

NCC Test Report

Equipment : BLE Mini Hybrid Watch
Brand Name : SKAGEN, FOSSIL, EMPORIO ARMANI
Model No. : NDW4A, NDW4G, NDW4H, NDW4J, NDW4K, NDW4D, NDW4F5, NDW4E1
EMC sample S/N : MZ10FDV0PL, MZ10FDV0PW, MZ10LDV0ZZ, MZ10LDV0ZT, MZ10LDV0RP, MZ10FDV1H5, MZ10LDV0UA, M05103010E, MZ10FPV1CL, MZ10FPV1VU, MZ10FPV18H, MZ10FPV1AK, M0E001010F
Radiated sample S/N : MZ10FDV1C4, MZ10FDV1PD, MZ10FDV1Q0, MZ10FDV1PG, MZ10FDV1TK, MZ10FDV1RE, MZ10FDV1Q3, M010F02NU4, M010F02NNU, M010F02NN3, M010F02NYP, M010010160
Conducted sample S/N : MZ10FDV160
Standard : LP0002 Section 3.10.1 (2016-08-23)
Frequency : 2400 MHz – 2483.5 MHz
Function : ☒ Point-to-multipoint; ☐ Point-to-point
Applicant : 香港商富思股份有限公司台灣分公司
106 台北市大安區忠孝東路 4 段 219 號 5 樓
Manufacturer : Fossil Group, Inc.
901 S. Central Expressway Richardson TX 75080
USA

The product sample received on Jun. 05, 2017 and completely tested on Dec. 13, 2017. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.


Cliff Chang
SPORTON INTERNATIONAL INC.



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Summary of Test Result

Conformance Test Specifications				
Report Clause	Ref. Std. Clause	Description	Limit	Result
1.1.2	3.10.1.4	Antenna Requirement	LP0002-2.2	Complied
3.1	3.10.1.5	Emissions in Restricted Frequency Bands	Restricted Bands: LP0002-2.8	Complied

Note: It was supplied power by Battery for EUT; it's not necessary to apply to AC Power-line Conducted Emissions.



SPORTON INTERNATIONAL INC.
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1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	Bluetooth Mode	Ch. Frequency (MHz)	Channel Number
2400-2483.5	LE	2402-2480	0-39 [40]

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	BT-LE(1Mbps)	1	1TX

Note:

- ♦ Bluetooth LE uses a GFSK (1Mbps) modulation for DSSS.
- ♦ BWch is the channel separation
- ♦ Nss-Min is the minimum number of spatial streams.
- ♦ Nant is the number of outputs. e.g., 2(2, 3) means have 2 outputs for port 2 and port 3. 2 means have 2 outputs for port 1 and port 2.

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	-	-	Printed Antenna	N/A	-10

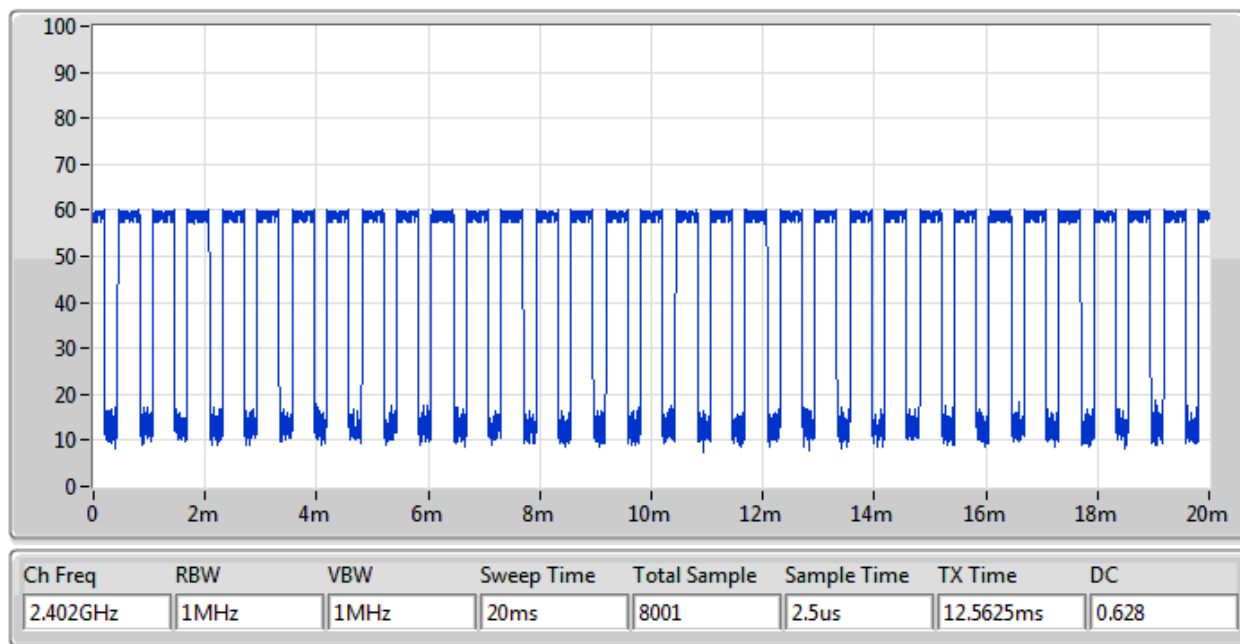
1.1.3 Mode Test Duty Cycle

For EUT 8:

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
BT-LE(1Mbps)	0.628	2.02	392.5us	3k

Note: $10 \cdot \log(1/0.628) = 2.02$

DC;BT-LE;BWch:1.0



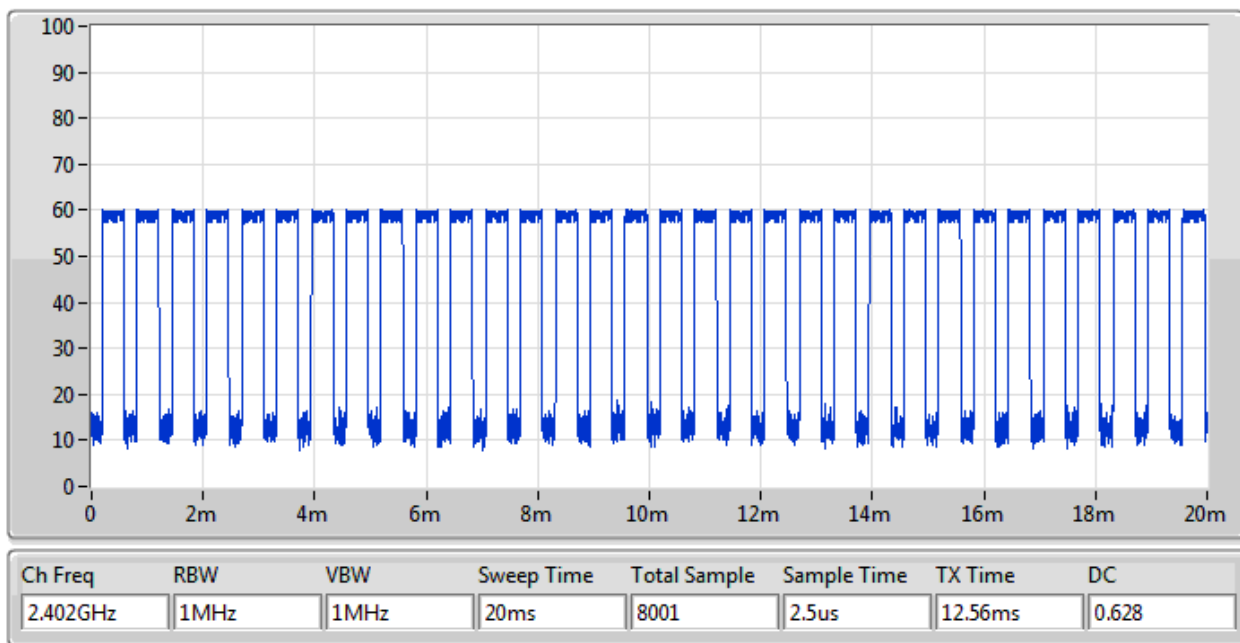
Note: Duty cycle = TX time/sweep time

For EUT 9:

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
BT-LE(1Mbps)	0.628	2.02	392.5us	3k

Note: $10 \cdot \log(1/0.628) = 2.02$

DC;BT-LE;BWch:1.0



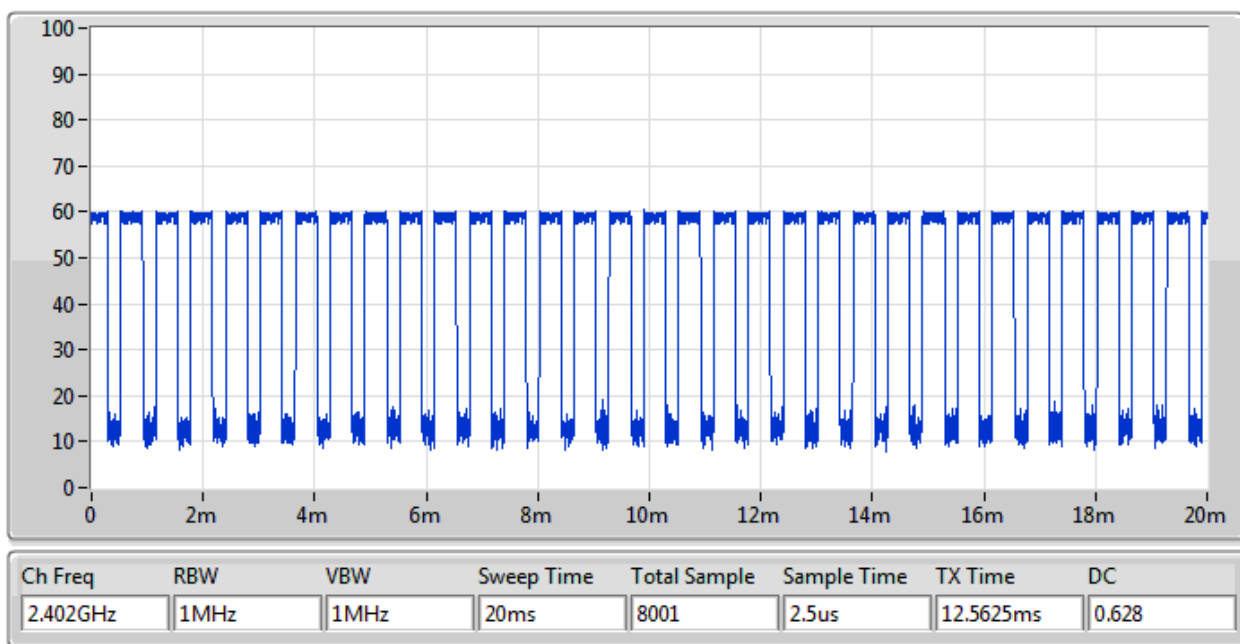
Note: Duty cycle = TX time/sweep time

For EUT 10:

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
BT-LE(1Mbps)	0.628	2.02	392.5us	3k

Note: $10 \cdot \log(1/0.628) = 2.02$

DC;BT-LE;BWch:1.0



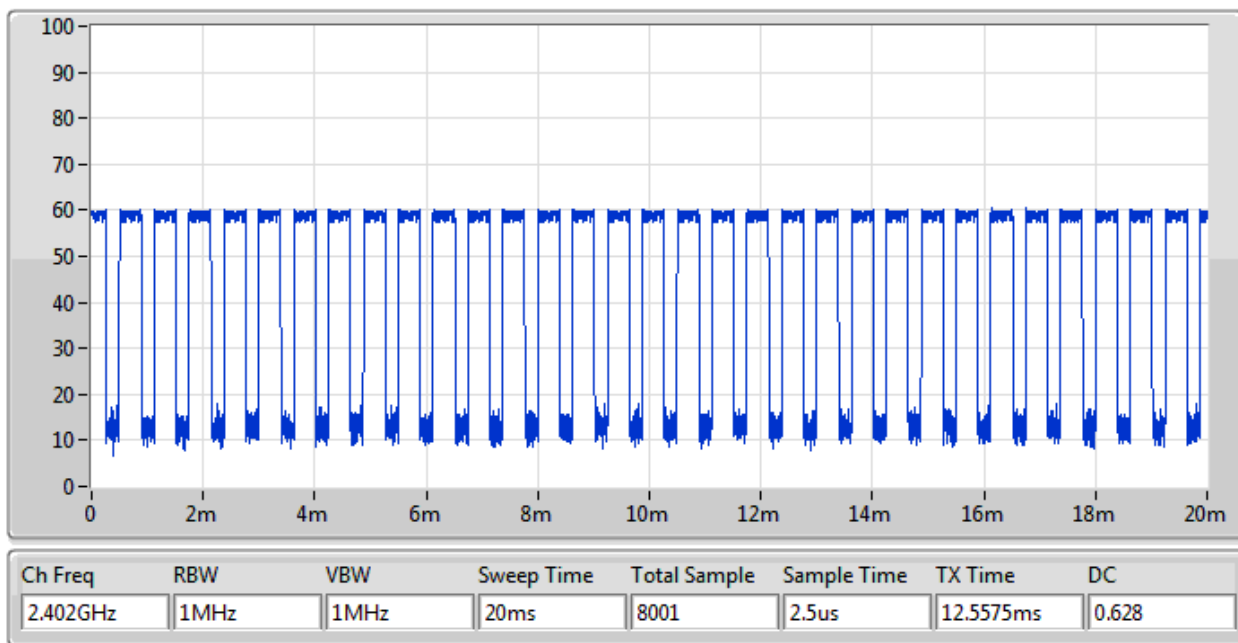
Note: Duty cycle = TX time/sweep time

For EUT 11:

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
BT-LE(1Mbps)	0.628	2.02	392.5us	3k

Note: $10 \cdot \log(1/0.628) = 2.02$

DC;BT-LE;BWch:1.0



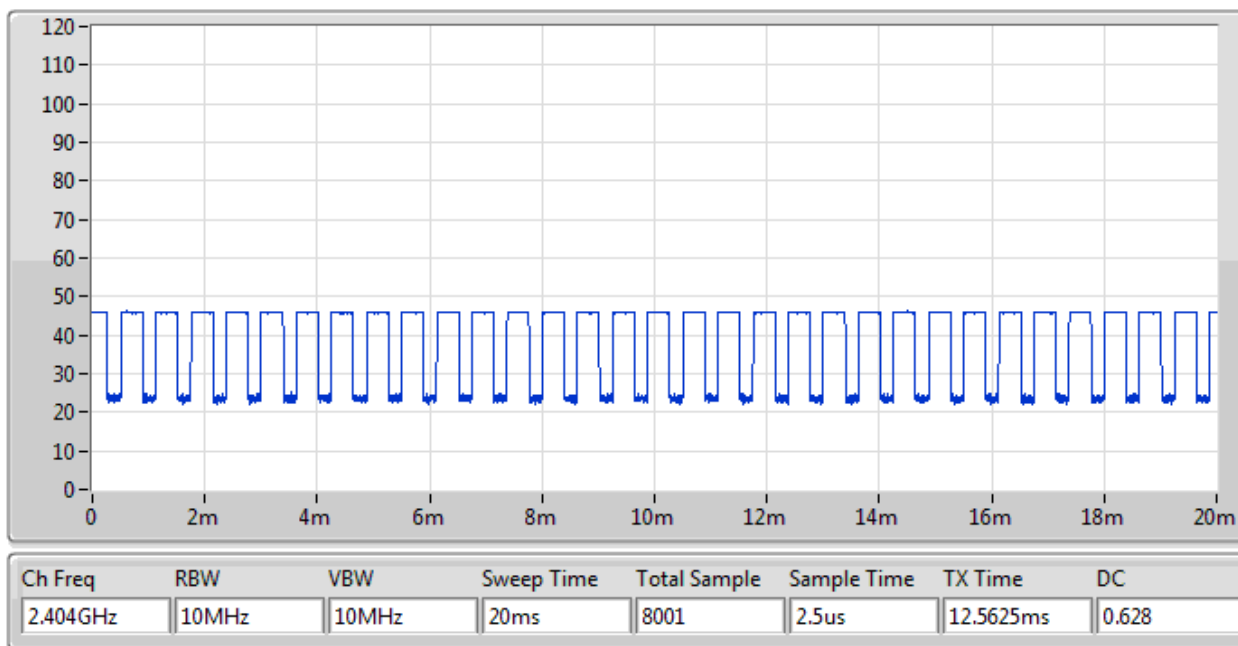
Note: Duty cycle = TX time/sweep time

For EUT 12~EUT 13:

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
BT-LE(1Mbps)	0.628	2.02	392.5us	3k

Note: $10 \cdot \log(1/0.628) = 2.02$

DC;BT-LE;BWch:1



Note: Duty cycle = TX time/sweep time

1.1.4 EUT Operational Condition

EUT Power Type	Normal Link: From battery (3V) Continuous transmitting: From DC power supply
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1.1.5 Table for Multiple Listing

The model numbers in the following table are all refer to the identical product.

Model Name	Radiated sample S/N	EMC sample S/N	Material of Watch Band	EUT	Description
NDW4A	MZ10FDV1C4	MZ10FDV0PL	Leather	EUT 1	All the models are identical, the difference model names because of different outward appearance of EUT.
NDW4A	MZ10FDV1PD	MZ10FDV0PW	Metal	EUT 2	
NDW4G	MZ10FDV1Q0	MZ10LDV0ZZ	Leather	EUT 3	
NDW4H	MZ10FDV1PG	MZ10LDV0ZT	Metal	EUT 4	
NDW4J	MZ10FDV1TK	MZ10LDV0RP	Leather	EUT 5	
NDW4J	MZ10FDV1RE	MZ10FDV1H5	Metal	EUT 6	
NDW4K	MZ10FDV1Q3	MZ10LDV0UA	Metal	EUT 7	
NDW4D	MZ10FPV18H	M05103010E	Leather	EUT 8	
NDW4D	M010F02NNU	MZ10FPV1CL	Metal	EUT 9	
NDW4F5	M010F02NN3	MZ10FPV1VU	Leather	EUT 10	
NDW4F5	M010F02NYP	MZ10FPV18H	Metal	EUT 11	
NDW4E1	NA	MZ10FPV1AK	Leather	EUT 12	
NDW4E1	M010010160	M0E001010F	Metal	EUT 13	

1.1.6 Table for Slight Change

This product is an extension of original one reported under Sporton project number: TR760510-05

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
Adding one Brand Name and model numbers for two EUTs. (Brand Name: EMPORIO ARMANI, Model No.: NDW4E1 for EUT 12, EUT 13.)	Emissions in Restricted Frequency Bands.

Note: Other test results are based on original test report.

1.2 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ◆ NCC LP0002 (2016-08-23)
- ◆ ANSI C63.10-2013
- ◆ FCC KDB 558074 D01 v04
- ◆ FCC KDB 412172 D01 v01r01

1.3 Testing Location Information

Testing Location		
☐	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-318-0055
☒	JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085

Test Condition	Test Site No.	Test Engineer		Test Environment	Test Date
Radiated	03CH01-CB	For EUT 8~EUT 11	Mason Chen, Cola Fan	22°C / 59%	Nov. 03, 2017~ Nov. 06, 2017
		For EUT 12~EUT 13	Mason Chen, Cola Fan	22°C / 59%	Dec. 08, 2017~ Dec. 13, 2017

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086D with Industry Canada.

1.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

Test Items	Uncertainty	Remark
Radiated Emission (30MHz ~ 1,000MHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Channel Mode

Mode	Power Setting
BT-LE(1Mbps)	-
2402MHz	Default
2440MHz	Default
2480MHz	Default

2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	Emissions in Restricted Frequency Bands
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.
Operating Mode < 1GHz	Intentional - CTX
The EUT was performed at X axis, Y axis and Z axis position. The worst case was found at Y axis, thus measurement for all modes will follow this same test mode.	
1	EUT 8 in Y axis
2	EUT 9 in Y axis
3	EUT 10 in Y axis
4	EUT 11 in Y axis
5	EUT 12 in Y axis
6	EUT 13 in Y axis
Operating Mode < 1GHz	Unintentional - CRX
1	EUT 8 in X axis
2	EUT 8 in Y axis
3	EUT 8 in Z axis
4	EUT 9 in X axis
5	EUT 9 in Y axis
6	EUT 9 in Z axis
7	EUT 10 in X axis
8	EUT 10 in Y axis
9	EUT 10 in Z axis
10	EUT 11 in X axis
11	EUT 11 in Y axis
12	EUT 11 in Z axis
13	EUT 12 in X axis

14	EUT 12 in Y axis
15	EUT 12 in Z axis
16	EUT 13 in X axis
17	EUT 13 in Y axis
18	EUT 13 in Z axis
Mode 2, Mode 5, Mode 8, Mode 11, Mode 14 and Mode 17 are worst test result among Mode 1~Mode 18, and the test result of those six modes are selected to record in the test report.	
Operating Mode Unintentional 1GHz~5th	Unintentional - CRX
The Emissions in Restricted Frequency Bands unintentional 1GHz~5th Harmonic test was performed according to the worst case of Emissions in Restricted Frequency Bands below 1GHz test. For Emissions in Restricted Frequency Bands unintentional 1GHz~5th Harmonic test, the following modes were performed:	
1	EUT 8 in Y axis
2	EUT 9 in Y axis
3	EUT 10 in Y axis
4	EUT 11 in Y axis
5	EUT 12 in Y axis
6	EUT 13 in Y axis
Operating Mode Intentional 1GHz~10th	Intentional - CTX
The EUT was performed at X axis, Y axis and Z axis position. The worst case was found at Y axis, thus measurement for all modes will follow this same test mode.	
1	EUT 8 in Y axis
2	EUT 9 in Y axis
3	EUT 10 in Y axis
4	EUT 11 in Y axis
5	EUT 12 in Y axis
6	EUT 13 in Y axis

2.3 EUT Operation during Test

The EUT was programmed to be in continuously transmitting/receiving mode.

2.4 Accessories

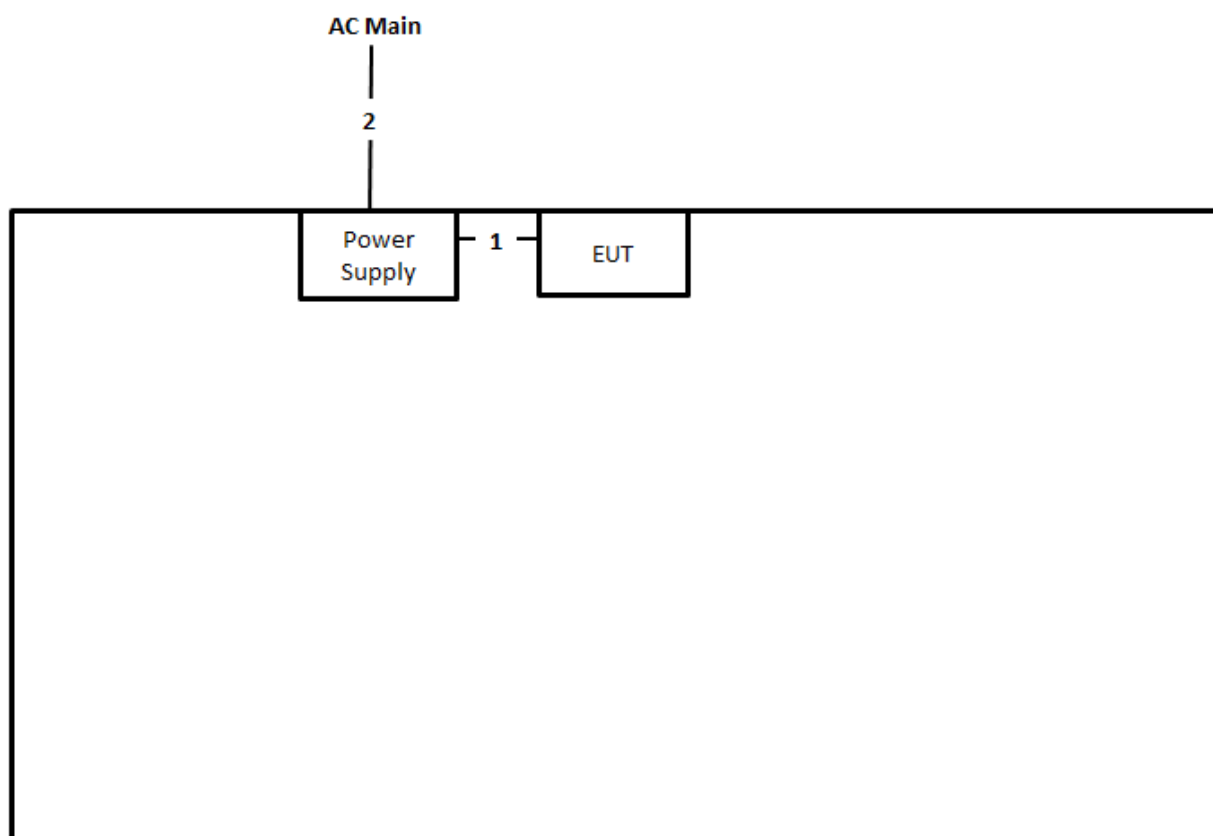
N/A

2.5 Support Equipment

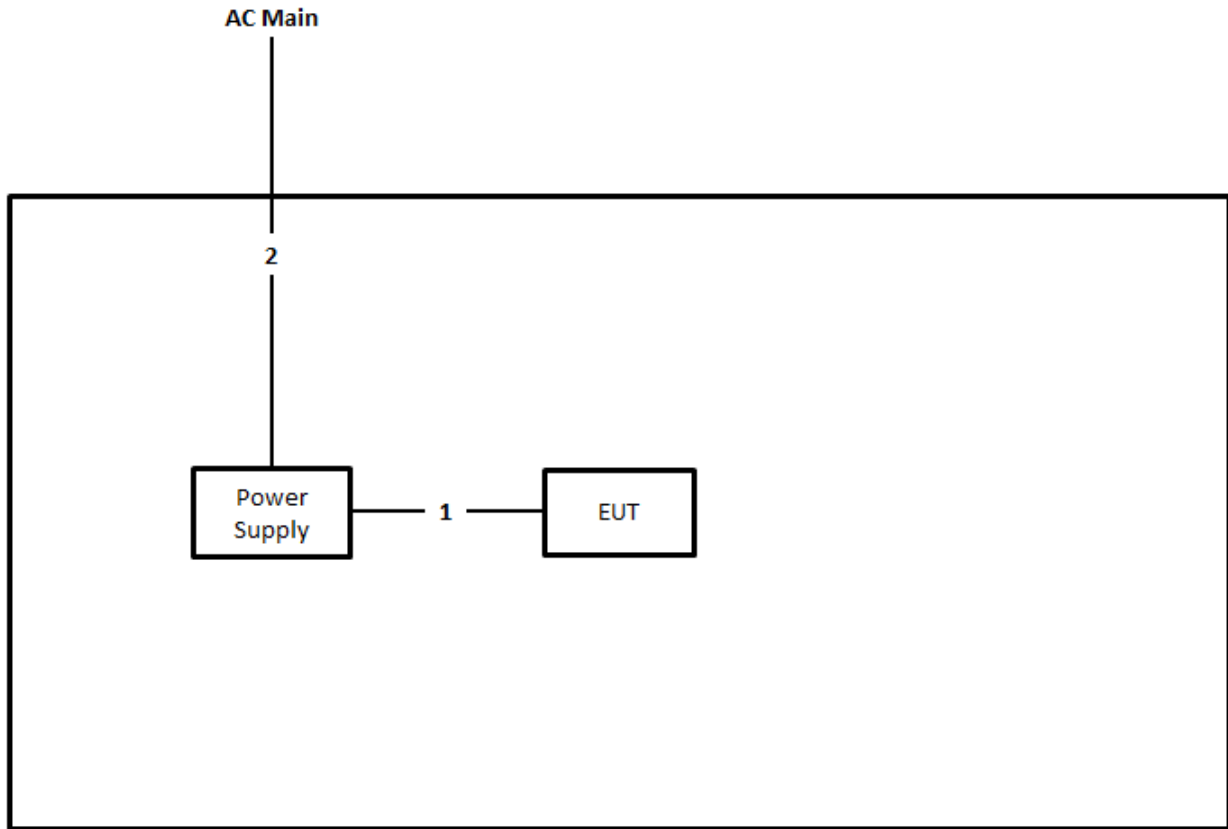
Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
1	Power Supply	GWINSTEK	GPC-6030D	N/A

2.6 Test Setup Diagram

Test Setup Diagram - Radiated Test < 1GHz and Unintentional 1GHz~5th



Item	Connection	Shielded	Length
1	Crocodile clip	No	1 m
2	Power cable	No	1.8 m

Test Setup Diagram - Radiated Test > 1GHz Unintentional 1GHz~10th


Item	Connection	Shielded	Length
1	Crocodile clip	No	1 m
2	Power cable	No	1.8 m

3 Transmitter Test Result

3.1 Emissions in Restricted Frequency Bands

3.1.1 Emissions in Restricted Frequency Bands Limit

Restricted Band Emissions Limit			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB / decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

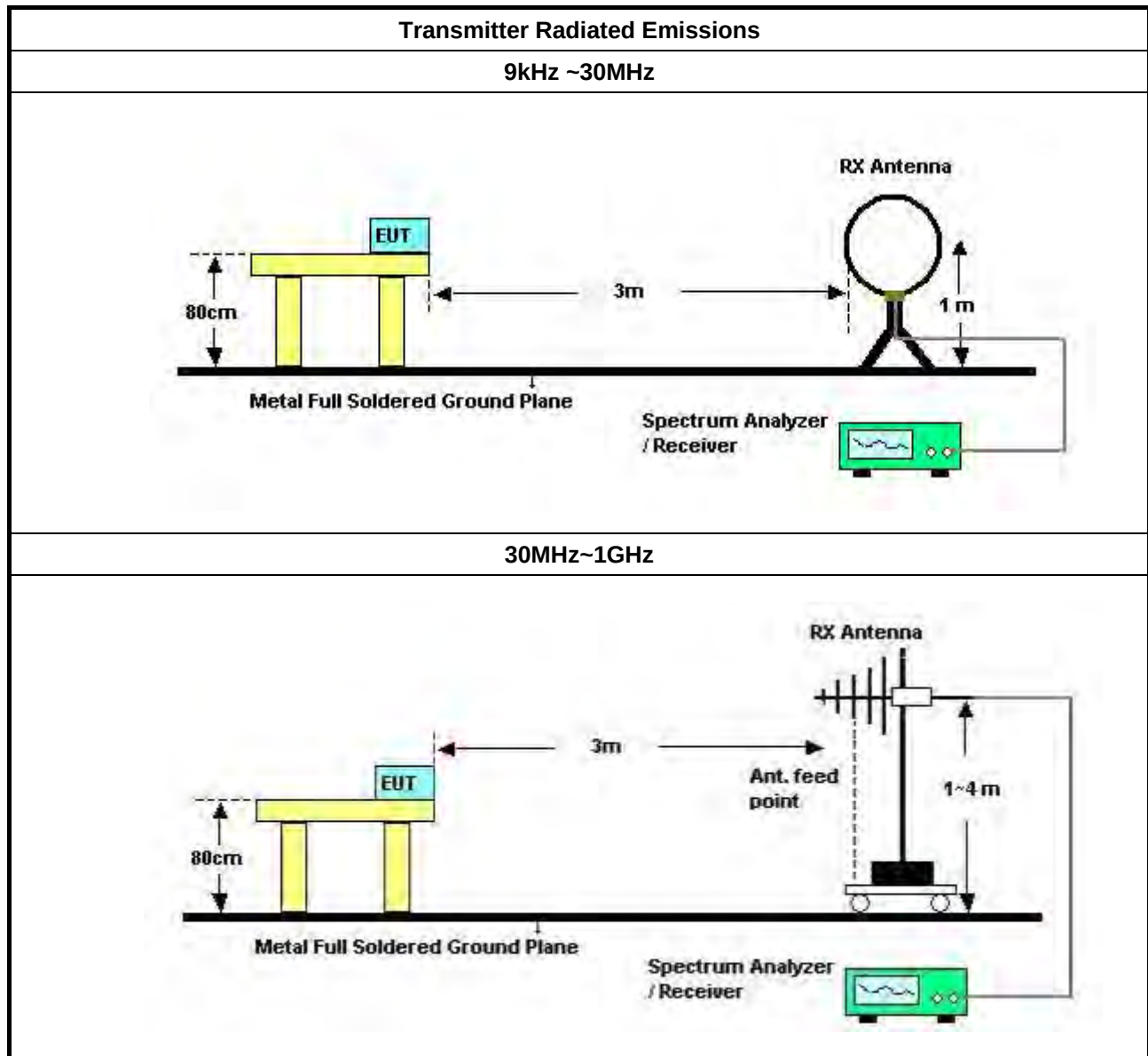
3.1.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

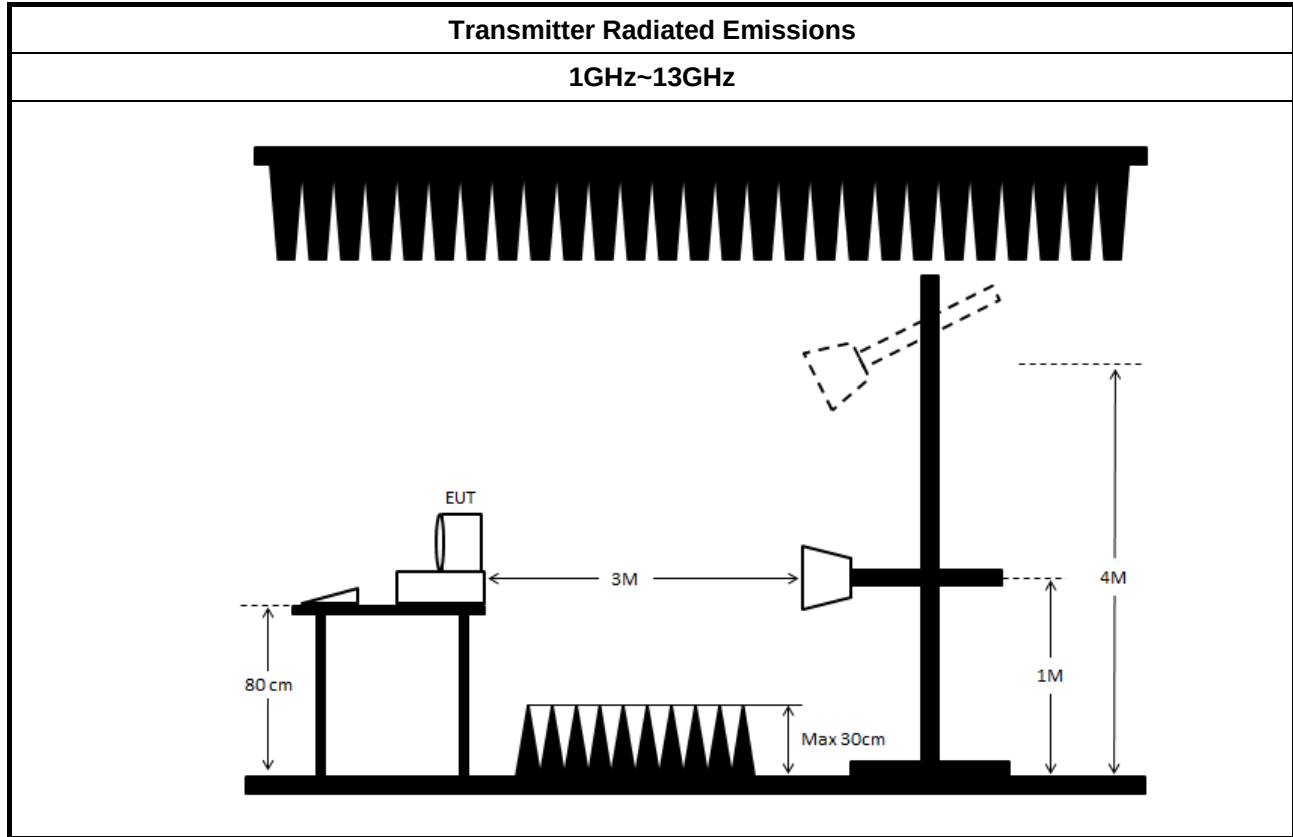
3.1.3 Test Procedures

Test Method	
<ul style="list-style-type: none"> The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor]. 	
<ul style="list-style-type: none"> Refer as ANSI C63.10, clause 6.9.2.2 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band. 	
<ul style="list-style-type: none"> For the transmitter unwanted emissions shall be measured using following options below: 	
	<ul style="list-style-type: none"> Refer as FCC KDB 558074, clause 12 for unwanted emissions into restricted bands.
	☐ Refer as FCC KDB 558074, clause 12.2.5.1 Option 1 (trace averaging for duty cycle $\geq 98\%$)
	☐ Refer as FCC KDB 558074, clause 12.2.5.2 Option 2 (trace averaging + duty factor).
	☒ Refer as FCC KDB 558074, clause 12.2.5.3 Option 3 (Reduced VBW $\geq 1/T$).
	☐ Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). VBW $\geq 1/T$, where T is pulse time.
	☐ Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions.
	☒ Refer as FCC KDB 558074, clause 12.2.4 measurement procedure peak limit.
<ul style="list-style-type: none"> For the transmitter band-edge emissions shall be measured using following options below: 	
	<ul style="list-style-type: none"> Refer as FCC KDB 558074 clause 13.1, When the performing peak or average radiated measurements, emissions within 2 MHz of the authorized band edge may be measured using the marker-delta method described below.
	<ul style="list-style-type: none"> Refer as FCC KDB 558074, clause 13.2 (ANSI C63.10, clause 6.9.3) for marker-delta method for band-edge measurements.
	<ul style="list-style-type: none"> Refer as FCC KDB 558074, clause 13.3 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).
<ul style="list-style-type: none"> For conducted and cabinet radiation measurement, refer as FCC KDB 558074, clause 12.2.2. 	
	<ul style="list-style-type: none"> For conducted unwanted emissions into restricted bands (absolute emission limits). Devices with multiple transmit chains using options given below: (1) Measure and sum the spectra across the outputs or (2) Measure and add $10 \log(N)$ dB
	<ul style="list-style-type: none"> For FCC KDB 662911 The methodology described here may overestimate array gain, thereby resulting in apparent failures to satisfy the out-of-band limits even if the device is actually compliant. In such cases, compliance may be demonstrated by performing radiated tests around the frequencies at which the apparent failures occurred.

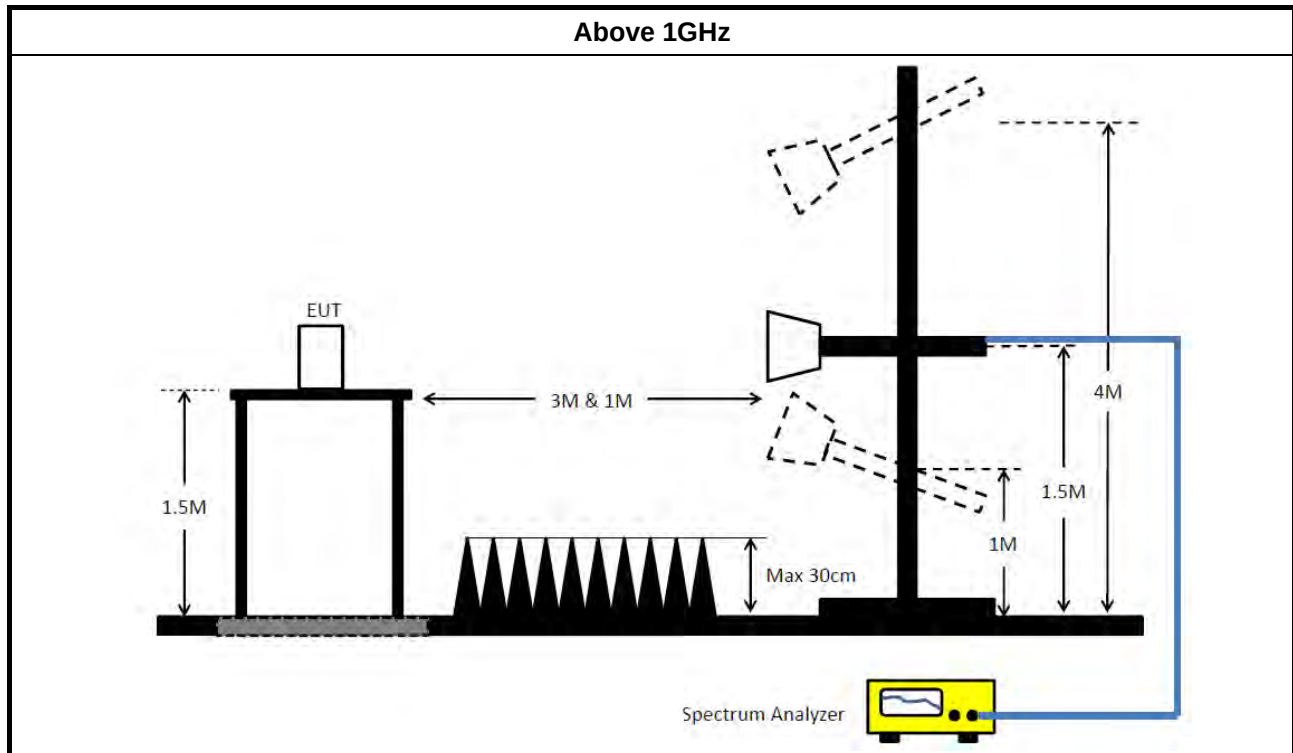
3.1.4 Test Setup



For Unintentional 1GHz~5th – CRX



For Intentional 1GHz~10th - CTX





3.1.5 Transmitter Radiated Unwanted Emissions (Below 30MHz)

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

3.1.6 Transmitter Radiated Unwanted Emissions

Refer as Appendix A

4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Loop Antenna	Teseq	HLA 6120	24155	9kHz ~ 30 MHz	Mar. 16, 2016*	Mar. 15, 2018*	Radiation (03CH01-CB)
BILOG ANTENNA with 6dB Attenuator	TESEQ & EMCI	CBL6112D & N-6-06	37880 & AT-N0609	20MHz ~ 2GHz	Aug. 30, 2017	Aug. 29, 2018	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Nov. 10, 2016	Nov. 09, 2017	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Nov. 20, 2017	Nov. 19, 2018	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 05, 2017	Jul. 04, 2018	Radiation (03CH01-CB)
Pre-Amplifier	EMCI	EMC330N	980332	20MHz ~ 3GHz	May 02, 2017	May 01, 2018	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 16, 2017	Jan. 15, 2018	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Nov. 22, 2016	Nov. 21, 2017	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Nov. 23, 2017	Nov. 22, 2018	Radiation (03CH01-CB)
EMI Test	R&S	ESCS	100355	9kHz ~ 2.75GHz	May 06, 2017	May 05, 2018	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-16+17	N/A	30 MHz ~ 1 GHz	Oct. 11, 2017	Oct. 10, 2018	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Oct. 11, 2017	Oct. 10, 2018	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16+17	N/A	1 GHz ~ 18 GHz	Oct. 11, 2017	Oct. 10, 2018	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#1	N/A	18GHz ~ 40 GHz	Oct. 11, 2017	Oct. 10, 2018	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#2	N/A	18GHz ~ 40 GHz	Oct. 11, 2017	Oct. 10, 2018	Radiation (03CH01-CB)

Note: Calibration Interval of instruments listed above is one year.

“*” Calibration Interval of instruments listed above is two years.