



RADIO TEST REPORT

Test Report No. : 32KE0041-HO-02-E-R1

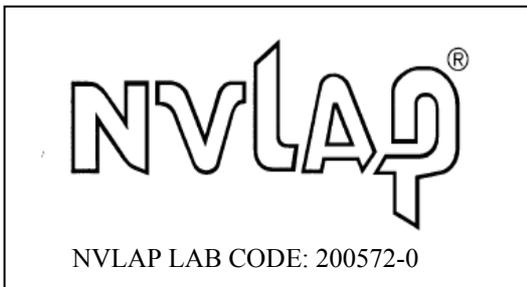
Applicant : Sony Corporation
Type of Equipment : Personal Computer
Model No. : SVD112A1WL
FCC ID : AK8SVD112A1WL
Test regulation : **FCC Part 15 Subpart E: 2012**
(DFS test only)
Test Result : **Complied**

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.
6. This report is a revised version of 32KE0041-HO-02-E. 32KE0041-HO-02-E is replaced with this report.

Date of test: August 23, 2012

Representative test engineer: 
Katsunori Okai
Engineer of WiSE Japan,
UL Verification Service

Approved by: 
Takahiro Hatakeda
Leader of WiSE Japan,
UL Verification Service



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SECTION 1: Customer information

Company Name : Sony Corporation
Address : 1-7-1 Konan, Minato-ku, Tokyo, 399-8282 Japan
Telephone Number : +81-263-71-8272
Facsimile Number : +81-263-71-8984
Contact Person : Yuichi Kosaka

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment : Personal Computer
Model No. : SVD112A1WL
Serial No. : Refer to Section 5, Clause 5.2
Rating : DC 10.5V, 4.3A
Receipt Date of Sample : July 7, 2012
Country of Mass-production : Japan
Condition of EUT : Production prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT : No Modification by the test lab

2.2 Product description

General Specification

Feature of EUT : This model is co-located with Wireless LAN(IEEE802.11a/b/g/n)/
Bluetooth module, NFC Module and stylus.
Each antenna is included in the Personal computer.
This model can co-operate Wireless LAN(IEEE802.11a) + Bluetooth +
NFC + stylus.
Clock frequency(ies) in the system : 12MHz, 25MHz

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Radio Specification

Specification of Wireless LAN (IEEE802.11a/b/g) and Bluetooth

| Type of radio | Wireless LAN (IEEE802.11a) | Wireless LAN (IEEE802.11b/g) | Bluetooth (EDR/BDR/LE) |
|-----------------------------|--|--|--|
| Equipment Type | Transceiver | | |
| Frequency of Operation | Low Band Lower frequency=5180MHz Upper frequency=5320MHz High Band Lower frequency=5500MHz Upper frequency=5700MHz Upper Band Lower frequency=5745MHz Upper frequency=5825MHz | Lower frequency=2412MHz Upper frequency=2462MHz | Lower frequency=2402MHz Upper frequency=2480MHz |
| Bandwidth & Channel spacing | Bandwidth: 20MHz Ch spacing: 20MHz | Bandwidth: 20MHz Ch spacing: 5MHz | Bandwidth: 1MHz Ch spacing: 1MHz (EDR/BDR), 2MHz (LE) |
| Type of Modulation | OFDM | 11b: DSSS 11g: OFDM | EDR/BDR: GFSK, $\pi/4$ DQPSK, 8DPSK LE: GFSK |
| Antenna Type | PIFA (Internal) | | |
| Antenna Connector Type | U.FL compatible connector | | |
| Antenna Gain | Antenna 1: +1.95dBi (2.4GHz) +1.83dBi (5GHz) Antenna 2: +1.20dBi (2.4GHz) +2.33dBi (5GHz) (Including Cableloss) | | +1.20dBi |
| Power Supply | DC 3.3V | | |
| Operating temperature range | +5 to +35 deg. C. | | |

Specification of Wireless LAN (IEEE802.11n)

| Type of radio | Wireless LAN (IEEE802.11n) | | | |
|-----------------------------|---|--|--|--|
| | 2.4G Band MISO / MIMO (20M Band) | 2.4G Band MISO / MIMO (40M Band) | 5G Band MISO / MIMO (20M Band) | 5G Band MISO / MIMO (40M Band) |
| Equipment Type | Transceiver | | | |
| Frequency of Operation | Lower frequency =2412MHz Upper frequency =2462MHz | Lower frequency =2422MHz Upper frequency =2452MHz | Low Band Lower frequency=5180MHz Upper frequency=5320MHz High Band Lower frequency=5500MHz Upper frequency=5700MHz Upper Band Lower frequency=5745MHz Upper frequency=5825MHz | Low Band Lower frequency=5190MHz Upper frequency=5310MHz High Band Lower frequency=5510MHz Upper frequency=5670MHz Upper Band Lower frequency=5755MHz Upper frequency=5795MHz |
| Bandwidth & Channel spacing | Bandwidth: 20MHz Ch spacing: 5MHz | Bandwidth: 40MHz Ch spacing: 5MHz | Bandwidth: 20MHz Ch spacing: 20MHz | Bandwidth: 40MHz Ch spacing: 40MHz |
| Type of Modulation | OFDM | | | |
| Antenna Type | PIFA (Internal) | | | |
| Antenna Connector Type | U.FL compatible connector | | | |
| Antenna Gain | Antenna 1: +1.95dBi (2.4GHz) +1.83dBi (5GHz) Antenna 2: +1.20dBi (2.4GHz) +2.33dBi (5GHz) (Including Cableloss) | | | |
| Power Supply | DC 3.3V | | | |
| Operating temperature range | +5 to +35 deg. C. | | | |

*This test report applies for Wireless LAN (IEEE802.11a/n-20/n-40).

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SECTION 3: Scope of Report

This report only covers DFS requirement, as specified by the following referenced procedures.

SECTION 4: Test specification, procedures & results

4.1 Test Specification

| | | |
|--------------------|---|--|
| Test Specification | : | FCC Part 15 Subpart E: 2012, final revised on July 23, 2012 and effective August 22, 2012 |
| Title | : | FCC 47CFR Part15 Radio Frequency Device Subpart E Unlicensed National Information Infrastructure Devices Section 15.407 General technical requirements |
| Test Specification | : | FCC 06-96 APPENDIX |
| Title | : | COMPLIANCE MEASUREMENT PROCEDURES FOR UNLICENSED- NATIONAL INFORMATION INFRASTRUCTURE DEVICES OPERATING IN THE 5250-5350 MHz AND 5470-5725MHz BANDS INCORPORATING DYNAMIC FREQUENCY SELECTION |

FCC 15.31 (e)

This EUT provides stable voltage(DC3.3V) constantly to RF Part regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

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4.2 Procedures and results

Table 1 Applicability of DFS Requirements

| Requirement | Operating Mode | Test Procedures & Limits | Deviation | Results |
|--|--------------------------------|----------------------------|-----------|----------|
| | Client without Radar Detection | | | |
| U-NII Detection Bandwidth | Not required | FCC 06-96 Appendix 7.8.1 | N/A | N/A |
| Channel Availability Check Time | Not required | FCC15.407 (h) | N/A | N/A |
| | | FCC 06-96 Appendix 7.8.2.1 | | |
| | | Appendix 7.8.2.2 | | |
| | | Appendix 7.8.2.3 | | |
| Channel Move Time, Channel Closing Transmission Time | Yes | FCC15.407 (h) | N/A | Complied |
| | | FCC 06-96 Appendix 7.8.3 | | |
| | | RSS-210 A9.3 | | |
| Non-Occupancy period | Yes | FCC15.407 (h) | N/A | Complied |
| | | FCC 06-96 Appendix 7.8.3 | | |
| | | RSS-210 A9.3 | | |
| In-Service Monitoring | Not required | FCC15.407 (h) | N/A | N/A |
| | | FCC 06-96 Appendix 7.8.4 | | |
| Overlapping Channel Tests | Not required | FCC15.407 (h) | N/A | N/A |

Table 2 DFS Detection Thresholds for Master Devices and Client Devices With Radar

| Maximum Transmit Power | Value (See Notes 1 and 2) |
|---|---------------------------|
| ≥ 200 milliwatt | -64 dBm |
| < 200 milliwatt | -62 dBm |
| <p>Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna.</p> <p>Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.</p> | |

Table 3 DFS Response Requirement Values

| Parameter | Value |
|--|--|
| Non-occupancy period | Minimum 30 minutes |
| Channel Availability Check Time | 60 seconds |
| Channel Move Time | 10 seconds See Note 1 |
| Channel Closing Transmission Time | 200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2 |
| U-NII Detection Bandwidth | Minimum 80% of the U-NII 99% transmission power bandwidth See Note 3 |
| <p>Note 1: The instant that the Channel Move Time and the Channel Closing Transmission Time begins is as follows:</p> <ul style="list-style-type: none"> • For the Short Pulse Radar Test Signals this instant is the end of the <i>Burst</i>. • For the Frequency Hopping radar Test Signal, this instant is the end of the last radar <i>Burst</i> generated • For the Long Pulse Radar Test Signal this instant is the end of the 12 second period defining the <i>Radar Waveform</i>. <p>Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signal will not count quiet periods in between transmissions.</p> <p>Note 3: During the U-NII Detection Bandwidth detection test, radar type 1 is used and for each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.</p> | |

Table 4 Short Pulse Radar Test Waveform

| Radar Type | Pulse Width (μsec) | PRI (μsec) | Number of Pulses | Minimum Percentage of Successful Detection | Minimum Number of Trials |
|-----------------------------|--------------------|------------|------------------|--|--------------------------|
| 1 | 1 | 1428 | 18 | 60% | 30 |
| 2 | 1-5 | 150-230 | 23-29 | 60% | 30 |
| 3 | 6-10 | 200-500 | 16-18 | 60% | 30 |
| 4 | 11-20 | 200-500 | 12-16 | 60% | 30 |
| Aggregate (Rader Types 1-4) | | | | 80% | 120 |

Table 5 Long Pulse Radar Test Waveform

| Radar Type | Pulse Width (μsec) | Chip Width (MHz) | PRI (μsec) | Number of Pulses per Burst | Number of Burst | Minimum Percentage of Successful Detection | Minimum Number of Trials |
|------------|--------------------|------------------|------------|----------------------------|-----------------|--|--------------------------|
| 5 | 50-100 | 5-20 | 1000-2000 | 1-3 | 8-20 | 80% | 30 |

Table 6 Frequency Hopping Radar Test Waveform

| Radar Type | Pulse Width (μsec) | PRI (μsec) | Pulse per Hop (kHz) | Hopping Rate (kHz) | Hopping Sequence Length (msec) | Minimum Percentage of Successful Detection | Minimum Number of Trials |
|------------|--------------------|------------|---------------------|--------------------|--------------------------------|--|--------------------------|
| 6 | 1 | 333 | 9 | 0.333 | 300 | 70% | 30 |

4.3 Test Location

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| | FCC Registration Number | IC Registration Number | Width x Depth x Height (m) | Size of reference ground plane (m) / horizontal conducting plane | Other rooms |
|----------------------------|-------------------------|------------------------|----------------------------|--|------------------------|
| No.1 semi-anechoic chamber | 313583 | 2973C-1 | 19.2 x 11.2 x 7.7m | 7.0 x 6.0m | No.1 Power source room |
| No.2 semi-anechoic chamber | 655103 | 2973C-2 | 7.5 x 5.8 x 5.2m | 4.0 x 4.0m | - |
| No.3 semi-anechoic chamber | 148738 | 2973C-3 | 12.0 x 8.5 x 5.9m | 6.8 x 5.75m | No.3 Preparation room |
| No.3 shielded room | - | - | 4.0 x 6.0 x 2.7m | N/A | - |
| No.4 semi-anechoic chamber | 134570 | 2973C-4 | 12.0 x 8.5 x 5.9m | 6.8 x 5.75m | No.4 Preparation room |
| No.4 shielded room | - | - | 4.0 x 6.0 x 2.7m | N/A | - |
| No.5 semi-anechoic chamber | - | - | 6.0 x 6.0 x 3.9m | 6.0 x 6.0m | - |
| No.6 shielded room | - | - | 4.0 x 4.5 x 2.7m | 4.75 x 5.4 m | - |
| No.6 measurement room | - | - | 4.75 x 5.4 x 3.0m | 4.75 x 4.15 m | - |
| No.7 shielded room | - | - | 4.7 x 7.5 x 2.7m | 4.7 x 7.5m | - |
| No.8 measurement room | - | - | 3.1 x 5.0 x 2.7m | N/A | - |
| No.9 measurement room | - | - | 8.0 x 4.5 x 2.8m | 2.0 x 2.0m | - |
| No.10 measurement room | - | - | 2.6 x 2.8 x 2.5m | 2.4 x 2.4m | - |
| No.11 measurement room | - | - | 3.1 x 3.4 x 3.0m | 2.4 x 3.4m | - |

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

4.4 Uncertainty

The following uncertainties have been calculated to provide a confidence level of 95% using a coverage factor k=2.
Time Measurement uncertainty for this test was: (\pm) 0.012%

4.5 Data of DFS test, Test instruments of DFS, Test set up

Refer to APPENDIX.

SECTION 5: Operation of E.U.T. during testing

5.1 Operating Modes

The EUT, which is a Client Device without Radar detection capability, operates over the 5250-5350MHz and 5470-5725MHz.

Power level(EIRP) of the EUT[dBm]

| 5250-5350MHz Band* | | 5470-5725MHz Band* | |
|--------------------|-------------------|--------------------|-------------------|
| Output Power (Min) | Output Power(Max) | Output Power (Min) | Output Power(Max) |
| 14.20 | 17.86 | 16.39 | 17.87 |

*Refer to 32KE0041-HO-02-D, FCC Part 15E (FCC 15.407) report for other parts than DFS.

The EUT uses one transmitter connected to two 50-ohm coaxial antenna ports. Both antenna ports are connected to the test system via a power divider to perform conducted tests.

WLAN traffic is generated by streaming the MPEG Test file "6 ½ Magic Hours" from the Master to the Client in full motion video mode using the media player with the V2.61 Codec package.

The EUT utilizes the 802.11a architecture, with a nominal channel bandwidth.

The FCC ID for the Master Device used with EUT for DFS testing is LDK102056.

The rated output power of the Master unit is >200mW(23dBm). Therefore the required interference threshold level is -64 dBm. After correction for antenna gain and procedural adjustments, the required conducted threshold at the antenna port is $-64 + 1 + 3.5 = -59.5$ dBm (threshold level + additional 1dB + antenna gain).

It is impossible for users to change DFS control, because the DFS function is written on the firmware and users cannot access it.

The EUT was set by the software as follows:

Software name & version: Driver 15.2.0.19

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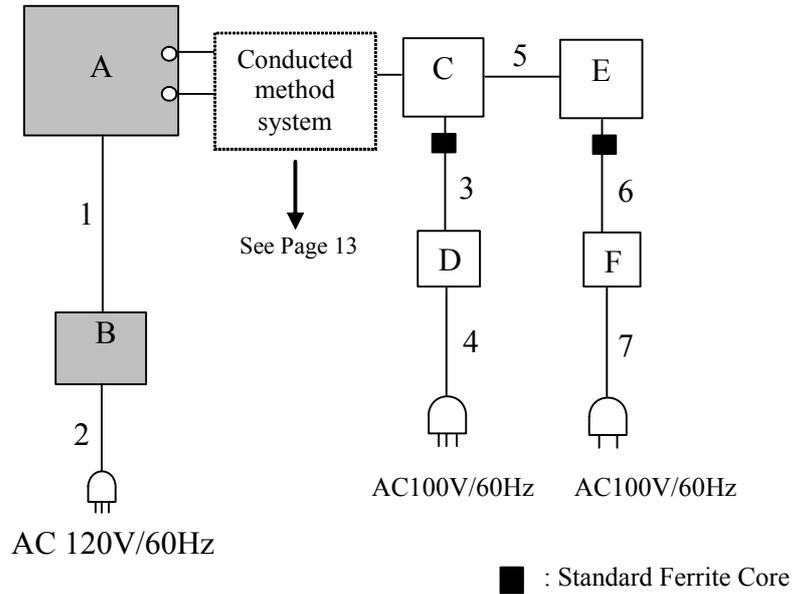
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5.2 Configuration and peripherals



Description of EUT and Support equipment

| No. | Item | Model number | Serial number | Manufacturer | Remarks |
|-----|---------------------------|-------------------|----------------------------|------------------|---------|
| A | Personal Computer | SVD112A1WL | XTA2-1 3 | Sony Corporation | EUT |
| B | AC Adapter | VGP-AC10V8 | 1490488110000393 | Sony Corporation | EUT |
| C | Wireless LAN access point | AIR-AP1242AG-A-K9 | FTX1045B9L0 | Cisco Systems | - |
| D | AC Adaptor | ADP-18PB | PZT0639562214 | Cisco Systems | - |
| E | Laptop PC | 7661CB9 | L3R2055 | Lenovo | - |
| F | AC Adaptor | 92P1213 | 11S92P1213Z1ZBG K7AH11F | Lenovo | - |

List of cables used

| No. | Name | Length (m) | Shield | |
|-----|-----------|------------|------------|------------|
| | | | Cable | Connector |
| 1 | DC Cable | 1.7 | Unshielded | Unshielded |
| 2 | AC Cable | 1.5 | Unshielded | Unshielded |
| 3 | DC Cable | 1.8 | Unshielded | Unshielded |
| 4 | AC Cable | 2.0 | Unshielded | Unshielded |
| 5 | LAN Cable | 3.0 | Unshielded | Unshielded |
| 6 | DC Cable | 1.8 | Unshielded | Unshielded |
| 7 | AC Cable | 0.9 | Unshielded | Unshielded |

5.3 Test and Measurement System

SYSTEM OVERVIEW

The measurement system is based on a conducted test method.

The software selects waveform parameters from within the bounds of the signal type on a random basis using uniform distribution. The short pulse types 2, 3, and 4, the long pulse type 5, and the frequency hopping type 6 parameters are randomized at run-time.

The signal monitoring equipment consists of a spectrum analyzer with the capacity to display 8001 bins on the horizontal axis. A time-domain resolution of 2 msec/bin is achievable with a 16 second sweep time, meeting the 10 seconds short pulse reporting criteria. The aggregate ON time is calculated by multiplying the number of bins above a threshold during a particular observation period by the dwell time per bin, with the analyzer set to peak detection. A time-domain resolution of 3 msec/bin is achievable with a 24 second sweep time, meeting the 22 second long pulse reporting criteria and allowing a minimum of 10 seconds after the end of the long pulse waveform.

FREQUENCY HOPPING RADAR WAVEFORM GENERATING SUBSYSTEM

The first 100 frequencies are selected out of the hopping sequence of the randomized 475 hop frequencies. Only a *Burst* that has the frequency falling within the receiver bandwidth of the tested U-NII device is selected among those frequencies. (Frequency-domain simulation). The radar waveform generated at the start time of the selected *Burst* (Time-domain simulation) is download to the Signal Generator. If all of the randomly selected 100 frequencies do not fall within the receiver bandwidth of the U-NII device, the radar waveform is not used for the test.

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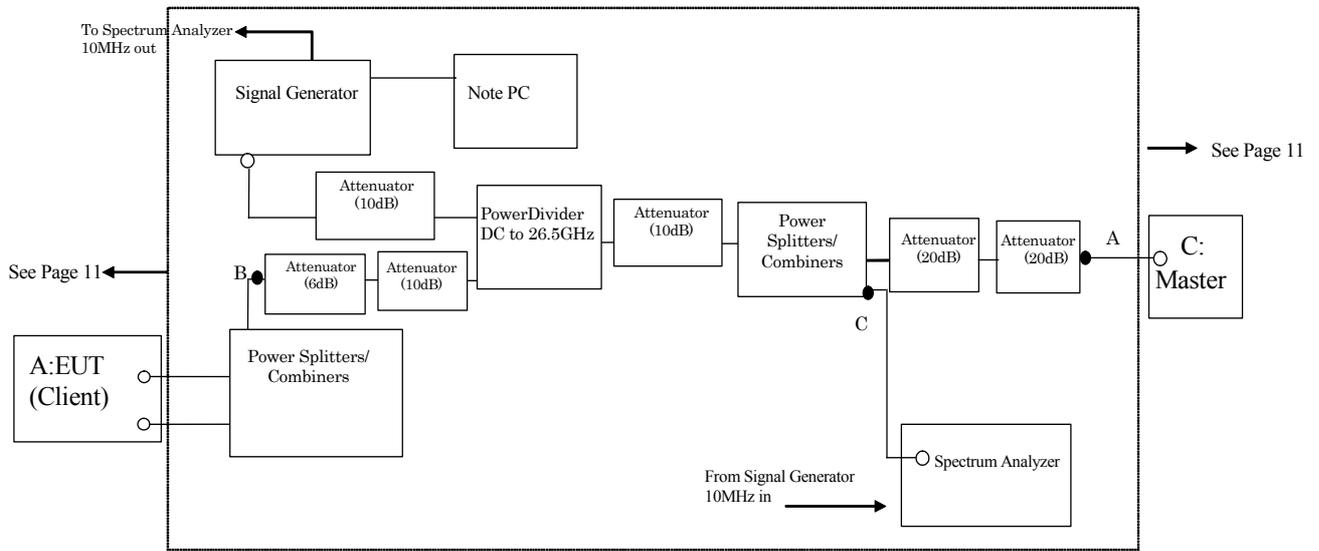
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CONDUCTED METHODS SYSTEM BLOCK DIAGRAM



MEASUREMENT SYSTEM FREQUENCY REFERENCE

Lock the signal generator and the spectrum analyzer to the same reference sources as follows: Connect the 10MHz OUT on the signal generator to the 10MHz IN on the spectrum analyzer and set the spectrum analyzer 10MHz In to On.

SYSTEM CALIBRATION

Step 1: Set the system as shown in Figure 3 of FCC 06-96 7.2.1.

Step 2: Adjust each attenuator to fulfill the following three conditions:

- WLAN can be communicated, and
- Rader detection threshold level is bigger than Client Device traffic level on the spectrum analyzer, and
- Master Device traffic level is not displayed on the spectrum analyzer.

Step 3: Terminate 50 ohm at B and C points, and connect the spectrum analyzer to the point A. (See the figure on page 13)

At the point A, adjust the signal generator and spectrum analyzer to the center frequency of the channel to be measured.

Download the applicable radar waveforms to the signal generator. Select the radar waveform, trigger a burst manually and measure the amplitude on the spectrum analyzer. Readjust the amplitude of the signal generator as required so that the peak level of the waveform is at a displayed level equal to the required or desired interference detection threshold.

Separate signal generator amplitude settings are determined as required for each radar type.

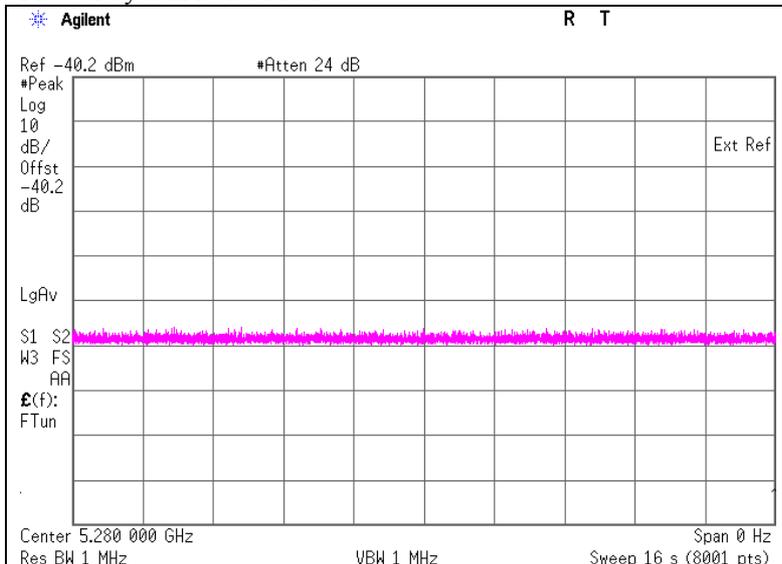
Step 4: Without changing any of the instrument settings, restore the system setting to Step 2 and adjust the Reference Level Offset of the spectrum analyzer to the level at Step 3.

By taking the above steps 1 to 4, the spectrum analyzer displays the level of the signal generator as received at the antenna ports of the Master Device.

See Clause 5.4 for Plots of Noise, Rader Waveforms, and WLAN signals.

5.4 Plots of Noise, Rader Waveforms, and WLAN signals

Plots of System Noise Floor



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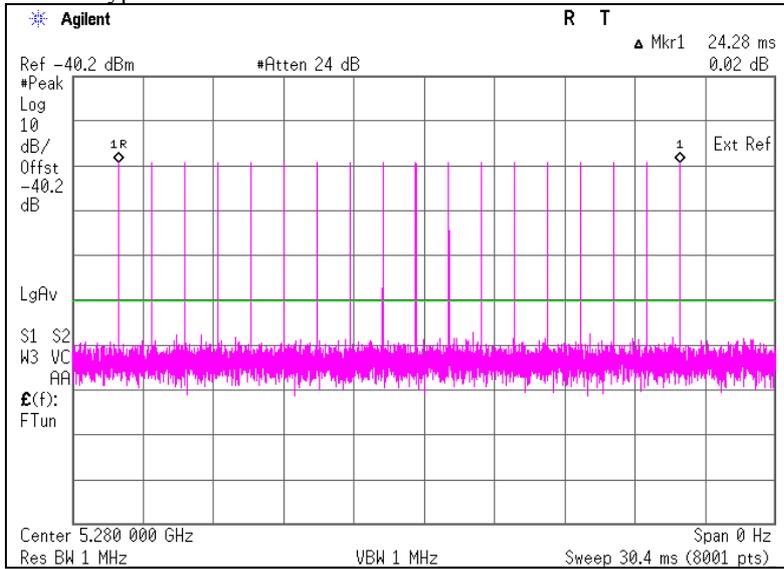
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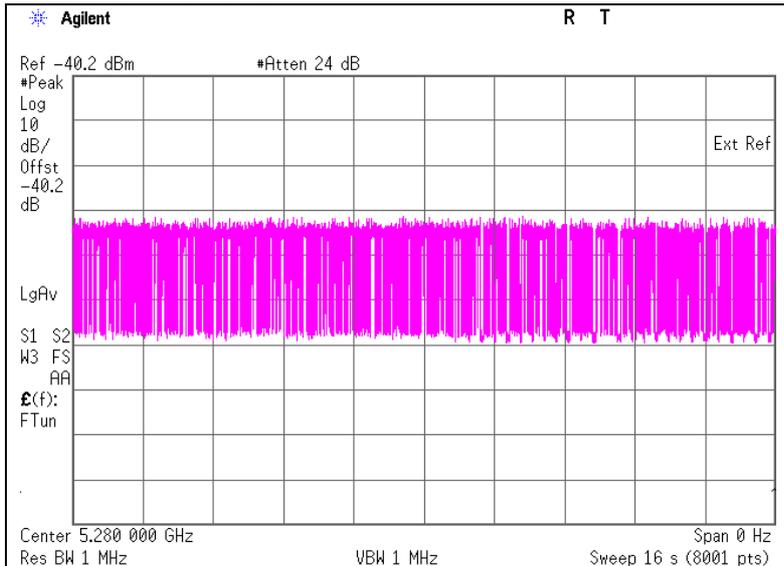
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Plots of Radar Waveforms

Rader Type 1



Plots of WLAN Traffic



SECTION 6: Channel Move Time, Channel Closing Transmission Time

6.1 Operating environment

Test place : No.7 shielded room
Temperature : 24 deg.C
Humidity : 48 % RH

6.2 Test Procedure

Stream the MPEG test file from the Master Device to the Client Device on the test Channel for the entire period of the test.

The Radar Waveform generator sends a Burst of pulses for one of the Short Pulse Radar Types 1-4 at levels defined , on the Operating Channel. An additional 1 dB is added to the radar test signal to ensure it is at or above the DFS Detection Threshold, accounting for equipment variations/errors.

Observe the transmissions of the EUT at the end of the radar Burst on the Operating Channel for duration greater than 10 seconds.

6.3 Test data

| Test Item | Unit | Measurement Time | Limit | Results |
|---------------------------------------|--------|------------------|--------|---------|
| Channel Move Time *1) | [sec] | 0.000 | 10.000 | Pass |
| Channel Closing Transmission Time *2) | [msec] | 0 | 60 | Pass |

*1) Channel Move Time is calculated as follows:

$$(\text{Channel Move Time}) = (\text{End of Transmission}) - (\text{End of Burst})$$

*2) Channel Closing Transmission Time is calculated from (End of Burst + 200msec) to (End of Burst + 10sec)

$$(\text{Channel Closing Transmission Time}) = (\text{Number of analyzer bins showing transmission}) * (\text{dwell time per bin}) \\ = 0 * 2(\text{msec})$$

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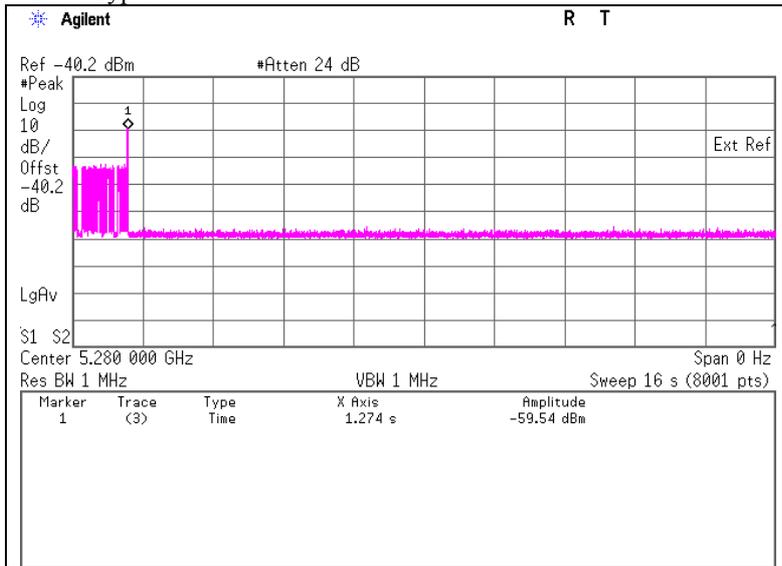
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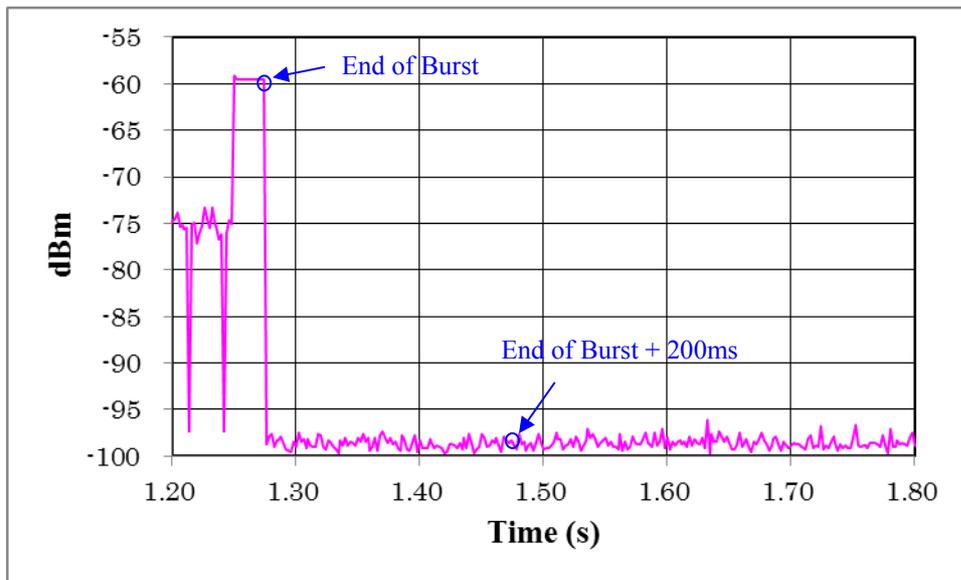
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Radar Type 1



Marker 1 : End of Burst : 1274 ms



6.4 Test result

Test result: Pass

Date : August 23, 2012

Test engineer : Katsunori Okai

SECTION 7: Non-Occupancy Period

7.1 Operating environment

Test place : No.7 shielded room
 Temperature : 24 deg.C
 Humidity : 48 % RH

7.2 Test Procedure

The following two tests are performed:

1). Stream the MPEG test file from the Master Device to the Client Device on the test Channel for the entire period of the test.

The Radar Waveform generator sends a Burst of pulses for one of the Radar Types 1-6 at levels defined on the Operating Channel. An additional 1 dB is added to the radar test signal to ensure it is at or above the DFS Detection Threshold, accounting for equipment variations/errors.

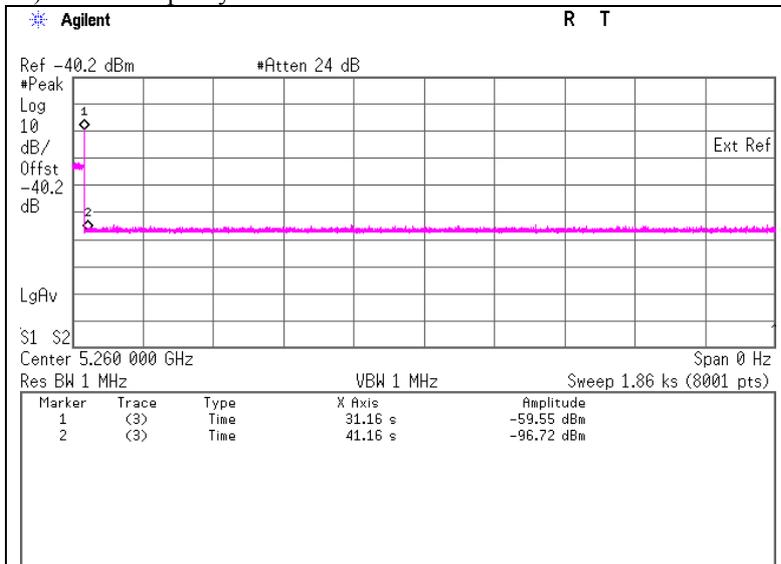
Observe the transmissions of the EUT after the Channel Move Time on the Operating Channel for duration greater than 30 minutes.

2). Stream the MPEG test file from the Master Device to the Client Device on the test Channel for the entire period of the test.

Observe the transmissions of the EUT on the Operating Channel for duration greater than 30 minutes after the Master Device is shut off.

7.3 Test data

1). Non-Occupancy Period



Marker 1 : End of Burst : 31.16 sec

Marker 2 : End of Burst +10sec : 41.16 sec

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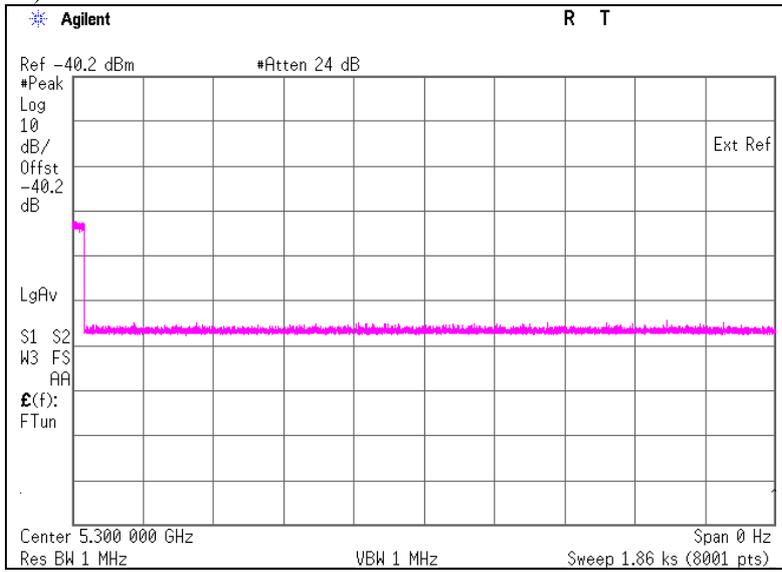
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2).Master is shut off



7.4 Test result

Test result: Pass

Date :August 23, 2012

Test engineer : Katsunori Okai

APPENDIX 1: Test instruments

EMI Test Equipment

| Control No. | Instrument | Manufacturer | Model No | Serial No | Test Item | Calibration Date * Interval(month) |
|--------------|-----------------------------------|--------------------------|----------------------|------------|-----------|---------------------------------------|
| MOS-04 | Digital Humidity Indicator | N.T | NT-1800 | MOS04 | DFS | 2012/02/06 * 12 |
| MSA-10 | Spectrum Analyzer | Agilent | E4448A | MY46180655 | DFS | 2012/02/03 * 12 |
| EST-48 *1) | Signal Generator | Agilent | E4438C | MY45090353 | DFS | 2011/11/09 * 12 |
| MCC-98 | Microwave Cable 1G-40GHz | Schner | SUCOFLEX102 | 30819/2 | DFS | 2012/05/09 * 12 |
| MCC-144 | Microwave Cable | Junkosha | MWX221 | 1207S407 | DFS | 2012/08/03 * 12 |
| MCC-137 | Microwave cable | HUBER+SUHNER | SUCOFLEX 102 | 37954/2 | DFS | 2011/10/28 * 12 |
| MPSC-02 | Power Splitters/Combiners | Mini-Circuit | ZFSC-2-10G | 0127 | DFS | Pre Check |
| MPSC-04 | Power Splitters/Combiners | Mini-Circuit | ZFSC-2-10G | 0326 | DFS | Pre Check |
| MPD-01 | PowerDivider DC to 26.5GHz | Agilent | 11636B | 52258 | DFS | 2012/03/27 * 12 |
| MAT-56 | Attenuator(10dB) | Suhner | 6810.19.A | - | DFS | Pre Check |
| MAT-57 | Attenuator(10dB) | Suhner | 6810.19.A | - | DFS | Pre Check |
| MAT-19 | Attenuator(6dB)(above 1 GHz) | HIROSE ELECTRIC CO.,LTD. | AT-106 | - | DFS | 2012/01/12 * 12 |
| MAT-58 | Attenuator(10dB) | Suhner | 6810.19.A | - | DFS | Pre Check |
| MAT-60 | Attenuator(20dB) | Suhner | 6820.19.A | - | DFS | Pre Check |
| MAT-61 | Attenuator(20dB) | Suhner | 6820.19.A | - | DFS | Pre Check |
| COTS-MDFS-01 | Signal Studio Software for DFS | Agilent | N7620A-101 | 5010-7739 | DFS | - |
| COTS-MDFS-02 | Radar Generating Software for DFS | Agilent | - | - | DFS | - |
| MCC-35 | Microwave Cable | Hirose Electric | U.FL-2LP-066-A-(200) | - | DFS | 2011/09/30 * 12 |
| MCC-36 | Microwave Cable | Hirose Electric | U.FL-2LP-066-A-(200) | - | DFS | 2011/09/30 * 12 |

***1) Signal generator is only used to generate radar test signal, and the wave form is confirmed with spectrum analyzer every time before the test.**

The expiration date of the calibration is the end of the expired month.

All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

DFS: Dynamic Frequency Selection

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