



TEST REPORT

REGULATION : **FCC Part 2, 90**
RSS-119 Issue 11

Applicant	Testing Laboratory
Kenwood Corporation 1-16-2, Hakusan, Midori-ku, Yokohama-shi Kanagawa, 226-8525 Japan Tel.: +81 45 939 6254 Fax.: +81 45 939 7097	Intertek Japan K. K. Kashima Laboratory 3-2, Sunayama, Kamisu-shi, Ibaraki-ken 314-0255 Japan Tel.: +81 479 40 1097 Intertek Japan K. K. Tochigi Laboratory 870 Nakaawano, Kanuma-shi, Tochigi-ken 322-0306 Japan Tel.: +81 289 86 7121

Equipment type	UHF DIGITAL BASE-REPEATER
Trademark	KENWOOD
Model(s)	NXR-800-E3
Serial No.	B0500064
FCC ID	K44371412
IC CN and UPN	282F-371412
Test Result	Complied
Report Number	JT11050003
Report issue date	June 08, 2011

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Approved by K. Gokita

Kazuo Gokita

[Site Manager]

Tested by A. Morishima

Atsuyuki Morishima

K. Wagatsuma

Koichi Wagatsuma

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	: K44371412
Model number	: NXR-800-E3
Serial number	: B0500064
(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) *16K0F3E is IC only. 8K30F1E(Narrow) / 8K30F1D(Narrow) / 8K30F7W(Narrow) 4K00F1E(Very Narrow) / 4K00F1D(Very Narrow) / 4K00F7W(Very Narrow) 4K00F2D(Very Narrow)
(c)(5) Frequency range	
Frequency Range	: 406.1 to 430 MHz(FCC / RSS)
(c)(6) Power Rating	
Output Power	: 5 to 25 W
Type	: Continuously Variable
(c)(7) Maximum Power Rating	
Output Power	: 25 W
(c)(8): Voltages & currents in all elements in final RF stage, including final transistor or solid-state device	
Collector Current, A	: 9.0 amps (Maximum)
Collector Voltage, Vdc	: 13.2 Vdc
Supply Voltage, Vdc	: 13.2 Vdc
Other Information	
Number of Channel	: 30 channels
Maximum Deviation	: 5 kHz / 2.5kHz *5kHz is IC only
Frequency Stability	: 1.0 ppm, 0.5ppm with KXX-3 OCXO UNIT
Antenna Impedance	: 50 Ω Norminal
Note	

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SECTION 1. GENERAL INFORMATION

TEST PERFORMED

Location	Kashima No.1 Test Site, Tochigi No.2 Test Site		
EUT Received	May 10, 2011		
Date of Test	May 11, 2011	to	May 27, 2011
Standard Applied	FCC Part 2, 90 RSS-119 Issue 11		
Measurement Method	ANSI/TIA-603-D-2010 / RSS-119 Issue 11(2011), RSS-Gen Issue 3(2010)		
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	

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	PEK	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
-	90.214	5.9	Transient Frequency Behavior	PASS
2.1047 (a)	-	-	Audio Low Pass Filter (Voice Input)	PASS
2.1047 (a)	-	-	Audio Frequency Response	PASS
2.1047 (b)	-	-	Modulation Limiting	PASS
2.1055 (a) (1)	90.213 (a)	5.3	Frequency Stability (Temperature Variation)	PASS
2.1055 (d) (1)	90.213 (a)	5.3	Frequency Stability (Voltage Variation)	PASS
-	-	5.11	Receiver Spurious Emissions	PASS
-	90.203 (j)(3)	-	Certification required (FCC Part 90.203(j)(3))	Complied
-	90.203 (j)(4)	-	Certification required (FCC Part 90.203(j)(4))	Complied
-	90.203 (j)(5)	-	Certification required (FCC Part 90.203(j)(5))	Complied
-	90.203 (e)	-	Certification required (FCC Part 90.203(e))	Complied

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.

Note:

As for the FCC Part 15 Subpart 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.
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
A1	UHF DIGITAL BASE-REPEATER	NXR-800-E3	B0500064	KENWOOD	EUT
A2	OCXO Unit	KXK-3	None	KENWOOD	EUT
Power Ratings of EUT :		DC 13.2 V (DC 10.8 to 15.6 V)		9.0 A Maximum	
Power Supply :		DC 13.2 V +/- 15 %			
Condition of Equipment		Production			
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	BNC	2 pin	
REF OUT	BNC	2pin	
REF IN	BNC	2pin	
DC IN	JST VLR-02V	2pin	
TX	BNC	2pin	
TEST/SPKR	MOLEX 1625-15p	15pin	
Control I/O	D-sub	25pin	
SYNC 1	RJ-11	4pin	
SYNC 2	RJ-11	4pin	
LAN	RJ-45	8 pin	
MICROPHONE	RJ-45	8 pin	
COM	D-sub	9 pin	

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

Base Clock	Operating Frequency	Board Name	Remarks
430 MHz	430 MHz	TX 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	Microphone	KMC-35	None	Kenwood	N/A
C	HUB	SF 100D-05	PSJ1414039B	CISCO	DoC
D	Modem	Tuff-Modem	700865	Trident Micro Systems	N/A
E	Controller	None	None	None	N/A
F	External Speaker	KES-5	None	Kenwood	N/A
G	Terminator	DL-30N	None	DIAMOND ANTENNA	N/A
H	Dummy Load	CT-150NP	1138693	TME	N/A
I	Base-Repeater (1)	NXR-JIG1	None	Kenwood	N/A
J	Base-Repeater (2)	NXR-JIG2	None	Kenwood	N/A
K	DC Power Supply (1)	GZV4000	90290932	Daiichi Denpa Kogyo	N/A
L	DC Power Supply (2)	GZV4000	90290931	Daiichi Denpa Kogyo	N/A
M	DC Power Supply (3)	PS3020	None	Daiwa	N/A
N	DC Power Supply (4)	HWS300-15	5JY-139MC2-0005	TDK-Lamba	N/A
O	AC Adapter	MU06-6120050-A1	None	LEADER ELECTRONICS INC	N/A
P	Terminator	DL-30N	None	DIAMOND ANTENNA	N/A
Q	Terminator	DL-30N	None	DIAMOND ANTENNA	N/A
R	Terminator	DL-30N	None	DIAMOND ANTENNA	N/A
S	Terminator	DL-30N	None	DIAMOND ANTENNA	N/A
T	Terminator	DL-30N	None	DIAMOND ANTENNA	N/A
Supplied Power:					
K, L, M N, O	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	Mic. cable	0.60	No	Plastic	
2	LAN cable	1.00	No	Plastic	
3	RS-232C cable	1.00	Yes	Metal	
4	D-Sub cable	1.20	Yes	Metal	
5	Speaker cable	2.80	No	Plastic	
6	Modular cable	0.10	No	Plastic	
7	Modular cable	0.10	No	Plastic	
8	DC cable for EUT	4.00	No	Plastic	Removable x 1
9	DC cable for Base-Repeater (1)	4.00	No	Plastic	Removable x 1
10	DC cable for Base-Repeater (2)	4.00	No	Plastic	Removable x 1
11	Power cable for DC Power Supply (1)	1.80	No	Plastic	
12	Power cable for DC Power Supply (2)	1.80	No	Plastic	
13	Power cable for DC Power Supply (3)	1.80	No	Plastic	
14	Power cable for DC Power Supply (4)	1.80	No	Plastic	
15	DC cable for Modem	1.50	No	Plastic	
16	DC cable for HUB	1.45	No	Plastic	
17	Coaxial cable	1.00	Yes	Metal	
18	Coaxial cable	0.90	Yes	Metal	

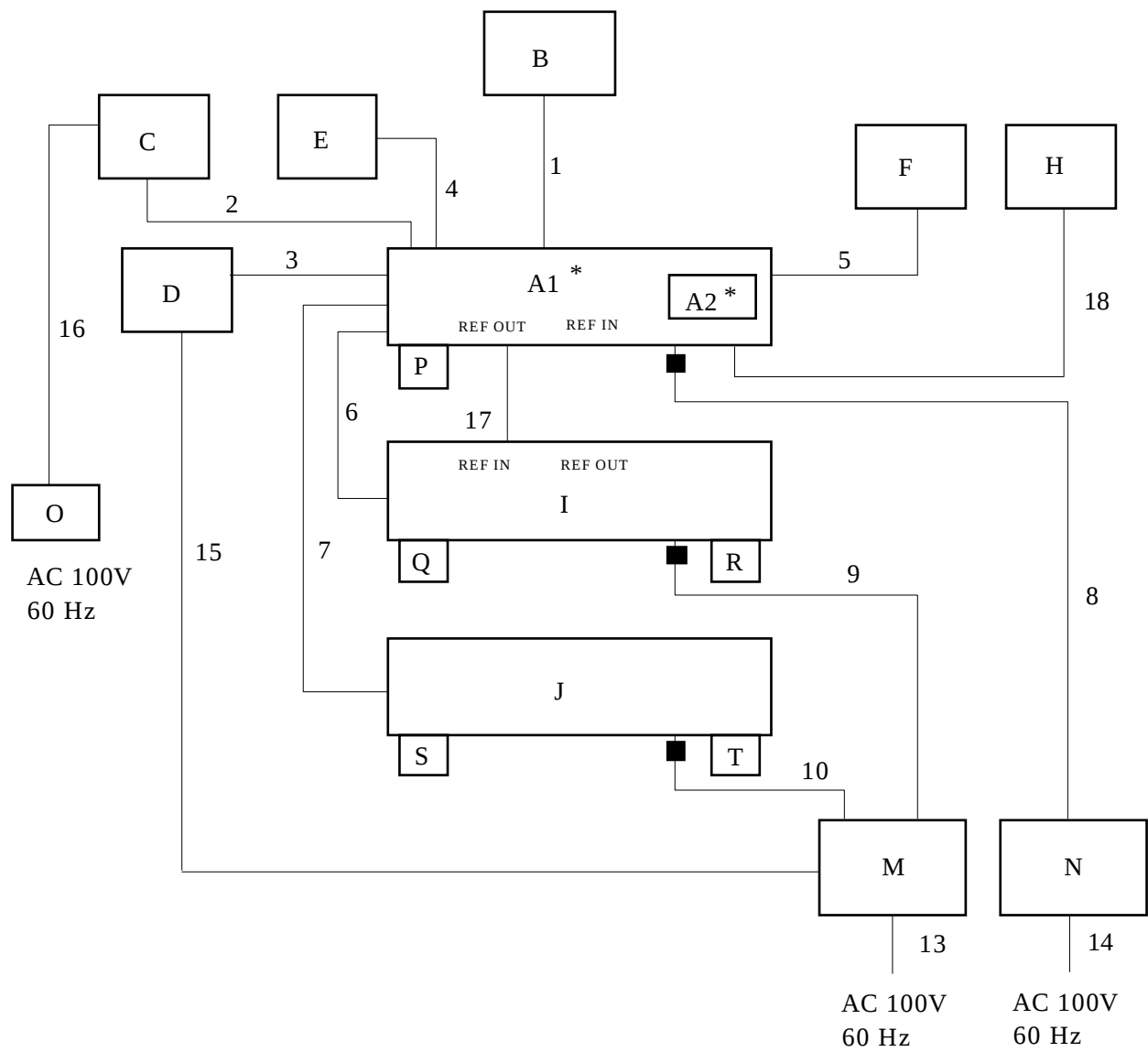
SECTION 7. TEST CONFIGURATION

Details of Configuration and Connection

Example: Case of Section 10.3 Test

* : EUT

■ : Ferrite core



SECTION 8. OPERATING CONDITION

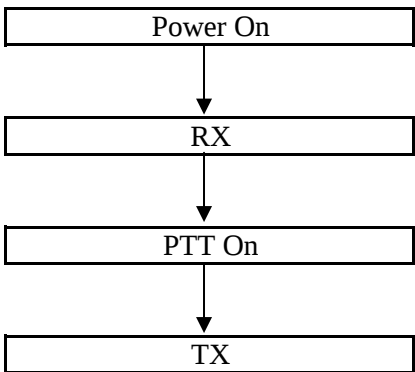
The EUT was operated under the following condition during the test.

8.1 Operating Condition

The test was carried out under Transmit mode.
(FCC:440.05MHz, 455.05MHz, 469.95MHz, RSS:450.05MHz, 460.05MHz, 469.95MHz)
(High Power : 25 W, Low Power : 5 W)
The test was carried out under Receive mode.
(RSS:450.05MHz, 460.05MHz, 469.95MHz)
EUT was examined in the operating conditions that had maximum emissions.

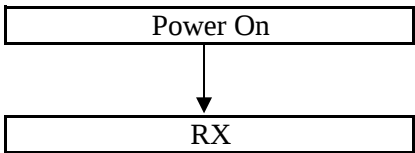
8.2 Operating Flow [Transmit mode]

Following operations were performed continuously.



8.3 Operating Flow [Receive mode]

Following operations were performed continuously.



SECTION 9. MEASUREMENT UNCERTAINTY

Carrier Output Power (Conducted)	U _{lab}	Utia-603-D
	+/- 0.29dB (k = 2)	+/- 0.59 dB
Unwanted Emissions (Transmitter Conducted)		
	+/- 2.19 dB (k = 2)	+/- 1.1 dB
Field Strength of Spurious Radiation		
	+/- 3.90dB (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}	Ucisp
30-1000MHz	+/- 3.52dB (k = 2)	+/- 5.2 dB
abobe 1GHz	+/- 4.26dB (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-D 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)

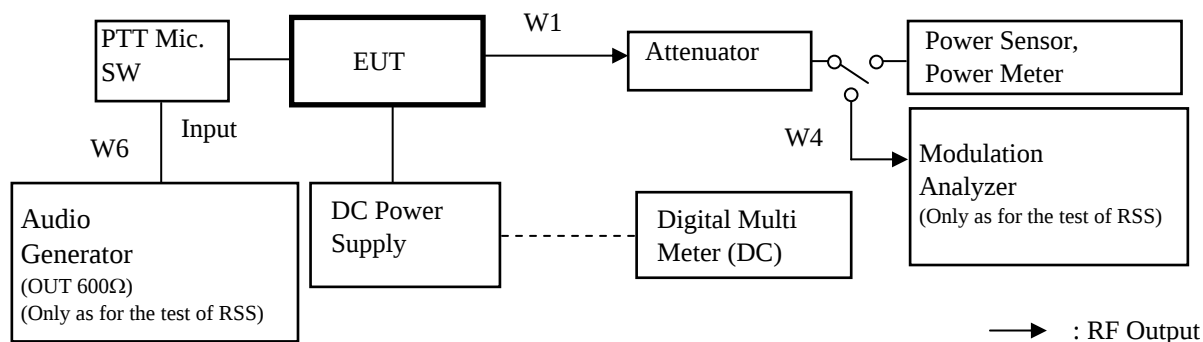
Measuring Equipments

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Power Meter	Hewlett Packard	E4418B	GB38410265	May 20, 10	May 31, 11
2	Power Sensor	Hewlett Packard	8482A	US37292237	May 20, 10	May 31, 11
3	Attenuator (30dB)	Weinschel	WA-29-30-34	8923	May 20, 10	May 31, 11
4	Audio Generator	Anritsu	MG443B	M70150	Apr. 15, 11	Apr. 30, 12
5	Modulation Analyzer	Hewlett Packard	8901B	2806A01669	Mar. 08, 11	Mar. 31, 12
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	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. 19, 10	Nov. 30, 11
W6	Balance Cable	Nicoon	3D-2V	KSR00092	Oct. 14, 10	Oct. 31, 11

Measuring Equipment Configuration



Test Results

Test date	May. 11, 2011
Location	Tochigi No.2 Test Site
temperature	20.0 to 21.0 [degree C]
Humidity Variation	68 to 70 [%]
Atmospheric Pressure	98.8 to 98.9 [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	406.15	Low (FCC/RSS)	High Power	25.00
2	418.05	Middle (FCC/RSS)	High Power	25.00
3	429.95	High (FCC/RSS)	High Power	25.00
4	406.15	Low (FCC/RSS)	Low Power	5.00
5	418.05	Middle (FCC/RSS)	Low Power	5.00
6	429.95	High (FCC/RSS)	Low Power	5.00

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-D Section 2.2.13.2 / RSS-119 Section 4.2, RSS-Gen Section 4.9

Test Procedure

- The EUT and test equipment were set up as shown on the following page.
- 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.
- Adjust the spectrum analyzer for the following setting:
 - RBW : 10 kHz (< 1 GHz), 1 MHz (> 1 GHz).
 - VBW : 30 kHz (< 1 GHz), 3 MHz (> 1 GHz).
 - Sweep Speed : 50 msec.
 - Detector mode : Average power (FM Modulation) , Positive peak with peak hold (Digital Modulation)
- The emissions were measured for the worst case as follows:
 - : within a band of frequencies defined by the carrier frequency plus and minus one channel.
 - : 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.

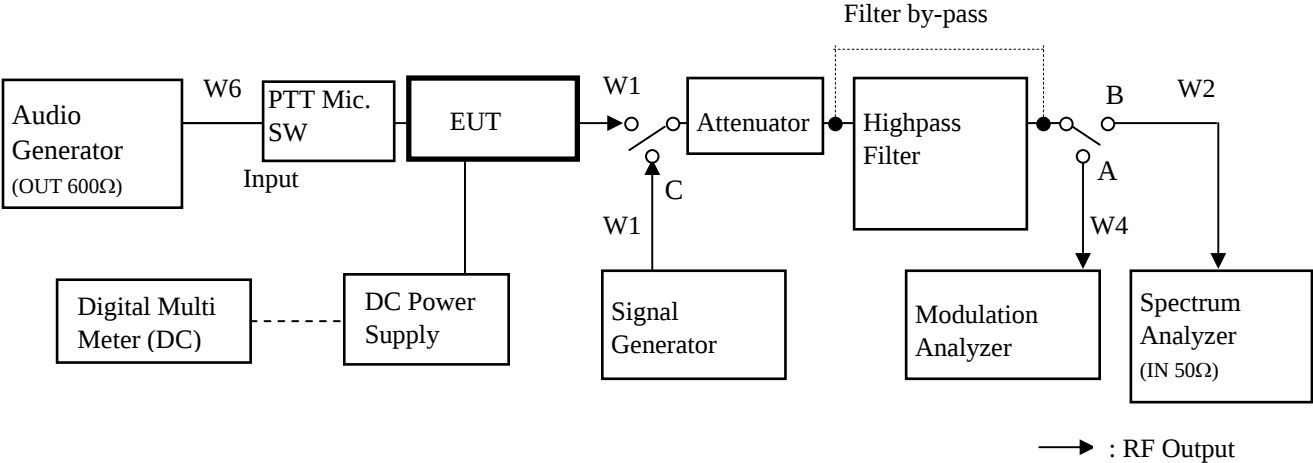
Measuring Equipments

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Attenuator (20dB)	Aeroflex/Wenshel	66-20-34	BY4357	Apr. 22, 11	Apr. 30, 12
2	Attenuator (30dB)	Weinschel	WA-29-30-34	8923	May 20, 10	May 31, 11
3	Highpass Filter	Anritsu	MP526D	6200220657	Dec. 08, 10	Dec. 31, 11
4	Audio Generator	Anritsu	MG443B	M70150	Apr. 15, 11	Apr. 30, 12
5	Modulation Analyzer	Hewlett Packard	8901B	2806A01669	Mar. 08, 11	Mar. 31, 12
6	Signal Generator	Rohde&Schwarz	SMT06	100684	Jan. 13, 11	Jan. 31, 12
7	Spectrum Analyzer	Agilent	E7403A	MY42000061	Jul. 23, 10	Jul. 31, 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	SUCOFLEX100	KSR00042	Apr. 22, 11	Apr. 30, 12
W4	Coaxial Cable	Pacific custom	RG-58 C/U	KSR00096	Nov. 19, 10	Nov. 30, 11
W6	Balance Cable	Nicoon	3D-2V	KSR00092	Oct. 14, 10	Oct. 31, 11

Measuring Equipment Configuration



Test Results

Test date	May 16, 2011
Location	Tochigi No.2 Test Site
temperature	20.0 to 21.0 [degree C]
Humidity Variation	68 to 70 [%]
Atmospheric Pressure	98.8 to 98.9 [kPa]
Test Engineer	Atsuyuki Morishima

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

State : High Power / Authorized Bandwidth 6 kHz

No.	Band	Frequency (MHz)	Correct Level (dBm)	Emission Level (dBc)	Mask E Limit (dBc)	Margin (dB)
1	Low (FCC/RSS)	812.30	-45.10	-89.08	-65.0	24.1
2	Middle (FCC/RSS)	836.10	-45.30	-89.28	-65.0	24.3
3	High (FCC/RSS)	859.90	-46.40	-90.38	-65.0	25.4
There is the margin of 20dB over except for the above points.						

State : Low Power / Authorized Bandwidth 6kHz

No.	Band	Frequency (MHz)	Correct Level (dBm)	Emission Level (dBc)	Mask E Limit (dBc)	Margin (dB)
1	Low (FCC/RSS)	No Point detected	-	-	-62.0	-
2	Middle (FCC/RSS)	No Point detected	-	-	-62.0	-
3	High (FCC/RSS)	No Point detected	-	-	-62.0	-
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-D Section 2.2.12.2 / RSS-119 Section 4.2, RSS-Gen Section 4.9

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

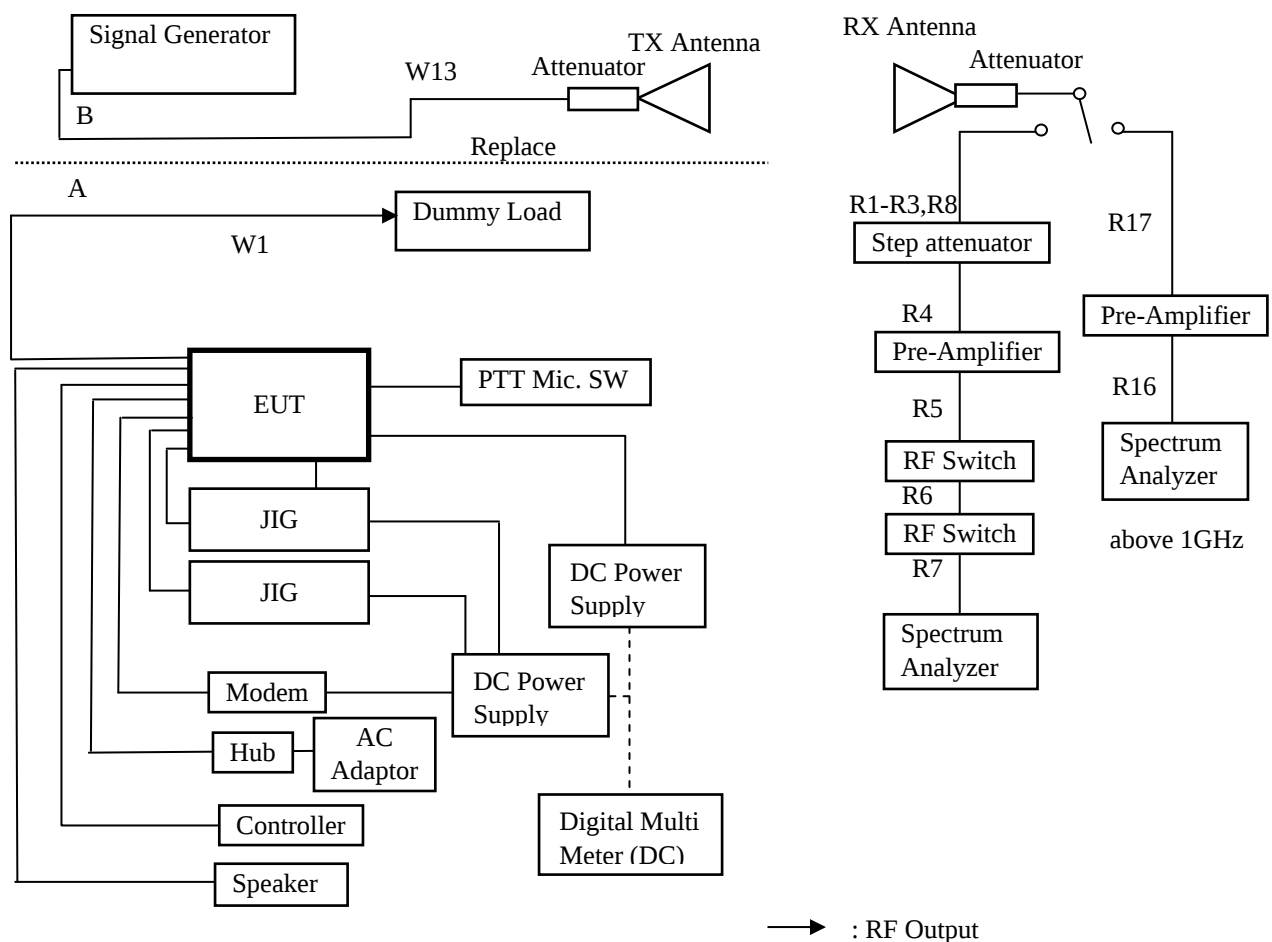
Measuring Equipments

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Dipole Antenna(TX)	Schwarzbeck	UHA9105	AM0082002	Jun. 03, 10	Jun. 30, 11
2	D.R.G Antenna(TX)	Schwarzbeck	BBHA9120D	457	Aug. 20, 10	Aug. 31, 11
3	Broad Band antenna	Schwarzbeck	VULB9168	218	Mar. 29, 11	Mar. 31, 12
4	D.R.G Antenna(RX)	Schwarzbeck	3115	5044	Jun. 07, 10	Jun. 30, 11
5	Pre-Amplifier	Hewlett Packard	8447D	2944A06342	May 13, 11	May 31, 12
6	Pre-Amplifier	Hewlett Packard	8449B	3008A01182	Apr 19, 11	Apr 30, 12
7	Attenuator(10dB)	HUBER+SUHNER	6810.17B	KSR0044	Feb. 14, 11	Feb. 29, 12
8	Attenuator(6dB)	TAMAGAWA	CFA-01(NPJ-6)	None	May 13, 11	May 31, 12
9	Attenuator(6dB)	Agilent	8493C	75550	Apr 13, 11	Apr 30, 12
10	Step Attenuator	Hewlett Packard	8494B	2805A14563	May 13, 11	May 31, 12
11	Dummy Load	TME	CT-150NP	1138693	Dec. 22, 10	Dec. 31, 11
12	Signal Generator	Rohde&Schwarz	SMT06	100684	Jan. 13, 11	Jan. 31, 12
13	Spectrum Analyzer	Agilent	E7403B	MY45102460	Feb. 02, 11	Feb. 29, 12
14	Digital Multi Meter	FLUKE	8846A	9642018	Jul. 22, 10	Jul. 31, 11
15	DC Power Supply	TDK-Lambda	HWS300-15	5JY-139MC2-0005	None	None
16	DC Power Supply	Daiwa	PS-3020	None	None	None

Measuring Cables

No.	Cable	Manufacturer	Model No.	Serial No.	Cal Date	Cal Exp.
W1	Coaxial Cable	Suhner	SUCOFLEX104	F0000017	Sep. 30, 10	Sep. 30, 11
W13	Coaxial Cable	Suhner	SUCOFLEX100	KSR00207	Jul. 14, 10	Jul. 31, 11
R1	Coaxial Cable	ETL SEMKO	5D-2W	2R1001a	May 13, 11	May 31, 12
R2	Coaxial Cable	ETL SEMKO	RG-117/U	2R1002	May 13, 11	May 31, 12
R3	Coaxial Cable	ETL SEMKO	RG-5A/U	2R1003	May 13, 11	May 31, 12
R4	Coaxial Cable	ETL SEMKO	RG-5A/U	2R1004	May 13, 11	May 31, 12
R5	Coaxial Cable	ETL SEMKO	5D-2W	2R1005	May 13, 11	May 31, 12
R6	Coaxial Cable	ETL SEMKO	5D-2W	2R1006	May 13, 11	May 31, 12
R7	Coaxial Cable	ETL SEMKO	5D-2W	2R1007	May 13, 11	May 31, 12
R8	Coaxial Cable	ETL SEMKO	5D-2W	2R1008a	May 13, 11	May 31, 12
R16	Coaxial Cable	Suhner	SUCOFLEX104	290799/4	Apr. 19, 11	Apr. 30, 12
R17	Coaxial Cable	Suhner	SUCOFLEX104	280800/4	Apr. 19, 11	Apr. 30, 12

Measuring Equipment Configuration



Test Results

Test date	May 16, 2011
Location	Tochigi No.2 Test Site
temperature	20 to 23 [degree C]
Humidity Variation	68 to 72 [%]
Atmospheric Pressure	99.0 to 99.1 [kPa]
Test Engineer	Atsuyuki Morishima

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

State : High Power / Authorized Bandwidth 6 kHz / 406.15 MHz (FCC/RSS)

No	Frequency (MHz)	Pol	Reading Level (dBm)	SG Out Level (dBm)	Antenna Gain (dBi)	Loss (dB)	Correct Level (dBm)	Emission Level (dBc)	MASK E Limit Level (dBc)	Margin (dB)
1	812.30	Hor.	-79.73	-53.10	2.15	12.17	-63.1	-107.1	-65.0	42.1
		Ver.	-79.47	-50.20	2.15	12.17	-60.2	-104.2	-65.0	39.2
2	1218.45	Hor.	-60.69	-51.50	6.51	12.63	-57.6	-101.6	-65.0	36.6
		Ver.	-59.10	-50.00	6.51	12.63	-56.1	-100.1	-65.0	35.1
3	1624.60	Hor.	-61.88	-53.40	9.42	13.03	-57.0	-101.0	-65.0	36.0
		Ver.	-61.08	-52.20	9.42	13.03	-55.8	-99.8	-65.0	34.8
4	2030.75	Hor.	-58.90	-45.20	10.00	13.43	-48.6	-92.6	-65.0	27.6
		Ver.	-59.88	-46.70	10.00	13.43	-50.1	-94.1	-65.0	29.1
5	2436.90	Hor.	-60.79	-47.60	10.22	13.83	-51.2	-95.2	-65.0	30.2
		Ver.	-62.75	-50.20	10.22	13.83	-53.8	-97.8	-65.0	32.8
6	2843.05	Hor.	-	-	10.46	14.23	-	-	-65.0	-
		Ver.	-	-	10.46	14.23	-	-	-65.0	-
7	3249.20	Hor.	-64.10	-49.40	11.88	14.55	-52.1	-96.1	-65.0	31.1
		Ver.	-62.85	-46.40	11.88	14.55	-49.1	-93.1	-65.0	28.1
8	3655.35	Hor.	-	-	12.22	14.82	-	-	-65.0	-
		Ver.	-	-	12.22	14.82	-	-	-65.0	-
9	4061.50	Hor.	-63.60	-45.30	12.33	15.10	-48.1	-92.0	-65.0	27.0
		Ver.	-61.35	-40.70	12.33	15.10	-43.5	-87.4	-65.0	22.4

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 / 406.15 MHz(FCC/RSS)

No	Frequency (MHz)	Pol	Reading Level (dBm)	SG Out Level (dBm)	Antenna Gain (dBi)	Loss (dB)	Correct Level (dBm)	Emission Level (dBc)	MASK E Limit Level (dBc)	Margin (dB)
1	812.30	Hor.	-84.33	-58.10	2.15	12.17	-68.1	-105.1	-62.0	43.1
		Ver.	-84.94	-56.10	2.15	12.17	-66.1	-103.1	-62.0	41.1
2	1218.45	Hor.	-		6.51	12.63	-	-	-62.0	-
		Ver.	-		6.51	12.63	-	-	-62.0	-
3	1624.60	Hor.	-		9.42	13.03	-	-	-62.0	-
		Ver.	-		9.42	13.03	-	-	-62.0	-
4	2030.75	Hor.	-		10.00	13.43	-	-	-62.0	-
		Ver.	-		10.00	13.43	-	-	-62.0	-
5	2436.90	Hor.	-		10.22	13.83	-	-	-62.0	-
		Ver.	-		10.22	13.83	-	-	-62.0	-
6	2843.05	Hor.	-		10.46	14.23	-	-	-62.0	-
		Ver.	-		10.46	14.23	-	-	-62.0	-
7	3249.20	Hor.	-		11.88	14.55	-	-	-62.0	-
		Ver.	-		11.88	14.55	-	-	-62.0	-
8	3655.35	Hor.	-		12.22	14.82	-	-	-62.0	-
		Ver.	-		12.22	14.82	-	-	-62.0	-
9	4061.50	Hor.	-65.86	-47.90	12.33	15.10	-50.7	-87.7	-62.0	25.7
		Ver.	-62.75	-42.50	12.33	15.10	-45.3	-82.3	-62.0	20.3
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-D Section 2.2.11.2 / RSS-119 Section 4.2.1, 4.2.2

Test Procedure

- The EUT and test equipment were set up as shown on the following page.
- 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).
- With level constant, the signal level was increased 16 dB.
- For EUT supporting digital modulation, the digital modulation mode was operated to its maximum extent.
- Adjust the spectrum analyzer for the following setting:
 - 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).
 - VBW : 10times the RBW (Non modulation , Authorized Band 11.25 kHz and Authorized Band 20 kHz).
 - RBW and VBW : 30 kHz (Non Modulation / Digital Modulation).
 - Sweep Speed : 8 sec.
 - Sampling Time : 10 times
- The occupied Bandwidth was measured with the Spectrum Analyzer controls set as shown on the test results.

Measuring Equipments

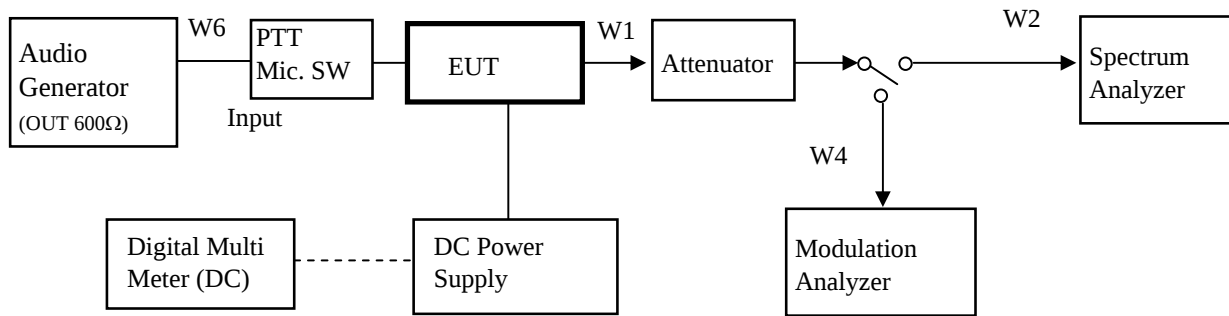
No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Attenuator (10dB)	Aeroflex/Wenshel	66-10-34	BY2887	May 20, 10	May 31, 11
2	Attenuator (30dB)	Weinschel	WA-29-30-34	8923	May 20, 10	May 31, 11
3	Audio Generator	Anritsu	MG443B	M70150	Apr. 15, 11	Apr. 30, 12
4	Modulation Analyzer	Hewlett Packard	8901B	2806A01669	Mar. 08, 11	Mar. 31, 12
5	Spectrum Analyzer	Agilent	E7403A	MY45102460	Feb. 02, 11	Feb. 29, 12
6	Spectrum Analyzer	HP	8563E	3821A09565	May 02, 11	May 31, 12
7	Digital Multi Meter	FLUKE	8846A	9642018	Jul. 22, 10	Jul. 31, 11
8	DC Power Supply	Daiichi denpa kogyo	GZV4000	90290931	None	None
9	JIG	DELL	INSPION630m	CN-0HC416-70	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
W2	Coaxial Cable	Suhner	SUCOFLEX100	KSR00042	Apr. 22, 11	Apr. 30, 12
W4	Coaxial Cable	Pacific custom	RG-58 C/U	KSR00096	Nov. 19, 10	Nov. 30, 11
W6	Balance Cable	Nicoon	3D-2V	KSR00092	Oct. 14, 10	Oct. 31, 11
W20	FPU Cable	SANWA Supply	None	None	None	None
W21	USB Adapter	Kenwood	KCT-53U	None	None	None

Measuring Equipment Configuration

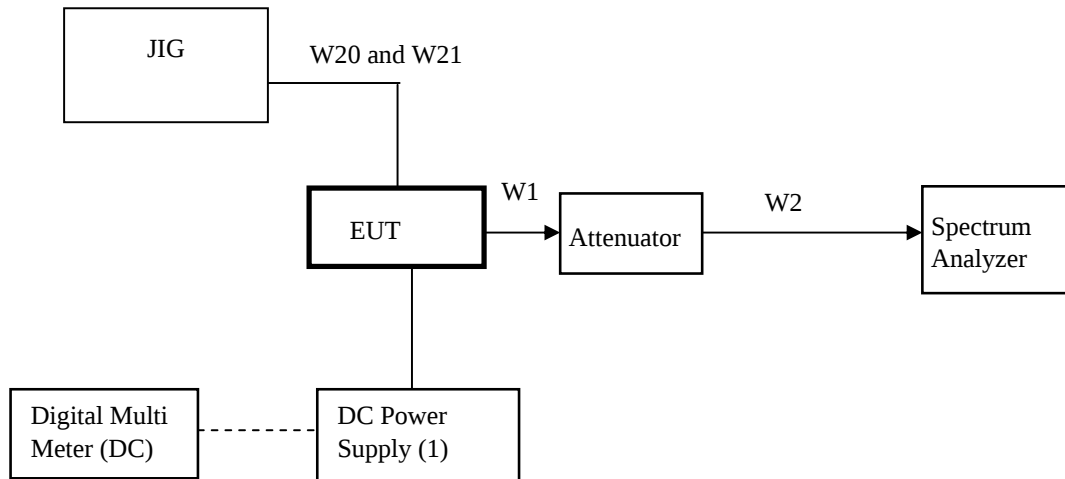
<FM Modulation Case>



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

→ : RF Output

<CW ID Modulation Case>



Test Results

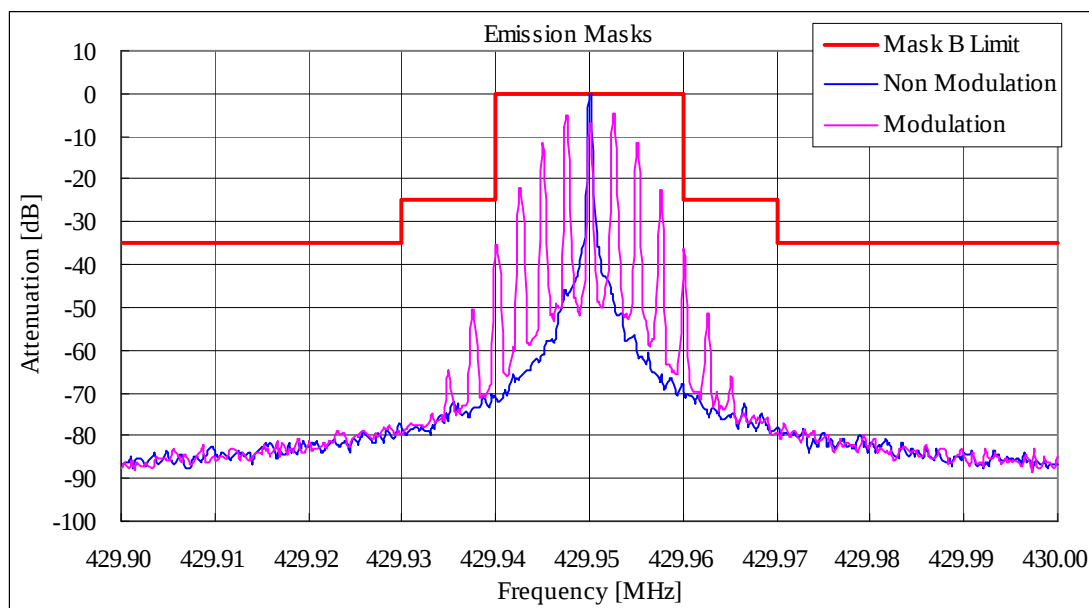
Test date	May 13, 2011	
Location	Tochigi No.2 Test Site	
temperature	21 to 24	[degree C]
Humidity Variation	65 to 75	[%]
Atmospheric Pressure	97 to 97.3	[kPa]
Test Engineer	Atsuyuki Morishima	

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

State the worst case (below).

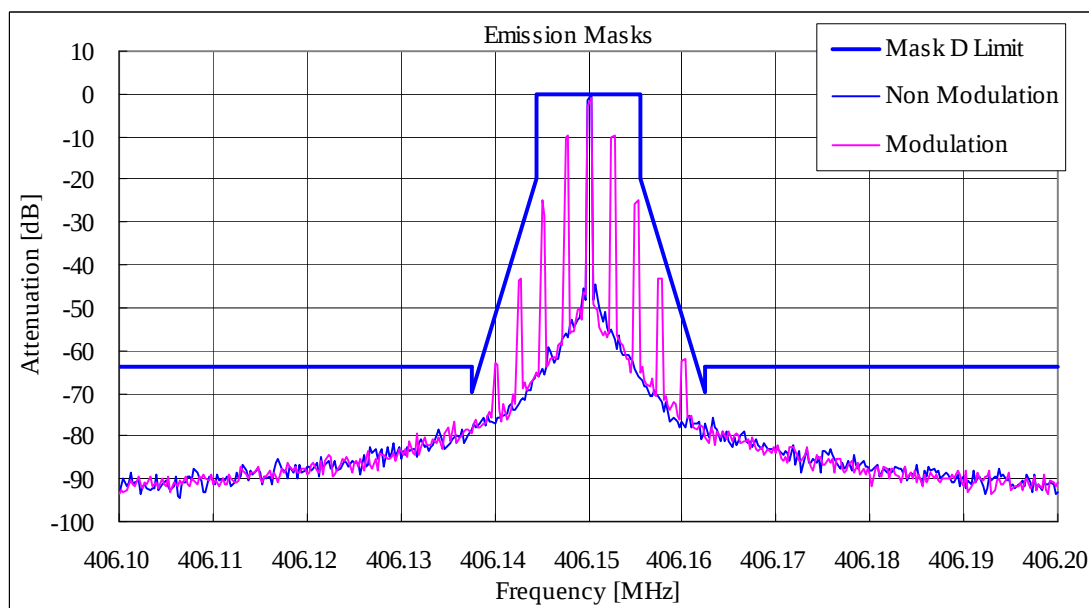
State : High Power / Authorized Bandwidth 20 kHz/ 16K0F3E/ 429.05 MHz(RSS)

RSS Limit : Mask B

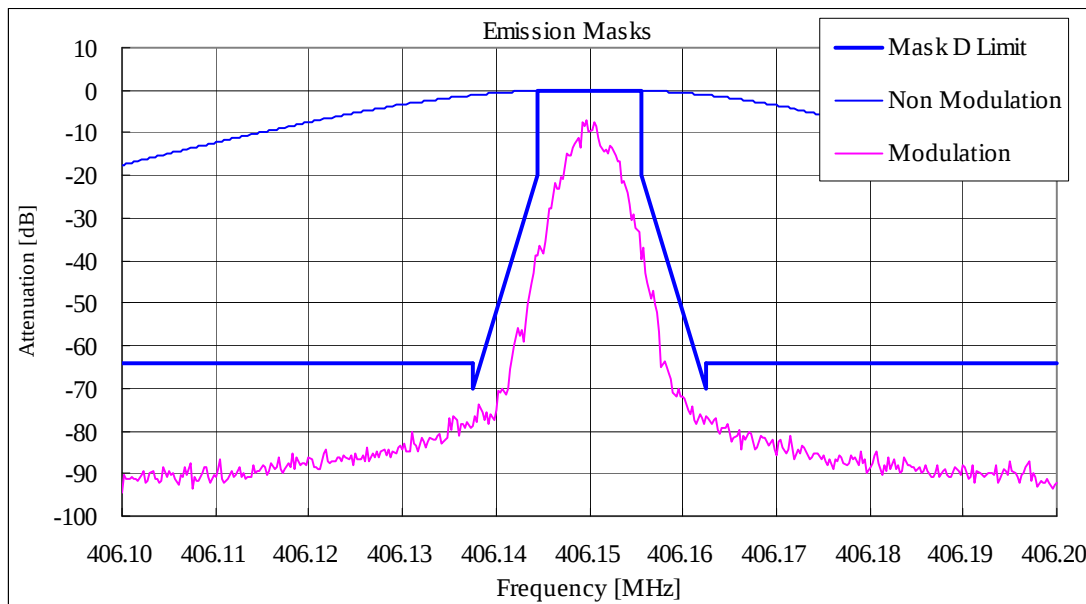


State : High Power / Authorized Bandwidth 11.25 kHz/ 11K0F3E/ 406.15 MHz(FCC/RSS)

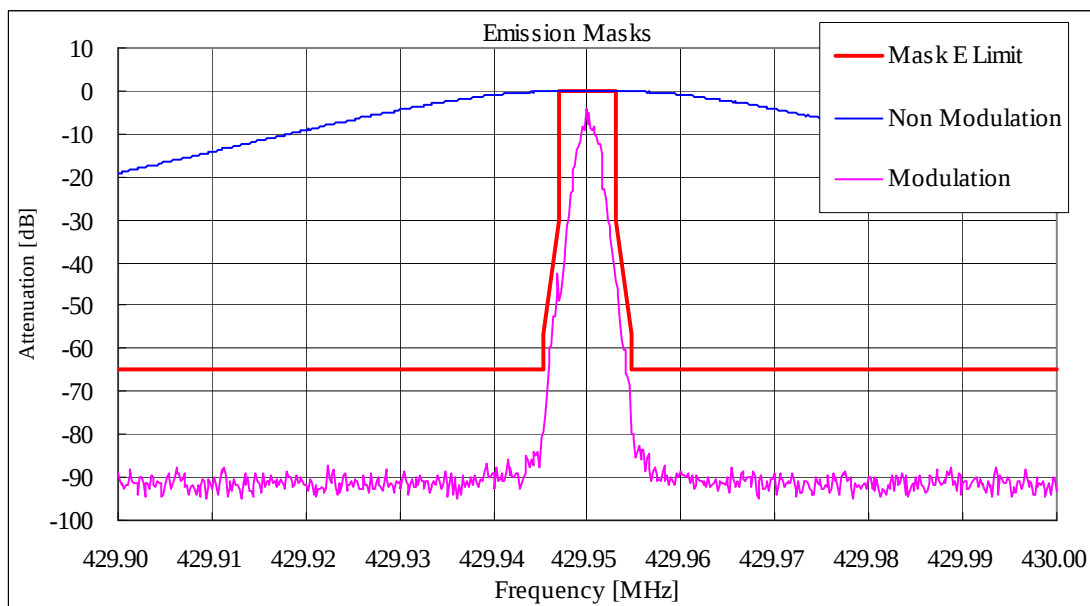
FCC/RSS Limit : Mask D



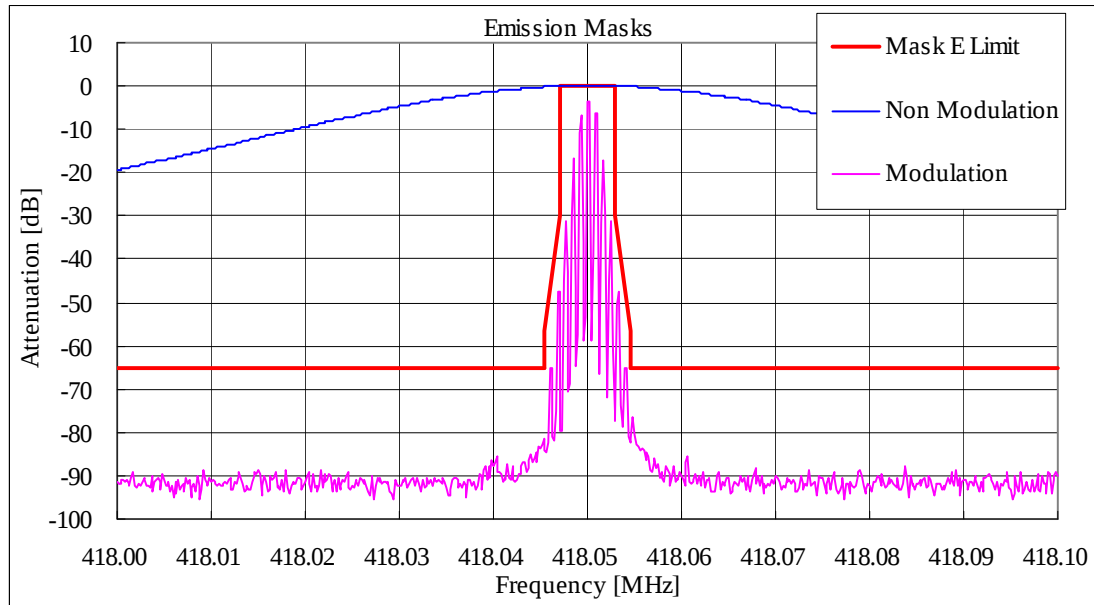
State : High Power / Authorized Bandwidth 11.25 kHz/ 8K30F1E/F1D/F7W/ 406.15 MHz(FCC/RSS)
FCC/RSS Limit : Mask D



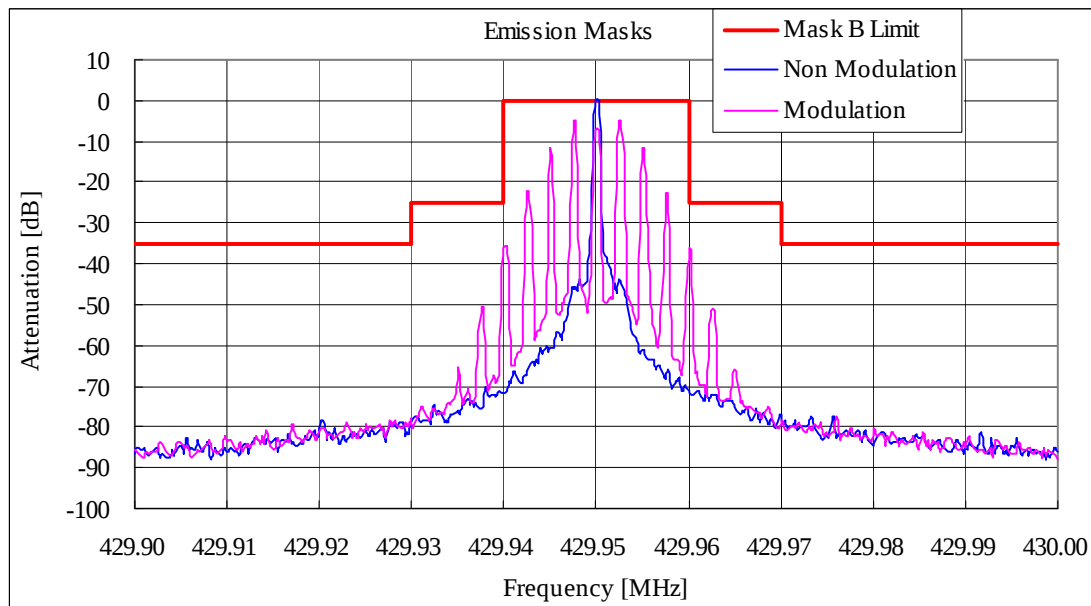
State : High Power / Authorized Bandwidth 6 kHz/ 4K00F1E/F1D/F7W/ 429.95 MHz(FCC/RSS)
FCC/RSS Limit : Mask E



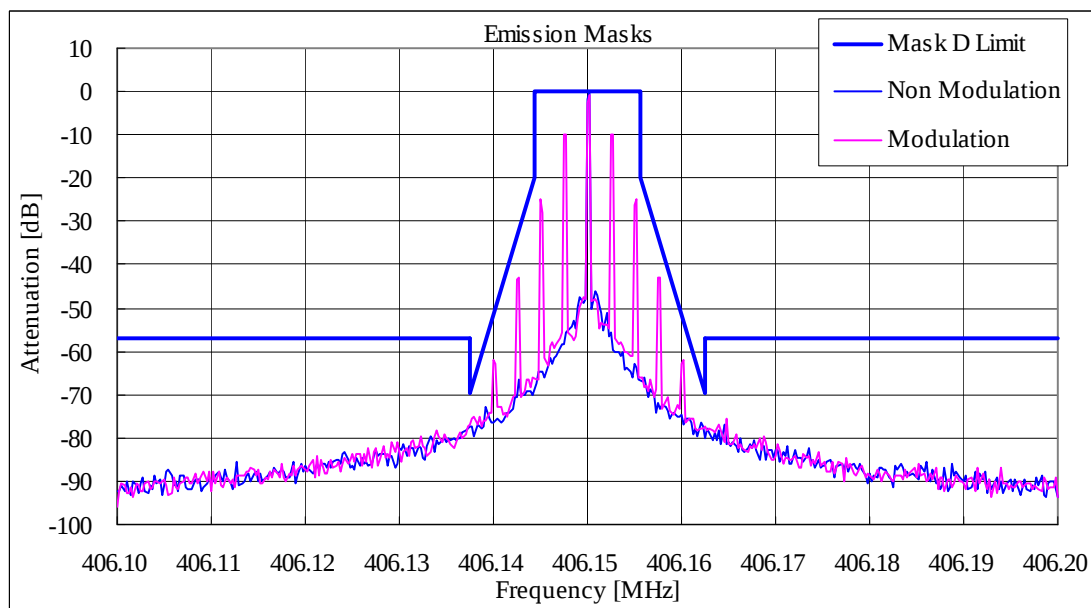
State : High Power / Authorized Bandwidth 6 kHz/ 4K00F2D/ 418.05 MHz(FCC/RSS)
FCC/RSS Limit : Mask E



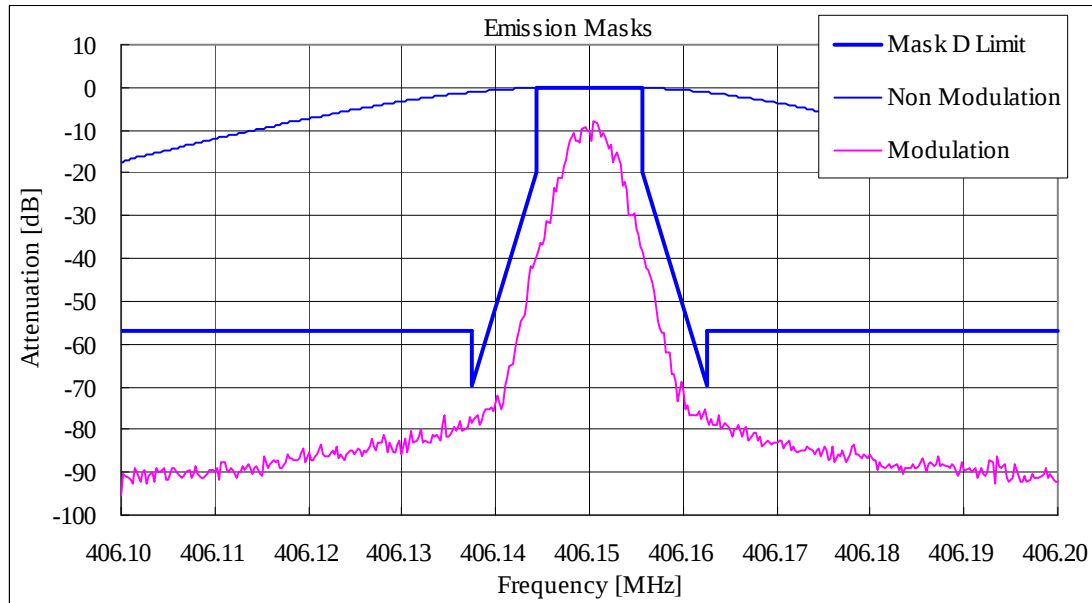
State : LowPower / Authorized Bandwidth 20 kHz/ 16K0F3E/ 429.05 MHz(RSS)
RSS Limit : Mask B



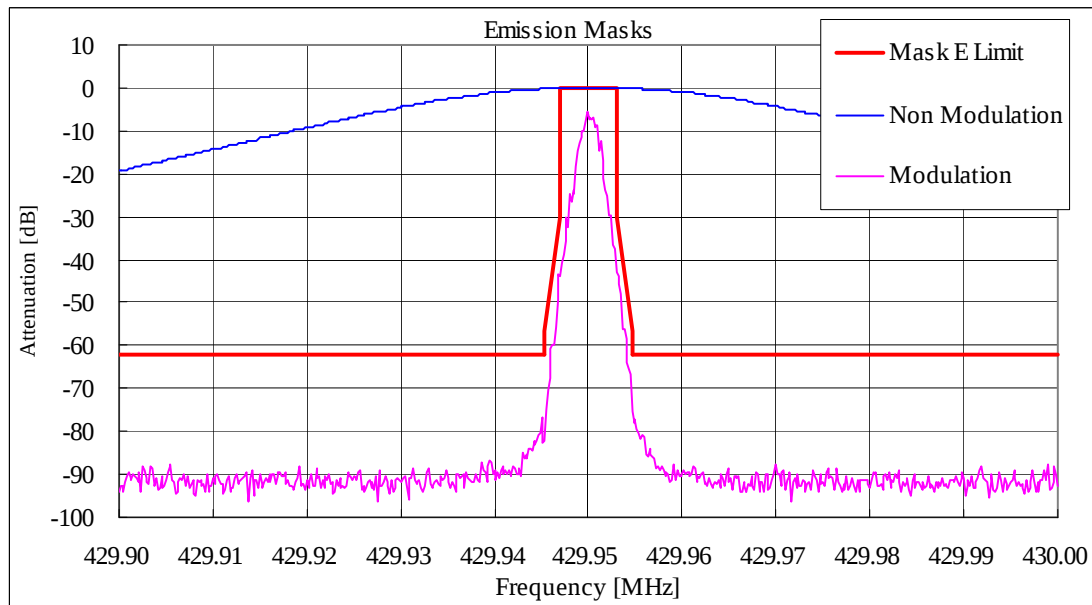
State : Low Power / Authorized Bandwidth 11.25 kHz/ 11K0F3E/ 406.15 MHz(FCC/RSS)
FCC/RSS Limit : Mask D



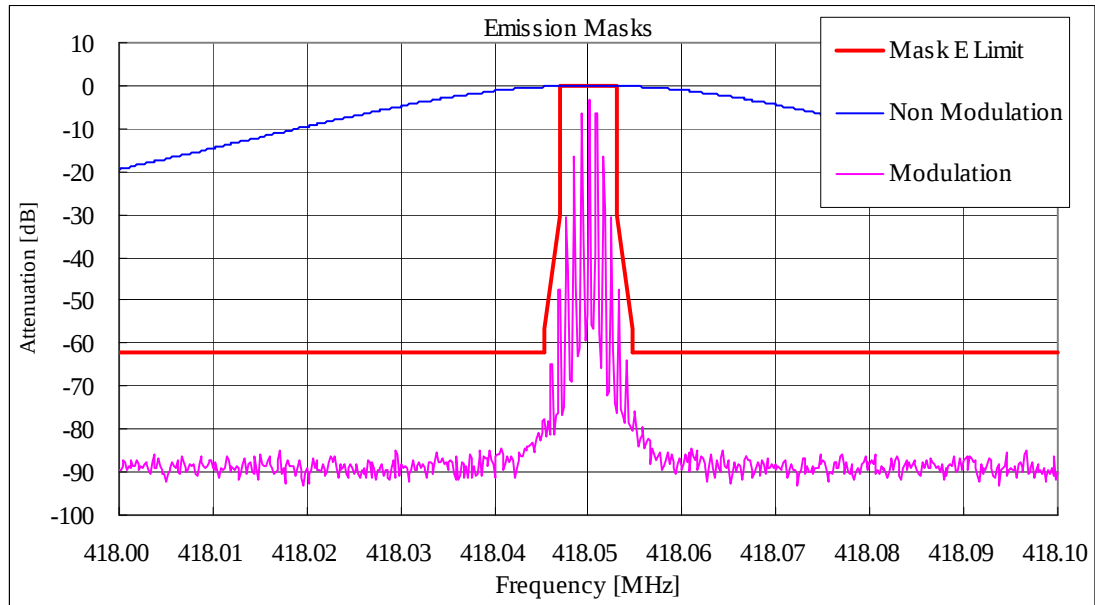
State : Low Power / Authorized Bandwidth 11.25 kHz/ 8K30F1E/F1D/F7W/ 406.15 MHz(FCC/RSS)
FCC/RSS Limit : Mask D



State : Low Power / Authorized Bandwidth 6 kHz/ 4K00F1E/F1D/F7W/ 429.95 MHz(FCC/RSS)
FCC/RSS Limit : Mask E



State : Low Power / Authorized Bandwidth 6 kHz/ 4K00F2D/ 418.05 MHz(FCC/RSS)
FCC/RSS Limit : Mask E



10.5 Transient Frequency Behavior

REGULATIONS : FCC Part 90 Section 214 / RSS-119 Section 5.9

TEST METHOD/GUIDE : ANSI/TIA-603-D, Section 2.2.19.3

Test Procedure

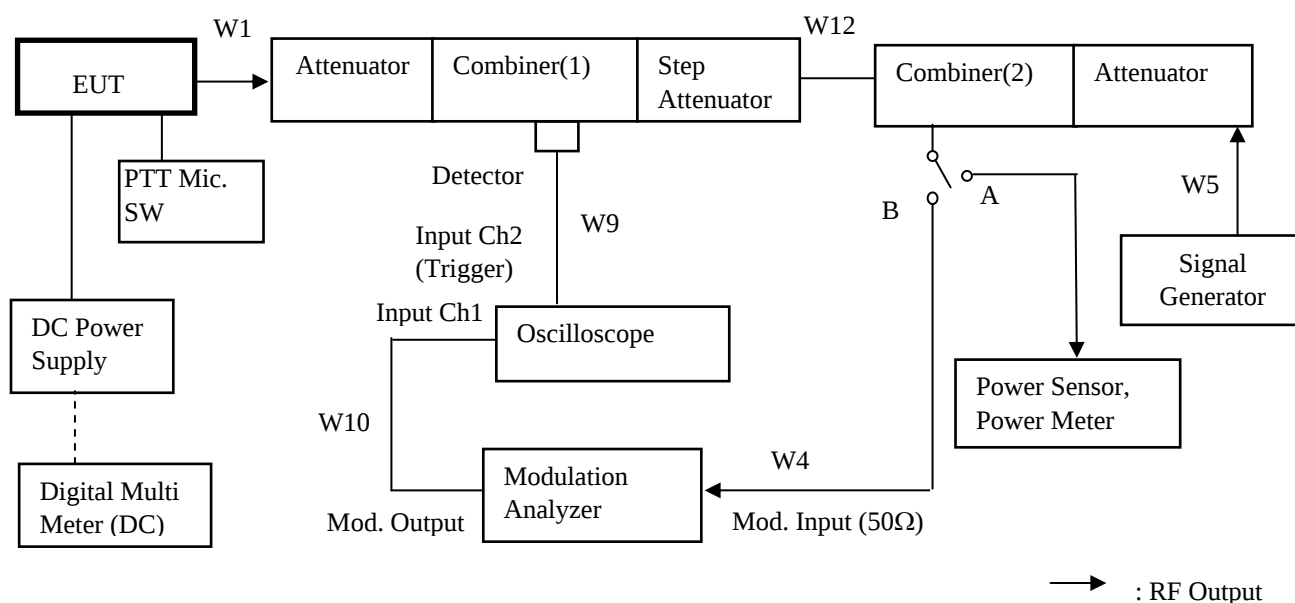
- 1 The EUT and test equipment were set up as shown on the following page.
- 2 The transmitter was turned on.
- 3 The transmitter carrier level was measured at the output of the combiner .
- 4 The transmitter was turned off.
- 5 An RF signal generator (1) modulated with a 1 kHz tone at either 25 kHz 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-603-D steps j and k as a guide, however 1000 Hz tone was adjusted at +- 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-D steps m, n, and o was captured and plotted.
- 9 The carrier off-time as referenced in TIA-603-D steps p, q, r, and s was captured and plotted.

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Attenuator (20dB)	Aeroflex/Wenshel	66-20-34	BY4357	Apr. 22, 11	Apr. 30, 12
2	Attenuator (30dB)	Weinschel	WA-29-30-34	8923	May 20, 10	May 31, 11
3	Attenuator (3dB)	TME	CFA-20NPJ-3	679701	May 20, 10	May 31, 11
4	Step Attenuator	Hewlett Packard	8494B	2726A14515	Dec 22, 10	Dec 31, 11
5	Power Meter	Hewlett Packard	E4418B	GB38410265	May. 20, 10	May. 31, 11
6	Power Sensor	Hewlett Packard	8482A	US37292237	May. 20, 10	May. 31, 11
7	Oscilloscope	Lecroy	9360	1408	Apr. 11, 11	Apr. 30, 12
8	Modulation Analyzer	Hewlett Packard	8901B	2806A01669	Mar. 08, 11	Mar. 31, 12
9	Combiner(1)	Anritsu	Z-164A	M89249	Nov. 18, 10	Nov. 30, 11
10	Combiner(2)	Anritsu	Z-164A	M89549	Nov. 18, 10	Nov. 30, 11
11	Signal Generator	Rohde&Schwarz	SMT06	100684	Jan 13, 11	Jan 31, 12
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. 19, 10	Nov. 30, 11
W9	Coaxial Cable	Pacific custom	RG-58 C/U	KSR00094	Nov. 19, 10	Nov. 30, 11
W10	Coaxial Cable	Pacific custom	RG-58 C/U	KSR00097	Nov. 19, 10	Nov. 30, 11
W12	Coaxial Cable	Suhner	SUCOFLEX104	KSR00042	Apr. 22, 11	Apr. 30, 12
W5	Coaxial Cable	Suhner	SUCOFLEX104	KSR00217	Sep. 30, 11	Sep. 30, 12

Measuring Equipment Configuration

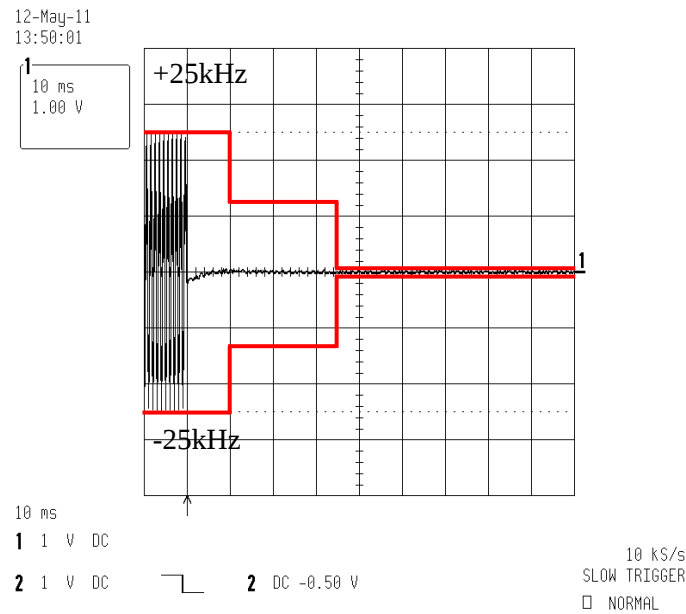


Test Results

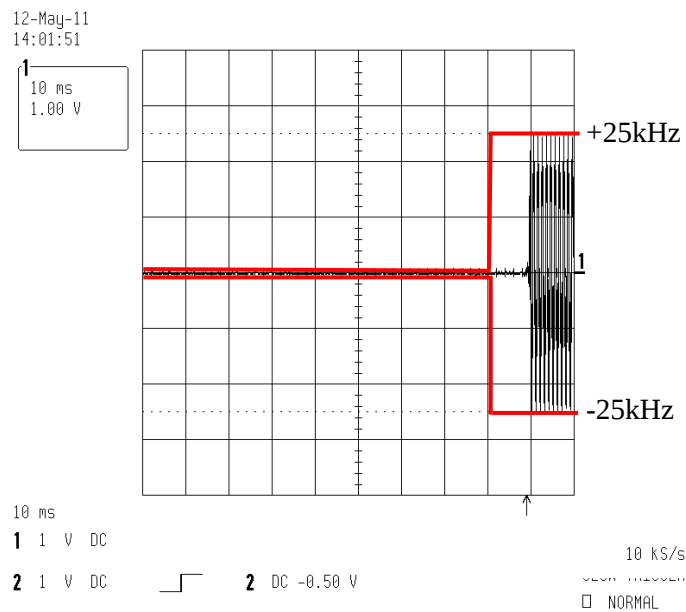
Test date	May 12, 2011		
Location	Tochigi No.2 Test Site		
temperature	22 to 23	[degree C]	
Humidity Variation	67 to 68	[%]	
Atmospheric Pressure	98.9 to 99	[kPa]	
Test Engineer	Atsuyuki Morishima		

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

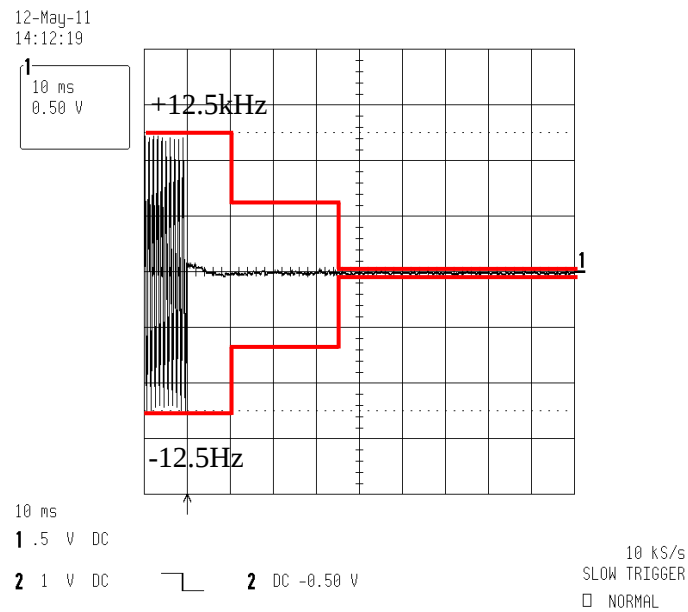
State : High Power / Authorized Bandwidth 20 kHz / 16K0F3E / 406.15 MHz (RSS)/ PTT:OFF -ON



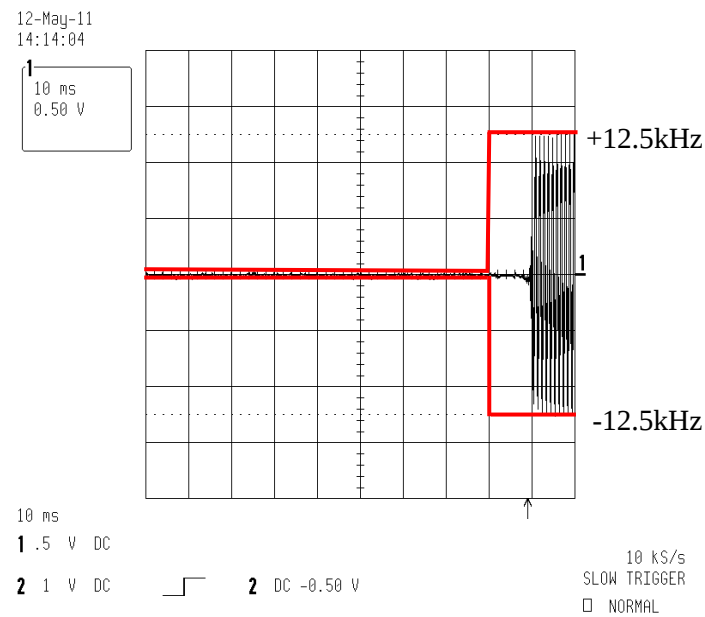
State : High Power / Authorized Bandwidth 20 kHz / 16K0F3E / 406.15 MHz (RSS)/ PTT:ON -OFF



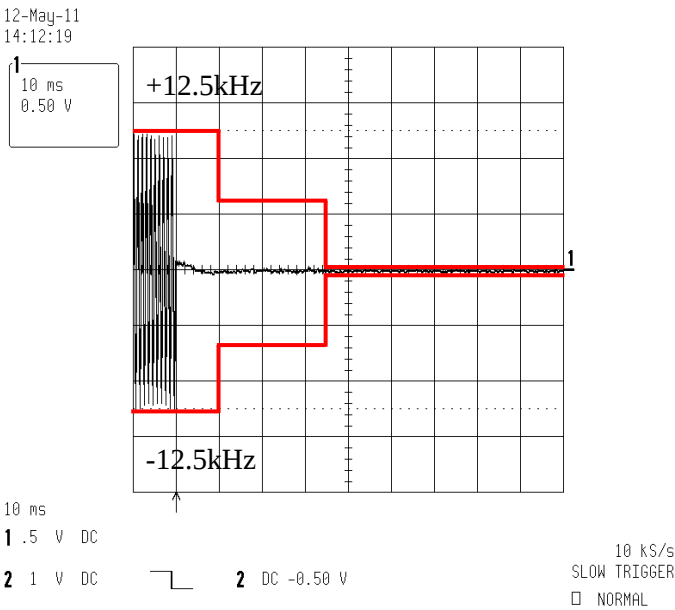
State : High Power / Authorized Bandwidth 11.25 kHz / 11K0F3E / 429.95 MHz (FCC/RSS)/ PTT:OFF -ON



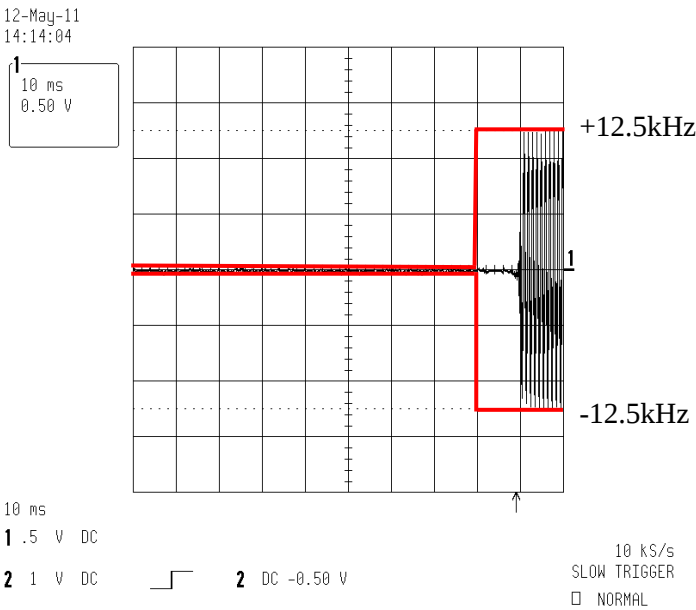
State : High Power / Authorized Bandwidth 11.25 kHz / 11K0F3E / 429.95 MHz (FCC/RSS)/ PTT:ON -OFF



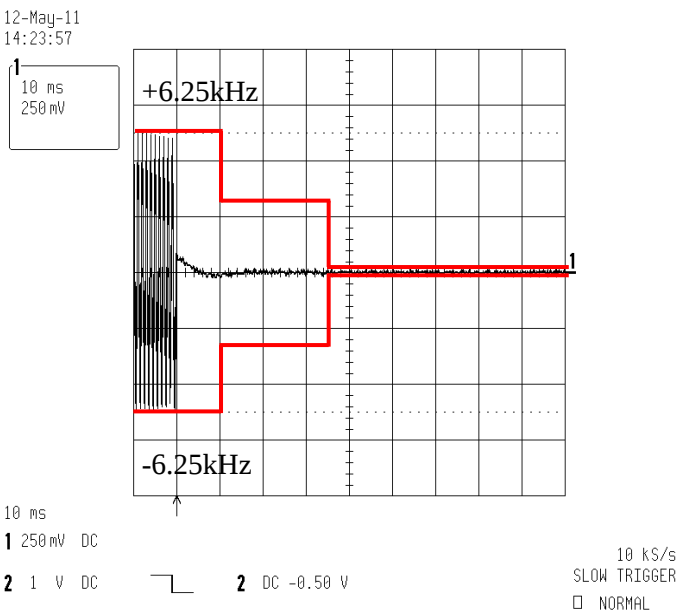
State : High Power / Authorized Bandwidth 11.25 kHz / 8K30F1E/ F1D/ F7W / 429.95 MHz(FCC/RSS)/ PTT:OFF -ON



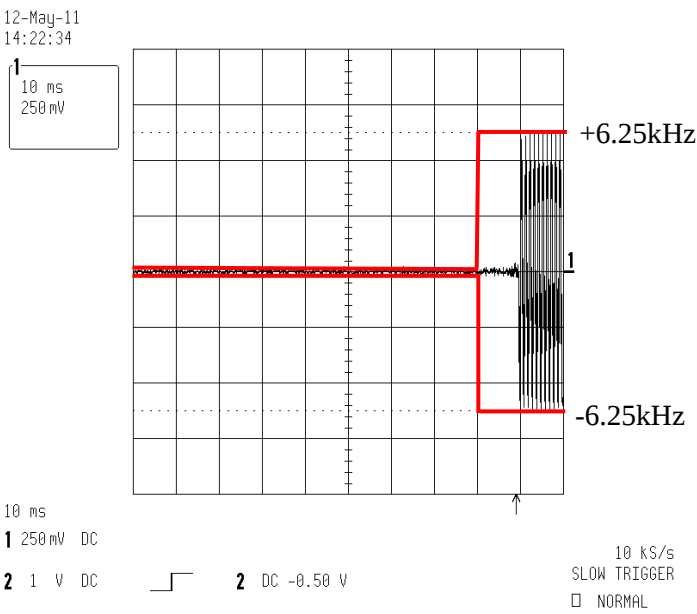
State : High Power / Authorized Bandwidth 11.25 kHz / 8K30F1E/ F1D/ F7W / 429.95 MHz(FCC/RSS)/ PTT:ON -OFF



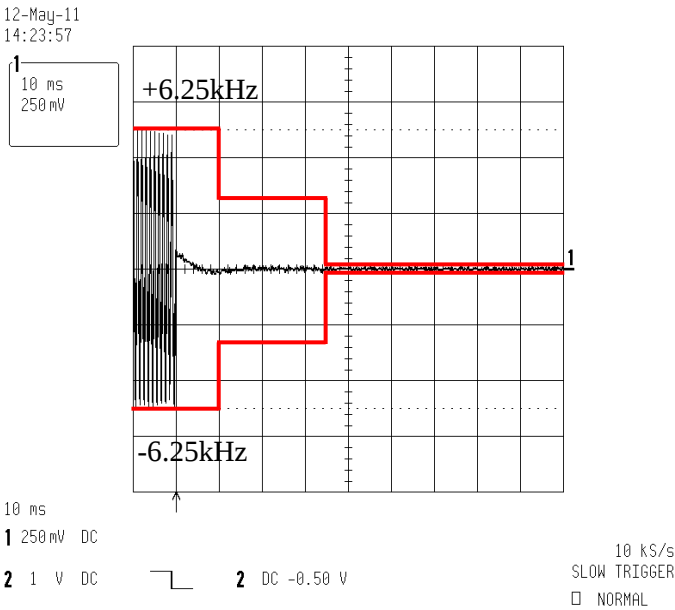
State : High Power / Authorized Bandwidth 6 kHz / 4K00F1E/F1D/F7W / 429.95 MHz(FCC/RSS)/ PTT:OFF -ON



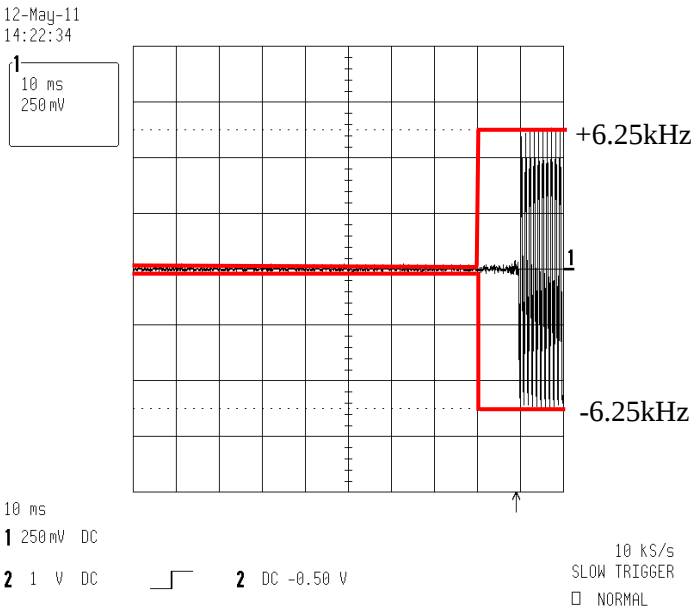
State : High Power / Authorized Bandwidth 6 kHz / 4K00F1E/F1D/F7W / 429.95 MHz(FCC/RSS)/ PTT:ON -OFF



State : High Power / Authorized Bandwidth 6 kHz / 4K00F2D / 429.95 MHz(FCC/RSS)/ PTT:OFF -ON



State : High Power / Authorized Bandwidth 6 kHz / 4K00F2D / 429.95 MHz(FCC/RSS)/ 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-D 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.

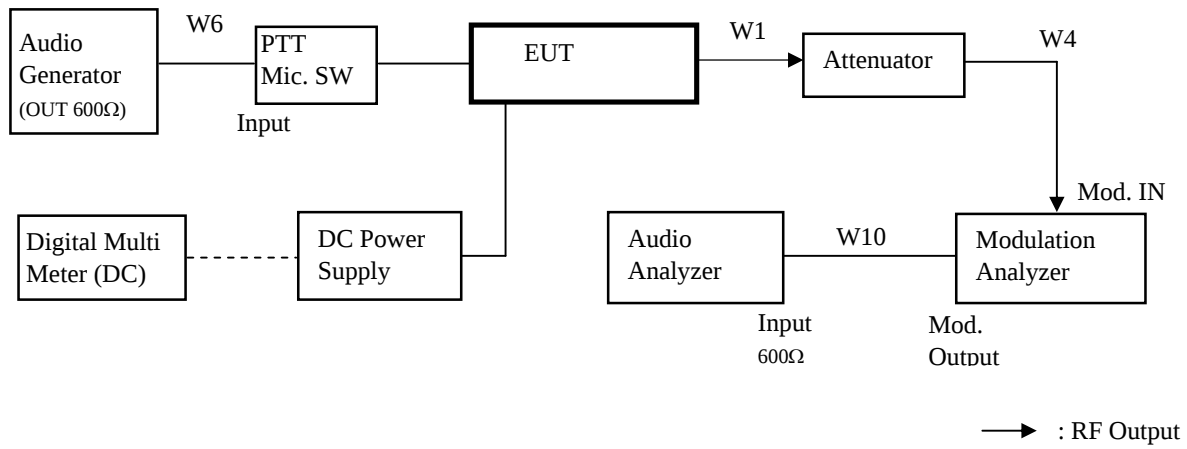
Measuring Equipments

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Attenuator (10dB)	Aeroflex/Wenshel	66-10-34	BY2887	May 20, 10	May 31, 11
2	Attenuator (30dB)	Weinschel	WA-29-30-34	8923	May 20, 10	May 31, 11
3	Audio Generator	Anritsu	MG443B	M70150	Apr 15, 11	Apr 30, 12
4	Audio Analyzer	Hewlett Packard	8903B	2948A07326	Mar. 18, 11	Mar. 31, 12
5	Modulation Analyzer	Hewlett Packard	8901B	2806A01669	Mar. 08, 11	Mar. 31, 12
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. 19, 10	Nov. 30, 11
W6	Balance Cable	Nicoon	3D-2V	KSR00092	Oct. 14, 10	Oct. 31, 11
W10	Coaxial Cable	Pacific custom	RG-58 C/U	KSR00097	Nov. 19, 10	Nov. 30, 11

Measuring Equipment Configuration



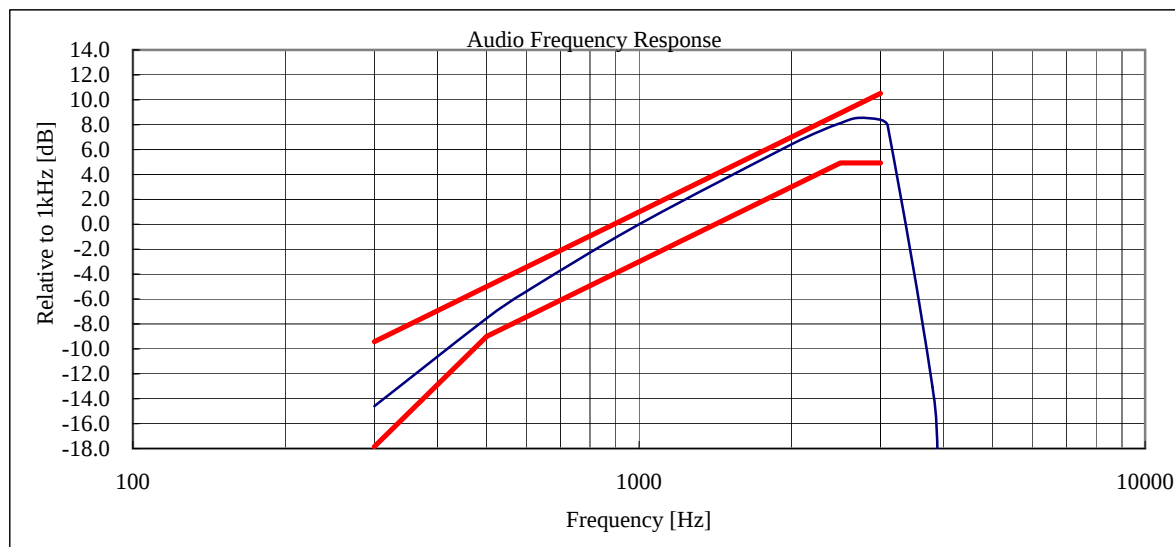
Test Results

Test date	May 11, 2011	
Location	Tochigi No.2 Test Site	
temperature	21.0 to 22	[degree C]
Humidity Variation	63 to 61	[%]
Atmospheric Pressure	98.9 to 98.8	[kPa]
Test Engineer	Atsuyuki Morishima	

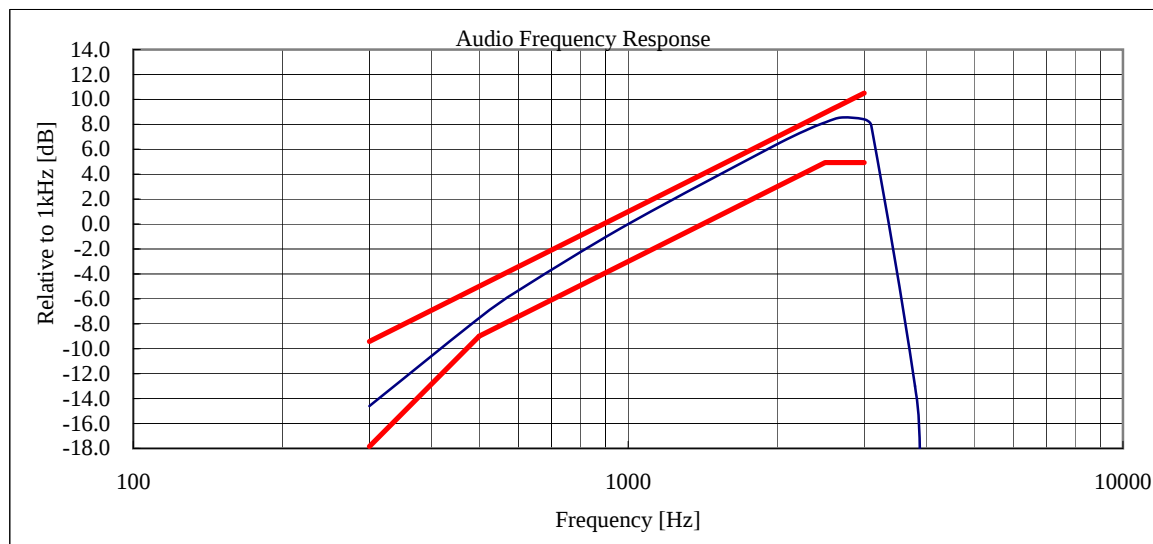
Test was carried out for all the frequency band of section 10.1

State the worst case (below).

State : High Power / Authorized Bandwidth 20 kHz / 16K0F3E / 406.15 MHz(RSS)



State : High Power / Authorized Bandwidth 11.25 kHz / 11K0F3E / 406.15 MHz(FCC / RSS)



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-D 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.

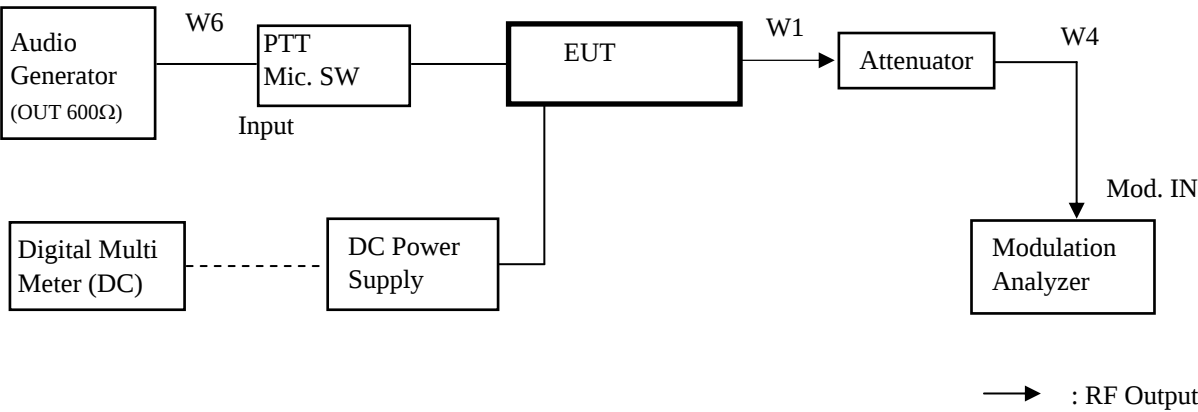
Measuring Equipments

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Attenuator (10dB)	Aeroflex/Wenshel	66-10-34	BY2887	May 20, 10	May 31, 11
2	Attenuator (30dB)	Weinschel	WA-29-30-34	8923	May 20, 10	May 31, 11
3	Audio Generator	Anritsu	MG443B	M70150	Apr 15, 11	Apr 30, 12
4	Modulation Analyzer	Hewlett Packard	8901B	2806A01669	Mar. 08, 11	Mar. 31, 12
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. 19, 10	Nov. 30, 11
W6	Balance Cable	Nicoon	3D-2V	KSR00092	Oct. 14, 10	Oct. 31, 11

Measuring Equipment Configuration

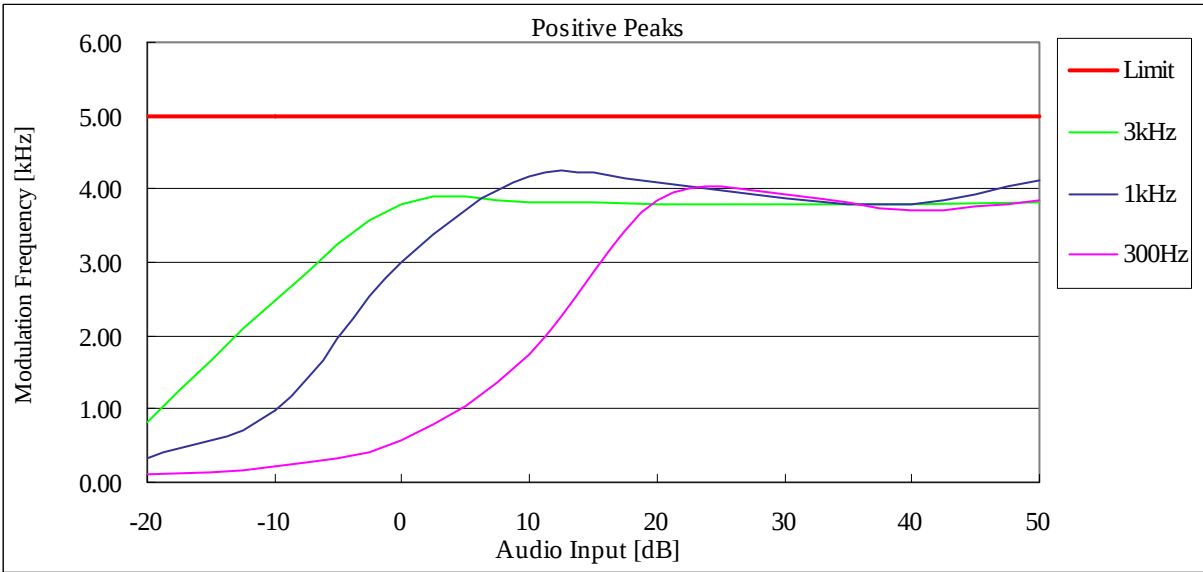


Test Results

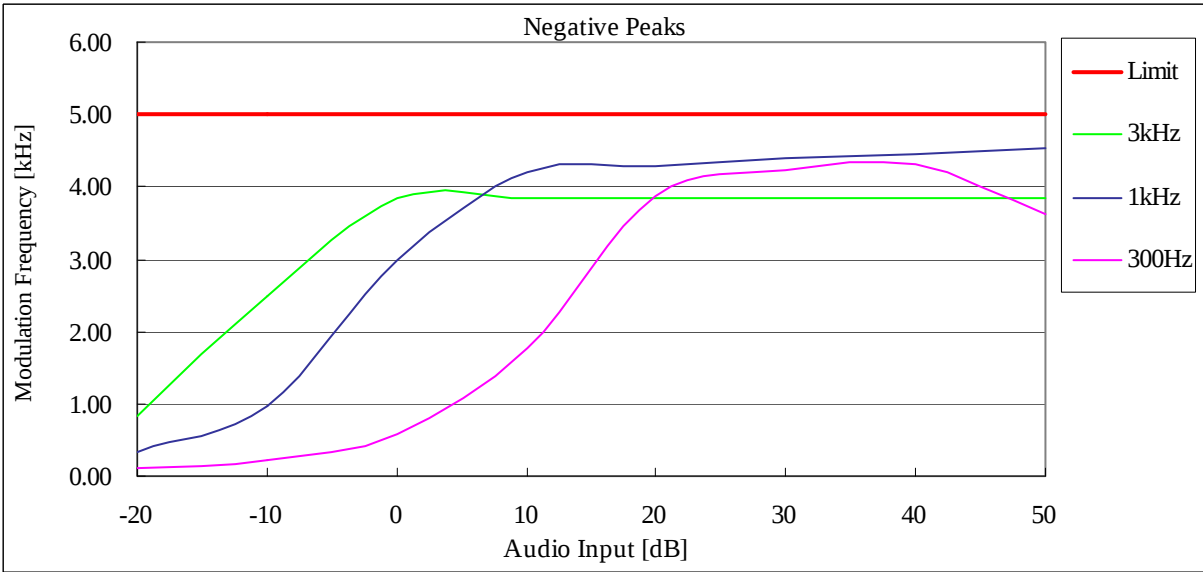
Test date	May 11, 2011		
Location	Tochigi No.2 Test Site		
temperature	20.0 to 21.0	[degree C]	
Humidity Variation	63 to 64	[%]	
Atmospheric Pressure	98.6 to 98.7	[kPa]	
Test Engineer	Atsuyuki Morishima		

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

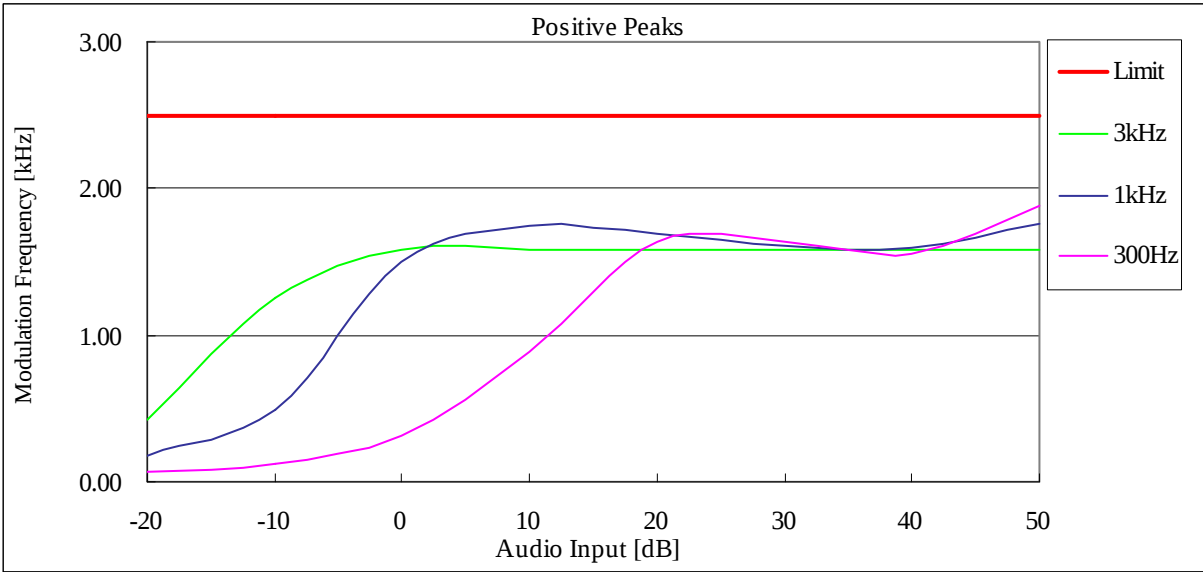
State : High Power / Authorized Bandwidth 20 kHz / 16K0F3E / 406.15 MHz(RSS)



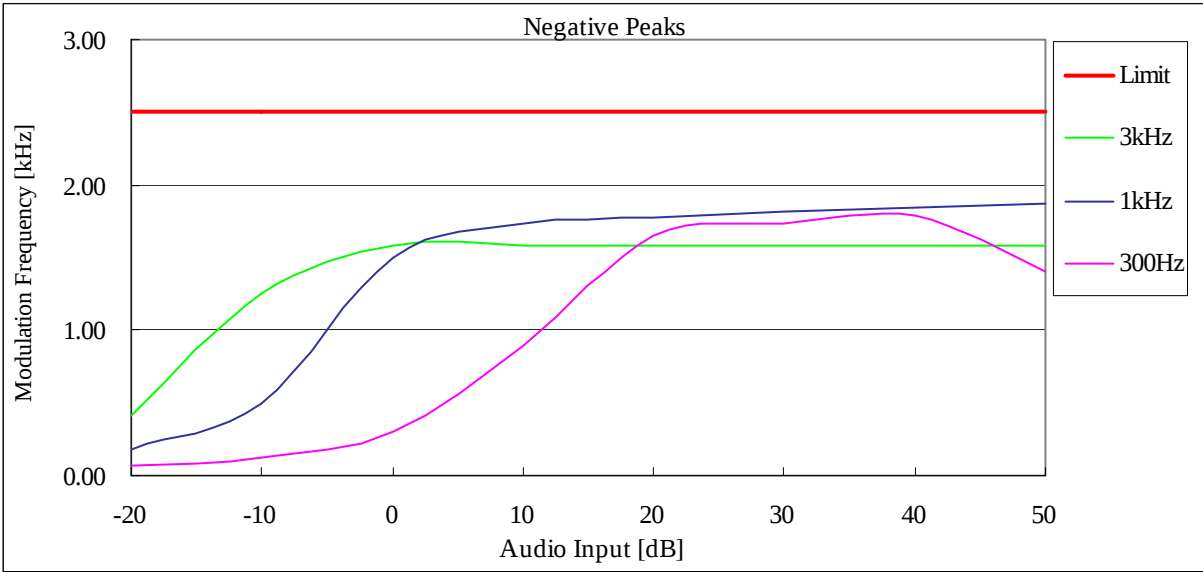
State : High Power / Authorized Bandwidth 20 kHz / 16K0F3E / 406.15 MHz(RSS)



State : High Power / Authorized Bandwidth 11.25 kHz / 11K0F3E / 406.15 MHz(FCC/ RSS)



State : High Power / Authorized Bandwidth 11.25 kHz / 11K0F3E / 406.15 MHz(FCC/ RSS)



10.8 Frequency Stability (Temperature Variation)

REGULATIONS	: FCC Part 2 Section 1055 (a) (1), Part 90 Section 213(a) / RSS-119 Section 5.3
TEST METHOD/GUIDE	: TIA-603-D Section 2.3.2.2 / RSS-Gen Section 4.7(a)

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.
One 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.

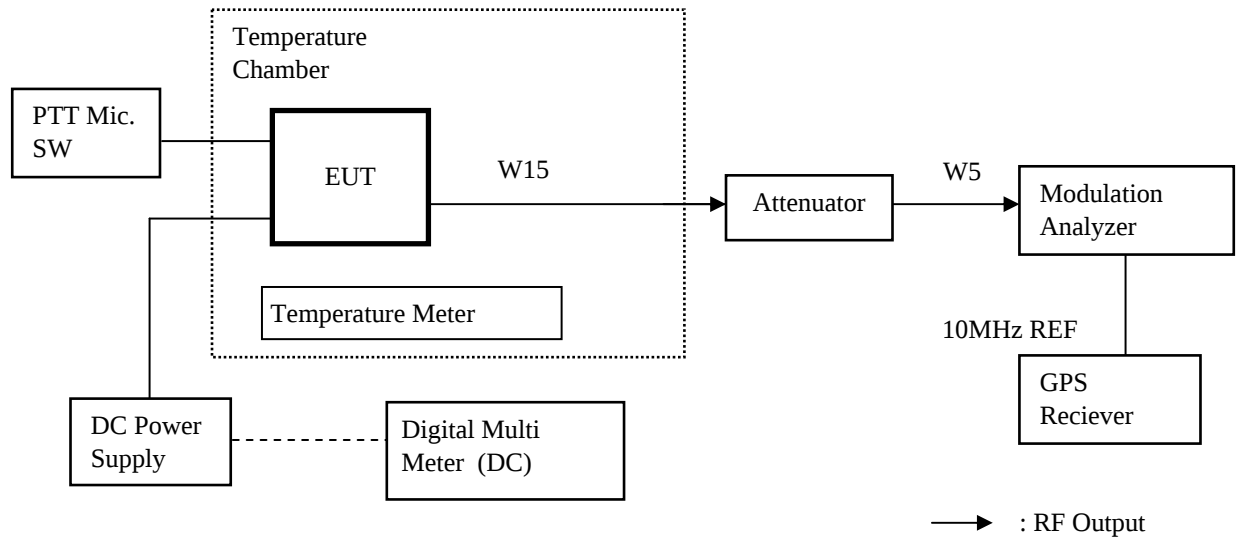
Measuring Equipments

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Attenuator (10dB)	Aeroflex/Wenshel	66-10-34	BY2887	May 20, 10	May 31, 11
2	Attenuator (30dB)	Weinschel	WA-29-30-34	8924	May 20, 10	May 31, 11
3	Modulation Analyzer	Hewlett Packard	8901B	3403A04852	Jul. 22, 10	Jul. 31, 11
4	Digital Multi Meter	FLUKE	87V	92380042	Jan. 13, 11	Jan. 31, 12
5	DC Power Supply	Daiichi denpa kogyo	GZV4000	90290932	None	None
6	Temperature Chamber	Tabai	PL-3F	5103661	None	None
7	Temperature Meter	Sato	PC-5000TRH-II	A11999972	Apr. 15, 11	Apr. 30, 12
8	GPS Receiver	Hewlett Packard	HP Z3801A	3542A02414	None	None

Measuring Cables

No.	Cable	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
W5	Coaxial Cable	Suhner	SUCOFLEX104	KSR00217	Sep. 30, 10	Sep. 30, 11
W15	Coaxial Cable	Suhner	SUCOFLEX104	F0000018	Sep. 30, 10	Sep. 30, 11

Measuring Equipment Configuration



Test Results

Test date	May 25, 2011 to May 27, 2011
Location	Kashima No.1 Test Site
Test Engineer	Koichi Wagatsuma

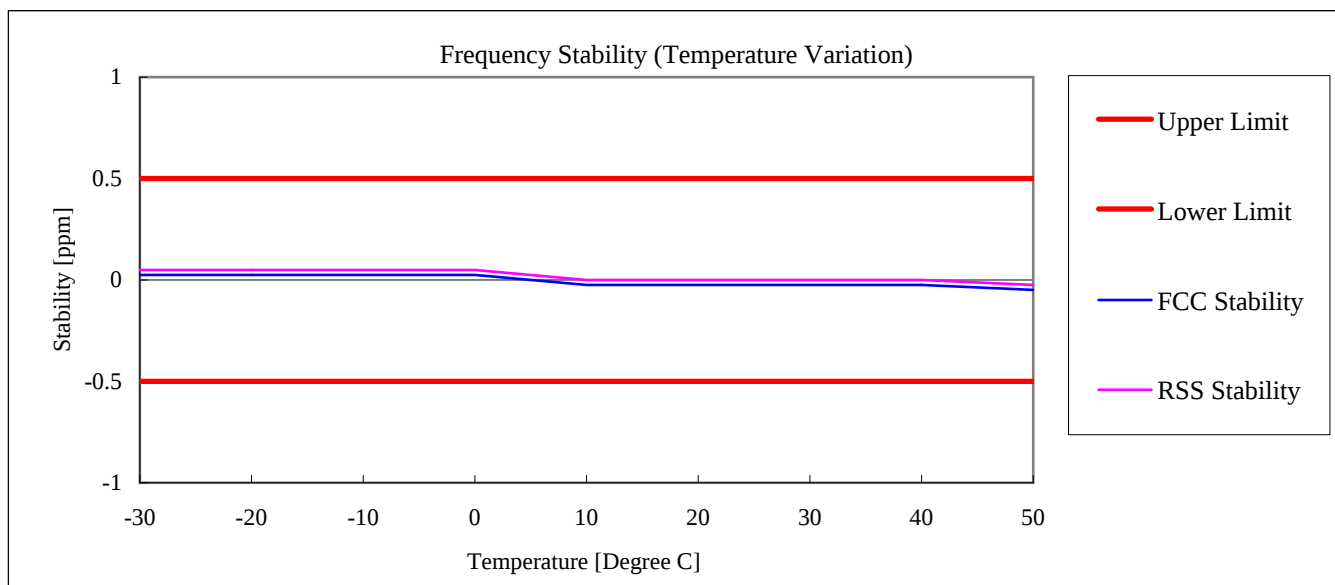
Test was carried out for all the frequency band of section 10.1
State the worst case (below).

State : High Power / Authorized Bandwidth 11.25 kHz / 406.15 MHz (With OCXO) (FCC/RSS)

Reference Frequency: 406.150000 MHz(FCC Stability)

406.149990 MHz(RSS Stability)

No.	Temperature (Degree C)	Frequency (MHz)	FCC Stability (ppm)	RSS Stability (ppm)	Limit (+/- ppm)	Min. Margin (ppm)
1	-30	406.150010	0.02	0.05	0.5	0.45
2	-20	406.150010	0.02	0.05	0.5	0.45
3	-10	406.150010	0.02	0.05	0.5	0.45
4	0	406.150010	0.02	0.05	0.5	0.45
5	10	406.149990	-0.02	0.00	0.5	0.48
6	20	406.149990	-0.02	0.00	0.5	0.48
7	30	406.149990	-0.02	0.00	0.5	0.48
8	40	406.149990	-0.02	0.00	0.5	0.48
9	50	406.149980	-0.05	-0.02	0.5	0.45

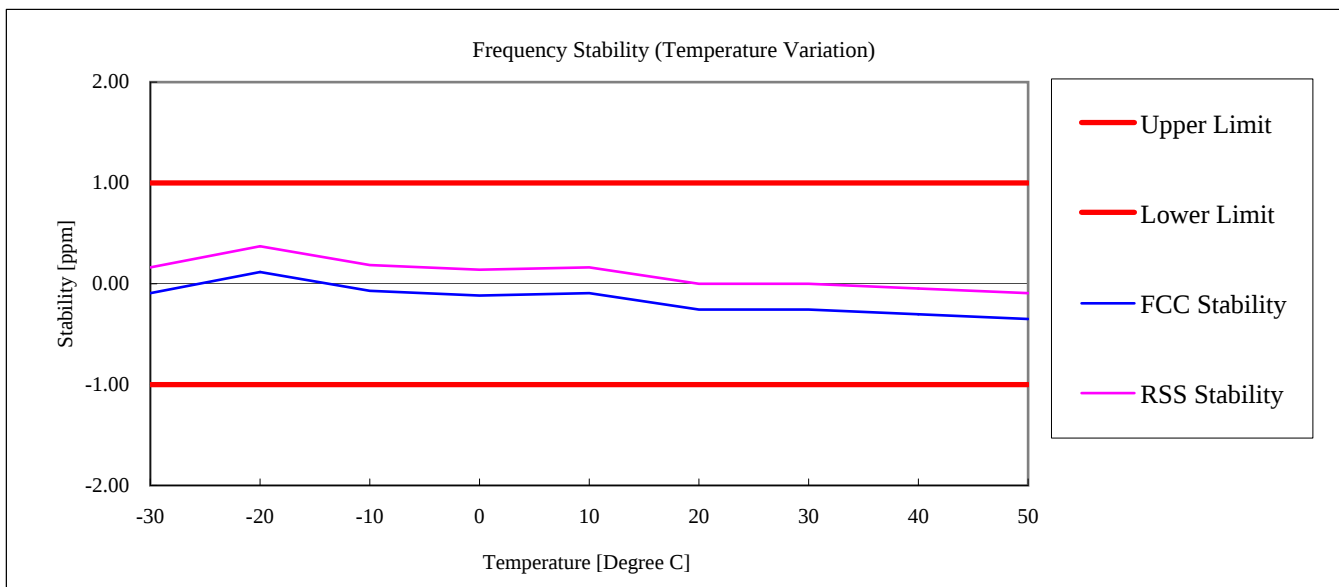


State : High Power / Authorized Bandwidth 11.25 kHz / 429.95 MHz (Without OCXO) (FCC/RSS)

Reference Frequency: 429.950000 MHz(FCC Stability)

429.949890 MHz(RSS Stability)

No.	Temperature (Degree C)	Frequency (MHz)	FCC Stability (ppm)	RSS Stability (ppm)	Limit (+/- ppm)	Min. Margin (ppm)
1	-30	429.949960	-0.09	0.16	1.0	0.84
2	-20	429.950050	0.12	0.37	1.0	0.63
3	-10	429.949970	-0.07	0.19	1.0	0.81
4	0	429.949950	-0.12	0.14	1.0	0.86
5	10	429.949960	-0.09	0.16	1.0	0.84
6	20	429.949890	-0.26	0.00	1.0	0.74
7	30	429.949890	-0.26	0.00	1.0	0.74
8	40	429.949870	-0.30	-0.05	1.0	0.70
9	50	429.949850	-0.35	-0.09	1.0	0.65



10.9 Frequency Stability (Voltage Variation)

REGULATIONS : FCC Part 2 Section 1055 (d) (1), Part 90 Section 213(a) / RSS-119 Section 5.3

TEST METHOD/GUIDE : TIA-603-D Section 2.2.2.2 / RSS-Gen Section 4.7(b)

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.

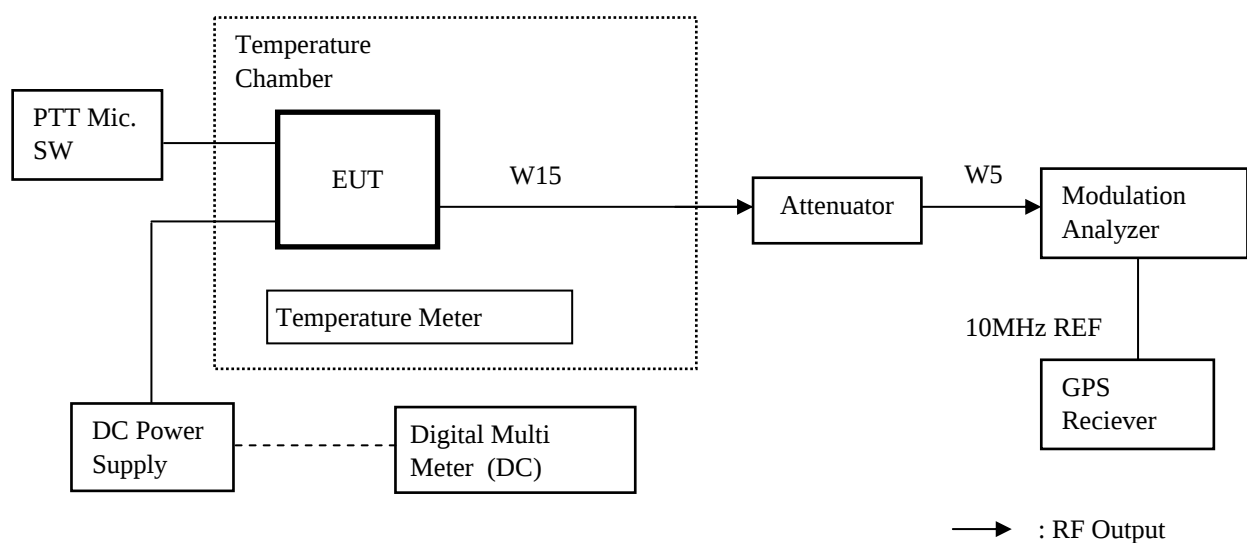
Measuring Equipments

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Attenuator (10dB)	Aeroflex/Wenshel	66-10-34	BY2887	May 20, 10	May 31, 11
2	Attenuator (30dB)	Weinschel	WA-29-30-34	8924	May 20, 10	May 31, 11
3	Modulation Analyzer	Hewlett Packard	8901B	3403A04852	Jul. 22, 10	Jul. 31, 11
4	Digital Multi Meter	FLUKE	87V	92380042	Jan. 13, 11	Jan. 31, 12
5	DC Power Supply	Daiichi denpa kogyo	GZV4000	90290932	None	None
6	Temperature Chamber	Tabai	PL-3F	5103661	None	None
7	Temperature Meter	Sato	PC-5000TRH-II	A11999972	Apr. 15, 11	Apr. 30, 12
8	GPS Receiver	Hewlett Packard	HP Z3801A	3542A02414	None	None

Measuring Cables

No.	Cable	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
W5	Coaxial Cable	Suhner	SUCOFLEX104	KSR00217	Sep. 30, 10	Sep. 30, 11
W15	Coaxial Cable	Suhner	SUCOFLEX104	F0000018	Sep. 30, 10	Sep. 30, 11

Measuring Equipment Configuration



Test Results

Test date	May 25, 2011 to May 27, 2011
Location	Kashima No.1 Test Site
Test Engineer	Koichi Wagatsuma

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

State the worst case (below).

Reference Frequency: 406.150000 MHz

State : High Power / Authorized Bandwidth 11.25 kHz / 406.15 MHz (With OCXO) (FCC/RSS)

No.	Temperature (Degree C)	Diviation (%)	Voltage (V)	Frequency (MHz)	Stability (ppm)	Limit +/- (ppm)	Margin (ppm)
1	20+/-5	85	11.22	406.149990	-0.02	0.5	0.48
2	20+/-5	100	13.20	406.149990	-0.02	0.5	0.48
3	20+/-5	115	15.18	406.149990	-0.02	0.5	0.48

Reference Frequency: 429.950000 MHz

State : High Power / Authorized Bandwidth 11.25 kHz / 429.95 MHz (Without OCXO) (FCC/RSS)

No.	Temperature (Degree C)	Diviation (%)	Voltage (V)	Frequency (MHz)	Stability (ppm)	Limit +/- (ppm)	Margin (ppm)
1	20+/-5	85	11.22	429.949890	-0.26	1.0	0.74
2	20+/-5	100	13.20	429.949890	-0.26	1.0	0.74
3	20+/-5	115	15.18	429.949890	-0.26	1.0	0.74

10.10 Receiver Spurious Emissions(Radiated)

REGULATIONS	:	RSS-119 Section 5.11, RSS-Gen Section 6
TEST METHOD/GUIDE	:	RSS-Gen Section 4.10

TEST PROCEDURE

- 1 The EUT and test equipment were set up as shown on the following page.
- 2 Tabletop Equipment
EUT is placed on the wooden table, the top of which is 0.8meter above the metal ground plane(turntable).
- 3 Interconnecting Cables
Excess part of the interconnecting cables longer than 1 meter are bundled in the center.
Cables that hang closer than 40 cm to the ground plane is folded back and forth forming bundle 30 to 40 cm long,
- 4 Measuring Instruments
Measuring instruments list and their calibration schedule are shown on Measurement Equipment Configuration.
The brief description are as follows;
- 5 Antennas
The broadband Bi-cog antenna is used for measurement on the frequency range 30 – 1000 MHz.
The Double ridged guide antenna is used for frequency higher than 1000 MHz
- 6 Pre-amplifier
The broadband pre-amplifier is used for radiated emission measurement.
The signal to noise ratio is improved by using pre-amplifier.
- 7 Spectrum Analyzer
The spectrum analyzer is used for preliminary measurement of frequency range 30 – 1000 MHz, and also used for final measurement of higher than 1000 MHz (RBW : 1 MHz).
- 8 EMI Test Receiver
The Quasi-peak detector (IF bandwidth : 120 kHz) built in test receiver is used for final measurement of the frequency 30 – 1000 MHz.
The test receiver is complied with the specification of the CISPR publication 16.
- 9 Turntable
The turntable is capable for EUT weight and rotatable 0 to 360 degree horizontally by remote control in the test room.
- 10 Antenna Mast
The antenna mast is attachable to all antennas described on antenna height is adjustable 1 to 4 meters continuously by remote control at the test room, and antenna polarization is also changed by the remote control.
- 11 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. Then spectrum chart are plotted out to find the worst emission conditions in configuration, operating mode, or ambient noise notation.

12 Final Measurement

The EUT operated in the condition where maximum emission is found in 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.

When the uncertain result was obtained, the measurement is retried by using the half wave dipole antenna instead of the broadband antenna

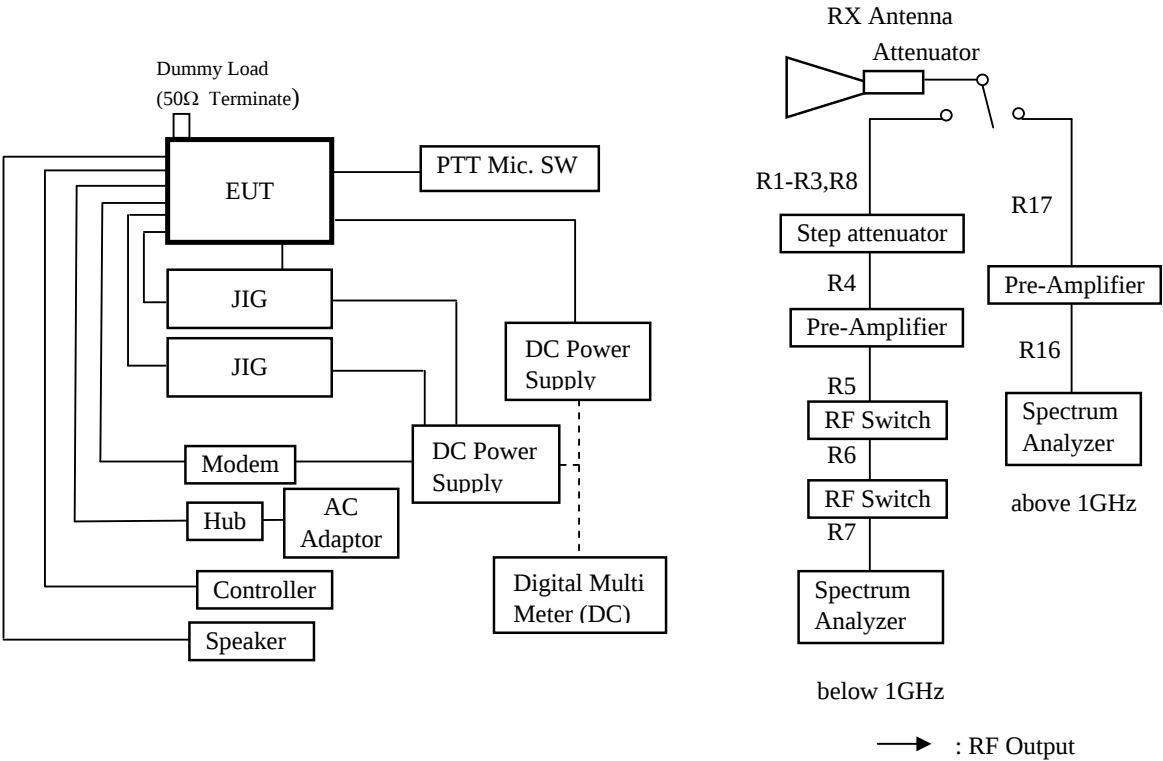
TEST EQUIPMENTS

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Broad Band antenna	Schwarzbeck	VULB9168	218	Mar. 29, 11	Mar. 31, 12
2	D.R.G Antenna(RX)	Schwarzbeck	3115	5044	Jun. 07, 10	Jun. 30, 11
3	Pre-Amplifier	Hewlett Packard	8447D	2944A06342	May 13, 10	May 31, 11
4	Pre-Amplifier	Hewlett Packard	8449B	3008A01182	Apr. 19, 11	Apr. 30, 12
5	Attenuator(6dB)	TAMAGAWA	CFA-01(NPJ-6)	None	May 13, 10	May 31, 11
6	Attenuator(6dB)	Agilent	8493C	75550	Apr. 13, 11	Apr. 30, 12
7	Spectrum Analyzer	Hewlett Packard	8563E (rev.971024)	3821A09565	May 02, 11	May 31, 12
8	Step Attenuator	Hewlett Packard	8494B	2805A14563	May 13, 10	May 31, 11
9	Test Receiver	Rohde & Schwarz	ESS	842886/013	Jan. 21, 11	Jan. 31, 12
10	RF Switch	Intertek Japan	ACX-150	None	May 13, 10	May 31, 11
11	Digital Multi Meter	FLUKE	8846A	9642018	Jul. 22, 10	Jul. 31, 11
12	DC Power Supply	TDK-Lamba	HWS300-15	5JY-139MC2-0005	None	None

USED CABLES

No.	Cable	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
R1	Coaxial Cable	Intertek Japan	5D-2W	2R1001a	May 13, 10	May 31, 11
R2	Coaxial Cable	Intertek Japan	RG-117/U	2R1002	May 13, 10	May 31, 11
R3	Coaxial Cable	Intertek Japan	RG-5A/U	2R1003	May 13, 10	May 31, 11
R4	Coaxial Cable	Intertek Japan	RG-5A/U	2R1004	May 13, 10	May 31, 11
R5	Coaxial Cable	Intertek Japan	5D-2W	2R1005	May 13, 10	May 31, 11
R6	Coaxial Cable	Intertek Japan	5D-2W	2R1006	May 13, 10	May 31, 11
R7	Coaxial Cable	Intertek Japan	5D-2W	2R1007	May 13, 10	May 31, 11
R8	Coaxial Cable	Intertek Japan	5D-2W	2R1008	May 13, 10	May 31, 11
R16	Coaxial Cable	Suhner	SUCOFLEX104	290799/4	Apr. 19, 11	Apr. 30, 12
R17	Coaxial Cable	Suhner	SUCOFLEX104	280800/4	Apr. 19, 11	Apr. 30, 12

MEASUREMENT EQUIPMENT CONFIGURATION



TEST RESULTS

Test date	May. 23, 2011
Location	Tochigi No.2 Test Site
temperature	20.7 to 25.9 [degree C]
Humidity Variation	47 to 68 [%]
Atmospheric Pressure	97.4 to 99.7 [kPa]
Test Engineer	Atsuyuki Morishima

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

State the worst case (below).

State : 406.15 MHz (With OCXO(External)) Receiver Condition

No.	Frequency (MHz)	Pol	Mode	Reading Level (dBuv)	Factor* (dB)	Emission Level (dBuV/m)	Limit Level (dBuV/m)	Margin (dB)
1	39.30	Hor.		-	-6.40	-	40.0	-
		Ver.		41.50	-6.40	35.10	40.0	4.9
2	200.00	Hor.		-	-6.40	-	43.5	-
		Ver.		36.20	-6.40	29.80	43.5	13.7
3	206.43	Hor.		-	-6.00	-	43.5	-
		Ver.		40.40	-6.00	34.40	43.5	9.1
4	229.86	Hor.		35.50	-4.80	30.70	46.0	15.3
		Ver.		36.20	-4.80	31.40	46.0	14.6
5	258.05	Hor.		46.60	-3.30	43.30	46.0	2.7
		Ver.		-	-3.30	-	46.0	-
6	350.00	Hor.		39.20	-0.10	39.10	46.0	6.9
		Ver.		-	-0.10	-	46.0	-
7	400.00	Hor.		42.10	0.70	42.80	46.0	3.2
		Ver.		40.50	0.70	41.20	46.0	4.8
8	450.00	Hor.		38.00	1.90	39.90	46.0	6.1
		Ver.		-	1.90	-	46.0	-
9	712.40	Hor.		21.80	7.60	29.40	46.0	16.6
		Ver.		21.60	7.60	29.20	46.0	16.8
10	750.08	Hor.		29.30	8.70	38.00	46.0	8.0
		Ver.		27.60	8.70	36.30	46.0	9.7
11	774.15	Hor.		28.60	8.90	37.50	46.0	8.5
		Ver.		27.60	8.90	36.50	46.0	9.5
12	800.09	Hor.		24.50	9.60	34.10	46.0	11.9
		Ver.		24.10	9.60	33.70	46.0	12.3
13	900.11	Hor.		23.50	11.70	35.20	46.0	10.8
		Ver.		23.60	11.70	35.30	46.0	10.7
14	1068.60	Hor.	AVG	41.60	-2.10	39.50	54.0	14.5
		Ver.	AVG	44.80	-2.10	42.70	54.0	11.3
15	1500.05	Hor.	AVG	-	0.40	-	54.0	-
		Ver.	AVG	41.30	0.40	41.70	54.0	12.3
16	1999.99	Hor.	AVG	31.30	3.00	34.30	54.0	19.7
		Ver.	AVG	36.70	3.00	39.70	54.0	14.3

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

* Factor = Antenna,Antenna Pad,Cable,Preamp

Emission Level = Reading Level + Factor

Note:

- 1 Measurement distance is 3 metres.
- 2 Scanned frequency are 30 to 2000 MHz.
- 3 Highest oscillator frequency is 430 MHz.

10.11 Necessary Bandwidth and Emission Bandwidth

REGULATIONS : FCC Part 2 Section 202 (g) & Federal Register/ Vol.68, No236
TRC 43

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

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

State : 8K30F1E / 8K30F1D / 8K30F7W (4Level FSK / 9600bps, Authorized Bandwidth 11.25 kHz)

Item	Mark		
Digital information rate	(R)	9600	bps
Peak frequency deviation	(D)	3.391	kHz
Signaling states	(S)	4	
Numerical factor	(K)	0.516	
Necessary Bandwidth	(Bn)	8.3	kHz

$$B_n = (R / \log_2 S) + 2 \times D \times K$$

State : 4K00F1E / 4K00F1D / 4K00F7W (4Level FSK / 4800bps, Authorized Bandwidth 6 kHz)

Item	Mark		
Digital information rate	(R)	4800	bps
Peak frequency deviation	(D)	1.55	kHz
Signaling states	(S)	4	
Numerical factor	(K)	0.516	
Necessary Bandwidth	(Bn)	4	kHz

$$B_n = (R / \log_2 S) + 2 \times D \times K$$

State : 4K00F2D (CWID, Authorized Bandwidth 6 kHz)

Item	Mark		
Maximum Modulation	(M)	0.8	kHz
Maximum Deviation	(D)	1.2	kHz
Numerical factor	(K)	1	
Necessary Bandwidth	(Bn)	4	kHz

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