



FCC RADIO TEST REPORT

FCC ID	:	PY322100558
Equipment	:	Netgear 5G MHS Travel Router
Brand Name	:	Netgear
Model Name	:	MR6400
Applicant	:	Netgear Inc 350 E. Plumeria Drive, San Jose, CA 95134, United States
Manufacturer	:	Netgear Inc 350 E. Plumeria Drive, San Jose, CA 95134, United States
Standard	:	FCC Part 15 Subpart E §15.407

The product was received on Apr. 08, 2022 and testing was performed from May 09, 2022 to May 10, 2022. We, Sporton International Inc. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this variant report apply exclusively to the tested model / sample. Without written approval from Sporton International Inc. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Louis Win

Approved by: Louis Wu Sporton International Inc. EMC & Wireless Communications Laboratory No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)



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History of this test report

Report No.	Version	Description	Issue Date
FR190614-03D	01	Initial issue of report	May 11, 2022



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
-	15.403(i) 15.407(a)(10)	26dB Emission Bandwidth	Not Required	-
-	2.1049	99% Occupied Bandwidth	Not Required	-
-	15.407(a)(8)	Maximum Conducted Output Power	Not Required	-
-	15.407(a)(8)	Fundamental Maximum EIRP	Not Required	-
-	15.407(a)(8)	Fundamental Power Spectral Density	Not Required	-
-	15.407(b)(6)	In-Band Emissions (Channel Mask)	Not Required	-
2.1	15.407(d)(6)	Contention Based Protocol	Pass	
-	15.407(b)	Unwanted Emissions	Not Required	-
-	15.207	AC Conducted Emission	Not Required	-
-	15.203 15.407(a)	Antenna Requirement	Not Required	-

Note:

 This is a variant report by adding support band via software. All the test cases were performed on original report which can be referred to Sporton Report Number: FR190614D. Based on the original report, the test cases

were verified.

2. Not required means after assessing, test items are not necessary to carry out.

Declaration of Conformity:

The test results (PASS/FAIL) with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

It's means measurement values may risk exceeding the limit of regulation standards, if measurement uncertainty is include in test results.

Comments and Explanations:

The product specifications of the EUT presented in the report are declared by the manufacturer who shall take full responsibility for the authenticity.

Reviewed by: Avis Chuang Report Producer: Cindy Liu



1 General Description

1.1 Product Feature of Equipment Under Test

LTE/5G NR, Wi-Fi 2.4GHz 802.11b/g/n/ac/ax, Wi-Fi 5GHz 802.11a/n/ac/ax, Wi-Fi 6GHz 802.11a/n/ac/ax, and GPS

WWAN: <ant. 1="">: Monopole Antenna <ant. 2="">: Monopole Antenna WLAN: <ant. 3="">: Monopole Antenna <ant. 4="">: Monopole Antenna GPS: PIFA Antenna</ant.></ant.></ant.></ant.>	Product Feature				
	Antenna Type	WWAN: <ant. 1=""></ant.> : Monopole Antenna <ant. 2=""></ant.> : Monopole Antenna WLAN: <ant. 3=""></ant.> : Monopole Antenna <ant. 4=""></ant.> : Monopole Antenna GPS: PIFA Antenna			

Antenna information					
Antenna 3	Peak Gain (dBi)	Band 5: 3.40 Band 6: 3.40 Band 7: 3.40 Band 8: 3.40			
Antenna 4	Peak Gain (dBi)	Band 5: 1.54 Band 6: 1.54 Band 7: 1.54 Band 8: 1.54			

Remark: The above EUT's information is declared by manufacturer. Please refer to Comments and Explanations in report summary.

1.2 Modification of EUT

No modifications made to the EUT during the testing.



1.3 Testing Location

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory					
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978					
Test Site No.	Sporton Site No. DF02-HY					

FCC designation No.: TW1190

1.4 Applicable Standards

According to the specifications declared by the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart E
- FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
- FCC KDB 987594 D02 U-NII 6 GHz EMC Measurement v01
- ANSI C63.10-2013

Remark:

- 1. All the test items were validated and recorded in accordance with the standards without any modification during the testing.
- 2. The TAF code is not including all the FCC KDB listed without accreditation.
- 3. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.



2 **Test Result**

2.1 Contention Based Protocol

2.1.1 Limit of Contention Based Protocol

<FCC 14-30 CFR 15.407>

(d)(6) Indoor access points, subordinate devices and client devices operating in the 5.925-7.125 GHz band must employ a contention-based protocol.

FCC KDB 987594 D02 U-NII 6GHz EMC Measurement v01

Unlicensed low-power indoor devices must detect co-channel radio frequency power that is at least -62 dBm or lower. Upon detection of energy in the band, unlicensed low power indoor devices must vacate the channel and stay off the channel as long as detected radio frequency power is equal to or greater than the threshold (-62 dBm). The -62 dBm (or lower) threshold is referenced to a 0 dBi antenna gain. To ensure incumbent operations are reliably detected in the band, low power indoor devices must detect RF energy throughout their intended operating channel. For example, an 802.11 device that plans to transmit a 40 MHz- wide signal (on a primary 20 MHz channel and a secondary 20 MHz channel) must detect energy throughout the entire 40 MHz channel. Additionally, low-power indoor devices must detect co-channel energy with 90% or greater certainty.

If	Number of Tests	Placement of Incumben Transmission
$BW_{EUT} \leq BW_{Inc}$	Once	Tune incumbent and EUT transmissions ($f_{c1} = f_{c2}$)
$BW_{Inc} < BW_{EUT} \le 2BW_{Inc}$	Once	Incumbent transmission i contained within <i>BW_{EUT}</i>
$2BW_{Inc} < BW_{EUT} \le 4BW_{Inc}$	Twice. Incumbent transmission is contained within BW_{EUT}	Incumbent transmission i located as closely as possible to the lower edge and upper edge, respectively, of the EUT channel
$BW_{EUT} > 4BW_{Inc}$	Three times	Incumbent transmission i located as closely as possible to the lower edge of the EUT channel, in th middle of EUT channel, and as closely as possible to the upper edge of the EUT channel

where:

BWEUT: Transmission bandwidth of EUT signal

BWInc: Transmission bandwidth of the simulated incumbent signal (10 MHz wide AWGN signal)

fc1: Center frequency of EUT transmission

fc2: Center frequency of simulated incumbent signal





2.1.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

2.1.3 Test Procedures

Refer to KDB 987594 D02 v01v01.

- 1. To ensure EUT reliably detects an incumbent signal in both scenarios shown in Figure 1, the detection threshold test may be repeated more than once with the incumbent signal (having center frequency fc2) tuned to different center frequencies within the UT transmission bandwidth. The criteria specified in Table 1 determines how many times the detection threshold test must be performed;
- Using an AWGN signal source, generate (but do not transmit, i.e., RF OFF) a 10 MHz-wide AWGN signal. Use Table 1 to determine the center frequency of the 10 MHz AWGN signal relative to the EUT's channel bandwidth and center frequency.
- 3. Monitor the signal analyzer to verify if the AWGN signal has been detected and the EUT has ceased transmission. If the EUT continues to transmit, then incrementally increase the AWGN signal power level until the EUT stops transmitting.
- 4. (Including all losses in the RF paths) Determine and record the AWGN signal power level (at the EUT's antenna port) at which the EUT ceased transmission. Repeat the procedure at least 10 times to verify the EUT can detect an AWGN signal with 90% (or better) level of certainty.

 Refer to Table 1 to determine number of times the detection threshold testing needs to be repeated. If testing is required more than once, then go back to step 2, choose a different center frequency for the AWGN signal and repeat the process.

2.1.4 Test Setup



2.1.5 Support Unit used in test configuration and system

Instrument	Instrument Brand Name		Characteristics		
Notebook	Acer	N15C1	LAN		



Temperature : **24~26**℃ Test Engineer : Kai Liao **Relative Humidity :** 45~50% Regulated Injected Channel Channel Incumbent Detection Adjusted AWGN Threshold Margin BW Band Freq. freq. Rate Power Level level (dB) (MHz) (MHz) (MHz) (%) (dBm) (dBm) (dBm) -62 -75.64 100 13.64 -74.1 **Result: Stop Transmission** 15.64 < 90 -62 -77.64 6135 20 6135 -76.10 **Result: Minimal Operation** 0 -62 -78.64 16.64 -77.10 **Result: Normal Operation** -72.41 10.41 100 -62 -70.87 **Result: Stop Transmission** < 90 -74.41 -62 12.41 6110 -72.87 **Result: Minimal Operation** 0 -62 -75.41 13.41 -73.87 **Result: Normal Operation** UNII -67.24 5.24 Band 5 100 -62 -65.7 **Result: Stop Transmission** 7.24 < 90 -62 -69.24 6185 160 6185 -67.70 **Result: Minimal Operation** 0 -62 -70.24 8.24 -68.70 **Result: Normal Operation** -72.70 100 -62 10.7 -71.16 **Result: Stop Transmission** -74.70 < 90 -62 12.70 6260 -73.16 **Result: Minimal Operation** -75.70 0 -62 13.70 -74.16 **Result: Normal Operation**

2.1.6 Test Summary of Contention Based Protocol Test

Note 1: Adjusted Power = Injected AWGN Level - minimum antenna gain 1.54 dBi.

Note 2: The antenna gain has included the cable loss.



Band	Channel Freq. (MHz)	Channel BW (MHz)	Incumbent freq. (MHz)	Injected AWGN Level (dBm)	Detection Rate (%)	Regulated Threshold level (dBm)	Adjusted Power (dBm)	Margin (dB)
				72 70	100	-62	-75.33	13.33
				-13.19		Result: Stop	Transmission	
	6455	20	6455	75 70	< 90	-62	-77.33	15.33
	0400	20	0433	-13.19		Result: Minin	nal Operation	
				76 70	0	-62	-78.33	16.33
				-70.79		Result: Norm	nal Operation	
				70.64	100	-62	-72.18	10.18
				-70.04		Result: Stop	Transmission	
			0.400	70.04	< 90	-62	-74.18	12.18
			0430	-72.04	Result: Minimal Operation			
		160		-73.64	0	-62	-75.18	13.18
UNII						Result: Norm	nal Operation	
Band 6			6505	-64.34	100	-62	-65.88	3.88
	6505				Result: Stop Transmission			
				-66.34	< 90	-62	-67.88	5.88
	6005					Result: Minin	nal Operation	
				67.04	0	-62	-68.88	6.88
				-67.34		Result: Norm	nal Operation	
				74.44	100	-62	-72.65	10.65
				-71.11		Result: Stop	Transmission	
				70.44	< 90	-62	-74.65	12.65
			0860	-73.11		Result: Minimal Operation		
				74 44	0	-62	-75.65	13.65
				-74.11		Result: Norm	nal Operation	

Note 1: Adjusted Power = Injected AWGN Level - minimum antenna gain 1.54 dBi.

Note 2: The antenna gain has included the cable loss.



Band	Channel Freq. (MHz)	Channel BW (MHz)	Incumbent freq. (MHz)	Injected AWGN Level (dBm)	Detection Rate (%)	Regulated Threshold level (dBm)	Adjusted Power (dBm)	Margin (dB)
				72.54	100	-62	-75.08	13.08
				-73.34		Result: Stop	Transmission	
	6605	20	6605	-75 54	< 90	-62	-77.08	15.08
	0095	20	0095	-73.34		Result: Minin	nal Operation	
				76 54	0	-62	-78.08	16.08
				-70.34		Result: Norm	nal Operation	
				71 50	100	-62	-73.13	11.13
	6665			-71.59		Result: Stop	Transmission	
		160	0500	70.50	< 90	-62	-75.13	13.13
			0090	-73.59	Result: Minimal Operation			
				-74.59	0	-62	-76.13	14.13
UNII						Result: Norm	nal Operation	
Band 7			6665	-64.68	100	-62	-66.22	4.22
					Result: Stop Transmission			
				-66.68	< 90	-62	-68.22	6.22
	0000					Result: Minin	nal Operation	
				67.69	0	-62	-69.22	7.22
				-67.68		Result: Norm	nal Operation	
				71.07	100	-62	-72.81	10.81
				-/1.2/		Result: Stop	Transmission	
			6740	70.07	< 90	-62	-74.81	12.81
			0740	-13.21		Result: Minimal Operation		
				74.07	0	-62	-75.81	13.81
				-/4.2/		Result: Norm	nal Operation	

Note 1: Adjusted Power = Injected AWGN Level - minimum antenna gain 1.54 dBi.

Note 2: The antenna gain has included the cable loss.



Band	Channel Freq. (MHz)	Channel BW (MHz)	Incumbent freq. (MHz)	Injected AWGN Level (dBm)	Detection Rate (%)	Regulated Threshold level (dBm)	Adjusted Power (dBm)	Margin (dB)
				72 /5	100	-62	-74.99	12.99
				-73.45		Result: Stop	Transmission	
	7015	20	7015	-75 45	< 90	-62	-76.99	14.99
	7015	20	7015	-73.43		Result: Minin	nal Operation	
				76 45	0	-62	-77.99	15.99
				-70.45		Result: Norm	nal Operation	
				60.61	100	-62	-71.15	9.15
	6095			-09.01	Result: Stop Transmission			
		160	0010	74.04	< 90	-62	-73.15	11.15
			6910	-71.01	Result: Minimal Operation			
				-72.61	0	-62	-74.15	12.15
UNII						Result: Norm	nal Operation	
Band 8			6985	-63.14	100	-62	-64.68	2.68
					Result: Stop Transmission			
				-65.14	< 90	-62	-66.68	4.68
	6985					Result: Minin	nal Operation	
				00.44	0	-62	-67.68	5.68
				-00.14		Result: Norm	nal Operation	
				00.04	100	-62	-70.35	8.35
				-68.81		Result: Stop	Transmission	
				70.04	< 90	-62	-72.35	10.35
			7060	-70.81		Result: Minimal Operation		
				74.04	0	-62	-73.35	11.35
				-71.81		Result: Norm	nal Operation	

Note 1: Adjusted Power = Injected AWGN Level - minimum antenna gain 1.54 dBi.

Note 2: The antenna gain has included the cable loss.





2.1.7 Test Plots of Contention Based Protocol Test































































3 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Signal Generator (Interferer)	Rohde & Schwarz	SMW200A	109425	100kHz~7.5GHz	Jan. 13, 2022	May 09, 2022~ May 10, 2022	Jan. 12, 2023	CBP (DF02-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV3044	101104	10Hz~44GHz	Feb. 16, 2022	May 09, 2022~ May 10, 2022	Feb. 15, 2023	CBP (DF02-HY)
Power Divider	Woken	2Way Divider	DCMB1KW7A1	0.5GHz-18GHz	Calibration from System	May 09, 2022~ May 10, 2022	Calibration from System	CBP (DF02-HY)
Power Divider	Woken	2Way Divider	DCMB1KW7A2	0.5GHz- 18GHz	Calibration from System	May 09, 2022~ May 10, 2022	Calibration from System	CBP (DF02-HY)
Coupler	Woken	10dB 30W SMA	DOM5CIW3A1	0.5-18GHz	Calibration from System	May 09, 2022~ May 10, 2022	Calibration from System	CBP (DF02-HY)
Power Divider	Woken	3Way SMA Power Divder Rated to 20W	STI08-0010 (#2)	2GHz-8GHz	Calibration from System	May 09, 2022~ May 10, 2022	Calibration from System	CBP (DF02-HY)