



# TEST REPORT

REGULATION :

FCC Part 2, 22, 74, 90, 90.210

Applicant	Testing Laboratory
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<b>Equipment type</b>	VHF FM TRANSCEIVER
<b>Trademark</b>	KENWOOD
<b>Model(s)</b>	TK-7360-M
<b>Serial No.</b>	None
<b>FCC ID</b>	K44415400
<b>Test Result</b>	Complied
<b>Report Number</b>	JM10090009
<b>Report issue date</b>	October 26, 2010

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Approved by

Kazuo Gokita

[Site Manager]

Tested by

Hideaki Kosemura

**In Accordance with FCC Rules and Regulations, Volume II, Part 2 and 90**

**Sub-part 2.1033**

<b>(c)(1) Applicant and Manufacture Information</b>	
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
<b>(c)(2) FCC ID</b>	
FCC ID	: K44415400
Model number	: TK-7360-M
Serial number	: None
<b>(c)(3) Instruction Manual(S)</b>	
Instruction manual(s)	: Please refer to attached Exhibits F
<b>(c)(4) Type of Emission</b>	
Emission Designation	: 16K0F3E(Wide) /11K0F3E(Narrow)
<b>(c)(5) Frequency range</b>	
Frequency Range	: 150 to 174 MHz
<b>(c)(6) Power Rating</b>	
Output Power	: 5 to 25 W
Type	: Continuously Variable
<b>(c)(7) Maximum Power Rating</b>	
Output Power	: 25 W
<b>(c)(8): Voltages &amp; currents in all elements in final RF stage, including final transistor or solid-state device</b>	
Collector Current, A	: 8.0 amps (Maximum)
Collector Voltage, Vdc	: 13.6 vdc
Supply Voltage, Vdc	: 13.6 vdc
<b>Other Information</b>	
Number of Channel	: 128 channels, 128 zone
Maximum Deviation	: 5 kHz / 2.5kHz
Frequency Stability	: 2.5 ppm
Antenna Impedance	: 50 $\Omega$ Norminal
<b>Note</b>	

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## SECTION 1. GENERAL INFORMATION

### TEST PERFORMED

Location	Kashima No.1 Test Site, Tochigi No.3 Test Site and Matsuda No.1 Test Site
EUT Received	August 31, 2010
Date of Test	September 08, 2010 to October 19, 2010
Standard Applied	FCC Part 2, 22, 74, 90, 90.210
Measurement Method	ANSI/TIA-603-C-2004
Deviation from Standard(s)	Not applicable

### QUALIFICATIONS OF TESTING LABORATORY (Kashima Lab.)

ACCREDITATION	SCOPE	LAB. CODE	Remarks
NVLAP	EMC Testing	100290-0	USA
VLAC	EMC Testing	VLAC-008-1	JAPAN
BSMI	EMC Testing	SL2-IN-E-6008	TAIWAN
Vietnam MIC	EMC Testing	62/QD-QLCL	VIETNAM
FILING			
VCCI	EMC Testing	R-788, C-278, C-279, T-1716, T-1717, G-119 R-274, C-280, C-281, T-1718, T-1719, G-120 R-272, C-276, C-277, T-1720, T-1721 R-576, C-590, T-1722, G-121	JAPAN
FCC	EMC Testing	Designation Number:JP0008	USA
IC	EMC Testing	IC-2042K-1, IC-2042K-3	CANADA
CB-Scheme	EMC Testing	TL222	IECEE
SAUDI ARABIA	EMC Testing	N/A	

### QUALIFICATIONS OF TESTING LABORATORY (Tochigi Lab.)

ACCREDITATION	SCOPE	LAB. CODE	Remarks
VLAC	EMC Testing	VLAC-008-5	JAPAN
BSMI	EMC Testing	SL2-IN-E-6017, SL2-A-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	IC-2042P-1, IC-2042P-2	CANADA
SAUDI ARABIA	EMC Testing	N/A	

### QUALIFICATIONS OF TESTING LABORATORY (Matsuda Lab.)

ACCREDITATION	SCOPE	LAB. CODE	Remarks
VLAC	EMC Testing	VLAC-008-3	JAPAN
BSMI	EMC Testing	SL2-IN-E-6009	TAIWAN
FILING			
VCCI	EMC Testing	R-252, C-287, C-255, T-1723 R-253, C-288, C-256, T-1724 R-254, C-289, C-257, T-1725 R-255, C-290, C-258, T-1728 R-256, C-291, C-259, T-1729, G-122	JAPAN
FCC	EMC Testing	Designation Number:JP0009	USA
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	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	Part22	Part74	Part90	TEST ITEM	RESULTS
2.1046 (a)	-	74.461	-	Carrier Output Power (Conducted)	PASS
2.1051	-	-	90.210	Unwanted Emissions (Transmitter Conducted)	PASS
2.1053 (a)	-	-	90.210	Field Strength of Spurious Radiation	PASS
2.1049 (c) (1)	22.359, 357 (a)	74.462	90.210	Emission Masks (Occupied Bandwidth)	PASS
-	-	-	90.214	Transient Frequency Behavior	PASS
2.1047 (a)	-	-	90.242 (b) (8)	Audio Low Pass Filter (Voice Input)	PASS
2.1047 (a)	-	-	-	Audio Frequency Response	PASS
2.1047 (b)	-	-	-	Modulation Limiting	PASS
2.1055 (a) (1)	22.355	74.464	90.213 (a)	Frequency Stability (Temperature Variation)	PASS
2.1055 (d) (1)	22.355	74.464	90.213 (a)	Frequency Stability (Voltage Variation)	PASS
-	-	-	90.203 (j)(3)	Certification required (FCC Part 90.203(j)(3))	Complied

### Limitation on Results

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

### Note:

As for the FCC Part 15 Subport B-Unintentional Radiators, the EUT has been measured and declared as Verification by Kenwood Corporation.

### 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.
<b>Part 22</b>	<b>Non Cellular</b>	<b>YES</b>
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.
<b>Part 74</b>	<b>Experimental Radio Auxiliary , Special Broadcast and Other Program Distributional Services</b>	<b>YES</b>
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.
<b>Part 90</b>	<b>Private Land Mobile radio Services</b>	<b>YES</b>
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	N.A.
RSS-Gen	General Requirements and Information for the Certification of Radiocommunication Equipment	N.A.

## 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 FM TRANSCEIVER	TK-7360-M	None	KENWOOD	EUT
Power Ratings of EUT :		DC 13.6 V +/- 15 %		8.0 A Maximum	
Power Supply :		DC 13.6 V +/- 15 %			
Condition of Equipment		Proto type			
Type		Mobile 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
ACC	D-sub	15 pin	
Speaker	3.5φ	2 pin	
Antenna	M	2 pin	
Microphone	RJ-45	8 pin	

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

Base Clock	Operating Frequency	Board Name	Remarks
212.85 MHz	212.85 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	DC Power Supply	GP035-20R	1014199059	TAKASAGO,LTD.	N/A
C	External Speaker	KES-3	None	KENWOOD	N/A
D	Keypad Microphone	KMC-32	None	KENWOOD	N/A
E	Dummy Load	1430-4	BW5572	Aeroflex/Weinschel	N/A
F	DC Power Supply	GZV4000	90290932	Daiichi Denpa Kogyo	N/A
Supplied Power:					
B, 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	Speaker cable	2.90	No	Plastic	
2	Antenna cable	1.00	Yes	Metal	
3	Mic. cable	0.55	No	Plastic	
4	Ignition sense cable(KCT-18)	3.15	No	Plastic	
5	Connection cable (KCT-60)	0.30	No	Plastic	
6	Power cable (DC) for EUT	0.25	No	Plastic	
7	Power cable (DC) for EUT	3.00	No	Plastic	
8	Power Cable for DC Power Supply	1.85	No	-	

## SECTION 7. TEST CONFIGURATION

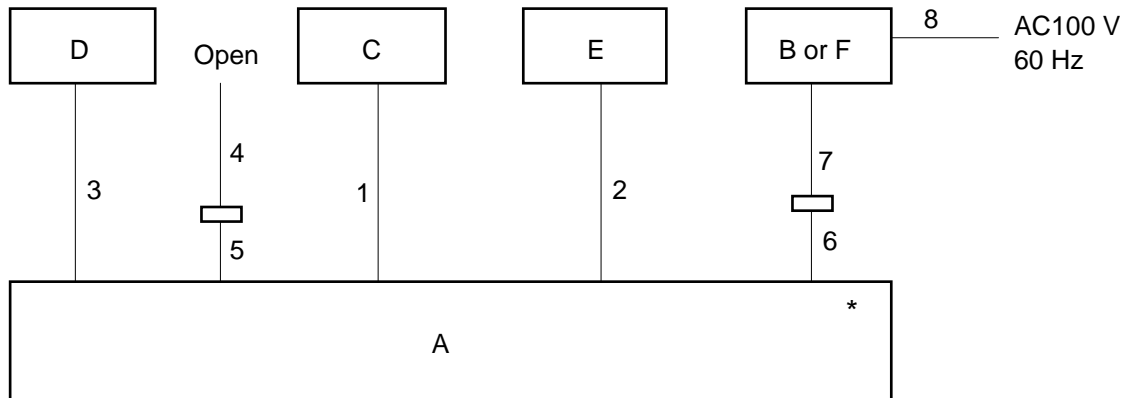
### Details of Configuration and Connection

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.

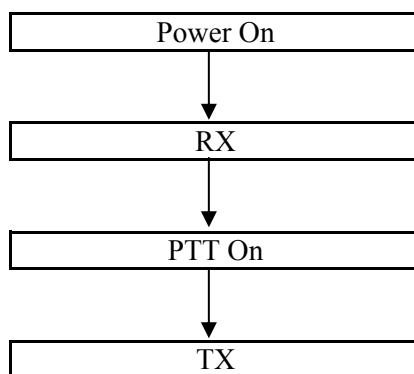
(FCC:150.05MHz, 162.05MHz, 173.95MHz)

(High Power : 25 W, Low Power : 5 W)

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 <sub>lab</sub>	Utia-603-c
	+/- 0.29dB ( <i>k</i> = 2)	+/- 0.59 dB
Unwanted Emissions (Transmitter Conducted)		
	+/- 2.19 dB ( <i>k</i> = 2)	+/- 1.1 dB
Field Strength of Spurious Radiation		
	+/- 4.83dB ( <i>k</i> = 2)	+/- 3.3 dB
Emission Masks (Occupied Bandwidth)		
	+/- 0.5dB ( <i>k</i> = 2)	+/- 2.1 dB
Transient Frequency Behavior		
	+/- 1.10% ( <i>k</i> = 2)	+/- 21.6 %
Audio Low Pass Filter (Voice Input)		
	+/- 0.1dB ( <i>k</i> = 2)	+/- 1.2 dB
Audio Frequency Response		
	+/- 0.1dB ( <i>k</i> = 2)	+/- 1.2 dB
Modulation Limiting		
	+/- 1% ( <i>k</i> = 2)	+/- 1 %
Frequency Stability (Temperature Variation)		
	+/- 10.1Hz ( <i>k</i> =2)	+/-34.2 Hz
Frequency Stability (Voltage Variation)		
	+/- 10.1Hz ( <i>k</i> =2)	+/-34.2 Hz

## SECTION 10. TEST DATA

### 10.1 Carrier Output Power (Conducted)

REGULATIONS : FCC Part 2 Section 1046 (a)

TEST METHOD/GUIDE : ANSI/TIA-603-C Section 2.2.1.2

#### Test Procedure

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

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

$$\text{RF Power (W)} = 10^{(\text{RF Power (dBm)}/10)}/1000$$

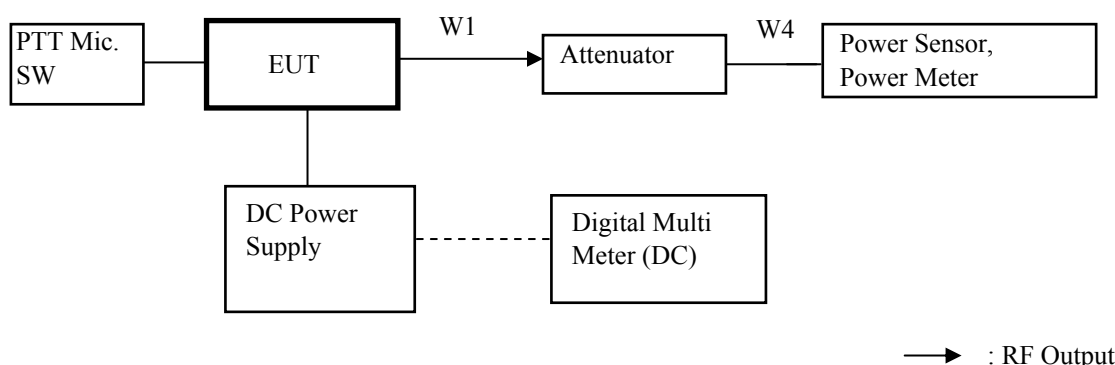
#### Measuring Equipments

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Power Meter	Hewlett Packard	E4418B	GB38410265	May 20, 10	May 31, 11
2	Power Sensor	Hewlett Packard	8482A	US37292237	May 20, 10	May 31, 11
3	Attenuator (20dB)	Aeroflex/Wenshel	66-20-34	BY4537	Mar. 12, 10	Mar. 31, 11
4	Attenuator (30dB)	Weinschel	WA-29-30-34	8923	May 20, 10	May 31, 11
5	Digital Multi Meter	FLUKE	8846A	9642018	Jul. 22, 10	Jul. 31, 11
6	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 20, 10	May 31, 11
W4	Coaxial Cable	Pacific custom	RG-58 C/U	KSR00096	Nov. 09, 09	Nov. 30, 10

#### Measuring Equipment Configuration



## Test Results

Test date	Sep. 08, 2010
Location	Tochigi No.3 Test Site
temperature	24.0 to 25.0 [degree C]
Humidity Variation	58 to 62 [%]
Atmospheric Pressure	98.5 to 98.8 [kPa]
Test Engineer	Hideaki Kosemura

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

No.	Frequency (MHz)	Band	Setting	RF Power (W)
1	150.05	Low	High Power	25
2	162.05	Middle	High Power	25
3	173.95	High	High Power	25
4	150.05	Low	Low Power	5
5	162.05	Middle	Low Power	5
6	173.95	High	Low Power	5

RF Power: Peak reading

## 10.2 Unwanted Emissions (Transmitter Conducted)

REGULATIONS : FCC Part 2 Section 1051, Part 90 Section 210

TEST METHOD/GUIDE : ANSI/TIA-603-C Section 2.2.13.2

### 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

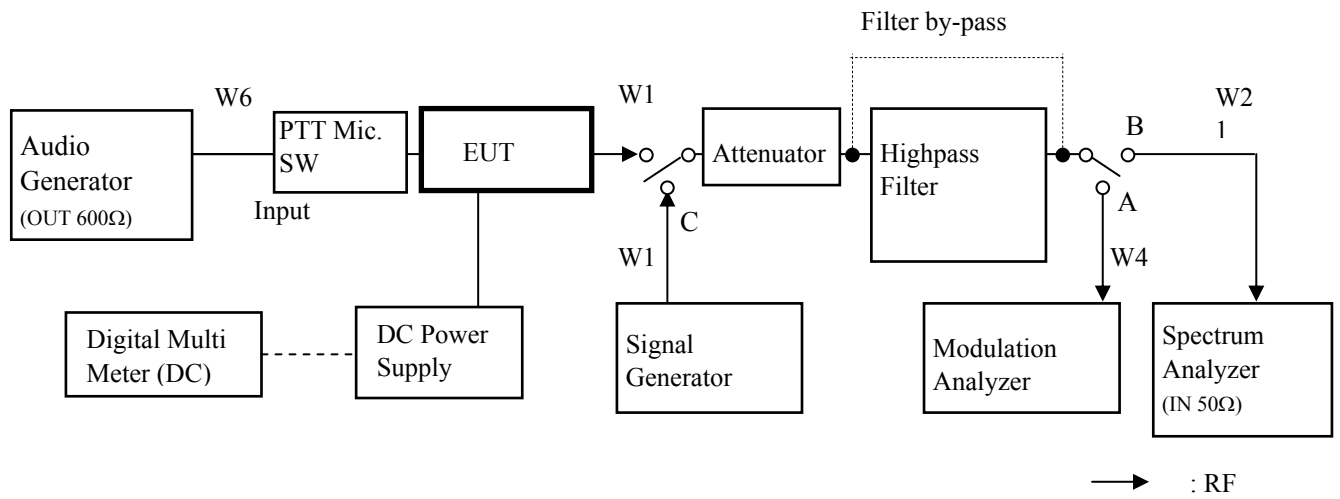
No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Audio Generator	Anritsu	MG443B	M70150	Apr. 15, 10	Apr. 30, 11
2	Attenuator (20dB)	Aeroflex/Wenschel	66-20-34	BY4537	Mar. 12, 10	Mar. 31, 11
3	Attenuator (30dB)	Weinschel	WA-29-30-34	8923	May 20, 10	May 31, 11
4	Highpass Filter	Anritsu	MP526B	6200220636	Dec. 29, 09	Dec. 31, 10
5	Modulation Analyzer	Hewlett Packard	8901B	3403A04852	Jul. 22, 10	Jul. 31, 11
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. 22, 10	Jul. 31, 11
9	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 20, 10	May 31, 11
W2	Coaxial Cable	Suhner	SUCOFLEX104	KSR00042	Mar. 12, 10	Mar. 31, 11
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	Sep. 13, 2010
Location	Tochigi No.3 Test Site
temperature	25.0 to 26.0 [degree C]
Humidity Variation	45 to 53 [%]
Atmospheric Pressure	98.1 to 98.3 [kPa]
Test Engineer	Hideaki Kosemura

Test was carried out for all the frequency band of section 10.1  
State the worst case (below).

State : High Power / Authorized Bandwidth 11.25 kHz

No.	Band	Frequency (MHz)	Correct Level (dBm)	Emission Level (dBc)	Mask D Limit (dBc)	Margin (dB)
1	Low	450.15	-44.20	-88.18	-64.0	24.2
2	Middle	324.10	-45.50	-89.48	-64.0	25.5
3	High	521.85	-43.60	-87.58	-64.0	23.6
There is the margin of 20dB over except for the above points.						

State : Low Power / Authorized Bandwidth 11.25 kHz

No.	Band	Frequency (MHz)	Correct Level (dBm)	Emission Level (dBc)	Mask D Limit (dBc)	Margin (dB)
1	Low	300.10	-43.80	-80.79	-57.0	23.8
2	Middle	324.10	-46.20	-83.19	-57.0	26.2
3	High	521.85	-43.80	-80.79	-57.0	23.8
There is the margin of 20dB over except for the above points.						

Mask D Limit (dBc) =  $-(50+10\log(P))$

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
TEST METHOD/GUIDE	: ANSI/TIA-603-C Section 2.2.12.2

#### Test Procedure

- The EUT and test equipment were set up as shown on the following page.
- Adjust the spectrum analyzer for the following setting:
  - RBW : 10 kHz (< 1 GHz), 1 MHz (> 1 GHz).
  - VBW : 300 kHz (< 1 GHz), 3 MHz (> 1 GHz).
  - Sweep Speed : 50ms.
  - Detector mode : Positive Peak
- The transmitter was placed on a wooden turntable, and it was transmitting into non-radiating load which was also placed on the turntable.
- 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.
- The frequency range up to tenth harmonic of the fundamental frequency was investigated.
- 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.
- Spurious emissions in dB = 10 Log (TX power in Watts/0.001) – the absolute level

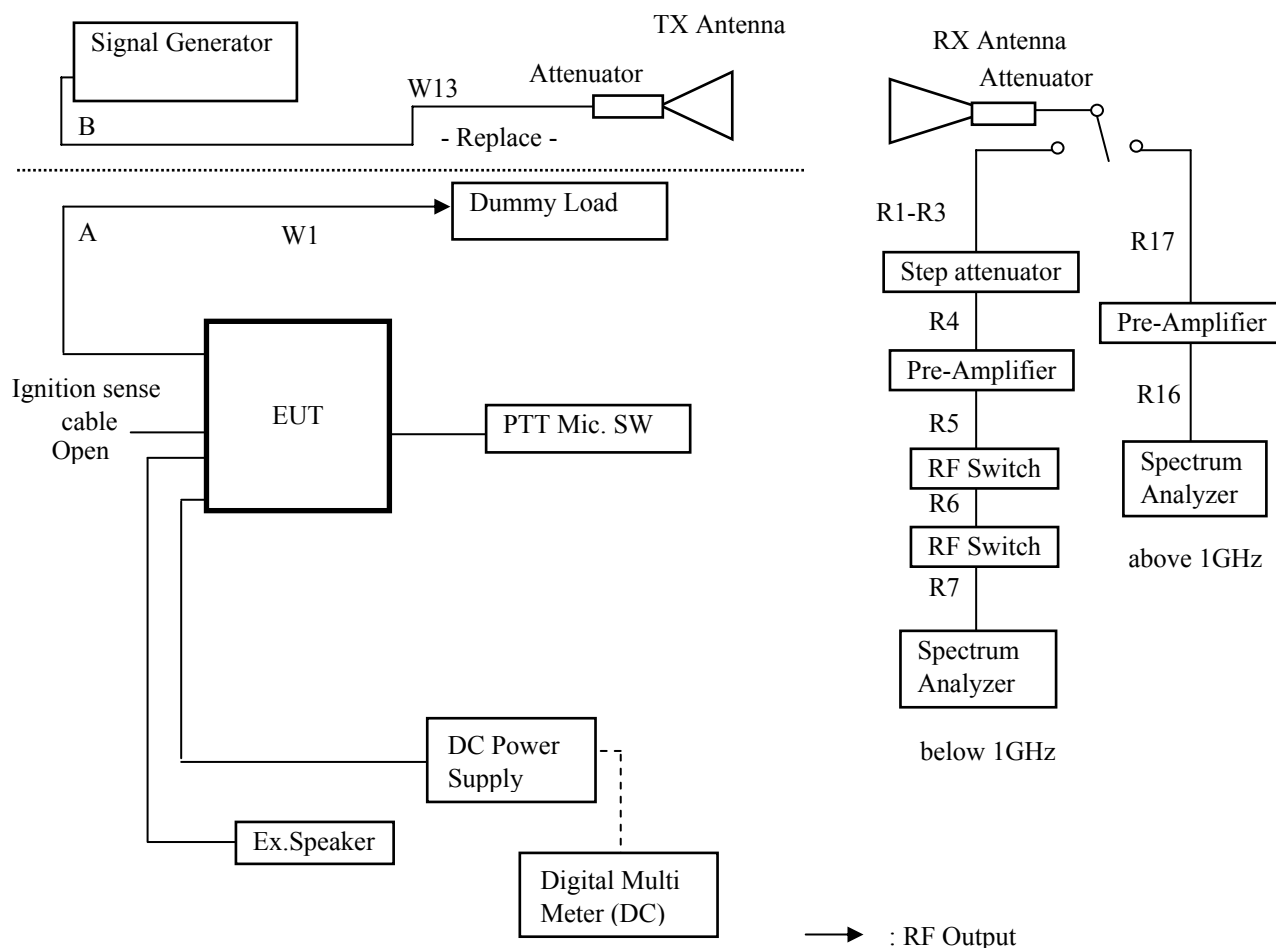
#### Measuring Equipments

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Dipole Antenna(TX)	Schwarzbeck	UHA9105	CEC009	Dec. 07, 09	Dec. 31, 10
2	D.R.G Antenna(TX)	ETS LINDGREN	3117	55157	Aug. 17, 10	Aug. 31, 11
3	B.B Antenna(RX)	Schwarzbeck	VULB9168	329	Jan. 05, 10	Jan. 31, 11
4	D.R.G Antenna(RX)	EMCO	3115	3024	Nov. 19, 09	Nov. 30, 10
5	Pre-Amplifier	Hewlett Packard	8447D	2727A05849	Jan. 05, 10	Jan. 31, 11
6	Pre-Amplifier	Hewlett Packard	8449B	3008A00615	Jun. 25, 10	Jun. 30, 11
7	Attenuator(6dB)	ANRITSU	MP721B	M54588	Jan. 05, 10	Jan. 31, 11
8	Attenuator(6dB)	SUNNER	6806.17.B	None	Jun. 25, 10	Jun. 30, 11
9	Attenuator(10dB)	HUBER+SUHNER	6810.17B	DML255	Apr. 07, 10	Apr. 30, 11
10	Spectrum Analyzer	Hewlett Packard	8563E	3337A01513	Jun. 22, 10	Jun. 30, 11
11	Signal Generator	Rohde&Schwarz	SMT06	100684	Dec. 24, 09	Dec. 31, 10
12	Dummy Load	Aeroflex/Weinschel	1430-4	BW5572	Jul. 27, 10	Jul. 31, 11
13	Digital Multi Meter	Hewlett Packard	8478A	2911A57726	Jan. 08, 10	Jan. 31, 11
14	DC Power Supply	TAKASAGO,LTD.	GP035-20R	1014199059	None	None

## Measuring Cables

No.	Cable	Manufacturer	Model No.	Serial No.	Cal Date	Cal Exp.
W1	Coaxial Cable	Suhner	SUCOFLEX106	12719/6	Oct. 06, 10	Oct 31, 11
W13	Coaxial Cable	Suhner	SUCOFLEX104A	47047/4A	Jan. 08, 10	Jan. 31, 11
R1	Coaxial Cable	Intertek Japan	5D-2W	MTS01R3-8	Jan. 05, 10	Jan. 31, 11
R2	Coaxial Cable	Suhner	RG214HF	MTS01R3-1	Jan. 05, 10	Jan. 31, 11
R3	Coaxial Cable	Intertek Japan	12D-SFA	MTS01R3-2	Jan. 05, 10	Jan. 31, 11
R4	Coaxial Cable	Suhner	RG214HF	MTS01R3-3	Jan. 05, 10	Jan. 31, 11
R5	Coaxial Cable	Suhner	RG214HF	MTS01R3-4	Jan. 05, 10	Jan. 31, 11
R6	Coaxial Cable	Suhner	RG214HF	MTS01R3-5	Jan. 05, 10	Jan. 31, 11
R7	Coaxial Cable	Suhner	RG214HF	MTS01R3-6	Jan. 05, 10	Jan. 31, 11
R16	Coaxial Cable	Suhner	SUCOFLEX104	58441/4PE	Jun. 25, 10	Jun. 30, 11
R17	Coaxial Cable	Suhner	SUCOFLEX104	58440/4PE	Jun. 25, 10	Jun. 30, 11

## Measuring Equipment Configuration



## Test Results

Test date	Oct. 06, 2010
Location	Matsuda No.1 Test Site
temperature	23.0 to 25.0 [degree C]
Humidity Variation	64 to 70 [%]
Atmospheric Pressure	98.1 to 99.3 [kPa]
Test Engineer	Hideaki Kosemura

Test was carried out for all the frequency band of section 10.1  
State the worst case (below).

State : High Power / Authorized Bandwidth 11.25 kHz / 173.95 MHz

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	347.90	Hor.	-60.40	-43.70	2.15	12.07	-53.6	-97.6	-64.0	33.6
		Ver.	-61.65	-40.30	2.15	12.07	-50.2	-94.2	-64.0	30.2
2	521.85	Hor.	-56.35	-33.80	2.15	12.53	-44.2	-88.2	-64.0	24.2
		Ver.	-54.70	-32.90	2.15	12.53	-43.3	-87.3	-64.0	23.3
3	695.80	Hor.	-55.15	-28.20	2.15	12.92	-39.0	-83.0	-64.0	19.0
		Ver.	-54.50	-27.30	2.15	12.92	-38.1	-82.1	-64.0	18.1
4	869.75	Hor.	-56.50	-27.00	2.15	13.27	-38.1	-82.1	-64.0	18.1
		Ver.	-52.85	-20.20	2.15	13.27	-31.3	-75.3	-64.0	11.3
5	1043.70	Hor.	-53.00	-43.60	3.26	13.58	-53.9	-97.9	-64.0	33.9
		Ver.	-48.50	-37.50	3.26	13.58	-47.8	-91.8	-64.0	27.8
6	1217.65	Hor.	-57.00	-48.10	3.62	13.80	-58.3	-102.3	-64.0	38.3
		Ver.	-55.30	-45.60	3.62	13.80	-55.8	-99.8	-64.0	35.8
7	1391.60	Hor.	-59.40	-53.60	5.39	14.03	-62.2	-106.2	-64.0	42.2
		Ver.	-57.58	-48.80	5.39	14.03	-57.4	-101.4	-64.0	37.4
8	1565.55	Hor.	-59.08	-53.20	5.98	14.26	-61.5	-105.5	-64.0	41.5
		Ver.	-57.75	-48.30	5.98	14.26	-56.6	-100.6	-64.0	36.6
9	1739.50	Hor.	-55.92	-43.90	5.24	14.49	-53.2	-97.1	-64.0	33.2
		Ver.	-55.83	-42.50	5.24	14.49	-51.8	-95.7	-64.0	31.8
There is the margin of 20dB over except for the above points.										

Mask D Limit (dBc) = -(50+10Log(P))

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

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

P = Carrier Level (W)

" - " = Measurement Limit

State : Low Power / Authorized Bandwidth 11.25 kHz / 150.05 MHz

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	300.10	Hor.	-58.90	-43.50	2.15	11.94	-53.3	-90.3	-57.0	33.3
		Ver.	-64.75	-37.70	2.15	11.94	-47.5	-84.5	-57.0	27.5
2	450.15	Hor.	-62.05	-42.00	2.15	12.34	-52.2	-89.2	-57.0	32.2
		Ver.	-61.40	-40.00	2.15	12.34	-50.2	-87.2	-57.0	30.2
3	600.20	Hor.	-65.80	-43.10	2.15	12.70	-53.7	-90.6	-57.0	33.6
		Ver.	-62.80	-43.40	2.15	12.70	-54.0	-90.9	-57.0	33.9
4	750.25	Hor.	-58.25	-31.60	2.15	13.03	-42.5	-79.5	-57.0	22.5
		Ver.	-54.60	-24.00	2.15	13.03	-34.9	-71.9	-57.0	14.9
5	900.30	Hor.	-57.45	-37.40	2.15	13.33	-48.6	-85.6	-57.0	28.6
		Ver.	-55.95	-23.90	2.15	13.33	-35.1	-72.1	-57.0	15.1
6	1050.35	Hor.	-46.83	-35.30	3.31	13.58	-45.6	-82.6	-57.0	25.6
		Ver.	-45.13	-32.80	3.31	13.58	-43.1	-80.1	-57.0	23.1
7	1200.40	Hor.	-55.67	-45.80	3.70	13.78	-55.9	-92.9	-57.0	35.9
		Ver.	-53.92	-43.80	3.70	13.78	-53.9	-90.9	-57.0	33.9
8	1350.45	Hor.	-58.42	-49.90	4.82	13.98	-59.1	-96.0	-57.0	39.0
		Ver.	-57.83	-50.20	4.82	13.98	-59.4	-96.3	-57.0	39.3
9	1500.50	Hor.	-	-	6.37	14.18	-	-	-57.0	-
		Ver.	-	-	6.37	14.18	-	-	-57.0	-
There is the margin of 20dB over except for the above points.										

Mask D Limit (dBc) =  $-(50+10\log(P))$

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

TEST METHOD/GUIDE : ANSI/TIA-603-C Section 2.2.11.2

#### 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 (Non modulation , Authorized Band 11.25 kHz and Authorized Band 20 kHz).
  - c) Sweep Speed : 8 sec.
  - d) Sampling Time : 10 times
- 5 The occupied Bandwidth was measured with the Spectrum Analyzer controls set as shown on the test results.

#### Measuring Equipments

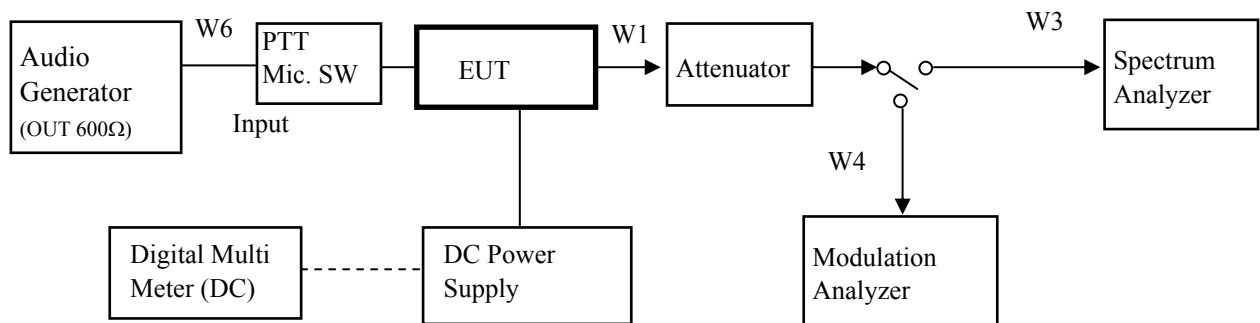
No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Audio Generator	Anritsu	MG443B	M70150	Apr. 15, 10	Apr. 30, 11
2	Attenuator (20dB)	Aeroflex/Wenshel	66-20-34	BY4537	Mar. 12, 10	Mar. 31, 11
3	Attenuator (30dB)	Weinschel	WA-29-30-34	8923	May 20, 10	May 31, 11
4	Modulation Analyzer	Hewlett Packard	8901B	3403A04852	Jul. 22, 10	Jul. 31, 11
5	Spectrum Analyzer	Agilent	E4407B	MY45102460	Feb 08, 10	Feb 28, 11
6	Digital Multi Meter	FLUKE	8846A	9642018	Jul. 22, 10	Jul. 31, 11
7	DC Power Supply	Daiichi denpa kogyo	GZV4000	90290931	None	None

#### Measuring Cables

No.	Cable	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
W1	Coaxial Cable	Suhner	SUCOFLEX104	KSR00091	May 20, 10	May 31, 11
W3	Coaxial Cable	Suhner	SUCOFLEX104	KSR00042	Mar. 12, 10	Mar. 31, 11
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

### <FM Modulation Case>



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

→ : RF Output

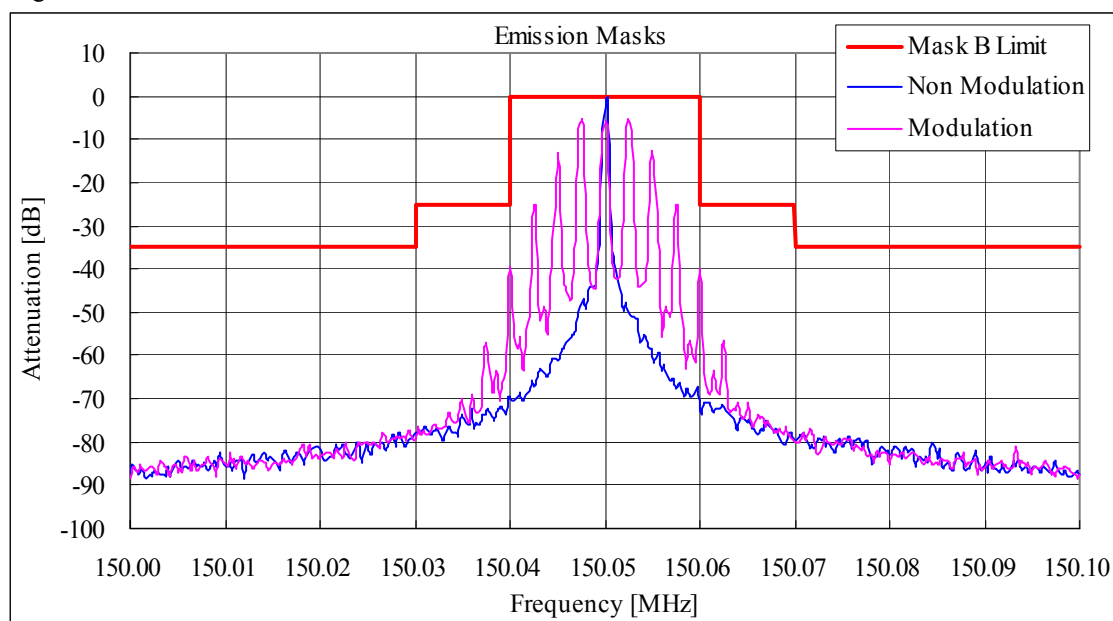


## Test Results

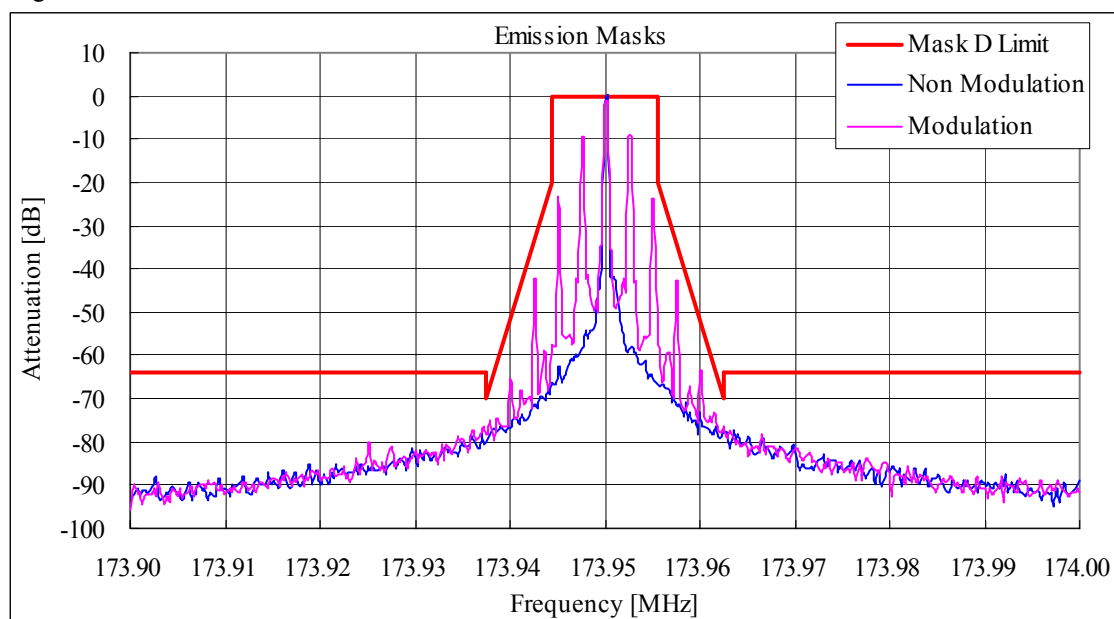
Test date	Sep. 10, 2010	
Location	Tochigi No.3 Test Site	
temperature	24.0 to 26.0	[degree C]
Humidity Variation	47 to 52	[%]
Atmospheric Pressure	98.9 to 99.2	[kPa]
Test Engineer	Hideaki Kosemura	

Test was carried out for all the frequency band of section 10.1  
State the worst case (below).

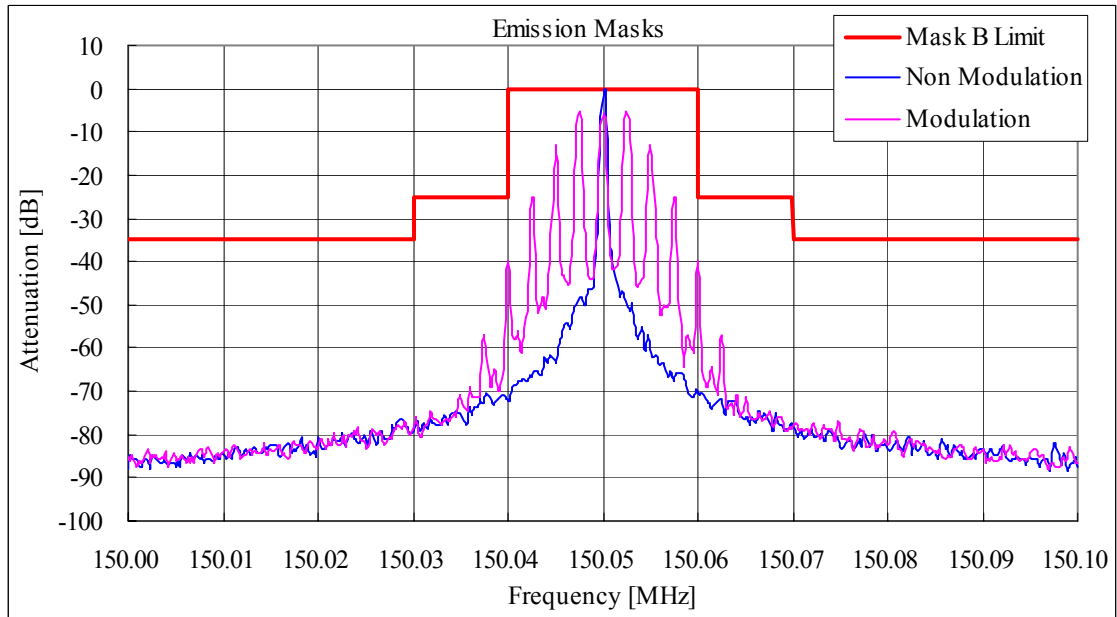
State : High Power / Authorized Bandwidth 20 kHz:FM / 150.05 MHz



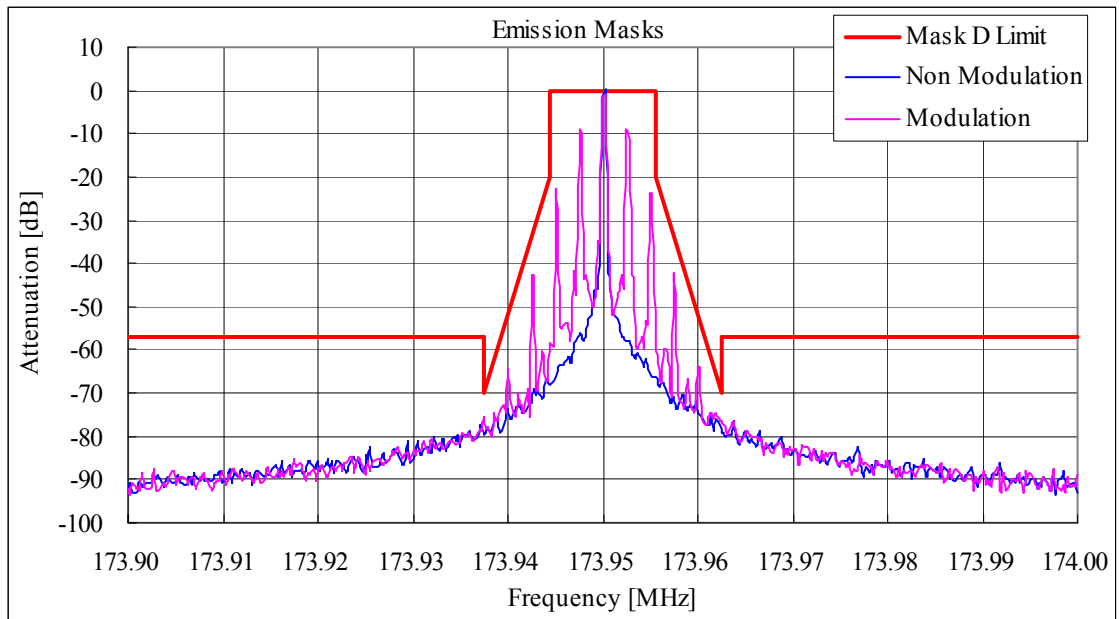
State : High Power / Authorized Bandwidth 11.25 kHz:FM / 173.95 MHz



State : Low Power / Authorized Bandwidth 20 kHz:FM / 150.05 MHz



State : Low Power / Authorized Bandwidth 11.25 kHz:FM / 173.95 MHz



## 10.5 Transient Frequency Behavior

REGULATIONS : FCC Part 90 Section 214

TEST METHOD/GUIDE : ANSI/TIA-603-C Section 2.2.19.3

### Test Procedure

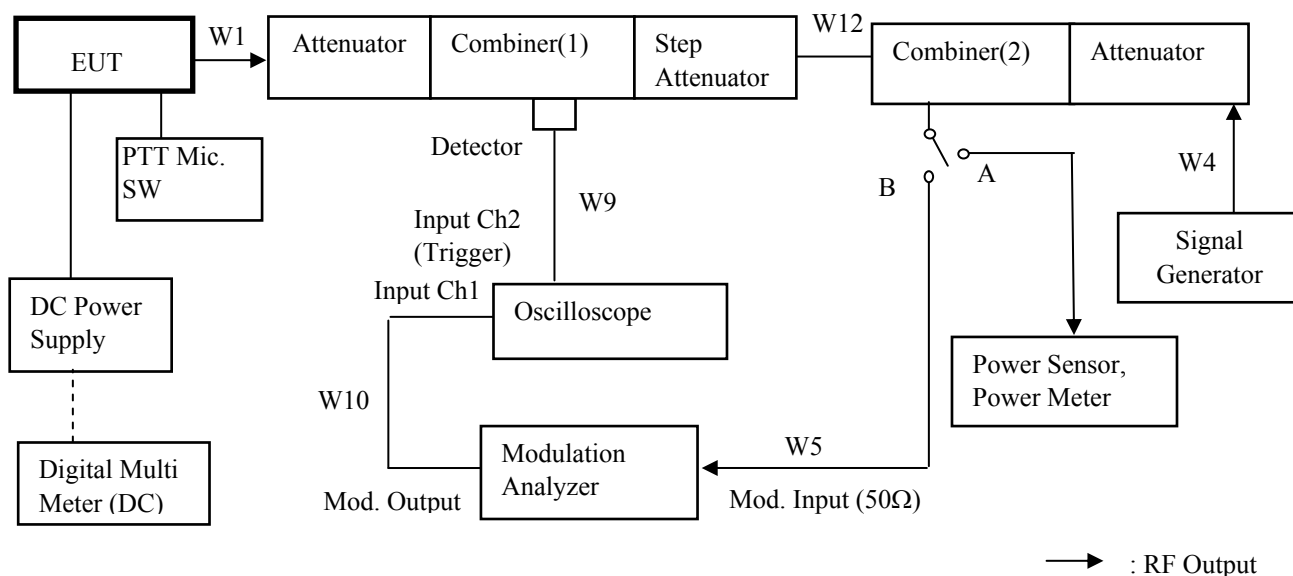
- 1 The EUT and test equipment were set up as shown on the following page.
- 2 The transmitter was turned on.
- 3 The transmitter carrier level was measured at the output of the combiner .
- 4 The transmitter was turned off.
- 5 An RF signal generator (1) modulated with a 1 kHz tone at either 25 kHz or 12.5 kHz or 6.25 kHz deviation, and set to the same frequency as the assigned transmitter frequency, (2) was adjusted to a level -30 dB below the level recorded in Procedure 3, as measured at the output of the combiner.  
This level was then fixed for the remainder of the test and is recorded at step h.
- 6 The oscilloscope was setup using TIA-603C steps j and k as a guide, however 1000 Hz tone was adjusted at  $\pm 2.5$  /div vertically centered on the display.
- 7 The transmitter was turned on, and the level of the carrier at the output of the combiner was recorded as step l.
- 8 The carrier on-time as referenced in TIA-603-C steps m, n, and o was captured and plotted.
- 9 The carrier off-time as referenced in TIA-603-C steps p, q, r, and s was captured and plotted.

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Signal Generator	Rohde&Schwarz	SMT06	100684	Dec. 24, 09	Dec. 31, 10
2	Oscilloscope	Lecroy	9360	1408	Apr. 15, 10	Apr. 30, 11
3	Power Meter	Hewlett Packard	E4418B	GB38410265	May 20, 10	May 31, 11
4	Power Sensor	Hewlett Packard	8482A	US37292237	May 20, 10	May 31, 11
5	Attenuator (20dB)	Aeroflex/Wenshel	66-20-34	BY4537	Mar. 12, 10	Mar. 31, 11
6	Attenuator (30dB)	Weinschel	WA-29-30-34	8923	May. 20, 10	May. 31, 11
7	Step Attenuator	Hewlett Packard	8494B	2726A14515	Dec. 29, 09	Dec. 31, 10
8	Modulation Analyzer	Hewlett Packard	8901B	3403A04852	Jul. 22, 10	Jul. 31, 11
9	Combiner(1)	Anritsu	Z-164A	M89249	Nov. 06, 09	Nov. 30, 10
10	Combiner(2)	Anritsu	Z-164A	M89549	Nov. 06, 09	Nov. 30, 10
11	Attenuator (3dB)	TME	CFA-20NPJ-3	679701	May 20, 10	May 31, 11
12	Digital Multi Meter	FLUKE	8846A	9642018	Jul. 22, 10	Jul. 31, 11
13	DC Power Supply	Daiichi denpa kogyo	GZV4000	90290931	None	None

### Measuring Cables

No.	Cable	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
W1	Coaxial Cable	Suhner	SUCOFLEX104	KSR00091	May 20, 10	May 31, 11
W4	Coaxial Cable	Pacific custom	RG-58 C/U	KSR00096	Nov. 09, 09	Nov. 30, 10
W5	Coaxial Cable	Suhner	SUCOFLEX104	KSR00211	Aug. 19, 10	Aug. 31, 11
W9	Coaxial Cable	Pacific custom	RG-58 C/U	KSR00094	Nov. 09, 09	Nov. 30, 10
W10	Coaxial Cable	Pacific custom	RG-58 C/U	KSR00097	Nov. 09, 09	Nov. 30, 10
W12	Coaxial Cable	Suhner	SUCOFLEX104	KSR00042	Mar. 12, 10	Mar. 31, 11

### Measuring Equipment Configuration



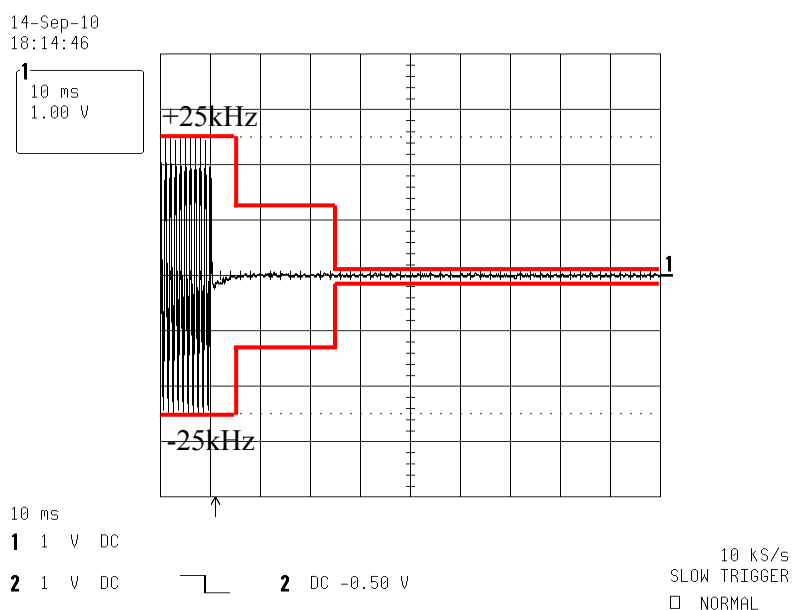
## Test Results

Test date	Sep. 14, 2010		
Location	Tochigi No.3 Test Site		
temperature	24.0 to 26.0	[degree C]	
Humidity Variation	48 to 60	[%]	
Atmospheric Pressure	98.4 to 98.6	[kPa]	
Test Engineer	Hideaki Kosemura		

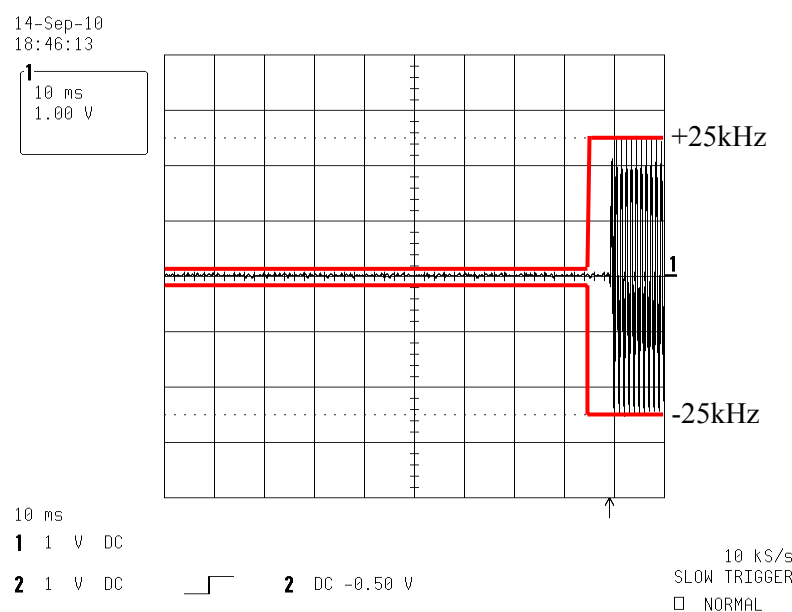
Test was carried out for all the frequency band of section 10.1

State the worst case (below).

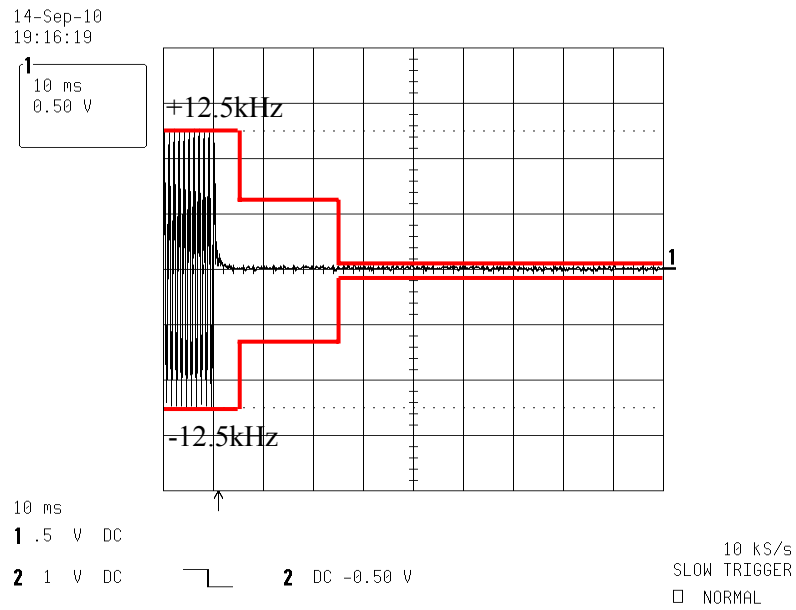
State : High Power / Authorized Bandwidth 20 kHz / FM / 173.95 MHz/ PTT:OFF -ON



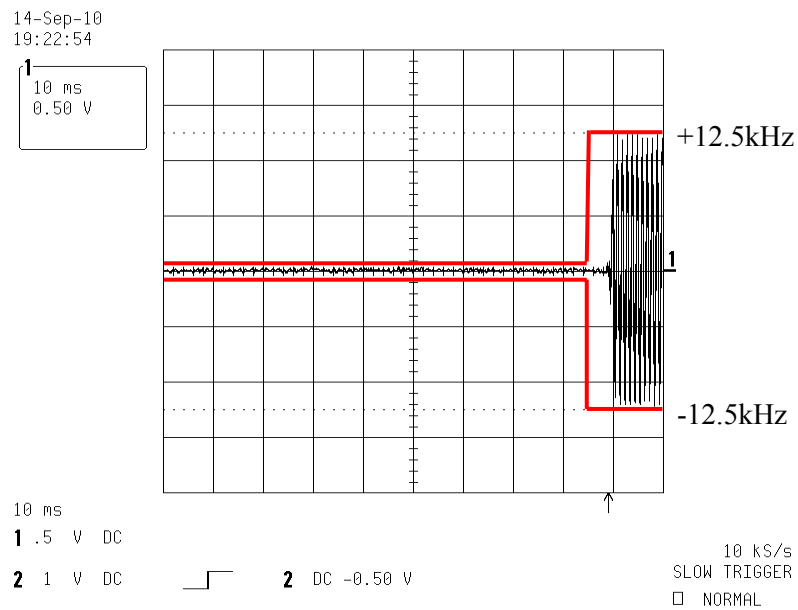
State : High Power / Authorized Bandwidth 20 kHz / FM / 173.95 MHz/ PTT:ON -OFF



State : High Power / Authorized Bandwidth 11.25 kHz / FM / 150.05 MHz/ PTT:OFF -ON



State : High Power / Authorized Bandwidth 11.25 kHz / FM / 150.05 MHz/ PTT:ON -OFF



## 10.6 Audio Frequency Response / Audio Low Pass Filter (Voice Input)

REGULATIONS : FCC Part 2 Section 1047 (a)

TEST METHOD/GUIDE : ANSI/TIA-603-C Section 2.2.6.2.2, 3.2.6.2

### Test Procedure

- 1 The EUT and test equipment were set up as shown on the following page.
- 2 Adjust the Modulation Analyzer for the following setting:
  - a) High-pass filter : 50 Hz
  - b) Low-pass filter : 15 kHz
  - c) Detector : positive peak
  - d) Function : FM
- 3 The audio signal input was adjusted to obtain 20 % modulation at 1 kHz, and this point was taken as the 0 dB reference level.
- 4 With input levels held constant and below limiting at all frequencies, the audio signal generator was varied from 300 Hz to 5 kHz.
- 5 The response in dB relative to 1 kHz was then measured, using the Modulation Analyzer.

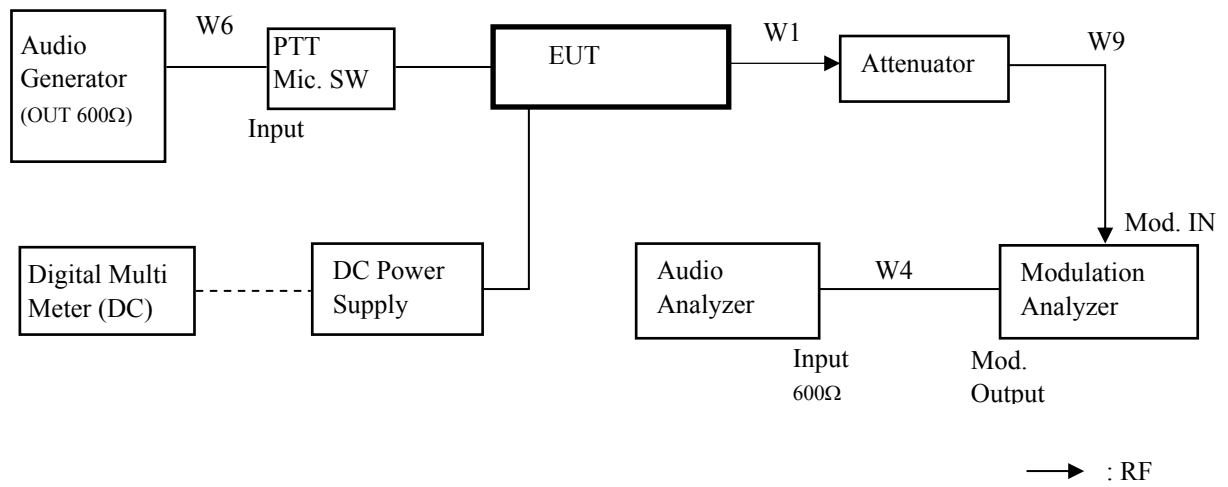
### Measuring Equipments

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Audio Generator	Anritsu	MG443B	M70150	Apr. 15, 10	Apr. 30, 11
2	Audio Analyzer	Hewlett Packard	8903B	2818A04372	Apr. 09, 10	Apr. 30, 11
3	Attenuator (20dB)	Aeroflex/Wenshel	66-20-34	BY4537	Mar. 12, 10	Mar. 31, 11
4	Attenuator (30dB)	Weinschel	WA-29-30-34	8923	May 20, 10	May 31, 11
5	Modulation Analyzer	Hewlett Packard	8901B	3403A04852	Jul. 22, 10	Jul. 31, 11
6	Digital Multi Meter	FLUKE	8846A	9642018	Jul. 22, 10	Jul. 31, 11
7	DC Power Supply	Daiichi denpa kogyo	GZV4000	90290931	None	None

### Measuring Cables

No.	Cable	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
W1	Coaxial Cable	Suhner	SUCOFLEX104	KSR00091	May 20, 10	May 31, 11
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
W9	Coaxial Cable	Pacific custom	RG-58 C/U	KSR00097	Nov. 09, 09	Nov. 30, 10

## Measuring Equipment Configuration





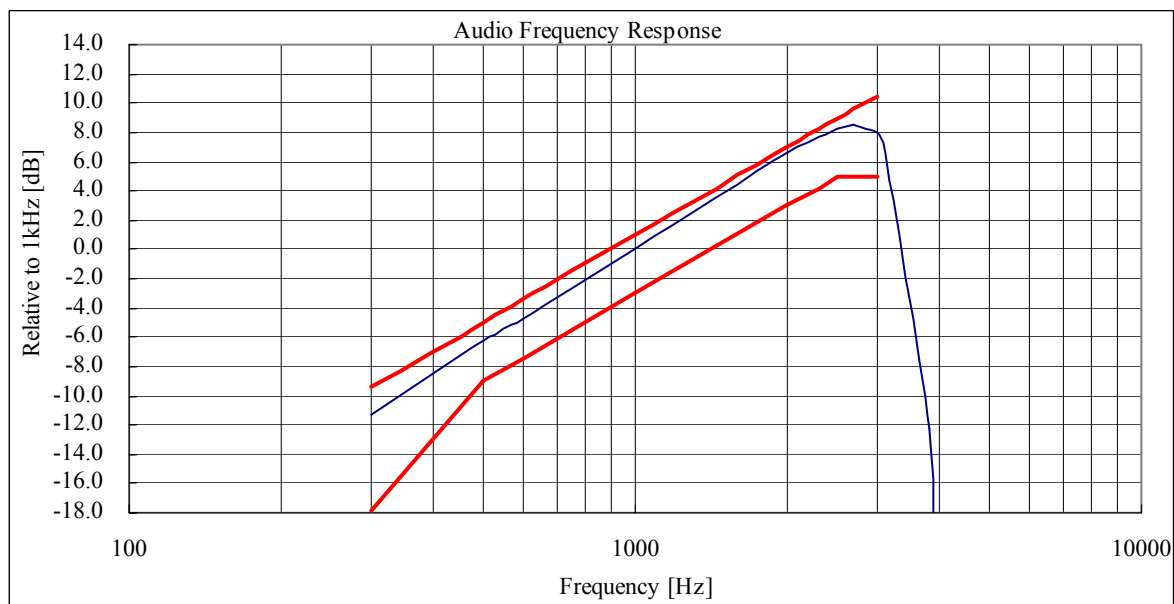
## Test Results

Test date	Sep. 09, 2010
Location	Tochigi No.3 Test Site
temperature	24.0 to 25.0 [degree C]
Humidity Variation	49 to 54 [%]
Atmospheric Pressure	99.1 to 99.3 [kPa]
Test Engineer	Hideaki Kosemura

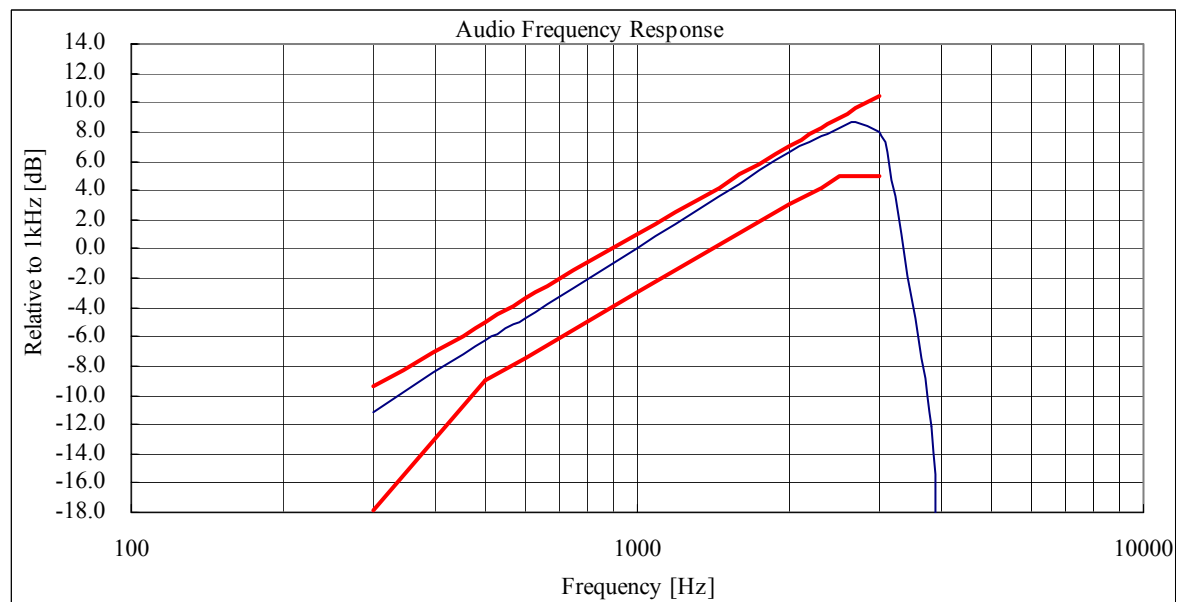
Test was carried out for all the frequency band of section 10.1

State the worst case (below).

State : High Power / Authorized Bandwidth 20 kHz / 162.05 MHz



State : High Power / Authorized Bandwidth 11.25 kHz / 162.05 MHz



Note:

Audio Filter of the above result is substituted with the same structure as Audio Frequency Response.  
On the transmission condition below 3kHz, Transceiver shows pre-emphasis condition of transmission function.  
On the transmission condition above 3kHz, Transceiver shows Audio Low Pass Filter.

## 10.7 Modulation Limiting

REGULATIONS	: FCC Part 2 Section 1047 (b)
TEST METHOD/GUIDE	: ANSI/TIA-603-C Section 2.2.3.2, 1.3.4.4

### Test Procedure

- 1 The EUT and test equipment were set up as shown on the following page.
- 2 Adjust the Modulation Analyzer for the following setting:
  - a) High-pass filter : off
  - b) Low-pass filter : 15 kHz
  - c) Detector : positive peak
  - d) Function : FM
- 3 Apply a 1kHz modulation signal to the transmitter from the audio generator, and adjust the level to obtain 60% of full rated system deviation.
- 4 Measure the modulation frequency that was showed on the Modulation Analyzer when the output levels of the Audio Generator were changed from -20 dB to +50 dB by 10 dB.
- 5 Set the output frequencies of the Audio Generator 300 Hz and 3 kHz, and repeat test procedure 4.
- 6 Set the Detector of the Modulation Analyzer Negative Peak.
- 7 Repeat test procedure 4 and 5.

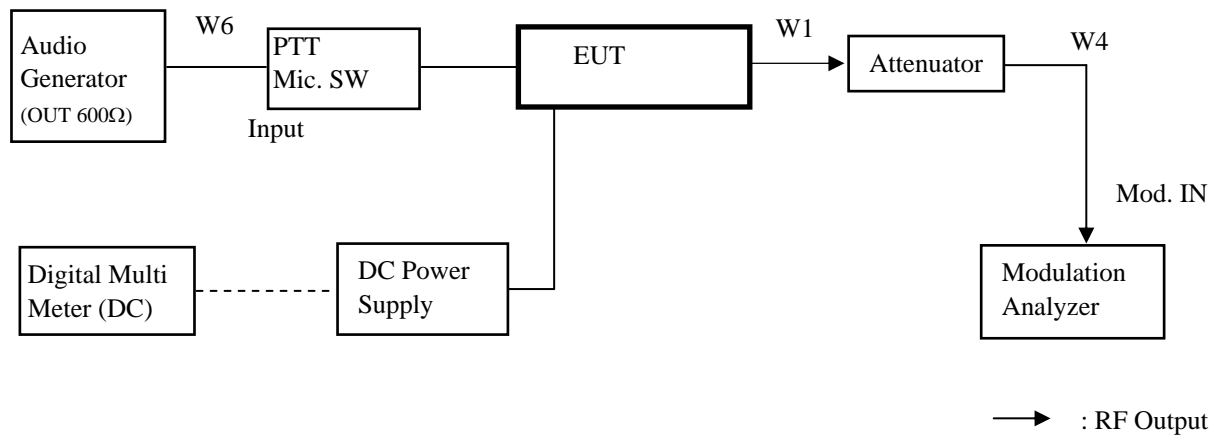
### Measuring Equipments

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Audio Generator	Anritsu	MG443B	M70150	Apr. 15, 10	Apr. 30, 11
2	Attenuator (20dB)	Aeroflex/Wenshel	66-20-34	BY4537	Mar. 12, 10	Mar. 31, 11
3	Attenuator (30dB)	Weinschel	WA-29-30-34	8923	May 20, 10	May 31, 11
4	Modulation Analyzer	Hewlett Packard	8901B	3403A04852	Jul. 22, 10	Jul. 31, 11
5	Digital Multi Meter	FLUKE	8846A	9642018	Jul. 22, 10	Jul. 31, 11
6	DC Power Supply	Daiichi denpa kogyo	GZV4000	90290931	None	None

### Measuring Cables

No.	Cable	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
W1	Coaxial Cable	Suhner	SUCOFLEX104	KSR00091	May 20, 10	May 31, 11
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

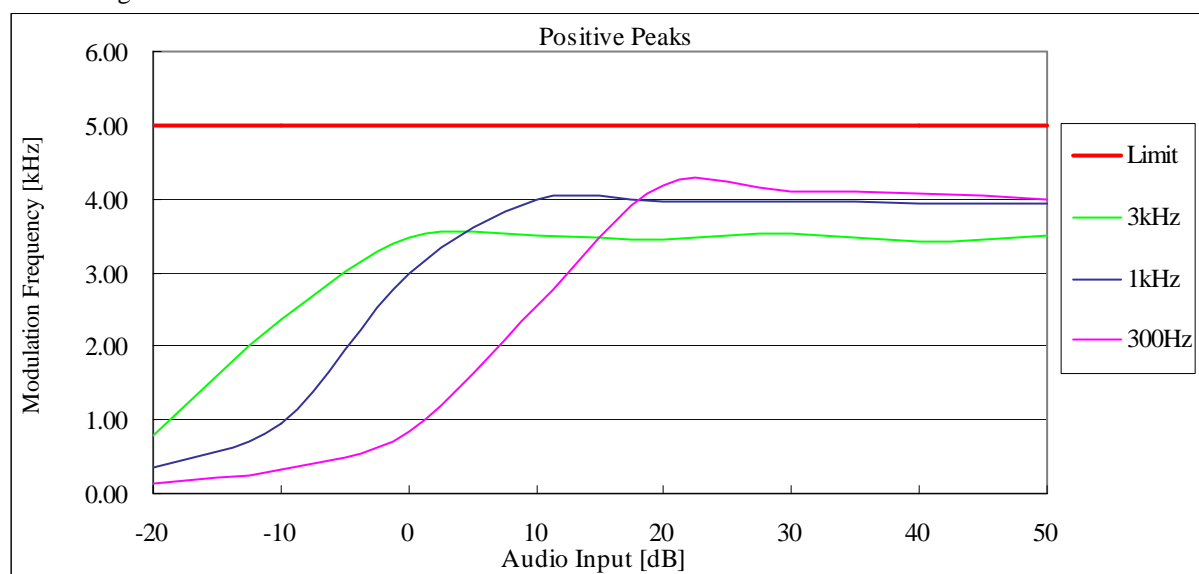


## Test Results

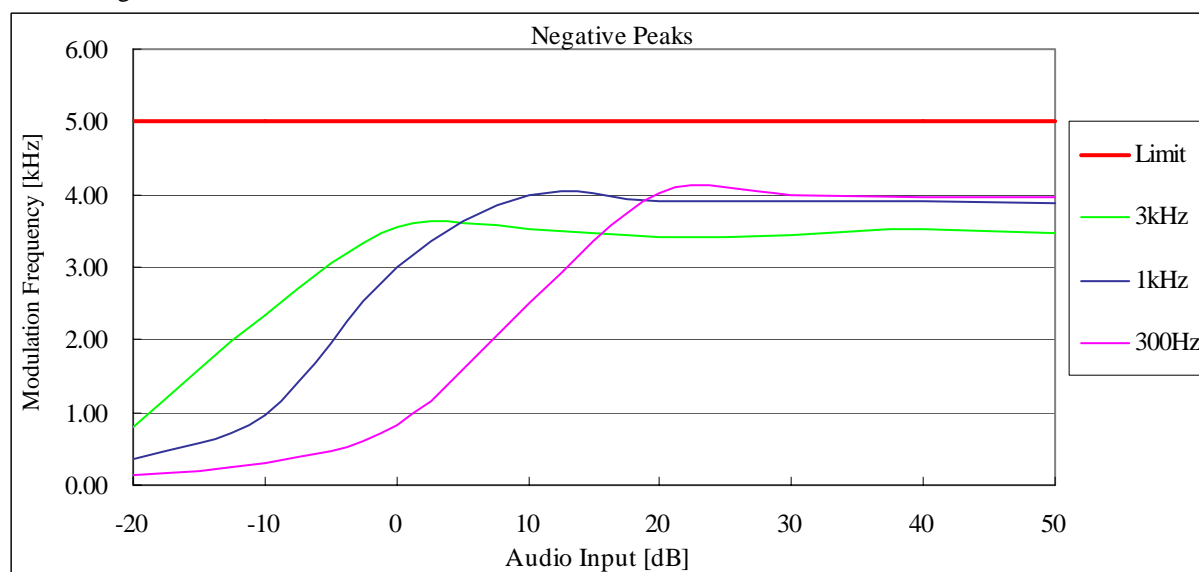
Test date	Sep. 08, 2010
Location	Tochigi No.3 Test Site
temperature	25.0 to 26.0 [degree C]
Humidity Variation	61 to 63 [%]
Atmospheric Pressure	98.5 to 98.7 [kPa]
Test Engineer	Hideaki Kosemura

Test was carried out for all the frequency band of section 10.1  
State the worst case (below).

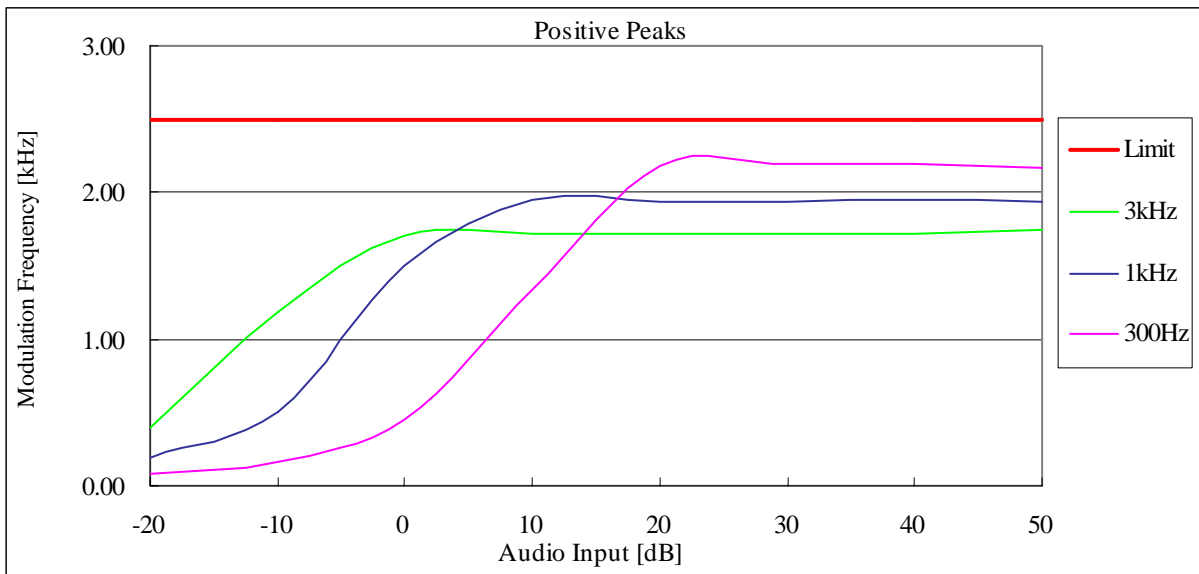
State : High Power / Authorized Bandwidth 20 kHz / 162.05 MHz



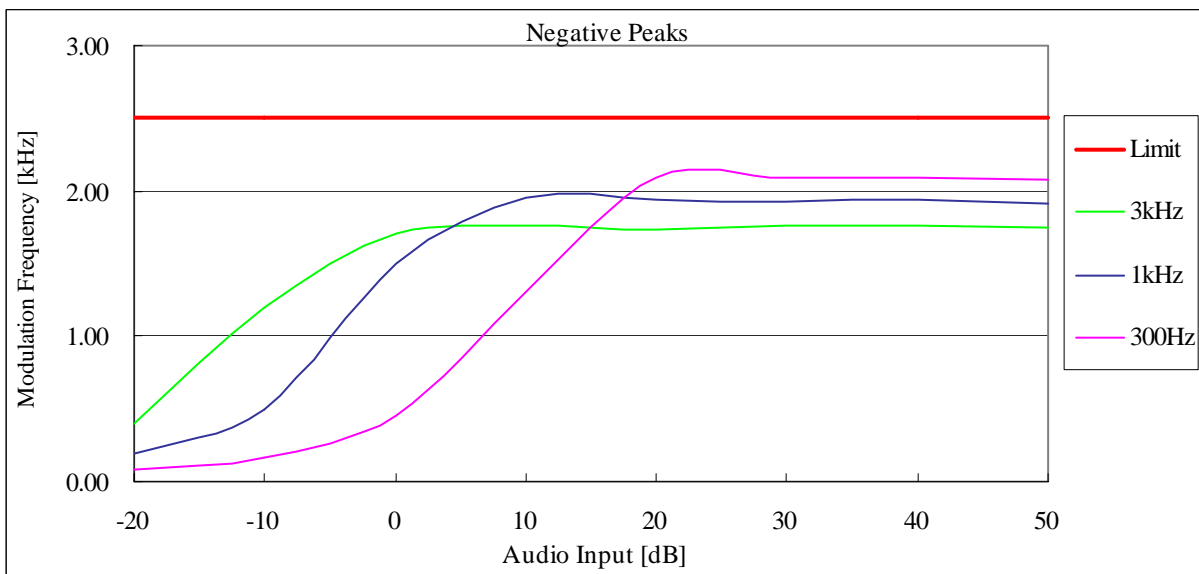
State : High Power / Authorized Bandwidth 20 kHz / 162.05 MHz



State : High Power / Authorized Bandwidth 11.25 kHz / 162.05 MHz



State : High Power / Authorized Bandwidth 11.25 kHz / 162.05 MHz



## 10.8 Frequency Stability (Temperature Variation)

REGULATIONS	: FCC Part 2 Section 1055 (a) (1), Part 90 Section 213(a)
TEST METHOD/GUIDE	: ANSI/TIA-603-C Section 2.2.2.2

### Test Procedure

- 1 The EUT and test equipment were set up as shown on the following page.
- 2 Set the temperature -30 degrees C.
- 3 Leave the EUT for 1 hour after it became the temperature that was set up.
- 4 Make the EUT the transmitting state.  
Two minutes later, measure the output frequency.
- 5 Make the EUT the receiving state.
- 6 Set the temperature 50 degrees C by 10 degrees C.  
And repeat test procedure 3 to 5.

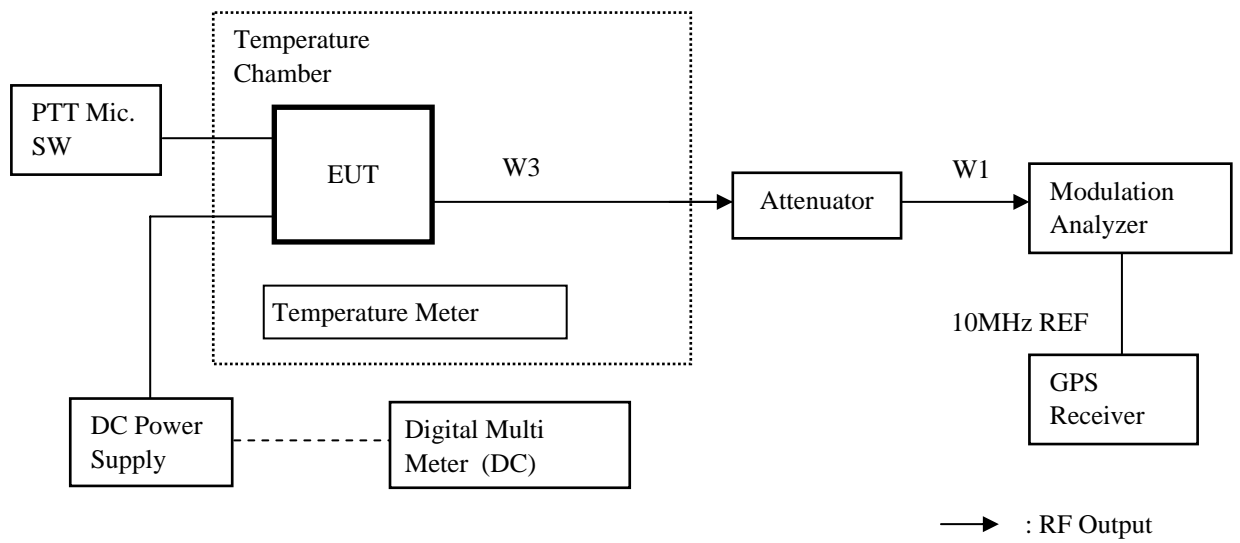
### Measuring Equipments

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Attenuator (30dB)	Weinschel	WA-29-30-34	8923	May 20, 10	May 31, 11
2	Attenuator (20dB)	Aeroflex/Wenshel	66-20-34	BY4537	Mar. 12, 10	Mar. 31, 11
3	Modulation Analyzer	Hewlett Packard	8901B	3403A04852	Jul. 22, 10	Jul. 31, 11
4	Digital Multi Meter	FLUKE	8846A	9642018	Jul. 22, 10	Jul. 31, 11
5	DC Power Supply	Daiichi denpa kogyo	GZV4000	90290931	None	None
6	DC Power Supply	Micky	10A	None	None	None
7	Temperature Chamber	Tabai	PL-3F	5103661	None	None
8	Temperature Meter	Sato	PC-5000TRH-II	A11999972	Apr. 15, 10	Apr. 30, 11
9	GPS Receiver	Hewlett Packard	HP Z3801A	3542A02414	None	None

### Measuring Cables

No.	Cable	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
W1	Coaxial Cable	Suhner	SUCOFLEX104	KSR00091	May 20, 10	May 31, 11
W3	Coaxial Cable	Suhner	SUCOFLEX104	KSR00042	Mar. 12, 10	Mar. 31, 11

## Measuring Equipment Configuration



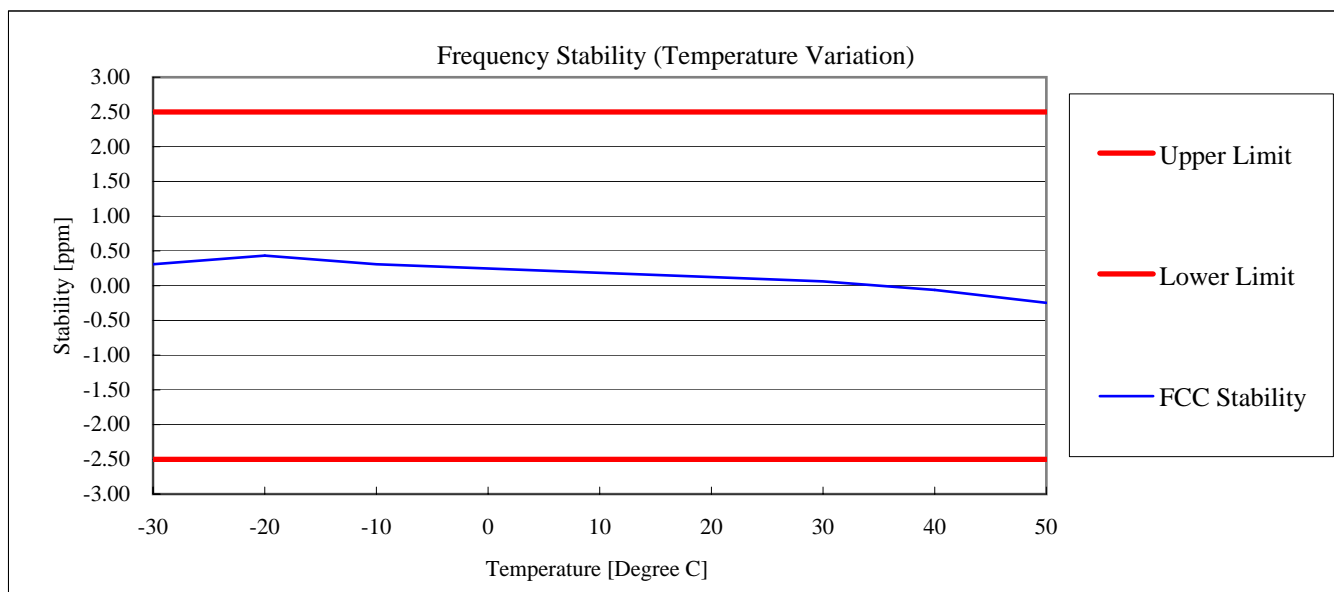
## Test Results

Test date	Oct. 18, 2010 to Oct. 19, 2010
Location	Kashima No.1 Test Site
Test Engineer	Hideaki Kosemura

Test was carried out for all the frequency band of section 10.1  
State the worst case (below).

State : High Power / Authorized Bandwidth 20 kHz / 162.05 MHz  
Reference Frequency: 162.050000 MHz(FCC Stability)

No.	Temperature (Degree C)	Frequency (MHz)	FCC Stability (ppm)	Limit (+/- ppm)	Min. Margin (ppm)
1	-30	162.050050	0.31	2.5	2.19
2	-20	162.050070	0.43	2.5	2.07
3	-10	162.050050	0.31	2.5	2.19
4	0	162.050040	0.25	2.5	2.25
5	10	162.050030	0.19	2.5	2.31
6	20	162.050020	0.12	2.5	2.38
7	30	162.050010	0.06	2.5	2.44
8	40	162.049990	-0.06	2.5	2.44
9	50	162.049960	-0.25	2.5	2.25





## 10.9 Frequency Stability (Voltage Variation)

REGULATIONS : FCC Part 2 Section 1055 (d) (1), Part 90.213(a)

TEST METHOD/GUIDE : ANSI/TIA-603-C Section 2.2.2.2

### Test Procedure

- 1 The EUT and test equipment were set up as shown on the following page.
- 2 The power supply voltage to the EUT was varied from 85 % to 115 % of the nominal value measured at the input to the EUT.

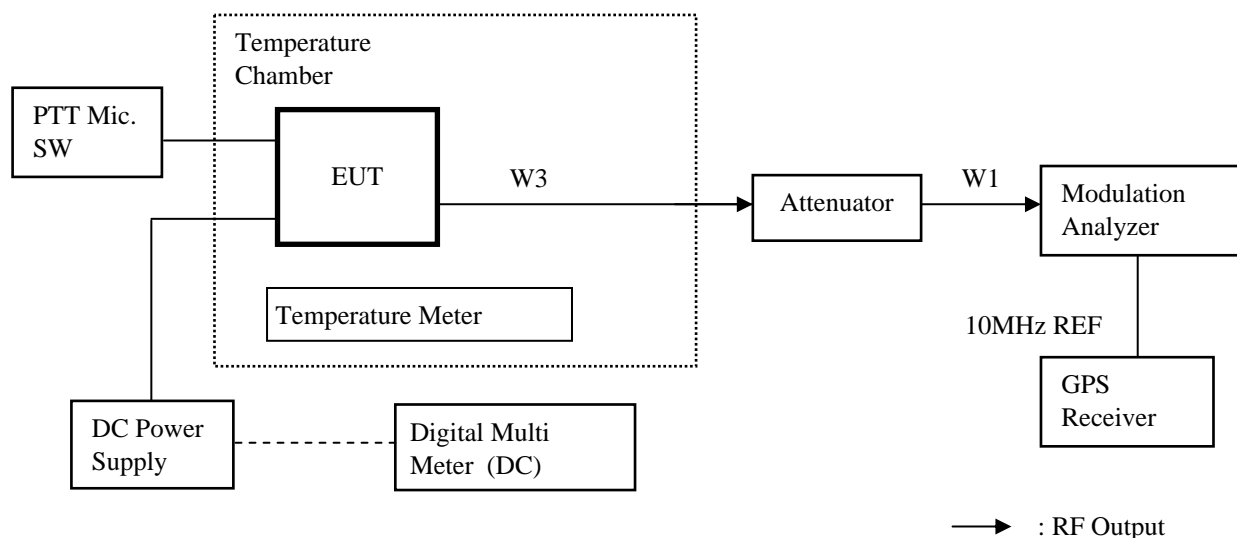
### Measuring Equipments

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Attenuator (30dB)	Weinschel	WA-29-30-34	8923	May 20, 10	May 31, 11
2	Attenuator (20dB)	Aeroflex/Wenshel	66-20-34	BY4537	Mar. 12, 10	Mar. 31, 11
3	Modulation Analyzer	Hewlett Packard	8901B	3403A04852	Jul. 22, 10	Jul. 31, 11
4	Digital Multi Meter	FLUKE	8846A	9642018	Jul. 22, 10	Jul. 31, 11
5	DC Power Supply	Daiichi denpa kogyo	GZV4000	90290931	None	None
6	DC Power Supply	Micky	10A	None	None	None
7	Temperature Chamber	Tabai	PL-3F	5103661	None	None
8	Temperature Meter	Sato	PC-5000TRH-II	A11999972	Apr. 15, 10	Apr. 30, 11
9	GPS Receiver	Hewlett Packard	HP Z3801A	3542A02414	None	None

### Measuring Cables

No.	Cable	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
W1	Coaxial Cable	Suhner	SUCOFLEX104	KSR00091	May 20, 10	May 31, 11
W3	Coaxial Cable	Suhner	SUCOFLEX104	KSR00042	Mar. 12, 10	Mar. 31, 11

### Measuring Equipment Configuration



# Test Results

Test date	Oct. 18, 2010 to Oct. 19, 2010
Location	Kashima No.1 Test Site
Test Engineer	Hideaki Kosemura

Test was carried out for all the frequency band of section 10.1  
State the worst case (below).

State : High Power / Authorized Bandwidth 20 kHz / 162.05 MHz

No.	Temperature (Degree C)	Deviation (%)	Voltage (V)	Frequency (MHz)	Stability (ppm)	Limit +/- (ppm)	Margin (ppm)
1	25 +/- 5	85	11.56	162.050010	0.16	2.5	2.34
2	25 +/- 5	100	13.60	162.050020	0.16	2.5	2.34
3	25 +/- 5	115	15.64	162.050020	0.11	2.5	2.39

## 10.10 Necessary Bandwidth and Emission Bandwidth

REGULATIONS : FCC Part 2 Section 202 (g) & Federal Register/ Vol.68, No236

### Calculation Results

State : 16K0F3E (Authorized Bandwidth 20 kHz)

Item	Mark		
Maximum Modulation	(M)	3	kHz
Maximum Deviation	(D)	5	kHz
Constant Factor	(K)	1	
Necessary Bandwidth	(Bn)	16	kHz

$$B_n = (2 \times M) + (2 \times D \times K)$$

State : 11K0F3E (Authorized Bandwidth 11.25 kHz)

Item	Mark		
Maximum Modulation	(M)	3	kHz
Maximum Deviation	(D)	2.5	kHz
Constant Factor	(K)	1	
Necessary Bandwidth	(Bn)	11	kHz

$$B_n = (2 \times M) + (2 \times D \times K)$$