

RF Test Report

Applicant : Weifang Goertek Electronics Co., Ltd

Product Name : Interactive Device

Model Number : GUQ1Z

Applicable Standard : Notification No.88 of MIC, 2004, Annex 43
2.4 GHz band wide-band low-power data communication system
(Item 19 of Article 2 Paragraph 1)

Received Date : Mar. 26, 2026

Test Period : Apr. 07, 2026 ~ Apr. 09, 2026

Issued Date : Apr. 28, 2026

Issued 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:

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Revision History

Rev.	Issued Date	Description	Revised by
00	Apr. 28, 2026	Initial Issue	Rowan Hsieh

Verification of Compliance

Applicant : Weifang Goertek Electronics Co., Ltd

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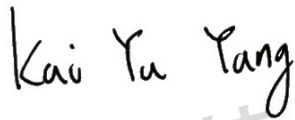
Applicable Standard : Notification No.88 of MIC, 2004, Annex 43
2.4 GHz band wide-band low-power data communication system
(Item 19 of Article 2 Paragraph 1)

Test Result : Complied

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Measurement was conducted by the following test method: The test method of Ordinance Concerning Technical Regulations Conformity Certification etc. of Specified Radio Equipment in Annex 1, the Ministry of Internal Affairs and Communication notification in Annex 43 of Article 88, Paragraph 1 or the test method more than equivalent.

Approved By :



Kai Yu Yang / RF Supervisor

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Appendix A. Test Data

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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).

Applicant	Weifang Goertek Electronics Co., Ltd Gaoxin 2 Road, Free Trade Zone, Weifang, Shandong, 261205, P.R.China		
Product Name	Interactive Device		
Model Number	GUQ1Z		
Antenna Information	Trade Name: GTK Model Number: TFPA08H36920011 Antenna Type: FPC+Cable Antenna Max. Gain: 4.46 dBi		
Radio Equipment	2.4 GHz Band Wide-Band Low-Power Data Communication System		
Classification of Specified Radio Equipment	Article 2 Clause 1 Item 19		
Frequency Band	Bluetooth : 2402 ~ 2480 MHz 2402 ~ 2421 MHz (AFH)		
Modulation Type	GFSK for 1 Mbps		
	$\pi/4$ -DQPSK for 2 Mbps		
	8DPSK for 3 Mbps		
Type of Emissions	GFSK: F1D		
	$\pi/4$ -DQPSK: G1D		
	8DPSK: G1D		
Channel Number	79 Channel 20 Channel (AFH)		
Channel Space	1 MHz		
Identification Code	48 Bits		
Operate Temp. Range	0 ~ +35 °C		
EUT Power Rating	30 W, 20 Vdc, 1.5 A		
Declared Rated Power	Normal mode:		
	GFSK	1.100 mW/MHz	0.414 dBm/MHz
	$\pi/4$ -DQPSK	0.260 mW/MHz	-5.850 dBm/MHz
	8DPSK	0.270 mW/MHz	-5.686 dBm/MHz
	AFH mode:		
	GFSK	1.590 mW/MHz	2.014 dBm/MHz
	$\pi/4$ -DQPSK	1.070 mW/MHz	0.294 dBm/MHz
	8DPSK	1.100 mW/MHz	0.414 dBm/MHz

Testing Sample No.	
Test Item	Sample Number
Conducted	C263352_A003

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	PASS	----
Occupied Bandwidth	PASS	----
Antenna Power (Conducted)	PASS	----
EIRP Power (density)	PASS	----
Unwanted Emission Strength	PASS	----
Secondarily Emitted Radio Wave Strength	PASS	----
Dwell Time	PASS	----
Radio Interference Prevention Capability	PASS	----

Decision Rule

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

2 Test Methodology

2.1. Mode of Operation

Test Category

2.4 GHz Band Wideband Low-Power Data Communication System

Pre-Test Mode	Final-Test Mode
BT_GFSK	V
BT_π/4-DQPSK	
BT_8DPSK	V
BT_GFSK_AFH	V
BT_π/4-DQPSK_AFH	
BT_8DPSK_AFH	V

Note: After verification, all tests were carried out with the worst case test modes. (BT_8DPSK Cover BT_π/4-DQPSK、BT_8DPSK_AFH Cove BT_π/4-DQPSK_AFH)

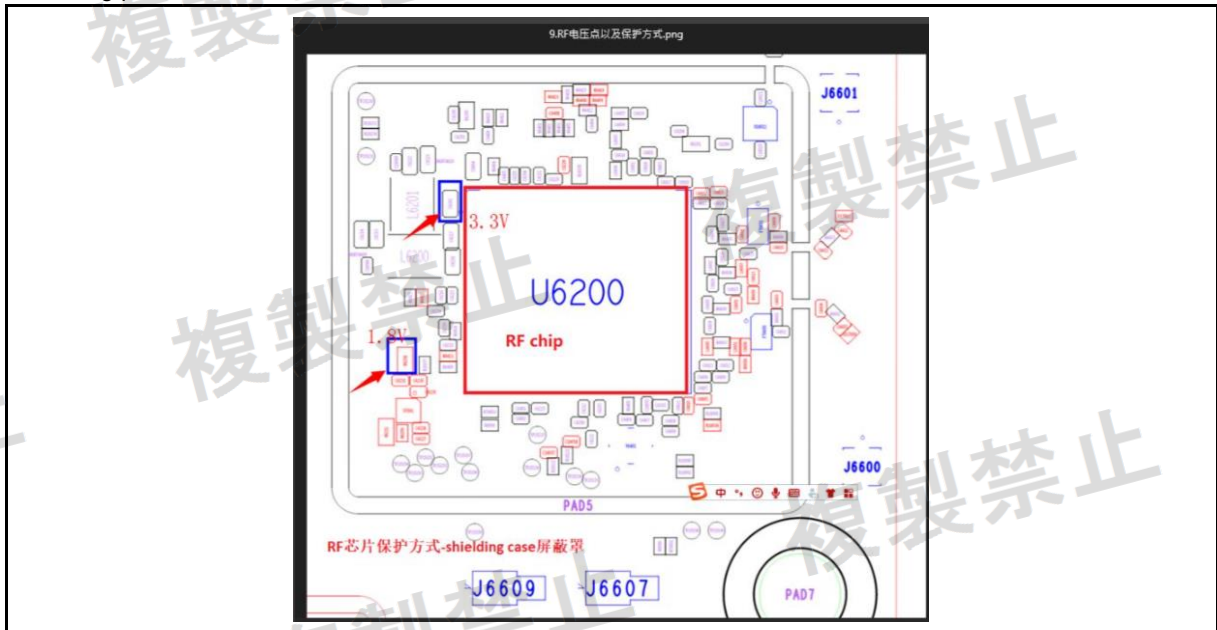
Comprehensive operation test

The normal voltage settings are respectively adopted during the test. Because the voltage error are less than 1 %.

Constant voltage check

EUT and Module Power tables				
EUT Setup Value (Vdc)		Normal	Hight(+10 %)	Low(-10 %)
		20	22	18
Module Vdd Power Measurement Value (Vdc)		Normal	Hight(+10 %)	Low(-10 %)
		3.34	3.34	3.33
Voltage error (%)	Result	Ref. level	0.0000	0.2994
	Limit	---	± 1	
Judgment		---	PASS	PASS

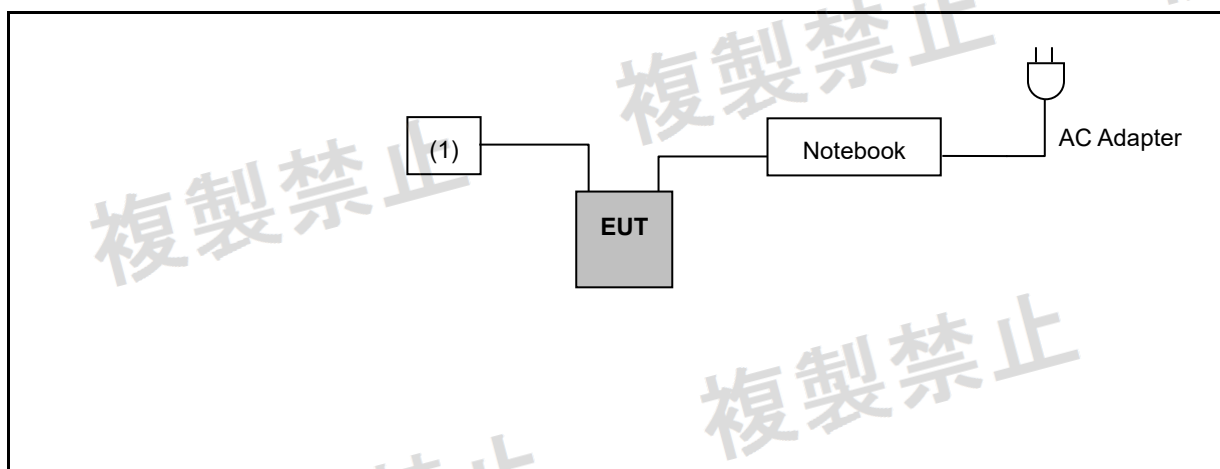
Measuring point



2.2. EUT Test Step

1	Setup the EUT shown on "Configuration of Test System Details".
2	Turn on Bluetooth function.
3	EUT run test program.

2.3. Configuration of Test System Details



Devices Description					
Product		Manufacturer	Model Number	Serial Number	Power Cord
(1)	Adapter	TenPao	G537M	---	---

2.4. Test Instruments

For Conducted

Test Period: Apr. 07, 2026~ Apr. 09, 2026

Testing Engineer: Joanne Tian

Test Site			RF04-WG					
Use	Equipment	Manufacturer	Model Number	Serial Number	Calibration Authority	Cal. Date	Cal. Period	Cal. Method
☒	Spectrum Analyzer (10 Hz~26.5 GHz)	Keysight	N9010B	MY64020105	ETC	Jan. 16, 2026	1 year	(C)
☒	Power Sensor	Anritsu	MA24408A	11998	ETC	Jan. 16, 2026	1 year	(C)
☒	Power Supply	KEITHLEY	2303	4045290	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	4.8×10^{-7}	4.9×10^{-7}
Occupied Bandwidth	4.4%	4.4%
Spread 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

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.

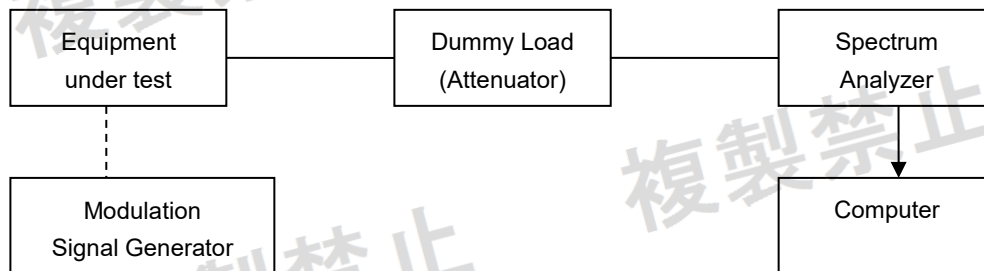
3 Measurement Procedure

3.1. Frequency Error Measurement

■ Limit

Frequency Tolerances ≤ 50 ppm.

■ Test Setup



■ Measuring Equipment Conditions

Spectrum Analyzer Setting

SPAN : 300 kHz

RBW : 1 KH

VBW : 30 kHz

Sweep Time : AUTO (Minimum time to ensure measurement accuracy.)

Data Points : 401 points or more

Sweep Mode : Single Sweep

Detection Mode : Positive Peak

Storage Mode : Normal

Y-axis Scale : 10 dB/Div.

Reference Level : Enough level for maximum dynamic range

■ 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

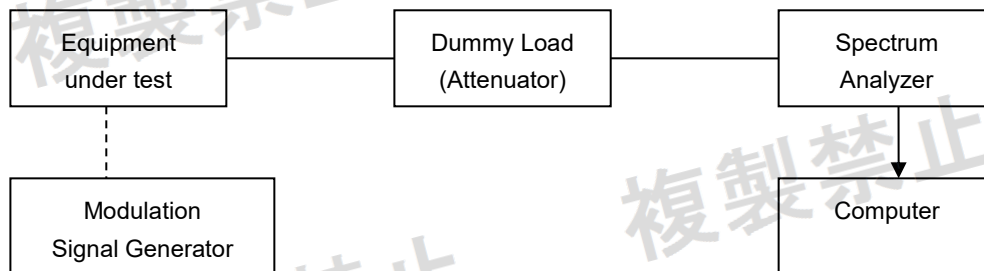
In case of burst waves, the measurement shall be done for enough time (e.g. covering 20 or more of burst waves) in order to obtain the enough measuring accuracy, and the average of the measured values becomes the final value.

3.2. Occupied Bandwidth Measurement

■ Limit

Max. Occupied Bandwidth: 83.5 MHz.

■ Test Setup



■ Measuring Equipment Conditions

Spectrum Analyzer Setting

SPAN : 200 MHz

RBW : 300 kHz

VBW : 300 kHz

Sweep Time : AUTO (Minimum time to ensure measurement accuracy.)

Data Points : 401 points or more

Indication mode : Max hold

Detection Mode : Positive Peak

Storage Mode : Normal

Y-axis Scale : 10 dB/Div.

Reference Level : Enough level for maximum dynamic range

■ Conditions of Equipment under Test

Set to testing frequency and modulate using standard encoding test signals.

■ Measuring Operation Procedures

- (1) Configure the setting of the spectrum analyzer to 3.3(1).
- (2) After repeating sweeps until no display changes are found, import the values of all the data points as array variables of the computer.
- (3) Convert the dB value into the antilog of the power dimension (i.e. mW) for all the data.
- (4) Find the total power of the all the data and record as "Total Power" in mW.
- (5) Add power to the minimum frequency data in order and find the value of the limiting data point that is 0.5 % (5 % in the case of spread bandwidth) of the "Total Power". Convert the limiting point into a frequency and record as the "lower limit" frequency.
- (6) Add power to the maximum frequency data in order and find the value of the limiting data point that is 0.5 % (5 % in the case of spread bandwidth) of the "Total Power". Convert the limiting point into a frequency and record as the "upper limit" frequency.

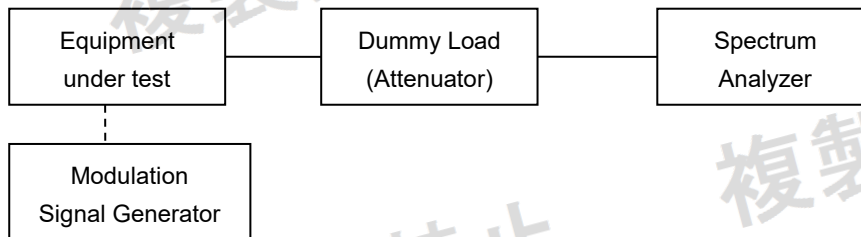
3.3. Antenna Power (Conducted) Measurement

■ Limit

RF Output Power ≤ 3 mW/MHz.

RF Output Power Tolerance ≤ 20 %.

■ Test Setup



■ Measuring Equipment Conditions

- (1) Measure the equivalent noise bandwidth (NWB) of the 1 MHz resolution bandwidth in the set-up as stated above; to be used for correction of the output reading.
Correction = [RBW / NWB]
If the spreading bandwidth is less than 1 MHz, and "spreading bandwidth (MHz) / NWB (MHz)" exceeds 1, the RBW must be reduced.
- (2) Set the attenuation of the attenuator to values that provides acceptable input levels to the spectrum analyzer for optimal functioning (middle of the linear part of the mixer).
- (3) The settings of the spectrum analyzer when searching for frequencies that provide maximum antenna power are as follows:

Center frequency:	Middle frequencies of the applied frequency bands
Frequency sweep width:	50 MHz
Resolution bandwidth:	1 MHz
Video bandwidth:	About 3 times the resolution bandwidth
Y-axis scale:	10 dB/Div.
Sweep time:	Minimum amount of time to ensure measurement accuracy
Trigger condition:	Free run
Data points:	Over 400 points
Sweep mode:	Continuous sweep
Detection mode:	Positive peak
Indication mode:	Maximum hold

- (4) The settings of the spectrum analyzer when measuring antenna power are as follows for the direct spread systems:

Center frequency:	Frequencies providing maximum power density (acquired frequencies during search)
Frequency sweep width:	0 Hz
Resolution bandwidth:	1 MHz
Video bandwidth:	Comparable to resolution bandwidth
Sweep mode:	Continuous sweep

■ Conditions of Equipment under Test

Frequency hopping system or combined systems of direct spread and frequency hopping:

- Connect the high frequency power meter to the output of the attenuator and measure the total power (without bandwidth limitation)
- Divide the total power by the spread bandwidth to find the "average" power per MHz.
- Confirm that frequency distribution of the hopping frequencies is homogeneous according to the supporting data. If frequency distribution of the frequencies is not homogeneous, consider other measurement or correction methods based on the supporting data.
- Set the antenna power as follows:

Continuous waves:	value in b.
Burst waves:	value in b. and value calculated from the average power within bursts from rates of transmission times

3.4. EIRP Power (density) Measurement

■ Limit

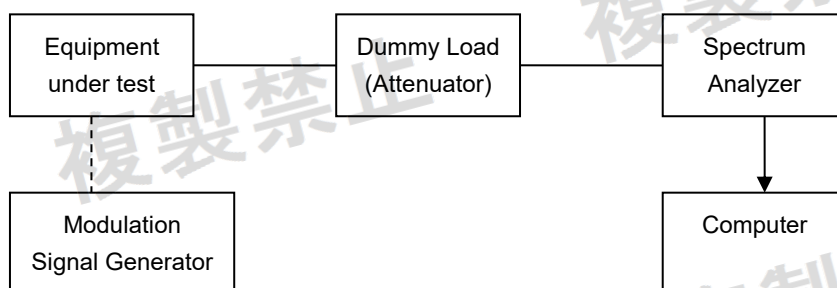
Max. EIRP: 6.91 dBm/MHz

3.5. Unwanted Emission Strength Measurement

■ Limit

Frequency (MHz)	Limit (μW/MHz)
Under 2387 MHz	≤ 2.5
2387-2400 MHz	≤ 25
2483.5-2496.5 MHz	≤ 25
2496.5 - 12.5 GHz	≤ 2.5

■ Test Setup



Note 1: The computer is used for calculating the mean value of amplitude levels.

■ Measuring Equipment Conditions

- (1) The setting of the spectrum analyzer during spurious searches are as follow:

Sweep Bandwidth:	Starts spurious searches from the smallest possible frequencies to more than 5 times the carrier frequencies..
Resolution bandwidth:	1 MHz
Video bandwidth:	1 MHz
Y-axis scale:	10 dB/Div.
Input level:	Maximum dynamic range value
Sweep time:	Minimum amount of time to ensure measurement accuracy.
Sweep mode:	Continuous mode
Data Points:	Over 400 points
Detection mode:	Positive peak
Display mode:	Maximum hold

- (2) The setting of spectrum analyzer while conducting spurious amplitude measurement are as follows:

Center Frequency:	Acquired spurious frequency in (1)
Frequency sweep width:	0 MHz
Resolution bandwidth:	1 MHz
Video bandwidth:	Same as Resolution bandwidth
	Note: take into account that the requirement limits the power in a bandwidth of 1 MHz. If the measurement is carried out with a bandwidth of 100 kHz (for frequencies below 1 GHz), the limit shall be reduced with 10 dB
Y-axis scale:	10 dB/Div
Input level:	Choose input level within the linear range of the SA mixer (so that no additional spurious are generated by the mixer).
Sweep mode:	Minimum amount of time to ensure measurement accuracy.
Data Points:	Over 400 points
Sweep mode:	Single sweep
Detection mode:	Sample (BIN-Width <<RBW, so that all spurious emissions are captured). [BIN-width is the frequency difference between 2 adjacent sample points on the display.]

■ Conditions of Equipment under Test

Set the testing frequency and testing spread codes and modulate using standard encoding test signals. Choose a frequency / channel according to specified range (Low, Middle and High).

Note: If the spurious limit is specified with the EIRP value, the effective (maximum) antenna gain shall be taken into account.

■ Measuring Operation Procedures

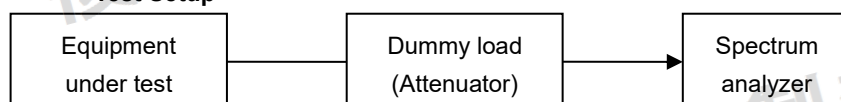
- Configure the settings of the spectrum analyzer to 8.3(1) and search for spurious frequencies by sweeping. Do not conduct the measurements in 8.3(2) if the amplitude value of the acquired spurious frequencies meets the standard value.
- If the acquired spurious amplitude value exceeds the standard value, narrow the sweep Bandwidth, in the order of 100 MHz, 10 MHz, and 1 MHz, to increase the frequency accuracy of the spectrum analyzer and accurately find the spurious frequency. Configure the spectrum analyzer to the settings in 8.3(2), find the average of the spurious amplitude values (in the case of burst waves, the average values are within the respective burst and set this as the measured value. Averaging can be done by summing up the power (display must give the linear power in uW) according to 8.3(2) and dividing by the amount of points. Correction on the equivalent noise bandwidth shall be necessary (if not realized automatically).

3.6. Secondly Emitted Radio Wave Strength Measurement

■ Limit

Frequency (MHz)	Limit (nW)
Under 1 GHz	≤ 4
1 - 12.5 GHz	≤ 20

■ Test Setup



■ Measuring Equipment Conditions

- (1) Set the attenuation of the attenuator to under 20 dB because the subject for measurement is of low level.
- (2) Set the spectrum analyzer as follow:

Frequency sweep width:	See 7.5 Measuring Operation Procedures
Resolution bandwidth:	A value determined by the specified dynamic range and the sweep time. (e.g. 30 kHz for 8 GHz sweep width and 30 second sweep time.)
Video bandwidth:	Approximately the same bandwidth as resolution bandwidth.
Y-axis scale:	10 dB/Div
Input level:	0 dB, if possible.
Sweep mode:	Single sweep
Detection mode:	Positive peak

■ Conditions of Equipment under Test

Set the EUT to receiver the test frequency with forced continuous receiving control.

■ Measuring Operation Procedures

Sweep the spectrum analyzer from a low frequency to a frequency of 3 times if the carrier or over (e.g. 10 MHz to about 8 GHz) and measure the collateral radio emissions.

3.7. Dwell Time Measurement

■ Limit

- (1) Observe the frequency retention time during the observation time T (in seconds) equal to: $T = \text{spreading rate} \times 0.4\text{s}$.
- (2) Select a discrete frequency for monitoring (L, M and H).
- (3) Sum-up the different lengths of the bursts for the selected frequency during the observation time. By definition the sum is equal to the dwell time.
- (4) Repeat the measurement for each different mode and for both the maximum amount of hopping channels and the minimum.

The dwell time shall be less than 0.4 seconds in any situation. For category UV equipment (Model-aircraft) the limit for a single transmission burst is 0.05 seconds.

3.8. Radio Interference Prevention Capability Measurement

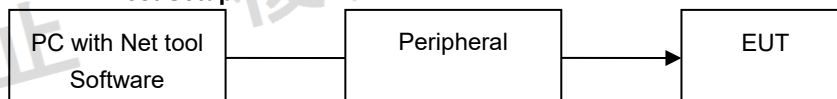
■ Limit

Identification code $\geq$ 48 bits

■ Measuring Id Code Software

MAC IP List: MAC Scan

■ Test Setup



■ Measuring Operation Procedures

1. In the case that the EUT has the function of automatically transmitting the identification code: a. Transmit the predetermined identification codes from EUT. b. Check the transmitted identification codes with the demodulator.
2. In the case of receiving the identification code: a. Transmit the predetermined identification codes from the counterpart. b. Check if communication is normal. c. Transmit the signals other than predetermined ID codes from the counterpart. d. Check if the EUT stops the transmission, or if it displays that identification codes are different from the predetermined ones.

3.9. 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)
No	Type	Model Name	Max Gain (dBi)	Attenuation (dB)	Net Gain (dBi)	
1	FPC+Cable Antenna	TFPA08H36920011	4.46	0	0	Polarization (Horizontal+Vertical)

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

--- END---