Test Report

Report No.:	MTi220901015-07E2
Date of issue:	2022-10-27
Applicant:	Shenzhen DZH Industrial Co., Ltd
Product:	Dual mode wireless keyboard
Model(s):	B087
FCC ID:	2AFW2-B087

Shenzhen Microtest Co., Ltd.
http://www.mtitest.com

Address: 101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China.
Tel: (86-755)88850135 Fax: (86-755) 88850136 Web: www.mtitest.com E-mail: mti@51mti.com

Instructions

1. The report shall not be partially reproduced without the written consent of the laboratory;
2. The test results of this report are only responsible for the samples submitted;
3. This report is invalid without the seal and signature of the laboratory;
4. This report is invalid if transferred, altered or tampered with in any form without authorization;
5. Any objection to this report shall be submitted to the laboratory within 15 days from the date of receipt of the report.

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TEST RESULT CERTIFICATION	
Applicant's name	Shenzhen DZH Industrial Co., Ltd
Address	3th Floor, YiTuo Mike Industrial A building, Bu Yong Industrial D zone, ShaJing, Shenzhen, China
Manufacturer's Name	Shenzhen DZH Industrial Co., Ltd
Address	3th Floor, YiTuo Mike Industrial A building, Bu Yong Industrial D zone, ShaJing, Shenzhen, China
Product description	
Product name	Dual mode wireless keyboard
Trademark	N/A
Model Name	B087
Series Model	N/A
Standards	FCC Part 15.249
Test procedure	ANSI C63.10-2013
Date of Test	
Date (s) of performance of tests ..... :	2022-10-08 ~ 2022-10-27
Test Result ..... :	Pass
This device described above has been tested by Shenzhen Microtest Co., Ltd. and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.	

Testing Engineer : Yanice Xie

(Yanice Xie)

Technical Manager : Leon Chen

(Leon Chen)

Authorized Signatory : Tom Xue

(Tom Xue)

1 General description

1.1 Feature of equipment under test (EUT)

Equipment:	Dual mode wireless keyboard
Model Name:	B087
Serial Model:	N/A
Model Difference:	N/A
Operation Frequency:	2402 - 2480 MHz
Modulation Type:	GFSK
Antenna Type:	PCB antenna
Antenna Gain:	0 dBi
Max. Field Strength:	86.81dBuV/m
Power Source:	Input: DC 5V/1A
Battery:	DC 3.7V 180mAh 0.666Wh
Hardware version:	V1.2
Software version:	V1.0

1.2 Operation channel list

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461	-	-

1.3 Test Frequency Channel

Channel	Frequency(MHz)
Low	2402
Middle	2441
High	2480

1.4 EUT operation mode

During testing, RF test program provided by the manufacture to control the Tx operation followed the test requirement.

1.5 Ancillary equipment list

Equipment	Model	S/N	Manufacturer
Adapter	HW-090200CH0	/	Huizhou BYD Electronics Co., Ltd.
Laptop	E485	/	Lenovo

2 Summary of Test Result

Test procedures according to the technical standards:

Item	FCC Part No.	Description of Test	Result
1	FCC Part15.203	Antenna Requirement	Pass
2	FCC Part15.207	AC power line conducted emission	Pass
5	FCC Part15.249(d)	Radiated spurious emission	Pass
4	FCC Part 15.215	20dB and 99% Bandwidth	Pass

3 Test Facilities and Accreditations

3.1 Test laboratory

Test Laboratory	Shenzhen Microtest Co., Ltd
Location	101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China.
FCC Registration No.	448573

3.2 Environmental conditions

Temperature:	15ºC~35ºC
Humidity	20%~75%
Atmospheric pressure	98kPa~101kPa

3.3 Measurement uncertainty

The reported uncertainty of measurement y ± U，where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2，providing a level of confidence of approximately 95 %

RF frequency	1 x 10-7
RF power, conducted	± 1 dB
Conducted emission(150kHz~30MHz)	± 2.5 dB
Radiated emission (9 kHz ~ 30 MHz)	±4.0 dB
Radiated emission(30MHz~1GHz)	± 4.2 dB
Radiated emission (above 1GHz)	± 4.3 dB
Temperature	±1 degree
Humidity	± 5 %

3.4 Test software

Software Name	Manufacturer	Model	Version
Bluetooth and WiFi Test System	Shenzhen JS tonscend co,.ltd	JS1120-3	2.5.77.0418

4 List of test equipment

Equipment No.	Equipment Name	Manufacturer	Model	Serial No.	Calibration date	Due date
MTI-E043	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2022/05/05	2023/05/04
MTI-E044	TRILOG Broadband Antenna	schwarabeck	VULB 9163	9163-1338	2021/05/30	2023/05/29
MTI-E047	Amplifier	Hewlett-Packard	8447F	3113A06150	2022/05/05	2023/05/04
MTI-E089	ESG Vector Signal Generator	Agilent	N5182A	MY49060455	2022/05/05	2023/05/04
MTI-E058	ESG Series Analog Ssignal Generator	Agilent	E4421B	GB40051240	2022/05/05	2023/05/04
MTI-E062	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2022/05/05	2023/05/04
MTI-E066	MXA Signal Analyzer	Agilent	N9020A	MY50143483	2022/05/05	2023/05/04
MTI-E078	Synthesized Sweeper	Agilent	83752A	3610A01957	2022/05/05	2023/05/04
MTI-E079	DC Power Supply	Agilent	E3632A	MY40027695	2022/05/05	2023/05/04
MTI-E045	Double Ridged Broadband Horn Antenna	schwarabeck	BBHA 9120D	9120D-2278	2021/05/30	2023/05/29
MTI-E021	EMI Test Receiver	Rohde&schwarz	ESCS30	100210	2022/05/05	2023/05/04
MTI-E022	Pulse Limiter	Schwarzbeck	VSTD 9561-F	00679	2022/05/05	2023/05/04
MTI-E023	Artificial mains network	Schwarzbeck	NSLK 8127	NSLK 8127 #841	2022/05/05	2023/05/04
MTI-E046	Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00044	2021/05/30	2023/05/29
MTI-E048	Amplifier	Agilent	8449B	3008A02400	2022/05/05	2023/05/04
MTI-E072	Thermometer Clock Humidity Monitor	-	HTC-1	/	2022/05/05	2023/05/04
Note: the calibration interval of the above test instruments is 12 or 24 months and the calibrations are traceable to international system unit (SI).						

5 Test Result

5.1 Antenna requirement

5.1.1 Standard requirement

FCC 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. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

This requirement does not apply to carrier current devices or to devices operated under the provisions of §§15.211, 15.213, 15.217, 15.219, 15.221, or §15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

5.1.2 EUT Antenna

The antenna is a PCB antenna, which was permanently affixed to the device and un-replaced, complies with 15.203. In addition, the maximum antenna gain is 0 dBi.

5.2 AC power line conducted emission

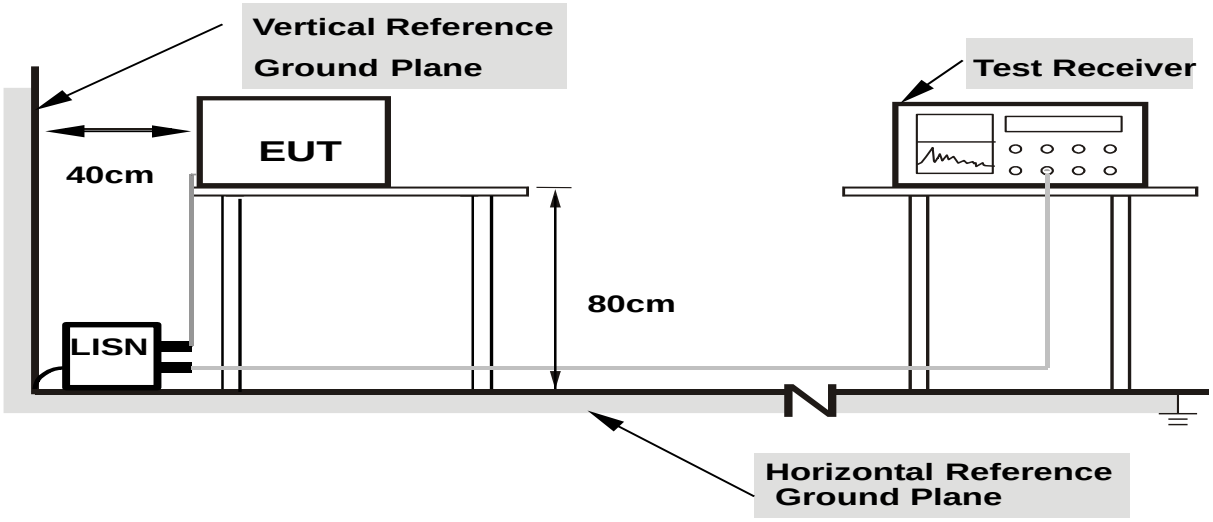
5.2.1 Limits

FCC §15.207;

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 within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50μH/50Ω line impedance stabilization network (LISN).

Frequency (MHz)	Quasi-peak	Average
0.15 -0.5	66 - 56 note2	56 - 46 note2
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00
Note1: The tighter limit applies at the band edges. Note2: The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.		

5.2.2 Test setup



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

5.2.3 Test procedure

a. EUT Operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

b. The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

c. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment's powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

d. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

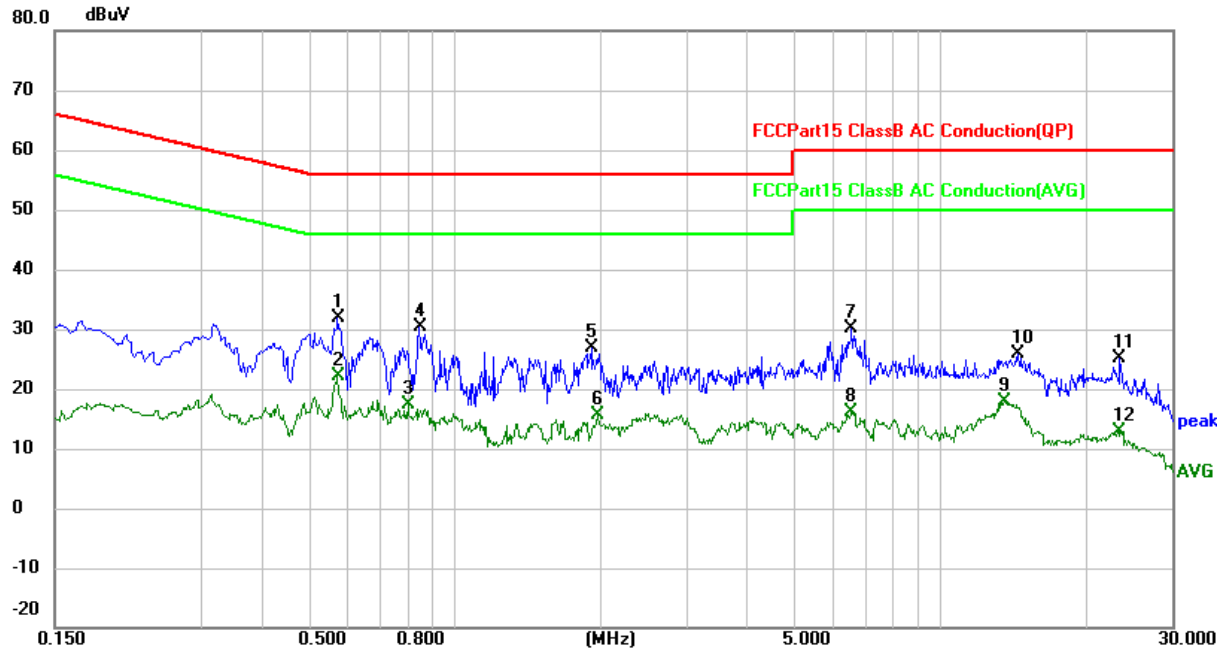
e. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

f. LISN at least 80 cm from nearest part of EUT chassis.

For the actual test configuration, please refer to the related Item –EUT Test Photos.

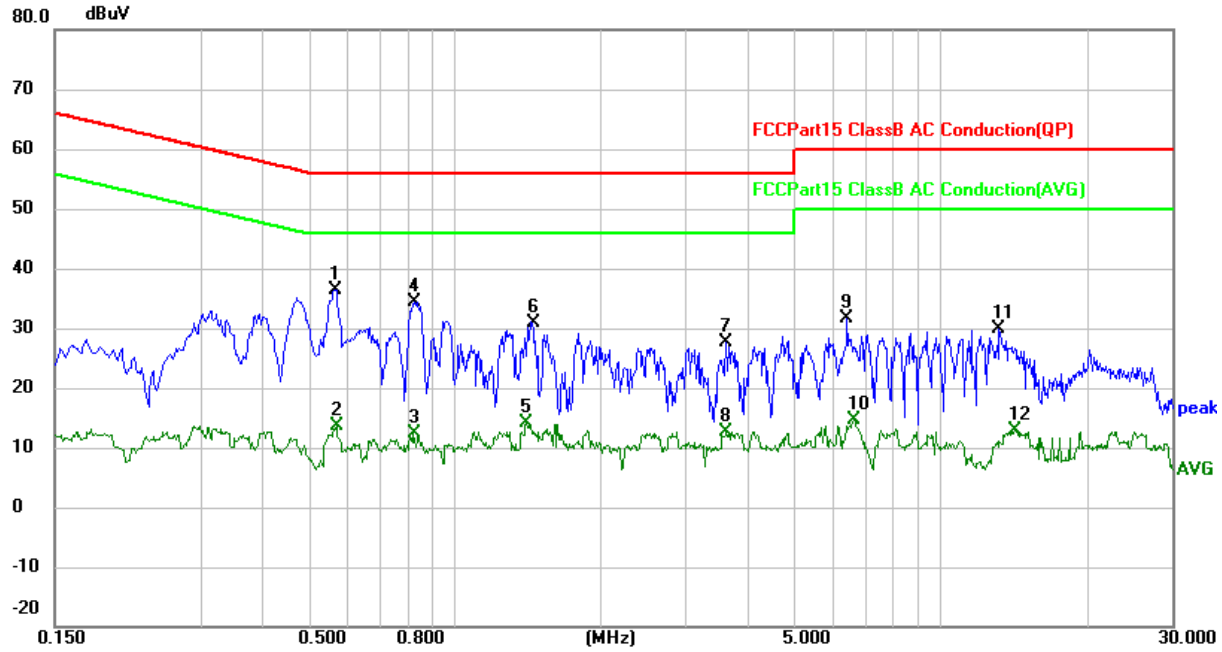
5.2.4 Test results

EUT:	Dual mode wireless keyboard	Model Name :	B087
Pressure:	101kPa	Polarization:	N
Test voltage:	AC 120V/60Hz	Test mode:	Charging+TX



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.5738	20.31	11.48	31.79	56.00	-24.21	QP
2	*	0.5738	10.76	11.48	22.24	46.00	-23.76	AVG
3		0.8020	5.29	11.98	17.27	46.00	-28.73	AVG
4		0.8458	18.33	12.09	30.42	56.00	-25.58	QP
5		1.9138	16.88	10.03	26.91	56.00	-29.09	QP
6		1.9778	5.67	10.01	15.68	46.00	-30.32	AVG
7		6.5900	19.91	10.28	30.19	60.00	-29.81	QP
8		6.5900	5.79	10.28	16.07	50.00	-33.93	AVG
9		13.5617	7.49	10.49	17.98	50.00	-32.02	AVG
10		14.4778	15.29	10.49	25.78	60.00	-34.22	QP
11		23.4420	14.48	10.74	25.22	60.00	-34.78	QP
12		23.4420	2.25	10.74	12.99	50.00	-37.01	AVG

EUT:	Dual mode wireless keyboard	Model Name :	B087
Pressure:	101kPa	Polarization:	L
Test voltage:	AC 120V/60Hz	Test mode:	Charging+TX



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	*	0.5658	24.85	11.49	36.34	56.00	-19.66	QP
2		0.5700	2.08	11.49	13.57	46.00	-32.43	AVG
3		0.8258	0.25	12.03	12.28	46.00	-33.72	AVG
4		0.8300	22.47	12.03	34.50	56.00	-21.50	QP
5		1.4100	0.87	13.20	14.07	46.00	-31.93	AVG
6		1.4458	17.54	13.29	30.83	56.00	-25.17	QP
7		3.6379	17.36	10.28	27.64	56.00	-28.36	QP
8		3.6379	2.46	10.28	12.74	46.00	-33.26	AVG
9		6.4339	21.44	10.28	31.72	60.00	-28.28	QP
10		6.6337	4.38	10.28	14.66	50.00	-35.34	AVG
11		13.2619	19.35	10.42	29.77	60.00	-30.23	QP
12		14.2339	2.41	10.46	12.87	50.00	-37.13	AVG

5.3 Radiated spurious emission

5.3.1 Limit

FCC PART 15.249(a);

Except as provided in paragraph (a) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Frequency (MHz)	Field Strength of Fundamental (mV/m)	Field Strength of Harmonics (μV/m)
902-928	50	500
2400-2483.5	50	500
5725-5875	50	500

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

5.3.2 Test method

a) The EUT is placed on a turntable, which is 0.8m above ground plane for test frequency range blew 1GHz, and 1.5m above ground plane for test frequency range above 1GHz.

b) EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.

c) Use the following spectrum analyser settings:

   1) Span = wide enough to fully capture the emission being measured

   2) RBW = 1 MHz for f ≥ 1GHz, 100 kHz for f < 1 GHz

   3) VBW ≥ RBW, Sweep = auto

   4) Detector function = peak

   5) Trace = max hold

d) Follow the guidelines in ANSI C63.4-2014 with respect to maximizing the emission by rotating the EUT, adjusting the measurement antenna height and polarization, etc. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, submit this data. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

e) The peak level, once corrected, must comply with the limit specified in Section 15.209. Set the RBW = 1MHz, VBW = 10Hz, Detector = PK for AV value, while maintaining all of the other instrument settings.

5.3.3 Test Result

Below 30MHz

EUT:	Dual mode wireless keyboard	Model name. :	B087
Pressure:	1010 hPa	Test voltage:	AC 120V/60Hz
Test mode:	Charging+TX	Polarization :	--

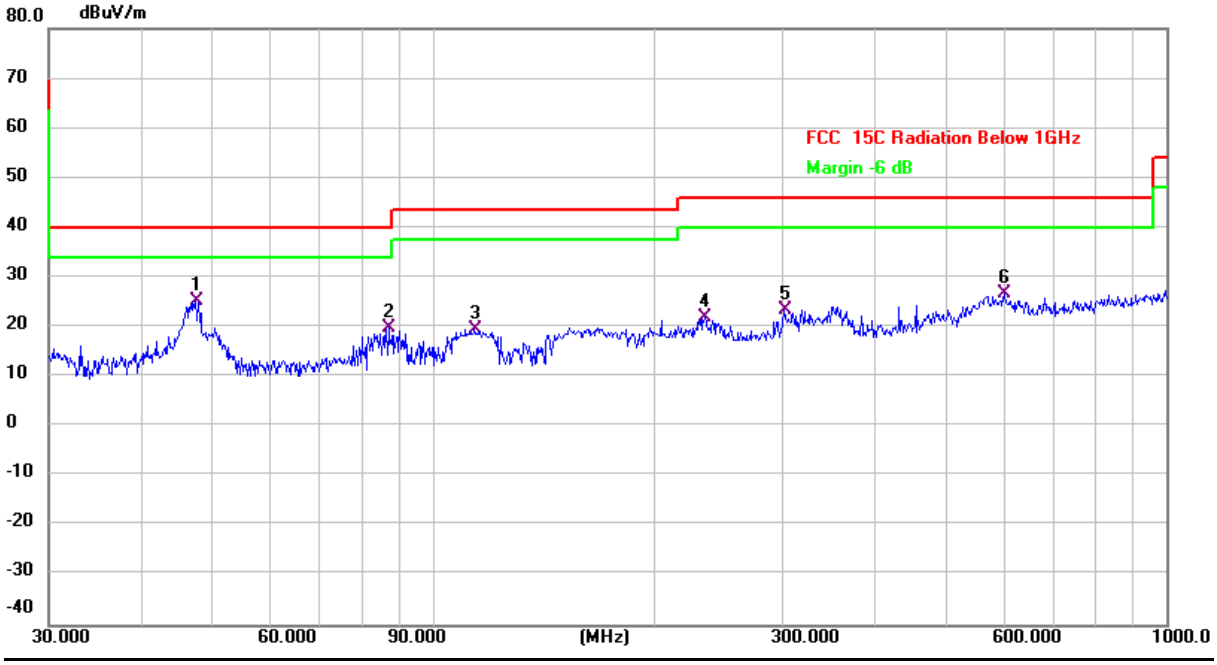
Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	Pass
--	--	--	--	Pass

Note:

1. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
2. Distance extrapolation factor =40 log (specific distance/test distance)(dB);
3. Limit line = specific limits (dBuV) + distance extrapolation factor.

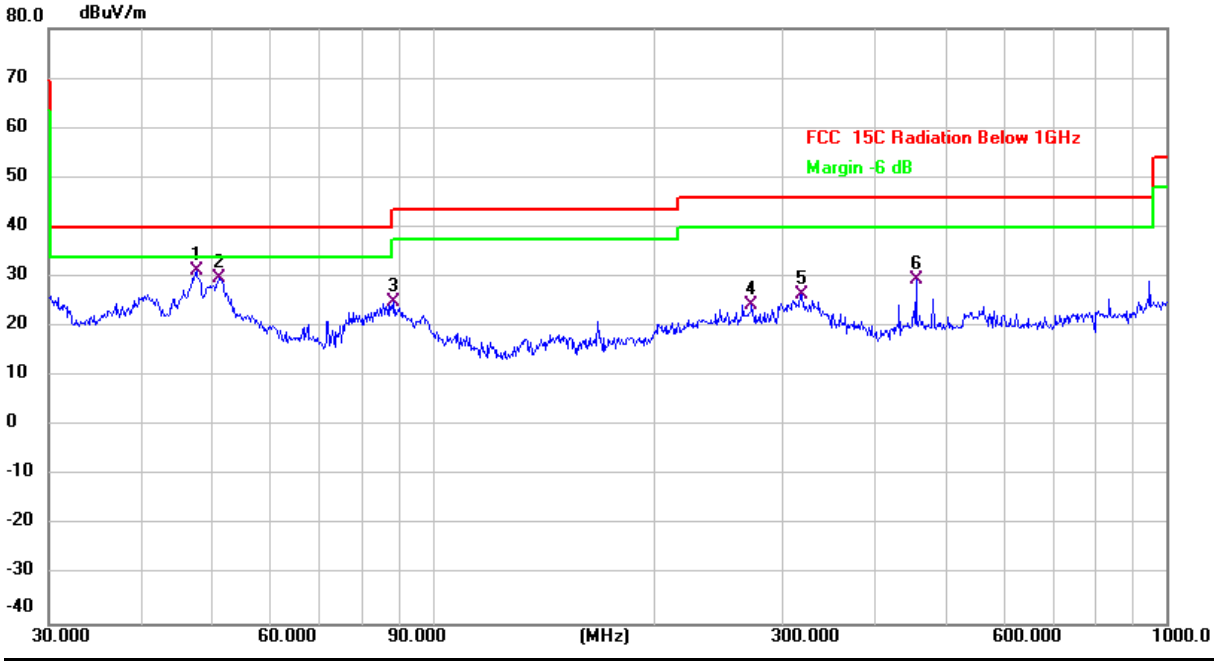
30MHz-1GHz

EUT:	Dual mode wireless keyboard	Model Name:	B087
Pressure:	101kPa	Polarization:	Horizontal
Test voltage:	AC 120V/60Hz	Test Mode:	TX-2480MHz



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	47.4918	34.53	-9.22	25.31	40.00	-14.69	QP
2		87.1117	30.73	-10.94	19.79	40.00	-20.21	QP
3		114.1138	30.85	-11.30	19.55	43.50	-23.95	QP
4		234.9909	30.80	-8.74	22.06	46.00	-23.94	QP
5		301.4224	31.56	-8.16	23.40	46.00	-22.60	QP
6		601.4265	29.60	-2.73	26.87	46.00	-19.13	QP

EUT:	Dual mode wireless keyboard	Model Name:	B087
Pressure:	101kPa	Polarization:	Vertical
Test voltage:	AC 120V/60Hz	Test Mode:	TX-2480MHz



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	47.6586	40.46	-9.23	31.23	40.00	-8.77	QP
2		51.1209	39.19	-9.54	29.65	40.00	-10.35	QP
3		88.6524	35.62	-10.76	24.86	43.50	-18.64	QP
4		272.2776	32.38	-7.93	24.45	46.00	-21.55	QP
5		318.8170	33.68	-7.24	26.44	46.00	-19.56	QP
6		455.9058	35.65	-6.22	29.43	46.00	-16.57	QP

Note:

1. Emission Level = Meter Reading + Factor, Margin= Emission Level- Limit, Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. The three modulated high, medium and low channels have been tested. The report only shows the worst mode. The worst mode is CH78.

1GHz-26.5GHz:

Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
GFSK - 2402 MHz TX mode							
4804.000	39.76	0.81	40.57	74.00	-33.43	Peak	V
4804.000	33.40	0.81	34.21	54.00	-19.79	AVG	V
7206.000	41.33	5.86	47.19	74.00	-26.81	Peak	V
7206.000	35.27	5.86	41.13	54.00	-12.87	AVG	V
9608.000	41.21	6.32	47.53	74.00	-26.47	Peak	V
9608.000	35.00	6.32	41.32	54.00	-12.68	AVG	V
4804.000	43.64	0.81	44.45	74.00	-29.55	Peak	H
4804.000	37.43	0.81	38.24	54.00	-15.76	AVG	H
7206.000	42.18	5.86	48.04	74.00	-25.96	Peak	H
7206.000	36.24	5.86	42.10	54.00	-11.90	AVG	H
9608.000	42.07	6.32	48.39	74.00	-25.61	Peak	H
9608.000	35.98	6.32	42.30	54.00	-11.70	AVG	H
GFSK - 2441 MHz TX mode							
4882.000	41.36	1.18	42.54	74.00	-31.46	Peak	V
4882.000	35.06	1.18	36.24	54.00	-17.76	AVG	V
7323.000	39.68	5.52	45.20	74.00	-28.80	Peak	V
7323.000	33.62	5.52	39.14	54.00	-14.86	AVG	V
9764.000	41.73	6.21	47.94	74.00	-26.06	Peak	V
9764.000	35.34	6.21	41.55	54.00	-12.45	AVG	V
4882.000	40.40	1.18	41.58	74.00	-32.42	Peak	H
4882.000	34.08	1.18	35.26	54.00	-18.74	AVG	H
7323.000	39.43	5.52	44.95	74.00	-29.05	Peak	H
7323.000	32.80	5.52	38.32	54.00	-15.68	AVG	H
9764.000	39.57	6.21	45.78	74.00	-28.22	Peak	H
9764.000	33.12	6.21	39.33	54.00	-14.67	AVG	H

Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
GFSK - 2480 MHz TX mode							
4960.000	41.25	1.53	42.78	74.00	-31.22	Peak	V
4960.000	34.68	1.53	36.21	54.00	-17.79	AVG	V
7440.000	40.90	5.16	46.06	74.00	-27.94	Peak	V
7440.000	34.94	5.16	40.10	54.00	-13.90	AVG	V
9920.000	42.15	6.09	48.24	74.00	-25.76	Peak	V
9920.000	36.06	6.09	42.15	54.00	-11.85	AVG	V
4960.000	43.09	1.53	44.62	74.00	-29.38	Peak	H
4960.000	36.71	1.53	38.24	54.00	-15.76	AVG	H
7440.000	40.57	5.16	45.73	74.00	-28.27	Peak	H
7440.000	34.12	5.16	39.28	54.00	-14.72	AVG	H
9920.000	41.95	6.09	48.04	74.00	-25.96	Peak	H
9920.000	36.01	6.09	42.10	54.00	-11.90	AVG	H

Note:

1. All Readings are Peak Value (VBW=3MHz) and AV Value (VBW=10Hz).
2. Emission Level= Antenna Factor + Cable Loss + Read Level - Preamp Factor

5.3.4 Band edge–Field strength of fundamental

Frequency	Ant. Polarization	Emission level	Limits	Detector	Result
(MHz)	H / V	dBμV/m	dBμV/m		
2402	H	86.76	114	PK	PASS
2402	H	81.82	94	AV	PASS
2402	V	77.47	114	PK	PASS
2402	V	72.31	94	AV	PASS

Frequency	Ant. Polarization	Emission level	Limits	Detector	Result
(MHz)	H / V	dBμV/m	dBμV/m		
2441	H	86.78	114	PK	PASS
2441	H	81.86	94	AV	PASS
2441	V	77.35	114	PK	PASS
2441	V	71.86	94	AV	PASS

Frequency	Ant. Polarization	Emission level	Limits	Detector	Result
(MHz)	H / V	dBμV/m	dBμV/m		
2480	H	86.81	114	PK	PASS
2480	H	81.92	94	AV	PASS
2480	V	76.18	114	PK	PASS
2480	V	71.03	94	AV	PASS

5.3.5 Band edge-radiated

Frequency	Reading Level	Correct Factor	Measurement	Limits	Over	Detector	Polarization
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
GFSK – Low band-edge							
(MHz)	(dBμV)	(dB/m)	(dBμV/m)	(dBμV/m)	(dB)	Peak/AVG	H/V
2310.000	47.36	-8.20	39.16	74.00	-34.84	Peak	V
2310.000	37.07	-8.20	28.87	54.00	-25.13	AVG	V
2390.000	46.91	-7.83	39.08	74.00	-34.92	Peak	V
2390.000	37.38	-7.83	29.55	54.00	-24.45	AVG	V
2400.000	61.91	-7.78	54.13	74.00	-19.87	Peak	V
2400.000	49.45	-7.78	41.67	54.00	-12.33	AVG	V
2310.000	46.55	-8.20	38.35	74.00	-35.65	Peak	H
2310.000	37.04	-8.20	28.84	54.00	-25.16	AVG	H
2390.000	51.86	-7.83	44.03	74.00	-29.97	Peak	H
2390.000	37.81	-7.83	29.98	54.00	-24.02	AVG	H
2400.000	70.09	-7.78	62.31	74.00	-11.69	Peak	H
2400.000	58.78	-7.78	51.00	54.00	-3.00	AVG	H
GFSK – High band-edge							
2483.5	53.67	-7.39	46.28	74.00	-27.72	Peak	V
2483.5	39.79	-7.39	32.40	54.00	-21.60	AVG	V
2500	47.24	-7.32	39.92	74.00	-34.08	Peak	V
2500	37.75	-7.32	30.43	54.00	-23.57	AVG	V
2483.5	61.90	-7.39	54.51	74.00	-19.49	Peak	H
2483.5	46.65	-7.39	39.26	54.00	-14.74	AVG	H
2500	46.94	-7.32	39.62	74.00	-34.38	Peak	H
2500	37.73	-7.32	30.41	54.00	-23.59	AVG	H

5.4 20dB and 99% bandwidth

5.4.1 Limits

FCC §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.

5.4.2 Test method

Use the following spectrum analyzer settings:

For 20 dB bandwidth

Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel

RBW ≥1% of the 20 dB bandwidth

VBW ≥RBW

Sweep = auto

Detector function = peak

Trace = max hold

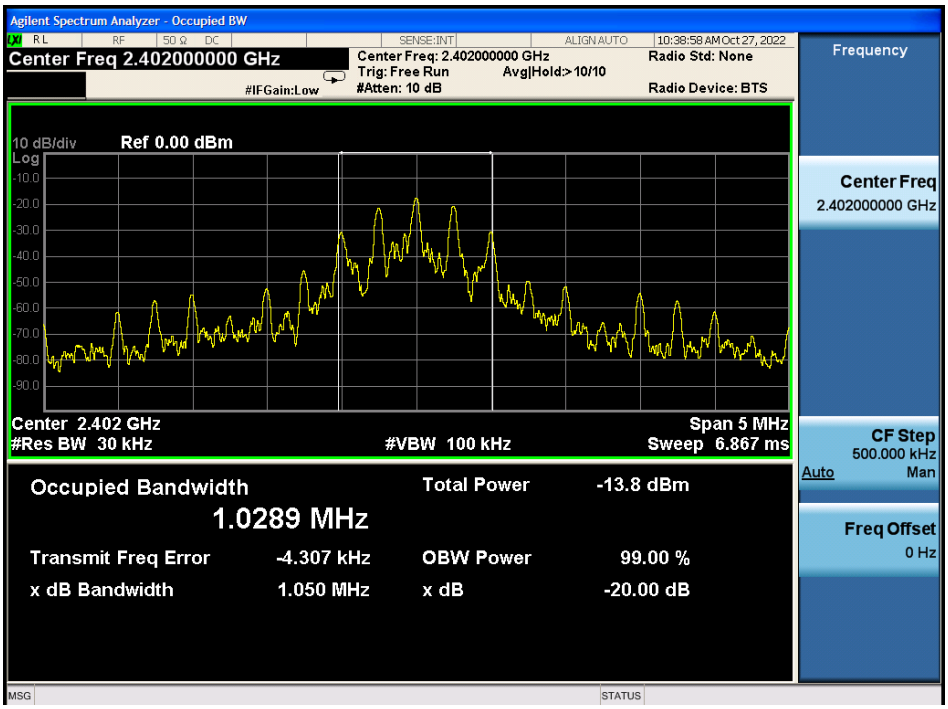
The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth and 99% occupied bandwidth of the emission

5.4.3 Test result

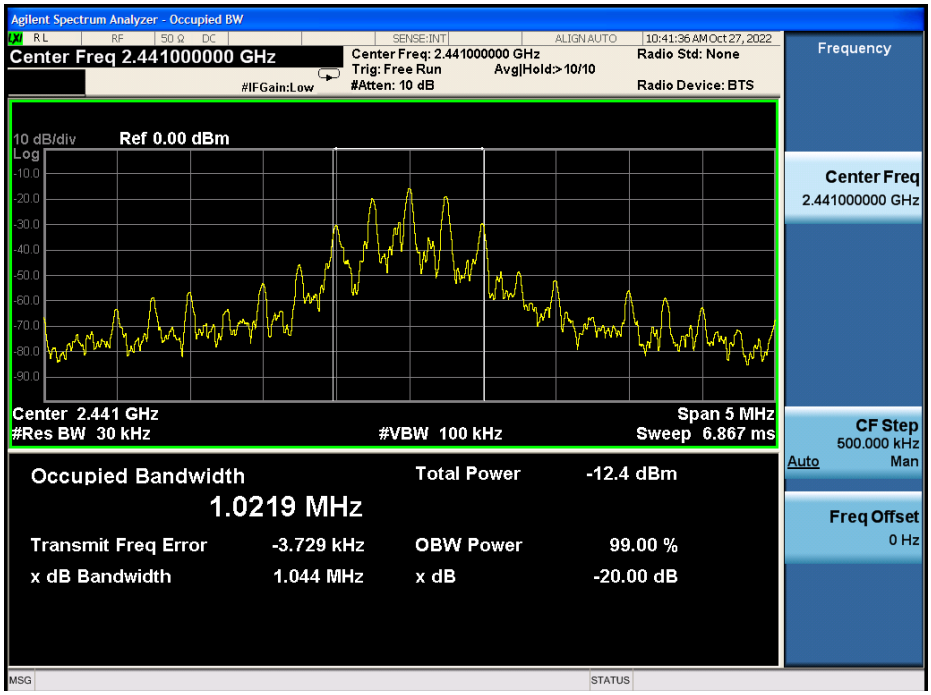
Frequency (MHz)	20dB bandwidth (MHz)	99% bandwidth (MHz)
2402	1.050	1.0289
2441	1.044	1.0219
2480	1.047	1.0272

Test plots

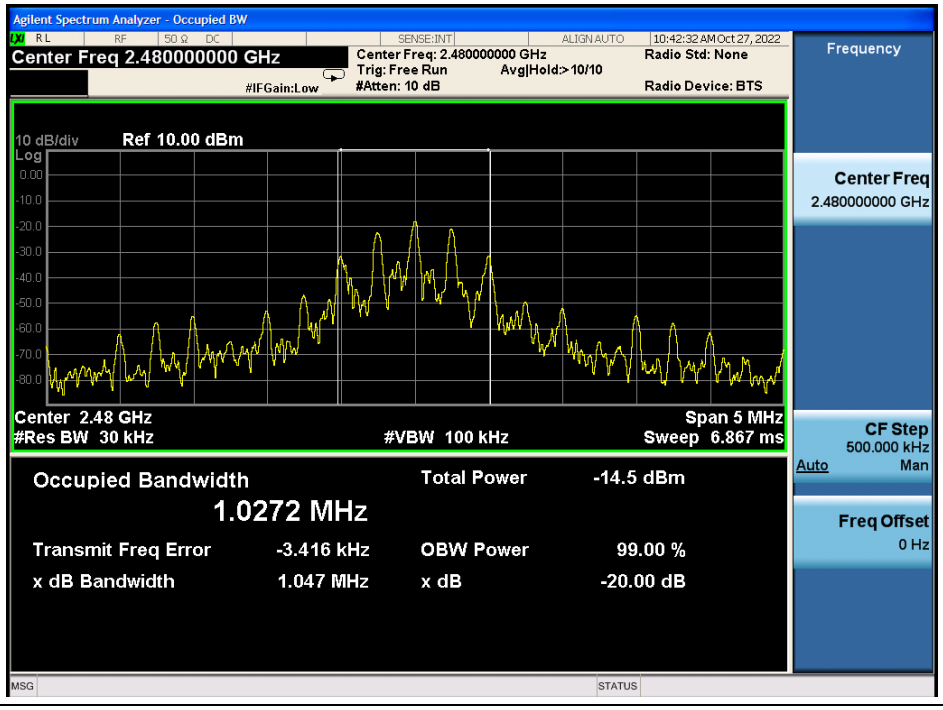
2402MHz



2441MHz



2480MHz



Photographs of the Test Setup

See the Appendix – Test setup photos.

Photographs of the EUT

See the Appendix - EUT Photos.

----END OF REPORT----