FCC 47 CFR Part 90

TEST REPORT

For

Corning Optical Communication LLC

840 N McCarthy Blvd Milpitas California United States

FCC ID: OJFE62-N3-7UF

Report Type:	Product Name:
Original Report	Remote Unit

Report Number:	RKSA240125001-00C
Report Date:	2024-05-07
Reviewed By:	Bard Liu
Approved By:	Oscar Ye
Prepared By:	Bay Area Compliance Laboratories Corp. (Kunshan) No.248 Chenghu Road, Kunshan, Jiangsu Province, China Tel: +86-512-86175000 Fax: +86-512-88934268 www.baclcorp.com.cn

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REPORT REVISION HISTORY

Number of Revisions	Report No.	Version	Issue Date	Description
0	RKSA240125001-00B	R1V1	2024-05-07	Initial Release

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

Applicant/Manufacturer:	Corning Optical Communication LLC
Tested Model:	E62-N3
Product Name:	Remote Unit
Power Supply:	DC 48V
Operating Frequency Band:	Downlink: 746-757 MHz(TX) Uplink: 776-787 MHz（RX）
Input Signal:	GSM, WCDMA, LTE, NR
Maximun Channel Bandwidth:	10MHz
MIMO Type:	Support 2*2 MIMO
★Maximum Antenna Gain:	3.0 dBi

Note:
1. The operating frequency range and maximum antenna gain is declared by the manufacturer and BACL (Kunshan) is not responsible for their accuracy.
2. For Uplink, the EUT only receives and then outputs information from the optical fiber.

All measurement and test data in this report was gathered from production sample serial number: RKSA240125001-1 (Assigned by BACL (Kunshan). The EUT supplied by the applicant was received on 2024-01-25).

1.2 Objective

This report is prepared for *Corning Optical Communication LLC* in accordance with in accordance with Part 2 and Part 90 of the Federal Communication Commissions rules.

1.3 Submittal(s)/Grant(s)

No related submittal(s)/grant(s).

1.4 Test Facility

Location of Testing:

The emissions tests described herein were performed at the test facility of Bay Area Compliance Laboratories Corp. (Kunshan) which is located on the No.248 Chenghu Road, Kunshan, Jiangsu Province, China.

Qualification authorization information:

Bay Area Compliance Laboratories Corp. (Kunshan) is accredited in accordance with ISO/IEC 17025:2017 by NVLAP (Lab code: 600338-0), and the lab has been recognized as the FCC accredited lab under the KDB 974614 D01, the FCC Designation No. : CN5055.

1.5 Test Methodology

All tests and measurements indicated in this document were performed in accordance with FCC 47 CFR Part 90 – Private Land Mobile Radio Services, and KDB 935210 D05 Indus Booster Basic Meas v01r04 – Measurement Guidance for Industrial and Non-consumer Signal Booster, Repeater, and Amplifier Devices.

Applicable Standard: ANSI C63.26-2015 – American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services, and KDB 935210 D02 Signal Boosters Certification v04r02 – SIGNAL BOOSTERS BASIC CERTIFICATION REQUIREMENTS.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Kunshan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

1.6 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the product as specified in CISPR 16-4-2. This uncertainty represents expanded uncertainty expressed at 95.45% confidence level using a coverage factor of k=2.
If U_{lab} is less than or equal to U_{cispr}, then: – compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit.

$$u_c(y) = \sqrt{\sum_i c_i^2 \; u^2(x_i)}$$

Items		Uncertainty (U_{lab})
Radiated Emissions	30MHz~1GHz	4.61dB
	1GHz~6GHz	4.52dB
	6GHz~18GHz	5.39dB
Occupied Channel Bandwidth		±5%
Input/Output Power and amplifier Gain		±1.5dB
Unwanted Emission, Conducted		±1.5dB
Intermodulation		±1.5dB
Noise Figure Measurements		±1.5dB
Temperature		1.0℃
Humidity		5%

2. SYSTEM TEST CONFIGURATION

2.1 Description of Test Configuration

The EUT was configured for testing in an engineering mode which was provided by the manufacturer.

ANSI C63.26, Clause 5.1.2:
Measurements of transmitters shall be performed and, if required, reported for each frequency band in which the EUT can be operated with the device transmitting at the number of frequencies in each band specified in table below.

Frequency range over which EUT operates	Number of frequencies	Location in frequency range of operation
1 MHz or less	1	Middle
1 MHz to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle, and 1 near bottom

Notes: "near" means as close as possible to or at the centre / low end / high end of the frequency range over which the device operates.

2.2 Equipment Software

No software was used to test.

2.3 Special Accessories

No special accessory was used.

2.4 Equipment Modifications

No modifications were made to the EUT.

2.5 Support Equipment List and Details

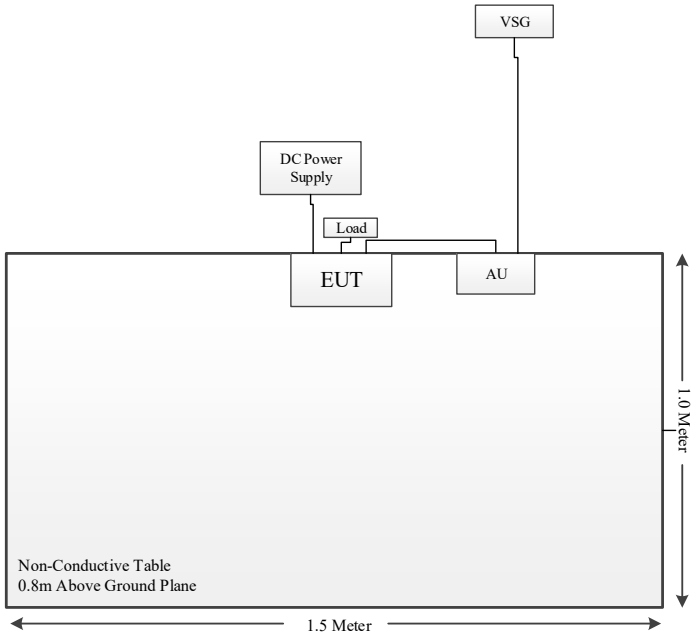
Manufacturer	Description	Model	Serial Number
Corning	Access Unit	E63-A3	KSCR2305000877AT
MAISHENG	DC Power Supply	MP3005D	2020121996
Keysight	Vector Signal Generator	N5182B	MY53051592
LUCAS WEINSCHEL	High Power Load	33-10-33	AW5737

2.6 External I/O Cable

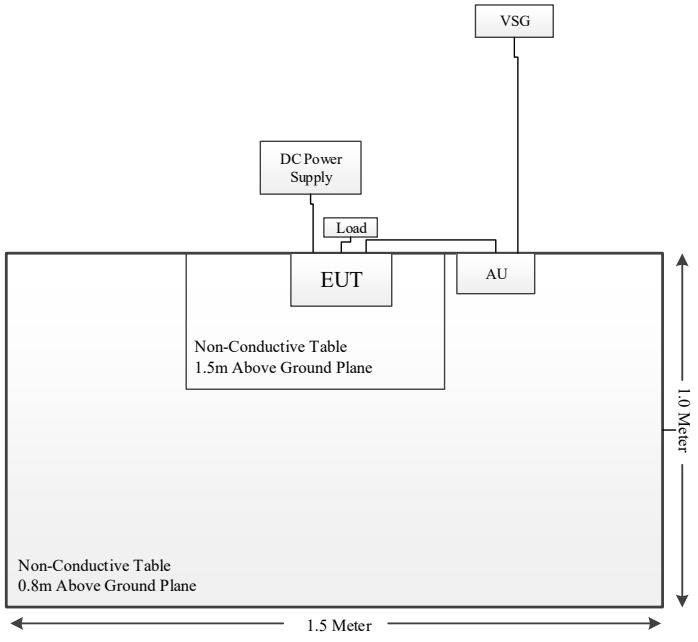
Cable Description	Length (m)	From Port	To Port
Power Cable	2	DC Power Supply	EUT
Optical Cable	3	EUT	AU
Coaxial Cable	5	AU	VSG
Coaxial Cable	0.2	EUT	Load

2.7 Block Diagram of Test Setup

For Radiated Spurious Emissions (Below 1GHz):



For Radiated Spurious Emissions (Above 1GHz):



3. SUMMARY OF TEST RESULTS

Clause	Test description	Results
KDB 935210 D02 Clause II. (p4) KDB 935210 D05 §4.2	AGC threshold level	Compliance
KDB 935210 D02 Clause II. (p2) KDB 935210 D05 §4.3	Out-of-band rejection	Compliance
KDB 935210 D02 Clause II. (p3) KDB 935210 D05 §4.4	Input-versus-output signal comparison (Including occupied bandwidth)	Compliance
FCC 47 CFR Part §90.219(e4) FCC 47 CFR Part §90.210(n) KDB 935210 D05 §4.4	Emission Mask	Compliance
FCC 47 CFR Part §90.219(e1) KDB 935210 D05 §4.5	Mean output power and amplifier/booster gain	Compliance
FCC 47 CFR Part §90.219(e2) KDB 935210 D05 §4.6	Noise Figure	Compliance
FCC 47 CFR Part §90.543(c,e,f) FCC 47 CFR Part §90.219(e3) KDB 935210 D05 §4.7	Out-of-band/out-of-block (Including intermodulation) emissions	Compliance
FCC 47 CFR Part §90.543(c,e,f) KDB 935210 D05 §4.7	Conducted spurious emissions	Compliance
FCC 47 CFR Part §90.539 KDB 935210 D05 §4.8	Frequency stability	N/A (See Note)
FCC 47 CFR Part §90.543(c,e,f) KDB 935210 D05 §4.9	Radiated spurious emissions	Compliance

Note: The EUT has no input signal processing capability, so the frequency stability measurement in this section is not required.

4. TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Spurious Emissions Chamber 1# (30 MHz to 1 GHz)					
Keysight	Signal Generator	N5183A	MY47420304	2023-05-23	2024-05-22
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2023-05-23	2024-05-22
Sunol Sciences	Hybrid Antenna	JB3	A090314-1	2023-11-11	2024-11-10
Sunol Sciences	Hybrid Antenna	JB3	A060217	2023-12-14	2024-12-13
Narda	6dB Attenuator	773-6	10690812-2-1	2023-11-11	2024-11-10
Sonoma Instrument	Amplifier	310N	171205	2023-05-23	2024-05-22
MICRO-COAX	Coaxial Cable	Cable-8	008	2023-05-23	2024-05-22
MICRO-COAX	Coaxial Cable	Cable-9	009	2023-05-23	2024-05-22
MICRO-COAX	Coaxial Cable	Cable-10	010	2023-05-23	2024-05-22
MICRO-COAX	Coaxial Cable	Cable-7	007	2023-05-23	2024-05-22
Rohde & Schwarz	Test Software	EMC32	100361	N/A	N/A
Radiated Spurious Emissions Chamber 2# (Above 1 GHz)					
Keysight	Signal Generator	N5183A	MY47420304	2023-05-23	2024-05-22
Rohde & Schwarz	EMI Test Receiver	ESU40	100207/040	2023-05-19	2024-05-18
Electro-Mechanics	Horn Antenna	3115	9207-3900	2023-06-27	2024-06-26
ETS-LINDGREN	Horn Antenna	3115	9311-4159	2023-12-02	2024-12-01
A.H.Systems,inc	Amplifier	PAM-0118P	512	2023-05-23	2024-05-22
MICRO-COAX	Coaxial Cable	Cable-11	011	2023-05-23	2024-05-22
MICRO-COAX	Coaxial Cable	Cable-12	012	2023-05-23	2024-05-22
MICRO-COAX	Coaxial Cable	Cable-13	013	2023-05-23	2024-05-22
MICRO-COAX	Coaxial Cable	Cable-6	006	2023-05-23	2024-05-22
Rohde & Schwarz	Test Software	EMC32	100361	N/A	N/A
RF Conducted Test					
Keysight	Vector Signal Generator	N5182B	MY53051592	2023-05-23	2024-05-22
Keysight	Signal Generator	N5183A	MY47420304	2023-05-23	2024-05-22
Rohde & Schwarz	Signal Analyzer	FSIQ26	100048	2023-05-23	2024-05-22
Agilent	Power Meter	E4419B	MY41291878	2023-05-23	2024-05-22
Agilent	Power Sensor	MA24418A	12621	2023-09-27	2024-09-26
BACL	Temperature & Humidity Chamber	BTH-150	30023	2023-05-23	2024-05-22
XHFDZ	RG316 Coaxial Cable	SMA-316	XHF-1175	Each time	N/A
XHFDZ	RG178 Coaxial Cable	SMA-178	XHF-1102	Each time	N/A

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

5. REQUIREMENTS AND TEST PROCEDURES

5.1 AGC threshold level

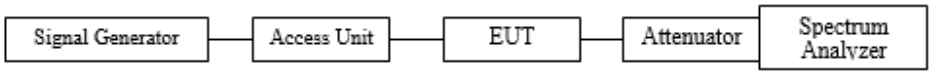
5.1.1 Applicable Standard

KDB 935210 D02 Signal Boosters Certification v04r02 Clause II. (p)(4):
For devices using automatic gain control (AGC) as a means for complying with service rule power limits, provide test results showing maximum output with and without AGC activated.

5.1.2 Test Procedure

KDB 935210 D05 Indus Booster Basic Meas v01r04 Clause 4.2

5.1.3 Test Setup



5.2 Out-of-band rejection

5.2.1 Applicable Standard

KDB 935210 D02 Signal Boosters Certification v04r02 Clause II. (p)(2):
Out-of-band rejection–testing for rejection of out-of-band signals may be appropriate. Alternatively, filter frequency response plots are acceptable.

5.2.2 Test Procedure

KDB 935210 D05 Indus Booster Basic Meas v01r04 Clause 4.3

5.2.3 Test Setup

5.3 Input-versus-output signal comparison

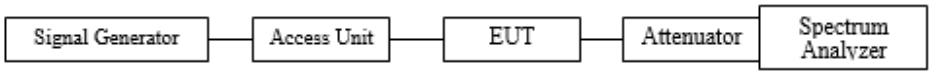
5.3.1 Applicable Standard

KDB 935210 D02 Signal Boosters Certification v04r02 Clause II. (p)(3):
Report worst case results for occupied bandwidth comparison and intermodulation tests done with and without any AGC circuitry activated, for devices so equipped.

5.3.2 Test Procedure

KDB 935210 D05 Indus Booster Basic Meas v01r04 Clause 4.4

5.3.3 Test Setup



5.4 Emission Mask

5.4.1 Applicable Standard

FCC 47 CFR Part §90.219(e4):
A signal booster must be designed such that all signals that it retransmits meet the following requirements:

(i) The signals are retransmitted on the same channels as received. Minor departures from the exact provider or reference frequencies of the input signals are allowed, provided that the retransmitted signals meet the requirements of § 90.213.

(ii) There is no change in the occupied bandwidth of the retransmitted signals.

(iii) The retransmitted signals continue to meet the unwanted emissions limits of § 90.210 applicable to the corresponding received signals (assuming that these received signals meet the applicable unwanted emissions limits by a reasonable margin).

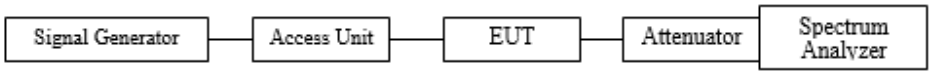
FCC 47 CFR Part §90.210(n):

Other frequency bands. Transmitters designed for operation under this part on frequencies other than listed in this section must meet the emission mask requirements of Emission Mask B. Equipment operating under this part on frequencies allocated to but shared with the Federal Government, must meet the applicable Federal Government technical standards.

5.4.2 Test Procedure

KDB 935210 D05 §4.4

5.4.3 Test Setup



5.5 Mean output power and amplifier/booster gain

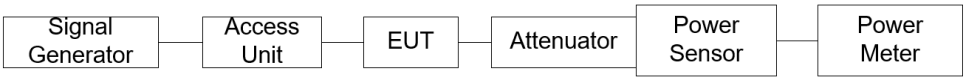
5.5.1 Applicable Standard

FCC 47 CFR Part 90, Subpart R §90.219 (e1):
The output power capability of a signal booster must be designed for deployments providing a radiated power not exceeding 5 Watts ERP for each retransmitted channel.

5.5.2 Test Procedure

KDB 935210 D05 Indus Booster Basic Meas v01r04 Clause 4.5

5.5.3 Test Setup



5.6 Out-of-band/out-of-block emissions

5.6.1 Applicable Standard

FCC 47 CFR Part 90, Subpart R §90.543 (c):
On any frequency outside of the frequency ranges covered by the ACP tables in this section, the power of any emission must be reduced below the mean output power (P) by at least 43 + 10log (P) dB measured in a 100 kHz bandwidth for frequencies less than 1 GHz, and in a 1 MHz bandwidth for frequencies greater than 1 GHz.

FCC 47 CFR Part 90, Subpart R §90.543 (e):

For operations in the 758-768 MHz and the 788-798 MHz bands, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations.

(2) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

(3) On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB.

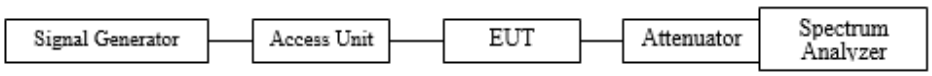
(4) Compliance with the provisions of paragraphs (e)(1) and (2) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

(5) Compliance with the provisions of paragraph (e)(3) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of 30 kHz may be employed.

5.6.2 Test Procedure

KDB 935210 D05 Indus Booster Basic Meas v01r04 Clause 4.7

5.6.3 Test Setup



5.7 Noise Figure

5.7.1 Applicable Standard

FCC 47 CFR Part 90.219 (e) 2

The noise figure of a zone enhancer shall not exceed 9 dB in either direction.

5.7.2 Test Procedure

KDB 935210 D05 Indus Booster Basic Meas v01r04 Clause 4.6

a) A spectrum analyzer was connected to EUT output port

b) The EUT input was terminated

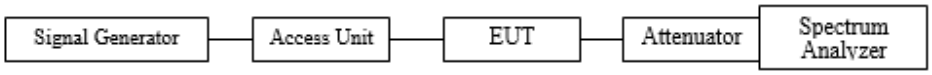
c) The spectrum analyzer was set to 100 trace average in the RMS average mode

d) A peak reading was recorded.

e) The noise figure was calculated using the following formula NF= Max reading- (-174 + Booster gain)

Note: 174= Thermal noise for 1Hz RBW at room temperature RBW= Resolution Bandwidth of Spectrum Analyzer in Hz

5.7.3 Test Setup



5.8 Conducted spurious emissions

5.8.1 Applicable Standard

FCC 47 CFR Part 90, Subpart R §90.543 (c):
On any frequency outside of the frequency ranges covered by the ACP tables in this section, the power of any emission must be reduced below the mean output power (P) by at least 43 + 10log (P) dB measured in a 100 kHz bandwidth for frequencies less than 1 GHz, and in a 1 MHz bandwidth for frequencies greater than 1 GHz.

FCC 47 CFR Part 90, Subpart R §90.543 (e):

For operations in the 758-768 MHz and the 788-798 MHz bands, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations.

(2) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

(3) On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB.

(4) Compliance with the provisions of paragraphs (e)(1) and (2) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

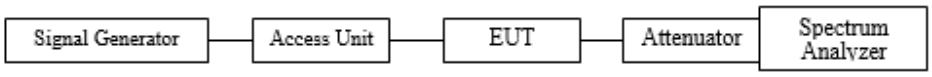
(5) Compliance with the provisions of paragraph (e)(3) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of 30 kHz may be employed.

(f) For operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

5.8.2 Test Procedure

KDB 935210 D05 Indus Booster Basic Meas v01r04 Clause 4.7

5.8.3 Test Setup



5.9 Radiated spurious emissions

5.9.1 Applicable Standard

FCC 47 CFR Part 90, Subpart R §90.543 (c):

On any frequency outside of the frequency ranges covered by the ACP tables in this section, the power of any emission must be reduced below the mean output power (P) by at least 43 + 10log (P) dB measured in a 100 kHz bandwidth for frequencies less than 1 GHz, and in a 1 MHz bandwidth for frequencies greater than 1 GHz.

FCC 47 CFR Part 90, Subpart R §90.543 (e):

For operations in the 758-768 MHz and the 788-798 MHz bands, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations.

(2) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

(3) On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB.

(4) Compliance with the provisions of paragraphs (e)(1) and (2) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

(5) Compliance with the provisions of paragraph (e)(3) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of 30 kHz may be employed.

(f) For operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

FCC 47 CFR Part 90, Subpart R §90.543 (f):

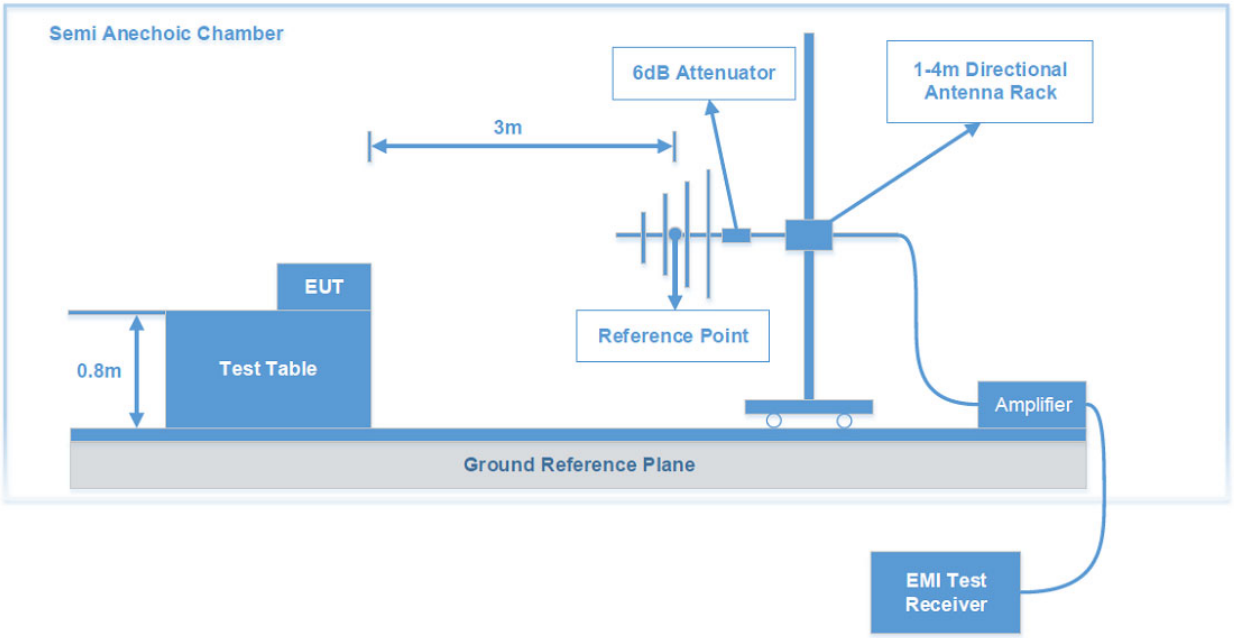
For operations in the 758–775 MHz and 788–805 MHz bands, all emissions including harmonics in the band 1559–1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

5.9.2 Test Procedure

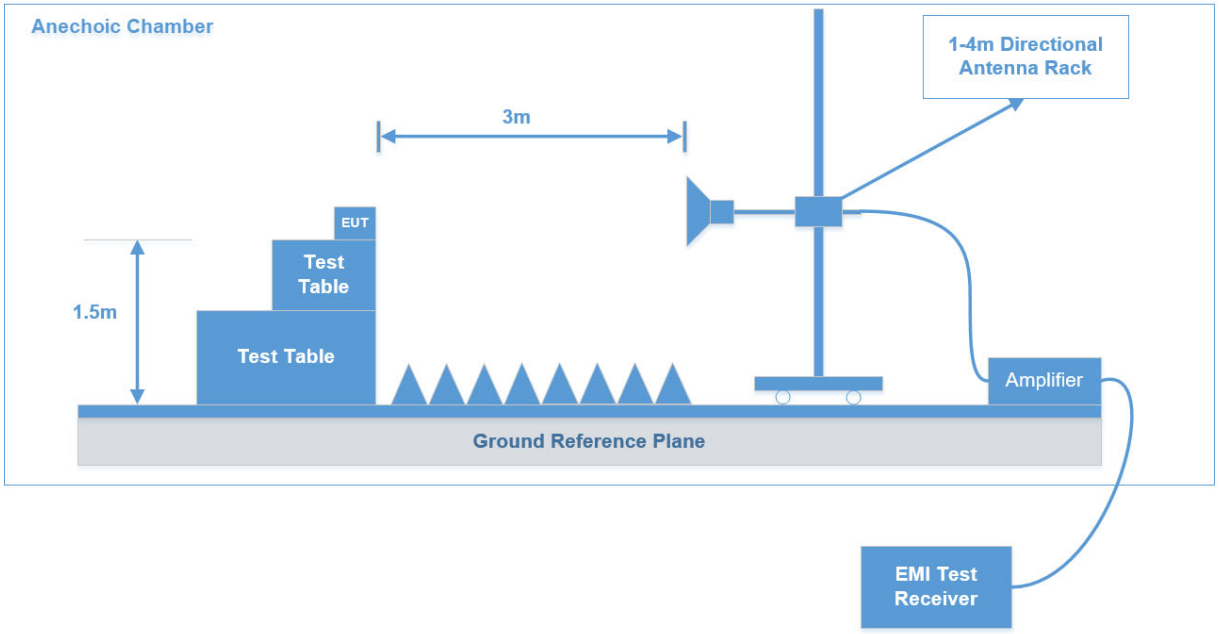
KDB 935210 D05 Indus Booster Basic Meas v01r04 Clause 4.9

5.9.3 Test Setup

Radiated testing block diagram (below 1 GHz):



Radiated testing block diagram (above 1 GHz):



6. TEST CONDITIONS

6.1 Environmental Conditions & Test Information

Test Item:	AGC THRESHOLD LEVEL	OUT-OF-BAND REJECTION	INPUT-VERSUS-OUTPUT SIGNAL COMPARISON	EMISSION MASK	MEAN OUTPUT POWER AND AMPLIFIER/BOOSTER GAIN
Test Date:	2024-04-16	2024-04-16	2024-02-07	2024-03-13	2024-04-16
Temperature:	20.5 ℃	20.5 ℃	18.2 ℃	21.6 ℃	20.5 ℃
Relative Humidity:	45 %	45 %	55 %	37 %	45 %
ATM Pressure:	102.5kPa	102.5kPa	103.2kPa	102.7kPa	102.5kPa
Test Result:	Pass	Pass	Pass	Pass	Pass
Test Engineer:	Jenny Yang	Jenny Yang	Chris Wang	Jenny Yang	Jenny Yang

Test Item:	NOISE FIGURE	OUT-OF-BAND/OUT-OF-BLOCK EMISSIONS	CONDUCTED SPURIOUS EMISSIONS	RADIATED SPURIOUS EMISSIONS
Test Date:	2024-05-07	2024-04-16	2024-02-08/2024-04-28	2024-02-23
Temperature:	22.8 ℃	20.5 ℃	19.3 ℃ ~ 22.8℃	21.2 ℃
Relative Humidity:	37 %	45 %	36 % ~ 55%	41%
ATM Pressure:	101.5kPa	102.5kPa	101.3 kPa~102.8kPa	103.2kPa
Test Result:	Pass	Pass	Pass	Pass
Test Engineer:	Jenny Yang	Jenny Yang	Chris Wang/Jenny Yang	Chris Wang

6.2 Power Supply Range

The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages ±5 %, for which the equipment was designed.

6.3 MIMO Test instruction

Only show the worst case (RF port1) data in the report except power test.

6.4 Test Channel instruction

Frequency Band (MHz)	Signal Type	channel	Frequency (MHz)
758-768	AWGN	Low	760.5
		High	765.5
	CW	Middle	763

7. TEST DATA

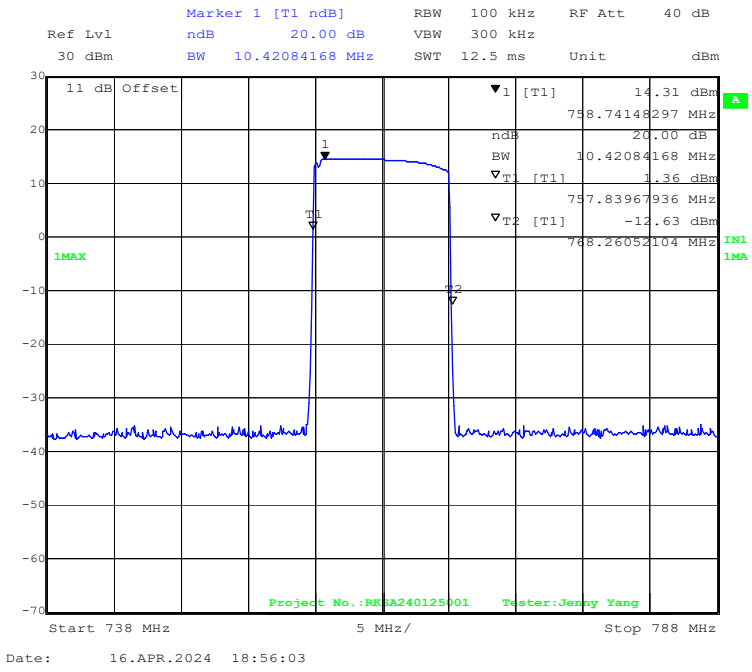
7.1 AGC threshold level

Frequency Band (MHz)	Signal Type	AGC Input Level (dBm)
758-768	AWGN	0

7.2 Out-of-band rejection

Frequency Band (MHz)	Lower Frequency f_1 (MHz)	Upper Frequency f_2 (MHz)	Peak Amplitude Frequency f_0 (MHz)
758-768	757.840	768.261	758.741

Note:
f1 is the lower edge of the 20dBc center frequency
f2 is the upper edge of the 20dBc center frequency

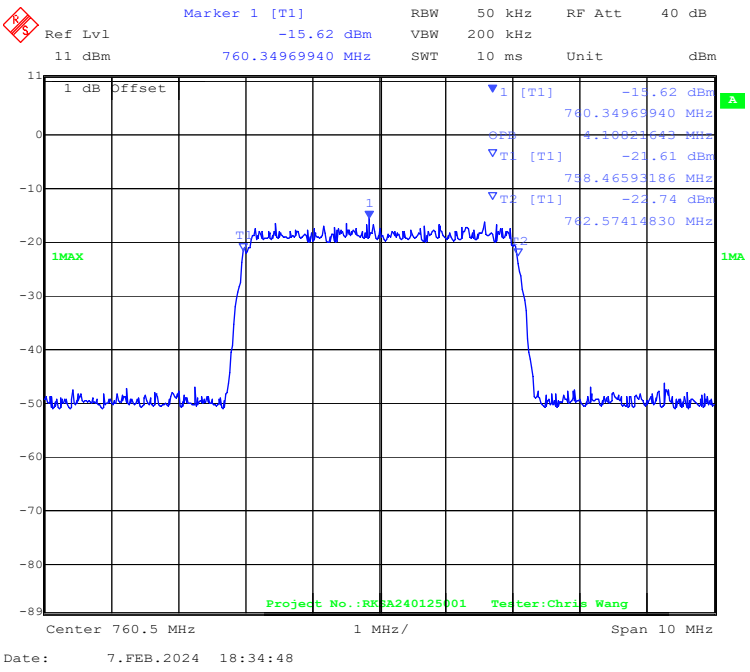


7.3 Input-versus-output signal comparison

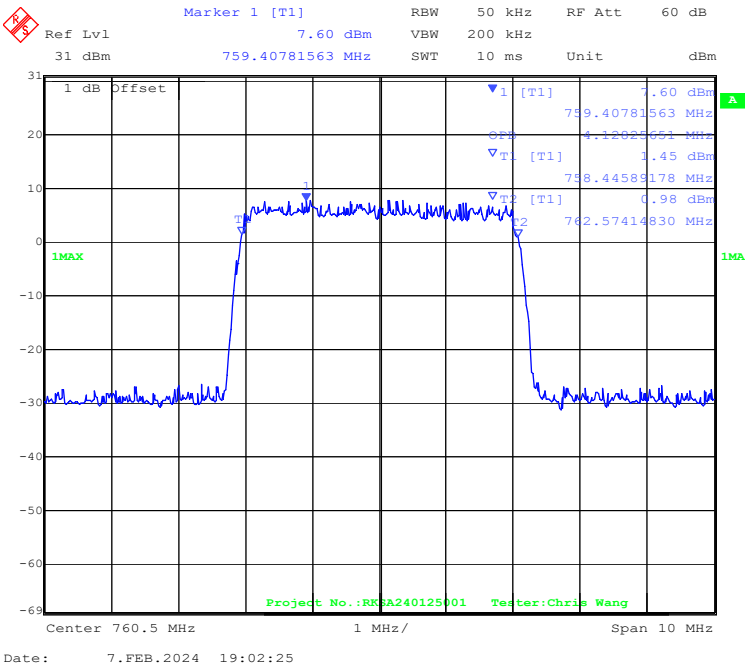
Frequency Band (MHz)	Signal Type	Channel	Signal Level	Input	Output	Spectral growth of the 99% OBW (%)
				99% OBW (MHz)	99% OBW (MHz)	
758-768	AWGN	Low	AGC	4.108	4.128	0.49
			AGC + 3dB	4.108	4.128	0.49
		High	AGC	4.128	4.108	0.48
			AGC + 3dB	4.128	4.108	0.48

Signal Type: AWGN

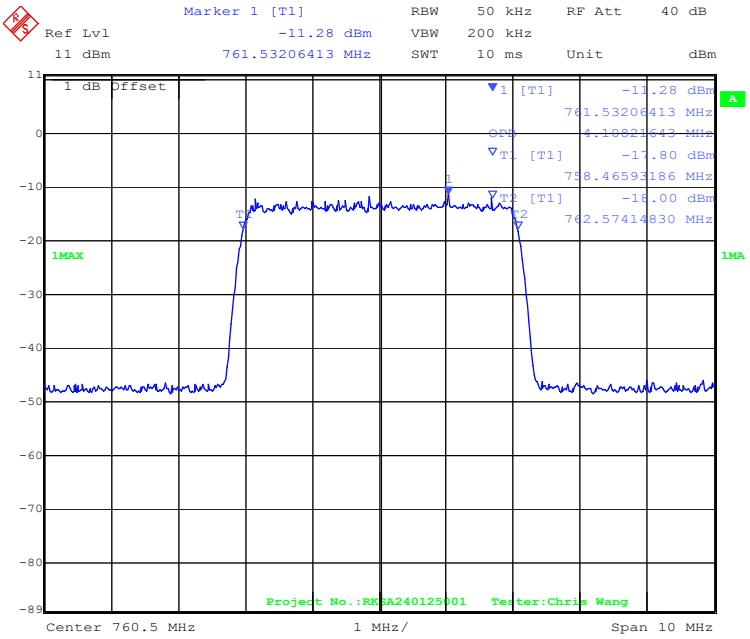
Low Channel: 760.5 MHz, 99% Occupied Bandwidth AGC Input



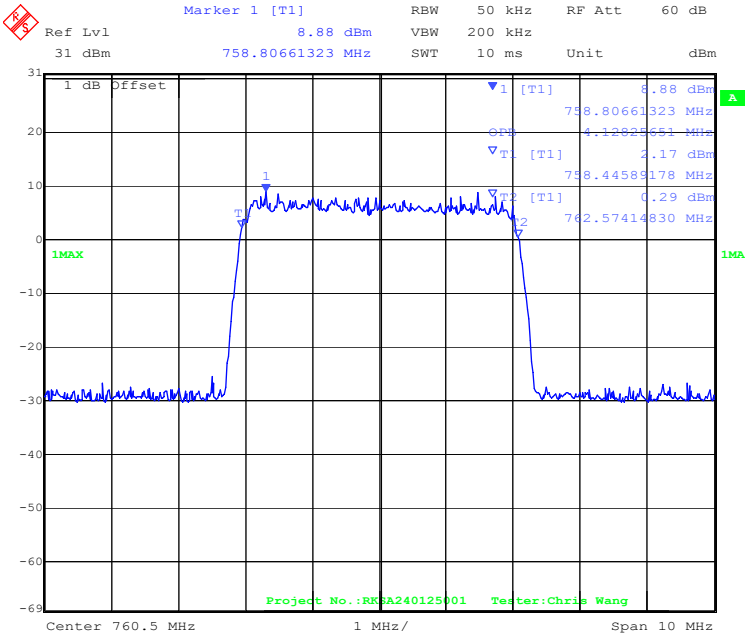
Low Channel: 760.5 MHz, 99% Occupied Bandwidth AGC Output



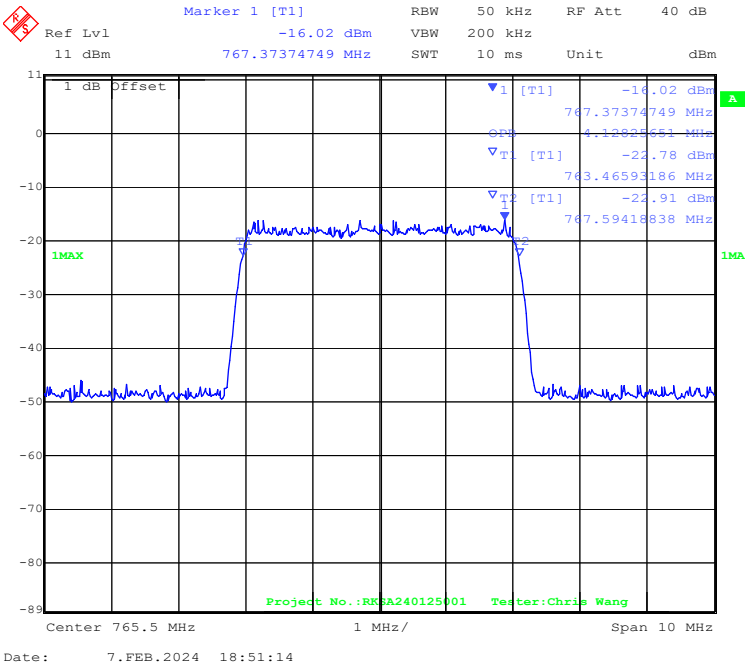
Low Channel: 760.5 MHz, 99% Occupied Bandwidth AGC + 3dB Input



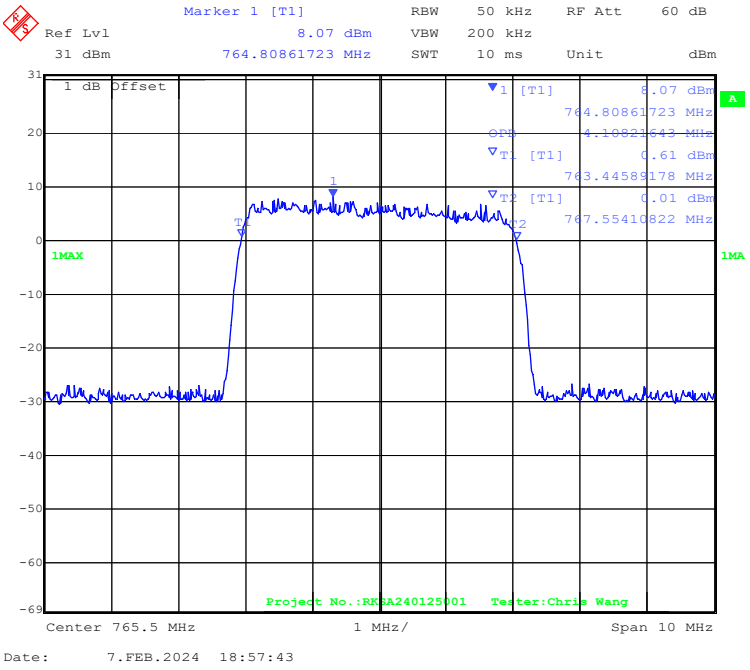
Low Channel: 760.5 MHz, 99% Occupied Bandwidth AGC + 3dB Output



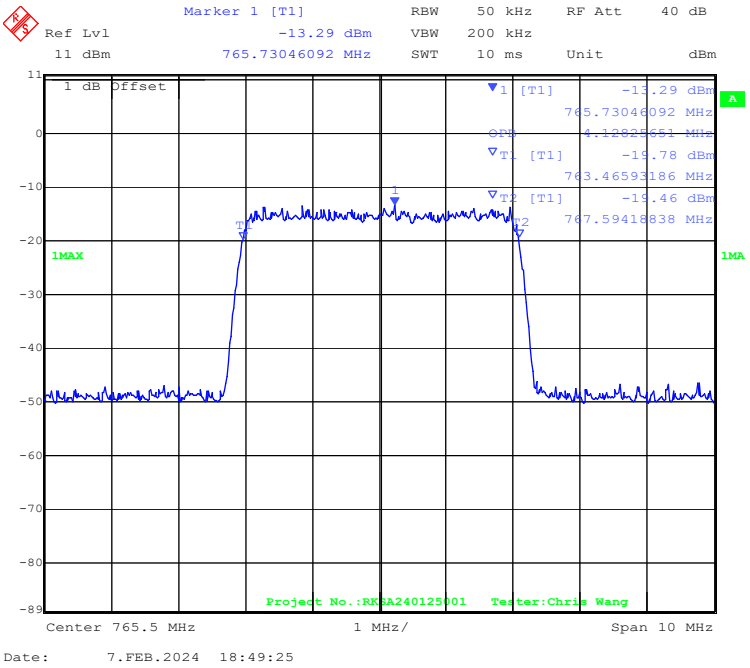
High Channel: 765.5 MHz, 99% Occupied Bandwidth AGC Input



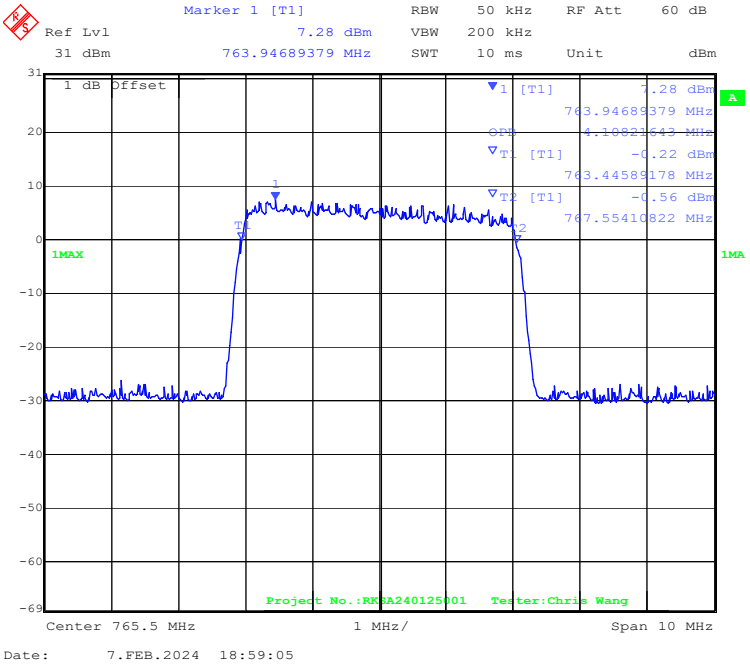
High Channel: 765.5 MHz, 99% Occupied Bandwidth AGC Output



High Channel: 765.5 MHz, 99% Occupied Bandwidth AGC + 3dB Input



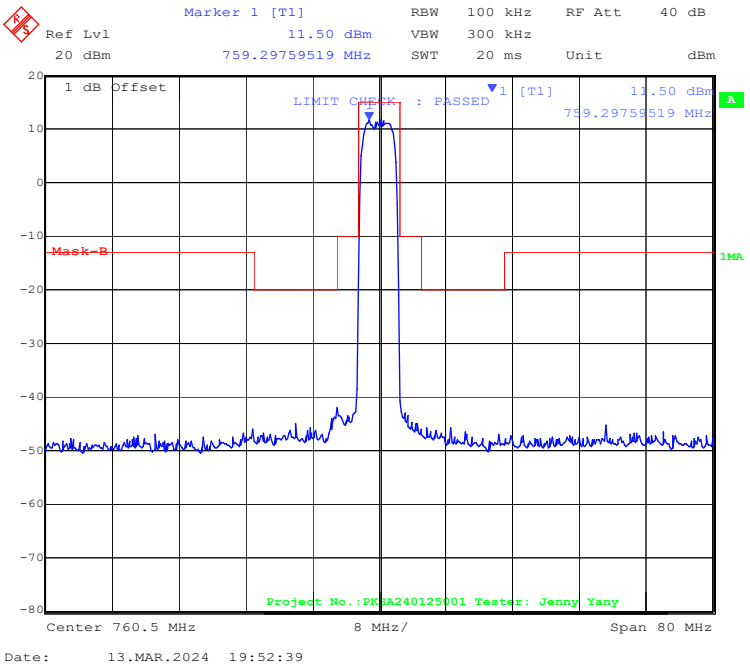
High Channel: 765.5 MHz, 99% Occupied Bandwidth AGC + 3dB Output



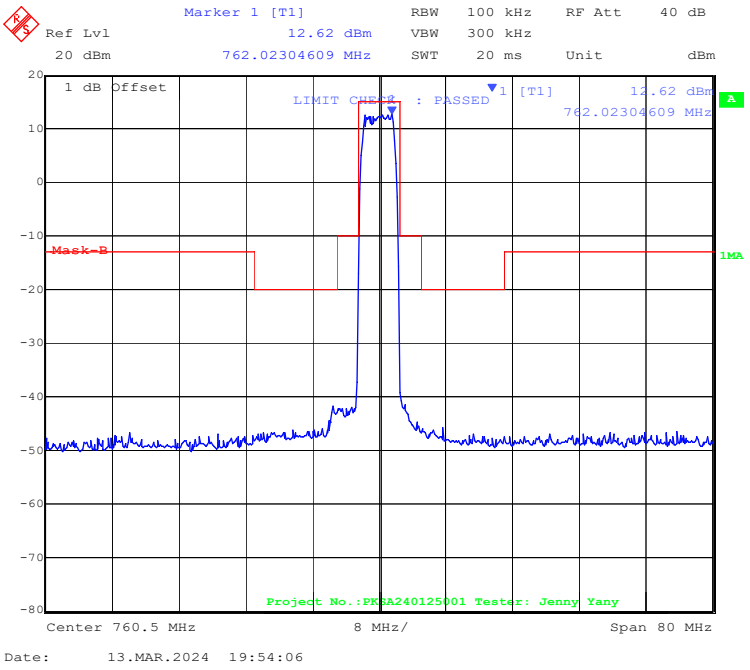
7.4 Emission Mask

Signal Type: AWGN

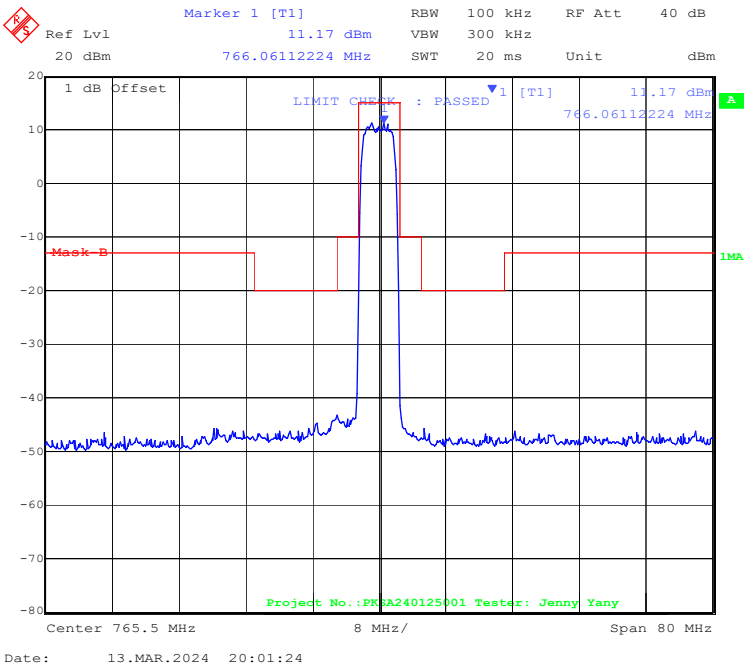
Low Channel: 760.5 MHz, AGC Output



Low Channel: 760.5 MHz, AGC + 3dB Output

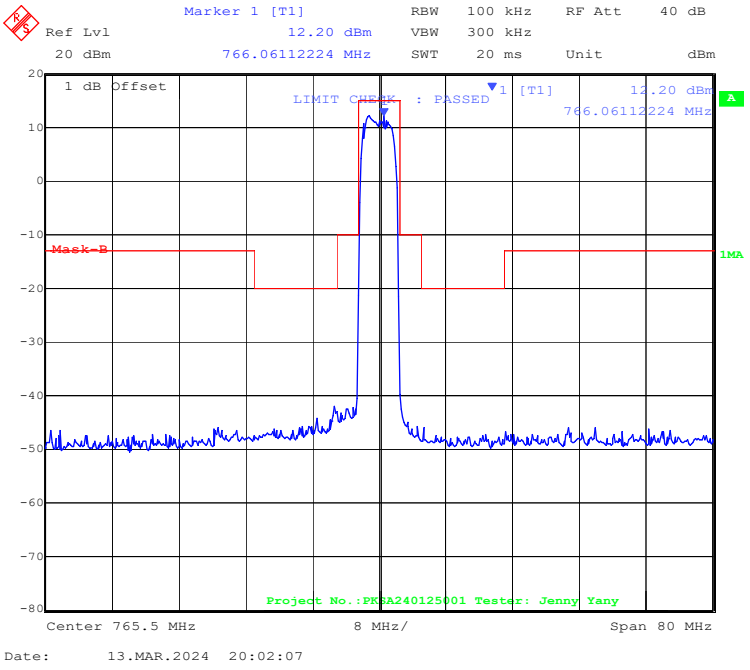


High Channel: 765.5 MHz, AGC Output



Date: 13.MAR.2024 20:01:24

High Channel: 765.5 MHz, AGC + 3dB Output



Date: 13.MAR.2024 20:02:07

7.5 Mean output power and amplifier/booster gain

Operational Frequencies (MHz)	Signal Type	Frequency f_0 (MHz)	Signal Level	Input Power (dBm)	Output Power (dBm)		Gain (dB)		MIMO Output Power (dBm)	Total ERP (dBm)	ERP Limit (dBm)
					RF Port 1	RF Port 2	RF Port 1	RF Port 2			
758-768	AWGN	758.741	AGC	0.0	15.58	15.52	15.58	15.52	18.56	19.41	37
			AGC + 3dB	3.0	15.47	15.33	/	/	18.41	19.26	37

Note:
The maximum antenna gain is 3dBi, 3dBi=0.85dBd.
Total ERP = MIMO Output Power + antenna gain (dBd).

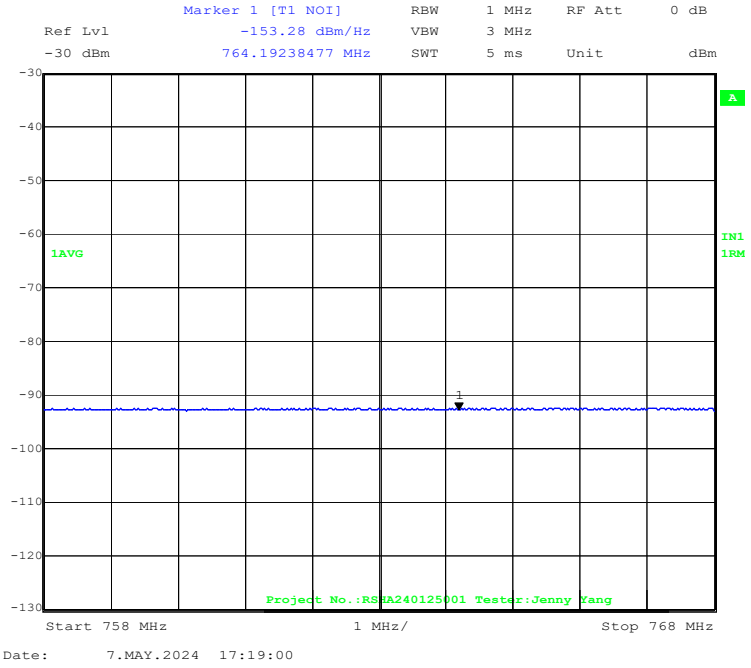
7.6 Noise Figure

Frequency (MHz)	Noise level within the passband P_{noise}(dBm/Hz)	Power gain G (dB)	Noise Figure (dB)	Limit (dB)
758-768	-153.28	16	4.72	⩽9

Note:
Noise Figure (dB) = P_{noise} +174 – G.

Conducted Noise Level:

Noise level within the passband



7.7 Out-of-band/out-of-block emissions

1. 90.543(c) Out-of-band emission limit.
The power of any emission must be reduced below the mean output power (P) by at least 43 + 10log (P) dB, Here,
P=20.15dBm= 0.1035W
So the limit = P (dBm)- [43 + 10 log (0.1035W)] =-13dBm

The EUT supports 2x2 MIMO and the emissions were measured at one of output port, so the limit line was set to **-16.01dBm** in following test plots in order to determine the test result conveniently.

2. 90.543e (1) limit:
On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations.

Here, P=19.41dBm= 0.0873W

So the limit = P(dBm)- [76 + 10 log (0.0873W)] =-46dBm

The EUT supports 2x2 MIMO and the emissions were measured at one of output port, so the limit line was set to **-49.01dBm** in following test plots in order to determine the test result conveniently.

3. 90.543 (e)(3) limit:
On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB
Here, P=19.41dBm= 0.0873W
So the limit = P(dBm)- [43 + 10 log (0.0873W)] =-13dBm

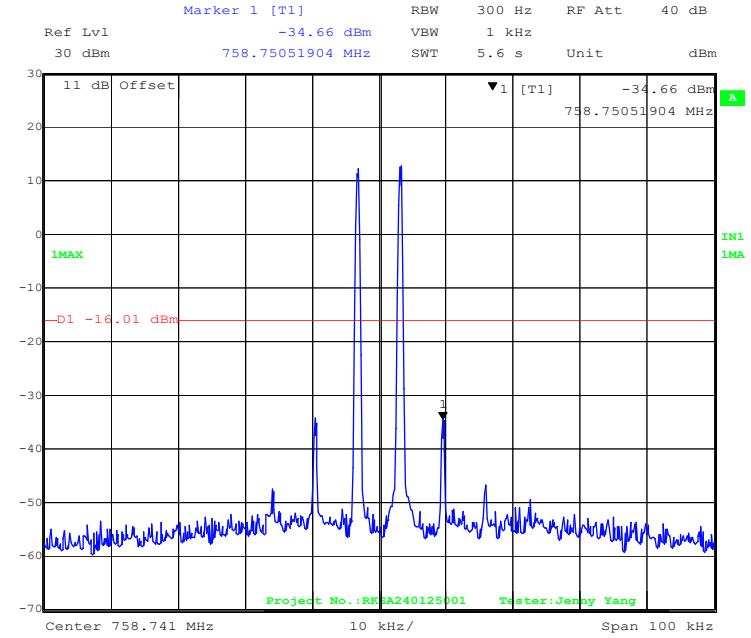
The EUT supports 2x2 MIMO and the emissions were measured at one of output port, so the limit line was set to **-16.01dBm** in following test plots in order to determine the test result conveniently.

4. Intermodulation has been tested using an input signal with Pre-AGC level and an input signal with AGC+3dB level, only the worst-case was recorded in this report.

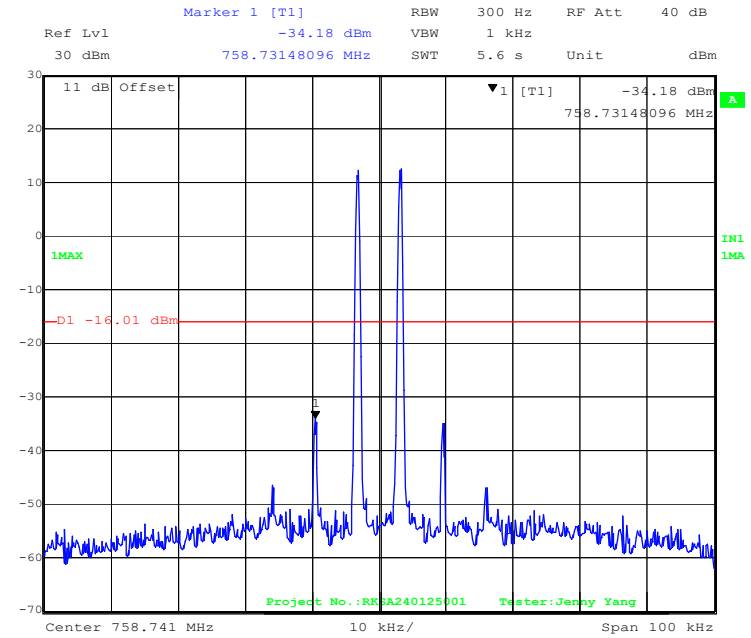
Note: The EUT supports 2*2 MIMO, since we only exhibited the results of ant 1 port which has the worse case power, so we subtract 10 * log (2) from -13dBm.

Two CW Spacing 6.25kHz
fo=758.741MHz

AGC output

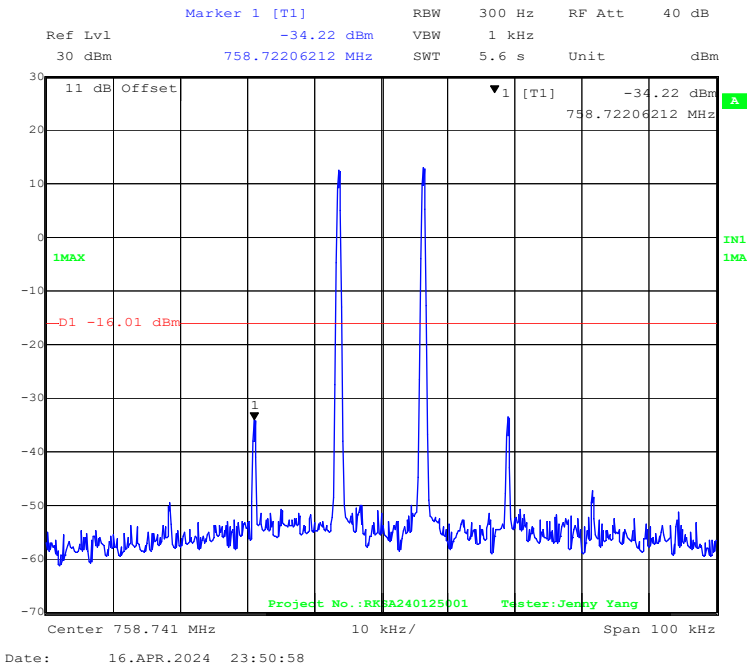


AGC+3 output

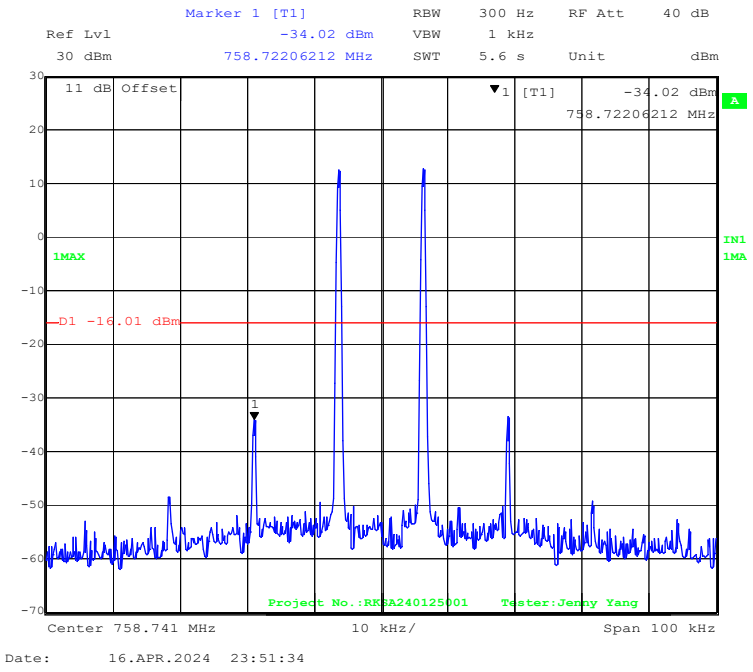


Two CW Spacing 12.5kHz
fo=758.741MHz

AGC output



AGC+3 output



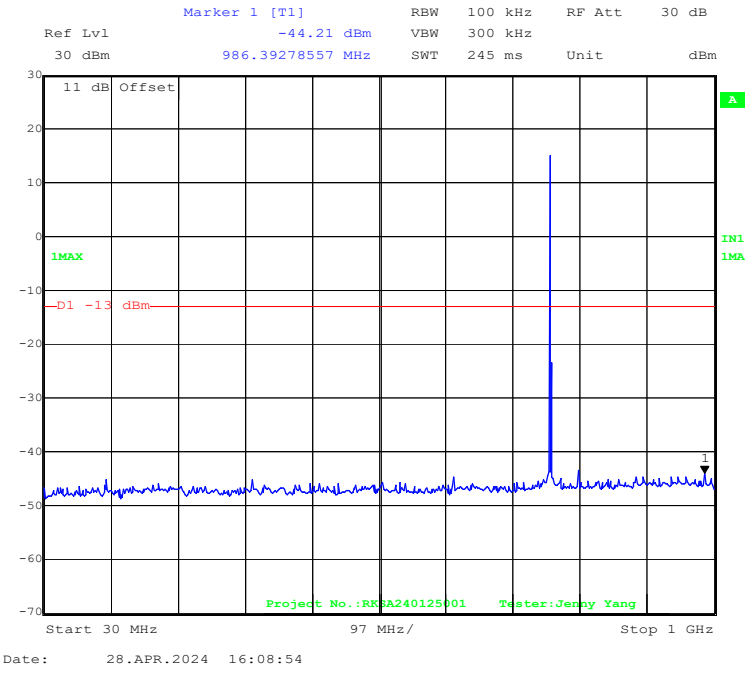
7.8 Conducted spurious emissions

Frequency Band (MHz)	Channel	Test Frequency Range (MHz)	Test Signal Level (dBm)	Limit (dBm)	Result
758-768	Middle	30-1000	-44.21	-16.01	PASS
		1000-7680	-32.25		

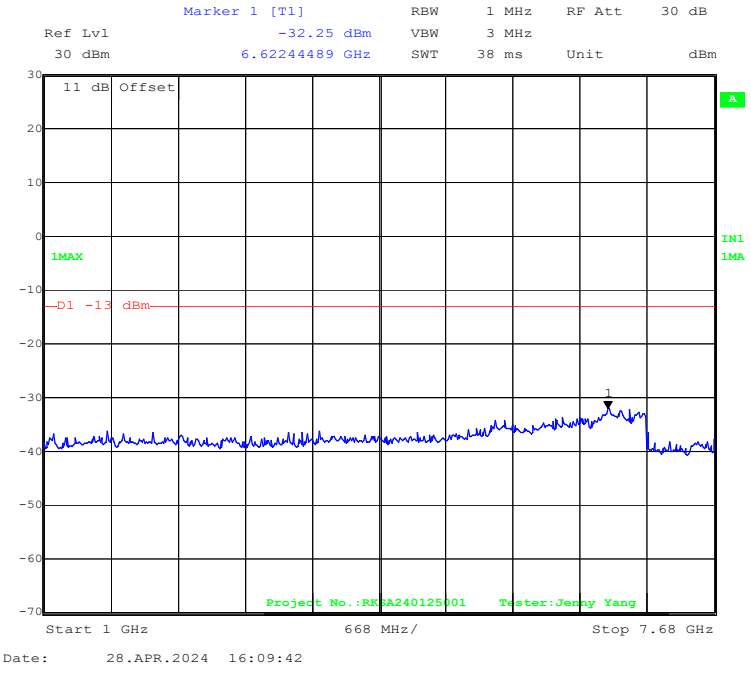
Note: The EUT supports 2*2 MIMO, since we only exhibited the results of ant 1 port which has the worse case power, so we subtract 10*log (2) = 3.01dB from -13dBm.

Signal Type: CW

Middle Channel, Frequency Range: 30MHz-1000MHz



Middle Channel, Frequency Range: 1G-7.68GHz



FCC 47 CFR Part §90.543(e) Additional Requirement:

Frequency Band (MHz)	Channel	Test Frequency Range (MHz)	Test Signal Level (dBm)	Limit (dBm)	Result
758-768	Low	769-775	-69.22	-49.98	PASS
		799-805	-74.34		
	High	769-775	-70.14		
		799-805	-74.47		

Note:
1. In a 6.25 kHz reference bandwidth, the limit is -46dBm. So in a 5 kHz mesured bandwidth, the limit is -46.97dBm.
2. Computational formula:

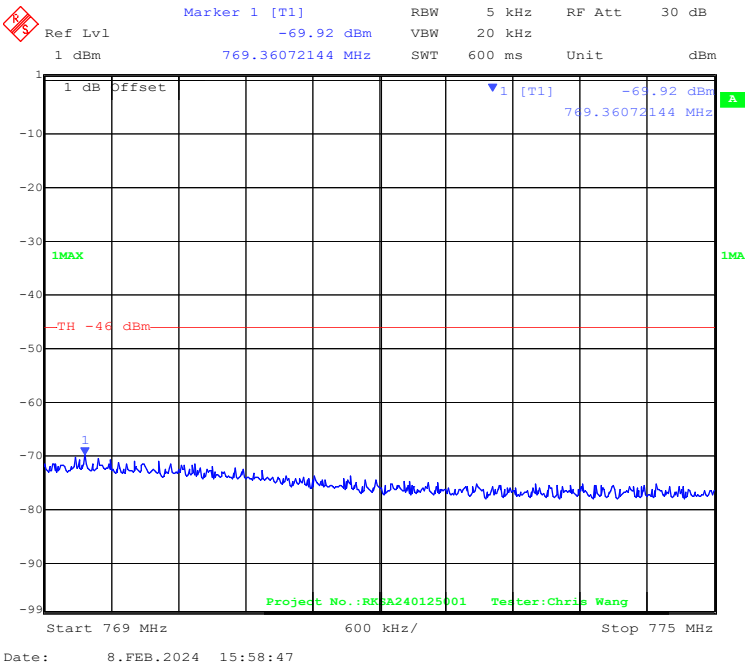
$$B = A + 10\log\frac{BW_{REFERENCE}}{BW_{MEASURED}}$$

B is the measured level corresponding the mesured bandwidth, A is actual measured value corresponding the reference bandwidth.

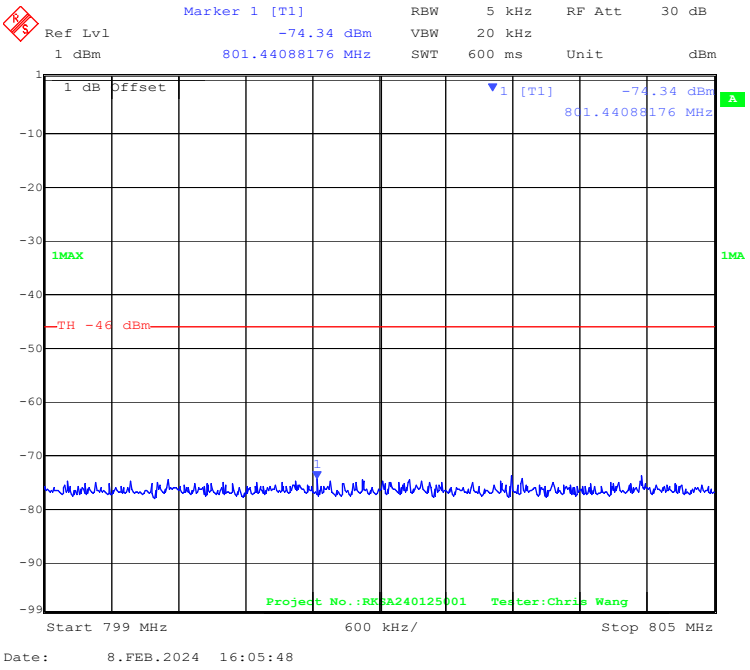
3. The EUT supports 2*2 MIMO, since we only exhibited the results of ant 1 port which has the worse case power, so we subtract 10*log (2) = 3.01dB from –46.97dBm.

Signal Type: AWGN

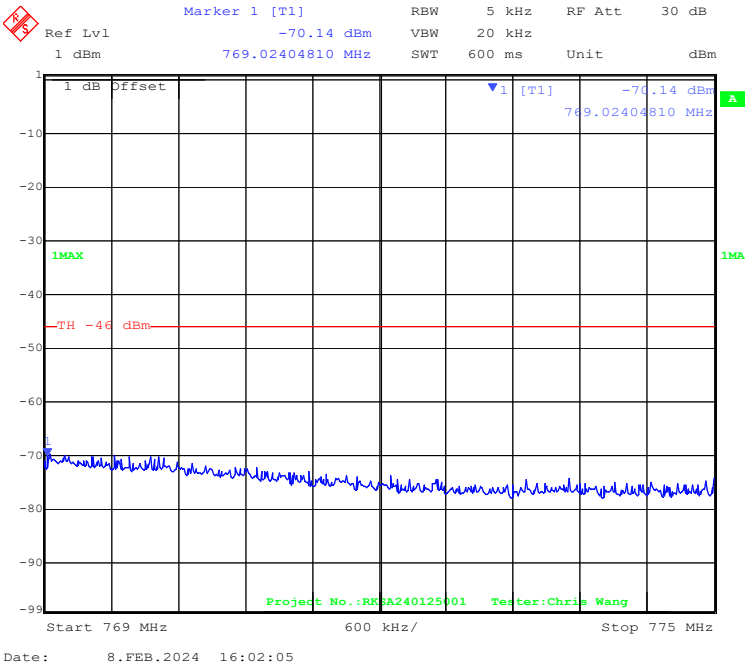
Low Channel, Frequency Range: 769-775MHz



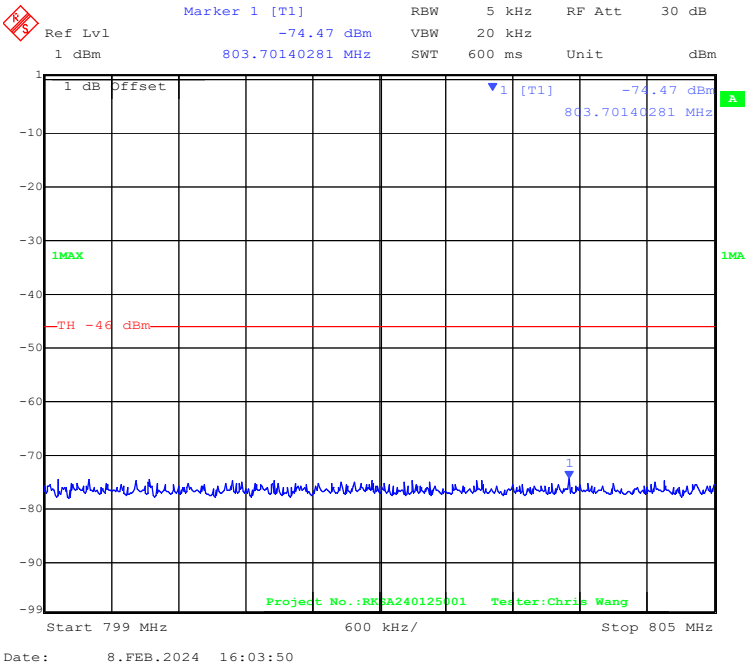
Low Channel, Frequency Range: 799-805MHz



High Channel, Frequency Range: 769-775MHz



High Channel, Frequency Range: 799-805MHz



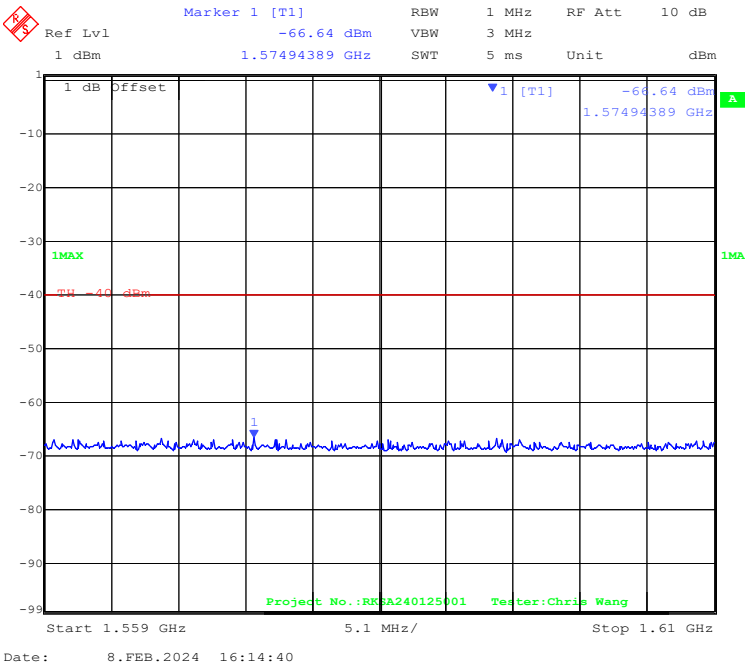
FCC 47 CFR Part §90.543(f) Additional Requirement:

Frequency Band (MHz)	Frequency Range (MHz)	Signal Type	Channel	Conducted Power (dBm)	Antenna Gain (dBi)	Measured EIRP (dBm)	EIRP Limit (dBm)
758-768	1559-1610	AWGN	Low	-66.24	3	-63.24	-43.01
			High	-66.73	3	-63.73	

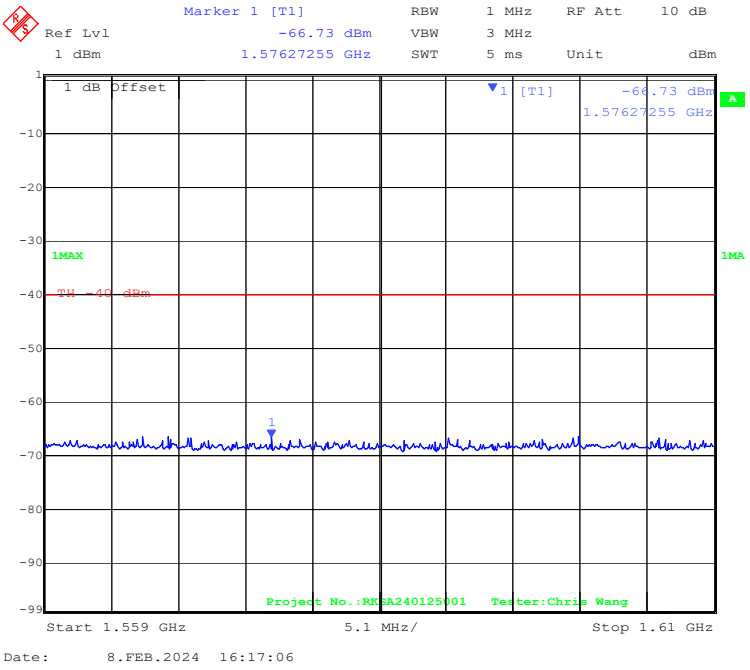
Note:
1. Measured EIRP = Conducted Power (dBm) + Antenna Gain (dBi)
2. The antenna gain in 758–768MHz band is 3dBi.
3. The EUT supports 2*2 MIMO, since we only exhibited the results of ant 1 port which has the worse case power, so we subtract 10*log (2) = 3.01dB from -40dBm.

Signal Type: AWGN

Low Channel, Frequency Range: 1559-1610MHz



High Channel, Frequency Range: 1559-1610MHz



7.9 Radiated spurious emissions

Input Signal Type: AWGN

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
Low Channel										
874.75	41.54	357	200	H	-53.95	0.63	-1.03	-55.61	-13	42.61
874.75	42.77	125	179	V	-54.14	0.63	-1.03	-55.80	-13	42.80
7864.90	56.06	132	159	H	-43.33	1.83	10.03	-35.13	-13	22.13
7864.90	56.58	278	193	V	-42.81	1.83	10.03	-34.61	-13	21.61
High Channel										
870.99	41.33	29	109	H	-53.88	0.63	-1.04	-55.55	-13	42.55
870.99	43.11	353	108	V	-54.01	0.63	-1.04	-55.68	-13	42.68
7864.90	55.59	227	184	H	-43.80	1.83	10.03	-35.60	-13	22.60
7864.90	56.02	159	229	V	-43.37	1.83	10.03	-35.17	-13	22.17

Note:
1) Antenna gain is dBd for frequency below 1GHz and is dBi for frequency above 1GHz.
2) Absolute Level = SG Level - Cable loss + Antenna Gain
3) Margin = Limit- Absolute Level

8. PHOTOS

8.1 Photos of the test set-up

Please refer to the document “EXHIBIT C_TEST SETUP PHOTOGRAPHS”.

8.2 Photos of the EUT

Please refer to the document “EXHIBIT A_EUT EXTERNAL PHOTOGRAPHS” and “EXHIBIT B_EUT INTERNAL PHOTOGRAPHS”.

Declarations

1. Bay Area Compliance Laboratories Corp. (Kunshan) is not responsible for authenticity of any test data provided by the applicant. Test data from the applicant that may affect test results are marked with an asterisk "★". The model number, product name, address, trademark, etc. from the applicant are not considered as test data.

2. Unless otherwise stated, the results shown in this test report refer only to the sample(s) tested.

3. Unless required by the rule provided by the applicant or product regulations, then decision rule in this report did not consider the uncertainty.

4. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor k=2 with the 95.45% confidence interval.

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