

Advanced
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ELECTROMAGNETIC EMISSION COMPLIANCE REPORT of

DM ASSET TAG
MODEL: ITD761 SERIES
FCC ID: ST2-DM76Y

July 05, 2012

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

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.

Transition Rules Request per 15.37? yes ☐ no ☒
If no, assumed Part 15, Subpart B for unintentional radiators - the new 47 CFR
[10-1-90 Edition] provision.

Report prepared for: CENTRAK, INC.
Report prepared by: Advanced Compliance Lab
Report number: 0048-120621-01



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: DM ASSET TAG

Model: ITD761 SERIES

Applicant: CENTRAK, INC.

Test Type: FCC Part 15C Sec. 15.249 CERTIFICATION

Result: PASS

Tested by: ADVANCED COMPLIANCE LABORATORY

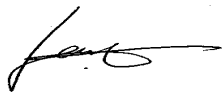
Test Date: July 05, 2012

Report Number: 0048-120621-01

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.	± 2.36	± 2.99	± 1.83



Wei Li
Lab Manager
Advanced Compliance Lab

Date July 05, 2012

1.2 Equipment Modifications

N/A

1.3 Product Information

System Configuration

ITEM	DESCRIPTION	FCC ID	CABLE
Product	DM ASSET TAG ⁽¹⁾	ST2-DM76Y	
Housing	PLASTICS		
Power Supply	3V DC Battery		
Operation Freq.	904MHz ~ 926MHz , 2412MHz ~ 2462MHz		
Receiver	2X76Y(RX)	Verification	

(1) EUT submitted for grant.

1.4 Test Methodology

Radiated tests were performed according to the procedures in ANSI C63.4-2003 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. This site has been accepted by FCC to perform measurements under Part 15 or 18 in a letter dated May 19, 1997 (Refer to: 31040/PRV 1300F2). 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/yy
Hewlett-Packard	HP8546A	3448A00290	EMI Receiver	15/10/12
Agilent	E4440A	US40420700	3Hz-26.5GHz Spectrum Analyzer	25/8/12
EMCO	3104C	9307-4396	20-300MHz Biconical Antenna	15/01/13
EMCO	3146	9008-2860	200-1000MHz Log-Periodic Antenna	15/01/13
ARA	MWH-1826/B	1013	18-26GHZ Horn Antena	10/2/2013
EMCO	3115	4945	Double Ridge Guide Horn Antenna	22/01/13
Electro-Meterics	ALR-25M/30	289	10KHz-30MHz Active Loop Antenna	28/05/13
Fischer Custom	LISN-1	900-4-0008	Line Impedance Stabilization Networks	18/03/13
Fischer Custom	LISN-2	900-4-0009	Line Impedance Stabilization Networks	24/03/13

All Test Equipment Used are Calibrated Traceable to NIST Standards.

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. Government.

2. PRODUCT LABELING

FCC ID: ST2-DM76Y

This device complies with part 15 of the FCC Rules. Operating is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**Figure 2.1 FCC ID Label
(Only FCC ID shown on EUT)**



Figure 2.2 FCC Label Location

3. SYSTEM TEST CONFIGURATION

3.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it). And its antenna was permanently attached to the EUT with max length, 2”.

Testing was performed as EUT was continuously operated at the following frequency channels:

Low=904MHz, Middle= 915MHz, High=926MHz and
Low=2412MHz, Middle= 2437MHz, High=2462MHz

Fresh external battery was used for extended operating time.

3.2 Special Accessories

N/A

3.3 Configuration of Tested System

Figure 3.1 to Figure 3.3 illustrate this system, which is tested standing along.



Figure 3.1 Radiated Test Setup, position 1



Figure 3.2 Radiated Test Setup, position 2



Figure 3.3 Radiated Test Setup, position 3

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 μ V/m

RA: Amplitude of EMI Receiver before correction in dB μ 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)

THE "DUTY CYCLE CORRECTION FACTOR" FOR SPURIOUS RADIATED EMISSIONS IS;
 $20 \log * (4 \text{ ms} / 100 \text{ ms}) = -28 \text{ dB}$, WHICH WAS USED TO CORRECT THE AVERAGE RADIATED EMISSION READINGS.

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. Up to 10th 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: July 05, 2012

Radiated Test Data (CH-904MHz/915MHz/926MHz & Harmonics)

Frequency (MHz)	Polarity (V,H) Position (X,Y,Z)	Antenna Height (m)	Azimuth (Degree)	Peak Reading at 3m (2) (dBuV/m)	Reading After Correction (dBuV/m)	FCC 3m Limit (1) (dBuV/m)	Difference (dBuV/m)
904	V/X	1.2	180	89.9	61.9	94	-32.1
1808	V/X	1.1	270	53.8	25.8	54	-28.2
2712	V/X	1.0	225	58.5	30.5	54	-23.5
904	H/X	1.2	225	91.3	63.3	94	-30.7
1808	H/X	1.1	225	52.5	24.5	54	-29.5
2712	H/X	1.1	180	62.5	34.5	54	-19.5
915	V/X	1.2	090	84.2	56.2	94	-37.8
1830	V/X	1.1	000	53.8	25.8	54	-28.2
2745	V/X	1.0	270	59.1	31.1	54	-22.9
915	H/X	1.2	045	89.3	61.3	94	-32.7
1830	H/X	1.1	000	54.9	26.9	54	-27.1
2745	H/X	1.1	090	57.8	29.8	54	-24.2
926	V/X	1.2	180	81.5	53.5	94	-40.5
1852	V/X	1.0	270	54.7	26.7	54	-27.3
2778	V/X	1.0	090	58.1	30.1	54	-23.9
926	H/X	1.2	225	89.9	61.9	94	-32.1
1852	H/X	1.0	090	55.9	27.9	54	-26.1
2778	H/X	1.1	000	59.2	31.2	54	-22.8
904	V/Y	1.2	225	85.1	57.1	94	-36.9
1808	V/Y	1.1	180	57.7	29.7	54	-24.3
2712	V/Y	1.0	180	63.2	35.2	54	-18.8
904	H/Y	1.2	225	89.1	61.1	94	-32.9
1808	H/Y	1.1	180	53.8	25.8	54	-28.2
2712	H/Y	1.0	225	57.0	29.0	54	-25.0
915	V/Y	1.2	180	85.6	57.6	94	-36.4
1830	V/Y	1.1	270	59.4	31.4	54	-22.6
2745	V/Y	1.0	000	61.8	33.8	54	-20.2
915	H/Y	1.2	225	88.9	60.9	94	-33.1
1830	H/Y	1.1	180	54.6	26.6	54	-27.4
2745	H/Y	1.0	045	56.8	28.8	54	-25.2

926	V/Y	1.2	045	86.9	58.9	94	-35.1
1852	V/Y	1.0	045	59.7	31.7	54	-22.3
2778	V/Y	1.0	000	60.1	32.1	54	-21.9
926	H/Y	1.2	225	85.9	57.9	94	-36.1
1852	H/Y	1.0	000	57.2	29.2	54	-24.8
2778	H/Y	1.0	180	57.2	29.2	54	-24.8
904	V/Z	1.2	225	89.8	61.8	94	-32.2
1808	V/Z	1.1	090	51.5	23.5	54	-30.5
2712	V/Z	1.1	000	58.6	30.6	54	-23.4
904	H/Z	1.2	180	91.1	63.1	94	-30.9
1808	H/Z	1.0	090	54.4	26.4	54	-27.6
2712	H/Z	1.0	090	61.8	33.8	54	-20.2
915	V/Z	1.2	135	90.9	62.9	94	-31.1
1830	V/Z	1.1	270	55.2	27.2	54	-26.8
2745	V/Z	1.1	045	63.3	35.3	54	-18.7
915	H/Z	1.2	180	89.3	61.3	94	-32.7
1830	H/Z	1.1	090	51.5	23.5	54	-30.5
2745	H/Z	1.0	225	58.7	30.7	54	-23.3
926	V/Z	1.2	180	87.2	59.2	94	-34.8
1852	V/Z	1.0	090	55.9	27.9	54	-26.1
2778	V/Z	1.0	045	62.2	34.2	54	-19.8
926	H/Z	1.2	180	86.7	58.7	94	-35.3
1852	H/Z	1.0	000	55.1	27.1	54	-26.9
2778	H/Z	1.0	225	57.3	29.3	54	-24.7

(1) The limit for emissions within the 902-928MHz band is 50mV(94dB) per Sec. 15.249. 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 each peak reading is less than the FCC average limit, it'll be not necessary to show the measured/ calculated average reading.

Radiated Test Data (CH-2412MHz/2437MHz/2462MHz & Harmonics)

Frequency (MHz)	Polarity (V,H) Position (X,Y,Z)	Antenna Height (m)	Azimuth (Degree)	Peak Reading at 3m (2) (dBuV/m)	Reading After Correction (dBuV/m)	FCC 3m Limit (1) (dBuV/m)	Difference (dBuV/m)
2412	V/X	1.1	000	97.5	69.5	94	-24.5
4824	V/X	1.0	045	69.7	41.7	54	-12.3
2412	H/X	1.0	000	95.0	67	94	-27
4824	H/X	1.1	000	65.5	37.5	54	-16.5
2437	V/X	1.1	135	98.5	70.5	94	-23.5
4874	V/X	1.1	180	69.6	41.6	54	-12.4
2437	H/X	1.0	090	97.8	69.8	94	-24.2
4874	H/X	1.1	135	68.5	40.5	54	-13.5
2462	V/X	1.2	000	98.3	70.3	94	-23.7
4924	V/X	1.0	000	69.5	41.5	54	-12.5
2462	H/X	1.2	180	93.5	65.5	94	-28.5
4924	H/X	1.0	225	64.5	36.5	54	-17.5
2412	V/Y	1.2	090	91.8	63.8	94	-30.2
4824	V/Y	1.1	000	63.0	35	54	-19
2412	H/Y	1.2	000	99.7	71.7	94	-22.3
4824	H/Y	1.1	045	70.5	42.5	54	-11.5
2437	V/Y	1.2	090	98.8	70.8	94	-23.2
4874	V/Y	1.1	045	69.9	41.9	54	-12.1
2437	H/Y	1.0	000	98.3	70.3	94	-23.7
4874	H/Y	1.1	000	68.8	40.8	54	-13.2
2462	V/Y	1.2	045	89.9	61.9	94	-32.1
4924	V/Y	1.0	090	61.2	33.2	54	-20.8
2462	H/Y	1.2	000	98.7	70.7	94	-23.3
4924	H/Y	1.0	000	69.6	41.6	54	-12.4
2412	V/Z	1.2	000	102.2	74.2	94	-19.8
4824	V/Z	1.1	180	72.3	44.3	54	-9.7
2412	H/Z	1.2	000	92.1	64.1	94	-29.9
4824	H/Z	1.0	180	63.3	35.3	54	-18.7

2437	V/Z	1.2	135	94.4	66.4	94	-27.6
4874	V/Z	1.1	045	65.0	37	54	-17
2437	H/Z	1.2	000	92.6	64.6	94	-29.4
4874	H/Z	1.1	090	63.6	35.6	54	-18.4
2462	V/Z	1.2	000	99.7	71.7	94	-22.3
4924	V/Z	1.0	000	70.1	42.1	54	-11.9
2462	H/Z	1.2	180	85.8	57.8	94	-36.2
4924	H/Z	1.0	135	57.1	29.1	54	-24.9

The limit for emissions within the 2400-2483.5MHz band is 50mV(94dB) per Sec. 15.249.

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 each peak reading is less than the FCC average limit, it'll be not necessary to show the measured/ calculated average reading.

Other Spurious outside of the band 902-928MHz

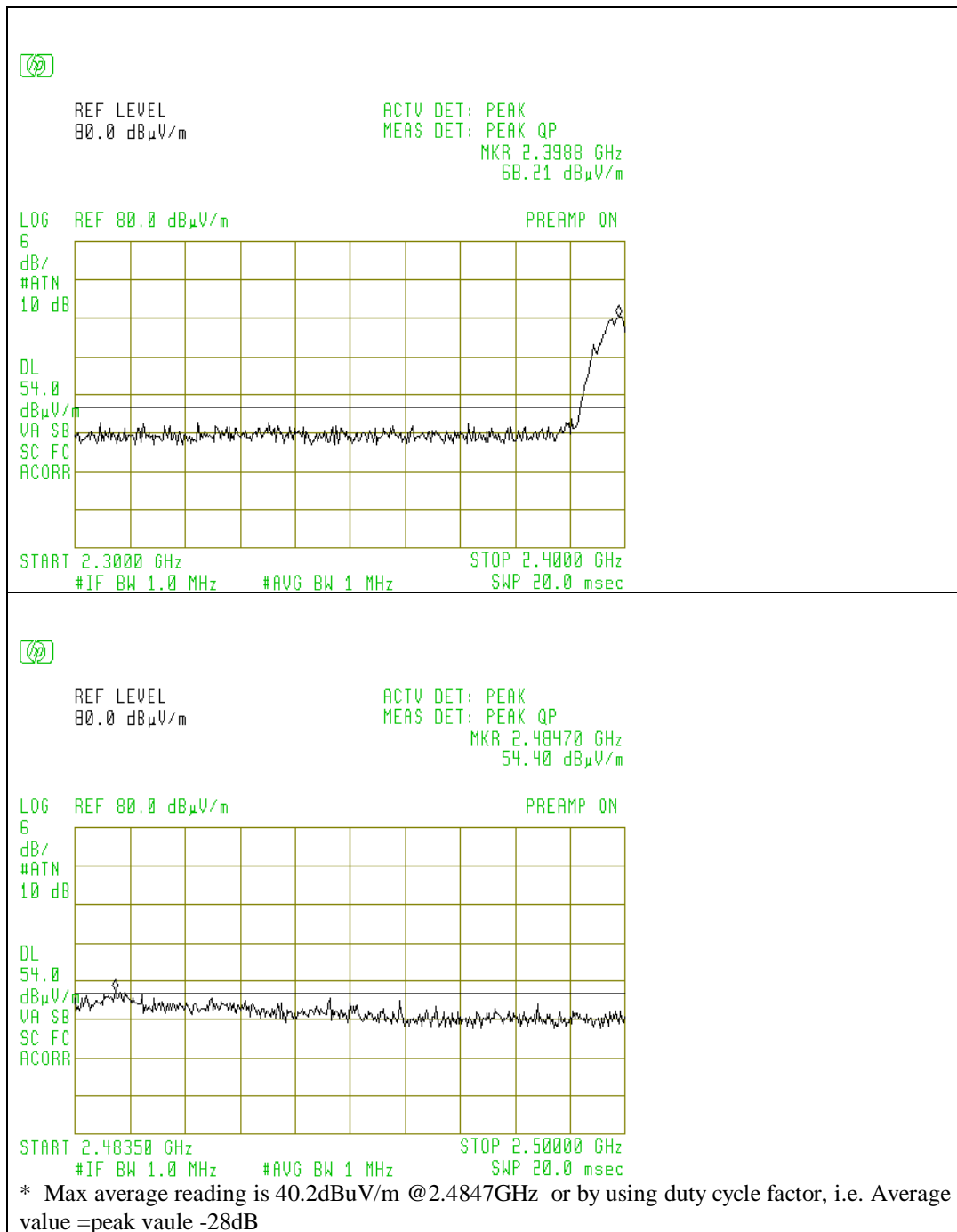
Frequency (MHz)	Polarity (V,H) Position (X,Y,Z)	Antenna Height (m)	Azimuth (Degree)	Peak Reading at 3m (2) (dBuV/m)	FCC 3m Limit (1) (dBuV/m)	Difference (dBuV/m)
472.5	V	1.1	225	40.8	46.5	-5.7
578.0	V	1.1	270	39.7	46.5	-6.8
890.9	V	1.1	180	41.9	46.5	-4.6
928.2	V	1.0	180	41.7	46.5	-4.8
368.1	H	1.0	090	36.5	46.5	-10.0
420.3	H	1.0	090	41.8	46.5	-4.7
472.0	H	1.0	000	41.3	46.5	-5.2

Other Spurious outside of the band 2400-2483.5MHz

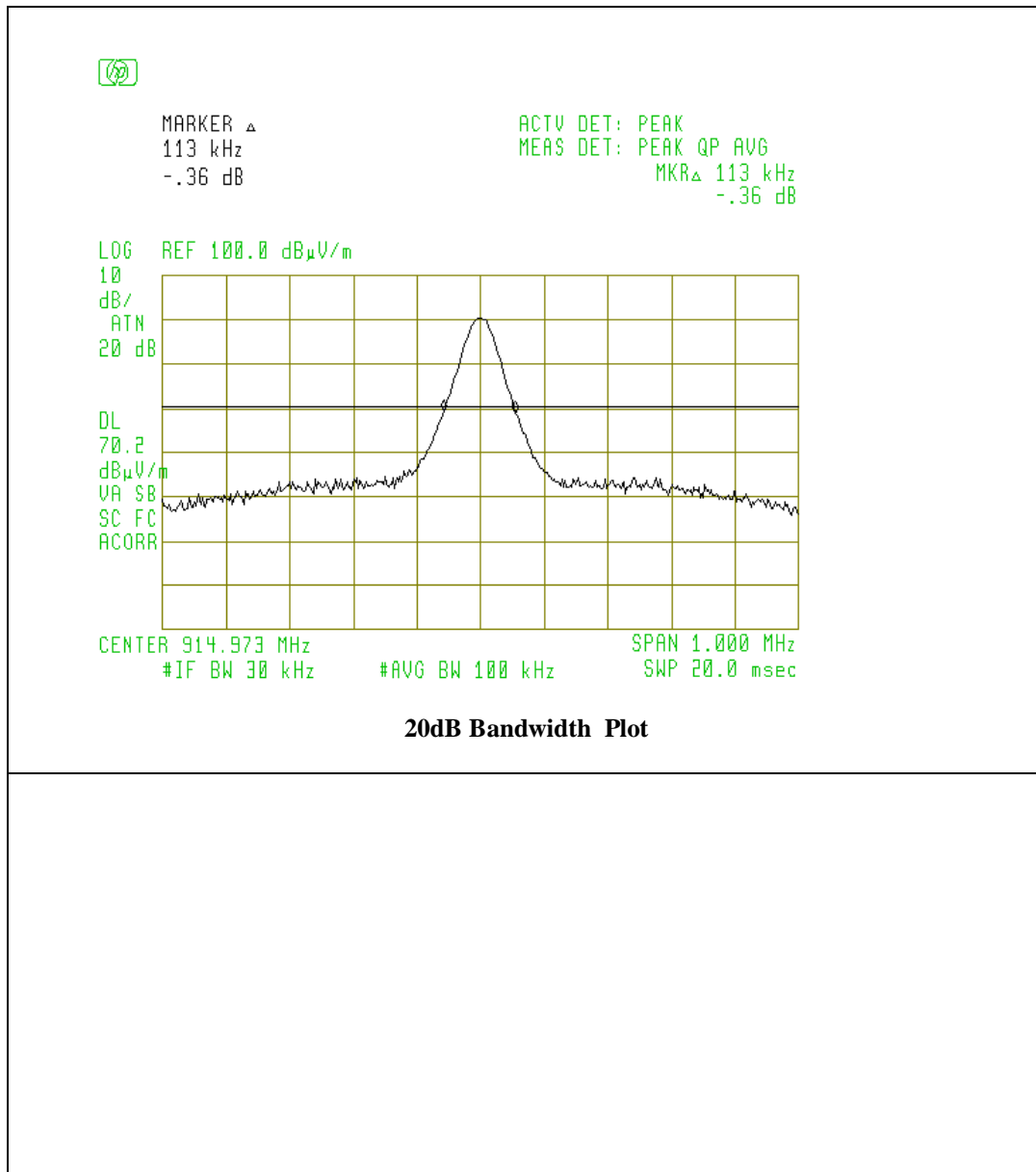
Frequency (MHz)	Polarity (V,H) Position (X,Y,Z)	Antenna Height (m)	Azimuth (Degree)	Peak Reading at 3m (2) (dBuV/m)	FCC 3m Limit (1) (dBuV/m)	Difference (dBuV/m)
1448.0	V	1.1	090	48.5	54.0	-5.5
1694.8	V	1.1	045	49.4	54.0	-4.6
1905.0	V	1.1	090	47.9	54.0	-6.1
1448.0	H	1.0	000	45.7	54.0	-8.3
1694.8	H	1.0	225	48.3	54.0	-5.7
1905.0	H	1.0	180	43.8	54.0	-10.2

Comparing to the limit defined in Sec. 15.209, emissions below the limit by 20dB were not recorded.

Band-edge Restricted band spurious



20 dB Bandwidth : 900MHz Band



20 dB Bandwidth : 2400MHz Band

