



TEST REPORT

REGULATION :

FCC Part 2, 90, 90.210

RSS-119 Issue 9

Applicant	Testing Laboratory
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Equipment type	VHF DIGITAL BASE-REPEATER
Trademark	KENWOOD
Models)	NXR-710-K
Serial No.	None
FCC ID	K44422300
IC CONN and PUNY	282F-422300
Test Result	Complied
Report Number	JT10030003
Report issue date	March 25, 2010

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Approved by

Kazuo Gokita

[Site Manager]

Tested by

Atsuyuki Morishima

In Accordance with FCC Rules and Regulations, Volume II, Part 2 and 90**Sub-part 2.1033**

(c)(1) Applicant and Manufacture Information	
APPLICANT	
Company	: Kenwood Corporation
Address	: 1-16-2, Hakusan, Midori-ku, Yokohama-shi, Kanagawa, 226-8525 Japan
Contact Person	: Tamaki Shimamura Manager, Communications Equipment Division
MANUFACTURER	
Company	: Kenwood Corporation
Address	: 1-16-2, Hakusan, Midori-ku, Yokohama-shi, Kanagawa, 226-8525 Japan
(c)(2) FCC ID	
FCC ID	: K44422300
Model number	: NXR-710-K
Serial number	: None
(c)(3) Instruction Manual(S)	
Instruction manual(s)	: Please refer to attached Exhibits F
(c)(4) Type of Emission	
Emission Designation	: 16K0F3E(Wide) /11K0F3E(Narrow) 8K30F1E(Narrow) / 8K30F1D(Narrow) / 8K30F7W(Narrow) 4K00F1E(Very Narrow) / 4K00F1D(Very Narrow) / 4K00F7W(Very Narrow) 4K00F2D(Very Narrow)
(c)(5) Frequency range	
Frequency Range	: 150 to 174 MHz(FCC), 138 to 144 MHz and 148 to 174 MHz(RSS)
(c)(6) Power Rating	
Output Power	: 5 to 50 W
Type	: Continuously Variable
(c)(7) Maximum Power Rating	
Output Power	: 50 W
(c)(8): Voltages & currents in all elements in final RF stage, including final transistor or solid-state device	
Collector Current, A	: 13.0 amps (Maximum)
Collector Voltage, Vdc	: 13.6 vdc
Supply Voltage, Vdc	: 13.6 vdc
Other Information	
Number of Channel	: 30
Maximum Deviation	: 5 kHz / 2.5kHz
Frequency Stability	: 1.0 ppm
Antenna Impedance	: 50 Ω Norminal
Note	

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SECTION 1. GENERAL INFORMATION**TEST PERFORMED**

Location	Tochigi No.2 Test Site
EUT Received	March 06, 2010
Date of Test	March 08, 2010 to March 17, 2010
Standard Applied	FCC Part 2, 90, 90.210 RSS-119 Issue 9
Measurement Method	ANSI/TIA-603-C-2004 / RSS-119 Issue 9(2007), RSS-Gen Issue 2(2007)
Deviation from Standard(s)	Not applicable

QUALIFICATIONS OF TESTING LABORATORY (Tochigi Lab.)

ACCREDITATION	SCOPE	LAB. CODE	Remarks
VLAC	EMC Testing	VLAC-008-5	JAPAN
BMSI	EMC Testing	SL-2-IN-E-6017, SL2-AI-E-6017	TAIWAN
FILING			
VCCI	EMC Testing	R-257, C-260, C-284, T-1763, 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	IC-2042P-1, IC-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	4LEVEL FSK	4LEVEL Frequency Shift Key
GMSK	Gaussian Maximum Shift Key	CW ID	Continuously Repeating bit stream
FM	Frequency Modulation	C4FM	Constant envelope 4 Level FM
PTT	Push to Talk	AFC	Automatic frequency control

SECTION 2. SUMMARY OF TEST RESULT

FCC Part2	Part90	IC RSS-119	TEST ITEM	RESULTS
2.1046 (a)	-	5.4	Carrier Output Power (Conducted)	PASS
2.1051	90.210	5.8	Unwanted Emissions (Transmitter Conducted)	PASS
2.1053 (a)	90.210	5.8	Field Strength of Spurious Radiation	PASS
2.1049 (c) (1)	90.210	5.8	Emission Masks (Occupied Bandwidth)	PASS

Limitation on Results

The test result of this report is effective equipment under test itself and under the test configuration described on the report.

This test report does not assure that whether the test result taken in other testing laboratory is compatible or reproducible to the test result on this report or not.

SECTION 3. TEST AND MEASUREMENT DATA

All test and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-part J and Industry Canada as the following individual parts:

FCC Rule	Test Item	Tested
Part 21	Domestic Public Fixed radio Services	N.A.
Part 22	Non Cellular	N.A.
Part 22	Public Mobile Services	N.A.
Part 22	Subpart H - Cellular Radiotelephone Service	N.A.
Part 22	Alternative technologies and auxiliary service	N.A.
Part 23	International Fixed Public Radiocommunication service	N.A.
Part 24	Personal Communications Services	N.A.
Part 74	Experimental Radio Auxiliary , Special Broadcast and Other Program Distributional Services	N.A.
Part 80	Stations in the Maritime Services	N.A.
Part 80	Subpart E - general Technical Standards	N.A.
Part 80	Subpart F - Equipment Authorization for Compulsory Ships	N.A.
Part 80	Subpart K - Private Coast Stations and Marine Utility Stations	N.A.
Part 80	Subpart S - Compulsory radiotelephone Installations for Small Passenger Boats	N.A.
Part 80	Subpart T - Radiotelephone Installation Required for Vessels on the Great Lakes	N.A.
Part 80	Subpart U - Radiotelephone Installations Required by the Bridge-to- Bridge Act	N.A.
Part 80	Subpart V - Emergency Position Indicating Radiobeacons (EPIRB'S)	N.A.
Part 80	Subpart W - Global Maritime Distress and Safety System (GMDSS)	N.A.
Part 80	Subpart X - Voluntary Radio Installations	N.A.
Part 87	Aviation Services	N.A.
Part 90	Private Land Mobile radio Services	YES
Part 94	Private Operational - Fixed Microwave Service	N.A.
Part 95	Subpart A - General Mobile radio Service	N.A.
Part 95	Subpart C - Radio Control (R/C) radio Service	N.A.
Part 95	Subpart D - Citizens Band (CB) Radio Service	N.A.
Part 95	Subpart E -Family radio Service	N.A.
Part 95	Subpart F -Interactive Video and Data Service (IVDS)	N.A.
Part 97	Amateur Radio Service	N.A.
Part 101	Fixed Microwave Service	N.A.

IC Rule	Test Item	Tested
RSS-119	Land Mobile and Fixed Radio Transmitters and Receivers	YES
RSS-Gen	General Requirements and Information for the Certification of Radiocommunication Equipment	YES

SECTION 4. INFORMATION ABOUT EUT AND SUPPORT EQUIPMENT(S)**4.1 List of System Configuration**

Symbol	Item	Model No.	Serial No.	Manufacture	Remarks
A	VHF DIGITAL BASE-REPEATER	NXR-710-K	None	KENWOOD	EUT
Power Ratings of EUT :		DC 13.6 V (DC 10.8 to 15.6 V)		13.0 A Maximum	
Power Supply :		DC 13.6 V +/- 15 %			
Condition of Equipment		Proto type			
Type		Rack Mount type			
Suppression Devices		No Modifications by the laboratory were made to the device			

4.2 Port(s)/Connector(s)

Port Name	Connector Type	Connector Pin	Remarks
RX IN	BNC	2 pin	
Microphone	RJ-45	8 pin	
Control I/O	D-sub	25 pin	
TX OUT	N	2 pin	
TEST / SPKR	MOLEX 1625-15p	15 pin	
N SYNC 1	RJ-11	4 pin	
N SYNC 2	RJ-11	4 pin	
DC 13.6V	JST VLR-02V	2 pin	
REF IN (for Serviceman use only)	BNC	2 pin	

4.3 Highest Frequency Oscillator(s)/Crystal(s)

Base Clock	Operating Frequency	Board Name	Remarks
233 MHz	233 MHz	TXRX Unit	

SECTION 5. SUPPORT EQUIPMENT

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

Symbol	Item	Model No.	Serial No.	Manufacture	FCC ID
B	Dummy Load	None	None	STACK	N/A
C	Microphone	KMC-35	None	KENWOOD	N/A
D	Controller	None	None	None	N/A
E	DC Power Supply	GZV4000	90290932	Daiichi Denpa Kogyo	N/A
F	DC Power Supply	GZV4000	90290931	Daiichi Denpa Kogyo	N/A
G	Dummy Load	CT-150NP	1138693	TME	N/A
H	External Speaker	KES-5	None	KENWOOD	N/A
I	BASE REPEATER	NXR-810-K2	None	KENWOOD	N/A
Supplied Power:					
E, F	AC	100V,60Hz			

SECTION 6. USED CABLE(S)

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

No.	Name	Length (m)	Shield	Connector	Ferrite core
1	Microphone Cable	0.60	No	Plastic	
2	D-sub Cable	1.20	No	Plastic	
3	Coaxial Cable	0.90	Yes	Metal	
4	Speaker Cable	2.80	No	Plastic	
5	Modular Cable	0.18	No	Plastic	
6	Modular Cable	0.18	No	Plastic	
7	Power Cable (DC) for EUT	4.00	No	Plastic	Removable
8	Power Cable (DC) for (I)	4.00	No	Plastic	Removable
9	Power Cable for DC Power Supply	1.80	No	-	
10	Power Cable for DC Power Supply	1.80	No	-	

SECTION 7. TEST CONFIGURATION

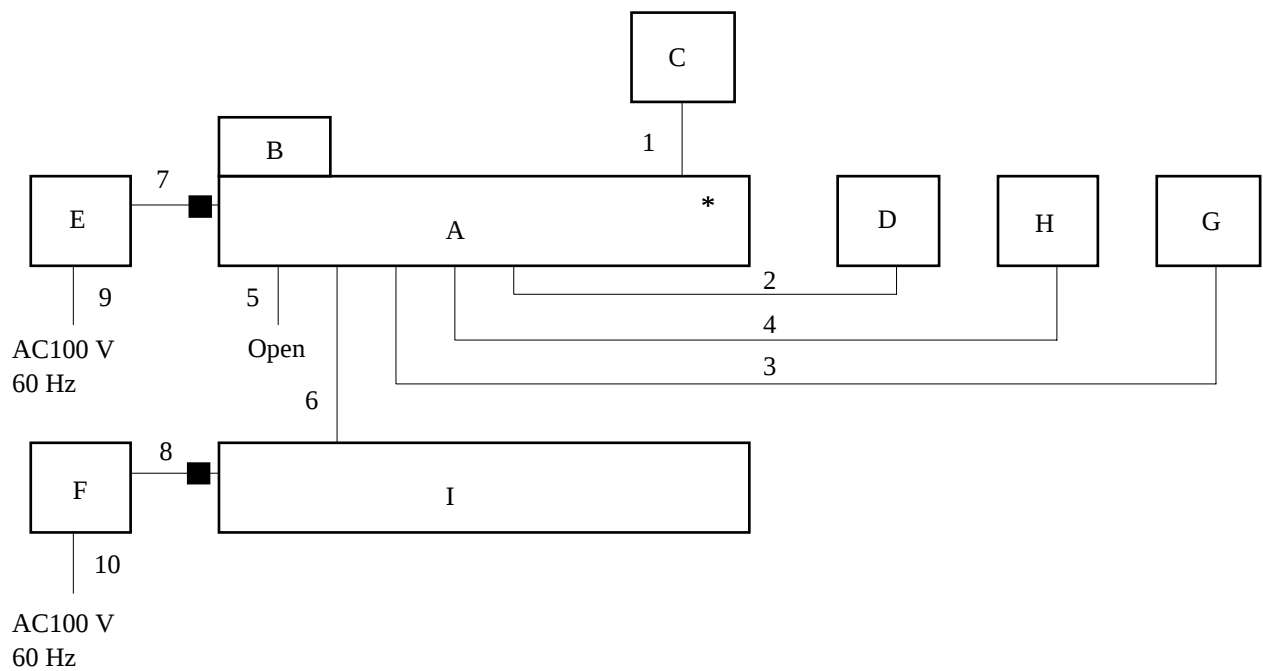
Details of Configuration and Connection

Example: Case of Section 10.3 Test

* : EUT

□ : Joint Connector

■ : Ferrite core



SECTION 8. OPERATING CONDITION

The EUT was operated under the following condition during the test.

8.1 Operating Condition

The test was carried out under Transmit mode.

(Frequency(FCC):[Low Band]150.10MHz, [Middle Band]162.10MHz,[High Band] 173.90MHz)

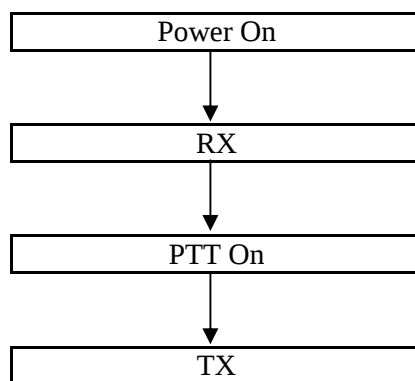
(Frequency(RSS):[Low Band]138.10MHz, [Middle Band]158.10MHz, [High Band]173.90MHz)

(Output Power:[Low power] 5W)

EUT was examined in the operating conditions that had maximum emissions.

8.2 Operating Flow [Transmit mode]

Following operations were performed continuously.



SECTION 9. MEASUREMENT UNCERTAINTY

Carrier Output Power (Conducted)	U_{lab}	$U_{tia-603-c}$
	+/- 0.29dB ($k = 2$)	+/- 0.59 dB
Unwanted Emissions (Transmitter Conducted)		
	+/- 2.19 dB ($k = 2$)	+/- 1.1 dB
Field Strength of Spurious Radiation		
below 1GHz	+/- 3.8dB ($k = 2$)	+/- 3.3 dB
above 1GHz	+/- 4.3dB ($k = 2$)	+/- 3.3 dB
Emission Masks (Occupied Bandwidth)		
	+/- 0.5dB ($k = 2$)	+/- 2.1 dB
Transient Frequency Behavior		
	+/- 1.10% ($k = 2$)	+/- 21.6 %
Audio Low Pass Filter (Voice Input)		
	+/- 0.1dB ($k = 2$)	+/- 1.2 dB
Audio Frequency Response		
	+/- 0.1dB ($k = 2$)	+/- 1.2 dB
Modulation Limiting		
	+/- 1% ($k = 2$)	+/- 1 %
Frequency Stability (Temperature Variation)		
	+/- 10.1Hz ($k = 2$)	+/-34.2 Hz
Frequency Stability (Voltage Variation)		
	+/- 10.1Hz ($k = 2$)	+/-34.2 Hz
Receiver Spurious Emissions	U_{lab}	U_{cisprr}
below 1GHz	+/- 3.6dB ($k = 2$)	+/- 5.2 dB
above 1GHz	+/- 4.2dB ($k = 2$)	

SECTION 10. TEST DATA

10.1 Carrier Output Power (Conducted)

REGULATIONS	: FCC Part 2 Section 1046 (a) / RSS-119 Section 5.4
TEST METHOD/GUIDE	: ANSI/TIA-603-C Section 2.2.1.2 / RSS-119 Section 4.1

Test Procedure

- The EUT and test equipment were set up as shown on the following page.
- The EUT was conducted to a resistive coaxial attenuator of normal load impedance.

$$\text{RF Power (dBm)} = \text{Power Meter reading (dBm)} + \text{Attenuator Loss (dB)} + \text{Cable Loss (dB)}$$

$$\text{RF Power (W)} = 10^{(\text{RF Power (dBm)}/10)}/1000$$
- Modulate the transmitter with a 2.5 kHz sine wave at an input Level of 16 dB greater than that necessary to produce 50 % of rated system deviation.(Only as for the test of RSS)

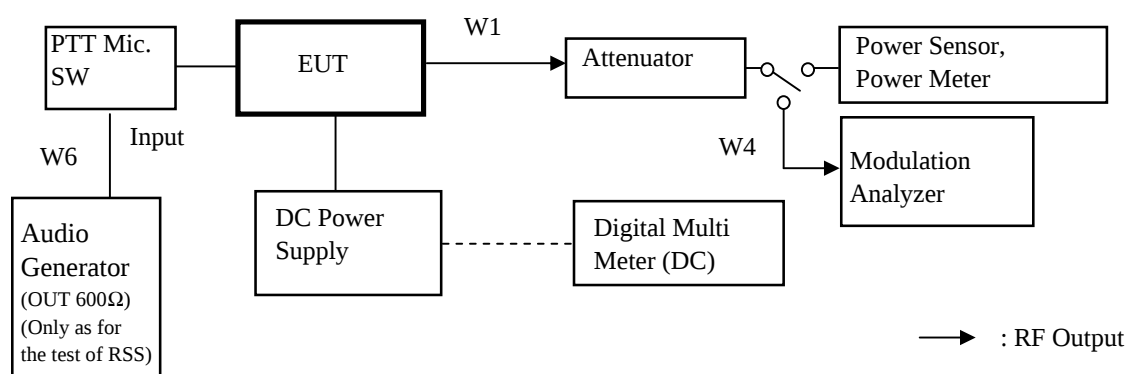
Measuring Equipments

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Power Meter	Hewlett Packard	E4418B	GB38410265	May 26, 09	May 31, 10
2	Power Sensor	Hewlett Packard	8482A	US37292237	May 26, 09	May 31, 10
3	Attenuator (10dB)	Aeroflex/Wenshel	66-10-34	BY2887	Mar. 30, 09	Mar. 31, 10
4	Attenuator (30dB)	Weinschel	WA-29-30-34	8923	May 15, 09	May 31, 10
5	Audio Generator	Anritsu	MG443B	M70150	Apr. 01, 09	Apr. 30, 10
6	Digital Multi Meter	FLUKE	8846A	9642018	Jul. 06, 09	Jul. 31, 10
7	Modulation Analyzer	Hewlett Packard	8901B	3403A04852	Jul. 08, 09	Jul. 31, 10
8	DC Power Supply	Daiichi denpa kogyo	GZV4000	90290932	None	None

Measuring Cables

No.	Cable	Manufacturer	Model No.	Serial No.	Cal Date	Cal Exp.
W1	Coaxial Cable	Suhner	SUCOFLEX104	KSR00091	May 15, 09	May 31, 10
W4	Coaxial Cable	Pacific custom	RG-58 C/U	KSR00096	Nov. 09, 09	Nov. 30, 10
W6	Balance Cable	Nicoon	3D-2V	KSR00092	Oct. 26, 09	Oct. 31, 10

Measuring Equipment Configuration



Test Results

Test date	Mar. 8, 2010		
Location	Tochigi No.2 Test Site		
temperature	24.0 to 24.5	[degree C]	
Humidity Variation	45 to 48	[%]	
Atmospheric Pressure	100.4 to 100.8	[kPa]	
Test Engineer	Atsuyuki Morishima		

Test was carried out for all the Authorized Bandwidth.
State the worst case (below).

No.	Frequency (MHz)	Band	Setting	RF Power (W)
1	138.10	Low (RSS)	Low Power	5
2	150.10	Low (FCC)	Low Power	5
3	158.10	Middle (RSS)	Low Power	5
4	162.10	Middle (FCC)	Low Power	5
5	173.90	High (FCC/RSS)	Low Power	5

RF Power: Peak reading

10.2 Unwanted Emissions (Transmitter Conducted)

REGULATIONS : FCC Part 2 Section 1051, Part 90 Section 210 / RSS-119 Section 5.8

TEST METHOD/GUIDE : ANSI/TIA-603-C Section 2.2.13.2 / RSS-119 Section 4.2, RSS-Gen Section 4.9

Test Procedure

- 1 The EUT and test equipment were set up as shown on the following page.
- 2 Modulate the transmitter with a 2.5 kHz sine wave at an input Level of 16 dB greater than that necessary to produce 50 % of rated system deviation.
- 3 Adjust the spectrum analyzer for the following setting:
 - a) RBW : 10 kHz (< 1 GHz), 1 MHz (> 1 GHz).
 - b) VBW : 30 kHz (< 1 GHz), 3 MHz (> 1 GHz).
 - c) Sweep Speed : 50 msec.
 - d) Detector mode : Average power (FM Modulation) , Positive peak with peak hold (Digital Modulation)
- 4 The emissions were measured for the worst case as follows:
 - a) : within a band of frequencies defined by the carrier frequency plus and minus one channel.
 - b) : from the lowest frequency generated in the EUT and to at least the 10th harmonic of the carrier frequency, or 40 GHz, whichever is lower.

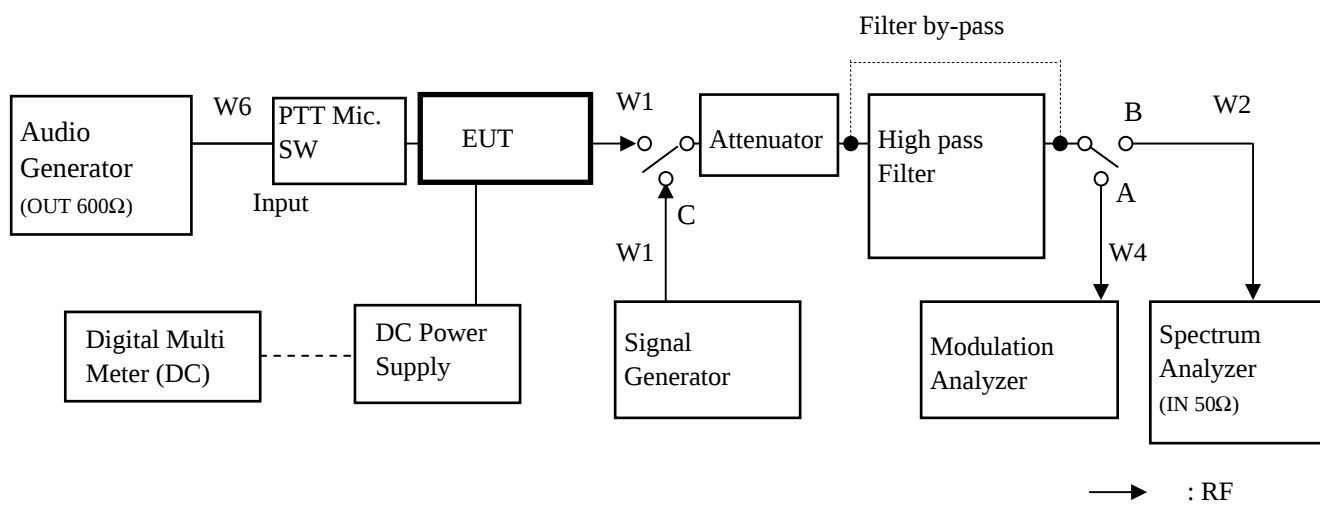
Measuring Equipments

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Audio Generator	Anritsu	MG443B	M70150	Apr. 01, 09	Apr. 30, 10
2	Attenuator (10dB)	Aeroflex/Wenshel	66-10-34	BY2887	Mar. 30, 09	Mar. 31, 10
3	Attenuator (30dB)	Weinschel	WA-29-30-34	8923	May 15, 09	May 31, 10
4	Highpass Filter	Anritsu	MP526B	6200220636	Dec. 29, 09	Dec. 31, 10
5	Modulation Analyzer	Hewlett Packard	8901B	3403A04852	Jul. 08, 09	Jul. 31, 10
6	Signal Generator	Rohde&Schwarz	SMT06	100684	Dec. 24, 09	Dec. 31, 10
7	Spectrum Analyzer	Agilent	E4407B	MY45102460	Feb. 08, 10	Feb. 28, 11
8	Digital Multi Meter	FLUKE	8846A	9642018	Jul. 06, 09	Jul. 31, 10
9	DC Power Supply	Daiichi denpa kogyo	GZV4000	90290932	None	None

Measuring Cables

No.	Cable	Manufacturer	Model No.	Serial No.	Cal Date	Cal Exp.
W1	Coaxial Cable	Suhner	SUCOFLEX104	KSR00091	May 15, 09	May 31, 10
W2	Coaxial Cable	Suhner	SUCOFLEX104	KSR00042	Mar. 12, 09	Mar. 31, 10
W4	Coaxial Cable	Pacific custom	RG-58 C/U	KSR00096	Nov. 09, 09	Nov. 30, 10
W6	Balance Cable	Nicoon	3D-2V	KSR00092	Oct. 26, 09	Oct. 31, 10

Measuring Equipment Configuration



Test Results

Test date	Mar. 10, 2010
Location	Tochigi No.2 Test Site
temperature	25.2 to 26.3 [degree C]
Humidity Variation	48 to 51 [%]
Atmospheric Pressure	99.8 to 99.9 [kPa]
Test Engineer	Atsuyuki Morishima

Test was carried out for all the frequency band of section 10.1

State the worst case (below).

State : Low Power / Authorized Bandwidth 6 kHz

No.	Band	Frequency (MHz)	Correct Level (dBm)	Emission Level (dBc)	Mask E Limit (dBc)	Margin (dB)
1	Low (RSS)	552.40	-43.90	-80.89	-62.0	18.9
2	Low (FCC)	300.20	-41.70	-78.69	-62.0	16.7
3	Middle (RSS)	316.20	-41.40	-78.39	-62.0	16.4
4	Middle (FCC)	324.20	-40.70	-77.69	-62.0	15.7
5	High (FCC/RSS)	347.80	-42.00	-78.99	-62.0	17.0
There is the margin of 20dB over except for the above points.						

Mask E Limit (dBc) = whichever is the lesser attenuation ; $-(55+10\log(P))$ or -65

Correct Level (dBm) = Substitute SG Level (dBm)

Emission Level (dBc) = Correct Level (dBm) - $10\log(P*1000)$

P = Carrier Level (W)

" - " = Measurement Limit

10.3 Field Strength of Spurious Radiation

REGULATIONS : FCC Part 2 Section 1053 (a), Part 90 Section 210 / RSS-119 Section 5.8

TEST METHOD/GUIDE : ANSI/TIA-603-C Section 2.2.12.2 / RSS-119 Section 4.2, RSS-Gen Section 4.9

Test Procedure

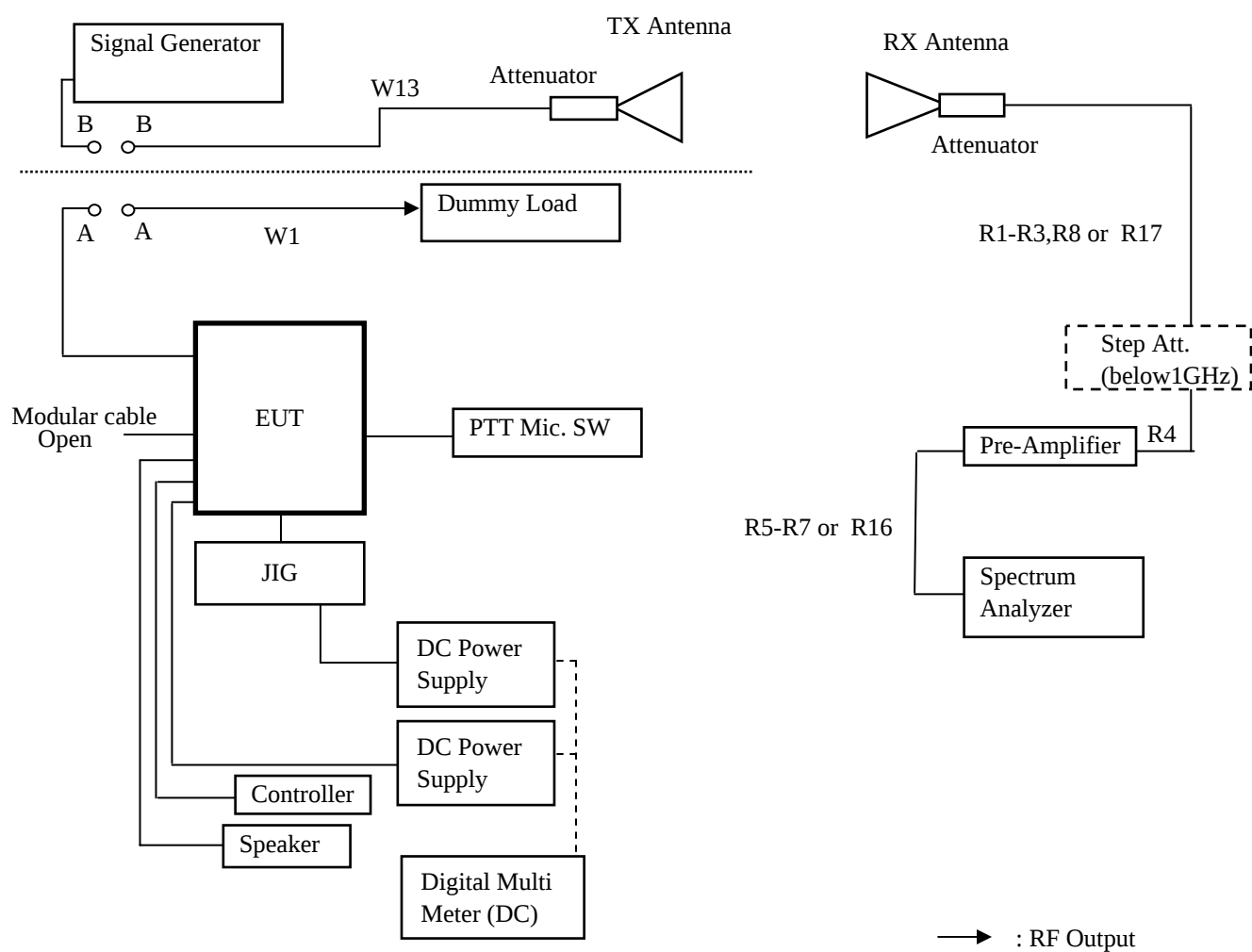
- 1 The EUT and test equipment were set up as shown on the following page.
- 2 Adjust the spectrum analyzer for the following setting:
 - a) RBW : 10 kHz (< 1 GHz), 1 MHz (> 1 GHz).
 - b) VBW : 300 kHz (< 1 GHz), 3 MHz (> 1 GHz).
 - c) Sweep Speed : 50ms.
 - d) Detector mode : Positive Peak
- 3 The transmitter was placed on a wooden turntable, and it was transmitting into non-radiating load which was also placed on the turntable.
- 4 The measurement antenna was placed at a distance of 3 meters from the EUT.
During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT.
The test was performed by placing the EUT on 3-orthogonal axis.
- 5 The frequency range up to tenth harmonic of the fundamental frequency was investigated.
- 6 Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable.
The absolute levels of the spurious emissions were measured by the substitution.
- 7 Spurious emissions in dB = 10 Log (TX power in Watts/0.001) – the absolute level

Measuring Equipments

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Dipole Antenna(TX)	Schwarzbeck	UHA9105	AM0082002	May 18, 09	May 31, 10
2	D.R.G Antenna(TX)	Schwarzbeck	3117	KSR00038	Aug. 13, 09	Aug. 31, 10
3	Tri-log Antenna(RX)	Schwarzbeck	VULB9168	218	Mar. 05, 09	Mar. 31, 10
4	D.R.G Antenna(RX)	EMCO	3115	9903-5699	Apr. 28, 09	Apr. 30, 10
5	Pre-Amplifier	Hewlett Packard	8449B	3008A01182	Apr. 22, 09	Apr. 30, 10
6	Pre-Amplifier	Hewlett Packard	8447D	2727A05324	May 20, 09	May 31, 10
7	Attenuator(6dB)	TAMAGAWA	CFA-01(NPJ-6)	None	May 20, 09	May 31, 10
8	Attenuator(6dB)	Hewlett Packard	8493C	18493	Apr. 22, 09	Apr. 30, 10
9	Attenuator(10dB)	HUBER+SUHNER	6810.17B	KSR0044	Feb. 05, 10	Feb. 28, 11
10	Spectrum Analyzer	Agilent	E4407B	MY45102460	Feb. 08, 10	Feb. 28, 11
11	Signal Generator	Rohde&Schwarz	SMT06	100684	Dec. 24, 09	Dec. 31, 10
12	Dummy Load	TME	CT-150NP	1138693	Oct. 01, 09	Oct. 31, 10
13	Digital Multi Meter	FLUKE	8846A	9642018	Jul. 06, 09	Jul. 31, 10
14	Step Attenuator	Hewlett Packard	8494B	2805A14563	May 20, 09	May 31, 10
15	DC Power Supply	Daiichi denpa kogyo	GZV4000	90290932	None	None
16	DC Power Supply	Daiichi denpa kogyo	GZV4000	90290931	None	None

Measuring Cables

No.	Cable	Manufacturer	Model No.	Serial No.	Cal Date	Cal Exp.
W1	Coaxial Cable	Suhner	SUCOFLEX104	KSR00091	May 15, 09	May 31, 10
R1	Coaxial Cable	Intertek Japan	5D-2W	2R1001a	May 20, 09	May 31, 10
R2	Coaxial Cable	Intertek Japan	RG-177/U	2R1002	May 20, 09	May 31, 10
R3	Coaxial Cable	Intertek Japan	RG-5A/U	2R1003	May 20, 09	May 31, 10
R4	Coaxial Cable	Intertek Japan	RG-5A/U	2R1004	May 20, 09	May 31, 10
R5	Coaxial Cable	Intertek Japan	5D-2W	2R1005	May 20, 09	May 31, 10
R6	Coaxial Cable	Intertek Japan	5D-2W	2R1006	May 20, 09	May 31, 10
R7	Coaxial Cable	Intertek Japan	5D-2W	2R1007	May 20, 09	May 31, 10
R8	Coaxial Cable	Intertek Japan	5D-2W	2R1008a	May 20, 09	May 31, 10
R16	Coaxial Cable	Suhner	SUCOFLEX104	290799/4	Apr. 22, 09	Apr. 30, 10
R17	Coaxial Cable	Suhner	SUCOFLEX104	290800/4	Apr. 22, 09	Apr. 30, 10
W13	Coaxial Cable	Suhner	SUCOFLEX104	KSR00207	Jun. 12, 09	Jun. 30, 10

Measuring Equipment Configuration

Test Results

Test date	Mar. 15, 2010	to	Mar. 17, 2010
Location	Tochigi No.2 Test Site		
temperature	21 to 27	[degree C]	
Humidity Variation	46 to 66	[%]	
Atmospheric Pressure	98.1 to 99.7	[kPa]	
Test Engineer	Atsuyuki Morishima		

Test was carried out for all the frequency band of section 10.1

State the worst case (below).

State : Low Power / Authorized Bandwidth 6 kHz / 162.1 MHz(FCC)

No	Frequency (MHz)	Pol	Reading Level (dBm)	SG Out Level (dBm)	Antenna Gain (dBi)	Loss (dB)	Correct Level (dBm)	Emission Level (dBc)	Limit Level (dBc)	Margin (dB)
1	324.20	Hor.	-45.37	-28.30	2.15	11.29	-37.4	-74.4	-62.0	12.4
		Ver.	-50.82	-28.60	2.15	11.29	-37.7	-74.7	-62.0	12.7
2	486.30	Hor.	-53.05	-30.50	2.15	11.67	-40.0	-77.0	-62.0	15.0
		Ver.	-57.30	-37.30	2.15	11.67	-46.8	-83.8	-62.0	21.8
3	648.40	Hor.	-65.43	-41.90	2.15	11.89	-51.6	-88.6	-62.0	26.6
		Ver.	-67.58	-43.90	2.15	11.89	-53.6	-90.6	-62.0	28.6
4	810.50	Hor.	-59.96	-31.20	2.15	12.14	-41.2	-78.2	-62.0	16.2
		Ver.	-60.05	-29.10	2.15	12.14	-39.1	-76.1	-62.0	14.1
5	972.60	Hor.	-75.85	-44.90	2.15	12.37	-55.1	-92.1	-62.0	30.1
		Ver.	-75.44	-43.80	2.15	12.37	-54.0	-91.0	-62.0	29.0
6	1134.70	Hor.	-57.67	-43.30	3.63	12.55	-52.2	-89.2	-62.0	27.2
		Ver.	-56.92	-43.10	3.63	12.55	-52.0	-89.0	-62.0	27.0
7	1296.80	Hor.	-57.58	-43.20	4.65	12.74	-51.3	-88.3	-62.0	26.3
		Ver.	-57.75	-41.90	4.65	12.74	-50.0	-87.0	-62.0	25.0
8	1458.90	Hor.	-	-	6.04	12.94	-	-	-62.0	-
		Ver.	-	-	6.04	12.94	-	-	-62.0	-
9	1621.00	Hor.	-56.42	-42.90	6.53	13.10	-49.5	-86.5	-62.0	24.5
		Ver.	-57.58	-42.40	6.53	13.10	-49.0	-86.0	-62.0	24.0
There is the margin of 20dB over except for the above points.										

Mask E Limit (dBc) = whichever is the lesser attenuation ; $-(55+10\log(P))$ or -65

Correct Level (dBm) = Substitute SG Level (dBm) + ANT Gain (dBi) - Loss (Cable, Attenuator) (dB)

Emission Level (dBc) = Correct Level (dBm) - $10\log(P*1000)$

P = Carrier Level (W)

" - " = Measurement Limit

State : Low Power / Authorized Bandwidth 6 kHz / 158.1 MHz(RSS)

No	Frequency (MHz)	Pol	Reading Level (dBm)	SG Out Level (dBm)	Antenna Gain (dBi)	Loss (dB)	Correct Level (dBm)	Emission Level (dBc)	Limit Level (dBc)	Margin (dB)
1	316.20	Hor.	-45.60	-28.60	2.15	11.28	-37.7	-74.7	-62.0	12.7
		Ver.	-49.55	-26.20	2.15	11.28	-35.3	-72.3	-62.0	10.3
2	474.30	Hor.	-52.68	-31.10	2.15	11.64	-40.6	-77.6	-62.0	15.6
		Ver.	-56.56	-35.70	2.15	11.64	-45.2	-82.2	-62.0	20.2
3	632.40	Hor.	-61.69	-36.60	2.15	11.87	-46.3	-83.3	-62.0	21.3
		Ver.	-65.04	-39.70	2.15	11.87	-49.4	-86.4	-62.0	24.4
4	790.50	Hor.	-65.16	-37.70	2.15	12.11	-47.7	-84.7	-62.0	22.7
		Ver.	-60.14	-29.60	2.15	12.11	-39.6	-76.6	-62.0	14.6
5	948.60	Hor.	-78.52	-48.00	2.15	12.34	-58.2	-95.2	-62.0	33.2
		Ver.	-78.97	-48.00	2.15	12.34	-58.2	-95.2	-62.0	33.2
6	1106.70	Hor.	-55.25	-44.40	3.57	12.53	-53.4	-90.4	-62.0	28.4
		Ver.	-53.83	-42.60	3.57	12.53	-51.6	-88.6	-62.0	26.6
7	1264.80	Hor.	-59.17	-45.30	4.43	12.73	-53.6	-90.6	-62.0	28.6
		Ver.	-55.17	-39.80	4.43	12.73	-48.1	-85.1	-62.0	23.1
8	1422.90	Hor.	-61.17	-48.60	5.55	12.89	-55.9	-92.9	-62.0	30.9
		Ver.	-59.42	-44.60	5.55	12.89	-51.9	-88.9	-62.0	26.9
9	1581.00	Hor.	-60.75	-47.60	6.63	13.05	-54.0	-91.0	-62.0	29.0
		Ver.	-57.75	-42.30	6.63	13.05	-48.7	-85.7	-62.0	23.7

There is the margin of 20dB over except for the above points.

Mask E Limit (dBc) = whichever is the lesser attenuation ; $-(55+10\log(P))$ or -65

Correct Level (dBm) = Substitute SG Level (dBm) + ANT Gain (dBi) - Loss (Cable, Attenuator) (dB)

Emission Level (dBc) = Correct Level (dBm) - $10\log(P*1000)$

P = Carrier Level (W)

" - " = Measurement Limit

10.4 Emission Masks (Occupied Bandwidth)

REGULATIONS : FCC Part 2 Section 1049 (c) (1), Part 90 Section 210 / RSS-119 Section 5.8

TEST METHOD/GUIDE : ANSI/TIA-603-C Section 2.2.11.2 / RSS-119 Section 4.2.1, 4.2.2

Test Procedure

- 1 The EUT and test equipment were set up as shown on the following page.
- 2 For EUT supporting audio modulation, the audio signal generator was adjusted to the frequency of maximum response and with output level set for +/- 2.5 kHz deviation (or 50 % modulation). (FM modulation).
- 3 With level constant, the signal level was increased 16 dB.
- 4 Adjust the spectrum analyzer for the following setting:
 - a) RBW : 100Hz (Non modulation and Authorized Band 6 kHz),
100Hz (Non modulation and Authorized Band 11.25 kHz),
300Hz (Non modulation and Authorized Band 20 kHz).
 - b) VBW : 10times the RBW
 - c) RBW and VBW : 30 kHz (Non Modulation / Digital Modulation).
 - d) Sweep Speed : 8 sec.
 - e) Sampling Time : 10 times
- 5 The occupied Bandwidth was measured with the Spectrum Analyzer controls set as shown on the test results.

Measuring Equipments

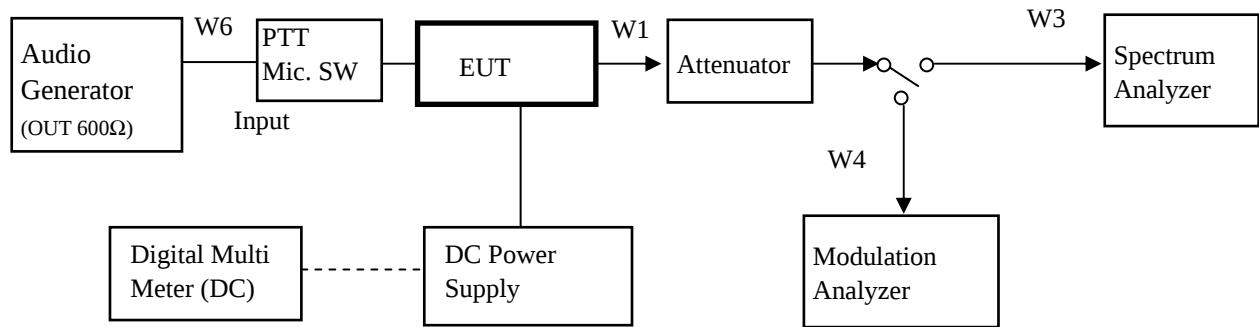
No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Audio Generator	Anritsu	MG443B	M70150	Apr. 01, 09	Apr. 30, 10
2	Attenuator (10dB)	Aeroflex/Wenshel	66-10-34	BY2887	Mar. 30, 09	Mar. 31, 10
3	Attenuator (30dB)	Weinschel	WA-29-30-34	8923	May 15, 09	May 31, 10
4	Modulation Analyzer	Hewlett Packard	8901B	3403A04852	Jul. 08, 09	Jul. 31, 10
5	Spectrum Analyzer	HP	8563E	3821A09565	Dec 24, 09	Dec 31, 10
6	Spectrum Analyzer	Agilent	E4407B	MY45102460	Feb. 08, 10	Feb. 28, 11
7	Digital Multi Meter	FLUKE	8846A	9642018	Jul. 06, 09	Jul. 31, 10
8	JIG	DELL	Inspiron630m	CN-OHC416-70166-1N-OH8Q	None	None
9	DC Power Supply	Daiichi denpa kogyo	GZV4000	90290932	None	None

Measuring Cables

No.	Cable	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
W1	Coaxial Cable	Suhner	SUCOFLEX104	KSR00091	May 15, 09	May 31, 10
W3	Coaxial Cable	Suhner	SUCOFLEX104	KSR00042	Mar. 12, 09	Mar. 31, 10
W4	Coaxial Cable	Pacific custom	RG-58 C/U	KSR00096	Nov. 09, 09	Nov. 30, 10
W6	Balance Cable	Nicoon	3D-2V	KSR00092	Oct. 26, 09	Oct. 31, 10
W20	RS232C- USB Cable	SANWA Supply	USB-CVRS9	FXLA00719	None	None
W21	Programming interface Cable	Kenwood	KPG-46A	90290932	None	None

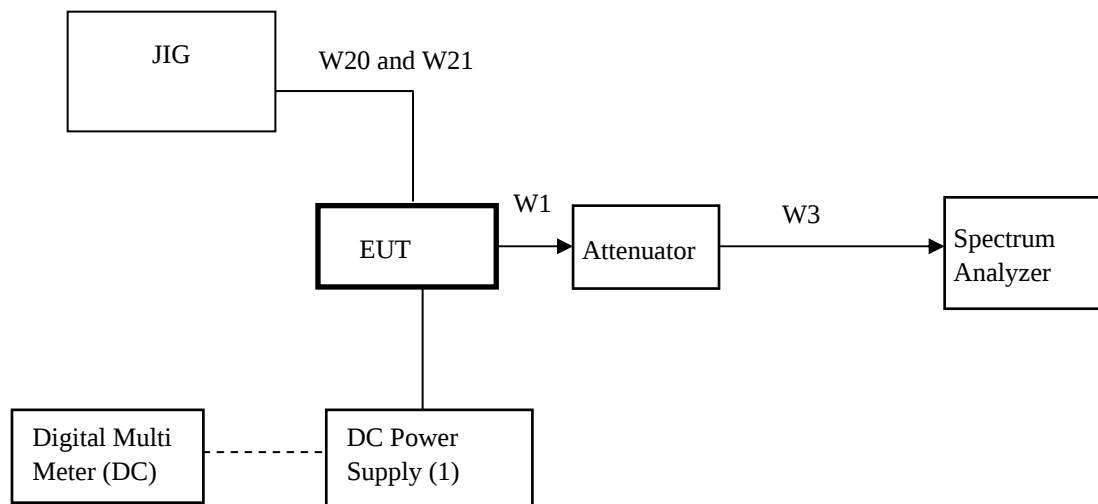
Measuring Equipment Configuration

<FM Modulation Case>



Note: Configuration of other Modulation(4Level FSK) test is composed without the Audio Generator.

<CW ID Modulation Case>



→ : RF Output

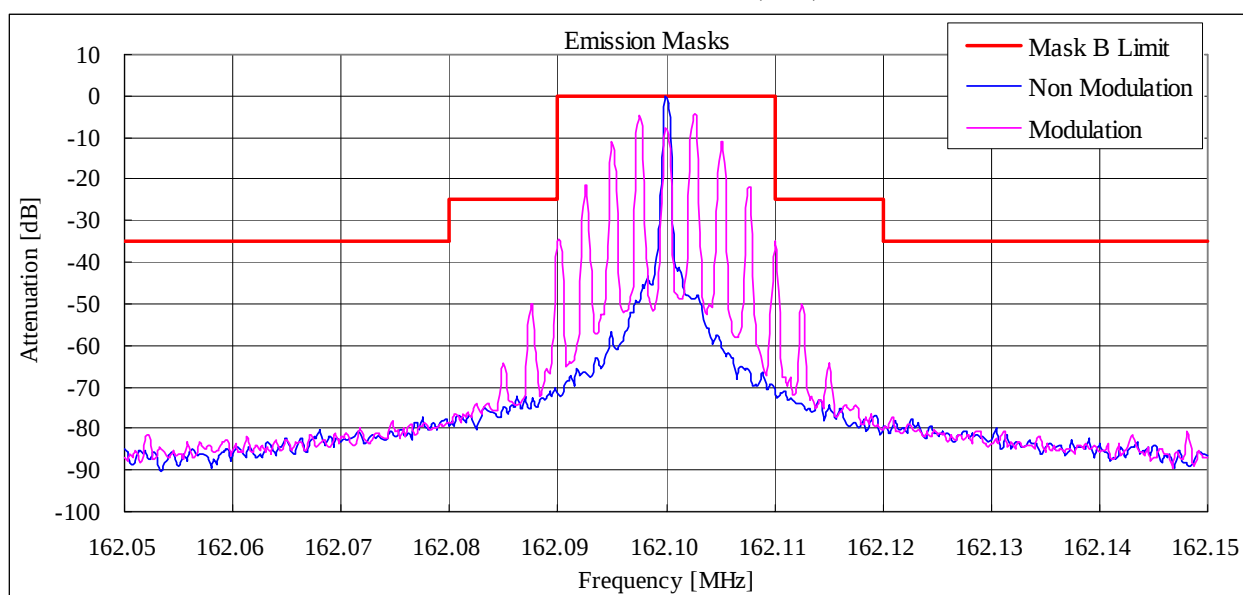
Test Results

Test date	Mar. 8, 2010	to	Mar. 9, 2010
Location	Tochigi No.2 Test Site		
temperature	22.2 to 25.0	[degree C]	
Humidity Variation	46 to 52	[%]	
Atmospheric Pressure	99.8 to 100.6	[kPa]	
Test Engineer	Atsuyuki Morishima		

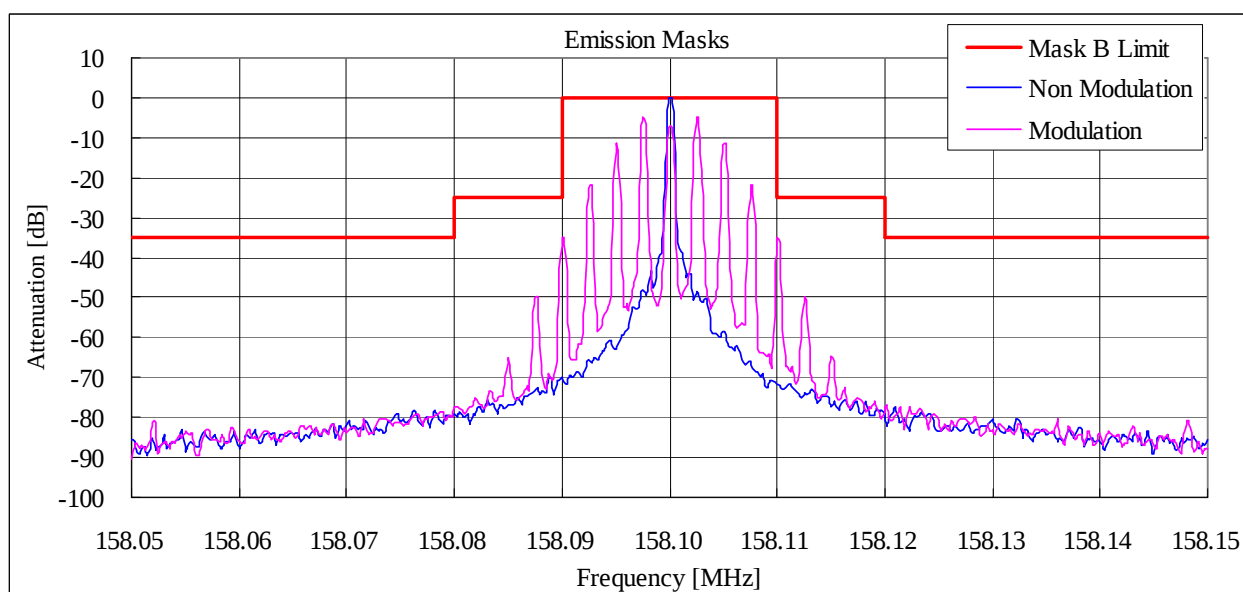
Test was carried out for all the frequency band of section 10.1

State the worst case (below).

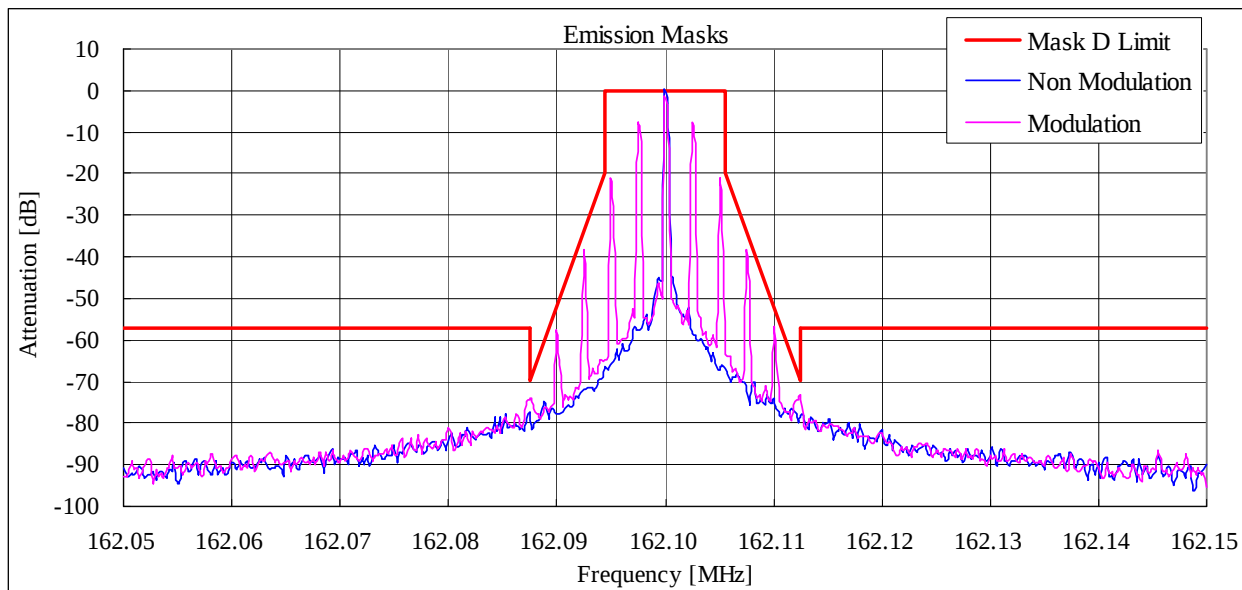
State : Low Power / Authorized Bandwidth 20 kHz:FM / 162.1 MHz (FCC)



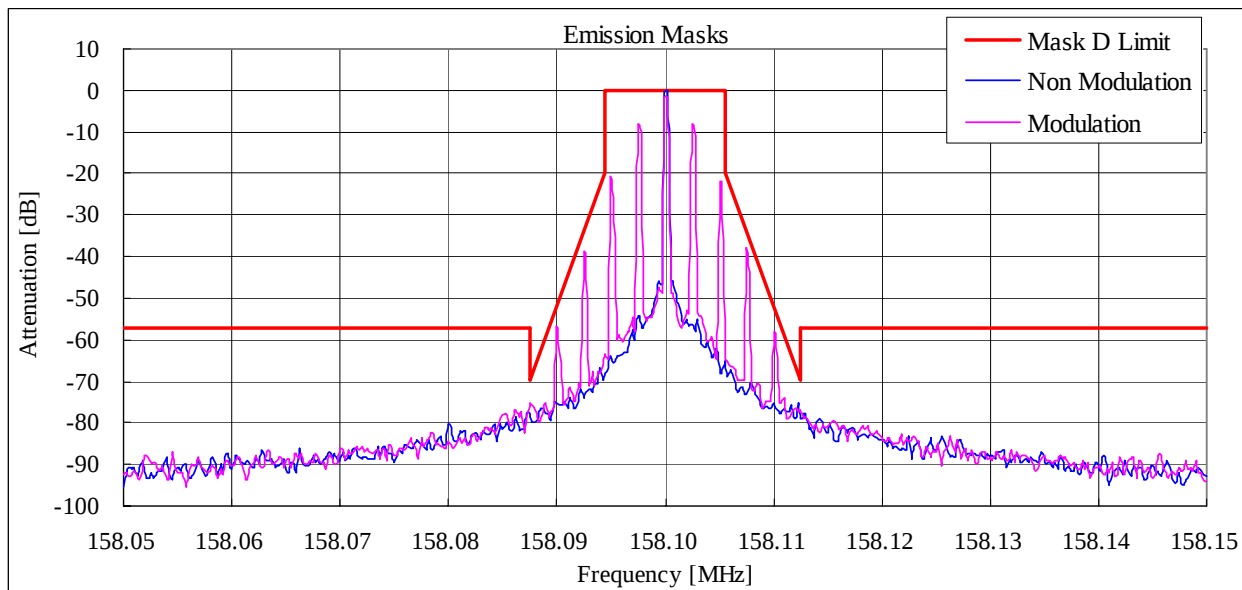
State : Low Power / Authorized Bandwidth 20 kHz:FM / 158.1 MHz (RSS)



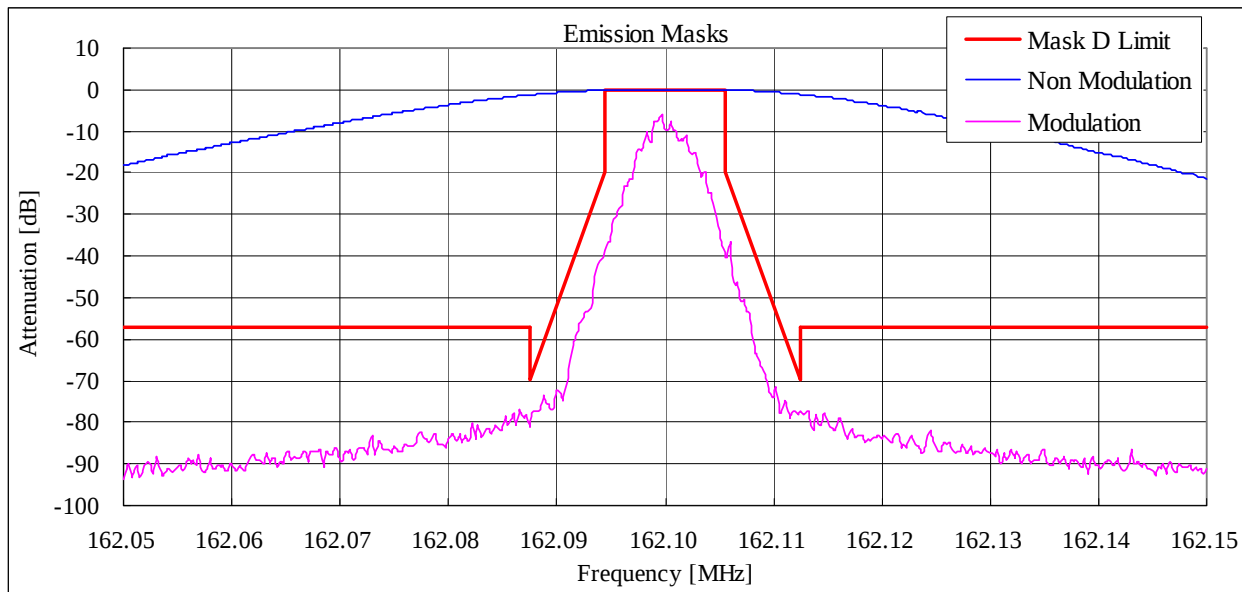
State : Low Power / Authorized Bandwidth 11.25 kHz:FM / 162.1 MHz (FCC)



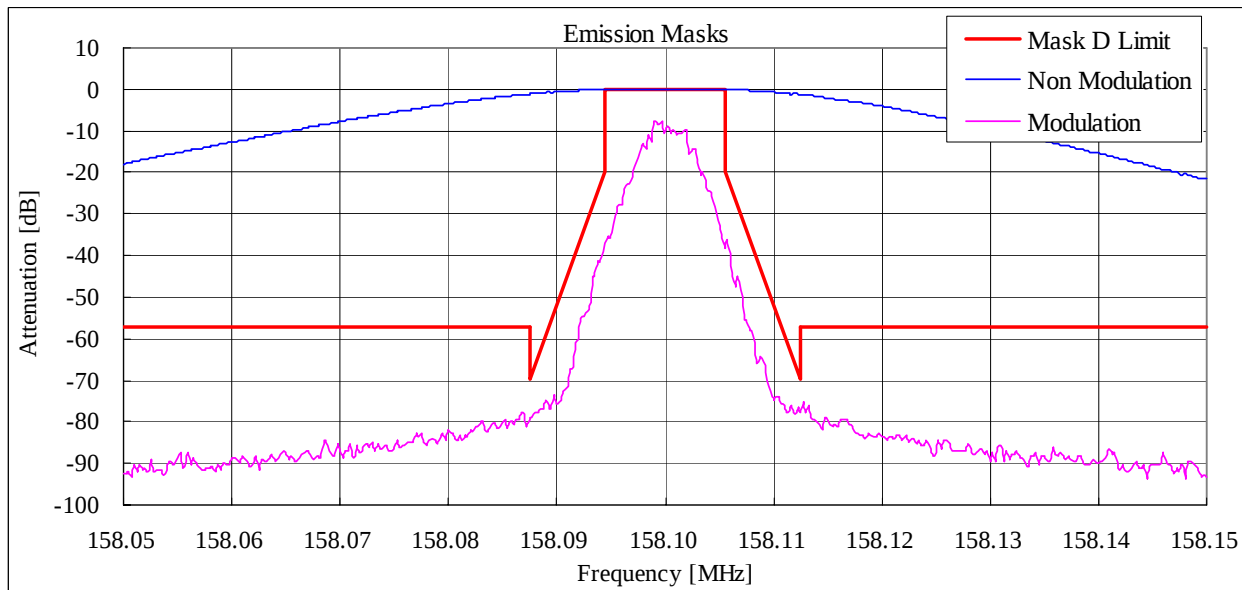
State : Low Power / Authorized Bandwidth 11.25 kHz:FM / 158.1 MHz (RSS)



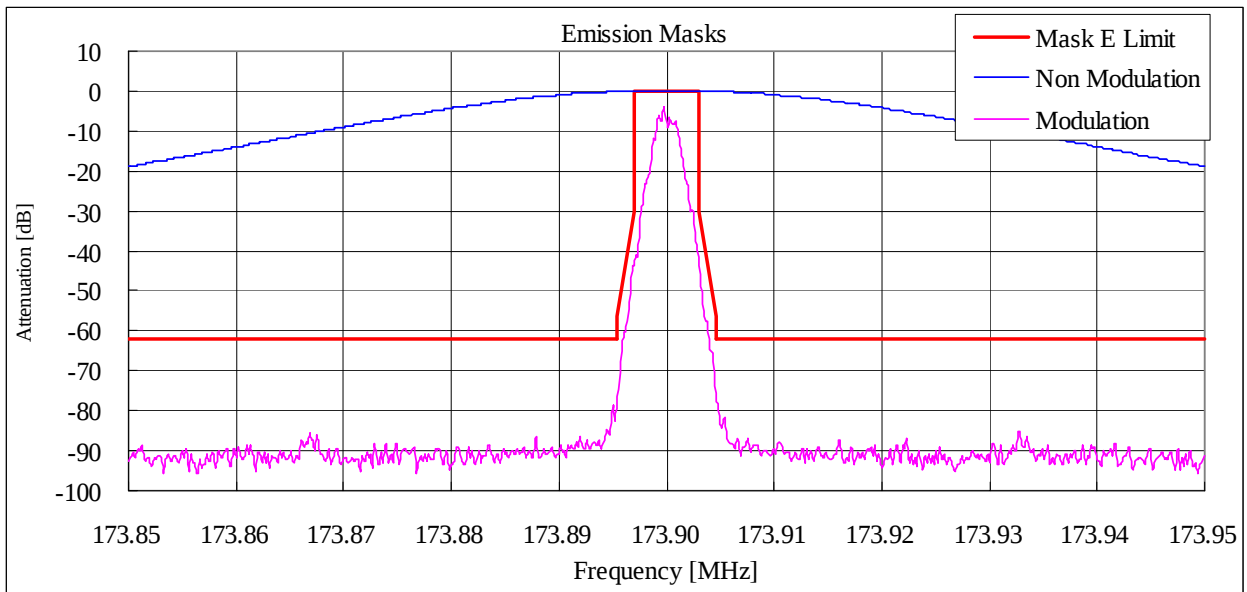
State : Low Power / Authorized Bandwidth 11.25 kHz: 4Level FSK / 162.1 MHz (FCC)



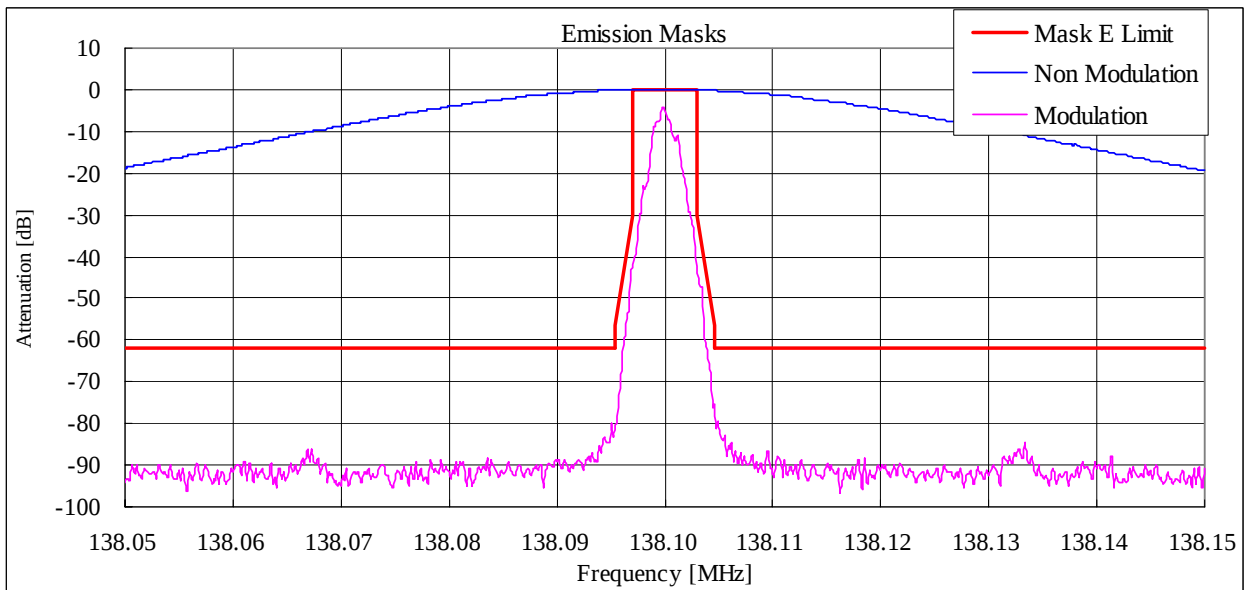
State : Low Power / Authorized Bandwidth 11.25 kHz: 4Level FSK / 158.1 MHz (RSS)



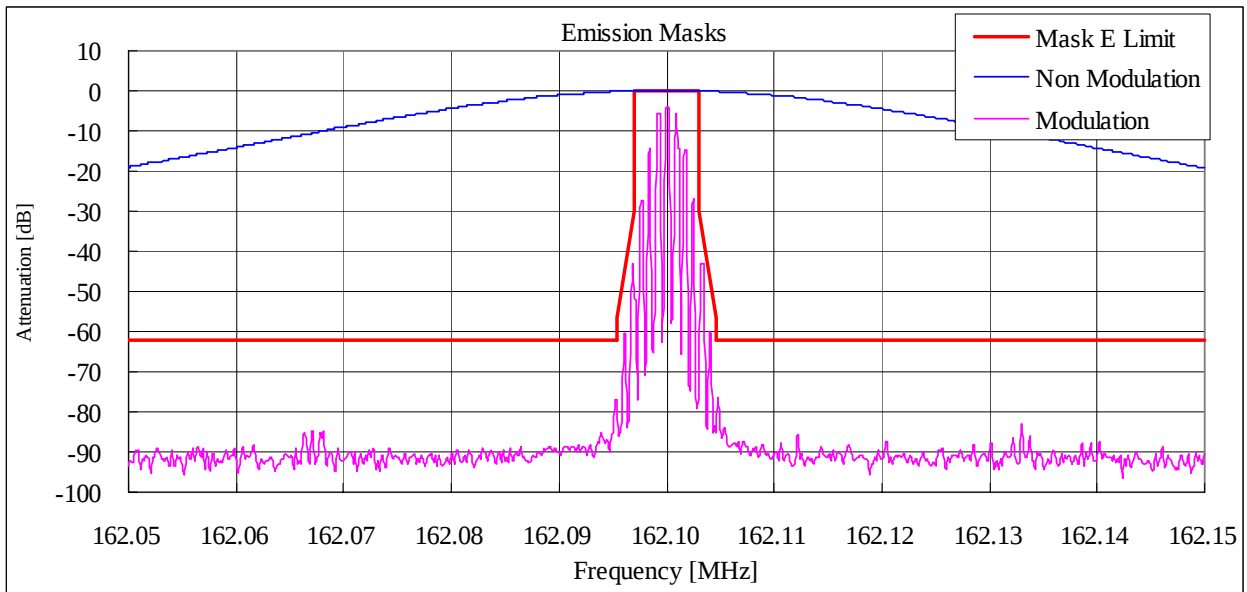
State : Low Power / Authorized Bandwidth 6 kHz: 4Level FSK / 173.9 MHz (FCC)



State : Low Power / Authorized Bandwidth 6 kHz: 4Level FSK / 138.1 MHz (RSS)



State : Low Power / Authorized Bandwidth 6 kHz: CW ID / 162.1 MHz (FCC)



State : Low Power / Authorized Bandwidth 6 kHz: CW ID / 138.1 MHz (RSS)

