

Test Report C-3939D RFX

Equipment Under Test:	252.433.00.1T
Requirement(s):	FCC 15.247
Test Date(s):	12/4/2025 – 12/9/2025
Prepared for:	The Chicago Faucet Company Attn: Robert Bobek 2100 Clearwater Drive Des Plaines, IL 60018

Report Issued by: Mitchell Freund, EMC Test Engineer	
Signature: 	Date: 02/12/2026
Report Reviewed by: Adam Alger, Sr. Manager, EMC Laboratory	
Signature: 	Date: 02/12/2026
Report Constructed by: Mitchell Freund, EMC Test Engineer	
Signature: 	Date: 02/12/2026

This test report may not be reproduced, except in full, without approval of Ezurio

Company: The Chicago Faucet Company	Page 1 of 16	Name: 252.433.00.1T
Report: TR3939D		Model: IWT-07-B
Quote: NBO-01-2024-006892-4		Serial: Engineering Sample

CONTENTS

Contents.....	2
Ezurio Test Services in Review	3
1 Test Report Summary	4
2 Client Information.....	5
2.1 Equipment Under Test (EUT) Information.....	5
2.2 Product Description.....	5
2.3 Modifications Incorporated for Compliance	5
2.4 Deviations and Exclusions from Test Specifications.....	5
2.5 Additional Information	5
2.6 EUT Programming.....	6
2.7 Antenna Information	6
2.8 Test Channels and Power Setting.....	6
3 References	7
4 Uncertainty Summary	8
5 Test Data	9
5.1 Antenna Port Conducted Emissions	9
6 FCC SAR Exclusion	12
6.1 SAR Exclusion Limit.....	12
6.2 Distance	12
6.3 Power Calculation.....	12
6.4 SAR Test Exclusion Calculation	12
6.5 Result	12
7 ISED SAR Exemption.....	13
7.1 SAR Exemption Limit.....	13
7.2 Calculation	13
7.3 SAR Test Exemption Calculation	13
7.4 ISED SAR Total Exposure Ratio Calculation	14
7.5 Result	15
8 Revision History	16

Ezurio Test Services in Review

The Ezurio laboratory located at W66 N220 Commerce Court Cedarburg, Wisconsin, 53012 USA is recognized through the following organizations:



A2LA – American Association for Laboratory Accreditation

Accreditation based on ISO/IEC 17025:2017 with Electrical (EMC) Scope

A2LA Certificate Number: 1255.01

Scope of accreditation includes all test methods listed herein unless otherwise noted



Federal Communications Commission (FCC) – USA

Accredited Test Firm Registration Number: 953492

Recognition of two 3 meter Semi-Anechoic Chambers



Innovation, Science and Economic Development Canada

Accredited U.S. Identification Number: US0218

Recognition of two 3 meter Semi-Anechoic Chambers

Company: The Chicago Faucet Company	Page 3 of 16	Name: 252.433.00.1T
Report: TR3939D		Model: IWT-07-B
Quote: NBO-01-2024-006892-4		Serial: Engineering Sample

1 TEST REPORT SUMMARY

During **12/4/2025-12/9/2025** the Equipment Under Test (EUT), **252.433.00.1T**, as provided by **The Chicago Faucet Company**, was tested to the following requirements:

Requirements	Description	Method	Compliant
FCC Part 1.1310, 2.1093	Radio Frequency Radiation Exposure Evaluation	ANSI C63.10	Yes
ISED RSS-102	Radio Frequency Exposure Compliance of Radiocommunication Apparatus	RSS-102	Yes

Notice:

The results relate only to the item tested as configured and described in this report. Any additional configurations, modes of operation, or modifications made to the equipment under test after the specified test date(s) are at the decision of the client and may not apply to the data seen in this test report.

The decision rule for Pass / Fail assessment to the specification or standard listed in this test report has been agreed upon by the client and laboratory to be as follows:

Measurement Type	Rule
Emissions – Amplitude	1 dB below specified limit
Emissions – Frequency	1% less than the specification
Immunity	Tested at specified level

2 CLIENT INFORMATION

Company Name	The Chicago Faucet Company
Contact Person	Robert Bobek
Address	2100 Clearwater Drive Des Plaines, IL 60018

2.1 Equipment Under Test (EUT) Information

The following information has been supplied by the client

Product Name	252.433.00.1T
Model Number	IWT-07-B
Serial Number	Engineering Sample
Date of Receipt	11/25/2025
Condition	Good
FCC ID	2APTX-CFC04
IC ID	31327-CFC04

2.2 Product Description

IR sensor with Bluetooth and BMS communication capabilities

2.3 Modifications Incorporated for Compliance

None noted at time of test

2.4 Deviations and Exclusions from Test Specifications

None noted at time of test

2.5 Additional Information

Input Power = draws 12-24V from the Gateway via BUS Converter which then provides 4.5 VDC to Sensor.

Company: The Chicago Faucet Company	Page 5 of 16	Name: 252.433.00.1T
Report: TR3939D		Model: IWT-07-B
Quote: NBO-01-2024-006892-4		Serial: Engineering Sample

2.6 EUT Programming

Equipment used for EUT programming (not part of the EUT)

HP EliteBook 840

Linksys E6900 V1.1 – Router

Program used on HP Elitebook – STM32CubeMonitor RF Version 2.14.0

Programmed Via USB and appears in the system as a virtual serial port.

2.7 Antenna Information

Johanson Technology 2.45 GHz Antenna

P/N 2450AT42A100

Frequency Range: 2400-2500 MHz

2.8 Test Channels and Power Setting

Channel	Frequency (MHz)	Data Rates	Power Setting
37	2402.0	LE 1M PHY LE 2M PHY	Power set to level 31 (+6dB)
17	2440.0		
39	2480.0		

3 REFERENCES

Publication	Edition	Date	AMD 1	AMD 2
ANSI C63.10		2020	2024	
RSS-247	4	2025		
eCFR		2026		
RSS-102	6	2023		
KDB 447498 D01	V06	2015		

4 UNCERTAINTY SUMMARY

Using the guidance of the following publications the calculated measurement uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level, using a coverage factor of $k = 2$.

References
CISPR 16-4-1
CISPR 16-4-2
CISPR 32
ANSI C63.23
A2LA P103
A2LA P103c
ETSI TR 100-028

Measurement Type	Configuration	Uncertainty $\pm$
Radiated Emissions	Biconical Antenna	5.0 dB
Radiated Emissions	Log Periodic Antenna	5.3 dB
Radiated Emissions	Horn Antenna	4.7 dB
AC Line Conducted Emissions	Artificial Mains Network	3.4 dB
Telecom Conducted Emissions	Asymmetric Artificial Network	4.9 dB
Disturbance Power Emissions	Absorbing Clamp	4.1 dB
Radiated Immunity	3 Volts/meter	2.2 dB
Conducted Immunity	CDN/EM/BCI	2.4/3.5/3.4 dB
EFT Burst/Surge	Peak pulse voltage	164 volts
ESD Immunity	15 kV level	1377 Volts

Parameter	ETSI U.C. $\pm$	U.C. $\pm$
Radio Frequency, from F0	1×10^{-7}	0.55×10^{-7}
Occupied Channel Bandwidth	5 %	2 %
RF conducted Power (Power Meter)	1.5 dB	1.2 dB
RF conducted emissions (Spectrum Analyzer)	3.0 dB	1.7 dB
All emissions, radiated	6.0 dB	5.3 dB
Temperature	1° C	0.65° C
Humidity	5 %	2.9 %
Supply voltages	3 %	1 %

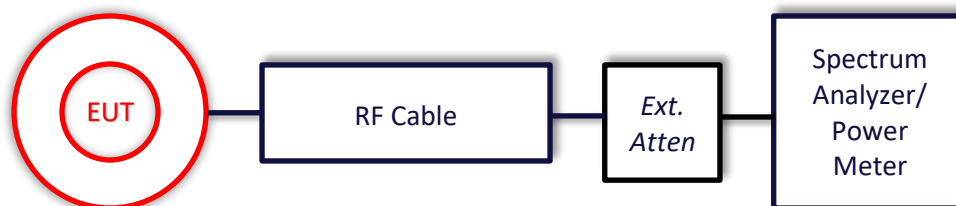
Company: The Chicago Faucet Company	Page 8 of 16	Name: 252.433.00.1T
Report: TR3939D		Model: IWT-07-B
Quote: NBO-01-2024-006892-4		Serial: Engineering Sample

5 TEST DATA

5.1 Antenna Port Conducted Emissions

Description of Measurement	The direct measurement of emissions at the antenna port of the EUT is achieved by use of a RF connection to a spectrum analyzer or power meter. The cable and attenuator factors are loaded into the analyzer or power meter allowing for direct measurement readings without the need for further corrections.
Example Calculations	Measurement (dBm) + Cable factor (dB) + External Attenuator (dB) = Corrected Reading (dBm) Margin (dB) = Limit (dBm) – Corrected Reading (dBm)

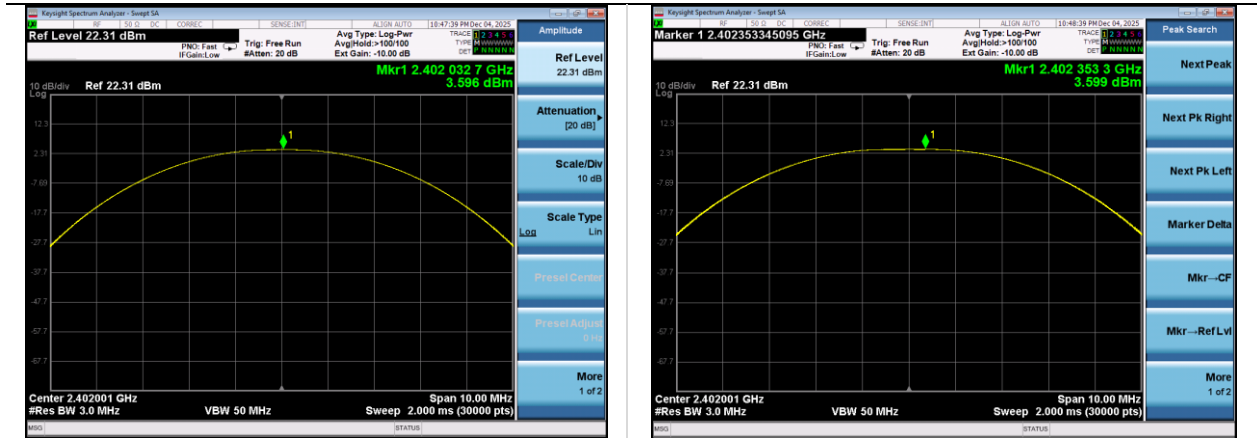
Block Diagram



5.1.1 Antenna Port Conducted Emissions – RF Output Power BLE

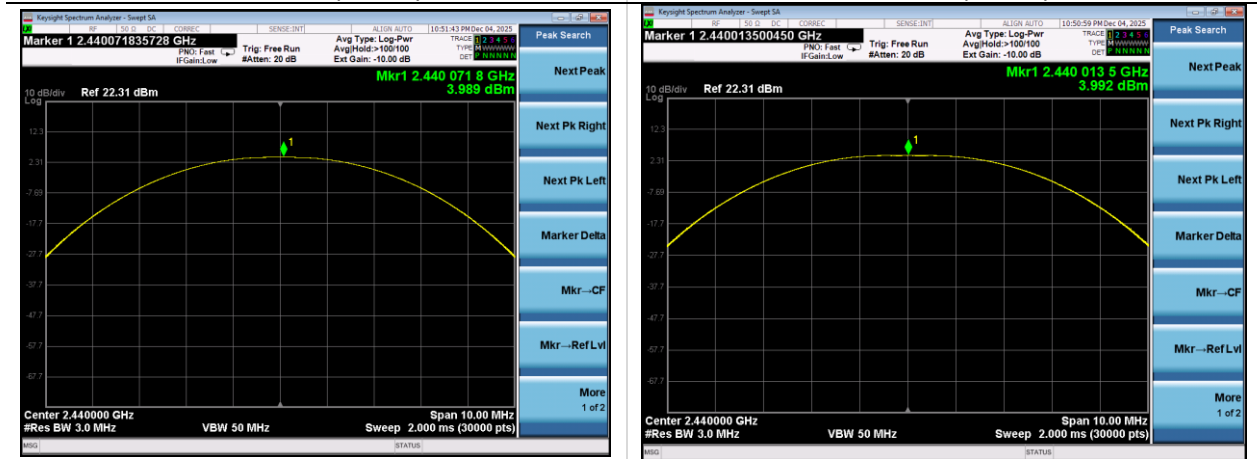
Rate	Frequency (MHz)	Channel	Peak Output Power (dBm)	Limit (dBm)	Margin (dB)
1 Mbps	2402	37	3.6	30	26.4
1 Mbps	2440	17	4.0	30	26.0
1 Mbps	2480	39	3.9	30	26.1
2 Mbps	2402	37	3.6	30	26.4
2 Mbps	2440	17	4.0	30	26.0
2 Mbps	2480	39	4.0	30	26.0

Plots



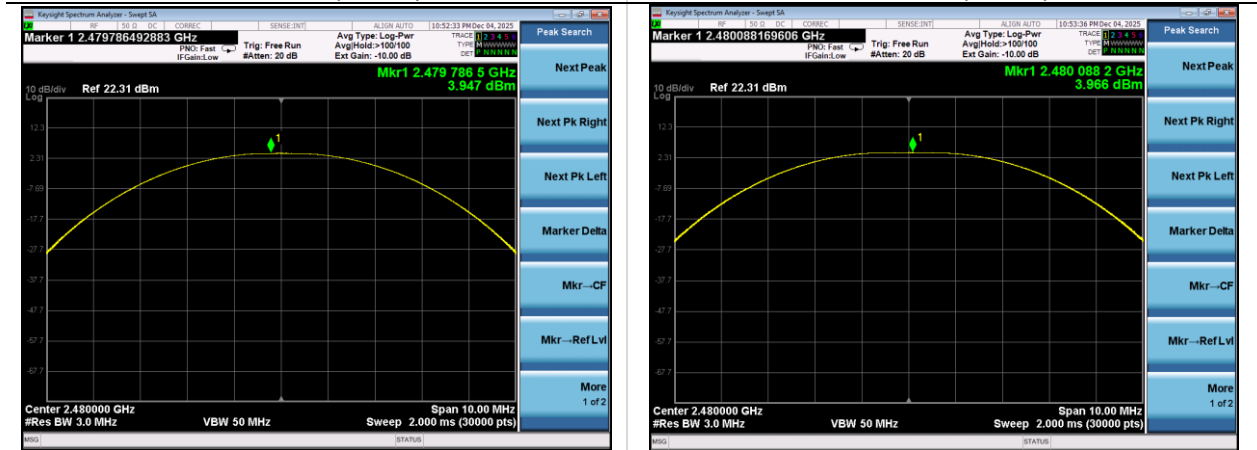
Channel 37 | 1 Mbps

Channel 37 | 2 Mbps



Channel 17 | 1 Mbps

Channel 17 | 2 Mbps



Channel 39 | 1 Mbps

Channel 39 | 2 Mbps

6 FCC SAR EXCLUSION

6.1 SAR Exclusion Limit

For separation distance of 50mm or less

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot$

$[\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR

- F(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- The value 3.0 is referred to as numeric thresholds

KDB 447498 D01

6.2 Distance

$\geq 5 \text{ mm}$

6.3 Power Calculation

Max Power of Channel = 4.0 dBm (High Channel)

Tune up Tolerance = 1.0 dB

Total Power = dBm + Tune up Tolerance = 5.0 dBm = 3.2 mW

6.4 SAR Test Exclusion Calculation

$[(3.2\text{mW})/(5\text{mm})] \times \sqrt{2.48} = 1.0$

6.5 Result

The EUT is excluded from SAR testing at distances greater than or equal to 5mm as 1.0 is less than 3.0.

7 ISED SAR EXEMPTION

7.1 SAR Exemption Limit

Frequency (MHz)	≤ 5 mm (mW)	10 mm (mW)	15 mm (mW)	20 mm (mW)	25 mm (mW)	30 mm (mW)	35 mm (mW)	40 mm (mW)	45 mm (mW)	> 50 mm (mW)
≤ 300	45	116	139	163	189	216	246	280	319	362
450	32	71	87	104	124	147	175	208	248	296
835	21	32	41	54	72	96	129	172	228	298
1900	6	10	18	33	57	92	138	194	257	323
2450	3	7	16	32	56	89	128	170	209	245
3500	2	6	15	29	50	72	94	114	134	158
5800	1	5	13	23	32	41	54	74	102	128

Power Limits for exemption from SAR evaluation RSS-102

7.2 Calculation

Max Power of Channel = 4.0 dBm (High Channel)

Tune-up Tolerance = 1.0 dBi

Antenna Gain = -4.54 dBi

Total Power = 4.0 dBm + Tune-up Tolerance + Gain = 0.46 dBm = 1.11 mW

7.3 SAR Test Exemption Calculation

The exemption limit at 5mm is 2.97mW. The total power of the EUT is 1.11mW. $1.11\text{mW} \leq 2.97\text{mW}$

7.4 ISED SAR Total Exposure Ratio Calculation

7.1.8 SAR estimation for exempted transmitters

SAR values from exempted transmitters shall be included in the total exposure assessment. A SAR value of 0.4 W/kg for 1 g, 1 W/kg for 10 g, or an estimated SAR value based on the ratio of the power level and the power exemption limit may be used to determine the standalone SAR value for test configurations that do not require a SAR evaluation based on test reductions or on the exemption limits outlined in section 6.3. The estimated SAR value, $SAR_{estimated}$ is calculated using equation (2):

$$SAR_{estimated} = \frac{P_{max}}{P_{max,exemption}} \times 0.25 \times SAR_{limit} \text{ W/kg} \quad (2)$$

where:

- P_{max} is the maximum power level including tune-up tolerance for the exempted transmitter
- $P_{max,exemption}$ is the maximum power level of exemption at the same frequency and distance for the exempted transmitter
- SAR_{limit} is the applicable SAR limit (e.g. 1.6 W/kg for 1 g or 4 W/kg for 10 g)

For example, transmitter A has a maximum output power of 2 mW and the power exemption threshold is 3 mW at that specific frequency and distance (i.e. 2.45 GHz with a separation distance of 5 mm). The estimated SAR = (2 mW / 3 mW) * 0.4 W/kg = 0.27 W/kg.

The SAR levels from exempted transmitters shall be included in the total exposure ratio assessment. Detailed guidance is included in section 8.2.2.1.

$$SAR_{Estimated} = (P_{max}/P_{max, exemption}) \times 0.25 \times SAR_{limit} \text{ W/kg}$$

$$SAR_{Estimated} = (1.11/2.97) \times 0.25 \times 1.6 \text{ W/kg}$$

$$SAR_{Estimated} = 0.15 \text{ W/kg}$$

8.2.2.1 SAR-based ER (above 10 MHz to 6 GHz)

The thermal-based ER for transmitters operating above 10 MHz ($ER_{therm>10MHz}$) is evaluated based on the operating frequency or test frequency and the type of measurement or simulation result. The ER resulting from SAR-based measurements/simulations above 10 MHz to 6 GHz can be calculated using equation (9)

$$ER_{therm>10MHz,t} = \frac{SAR_t}{SAR_{limit,t}}, 10 \text{ MHz} < f_t \leq 6 \text{ GHz} \quad (9)$$

where:

- SAR_t is the SAR value of the t-th transmitter/test frequency
- $SAR_{limit,t}$ is the basic restriction limit that is applicable for the t-th transmitter and
- f_t is the operating frequency / test frequency of the t-th transmitter

The ER resulting from SAR-based exempted transmitters can be calculated using equation (10) :

$$ER_{therm>10MHz,u} = \frac{SAR_{estimated,u}}{SAR_{limit,u}}, 10 \text{ MHz} < f_u \leq 6 \text{ GHz} \quad (10)$$

where:

- $SAR_{estimated,u}$ is the SAR value of the exempted u-th transmitter/test frequency (refer to section 7.1.8)
- $SAR_{limit,u}$ is the basic restriction limit that is applicable for the u-th transmitter and
- f_u is the operating frequency / test frequency of the u-th transmitter

Company: The Chicago Faucet Company	Page 14 of 16	Name: 252.433.00.1T
Report: TR3939D		Model: IWT-07-B
Quote: NBO-01-2024-006892-4		Serial: Engineering Sample

SAR Estimated = 0.15 W/kg

SAR Limit = 1.6 W/kg

ER Therm > 10 MHz = (0.15/1.6), 10 MHz < 2480 MHz < 6 GHz = 0.094

7.5 Result

The EUT is exempt from routine SAR testing at distances greater than or equal to 5mm as 1.11mW is less than 2.97mW and has a total exposure ratio of less than 1.

Company: The Chicago Faucet Company	Page 15 of 16	Name: 252.433.00.1T
Report: TR3939D		Model: IWT-07-B
Quote: NBO-01-2024-006892-4		Serial: Engineering Sample

8 REVISION HISTORY

Version	Date	Notes	Person
0.0	2/10/2026	Initial Draft	Mitchell Freund
1.0	2/12/2026	Revised Draft	Mitchell Freund

END OF REPORT