



RADIO EXPOSURE TEST REPORT

FCC ID : YG7ZAT6000L2106
Equipment : ATSC3.0 STB
Brand Name : ZINWELL
Model Name : ZAT-6000L
Applicant : ZINWELL CORPORATION
7F.,No.512, Yuanshan Rd., Zhonghe Dist., New
Taipei City 235, Taiwan
Manufacturer : ZINWELL CORPORATION
7F.,No.512, Yuanshan Rd., Zhonghe Dist., New
Taipei City 235, Taiwan
Standard : 47 CFR Part 2.1091

The product was received on May 25, 2021, and testing was started from May 25, 2021 and completed on Jun. 04, 2021. We, Sporton International Inc. Hsinchu Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR Part 2.1091 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. Hsinchu Laboratory, the test report shall not be reproduced except in full.

Approved by: Sam Chen

Sporton International Inc. Hsinchu Laboratory

No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)



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Photographs of EUT v01



History of this test report

Report No.	Version	Description	Issued Date
FA161613	01	Initial issue of report	Jul. 23, 2021



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
2	-	Exposure evaluation	PASS	-

Declaration of Conformity:

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

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: **Sam Chen**

Report Producer: **Vicky Huang**



1 General Description

1.1 EUT General Information

RF General Information			
Evaluation Mode	Frequency Range (MHz)	Operating Frequency (MHz)	Modulation Type
2.4GHz WLAN	2400-2483.5	2412-2462	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)

RF General Information				
Evaluation Mode	Band	Uplink (UL) operating band (MHz)	Downlink (DL) operating band (MHz)	Modulation Type
LTE	2	1850~1910	1930~1990	QPSK, 16QAM
	4	1710~1755	2110~2155	
	5	824~849	869~894	
	12	699~716	729~746	
	13	777~787	746~756	
	14	788~798	758~768	
	17	704~716	734~746	
	66	1710~1780	2110~2200	
	71	663~698	617~652	



1.2 Antenna Information

For WWAN:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	
					698~960MHz	1710~2170MHz
1	INPAQ	RFPCA652304IMTB301	PCB	I-PEX	0.51	3.78
2	INPAQ	RFPCA652314IMTB301	PCB	I-PEX	-0.42	4.29

For WLAN:

Ant.	Port	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
3	2	INPAQ	RFPCA302306IMAB301	PCB	I-PEX	5.83
4	1	INPAQ	RFPCA302311IMAB301	PCB	I-PEX	3.66

Note: The above information was declared by manufacturer.

For IEEE 802.11n mode (2TX/2RX)

Ant. 3 and Ant. 4 can be used as transmitting/receiving antenna.

Ant. 3 and Ant. 4 could transmit/receive simultaneously.

For IEEE 802.11b/g mode (1TX/1RX):

The EUT supports all antennas with TX/RX diversity functions.

At once time there is only one antenna port can transmitting/receiving RF signal.

1.3 Table for WWAN Module Information

The certified WWAN module information is listed below:

WWAN Module	WWAN Module	FCC ID	Support Function
1	Brand Name: Quectel Model Name: EC25-AFXD	XMR202008EC25AFXD	LTE band 2,4,5,12,13,14,66,71
2	Brand Name: Fibocom Model Name: NL668-AM-00	ZMONL668AM00	LTE band 2,4,5,12,13,17,66,71

Note: The above information was declared by manufacturer.

1.4 Table for EUT Information

EUT	Installed WWAN Module
1	1
2	2



1.5 Accessories

Accessories			
Equipment Name	Brand Name	Model Name	Rating
Adapter	APD	WB-18Q12FU1	INPUT: 100-240V~,50/60Hz, 0.6A Max. OUTPUT: 12V, 1.5A

1.6 Testing Location

Testing Location Information	
Test Lab. : Sporton International Inc. Hsinchu Laboratory	
Hsinchu	ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)
(TAF: 3787)	TEL: 886-3-656-9065 FAX: 886-3-656-9085
Test site Designation No. TW3787 with FCC.	
Conformity Assessment Body Identifier (CABID) TW3787 with ISED.	



2 Maximum Permissible Exposure

2.1 Limit of Maximum Permissible Exposure

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	*(100)	<6
3.0-30	1842/f	4.89/f	*(900/f ²)	<6
30-300	61.4	0.163	1.0	<6
300-1500	-	-	f/300	<6
1500-100,000	-	-	5	<6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	*(100)	<30
1.34-30	824/f	2.19/f	*(180/f ²)	<30
30-300	27.5	0.073	0.2	<30
300-1500	-	-	f/1500	<30
1500-100,000	-	-	1.0	<30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

2.2 MPE Calculation Method

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \qquad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric field (V/m)

P = RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$



2.3 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

For WLAN 2.4GHz:

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)
2.4G;D1D	5.83	23.42	29.25	0.50	29.75	0.94406	20	0.18781	1.00000

For WWAN Module 1

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)
LTE Band 2	4.29	25.00	29.29	0.50	29.79	0.95280	20	0.18955	1.00000

For WWAN Module 2

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)
LTE Band 2	4.29	24.00	28.29	0.50	28.79	0.75683	20	0.15056	1.00000

Simultaneous Transmission Analysis Mode: WLAN 2.4GHz+WWAN Module 1

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
2.4G;D1D	5.83	23.42	29.25	0.50	29.75	0.94406	20	0.18781	1.00000	0.18781
LTE Band 2	4.29	25.00	29.29	0.50	29.79	0.95280	20	0.18955	1.00000	0.18955
									Sum Ratio	0.37736
									Ratio Limit	1

Simultaneous Transmission Analysis Mode: WLAN 2.4GHz+WWAN Module 2

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
2.4G;D1D	5.83	23.42	29.25	0.50	29.75	0.94406	20	0.18781	1.00000	0.18781
LTE Band 2	4.29	24.00	28.29	0.50	28.79	0.75683	20	0.15056	1.00000	0.15056
									Sum Ratio	0.33837
									Ratio Limit	1

Note: The above antenna gain was declared by manufacturer.

————THE END————