

ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR LOW-POWER, NON-LICENSED TRANSMITTER

Test Report No. : W156R-D035

AGR No. : A154A-165

Applicant : LG Innotek Co., Ltd.

Address : 978-1, Jangduk-dong, Gwangsan-gu, Gwangju, 506-731 Korea

Manufacturer : LG Innotek Co., Ltd.

Address : 978-1, Jangduk-dong, Gwangsan-gu, Gwangju, 506-731 Korea

Type of Equipment : Wi-Fi module

FCC ID. : YZP-TWCMB202D

IC Certification No. : 7414C-TWCMB202D

Model Name : TWCM-B202D

Serial number : N/A

Total page of Report : 21 pages (including this page)

Date of Incoming : February 13, 2015

Date of issue : June 24, 2015

SUMMARY

The equipment complies with the regulation; FCC PART 15 SUBPART C Section 15.247 and

FCC PART 15 SUBPART E Section 15.407, IC RSS-Gen Issue 4 Nov 2014 and RSS-247 Issue 1 May 2015

This test report only contains the result of a single test of the sample supplied for the examination.

It is not a generally valid assessment of the features of the respective products of the mass-production.

Reviewed by: Ki-Hong, Nam / Asst, Chief Engineer ONETECH Corp.

Approved by:

Sung-Ik, Han/ Managing Director ONETECH Corp.

Report No.: W156R-D035

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EMC-003 (Rev.2)





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Revision History

Issued Report No.	Issued Date	Revisions	Effect Section
W156R-D035	June 24, 2015	Initial Issue	All

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EMC-003 (Rev.2)





1. VERIFICATION OF COMPLIANCE

Applicant : LG Innotek Co., Ltd.

Address : 978-1, Jangduk-dong, Gwangsan-gu, Gwangju, 506-731 Korea

Contact Person : Inchang, Jeong / Director

Telephone No. : +82-62-950-0332

FCC ID : YZP-TWCMB202D IC Certification No. : 7414C-TWCMB202D

Model Name : TWCM-B202D

Serial Number : N/A

Date : June 24, 2015

	FCC : DTS – DIGITAL TRNSMISSION SYSTEM		
EQUIDMENT CLASS	FCC : DSS – PART 15 SPREAD SPECTRUM TRANSMITTER		
EQUIPMENT CLASS	FCC : Unlicensed National Information infrastructure(UNII)		
	IC : Low Power License-Exempt Radio-communication Device		
E.U.T. DESCRIPTION	Modular Transmitter, Wi-Fi module		
THIS REPORT CONCERNS	Original Grant		
MEASUREMENT PROCEDURES	ANSI C63.10: 2013		
TYPE OF EQUIPMENT TESTED	Pre-Production		
KIND OF EQUIPMENT			
AUTHORIZATION REQUESTED	Certification, Modular Approval		
EQUIPMENT WILL BE OPERATED	FCC PART 15 SUBPART C Section 15.247,		
UNDER FCC RULES PART(S)	FCC PART 15 SUBPART E Section 15.407,		
	IC RSS-Gen Issue 4 Nov 2014 and RSS-247 Issue 1 May 2015		
Modifications on the Equipment to Achieve	Maria		
Compliance	None		
Final Test was Conducted On	3 m, Semi Anechoic Chamber		

^{-.} The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC&IC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

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2. GENERAL INFORMATION

2.1 Product Description

The LG Innotek Co., Ltd., Model TWCM-B202D (referred to as the EUT in this report) is a Wi-Fi module. Product specification information described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	Wi-Fi module			
	WW AND	2 412 MHz ~ 2 462 MHz (802.11b/g/n(HT20))		
	WLAN	2 422 MHz ~ 2 452 MHz (802.11n(HT40))		
	Bluetooth	2 402 MHz ~ 2 480) MHz	
	Bluetooth LE	2 402 MHz ~ 2 480 MHz		
	5 150 NAV	5 180 MHz ~ 5 240	0 MHz (802.11a/n(HT20)/ac(HT20))	
	5 150 MHz ~	5 190 MHz ~ 5 230	0 MHz (802.11n(HT40)/ac(HT40))	
	5 250 MHz Band	5 210 MHz (802.1	1n(HT80))	
ODED ATING EDECLIENCY	5.250 MH	5 260 MHz ~ 5 320	0 MHz (802.11a/n(HT20)/ac(HT20))	
OPERATING FREQUENCY	5 250 MHz ~	5 270 MHz ~ 5 310	0 MHz (802.11n(HT40)/ac(HT40))	
	5 350 MHz Band	5 290 MHz (802.1	1n(HT80))	
	5 470 MHz ~ 5 725 MHz Band	5 500 MHz ~ 5 700	0 MHz (802.11a/n(HT20)/ac(HT20))	
		5 510 MHz ~ 5 670 MHz (802.11n(HT40)/ac(HT40))		
		5 530 MHz (802.11n(HT80))		
	5 725 MHz ~	5 745 MHz ~ 5 825 MHz (802.11a/n(HT20)/ac(HT20))		
	5 850 MHz Band	5 755 MHz ~ 5 795 MHz (802.11n(HT40)/ac(HT40))		
	3 030 WHZ Band	5 775 MHz (802.11n(HT80))		
			Wi-Fi 802.11b (13.85 dBm)	
		Antenna 0	Wi-Fi 802.11g (13.37 dBm)	
		Antenna 0	Wi-Fi 802.11n_20 MHz (11.32 dBm)	
			Wi-Fi 802.11n_40 MHz (11.52 dBm)	
			Wi-Fi 802.11b (14.08 dBm)	
MAX. RF OUTPUT POWER	WLAN	Antenna 1	Wi-Fi 802.11g (13.75 dBm)	
		Antenna 1	Wi-Fi 802.11n_20 MHz (11.65 dBm)	
			Wi-Fi 802.11n_40 MHz (11.86 dBm)	
			Wi-Fi 802.11g (16.57 dBm)	
		Multiple transmit	Wi-Fi 802.11n_20 MHz (14.50 dBm)	
			Wi-Fi 802.11n_40 MHz (14.70 dBm)	

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П			
		1 Mbps	4.13 dBm
	Bluetooth	2 Mbps	5.21 dBm
		3 Mbps	5.86 dBm
	Bluetooth LE	6.39 dBm	
			Wi-Fi 802.11a (12.09 dBm)
			Wi-Fi 802.11n_20 MHz (12.11 dBm)
		5 150 MHz ~	Wi-Fi 802.11n_40 MHz (12.31 dBm)
		5 250 MHz Band	Wi-Fi 802.11ac_20 MHz (12.15 dBm)
			Wi-Fi 802.11ac_40 MHz (12.65 dBm)
			Wi-Fi 802.11ac_80 MHz (9.81 dBm)
			Wi-Fi 802.11a (13.44 dBm)
			Wi-Fi 802.11n_20 MHz (13.66 dBm)
		5 250 MHz ~	Wi-Fi 802.11n_40 MHz (13.50 dBm)
MAX. RF OUTPUT POWER		5 350 MHz Band	Wi-Fi 802.11ac_20 MHz (13.35 dBm)
MAX. RI OUTFUT FOWER			Wi-Fi 802.11ac_40 MHz (13.82 dBm)
	A		Wi-Fi 802.11ac_80 MHz (9.74 dBm)
	Antenna 0		Wi-Fi 802.11a (13.94 dBm)
			Wi-Fi 802.11n_20 MHz (13.73 dBm)
		5 470 MHz ~	Wi-Fi 802.11n_40 MHz (14.06 dBm)
		5 725 MHz Band	Wi-Fi 802.11ac_20 MHz (13.97 dBm)
			Wi-Fi 802.11ac_40 MHz (14.34 dBm)
			Wi-Fi 802.11ac_80 MHz (11.40 dBm)
			Wi-Fi 802.11a (12.90 dBm)
			Wi-Fi 802.11n_20 MHz (12.69 dBm)
		5 725 MHz ~	Wi-Fi 802.11n_40 MHz (13.09 dBm)
		5 850 MHz Band	Wi-Fi 802.11ac_20 MHz (12.74 dBm)
			Wi-Fi 802.11ac_40 MHz (13.24 dBm)
			Wi-Fi 802.11ac_80 MHz (10.32 dBm)

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		<u> </u>	
			Wi-Fi 802.11a (13.15 dBm)
			Wi-Fi 802.11n_20 MHz (12.98 dBm)
		5 150 MHz ~	Wi-Fi 802.11n_40 MHz (13.08 dBm)
		5 250 MHz Band	Wi-Fi 802.11ac_20 MHz (12.83 dBm)
			Wi-Fi 802.11ac_40 MHz (13.37 dBm)
			Wi-Fi 802.11ac_80 MHz (10.82 dBm)
			Wi-Fi 802.11a (12.07 dBm)
			Wi-Fi 802.11n_20 MHz (12.42 dBm)
		5 250 MHz ~	Wi-Fi 802.11n_40 MHz (12.26 dBm)
		5 350 MHz Band	Wi-Fi 802.11ac_20 MHz (12.14 dBm)
			Wi-Fi 802.11ac_40 MHz (12.73 dBm)
MAX. RF OUTPUT POWER	Antenna 1		Wi-Fi 802.11ac_80 MHz (10.59 dBm)
MAA. RF OUTPUT POWER	Antenna i		Wi-Fi 802.11a (13.60 dBm)
			Wi-Fi 802.11n_20 MHz (13.22 dBm)
		5 470 MHz ~	Wi-Fi 802.11n_40 MHz (13.44 dBm)
		5 725 MHz Band	Wi-Fi 802.11ac_20 MHz (13.34 dBm)
			Wi-Fi 802.11ac_40 MHz (13.79 dBm)
			Wi-Fi 802.11ac_80 MHz (10.59 dBm)
			Wi-Fi 802.11a (13.72 dBm)
			Wi-Fi 802.11n_20 MHz (13.56 dBm)
		5 725 MHz ~	Wi-Fi 802.11n_40 MHz (13.69 dBm)
		5 850 MHz Band	Wi-Fi 802.11ac_20 MHz (13.54 dBm)
			Wi-Fi 802.11ac_40 MHz (14.22 dBm)
			Wi-Fi 802.11ac_80 MHz (11.30 dBm)



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MAX. RF OUTPUT POWER Multiple transmit Multiple transmit MAX. RF OUTPUT POWER Multiple transmit Multipl		_		
S 150 MHz ~ Wi-Fi 802.11a_40 MHz (15.68 dBm) Wi-Fi 802.11a_20 MHz (16.04 dBm) Wi-Fi 802.11a_20 MHz (16.04 dBm) Wi-Fi 802.11a_20 MHz (13.35 dBm) Wi-Fi 802.11a_20 MHz (13.35 dBm) Wi-Fi 802.11a_20 MHz (16.09 dBm) Wi-Fi 802.11a_20 MHz (16.09 dBm) Wi-Fi 802.11a_20 MHz (16.09 dBm) Wi-Fi 802.11a_20 MHz (16.26 dBm) Wi-Fi 802.11a_20 MHz (16.49 dBm) Wi-Fi 802.11a_20 MHz (16.49 dBm) Wi-Fi 802.11a_20 MHz (16.49 dBm) Wi-Fi 802.11a_20 MHz (16.68 dBm) Wi-Fi 802.11a_20 MHz (16.68 dBm) Wi-Fi 802.11a_20 MHz (16.08 dBm) Wi-Fi 802.11a_20 MHz (16.08 dBm) Wi-Fi 802.11a_20 MHz (16.16 dBm) Wi-Fi 802.11a_20 MHz (16.17 dBm) Wi-Fi 802.11a_20 MHz (16.18 dBm)				Wi-Fi 802.11a (15.63 dBm)
S 250 MHz Band Wi-Fi 802.11ac_20 MHz (15.47 dBm) Wi-Fi 802.11ac_80 MHz (13.35 dBm) Wi-Fi 802.11ac_80 MHz (13.35 dBm) Wi-Fi 802.11ac_80 MHz (13.35 dBm) Wi-Fi 802.11a (15.82 dBm) Wi-Fi 802.11a (15.82 dBm) Wi-Fi 802.11a (15.82 dBm) Wi-Fi 802.11a (15.93 dBm) Wi-Fi 802.11ac_40 MHz (15.93 dBm) Wi-Fi 802.11ac_40 MHz (15.93 dBm) Wi-Fi 802.11ac_40 MHz (16.26 dBm) Wi-Fi 802.11ac_80 MHz (13.20 dBm) Wi-Fi 802.11ac_80 MHz (13.20 dBm) Wi-Fi 802.11ac_80 MHz (13.20 dBm) Wi-Fi 802.11ac_90 MHz (16.49 dBm) Wi-Fi 802.11ac_90 MHz (16.47 dBm) Wi-Fi 802.11ac_90 MHz (16.77 dBm) Wi-Fi 802.11ac_90 MHz (16.70 dBm) Wi-Fi 802.11ac_90 MHz (16.70 dBm) Wi-Fi 802.11ac_90 MHz (16.70 dBm) Wi-Fi 802.11ac_90 MHz (16.71 dBm) Wi-Fi 8				Wi-Fi 802.11n_20 MHz (15.52 dBm)
Wi-Fi 802.11ac_40 MHz (16.04 dBm) Wi-Fi 802.11ac_80 MHz (13.35 dBm) Wi-Fi 802.11ac_80 MHz (13.35 dBm) Wi-Fi 802.11a (15.82 dBm) Wi-Fi 802.11a (15.82 dBm) Wi-Fi 802.11ac_20 MHz (16.09 dBm) Wi-Fi 802.11ac_20 MHz (15.93 dBm) Wi-Fi 802.11ac_40 MHz (15.93 dBm) Wi-Fi 802.11ac_40 MHz (15.93 dBm) Wi-Fi 802.11ac_40 MHz (16.26 dBm) Wi-Fi 802.11ac_80 MHz (13.20 dBm) Wi-Fi 802.11ac_80 MHz (13.20 dBm) Wi-Fi 802.11ac_90 MHz (16.49 dBm) Wi-Fi 802.11ac_90 MHz (16.77 dBm) Wi-Fi 802.11ac_90 MHz (16.77 dBm) Wi-Fi 802.11ac_90 MHz (16.77 dBm) Wi-Fi 802.11ac_90 MHz (16.78 dBm) Wi-Fi 802.11ac_90 MHz (16.74 dBm) Wi-Fi 802.11ac_90 MHz (16.16 dBm) Wi-Fi 802.11ac_90 MHz (16.17 dBm) Wi-Fi 802.11ac_90 MHz (16.17 dBm) Wi-Fi 802.11ac_90 MHz (16.77 dBm) Wi-Fi 80			5 150 MHz ~	Wi-Fi 802.11n_40 MHz (15.68 dBm)
MAX. RF OUTPUT POWER MAX. RF OUTPUT POWER Multiple transmit Multipl			5 250 MHz Band	Wi-Fi 802.11ac_20 MHz (15.47 dBm)
MAX. RF OUTPUT POWER Multiple transmit MAX. RF OUTPUT POWER Multiple transmit Wi-Fi 802.11ac_20 MHz (16.49 dBm) Wi-Fi 802.11ac_20 MHz (16.47 dBm) Wi-Fi 802.11ac_20 MHz (16.16 dBm) Wi-Fi 802.11ac_20 MHz (16.41 dBm) Wi-Fi 802.11ac_20 MHz (16.47 dBm) Wi-Fi 802.11ac_20 MH				Wi-Fi 802.11ac_40 MHz (16.04 dBm)
MAX. RF OUTPUT POWER Multiple transmit Multiple transmit MAX. RF OUTPUT POWER Multiple transmit Wi-Fi 802.11ac_20 MHz (16.49 dBm) Wi-Fi 802.11ac_20 MHz (16.49 dBm) Wi-Fi 802.11ac_20 MHz (16.68 dBm) Wi-Fi 802.11ac_20 MHz (16.16 dBm) Wi-Fi 802.11ac_20 MHz (16.16 dBm) Wi-Fi 802.11ac_20 MHz (16.17 dBm)				Wi-Fi 802.11ac_80 MHz (13.35 dBm)
MAX. RF OUTPUT POWER Multiple transmit Wi-Fi 802.11ac_40 MHz (16.49 dBm) Wi-Fi 802.11ac_40 MHz (16.68 dBm) Wi-Fi 802.11ac_40 MHz (16.64 dBm) Wi-Fi 802.11ac_40 MHz (16.68 dBm) Wi-Fi 802.11ac_40 MHz (16.68 dBm) Wi-Fi 802.11ac_40 MHz (16.67 dBm) Wi-Fi 802.11ac_40 MHz (16.77 dBm) Wi-Fi 802.11ac_40 MHz (16.67 dBm) Wi-Fi 802.11ac_				Wi-Fi 802.11a (15.82 dBm)
MAX. RF OUTPUT POWER Multiple transmit Wi-Fi 802.11ac_40 MHz (16.26 dBm) Wi-Fi 802.11ac_80 MHz (13.20 dBm) Wi-Fi 802.11ac_90 MHz (16.49 dBm) Wi-Fi 802.11ac_90 MHz (16.49 dBm) Wi-Fi 802.11ac_90 MHz (16.68 dBm) Wi-Fi 802.11ac_90 MHz (16.68 dBm) Wi-Fi 802.11ac_90 MHz (16.68 dBm) Wi-Fi 802.11ac_90 MHz (16.16 dBm) Wi-Fi 802.11ac_90 MHz (16.17 dBm) Wi-Fi 802.11ac_90 MHz (16.16 dBm) Wi-Fi 802.1				Wi-Fi 802.11n_20 MHz (16.09 dBm)
MAX. RF OUTPUT POWER Multiple transmit Wi-Fi 802.11ac_80 MHz (16.26 dBm) Wi-Fi 802.11ac_10 MHz (16.49 dBm) Wi-Fi 802.11ac_20 MHz (16.77 dBm) Wi-Fi 802.11ac_20 MHz (16.68 dBm) Wi-Fi 802.11ac_40 MHz (17.08 dBm) Wi-Fi 802.11ac_80 MHz (14.02 dBm) Wi-Fi 802.11ac_10 MHz (16.16 dBm) Wi-Fi 802.11ac_10 MHz (16.16 dBm) Wi-Fi 802.11ac_10 MHz (16.17 dBm) Wi-Fi 802.11ac_20 MHz (16.17 dBm) Wi-Fi 802.11ac_10 MHz (16.17 dBm) Wi-Fi 802.11ac_10 MHz (16.77 dBm) Wi-Fi 802.11ac_10 MHz (16.70 d			5 250 MHz ~	Wi-Fi 802.11n_40 MHz (15.93 dBm)
MAX. RF OUTPUT POWER Multiple transmit Multiple transmit Multiple transmit Multiple transmit Multiple transmit Multiple transmit Wi-Fi 802.11a (16.78 dBm) Wi-Fi 802.11n_20 MHz (16.49 dBm) Wi-Fi 802.11n_20 MHz (16.77 dBm) 5 470 MHz ~ Wi-Fi 802.11ac_20 MHz (16.68 dBm) Wi-Fi 802.11ac_40 MHz (17.08 dBm) Wi-Fi 802.11ac_80 MHz (14.02 dBm) Wi-Fi 802.11ac_80 MHz (14.02 dBm) Wi-Fi 802.11ac_80 MHz (16.16 dBm) Wi-Fi 802.11ac_90 MHz (16.16 dBm) Wi-Fi 802.11ac_90 MHz (16.17 dBm) Wi-Fi 802.11ac_80 MHz (16.77 dBm) Wi-Fi 802.11ac_80 MHz (13.85 dBm) Wi-Fi 802.11ac_80 Mz (13.85 dBm)			5 350 MHz Band	Wi-Fi 802.11ac_20 MHz (15.80 dBm)
MAX. RF OUTPUT POWER Multiple transmit Wi-Fi 802.11a (16.78 dBm) Wi-Fi 802.11n_20 MHz (16.49 dBm) Wi-Fi 802.11n_20 MHz (16.77 dBm) Vi-Fi 802.11ac_20 MHz (16.68 dBm) Wi-Fi 802.11ac_20 MHz (16.68 dBm) Wi-Fi 802.11ac_80 MHz (17.08 dBm) Wi-Fi 802.11ac_80 MHz (14.02 dBm) Wi-Fi 802.11ac_80 MHz (16.16 dBm) Wi-Fi 802.11ac_10 MHz (16.16 dBm) Wi-Fi 802.11ac_20 MHz (16.17 dBm) Wi-Fi 802.11ac_20 MHz (16.17 dBm) Wi-Fi 802.11ac_80 MHz (16.77 dBm) Wi-Fi 802.11ac_80 MHz (13.85 dBm) Wi-Fi 802.11ac_80 MHz (16.77 dBm) Wi-Fi 802.11ac_80 MHz (16.77 dBm) Wi-Fi 802.11ac_90 MHz (16.70 dBm) Wi-Fi 802.11ac_90 MH				Wi-Fi 802.11ac_40 MHz (16.26 dBm)
Wi-Fi 802.11a (16.78 dBm) Wi-Fi 802.11n_20 MHz (16.49 dBm) Wi-Fi 802.11n_20 MHz (16.77 dBm) Wi-Fi 802.11a_20 MHz (16.68 dBm) Wi-Fi 802.11ac_40 MHz (17.08 dBm) Wi-Fi 802.11ac_80 MHz (14.02 dBm) Wi-Fi 802.11ac_80 MHz (14.02 dBm) Wi-Fi 802.11ac_80 MHz (16.64 dBm) Wi-Fi 802.11ac_80 MHz (16.16 dBm) Wi-Fi 802.11ac_80 MHz (16.16 dBm) Wi-Fi 802.11ac_90 MHz (16.16 dBm) Wi-Fi 802.11ac_90 MHz (16.17 dBm) Wi-Fi 802.11ac_90 MHz (16.17 dBm) Wi-Fi 802.11ac_90 MHz (16.77 dBm) Wi-	MAN DE OUTEDUTE DONNED	36.10.1		Wi-Fi 802.11ac_80 MHz (13.20 dBm)
5 470 MHz ~ Wi-Fi 802.11n_40 MHz (16.77 dBm) 5 725 MHz Band Wi-Fi 802.11ac_20 MHz (16.68 dBm) Wi-Fi 802.11ac_20 MHz (16.68 dBm) Wi-Fi 802.11ac_40 MHz (17.08 dBm) Wi-Fi 802.11ac_80 MHz (14.02 dBm) Wi-Fi 802.11ac_80 MHz (16.16 dBm) Wi-Fi 802.11n_20 MHz (16.16 dBm) Wi-Fi 802.11n_20 MHz (16.16 dBm) Wi-Fi 802.11ac_20 MHz (16.17 dBm) Wi-Fi 802.11ac_40 MHz (16.77 dBm) Wi-Fi 802.11ac_80 MHz (13.85 dBm) WLAN 2.4 G	MAX. RF OUTPUT POWER	Multiple transmit		Wi-Fi 802.11a (16.78 dBm)
5 725 MHz Band Wi-Fi 802.11ac_20 MHz (16.68 dBm) Wi-Fi 802.11ac_40 MHz (17.08 dBm) Wi-Fi 802.11ac_80 MHz (14.02 dBm) Wi-Fi 802.11ac_80 MHz (14.02 dBm) Wi-Fi 802.11a (16.34 dBm) Wi-Fi 802.11a_20 MHz (16.16 dBm) Wi-Fi 802.11a_20 MHz (16.16 dBm) Wi-Fi 802.11ac_20 MHz (16.41 dBm) Wi-Fi 802.11ac_20 MHz (16.77 dBm) Wi-Fi 802.11ac_80 MHz (16.77 dBm) Wi-Fi 802.11ac_80 MHz (13.85 dBm) Wi-Fi 802.11ac_80 MHz (16.77 dBm) Wi-Fi 802.11ac_80 MHz				Wi-Fi 802.11n_20 MHz (16.49 dBm)
Wi-Fi 802.11ac_40 MHz (17.08 dBm)			5 470 MHz ~	Wi-Fi 802.11n_40 MHz (16.77 dBm)
Wi-Fi 802.11ac_80 MHz (14.02 dBm)			5 725 MHz Band	Wi-Fi 802.11ac_20 MHz (16.68 dBm)
Wi-Fi 802.11a (16.34 dBm) Wi-Fi 802.11n_20 MHz (16.16 dBm) 5 725 MHz ~ Wi-Fi 802.11n_20 MHz (16.41 dBm) 5 850 MHz Band Wi-Fi 802.11ac_20 MHz (16.17 dBm) Wi-Fi 802.11ac_20 MHz (16.17 dBm) Wi-Fi 802.11ac_40 MHz (16.77 dBm) Wi-Fi 802.11ac_80 MHz (13.85 dBm) WLAN 2.4 G			Wi-Fi 802.11ac_40 MHz	Wi-Fi 802.11ac_40 MHz (17.08 dBm)
Wi-Fi 802.11n_20 MHz (16.16 dBm) 5 725 MHz ~ Wi-Fi 802.11n_40 MHz (16.41 dBm) 5 850 MHz Band Wi-Fi 802.11ac_20 MHz (16.17 dBm) Wi-Fi 802.11ac_40 MHz (16.77 dBm) Wi-Fi 802.11ac_40 MHz (16.77 dBm) Wi-Fi 802.11ac_80 MHz (13.85 dBm) WLAN 2.4 G				Wi-Fi 802.11ac_80 MHz (14.02 dBm)
5 725 MHz ~ Wi-Fi 802.11n_40 MHz (16.41 dBm) 5 850 MHz Band Wi-Fi 802.11ac_20 MHz (16.17 dBm) Wi-Fi 802.11ac_40 MHz (16.77 dBm) Wi-Fi 802.11ac_80 MHz (13.85 dBm) WLAN 2.4 G DSSS Modulation(DBPSK/DQPSK/CCK) WLAN 5 G OFDM Modulation(BPSK/QPSK/16QAM/64QAM) Bluetooth GFSK for 1 Mbps, DQPSK for 2 Mbps, 8-DPSK for 3 Mbps Bluetooth LE GFSK WLAN : PIFA Antenna Bluetooth / Bluetooth LE : PIFA Antenna WLAN : 2.9 dBi				Wi-Fi 802.11a (16.34 dBm)
MODULATION TYPE Second Period				Wi-Fi 802.11n_20 MHz (16.16 dBm)
Wi-Fi 802.11ac_40 MHz (16.77 dBm) Wi-Fi 802.11ac_80 MHz (13.85 dBm) WLAN 2.4 G DSSS Modulation(DBPSK/DQPSK/CCK) WLAN 5 G OFDM Modulation(BPSK/QPSK/16QAM/64QAM) Bluetooth GFSK for 1 Mbps, DQPSK for 2 Mbps, 8-DPSK for 3 Mbps Bluetooth LE GFSK WLAN : PIFA Antenna Bluetooth / Bluetooth LE : PIFA Antenna WLAN : 2.9 dBi			5 725 MHz ~	Wi-Fi 802.11n_40 MHz (16.41 dBm)
WLAN 2.4 G DSSS Modulation(DBPSK/DQPSK/CCK) WLAN 5 G OFDM Modulation(BPSK/QPSK/16QAM/64QAM) Bluetooth GFSK for 1 Mbps, DQPSK for 2 Mbps, 8-DPSK for 3 Mbps Bluetooth LE GFSK WLAN : PIFA Antenna Bluetooth / Bluetooth LE : PIFA Antenna WLAN : 2.9 dBi			5 850 MHz Band	Wi-Fi 802.11ac_20 MHz (16.17 dBm)
WLAN 2.4 G DSSS Modulation(DBPSK/DQPSK/CCK) WLAN 5 G OFDM Modulation(BPSK/QPSK/16QAM/64QAM) Bluetooth GFSK for 1 Mbps, DQPSK for 2 Mbps, 8-DPSK for 3 Mbps Bluetooth LE GFSK WLAN : PIFA Antenna Bluetooth / Bluetooth LE : PIFA Antenna WLAN : 2.9 dBi				Wi-Fi 802.11ac_40 MHz (16.77 dBm)
MODULATION TYPE WLAN 5 G OFDM Modulation(BPSK/QPSK/16QAM/64QAM) Bluetooth GFSK for 1 Mbps, DQPSK for 2 Mbps, 8-DPSK for 3 Mbps Bluetooth LE GFSK WLAN : PIFA Antenna Bluetooth / Bluetooth LE : PIFA Antenna WLAN : 2.9 dBi				Wi-Fi 802.11ac_80 MHz (13.85 dBm)
MODULATION TYPE Bluetooth GFSK for 1 Mbps, DQPSK for 2 Mbps, 8-DPSK for 3 Mbps Bluetooth LE GFSK WLAN : PIFA Antenna Bluetooth / Bluetooth LE : PIFA Antenna WLAN : 2.9 dBi		WLAN 2.4 G	DSSS Modulation(DBPSK/DQPSK/CCK)
Bluetooth GFSK for 1 Mbps, DQPSK for 2 Mbps, 8-DPSK for 3 Mbps Bluetooth LE GFSK WLAN : PIFA Antenna Bluetooth / Bluetooth LE : PIFA Antenna WLAN : 2.9 dBi	MODIII ATION TYPE	WLAN 5 G	OFDM Modulation	n(BPSK/QPSK/16QAM/64QAM)
ANTENNA TYPE WLAN : PIFA Antenna Bluetooth / Bluetooth LE : PIFA Antenna WLAN : 2.9 dBi	MODULATION TYPE	Bluetooth	GFSK for 1 Mbps,	DQPSK for 2 Mbps, 8-DPSK for 3 Mbps
ANTENNA TYPE Bluetooth / Bluetooth LE : PIFA Antenna WLAN : 2.9 dBi ANTENNA GAIN		Bluetooth LE	GFSK	
Bluetooth / Bluetooth LE : PIFA Antenna WLAN : 2.9 dBi ANTENNA GAIN	ANTERNIA TRADE	WLAN : PIFA Ante	enna	
ANTENNA GAIN	ANTENNA TYPE	Bluetooth / Bluetooth LE: PIFA Antenna		
	ANTERNALO	WLAN: 2.9 dBi		
<u>, </u>	ANTENNA GAIN	Bluetooth / Bluetooth LE : 0.42 dBi		
List of each Osc. or crystal	List of each Osc. or crystal	40.741		
Freq.(Freq. \geq 1 MHz) 40 MHz	Freq.(Freq. >= 1 MHz)	40 MHz		

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2.2 Alternative type(s)/model(s); also covered by this test report.

-. None

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3. MAXIMUM PERMISSIBLE EXPOSURE

3.1 RF Exposure Calculation

According to the FCC rule 1.1310 table 1B, the limit for the maximum permissible RF exposure for an uncontrolled environment are f/1500 mW/cm² for the frequency range between 300 MHz and 1.00 mW/cm² for the frequency range between 1 500 MHz and 100 000 MHz.

The electric field generated for a 1 mW/cm² exposure is calculated as follows:

$$E = \sqrt{(30 * P * G)} / d$$
, and $S = E^2 / Z = E^2 / 377$, because 1 mW/cm² = 10 W/m²

Where

S = Power density in mW/cm², Z = Impedance of free space, 377 Ω

E = Electric filed strength in V/m, G = Numeric antenna gain, and d = distance in meter

Combing equations and rearranging the terms to express the distance as a function of the remaining variable

$$d = \sqrt{(30 * P * G) / (377 * 10 S)}$$

Changing to units of mW and cm, using P(mW) = P(W) / 1000, d(cm) = 0.01 * d(m)

$$d = 0.282 * \sqrt{(P * G) / S}$$

Where

d = distance in cm, P = Power in mW, G = Numeric antenna gain, and S = Power density in mW/cm²

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3.2 EUT Description

Kind of EUT	Wi-Fi module		
	☐ Wireless Microphone: 494.000 MHz ~ 501.000 MHz		
	and 498.200 MHz ~ 505.200 MHz		
	■ WLAN: 2 412 M	Hz ~ 2 462 MHz	
Operating Frequency Band	■ WLAN: 5 180 MHz ~ 5 320 MHz / 5 500 MHz ~ 5 700 MHz ■ WLAN: 5 745 MHz ~ 5 825 MHz		
	■ Bluetooth: 2 402 l	MHz ~ 2 480 MHz	
	■ Bluetooth BLE: 2	402 MHz ~ 2 480 M	Hz
	☐ Portable (< 20 cm	separation)	
Device Category	☐ Mobile (> 20 cm	separation)	
	■ Others		
		Antenna 0	Wi-Fi 802.11b (13.85 dBm)
			Wi-Fi 802.11g (11.92 dBm)
			Wi-Fi 802.11n_20 MHz (11.32 dBm)
			Wi-Fi 802.11n_40 MHz (11.52 dBm)
			Wi-Fi 802.11b (14.08 dBm)
MAX. RF OUTPUT POWER	WLAN		Wi-Fi 802.11g (13.75 dBm)
		Antenna 1	Wi-Fi 802.11n_20 MHz (11.65 dBm)
			Wi-Fi 802.11n_40 MHz (11.86 dBm)
			Wi-Fi 802.11g (16.57 dBm)
		Multiple transmit	Wi-Fi 802.11n_20 MHz (14.50 dBm)
			Wi-Fi 802.11n_40 MHz (14.70 dBm)





	I	I	T
		1 Mbps	4.13 dBm
	Bluetooth	2 Mbps	5.21 dBm
		3 Mbps	5.86 dBm
	Bluetooth LE	6.39 dBm	,
			Wi-Fi 802.11a (12.09 dBm)
			Wi-Fi 802.11n_20 MHz (12.11 dBm)
		5 150 MHz ~	Wi-Fi 802.11n_40 MHz (12.31 dBm)
		5 250 MHz Band	Wi-Fi 802.11ac_20 MHz (12.15 dBm)
			Wi-Fi 802.11ac_40 MHz (12.65 dBm)
			Wi-Fi 802.11ac_80 MHz (9.81 dBm)
			Wi-Fi 802.11a (13.44 dBm)
			Wi-Fi 802.11n_20 MHz (13.66 dBm)
		5 250 MHz ~	Wi-Fi 802.11n_40 MHz (13.50 dBm)
MAX. RF OUTPUT POWER		5 350 MHz Band	Wi-Fi 802.11ac_20 MHz (13.35 dBm)
MAX. RI OUTFUT FOWER			Wi-Fi 802.11ac_40 MHz (13.82 dBm)
	A		Wi-Fi 802.11ac_80 MHz (9.74 dBm)
	Antenna 0		Wi-Fi 802.11a (13.94 dBm)
			Wi-Fi 802.11n_20 MHz (13.73 dBm)
		5 470 MHz ~	Wi-Fi 802.11n_40 MHz (14.06 dBm)
		5 725 MHz Band	Wi-Fi 802.11ac_20 MHz (13.97 dBm)
			Wi-Fi 802.11ac_40 MHz (14.34 dBm)
			Wi-Fi 802.11ac_80 MHz (11.40 dBm)
			Wi-Fi 802.11a (12.90 dBm)
			Wi-Fi 802.11n_20 MHz (12.69 dBm)
		5 725 MHz ~	Wi-Fi 802.11n_40 MHz (13.09 dBm)
		5 850 MHz Band	Wi-Fi 802.11ac_20 MHz (12.74 dBm)
			Wi-Fi 802.11ac_40 MHz (13.24 dBm)
			Wi-Fi 802.11ac_80 MHz (10.32 dBm)



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		<u> </u>	
			Wi-Fi 802.11a (13.15 dBm)
			Wi-Fi 802.11n_20 MHz (12.98 dBm)
		5 150 MHz ~	Wi-Fi 802.11n_40 MHz (13.08 dBm)
		5 250 MHz Band	Wi-Fi 802.11ac_20 MHz (12.83 dBm)
			Wi-Fi 802.11ac_40 MHz (13.37 dBm)
			Wi-Fi 802.11ac_80 MHz (10.82 dBm)
			Wi-Fi 802.11a (12.07 dBm)
			Wi-Fi 802.11n_20 MHz (12.42 dBm)
		5 250 MHz ~	Wi-Fi 802.11n_40 MHz (12.26 dBm)
		5 350 MHz Band	Wi-Fi 802.11ac_20 MHz (12.14 dBm)
			Wi-Fi 802.11ac_40 MHz (12.73 dBm)
MAX. RF OUTPUT POWER	Antenna 1		Wi-Fi 802.11ac_80 MHz (10.59 dBm)
MAA. RF OUTPUT POWER	Antenna i		Wi-Fi 802.11a (13.60 dBm)
			Wi-Fi 802.11n_20 MHz (13.22 dBm)
		5 470 MHz ~	Wi-Fi 802.11n_40 MHz (13.44 dBm)
		5 725 MHz Band	Wi-Fi 802.11ac_20 MHz (13.34 dBm)
			Wi-Fi 802.11ac_40 MHz (13.79 dBm)
			Wi-Fi 802.11ac_80 MHz (10.59 dBm)
			Wi-Fi 802.11a (13.72 dBm)
			Wi-Fi 802.11n_20 MHz (13.56 dBm)
		5 725 MHz ~	Wi-Fi 802.11n_40 MHz (13.69 dBm)
		5 850 MHz Band	Wi-Fi 802.11ac_20 MHz (13.54 dBm)
			Wi-Fi 802.11ac_40 MHz (14.22 dBm)
			Wi-Fi 802.11ac_80 MHz (11.30 dBm)

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n	1	T.	1
			Wi-Fi 802.11a (15.63 dBm)
			Wi-Fi 802.11n_20 MHz (15.52 dBm)
		5 150 MHz ~	Wi-Fi 802.11n_40 MHz (15.68 dBm)
		5 250 MHz Band	Wi-Fi 802.11ac_20 MHz (15.47 dBm)
			Wi-Fi 802.11ac_40 MHz (16.04 dBm)
			Wi-Fi 802.11ac_80 MHz (13.35 dBm)
			Wi-Fi 802.11a (15.82 dBm)
			Wi-Fi 802.11n_20 MHz (16.09 dBm)
		5 250 MHz ~	Wi-Fi 802.11n_40 MHz (15.93 dBm)
		5 350 MHz Band	Wi-Fi 802.11ac_20 MHz (15.80 dBm)
			Wi-Fi 802.11ac_40 MHz (16.26 dBm)
MAN DE OUTDUT DOWED	M. M. Idala da ana ana da		Wi-Fi 802.11ac_80 MHz (13.20 dBm)
MAX. RF OUTPUT POWER	Multiple transmit		Wi-Fi 802.11a (16.78 dBm)
			Wi-Fi 802.11n_20 MHz (16.49 dBm)
		5 470 MHz ~	Wi-Fi 802.11n_40 MHz (16.77 dBm)
		5 725 MHz Band	Wi-Fi 802.11ac_20 MHz (16.68 dBm)
			Wi-Fi 802.11ac_40 MHz (17.08 dBm)
			Wi-Fi 802.11ac_80 MHz (14.02 dBm)
			Wi-Fi 802.11a (16.34 dBm)
			Wi-Fi 802.11n_20 MHz (16.16 dBm)
		5 725 MHz ~	Wi-Fi 802.11n_40 MHz (16.41 dBm)
		5 850 MHz Band	Wi-Fi 802.11ac_20 MHz (16.17 dBm)
			Wi-Fi 802.11ac_40 MHz (16.77 dBm)
			Wi-Fi 802.11ac_80 MHz (13.85 dBm)
Head Antonno Coin	WLAN: 2.9 dBi		
Used Antenna Gain	Bluetooth / Bluetoo	oth LE: 0.42 dBi	
E	■ MPE		
Exposure	□ SAR		
Evaluation Applied	□ N/A		

2.4GHz & 5GHz can not transmit at the same time.





3.3 Calculated MPE Safe Distance

3.3.1 Test data for Antenna 0

According to above equation, the following result was obtained.

Operating Freq. Band	Operating Mode	Target Power W/tolerance		Max tune up		ına Gain	Safe Distance	Power Density (mW/cm²)	Limit (mW/
(MHz)		(dBm)	(dBm)	(mW)	Log	Linear	(cm)	@ 20 cm Separation	cm²)
	802.11b	13.5 ± 1.0	14.5	28.18			2.09	0.0109	1.00
	802.11g(L)	9.0 ± 0.5	9.5	8.91			1.18	0.0035	1.00
	802.11g(M)	13.0 ± 0.5	13.5	22.39			1.86	0.0087	1.00
	802.11g(H)	9.0 ± 0.5	9.5	8.91			1.18	0.0035	1.00
	802.11n_ HT20(L)	7.5 ± 0.5	8.0	6.31			0.99	0.0024	1.00
2 400	802.11n_ HT20(M)	11.0 ± 0.5	11.5	14.13	2.90	1.95	1.48	0.0055	1.00
~ 2 483.5	802.11n_ HT20(H)	9.0 ± 0.5	9.5	8.91			1.18	0.0035	1.00
	802.11n_ HT40(L)	4.0 ± 0.5	4.5	2.82			0.66	0.0011	1.00
	802.11n_ HT40(M)	12.5 ± 0.5	13.0	19.95			1.76	0.0077	1.00
	802.11n_ HT40(H)	6.0 ± 0.5	6.5	4.47			0.83	0.0017	1.00

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Operating Freq. Band (MHz)	Operating Mode	Target Power W/tolerance (dBm)		une up wer (mW)	Anter	nna Gain Linear	Safe Distance (cm)	Power Density (mW/cm²) @ 20 cm Separation	Limit (mW/ cm²)
	802.11a	12.0 ± 0.5	12.5	17.78			1.66	0.0069	1.00
	802.11n_HT20	12.0 ± 0.5	12.5	17.78			1.66	0.0069	1.00
5 150	802.11n_HT40	12.0 ± 0.5	12.5	17.78			1.66	0.0069	1.00
~ 5 250	802.11ac_HT20	12.0 ± 0.5	12.5	17.78			1.66	0.0069	1.00
	802.11ac_HT40	12.5 ± 0.5	13.0	19.95			1.76	0.0077	1.00
	802.11ac_HT80	9.5 ± 0.5	10.0	10.00			1.25	0.0039	1.00
	802.11a	13.0 ± 1.0	14.0	25.12			1.97	0.0097	1.00
	802.11n_HT20	13.0 ± 1.0	14.0	25.12			1.97	0.0097	1.00
5 250	802.11n_HT40	13.0 ± 1.0	14.0	25.12			1.97	0.0097	1.00
~ 5 350	802.11ac_HT20	13.0 ± 1.0	14.0	25.12			1.97	0.0097	1.00
	802.11ac_HT40	13.0 ± 1.0	14.0	25.12			1.97	0.0097	1.00
	802.11ac_HT80	9.0 ± 1.0	10.0	10.00	2.00	1.05	1.25	0.0039	1.00
	802.11a	13.5 ± 1.0	14.5	28.18	2.90	1.95	2.09	0.0109	1.00
	802.11n_HT20	13.0 ± 1.0	14.0	25.12			1.97	0.0097	1.00
5 470	802.11n_HT40	13.5 ± 1.0	14.5	28.18			2.09	0.0109	1.00
~ 5 725	802.11ac_HT20	13.5 ± 1.0	14.5	28.18			2.09	0.0109	1.00
	802.11ac_HT40	13.5 ± 1.0	14.5	28.18			2.09	0.0109	1.00
	802.11ac_HT80	11.0 ± 1.0	12.0	15.85			1.57	0.0061	1.00
	802.11a	12.5 ± 1.0	13.5	22.39			1.86	0.0087	1.00
	802.11n_ HT20	12.5 ± 1.0	13.5	22.39			1.86	0.0087	1.00
5 725	802.11n_HT40	12.5 ± 1.0	13.5	22.39			1.86	0.0087	1.00
~ 5 825	802.11ac_ HT20	12.5 ± 1.0	13.5	22.39			1.86	0.0087	1.00
	802.11ac_HT40	12.5 ± 1.0	13.5	22.39			1.86	0.0087	1.00
	802.11ac_HT80	10.0 ± 1.0	11.0	12.59			1.40	0.0049	1.00





3.3.2 Test data for Antenna 1

According to above equation, the following result was obtained.

Operating Freq. Band	Operating Mode	Target Power W/tolerance	Max tune up power		Antenna Gain		Safe Distance	Power Density (mW/cm²)	Limit (mW/
(MHz)		(dBm)	(dBm)	(mW)	Log	Linear	(cm)	@ 20 cm Separation	cm²)
	802.11b	13.5 ± 1.0	14.5	28.18			2.09	0.0109	1.00
	802.11g(L)	10.0 ± 0.5	10.5	11.22			1.32	0.0044	1.00
	802.11g(M)	13.5 ± 0.5	14.0	25.12			1.97	0.0097	1.00
	802.11g(H)	10.0 ± 0.5	10.5	11.22			1.32	0.0044	1.00
2 400	802.11n_ HT20(L)	9.0 ± 0.5	9.5	8.91	2 00	4.05	1.18	0.0035	1.00
~ 2 483.5	802.11n_ HT20(M)	11.5 ± 0.5	12.0	15.85	2.90	1.95	1.57	0.0061	1.00
	802.11n_ HT20(H)	9.5 ± 0.5	10.0	10.00			1.25	0.0039	1.00
	802.11n_ HT40(L)	7.0 ± 0.5	7.5	5.62			0.93	0.0022	1.00
	802.11n_ HT40(M)	11.5 ± 0.5	12.0	15.85			1.57	0.0061	1.00
	802.11n_ HT40(H)	8.0 ± 0.5	8.5	7.08			1.05	0.0027	1.00

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Operating Freq. Band (MHz)	Operating Mode	Target Power W/tolerance (dBm)		une up wer (mW)	Anter	nna Gain Linear	Safe Distance (cm)	Power Density (mW/cm²) @ 20 cm Separation	Limit (mW/ cm²)
	802.11a	13.0 ± 0.5	13.5	22.39			1.86	0.0087	1.00
	802.11n_HT20	12.5 ± 0.5	13.0	19.95			1.76	0.0077	1.00
5 150	802.11n_HT40	13.0 ± 0.5	13.5	22.39			1.86	0.0087	1.00
~ 5 250	802.11ac_HT20	12.5 ± 0.5	13.0	19.95			1.76	0.0077	1.00
	802.11ac_HT40	13.0 ± 0.5	13.5	22.39			1.86	0.0087	1.00
	802.11ac_HT80	10.5 ± 0.5	11.0	12.59			1.40	0.0049	1.00
	802.11a	11.0 ± 1.0	12.0	15.85			1.57	0.0061	1.00
	802.11n_HT20	12.0 ± 1.0	13.0	19.95			1.76	0.0077	1.00
5 250	802.11n_HT40	11.5 ± 1.0	12.5	17.78			1.66	0.0069	1.00
~ 5 350	802.11ac_HT20	12.0 ± 1.0	13.0	19.95			1.76	0.0077	1.00
	802.11ac_HT40	12.0 ± 1.0	13.0	19.95			1.76	0.0077	1.00
	802.11ac_HT80	10.0 ± 1.0	11.0	12.59	2.00	1.05	1.40	0.0049	1.00
	802.11a	13.0 ± 1.0	14.0	25.12	2.90	1.95	1.97	0.0097	1.00
	802.11n_ HT20	13.0 ± 1.0	14.0	25.12			1.97	0.0097	1.00
5 470	802.11n_HT40	13.0 ± 1.0	14.0	25.12			1.97	0.0097	1.00
~ 5 725	802.11ac_HT20	13.0 ± 1.0	14.0	25.12			1.97	0.0097	1.00
	802.11ac_HT40	13.0 ± 1.0	14.0	25.12			1.97	0.0097	1.00
	802.11ac_HT80	9.0 ± 1.0	10.0	10.00			1.25	0.0039	1.00
	802.11a	13.0 ± 1.0	14.0	25.12			1.97	0.0097	1.00
	802.11n_ HT20	13.0 ± 1.0	14.0	25.12			1.97	0.0097	1.00
5 725	802.11n_HT40	13.0 ± 1.0	14.0	25.12			1.97	0.0097	1.00
~ 5 825	802.11ac_ HT20	13.0 ± 1.0	14.0	25.12			1.97	0.0097	1.00
	802.11ac_HT40	13.5 ± 1.0	14.5	28.18			2.09	0.0109	1.00
	802.11ac_HT80	11.0 ± 1.0	12.0	15.85			1.57	0.0061	1.00





3.3.3 Test data for Multiple transmit

According to above equation, the following result was obtained.

Operating Freq. Band	Operating Mode	Target Power W/tolerance	Max t	une up wer	Antenna Gain		Safe Distance	Power Density (mW/cm²)	Limit (mW/
(MHz)	r c	(dBm)	(dBm)	(mW)	Log	Linear	(cm)	@ 20 cm Separation	cm²)
	802.11g(L)	12.5 ± 0.5	13.0	19.95			1.76	0.0077	1.00
	802.11g(M)	16.5 ± 0.5	17.0	50.12			2.79	0.0194	1.00
	802.11g(H)	12.5 ± 0.5	13.0	19.95			1.76	0.0077	1.00
	802.11n_ HT20(L)	11.5 ± 0.5	12.0	15.85			1.57	0.0061	1.00
2 400	802.11n_ HT20(M)	14.5 ± 0.5	15.0	31.62	2.90	1.95	2.21	0.0123	1.00
~ 2 483.5	802.11n_ HT20(H)	12.5 ± 0.5	13.0	19.95			1.76	0.0077	1.00
	802.11n_ HT40(L)	9.0 ± 0.5	9.5	8.91			1.18	0.0035	1.00
	802.11n_ HT40(M)	14.5 ± 0.5	15.0	31.62			2.21	0.0123	1.00
	802.11n_ HT40(H)	10.0 ± 0.5	10.5	11.22			1.32	0.0044	1.00

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Operating Freq. Band (MHz)	Operating Mode	Target Power W/tolerance (dBm)		une up wer (mW)	Anter	nna Gain Linear	Safe Distance (cm)	Power Density (mW/cm²) @ 20 cm Separation	Limit (mW/ cm²)
	802.11a	15.5 ± 0.5	16.0	39.81			2.48	0.0154	1.00
	802.11n_HT20	15.5 ± 0.5	16.0	39.81			2.48	0.0154	1.00
5 150	802.11n_HT40	15.5 ± 0.5	16.0	39.81			2.48	0.0154	1.00
~ 5 250	802.11ac_HT20	15.0 ± 0.5	15.5	35.48			2.35	0.0138	1.00
	802.11ac_HT40	16.0 ± 0.5	16.5	44.67			2.63	0.0173	1.00
	802.11ac_HT80	13.0 ± 0.5	13.5	22.39			1.86	0.0087	1.00
	802.11a	15.0 ± 1.0	16.0	39.81			2.48	0.0154	1.00
	802.11n_HT20	15.5 ± 1.0	16.5	44.67			2.63	0.0173	1.00
5 250	802.11n_HT40	15.0 ± 1.0	16.0	39.81			2.48	0.0154	1.00
~ 5 350	802.11ac_HT20	15.0 ± 1.0	16.0	39.81			2.48	0.0154	1.00
	802.11ac_HT40	16.0 ± 1.0	17.0	50.12			2.79	0.0194	1.00
	802.11ac_HT80	13.0 ± 1.0	14.0	25.12	2.00	1.05	1.97	0.0097	1.00
	802.11a	16.5 ± 1.0	17.5	56.23	2.90	1.95	2.95	0.0218	1.00
	802.11n_HT20	16.5 ± 1.0	17.5	56.23			2.95	0.0218	1.00
5 470	802.11n_HT40	16.0 ± 1.0	17.0	50.12			2.79	0.0194	1.00
~ 5 725	802.11ac_HT20	16.0 ± 1.0	17.0	50.12			2.79	0.0194	1.00
	802.11ac_HT40	16.5 ± 1.0	17.5	56.23			2.95	0.0218	1.00
	802.11ac_HT80	13.5 ± 1.0	14.5	28.18			2.09	0.0109	1.00
	802.11a	16.0 ± 1.0	17.0	50.12			2.79	0.0194	1.00
	802.11n_HT20	16.0 ± 1.0	17.0	50.12			2.79	0.0194	1.00
5 725	802.11n_HT40	16.0 ± 1.0	17.0	50.12			2.79	0.0194	1.00
~ 5 825	802.11ac_HT20	16.0 ± 1.0	17.0	50.12			2.79	0.0194	1.00
	802.11ac_HT40	16.0 ± 1.0	17.0	50.12			2.79	0.0194	1.00
	802.11ac_HT80	13.0 ± 1.0	14.0	25.12			1.97	0.0097	1.00





3.3.4 Test Result for BLUETOOTH

According to the procedure, KDB 447498 D01, the standalone SAR test exclusion threshold is [(Max. Power of channel, including tune-up tolerance, mW)/(Mim. test separation distance, mm)] X [$\sqrt{f(GHz)}$] < 3 = (3.98/5) X $\sqrt{2.402}$ = 1.23

Conclusion: The SAR test exclusion threshold is less than 3, so the device meets the RF Exposure Requirement and excluded SAR Test.

	Frequency (MHz)	Target Power W/tolerance (dBm)	Max tune up power (dBm)	Max tune up power (mW)	Separation distance (mm)	RF exposure
1 Mbps	2 402	4.0 ± 0.5	4.5	2.82	5	0.87
2 Mbps	2 402	4.5 ± 1.0	5.5	3.55	5	1.10
3 Mbps	2 402	5.0 ± 1.0	6.0	3.98	5	1.23

3.3.5 Test Result for BLUETOOTH LE

According to the procedure, KDB 447498 D01, the standalone SAR test exclusion threshold is $[(Max.\ Power\ of\ channel,\ including\ tune-up\ tolerance,\ mW)/(Mim.\ test\ separation\ distance,\ mm)]\ X\ [\ \sqrt{\ f(GHz)}] < 3$ $= (5.01/5)\ X\ \sqrt{\ 2.402} = 1.552$

Conclusion: The SAR test exclusion threshold is less than 3, so the device meets the RF Exposure Requirement and excluded SAR Test.

	Frequency (MHz)	Target Power W/tolerance (dBm)	Max tune up power (dBm)	Max tune up power (mW)	Separation distance (mm)	RF exposure
BLE (GFSK)	2 402	6 ± 1.0	7.0	5.01	5	1.552

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