TEST REPORT

Applicant:	**Renesas Design Korea Inc.**
Address:	**7th SiliconPark, 35 Pangyo-ro 255 beon-gil Bundang-gu, Seongnam-si, Gyeonggi-do, 13486 Republic of Korea**
Product Name:	**RRQ61051 Module**
Model Name:	**RRQ61051-009, RRQ61051-010**
Type of Equipment:	**Certification Ordinance Article 2, Paragraph 1, Item 19-2**
Test method(s):	**MIC Notice No.88 of 2004, Appendix No.44 (Version: MIC Notice No.409 of 2023)**
Report Number:	**2502Q45198E-RF-07C**
Report Date:	**2025/8/28**

The above device has been tested and found compliant with the requirement of the relevant standards by Bay Area Compliance Laboratories Corp. (Dongguan).

Reviewed By: **Carlos Wu** | **Approved By:** **Rocky Xiao**

Title: **Project Engineer** | Title: **RF Supervisor**

Bay Area Compliance Laboratories Corp. (Dongguan)
No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China

Tel: +86-769-86858888
Fax: +86-769-86858891

www.baclcorp.com.cn

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1.0	2502Q45198E-RF-07C	Original Report	2025/8/28

GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

Product Name:	RRQ61051 Module
Test Model:	RRQ61051-009
Multiple Models:	RRQ61051-010
Model Difference:	Please refer to the DOS
Rated Input Voltage:	1.8~3.6Vdc (Typical:3.3Vdc)
Serial Number:	2YVE-1
EUT Received Date:	2025/2/25
EUT Received Status:	Good

Technical Specification

Accessory Description	Manufacturer	Model	Parameters
/	/	/	/

Technical Specification

Operation Frequency Range (MHz):	2484
Max. RF Output Power (Conducted):	1.8mW/MHz
Number of TX Chain(s):	1
Number of RX Chain(s):	1
Antenna Gain (dBi)▲:	3.3
Modulation Type:	DSSS
Emission Type	G1D

SUMMARY OF TEST RESULTS

SN	Description of Test	Result
1	Frequency Error	Compliant
2	Occupied Bandwidth	Compliant
3	Transmitter Spurious Emission and Unwanted Emission Intensity	Compliant
4	Antenna Output Power and Output Power Tolerance	Compliant
5	Receiver Spurious Emission and Unwanted Emission Intensity	Compliant
6	Interference Prevention Function	Compliant
7	Carrier sensing capability (1)	Compliant
8	Carrier sensing capability (2)	Not Applicable*
9	Correlation signal sensing capability (1)	Compliant
10	Correlation signal sensing capability (2)	Not Applicable*
11	Frequency Hopping Dwell Time	Not Applicable**
12	Construction Protection Confirmation	Compliant

Note:

Not Applicable: Only required for outdoor use radio control of model airplanes.*

*Not Applicable**: Testing is only required for FHSS system devices.*

DESCRIPTION OF TEST CONFIGURATION

Operation Frequency Detail

The system was configured for testing in engineering mode, which was provided by manufacturer. Only one channels are provided as below table:

Channel	Frequency (MHz)
14	**2484**

The extreme voltage test conditions which were declared by the manufacturer and the normal conditions are as below:

NV: Normal Voltage 3.3V_{DC}

LV: Low Voltage 1.8V_{DC}

HV: High Voltage 3.6V_{DC}

The EUT in built a power manage system, power deviation of the RF chipset input is less than 1% when the extreme voltage supplied by measuring the voltage of pin 48 (VDDRF), therefore the test only performed at normal condition. Details as following:

Voltage Condition	Input(V_{AC})	RF System Voltage(V_{DC})
NV	3.3	1.37
LV	1.8	1.37
HV	3.6	1.37

EUT Operation Condition

The EUT was configured for testing in Engineering Mode, which was provided by the manufacturer. The EUT configuration as below:

EUT Exercise Software:	Tera Term VT		
The software was provided by manufacturer. The maximum power was configured as below, that was provided by the manufacturer▲:			
Channel	**Frequency (MHz)**	**Rate (Mbps)**	**Power Level Setting**
14	2484	**1**	10

Equipment Modifications

No modifications are made to the EUT during all test items.

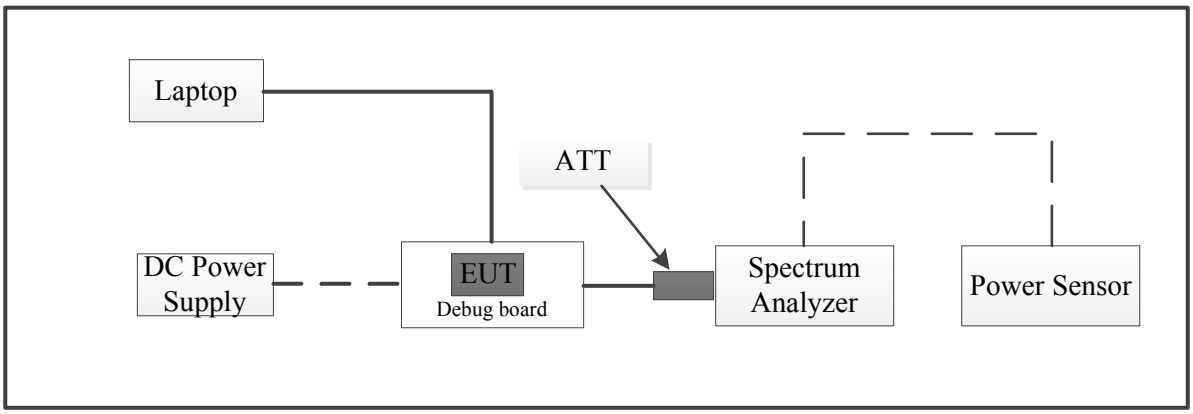
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
All-sun	Multimeter	EM305A	8348897
TDK-Lambda	DC Power Supply	Z+60-14	F-08-EM038-1
Azeyoo	Laptop	AL141U	unknown
unknown	Debug Board	unknown	unknown

Support Cable List and Details

Manufacturer	Shielding Type	Ferrite Core	Length (m)	From Port	To
USB Cable	NO	NO	1.1	Debug Board	Laptop
DC Cable	NO	NO	0.8	EUT	DC Power Supply

Configuration of Test Setup



Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China.

Measurement Uncertainty

Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Parameter	Measurement Uncertainty
Frequency Error	±0,5 ppm
Occupied bandwidth and spreading bandwidth	±5 %
RF output power, conducted	±0.61dB
Unwanted Emissions(TX&RX), conducted	±1.5 dB
Temperature	±1℃
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%

1 - FREQUENCY ERROR

Limit

Within ±50ppm.

Test Procedure

Set the EUT to the measurement frequency without modulation.
Setting of SA is following as: Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: MAX Hold.
Record the peak spot frequency.

If the EUT can`t set at un-modulation mode, measure the 10dBc center frequency.

Test Data

Test Result: Compliant. The details please refer to the Appendix.

2 - OCCUPIED BANDWIDTH AND SPREAD BANDWIDTH

Limit

- Occupied bandwidth: ≤ 26 MHz;
- Spread Bandwidth: ≥ 500 kHz, Spread factor > 10.

Test Procedure

1. Setting of SA is following as: RB: 300 kHz / VB: 300 kHz / SPAN: 40 MHz / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold
2. EUT have transmitted the maximum modulation signal and fixed channelize. SA set to 99% of occupied bandwidth to measure occupied bandwidth.
3. EUT have transmitted the maximum modulation signal and fixed channelize. SA set to 90% of occupied bandwidth to measure spread bandwidth.
4. Spread Factor=Spread Bandwidth/modulation rate. The modulation rate: MR=1.375 for 802.11b.

Test Data

Test Result: Compliant. The details please refer to the Appendix.

3 – TRANSMITTER SPURIOUS EMISSION STRENGTH AND UNWANTED EMISSION INTENSITY

Limit

- f＜1000 MHz: ≤0.25μW/100kHz
- 1000 MHz ≤ f ＜ 2458 MHz; f ＞ 2510 MHz: ≤ 2.5μW/MHz
- 2458 MHz ≤ f ≤ 2471 MHz; 2497 MHz ＜ f ≤ 2510 MHz: ≤ 25μW/MHz

Test Procedure

❖ Conditions of Application Equipment (EUT)

- The modulation state shall be in continuously transmitting mode.

❖ Spectrum Analyzer Conditions

- Setting of SA start 30MHz and stop frequency 1000MHz,RB:100kHz/VB:100kHz,Sweep time: Auto. Sweep mode: continuous sweep .Detect mode: Positive peak/Trace mode: max hold. Then to mark peak. reading value + cable loss shall be less than 0.25μW/100kHz.
- Setting of SA start 1000MHz and stop frequency 2458MHz,RB:1MHz/VB:1MHz,Sweep time: Auto. Sweep mode: continuous sweep .Detect mode: Positive peak/Trace mode: max hold. Then to mark peak. reading value + cable loss shall be less than 2.5μW/MHz.
- Setting of SA start 2458MHz and stop frequency 2471MHz,RB:1MHz/VB:1MHz,Sweep time: Auto. Sweep mode: continuous sweep .Detect mode: Positive peak/Trace mode: max hold. Then to mark peak. reading value + cable loss shall be less than 25μW/MHz.
- Setting of SA start 2497MHz and stop frequency 2510MHz,RB:1MHz/VB:1MHz,Sweep time: Auto. Sweep mode: continuous sweep .Detect mode: Positive peak/Trace mode: max hold. Then to mark peak. reading value + cable loss shall be less than 25μW/MHz.
- Setting of SA start 2510MHz and stop frequency 12500MHz,RB:1MHz/VB:1MHz,Sweep time: Auto. Sweep mode: continuous sweep .Detect mode: Positive peak/Trace mode: max hold. Then to mark peak. reading value + cable loss shall be less than 2.5μW/MHz.

If above test over the limit, the below test procedure should be used:

Step 1:

Center the frequency which was want to investigate, search the peak frequency.

Step 2:
Center frequency: Searched Frequency
Span: 0Hz
RBW: 1MHz(Above 1GHz), VBW: Same as RBW.
Sweep time: Auto(Minimum time to ensure measurement accuracy. *In case of burst wave, one burst shall be included per data point) Data points: 400 points or more. Sweep mode: Single Sweep.
Detection Mode: Sample

Test Data

Test Result: Compliant. The details please refer to the Appendix.

4 - ANTENNA OUTPUT POWER AND ANTENNA POWER TOLERANCE

Limit

Antenna output power:

- ≤ 10 mW/MHz
- The Output Power Tolerance must be within +20% ~ -80%.
- EIRP ≤ 12.14dBm/MHz (other from 2400-2483.5 MHz)

Test Procedure

Step 1:
Use the following settings on the spectrum analyser:

- Centre Frequency: The centre frequency of the channel under test.
- Resolution BW: 1 MHz.
- Video BW: 3MHz.
- Detector mode: Peak.
- Averaging: Off.
- Sweep: Continuous.
- Span: Twice the nominal OBW.

Step 2:
Connect the E.U.T. to the Spectrum Analyzer and switch on the U.U.T.

Step 3:
Adjust the Reference Level of the Spectrum Analyzer so that the peak of the power envelope is between the Reference Level and the Reference Level - 10 dB. This assumes a 10 dB/devision setting is used on the spectrum analyser.

Step 4:
Use the marker to find the peak value of the power envelope.
Adjust the centre frequency of the analyser to the marker frequency, resulting in the peak of the power envelope being in the centre of the screen.

Step 5:
Change the Spectrum Analyzer settings as follows:

- Resolution BW: 1 MHz.
- Video BW: 1 MHz.
- Detector mode: Peak.
- Averaging: Off.
- Sweep: Continuous.
- Span: 0 Hz.

Step 6:
Connect a Power Meter to the "Narrow I.F" output port of the Spectrum Analyzer. The power is set Auto Duty factor.

NOTE: The IF output of the spectrum analyser may be 20 dB or more below the input level of the spectrum analyser. Unless the power meter has adequate sensitivity, a wideband amplifier may be required.

Adjust the Centre Frequency of the spectrum analyser carefully (fine tune) for maximum indication on the power meter.
The level measured by the power meter shall be recorded as level "D".

The maximum e.i.r.p. is calculated from the above measured “D”, and the applicable antenna assembly gain "G" in dBi, according to the formula below. If more than one antenna assembly is intended for this power setting, the gain of the antenna assembly with the highest gain shall be used.

- PD = D + G

The above procedure shall be repeated for each of the frequency channels.

Where the spectrum analyser bandwidth is non-Gaussian, a suitable correction factor shall be determined and applied.

Test Data

Test Result: Compliant. The details please refer to the Appendix.

5 - RECEIVER SPURIOUS EMISSION AND UNWANTED EMISSION INTENSITY

Limit

- ≤ 4 nW (30 MHz ≤ f ≤ 1000 MHz)
- ≤ 20 nW (1 GHz ≤ f ≤ 12.5 GHz)

Test Procedure

❖ Conditions of Application Equipment (EUT)
- The modulation state shall be “continuous receiving mode”.

❖ Spectrum Analyzer Conditions

- Start Frequency: Start Frequency of frequency range to measure (30MHz to 1GHz)
- Stop Frequency: Stop Frequency of frequency range to measure (1GHz to 12.5GHz)
- Span: AUTO (Measurement Range)
- RBW: 100 kHz, VBW: 100 kHz for Frequency < 1 GHz
- RBW: 1MHz, VBW: 1MHz for Frequency > 1 GHz
- Sweep time: AUTO or more
- Sweep mode: Auto Sweep
- Detection: Positive Peak
- Reference Level: Enough level for maximum dynamic range

Test Data

Test Result: Compliant. The details please refer to the Appendix.

6 - INTERFERENCE PREVENTION FUNCTION

Requirement

Article 6-2.3 of Regulations for Enforcement of the radio law

A wireless device used mainly in the same premises to automatically transmit or receive identification codes.

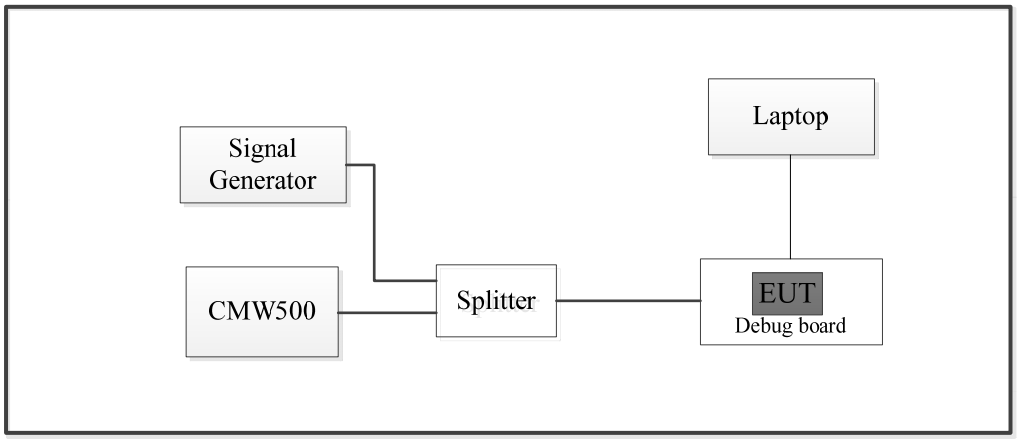
Article 1.8 of MPT Ministerial Notice No. 424 of 1994 (the last revision: Notice No. 374 of Nov. 10, 2023)

48 bits or more. However, for radio of the following frequencies, the requirement is 19 bits or more:

(1), 5150-5250MHz; 5470-5730MHz; 5925-6425MHz;
(2), 24.77-25.23GHz;
(3), 57-66GHz.

Test Procedure

- Measurement System Diagram



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

Test Data

Test Information:

Serial No.:	2YVE-1	**Test Date:**	2025/08/07
Test Site:	RF	**Test Mode:**	Transmitting
Tester:	Cooper Zhou	**Test Result:**	Pass

Environmental Conditions:

Temperature: (°C)	25.9	**Relative Humidity: (%)**	72	**ATM Pressure: (kPa)**	99.7

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date	Calibration Agency	Calibration Method
Mini-Circuits	Coaxial Power Splitters & Combiner	ZFRSC-183-S+	SF448201614	2025/2/25	2026/2/24	BACL(DG)	D
R&S	Wideband Radio Communication Tester	CMW500	149216	2024/9/5	2025/9/4	BACL Metrology	C
All-sun	Multimeter	EM305A	8348897	2024/8/16	2025/8/15	BACL Metrology	C
TDK-Lambda	DC Power Supply	Z+60-14	F-08-EM038-1	N/A	N/A	N/A	N/A
Agilent	MXG Vector Signal Generator	N5182B	MY51350142	2024/8/26	2025/8/25	GRGTEST	C

** Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Note:

A. Calibration conducted by the National Institute of Information and Communications Technology (NICT) (hereinafter referred to as "NICT") or a designated calibration agency under Article 102-18 paragraph (1).

B. Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law (Law No. 51 of 1992).

C. Calibration conducted in foreign countries, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1).

D. Calibration conducted by using measuring instruments and other equipment which shall have been given any of calibration, etc. listed above from a) to c).

Item	Result	Requirement	Verdict
Methodology to transmit ID Code:	Automatically	Automatically	Compliant
Methodology to receive ID Code:	Automatically	Automatically	Compliant
Identification Codes (ID Codes) of EUT:	EC:9F:0D:9F:FF:FE	/	/
Bits of ID Codes:	48 bits	48 bits or more	Compliant

Test Result: Compliant

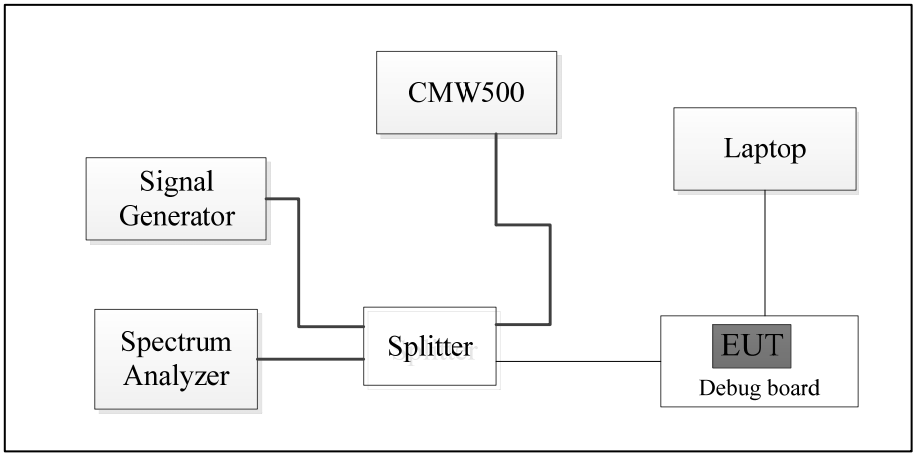
7 – CARRIER SENSING CAPABILITY

Limit

EUT stop RF transmission signal after carrier inject to EUT

Test Procedure

❖ Measurement System Diagram



❖ Test Procedure

1. Setting the SG as following:

- Center frequency: Center frequency of the receiving frequency band
- Modulation: Non-modulation
- Output level: The regulated power level on the antenna input of the EUT.

2. Setting the SA as following:
- Center frequency: Center frequency of the receiving frequency band
- Span: 50MHz
- RB: 1MHz
- VB: Same as RB
- Trigger type: Free-run
- Detector: Peak

3. Set the EUT in receiving state.

4. Test step:
1) The output level of the standard signal generator is set at the input of the receiver of the test equipment to the input level specified in the submitted document.
2) Put the test equipment in the receiving state.
3) Turn on the output of the standard signal generator.
4) Set the test equipment to the transmission operation and confirm with the spectrum analyzer that no radio waves are emitted.
5) Put the test equipment in the receiving state.

6) Turn off the output of the standard signal generator.
7) Set the test equipment to the transmission operation and confirm that the radio wave is emitted with a spectrum analyzer.

Measurement Result

Test Information:

Serial No.:	2YVE-1	**Test Date:**	2025/08/07
Test Site:	RF	**Test Mode:**	Transmitting
Tester:	Cooper Zhou	**Test Result:**	Pass

Environmental Conditions:

Temperature: (°C)	25.9	**Relative Humidity: (%)**	72	**ATM Pressure: (kPa)**	99.7

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date	Calibration Agency	Calibration Method
R&S	Spectrum Analyzer	FSV40	101589	2024/9/5	2025/9/4	BACL Metrology	C
Narda	4-Way Power Divider	4322-4	02355	2025/3/1	2026/2/28	BACL(DG)	D
R&S	Wideband Radio Communication Tester	CMW500	149216	2024/9/5	2025/9/4	BACL Metrology	C
All-sun	Multimeter	EM305A	8348897	2024/8/16	2025/8/15	BACL Metrology	C
TDK-Lambda	DC Power Supply	Z+60-14	F-08-EM038-1	N/A	N/A	N/A	N/A
Agilent	MXG Vector Signal Generator	N5182B	MY51350142	2024/8/26	2025/8/25	GRGTEST	C

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B. Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law (Law No. 51 of 1992).

C. Calibration conducted in foreign countries, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1).

D. Calibration conducted by using measuring instruments and other equipment which shall have been given any of calibration, etc. listed above from a) to c).

Result: Compliant. The EUT stop transmitting in step 4, the test result is good.

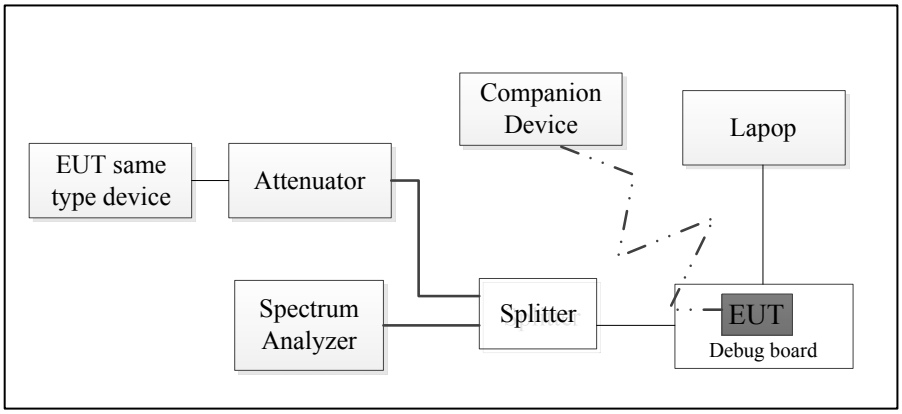
9 – CORRELATION SIGNAL SENSING CAPABILITY

Limit

EUT can recognize the correlation signal.

Test Procedure

❖ Measurement System Diagram



Support Device:

Support Device	Manufacturer	Description	Model	Serial Number
Companion Device	R&S	Wideband Radio Communication Tester	CMW500	149216
EUT same type device	Renesas Design Korea Inc.	RRQ61051 Module	RRQ61051-008	/

❖ Test Procedure

1. Adjust the attenuator that the receiver that can confirm the relevant signal sense operation reliably, and the appropriate value that can distinguish the signal from the EUT same type device as the test device and the signal from the test device according to their level difference.

2. Setting the EUT same type device as following:

- Carrier frequency: Same frequency as the receiving frequency of the test equipment.
- Spreading code: Same diffusion code for the transmission of the test equipment.
- If the output level is variable: Maximum output level
- Others: Store it in a shield box, etc., as necessary.

3. Setting the SA as following:
- Center frequency: Center frequency of the receiving frequency band
- Span: 50MHz
- RB: 1MHz
- VB: Same as RB
- Trigger type: Free-run
- Detector: Peak
- Trace Mode: Max Hold

4. Set the EUT in receiving state.

5. Test step:

1) Turn on the output of the EUT and the EUT same type device.
2) Set the EUT to the transmission operation and confirm with the spectrum analyzer that no radio waves are emitted.
3) Set the EUT in receiving state.
4) Turn off the output of the EUT same type device.
5) Set the EUT to the transmission operation and confirm that the radio wave is emitted with a spectrum analyzer.

Measurement Result

Test Information:

Serial No.:	2YVE-1	**Test Date:**	2025/08/07
Test Site:	RF	**Test Mode:**	Transmitting
Tester:	Cooper Zhou	**Test Result:**	Pass

Environmental Conditions:

Temperature: (°C)	25.9	**Relative Humidity: (%)**	72	**ATM Pressure: (kPa)**	99.7

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date	Calibration Agency	Calibration Method
R&S	Spectrum Analyzer	FSV40	101589	2024/9/5	2025/9/4	BACL Metrology	C
Eastsheep	Coaxial Attenuator	5W-N-JK-6G-10dB	F-08-EM503	2025/6/6	2026/6/5	BACL(DG)	D
Mini-Circuits	Coaxial Power Splitters & Combiner	ZFRSC-183-S+	SF448201614	2025/2/25	2026/2/24	BACL(DG)	D
R&S	Wideband Radio Communication Tester	CMW500	149216	2024/9/5	2025/9/4	BACL Metrology	C
All-sun	Multimeter	EM305A	8348897	2024/8/16	2025/8/15	BACL Metrology	C
TDK-Lambda	DC Power Supply	Z+60-14	F-08-EM038-1	N/A	N/A	N/A	N/A
Agilent	MXG Vector Signal Generator	N5182B	MY51350142	2024/8/26	2025/8/25	GRGTEST	C

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D. Calibration conducted by using measuring instruments and other equipment which shall have been given any of calibration, etc. listed above from a) to c).

Result: Compliant. The EUT stop transmitting in step 2 and transmit in step 5, the test result is good.

12 - CONSTRUCTION PROTECTION CONFIRMATION

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.

Confirmation Method

Compliant, the RF part (Except for antenna) was covered by metal shielding case, it can`t be opened easily. Please refer the EUT photo.

EXHIBIT A – EUT PHOTOGRAPHS

Please refer to the attachment 2502Q45198E-RF-EXP EUT External photos and 2502Q45198E-RF-INP EUT Internal photos.

EXHIBIT B – TEST SETUP PHOTOGRAPHS

Please refer to the attachment 2502Q45198E-RF-TSP Test Setup Photos.

APPENDIX - TEST DATA

Frequency Error

Test Information:

Serial No.:	2YVE-1	**Test Date:**	2025/08/07
Test Site:	RF	**Test Mode:**	Transmitting
Tester:	Cooper Zhou	**Test Result:**	Pass

Environmental Conditions:

Temperature: (°C)	25.9	**Relative Humidity: (%)**	72	**ATM Pressure: (kPa)**	99.7

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date	Calibration Agency	Calibration Method
All-sun	Multimeter	EM305A	8348897	2024/08/16	2025/08/15	BACL Metrology	C
R&S	Spectrum Analyzer	FSV40	101589	2024/09/05	2025/09/04	BACL Metrology	C
Mini-Circuits	Coaxial DC Block	BLK-18-S+	15542	2025/02/28	2026/02/27	BACL(DG)	D
R&S	Coaxial Attenuator	10dB	F-08-EM512	2025/06/13	2026/06/12	BACL(DG)	D
TDK-Lambda	DC Power Supply	Z+60-14	F-08-EM038-1	N/A	N/A	N/A	N/A

** Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

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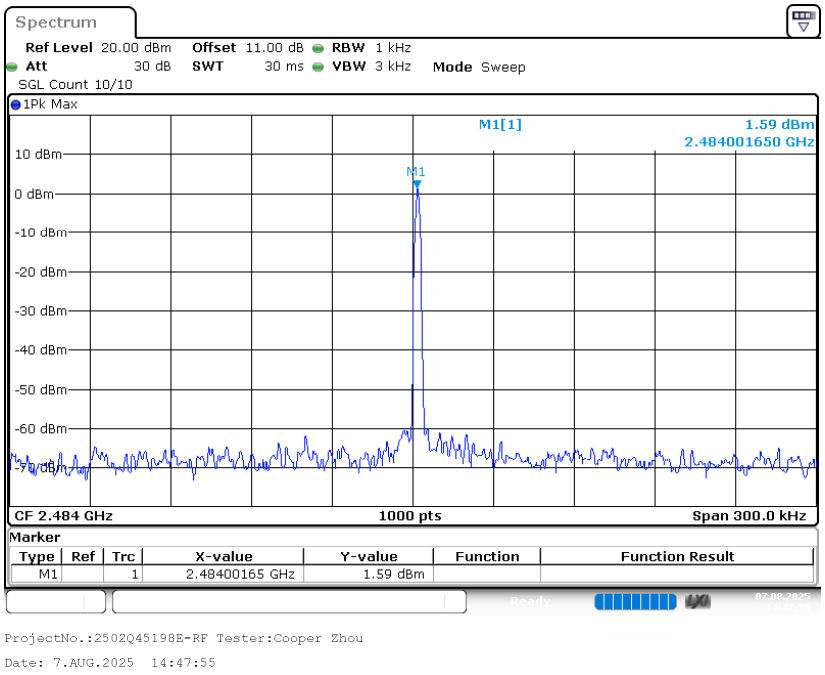
Test Condition: NV

Mode	Frequency (MHz)	Measure Frequency (MHz)	Frequency Tolerance (ppm)	Limit (ppm)	Verdict
Single Carrier	2484	2484.00165	0.66	± 50	Pass

Note:
Frequency Tolerance = (Measure Frequency - Frequency)/Frequency*10^6

Test Condition: NV

2484MHz



Note: Offset = Coaxial Attenuator (10dB) + Cable Loss (1dB)

Occupied Bandwidth and Spreading Bandwidth

Test Information:

Serial No.:	2YVE-1	**Test Date:**	2025/08/07
Test Site:	RF	**Test Mode:**	Transmitting
Tester:	Cooper Zhou	**Test Result:**	Pass

Environmental Conditions:

Temperature: (°C)	25.9	**Relative Humidity: (%)**	72	**ATM Pressure: (kPa)**	99.7

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date	Calibration Agency	Calibration Method
All-sun	Multimeter	EM305A	8348897	2024/08/16	2025/08/15	BACL Metrology	C
R&S	Spectrum Analyzer	FSV40	101589	2024/09/05	2025/09/04	BACL Metrology	C
Mini-Circuits	Coaxial DC Block	BLK-18-S+	15542	2025/02/28	2026/02/27	BACL(DG)	D
R&S	Coaxial Attenuator	10dB	F-08-EM512	2025/06/13	2026/06/12	BACL(DG)	D
TDK-Lambda	DC Power Supply	Z+60-14	F-08-EM038-1	N/A	N/A	N/A	N/A

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Test Condition: NV

Test Items	Measured Result	Limit	Verdict
Occupied bandwidth (MHz)	17.960	<= 26	Pass
Spreading bandwidth (MHz)	14.560	≥ 0.5	Pass
Spreading Factor	10.589	≥ 10	Pass

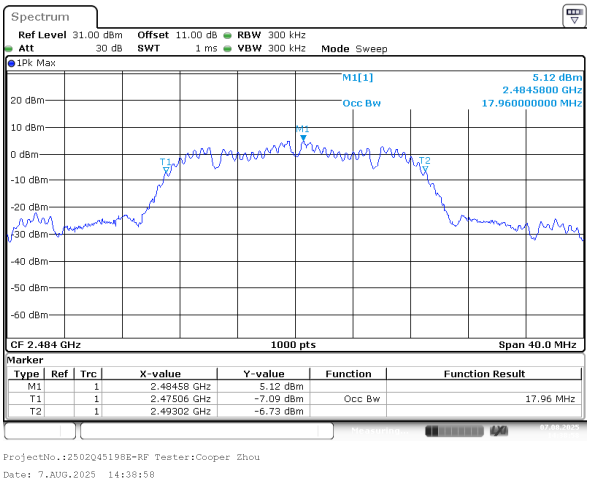
Note1: Spread factor = spread bandwidth/modulation rate

Note2: Modulation rate: 802.11b = 1.375

Test Condition: NV

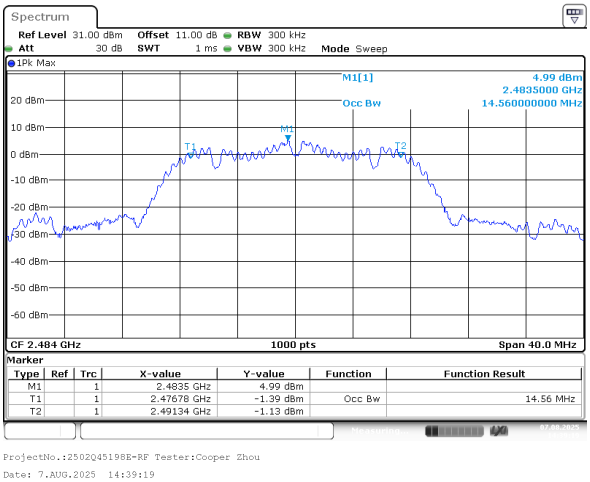
802.11b_2484MHz

Occupied Bandwidth



ProjectNo.:2502Q45198E-RF Tester:Cooper Zhou
Date: 7.AUG.2025 14:38:58

Spreading Bandwidth



ProjectNo.:2502Q45198E-RF Tester:Cooper Zhou
Date: 7.AUG.2025 14:39:19

Note: Offset = Coaxial Attenuator (10dB) + Cable Loss (1dB)

Transmitter Spurious Emission Strength

Test Information:

Serial No.:	2YVE-1	**Test Date:**	2025/08/07~2025/08/26
Test Site:	RF	**Test Mode:**	Transmitting
Tester:	Cooper Zhou	**Test Result:**	Pass

Environmental Conditions:

Temperature: (°C)	26.4~27	**Relative Humidity: (%)**	63~71	**ATM Pressure: (kPa)**	99.9~100.9

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date	Calibration Agency	Calibration Method
All-sun	Multimeter	EM305A	8348897	2024/08/16	2025/08/15	BACL Metrology	C
R&S	Spectrum Analyzer	FSV40	101589	2024/09/05	2025/09/04	BACL Metrology	C
Mini-Circuits	Coaxial DC Block	BLK-18-S+	15542	2025/02/28	2026/02/27	BACL(DG)	D
HUBER+SUHNER	Coaxial Attenuator	6610_SMA-50-1	0064	2025/06/13	2026/06/12	BACL(DG)	D
All-sun	Multimeter	EM305A	8348897	2025/08/15	2026/08/14	BACL Metrology	C
TDK-Lambda	DC Power Supply	Z+60-14	F-08-EM038-1	N/A	N/A	N/A	N/A

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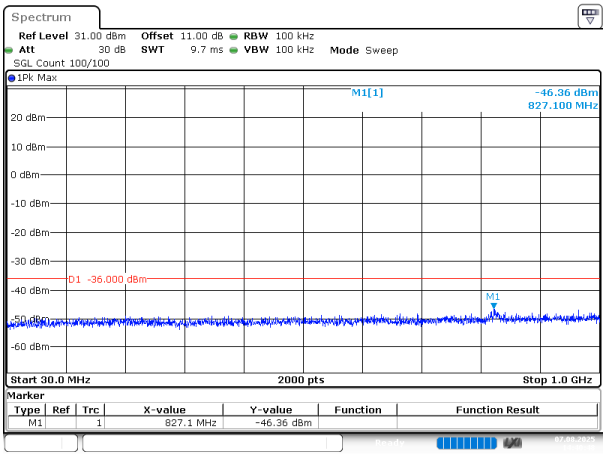
Test Condition: NV

802.11b

Channel	Test Band (RBW)	Frequency Range		Max.Emission Located(MHz)	Result (dBm/RBW)	Result (μW/RBW)	Limit (μW/RBW)	Verdict
		Start (MHz)	Stop (MHz)					
14	Band I (100kHz)	30	1000	827.1	-46.36	0.02	0.25	Pass
	Band II (1MHz)	1000	2458	2173.33	-27.50	1.78	2.50	Pass
	Band III (1MHz)	2458	2471	2470.9318	-17.39	18.24	25	Pass
	Band IV (1MHz)	2497	2510	2497.3478	-17.60	17.38	25	Pass
	Band V (1MHz)	2510	12500	3311.7	-29.00	1.26	2.50	Pass

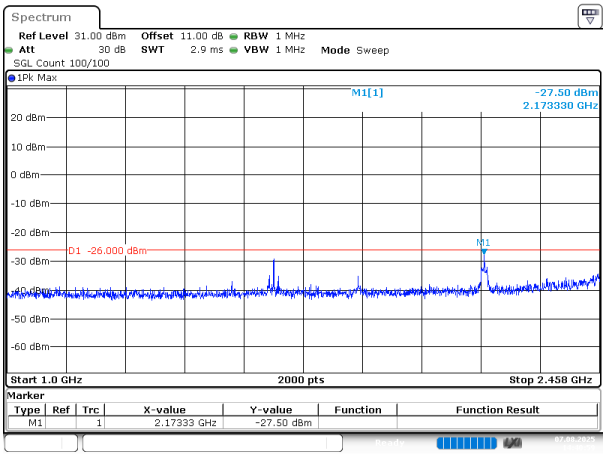
Test Condition: NV

802.11b, Middle Channel(30MHz~1GHz)



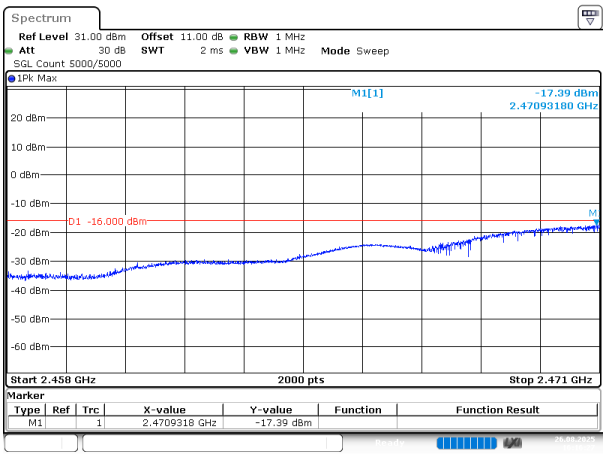
ProjectNo.:2502Q45198E-RF Tester:Cooper Zhou
Date: 7.AUG.2025 14:40:48

802.11b, Middle Channel(1GHz~2.458GHz)



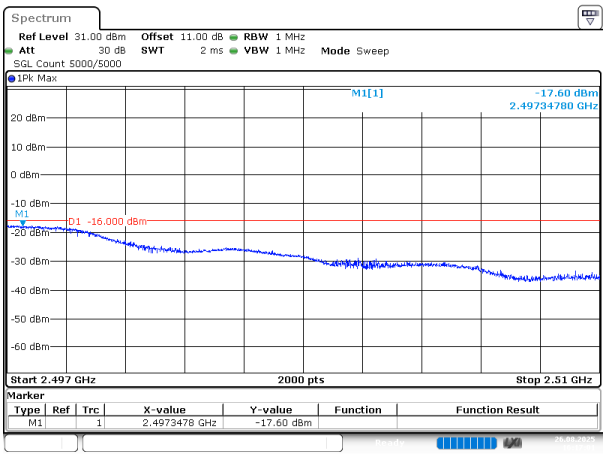
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Date: 7.AUG.2025 14:40:59

802.11b, Middle Channel(2.458GHz~2.471GHz)



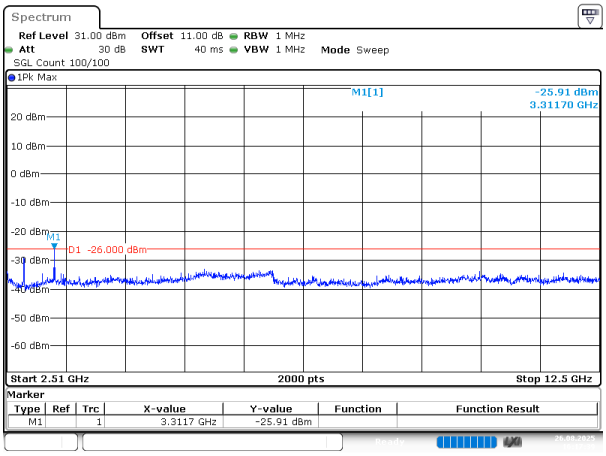
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Date: 26.AUG.2025 16:16:27

802.11b, Middle Channel(2.497GHz~2.51GHz)



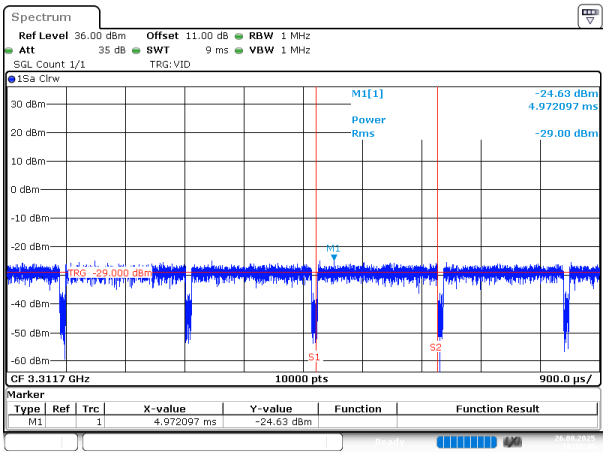
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Date: 26.AUG.2025 16:17:01

802.11b, Middle Channel(2.51GHz~12.5GHz)



ProjectNo.:2502Q45198E-RF Tester:Cooper Zhou
Date: 26.AUG.2025 16:17:40

802.11b, Middle Channel(2.51GHz~12.5GHz)



ProjectNo.:2502Q45198E-RF Tester:Cooper Zhou
Date: 26.AUG.2025 16:18:41

Note:

1. For those unwanted emissions which exceeded the limits in the pre-scan measurements, all of them have already been accurately measured and which all were passed, but only the worst case was showed in report.

2. Note: Offset = Coaxial Attenuator (10dB) + Cable Loss (1dB)

Antenna Output Power and Output Power Tolerance

Test Information:

Serial No.:	2YVE-1	**Test Date:**	2025/08/07
Test Site:	RF	**Test Mode:**	Transmitting
Tester:	Cooper Zhou	**Test Result:**	Pass

Environmental Conditions:

Temperature: (°C)	25.9	**Relative Humidity: (%)**	72	**ATM Pressure: (kPa)**	99.7

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date	Calibration Agency	Calibration Method
All-sun	Multimeter	EM305A	8348897	2024/08/16	2025/08/15	BACL Metrology	C
R&S	Spectrum Analyzer	FSP 38	100478	2024/09/05	2025/09/04	BACL Metrology	C
Mini-Circuits	Coaxial DC Block	BLK-18-S+	15542	2025/02/28	2026/02/27	BACL(DG)	D
Anritsu	Microwave Peak Power Sensor	MA24418A	12618	2025/06/11	2026/06/10	BACL Metrology	C
R&S	Coaxial Attenuator	10dB	F-08-EM512	2025/06/13	2026/06/12	BACL(DG)	D
TDK-Lambda	DC Power Supply	Z+60-14	F-08-EM038-1	N/A	N/A	N/A	N/A

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Test Condition: NV

Mode	Antenna gain (dBi)	Declared power (mW/MHz)
802.11b	3.3	1.8

Mode	Channel	Antenna output power (dBm/MHz)	Antenna output power(mW/MHz)		Antenna output tolerance(%)		EIRP (dBm/MHz)		Verdict
			Result	Limit	Result	Limit	Result	Limit	
802.11b	Middle	2.48	1.770	≤ 10	-1.67	-80~+20	5.78	≤ 12.14	Pass

Note:
Antenna output power (mW/MHz)= 10^[Antenna output power(dBm/MHz) / 10]
Antenna output power tolerance(%) = (Antenna output power - Declared power) / Declared power * 100
EIRP(dBm/MHz) = Antenna output power(dBm/MHz) + Antenna gain.

Receiver Spurious Emission and Unwanted Emission Intensity

Test Information:

Serial No.:	2YVE-1	**Test Date:**	2025/08/08
Test Site:	RF	**Test Mode:**	Transmitting
Tester:	Cooper Zhou	**Test Result:**	Pass

Environmental Conditions:

Temperature: (°C)	26.4	**Relative Humidity: (%)**	71	**ATM Pressure: (kPa)**	99.9

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date	Calibration Agency	Calibration Method
All-sun	Multimeter	EM305A	8348897	2024/08/16	2025/08/15	BACL Metrology	C
R&S	Spectrum Analyzer	FSV40	101589	2024/09/05	2025/09/04	BACL Metrology	C
Mini-Circuits	Coaxial DC Block	BLK-18-S+	15542	2025/02/28	2026/02/27	BACL(DG)	D
R&S	Coaxial Attenuator	10dB	F-08-EM512	2025/06/13	2026/06/12	BACL(DG)	D
TDK-Lambda	DC Power Supply	Z+60-14	F-08-EM038-1	N/A	N/A	N/A	N/A

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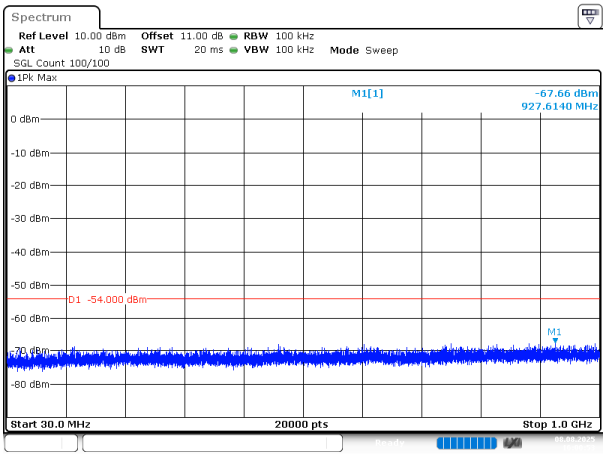
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Test Condition: NV

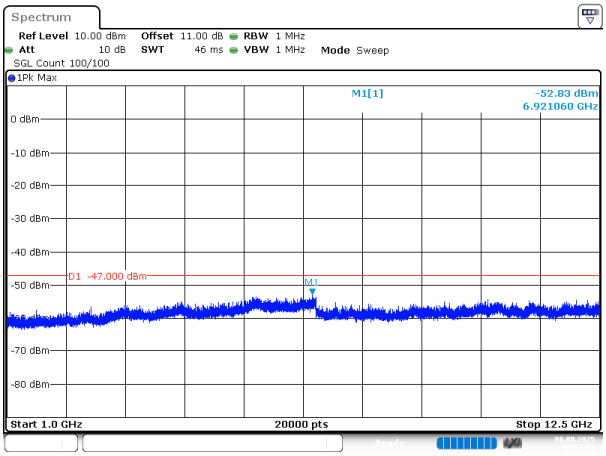
Mode	Channel	Test Band (RBW)	Frequency Range		Max.Emission Located(MHz)	Result (dBm)	Result (nW)	Limit (nW)	Verdict
			Start(MHz)	Stop(MHz)					
802.11b	Middle	Band I (100kHz)	30	1000	927.614	-67.66	0.17	4	Pass
		Band II (1MHz)	1000	12500	6921.06	-52.83	5.21	20	Pass

Test Condition: NV

802.11b, Middle Channel(30MHz~1GHz)



802.11b, Middle Channel(1GHz~12.5GHz)



******END OF REPORT******