Test Report

Report No.:	MTi220613010-22E1
Date of issue:	2022-06-27
Applicant:	Shenzhen Silver Storm Technology Co., Ltd.
Product name:	A80 Mechanical Keyboard
Model(s):	A80 Explorer
FCC ID:	2A7G9-A80

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.
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TEST RESULT CERTIFICATION	
Applicant's name ..... :	Shenzhen Silver Storm Technology Co., Ltd.
Address ..... :	A905, Rongchaobinhai Bldg., Haixiu Rd., Xin'an Subdistrict, Bao'an District, Shenzhen, China
Manufacturer's Name ..... :	Shenzhen Silver Storm Technology Co., Ltd.
Address ..... :	A905, Rongchaobinhai Bldg., Haixiu Rd., Xin'an Subdistrict, Bao'an District, Shenzhen, China
Factory's Name ..... :	Dongguan Ranre Metalware Technology Co., Ltd.
Address ..... :	No. 288 Siweixi Rd., Xitailong Village, Shatian Town, Dongguan, Guangdong, China
Product description	
Product name ..... :	A80 Mechanical Keyboard
Trademark ..... :	IQUNIX
Model Name ..... :	A80 Explorer
Serial Model	N/A
Standards ..... :	FCC Part 15.249
Test procedure ..... :	ANSI C63.10-2013
Date of Test	
Date (s) of performance of tests ..... :	2022-06-21 ~2022-07-19
Test Result ..... :	Pass

Testing Engineer : Cindy Qin

(Cindy Qin)

Technical Manager : Leon Chen

(Leon Chen)

Authorized Signatory : Tom Xue

(Tom Xue)

1 General description

1.1 Feature of equipment under test (EUT)

Equipment:	A80 Mechanical Keyboard
Model Name:	A80 Explorer
Serial Model:	N/A
Model Difference:	N/A
Operation Frequency:	2402 - 2480 MHz
Modulation Type:	GFSK
Antenna Type:	FPC antenna
Antenna Gain:	2dBi
Max. Field Strength:	81.38dBuV/m
Power Source:	Input: DC 5V 1A Battery: DC 3.7V 4000mAh
Cable:	USB-A to USB-C cable 1.5m
Battery:	DC 3.7V 4000mAh
Hardware version:	A80-2.4GLYHC-VS V1.0 20210128
Software version:	V0004

1.2 Operation channel list

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

1.3 Test Frequency Channel

Channel	Frequency(MHz)
Low	2402
Middle	2440
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.

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 FPC antenna, which was permanently affixed to the device and un-replaced, complies with 15.203. In addition, the maximum antenna gain is 2dBi.

5.2 AC power line conducted emission

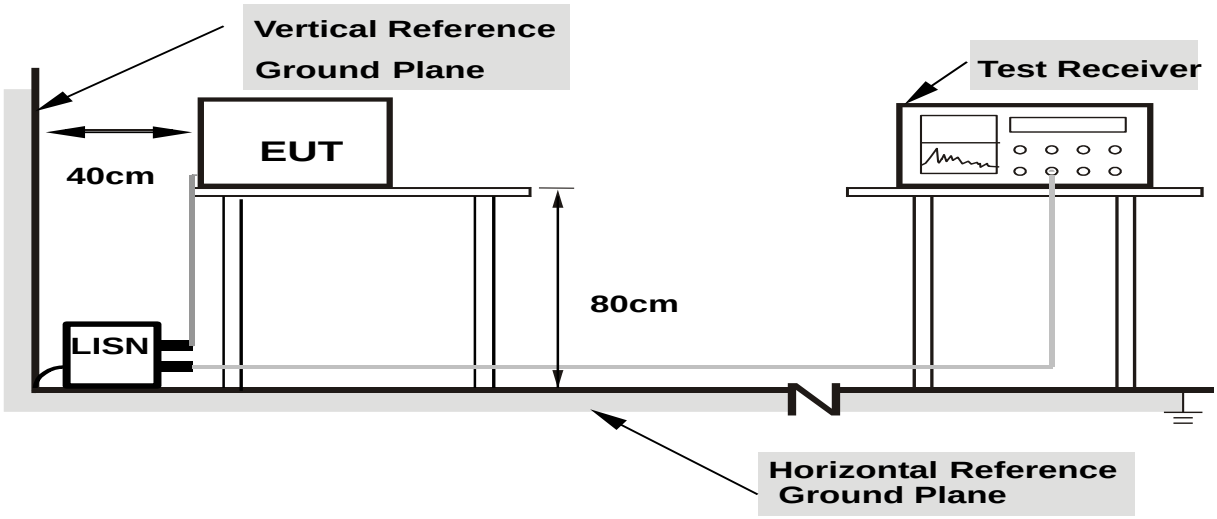
5.2.1 Limits

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.

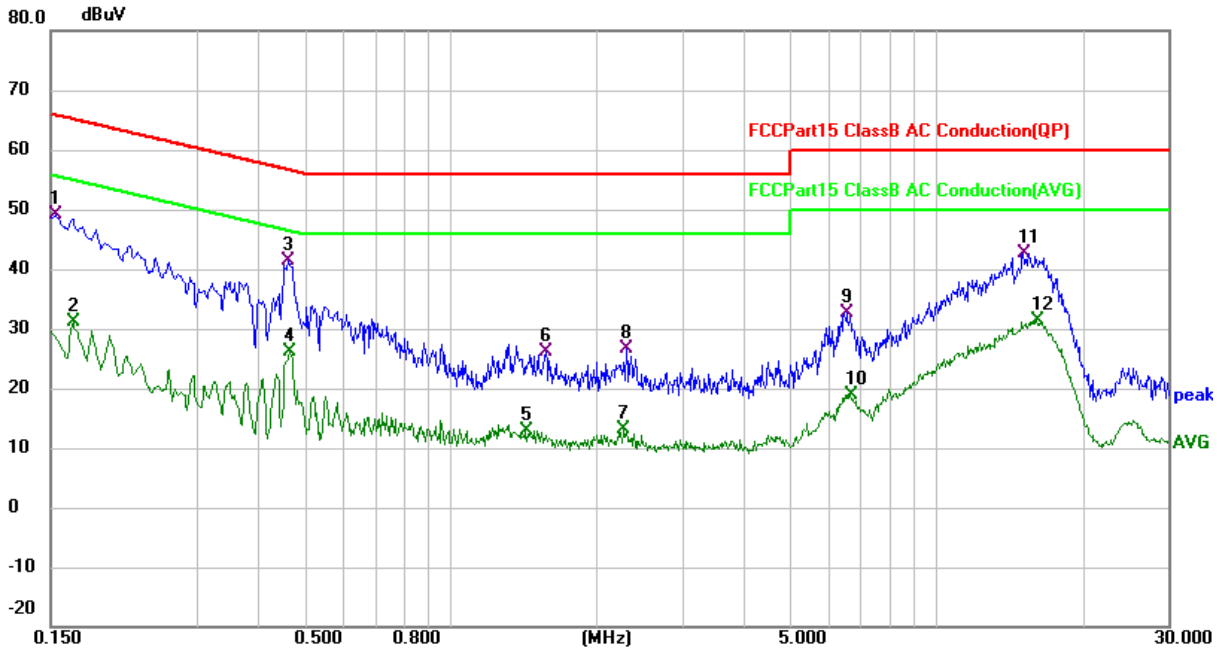
e. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

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.

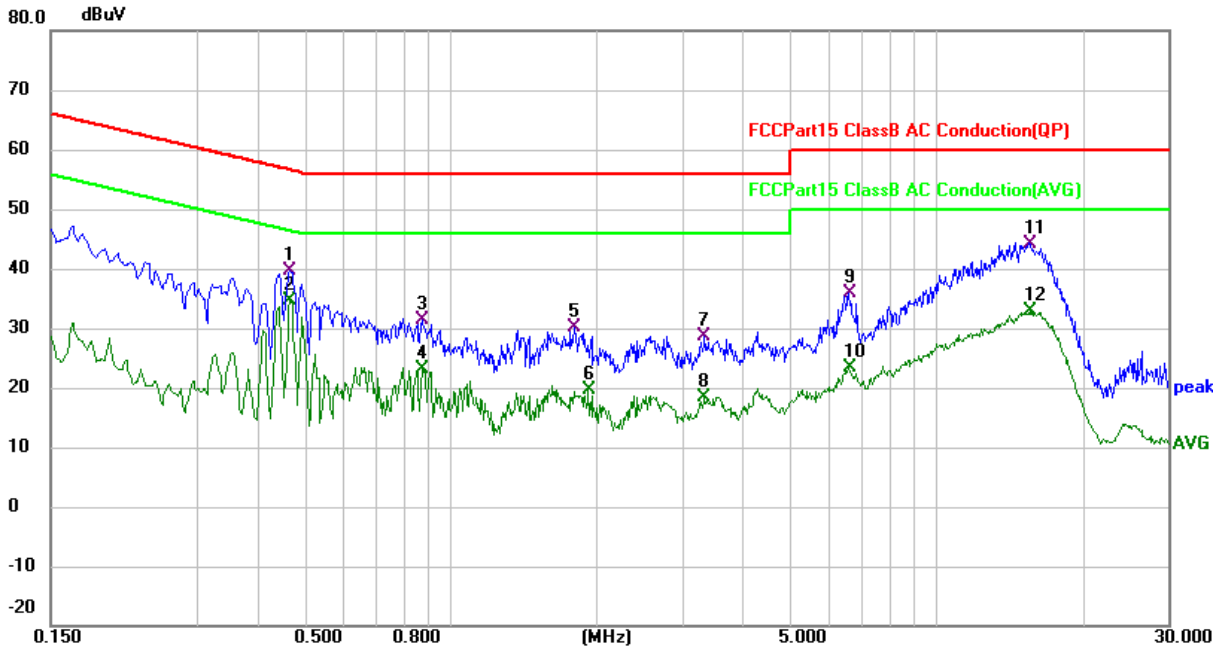
5.2.4 Test results

EUT:	A80 Mechanical Keyboard	Model Name :	A80 Explorer
Pressure:	101kPa	Polarization:	N
Test voltage:	Power by adapter AC 120V/60Hz	Test mode:	TX-2402MHz



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1539	38.05	10.99	49.04	65.79	-16.75	QP
2		0.1660	20.07	10.99	31.06	55.16	-24.10	AVG
3	*	0.4620	30.27	11.02	41.29	56.66	-15.37	QP
4		0.4660	15.12	11.03	26.15	46.58	-20.43	AVG
5		1.4260	-1.31	14.20	12.89	46.00	-33.11	AVG
6		1.5700	11.66	14.50	26.16	56.00	-29.84	QP
7		2.2740	-2.90	15.95	13.05	46.00	-32.95	AVG
8		2.3020	10.58	16.00	26.58	56.00	-29.42	QP
9		6.5260	21.10	11.58	32.68	60.00	-27.32	QP
10		6.6580	7.37	11.59	18.96	50.00	-31.04	AVG
11		15.1060	30.96	11.72	42.68	60.00	-17.32	QP
12		16.0940	19.71	11.74	31.45	50.00	-18.55	AVG

EUT:	A80 Mechanical Keyboard	Model Name :	A80 Explorer
Pressure:	101kPa	Polarization:	L
Test voltage:	Power by adapter AC 120V/60Hz	Test mode:	TX-2402MHz



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.4660	28.70	10.89	39.59	56.58	-16.99	QP
2	*	0.4660	23.70	10.89	34.59	46.58	-11.99	AVG
3		0.8740	18.39	12.89	31.28	56.00	-24.72	QP
4		0.8780	10.18	12.92	23.10	46.00	-22.90	AVG
5		1.7980	15.29	14.96	30.25	56.00	-25.75	QP
6		1.9220	4.32	15.22	19.54	46.00	-26.46	AVG
7		3.3420	17.17	11.37	28.54	56.00	-27.46	QP
8		3.3420	7.00	11.37	18.37	46.00	-27.63	AVG
9		6.6180	24.45	11.39	35.84	60.00	-24.16	QP
10		6.6180	11.94	11.39	23.33	50.00	-26.67	AVG
11		15.4980	32.53	11.72	44.25	60.00	-15.75	QP
12		15.5940	21.17	11.73	32.90	50.00	-17.10	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：	A80 Mechanical Keyboard	Model name. ：	A80 Explorer
Pressure：	1010 hPa	Test voltage：	Power by adapter AC 120V/60Hz
Test mode：	TX	Polarization :	--

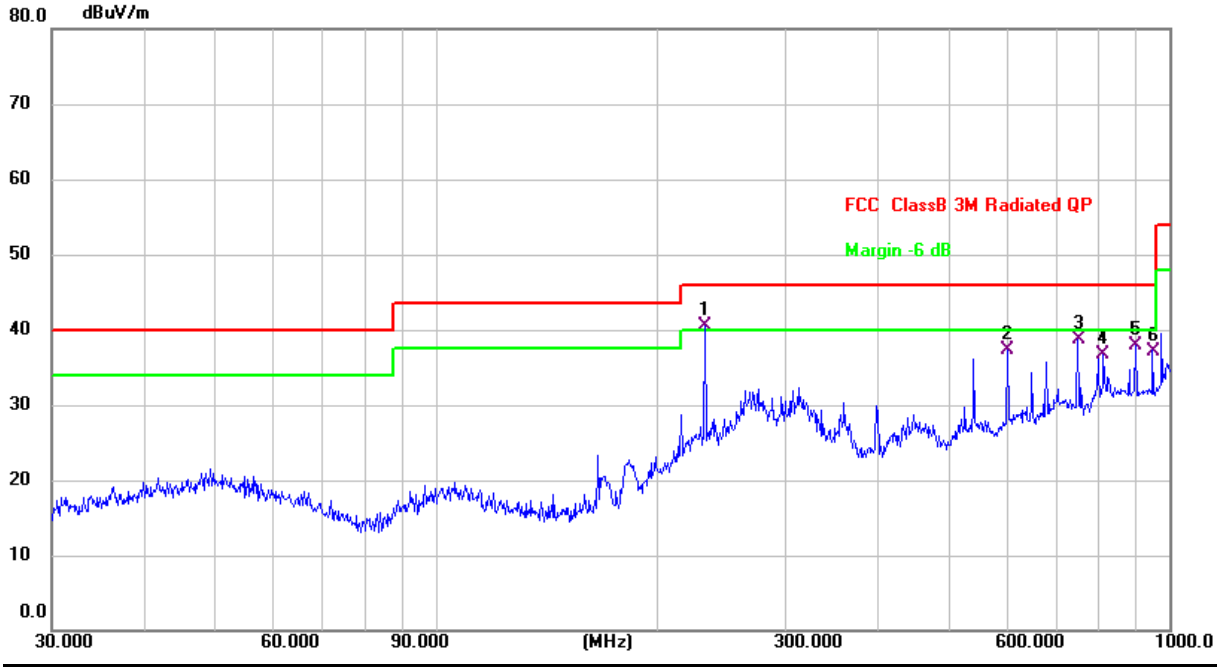
Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	Pass
--	--	--	--	Pass

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.

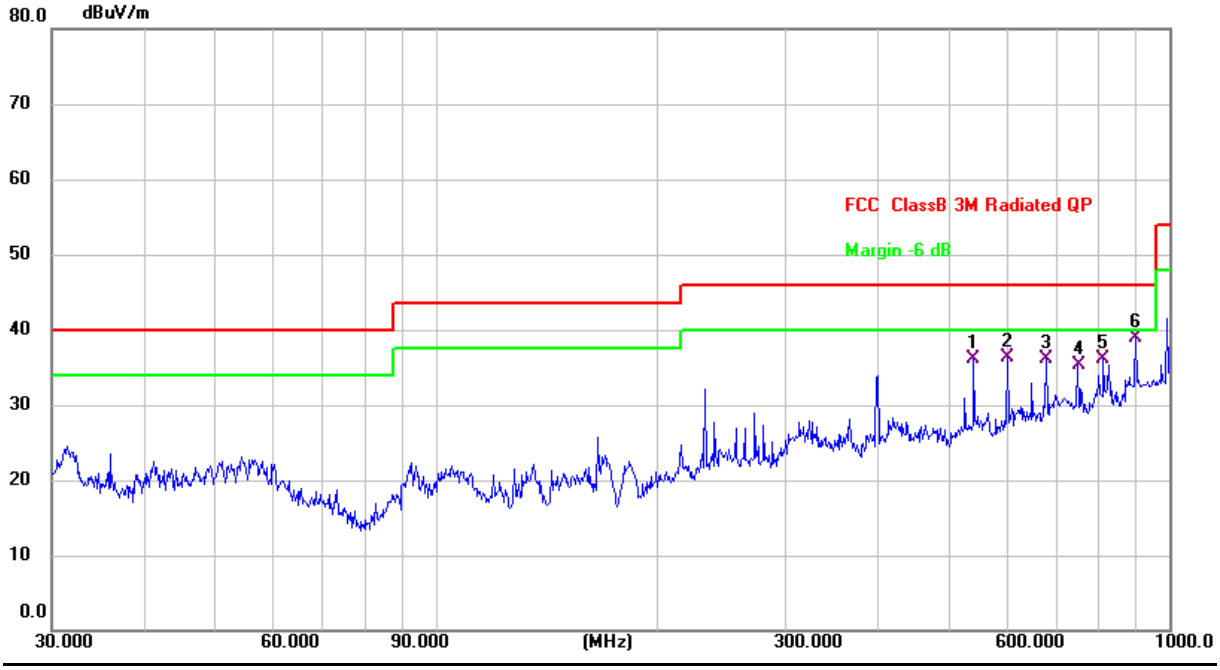
30MHz-1GHz

EUT:	A80 Mechanical Keyboard	Model Name:	A80 Explorer
Pressure:	101kPa	Polarization:	Horizontal
Test voltage:	DC 3.7V	Test Mode:	TX-2402MHz



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	232.5318	46.26	-5.69	40.57	46.00	-5.43	QP
2		601.4265	34.12	3.10	37.22	46.00	-8.78	QP
3		750.1083	33.33	5.47	38.80	46.00	-7.20	QP
4		813.1115	30.51	6.26	36.77	46.00	-9.23	QP
5		900.1474	30.50	7.39	37.89	46.00	-8.11	QP
6		948.7610	29.06	8.14	37.20	46.00	-8.80	QP

EUT:	A80 Mechanical Keyboard	Model Name:	A80 Explorer
Pressure:	101kPa	Polarization:	Vertical
Test voltage:	DC 3.7V	Test Mode:	TX-2402MHz



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		541.3725	34.79	1.33	36.12	46.00	-9.88	QP
2		601.4265	33.13	3.10	36.23	46.00	-9.77	QP
3		679.9600	31.85	4.24	36.09	46.00	-9.91	QP
4		750.1083	29.78	5.62	35.40	46.00	-10.60	QP
5		813.1115	29.84	6.26	36.10	46.00	-9.90	QP
6	*	900.1474	31.48	7.39	38.87	46.00	-7.13	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.

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	51.22	1.52	52.74	74.00	-21.26	Peak	V
4804.000	44.67	1.52	46.19	54.00	-7.81	AVG	V
7206.000	46.13	5.46	51.59	74.00	-22.41	Peak	V
7206.000	40.02	5.46	45.48	54.00	-8.52	AVG	V
9608.000	41.69	6.33	48.02	74.00	-25.98	Peak	V
9608.000	35.77	6.33	42.10	54.00	-11.90	AVG	V
4804.000	49.49	1.52	51.01	74.00	-22.99	Peak	H
4804.000	43.58	1.52	45.10	54.00	-8.90	AVG	H
7206.000	43.77	5.46	49.23	74.00	-24.77	Peak	H
7206.000	37.93	5.46	43.39	54.00	-10.61	AVG	H
9608.000	41.41	6.33	47.74	74.00	-26.26	Peak	H
9608.000	35.23	6.33	41.56	54.00	-12.44	AVG	H
GFSK - 2440 MHz TX mode							
4880.000	52.52	1.68	54.20	74.00	-19.80	Peak	V
4880.000	46.38	1.68	48.06	54.00	-5.94	AVG	V
7320.000	49.11	5.45	54.56	74.00	-19.44	Peak	V
7320.000	42.70	5.45	48.15	54.00	-5.85	AVG	V
9760.000	41.46	6.37	47.83	74.00	-26.17	Peak	V
9760.000	34.98	6.37	41.35	54.00	-12.65	AVG	V
4880.000	50.39	1.68	52.07	74.00	-21.93	Peak	H
4880.000	44.47	1.68	46.15	54.00	-7.85	AVG	H
7320.000	45.68	5.45	51.13	74.00	-22.87	Peak	H
7320.000	39.65	5.45	45.10	54.00	-8.90	AVG	H
9760.000	41.45	6.37	47.82	74.00	-26.18	Peak	H
9760.000	35.19	6.37	41.56	54.00	-12.44	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	49.87	1.83	51.70	74.00	-22.30	Peak	V
4960.000	43.33	1.83	45.16	54.00	-8.84	AVG	V
7440.000	46.12	5.43	51.55	74.00	-22.45	Peak	V
7440.000	39.93	5.43	45.36	54.00	-8.64	AVG	V
9920.000	41.41	6.41	47.82	74.00	-26.18	Peak	V
9920.000	35.24	6.41	41.65	54.00	-12.35	AVG	V
4960.000	49.13	1.83	50.96	74.00	-23.04	Peak	H
4960.000	42.56	1.83	44.39	54.00	-9.61	AVG	H
7440.000	43.61	5.43	49.04	74.00	-24.96	Peak	H
7440.000	37.66	5.43	43.09	54.00	-10.91	AVG	H
9920.000	41.41	6.41	47.82	74.00	-26.18	Peak	H
9920.000	34.84	6.41	41.25	54.00	-12.75	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
3. All the modulation modes have been tested, and the worst results are reflected in the report.

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	81.38	114	PK	PASS
2402	H	80.57	94	AV	PASS
2402	V	79.34	114	PK	PASS
2402	V	78.62	94	AV	PASS

Frequency	Ant. Polarization	Emission level	Limits	Detector	Result
(MHz)	H / V	dBμV/m	dBμV/m		
2440	H	80.90	114	PK	PASS
2440	H	80.30	94	AV	PASS
2440	V	80.70	114	PK	PASS
2440	V	80.04	94	AV	PASS

Frequency	Ant. Polarization	Emission level	Limits	Detector	Result
(MHz)	H / V	dBμV/m	dBμV/m		
2480	H	77.56	114	PK	PASS
2480	H	76.94	94	AV	PASS
2480	V	77.71	114	PK	PASS
2480	V	77.10	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	48.13	-6.60	41.53	74.00	-32.47	Peak	V
2310.000	37.78	-6.60	31.18	54.00	-22.82	AVG	V
2390.000	48.57	-6.23	42.34	74.00	-31.66	Peak	V
2390.000	38.12	-6.23	31.89	54.00	-22.11	AVG	V
2400.000	57.76	-6.18	51.58	74.00	-22.42	Peak	V
2400.000	45.00	-6.18	38.82	54.00	-15.18	AVG	V
2310.000	47.78	-6.60	41.18	74.00	-32.82	Peak	H
2310.000	37.22	-6.60	30.62	54.00	-23.38	AVG	H
2390.000	47.41	-6.23	41.18	74.00	-32.82	Peak	H
2390.000	37.39	-6.23	31.16	54.00	-22.84	AVG	H
2400.000	60.98	-6.18	54.80	74.00	-19.20	Peak	H
2400.000	46.32	-6.18	40.14	54.00	-13.86	AVG	H
GFSK – High band-edge							
2483.500	50.64	-5.79	44.85	74.00	-29.15	Peak	V
2483.500	36.99	-5.79	31.20	54.00	-22.80	AVG	V
2500.000	47.35	-5.72	41.63	74.00	-32.37	Peak	V
2500.000	37.19	-5.72	31.47	54.00	-22.53	AVG	V
2483.500	50.99	-5.79	45.20	74.00	-28.80	Peak	H
2483.500	37.51	-5.79	31.72	54.00	-22.28	AVG	H
2500.000	48.25	-5.72	42.53	74.00	-31.47	Peak	H
2500.000	37.21	-5.72	31.49	54.00	-22.51	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

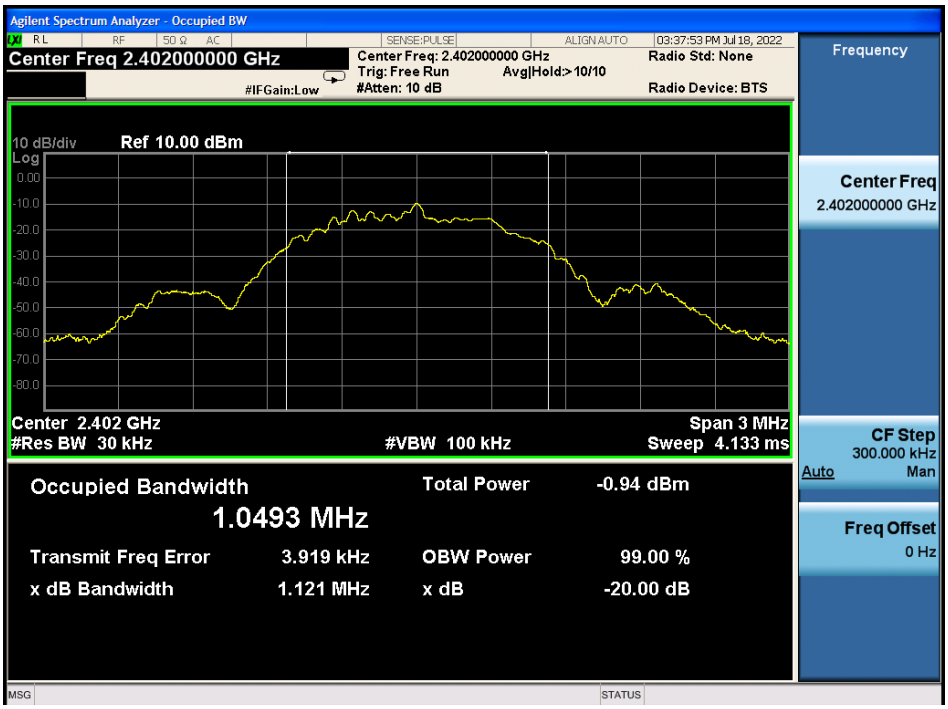
The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the 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	1.121	1.0493
2440	1.122	1.0527
2480	1.122	1.0540

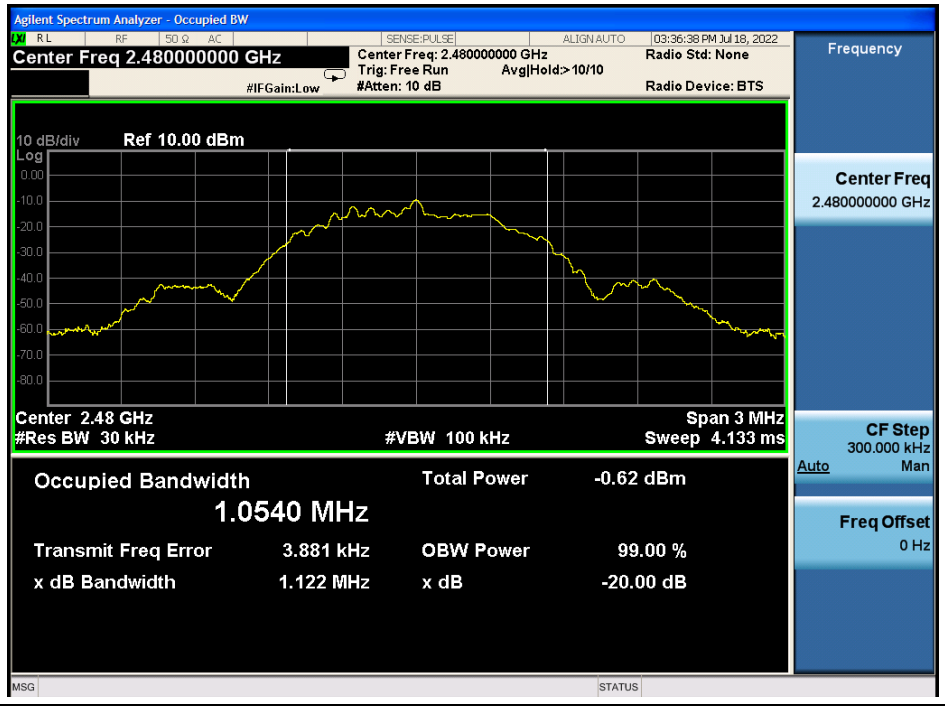
Test plots

2402MHz



2440MHz

2480MHz



Photographs of the Test Setup

See the APPENDIX –MTi220613010-22E1-2-Test setup photos.

Photographs of the EUT

See the Appendix - MTi220613010-22E1-2-EUT Photos.

----END OF REPORT----