

TEST REPORT

STANDARD : FCC Part15B Class B -Peripherals-

Applicant	Testing Laboratory
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Equipment Type	HF/50MHz TRANSCEIVER
Trademark	KENWOOD
Model(s)	TS-990S
Serial No.	82A90005
Equipment Authorization	Certification
FCC ID	K44412000
Test Result	Complied
Report Number	JK12120001
Report Issue Date	December 21, 2012

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Approved by *K. Gokita*
 Kazuo Gokita
 [Manager]

Tested by *K. Wagatsuma*
 Koichi Wagatsuma



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SECTION 1. GENERAL INFORMATION

Test Performed

EUT Received	December 3, 2012
Date of Test	From December 4, 2012 to December 6, 2012
Standard Applied	FCC Part15B Class B -Peripherals-
Test methods	ANSI C63.4-2003
Deviation from Standard(s)	None

Qualifications of Testing Laboratory

Accreditation	Scope	Lab. Code	Remarks
VLAC	EMC Testing	VLAC-008-3	JAPAN
BSMI	EMC Testing	SL2-IN-E-6009	TAIWAN
Filing			
VCCI	EMC Testing	A-0127	JAPAN
FCC	EMC Testing	Designation Number : JP0009	USA
IC	EMC Testing	2042S-1, 2042S-2, 2042S-3, 2042S-4	Canada
CB-Scheme	EMC Testing	TL223	IECEE
SAUDI ARABIA	EMC Testing	N/A	

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.

Standard Applied	FCC Part15B Class B -Peripherals-	
Test Item	Minimum margin	Remarks
Conducted disturbance at mains terminals	12.6 dB (0.1858 MHz) [Q-P] RX mode(59.99MHz)	
Radiated disturbance	1.9 dB (70.70 MHz) RX mode(59.99MHz)	

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
A	HF/50MHz TRANSCEIVER	TS-990S	82A90005	JVC KENWOOD
Rated Power : AC120 V, 60 Hz, $\pm 10\%$, 1.0 A max.				
Supplied Power : AC120 V, 60 Hz				
Condition of Equipment	Prototype			
Type	Tabletop			
Suppression Devices	No Modifications by the laboratory were made to the device			

3.2 Port(s)/Connector(s)

Frequency Ranges	0.030 – 60.000 MHz
Receiver Type	Double or Triple conversion
Model of Operation	J3E, A1A, F1B, G1B, A3E, F3E

3.3 Port(s)/Connector(s)

1st	8.248 MHz, 11.374 MHz or 73.095 MHz
2nd	24 kHz, 455 kHz or 10.695 MHz
3rd	24 kHz or 455 kHz

3.4 Port(s)/Connector(s)

Port Name	Connector Type	Connector Pin	Remarks
PHONES	φ6.3 Phone Jack	3pin	
PADDLE	φ6.3 Phone Jack	3pin	
USB	USB-A	4pin	2 ports
MIC	Metal type	8pin	
ANT1	M	2pin	
ANT2	M	2pin	
ANT3	M	2pin	
ANT4	M	2pin	
REF I/O	BNC	2pin	
AT	Square shape	6pin	
KEYPAD	φ3.5 Phone Jack	3pin	
COM	D-SUB	9pin	
AC IN	AC INTLET	3pin	
GND	Wing Nut type	1pin	
EXT SP1	φ3.5 Phone Jack	2pin	
EXT SP2	φ3.5 Phone Jack	2pin	
LAN	RJ-45 Modular Jack	8pin	
DISPLAY	DVI-I	29pin	
USB	USB-B	4pin	
OPTICAL OUT	EIAJ Optical	1pin	
OPTICAL IN	EIAJ Optical	1pin	
DRV	RCA	2pin	
METER	φ3.5 Phone Jack	3pin	
REMOTE	DIN	7pin	
ACC 2	DIN	13pin	
KEY	φ6.3 Phone Jack	3pin	
RX IN	RCA	2pin	
RX OUT	RCA	2pin	

3.5 Highest Frequency Generated / Used

Operating Frequency	Board Name	Remarks
598 MHz	DIGITAL UNIT	

SECTION 4. SUPPORT EQUIPMENT

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

Symbol	Item	Model No.	Serial No.	Manufacturer	FCC ID
B	Head Phones	HS-6	None	JVC KENWOOD	N/A
C	USB Keyboard	SK-8115	CN-0J4637-71616-568-0NWW	DELL	DoC
D	Microphone	MC-47	None	JVC KENWOOD	N/A
E	50Ω Terminator	11593A	1250-0256	HP	N/A
F	50Ω Terminator	3204-BNCM	None	AEROFLEX	N/A
G	50Ω Terminator	3204-BNCM	None	AEROFLEX	N/A
H	50Ω Terminator	3204-BNCM	None	AEROFLEX	N/A
I	50Ω Terminator	None	None	None	N/A
J	50Ω Terminator	None	None	JVC KENWOOD	N/A
K	50Ω Terminator	None	None	JVC KENWOOD	N/A
L	50Ω Terminator	None	None	JVC KENWOOD	N/A
M	Speaker	SP-990	None	JVC KENWOOD	N/A
N	Speaker	SP-50B	None	JVC KENWOOD	N/A
O	Hub	SF100D-05	PSJ16070C36	CISCO	DoC
P	AC Adapter	MU06-6120050-A1	None	CISCO	N/A
Q	LCD (DVI)	750B	CL17HMEY908025	SAMSUNG	DoC
R	Computer	DHP	85TBQ1X	DELL	DoC
S	LCD (VGA)	HSTND-2B07	CNK6341VSH	HP	DoC
T	Printer	BJS630	None	CANON	DoC
U	Keyboard	RT7D00	TH-054EXM-37171-12C-1216	DELL	AQ6-7D0080COB
V	Mouse	X05-90006	63618-0EM-5564852-0	DELL	DoC
Supplied Power:					
O	DC12 V, 0.5 A				
P, Q, R, S, T	AC120 V, 60 Hz				

SECTION 5. USED CABLE(S)

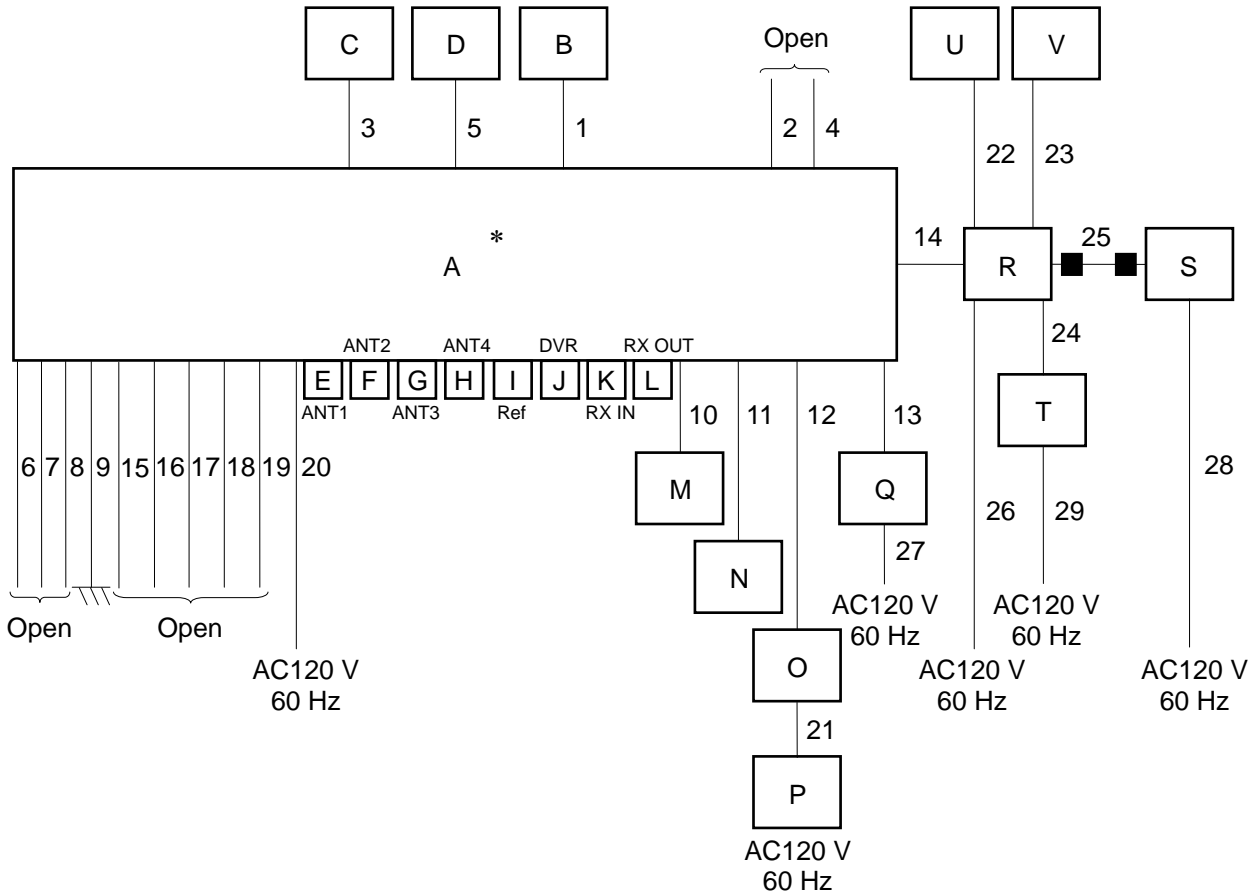
The following cable(s) was used for the test.

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

Note : Cable No.25 is supplied together with LCD(VGA) (S).

SECTION 6. TEST CONFIGURATION

* : EUT
 ■ : Ferrite core



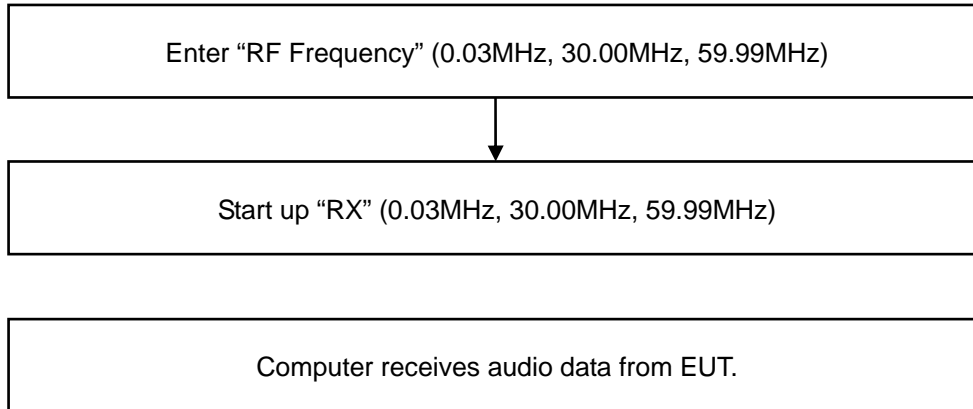
The symbols and numbers assigned to the equipments and cables on this diagram correspond to the ones in Sections 3 to 5.

SECTION 7. OPERATING CONDITION

The test was carried out under the following mode.

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.

Radiated disturbance at 3m	$U_{lab} [k = 2]$	U_{cispr}
30 MHz – 1000 MHz	+/- 4.03 dB	5.19 dB
CISPR22	+/- 3.84 dB	
Above 1 GHz ANSI 63.4	+/- 4.40 dB	
Radiated disturbance at 10m		
30 MHz – 1000 MHz	+/- 4.44 dB	5.06 dB
Above 1 GHz	+/- 4.49 dB	
Radiated disturbance at 30m		
	N/A	5.02 dB
Conducted disturbance at mains terminals		
9 kHz – 150 kHz	+/- 1.63 dB	3.97 dB
150 kHz – 30 MHz		3.60 dB
Conducted disturbance at telecommunication ports (ISN)		
150 kHz – 30 MHz	+/- 1.91 dB	Nil
Conducted disturbance at telecommunication ports (Capacitive Voltage Probe)		
150 kHz – 30 MHz	+/- 1.70 dB	Nil
Conducted disturbance at telecommunication ports (Current Probe)		
150 kHz – 30 MHz	+/- 1.80 dB	Nil
Conducted disturbance at terminals		
150 kHz – 30 MHz	+/- 1.69 dB	Nil
Disturbance power		
30 MHz – 300 MHz	+/- 2.75 dB	4.45 dB

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

SECTION 9. EVALUATION OF TEST RESULTS

Location	Matsuda No.4 Test Site
Test Engineer	Koichi Wagatsuma

Frequency Range of Measurements

	Required Measurement Frequency Range	Measured Frequency Range
Conducted	0.15 – 30 MHz	0.15 – 30 MHz
Radiated	30 – 5000 MHz	30 – 5000 MHz

Test Procedure

Item	Document number
Conducted disturbance at mains terminals	RJP-EM001
Radiated disturbance	RJP-EM003

Setting for the Measuring instruments

Frequency [MHz]	Instrument	Detector	Resolution Bandwidth	Video Bandwidth
0.15 – 30	Receiver	Quasi Peak	10 kHz	N/A
		Average	10 kHz	N/A
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 >

* Conducted disturbance at mains terminals

Emission Level [dB μ V] = Meter Reading [dB μ V] + Factor [dB]

Margin [dB] = Limit [dB μ V] - Emission Level [dB μ V]

* Factor = LISN Factor + Cable Loss + ATT

* Radiated disturbance

Emission Level [dB μ V/m] = Meter Reading [dB μ V] + Factor [dB/m]

Margin [dB] = Limit [dB μ V/m] - Emission Level [dB μ V/m]

* Factor = Antenna Factor + Cable Loss - Amplifier Gain + ATT

(– Distance Conversion Factor)

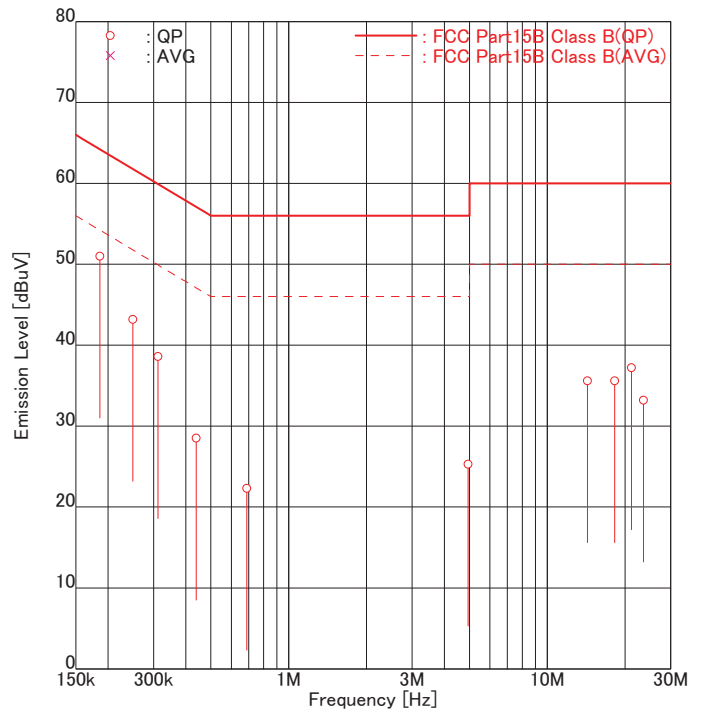
9.1 Conducted disturbance at mains terminals

9.1.1 RX mode(0.03MHz)

Intertek Japan K.K.
Matsuda No.4 Test Site

Conducted Voltages on Mains Port

APPLICANT : JVC KENWOOD CORPORATION
EUT NAME : HF/50MHz TRANSCEIVER
MODEL NO. : TS-990S
SERIAL NO. : 82A90005
TEST MODE : RX mode(0.03MHz)
POWER SOURCE : AC 120 V, 60 Hz
DATE TESTED : Dec 06 2012
FILE NO. : -
REGULATION : FCC Part15B Class B
TEST METHOD : ANSI C63.4-2003
TEMPERATURE : 22.2 [degC]
HUMIDITY : 35.0 [%]
NOTE : MAIN:ANT1,SUB:ANT2



ENGINEER : Koichi Wagatsuma

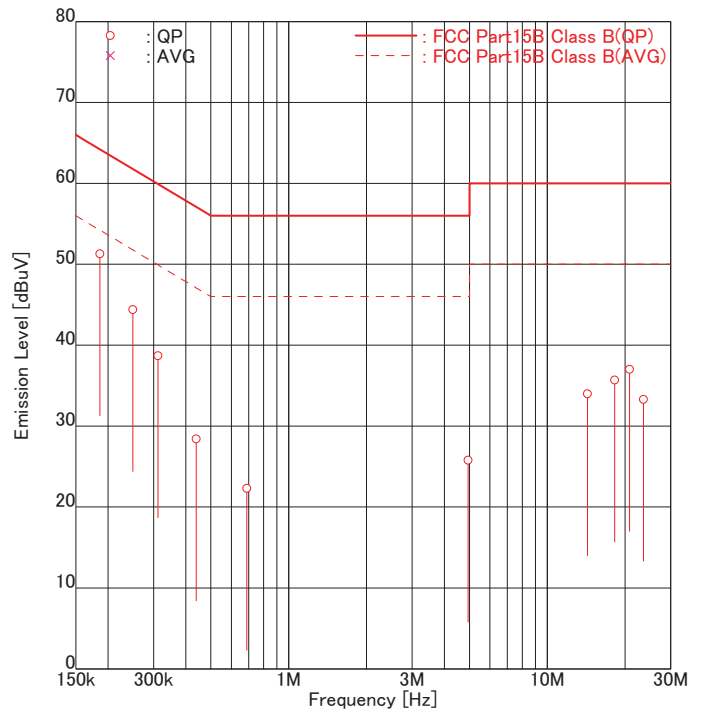
FREQUENCY [No]	MODE [MHz]		READING [dBuV]		FACTOR [dB]		EMISSION [dBuV]		LIMIT [dBuV]	MARGIN [dB]	
			Line1	Line2	Line1	Line2	Line1	Line2		Line1	Line2
1	0.1858	QP	<u>40.9</u>	40.9	10.1	10.1	<u>51.0</u>	51.0	64.2	<u>13.2</u>	13.2
2	0.2496	QP	32.8	<u>33.0</u>	10.2	10.2	43.0	<u>43.2</u>	61.8	18.8	<u>18.6</u>
3	0.3124	QP	28.3	<u>28.4</u>	10.2	10.2	38.5	<u>38.6</u>	59.9	21.4	<u>21.3</u>
4	0.4386	QP	18.3	<u>16.7</u>	10.2	10.2	28.5	<u>26.9</u>	57.1	28.6	<u>30.2</u>
5	0.6889	QP	11.4	12.1	10.2	10.2	21.6	22.3	56.0	34.4	33.7
6	4.9357	QP	14.8	6.0	10.5	10.5	25.3	16.5	56.0	30.7	39.5
7	14.3041	QP	<u>24.7</u>	15.0	10.9	11.0	<u>35.6</u>	26.0	60.0	<u>24.4</u>	34.0
8	18.2456	QP	<u>24.5</u>	23.5	11.1	11.1	<u>35.6</u>	34.6	60.0	<u>24.4</u>	25.4
9	21.1811	QP	21.1	<u>26.1</u>	11.1	11.1	32.2	<u>37.2</u>	60.0	27.8	<u>22.8</u>
10	23.5616	QP	22.2	<u>20.0</u>	11.0	11.0	33.2	31.0	60.0	26.8	29.0

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

9.1.2 RX mode(30.00MHz)

Intertek Japan K.K.
Matsuda No.4 Test Site
Conducted Voltages on Mains Port

APPLICANT : JVC KENWOOD CORPORATION
EUT NAME : HF/50MHz TRANSCEIVER
MODEL NO. : TS-990S
SERIAL NO. : 82A90005
TEST MODE : RX mode(30.00MHz)
POWER SOURCE : AC 120 V, 60 Hz
DATE TESTED : Dec 06 2012
FILE NO. : -
REGULATION : FCC Part15B Class B
TEST METHOD : ANSI C63.4-2003
TEMPERATURE : 22.2 [degC]
HUMIDITY : 35.0 [%]
NOTE : MAIN:ANT1,SUB:ANT2



ENGINEER : Koichi Wagatsuma

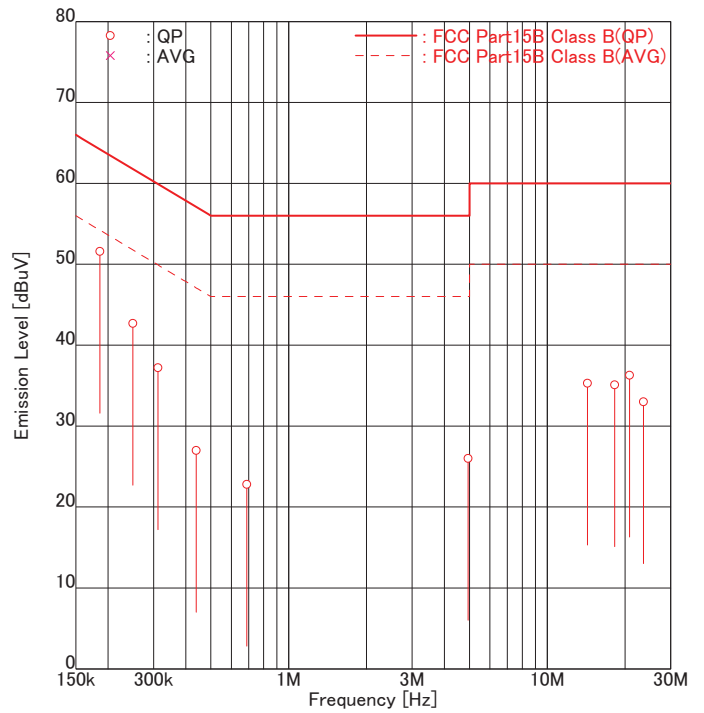
FREQUENCY [No]	MODE [MHz]		READING [dBuV]		FACTOR [dB]		EMISSION [dBuV]		LIMIT [dBuV]	MARGIN [dB]	
			Line1	Line2	Line1	Line2	Line1	Line2		Line1	Line2
1	0.1858	QP	<u>41.2</u>	41.1	10.1	10.1	<u>51.3</u>	51.2	64.2	<u>12.9</u>	13.0
2	0.2496	QP	34.0	<u>34.2</u>	10.2	10.2	44.2	<u>44.4</u>	61.8	17.6	<u>17.4</u>
3	0.3124	QP	<u>28.5</u>	28.5	10.2	10.2	<u>38.7</u>	38.7	59.9	<u>21.2</u>	21.2
4	0.4386	QP	18.2	16.7	10.2	10.2	28.4	26.9	57.1	28.7	30.2
5	0.6889	QP	11.6	12.1	10.2	10.2	21.8	22.3	56.0	34.2	33.7
6	4.9357	QP	15.3	6.5	10.5	10.5	25.8	17.0	56.0	30.2	39.0
7	14.3041	QP	<u>23.1</u>	15.6	10.9	11.0	<u>34.0</u>	26.6	60.0	<u>26.0</u>	33.4
8	18.2456	QP	<u>24.6</u>	23.4	11.1	11.1	<u>35.7</u>	34.5	60.0	<u>24.3</u>	25.5
9	20.8102	QP	23.6	<u>25.9</u>	11.1	11.1	34.7	<u>37.0</u>	60.0	25.3	<u>23.0</u>
10	23.5616	QP	22.3	20.3	11.0	11.0	33.3	31.3	60.0	26.7	28.7

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

9.1.3 RX mode(59.99MHz)

Intertek Japan K.K.
Matsuda No.4 Test Site
Conducted Voltages on Mains Port

APPLICANT : JVC KENWOOD CORPORATION
EUT NAME : HF/50MHz TRANSCEIVER
MODEL NO. : TS-990S
SERIAL NO. : 82A90005
TEST MODE : RX mode(59.99MHz)
POWER SOURCE : AC 120 V, 60 Hz
DATE TESTED : Dec 06 2012
FILE NO. : -
REGULATION : FCC Part15B Class B
TEST METHOD : ANSI C63.4-2003
TEMPERATURE : 22.2 [degC]
HUMIDITY : 35.0 [%]
NOTE : MAIN:ANT1,SUB:ANT2



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	0.1858	QP	41.3	<u>41.5</u>	10.1	10.1	51.4	<u>51.6</u>	64.2	12.8	<u>12.6</u>
2	0.2496	QP	<u>32.5</u>	32.4	10.2	10.2	<u>42.7</u>	42.6	61.8	19.1	19.2
3	0.3124	QP	<u>27.0</u>	27.0	10.2	10.2	<u>37.2</u>	37.2	59.9	22.7	22.7
4	0.4386	QP	16.8	12.4	10.2	10.2	27.0	22.6	57.1	30.1	34.5
5	0.6889	QP	12.0	12.6	10.2	10.2	22.2	22.8	56.0	33.8	33.2
6	4.9357	QP	15.5	6.3	10.5	10.5	26.0	16.8	56.0	30.0	39.2
7	14.3041	QP	<u>24.4</u>	15.5	10.9	11.0	<u>35.3</u>	26.5	60.0	24.7	33.5
8	18.2456	QP	<u>24.0</u>	23.3	11.1	11.1	<u>35.1</u>	34.4	60.0	24.9	25.6
9	20.8102	QP	23.3	<u>25.2</u>	11.1	11.1	34.4	<u>36.3</u>	60.0	25.6	<u>23.7</u>
10	23.5616	QP	22.0	20.2	11.0	11.0	33.0	31.2	60.0	27.0	28.8

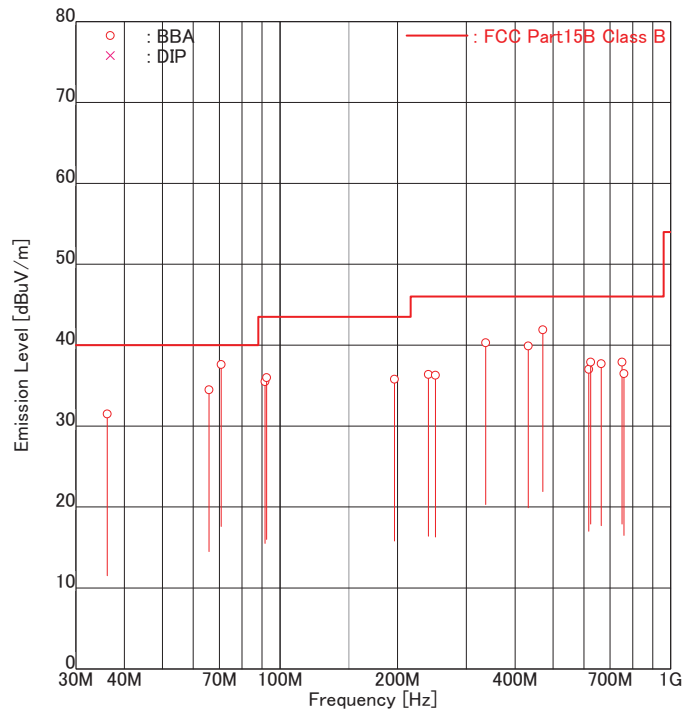
Higher six points are underlined.
Other frequencies : Below the FCC Part15B Class B limit
Emission Level = Read + Factor(LISN,Pad,Cable)

9.2 Radiated disturbance

9.2.1 RX mode(0.03MHz)
30 – 1000 MHz

Intertek Japan K.K.
Matsuda No.4 Test Site
Radiated Electric Field

APPLICANT : JVC KENWOOD CORPORATION
EUT NAME : HF/50MHz TRANSCEIVER
MODEL NO. : TS-990S
SERIAL NO. : 82A90005
TEST MODE : RX mode(0.03MHz)
POWER SOURCE : AC 120 V, 60 Hz
DATE TESTED : Dec 04 2012
FILE NO. : -
REGULATION : FCC Part15B Class B
TEST METHOD : ANSI C63.4-2003
DISTANCE : 3.00 [m]
TEMPERATURE : 20.5 [degC]
HUMIDITY : 35.5 [%]
NOTE : MAIN:ANT1,SUB:ANT2



ENGINEER : Koichi Wagatsuma

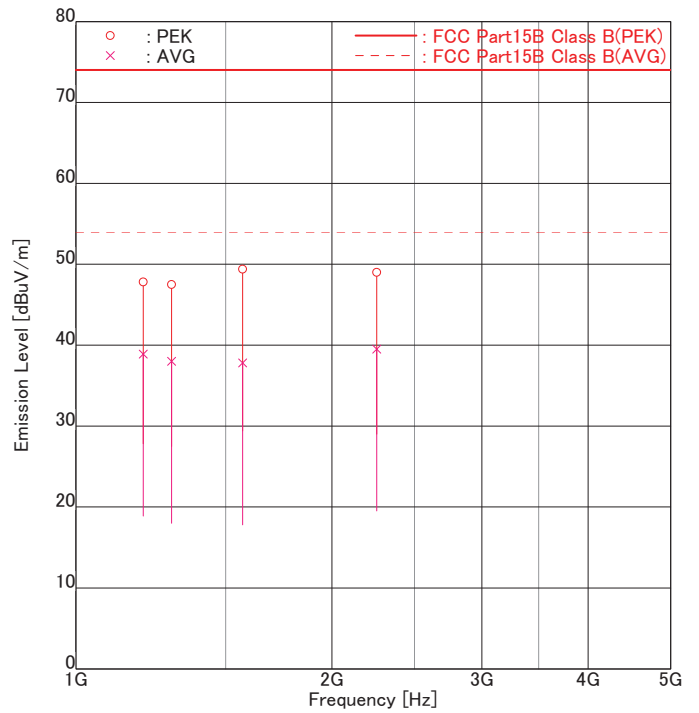
FREQUENCY [No]	FREQ [MHz]	ANT.	READING [dBuV]		FACTOR [dB/m]		EMISSION [dBuV/m]		LIMIT [dBuV/m]	MARGIN [dB]	
			Hori	Vert	Hori	Vert	Hori	Vert		Hori	Vert
1	36.14	BBA	-	38.9	-7.4	-7.4	-	31.5	40.0	-	8.5
2	65.85	BBA	-	<u>42.1</u>	-7.6	-7.6	-	<u>34.5</u>	40.0	-	<u>5.5</u>
3	70.70	BBA	<u>45.9</u>	42.9	-8.3	-8.3	<u>37.6</u>	34.6	40.0	<u>2.4</u>	5.4
4	91.56	BBA	47.1	-	-11.6	-11.6	35.5	-	43.5	8.0	-
5	92.40	BBA	-	<u>47.4</u>	-11.4	-11.4	-	<u>36.0</u>	43.5	-	<u>7.5</u>
6	196.38	BBA	44.0	43.2	-8.2	-8.2	35.8	35.0	43.5	7.7	8.5
7	240.05	BBA	43.2	-	-6.8	-6.8	36.4	-	46.0	9.6	-
8	250.01	BBA	42.7	41.1	-6.4	-6.4	36.3	34.7	46.0	9.7	11.3
9	336.03	BBA	<u>43.6</u>	-	-3.3	-3.3	<u>40.3</u>	-	46.0	<u>5.7</u>	-
10	432.09	BBA	<u>40.6</u>	-	-0.7	-0.7	<u>39.9</u>	-	46.0	<u>6.1</u>	-
11	471.26	BBA	<u>41.4</u>	36.7	0.5	0.5	<u>41.9</u>	37.2	46.0	<u>4.1</u>	8.8
12	616.97	BBA	-	32.6	4.4	4.4	-	37.0	46.0	-	9.0
13	624.10	BBA	32.2	33.4	4.5	4.5	36.7	37.9	46.0	9.3	8.1
14	664.46	BBA	32.6	-	5.1	5.1	37.7	-	46.0	8.3	-
15	750.95	BBA	-	31.0	6.9	6.9	-	37.9	46.0	-	8.1
16	759.36	BBA	-	29.4	7.1	7.1	-	36.5	46.0	-	9.5

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)

1000 – 5000 MHz

Intertek Japan K.K.
Matsuda No.4 Test Site
Radiated Electric Field

APPLICANT : JVC KENWOOD CORPORATION
EUT NAME : HF/50MHz TRANSCEIVER
MODEL NO. : TS-990S
SERIAL NO. : 82A90005
TEST MODE : RX mode(0.03MHz)
POWER SOURCE : AC 120 V, 60 Hz
DATE TESTED : Dec 05 2012
FILE NO. : -
REGULATION : FCC Part15B Class B
TEST METHOD : ANSI C63.4-2003
DISTANCE : 3.00 [m]
TEMPERATURE : 20.5 [degC]
HUMIDITY : 35.5 [%]
NOTE : MAIN:ANT1,SUB:ANT2



ENGINEER : Koichi Wagatsuma

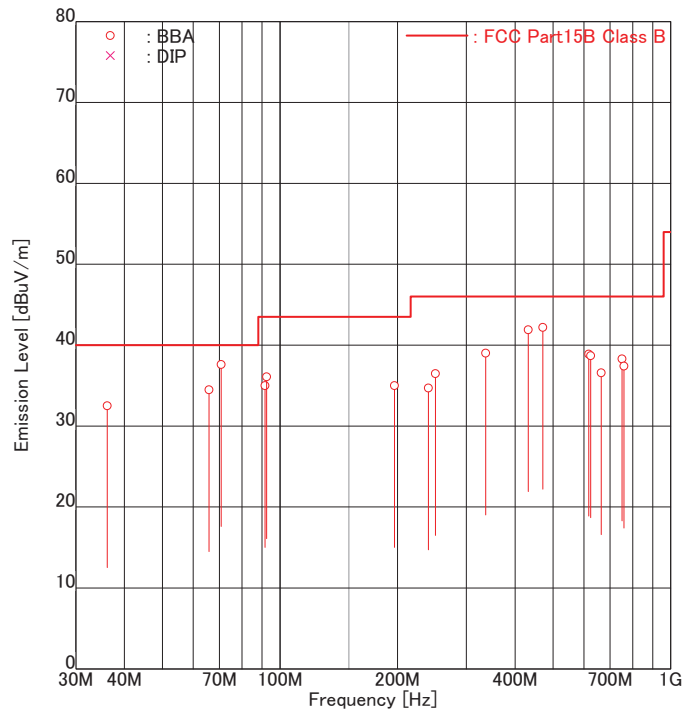
FREQUENCY [No]	MODE	MODE	READING [dBuV]		FACTOR [dB]		EMISSION [dBuV/m]		LIMIT [dBuV/m]	MARGIN [dB]	
			Hori	Vert	Hori	Vert	Hori	Vert		Hori	Vert
1	1200.23	PEK	50.4	<u>53.3</u>	-5.5	-5.5	44.9	47.8	74.0	29.1	26.2
2	1200.23	AVG	39.2	<u>44.4</u>	-5.5	-5.5	33.7	<u>38.9</u>	54.0	20.3	<u>15.1</u>
3	1296.20	PEK	-	<u>52.5</u>	-5.0	-5.0	-	47.5	74.0	-	26.5
4	1296.20	AVG	-	<u>43.0</u>	-5.0	-5.0	-	<u>38.0</u>	54.0	-	<u>16.0</u>
5	1571.08	PEK	<u>52.9</u>	50.5	-3.5	-3.5	<u>49.4</u>	47.0	74.0	<u>24.6</u>	27.0
6	1571.08	AVG	40.7	<u>41.3</u>	-3.5	-3.5	37.2	<u>37.8</u>	54.0	16.8	<u>16.2</u>
7	2256.75	PEK	48.4	<u>48.5</u>	0.5	0.5	48.9	<u>49.0</u>	74.0	25.1	<u>25.0</u>
8	2256.75	AVG	37.4	<u>39.0</u>	0.5	0.5	37.9	<u>39.5</u>	54.0	16.1	<u>14.5</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)

9.2.2 RX mode(30.00MHz)
30 – 1000 MHz

Intertek Japan K.K.
Matsuda No.4 Test Site
Radiated Electric Field

APPLICANT : JVC KENWOOD CORPORATION
EUT NAME : HF/50MHz TRANSCEIVER
MODEL NO. : TS-990S
SERIAL NO. : 82A90005
TEST MODE : RX mode(30.00MHz)
POWER SOURCE : AC 120 V, 60 Hz
DATE TESTED : Dec 04 2012
FILE NO. : -
REGULATION : FCC Part15B Class B
TEST METHOD : ANSI C63.4-2003
DISTANCE : 3.00 [m]
TEMPERATURE : 20.5 [degC]
HUMIDITY : 35.5 [%]
NOTE : MAIN:ANT1,SUB:ANT2



ENGINEER : Koichi Wagatsuma

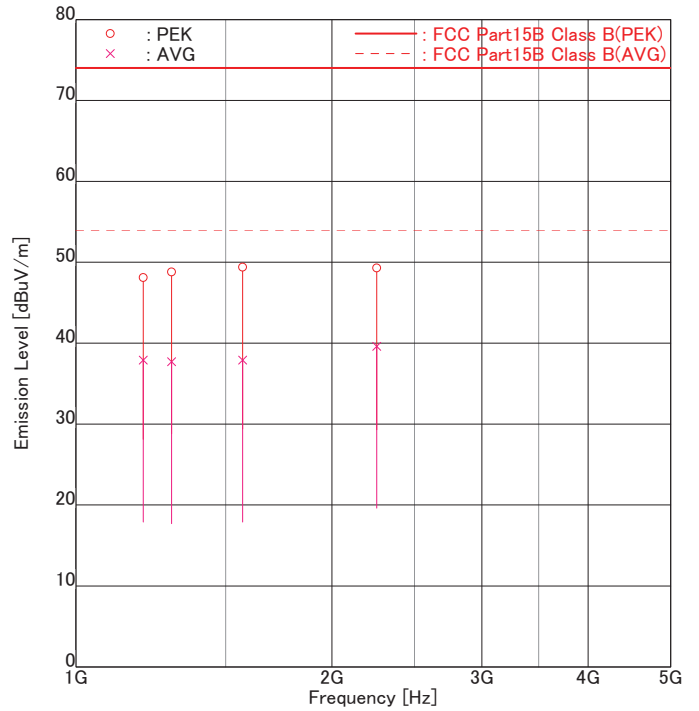
FREQUENCY [No]	FREQ [MHz]	ANT.	READING [dBuV]		FACTOR [dB/m]		EMISSION [dBuV/m]		LIMIT [dBuV/m]	MARGIN [dB]	
			Hori	Vert	Hori	Vert	Hori	Vert		Hori	Vert
1	36.14	BBA	-	39.9	-7.4	-7.4	-	32.5	40.0	-	7.5
2	65.85	BBA	-	<u>42.1</u>	-7.6	-7.6	-	<u>34.5</u>	40.0	-	<u>5.5</u>
3	70.70	BBA	<u>45.9</u>	42.9	-8.3	-8.3	<u>37.6</u>	34.6	40.0	<u>2.4</u>	5.4
4	91.56	BBA	46.6	-	-11.6	-11.6	35.0	-	43.5	8.5	-
5	92.40	BBA	-	47.5	-11.4	-11.4	-	36.1	43.5	-	7.4
6	196.38	BBA	43.2	43.2	-8.2	-8.2	35.0	35.0	43.5	8.5	8.5
7	240.05	BBA	41.5	-	-6.8	-6.8	34.7	-	46.0	11.3	-
8	250.01	BBA	42.9	-	-6.4	-6.4	36.5	-	46.0	9.5	-
9	336.07	BBA	<u>42.3</u>	-	-3.3	-3.3	<u>39.0</u>	-	46.0	<u>7.0</u>	-
10	432.09	BBA	<u>42.6</u>	-	-0.7	-0.7	<u>41.9</u>	-	46.0	<u>4.1</u>	-
11	471.26	BBA	<u>41.7</u>	37.9	0.5	0.5	<u>42.2</u>	38.4	46.0	<u>3.8</u>	7.6
12	617.02	BBA	-	<u>34.5</u>	4.4	4.4	-	<u>38.9</u>	46.0	-	<u>7.1</u>
13	624.10	BBA	32.2	34.2	4.5	4.5	36.7	38.7	46.0	9.3	7.3
14	664.48	BBA	31.5	-	5.1	5.1	36.6	-	46.0	9.4	-
15	750.91	BBA	-	31.4	6.9	6.9	-	38.3	46.0	-	7.7
16	759.40	BBA	-	30.3	7.1	7.1	-	37.4	46.0	-	8.6

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)

1000 – 5000 MHz

Intertek Japan K.K.
Matsuda No.4 Test Site
Radiated Electric Field

APPLICANT : JVC KENWOOD CORPORATION
EUT NAME : HF/50MHz TRANSCEIVER
MODEL NO. : TS-990S
SERIAL NO. : 82A90005
TEST MODE : RX mode(30.00MHz)
POWER SOURCE : AC 120 V, 60 Hz
DATE TESTED : Dec 05 2012
FILE NO. : -
REGULATION : FCC Part15B Class B
TEST METHOD : ANSI C63.4-2003
DISTANCE : 3.00 [m]
TEMPERATURE : 20.5 [degC]
HUMIDITY : 35.5 [%]
NOTE : MAIN:ANT1,SUB:ANT2



ENGINEER : Koichi Wagatsuma

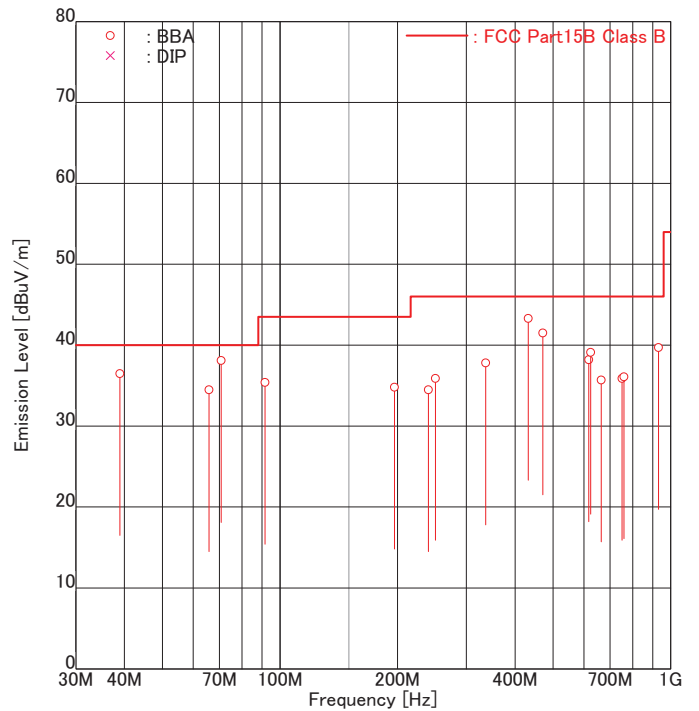
FREQUENCY [No]	MODE	READING [dBuV]		FACTOR [dB]		EMISSION [dBuV/m]		LIMIT [dBuV/m]	MARGIN [dB]	
		Hori	Vert	Hori	Vert	Hori	Vert		Hori	Vert
1	1200.23 PEK	49.9	<u>53.6</u>	-5.5	-5.5	44.4	48.1	74.0	29.6	25.9
2	1200.23 AVG	38.8	<u>43.4</u>	-5.5	-5.5	33.3	<u>37.9</u>	54.0	20.7	<u>16.1</u>
3	1296.20 PEK	-	<u>53.8</u>	-5.0	-5.0	-	48.8	74.0	-	25.2
4	1296.20 AVG	-	<u>42.7</u>	-5.0	-5.0	-	<u>37.7</u>	54.0	-	<u>16.3</u>
5	1571.08 PEK	<u>52.9</u>	51.1	-3.5	-3.5	<u>49.4</u>	47.6	74.0	<u>24.6</u>	26.4
6	1571.08 AVG	<u>41.4</u>	41.0	-3.5	-3.5	<u>37.9</u>	37.5	54.0	<u>16.1</u>	16.5
7	2256.75 PEK	48.3	<u>48.8</u>	0.5	0.5	48.8	<u>49.3</u>	74.0	25.2	<u>24.7</u>
8	2256.75 AVG	37.4	<u>39.1</u>	0.5	0.5	37.9	<u>39.6</u>	54.0	16.1	<u>14.4</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)

9.2.3 RX mode(59.99MHz)
30 – 1000 MHz

Intertek Japan K.K.
Matsuda No.4 Test Site
Radiated Electric Field

APPLICANT : JVC KENWOOD CORPORATION
EUT NAME : HF/50MHz TRANSCEIVER
MODEL NO. : TS-990S
SERIAL NO. : 82A90005
TEST MODE : RX mode(59.99MHz)
POWER SOURCE : AC 120 V, 60 Hz
DATE TESTED : Dec 04 2012
FILE NO. : -
REGULATION : FCC Part15B Class B
TEST METHOD : ANSI C63.4-2003
DISTANCE : 3.00 [m]
TEMPERATURE : 20.5 [degC]
HUMIDITY : 35.5 [%]
NOTE : MAIN:ANT1,SUB:ANT2



ENGINEER : Koichi Wagatsuma

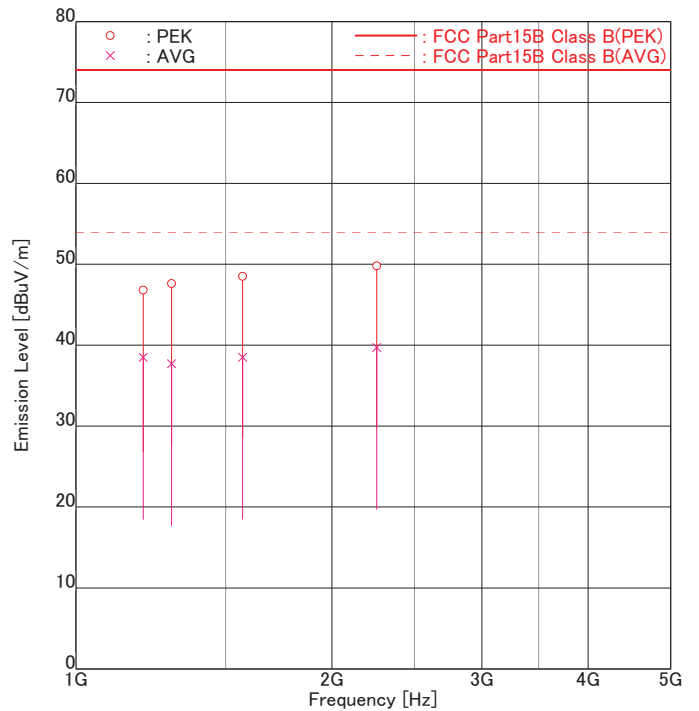
FREQUENCY [No]	FREQUENCY [MHz]	ANT.	READING [dBuV]		FACTOR [dB/m]		EMISSION [dBuV/m]		LIMIT [dBuV/m]	MARGIN [dB]	
			Hori	Vert	Hori	Vert	Hori	Vert		Hori	Vert
1	38.93	BBA	-	<u>43.5</u>	-7.0	-7.0	-	<u>36.5</u>	40.0	-	<u>3.5</u>
2	65.85	BBA	-	<u>42.1</u>	-7.6	-7.6	-	<u>34.5</u>	40.0	-	<u>5.5</u>
3	70.70	BBA	<u>46.4</u>	42.9	-8.3	-8.3	<u>38.1</u>	34.6	40.0	<u>1.9</u>	5.4
4	91.56	BBA	47.0	-	-11.6	-11.6	35.4	-	43.5	8.1	-
5	196.38	BBA	41.0	43.0	-8.2	-8.2	32.8	34.8	43.5	10.7	8.7
6	240.05	BBA	41.3	-	-6.8	-6.8	34.5	-	46.0	11.5	-
7	250.01	BBA	42.3	-	-6.4	-6.4	35.9	-	46.0	10.1	-
8	336.07	BBA	41.1	-	-3.3	-3.3	37.8	-	46.0	8.2	-
9	432.09	BBA	<u>44.0</u>	-	-0.7	-0.7	<u>43.3</u>	-	46.0	<u>2.7</u>	-
10	471.26	BBA	<u>41.0</u>	37.0	0.5	0.5	<u>41.5</u>	37.5	46.0	<u>4.5</u>	8.5
11	617.02	BBA	-	33.8	4.4	4.4	-	38.2	46.0	-	7.8
12	624.13	BBA	33.4	34.6	4.5	4.5	37.9	39.1	46.0	8.1	6.9
13	664.48	BBA	30.6	-	5.1	5.1	35.7	-	46.0	10.3	-
14	750.96	BBA	-	29.0	6.9	6.9	-	35.9	46.0	-	10.1
15	759.43	BBA	-	29.0	7.1	7.1	-	36.1	46.0	-	9.9
16	931.54	BBA	-	<u>30.0</u>	9.7	9.7	-	<u>39.7</u>	46.0	-	<u>6.3</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)

1000 – 5000 MHz

Intertek Japan K.K.
Matsuda No.4 Test Site
Radiated Electric Field

APPLICANT : JVC KENWOOD CORPORATION
EUT NAME : HF/50MHz TRANSCEIVER
MODEL NO. : TS-990S
SERIAL NO. : 82A90005
TEST MODE : RX mode(59.99MHz)
POWER SOURCE : AC 120 V, 60 Hz
DATE TESTED : Dec 05 2012
FILE NO. : -
REGULATION : FCC Part15B Class B
TEST METHOD : ANSI C63.4-2003
DISTANCE : 3.00 [m]
TEMPERATURE : 20.5 [degC]
HUMIDITY : 35.5 [%]
NOTE : MAIN:ANT1,SUB:ANT2



ENGINEER : Koichi Wagatsuma

FREQUENCY [No]	MODE [MHz]	READING [dBuV]		FACTOR [dB]		EMISSION [dBuV/m]		LIMIT [dBuV/m]	MARGIN [dB]	
		Hori	Vert	Hori	Vert	Hori	Vert		Hori	Vert
1	1200.23 PEK	50.4	52.3	-5.5	-5.5	44.9	46.8	74.0	29.1	27.2
2	1200.23 AVG	38.6	<u>44.0</u>	-5.5	-5.5	33.1	<u>38.5</u>	54.0	20.9	<u>15.5</u>
3	1296.20 PEK	-	<u>52.6</u>	-5.0	-5.0	-	47.6	74.0	-	26.4
4	1296.20 AVG	-	<u>42.7</u>	-5.0	-5.0	-	<u>37.7</u>	54.0	-	<u>16.3</u>
5	1571.08 PEK	<u>52.0</u>	50.8	-3.5	-3.5	<u>48.5</u>	47.3	74.0	<u>25.5</u>	26.7
6	1571.08 AVG	40.3	<u>42.0</u>	-3.5	-3.5	36.8	<u>38.5</u>	54.0	17.2	<u>15.5</u>
7	2256.75 PEK	<u>49.3</u>	49.0	0.5	0.5	<u>49.8</u>	49.5	74.0	<u>24.2</u>	24.5
8	2256.75 AVG	<u>39.2</u>	38.8	0.5	0.5	<u>39.7</u>	39.3	54.0	<u>14.3</u>	14.7

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)

SECTION 11. LIST OF MEASURING INSTRUMENTS

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

Instrument	Model No.	Serial No.	Manufacturer	Cal. Interval	Effective period
Conducted disturbance at mains terminals					
LISN(EUT)	ESH2-Z5	882395/019	Rohde & Schwarz	1 Y	Jul.31, 2013
LISN(Peripheral)	KNW-407	8-1395-9	Kyoritsu	1 Y	Jul.31, 2013
10dB LISN Pad	CFA-01	E04AT10B	TAMAGAWA	1 Y	Jul.31, 2013
50ohm Termination	65BNC-50-0-2/133NE	E04TRM50B	SUHNER	1 Y	Jul.31, 2013
Coaxial Cable (C1)	3D-2W(5.0m)	MTS04CSR-1	Intertek	1 Y	Aug.31, 2013
Coaxial Cable (C2)	RG-5A/U(4.0m)	MTS04CSR-2	Intertek	1 Y	Aug.31, 2013
Coaxial Cable (C3)	RG214HF(1.5m)	MTS04CSR-3	SUHNER	1 Y	Aug.31, 2013
Coaxial Cable (C4)	RG214HF(1.5m)	MTS04CSR-4	SUHNER	1 Y	Aug.31, 2013
Coaxial Cable (C5)	RG214HF(1.5m)	MTS04CSR-5	SUHNER	1 Y	Aug.31, 2013
Radiated disturbance					
Broad Band Antenna	VULB9168	331	Schwarzbeck	1 Y	Nov.30, 2013
Amplifier	8447D	1937A02669	Hewlett Packard	1 Y	Aug.31, 2013
6dB Attenuator	6806.17.AC	None	HUBER + SUHNER	1 Y	Aug.31, 2013
Step Attenuator	8494A	1510A08521	Hewlett Packard	1 Y	Aug.31, 2013
Spectrum Analyzer	8563E	3337A01513	Hewlett Packard	1 Y	Jul.31, 2013
Double Ridged Antenna	3115	3024	EMCO	1 Y	Nov.30, 2013
Amplifier	8449B	3008A00615	Hewlett Packard	1 Y	Jul.31, 2013
6dB Attenuator	6806.17.B	None	SUHNER	1 Y	Jul.31, 2013
Coaxial Cable (R1)	RG214HF(9.0m)	MTS04R3-1	SUHNER	1 Y	Aug.31, 2013
Coaxial Cable (R2)	8D-2W(15.0m)	MTS04R3-2	Intertek	1 Y	Aug.31, 2013
Coaxial Cable (R3)	RG214HF(2.0m)	MTS04R3-3	SUHNER	1 Y	Aug.31, 2013
Coaxial Cable (R4)	RG214HF(0.4m)	MTS04R3-4	SUHNER	1 Y	Aug.31, 2013
Coaxial Cable (R5)	RG214HF(0.4m)	MTS04R3-5	SUHNER	1 Y	Aug.31, 2013
Coaxial Cable (R6)	RG214HF(1.5m)	MTS04R3-6	SUHNER	1 Y	Aug.31, 2013
Coaxial Cable (R7)	RG214HF(1.5m)	MTS04R3-7	SUHNER	1 Y	Aug.31, 2013
Coaxial Cable (R8)	RG214HF(1.5m)	MTS04R3-8	SUHNER	1 Y	Aug.31, 2013
Coaxial Cable (R9)	RG214HF(6.0m)	MTS04R3-8	SUHNER	1 Y	Aug.31, 2013
Coaxial Cable (R11)	SUCOFLEX 104(6.0m)	58440/4PE	SUHNER	1 Y	Jul.31, 2013
Coaxial Cable (R12)	SUCOFLEX 104(1.0m)	58441/4PE	SUHNER	1 Y	Jul.31, 2013
Site Attenuation				1 Y	May 31, 2013
Common					
Test receiver	ESS (Firmware Version 1.07)	845637/001	Rohde & Schwarz	1 Y	Dec.31, 2012
RF Switch(1)	MP59B	M21448	ANRITSU	1 Y	Aug.31, 2013
RF Switch(2)	ACX-150-1	E04301501	Intertek	1 Y	Aug.31, 2013
Testing Software	emiT (Version 3,0,0,0)				

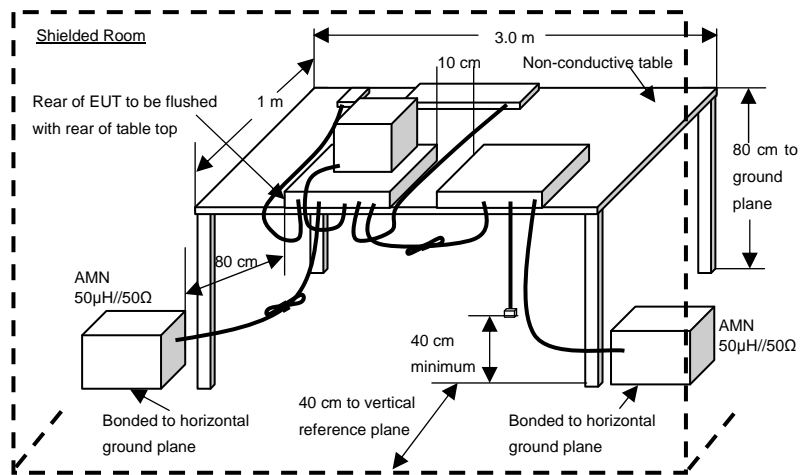
ANNEX

A. TEST PROCEDURE(S)

Test was carried out under the following conditions.

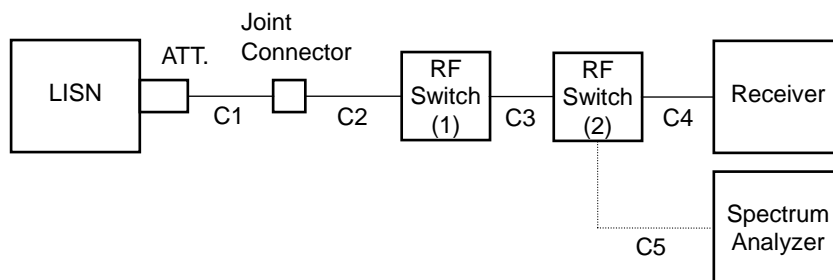
Conducted disturbance at mains terminals

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

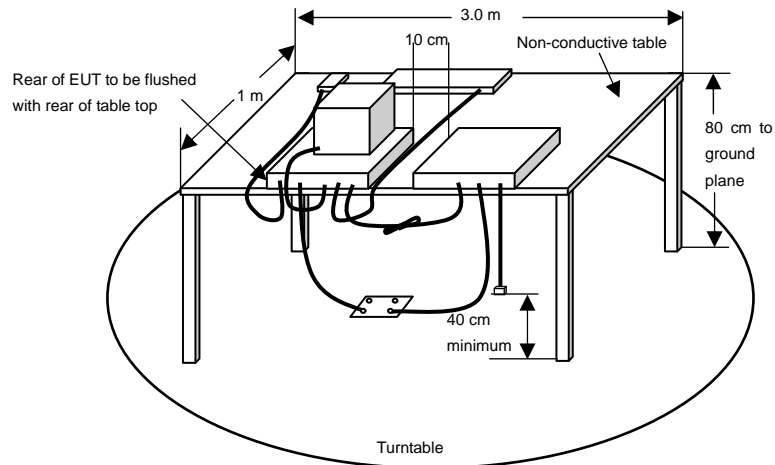
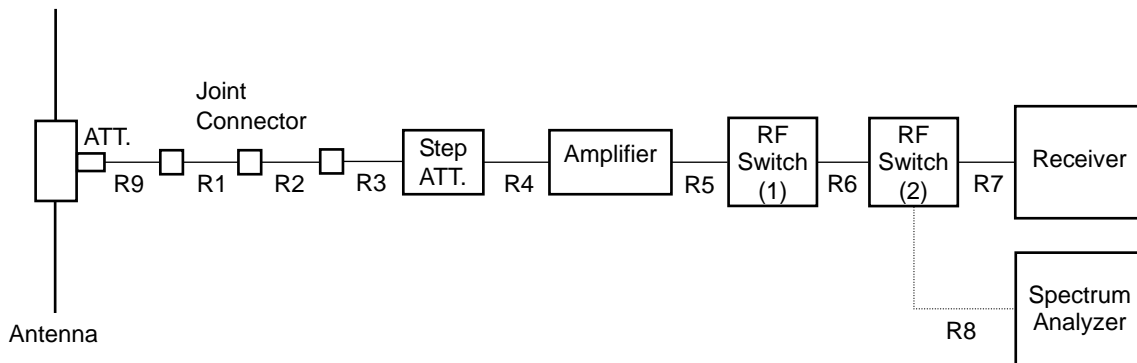
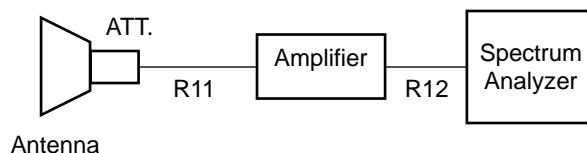


Diagram of the measuring instruments (30-1000MHz)



Above 1GHz



[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.