# TEST REPORT

## STANDARD : FCC Part15C, RSS-210 Issue 7, RSS-Gen Issue 2

| Applicant | Testing Laboratory |
|---|---|
| Olympus Medical Systems Corp.<br><br>2951 Ishikawa-cho, Hachioji-shi, Tokyo<br>192-8507 Japan<br>Tel. +81 42 642 9249 | Intertek Japan K.K. Tochigi Laboratory<br>URL: http://www.japan.intertek-etlsemko.com<br><br>870, Nakaawano, Kanuma-shi, Tochigi-ken<br>322-0306 Japan<br>Tel. +81 289 86 7121 |

| | |
|---|---|
| **Equipment Type** | Endoscope Position Detecting Unit |
| **Trademark** | Olympus |
| **Model(s)** | UPD-3 |
| **Serial No.** | 700K009 |
| **Equipment Authorization** | Certification (FCC ID : S8QUPD-3)<br>(IC ID : 4763B-UPD3) |
| **Test Result** | Complied |
| **Report Number** | JK10060009(R1) |
| **Report Issue Date** | November 16, 2010 |



The test report JK10060009 has been superseded by this test report.

Approved by K. Gokita

Kazuo Gokita
[ Manager ]

Tested by K, Wagatsuma

Koichi Wagatsuma

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# SECTION 1. GENERAL INFORMATION

**TEST PERFORMED**

| | |
|---|---|
| **Location** | Tochigi No.2 Test Site |
| **EUT Received** | June 28, 2010 |
| **Date of Test** | From June 29, 2010 to July 5, 2010 |
| **Standard Applied** | FCC Part15C<br>RSS-210 Issue 7, RSS-Gen Issue 2 |
| **Measurement methods** | ANSI C63.4-2003 |
| **Test Procedure** | Document number : RJP-EM001, RJP-EM003 |
| **Deviation from Standard(s)** | None |

**QUALIFICATIONS OF TESTING LABORATORY**

| **ACCREDITATION** | **SCOPE** | **LAB. CODE** | **Remarks** |
|---|---|---|---|
| VLAC | EMC Testing | VLAC-008-5 | JAPAN |
| BSMI | EMC Testing | SL2-IN-E-6017, SL2-AI-E-6017 | TAIWAN |
| **FILING** | | | |
| VCCI | EMC Testing | R-257, C-260, C-284, T-1736, T-1737, G-124<br>R-258, C-261, C-285, T-1738, T-1739<br>R-259, C-262, T-1740, G-125 | JAPAN |
| FCC | EMC Testing | Designation Number : JP0011 | USA |
| IC | EMC Testing | 2042P-1, 2042P-2 | CANADA |
| SAUDI ARABIA | EMC Testing | N/A | |

**ABBREVIATIONS**

| | | | |
|---|---|---|---|
| EUT | Equipment Under Test | DoC | Declaration of Conformity |
| AMN | Artificial Mains Network | ISN | Impedance Stabilization Network |
| LISN | Line Impedance Stabilization Network | Q-P | Quasi-peak |
| AMP | Amplifier | AVG | Average |
| ATT | Attenuator | PK | Peak |
| ANT | Antenna | Cal | Calibration |
| BBA | Broadband Antenna | N/A | Not applicable or Not available |
| DIP | Dipole Antenna | LCD | Liquid-Crystal Display |
| AE | Associated Equipment | HDMI | High-Definition Multimedia Interface |

## SECTION 2. SUMMARY OF TEST RESULTS

The minimum margins to the limits are as follows:

| Test | Reference <FCC> | Reference <IC> | Result |
|---|---|---|---|
| **AC Conducted Emission** | 15.207 | RSS-Gen Issue 2<br>7.2.2 | Pass |
| **Field Strength Emission** | 15.209 | RSS-210 Issue 7<br>2.7 Table 3 | Pass |
| **Spurious Emission – Radiated** | 15.209<br>15.205 | RSS-210 Issue 7<br>A2.6 (d)<br>2.7 Table 1<br>2.7 Table 2<br>2.7 Table 3 | Pass |
| **Variation Carrier Output Power** | 15.31(e) | - | Pass |
| **Restricted Band of Operation** | 15.205 | RSS-210 Issue 7<br>2.7 Table 1 | Pass |

Note : See Section 10 for details.

< Measurement data correction >

* Conducted disturbance at mains terminals
  Emission Level [dBμV] = Meter Reading [dBμV] + Factor [dB]
  Margin [dB] = Limit [dBμV] - Emission Level [dBμV]
  * Factor = LISN Factor + Cable Loss + ATT

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

# SECTION 3. EQUIPMENT UNDER TEST

The equipment under test (EUT) consisted of the following apparatus.

### 3.1 System Configuration

| Symbol | Item | Model No. | Serial No. | Manufacturer | ID |
|---|---|---|---|---|---|
| **A1** | Endoscope Position Detecting Unit | UPD-3 | 700K009 | Olympus Medical Systems Corp. | FCC : S8QUPD-3<br>IC : 4763B-UPD3 |
| **A2** | RECEIVER DISH | MAJ-1868 | 700K018 | Olympus Medical Systems Corp. | |
| **A3** | HAND COIL | MAJ-1859 | 700K009 | Olympus Medical Systems Corp. | |
| **A4** | REFERENCE PLATE | MAJ-1860 | 700K001 | Olympus Medical Systems Corp. | |
| **A5** | REMOTE CONTROL | MAJ-1890 | 700K029 | Olympus Medical Systems Corp. | |
| **A6** | COLONOVIDEOSCOPE | CF TYPE Q160DL | 42106642 | Olympus Medical Systems Corp. | |
| **Rated Power** : AC100-240 V, 50/60 Hz, 110 VA | | | | | |
| **Supplied Power** : AC120 V, 60 Hz | | | | | |
| **Condition of Equipment** | Preproduction | | | | |
| **Type** | Built-in | | | | |
| **Suppression Devices** | No Modifications by the laboratory were made to the device | | | | |

### 3.2 Overview of EUT

| | |
|---|---|
| **Carrier Frequency** | 9.888 kHz, 10.712 kHz *, 11.536 kHz (* tested by 10.712 kHz) |
| **Modulation Method** | Non modulation |
| **RF Output Power** | 59.3 dBuV/m (at 3.0 m: Measurement value) |

### 3.3 Port(s)/Connector(s)

| Port Name | Connector Type | Connector Pin | Remarks |
|---|---|---|---|
| Hand coil terminal | Round connector | 6pin | |
| Reference plate terminal | Round connector | 14pin | |
| Receiver dish terminal | Half – pitch bellows | 50pin | |
| Scope/probe terminal | BOX connector | 34pin | |
| CLV terminal | BOX connector | 20pin | |
| Connection unit terminal | Micro connector | 14pin | |
| XGA out terminal | D-sub | 15pin | |
| Y/C out terminal | Y/C video | 4pin | |
| SDI out terminal | BNC | 2pin | |
| Remote control terminal | Micro connector | 14pin | |
| CV remote terminal | Half – pitch bellows | 14pin | |
| LINK-IN terminal | Micro connector | 26pin | |
| LINK-OUT terminal | Micro connector | 14pin | |

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

| Base Clock | Operating Frequency | Board Name | Remarks |
|---|---|---|---|
| 66 MHz | 66 MHz | Main board | |

### 3.5 Frequency Range of Measurements

| | |
|---|---|
| AC Conducted Emission | 0.15 – 30 MHz |
| Field Strength Emission | 0.009 – 30 MHz |
| Spurious Emission – Radiated (Magnetic Field) | 0.009 – 30 MHz |
| Spurious Emission – Radiated (Electric Field) | 30 - 1000 MHz |

## SECTION 4. SUPPORT EQUIPMENT

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

| Symbol | Item | Model No. | Serial No. | Manufacturer | FCC ID |
|---|---|---|---|---|---|
| **B** | LCD (VGA) | ET1528L-7CJM-1-BG-G | H09C029979 | ELO Touch systems | DoC |
| **C** | AC adapter | HES49-12040 | 010-1655-00 | HiTRON electronics corporation | None |
| **D** | EVIS EXERA VIDEO SYSTEM CENTER | CV-160 | 7000721 | Olympus Medical Systems Corp. | None (Medical Device) |
| **E** | EVIS EXERA III XENON LIGHT SOURSE | CLV-Y0013 | 700K070 | Olympus Medical Systems Corp. | None (Medical Device) |
| **F** | LCD (Y/C) | 226MS | CR22HVR PC00884P | SAMSUNG | DoC |
| **Supplied Power:** | | | | | |
| **B** | DC12 V, 4 A | | | | |
| **C, D, E, F** | AC120 V, 60 Hz | | | | |

## SECTION 5. USED CABLE(S)

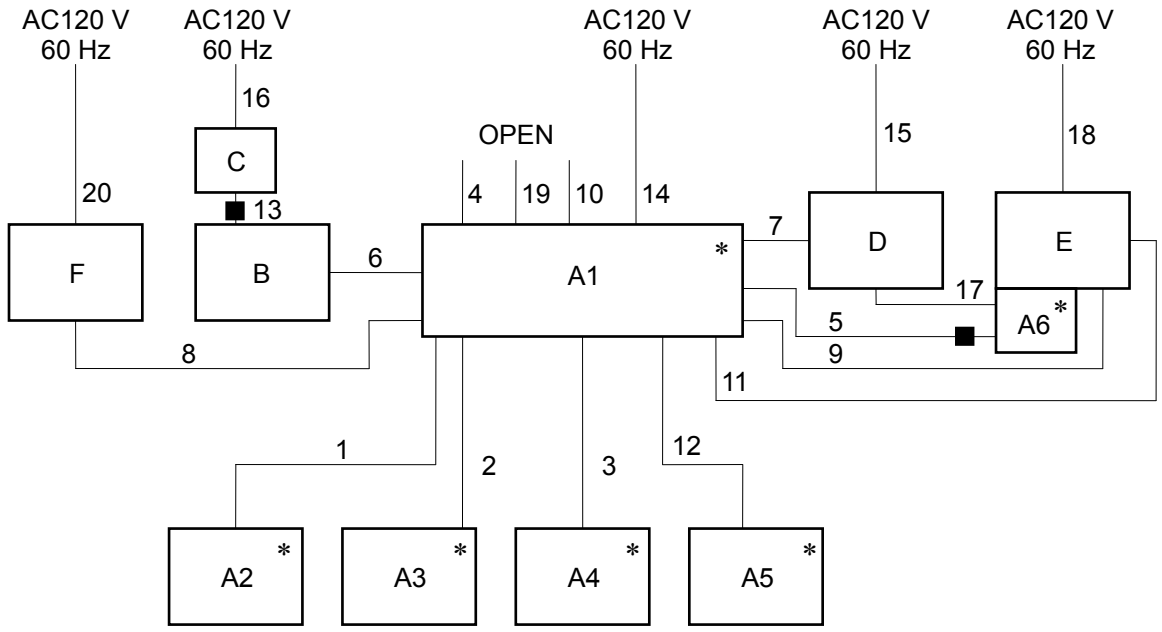
The following cable(s) was used for the test.

| No. | Name | Length (m) | Shield | Metal Connector | Ferrite Core |
|---|---|---|---|---|---|
| **1** | RECEIVER DISH CABLE | 7.00 | Yes | Yes | |
| **2** | HAND COIL CABLE | 2.30 | Yes | No | |
| **3** | REFERENCE PLATE CABLE | 2.30 | Yes | No | |
| **4** | EXTENSION CABLE FOR HC-RP | 7.00 | Yes | Yes | |
| **5** | UPD CABLE | 2.00 | Yes | No | Fixed x 1 |
| **6** | VIDEO CABLE (VGA) | 1.80 | Yes | Yes | |
| **7** | VIDEO CABLE (SDI) | 2.50 | Yes | Yes | |
| **8** | Y/C CABLE | 2.90 | Yes | Yes | |
| **9** | CLV-UPD CABLE | 1.50 | Yes | No | |
| **10** | FlexRay CABLE | 1.50 | Yes | Yes | |
| **11** | FlexRay CABLE | 1.50 | Yes | Yes | |
| **12** | REMOTE CONTROL CABLE | 2.90 | Yes | Yes | |
| **13** | Power cable for LCD (VGA) | 1.90 | No | No | Fixed x 1 |
| **14** | Power cable for UPD-3 | 3.00 | No | No | |
| **15** | Power cable for CV-160 | 2.50 | No | No | |
| **16** | Power cable for LCD (VGA) | 2.40 | No | No | |
| **17** | Videoscope cable 100 | 0.51 | Yes | Yes | |
| **18** | Power cable for CLV-190 | 3.00 | No | No | |
| **19** | REMOTE CABLE | 1.50 | Yes | Yes | |
| **20** | Power cable for LCD (Y/C) | 2.00 | No | No | |

Note : 1. No.5 cable is supplied together with EUT by the applicant.
2. One core of No. 5 cable is supplied together with EUT by the applicant.
3. No.13 cable is supplied together with LCD (VGA) (B) by the applicant.
4. One core of No. 13 cable is supplied together with LCD (VGA) (B) by the applicant.

## SECTION 6. TEST CONFIGURATION

＊: EUT
■: Ferrite core




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

# SECTION 7. OPERATING CONDITION

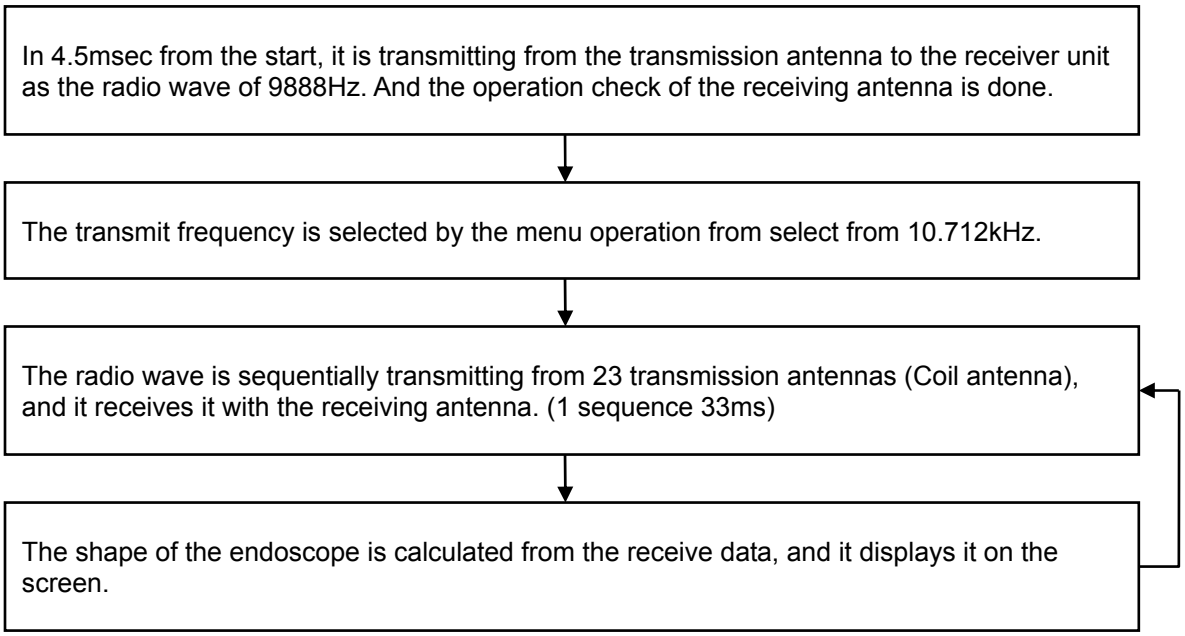
The EUT was operated under the following conditions during the test.

## 7.1 Operating Condition

The test was carried out under Communication 10.712 kHz mode.
EUT was examined in the operating conditions that had maximum emissions.

## 7.2 Operating Flow [Communication 10.712 kHz mode]

Following operations were performed continuously.

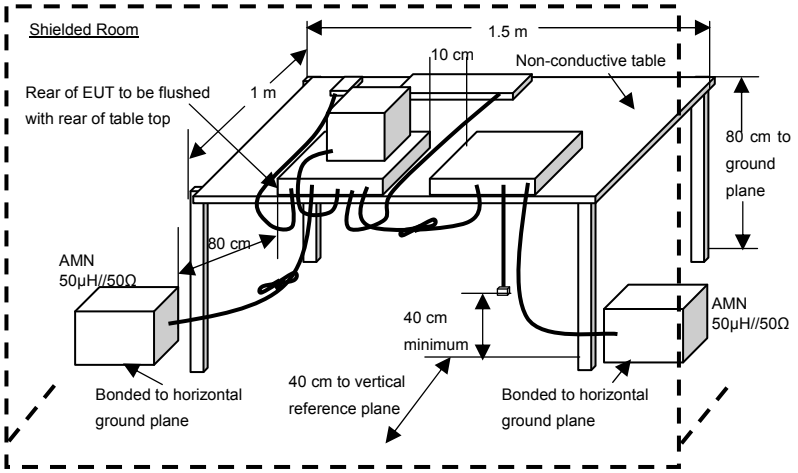


## SECTION 8. TEST PROCEDURE(S)

Test was carried out under the following conditions.

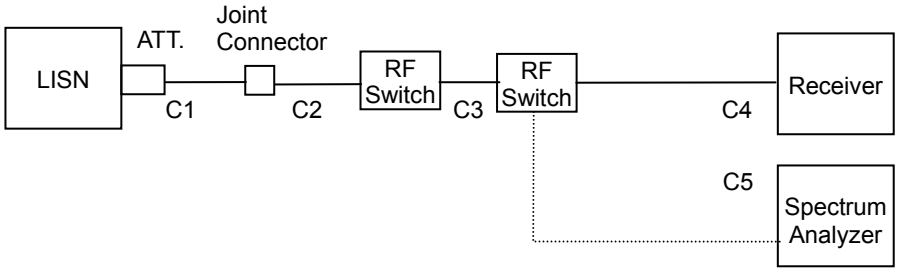
**Conducted disturbance at mains terminals**

Test setup as per standard




* Reference Ground plane : greater than 2 x 2m

Diagram of the measuring instruments




Setting for the instruments

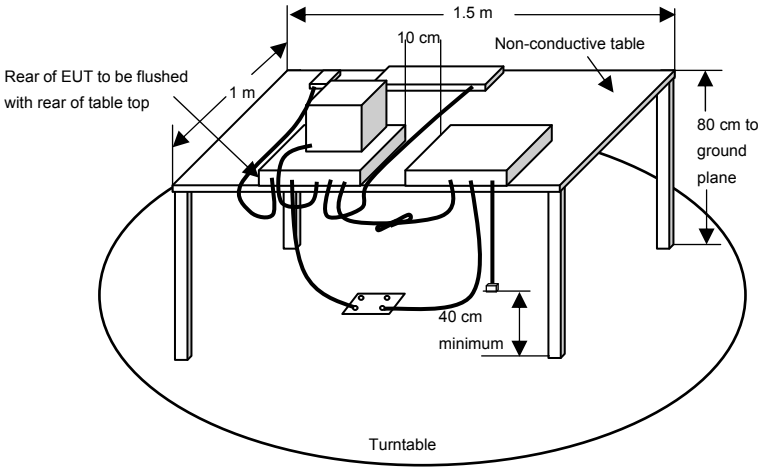
| Frequency [MHz] | Instrument | Detector Function | Resolution Bandwidth | Video Bandwidth |
|---|---|---|---|---|
| 0.15 – 30 | Receiver | Quasi Peak | 10 kHz | N/A |
| | | Average | 10 kHz | N/A |

[ Preliminary Measurement ]
EUT is tested on all operating conditions.
The spectrum analyzer is controlled by the computer program to sweep the frequency range to be measured, then spectrum chart is plotted out to find the worst emission conditions in operating mode and/or configuration decision for the final test.
All leads other than safety ground are tested.

[ Final Measurement ]
The EUT is operated in the worst emission condition found by the preliminary test.
The equipment and cables are arranged or manipulated within the range of the test standard in the above condition.
At least six highest spectrum are measured in quasi-peak and average (if necessary) using the test receiver.

**Radiated disturbance**

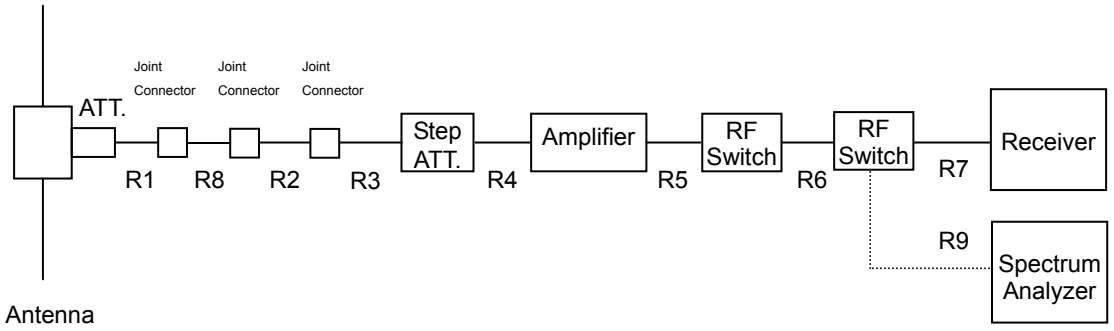
Test setup as per standard




Schema for the field strength emission & spurious emission radiated magnetic field measurement

< Below 30MHz >


Diagram of the measuring instruments (30 – 1000 MHz)



**< Below 30MHz >**

Setting for the instruments

| Frequency [MHz] | Instrument | Detector Function | Resolution Bandwidth | Video Bandwidth |
|---|---|---|---|---|
| 0.009 - 0.15 | Receiver | 0.009 - 0.090 [MHz] AVG.<br>0.090 -.0.110 [MHz] QP<br>0.110 - 0.15 [MHz] AVG. | 200 Hz | N/A |
| 0.15 - 30 | Receiver | 0.15 - 0.49 [MHz] AVG.<br>0.49 - 30 [MHz] QP | 10 kHz | N/A |

[ Preliminary Measurement ]
EUT is tested on all operating conditions.
The Loop antenna is used for Magnetic field measurements on the frequency range 0.009 – 30 MHz.
The antenna mast is attachable to the Loop antenna and antenna's center height is set 1 meter above the ground.
Antenna angle is adjustable 0 to 360 degree and antenna polarization is also changed. (vertical and horizontal)
The spectrum analyzer is set max-hold mode and swept during turntable was rotated 0 to 360 degree. Then spectrum chart are plotted out to find the worst emission conditions in configuration, operating mode, or ambient noise notation.

[ Final Measurement ]
The EUT operated in the worst emission condition found by the preliminary test.
The turntable azimuth (EUT direction) and antenna angle are adjusted the position so that maximum field strength is obtained for each frequency spectrum to be measured.
The equipment and cables are arranged or manipulated within the range of the test standard in the above condition.
Higher spectrum is measured by the test receiver (AVG. or quasi-peak).

**< 30 - 1000MHz >**

Setting for the instruments

| Frequency [MHz] | Instrument | Detector Function | Resolution Bandwidth | Video Bandwidth |
|---|---|---|---|---|
| 30 – 1000 | Receiver | Quasi Peak | 120 kHz | N/A |

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

[ Final Measurement ]
The EUT operated in the worst emission condition found by the preliminary test.
The turntable azimuth (EUT direction) and antenna height are adjusted the position so that maximum field strength is obtained for each frequency spectrum to be measured.
The equipment and cables are arranged or manipulated within the range of the test standard in the above condition. At least six highest spectrums are measured by the test receiver (quasi-peak) and spectrum analyzer (peak and average). When the uncertain result was obtained (30 – 1000 MHz), the measurement is retried by using the half wave dipole antenna instead of the broadband antenna.

## SECTION 9. MEASUREMENT UNCERTAINTY

| **Radiated disturbance at 3m** | $U_{lab}$ | $U_{cispr}$ |
|---|---|---|
| 30 MHz – 1000 MHz | 3.57 dB | 5.19 dB |
| Above 1 GHz CISPR22 | N/A | |
| Above 1 GHz ANSI 63.4 | 4.24 dB | |
| **Radiated disturbance at 10m** | | |
| 30 MHz – 1000 MHz | 3.73 dB | 5.06 dB |
| Above 1 GHz | 4.24 dB | |
| **Radiated disturbance at 30m** | | |
| | N/A | 5.02 dB |
| **Radiated disturbance (power)** | | |
| 11.7 GHz – 12.7 GHz | N/A | Nil |
| **Radiated disturbance (magnetic field)** | | |
| 9 kHz – 30 MHz | 3.09 dB | Nil |
| **Conducted disturbance at mains terminals** | | |
| 9 kHz – 150 kHz | 2.70 dB | 3.97 dB |
| 150 kHz – 30 MHz | | 3.60 dB |
| **Conducted disturbance at telecommunication ports (voltage)** | | |
| 9 kHz – 30 MHz | 2.70 dB | Nil |
| **Conducted disturbance at telecommunication ports (current)** | | |
| 9 kHz – 30 MHz | 2.81 dB | Nil |
| **Conducted disturbance at terminals** | | |
| 150 kHz – 30 MHz | 2.74 dB | Nil |
| **Disturbance power** | | |
| 30 MHz – 300 MHz | 4.94 dB | 4.45 dB |

The above expanded instrumentation uncertainty, $U_{lab.}$, is estimated in accordance with CISPR 16-4-2.
Traceability to national standard in SI units is ensured with these values.
Compliance with the limits in this standard are determined without in consideration of the measurement uncertainty of the measurement instrumentation.

## SECTION 10. EVALUATION OF TEST RESULTS

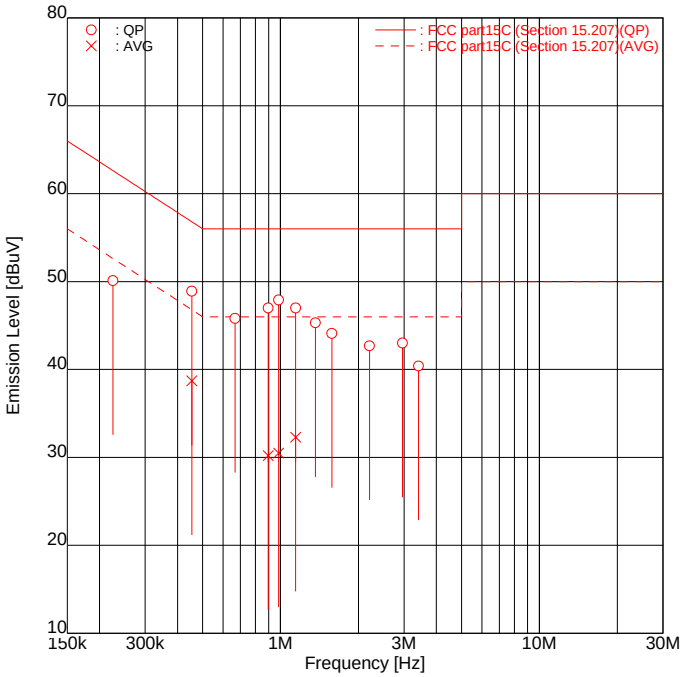
### 10.1 AC Conducted Emission

# Intertek Japan K.K.

## Tochigi No.2 Test Site

Conducted Voltages on Mains Port

| | |
|---|---|
| APPLICANT | : Olympus Medical Systems Corp. |
| EUT NAME | : Endoscope Position Detecting Unit |
| MODEL NO. | : UPD-3 |
| SERIAL NO. | : 700K009 |
| TEST MODE | : Communication 10.712kHz |
| POWER SOURCE | : AC 120V/60Hz |
| DATE TESTED | : Jul 02 2010 |
| FILE NO. | : JK10060009 |
| REGULATION | : FCC part15C (Section 15.207) |
| TEST METHOD | : ANSI C63.4-2003 |
| TEMPERATURE | : 24.0 [degC] |
| HUMIDITY | : 59.0 [%] |
| NOTE | : |




ENGINEER : Koichi Wagatsuma

| [No] | FREQUENCY [MHz] | MODE | READING [dBuV] Line1 | READING [dBuV] Line2 | FACTOR [dB] Line1 | FACTOR [dB] Line2 | EMISSION [dBuV] Line1 | EMISSION [dBuV] Line2 | LIMIT [dBuV] | MARGIN [dB] Line1 | MARGIN [dB] Line2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.2253 | QP | 31.2 | 39.4 | 10.7 | 10.7 | 41.9 | 50.1 | 62.6 | 20.7 | 12.5 |
| 2 | 0.4541 | QP | 31.6 | 38.2 | 10.7 | 10.7 | 42.3 | 48.9 | 56.8 | 14.5 | **7.9** |
| 3 | 0.4541 | AVG | 21.1 | 28.0 | 10.7 | 10.7 | 31.8 | 38.7 | 46.8 | 15.0 | 8.1 |
| 4 | 0.6671 | QP | 28.8 | 35.1 | 10.7 | 10.7 | 39.5 | 45.8 | 56.0 | 16.5 | 10.2 |
| 5 | 0.8957 | QP | 30.0 | 36.3 | 10.7 | 10.7 | 40.7 | 47.0 | 56.0 | 15.3 | 9.0 |
| 6 | 0.8957 | AVG | 16.0 | 19.5 | 10.7 | 10.7 | 26.7 | 30.2 | 46.0 | 19.3 | 15.8 |
| 7 | 0.9834 | QP | 31.0 | 37.2 | 10.7 | 10.7 | 41.7 | 47.9 | 56.0 | 14.3 | 8.1 |
| 8 | 0.9834 | AVG | 15.0 | 19.8 | 10.7 | 10.7 | 25.7 | 30.5 | 46.0 | 20.3 | 15.5 |
| 9 | 1.1448 | QP | 30.1 | 36.3 | 10.7 | 10.7 | 40.8 | 47.0 | 56.0 | 15.2 | 9.0 |
| 10 | 1.1448 | AVG | 16.8 | 21.6 | 10.7 | 10.7 | 27.5 | 32.3 | 46.0 | 18.5 | 13.7 |
| 11 | 1.3633 | QP | 29.1 | 34.6 | 10.7 | 10.7 | 39.8 | 45.3 | 56.0 | 16.2 | 10.7 |
| 12 | 1.5790 | QP | 28.0 | 33.4 | 10.7 | 10.7 | 38.7 | 44.1 | 56.0 | 17.3 | 11.9 |
| 13 | 2.2050 | QP | 26.7 | 31.9 | 10.8 | 10.8 | 37.5 | 42.7 | 56.0 | 18.5 | 13.3 |
| 14 | 2.9607 | QP | 27.3 | 32.2 | 10.8 | 10.8 | 38.1 | 43.0 | 56.0 | 17.9 | 13.0 |
| 15 | 3.4090 | QP | 25.0 | 29.4 | 11.0 | 11.0 | 36.0 | 40.4 | 56.0 | 20.0 | 15.6 |

Higher six points are underlined.
Other frequencies : Below the FCC part15C (Section 15.207) limit
Emisson Level = Read + Factor(LISN,Pad,Cable)

emiT 3, 0, 0, 0

## 10.2 Field Strength Emission

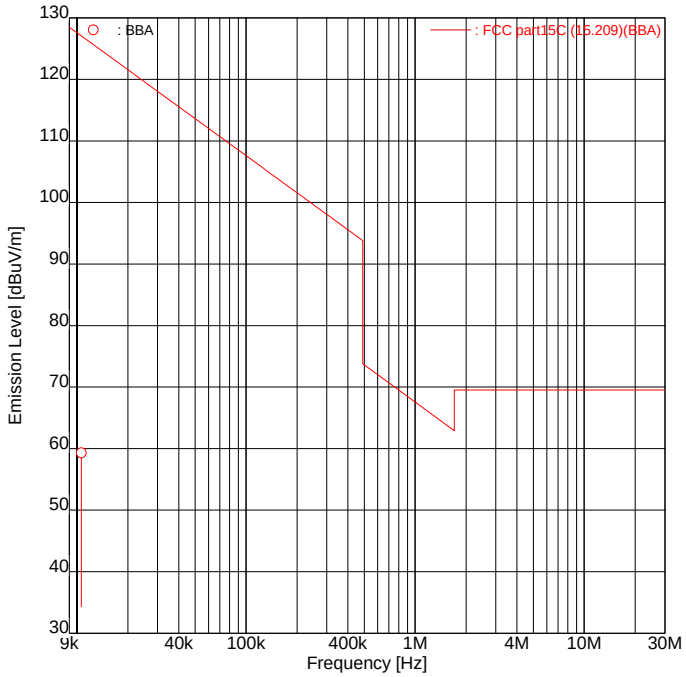
# Intertek Japan K.K.

## Tochigi No.2 Test Site

Radiated Magnetic Field

| | |
|---|---|
| APPLICANT | : Olympus Medical Systems Corp. |
| EUT NAME | : Endoscope Position Detecting Unit |
| MODEL NO. | : UPD-3 |
| SERIAL NO. | : 700K009 |
| TEST MODE | : Communication 10.712kHz |
| POWER SOURCE | : AC 120V/60Hz |
| DATE TESTED | : Jul 02 2010 |
| FILE NO. | : JK10060009 |
| REGULATION | : FCC part15C (15.209) |
| TEST METHOD | : ANSI C63.4-2003 |
| DISTANCE | : 3.00 [m] |
| TEMPERATURE | : 25.0 [degC] |
| HUMIDITY | : 60.0 [%] |
| NOTE | : |

ENGINEER : Koichi Wagatsuma




| [No] | FREQUENCY [MHz] | READING [dBuV] Hori | READING [dBuV] Vert | FACTOR [dB] Hori | FACTOR [dB] Vert | EMISSION [dBuV/m] Hori | EMISSION [dBuV/m] Vert | LIMIT [dBuV/m] | MARGIN [dB] Hori | MARGIN [dB] Vert |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.0106 | 30.5 | 30.8 | 28.5 | 28.5 | 59.0 | 59.3 | 127.1 | 68.1 | **67.8** |

Higher six points are underlined.
Other frequencies : Below the FCC part15C (15.209) limit
Emisson Level = Read + Factor(Antenna,Cable,Preamp)

emiT 3, 0, 0, 0

**10.3 Spurious Emission – Radiated**

10.3.1 Communication 10.712 kHz mode (9 kHz – 30 MHz)

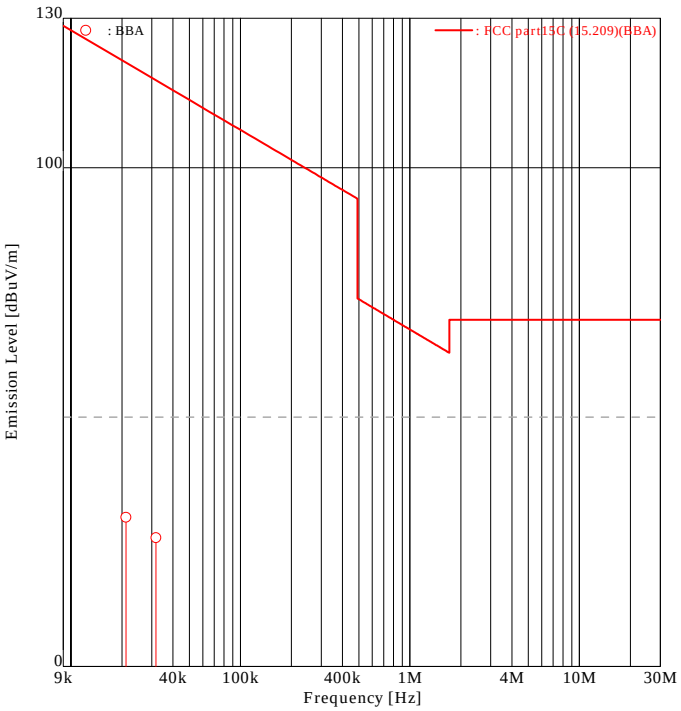
# Intertek Japan K.K.

## Tochigi No.2 Test Site

Radiated Magnetic Field

| | |
|---|---|
| APPLICANT | : Olympus Medical Systems Corp. |
| EUT NAME | : Endoscope Position Detecting Unit |
| MODEL NO. | : UPD-3 |
| SERIAL NO. | : 700K009 |
| TEST MODE | : Communication 10.712kHz |
| POWER SOURCE | : AC 120V/60Hz |
| DATE TESTED | : Jul 02 2010 |
| FILE NO. | : JK10060009 |
| REGULATION | : FCC part15C (15.209) |
| TEST METHOD | : ANSI C63.4-2003 |
| DISTANCE | : 3.00 [m] |
| TEMPERATURE | : 25.0 [degC] |
| HUMIDITY | : 60.0 [%] |
| NOTE | : |

ENGINEER : Koichi Wagatsuma




| [No] | FREQUENCY [MHz] | READING [dBuV] Hori | READING [dBuV] Vert | FACTOR [dB] Hori | FACTOR [dB] Vert | EMISSION [dBuV/m] Hori | EMISSION [dBuV/m] Vert | LIMIT [dBuV/m] | MARGIN [dB] Hori | MARGIN [dB] Vert |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.0211 | 2.7 | 2.9 | 27.0 | 27.0 | 29.7 | 29.9 | 121.1 | 91.4 | **91.2** |
| 2 | 0.0317 | 0.0 | 0.1 | 25.7 | 25.7 | 25.7 | 25.8 | 117.6 | 91.9 | 91.8 |

Higher six points are underlined.
Other frequencies : Below the FCC part15C (15.209) limit
Emisson Level = Read + Factor(Antenna,Cable,Preamp)

10.3.2 Communication 10.712 kHz mode (30 MHz – 1000 MHz)

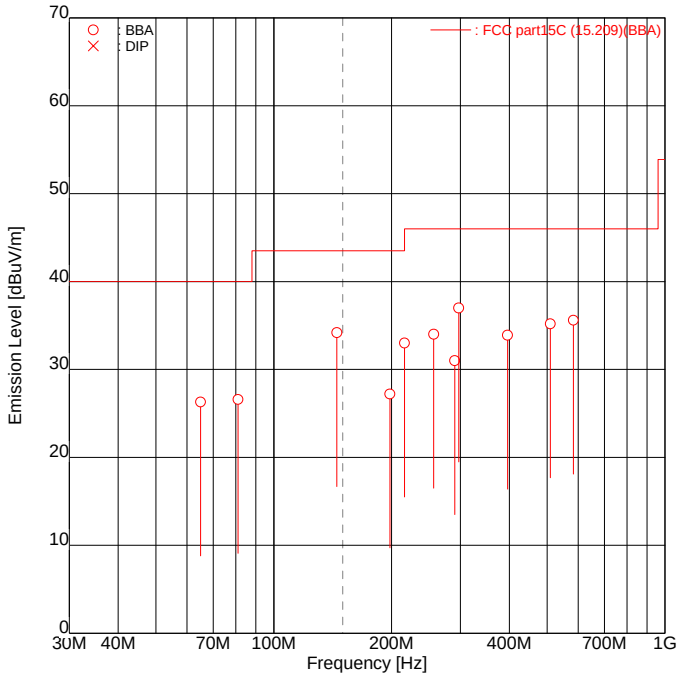
# Intertek Japan K.K.

## Tochigi No.2 Test Site

Radiated Electric Field

| | |
|---|---|
| APPLICANT | : Olympus Medical Systems Corp. |
| EUT NAME | : Endoscope Position Detecting Unit |
| MODEL NO. | : UPD-3 |
| SERIAL NO. | : 700K009 |
| TEST MODE | : Communication 10.712kHz |
| POWER SOURCE | : AC 120V/60Hz |
| DATE TESTED | : Jul 01 2010 |
| FILE NO. | : JK10060009 |
| REGULATION | : FCC part15C (15.209) |
| TEST METHOD | : ANSI C63.4-2003 |
| DISTANCE | : 3.00 [m] |
| TEMPERATURE | : 25.0 [degC] |
| HUMIDITY | : 60.0 [%] |
| NOTE | : |

ENGINEER : Koichi Wagatsuma




| [No] | FREQUENCY [MHz] | ANT. | READING [dBuV] Hori | READING [dBuV] Vert | FACTOR [dB/m] Hori | FACTOR [dB/m] Vert | EMISSION [dBuV/m] Hori | EMISSION [dBuV/m] Vert | LIMIT [dBuV/m] | MARGIN [dB] Hori | MARGIN [dB] Vert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 65.01 | BBA | - | 32.3 | -6.0 | -6.0 | - | 26.3 | 40.0 | - | 13.7 |
| 2 | 81.00 | BBA | 35.6 | 35.0 | -9.0 | -9.0 | 26.6 | 26.0 | 40.0 | 13.4 | 14.0 |
| 3 | 144.92 | BBA | 37.5 | 38.5 | -4.3 | -4.3 | 33.2 | 34.2 | 43.5 | 10.3 | 9.3 |
| 4 | 198.00 | BBA | 32.0 | 33.2 | -6.0 | -6.0 | 26.0 | 27.2 | 43.5 | 17.5 | 16.3 |
| 5 | 216.01 | BBA | - | 38.4 | -5.4 | -5.4 | - | 33.0 | 46.0 | - | 13.0 |
| 6 | 256.50 | BBA | - | 37.5 | -3.5 | -3.5 | - | 34.0 | 46.0 | - | 12.0 |
| 7 | 290.12 | BBA | 32.8 | - | -1.8 | -1.8 | 31.0 | - | 46.0 | 15.0 | - |
| 8 | 297.00 | BBA | 36.7 | 38.5 | -1.5 | -1.5 | 35.2 | 37.0 | 46.0 | 10.8 | **9.0** |
| 9 | 396.00 | BBA | 33.5 | - | 0.4 | 0.4 | 33.9 | - | 46.0 | 12.1 | - |
| 10 | 509.42 | BBA | 32.2 | 30.7 | 3.0 | 3.0 | 35.2 | 33.7 | 46.0 | 10.8 | 12.3 |
| 11 | 583.20 | BBA | 30.6 | - | 5.0 | 5.0 | 35.6 | - | 46.0 | 10.4 | - |

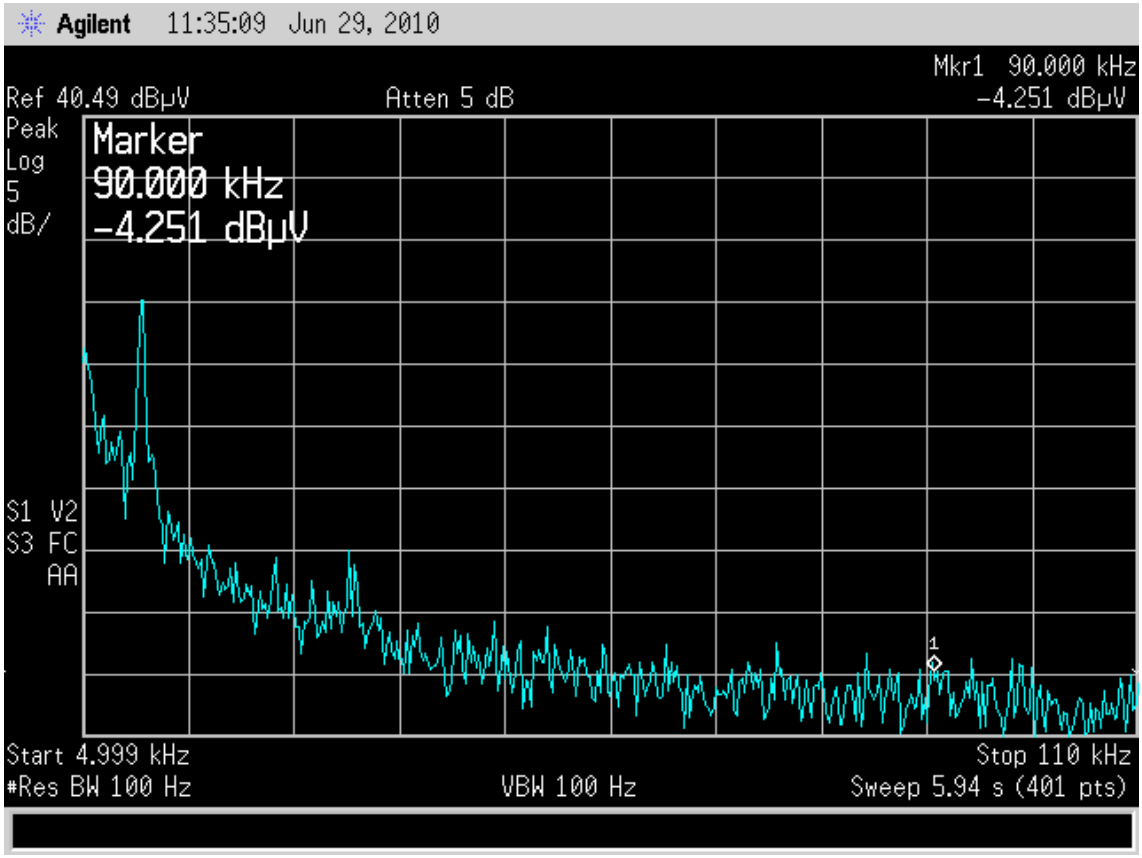
Higher six points are underlined.
Other frequencies : Below the FCC part15C (15.209) limit
Emisson Level = Read + Factor(Antenna,Antenna Pad,Cable,Preamp)
ANT. : Used antenna(BBA = Broadband antenna, DIP = Dipole antenna)

emiT 3, 0, 0, 0

### 10.4 Variation Carrier Output Power

| Operation Band (kHz) | Rate (%) | Supply Voltage (V) | Output Power (dBuV/m) | Deviation (dBuV/m) |
|---|---|---|---|---|
| 10.712 | 85 | 102 | 30.8 | 0.0 |
| | 100 | 120 | 30.8 | Reference |
| | 120 | 138 | 30.8 | 0.0 |

### 10.5 Restricted bands of operation



## SECTION 11. LIST OF MEASURING INSTRUMENTS

| Instrument | Model No. | Serial No. | Manufacturer | Cal. date | Due date |
|---|---|---|---|---|---|
| **Conducted disturbance at mains terminals** | | | | | |
| LISN (EUT) | ESH2-Z5 | 892377/021 | ROHDE & SCHWARZ | Jul. 06, 09 | Jul. 31, 10 |
| 10dB Attenuator | CFA-01(BPJ-10) | None | TAMAGAWA | May 13, 10 | May 31, 11 |
| LISN (Peripheral) | KNW-242 | 8-851-27 | KYORITSU | Jul. 14, 09 | Jul. 31, 10 |
| 50Ω Termination | CT-01 | None | TAMAGAWA | Jul. 14, 09 | Jul. 31, 10 |
| Coaxial cable(C1) | 5D-2W(6.0 m) | 2CL01a | INTERTEK | May 13, 10 | May 31, 11 |
| Coaxial cable(C2) | RG-5A/U(7.0 m) | 2CL02 | INTERTEK | May 13, 10 | May 31, 11 |
| Coaxial cable(C3) | 5D-2W(0.2 m) | 2CL03 | INTERTEK | May 13, 10 | May 31, 11 |
| Coaxial cable(C4) | 5D-2W(1.7 m) | 2CL04 | INTERTEK | May 13, 10 | May 31, 11 |
| **Radiated disturbance** | | | | | |
| Broad Band antenna | VULB9168 | 218 | Schwarzbeck | Mar. 31, 10 | Mar. 31, 11 |
| 6dB Attenuator | CFA-01(NPJ-6) | None | TAMAGAWA | May 13, 10 | May 31, 11 |
| Step Attenuator | 8494B | 2805A14563 | HEWLETT PACKARD | May 13, 10 | May 31, 11 |
| Amplifier | 8447D | 2944A06342 | HEWLETT PACKARD | May 13, 10 | May 31, 11 |
| Loop | HFH2-Z2 | 882964/17 | ROHDE & SCHWARZ | Jul 14, 09 | Jul 31, 10 |
| Attenuator | CFA-01 | None | TME | Nov. 18, 09 | Nov. 30, 10 |
| Spectrum Analyzer | E4407B | MY45102460 | Agilent | Feb 18, 10 | Feb 28, 11 |
| Large Loop cable | MR1 | 10.4 | INTERTEK | Nov. 18, 09 | Nov. 30, 10 |
| Coaxial cable(R1) | 5D-2W(10.0 m) | 2R1001a | INTERTEK | May 13, 10 | May 31, 11 |
| Coaxial cable(R2) | RG-177/U(20.0 m) | 2R1002 | INTERTEK | May 13, 10 | May 31, 11 |
| Coaxial cable(R3) | RG-5A/U(1.3 m) | 2R1003 | INTERTEK | May 13, 10 | May 31, 11 |
| Coaxial cable(R4) | RG-5A/U(0.2 m) | 2R1004 | INTERTEK | May 13, 10 | May 31, 11 |
| Coaxial cable(R5) | 5D-2W(0.7 m) | 2R1005 | INTERTEK | May 13, 10 | May 31, 11 |
| Coaxial cable(R6) | 5D-2W(0.2 m) | 2R1006 | INTERTEK | May 13, 10 | May 31, 11 |
| Coaxial cable(R7) | 5D-2W(1.7 m) | 2R1007 | INTERTEK | May 13, 10 | May 31, 11 |
| Coaxial cable(R8) | 5D-2W(6.0 m) | 2R1008a | INTERTEK | May 13, 10 | May 31, 11 |
| Site Attenuation | | | | Aug. 18, 09 | Aug. 31, 10 |
| **Common** | | | | | |
| Test receiver | ESS (Firmware Version 1.07) | 842886/013 | ROHDE & SCHWARZ | Jan. 06, 10 | Jan. 31, 11 |
| RF Switch | ACX-150 | None | INTERTEK | May 13, 10 | May 31, 11 |
| Testing Software | emiT (Version 3,0,0,0) | | | | |

Note: Test instruments are calibrated according to Quality Manual and Calibration Rules of Intertek Japan K.K.