

TEST REPORT For FCC

FCC Standards : FCC 47CFR part 15 subpart C

Test Report No. : CTK-2014-00891
Date of Issue : July 23, 2014
FCC ID : 2ACIY-FSIF-M0
Basic Model/Type No. : FSIF-M0
Variant Model/Type No. : -
Kind of Product : Facilities Serial InterFace-Mini 0
Applicant : DONGAH ELECOMM
Applicant Address : 16, Namgok-ro, Yangji-myeon, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea
Manufacturer : DONGAH ELECOMM
Manufacturer Address : 16, Namgok-ro, Yangji-myeon, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea
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Received Date : July 29, 2013
Test period : Start : April 04, 2014 End : May 29, 2014
Test Results : ☒ In Compliance ☐ Not in Compliance

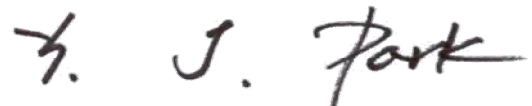
The test results presented in this report relate only to the object tested.

Tested by



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Test Engineer
Date: July 23, 2014

Reviewed by



Young-Joon, Park
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REPORT REVISION HISTORY

Date	Revision	Page No
July 23, 2014	Issued (CTK-2014-00891)	All

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1.0 General Product Description

Equipment model name	FSIF-M0
Serial number	Prototype
EUT condition	Pre-production, not damaged
Frequency Range	802.11b/g/n(HT20) : 2412 MHz - 2472 MHz 802.11n(HT40) : 2422 MHz - 2452 MHz
RF output power	MAX 0.0097W
Number of channels	802.11b/g/n(HT20) : 13 802.11n(HT40) : 7
Channel Spacing	5 MHz
Type of Modulation	802.11b : DSSS 802.11g/n : OFDM
Duty cycle	1.0
Power Source	DC 5.0 V
Antenna Specification	Dipole Antenna : 2.882 dBi Magnet Dipole Antenna : 1.816 dBi

1.1 Test Frequency

802.11b, 802.11g, 802.11n(HT20)

	LOW	MID	HIGH
Frequency (MHz)	2412	2442	2472

802.11n(HT40)

	LOW	MID	HIGH
Frequency (MHz)	2422	2437	2452

1.2 Test Mode

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

[Data rate]

Mode	Description
Mode 1	802.11b
Mode 2	802.11g
Mode 3	802.11n(HT20)
Mode 4	802.11n(HT40)

[Antenna type]

Mode	Description
Mode 1	Dipole Antenna
Mode 2	Magnet Dipole Antenna

1.3 Device Modifications

The following modifications were necessary for compliance:

Not applicable

1.4 Peripheral Devices

Device	Manufacturer	Model No.	Serial No.
Notebook Computer	DELL	PP20L	-
AC/DC ADAPTER	DELL	HA65NS0-00	CN-0DF261-47890-729-A18H

1.5 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

1.6 Test Facility

The measurement facility is located at 113, Yejik-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

1.7 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3 m & 10 m SAC and Conducted Test Site to perform FCC Part 15/18 measurements	 805871
JAPAN	VCCI	3 m & 10 m SAC and Conducted Test Site	 C-986, T-1843 R-3627, G-387
KOREA	KCC	EMI (3 m & 10 m SAC and Conducted Test Site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and Interruptions)	 No. 51, KR0025
International	KOLAS	EMC	

2 Summary of tests

FCC Part Section(s)	Parameter	Limit	Test Condition	Status (Note 1, Note 2)
15.247(a)	6 dB Bandwidth	> 500 kHz	Conducted	NA
15.247(b)	Maximum Output Power	< 1 Watt		NA
15.247(d)	Conducted Spurious emission	> 20 dBc		NA
15.247(d)	Band Edge	> 20 dBc		NA
15.247(e)	Transmitter Power Spectral Density	< 8 dBm @ 3 kHz		NA
15.209	Field Strength of Harmonics	15.209(a)	Radiated	C
15.207	AC Conducted Emissions	15.207(a)	Line Conducted	C

Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable

Note 2: WIFI Module(FCC ID : XR2WIZ630WI) is certified.

Note 3: The data in this test report are traceable to the national or international standards.

The sample was tested according to the following specification:
- FCC Part 15.247, ANSI C63.4-2003

The tests were performed according to the method of measurements prescribed in
558074 D01 DTS Meas Guidance v03r01.

2.1 Technical Characteristic Test

2.1.1 Field Strength of Emissions

Test Location

- ☒ 10 m SAC (test distance : ☐ 10 m, ☒ 3 m)
☒ 3 m SAC (test distance : 3 m)

Test Procedures

- 1) In the frequency range of 9 kHz to 30 MHz, magnetic field is measured with Loop Antenna. The Test Antenna is positioned with its plane vertical at 1m distance from the EUT. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.
- 2) In the frequency range above 30 MHz, Bi-Log Test Antenna(30 MHz to 1 GHz) and Horn Test Antenna(above 1 GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is carried from 1m to 4m above the ground to determine the maximum value of the field strength. The emissions levels at both horizontal and vertical polarizations should be tested.

The spectrum analyzer is set to:

Frequency Range = 9 kHz ~ 25 GHz (2.4 GHz 10th harmonic)

RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz, 9 kHz for $f < 30$ MHz

VBW $\geq$ RBW

Sweep = auto

Limit

§ 15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	MHz	MHz	GHz
0.09-0.11	8.37626-8.38675	73-74.6	399.9-410	2690-2900	10.6-12.7
¹ 0.495-0.505	8.41425-8.41475	74.8-75.2	608-614	3260-3267	13.25-13.4
2.1735-2.1905	12.29-12.293	108-121.94	960-1240	3332-3339	14.47-14.5
4.125-4.128	12.51975-12.52025	123-138	1300-1427	3345.8-3358	15.35-16.2
4.17725-4.17775	12.57675-12.57725	149.9-150.05	1435-1626.5	3600-4400	17.7-21.4
4.20725-4.20775	13.36-13.41	156.52475-156.52525	1645.5-1646.5	4500-5150	22.01-23.12
6.215-6.218	16.42-16.423	156.7-156.9	1660-1710	5350-5460	23.6-24
6.26775-6.26825	16.69475-16.69525	162.0125-167.17	1718.8-1722.2	7250-7750	31.2-31.8
6.31175-6.31225	16.80425-16.80475	167.72-173.2	2200-2300	8025-8500	36.43-36.5
8.291-8.294	25.5-25.67	240-285	2310-2390	9000-9200	² Above 38.6
8.362-8.366	37.5-38.25	322-335.4	2483.5-2500	9300-9500	

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

§ 15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

§ 15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table :

Frequency(MHz)	Field Strength uV/m@3m	Field Strength dBuV/m@3m	Deasurement Distance (meters)
0.009-0.490	2400/F(kHz)	-	300
0.490-1.705	24000/F(kHz)	-	30
1.705-30	30	-	30
30-88	100**	40	3
88-216	150**	43.5	3
216-960	200**	46	3
Above 960	500	54	3

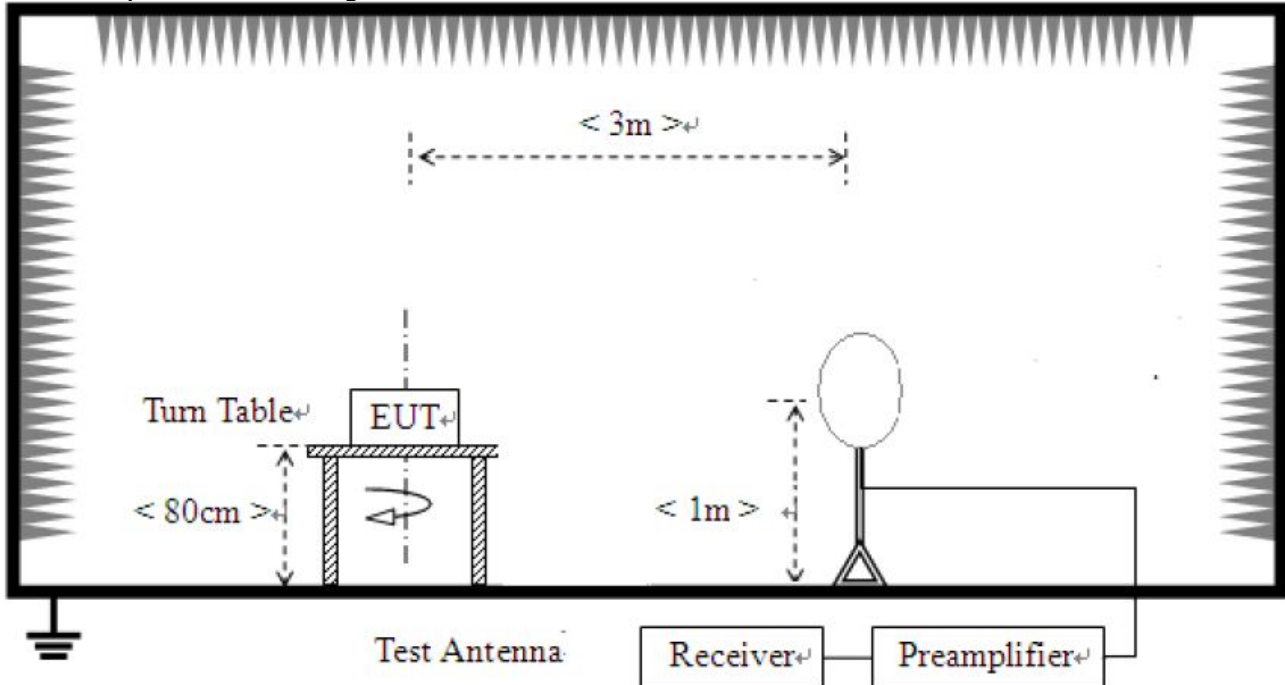
** Except as provided in 15.209(g).fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72MHz, 76-88MHz, 174-216MHz, 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g.15.231 and 15.241.

Note :

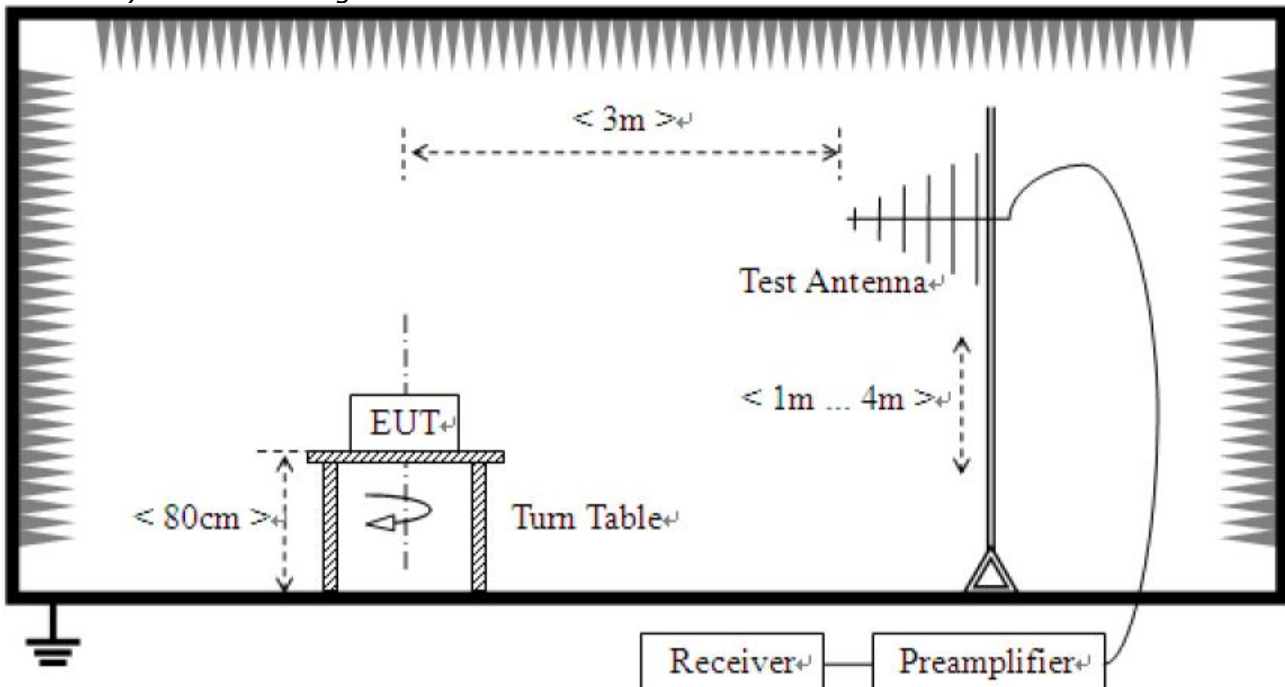
- 1) For above 1 GHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.
- 2) For above 1 GHz, limit field strength of harmonics : 54 dBuV/m@3m (AV) and 74 dBuV/m@3m (PK)

Test Setup:

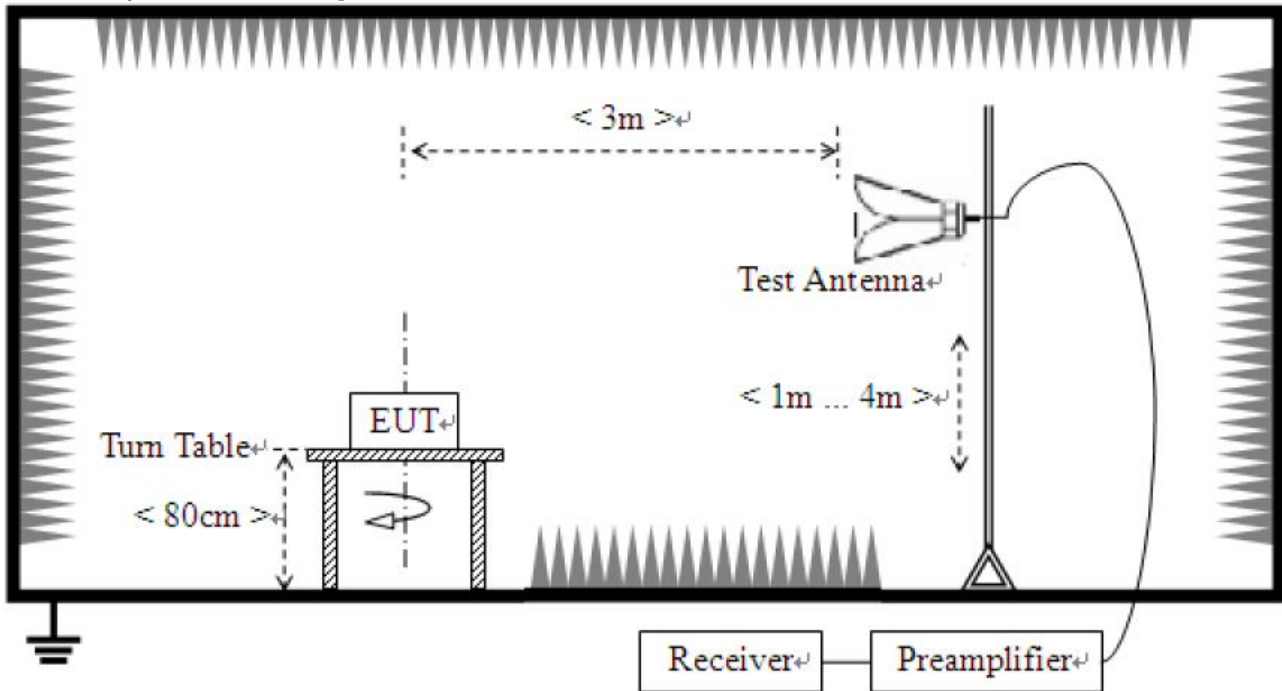
1) For field strength of emissions from 9 kHz to 30 MHz



2) For field strength of emissions from 30 MHz to 1 GHz



3) For field strength of emissions above 1 GHz



Test Results

1) 9 kHz to 30 MHz

EUT	Facilities Serial InterFace-Mini 0	Measurement Detail	
Model	FSIF-M0	Frequency Range	9 kHz - 30 MHz
Test mode	802.11b(worst case)	Detector function	Quasi-Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBUV/m)	Margin (dB)	Remark
-	-	-	See note

Note :

The amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB)

Test Results

Test mode : 802.11b_ Dipole Antenna

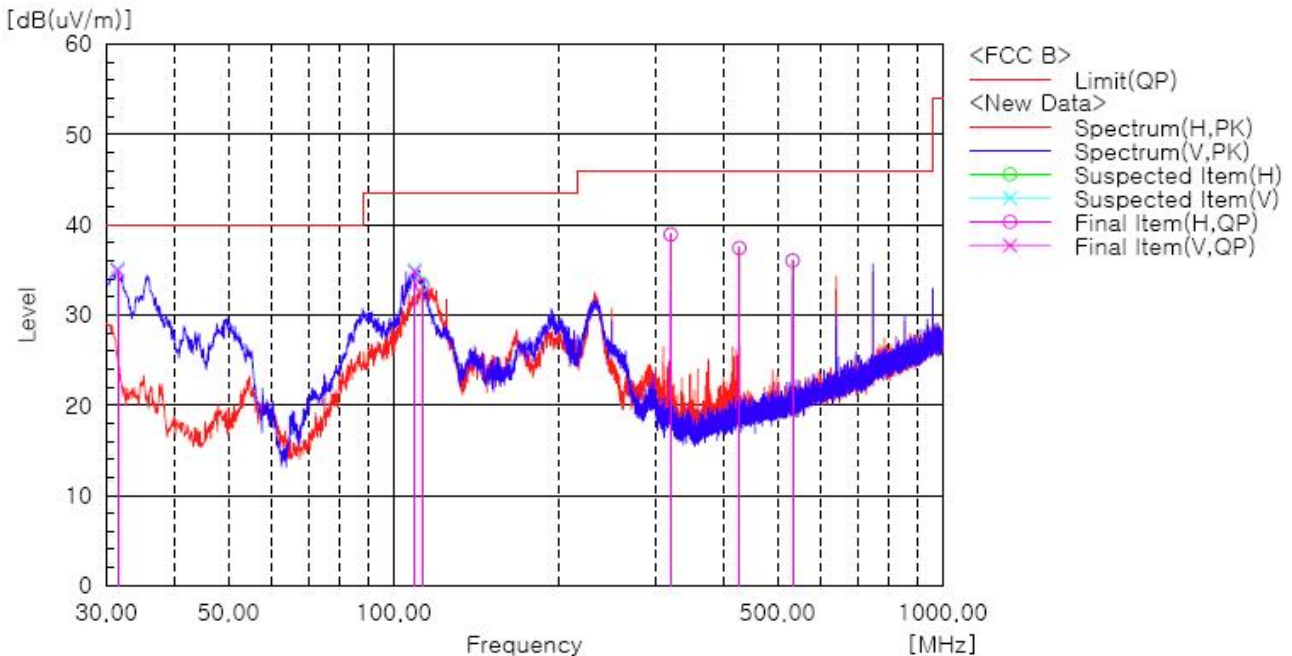
EUT	Facilities Serial InterFace-Mini 0	Measurement Detail	
Model	FSIF-M0	Frequency Range	Below 1000MHz
Mode	802.11b(Worst Case)	Detector function	Quasi-Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
31.455	34.9	5.1	Quasi-peak

Test data



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
1	31.455	V	47.4	-12.5	34.9	40.0	5.1	100.0	28.0
2	109.298	V	47.2	-12.4	34.8	43.5	8.7	100.0	28.0
3	112.935	H	45.5	-12.3	33.2	43.5	10.3	400.0	253.0
4	320.030	H	47.6	-8.7	38.9	46.0	7.1	100.0	93.0
5	426.609	H	43.1	-5.7	37.4	46.0	8.6	100.0	355.0
6	533.309	H	39.3	-3.3	36.0	46.0	10.0	100.0	130.0

Remark :

1. The field strength of spurious emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in stand-up position(X axis) and the worst case was recorded.
2. Result = Reading + Correction factor
3. Correction factor(c.f) = Antenna factor + Cable loss + 6 dB attenuator - Amp Gain

Test Results

Test mode : 802.11b_ Magnet Dipole Antenna

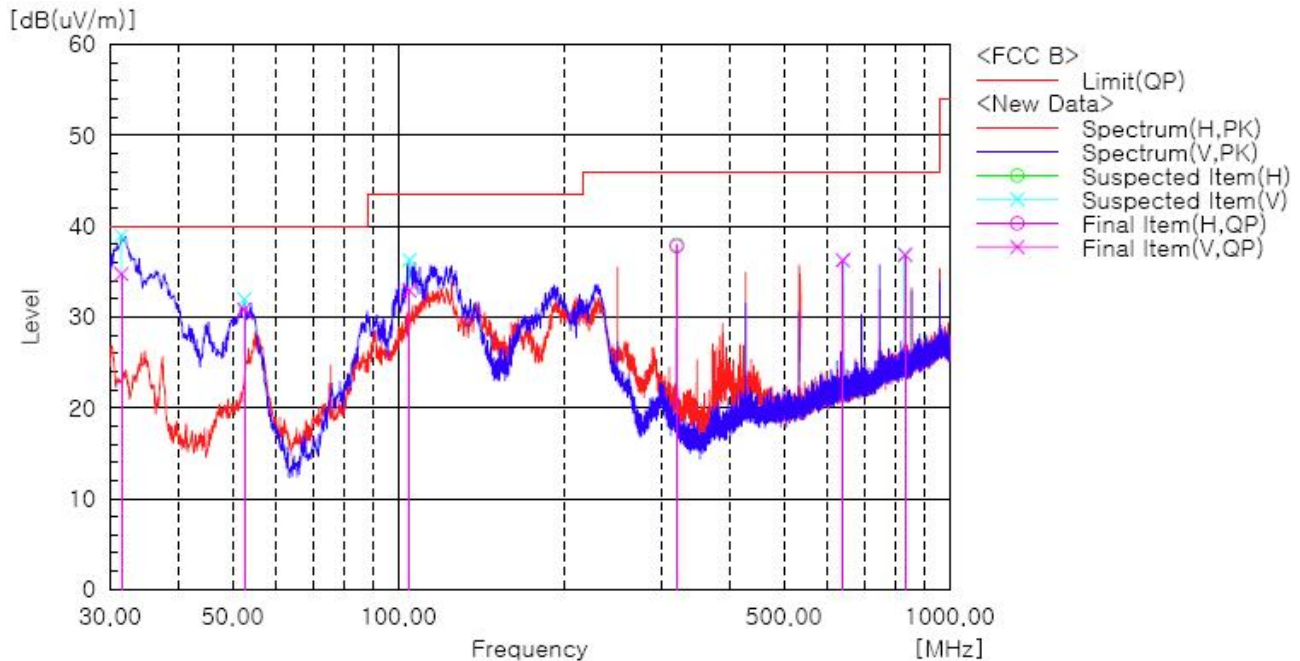
EUT	Facilities Serial InterFace-Mini 0	Measurement Detail	
Model	FSIF-M0	Frequency Range	Below 1000MHz
Mode	802.11b(Worst Case)	Detector function	Quasi-Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
31.455	34.7	5.3	Quasi-peak

Test data



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
1	31.455	V	47.2	-12.5	34.7	40.0	5.3	100.0	290.0
2	52.553	V	43.8	-13.0	30.8	40.0	9.2	100.0	253.0
3	104.690	V	45.3	-12.4	32.9	43.5	10.6	100.0	30.0
4	320.030	H	46.5	-8.7	37.8	46.0	8.2	100.0	353.0
5	640.009	V	37.5	-1.3	36.2	46.0	9.8	100.0	290.0
6	830.371	V	34.7	2.1	36.8	46.0	9.2	100.0	104.0

Remark :

1. The field strength of spurious emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in stand-up position(X axis) and the worst case was recorded.

2. Result = Reading + Correction factor

3. Correction factor(c.f) = Antenna factor + Cable loss + 6 dB attenuator - Amp Gain

Test Results

Test mode : Dipole Antenna

EUT	Facilities Serial InterFace-Mini 0	Measurement Detail	
Model	FSIF-M0	Frequency Range	1-25GHz
Channel	Low Channel	Detector function	Peak

Remarks

We have tested three mode (X, Y, Z). The worst mode (X axis) for final test.

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
2346.7	42.6	11.4	Average

Test Data – 802.11b

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									

Test Data – 802.11g

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									

Test Data – 802.11n(HT20)

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									

Test Data – 802.11n(HT40)

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									



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Restricted band edge test data

Measured frequency range : 2310-2390 MHz, 2483.5-2500 MHz

Test data - 802.11b

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Height [m]	Correction Factor	Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
					Antenna + Amp. Gain + Cable						
2346.70	37.4	47.3	V	1.0	5.1	54.0	74.0	42.5	52.4	11.5	21.6

Test Data - 802.11g

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Height [m]	Correction Factor	Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
					Antenna + Amp. Gain + Cable						
2346.70	37.4	47.3	V	1.0	5.1	54.0	74.0	42.5	52.4	11.5	21.6

Test Data - 802.11n(HT20)

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Height [m]	Correction Factor	Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
					Antenna + Amp. Gain + Cable						
2346.70	37.5	47.2	V	1.0	5.1	54.0	74.0	42.6	52.3	11.4	21.7

Test Data - 802.11n(HT40)

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Height [m]	Correction Factor	Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
					Antenna + Amp. Gain + Cable						
2346.70	37.2	49.2	V	1.0	5.1	54.0	74.0	42.3	54.3	11.7	19.7

Test Results

Test mode : Dipole Antenna

EUT	Facilities Serial InterFace-Mini 0	Measurement Detail	
Model	FSIF-M0	Frequency Range	1-25GHz
Channel	Middle Channel	Detector function	Peak

Remarks

We have tested three mode (X, Y, Z). The worst mode (X axis) for final test.

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
No emissions were detected at a level greater than 20dB below limit.			

Test Data – 802.11b

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									

Test Data – 802.11g

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									

Test Data – 802.11n(HT20)

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									

Test Data – 802.11n(HT40)

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									

Test Results

Test mode : Dipole Antenna

EUT	Facilities Serial InterFace-Mini 0	Measurement Detail	
Model	FSIF-M0	Frequency Range	1-25GHz
Channel	High Channel	Detector function	Peak

Remarks

We have tested three mode (X, Y, Z). The worst mode (X axis) for final test.

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
2483.7	45.7	8.3	Average

Test Data – 802.11b

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									

Test Data – 802.11g

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									

Test Data – 802.11n(HT20)

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									

Test Data – 802.11n(HT40)

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									



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Restricted band edge test data

Measured frequency range : 2310-2390 MHz, 2483.5-2500 MHz

Test data - 802.11b

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Height [m]	Correction Factor	Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
					Antenna + Amp. Gain + Cable						
2483.50	37.8	50.3	V	1.0	5.4	54.0	74.0	43.2	55.7	10.8	18.3

Test Data - 802.11g

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Height [m]	Correction Factor	Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
					Antenna + Amp. Gain + Cable						
2483.90	38.1	50.3	V	1.0	5.4	54.0	74.0	43.5	55.7	10.5	18.3

Test Data - 802.11n(HT20)

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Height [m]	Correction Factor	Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
					Antenna + Amp. Gain + Cable						
2483.70	40.6	52.1	V	1.0	5.1	54.0	74.0	45.7	57.2	8.3	16.8

Test Data - 802.11n(HT40)

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Height [m]	Correction Factor	Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
					Antenna + Amp. Gain + Cable						
2487.30	30.6	45.3	V	1.0	5.1	54.0	74.0	35.7	50.4	18.3	23.6

Test Results

Test mode : Magnet Dipole Antenna

EUT	Facilities Serial InterFace-Mini 0	Measurement Detail	
Model	FSIF-M0	Frequency Range	1-25GHz
Channel	Low Channel	Detector function	Peak

Remarks

We have tested three mode (X, Y, Z). The worst mode (X axis) for final test.

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
2346.7	42.3	11.7	Average

Test Data – 802.11b

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									

Test Data – 802.11g

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									

Test Data – 802.11n(HT20)

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									

Test Data – 802.11n(HT40)

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									



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Restricted band edge test data

Measured frequency range : 2310-2390 MHz, 2483.5-2500 MHz

Test data - 802.11b

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Height [m]	Correction Factor	Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
					Antenna + Amp. Gain + Cable						
2346.70	37.2	46.8	V	1.0	5.1	54.0	74.0	42.3	51.9	11.7	22.1

Test Data - 802.11g

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Height [m]	Correction Factor	Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
					Antenna + Amp. Gain + Cable						
2346.70	35.6	46.4	V	1.0	5.1	54.0	74.0	40.7	51.5	13.3	22.5

Test Data - 802.11n(HT20)

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Height [m]	Correction Factor	Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
					Antenna + Amp. Gain + Cable						
2346.70	35.6	46.5	V	1.0	5.1	54.0	74.0	40.7	51.6	13.3	22.4

Test Data - 802.11n(HT40)

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Height [m]	Correction Factor	Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
					Antenna + Amp. Gain + Cable						
2346.70	36.8	43.7	V	1.0	5.1	54.0	74.0	41.9	48.8	12.1	25.2

Test Results

Test mode : Magnet Dipole Antenna

EUT	Facilities Serial InterFace-Mini 0	Measurement Detail	
Model	FSIF-M0	Frequency Range	1-25GHz
Channel	Middle Channel	Detector function	Peak

Remarks

We have tested three mode (X, Y, Z). The worst mode (X axis) for final test.

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
No emissions were detected at a level greater than 20dB below limit.			

Test Data – 802.11b

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									

Test Data – 802.11g

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									

Test Data – 802.11n(HT20)

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									

Test Data – 802.11n(HT40)

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									

Test Results

Test mode : Magnet Dipole Antenna

EUT	Facilities Serial InterFace-Mini 0	Measurement Detail	
Model	FSIF-M0	Frequency Range	1-25GHz
Channel	High Channel	Detector function	Peak

Remarks

We have tested three mode (X, Y, Z). The worst mode (X axis) for final test.

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
2483.7	47.1	6.9	Average

Test Data – 802.11b

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									

Test Data – 802.11g

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									

Test Data – 802.11n(HT20)

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									

Test Data – 802.11n(HT40)

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emissions were detected at a level greater than 20dB below limit.									



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Restricted band edge test data

Measured frequency range : 2310-2390 MHz, 2483.5-2500 MHz

Test data - 802.11b

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Height [m]	Correction Factor	Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
					Antenna + Amp. Gain + Cable						
2483.70	39.7	52.3	V	1.0	5.4	54.0	74.0	45.1	57.7	8.9	16.3

Test Data - 802.11g

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Height [m]	Correction Factor	Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
					Antenna + Amp. Gain + Cable						
2483.70	39.2	51.6	V	1.0	5.4	54.0	74.0	44.6	57.0	9.4	17.0

Test Data - 802.11n(HT20)

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Height [m]	Correction Factor	Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
					Antenna + Amp. Gain + Cable						
2483.70	42.0	53.3	V	1.0	5.1	54.0	74.0	47.1	58.4	6.9	15.6

Test Data - 802.11n(HT40)

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Height [m]	Correction Factor	Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
					Antenna + Amp. Gain + Cable						
2493.80	25.3	50.8	V	1.0	5.1	54.0	74.0	30.4	55.9	23.6	18.1

2.1.6 AC Conducted Emissions

Test Location

Shielded Room

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Procedures

The EUT was placed on a non-metallic table 0.8m above the metallic, grounded floor and 0.4m from the reference ground plane wall. The distance to other metallic surfaces was at least 0.8m.

Amplitude measurements were performed with a quasi-peak detector and an average detector.

Limit

- 15.207(a)

Frequency (MHz)	Conducted Limit (dBuV/m)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56*	56 to 46*
0.5 ~ 5	56	46
5 ~ 30	60	50

* Decreases with the logarithm of the frequency.

Test Results

The requirements are:

☒ Complies

Test mode : 802.11b

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
1.5045	34.4	11.6	Average



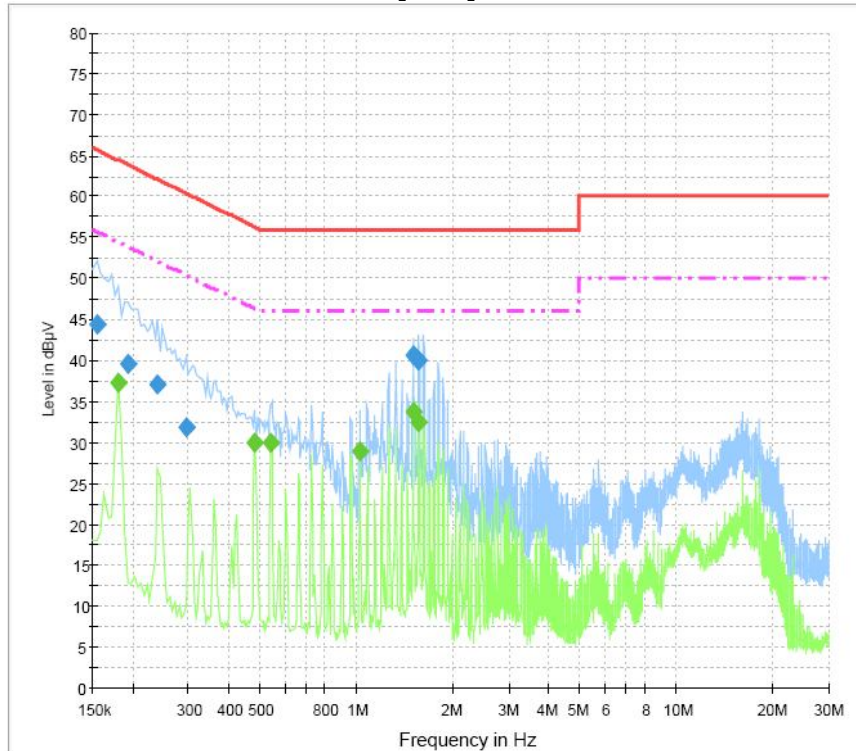
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Test Data_Dipole Antenna

[HOT]



Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.154500	44.5	1000.0	9.000	On	L1	10.1	21.3	65.8
0.195000	39.6	1000.0	9.000	On	L1	9.9	24.2	63.8
0.240000	37.2	1000.0	9.000	On	L1	9.9	24.9	62.1
0.294000	31.7	1000.0	9.000	On	L1	10.0	28.7	60.4
1.509000	40.6	1000.0	9.000	On	L1	9.9	15.4	56.0
1.572000	39.9	1000.0	9.000	On	L1	9.9	16.1	56.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.181500	37.3	1000.0	9.000	On	L1	10.1	17.1	54.4
0.483000	30.0	1000.0	9.000	On	L1	10.2	16.3	46.3
0.541500	30.0	1000.0	9.000	On	L1	10.2	16.0	46.0
1.027500	28.8	1000.0	9.000	On	L1	9.9	17.2	46.0
1.509000	33.8	1000.0	9.000	On	L1	9.9	12.2	46.0
1.572000	32.5	1000.0	9.000	On	L1	9.9	13.5	46.0



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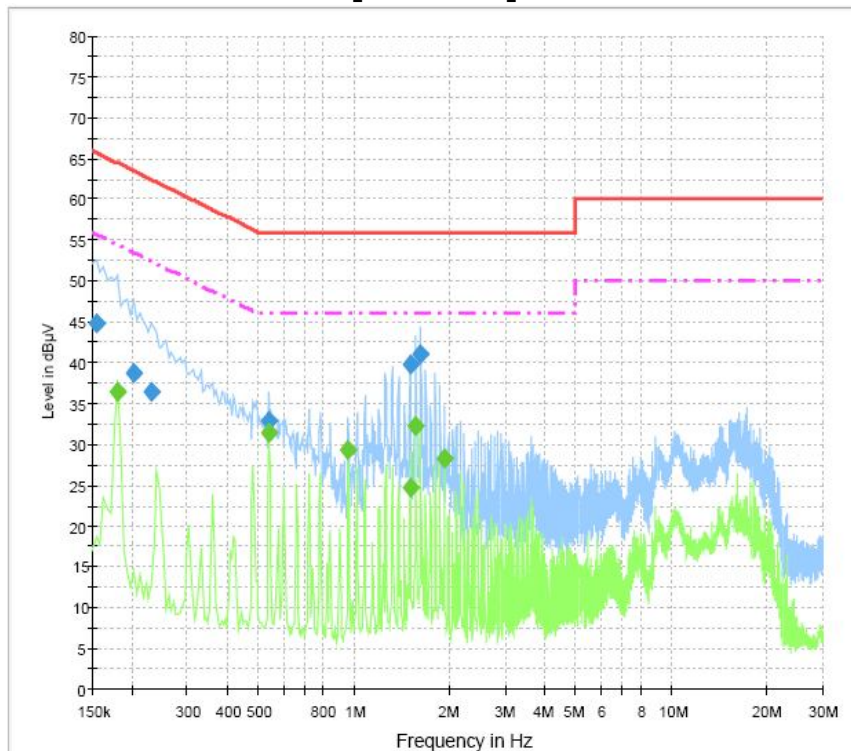
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[NEUTRAL]



Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.154500	44.8	1000.0	9.000	On	N	9.9	20.9	65.8
0.204000	38.7	1000.0	9.000	On	N	10.0	24.8	63.4
0.231000	36.4	1000.0	9.000	On	N	10.0	26.0	62.4
0.541500	33.0	1000.0	9.000	On	N	10.1	23.0	56.0
1.504500	39.7	1000.0	9.000	On	N	9.9	16.3	56.0
1.626000	41.1	1000.0	9.000	On	N	9.9	14.9	56.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.181500	36.4	1000.0	9.000	On	N	10.2	18.0	54.4
0.541500	31.3	1000.0	9.000	On	N	10.1	14.7	46.0
0.964500	29.3	1000.0	9.000	On	N	9.9	16.7	46.0
1.509000	24.8	1000.0	9.000	On	N	9.9	21.2	46.0
1.567500	32.3	1000.0	9.000	On	N	9.9	13.7	46.0
1.927500	28.3	1000.0	9.000	On	N	9.9	17.7	46.0



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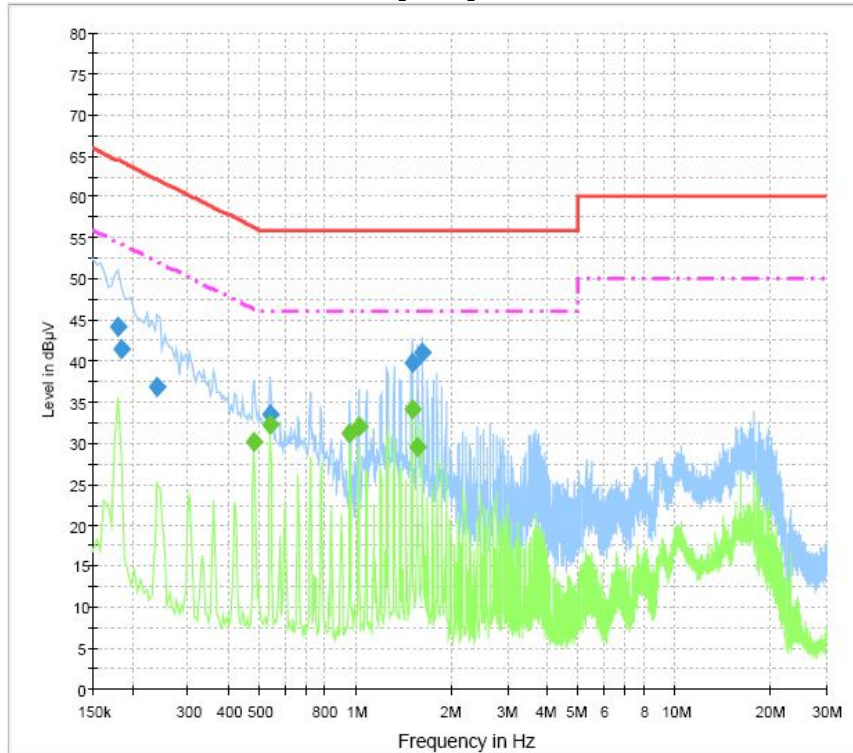
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Test Data_Magnet Dipole Antenna

[HOT]



Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.181500	44.1	1000.0	9.000	On	L1	10.1	20.3	64.4
0.186000	41.5	1000.0	9.000	On	L1	10.1	22.7	64.2
0.240000	36.9	1000.0	9.000	On	L1	9.9	25.2	62.1
0.541500	33.5	1000.0	9.000	On	L1	10.2	22.5	56.0
1.504500	39.9	1000.0	9.000	On	L1	9.9	16.1	56.0
1.626000	41.1	1000.0	9.000	On	L1	9.9	14.9	56.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.483000	30.2	1000.0	9.000	On	L1	10.2	16.1	46.3
0.541500	32.3	1000.0	9.000	On	L1	10.2	13.7	46.0
0.964500	31.1	1000.0	9.000	On	L1	9.9	14.9	46.0
1.023000	32.0	1000.0	9.000	On	L1	9.9	14.0	46.0
1.504500	34.0	1000.0	9.000	On	L1	9.9	12.0	46.0
1.563000	29.6	1000.0	9.000	On	L1	9.9	16.4	46.0

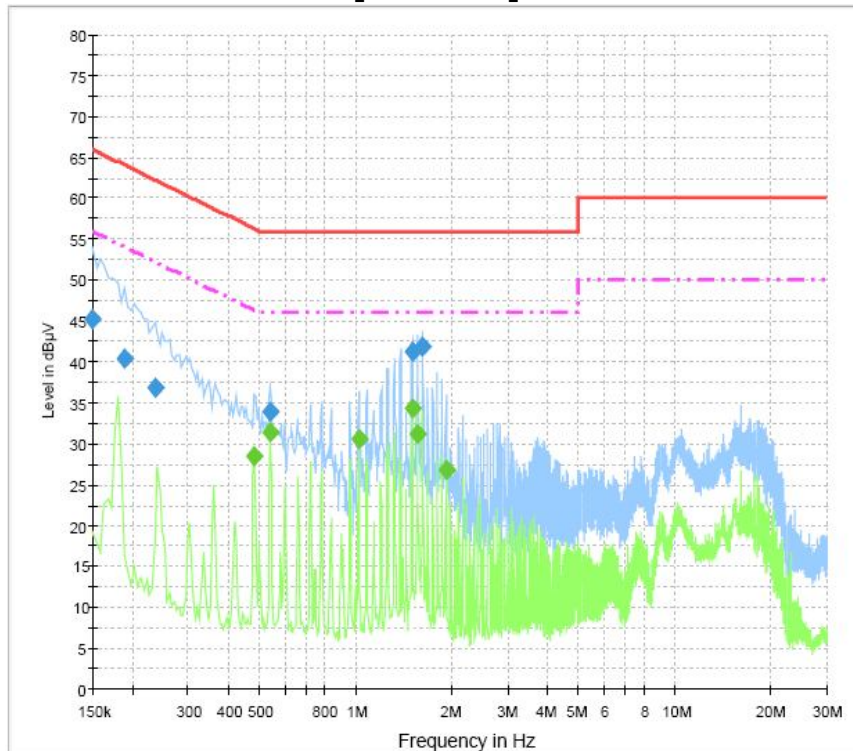


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[NEUTRAL]



Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	45.3	1000.0	9.000	On	N	9.7	20.7	66.0
0.190500	40.5	1000.0	9.000	On	N	10.1	23.5	64.0
0.235500	36.8	1000.0	9.000	On	N	10.0	25.4	62.3
0.541500	34.0	1000.0	9.000	On	N	10.1	22.0	56.0
1.504500	41.3	1000.0	9.000	On	N	9.9	14.7	56.0
1.626000	41.8	1000.0	9.000	On	N	9.9	14.2	56.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.483000	28.4	1000.0	9.000	On	N	10.2	17.9	46.3
0.541500	31.4	1000.0	9.000	On	N	10.1	14.6	46.0
1.023000	30.7	1000.0	9.000	On	N	9.9	15.3	46.0
1.504500	34.4	1000.0	9.000	On	N	9.9	11.6	46.0
1.563000	31.3	1000.0	9.000	On	N	9.9	14.7	46.0
1.927500	26.8	1000.0	9.000	On	N	9.9	19.2	46.0



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APPENDIX A – Test Equipment Used For Tests

	Name of Equipment	Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date
1	Signal Analyzer	Agilent	N9020A	MY48011598	2013-11-08	2014-11-08
2	EMI Test Receiver	Rohde & Schwarz	ESCI7	100814	2012-12-14	2014-12-06
3	EMI Test Receiver	Rohde & Schwarz	ESCI7	100816	2012-12-14	2014-12-06
4	EMI Test Receiver	Rohde & Schwarz	ESU40	100336	2014-05-15	2015-05-15
5	Bilog Antenna	Schaffner	CBL6111C	2551	2014-05-08	2016-05-08
6	Double Ridged Guide Antenna	ETS-Lindgren	3117	00154525	2013-07-03	2015-07-03
7	Double Ridged Guide Antenna	ETS-Lindgren	3116	00062916	2013-03-20	2015-03-20
8	Active Loop Antenna	SCHWARZBECK	FMZB 1513	1513-126	2014-05-19	2016-05-19
9	Attenuator	Rohde & Schwarz	DNF	272.4110.50	2013-11-12	2014-11-12
10	PREAMPLIFIER	Agilent	8449B	3008A02307	2013-11-08	2014-11-08
11	AMPLIFIER	Sonoma Instrument Co.	310	291721	2013-03-21	2015-02-06
12	LISN	Rohde & Schwarz	ENV216	101760	2014-02-03	2015-02-03
13	Band Reject Filter	Wainwright Instruments GmbH	WRCGV 2400/2483- 2375/2505- 50/10EE	2	2013-09-09	2014-09-09
14	Signal Generator	Agilent	E4432B	US40054094	2013-11-08	2014-11-08
15	Signal Generator	HP	8341B	2819A01563	2013-11-08	2014-11-08