

RF Test Report

Applicant : Safie Inc.

Product Name : Network Camera

Trade Name : Safie

Model Number : SF-UNICAM

Applicable Standard : MIC notification No.88 of 2004, Annex 45
Test Method for 5 GHz Band Wideband Low-power Data
Communications System.
(Item 19-3 of Article 2 Paragraph 1)

Received Date : Mar. 13, 2026

Test Period : Mar. 30, 2026 ~ Apr. 17, 2026

Issued Date : Apr. 29, 2026

Issue by

Eurofins E&E Wireless Taiwan Co., Ltd.
No. 140-1, Changan Street, Bade District,
Taoyuan City, Taiwan (R.O.C)
Tel : +886-3-2710188 / Fax : +886-3-2710190

Note:

1. The test results are valid only for samples provided by customers and under the test conditions described in this report.
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3. The relevant information is provided by customers in this test report. According to the correctness, appropriateness or completeness of the information provided by the customer, if there is any doubt or error in the information which affects the validity of the test results, the laboratory does not take the responsibility.

Revision History

Rev.	Issued Date	Description	Revised by
00	Apr. 29, 2026	Initial Issue	Abby Huang

Verification of Compliance

Applicant : Safie Inc.

Product Name : Network Camera

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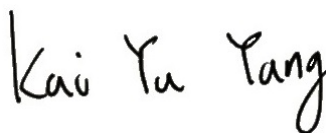
Applicable Standard : MIC notification No.88 of 2004, Annex 45
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Test Result : Complied

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The above equipment has been tested by Eurofins E&E Wireless Taiwan Co., Ltd., and found compliance with the requirements set forth in the 5 GHz band wide-band low-power data communication system (Item 19-3 of Article 2 Paragraph 1) and technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved By :



Kai Yu Yang / RF Supervisor

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1 General Information

1.1. EUT Description

The product specifications of the EUT presented in the report are declared by the manufacturer who shall take full responsibility for the authenticity(except Declared Rated Power , E.I.R.P).

Applicant	Safie Inc. Sumitomo Fudosan Osaki Garden Tower, 1-1-1 Nishi-Shinagawa, Shinagawa-ku, Tokyo, 141-0033 Japan
Product Name	Network Camera
Trade Name	Safie
Model Number	SF-UNICAM
Hardware Version	V1
Software Version	1.0.9.20260213
Antenna Information	Trade Name: LYNwave Technology Ltd Model Number: ALA25F-222AA7-00 Antenna Type: PIFA Antenna Max. Gain: 3.2 dBi
Radio Equipment	Test Method for 5 GHz Band Wideband Low-power Data Communications System
Classification of Specified Radio Equipment	Article 2 Clause 1 Item 19-3
Operate Band	802.11a W52: 5180 MHz – 5240 MHz
	802.11a W53: 5260 MHz – 5320 MHz
	802.11a W56: 5500 MHz – 5700 MHz
	802.11n HT20 / 802.11ac VHT20 / 802.11ax HE20 W52: 5180 MHz – 5240 MHz
	802.11n HT20 / 802.11ac VHT20 / 802.11ax HE20 W53: 5260 MHz – 5320 MHz
	802.11n HT20 / 802.11ac VHT20 / 802.11ax HE20 W56: 5500 MHz – 5720 MHz
	802.11n HT40 / 802.11ac VHT40 / 802.11ax HE40 W52: 5190 MHz – 5230 MHz
	802.11n HT40 / 802.11ac VHT40 / 802.11ax HE40 W53: 5270 MHz – 5310 MHz
	802.11n HT40 / 802.11ac VHT40 / 802.11ax HE40 W56: 5510 MHz – 5710 MHz
	802.11ac VHT80 / 802.11ax HE80 W52: 5210 MHz
	802.11ac VHT80 / 802.11ax HE80 W53: 5290 MHz
	802.11ac VHT80 / 802.11ax HE80 W56: 5530 MHz – 5690 MHz
Modulation Type	OFDM / OFDMA
Type of Emissions	D1D, G1D
Operate Temp. Range	-10 ~ 45 °C
EUT Power Rating	5 VDC, PoE 48 V

Declared Rated Power	802.11a W52	2.85	mW/MHz	4.55	dBm/MHz
	802.11a W53	2.08	mW/MHz	3.18	dBm/MHz
	802.11a W56	2.07	mW/MHz	3.17	dBm/MHz
	802.11ax HE20 W52	2.81	mW/MHz	4.48	dBm/MHz
	802.11ax HE20 W53	1.87	mW/MHz	2.71	dBm/MHz
	802.11ax HE20 W56	1.60	mW/MHz	2.04	dBm/MHz
	802.11ax HE40 W52	1.40	mW/MHz	1.45	dBm/MHz
	802.11ax HE40 W53	1.13	mW/MHz	0.53	dBm/MHz
	802.11ax HE40 W56	1.05	mW/MHz	0.21	dBm/MHz
	802.11ax HE80 W52	0.61	mW/MHz	-2.13	dBm/MHz
	802.11ax HE80 W53	0.54	mW/MHz	-2.67	dBm/MHz
	802.11ax HE80 W56	0.46	mW/MHz	-3.37	dBm/MHz
E.I.R.P	802.11a W52	7.75 dBm/MHz			
	802.11a W53	6.38 dBm/MHz			
	802.11a W56	6.37 dBm/MHz			
	802.11ax HE20 W52	7.68 dBm/MHz			
	802.11ax HE20 W53	5.91 dBm/MHz			
	802.11ax HE20 W56	5.24 dBm/MHz			
	802.11ax HE40 W52	4.65 dBm/MHz			
	802.11ax HE40 W53	3.73 dBm/MHz			
	802.11ax HE40 W56	3.41 dBm/MHz			
	802.11ax HE80 W52	1.07 dBm/MHz			
	802.11ax HE80 W53	0.53 dBm/MHz			
	802.11ax HE80 W56	-0.17 dBm/MHz			

Testing Sample No.	
Test Item	Sample Number
Conducted	C263190_A002

1.2. Testing Location

Lab Name: Eurofins E&E Wireless Taiwan Co., Ltd.
Site Address: ☒ No. 140-1, Changan Street, Bade District, Taoyuan City, Taiwan (R.O.C.)
Site Address: ☐ No. 2, Wuquan 5th Rd. Wugu Dist., New Taipei City, Taiwan (R.O.C.)

1.3. Summary of Test Result

Item	Result	Remark
Frequency Error Measurement	PASS	-----
Occupied Bandwidth	PASS	-----
Antenna Power Error	PASS	-----
Adjacent Channel Leakage Power	PASS	-----
Unwanted Emission Strength	PASS	-----
Secondarily Emitted Radio Wave Strength	PASS	-----
Carrier Sense	PASS	-----
Burst Length of Transmitted Signals	PASS	-----
Interference Prevention Function	PASS	-----

Decision Rule

- ☒ Uncertainty is not included.
☐ Uncertainty is included.

2 Test Methodology

2.1. Mode of Operation

Test Category

Pre-Test Mode	Final-Test Mode
802.11a W52	V
802.11a W53	V
802.11a W56	V
802.11n HT20 W52	
802.11n HT20 W53	
802.11n HT20 W56	
802.11n HT40 W52	
802.11n HT40 W53	
802.11n HT40 W56	
802.11ac VHT20 W52	
802.11ac VHT20 W53	
802.11ac VHT20 W56	
802.11ac VHT40 W52	
802.11ac VHT40 W53	
802.11ac VHT40 W56	
802.11ac VHT80 W52	
802.11ac VHT80 W53	
802.11ac VHT80 W56	
802.11ax HE20 W52	V
802.11ax HE20 W53	V
802.11ax HE20 W56	V
802.11ax HE40 W52	V
802.11ax HE40 W53	V
802.11ax HE40 W56	V
802.11ax HE80 W52	V
802.11ax HE80 W53	V
802.11ax HE80 W56	V

Note 1: Investigation has been done on all the possible configurations for searching the worst cases (HE mode covers HT/VHT mode). The table is a list of the test modes show in this test report.

Items	Description
Operating mode	☐ Master
	☒ Client
	☐ Beamforming
TPC mode	☒ Non-support TPC
	☐ Support TPC

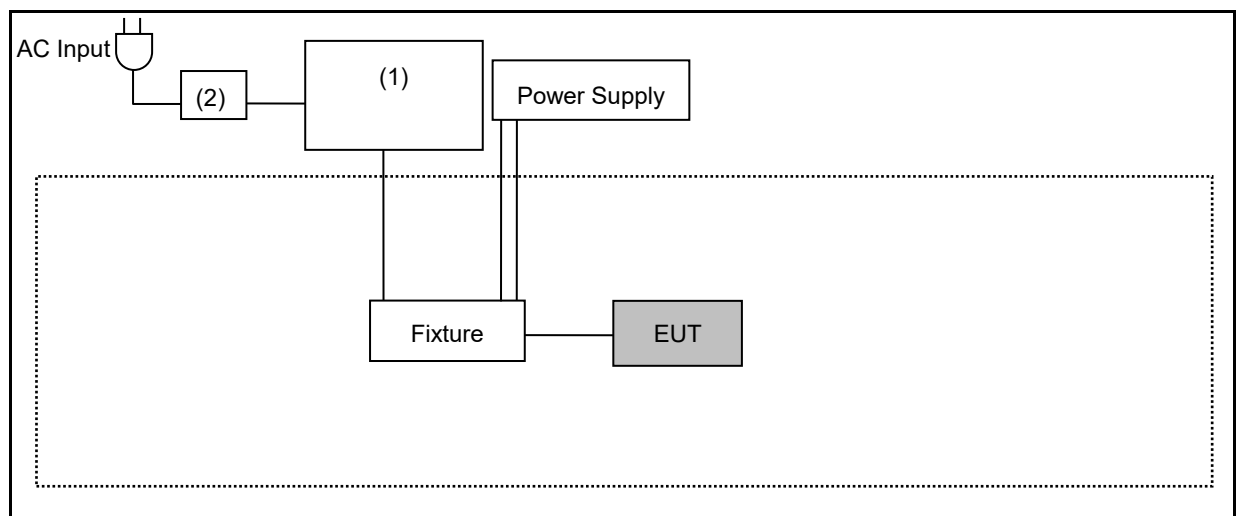
Manufacturer declares that when the normal supply voltage of EUT varies to $\pm 10\%$ extreme voltage, the input voltage of internal RF circuit can be controlled within $\pm 1\%$ range.

Hence, all the rest of test cases were done only with the normal supply voltage.

2.2. EUT Test Step

1.	Setup the EUT shown on "Configuration of Test System Details".
2.	Open Wi-Fi function.
3.	EUT run test program.

2.3. Configuration of Test System Details



Devices Description					
	Product	Manufacturer	Model Number	Serial Number	Power Cord
(1)	Notebook	DELL	LATITUDE E6440	5HZBD72	---
(2)	AC Adapter	DELL	HA65NM130	---	Non-Shielded, 0.8 m

2.4. Test Instruments

For Conducted

Test Period: Mar. 30, 2026 ~ Apr. 17, 2026

Testing Engineer: Peter Shui

Test Site			RF01-BD					
Use	Equipment	Manufacturer	Model Number	Serial Number	Calibration Authority	Cal. Date	Cal. Period	Cal. Method
☒	Power Sensor	Anritsu	MA24208A	2326014	ETC	Nov. 27, 2025	1 year	(C)
☒	Spectrum Analyzer (20 Hz~26.5 GHz)	Agilent	N9020A	US47520902	ETC	Sep. 01, 2025	1 year	(C)
☒	Signal Generator	Keysight	N5182B	MY53052569	ETC	Apr. 18, 2025	1 year	(C)
☒	Signal Generator	Keysight	N5182BX07	MY59360221	ETC	Apr. 18, 2025	1 year	(C)
☒	Digital Power Analyzer	IDRC	CP-268	268711	OCL	Dec. 18, 2025	1 year	(C)
Remark : (a) Calibration conducted by the National Institute of Information and Communications Technology (NICT) in Japan (hereinafter referred to as "NICT") or a designated calibration agency under Article 102-18 paragraph (1) in JRL. (b) Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Act (Act No. 51 of 1992). (c) Calibration conducted in countries except Japan, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1). (d) Calibration, etc. conducted by using measuring instruments and other equipment listed in the right column of appended table No. 3, which shall have been given any type of calibration, etc. listed above from (a) to (c) From JRL Article 24-2, paragraph 4, Item 2								

2.5. Uncertainty of Measured Value

Test Item	Uncertainty	
	BD	WG
Frequency Error	2.6×10^{-7}	2.4×10^{-7}
Occupied Bandwidth	4.4%	4.4%
Antenna Power Error	1.1 dB	1.1 dB
Unwanted Emission Strength	1.0 dB	1.0 dB
Secondarily Emitted Radio Wave Strength	1.0 dB	1.0 dB
Carrier Sense	1.2 dB	1.2 dB
Adjacent Channel Leakage Power	1.0 dB	1.0 dB

2.6. Test Site Environment

Items	Test Item	Required	Interval(*)
Temperature (°C)	Conducted	5-35	20-30
Humidity (%RH)		45-85	45-75

(*)The measurement ambient temperature is within this range.

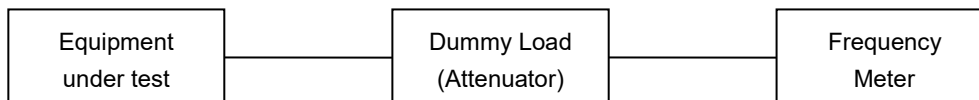
3 Measurement Procedure

3.1. Frequency Error Measurement

■ Limit

Frequency Tolerance: $f \leq 20$ ppm.

■ Test Setup



■ Measuring Equipment Conditions

- (1) Use a frequency counter that has sensitivity of -20 dBm or better or a spectrum analyzer that has synthesized local oscillator.
- (2) Accuracy of the frequency counter shall be one tenth of the tolerance specified for EUT or less(e.g. 5×10^{-6} or less)
- (3) Attenuation of the attenuator shall be adjusted to give the optimum operation input level to the frequency meter in order to avoid the effect from the amplitude fluctuation of measurement wave.
- (4) When measuring burst waves, use the pulse measuring function of the counter and set the gate open time to a value that enables the measurement though entire period of burst as long as possible.

■ Conditions of Equipment under Test

- (1) Set the EUT to the test frequency and transmit RF signal.
- (2) The modulation state is "continuous wave without modulation" by stopping spread spectrum in principle. But, if it is not possible, it shall be "continuous burst wave without modulation".

■ Measuring Operation Procedures

In case of burst waves, the measurement shall be done for enough time(e.g. covering 20 or more of burst waves) in order to obtain the enough measuring accuracy, and the average of the measured values becomes the final value.

3.2. Occupied Bandwidth Measurement

■ Limit

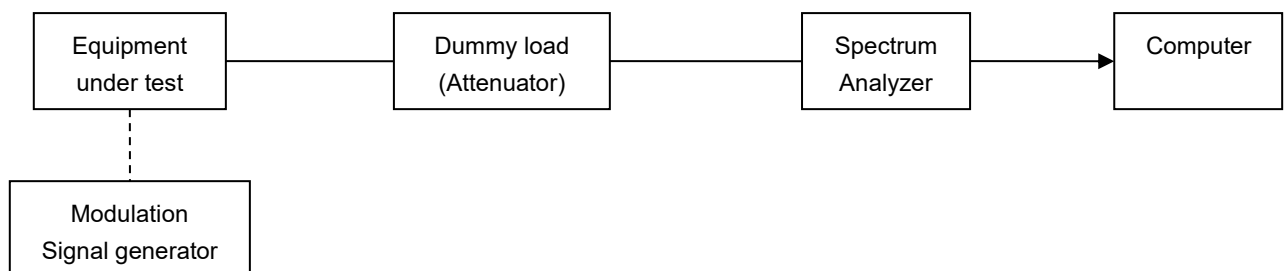
For 5.2 GHz band and 5.3 GHz band:

- Radio equipment using radio waves of 5250 MHz (Only for OFDM system which occupied bandwidth is over 80 MHz)
160 MHz system (OFDM system), Tolerance: Within 160 MHz
- Radio equipment using radio waves of 5210, 5290 MHz (Only for OFDM system which occupied bandwidth is over 40 MHz)
80 MHz system (OFDM system), Tolerance: Within 80 MHz
- Radio equipment using radio waves of 5190, 5230, 5270 or 5310 MHz (Only for OFDM system which occupied bandwidth is over 20MHz)
40 MHz system (OFDM system), Tolerance: Within 40 MHz
- Radio equipment using radio waves of 5180, 5200, 5220, 5240, 5260, 5280, 5300 or 5320 MHz
20 MHz system (OFDM system), Tolerance: Within 20 MHz

For 5.6 GHz band:

- Radio equipment using radio waves of 5570 MHz (Only for OFDM system which occupied bandwidth is over 80 MHz)
160 MHz system (OFDM system), Tolerance: Within 160 MHz
- Radio equipment using radio waves of 5530, 5610 or 5690 MHz (Only for OFDM system which occupied bandwidth is over 40 MHz)
80 MHz system (OFDM system), Tolerance: Within 80 MHz
- Radio equipment using radio waves of 5510, 5550, 5590, 5630, 5670 or 5710 MHz (Only for OFDM system which occupied bandwidth is over 20 MHz)
40 MHz system (OFDM system), Tolerance: Within 40 MHz
- Radio equipment using radio waves of 5500, 5520, 5540, 5560, 5580, 5600, 5620, 5640, 5660, 5680, 5700 or 5720 MHz
20 MHz system (OFDM system), Tolerance: Within 20 MHz

■ Test Setup



■ Measuring Equipment Conditions

(1) Spectrum analyzer shall be follows:

Center frequency:	Test frequency (e.g. 5180 MHz).
Frequency sweep width:	2 to 3.5 times wider than the tolerance (e.g. 40 MHz).
Resolution bandwidth:	3 % or less of the tolerance (e.g. 300 kHz)
Video bandwidth:	Approximately same as the resolution bandwidth.
Y-axis scale:	10 dB/Div.
Input level:	Carrier level shall be enough higher than noise level of the spectrum analyzer.
Sweep time:	Minimum time to ensure the measuring accuracy (In case of burst wave, one burst shall be included in one sample at least.)
Data points:	400 points or more (e.g. 1001 points)
Sweep mode:	Continuous sweep
Number of times for averaging:	10 times or more
Detection mode:	Positive peak
Display mode:	Maximum hold

(2) The values measured by the spectrum analyzer shall be processed by external or built-in computer.

■ Conditions of Equipment under Test

Set the EUT to the test frequency and modulate it with standard coding test signal.

■ Measuring Operation Procedures

- (1) After repeating sweeps until the display shows steady data, store the values at all data points to the array variables of computer.
- (2) Convert the dBm values at all data point to the antilogarithm values on the power dimension.
- (3) Obtain the sum total of the power at all data points, and store it as "Total power".
- (4) Accumulate the power at each data point sequentially upward from the data point for the lowest frequency.
Obtain the limit data point where the accumulated power equals 0.5 % (5% when spread-spectrum bandwidth) of the "total power". Convert this limit data point into frequency, and store it as the "lower limit frequency".
- (5) Accumulate the power at each data point sequentially downward from the data point for the highest frequency.
Obtain the limit data point where the accumulated power equals 0.5 % (5% when spread-spectrum bandwidth) of the "Total power". Convert this limit data point into frequency, and store it as the "Upper limit frequency".

3.3. Antenna Power Error Measurement

■ Limit

For 5.2 GHz band and 5.3 GHz band:

■ Tolerance: Upper limit: +20 %, Lower limit: -80 %

■ Antenna power:

For spread spectrum system using direct sequence spreading: ≤ 10 mW

For orthogonal frequency division multiplexing system:

Occupied bandwidth of 20 MHz or less ≤ 10 mW/MHz

Occupied bandwidth of over 20 MHz to 40 MHz ≤ 5 mW/MHz

Occupied bandwidth of over 40 MHz to 80 MHz ≤ 2.5 mW/MHz

Occupied bandwidth of over 80 MHz to 160 MHz ≤ 1.25 mW/MHz

■ EIRP:

For occupied bandwidth of 20 MHz or less

- a. 5180, 5200, 5220 or 5240 MHz ≤ 10 mW/MHz
- b. 5260, 5280, 5300 or 5320 MHz ≤ 10 mW/MHz (for EUT having a transmission power control function)
- c. 5260, 5280, 5300 or 5320 MHz ≤ 5 mW/MHz (for other EUT than above)

For occupied bandwidth of over 20 MHz to 40 MHz

- a. 5190 or 5230 MHz ≤ 5 mW/MHz
- b. 5270 or 5310 MHz ≤ 5 mW/MHz (for EUT having a transmission power control function)
- c. 5270 or 5310 MHz ≤ 2.5 mW/MHz (for other EUT than above)

For occupied bandwidth of over 40 MHz to 80 MHz

- a. 5210 MHz ≤ 2.5 mW/MHz
- b. 5290 MHz ≤ 2.5 mW/MHz (for EUT having a transmission power control function)
- c. 5290 MHz ≤ 1.25 mW/MHz (for other EUT than above)

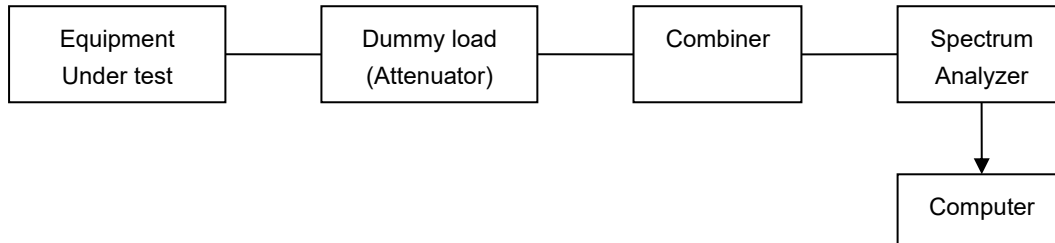
For occupied bandwidth of over 80 MHz to 160 MHz

- a. 5250 MHz ≤ 1.25 mW/MHz (for EUT having a transmission power control function)
- b. 5250 MHz ≤ 0.625 mW/MHz (for other EUT than above)

For 5.6 GHz band:

- Tolerance: Upper limit: +50 %, Lower limit: -50 %
- Antenna power:
 - For spread spectrum system using direct sequence spreading: ≤ 10 mW
 - For orthogonal frequency division multiplexing system:
 - Occupied bandwidth of 20 MHz or less ≤ 10 mW/MHz
 - Occupied bandwidth of over 20 MHz to 40 MHz ≤ 5 mW/MHz
 - Occupied bandwidth of over 40 MHz to 80 MHz ≤ 2.5 mW/MHz
 - Occupied bandwidth of over 80 MHz to 160 MHz ≤ 1.25 mW/MHz
- EIRP:
 - For occupied bandwidth of 20 MHz or less
 - ≤ 50 mW/MHz (for EUT having a transmission power control function)
 - ≤ 25 mW/MHz (for other EUT than above)
 - For occupied bandwidth of over 20 MHz to 40 MHz
 - ≤ 25 mW/MHz (for EUT having a transmission power control function)
 - ≤ 12.5 mW/MHz (for other EUT than above)
 - For occupied bandwidth of over 40 MHz to 80 MHz
 - ≤ 12.5 mW/MHz (for EUT having a transmission power control function)
 - ≤ 6.25 mW/MHz (for other EUT than above)
 - For occupied bandwidth of over 80 MHz to 160 MHz
 - ≤ 6.25 mW/MHz (for EUT having a transmission power control function)
 - ≤ 3.125 mW/MHz (for other EUT than above)

■ Test Setup



Note 1: Connect the power meter directly to the output of the dummy load when it is necessary to measure the total power of EUT other than the direct sequence spread-spectrum system.

Note 2: Use the computer for measuring the spread-spectrum bandwidth.

■ Measuring Equipment Conditions

- (1) Measure the equivalent noise bandwidth of the spectrum analyzer at the resolution bandwidth of 1 MHz to obtain correction coefficient.

If the spread-spectrum bandwidth is under 1 MHz, correct the measure value only when “spread-spectrum bandwidth (MHz) /equivalent noise bandwidth (MHz)” is over 1.

- (2) Attenuation of the attenuator shall be set to provide an optimum input level to the spectrum analyzer.
- (3) Set the spectrum analyzer as follows to search the frequency giving the maximum antenna power:

Center frequency:	The test frequency (e.g. 5180 MHz)
Frequency sweep width:	Approximately twice the occupied bandwidth (e.g. 40 MHz)
Resolution bandwidth:	1 MHz
Video bandwidth:	Approximately 3 times the resolution bandwidth (e.g. 3 MHz)
Y-axis scale:	10 dB/Div.
Sweep time:	Minimum time to ensure the measuring accuracy (In case of burst wave, one burst shall be included per data point).
Trigger condition:	Free run
Data points:	601 points or more (e.g. 1001 points)
Sweep mode:	Continuous sweep
Detection mode:	Positive peak
Indication mode:	Maximum hold

- (4) Set the spectrum analyzer as follows for measuring antenna power. Connect the power meter to the IF output of spectrum analyzer, and calibrate the indication of the power meter to the output value of the EUT.

Center frequency:	Frequency giving the maximum power (searched frequency)
Frequency sweep width:	0 Hz
Resolution bandwidth:	1 MHz
Video bandwidth:	Approximately the same bandwidth as resolution bandwidth
Sweep mode:	Continuous sweep

■ Conditions of Equipment under Test

Set to the test frequency and continuous transmission state or continuing (constant repetition period, constant burst length) burst transmission state.

■ Measuring Operation Procedures

For orthogonal frequency division multiplexing system or spread spectrum system using direct sequence spreading

- (1) Set the spectrum analyzer according to 5.3.(3).
- (2) After repeating sweeping until the spectrum fluctuation is not observed, measure the frequency giving the maximum power per 1 MHz.
- (3) Set the spectrum analyzer to 5.3.(4).
- (4) Connect the power meter to the IF output of the spectrum analyzer.
- (5) Antenna shall be as follows:
 - a. In case of continuous waves: Corrected value from power meter indication according to 5.3.(1).
 - b. In case of burst waves: Calculated value from the corrected value same as for continuous wave and the ratio of transmission time.

If there are sections where data is not transmitted and these signal level is lower than that of section where data is transmitted these sections are regarded as a burst stopping period and these sections shall not be measured.
- (6) When the EUT has plural modulation methods for sub-carriers in orthogonal frequency division multiplexing system, measure antenna power for each modulation method and use the maximum value as the measure value.
- (7) When EUT has plural antenna terminals, conduct above measurement at each terminal.

3.4. Adjacent Channel Leakage Power Measurement

■ Limit

For 5.2 GHz band and 5.3 GHz band:

- For occupied bandwidth of 18 MHz or less:
 - Lower than carrier power by 25 dB or more in ± 9 MHz band at 20 MHz detuning.
 - Lower than carrier power by 40 dB or more in ± 9 MHz band at 40 MHz detuning.
- For occupied bandwidth of over 18 MHz to 20MHz:
 - Lower than carrier power by 25 dB or more in ± 10 MHz band at 20 MHz detuning.
 - Lower than carrier power by 40 dB or more in ± 10 MHz band at 40 MHz detuning.
- For occupied bandwidth of over 20 MHz to 40 MHz:
 - Lower than carrier power by 25 dB or more in ± 20 MHz band at 40 MHz detuning.
 - Lower than carrier power by 40 dB or more in ± 20 MHz band at 80 MHz detuning.
- For occupied bandwidth of over 40 MHz to 80 MHz:
 - Lower than carrier power by 25 dB or more in ± 40 MHz band at 80 MHz detuning.

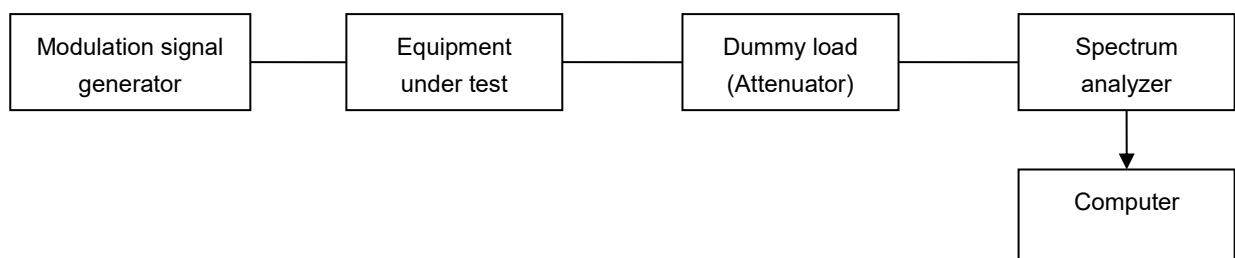
For 5.6 GHz band:

- Other than OFDM system:
 - Lower than carrier power by 25 dB or more in ± 10 MHz band at 20 MHz detuning.
 - Lower than carrier power by 40 dB or more in ± 10 MHz band at 40 MHz detuning.
- OFDM system:

For occupied bandwidth of 20 MHz or less:

 - Lower than carrier power by 25 dB or more in ± 10 MHz band at 20 MHz detuning.
 - Lower than carrier power by 40 dB or more in ± 10 MHz band at 40 MHz detuning.
- For occupied bandwidth of over 20 MHz to 40 MHz:
 - Lower than carrier power by 25 dB or more in ± 20 MHz band at 40 MHz detuning.
 - Lower than carrier power by 40 dB or more in ± 20 MHz band at 80 MHz detuning.
- For occupied bandwidth of over 40 MHz to 80 MHz:
 - Lower than carrier power by 25 dB or more in ± 40 MHz band at 80 MHz detuning.

■ Test Setup



■ **Measuring Equipment Conditions**

- (1) Set the spectrum analyzer as follows to measure adjacent channel leakage power.
- | | |
|---|---|
| Center frequency: | Frequency shown in 7.5 Measuring Operation Procedures. |
| Frequency sweep width: | Frequency width shown in "Note 1" |
| Resolution bandwidth: | 300 kHz |
| Video bandwidth: | 300 kHz |
| Y-axis scale: | 10 dB / div |
| Input level: | A level to obtain maximum dynamic range
(e.g. approximately -10 to -15 dBm carrier level at mixer input) |
| Number of data points: | 400 points or more (e.g. 1001 points) |
| Sweep mode: | Continuous sweep |
| Detection mode: | Sample
However, positive peak for burst wave |
| Number of times for averaging amplitude levels: | Until spectrum fluctuation is not observed
(e.g. approximately 10 times) |

Note 1: Frequency sweep width shall be as follows:

- For 5.2 GHz band and 5.3 GHz band:
 - For occupied bandwidth of 18 MHz or less: 18 MHz
 - For occupied bandwidth of over 18 MHz to 20 MHz: 20 MHz
 - For occupied bandwidth of over 20 MHz to 40 MHz: 40 MHz
 - For occupied bandwidth of over 40 MHz to 80 MHz: 80 MHz
- For 5.6 GHz band:
 - Other than OFDM system: 18 MHz
 - OFDM system:
 - For occupied bandwidth of 20 MHz or less: 20 MHz
 - For occupied bandwidth of over 20 MHz to 40 MHz: 40 MHz
 - For occupied bandwidth of over 40 MHz to 80 MHz: 80 MHz

■ **Conditions of Equipment under Test**

- (1) Set the EUT to EUT to test frequency and modulate it with standard coding test signal.
- (2) Set the EUT to continuous transmission state or continuing (constant repetition period, constant burst length) burst transmission state.

■ Measuring Operation Procedures

- (1) Set the spectrum analyzer according to 7.3(1).
- (2) Measurement of carrier power (P_c)
 - a. Sweep by setting the center frequency to the carrier frequency.
 - b. Store the values at all data points into the computer array variables.
 - c. Convert dB values at all data points into the antilogarithm on the power dimension.
 - d. Calculate sum total of the power t all data points and store it as " P_c ".
- (3) Measurement of upper adjacent channel leakage power (P_u)
 - a. Sweep by setting the center frequency to "carrier frequency +20 MHz or 40 MHz (Note 2)".
 - b. Store the values at all data points into the computer array variables.
 - c. Convert dB values at all data points into antilogarithm on the power dimension.
 - d. Calculate sum total of the power at all data points and store it as " P_u ".
 - e. After sweeping by setting the center frequency to "carrier frequency +40 MHz or 80 MHz (Note 2)", repeat the procedure (b) though (d).
- (4) Measurement of lower adjacent channel leakage power (P_L).
 - a. Sweep by setting the center frequency to "carrier frequency -20 MHz or 40 MHz (Note 2)".
 - b. Store the values at all data points into the computer array variables.
 - c. Convert dB values at all data points into antilogarithm on the power dimension.
 - d. Calculate sum total of the power at all data points and store it as " P_L ".
 - e. After sweeping by setting the center frequency to "carrier frequency -40 MHz or 80 MHz (Note 2)", repeat the procedure (b) though (d).

Note 2:

- For 5.2 GHz band and 5.3 GHz band:
 - For occupied bandwidth of 18 MHz or less: ± 20 MHz, ± 40 MHz
 - For occupied bandwidth of over 18 MHz to 20 MHz: ± 20 MHz, ± 40 MHz
 - For occupied bandwidth of over 20 MHz to 40 MHz: ± 40 MHz, ± 80 MHz
 - For occupied bandwidth of over 40 MHz to 80 MHz: ± 40 MHz, ± 80 MHz
- For 5.6 GHz band:
 - Other than OFDM system: ± 20 MHz, ± 40 MHz
 - OFDM system:
 - For occupied bandwidth of 20 MHz or less: ± 20 MHz, ± 40 MHz
 - For occupied bandwidth of over 20 MHz to 40 MHz: ± 40 MHz, ± 80 MHz
 - For occupied bandwidth of over 40 MHz to 80 MHz: ± 40 MHz, ± 80 MHz

- (5) When EUT has plural antenna terminals, above measurement shall be conducted in the state that the terminals are connected though a combiner besides the measurement at each antenna terminal.

3.5. Unwanted Emission Strength Measurement

■ Limit

A rated value is defined by the E.I.R.P. .

For 5.2 GHz band:

■ 20 MHz system:

When using radio waves of 5180, 5200 or 5240 MHz.

For occupied bandwidth of 18 MHz or less

Reference channel: 5240 MHz

Frequency Band	Unwanted Emission Strength
≤ 5142 MHz	2.5 μ W/MHz or less
5142 to 5150 MHz	15 μ W/MHz or less
5250 to below 5251 MHz	$10^{1-(f-9)}$ mW/MHz or less
5251 to below 5260 MHz	$10^{-1-(8/90)(f-11)}$ mW/MHz or less
5260 to below 5266.7 MHz	$10^{-1.8-(6/50)(f-20)}$ mW/MHz or less
≥ 5266.7 MHz	2.5 μ W/MHz or less

For occupied bandwidth of over 18 MHz to 20 MHz

Reference channel: 5240 MHz

Frequency Band	Unwanted Emission Strength
≤ 5142 MHz	2.5 μ W/MHz or less
5142 to 5150 MHz	15 μ W/MHz or less
5250 to below 5250.2 MHz	$10^{1-(8/3)(f-9.75)}$ mW/MHz or less
5250.2 to below 5251 MHz	$10^{1-(f-9)}$ mW/MHz or less
5251 to below 5260 MHz	$10^{-1-(8/90)(f-11)}$ mW/MHz or less
5260 to below 5266.7 MHz	$10^{-1.8-(6/50)(f-20)}$ mW/MHz or less
≥ 5266.7 MHz	2.5 μ W/MHz or less

■ 40 MHz system:

When using radio waves of 5190 or 5230 MHz.

Reference channel: 5230 MHz

Frequency Band	Unwanted Emission Strength
≤ 5141.6 MHz	2.5 μ W/MHz or less
5141.6 to below 5150 MHz	15 μ W/MHz or less
5250 to below 5251 MHz	$10^{-(f-20) + \log(1/2)}$ mW/MHz or less
5251 to below 5270 MHz	$10^{-(8/190)(f-21)-1 + \log(1/2)}$ mW/MHz or less
5270 to below 5278.4 MHz	$10^{-(3/50)(f-40) - 1.8 + \log(1/2)}$ mW/MHz or less
≥ 5278.4 MHz	2.5 μ W/MHz or less

■ 80 MHz system:

When using radio waves of 5210 MHz.

Reference channel: 5210 MHz

Frequency Band	Unwanted Emission Strength
≤ 5123.2 MHz	2.5 μ W/MHz or less
5123.2 to below 5150 MHz	15 μ W/MHz or less
5250 to below 5251 MHz	$10^{1-(f-40) + \log(1/4)}$ mW/MHz or less
5251 to below 5290 MHz	$10^{-(8/390)(f-41)-1 + \log(1/4)}$ mW/MHz or less
5290 to below 5296.7 MHz	$10^{-(3/100)(f-80) - 1.8 + \log(1/4)}$ mW/MHz or less
≥ 5296.7 MHz	2.5 μ W/MHz or less

For 5.3 GHz band:

■ 20 MHz system:

When using radio waves of 5260, 5280, 5300 or 5320 MHz.

For occupied bandwidth of 18 MHz or less

Reference channel: 5260 MHz

Frequency Band	Unwanted Emission Strength
≤ 5233.3 MHz	2.5 μ W/MHz or less
5233.3 to 5240 MHz	$10^{-1.8-(6/50)(f-20)}$ mW/MHz or less
5240 to 5249 MHz	$10^{-1-(8/90)(f-11)}$ mW/MHz or less
5249 to 5250 MHz	$10^{1-(f-9)}$ mW/MHz or less
≥ 5350 MHz	2.5 μ W/MHz or less

For occupied bandwidth of over 18 MHz to 20 MHz

Reference channel: 5260 MHz

Frequency Band	Unwanted Emission Strength
≤ 5233.3 MHz	2.5 μ W/MHz or less
5233.3 to 5240 MHz	$10^{-1.8-(6/50)(f-20)}$ mW/MHz or less
5240 to 5249 MHz	$10^{-1-(8/90)(f-11)}$ mW/MHz or less
5249 to 5249.8 MHz	$10^{1-(f-9)}$ mW/MHz or less
5249.8 to 5250 MHz	$10^{1-(8/3)(f-9.75)}$ mW/MHz or less
≥ 5350 MHz	2.5 μ W/MHz or less

■ 40 MHz system:

When using radio waves of 5270 or 5310 MHz.

Reference channel: 5270 MHz

Frequency Band	Unwanted Emission Strength
≤ 5221.6 MHz	2.5 μ W/MHz or less
5221.6 to 5230 MHz	$10^{-(3/50)(f-40)-1.8+\log(1/2)}$ mW/MHz or less
5230 to 5249 MHz	$10^{-(8/190)(f-21)-1+\log(1/2)}$ mW/MHz or less
5249 to 5250 MHz	$10^{-(f-20)+\log(1/2)}$ mW/MHz or less
5350 to 5358.4 MHz	15 μ W/MHz or less
≥ 5358.4 MHz	2.5 μ W/MHz or less

■ 80 MHz system:

When using radio waves of 5290 MHz.

Frequency Band	Unwanted Emission Strength
≤ 5203.3 MHz	2.5 μ W/MHz or less
5203.3 to 5210 MHz	$10^{-(3/100)(f-80)-1.8+\log(1/4)}$ mW/MHz or less
5210 to 5249 MHz	$10^{-(8/390)(f-41)-1+\log(1/4)}$ mW/MHz or less
5249 to 5250 MHz	$10^{-(f-40)+\log(1/4)}$ mW/MHz or less
5350 to 5376.8 MHz	15 μ W/MHz or less
≥ 5376.8 MHz	2.5 μ W/MHz or less

For 5.2 GHz + 5.3 GHz band:

■ 160 MHz system:

Frequency Band	Unwanted Emission Strength
≤ 5099.6 MHz	2.5 μ W/MHz or less
5099.6 to 5150 MHz	15 μ W/MHz or less
5350 to 5400.4 MHz	15 μ W/MHz or less
≥ 5400.4 MHz	2.5 μ W/MHz or less

For 5.6 GHz band:

■ 20 MHz system:

When using radio waves of 5500, 5520, 5540, 5560, 5580, 5600, 5620, 5640, 5660, 5680, 5700 or 5720 MHz.

For other than OFDM system

Frequency Band	Unwanted Emission Strength
≤ 5470 MHz	12.5 μ W/MHz or less
≥ 5730 MHz	12.5 μ W/MHz or less

For OFDM system

Frequency Band	Unwanted Emission Strength
≤ 5460 MHz	2.5 μ W/MHz or less
5460 to 5470 MHz	12.5 μ W/MHz or less
5745 to 5765 MHz	12.5 μ W/MHz or less
≥ 5765 MHz	2.5 μ W/MHz or less

■ 40 MHz system:

When using radio waves of 5510, 5550, 5590, 5630, 5670 or 5710 MHz.

Frequency Band	Unwanted Emission Strength
≤ 5460 MHz	12.5 μ W/MHz or less
5460 to 5470 MHz	50 μ W/MHz or less
≥ 5770 MHz	12.5 μ W/MHz or less

■ 80 MHz system:

When using radio waves of 5530, 5610 or 5690 MHz.

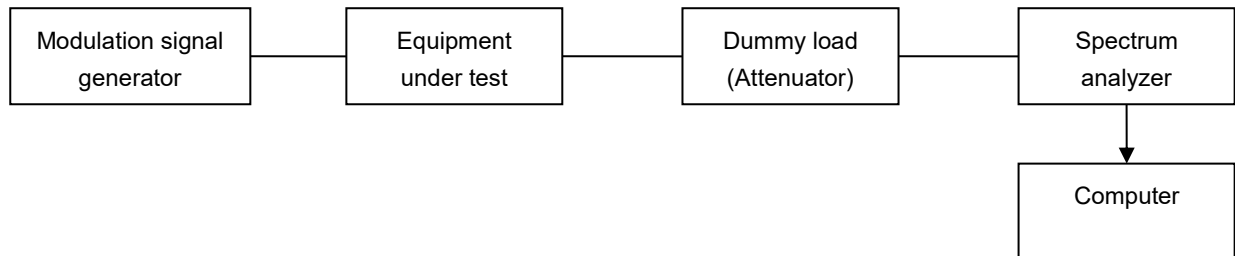
Frequency Band	Unwanted Emission Strength
≤ 5460 MHz	12.5 μ W/MHz or less
5460 to 5469.5 MHz	50 μ W/MHz or less
5469.5 to 5470 MHz	51.2 μ W/MHz or less
≥ 5770 MHz	12.5 μ W/MHz or less

■ 160 MHz system:

When using radio waves of 5570 MHz.

Frequency Band	Unwanted Emission Strength
≤ 5419.6 MHz	12.5 μ W/MHz or less
5419.6 to 5470 MHz	50 μ W/MHz or less
≥ 5725 MHz	12.5 μ W/MHz or less

■ Test Setup



■ Measuring Equipment Conditions

- (1) Set the spectrum analyzer as follows to measure out-band leakage power.

Center frequency:	Frequency of out-band leakage power (searched frequency)
Frequency sweep width:	0 Hz
Resolution bandwidth:	1 MHz
Video bandwidth:	Approximately same as the resolution bandwidth
Sweep time:	Minimum time to ensure the measuring accuracy
Sweep mode:	Continuous sweep
Detection mode:	Sample
Y-axis scale:	10 dB / div.

■ Conditions of Equipment under Test

- (1) Set the EUT to EUT to test frequency and modulate it with standard coding test signal.
- (2) Set the EUT to continuous transmission state or continuing (constant repetition period, constant burst length) burst transmission state.

■ Measuring Operation Procedures

- (1) Set the spectrum analyzer according to 7.3(2).
- (2) Sweep for each frequency sweep width specified in 7.3(2) and obtain the maximum power level in each band. When power levels of the searched leakage power signals comply with the technical requirement, convert the levels into EIRP values and use them as the measured values.
- (3) When a level of a searched signal exceeds the requirement, set the spectrum analyzer in accordance with 8.3(1) and measure the mean power at the frequency giving the maximum level. Convert the mean power into EIRP value and use it as the measured value.
The EIRP (P_{OA}) is calculated from the following expression.

$$P_{OA} = P_A + G_T - L_F \text{ (dBm/MHz)}$$
 where
 P_A : Out-band leakage power measured with a spectrum analyzer (dBm/MHz)
 G_T : Absolute antenna gain at the frequency of out-band leakage power (dBi)
 L_F : Feeder loss etc as the frequency of out-band leakage power (dB)
- (4) When EUT has plural antenna terminals, above measurement shall be conducted in the state that the terminals are connected through a combiner besides the measurement at each antenna terminal.

3.6. Secondly Emitted Radio Wave Strength Measurement

■ **Limit**

Frequency (MHz)	Limit (nW)
Under 1 GHz	≤ 4
1 - 26 GHz	≤ 20

■ **Test Setup**



■ **Measuring Equipment Conditions**

- (1) Set the dummy load attenuation to a range as low as possible (20 dB or less) because of low level measurement.
- (2) Set the spectrum analyzer as follow to search for secondary radiated emissions:
 - Frequency sweep width: (See Note 1.)
 - Resolution bandwidth: 100 kHz for the frequency of below 1 GHz
1 MHz for the frequency of 1 GHz or higher
 - Video bandwidth: Approximately same as the resolution bandwidth.
 - Sweep time: Minimum time to ensuer the measuring accuracy
 - Y-axis scale: 10 dB/Div
 - Number of data points: 400 points or more (e.g. 1001 points)
 - Sweep mode: Single sweep
 - Detection mode: Positive peak

Note 1: Search for secondary radiated emission from a frequency as low as possible to more than 3 times the carrier frequency (from 10 MHz to 16 GHz for exeple).

- (3) Set the spectrum analyzer as follow to measure secondary radiate emission levels:

Center Frequency:	Frequency of secondary radiated emission to br measured (Searched frequency)
Frequency sweep width:	0 MHz
Resolution bandwidth:	100 kHz for the frequency of below 1 GHz 1 MHz for the frequency of 1 GHz or higher
Video bandwidth:	Approximately same as the resolution bandwidth.
Sweep time:	Minimum time to ensuer the measuring accuracy
Y-axis scale:	10 dB/Div
Number of data points:	400 points or more (e.g. 1001 points)
Sweep mode:	Single sweep
Detection mode:	Sample

■ Conditions of Equipment under Test

Set the EUT to enable continuous reception of test frequency during the test.

■ Measuring Operation Procedures

- (1) Set the spectrum analyzer according 9.3(2) and search for the maximum amplitude level of secondary radiate emission by sweeping from a frequency as low as possible to more than 3 times the carrier frequency.
- (2) When amplitude level of the searched emission is lower than the requirements, record the value obtained in (1) as the measured value.
- (3) When the value obtained in (1) is over the requirement, narrow down the frequency sweep width sequentially from 100 MHz up to appromimately 10 times the resolution bandwidth in order ti raise the center frequency accuracy of the spectrum analyzer and read the frequency. Then set the spectrum analyzer according to 9.3(2) and measure the mean power by averaging the levels.
- (4) When the EUT has plural antenna terminals, above measurement shall be conducted at wach terminal.

3.7. Carrier Sense Measurement

■ Limit

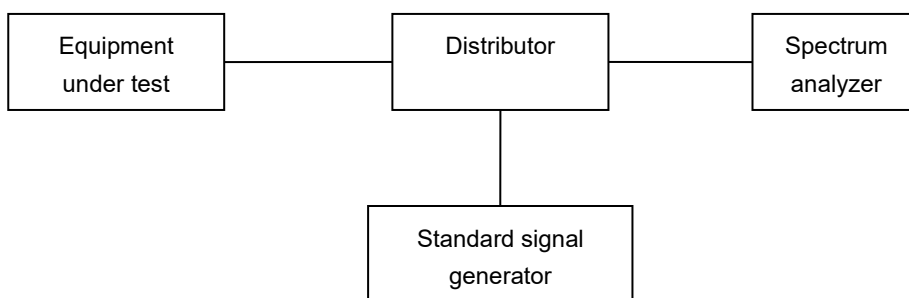
- (1) Carrier sensing function shall be as follows:

When radio equipment receives a radio wave transmitted from a radio station other than the partner station under communications and the field strength at direction of the maximum gain of the reception antenna exceeds 100 mV/m, the radio equipment shall not transmit radio wave at the same frequency as that of the radio channel being used.

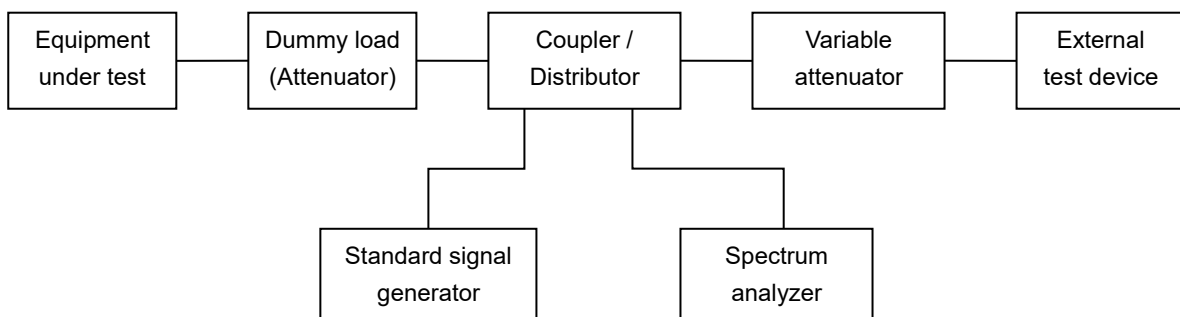
- (2) Radio equipment shall start the transmission after carrier sensing. However the carrier sensing may be omitted in case that its transmission and reception are controlled by the other radio station or radio equipment restarts its transmission within 4 milliseconds after carrier sensing.

■ Test Setup

For the test without external test device



For the test using an external test device



■ Measuring Equipment Conditions

- (1) Set the standard signal generator as follow:

Carrier frequency: Center of reception frequency band of the EUT
Output level: A level giving the field strength of 100 mV/m at antenna input terminal of the EUT.

Note 1: When the carrier sense of the EUT does not function by unmodulated carrier signal at the center frequency, detune the frequency or modulate the carrier as appropriate.

- (2) Set the spectrum analyzer as follow:

Carrier frequency: Center of reception frequency band to be used
Frequency sweep width: 50 MHz
Resolution bandwidth: Approximately 1 MHz
Video bandwidth: Approximately same as the resolution bandwidth.
Y-axis scale: 10 dB/Div
Trigger condition: Free run
Detection mode: Positive peak

- (3) The external test device shall be able to make a line connection with the EUT. Radio equipment that can communicate with the EUT may be used instead of the external test device.

■ Conditions of Equipment under Test

At first, set the EUT to reception state after setting to test frequency and test spreading code. When using an external test device, make a line connection between the EUT and the external test device.

■ Measuring Operation Procedures

For the test without external device:

- (1) Turn off the output of the standard signal generator, set the EUT to transmission state and confirm using the spectrum analyzer that the EUT is transmitting radio wave.
- (2) Set the EUT to reception state.
- (3) Turn on the output of the standard signal generator set the EUT to transmission state and confirm using the spectrum analyzer that the EUT does not transmit radio wave.

For the test using external test device:

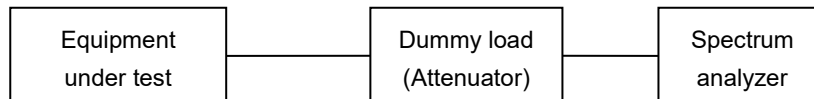
- (1) Turn off the output of the standard signal generator.
- (2) Make a line connection between the EUT and the external test device and confirm using the spectrum analyzer that the EUT is transmitting a test frequency signal.
- (3) Set the EUT to reception state.
- (4) Turn on the output of the standard signal generator, switch the EUT to transmission state and confirm using the spectrum analyzer that the EUT does no transmit radio wave.

3.8. Burst Length of Transmitted Signals Measurement

■ Limit

Tolerance: 8 ms or less

■ Test Setup



■ Measuring Equipment Conditions

Set the spectrum analyzer as follow:

Center frequency:	Test frequency
Resolution sweep width:	0 Hz
Resolution bandwidth:	1 MHz
Video bandwidth:	Approximately same as the resolution bandwidth
Sweep Time:	Minimum time to ensure the measuring accuracy
Y-axis scale:	10 dB/Div
Detection mode:	Positive peak
Trigger condition:	Leading edge off level

■ Conditions of Equipment under Test

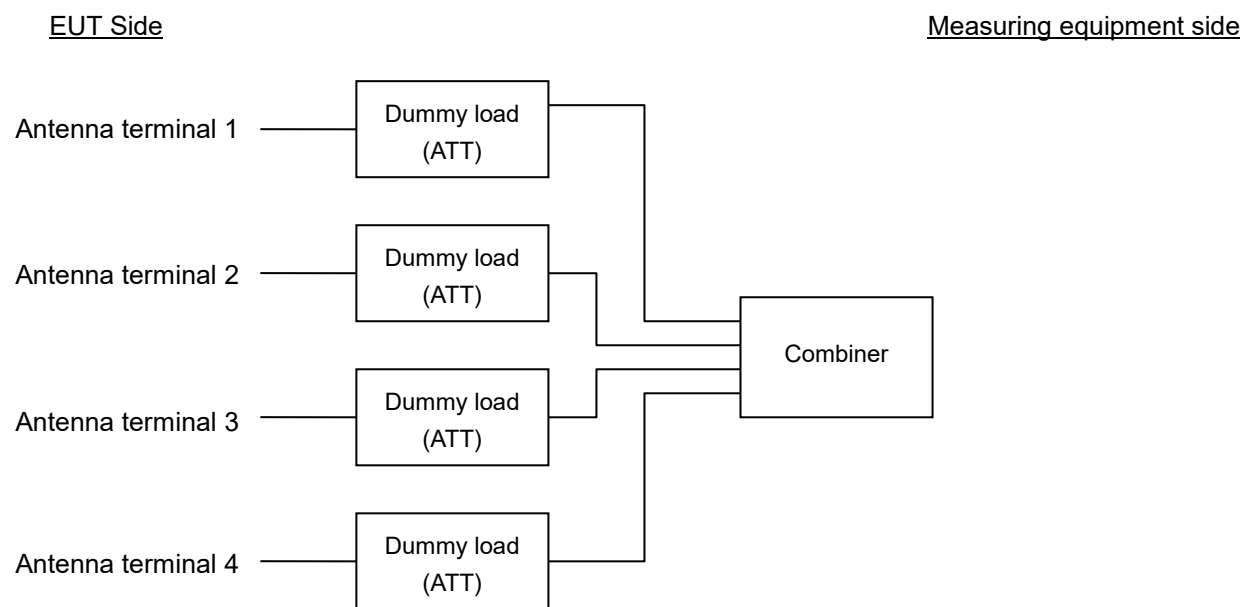
After setting to a test frequency, EUT is set to reception state and then switched to transmission state.

■ Measuring Operation Procedures

- (1) Set the spectrum analyzer according to 11.3. Then set trigger condition to a leading edge trigger and the EUT to transmission state.
- (2) When EUT has plural antenna terminal, combine the output of the antenna terminals referring to 11.6 and measure the time from start of radio wave transmission from an antennas to termination of radio wave transmission from all antennas.

■ Supplementary explanation

When EUT has plural antenna terminal, the measurement shall be conducted by connecting the antenna terminals through a combiner etc. Connection diagram in case of four antenna terminals is as follows:



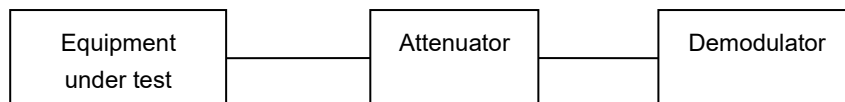
3.9. Interference Prevention Function Measurement

■ Limit

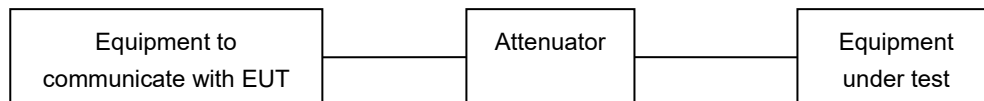
EUT shall have a function of automatic transmission or reception of identification code.

■ Test Setup

- (1) Block diagram for transmitting identification code



- (2) Block diagram for receiving identification code



■ Measuring Equipment Conditions

- (1) The demodulator shall be able to demodulate signals transmitted from the EUT and display description on a received identification code.
- (2) The “equipment to communicate with EUT” shall be able to transmit identification code equivalent to the code transmitted from the EUT.

■ Conditions of Equipment under Test

Set the EUT to normal operation state.

3.10. Construction Protection Confirmation Method

■ Limit

The high-frequency section and modulation section of the radio equipment except for the antenna system shall not be capable of being opened easily.

4 Test Results

Reference Appendix A

■ Antenna List

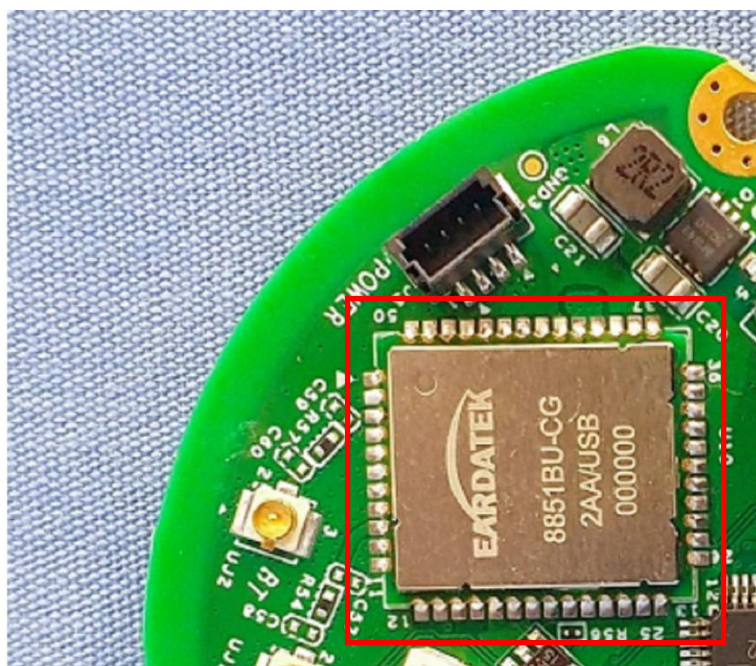
Antenna			Gain Specification			Notes (Cable or Others)	
ANT	Type	Model Name	Max Gain (dBi)		Attenuation (dB)		Net Gain (dBi)
1	PIFA Antenna	ALA25F-222AA7-00	W52	3.2	0	0	Horizontal +Vertical
			W53	3.2			
			W56	3.2			

■ Construction Protection Confirmation Method

Confirmation Method

☐	1. Sealed with special screws (indicate the special screws used in Exterior View Drawings, and also attach its technical drawings of such screws).
☐	2. Plastic chassis is being welded using ultrasonic waves.
☐	3. Chassis is glued using a special adhesive.
☒	4. Metal covers are spot-fused (indicate the fused points in Exterior View Drawings).
☐	5. Cover is specially interlocked (indicate the interlocked part in Exterior View Drawings).
☐	6. Shield case is welded at RF and modulation parts, and ID-ROM is welded using the BGA Method.
☐	7. Shield case is welded at RF and modulation parts, and ID-ROM is glued at its lead with a special adhesive.
☐	8. Shield case is welded at RF and modulation parts, and ID-ROM is glued with a non-transparent laminating agent.
☐	9. Other ()

Photo



■ Test Graphs

Reference Appendix B

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