

TEST REPORT

For

HF/50MHz TRANSCEIVER

In conformity with

FCC CFR 47 Part15 Subpart B (CSR)

Model : FTDX101D

FCC ID : K6620681X50

Test Item : HF/50MHz TRANSCEIVER

Report No. : WE180703BC1-12

Issue Date : 15 Feb. 2019

Prepared for

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History

Report No.	Date	Revisions	Issued By
WE180703BC1-11	01 Feb. 2019	Initial Issue	T. Kato
WE180703BC1-12	15 Feb. 2019	Add the information of DC power supply (Sec. 1.6.1 / 1.6.3)	T. Kato

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1 General information

1.1 Product description

Test item	: HF/50MHz TRANSCEIVER
Manufacturer	: YAESU MUSEN CO., LTD.
Address	: 43 Utsuroda, Morijuku, Sukagawa-shi, Fukushima-ken 962-0001 JAPAN
Model	: FTDX101D
FCC ID	: K6620681X50
Serial number	: SPP21
Hardware version	: SPP21
Software version	: 2019-01-04-1 V00-08 (MAIN) : 2018-12-27-3 V00-18 (DISPLAY) : V91-52 (MAIN DSP) : V91-52 (SUB DSP) : V91-13 (AF DSP) : V01-01 (MAIN SDR) : V01-01 (SUB SDR)
Operating frequency range	: 0.03 - 75 MHz
Highest internal operating Freq.	: 400 MHz
Receipt date of EUT	: 22 Jan. 2019
Nominal power source voltages	: DC 13.8 V (This is supplied by a DC power supply)

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1.2 Test(s) performed/ Summary of test result

Test specification(s) : FCC CFR 47 Part 15 Subpart B
 Test method(s) : ANSI C63.4: 2014
 Test(s) started : 22 Jan. 2019
 Test(s) completed : 30 Jan. 2019
 Purpose of test(s) : Certification as the scanning receiver

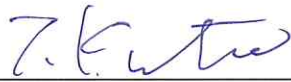
Summary of test result : Complied

Note: The above judgment is only based on the measurement data and it does not include the measurement uncertainty. Accordingly, the statement below is applied to the test result.

The EUT complies with the limit required in the standard in case that the margin is not less than the measurement uncertainty in the Laboratory.

Compliance of the EUT is more probable than non-compliance is case that the margin is less than the measurement uncertainty in the Laboratory.

Test engineer

: 
 T. Kato
 (Test Engineer, EMC/RF Testing Lab.)

Reviewer

: 
 K. Onishi
 (Testing Leader, EMC/RF Testing Lab.)

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1.3 Test facility

The Federal Communications Commission has reviewed the technical characteristics of the test facilities at SGS Japan Inc., located in 472, Nippa-cho, Kohoku-ku, Yokohama, 223-0057, Japan, and has found these test facilities to be in compliance with the requirements of 47 CFR Part 15, section 2.948.

The description of the test facilities has been filed under registration number 319924 at the Office of the Federal Communications Commission. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

The list of all public test facilities is available on the Internet at <http://www.fcc.gov>.

Registered by Innovation, Science and Economic Development Canada (ISED):

The registered facility number is as follows;

Test site No. 1 (Semi-Anechoic chamber 3m): 6974A-1

Accredited by **National Voluntary Laboratory Accreditation Program (NVLAP)** for the emission tests stated in the scope of the certificate under Certificate Number 200780-0

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.



1.4 Measurement uncertainty

The treatment of uncertainty is based on the general matters on the definition of uncertainty in “Guide to the expression of uncertainty in measurement (GUM)” published by ISO. The Lab’s uncertainty is determined by referring UKAS Publication LAB34: 2002 “The Expression of Uncertainty in EMC Testing” and CISPR16-4-2: 2011 “Uncertainty in EMC Measurements”.

The uncertainty of the measurement result in the level of confidence of approximately 95% (k=2) is as follows;

AC conducted emission (150 kHz - 30 MHz)	: ± 3.3 dB
RF conducted emission (30 MHz - 6 GHz)	: ± 0.9 dB
Radiated emission (30 MHz - 200 MHz)	: ± 4.7 dB
Radiated emission (200 MHz - 1000 MHz)	: ± 6.1 dB
Radiated emission (1 GHz - 6 GHz)	: ± 4.4 dB

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1.5 Summary of test results

Requirement	Section in specification	Result	Section in this report
Radiated emissions (30 to 2000 MHz) (*1)	15.109	Complied	2.1
Conducted emission for receiver	15.111	Complied	2.2
AC power line conducted emissions	15.107	Complied	2.3
38 dB Rejection (cellular band)	15.121 (b)	- (*2)	-

(*1) The highest internal operating frequency is 400 MHz

(*2) This item was not tested in this report.

1.6 Setup of equipment under test (EUT)

1.6.1 Test configuration of EUT

Equipment(s) under test

No.	Item	Manufacture	Model No.	Serial No.
1	HF/50MHz TRANSCEIVER	YAESU MUSEN CO., LTD.	FTDX101D	SPP21
-	-	-	-	-

Support Equipment(s)

No.	Item	Manufacture	Model No.	Serial No.
2	Microphone	YAESU MUSEN CO., LTD.	SSM-75G	ES01
3	Stereo Headphone	YAESU MUSEN CO., LTD.	YH-77STA	YTS03
4	USB Mouse	Dell	MO56UC	F0E01TU4
5	USB Keyboard	Dell	KB-212-B	CN-0DH939-71616-38R-0HDB-A00
6	External Speaker	YAESU MUSEN CO., LTD.	SP-101	ES01
7	Remote Control Keypad	YAESU MUSEN CO., LTD.	FH-2	YTS02
8	Monitor	Lenovo	6622-HJ1	V1B7857
9	DC Power Supply	YAESU MUSEN CO., LTD.	FP-1030A	1412167017

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Connected cable(s)

No.	Item	From	To	Cable Shielded	Ferrite Core	Length [m]
A	Mic. Cable	1	2	No	No	0.5
B	Headphone Cable	1	3	No	No	1.8
C	Key Cable 1	1	OPEN	No	No	1.2
D	Mouse Cable	1	4	Yes	No	1.8
E	Keyboard Cable	1	5	Yes	No	2.1
F	Speaker A Cable	1	6	No	No	1.0
G	REM Cable	1	7	No	No	1.0
H	DVI Cable	1	8	Yes	Yes (Pre-assy)	1.9
I	Speaker B Cable	1	OPEN	No	No	1.0
J	Key Cable 2	1	OPEN	No	No	1.6
K	AF-OUT Cable	1	OPEN	No	No	1.5
L	RTTY/DATA Cable	1	OPEN	No	No	1.6
M	METER Cable	1	OPEN	No	No	2.0
N	EXT ALC Cable	1	OPEN	No	No	1.1
O	USB Cable	1	OPEN	No	No	1.8
P	RS-232C Cable	1	OPEN	Yes	No	2.0
Q	LINEAR Cable	1	OPEN	No	No	1.0
R	ACC Cable	1	OPEN	Yes	No	1.8
S	TX-GND Cable	1	OPEN	No	No	1.1
T	PTT Cable	1	OPEN	No	No	1.1
U	+13.8V Cable	1	OPEN	No	No	1.1
V	TUNER Cable	1	OPEN	No	No	1.0
W	RX OUT A Cable	1	OPEN	No	No	1.1
X	IF OUT A Cable	1	OPEN	No	No	1.1
Y	RX OUT B Cable	1	OPEN	No	No	1.1
Z	IF OUT B Cable	1	OPEN	No	No	1.1
AA	DC Cable	1	DC	No	No	2.8
AB	GND Cable	1	GND	No	No	2.0

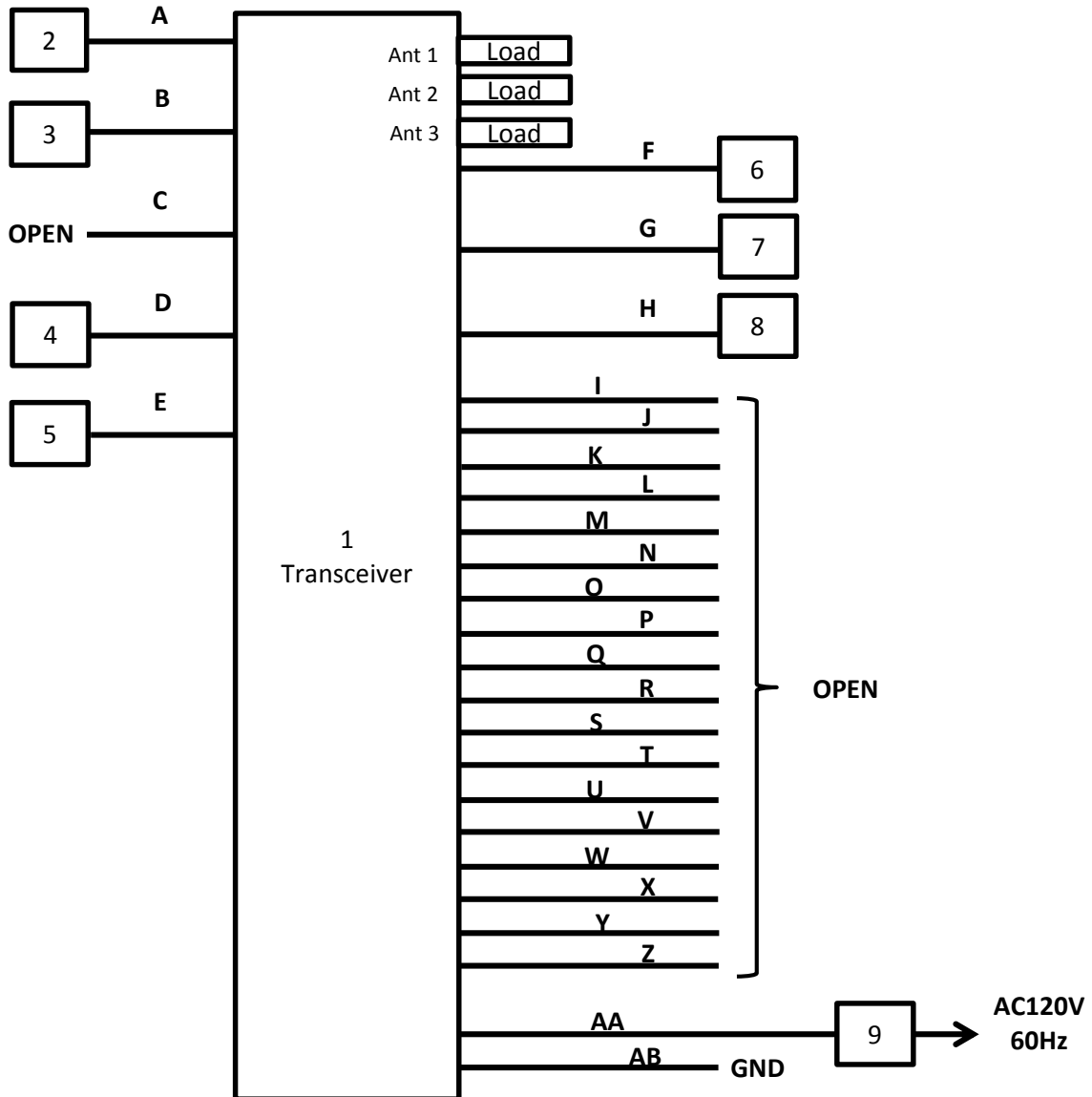
1.6.2 Operating condition:

- Rx 0.03 MHz
- Rx 28 MHz
- Rx 75 MHz

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1.6.3 Setup diagram of tested system



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1.7 Equipment modifications

No modifications have been made to the equipment in order to achieve compliance with the applicable standards described in clause 1.2.

1.8 Deviation from the standard

No deviations from the standards described in clause 1.2.

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2 Test procedure and test data

2.1 Radiated emissions

Test setup

Test setup was implemented according to the method of ANSI C63.4 clause 6 “General requirements for EUT equipment arrangements and operation”, clause 8.2 and Annex H.3 “Radiated emission measurements setup”.

Test procedure

Measurement procedures were implemented according to the method of ANSI C63.4 clauses 8.2. The EUT is placed on a non-conducted table which is 0.8 m height from a ground plane and the measurement antenna to EUT distance is 3 meters. The turn table is rotated for 360 degrees to determine the maximum emission level.

The antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

The spectrum analyzer and receiver are set to the followings;

RBW=100 kHz (up to 1000 MHz) or 1 MHz (above 1000 MHz) ,
 VBW= 300 kHz (up to 1000 MHz) or 3 MHz (above 1000 MHz)

Final measurement is carried out with a receiver RBW of 120 kHz (up to 1000 MHz), or 1 MHz (above 1000 MHz).

Applicable rule and limitation

FCC 15.109 Radiated emissions limits

Frequency [MHz]	Field Strength [$\mu\text{V/m}$]	Measurement Distance [m]	Field Strength [$\text{dB}\mu\text{V/m}$]
30 – 88	100	3	40.0
88 – 216	150	3	43.5
216 – 960	200	3	46.0
Above 960	500	3	53.9

In the emission table above, the tighter limit applies at the band edges.

The emission limits shown in the above table are based on measurements employing a QP detector (up to 1000 MHz) or AVE/PEAK detector (above 1000 MHz).

Test results - Complied with requirement

Test equipment used (refer to List of utilized test equipment)

AC01	TR06	CL11	PR21	BA07	CL30	CL38
PR12	DH06					

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Test software used
 EMI1 Ver. 5.9

Calculation method

The Correction Factor and Result are calculated as followings.

$$\text{Correction Factor [dB/m]} = \text{Ant. Factor [dB/m]} + \text{Loss [dB]} - \text{Gain [dB]}$$

$$\text{Result [dB}\mu\text{V/m]} = \text{Reading [dB}\mu\text{V]} + \text{Correction Factor [dB/m]}$$

Test Data

Operating mode: Rx 0.03 MHz

Range: 30 - 1000 MHz

No.	Frequency [MHz]	Reading [dBμV]	Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Ant.
1	155.699	46.9	11.1	8.3	30.2	36.1	43.5	7.4	Hori.
2	159.338	47.8	10.8	8.3	30.2	36.7	43.5	6.8	Hori.
3	239.618	51.3	12.3	9.0	30.2	42.4	46.0	3.6	Hori.
4	333.675	48.1	14.4	9.7	30.2	42.0	46.0	4.0	Hori.
5	405.504	44.1	16.4	10.2	30.2	40.5	46.0	5.5	Hori.
6	33.368	42.5	21.0	6.9	30.4	40.0	40.0	0.0	Vert.
7	100.103	50.8	10.4	7.7	30.2	38.7	43.5	4.8	Vert.
8	165.888	53.5	10.5	8.3	30.2	42.1	43.5	1.4	Vert.
9	667.350	43.0	18.7	11.6	30.2	43.1	46.0	2.9	Vert.
10	934.290	39.5	20.7	12.7	28.9	44.0	46.0	2.0	Vert.

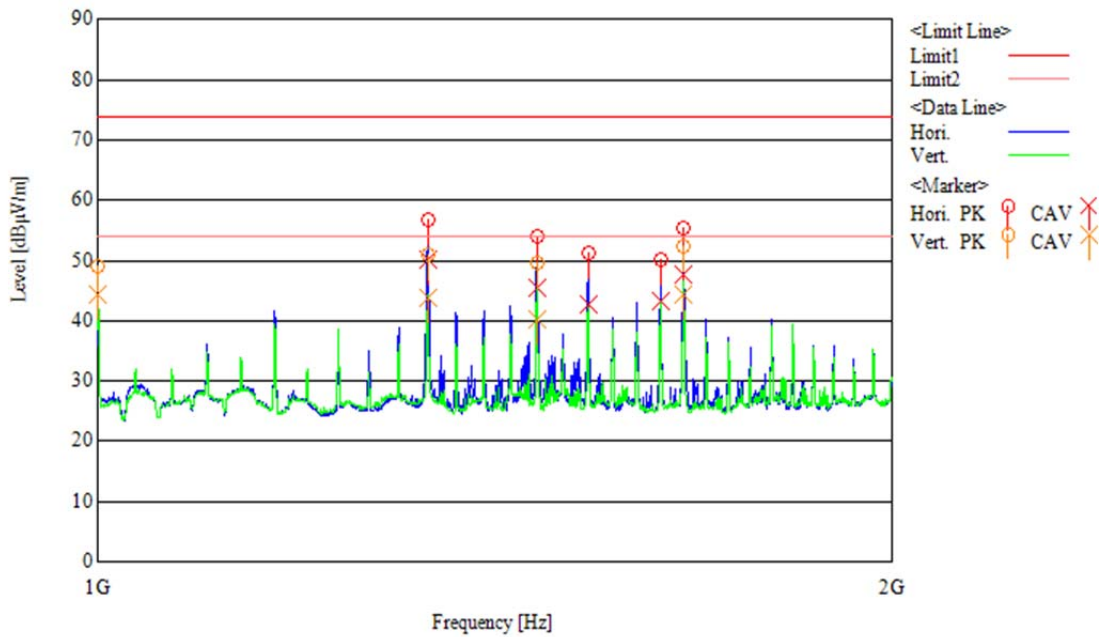
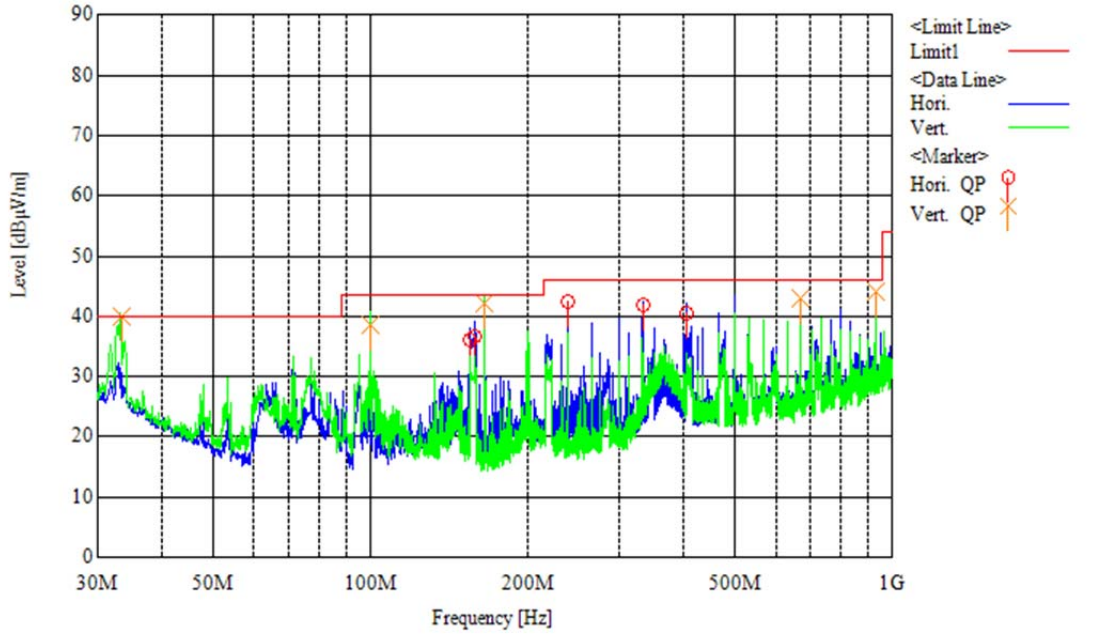
Range: 1000 - 2000 MHz

No.	Frequency [MHz]	Reading PK [dBμV]	Reading AVE [dBμV]	C.Factor [dB/m]	Result PK [dBμV/m]	Result AVE [dBμV/m]	Limit PK [dBμV/m]	Limit AVE [dBμV/m]	Margin PK [dB]	Margin AVE [dB]	Ant.
1	1334.699	65.5	58.8	-8.7	56.8	50.1	73.9	53.9	17.1	3.8	Hori.
2	1468.170	62.6	54.1	-8.7	53.9	45.4	73.9	53.9	20.0	8.5	Hori.
3	1534.905	59.8	51.4	-8.6	51.2	42.8	73.9	53.9	22.7	11.1	Hori.
4	1635.007	58.9	51.9	-8.7	50.2	43.2	73.9	53.9	23.7	10.7	Hori.
5	1668.375	63.8	56.2	-8.5	55.3	47.7	73.9	53.9	18.6	6.2	Hori.
6	1001.025	60.1	55.4	-11.0	49.1	44.4	73.9	53.9	24.8	9.5	Vert.
7	1334.700	59.7	52.5	-8.7	51.0	43.8	73.9	53.9	22.9	10.1	Vert.
8	1468.169	58.3	49.0	-8.7	49.6	40.3	73.9	53.9	24.3	13.6	Vert.
9	1668.375	60.8	52.9	-8.5	52.3	44.4	73.9	53.9	21.6	9.5	Vert.

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[Chart]



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Operating mode: Rx 28 MHz

Range: 30 - 1000 MHz

No.	Frequency [MHz]	Reading [dBμV]	Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Ant.
1	155.652	46.8	11.1	8.3	30.2	36.0	43.5	7.5	Hori.
2	159.341	47.9	10.8	8.3	30.2	36.8	43.5	6.7	Hori.
3	239.616	51.3	12.3	9.0	30.2	42.4	46.0	3.6	Hori.
4	333.675	48.1	14.4	9.7	30.2	42.0	46.0	4.0	Hori.
5	800.820	39.9	19.8	12.2	30.0	41.9	46.0	4.1	Hori.
6	934.290	37.4	20.7	12.7	28.9	41.9	46.0	4.1	Hori.
7	33.368	42.4	21.0	6.9	30.4	39.9	40.0	0.1	Vert.
8	61.910	46.4	10.1	7.3	30.3	33.5	40.0	6.5	Vert.
9	100.100	51.7	10.4	7.7	30.2	39.6	43.5	3.9	Vert.
10	165.888	53.7	10.5	8.3	30.2	42.3	43.5	1.2	Vert.
11	934.290	40.0	20.7	12.7	28.9	44.5	46.0	1.5	Vert.

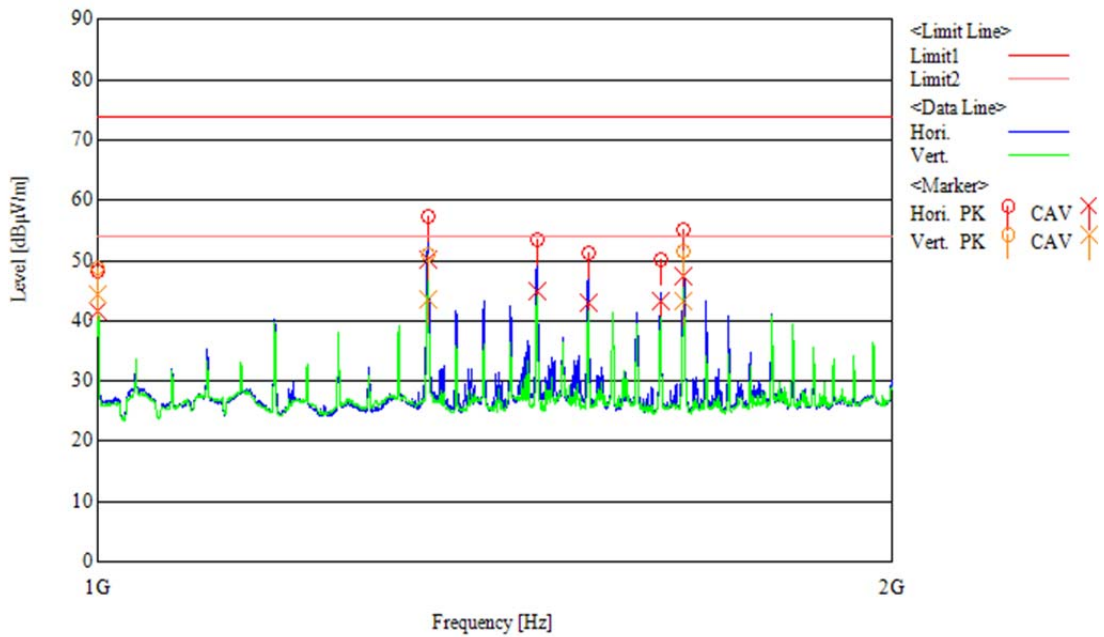
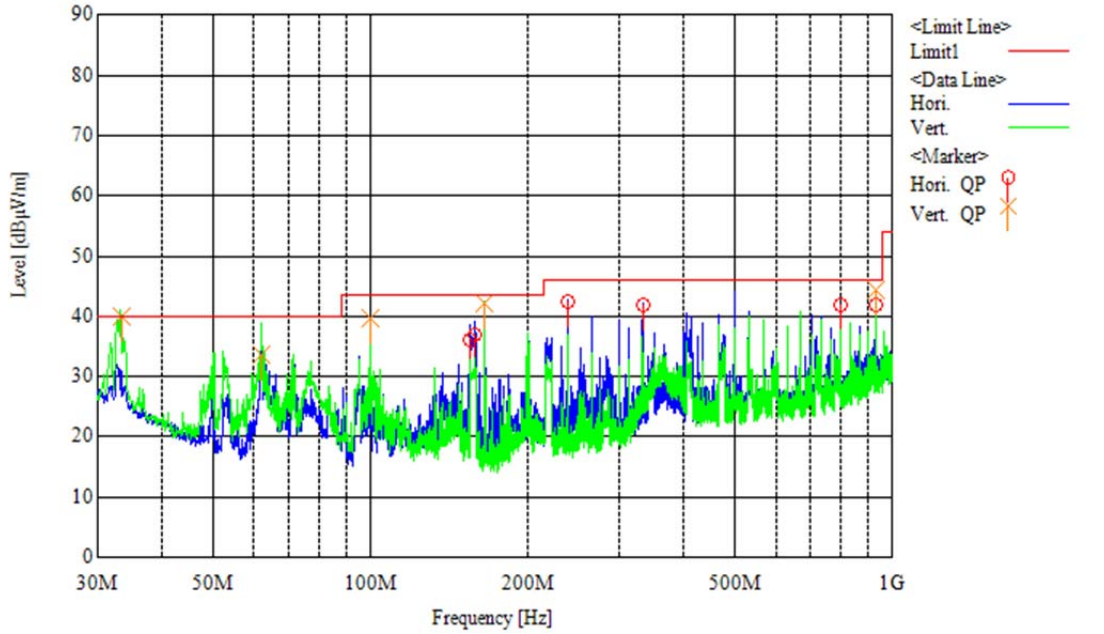
Range: 1000 - 2000 MHz

No.	Frequency [MHz]	Reading PK [dBμV]	Reading AVE [dBμV]	C.Factor [dB/m]	Result PK [dBμV/m]	Result AVE [dBμV/m]	Limit PK [dBμV/m]	Limit AVE [dBμV/m]	Margin PK [dB]	Margin AVE [dB]	Ant.
1	1001.025	59.1	52.6	-11.0	48.1	41.6	73.9	53.9	25.8	12.3	Hori.
2	1334.700	66.0	59.0	-8.7	57.3	50.3	73.9	53.9	16.6	3.6	Hori.
3	1468.170	62.2	53.7	-8.7	53.5	45.0	73.9	53.9	20.4	8.9	Hori.
4	1534.905	59.8	51.5	-8.6	51.2	42.9	73.9	53.9	22.7	11.0	Hori.
5	1635.008	59.0	52.1	-8.7	50.3	43.4	73.9	53.9	23.6	10.5	Hori.
6	1668.375	63.5	55.8	-8.5	55.0	47.3	73.9	53.9	18.9	6.6	Hori.
7	1001.025	59.7	55.3	-11.0	48.7	44.3	73.9	53.9	25.2	9.6	Vert.
8	1334.699	59.7	52.3	-8.7	51.0	43.6	73.9	53.9	22.9	10.3	Vert.
9	1668.375	60.1	51.8	-8.5	51.6	43.3	73.9	53.9	22.3	10.6	Vert.

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[Chart]



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Operating mode: Rx 75 MHz

Range: 30 - 1000 MHz

No.	Frequency [MHz]	Reading [dB μ V]	Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Ant.
1	159.328	47.9	10.8	8.3	30.2	36.8	43.5	6.7	Hori.
2	239.616	51.7	12.3	9.0	30.2	42.8	46.0	3.2	Hori.
3	333.675	48.2	14.4	9.7	30.2	42.1	46.0	3.9	Hori.
4	500.513	45.9	17.3	10.7	30.1	43.8	46.0	2.2	Hori.
5	800.820	39.8	19.8	12.2	30.0	41.8	46.0	4.2	Hori.
6	33.367	42.5	21.0	6.9	30.4	40.0	40.0	0.0	Vert.
7	61.910	46.2	10.1	7.3	30.3	33.3	40.0	6.7	Vert.
8	71.241	47.4	8.5	7.4	30.3	33.0	40.0	7.0	Vert.
9	100.103	51.2	10.4	7.7	30.2	39.1	43.5	4.4	Vert.
10	165.888	53.4	10.5	8.3	30.2	42.0	43.5	1.5	Vert.
11	667.350	43.4	18.7	11.6	30.2	43.5	46.0	2.5	Vert.
12	934.291	39.8	20.7	12.7	28.9	44.3	46.0	1.7	Vert.

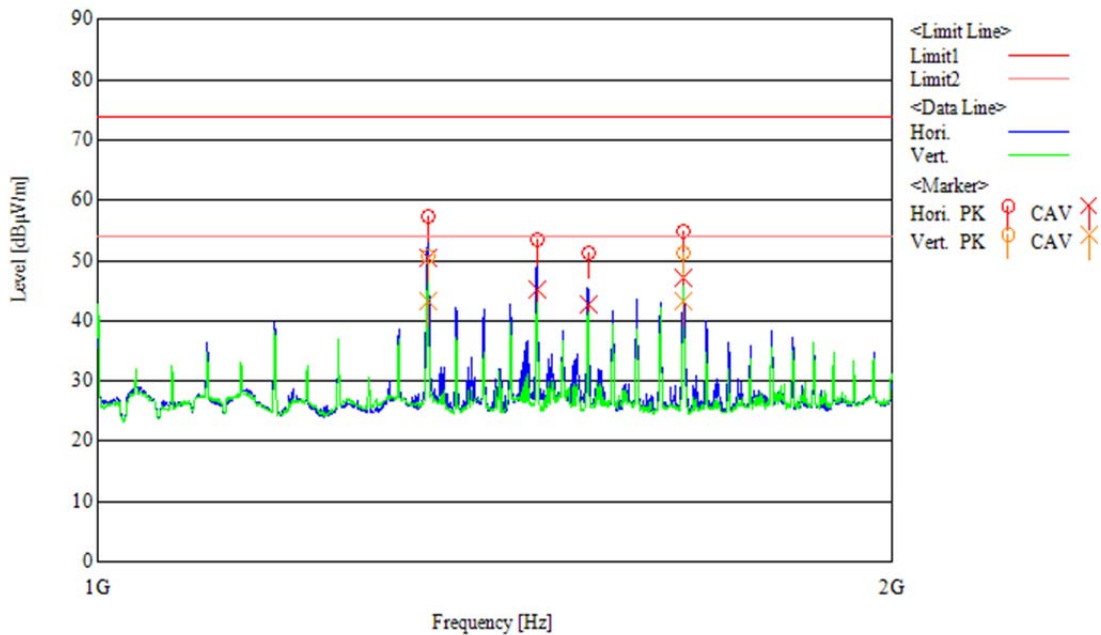
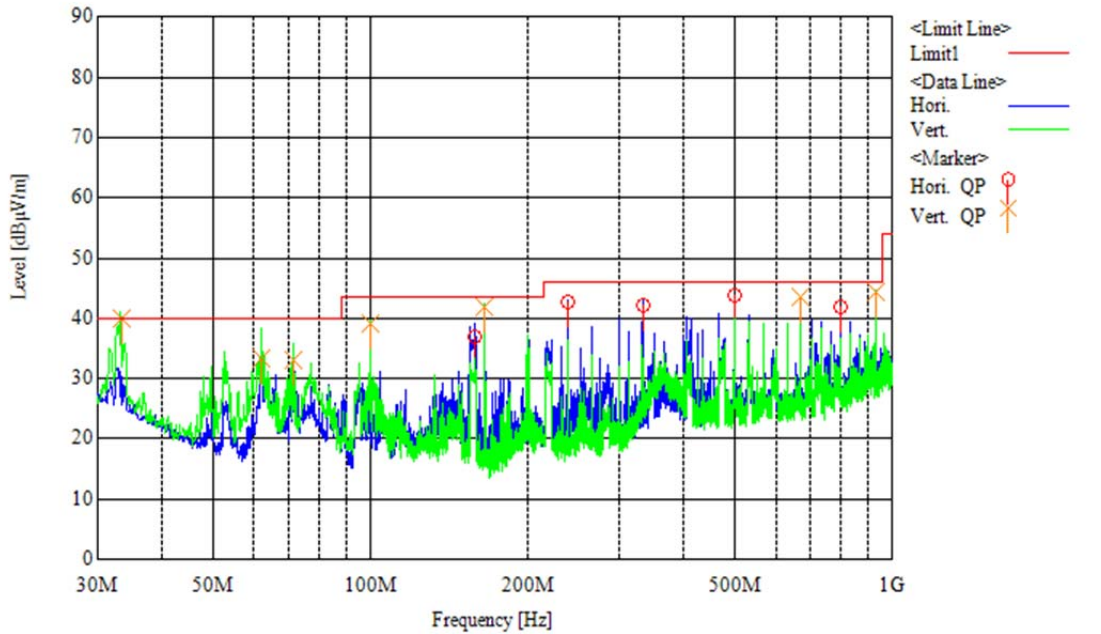
Range: 1000 - 2000 MHz

No.	Frequency [MHz]	Reading PK [dB μ V]	Reading AVE [dB μ V]	C.Factor [dB/m]	Result PK [dB μ V/m]	Result AVE [dB μ V/m]	Limit PK [dB μ V/m]	Limit AVE [dB μ V/m]	Margin PK [dB]	Margin AVE [dB]	Ant.
1	1334.700	66.1	59.2	-8.7	57.4	50.5	73.9	53.9	16.5	3.4	Hori.
2	1468.169	62.2	53.8	-8.7	53.5	45.1	73.9	53.9	20.4	8.8	Hori.
3	1534.905	59.8	51.3	-8.6	51.2	42.7	73.9	53.9	22.7	11.2	Hori.
4	1668.375	63.4	55.6	-8.5	54.9	47.1	73.9	53.9	19.0	6.8	Hori.
5	1334.699	59.5	51.9	-8.7	50.8	43.2	73.9	53.9	23.1	10.7	Vert.
6	1668.375	59.9	51.9	-8.5	51.4	43.4	73.9	53.9	22.5	10.5	Vert.

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[Chart]



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[Test condition]

Day 1

Tested Date: 22 Jan. 2019
 Humidity: 30 %

Temperature: 15 degC
 Atmos. Press: 1012 hPa

Day 2

Tested Date: 30 Jan. 2019
 Humidity: 26 %

Temperature: 16 degC
 Atmos. Press: 1026 hPa

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2.2 Conducted emissions for receiver

Test setup



Applicable rule and limitation

§15.111 (b) Antenna power conducted limit : 2 nW (= -57 dBm)

Test equipment used (refer to List of utilized test equipment)

TR06	CL31	
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Test results - Complied with requirement

Test Data

[The maximum spurious level at antenna port 1]

Operating freq. [MHz]	Frequency range 30 - 1000 MHz		Frequency range 1000 - 2000 MHz	
	Freq. [MHz]	Level [dBm]	Freq. [MHz]	Level [dBm]
0.03	- (Note)	- (Note)	- (Note)	- (Note)
28	- (Note)	- (Note)	- (Note)	- (Note)
75	- (Note)	- (Note)	- (Note)	- (Note)

Note: No emission above noise floor was found.

[The maximum spurious level at antenna port 2]

Operating freq. [MHz]	Frequency range 30 - 1000 MHz		Frequency range 1000 - 2000 MHz	
	Freq. [MHz]	Level [dBm]	Freq. [MHz]	Level [dBm]
0.03	- (Note)	- (Note)	- (Note)	- (Note)
28	- (Note)	- (Note)	- (Note)	- (Note)
75	- (Note)	- (Note)	- (Note)	- (Note)

Note: No emission above noise floor was found.

[The maximum spurious level at antenna port 3]

This port was not tested by the manufacturer's request.

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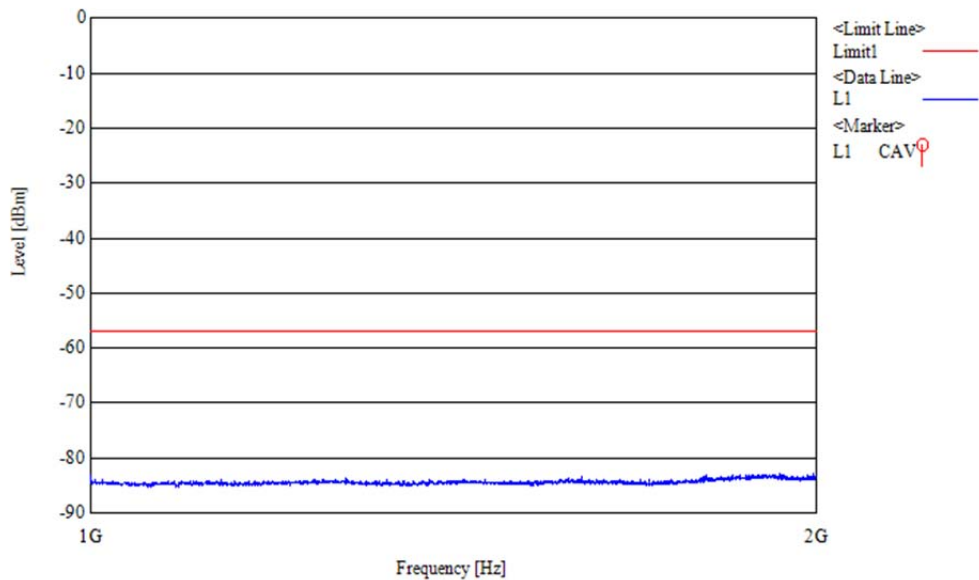
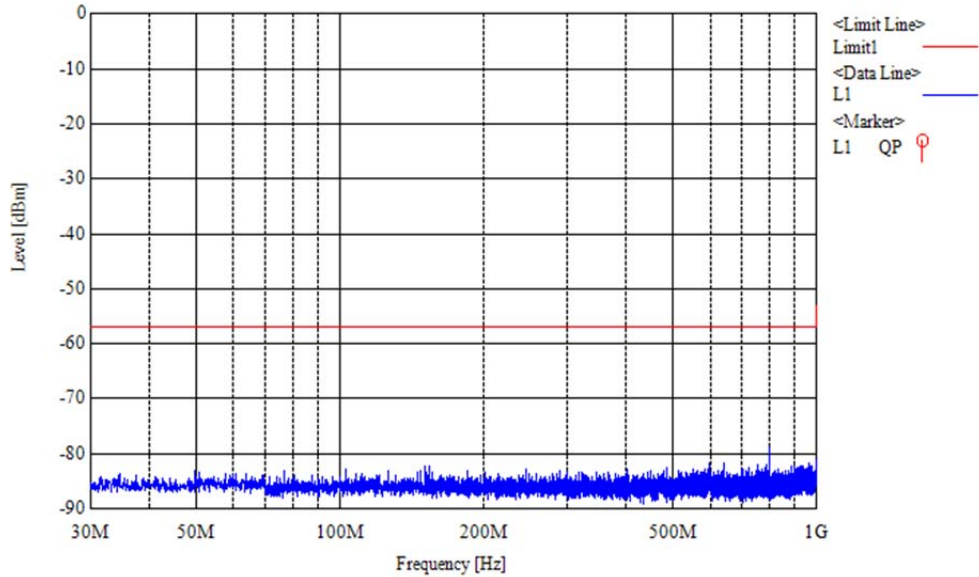
[Test condition]

Tested Date: 30 Jan. 2019
 Humidity: 26 %

Temperature: 16 degC
 Atmos. Press: 1026 hPa

[Chart]

Operating mode: Rx 0.03 MHz at Ant port 1 (Worst)



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2.3 AC power line conducted emissions

Test setup

Test setup was implemented according to the method of ANSI C63.4 clause 6 “General requirements for EUT equipment arrangements and operation” and Annex H.1 “AC power line conducted emission measurements setup”.

Test procedure

Measurement procedures were implemented according to the method of ANSI C63.4 clauses 7, clause 13.1.3 and Annex H.2 “AC power line conducted emission measurements”.

Exploratory measurements were used the spectrum analyzer to identify the frequency of the emission that has the highest amplitude relative to the limit by operating the EUT in a range of typical modes of operation, cable positions, and with a typical system equipment configuration and arrangement.

Final ac power line conducted emission measurements were performed based on the exploratory tests.

The EUT cable configuration and arrangement and mode of operation that produced the emission with the highest amplitude relative to the limit are selected for the final measurement.

When the measurement value is greater than average limitation the average detection measurements were performed.

Applicable rule and limitation

§15.107 (b) AC power line conducted limits

Frequency of Emission [MHz]	Conducted emissions Limit [dB μ V]	
	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. The lower limit applies at the band edges.

Test equipment used (refer to List of utilized test equipment)

TR06	LN05	CL18
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Test software used

EMI1 Ver. 5.9

Calculation method

The Correction Factor and Result are calculated as followings.

$$\begin{aligned} \text{Correction Factor [dB]} &= \text{ISN Factor [dB]} + \text{Loss [dB]} \\ \text{Result [dB}\mu\text{V]} &= \text{Reading [dB}\mu\text{V]} + \text{Correction Factor [dB]} \end{aligned}$$

Test results - Complied with requirement

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Test Data

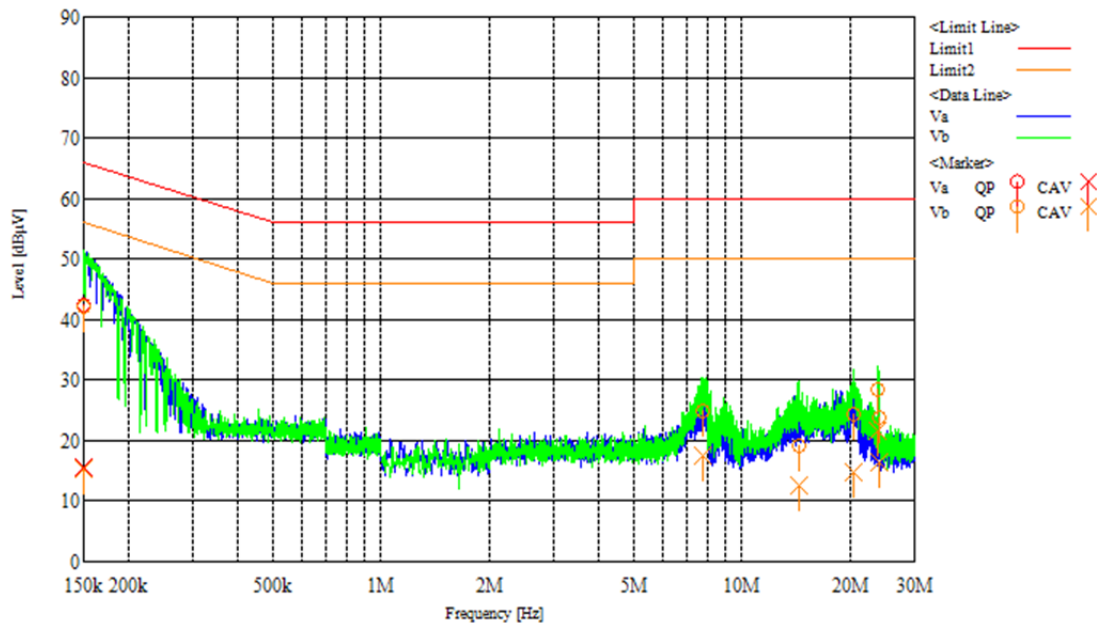
[Emission level]

Operating mode: Rx 0.03 MHz

	Freq. [MHz]	Reading QP [dBμV]	Reading Ave [dBμV]	Factor [dB]	Result QP [dBμV]	Result Ave [dBμV]	Limit QP [dBμV]	Limit Ave [dBμV]	Margin QP [dB]	Margin Ave [dB]	Line
1	0.15000	32.1	5.2	10.3	42.4	15.5	66.0	56.0	23.6	40.5	Va
2	0.15000	31.8	5.0	10.3	42.1	15.3	66.0	56.0	23.9	40.7	Vb
3	7.81191	14.6	7.1	10.3	24.9	17.4	60.0	50.0	35.1	32.6	Vb
4	14.41220	8.9	2.3	10.4	19.3	12.7	60.0	50.0	40.7	37.3	Vb
5	20.46523	13.8	4.3	10.5	24.3	14.8	60.0	50.0	35.7	35.2	Vb
6	23.74687	18.0	11.1	10.6	28.6	21.7	60.0	50.0	31.4	28.3	Vb
7	24.01300	13.1	5.7	10.6	23.7	16.3	60.0	50.0	36.3	33.7	Vb

[Chart]

Operating mode: Rx 0.03 MHz



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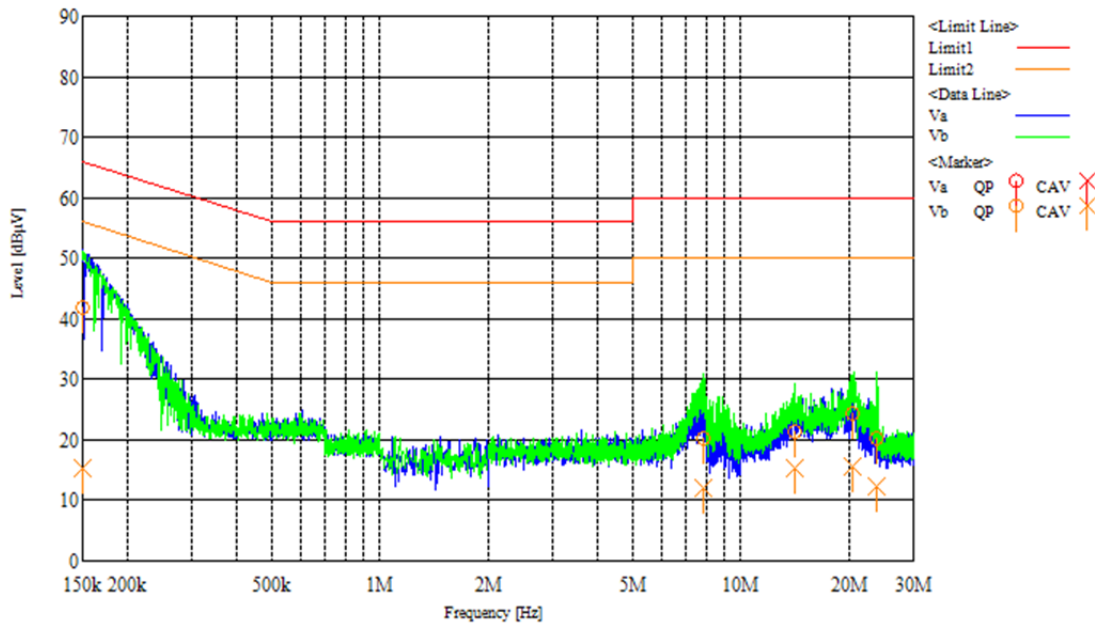
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Operating mode: Rx 28 MHz

	Freq. [MHz]	Reading QP [dBμV]	Reading Ave [dBμV]	Factor [dB]	Result QP [dBμV]	Result Ave [dBμV]	Limit QP [dBμV]	Limit Ave [dBμV]	Margin QP [dB]	Margin Ave [dB]	Line
1	0.15000	31.7	4.9	10.3	42.0	15.2	66.0	56.0	24.0	40.8	Va
2	0.15000	31.7	5.0	10.3	42.0	15.3	66.0	56.0	24.0	40.7	Vb
3	7.83892	10.1	1.8	10.3	20.4	12.1	60.0	50.0	39.6	37.9	Vb
4	14.12206	10.9	4.9	10.4	21.3	15.3	60.0	50.0	38.7	34.7	Vb
5	20.38519	14.0	5.0	10.5	24.5	15.5	60.0	50.0	35.5	34.5	Vb
6	23.76688	9.7	1.7	10.6	20.3	12.3	60.0	50.0	39.7	37.7	Vb

[Chart]

Operating mode: Rx 28 MHz



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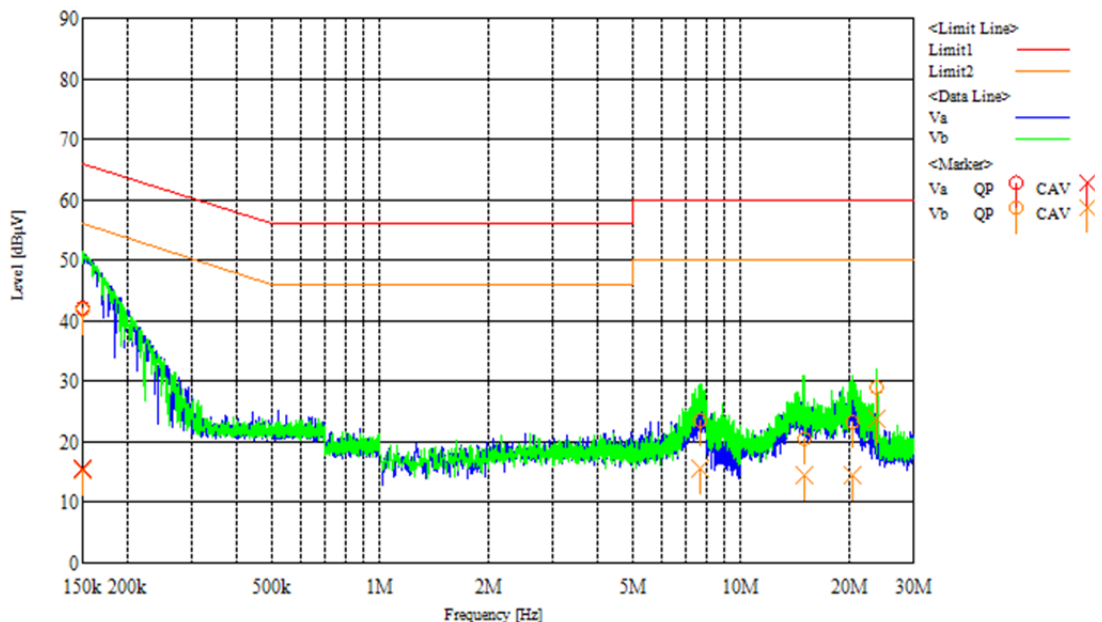
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Operating mode: Rx 75 MHz

	Freq. [MHz]	Reading QP [dBμV]	Reading Ave [dBμV]	Factor [dB]	Result QP [dBμV]	Result Ave [dBμV]	Limit QP [dBμV]	Limit Ave [dBμV]	Margin QP [dB]	Margin Ave [dB]	Line
1	0.15000	32.0	5.2	10.3	42.3	15.5	66.0	56.0	23.7	40.5	Va
2	0.15000	31.7	4.9	10.3	42.0	15.2	66.0	56.0	24.0	40.8	Vb
3	7.73087	13.2	5.2	10.3	23.5	15.5	60.0	50.0	36.5	34.5	Vb
4	14.91245	10.1	4.0	10.4	20.5	14.4	60.0	50.0	39.5	35.6	Vb
5	20.36518	12.7	4.1	10.5	23.2	14.6	60.0	50.0	36.8	35.4	Vb
6	23.75687	18.4	13.3	10.6	29.0	23.9	60.0	50.0	31.0	26.1	Vb

[Chart]

Operating mode: Rx 28 MHz



[Test condition]

Tested Date: 22 Jan. 2019
 Humidity: 32 %

Temperature: 20 degC
 Atmos. Press: 1015 hPa

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4 List of utilized test equipment / calibration

ID No.	Kind of Equipment	Manufacturer	Model No.	Serial Number	Cal. Date	Cal. until
AC01(EM)	Anechoic Chamber (1st test room)	JSE	203397C	-	2018/4/14	2019/4/30
AC01(EG)	Anechoic Chamber (1st test room)	JSE	203397C	-	2018/3/21	2019/3/31
BA07	Biological Antenna	TESEQ	CBL6143A	26670	2018/12/7	2019/12/31
CL11	RF Cable for RE	RFT	-	-	2018/3/26	2019/3/31
CL18	RF Cable for CE	RFT	-	-	2018/3/27	2019/3/31
CL30	RF Cable 5 m	SUHNER	SUCOFLEX104PE	MY3599	2019/1/23	2020/1/31
CL31	RF Cable 1 m	Junkosha	MWX221	1303S118	2019/1/23	2020/1/31
CL38	RF Cable 2 m	Junkosha	MWX221	1603S626	2019/1/23	2020/1/31
DH06	DRG Horn Antenna	A.H. Systems	SAS-571	1339	2018/6/19	2020/6/30
LN05	LISN	Kyoritsu	KNW-407F	8-1773-2	2018/5/16	2019/5/31
PR12	Pre. Amplifier (1-26G)	Agilent Technologies	8449B	3008A02513	2019/1/23	2020/1/31
PR21	Pre. Amplifier	Anritsu	MH648A	6200467119	2018/12/4	2019/12/31
TR06	Test Receiver (F/W : 4.73 SP4)	Rohde & Schwarz	ESU26	100002	2018/10/11	2019/10/31

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

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