

RF Exposure Evaluation Report

Report Reference No......: **MTEB24110305-H**

FCC ID.....: **2BKT2-SA-T7D**

Compiled by

(position+printed name+signature)..: File administrators Alisa Luo

Supervised by

(position+printed name+signature)..: Test Engineer Sunny Deng

Approved by

(position+printed name+signature)..: Manager Yvette Zhou

Date of issue.....: **Nov.28,2024**

Representative Laboratory Name.: **Shenzhen Most Technology Service Co., Ltd.**

Address.....: No.5, 2nd Langshan Road, North District, Hi-tech Industrial Park,
Nanshan, Shenzhen, Guangdong, China.

Applicant's name.....: **Sintron Distribution GmbH**

Address.....: Sudring 14, 76473 Iffezheim, Germany

Test specification/ Standard.....: **47 CFR Part 1.1307;47 CFR Part 1.1310**
KDB447498D01 General RF Exposure Guidance v06

TRF Originator.....: Shenzhen Most Technology Service Co., Ltd.

Shenzhen Most Technology Service Co., Ltd. All rights reserved.

This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen Most Technology Service Co., Ltd. is acknowledged as copyright owner and source of the material. Shenzhen Most Technology Service Co., Ltd. takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

Test item description.....: TUBE STEREO PREAMPLIFIER

Trade Mark.....: Vincent

Model/Type reference.....: SA-T7D

Listed Models: N/A

Modulation Type.....: GFSK, $\pi/4$ DQPSK, 8DPSK

Operation Frequency.....: From 2402MHz to 2480MHz

Hardware Version.....: V1.0

Software Version.....: V1.0

Rating.....: AC 120V/60Hz

Result.....: **PASS**

TEST REPORT

Equipment under Test : TUBE STEREO PREAMPLIFIER

Model /Type : SA-T7D

Listed Models : N/A

Remark : N/A

Applicant : Sintron Distribution GmbH

Address : Sudring 14, 76473 Iffezheim, Germany

Manufacturer : Zhongshan ShengYa audio electronics co., LTD

Address : Taohuasha industrial Zone, Minan Road, Xiaolan, Zhongshan, Guangdong, P.R.China.

Test Result:	PASS
---------------------	-------------

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

1. Revision History

Revision	Issue Date	Revisions	Revised By
00	2024.11.28	Initial Issue	Alisa Luo

2. SAR Evaluation

2.1 RF Exposure Compliance Requirement

2.1.1 Standard Requirement

According to KDB447498D01 General RF Exposure Guidance v06

4.3.1. Standalone SAR test exclusion considerations

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

2.1.2 Limits

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f ²)	6
30–300	61.4	0.163	1.0	6
300–1500 .....	.....	.....	f/300	6
1500–100,000 .....	.....	.....	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	30
30–300	27.5	0.073	0.2	30
300–1500 .....	.....	.....	f/1500	30
1500–100,000 .....	.....	.....	1.0	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * R^2)$ Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d is the limit of MPE, 1 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

2.1.3 EUT RF Exposure

BLE

GFSK			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2402 MHz)	-0.200	-0.200 ± 1	0.8
Middle(2440MHz)	-1.039	-1.039 ± 1	-0.039
Highest(2480MHz)	-2.087	-2.087 ± 1	-1.087

BLE

Worst case: GFSK						
Channel	Maximum tune-up Power (dBm)	Maximum tune-up Power (MW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
Lowest(2402 MHz)	0.8	1.20	5	0.00075	1.0	Pass

Note: 1) Refer to report MTEB24110301-R1 for EUT test Max Conducted average Output Power value.

Note: 2) $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2) = (1.20 \cdot 3.16) / (4 \cdot 3.1416 \cdot 20^2) = 0.00075$

BT classic

GFSK			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2402MHz)	-1.047	-1.047 ± 1	-0.047
Middle(2441MHz)	-1.665	-1.665 ± 1	-0.665
Highest(2480MHz)	-2.385	-2.385 ± 1	-1.385

$\pi/4$ DQPSK			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2402MHz)	-0.250	-0.250 ± 1	0.75
Middle(2441MHz)	-0.863	-0.863 ± 1	0.137
Highest(2480MHz)	-1.557	-1.557 ± 1	-0.557

8DPSK			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2402MHz)	0.128	0.128 ± 1	1.128
Middle(2441MHz)	-0.531	-0.531 ± 1	0.469
Highest(2480MHz)	-1.267	-1.267 ± 1	-0.267

Worst case: 8DPSK						
Channel	Maximum tune-up Power (dBm)	Maximum tune-up Power (MW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
Lowest(2402MHz)	1.128	1.30	5	0.00082	1.0	Pass

Note: 1) Refer to report MTEB24110301-R for EUT test Max Conducted average Output Power value.

Note: 2) $P_d = (P_{out} * G) / (4 * \pi * R^2) = (1.30 * 3.16) / (4 * 3.1416 * 20^2) = 0.00082$

Note: 3) EUT's Bluetooth module is more than 20cm away from the human body.

.....**THE END OF REPORT**.....