



RF Exposure Part 1 Test Report

Applicant Name:
Microsoft Corporation
One Microsoft Way
Redmond, WA 98052 USA

Date of Testing:
05/18/2026 – 07/06/2026
Test Site/Location:
Element, Columbia, MD, USA
Document Serial No.:
1M2604150032-01.C3K (Rev1)

FCC ID: C3K00002101

APPLICANT: MICROSOFT CORPORATION

DUT Type: Wireless Module
Application Type: Class II Permissive Change - Limited Modular Approval
FCC Rule Part(s): CFR §2.1093
Model(s): HWB-Q94
Host Device Model Name: 2145
Permissive Change(s): C2PC Cover Letter

Equipment Class	Band & Mode	Tx Frequency	1g Body (W/kg)	
DTS	2.4 GHz WIFI	2412 - 2472 MHz	0.78	
NII	5 GHz WIFI	U-NII-1: 5180 - 5240 MHz U-NII-2A: 5260 - 5320 MHz U-NII-2C: 5500 - 5720 MHz U-NII-3: 5745 - 5825 MHz U-NII-4: 5845 - 5885 MHz	0.69	
6CD	6 GHz WIFI	U-NII-5: 5935 - 6415 MHz U-NII-6: 6435 - 6515 MHz U-NII-7: 6535 - 6875 MHz U-NII-8: 6895 - 7115 MHz	0.32	
DSS	2.4 GHz Bluetooth	2402 - 2480 MHz	0.21	
Simultaneous SAR per KDB 690783 D01v01r03:			1.08	
Equipment Class	Band & Mode	Tx Frequency	APD (W/m ²) Body	Reported PD (W/m ²)
6CD	6 GHz WIFI	U-NII-5: 5935 - 6415 MHz U-NII-6: 6435 - 6515 MHz U-NII-7: 6535 - 6875 MHz U-NII-8: 6895 - 7115 MHz	2.62	6.93

Note, this report documents the RF exposure evaluation performed for the integration of FCC ID C3K00002101 into a host device.

Only the RF exposure conditions and operating configurations associated with this host integration were evaluated under this filing. All other transmitter characteristics and operating modes remain unchanged from the previously authorized module approval.

This wireless portable device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in ANSI/IEEE C95.1-1992 and has been tested in accordance with the measurement procedures specified in Section 2.8 of this report; for North American frequency bands only.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them. Test results reported herein relate only to the item(s) tested.

Note: This revised test report supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.



RJ Ortanez
VP - Connected Technologies



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03/30/2022

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Revision	Description	Issue Date	Revised By
-	Initial Release	06/26/2026	WKR023556
Rev1	Updated per TCB comments	07/15/2026	WKR023556

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1 TEST LABORATORY INFORMATION

1.1 Introduction

This test report for device subject to testing at an accredited testing laboratory has been generated by the testing laboratory that tested the device. Detailed location and accredited information regarding the testing laboratories are provided below.

1.2 Test Laboratories Information

1.2.1 Testing Laboratory 1

Test Firm Name	ELEMENT MATERIALS TECHNOLOGY WASHINGTON DC LLC
Test Lab Location	7185 Oakland Mills Road, Columbia, MD 21046, United States Tel. +1.410.290.6652 / Fax +1.410.290.6654
Accreditation Info.	Lab Code. (ISED): 2451B
	CAB Identifier (NIST): US0110
	ISO/IEC 17025 (A2LA): CERT #2041.01
	 
Measurement System No.	J, O, R, S, Q

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2 DEVICE UNDER TEST

2.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
2.4 GHz WIFI	Data	2412 - 2472 MHz
5 GHz WIFI	Data	U-NII-1: 5180 - 5240 MHz U-NII-2A: 5260 - 5320 MHz U-NII-2C: 5500 - 5720 MHz U-NII-3: 5745 - 5825 MHz U-NII-4: 5845 - 5885 MHz
6 GHz WIFI	Data	U-NII-5: 5935 - 6415 MHz U-NII-6: 6435 - 6515 MHz U-NII-7: 6535 - 6875 MHz U-NII-8: 6895 - 7115 MHz
2.4 GHz Bluetooth	Data	2402 - 2480 MHz

FCC ID C3K00002101 (Module Model: HWB-Q94) is a certified transmitter module intended for integration into host devices.

This report documents the RF exposure evaluation for the integration of FCC ID C3K00002101 into the host device evaluated under this filing. While the transmitter characteristics remain unchanged from the authorized module approval, RF exposure compliance is dependent upon the final host implementation and must be demonstrated for the specific host configuration.

2.2 Time-Averaging Algorithm for RF Exposure Compliance

This Device is enabled with the Qualcomm® FastConnect TAS feature for WLAN technologies. This feature performs time averaging algorithm in real time to control and manage transmitting power and ensure the timeaveraged RF exposure is in compliance with FCC requirements all the time. Refer to Compliance Summary document for detailed description of Qualcomm® FastConnect TAS feature (report SN could be found in Section 2.10 – Bibliography).

Note that Bluetooth operations are not enabled with TAS.

The FastConnect TAS algorithm maintains the time-averaged transmit power, in turn, time-averaged RF exposure of SAR_design_target, below the predefined time-averaged power limit (i.e., *Plimit* for WLAN), for each characterized technology and band (see RF Exposure Part 0 Test Report, report SN found in Section 2.10 - Bibliography).

FastConnect TAS allows the device to transmit at higher power instantaneously, as high as *Pmax*, when needed, but enforces power limiting to maintain time-averaged transmit power to *Plimit*. Below table shows Final *Plimit* settings and maximum tune up output power *Pmax* configured for this DUT for various transmit conditions (Device State Index DSI for FastConnect.)

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Exposure Scenario Averaging Volume Spacing DSI		Maximum Tune-Up Output Power*	Body
			1 g
			0mm/5mm
			1
Technology/Band	Antenna	P _{max}	P _{limit}
2.4 GHz WIFI	R	19.5	20.00
2.4 GHz WIFI	L	19.5	21.80
2.4 GHz WIFI	MIMO	19.5	22.50
5 GHz WIFI UNII-1	R	15.5	15.50
5 GHz WIFI UNII-1	L	15.5	15.50
5 GHz WIFI UNII-1	MIMO	15.5	15.50
5 GHz WIFI UNII-2A	R	17.0	16.00
5 GHz WIFI UNII-2A	L	17.0	16.00
5 GHz WIFI UNII-2A	MIMO	17.0	16.00
5 GHz WIFI UNII-2C	R	16.0	15.50
5 GHz WIFI UNII-2C	L	16.0	15.50
5 GHz WIFI UNII-2C	MIMO	16.0	15.50
5 GHz WIFI UNII-3	R	20.5	15.50
5 GHz WIFI UNII-3	L	20.5	15.50
5 GHz WIFI UNII-3	MIMO	20.5	15.50
5 GHz WIFI UNII-4	R	17.0	16.25
5 GHz WIFI UNII-4	L	17.0	16.25
5 GHz WIFI UNII-4	MIMO	17.0	16.25
6 GHz WIFI UNII-5	R	17.5	11.00
6 GHz WIFI UNII-5	L	17.5	11.00
6 GHz WIFI UNII-5	MIMO	17.5	11.00
6 GHz WIFI UNII-6	R	10.0	18.70
6 GHz WIFI UNII-6	L	10.0	18.20
6 GHz WIFI UNII-6	MIMO	10.0	17.10
6 GHz WIFI UNII-7	R	18.0	11.75
6 GHz WIFI UNII-7	L	18.0	11.75
6 GHz WIFI UNII-7	MIMO	18.0	11.75
6 GHz WIFI UNII-8	R	7.5	18.00
6 GHz WIFI UNII-8	L	7.5	18.60
6 GHz WIFI UNII-8	MIMO	7.5	15.60

Notes:

1. All Plimit and maximum tune up output power P_{max} levels entered in above Table correspond to average power levels after accounting for duty cycle in the case of OFDM modulation schemes (e.g. WLAN).
2. The purpose of this report (Part 1 test) is to demonstrate that the EUT meets FCC SAR limits when transmitting in static transmission scenario at maximum allowable time-averaged power levels.

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2.3 Power Reduction for SAR

This device used an independent fixed level power reduction mechanism for Bluetooth operations when the device is used in simultaneous scenarios with WLAN. Detailed descriptions of the power reduction mechanism are included in the operational description.

2.4 Nominal and Maximum Output Power Specifications

This device operates using the following maximum and nominal output power specifications. SAR values were scaled to the maximum allowed power to determine compliance per KDB Publication 447498 D04v01.

Note: Targets for 802.11ax/be RU operations can be found in 802.11ax/be RU SAR Exclusion Appendix.

2.4.1 2.4 GHz WLAN Output Power

The below table is applicable in the following conditions:

- Pmax
- DSI=1 (Body)

Band	IEEE 802.11 Modulated Frame Output Power (in dBm)																							
	SISO / SISO in MIMO												SISO / SISO in MIMO											
	Antenna R												Antenna L											
	b		g		n		ac		ax (SU)		be (SU)		b		g		n		ac		ax (SU)		be (SU)	
Maximum / Nominal Power	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
2.4 GHz WLAN 20MHz	19.00	18.00	20.50	19.50	19.50	18.50	19.50	18.50	19.50	18.50	19.50	18.50	19.00	18.00	20.50	19.50	19.50	18.50	19.50	18.50	19.50	18.50	19.50	18.50
	ch. 1: 16.00		15.00		ch. 1: 16.00		15.00		ch. 1: 16.00		15.00		ch. 1: 16.00		15.00		ch. 1: 16.00		15.00		ch. 1: 16.00		15.00	
	ch. 2: 18.00		17.00		ch. 2: 18.00		17.00		ch. 2: 18.00		17.00		ch. 2: 18.00		17.00		ch. 2: 18.00		17.00		ch. 2: 18.00		17.00	
	ch. 3: 19.00		18.00		ch. 3: 19.00		18.00		ch. 3: 19.00		18.00		ch. 3: 19.00		18.00		ch. 3: 19.00		18.00		ch. 3: 19.00		18.00	
	ch. 11: 19.50		18.50		ch. 11: 19.50		18.50		ch. 11: 19.50		18.50		ch. 11: 19.50		18.50		ch. 11: 19.50		18.50		ch. 11: 19.50		18.50	
	ch. 12: 16.50		15.50		ch. 12: 16.50		15.50		ch. 12: 16.50		15.50		ch. 12: 16.50		15.50		ch. 12: 16.50		15.50		ch. 12: 16.50		15.50	
2.4 GHz WLAN 40MHz	18.50	17.50	18.50	17.50	18.50	17.50	18.50	17.50	18.50	17.50	18.50	17.50	18.50	17.50	18.50	17.50	18.50	17.50	18.50	17.50	18.50	17.50	18.50	
	ch. 3: 14.00		13.00		ch. 3: 14.00		13.00		ch. 3: 14.00		13.00		ch. 3: 14.00		13.00		ch. 3: 14.00		13.00		ch. 3: 14.00		13.00	
	ch. 4: 16.00		15.00		ch. 4: 16.00		15.00		ch. 4: 16.00		15.00		ch. 4: 16.00		15.00		ch. 4: 16.00		15.00		ch. 4: 16.00		15.00	
	ch. 5: 16.00		15.00		ch. 5: 16.00		15.00		ch. 5: 16.00		15.00		ch. 5: 16.00		15.00		ch. 5: 16.00		15.00		ch. 5: 16.00		15.00	
	ch. 7: 17.50		16.50		ch. 7: 17.50		16.50		ch. 7: 17.50		16.50		ch. 7: 17.50		16.50		ch. 7: 17.50		16.50		ch. 7: 17.50		16.50	
	ch. 8: 17.50		16.50		ch. 8: 17.50		16.50		ch. 8: 17.50		16.50		ch. 8: 17.50		16.50		ch. 8: 17.50		16.50		ch. 8: 17.50		16.50	

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2.4.2 5 GHz WLAN Output Power

The below table is applicable in the following conditions:

- P_{max}

Mode	Band	IEEE 802.11 Modulated Output Power (in dBm)																			
		SISO / SISO in MIMO										SISO / SISO in MIMO									
		Antenna R										Antenna L									
		a		n		ac		aa (SU)		ba (SU)		a		n		ac		aa (SU)		ba (SU)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
5 GHz WLAN (20MHz BW)	UNII-1	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00
	UNII-2A	17.50	16.50	17.50	16.50	17.50	16.50	17.50	16.50	17.50	16.50	17.50	16.50	17.50	16.50	17.50	16.50	17.50	16.50	17.50	16.50
	UNII-2C	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50
		ch. 100: 15.00	14.00	ch. 100: 15.00	14.00	ch. 100: 15.00	14.00	ch. 100: 15.00	14.00	ch. 100: 15.00	14.00	ch. 100: 15.00	14.00	ch. 100: 15.00	14.00	ch. 100: 15.00	14.00	ch. 100: 15.00	14.00	ch. 100: 15.00	14.00
		ch. 104: 15.00	14.00	ch. 104: 15.00	14.00	ch. 104: 15.00	14.00	ch. 104: 15.00	14.00	ch. 104: 15.00	14.00	ch. 104: 15.00	14.00	ch. 104: 15.00	14.00	ch. 104: 15.00	14.00	ch. 104: 15.00	14.00	ch. 104: 15.00	14.00
		ch. 108: 15.00	14.00	ch. 108: 15.00	14.00	ch. 108: 15.00	14.00	ch. 108: 15.00	14.00	ch. 108: 15.00	14.00	ch. 108: 15.00	14.00	ch. 108: 15.00	14.00	ch. 108: 15.00	14.00	ch. 108: 15.00	14.00	ch. 108: 15.00	14.00
		ch. 112: 15.00	14.00	ch. 112: 15.00	14.00	ch. 112: 15.00	14.00	ch. 112: 15.00	14.00	ch. 112: 15.00	14.00	ch. 112: 15.00	14.00	ch. 112: 15.00	14.00	ch. 112: 15.00	14.00	ch. 112: 15.00	14.00	ch. 112: 15.00	14.00
		ch. 116: 15.00	14.00	ch. 116: 15.00	14.00	ch. 116: 15.00	14.00	ch. 116: 15.00	14.00	ch. 116: 15.00	14.00	ch. 116: 15.00	14.00	ch. 116: 15.00	14.00	ch. 116: 15.00	14.00	ch. 116: 15.00	14.00	ch. 116: 15.00	14.00
		ch. 120: 15.00	14.00	ch. 120: 15.00	14.00	ch. 120: 15.00	14.00	ch. 120: 15.00	14.00	ch. 120: 15.00	14.00	ch. 120: 15.00	14.00	ch. 120: 15.00	14.00	ch. 120: 15.00	14.00	ch. 120: 15.00	14.00	ch. 120: 15.00	14.00
		ch. 124: 15.00	14.00	ch. 124: 15.00	14.00	ch. 124: 15.00	14.00	ch. 124: 15.00	14.00	ch. 124: 15.00	14.00	ch. 124: 15.00	14.00	ch. 124: 15.00	14.00	ch. 124: 15.00	14.00	ch. 124: 15.00	14.00	ch. 124: 15.00	14.00
		ch. 128: 15.00	14.00	ch. 128: 15.00	14.00	ch. 128: 15.00	14.00	ch. 128: 15.00	14.00	ch. 128: 15.00	14.00	ch. 128: 15.00	14.00	ch. 128: 15.00	14.00	ch. 128: 15.00	14.00	ch. 128: 15.00	14.00	ch. 128: 15.00	14.00
		ch. 132: 15.00	14.00	ch. 132: 15.00	14.00	ch. 132: 15.00	14.00	ch. 132: 15.00	14.00	ch. 132: 15.00	14.00	ch. 132: 15.00	14.00	ch. 132: 15.00	14.00	ch. 132: 15.00	14.00	ch. 132: 15.00	14.00	ch. 132: 15.00	14.00
		ch. 136: 15.00	14.00	ch. 136: 15.00	14.00	ch. 136: 15.00	14.00	ch. 136: 15.00	14.00	ch. 136: 15.00	14.00	ch. 136: 15.00	14.00	ch. 136: 15.00	14.00	ch. 136: 15.00	14.00	ch. 136: 15.00	14.00	ch. 136: 15.00	14.00
		ch. 140: 16.00	15.00	ch. 140: 16.00	15.00	ch. 140: 16.00	15.00	ch. 140: 16.00	15.00	ch. 140: 16.00	15.00	ch. 140: 16.00	15.00	ch. 140: 16.00	15.00	ch. 140: 16.00	15.00	ch. 140: 16.00	15.00	ch. 140: 16.00	15.00
	UNII-3	21.50	20.50	21.50	20.50	21.50	20.50	21.50	20.50	21.50	20.50	21.50	20.50	21.50	20.50	21.50	20.50	21.50	20.50	21.50	20.50
	UNII-4	14.50	13.50	14.50	13.50	14.50	13.50	14.50	13.50	14.50	13.50	14.50	13.50	14.50	13.50	14.50	13.50	14.50	13.50	14.50	13.50
5 GHz WLAN (40MHz BW)	UNII-1	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00
	UNII-2A	17.50	16.50	17.50	16.50	17.50	16.50	17.50	16.50	17.50	16.50	17.50	16.50	17.50	16.50	17.50	16.50	17.50	16.50	17.50	16.50
	UNII-2C	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50
		ch. 102: 15.00	14.00	ch. 102: 15.00	14.00	ch. 102: 15.00	14.00	ch. 102: 15.00	14.00	ch. 102: 15.00	14.00	ch. 102: 15.00	14.00	ch. 102: 15.00	14.00	ch. 102: 15.00	14.00	ch. 102: 15.00	14.00	ch. 102: 15.00	14.00
		ch. 106: 15.00	14.00	ch. 106: 15.00	14.00	ch. 106: 15.00	14.00	ch. 106: 15.00	14.00	ch. 106: 15.00	14.00	ch. 106: 15.00	14.00	ch. 106: 15.00	14.00	ch. 106: 15.00	14.00	ch. 106: 15.00	14.00	ch. 106: 15.00	14.00
		ch. 110: 16.00	15.00	ch. 110: 16.00	15.00	ch. 110: 16.00	15.00	ch. 110: 16.00	15.00	ch. 110: 16.00	15.00	ch. 110: 16.00	15.00	ch. 110: 16.00	15.00	ch. 110: 16.00	15.00	ch. 110: 16.00	15.00	ch. 110: 16.00	15.00
	UNII-3	19.00	18.00	19.00	18.00	19.00	18.00	19.00	18.00	19.00	18.00	19.00	18.00	19.00	18.00	19.00	18.00	19.00	18.00	19.00	18.00
		ch. 151: 18.00	17.00	ch. 151: 18.00	17.00	ch. 151: 18.00	17.00	ch. 151: 18.00	17.00	ch. 151: 18.00	17.00	ch. 151: 18.00	17.00	ch. 151: 18.00	17.00	ch. 151: 18.00	17.00	ch. 151: 18.00	17.00	ch. 151: 18.00	17.00
	UNII-4	17.50	16.50	17.50	16.50	17.50	16.50	17.50	16.50	17.50	16.50	17.50	16.50	17.50	16.50	17.50	16.50	17.50	16.50	17.50	16.50
5 GHz WLAN (80MHz BW)	UNII-1	13.00	12.00	13.00	12.00	13.00	12.00	13.00	12.00	13.00	12.00	13.00	12.00	13.00	12.00	13.00	12.00	13.00	12.00	13.00	12.00
	UNII-2A	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00
	UNII-2C	17.00	16.00	17.00	16.00	17.00	16.00	17.00	16.00	17.00	16.00	17.00	16.00	17.00	16.00	17.00	16.00	17.00	16.00	17.00	16.00
	UNII-3	17.50	16.50	17.50	16.50	17.50	16.50	17.50	16.50	17.50	16.50	17.50	16.50	17.50	16.50	17.50	16.50	17.50	16.50	17.50	16.50
5 GHz WLAN (160MHz BW)	UNII-4	18.00	17.00	18.00	17.00	18.00	17.00	18.00	17.00	18.00	17.00	18.00	17.00	18.00	17.00	18.00	17.00	18.00	17.00	18.00	17.00
	UNII-22A	11.00	10.00	11.00	10.00	11.00	10.00	11.00	10.00	11.00	10.00	11.00	10.00	11.00	10.00	11.00	10.00	11.00	10.00	11.00	10.00
	UNII-2C	8.50	7.50	8.50	7.50	8.50	7.50	8.50	7.50	8.50	7.50	8.50	7.50	8.50	7.50	8.50	7.50	8.50	7.50	8.50	7.50
	UNII-34	12.50	11.50	12.50	11.50	12.50	11.50	12.50	11.50	12.50	11.50	12.50	11.50	12.50	11.50	12.50	11.50	12.50	11.50	12.50	11.50

FCC ID: C3K00002101	RF Exposure Part 1 Test Report		Approved by: Technical Manager
Document S/N: 1M2604150032-01.C3K (Rev1)	DUT Type: Wireless Module	This report is Blockchain Verified. To verify the report authenticity, please visit https://www.blockchain-verified.com or by clicking on the Blockchain logo	Page 8 of 54



The below table is applicable in the following conditions:

- DSI = 1 (Body)

Mode	Band	IEEE 802.11 Modulated Output Power (in dBm)																					
		SISO / SISO in MIMO											SISO / SISO in MIMO										
		Antenna R											Antenna L										
		a		n		ac		ae (SU)		be (SU)	a		n		ac		ae (SU)		be (SU)				
Maximum / Nominal Power	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.					
5 GHz WiFi (20MHz BW)	UNII-1	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	
	UNII-2A	17.00	16.00	17.00	16.00	17.00	16.00	17.00	16.00	17.00	16.00	17.00	16.00	17.00	16.00	17.00	16.00	17.00	16.00	17.00	16.00		
	UNII-2C	16.50	15.50	ch. 64: 16.50	15.50	ch. 64: 16.50	15.50	ch. 64: 16.50	15.50	ch. 64: 16.50	15.50	16.50	15.50	ch. 64: 16.50	15.50	ch. 64: 16.50	15.50	ch. 64: 16.50	15.50	ch. 64: 16.50	15.50		
		ch. 100: 16.00	15.00	ch. 100: 16.00	15.00	ch. 100: 16.00	15.00	ch. 100: 16.00	15.00	ch. 100: 16.00	15.00	ch. 100: 16.00	15.00	ch. 100: 16.00	15.00	ch. 100: 16.00	15.00	ch. 100: 16.00	15.00	ch. 100: 16.00	15.00		
		ch. 104: 15.50	14.50	ch. 104: 15.50	14.50	ch. 104: 15.50	14.50	ch. 104: 15.50	14.50	ch. 104: 15.50	14.50	ch. 104: 15.50	14.50	ch. 104: 15.50	14.50	ch. 104: 15.50	14.50	ch. 104: 15.50	14.50	ch. 104: 15.50	14.50		
		ch. 108: 15.50	14.50	ch. 108: 15.50	14.50	ch. 108: 15.50	14.50	ch. 108: 15.50	14.50	ch. 108: 15.50	14.50	ch. 108: 15.50	14.50	ch. 108: 15.50	14.50	ch. 108: 15.50	14.50	ch. 108: 15.50	14.50	ch. 108: 15.50	14.50		
		ch. 112: 15.50	14.50	ch. 112: 15.50	14.50	ch. 112: 15.50	14.50	ch. 112: 15.50	14.50	ch. 112: 15.50	14.50	ch. 112: 15.50	14.50	ch. 112: 15.50	14.50	ch. 112: 15.50	14.50	ch. 112: 15.50	14.50	ch. 112: 15.50	14.50		
		ch. 116: 15.50	14.50	ch. 116: 15.50	14.50	ch. 116: 15.50	14.50	ch. 116: 15.50	14.50	ch. 116: 15.50	14.50	ch. 116: 15.50	14.50	ch. 116: 15.50	14.50	ch. 116: 15.50	14.50	ch. 116: 15.50	14.50	ch. 116: 15.50	14.50		
		ch. 120: 15.50	14.50	ch. 120: 15.50	14.50	ch. 120: 15.50	14.50	ch. 120: 15.50	14.50	ch. 120: 15.50	14.50	ch. 120: 15.50	14.50	ch. 120: 15.50	14.50	ch. 120: 15.50	14.50	ch. 120: 15.50	14.50	ch. 120: 15.50	14.50		
		ch. 124: 15.50	14.50	ch. 124: 15.50	14.50	ch. 124: 15.50	14.50	ch. 124: 15.50	14.50	ch. 124: 15.50	14.50	ch. 124: 15.50	14.50	ch. 124: 15.50	14.50	ch. 124: 15.50	14.50	ch. 124: 15.50	14.50	ch. 124: 15.50	14.50		
		ch. 128: 15.50	14.50	ch. 128: 15.50	14.50	ch. 128: 15.50	14.50	ch. 128: 15.50	14.50	ch. 128: 15.50	14.50	ch. 128: 15.50	14.50	ch. 128: 15.50	14.50	ch. 128: 15.50	14.50	ch. 128: 15.50	14.50	ch. 128: 15.50	14.50		
		ch. 132: 15.50	14.50	ch. 132: 15.50	14.50	ch. 132: 15.50	14.50	ch. 132: 15.50	14.50	ch. 132: 15.50	14.50	ch. 132: 15.50	14.50	ch. 132: 15.50	14.50	ch. 132: 15.50	14.50	ch. 132: 15.50	14.50	ch. 132: 15.50	14.50		
ch. 136: 15.50	14.50	ch. 136: 15.50	14.50	ch. 136: 15.50	14.50	ch. 136: 15.50	14.50	ch. 136: 15.50	14.50	ch. 136: 15.50	14.50	ch. 136: 15.50	14.50	ch. 136: 15.50	14.50	ch. 136: 15.50	14.50	ch. 136: 15.50	14.50				
ch. 140: 16.00	15.00	ch. 140: 16.00	15.00	ch. 140: 16.00	15.00	ch. 140: 16.00	15.00	ch. 140: 16.00	15.00	ch. 140: 16.00	15.00	ch. 140: 16.00	15.00	ch. 140: 16.00	15.00	ch. 140: 16.00	15.00	ch. 140: 16.00	15.00				
UNII-3	16.50	15.50	ch. 140: 16.50	15.50	ch. 140: 16.50	15.50	ch. 140: 16.50	15.50	ch. 140: 16.50	15.50	16.50	15.50	ch. 140: 16.50	15.50	ch. 140: 16.50	15.50	ch. 140: 16.50	15.50	ch. 140: 16.50	15.50			
UNII-4	14.50	13.50	ch. 149: 16.00	15.00	ch. 149: 16.00	15.00	ch. 149: 16.00	15.00	ch. 149: 16.00	15.00	ch. 149: 16.00	15.00	ch. 149: 16.00	15.00	ch. 149: 16.00	15.00	ch. 149: 16.00	15.00	ch. 149: 16.00	15.00			
5 GHz WiFi (40MHz BW)	UNII-1	14.50	13.50	14.50	13.50	14.50	13.50	14.50	13.50	14.50	13.50	14.50	13.50	14.50	13.50	14.50	13.50	14.50	13.50	14.50	13.50		
	UNII-4	ch. 173: 13.50	12.50	ch. 173: 13.50	12.50	ch. 173: 13.50	12.50	ch. 173: 13.50	12.50	ch. 173: 13.50	12.50	ch. 173: 13.50	12.50	ch. 173: 13.50	12.50	ch. 173: 13.50	12.50	ch. 173: 13.50	12.50	ch. 173: 13.50	12.50		
	UNII-2A	ch. 177: 13.50	12.50	ch. 177: 13.50	12.50	ch. 177: 13.50	12.50	ch. 177: 13.50	12.50	ch. 177: 13.50	12.50	ch. 177: 13.50	12.50	ch. 177: 13.50	12.50	ch. 177: 13.50	12.50	ch. 177: 13.50	12.50	ch. 177: 13.50	12.50		
	UNII-2C	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50		
		ch. 38: 13.50	12.50	ch. 38: 13.50	12.50	ch. 38: 13.50	12.50	ch. 38: 13.50	12.50	ch. 38: 13.50	12.50	ch. 38: 13.50	12.50	ch. 38: 13.50	12.50	ch. 38: 13.50	12.50	ch. 38: 13.50	12.50	ch. 38: 13.50	12.50		
		17.00	16.00	17.00	16.00	17.00	16.00	17.00	16.00	17.00	16.00	17.00	16.00	17.00	16.00	17.00	16.00	17.00	16.00	17.00	16.00		
		ch. 62: 14.50	13.50	ch. 62: 14.50	13.50	ch. 62: 14.50	13.50	ch. 62: 14.50	13.50	ch. 62: 14.50	13.50	ch. 62: 14.50	13.50	ch. 62: 14.50	13.50	ch. 62: 14.50	13.50	ch. 62: 14.50	13.50	ch. 62: 14.50	13.50		
		16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50		
		ch. 102: 15.00	14.00	ch. 102: 15.00	14.00	ch. 102: 15.00	14.00	ch. 102: 15.00	14.00	ch. 102: 15.00	14.00	ch. 102: 15.00	14.00	ch. 102: 15.00	14.00	ch. 102: 15.00	14.00	ch. 102: 15.00	14.00	ch. 102: 15.00	14.00		
		ch. 110: 16.00	15.00	ch. 110: 16.00	15.00	ch. 110: 16.00	15.00	ch. 110: 16.00	15.00	ch. 110: 16.00	15.00	ch. 110: 16.00	15.00	ch. 110: 16.00	15.00	ch. 110: 16.00	15.00	ch. 110: 16.00	15.00	ch. 110: 16.00	15.00		
		ch. 142: 16.00	15.00	ch. 142: 16.00	15.00	ch. 142: 16.00	15.00	ch. 142: 16.00	15.00	ch. 142: 16.00	15.00	ch. 142: 16.00	15.00	ch. 142: 16.00	15.00	ch. 142: 16.00	15.00	ch. 142: 16.00	15.00	ch. 142: 16.00	15.00		
		16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50		
UNII-3		17.25	16.25	17.25	16.25	17.25	16.25	17.25	16.25	17.25	16.25	17.25	16.25	17.25	16.25	17.25	16.25	17.25	16.25	17.25	16.25		
UNII-1	13.00	12.00	13.00	12.00	13.00	12.00	13.00	12.00	13.00	12.00	13.00	12.00	13.00	12.00	13.00	12.00	13.00	12.00	13.00	12.00			
UNII-2A	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00	15.00	14.00			
5 GHz WiFi (80MHz BW)	UNII-2C	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50		
	UNII-3	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50	16.50	15.50		
	UNII-4	17.25	16.25	17.25	16.25	17.25	16.25	17.25	16.25	17.25	16.25	17.25	16.25	17.25	16.25	17.25	16.25	17.25	16.25	17.25	16.25		
	UNII-1/2A	10.00	9.00	10.00	9.00	10.00	9.00	10.00	9.00	10.00	9.00	10.00	9.00	10.00	9.00	10.00	9.00	10.00	9.00	10.00	9.00		
	UNII-2C	8.50	7.50	8.50	7.50	8.50	7.50	8.50	7.50	8.50	7.50	8.50	7.50	8.50	7.50	8.50	7.50	8.50	7.50	8.50	7.50		
	UNII-3/4	12.50	11.50	12.50	11.50	12.50	11.50	12.50	11.50	12.50	11.50	12.50	11.50	12.50	11.50	12.50	11.50	12.50	11.50	12.50	11.50		

FCC ID: C3K00002101	RF Exposure Part 1 Test Report		Approved by: Technical Manager
Document S/N: 1M2604150032-01.C3K (Rev1)	DUT Type: Wireless Module	This report is Blockchain Verified. To verify the report authenticity, please visit https://www.blockchain-verified.com or by clicking on the Blockchain logo	Page 9 of 54



2.4.3 6 GHz WLAN Output Power

The below table is applicable in the following conditions:

- LPI: Pmax
- DSI = 1 (Body)

Mode	Band	IEEE 802.11 Modulated/Frame Output Power (in dBm)											
		SISO / SISO in MIMO						SISO / SISO in MIMO					
		Antenna R						Antenna L					
		a		ax (SU)		be (SU)		a		ax (SU)		be (SU)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
6 GHz WIFI (20MHz BW) - LPI	UNII-5	-2.00	-3.00	-2.00	-3.00	-2.00	-3.00	-2.00	-3.00	-2.00	-3.00	-2.00	-3.00
	UNII-6	0.00	-1.00	0.00	-1.00	0.00	-1.00	0.00	-1.00	0.00	-1.00	0.00	-1.00
	UNII-7	-2.00	-3.00	-2.00	-3.00	-2.00	-3.00	-2.00	-3.00	-2.00	-3.00	-2.00	-3.00
	UNII-8	-3.50	-4.50	-8.50	-9.50	-8.50	-9.50	-3.50	-4.50	-8.50	-9.50	-8.50	-9.50
6 GHz WIFI (40MHz BW) - LPI	UNII-5			2.50	1.50	2.50	1.50			2.50	1.50	2.50	1.50
	UNII-6			3.50	2.50	3.50	2.50			3.50	2.50	3.50	2.50
	UNII-7			ch. 115: 2.50	1.50	ch. 115: 2.50	1.50			ch. 115: 2.50	1.50	ch. 115: 2.50	1.50
	UNII-8			2.50	1.50	2.50	1.50			2.50	1.50	2.50	1.50
6 GHz WIFI (80MHz BW) - LPI	UNII-5			6.00	5.00	6.00	5.00			6.00	5.00	6.00	5.00
	UNII-6			ch. 87: 5.50	4.50	ch. 87: 5.50	4.50			ch. 87: 5.50	4.50	ch. 87: 5.50	4.50
	UNII-7			6.50	5.50	6.50	5.50			6.50	5.50	6.50	5.50
	UNII-8			5.50	4.50	5.50	4.50			5.50	4.50	5.50	4.50
6 GHz WIFI (160MHz BW) - LPI	UNII-5			ch. 183: 3.50	2.50	ch. 183: 3.50	2.50			ch. 183: 3.50	2.50	ch. 183: 3.50	2.50
	UNII-6			3.50	2.50	3.50	2.50			3.50	2.50	3.50	2.50
	UNII-7			8.00	7.00	8.00	7.00			8.00	7.00	8.00	7.00
	UNII-8			8.00	7.00	8.00	7.00			8.00	7.00	8.00	7.00
6 GHz WIFI (320MHz BW) - LPI	UNII-5			ch. 175: 6.00	5.00	ch. 175: 6.00	5.00			ch. 175: 6.00	5.00	ch. 175: 6.00	5.00
	UNII-6			6.00	5.00	6.00	5.00			6.00	5.00	6.00	5.00
	UNII-7			11.00	10.00	11.00	10.00			11.00	10.00	11.00	10.00
	UNII-8			11.00	10.00	11.00	10.00			11.00	10.00	11.00	10.00
6 GHz WIFI (320MHz BW) - LPI	UNII-5			ch. 159: 8.50	7.50	ch. 159: 8.50	7.50			ch. 159: 8.50	7.50	ch. 159: 8.50	7.50
	UNII-6			8.50	7.50	8.50	7.50			8.50	7.50	8.50	7.50
	UNII-7			8.50	7.50	8.50	7.50			8.50	7.50	8.50	7.50
	UNII-8			8.50	7.50	8.50	7.50			8.50	7.50	8.50	7.50

The below table is applicable in the following conditions:

- SP: Pmax

Mode	Band	IEEE 802.11 Modulated/Frame Output Power (in dBm)											
		SISO / SISO in MIMO						SISO / SISO in MIMO					
		Antenna R						Antenna L					
		a		ax (SU)		be (SU)		a		ax (SU)		be (SU)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
6 GHz WIFI (20MHz BW) - SP	UNII-5	16.00	15.00	16.00	15.00	16.00	15.00	16.00	15.00	16.00	15.00	16.00	15.00
	UNII-7	ch. 181: 14.50	13.50	ch. 181: 14.50	13.50	ch. 181: 14.50	13.50	ch. 181: 14.50	13.50	ch. 181: 14.50	13.50	ch. 181: 14.50	13.50
6 GHz WIFI (40MHz BW) - SP	UNII-5			18.00	17.00	18.00	17.00			18.00	17.00	18.00	17.00
	UNII-7			18.00	17.00	18.00	17.00			18.00	17.00	18.00	17.00
6 GHz WIFI (80MHz BW) - SP	UNII-5			18.00	17.00	18.00	17.00			18.00	17.00	18.00	17.00
	UNII-6			ch. 7: 16.00	15.00	ch. 7: 16.00	15.00			ch. 7: 16.00	15.00	ch. 7: 16.00	15.00
	UNII-7			19.00	18.00	19.00	18.00			19.00	18.00	19.00	18.00
	UNII-8			ch. 119: 17.50	16.50	ch. 119: 17.50	16.50			ch. 119: 17.50	16.50	ch. 119: 17.50	16.50
6 GHz WIFI (160MHz BW) - SP	UNII-5			ch. 135: 17.50	16.50	ch. 135: 17.50	16.50			ch. 135: 17.50	16.50	ch. 135: 17.50	16.50
	UNII-7			18.50	17.50	18.50	17.50			18.50	17.50	18.50	17.50
6 GHz WIFI (320MHz BW) - SP	UNII-5			ch. 15: 16.00	15.00	ch. 15: 16.00	15.00			ch. 15: 16.00	15.00	ch. 15: 16.00	15.00
	UNII-7			ch. 47: 16.50	15.50	ch. 47: 16.50	15.50			ch. 47: 16.50	15.50	ch. 47: 16.50	15.50
6 GHz WIFI (320MHz BW) - SP	UNII-5			19.00	18.00	19.00	18.00			19.00	18.00	19.00	18.00
	UNII-7			18.00	17.00	18.00	17.00			18.00	17.00	18.00	17.00

FCC ID: C3K00002101	RF Exposure Part 1 Test Report						Approved by: Technical Manager	
Document S/N: 1M2604150032-01.C3K (Rev1)	DUT Type: Wireless Module	This report is Blockchain Verified. To verify the report authenticity, please visit https://www.blockchain-verified.com or by clicking on the Blockchain logo					Page 10 of 54	

The below table is applicable in the following conditions:

- SP: DSI = 1 (Body)

Mode	Band	IEEE 802.11 Modulated/Frame Output Power (in dBm)											
		SISO / SISO in MIMO						SISO / SISO in MIMO					
		Antenna R						Antenna L					
		a		ax (SU)		be (SU)		a		ax (SU)		be (SU)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
6 GHz WIFI (20MHz BW) - SP	UNII-5	12.00	11.00	12.00	11.00	12.00	11.00	12.00	11.00	12.00	11.00	12.00	11.00
	UNII-7	12.75	11.75	12.75	11.75	12.75	11.75	12.75	11.75	12.75	11.75	12.75	11.75
6 GHz WIFI (40MHz BW) - SP	UNII-5			12.00	11.00	12.00	11.00			12.00	11.00	12.00	11.00
	UNII-7			12.75	11.75	12.75	11.75			12.75	11.75	12.75	11.75
6 GHz WIFI (80MHz BW) - SP	UNII-5			12.00	11.00	12.00	11.00			12.00	11.00	12.00	11.00
	UNII-7			12.75	11.75	12.75	11.75			12.75	11.75	12.75	11.75
6 GHz WIFI (160MHz BW) - SP	UNII-5			12.00	11.00	12.00	11.00			12.00	11.00	12.00	11.00
	UNII-7			12.75	11.75	12.75	11.75			12.75	11.75	12.75	11.75
6 GHz WIFI (320MHz BW) - SP	UNII-5					12.00	11.00					12.00	11.00

2.4.4 2.4 GHz Maximum Bluetooth Output Power

The below table is applicable in the following conditions:

- Maximum Power, WLAN inactive

Mode	Data Rate	Modulated Output Power (in dBm)					
		Single Antenna				Each Chain in Dual Mode	
		Antenna R		Antenna L		MIMO	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.
Bluetooth	1Mbps	20.5	18.5	20.5	18.5	16.0	14.0
Bluetooth EDR	2Mbps	17.5	15.5	17.5	15.5	13.0	11.0
Bluetooth EDR	3Mbps	17.5	15.5	17.5	15.5	13.0	11.0
Bluetooth LE	1Mbps	19.5	17.5	19.5	17.5	13.5	11.5
Bluetooth LE	2Mbps	19.5	17.5	19.5	17.5	13.5	11.5
Bluetooth LE	125kbps	16.0	14.0	16.0	14.0	12.5	10.5
Bluetooth LE	500kbps	16.0	14.0	16.0	14.0	12.5	10.5

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2.4.5 2.4 GHz Bluetooth Output Power

The below table is applicable in the following conditions:

- WLAN active

Mode	Data Rate	Modulated Output Power (in dBm)					
		Single Antenna				Each Chain in Dual Mode	
		Antenna R		Antenna L		MIMO	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.
Bluetooth	1Mbps	18.0	16.0	18.0	16.0	16.0	14.0
Bluetooth EDR	2Mbps	17.5	15.5	17.5	15.5	13.0	11.0
Bluetooth EDR	3Mbps	17.5	15.5	17.5	15.5	13.0	11.0
Bluetooth LE	1Mbps	18.0	16.0	18.0	16.0	13.5	11.5
Bluetooth LE	2Mbps	18.0	16.0	18.0	16.0	13.5	11.5
Bluetooth LE	125kbps	16.0	14.0	16.0	14.0	12.5	10.5
Bluetooth LE	500kbps	16.0	14.0	16.0	14.0	12.5	10.5

2.5 DUT Antenna Locations

The overall dimensions of this device are > 200 mm. A diagram showing the location of the device antennas can be found in the DUT Antenna Diagram and SAR Test Setup Photographs Appendix. Exact dimensions and separation distances are shown in the Technical Descriptions in the FCC filings.

Table 2-1
Device Edges/Sides for SAR Testing

Antenna	Back	Front	Top	Bottom	Right	Left
R	No	No	No	Yes	No	No
L	No	No	No	Yes	No	No
MIMO	No	No	No	Yes	No	No

Note: Per FCC KDB Publication 616217 D04, only the back surface and antenna-containing edges requiring SAR evaluation were tested. Adjacent edges were evaluated in accordance with the SAR Test Exclusion Threshold in KDB 447498 and were excluded from standalone SAR testing where the exclusion criteria were satisfied. Additional edge configurations may have been considered for simultaneous transmission analysis, as applicable.

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2.6 Simultaneous Transmission Capabilities

According to FCC KDB Publication 447498 D04v01, transmitters are considered to be operating simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds.

This device contains multiple transmitters that may operate simultaneously and therefore requires a simultaneous transmission analysis according to FCC KDB Publication 447498 D04v01 4.3.2 procedures.

**Table 2-2
Simultaneous Transmission Scenarios**

No.	Capable Transmit Configuration	Body
1	2.4 GHz WLAN MIMO	Yes
2	5 GHz WLAN MIMO	Yes
3	6 GHz WLAN MIMO	Yes
4	2.4 GHz Bluetooth Beam Forming	Yes
5	2.4 GHz WLAN Ant R + 2.4 GHz Bluetooth Ant L	Yes
6	2.4 GHz Bluetooth Ant R + 2.4 GHz WLAN Ant L	Yes
7	5 GHz WLAN Ant R + 2.4 GHz Bluetooth Ant L	Yes
8	6 GHz WLAN Ant R + 2.4 GHz Bluetooth Ant L	Yes
9	2.4 GHz Bluetooth Ant R + 5 GHz WLAN Ant L	Yes
10	2.4 GHz Bluetooth Ant R + 6 GHz WLAN Ant L	Yes
11	5 GHz WLAN MIMO + 2.4 GHz Bluetooth Ant R	Yes
12	6 GHz WLAN MIMO + 2.4 GHz Bluetooth Ant R	Yes
13	5 GHz WLAN MIMO + 2.4 GHz Bluetooth Ant L	Yes
14	6 GHz WLAN MIMO + 2.4 GHz Bluetooth Ant L	Yes
15	2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO	Yes
16	2.4 GHz WLAN MIMO + 6 GHz WLAN MIMO	Yes
17	2.4 GHz WLAN Ant R + 5 GHz WLAN MIMO	Yes
18	2.4 GHz WLAN Ant R + 6 GHz WLAN MIMO	Yes
19	2.4 GHz WLAN Ant L + 5 GHz WLAN MIMO	Yes
20	2.4 GHz WLAN Ant L + 6 GHz WLAN MIMO	Yes
21	2.4 GHz Bluetooth Ant R + 2.4 GHz WLAN Ant L + 5 GHz WLAN Ant L	Yes
22	2.4 GHz Bluetooth Ant R + 2.4 GHz WLAN Ant L + 6 GHz WLAN Ant L	Yes
23	2.4 GHz WLAN Ant R + 5 GHz WLAN Ant R + 2.4 GHz Bluetooth Ant L	Yes
24	2.4 GHz WLAN Ant R + 6 GHz WLAN Ant R + 2.4 GHz Bluetooth Ant L	Yes
25	5 GHz WLAN MIMO + 2.4 GHz Bluetooth Ant R + 2.4 GHz WLAN Ant L	Yes
26	6 GHz WLAN MIMO + 2.4 GHz Bluetooth Ant R + 2.4 GHz WLAN Ant L	Yes
27	5 GHz WLAN MIMO + 2.4 GHz WLAN Ant R + 2.4 GHz Bluetooth Ant L	Yes
28	6 GHz WLAN MIMO + 2.4 GHz WLAN Ant R + 2.4 GHz Bluetooth Ant L	Yes
29	2.4 GHz WLAN Ant R + 5 GHz WLAN Ant L	Yes
30	2.4 GHz WLAN Ant R + 6 GHz WLAN Ant L	Yes
31	5 GHz WLAN Ant R + 2.4 GHz WLAN Ant L	Yes
32	6 GHz WLAN Ant R + 2.4 GHz WLAN Ant L	Yes
33	5 GHz WLAN Ant L + 2.4 GHz Bluetooth Ant L	Yes
34	6 GHz WLAN Ant L + 2.4 GHz Bluetooth Ant L	Yes
35	5 GHz WLAN Ant R + 2.4 GHz Bluetooth Ant R	Yes
36	6 GHz WLAN Ant R + 2.4 GHz Bluetooth Ant R	Yes
37	2.4 GHz WLAN MIMO + 5 GHz WLAN Ant R	Yes
38	2.4 GHz WLAN MIMO + 6 GHz WLAN Ant R	Yes
39	2.4 GHz WLAN MIMO + 5 GHz WLAN Ant L	Yes
40	2.4 GHz WLAN MIMO + 6 GHz WLAN Ant L	Yes
41	2.4 GHz WLAN Ant L + 5 GHz WLAN Ant L	Yes
42	2.4 GHz WLAN Ant L + 6 GHz WLAN Ant L	Yes
43	2.4 GHz WLAN Ant R + 5 GHz WLAN Ant R	Yes
44	2.4 GHz WLAN Ant R + 6 GHz WLAN Ant R	Yes
45	5 GHz WLAN MIMO + 2.4 GHz Bluetooth Beam Forming	Yes
46	6 GHz WLAN MIMO + 2.4 GHz Bluetooth Beam Forming	Yes

1. 2.4 GHz WLAN Antenna R and 2.4 GHz Bluetooth Ant R share the same antenna path and cannot transmit simultaneously.
2. 2.4 GHz WLAN Antenna L and 2.4 GHz Bluetooth Ant L share the same antenna path and cannot transmit simultaneously.
3. 5 GHz WLAN and 6 GHz WLAN share the same antenna path and cannot transmit simultaneously.
4. This device supports 2x2 MIMO Tx for WLAN 802.11b/a/g/n/ac/ax/be. 802.11b/a/g/n/ac/ax/be supports CDD and STBC and 802.11n/ac/ax/be additionally supports SDM.
5. This device supports Bluetooth Tethering.

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2.7 Miscellaneous SAR Test Considerations

(A) WIFI/BT

When U-NII-1 and U-NII-2A bands have the same maximum output power and the highest reported SAR for U-NII-2A is less than 1.2 W/kg, SAR is not required for U-NII-1 band according to FCC KDB Publication 248227 D01v02r02.

This device supports IEEE 802.11ac with the following features:

- a) Up to 160 MHz Bandwidth only
- b) No aggregate channel configurations
- c) 2 Tx antenna output
- d) 256 QAM is supported
- e) TDWR and Band gap channels are supported

This device supports IEEE 802.11ax/be with the following features:

- a) Up to 320 MHz Bandwidth only for 6 GHz
- b) Up to 160 MHz Bandwidth only for 5 GHz
- c) Up to 40 MHz Bandwidth only for 2.4 GHz
- d) 2 Tx antenna output
- e) Up to 1024 QAM is supported
- f) TDWR and Band gap channels are supported for 5/6 GHz
- g) MU-MIMO UL Operations are not supported

Per FCC Guidance, 802.11ax/be RU/MRU was considered a higher order 802.11 mode when compared to a/b/g/n/ac/be to apply KDB Publication 248227 D01v02r02 for OFDM mode selection. Therefore, SAR tests were not required for 802.11ax/be RU/MRU based on the maximum allowed output powers of OFDM modes and the reported SAR values. Per FCC Guidance, maximum conducted powers were performed for each RU/MRU size to demonstrate that the output powers would not be higher than the other OFDM 802.11 modes. Please see RU/MRU SAR Exclusion Appendix for 802.11ax/be RU/MRU output powers.

This device supports channel 1-13 for 2.4 GHz WLAN. However, because channel 12/13 targets are not higher than that of channels 1-11, channels 1, 6, and 11 were considered for SAR testing per FCC KDB 248227 D01V02r02.

Per FCC guidance, SAR was performed using 6.5 GHz SAR probe calibration factors. FCC KDB 648474 and FCC KDB 248227 were followed for test positions, distances, and modes. Per TCB Workshop October 2020 notes, channels were tested to cover the full frequency range. Absorbed Power Density (APD) using a 4 cm² averaging area is reported based on SAR measurements. Incident Power Density (IPD) is evaluated at a 2 mm evaluation distance in accordance with the applicable FCC guidance. Power density results are scaled to account for measurement uncertainty when the uncertainty exceeds 30%.

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2.8 Guidance Applied

- IEEE 1528-2013
- FCC KDB Publication 248227 D01v02r02 (SAR Considerations for 802.11 Devices)
- FCC KDB Publication 447498 D04v01 (Interim General SAR Guidance)
- FCC KDB Publication 865664 D01v01r04, D02v01r02 (SAR Measurements up to 6 GHz)
- FCC KDB Publication 616217 D04v01r02
- FCC KDB Publication 388624 D02 (SAR Measurement over 6 GHz)
- IEC/IEEE 63195-1:2022
- IEC 62479:2010
- November 2017, October 2018, April 2019, November 2019, October 2020 TCB Workshop Notes (IEEE 802.11ax/be)
- SPEAG DASY6 System Handbook
- SPEAG DASY6 Application Note (Interim Procedures for Devices Operating at 6-10 GHz) (Nov 2021)

2.9 Device Serial Numbers

Several samples with identical hardware were used to support SAR testing. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units. The serial numbers used for each test are indicated alongside the results in Section 10 and Section 11.

2.10 Bibliography

Report Type	Report Serial Number
RF Exposure Part 2 Test Report	1M2604150032-03.C3K
RF Exposure Compliance Summary Report	1M2604150032-04.C3K
RF Exposure Part 0 Test Report	1M2604150032-02.C3K

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3 INTRODUCTION

The FCC and Innovation, Science, and Economic Development Canada have adopted the guidelines for evaluating the environmental effects of radio frequency (RF) radiation in ET Docket 93-62 on Aug. 6, 1996 and Health Canada Safety Code 6 to protect the public and workers from the potential hazards of RF emissions due to FCC-regulated portable devices. [1]

The safety limits used for the environmental evaluation measurements are based on the criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (SAR) in IEEE/ANSI C95.1-1992 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz [3] and Health Canada RF Exposure Guidelines Safety Code 6 [22]. The measurement procedure described in IEEE/ANSI C95.3-2002 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave [4] is used for guidance in measuring the Specific Absorption Rate (SAR) due to the RF radiation exposure from the Device Under Test (DUT). These criteria for SAR evaluation are similar to those recommended by the International Committee for Non-Ionizing Radiation Protection (ICNIRP) in Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields,” Report No. Vol 74. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards.

3.1 SAR Definition

Specific Absorption Rate is defined as the time derivative (rate) of the incremental energy (dU) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dV) of a given density (ρ). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body (see Equation 3-1).

Equation 3-1
SAR Mathematical Equation

$$SAR = \frac{d}{dt} \left(\frac{dU}{dm} \right) = \frac{d}{dt} \left(\frac{dU}{\rho dv} \right)$$

SAR is expressed in units of Watts per Kilogram (W/kg).

$$SAR = \frac{\sigma \cdot E^2}{\rho}$$

where:

- σ = conductivity of the tissue-simulating material (S/m)
- ρ = mass density of the tissue-simulating material (kg/m³)
- E = Total RMS electric field strength (V/m)

NOTE: The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relation to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane.[6]

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4 DOSIMETRIC ASSESSMENT

4.1 Measurement Procedure

The evaluation was performed using the following procedure compliant to FCC KDB Publication 865664 D01v01r04 and IEEE 1528-2013:

1. The SAR distribution at the exposed side of the head or body was measured at a distance no greater than 5.0 mm from the inner surface of the shell. The area covered the entire dimension of the device-head and body interface and the horizontal grid resolution was determined per FCC KDB Publication 865664 D01v01r04 (See Table 4-1) and IEEE 1528-2013.
2. The point SAR measurement was taken at the maximum SAR region determined from Step 1 to enable the monitoring of SAR fluctuations/drifts during the 1g/10g cube evaluation. SAR at this fixed point was measured and used as a reference value.
3. Based on the area scan data, the peak of the region with maximum SAR was determined by spline interpolation. Around this point, a volume was assessed according to the measurement resolution and volume size requirements of FCC KDB Publication 865664 D01v01r04 (See Table 4-1) and IEEE 1528-2013. On the basis of this data set, the spatial peak SAR value was evaluated with the following procedure (see references or the DASY manual online for more details):
 - a. SAR values at the inner surface of the phantom are extrapolated from the measured values along the line away from the surface with spacing no greater than that in Table 4-1. The extrapolation was based on a least-squares algorithm. A polynomial of the fourth order was calculated through the points in the z-axis (normal to the phantom shell).
 - b. After the maximum interpolated values were calculated between the points in the cube, the SAR was averaged over the spatial volume (1g or 10g) using a 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the “Not a knot” condition (in x, y, and z directions). The volume was then integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were obtained through interpolation, in order to calculate the averaged SAR.
 - c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.
4. The SAR reference value, at the same location as step 2, was re-measured after the zoom scan was complete to calculate the SAR drift. If the drift deviated by more than 5%, the SAR test and drift measurements were repeated.

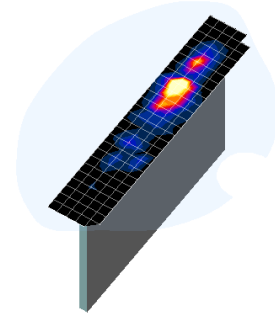


Figure 4-1
Sample SAR Area Scan

Table 4-1
Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v01r04*

Frequency	Maximum Area Scan Resolution (mm) ($\Delta x_{\text{area}}, \Delta y_{\text{area}}$)	Maximum Zoom Scan Resolution (mm) ($\Delta x_{\text{zoomTV}}, \Delta y_{\text{zoom}}$)	Maximum Zoom Scan Spatial Resolution (mm)			Minimum Zoom Scan Volume (mm) (x,y,z)
			Uniform Grid	Graded Grid		
				$\Delta z_{\text{zoom}}(n)$	$\Delta z_{\text{zoom}}(1)^*$	
≤ 2 GHz	≤ 15	≤ 8	≤ 5	≤ 4	≤ 1.5* $\Delta z_{\text{zoom}}(n-1)$	≥ 30
2-3 GHz	≤ 12	≤ 5	≤ 5	≤ 4	≤ 1.5* $\Delta z_{\text{zoom}}(n-1)$	≥ 30
3-4 GHz	≤ 12	≤ 5	≤ 4	≤ 3	≤ 1.5* $\Delta z_{\text{zoom}}(n-1)$	≥ 28
4-5 GHz	≤ 10	≤ 4	≤ 3	≤ 2.5	≤ 1.5* $\Delta z_{\text{zoom}}(n-1)$	≥ 25
5-6 GHz	≤ 10	≤ 4	≤ 2	≤ 2	≤ 1.5* $\Delta z_{\text{zoom}}(n-1)$	≥ 22

*Also compliant to IEEE 1528-2013 Table 6

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5 TEST CONFIGURATION POSITIONS

5.1 Device Holder

The device holder is made out of low-loss POM material having the following dielectric parameters: relative permittivity $\epsilon = 3$ and loss tangent $\delta = 0.02$.

5.2 SAR Testing per KDB Publication 616217 D04v01r02

Per FCC KDB Publication 616217 D04v01r02, for devices containing a keyboard, SAR is required for the bottom surface. For devices with overall dimensions $>200\text{mm}$, the back surface and edges of the device should be tested for SAR compliance with the device touching the phantom. The SAR Exclusion Threshold in KDB 447498 D04v01 can be applied to determine SAR test exclusion for adjacent edge configurations. The closest distance from the antenna to an adjacent edge is used to determine if SAR testing is required for the adjacent edges, with the adjacent edge positioned against the phantom and the edge containing the antenna positioned perpendicular to the phantom. Please see the exact antenna locations shown in the Technical Descriptions document.

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6 RF EXPOSURE LIMITS

6.1 Uncontrolled Environment

UNCONTROLLED ENVIRONMENTS are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

6.2 Controlled Environment

CONTROLLED ENVIRONMENTS are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

6.3 RF Exposure Limits for Frequencies Below 6 GHz

Table 6-1
SAR Human Exposure Specified in ANSI/IEEE C95.1-1992 and Health Canada Safety Code 6

HUMAN EXPOSURE LIMITS		
	UNCONTROLLED ENVIRONMENT <i>General Population</i> (W/kg) or (mW/g)	CONTROLLED ENVIRONMENT <i>Occupational</i> (W/kg) or (mW/g)
Peak Spatial Average SAR Head	1.6	8.0
Whole Body SAR	0.08	0.4
Peak Spatial Average SAR Hands, Feet, Ankle, Wrists, etc.	4.0	20

1. The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.
2. The Spatial Average value of the SAR averaged over the whole body.
3. The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

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6.4 RF Exposure Limits for Frequencies Above 6 GHz

Per §1.1310 (d)(3), the MPE limits are applied for frequencies above 6 GHz. Power Density is expressed in units of W/m² or mW/cm².

Peak Spatially Averaged Power Density was evaluated over a circular area of 4 cm² per interim FCC Guidance for near-field power density evaluations per October 2018 TCB Workshop notes.

Table 6-2
Human Exposure Limits Specified in FCC 47 CFR §1.1310

Human Exposure to Radiofrequency (RF) Radiation Limits		
Frequency Range [MHz]	Power Density [mW/cm ²]	Average Time [Minutes]
(A) Limits For Occupational / Controlled Environments		
1,500 – 100,000	5.0	6
(B) Limits For General Population / Uncontrolled Environments		
1,500 – 100,000	1.0	30

Note: 1.0 mW/cm² is 10 W/m²

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7 FCC MEASUREMENT PROCEDURES

7.1 Measured and Reported SAR

Per FCC KDB Publication 447498 D04v01, when SAR is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance. For simultaneous transmission, the measured aggregate SAR must be scaled according to the sum of the differences between the maximum tune-up tolerance and actual power used to test each transmitter. When SAR is measured at or scaled to the maximum tune-up tolerance limit, the results are referred to as *reported* SAR. The highest *reported* SAR results are identified on the grant of equipment authorization according to procedures in KDB 690783 D01v01r03.

7.2 SAR Testing with 802.11 Transmitters

The normal network operating configurations of 802.11 transmitters are not suitable for SAR measurements. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure the results are consistent and reliable. See KDB Publication 248227 D01v02r02 for more details.

7.2.1 General Device Setup

Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in test mode for SAR measurements must be identical to those programmed in production units, including output power levels, amplifier gain settings and other RF performance tuning parameters.

A periodic duty factor is required for current generation SAR systems to measure SAR. When 802.11 frame gaps are accounted for in the transmission, a maximum transmission duty factor of 92 - 96% is typically achievable in most test mode configurations. A minimum transmission duty factor of 85% is required to avoid certain hardware and device implementation issues related to wide range SAR scaling. The reported SAR is scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

7.2.2 U-NII-1 and U-NII-2A

For devices that operate in both U-NII-1 and U-NII-2A bands, when the same maximum output power is specified for both bands, SAR measurement using OFDM SAR test procedures is not required for U-NII-1 unless the highest reported SAR for U-NII-2A is > 1.2 W/kg. When different maximum output powers are specified for the bands, SAR measurement for the U-NII band with the lower maximum output power is not required unless the highest reported SAR for the U-NII band with the higher maximum output power, adjusted by the ratio of lower to higher specified maximum output power for the two bands, is > 1.2 W/kg. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

7.2.3 U-NII-2C and U-NII-3

The frequency range covered by U-NII-2C and U-NII-3 is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. When Terminal Doppler Weather Radar (TDWR) restriction applies, the channels at 5.60 – 5.65 GHz in U-NII-2C band must be disabled with acceptable mechanisms and documented in the equipment certification. Unless band gap channels are permanently disabled, SAR must be considered for these channels. Each band is tested independently according to the normally required OFDM SAR measurement and probe calibration frequency points requirements.

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7.2.4 2.4 GHz SAR Test Requirements

SAR is measured for 2.4 GHz 802.11b DSSS using either the fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:

- 1) When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
- 2) When the reported SAR is > 0.8 W/kg, SAR is required for that position using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

2.4 GHz 802.11 g/n/ax OFDM are additionally evaluated for SAR if the highest reported SAR for 802.11b, adjusted by the ratio of the OFDM to DSSS specified maximum output power, is > 1.2 W/kg. When SAR is required for OFDM modes in 2.4 GHz band, the Initial Test Configuration Procedures should be followed. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

7.2.5 OFDM Transmission Mode and SAR Test Channel Selection

When the same maximum output power was specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration with the largest channel bandwidth, lowest order modulation and lowest data rate. When the maximum output power of a channel is the same for equivalent OFDM configurations; for example, 802.11a, 802.11n and 802.11ac or 802.11g and 802.11n with the same channel bandwidth, modulation and data rate etc., the lower order 802.11 mode i.e., 802.11a, then 802.11n and 802.11ac or 802.11g then 802.11n, is used for SAR measurement. Per April 2019 TCB Workshop guidance, 802.11ax was considered the highest order 802.11 mode. When the maximum output power are the same for multiple test channels, either according to the default or additional power measurement requirements, SAR is measured using the channel closest to the middle of the frequency band or aggregated band. When there are multiple channels with the same maximum output power, SAR is measured using the higher number channel.

7.2.6 Initial Test Configuration Procedure

For OFDM, an initial test configuration is determined for each frequency band and aggregated band, according to the transmission mode with the highest maximum output power specified for SAR measurements. When the same maximum output power is specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration(s) with the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order IEEE 802.11 mode. The channel of the transmission mode with the highest average RF output conducted power will be the initial test configuration.

When the reported SAR is ≤ 0.8 W/kg, no additional measurements on other test channels are required. Otherwise, SAR is evaluated using the subsequent highest average RF output channel until the reported SAR result is ≤ 1.2 W/kg or all channels are measured. When there are multiple untested channels having the same subsequent highest average RF output power, the channel with higher frequency from the lowest 802.11 mode is considered for SAR measurements (See Section 7.2.5). When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

7.2.7 Subsequent Test Configuration Procedures

For OFDM configurations in each frequency band and aggregated band, SAR is evaluated for initial test configuration using the fixed test position or the initial test position procedure. When the highest reported SAR

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(for the initial test configuration), adjusted by the ratio of the specified maximum output power of the subsequent test configuration to initial test configuration, is ≤ 1.2 W/kg, no additional SAR tests for the subsequent test configurations are required. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

7.2.8 MIMO SAR considerations

Per KDB Publication 248227 D01v02r02, the simultaneous SAR provisions in KDB Publication 447498 D04v01 should be applied to determine simultaneous transmission SAR test exclusion for WIFI MIMO. If the sum of 1g single transmission chain SAR measurements is < 1.6 W/kg, no additional SAR measurements for MIMO are required. Alternatively, SAR for MIMO can be measured with all antennas transmitting simultaneously at the specified maximum output power of MIMO operation. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

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8 RF CONDUCTED POWERS

8.1 WLAN Conducted Powers

Table 8-1
2.4 GHz WLAN Measured Pmax Average Power for DSI = 1 – Antenna R

2.4GHz WIFI (20MHz 802.11b SISO ANT R)			
Freq. [MHz]	Channel	Detector	Conducted Power [dBm]
2412	1	Average	18.32
2437	6		18.34
2462	11		18.14
2467	12		15.49
2472	13		7.91

2.4GHz WIFI (20MHz 802.11g SISO ANT R)			
Freq. [MHz]	Channel	Detector	Conducted Power [dBm]
2412	1	Average	15.28
2417	2		17.48
2422	3		18.57
2427	4		19.86
2437	6		19.95
2457	10		19.69
2462	11		14.96
2467	12		12.15
2472	13		-8.21

2.4GHz WIFI (20MHz 802.11n SISO ANT R)			
Freq. [MHz]	Channel	Detector	Conducted Power [dBm]
2412	1	Average	15.82
2417	2		18.07
2422	3		19.25
2437	6		18.81
2457	10		18.54
2462	11		13.99
2467	12		11.66
2472	13		-9.62

2.4GHz WIFI (20MHz 802.11ac SISO ANT R)			
Freq. [MHz]	Channel	Detector	Conducted Power [dBm]
2412	1	Average	15.81
2417	2		18.09
2422	3		19.28
2437	6		18.79
2457	10		18.53
2462	11		13.99
2467	12		11.67
2472	13		-9.61

2.4GHz WIFI (20MHz 802.11ax SU SISO ANT R)			
Freq. [MHz]	Channel	Detector	Conducted Power [dBm]
2412	1	Average	15.92
2417	2		18.20
2422	3		19.40
2437	6		18.93
2457	10		18.66
2462	11		13.62
2467	12		11.78
2472	13		-10.04

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Table 8-2
2.4 GHz WLAN Measured Pmax Average Power for DSI = 1 – Antenna L

2.4GHz WIFI (20MHz 802.11b SISO ANT L)			
Freq. [MHz]	Channel	Detector	Conducted Power [dBm]
2412	1	Average	18.35
2437	6		18.03
2462	11		18.08
2467	12		15.39
2472	13		7.81

2.4GHz WIFI (20MHz 802.11g SISO ANT L)			
Freq. [MHz]	Channel	Detector	Conducted Power [dBm]
2412	1	Average	15.28
2417	2		16.32
2422	3		17.51
2427	4		19.53
2437	6		20.11
2457	10		19.53
2462	11		14.96
2467	12		11.17
2472	13		-8.45

2.4GHz WIFI (20MHz 802.11n SISO ANT L)			
Freq. [MHz]	Channel	Detector	Conducted Power [dBm]
2412	1	Average	15.84
2417	2		17.00
2422	3		18.13
2437	6		18.71
2457	10		18.67
2462	11		13.97
2467	12		10.74
2472	13		-9.84

2.4GHz WIFI (20MHz 802.11ac SISO ANT L)			
Freq. [MHz]	Channel	Detector	Conducted Power [dBm]
2412	1	Average	15.95
2417	2		17.01
2422	3		18.09
2437	6		18.71
2457	10		18.67
2462	11		13.97
2467	12		10.73
2472	13		-9.85

2.4GHz WIFI (20MHz 802.11ax SU SISO ANT L)			
Freq. [MHz]	Channel	Detector	Conducted Power [dBm]
2412	1	Average	15.96
2417	2		17.00
2422	3		18.12
2437	6		18.81
2457	10		18.75
2462	11		13.54
2467	12		10.76
2472	13		-10.27

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Table 8-3
2.4 GHz WLAN Measured Pmax Average Power for DSI = 1 – MIMO

2.4GHz WIFI (20MHz 802.11b MIMO)					
Freq [MHz]	Channel	Detector	Conducted Power [dBm]		
			ANT1	ANT2	MIMO
2412	1	Average	18.27	18.31	21.30
2437	6		18.22	17.99	21.12
2462	11		18.11	18.03	21.08
2467	12		15.42	15.36	18.40
2472	13		7.81	7.74	10.79

2.4GHz WIFI (20MHz 802.11g MIMO)					
Freq [MHz]	Channel	Detector	Conducted Power [dBm]		
			ANT1	ANT2	MIMO
2412	1	Average	15.13	15.25	18.20
2417	2		17.56	16.87	20.24
2422	3		18.67	17.96	21.34
2427	4		19.63	19.84	22.75
2437	6		20.29	20.06	23.19
2457	10		19.99	20.03	23.02
2462	11		14.72	14.93	17.84
2467	12		11.81	11.12	14.49
2472	13		-9.06	-8.46	-5.74

2.4GHz WIFI (20MHz 802.11n MIMO)					
Freq [MHz]	Channel	Detector	Conducted Power [dBm]		
			ANT1	ANT2	MIMO
2412	1	Average	15.77	15.83	18.81
2417	2		17.64	16.99	20.34
2422	3		18.68	18.08	21.40
2437	6		18.71	18.67	21.70
2457	10		18.52	18.64	21.59
2462	11		13.97	13.91	16.95
2467	12		11.36	11.67	14.53
2472	13		-10.45	-9.83	-7.12

2.4GHz WIFI (20MHz 802.11ac MIMO)					
Freq [MHz]	Channel	Detector	Conducted Power [dBm]		
			ANT1	ANT2	MIMO
2412	1	Average	15.81	15.83	18.83
2417	2		17.64	16.98	20.33
2422	3		18.71	18.10	21.43
2437	6		18.79	18.65	21.73
2457	10		18.51	18.61	21.57
2462	11		13.96	13.91	16.95
2467	12		11.38	10.65	14.04
2472	13		-10.47	-9.84	-7.13

2.4GHz WIFI (20MHz 802.11ax MIMO)					
Freq [MHz]	Channel	Detector	Conducted Power [dBm]		
			ANT1	ANT2	MIMO
2412	1	Average	15.91	15.91	18.92
2417	2		17.93	16.99	20.50
2422	3		18.78	18.09	21.46
2437	6		18.88	18.76	21.83
2457	10		18.61	18.70	21.67
2462	11		14.06	14.00	17.04
2467	12		11.47	10.71	14.12
2472	13		-10.93	-10.26	-7.57

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Table 8-4
5 GHz WLAN Measured Plimit Average Power for DSI = 1 – Antenna R

5GHz WIFI (40MHz 802.11n SISO ANT R)			
Band	Freq. [MHz]	Channel	Avg. Conducted Power [dBm]
UNII-1	5190	38	12.29
	5230	46	15.35
UNII-2A	5270	54	16.04
	5310	62	13.46

5GHz WIFI (40MHz 802.11ac SISO ANT R)			
Band	Freq. [MHz]	Channel	Avg. Conducted Power [dBm]
UNII-1	5190	38	12.29
	5230	46	15.32
UNII-2A	5270	54	16.02
	5310	62	13.44

5GHz WIFI (40MHz 802.11ax SU SISO ANT R)			
Band	Freq. [MHz]	Channel	Avg. Conducted Power [dBm]
UNII-1	5190	38	12.31
	5230	46	15.38
UNII-2A	5270	54	16.00
	5310	62	13.41

5GHz WIFI (40MHz 802.11be SU SISO ANT R)			
Band	Freq. [MHz]	Channel	Avg. Conducted Power [dBm]
UNII-1	5190	38	12.28
	5230	46	15.35
UNII-2A	5270	54	16.03
	5310	62	13.42

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5GHz WIFI (80MHz 802.11ac SISO ANT R)			
Band	Freq. [MHz]	Channel	Avg. Conducted Power [dBm]
UNII-2C	5530	106	13.31
	5610	122	15.25
	5690	138	15.24
UNII-3	5775	155	15.31
UNII-4	5855	171	15.86

5GHz WIFI (80MHz 802.11ax SU SISO ANT R)			
Band	Freq. [MHz]	Channel	Avg. Conducted Power [dBm]
UNII-2C	5530	106	13.36
	5610	122	15.26
	5690	138	15.29
UNII-3	5775	155	15.38
UNII-4	5855	171	15.92

5GHz WIFI (80MHz 802.11be SU SISO ANT R)			
Band	Freq. [MHz]	Channel	Avg. Conducted Power [dBm]
UNII-2C	5530	106	13.38
	5610	122	15.29
	5690	138	15.27
UNII-3	5775	155	15.37
UNII-4	5855	171	15.93

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Table 8-5
5 GHz WLAN Measured Plimit Average Power for DSI = 1 – Antenna L

5GHz WIFI (40MHz 802.11n SISO ANT L)			
Band	Freq. [MHz]	Channel	Avg. Conducted Power [dBm]
UNII-1	5190	38	13.10
	5230	46	16.09
UNII-2A	5270	54	16.68
	5310	62	14.14

5GHz WIFI (40MHz 802.11ac SISO ANT L)			
Band	Freq. [MHz]	Channel	Avg. Conducted Power [dBm]
UNII-1	5190	38	13.12
	5230	46	16.11
UNII-2A	5270	54	16.66
	5310	62	14.12

5GHz WIFI (40MHz 802.11ax SU SISO ANT L)			
Band	Freq. [MHz]	Channel	Avg. Conducted Power [dBm]
UNII-1	5190	38	13.09
	5230	46	16.08
UNII-2A	5270	54	16.64
	5310	62	14.10

5GHz WIFI (40MHz 802.11be SU SISO ANT L)			
Band	Freq. [MHz]	Channel	Avg. Conducted Power [dBm]
UNII-1	5190	38	13.10
	5230	46	16.05
UNII-2A	5270	54	16.65
	5310	62	14.09

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5GHz WIFI (80MHz 802.11ac SISO ANT L)			
Band	Freq. [MHz]	Channel	Avg. Conducted Power [dBm]
UNII-2C	5530	106	13.91
	5610	122	15.77
	5690	138	15.72
UNII-3	5775	155	15.74
UNII-4	5855	171	16.15

5GHz WIFI (80MHz 802.11ax SU SISO ANT L)			
Band	Freq. [MHz]	Channel	Avg. Conducted Power [dBm]
UNII-2C	5530	106	13.93
	5610	122	15.83
	5690	138	15.71
UNII-3	5775	155	15.76
UNII-4	5855	171	16.17

5GHz WIFI (80MHz 802.11be SU SISO ANT L)			
Band	Freq. [MHz]	Channel	Avg. Conducted Power [dBm]
UNII-2C	5530	106	13.96
	5610	122	15.84
	5690	138	15.70
UNII-3	5775	155	15.87
UNII-4	5855	171	16.18

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Table 8-6
5 GHz WLAN Measured Plimit Average Power for DSI = 1 – MIMO

5GHz WIFI (40MHz 802.11n MIMO)					
Band	Freq [MHz]	Channel	Avg. Conducted Powers [dBm]		
			ANT1	ANT2	MIMO
UNII-1	5190	38	12.72	13.18	15.97
	5230	46	15.74	16.13	18.95
UNII-2A	5270	54	16.27	16.72	19.51
	5310	62	13.70	14.34	17.04

5GHz WIFI (40MHz 802.11ac MIMO)					
Band	Freq [MHz]	Channel	Avg. Conducted Powers [dBm]		
			ANT1	ANT2	MIMO
UNII-1	5190	38	12.78	13.18	15.99
	5230	46	15.83	16.21	19.03
UNII-2A	5270	54	16.29	16.76	19.54
	5310	62	13.73	14.34	17.06

5GHz WIFI (40MHz 802.11ax MIMO)					
Band	Freq [MHz]	Channel	Avg. Conducted Powers [dBm]		
			ANT1	ANT2	MIMO
UNII-1	5190	38	12.67	13.20	15.95
	5230	46	15.76	16.21	19.00
UNII-2A	5270	54	16.22	16.71	19.48
	5310	62	13.63	14.31	16.99

5GHz WIFI (40MHz 802.11be MIMO)					
Band	Freq [MHz]	Channel	Avg. Conducted Powers [dBm]		
			ANT1	ANT2	MIMO
UNII-1	5190	38	12.71	13.11	15.92
	5230	46	15.68	16.13	18.92
UNII-2A	5270	54	16.25	16.74	19.51
	5310	62	13.65	14.30	17.00

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5GHz WIFI (80MHz 802.11ac MIMO)					
Band	Freq [MHz]	Channel	Avg. Conducted Powers [dBm]		
			ANT1	ANT2	MIMO
UNII-2C	5530	106	13.58	13.90	16.75
	5610	122	15.38	15.70	18.55
	5690	138	15.43	15.61	18.53
UNII-3	5775	155	15.44	15.82	18.64
UNII-4	5855	171	15.84	16.31	19.09

5GHz WIFI (80MHz 802.11ax MIMO)					
Band	Freq [MHz]	Channel	Avg. Conducted Powers [dBm]		
			ANT1	ANT2	MIMO
UNII-2C	5530	106	13.69	13.96	16.84
	5610	122	15.56	15.77	18.68
	5690	138	15.53	15.81	18.68
UNII-3	5775	155	15.48	15.87	18.69
UNII-4	5855	171	15.99	16.24	19.13

5GHz WIFI (80MHz 802.11be MIMO)					
Band	Freq [MHz]	Channel	Avg. Conducted Powers [dBm]		
			ANT1	ANT2	MIMO
UNII-2C	5530	106	13.61	13.95	16.79
	5610	122	15.51	15.78	18.66
	5690	138	15.48	15.85	18.68
UNII-3	5775	155	15.55	15.91	18.74
UNII-4	5855	171	15.98	16.27	19.14

Table 8-7
6 GHz WLAN Measured Plimit Average Power for DSI = 1 – Antenna R

6GHz WIFI (320MHz 802.11be SU SISO ANT R)			
Band	Freq. [MHz]	Channel	Avg. Conducted Power [dBm]
UNII-5	6105	31	10.45
UNII-5	6265	63	10.79
UNII-6	6425	95	9.60
UNII-8	6905	191	7.55

6GHz WIFI (160MHz 802.11ax SU SISO ANT R)			
Band	Freq. [MHz]	Channel	Avg. Conducted Power [dBm]
UNII 7	6665	143	11.48

6GHz WIFI (160MHz 802.11be SU SISO ANT R)			
Band	Freq. [MHz]	Channel	Avg. Conducted Power [dBm]
UNII 7	6665	143	11.38

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Table 8-8
6 GHz WLAN Measured Plimit Average Power for DSI = 1 – Antenna L

6GHz WIFI (320MHz 802.11be SU SISO ANT L)			
Band	Freq. [MHz]	Channel	Avg. Conducted Power [dBm]
UNII-5	6105	31	10.75
UNII-5	6265	63	10.82
UNII-6	6425	95	9.85
UNII-8	6905	191	7.85
6GHz WIFI (160MHz 802.11ax SU SISO ANT L)			
Band	Freq. [MHz]	Channel	Avg. Conducted Power [dBm]
UNII 7	6665	143	11.51

6GHz WIFI (160MHz 802.11be SU SISO ANT L)			
Band	Freq. [MHz]	Channel	Avg. Conducted Power [dBm]
UNII 7	6665	143	11.42

Table 8-9
6 GHz WLAN Measured Plimit Average Power for DSI = 1 – MIMO

6GHz WIFI (320MHz 802.11be MIMO)					
Band	Freq [MHz]	Channel	Avg. Conducted Powers [dBm]		
			ANT1	ANT2	MIMO
UNII-5	6105	31	10.40	10.95	13.69
UNII-5	6265	63	10.50	11.25	13.90
UNII-6	6425	95	9.68	10.27	13.00
UNII-8	6905	191	7.48	7.77	10.64
6GHz WIFI (160MHz 802.11ax MIMO)					
Band	Freq [MHz]	Channel	Avg. Conducted Powers [dBm]		
			ANT1	ANT2	MIMO
UNII 7	6665	143	11.41	11.50	14.47

6GHz WIFI (160MHz 802.11be MIMO)					
Band	Freq [MHz]	Channel	Avg. Conducted Powers [dBm]		
			ANT1	ANT2	MIMO
UNII 7	6665	143	11.37	11.44	14.42

Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02:

- Power measurements were performed for the transmission mode configuration with the highest maximum output power specified for production units.
- For transmission modes with the same maximum output power specification, powers were measured for the largest channel bandwidth, lowest order modulation and lowest data rate.
- For transmission modes with identical maximum specified output power, channel bandwidth, modulation and data rates, power measurements were required for all identical configurations.
- For each transmission mode configuration, powers were measured for the highest and lowest channels; and at the mid-band channel(s) when there were at least 3 channels supported. For configurations with multiple mid-band channels, due to an even number of channels, both channels were measured.

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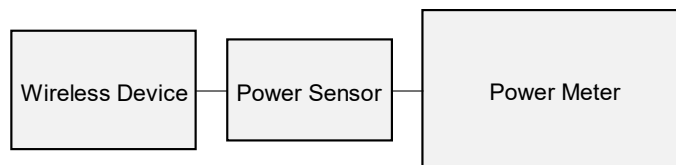


Figure 8-1
Power Measurement Setup

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8.2 Bluetooth Conducted Powers

Table 8-10
Bluetooth Maximum Average RF Power for WLAN OFF – Antenna R

Frequency [MHz]	Data Rate [Mbps]	Mod.	Channel No.	Avg Conducted Power	
				[dBm]	[mW]
2402	1.0	GFSK	0	18.67	73.621
2441	1.0	GFSK	39	18.97	78.886
2480	1.0	GFSK	78	18.56	71.779

Table 8-11
Bluetooth Maximum Average RF Power for WLAN OFF – Antenna L

Frequency [MHz]	Data Rate [Mbps]	Mod.	Channel No.	Avg Conducted Power	
				[dBm]	[mW]
2402	1.0	GFSK	0	18.63	72.946
2441	1.0	GFSK	39	18.93	78.163
2480	1.0	GFSK	78	18.89	77.446

Table 8-12
Bluetooth Reduced Average RF Power for WLAN ON – Antenna R

Frequency [MHz]	Data Rate [Mbps]	Mod.	Channel No.	Avg Conducted Power	
				[dBm]	[mW]
2402	1.0	GFSK	0	17.19	52.360
2441	1.0	GFSK	39	17.57	57.148
2480	1.0	GFSK	78	17.34	54.200

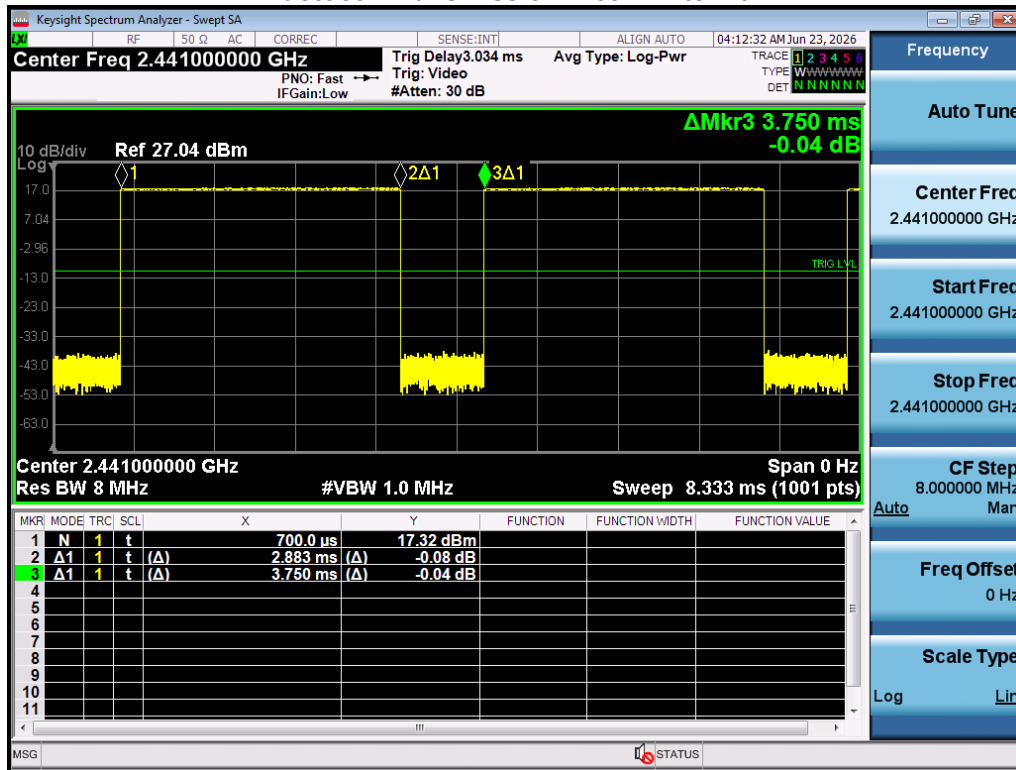
Table 8-13
Bluetooth Reduced Average RF Power for WLAN ON – Antenna L

Frequency [MHz]	Data Rate [Mbps]	Mod.	Channel No.	Avg Conducted Power	
				[dBm]	[mW]
2402	1.0	GFSK	0	16.46	44.259
2441	1.0	GFSK	39	16.97	49.774
2480	1.0	GFSK	78	17.02	50.350

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Figure 8-2
Bluetooth Transmission Plot – Antenna R



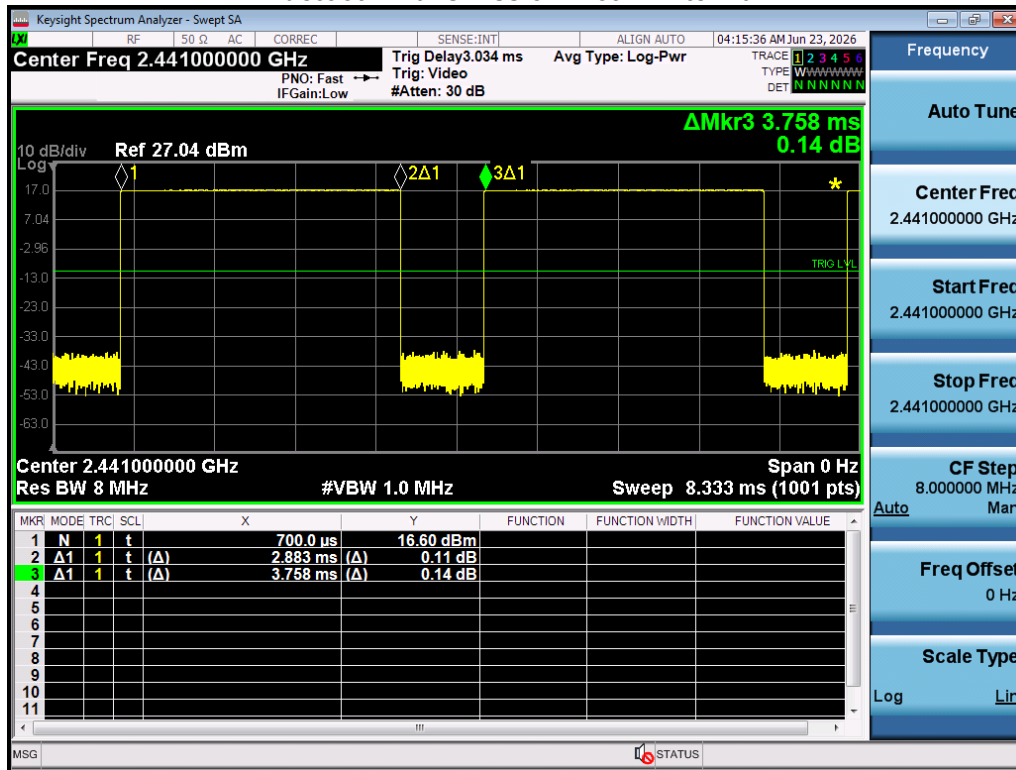
Equation 8-1

Bluetooth Antenna R Duty Cycle Calculation

$$Duty\ Cycle = \frac{Pulse\ Width}{Period} * 100\% = \frac{2.883ms}{3.750ms} * 100\% = 76.88\%$$

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Figure 8-3
Bluetooth Transmission Plot – Antenna L



Equation 8-2
Bluetooth Antenna L Duty Cycle Calculation

$$\text{Duty Cycle} = \frac{\text{Pulse Width}}{\text{Period}} * 100\% = \frac{2.883\text{ms}}{3.758\text{ms}} * 100\% = 76.72\%$$

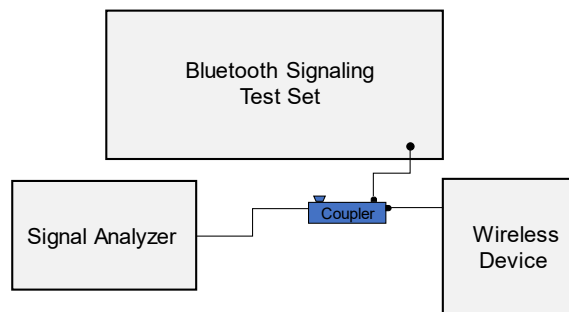


Figure 8-4
Power Measurement Setup

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9 SYSTEM VERIFICATION

9.1 Tissue Verification

Table 9-1
Measured Head Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ϵ	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ϵ	% dev σ	% dev ϵ
05/18/2026	2450 Head	20.1	2300	1.702	38.023	1.670	39.500	1.92%	-3.74%
			2310	1.709	38.015	1.679	39.480	1.79%	-3.71%
			2320	1.716	38.006	1.687	39.460	1.72%	-3.68%
			2400	1.772	37.875	1.756	39.289	0.91%	-3.60%
			2450	1.815	37.819	1.800	39.200	0.83%	-3.52%
			2480	1.833	37.756	1.833	39.162	0.00%	-3.59%
			2500	1.846	37.711	1.855	39.136	-0.49%	-3.64%
			2510	1.854	37.688	1.866	39.123	-0.64%	-3.67%
			2535	1.876	37.642	1.893	39.092	-0.90%	-3.71%
			2550	1.891	37.622	1.909	39.073	-0.94%	-3.71%
			2560	1.900	37.607	1.920	39.060	-1.04%	-3.72%
			2600	1.927	37.553	1.964	39.009	-1.88%	-3.73%
			2650	1.963	37.424	2.018	38.945	-2.73%	-3.91%
			2680	1.992	37.381	2.051	38.907	-2.88%	-3.92%
			2700	2.008	37.377	2.073	38.882	-3.14%	-3.87%
07/06/2026	2450 Head	20.1	2300	1.674	38.381	1.670	39.500	0.21%	-2.83%
			2310	1.681	38.367	1.679	39.480	0.14%	-2.82%
			2320	1.689	38.356	1.687	39.460	0.14%	-2.80%
			2400	1.748	38.232	1.756	39.289	-0.48%	-2.69%
			2450	1.787	38.142	1.800	39.200	-0.71%	-2.70%
			2480	1.812	38.098	1.833	39.162	-1.12%	-2.72%
			2500	1.826	38.073	1.855	39.136	-1.55%	-2.72%
			2510	1.832	38.054	1.866	39.123	-1.80%	-2.73%
			2535	1.848	38.001	1.893	39.092	-2.36%	-2.79%
			2550	1.860	37.972	1.909	39.073	-2.59%	-2.82%
			2560	1.868	37.952	1.920	39.060	-2.70%	-2.84%
			2600	1.903	37.905	1.964	39.009	-3.12%	-2.83%
			2650	1.938	37.806	2.018	38.945	-3.94%	-2.93%
			2680	1.959	37.750	2.051	38.907	-4.47%	-2.97%
			2700	1.976	37.737	2.073	38.882	-4.69%	-2.95%

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Table 9-2
Measured Head Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ϵ	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ϵ	% dev σ	% dev ϵ
05/26/2026	5200-5800 Head	19.0	5150	4.408	36.640	4.608	36.050	-4.34%	1.64%
			5160	4.419	36.639	4.618	36.040	-4.31%	1.66%
			5170	4.431	36.628	4.629	36.030	-4.28%	1.66%
			5180	4.441	36.600	4.635	36.009	-4.19%	1.64%
			5190	4.449	36.573	4.645	35.998	-4.22%	1.60%
			5200	4.457	36.554	4.655	35.986	-4.25%	1.58%
			5210	4.465	36.542	4.666	35.975	-4.31%	1.58%
			5220	4.477	36.510	4.676	35.963	-4.26%	1.52%
			5240	4.508	36.451	4.696	35.940	-4.00%	1.42%
			5250	4.524	36.437	4.706	35.929	-3.87%	1.41%
			5260	4.535	36.436	4.717	35.917	-3.86%	1.44%
			5270	4.542	36.427	4.727	35.906	-3.91%	1.45%
			5280	4.551	36.406	4.737	35.894	-3.93%	1.43%
			5290	4.563	36.385	4.748	35.883	-3.90%	1.40%
			5300	4.575	36.371	4.758	35.871	-3.85%	1.39%
			5310	4.583	36.349	4.768	35.860	-3.88%	1.36%
			5320	4.593	36.331	4.778	35.849	-3.87%	1.34%
			5500	4.786	35.967	4.963	35.643	-3.57%	0.91%
			5510	4.800	35.955	4.973	35.632	-3.48%	0.91%
			5520	4.812	35.934	4.983	35.620	-3.43%	0.88%
			5530	4.820	35.913	4.994	35.609	-3.48%	0.85%
			5540	4.832	35.893	5.004	35.597	-3.44%	0.83%
			5550	4.846	35.879	5.014	35.586	-3.35%	0.82%
			5560	4.858	35.854	5.024	35.574	-3.30%	0.79%
			5580	4.882	35.824	5.045	35.551	-3.23%	0.77%
			5600	4.909	35.788	5.065	35.529	-3.08%	0.73%
			5610	4.919	35.778	5.076	35.518	-3.09%	0.73%
			5620	4.928	35.772	5.086	35.506	-3.11%	0.75%
			5640	4.951	35.720	5.106	35.483	-3.04%	0.67%
			5660	4.977	35.677	5.127	35.460	-2.93%	0.61%
			5670	4.987	35.672	5.137	35.449	-2.92%	0.63%
			5680	4.998	35.663	5.147	35.437	-2.89%	0.64%
			5690	5.012	35.639	5.158	35.426	-2.83%	0.60%
			5700	5.026	35.631	5.168	35.414	-2.75%	0.61%
			5710	5.039	35.609	5.178	35.403	-2.68%	0.58%
			5720	5.046	35.595	5.188	35.391	-2.74%	0.58%
			5745	5.069	35.540	5.214	35.363	-2.78%	0.50%
			5750	5.074	35.528	5.219	35.357	-2.78%	0.48%
			5755	5.082	35.518	5.224	35.351	-2.72%	0.47%
			5765	5.095	35.490	5.234	35.340	-2.66%	0.42%
			5775	5.110	35.475	5.245	35.329	-2.57%	0.41%
			5785	5.124	35.460	5.255	35.317	-2.49%	0.40%
			5795	5.136	35.453	5.265	35.305	-2.45%	0.42%
			5805	5.150	35.436	5.275	35.294	-2.37%	0.40%
			5825	5.168	35.414	5.296	35.271	-2.42%	0.41%
			5835	5.178	35.403	5.305	35.230	-2.39%	0.49%
			5845	5.189	35.386	5.315	35.210	-2.37%	0.50%
			5850	5.194	35.376	5.320	35.200	-2.37%	0.50%
			5855	5.200	35.368	5.325	35.197	-2.35%	0.49%
			5875	5.218	35.334	5.347	35.183	-2.41%	0.43%
			5885	5.229	35.308	5.357	35.177	-2.39%	0.37%
			5905	5.257	35.251	5.379	35.163	-2.27%	0.25%
06/08/2026	6000 Head	19.4	6000	5.323	36.802	5.480	35.100	-2.86%	4.85%
			6025	5.263	36.774	5.510	35.070	-4.48%	4.86%
			6065	5.334	36.709	5.557	35.022	-4.01%	4.82%
			6075	5.337	36.686	5.569	35.010	-4.17%	4.79%
			6085	5.338	36.653	5.580	34.998	-4.34%	4.73%
			6185	5.504	36.425	5.698	34.878	-3.40%	4.44%
			6275	5.625	36.328	5.805	34.770	-3.10%	4.48%
			6285	5.632	36.317	5.816	34.758	-3.16%	4.49%
			6305	5.640	36.292	5.840	34.734	-3.42%	4.49%
			6345	5.699	36.154	5.887	34.686	-3.19%	4.23%
			6475	5.849	35.918	6.041	34.530	-3.18%	4.02%
			6485	5.866	35.924	6.052	34.518	-3.07%	4.07%
			6500	5.880	35.969	6.070	34.500	-3.13%	4.26%
			6505	5.881	35.974	6.076	34.494	-3.21%	4.29%
			6545	5.888	35.881	6.122	34.446	-3.82%	4.11%
			6665	6.002	35.605	6.265	34.302	-4.20%	3.80%
			6675	6.015	35.536	6.273	34.290	-4.11%	3.63%
			6685	6.033	35.502	6.285	34.278	-4.01%	3.57%
			6715	6.101	35.513	6.319	34.242	-3.45%	3.71%
			6785	6.130	35.346	6.400	34.158	-4.22%	3.48%
			6825	6.241	35.308	6.447	34.110	-3.20%	3.51%
			6985	6.346	35.130	6.633	33.918	-4.33%	3.57%
			6995	6.335	35.096	6.644	33.906	-4.65%	3.51%
			7000	6.333	35.072	6.650	33.900	-4.77%	3.46%
			7005	6.334	35.044	6.656	33.894	-4.84%	3.39%
			7025	6.376	34.932	6.680	33.870	-4.55%	3.14%
			7500	7.129	34.238	7.240	33.300	-1.53%	2.82%

The above measured tissue parameters were used in the DASY software. The DASY software was used to perform interpolation to determine the dielectric parameters at the SAR test device frequencies (per KDB Publication 865664 D01v01r04 and IEEE 1528-2013 6.6.1.2. The tissue parameters listed in the SAR test plots may slightly differ from the table above due to significant digit rounding in the software.

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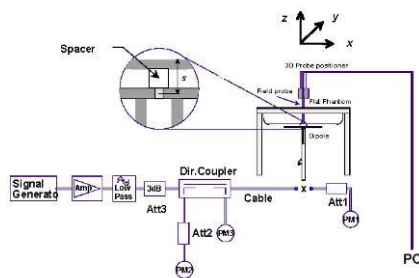


9.2 Test System Verification

Prior to SAR assessment, the system is verified to $\pm 10\%$ of the SAR measurement on the reference dipole at the time of calibration by the calibration facility. Full system validation status and result summary can be found in the SAR System Validation Appendix.

**Table 9-3
System Verification Results**

System Verification TARGET & MEASURED																			
SAR System	Tissue Frequency (MHz)	Tissue Type	Date	Amb. Temp. (C)	Liquid Temp. (C)	Input Power (W)	Source SN	Probe SN	DAE	Measured SAR 1g (W/kg)	1W Target SAR 1g (W/kg)	1W Normalized SAR 1g (W/kg)	Deviation 1g (%)	Measured SAR 10g (W/kg)	1W Target SAR 10g (W/kg)	1W Normalized SAR 10g (W/kg)	Deviation 10g (%)	Measured 4cm ² APD (W/m ²)	1W Target 4cm ² APD (W/m ²)
L	2450	Head	05/18/2026	20.7	20.1	0.10	719	7539	1450	5.61	52.20	56.10	7.47%	2.62	24.60	26.20	6.50%	N/A	N/A
L	2450	Head	07/06/2026	21.8	20.2	0.10	719	7539	1450	5.72	52.20	57.20	9.58%	2.67	24.60	26.70	8.54%	N/A	N/A
S	5250	HEAD	05/26/2026	21.4	19.0	0.05	1057	7661	1558	3.72	79.40	74.40	-6.30%	1.07	22.70	21.40	-5.73%	N/A	N/A
S	5600	HEAD	05/26/2026	21.4	19.0	0.05	1057	7661	1558	3.77	82.80	75.40	-8.94%	1.07	23.60	21.40	-9.32%	N/A	N/A
S	5750	HEAD	05/26/2026	21.4	19.0	0.05	1057	7661	1558	3.67	79.80	73.40	-8.02%	1.04	22.70	20.80	-8.37%	N/A	N/A
S	5850	HEAD	05/26/2026	21.4	19.0	0.05	1057	7661	1558	3.87	81.50	77.40	-5.03%	1.09	23.00	21.80	-5.22%	N/A	N/A
M	6500	HEAD	06/08/2026	19.9	19.4	0.03	1018	7406	1677	7.81	298.00	312.40	4.83%	1.43	55.70	57.20	2.69%	34.60	1350.00
																		1384.00	2.52%



**Figure 9-1
System Verification Setup Diagram**



**Figure 9-2
System Verification Setup Photo**

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9.3 Power Density Test System Verification

The system was verified to be within ± 0.66 dB of the power density targets on the calibration certificate according to the test system specification in the user's manual and calibration facility recommendation. The 0.66 dB deviation threshold represents the expanded uncertainty for system performance checks using SPEAG's mmWave verification sources. The same spatial resolution and measurement region used in the source calibration was applied during the system check.

The measured power density distribution of verification source was also confirmed through visual inspection to have no noticeable differences, both spatially (shape) and numerically (level) from the distribution provided by the manufacturer, per November 2017 TCBC Workshop Notes.

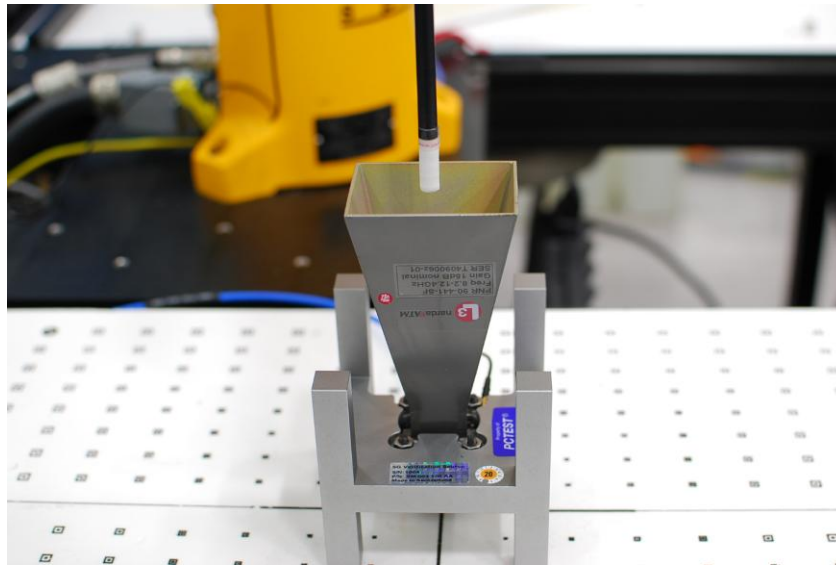


Figure 9-3
System Verification Setup Photo

Table 9-4
10 GHz Verifications

System	Frequency (GHz)	Date	Source S/N	Probe S/N	Prad (mW)	Normal psPD (W/m ² over 4 cm ²)		Deviation (dB)	Total psPD (W/m ² over 4 cm ²)		Deviation (dB)
						Measured	Target		Measured	Target	
Q	10	06/01/2026	1004	9389	93.3	53.30	54.60	-0.10	53.50	55.60	-0.17

Note: A **10 mm distance spacing** was used from the reference horn antenna aperture to the probe element.

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10 SAR DATA SUMMARY

10.1 2.4 GHz WLAN Standalone SAR

Table 10-1
2.4 GHz WLAN Antenna R | Plot A1

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle [%]	Power Drift [dB]	Frequency [MHz]	Channel #	Data Rate [Mbps]	Max Allowed Power [dBm]	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 1g SAR [W/kg]	Power Scaling Factor	Duty Cycle Scaling Factor	Reported 1g SAR [W/kg]	Plot #	Plimit [dBm]	Overall Plimit [dBm]
Body	2.4 GHz WiFi/ IEEE 802.11b	22	DSSS	R	0F393T926063K3	86.71	0.01	2437.00	6	1.0	19.0	18.34	Bottom	5	0.583	1.164	1.153	0.782	Plot	20.0	20.0
ANSI/IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population													Body 1.6 W/kg (mW/g) averaged over 1 gram								

Table 10-2
2.4 GHz WLAN Antenna L

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle [%]	Power Drift [dB]	Frequency [MHz]	Channel #	Data Rate [Mbps]	Max Allowed Power [dBm]	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 1g SAR [W/kg]	Power Scaling Factor	Duty Cycle Scaling Factor	Reported 1g SAR [W/kg]	Plot #	Plimit [dBm]	Overall Plimit [dBm]
Body	2.4 GHz WiFi/ IEEE 802.11b	22	DSSS	L	0F393T926063K3	97.09	-0.01	2412.00	1	1.0	19.0	18.35	Bottom	5	0.431	1.161	1.030	0.515		21.8	21.8
ANSI/IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population													Body 1.6 W/kg (mW/g) averaged over 1 gram								

Table 10-3
2.4 GHz WLAN MIMO

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle [%]	Power Drift [dB]	Frequency [MHz]	Channel #	Data Rate [Mbps]	Max Allowed Power [dBm]	Conducted Power [dBm]	Max Allowed Power (2nd ant) [dBm]	Conducted Power (2nd ant) [dBm]	Test Position	Spacing [mm]	Measured 1g SAR [W/kg]	Power Scaling Factor	Duty Cycle Scaling Factor	Reported 1g SAR [W/kg]	Exposure Ratio (1g SAR)	Plot #	Plimit [dBm]	Overall Plimit [dBm]
Body	2.4 GHz WiFi / IEEE 802.11b	22	DSSS	MIMO	0F394C626063K3	87.78	0.01	2412.00	1	1.0	19.0	18.27	19.0	18.31	Bottom	5	0.366	1.183	1.023	0.443	0.277		22.5	22.5
ANSI/IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population														Body 1.6 W/kg (mW/g) averaged over 1 gram										
Note: To achieve the 22 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 19 dBm.																								

Note: To achieve the 22 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 19 dBm.

10.2 5 GHz WLAN Standalone SAR

Table 10-4
5 GHz WLAN Antenna R

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle [%]	Power Drift [dB]	Frequency [MHz]	Channel #	U-NII band	Data Rate [Mbps]	Max Allowed Power [dBm]	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 1g SAR [W/kg]	Power Scaling Factor	Duty Cycle Scaling Factor	Reported 1g SAR [W/kg]	Plot #	Plimit [dBm]	Overall Plimit [dBm]
Body	5 GHz WiFi/ IEEE 802.11n	40	OFDM	R	0F393T926063K3	99.67	-0.03	5270.00	54	U-NII-2A	13.5	17.00	16.04	Bottom	5	0.330	1.247	1.003	0.413		20.8	
Body	5 GHz WiFi/ IEEE 802.11ac	80	OFDM	R	0F393T926063K3	99.65	0.04	5610.00	122	U-NII-2C	29.3	16.50	15.25	Bottom	5	0.254	1.348	1.004	0.336		21.2	
Body	5 GHz WiFi/ IEEE 802.11ac	80	OFDM	R	0F393T926063K3	99.65	0.11	5775.00	155	U-NII-3	29.3	16.50	15.31	Bottom	5	0.285	1.315	1.004	0.376		20.7	
Body	5 GHz WiFi/ IEEE 802.11ac	80	OFDM	R	0F393T926063K3	99.65	0.00	5855.00	171	U-NII-4	29.3	17.25	15.86	Bottom	5	0.365	1.377	1.004	0.505		20.2	
ANSI/IEEE C95.1 1992 - SAFETY LIMIT																						
Spatial Peak													Body									
Uncontrolled Exposure/General Population													1.6 W/kg (mW/g) averaged over 1 gram									

Table 10-5
5 GHz WLAN Antenna L

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle [%]	Power Drift [dB]	Frequency [MHz]	Channel #	U-NII band	Data Rate [Mbps]	Max Allowed Power [dBm]	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 1g SAR [W/kg]	Power Scaling Factor	Duty Cycle Scaling Factor	Reported 1g SAR [W/kg]	Plot #	Plimit [dBm]	Overall Plimit [dBm]
Body	5 GHz WiFi/ IEEE 802.11n	40	OFDM	L	0F393T926063K3	99.48	0.18	5270.00	54	U-NII-2A	13.5	17.00	16.68	Bottom	5	0.504	1.076	1.005	0.545		19.6	
Body	5 GHz WiFi/ IEEE 802.11ac	80	OFDM	L	0F393T926063K3	99.30	0.08	5610.00	122	U-NII-2C	29.3	16.50	15.77	Bottom	5	0.477	1.183	1.007	0.568		18.9	
Body	5 GHz WiFi/ IEEE 802.11ac	80	OFDM	L	0F393T926063K3	99.30	0.16	5775.00	155	U-NII-3	29.3	16.50	15.74	Bottom	5	0.409	1.191	1.007	0.491		19.5	
Body	5 GHz WiFi/ IEEE 802.11ac	80	OFDM	L	0F393T926063K3	99.30	0.05	5855.00	171	U-NII-4	29.3	17.25	16.15	Bottom	5	0.511	1.208	1.007	0.689		18.8	
ANSI/IEEE C95.1 1992 - SAFETY LIMIT																						
Spatial Peak													Body									
Uncontrolled Exposure/General Population													1.6 W/kg (mW/g) averaged over 1 gram									

Table 10-6
5 GHz WLAN MIMO | Plot A2

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle [%]	Power Drift [dB]	Frequency [MHz]	Channel #	U-NII band	Data Rate [Mbps]	Max Allowed Power [dBm]	Conducted Power [dBm]	Max Allowed Power (2nd ant) [dBm]	Conducted Power (2nd ant) [dBm]	Test Position	Spacing [mm]	Measured 1g SAR [W/kg]	Power Scaling Factor	Duty Cycle Scaling Factor	Reported 1g SAR [W/kg]	Plot #	Plimit [dBm]	Overall Plimit [dBm]
Body	5 GHz WiFi / IEEE 802.11n	40	OFDM	MIMO	0F393T926063K3	99.28	0.01	5270.00	54	U-NII-2A	27.0	17.00	16.72	17.00	16.72	Bottom	5	0.577	1.183	1.007	0.687		18.6	17.5
Body	5 GHz WiFi / IEEE 802.11ac	80	OFDM	MIMO	0F393T926063K3	98.49	0.03	5610.00	122	U-NII-2C	58.5	16.50	15.88	16.50	15.70	Bottom	5	0.572	1.254	1.015	0.751		17.7	
Body	5 GHz WiFi / IEEE 802.11ac	80	OFDM	MIMO	0F393T926063K3	98.49	0.08	5775.00	155	U-NII-3	58.5	16.50	15.44	16.50	15.82	Bottom	5	0.501	1.276	1.015	0.649		18.3	
Body	5 GHz WiFi / IEEE 802.11ac	80	OFDM	MIMO	0F393T926063K3	98.49	0.05	5855.00	171	U-NII-4	58.5	17.25	15.84	17.25	16.31	Bottom	5	0.626	1.384	1.015	0.941	Plot	17.5	
ANSI/IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population													Body 1.6 W/kg (mW/g) averaged over 1 gram											

Note: To achieve the 20 dBm maximum allowed MIMO power for U-NII-2A shown in the documentation, each antenna transmits at a maximum allowed power of 17 dBm.
Note: To achieve the 19.5 dBm maximum allowed MIMO power for U-NII-2C shown in the documentation, each antenna transmits at a maximum allowed power of 16.5 dBm.
Note: To achieve the 19.5 dBm maximum allowed MIMO power for U-NII-3 shown in the documentation, each antenna transmits at a maximum allowed power of 16.5 dBm.
Note: To achieve the 20.25 dBm maximum allowed MIMO power for U-NII-4 shown in the documentation, each antenna transmits at a maximum allowed power of 17.25 dBm.

FCC ID: C3K00002101	RF Exposure Part 1 Test Report			Approved by: Technical Manager
Document S/N: 1M2604150032-01.C3K (Rev1)	DUT Type: Wireless Module	This report is Blockchain Verified. To verify the report authenticity, please visit https://www.blockchain-verified.com or by clicking on the Blockchain logo		Page 42 of 54



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10.3 6 GHz Standalone SAR

Table 10-7
6 GHz WLAN Antenna R

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle [%]	Power Drift [dB]	Frequency [MHz]	Channel #	U-NII band	Data Rate [Mbps]	Max Allowed Power [dBm]	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 1g SAR [W/kg]	Power Scaling Factor	Duty Cycle Scaling Factor	Reported 1g SAR [W/kg]	Exposure Ratio (1g SAR)	Plot #	Plimit [dBm]	Overall Plimit [dBm]
Body	6 GHz WIFU / IEEE 802.11be	320	OFDM	R	DF394D/26063K3	97.92	0.02	6105.00	31	U-NII-5	136.1	12.00	10.45	Bottom	0	0.189	1.429	1.021	0.303	0.127		18.9	17.7
Body	6 GHz WIFU / IEEE 802.11be	320	OFDM	R	DF393T26063K3	97.92	0.03	6265.00	63	U-NII-5	136.1	12.00	10.79	Bottom	0	0.177	1.321	1.021	0.185	0.116		19.3	
Body	6 GHz WIFU / IEEE 802.11be	320	OFDM	R	DF393T26063K3	97.92	-0.19	6425.00	95	U-NII-6	136.1	11.00	9.60	Bottom	0	0.119	1.380	1.021	0.168	0.105		18.7	
Body	6 GHz WIFU / IEEE 802.11ax	160	OFDM	R	DF394H/26063K3	99.59	-0.21	6665.00	143	U-NII-7	68.1	12.75	11.48	Bottom	0	0.235	1.340	1.004	0.116	0.108		17.7	
Body	6 GHz WIFU / IEEE 802.11be	320	OFDM	R	DF393T26063K3	97.92	-0.10	6905.00	191	U-NII-8	136.1	8.50	7.55	Bottom	0	0.087	1.245	1.021	0.111	0.069		18.0	
ANSI/IEEE C63.1.1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population																Body 1.6 W/kg (mW/g) averaged over 1 gram							
Exposure	Band/ Mode	Bandwidth [MHz]	Service/ Modulation	Ant.	Serial Number	Duty Cycle [%]	Power Drift [dB]	Frequency [MHz]	Channel #	U-NII band	Data Rate [Mbps]	Max Allowed Power [dBm]	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured APO [W/m² (4cm²)]	Power Scaling Factor	Duty Cycle Scaling Factor	Reported APO [W/m² (4cm²)]	APD Exposure Ratio	Plot #	Plimit [dBm]	Overall Plimit [dBm]
Body	6 GHz WIFU / IEEE 802.11be	320	OFDM	R	DF394D/26063K3	97.92	0.02	6105.00	31	U-NII-5	136.1	12.00	10.45	Bottom	0	1.220	1.429	1.021	1.780	0.089		20.5	19.8
Body	6 GHz WIFU / IEEE 802.11be	320	OFDM	R	DF393T26063K3	97.92	0.03	6265.00	63	U-NII-5	136.1	12.00	10.79	Bottom	0	1.060	1.321	1.021	1.430	0.072		21.4	
Body	6 GHz WIFU / IEEE 802.11be	320	OFDM	R	DF393T26063K3	97.92	-0.19	6425.00	95	U-NII-6	136.1	11.00	9.60	Bottom	0	0.345	1.380	1.021	1.277	0.064		20.9	
Body	6 GHz WIFU / IEEE 802.11ax	160	OFDM	R	DF394H/26063K3	99.59	-0.21	6665.00	143	U-NII-7	68.1	12.75	11.48	Bottom	0	1.830	1.340	1.004	2.462	0.123		19.8	
Body	6 GHz WIFU / IEEE 802.11be	320	OFDM	R	DF393T26063K3	97.92	-0.10	6905.00	191	U-NII-8	136.1	8.50	7.55	Bottom	0	0.662	1.245	1.021	0.841	0.042		20.2	

Table 10-8
6 GHz WLAN Antenna L

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle [%]	Power Drift [dB]	Frequency [MHz]	Channel #	U-NII band	Data Rate [Mbps]	Max Allowed Power [dBm]	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 1g SAR [W/kg]	Power Scaling Factor	Duty Cycle Scaling Factor	Reported 1g SAR [W/kg]	Exposure Ratio (1g SAR)	Plot #	Plimit [dBm]	Overall Plimit [dBm]
Body	6 GHz WIF / IEEE 802.11be	320	OFDM	L	DF394D/26063K3	97.85	0.06	6105.00	31	U-NII-5	136.1	12.00	10.75	Bottom	0	0.277	1.334	1.022	0.309	0.193		17.0	17.0
Body	6 GHz WIF / IEEE 802.11be	320	OFDM	L	DF393T26063K3	97.85	0.02	6265.00	63	U-NII-5	136.1	12.00	10.82	Bottom	0	0.119	1.312	1.022	0.160	0.100		19.9	
Body	6 GHz WIF / IEEE 802.11be	320	OFDM	L	DF393T26063K3	97.85	0.03	6425.00	95	U-NII-6	136.1	11.00	9.85	Bottom	0	0.142	1.303	1.022	0.189	0.118		18.2	
Body	6 GHz WIF / IEEE 802.11ax	160	OFDM	L	DF394H/26063K3	99.59	0.08	6665.00	143	U-NII-7	68.1	12.75	11.53	Bottom	0	0.189	1.330	1.004	0.310	0.199		17.7	
Body	6 GHz WIF / IEEE 802.11be	320	OFDM	L	DF393T26063K3	97.85	-0.04	6905.00	191	U-NII-8	136.1	8.50	7.85	Bottom	0	0.081	1.161	1.022	0.096	0.060		18.6	
ANSI/IEEE C63.1.1992 - SAFETY LIMIT																Body 1.6 W/kg (mW/g) averaged over 1 gram							
Spatial Peak Uncontrolled Exposure/General Population																							
Exposure	Band/ Mode	Bandwidth [MHz]	Service/ Modulation	Ant.	Serial Number	Duty Cycle [%]	Power Drift [dB]	Frequency [MHz]	Channel #	U-NII band	Data Rate [Mbps]	Max Allowed Power [dBm]	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured APO [W/m² (4cm²)]	Power Scaling Factor	Duty Cycle Scaling Factor	Reported APO [W/m² (4cm²)]	APD Exposure Ratio	Plot #	Plimit [dBm]	Overall Plimit [dBm]
Body	6 GHz WIF / IEEE 802.11be	320	OFDM	L	DF394D/26063K3	97.85	0.06	6105.00	31	U-NII-5	136.1	12.00	10.75	Bottom	0	1.520	1.334	1.022	2.618	0.131		18.8	18.8
Body	6 GHz WIF / IEEE 802.11be	320	OFDM	L	DF393T26063K3	97.85	0.02	6265.00	63	U-NII-5	136.1	12.00	10.82	Bottom	0	1.080	1.312	1.022	1.448	0.072		21.3	
Body	6 GHz WIF / IEEE 802.11be	320	OFDM	L	DF393T26063K3	97.85	0.03	6425.00	95	U-NII-6	136.1	11.00	9.85	Bottom	0	1.050	1.303	1.022	1.398	0.070		20.5	
Body	6 GHz WIF / IEEE 802.11ax	160	OFDM	L	DF394H/26063K3	99.59	0.08	6665.00	143	U-NII-7	68.1	12.75	11.53	Bottom	0	1.710	1.330	1.004	2.783	0.114		20.1	
Body	6 GHz WIF / IEEE 802.11be	320	OFDM	L	DF393T26063K3	97.85	0.04	6905.00	191	U-NII-8	136.1	8.50	7.85	Bottom	0	0.589	1.161	1.022	0.699	0.035		21.0	

Table 10-9
6 GHz WLAN MIMO | Plot A3

Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle [%]	Power Drift [dB]	Frequency [MHz]	Channel #	U-NII band	Data Rate [Mbps]	Max Allowed Power [dBm]	Conducted Power [dBm]	Max Allowed Power (2nd ant) [dBm]	Conducted Power (2nd ant) [dBm]	Test Position	Spacing [mm]	Measured 1g SAR [W/kg]	Power Scaling Factor	Duty Cycle Scaling Factor	Reported 1g SAR [W/kg]	Exposure Ratio (1g SAR)	Plot #	Plimit [dBm]	Overall Plimit [dBm]
Body	6 GHz WIF / IEEE 802.11be	320	OFDM	MIMO	DF394H/26063K3	96.84	0.11	6105.00	31	U-NII-5	272.2	12.00	10.40	12.00	10.95	Bottom	0	0.262	1.445	1.033	0.363	0.226		16.4	15.6
Body	6 GHz WIF / IEEE 802.11be	320	OFDM	MIMO	DF393T26063K3	96.84	-0.11	6265.00	63	U-NII-5	272.2	12.00	10.50	12.00	11.25	Bottom	0	0.218	1.413	1.033	0.333	0.208		16.7	
Body	6 GHz WIF / IEEE 802.11be	320	OFDM	MIMO	DF393T26063K3	96.84	0.14	6425.00	95	U-NII-6	272.2	11.00	9.68	11.00	10.27	Bottom	0	0.175	1.355	1.033	0.249	0.133		17.1	
Body	6 GHz WIF / IEEE 802.11ax	160	OFDM	MIMO	DF394H/26063K3	99.59	0.00	6665.00	143	U-NII-7	136.1	12.75	11.43	12.75	11.50	Bottom	0	0.303	1.361	1.004	0.411	0.237	Plot	16.6	
Body	6 GHz WIF / IEEE 802.11be	320	OFDM	MIMO	DF394D/26063K3	96.84	-0.02	6905.00	191	U-NII-8	272.2	8.50	7.48	8.50	7.77	Bottom	0	0.149	1.265	1.033	0.195	0.102		15.6	
ANSI/IEEE C63.1.1992 - SAFETY LIMIT																						Body			
Spatial Peak																						1.6 W/kg (mW/g)			
Uncontrolled Exposure/General Population																						averaged over 1 gram			
Note: To achieve the 15 dBm maximum allowed MIMO power for U-NII-5 shown in the documentation, each antenna transmits at a maximum allowed power of 12 dBm. Note: To achieve the 14 dBm maximum allowed MIMO power for U-NII-6 shown in the documentation, each antenna transmits at a maximum allowed power of 11 dBm. Note: To achieve the 15.75 dBm maximum allowed MIMO power for U-NII-7 shown in the documentation, each antenna transmits at a maximum allowed power of 12.75 dBm. Note: To achieve the 11.5 dBm maximum allowed MIMO power for U-NII-8 shown in the documentation, each antenna transmits at a maximum allowed power of 8.5 dBm.																									
Exposure	Band / Mode	Bandwidth [MHz]	Service / Modulation	Ant.	Serial Number	Duty Cycle [%]	Power Drift [dB]	Frequency [MHz]	Channel #	U-NII band	Data Rate [Mbps]	Max Allowed Power [dBm]	Conducted Power [dBm]	Max Allowed Power (2nd ant) [dBm]	Conducted Power (2nd ant) [dBm]	Test Position	Spacing [mm]	Measured APO [W/m² (4cm²)]	Power Scaling Factor	Duty Cycle Scaling Factor	Reported APO [W/m² (4cm²)]	APD Exposure Ratio	Plot #	Plimit [dBm]	Overall Plimit [dBm]
Body	6 GHz WIF / IEEE 802.11be	320	OFDM	MIMO	DF394H/26063K3	96.84	0.11	6105.00	31	U-NII-5	272.2	12.00	10.40	12.00	10.95	Bottom	0	2.140	1.445	1.033	1.194	0.160		17.9	17.9
Body	6 GHz WIF / IEEE 802.11be	320	OFDM	MIMO	DF393T26063K3	96.84	0.08	6265.00	63	U-NII-5	272.2	12.00	10.50	12.00	11.25	Bottom	0	2.020	1.413	1.033	1.065	0.153		18.1	
Body	6 GHz WIF / IEEE 802.11be	320	OFDM	MIMO	DF393T26063K3	96.84	0.14	6425.00	95	U-NII-6	272.2	11.00	9.68	11.00	10.27	Bottom	0	1.880	1.355	1.033	1.932	0.097		19.1	
Body	6 GHz WIF / IEEE 802.11ax	160	OFDM	MIMO	DF394H/26063K3	99.59	0.00	6665.00	143	U-NII-7	136.1	12.75	11.43	12.75	11.50	Bottom	0	2.190	1.361	1.004	2.993	0.150		18.0	
Body	6 GHz WIF / IEEE 802.11be	320	OFDM	MIMO	DF394D/26063K3	96.84	-0.02	6905.00	191	U-NII-8	272.2	8.50	7.48	8.50	7.77	Bottom	0	1.100	1.265	1.033	1.437	0.072		17.0	
Note: To achieve the 15 dBm maximum allowed MIMO power for U-NII-5 shown in the documentation, each antenna transmits at a maximum allowed power of 12 dBm. Note: To achieve the 14 dBm maximum allowed MIMO power for U-NII-6 shown in the documentation, each antenna transmits at a maximum allowed power of 11 dBm. Note: To achieve the 15.75 dBm maximum allowed MIMO power for U-NII-7 shown in the documentation, each antenna transmits at a maximum allowed power of 12.75 dBm. Note: To achieve the 11.5 dBm maximum allowed MIMO power for U-NII-8 shown in the documentation, each antenna transmits at a maximum allowed power of 8.5 dBm.																									

10.4 Bluetooth SISO Standalone SAR

Table 10-10
Bluetooth Antenna R – WLAN OFF

Exposure	Band / Mode	Service / Modulation	Ant.	Serial Number	Duty Cycle [%]	Power Drift [dB]	Frequency [MHz]	Channel #	Data Rate [Mbps]	Max Allowed Power [dBm]	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 1g SAR [W/kg]	Power Scaling Factor	Duty Cycle Scaling Factor	Reported 1g SAR [W/kg]	Plot #
Body	2.4 GHz Bluetooth	FHSS	R	DF394HT26063K3	76.88	0.06	2441.00	39	1	20.5	18.97	Bottom	5	0.119	1.422	1.015	0.172	
ANSI/IEEE C95.1 1992 - SAFETY LIMIT														Body 1.6 W/kg (mW/g) averaged over 1 gram				
Spatial Peak Uncontrolled Exposure/General Population																		

FCC ID: C3K00002101	RF Exposure Part 1 Test Report				Approved by: Technical Manager	
Document S/N: 1M2604150032-01.C3K (Rev1)	DUT Type: Wireless Module	This report is Blockchain Verified. To verify the report authenticity, please visit https://www.blockchain-verified.com or by clicking on the Blockchain logo				Page 43 of 54

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Table 10-11
Bluetooth Antenna L – WLAN OFF | Plot A7

Exposure	Band / Mode	Service / Modulation	Ant.	Serial Number	Duty Cycle [%]	Power Drift [dB]	Frequency [MHz]	Channel #	Data Rate [Mbps]	Max Allowed Power [dBm]	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 1g SAR [W/kg]	Power Scaling Factor	Duty Cycle Scaling Factor	Reported 1g SAR [W/kg]	Plot #
Body	2.4 GHz Bluetooth	FHSS	L	0F394H125063X3	76.72	-0.06	2441.00	39	1	20.5	18.93	Bottom	5	0.144	1.435	1.017	0.210	Plot
ANSI/IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population													Body 1.6 W/kg (mW/g) averaged over 1 gram					

Table 10-12
Bluetooth Reduced Antenna R – WLAN ON

Exposure	Band / Mode	Service / Modulation	Ant.	Serial Number	Duty Cycle [%]	Power Drift [dB]	Frequency [MHz]	Channel #	Data Rate [Mbps]	Max Allowed Power [dBm]	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 1g SAR [W/kg]	Power Scaling Factor	Duty Cycle Scaling Factor	Reported 1g SAR [W/kg]	Plot #
Body	2.4 GHz Bluetooth	FHSS	R	0F394D626063X3	76.88	0.09	2441.00	39	1	18.0	17.57	Bottom	5	0.059	1.104	1.015	0.066	
ANSI/IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population													Body 1.6 W/kg (mW/g) averaged over 1 gram					

Table 10-13
Bluetooth Reduced Antenna L – WLAN ON

Exposure	Band / Mode	Service / Modulation	Ant.	Serial Number	Duty Cycle [%]	Power Drift [dB]	Frequency [MHz]	Channel #	Data Rate [Mbps]	Max Allowed Power [dBm]	Conducted Power [dBm]	Test Position	Spacing [mm]	Measured 1g SAR [W/kg]	Power Scaling Factor	Duty Cycle Scaling Factor	Reported 1g SAR [W/kg]	Plot #
Body	2.4 GHz Bluetooth	FHSS	L	0F394D626063X3	76.72	0.02	2480.00	78	1	18.0	17.02	Bottom	5	0.057	1.253	1.017	0.073	
ANSI/IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population													Body 1.6 W/kg (mW/g) averaged over 1 gram					

10.5 SAR Test Notes

General Notes:

- The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2013, FCC KDB Publication 447498 D04v01, and FCC KDB Publication 616217 D04v01r02.
- Batteries are fully charged at the beginning of the SAR measurements.
- Liquid tissue depth was at least 15.0 cm for all frequencies.
- The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
- SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D04v01.
- Per FCC KDB 865664 D01v01r04, variability SAR tests were not performed since the measured SAR results for a frequency band were less than 0.8 W/kg.
- This device uses Qualcomm FastConnect TAS for WLAN operations to control and manage transmitting power in real time to ensure RF Exposure compliance. Per FCC Guidance, compliance was assessed at the minimum of the time averaged power and the maximum output power for each band/mode/exposure condition (DSI).
- Per October 2020 TCB Workshop notes, absorbed power density (APD) using a 4cm² averaging area is reported based on SAR measurements.
- Per FCC KDB 616217 D04, SAR is evaluated for the bottom surface of a keyboard when it is attached to the DUT in DSI=1 configuration.
- The orange highlights throughout the report represent the highest scaled SAR per Equipment Class.

WLAN Notes:

- Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 2.4 GHz WIFI single transmission chain operations, the highest measured maximum output power channel for DSSS was selected for SAR measurement. SAR for OFDM modes (2.4 GHz 802.11g/n/ax/be) was not required due to the maximum allowed powers and the highest reported DSSS SAR. See Section 7.2.4 for more information.
- Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 5 GHz WIFI operations, the initial test configuration was selected according to the transmission mode with the highest maximum allowed powers. Other transmission modes were not investigated since the highest reported

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SAR for initial test configuration adjusted by the ratio of maximum output powers is less than 1.2 W/kg for 1g evaluations. See Section 7.2.5 for more information.

3. Per KDB Publication 248227 D01v02r02, SAR for MIMO was evaluated by following the simultaneous SAR provisions from KDB Publication 447498 D04v01 by either evaluating the sum of the 1g SAR values of each antenna transmitting independently or making a SAR measurement with both antennas transmitting simultaneously. Please see the Multi-Tx and Antenna SAR Considerations Appendix for complete analysis.
4. When the maximum reported 1g averaged SAR is ≤ 0.8 W/kg, SAR testing on additional channels was not required. Otherwise, SAR for the next highest output power channel was required until the reported SAR result was ≤ 1.20 W/kg for 1g evaluations or all test channels were measured.
5. The device was configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools. The reported SAR was scaled to the 100% transmission duty factor to determine compliance.
6. Per FCC guidance, SAR was performed using 6.5 GHz SAR probe calibration factors. Per October 2020 TCB Workshop notes, channels were tested to cover the entire range.
7. For 6 GHz SAR testing, testing was done at a more conservative distance and power level and no further evaluation is necessary

Bluetooth Notes

1. Bluetooth SAR was measured with the device connected to a call box with hopping disabled with DH5 operation and Tx Tests test mode type. Per October 2016 TCB Workshop Notes, the reported SAR was scaled to the 78% transmission duty factor for Bluetooth Antenna R and 78% transmission duty factor for Bluetooth Antenna L to determine compliance. See RF Conducted Power Section for the time domain plot and calculation for the duty factor of the device.

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11 POWER DENSITY DATA SUMMARY

11.1 6 GHz WIFI Power Density Results

Table 11-1
6 GHz WLAN | Plot A9

MEASUREMENT RESULTS																								
Frequency (MHz)	Channel	Mode	Service	Bandwidth (MHz)	Maximum Allowed Power (Ant 1) (dBm)	Conducted Power (Ant 1) (dBm)	Maximum Allowed Power (Ant 2) (dBm)	Conducted Power (Ant 2) (dBm)	Power Diff (dB)	Spacing (mm)	Antenna Config.	DUT Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Grid Step (A)	Scaling Factor for Measurement Uncertainty per IEC 62479	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Normal psPD (W/m²)	Scaled Normal psPD (W/m²)	Total psPD (W/m²)	Scaled Total psPD (W/m²)	Plot #
6665.00	143	802.11ax	OFDM	160	12.75	11.48	N/A	N/A	-0.14	2	R	9F39T920063K3	68.1	Bottom	99.59	0.046	1.610	1.340	1.004	2.810	6.087	3.200	6.931	
6665.00	143	802.11ax	OFDM	160	N/A	N/A	12.75	11.51	0.12	2	L	9F39T920063K3	68.1	Bottom	99.59	0.046	1.610	1.330	1.004	1.490	3.203	1.920	4.128	
6665.00	143	802.11ax	OFDM	160	12.75	11.41	12.75	11.50	0.20	2	MMO	9F39T920063K3	136.1	Bottom	99.59	0.046	1.610	1.361	1.004	2.790	6.138	3.250	7.150	Plot
47 CFR §1.1310 - SAFETY LIMIT Spatial Average Uncontrolled Exposure / General Population																	Power Density 10 W/m² averaged over 4 cm²							

Power Density General Notes

1. The manufacturer has confirmed that the devices tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
2. Batteries are fully charged at the beginning of the measurements. The DUT was connected to a wall charger for some measurements due to the test duration. It was confirmed that the charger plugged into this DUT did not impact the near-field PD test results.
3. For PTP-PR, Power density was reconstructed using PTP-PR algorithm based on E-field measurements acquired on two parallel measurement planes separated by $\lambda/4$.
4. For ESR, Power density was reconstructed using ESR algorithm based on E-field measurements acquired on three measurement planes.
5. Per FCC guidance and equipment manufacturer guidance, power density results were scaled according to IEC 62479:2010 for the portion of the measurement uncertainty > 30%. Total expanded uncertainty of 2.80 dB (90.5%) was used to determine the psPD measurement scaling factor.
6. Power density was measured at an evaluation distance of 2 mm. The grid size and grid step were selected to ensure adequate spatial resolution for power density evaluation.
7. The PTP-PR algorithm was used to reconstruct psPD from E-field measurements acquired on two parallel measurement planes separated by $\lambda/4$.
8. PD results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D04v01.

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12 SAR MEASUREMENT VARIABILITY

12.1 Measurement Variability

Per FCC KDB Publication 865664 D01v01r04, SAR measurement variability was assessed for each frequency band, which was determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media were required for SAR measurements in a frequency band, the variability measurement procedures were applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. These additional measurements were repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device was returned to ambient conditions (normal room temperature) with the battery fully charged before it was re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

SAR Measurement Variability was assessed using the following procedures for each frequency band:

- 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.
- 2) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1g SAR limit).
- 3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .
- 4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg

12.2 Measurement Uncertainty

The measured SAR was < 1.5 W/kg for 1g for all frequency bands. Therefore, per KDB Publication 865664 D01v01r04, the extended measurement uncertainty analysis per IEEE 1528-2013 was not required.

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13 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	E4404B	Spectrum Analyzer	N/A	N/A	N/A	MY45113242
Agilent	E4438C	ESG Vector Signal Generator	11/2/2025	Annual	11/2/2026	MY45093852
Agilent	E4438C	ESG Vector Signal Generator	3/23/2026	Annual	3/23/2027	MY45092078
Agilent	N5182A	MXG Vector Signal Generator	4/13/2026	Annual	4/13/2027	MY48180366
Agilent	8753ES	S-Parameter Vector Network Analyzer	10/28/2025	Annual	10/28/2026	MY40003841
Agilent	8753ES	S-Parameter Vector Network Analyzer	10/27/2025	Annual	10/27/2026	US39170118
Agilent	N4010A	Wireless Connectivity Test Set	N/A	N/A	N/A	GB46170464
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433973
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433974
Amplifier Research	150A100C	Amplifier	CBT	N/A	CBT	350132
Anritsu	ML2496A	Power Meter	8/21/2025	Annual	8/21/2026	1138001
Anritsu	ML2496A	Power Meter	6/27/2025	Annual	6/27/2026	1840005
Anritsu	MA2411B	Pulse Power Sensor	10/14/2025	Annual	10/14/2026	1726262
Anritsu	MA2411B	Pulse Power Sensor	10/14/2025	Annual	10/14/2026	1027293
Insize	1108-150	Insize - Digital Caliper	1/7/2026	Annual	1/7/2027	1410255640
Anritsu	MA24106A	USB Power Sensor	8/4/2025	Annual	8/4/2026	1827530
Anritsu	MA24106A	USB Power Sensor	2/20/2026	Annual	2/20/2027	1520501
Control Company	4352	Long Stem Thermometer	12/22/2025	Biennial	12/22/2027	250770121
Control Company	4352	Long Stem Thermometer	12/22/2025	Biennial	12/22/2027	250770096
Control Company	4040	Therm./ Clock/ Humidity Monitor	12/29/2025	Biennial	12/29/2027	250778120
Control Company	4040	Therm./ Clock/ Humidity Monitor	10/24/2025	Biennial	10/24/2027	250652331
Control Company	4040	Therm./ Clock/ Humidity Monitor	10/15/2024	Biennial	10/15/2026	240763503
Keysight Technologies	N9020A	MXA Signal Analyzer	7/7/2025	Annual	7/7/2026	MY48010233
Agilent	N9020A	MXA Signal Analyzer	7/7/2025	Biennial	7/7/2027	MY56470202
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
Mini-Circuits	VLF-6000+	Low Pass Filter DC to 6000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	VLF-6000+	Low Pass Filter DC to 6000 MHz	7/3/2025	Annual	7/3/2026	31634
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
Mini-Circuits	ZUDC10-83-S+	Directional Coupler	CBT	N/A	CBT	2050
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Narda	BW-S3W2	Attenuator (3dB)	CBT	N/A	CBT	120
Pasternack	NC-100	Torque Wrench	5/29/2025	Biennial	5/29/2027	N/A
SPEAG	DAK-3.5	Dielectric Assessment Kit	11/10/2025	Annual	11/10/2026	1277
SPEAG	DAKS-3.5	Portable Dielectric Assessment Kit	8/5/2025	Annual	8/5/2026	1041
SPEAG	MAIA	Modulation and Audio Interference Analyzer	N/A	N/A	N/A	1237
SPEAG	MAIA	Modulation and Audio Interference Analyzer	N/A	N/A	N/A	1331
SPEAG	MAIA	Modulation and Audio Interference Analyzer	N/A	N/A	N/A	1390
SPEAG	DAK-12	Dielectric Assessment Kit (4MHz - 3GHz)	3/3/2026	Annual	3/3/2027	1102
SPEAG	D2450V2	2450 MHz SAR Dipole	8/7/2024	Biennial	8/7/2026	719
SPEAG	D5GHzV2	5 GHz SAR Dipole	2/21/2024	Triennial	2/21/2027	1057
SPEAG	D6.5GHzV2	6.5 GHz SAR Dipole	12/5/2025	Annual	12/5/2026	1018
SPEAG	5G Verification Source 10GHz	10GHz System Verification Antenna	8/6/2025	Annual	8/6/2026	1004
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/10/2026	Annual	3/10/2027	1450
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/5/2025	Annual	11/5/2026	1677
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/5/2025	Annual	6/5/2026	1558
SPEAG	DAE4ip	Dasy Data Acquisition Electronics	2/9/2026	Annual	2/9/2027	1638
SPEAG	EX3DV4	SAR Probe	11/7/2025	Annual	11/7/2026	7406
SPEAG	EX3DV4	SAR Probe	6/11/2025	Annual	6/11/2026	7661
SPEAG	EX3DV4	SAR Probe	3/11/2026	Annual	3/11/2027	7539
SPEAG	EUmmWV3	EUmmWV3 Probe	1/14/2026	Annual	1/14/2027	9389

Note: 1) All equipment was used solely within its respective calibration period. 2) CBT (Calibrated Before Testing). Prior to testing, the measurement paths containing a cable, amplifier, attenuator, coupler or filter were connected to a calibrated source (i.e. a signal generator) to determine the losses of the measurement path. The power meter offset was then adjusted to compensate for the measurement system losses. This level offset is stored within the power meter before measurements are made. This calibration verification procedure applies to the system verification and output power measurements. The calibrated reading is then taken directly from the power meter after compensation of the losses for all final power measurements.

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14 MEASUREMENT UNCERTAINTIES

Note: The tables below represent the worst-case uncertainty budget among the uncertainty budgets of all testing laboratories listed in Section 1.2

Applicable for SAR measurements < 6GHz on a flat phantom:

SAR Uncertainty Budget based on IEEE 1528-2013 and SPEAG (0.3 GHz to 6 GHz)

a	b	c	d	e f(d,k)	f	g	h cx/fe	i exg/e	k
Uncertainty component	Reference	Tol. (± %)	Prob. dist.	Dvi.	ci (1g)	ci (10g)	lg ui (± %)	10g ui (± %)	vi
Measurement system									
Probe calibration	E.2.1	6.55	N	1	1	1	6.55	6.55	∞
Axial isotropy	E.2.2	0.25	N	1	0.707	0.707	0.18	0.18	∞
Hemispherical isotropy	E.2.2	1.30	N	1	0.707	0.707	0.92	0.92	∞
Boundary effect	E.2.3	2.00	R	1.73	1	1	1.15	1.15	∞
Linearity	E.2.4	0.30	R	1.73	1	1	0.17	0.17	∞
System detection limits	E.2.4	0.25	R	1.73	1	1	0.14	0.14	∞
Modulation response	E.2.5	4.80	R	1.73	1	1	2.77	2.77	∞
Readout electronics	E.2.6	0.30	N	1	1	1	0.30	0.30	∞
Response time	E.2.7	1.01	R	1.73	1	1	0.58	0.58	∞
Integration time	E.2.8	2.60	R	1.73	1	1	1.50	1.50	∞
RF ambient conditions - noise	E.6.1	3.00	R	1.73	1	1	1.73	1.73	∞
RF ambient conditions - reflections	E.6.1	3.00	R	1.73	1	1	1.73	1.73	∞
Probe positioner mechanical tolerance	E.6.2	0.04	R	1.73	1	1	0.02	0.02	∞
Probe positioning with respect to phantom shell	E.6.3	0.80	R	1.73	1	1	0.46	0.46	∞
Extrapolation, interpolation, and integration algorithms for max. SAR evaluation	E.5	4.00	R	1.73	1	1	2.31	2.31	∞
Test sample related									
Test sample positioning	E.4.2	3.12	N	1	1	1	3.12	3.12	35
Device holder uncertainty	E.4.1	1.67	N	1	1	1	1.67	1.67	5
Output power variation - SAR drift	E.2.9	5.00	R	1.73	1	1	2.89	2.89	∞
SAR scaling	E.6.5	0.00	R	1.73	1	1	0.00	0.00	∞
Phantom and tissue parameters									
Phantom shell uncertainty - shape, thickness and permittivity	E.3.1	7.60	R	1.73	1	1	4.39	4.39	∞
Uncertainty in SAR correction for deviations in permittivity and conductivity	E.3.2	0.00	N	1	1	1	0.00	0.00	∞
Liquid conductivity measurement	E.3.3	2.50	N	1	0.78	0.71	1.95	1.78	∞
Liquid permittivity measurement	E.3.3	2.50	N	1	0.23	0.26	0.58	0.65	∞
Liquid conductivity - temperature uncertainty	E.3.4	3.36	R	1.73	0.78	0.71	1.51	1.38	∞
Liquid permittivity - temperature uncertainty	E.3.4	0.77	R	1.73	0.23	0.26	0.10	0.12	∞
Liquid Conductivity - deviation from target values	E.3.2	5.00	R	1.73	0.64	0.43	1.85	1.24	∞
Liquid Permittivity - deviation from target values	E.3.2	5.00	R	1.73	0.60	0.49	1.73	1.41	∞
Combined standard uncertainty							11.0	10.8	40
Expanded uncertainty (95% confidence interval)							21.9	21.6	

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Applicable for SAR measurements > 6 GHz on a flat phantom:

SAR Uncertainty Budget based on IEC/IEEE 62209-1528:2020 (4 MHz to 10 GHz)

Symbol	Input quantity X (source of uncertainty)	Ref.	Prob. Dist. PDFi	Unc. a(xi)	Div. qi	u(xi) = a(xi)/qi	ci (1g)	ci (10g)	u(y) = cixu(xi) 1g (± %)	u(y) = cixu(xi) 10g (± %)	vi
Measurement system errors											
CF	Probe calibration	8.4.1.1	N (k=2)	9.30	1	9.30	1	1	9.30	9.30	∞
CFdrift	Probe calibration drift	8.4.1.2	R	1.70	1.73	0.98	1	1	0.98	0.98	∞
LIN	Probe linearity and detection limit	8.4.1.3	R	4.70	1.73	2.71	1	1	2.71	2.71	∞
BBS	Broadband signal	8.4.1.4	R	2.80	1.73	1.62	1	1	1.62	1.62	∞
ISO	Probe isotropy	8.4.1.5	R	7.60	1.73	4.39	1	1	4.39	4.39	∞
DAE	Other probe and data acquisition errors	8.4.1.6	N	2.40	1	2.40	1	1	2.40	2.40	∞
AMB	RF ambient and noise	8.4.1.7	N	1.80	1	1.80	1	1	1.80	1.80	∞
Δxyz	Probe positioning errors	8.4.1.8	N	0.30	1	0.30	1	1	0.30	0.30	∞
DAT	Data processing errors	8.4.1.9	N	3.50	1.00	3.50	1	1	3.50	3.50	∞
Phantom and device (DUT or validation antenna) errors											
LIQ(σ)	Measurement of phantom conductivity	8.4.2.1	N	2.50	1	2.50	0.78	0.71	1.95	1.78	∞
LIQ(Tc)	Temperature effects (medium)	8.4.2.2	R	5.40	1.73	3.12	0.78	0.71	2.43	2.21	∞
EPS	Shell permittivity	8.4.2.3	R	14.00	1.73	8.08	0.5	0.5	4.04	4.04	∞
DIS	Distance between the radiating element of the DUT and the phantom medium	8.4.2.4	N	2.00	1	2.00	2	2	4.00	4.00	∞
Dxyz	Repeatability of positioning the DUT or source against the phantom	8.4.2.5	N	3.12	1	3.12	1	1	3.12	3.12	35
H	Device holder effects	8.4.2.6	N	1.67	1	1.67	1	1	1.67	1.67	5
MOD	Effect of operating mode on probe sensitivity	8.4.2.7	R	2.40	1.73	1.39	1	1	1.39	1.39	∞
TAS	Time-average SAR	8.4.2.8	R	1.73	1.73	1.00	1	1	1.00	1.00	∞
RFdrift	Variation in SAR due to drift in output power of DUT	8.4.2.9	N	2.50	1	2.50	1	1	2.50	2.50	∞
VAL	Validation antenna uncertainty (validation measurement only)	8.4.2.10	N	0.00	1	0.00	1	1	0.00	0.00	∞
Pin	Uncertainty in accepted power (validation measurement only)	8.4.2.11	N	0.00	1	0.00	1	1	0.00	0.00	∞
Corrections to the SAR result (if applied)											
C(ε',σ)	Phantom deviation from target	8.4.3.1	R	5.00	1.73	2.89	0.64	0.43	1.85	1.24	∞
C(R)	SAR scaling	8.4.3.2	R	0.00	1.73	0.00	1	1	0.00	0.00	∞
u(ASAR)	Combined uncertainty								14.32	14.20	40
U	Expanded uncertainty and effective degrees of freedom								28.65	28.40	

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Applicable for Power Density Measurements:

PD Uncertainty Budget based on IEC IEEE 63195-1 for PTP-PR Reconstruction Mode and/or IPD Measurement at $d < \lambda/5$ under 24 GHz

Symbol	Source of uncertainty	Description	Unc. $\pm$ dB	Prob. Dist.	Div. q _i	c _i	Standard uncertainty $\pm$ dB	v _i
Uncertainty terms dependent on the measurement system								
CAL	Calibration	8.4.1	0.49	N	1	1	0.49	∞
COR	Probe correction	8.4.2	0.00	R	1.73	1	0.00	∞
FRS	Frequency response	8.4.3	0.20	R	1.73	1	0.12	∞
SCC	Sensor cross coupling	8.4.4	0.00	R	1.73	1	0.00	∞
ISO	Isotropy	8.4.5	0.50	R	1.73	1	0.29	∞
LIN	System linearity error	8.4.6	0.20	R	1.73	1	0.12	∞
PSC	Probe scattering	8.4.7	0.00	R	1.73	1	0.00	∞
PPO	Probe positioning offset	8.4.8	0.30	R	1.73	1	0.17	∞
PPR	Probe positioning repeatability	8.4.9	0.04	R	1.73	1	0.02	∞
SMO	Sensor mechanical offset	8.4.10	0.02	R	1.73	1	0.01	∞
PSR	Probe spatial resolution	8.4.11	0.00	R	1.73	1	0.00	∞
FLD	Field impedance dependence	8.4.12	0.00	R	1.73	1	0.00	∞
MED	Measurement drift	8.4.13	0.00	R	1.73	1	0.00	∞
APN	Amplitude and phase noise	8.4.14	0.04	R	1.73	1	0.02	∞
TR	Measurement area truncation	8.4.15	0.10	R	1.73	1	0.06	∞
DAQ	Data acquisition	8.4.16	0.03	N	1	1	0.03	∞
SMP	Sampling	8.4.17	0.00	R	1.73	1	0.00	∞
REC	Field reconstruction	8.4.18	2.00	R	1.73	1	1.15	∞
SNR	Signal-to-noise ratio	8.4.19	0.00	N	1	1	0.00	∞
TRA	Forward and backward transformation	8.4.20	0.70	R	1.73	1	0.40	∞
SCA	Power density scaling	8.4.21	0.00	R	1.73	1	0.00	∞
SAV	Spatial averaging	8.4.22	0.10	R	1.73	1	0.06	∞
COM	Exposure combining	8.4.23	0.00	N	1	1	0.00	∞
SDL	System detection limit		0.04	R	1.73	1	0.02	∞
Uncertainty terms dependent on the DUT and environmental factors								
PC	Probe coupling with DUT	8.5.1	0.00	R	1.73	1	0.00	∞
MOD	Modulation response	8.5.2	0.40	R	1.73	1	0.23	∞
IT	Integration time	8.5.3	0.00	R	1.73	1	0.00	∞
RT	Response time	8.5.4	0.00	R	1.73	1	0.00	∞
DH	Device holder influence	8.5.5	0.10	R	1.73	1	0.06	∞
DA	DUT alignment	8.5.6	0.00	R	1.73	1	0.00	∞
AC	RF ambient conditions	8.5.7	0.04	R	1.73	1	0.02	∞
TEM	Laboratory temperature	8.5.8	0.00	R	1.73	1	0.00	∞
REF	Reflections in laboratory	8.5.9	0.04	R	1.73	1	0.02	∞
MSI	Immunity / secondary reception	8.5.10	0.00	R	1.73	1	0.00	∞
DRI	DUT drift	8.5.11	0.22	R	1.73	1	0.13	∞
u(ASAR)	Combined uncertainty						1.40	
U	Expanded uncertainty and effective degrees of freedom (95 % confidence interval)						2.80	

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15 CONCLUSION

15.1 Measurement Conclusion

The SAR evaluation indicates that the DUT complies with the RF radiation exposure limits of the FCC and Innovation, Science, and Economic Development Canada, with respect to all parameters subject to this test. These measurements were taken to simulate the RF effects of RF exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests. The results and statements relate only to the item(s) tested.

Please note that the absorption and distribution of electromagnetic energy in the body are very complex phenomena that depend on the mass, shape, and size of the body, the orientation of the body with respect to the field vectors, and the electrical properties of both the body and the environment. Other variables that may play a substantial role in possible biological effects are those that characterize the environment (e.g. ambient temperature, air velocity, relative humidity, and body insulation) and those that characterize the individual (e.g. age, gender, activity level, debilitation, or disease). Because various factors may interact with one another to vary the specific biological outcome of an exposure to electromagnetic fields, any protection guide should consider maximal amplification of biological effects as a result of field-body interactions, environmental conditions, and physiological variables. [3]

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