

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT
INTENTIONAL RADIATOR CERTIFICATION TO
FCC PART 15 SUBPART C
REQUIREMENT T**

OF

Control Unit 258-4

MODEL No.: CU258-4



BRAND NAME: A Phoenix Mecano Brand

FCC ID: O3YCU258-4

REPORT NO: ES121127220E1

ISSUE DATE: December 12, 2012

Prepared for

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VERIFICATION OF COMPLIANCE


Applicant:	DewertOkin GmbH Weststr. 1, 32278 Kirchleugern, Germany
Manufacturer:	Shenzhen C&D Electronics Co., Ltd Building 2, XiaYouSong Mountaintop Industrial District, YouSong Village, Longhua Town, BaoAn District, ShenZhen, Guangdong, China
Product Description:	Control Unit 258-4
Model Number:	CU258-4
Serial Number:	N/A
Trademark:	
File Number:	ES121127220E1
Date of Test:	November 27, 2012 to December 12, 2012

We hereby certify that:

The above equipment was tested by SHENZHEN EMTEK CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2009) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.249.

The test results of this report relate only to the tested sample identified in this report.

Date of Test : November 27, 2012 to December 12, 2012

Prepared by : 
 Aaron Lai/Editor

Reviewer : 
 King Wang/Supervisor

Approve & Authorized Signer : 
 Lisa Wang/Manager

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1. GENERAL INFORMATION

1.1. Product Description

The DewertOkin GmbH

Model: CU258-4 (referred to as the EUT in this report) The EUT is a short range, lower power, Control Unit 258-4 designed as a Device. It is designed by way of utilizing the GFSK modulation achieves the system operating.

A major technical descriptions of EUT is described as following:

- A). Operation Frequency: 2403-2480MHz
- B). Modulation: GFSK
- C). Number of Channel: 78
- D). Channel space: 1MHz
- E). Rate of Transmission: 1Mbps
- F). Antenna Type: Integral antenna
- G). Antenna Gain: 2.3dBi
- H). Rating: AC 120V, 60Hz with AC Adapter
- I). Adapter: Model: PD12 65444
Input: AC 100-240V, 50/60Hz 1.5A Max
Output: DC 29V, 52W, 24V, 4A Duty Cycle, 2min ON/18min OFF.

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

This submittal(s) (test report) is intended for FCC ID: O3YCU258-4 filing to comply with Section 15.249 of the FCC Part 15, Subpart C Rules.

1.3. Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10 (2009). Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4. Special Accessories

Not available for this EUT intended for grant.

1.5. Equipment Modifications

Not available for this EUT intended for grant.

1.6. Measurement Uncertainty

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	±3.00dB
Fundamental Fieldstrength	Not Applicable	95%	±2.94dB
Transmitter 20 dB Bandwidth	Not Applicable	95%	±0.92PPm
Radiated Spurious Emissions	30 MHz to 40 GHz	95%	±3.00dB

1.7. Test Facility

Site Description

EMC Lab.

: Accredited by CNAS, 2010.10.29
 The certificate is valid until 2013.10.28
 The Laboratory has been assessed and proved to be in compliance with CNAS/CL01:2006(identical to ISO/IEC17025: 2005)
 The Certificate Registration Number is L2291

Accredited by TUV Rheinland Shenzhen 2010.5.25
 The Laboratory has been assessed according to the requirements ISO/IEC 17025

Accredited by FCC, October 28, 2010
 The Certificate Registration Number is 406365.

Accredited by Industry Canada, March 5, 2010
 The Certificate Registration Number is 4480A-2.

Name of Firm

Site Location

: SHENZHEN EMTEK CO., LTD
 : Bldg 69, Majialong Industry Zone,
 Nanshan District, Shenzhen, Guangdong, China

2. SYSTEM TEST CONFIGURATION

2.1. EUT Configuration

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

2.2. EUT Exercise

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

2.3. Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4-2009 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode.

2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. Emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4-2009.

2.4. Description of test modes

The EUT (Control Unit 258-4) has been tested under normal operating condition. Pre-scanned tests, X, Y, Z in the three orthogonal panels, were conducted to determine the final configuration from all possible combinations. We use blue test to control the EUT, Let EUT hopping on and transmit with highest power, and the worst result was reported with modulation GFSK. 78 Channels are provided by EUT. The 3 channels of lower, medium and higher were chosen for test.

Pretest Mode	Description
Mode 1	Low – 2403MHz
Mode 2	Middle – 2440MHz
Mode 3	High -2480MHz

For Conducted Test	
Final Test Mode	Description
--	” N/A” denotes test is not applicable in this test report.

For Radiated Test	
Mode 1	Low – 2403MHz
Mode 2	Middle – 2440MHz
Mode 3	High -2480MHz

Channel list

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2403	28	2430	55	2457
2	2404	29	2431	56	2458
3	2405	30	2432	57	2459
4	2406	31	2433	58	2460
5	2407	32	2434	59	2461
6	2408	33	2435	60	2462
7	2409	34	2436	61	2463
8	2410	35	2437	62	2464
9	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454		
26	2428	53	2455		
27	2429	54	2456		

Note:

1. Test of channel was included the lowest middle and highest frequency to perform the test, and then record on this report.

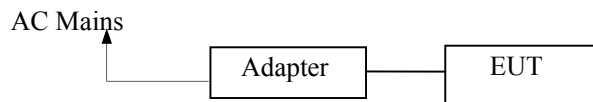
3. SUMMARY OF TEST RESULTS

FCC Part15, Subpart C (15.249)&Canada RSS-Gen:2010		
Standard Section	Test Item	Result
FCC		
15.207	Conducted Emission	N/A
15.209	Radiated Emission	Pass
15.249	Radiated Spurious Emission	Pass
15.249	Band edge test	Pass
15.249	20dB Bandwidth	Pass

Note: (1) "N/A" denotes test is not applicable in this test report.

3.1. CONFIGURATION OF TESTED SYSTEM

Fig. 2-1 Configuration of Tested System



3.2. DESCRIPTION OF SUPPORT UNITS

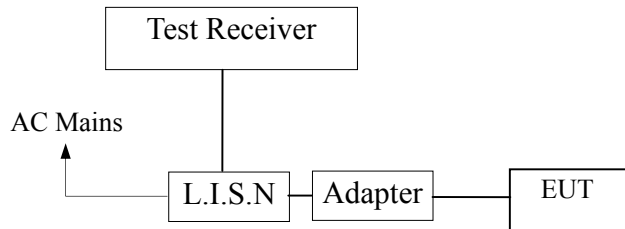
Equipment	Mfr/Brand	Model/Type No.	FCC ID / IC	Series No.	Note
Control Unit 258-4	DewertOkin GmbH	CU258-4	FCC ID:O3YCU258-4	N/A	EUT

4. CONDUCTED EMISSIONS TEST

4.1. Measurement Procedure:

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured was complete.

4.2. Test SET-UP (Block Diagram of Configuration)



4.3. Measurement Equipment Used:

Conducted Emission Test Site # 1					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Test Receiver	Rohde & Schwarz	ESCS30	828985/018	05/28/2012	05/28/2013
L.I.S.N	Rohde & Schwarz	ESH2-Z5	834549/005	05/28/2012	05/28/2013
L.I.S.N	Rohde & Schwarz	ENV216	834549/005	05/28/2012	05/28/2013
50ΩCoaxial Switch	Anritsu	MP59B	M20531	05/28/2012	05/28/2013

4.4. Conducted Emission Limit

(7) Conducted Emission

Frequency(MHz)	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. The lower limit shall apply at the transition frequencies
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

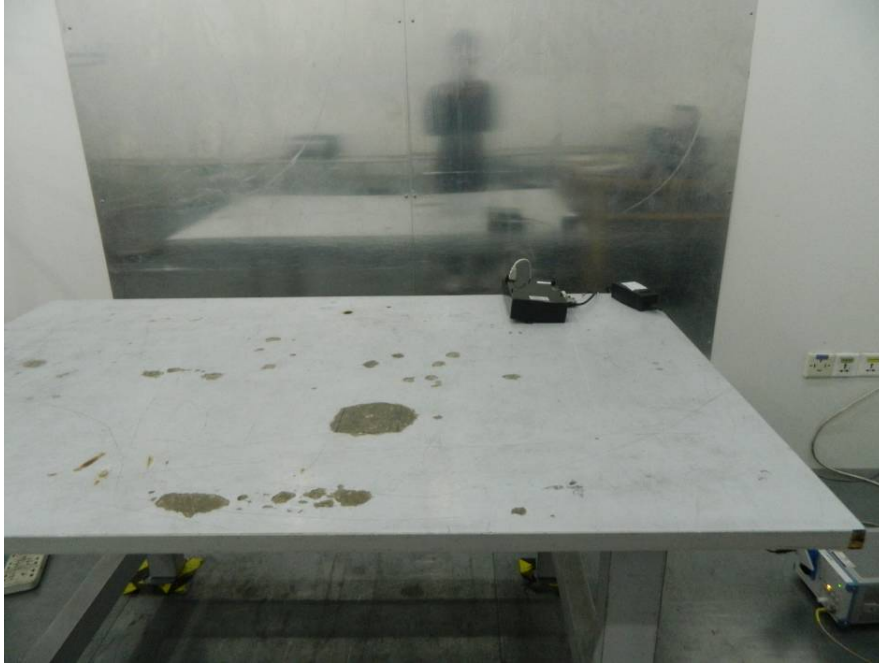
4.5. Measurement Result:

We take all modes to test and the worst test data as following and all modulation methods do not exceed the above mentioned limits.

Date of Test: November 30, 2012 Temperature: 22°C
 Frequency Detector: 0.15~30MHz Humidity: 50%
 Test Result: PASS Test Mode: TX Mode

Test Line	Frequency MHz	Emission Level QP dB(μV)	Emission Level AV dB(μV)	Limits QP dB(μV)	Limits AV dB(μV)	Over QP dB(μV)	Over AV dB(μV)
Line	0.16	52.31	19.82	65.46	55.46	-13.15	-35.64
	0.19	45.31	13.45	64.04	54.04	-18.73	-40.59
	0.23	40.43	13.14	62.45	52.45	-22.02	-39.31
	0.58	33.60	13.61	56.00	46.00	-22.40	-32.39
	1.49	34.94	10.97	56.00	46.00	-21.06	-35.03
	2.82	33.61	10.44	56.00	46.00	-22.39	-35.56
Neutral	0.15	52.57	20.87	66.00	56.00	-13.43	-35.13
	0.17	49.07	21.45	64.96	54.96	-15.89	-33.51
	0.19	45.31	14.93	64.04	54.04	-18.73	-39.11
	0.24	43.04	10.50	62.10	52.10	-19.06	-41.60
	0.58	30.98	12.29	56.00	46.00	-25.02	-33.71
	2.54	33.48	10.51	56.00	46.00	-22.52	-35.49

4.6. Conducted Measurement Photos:



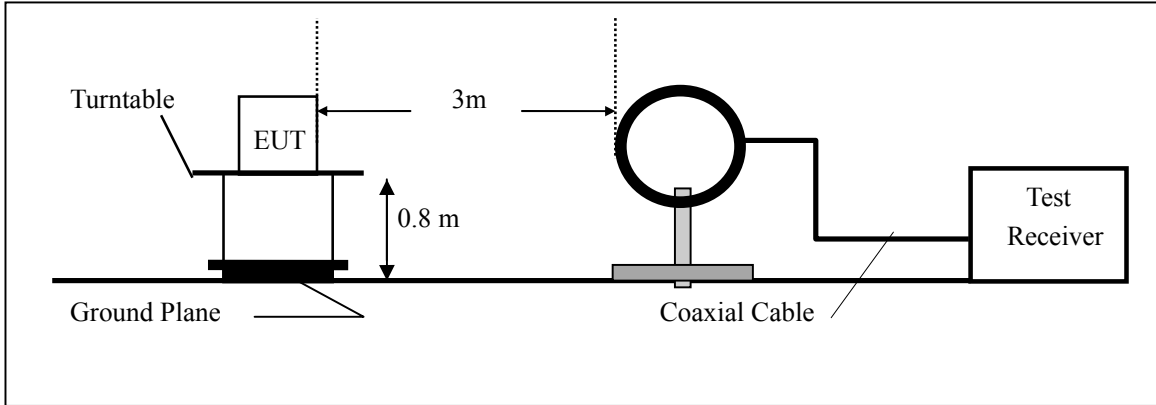
5. RADIATED EMISSION TEST

5.1. Measurement Procedure

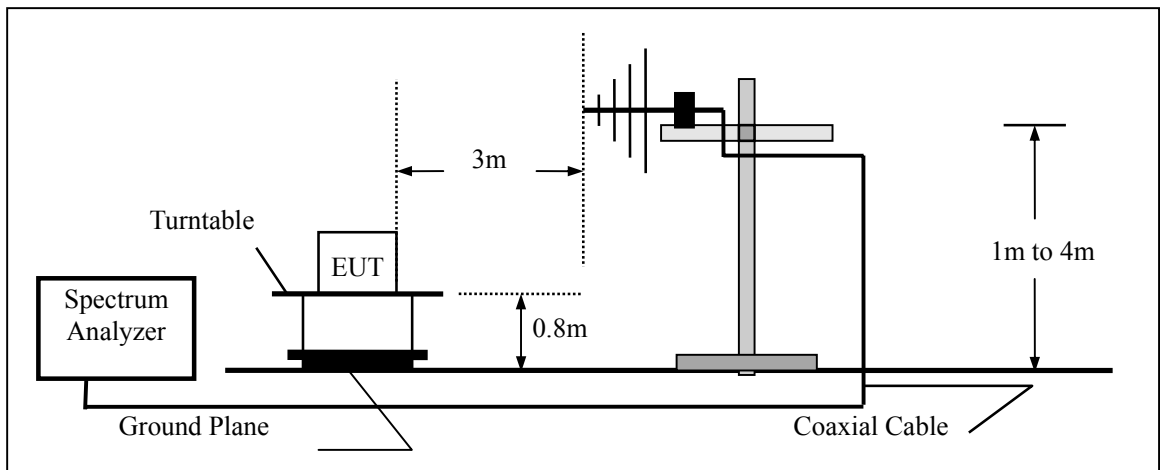
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter Semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter Semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
- 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 AV 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.

5.2. Test SET-UP (Block Diagram of Configuration)

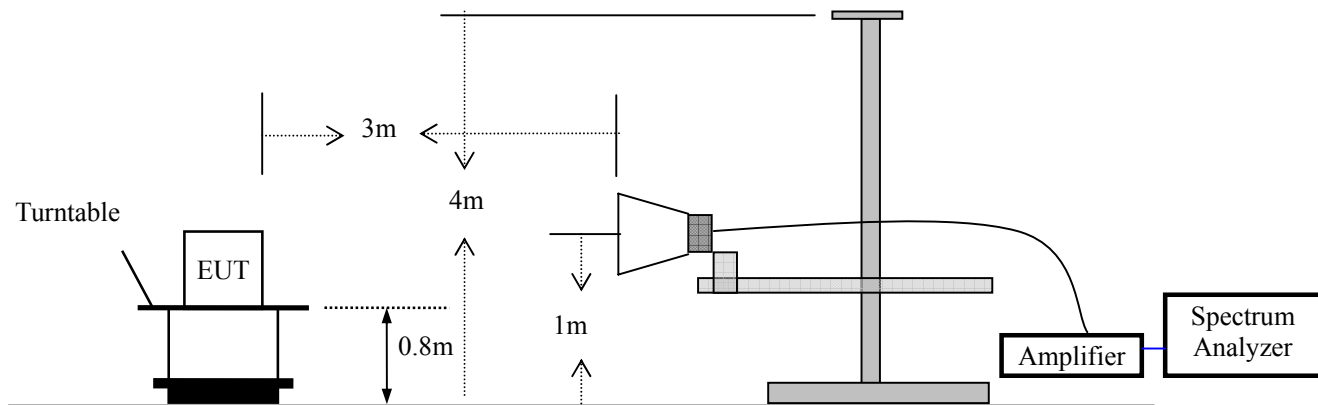
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



5.3 Measurement Equipment Used:

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Rohde & Schwarz	FSP7	839511/010	05/29/2012	05/28/2013
Spectrum Analyzer	HP	E4407B	839840481	05/29/2012	05/28/2013
EMI Test Receiver	Rohde & Schwarz	ESCS30	828985/018	05/29/2012	05/28/2013
Pre-Amplifier	HP	8447D	2944A07999	05/29/2012	05/28/2013
Bilog Antenna	Schwarzbeck	VULB9163	142	05/29/2012	05/28/2013
Loop Antenna	ARA	PLA-1030/B	1029	05/29/2012	05/28/2013
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170399	05/29/2012	05/28/2013
Horn Antenna	Schwarzbeck	BBHA 9120	D143	05/29/2012	05/28/2013

5.4 Radiated Emission Limit

Frequencies (MHz)	Field Strength (microvolts/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
960~1000500	3	

Harmonic emissions limits comply with below 54 dBuV/m at 3m. Other 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 comply with the radiated emissions limits specified in section 1 5.209(a) limit in the table below has to be followed.

Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission level (dBuV/m)=20log Emission level (uV/m).

Limits of radiated emission measurement (FCC 15.209)

FREQUENCY (MHz)	(dBuV/m) (at 3m)	
	PEAK	AVERAGE
Above 1000	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).

Limits of radiated emission measurement (FCC 15.249)

FCC Part15 (15.249) , Subpart C	
Limit	Frequency Range (MHz)
Field strength of fundamental 50000V/m (94 dBV/m) @ 3 m	2400-2483.5
Field strength of harmonics 500V/m (54 dBV/m) @ 3 m	Above 2483.5

5.5 Measurement Equipment Used:

Receiver Parameter	Setting
Attenuation	Auto
Stop Frequency	10th carrier harmonic
Start ~ Stop Frequency	9kHz~30MHz for QP detector
Start ~ Stop Frequency	30MHz~1GHz for QP detector
Start ~ Stop Frequency	Above 1000MHz for Peak detector

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

5.6 Measurement Result

Transmitter Fundamental Field Strength

Operation Mode: CH01: 2403MHz Test Date : November 30, 2012
 FCC Part: 15.249(a) Temperature : 28°C
 Test Result: PASS Humidity : 65 %
 Measured Distance: 3m Test By: WOLF
 Test Method Used: As detailed in ANSI C63.4 Section 8 and relevant annexes

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
2403.00	V	75.70	68.20	114.00	94.00	-38.30	-25.80
2403.00	H	71.98	66.69	114.00	94.00	-42.02	-27.31

Operation Mode: CH38: 2440MHz Test Date : November 30, 2012
 FCC Part: 15.249(a) Temperature : 28°C
 Test Result: PASS Humidity : 65 %
 Measured Distance: 3m Test By: WOLF
 Test Method Used: As detailed in ANSI C63.4 Section 8 and relevant annexes

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
2440.00	V	76.45	69.47	114.00	94.00	-37.55	-24.53
2440.00	H	77.06	70.60	114.00	94.00	-36.94	-23.40

Operation Mode: CH78: 2480MHz Test Date : November 30, 2012
 FCC Part: 15.249(a) Temperature : 28°C
 Test Result: PASS Humidity : 65 %
 Measured Distance: 3m Test By: WOLF
 Test Method Used: As detailed in ANSI C63.4 Section 8 and relevant annexes

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
2480.00	V	78.80	70.10	114.00	94.00	-35.20	-23.90
2480.00	H	75.15	69.45	114.00	94.00	-38.85	-24.55

All the modes were tested and the data of the worst mode are recorded in the following pages.

Operation Mode: TX Test Date : November 30, 2012
 Frequency Range: 9KHz~30MHz Temperature : 28°C
 Test Result: PASS Humidity : 65 %
 Measured Distance: 3m Test By: WOLF

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Over (dB)
--	--	--	--	--

Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

Operation Mode: CH01: 2403MHz Test Date : November 30, 2012
 Frequency Range: 30~1000MHz Temperature : 28 °C
 Test Result: PASS Humidity : 65 %
 Measured Distance: 3m Test By: KL

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)	Note
31.55	V	33.12	40.00	-6.88	PK
51.76	V	30.81	40.00	-9.19	PK
59.54	V	29.10	40.00	-10.90	PK
92.18	V	22.96	43.50	-20.54	PK
137.26	V	24.02	43.50	-19.48	PK
191.67	V	23.71	43.50	-19.79	PK
53.32	H	24.43	40.00	-15.57	PK
157.47	H	24.75	43.50	-18.75	PK
258.51	H	25.75	46.00	-20.25	PK
300.48	H	28.89	46.00	-17.11	PK
367.32	H	28.05	46.00	-17.95	PK
384.42	H	29.76	46.00	-16.24	PK

Operation Mode: CH38: 2440MHz Test Date : November 30, 2012
 Frequency Range: 30~1000MHz Temperature : 28 °C
 Test Result: PASS Humidity : 65 %
 Measured Distance: 3m Test By: KL

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)	Note
31.55	V	32.42	40.00	-7.58	PK
51.76	V	33.91	40.00	-6.09	PK
59.54	V	28.44	40.00	-11.56	PK
68.86	V	22.22	40.00	-17.78	PK
92.18	V	21.96	43.50	-21.54	PK
137.26	V	24.49	43.50	-19.01	PK
53.32	H	23.50	40.00	-16.50	PK
155.91	H	24.50	43.50	-19.00	PK
228.97	H	26.89	46.00	-19.11	PK
258.51	H	25.63	46.00	-20.37	PK
362.66	H	27.31	46.00	-18.69	PK
384.42	H	30.15	46.00	-15.85	PK

Operation Mode: CH78: 2480MHz Test Date : November 30, 2012
 Frequency Range: 30~1000MHz Temperature : 28 °C
 Test Result: PASS Humidity : 65 %
 Measured Distance: 3m Test By: KL

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)	Note
31.55	V	32.32	40.00	-7.68	PK
51.76	V	34.61	40.00	-5.39	PK
59.54	V	28.77	40.00	-11.23	PK
92.18	V	22.45	43.50	-21.05	PK
137.26	V	23.55	43.50	-19.95	PK
179.23	V	22.73	43.50	-20.77	PK
53.32	H	23.63	40.00	-16.37	PK
221.20	H	25.44	46.00	-20.56	PK
258.51	H	28.94	46.00	-17.06	PK
306.70	H	27.19	46.00	-18.81	PK
367.32	H	32.78	46.00	-13.22	PK
384.42	H	31.96	46.00	-14.04	PK

- Note:** (1) All Readings are Peak Value.
 (2) Emission Level= Reading Level+Probe Factor +Cable Loss
 (3) The average measurement was not performed when the peak measured data under the limit of average detection.
 (4) All the x/y/z orientation has been investigated, and only worst case is presented in this report.

Operation Mode: CH1: 2403MHz Test Date : November 30, 2012
 Frequency Range: 1-25GHz Temperature : 28 °C
 Test Result: PASS Humidity : 65 %
 Measured Distance: 3m Test By: Andy

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
1217.95	V	38.18	20.84	74.00	54.00	-35.82	-33.16
1844.55	V	40.20	22.23	74.00	54.00	-33.80	-31.77
2144.23	V	53.40	36.09	74.00	54.00	-20.60	-17.91
4868.59	V	47.96	31.63	74.00	54.00	-26.04	-22.37
7184.30	V	50.87	33.51	74.00	54.00	-23.13	-20.49
1844.55	H	39.11	22.53	74.00	54.00	-34.89	-31.47
3833.33	H	42.73	24.69	74.00	54.00	-31.27	-29.31
5304.49	H	45.78	27.71	74.00	54.00	-28.22	-26.29
6612.18	H	49.43	32.12	74.00	54.00	-24.57	-21.88
7293.27	H	50.35	32.61	74.00	54.00	-23.65	-21.39

Operation Mode: CH38: 2440MHz Test Date : November 30, 2012
 Frequency Range: 1-25GHz Temperature : 28 °C
 Test Result: PASS Humidity : 65 %
 Measured Distance: 3m Test By: Andy

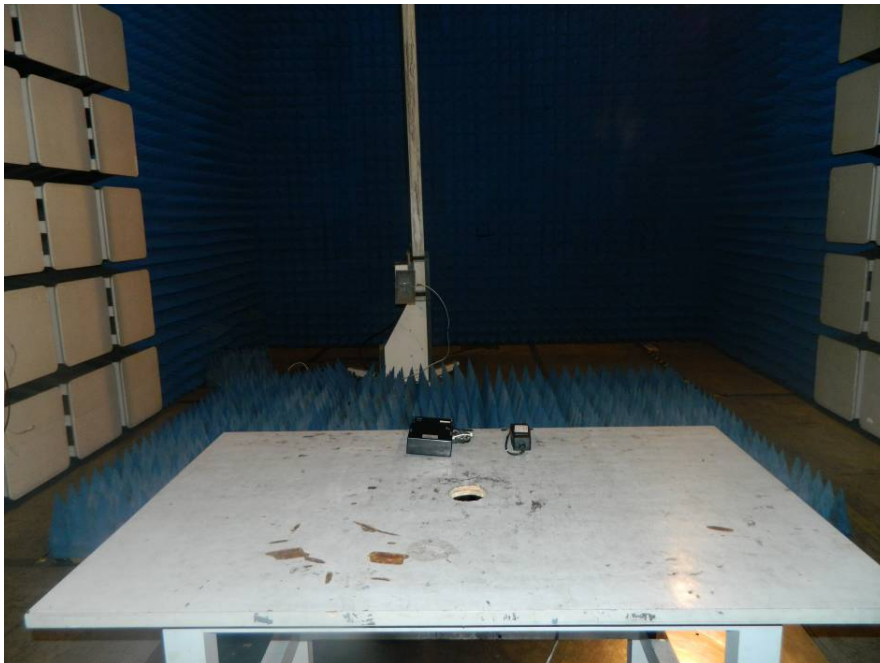
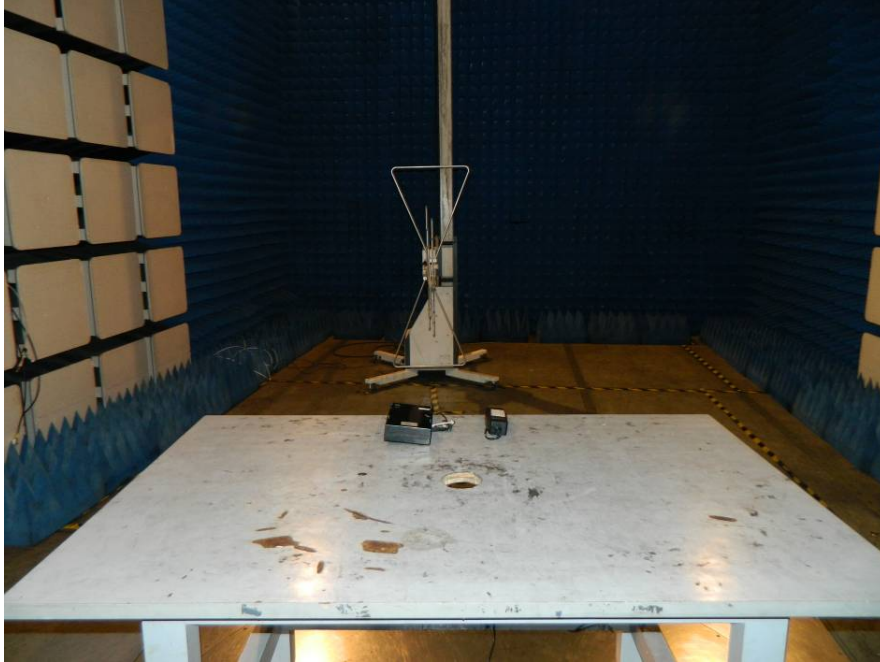
Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
1844.55	V	40.23	23.23	74.00	54.00	-33.77	-30.77
3833.33	V	43.19	26.39	74.00	54.00	-30.81	-27.61
5032.05	V	46.38	29.15	74.00	54.00	-27.62	-24.85
7320.51	V	50.92	33.35	74.00	54.00	-23.08	-20.65
8083.33	V	52.16	33.95	74.00	54.00	-21.84	-20.05
1844.55	H	39.70	22.93	74.00	54.00	-34.30	-31.07
3016.03	H	42.08	25.18	74.00	54.00	-31.92	-28.82
4705.13	H	45.10	28.44	74.00	54.00	-28.90	-25.56
4950.32	H	46.37	29.15	74.00	54.00	-27.63	-24.85
7592.95	H	51.73	33.91	74.00	54.00	-22.27	-20.09

Operation Mode: CH78: 2480MHz Test Date : November 30, 2012
 Frequency Range: 1-25GHz Temperature : 28 °C
 Test Result: PASS Humidity : 65 %
 Measured Distance: 3m Test By: Andy

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
1190.71	V	38.82	22.67	74.00	54.00	-35.18	-31.33
1844.55	V	39.39	22.53	74.00	54.00	-34.61	-31.47
4677.89	V	45.66	28.96	74.00	54.00	-28.34	-25.04
6911.86	V	50.38	32.43	74.00	54.00	-23.62	-21.57
7211.54	V	50.85	33.13	74.00	54.00	-23.15	-20.87
1844.55	H	38.63	21.43	74.00	54.00	-35.37	-32.57
2144.23	H	38.75	21.40	74.00	54.00	-35.25	-32.60
5358.97	H	47.39	29.30	74.00	54.00	-26.61	-24.70
5849.36	H	47.25	30.82	74.00	54.00	-26.75	-23.18
6639.42	H	49.19	31.06	74.00	54.00	-24.81	-22.94

- Note:**
- (1) All Readings are Peak Value and AV.
 - (2) Emission Level= Reading Level+Probe Factor +Cable Loss
 - (3) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
 - (4) All the x/y/z orientation has been investigated, and only worst case is presented in this report.

5.7 Radiated Measurement Photos:



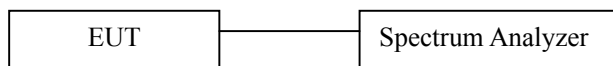


6. BANDWIDTH TEST

6.1. Measurement Procedure

The EUT was operating in hopping mode or could be controlled its channel. Printed out the test result from the spectrum by hard copy function.

6.2. Test SET-UP (Block Diagram of Configuration)



6.3. Measurement Equipment Used:

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	E4407B	88156318	05/29/2012	05/28/2013

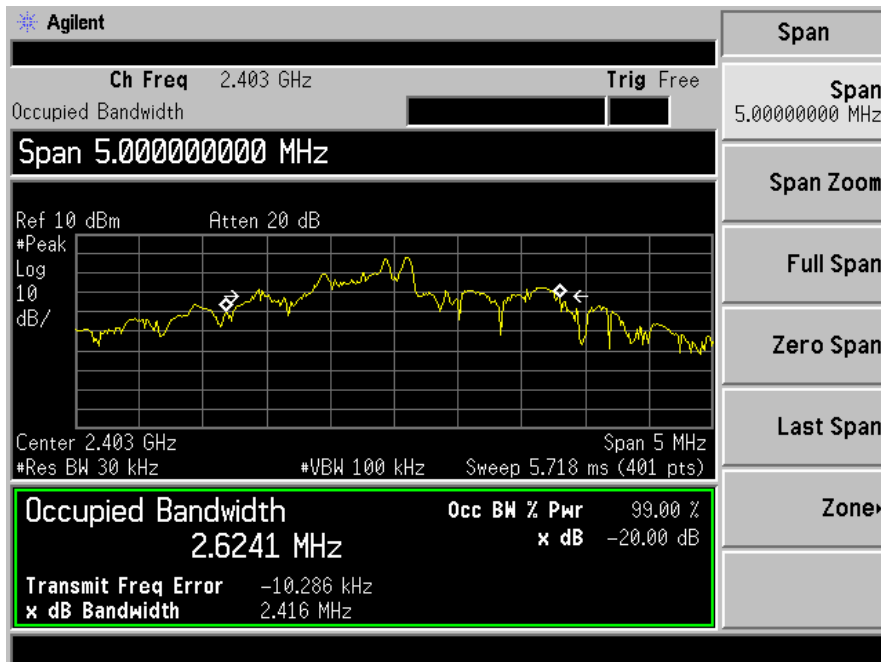
6.4. Measurement Results:

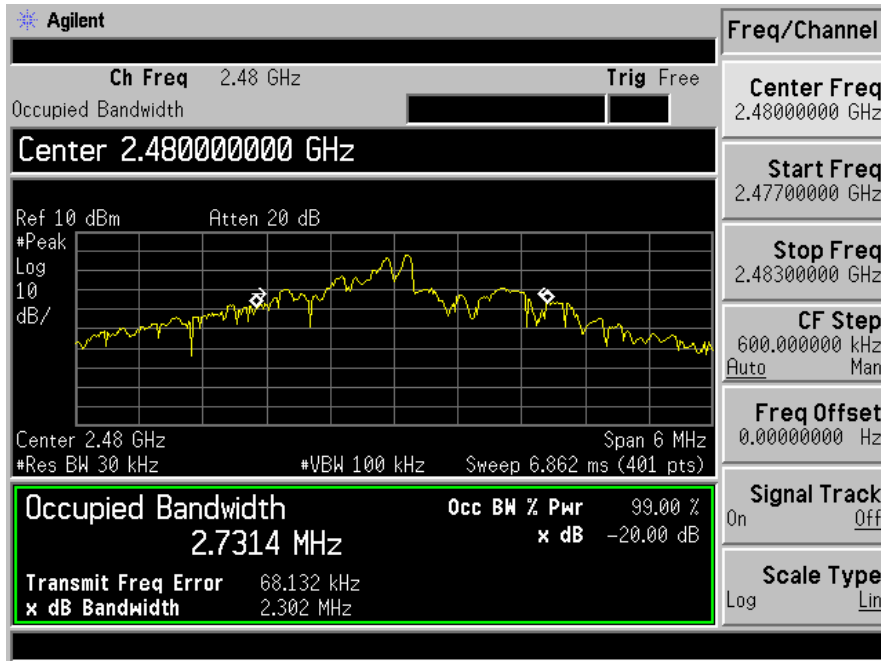
6.4.1. 20dB Bandwidth test data Chart:

Refer to attached data chart.

Spectrum Detector:	PK	Test Date:	November 30, 2012
Test By:	Andy	Temperature:	28 °C
Test Result:	PASS	Humidity:	65 %
Modulation:	GFSK		

Channel number	Channel frequency (MHz)	20dB Down BW(kHz)	99% Down BW(kHz)
CH01	2403	2416.00	2624.10
CH38	2440	2585.00	3298.50
CH78	2480	2302.00	2731.40





7. BAND EDGE TEST

7.1. Measurement Procedure

1. The EUT was Operating in hopping mode or could be controlled its channel. Printed out test result from the spectrum by hard copy function.
2. The EUT was placed on a turn table which is 0.8m above ground plane.
3. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
4. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
5. Repeat above procedures until all frequency measured were complete.

7.2. Test SET-UP (Block Diagram of Configuration)

As 5.2 Test set up (B) and (C)

7.3. Measurement Equipment Used:

Same as 5.3 Radiated Emission Measurement.

7.4. Measurement Results:

Spectrum Detector: PK/AV Test Date : November 30, 2012
 Test By: Andy Temperature : 28 °C
 Test channel: CH01 Humidity : 65 %

Frequency (MHz)	Polarity	Level (dBuV/m)		Limited (dBuV/m)	
		PK	AV	PK	AV
2390.00	H	47.21	41.51	74	54
2390.00	V	48.69	42.14	74	54

Spectrum Detector: PK/AV Test Date : November 30, 2012
 Test By: Andy Temperature : 28 °C
 Test channel: CH78 Humidity : 65 %

Frequency (MHz)	Polarity	Level (dBuV/m)		Limited (dBuV/m)	
		PK	AV	PK	AV
2483.50	H	47.02	41.24	74	54
2483.50	V	46.61	40.15	74	54

8. Antenna Application

12.1 Antenna Requirement

For intentional device, according to FCC 47 CFR Section 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. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

12.2 Result

The EUT'S antenna is PCB Antenna. The antenna's gain is 2.3dBi and meets the requirement.