3.6 Test Conditions and Results - Maximum peak conducted output power

3.6.1 Information

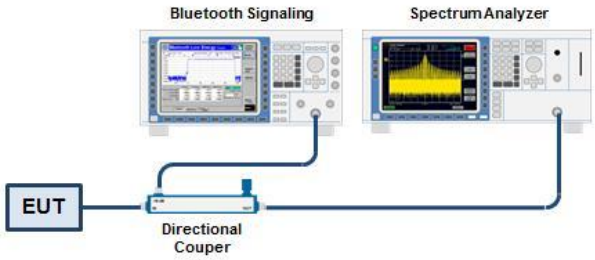
Test Information	
Reference	FCC § 15.247(b); ISED RSS-247, Issue 3 (section 5.4)
Measurement Method	ANSI C63.10 7.8.5
Measurement Uncertainty	± 2.86 dB
Operator	Md Abu Bakar Siddique
Date	2024-02-02

3.6.2 Limits

Limits	
Condition	Power
Number of hopping channels ≥ 75	1 W (30 dBm)
75 > Number of hopping channels ≥ 15	0.125 W (21 dBm)
The conducted output power limit specified above is based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in the table, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.	

3.6.3 Setup

Test Setup



3.6.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSP 30	EF00312	2023-08	2024-08
Cable(CAABC)	Gigalane	GIGALANE 1730	EF00779	2023-03	2024-03

3.6.5 Procedure

Test Procedure

1. EUT set to test mode (Communication tester is used if needed)
2. Analyzer resolution bandwidth is set ≥ DTS bandwidth
3. Detector set to peak and max hold
4. Sweep time is set to auto
5. After the trace has stabilized a marker is set to peak of envelope

3.6.6 Results

Test Results - DH5				
Channel [MHz]	Power [dBm]	Power [W]	Limit [W]	Verdict
2402	2.788	0.0019	1.0	PASS
2441	2.653	0.0018	1.0	PASS
2480	2.448	0.0018	1.0	PASS

Test Results - 2-DH5				
Channel [MHz]	Power [dBm]	Power [W]	Limit [W]	Verdict
2402	0.998	0.0013	1.0	PASS
2441	0.451	0.0011	1.0	PASS
2480	0.456	0.0011	1.0	PASS

Test Results - 3-DH5				
Channel [MHz]	Power [dBm]	Power [W]	Limit [W]	Verdict
2402	1.184	0.0013	1.0	PASS
2441	0.650	0.0012	1.0	PASS
2480	0.666	0.0012	1.0	PASS

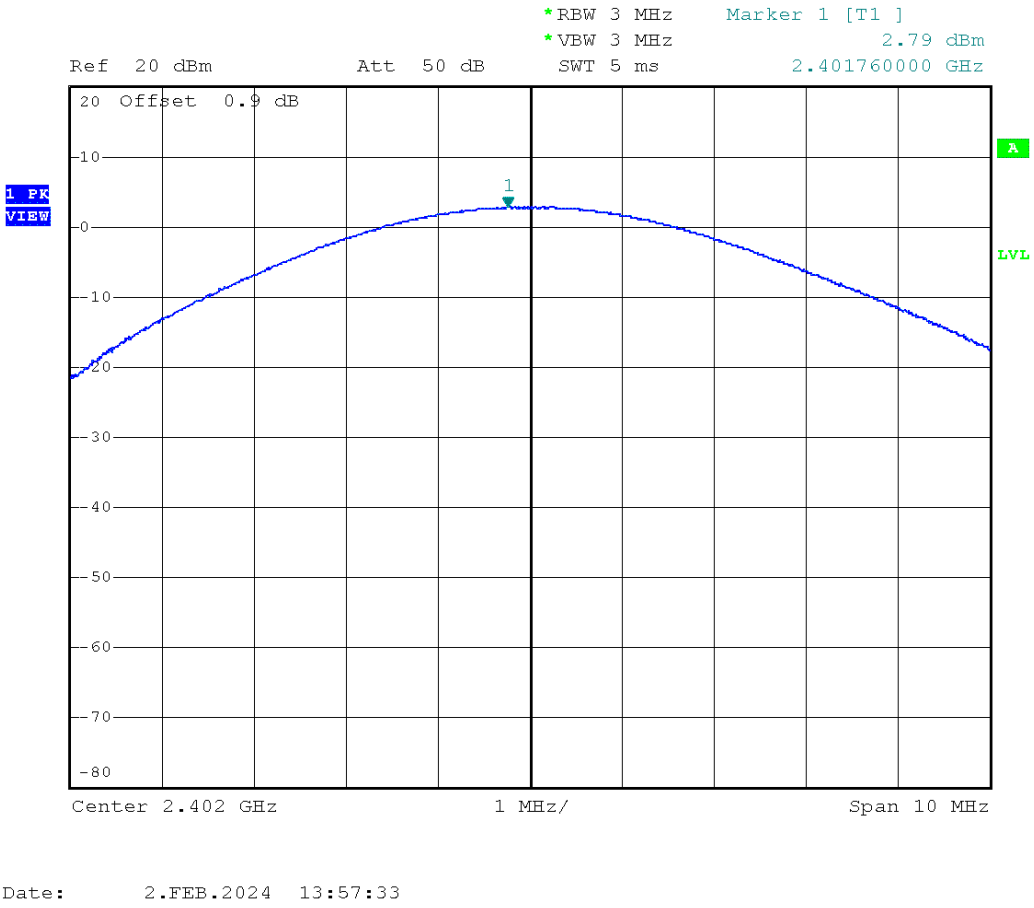
Test Results DH5 - ISED							
Channel [MHz]	Conducted Power [dBm]	Conducted Power [W]	Conducted Limit [W]	EIRP Power [dBm]	EIRP Power [W]	EIRP Limit [W]	Verdict
2402	2.788	0.0019	1.0	7.988	0.0063	4.0	PASS
2441	2.653	0.0018	1.0	7.853	0.0061	4.0	PASS
2480	2.448	0.0018	1.0	7.648	0.0058	4.0	PASS
Comment: worst case: with maximum antenna gain (5.2 dBi)							

Test Results 2-DH5 - ISED							
Channel [MHz]	Conducted Power [dBm]	Conducted Power [W]	Conducted Limit [W]	EIRP Power [dBm]	EIRP Power [W]	EIRP Limit [W]	Verdict
2402	0.998	0.0013	1.0	6.198	0.0042	4.0	PASS
2441	0.451	0.0011	1.0	5.651	0.0037	4.0	PASS
2480	0.456	0.0011	1.0	5.656	0.0037	4.0	PASS
Comment: worst case: with maximum antenna gain (5.2 dBi)							

Test Results 3-DH5 - ISED							
Channel [MHz]	Conducted Power [dBm]	Conducted Power [W]	Conducted Limit [W]	EIRP Power [dBm]	EIRP Power [W]	EIRP Limit [W]	Verdict
2402	1.184	0.0013	1.0	6.384	0.0043	4.0	PASS
2441	0.650	0.0012	1.0	5.85	0.0038	4.0	PASS
2480	0.666	0.0012	1.0	5.866	0.0039	4.0	PASS
Comment: worst case: with maximum antenna gain (5.2 dBi)							

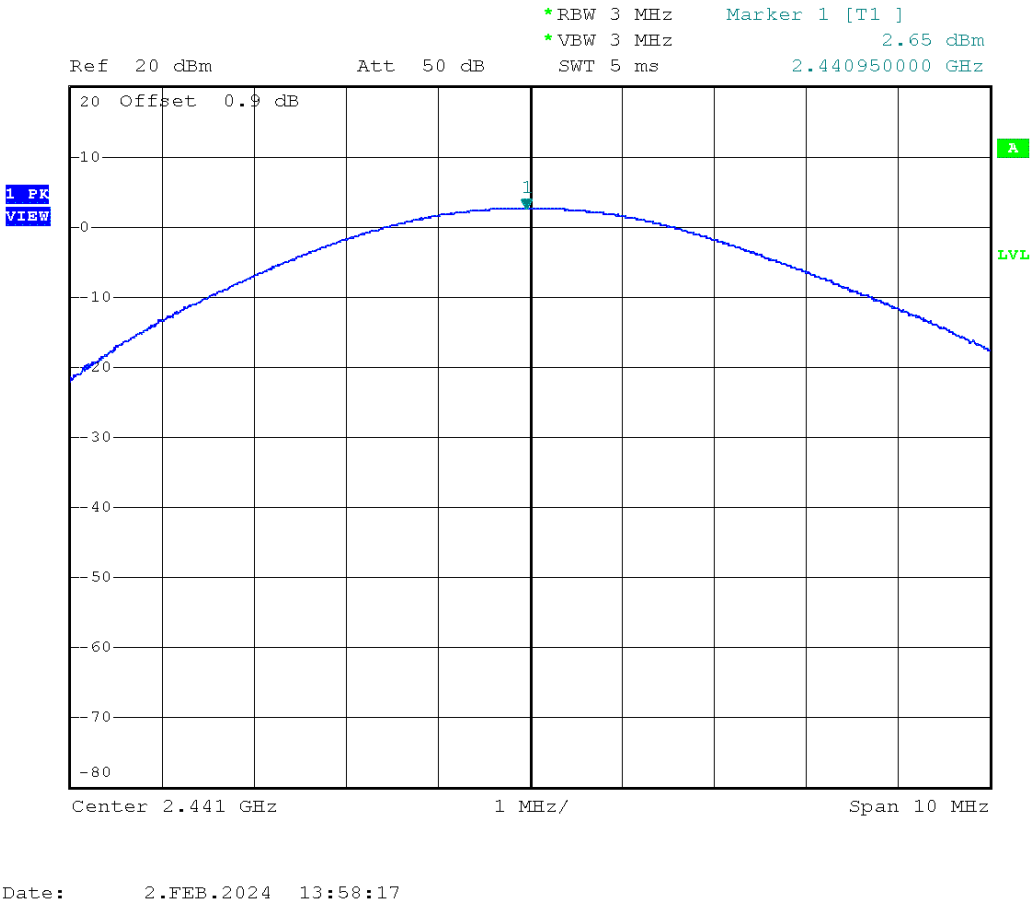
Peak Conducted Output Power

Project Number:	G0M-2309-2215
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.5
Operational Mode:	DH5, Channel: 0, 2402 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-02-02
Peak Power [dBm]:	2.788
Peak Power [W]:	0.0019



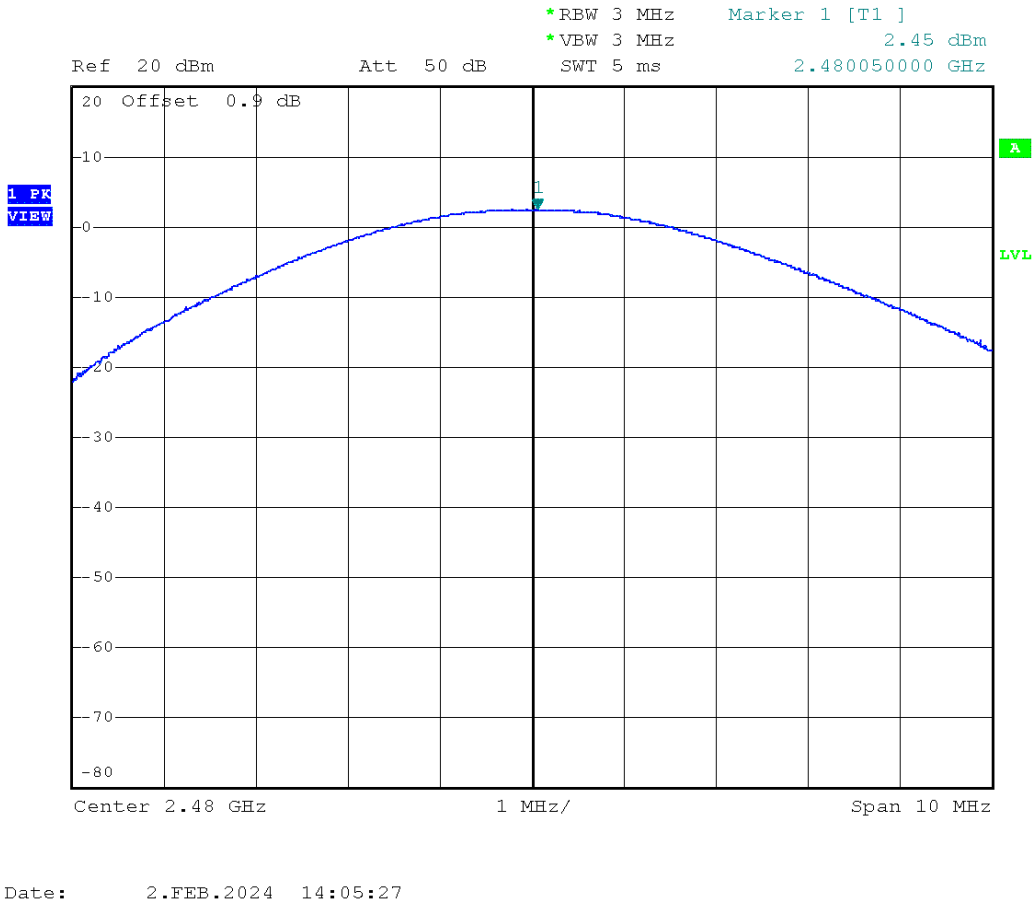
Peak Conducted Output Power

Project Number:	G0M-2309-2215
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.5
Operational Mode:	DH5, Channel: 39, 2441 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-02-02
Peak Power [dBm]:	2.653
Peak Power [W]:	0.0018



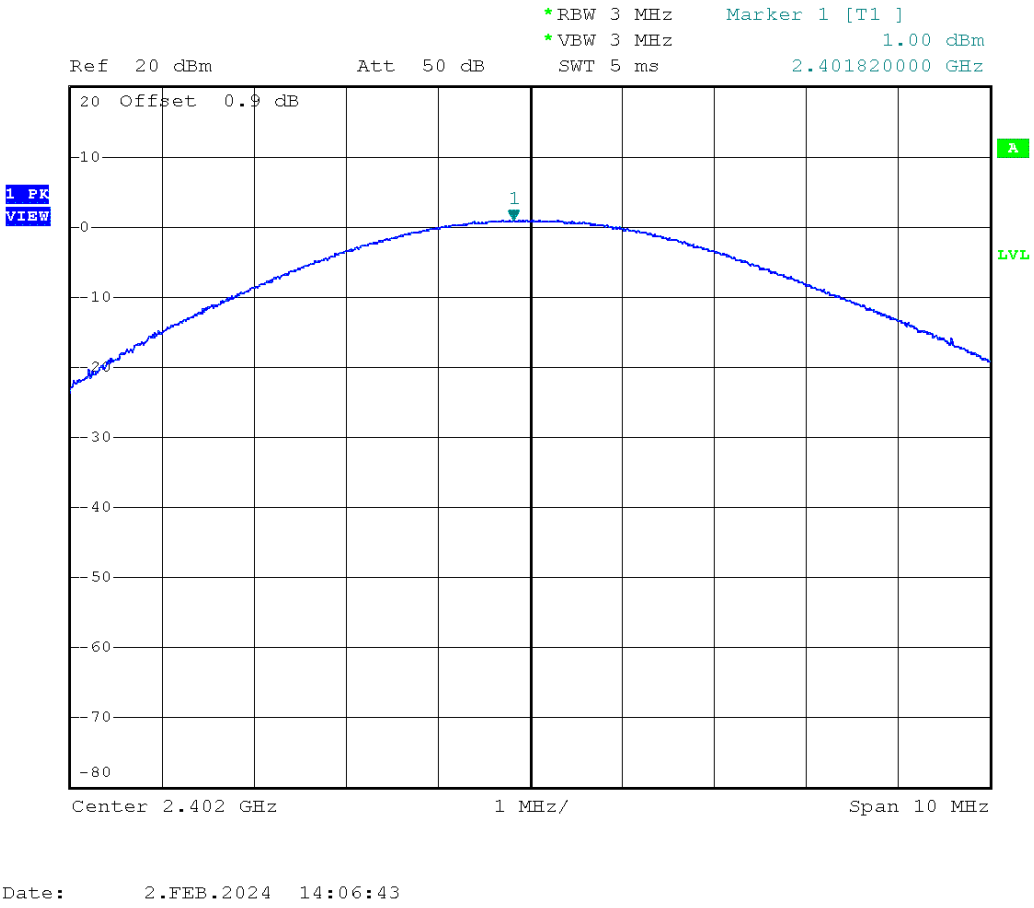
Peak Conducted Output Power

Project Number:	G0M-2309-2215
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.5
Operational Mode:	DH5, Channel: 78, 2480 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-02-02
Peak Power [dBm]:	2.448
Peak Power [W]:	0.0018



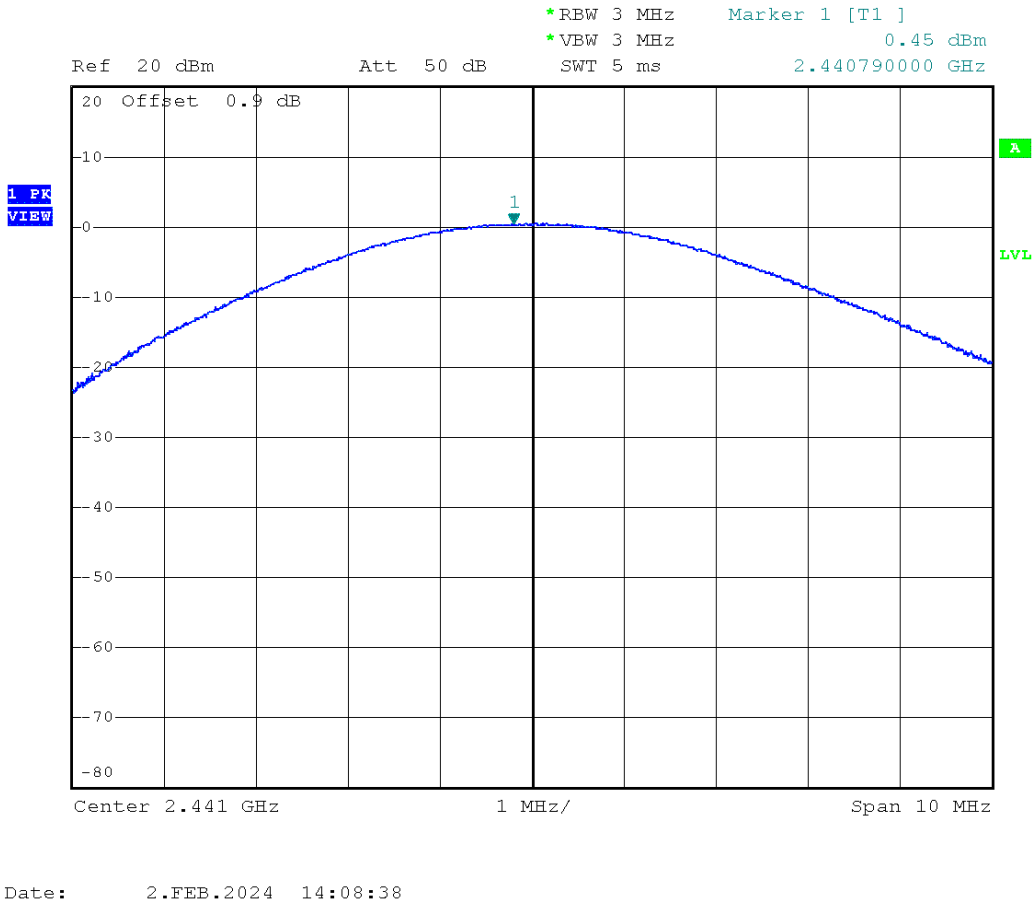
Peak Conducted Output Power

Project Number:	G0M-2309-2215
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.5
Operational Mode:	2-DH5, Channel: 0, 2402 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-02-02
Peak Power [dBm]:	0.998
Peak Power [W]:	0.0013



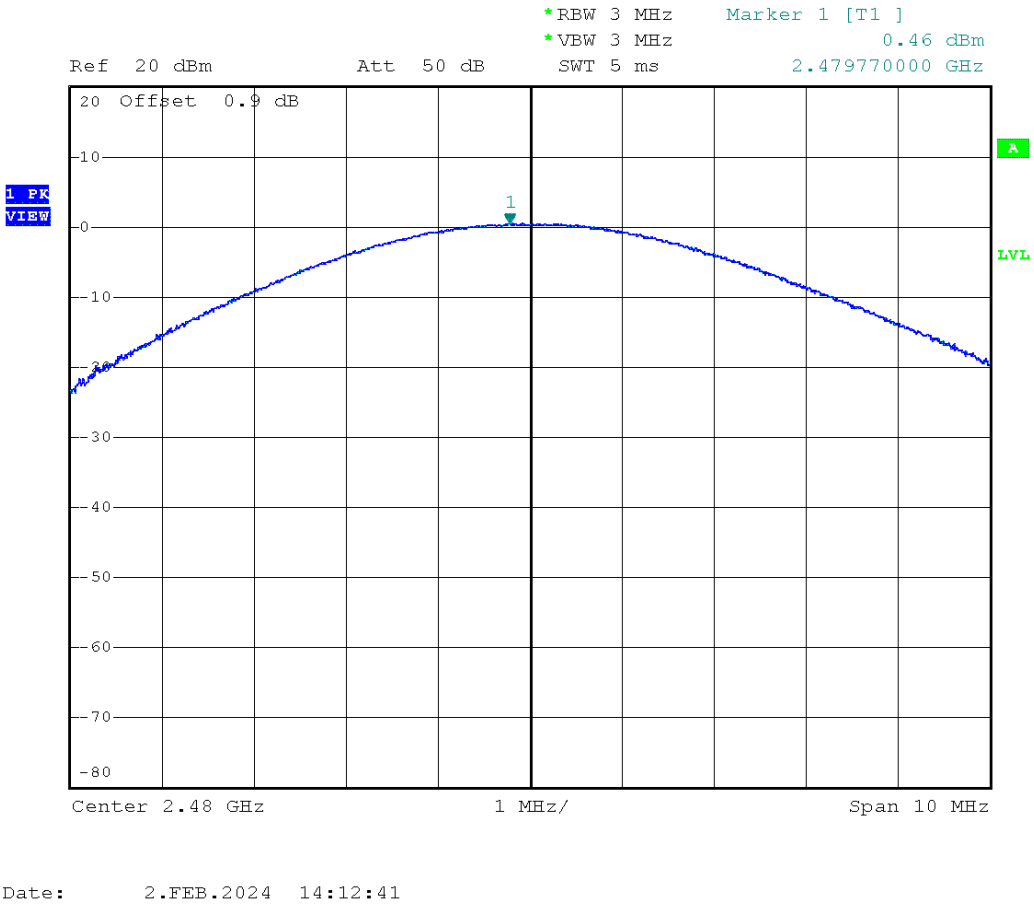
Peak Conducted Output Power

Project Number:	G0M-2309-2215
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.5
Operational Mode:	2-DH5, Channel: 39, 2441 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-02-02
Peak Power [dBm]:	0.451
Peak Power [W]:	0.0011



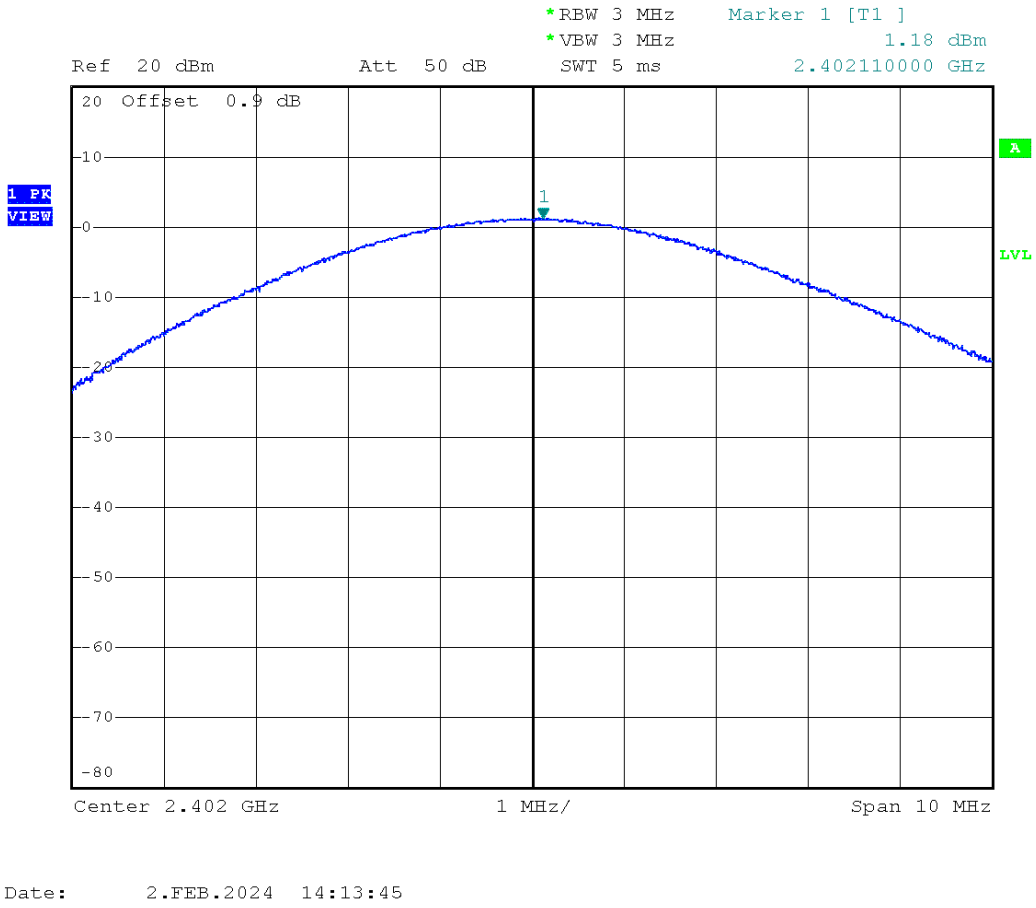
Peak Conducted Output Power

Project Number:	G0M-2309-2215
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.5
Operational Mode:	2-DH5, Channel: 78, 2480 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-02-02
Peak Power [dBm]:	0.456
Peak Power [W]:	0.0011



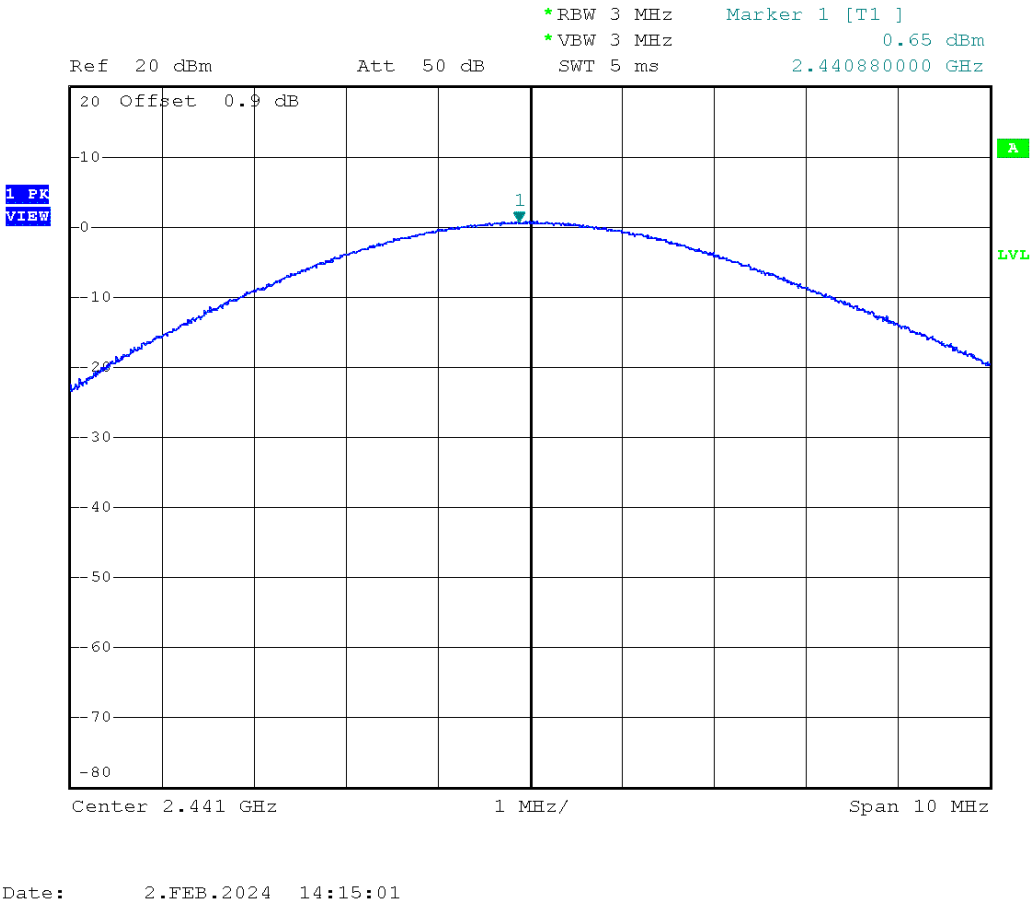
Peak Conducted Output Power

Project Number:	G0M-2309-2215
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.5
Operational Mode:	3-DH5, Channel: 0, 2402 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-02-02
Peak Power [dBm]:	1.184
Peak Power [W]:	0.0013



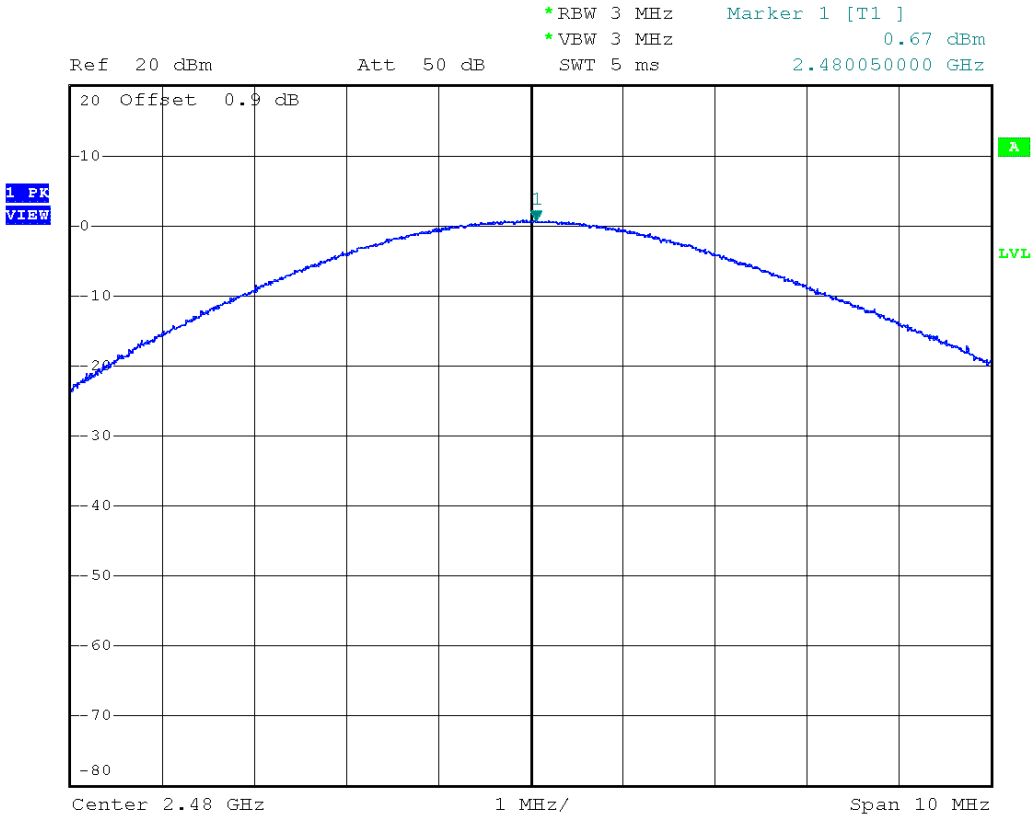
Peak Conducted Output Power

Project Number:	G0M-2309-2215
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.5
Operational Mode:	3-DH5, Channel: 39, 2441 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-02-02
Peak Power [dBm]:	0.650
Peak Power [W]:	0.0012



Peak Conducted Output Power

Project Number:	G0M-2309-2215
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.5
Operational Mode:	3-DH5, Channel: 78, 2480 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-02-02
Peak Power [dBm]:	0.666
Peak Power [W]:	0.0012



3.7 Test Conditions and Results - AC powerline conducted emissions

3.7.1 Information

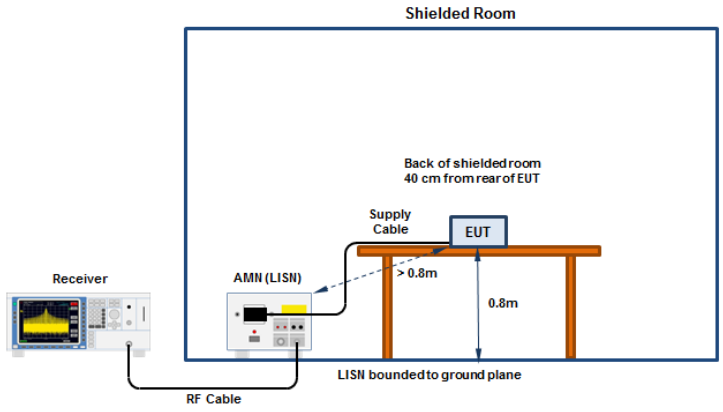
Test Information	
Reference	FCC § 15.207; ISED RSS-247, Issue 3 (section 3.1)
Measurement Method	ANSI C63.10 6.2
Measurement Uncertainty	± 3.82 dB
Operator	Md Abu Bakar Siddique
Date	2024-02-02

3.7.2 Limits

Limits		
Frequency [MHz]	Quasi-Peak [dBµV]	Average [dBµV]
0.15 - 0.5	66 - 56*	56 - 46*
0.5 - 5	56	46
5 - 30	60	50
* Limit decreases linearly with the logarithm of the frequency		

3.7.3 Setup

Test Setup



3.7.4 Equipment

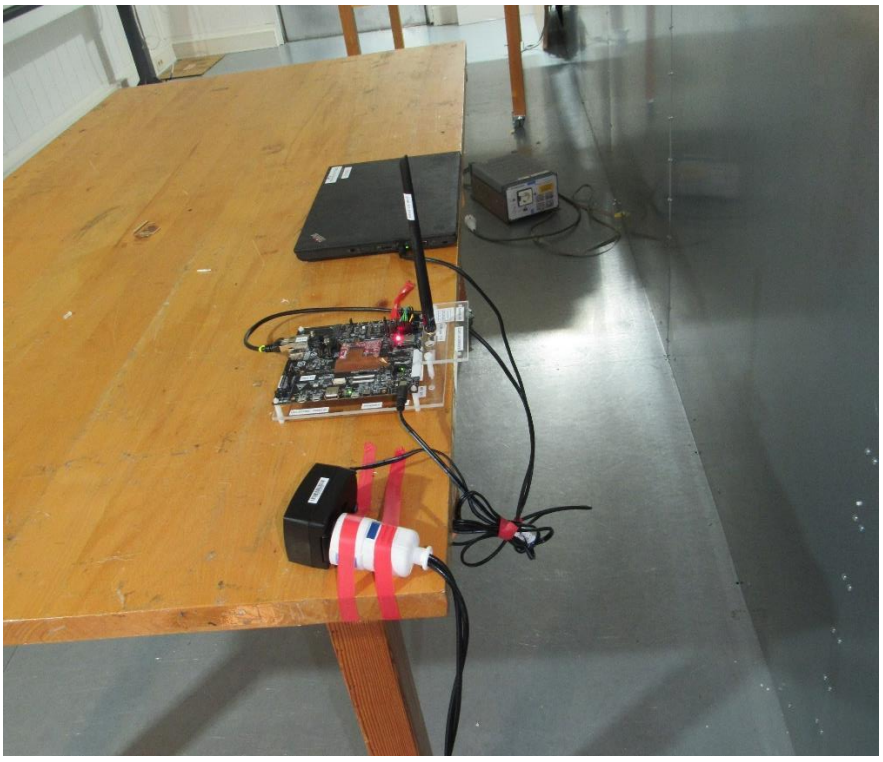
Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	RadiMation	2020.1.8

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMI Test Receiver	R&S	ESCS 30	EF00297	2023-08	2024-08
Pulse Limiter	R&S	ESH3-Z2	EF01222	2023-08	2025-08
LISN	Schwarzbeck	NSLK 8127 RC	EF01592	2023-06	2024-06
AC & DC Power Supply	Chroma ATE Inc.	61604	EF01380	2023-08	2025-08

3.7.5 Setup Photos

Setup for measurements 150 KHz - 30 MHz

EUT Setup



Conducted emissions at the mains power port
according to 47 CFR Part 15.247

Project Number:	G0M-2309-2215
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Siddique
Test Date:	2024-01-30
Operating Conditions:	ambient temperature: 25 °Celsius power input: 12 V DC via AC/DC-Adapter (120 V AC / 60 Hz)
LISN:	Schwarzbeck NSLK 8127 RC L1
Operational Mode:	Tx: BT, GFSK, DH5, L
Applied to Port:	Port of the AC/DC-Adapter

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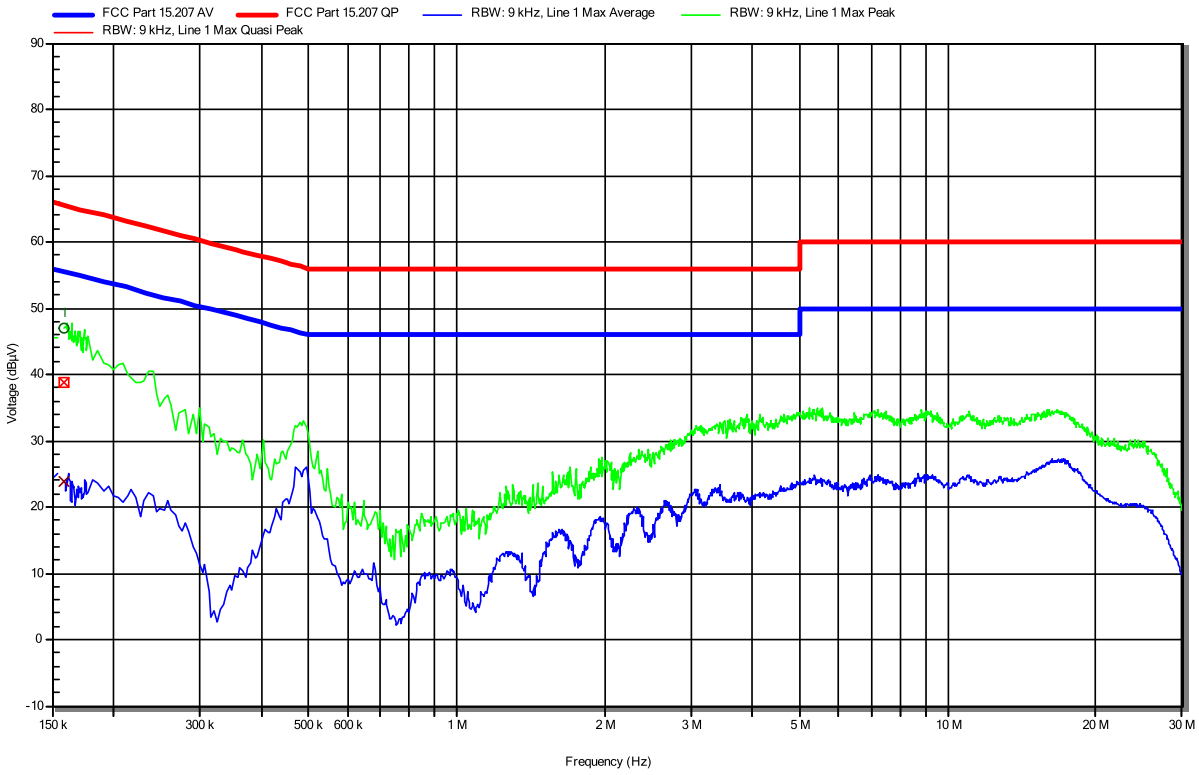
RadiMation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	159 kHz	38.75 dBµV	65.52 dBµV	-26.77 dB	Pass	Line 1

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	159 kHz	23.97 dBµV	55.52 dBµV	-31.55 dB	Pass	Line 1

Conducted emissions at the mains power port
according to 47 CFR Part 15.247

Project Number:	G0M-2309-2215
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Siddique
Test Date:	2024-01-30
Operating Conditions:	ambient temperature: 25 °Celsius power input: 12 V DC via AC/DC-Adapter (120 V AC / 60 Hz)
LISN:	Schwarzbeck NSLK 8127
Operational Mode:	Tx: BT, GFSK, DH5, N
Applied to Port:	Port of the AC/DC-Adapter

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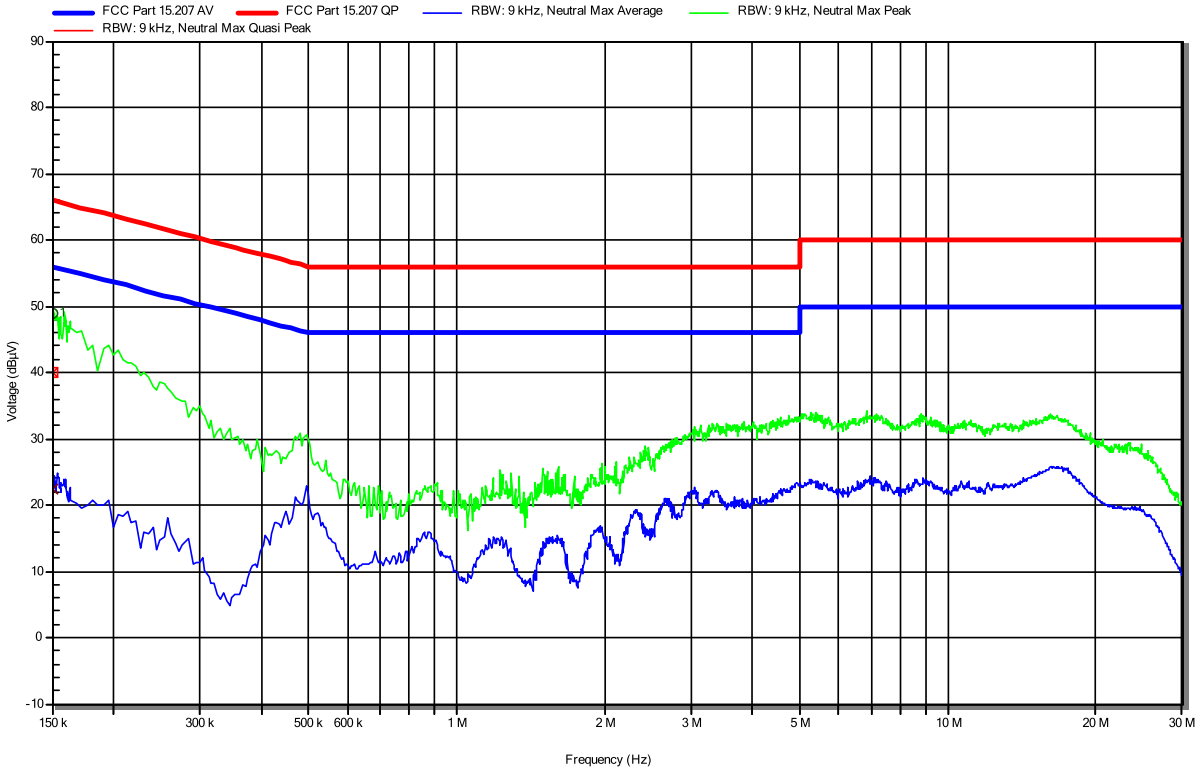
RadiMation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	150 kHz	39.96 dBµV	66 dBµV	-26.04 dB	Pass	Neutral

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	150 kHz	22.33 dBµV	56 dBµV	-33.67 dB	Pass	Neutral

Conducted emissions at the mains power port
according to 47 CFR Part 15.247

Project Number:	G0M-2309-2215
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Siddique
Test Date:	2024-01-30
Operating Conditions:	ambient temperature: 25 °Celsius power input: 12 V DC via AC/DC-Adapter (120 V AC / 60 Hz)
LISN:	Schwarzbeck NSLK 8127 RC L1
Operational Mode:	Rx: BT, Scan mode, L
Applied to Port:	Port of the AC/DC-Adapter

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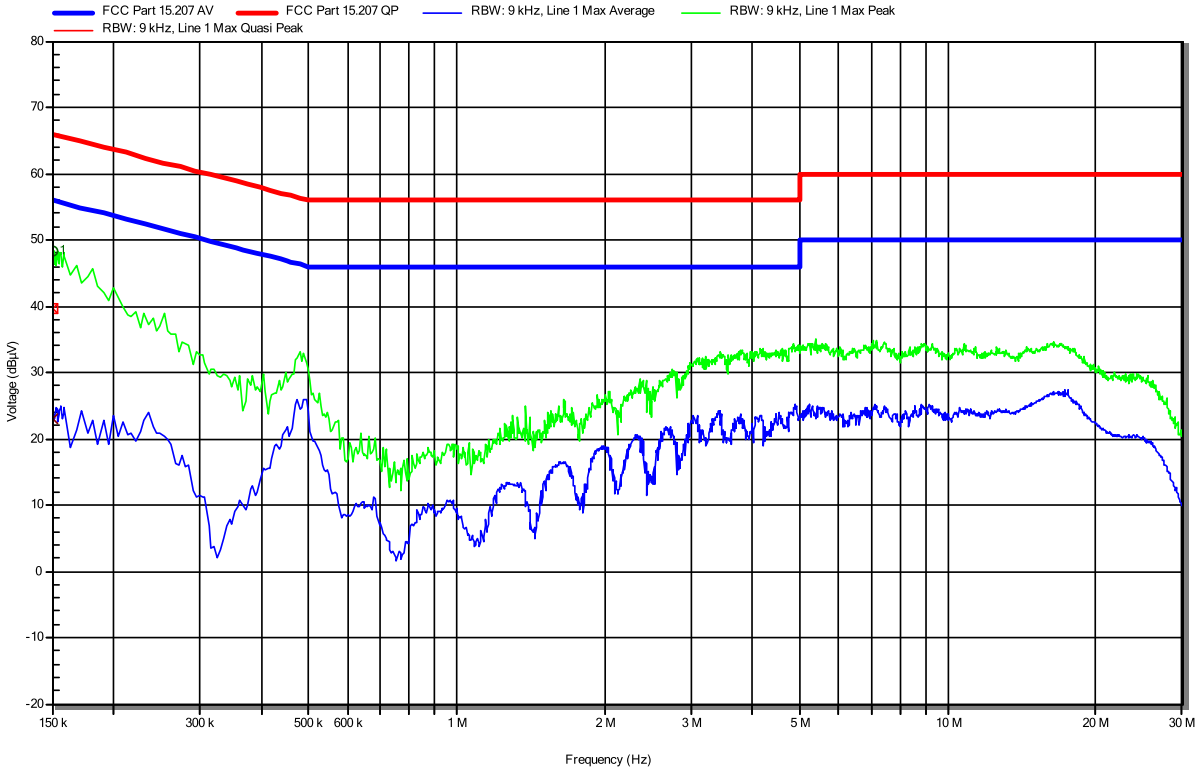
RadiMation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	150 kHz	39.59 dBµV	66 dBµV	-26.41 dB	Pass	Line 1

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	150 kHz	22.91 dBµV	56 dBµV	-33.09 dB	Pass	Line 1

Conducted emissions at the mains power port
according to 47 CFR Part 15.247

Project Number:	G0M-2309-2215
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Siddique
Test Date:	2024-01-30
Operating Conditions:	ambient temperature: 25 °Celsius power input: 12 V DC via AC/DC-Adapter (120 V AC / 60 Hz)
LISN:	Schwarzbeck NSLK 8127
Operational Mode:	Rx: BT, Scan mode, N
Applied to Port:	Port of the AC/DC-Adapter

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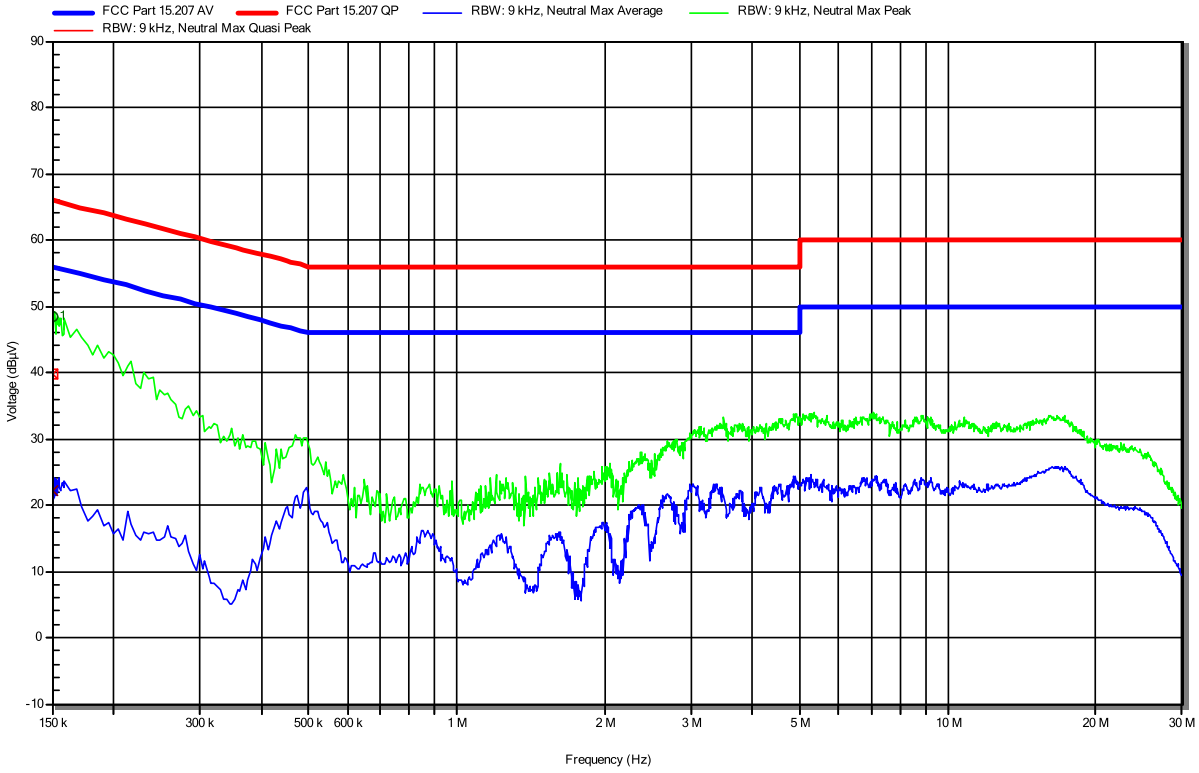
RadiMation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	150 kHz	39.68 dBµV	66 dBµV	-26.32 dB	Pass	Neutral

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	150 kHz	22.16 dBµV	56 dBµV	-33.84 dB	Pass	Neutral

3.8 Test Conditions and Results - Band-edge compliance

3.8.1 Information

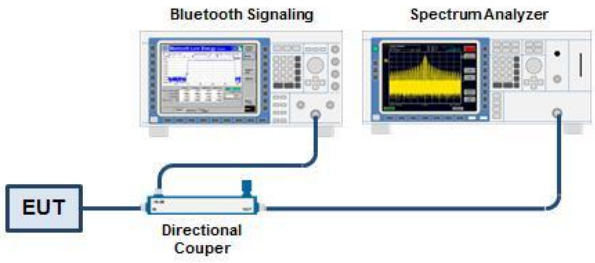
Test Information	
Reference	FCC § 15.247(d); ISED RSS-247, Issue 3 (section 5.5)
Measurement Uncertainty	± 3.64 dB
Measurement Method	ANSI C63.10 6.10
Operator	Md Abu Bakar Siddique
Date	2024-02-02

3.8.2 Limits

Limits	
Power Measurement	Out-of-band attenuation [dB]
Peak	20
RMS	30

3.8.3 Setup

Test Setup



3.8.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSP 30	EF00312	2023-08	2024-08
Cable(CAABC)	Gigalane	GIGALANE 1730	EF00779	2023-03	2024-03

3.8.5 Procedure

Test Procedure

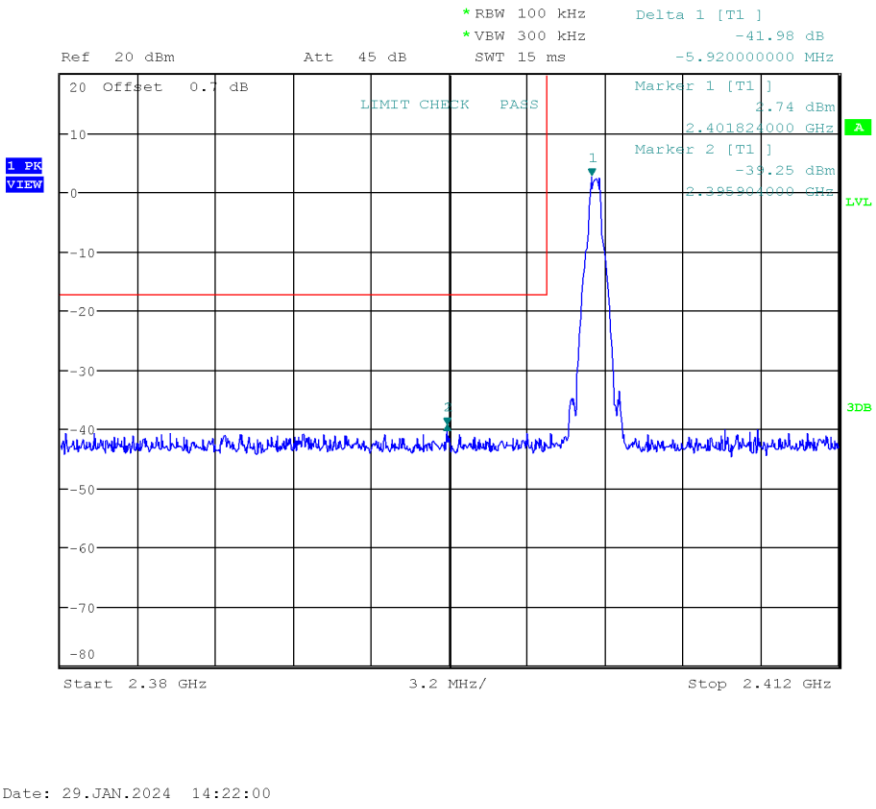
1. EUT set to test mode (Communication tester is used if needed)
2. Span set around lower band edge and detector is set to peak and max hold
3. Resolution bandwidth is set to 100 kHz
4. Markers are set to peak emission levels within frequency band and outside frequency band
5. Band edge attenuation is determined from level difference

3.8.6 Results

Test Results				
Mode	Channel [MHz]	Out-of-band Attenuation [dB]	Limit [dB]	Verdict
DH5 single	2402	-41.98	-20	PASS
DH5 single	2480	-41.63	-20	PASS
DH5 hopping	2402	-42.13	-20	PASS
DH5 hopping	2480	-42.14	-20	PASS
2-DH5 single	2402	-35.19	-20	PASS
2-DH5 single	2480	-35.69	-20	PASS
2-DH5 hopping	2402	-35.28	-20	PASS
2-DH5 hopping	2480	-34.07	-20	PASS
3-DH5 single	2402	-35.66	-20	PASS
3-DH5 single	2480	-35.4	-20	PASS
3-DH5 hopping	2402	-35.81	-20	PASS
3-DH5 hopping	2480	-35.52	-20	PASS

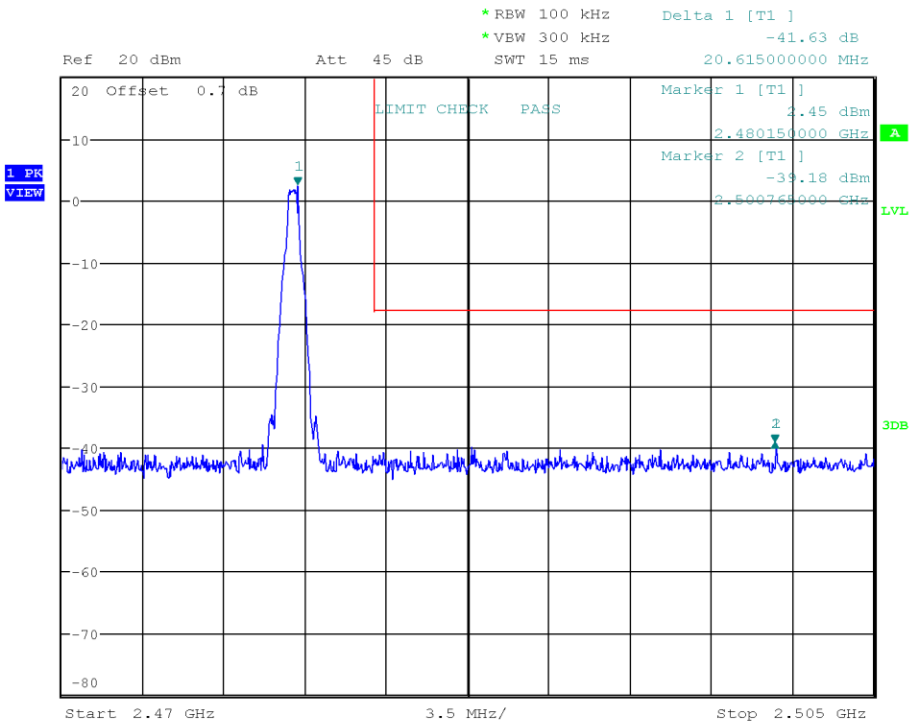
Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-2309-2215
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.6, 6.10.4
Operational Mode:	DH5, Channel: 0, 2402 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-01-29
Band-edge	Lower
In-band Frequency [MHz]:	2401.824
Max. in-band Level [dBm/100 kHz]:	2.736
Out-of-band Frequency [MHz]:	2395.904
Max. out-of-band Level [dBm/100 kHz]:	-39.246
Attenuation [dB]:	-41.98



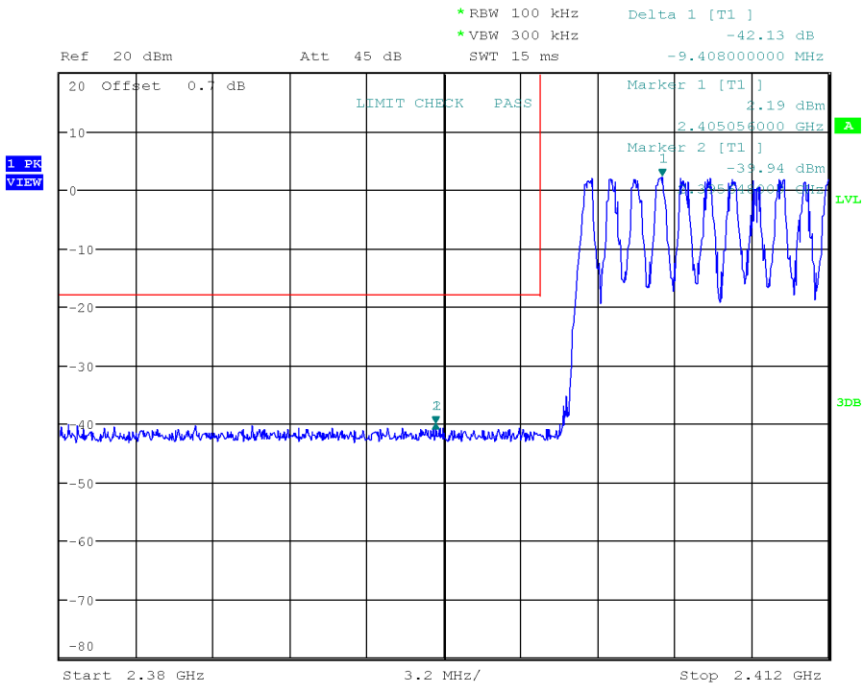
Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-2309-2215
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.6, 6.10.4
Operational Mode:	DH5, Channel: 78, 2480 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-01-29
Band-edge	Upper
In-band Frequency [MHz]:	2480.15
Max. in-band Level [dBm/100 kHz]:	2.453
Out-of-band Frequency [MHz]:	2500.765
Max. out-of-band Level [dBm/100 kHz]:	-39.179
Attenuation [dB]:	-41.63



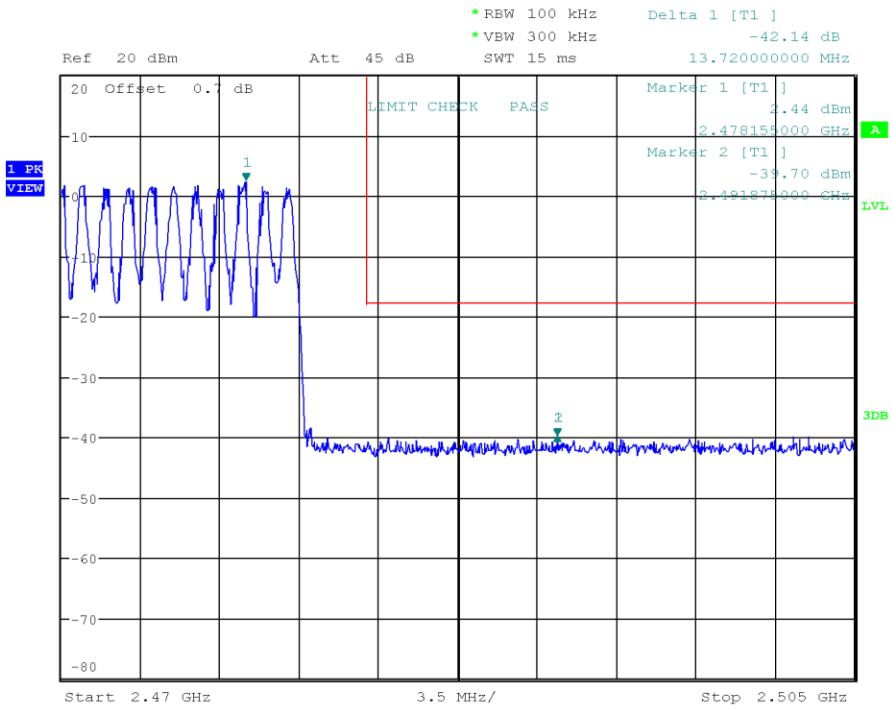
Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-2309-2215
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.6, 6.10.4
Operational Mode:	DH5, Hopping
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-01-29
Band-edge	Lower
In-band Frequency [MHz]:	2405.056
Max. in-band Level [dBm/100 kHz]:	2.187
Out-of-band Frequency [MHz]:	2395.648
Max. out-of-band Level [dBm/100 kHz]:	-39.942
Attenuation [dB]:	-42.13



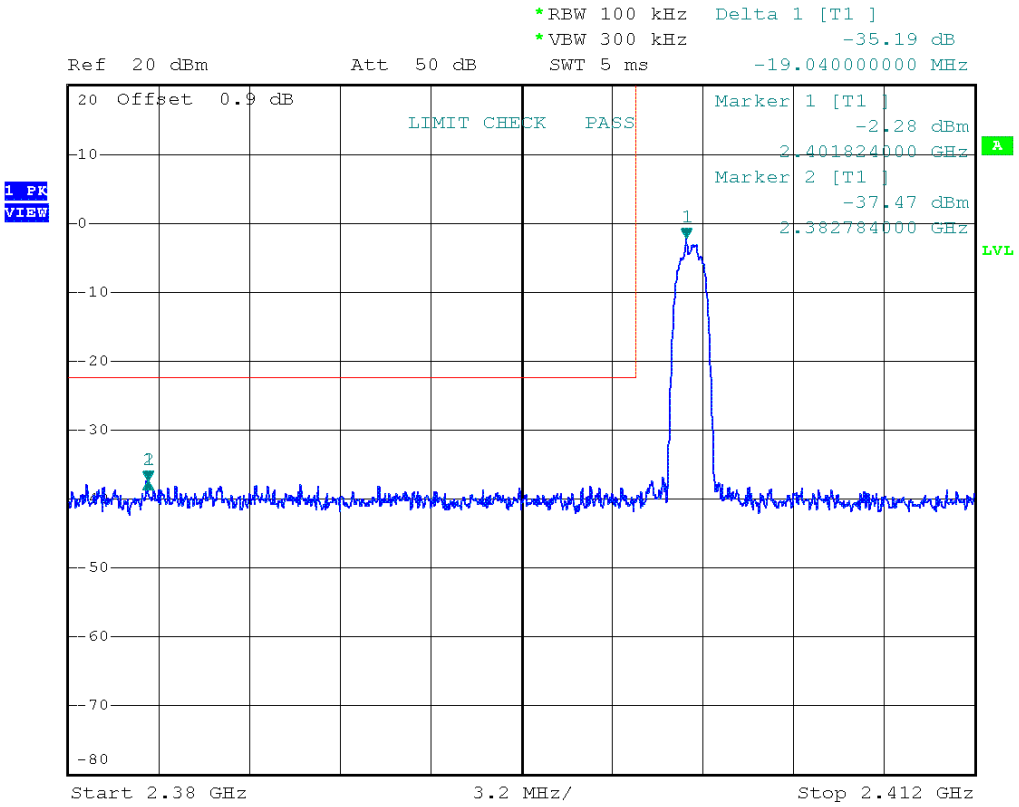
Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-2309-2215
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.6, 6.10.4
Operational Mode:	DH5, Hopping
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-01-29
Band-edge	Upper
In-band Frequency [MHz]:	2478.155
Max. in-band Level [dBm/100 kHz]:	2.438
Out-of-band Frequency [MHz]:	2491.875
Max. out-of-band Level [dBm/100 kHz]:	-39.7
Attenuation [dB]:	-42.14



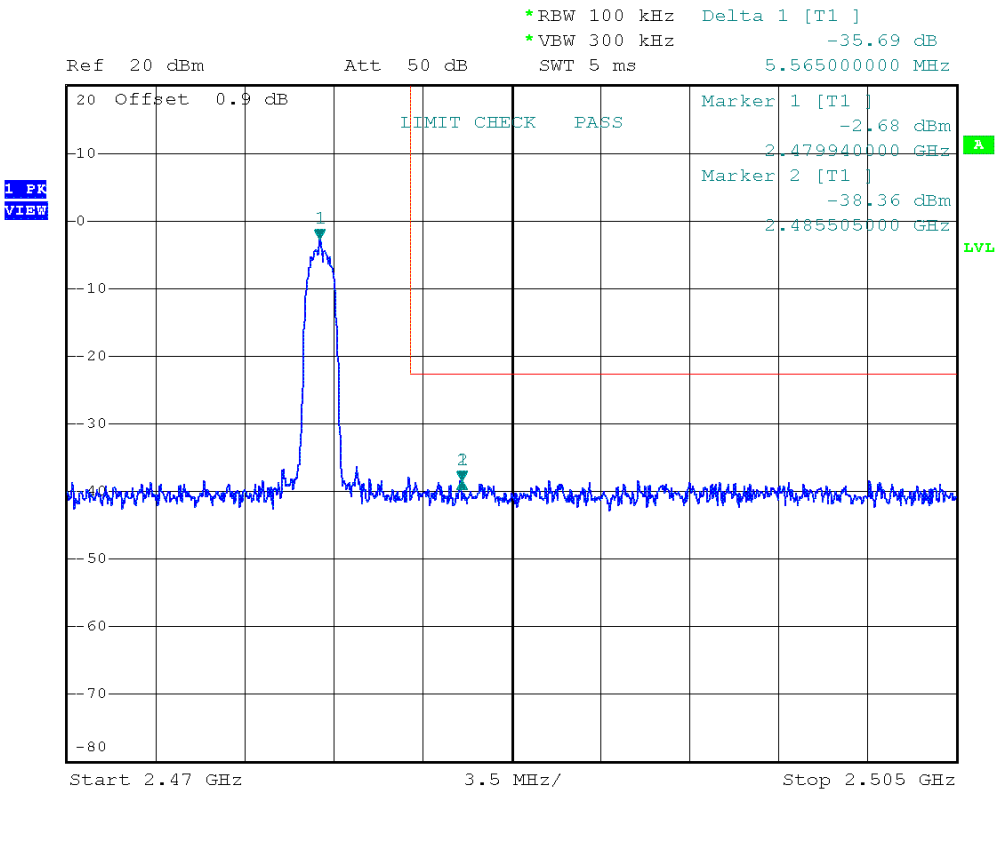
Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-2309-2215
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.6, 6.10.4
Operational Mode:	2-DH5, Channel: 0, 2402 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-02-02
Band-edge	Lower
In-band Frequency [MHz]:	2401.824
Max. in-band Level [dBm/100 kHz]:	-2.283
Out-of-band Frequency [MHz]:	2382.784
Max. out-of-band Level [dBm/100 kHz]:	-37.47
Attenuation [dB]:	-35.19



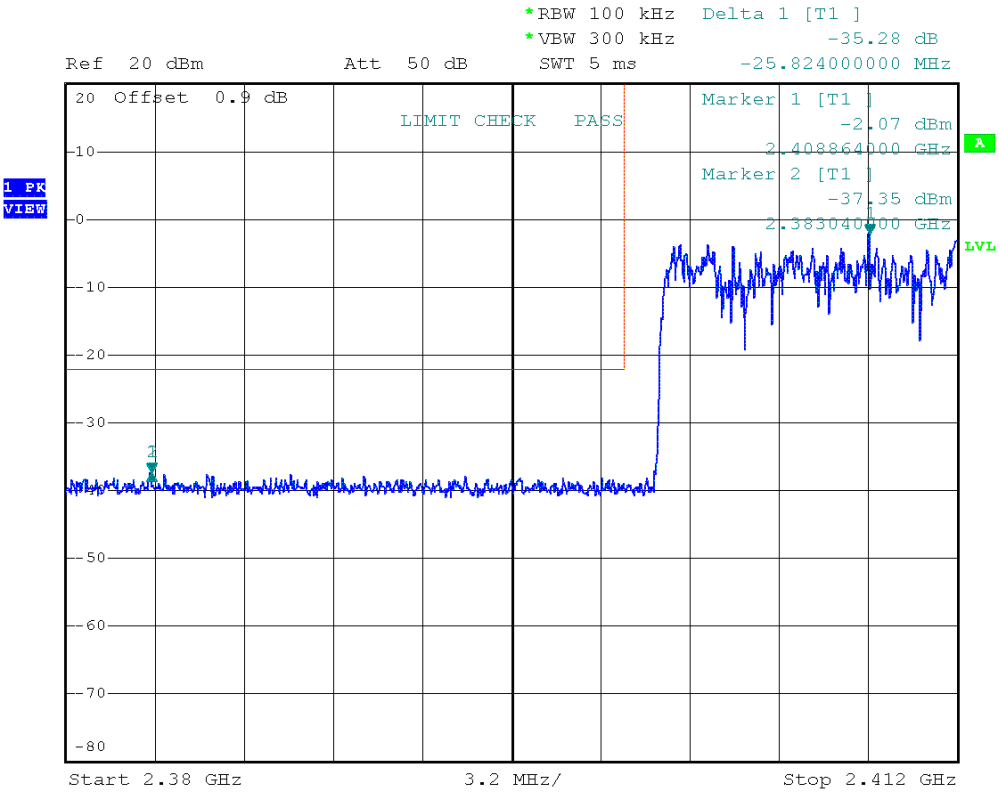
Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-2309-2215
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.6, 6.10.4
Operational Mode:	2-DH5, Channel: 78, 2480 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-02-02
Band-edge	Upper
In-band Frequency [MHz]:	2479.94
Max. in-band Level [dBm/100 kHz]:	-2.676
Out-of-band Frequency [MHz]:	2485.505
Max. out-of-band Level [dBm/100 kHz]:	-38.364
Attenuation [dB]:	-35.69



Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-2309-2215
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.6, 6.10.4
Operational Mode:	2-DH5, Hopping
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-02-02
Band-edge	Lower
In-band Frequency [MHz]:	2408.864
Max. in-band Level [dBm/100 kHz]:	-2.069
Out-of-band Frequency [MHz]:	2383.04
Max. out-of-band Level [dBm/100 kHz]:	-37.35
Attenuation [dB]:	-35.28



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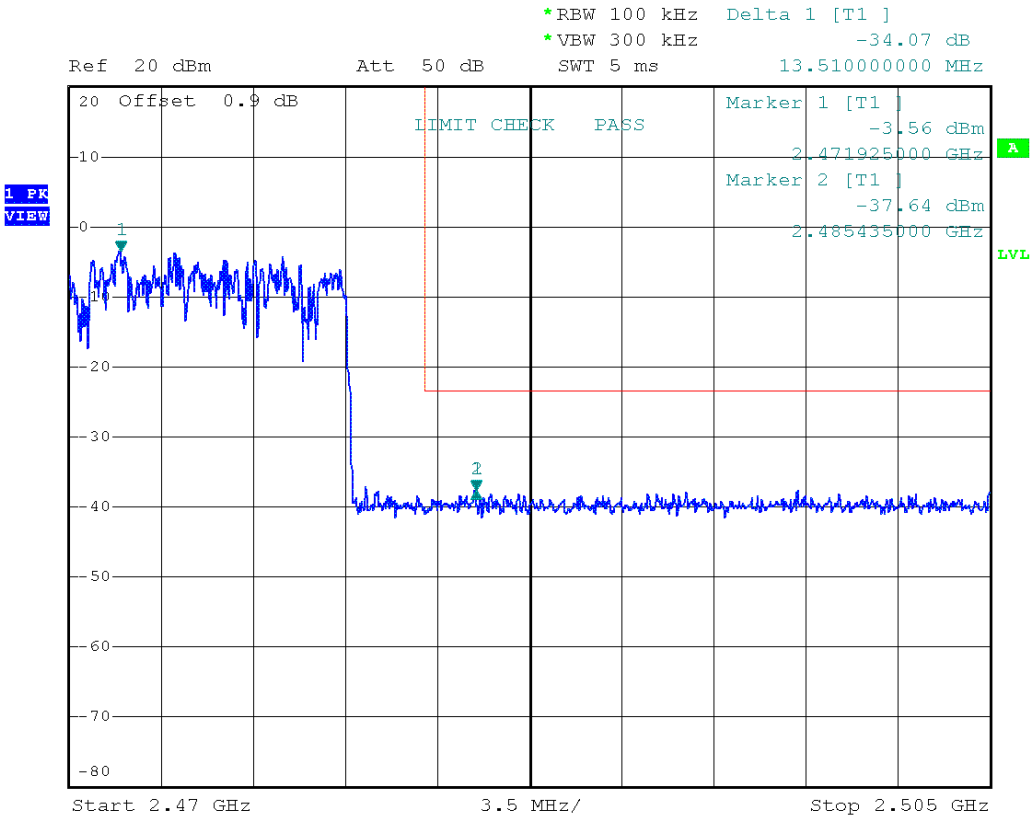
Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-2309-2215
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.6, 6.10.4
Operational Mode:	2-DH5, Hopping
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-02-02
Band-edge	Upper
In-band Frequency [MHz]:	2471.925
Max. in-band Level [dBm/100 kHz]:	-3.563
Out-of-band Frequency [MHz]:	2485.435
Max. out-of-band Level [dBm/100 kHz]:	-37.637
Attenuation [dB]:	-34.07



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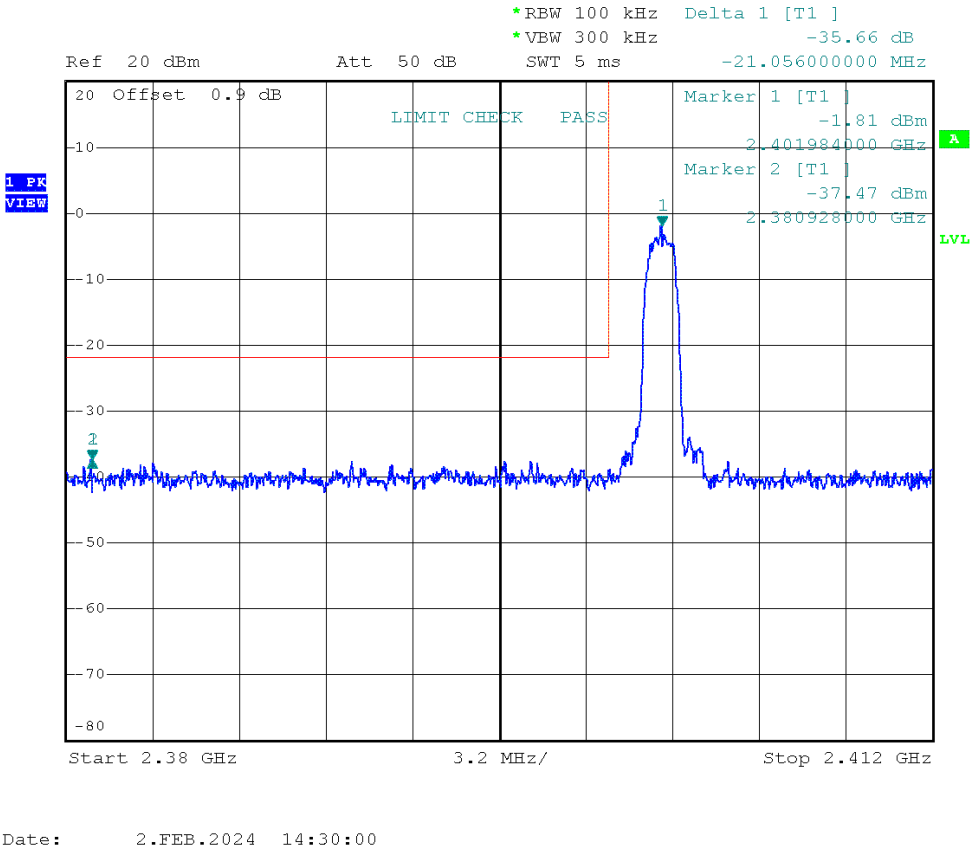
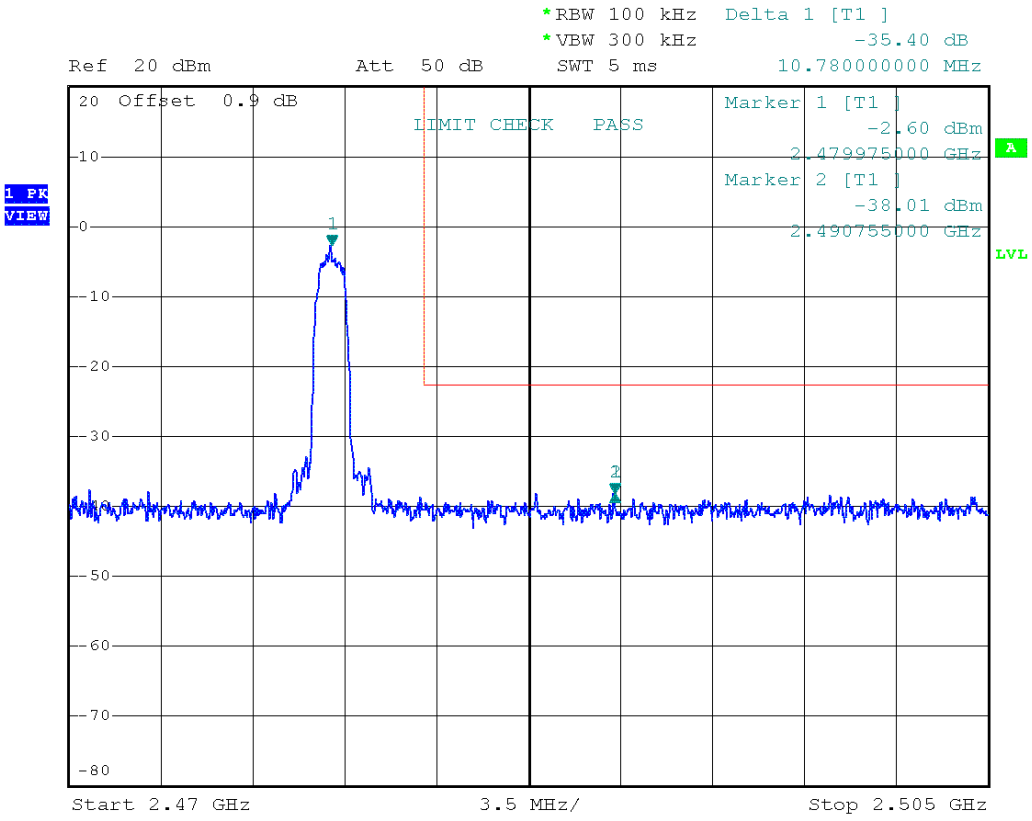
Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-2309-2215
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.6, 6.10.4
Operational Mode:	3-DH5, Channel: 0, 2402 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-02-02
Band-edge	Lower
In-band Frequency [MHz]:	2401.984
Max. in-band Level [dBm/100 kHz]:	-1.809
Out-of-band Frequency [MHz]:	2380.928
Max. out-of-band Level [dBm/100 kHz]:	-37.466
Attenuation [dB]:	-35.66



Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-2309-2215
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.6, 6.10.4
Operational Mode:	3-DH5, Channel: 78, 2480 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-02-02
Band-edge	Upper
In-band Frequency [MHz]:	2479.975
Max. in-band Level [dBm/100 kHz]:	-2.604
Out-of-band Frequency [MHz]:	2490.755
Max. out-of-band Level [dBm/100 kHz]:	-38.007
Attenuation [dB]:	-35.4



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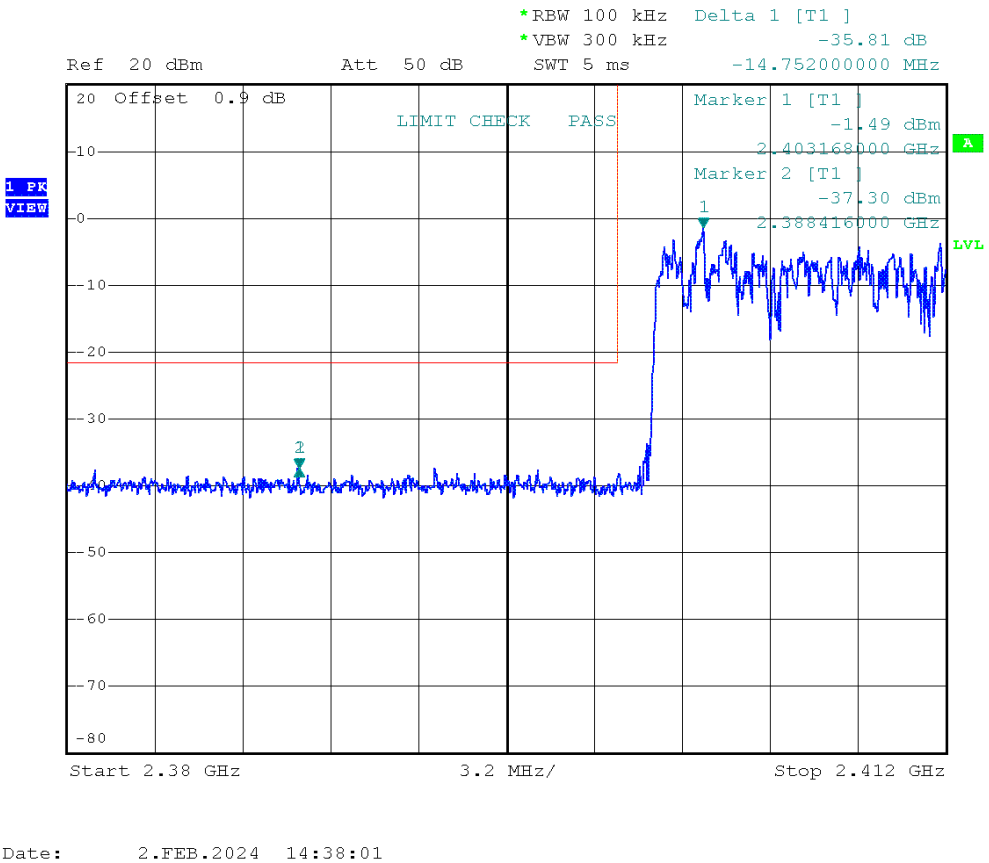
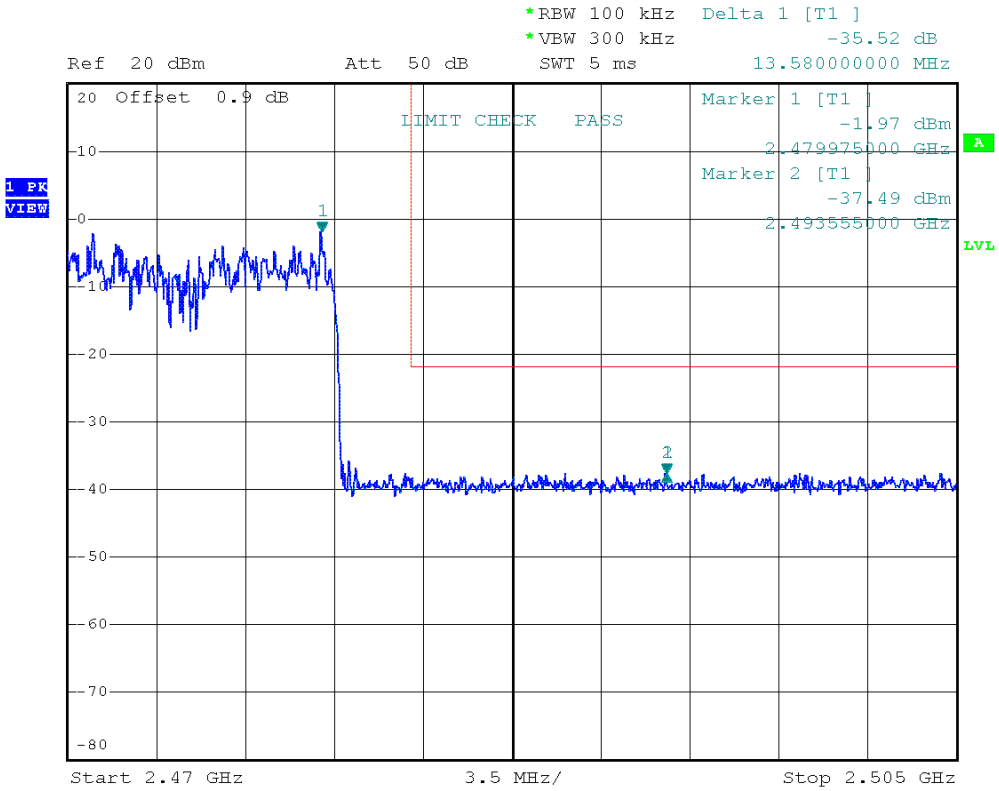
Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-2309-2215
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.6, 6.10.4
Operational Mode:	3-DH5, Hopping
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-02-02
Band-edge	Lower
In-band Frequency [MHz]:	2403.168
Max. in-band Level [dBm/100 kHz]:	-1.487
Out-of-band Frequency [MHz]:	2388.416
Max. out-of-band Level [dBm/100 kHz]:	-37.298
Attenuation [dB]:	-35.81



Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-2309-2215
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.6, 6.10.4
Operational Mode:	3-DH5, Hopping
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-02-02
Band-edge	Upper
In-band Frequency [MHz]:	2479.975
Max. in-band Level [dBm/100 kHz]:	-1.973
Out-of-band Frequency [MHz]:	2493.555
Max. out-of-band Level [dBm/100 kHz]:	-37.495
Attenuation [dB]:	-35.52



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3.9 Test Conditions and Results - Conducted spurious emissions

3.9.1 Information

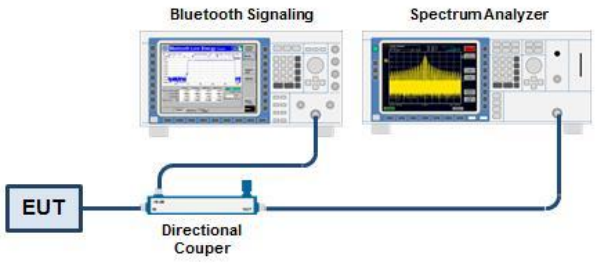
Test Information	
Reference	FCC § 15.247(d); ISED RSS-247, Issue 3 (section 5.5)
Measurement Uncertainty	± 4.25 dB
Measurement Method	ANSI C63.10 6.10
Operator	Md Abu Bakar Siddique
Date	2024-02-02

3.9.2 Limits

Limits	
Power Measurement	Out-of-band attenuation [dB]
Peak	20
RMS	30

3.9.3 Setup

Test Setup



3.9.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSP 30	EF00312	2023-08	2024-08
Cable(CAABC)	Gigalane	GIGALANE 1730	EF00779	2023-03	2024-03

3.9.5 Procedure

Test Procedure

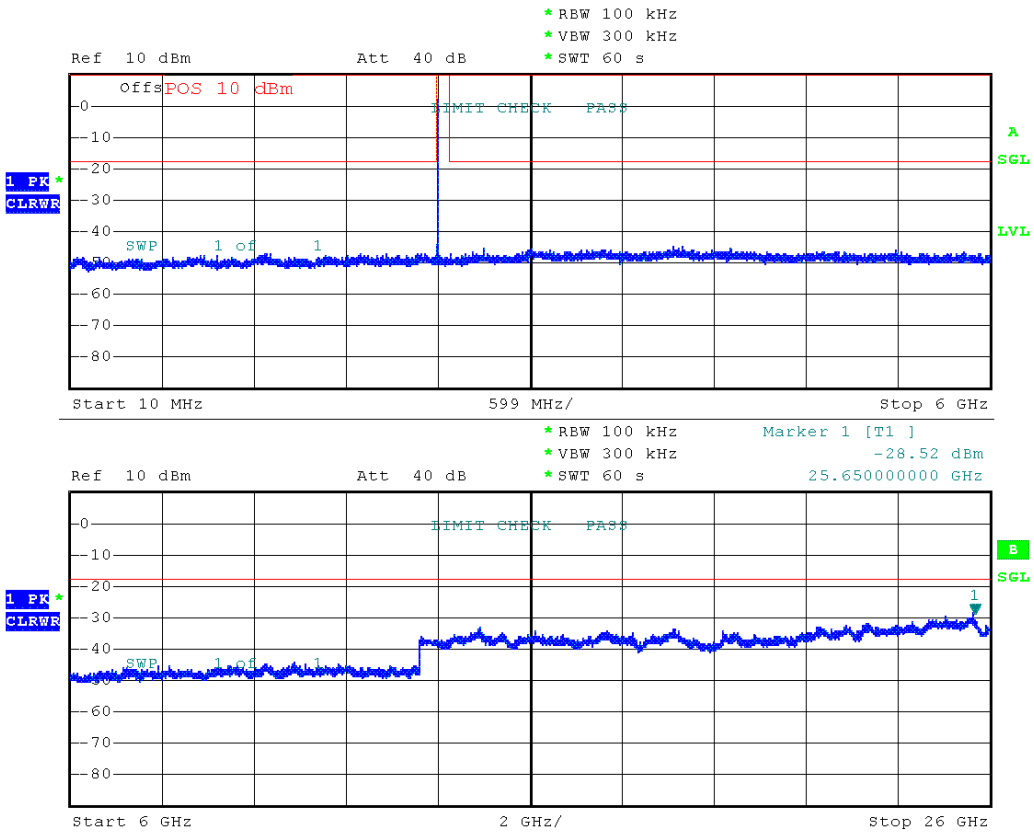
1. EUT set to test mode (Communication tester is used if needed)
2. Span set around lower band edge and detector is set to peak and max hold
3. Resolution bandwidth is set to 100 kHz
4. Markers are set to peak emission levels outside frequency band

3.9.6 Results

Test Results		
Mode	Channel [MHz]	Verdict
DH5	2402	PASS
DH5	2441	PASS
DH5	2480	PASS
2-DH5	2402	PASS
2-DH5	2441	PASS
2-DH5	2480	PASS
3-DH5	2402	PASS
3-DH5	2441	PASS
3-DH5	2480	PASS

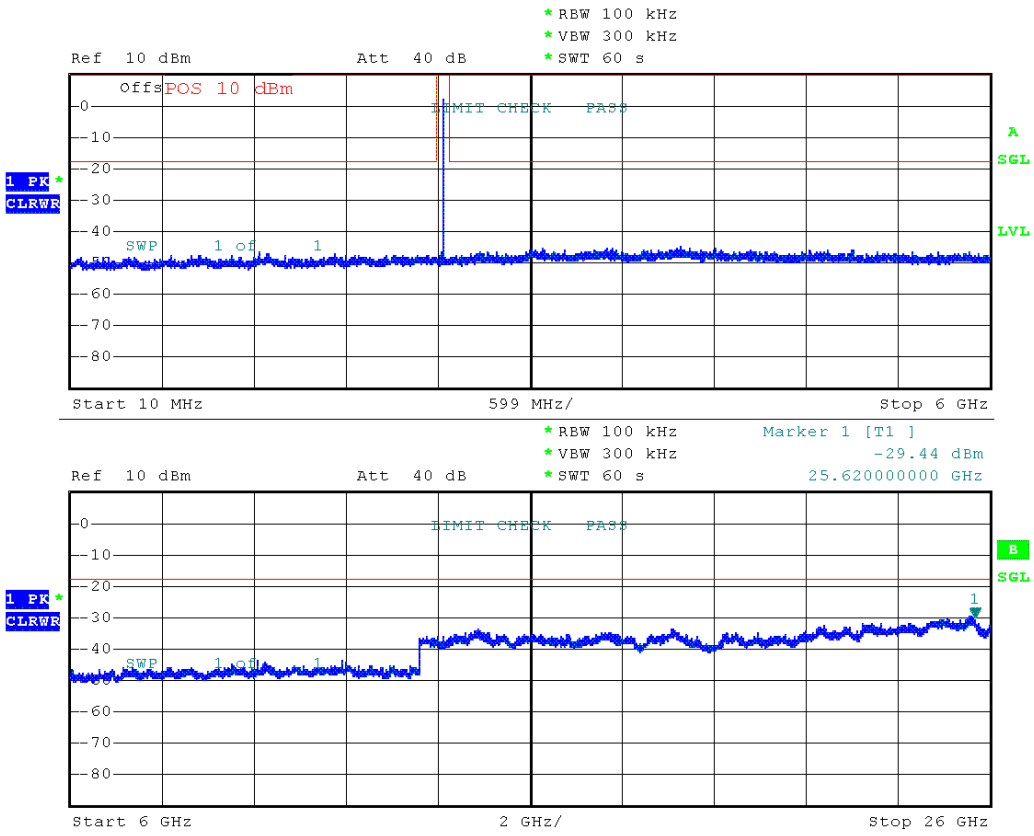
Conducted Spurious Emissions

Project Number:	G0M-2309-2215
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.8
Operational Mode:	DH5, Channel: 0, 2402 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-02-02
Max. in-band Frequency [MHz]:	2402.2
Max. in-band Level [dBm/100 kHz]:	2.4
Out-of-band Limit [dBm/100 kHz]:	-17.6



Conducted Spurious Emissions

Project Number:	G0M-2309-2215
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.8
Operational Mode:	DH5, Channel: 39, 2440 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-02-02
Max. in-band Frequency [MHz]:	2440.8
Max. in-band Level [dBm/100 kHz]:	2.3
Out-of-band Limit [dBm/100 kHz]:	-17.7



Conducted Spurious Emissions

Project Number:	G0M-2309-2215
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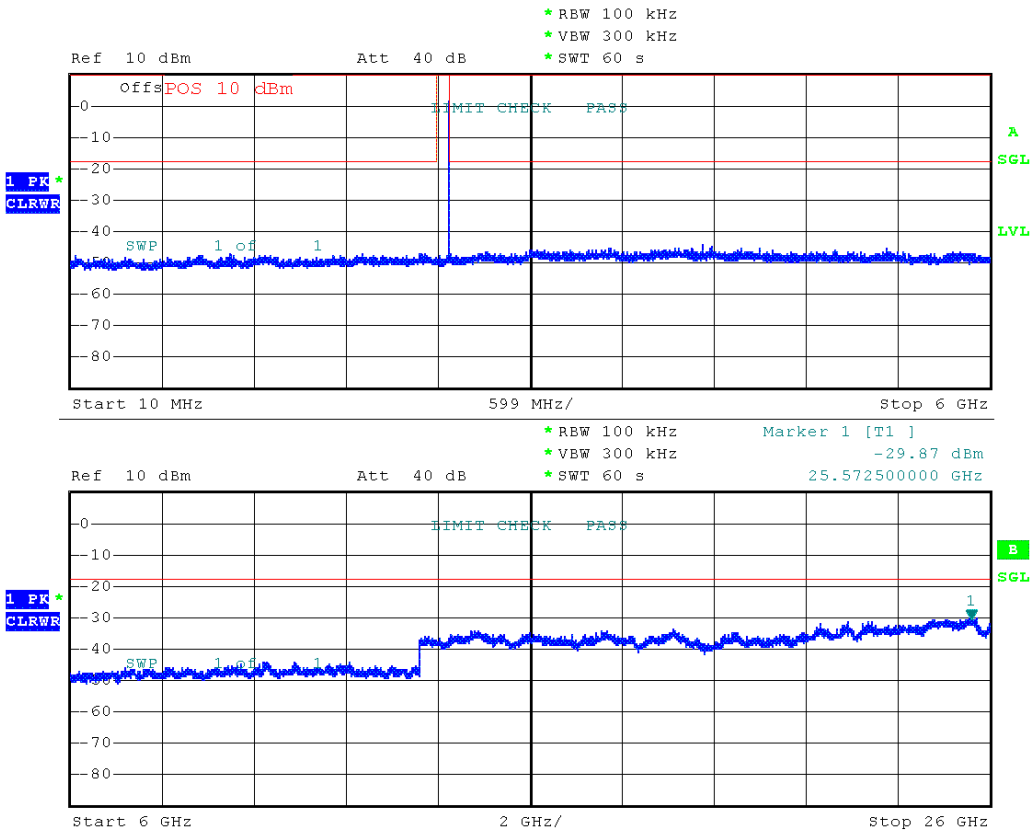
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.8
Operational Mode:	DH5, Channel: 78, 2480 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-02-02
Max. in-band Frequency [MHz]:	2479.8
Max. in-band Level [dBm/100 kHz]:	2.0
Out-of-band Limit [dBm/100 kHz]:	-18.0



Conducted Spurious Emissions

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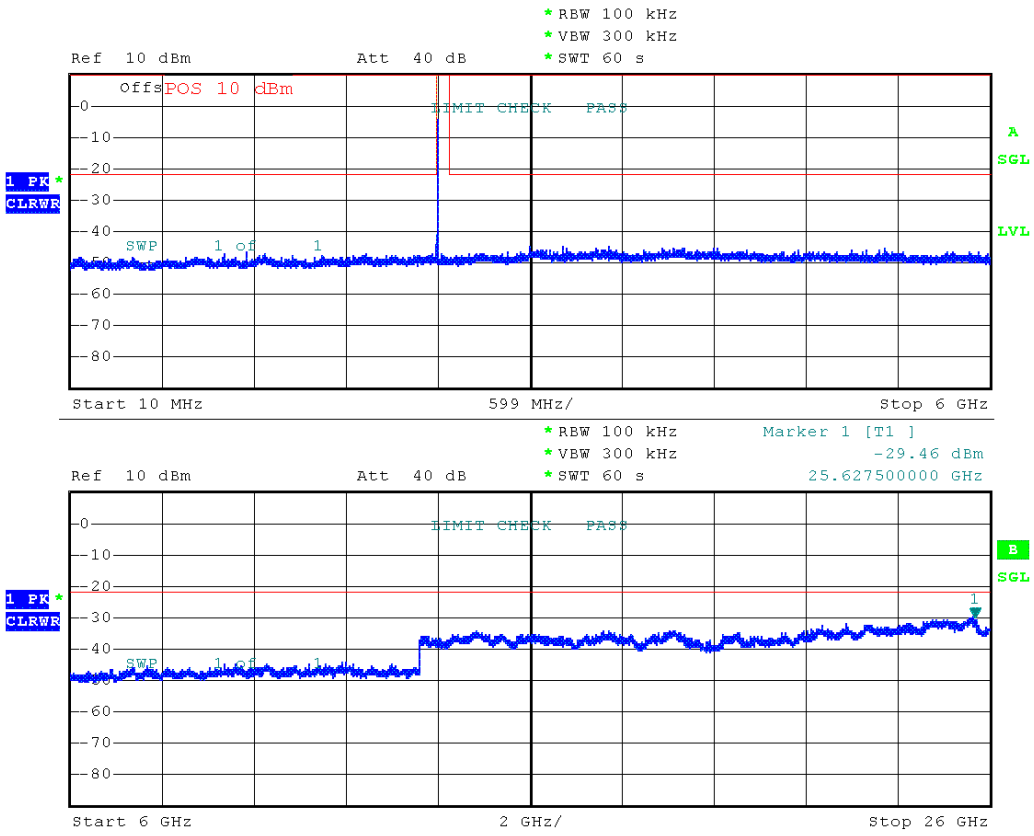
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.8
Operational Mode:	2-DH5, Channel: 0, 2402 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-02-02
Max. in-band Frequency [MHz]:	2402.0
Max. in-band Level [dBm/100 kHz]:	-1.7
Out-of-band Limit [dBm/100 kHz]:	-21.7



Conducted Spurious Emissions

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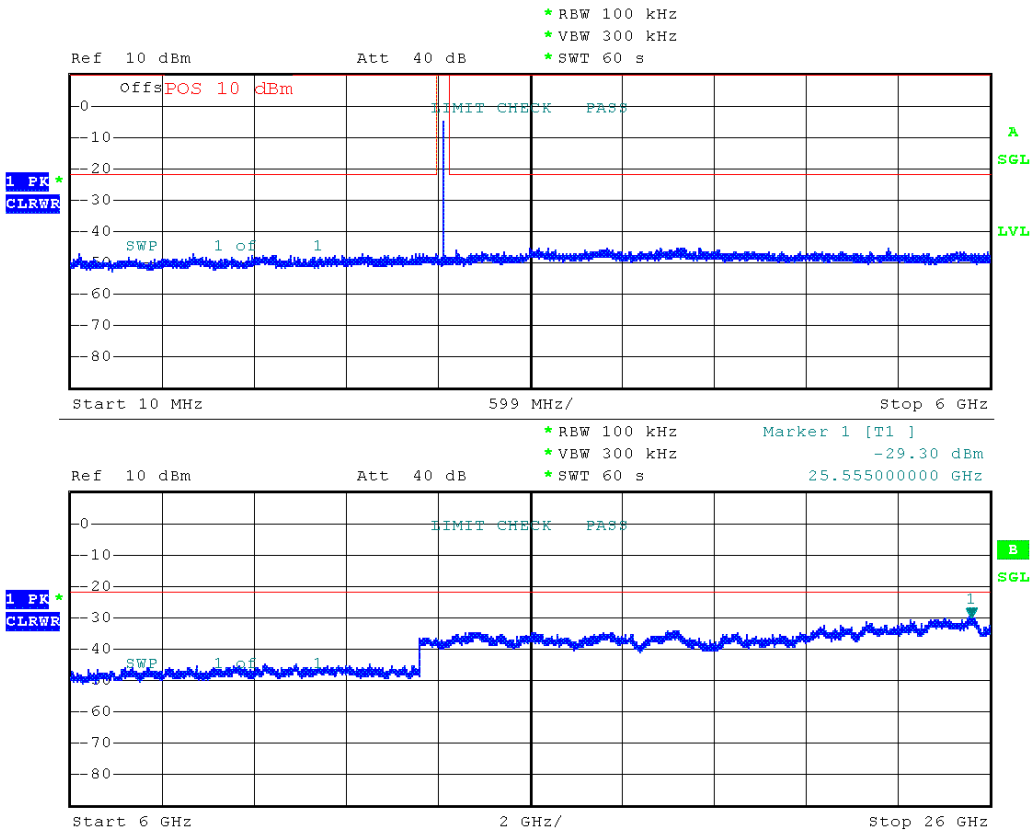
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.8
Operational Mode:	2-DH5, Channel: 39, 2440 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-02-02
Max. in-band Frequency [MHz]:	2441.0
Max. in-band Level [dBm/100 kHz]:	-2.1
Out-of-band Limit [dBm/100 kHz]:	-22.1



Conducted Spurious Emissions

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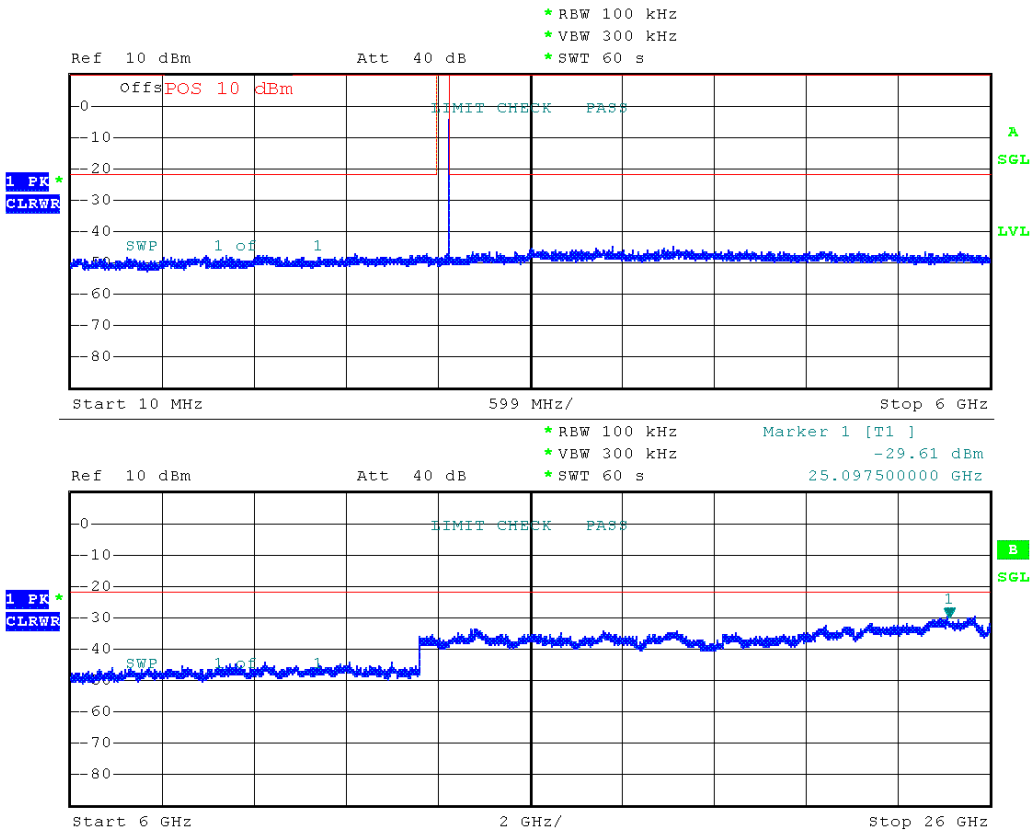
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.8
Operational Mode:	2-DH5, Channel: 78, 2480 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-02-02
Max. in-band Frequency [MHz]:	2480.1
Max. in-band Level [dBm/100 kHz]:	-2.1
Out-of-band Limit [dBm/100 kHz]:	-22.1



Conducted Spurious Emissions

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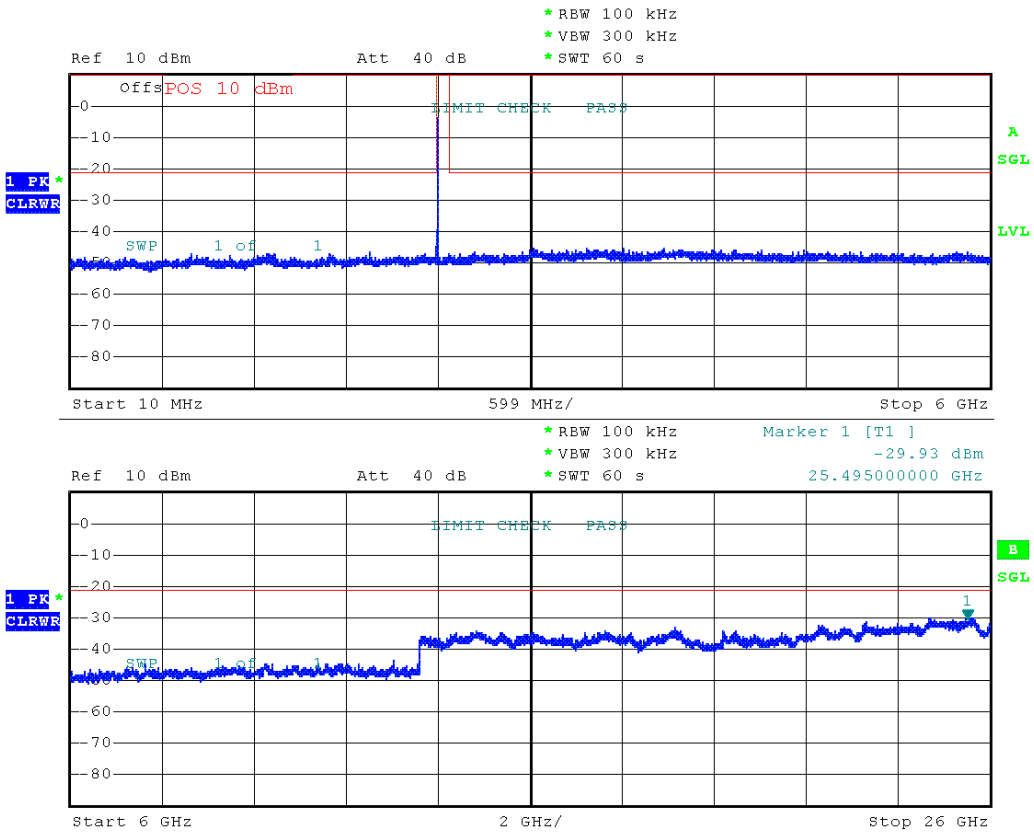
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.8
Operational Mode:	3-DH5, Channel: 0, 2402 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-02-02
Max. in-band Frequency [MHz]:	2401.8
Max. in-band Level [dBm/100 kHz]:	-1.4
Out-of-band Limit [dBm/100 kHz]:	-21.4



Conducted Spurious Emissions

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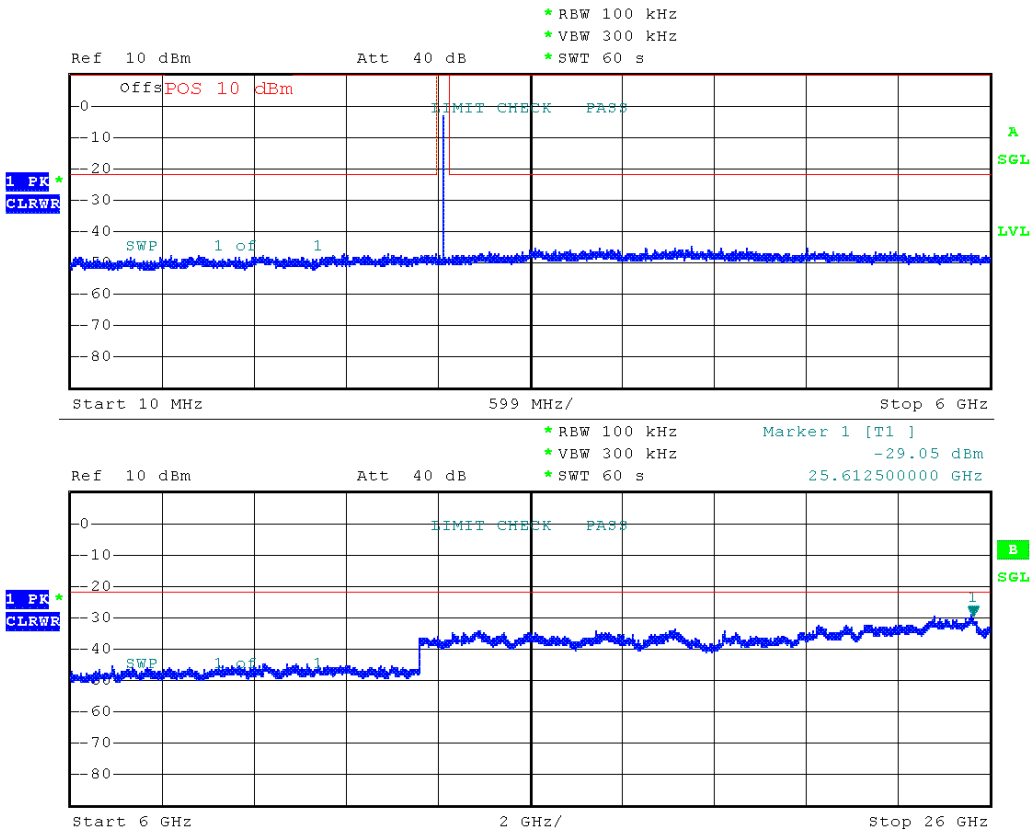
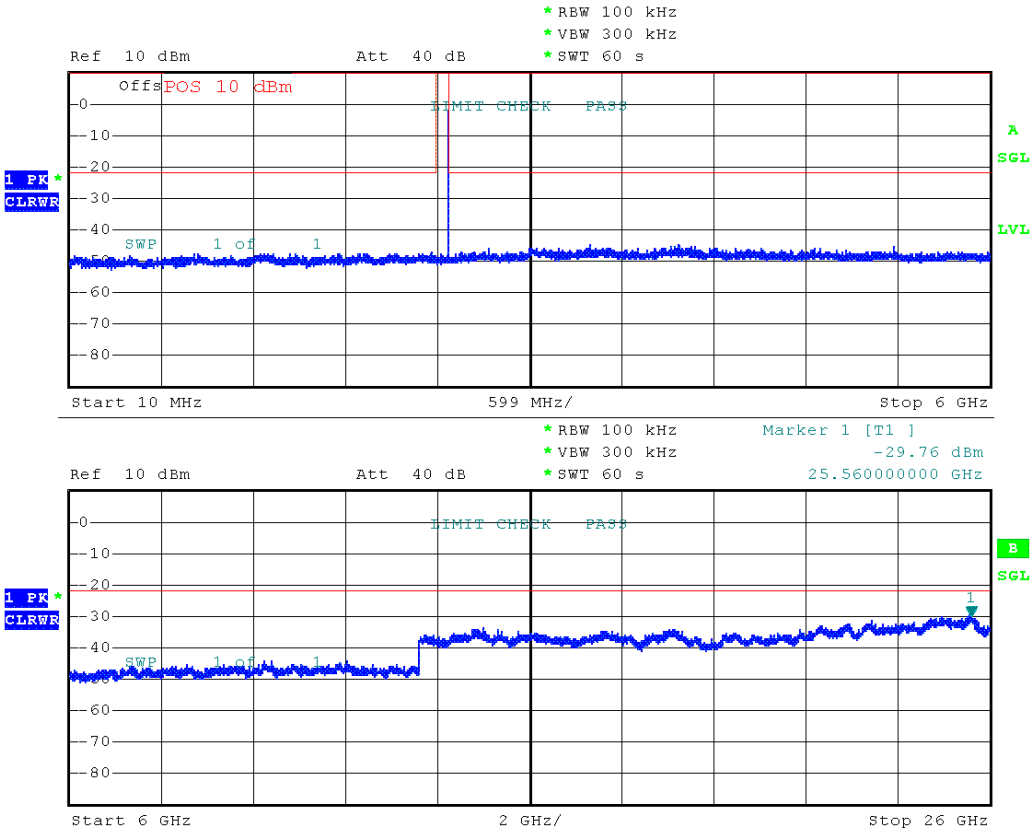
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.8
Operational Mode:	3-DH5, Channel: 39, 2440 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-02-02
Max. in-band Frequency [MHz]:	2441.1
Max. in-band Level [dBm/100 kHz]:	-1.9
Out-of-band Limit [dBm/100 kHz]:	-21.9



Conducted Spurious Emissions

Project Number:	G0M-2309-2215
Applicant:	Panasonic Industrial Devices Europe GmbH
Model Description:	Wi-Fi 6 Dual Band 2.4 GHz/5 GHz, Bluetooth® and 802.15.4 Module
Model:	ENWF9511C1KF
Test Sample ID:	46900
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.8
Operational Mode:	3-DH5, Channel: 78, 2480 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Md Abu Bakar Siddique
Test Site:	Eurofins Product Service GmbH
Test Date:	2024-02-02
Max. in-band Frequency [MHz]:	2479.8
Max. in-band Level [dBm/100 kHz]:	-1.9
Out-of-band Limit [dBm/100 kHz]:	-21.9



Date: 2.FEB.2024 15:41:43

3.10 Test Conditions and Results - Transmitter radiated emissions

3.10.1 Information

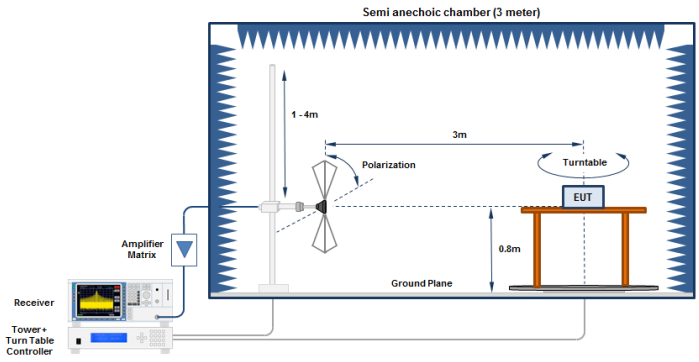
Test Information	
Reference	FCC § 15.247(d); FCC § 15.209; ISED RSS-Gen, Issue 5 A2 (section 6.13)
Measurement Uncertainty	± 5.95 dB
Measurement Method	ANSI C63.10 6.4, 6.5, 6.6
Operator	Md Abu Bakar Siddique
Date	2024-02-05

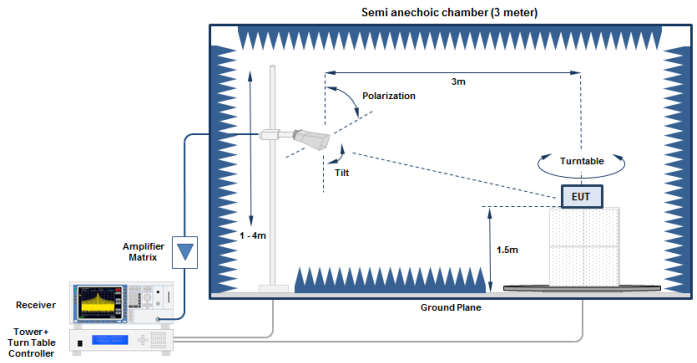
3.10.2 Limits

Limits			
Frequency range [MHz]	Detector	Field strength [µV/m]	Measurement distance [m]
0.009 - 0.09	Average	2400/F[kHz]	300
0.09 - 0.110	Quasi-Peak	2400/F[kHz]	300
0.110 - 0.490	Average	2400/F[kHz]	300
0.490 - 1.705	Quasi-Peak	24000/F[kHz]	30
1.705 - 30.0	Quasi-Peak	30	30
30 - 88	Quasi-Peak	100	3
88 - 216	Quasi-Peak	150	3
216 - 960	Quasi-Peak	200	3
960 - 1000	Quasi-Peak	500	3
>1000	Average	500	3

3.10.3 Setup

Test Setup 30 MHz - 1000 MHz



Test Setup > 1 GHz


3.10.4 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	RadiMation	2020.1.8

Test Equipment 30 - 1000 MHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2022-11	2025-11
Measurement Receiver	R&S	ESU8	EF00379	2023-08	2024-08
Antenna	Schwarzbeck	VULB 9168	EF01824	2022-10	2025-10

Test Equipment > 1 GHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC2	EF01616	2023-12	2024-12
Spectrum analyzer	R&S	FSW43	EF00896	2023-08	2024-08
Antenna	Schwarzbeck	BBHA 9120B	EF01678	2021-03	2024-03
Antenna	Schwarzbeck	HWRD 650	EF01679	2021-03	2024-03

3.10.5 Procedure

Test Procedure 30 MHz - 1000 MHz
1. EUT is placed on a non conducting support at the center of a turn table 0.8 m above the ground 2. EUT set to test mode 3. The receiver is set to peak detection with max hold 4. The EUT is rotated through 360° and the height of the antenna is varied from 1 m to 4 m 5. All significant emissions are measured again using the corresponding final detector

Test Procedure > 1 GHz
1. EUT is placed on a non conducting support at the center of a turn table 1.5 m above the ground 2. EUT set to test mode 3. The receiver is set to peak detection with max hold 4. The EUT is rotated through 360° and the height of the antenna is varied from 1 m to 4 m 5. All significant emissions are measured again using the corresponding final detector

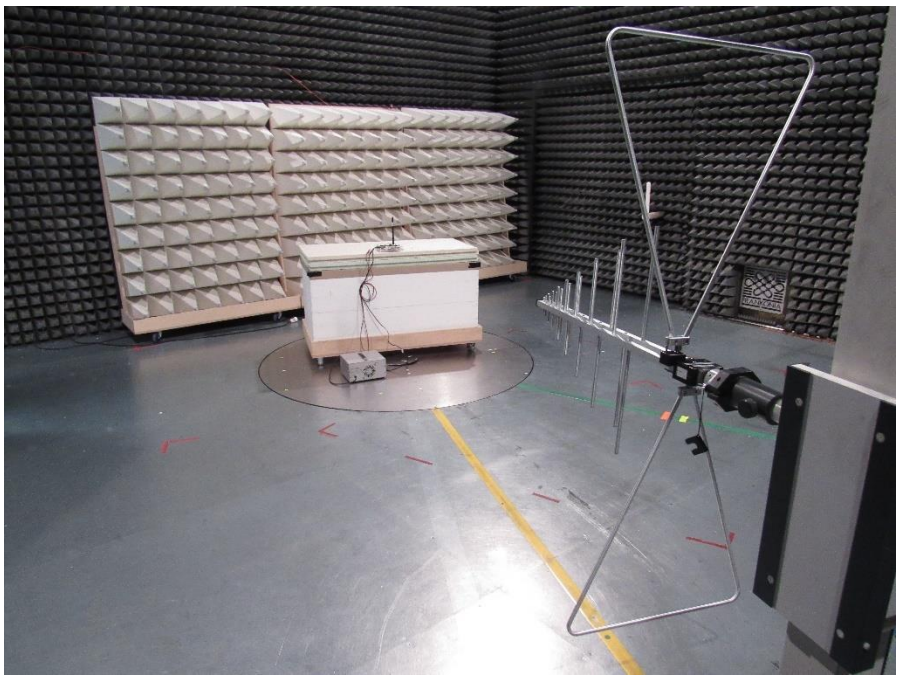
3.10.6 Results

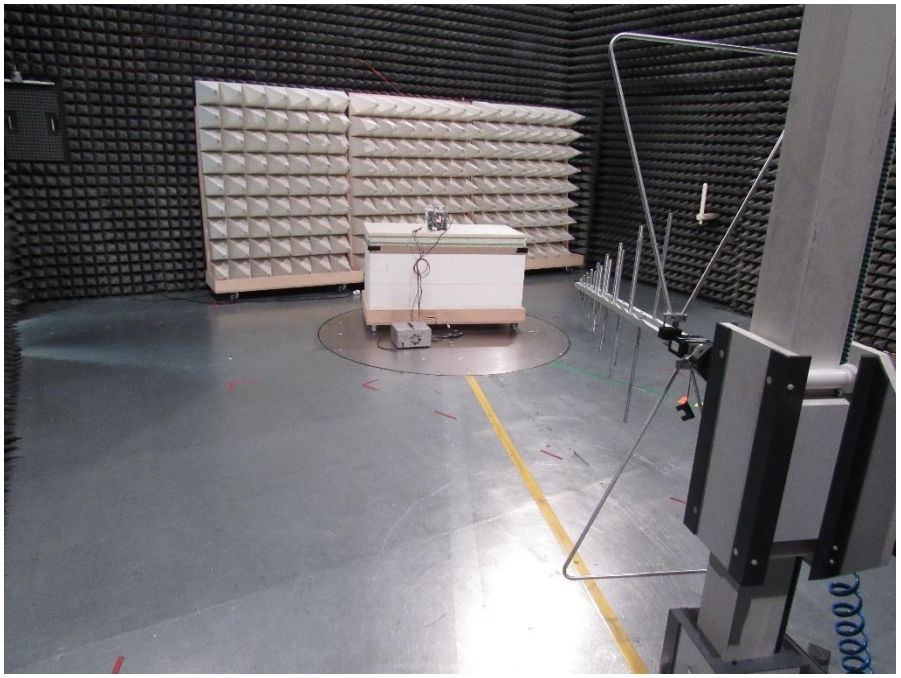
Test Results – Antenna 1 (External, ANT-Taoglas-GW.51.5153) – Annex A						
Channel [MHz]	Emission [MHz]	Level [dBµV/m]	Det.	Pol.	Limit [dBµV/m]	Margin [dB]
2402	609.09	36.00	pk	ver	46.00	-10.03
2480	609.5427	36.50	pk	ver	46.00	-09.49
2480	1450	44.64	pk	hor	74.00	-29.36
2480	1450	27.26	avg	hor	54.00	-26.74
2480	3903	43.55	pk	ver	74.00	-30.45
2480	3903	39.39	avg	ver	54.00	-14.61
2441	608.993	35.20	pk	ver	46.00	-10.82
2441	1222	47.07	pk	hor	74.00	-26.93
2441	1222	27.46	avg	hor	54.00	-26.54
2441	3903.3	43.38	pk	ver	74.00	-30.62
2441	3903.3	39.18	avg	ver	54.00	-14.82

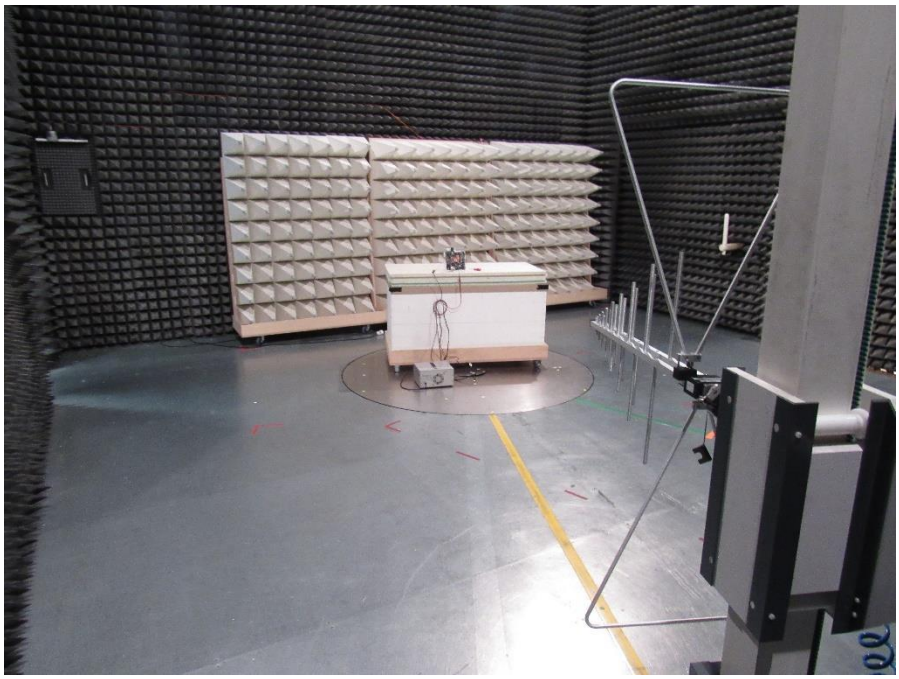
Test Results – Antenna 2 (External, ANT-2J Antennas-2JF1002P) – Annex B						
Channel [MHz]	Emission [MHz]	Level [dBµV/m]	Det.	Pol.	Limit [dBµV/m]	Margin [dB]
2402	611.321	36.10	pk	ver	46.00	-09.91
2402	2385.6	54.76	pk	hor	74.00	-19.24
2402	2385.6	39.93	avg	hor	54.00	-14.07
2480	610.933	35.70	pk	hor	46.00	-10.26
2480	2320	46.64	pk	hor	74.00	-27.36
2480	2320	31.61	avg	hor	54.00	-22.39
2480	2487.9	58.30	pk	hor	74.00	-15.70
2480	2487.9	44.41	avg	hor	54.00	-09.59
2480	3903	44.41	pk	ver	74.00	-29.59
2480	3903	35.50	avg	ver	54.00	-18.50

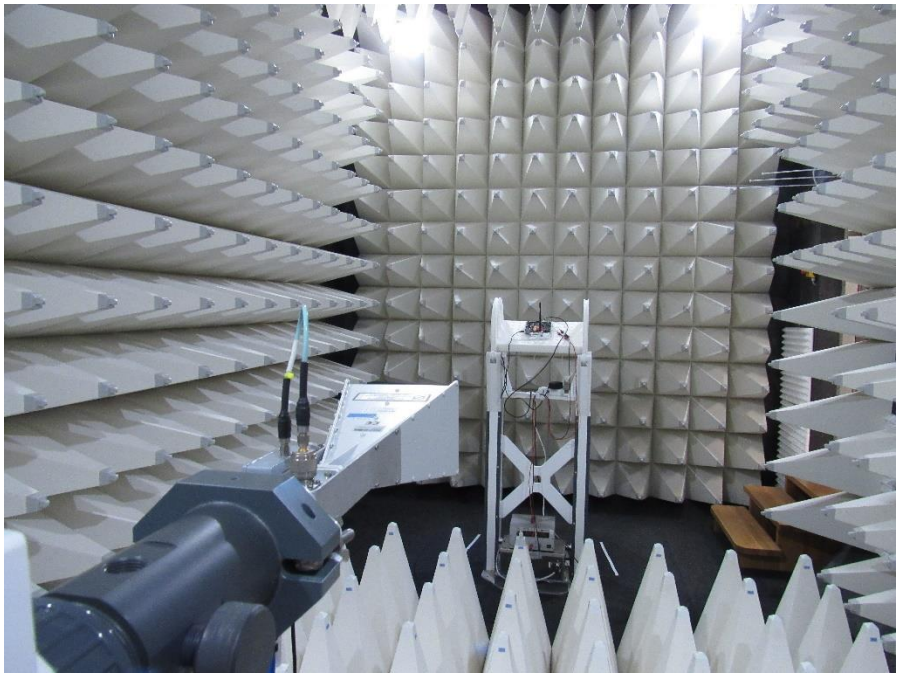
Test Results – Antenna 3 (External, ANT-TDK-ANT162442DT-2001A2) – Annex C						
Channel [MHz]	Emission [MHz]	Level [dBµV/m]	Det.	Pol.	Limit [dBµV/m]	Margin [dB]
2402	2385.9	55.12	pk	ver	74.00	-18.88
2402	2385.9	41.52	avg	ver	54.00	-12.48
2402	3903.5	43.89	pk	ver	74.00	-30.11
2402	3903.5	37.30	avg	ver	54.00	-16.70
2480	2487.7	56.74	pk	hor	74.00	-17.26
2480	2487.7	44.12	avg	hor	54.00	-09.88
2480	3998	44.28	pk	hor	74.00	-29.72
2480	3998	32.57	avg	hor	54.00	-21.43

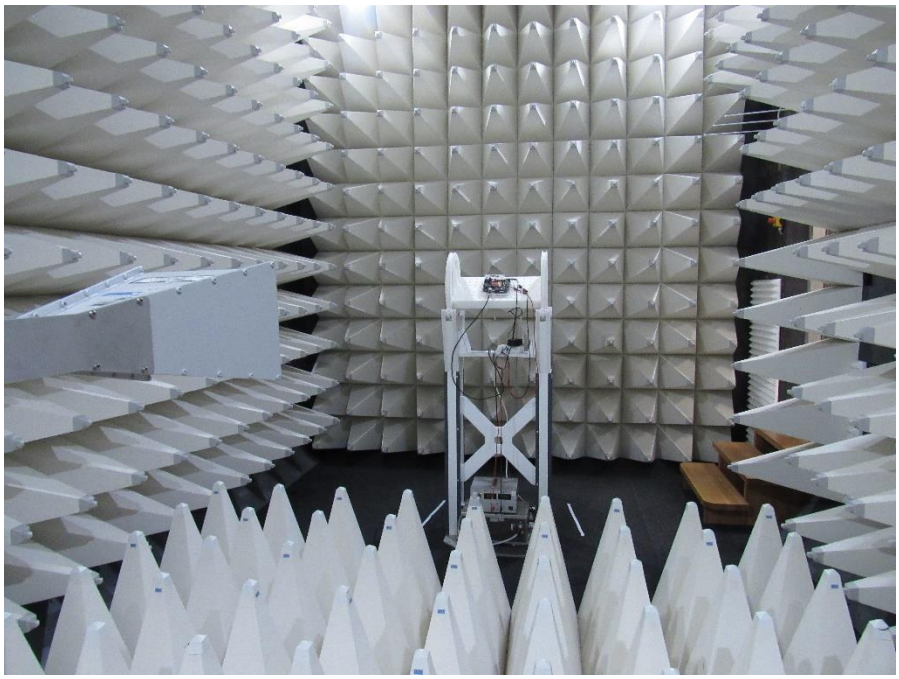
3.10.7 Setup Photos

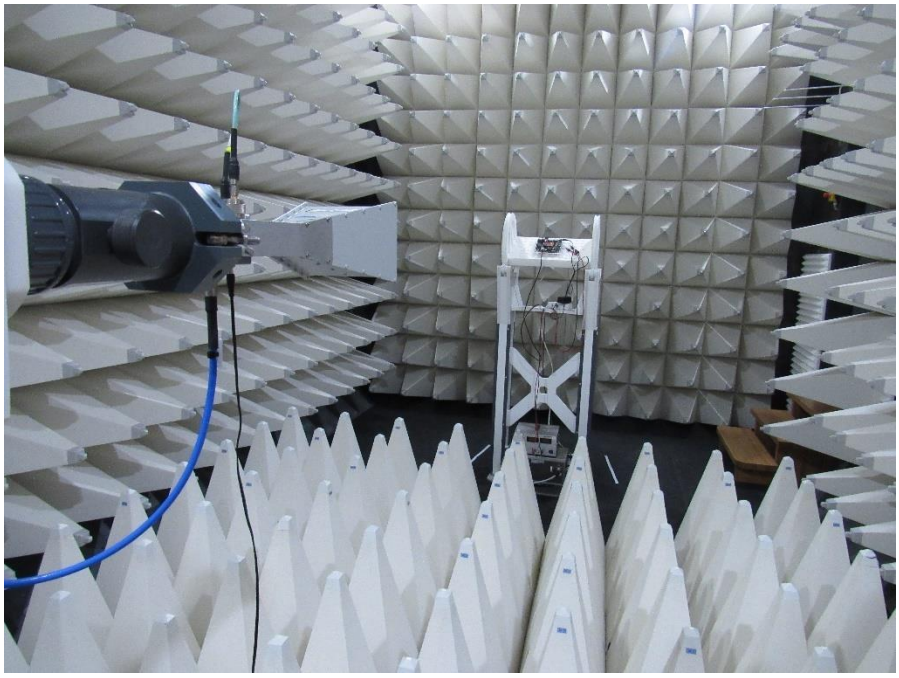
Setup for measurements below 1 GHz- Antenna 1


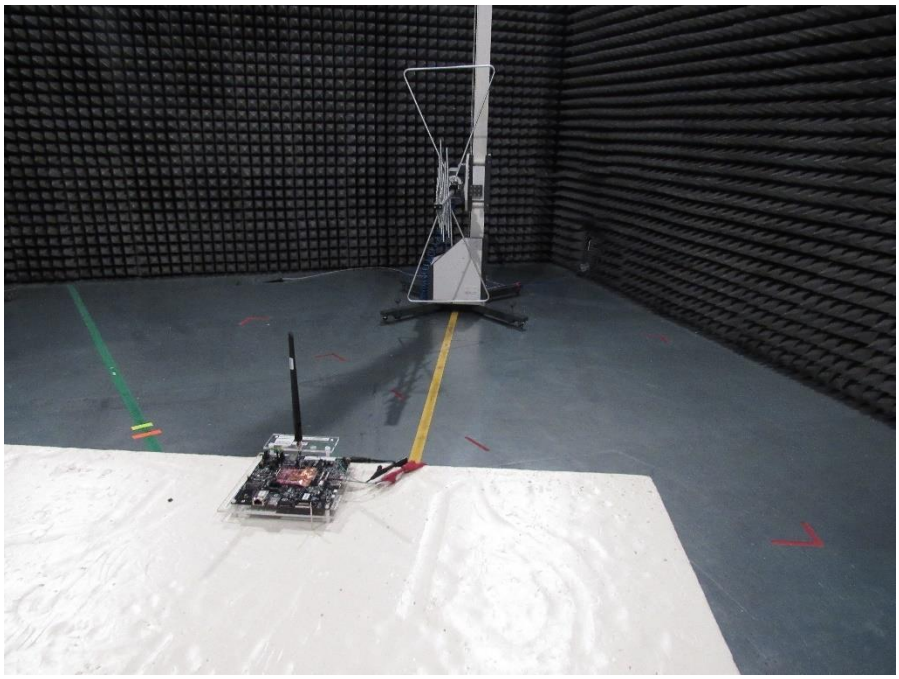
Setup for measurements below 1 GHz- Antenna 2


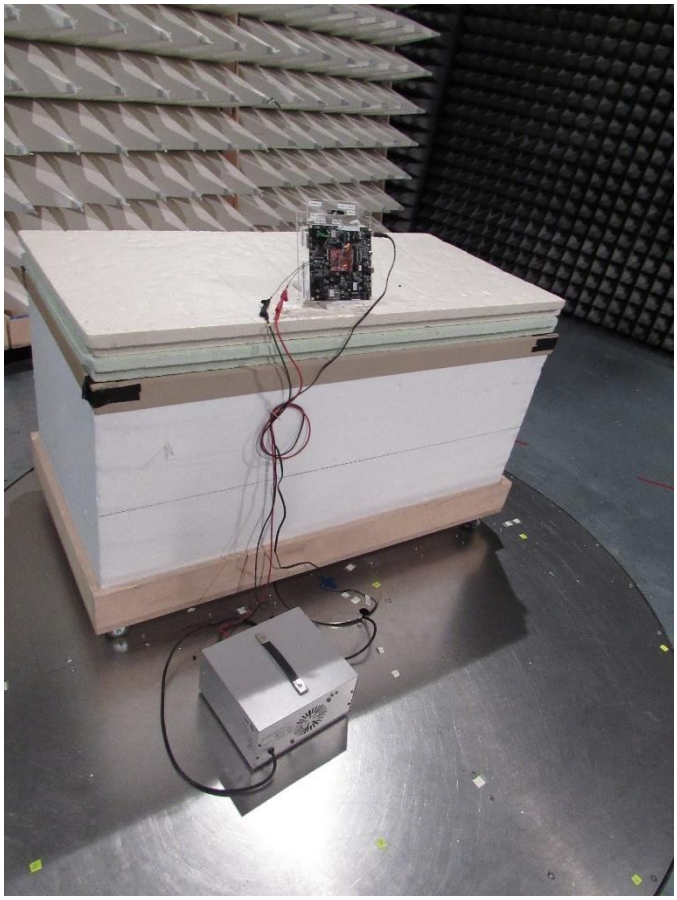
Setup for measurements below 1 GHz- Antenna 3


Setup for measurements above 1 GHz-Antenna 1


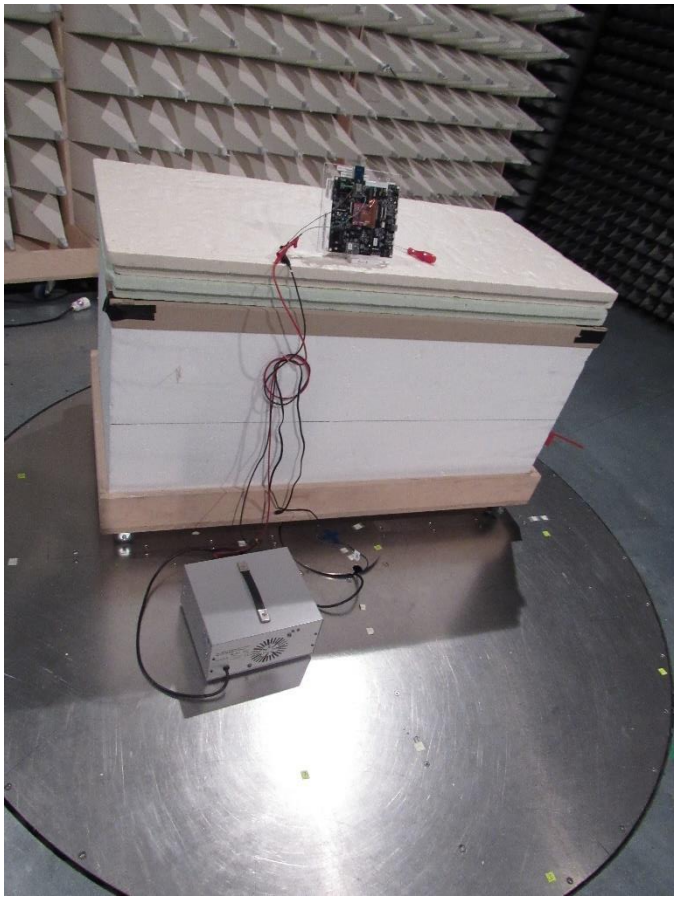
Setup for measurements above 1 GHz-Antenna 2


Setup for measurements above 1 GHz-Antenna 3


EUT Test Setup below 1 GH- Antenna 1


EUT Test Setup below 1 GH- Antenna 2


EUT Test Setup below 1 GH- Antenna 3



EUT Test Setup above 1 GHz-Antenna 1