

RF Exposure Evaluation Report

Product : Hypershell Pro X, Hypershell Go X,
Hypershell Carbon X

Trade mark : Hypershell

Model/Type reference : HPX-800W-NYL, HGX-400W-NYL,
HCX-800W-GTX

Serial Number : N/A

Report Number : EED32Q80742603

FCC ID : 2BHQ3HGPCX400-800W

Date of Issue : Oct. 12, 2024

Test Standards : 47 CFR Part 1.1307
47 CFR Part 1.1310
47 CFR Part 2.1091
47 CFR Part 2.1093
447498 D04 Interim General RF
Exposure Guidance v01

Test result : PASS

Prepared for:

Hypershell Co., Ltd**83 Hongxiang North Road, Lingang Section of Shanghai Pilot Free
Trade Zone, Shanghai, China**

Prepared by:

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2 Version

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4 General Information

4.1 Client Information

Applicant:	Hypershell Co., Ltd
Address of Applicant:	83 Hongxiang North Road, Lingang Section of Shanghai Pilot Free Trade Zone, Shanghai, China
Manufacturer:	Hypershell Co., Ltd
Address of Manufacturer:	83 Hongxiang North Road, Lingang Section of Shanghai Pilot Free Trade Zone, Shanghai, China
Factory:	Dongguan Kaipin Electronic Technology Co., Ltd
Address of Factory:	1st to 2nd floors, Building 2, Qihua Industrial Zone, Xinyuan 1st Road, Wulian Village, Fenggang Town, Dongguan City

4.2 General Description of EUT

Product Name:	Hypershell Pro X, Hypershell Go X, Hypershell Carbon X
Model No.(EUT):	HPX-800W-NYL, HGX-400W-NYL, HCX-800W-GTX
Test Model No.:	HPX-800W-NYL
Trade Mark:	Hypershell

4.3 Product Specification subjective to this standard

Frequency Range:	2402MHz~2480MHz	
Modulation Type:	BLE: GFSK BT: GFSK, $\pi/4$ DQPSK, 8DPSK	
Test Power Grade:	Default	
Test Software of EUT:	EspRFTTestTool_v3.6_Manual	
Antenna Type:	PCB Antenna	
Antenna Gain:	3.76dBi	
Power Supply:	Adapter:	DC 5V
	Battery:	DC 14.4V
Sample Received Date:	Jul. 09, 2024	
Sample tested Date:	Jul. 09, 2024 to Jul. 15, 2024	
Remark: Company Name and Address shown on Report, the sample(s) and sample Information was/ were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified. Model No.: HPX-800W-NYL, HGX-400W-NYL, HCX-800W-GTX Only the model HPX-800W-NYL was tested, since the following model numbers have same electrical, PCB and layout. only the model name, with different for marketing requirements.		

4.4 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd

Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China

Telephone: +86 (0) 755 33683668 Fax: +86 (0) 755 33683385

No tests were sub-contracted.

FCC Designation No.: CN1164

4.5 Deviation from Standards

None.

4.6 Abnormalities from Standard Conditions

None.

4.7 Other Information Requested by the Customer

None.

5 SAR Evaluation

5.1 RF Exposure Compliance Requirement

5.1.1 Limits

The SAR-based exemption formula of § 1.1307(b)(3)(i)(B), repeated here as Formula (B.2), applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold P_{th} (mW).

This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by Formula

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right)$$

and f is in GHz, d is the separation distance (cm), and $ERP_{20 \text{ cm}}$ is per Formula (B.1).

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases} \quad (\text{B.1})$$

The 1 mW Blanket Exemption of § 1.1307(b)(3)(i)(A) applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power of no more than 1 mW, regardless of separation distance.

5.1.2 Test Procedure

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

5.1.3 EUT RF Exposure Evaluation**For Stand alone:****For BLE**

Frequency (MHz)	Max. Conducted Output power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	ERP (dBm)	ERP (mW)	Limit (mW)	Result
2402	2.62	3.76	6.38	4.23	2.649	2.788	PASS

For BT

Frequency (MHz)	Max. Conducted Output power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	ERP (dBm)	ERP (mW)	Limit (mW)	Result
2402	2.73	3.76	6.49	4.34	2.716	2.788	PASS

Note:

- ① EIRP=conducted power+antenna gain;
- ② ERP=EIRP-2.15;
- ③ $\text{EIRP(dBm)} = \text{Field strength of the fundamental signal(dBuV/m@3m)} - 95.23$;
- ④ $\text{ERP(mW)} = 10^{(\text{ERP (dBm)}/10)}$;
- ⑤ The estimation distance is 0.5cm;
- ⑥ The test data please refer to the report of EED32Q80742601, EED32Q80742602 and only the worst case data was recorded in the report.

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CTI, this report can't be reproduced except in full.

*** End of Report ***