

Advanced  
Compliance Laboratory

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## ELECTROMAGNETIC EMISSION COMPLIANCE REPORT

of

SWF Virtual Cord Control ZWave  
MODEL: VCZ1  
FCC ID: DWNVCZ IC: 12049A-VCZ

*April 18, 2016*

This report concerns (check one): Original grant  Class II change   
Equipment type: Low Power Intentional Radiator

Test Specifications:  
 FCC Part 15C Sec. 15.249  
 Industry Canada RSS-210 (Issue 8) & RSS-Gen (Issue 3)

Deferred grant requested per 47 CF 0.457(d)(1)(ii)?    yes     no   
If yes, defer until: \_\_\_\_\_ (date)  
Company agrees to notify the Commission by \_\_\_\_\_ (date)  
of the intended date of announcement of the product so that the grant can be  
issued on that date.

Report prepared for:                            SOMFY SYSTEMS INC.  
Report prepared by:                            Advanced Compliance Lab  
Report number:                                    0048-160405-02



Lab Code: 200101

The test result in this report IS supported and covered by the NVLAP accreditation

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## 1. GENERAL INFORMATION

### 1.1 Verification of Compliance

EUT: SWF Virtual Cord Control ZWave

Model: VCZ1

Applicant: SOMFY SYSTEMS INC.

Test Type: FCC Part 15.249 &  
IC RSS-210 (Issue 8) A2.9 & RSS-Gen (Issue 4)

Result: PASS

Tested by: ADVANCED COMPLIANCE LABORATORY

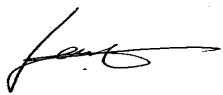
Test Date: April 18, 2016

Report Number: 0048-160405-02

The above equipment was tested by Compliance Laboratory, Advanced Technologies, Inc. for compliance with the requirement set forth in the FCC rules and regulations Part 15 subpart C. This said equipment in the configuration described in the report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

The estimated uncertainty of the test result is given as following. The method of uncertainty calculation is provided in Advanced Compliance Lab. Doc. No. 0048-01-01.

	Prob. Dist.	Uncertainty(dB)	Uncertainty(dB)	Uncertainty(dB)
		30-1000MHz	1-6.5GHz	Conducted
Combined Std. Uncertainty $u_c$	norm.	$\pm 2.36$	$\pm 2.99$	$\pm 1.83$



Wei Li  
Lab Manager  
Advanced Compliance Lab

Date April 18, 2016

## **1.2 Equipment Modifications**

N/A

### 1.3 Product Information

#### System Configuration

ITEM	DESCRIPTION	FCC/IC ID	CABLE
Product	SWF Virtual Cord Control ZWave Model:VCZ1	DWNVCZ (1) 12049A-VCZ	
Housing	PLASTICS		
Power Supply	3V DC Battery		
Operation Freq.	908.42/916.0MHz		
Receiver	VCZ1(Rx)	Verification	

(1) EUT submitted for grant.

### 1.4 Test Methodology

Radiated tests were performed according to the procedures in ANSI C63.4-2014 at an antenna to EUT distance of 3 meters.

### 1.5 Test Facility

The open area test site and conducted measurement facility used to collect the radiated and conducted data are located at Hillsborough, New Jersey, USA. This site is accepted by FCC to perform measurements under Part 15 or 18 (Registration # 90601) and also designated by IC as “site IC 3130”. This site The NVLAP Lab code for accreditation of FCC EMC Test Method is: 200101-0.

### 1.6 Test Equipment

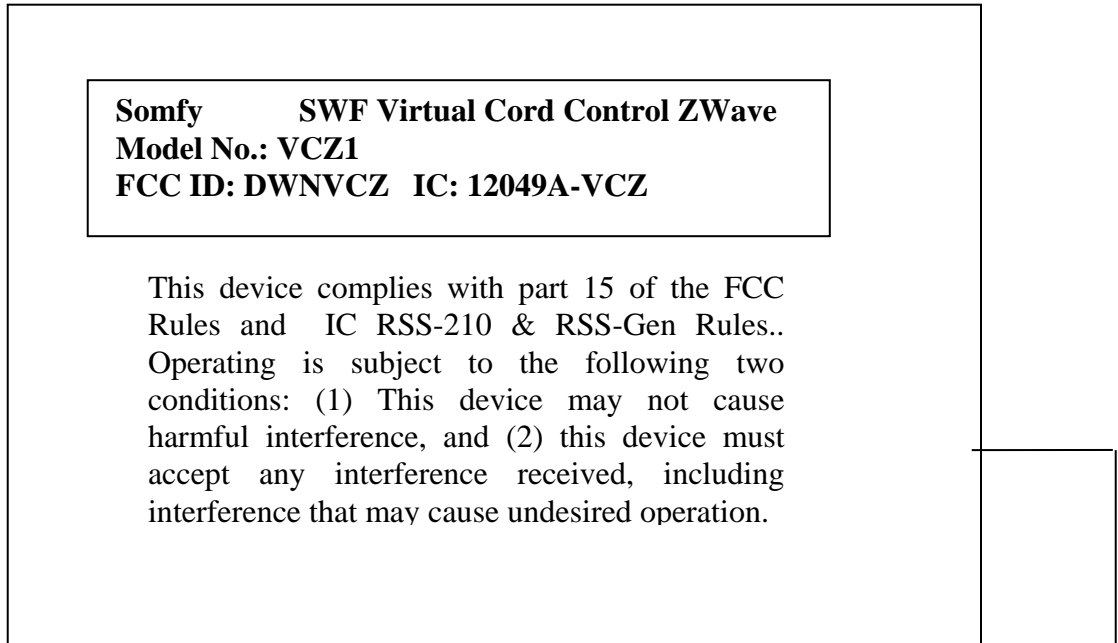
Manufacture	Model	Serial No.	Description	Cal Due dd/mm/y
Hewlett-Packard	HP8546A	3448A00290	EMI Receiver	25/09/16
Agilent	E4440A	US40420700	3Hz-26.5GHz Spectrum Analyzer	17/06/16
Electro-Meterics	ALR-25M/30	289	10KHz-30MHz Active Loop Antenna	28/05/16
EMCO	3104C	9307-4396	20-300MHz Biconical Antenna	12/11/17
EMCO	3146	9008-2860	200-1000MHz Log-Periodic Antenna	13/11/17
EMCO	3115	49225	Double Ridge Guide Horn Antenna	28/11/17

All Test Equipment Used are Calibrated Traceable to NIST Standards. Calibration interval: 2 year.

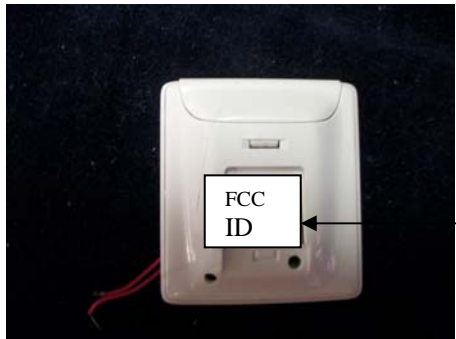
### **1.7 Statement for the Document Use**

This report shall not be reproduced except in full, without the written approval of the laboratory. And this report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. & Canada Government.

## 2. PRODUCT LABELING



**Figure 2.1 FCC/IC ID Label**  
(Only ID show on the EUT)



**Figure 2.2 Location of the Label**



### **3. SYSTEM TEST CONFIGURATION**

#### **3.1 Justification**

The system was configured for testing in a typical fashion (as a customer would normally use it). Customized antenna on PCB was used. Testing was performed as EUT was continuously operated at the following frequency channels: Low=908.42MHz, High=916MHz.

Fresh external battery was used for extended operating time. However, EUT was checked with the internal battery and it was confirmed that the readings obtained with the fresh external battery remain representative of the device as marketed.

#### **3.2 Special Accessories**

N/A

#### **3.3 Configuration of Tested System**

Figure 3.1 illustrate this system, which is tested standing along.









**Figure 3.1 Radiated Test Setup**

## **4. SYSTEM SCHEMATICS**

**See Attachment.**

**Figure 4.1 System Schematics**

## 5. RADIATED EMISSION DATA

### 5.1 Field Strength Calculation

The corrected field strength is automatically calculated by EMI Receiver using following:

$$FS = RA + AF + CF + AG$$

where FS: Corrected Field Strength in dB $\mu$ V/m

RA: Amplitude of EMI Receiver before correction in dB $\mu$ V

AF: Antenna Factor in dB/m

CF: Cable Attenuation Factor in dB

AG: Built-in Preamplifier Gain in dB (Stored in receiver as part of the calibration data)

### 5.2 Test Methods and Conditions

The initial step in collecting radiated data is a EMI Receiver scan of the measurement range below 30MHz using peak detector and 9KHz IF bandwidth / 30KHz video bandwidth. For the range 30MHz - 1GHz, 100KHz IF bandwidth / 100KHz video bandwidth are used. Both bandwidths are 1MHz for above 1GHz measurement. The frequency range from 9KHz up to 10<sup>th</sup> harmonics were investigated.

### 5.3 Test Data

The following data lists the significant emission frequencies, polarity and position, peak reading of the EMI Receiver, the FCC limit, and the difference between the peak reading and the limit. Explanation of the correction and calculation are given in section 5.1.

Test Personnel:



Typed/Printed Name: Edward Lee

Date: April 18, 2016

**Radiated Test Data (CH-908/916MHz)**

Frequency (MHz)	Polarity (V,H) Position (X,Y,Z)	Antenna Height (m)	Azimuth (Degree)	Peak /QP Reading at 3m (2) (dBuV/m)	FCC/IC 3m Peak Limit (3) (dBuV/m)	Difference To Peak Limit (dBuV/m)	Average Reading with Correction (>1GHz) (dBuV/m)	FCC/IC 3m QP/Average Limit (1) (dBuV/m)	Difference To AVG Limit (dBuV/m)
908.4	V/X	1.1	250	74.5				94	-19.5
1816.8	V/X	1.1	180	38.8	74	-35.2		54	-15.2
2725.2	V/X	1.1	000	43.8	74	-30.2		54	-10.2
908.4	H/X	1.1	090	84.5				94	-9.5
1816.9	H/X	1.0	180	42.2	74	-31.8		54	-11.8
2725.5	H/X	1.0	090	43.0	74	-31		54	-11.0
916	V/X	1.1	045	73.5				94	-20.5
1832	V/X	1.1	045	38.8	74	-35.2		54	-15.2
2748	V/X	1.1	045	44.0	74	-30		54	-10.0
916	H/X	1.0	090	82.6				94	-11.4
1832	H/X	1.1	180	42.0	74	-32		54	-12
2748	H/X	1.1	000	43.1	74	-30.9		54	-10.9
908.4	V/Y	1.1	090	78.9				94	-15.1
1816.8	V/Y	1.1	000	39.8	74	-34.2		54	-14.2
2725.2	V/Y	1.1	270	44.8	74	-29.2		54	-9.2
908.4	H/Y	1.0	180	80.5				94	-13.5
1816.9	H/Y	1.1	180	42.8	74	-31.2		54	-11.2
2725.5	H/Y	1.1	000	43.5	74	-30.5		54	-10.5
916	V/Y	1.1	270	78.3				94	-15.7
1832	V/Y	1.1	090	41.2	74	-32.8		54	-12.8
2748	V/Y	1.1	330	44.3	74	-29.7		54	-9.7
916	H/Y	1.0	180	80.5				94	-13.5
1832	H/Y	1.1	180	39.8	74	-34.2		54	-14.2
2748	H/Y	1.1	000	42.5	74	-31.5		54	-11.5
908.4	V/Z	1.1	275	82.6				94	-11.4
1816.8	V/Z	1.1	045	38.9	74	-35.1		54	-15.1
2725.2	V/Z	1.1	045	44.8	74	-29.2		54	-9.2
908.4	H/Z	1.0	090	76.7				94	-17.3
1816.9	H/Z	1.1	000	38.2	74	-35.8		54	-15.8
2725.5	H/Z	1.1	000	43.4	74	-30.6		54	-10.6
916	V/Z	1.1	270	81.2				94	-12.8
1832	V/Z	1.1	090	38.6	74	-35.4		54	-15.4
2748	V/Z	1.1	330	44.6	74	-29.4		54	-9.4
916	H/Z	1.0	045	73.7				94	-20.3
1832	H/Z	1.1	090	39.3	74	-34.7		54	-14.7
2748	H/Z	1.1	045	42.3	74	-31.7		54	-11.7



(1) The limit for emissions within the 902-928MHz band is 50mV(94dB) per FCC Sec. 15.249 & IC RSS-210 Annex 2.9. The limit for its harmonics is 500uV (54dB). Other spurious emissions shall be lower than either its fundamental by 50dB or the limit defined in Sec. 15.209, whichever is higher.

(2) If the peak reading is less than the FCC/IC quasi-peak or average limit, it'll be not necessary to show the measured/ calculated quasi-peak or average reading.

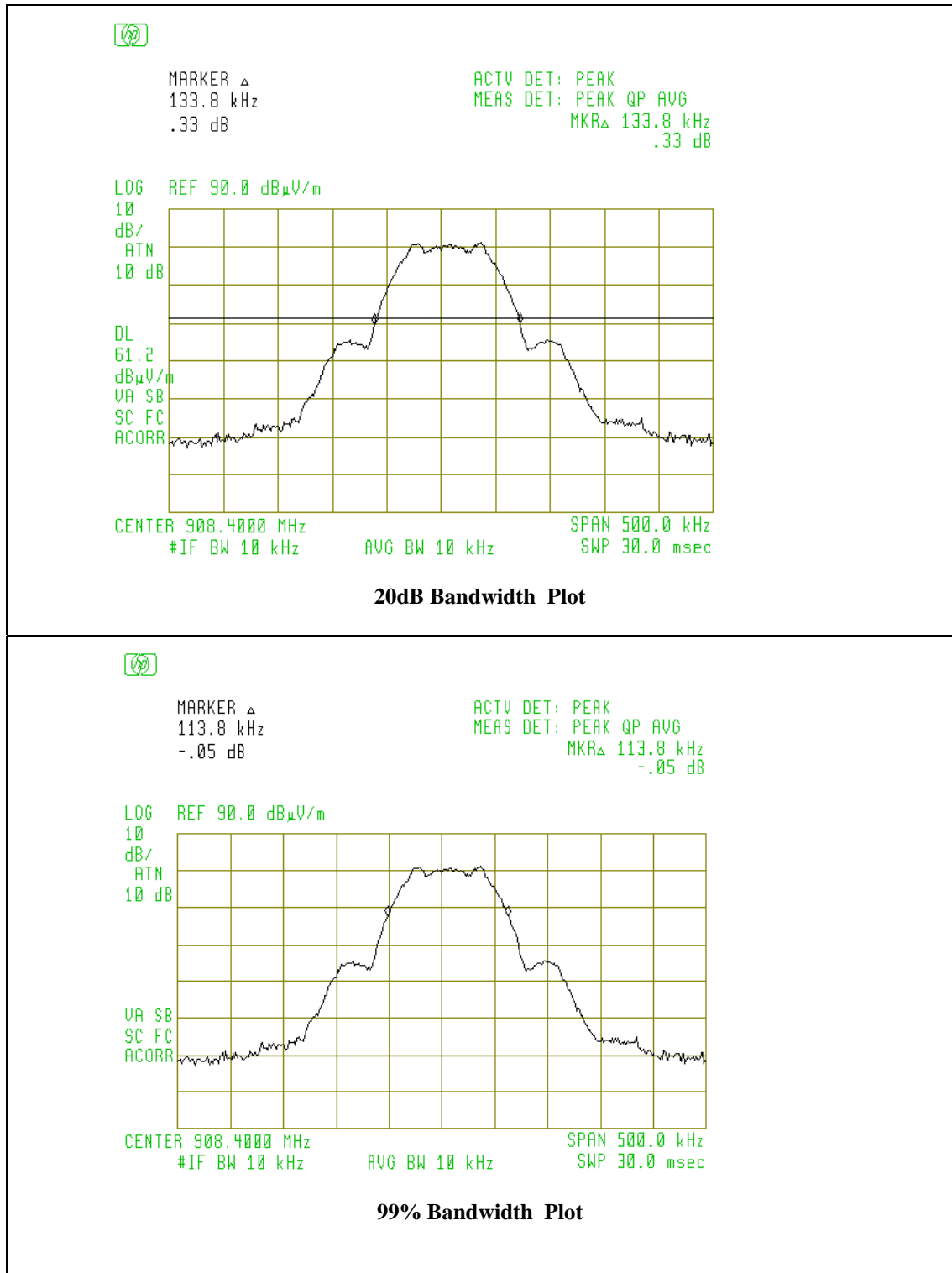
(3) For above 1GHz range, peak reading shall meet the limit: average Limit+20dB.

### Other Spurious outside of the band 902-928MHz

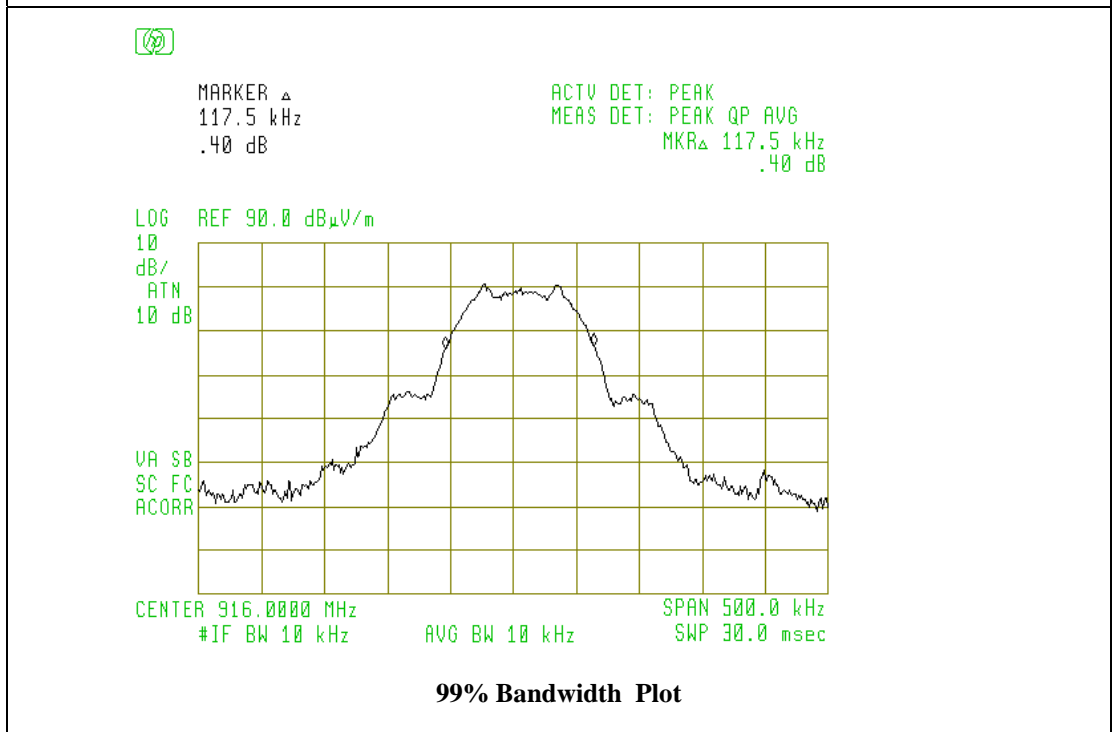
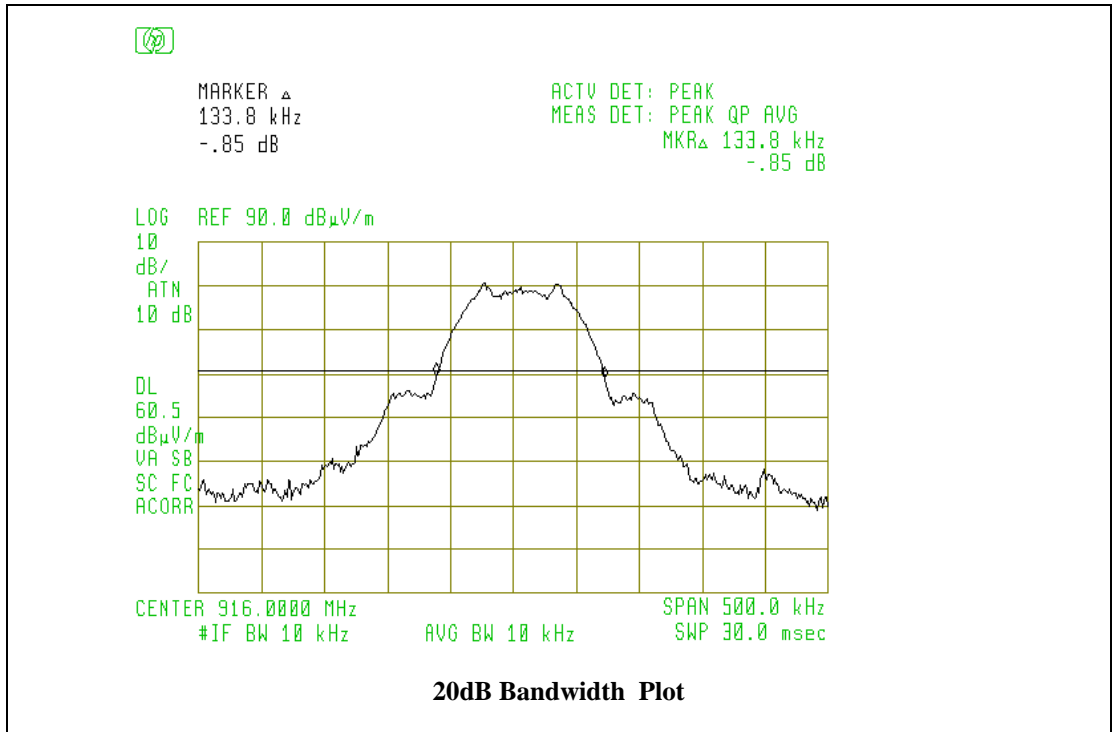
Frequency (MHz)	Polarity (V,H) Position (X,Y,Z)	Antenna Height (m)	Azimuth (Degree)	Peak Reading at 3m (2) (dBuV/m)	Peak Reading After Correction (dBuV/m)	FCC/IC 3m Limit (1) (dBuV/m)	Difference (dBuV/m)
254	H/Y	1.1	000	34.3		46.5	-12.2
508	H/Y	1.1	000	34.8		46.5	-11.7
600	H/Y	1.0	135	39.3		46.5	-7.2
830	H/Y	1.0	270	40.5		46.5	-6.0
252	V/Z	1.2	045	33.7		46.5	-12.8
508	V/Z	1.1	135	34.8		46.5	-11.7
600	V/Z	1.1	000	38.9		46.5	-7.6
830	V/Z	1.1	045	41.5		46.5	-5.0

Comparing to the limit defined in FCC Sec. 15.209/IC RSS-Gen, emissions below the limit by 20dB were not recorded.

Frequency: 908MHz



Frequency: 916MHz



## 6. EUT RECEIVING MODE VERIFICATION

### Radiated Test Data for Receiving Mode (worst case: Z&Y-position)

Frequency (MHz)	Polarity (V,H) Position (X,Y,Z)	Antenna Height (m)	Azimuth (Degree)	Peak Reading at 3m (2) (dBuV/m)	Peak Reading After Correction (dBuV/m)	FCC/IC 3m Limit (1) (dBuV/m)	Difference (dBuV/m)
252	H/Y	1.1	135	34.5		46.5	-12.0
500	H/Y	1.0	135	35.3		46.5	-11.2
600	H/Y	1.0	090	39.0		46.5	-7.5
810	H/Y	1.0	235	40.1		46.5	-6.4
250	V/Z	1.2	090	34.0		46.5	-12.5
500	V/Z	1.1	330	36.2		46.5	-10.3
550	V/Z	1.1	330	36.8		46.5	-9.7
810	V/Z	1.1	000	39.5		46.5	-7.0

(1) Receiving mode spurious emissions shall be lower than the limit defined in FCC Sec. 15.209 & IC RSS-GEN.

(2) If the peak reading is less than the FCC/IC quasi-peak or average limit, it'll be not necessary to show the measured/ calculated quasi-peak or average reading.