



# TEST REPORT

REGULATION : FCC Part 2, 90

| Applicant                                                                                                                                             | Testing Laboratory                                                                                                                                                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| JVC KENWOOD Corporation<br><br>1-16-2, Hakusan, Midori-ku, Yokohama-shi<br>Kanagawa, 226-8525 Japan<br>Tel.: +81 45 939 6254<br>Fax.: +81 45 939 6261 | Intertek Japan K.K. Kashima Laboratory<br>URL: <a href="http://www.japan.intertek-etlsemko.com">http://www.japan.intertek-etlsemko.com</a><br>(No.12 Test Site)<br>298-6 Sada, Kashima, Ibaraki<br>314-0027 Japan<br>Tel. +81 299 82 8464<br>(No.1 Test Site)<br>3-2 Sunayama, Kamisu, Ibaraki<br>314-0255 Japan<br>Tel. +81 479 40 1097 |

|                            |                         |
|----------------------------|-------------------------|
| <b>Equipment type</b>      | UHF DIGITAL TRANSCEIVER |
| <b>Trademark</b>           | KENWOOD                 |
| <b>FCC Model(s)</b>        | NX-3820HG-K             |
| <b>Serial No.</b>          | 90-No.13                |
| <b>FCC ID</b>              | K44479300               |
| <b>Test Result</b>         | Complied                |
| <b>Report Number</b>       | 17020202JKA-003         |
| <b>Original Issue Date</b> | March 31, 2017          |

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Approved by

Hideaki Kosemura

[Technical Manager]

Tested by

Koichi Wagatsuma

[Engineer]



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

**Sub-part 2.1033**

|                                                                                                                        |                                                                                                                                                                                                                              |
|------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Applicant and Manufacture Information</b>                                                                           |                                                                                                                                                                                                                              |
| APPLICANT                                                                                                              |                                                                                                                                                                                                                              |
| Company                                                                                                                | : JVC KENWOOD Corporation                                                                                                                                                                                                    |
| Address                                                                                                                | : 1-16-2, Hakusan, Midori-ku, Yokohama-shi<br>Kanagawa, 226-8525 Japan                                                                                                                                                       |
| Contact Person                                                                                                         | : Tamaki Shimamura<br>Manager, Communications Systems Devision                                                                                                                                                               |
| MANUFACTURER                                                                                                           |                                                                                                                                                                                                                              |
| Company                                                                                                                | : JVC KENWOOD Corporation                                                                                                                                                                                                    |
| Address                                                                                                                | : 1-16-2, Hakusan, Midori-ku, Yokohama-shi<br>Kanagawa, 226-8525 Japan                                                                                                                                                       |
| <b>(c)(2) FCC ID</b>                                                                                                   |                                                                                                                                                                                                                              |
| FCC ID                                                                                                                 | : K44479300                                                                                                                                                                                                                  |
| Model number                                                                                                           | : NX-3820HG-K                                                                                                                                                                                                                |
| Serial number                                                                                                          | : 90-No.13                                                                                                                                                                                                                   |
| <b>Instruction Manual(S)</b>                                                                                           |                                                                                                                                                                                                                              |
| Instruction manual(s)                                                                                                  | : Please refer to attached Exhibits F                                                                                                                                                                                        |
| <b>Type of Emission</b>                                                                                                |                                                                                                                                                                                                                              |
| Emission Designation                                                                                                   | : 16K0F3E(Wide)<br>11K0F3E(Narrow)<br>8K30F1E(Narrow) / 8K30F1D(Narrow) / 8K30F7W(Narrow)<br>7K60FXD(Narrow) / 7K60FXE(Narrow)<br>4K00F1E(Very Narrow) / 4K00F1D(Very Narrow) / 4K00F7W(Very Narrow)<br>4K00F2D(Very Narrow) |
| <b>Frequency range</b>                                                                                                 |                                                                                                                                                                                                                              |
| Frequency Range                                                                                                        | : FCC: 450 to 512 MHz<br>16K0F3E is 470 - 512 MHz Only                                                                                                                                                                       |
| <b>Power Rating</b>                                                                                                    |                                                                                                                                                                                                                              |
| Output Power                                                                                                           | : 5 to 45 W                                                                                                                                                                                                                  |
| Type                                                                                                                   | : Continuously Variable                                                                                                                                                                                                      |
| <b>Maximum Power Rating</b>                                                                                            |                                                                                                                                                                                                                              |
| Output Power                                                                                                           | : 45W                                                                                                                                                                                                                        |
| <b>Voltages &amp; currents in all elements in final RF stage,<br/>including final transistor or solid-state device</b> |                                                                                                                                                                                                                              |
| Collector Current, A                                                                                                   | : 13.0 A Maximum                                                                                                                                                                                                             |
| Collector Voltage, Vdc                                                                                                 | : 13.6 Vdc                                                                                                                                                                                                                   |
| Supply Voltage, Vdc                                                                                                    | : 13.6 Vdc                                                                                                                                                                                                                   |
| <b>Other Information</b>                                                                                               |                                                                                                                                                                                                                              |
| Number of Channel                                                                                                      | : Zone 128max. Cannels 512 max.(per Zone)                                                                                                                                                                                    |
| Maximum Deviation                                                                                                      | : $\pm 5$ kHz (16K0F3E), $\pm 2.5$ kHz (11K0F3E)                                                                                                                                                                             |
| Frequency Stability                                                                                                    | : 1.0 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 and No.12 Test Site |    |                |
| EUT Received               | February 20, 2017                          |    |                |
| Date of Test               | February 22, 2017                          | to | March 23, 2017 |
| Standard Applied           | FCC Part 2, 90                             |    |                |
| Measurement Method         | ANSI/TIA-603-D-2010                        |    |                |
| Deviation from Standard(s) | Not applicable                             |    |                |

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

| ACCREDITATION | SCOPE       | LAB. CODE               | Remarks |
|---------------|-------------|-------------------------|---------|
| VLAC          | EMC Testing | VLAC-008-1              | JAPAN   |
| FILING        |             |                         |         |
| VCCI          | EMC Testing | A-0126                  | JAPAN   |
| FCC           | EMC Testing | JP0008                  |         |
| IC            | EMC Testing | IC-2042K-3, IC-2042Q-12 | CANADA  |
| CB-Scheme     | EMC Testing | TL222                   | IECEE   |

### 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       |

### Revision Summary

| Revised Date | Section | Description of Changes |
|--------------|---------|------------------------|
|              |         |                        |
|              |         |                        |
|              |         |                        |

## SECTION 2. SUMMARY OF TEST RESULT

| FCC Part2      | Part90        | TEST ITEM                                      | RESULTS         | Comments |
|----------------|---------------|------------------------------------------------|-----------------|----------|
| 2.1046 (a)     | -             | Carrier Output Power (Conducted)               | <b>PASS</b>     |          |
| 2.1051         | 90.210        | Unwanted Emissions (Transmitter Conducted)     | <b>PASS</b>     |          |
| 2.1053 (a)     | 90.210        | Field Strength of Spurious Radiation           | <b>PASS</b>     |          |
| 2.1049 (c) (1) | 90.210        | Emission Masks (Occupied Bandwidth)            | <b>PASS</b>     |          |
| -              | 90.214        | Transient Frequency Behavior                   | <b>PASS</b>     |          |
| 2.1047 (a)     | -             | Audio Low Pass Filter (Voice Input)            | <b>PASS</b>     |          |
| 2.1047 (a)     | -             | Audio Frequency Response                       | <b>PASS</b>     |          |
| 2.1047 (b)     | -             | Modulation Limiting                            | <b>PASS</b>     |          |
| 2.1055 (a) (1) | 90.213 (a)    | Frequency Stability (Temperature Variation)    | <b>PASS</b>     |          |
| 2.1055 (d) (1) | 90.213 (a)    | Frequency Stability (Voltage Variation)        | <b>PASS</b>     |          |
| -              | -             | Receiver Spurious Emissions                    | <b>PASS</b>     |          |
| -              | 90.203 (j)(3) | Certification required (FCC Part 90.203(j)(3)) | <b>Complied</b> |          |
| -              | 90.203 (j)(4) | Certification required (FCC Part 90.203(j)(4)) | <b>Complied</b> |          |
| -              | 90.203 (j)(5) | Certification required (FCC Part 90.203(j)(5)) | <b>Complied</b> |          |
| -              | 90.203 (e)    | Certification required (FCC Part 90.203(e))    | <b>Complied</b> |          |

### Limitation on Results

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

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

### Note:

As for the FCC Part 15 Subpart B-Unintentional Radiators, the EUT has been measured and declared as Verification by JVC 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 24        | Personal Communications Services          | N.A.       |
| Part 80        | Stations in the Maritime Services         | N.A.       |
| <b>Part 90</b> | <b>Private Land Mobile radio Services</b> | <b>YES</b> |

| IC Rule | Test Item                                                                                                            | Tested |
|---------|----------------------------------------------------------------------------------------------------------------------|--------|
| RSS-119 | Radio Transmitters and Receivers Operating in the Land Mobile and Fixed Services in the Frequency Range 27.4-960 MHz | N.A.   |
| RSS-134 | 900MHz Narrowband Personal Communication Service                                                                     | N.A.   |
| RSS-Gen | General Requirements for Compliance of Radio Apparatus                                                               | 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                      | UHF DIGITAL TRANSCEIVER | NX-3820HG-K                                                | 90-No.13   | JVC KENWOOD Corporation | EUT     |
| Power Ratings of EUT : |                         | DC 13.6V ± 15%                                             |            | 13.0 A Maximum          |         |
| Power Supply :         |                         | DC 13.6 V                                                  |            |                         |         |
| Condition of Equipment |                         | Proto type                                                 |            |                         |         |
| Type                   |                         | Mobile type                                                |            |                         |         |
| Suppression Devices    |                         | No Modifications by the laboratory were made to the device |            |                         |         |

Note: Serial No. 0

### 4.2 Port(s)/Connector(s)

| Port Name        | Connector Type | Connector Pin | Remarks |
|------------------|----------------|---------------|---------|
| ACC              | D-sub          | 15 pin        |         |
| External Speaker | 3.5 $\phi$     | 2 pin         |         |
| RF Antenna       | M              | 2 pin         |         |
| Microphone       | RJ-45          | 8 pin         |         |
| GPS Antenna      | SMA            | 2 pin         |         |

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

| Operating Frequency | Board Name     | Remarks |
|---------------------|----------------|---------|
| 1024 MHz            | TXRX UNIT      |         |
| 4960 MHz            | Bluetooth 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 Jig   | None      | None       | JVC KENWOOD Corporation | N/A    |
| C      | GPS Antenna      | KRA-40G   | None       | JVC KENWOOD Corporation | N/A    |
| D      | External Speaker | KES-3     | None       | JVC KENWOOD Corporation | N/A    |
| E      | Dummy Load       | CT-150NP  | 1138693    | TME                     | N/A    |
| F      | DC Power Supply  | 8846A     | 90290931   | Daiichi denpa kogyo     | N/A    |

Supplied Power:

|   |    |           |
|---|----|-----------|
| E | AC | 100V,60Hz |
|---|----|-----------|

## SECTION 6. USED CABLE(S)

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

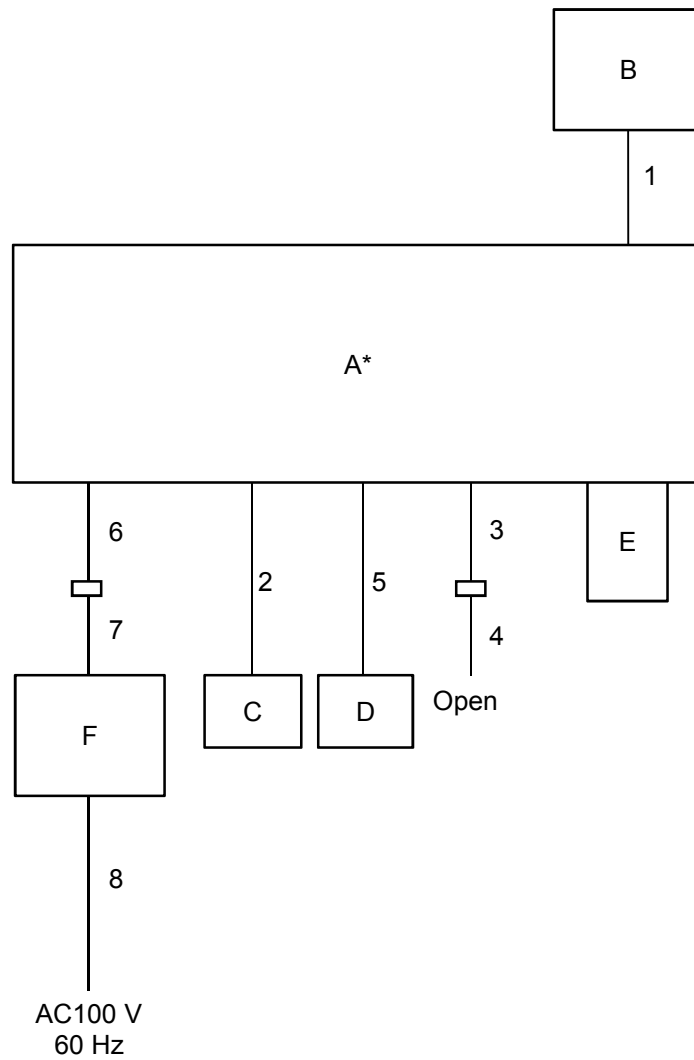
| No. | Name                            | Length (m) | Shield | Connector | Ferrite core |
|-----|---------------------------------|------------|--------|-----------|--------------|
| 1   | Microphone Jig Cable            | 0.55       | No     | No        |              |
| 2   | GPS Antenna cable               | 1.00       | No     | Yes       |              |
| 3   | KCT-60 (Connection cable)       | 0.30       | No     | No        |              |
| 4   | KCT-18 (Ignition sense cable)   | 3.10       | No     | No        |              |
| 5   | Speaker cable                   | 2.90       | No     | No        |              |
| 6   | DC cable for EUT                | 0.25       | No     | No        |              |
| 7   | DC cable for EUT                | 3.00       | No     | No        |              |
| 8   | Power Cable for DC Power Supply | 2.00       | No     | No        |              |

## SECTION 7. TEST CONFIGURATION

### Details of Configuration and Connection

Example: Case of Section 10.3Test

\* : EUT  
■ : Ferrite core  
□ : Joint Connector



## SECTION 8. OPERATING CONDITION

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

### 8.1 Operating Condition

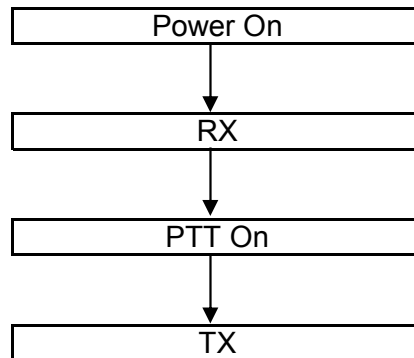
The test was carried out under Transmit mode.

(FCC:450.05MHz, 481.05MHz, 511.95MHz, 16K0F3E: 470.05MHz, 491.05MHz, 511.95MHz)

(High Power : 45W, Low Power : 5 W)

### 8.2 Operating Flow [Transmit 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        |                         |             |
|                                             | +/- 2.78dB ( $k = 2$ )  | +/- 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% ( $k = 2$ )      | +/- 1.0 %   |
| Frequency Stability (Temperature Variation) |                         |             |
|                                             | +/- 10.1Hz ( $k=2$ )    | +/-34.2 Hz  |
| Frequency Stability (Voltage Variation)     |                         |             |
|                                             | +/- 10.1Hz ( $k=2$ )    | +/-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-D 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.  

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

$$\text{RF Power (W)} = 10^{(\text{RF Power (dBm)}/10)/1000}$$
- 3 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)

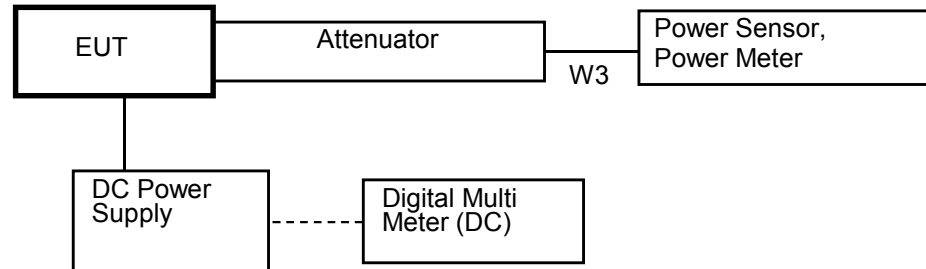
#### Measuring Equipments

| No. | Equipment           | Manufacture         | Model No.   | Serial No. | Cal. Interval | Effective period |
|-----|---------------------|---------------------|-------------|------------|---------------|------------------|
| 1   | Power Meter         | Hewlett Packard     | E4418B      | GB38410265 | 1Y            | May. 31, 17      |
| 2   | Power Sensor        | Hewlett Packard     | 8482A       | US37292237 | 1Y            | May. 31, 17      |
| 3   | Attenuator (20dB)   | Aeroflex/Wenshel    | 66-20-34    | BY4357     | 1Y            | May. 31, 17      |
| 4   | Attenuator (30dB)   | Weinschel           | WA-29-30-34 | 8924       | 1Y            | May. 31, 17      |
| 6   | DC Power Supply     | Daiichi denpa kogyo | GZV4000     | 90290931   | None          | None             |
| 7   | Digital Multi Meter | FLUKE               | 8846A       | 9642018    | 1Y            | Sep. 30, 17      |

#### Measuring Cables

| No. | Cable         | Manufacturer   | Model No. | Serial No. | Cal. Interval | Effective period |
|-----|---------------|----------------|-----------|------------|---------------|------------------|
| W3  | Coaxial Cable | Pacific custom | RG-58 C/U | AM90C04    | 1Y            | Feb. 28, 18      |

## Measuring Equipment Configuration



## Test Results

|                      |                        |            |
|----------------------|------------------------|------------|
| Test date            | Feb. 22, 2017          |            |
| Location             | Kashima No.1 Test Site |            |
| temperature          | 24.0                   | [degree C] |
| Humidity Variation   | 56.0                   | [%]        |
| Atmospheric Pressure | 101.4                  | [kPa]      |
| Test Engineer        | Koichi Wagatsuma       |            |

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

| No. | Frequency (MHz) | Band               | Setting    | RF Power (W) |
|-----|-----------------|--------------------|------------|--------------|
| 1   | 450.05          | Low                | High Power | 45           |
| 2   | 470.05          | Low for 16K0F3E    | High Power | 45           |
| 3   | 481.05          | Middle             | High Power | 45           |
| 4   | 491.05          | Middle for 16K0F3E | High Power | 45           |
| 5   | 511.95          | High               | High Power | 45           |
| 6   | 450.05          | Low                | Low Power  | 5            |
| 7   | 470.05          | Low for 16K0F3E    | Low Power  | 5            |
| 8   | 481.05          | Middle             | Low Power  | 5            |
| 9   | 491.05          | Middle for 16K0F3E | Low Power  | 5            |
| 10  | 511.95          | High               | Low Power  | 5            |

RF Power: Peak reading

## 10.2 Unwanted Emissions (Transmitter Conducted)

|                   |                                                                                            |
|-------------------|--------------------------------------------------------------------------------------------|
| REGULATIONS       | : FCC Part 2 Section 1051, Part 80 Section 211, Part 90 Section 210<br>RSS-119 Section 5.8 |
| TEST METHOD/GUIDE | : ANSI/TIA-603-D Section 2.2.13.2 / RSS-119 Section 4.2                                    |

### 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 than necessary to produce 50 % of rated system deviation.
- Adjust the spectrum analyzer for the following setting:
  - RBW : 100 kHz (< 1 GHz), 1 MHz (> 1 GHz).
  - VBW : 300 kHz (< 1 GHz), 3 MHz (> 1 GHz).
  - 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.

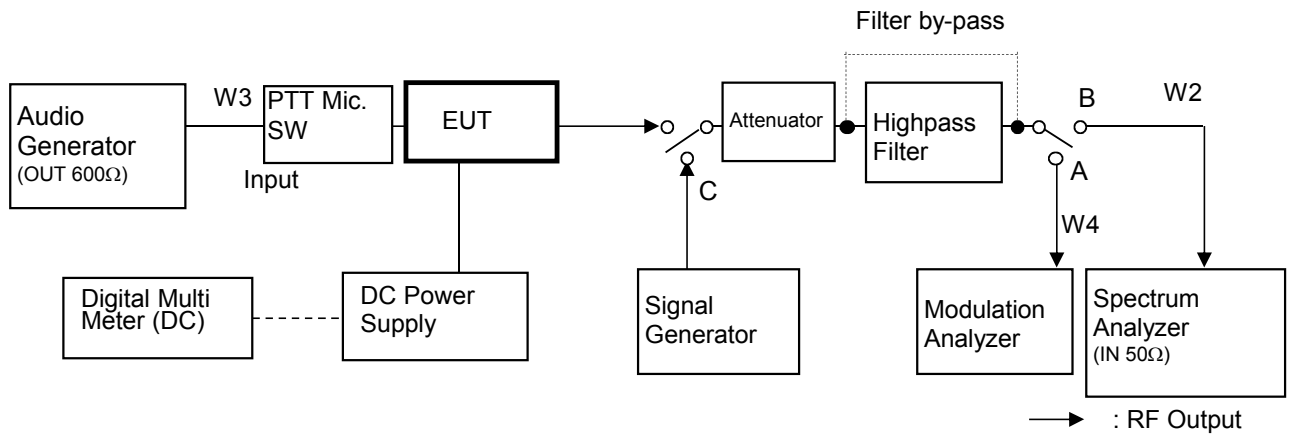
### Measuring Equipments

| No. | Equipment           | Manufacture         | Model No.   | Serial No. | Cal. Interval | Effective period |
|-----|---------------------|---------------------|-------------|------------|---------------|------------------|
| 1   | Attenuator (20dB)   | Aeroflex/Wenschel   | 66-20-34    | BY4357     | 1Y            | May. 31, 17      |
| 2   | Attenuator (30dB)   | Weinschel           | WA-29-30-34 | 8924       | 1Y            | May. 31, 17      |
| 3   | Highpass Filter     | Anritsu             | MP526D      | 6200220657 | 1Y            | Jan. 31, 18      |
| 4   | Modulation Analyzer | Hewlett Packard     | 8901B       | 3403A04852 | 1Y            | Dec. 31, 17      |
| 5   | Signal Generator    | Rohde&Schwarz       | SMB 100A    | 105709     | 1Y            | Apr. 30, 17      |
| 6   | Audio Generator     | Anritsu             | MG443B      | M70150     | 1Y            | May. 31, 17      |
| 7   | Spectrum Analyzer   | Agilent             | N9030A      | US51350220 | 1Y            | Feb. 28, 18      |
| 8   | DC Power Supply     | Daiichi denpa kogyo | GZV4000     | 90290931   | None          | None             |
| 9   | Digital Multi Meter | FLUKE               | 8846A       | 9642018    | 1Y            | Sep. 30, 17      |

### Measuring Cables

| No. | Cable         | Manufacture    | Model No.    | Serial No. | Cal. Interval | Effective period |
|-----|---------------|----------------|--------------|------------|---------------|------------------|
| W3  | Balance Cable | Huber+Suher    | RG59BU/11BNC | KSR00218   | 1Y            | May. 31, 17      |
| W4  | Coaxial Cable | Pacific custom | RG-58 C/U    | AM90C04    | 1Y            | Feb. 28, 18      |
| W2  | Coaxial Cable | Suhner         | SUCOFLEX104  | KSR00217   | 1Y            | May. 31, 17      |

## Measuring Equipment Configuration



Note: Configuration of other Modulation test is composed without the Audio Generator.

## Test Results

|                      |                        |
|----------------------|------------------------|
| Test date            | Feb. 23, 2017          |
| Location             | Kashima No.1 Test Site |
| temperature          | 21 [degree C]          |
| Humidity Variation   | 61 [%]                 |
| Atmospheric Pressure | 99.1 [kPa]             |
| 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

| No. | Tuned Frequency (MHz) | Band   | Spurious Frequency (MHz) | Correct Level (dBm) | Emission Level (dBc) | Mask D Limit (dBc) | Margin (dB) |
|-----|-----------------------|--------|--------------------------|---------------------|----------------------|--------------------|-------------|
| 1   | 450.05                | Low    | 900.10                   | -39.91              | <b>-86.44</b>        | -66.5              | 19.9        |
| 2   | 481.05                | Middle | 962.10                   | -36.98              | <b>-83.51</b>        | -66.5              | 17.0        |
| 3   | 511.95                | High   | No Point detected        | -                   | -                    | -66.5              | -           |

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

State : Low Power / Authorized Bandwidth 6 kHz

| No. | Tuned Frequency (MHz) | Band   | Spurious Frequency (MHz) | Correct Level (dBm) | Emission Level (dBc) | Mask E Limit (dBc) | Margin (dB) |
|-----|-----------------------|--------|--------------------------|---------------------|----------------------|--------------------|-------------|
| 1   | 450.05                | Low    | No Point detected        | -                   | -                    | -62.0              | -           |
| 2   | 481.05                | Middle | 962.10                   | -40.53              | <b>-77.51</b>        | -62.0              | 15.5        |
| 3   | 511.95                | High   | 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 |
| TEST METHOD/GUIDE | : | ANSI/TIA-603-D 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 : 100 kHz (< 1 GHz), 1 MHz (> 1 GHz).
  - VBW : 300 kHz (< 1 GHz), 3 MHz (> 1 GHz).
  - 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

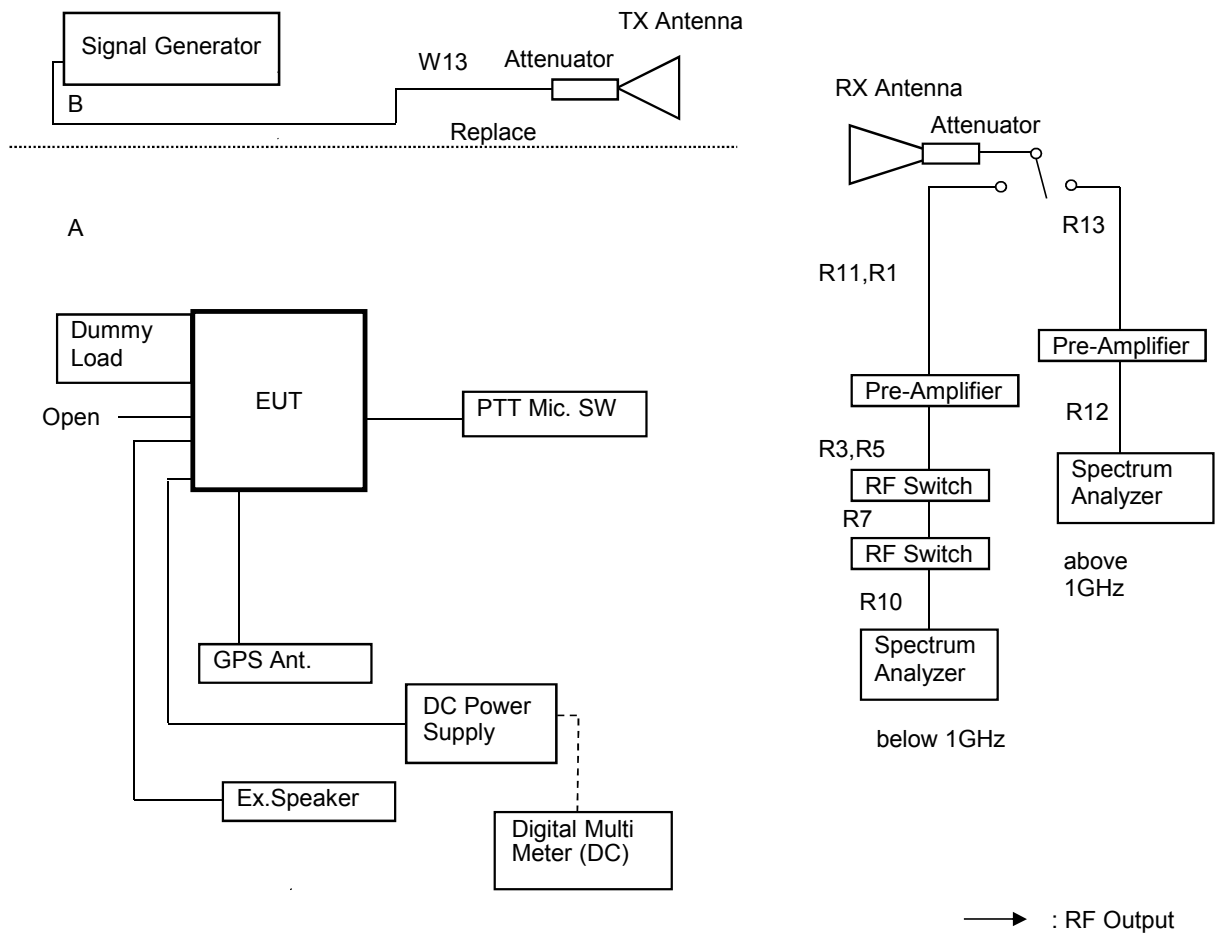
#### Measuring Equipments

| No. | Equipment           | Manufacture         | Model No.  | Serial No. | Cal. Interval | Effective period |
|-----|---------------------|---------------------|------------|------------|---------------|------------------|
| 1   | Attenuator(10dB)    | HUBER+SUHNER        | 6810.17B   | 5061       | 1Y            | Feb. 28, 18      |
| 2   | Dummy Load          | TME                 | CT-150NP   | 1138693    | 1Y            | Feb. 28, 18      |
| 3   | Signal Generator    | Rohde&Schwarz       | SMB 100A   | 105709     | 1Y            | Apr. 30, 17      |
| 4   | Spectrum Analyzer   | Agilent             | N9000A     | MY51260520 | 1Y            | May. 31, 17      |
| 5   | D.R.G Antenna(RX)   | Schwarzbeck         | 3115       | 5045       | 1Y            | Mar. 31, 17      |
| 6   | D.R.G Antenna(TX)   | ETS LINDGREN        | 3117       | 00055157   | 1Y            | May. 31, 17      |
| 7   | Dipole Antenna(TX)  | Schwarzbeck         | UHA9105    | AM0082002  | 1Y            | Aug. 31, 17      |
| 8   | Dipole Antenna(TX)  | Schwarzbeck         | VHA9103    | C01082007  | 1Y            | Aug. 31, 17      |
| 9   | Tri-log Antenna(RX) | Schwarzbeck         | VULB9168WP | 126        | 1Y            | Dec. 31, 17      |
| 10  | DC Power Supply     | Daiichi denpa kogyo | GZV4000    | 90290931   | None          | None             |
| 11  | Digital Multi Meter | FLUKE               | 8846A      | 9642018    | 1Y            | Sep. 30, 17      |
| 12  | Amplifier           | TOYO                | TPA0118-30 | 0402       | 1Y            | Mar. 31, 17      |
| 13  | Attenuator          | HUBER + SUHNER      | 6803.17.B  | 5111       | 1Y            | Mar. 31, 17      |
| 14  | Amplifier           | Intertek Japan      | ZX60-3018G | 005        | 1Y            | Feb. 28, 18      |
| 15  | Attenuator          | TAMAGAWA            | CFA-01     | A00040805  | 1Y            | Feb. 28, 18      |
| 16  | RF Switch           | Intertek Japan      | ACX-150-1  | A12301501  | 1Y            | Feb. 28, 18      |

## Measuring Cables

| No. | Cable         | Manufacturer | Model No.         | Serial No. | Cal. Interval | Effective period |
|-----|---------------|--------------|-------------------|------------|---------------|------------------|
| R11 | Coaxial Cable | FUJIKURA     | 5D-2W             | R11        | 1Y            | Feb. 28, 18      |
| R1  | Coaxial Cable | FUJIKURA     | 5D-2W             | R1         | 1Y            | Feb. 28, 18      |
| R3  | Coaxial Cable | FUJIKURA     | 10D-2W            | R3         | 1Y            | Feb. 28, 18      |
| R5  | Coaxial Cable | FUJIKURA     | RG-5A/U           | R5         | 1Y            | Feb. 28, 18      |
| R7  | Coaxial Cable | MIYAZAKI     | 5D-2W             | R7         | 1Y            | Feb. 28, 18      |
| R10 | Coaxial Cable | FUJIKURA     | 5D-2W             | R10        | 1Y            | Feb. 28, 18      |
| R13 | Coaxial Cable | SUHNER       | SUCOFLEX 104      | 229603     | 1Y            | Mar. 31, 17      |
| R12 | Coaxial Cable | Candox       | 5B-048-98-98-5000 | 111130     | 1Y            | Mar. 31, 17      |
| W13 | Coaxial Cable | Suhner       | SUCOFLEX106       | KSR00207   | 1Y            | Feb. 28, 18      |

## Measuring Equipment Configuration



## Test Results

|                      |                         |            |              |
|----------------------|-------------------------|------------|--------------|
| Test date            | Mar 16, 2017            | to         | Mar 19, 2017 |
| Location             | Kashima No.12 Test Site |            |              |
| temperature          | 20.0 to 21.5            | [degree C] |              |
| Humidity Variation   | 30 to 40                | [%]        |              |
| Atmospheric Pressure | 101 to 102              | [kPa]      |              |
| 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 / 481.05MHz(FCC /RSS)

| No | Frequency (MHz) | Pol  | Reading Level (dBm) | SG Out Level (dBm) | Antenna Gain (dBd) | Loss (dB) | Correct Level (dBm) | Emission Level (dBc) | MASK D Limit Level (dBc) | Margin (dB) |
|----|-----------------|------|---------------------|--------------------|--------------------|-----------|---------------------|----------------------|--------------------------|-------------|
| 1  | 962.10          | Hor. | -63.06              | -27.61             | 0.00               | 12.51     | -40.1               | <b>-86.7</b>         | -66.5                    | 20.2        |
|    |                 | Ver. | -63.83              | -26.55             | 0.00               | 12.51     | -39.1               | <b>-85.6</b>         | -66.5                    | 19.1        |
| 2  | 1443.15         | Hor. | -50.17              | -37.31             | 3.46               | 13.07     | -46.9               | <b>-93.4</b>         | -66.5                    | 26.9        |
|    |                 | Ver. | -51.43              | -37.56             | 3.46               | 13.07     | -47.2               | <b>-93.7</b>         | -66.5                    | 27.2        |
| 3  | 1924.20         | Hor. | -58.74              | -42.40             | 3.19               | 13.62     | -52.8               | <b>-99.4</b>         | -66.5                    | 32.9        |
|    |                 | Ver. | -58.21              | -40.36             | 3.19               | 13.62     | -50.8               | <b>-97.3</b>         | -66.5                    | 30.8        |
| 4  | 2405.25         | Hor. | -53.36              | -36.56             | 3.47               | 14.06     | -47.1               | <b>-93.7</b>         | -66.5                    | 27.2        |
|    |                 | Ver. | -54.64              | -35.91             | 3.47               | 14.06     | -46.5               | <b>-93.0</b>         | -66.5                    | 26.5        |
| 5  | 2886.30         | Hor. | -59.67              | -41.68             | 4.49               | 14.49     | -51.7               | <b>-98.2</b>         | -66.5                    | 31.7        |
|    |                 | Ver. | -60.70              | -41.92             | 4.49               | 14.49     | -51.9               | <b>-98.5</b>         | -66.5                    | 32.0        |
| 6  | 3367.35         | Hor. | -                   | -                  | 5.61               | 14.86     | -                   | -                    | -66.5                    | -           |
|    |                 | Ver. | -                   | -                  | 5.61               | 14.86     | -                   | -                    | -66.5                    | -           |
| 7  | 3848.40         | Hor. | -                   | -                  | 6.23               | 15.21     | -                   | -                    | -66.5                    | -           |
|    |                 | Ver. | -                   | -                  | 6.23               | 15.21     | -                   | -                    | -66.5                    | -           |
| 8  | 4329.45         | Hor. | -                   | -                  | 6.81               | 15.51     | -                   | -                    | -66.5                    | -           |
|    |                 | Ver. | -                   | -                  | 6.81               | 15.51     | -                   | -                    | -66.5                    | -           |
| 9  | 4810.50         | Hor. | -61.35              | -37.19             | 7.24               | 15.77     | -45.7               | <b>-92.2</b>         | -66.5                    | 25.7        |
|    |                 | Ver. | -60.88              | -37.34             | 7.24               | 15.77     | -45.9               | <b>-92.4</b>         | -66.5                    | 25.9        |

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

Mask D Limit (dBc) = whichever is the lesser attenuation ;  $-(50+10\log(P))$  or -70

Correct Level (dBm) = Substitute SG Level (dBm) + ANT Gain (dBd) - 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 / 481.05MHz(FCC /RSS)

| No | Frequency<br>(MHz) | Pol  | Reading<br>Level<br>(dBm) | SG Out<br>Level<br>(dBm) | Antenna<br>Gain<br>(dBd) | Loss<br>(dB) | Correct<br>Level<br>(dBm) | Emission<br>Level<br>(dBc) | MASK E<br>Limit Level<br>(dBc) | Margin<br>(dB) |
|----|--------------------|------|---------------------------|--------------------------|--------------------------|--------------|---------------------------|----------------------------|--------------------------------|----------------|
| 1  | 962.10             | Hor. | -67.57                    | -32.11                   | 0.00                     | 12.51        | -44.6                     | <b>-81.6</b>               | -62.0                          | 19.6           |
|    |                    | Ver. | -64.95                    | -27.68                   | 0.00                     | 12.51        | -40.2                     | <b>-77.2</b>               | -62.0                          | 15.2           |
| 2  | 1443.15            | Hor. | -                         | -                        | 3.46                     | 13.07        | -                         | -                          | -62.0                          | -              |
|    |                    | Ver. | -                         | -                        | 3.46                     | 13.07        | -                         | -                          | -62.0                          | -              |
| 3  | 1924.20            | Hor. | -59.70                    | -43.36                   | 3.19                     | 13.62        | -53.8                     | <b>-90.8</b>               | -62.0                          | 28.8           |
|    |                    | Ver. | -57.89                    | -40.04                   | 3.19                     | 13.62        | -50.5                     | <b>-87.5</b>               | -62.0                          | 25.5           |
| 4  | 2405.25            | Hor. | -58.70                    | -41.90                   | 3.47                     | 14.06        | -52.5                     | <b>-89.5</b>               | -62.0                          | 27.5           |
|    |                    | Ver. | -59.11                    | -40.39                   | 3.47                     | 14.06        | -51.0                     | <b>-88.0</b>               | -62.0                          | 26.0           |
| 5  | 2886.30            | Hor. | -61.76                    | -43.77                   | 4.49                     | 14.49        | -53.8                     | <b>-90.8</b>               | -62.0                          | 28.8           |
|    |                    | Ver. | -61.50                    | -42.73                   | 4.49                     | 14.49        | -52.7                     | <b>-89.7</b>               | -62.0                          | 27.7           |
| 6  | 3367.35            | Hor. | -                         | -                        | 5.61                     | 14.86        | -                         | -                          | -62.0                          | -              |
|    |                    | Ver. | -                         | -                        | 5.61                     | 14.86        | -                         | -                          | -62.0                          | -              |
| 7  | 3848.40            | Hor. | -                         | -                        | 6.23                     | 15.21        | -                         | -                          | -62.0                          | -              |
|    |                    | Ver. | -                         | -                        | 6.23                     | 15.21        | -                         | -                          | -62.0                          | -              |
| 8  | 4329.45            | Hor. | -                         | -                        | 6.81                     | 15.51        | -                         | -                          | -62.0                          | -              |
|    |                    | Ver. | -                         | -                        | 6.81                     | 15.51        | -                         | -                          | -62.0                          | -              |
| 9  | 4810.50            | Hor. | -                         | -                        | 7.24                     | 15.77        | -                         | -                          | -62.0                          | -              |
|    |                    | Ver. | -                         | -                        | 7.24                     | 15.77        | -                         | -                          | -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) + ANT Gain (dBd) - 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-D 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 For EUT supporting digital modulation, the digital modulation mode was operated to its maximum extent.
- 5 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 6kHz, 11.25 kHz and 20 kHz).
  - c) RBW and VBW : 30 kHz (Non modulation(Digital Modulation)).
- 6 The occupied Bandwidth was measured with the Spectrum Analyzer controls set as shown on the test results.

#### The selection of Emission Mask

| No.                                    | Frequency<br>(MHz) | Audio Filter | Channel<br>Bandwidth<br>(kHz) | Authorized<br>Bandwidth<br>(kHz) | Selection of<br>Emission Mask<br>FCC |
|----------------------------------------|--------------------|--------------|-------------------------------|----------------------------------|--------------------------------------|
| Emission Designation : 16K0F3E         |                    |              |                               |                                  |                                      |
| 1                                      | 470.05             | With         | 25                            | 20                               | B                                    |
| 2                                      | 491.05             | With         | 25                            | 20                               | B                                    |
| 3                                      | 511.95             | With         | 25                            | 20                               | B                                    |
| Emission Designation : 11K0F3E         |                    |              |                               |                                  |                                      |
| 1                                      | 450.05             | With         | 12.5                          | 11.25                            | D                                    |
| 2                                      | 481.05             | With         | 12.5                          | 11.25                            | D                                    |
| 3                                      | 511.95             | With         | 12.5                          | 11.25                            | D                                    |
| Emission Designation : 8K30F1E/F1D/F7W |                    |              |                               |                                  |                                      |
| 1                                      | 450.05             | Without      | 12.5                          | 11.25                            | D                                    |
| 2                                      | 481.05             | Without      | 12.5                          | 11.25                            | D                                    |
| 3                                      | 511.95             | Without      | 12.5                          | 11.25                            | D                                    |
| Emission Designation : 7K60FXE/FXD     |                    |              |                               |                                  |                                      |
| 1                                      | 450.05             | Without      | 12.5                          | 11.25                            | D                                    |
| 2                                      | 481.05             | Without      | 12.5                          | 11.25                            | D                                    |
| 3                                      | 511.95             | Without      | 12.5                          | 11.25                            | D                                    |
| Emission Designation : 4K00F1E/F1D/F7W |                    |              |                               |                                  |                                      |
| 1                                      | 450.05             | Without      | 6.25                          | 6                                | E                                    |
| 2                                      | 481.05             | Without      | 6.25                          | 6                                | E                                    |
| 3                                      | 511.95             | Without      | 6.25                          | 6                                | E                                    |
| Emission Designation : 4K00F2D         |                    |              |                               |                                  |                                      |
| 1                                      | 450.05             | Without      | 6.25                          | 6                                | E                                    |
| 2                                      | 481.05             | Without      | 6.25                          | 6                                | E                                    |
| 3                                      | 511.95             | Without      | 6.25                          | 6                                | E                                    |

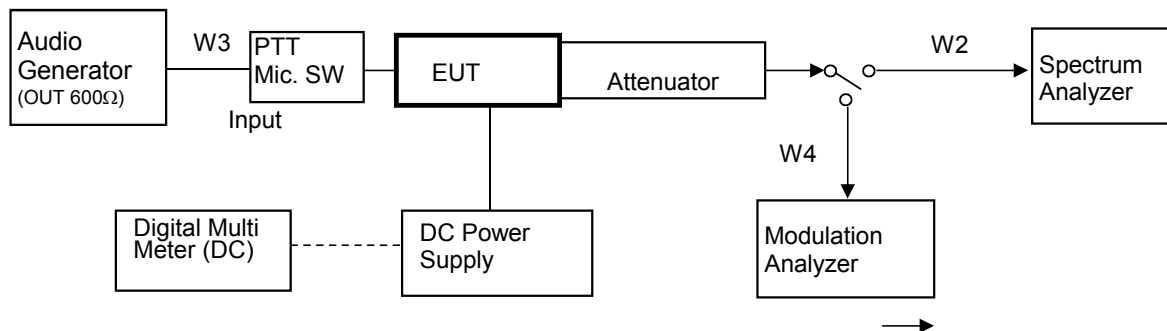
### Measuring Equipments

| No. | Equipment           | Manufacture        | Model No.   | Serial No. | Cal. Interval | Effective period |
|-----|---------------------|--------------------|-------------|------------|---------------|------------------|
| 1   | Attenuator (20dB)   | Aeroflex/Wenshel   | 66-20-34    | BY4357     | 1Y            | May. 31, 17      |
| 2   | Attenuator (30dB)   | Weinschel          | WA-29-30-34 | 8924       | 1Y            | May. 31, 17      |
| 3   | Modulation Analyzer | Hewlett Packard    | 8901B       | 3403A04852 | 1Y            | Dec. 31, 17      |
| 4   | Audio Generator     | Anritsu            | MG443B      | M70150     | 1Y            | May. 31, 17      |
| 5   | Spectrum Analyzer   | Agilent            | N9030A      | US51350220 | 1Y            | Feb. 28, 18      |
| 6   | DC Power Supply     | Daichi denpa kogyo | GZV4000     | 90290931   | None          | None             |
| 7   | Digital Multi Meter | FLUKE              | 8846A       | 9642018    | 1Y            | Sep. 30, 17      |

### Measuring Cables

| No. | Cable         | Manufacture    | Model No.    | Serial No. | Cal. Interval | Effective period |
|-----|---------------|----------------|--------------|------------|---------------|------------------|
| W3  | Balance Cable | Huber+Suher    | RG59BU/11BNC | KSR00218   | 1Y            | May. 31, 17      |
| W4  | Coaxial Cable | Pacific custom | RG-58 C/U    | AM90C04    | 1Y            | Feb. 28, 18      |
| W2  | Coaxial Cable | Suhner         | SUCOFLEX104  | KSR00217   | 1Y            | May. 31, 17      |

### Measuring Equipment Configuration



FM Modulation test is with the the Audio Generator.

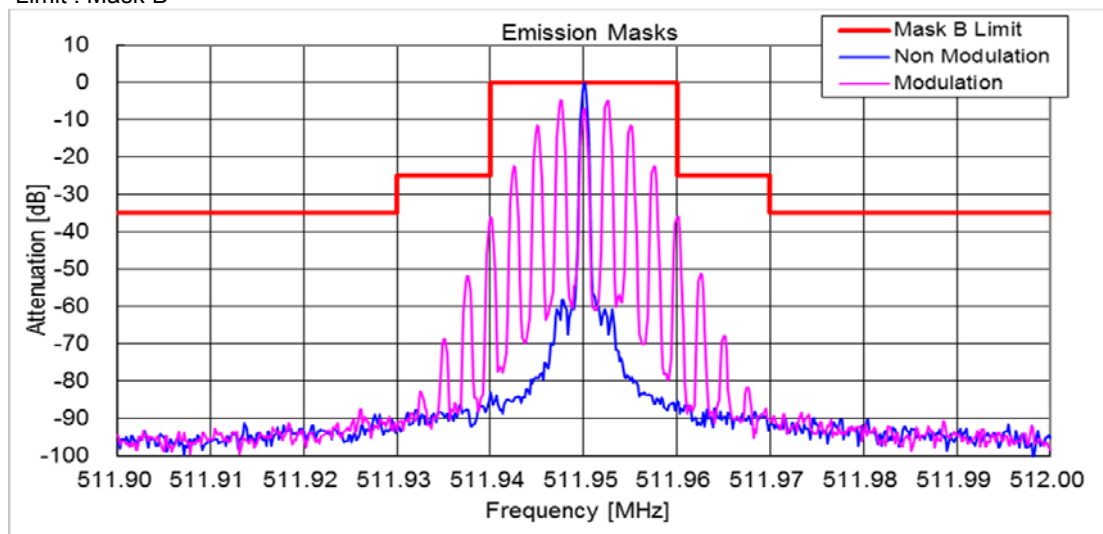
Configuration of other Modulation test is composed without the Audio Generator.

## Test Results

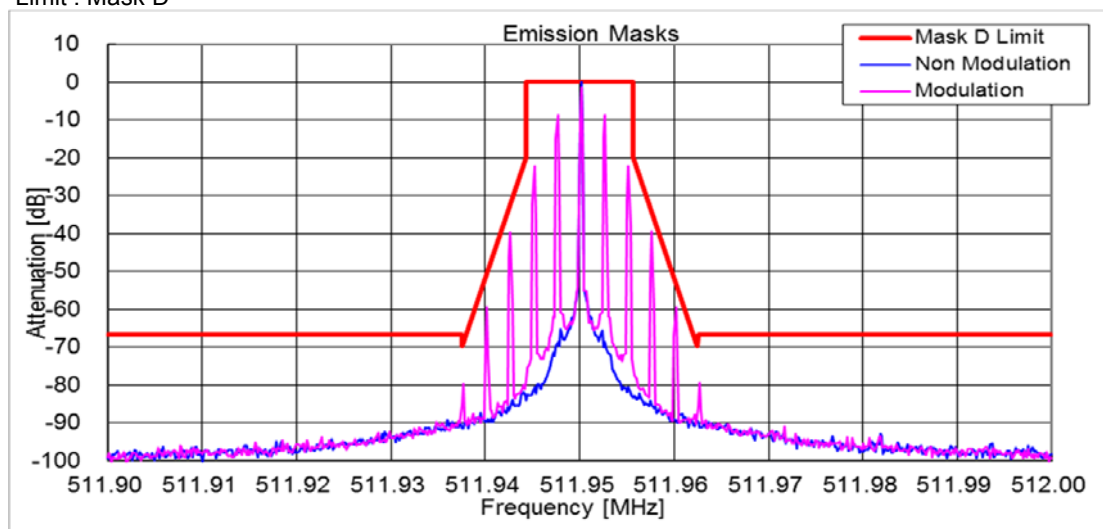
|                      |                        |
|----------------------|------------------------|
| Test date            | Feb. 27, 2017          |
| Location             | Kashima No.1 Test Site |
| temperature          | 21 [degree C]          |
| Humidity Variation   | 50 [%]                 |
| Atmospheric Pressure | 102.2 [kPa]            |
| Test Engineer        | Koichi Wagatsuma       |

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

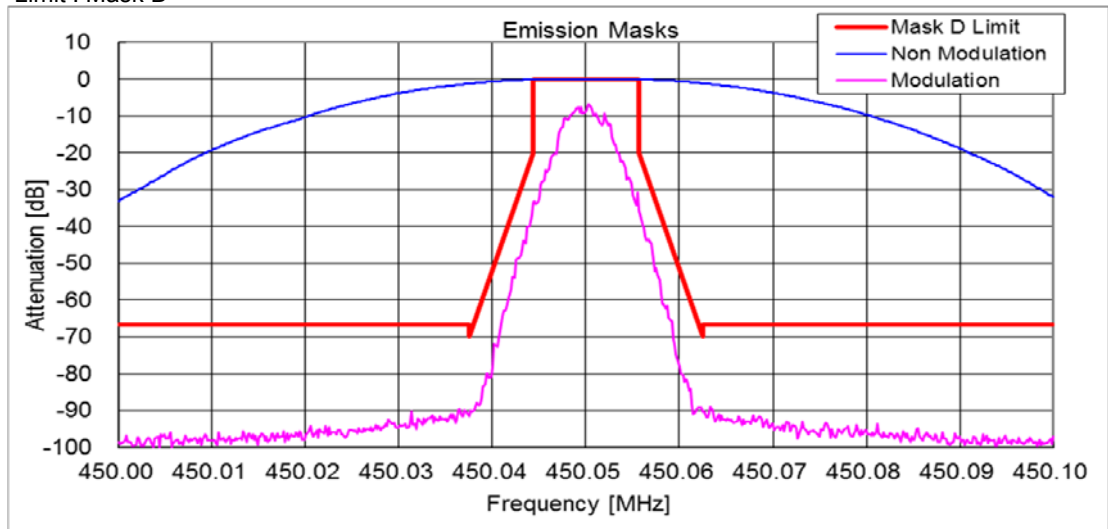
State : High Power / Authorized Bandwidth 20 kHz/ 16K0F3E / 511.95 MHz  
Limit : Mask B



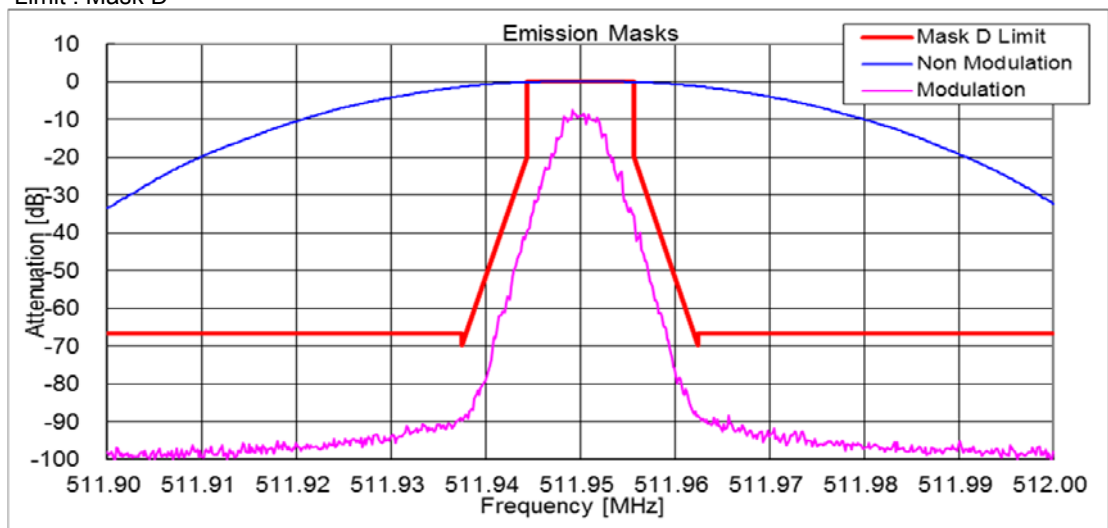
State : High Power / Authorized Bandwidth 11.25 kHz/ 11K0F3E / 511.95 MHz  
Limit : Mask D



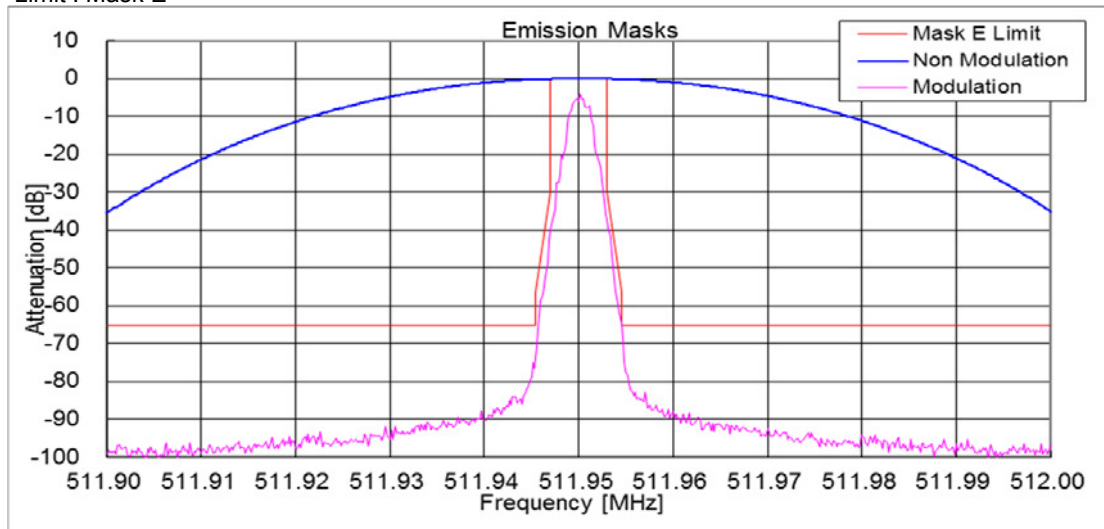
State : High Power / Authorized Bandwidth 11.25 kHz/ 8K30F1E/F1D/F7W / 450.05 MHz  
Limit : Mask D



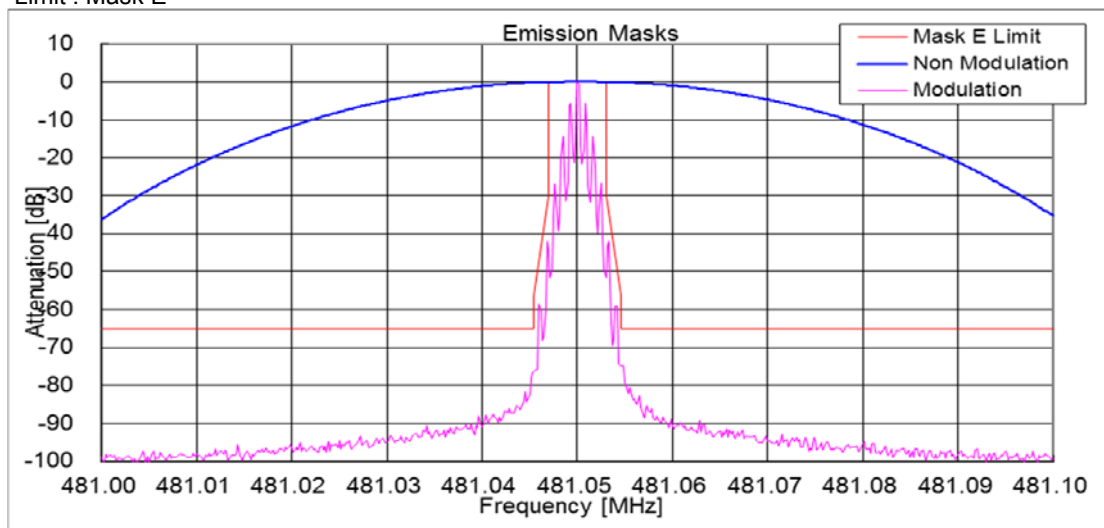
State : High Power / Authorized Bandwidth 11.25 kHz/ 7K60FXD/FXE / 511.95 MHz  
Limit : Mask D



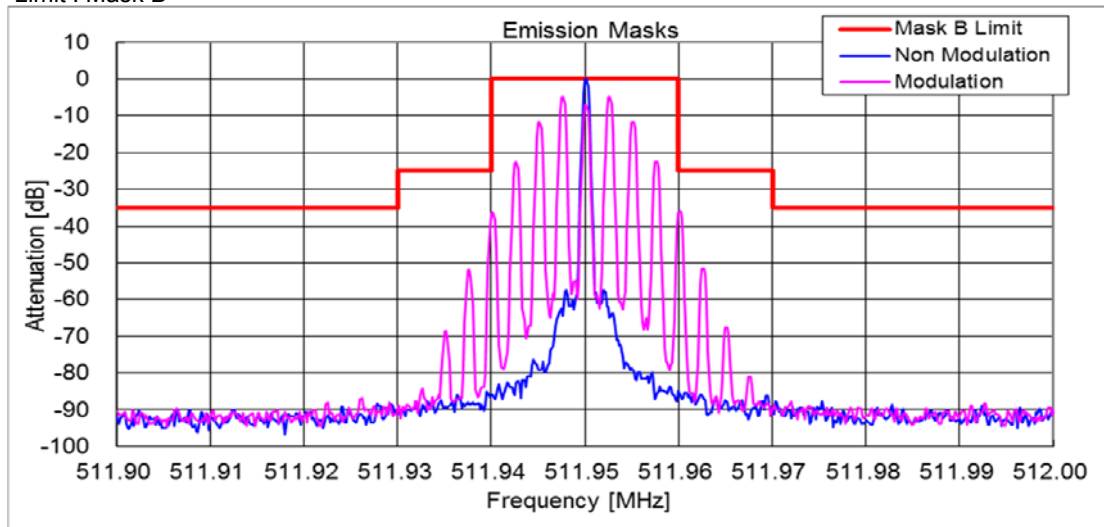
State : High Power / Authorized Bandwidth 6 kHz/ 4K00F1E / F1D / F7W / 511.95 MHz  
Limit : Mask E



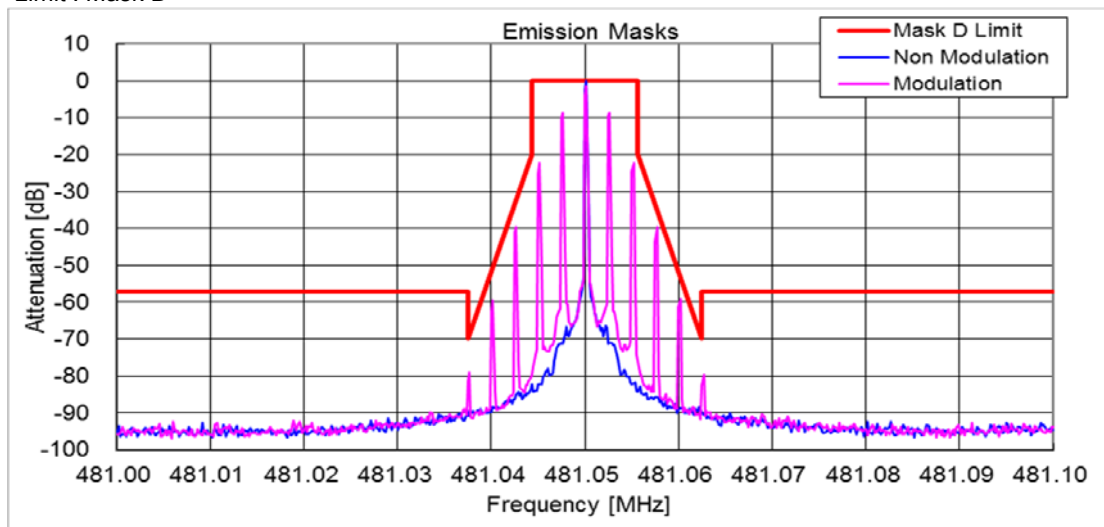
State : High Power / Authorized Bandwidth 6 kHz/ 4K00F2D / 481.05 MHz  
Limit : Mask E



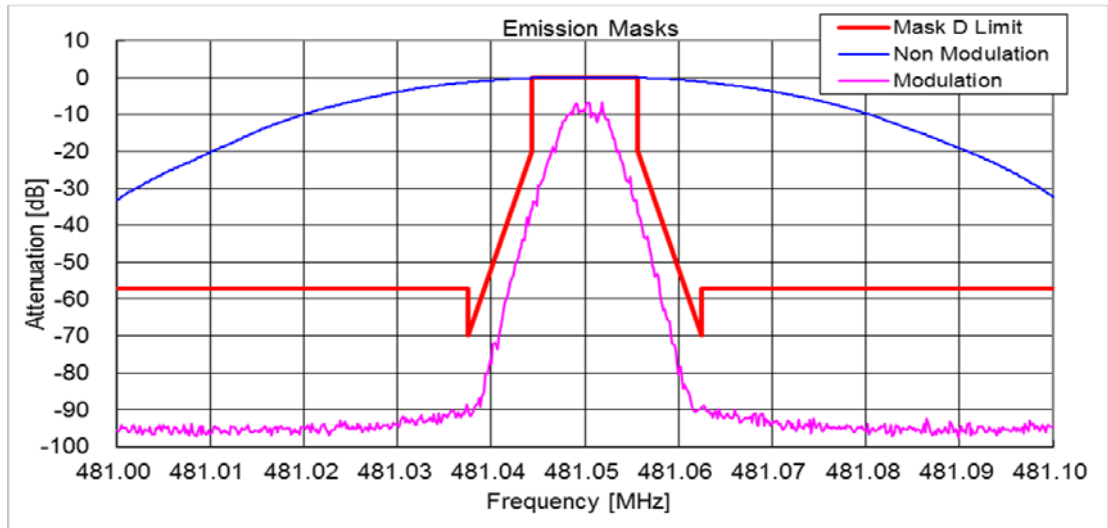
State : Low Power / Authorized Bandwidth 20 kHz/ 16K0F3E / 511.95 MHz  
Limit : Mask B



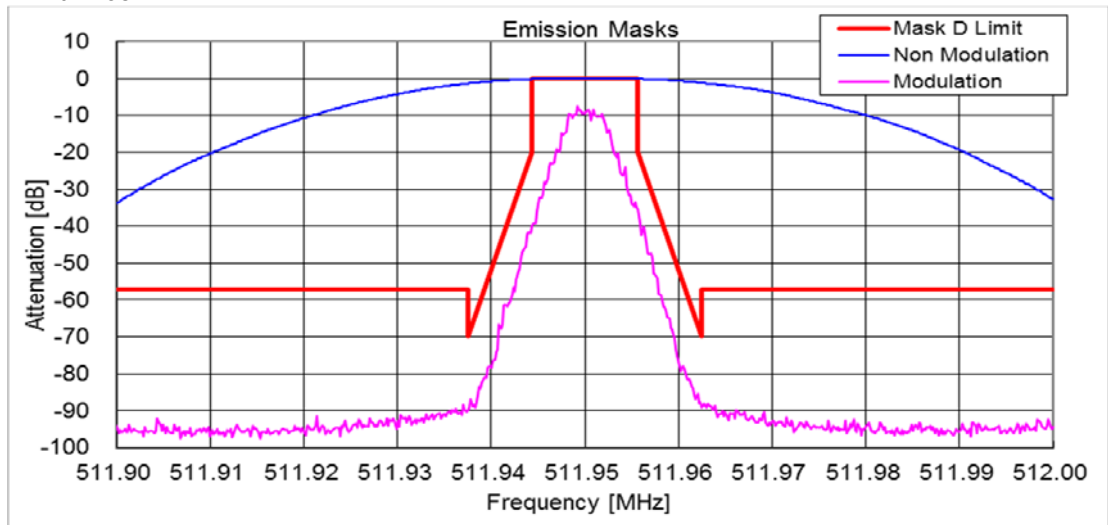
State : Low Power / Authorized Bandwidth 11.25 kHz/ 11K0F3E / 481.05 MHz  
Limit : Mask D



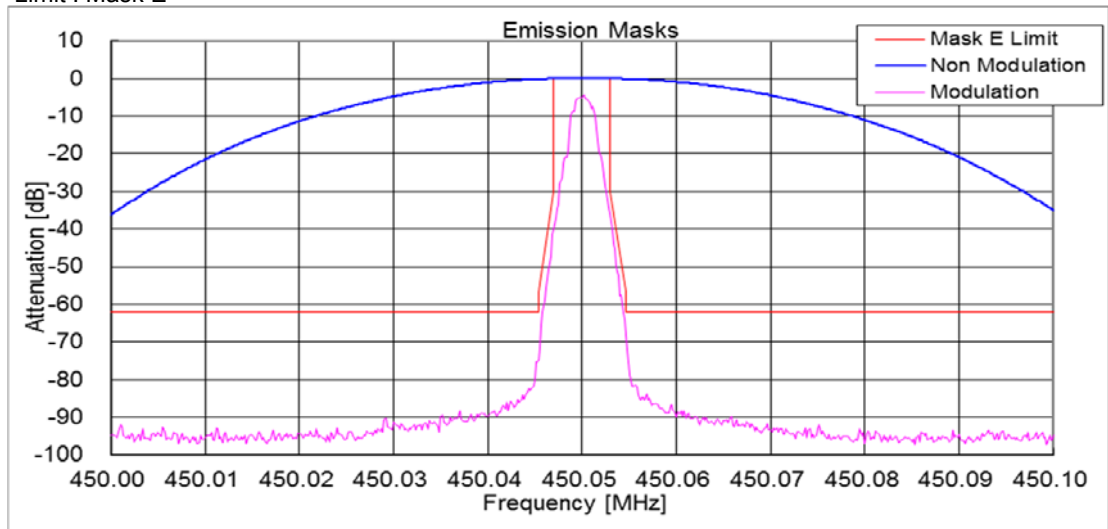
State : Low Power / Authorized Bandwidth 11.25 kHz/ 8K30F1E/F1D/F7W / 481.05 MHz  
Limit : Mask D



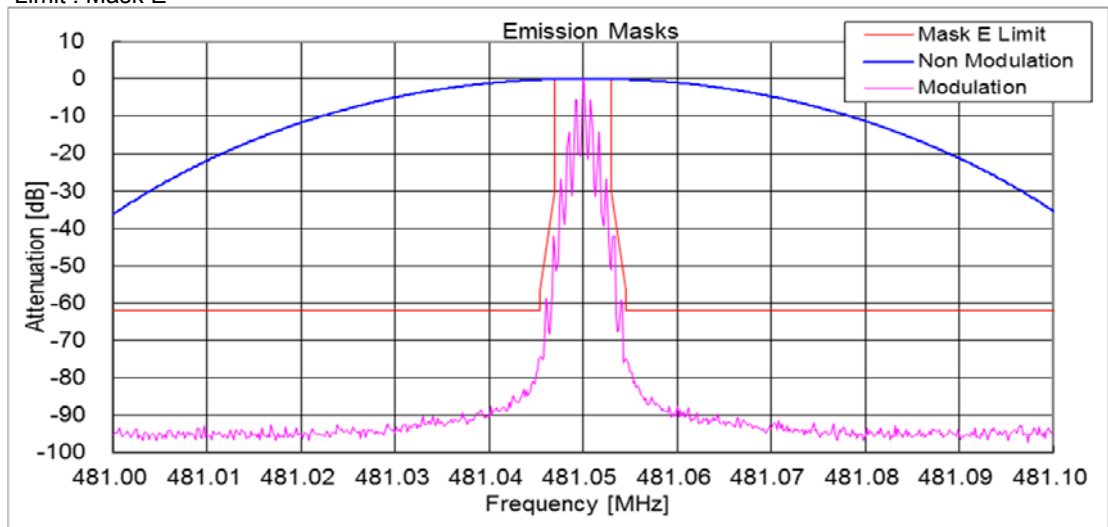
State : Low Power / Authorized Bandwidth 11.25 kHz/ 7K60FXD/FXE / 511.95 MHz  
Limit : Mask D



State : Low Power / Authorized Bandwidth 6 kHz/ 4K00F1E / F1D / F7W / 450.05 MHz  
Limit : Mask E



State : Low Power / Authorized Bandwidth 6 kHz/ 4K00F1E / 481.05 MHz  
Limit : Mask E



## 10.5 Transient Frequency Behavior

|                   |                                    |
|-------------------|------------------------------------|
| REGULATIONS       | : FCC Part 90 Section 214          |
| TEST METHOD/GUIDE | : ANSI/TIA-603-D, Section 2.2.19.3 |

### Test Procedure

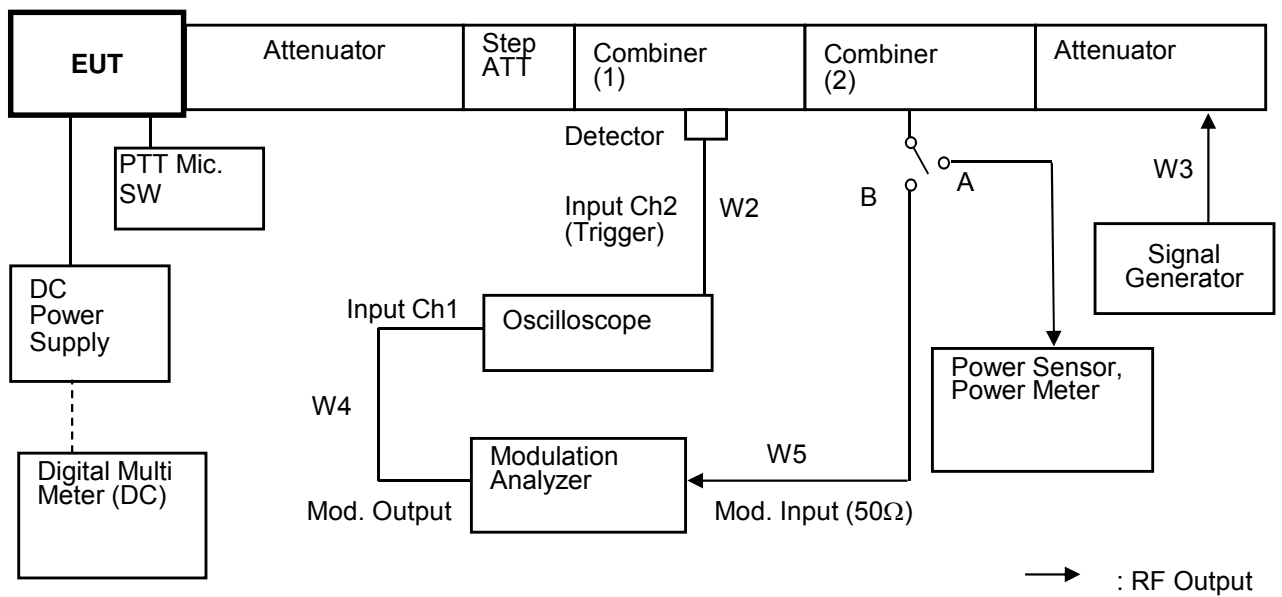
- 1 The EUT and test equipment were set up as shown on the following page.
- 2 The transmitter was turned on.
- 3 The transmitter carrier level was measured at the output of the combiner .
- 4 The transmitter was turned off.
- 5 An RF signal generator (1) modulated with a 1 kHz tone at either 25 kHz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

| No. | Equipment           | Manufacture         | Model No.   | Serial No. | Cal. Interval | Effective period |
|-----|---------------------|---------------------|-------------|------------|---------------|------------------|
| 1   | Power Meter         | Hewlett Packard     | E4418B      | GB38410265 | 1Y            | May. 31, 17      |
| 2   | Power Sensor        | Hewlett Packard     | 8482A       | US37292237 | 1Y            | May. 31, 17      |
| 3   | Attenuator (20dB)   | Aeroflex/Wenshel    | 66-20-34    | BY4357     | 1Y            | May. 31, 17      |
| 4   | Attenuator (3dB)    | TME                 | CFA-20NPJ-3 | 679701     | 1Y            | May. 31, 17      |
| 5   | Attenuator (30dB)   | Weinschel           | WA-29-30-34 | 8924       | 1Y            | May. 31, 17      |
| 6   | Step Attenuator     | Hewlett Packard     | 8494B       | 272614515  | 1Y            | Jan. 31, 18      |
| 7   | Combiner(1)         | Anritsu             | Z-164A      | M89249     | 1Y            | Jan. 31, 18      |
| 8   | Combiner(2)         | Anritsu             | Z-164A      | M89549     | 1Y            | Jan. 31, 18      |
| 9   | Modulation Analyzer | Hewlett Packard     | 8901B       | 3403A04852 | 1Y            | Dec. 31, 17      |
| 10  | Signal Generator    | Rohde&Schwarz       | SMB 100A    | 105709     | 1Y            | Apr. 30, 17      |
| 11  | Oscilloscope        | Tektronix           | TDS 680B    | B010292    | 1Y            | Feb. 28, 18      |
| 12  | DC Power Supply     | Daiichi denpa kogyo | GZV4000     | 90290931   | None          | None             |
| 13  | Digital Multi Meter | FLUKE               | 8846A       | 9642018    | 1Y            | Sep. 30, 17      |

## Measuring Cables

| No. | Cable         | Manufacture    | Model No. | Serial No. | Cal. Interval | Effective period |
|-----|---------------|----------------|-----------|------------|---------------|------------------|
| W2  | Coaxial Cable | Pacific custom | RG-58 C/U | KSR00097   | 1Y            | Jan. 31, 18      |
| W4  | Coaxial Cable | Daiyu Densen   | 3D-2V     | KSR00101   | 1Y            | Feb. 28, 18      |
| W5  | Coaxial Cable | Pacific custom | RG-58 C/U | AM90C04    | 1Y            | Feb. 28, 18      |
| W3  | Coaxial Cable | Pacific custom | RG-58 C/U | KSR00041   | 1Y            | Feb. 28, 18      |

## Measuring Equipment Configuration



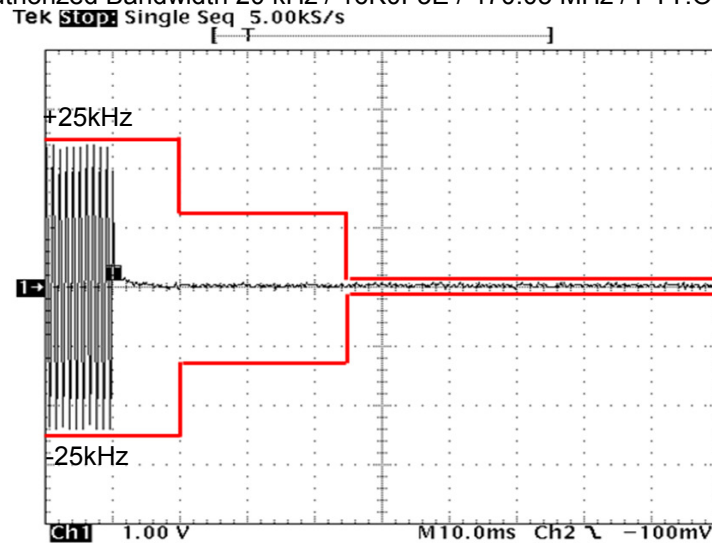
## Test Results

|                      |                        |            |
|----------------------|------------------------|------------|
| Test date            | Feb 27, 2017           |            |
| Location             | Kashima No.1 Test Site |            |
| temperature          | 20                     | [degree C] |
| Humidity Variation   | 51                     | [%]        |
| Atmospheric Pressure | 102                    | [kPa]      |
| Test Engineer        | Koichi Wagatsuma       |            |

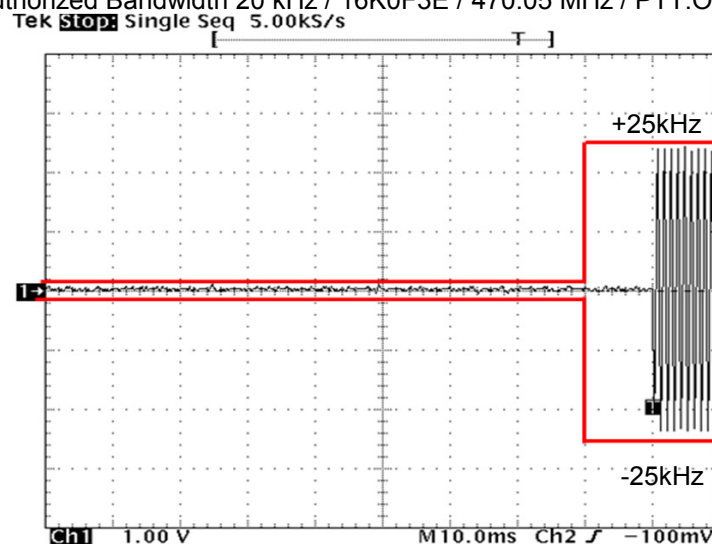
Test was carried out for all the frequency band of section 10.1

State the worst case (below).

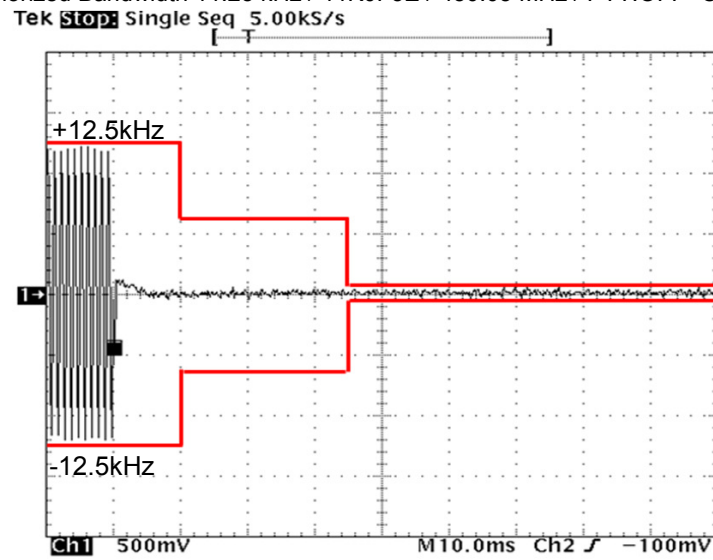
State : High Power / Authorized Bandwidth 20 kHz / 16K0F3E / 470.05 MHz / PTT:OFF -ON



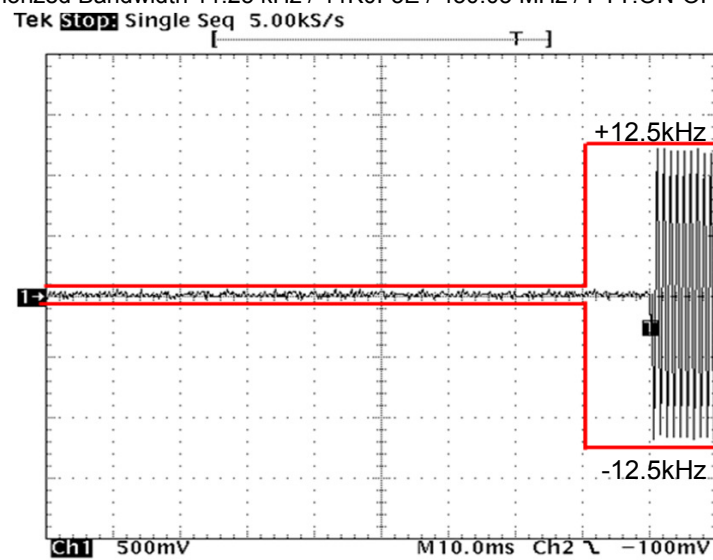
State : High Power / Authorized Bandwidth 20 kHz / 16K0F3E / 470.05 MHz / PTT:ON -OFF



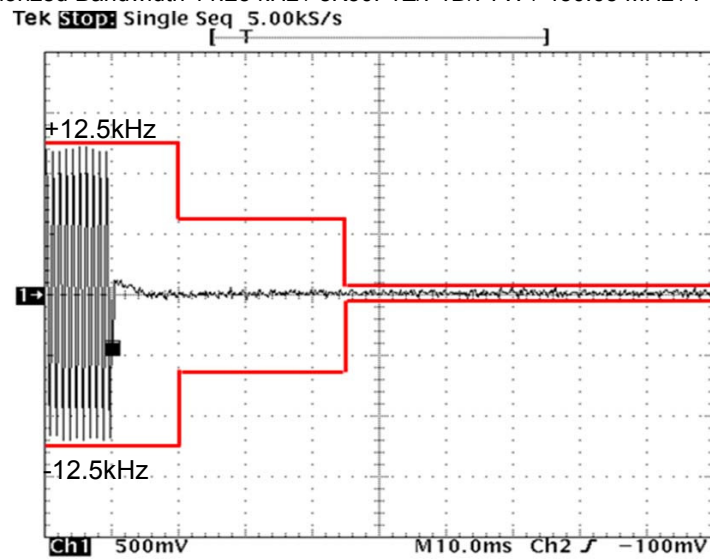
State : High Power / Authorized Bandwidth 11.25 kHz / 11K0F3E / 450.05 MHz / PTT:OFF -ON



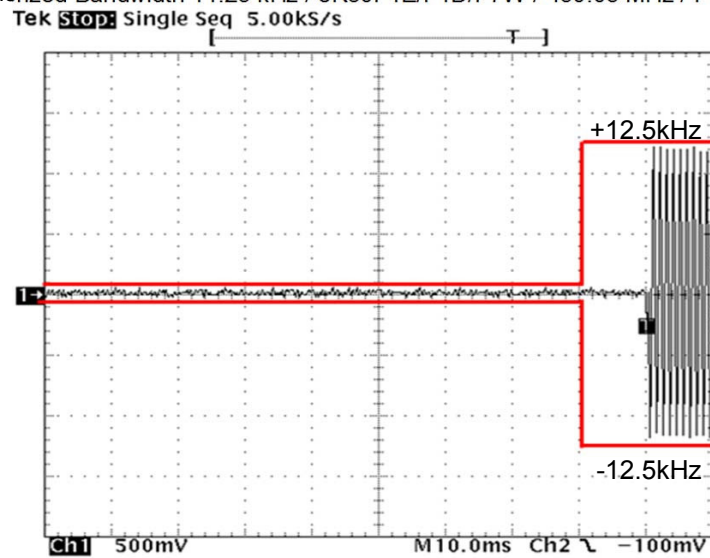
State : High Power / Authorized Bandwidth 11.25 kHz / 11K0F3E / 450.05 MHz / PTT:ON-OFF



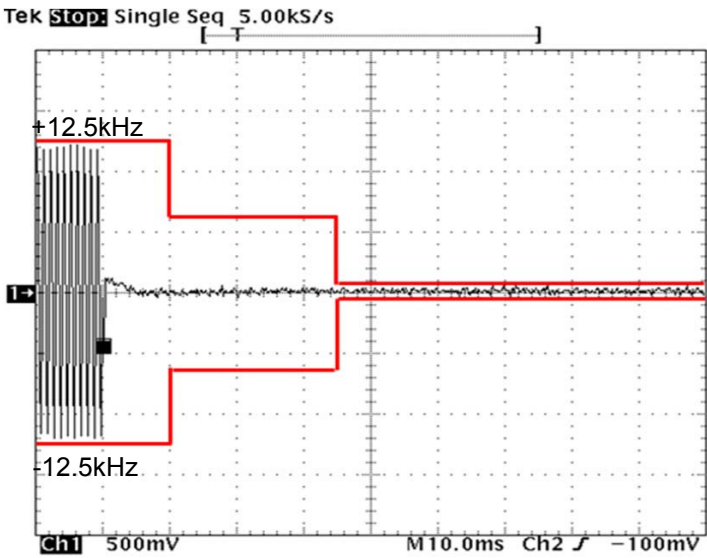
State : High Power / Authorized Bandwidth 11.25 kHz / 8K30F1E/F1D/F7W / 450.05 MHz / PTT:OFF -ON



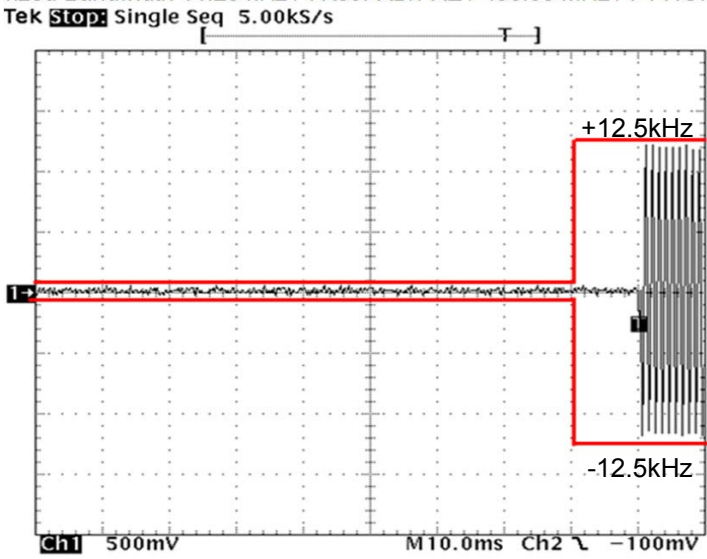
State : High Power / Authorized Bandwidth 11.25 kHz / 8K30F1E/F1D/F7W / 450.05 MHz / PTT:ON-OFF



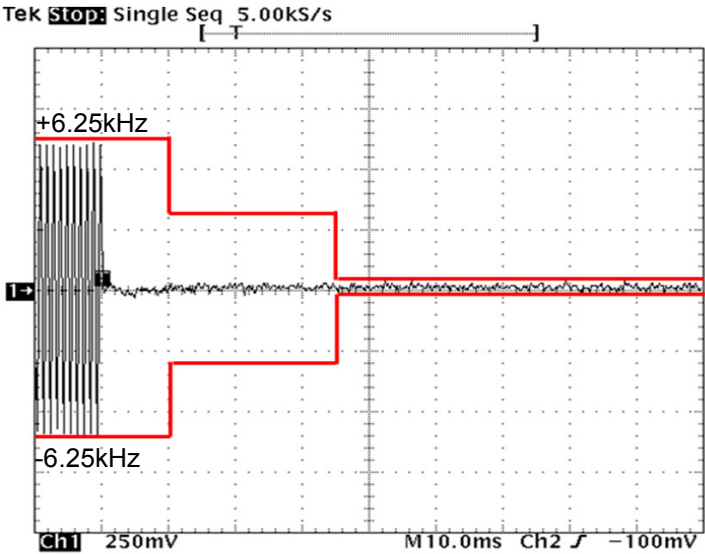
State : High Power / Authorized Bandwidth 11.25 kHz / 7K60FXD/FXE / 450.05 MHz / PTT:OFF -ON



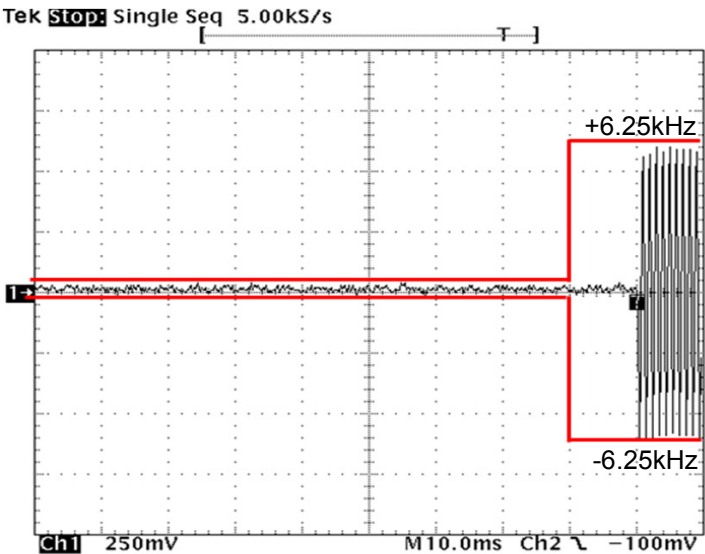
State : High Power / Authorized Bandwidth 11.25 kHz / 7K60FXD/FXE / 450.05 MHz / PTT:ON-OFF



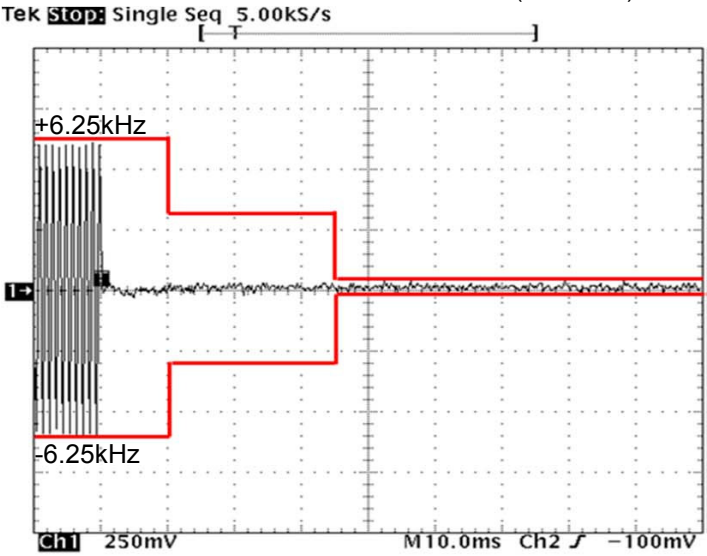
State : High Power / Authorized Bandwidth 6 kHz / 4K00F1E / F1D / F7W / 511.95 MHz / PTT:OFF -ON



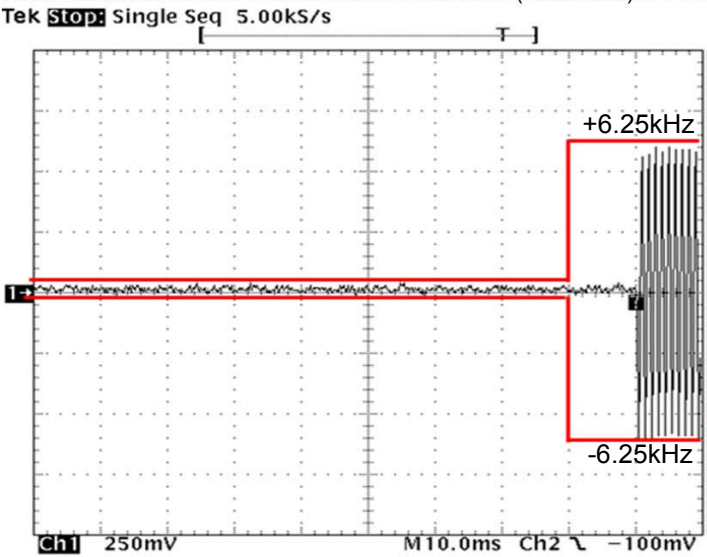
State : High Power / Authorized Bandwidth 6 kHz / 4K00F1E / F1D / F7W / 511.95 MHz / PTT:ON-OFF



State : High Power / Authorized Bandwidth 6 kHz / 4K00F2D / 511.95 MHz (FCC/RSS)/ PTT:OFF -ON



State : High Power / Authorized Bandwidth 6 kHz / 4K00F2D / 511.95 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 100 Hz to 5 kHz.
- 5 The response in dB relative to 1 kHz was then measured, using the Modulation Analyzer.

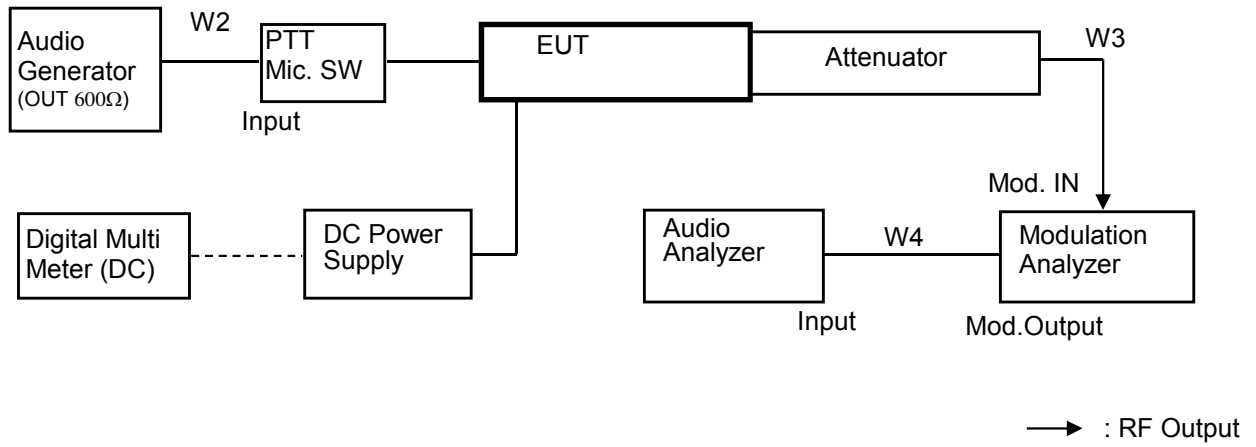
### Measuring Equipments

| No. | Equipment           | Manufacture         | Model No.   | Serial No. | Cal. Interval | Effective period |
|-----|---------------------|---------------------|-------------|------------|---------------|------------------|
| 1   | Attenuator (20dB)   | Aeroflex/Wenshel    | 66-20-34    | BY4357     | 1Y            | May. 31, 17      |
| 2   | Attenuator (30dB)   | Weinschel           | WA-29-30-34 | 8924       | 1Y            | May. 31, 17      |
| 3   | Modulation Analyzer | Hewlett Packard     | 8901B       | 3403A04852 | 1Y            | Dec. 31, 17      |
| 4   | Audio Generator     | Anritsu             | MG443B      | M70150     | 1Y            | May. 31, 17      |
| 5   | Audio Analyzer      | Hewlett Packard     | 8903B       | 2948A07326 | 1Y            | Sep. 30, 17      |
| 6   | DC Power Supply     | Daiichi denpa kogyo | GZV4000     | 90290931   | None          | None             |
| 7   | Digital Multi Meter | FLUKE               | 8846A       | 9642018    | 1Y            | Sep. 30, 17      |

### Measuring Cables

| No. | Cable         | Manufacture    | Model No.    | Serial No. | Cal. Interval | Effective period |
|-----|---------------|----------------|--------------|------------|---------------|------------------|
| W2  | Balance Cable | Huber+Suher    | RG59BU/11BNC | KSR00218   | 1Y            | May. 31, 17      |
| W4  | Coaxial Cable | Daiyu Densen   | 3D-2V        | KSR00101   | 1Y            | Feb. 28, 18      |
| W3  | Coaxial Cable | Pacific custom | RG-58 C/U    | AM90C04    | 1Y            | Feb. 28, 18      |

## Measuring Equipment Configuration



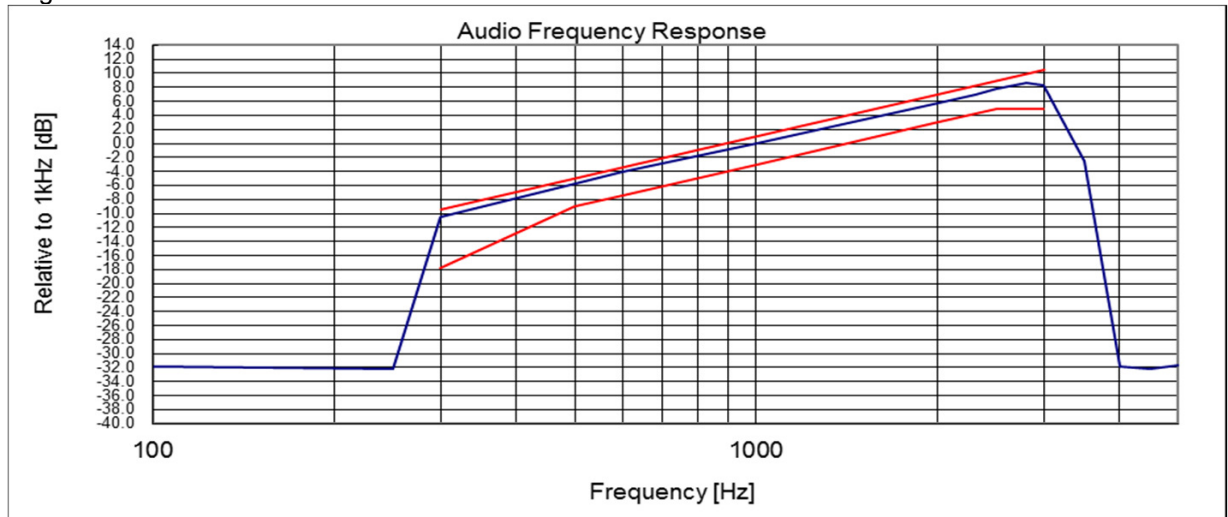
## Test Results

|                      |                        |            |
|----------------------|------------------------|------------|
| Test date            | Feb 22, 2017           |            |
| Location             | Kashima No.1 Test Site |            |
| temperature          | 20                     | [degree C] |
| Humidity Variation   | 51                     | [%]        |
| Atmospheric Pressure | 102                    | [kPa]      |
| 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 20 kHz / 16K0F3E / 491.05 MHz



### Note:

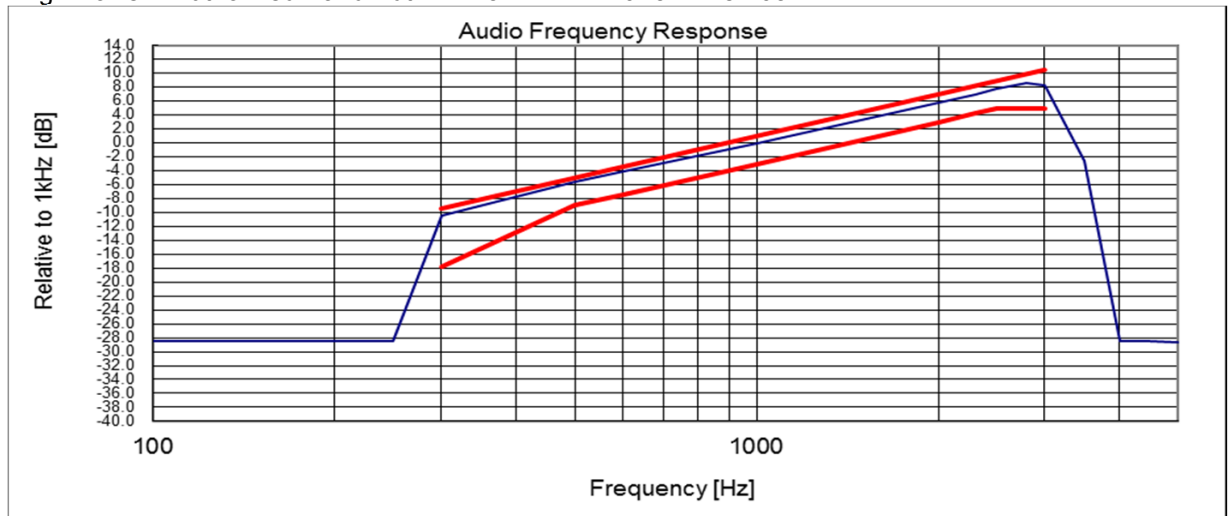
Audio Filter of the above result is substituted with the same structure as Audio Frequency Response.

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.

State : High Power / Authorized Bandwidth 11.25 kHz / 11K0F3E / 481.05 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-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.

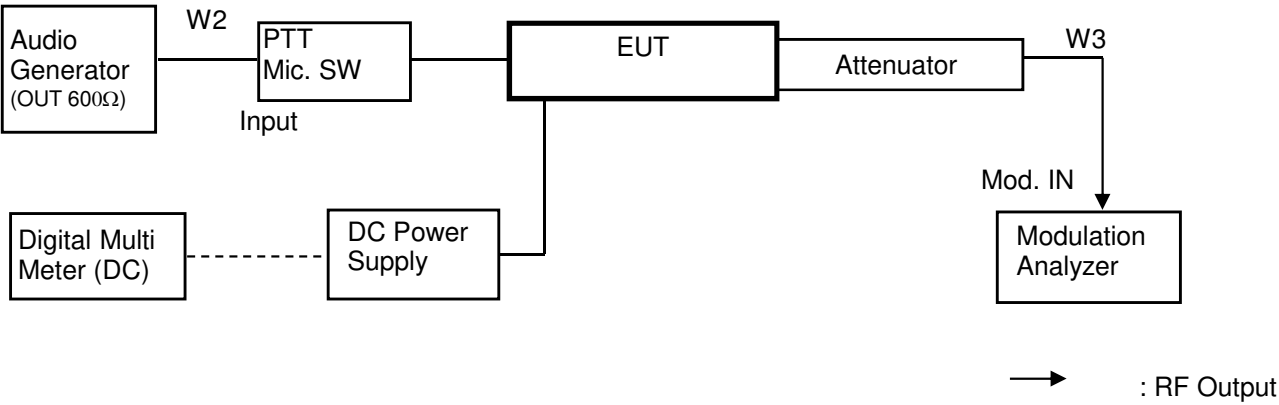
### Measuring Equipments

| No. | Equipment           | Manufacture        | Model No.   | Serial No. | Cal. Interval | Effective period |
|-----|---------------------|--------------------|-------------|------------|---------------|------------------|
| 1   | Attenuator (20dB)   | Aeroflex/Wenshel   | 66-20-34    | BY4357     | 1Y            | May. 31, 17      |
| 2   | Attenuator (30dB)   | Weinschel          | WA-29-30-34 | 8924       | 1Y            | May. 31, 17      |
| 3   | Modulation Analyzer | Hewlett Packard    | 8901B       | 3403A04852 | 1Y            | Dec. 31, 17      |
| 4   | Audio Generator     | Anritsu            | MG443B      | M70150     | 1Y            | May. 31, 17      |
| 5   | DC Power Supply     | Daichi denpa kogyo | GZV4000     | 90290931   | None          | None             |
| 4   | Digital Multi Meter | FLUKE              | 8846A       | 9642018    | 1Y            | Sep. 30, 17      |

### Measuring Cables

| No. | Cable         | Manufacture    | Model No.    | Serial No. | Cal. Interval | Effective period |
|-----|---------------|----------------|--------------|------------|---------------|------------------|
| W2  | Balance Cable | Huber+Suher    | RG59BU/11BNC | KSR00218   | 1Y            | May. 31, 17      |
| W3  | Coaxial Cable | Pacific custom | RG-58 C/U    | AM90C04    | 1Y            | Feb. 28, 18      |

Measuring Equipment Configuration

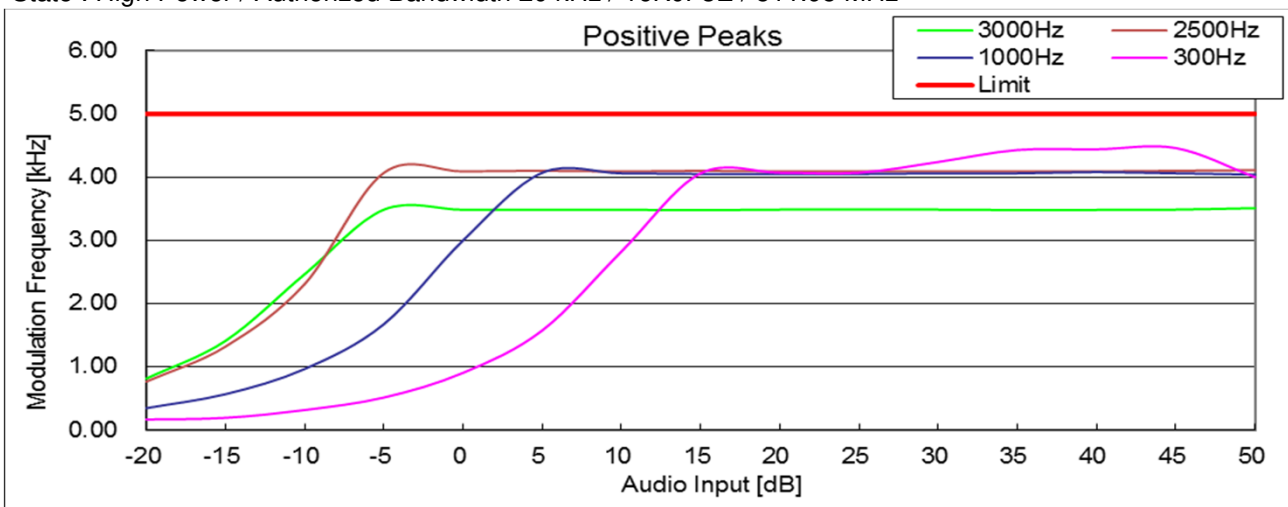


## Test Results

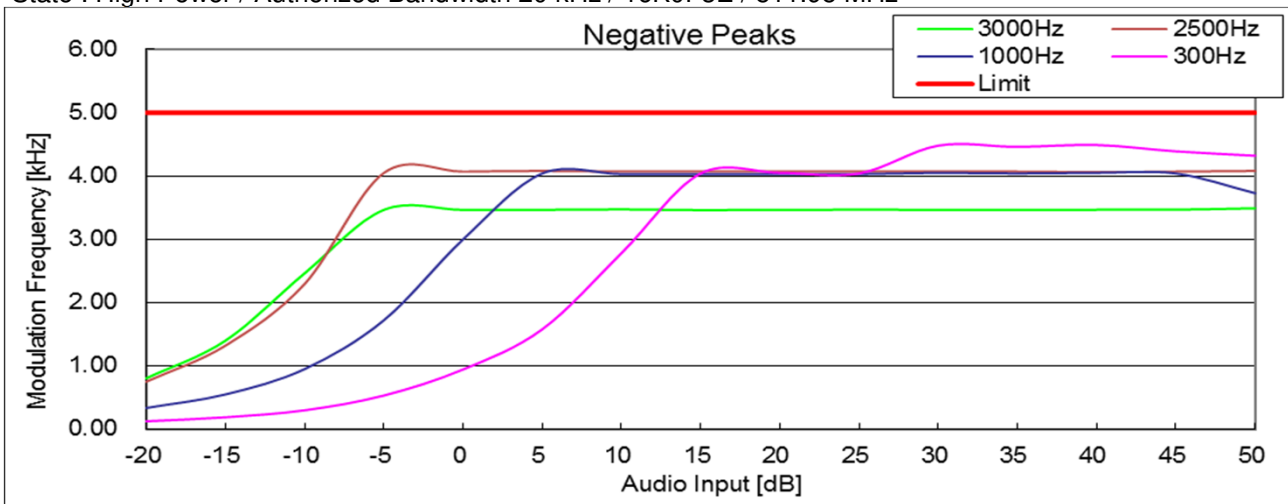
|                      |                        |            |  |
|----------------------|------------------------|------------|--|
| Test date            | Feb. 22, 2017          |            |  |
| Location             | Kashima No.1 Test Site |            |  |
| temperature          | 20                     | [degree C] |  |
| Humidity Variation   | 50                     | [%]        |  |
| Atmospheric Pressure | 102                    | [kPa]      |  |
| Test Engineer        | Koichi Wagatsuma       |            |  |

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

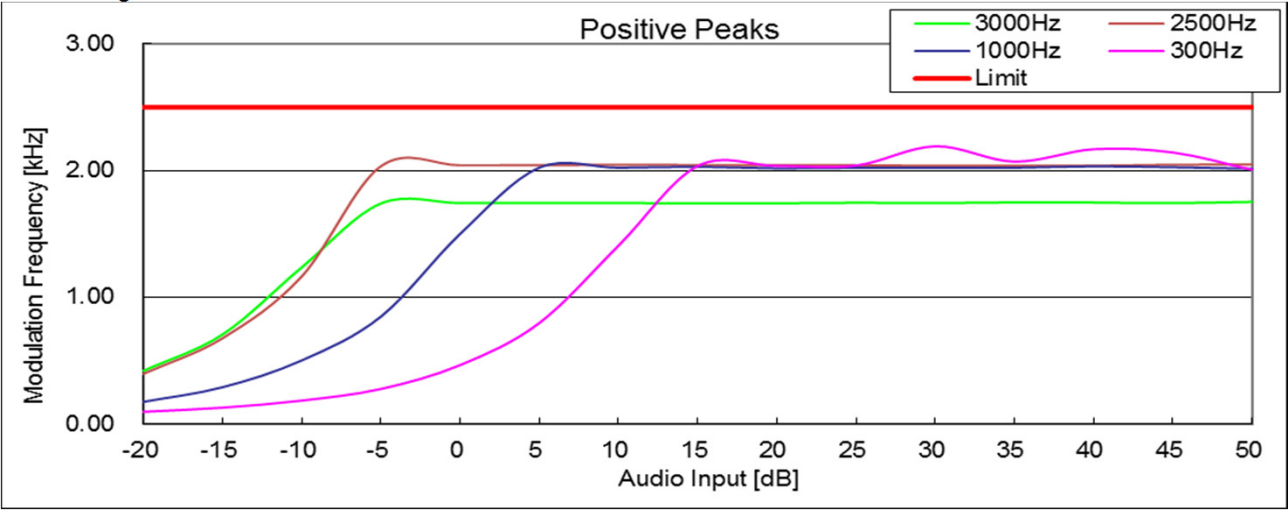
State : High Power / Authorized Bandwidth 20 kHz / 16K0F3E / 511.95 MHz



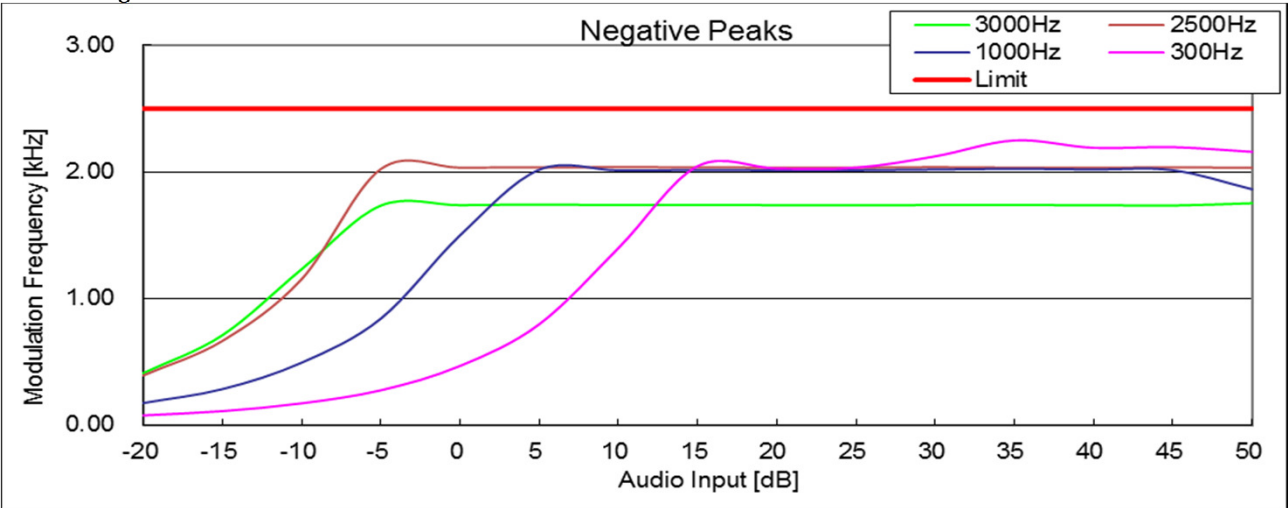
State : High Power / Authorized Bandwidth 20 kHz / 16K0F3E / 511.95 MHz



State : High Power / Authorized Bandwidth 11.25 kHz / 11K0F3E / 481.05 MHz



State : High Power / Authorized Bandwidth 11.25 kHz / 11K0F3E / 481.05 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-D 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.  
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 4 to 6.

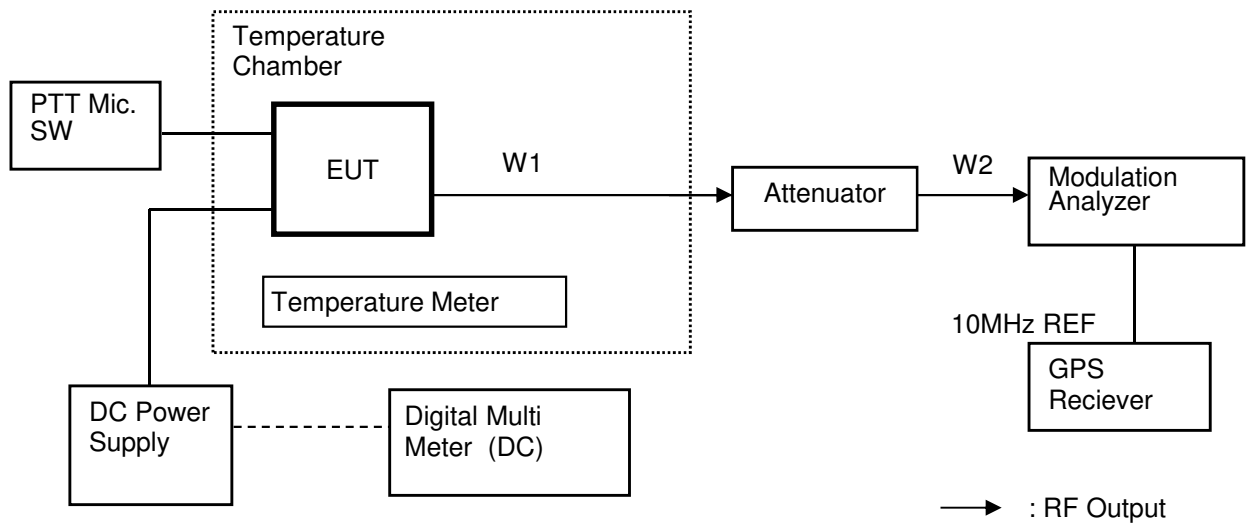
### Measuring Equipments

| No. | Equipment           | Manufacture      | Model No.     | Serial No. | Cal. Interval | Effective period |
|-----|---------------------|------------------|---------------|------------|---------------|------------------|
| 1   | Attenuator (20dB)   | Aeroflex/Wenshel | 66-20-34      | BY4357     | 1Y            | May. 31, 17      |
| 2   | Attenuator (30dB)   | Weinschel        | WA-29-30-34   | 8924       | 1Y            | May. 31, 17      |
| 3   | Modulation Analyzer | Hewlett Packard  | 8901B         | 3403A04852 | 1Y            | Dec. 31, 17      |
| 4   | DC Power Supply     | Takasago         | GP035-20R     | 1014199060 | None          | None             |
| 5   | Digital Multi Meter | FLUKE            | 8846A         | 9642018    | 1Y            | Sep. 30, 17      |
| 6   | Temperature Chamber | Tabai            | PL-3F         | 5103661    | None          | None             |
| 7   | Temperature Meter   | Sato             | PC-5000TRH-II | A11999972  | 1Y            | Feb. 28, 18      |
| 8   | GPS Receiver        | Hewlett Packard  | HP Z3801A     | 3542A02414 | None          | None             |

### Measuring Cables

| No. | Cable         | Manufacture    | Model No.   | Serial No. | Cal. Interval | Effective period |
|-----|---------------|----------------|-------------|------------|---------------|------------------|
| W2  | Coaxial Cable | Pacific custom | RG-58 C/U   | KSR00041   | 1Y            | Feb. 28, 18      |
| W1  | Coaxial Cable | Suhner         | SUCOFLEX104 | KSR00042   | 1Y            | May. 31, 17      |

## Measuring Equipment Configuration



## Test Results

|               |                        |
|---------------|------------------------|
| Test date     | Mar. 23, 2017          |
| Location      | Kashima No.1 Test Site |
| Test Engineer | Koichi Wagatsuma       |

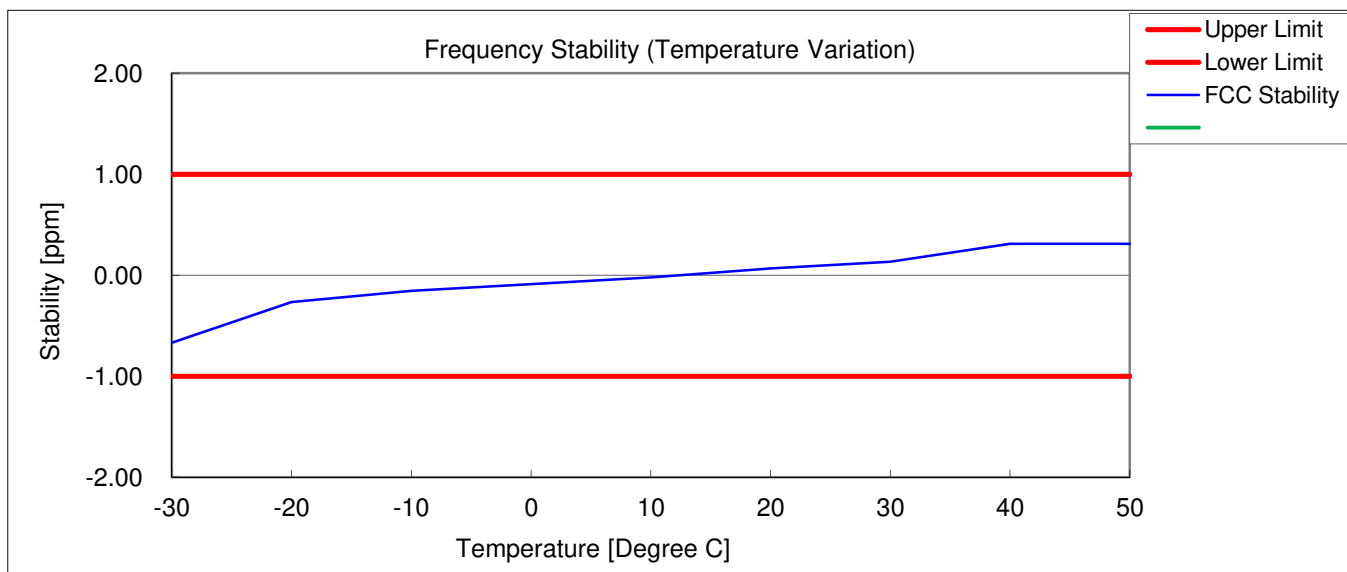
Test was carried out for all the frequency band of section 10.1

State the worst case (below).

State : High Power / Authorized Bandwidth 11.25 kHz / 450.05 MHz (FCC / RSS)

Reference Frequency: 450.050000 MHz(FCC Stability)

| No. | Temperature<br>(Degree C) | Frequency<br>(MHz) | FCC Stability<br>(ppm) | Limit<br>(+/- ppm) | Min. Margin<br>(ppm) |
|-----|---------------------------|--------------------|------------------------|--------------------|----------------------|
| 1   | -30                       | 450.049700         | -0.67                  | 1.0                | 0.33                 |
| 2   | -20                       | 450.049880         | -0.27                  | 1.0                | 0.73                 |
| 3   | -10                       | 450.049930         | -0.16                  | 1.0                | 0.84                 |
| 4   | 0                         | 450.049960         | -0.09                  | 1.0                | 0.91                 |
| 5   | 10                        | 450.049990         | -0.02                  | 1.0                | 0.98                 |
| 6   | 20                        | 450.050030         | 0.07                   | 1.0                | 0.93                 |
| 7   | 30                        | 450.050060         | 0.13                   | 1.0                | 0.87                 |
| 8   | 40                        | 450.050140         | 0.31                   | 1.0                | 0.69                 |
| 9   | 50                        | 450.050140         | 0.31                   | 1.0                | 0.69                 |



## 10.9 Frequency Stability (Voltage Variation)

REGULATIONS : FCC Part 2 Section 1055 (a) (1), Part 90 Section 213(a)

TEST METHOD/GUIDE : ANSI/TIA-603-D 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.

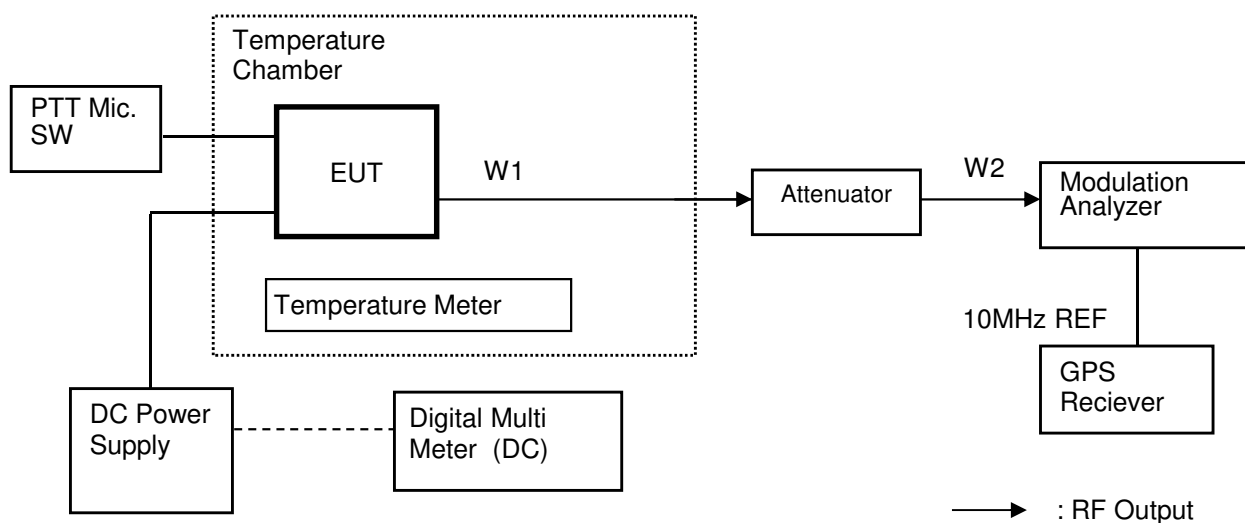
### Measuring Equipments

| No. | Equipment           | Manufacture      | Model No.     | Serial No. | Cal. Interval | Effective period |
|-----|---------------------|------------------|---------------|------------|---------------|------------------|
| 1   | Attenuator (20dB)   | Aeroflex/Wenshel | 66-20-34      | BY4357     | 1Y            | May. 31, 17      |
| 2   | Attenuator (30dB)   | Weinschel        | WA-29-30-34   | 8924       | 1Y            | May. 31, 17      |
| 3   | Modulation Analyzer | Hewlett Packard  | 8901B         | 3403A04852 | 1Y            | Dec. 31, 17      |
| 4   | DC Power Supply     | Takasago         | GP035-20R     | 1014199060 | None          | None             |
| 5   | Digital Multi Meter | FLUKE            | 8846A         | 9642018    | 1Y            | Sep. 30, 17      |
| 6   | Temperature Chamber | Tabai            | PL-3F         | 5103661    | None          | None             |
| 7   | Temperature Meter   | Sato             | PC-5000TRH-II | A11999972  | 1Y            | Feb. 28, 18      |
| 8   | GPS Receiver        | Hewlett Packard  | HP Z3801A     | 3542A02414 | None          | None             |

### Measuring Cables

| No. | Cable         | Manufacture    | Model No.   | Serial No. | Cal. Interval | Effective period |
|-----|---------------|----------------|-------------|------------|---------------|------------------|
| W2  | Coaxial Cable | Pacific custom | RG-58 C/U   | KSR00041   | 1Y            | Feb. 28, 18      |
| W1  | Coaxial Cable | Suhner         | SUCOFLEX104 | KSR00042   | 1Y            | May. 31, 17      |

### Measuring Equipment Configuration



## Test Results

|               |                        |
|---------------|------------------------|
| Test date     | Mar 23, 2017           |
| 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

Reference Frequency: 450.050030 MHz

| No. | Temperature<br>(Degree C) | Diviation<br>(%) | Voltage<br>(V) | Frequency<br>(MHz) | Stability<br>(ppm) | Limit<br>+/- (ppm) | Margin<br>(ppm) |
|-----|---------------------------|------------------|----------------|--------------------|--------------------|--------------------|-----------------|
| 1   | 20+/-5                    | 85               | 11.56          | 450.050020         | -0.02              | 1.0                | 0.98            |
| 2   | 20+/-5                    | 100              | 13.60          | 450.050030         | 0.00               | 1.0                | 1.00            |
| 3   | 20+/-5                    | 115              | 15.64          | 450.050020         | -0.02              | 1.0                | 0.98            |

### 10.10 Necessary Bandwidth and Emission Bandwidth

|             |                                                                          |
|-------------|--------------------------------------------------------------------------|
| REGULATIONS | : FCC Part 2 Section 202 (g) & Federal Register/ Vol.68, No236<br>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 |

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

- |                                                    |    |                                                |
|----------------------------------------------------|----|------------------------------------------------|
| 1.types of modulation of the main carrier :        | F= | Frequency modulation                           |
| 2.nature of signal(s) modulating the main carrier: | 3= | A single channel containing analog information |
| 3.type of information to be transmitted:           | E= | Telephony (including sound broadcasting)       |

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 |

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

- |                                                    |    |                                                |
|----------------------------------------------------|----|------------------------------------------------|
| 1.types of modulation of the main carrier :        | F= | Frequency modulation                           |
| 2.nature of signal(s) modulating the main carrier: | 3= | A single channel containing analog information |
| 3.type of information to be transmitted:           | E= | Telephony (including sound broadcasting)       |

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 |

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

- |                                                    |    |                                                                                                          |
|----------------------------------------------------|----|----------------------------------------------------------------------------------------------------------|
| 1.types of modulation of the main carrier :        | F= | Frequency modulation                                                                                     |
| 2.nature of signal(s) modulating the main carrier: | 1= | A single channel containing quantized or digital information without the use of a modulating sub-carrier |
|                                                    | 7= | Two or more channels containing quantized or digital information                                         |
| 3.type of information to be transmitted:           | E= | Telephony (including sound broadcasting)                                                                 |
|                                                    | D= | Data transmission, telemetry, telecommand                                                                |
|                                                    | W= | Combination of the above                                                                                 |

State : 7K60FXE / 7K60FXD (9600bps, Authorized Bandwidth 11.25 kHz)

| Item                     | Mark |       |     |
|--------------------------|------|-------|-----|
| Digital information rate | (R)  | 9600  | bps |
| Peak frequency deviation | (D)  | 3.024 | kHz |
| Signaling states         | (S)  | 4     |     |
| Numerical factor         | (K)  | 0.463 |     |
| Necessary Bandwidth      | (Bn) | 7.6   | kHz |

$$Bn = (R/\log_2 S) + 2x D x K$$

- 1.types of modulation of the main carrier : F= Frequency modulation  
 2.nature of signal(s) modulating the main carrier: X= Cases not otherwise covered  
 3.type of information to be transmitted: E= Telephony (including sound broadcasting)  
 D= Data transmission, telemetry, telecommand

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 |

$$Bn = (R/\log_2 S) + 2x D x K$$

- 1.types of modulation of the main carrier : F= Frequency modulation  
 2.nature of signal(s) modulating the main carrier: 1= A single channel containing quantized or digital information without the use of a modulating sub-carrier  
 7= Two or more channels containing quantized or digital information  
 3.type of information to be transmitted: E= Telephony (including sound broadcasting)  
 D= Data transmission, telemetry, telecommand  
 W= Combination of the above

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 |

$$Bn = (2xM) + (2x D x K)$$

- 1.types of modulation of the main carrier : F= Frequency modulation  
 2.nature of signal(s) modulating the main carrier: 2= A single channel containing quantized or digital information with the  
 3.type of information to be transmitted: D= Data transmission, telemetry, telecommand