



# FCC RADIO TEST REPORT

FCC ID :	MSQAI2202
Equipment :	ASUS Phone(Mobile Phone)
Brand Name :	ASUS
Model Name :	ASUS_AI2202
Applicant :	ASUSTeK COMPUTER INC.
	1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan
Manufacturer :	ASUSTeK COMPUTER INC.
	1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan
Standard :	FCC Part 15 Subpart C §15.247

The product was received on May 03, 2022 and testing was performed from May 27, 2022 to Jul. 14, 2022. We, Sporton International Inc. Wensan 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 from Sporton International Inc. Wensan Laboratory, the test report shall not be reproduced except in full.

Louis Wu

Approved by: Louis Wu

Sporton International Inc. Wensan Laboratory

No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)

TEL: 886-3-327-0868
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Report Template No.: BU5-FR15CBT Version 2.4

Page Number: 1 of 69Issue Date: Jul. 21, 2022Report Version: 01



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# History of this test report

Report No.	Version	Description	Issue Date
FR210409A	01	Initial issue of report	Jul. 21, 2022



# Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.247(a)(1)	Number of Channels	Pass	-
3.2	15.247(a)(1)	Hopping Channel Separation	Pass	-
3.3	15.247(a)(1)	Dwell Time of Each Channel	Pass	-
3.4	15.247(a)(1)	20dB Bandwidth	Pass	-
3.4	2.1049	99% Occupied Bandwidth	Reporting only	-
3.5	15.247(b)(1)	Peak Output Power	Pass	-
3.6	15.247(d)	Conducted Band Edges	Pass	-
3.7	15.247(d)	Conducted Spurious Emission	Pass	-
3.8	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	Pass	7.61 dB under the limit at 41.640 MHz
3.9	15.207	AC Conducted Emission	Pass	15.37 dB under the limit at 9.544 MHz
3.10	15.203 & 15.247(b)	Antenna Requirement Pass		-

#### Declaration of Conformity:

 The test results (PASS/FAIL) with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers. It's means measurement values may risk exceeding the limit of regulation standards, if

measurement uncertainty is include in test results.

2. The measurement uncertainty please refer to this report "Uncertainty of Evaluation". **Comments and Explanations:** 

The product specifications of the EUT presented in the report are declared by the manufacturer who shall take full responsibility for the authenticity.

# Reviewed by: Avis Chuang

**Report Producer: Clio Lo** 



# **1** General Description

# **1.1 Product Feature of Equipment Under Test**

GSM/WCDMA/LTE/5G NR, Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n/ac/ax, Wi-Fi 5GHz 802.11a/n/ac/ax, Wi-Fi 6GHz 802.11a/n/ac/ax, NFC, and GNSS.

Product Feature				
	WWAN: PIFA Ante	enna		
	WLAN			
	<ant. 7="">: PIFA Ar</ant.>	itenna		
	<ant. 8="">: PIFA Ar</ant.>	itenna		
Antenna Type	Bluetooth	Bluetooth		
	<ant. 7="">: PIFA Ar</ant.>	<ant. 7="">: PIFA Antenna</ant.>		
	<ant. 8="">: PIFA Ar</ant.>	<ant. 8="">: PIFA Antenna</ant.>		
	GPS / Glonass / E	GPS / Glonass / BDS / Galileo / SBAS: PIFA Antenna		
	NFC: Loop Anten	na		
Antenna information				
2400 MHz ~ 2483.5 MHz	Peak Gain (dBi)	Ant. 7 : -0.62		
		Apt 9: 2.92		

**Remark:** The EUT's information above is declared by manufacturer. Please refer to Comments and Explanations in report summary.

Ant. 8: -3.82

# **1.2 Modification of EUT**

No modifications made to the EUT during the testing.



# **1.3 Testing Location**

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory		
Test Site LocationNo.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.		
Test Sile No.	CO05-HY (TAF Code: 1190)		
Remark         The Conducted Emission test item subcontracted to Sporton Interna Inc. EMC & Wireless Communications Laboratory.			

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

Test Site	Sporton International Inc. Wensan Laboratory	
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855	
Test Site No.	Sporton Site No. TH05-HY, 03CH11-HY	

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

FCC designation No.: TW1190 and TW3786

# **1.4 Applicable Standards**

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

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v05r02
- FCC KDB 414788 D01 Radiated Test Site v01r01
- ANSI C63.10-2013

#### Remark:

- 1. All the test items were validated and recorded in accordance with the standards without any modification during the testing.
- 2. The TAF code is not including all the FCC KDB listed without accreditation.
- 3. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

# 2 Test Configuration of Equipment Under Test

# 2.1 Carrier Frequency Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
	0	2402	27	2429	54	2456
	1	2403	28	2430	55	2457
	2	2404	29	2431	56	2458
	3	2405	30	2432	57	2459
	4	2406	31	2433	58	2460
	5	2407	32	2434	59	2461
	6	2408	33	2435	60	2462
	7	2409	34	2436	61	2463
	8	2410	35	2437	62	2464
	9	2411	36	2438	63	2465
	10	2412	37	2439	64	2466
	11	2413	38	2440	65	2467
	12	2414	39	2441	66	2468
2400-2483.5 MHz	13	2415	40	2442	67	2469
	14	2416	41	2443	68	2470
	15	2417	42	2444	69	2471
	16	2418	43	2445	70	2472
	17	2419	44	2446	71	2473
	18	2420	45	2447	72	2474
	19	2421	46	2448	73	2475
	20	2422	47	2449	74	2476
	21	2423	48	2450	75	2477
	22	2424	49	2451	76	2478
	23	2425	50	2452	77	2479
	24	2426	51	2453	78	2480
	25	2427	52	2454	-	-
	26	2428	53	2455	-	-

# 2.2 Test Mode

- 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). For radiated measurement, 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, and the worst mode of radiated spurious emissions is Bluetooth 1Mbps mode, and recorded in this report.
- b. AC power line Conducted Emission was tested under maximum output power.

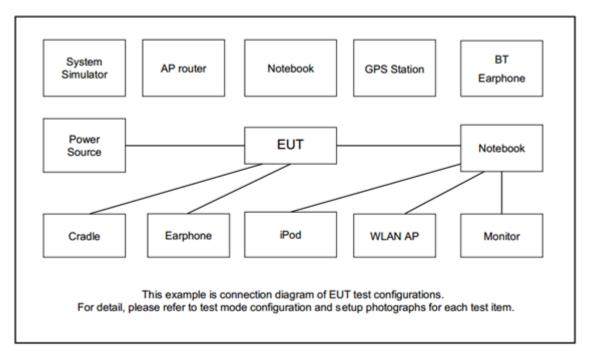
Summary table of Test Cases					
Test Item		Data Rate / Modulation			
	Bluetooth BR 1Mbps GFSK	Bluetooth EDR 2Mbps $\pi$ /4-DQPSK	Bluetooth EDR 3Mbps 8-DPSK		
Conducted	Mode 1: CH00_2402 MHz	Mode 4: CH00_2402 MHz	Mode 7: CH00_2402 MHz		
Test Cases	Mode 2: CH39_2441 MHz	Mode 5: CH39_2441 MHz	Mode 8: CH39_2441 MHz		
	Mode 3: CH78_2480 MHz	Mode 6: CH78_2480 MHz	Mode 9: CH78_2480 MHz		
	Bluetooth BR 1Mbps GFSK				
Radiated	Mode 1: CH00_2402 MHz				
Test Cases	Mode 2: CH39_2441 MHz				
	Mode 3: CH78_2480 MHz				
AC Conducted	Mode 1 :GSM850 Idle +	Bluetooth Link + WLAN	(2.4GHz) Link + Camera		
Emission	(Front) + NFC on + USB Cable 1 (Charging from AC Adapter 1) + SIM 1				
<ul> <li>Remark:</li> <li>1. For Radiated Test Cases, the worst mode data rate 1Mbps was reported only since the highest RF output power in the preliminary tests. The conducted spurious emissions and conducted band edge measurement for other data rates were not worse than 1Mbps, and no other significantly frequencies found in conducted spurious emission.</li> </ul>					

The following summary table is showing all test modes to demonstrate in compliance with the standard.

2. For Radiated Test Cases, the tests were performed with Adapter 1 and USB Cable 1.



# 2.3 Connection Diagram of Test System



# 2.4 Support Unit used in test configuration and system

ltem	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8m
2.	Bluetooth Earphone	Sony Ericsson	MW600	PY700A2029	N/A	N/A
3.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8m
4.	Notebook	Dell	Latitude 3400	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	Earphone	ASUS	EA010B	N/A	N/A	N/A

# 2.5 EUT Operation Test Setup

The RF test items, utility "QRCT 4.0.00193.0" 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 10 dB attenuator.

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

= 4.2 + 10 = 14.2 (dB)



# 3 Test Result

# 3.1 Number of Channel Measurement

# 3.1.1 Limits of Number of Hopping Frequency

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

# 3.1.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

# 3.1.3 Test Procedure

- 1. The testing follows ANSI C63.10-2013 clause 7.8.3.
- 2. The RF output of EUT is connected to the spectrum analyzer by RF cable and attenuator. The path loss is compensated to the results for each measurement.
- 3. Set the maximum power setting and enable the EUT to transmit continuously.
- 4. Enable the EUT hopping function.
- Use the following spectrum analyzer settings: Span = the frequency band of operation;
   RBW = 300 kHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold.
- 6. The number of hopping frequency used is defined as the number of total channel.
- 7. Record the measurement data derived from spectrum analyzer.

# 3.1.4 Test Setup



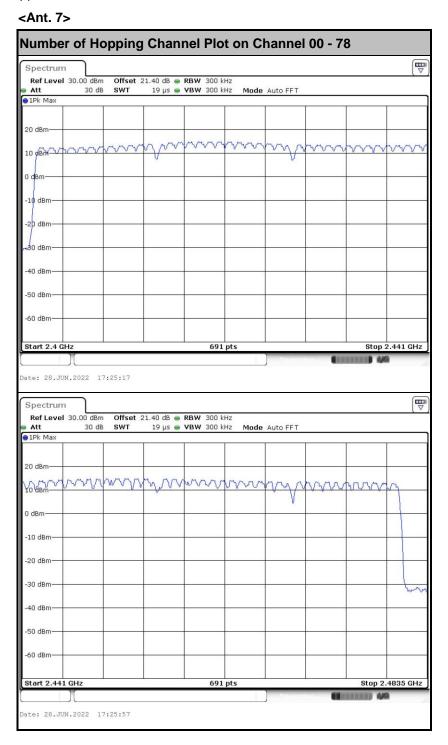
Spectrum Analyzer

EUT



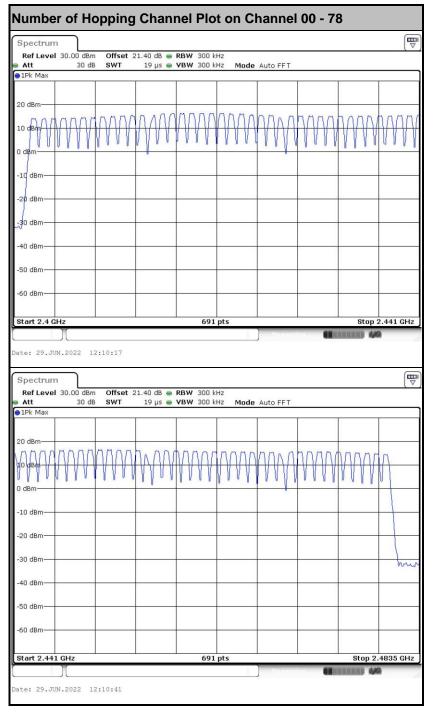
# 3.1.5 Test Result of Number of Hopping Frequency

Please refer to Appendix A.





#### <Ant. 8>



# **3.2 Hopping Channel Separation Measurement**

# 3.2.1 Limit of Hopping Channel Separation

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

# **3.2.2 Measuring Instruments**

Please refer to the measuring equipment list in this test report.

### 3.2.3 Test Procedures

- 1. The testing follows ANSI C63.10-2013 clause 7.8.2.
- 2. The RF output of EUT is connected to the spectrum analyzer by RF cable and attenuator. The path loss is compensated to the results for each measurement.
- 3. Set the maximum power setting and enable the EUT to transmit continuously.
- 4. Enable the EUT hopping function.
- Use the following spectrum analyzer settings:
   Span = wide enough to capture the peaks of two adjacent channels;
   RBW = 300 kHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold.
- 6. Measure and record the results in the test report.

# 3.2.4 Test Setup



Spectrum Analyzer

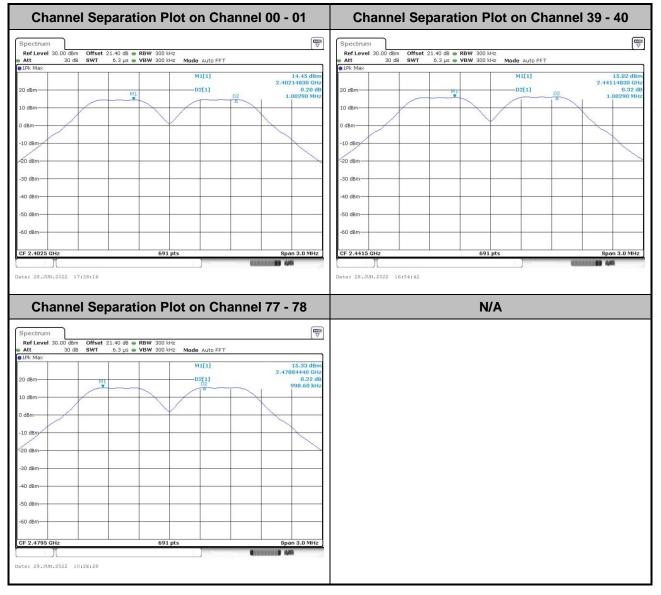
# 3.2.5 Test Result of Hopping Channel Separation

Please refer to Appendix A.



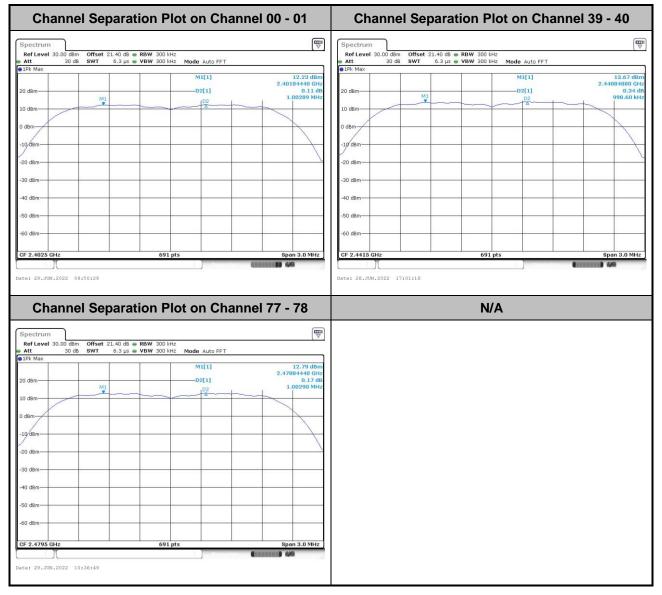
# <Ant. 7>

#### <1Mbps>



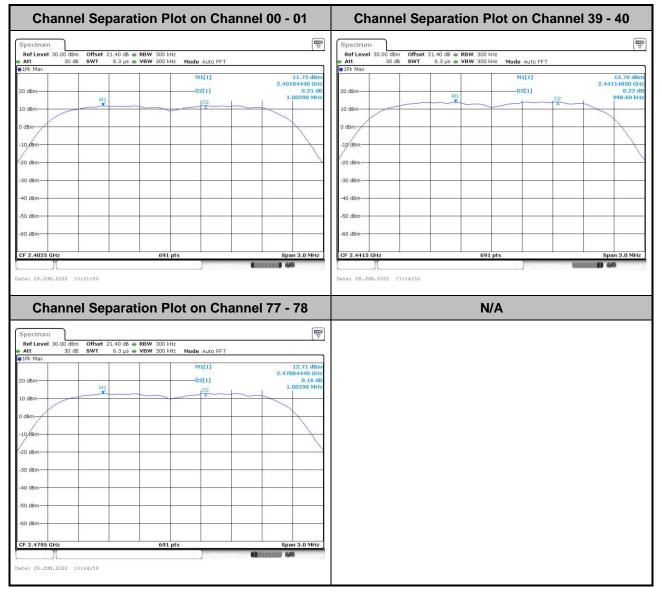


#### <2Mbps>





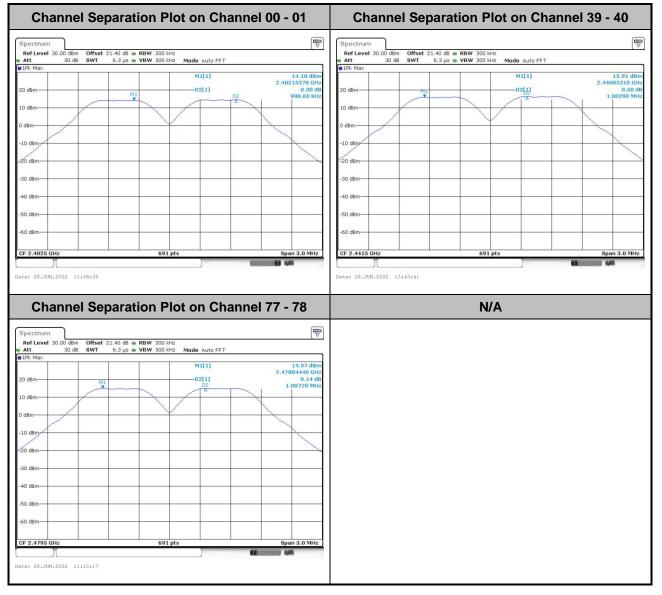
#### <3Mbps>





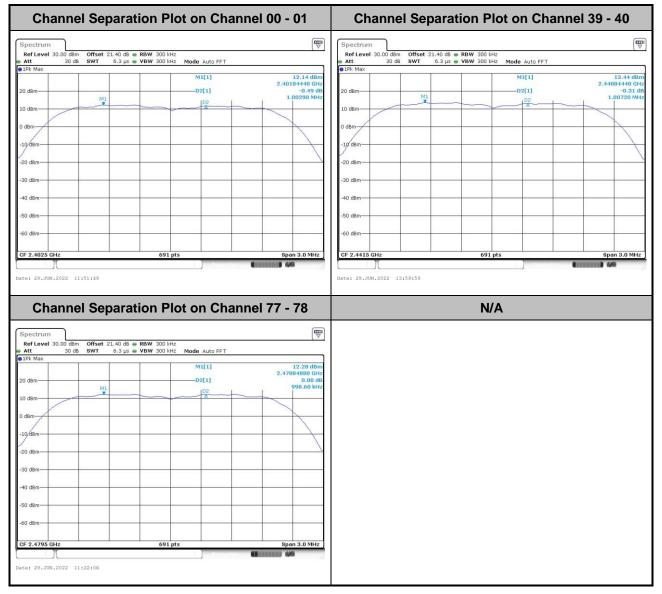
#### <Ant. 8>

#### <1Mbps>



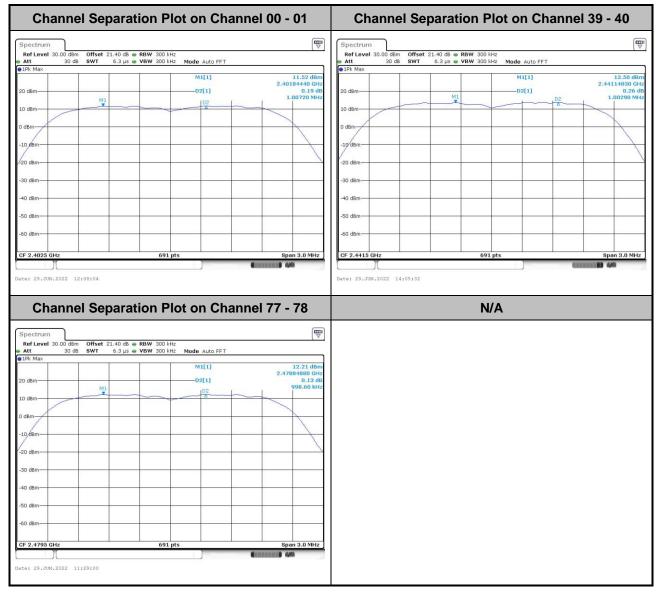


#### <2Mbps>





#### <3Mbps>





# 3.3 Dwell Time Measurement

### 3.3.1 Limit of Dwell Time

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

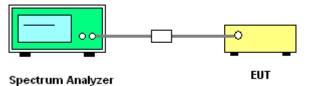
### **3.3.2 Measuring Instruments**

Please refer to the measuring equipment list in this test report.

### 3.3.3 Test Procedures

- 1. The testing follows ANSI C63.10-2013 clause 7.8.4.
- 2. The RF output of EUT is connected to the spectrum analyzer by RF cable and attenuator. The path loss is compensated to the results for each measurement.
- 3. Set the maximum power setting and enable the EUT to transmit continuously.
- 4. Enable the EUT hopping function.
- 5. Use the following spectrum analyzer settings: Span = zero span, centered on a hopping channel; RBW = 1 MHz; VBW ≥ RBW; Sweep = as necessary to capture the entire dwell time per hopping channel; Detector function = peak; Trace = max hold.
- 6. Measure and record the results in the test report.

### 3.3.4 Test Setup

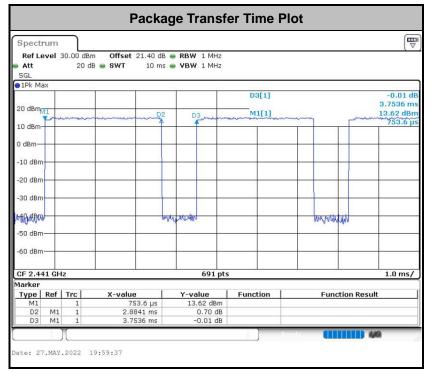


# 3.3.5 Test Result of Dwell Time

Please refer to Appendix A.







#### Remark:

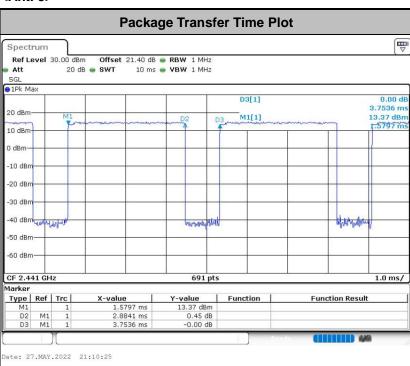
**1.** In normal mode, hopping rate is 1600 hops/s with 6 slots in 79 hopping channels. With channel hopping rate (1600 / 6 / 79) in Occupancy Time Limit  $(0.4 \times 79)$  (s),Hops Over Occupancy Time comes to  $(1600 / 6 / 79) \times (0.4 \times 79) = 106.67$  hops.

**2.** In AFH mode, hopping rate is 800 hops/s with 6 slots in 20 hopping channels. With channel hopping rate (800 / 6 / 20) in Occupancy Time Limit  $(0.4 \times 20)$  (s), Hops Over Occupancy Time comes to  $(800 / 6 / 20) \times (0.4 \times 20) = 53.33$  hops.

3. Dwell Time(s) = Hops Over Occupancy Time (hops) x Package Transfer Time

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#### <Ant. 8>

#### Remark:

**1.** In normal mode, hopping rate is 1600 hops/s with 6 slots in 79 hopping channels. With channel hopping rate (1600 / 6 / 79) in Occupancy Time Limit  $(0.4 \times 79)$  (s),Hops Over Occupancy Time comes to  $(1600 / 6 / 79) \times (0.4 \times 79) = 106.67$  hops.

**2.** In AFH mode, hopping rate is 800 hops/s with 6 slots in 20 hopping channels. With channel hopping rate (800 / 6 / 20) in Occupancy Time Limit  $(0.4 \times 20)$  (s), Hops Over Occupancy Time comes to  $(800 / 6 / 20) \times (0.4 \times 20) = 53.33$  hops.

3. Dwell Time(s) = Hops Over Occupancy Time (hops) x Package Transfer Time

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# 3.4 20dB and 99% Bandwidth Measurement

# 3.4.1 Limit of 20dB and 99% Bandwidth

Reporting only

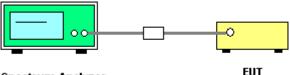
### 3.4.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

### 3.4.3 Test Procedures

- 1. The testing follows ANSI C63.10-2013 clause 6.9.2 and 6.9.3.
- 2. The RF output of EUT is connected to the spectrum analyzer by RF cable and attenuator. The path loss is compensated to the results for each measurement.
- 3. Set the maximum power setting and enable the EUT to transmit continuously.
- Use the following spectrum analyzer settings for 20 dB Bandwidth measurement.
  Span = approximately 2 to 5 times the 20 dB bandwidth, centered on a hopping channel;
  RBW ≥ 1% of the 20 dB bandwidth; VBW ≥ RBW; Sweep = auto; Detector function = peak;
  Trace = max hold.
- Use the following spectrum analyzer settings for 99 % Bandwidth measurement.
   Span = approximately 1.5 to 5 times the 99% bandwidth, centered on a hopping channel;
   RBW ≥ 1-5% of the 99% bandwidth; VBW ≥ 3 \* RBW; Sweep = auto; Detector function = peak;
   Trace = max hold.
- 6. Measure and record the results in the test report.

# 3.4.4 Test Setup



Spectrum Analyzer

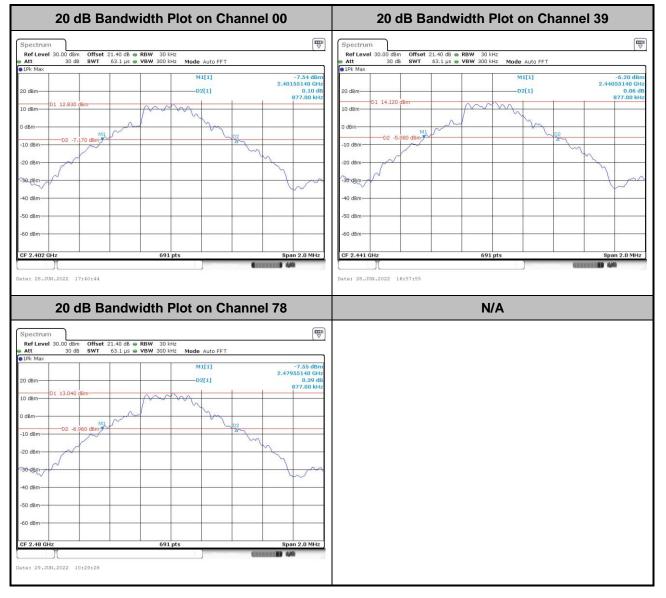
# 3.4.5 Test Result of 20dB Bandwidth

Please refer to Appendix A.



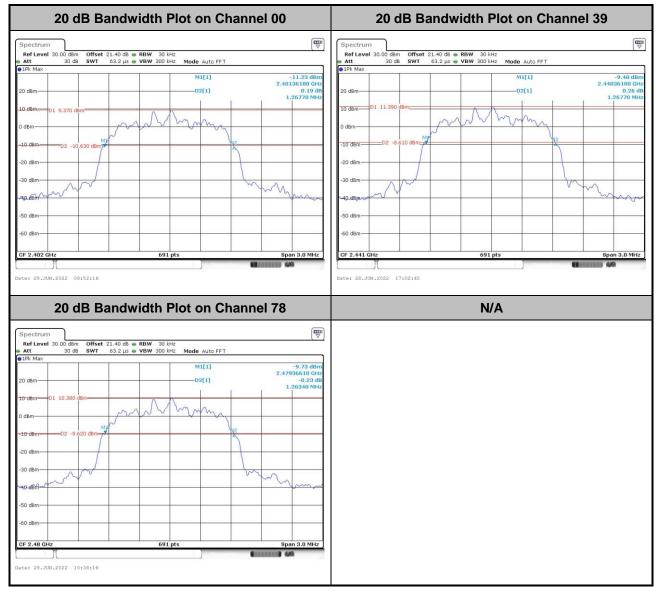
#### <Ant. 7>

#### <1Mbps>



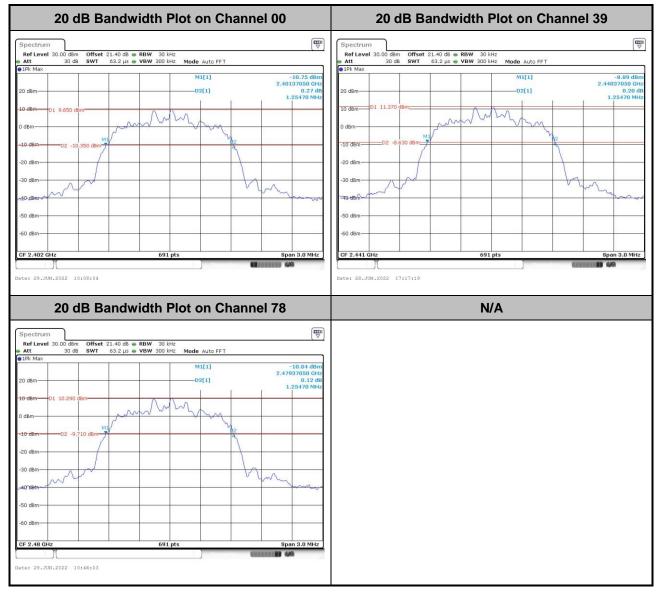


#### <2Mbps>





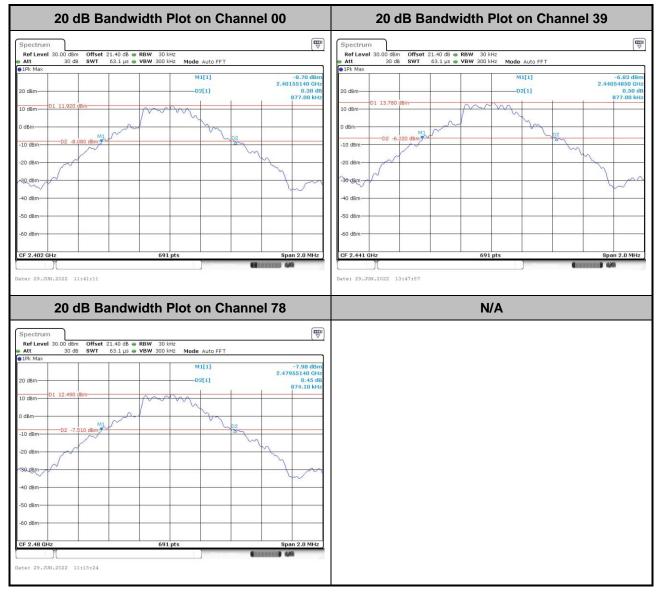
#### <3Mbps>





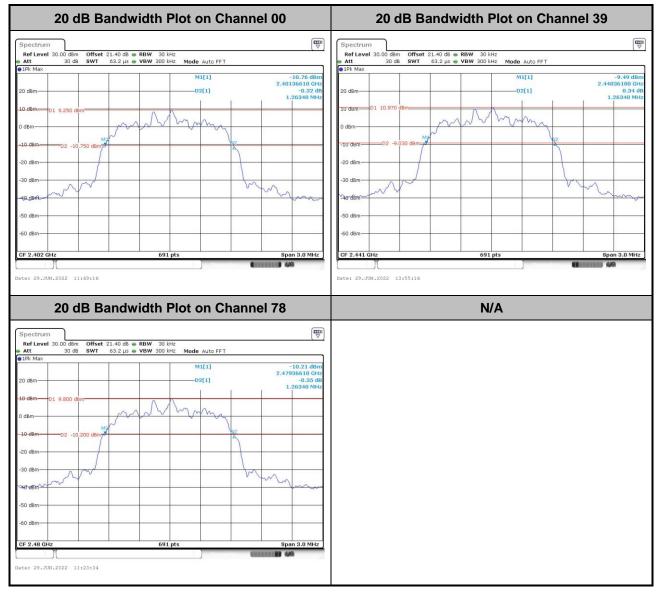
#### <Ant. 8>

#### <1Mbps>



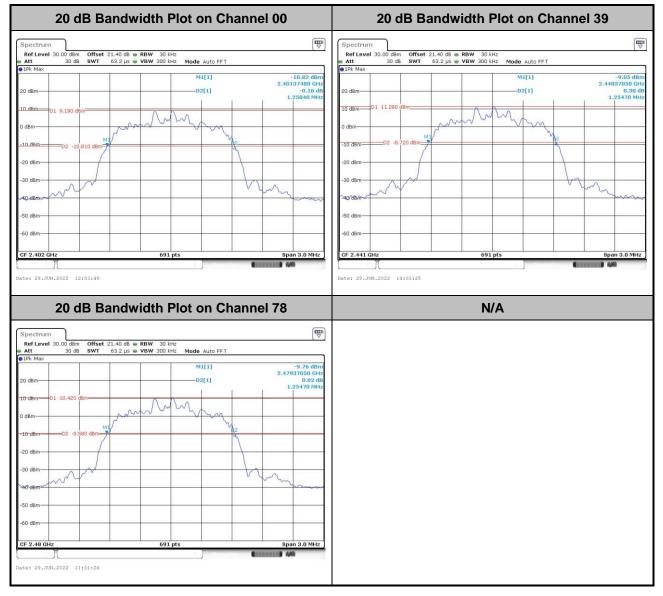


#### <2Mbps>





#### <3Mbps>



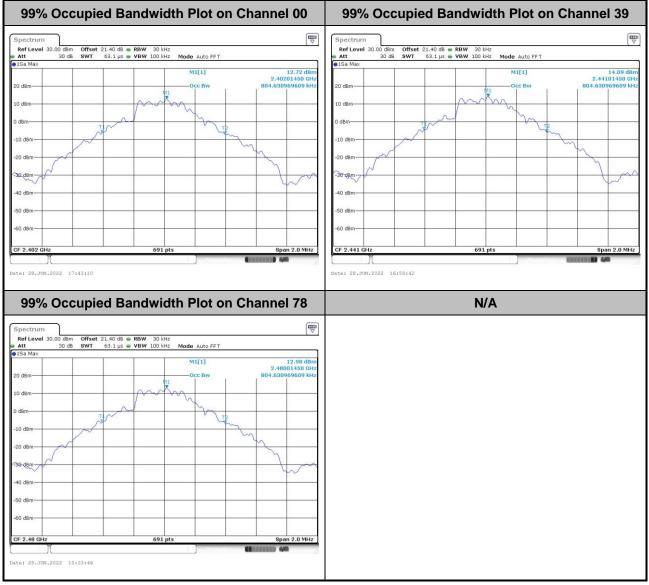


# 3.4.6 Test Result of 99% Occupied Bandwidth

Please refer to Appendix A.

#### <Ant. 7>

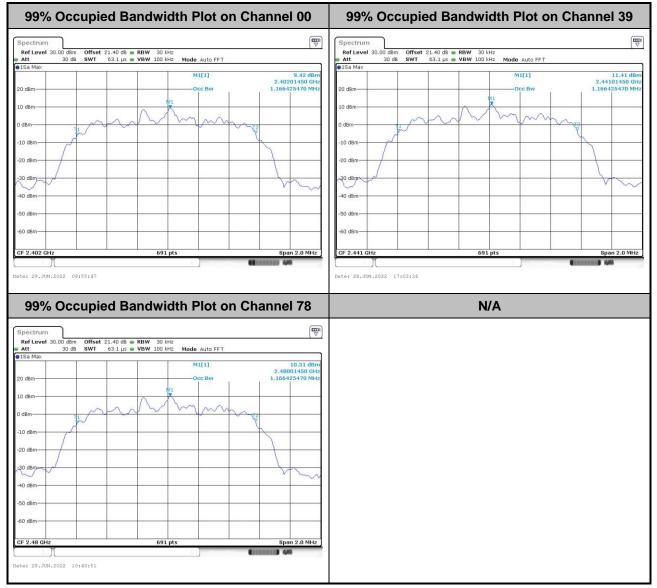
#### <1Mbps>



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



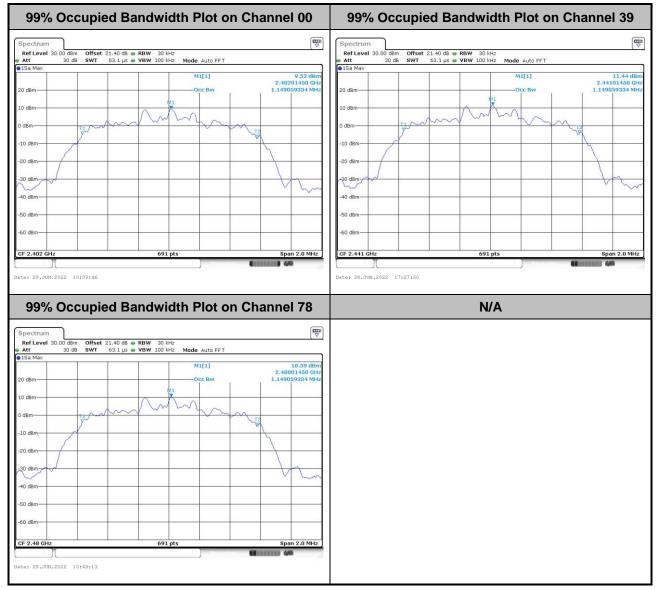
#### <2Mbps>



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



#### <3Mbps>

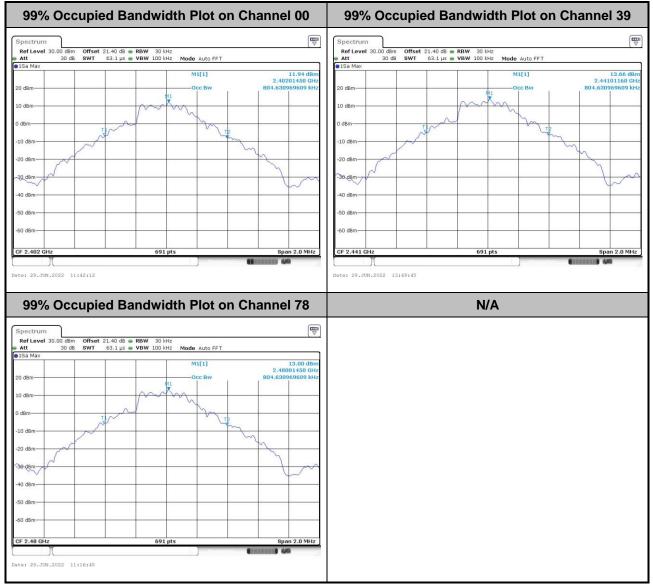


Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.



### <Ant. 8>

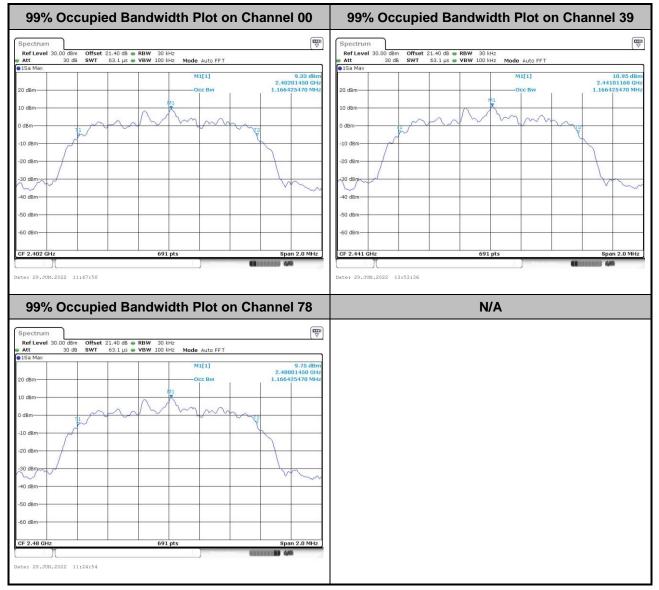
#### <1Mbps>



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



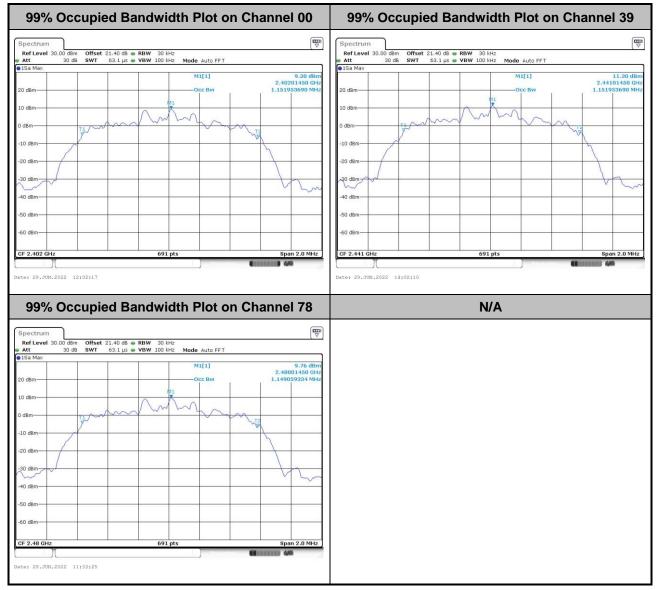
#### <2Mbps>



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



#### <3Mbps>



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



# 3.5 Output Power Measurement

### 3.5.1 Limit of Output Power

The maximum peak conducted output power of the intentional radiator shall not exceed the following: For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band 0.125 watts.

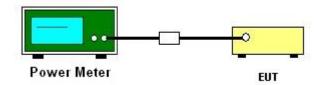
### 3.5.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

### 3.5.3 Test Procedures

- 1. The testing follows ANSI C63.10-2013 clause 7.8.5.
- 2. The RF output of EUT is connected to the power meter by RF cable and attenuator. The path loss is compensated to the results for each measurement.
- 3. Set the maximum power setting and enable the EUT to transmit continuously.
- 4. Measure the conducted output power with cable loss and record the results in the test report.
- 5. Measure and record the results in the test report.

## 3.5.4 Test Setup



## 3.5.5 Test Result of Peak Output Power

Please refer to Appendix A.

## 3.5.6 Test Result of Average Output Power (Reporting Only)

Please refer to Appendix A.



# 3.6 Conducted Band Edges Measurement

## 3.6.1 Limit of Band Edges

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

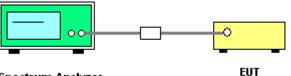
### 3.6.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

### 3.6.3 Test Procedures

- 1. The testing follows ANSI C63.10-2013 clause 7.8.6.
- 2. Set the maximum power setting and enable the EUT to transmit continuously.
- 3. Set RBW = 100 kHz, VBW = 300 kHz. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW. The attenuation shall be 30 dB instead of 20 dB when RMS conducted output power procedure is used.
- 4. Enable hopping function of the EUT and then repeat step 2 and 3.
- 5. Measure and record the results in the test report.

## 3.6.4 Test Setup



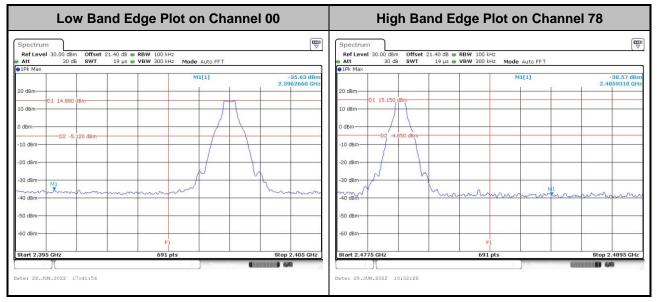
Spectrum Analyzer



# 3.6.5 Test Result of Conducted Band Edges

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Spectrum         Spectrum	Low Band E	High	n Band Edge	Plot on Ch	annel 78		
20 dBm       M1[1]       -35.41 dBm         20 dBm       2.0353040 GHz       2.0353040 GHz         10 dBm       01 11.490 dBm       0         0 dBm       0       0         -10 dBm       02 9.510 dBm       0         -20 dBm       0       0         -30 dBm       0       0         -30 dBm       0       0         -20 dBm       0       0         -30 dBm       0       0         -30 dBm       0       0         -30 dBm       0       0         -50 dBm       0       0         -60 dBm       0       0         -50 dBm       0       0	Ref Level 30.00 dBm Offset 21.40 dB Att 30 dB SWT 19 µs			Ref Level 30.00 dBm Att 30 dB			
10 dem 02 4.510 dem 02 4.510 dem 02 4.510 dem 04 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	20 dBm	M1[1]				M1[1]	
-10 dem	10 000	- may		10 dBm	30		
40 dBm     40 dBm <td>-10 dBill</td> <td></td> <td></td> <td>-10 dBm-</td> <td>70 dBm</td> <td></td> <td></td>	-10 dBill			-10 dBm-	70 dBm		
-60 dBm F1 691 pts Stop 2.405 GHz 691 pts Stop 2.405 GHz 691 pts Stop 2.4895 GHz	mann		human	mon		mmmmm	V
Start 2.395 GHz 691 pts Stop 2.405 GHz 691 pts Stop 2.405 GHz 691 pts Stop 2.4095 GHz	-50 d8m			-50 dBm			
		I I I I I I I I I I I I I I I I I I I	Stop 2 405 GHz			T.	Stop 2 4895 CHz
		031 hr2				091 pt3	20

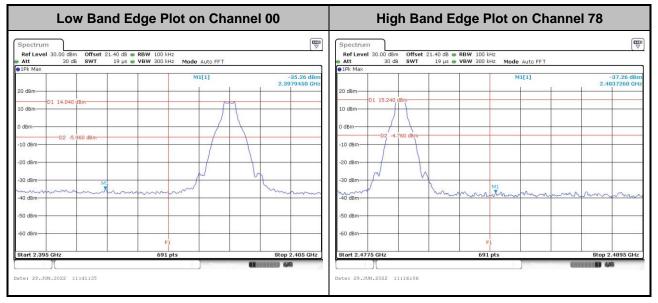


Low Banc	d Edge Plot on Chann	el 00	High Ba	and Edge Plot on Ch	annel 78
	0 dB = RBW 100 kHz 9 µs = VBW 300 kHz Mode Auto FFT M1[1]	-35.05 dBm	Spectrum Ref Level 30.00 dBm Offse Att 30 dB SWT	21.40 dB ⊕ RBW 100 kHz 19 μs ⊕ VBW 300 kHz Mode Auto FFT M1[1]	-35.16 dBm
20 dBm 01 11.660 dBm 01 11.660 dBm 0 dBm 01 11.660 dBm 01 0 dBm 02 -8.340 dBm		2.3950360 GHz	20 dBm 10 dBm 0 dBm -10 dBm -10 dBm -20 dBm -20 dBm		2.4844558 GHz
130 dBm -40 dBm -50 dBm -60 dBm		humm	-30 dBm	Muran Marin	
Stort 2.395 GHz	F1 691 pts	Stop 2.405 GHz	Start 2.4775 GHz	691 pts	Stop 2.4895 GHz
Date: 29.JUN.2022 10:08:29			Date: 29.JUN.2022 10:47:39		



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Low Band E	dge Plot on Channe	el 00	High Ba	nd Edge Plot on Cl	nannel 78
Spectrum           Ref Level 30.00 dBm         Offset 21.40 dB           Att         30 dB         SWT         19 µs           IPk Max	RBW 100 kHz     VBW 300 kHz     Mode Auto FFT		Spectrum Ref Level 30.00 dBm Offset 2 Att 30 dB SWT	1.40 dB ● RBW 100 kHz 19 µs ● VBW 300 kHz Mode Auto FFT	
20 dBm-	M1[1]	-34.55 dBm 2.3960200 GHz	20 dBm-	M1[1]	-35.48 dBm 2.4847160 GHz
10 dBm01 11.410 dBm	- my		10 dBm 01 11.980 dBm		
-10 dBm02 -8.590 dBm		· · · · · · · · · · · · · · · · · · ·	-10 dBm		
-30 dBm - M1		hanner	-30 dBm	M1 M1	
-50 d8m			-50 dBm		
-60 dBm	F1 691 pts	Stop 2.405 GHz	-60 dBm	F1 691 pts	Stop 2.4895 GHz
Date: 29.JUN.2022 11:48:21	Maximum		Date: 29.JUN.2022 11:23:57		0000000 444



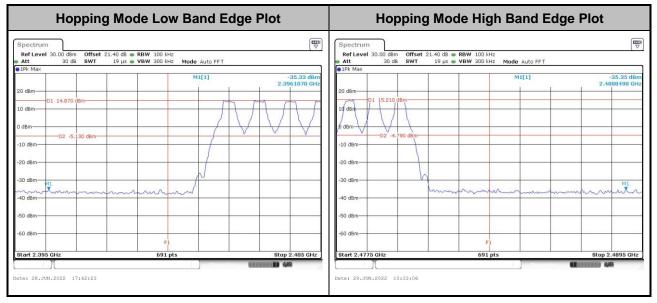
Low Band	Edge Plot on Channe	el 00	High Band Edge Plot on Channel 78
	0 d8 • RBW 100 kHz 9 µs • VBW 300 kHz Mode Auto FFT M3[1]		Spectrum         Important           Ref Level 30.00 dBm         Offset 21.40 dB ● RBW 100 kHz           Att         30 dB           SWT         19 µs           VBW 300 kHz         Mode Auto FFT
20 dBm	(MILI)	2.3957740 GHz	20 d8m
10 dBm 01 11.360 dBm 0 0 dBm 02 -8.640 dBm			10 dBm         01 11.980 dBm         0           0 dBm         0         0           -10 dBm         0         0           -20 dBm         0         0           -30 dBm         0         0
-40 d8m	F1		-60 d8m
Start 2.395 GHz	691 pts	Stop 2.405 GHz	Start 2.4775 GHz 691 pts Stop 2.4895 GHz
Date: 29.JUN.2022 12:02:38	the statistics	Da	Date: 29.JUN.2022 11:32:29



# 3.6.6 Test Result of Conducted Hopping Mode Band Edges

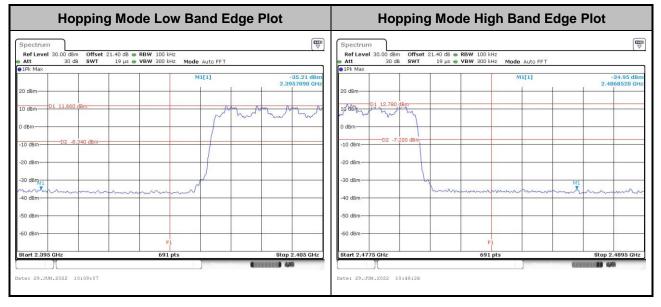
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Hopping Mo	Hopping Mode High Band Edge Plot					
Spectrum           Ref Level 30:00 dBm         Offset 21:40 dB           Att         30 dB         SWT         19 µs           DPL Max           19 µs	RBW 100 kHz     VBW 300 kHz     Mode Auto FFT			offset 21.40 dB ⊕ RBW 8 SWT 19 µs ⊕ VBW	100 kHz 300 kHz <b>Mode</b> Auto	₽ FFT
20 d8m	M1[1]	-35.79 dBm 2.3954410 GHz	20 dBm-		M1[1]	-35.22 dBn 2.4894910 GH
10 dBmD1 11.480 dBm	m	Am Man Marken	10 dBm	dBm-		
-10 dBmD2 -8.520 dBm				250 dBm		
-30 dBm M1	mmmm		-30 dBm	human	mmm	
-50 dBm			-50 dBm			
-60 dBm	F1		-60 dBm		F1	
Start 2.395 GHz	691 pts	Stop 2.405 GHz	Start 2.4775 GHz		691 pts	Stop 2.4895 GHz

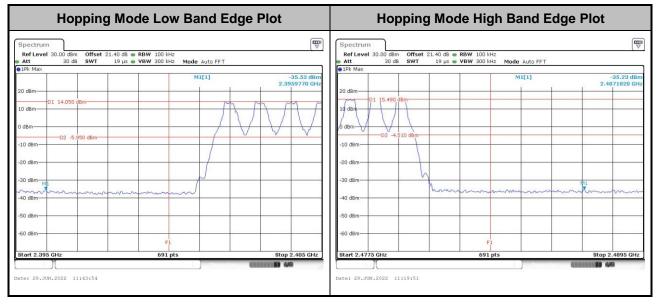






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	Hopping Mode High Band Edge Plot
Ref Level         30.00 dBm         Offset         21.40 dB         RBW         100 kHz           Att         30 dB         SWT         19 µs         VBW         300 kHz         Mode         Auto FFT	Spectrum         Image: Constraint of the second seco
M1[1] -34.76 dBm 2.3951520 GHz	20 dBm
m m m m	19 / HBan
-10 dBm	-10 dBm
	-30 dBm
-50 d8m	-50 dBm
-60 dBm F1 Start 2.395 GHz 691 pts Stop 2.405 GHz	-60 dBm F1 Start 2.4775 GHz 691 pts 8top 2.4895 GHz



Spectrum 🕎	
Ref Level 30.00 dBm         Offset 21.40 dB         RBW 100 kHz           Att         30 dB         SWT         19 µs         VBW 300 kHz	Spectrum         Image: Constraint of the second secon
20 dBm 01 11.400 dBm 01 11.400 dBm	20 dBm
0 d8m 02 -8,600 d8m	0 dBm
-30 dgm	-30 dBm
-50 dBm -60 dBm F1 Start 2.395 GHz 691 pts Stop 2.405 GHz	-50 dBm F1 -60 dBm F1 Start 2.4775 GHz 691 pts Stop 2.4895 GHz

# 3.7 Conducted Spurious Emission Measurement

## 3.7.1 Limit of Spurious Emission Measurement

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

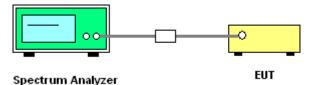
## 3.7.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

## 3.7.3 Test Procedure

- 1. The testing follows ANSI C63.10-2013 clause 7.8.8.
- 2. The RF output of EUT is connected to the spectrum analyzer by RF cable and attenuator. The path loss is compensated to the results for each measurement.
- 3. Set the maximum power setting and enable the EUT to transmit continuously.
- Set RBW = 100 kHz, VBW = 300 kHz, scan up through 10th harmonic. All harmonics / spurious must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.
- 5. Measure and record the results in the test report.
- 6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

# 3.7.4 Test Setup



TEL : 886-3-327-0868 FAX : 886-3-327-0855 Report Template No.: BU5-FR15CBT Version 2.4



# 3.7.5 Test Result of Conducted Spurious Emission

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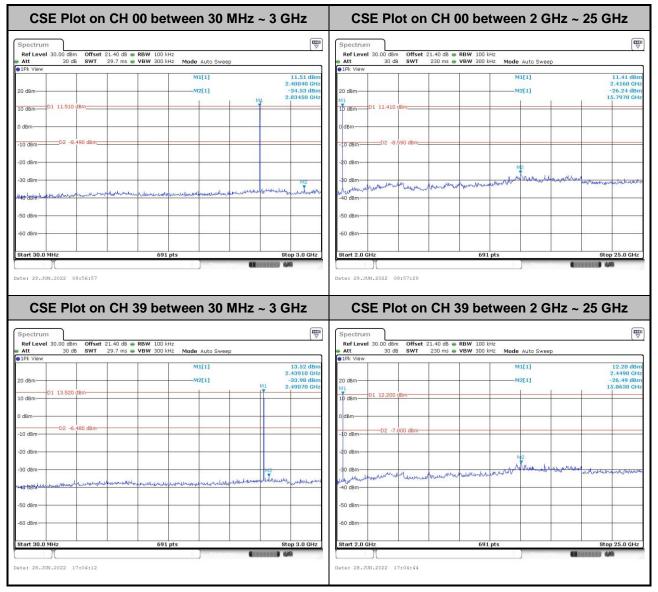
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ectrum ef Level 30.00 dBm Offset 21.4			Spectro Ref La	um ) vel 30.00 dBm Offset 21.40			
tt 30 dB SWT 29	7 ms 🖶 VBW 300 kHz Mode Auto Swee	p	Att	30 dB SWT 230	0 dB	lode Auto Sweep	
k View	M1[1]		• 1Pk Vie 14.73 dBm	<i>"</i>		M1[1]	14.14 0
		2.4	40040 GHz				2.4160
01 14.730 dBm	M2[1]		34.51 dBm 64540 GHz	D1 14.140 dBm		M2[1]	-25.98 0
Bm-			10 dBm-	01 14.140 dbm			
			A (2020)				
D2 -5.270 dBm			0 dBm-				
IBm-			-10 dBm-	D2 -5.860 dBm			
25							
iBm-			-20 dBm-			M2	
IBm-		MO	-30 dBm-			Not mar stall mor	Alle Mary share want 100
and war a selene and for herder you	human alice way mon and a grander way	un sun abrance	underes wer show the	in a when the stand watches the	Jernoneverteent		han warmen ba
BALLesson illunger approximation pre			-40 dBm-				
Bm			-50 dBm-				
Bm-			-60 dBm-				
30.0 MHz	691 pts	Sto	p 3.0 GHz Start 2.0	) GHz	691 pts		Stop 25.0 G
CSE Plot on (	CH 39 between 30	MHz ~ 3 G	Hz C	SE Plot on C	H 39 betwe	en 2 GHz	z ~ 25 GHz
CSE Plot on (		MHz ~ 3 G	Hz C	SE Plot on C		een 2 GHz	z ~ 25 GHz
f Level 30.00 dBm Offset 21 t 30 dB SWT 29			Hz C	SE Plot on C			z ~ 25 GHz
CSE Plot on (	10 dB ● RBW 100 kHz 7 ms ● VBW 300 kHz Mode Auto Swee	p	Hz C	SE Plot on C	0 dB 🖷 RBW 100 kHz	tode Auto Sweep	z ~ 25 GHz
CSE Plot on C	0 dB • RBW 100 kHz 7 ms • VBW 300 kHz Mode Auto Swee	р 2.	Hz C	SE Plot on C	0 dB 🖷 RBW 100 kHz	lode Auto Sweep M1[1]	15.53 ( 2.4490
CSE Plot on (	10 dB ● RBW 100 kHz 7 ms ● VBW 300 kHz Mode Auto Swee	р 2. M1	Hz C	SE Plot on C	0 dB 🖷 RBW 100 kHz	tode Auto Sweep	15.53 (
CSE Plot on ( ctrum t Level 30.00 dBm Offset 21. 30 dB SWT 29 View m D1 15.900 dBm	0 dB • RBW 100 kHz 7 ms • VBW 300 kHz Mode Auto Swee	р 2. M1	Hz C	SE Plot on C	0 dB 🖷 RBW 100 kHz	lode Auto Sweep M1[1]	15,53 2,4490 -26,43 (
CSE Plot on ( ctrum Level 30.00 dBm Offset 21. 30 dB SWT 29 View m 01 15.000 dBm m m	0 dB • RBW 100 kHz 7 ms • VBW 300 kHz Mode Auto Swee	р 2. M1	Hz C	SE Plot on C	0 dB 🖷 RBW 100 kHz	lode Auto Sweep M1[1]	15,53 2,4490 -26,43 (
CSE Plot on ( ctrum Level 30.00 dBm offset 21. 30 dB SWT 29 View m 01 15.900 dBm m 01 15.900 dBm	0 dB • RBW 100 kHz 7 ms • VBW 300 kHz Mode Auto Swee	р 2. M1	Hz C	SE Plot on C	0 dB 🖷 RBW 100 kHz	lode Auto Sweep M1[1]	15,53 2,4490 -26,43 (
CSE Plot on ( trum Level 30.00 dBm Offset 21 30 dB SWT 29 View 	0 dB • RBW 100 kHz 7 ms • VBW 300 kHz Mode Auto Swee	р 2. M1	Hz C	SE Plot on C	0 dB 🖷 RBW 100 kHz	lode Auto Sweep M1[1]	15,53 2,4490 -26,43 (
CSE Plot on ( trum Level 30.00 dBm Offset 21. 30 dB SWT 29 View 01 15.900 dBm 02 4.100 dBm	0 dB • RBW 100 kHz 7 ms • VBW 300 kHz Mode Auto Swee	р 2. M1	Hz C	SE Plot on C	0 dB 🖷 RBW 100 kHz	lode Auto Sweep M1[1]	15,53 2,4490 -26,43 (
CSE Plot on ( trum Level 30.00 dBm Offset 21. 30 dB SWT 29 View 01 15.900 dBm 02 4.100 dBm	0 dB • RBW 100 kHz 7 ms • VBW 300 kHz Mode Auto Swee	р 2. M1	Hz C	SE Plot on C	2 dB • RBW 100 kHz N Ims • VBW 300 kHz N	tode Auto Sweep           M1[1]           —M2[1]	15.53 2.4490 -26.43 15.650
CSE Plot on ( ctrum Level 30.00 dbm offset 21. 30 db swr 29 View 01 15.000 dbm 02 4.100 dbm am	0 dB • RBW 100 kHz 7 ms • VBW 300 kHz Mode Auto Swee	p	Hz C	SE Plot on C	2 dB • RBW 100 kHz N Ims • VBW 300 kHz N	tode Auto Sweep           M1[1]           —M2[1]	15.53 2.4490 -26.43 15.650
CSE Plot on ( ctrum Level 30.00 dBm Offset 21. 30 dB SWT 29 View 01 15.900 dBm 01 15.900 dBm Bm Bm Bm Bm	0 dB • RBW 100 kHz 7 ms • VBW 300 kHz Mode Auto Swee	р 2. M1	Hz C	SE Plot on C	0 dB 🖷 RBW 100 kHz	tode Auto Sweep           M1[1]           —M2[1]	15.53 2.4490 -26.43 15.650
CSE Plot on ( ctrum Level 30.00 dBm Offset 21. 30 dB SWT 29 View 01 15.900 dBm 01 15.900 dBm Bm Bm Bm Bm	0 dB • RBW 100 kHz 7 ms • VBW 300 kHz Mode Auto Swee M1[1] 	p	Hz C	SE Plot on C	2 dB • RBW 100 kHz N ms • VBW 300 kHz N	tode Auto Sweep           M1[1]           —M2[1]	15.53 2.4490 -26.43 15.650
CSE Plot on C	0 dB • RBW 100 kHz 7 ms • VBW 300 kHz Mode Auto Swee M1[1] 	p	Hz C	SE Plot on C	2 dB • RBW 100 kHz N ms • VBW 300 kHz N	tode Auto Sweep           M1[1]           —M2[1]	15.53 2.4490 -26.43 15.650
CSE Plot on C	0 dB • RBW 100 kHz 7 ms • VBW 300 kHz Mode Auto Swee M1[1] 	p	Hz C	SE Plot on C	2 dB • RBW 100 kHz N ms • VBW 300 kHz N	tode Auto Sweep           M1[1]           —M2[1]	15.53 2.4490 -26.43 15.650
CSE Plot on C	0 dB • RBW 100 kHz 7 ms • VBW 300 kHz Mode Auto Swee M1[1] 	p	Hz C	SE Plot on C	2 dB • RBW 100 kHz N ms • VBW 300 kHz N	tode Auto Sweep           M1[1]           —M2[1]	15.53 2.4490 -26.43 15.650
CSE Plot on C	10 dB e RBW 100 kHz 7 ms e VBW 300 kHz M1[1] M2[		Hz C	SE Plot on C	2 dB • RBW 100 kHz N ms • VBW 300 kHz N	tode Auto Sweep           M1[1]           —M2[1]	15.53 2.4490 -26.43 15.6630
CSE Plot on C	0 dB • RBW 100 kHz 7 ms • VBW 300 kHz Mode Auto Swee M1[1] 		Hz C	SE Plot on C	2 dB • RBW 100 kHz N ms • VBW 300 kHz N	tode Auto Sweep           M1[1]           —M2[1]	15.53 2.4490 -26.43 15.650



pectrum			Spectrum			(E
Ref Level 30.00 dBm Offset 21.40 dB 🖷 R		(*)	Ref Level 30.00 dBm Off	set 21.40 dB 👜 RBW 100		L'
Att 30 dB SWT 29.7 ms 🖷 V 1Pk View	BW 300 kHz Mode Auto Sweep		Att 30 dB SW	T 230 ms 🖶 VBW 300 l	Hz Mode Auto Sweep	
0 dBm	M1[1] M2[1]	15.10 dBm 2.47780 GHz −32.86 dBm ▼ 2.35740 GHz	20. dBm		M1[1] M2[1]	14.72 dB 2.4830 GI -26.35 dB 17.8940 GI
D1 15.100 dBm			01 14.720 dBm-			
dBm			0 dBm			
0 d8m-			-10 dBm-			
10 dBm			-20 dBm		Mg	
10 dBm		M2	-30 dBm	war present sources and	and the the ward have a	the well worth word when the most
out the all a bring is a considered and the second	a concerning the second of the	and the second s	-40 dBm			
0 dBm			-50 dBm			
0 dBm			-60 dBm			
tart 30.0 MHz	691 pts	Stop 3.0 GHz	Start 2.0 GHz	691	pts	Stop 25.0 GH

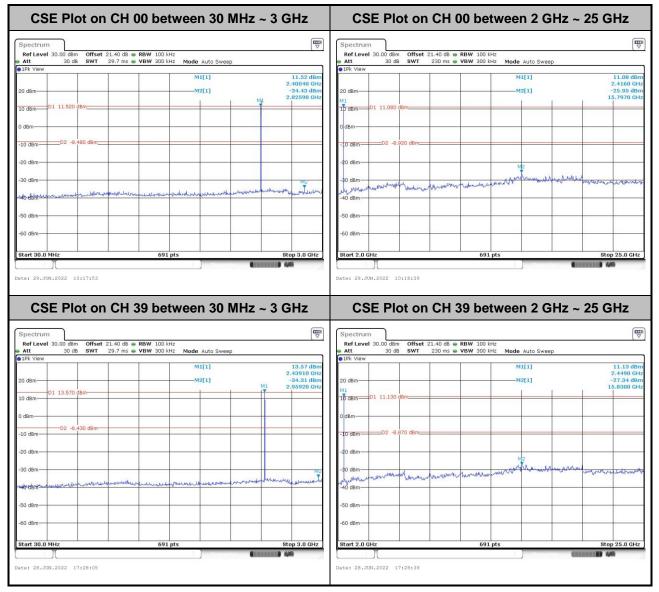






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Spectrum Ref Level 30.00 dBm Offset 21.40 dB			Spectrum Ref Level 30.00 dBm Offset 21	40 dB 🖷 RBW 100 kHz	a a a a a a a a a a a a a a a a a a a
	VBW 300 kHz Mode Auto Sweep			30 ms - VBW 300 kHz Mode Auto Sweep	
1Pk View			• 1Pk View		
	M1[1]	11.94 dBm 2.48210 GHz		M1[1]	11.15 dE 2.4830 G
0 dBm	-M2[1]	-34.38 dBm	20 dBm	M2[1]	-27.09 dB
2.1		M1 2.63250 GHz	M1		15.8630 G
0 dBm D1 11.940 dBm			10 dBm 01 11.150 dBm		
dBm			0 dBm		
D2 -8.060 dBm			-10 dBm D2 -8.850 dBm		
LO dBm- 02 90.000 dBm			-10 dBm		
20 dBm			-20 dBm-		
20 dbin				M2	
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		meder the aly war one	a warman and the warden	as manufactor and a second and	and the strength of the second
+0/08/11- a deserve and a served and a server	had we have been been been been been been been be	An an abrander	-40 dBm		
50 dBm-			-50 dBm		
60 dBm			-60 dBm		
tart 30.0 MHz	691 pts	Stop 3.0 GHz	Start 2.0 GHz	691 pts	Stop 25.0 GH
	Measure	<b>E</b>		Me additions .	E





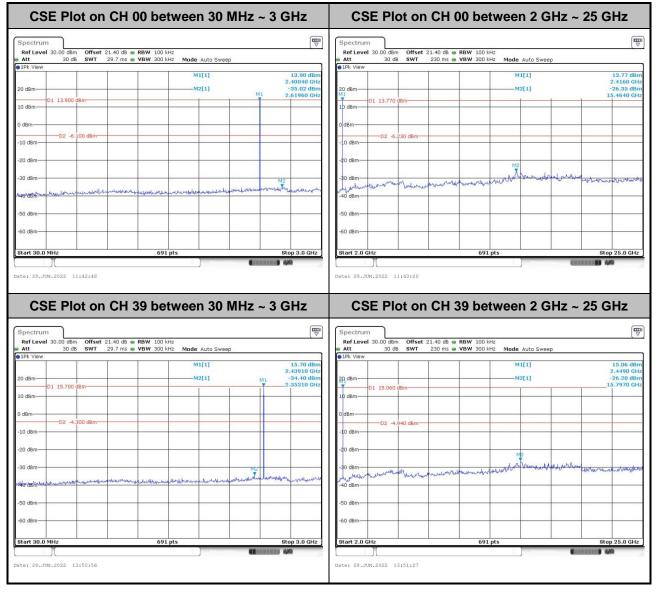


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Spectrum			Spectrum		[
	B  RBW 100 kHz S  VBW 300 kHz Mode Auto Sweep		Ref Level 30.00 dBm Offset 3 Att 30 dB SWT	1.40 dB ● RBW 100 kHz 230 ms ● VBW 300 kHz Mode Auto Swee	p
1Pk View	-		• 1Pk View		
20 dBm	M1[1] M2[1]	12,43 dBm 2,47780 GHz -34,61 dBm M1 2,43480 GHz	20 dBm	M1[1] M2[1]	12.63 dB 2.4830 G -26.51 dB 15.8300 G
0 dBm D1 12.430 dBm		T T	10 dBm D1 12.630 dBm		
) dBm			0 dBm		
10 dBm D2 -7.570 dBm			-10 d8m-02 -7.370 d8m-		
20 dBm			-20 dBm	M2	
30 dBm	marin and he was a start of the second	M2	-30 dBm	man which have been thanked	aliter and the second second second
10 all and a second	angeling and the second of the second s		-40 dBm		
50 dBm			-50 dBm		
60 dBm			-60 dBm		
start 30.0 MHz	691 pts	Stop 3.0 GHz	Start 2.0 GHz	691 pts	Stop 25.0 GH
八	the advertices	C	<u> </u>	- Constant	CONTRACTOR AND



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Spectrum			Spectrum		E.
Ref Level 30.00 dBm Offset 21.40 dB @		(*)	Ref Level 30.00 dBm Offset 2	1.40 dB 📾 RBW 100 kHz	1
Att 30 dB SWT 29.7 ms	VBW 300 kHz Mode Auto Sweep		Att 30 dB SWT	230 ms  VBW 300 kHz Mode Auto Sweep	)
20 dBm-	M1[1] M2[1]	15.17 dBm 2.47780 GHz −35.11 dBm ▼ 2.55080 GHz	20 dBm	M1[1] M2[1]	14.89 dB 2.4630 G -25.67 dB 15.8630 G
D1 15.170 dBm			10 dBm		
0 dBm			0 dBm		
10 dBm-			-10 dBm		
-20 dBm			-20 dBm	M2	
-30 dBm	- management	M2	-20 dBm- Mushand-anticomentation	own have a second to the second	he was a wat to a service of the
50 dBm			-50 dBm		
60 dBm			-60 dBm		
Start 30.0 MHz	691 pts	Stop 3.0 GHz	Start 2.0 GHz	691 pts	Stop 25.0 GH