

## RF Exposure Evaluation Report

**Report Reference No.**..... : **MTWG2206097-H**

**FCC ID**..... : **2A3AI-MAX1**

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

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Nanshan, Shenzhen, Guangdong, China.

**Applicant's name**.....: **New Wanaka Limited**

Address.....: FLAT/RM 803 8/F, EASEY COMMERCIAL BUILDING  
253-261 HENNESSY ROAD, WAN CHAI HONG KONG

**Test specification/ Standard**.....: **47 CFR Part 1.1307**

**47 CFR Part 2.1093**

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

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**Test item description**.....: smart piano

Trade Mark.....: The ONE

Model/Type reference.....: MAX1

Listed Models .....: N/A

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

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

Rating.....: Input: 100-240V~50Hz/60Hz 1.5A MAX

Output: 15V= 2.5A 37.5W

Hardware version.....: TOP3\_MB\_V01

Software version .....: V1.0.1

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

**TEST REPORT**

Equipment under Test : smart piano

Model /Type : MAX1

Listed Models : N/A

Remark : N/A

**Applicant** : **New Wanaka Limited**

Address : FLAT/RM 803 8/F, EASEY COMMERCIAL BUILDING  
253-261 HENNESSY ROAD, WAN CHAI HONG KONG

**Manufacturer** : **Medeli Musical Instrument (Zhuhai) Co.,Ltd.**

Address : Medeli Industrial Park,2 Shuang Lin East Road,Dalinshan  
Area,Liangang Industrial Zone,Jinwan District,Zhuhai,China.

<b>Test Result:</b>	<b>PASS</b>
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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	2022.06.30	Initial Issue	Alisa Luo

## 2. SAR Evaluation

### 2.1 RF Exposure Compliance Requirement

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 <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposures</b>				
0.3–3.0 .....	614	1.63	*(100)	6
3.0–30 .....	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30–300 .....	61.4	0.163	1.0	6
300–1500 .....	.....	.....	f/300	6
1500–100,000 .....	.....	.....	5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3–1.34 .....	614	1.63	*(100)	30
1.34–30 .....	824/f	2.19/f	*(180/f <sup>2</sup> )	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/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

G = gain of antenna in linear scale

$\pi$  = 3.1416

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

$P_d$  is the limit of MPE, 1 mW/cm<sup>2</sup>. 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**

Measurement Data

BLE

GFSK				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	-4.599	$-4.599 \pm 1$	-3.599	0.44
Middle(2440MHz)	-4.352	$-4.352 \pm 1$	-3.352	0.46
Highest(2480MHz)	-4.531	$-4.531 \pm 1$	-3.531	0.44

Worst case: GFSK						
Channel	Maximum Peak Conducted Output Power (dBm)	Maximum Peak Conducted Output Power (MW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit	Result
Highest(2462 MHz)	-3.352	0.46	2.5	0.0001	1.0	Pass

Note: 1) Refer to report **MTWG2206097-R2** for EUT test Max Conducted average Output Power value.

Note: 2)  $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2) = (0.46 \cdot 1.78) / (4 \cdot 3.1416 \cdot 20^2) = 0.0001$

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

## Measurement Data

## BT classic

GFSK			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2402MHz)	-4.087	$-4.087 \pm 1$	-3.087
Middle(2441MHz)	-4.139	$-4.139 \pm 1$	-3.139
Highest(2480MHz)	-3.365	$-3.365 \pm 1$	-2.365

$\pi/4$ DQPSK			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2402MHz)	-1.823	$-1.823 \pm 1$	-0.823
Middle(2441MHz)	-1.685	$-1.685 \pm 1$	-0.685
Highest(2480MHz)	0.633	$0.633 \pm 1$	1.633

8DPSK			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2402MHz)	-1.339	$-1.339 \pm 1$	0.339
Middle(2441MHz)	-1.079	$-1.079 \pm 1$	-0.079
Highest(2480MHz)	-0.302	$-0.302 \pm 1$	0.698

Worst case: $\pi/4$ DQPSK						
Channel	Maximum Peak Conducted Output Power (dBm)	Maximum Peak Conducted Output Power (MW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit	Result
Highest(2462 MHz)	1.633	1.46	1	0.0004	1.0	Pass

Note: 1) Refer to report **MTWG2206097-R1** for EUT test Max Conducted average Output Power value.

Note: 2)  $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2) = (1.46 \cdot 1.25) / (4 \cdot 3.1416 \cdot 20^2) = 0.0004$

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

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