



RF Exposure Evaluation Report

Application No.: SZEM2011012189CR
Applicant: Jwipc Technology Co., Ltd.
Address of Applicant: 13/F, Building B, Haisong Edifice, Tairan 9th Road, Futian District, Shenzhen, China
Manufacturer: Jwipc Technology Co., Ltd.
Address of Manufacturer: 13/F, Building B, Haisong Edifice, Tairan 9th Road, Futian District, Shenzhen, China
Factory: Dongguan Scd Technology Co., Ltd.
Address of Factory: No.1 The 2nd Street, Huihuang Industrial Zone, Xiekeng Village, Qingxi Town, Dongguan, 523000 Guangdong, China
Equipment Under Test (EUT):
Product Name: OPS PC MODULE
Model No.: H064, S064, TEY21*, S0*****, TEY21*-***** (*=A-Z, 0-9, character or blank) ♣
♣ Please refer to section 4.1 of this report which indicates which model was actually tested and which were electrically identical.
FCC ID: 2AYLN-S064
Standards: 47 CFR Part 1.1307
47 CFR Part 1.1310
47 CFR Part 2.1091
Date of Receipt: 2020-11-27
Date of Test: 2020-12-04 to 2020-12-21
Date of Issue: 2020-12-26

Test Result :	PASS*
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* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu

Keny Xu
EMC Laboratory Manager



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Report No.: SZEM201101218906
Page: 2 of 11

2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2020-12-26		Original

Authorized for issue by:				
				
		Harry Wu/Project Engineer		
				
		Eric Fu/Reviewer		



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3 Contents

	Page
1 COVER PAGE	1
2 VERSION	2
3 CONTENTS	3
4 GENERAL INFORMATION	4
4.1 GENERAL DESCRIPTION OF EUT	4
4.2 TEST LOCATION	7
4.3 TEST FACILITY	7
4.4 DEVIATION FROM STANDARDS	7
4.5 ABNORMALITIES FROM STANDARD CONDITIONS	7
4.6 OTHER INFORMATION REQUESTED BY THE CUSTOMER	7
5 RF EXPOSURE EVALUATION	8
5.1 RF EXPOSURE COMPLIANCE REQUIREMENT	8
5.1.1 Limits	8
5.1.2 Test Procedure	8
4.1.3 EUT RF EXPOSURE EVALUATION	9-11



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4 General Information

4.1 General Description of EUT

Rated voltage:	Input:DC19.0V, 4.74A
For BT:	
Bluetooth Version:	V5.1 Classic mode
Operation Frequency:	2402MHz to 2480MHz
Modulation Type:	GFSK, Pi/4DQPSK, 8DPSK
Number of Channels:	79
Channel Spacing:	1MHz
Antenna Type:	Dipole Antenna
Antenna Gain:	Antenna 1&2: 5dBi
For BLE:	
Bluetooth Version:	V5.1 BLE mode
Operation Frequency:	2402MHz to 2480MHz
Modulation Type:	GFSK
Number of Channels:	40
Channel Spacing:	2MHz
Data Rate:	1Mb/s, 2Mb/s
Antenna Type:	Dipole Antenna
Antenna Gain:	Antenna 1&2: 5dBi
For 2.4G Wifi	
Operation Frequency:	802.11b/g/n/ax(HT20/HE20): 2412MHz to 2462MHz 802.11n/ax(HT40/HE40): 2422MHz to 2452MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK) 802.11ax: OFDM&OFDMA (1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK)
Number of Channels:	802.11802.11b/g/n(HT20)/ax(HE20): 11 802.11n(HT40)/ax(HE40):7
Channel Spacing:	5MHz
Antenna Type:	Dipole Antenna
Antenna Gain:	Antenna 1&2:5dBi
For 5GHz Wifi	
DFS Function:	Slaver





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Report No.: SZEM201101218906
Page: 5 of 11

TPC Function:	Not Support
Antenna Type:	Dipole Antenna
Antenna Gain:	Antenna 1&2:3dBi

Operation Frequency:	Band	Mode	Frequency Range(MHz)	Number of channels
	UNII Band I	802.11a/n(HT20)/ac(VHT20)/ax(HE20)	5180-5240	4
		802.11n(HT40)/ac(VHT40)/ax(HE40)	5190-5230	2
		802.11ac(VHT80)/ax(HE80)	5210	1
	UNII Band II-A	802.11a/n(HT20)/ac(VHT20)/ax(HE20)	5260-5320	4
		802.11n(HT40)/ac(VHT40)/ax(HE40)	5270-5310	2
		802.11ac(VHT80)/ax(HE80)	5290	1
		802.11ac(VHT160)/ax(HE160)	5250	1
	UNII Band II-C	802.11a/n(HT20)/ac(VHT20)/ax(HE20)	5500-5700	11
		802.11n(HT40)/ac(VHT40)/ax(HE40)	5510-5670	5
		802.11ac(VHT80)/ax(HE80)	5530-5630	2
		802.11ac(VHT160)/ax(HE160)	5570	1
	UNII Band III	802.11a/n(HT20)/ac(VHT20)/ax(HE20)	5745-5825	5
		802.11n(HT40)/ac(VHT40)/ax(HE40)	5755-5895	2
		802.11ac(VHT80)/ax(HE80)	5775	1
Modulation Type:	802.11a: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) 802.11ax: OFDM&OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)			
Channel Spacing:	802.11a/n(HT20)/ac(VHT20)/ax(HE20) : 20MHz 802.11n(HT40)/ac(VHT40)/ax(HE40) : 40MHz 802.11ac(VHT80)/ax(HE80) : 80MHz 802.11ac(VHT160)/ax(HE160) : 160MHz			



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Report No.: SZEM201101218906
Page: 6 of 11

Declaration of EUT Family Grouping:

Model No.: H064, S064, TEY21*, S0*****, TEY21*-* (*=A-Z, 0-9, character or blank)

Only the model S064 was tested. According to the declaration from the applicant, the electrical circuit design, layout, components used, internal wiring and functions were identical for the above models, with only difference on model No, memory capacity and hard disk capacity.

Object / part No.	Manufacturer/trademark	Type / model
PCB	CHUAN YI COMPUTER(SHENZHEN)CO LTD	Interchangeable
Alt.	Interchangeable	Interchangeable
Fan motor	Shenzhen Yongyihao Electronic Co., LTD.	YY6010L05B
Button Battery	Yichang POWER GLORY BATTERY TECH(HK)CO LTD	CR2032
CPU	INTEL	i5-10210U
CPU	INTEL	i3-10110U
CPU	INTEL	i7-10510U
Memory	Kingston	DDR4-SODIMM
Alt.	Samsung	DDR4-SODIMM
Alt.	Foresee	DDR4-SODIMM
Alt.	TIGO	DDR4-SODIMM
SSD	Kingston	SSD
Alt.	Samsung	SSD
Alt.	Phison	SSD
Alt.	Foresee	SSD



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4.2 Test Location

All tests were performed at:

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Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

4.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

- **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

- **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

4.4 Deviation from Standards

None.

4.5 Abnormalities from Standard Conditions

None.

4.6 Other Information Requested by the Customer

None.



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5 RF Exposure Evaluation

5.1 RF Exposure Compliance Requirement

5.1.1 Limits

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
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				
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

F= Frequency in MHz

Friis Formula

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d is the limit of MPE, 1 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

5.1.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.



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4.1.3 EUT RF Exposure Evaluation

For BT:

Antenna Gain: 5dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 3.162 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Antenna	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
1	2402	9.42	8.75	0.006	1.0	PASS

Note: Refer to report No. SZEM201101218902 for EUT test Max Conducted Peak Output Power value.
The distance r (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.

For BLE:

Antenna Gain: 5dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 3.162 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Antenna	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
1	2402	5.62	3.648	0.002	1.0	PASS

Note: Refer to report No. SZEM201101218903 for EUT test Max Conducted Peak Output Power value.
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Report No.: SZEM201101218906
Page: 10 of 11

For 2.4G:

For SISO:

Antenna Gain: 5dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 3.162 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Antenna	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
1	2437	15.29	33.81	0.021	1.0	PASS

For MIMO:

Antenna Gain: 5dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 3.162 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Antenna	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
1+2	2422	14.94	31.19	0.02	1.0	PASS

Note: Refer to report No. SZEM201101218904 for EUT test Max Conducted Peak Output Power value.
The distance r (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.



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Report No.: SZEM201101218906
Page: 11 of 11

For 5G:

For SISO:

Antenna Gain: 3dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.995 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Antenna	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
2	5200	13.86	24.32	0.010	1.0	PASS

For MIMO:

Antenna Gain: 3dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.995 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Antenna	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
1+2	5190	14.98	31.48	0.012	1.0	PASS

Note: Refer to report No. SZEM201101218905 for EUT test Max Conducted Peak Output Power value.
The distance r (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.

- End of the Report -



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