



FCC RADIO TEST REPORT

FCC ID : I28-WYSBHVDXP
Equipment : WLAN/BTLE module
Brand Name : ZEBRA
Model Name : WYSBHVDXP
Applicant : Zebra Technologies Corporation
3 Overlook Point, Lincolnshire, IL
60069, United States
Manufacturer : Zebra Technologies Corporation
3 Overlook Point, Lincolnshire, IL
60069, United States
Standard : FCC Part 15 Subpart E §15.407

The product was received on Feb. 11, 2022 and testing was performed from Mar. 03, 2022 to Mar. 08, 2022. We, Sporton International Inc. Wensan 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. Wensan Laboratory, the test report shall not be reproduced except in full.

Approved by: Louis Wu

Sporton International Inc. Wensan Laboratory

No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)



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Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
-	15.403(i)	6dB & 26dB Bandwidth	Not Required	-
-	2.1049	99% Occupied Bandwidth	Not Required	-
3.1	15.407(a)	Maximum Conducted Output Power	Pass	-
-	15.407(a)	Power Spectral Density	Not Required	-
-	15.407(b)	Unwanted Emissions	Not Required	-
-	15.207	AC Conducted Emission	Not Required	-
3.2	15.203 15.407(a)	Antenna Requirement	Pass	-

Note: This is a variant report which can be referred Product Equality Declaration. All the test cases were performed on original report which can be referred to Sporton Report Number FR0D2423E. Based on the original report, the test cases were verified.

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: Wei Chen
Report Producer: Clio Lo



1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	WLAN/BTLE module
Brand Name	ZEBRA
Model Name	WYSBHVDXP
FCC ID	I28-WYSBHVDXP
EUT supports Radios application	WLAN 11a/b/g/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 WLAN 11ax HE20/HE40/HE80 Bluetooth BR/EDR/LE
HW Version	Revision G
SW Version	17.68.01.p94
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer.

Supported Unit Used in Test Configuration and System				
Printer	Brand Name	ZEBRA	Model Name	ZQ521
Battery	Brand Name	ZEBRA	Part Number	P1089503-003
AC Adapter	Brand Name	ZEBRA	Model Name	FSP025-DYAA3
Bluetooth Antenna 1	Brand Name	gigaAnt	Model Name	3030A5645-01
Bluetooth Antenna 2	Brand Name	TAIYO YUDEN	Model Name	AH 168M245001
Bluetooth Antenna 3	Brand Name	Johanson Technology	Model Name	2450AT07A0100
WLAN Antenna 1	Brand Name	Laird	Model Name	RD2458-5
WLAN Antenna 2	Brand Name	Pulse	Model Name	W3006
WLAN Antenna 3	Brand Name	Auden	Model Name	220370-09
WLAN Antenna 4	Brand Name	Auden	Model Name	B91882-30



1.2 Product Specification of Equipment Under Test

Product Specification is subject to this standard			
Tx/Rx Frequency Range	5745 MHz ~ 5825 MHz		
Maximum Output Power to Antenna	MIMO <Ant. 1+2> 802.11n HT20: 12.31 dBm / 0.0170 W 802.11n HT40: 11.71 dBm / 0.0148 W 802.11ac VHT20: 12.21 dBm / 0.0167 W 802.11ac VHT40: 11.61 dBm / 0.0145 W 802.11ac VHT80: 5.31 dBm / 0.0034 W 802.11ax HE20: 12.41 dBm / 0.0174 W 802.11ax HE40: 11.81 dBm / 0.0152 W 802.11ax HE80: 5.41 dBm / 0.0035 W		
Antenna Type / Gain	<RD2458-5> : <Ant. 1>: Dipole Antenna with gain 5.00 dBi <Ant. 2>: Dipole Antenna with gain 5.00 dBi <W3006> : <Ant. 1>: Chip Antenna with gain 4.20 dBi <Ant. 2>: Chip Antenna with gain 4.20 dBi <220370-09> : <Ant. 1>: Mylar Antenna with gain 2.69 dBi <Ant. 2>: Mylar Antenna with gain 2.69 dBi <B91882-30> : <Ant. 1>: Mylar Antenna with gain 4.00 dBi <Ant. 2>: Mylar Antenna with gain 4.00 dBi		
Type of Modulation	802.11a/n : OFDM (BPSK/QPSK/16QAM/64QAM) 802.11ac : OFDM (BPSK/QPSK/16QAM/64QAM/256QAM) 802.11ax : OFDMA (BPSK/QPSK/16QAM/64QAM/256QAM/ 1024QAM)		
Antenna Function Description		Ant. 1	Ant. 2
	802.11 n/ac/ax MIMO	V	V

Remark:

1. MIMO Ant. 1+2 is a calculated result from sum of the power MIMO Ant. 1 and MIMO Ant. 2.
2. The above EUT's information is declared by manufacturer. Please refer to Comments and Explanations in report summary

1.3 Modification of EUT

No modifications made to the EUT during the testing.



1.4 Testing Location

Test Site	Sporton International Inc. Wensan Laboratory
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	Sporton Site No. TH05-HY

Note: The test site complies with ANSI C63.4 2014 requirement.

FCC designation No.: TW3786

1.5 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 662911 D01 Multiple Transmitter Output v02r01.
- ♦ 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.



2 Test Configuration of Equipment Under Test

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5725-5850 MHz Band 4 (U-NII-3)	149	5745	157	5785
	151*	5755	159*	5795
	153	5765	161	5805
	155#	5775	165	5825

Note:

1. The above Frequency and Channel with "*" are 802.11n HT40 and 802.11ac VHT40 and 802.11ax HE40.
2. The above Frequency and Channel with "#" are 802.11ac VHT80 and 802.11ax HE80.

2.2 Test Mode

The final test modes consider the modulation and the worst data rates as shown in the table below.

MIMO Mode

Modulation	Data Rate
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT20	MCS0
802.11ac VHT40	MCS0
802.11ac VHT80	MCS0
802.11ax HE20	MCS0
802.11ax HE40	MCS0
802.11ax HE80	MCS0

2.3 EUT Operation Test Setup

The RF test items, utility "Toolbox 1.84" was installed in Notebook which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

3 Test Result

3.1 Maximum Conducted Output Power Measurement

3.1.1 Limit of Maximum Conducted Output Power

For the band 5.725–5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.1.2 Measuring Instruments

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

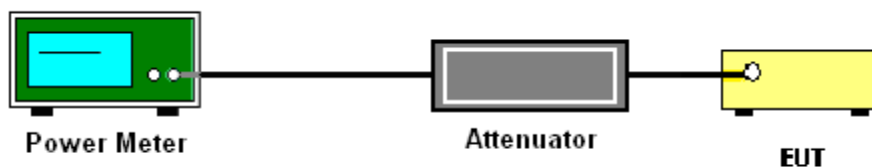
3.1.3 Test Procedures

The testing follows Method PM-G of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

Method PM-G (Measurement using a gated RF average power meter):

1. Measurement is performed using a wideband RF power meter.
2. The EUT is configured to transmit at its maximum power control level.
3. Measure the average power of the transmitter.
4. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.
5. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01

3.1.4 Test Setup





3.1.5 Test Result of Maximum Conducted Output Power

Test Engineer :	Hank Hsu	Temperature :	21~25°C
		Relative Humidity :	51~54%

Band IV MIMO												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail
					Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
HT20	MCS0	2	149	5745	9.10	9.00	12.06	30.00	5.00		Pass	
HT20	MCS0	2	157	5785	9.50	9.10	12.31	30.00	5.00		Pass	
HT20	MCS0	2	165	5825	9.00	8.70	11.86	30.00	5.00		Pass	
HT40	MCS0	2	151	5755	8.70	8.70	11.71	30.00	5.00		Pass	
HT40	MCS0	2	159	5795	8.60	8.10	11.37	30.00	5.00		Pass	
VHT20	MCS0	2	149	5745	9.00	8.90	11.96	30.00	5.00		Pass	
VHT20	MCS0	2	157	5785	9.40	9.00	12.21	30.00	5.00		Pass	
VHT20	MCS0	2	165	5825	8.90	8.60	11.76	30.00	5.00		Pass	
VHT40	MCS0	2	151	5755	8.60	8.60	11.61	30.00	5.00		Pass	
VHT40	MCS0	2	159	5795	8.50	8.00	11.27	30.00	5.00		Pass	
VHT80	MCS0	2	155	5775	2.30	2.30	5.31	30.00	5.00		Pass	

Band IV MIMO													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Average Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail
						Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
HE20	MCS0	2	149	5745	Full	9.20	9.10	12.16	30.00	5.00		Pass	
HE20	MCS0	2	157	5785	Full	9.60	9.20	12.41	30.00	5.00		Pass	
HE20	MCS0	2	165	5825	Full	9.10	8.80	11.96	30.00	5.00		Pass	
HE40	MCS0	2	151	5755	Full	8.80	8.80	11.81	30.00	5.00		Pass	
HE40	MCS0	2	159	5795	Full	8.70	8.20	11.47	30.00	5.00		Pass	
HE80	MCS0	2	155	5775	Full	2.40	2.40	5.41	30.00	5.00		Pass	



3.2 Antenna Requirements

3.2.1 Standard Applicable

If transmitting antenna directional gain is greater than 6 dBi, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.2.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.2.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.



4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	TECPEL	DTM-303A	TP201996	N/A	Nov. 16, 2021	Mar. 03, 2022~ Mar. 08, 2022	Nov. 15, 2022	Conducted (TH05-HY)
Power Meter	DARE	RPR3006W	16I00054SNO 12 (NO:113)	10MHz~6GHz	Dec. 16, 2021	Mar. 03, 2022~ Mar. 08, 2022	Dec. 15, 2022	Conducted (TH05-HY)
Power Meter	Anritsu	ML2495A	932001	N/A	Sep. 30, 2021	Mar. 03, 2022~ Mar. 08, 2022	Sep. 29, 2022	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	846202	300MHz~40GHz	Sep. 30, 2021	Mar. 03, 2022~ Mar. 08, 2022	Sep. 29, 2022	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101566	10Hz~40GHz	Aug. 30, 2021	Mar. 03, 2022~ Mar. 08, 2022	Aug. 29, 2022	Conducted (TH05-HY)
Switch Control Manframe	E-IUSTRUMENT	ETF-1405-0	EC1900067 (BOX7)	N/A	Aug. 12, 2021	Mar. 03, 2022~ Mar. 08, 2022	Aug. 11, 2022	Conducted (TH05-HY)

————THE END————