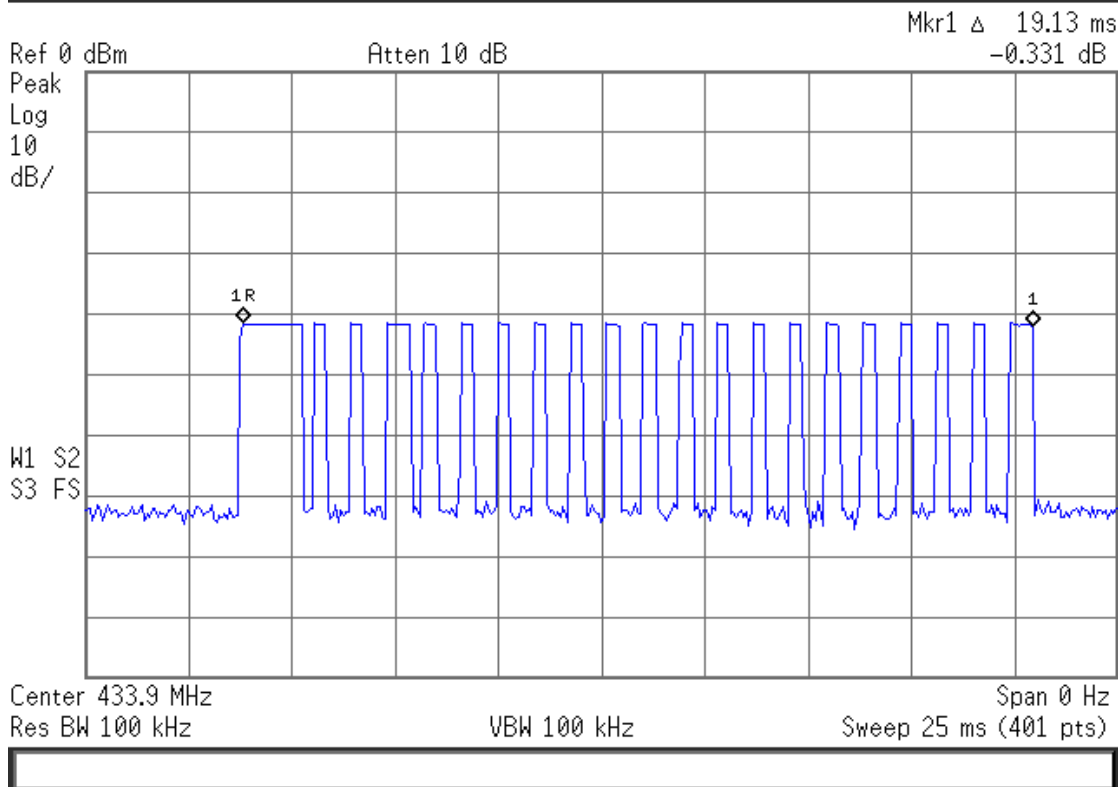
### Complete Envelope:

Agilent 10:48:32 Jun 25, 2010



### Per Envelope:

Agilent 09:28:23 Jun 25, 2010



\*\*\* EUT only (Battery Mode) \*\*\*

The transmitter stop transmit within 5 second after button is released

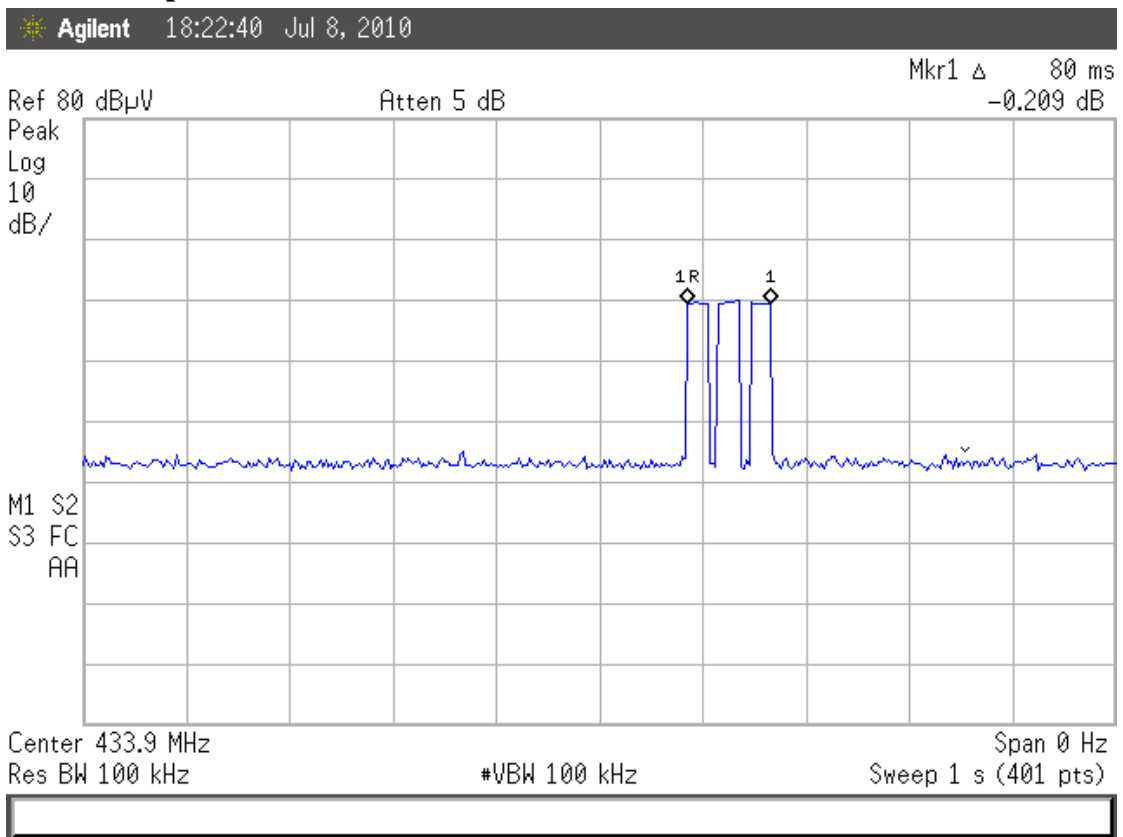
PASS. T = 80ms (< 5sec.)

Fundamental Frequency: 433.9MHz

Test Date: Jul. 08, 2010 Temperature: 22°C Humidity: 42%

The graph of testing is attached in next page.

**Per Envelope:**



## **6. DEVIATION TO TEST SPECIFICATIONS**

**【NONE】**