

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT



Applicant: Morse Micro Pty Ltd
Level 8, 10-14 Waterloo St, Surry Hills NSW 2010, Australia

Manufacturer: Morse Micro Pty Ltd
Level 8, 10-14 Waterloo St, Surry Hills NSW 2010, Australia

Product Name: MM6108-MF08651-US

Brand Name: Morse Micro

Model No.: MM6108-MF08651-US

Report Number: TERF2406001545E2

FCC ID: 2A74O-DB3F2B

Date of EUT Received: May 29, 2024

Date of Test: June 05, 2024 ~ August 15, 2024

Issue Date: September 05, 2024

Approved By _____

Vito Pei

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Central RF Lab The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10:2013 and the energy emitted by the sample EUT comply with FCC rule part §15.247.

The results of this report relate only to the sample identified in this report.

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Revision History

Report Number	Revision	Description	Issue Date	Revised By	Remark
TERF2406001545E2	00	Original	August 01, 2024	Sharon Kuo	
TERF2406001545E2	01	Revise: Date of Test 8.5 Duty Factor 8.6.1 Peak & Avg 10.4 Measurement Result 12.4 Measurement Result	August 22, 2024	Sharon Kuo	*
TERF2406001545E2	02	Revise: 8.5 Duty Factor	August 30, 2024	Sharon Kuo	*
TERF2406001545E2	03	Revise: 8.5 Duty Factor 8.6.1 Peak & Avg	September 05, 2024	Sharon Kuo	*

Note:

- 1、The remark "*" indicates modification of the report upon requests from certification body.
- 2、This test report is based on the voltage of **4.3V** for worst test.

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1 GENERAL INFORMATION

1.1 Product Description

Product Name:	MM6108-MF08651-US
Brand Name:	Morse Micro
Model No.:	MM6108-MF08651-US
Hardware Version:	3.3Vdc: V13.2 4.3Vdc: V13.2
Firmware Version:	3.3Vdc: 1.12.2 4.3Vdc: 1.12.2
EUT Series No.:	3.3Vdc: 0-00N1UU 4.3Vdc: 0-00X23U
VFEM Power Supply:	3.3Vdc; 4.3Vdc
Test Software (Name/Version)	3.3Vdc: mm_rf_tester_V1.2.2 4.3Vdc: mm_rf_tester_V1.2.2

1.2 RF Specification

Radio Technology:	802.11ah
Frequency Range:	902~928MHz
Modulation type:	OFDM
Transmit Power:	3.3Vdc 802.11ah 1M: 26.22 dBm 802.11ah 2M: 27.12 dBm 802.11ah 4M: 26.83 dBm 802.11ah 8M: 26.97 dBm 4.3Vdc 802.11ah 1M: 29.95 dBm 802.11ah 2M: 29.60 dBm 802.11ah 4M: 29.70 dBm 802.11ah 8M: 29.84 dBm

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1.3 Antenna Designation

Antenna Type	Freq. (MHz)	Peak Antenna Gain (dBi)
dipole Antenna	902~928	1.00

Note: Antenna information is provided by the applicant.

1.4 Test Methodology of Applied Standards

FCC Part 15, Subpart C §15.247

FCC KDB 558074 D01 15.247 Meas Guidance v05r02

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1.5 Test Facility

Laboratory	Test Site Address	Test Site Name	FCC Designa- tion number	IC CAB identifier
SGS Taiwan Ltd. Central RF Lab. (TAF code 3702)	No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan.	SAC 1	TW0027	TW3702
		SAC 2		
		SAC 3		
		Conduction 1		
		Conducted 1		
		Conducted 2		
		Conducted 3		
		Conducted 4		
		Conducted 5		
		Conducted 6		
	No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333	Conduction C	TW0028	
		SAC C		
		SAC D		
		SAC G		
		Conducted A		
		Conducted B		
		Conducted C		
		Conducted D		
		Conducted E		
		Conducted F		
Conducted G				

Note: Test site name is remarked on the equipment list in each section of this report as an indication where measurements occurred in specific test site and address.

1.6 Special Accessories

There are no special accessories used while test was conducted.

1.7 Equipment Modifications

There was no modification incorporated into the EUT.

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2 SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is placed on a table which is 0.8 m above ground plane. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz. The CISPR Quasi-Peak and Average detector mode is employed. The two LISNs provide 50uH/50 ohm of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

2.3.2 Conducted Test (RF)

The active antenna port of the unlicensed wireless device is connected to the spectrum analyzer with attenuator to protect the instrumentation. If a second antenna port is available, it is tested at one operating frequency, with other port(s) appropriately terminated, to verify it has similar output characteristics as the fully tested port.

2.3.3 Radiated Emissions

The EUT is placed on a turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

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2.4 Measurement Results Explanation Example

2.4.1 Radiated Emission Test Sites For Measurements From 9 kHz To 30 MHz

Radiated emission below 30MHz is measured in a 9m*6m*6m semi-anechoic chamber, the measurements correspond to those obtained at an open-field test site.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

2.4.2 For all conducted test items:

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

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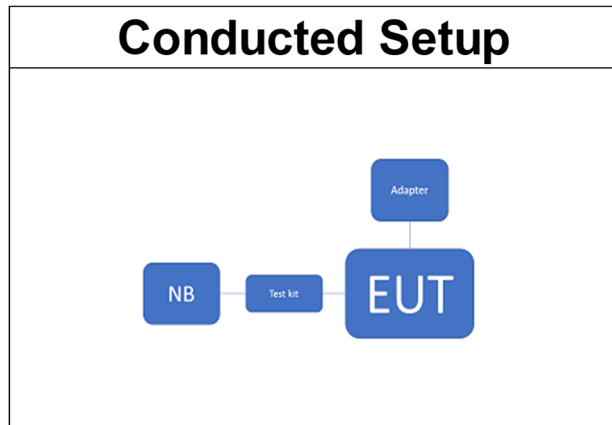
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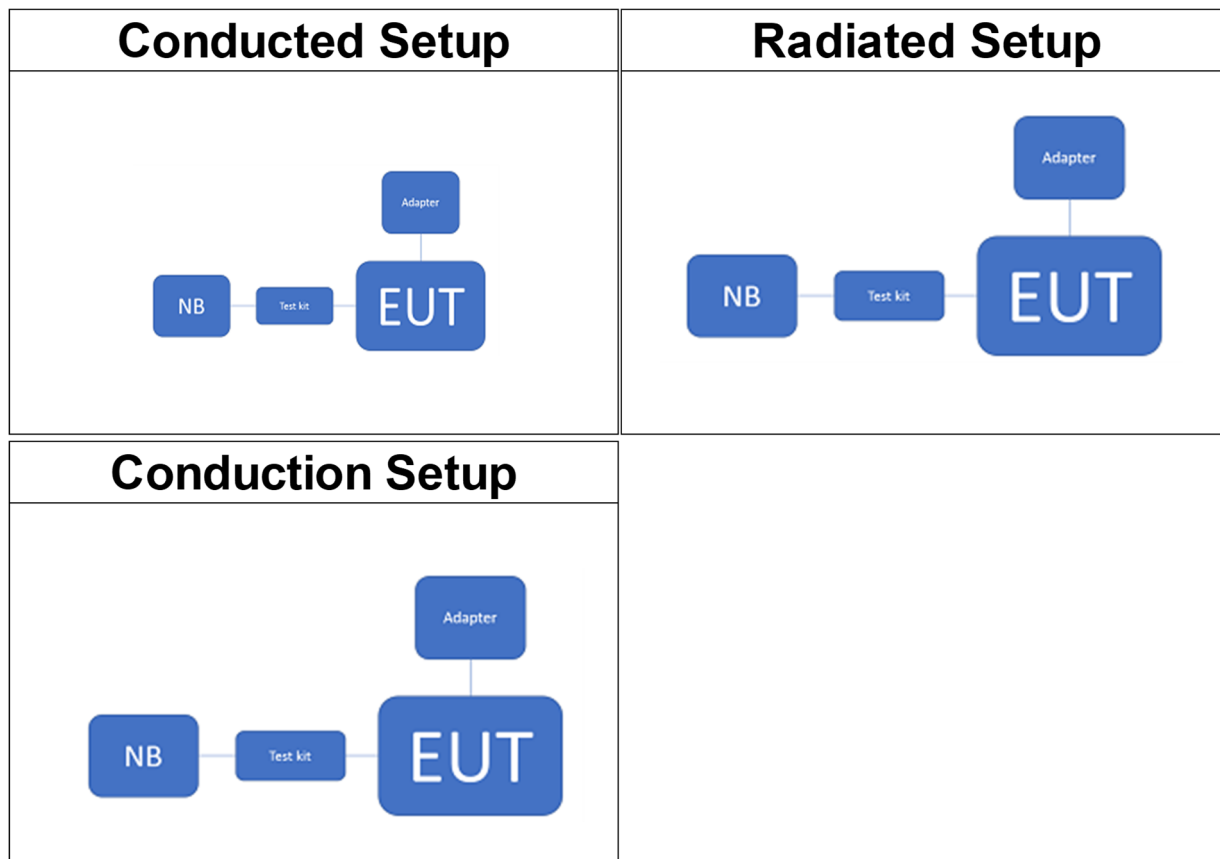
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2.5 Test Configuration

3.3V



4.3V



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2.6 Control Unit(s)

3.3V

Conducted Emission Test Site: Conducted C					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Notebook	Lenovo	T14	P0003332	N/A	N/A
Adapter	ROHS	RPI-18PFCA-05	N/A	N/A	N/A
Test Kit	Morse Micro	MM-DEBUG	N/A	N/A	N/A

4.3V

Conducted Emission Test Site: Conducted C					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Notebook	Lenovo	T14	P0003332	N/A	N/A
Adapter	ROHS	RPI-18PFCA-05	N/A	N/A	N/A
Test Kit	Morse Micro	MM-DEBUG	N/A	N/A	N/A

Radiated Emission Test Site: SAC D					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Test Kit	Morse Micro	MM-DEBUG	N/A	N/A	N/A
Adapter	ROHS	RPI-18PFCA-05	N/A	N/A	N/A
Notebook	Lenovo	L480	P0002332	N/A	N/A

AC Power-Line Conducted Emission Test Site: Conduction C					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Test Kit	Morse Micro	MM-DEBUG	N/A	N/A	N/A
Adapter	ROHS	RPI-18PFCA-05	N/A	N/A	N/A
Notebook	Lenovo	L480	P0002332	N/A	N/A

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3 SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§15.207(a)	AC Power Line Conducted Emission	Compliant
§15.247(b) (3)	Peak Output Power	Compliant
§15.247(a)(2)	Emission Bandwidth	Compliant
§15.205 §15.209 §15.247(d)	Conducted Band Edge and Spurious Emission	Compliant
§15.205 §15.209 §15.247(d)	Radiated Band Edge and Spurious Emission	Compliant
§15.205	Restricted Bands	Compliant
§15.247(e)	Peak Power Density	Compliant
§15.203	Antenna Requirement	Compliant

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4 DESCRIPTION OF TEST MODES

4.1 Operating Frequencies

Channel List	OFDM 1M		OFDM 2M		OFDM 4M		OFDM 8M	
	CH	Freq.(MHz)	CH	Freq.(MHz)	CH	Freq.(MHz)	CH	Freq.(MHz)
	3	903.5	6	905	8	906	12	908
	5	904.5	10	907	16	910	28	916
	7	905.5	14	909	24	914	44	924
	9	906.5	18	911	32	918		
	11	907.5	22	913	40	922		
	13	908.5	26	915	48	926		
	15	909.5	30	917				
	17	910.5	34	919				
	19	911.5	38	921				
	21	912.5	42	923				
	23	913.5	46	925				
	25	914.5						
	27	915.5						
	29	916.5						
	31	917.5						
	33	918.5						
	35	919.5						
	37	920.5						
	39	921.5						
	41	922.5						
	43	923.5						
	45	924.5						
47	925.5							
49	926.5							

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4.2 The Worst Test Modes and Channel Details

1. The EUT has been tested under operating condition.
2. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.
3. Investigation has been done on all the possible configurations for searching the worst case. The gevin UE is pre-scanned among below modes.

3.3V

CONDUCTED TEST				
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11ah 1M	3 to 49	3,25,49	OFDM	MCS0
802.11ah 2M	6 to 46	6,26,46	OFDM	MCS0
802.11ah 4M	8 to 48	8,24,40,48	OFDM	MCS0
802.11ah 8M	12 to 44	12,28,44	OFDM	MCS0

4.3V

CONDUCTED TEST				
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11ah 1M	3 to 49	3,25,49	OFDM	MCS0
802.11ah 2M	6 to 46	6,26,46	OFDM	MCS0
802.11ah 4M	8 to 48	8,24,48	OFDM	MCS0
802.11ah 8M	12 to 44	12,28,44	OFDM	MCS0

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RADIATED EMISSION TEST (BELOW 1 GHz)				
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11ah 1M	3 to 49	25	OFDM	MCS0
802.11ah 2M	6 to 46	26	OFDM	MCS0
802.11ah 4M	8 to 48	24	OFDM	MCS0
802.11ah 8M	12 to 44	28	OFDM	MCS0

RADIATED EMISSION TEST (ABOVE 1 GHz)				
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11ah 1M	3 to 49	3,25,49	OFDM	MCS0
802.11ah 2M	6 to 46	6,26,46	OFDM	MCS0
802.11ah 4M	8 to 48	8,24,48	OFDM	MCS0
802.11ah 8M	12 to 44	12,28,44	OFDM	MCS0

Note:

The field strength of radiated emission was measured as the EUT positioned in different orthogonal planes (E1/E2/H) based on actual usage of the EUT to pre-scan the emissions for determining the worst case scenario.

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5 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 1.54 dB
Output Power measurement	+/- 0.97 dB
Emission Bandwidth	+/- 1.38 Hz
Conducted emission measurement	+/- 0.77 dB
Peak Power Density	+/- 0.61 dB
Temperature	+/- 0.6 °C
Humidity	+/- 3 %
DC / AC Power Source	+/- 1 %

Radiated Spurious Emission Measurement Uncertainty				
Polarization: Vertical	+/-	1.89	dB	9kHz~30MHz
	+/-	4.15	dB	30MHz - 1000MHz
	+/-	3.43	dB	1GHz - 18GHz
	+/-	3.86	dB	18GHz - 40GHz
Polarization: Horizontal	+/-	1.89	dB	9kHz~30MHz
	+/-	4.02	dB	30MHz - 1000MHz
	+/-	3.43	dB	1GHz - 18GHz
	+/-	3.86	dB	18GHz - 40GHz
Radiated Spurious Emission	+/-	2	dB	33GHz-50GHz
	+/-	1.59	dB	50GHz-60GHz
	+/-	1.7	dB	60GHz-90GHz
	+/-	1.64	dB	90GHz-140GHz
	+/-	3.83	dB	140GHz-220GHz

Note:

1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
2. The conformity assessment statement in this report is based solely on the test results, measurement uncertainty is excluded.

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6 MEASUREMENT EQUIPMENT USED

6.1 Emission from AC power line

AC Power-Line Conducted Emission Test Site: Conduction C					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Coaxial Cable	EC Lab	RF-HY-CAB-250	RF-HY-CAB-250-01	03/27/2024	03/26/2025
EMI Test Receiver	R&S	ESCI	101342	04/29/2024	04/28/2025
LISN	SCHWARZBECK Mess-Elektronik	NSLK8127	973	04/22/2024	04/21/2025
Pulse Limiter	EC Lab	VTSD 9561F-N	485	03/27/2024	03/26/2025
Test Software	audix	e3	E3 20923 SGS Ver.9 (C)	N.C.R	N.C.R

6.2 Conducted Measurement

3.3V

Conducted Emission Test Site: Conducted C					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Attenuator	Woken	WATT-218FS-10	RF18	11/15/2023	11/14/2024
Attenuator	Woken	WATT-218FS-10	RF19	11/15/2023	11/14/2024
DC Block	PASTERNAK	PE8210	RF155	11/15/2023	11/14/2024
Power Meter	Anritsu	ML2496A	2138005	09/25/2023	09/24/2024
Power Sensor	Anritsu	MA2411B	1911395	09/25/2023	09/24/2024
Power Sensor	Anritsu	MA2411B	1911396	09/25/2023	09/24/2024
Spectrum Analyzer	KEYSIGHT	N9010B	MY59071573	05/24/2024	05/23/2025
Test Software	SGS Taiwan	Radio Test Software	Ver.21	N.C.R	N.C.R

4.3V

Conducted Emission Test Site: Conducted C					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Attenuator	Woken	WATT-218FS-10	RF18	11/15/2023	11/14/2024
Attenuator	Woken	WATT-218FS-10	RF19	11/15/2023	11/14/2024
DC Block	PASTERNAK	PE8210	RF155	11/15/2023	11/14/2024
Power Meter	Anritsu	ML2496A	2138005	09/25/2023	09/24/2024
Power Sensor	Anritsu	MA2411B	1911395	09/25/2023	09/24/2024
Power Sensor	Anritsu	MA2411B	1911396	09/25/2023	09/24/2024
Spectrum Analyzer	KEYSIGHT	N9010B	MY59071573	05/24/2024	05/23/2025
Test Software	SGS Taiwan	Radio Test Software	Ver.21	N.C.R	N.C.R

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6.3 Radiated Measurement

Radiated Emission Test Site: SAC D					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
3m Site NSA	SGS	966 chamber D	N/A	04/30/2024	04/29/2025
Active Loop Antenna	COM-POWER	AL-130R	10160105	12/04/2023	12/03/2024
Broadband Antenna	SCHWARZBECK	VULB 9168	9168-617	12/14/2023	12/13/2024
Coaxial Cable	Huber+Suhner	EMC106-SM-SM-7200	150703	11/15/2023	11/14/2024
Coaxial Cable	Huber+Suhner	RG 214/U	W21.01	11/15/2023	11/14/2024
Horn Antenna	Schwarzbeck	BBHA9120D	1341	05/30/2024	05/29/2025
Pre-Amplifier	EMC Instruments	EMC12630SE	980273	11/15/2023	11/14/2024
Pre-Amplifier	EMC Instruments	EMC18405SEE	980881	11/15/2023	11/14/2024
Pre-Amplifier	EMC Instruments	EMC9135	980234	11/15/2023	11/14/2024
Spectrum Analyzer	KEYSIGHT	N9010A	MY57120200	04/03/2024	04/02/2025
Test Software	audix	e3	E3 20923 SGS Ver.9 (C)	N.C.R	N.C.R

NOTE: N.C.R means No Calibration Required.

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7 CONDUCTED EMISSION TEST

7.1 Standard Applicable:

Frequency range within 150kHz to 30MHz shall not exceed the Limit table as below.

Frequency range MHz	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

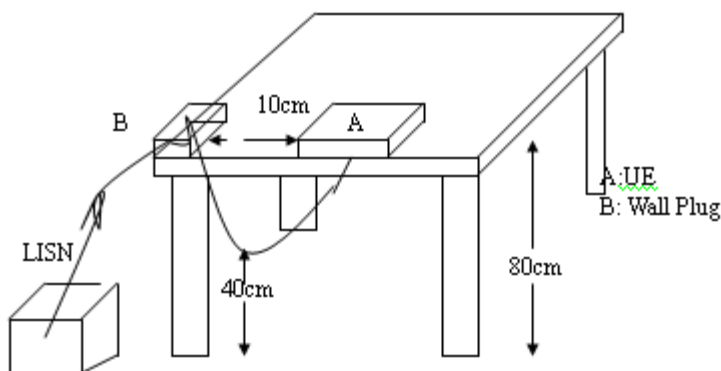
Note

- 1.The lower limit shall apply at the transition frequencies
- 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

7.2 EUT Setup:

1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.10:2013.
2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
3. The LISN was connected with 120Vac/60Hz power source.

7.3 Test Setup



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7.4 Measurement Procedure:

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all phases of power being supplied by given UE are completed

7.5 Measurement Result:

Note: Refer to next page for measurement data and plots.

Note2: The * reveals the worst-case results that closest to the limit.

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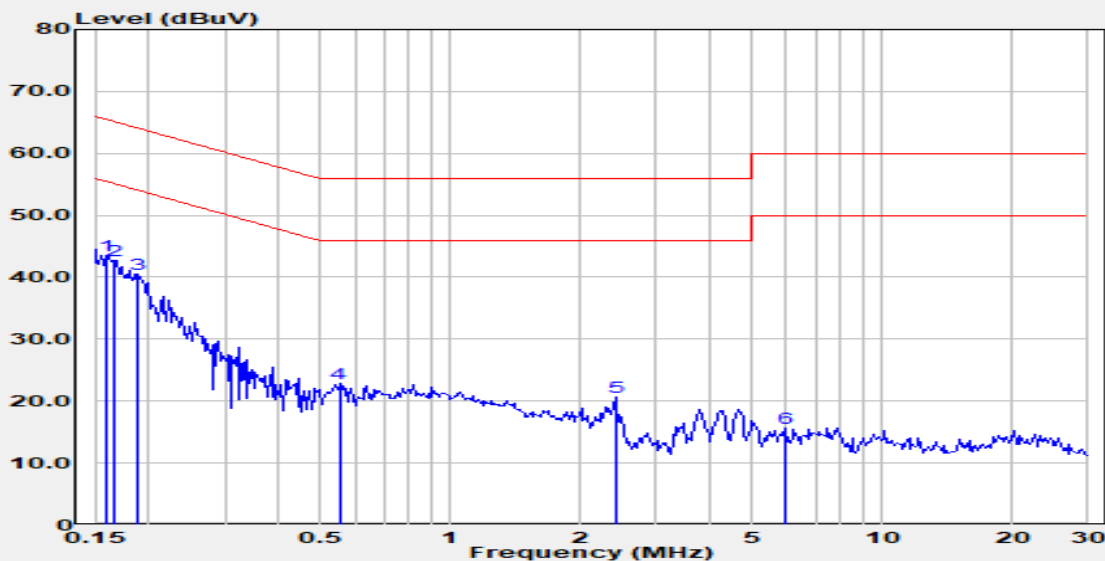
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AC POWER LINE CONDUCTED EMISSION TEST DATA

Report Number	:TERF2406001545E2	Test Site	:Conduction C
Test Mode	:OFDM 8M	Test Date	:2024-07-06
Power	:120V/60Hz	Temp./Humi.	:22.4°C/65%
Probe	:L1	Engineer	:Sam Huang

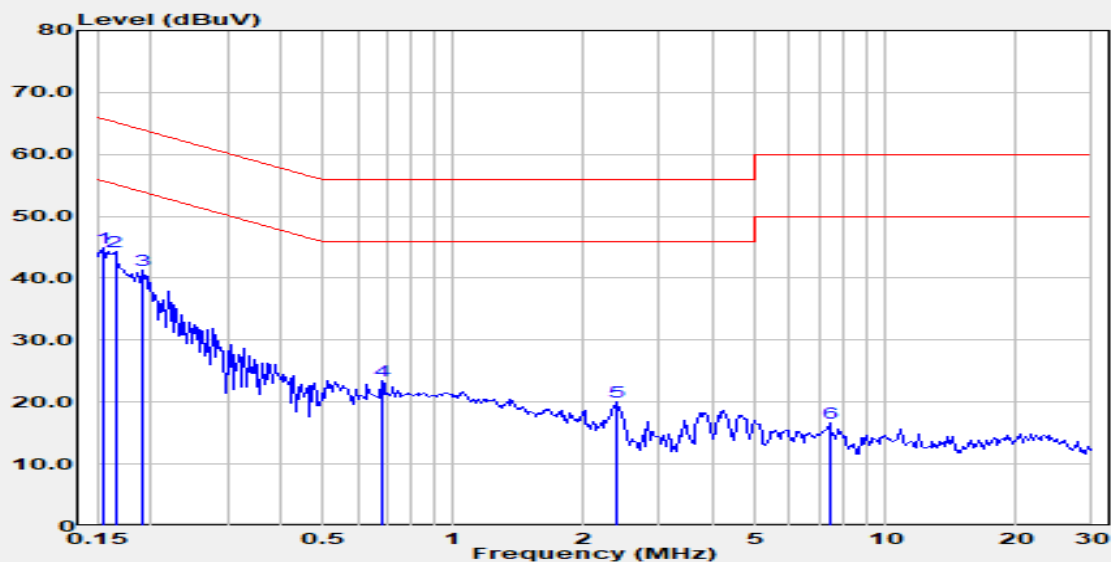


Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV	Limit dBμV	Margin dB
0.160	Peak	32.81	10.65	43.46	65.47	-22.01
0.167	Peak	32.14	10.65	42.79	65.12	-22.33
0.189	Peak	29.88	10.65	40.53	64.06	-23.53
0.552	Peak	12.33	10.63	22.95	56.00	-33.05
2.409	Peak	9.83	10.80	20.63	56.00	-35.37
5.929	Peak	4.75	10.96	15.71	60.00	-44.29

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Report Number	:TERF2406001545E2	Test Site	:Conduction C
Test Mode	:OFDM 8M	Test Date	:2024-07-06
Power	:120V/60Hz	Temp./Humi.	:22.4°C/65%
Probe	:N	Engineer	:Sam Huang



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode	Reading Level		FS		
	PK/QP/AV	dBμV	dB	dBμV	dBμV	dB
0.155	Peak	34.17	10.66	44.83	65.74	-20.91
0.165	Peak	33.59	10.66	44.25	65.21	-20.96
0.191	Peak	30.62	10.65	41.28	63.98	-22.70
0.683	Peak	12.74	10.63	23.37	56.00	-32.63
2.384	Peak	9.31	10.78	20.09	56.00	-35.91
7.407	Peak	5.65	10.94	16.60	60.00	-43.40

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8 PEAK OUTPUT POWER MEASUREMENT

8.1 Standard Applicable:

For systems using digital modulation in the 902-928 MHz bands, the limit for peak output power is 1Watt.

If the transmitting antenna of directional gain greater than 6dBi are used the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the Antenna exceeds 6dBi. (FCC only)

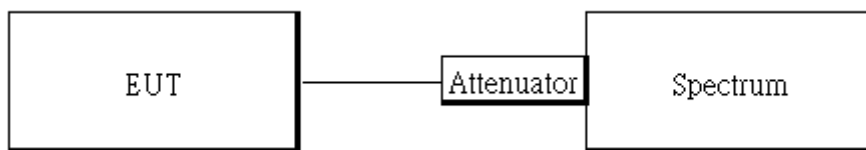
In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of Antenna exceeds 6dBi.

Note:

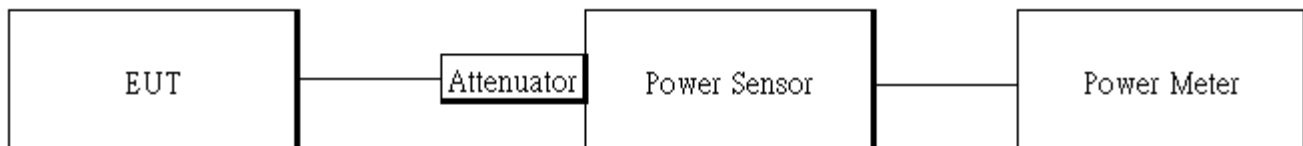
When the antenna gain is greater than 6 dBi, the power limit attenuated accordingly.

8.2 Test Setup

8.2.1 Duty Cycle



8.2.2 Output Power



8.3 Measurement Procedure:

8.3.1 Duty Cycle

1. Place the EUT on the table and set it in transmitting mode.
2. Set span = Zero
3. RBW = 8MHz, VBW = 8MHz,
4. Detector = Peak

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8.4 Output Power

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter.
4. Record the max. Reading as observed from Power Meter.
5. Repeat above procedures until all test default channel measured was complete.

8.5 Duty Factor:

3.3V

	Duty Cycle (%) = Ton / (Ton+Toff)	Duty Factor (dB) =10*log (1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)
OFDM_1M	96.74	0.14	0.25	1.00
OFDM_2M	98.14	0.08	0.25	0.01
OFDM_4M	97.41	0.11	0.25	1.00
OFDM_8M	97.77	0.10	0.25	1.00

4.3V

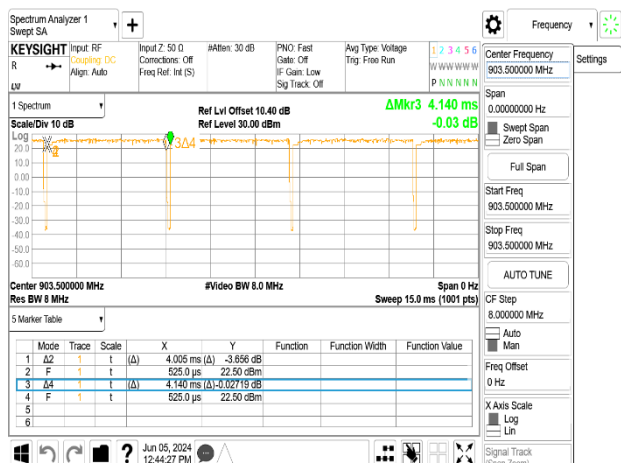
	Duty Cycle (%) = Ton / (Ton+Toff)	Duty Factor (dB) =10*log (1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)
OFDM_1M	98.15	0.08	0.13	0.01
OFDM_2M	97.78	0.10	0.25	1.00
OFDM_4M	98.51	0.07	0.25	0.01
OFDM_8M	98.51	0.07	0.25	0.01

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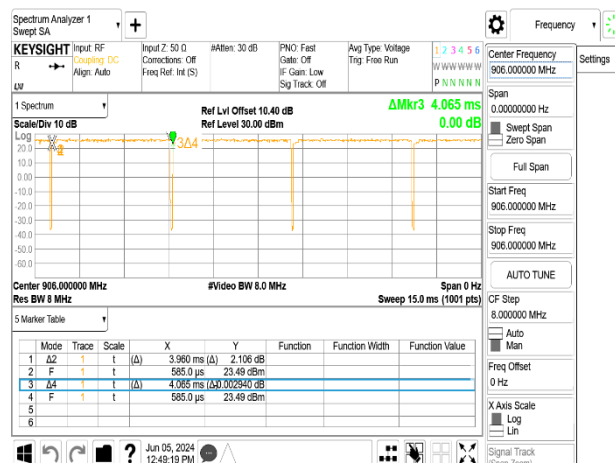
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3.3V

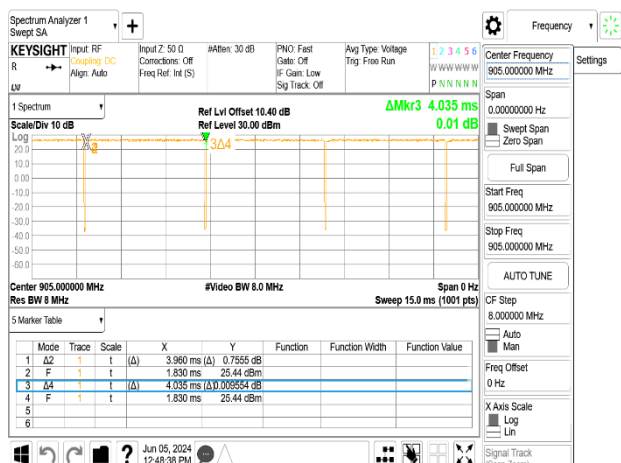
OFDM_1M_LowCH-903.5



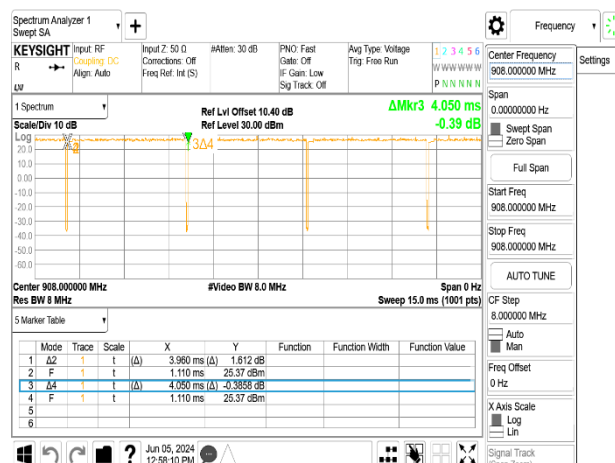
OFDM_4M_LowCH-906



OFDM_2M_LowCH-905



OFDM_8M_LowCH-908



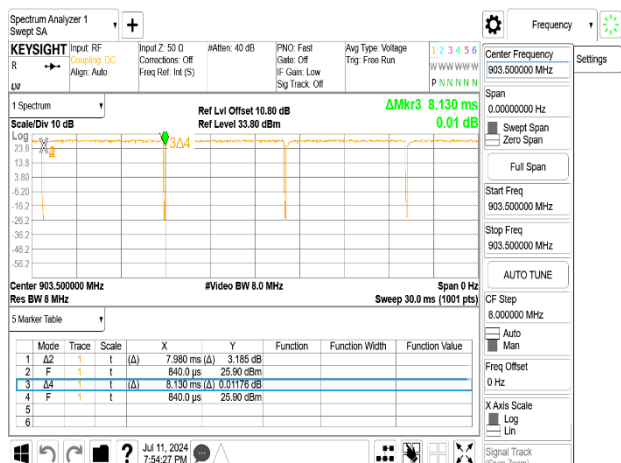
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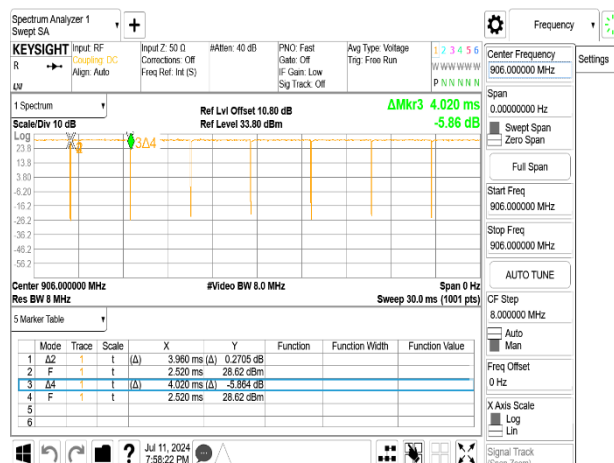
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4.3V

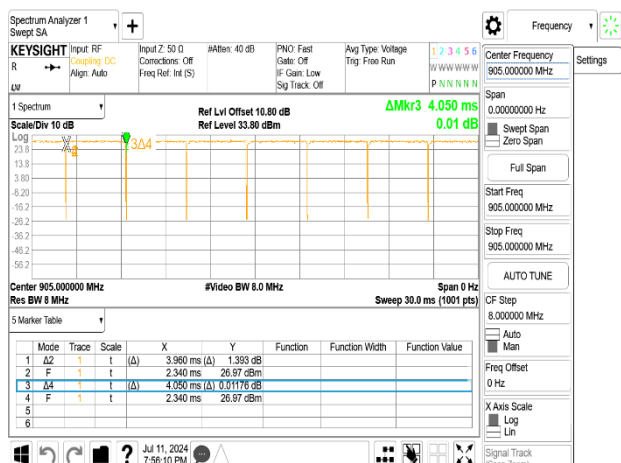
OFDM_1M_LowCH-903.5



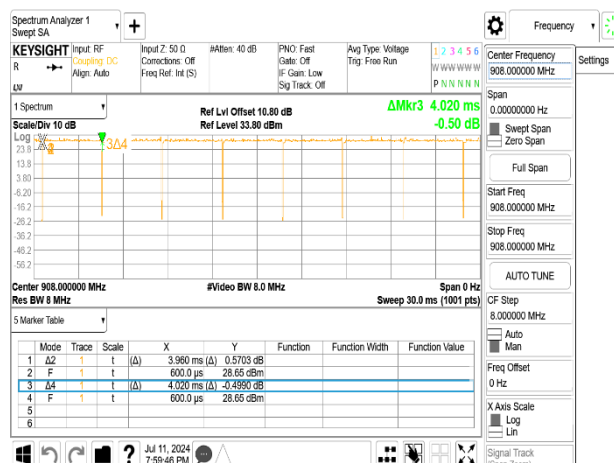
OFDM_4M_LowCH-906



OFDM_2M_LowCH-905



OFDM_8M_LowCH-908



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8.6 Output Power:

8.6.1 Peak & Avg

3.3V

OFDM 1M mode

CH	Frequency (MHz)	Power Setting	Peak Output Power (dBm)	Required Limit (dBm)
Low	903.5	default	26.22	30
Mid	914.5	default	26.16	30
High	926.5	default	26.11	30
CH	Frequency (MHz)	Power Setting	Avg. Output Power (dBm)	Required Limit (dBm)
Low	903.5	default	21.29	30
Mid	914.5	default	21.20	30
High	926.5	default	21.03	30

***Note:**

1.Measured by power meter, cable loss 10.4 dB + Duty cycle factor has been offseted to the power meter for Avg. power and cable loss has been offseted for Peak power measurement.

OFDM 2M mode

CH	Frequency (MHz)	Power set	Peak Output Power (dBm)	Required Limit (dBm)
Low	905	default	27.12	30
Mid	915	default	26.95	30
High	925	default	27.03	30
CH	Frequency (MHz)	Power set	Avg. Output Power (dBm)	Required Limit (dBm)
Low	905	default	21.18	30
Mid	915	default	21.12	30
High	925	default	20.93	30

***Note:**

1.Measured by power meter, cable loss 10.4 dB + Duty cycle factor has been offseted to the power meter for Avg. power and cable loss has been offseted for Peak power measurement.

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OFDM 4M mode

CH	Frequency (MHz)	Power set	Peak Output Power (dBm)	Required Limit (dBm)
Low	906	default	26.83	30
Mid	914	default	26.77	30
Mid	922	default	26.74	30
High	926	default	25.08	30
CH	Frequency (MHz)	Power set	Avg. Output Power (dBm)	Required Limit (dBm)
Low	906	default	21.10	30
Mid	914	default	21.03	30
Mid	922	default	20.86	30
High	926	default	17.49	30

***Note:**

1.Measured by power meter, cable loss 10.4 dB + Duty cycle factor has been offseted to the power meter for Avg. power and cable loss has been offseted for Peak power measurement.

OFDM 8M mode

CH	Frequency (MHz)	Power set	Peak Output Power (dBm)	Required Limit (dBm)
Low	908	default	26.97	30
Mid	916	default	26.86	30
High	924	default	26.35	30
CH	Frequency (MHz)	Power set	Avg. Output Power (dBm)	Required Limit (dBm)
Low	908	default	21.13	30
Mid	916	default	21.02	30
High	924	default	19.44	30

***Note:**

1.Measured by power meter, cable loss 10.4 dB + Duty cycle factor has been offseted to the power meter for Avg. power and cable loss has been offseted for Peak power measurement.

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4.3V

OFDM 1M mode

CH	Frequency (MHz)	Power Setting	Peak Output Power (dBm)	Required Limit (dBm)
Low	903.5	default	29.95	30
Mid	914.5	default	29.81	30
High	926.5	default	29.41	30
CH	Frequency (MHz)	Power Setting	Avg. Output Power (dBm)	Required Limit (dBm)
Low	903.5	default	23.54	30
Mid	914.5	default	23.78	30
High	926.5	default	23.66	30

***Note:**

1.Measured by power meter, cable loss 10.8 dB + Duty cycle factor has been offseted to the power meter for Avg. power and cable loss has been offseted for Peak power measurement.

OFDM 2M mode

CH	Frequency (MHz)	Power set	Peak Output Power (dBm)	Required Limit (dBm)
Low	905	default	29.37	30
Mid	915	default	29.51	30
High	925	default	29.60	30
CH	Frequency (MHz)	Power set	Avg. Output Power (dBm)	Required Limit (dBm)
Low	905	default	23.58	30
Mid	915	default	23.71	30
High	925	default	23.88	30

***Note:**

1.Measured by power meter, cable loss 10.8 dB + Duty cycle factor has been offseted to the power meter for Avg. power and cable loss has been offseted for Peak power measurement.

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OFDM 4M mode

CH	Frequency (MHz)	Power set	Peak Output Power (dBm)	Required Limit (dBm)
Low	906	default	29.55	30
Mid	914	default	29.61	30
High	926	default	29.70	30
CH	Frequency (MHz)	Power set	Avg. Output Power (dBm)	Required Limit (dBm)
Low	906	default	23.11	30
Mid	914	default	23.58	30
High	926	default	22.67	30

***Note:**

1.Measured by power meter, cable loss 10.8 dB + Duty cycle factor has been offseted to the power meter for Avg. power and cable loss has been offseted for Peak power measurement.

OFDM 8M mode

CH	Frequency (MHz)	Power set	Peak Output Power (dBm)	Required Limit (dBm)
Low	908	default	29.58	30
Mid	916	default	29.84	30
High	924	default	29.64	30
CH	Frequency (MHz)	Power set	Avg. Output Power (dBm)	Required Limit (dBm)
Low	908	default	23.65	30
Mid	916	default	23.77	30
High	924	default	22.58	30

***Note:**

1.Measured by power meter, cable loss 10.8 dB + Duty cycle factor has been offseted to the power meter for Avg. power and cable loss has been offseted for Peak power measurement.

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8.6.2 EIRP

3.3V

EIRP OFDM 1M mode

CH	Frequency (MHz)	Power Setting	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit
Low	903.5	default	21.29	1.00	22.29	4W= 36 dBm
Mid	914.5	default	21.20	1.00	22.20	4W= 36 dBm
High	926.5	default	21.03	1.00	22.03	4W= 36 dBm

* **Note:** EIRP = Average Power + Gain

EIRP OFDM 2M mode

CH	Frequency (MHz)	Power set	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit
Low	905	default	21.18	1.00	22.18	4W= 36 dBm
Mid	915	default	21.12	1.00	22.12	4W= 36 dBm
High	925	default	20.93	1.00	21.93	4W= 36 dBm

* **Note:** EIRP = Average Power + Gain

EIRP OFDM 4M mode

CH	Frequency (MHz)	Power set	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit
Low	906	default	21.10	1.00	22.10	4W= 36 dBm
Mid	914	default	21.03	1.00	22.03	4W= 36 dBm
Mid	922	default	20.86	1.00	21.86	4W= 36 dBm
High	926	default	17.49	1.00	18.49	4W= 36 dBm

* **Note:** EIRP = Average Power + Gain

EIRP OFDM 8M mode

CH	Frequency (MHz)	Power set	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit
Low	908	default	21.13	1.00	22.13	4W= 36 dBm
Mid	916	default	21.02	1.00	22.02	4W= 36 dBm
High	924	default	19.44	1.00	20.44	4W= 36 dBm

* **Note:** EIRP = Average Power + Gain

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4.3V

EIRP OFDM 1M mode

CH	Frequency (MHz)	Power Setting	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit
Low	903.5	default	23.54	1.00	24.54	4W= 36 dBm
Mid	914.5	default	23.78	1.00	24.78	4W= 36 dBm
High	926.5	default	23.66	1.00	24.66	4W= 36 dBm

* **Note:** EIRP = Average Power + Gain

EIRP OFDM 2M mode

CH	Frequency (MHz)	Power set	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit
Low	905	default	23.58	1.00	24.58	4W= 36 dBm
Mid	915	default	23.71	1.00	24.71	4W= 36 dBm
High	925	default	23.88	1.00	24.88	4W= 36 dBm

* **Note:** EIRP = Average Power + Gain

EIRP OFDM 4M mode

CH	Frequency (MHz)	Power set	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit
Low	906	default	23.11	1.00	24.11	4W= 36 dBm
Mid	914	default	23.58	1.00	24.58	4W= 36 dBm
High	926	default	22.67	1.00	23.67	4W= 36 dBm

* **Note:** EIRP = Average Power + Gain

EIRP OFDM 8M mode

CH	Frequency (MHz)	Power set	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit
Low	908	default	23.65	1.00	24.65	4W= 36 dBm
Mid	916	default	23.77	1.00	24.77	4W= 36 dBm
High	924	default	22.58	1.00	23.58	4W= 36 dBm

* **Note:** EIRP = Average Power + Gain

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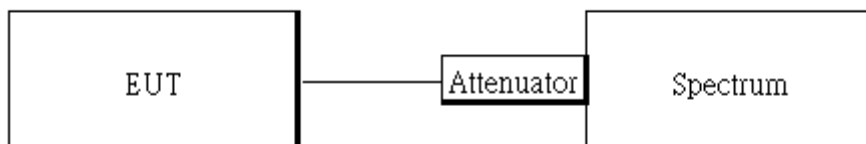
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9 EMISSION BANDWIDTH MEASUREMENT

9.1 Standard Applicable

The minimum 6 dB bandwidth shall be at least 500 kHz .

9.2 Test Setup



9.3 Measurement Procedure:

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

9.3.1 6dB BW measurements

1. The testing follows the Measurement Procedure of the KDB 558074 D01.
2. Set the spectrum analyzer as
RBW= 100 kHz ,
VBW = 3 X RBW,
Span= 2 to 5 times of the OBW,
Sweep=auto, Detector = Peak, and Max hold.
3. Mark the upper and lower frequencies of -6dB.
4. Repeat above procedures until all test default channel is completed.

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9.4 Measurement Result:

9.4.1 6dB BW measurements

OFDM 1M mode

Frequency (MHz)	6dB BW (MHz)	Required BW (MHz)	Result
903.5	0.8046	≥ 0.5	PASS
914.5	0.8157	≥ 0.5	PASS
926.5	0.8316	≥ 0.5	PASS

OFDM 2M mode

Frequency (MHz)	6dB BW (MHz)	Required BW (MHz)	Result
905	1.7320	≥ 0.5	PASS
915	1.7430	≥ 0.5	PASS
925	1.7370	≥ 0.5	PASS

OFDM 4M mode

Frequency (MHz)	6dB BW (MHz)	Required BW (MHz)	Result
906	3.5820	≥ 0.5	PASS
914	3.5800	≥ 0.5	PASS
926	3.5960	≥ 0.5	PASS

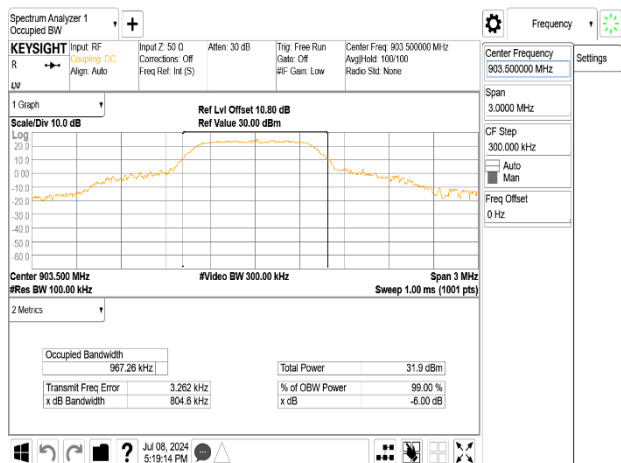
OFDM 8M mode

Frequency (MHz)	6dB BW (MHz)	Required BW (MHz)	Result
908	7.5590	≥ 0.5	PASS
916	7.5730	≥ 0.5	PASS
924	7.5100	≥ 0.5	PASS

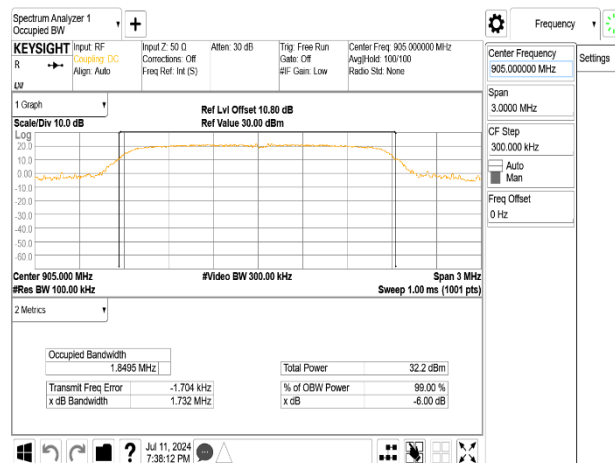
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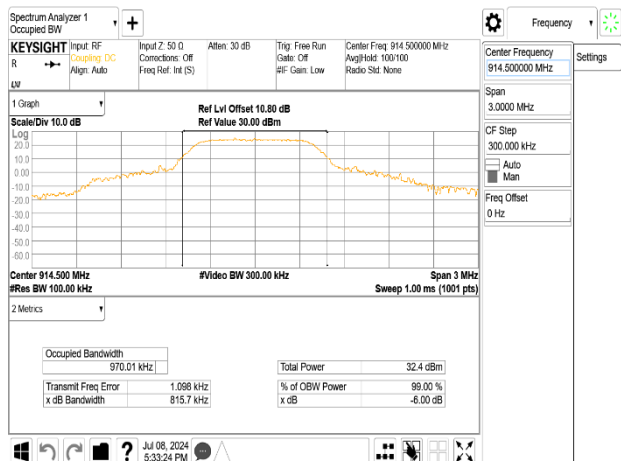
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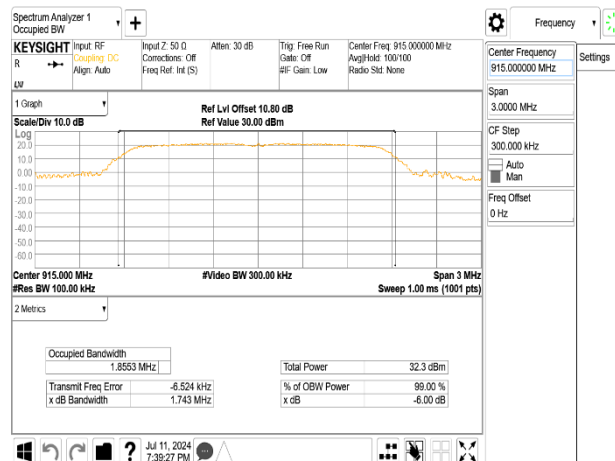
OFDM_2M_LowCH-905



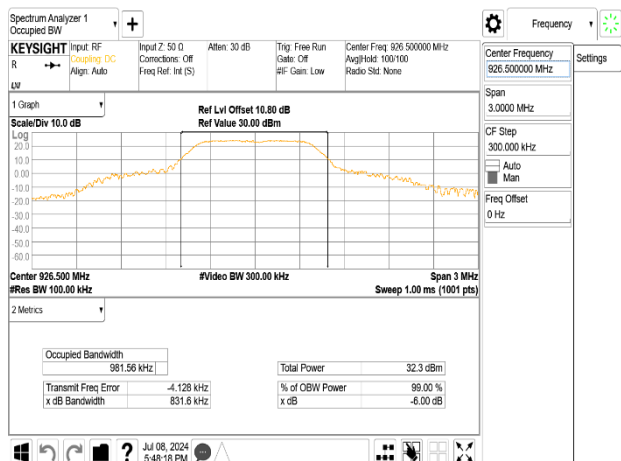
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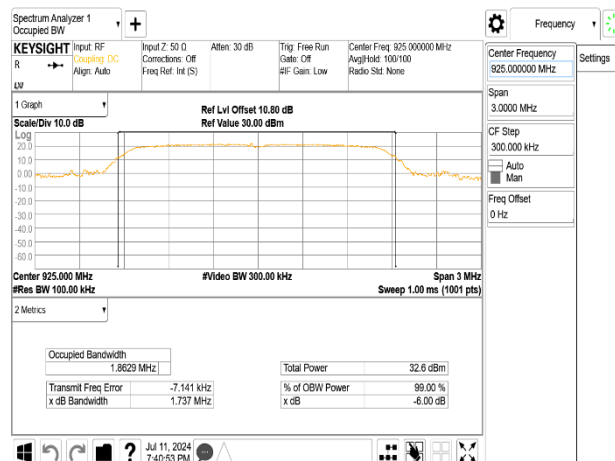
OFDM_2M_MidCH-915



OFDM_1M_HighCH-926.5



OFDM_2M_HighCH-925

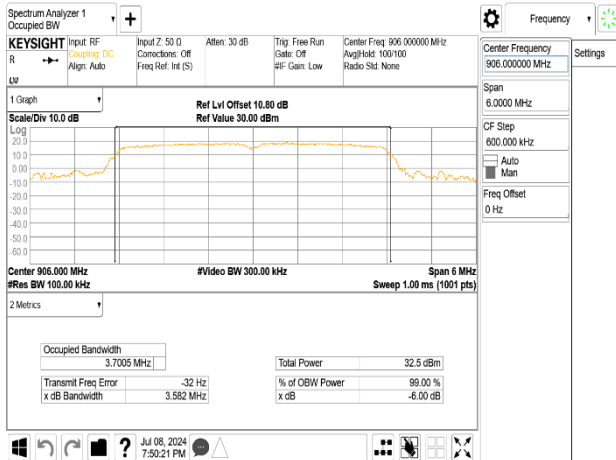


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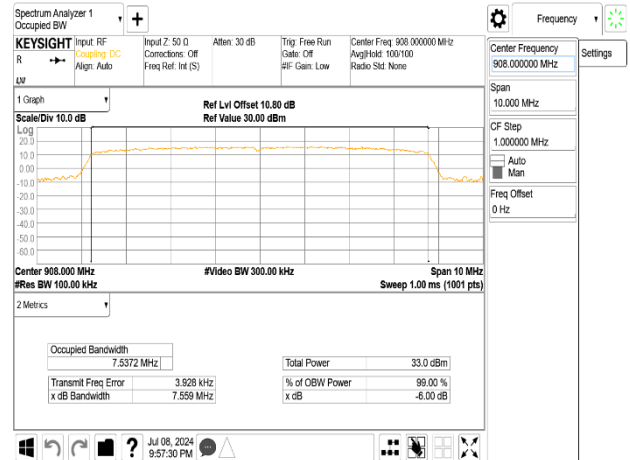
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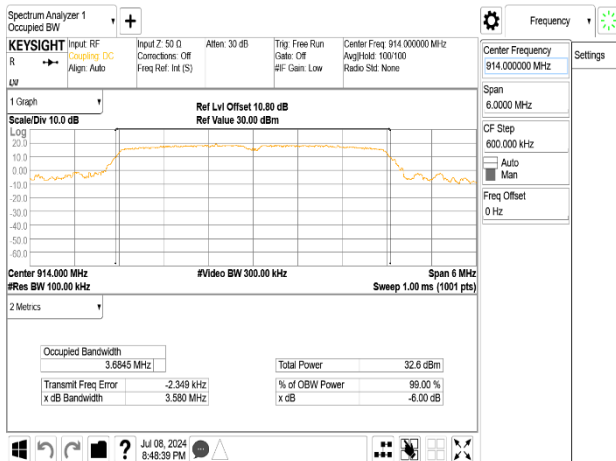
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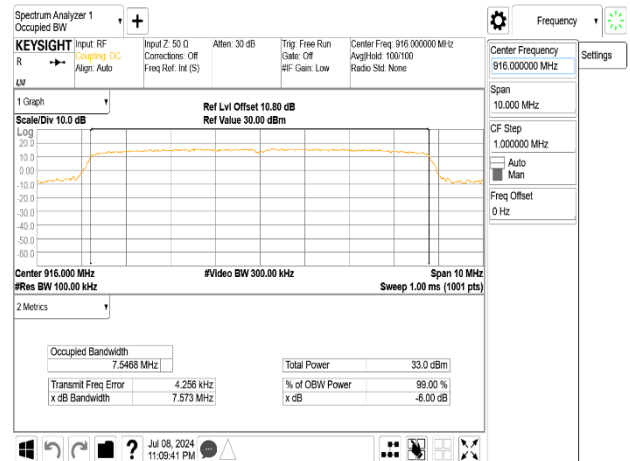
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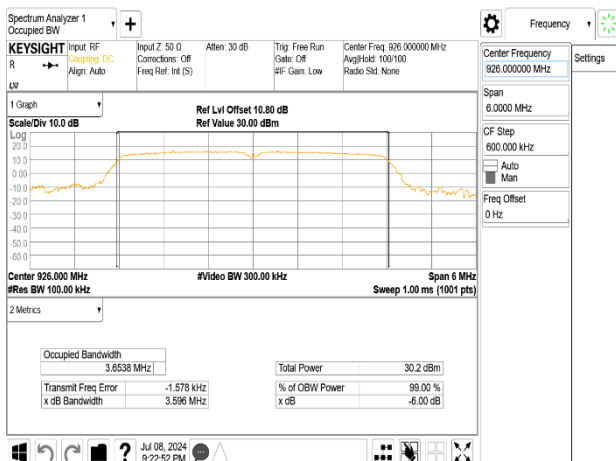
OFDM_4M_MidCH-914



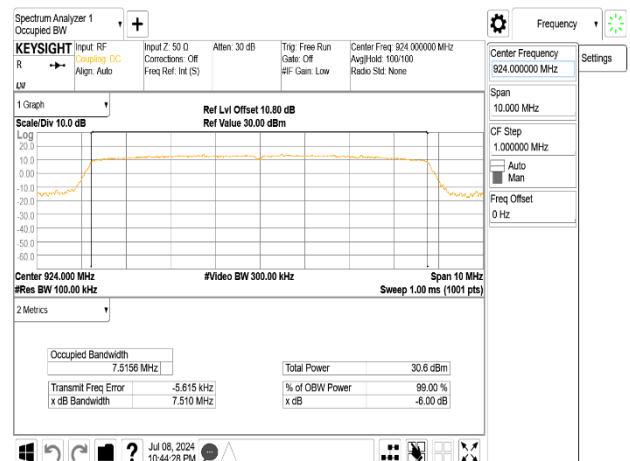
OFDM_8M_MidCH-916



OFDM_4M_HighCH-926



OFDM_8M_HighCH-924



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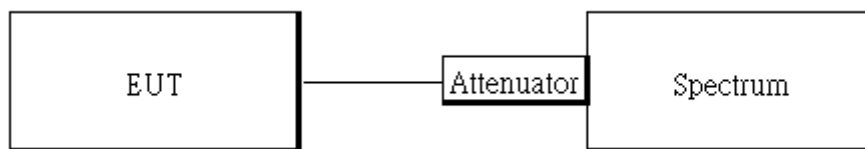
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10 CONDUCTED BAND EDGES AND SPURIOUS EMISSION MEASUREMENT

10.1 Standard Applicable

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

10.2 Test Setup



10.3 Measurement Procedure

10.3.1 Reference Level of Emission Limit:

1. Set analyzer center frequency to DTS channel center frequency.
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
3. Set the span to 1.5 times the DTS channel bandwidth.
4. Set the RBW = 100kHz & VBW = 300 kHz.
5. Detector = peak
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.

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10.3.2 Conducted Band Edge:

1. To connect Antenna Port of EUT to Spectrum.
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
4. Set start to edge frequency, and stop frequency of spectrum analyzer so as to encompass the spectrum to be examined.
5. Set the spectrum analyzer as RBW=100 kHz, VBW=300 kHz, Detector = Peak, Sweep = auto
6. Set DL as the limit =
OFDM 1M & 2M reading on marker of reference level measurement – 30dBm
OFDM 4M & 8M reading on marker of reference level measurement – 20dBm
7. Mark the highest readings of the emissions outside of 902-928 MHz.
8. Repeat above procedures until all default test channel (low, middle, and high) was complete.

10.3.3 Conducted Spurious Emission:

1. To connect Antenna Port of EUT to Spectrum.
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
3. Set RBW = 100 kHz & VBW=300 kHz, Detector =Peak, Sweep = Auto
4. Allow trace to fully stabilize.
5. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
6. Repeat above procedures until all default test channel measured were complete.

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10.4 Measurement Result

OFDM 1M mode_Reference Level of Limit

Frequency (MHz)	RF Power Density (dBm)	Reference Level of Limit = PSD - 30dB (dBm)
903.5	24.75	-5.25
914.5	24.50	-5.50
926.5	25.09	-4.91

***Note:**

- 1.cable loss as 10.8dB that offsets in the spectrum
- 2.Refer to next page for plots.

OFDM 2M mode_Reference Level of Limit

Frequency (MHz)	RF Power Density (dBm)	Reference Level of Limit = PSD - 30dB (dBm)
905	21.39	-8.61
915	22.22	-7.78
925	21.73	-8.27

***Note:**

- 1.cable loss as 10.8dB that offsets in the spectrum
- 2.Refer to next page for plots.

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OFDM 4M mode_Reference Level of Limit

Frequency (MHz)	RF Power Density (dBm)	Reference Level of Limit = PSD - 20dB (dBm)
906	18.44	-1.56
914	19.10	-0.90
926	17.20	-2.80

***Note:**

- 1.cable loss as 10.8dB that offsets in the spectrum
- 2.Refer to next page for plots.

OFDM 8M mode_Reference Level of Limit

Frequency (MHz)	RF Power Density (dBm)	Reference Level of Limit = PSD - 20dB (dBm)
908	16.75	-3.25
916	16.64	-3.36
924	13.39	-6.61

***Note:**

- 1.cable loss as 10.8dB that offsets in the spectrum
- 2.Refer to next page for plots.

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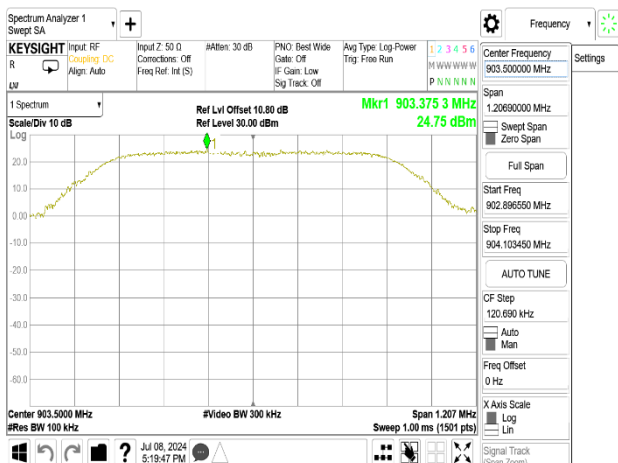
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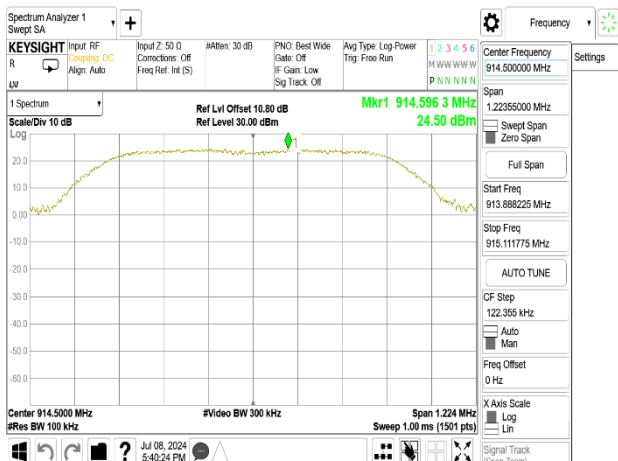
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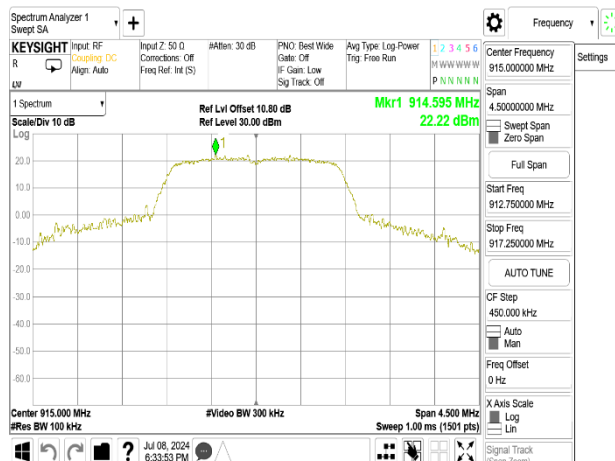
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OFDM_1M_MidCH-914.5



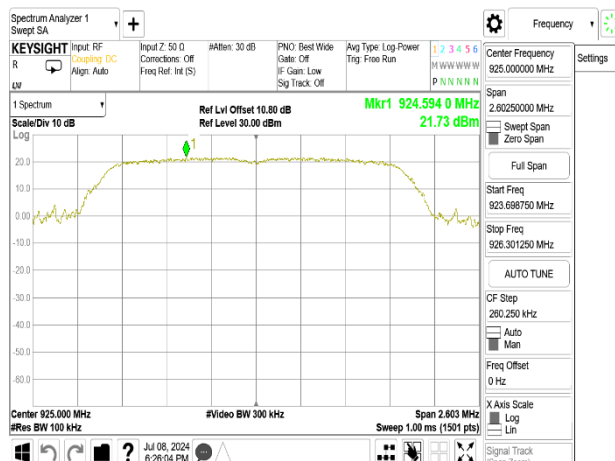
OFDM_2M_MidCH-915



OFDM_1M_HighCH-926.5



OFDM_2M_HighCH-925

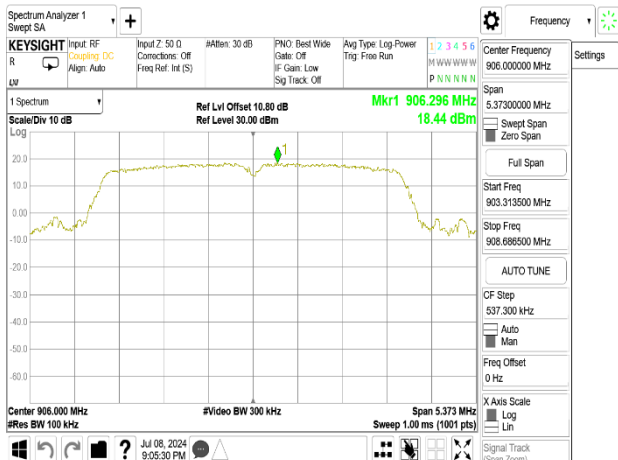


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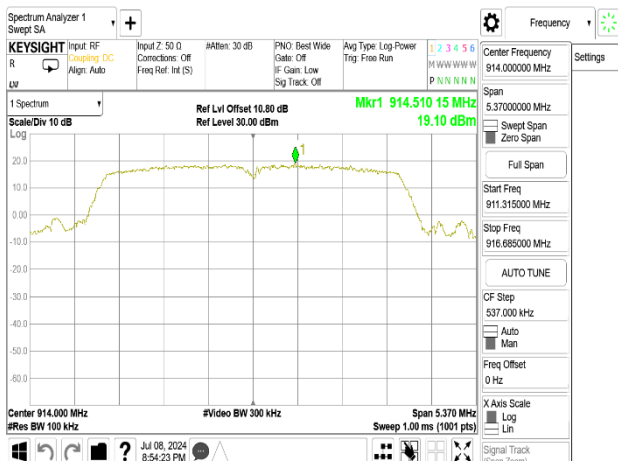
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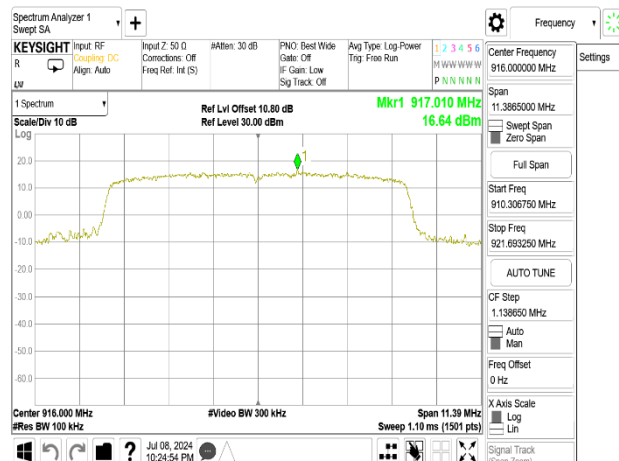
OFDM_8M_LowCH-908



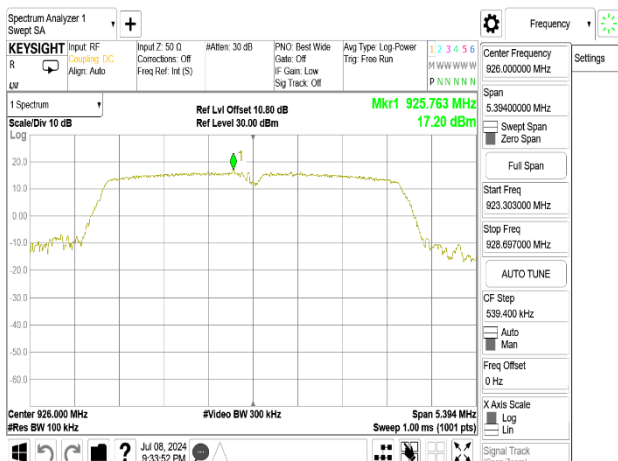
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OFDM_8M_MidCH-916



OFDM_4M_HighCH-926



OFDM_8M_HighCH-924

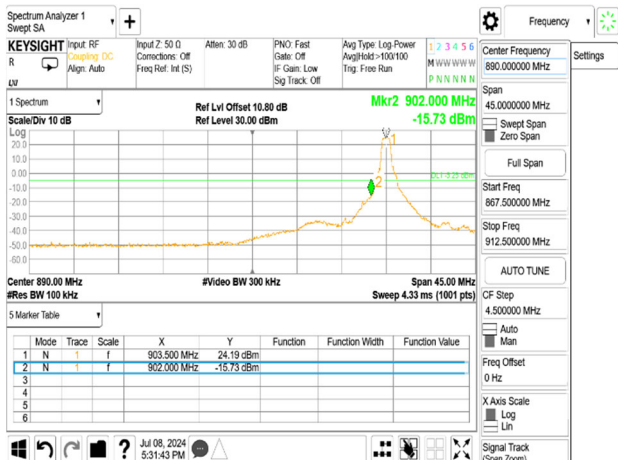


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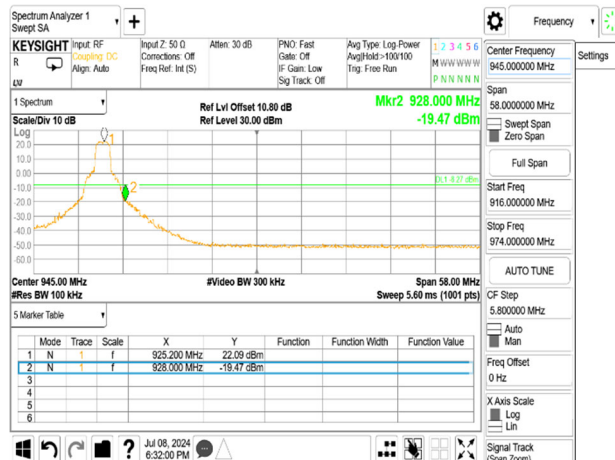
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OFDM_1M_LowCH-903.5



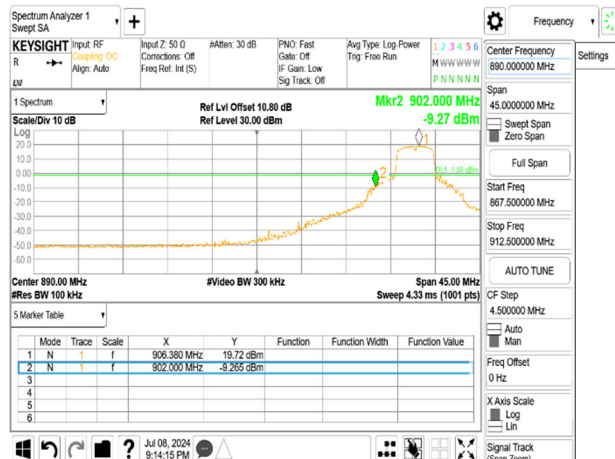
OFDM_2M_HighCH-925



OFDM_1M_HighCH-926.5



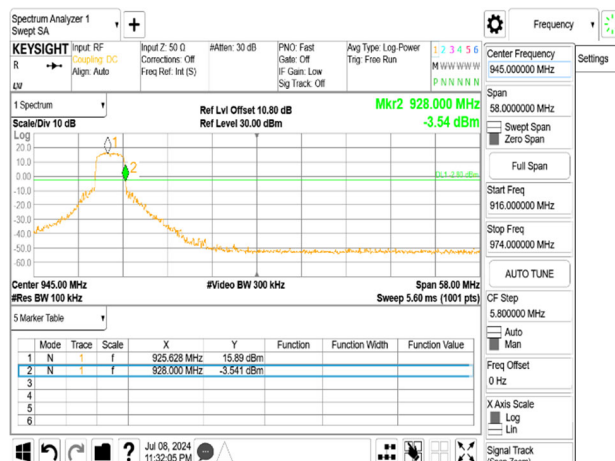
OFDM_4M_LowCH-906



OFDM_2M_LowCH-905



OFDM_4M_HighCH-926



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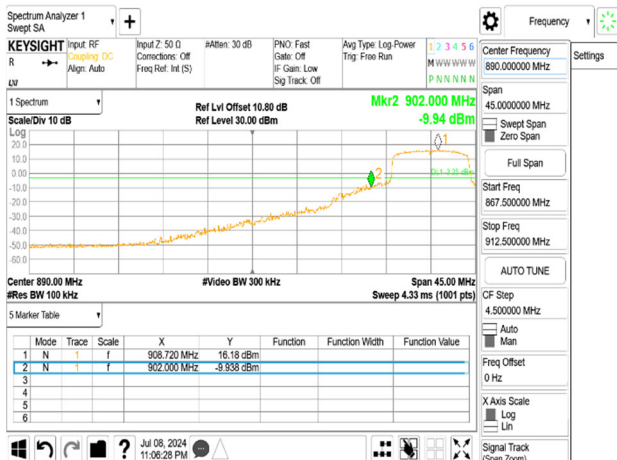
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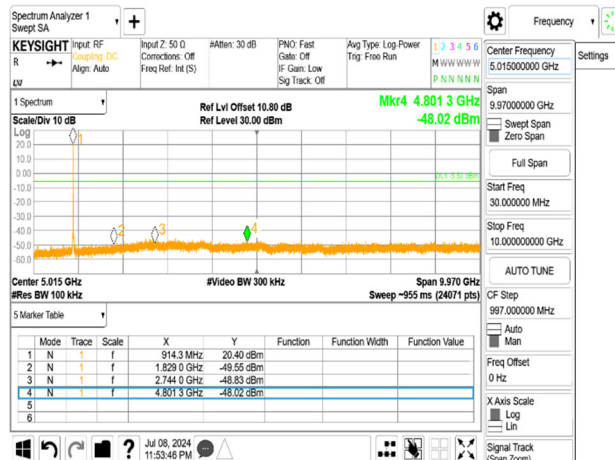
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OFDM_8M_LowCH-908



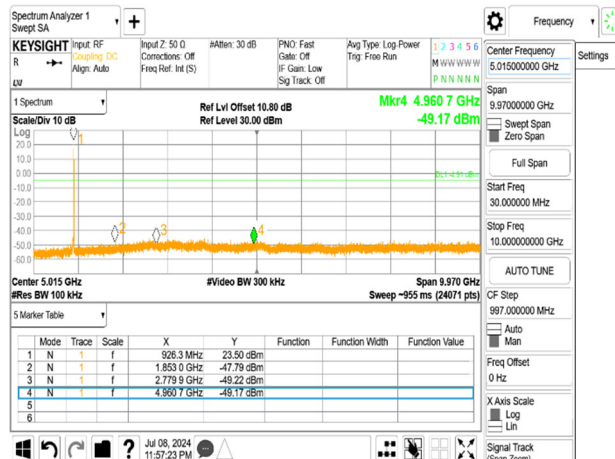
OFDM_1M_MidCH-914.5



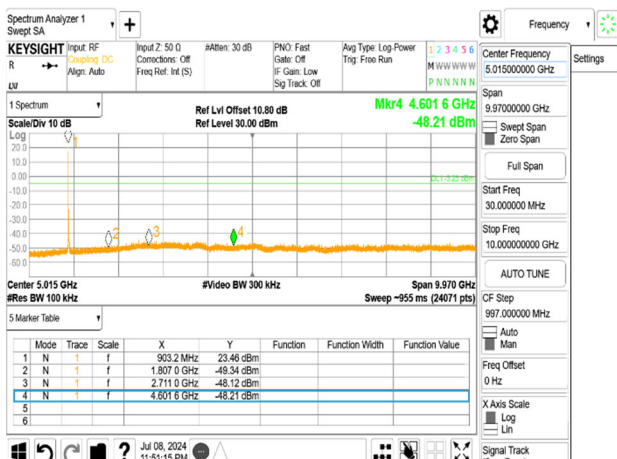
OFDM_8M_HighCH-924



OFDM_1M_HighCH-926.5



OFDM_1M_LowCH-903.5



OFDM_2M_LowCH-905



Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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