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TEST REPORT

Report No. .....:	**CHTEW22090087** Report verification **:**
Project No. .....:	**SHT2103098305EW**
Applicant's name .....:	**HARDWARIO a.s.**
Address .....:	U Jezu 525/4, 460 01 Liberec, CZECHIA
Test item description .....:	**CHESTER**
Trade Mark.....:	-
Model/Type reference .....:	CHESTER
Listed Model(s).....:	-
Standard.....:	**EN IEC 62311:2020**
Date of receipt of test sample.....:	Jun. 29, 2022
Date of testing.....:	Jun. 30, 2022- Sep. 20, 2022
Date of issue.....:	Sep. 21, 2022
Result ....:	**PASS**

Compiled by		
(position+printed name+signature) . :	File administrators Silvia Li	Silvia Li
Supervised by		
(position+printed name+signature) . :	Project Engineer David Chen	David Chen
Approved by		
(position+printed name+signature) . :	RF Manager Hans Hu	Hans Hu

Testing Laboratory Name.....:	**Shenzhen Huatongwei International Inspection Co., Ltd.**
Address .....:	1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

Contents

1. Test standards and Report version

1.1. Test standards

The tests were performed according to following standards:

EN IEC 62311:2020- Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz – 300 GHz) .
EN62232:2017- Determination of RF field strength, power density and SAR in the vicinity of radio communication base stations for the purpose of evaluating human exposure.

1.2. Report version information

Revision No.	Date of issue	Description
N/A	2022-09-21	Original

2. Summary

2.1. Client Information

Applicant:	HARDWARIO a.s.
Address:	U Jezu 525/4, 460 01 Liberec, CZECHIA
Manufacturer:	HARDWARIO a.s.
Address:	U Jezu 525/4, 460 01 Liberec, CZECHIA

2.2. Product Description

Name of EUT:	CHESTER
Trade Mark:	-
Model/Type reference:	CHESTER
Listed Model(s):	**-**
Power supply:	DC 3.6V
Hardware version:	R3.2
Software version:	v1.0.0

2.3. Radio specification description [#1]

LTE Cat M			
Operation Band:	☒ FDD Band 1	☒ FDD Band 3	☒ FDD Band 8
	☒ FDD Band 20	☒ FDD Band 28	
LTE NB-IoT			
Operation Band:	☒ FDD Band 1	☒ FDD Band 3	☒ FDD Band 8
	☒ FDD Band 20	☒ FDD Band 28	
Bluetooth			
Supported type:	☐ BR	☐ EDR	☒ LE-1Mbps
	☐ LE-2Mbps		
LoRa			
Operation Band:	863 ~ 871MHz		
GNSS			
Supported type:	☒GPS	☒GALILEO	☒GLONASS
	☒BeiDou		

Note

#1: Please refer to RF report for detailed technical specifications

2.4. Testing Laboratory Information

Laboratory Name	Shenzhen Huatongwei International Inspection Co., Ltd.
Laboratory Location	1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China
Connect information:	Tel: 86-755-26715499 E-mail: cs@szhtw.com.cn http://www.szhtw.com.cn

3. RF Exposure

LIMIT

Reference levels for electric, magnetic and electromagnetic fields (0Hz to 300GHz,unperturbed rms values)

Frequency range	E-field strength (V/m)	H-field strength (A/m)	B-field (uT)	Equivalent plane wave power density Seq(W/m2)
0-1Hz	--	3.2×10^4	4×10^4	--
1-8Hz	10000	$3.2\times10^4/f^2$	$4\times10^4/f^2$	--
8-25Hz	10000	4000/f	5000/f	--
0.025-0.8KHz	250/f	4/f	5/f	--
0.8-3KHz	250/f	5	6.25	--
3-150KHz	87	5	6.25	--
0.15-1MHz	87	0.73/f	0.92/f	--
1-10MHz	$87/f^{1/2}$	0.73/f	0.92/f	--
10-400MHz	28	0.073	0.092	2
400-2000MHz	$1.375f^{1/2}$	$0.0037f^{1/2}$	$0.0046f^{1/2}$	f/200
2-300GHz	61	0.16	0.20	10

Notes:
1. As indicated in the frequency range column.
2. For frequencies between 100kHz and 10GHz, S_{eq}, E^2, H^2 and B^2 are to be averaged over any six-minute period.
3. For frequencies exceeding 10GHz, S_{eq}, E^2, H^2 and B^2 are to be averaged over any $68/f^{1.05}$-minute period (.in GHz).
4. No E-field value is provided for frequencies <1Hz, which are effectively static electric fields. For most people the annoying perception of surface electric charges will not occur at field strengths less than 20kV/m. Spark discharges causing stress or annoyance should be avoided.

MPE Calculation Method

Equation from page 98 of EN 62232, Edition 2017

$$E=\eta_0 H=\frac{\sqrt{30PG(\theta,\phi)}}{r}$$

Where:
E: E-field strength (V/m)
P: power input to antenna (Watt)
G: is the antenna gain relative to an isotropic antenna;
θ,ϕ: are elevation and azimuth angles to point of investigation;
r: is the distance from observation point to the antenna;
η_0: is the characteristic impedance of free space.

TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

Type	Maximum EIRP (dBm)	r (m)	E-field strength (V/m)	Limit	Result
LoRa	12.20	0.20	3.53	40.39	Pass
BLE	10.00	0.20	2.74	61.00	Pass
LTE Band 1	27.50	0.20	20.54	60.25	Pass
LTE Band 3	27.50	0.20	20.54	56.86	Pass
LTE Band 8	27.50	0.20	20.54	40.79	Pass
LTE Band 20	27.50	0.20	20.54	39.66	Pass
LTE Band 28	27.50	0.20	20.54	36.46	Pass

Note:

r is the distance from observation point to the antenna which is declared by the applicant.

--------End of Report--------