

TEST REPORT

For

HF/50MHz TRANSCEIVER

In conformity with

FCC CFR 47 Part15 Subpart B (CSR)

Model : FTDX101MP

FCC ID : K6620681X60

Test Item : HF/50MHz TRANSCEIVER

Report No. : WE190311BC2-11

Issue Date : 07 Jun. 2019

Prepared for

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History

Report No.	Date	Revisions	Issued By
WE190311BC2-11	07 Jun. 2019	Initial Issue	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	: FTDX101MP
FCC ID	: K6620681X60
Serial number	: ES01
Hardware version	: ES
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	: 08 May 2019
Nominal power source voltages	: AC 120 V / 60 Hz

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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 : 31 May 2019
Test(s) completed : 05 Jun. 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 CAB identifier is JP0009.

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.	FTDX101MP	ES01
6	External Power Supply with Speaker	YAESU MUSEN CO., LTD.	FSP-101	ES01

Support Equipment(s)

No.	Item	Manufacture	Model No.	Serial No.
2	Microphone	YAESU MUSEN CO., LTD.	SSM-75G	ES01
3	Stereo Headphones	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
7	Remote Control Keypad	YAESU MUSEN CO., LTD.	FH-2	YTS02
8	Monitor	Lenovo	6622-HJ1	V1B7857

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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	REM Cable	1	7	No	No	1.0
G	DVI Cable	1	8	Yes	Yes (Pre-assy)	1.9
H	Speaker B Cable	1	OPEN	No	No	1.0
I	Key Cable 2	1	OPEN	No	No	1.6
J	AF-OUT Cable	1	OPEN	No	No	1.5
K	RTTY/DATA Cable	1	OPEN	No	No	1.6
L	METER Cable	1	OPEN	No	No	2.0
M	EXT ALC Cable	1	OPEN	No	No	1.1
N	USB Cable	1	OPEN	No	No	1.8
O	RS-232C Cable	1	OPEN	Yes	No	2.0
P	LINEAR Cable	1	OPEN	No	No	1.0
Q	ACC Cable	1	OPEN	Yes	No	1.8
R	TX-GND Cable	1	OPEN	No	No	1.1
S	PTT Cable	1	OPEN	No	No	1.1
T	+13.8V Cable	1	OPEN	No	No	1.1
U	TUNER Cable	1	OPEN	No	No	1.0
V	RX OUT A Cable	1	OPEN	No	No	1.1
W	IF OUT A Cable	1	OPEN	No	No	1.1
X	RX OUT B Cable	1	OPEN	No	No	1.1
Y	IF OUT B Cable	1	OPEN	No	No	1.1
Z	DC Cable	1	6	No	No	0.6
AA	Speaker A Cable	1	6	No	No	1.0
AB	GND Cable	1	GND	No	No	2.0
AC	AC Cable 1	8	AC	No	No	1.9
AD	AC Cable 2	6	AC	No	No	2.0

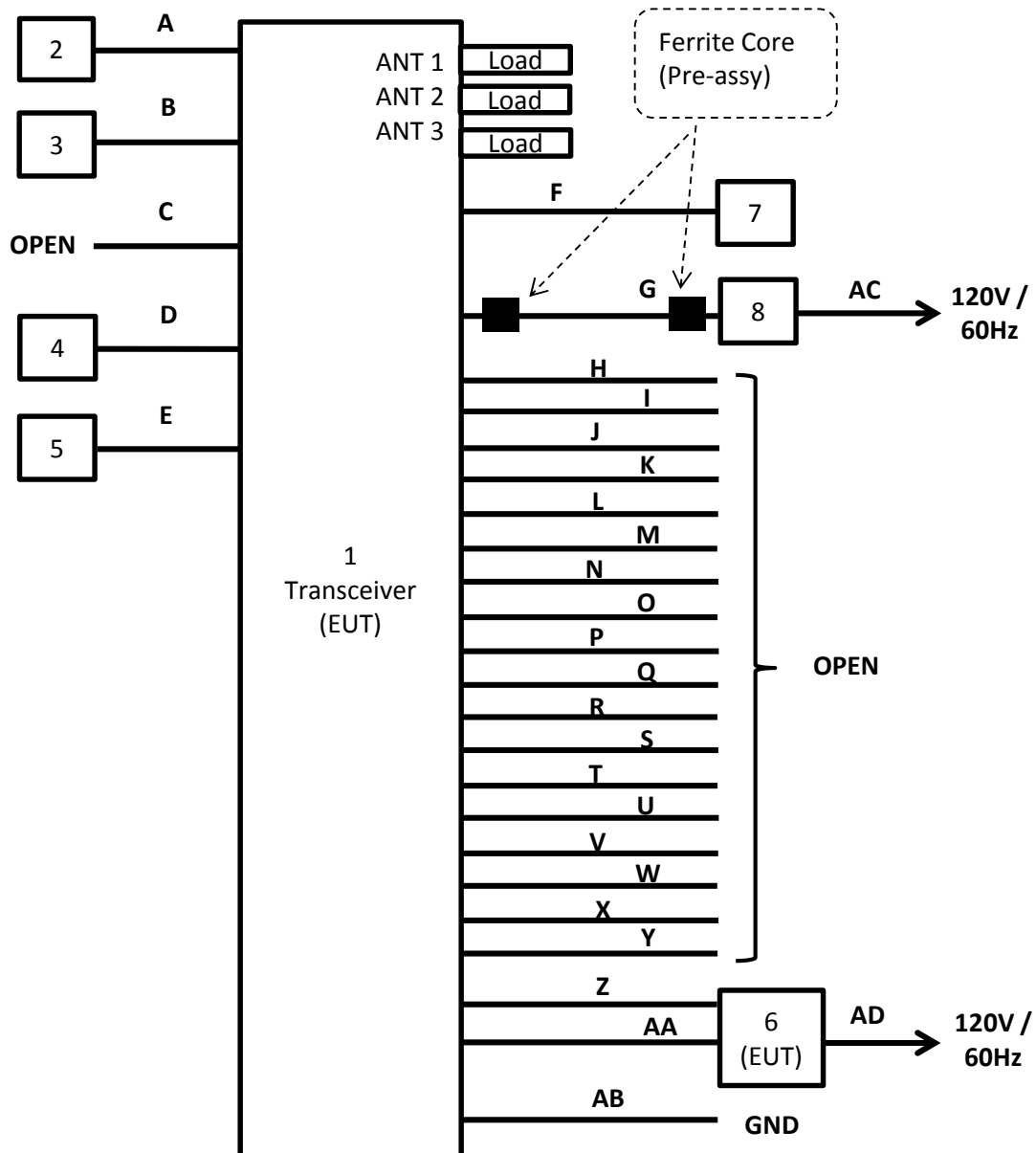
1.6.2 Operating condition:

- 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 [μ V/m]	Measurement Distance [m]	Field Strength [dB μ 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 [dB μ V]	Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Ant.
1	81.696	41.8	7.5	7.5	30.3	26.5	40.0	13.5	Hori.
2	155.699	47.2	11.1	8.3	30.2	36.4	43.5	7.1	Hori.
3	181.111	52.3	10.3	8.5	30.2	40.9	43.5	2.6	Hori.
4	217.853	48.4	11.9	8.8	30.2	38.9	46.0	7.1	Hori.
5	466.798	36.5	17.0	10.7	30.2	34.0	46.0	12.0	Hori.
6	667.343	43.6	18.7	11.7	30.2	43.8	46.0	2.2	Hori.
7	800.813	41.3	19.8	12.2	30.0	43.3	46.0	2.7	Hori.
8	834.177	40.5	20.0	12.3	29.8	43.0	46.0	3.0	Hori.
9	934.283	35.5	20.7	12.7	28.9	40.0	46.0	6.0	Hori.
10	30.000	33.8	22.7	6.8	30.4	32.9	40.0	7.1	Vert.
11	50.258	40.6	13.1	7.1	30.3	30.5	40.0	9.5	Vert.
12	52.167	39.7	12.6	7.1	30.3	29.1	40.0	10.9	Vert.
13	80.338	39.4	7.4	7.5	30.3	24.0	40.0	16.0	Vert.
14	181.208	44.0	10.3	8.5	30.2	32.6	43.5	10.9	Vert.
15	834.179	38.4	20.0	12.3	29.8	40.9	46.0	5.1	Vert.

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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	1334.685	62.5	54.7	-8.7	53.8	46.0	73.9	53.9	20.1	7.9	Hori.
2	1434.788	60.0	53.9	-9.0	51.0	44.9	73.9	53.9	22.9	9.0	Hori.
3	1468.153	66.3	59.0	-8.7	57.6	50.3	73.9	53.9	16.3	3.6	Hori.
4	1501.522	70.2	60.8	-8.5	61.7	52.3	73.9	53.9	12.2	1.6	Hori.
5	1534.889	63.3	54.9	-8.6	54.7	46.3	73.9	53.9	19.2	7.6	Hori.
6	1568.256	60.8	52.7	-8.6	52.2	44.1	73.9	53.9	21.7	9.8	Hori.
7	1668.359	61.7	53.8	-8.5	53.2	45.3	73.9	53.9	20.7	8.6	Hori.
8	1334.683	62.2	55.9	-8.7	53.5	47.2	73.9	53.9	20.4	6.7	Vert.
9	1468.157	62.0	54.0	-8.7	53.3	45.3	73.9	53.9	20.6	8.6	Vert.
10	1501.522	64.9	55.2	-8.5	56.4	46.7	73.9	53.9	17.5	7.2	Vert.
11	1534.895	59.3	50.8	-8.6	50.7	42.2	73.9	53.9	23.2	11.7	Vert.
12	1568.254	58.3	49.6	-8.6	49.7	41.0	73.9	53.9	24.2	12.9	Vert.
13	1668.352	63.8	56.0	-8.5	55.3	47.5	73.9	53.9	18.6	6.4	Vert.

[Test condition]

Day 1

Tested Date: 31 May 2019
Humidity: 50 %

Temperature: 24 degC
Atmos. Press: 1011 hPa

Day 2

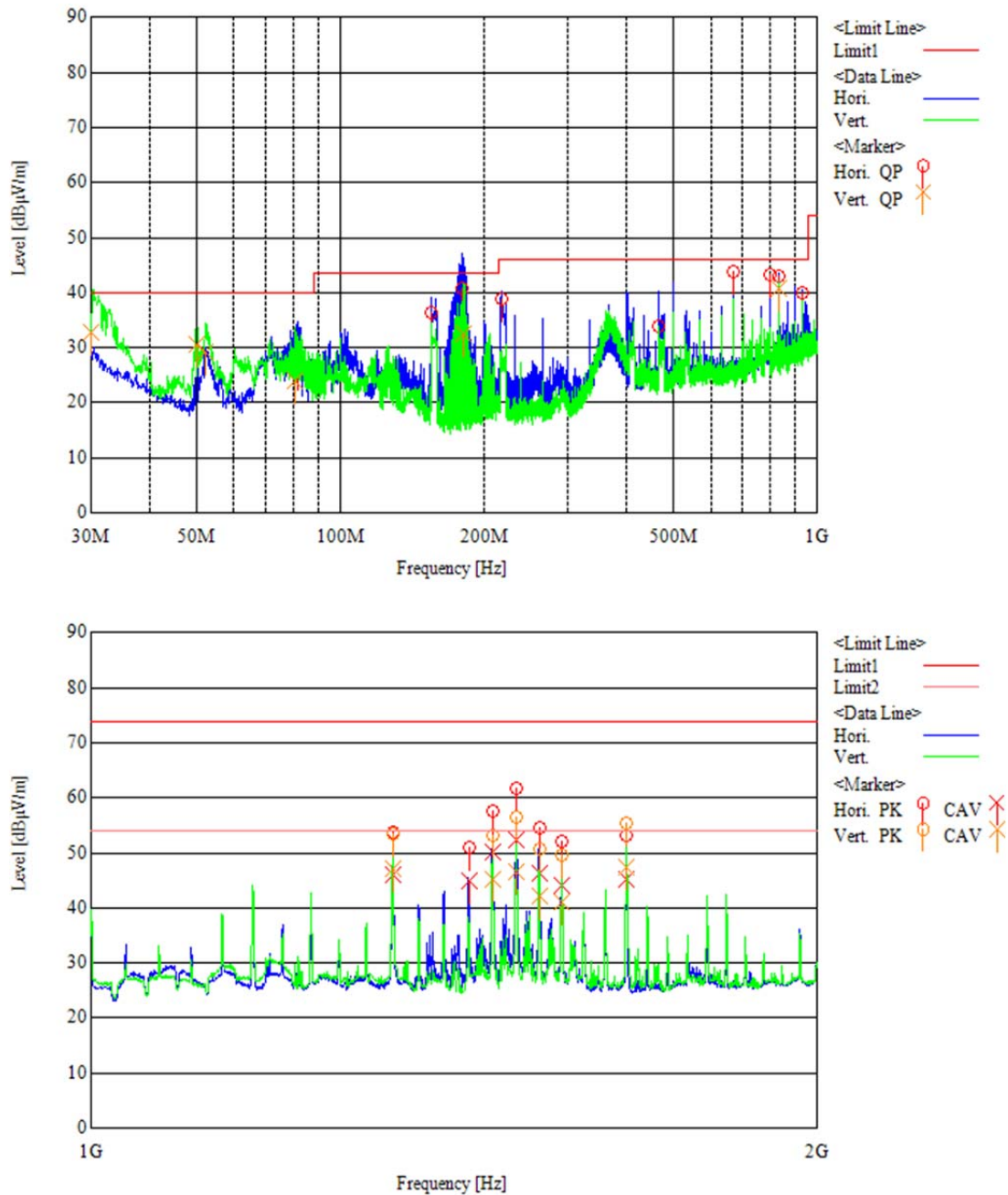
Tested Date: 05 Jun. 2019
Humidity: 53 %

Temperature: 23 degC
Atmos. Press: 1012 hPa

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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	159.328	47.4	10.8	8.3	30.2	36.3	43.5	7.2	Hori.
2	182.081	52.8	10.4	8.5	30.2	41.5	43.5	2.0	Hori.
3	217.870	48.3	11.9	8.8	30.2	38.8	46.0	7.2	Hori.
4	367.039	44.6	15.4	10.0	30.2	39.8	46.0	6.2	Hori.
5	467.140	43.3	17.0	10.7	30.2	40.8	46.0	5.2	Hori.
6	667.344	44.5	18.7	11.7	30.2	44.7	46.0	1.3	Hori.
7	800.812	43.3	19.8	12.2	30.0	45.3	46.0	0.7	Hori.
8	834.181	43.2	20.0	12.3	29.8	45.7	46.0	0.3	Hori.
9	30.000	35.5	22.7	6.8	30.4	34.6	40.0	5.4	Vert.
10	50.044	42.6	13.2	7.1	30.3	32.6	40.0	7.4	Vert.
11	52.696	38.3	12.4	7.1	30.3	27.5	40.0	12.5	Vert.
12	81.405	42.1	7.5	7.5	30.3	26.8	40.0	13.2	Vert.
13	181.529	46.9	10.3	8.5	30.2	35.5	43.5	8.0	Vert.

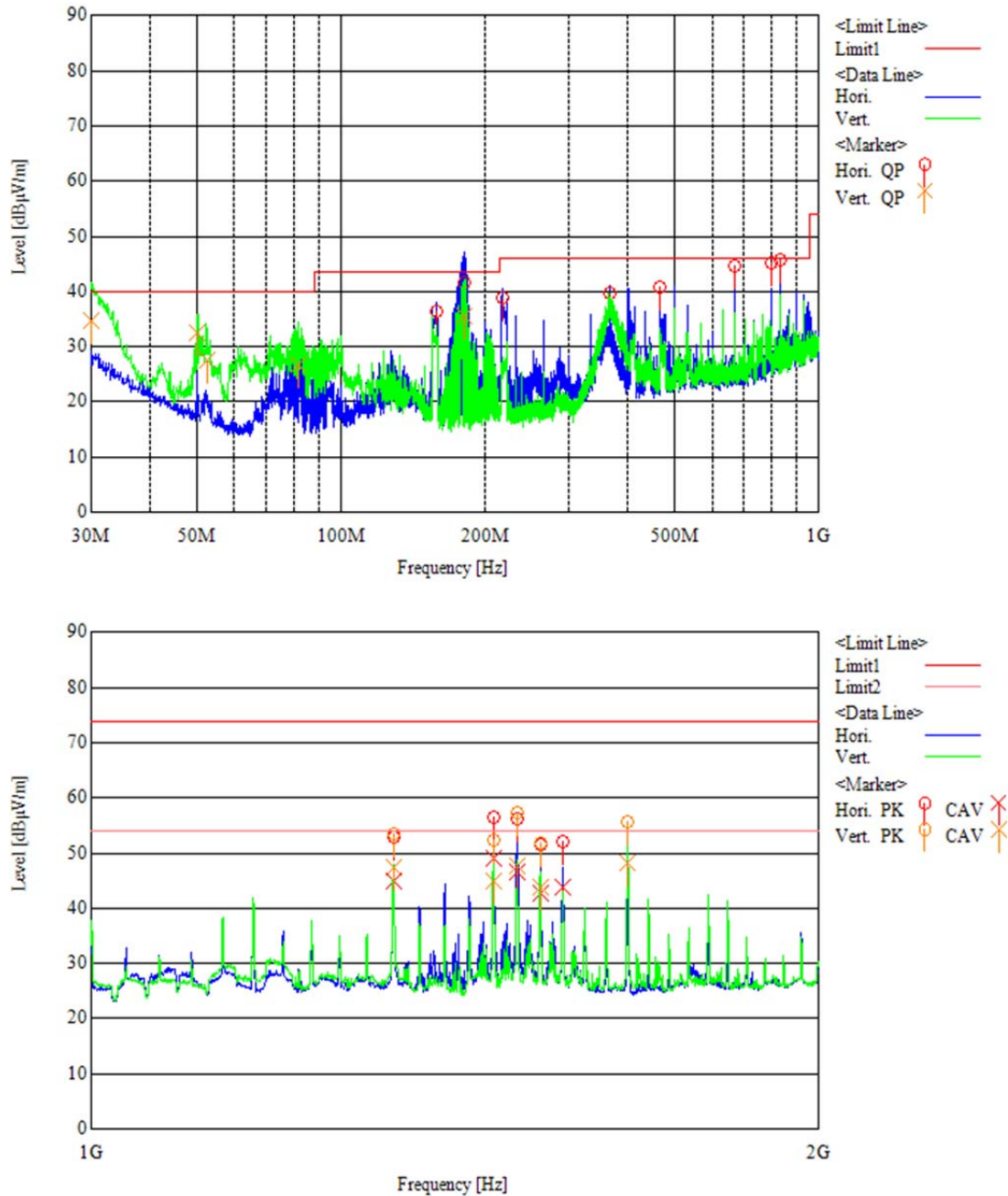
Range: 1000 - 2000 MHz

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	1334.688	61.7	53.6	-8.7	53.0	44.9	73.9	53.9	20.9	9.0	Hori.
2	1468.154	65.2	57.8	-8.7	56.5	49.1	73.9	53.9	17.4	4.8	Hori.
3	1501.521	64.6	55.0	-8.5	56.1	46.5	73.9	53.9	17.8	7.4	Hori.
4	1534.889	60.1	51.4	-8.6	51.5	42.8	73.9	53.9	22.4	11.1	Hori.
5	1568.258	60.7	52.3	-8.6	52.1	43.7	73.9	53.9	21.8	10.2	Hori.
6	1334.687	62.3	56.0	-8.7	53.6	47.3	73.9	53.9	20.3	6.6	Vert.
7	1468.155	61.2	53.5	-8.7	52.5	44.8	73.9	53.9	21.4	9.1	Vert.
8	1501.522	65.7	56.1	-8.5	57.2	47.6	73.9	53.9	16.7	6.3	Vert.
9	1534.889	60.3	52.4	-8.6	51.7	43.8	73.9	53.9	22.2	10.1	Vert.
10	1668.356	64.3	56.7	-8.5	55.8	48.2	73.9	53.9	18.1	5.7	Vert.

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[Chart]



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Operating mode: Rx 75 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	71.803	38.5	8.5	7.4	30.3	24.1	40.0	15.9	Hori.
2	80.463	41.0	7.4	7.5	30.3	25.6	40.0	14.4	Hori.
3	155.642	47.3	11.1	8.3	30.2	36.5	43.5	7.0	Hori.
4	181.305	53.3	10.3	8.5	30.2	41.9	43.5	1.6	Hori.
5	217.870	48.4	11.9	8.8	30.2	38.9	46.0	7.1	Hori.
6	467.139	44.9	17.0	10.7	30.2	42.4	46.0	3.6	Hori.
7	667.342	44.9	18.7	11.7	30.2	45.1	46.0	0.9	Hori.
8	30.000	36.3	22.7	6.8	30.4	35.4	40.0	4.6	Vert.
9	52.696	38.1	12.4	7.1	30.3	27.3	40.0	12.7	Vert.
10	81.719	41.9	7.5	7.5	30.3	26.6	40.0	13.4	Vert.
11	181.348	46.9	10.3	8.5	30.2	35.5	43.5	8.0	Vert.
12	500.508	45.6	17.3	10.9	30.1	43.7	46.0	2.3	Vert.
13	667.323	43.8	18.7	11.7	30.2	44.0	46.0	2.0	Vert.
14	834.180	38.3	20.0	12.3	29.8	40.8	46.0	5.2	Vert.

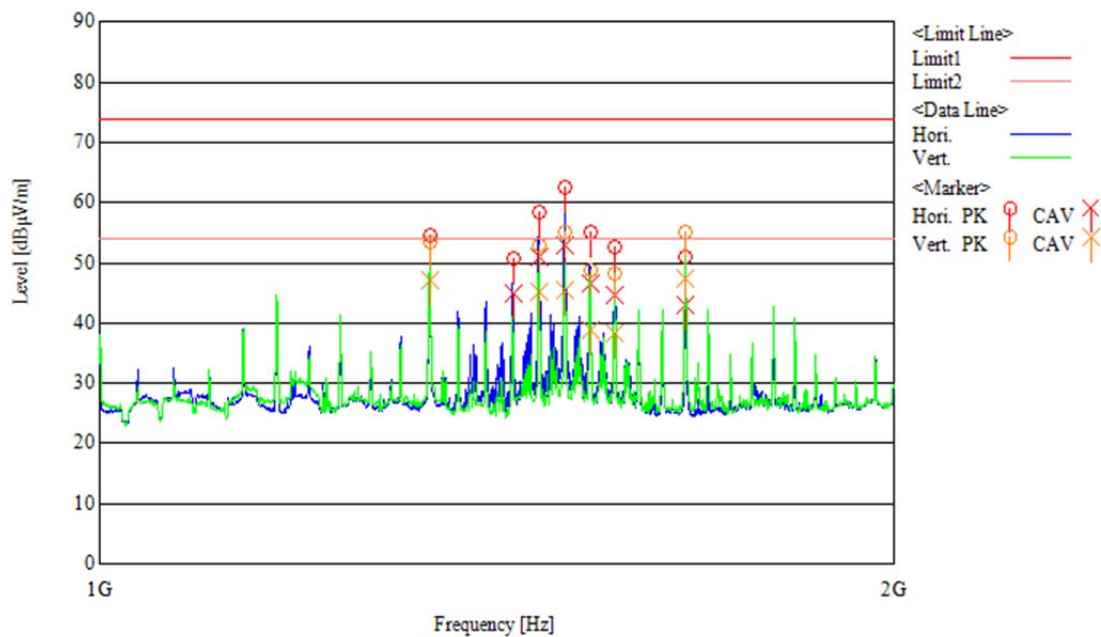
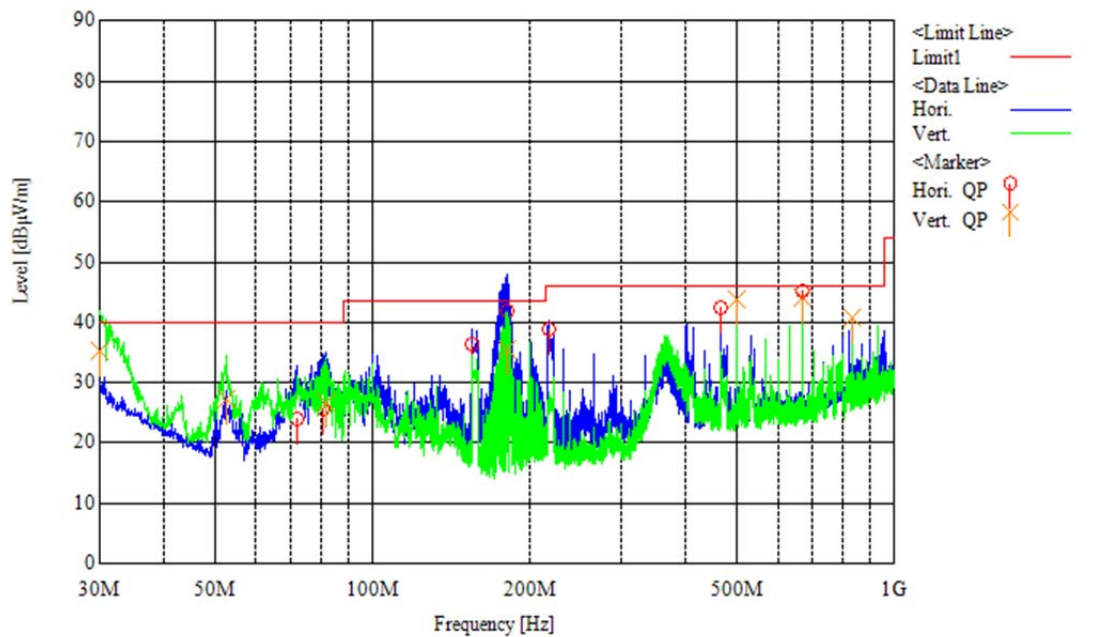
Range: 1000 - 2000 MHz

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	1334.686	63.2	55.7	-8.7	54.5	47.0	73.9	53.9	19.4	6.9	Hori.
2	1434.788	59.8	53.9	-9.0	50.8	44.9	73.9	53.9	23.1	9.0	Hori.
3	1468.158	67.0	59.8	-8.7	58.3	51.1	73.9	53.9	15.6	2.8	Hori.
4	1501.517	71.1	61.5	-8.5	62.6	53.0	73.9	53.9	11.3	0.9	Hori.
5	1534.890	63.6	55.3	-8.6	55.0	46.7	73.9	53.9	18.9	7.2	Hori.
6	1568.256	61.2	53.2	-8.6	52.6	44.6	73.9	53.9	21.3	9.3	Hori.
7	1668.357	59.5	51.5	-8.5	51.0	43.0	73.9	53.9	22.9	10.9	Hori.
8	1334.690	62.3	55.7	-8.7	53.6	47.0	73.9	53.9	20.3	6.9	Vert.
9	1468.156	61.5	53.8	-8.7	52.8	45.1	73.9	53.9	21.1	8.8	Vert.
10	1501.524	63.7	53.9	-8.5	55.2	45.4	73.9	53.9	18.7	8.5	Vert.
11	1534.890	57.5	47.4	-8.6	48.9	38.8	73.9	53.9	25.0	15.1	Vert.
12	1568.256	56.8	47.0	-8.6	48.2	38.4	73.9	53.9	25.7	15.5	Vert.
13	1668.358	63.7	56.0	-8.5	55.2	47.5	73.9	53.9	18.7	6.4	Vert.

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[Chart]

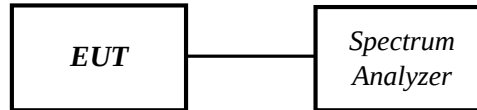


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2.2 Conducted emissions for receiver

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)

TR09	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	800.083	-78.5	- (Note)	- (Note)
28	800.083	-77.7	- (Note)	- (Note)
75	65.987 800.083	-76.6 -77.2	- (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	65.987	-74.5	- (Note)	- (Note)

Note: No emission above noise floor was found.

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[The maximum spurious level at antenna port 3]

Operating freq. [MHz]	Frequency range 30 - 1000 MHz		Frequency range 1000 - 2000 MHz	
	Freq. [MHz]	Level [dBm]	Freq. [MHz]	Level [dBm]
0.03	799.986	-79.2	- (Note)	- (Note)
	867.595	-78.2		
28	799.986	-79.8	- (Note)	- (Note)
	867.595	-79.4		
75	65.987	-74.7	- (Note)	- (Note)
	800.083	-79.7		
	867.595	-77.5		

Note: No emission above noise floor was found.

[Test condition]

Tested Date: 04 Jun. 2019
Humidity: 51 %

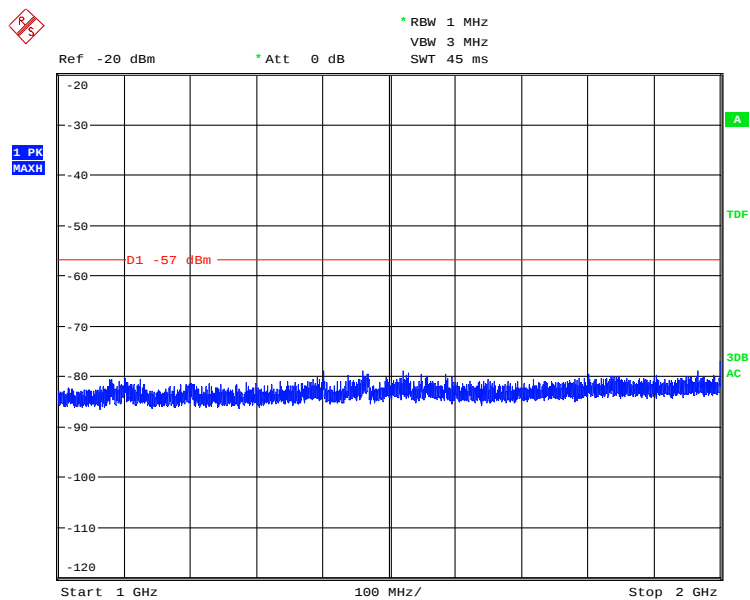
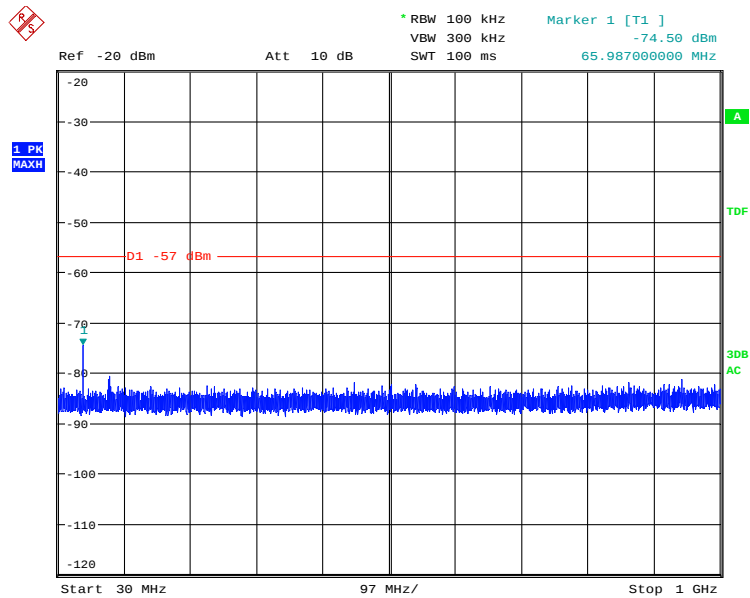
Temperature: 24 degC
Atmos. Press: 1013 hPa

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[Chart]

Operating mode: Rx 75 MHz at Ant port 2 (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 [dBμV]	
	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)

TR09	LN05	CL18	LN06
------	------	------	------

Test software used

EMI1 Ver. 5.9

Calculation method

The Correction Factor and Result are calculated as followings.

Correction Factor [dB] = ISN Factor [dB] + Loss [dB]

Result [dBμV] = Reading [dBμV] + Correction Factor [dB]

Test results - Complied with requirement

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Test Data

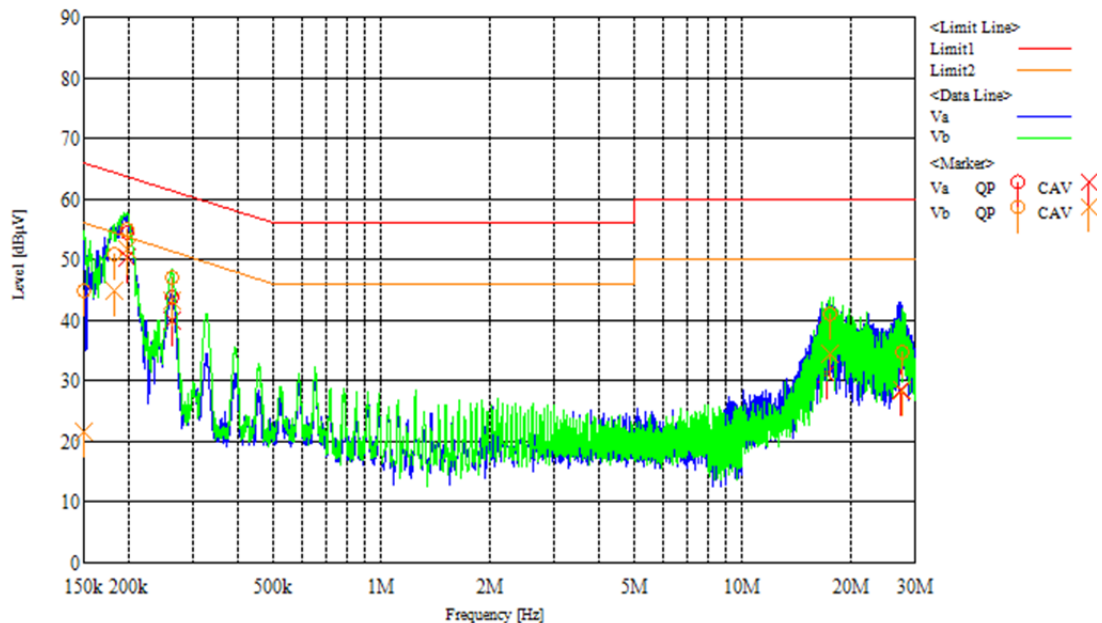
[Emission level]

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	34.5	11.4	10.3	44.8	21.7	66.0	56.0	21.2	34.3	Va
2	0.18133	40.6	34.8	10.2	50.8	45.0	64.4	54.4	13.6	9.4	Va
3	0.19669	44.2	40.3	10.2	54.4	50.5	63.7	53.7	9.3	3.2	Va
4	0.26226	33.7	29.9	10.2	43.9	40.1	61.4	51.4	17.5	11.3	Va
5	17.10955	29.1	20.9	10.3	39.4	31.2	60.0	50.0	20.6	18.8	Va
6	27.40068	24.6	17.9	10.6	35.2	28.5	60.0	50.0	24.8	21.5	Va
7	0.15000	34.5	11.2	10.3	44.8	21.5	66.0	56.0	21.2	34.5	Vb
8	0.18160	40.6	34.6	10.2	50.8	44.8	64.4	54.4	13.6	9.6	Vb
9	0.19667	44.8	41.6	10.2	55.0	51.8	63.8	53.8	8.8	2.0	Vb
10	0.26223	36.9	33.2	10.2	47.1	43.4	61.4	51.4	14.3	8.0	Vb
11	17.43792	30.6	24.1	10.5	41.1	34.6	60.0	50.0	18.9	15.4	Vb
12	27.72683	24.1	17.6	10.8	34.9	28.4	60.0	50.0	25.1	21.6	Vb

[Chart]

Operating mode: Rx 0.03 MHz



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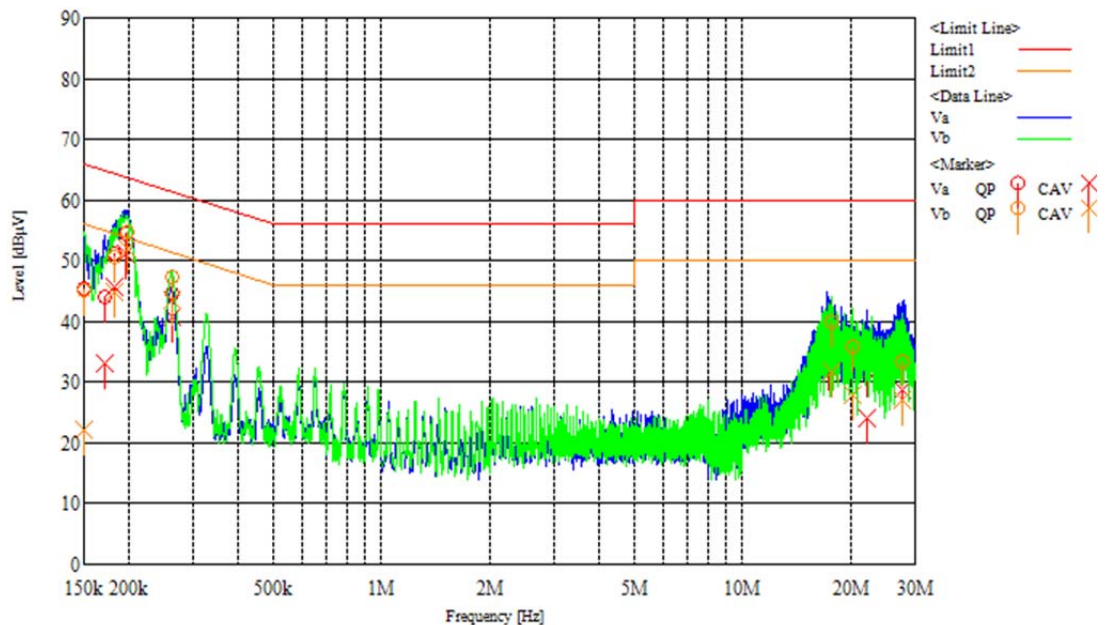
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Operating mode: Rx 28 MHz

	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	35.2	12.0	10.3	45.5	22.3	66.0	56.0	20.5	33.7	Va
2	0.17096	33.7	22.8	10.3	44.0	33.1	64.9	54.9	20.9	21.8	Va
3	0.18215	40.9	35.5	10.2	51.1	45.7	64.4	54.4	13.3	8.7	Va
4	0.19656	44.3	41.0	10.2	54.5	51.2	63.8	53.8	9.3	2.6	Va
5	0.26207	34.5	30.7	10.2	44.7	40.9	61.4	51.4	16.7	10.5	Va
6	17.36368	28.2	22.5	10.4	38.6	32.9	60.0	50.0	21.4	17.1	Va
7	22.01600	21.3	13.4	10.6	31.9	24.0	60.0	50.0	28.1	26.0	Va
8	27.57077	25.0	18.1	10.6	35.6	28.7	60.0	50.0	24.4	21.3	Va
9	0.15000	35.0	11.8	10.3	45.3	22.1	66.0	56.0	20.7	33.9	Vb
10	0.18181	40.4	34.7	10.2	50.6	44.9	64.4	54.4	13.8	9.5	Vb
11	0.19664	44.6	41.7	10.2	54.8	51.9	63.8	53.8	9.0	1.9	Vb
12	0.26216	37.1	33.3	10.2	47.3	43.5	61.4	51.4	14.1	7.9	Vb
13	17.69285	29.5	21.2	10.5	40.0	31.7	60.0	50.0	20.0	18.3	Vb
14	20.11506	25.4	17.2	10.6	36.0	27.8	60.0	50.0	24.0	22.2	Vb
15	27.55377	22.7	16.4	10.8	33.5	27.2	60.0	50.0	26.5	22.8	Vb

[Chart]

Operating mode: Rx 28 MHz



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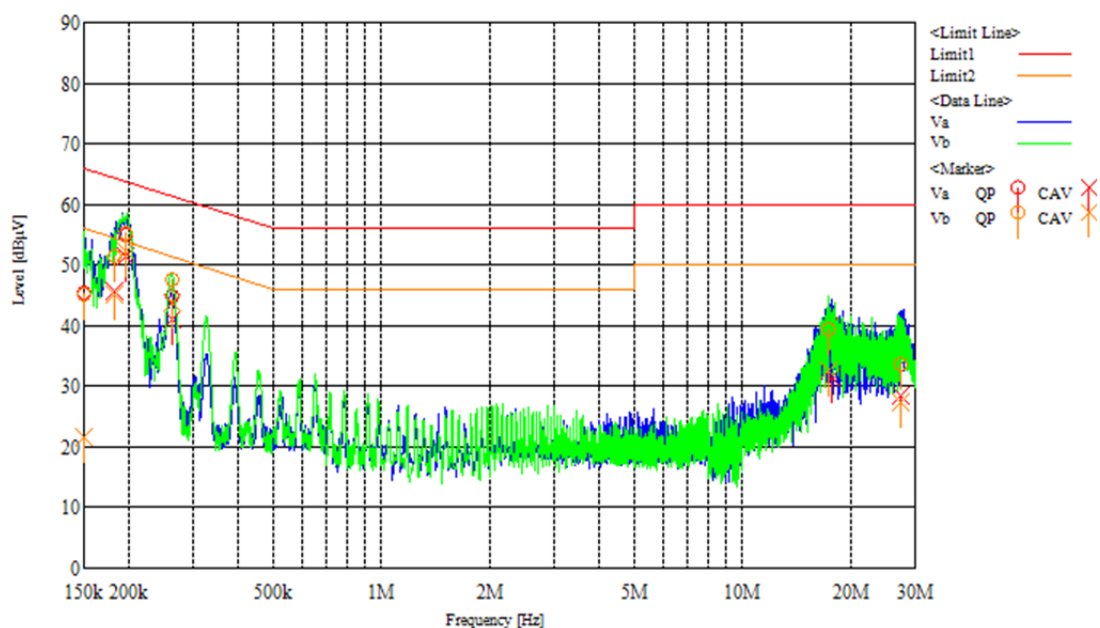
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Operating mode: Rx 75 MHz

	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	35.1	11.4	10.3	45.4	21.7	66.0	56.0	20.6	34.3	Va
2	0.18229	41.4	35.6	10.2	51.6	45.8	64.4	54.4	12.8	8.6	Va
3	0.19651	44.9	41.2	10.2	55.1	51.4	63.8	53.8	8.7	2.4	Va
4	0.26200	34.8	31.0	10.2	45.0	41.2	61.4	51.4	16.4	10.2	Va
5	17.61781	30.2	21.2	10.4	40.6	31.6	60.0	50.0	19.4	18.4	Va
6	27.35867	24.5	18.0	10.6	35.1	28.6	60.0	50.0	24.9	21.4	Va
7	0.15000	34.9	11.2	10.3	45.2	21.5	66.0	56.0	20.8	34.5	Vb
8	0.18276	41.2	35.1	10.2	51.4	45.3	64.4	54.4	13.0	9.1	Vb
9	0.19647	45.2	42.2	10.2	55.4	52.4	63.8	53.8	8.4	1.4	Vb
10	0.26196	37.5	33.7	10.2	47.7	43.9	61.4	51.4	13.7	7.5	Vb
11	17.29035	29.0	22.1	10.4	39.4	32.5	60.0	50.0	20.6	17.5	Vb
12	27.53876	22.9	16.7	10.8	33.7	27.5	60.0	50.0	26.3	22.5	Vb

[Chart]

Operating mode: Rx 75 MHz



[Test condition]

Tested Date: 31 May 2019
Humidity: 52 %

Temperature: 24 degC
Atmos. Press: 1014 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	-	2019/4/20	2020/4/30
AC01(EG)	Anechoic Chamber (1st test room)	JSE	203397C	-	2019/3/30	2020/3/31
BA07	Biological Antenna	TESEQ	CBL6143A	26670	2018/12/7	2019/12/31
CL11	RF Cable for RE	RFT	-	-	2019/3/19	2020/3/31
CL18	RF Cable for CE	RFT	-	-	2019/3/20	2020/3/31
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	2019/5/13	2020/5/31
LN06	LISN	Kyoritsu	KNW-407F	8-1773-3	2019/4/9	2020/4/30
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
TR09	Test Receiver (F/W : 4.43 SP3)	Rohde & Schwarz	ESU8	100386	2018/6/4	2019/6/30

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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