

TEST REPORT

STANDARD : FCC Part15B Class B -Peripherals-

Applicant	Testing Laboratory
JVC KENWOOD Corporation 1-16-2, Hakusan, Midori-ku, Yokohama-shi, Kanagawa, 226-8525 Japan Tel. +81 45 939 6254	Intertek Japan K.K. Kashima Laboratory 298-6 Sada, Kashima, Ibaraki 314-0027 Japan Tel. +81 299 82 8464 URL: http://www.japan.intertek-etlsemko.com

Equipment Type	HF/50MHz TRANSCEIVER
Trademark	KENWOOD
Model(s)	TS-890S
Serial No.	001
Equipment Authorization	Certification (FCC ID : K44512000) (ISED CN and UPN : 282F-512000)
Test Result	Complied
Report Number	18040195JKA-002
Original Issue Date	May 31, 2018

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Approved by

H. Kosemura

Hideaki Kosemura
[Technical. Manager]

Tested by

K. Wagatsuma

Koichi Wagatsuma
[Engineer]



Responsible Party of Test Item (Product)

Responsible Party	:
Add.	:
Tel.	:
Fax.	:
Contact Person	:

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APPENDIX PHOTOGRAPHS OF MAXIMUM EMISSION SET-UP

SECTION 1. GENERAL INFORMATION

Test Performed

EUT Received	May 14, 2018
Date of Test	From May 15, 2018 to May 19, 2018
Standard Applied	FCC Part15B Class B -Peripherals-
Test methods	ANSI C63.4-2014
Deviation from Standard(s)	None

Qualifications of Testing Laboratory

Accreditation	Scope	Lab. Code	Remarks
VLAC	EMC Testing	VLAC-008-1	JAPAN
Filing			
VCCI	EMC Testing	A-0126	JAPAN
FCC	EMC Testing	JP0008	USA
ISED	EMC Testing	2042Q-12	CANADA
CB-Scheme	EMC Testing	TL222	IECEE

Abbreviations

EUT	Equipment Under Test	DoC	Declaration of Conformity
AMN	Artificial Mains Network	ISN	Impedance Stabilization Network
LISN	Line Impedance Stabilization Network	Q-P	Quasi-peak
AMP	Amplifier	AVG	Average
ATT	Attenuator	PK	Peak
ANT	Antenna	Cal	Calibration
BBA	Broadband Antenna	N/A	Not applicable or Not available
DIP	Dipole Antenna	LCD	Liquid-Crystal Display
AE	Associated Equipment	HDMI	High-Definition Multimedia Interface

SECTION 2. SUMMARY OF TEST RESULTS

See Section9 for the detailed result.

Emission Tests

Standard Applied	FCC Part15B Class B -Peripherals-	
Test Item	Minimum margin	Remarks
Conducted disturbance at mains terminals	5.6 dB (24.3006 MHz) [AVG] RX mode(30.0000MHz)	
Radiated disturbance	2.2 dB (688.46 MHz) RX mode(30.0000MHz)	

SECTION 3. EQUIPMENT UNDER TEST

The equipment under test (EUT) consisted of the following apparatus.

3.1 System Configuration

Symbol	Item	Model No.	Serial No.	Manufacturer	Remarks
A	HF/50MHz TRANSCEIVER	TS-890S	001	JVC KENWOOD Corporation	
Rated Power : DC 13.8 V $\pm$ 15%, 3.0Amax					
Supplied Power :DC 13.8V					
Condition of Equipment		Prototype			
Type		Tabletop			
Suppression Devices		No Modifications by the laboratory were made to the device			

3.2 Overview of EUT

Frequency Ranges	0.1 – 60 MHz
Conversion Type	Double conversion

3.3 Intermediate frequency

1st	8.248 MHz
2nd	24 kHz (except FM)
3rd	36 kHz (FM)

3.4 Highest Frequency Generated / Used

Operating Frequency	Operating mode	Remarks
3633 MHz	RX mode	

3.5 Port(s)/Connector(s)

Port Name	Connector Type	Connector Pin	Remarks
MIC	Metal type	8 pin	
PHONES	Φ6.3 Phone Jack	3 pin	
PADDLE	Φ6.3 Phone Jack	3 pin	
USB	USB-A	4 pin	
Ext. AT	Square shape type	6 pin	
ANT1	M	2 pin	
ANT2	M	2 pin	
ANT OUT	RCA	2 pin	
RX IN	RCA	2 pin	
RX OUT	RCA	2 pin	
DRV	RCA	2 pin	
KEY	Φ6.3 Phone Jack	3 pin	
ACC2	DIN	13 pin	
REMOTE	DIN	7 pin	
COM	D-SUB	9 pin	
LAN	RJ-45 Modular	8 pin	
DISPLAY	DVI-I	29 pin	
USB	USB-A	4 pin	
USB	USB-B	4 pin	
SP	Φ3.5 Phone Jack	3 pin	
KEYPAD	Φ3.5 Phone Jack	3 pin	
METER	Φ3.5 Phone Jack	3 pin	
REF IN	BNC	2 pin	
GND	Wing Nut type	1 pin	

SECTION 4. SUPPORT EQUIPMENT

The EUT was supported by the following equipment during the test.

Symbol	Item	Model No.	Serial No.	Manufacturer	Remarks	FCC ID
B	DC Power Supply	PS-60	11/01 00148	JVC KENWOOD		N/A
C	Speaker	SP-23	None	JVC KENWOOD		N/A
D	Keyboard	SK-8115	CN-0J4637-7161 6-4C5-0NL1	DELL		DoC
E	HUB	SF100D-05	J16070C87	CISCO		DoC
F	LCD(DVI)	CR22WS	CR22HVRPC008 84P	SAMSUNG		DoC
G	Microphone	MC-47	0019048155894	JVC KENWOOD		N/A
H	Headphone	HS-6	TS-K023	JVC KENWOOD		N/A
I	Computer	D05D	2X3MYBX	DELL		DoC
J	Keyboard	SK-8120	CN-03C8WD-716 16-295-0EEN-A0	DELL		DoC
K	Mouse	MS-111L	CN-09RRC7-487 23-291-0KWX	DELL		DoC
L	AC Adapter	MU06-61200 50-A1	0432-011X000	CISCO		N/A
M	Terminator	CT-01	EM117	TME		N/A
N	Terminator	CT-01	EM120	TME		N/A
O	Terminator	None	None	JVC KENWOOD		N/A
P	Terminator	None	None	JVC KENWOOD		N/A
Q	Terminator	None	None	JVC KENWOOD		N/A
R	USB Memory	U273	95121270079086	pq1		DoC
S	LCD(VGA)	L1506	CNK6020V8H	HP		DoC
T	Printer	C8154A	TH571320G6	HP		DoC
U	AC Adapter	0957-2142	E10588013501L	HP		N/A
Supplied Power:						
F, I, L, S, U	AC120 V, 60 Hz					

SECTION 5. USED CABLE(S)

The following cable(s) was used for the test.

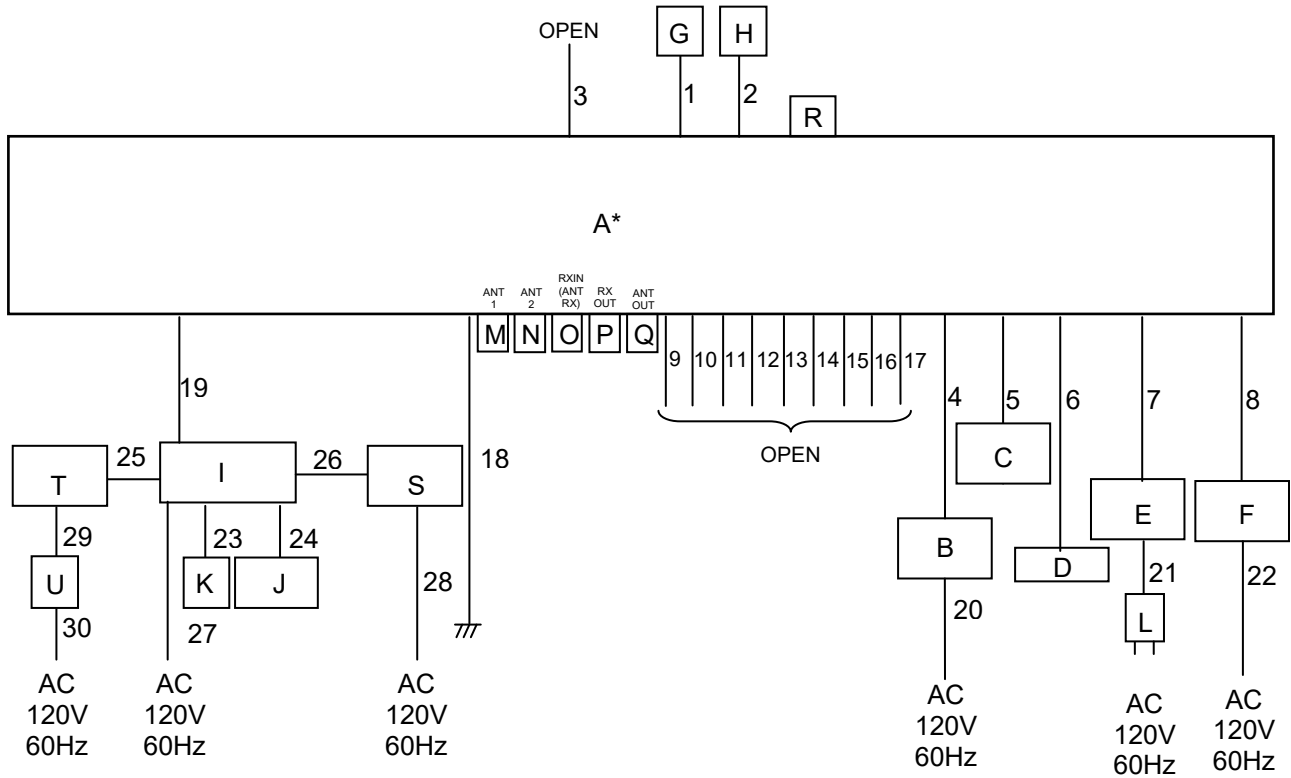
No.	Name	Length (m)	Shield	Metal Connector	Ferrite Core
1	MIC cable	0.45	No	Yes	
2	HEAD PHONE cable	1.50	No	No	
3	PADDLE cable	1.00	No	No	
4	Power cable for EUT (DC)	1.80	No	No	
5	Speaker cable	1.00	No	No	
6	USB Keyboard cable	2.00	Yes	Yes	
7	LAN cable	1.00	No	No	
8	DVI-D cable	1.10	Yes	Yes	
9	REF cable	1.00	Yes	Yes	
10	KEYPAD cable	1.00	No	No	
11	DRV cable	1.00	No	No	
12	ACC cable	1.00	No	No	
13	REMOTE cable	1.00	No	No	
14	METER cable	1.00	No	No	
15	KEY cable	1.00	No	No	
16	COM cable	1.50	Yes	Yes	
17	AT cable	1.00	No	No	
18	GND cable	1.20	No	No	
19	USB cable	1.50	Yes	Yes	
20	Power cable for DC Power Supply (AC)	2.00	No	No	
21	Power cable for Hub (DC)	1.50	No	No	
22	Power cable for LCD(DVI)	2.00	No	No	
23	Mouse cable	1.80	Yes	Yes	
24	Keyboard cable	2.10	Yes	Yes	
25	Centronics cable	2.50	Yes	Yes	
26	VGA cable	1.50	Yes	Yes	
27	Power cable for Computer	1.80	No	No	
28	Power cable for LCD(VGA)	2.00	No	No	
29	Power cable for Printer(DC)	1.70	No	No	
30	Power cable for Printer(AC)	2.20	No	No	

SECTION 6. TEST CONFIGURATION

6.1 Conducted disturbance at mains terminals Tests and Radiated disturbance tests

* : EUT

■: Ferrite core



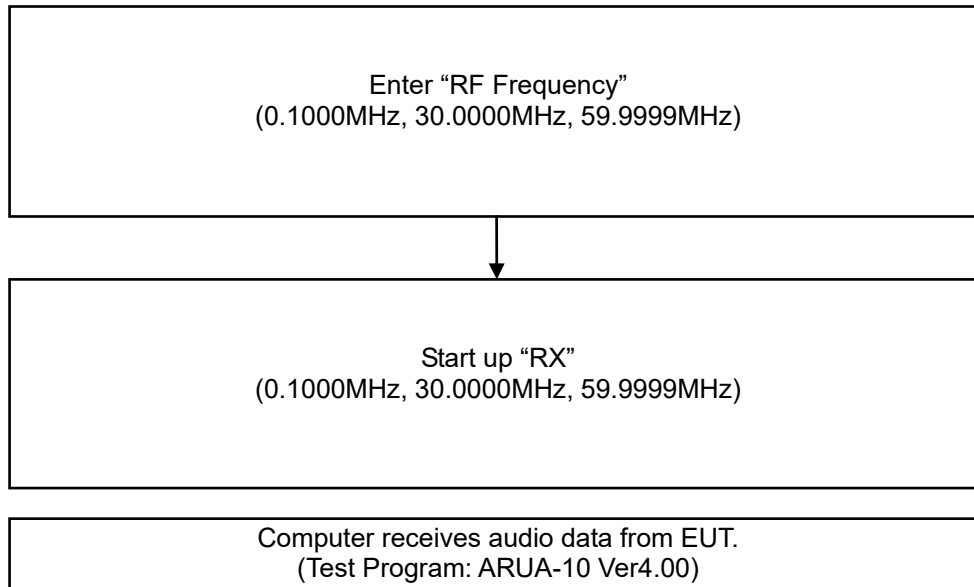
The symbols and numbers assigned to the equipments and cables on this diagram correspond to the ones in Sections 3 to 5.

SECTION 7. OPERATING CONDITION

The test was carried out under the following mode.

7.1 RX mode

Cycle time for operation: Continuity



SECTION 8. UNCERTAINTY

Traceability to national standard in SI units is ensured with these values.
Compliance with the limits in this standard are determined without in consideration of the measurement uncertainty of the measurement instrumentation.

8.1 Emission tests

Radiated disturbance at 3 m	U _{lab} [k = 2]	U _{cispr}
30 MHz – 1000 MHz	+/- 4.83 dB	6.3 dB
Above 1 GHz	+/- 4.33 dB	5.2 dB
Radiated disturbance at 10 m		
30 MHz – 1000 MHz	+/- 5.00 dB	6.3 dB
Above 1 GHz	+/- 4.95 dB	Nil
Conducted disturbance at mains terminals		
9 kHz – 150 kHz	+/- 2.82 dB	3.8 dB
150 kHz – 30 MHz	+/- 2.80 dB	3.4 dB
Conducted disturbance at terminals (High Voltage Probe)		
150 kHz – 30 MHz	+/- 2.80 dB	2.9 dB
Conducted disturbance at telecommunication ports (ISN)		
150 kHz – 30 MHz	+/- 3.85 dB	5.0 dB
Conducted disturbance at telecommunication ports (Capacitive Voltage Probe)		
150 kHz – 30 MHz	+/- 3.77 dB	3.9 dB
Conducted disturbance at telecommunication ports (Current Probe)		
150 kHz – 30 MHz	+/- 2.37 dB	2.9 dB
Disturbance power		
30 MHz – 300 MHz	+/- 3.34 dB	4.5 dB
Conducted power on antenna port		
30 MHz – 1000 MHz	+/- 3.01 dB	Nil
Above 1 GHz	+/- 2.06 dB	
38dB Rejection		
0.1 MHz – 600 MHz	+/- 0.56 dB	Nil

The above expanded instrumentation uncertainty, $U_{lab.}$, is estimated in accordance with CISPR 16-4-2:2011.

SECTION 9. EVALUATION OF TEST RESULTS

9.1 Emission tests

9.1.1 Conducted disturbance at mains terminals

Location	Kashima No.12 Test Site
Test Engineer	Koichi Wagatsuma

Frequency Range of Measurements

Required Measurement Frequency Range	Measured Frequency Range
0.15 – 30 MHz	0.15 – 30 MHz

Test Procedure

Item	Document number
Conducted disturbance at mains terminals	LEN-RJP-EM001

Setting for the Measuring instruments

Instrument	Detector	Resolution Bandwidth	Video Bandwidth
Receiver	Quasi Peak	10 kHz	N/A
	Average	10 kHz	N/A

< Measurement data correction >

Emission Level = Meter Reading + Factor

Margin = Limit- Emission Level

Factor = LISN Factor + Cable Loss + Attenuator

< Sample Calculations >

Sample @0.1500 MHz (RX mode(0.1000MHz))

Emission Level = 17.7 [dBuV] + 10.2 [dB] = 27.9 [dBuV]

Result of Conducted disturbance at mains terminals

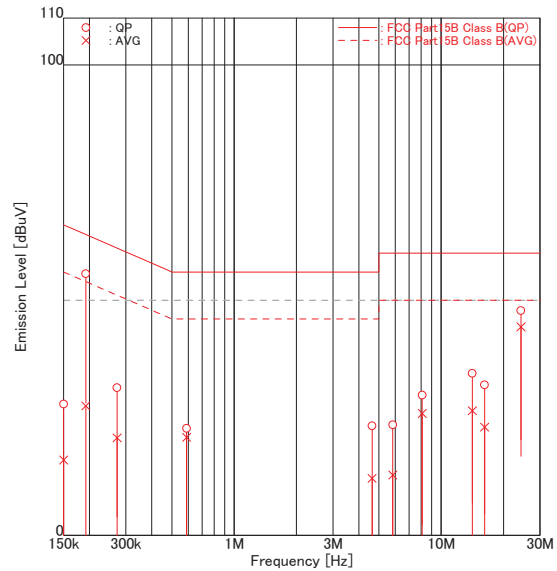
9.1.1.1 RX mode (0.1000MHz)

Intertek Japan K.K.

Kashima No.12 Test Site

Conducted Voltages on Mains Port

APPLICANT : JVC KENWOOD Corporation
EUT NAME : HF/50MHz TRANSCEIVER
MODEL NO. : TS-890S
SERIAL NO. : 001
TEST MODE : RX mode(0.1000MHz)
POWER SOURCE : DC 13.8V (AC 120V 60Hz)
DATE TESTED : May 16 2018
FILE NO. : -
REGULATION : FCC Part15B Class B
TEST METHOD : ANSI C63.4-2014
TEMPERATURE : 23.2 [degC]
HUMIDITY : 49.0 [%]
NOTE : -



ENGINEER : Koichi Wagatsuma

FREQUENCY [No]	MODE [MHz]		READING [dBuV]		FACTOR [dB]		EMISSION [dBuV]		LIMIT [dBuV]	MARGIN [dB]	
			Line1	Line2	Line1	Line2	Line1	Line2		Line1	Line2
1	0.1500	QP	17.7	17.0	10.2	10.2	27.9	27.2	66.0	38.1	38.8
2	0.1500	AVG	4.4	5.8	10.2	10.2	14.6	16.0	56.0	41.4	40.0
3	0.1918	QP	<u>45.4</u>	45.2	10.2	10.2	<u>55.6</u>	55.4	64.0	<u>8.4</u>	8.6
4	0.1918	AVG	17.3	16.0	10.2	10.2	27.5	26.2	54.0	26.5	27.8
5	0.2720	QP	21.2	21.2	10.2	10.2	31.4	31.4	61.1	29.7	29.7
6	0.2720	AVG	10.3	10.5	10.2	10.2	20.5	20.7	51.1	30.6	30.4
7	0.5896	QP	9.7	12.4	10.3	10.3	20.0	22.7	56.0	36.0	33.3
8	0.5896	AVG	2.9	<u>10.5</u>	10.3	10.3	13.2	<u>20.8</u>	46.0	32.8	<u>25.2</u>
9	4.6408	QP	8.2	12.7	10.6	10.6	18.8	23.3	56.0	37.2	32.7
10	4.6408	AVG	0.5	1.5	10.6	10.6	11.1	12.1	46.0	34.9	33.9
11	5.8342	QP	12.8	7.5	10.7	10.7	23.5	18.2	60.0	36.5	41.8
12	5.8342	AVG	2.1	0.5	10.7	10.7	12.8	11.2	50.0	37.2	38.8
13	8.1012	QP	18.9	18.6	10.9	10.9	29.8	29.5	60.0	30.2	30.5
14	8.1012	AVG	<u>15.0</u>	15.0	10.9	10.9	<u>25.9</u>	25.9	50.0	<u>24.1</u>	24.1
15	14.1407	QP	23.1	22.5	11.3	11.5	34.4	34.0	60.0	25.6	26.0
16	14.1407	AVG	7.4	<u>15.0</u>	11.3	11.5	18.7	<u>26.5</u>	50.0	31.3	<u>23.5</u>
17	16.2070	QP	20.6	20.4	11.3	11.6	31.9	32.0	60.0	28.1	28.0
18	16.2070	AVG	11.4	11.4	11.3	11.6	22.7	23.0	50.0	27.3	27.0
19	24.3006	QP	35.9	<u>36.0</u>	11.7	11.8	47.6	<u>47.8</u>	60.0	12.4	<u>12.2</u>
20	24.3006	AVG	32.3	<u>32.5</u>	11.7	11.8	44.0	<u>44.3</u>	50.0	6.0	<u>5.7</u>

Higher six points are underlined.
Other frequencies : Below the FCC Part15B Class B limit
Emission Level = Read + Factor(LISN,Pad,Cable)

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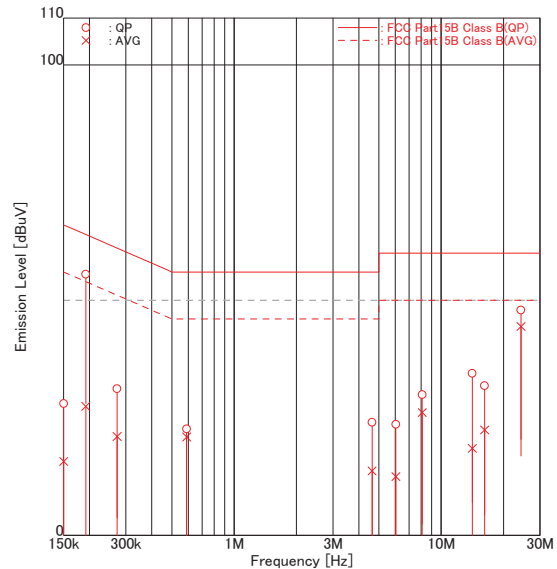
9.1.1.2 RX mode (30.0000MHz)

Intertek Japan K.K.

Kashima No.12 Test Site

Conducted Voltages on Mains Port

APPLICANT : JVC KENWOOD Corporation
EUT NAME : HF/50MHz TRANSCEIVER
MODEL NO. : TS-890S
SERIAL NO. : 001
TEST MODE : RX mode(30.0000MHz)
POWER SOURCE : DC 13.8V (AC 120V 60Hz)
DATE TESTED : May 16 2018
FILE NO. : -
REGULATION : FCC Part15B Class B
TEST METHOD : ANSI C63.4-2014
TEMPERATURE : 23.2 [degC]
HUMIDITY : 49.0 [%]
NOTE : -



ENGINEER : Koichi Wagatsuma

FREQUENCY [No]	MODE [MHz]		READING [dBuV]		FACTOR [dB]		EMISSION [dBuV]		LIMIT [dBuV]	MARGIN [dB]	
			Line1	Line2	Line1	Line2	Line1	Line2		Line1	Line2
1	0.1500	QP	17.8	17.4	10.2	10.2	28.0	27.6	66.0	38.0	38.4
2	0.1500	AVG	4.2	5.5	10.2	10.2	14.4	15.7	56.0	41.6	40.3
3	0.1918	QP	<u>45.3</u>	45.2	10.2	10.2	<u>55.5</u>	55.4	64.0	<u>8.5</u>	8.6
4	0.1918	AVG	17.2	17.1	10.2	10.2	27.4	27.3	54.0	26.6	26.7
5	0.2720	QP	20.8	21.0	10.2	10.2	31.0	31.2	61.1	30.1	29.9
6	0.2720	AVG	10.5	10.8	10.2	10.2	20.7	21.0	51.1	30.4	30.1
7	0.5896	QP	9.5	12.3	10.3	10.3	19.8	22.6	56.0	36.2	33.4
8	0.5896	AVG	2.8	<u>10.6</u>	10.3	10.3	13.1	<u>20.9</u>	46.0	32.9	<u>25.1</u>
9	4.6408	QP	8.3	13.4	10.6	10.6	18.9	24.0	56.0	37.1	32.0
10	4.6408	AVG	0.5	3.1	10.6	10.6	11.1	13.7	46.0	34.9	32.3
11	6.0424	QP	12.9	7.9	10.7	10.7	23.6	18.6	60.0	36.4	41.4
12	6.0424	AVG	1.8	0.5	10.7	10.7	12.5	11.2	50.0	37.5	38.8
13	8.1012	QP	19.0	18.5	10.9	10.9	29.9	29.4	60.0	30.1	30.6
14	8.1012	AVG	<u>15.2</u>	15.0	10.9	10.9	<u>26.1</u>	25.9	50.0	<u>23.9</u>	24.1
15	14.1407	QP	<u>23.1</u>	22.6	11.3	11.5	<u>34.4</u>	34.1	60.0	<u>25.6</u>	25.9
16	14.1407	AVG	7.2	7.0	11.3	11.5	18.5	18.5	50.0	31.5	31.5
17	16.2070	QP	20.5	20.0	11.3	11.6	31.8	31.6	60.0	28.2	28.4
18	16.2070	AVG	11.1	10.5	11.3	11.6	22.4	22.1	50.0	27.6	27.9
19	24.3006	QP	35.9	<u>36.1</u>	11.7	11.8	47.6	<u>47.9</u>	60.0	12.4	<u>12.1</u>
20	24.3006	AVG	32.3	<u>32.6</u>	11.7	11.8	44.0	<u>44.4</u>	50.0	6.0	<u>5.6</u>

Higher six points are underlined.
Other frequencies : Below the FCC Part15B Class B limit
Emission Level = Read + Factor(LISN,Pad,Cable)

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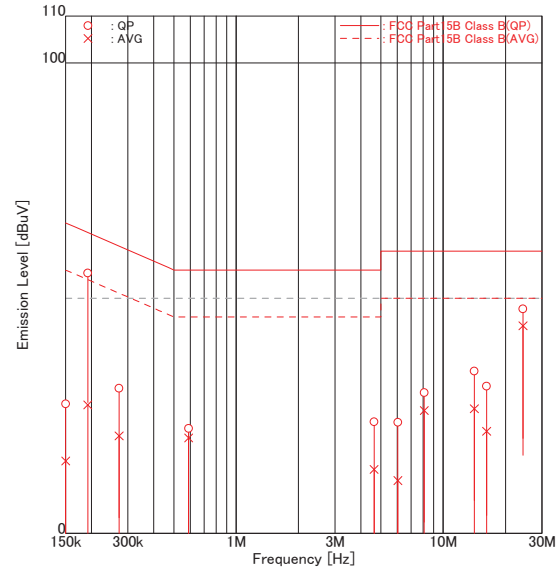
9.1.1.3 RX mode (59.9999MHz)

Intertek Japan K.K.

Kashima No.12 Test Site

Conducted Voltages on Mains Port

APPLICANT : JVC KENWOOD Corporation
EUT NAME : HF/50MHz TRANSCEIVER
MODEL NO. : TS-890S
SERIAL NO. : 001
TEST MODE : RX mode(59.9999MHz)
POWER SOURCE : DC 13.8V (AC 120V 60Hz)
DATE TESTED : May 16 2018
FILE NO. : -
REGULATION : FCC Part15B Class B
TEST METHOD : ANSI C63.4-2014
TEMPERATURE : 23.2 [degC]
HUMIDITY : 49.0 [%]
NOTE : -



ENGINEER : Koichi Wagatsuma

FREQUENCY [No]	MODE [MHz]		READING [dBuV]		FACTOR [dB]		EMISSION [dBuV]		LIMIT [dBuV]	MARGIN [dB]	
			Line1	Line2	Line1	Line2	Line1	Line2		Line1	Line2
1	0.1500	QP	17.3	16.8	10.2	10.2	27.5	27.0	66.0	38.5	39.0
2	0.1500	AVG	4.2	5.2	10.2	10.2	14.4	15.4	56.0	41.6	40.6
3	0.1918	QP	<u>45.1</u>	44.4	10.2	10.2	<u>55.3</u>	54.6	64.0	<u>8.7</u>	9.4
4	0.1918	AVG	17.1	16.5	10.2	10.2	27.3	26.7	54.0	26.7	27.3
5	0.2720	QP	20.5	20.6	10.2	10.2	30.7	30.8	61.1	30.4	30.3
6	0.2720	AVG	10.5	10.5	10.2	10.2	20.7	20.7	51.1	30.4	30.4
7	0.5896	QP	9.6	12.0	10.3	10.3	19.9	22.3	56.0	36.1	33.7
8	0.5896	AVG	1.7	10.0	10.3	10.3	12.0	20.3	46.0	34.0	25.7
9	4.6408	QP	8.5	13.1	10.6	10.6	19.1	23.7	56.0	36.9	32.3
10	4.6408	AVG	0.5	3.0	10.6	10.6	11.1	13.6	46.0	34.9	32.4
11	6.0424	QP	12.9	8.7	10.7	10.7	23.6	19.4	60.0	36.4	40.6
12	6.0424	AVG	0.4	0.5	10.7	10.7	11.1	11.2	50.0	38.9	38.8
13	8.1012	QP	19.0	18.3	10.9	10.9	29.9	29.2	60.0	30.1	30.8
14	8.1012	AVG	<u>15.2</u>	14.7	10.9	10.9	<u>26.1</u>	25.6	50.0	<u>23.9</u>	24.4
15	14.1407	QP	<u>23.2</u>	22.6	11.3	11.5	<u>34.5</u>	34.1	60.0	<u>25.5</u>	25.9
16	14.1407	AVG	<u>15.2</u>	14.7	11.3	11.5	<u>26.5</u>	26.2	50.0	<u>23.5</u>	23.8
17	16.2070	QP	20.0	19.7	11.3	11.6	31.3	31.3	60.0	28.7	28.7
18	16.2070	AVG	10.4	10.0	11.3	11.6	21.7	21.6	50.0	28.3	28.4
19	24.3006	QP	<u>36.0</u>	35.7	11.7	11.8	<u>47.7</u>	47.5	60.0	<u>12.3</u>	12.5
20	24.3006	AVG	<u>32.4</u>	32.2	11.7	11.8	<u>44.1</u>	44.0	50.0	<u>5.9</u>	6.0

Higher six points are underlined.
Other frequencies : Below the FCC Part15B Class B limit
Emission Level = Read + Factor(LISN,Pad,Cable)

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9.1.2 Radiated disturbance

Location	Kashima No.12 Test Site
Test Engineer	Koichi Wagatsuma

Frequency Range of Measurements

Operating mode	Required Frequency Range	Measured Frequency Range
RX mode(0.1000MHz) RX mode(30.0000MHz) RX mode(59.9999MHz)	30 – 19000 MHz	30 – 19000 MHz

Test Procedure

Item	Document number
Radiated disturbance	LEN-RJP-EM003

Setting for the Measuring instruments

Frequency [MHz]	Instrument	Detector	Resolution Bandwidth	Video Bandwidth
30 – 1000	Receiver	Quasi Peak	120 kHz	N/A
Above 1000	Spectrum Analyzer	Peak	1 MHz	1 MHz
		Average	1 MHz	10 Hz

< Measurement data correction >

Emission Level = Meter Reading + Factor

Margin = Limit - Emission Level

Factor = Antenna Factor + Cable Loss - Amplifier Gain + Attenuator (+ Distance Conversion Factor)*

* For other than Standard distance:

Distance Conversion Factor = $20 \log (\text{Measurement distance} / \text{Standard distance})$

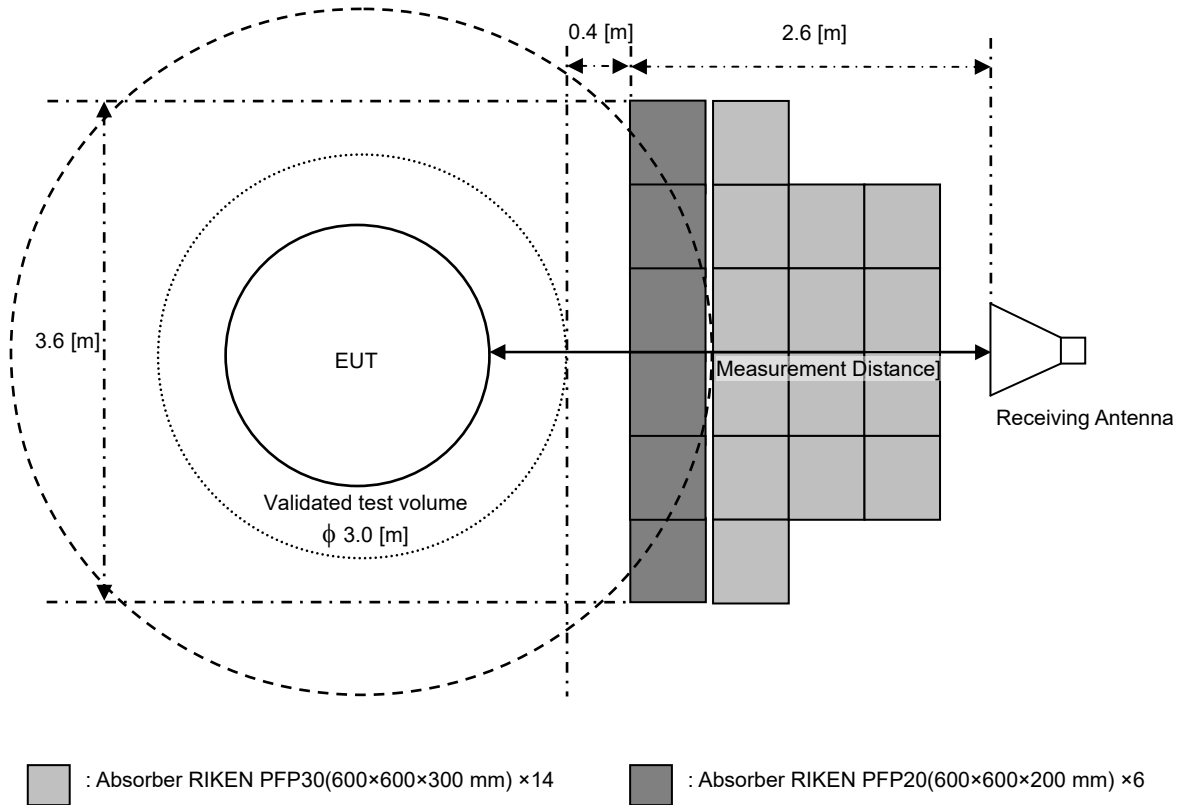
< Sample Calculations >

Sample @39.29 MHz (RX mode(0.1000MHz))

Emission Level = 35.6 [dBuV] – 1.0 [dB/m] = 34.6 [dBuV/m]

Operating Condition	Frequency Range	Measurement distance
RX mode(0.1000MHz) RX mode(30.0000MHz) RX mode(59.9999MHz)	30-1000 MHz	3 m
	Above 1 GHz	3.10 m

Absorber placement and Receive Antenna location in Radiated disturbance above 1 GHz

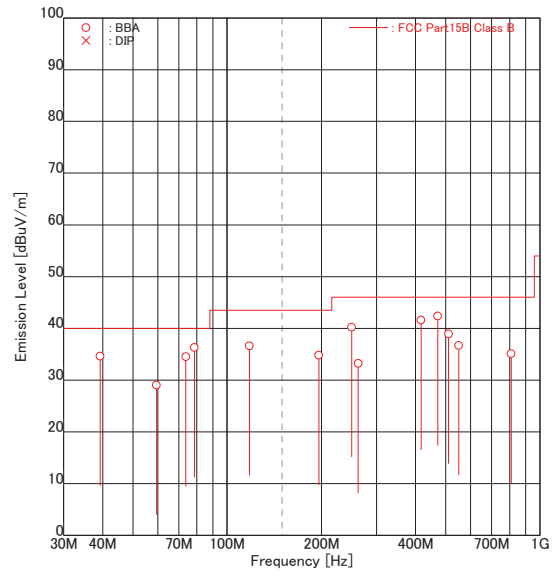


Result of Radiated disturbances

9.1.2.1 RX mode(0.1000MHz) 30 – 1000 MHz

Intertek Japan K.K. Kashima No.12 Test Site Radiated Electric Field

APPLICANT : JVC KENWOOD Corporation
EUT NAME : HF/50MHz TRANSCEIVER
MODEL NO. : TS-890S
SERIAL NO. : 001
TEST MODE : RX mode(0.1000MHz)
POWER SOURCE : DC 13.8V (AC 120V 60Hz)
DATE TESTED : May 15 2018
FILE NO. : -
REGULATION : FCC Part15B Class B
TEST METHOD : ANSI C63.4-2014
DISTANCE : 3.00 [m]
TEMPERATURE : 21.0 [degC]
HUMIDITY : 50.0 [%]
NOTE :



ENGINEER : Koichi Wagatsuma

FREQUENCY [No]	FREQ [MHz]	ANT.	READING [dBuV]		FACTOR [dB/m]		EMISSION [dBuV/m]		LIMIT [dBuV/m]	MARGIN [dB]	
			Hori	Vert	Hori	Vert	Hori	Vert		Hori	Vert
1	39.29	BBA	-	<u>35.6</u>	-1.0	-1.0	-	<u>34.6</u>	40.0	-	<u>5.4</u>
2	59.44	BBA	-	29.4	-0.4	-0.4	-	29.0	40.0	-	11.0
3	73.72	BBA	<u>37.0</u>	-	-2.5	-2.5	<u>34.5</u>	-	40.0	<u>5.5</u>	-
4	78.65	BBA	39.8	<u>40.0</u>	-3.7	-3.7	36.1	<u>36.3</u>	40.0	3.9	<u>3.7</u>
5	117.83	BBA	38.9	35.7	-2.3	-2.3	36.6	33.4	43.5	6.9	10.1
6	196.37	BBA	36.4	34.2	-1.6	-1.6	34.8	32.6	43.5	8.7	10.9
7	250.01	BBA	<u>39.6</u>	37.3	0.6	0.6	<u>40.2</u>	37.9	46.0	<u>5.8</u>	8.1
8	262.40	BBA	32.0	-	1.2	1.2	33.2	-	46.0	12.8	-
9	416.74	BBA	-	<u>34.9</u>	6.7	6.7	-	<u>41.6</u>	46.0	-	<u>4.4</u>
10	471.28	BBA	<u>34.1</u>	-	8.3	8.3	<u>42.4</u>	-	46.0	<u>3.6</u>	-
11	510.55	BBA	29.6	-	9.3	9.3	38.9	-	46.0	7.1	-
12	549.82	BBA	26.3	26.1	10.4	10.4	36.7	36.5	46.0	9.3	9.5
13	809.76	BBA	-	19.2	15.9	15.9	-	35.1	46.0	-	10.9

Higher six points are underlined.
Other frequencies : Below the FCC Part15B Class B limit
Emission Level = Read + Factor(Antenna,Antenna Pad,Cable,Preamp)
ANT. : Used antenna(BBA = Broadband antenna, DIP = Dipole antenna)

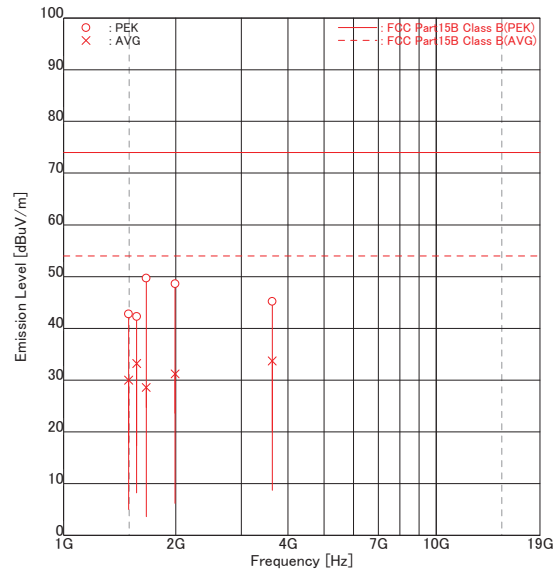
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1000 – 19000 MHz

Intertek Japan K.K. Kashima No.12 Test Site Radiated Electric Field

APPLICANT : JVC KENWOOD Corporation
EUT NAME : HF/50MHz TRANSCEIVER
MODEL NO. : TS-890S
SERIAL NO. : 001
TEST MODE : RX mode(0.1000MHz)
POWER SOURCE : DC 13.8V (AC 120V 60Hz)
DATE TESTED : May 19 2018
FILE NO. : -
REGULATION : FCC Part15B Class B
TEST METHOD : ANSI C63.4-2014
DISTANCE : 3.10 [m]
TEMPERATURE : 23.0 [degC]
HUMIDITY : 56.0 [%]
NOTE :



ENGINEER : Koichi Wagatsuma

FREQUENCY [No]	MODE [MHz]		READING [dBuV]		FACTOR [dB/m]		EMISSION [dBuV/m]		LIMIT [dBuV/m]	MARGIN [dB]	
			Hori	Vert	Hori	Vert	Hori	Vert		Hori	Vert
1	1495.05	PEK	-	45.8	-3.0	-3.0	-	42.8	74.0	-	31.2
2	1495.05	AVG	-	<u>33.0</u>	-3.0	-3.0	-	<u>30.0</u>	54.0	-	<u>24.0</u>
3	1570.80	PEK	44.8	44.9	-2.6	-2.6	42.2	42.3	74.0	31.8	31.7
4	1570.80	AVG	<u>35.8</u>	34.9	-2.6	-2.6	<u>33.2</u>	32.3	54.0	<u>20.8</u>	21.7
5	1666.51	PEK	-	<u>51.9</u>	-2.2	-2.2	-	<u>49.7</u>	74.0	-	<u>24.3</u>
6	1666.51	AVG	-	<u>30.8</u>	-2.2	-2.2	-	<u>28.6</u>	54.0	-	<u>25.4</u>
7	1991.72	PEK	46.0	<u>49.5</u>	-0.9	-0.9	45.1	<u>48.6</u>	74.0	28.9	<u>25.4</u>
8	1991.72	AVG	31.9	<u>32.1</u>	-0.9	-0.9	31.0	<u>31.2</u>	54.0	23.0	<u>22.8</u>
9	3633.00	PEK	41.0	40.7	4.2	4.2	45.2	44.9	74.0	28.8	29.1
10	3633.00	AVG	29.2	<u>29.5</u>	4.2	4.2	33.4	<u>33.7</u>	54.0	20.6	<u>20.3</u>

Higher six points are underlined.
Other frequencies : Below the FCC Part15B Class B limit
Emission Level = Read + Factor
Factor = Ant.Factor + Cable Loss - Amp. Gain + ATT - Dist. Conversion

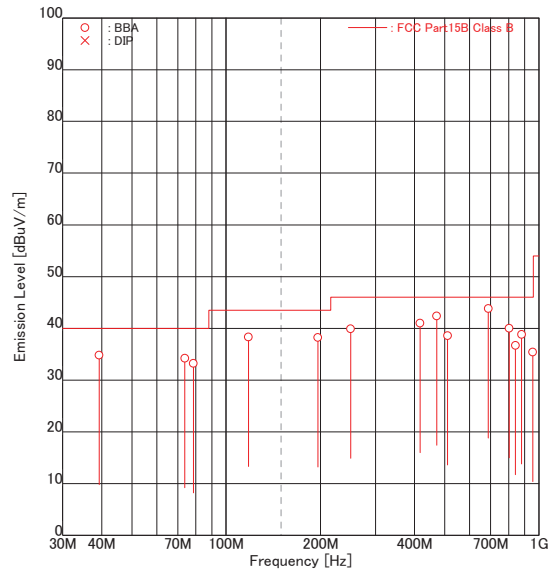
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9.1.2.2 RX mode(30.0000MHz) 30 – 1000 MHz

Intertek Japan K.K. Kashima No.12 Test Site Radiated Electric Field

APPLICANT : JVC KENWOOD Corporation
EUT NAME : HF/50MHz TRANSCEIVER
MODEL NO. : TS-890S
SERIAL NO. : 001
TEST MODE : RX mode(30.0000MHz)
POWER SOURCE : DC 13.8V (AC 120V 60Hz)
DATE TESTED : May 15 2018
FILE NO. : -
REGULATION : FCC Part15B Class B
TEST METHOD : ANSI C63.4-2014
DISTANCE : 3.00 [m]
TEMPERATURE : 21.0 [degC]
HUMIDITY : 50.0 [%]
NOTE :



ENGINEER : Koichi Wagatsuma

FREQUENCY [No]	[MHz]	ANT.	READING [dBuV]		FACTOR [dB/m]		EMISSION [dBuV/m]		LIMIT [dBuV/m]	MARGIN [dB]	
			Hori	Vert	Hori	Vert	Hori	Vert		Hori	Vert
1	39.29	BBA	-	<u>35.8</u>	-1.0	-1.0	-	<u>34.8</u>	40.0	-	<u>5.2</u>
2	73.72	BBA	36.7	-	-2.5	-2.5	34.2	-	40.0	5.8	-
3	78.65	BBA	36.9	36.3	-3.7	-3.7	33.2	32.6	40.0	6.8	7.4
4	117.83	BBA	<u>40.6</u>	39.2	-2.3	-2.3	<u>38.3</u>	36.9	43.5	<u>5.2</u>	6.6
5	196.37	BBA	<u>39.8</u>	35.0	-1.6	-1.6	<u>38.2</u>	33.4	43.5	<u>5.3</u>	10.1
6	250.01	BBA	39.3	37.0	0.6	0.6	39.9	37.6	46.0	6.1	8.4
7	416.74	BBA	-	<u>34.3</u>	6.7	6.7	-	<u>41.0</u>	46.0	-	<u>5.0</u>
8	471.28	BBA	<u>34.1</u>	-	8.3	8.3	<u>42.4</u>	-	46.0	<u>3.6</u>	-
9	510.55	BBA	29.3	-	9.3	9.3	38.6	-	46.0	7.4	-
10	688.46	BBA	26.9	<u>30.5</u>	13.3	13.3	40.2	<u>43.8</u>	46.0	5.8	<u>2.2</u>
11	803.21	BBA	-	24.1	15.9	15.9	-	40.0	46.0	-	6.0
12	841.46	BBA	-	20.3	16.4	16.4	-	36.7	46.0	-	9.3
13	879.70	BBA	-	21.8	17.0	17.0	-	38.8	46.0	-	7.2
14	956.20	BBA	-	17.3	18.1	18.1	-	35.4	46.0	-	10.6

Higher six points are underlined.
Other frequencies : Below the FCC Part15B Class B limit
Emission Level = Read + Factor(Antenna,Antenna Pad,Cable,Preamp)
ANT. : Used antenna(BBA = Broadband antenna, DIP = Dipole antenna)

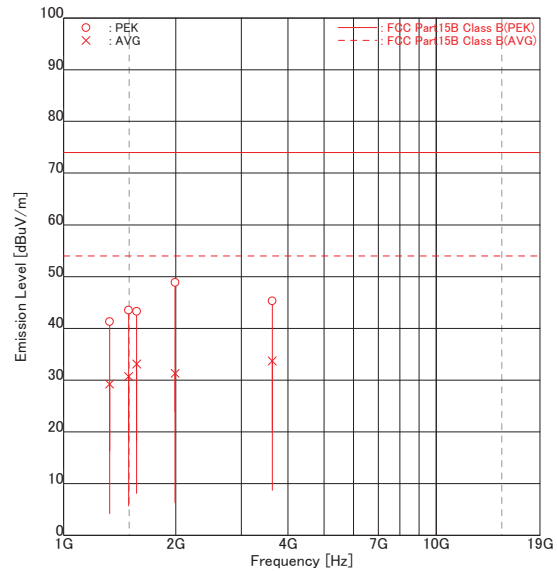
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1000 – 19000 MHz

Intertek Japan K.K. Kashima No.12 Test Site Radiated Electric Field

APPLICANT : JVC KENWOOD Corporation
EUT NAME : HF/50MHz TRANSCEIVER
MODEL NO. : TS-890S
SERIAL NO. : 001
TEST MODE : RX mode(30.0000MHz)
POWER SOURCE : DC 13.8V (AC 120V 60Hz)
DATE TESTED : May 19 2018
FILE NO. : -
REGULATION : FCC Part15B Class B
TEST METHOD : ANSI C63.4-2014
DISTANCE : 3.10 [m]
TEMPERATURE : 23.0 [degC]
HUMIDITY : 56.0 [%]
NOTE :



ENGINEER : Koichi Wagatsuma

FREQUENCY [No]	MODE [MHz]		READING [dBuV]		FACTOR [dB/m]		EMISSION [dBuV/m]		LIMIT [dBuV/m]	MARGIN [dB]	
			Hori	Vert	Hori	Vert	Hori	Vert		Hori	Vert
1	1328.48	PEK	-	44.9	-3.6	-3.6	-	41.3	74.0	-	32.7
2	1328.48	AVG	-	<u>32.8</u>	-3.6	-3.6	-	<u>29.2</u>	54.0	-	<u>24.8</u>
3	1495.05	PEK	-	46.5	-3.0	-3.0	-	43.5	74.0	-	30.5
4	1495.05	AVG	-	<u>33.7</u>	-3.0	-3.0	-	<u>30.7</u>	54.0	-	<u>23.3</u>
5	1570.80	PEK	45.9	45.2	-2.6	-2.6	43.3	42.6	74.0	30.7	31.4
6	1570.80	AVG	<u>35.7</u>	35.0	-2.6	-2.6	<u>33.1</u>	32.4	54.0	<u>20.9</u>	21.6
7	1991.72	PEK	45.6	49.8	-0.9	-0.9	44.7	48.9	74.0	29.3	25.1
8	1991.72	AVG	<u>32.2</u>	32.2	-0.9	-0.9	<u>31.3</u>	31.3	54.0	<u>22.7</u>	22.7
9	3633.00	PEK	41.1	40.9	4.2	4.2	45.3	45.1	74.0	28.7	28.9
10	3633.00	AVG	<u>29.5</u>	29.1	4.2	4.2	<u>33.7</u>	33.3	54.0	<u>20.3</u>	20.7

Higher six points are underlined.
Other frequencies : Below the FCC Part15B Class B limit
Emission Level = Read + Factor
Factor = Ant.Factor + Cable Loss - Amp. Gain + ATT - Dist. Conversion

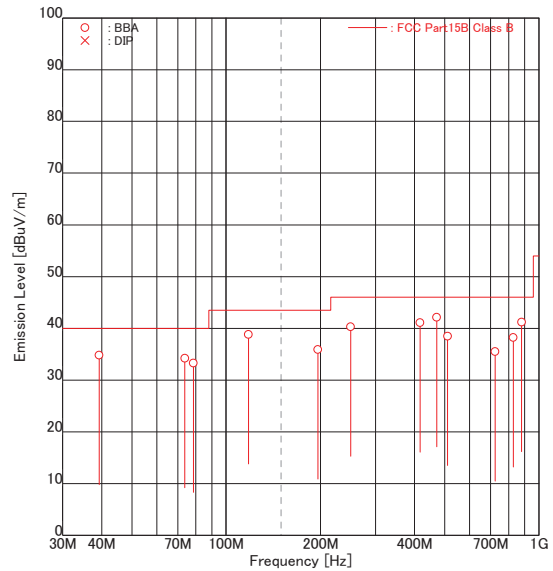
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9.1.2.3 RX mode(59.9999MHz) 30 – 1000 MHz

Intertek Japan K.K. Kashima No.12 Test Site Radiated Electric Field

APPLICANT : JVC KENWOOD Corporation
EUT NAME : HF/50MHz TRANSCEIVER
MODEL NO. : TS-890S
SERIAL NO. : 001
TEST MODE : RX mode(59.9999MHz)
POWER SOURCE : DC 13.8V (AC 120V 60Hz)
DATE TESTED : May 15 2018
FILE NO. : -
REGULATION : FCC Part15B Class B
TEST METHOD : ANSI C63.4-2014
DISTANCE : 3.00 [m]
TEMPERATURE : 21.0 [degC]
HUMIDITY : 50.0 [%]
NOTE :



ENGINEER : Koichi Wagatsuma

FREQUENCY [No]	[MHz]	ANT.	READING [dBuV]		FACTOR [dB/m]		EMISSION [dBuV/m]		LIMIT [dBuV/m]	MARGIN [dB]	
			Hori	Vert	Hori	Vert	Hori	Vert		Hori	Vert
1	39.29	BBA	-	<u>35.8</u>	-1.0	-1.0	-	<u>34.8</u>	40.0	-	<u>5.2</u>
2	73.72	BBA	36.7	-	-2.5	-2.5	34.2	-	40.0	5.8	-
3	78.65	BBA	37.0	36.3	-3.7	-3.7	33.3	32.6	40.0	6.7	7.4
4	117.83	BBA	<u>41.1</u>	40.5	-2.3	-2.3	<u>38.8</u>	38.2	43.5	<u>4.7</u>	5.3
5	196.37	BBA	37.5	33.0	-1.6	-1.6	35.9	31.4	43.5	7.6	12.1
6	250.01	BBA	<u>39.7</u>	37.1	0.6	0.6	<u>40.3</u>	37.7	46.0	<u>5.7</u>	8.3
7	416.74	BBA	-	<u>34.4</u>	6.7	6.7	-	<u>41.1</u>	46.0	-	<u>4.9</u>
8	471.28	BBA	<u>33.8</u>	-	8.3	8.3	<u>42.1</u>	-	46.0	<u>3.9</u>	-
9	510.55	BBA	29.2	-	9.3	9.3	38.5	-	46.0	7.5	-
10	724.53	BBA	-	21.5	14.0	14.0	-	35.5	46.0	-	10.5
11	828.04	BBA	-	21.9	16.3	16.3	-	38.2	46.0	-	7.8
12	879.79	BBA	24.0	<u>24.2</u>	17.0	17.0	41.0	<u>41.2</u>	46.0	5.0	<u>4.8</u>

Higher six points are underlined.
Other frequencies : Below the FCC Part15B Class B limit
Emission Level = Read + Factor(Antenna,Antenna Pad,Cable,Preamp)
ANT. : Used antenna(BBA = Broadband antenna, DIP = Dipole antenna)

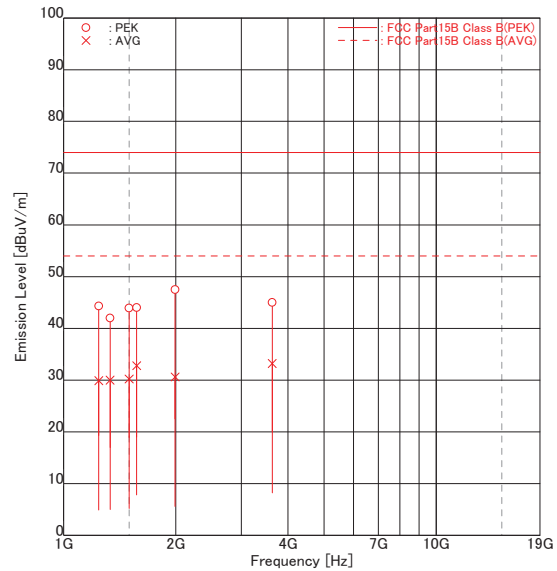
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1000 – 19000 MHz

Intertek Japan K.K. Kashima No.12 Test Site Radiated Electric Field

APPLICANT : JVC KENWOOD Corporation
EUT NAME : HF/50MHz TRANSCEIVER
MODEL NO. : TS-890S
SERIAL NO. : 001
TEST MODE : RX mode(59.9999MHz)
POWER SOURCE : DC 13.8V (AC 120V 60Hz)
DATE TESTED : May 19 2018
FILE NO. : -
REGULATION : FCC Part15B Class B
TEST METHOD : ANSI C63.4-2014
DISTANCE : 3.10 [m]
TEMPERATURE : 23.0 [degC]
HUMIDITY : 56.0 [%]
NOTE :



ENGINEER : Koichi Wagatsuma

FREQUENCY [No]	MODE [MHz]		READING [dBuV]		FACTOR [dB/m]		EMISSION [dBuV/m]		LIMIT [dBuV/m]	MARGIN [dB]	
			Hori	Vert	Hori	Vert	Hori	Vert		Hori	Vert
1	1242.05	PEK	-	48.3	-4.0	-4.0	-	44.3	74.0	-	29.7
2	1242.05	AVG	-	<u>33.9</u>	-4.0	-4.0	-	<u>29.9</u>	54.0	-	<u>24.1</u>
3	1333.04	PEK	-	45.6	-3.6	-3.6	-	42.0	74.0	-	32.0
4	1333.04	AVG	-	<u>33.6</u>	-3.6	-3.6	-	<u>30.0</u>	54.0	-	<u>24.0</u>
5	1499.06	PEK	-	46.9	-3.0	-3.0	-	43.9	74.0	-	30.1
6	1499.06	AVG	-	<u>33.2</u>	-3.0	-3.0	-	<u>30.2</u>	54.0	-	<u>23.8</u>
7	1570.80	PEK	46.6	44.2	-2.6	-2.6	44.0	41.6	74.0	30.0	32.4
8	1570.80	AVG	<u>35.4</u>	34.4	-2.6	-2.6	<u>32.8</u>	31.8	54.0	<u>21.2</u>	22.2
9	1991.72	PEK	45.5	48.4	-0.9	-0.9	44.6	47.5	74.0	29.4	26.5
10	1991.72	AVG	31.2	<u>31.5</u>	-0.9	-0.9	30.3	<u>30.6</u>	54.0	23.7	<u>23.4</u>
11	3633.00	PEK	40.5	40.8	4.2	4.2	44.7	45.0	74.0	29.3	29.0
12	3633.00	AVG	28.9	<u>29.0</u>	4.2	4.2	33.1	<u>33.2</u>	54.0	20.9	<u>20.8</u>

Higher six points are underlined.
Other frequencies : Below the FCC Part15B Class B limit
Emission Level = Read + Factor
Factor = Ant.Factor + Cable Loss - Amp. Gain + ATT - Dist. Conversion

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SECTION 10. LIST OF MEASURING INSTRUMENTS

Test instruments are calibrated according to Quality Manual and Calibration Rules of Intertek Japan K.K.

All measurements equipment used for the measurement is calibrated based on standard.

Each measurement result is traceable to national or international standards.

Antenna used for the measurement is calibrated based on the ANSI C63.5.

Instrument	Model No.	Serial No.	Manufacturer	Cal. Interval	Effective period
Conducted disturbance at mains terminals					
LISN(EUT)	ESH2-Z5	860903/012	Rohde & Schwarz	1Y	Dec. 31, 2018
LISN(Peripheral)	KNW-242	8-851-21	KYORITSU	1Y	Jan. 31, 2019
10dB LISN Pad	CFA-01	KSR00246	TME	1Y	Dec. 31, 2018
10dB LISN Pad	CFA-01	KSR00255	TME	1Y	Jan. 31, 2019
50 ohm Termination	CT-01	A120CON50	TME	1Y	Feb. 28, 2019
Coaxial cable	RG-5A/U (14.0 m)	R2	Intertek	1Y	Nov. 30, 2018
Coaxial cable	10D-2W (7.0m)	R4	Intertek	1Y	Nov. 30, 2018
Coaxial cable	RG-5A/U (4.0 m)	R6	Intertek	1Y	Nov. 30, 2018
Coaxial cable	RG-5A/U(0.6 m)	R7	Intertek	1Y	Nov. 30, 2018
Coaxial cable	5D-2W (1.2 m)	R10	Intertek	1Y	Nov. 30, 2018
MXE EMI Receiver	N9038A	MY51210201	Agilent	1Y	Nov. 30, 2018
RF Switch	ACX-150	A12301501	Intertek	1Y	Nov. 30, 2018
Radiated disturbance					
Broad Band antenna	VULB9168WP	288	Schwarzbeck	1Y	May. 31, 2018
6dB Attenuator	UFA-01	A00040805	TME	1Y	Nov. 30, 2018
Amplifier	ZX60-3018G	002	Intertek	1Y	Nov. 30, 2018
Coaxial Cable	5D-2W(14.0m)	R11	FUJIKURA	1Y	Nov. 30, 2018
Coaxial cable	5D-2W(8.0 m)	R1	FUJIKURA	1Y	Nov. 30, 2018
Coaxial cable	10D-2W(7.0 m)	R3	FUJIKURA	1Y	Nov. 30, 2018
Coaxial cable	RG-5A/U(4.0 m)	R5	FUJIKURA	1Y	Nov. 30, 2018
Coaxial cable	RG-5A/U(0.6 m)	R7	FUJIKURA	1Y	Nov. 30, 2018
Coaxial cable	5D-2W(1.2 m)	R10	FUJIKURA	1Y	Nov. 30, 2018
RF Switch	ACX-150	A12301501	Intertek	1Y	Nov. 30, 2018
Double ridged antenna	3115	5045	EMCO	1Y	Apr. 30, 2019
Horn Antenna with Preamplifier	MLA-18265-B03-30	1694440	TSJ	1Y	Mar. 31, 2019
3 dB Attenuator	6803.17.B	KSR00089	SUHNER	1Y	May. 31, 2019
Amplifier (1-18 GHz)	TPA0118-30	0402	TOYO	1Y	May. 31, 2019
Coaxial cable(G1)	SUCOFLEX 104	229603/4(R14)	SUHNER	1Y	May. 31, 2019
Coaxial cable(G2)	5B-048-98-98-5000	111130(R15)	Candox	1Y	May. 31, 2019
Coaxial Cable (G3)	5B-048-98-98-6000	120315	Candox	1Y	May. 31, 2019
MXE EMI Receiver	N9038A	MY51210201	Agilent	1Y	Nov. 30, 2018
Spectrum Analyzer	N9030ARev.A,08,54)	US51350220	Agilent	1Y	Mar. 31, 2019
Site Attenuation	-	-	-	1Y	Mar. 31, 2019
SVSWR	-	-	-	1Y	Feb. 28, 2019

Common					
Testing Software	emiT (Version 3,0,0,0)				

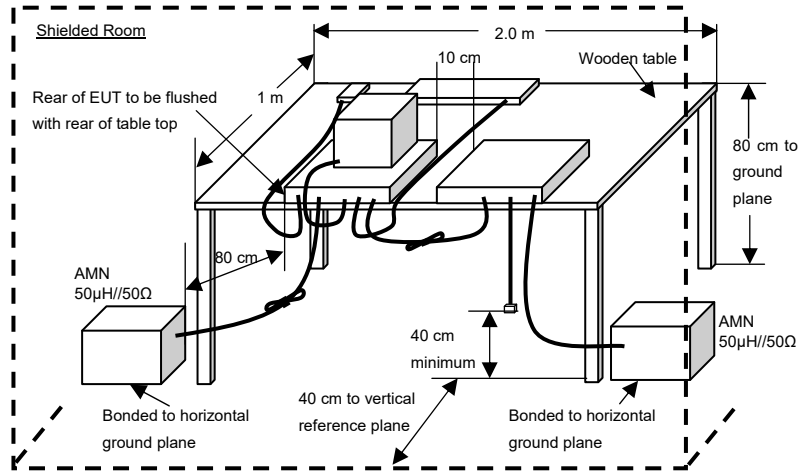
ANNEX

A. TEST PROCEDURE(S)

Test was carried out under the following conditions.

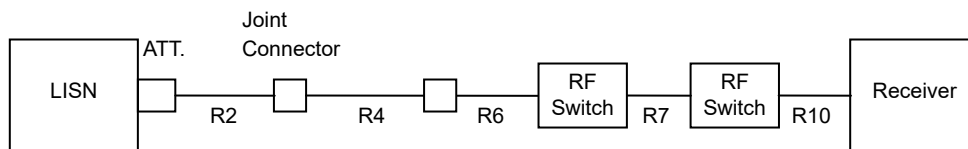
Conducted disturbance at mains terminals

Test setup as per standard



* Reference Ground plane : greater than 2 x 2m

Diagram of the measuring instruments



[Preliminary Measurement]

EUT is tested on all operating conditions.

The spectrum analyzer is controlled by the computer program to sweep the frequency range to be measured, then spectrum chart is plotted out to find the worst emission conditions in operating mode and/or configuration decision for the final test.

All leads other than safety ground are tested.

[Final Measurement]

The EUT is operated in the worst emission condition found by the preliminary test.

The equipment and cables are arranged or manipulated within the range of the test standard in the above condition.

At least six highest spectrum are measured in quasi-peak and average (if necessary) using the test receiver.

Radiated disturbance

Test setup as per standard

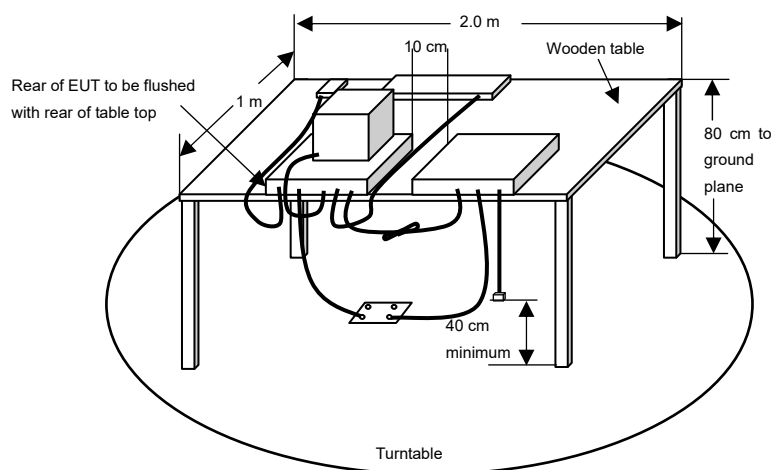
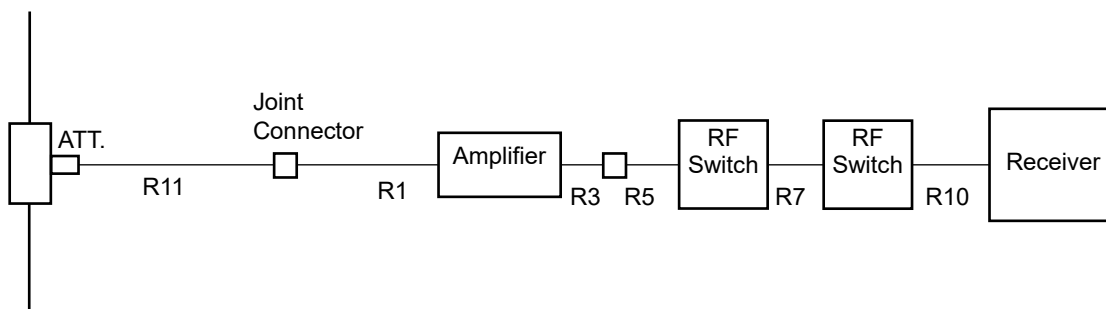
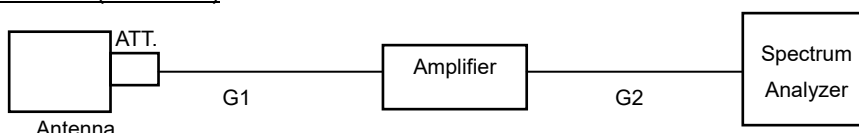


Diagram of the measuring instruments (30-1000MHz)



Above 1GHz(1-18GHz)



Above 1GHz(18-26.5GHz)



[Preliminary Measurement]

EUT is tested on all operating conditions.

The spectrum analyzer is set max-hold mode and swept during turntable was rotated 0 to 360 degree, And find the worst emission conditions in configuration, operating mode, or ambient noise notation.

[Final Measurement]

The EUT operated in the worst emission condition found by the preliminary test.

The turntable azimuth (EUT direction) and antenna height are adjusted the position so that maximum field strength is obtained for each frequency spectrum to be measured.

The equipment and cables are arranged or manipulated within the range of the test standard in the above condition. At least six highest spectrums are measured by the test receiver (quasi-peak) and spectrum analyzer (peak and average). When the uncertain result was obtained (30 – 1000 MHz), the measurement is retried by using the half wave dipole antenna instead of the broadband antenna.