

Test Report

Report No. : MTi250722013-0201E1
Date of issue : 2025-09-26
Applicant : Shenzhen Haochangsheng Network Technology Co., Ltd
Product : Wireless keyboard
Model(s) : KB528
FCC ID : 2BQNZ-KB528

Shenzhen Microtest Co., Ltd.

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Test Result Certification		
Applicant	Shenzhen Haochangsheng Network Technology Co., Ltd	
Applicant Address	Room 802, No. 89, Hekan Village, Wuhe Community, Bantian Street, Longgang District, Shenzhen City	
Manufacturer	Dongguan Mingjian Mold Co., Ltd	
Manufacturer Address	No. 11 Fengping Road, Dongguan City, Guangdong Province	
Factory	Dongguan Mingjian Mold Co., Ltd	
Factory Address	No. 11 Fengping Road, Dongguan City, Guangdong Province	
Product description		
Product name	Wireless keyboard	
Trademark	N/A	
Model name	KB528	
Series Model(s)	N/A	
Standards	47 CFR Part 15.249	
Test Method	ANSI C63.10-2020	
Testing Information		
Date of test	2025-08-20 to 2025-09-23	
Test result	Pass	
Prepared by:	Yanice Xie	<i>Yanice Xie</i>
Reviewed by:	David Lee	<i>David. Lee</i>
Approved by:	Lewis Lian	<i>Lewis Lian</i>

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1 General Description

1.1 Description of the EUT

Product name:	Wireless keyboard
Model name:	KB528
Series Model(s):	N/A
Model difference:	N/A
Electrical rating:	Input: DC 5V Battery: DC 3.7V 4000mAh
Accessories:	N/A
Test sample(s) number:	MTi250722013-02-R001
RF specification	
Operating frequency range:	2403.75—2479.75MHz
Channel number:	16
Modulation type:	GFSK
Antenna type:	PCB Antenna
Antenna gain:	2.03dBi

1.2 Description of test modes

No.	Emission test modes
Mode1	TX

1.2.1 Operation channel list

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2403.75	5	2407.75	9	2414.75	13	2419.75
2	2426.75	6	2422.75	10	2436.75	14	2439.75
3	2441.75	7	2445.75	11	2459.75	15	2453.75
4	2463.75	8	2466.75	12	2473.75	16	2479.75

Test Channel List

Operation Band: 2.4G

Lowest Channel (LCH) (MHz)	Middle Channel (MCH) (MHz)	Highest Channel (HCH) (MHz)
2403.75	2441.75	2479.75

Note: The test software provided by manufacturer is used to control EUT for working in engineering mode, that enables selectable channel, and capable of continuous transmitting mode.

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Test Software:

For power setting, refer to below table.

Mode	2403.75 MHz	2441.75 MHz	2479.75 MHz
GFSK	default	default	default

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1.3 Environmental Conditions

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

Temperature:	15°C ~ 35°C
Humidity:	20% RH ~ 75% RH
Atmospheric pressure:	98 kPa ~ 101 kPa

1.4 Description of support units

Support equipment list			
Description	Model	Serial No.	Manufacturer
USB-A HUAWEI CHARGE (10W)	HW-050200C02	K95212KA103561	HUAWEI
Support cable list			
Description	Length (m)	From	To
/	/	/	/

1.5 Measurement uncertainty

Measurement	Uncertainty
Occupied channel bandwidth	±3 %
Radiated spurious emissions (above 1GHz)	±5.3dB
Radiated spurious emissions (9kHz~30MHz)	±4.3dB
Radiated spurious emissions (30MHz~1GHz)	±4.7dB
Temperature	±1 °C
Humidity	± 5 %

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

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2 Summary of Test Result

No.	Item	Standard	Requirement	Result
1	Antenna requirement	47 CFR Part 15.249	47 CFR Part 15.203	Pass
2	Conducted Emission at AC power line	47 CFR Part 15.249	47 CFR 15.207(a)	Pass
3	Occupied Bandwidth	47 CFR Part 15.249	47 CFR 15.215(c)	Pass
4	Field strength of fundamental	47 CFR Part 15.249	47 CFR 15.249(a) 47 CFR 15.249(b)(1)	Pass
5	Band edge emissions (Radiated)	47 CFR Part 15.249	47 CFR 15.249(d)	Pass
6	Emissions in frequency bands (below 1GHz)	47 CFR Part 15.249	47 CFR 15.249(a) 47 CFR 15.249(d) 47 CFR 15.249(e)	Pass
7	Emissions in frequency bands (above 1GHz)	47 CFR Part 15.249	47 CFR 15.249(a) 47 CFR 15.249(d) 47 CFR 15.249(e)	Pass

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3 Test Facilities and accreditations

3.1 Test laboratory

Test laboratory:	Shenzhen Microtest Co., Ltd.
Test site location:	101, No.7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Telephone:	(86-755)88850135
Fax:	(86-755)88850136
CNAS Registration No.:	CNAS L5868
FCC Registration No.:	448573
IC Registration No.:	21760
CABID:	CN0093

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4 List of test equipment

No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due
Occupied Bandwidth						
1	Wideband Radio Communication Tester	Rohde&schwarz	CMW500	149155	2025-03-18	2026-03-17
2	ESG Series Analog Ssignal Generator	Agilent	E4421B	GB40051240	2025-03-14	2026-03-13
3	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2025-03-14	2026-03-13
4	Synthesized Sweeper	Agilent	83752A	3610A01957	2025-03-14	2026-03-13
5	MXA Signal Analyzer	Agilent	N9020A	MY50143483	2025-03-14	2026-03-13
6	RF Control Unit	Tonscend	JS0806-1	19D8060152	2025-03-18	2026-03-17
7	Band Reject Filter Group	Tonscend	JS0806-F	19D8060160	2025-03-14	2026-03-13
8	ESG Vector Signal Generator	Agilent	N5182A	MY50143762	2025-03-14	2026-03-13
9	DC Power Supply	Agilent	E3632A	MY40027695	2025-03-18	2026-03-17
Field strength of fundamental Band edge emissions (Radiated) Emissions in frequency bands (above 1GHz)						
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2025-03-14	2026-03-13
2	Double Ridged Broadband Horn Antenna	schwarabeck	BBHA 9120 D	2278	2025-05-27	2027-05-26
3	Amplifier	Agilent	8449B	3008A01120	2025-03-18	2026-03-17
4	MXA signal analyzer	Agilent	N9020A	MY54440859	2025-03-14	2026-03-13
5	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2025-03-14	2026-03-13
6	Horn antenna	Schwarzbeck	BBHA 9170	00987	2025-05-27	2027-05-26
7	Pre-amplifier	Space-Dtronics	EWLAN1840 G	210405001	2025-03-19	2026-03-18
Emissions in frequency bands (below 1GHz)						
1	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2025-03-14	2026-03-13
2	TRILOG Broadband Antenna	schwarabeck	VULB 9163	9163-1338	2025-05-23	2027-05-22
3	Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00066	2024-03-23	2026-03-22
4	Amplifier	Hewlett-Packard	8447F	3113A06184	2025-03-18	2026-03-17
Conducted emissions (AC power port)						
1	EMI Test Receiver	Rohde&schwarz	ESCI3	101368	2025-03-14	2026-03-13
2	Artificial mains network	Schwarzbeck	NSLK 8127	183	2025-03-18	2026-03-17

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No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due
3	Artificial Mains Network	Rohde & Schwarz	ESH2-Z5	100263	2025-03-18	2026-03-17

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5 Evaluation Results (Evaluation)

5.1 Antenna requirement

Test Requirement:	Refer to 47 CFR Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.
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5.1.1 Conclusion:

The antenna of the EUT is permanently attached.
The EUT complies with the requirement of FCC PART 15.203.

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6 Radio Spectrum Matter Test Results (RF)

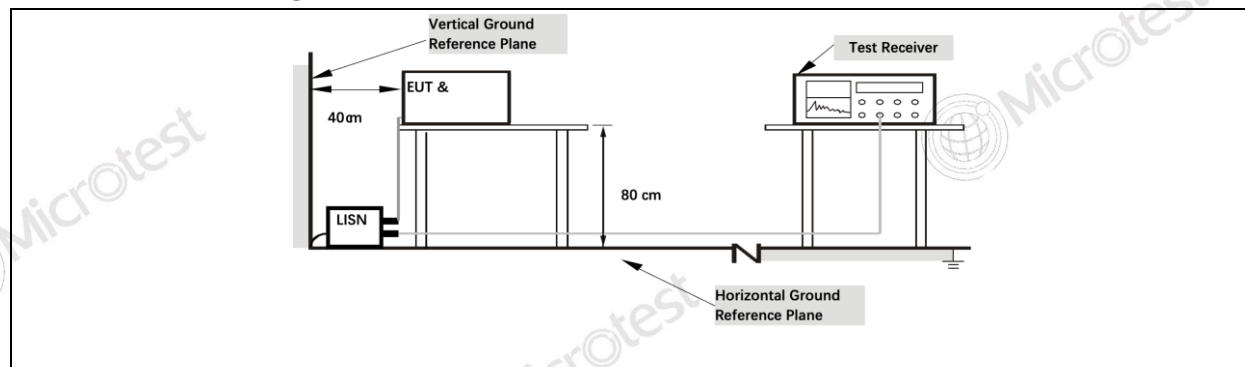
6.1 Conducted Emission at AC power line

Test Requirement:	Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN).		
Test Limit:	Frequency of emission (MHz)	Conducted limit (dB μ V)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
	*Decreases with the logarithm of the frequency.		
Test Method:	ANSI C63.10-2020 section 6.2		
Procedure:	Refer to ANSI C63.10-2020 section 6.2, standard test method for ac power-line conducted emissions from unlicensed wireless devices		

6.1.1 E.U.T. Operation:

Operating Environment:					
Temperature:	26 °C	Humidity:	69 %	Atmospheric Pressure:	100 kPa
Pre test mode:	Mode1				
Final test mode:	Mode1				

6.1.2 Test Setup Diagram:

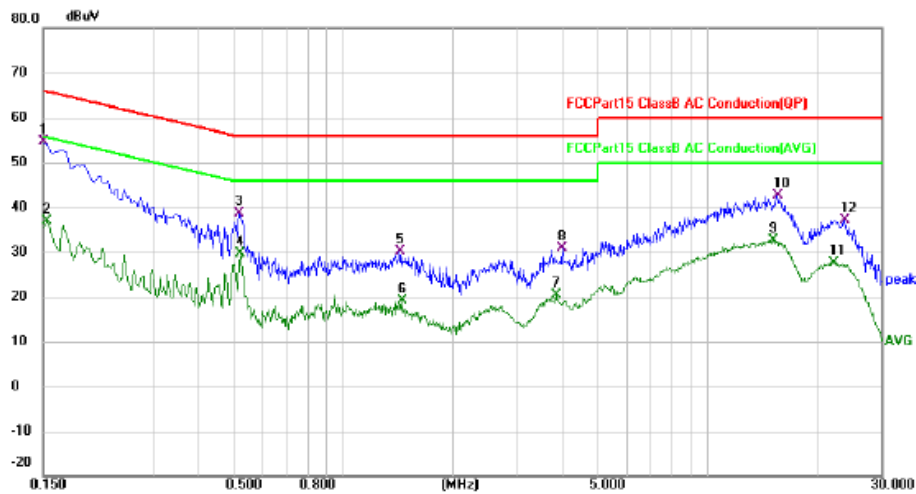


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6.1.3 Test Data:

Mode1 / Line: Line / CH: L

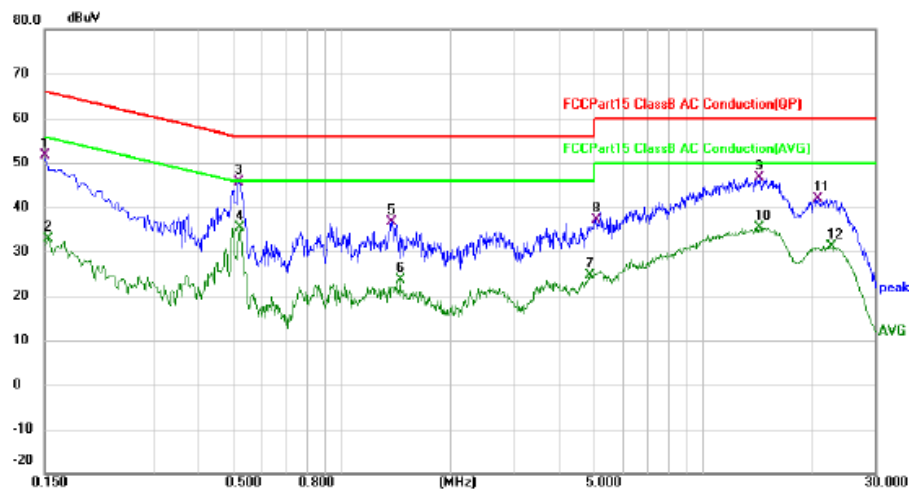


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1500	44.33	10.23	54.56	66.00	-11.44	QP	
2		0.1539	26.62	10.23	36.85	55.79	-18.94	AVG	
3		0.5180	28.53	10.22	38.75	56.00	-17.25	QP	
4		0.5220	19.36	10.22	29.58	46.00	-16.42	AVG	
5		1.4260	19.96	10.25	30.21	56.00	-25.79	QP	
6		1.4540	8.92	10.25	19.17	46.00	-26.83	AVG	
7		3.8580	9.92	10.35	20.27	46.00	-25.73	AVG	
8		3.9860	20.42	10.36	30.78	56.00	-25.22	QP	
9		15.1859	21.96	10.72	32.68	50.00	-17.32	AVG	
10		15.5339	31.79	10.73	42.52	60.00	-17.48	QP	
11		22.2099	16.89	10.86	27.75	50.00	-22.25	AVG	
12		23.6420	26.28	10.89	37.17	60.00	-22.83	QP	

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Mode1 / Line: Neutral / CH: L



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	Level	Factor	ment			Detector	Comment
			dBuV	dB	dBuV	dBuV	dB		
1		0.1500	41.50	10.17	51.67	66.00	-14.33	QP	
2		0.1539	22.75	10.17	32.92	55.79	-22.87	AVG	
3	*	0.5180	35.38	10.17	45.55	56.00	-10.45	QP	
4		0.5220	25.16	10.17	35.33	46.00	-10.67	AVG	
5		1.3740	26.40	10.19	36.59	56.00	-19.41	QP	
6		1.4540	13.32	10.20	23.52	46.00	-22.48	AVG	
7		4.8859	14.33	10.31	24.64	46.00	-21.36	AVG	
8		5.0380	26.85	10.31	37.16	60.00	-22.84	QP	
9		14.2900	36.03	10.52	46.55	60.00	-13.45	QP	
10		14.2900	24.75	10.52	35.27	50.00	-14.73	AVG	
11		20.8380	31.25	10.67	41.92	60.00	-18.08	QP	
12		22.6420	20.42	10.70	31.12	50.00	-18.88	AVG	

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6.2 Occupied Bandwidth

Test Requirement:	47 CFR 15.215(c)
Test Limit:	Refer to 47 CFR 15.215(c), intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.
Test Method:	ANSI C63.10-2020, section 6.9.2
Procedure:	a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the EMI receiver or spectrum analyzer shall be between two times and five times the OBW. b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW, unless otherwise specified by the applicable requirement. c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than $[10 \log (\text{OBW/RBW})]$ below the reference level. Specific guidance is given in 4.1.5.2. d) Steps a) through c) might require iteration to adjust within the specified tolerances. e) The dynamic range of the instrument at the selected RBW shall be more than 10 dB below the target “-xx dB down” requirement; that is, if the requirement calls for measuring the -20 dB OBW, the instrument noise floor at the selected RBW shall be at least 30 dB below the reference value. f) Set detection mode to peak and trace mode to max hold. g) Determine the reference value: Set the EUT to transmit an unmodulated carrier or modulated signal, as applicable. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value). h) Determine the “-xx dB down amplitude” using $[(\text{reference value}) - \text{xx}]$. Alternatively, this calculation may be made by using the marker-delta function of the instrument. i) If the reference value is determined by an unmodulated carrier, then turn the EUT modulation ON, and either clear the existing trace or start a new trace on the spectrum analyzer and allow the new trace to stabilize. Otherwise, the trace from step g) shall be used for step j). j) Place two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the “-xx dB down amplitude” determined in step h). If a marker is below this “-xx dB down amplitude” value, then it shall be as close as possible to this value. The occupied bandwidth is the frequency difference between the two markers. Alternatively, set a marker at the lowest frequency of the envelope of the spectral display, such that the marker is at or slightly below the “-xx dB down amplitude” determined in step h). Reset the marker-delta function and move the marker to the other side of the emission until the delta marker amplitude is at the same level as the reference marker amplitude. The marker-delta frequency reading at this point is the specified emission bandwidth.

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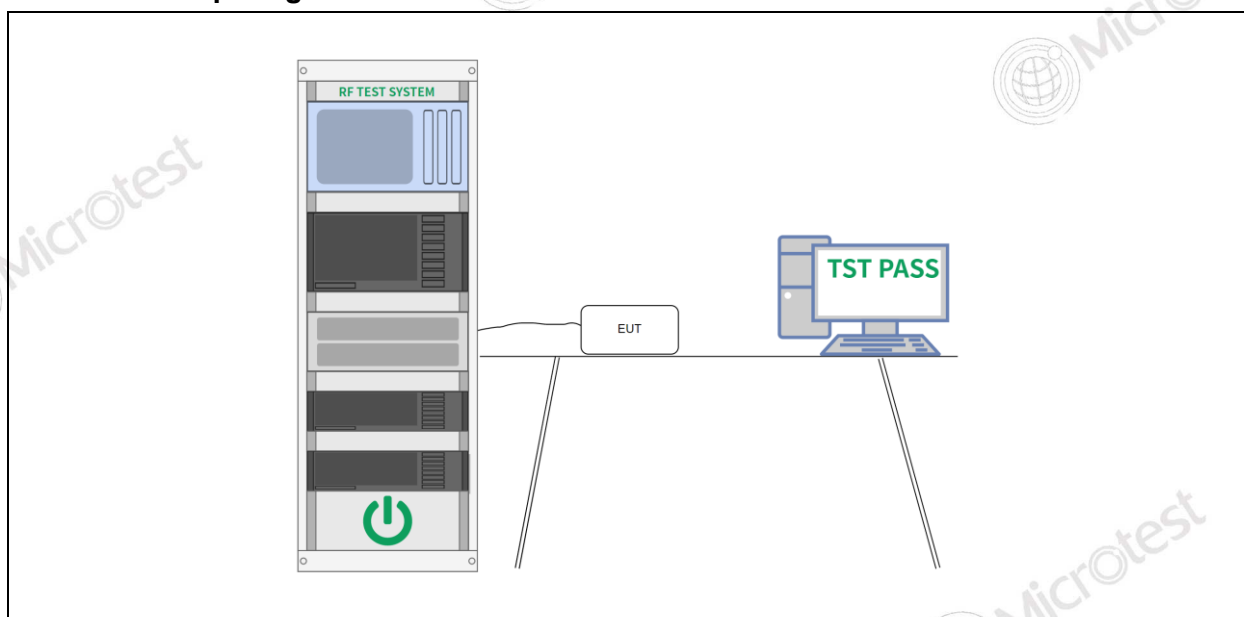
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	k) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).
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6.2.1 E.U.T. Operation:

Operating Environment:					
Temperature:	25.3 °C	Humidity:	45.1 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1				
Final test mode:	Mode1				

6.2.2 Test Setup Diagram:



6.2.3 Test Data:

Test Result

Test Mode	Antenna	Frequency [MHz]	OBW [MHz]	20db BW
GFSK	Ant1	2403.75	2.0850	2.043
		2441.75	2.0898	2.040
		2479.75	2.1187	2.102