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RF Exposure evaluation

Report Reference No. : CTL2512298017-WFH

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Product Name : Wi-Fi and Bluetooth wireless remote control device

Model/Type reference : miniDSP KD-1

List Model(s)..... : N/A

Trade Mark..... : miniDSP

FCC ID..... : 2APQC-KD1

Applicant's name : miniDSP Ltd

Address of applicant : Unit 307, Kingsford Industrial Centre, 13 Wang Hoi Road,
Kowloon Bay, Kowloon, Hong Kong

Test specification..... :

47CFR §1.1310

Standard : 47CFR §2.1091

KDB447498 D01 General RF Exposure Guidance v06

TRF Originator : Shenzhen CTL Testing Technology Co., Ltd.

Master TRF..... : Dated 2017-01

Date of receipt of test item : Sep 25, 2025

Date of Test : Jan 06, 2026-Apr 08, 2026

Date of Issue : Apr 08, 2026

Result..... : Pass

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TEST REPORT

Test Report No. :	CTL2512298017-WFH	Apr 08, 2026
		Date of issue

Product Name : Wi-Fi and Bluetooth wireless remote control device

Sample No : CTL250908204002, CTL250908204003, CTL250908204004

Model /Type : miniDSP KD-1

Listed Models : N/A

Applicant : **miniDSP Ltd**

Address : Unit 307, Kingsford Industrial Centre, 13 Wang Hoi Road,
Kowloon Bay, Kowloon, Hong Kong

Manufacturer : **miniDSP Ltd**

Address : Unit 307, Kingsford Industrial Centre, 13 Wang Hoi Road,
Kowloon Bay, Kowloon, Hong Kong

The test results presented in this report relate only to the object tested.

This report shall not be reproduced, except in full, without the written approval of the issuing testing laboratory.

** Modified History **

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Contents

- 1 GENERAL INFORMATION5
 - 1.1 ENVIRONMENTAL CONDITIONS5
 - 1.2 PRODUCT DESCRIPTION5
 - 1.3 TEST FACILITY6
 - 1.4 STATEMENT OF THE MEASUREMENT UNCERTAINTY6
- 2 METHOD OF MEASUREMENT8
 - 2.1 APPLICABLE STANDARD8
 - 2.2 EVALUATION METHOD AND LIMIT8
- 3 CONDUCTED POWER RESULTS10
- 4 MANUFACTURING TOLERANCE11
- 5 EVALUATION RESULTS.....12
 - 5.1 STANDALONE EVALUATION12
- 6 CONCLUSION12

1 GENERAL INFORMATION

1.1 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	18-28°C
Relative Humidity:	30-60%
Air Pressure:	965-1030hPa

1.2 Product Description

Product Name:	Wi-Fi and Bluetooth wireless remote control device
Model/Type reference:	miniDSP KD-1
Power supply:	DC 5V from AC-DC adapter
Test Voltage:	DC 5V from AC-DC adapter
Bluetooth Low Energy	
Supported type:	Bluetooth Low Energy
Modulation:	GFSK
Operation frequency:	2402MHz~2480MHz
Channel number:	40
Channel separation:	2MHz
Antenna type:	PCB antenna
Antenna gain:	3.26 dBi provided by ☒ Applicant ☐ Manufacturer
Wi-Fi 2.4GHz	
Supported type:	IEEE 802.11 b/g/n
Modulation:	IEEE 802.11 b: DSSS IEEE 802.11 g/IEEE 802.11 n(HT20)/IEEE 802.11 n(HT40): OFDM
Operation frequency:	IEEE 802.11 b/IEEE 802.11 g/IEEE 802.11 n(HT20): 2412MHz~2462MHz IEEE 802.11 n(HT40): 2422MHz~2452MHz
Channel number:	IEEE 802.11 b/IEEE 802.11 g/IEEE 802.11 n(HT20): 11 IEEE 802.11 n(HT40): 7
Channel separation:	5MHz
MIMO:	Not Support
Antenna type:	PCB antenna
Antenna gain:	3.26 dBi provided by ☒ Applicant ☐ Manufacturer

Note 1: For more details, refer to the user's manual of the EUT.

Note 2: Antenna gain and cable loss provided by the applicant.

1.3 Test Facility

Company Name:	Shenzhen CTL Testing Technology Co., Ltd.
Address 1:	Zone A.1/F..Warehouse 2.Baisha Technology Park, No.3011,Shahexi Road, Nanshan District,Shenzhen.518055,P.R.C.
Address 2:	Fl.A1, Bldg.A3, No.2533 GuanGuang Road, Fenghuang Community Fenghuang Street, Guangming District, Shenzhen, Guangdong, PR.C

1.3.2 Test location

All tests were performed at:

Company Name:	Shenzhen CTL Testing Technology Co., Ltd.
☐ Main location	Zone A.1/F..Warehouse 2.Baisha Technology Park, No.3011,Shahexi Road, Nanshan District,Shenzhen.518055,P.R.C.
☒ Satellite location	Fl.A1, Bldg.A3, No.2533 GuanGuang Road, Fenghuang Community Fenghuang Street, Guangming District, Shenzhen, Guangdong, PR.C

1.3.3 Laboratory accreditation

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L7497

Shenzhen CTL Testing Technology Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No. 4343.01

Shenzhen CTL Testing Technology Co., Ltd, EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

IC CAB identifier: CN0041

Main Company Number :9618B

Satellite Company Number:35187

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements with Main Company Number:9618B and Satellite Company Number:35187.

FCC-Registration No.: 399832

Designation No.: CN1216

Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation No.: CN1216. Test Firm Registration 399832.

1.4 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16-4 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen CTL Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CTL laboratory is reported:

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	± 1.18 dB	(1)

Note 1: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

2 METHOD OF MEASUREMENT

2.1 Applicable Standard

[ANSI C95.1-2019](#): IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

[FCC KDB447498 D01 General RF Exposure Guidance v06](#): Mobile and Portable Device, RF Exposure, Equipment Authorization Procedures.

[FCC CFR 47 part1 1.1310](#): Radiofrequency radiation exposure limits.

[FCC CFR 47 part2 2.1091](#): Radiofrequency radiation exposure evaluation: mobile devices

2.2 Evaluation Method and Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
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

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	30
3.0 – 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

*=Plane-wave equivalent power density

Predication of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S=PG/4\pi R^2$$

Where: S=power density

P=power input to antenna

G=power gain of the antenna in the direction of interest relative to an isotropic radiator

R=distance to the center of radiation of the antenna

Systems operating under the provisions of FCC 47 CFR section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.

In accordance with KDB447498D01 for Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modelled or measured field strengths or power density, is ≤ 1.0 . The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to MPE limit, at the test frequency. Either the maximum peak or spatially averaged results from measurements or numerical simulations may be used to determine the MPE ratios. Spatial averaging does not apply when MPE is estimated using simple calculations based on far-field plane-wave equivalent conditions. The antenna installation and operating requirements for the host device must meet the minimum test separation distances required by all antennas, in both standalone and simultaneous transmission operations, to satisfy compliance.

3 Conducted Power Results

Bluetooth Low Energy

Mode	Frequency (MHz)	Peak Conducted Output Power (dBm)
1M	2402	-2.63
	2440	-0.58
	2480	-2.87
2M	2402	-2.42
	2440	-0.54
	2480	-2.66

2.4G Wi-Fi

Mode	Frequency (MHz)	Peak Conducted Output Power (dBm)
802.11b	2412	13.73
	2437	15.37
	2462	15.09
802.11g	2412	15.05
	2437	16.43
	2462	15.95
802.11n (HT20)	2412	14.56
	2437	15.99
	2462	15.51
802.11n (HT40)	2422	15.31
	2437	16.33
	2452	15.13

4 Manufacturing Tolerance

Note: Tolerance $\pm$ (dB):1.0

Bluetooth Low Energy

Mode	Frequency (MHz)	Target (dBm)
1M	2402	-2
	2440	0
	2480	-2
2M	2402	-1
	2440	0
	2480	-2

2.4G Wi-Fi

Mode	Frequency (MHz)	Target (dBm)
802.11b	2412	15
	2437	16
	2462	16
802.11g	2412	16
	2437	17
	2462	17
802.11n (HT20)	2412	16
	2437	17
	2462	17
802.11n (HT40)	2422	16
	2437	17
	2452	16

5 Evaluation Results

5.1 Standalone Evaluation

Bluetooth Low Energy

Mode	f (GHz)	Antenna Distance (cm)	RF output power		G (Num.)	MPE	MPE Limit
			dBm	mW			
1M	2.402	20	-2	0.63	2.1184	0.0003	1.0000
	2.440	20	0	1.00	2.1184	0.0004	1.0000
	2.480	20	-2	0.63	2.1184	0.0003	1.0000
2M	2.402	20	-1	0.79	2.1184	0.0003	1.0000
	2.440	20	0	1.00	2.1184	0.0004	1.0000
	2.480	20	-2	0.63	2.1184	0.0003	1.0000

2.4G Wi-Fi

Mode	f (GHz)	Antenna Distance (cm)	RF output power		G (Num.)	MPE	MPE Limit
			dBm	mW			
802.11b	2412	20	15	31.62	2.1184	0.0133	1.0000
	2437	20	16	39.81	2.1184	0.0168	1.0000
	2462	20	16	39.81	2.1184	0.0168	1.0000
802.11g	2412	20	16	39.81	2.1184	0.0168	1.0000
	2437	20	17	50.12	2.1184	0.0211	1.0000
	2462	20	17	50.12	2.1184	0.0211	1.0000
802.11n (HT20)	2412	20	16	39.81	2.1184	0.0168	1.0000
	2437	20	17	50.12	2.1184	0.0211	1.0000
	2462	20	17	50.12	2.1184	0.0211	1.0000
802.11n (HT40)	2422	20	16	39.81	2.1184	0.0168	1.0000
	2437	20	17	50.12	2.1184	0.0211	1.0000
	2452	20	16	39.81	2.1184	0.0168	1.0000

Remark:

1. Output power including tune up tolerance;
2. When the minimum test separation distance is $\geq 20\text{cm}$, In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091

6 Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure and SAR Exclusion Threshold per KDB447498 D01 General RF Exposure Guidance v06, No SAR is required.

*****THE END*****