

RF Exposure Evaluation Report

Product : Echelon Strength Cable Crossover Pro

Trade mark : Echelon

Model/Type reference : ECH-STCROSS-s-22

Serial Number : N/A

Report Number : EED32Q80705106

FCC ID : 2AWD4-STCROSS22

Date of Issue : oct. 31, 2024

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

Test result : PASS

Prepared for:

Echelon Fitness Multimedia, LLC
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Prepared by:

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oct. 31, 2024



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1 Version

Version No.	Date	Description
00	oct. 31, 2024	Original

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3 General Information

3.1 Client Information

Applicant:	Echelon Fitness Multimedia, LLC
Address of Applicant:	605 Chestnut Street Suite 700, Chattanooga, TN USA 37450
Manufacturer:	Guangzhou Yuandong Smart Sports Technology Co., Ltd
Address of Manufacturer:	Room 192 Kezhu Road, Huangpu District, Guangzhou
Factory:	Shandong Relax Sports Technology Co.,Ltd.
Address of Factory:	No. 101 Shantou Road, Rizhao, Shandong, China

3.2 General Description of EUT

Product Name:	Echelon Strength Cable Crossover Pro
Model No.(EUT):	ECH-STCROSS-s-22
Trade Mark:	Echelon

3.3 Product Specification subjective to this standard

Frequency Range:	BLE/BT:2402MHz~2480MHz 2.4G Wi-Fi: IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz IEEE 802.11n(HT40): 2422MHz to 2452MHz 5G Wi-Fi: U-NII-1: 5150-5250MHz U-NII-2A: 5250-5350MHz U-NII-2C:5500-5700MHz U-NII-3:5745-5825MHz
Modulation Type:	BLE: GFSK BT: GFSK, $\pi/4$ DQPSK, 8DPSK 2.4G Wi-Fi: IEEE for 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE for 802.11g :OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n(HT20 and HT40) : OFDM (64QAM, 16QAM,QPSK,BPSK) 5G Wi-Fi: IEEE 802.11a: OFDM (BPSK, QPSK, 16QAM, 64QAM) IEEE 802.11n(HT20/HT40): OFDM (BPSK, QPSK, 16QAM, 64QAM) IEEE 802.11ac(VHT20/VHT40/VHT80): OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
Test Power Grade:	Default
Test Software of EUT:	adb.exe
Antenna Type:	FPC Antenna
Antenna Gain:	BLE/BT: 3.62dBi 2.4G Wi-Fi: ANT 1: 3.99dBi ANT 2: 3.88dBi 5G Wi-Fi: U-NII-1: ANT1: 3.85, ANT2: 3.86 U-NII-2A: ANT1: 3.85, ANT2: 3.55 U-NII-2C: ANT1: 3.54, ANT2: 4.24 U-NII-3: ANT1: 3.87, ANT2: 3.51

Power Supply:	Adapter:	DC12V
Sample Received Date:	Jul. 23, 2024	
Sample tested Date:	Jul. 23, 2024 to Aug. 30, 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.		

3.4 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

3.5 Deviation from Standards

None.

3.6 Abnormalities from Standard Conditions

None.

3.7 Other Information Requested by the Customer

None.

4 SAR Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 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.

4.1.2 Test Procedure

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

4.1.3 EUT RF Exposure Evaluation

For Stand alone:

For Bluetooth LE:

Frequency (MHz)	Max. Conducted Output power (dBm)	Antenna Gain (dBi)	ERP (dBm)	ERP (mW)	Limit (mW)	MPE ratio	Result
2402	1.90	3.62	3.37	2.173	3060	0.0007	PASS

For Bluetooth Classic:

Frequency (MHz)	Max. Conducted Output power (dBm)	Antenna Gain (dBi)	ERP (dBm)	ERP (mW)	Limit (mW)	MPE ratio	Result
2441	3.26	3.62	4.73	2.972	3060	0.0010	PASS

For 2.4G Wi-Fi:

Frequency (MHz)	Max. Conducted Output power (dBm)	Antenna Gain (dBi)	ERP (dBm)	ERP (mW)	Limit (mW)	MPE ratio	Result
2437	15.63	3.99	17.47	55.847	3060	0.0183	PASS

For 5G Wi-Fi:

Frequency (MHz)	Max. Conducted Output power (dBm)	Antenna Gain (dBi)	ERP (dBm)	ERP (mW)	Limit (mW)	MPE ratio	Result
5320	10.91	3.85	12.61	18.239	3060	0.0060	PASS

Frequency (MHz)	Max. Conducted Output power (dBm)	Antenna Gain (dBi)	ERP (dBm)	ERP (mW)	Limit (mW)	MPE ratio	Result
5580	10.91	4.24	13	19.953	3060	0.0065	PASS

Note:

- ① EIRP=conducted power+antenna gain;
- ② ERP=EIRP-2.15;
- ③ EIRP(dBm) = Field strength of the fundamental signal(dBuV/m@3m) - 95.23;
- ④ ERP(mW) = $10^{(ERP \text{ (dBm)}/10)}$;
- ⑤ The estimation distance is 20cm,

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⑥ The test data please refer to the report of EED32Q80705101, EED32Q80705102, EED32Q80705103, EED32Q80705104 and only the worst case data was recorded in the report.

For Simultaneous Transmission:

As MPE ratio (BLE+2.4G Wi-Fi+5G Wi-Fi)= $0.0010+0.0183+0.0065=0.0258 < 1$, it's deemed to fulfil the RF exposure requirement.

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*** End of Report ***