



Certificate #4312.01

RF EXPOSURE EVALUATION REPORT

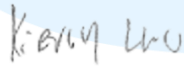
Product Name: Dual-Band Wi-Fi Router
Trade Mark: GRANDSTREAM
Model No. / HVIN: GWN7052
Report Number: 220322031RFC-4
Test Standards: FCC 47 CFR Part 1 Subpart I
 RSS-102 Issue 5
FCC ID: YZZGWN7052
IC: 11964A-GWN7052
Test Result: PASS
Date of Issue: May 27, 2022


Prepared for:

Grandstream Networks, Inc.
 126 Brookline Ave., 3rd Floor Boston, MA 02215, USA

Prepared by:

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Date: May 27, 2022

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Version

Version No.	Date	Description
V1.0	May 27, 2022	Original



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1. GENERAL INFORMATION

1.1 CLIENT INFORMATION

Applicant:	Grandstream Networks, Inc.
Address of Applicant:	126 Brookline Ave., 3rd Floor Boston, MA 02215, USA
Manufacturer:	Grandstream Networks, Inc.
Address of Manufacturer:	126 Brookline Ave., 3rd Floor Boston, MA 02215, USA

1.2 EUT INFORMATION

Product Name:	Dual-Band Wi-Fi Router		
Model No. / HVIN:	GWN7052		
Trade Mark:	GRANDSTREAM		
DUT Stage:	Identical Prototype		
EUT Supports Function: (Provided by the customer)	2.4 GHz ISM Band:	IEEE 802.11b/g/n	
	5 GHz U-NII Bands:	5 150 MHz to 5 250 MHz	IEEE 802.11a/n/ac
		5 250 MHz to 5 350 MHz	IEEE 802.11a/n/ac
		5 470 MHz to 5 725 MHz	IEEE 802.11a/n/ac
		5 725 MHz to 5 850 MHz	IEEE 802.11a/n/ac
Sample Received Date:	March 25, 2022		

Remark: The above EUT's information was provided by customer. Please refer to the specifications or user's manual for more detailed description.

1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

For 2.4 GHz ISM Band of Wi-Fi		
Frequency Band:	2400 MHz to 2483.5 MHz	
Frequency Range:	2412 MHz to 2462 MHz	
Support Standards:	IEEE 802.11b, IEEE 802.11g, IEEE 802.11n-HT20, IEEE 802.11n-HT40	
Type of Modulation:	IEEE 802.11b: DSSS(CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM(64-QAM, 16-QAM, QPSK, BPSK) IEEE 802.11n-HT20: OFDM(64-QAM, 16-QAM, QPSK, BPSK) IEEE 802.11n-HT40: OFDM(64-QAM, 16-QAM, QPSK, BPSK)	
Data Rate:	IEEE 802.11b: Up to 11 Mbps IEEE 802.11g: Up to 54 Mbps IEEE 802.11n-HT20: Up to MCS15 IEEE 802.11n-HT40: Up to MCS15	
Number of Channels:	IEEE 802.11b: 11 IEEE 802.11g: 11 IEEE 802.11n-HT20: 11 IEEE 802.11n-HT40: 7	
Channel Separation:	5 MHz	
Antenna Type:	Chain 0	External Antenna
	Chain 1	External Antenna
Antenna Gain: (Provided by the customer)	Chain 0	5.0dBi
	Chain 1	5.0dBi
Maximum conducted output power	SISO_ Chain 0	IEEE 802.11b: 21.28 dBm IEEE 802.11g: 24.29 dBm IEEE 802.11n-HT20: 22.21 dBm IEEE 802.11n-HT40: 22.92 dBm
	SISO_ Chain 1	IEEE 802.11b: 21.65 dBm IEEE 802.11g: 24.89 dBm IEEE 802.11n-HT20: 23.06 dBm

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		IEEE 802.11n-HT40: 22.95 dBm
	MIMO_Chain 0+1	IEEE 802.11n-HT20: 25.67 dBm IEEE 802.11n-HT40: 25.88 dBm

For 5 GHz U-NII Bands of Wi-Fi		
Frequency Bands:	5150 MHz to 5250 MHz (U-NII-1)	
	5250 MHz to 5350 MHz (U-NII-2A)	
	5470 MHz to 5725 MHz (U-NII-2C)	
	5 725 MHz to 5 850 MHz (U-NII-3)	
Frequency Ranges:	5180 MHz to 5240 MHz	
	5260 MHz to 5320 MHz	
	5500 MHz to 5700 MHz	
	5 745 MHz to 5 825 MHz	
Support Standards:	IEEE 802.11a/n/ac	
TPC Function:	Not Support	
DFS Operational mode:	Master	
Type of Modulation:	IEEE 802.11a: OFDM(64QAM, 16QAM, QPSK, BPSK)	
	IEEE 802.11n: OFDM(64QAM, 16QAM, QPSK, BPSK)	
	IEEE 802.11ac: OFDM(256QAM, 64QAM, 16QAM, QPSK, BPSK)	
Channel Spacing:	IEEE 802.11a/n-HT20/ac-VHT20: 20 MHz	
	IEEE 802.11n-HT40/ac-VHT40: 40 MHz	
	IEEE 802.11ac-VHT80: 80 MHz	
Data Rate:	IEEE 802.11a: Up to 54 Mbps	
	IEEE 802.11n-HT20: Up to MCS15	
	IEEE 802.11n-HT40: Up to MCS15	
	IEEE 802.11ac-VHT20: Up to MCS8	
	IEEE 802.11ac-VHT40: Up to MCS9	
Number of Channels:	5150 MHz to 5250 MHz: 4 for IEEE 802.11a/n-HT20/ac-VHT20 2 for IEEE 802.11n-HT40/ac-VHT40 1 for IEEE 802.11acVHT80	
	5250 MHz to 5350 MHz: 4 for IEEE 802.11a/n-HT20/ac-VHT20 2 for IEEE 802.11n-HT40/ac-VHT40 1 for IEEE 802.11acVHT80	
	5470 MHz to 5725 MHz: 11 for IEEE 802.11a/n-HT20/ac-VHT20 5 for IEEE 802.11n-HT40/ac-VHT40 2 for IEEE 802.11ac-VHT80	
	5725 MHz to 5850 MHz: 5 for IEEE 802.11a/n-HT20/ac-VHT20 2 for IEEE 802.11n-HT40/ac-VHT40 1 for IEEE 802.11ac-VHT80	
Antenna Type:	Chain 0	External Antenna
	Chain 1	External Antenna
Antenna Gain: (Provided by the customer)	Chain 0	5150 MHz to 5250 MHz: 5.0dBi
		5250 MHz to 5350 MHz: 5.0dBi
		5470 MHz to 5725 MHz: 5.0dBi

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	Chain 1	5725 MHz to 5850 MHz: 5.0dBi			
		5150 MHz to 5250 MHz: 5.0dBi			
		5250 MHz to 5350 MHz: 5.0dBi			
		5470 MHz to 5725 MHz: 5.0dBi			
		5725 MHz to 5850 MHz: 5.0dBi			
Maximum EIRP (dBm):	SISO_Chain 0	U-NII-1			
	IEEE 802.11a:	18.39			
	SISO_Chain 1	U-NII-1			
	IEEE 802.11a:	17.16			
	MIMO_Chain 0+1	U-NII-1			
	IEEE 802.11n-HT20:	15.88			
	IEEE 802.11n-HT40:	19.83			
	IEEE 802.11ac-VHT20:	15.96			
	IEEE 802.11ac-VHT40:	20.06			
IEEE 802.11ac-VHT80:	20.55				
Maximum conducted output power (dBm):	SISO_Chain 0	U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
	IEEE 802.11a:	19.05	19.20	16.52	19.85
	SISO_Chain 1	U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
	IEEE 802.11a:	17.82	17.41	14.59	18.22
	MIMO_Chain 0+1	U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
	IEEE 802.11n-HT20:	19.15	16.55	16.24	21.21
	IEEE 802.11n-HT40:	18.24	18.03	16.73	21.20
	IEEE 802.11ac-VHT20:	19.33	16.78	16.42	21.43
	IEEE 802.11ac-VHT40:	18.47	18.23	16.99	21.39
IEEE 802.11ac-VHT80:	15.55	15.46	13.64	21.21	

1.4 OTHER INFORMATION

Test channels for 2.4 GHz ISM Band of Wi-Fi				
Mode	Tx/Rx Frequency	Test RF Channel Lists		
		Lowest(L)	Middle(M)	Highest(H)
IEEE 802.11b	2412 MHz to 2462 MHz	Channel 1	Channel 6	Channel 11
		2412 MHz	2437 MHz	2462 MHz
IEEE 802.11g	2412 MHz to 2462 MHz	Channel 1	Channel 6	Channel 11
		2412 MHz	2437 MHz	2462 MHz
IEEE 802.11n-HT20	2412 MHz to 2462 MHz	Channel 1	Channel 6	Channel 11
		2412 MHz	2437 MHz	2462 MHz
IEEE 802.11n-HT40	2422 MHz to 2452 MHz	Channel 3	Channel 6	Channel 9
		2422 MHz	2437 MHz	2452 MHz

Test channels for 5 GHz U-NII Bands of Wi-Fi				
Mode	Tx/Rx Frequency	Test RF Channel Lists		
		Lowest(L)	Middle(M)	Highest(H)
IEEE 802.11a IEEE 802.11n-HT20 IEEE 802.11ac-VHT20	5150 MHz to 5250 MHz	Channel 36	Channel 44	Channel 48
		5180 MHz	5220 MHz	5240 MHz
	5250 MHz to 5350 MHz	Channel 52	Channel 60	Channel 64
		5260 MHz	5300 MHz	5320 MHz
	5470 MHz to 5725 MHz	Channel 100	Channel 116	Channel 140
		5500 MHz	5580 MHz	5700 MHz
	5725 MHz to 5850 MHz	Channel 149	Channel 157	Channel 165
		5745 MHz	5785 MHz	5825 MHz
IEEE 802.11n-HT40 IEEE 802.11ac-VHT40	5150 MHz to 5250 MHz	Channel 38	--	Channel 46
		5190 MHz	--	5230 MHz
	5250 MHz to 5350 MHz	Channel 54	--	Channel 62
		5270 MHz	--	5310 MHz
	5470 MHz to 5725 MHz	Channel 102	Channel 110	Channel 134
		5510 MHz	5550 MHz	5670 MHz
	5725 MHz to 5850 MHz	Channel 151	--	Channel 159
		5755 MHz	--	5795 MHz
IEEE 802.11ac-VHT80	5150 MHz to 5250 MHz	--	Channel 42	--
		--	5210 MHz	--
	5250 MHz to 5350 MHz	--	Channel 58	--
		--	5290 MHz	--
	5470 MHz to 5725 MHz	Channel 106	--	--
		5530 MHz	--	--
	5725 MHz to 5850 MHz	--	Channel 155	--
		--	5775 MHz	--

1.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product, according to the specifications of the manufacturers. It must comply with the requirements of the following standards:

FCC 47 CFR Part 1 Subpart I
RSS-102 Issue 5

All test items have been performed and recorded as per the above standards

1.6 DEVIATION FROM STANDARDS

None.

1.7 ABNORMALITIES FROM STANDARD CONDITIONS

None.

1.8 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

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2. EQUIPMENT LIST

Please refer to the RF test report.



3. MPE EVALUATION

3.1 REFERENCE DOCUMENTS FOR EVALUATION

No.	Identity	Document Title
1	FCC 47 CFR Part 1 Subpart I	PROCEDURES IMPLEMENTING THE NATIONAL ENVIRONMENTAL POLICY ACT OF 1969
2	RSS-102 Issue 5	Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)
3	KDB 447498 D01 General RF Exposure Guidance v06	RF EXPOSURE PROCEDURES AND EQUIPMENT AUTHORIZATION POLICIES FOR MOBILE AND PORTABLE DEVICES
4	KDB 662911 D01 Multiple Transmitter Output v02r01	Emissions Testing of Transmitters with Multiple Outputs in the Same Band

3.2 MPE COMPLIANCE REQUIREMENT

3.2.1 Limits

3.2.1.1 FCC 47 CFR Part 1 Subpart I

According to §1.1307(b)(1), system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

Limits for Occupational / Controlled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	F/300	6
1500-100000	/	/	5	6

Limits for General Population / Uncontrolled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-100000	/	/	1	30

Note: f = frequency in MHz: * = Plane-wave equivalent power density.

3.2.1.2 RSS-102 Issue 5

According to RSS-102 Issue 5, system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

According to RSS-102 Issue 5, system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- below 20 MHz⁶ and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f^{0.5}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

3.2.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

3.3 MPE CALCULATION METHOD

FCC 47 CFR Part 1 Subpart I

$$S = PG/4\pi R^2 = EIRP/4\pi R^2$$

S = power density (in appropriate units, e.g., mw/cm²)

P = power input to the antenna (in appropriate units, e.g., mw)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor is normally numeric gain.

R = 20cm distance to the center of radiation of the antenna (in appropriate units, e.g., cm)

3.4 MPE CALCULATION RESULTS

Note: For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

3.4.1 For WLAN

For Wi-Fi function, operating at 2412MHz to 2462 MHz for IEEE802.11b/g/n and
 operating at 5150 MHz to 5250 MHz for IEEE802.11a/n/ac and
 operating at 5250 MHz to 5350 MHz for IEEE802.11a/n/ac and
 operating at 5470 MHz to 5725 MHz for IEEE802.11a/n/ac and
 operating at 5725 MHz to 5850 MHz for IEEE802.11a/n/ac.

3.4.1.1 Antenna Type:

Chain 0: External Antenna

Chain 1: External Antenna

Antenna Gain:

Chain 0: 2412MHz to 2462 MHz: 5.0dBi
 5150 MHz to 5250 MHz: 5.0dBi
 5250 MHz to 5350 MHz: 5.0dBi
 5470 MHz to 5725 MHz: 5.0dBi
 5725 MHz to 5850 MHz: 5.0dBi

Chain 1: 2412MHz to 2462 MHz: 5.0dBi
 5150 MHz to 5250 MHz: 5.0dBi
 5250 MHz to 5350 MHz: 5.0dBi
 5470 MHz to 5725 MHz: 5.0dBi
 5725 MHz to 5850 MHz: 5.0dBi

3.4.1.2 Results for FCC 47 CFR Part 1 Subpart I

For SISO (1TX/1RX) Mode

Operating Mode	Freq.	Ant.	Declared maximum conducted output power	Max. positive tolerance according manufacturer	Antenna Gain	Calculated maximum EIRP	Declared maximum EIRP	MPE Limit	MPE Value	
	(MHz)									(dBm)
SISO	IEEE 802.11b	2412-2462	Ant 0 & Ant1	21	1	5.0	27	501.1872	1	0.0997
	IEEE 802.11g	2412-2462	Ant 0 & Ant1	24	1	5.0	30	1000.0000	1	0.1989
	IEEE 802.11a	5180-5240	Ant 0 & Ant1	18	2	5.0	25	316.2278	1	0.0629
		5260-5320	Ant 0 & Ant1	18	2	5.0	25	316.2278	1	0.0199
		5500-5700	Ant 0 & Ant1	15	2	5.0	22	158.4893	1	0.0315
		5745-5825	Ant 0 & Ant1	18	2	5.0	25	316.2278	1	0.0629

For MIMO (2TX/2RX) Mode

Operating Mode	Freq.	Ant.	Declared maximum conducted output power	Max. positive Tolerance according manufacturer	Antenna Gain	Calculated maximum EIRP	Declared maximum EIRP	MPE Limit	MPE Value	MIMO		
	(MHz)									(dBm)	(dBi)	(dBm)
MIMO (2TX/2RX)	IEEE 802.11n-HT20	Ant 0	23	1	5.0	29	794.3282	1	0.1580	0.3160	1	
		Ant 1	23	1	5.0	29	794.3282	1	0.1580			
	IEEE 802.11n-HT40	Ant 0	23	1	5.0	29	794.3282	1	0.1580	0.3160	1	
		Ant 1	23	1	5.0	29	794.3282	1	0.1580			
	IEEE 802.11n-HT20 802.11ac-VHT 20	5180-5240	Ant 0	16	2	5.0	23	199.5262	1	0.0397	0.1946	1
			Ant 1	16	2	5.0	23	199.5262	1	0.0397		1
		5260-5320	Ant 0	13	2	5.0	20	100.0000	1	0.0199	0.0398	1
			Ant 1	13	2	5.0	20	100.0000	1	0.0199		1

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Operating Mode	Freq.	Ant.	Declared maximum conducted output power	Max. positive Tolerance according manufacturer	Antenna Gain	Calculated maximum EIRP	Declared maximum EIRP	MPE Limit	MPE Value	MIMO		
	(MHz)									(dBm)	(dBi)	(dBm)
	5500-5700	Ant 0	13	2	5.0	20	100.0000	1	0.0199	0.0398	1	
		Ant 1	13	2	5.0	20	100.0000	1	0.0199		1	
	5745-5825	Ant 0	18	2	5.0	25	316.2278	1	0.0629	0.1258	1	
		Ant 1	18	2	5.0	25	316.2278	1	0.0629		1	
	IEEE 802.11n-HT40 802.11ac-VHT40	5190-5230	Ant 0	15	2	5.0	22	158.4893	1	0.0315	0.0630	1
			Ant 1	15	2	5.0	22	158.4893	1	0.0315		1
5270-5310		Ant 0	15	2	5.0	22	158.4893	1	0.0315	0.0630	1	
		Ant 1	15	2	5.0	22	158.4893	1	0.0315		1	
5510-5670		Ant 0	13	2	5.0	20	100.0000	1	0.0199	0.0398	1	
		Ant 1	13	2	5.0	20	100.0000	1	0.0199		1	
5755-5795		Ant 0	18	2	5.0	25	316.2278	1	0.0629	0.1258	1	
		Ant 1	18	2	5.0	25	316.2278	1	0.0629		1	
IEEE 802.11ac-VHT80		5210	Ant 0	12	2	5.0	19	79.4328	1	0.0158	0.0316	1
			Ant 1	12	2	5.0	19	79.4328	1	0.0158		1
		5290	Ant 0	12	2	5.0	19	79.4328	1	0.0158	0.0316	1
			Ant 1	12	2	5.0	19	79.4328	1	0.0158		1
	5530	Ant 0	11	2	5.0	18	63.0957	1	0.0126	0.0252	1	
		Ant 1	11	2	5.0	18	63.0957	1	0.0126		1	
	5775	Ant 0	18	1	5.0	24	251.1886	1	0.0500	0.1000	1	
		Ant 1	18	1	5.0	24	251.1886	1	0.0500		1	

Note: Directional gain according to KDB 662911 D01 Multiple Transmitter Output v02r01 f (ii).

3.4.1.3 Results for RSS-102 Issue 5

For SISO (1TX/1RX) Mode

Operating Mode	Freq.	Ant.	Declared maximum conducted output power	Max. positive tolerance according manufacturer	Antenna Gain	Calculated maximum EIRP	Declared maximum EIRP	Limit	
	(MHz)		(dBm)		(dBi)	(dBm)	(W)	(W)	
SISO	IEEE 802.11b	2412-2462	Ant 0 & Ant1	21	1	5.0	27	0.5012	2.6840
	IEEE 802.11g	2412-2462	Ant 0 & Ant1	24	1	5.0	30	1.0000	2.6840
	IEEE 802.11a	5180-5240	Ant 0 & Ant1	12	2	5.0	19	0.0794	4.5253
		5260-5320	Ant 0 & Ant1	18	2	5.0	25	0.3162	4.5729
		5500-5700	Ant 0 & Ant1	15	2	5.0	22	0.1585	4.7145
		5745-5825	Ant 0 & Ant1	18	2	5.0	25	0.3162	4.8570

For MIMO (2TX/2RX) Mode

Operating Mode	Freq.	Ant.	Declared maximum conducted output power	Max. positive Tolerance according manufacturer	Antenna Gain	Calculated maximum EIRP	Declared maximum EIRP	Limit	MIMO		
	(MHz)		(dBm)		(dBi)	(dBm)	(W)	(W)	Value	Limit	
MIMO (2TX/2RX)	IEEE 802.11n-HT20	Ant 0	23	1	5.0	29	0.7943	2.6840	0.5919	1	
		Ant 1	23	1	5.0	29	0.7943	2.6840			
	IEEE 802.11n-HT40	Ant 0	23	1	5.0	29	0.7943	2.6916	0.5902	1	
		Ant 1	23	1	5.0	29	0.7943	2.6916			
	IEEE 802.11n-HT20 802.11ac-VHT20	5180-5240	Ant 0	7	2	5.0	14	0.0251	4.5253	0.0111	1
			Ant 1	7	2	5.0	14	0.0251	4.5253		
		5260-5320	Ant 0	13	2	5.0	20	0.1000	4.5729	0.0437	1
			Ant 1	13	2	5.0	20	0.1000	4.5729		
		5500-5700	Ant 0	13	2	5.0	20	0.1000	4.7145	0.0424	1
			Ant 1	13	2	5.0	20	0.1000	4.7145		
		5745-5825	Ant 0	18	2	5.0	25	0.3162	4.8570	0.1302	1
			Ant 1	18	2	5.0	25	0.3162	4.8570		
	IEEE 802.11n-HT40 802.11ac-VHT40	5190-5230	Ant 0	12	1	5.0	18	0.0631	4.5312	0.0279	1
			Ant 1	12	1	5.0	18	0.0631	4.5312		
		5270-5310	Ant 0	15	2	5.0	22	0.1585	4.5789	0.0692	1
			Ant 1	15	2	5.0	22	0.1585	4.5789		
5510-5670		Ant 0	13	2	5.0	20	0.1000	4.7204	0.0424	1	
		Ant 1	13	2	5.0	20	0.1000	4.7204			

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Operating Mode	Freq.	Ant.	Declared maximum conducted output power	Max. positive Tolerance according manufacturer	Antenna Gain	Calculated maximum EIRP	Declared maximum EIRP	Limit	MIMO	
	(MHz)								(dBm)	(dBi)
IEEE 802.11ac-VHT80	5755-5795	Ant 0	18	2	5.0	25	0.3162	4.8628	0.1300	1
		Ant 1	18	2	5.0	25	0.3162	4.8628	0.1300	1
	5210	Ant 0	12	2	5.0	19	0.0794	4.5432	0.0350	1
		Ant 1	12	2	5.0	19	0.0794	4.5432		1
	5290	Ant 0	12	2	5.0	19	0.0794	4.5907	0.0346	1
		Ant 1	12	2	5.0	19	0.0794	4.5907		1
	5530	Ant 0	11	2	5.0	18	0.0631	4.7321	0.0267	1
		Ant 1	11	2	5.0	18	0.0631	4.7321		1
	5775	Ant 0	18	1	5.0	24	0.2512	4.8743	0.1031	1
		Ant 1	18	1	5.0	24	0.2512	4.8743		1

Note: Directional gain according to KDB 662911 D01 Multiple Transmitter Output v02r01 f (ii).

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3.4.2 Simultaneous Multi-band Transmission MPE Analysis

3.4.2.1 List of Mode for Simultaneous Multi-band Transmission

No.	Configurations	Support/Not Support
1	2.4G _WLAN + 5G _WLAN	Support

3.4.2.2 Results for transmit simultaneously

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No.	Configurations	Maximum MPE Value			Limits
		2.4G WLAN	5G WLAN	Transmit simultaneously	
1	2.4G _WLAN + 5G _WLAN	0.3160	0.1946	0.5106	1

Note:

According to KDB 447498 D01 General RF Exposure Guidance v06, At the transmit simultaneously calculation method is as follows:

$$\text{Transmit simultaneously MPE} = \Sigma \text{ of MPE ratios}$$

$$\text{MPE ratios} = \text{Field strengths or power density} / \text{MPE limit at the test frequency}$$

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No.	Configurations	Maximum MPE Value			Limits
		2.4G WLAN	5G WLAN	Transmit simultaneously	
1	2.4G _WLAN + 5G _WLAN	0.5919	0.1302	0.7221	1

Note:

According to KDB 447498 D01 General RF Exposure Guidance v06, At the transmit simultaneously calculation method is as follows:

$$\text{Transmit simultaneously MPE} = \Sigma \text{ of MPE ratios}$$

$$\text{MPE ratios} = \text{Field strengths or power density} / \text{MPE limit at the test frequency}$$

APPENDIX 1 PHOTOS OF TEST SETUP

N/A

APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal Photos.

*** End of Report ***

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