TEST REPORT

STANDARD : FCC Part15B Class B -Scanning Receiver
: Industry Canada RSS-215 Issue 2

Applicant	Testing Laboratory
Kenwood Corporation 1-16-2, Hakusan, Midori-ku, Yokohama-shi, Kanagawa, 226-8525 Japan Tel. +81 45 939 6254	Intertek Japan K.K. Tochigi Laboratory URL: http://www.japan.intertek-etlsemko.com 870, Nakaawano, Kanuma-shi, Tochigi-ken 322-0306 Japan Tel. +81 289 86 7121

Equipment Type	144 MHz FM TRANSCEIVER
Category	Scanning Receiver
Trademark	KENWOOD
Model(s)	TH-K20A
Serial No.	00000006
Equipment Authorization	Certification
FCC ID	K44441200
IC ID	282F-441200
Report Number	JT11080003
Report Issue Date	August 29 2011

Approved by K. Gokita

Kazuo Gokita
[Manager]

Tested by A. Morishima

Atsuyuki Morishima

VLAC-008-5

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SECTION 1. GENERAL INFORMATION

Test Performed

EUT Received	August 8, 2011
Date of Test	From August 17, 2011 to August 24, 2011
Standard Applied	FCC Part15B – Scanning Receiver Industry Canada RSS-215 Issue 2 * * It is not covered by accredited scope of VLAC.
Test methods	ANSI C63.4-2003 / RSS-GEN Issue3 -2010
Deviation from Standard(s)	None

Note : As for the ICES-003 “Digital Apparatus”, the EUT has been measured.
Refer to report No.“JT11080005”.
As for the FCC Part15B Class B “Peripherals”, the EUT has been measured.
Refer to report No.“JT11080004”.

Qualifications of Testing Laboratory

Accreditation	**Scope**	**Lab. Code**	**Remarks**
VLAC	EMC Testing	VLAC-008-5	JAPAN
BSMI	EMC Testing	SL2-IN-E-6017, SL2-AI-E-6017	TAIWAN
Filing			
VCCI	EMC Testing	R-257, C-260, C-284, T-1736, T-1737, G-124 R-258, C-261, C-285, T-1738, T-1739 R-259, C-262, T-1740, G-125	JAPAN
FCC	EMC Testing	Designation Number : JP0011	USA
IC	EMC Testing	2042P-1, 2042P-2	CANADA
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
VFO	Variable Frequency Oscillator		

SECTION 2. SUMMARY OF TEST RESULTS

See Section9 for the detailed result.

Standard Applied	FCC Part15B – Scanning Receiver Industry Canada RSS-215 Issue 2	
Test Item	**Minimum margin**	**Remarks**
Radiated disturbance	13.0 dB (959.25 Mz) VFO SCAN mode	
Conducted Power on Antenna Port (15.111/ RSS-215 5.1)	25.5dB (190.87 MHz) VFO SCAN mode	
38dB Rejection Test (15.121(b))	No frequency of response was detected -Passed-	

Note : 1. Conducted Emission Test is not required because the EUT is connected to Li-ion battery.
2. See Section 10 for details.

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	144 MHz FM TRANSCEIVER	TH-K20A	00000006	KENWOOD
Rated Power : DC7.5 V(DC6.0-9.0 V), 250mA max.				
Supplied Power : DC7.5 V(Battery)				
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	136-174 MHz
Receiver Type	Double Conversion
Model of Operation	F3E

3.3 Intermediate Frequencies

1st	38.85MHz (Upper)
2nd	450kHz (Lower)

3.4 Port(s)/Connector(s)

Port Name	Connector Type	Connector Pin	Remarks
Microphone	3.5 φ	3pin	
Speaker	2.5 φ	3pin	
Antenna	SMA	2pin	

3.5 Highest Frequency Generated / Used

Base Clock	Operating Frequency	Board Name	Remarks
212.85 MHz	212.85 MHz	TX RX 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	Speaker microphone	SMC-34	None	KENWOOD	N/A
C	Earphone	HS-9(G)	None	KENWOOD	N/A
D	Li-ion battery	KNB-63L	None	KENWOOD	N/A
E	Dummy Antenna	CT-01	None	TME	N/A
Note:					
E	50ohms				

SECTION 5. USED CABLE(S)

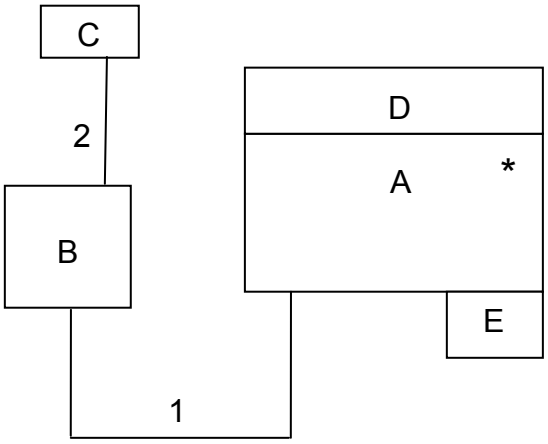
The following cable(s) was used for the test.

No.	Name	Length (m)	Shield	Metal Connector	Ferrite Core
1	Speaker microphone cable	0.48	No	No	
2	Earphone cable	1.00	No	No	

SECTION 6. TEST CONFIGURATION

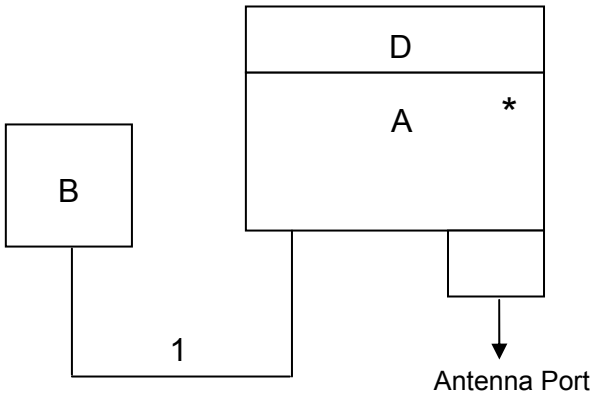
6.1 Radiated disturbance

＊: EUT
■: Ferrite core

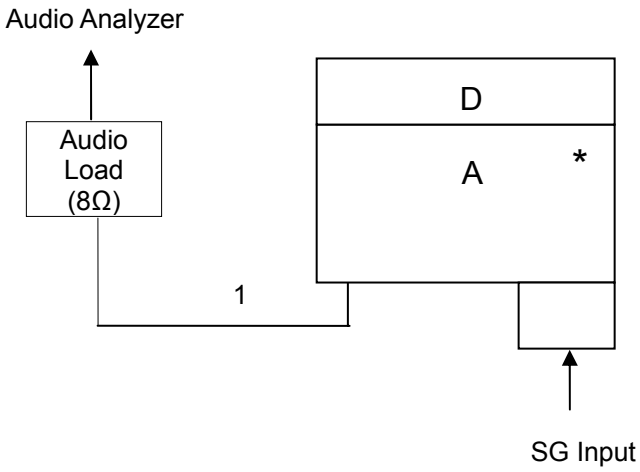


The symbols and numbers assigned to the equipments and cables on this diagram correspond to the ones in Sections 3 to 5.

6.2 Conducted Power on Antenna Port (15.111)



6.3 38dB Rejection Test (15.121(b))



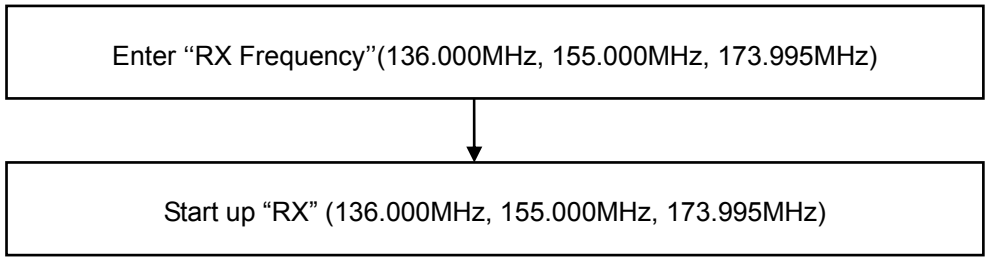
The symbols and numbers assigned to the equipments and cables on this diagram correspond to the ones in Sections 3 to 5.

SECTION 7. OPERATING CONDITION

The test was carried out under the following mode.

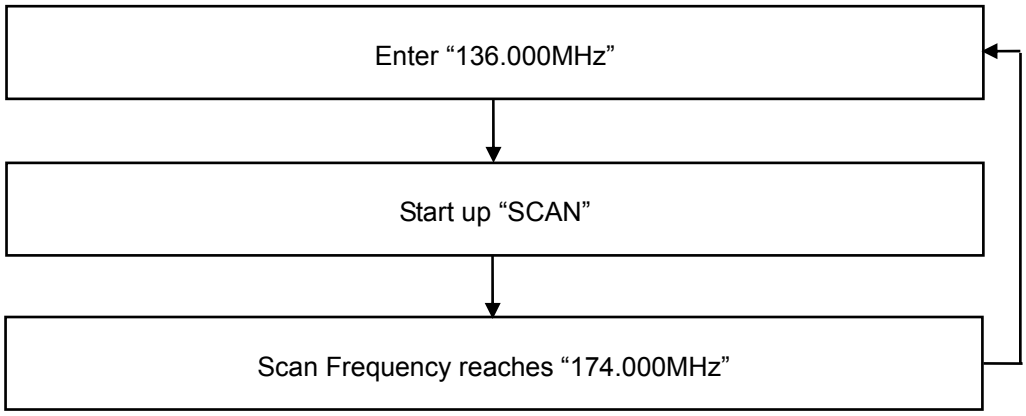
7.1 Rx mode

Cycle time for operation: Continuity



7.2 VFO SCAN 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	+/- 3.52 dB	5.19dB
Above 1 GHz CISPR22	N/A	
Above 1 GHz ANCI 63.4	+/- 4.26 dB	
Radiated disturbance at 10m		
30 MHz – 1000 MHz	+/- 3.98 dB	5.06 dB
Above 1 GHz	+/- 4.26 dB	
Radiated disturbance at 30m		
	N/A	5.02 dB
Conducted disturbance at mains terminals		
9 kHz – 150 kHz	+/- 2.76 dB	3.97 dB
150 kHz – 30 MHz		3.60 dB
Conducted disturbance at telecommunication ports (ISN)		
150 kHz – 30 MHz	+/- 2.76 dB	Nil
Conducted disturbance at telecommunication ports (Capacitive Voltage Probe)		
150 kHz – 30 MHz	+/- 3.10 dB	Nil
Conducted disturbance at telecommunication ports (Current Probe)		
150 kHz – 30 MHz	+/- 2.86 dB	Nil
Conducted disturbance at terminals		
150 kHz – 30 MHz	+/- 2.79 dB	Nil
Disturbance power		
30 MHz – 300 MHz	+/- 3.00 dB	4.45 dB
Conducted Power on Antenna Port		
30 MHz – 1000 MHz	+/- 2.90 dB	Nil
Above 1 GHz	+/- 1.60 dB	
38dB Rejection (15.121(b))		
136MHz – 174MHz	+/- 0.56 dB	Nil

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

SECTION 9. EVALUATION OF TEST RESULTS

Location	Tochigi No.2Test Site
Test Engineer	Atsuyuki Morishima

Frequency Range of Measurements

	Required Measurement Frequency Range	Measured Frequency Range
Radiated	30 – 2000 MHz	30 – 2000 MHz
Conducted Power on Antenna Port (15.111 /RSS-215 5.1)	30 – 2000 MHz	30 – 2000 MHz
38dB Rejection Test (15.121(b))	136 M – 174 MHz	136 M – 174 MHz

Test Procedure

Item	Document number
Radiated disturbance	RJP-EM003
Conducted Power on Antenna Port (15.111)	RJP-TE101
38dB Rejection Test (15.121(b))	RJP-TE102

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 [dBµV] = Meter Reading [dBµV] + Factor [dB]
  Margin [dB] = Limit [dBµV] - Emission Level [dBµV]
  * Factor = LISN Factor + Cable Loss + ATT

* Radiated disturbance
  Emission Level [dBµV/m] = Meter Reading [dBµV] + Factor [dB/m]
  Margin [dB] = Limit [dBµV/m] - Emission Level [dBµV/m]
  * Factor = Antenna Factor + Cable Loss - Amplifier Gain + ATT
  (– Distance Conversion Factor)

* Conducted Power on Antenna Port
  Emission Level [dBµV] = Meter Reading [dBµV] + Factor [dB]
  Margin [dB] = Limit [dBµV] - Emission Level [dBµV]
  * Factor = Pad +Cable Loss - Amplifier Gain

9.1 Radiated disturbance

9.1.1 RX mode(136.000MHz) [30 – 1000MHz]

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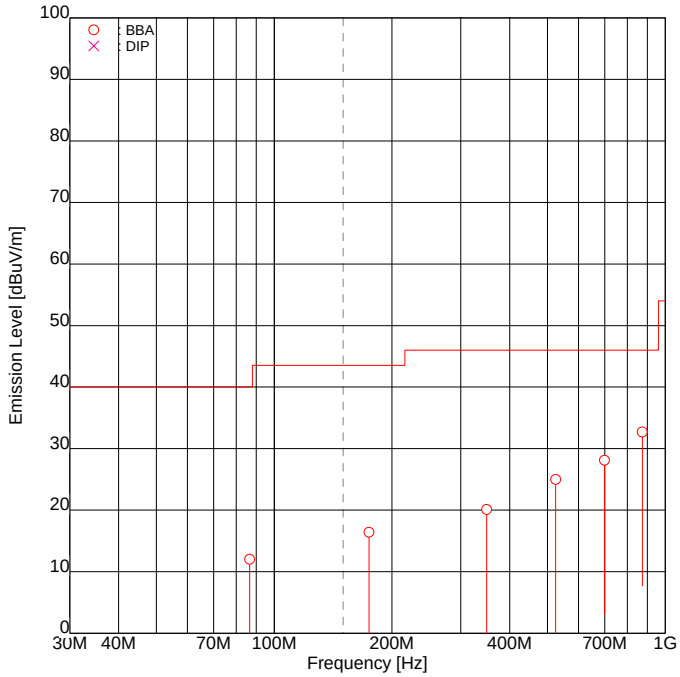
Tochigi No.2 Test Site

Radiated Electric Field

APPLICANT	: Kenwood Corporation
EUT NAME	: 144MHz FM TRANSCEIVER
MODEL NO.	: TH-K20A
SERIAL NO.	: 00000006
TEST MODE	: Rx mode(136.000MHz)
POWER SOURCE	: DC 7.5 V (Battery)
DATE TESTED	: Aug 22 2011
FILE NO.	: -
REGULATION	: FCC Part15B Class B
TEST METHOD	: ANSI C63.4-2003
DISTANCE	: 3.00 [m]
TEMPERATURE	: 20.0 [degC]
HUMIDITY	: 75.0 [%]
NOTE	:



ENGINEER : Atsuyuki Morishima

[No]	FREQUENCY [MHz]	ANT.	READING [dBuV] Hori	Vert	FACTOR [dB/m] Hori	Vert	EMISSION [dBuV/m] Hori	Vert	LIMIT [dBuV/m]	MARGIN [dB] Hori	Vert
1	86.54	BBA	20.7	21.7	-9.7	-9.7	11.0	12.0	40.0	29.0	28.0
2	174.85	BBA	20.4	20.9	-4.5	-4.5	15.9	16.4	43.5	27.6	27.1
3	349.70	BBA	19.8	19.6	0.3	0.3	20.1	19.9	46.0	25.9	26.1
4	524.55	BBA	21.0	21.0	4.0	4.0	25.0	25.0	46.0	21.0	21.0
5	699.40	BBA	20.6	20.5	7.5	7.5	28.1	28.0	46.0	17.9	18.0
6	874.25	BBA	21.6	21.0	11.1	11.1	32.7	32.1	46.0	**13.3**	13.9

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

emiT 3, 0, 0, 0

9.1.2 RX mode(136.000MHz) [1000 - 2000MHz]

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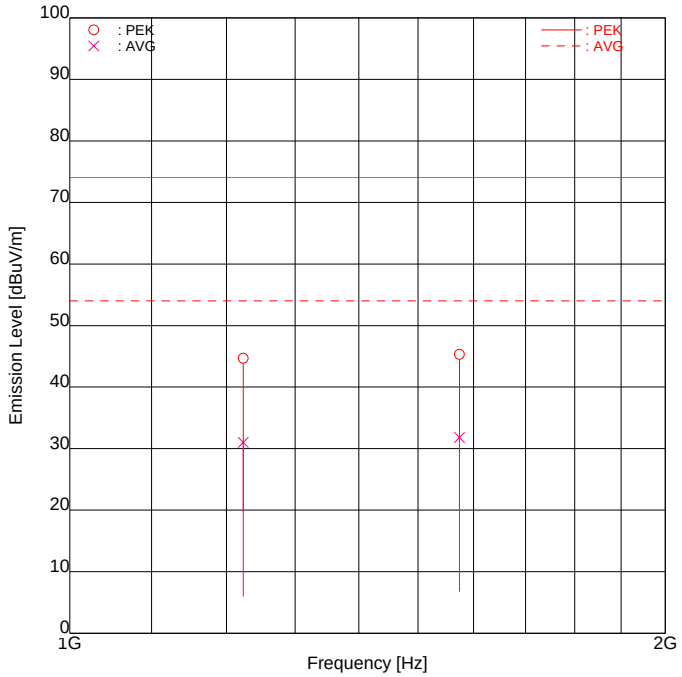
Tochigi No.2 Test Site

Radiated Electric Field

APPLICANT	: Kenwood Corporation
EUT NAME	: 144MHz FM TRANSCEIVER
MODEL NO.	: TH-K20A
SERIAL NO.	: 00000006
TEST MODE	: Rx mode (136.000MHz)
POWER SOURCE	: DC 7.5 V (Battery)
DATE TESTED	: Aug 23 2011
FILE NO.	: -
REGULATION	: FCC Part15B Class B
TEST METHOD	: ANSI C63.4-2003
DISTANCE	: 3.00 [m]
TEMPERATURE	: 21.0 [degC]
HUMIDITY	: 68.0 [%]
NOTE	:

ENGINEER : Atsuyuki Morishima



[No]	FREQUENCY [MHz]	MODE	READING [dBuV] Hori	READING [dBuV] Vert	FACTOR [dB] Hori	FACTOR [dB] Vert	EMISSION [dBuV/m] Hori	EMISSION [dBuV/m] Vert	LIMIT [dBuV/m]	MARGIN [dB] Hori	MARGIN [dB] Vert
1	1223.97	PEK	46.4	46.3	-1.7	-1.7	44.7	44.6	74.0	29.3	29.4
2	1223.97	AVG	32.3	32.7	-1.7	-1.7	30.6	31.0	54.0	23.4	23.0
3	1573.97	PEK	45.1	45.3	0.0	0.0	45.1	45.3	74.0	28.9	28.7
4	1573.97	AVG	31.8	31.4	0.0	0.0	31.8	31.4	54.0	**22.2**	22.6

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

emiT 3, 0, 0, 0

9.1.3 RX mode(155.000MHz) [30 - 1000MHz]

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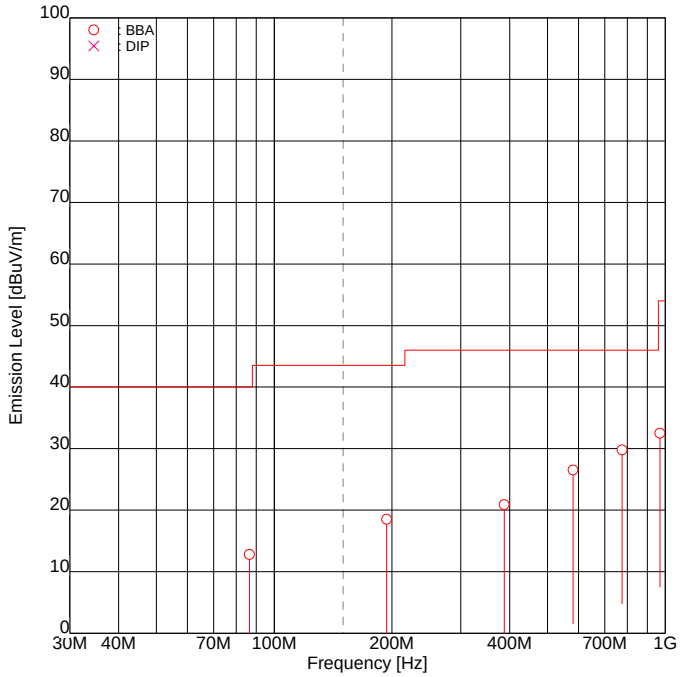
Tochigi No.2 Test Site

Radiated Electric Field

APPLICANT	: Kenwood Corporation
EUT NAME	: 144MHz FM TRANSCEIVER
MODEL NO.	: TH-K20A
SERIAL NO.	: 00000006
TEST MODE	: Rx mode(155.000MHz)
POWER SOURCE	: DC 7.5 V (Battery)
DATE TESTED	: Aug 22 2011
FILE NO.	: -
REGULATION	: FCC Part15B Class B
TEST METHOD	: ANSI C63.4-2003
DISTANCE	: 3.00 [m]
TEMPERATURE	: 21.0 [degC]
HUMIDITY	: 75.0 [%]
NOTE	:



ENGINEER : Atsuyuki Morishima

[No]	FREQUENCY [MHz]	ANT.	READING [dBuV] Hori	READING [dBuV] Vert	FACTOR [dB/m] Hori	FACTOR [dB/m] Vert	EMISSION [dBuV/m] Hori	EMISSION [dBuV/m] Vert	LIMIT [dBuV/m]	MARGIN [dB] Hori	MARGIN [dB] Vert
1	86.40	BBA	22.5	22.0	-9.7	-9.7	12.8	12.3	40.0	27.2	27.7
2	193.85	BBA	24.3	22.4	-5.8	-5.8	18.5	16.6	43.5	25.0	26.9
3	387.70	BBA	20.1	20.1	0.8	0.8	20.9	20.9	46.0	25.1	25.1
4	581.55	BBA	21.1	21.2	5.3	5.3	26.4	26.5	46.0	19.6	19.5
5	775.40	BBA	20.4	20.5	9.3	9.3	29.7	29.8	46.0	16.3	**16.2**
6	969.25	BBA	19.5	19.5	13.0	13.0	32.5	32.5	54.0	21.5	21.5

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

emiT 3, 0, 0, 0

9.1.4 RX mode(155.000MHz) [1000 - 2000MHz]

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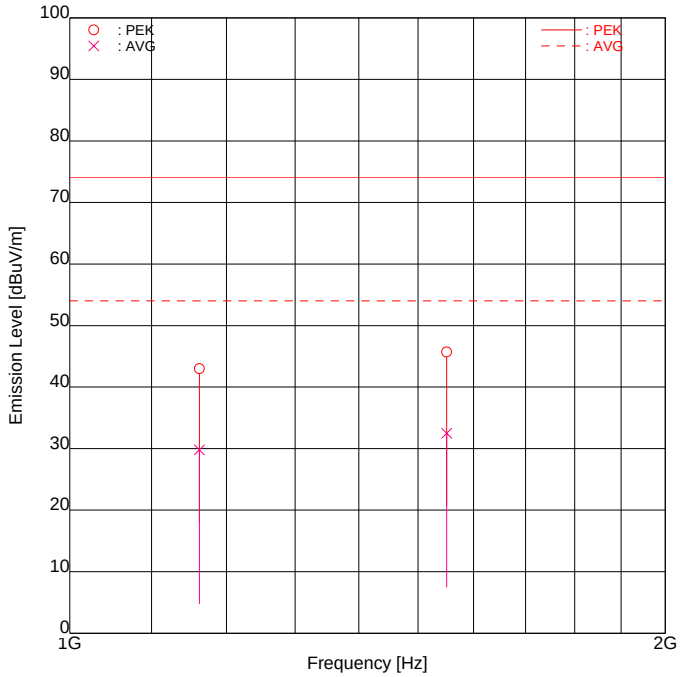
Tochigi No.2 Test Site

Radiated Electric Field

APPLICANT	: Kenwood Corporation
EUT NAME	: 144MHz FM TRANSCEIVER
MODEL NO.	: TH-K20A
SERIAL NO.	: 00000006
TEST MODE	: Rx mode (155.000MHz)
POWER SOURCE	: DC 7.5 V (Battery)
DATE TESTED	: Aug 23 2011
FILE NO.	: -
REGULATION	: FCC Part15B Class B
TEST METHOD	: ANSI C63.4-2003
DISTANCE	: 3.00 [m]
TEMPERATURE	: 21.0 [degC]
HUMIDITY	: 68.0 [%]
NOTE	:

ENGINEER : Atsuyuki Morishima



[No]	FREQUENCY [MHz]	MODE	READING [dBuV] Hori	READING [dBuV] Vert	FACTOR [dB] Hori	FACTOR [dB] Vert	EMISSION [dBuV/m] Hori	EMISSION [dBuV/m] Vert	LIMIT [dBuV/m]	MARGIN [dB] Hori	MARGIN [dB] Vert
1	1163.09	PEK	45.1	45.0	-2.1	-2.1	43.0	42.9	74.0	31.0	31.1
2	1163.09	AVG	31.8	31.9	-2.1	-2.1	29.7	29.8	54.0	24.3	24.2
3	1550.93	PEK	45.0	45.8	-0.1	-0.1	44.9	45.7	74.0	29.1	28.3
4	1550.93	AVG	31.8	32.6	-0.1	-0.1	31.7	32.5	54.0	22.3	**21.5**

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

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9.1.5 RX mode(173.995MHz) [30 - 1000MHz]

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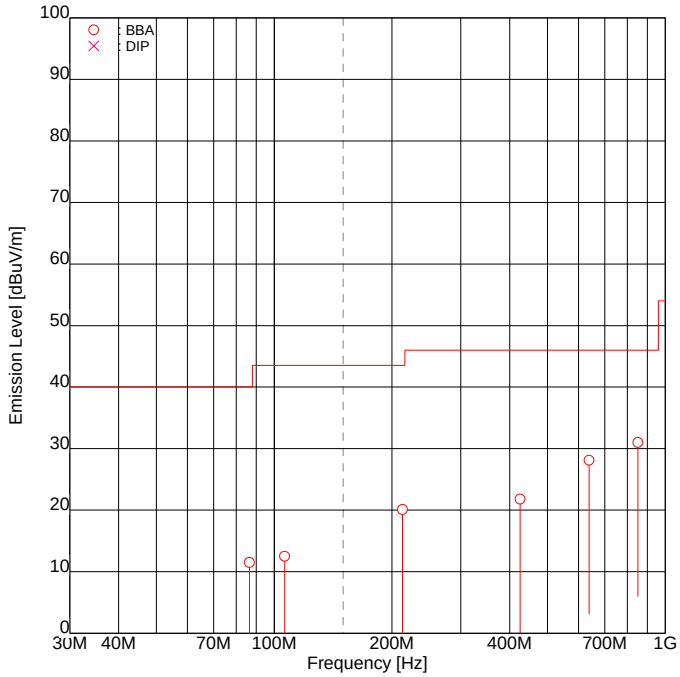
Tochigi No.2 Test Site

Radiated Electric Field

APPLICANT	: Kenwood Corporation
EUT NAME	: 144MHz FM TRANSCEIVER
MODEL NO.	: TH-K20A
SERIAL NO.	: 00000006
TEST MODE	: Rx mode(173.995MHz)
POWER SOURCE	: DC 7.5 V (Battery)
DATE TESTED	: Aug 22 2011
FILE NO.	: -
REGULATION	: FCC Part15B Class B
TEST METHOD	: ANSI C63.4-2003
DISTANCE	: 3.00 [m]
TEMPERATURE	: 21.0 [degC]
HUMIDITY	: 75.0 [%]
NOTE	:



ENGINEER : Atsuyuki Morishima

[No]	FREQUENCY [MHz]	ANT.	READING [dBuV] Hori	READING [dBuV] Vert	FACTOR [dB/m] Hori	FACTOR [dB/m] Vert	EMISSION [dBuV/m] Hori	EMISSION [dBuV/m] Vert	LIMIT [dBuV/m]	MARGIN [dB] Hori	MARGIN [dB] Vert
1	86.44	BBA	20.8	21.2	-9.7	-9.7	11.1	11.5	40.0	28.9	28.5
2	106.42	BBA	20.5	20.7	-8.2	-8.2	12.3	12.5	43.5	31.2	31.0
3	212.85	BBA	25.6	23.2	-5.5	-5.5	20.1	17.7	43.5	23.4	25.8
4	425.69	BBA	20.3	20.3	1.5	1.5	21.8	21.8	46.0	24.2	24.2
5	638.53	BBA	20.9	21.6	6.5	6.5	27.4	28.1	46.0	18.6	17.9
6	851.38	BBA	20.1	20.2	10.8	10.8	30.9	31.0	46.0	15.1	**15.0**

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

emiT 3, 0, 0, 0

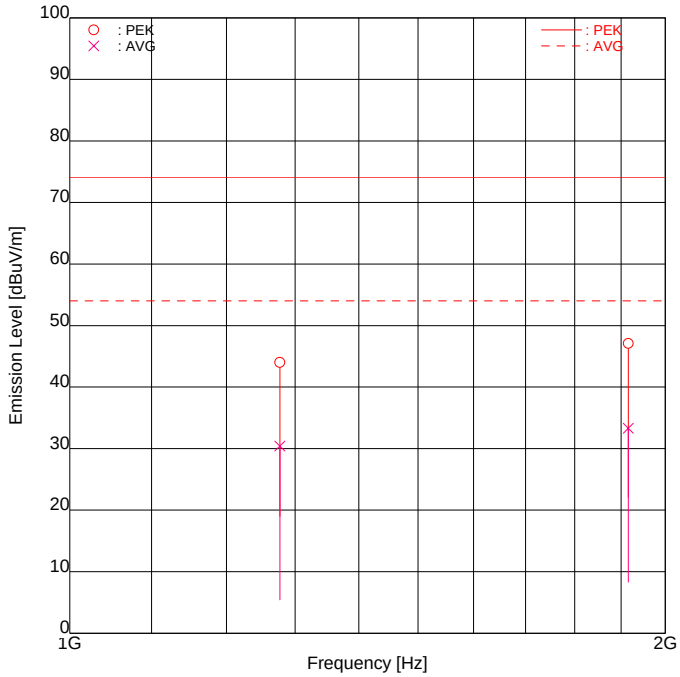
9.1.6 RX mode(173.995MHz) [1000 - 2000MHz]

Intertek Japan K.K.

Tochigi No.2 Test Site

Radiated Electric Field

APPLICANT	: Kenwood Corporation
EUT NAME	: 144MHz FM TRANSCEIVER
MODEL NO.	: TH-K20A
SERIAL NO.	: 00000006
TEST MODE	: Rx mode (173.995MHz)
POWER SOURCE	: DC 7.5 V (Battery)
DATE TESTED	: Aug 23 2011
FILE NO.	: -
REGULATION	: FCC Part15B Class B
TEST METHOD	: ANSI C63.4-2003
DISTANCE	: 3.00 [m]
TEMPERATURE	: 21.0 [degC]
HUMIDITY	: 68.0 [%]
NOTE	:



ENGINEER : Atsuyuki Morishima

[No]	FREQUENCY [MHz]	MODE	READING [dBuV] Hori	READING [dBuV] Vert	FACTOR [dB] Hori	FACTOR [dB] Vert	EMISSION [dBuV/m] Hori	EMISSION [dBuV/m] Vert	LIMIT [dBuV/m]	MARGIN [dB] Hori	MARGIN [dB] Vert
1	1277.07	PEK	45.2	45.5	-1.5	-1.5	43.7	44.0	74.0	30.3	30.0
2	1277.07	AVG	31.9	31.9	-1.5	-1.5	30.4	30.4	54.0	23.6	23.6
3	1915.70	PEK	44.3	45.2	1.9	1.9	46.2	47.1	74.0	27.8	26.9
4	1915.70	AVG	31.1	31.4	1.9	1.9	33.0	33.3	54.0	21.0	**20.7**

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

emiT 3, 0, 0, 0

9.1.7 VFO SCAN mode [30 - 1000MHz]

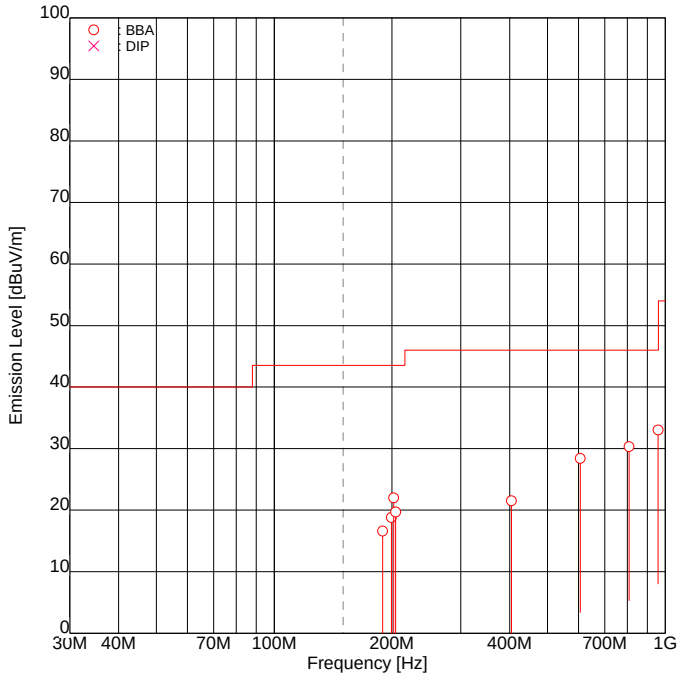
Intertek Japan K.K.

Tochigi No.2 Test Site

Radiated Electric Field

APPLICANT	: Kenwood Corporation
EUT NAME	: 144MHz FM TRANSCEIVER
MODEL NO.	: TH-K20A
SERIAL NO.	: 00000006
TEST MODE	: VFO SCAN mode
POWER SOURCE	: DC 7.5 V (Battery)
DATE TESTED	: Aug 22 2011
FILE NO.	: -
REGULATION	: FCC Part15B Class B
TEST METHOD	: ANSI C63.4-2003
DISTANCE	: 3.00 [m]
TEMPERATURE	: 21.0 [degC]
HUMIDITY	: 75.0 [%]
NOTE	:

ENGINEER : Atsuyuki Morishima



[No]	FREQUENCY [MHz]	ANT.	READING [dBuV] Hori	READING [dBuV] Vert	FACTOR [dB/m] Hori	FACTOR [dB/m] Vert	EMISSION [dBuV/m] Hori	EMISSION [dBuV/m] Vert	LIMIT [dBuV/m]	MARGIN [dB] Hori	MARGIN [dB] Vert
1	189.35	BBA	21.7	22.0	-5.4	-5.4	16.3	16.6	43.5	27.2	26.9
2	199.42	BBA	25.0	23.6	-6.2	-6.2	18.8	17.4	43.5	24.7	26.1
3	202.15	BBA	28.1	23.4	-6.1	-6.1	22.0	17.3	43.5	21.5	26.2
4	204.42	BBA	25.7	23.6	-6.0	-6.0	19.7	17.6	43.5	23.8	25.9
5	404.29	BBA	20.4	20.1	1.1	1.1	21.5	21.2	46.0	24.5	24.8
6	606.44	BBA	22.6	21.7	5.8	5.8	28.4	27.5	46.0	17.6	18.5
7	808.58	BBA	20.3	20.4	9.9	9.9	30.2	30.3	46.0	15.8	15.7
8	959.25	BBA	20.2	20.2	12.8	12.8	33.0	33.0	46.0	**13.0**	13.0

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

emiT 3, 0, 0, 0

9.1.8 VFO SCAN mode [1000 - 2000MHz]

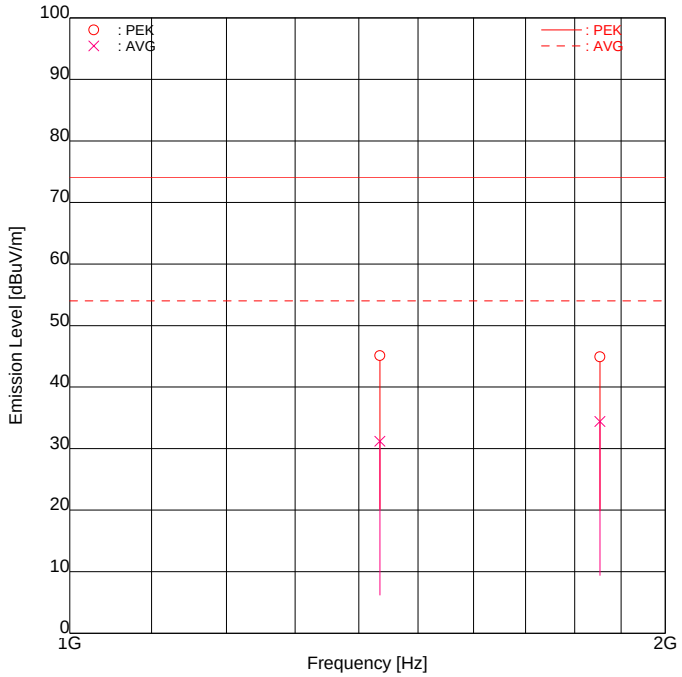
Intertek Japan K.K.

Tochigi No.2 Test Site

Radiated Electric Field

APPLICANT	: Kenwood Corporation
EUT NAME	: 144MHz FM TRANSCEIVER
MODEL NO.	: TH-K20A
SERIAL NO.	: 00000006
TEST MODE	: VFO SCAN mode
POWER SOURCE	: DC 7.5 V (Battery)
DATE TESTED	: Aug 24 2011
FILE NO.	: -
REGULATION	: FCC Part15B Class B
TEST METHOD	: ANSI C63.4-2003
DISTANCE	: 3.00 [m]
TEMPERATURE	: 23.0 [degC]
HUMIDITY	: 53.0 [%]
NOTE	:

ENGINEER : Atsuyuki Morishima



[No]	FREQUENCY [MHz]	MODE	READING [dBuV] Hori	READING [dBuV] Vert	FACTOR [dB] Hori	FACTOR [dB] Vert	EMISSION [dBuV/m] Hori	EMISSION [dBuV/m] Vert	LIMIT [dBuV/m]	MARGIN [dB] Hori	MARGIN [dB] Vert
1	1434.72	PEK	45.7	45.3	-0.6	-0.6	45.1	44.7	74.0	28.9	29.3
2	1434.72	AVG	31.8	31.7	-0.6	-0.6	31.2	31.1	54.0	22.8	22.9
3	1853.80	PEK	42.9	43.3	1.6	1.6	44.5	44.9	74.0	29.5	29.1
4	1853.80	AVG	32.5	32.8	1.6	1.6	34.1	34.4	54.0	19.9	**19.6**

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

emiT 3, 0, 0, 0

9.2 Conducted Power on Antenna Port (15.111)

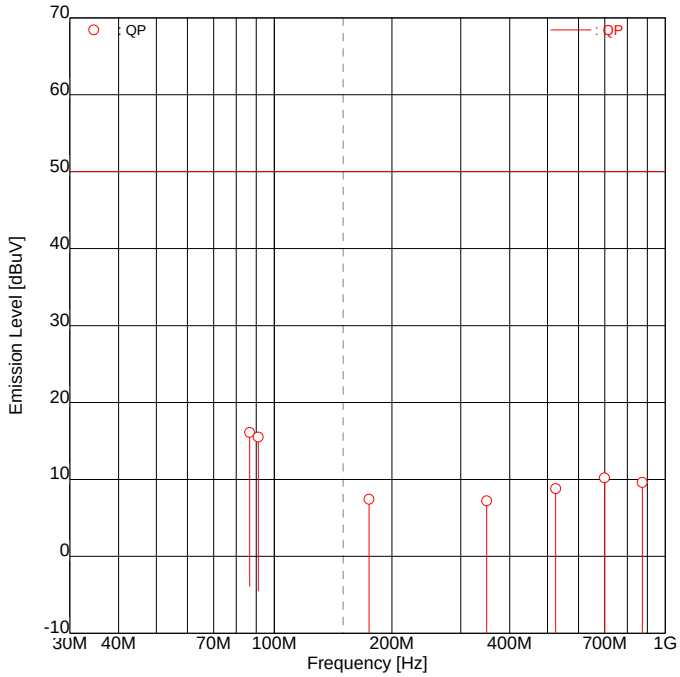
9.2.1 RX mode(136.000MHz) [30 – 1000MHz]

Intertek Japan K.K.

Tochigi No.2 Test Site

Conducted Power on Antenna Port

APPLICANT	: Kenwood Corporation
EUT NAME	: 144MHz FM TRANSCEIVER
MODEL NO.	: TH-K20A
SERIAL NO.	: 00000006
TEST MODE	: Rx mode(136.000MHz)
POWER SOURCE	: DC 7.5 V (Battery)
DATE TESTED	: Aug 17 2011
FILE NO.	: -
REGULATION	: FCC Part15B (15.111)
TEST METHOD	: ANSI C63.4-2003
TEMPERATURE	: 24.0 [degC]
HUMIDITY	: 47.0 [%]
NOTE	:



ENGINEER : Atsuyuki Morishima

[No]	FREQUENCY [MHz]	READING [dBuV]	FACTOR [dB]	EMISSION [dBuV]	LIMIT [dBuV]	MARGIN [dB]
1	86.5490	31.6	-15.5	16.1	50.0	**33.9**
2	91.0000	30.9	-15.4	15.5	50.0	34.5
3	174.8500	21.7	-14.3	7.4	50.0	42.6
4	349.7000	19.9	-12.7	7.2	50.0	42.8
5	524.5500	21.3	-12.5	8.8	50.0	41.2
6	699.4000	22.2	-12.0	10.2	50.0	39.8
7	874.2500	20.4	-10.8	9.6	50.0	40.4

Higher six points are underlined.
Other frequencies : Below the FCC Part15B (15.111) limit
Emisson Level = Read + Factor(Pad,Cable,Preamp)
Limt: 2nW = 50dBuV(50ohm impedance)

emiT 3, 0, 0, 0

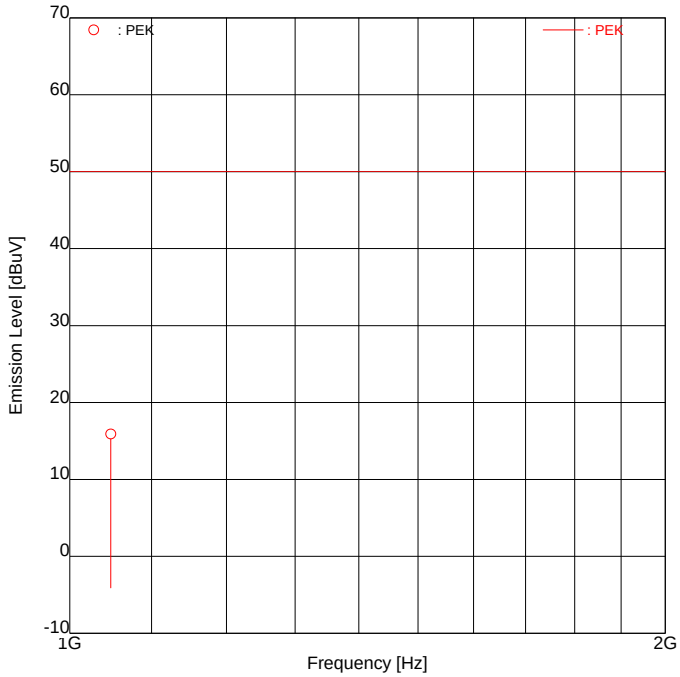
9.2.2 RX mode(136.000MHz) [1000– 2000MHz]

Intertek Japan K.K.

Tochigi No.2 Test Site

Conducted Power on Antenna Port

APPLICANT	: Kenwood Corporation
EUT NAME	: 144MHz FM TRANSCEIVER
MODEL NO.	: TH-K20A
SERIAL NO.	: 00000006
TEST MODE	: Rx mode(136.000MHz)
POWER SOURCE	: DC 7.5 V (Battery)
DATE TESTED	: Aug 18 2011
FILE NO.	: -
REGULATION	: FCC Part15B (15.111)
TEST METHOD	: ANSI C63.4-2003
TEMPERATURE	: 27.0 [degC]
HUMIDITY	: 46.0 [%]
NOTE	:



ENGINEER : Atsuyuki Morishima

[No]	FREQUENCY [MHz]	READING [dBuV]	FACTOR [dB]	EMISSION [dBuV]	LIMIT [dBuV]	MARGIN [dB]
1	1049.1000	46.3	-30.4	15.9	50.0	**34.1**

Higher six points are underlined.
Other frequencies : Below the FCC Part15B (15.111) limit
Emisson Level = Read + Factor(Pad,Cable,Preamp)
Limit: 2nW = 50dBuV(50ohm impedance)

emiT 3, 0, 0, 0

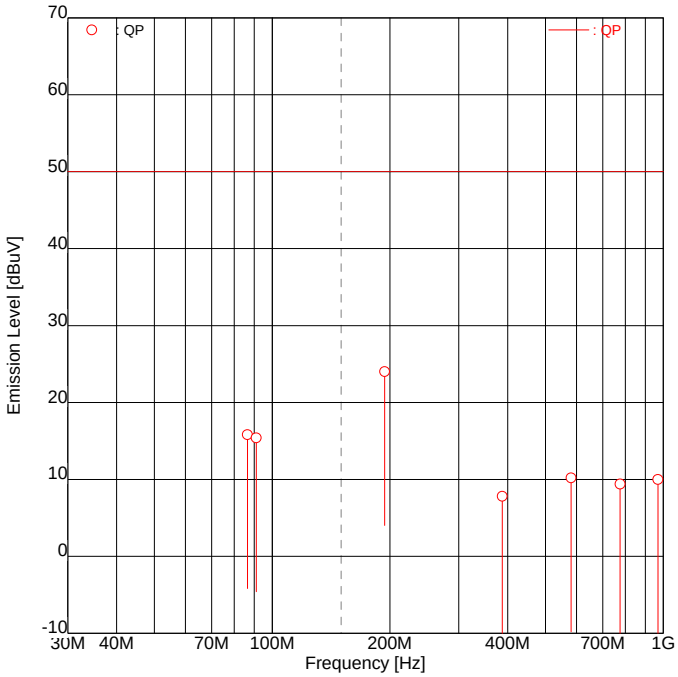
9.2.3 RX mode(155.000MHz) [30 – 1000MHz]

Intertek Japan K.K.

Tochigi No.2 Test Site

Conducted Power on Antenna Port

APPLICANT	: Kenwood Corporation
EUT NAME	: 144MHz FM TRANSCEIVER
MODEL NO.	: TH-K20A
SERIAL NO.	: 00000006
TEST MODE	: Rx mode(155.000MHz)
POWER SOURCE	: DC 7.5 V (Battery)
DATE TESTED	: Aug 17 2011
FILE NO.	: -
REGULATION	: FCC Part15B (15.111)
TEST METHOD	: ANSI C63.4-2003
TEMPERATURE	: 24.0 [degC]
HUMIDITY	: 47.0 [%]
NOTE	:



ENGINEER : Atsuyuki Morishima

[No]	FREQUENCY [MHz]	READING [dBuV]	FACTOR [dB]	EMISSION [dBuV]	LIMIT [dBuV]	MARGIN [dB]
1	86.4000	31.3	-15.5	15.8	50.0	34.2
2	91.0000	30.8	-15.4	15.4	50.0	34.6
3	193.8500	38.0	-14.0	24.0	50.0	**26.0**
4	387.7000	20.4	-12.6	7.8	50.0	42.2
5	581.5500	22.5	-12.3	10.2	50.0	39.8
6	775.4000	20.8	-11.4	9.4	50.0	40.6
7	969.2500	20.0	-10.0	10.0	50.0	40.0

Higher six points are underlined.
Other frequencies : Below the FCC Part15B (15.111) limit
Emisson Level = Read + Factor(Pad,Cable,Preamp)
Limt: 2nW = 50dBuV(50ohm impedance)

emiT 3, 0, 0, 0

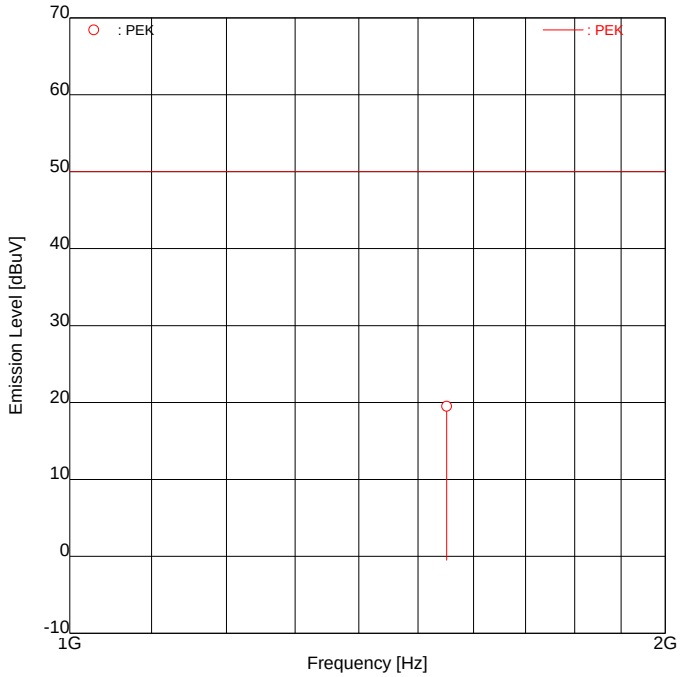
9.2.4 RX mode(155.000MHz) [1000 – 2000MHz]

Intertek Japan K.K.

Tochigi No.2 Test Site

Conducted Power on Antenna Port

APPLICANT	: Kenwood Corporation
EUT NAME	: 144MHz FM TRANSCEIVER
MODEL NO.	: TH-K20A
SERIAL NO.	: 00000006
TEST MODE	: Rx mode(155.000MHz)
POWER SOURCE	: DC 7.5 V (Battery)
DATE TESTED	: Aug 18 2011
FILE NO.	: -
REGULATION	: FCC Part15B (15.111)
TEST METHOD	: ANSI C63.4-2003
TEMPERATURE	: 27.0 [degC]
HUMIDITY	: 46.0 [%]
NOTE	:



ENGINEER : Atsuyuki Morishima

[No]	FREQUENCY [MHz]	READING [dBuV]	FACTOR [dB]	EMISSION [dBuV]	LIMIT [dBuV]	MARGIN [dB]
1	1550.8000	48.7	-29.2	19.5	50.0	**30.5**

Higher six points are underlined.
Other frequencies : Below the FCC Part15B (15.111) limit
Emisson Level = Read + Factor(Pad,Cable,Preamp)
Limit: 2nW = 50dBuV(50ohm impedance)

emiT 3, 0, 0, 0

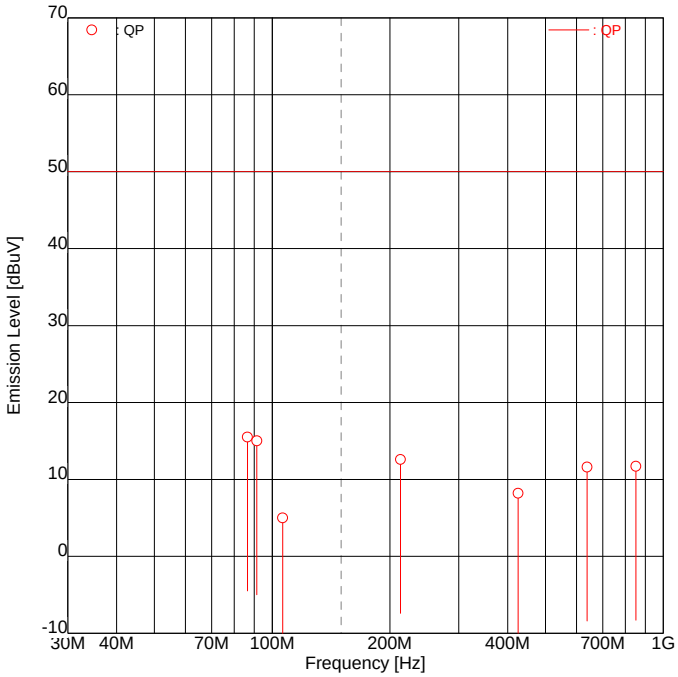
9.2.5 RX mode(173.995MHz) [30 – 1000MHz]

Intertek Japan K.K.

Tochigi No.2 Test Site

Conducted Power on Antenna Port

APPLICANT	: Kenwood Corporation
EUT NAME	: 144MHz FM TRANSCEIVER
MODEL NO.	: TH-K20A
SERIAL NO.	: 00000006
TEST MODE	: Rx mode(173.995MHz)
POWER SOURCE	: DC 7.5 V (Battery)
DATE TESTED	: Aug 17 2011
FILE NO.	: -
REGULATION	: FCC Part15B (15.111)
TEST METHOD	: ANSI C63.4-2003
TEMPERATURE	: 24.0 [degC]
HUMIDITY	: 47.0 [%]
NOTE	:



ENGINEER : Atsuyuki Morishima

[No]	FREQUENCY [MHz]	READING [dBuV]	FACTOR [dB]	EMISSION [dBuV]	LIMIT [dBuV]	MARGIN [dB]
1	86.4400	31.0	-15.5	15.5	50.0	**34.5**
2	91.4200	30.4	-15.4	15.0	50.0	35.0
3	106.4225	20.2	-15.2	5.0	50.0	45.0
4	212.8450	26.3	-13.7	12.6	50.0	37.4
5	425.6900	20.6	-12.4	8.2	50.0	41.8
6	638.5350	23.8	-12.2	11.6	50.0	38.4
7	851.3800	22.6	-10.9	11.7	50.0	38.3

Higher six points are underlined.
Other frequencies : Below the FCC Part15B (15.111) limit
Emisson Level = Read + Factor(Pad,Cable,Preamp)
Limt: 2nW = 50dBuV(50ohm impedance)

emiT 3, 0, 0, 0

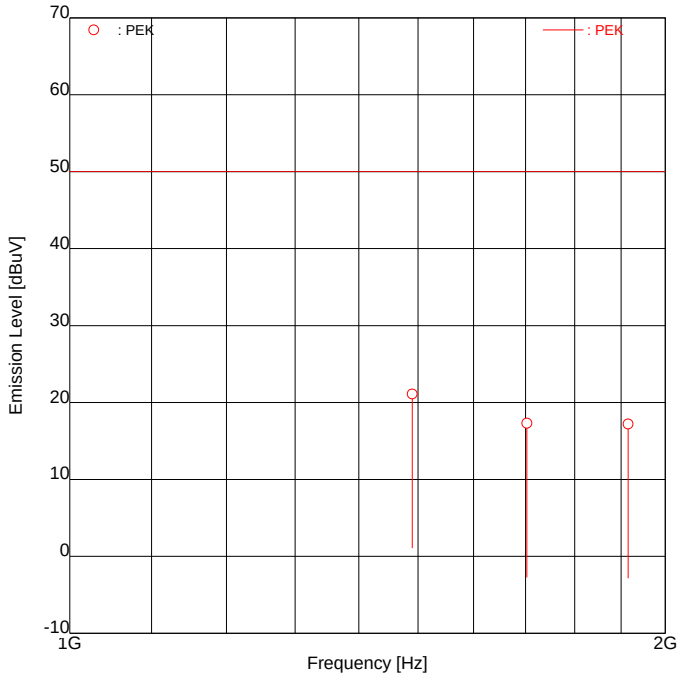
9.2.6 RX mode(173.995MHz) [1000 – 2000MHz]

Intertek Japan K.K.

Tochigi No.2 Test Site

Conducted Power on Antenna Port

APPLICANT	: Kenwood Corporation
EUT NAME	: 144MHz FM TRANSCEIVER
MODEL NO.	: TH-K20A
SERIAL NO.	: 00000006
TEST MODE	: Rx mode(173.995MHz)
POWER SOURCE	: DC 7.5 V (Battery)
DATE TESTED	: Aug 18 2011
FILE NO.	: -
REGULATION	: FCC Part15B (15.111)
TEST METHOD	: ANSI C63.4-2003
TEMPERATURE	: 27.0 [degC]
HUMIDITY	: 46.0 [%]
NOTE	:



ENGINEER : Atsuyuki Morishima

[No]	FREQUENCY [MHz]	READING [dBuV]	FACTOR [dB]	EMISSION [dBuV]	LIMIT [dBuV]	MARGIN [dB]
1	1489.9150	50.5	-29.4	21.1	50.0	**28.9**
2	1702.7600	46.3	-29.0	17.3	50.0	32.7
3	1915.6050	45.8	-28.6	17.2	50.0	32.8

Higher six points are underlined.
Other frequencies : Below the FCC Part15B (15.111) limit
Emisson Level = Read + Factor(Pad,Cable,Preamp)
Limit: 2nW = 50dBuV(50ohm impedance)

emiT 3, 0, 0, 0

9.2.7 VFO SCAN mode [30 – 1000MHz]

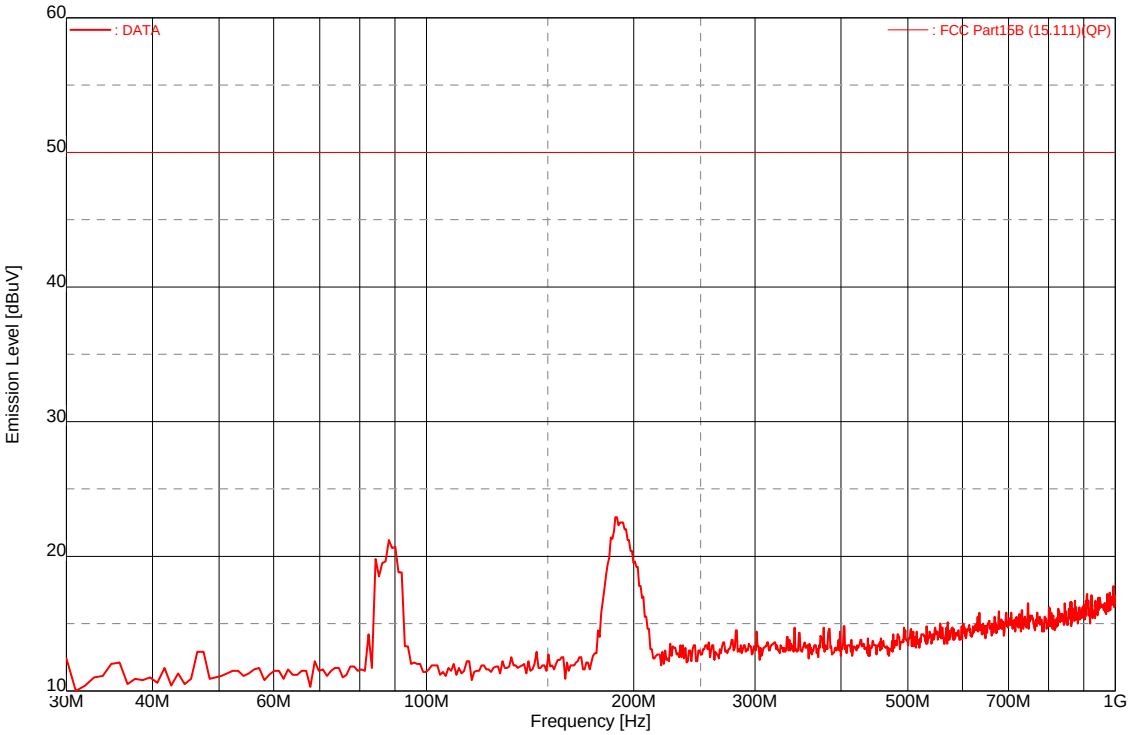
< Graph number #4 >

SPECTRUM ANALYSIS

Tochigi No.2 Test Site

27.0 degC /45.0%

Date tested	: Aug 18 2011	Test mode	: VFO SCAN mode
Company	: Kenwood Corporation	Power source	: DC 7.5 V (Battery)
EUT Name	: 144MHz FM TRANSCEIVER	File number	: -
Model number	: TH-K20A	Engineer	: Atsuyuki Morishima
Serial number	: 00000006	Note	:



Frequency [MHz]	Reading [dBuV]	Factor [dB]	Emission [dBuV]	Limit [dBuV]	Margin [dB]
86.60	31.0	-15.1	15.9	50.0	34.1
90.69	30.9	-15.0	15.9	50.0	34.1
188.90	37.5	-13.7	23.8	50.0	26.2
190.87	38.2	-13.7	24.5	50.0	25.5
195.87	36.5	-13.6	22.9	50.0	27.1
631.90	24.2	-12.1	12.1	50.0	37.9

Higher six points are underlined.
Other frequencies : Below the FCC Part15B (15.111) limit
Emission Level = Read + Factor (Pad, Cable, Preamp)
Limit : 2nW = 50dBuV (50ohm impedance)

9.2.8 VFO SCAN mode [1000 – 2000MHz]

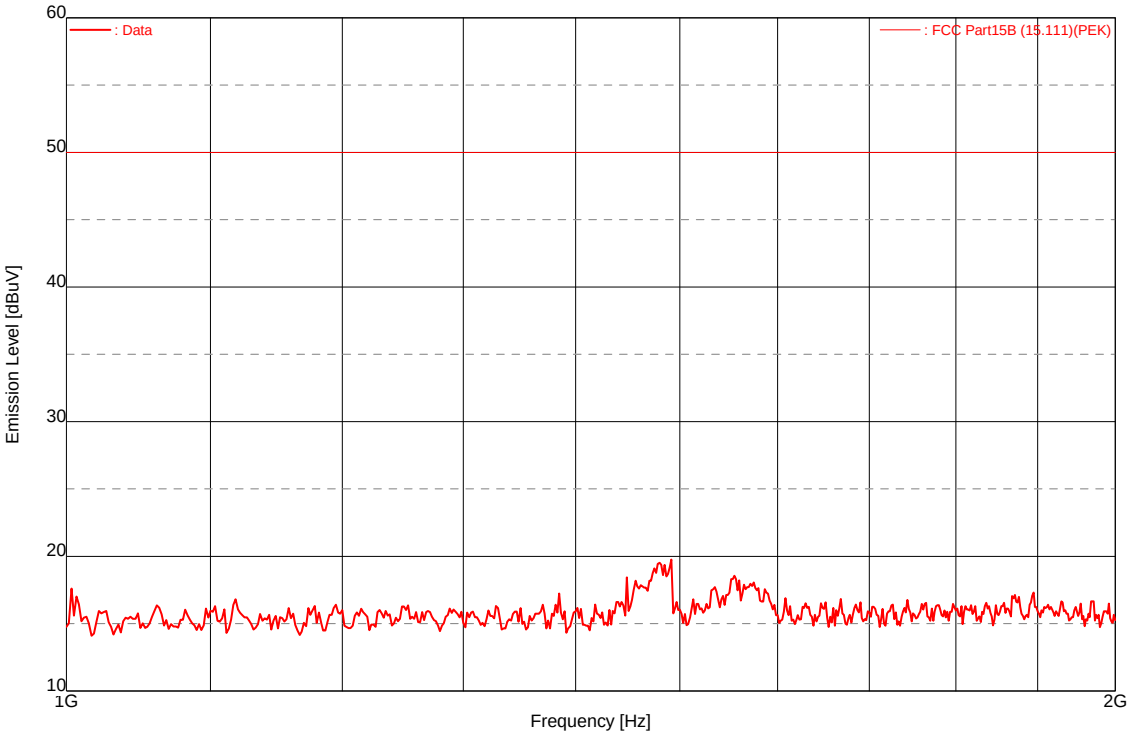
< Graph number #7 >

SPECTRUM ANALYSIS

Tochigi No.2 Test Site

27.0degC /46.0%

Date tested	: Aug 18 2011	Test mode	: VFO SCAN mode
Company	: Kenwood Corporation	Power source	: DC 7.5 V (Battery)
EUT Name	: 144MHz FM TRANSCEIVER	File number	: -
Model number	: TH-K20A	Engineer	: Atsuyuki Morishima
Serial number	: 00000006	Note	:



Frequency [MHz]	Reading [dBuV]	Factor [dB]	Emission [dBuV]	Limit [dBuV]	Margin [dB]
1476.920	51.0	-29.4	21.6	50.0	28.4
1546.983	48.9	-29.2	19.7	50.0	30.3

Higher six points are underlined.
Other frequencies : Below the FCC Part15B (15.111) limit
Emission Level = Read + Factor (Pad, Cable, Preamp)
Limit : 2nW = 50dBuV (50ohm impedance)

9.4 38dB Rejection Test (15.121(b))

9.4.1 VFO SCAN mode(136 – 174MHz)

Location	:	Tochigi No.2Test Site
Date Tested	:	August 24, 2011
Temperature	:	21 [degC]
Humidity	:	47 [%]
Engineer	:	Atsuyuki Morishima

Injected Frequency [MHz]	Detected Frequency [MHz]	12dB SINAD Reading Injected Frequency [dBm]	12dB SINAD Reading Detected Frequency	Rejection Level [dB]	Margin [dB]
824.040	No Point Detected	N / A	N / A	N / A	N / A
836.505	No Point Detected	N / A	N / A	N / A	N / A
848.970	No Point Detected	N / A	N / A	N / A	N / A
869.040	No Point Detected	N / A	N / A	N / A	N / A
881.505	No Point Detected	N / A	N / A	N / A	N / A
893.970	No Point Detected	N / A	N / A	N / A	N / A

SG Input Level = 66dBuV
SG Reference Level = -16.0dBuV (the worst case sensitivity)

SECTION 10. 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
Radiated disturbance					
Broad Band antenna	VULB9168	218	Schwarzbeck	1 Y	Mar., 2012
6dB Attenuator	CFA-01(NPJ-6)	None	TAMAGAWA	1 Y	May, 2012
Step Attenuator	8494B	2805A14563	Hewlett Packard	1 Y	May, 2012
Amplifier	8447D	2944A06342	Hewlett Packard	1 Y	May, 2012
Double ridged antenna	3115	9903-5699	EMCO	1 Y	May, 2012
6dB Attenuator	8493C	75550	Agilent	1 Y	Apr., 2012
Amplifier	8449B	3008A01182	Hewlett Packard	1 Y	Apr., 2012
Spectrum analyzer	8563E (Firmware Revision 971024)	3821A09565	Hewlett Packard	1 Y	May, 2012
Coaxial cable(R1)	5D-2W(10.0 m)	2R1001a	Intertek	1 Y	May, 2012
Coaxial cable(R2)	RG-177/U(20.0 m)	2R1002	Intertek	1 Y	May, 2012
Coaxial cable(R3)	RG-5A/U(1.3 m)	2R1003	Intertek	1 Y	May, 2012
Coaxial cable(R4)	RG-5A/U(0.2 m)	2R1004	Intertek	1 Y	May, 2012
Coaxial cable(R5)	5D-2W(0.7 m)	2R1005	Intertek	1 Y	May, 2012
Coaxial cable(R6)	5D-2W(0.2 m)	2R1006	Intertek	1 Y	May, 2012
Coaxial cable(R7)	5D-2W(1.7 m)	2R1007	Intertek	1 Y	May, 2012
Coaxial cable(R8)	5D-2W(6.0 m)	2R1008a	Intertek	1 Y	May, 2012
Coaxial cable(RG1)	SUCOFLEX(1.5 m)	290799/4	SUHNER	1 Y	Apr., 2012
Coaxial cable(RG2)	SUCOFLEX(6.0 m)	290800/4	SUHNER	1 Y	Apr., 2012
Site Attenuation				1 Y	Aug., 2011
Test receiver	ESS (Firmware Version 1.07)	842886/013	Rohde & Schwarz	1 Y	Jan., 2012
RF Switch	ACX-150	None(F02301501)	Intertek	1 Y	May, 2012
Testing Software	emiT (Version 3,0,0,0)				

Instrument	Model No.	Serial No.	Manufacturer	Cal. Interval	Effective period
Conducted Power on Antenna Port					
Step Attenuator	8494B	2805A14563	Hewlett Packard	1 Y	May, 2012
Amplifier	8447D	2944A06342	Hewlett Packard	1 Y	May, 2012
10dB Attenuator	CFA-05NPJ-10	262856	TAMAGAWA	1Y	Oct., 2011
Coaxial cable(R4)	RG-5A/U(0.2 m)	2R1004	Intertek	1 Y	May, 2012
Coaxial cable(R5)	5D-2W(0.7 m)	2R1005	Intertek	1 Y	May, 2012
Coaxial cable(R6)	5D-2W(0.2 m)	2R1006	Intertek	1 Y	May, 2012
Coaxial cable(R7)	5D-2W(1.7 m)	2R1007	Intertek	1 Y	May, 2012
Coaxial cable(C001a)	5D-2W(18.0m)	C001a	Intertek	1Y	Aug., 2011
RF Switch	ACX-150	None(F02301501)	Intertek	1 Y	May, 2012
Test receiver	ESS (Firmware Version 1.07)	842886/013	Rohde & Schwarz	1 Y	Jan., 2012
Amplifier	8449B	3008A01182	Hewlett Packard	1 Y	Apr., 2012
Coaxial cable(RG1)	SUCOFLEX(1.5 m)	290799/4	SUHNER	1 Y	Apr., 2012
Coaxial cable(RG2)	SUCOFLEX(6.0 m)	290800/4	SUHNER	1 Y	Apr., 2012
3dB Attenuator	8493C	07818	Hewlett Packard	1Y	Apr., 2012
Spectrum analyzer	8563E (Firmware Revision 971024)	3821A09565	Hewlett Packard	1 Y	May, 2012
Testing Software	emiT (Version 3,0,0,0)				
38dB Rejection					
Audio analyzer	8903B	2948A07326	Hewlett Packard	1 Y	Mar., 2012
Signal Generator	SMT03	1039.2000.03	ROHDE & SCHWARZ	1 Y	Aug., 2011
Coaxial cable(1m)	SUCOFLEX104	142854/4	SUHNER	1 Y	Jun., 2012

ANNEX

A. TEST PROCEDURE(S)

Test was carried out under the following conditions.

Radiated disturbance

Test setup as per standard

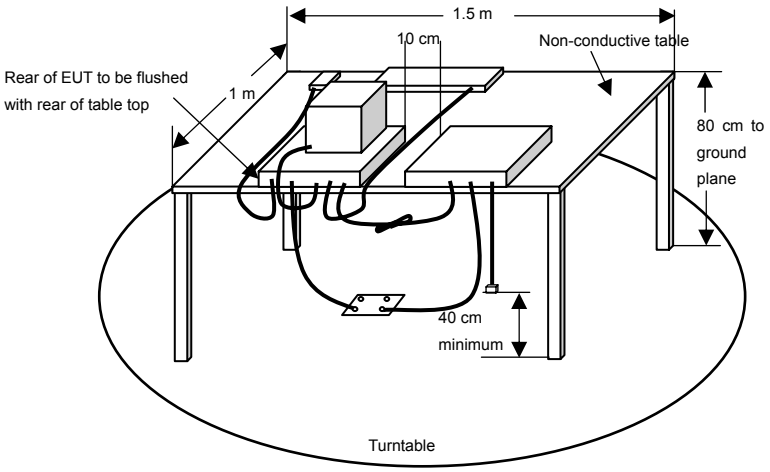
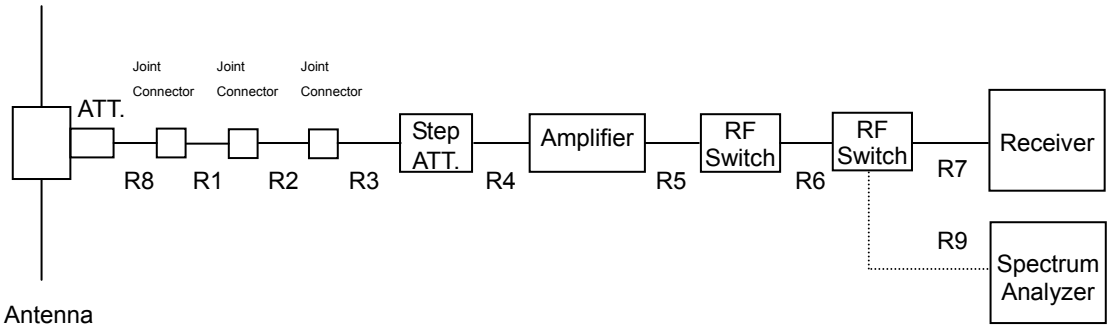
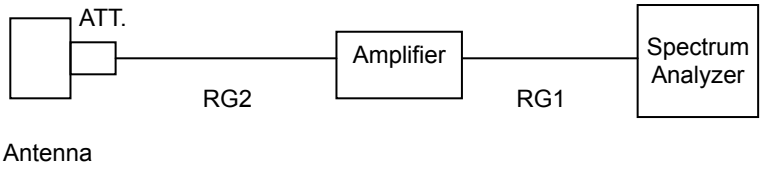


Diagram of the measuring instruments (30 – 1000 MHz)



Above 1GHz

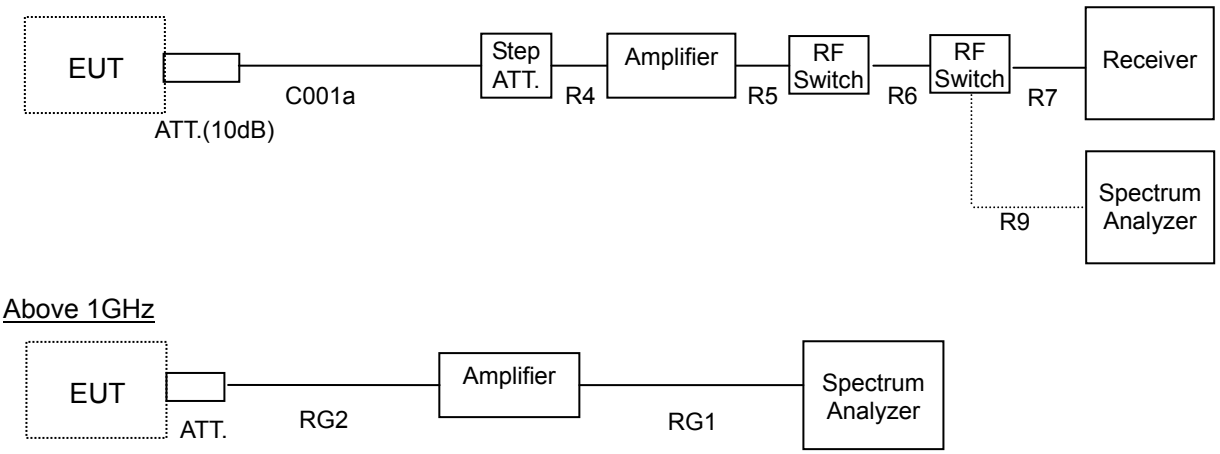


[Preliminary Measurement]
EUT is tested on all operating conditions.
The spectrum analyzer is set max-hold mode and swept during turntable was rotated 0 to 360 degree,
And find the worst emission conditions in configuration, operating mode, or ambient noise notation.

[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.

Conducted Power on Antenna port (15.111)

Schema for the conducted power on antenna port measurement



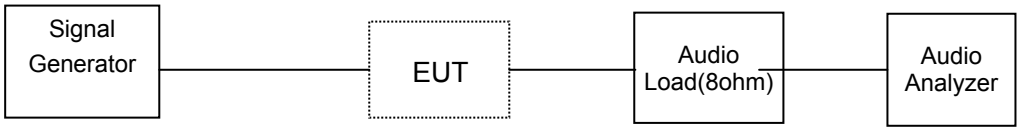
Above 1GHz

[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 are plotted out to find the worst emission conditions in operating mode and/or configuration decision for the final test.

[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 by the test receiver (quasi-peak) and spectrum analyzer (peak).

38dB Rejection

Schema for the 38dB rejection measurement



[Preliminary Measurement]

The Signal Genarator conditions :
Output level = 66 dBuV.
Modulation = Frequency modulated to 1 kHz tone at 3 kHz peak deviation.
Frequency Points = 824.040 MHz, 836.505 MHz, 848.970 MHz
869.040 MHz, 881.505 MHz, 893.970 MHz
(The Cellular Radiotelephone Service mobile and base frequency bands)
The EUT condition :
Scanning Frequency = 136MHz – 174MHz (5 kHz Step)
Scan stopped point, was the detected frequency.

[Final Measurement]

Injected 12dB SINAD Reading (SG RF Output)
The EUT condition :
Frequency = Scan stopped point
The Signal Genarator condition :
Frequency = Cellular point
Detected 12dB SINAD Reading (SG RF Output)
The EUT condition :
Frequency = Scan stopped point
The Signal Genarator condition :
Frequency = Scan stopped point
Under the requirements of Section15.121(b) of the Rule.
Injected 12dB SINAD Reading – Detected 12dB SINAD Reading = 38 dB or more.