



TEST REPORT

Report Number. :	90510-24-72-24-PP004	
Date of issue..... :	2024-03-29	
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Manufacturer's name :	Zhuhai Hengsheng Barcode Equipment Co., Ltd.	
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Factory's name :	Zhuhai Hengsheng Barcode Equipment Co., Ltd.	
Address..... :	Room # C301, 3rd Floor, No.#1/#2 building(Logistic building) of No.# 611 & No.# 613 Huayu Road, Xiangzhou District, Zhuhai City, Guangdong Province, China.	
Standard(s) :	FCC 1.1310: §1.1307(b)	
Test item description :	High Speed Thermal Label Printer, Industrial Barcode Printers, Industrial Label Printers, Label Printer, Thermal Printer, Thermal Barcode Printer, Thermal Label Printer	
Trade Mark :	Xprinter® 芯烨	

Model/Type reference :	XP-G480B, XP-G480E, 4B-2084GA, 4B-3064GA, XP-G481B, XP-G481E, 4B-2084GB, 4B-3064GB, XP-G482B, XP-G482E, 4B-2084GC, 4B-3064GC, XP-G483B, XP-G483E, 4B-2084GD, 4B-3064GD, XP-G484B, XP-G484E, 4B-2084GE, 4B-3064GE, XP-G485B, XP-G485E, 4B-2084GF, 4B-3064GF, XP-G486B, XP-G486E, 4B-2084GH, 4B-3064GH, XP-G487B, XP-G487E, 4B-2084GI, 4B-3064GI, XP-G488B, XP-G488E, 4B-2084GJ, 4B-3064GJ, XP-G489B, XP-G489E, 4B-2084GK, 4B-3064GK, XP-G3, XP-G3K, XP-G8, XP-G8K, XP-G3KS, 410B, 420B, D463B, D465B, P81, DB401, DB402, DB403, DB404, DB405, DB406, DB407, DB408, DB409, DB410, DB411, DB412, DB413, DB414, DB415, DB416, DB417, DB418, DB419, DB420, DB421, DB422, DB423, DB424, DB425, DB426, DB427, DB428, DB429, DB430, DB301, DB302, DB303, DB304, DB305, DB306, DB307, DB308, DB309, DB310, DB201, DB202, DB203, DB204, DB205, DB206, DB207, DB208, DB209, DB210, PB201, PB202, PB203, PB204, PB205, PB301, PB302, PB303, PB304, PB305, PB401, PB402, PB403, PB404, PB405
FCC ID :	2A6QO-XP-G480B
Date of receipt of test item :	2024-03-20
Date (s) of performance of test:	2024-03-21 to 2024-03-28
Summary of Test Results :	Pass
The Summary of Test Results based on a technical opinion belongs to the standard(s).	
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Modified History

Report No.	Revision Date	Summary
90510-24-72-24-PP004	2024-03-29	Original Report

1. EUT Specification

Characteristics	Description
Product:	High Speed Thermal Label Printer, Industrial Barcode Printers, Industrial Label Printers, Label Printer, Thermal Printer, Thermal Barcode Printer, Thermal Label Printer
Model Number:	XP-G480B, XP-G480E, 4B-2084GA, 4B-3064GA, XP-G481B, XP-G481E, 4B-2084GB, 4B-3064GB, XP-G482B, XP-G482E, 4B-2084GC, 4B-3064GC, XP-G483B, XP-G483E, 4B-2084GD, 4B-3064GD, XP-G484B, XP-G484E, 4B-2084GE, 4B-3064GE, XP-G485B, XP-G485E, 4B-2084GF, 4B-3064GF, XP-G486B, XP-G486E, 4B-2084GH, 4B-3064GH, XP-G487B, XP-G487E, 4B-2084GI, 4B-3064GI, XP-G488B, XP-G488E, 4B-2084GJ, 4B-3064GJ, XP-G489B, XP-G489E, 4B-2084GK, 4B-3064GK, XP-G3, XP-G3K, XP-G8, XP-G8K, XP-G3KS, 410B, 420B, D463B, D465B, P81, DB401, DB402, DB403, DB404, DB405, DB406, DB407, DB408, DB409, DB410, DB411, DB412, DB413, DB414, DB415, DB416, DB417, DB418, DB419, DB420, DB421, DB422, DB423, DB424, DB425, DB426, DB427, DB428, DB429, DB430, DB301, DB302, DB303, DB304, DB305, DB306, DB307, DB308, DB309, DB310, DB201, DB202, DB203, DB204, DB205, DB206, DB207, DB208, DB209, DB210, PB201, PB202, PB203, PB204, PB205, PB301, PB302, PB303, PB304, PB305, PB401, PB402, PB403, PB404, PB405 (Except for the Model name, product name and color, all models are the same; all tests are performed on type XP-G480B)
Sample:	1#
Device Type:	Bluetooth V5.3 BT/BLE 2.4G WIFI
Data Rate:	BT: 1Mbps for GFSK modulation 2Mbps for pi/4-DQPSK modulation 3Mbps for 8DPSK modulation BLE: 1Mbps or 2Mbps for GFSK modulation 802.11b/g/n(20MHz) for WIFI
Modulation:	BT: GFSK, pi/4-DQPSK, 8DPSK BLE: GFSK DSSS with DBPSK/DQPSK/CCK for 802.11b; OFDM with BPSK/QPSK/16QAM/64QAM for 802.11g/n
Operating Frequency Range(s) :	2402-2480MHz for Bluetooth DSS 2412-2462MHz for WIFI
Number of Channels:	79 Channels for Bluetooth DSS 40 Channels for Bluetooth DTS 11 channels for 802.11b/g/n(HT20);
Transmit Power Max:	0.43 dBm (0.001104 W) for BT -2.59 dBm (0.000550 W) for BLE 12.19 dBm (0.016557 W) for WIFI
Antenna Gain:	3.71 dBi

Power supply:	Input: 100-240VAC, 50/60Hz, 2.5A
Evaluation applied:	☒ MPE Evaluation ☐ SAR Evaluation

2. Test Requirement:

RF EXPOSURE EVALUATION

According to 447498 D01 V06: 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 §1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density(mW/cm ²)	Average Time
(A) Limits for Occupational/Control Exposures				
300-1500	--	--	F/300	6
1500-100000	--	--	5	6
(B) Limits for General Population/Uncontrol Exposures				
300-1500	--	--	F/1500	6
1500-100000	--	--	1	30

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

Where

P_d = Power density in mW/cm²

P_{out} = output power to antenna in mW

G = Numeric gain of the antenna relative to isotropic antenna

π = 3.1416

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

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

3. Measurement Result

Wifi 2.4G

Antenna gain: 3.71 dBi

modulation	Channel Freq. (MHz)	Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm ²)	Power density Limits (mW/cm ²)
11b	2412	12.19	±1	13	2.35	0.009327	1
	2437	12.07	±1	13	2.35	0.009327	1
	2462	10.50	±1	12	2.35	0.007408	1
11g	2412	9.90	±1	11	2.35	0.005885	1
	2437	9.68	±1	11	2.35	0.005885	1
	2462	9.52	±1	11	2.35	0.005885	1
11n HT20	2412	10.21	±1	11	2.35	0.005885	1
	2437	9.21	±1	10	2.35	0.004674	1
	2462	8.85	±1	10	2.35	0.004674	1

BT/BLE

Antenna gain: 3.71 dBi

modulation	Channel Freq. (MHz)	Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm ²)	Power density Limits (mW/cm ²)
GFSK	2402	-1.82	±1	-1	2.35	0.000371	1
	2441	-1.02	±1	-1	2.35	0.000371	1
	2480	-1.19	±1	-1	2.35	0.000371	1
pi/4-DQPSK	2402	-1.00	±1	0	2.35	0.000467	1
	2441	-0.20	±1	0	2.35	0.000467	1
	2480	-0.40	±1	0	2.35	0.000467	1
8DPSK	2402	-0.37	±1	0	2.35	0.000467	1
	2441	0.43	±1	1	2.35	0.000588	1
	2480	0.20	±1	1	2.35	0.000588	1
GFSK (BLE: 1Mbps)	2402	-2.94	±1	-2	2.35	0.000295	1
	2440	-2.67	±1	-2	2.35	0.000295	1
	2480	-2.59	±1	-2	2.35	0.000295	1
GFSK (BLE: 2Mbps)	2402	-3.00	±1	-2	2.35	0.000295	1
	2440	-2.92	±1	-2	2.35	0.000295	1
	2480	-2.75	±1	-2	2.35	0.000295	1

CONCLUSION of simultaneous transmitter

Both of the module 1 and module 2 can transmit simultaneously, the formula of calculated the MPE is:

$CPD1/LPD1 + CPD2/LPD2 + \dots \text{etc.} < 1$

CPD = Calculation power density

LPD = Limit of power density

Therefore the worst-case situation is $0.009327 / 1.00 + 0.000588 / 1.00 + 0.000295 / 1.00 = 0.01021$, which is less than "1",

This confirmed that the device comply with FCC 1.1310 MPE limit.

Therefore the worst-case situation is 0.01021, which is less than "1",

This confirmed that the device comply with FCC 1.1310 MPE limit.

*** End of Report ***

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