

Test Report

Prepared for: Trane Technologies

Model: TZM53040

Serial Number: NA
FCC ID: D87-TZM5304-U

Project No: p2460005
Test Results: Compliant

To

FCC Part 1.1310 / 2.1093
and
RSS-102: Issue 5 (March 2015)

Date of Issue: July 16, 2024

On the behalf of the applicant:

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Reviewed / Authorized By:



John Michalowicz, Test Engineer

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Test Report Revision History

Revision	Date	Revised By	Reason for Revision
1.0	July 16, 2024	John Michalowicz	Original Document
2.0	August 20, 2024	John Michalowicz	Updated 1 mW exemption reference

Current revision of the test report replaces any prior versions. Only the current version of the test report is valid.

EUT Description

Model Tested:	TZM53040
Serial:	NA
Firmware:	1.19
Software:	NA
Description:	900 MHz radio module
Additional Information:	The TZM5304 Modem is a fully integrated Z-Wave modem module consisting of a baseband controller, sub-1 GHz radio transceiver, crystal, decoupling, SAW filter, matching, and antenna. It is intended to provide a complete Z-Wave controller solution to an application executing in an external host microcontroller. Calculations in this report are based on measured values from the respective FCC 15.249 and RSS-210 Reports. Radio Frequency Range and Operational Info: 902-928MHz EUT is a module and operates off of 5vDC sourced from a evaluation board. Usage: Portable

MPE Evaluation (FCC)

This is a mobile device used in Uncontrolled Exposure environment.

Limits Controlled Exposure 47 CFR 1.1310 Table 1, (A)

0.3-3.0 MHz:	Limit [mW/cm ²] = 100
3.0-30 MHz:	Limit [mW/cm ²] = (900/f ²)
30-300 MHz:	Limit [mW/cm ²] = 1.0
300-1500 MHz:	Limit [mW/cm ²] = f/300
1500-100,000 MHz	Limit [mW/cm ²] = 5

Limits Uncontrolled Exposure 47 CFR 1.1310 Table 1, (B)

0.3-1.234 MHz:	Limit [mW/cm ²] = 100
1.34-30 MHz:	Limit [mW/cm ²] = (180/f ²)
30-300 MHz:	Limit [mW/cm ²] = 0.2
300-1500 MHz:	Limit [mW/cm ²] = f/1500
1500-100,000 MHz	Limit [mW/cm ²] = 1.0

Test Data

Test Frequency, MHz	902 - 928
Peak Power, Radiated, mW (P)	0.15
Antenna Type	Internal Omni
Distance (R)	0.5cm

The exemption limit for routine evaluation is set at 1 mW.as per KDB 447498 D04.
The EUT transmits at a level below 1 mW

MPE Evaluation (RSS 102) EIRP Calculations

Frequency (MHz)	Duty Cycle (%)	EIRP (dBm)	EIRP (mW)	Exemption Limit (mW)
902.24	100	-8.13	0.15	20

6.3 SAR exemption limits

Devices operating at or below the applicable output power levels (adjusted for tune-up tolerance) specified in table 11, based on the separation distance, are exempt from SAR evaluation. The separation distance, defined as the distance between the user and/or bystander and the antenna and/or radiating element of the device or the outer surface of the device, shall be less than or equal to 20 cm for these exemption limits to apply.

Table 11: Power limits for exemption from routine SAR evaluation based on the separation distance

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

The exemption limit for routine evaluation is set at 20 mW.
The EUT transmits at a level below 1 mW

The SAR measurement is not necessary.

RSS 102 Annex C has been submitted with this Technical Brief, which shows compliance to the RF Exposure Limits in RSS 102.

END OF TEST REPORT