



FCC RADIO TEST REPORT

FCC ID : A4RG9S9B

Equipment : Phone Model Name : G9S9B

Applicant : Google LLC

1600 Amphitheatre Parkway,

Mountain View, California, 94043 USA

Standard : FCC Part 15 Subpart E §15.407

The product was received on Jun. 08, 2021 and testing was started from Jun. 12, 2021 and completed on Aug. 22, 2021. We, Sporton International Inc. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Louis Wu

Approved by: Louis Wu

Sporton International Inc. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)

TEL: 886-3-327-3456 Page Number : 1 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

Table of Contents

Report No.: FR0D2942-04G

His	story o	of this test report	3
Su	mmar	y of Test Result	4
1	Gene	eral Description	5
	1.1	Product Feature of Equipment Under Test	5
	1.2	Product Specification of Equipment Under Test	
	1.3	Modification of EUT	7
	1.4	Testing Location	8
	1.5	Applicable Standards	8
2	Test	Configuration of Equipment Under Test	9
	2.1	Carrier Frequency and Channel	9
	2.2	Test Mode	11
	2.3	Connection Diagram of Test System	13
	2.4	Support Unit used in test configuration and system	14
	2.5	EUT Operation Test Setup	14
	2.6	Measurement Results Explanation Example	14
3	Test	Result	15
	3.1	26dB & 99% Occupied Bandwidth Measurement	15
	3.2	Maximum conducted Output Power and Fundamental Maximum EIRP Measurement	20
	3.3	Fundamental Power Spectral Density Measurement	
	3.4	In-Band Emissions (Channel Mask)	24
	3.5	Contention Based Protocol	52
	3.6	Unwanted Emissions Measurement	64
	3.7	AC Conducted Emission Measurement	69
	3.8	Antenna Requirements	71
4	List	of Measuring Equipment	73
5	Unce	ertainty of Evaluation	75
Аp	pendi	x A. Conducted Test Results	
•	•	x B. AC Conducted Emission Test Result	
Αp	pendi	x C. Radiated Spurious Emission	
Аp	pendi	x D. Radiated Spurious Emission Plots	
Аp	pendi	x E. Duty Cycle Plots	

TEL: 886-3-327-3456 Page Number : 2 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

Report Version

: 06

Report Template No.: BU5-FR15EWL AC MA Version 2.4

History of this test report

Report No.: FR0D2942-04G

Report No.	Version	Description	Issued Date
FR0D2942-04G	01	Initial issue of report	Jul. 30, 2021
FR0D2942-04G	02	 Revise test result of conducted test items Revise list of measuring equipment 	Aug. 04, 2021
FR0D2942-04G	03	 Add description and test data Add antenna gain section 	Aug. 19, 2021
FR0D2942-04G	04	 Retest for 26dB, 99% bandwidth and emission mask Revise remark for antenna gain calculation 	Aug. 24, 2021
FR0D2942-04G	05	 Remove HE20 CH7115 test data Revise description for Radiation Spurious Emission test items 	Sep. 06, 2021
FR0D2942-04G	06	Revise description for Radiation Spurious Emission test items Revise Radiated Spurious Emission data	Sep. 08, 2021

TEL: 886-3-327-3456 Page Number : 3 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

Summary of Test Result

Report No.: FR0D2942-04G

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.403(i) 15.407(a)(10)	26dB Emission Bandwidth	Pass	-
3.1	2.1049	99% Occupied Bandwidth	Reporting only	-
3.2	15.407(a)(8)	Maximum Conducted Output Power	Reporting only	-
3.2	15.407(a)(8)	Fundamental Maximum EIRP	Pass	-
3.3	15.407(a)(8)	Fundamental Power Spectral Density	Pass	-
3.4	15.407(b)(6)	In-Band Emissions (Channel Mask)	Pass	-
3.5	15.407(d)(6)	Contention Based Protocol	Pass	
3.6	15.407(b)	Unwanted Emissions	Pass	Under limit 6.07 dB at 30.000 MHz
3.7	15.207	AC Conducted Emission	Pass	Under limit 13.44 dB at 0.569 MHz
3.8	15.203 15.407(a)	Antenna Requirement	Pass	-

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: William Chen Report Producer: Lucy Wu

TEL: 886-3-327-3456 Page Number : 4 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature						
Equipment	Phone					
Model Name	G9S9B					
FCC ID	A4RG9S9B					
EUT supports Radios application	GSM/EGPRS/WCDMA/HSPA/LTE/5G NR /NFC/GNSS/WPC/WPT WLAN 11b/g/n HT20 WLAN 11a/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80/VHT160 WLAN 11ax HE20/HE40/HE80/HE160 Bluetooth BR/EDR/LE					

Report No.: FR0D2942-04G

Remark: The above EUT's information was declared by manufacturer.

EUT Information List							
S/N	Performed Test Item						
15211FDF60007M	Conducted Measurement						
15201FDF60006K	Radiated Spurious Emission						
15201FDF60009S	Conducted Emission						
15211FDF60007Q	Contention Based Protocol						

TEL: 886-3-327-3456 Page Number : 5 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

1.2 Product Specification of Equipment Under Test

Product Specific	cation subjective to this standard			
1 Todact Opecinic	5925 MHz ~ 6425 MHz			
	6425 MHz ~ 6525 MHz			
Tx/Rx Frequency Range	6525 MHz ~ 6875 MHz			
	6875 MHz ~ 7125 MHz			
-	<5925 MHz ~ 6425 MHz>			
	MIMO <ant. 4+3=""></ant.>			
	802.11ax HE20: 7.61 dBm / 0.0058 W			
	802.11ax HE20: 7.01 dBirl / 0.0038 W			
	802.11ax HE40. 10.03 dBill / 0.0101 W			
	802.11ax HE160: 16.27 dBm / 0.0424 W			
	<6425 MHz ~ 6525 MHz>			
	MIMO <ant. 4+3=""></ant.>			
	802.11ax HE20: 6.11 dBm / 0.0041 W			
	802.11ax HE40: 9.06 dBm / 0.0081 W			
	802.11ax HE80: 12.12 dBm / 0.0163 W			
	802.11ax HE160: 14.81 dBm / 0.0303 W			
Maximum Output Power	<6525 MHz ~ 6875 MHz>			
	MIMO <ant. 4+3=""></ant.>			
	802.11ax HE20: 6.27 dBm / 0.0042 W			
	802.11ax HE40: 9.26 dBm / 0.0084 W			
	802.11ax HE80: 12.18 dBm / 0.0165 W			
	802.11ax HE160: 14.51 dBm / 0.0282 W			
	<6875 MHz ~ 7125 MHz>			
	MIMO <ant. 4+3=""></ant.>			
	802.11ax HE20: 6.97 dBm / 0.0050 W			
	802.11ax HE40: 9.33 dBm / 0.0086 W			
	802.11ax HE80: 12.86 dBm / 0.0193 W			
	802.11ax HE160: 15.41 dBm / 0.0348 W			
	MIMO <ant. 4=""></ant.>			
	802.11ax HE20: 21.88 MHz			
	802.11ax HE40: 43.56 MHz			
	802.11ax HE80: 77.20 MHz			
	802.11ax HE160: 156.80 MHz			
99% Occupied Bandwidth	MIMO <ant. 3=""></ant.>			
	802.11ax HE20: 25.82 MHz			
	802.11ax HE40: 41.06 MHz			
	802.11ax HE80: 77.32 MHz			
	802.11ax HE160: 156.80 MHz			
	<5925 MHz ~ 6425 MHz>			
	<ant. 4="">: ILA Antenna</ant.>			
	<ant. 3="">: IFA Antenna</ant.>			
	<6425 MHz ~ 6525 MHz>			
	<ant. 4="">: ILA Antenna</ant.>			
Antonno Timo	<ant. 3="">: IFA Antenna</ant.>			
Antenna Type	<6525 MHz ~ 6875 MHz>			
	<ant. 4="">: ILA Antenna</ant.>			
	<ant. 3="">: IFA Antenna</ant.>			
	<6875 MHz ~ 7125 MHz>			
	<ant. 4="">: ILA Antenna</ant.>			
ĺ	<ant. 3="">: IFA Antenna</ant.>			

Report No.: FR0D2942-04G

TEL: 886-3-327-3456 Page Number : 6 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

Product Specific	cation subjective to th	is standard			
Antenna Gain	<5925 MHz ~ 6425 M <ant. 4="">: -0.3 dBi <ant. 3="">: -1.4 dBi <6425 MHz ~ 6525 M <ant. 4="">: 0.4 dBi <ant. 3="">: 0.4 dBi <6525 MHz ~ 6875 M <ant. 4="">: 0.0 dBi <ant. 3="">: 0.9 dBi <6875 MHz ~ 7125 M <ant. 4="">: 0.5 dBi <ant. 3="">: -1.3 dBi</ant.></ant.></ant.></ant.></ant.></ant.></ant.></ant.>	Hz>			
Type of Modulation	802.11ax : OFDMA (BPSK / QPSK / 16QAM / 64QAM / 256QAM / 1024QAM)				
Antenna Function Description	802.11 ax MIMO	Ant. 4 V	Ant. 3		

Remark:

- 1. MIMO Ant. 4+3 Directional Gain is a calculated result from MIMO Ant. 4 and MIMO Ant. 3. The formula used in calculation is documented in section 3.8.
 - Power of MIMO Ant. 4 + Ant. 3 is a calculated result from sum of the power MIMO Ant. 4 and MIMO Ant. 3.
- 2. The above EUT's information was declared by manufacturer. Please refer to Comments and Explanations in report summary.

1.3 Modification of EUT

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

TEL: 886-3-327-3456 Page Number : 7 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

1.4 Testing Location

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	Sporton Site No. TH02-HY, CO05-HY, 03CH07-HY, DFS02-HY

Report No.: FR0D2942-04G

Note: The test site complies with ANSI C63.4 2014 requirement.

FCC designation No.: TW1190

1.5 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart E
- FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
- FCC KDB 987594 D02 U-NII 6 GHz EMC Measurement v01
- FCC KDB 414788 D01 Radiated Test Site v01r01.
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ANSI C63.10-2013

Remark:

- 1. All test items were verified and recorded according to the standards and without any deviation during the test.
- 2. The TAF code is not including all the FCC KDB listed without accreditation.

TEL: 886-3-327-3456 Page Number : 8 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

2 Test Configuration of Equipment Under Test

a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). The measured emission level of the EUT was maximized by rotating the EUT on a turntable, adjusting the orientation of the EUT and EUT antenna in three orthogonal axis (X: flat, Y: portrait, Z: landscape), and adjusting the measurement antenna orientation, following C63.10 exploratory test procedures and find X plane as worst plane.

Report No.: FR0D2942-04G

b. AC power line Conducted Emission was tested under maximum output power.

2.1 Carrier Frequency and Channel

BW 20M	Channel	1	5	9	13	17	21	25	29
DVV ZUIVI	Freq. (MHz)	5955	5975	5995	6015	6035	6055	6075	6095
BW 40M	Channel	3		11		19		27	
DVV 4UIVI	Freq. (MHz)	5965		6005		6045		6085	
BW 80M	Channel		-	7		23			
DAA OOIAI	Freq. (MHz)		59	85		6065			
BW 160M	Channel	15							
DAA LOOIAI	Freq. (MHz)	6025							

BW 20M	Channel	33	37	41	45	49	53	57	61	
DVV ZUIVI	Freq. (MHz)	6115	6135	6155	6175	6195	6215	6235	6255	
BW 40M	Channel	35		43		51		59		
DVV 4UIVI	Freq. (MHz)	6125		6165		6205		6245		
BW 80M	Channel		3	9		55				
DAA OOIAI	Freq. (MHz)		61	45		6225				
BW 160M	Channel	47								
DVV TOUIVI	Freq. (MHz)	6185								

TEL: 886-3-327-3456 Page Number : 9 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

BW 160M

Freq. (MHz)

BW 20M	Channel	65	69	73	77	81	85	89	93		
DVV ZUIVI	Freq. (MHz)	6275	6295	6315	6335	6355	6375	6395	6415		
BW 40M	Channel	6	7	7	5	8	3	9	1		
DVV 4UIVI	Freq. (MHz)	62	85	63	25	63	65	64	05		
BW 80M	Channel		7	1			8	7			
DAA OOIAI	Freq. (MHz)		63	05			63	85			
BW 160M	Channel				7	'9					
DAN LOOINI	Freq. (MHz)				63	45					
	Channel	97	101	105	109	113	117	121	125		
BW 20M	Freq. (MHz)	6435	6455	6475	6495	6515	6535	6555	6575		
	Channel	9	! 9	10	07	1	15	12	23		
BW 40M	Freq. (MHz)	64	45	64	l85	65	25	65	65		
DW 0014	Channel		10	03				19			
BW 80M	Freq. (MHz)		64	65		6545					
DW 400M	Channel		111								
BW 160M	Freq. (MHz)		6505								
	Channel	129	133	137	141	145	149	153	157		
BW 20M	Freq. (MHz)	6595	6615	6635	6655	6675	6695	6715	6735		
	Channel	13	 31	139		147		155			
BW 40M	Freq. (MHz)	66	05	6645		6685		6725			
	Channel		13	35		151					
BW 80M	Freq. (MHz)		66	25		6705					
DW (222	Channel				14	43					
BW 160M	Freq. (MHz)				66	65					
	Channel	161	165	169	173	177	181	185	189		
BW 20M	Freq. (MHz)	6755	6775	6795	6815	6835	6855	6875	6895		
	Channel		63		71		79		37		
BW 40M	Freq. (MHz)		65		305	6845			85		
	Channel			1 67		183					
BW 80M	Freq. (MHz)		67	85		6865					
	Channel				1	75					
BW 160M						10					

Report No.: FR0D2942-04G

TEL: 886-3-327-3456 Page Number : 10 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

6825

BW 20M	Channel	193	197	201	205	209	213	217	221	
DVV ZUIVI	Freq. (MHz)	6915	6935	6955	6975	6995	7015	7035	7055	
BW 40M	Channel	195		203		211		219		
DVV 40IVI	Freq. (MHz)	6925		6965		7005		7045		
BW 80M	Channel		19	99		215				
DAA OOIAI	Freq. (MHz)		69	45		7025				
BW 160M	Channel	207								
DAA LOOIM	Freq. (MHz)	6985								
	Channel	225 220								

BW 20M	Channel	225	229	
DVV ZUIVI	Freq. (MHz)	7075	7095	
DW 40M	Channel	227		
BW 40M	Freq. (MHz)	7085		

2.2 Test Mode

This device support 26/52/106/242/484/996-tone RU but does not support 2x996-tone RU on 160MHz channel.

The PSD of partial RU is reduced to be smaller than full RU according to TCB workshop interim guidance.

Final test modes are considering the modulation and worse data rates as below table.

Modulation	Data Rate	
802.11ax HE20	MCS0	
802.11ax HE40	MCS0	
802.11ax HE80	MCS0	
802.11ax HE160	MCS0	

	Test Cases					
AC Conducted Emission	Mode 1: WLAN (6GHz) Link + Bluetooth Link + USB Cable 1 (Charging from AC Adapter 2)					

Remark

- 1. For Radiated Test Cases, the tests were performed with Adapter 2 and USB Cable 1.
- 2. During the preliminary test, both charging modes (Adapter mode and WPC Charging mode) were verified. It is determined that the adaptor mode is the worst case for official test.

TEL: 886-3-327-3456 Page Number : 11 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

	Ch. #	UNII-5 (5925-6425 MHz)	UNII-6 (6425-6525 MHz)	UNII-7 (6525-6875 MHz)	UNII-8 (6875-7125 MHz)
		802.11ax HE20	802.11ax HE20	802.11ax HE20	802.11ax HE20
L	Low	001	097	117	189
M	Middle	049	105	149	209
Н	High	093	113	181	229
	Straddle	-	-	185	-

Ch. #		UNII-5 (5925-6425 MHz)	UNII-6 (6425-6525 MHz)	UNII-7 (6525-6875 MHz)	UNII-8 (6875-7125 MHz)	
		802.11ax HE40	802.11ax HE40	802.11ax HE40	802.11ax HE40	
L	Low	003	099	123	195	
M Middle		051	-	147	211	
Н	High	091	107	179	227	
Straddle		-	115	187	-	

Ch. #		UNII-5 (5925-6425 MHz)	UNII-6 (6425-6525 MHz)	UNII-7 (6525-6875 MHz)	UNII-8 (6875-7125 MHz)
		802.11ax HE80	802.11ax HE80	802.11ax HE80	802.11ax HE80
L	Low	007		135	199
М	Middle	055	103	151	-
Н	High	087		167	215
Straddle		-	119	183	-

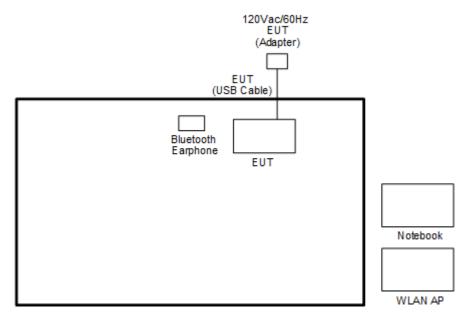
	Ch. #	UNII-5 (5925-6425 MHz)	UNII-6 (6425-6525 MHz)	UNII-7 (6525-6875 MHz)	UNII-8 (6875-7125 MHz) 802.11ax HE160	
		802.11ax HE160	802.11ax HE160	802.11ax HE160		
L	Low	015				
М	M Middle 047		-	143	207	
Н	High	079				
	Straddle	-	111	175	-	

Remark: For radiation spurious emission, the final modulation and the worst data rate was reference the max RF conducted power.

TEL: 886-3-327-3456 Page Number : 12 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

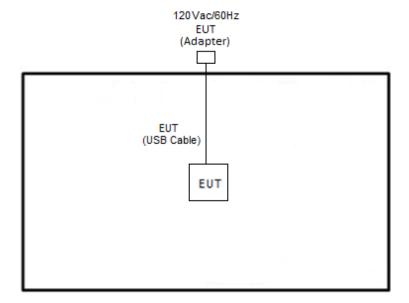
2.3 Connection Diagram of Test System

<AC Conducted Emission Mode>



Report No.: FR0D2942-04G

<WLAN Tx Mode>



TEL: 886-3-327-3456 Page Number : 13 of 75 FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021 : 06

2.4 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Bluetooth Earphone	Google	G1013	N/A	N/A	N/A
2.	WLAN AP	ASUS	GT-AXE11000	MSQ-RTAXJF00	N/A	Unshielded, 1.8 m
3.	Notebook	DELL	Latitude 3400	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m

Report No.: FR0D2942-04G

2.5 EUT Operation Test Setup

The RF test items, utility "adb command 1.0.36" was installed in Notebook which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

 $Offset(dB) = RF \ cable \ loss(dB) + attenuator \ factor(dB).$

= 4.2 + 10 = 14.2 (dB)

TEL: 886-3-327-3456 Page Number : 14 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

3 Test Result

3.1 26dB & 99% Occupied Bandwidth Measurement

3.1.1 Limit of 26dB & 99% Occupied Bandwidth

<FCC 14-30 CFR 15.407>

(a)(10) The maximum transmitter channel bandwidth for U-NII devices in the 5.925-7.125 GHz band is 320 megahertz.

Report No.: FR0D2942-04G

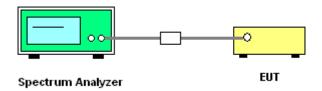
3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedures

- The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
 Section C) Emission bandwidth
- 2. Set RBW = approximately 1% of the emission bandwidth (1MHz for all supported bandwidth).
- 3. Set the VBW > RBW.
- 4. Detector = Peak.
- 5. Trace mode = max hold
- 6. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
- 7. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1-5% of the emission bandwidth and set the Video bandwidth (VBW) ≥ 3 * RBW.
- 8. Measure and record the results in the test report.

3.1.4 Test Setup

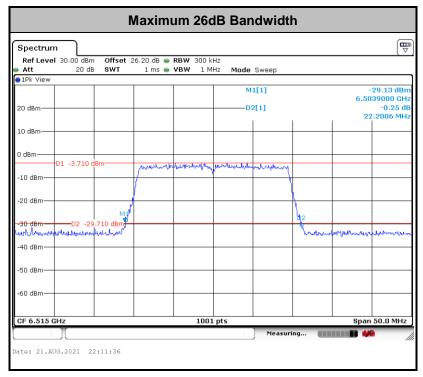


3.1.5 Test Result of 26dB & 99% Occupied Bandwidth

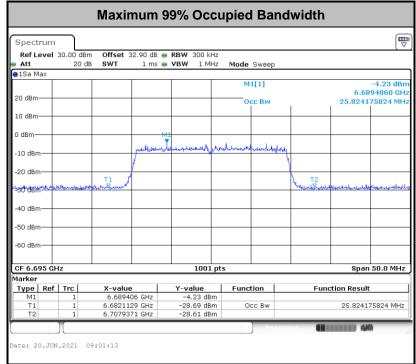
Please refer to Appendix A.

TEL: 886-3-327-3456 Page Number : 15 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

For 802.11ax HE 20 MHz



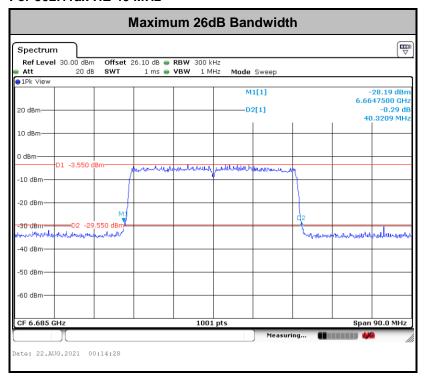
Report No.: FR0D2942-04G

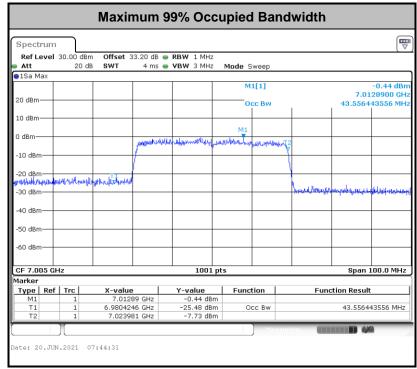


Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

TEL: 886-3-327-3456 Page Number : 16 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

For 802.11ax HE 40 MHz

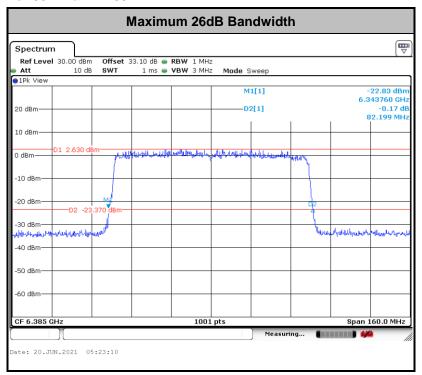




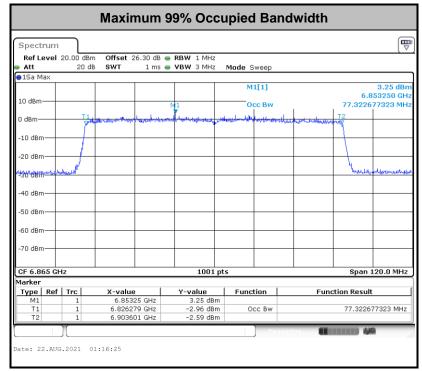
Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

TEL: 886-3-327-3456 Page Number : 17 of 75 FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

For 802.11ax HE 80 MHz



Report No.: FR0D2942-04G

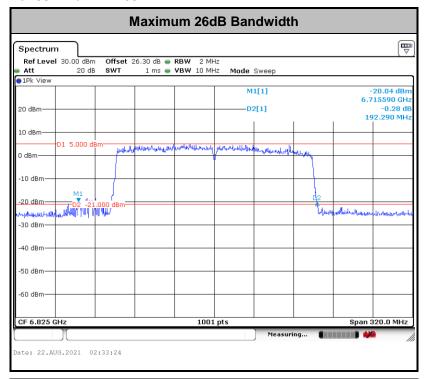


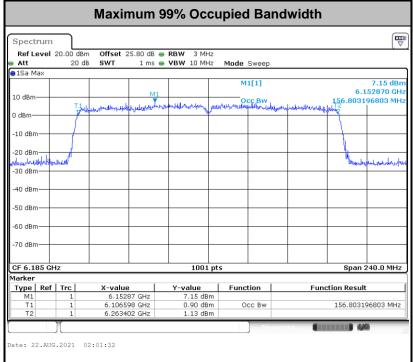
Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

TEL: 886-3-327-3456 Page Number : 18 of 75 FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

Report No.: FR0D2942-04G

For 802.11ax HE 160 MHz





Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

TEL: 886-3-327-3456 Page Number : 19 of 75 FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

3.2 Maximum conducted Output Power and Fundamental Maximum EIRP Measurement

3.2.1 Limit of Fundamental Maximum EIRP

<FCC 14-30 CFR 15.407>

(a)(8) For client devices operating under the control of an indoor access point in the 5.925-7.125 GHz bands, the maximum e.i.r.p. over the frequency band of operation must not exceed 24 dBm.

Report No.: FR0D2942-04G

3.2.2 Measuring Instruments

See list of measuring equipment of this test report.

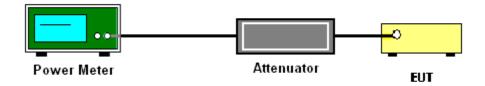
3.2.3 Test Procedures

The testing follows Method PM-G of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

Method PM-G (Measurement using a gated RF average power meter):

- 1. Measurement is performed using a wideband RF power meter.
- 2. The EUT is configured to transmit at its maximum power control level.
- 3. Measure the average power of the transmitter.
- 4. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

3.2.4 Test Setup



3.2.5 Test Result of Fundamental Maximum EIRP

Please refer to Appendix A.

TEL: 886-3-327-3456 Page Number : 20 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

3.3 Fundamental Power Spectral Density Measurement

3.3.1 Limit of Fundamental Power Spectral Density

<FCC 14-30 CFR 15.407>

(a)(8) For client devices operating under the control of an indoor access point in the 5.925-7.125 GHz bands, the maximum power spectral density must not exceed −1 dBm e.i.r.p. in any 1-megahertz band.

Report No.: FR0D2942-04G

3.3.2 Measuring Instruments

See list of measuring equipment of this test report.

3.3.3 Test Procedures

The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section F) Maximum power spectral density.

Method SA-3

(power averaging (rms) detection with max hold):

- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 1 MHz.
- Set VBW ≥ 3 MHz.
- Number of points in sweep ≥ 2 Span / RBW.
- Sweep time ≤ (number of points in sweep) × T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

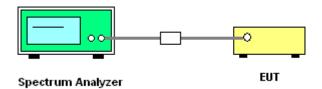
 Detector = power averaging (rms).
- Trace mode = max hold.
- · Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.
- 1. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
- 2. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.
- 3. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

Method (a): Measure and sum the spectra across the outputs.

The total final Power Spectral Density is from a device with 2 transmitter outputs. The spectrum measurements of the individual outputs are all performed with the same span and number of points; the spectrum value in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 to obtain the value for the first frequency bin of the summed spectrum.

TEL: 886-3-327-3456 Page Number : 21 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

3.3.4 Test Setup



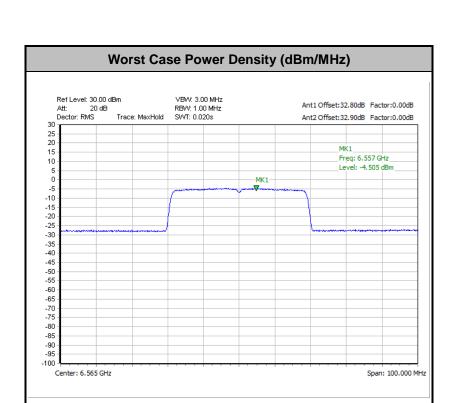
Report No.: FR0D2942-04G

3.3.5 Test Result of Power Spectral Density

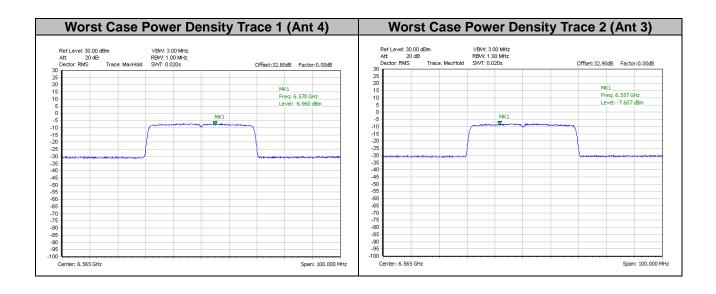
Please refer to Appendix A.

TEL: 886-3-327-3456 Page Number : 22 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021





Remark: The test plot is showing a bin by bin combined result mathematically adds two traces.



TEL: 886-3-327-3456 Page Number : 23 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

3.4 In-Band Emissions (Channel Mask)

3.4.1 Limit of Unwanted Emissions

<FCC 14-30 CFR 15.407>

(a)(6) For transmitters operating within the 5.925-7.125 GHz bands: Power spectral density must be suppressed by 20 dB at 1 MHz outside of channel edge, by 28 dB at one channel bandwidth from the channel center, and by 40 dB at one- and one-half times the channel bandwidth away from channel center. At frequencies between one megahertz outside an unlicensed device's channel edge and one channel bandwidth from the center of the channel, the limits must be linearly interpolated between 20 dB and 28 dB suppression, and at frequencies between one and one- and one-half times an unlicensed device's channel bandwidth, the limits must be linearly interpolated between 28 dB and 40 dB suppression. Emissions removed from the channel center by more than one- and one-half times the channel bandwidth must be suppressed by at least 40 dB.

Report No.: FR0D2942-04G

3.4.2 Measuring Instruments

See list of measuring equipment of this test report.

TEL: 886-3-327-3456 Page Number : 24 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

3.4.3 Test Procedures

The testing follows FCC KDB 987594 D02 U-NII 6GHz EMC Measurement v01.

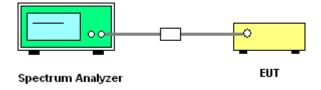
Section J) In-Band Emissions.

 Take nominal bandwidth as reference channel bandwidth provided that 26 dB emission bandwidth is always larger than nominal bandwidth

Report No.: FR0D2942-04G

- 2. Measure the power spectral density (which will be used for emissions mask reference) using the following procedure:
 - a) Set the span to encompass the entire 26 dB EBW of the signal.
 - b) Set RBW = same RBW used for 26 dB EBW measurement (1MHz for all supported bandwidth).
 - c) Set VBW ≥ 3 X RBW
 - d) Number of points in sweep ≥ [2 X span / RBW].
 - e) Sweep time = auto.
 - f) Detector = RMS (i.e., power averaging)
 - g) Trace average at least 100 traces in power averaging (rms) mode.
 - h) Use the peak search function on the instrument to find the peak of the spectrum.
- 3. Using the measuring equipment limit line function, develop the emissions mask based on the following requirements. The emissions power spectral density must be reduced below the peak power spectral density (in dB) as follows:
 - a. Suppressed by 20 dB at 1 MHz outside of the channel edge.
 - b. Suppressed by 28 dB at one channel bandwidth from the channel center.
 - c. Suppressed by 40 dB at one- and one-half times the channel bandwidth from the channel center.
- 4. Adjust the span to encompass the entire mask as necessary.
- Clear trace.
- 6. Trace average at least 100 traces in power averaging (rms) mode.
- Adjust the reference level as necessary so that the crest of the channel touches the top of the emission mask.

3.4.4 Test Setup



TEL: 886-3-327-3456 Page Number : 25 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

3.4.5 Test Result

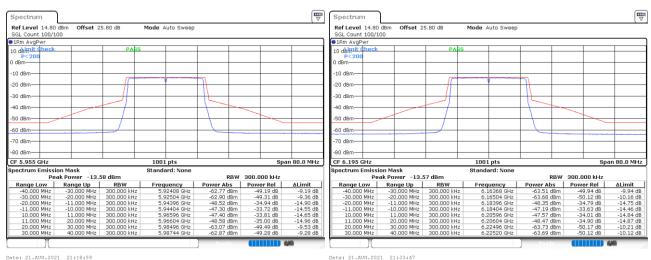
MIMO <Ant. 4+3(4)>

EUT Mode: 802.11ax HE20

Plot on Channel 5955MHz

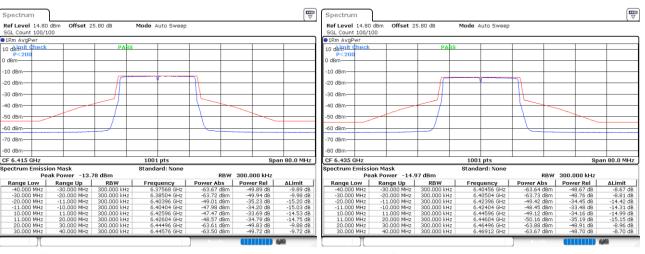
Plot on Channel 6195MHz

Report No.: FR0D2942-04G



Plot on Channel 6415MHz

Plot on Channel 6435MHz



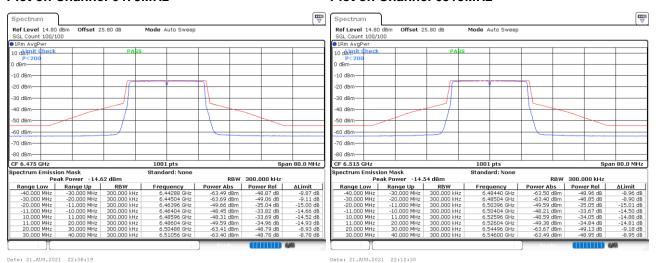
Date: 21.AUG.2021 21:41:04 Date: 21.AUG.2021 21:59:19

TEL: 886-3-327-3456 Page Number : 26 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

Plot on Channel 6475MHz

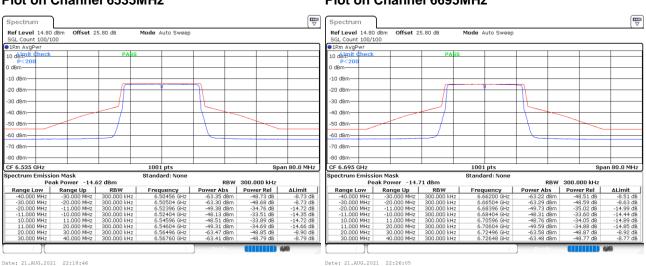
Plot on Channel 6515MHz

Report No.: FR0D2942-04G



Plot on Channel 6535MHz

Plot on Channel 6695MHz



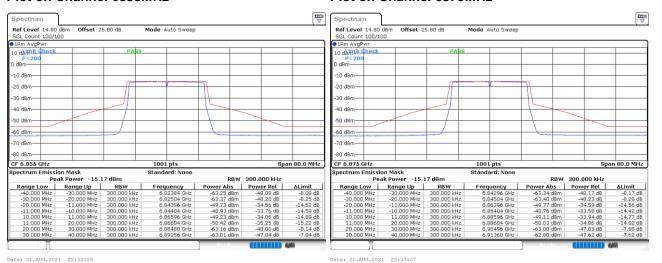
ate: 21.AUG.2021 22:18:46 Date: 21.AUG.2021 22:26:

TEL: 886-3-327-3456 Page Number : 27 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

Plot on Channel 6855MHz

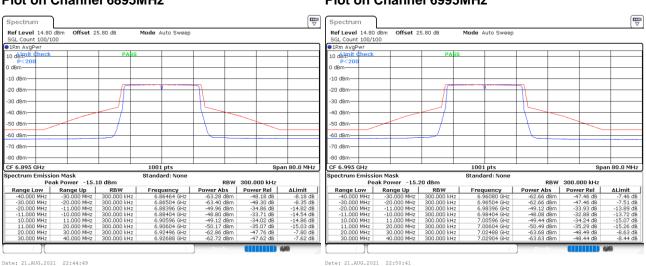
Plot on Channel 6875MHz

Report No.: FR0D2942-04G



Plot on Channel 6895MHz

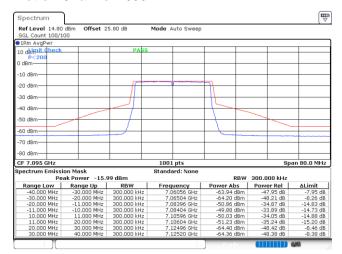
Plot on Channel 6995MHz



ate: 21.AUG.2021 22:44:49 Date: 21.AUG.2021 22:50:

TEL: 886-3-327-3456 Page Number : 28 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

Plot on Channel 7095MHz



Date: 21.AUG.2021 22:57:11

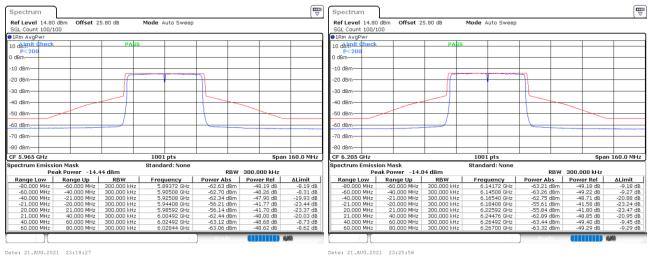
TEL: 886-3-327-3456 Page Number : 29 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

CC RADIO TEST REPORT Report No. : FR0D2942-04G

EUT Mode: 802.11ax HE40

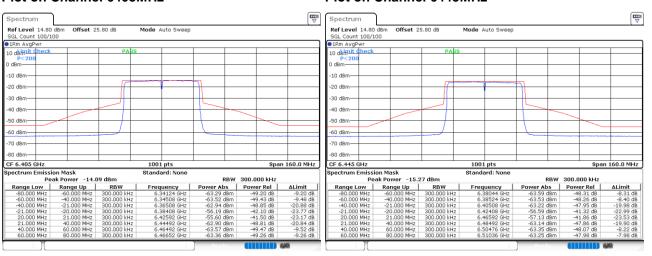
Plot on Channel 5965MHz

Plot on Channel 6205MHz



Plot on Channel 6405MHz

Plot on Channel 6445MHz



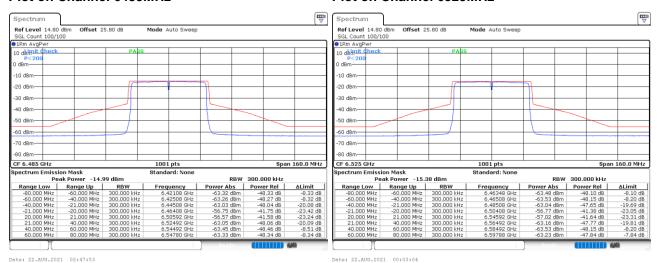
Date: 21.AUG.2021 23:31:34 Date: 21.AUG.2021 23:51:37

TEL: 886-3-327-3456 Page Number : 30 of 75 FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

Plot on Channel 6485MHz

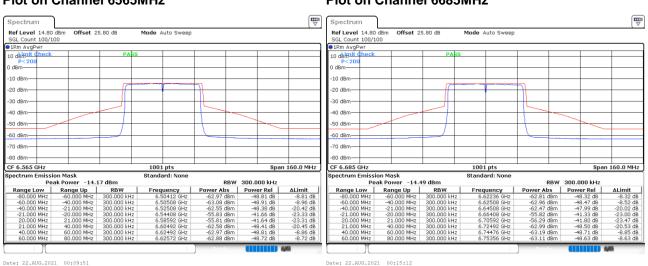
Plot on Channel 6525MHz

Report No.: FR0D2942-04G



Plot on Channel 6565MHz

Plot on Channel 6685MHz

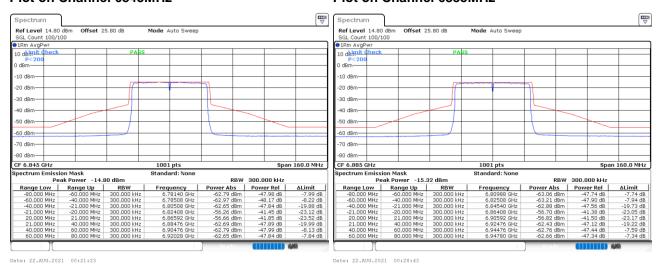


TEL: 886-3-327-3456 Page Number : 31 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

Plot on Channel 6845MHz

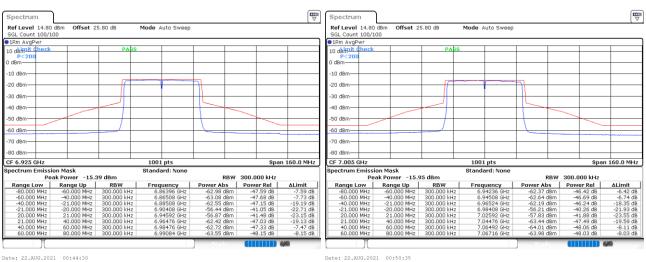
Plot on Channel 6885MHz

Report No.: FR0D2942-04G



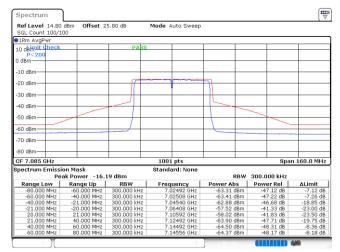
Plot on Channel 6925MHz

Plot on Channel 7005MHz



TEL: 886-3-327-3456 Page Number : 32 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

Plot on Channel 7085MHz



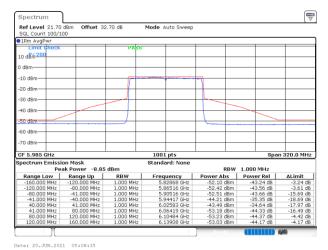
Date: 22.AUG.2021 00:56:55

TEL: 886-3-327-3456 Page Number : 33 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

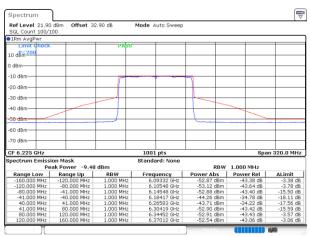
CC RADIO TEST REPORT Report No. : FR0D2942-04G

EUT Mode: 802.11ax HE80

Plot on Channel 5985MHz

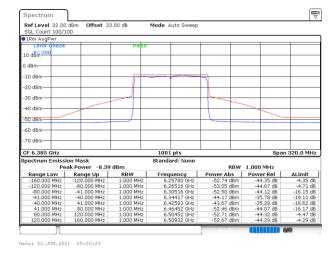


Plot on Channel 6225MHz

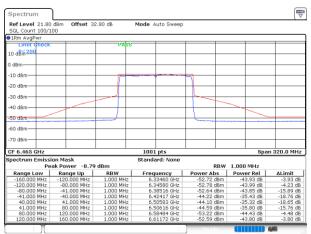


Date: 20.JUN.2021 05:13:37

Plot on Channel 6385MHz



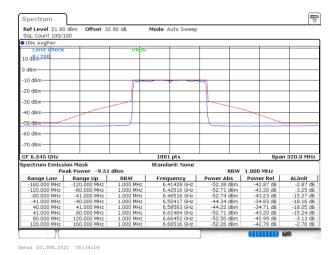
Plot on Channel 6465MHz



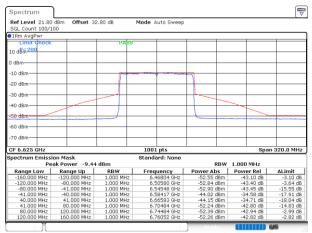
Date: 20.JUN.2021 05:27:49

TEL: 886-3-327-3456 Page Number : 34 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

Plot on Channel 6545MHz



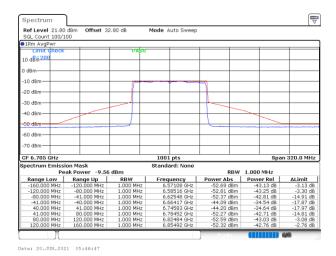
Plot on Channel 6625MHz



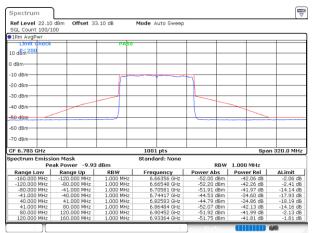
Report No.: FR0D2942-04G

Date: 20.JUN.2021 05:40:18

Plot on Channel 6705MHz



Plot on Channel 6785MHz



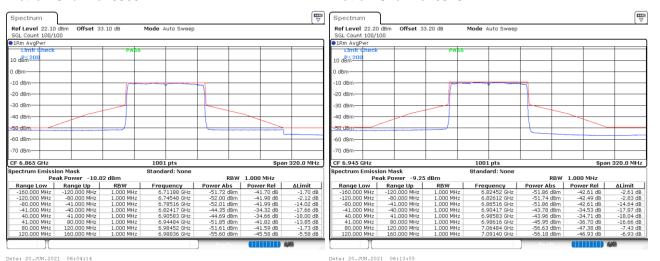
Date: 20.JUN.2021 05:52:35

TEL: 886-3-327-3456 Page Number : 35 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

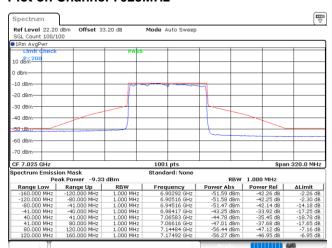
Plot on Channel 6865MHz

Plot on Channel 6945MHz

Report No.: FR0D2942-04G



Plot on Channel 7025MHz



Date: 20.JUN.2021 06:20:28

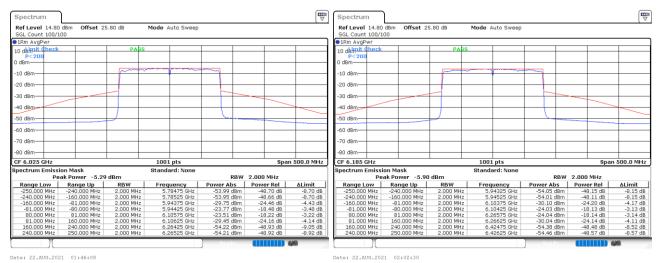
TEL: 886-3-327-3456 Page Number : 36 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

EUT Mode: 802.11ax HE160

Plot on Channel 6025MHz

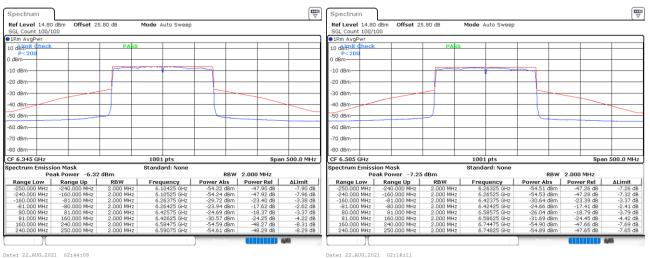
Plot on Channel 6185MHz

Report No.: FR0D2942-04G



Plot on Channel 6345MHz

Plot on Channel 6505MHz



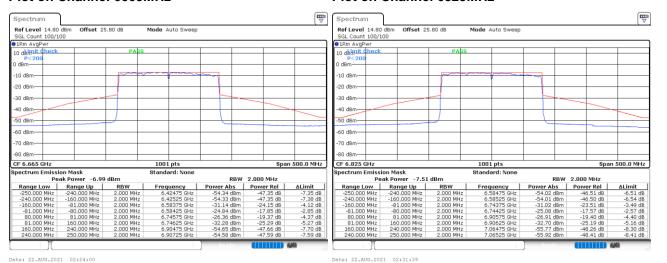
Date: 22.AUG.2021 02:44:08 Date: 22.AUG.2021 02:16:1

TEL: 886-3-327-3456 Page Number : 37 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

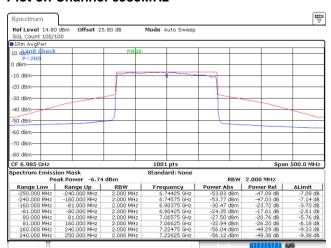
Plot on Channel 6665MHz

Plot on Channel 6825MHz

Report No.: FR0D2942-04G



Plot on Channel 6985MHz



Date: 22.AUG.2021 02:39:14

TEL: 886-3-327-3456 Page Number : 38 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

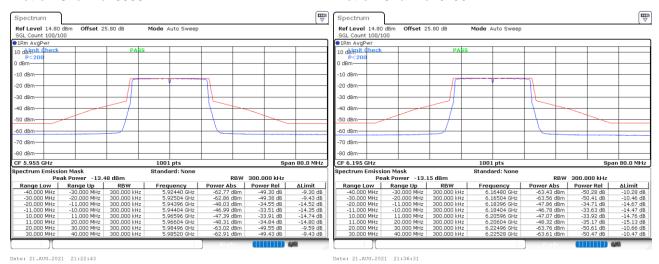
CC RADIO TEST REPORT Report No. : FR0D2942-04G

MIMO <Ant. 4+3(3)>

EUT Mode: 802.11ax HE20

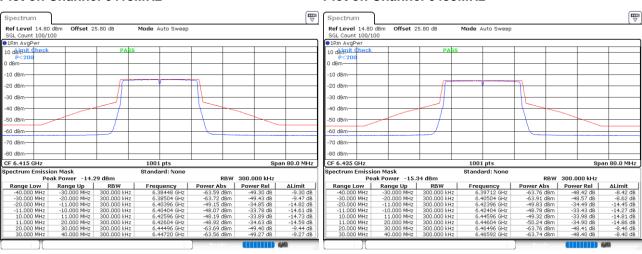
Plot on Channel 5955MHz

Plot on Channel 6195MHz



Plot on Channel 6415MHz

Plot on Channel 6435MHz



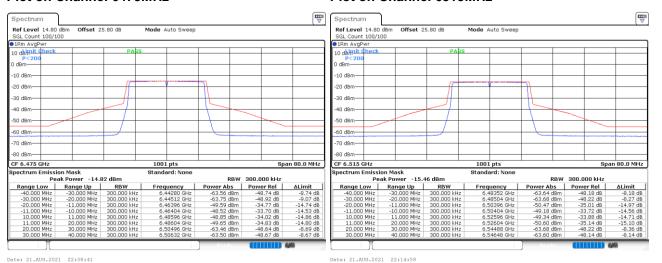
Date: 21.AUG.2021 21:43:13 Date: 21.AUG.2021 22:01:38

TEL: 886-3-327-3456 Page Number : 39 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

Plot on Channel 6475MHz

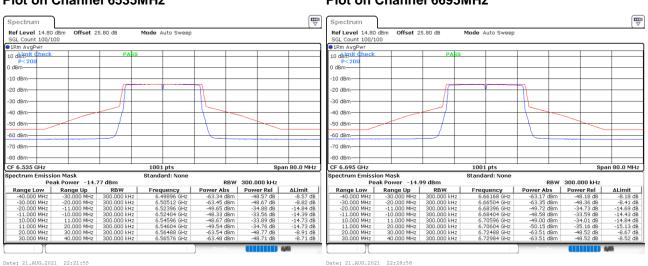
Plot on Channel 6515MHz

Report No.: FR0D2942-04G



Plot on Channel 6535MHz

Plot on Channel 6695MHz

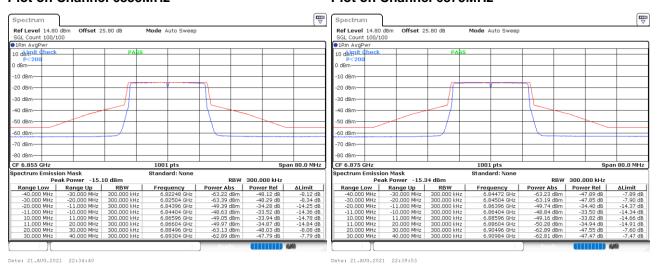


TEL: 886-3-327-3456 Page Number : 40 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

Plot on Channel 6855MHz

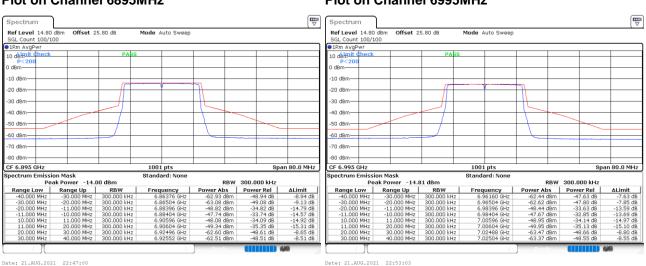
Plot on Channel 6875MHz

Report No.: FR0D2942-04G



Plot on Channel 6895MHz

Plot on Channel 6995MHz

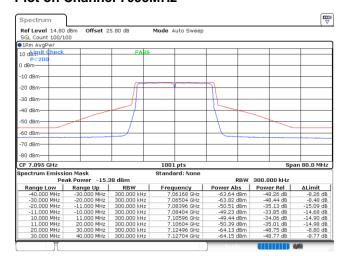


ate: 21.AUG.2021 22:47:00 Date: 21.AUG.2021 22:53:

TEL: 886-3-327-3456 Page Number : 41 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

Report No.: FR0D2942-04G

Plot on Channel 7095MHz



Date: 21.AUG.2021 22:59:24

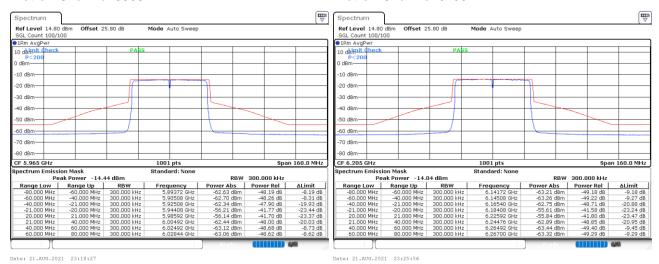
TEL: 886-3-327-3456 Page Number : 42 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

CC RADIO TEST REPORT Report No. : FR0D2942-04G

EUT Mode: 802.11ax HE40

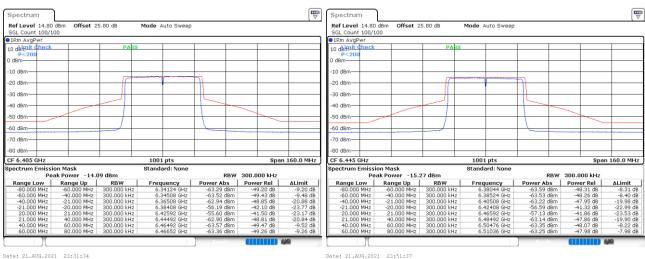
Plot on Channel 5965MHz

Plot on Channel 6205MHz



Plot on Channel 6405MHz

Plot on Channel 6445MHz



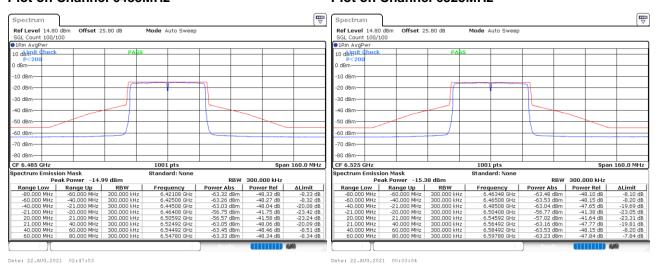
Date: 21.AUG.2021 23:31:34 Date: 21.AUG.2021 23:51:5

TEL: 886-3-327-3456 Page Number : 43 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

Plot on Channel 6485MHz

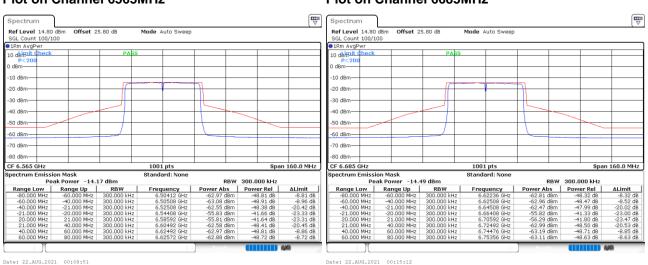
Plot on Channel 6525MHz

Report No.: FR0D2942-04G



Plot on Channel 6565MHz

Plot on Channel 6685MHz



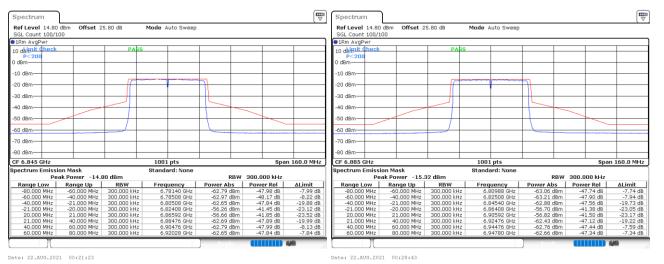
ate: 22.AUG.2021 00:09:51 Date: 22.AUG.2021 00:15:

TEL: 886-3-327-3456 Page Number : 44 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

Plot on Channel 6845MHz

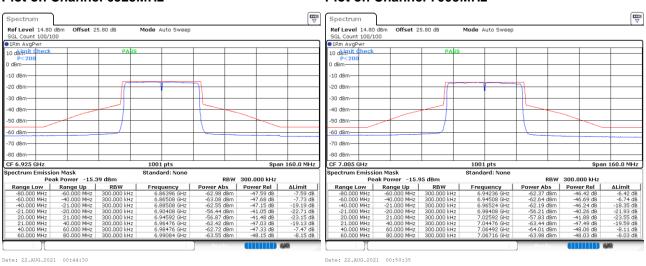
Plot on Channel 6885MHz

Report No.: FR0D2942-04G



Plot on Channel 6925MHz

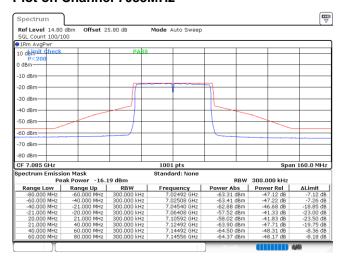
Plot on Channel 7005MHz



TEL: 886-3-327-3456 Page Number : 45 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

Report No.: FR0D2942-04G

Plot on Channel 7085MHz



Date: 22.AUG.2021 00:56:55

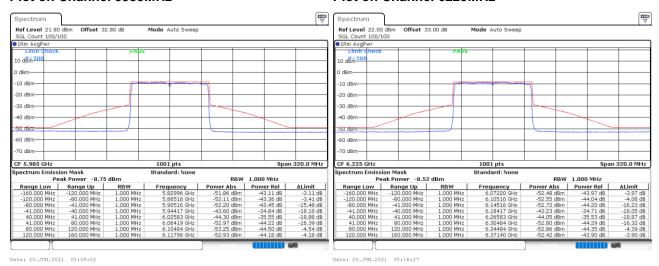
TEL: 886-3-327-3456 Page Number : 46 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

CC RADIO TEST REPORT Report No. : FR0D2942-04G

EUT Mode: 802.11ax HE80

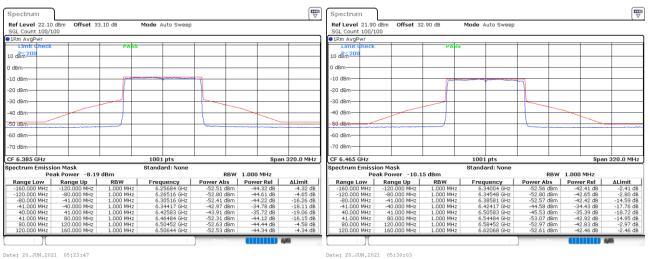
Plot on Channel 5985MHz

Plot on Channel 6225MHz



Plot on Channel 6385MHz

Plot on Channel 6465MHz



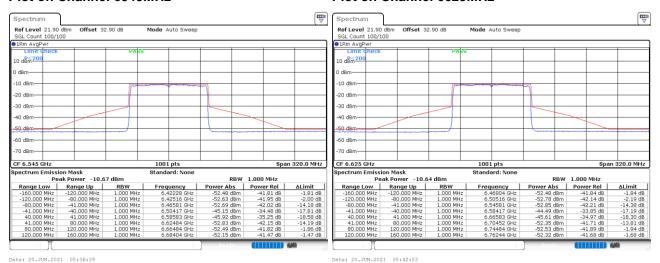
Date: 20.JUN.2021 05:23:47 Date: 20.JUN.2021 05:30:0

TEL: 886-3-327-3456 Page Number : 47 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021

Plot on Channel 6545MHz

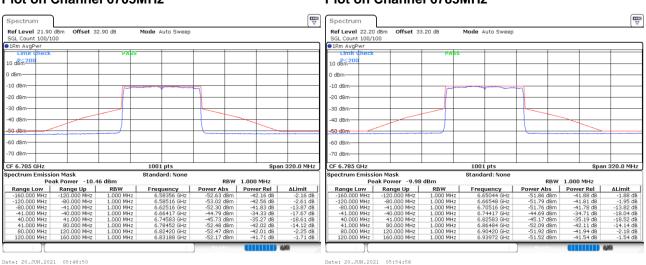
Plot on Channel 6625MHz

Report No.: FR0D2942-04G



Plot on Channel 6705MHz

Plot on Channel 6785MHz



tte: 20.JUN.2021 05:48:50 Date: 20.JUN.2021 05:54:5

TEL: 886-3-327-3456 Page Number : 48 of 75
FAX: 886-3-328-4978 Issued Date : Sep. 08, 2021