

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT



EUT Description: Open-Q 8550CS SOM
Applicant: Lantronix, Inc.
48 Discovery, Suite 250 Irvine, CA 92618 USA
Manufacturer: Lantronix, Inc.
48 Discovery, Suite 250 Irvine, CA 92618 USA
Brand Name: LANTRONIX
Model No./ISED HVIN: Open-Q 8550CS SOM
ISED PMN: Open-Q 8550CS SOM
Report Number: TERF2511004092ER
FCC ID R68OQ8550
IC: 3867A-OQ8550
Date of EUT Received: November 28, 2025
Date of Test: December 01, 2025 ~ February 10, 2026
Issue Date: February 24, 2026

Jazz Huang

Approved By

Jazz Huang

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 and the energy emitted by the sample EUT comply with FCC rule part §15.247, ISED RSS-247.

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

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t (886-2) 2299-3279

f (886-2) 2298-0488

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Revision History

Report Number	Revision	Description	Issue Date	Revised By	Remark
TERF2511004092ER	00	Original	February 13, 2026	Yuri Tsai	
TERF2511004092ER	01	Update section1.1	February 23, 2026	Yuri Tsai	*
TERF2511004092ER	02	Update section2.1	February 24, 2026	Yuri Tsai	*

Note:

- 1、The remark "*" indicates modification of the report upon requests from certification body.

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1 GENERAL INFORMATION

1.1 Product Description

EUT Description	Open-Q 8550CS SOM
Brand Name	LANTRONIX
Model No./ISED HVIN	Open-Q 8550CS SOM
Firmware Version	Open-Q 8550 Android BSP v1.3
Power Supply	3.8Vdc from battery or 5Vdc from USB
Test Software (Name/Version)	Qualcomm® Radio Control Toolkit v4.1/Version 4.0.175.1

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1.2 RF Specification

WLAN 2.4GHz

Mode	Frequency Range	Channels	Rated Power (dBm)		Modulation Technology
			Peak	Avg.	
802.11b	2412~2462	11	29.17	27.26	DSSS
802.11g	2412~2462	11	29.40	25.09	OFDM
802.11n_HT20 802.11ac_VHT20	2412~2462	11	29.34	24.64	OFDM
802.11n_HT40 802.11ac_VHT40	2422~2452	7	26.61	19.72	OFDM
802.11ax_HE20 802.11be_EHT20	2412~2462	11	29.39	24.14	OFDM/OFDMA
802.11ax_HE40 802.11be_EHT40	2422~2452	7	26.99	19.49	OFDM/OFDMA
Modulation type:		CCK,DQPSK, DBPSK for DSSS in 802.11b			
		64QAM, 16QAM, QPSK, BPSK for OFDM in 802.11g,11n			
		256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM in 802.11ac			
		1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDMA in 802.11ax			
		4096QAM, 1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDMA in 802.11be			
Data Rate:		802.11b: 1/2/5.5/11 Mbps			
		802.11g: 6/9/12/18/24/36/48/54 Mbps			
		802.11n_HT20:up to 144.4Mbps			
		802.11n_HT40:up to 300Mbps			
		802.11ac_VHT20:up to 173.4Mbps			
		802.11ac_VHT40:up to 400Mbps			
		802.11ax_HE20:up to 286.8Mbps			
		802.11ax_HE40:up to 573.6Mbps			
		802.11be_EHT20:up to 344.1Mbps			
		802.11be_EHT40:up to 688.2Mbps			

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WLAN 2.4GHz for IC

Mode	Frequency Range	Channels	Rated Power (dBm)		Rated Power in dBm (EIRP)	Modulation Technology
			Peak	Avg.		
802.11b	2412~2462	11	29.17	27.26	30.72	DSSS
802.11g	2412~2462	11	29.40	25.09	28.55	OFDM
802.11n_HT20 802.11ac_VHT20	2412~2462	11	29.34	24.64	28.10	OFDM
802.11n_HT40 802.11ac_VHT40	2422~2452	7	26.61	19.72	23.18	OFDM
802.11ax_HE20 802.11be_EHT20	2412~2462	11	29.39	24.14	27.60	OFDM/OFDMA
802.11ax_HE40 802.11be_EHT40	2422~2452	7	26.99	19.49	22.95	OFDM/OFDMA
Modulation type:		CCK,DQPSK, DBPSK for DSSS in 802.11b				
		64QAM, 16QAM, QPSK, BPSK for OFDM in 802.11g,11n				
		256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM in 802.11ac				
		1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDMA in 802.11ax				
		4096QAM, 1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDMA in 802.11be				
Data Rate:		802.11b: 1/2/5.5/11 Mbps				
		802.11g: 6/9/12/18/24/36/48/54 Mbps				
		802.11n_HT20:up to 144.4Mbps				
		802.11n_HT40:up to 300Mbps				
		802.11ac_VHT20:up to 173.4Mbps				
		802.11ac_VHT40:up to 400Mbps				
		802.11ax_HE20:up to 286.8Mbps				
		802.11ax_HE40:up to 573.6Mbps				
		802.11be_EHT20:up to 344.1Mbps				
		802.11be_EHT40:up to 688.2Mbps				

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1.3 Antenna Designation

Ant. Type	Ant. No.	Freq. (MHz)	Peak Gain(dBi)
Dipole	Ch0	2400~2483.5	3.46
Dipole	Ch1	2400~2483.5	3.46

Note:

1. Pre-scanned was done on the above antennas, measurements were demonstrated by using the antenna with the highest gain as the worst case scenarios.
2. The antenna information is provided by the applicant. The laboratory does not verify the accuracy of this information, and all test results related to antenna characteristics are based solely on the data supplied. Responsibility for the authenticity and accuracy of these specifications rests entirely with the party who provided the information.
3. The antenna complies with part 15.203 requirement and no consideration of replacement. Please see EUT photo for details.
4. The directional gain is calculated according to section F. 2). e). (ii) of FCC KDB 662911 D01.

1.4 Operating Frequencies

2400~2483.5 MHz, Bandwidth: 20MHz							
CH	Freq.	CH	Freq.	CH	Freq.	CH	Freq.
1	2412 MHz	2	2417 MHz	3	2422 MHz	4	2427 MHz
5	2432 MHz	6	2437 MHz	7	2442 MHz	8	2447 MHz
9	2452 MHz	10	2457 MHz	11	2462 MHz	-	-
2400~2483.5 MHz, Bandwidth: 40MHz							
CH	Freq.	CH	Freq.	CH	Freq.	CH	Freq.
3	2422 MHz	4	2427 MHz	5	2432 MHz	6	2437 MHz
7	2442 MHz	8	2447 MHz	9	2452 MHz	-	-

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1.5 EUT Availability and The Worst Test Modes

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. 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.
4. Investigation has been done on all the possible configurations for searching the worst case.

Mode		Transmission Chain								Single Transmission Spatial		Multi Transmission Spatial	
V	802.11 b	V	Ch0	V	Ch1		Ch2		Ch3		1TX	V	2TX
V	802.11 g	V	Ch0	V	Ch1		Ch2		Ch3		1TX	V	2TX
V	802.11 n	V	Ch0	V	Ch1		Ch2		Ch3		1TX	V	2TX
V	802.11 be	V	Ch0	V	Ch1		Ch2		Ch3		1TX	V	2TX

Note:

The 802.11n mode applies to 20 MHz (40 MHz), and the power of the 802.11ac modes is the same or lower than that of the 802.11n in OFDM mode.

The 802.11be mode applies to 20 MHz (40 MHz), and the power of 802.11ax modes is the same or lower than that of the 802.11be in OFDM mode.

The 802.11be mode applies to 20 MHz (40 MHz), and the power of 802.11ax modes is the same or lower than that of the 802.11be in OFDMA mode.

The worst-case 802.11b/g/n/be data will be presented in the test report.

5. Therefore, below summary is the modes of test configuration that yield the highest reading and generate the highest emission chosen to carry out the relevantly mandatory test items.

CONDUCTED TEST					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11b	1 to 11	1,2,3,4,6,7,8,9,10,11	DSSS	1	2TX
802.11g	1 to 11	1,2,3,4,5,6,7,8,9,10,11	OFDM	6	2TX
802.11n_HT20	1 to 11	1,2,3,4,5,6,7,8,9,10,11	OFDM	MCS0	2TX
802.11n_HT40	3 to 9	3,4,5,6,8,9	OFDM	MCS0	2TX
802.11be_EHT20	1 to 11	1,2,3,4,5,6,7,8,9,10,11	OFDM	MCS0	2TX
802.11be_EHT40	3 to 9	3,4,5,6,8,9	OFDM	MCS0	2TX

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CONDUCTED TEST						
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	RU CONFIGURATION	DATA RATE (Mbps)	ANTENNA PORT
802.11be_EHT20	1 to 11	1,2,3,4,5,6,7,8,9,10,11	OFDMA	242 26/0,26/8 52/37,52/40 106/53,106/54 52+26MRU1,MRU3 106+26MRU1,MRU2	MCS0	2TX
802.11be_EHT40	3 to 9	3,4,5,6,8,9	OFDMA	484	MCS0	2TX

TRANSMIT RADIATED EMISSION TEST (BELOW 1 GHz)						
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT	
802.11g	1 to 11	6	OFDM	6	2TX	

TRANSMIT RADIATED EMISSION TEST (ABOVE 1 GHz)						
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT	
802.11b	1 to 11	1,2,3,4,6,7,8,9,10,11	DSSS	1	2TX	
802.11g	1 to 11	1,2,3,4,5,6,7,8,9,10,11	OFDM	6	2TX	
802.11n20	1 to 11	1,2,3,4,5,6,7,8,9,10,11	OFDM	MCS0	2TX	
802.11n40	3 to 9	3,4,5,6,8,9	OFDM	MCS0	2TX	
802.11be20	1 to 11	1,2,3,4,5,6,7,8,9,10,11	OFDM	MCS0	2TX	
802.11be40	3 to 9	3,4,5,6,8,9	OFDM	MCS0	2TX	

TRANSMIT RADIATED EMISSION TEST (ABOVE 1 GHz)						
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	RU CONFIGURATION	DATA RATE (Mbps)	ANTENNA PORT
802.11be20	1 to 11	1,2,3,4,5,6,7,8,9,10,11	OFDMA	242 26/0,26/8 52/37,52/40 106/53,106/54 52+26MRU1,MRU3 106+26MRU1,MRU2	MCS0	2TX
802.11be40	3 to 9	3,4,5,6,8,9	OFDMA	484	MCS0	2TX

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2 SUMMARY OF TEST RESULTS

FCC Rules	ISED Rules	Description Of Test	Result
§15.207(a)	RSS-Gen §8.8	AC Power Line Conducted Emission	Compliant
§15.247(b) (3)	RSS-247 §6.3.2	Peak Output Power	Compliant
§15.247(a)(2)	RSS-247 §6.3.1.a RSS-Gen §6.7	Emission Bandwidth	Compliant
§15.205 §15.209 §15.247(d)	RSS-247 §6.6 RSS-Gen §8.9 RSS-Gen §8.10	Out of Band Emission	Compliant
§15.205 §15.209 §15.247(d)	RSS-247 §6.6 RSS-Gen §8.9 RSS-Gen §8.10	Unwanted Emission	Compliant
§15.247(e)	RSS-247 §6.3.1.b	Power Spectral Density	Compliant
§15.203	N/A	Antenna Requirement	Compliant

2.1 Test Methodology of Applied Standards

1. FCC Part 15, Subpart C §15.247
2. FCC KDB 558074 D01 15.247 Meas Guidance v05r02
3. FCC KDB 662911 D01 Multiple Transmitter Output v02r01
4. ISED RSS-247 issue 4 July 2025
5. ISED RSS-Gen, Issue 5 April 2018, Amendment 2 (February 2021)
6. ANSI C63.10-2020
7. ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024

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2.2 Measurement Uncertainty

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 1.61 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	+/- 0.60 °C
Humidity	+/- 3.00 %
DC / AC Power Source	+/- 1.00 %

Radiated Spurious Emission Measurement Uncertainty		
Polarization: Vertical	+/- 1.89 dB	9kHz - 30MHz
	+/- 4.10 dB	30MHz - 1000MHz
	+/- 3.41 dB	1GHz - 18GHz
	+/- 3.89 dB	18GHz - 40GHz
Polarization: Horizontal	+/- 1.89 dB	9kHz - 30MHz
	+/- 4.10 dB	30MHz - 1000MHz
	+/- 3.41 dB	1GHz - 18GHz
	+/- 3.89 dB	18GHz - 40GHz
Radiated Spurious Emission	+/- 2.00 dB	33GHz - 50GHz
	+/- 1.59 dB	50GHz - 60GHz
	+/- 1.71 dB	60GHz - 90GHz
	+/- 1.64 dB	90GHz - 140GHz
	+/- 3.84 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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2.3 Test Facility

Laboratory	Test Site Address	Test Site Name	FCC Designation number / Registration Number	IC CAB identifier / Company Number
SGS Taiwan Ltd. Central RF Lab. (TAF code 3702)	No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803	SAC 1 / SAC 2 / SAC 3 Conduction 1 / Conducted 1 Conducted 2 / Conducted 3 Conducted 4 / Conducted 5 Conducted 6	TW0027 / 891563	TW3702 / 4620A
SGS Taiwan Ltd. Central RF Lab. (TAF code 3702)	No.2, Keji 1st Rd, Guishan District, Taoyuan City, Taiwan 333	SAC C / SAC D / SAC G Conduction C/ Conducted A Conducted B / Conducted C Conducted D / Conducted E Conducted F / Conducted G	TW0028 / 200037	TW3702 / 4620E

Measurement	Test Site Name	Test Engineer	EUT S/N	Test Environment	Test Date
Conducted	Conducted 1	Chris Ye	1339-0A12-082025-0- 01369	21~23°C / 52~64%	2025/12/12 ~ 2026/02/10
Radiated	SAC 3	Nick Lin	1339-0A12-082025-0- 01384	20.5~21.8°C / 50~58%	2026/01/10 ~ 2026/02/06
Conduction	Conduction 1	Nick Lin	1339-0A12-082025-0- 01384	22.7~22.7°C / 59~59%	2026/01/26 ~ 2026/01/26

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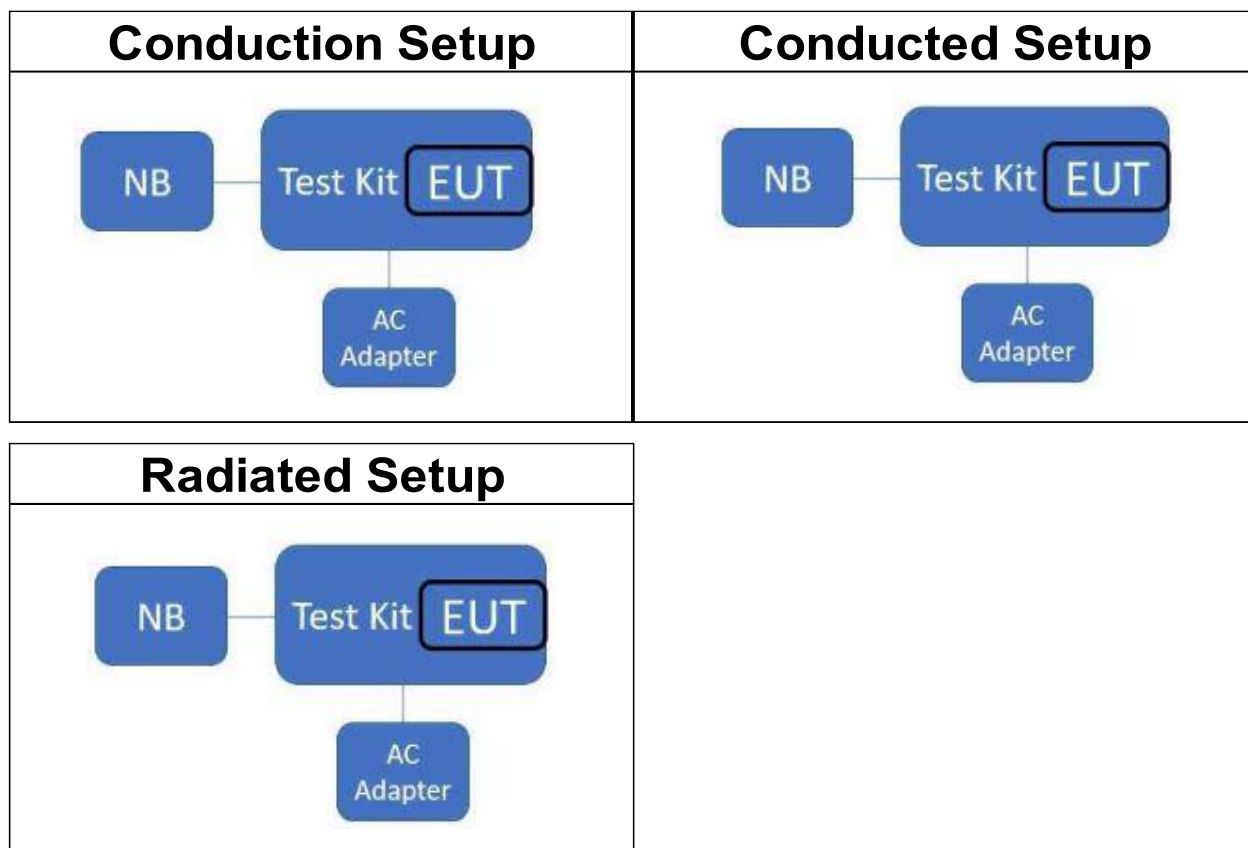
3 CONTROL UNIT(S) AND PERIPHERAL(S)

3.1 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.

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.

3.2 Diagrams



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3.3 List

3.3.1 Conduction Setup

AC Power-Line Conducted Emission Test Site: Conduction 1					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
AC Adapter	SHENZHEN YINGHUIYUAN ELECTRONICS CO., LTD	YHY-12005000	N/A	N/A	N/A
Test Kit	LANTRONIX	LOQ-8550-EVK A11	N/A	N/A	N/A
Notebook	Lenovo	L480	PF-1QCNW8 19/06	N/A	N/A

3.3.2 Conducted Setup

Conducted Emission Test Site: Conducted 1					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
AC Adapter	SHENZHEN YINGHUIYUAN ELECTRONICS CO., LTD	YHY-12005000	N/A	N/A	N/A
Test Kit	LANTRONIX	LOQ-8550-EVK A11	N/A	N/A	N/A
Notebook	Lenovo	T440P	PC-01V5PW 14/11	N/A	N/A

3.3.3 Radiated Setup

Radiated Emission Test Site: SAC 3					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
AC Adapter	SHENZHEN YINGHUIYUAN ELECTRONICS CO., LTD	YHY-12005000	N/A	N/A	N/A
Test Kit	LANTRONIX	LOQ-8550-EVK A11	N/A	N/A	N/A
Notebook	Lenovo	L480	PF-1QCNW8 19/06	N/A	N/A

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4 TEST INSTRUMENT

4.1 Conducted Measurement

Conducted Emission Test Site: Conducted 1					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
Attenuator	Mini-Circuits	BW-S10W2+	6	12/07/2025	12/06/2026
Attenuator	Mini-Circuits	BW-S10W2+	8	12/07/2025	12/06/2026
DC Block	Mini-Circuits	BLK-18-S+	10	12/07/2025	12/06/2026
EXA Spectrum Analyzer	KEYSIGHT	N9010B	MY59071571	06/24/2025	06/23/2026
Power Meter	Anritsu	ML2496A	1242004	10/23/2025	10/22/2026
Power Sensor	Anritsu	MA2411B	1207365	11/06/2025	11/05/2026
Power Sensor	Anritsu	MA2411B	1207368	10/23/2025	10/22/2026
Test Software	SGS	Radio Test Software	Ver. 21	N.C.R	N.C.R

4.2 Radiated Measurement

Radiated Emission Test Site: SAC 3					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
3.2G High Pass Filter	Woken	WHKX10-2624	4	12/07/2025	12/06/2026
Attenuator	Mini-Circuits	BW-S10W2+	15	12/07/2025	12/06/2026
Band Reject Filter 2400-2483.5	EWT	EWT-14-0166	M2	12/07/2025	12/06/2026
Bi-log Antenna	SCHWARZBECK	VULB9168	378	08/21/2025	08/20/2026
Coaxial Cables	EMCI+Huber Suhner	EMC107-SM-SM-1000 +SUCOFLEX 104PEA +EMC107-SM-SM-1500 +SUCOFLEX 106	RX Cable 9K-18G (221110+MY4251/4 PEA+221106+76096 /6)	07/14/2025	07/13/2026
Coaxial Cables	Huber Suhner	SUCOFLEX 102	RX Cable 18G-40G MY2630/2+805062/2	07/14/2025	07/13/2026
EMI Test Receiver	R&S	ESCI 7	100759	09/02/2025	09/01/2026
EXA Spectrum Analyzer	KEYSIGHT	N9010B	MY59071570	07/04/2025	07/03/2026
Horn Antenna	RF SPIN	DRH0844	LE2D05A0844	08/07/2025	08/06/2026
Horn Antenna	SCHWARZBECK	BBHA9120D	1441	10/03/2025	10/02/2026
Loop Antenna	COM-POWER	AL-130R	10160104	12/30/2025	12/29/2026
Pre-Amplifier	EMCI	EMC118A45SEE	980868	07/14/2025	07/13/2026
Pre-Amplifier	EMCI	EMC184045SEE	980939	07/14/2025	07/13/2026
Pre-Amplifier	HP	8447D	2944A07676	07/14/2025	07/13/2026
Site Cal	SGS	SAC 3	N/A	07/14/2025	07/13/2026
Test Software	Audix	e3	Ver. 9.210616	N.C.R	N.C.R

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4.3 Emission from AC power line

AC Power-Line Conducted Emission Test Site: Conduction 1					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
Coaxial Cables	EMC Instruments Corp.	EMCCFD300-BM-BM-3000	161207	06/22/2025	06/21/2026
EMI Test Receiver	R&S	ESCI 7	100759	09/02/2025	09/01/2026
LISN	SCHWARZBECK	NSLK 8127	1040	09/13/2025	09/12/2026
Pulse Limiter	SCHWARZBECK	VTSD 9561F-N	793	06/22/2025	06/21/2026
Test Software	Audix	e3	Ver. 9.210616	N.C.R	N.C.R

NOTE: N.C.R refers to Not Calibrated Required.

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5 REGULATORY REQUIREMENTS

5.1 Emission Bandwidth

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

5.2 Duty Cycle

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle.

All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

5.3 Maximum Output Power

FCC

For systems using digital modulation in the 2400-2483.5 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.

ISED

For systems using digital modulation in the 2400-2483.5 MHz bands, the limit for peak output power is 1Watt and the e.i.r.p. shall not exceed 4 W.

5.4 Maximum Power Spectral Density

The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

The power spectral density shall be determined using the same method as is used to determine the maximum conducted output power.

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5.5 Out of Band Emission

For emissions in non-restricted frequency bands, 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, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

5.6 Unwanted Emissions

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, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

In addition, radiated emissions which fall in the restricted bands must also comply with the applicable radiated emission limits as defined in the general emission limit tables.

Moreover, for an intentional radiator operating below 10 GHz, the frequency range of measurements shall extend up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

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Frequency (MHz)	Field strength (microvolts/meter)	Distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note: The lower limit shall apply at the transition frequencies.

5.7 AC Power Line Conducted Emission

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

Frequency range MHz	Limits (dBuV)	
	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

5.8 Antenna Requirement

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of § 15.211, 15.213, 15.217, 15.219, 15.221, or § 15.236. Further, this requirement does not

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apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

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6 TEST CONFIGURATION

6.1 Emission Bandwidth



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.
3. 6dB BW measurements
The testing is performed in accordance with the applicable regulatory measurement procedure.
Set the spectrum analyzer as
RBW= 1% to 5% of the OBW but not less than 100 kHz,
VBW $\geq 3 \times$ RBW,
Span= 2 to 5 times of the OBW,
Sweep=Auto, Detector = Peak, and Trace mode = Max Hold.
Use the X dB bandwidth mode function of the spectrum analyzer and set to 6dB.
Repeat above procedures until all test default channel is completed.
4. 99% BW measurements
The testing is performed in accordance with the applicable regulatory measurement procedure.
Set the spectrum analyzer as
RBW= 1 % to 5% of 99% without going below 10kHz,
VBW $\geq 3 \times$ RBW,
Span= 1.5 to 5 times of the OBW,
Sweep=Auto, Detector = Peak, and Trace mode = Max Hold.
Use the 99% power bandwidth function of the spectrum analyzer.
Repeat above procedures until all test default channel is completed.

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6.2 Maximum Output Power

6.2.1 Duty Cycle



Place the EUT on the table and set it in transmitting mode.

Set the spectrum analyzer as

Center Frequency = fundamental frequency

Span = Zero,

RBW = 8 MHz,

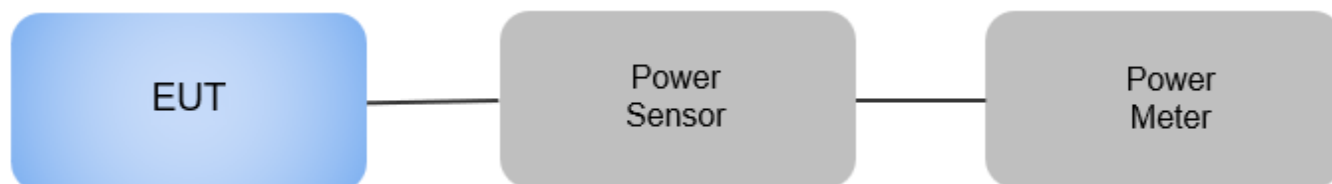
VBW = 8 MHz,

Detector = Peak,

Allow trace to fully stabilize.

Use the delta marker function to determine the ON and OFF times.

6.2.2 Maximum Output Power



1. The testing is performed in accordance with the applicable output power measurement procedure.
2. Place the EUT on the table and set it to transmit mode.
3. Remove the antenna from the EUT and connect a low-loss RF cable from the antenna port to the power meter.
4. The power meter is used as auxiliary test equipment to conduct the output power measurement. Record the maximum reading as observed from the spectrum analyzer or power meter.

When testing for multiple output ports in simultaneous transmission mode, the measured values of each individual output port are tested separately and then linearly summed.

The directional gain is calculated using the formula

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$$Directional\ Gain = 10 \times \log_{10} \left[\frac{\left(10^{\frac{G_1}{20}} + 10^{\frac{G_2}{20}} + \dots + 10^{\frac{G_n}{20}} \right)^2}{N_{ant}} \right]$$

Note: The duty cycle factor is compensated to obtain the maximum value of measurement in average.

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

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6.3 Maximum Power Spectral Density



The test is conducted in accordance with the applicable regulatory measurement procedure.

Set spectrum analyzer center frequency to DTS channel center frequency.

Set the span > 1.5 times the DTS channel bandwidth.

Set the RBW = 3 kHz and VBW = 10 kHz.

Detector = Peak

Sweep time = Auto Couple.

Trace mode = Max Hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum amplitude level.

When testing for multiple output ports in simultaneous transmission mode, the measured values of each individual output port are tested separately and then linearly summed.

The directional gain is calculated using the formula

$$\text{Directional Gain} = 10 \times \log_{10} \left[\frac{\left(10^{\frac{G_1}{20}} + 10^{\frac{G_2}{20}} + \dots + 10^{\frac{G_n}{20}} \right)^2}{N_{\{ant\}}} \right]$$

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6.4 Out of Band Emission



6.4.1 Reference Level of Emission Limit

The testing is performed in accordance with the applicable measurement procedure.

Set the analyzer center frequency to the DTS channel center frequency.

Set the span to 1.5 times the DTS channel bandwidth.

Set RBW = 100 kHz and VBW = 300 kHz.

Detector = peak

Sweep time = Auto Couple.

Trace mode = Max Hold.

Allow the trace to fully stabilize.

Use the peak marker function to determine the maximum amplitude level.

6.4.2 Conducted Band Edge

1. The testing is performed in accordance with the applicable measurement procedure.
2. Connect the antenna port of the EUT to the spectrum analyzer.
3. Remove the antenna from the EUT and connect a low-loss RF cable from the antenna port to the spectrum analyzer.
4. Set the start frequency and stop frequency of the spectrum analyzer to encompass the spectrum to be examined.
5. Configure the spectrum analyzer as follows:
 - RBW = 100 kHz
 - VBW = 300 kHz
 - Detector = Peak
 - Sweep = Auto
 - Mark the highest reading of the emission as the reference level.
 - Set the display limit as: reference level marker reading -20 dBm.
 - Mark the highest emissions observed outside of the 2400 MHz to 2483.5 MHz band.
6. Repeat the above procedure for each default test channel (low, middle, and high).

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6.4.3 Conducted Spurious Emission

1. The testing is performed in accordance with the applicable measurement procedure.
2. Connect the antenna port of the EUT to the spectrum analyzer.
3. Configure the spectrum analyzer as follows:
RBW = 100 kHz
VBW = 300 kHz
Detector = Peak
Sweep = Auto.
Allow the trace to fully stabilize.
Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental emission bandwidth (EBW).
4. Repeat the above procedures until all default test channels (low, middle, and high) have been measured.

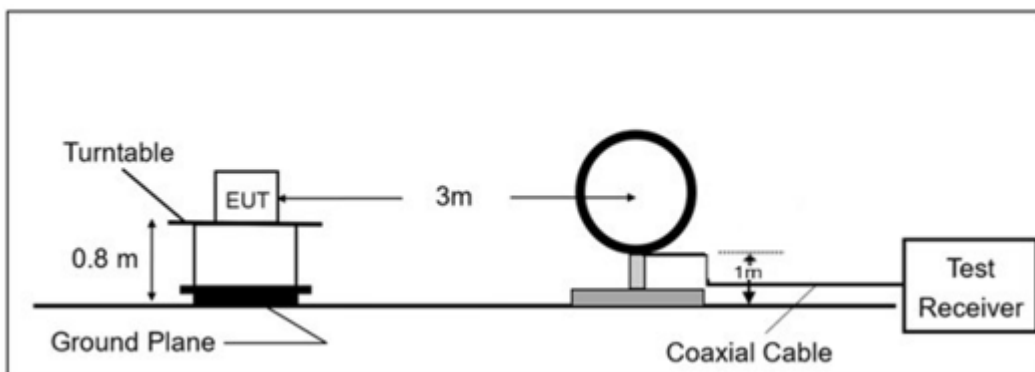
6.5 Unwanted Emissions

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.

Radiated Emission Test Set-Up, Frequency Below 30MHz.



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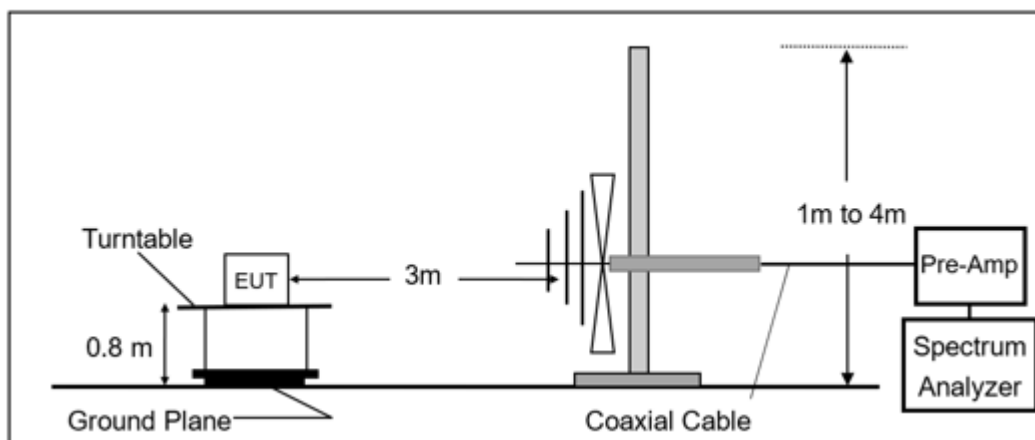
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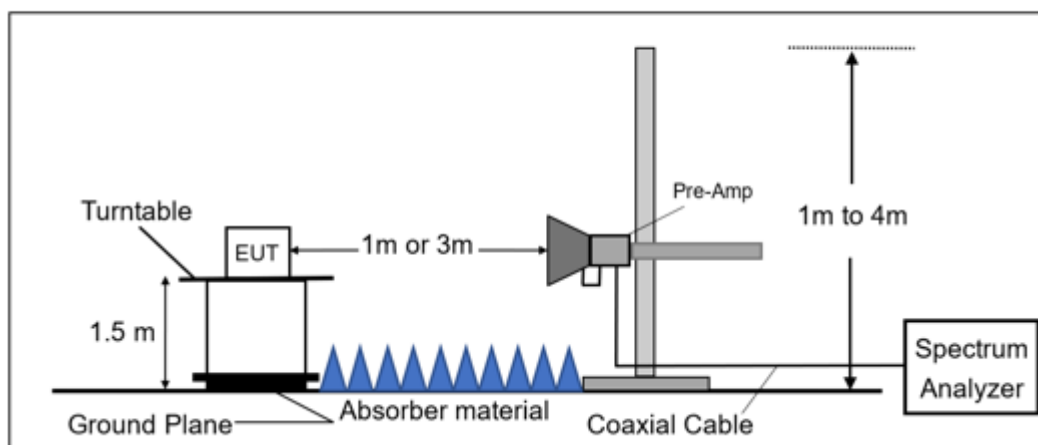
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Radiated Emission Test Set-Up, Frequency From 30MHz to 1000MHz.



Radiated Emission Test Set-Up, Frequency Above 1GHz.



1. The testing was performed in accordance with the applicable radiated emission measurement procedure.
2. The EUT was placed on a turntable at a height of 0.8 m for frequencies below 1 GHz and 1.5 m for frequencies above 1 GHz.
3. The turntable was rotated 360 degrees to determine the position of the maximum emission level.
4. The EUT was positioned 3 meters away from the receiving antenna, which was varied in height from 1 m to 4 m to locate the highest emissions.
5. For measurements below 30MHz, set the spectrum analyzer as
 - ☒ For Peak measurement
 - RBW=10 kHz
 - VBW=30 kHz
 - Detector = peak
 - Trace mode = max-hold
 - ☒ For Quasi-peak measurement in receiver mode
 - RBW=10 kHz

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Detector = Quasi-Peak

Peak detection is used unless otherwise noted as quasi-peak.

6. For measurements in 30MHz to 1GHz, set the spectrum analyzer as

☒ For Peak measurement

RBW=100 kHz

VBW=300 kHz

Detector = peak

Trace mode = max-hold

☒ For Quasi-peak measurement in receiver mode

RBW=120 kHz

Detector = Quasi-Peak

Peak detection is used unless otherwise noted as quasi-peak.

7. For measurements above 1GHz, set the spectrum analyzer as

☒ For Peak measurement:

RBW=1 MHz

VBW=3 MHz

Detector = peak

Trace mode = max-hold

☒ For Average measurement:

☒ Duty cycle $\geq$ 98%:

RBW=1 MHz

VBW=3 MHz

Detector = Power averaging (rms)

trace average was performed over at least 100 traces

☒ Duty cycle < 98%

RBW=1 MHz

VBW $\geq$ 1/T

Detector = peak

Trace mode = max-hold

☐ Duty cycle < 98%

RBW=1 MHz

VBW $\geq$ 3 MHz

Detector = Power averaging (rms)

trace average was performed over at least 100 traces

add Duty cycle factor(dB)

☐ Duty cycle factor (DCF)

the average value of pulsed emissions with duty cycle correction factor 20 log (Ton/100ms) from the peak measurement

8. When measuring radiated emissions above 1 GHz, the receiving antenna was maintained within the "cone of radiation" and pointed at the emission source in both azimuth and elevation, with polarization oriented for maximum response, ensuring it remained within the 3 dB illumination beamwidth of the measurement antenna.
9. The six highest emissions were fully maximized using the above procedures to ensure EUT compliance.
10. Each emission was further maximized by changing the receiving antenna polarization between horizontal and vertical.

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11. Repeat the above procedures until all default test channels (low, middle, and high) are measured.

Note: Emissions from 9 kHz to 30 MHz were pre-scanned and found to be at least 20 dB below the applicable limits, and are therefore not reported.

6.5.1 Field Strength Calculation

The field strength is calculated by adding the antenna factor and cable loss, then subtracting the amplifier gain and any applicable duty cycle correction factor from the measured reading. The basic equation and an example calculation are as follows:

$$FS = RA + AF + CL - AG$$

Where:

FS = Field Strength (dB μ V/m)
RA = Reading Amplitude (dB μ V)
AF = Antenna Factor (dB/m)
CL = Cable Loss (dB)
AG = Amplifier Gain (dB)

The emission limit is expressed in dB μ V/m, which corresponds to the logarithmic conversion of $20 \times \log_{10} (\mu\text{V/m})$.

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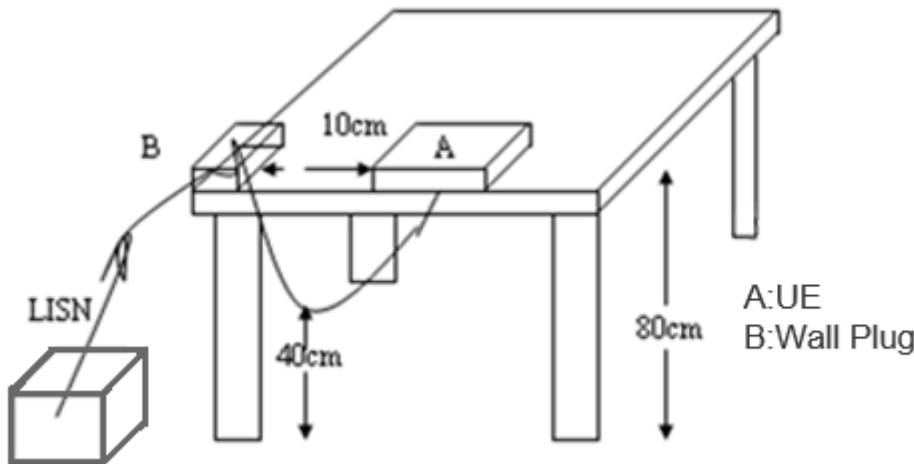
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6.6 AC Power Line Conducted Emission



1. The conducted emission tests were performed at the designated test site using a setup in accordance with ANSI_C63.10
2. The EUT was placed on a non-conductive table that is 0.8 meters above the ground plane. Conducted emissions were measured in the frequency range from 0.15 MHz to 30 MHz using CISPR Quasi-Peak and Average detector modes. The two LISNs provided 50 μ H / 50 ohm coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
3. The AC/DC power adaptor of the EUT was connected to the LISN. The EUT was positioned flush with the rear edge of the table, with a minimum 0.4-meter distance from the shielding wall.
4. The LISNs were connected to the power source and configured according to the test requirements.
5. The maximum emission levels were investigated for each mode of operation. The six highest emissions were further maximized to ensure compliance.
6. The above procedures were repeated for all power supply configurations of the EUT.

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7 TEST RESULTS

7.1 Emission Bandwidth

802.11b_Ch0

Freq. (MHz)	99% BW (MHz)	6dB BW (kHz)	6dB BW Limit (kHz)	Result
2412	13.987	8685	≥ 500	PASS
2437	15.969	9727	≥ 500	PASS
2462	13.974	8619	≥ 500	PASS

802.11b_Ch1

Freq. (MHz)	99% BW (MHz)	6dB BW (kHz)	6dB BW Limit (kHz)	Result
2412	14.515	9138	≥ 500	PASS
2437	14.953	9181	≥ 500	PASS
2462	13.874	8657	≥ 500	PASS

802.11g_Ch0

Freq. (MHz)	99% BW (MHz)	6dB BW (kHz)	6dB BW Limit (kHz)	Result
2412	17.326	16230	≥ 500	PASS
2437	19.786	16440	≥ 500	PASS
2462	17.572	16670	≥ 500	PASS

802.11g_Ch1

Freq. (MHz)	99% BW (MHz)	6dB BW (kHz)	6dB BW Limit (kHz)	Result
2412	17.396	16520	≥ 500	PASS
2437	17.603	16440	≥ 500	PASS
2462	17.540	16540	≥ 500	PASS

802.11n_HT20_Ch0

Freq. (MHz)	99% BW (MHz)	6dB BW (kHz)	6dB BW Limit (kHz)	Result
2412	18.134	17390	≥ 500	PASS
2437	18.948	17610	≥ 500	PASS
2462	18.372	17830	≥ 500	PASS

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802.11n_HT20_Ch1

Freq. (MHz)	99% BW (MHz)	6dB BW (kHz)	6dB BW Limit (kHz)	Result
2412	18.239	17670	≥ 500	PASS
2437	18.148	17620	≥ 500	PASS
2462	18.355	17880	≥ 500	PASS

802.11n_HT40_Ch0

Freq. (MHz)	99% BW (MHz)	6dB BW (kHz)	6dB BW Limit (kHz)	Result
2422	37.430	36810	≥ 500	PASS
2437	36.411	35130	≥ 500	PASS
2452	36.924	36490	≥ 500	PASS

802.11n_HT40_Ch1

Freq. (MHz)	99% BW (MHz)	6dB BW (kHz)	6dB BW Limit (kHz)	Result
2422	37.312	36790	≥ 500	PASS
2437	36.251	34880	≥ 500	PASS
2452	36.906	36640	≥ 500	PASS

802.11be_EHT20_SU_Ch0

Freq. (MHz)	99% BW (MHz)	6dB BW (kHz)	6dB BW Limit (kHz)	Result
2412	19.192	18060	≥ 500	PASS
2437	19.244	18960	≥ 500	PASS
2462	19.321	19230	≥ 500	PASS

802.11be_EHT20_SU_Ch1

Freq. (MHz)	99% BW (MHz)	6dB BW (kHz)	6dB BW Limit (kHz)	Result
2412	19.259	18950	≥ 500	PASS
2437	19.131	18830	≥ 500	PASS
2462	19.355	19120	≥ 500	PASS

802.11be_EHT40_SU_Ch0

Freq. (MHz)	99% BW (MHz)	6dB BW (kHz)	6dB BW Limit (kHz)	Result
2422	38.482	38340	≥ 500	PASS
2437	37.811	37120	≥ 500	PASS
2452	38.183	38100	≥ 500	PASS

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802.11be_EHT40_SU_Ch1

Freq. (MHz)	99% BW (MHz)	6dB BW (kHz)	6dB BW Limit (kHz)	Result
2422	38.388	38240	≥ 500	PASS
2437	37.760	37730	≥ 500	PASS
2452	38.151	38230	≥ 500	PASS

802.11be_EHT20_RU_Ch0

Freq. (MHz)	RU Config	99% BW (MHz)	6dB BW (kHz)	6dB BW Limit (kHz)	Result
2412	242	19.201	19000	≥ 500	PASS
2437	242	19.214	19040	≥ 500	PASS
2462	242	19.231	19250	≥ 500	PASS

802.11be_EHT20_RU_Ch1

Freq. (MHz)	RU Config	99% BW (MHz)	6dB BW (kHz)	6dB BW Limit (kHz)	Result
2412	242	19.280	19050	≥ 500	PASS
2437	242	19.084	19070	≥ 500	PASS
2462	242	19.209	19210	≥ 500	PASS

802.11be_EHT40_RU_Ch0

Freq. (MHz)	RU Config	99% BW (MHz)	6dB BW (kHz)	6dB BW Limit (kHz)	Result
2422	484	38.491	38220	≥ 500	PASS
2437	484	37.822	37550	≥ 500	PASS
2452	484	38.112	37970	≥ 500	PASS

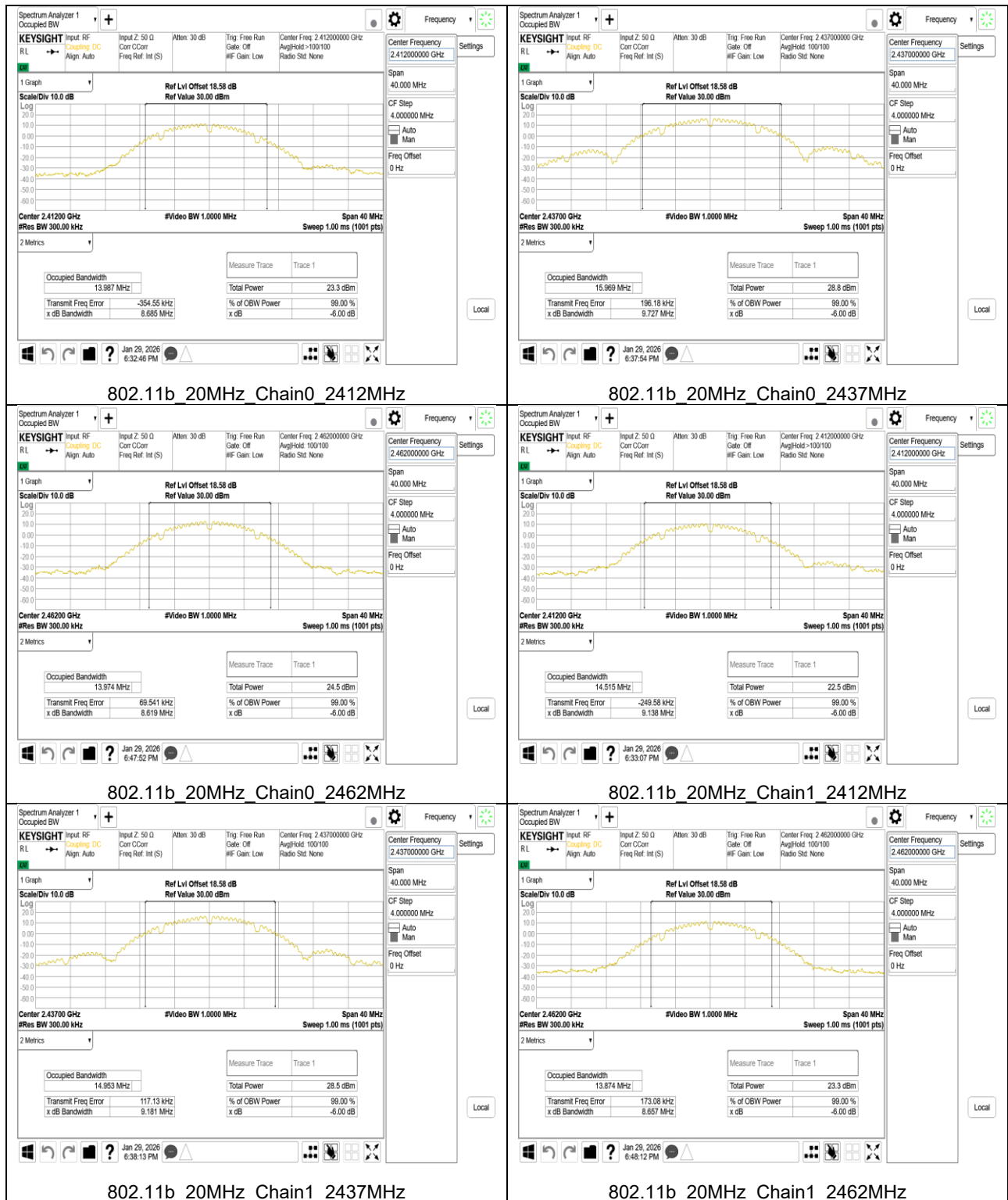
802.11be_EHT40_RU_Ch1

Freq. (MHz)	RU Config	99% BW (MHz)	6dB BW (kHz)	6dB BW Limit (kHz)	Result
2422	484	38.356	38160	≥ 500	PASS
2437	484	37.727	37540	≥ 500	PASS
2452	484	38.227	38070	≥ 500	PASS

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SGS Taiwan Ltd.

No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

台灣檢驗科技股份有限公司

t (886-2) 2299-3279

f (886-2) 2298-0488

www.sgs.com.tw

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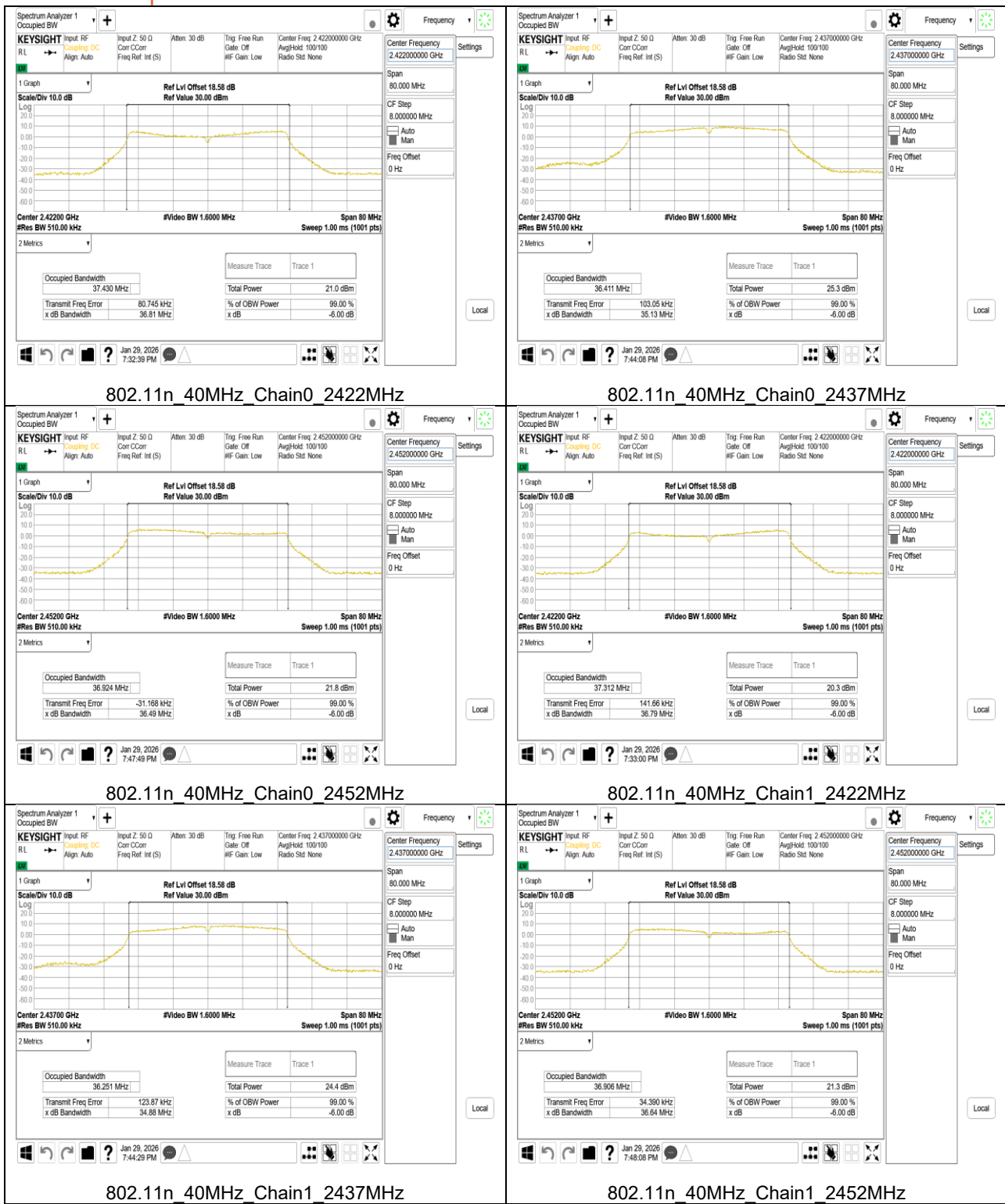
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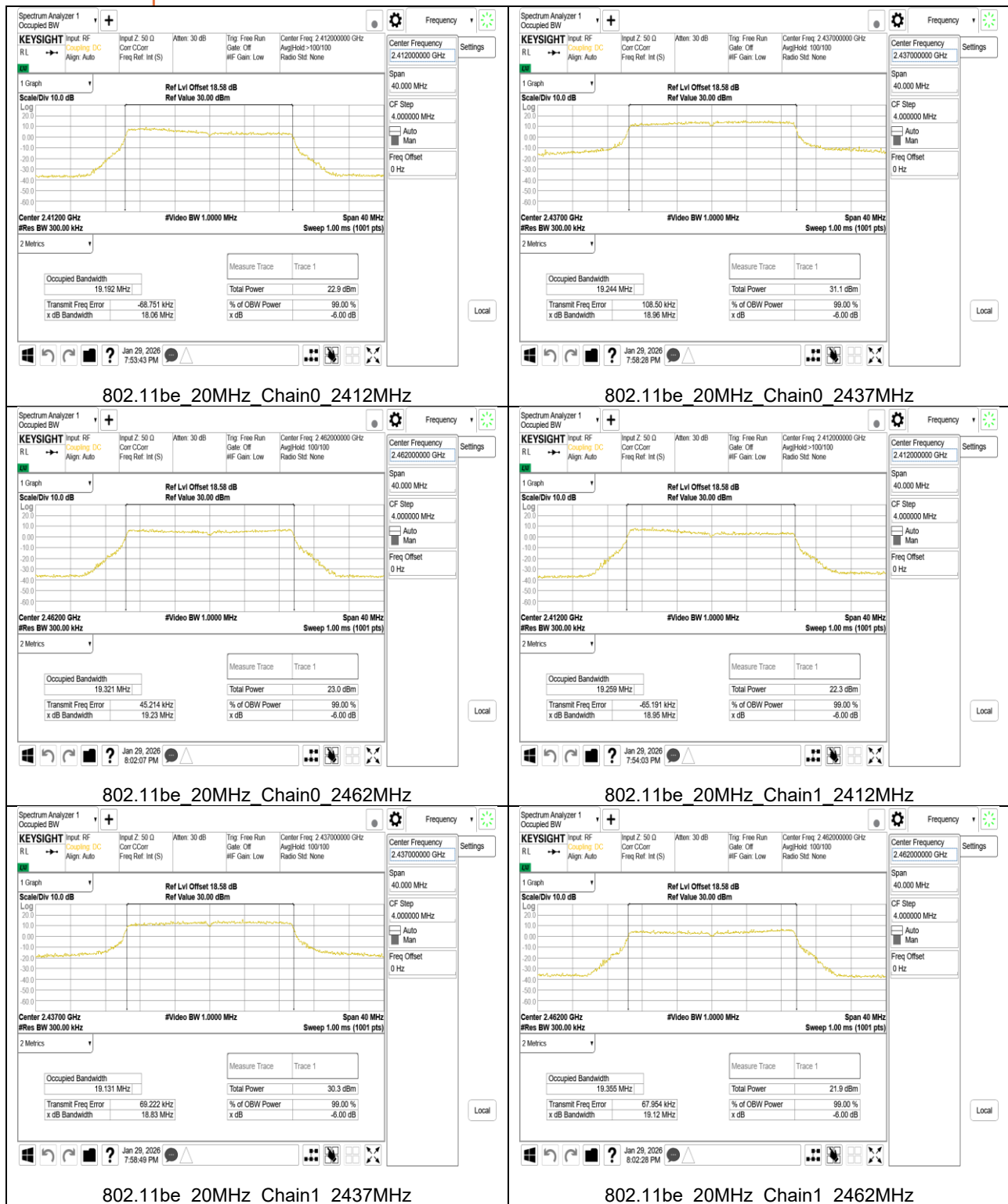
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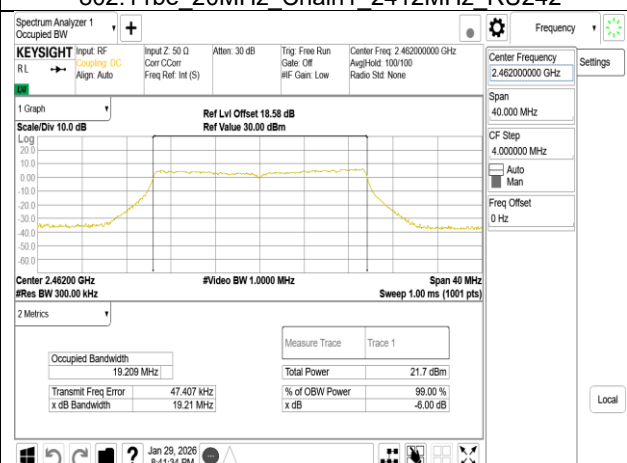
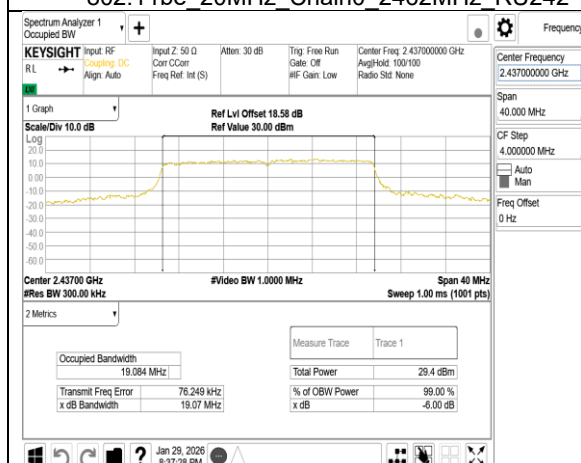
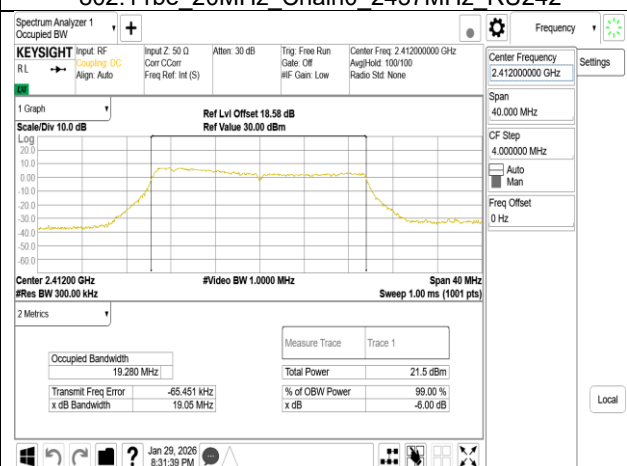
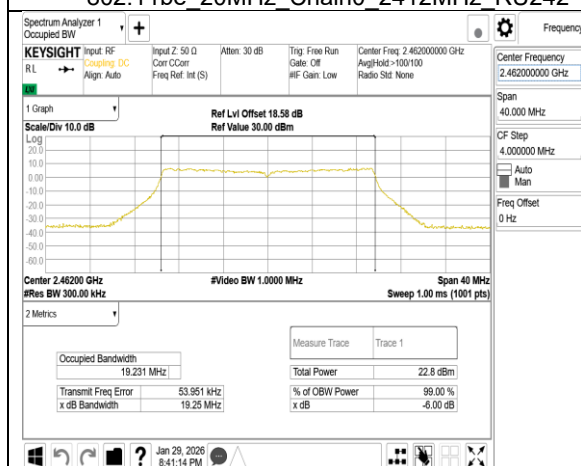
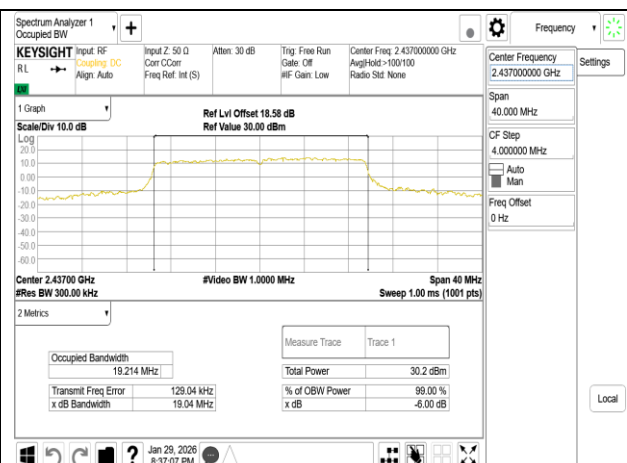
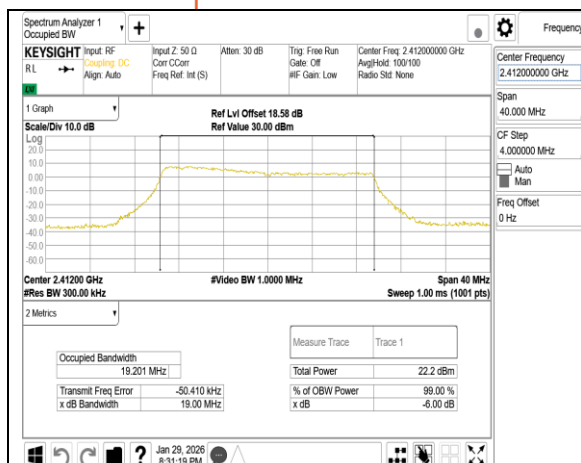
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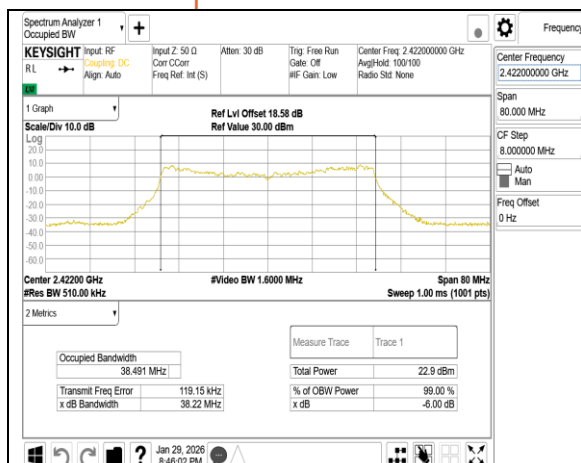
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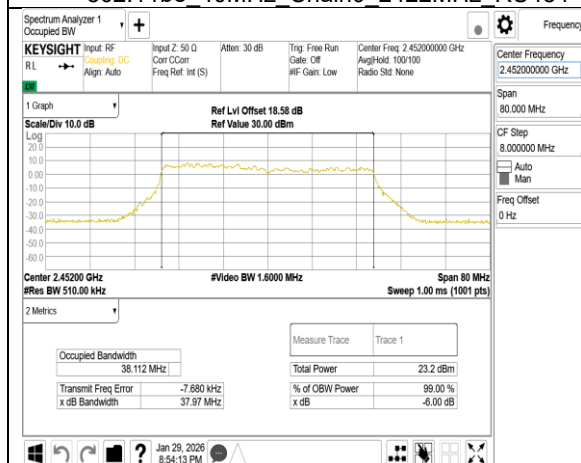
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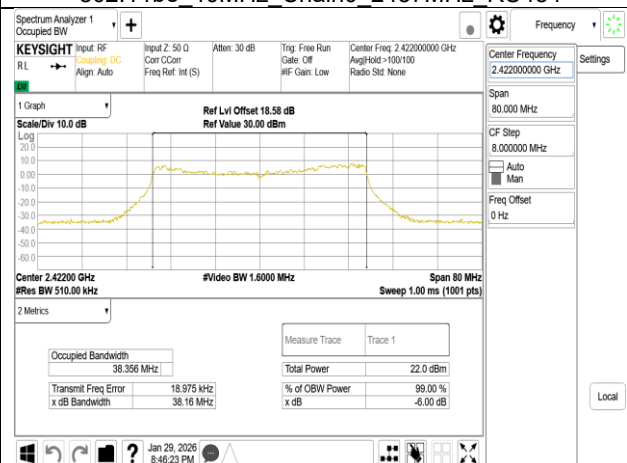
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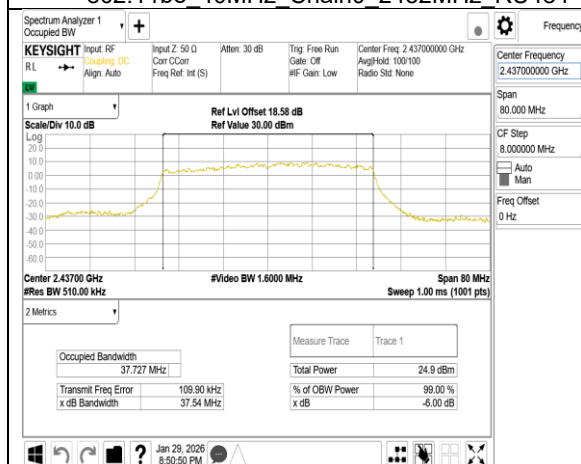
802.11be 40MHz Chain0 2437MHz RU484



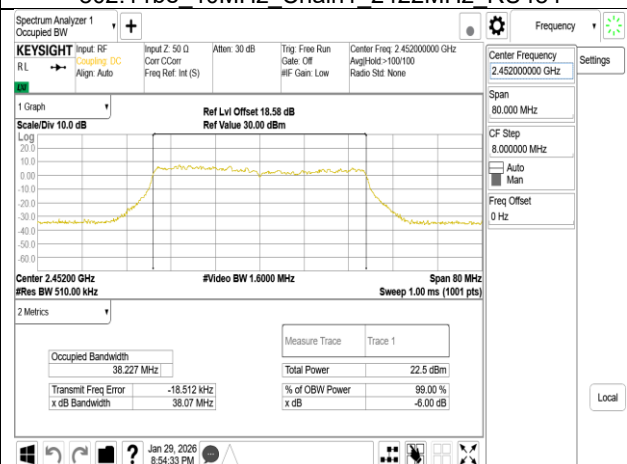
802.11be 40MHz Chain0 2452MHz RU484



802.11be 40MHz Chain1 2422MHz RU484



802.11be 40MHz Chain1 2437MHz RU484



802.11be 40MHz Chain1 2452MHz RU484

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7.2 Duty Cycle

Mode		Duty Cycle (%) = Ton / (Ton+Toff)	Duty Factor (dB) =10*log (1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)
802.11b		97.37	0.12	1.50	2.00
802.11g		99.01	0.04	0.48	0.01
802.11n_20		99.63	0.02	0.19	0.01
802.11n_40		99.70	0.01	0.19	0.01
802.11be_20_SU		99.55	0.02	0.19	0.01
802.11be_40_SU		99.70	0.01	0.19	0.01
Mode	RU Config	Duty Cycle (%) = Ton / (Ton+Toff)	Duty Factor (dB) =10*log (1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)
802.11be_20_RU	242	98.26	0.08	0.59	0.01
	26 RU	99.41	0.03	0.20	0.01
	52 RU	99.61	0.02	0.20	0.01
	106 RU	99.03	0.04	0.33	0.01
	52+26 MRU	99.34	0.03	0.22	0.01
	106+26 MRU	99.54	0.02	0.23	0.01
802.11be_40_RU	484	97.50	0.11	0.85	1.00

7.2.1 Duty Cycle test plots



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802.11n_20MHz_Chain0_2412MHz



802.11n_40MHz_Chain0_2422MHz



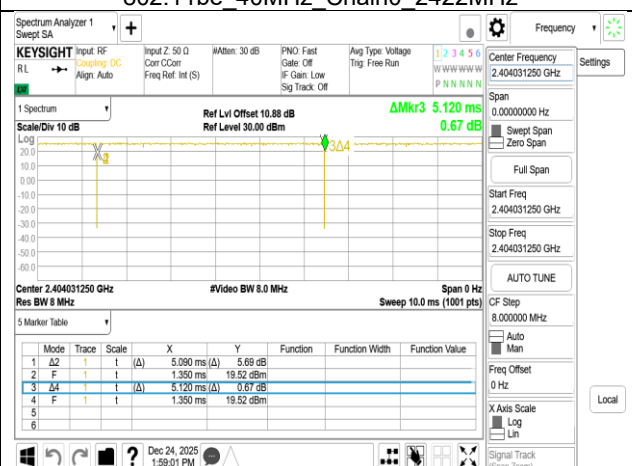
802.11be_20MHz_Chain0_2412MHz



802.11be_40MHz_Chain0_2422MHz



802.11be_20MHz_Chain0_2412MHz_RU242



802.11be_20MHz_Chain0_2412MHz_RU26_0

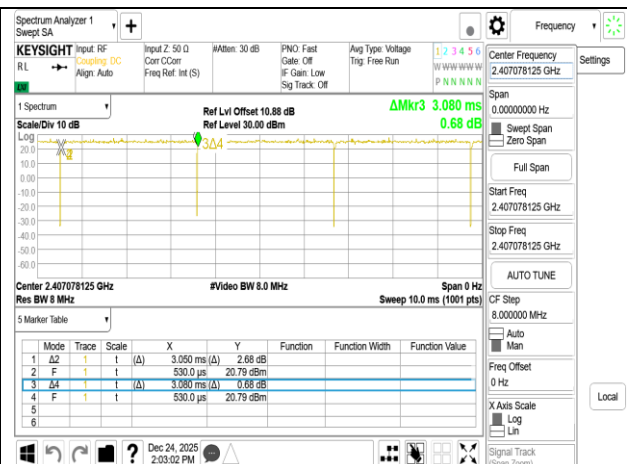
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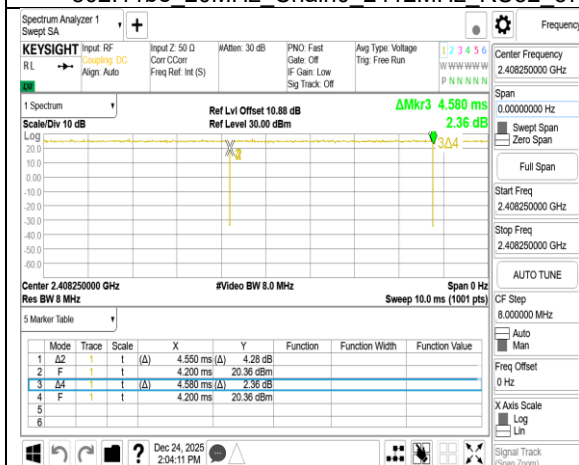
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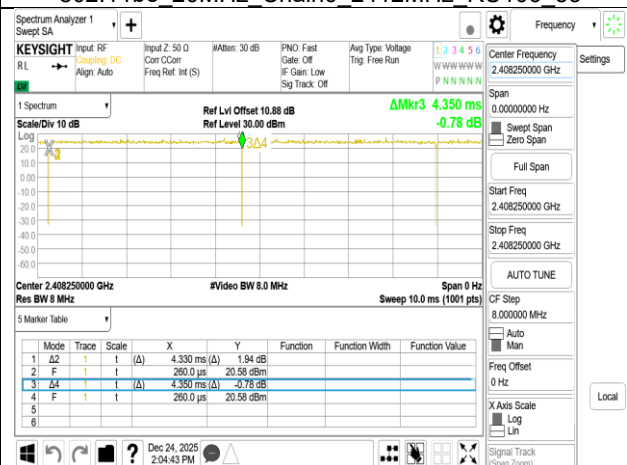
802.11be 20MHz Chain0 2412MHz RU52 37



802.11be 20MHz Chain0 2412MHz RU106 53



802.11be 20MHz Chain0 2412MHz 52+26 MRU1



802.11be 20MHz Chain0 2412MHz 106+26 MRU1



802.11be 40MHz Chain0 2422MHz RU484

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