TEST REPORT

Report No:	TW2304096-02E
Applicant:	Eastern Times Technology Co.,Ltd
Product:	REDRAGON 75% LOW-PROFILE WIRELESS MECHANICAL KEYBOARD
Trademark:	REDRAGON
Model No:	K652-RGB-PRO, K652GG-RGB-PRO, ET-8909
Test Standards:	ETSI EN 300 328 v2.2.2 (2019-07)
Test Result:	The RF Spectrum testing has been performed on the submitted samples and found in compliance with council Radio Equipment Directive (RED) 2014/53/EU

Approved By:

Terry Tang

EMC Manager

Dated: May 10, 2023

Results appearing herein relate only to the sample tested
The technical reports is issued errors and omissions exempt and is subject to withdrawal at

SHENZHEN TIMEWAY TESTING LABORATORIES

Zone C, 1st Floor, Block B, Jun Xiang Da Building, Zhongshan Park Road West, Tong Le Village, Nanshan District, Shenzhen, China

Tel (755) 83448688, Fax (755) 83442996, E-Mail:info@timeway-lab.com

Special Statement:

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meet with ISO/IEC-17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

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

CNAS-LAB Code: L2292

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:2017 General Requirements) for the Competence of testing Laboratories.

FCC-Registration No.: 744189

The 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. Registration No.: 744189.

Industry Canada (IC) —Registration No.:5205A

The EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 5205A.

A2LA (Certification Number:5013.01)

The EMC Laboratory has been accredited by the American Association for Laboratory Accreditation (A2LA). Certification Number:5013.01

CAB identifier: CN0033

Test Report Conclusion

Content

1. General Information

1.1 Notes

The test results of this report relate exclusively to the test item specified in 1.5. The TIMEWAY Lab does not assume Responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the TIMEWAY Lab.

1.2 Testing Laboratory

SHENZHEN TIMEWAY TESTING LABORATORIES
Zone C, 1st Floor, Block B, Jun Xiang Da Building, Zhongshan Park Road West, Tong Le Village, Nanshan District, Shenzhen, China
Tel: +86 755 83448688 Fax: +86 755 83442996
Internet: www.timeway-lab.com

Site on File With the Federal Communications and Commission – United States
Registration Number: 744189
For 3m Anechoic Chamber

Site Listed with Industry Canada of Ottawa, Canada
Registration Number: IC: 5205A
For 3m Anechoic Chamber

1.3 Test Data

Date of Receipt of Application: April 10, 2023
Date of Receipt of Test Item: April 10, 2023
Date of Test: April 10, 2023 ~ May 10, 2023

1.4 Description of EUT

EUT Type……:	REDRAGON 75% LOW-PROFILE WIRELESS MECHANICAL KEYBOARD	
Applicant……:	Eastern Times Technology Co.,Ltd Building D, Nan An Industrial Area, Youganpu Village, Fenggang Town, Dongguan City, Guangdong, China.	
Manufacturer……..:	Eastern Times Technology Co.,Ltd Building D, Nan An Industrial Area, Youganpu Village, Fenggang Town, Dongguan City, Guangdong, China.	
Equipment type……....:	Bluetooth 2.4G	
Modulation Type (Technology)…….:	GFSK	
Operating Frequency Range……..:	2.402GHz - 2.480GHz	
Modulation used by the equipment.	FHSS	
Maximum e.r.i.p…….....:	1.50dBm	
	GFSK	1010kHz
Adaptive Mode……...:	Adaptive/non-adaptive equipment:	Adaptive Equipment without the possibility to switch to a non-adaptive mode
	LBT Base DAA:	Yes
	Non-LBT Base DAA:	No
	Number of transmit chain:	1
	Number of receive chain:	1
	Channel Occupancy Time:	8.383ms (worse case)
Antenna Gain……:	Antenna Type:	PCB Antenna
	Antenna Gain:	-1.85dBi (Get from the antenna specification)
Operating voltage…….……..……..:	Normal:	DC3.7V
	Lowest:	DC3.3V
	Highest:	DC4.2V
Operating temperature……...:	Normal:	25℃
	Lowest:	-20℃
	Highest:	40℃

1.5 Setting of test system

Setting	Value	
EUT type:	Bluetooth 2.4G	
Test Mode:	Mode	Data Rate
	GFSK	1Mbps
EUT frequency configurable:	Yes	
Test channel-Low:	2402MHz (GFSK)	
Test channel-Middle:	2441MHz (GFSK)	
Test channel-High:	2480MHz (GFSK)	
Adaptive:	Yes	
With TPC function:	No	
Number of the antenna:	1	
Number of transmission chains:	1	
Beam forming:	No	
Operating frequency range:	2400MHz~2483.5MHz	
Maximum beam forming gain:	N. A	
Antenna gain:	-1.85dBi	

1.6 Test Standards

ETSI EN 300 328 v 2.2.2 (2019-07)

Wideband transmission systems;

Data transmission equipment operating in the 2,4 GHz band;

Harmonised Standard for access to radio spectrum

Note: All radiated measurements were made in all three orthogonal planes. The values reported are the maximum values.

1.7 Configuration of The EUT

The EUT was configured according to **CISPR16.** All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

A. EUT

Device	Manufacturer	Model
REDRAGON 75% LOW-PROFILE WIRELESS MECHANICAL KEYBOARD	Eastern Times Technology Co.,Ltd	K652-RGB-PRO, K652GG-RGB-PRO, ET-8909

B. Internal Devices

Device	Manufacturer	Model
N/A		

C. Peripherals

Device	Manufacturer	Model	Cable
N/A			

D. EUT Exercise

The EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements.

1.8 EUT Modifications

No modification by SHENZHEN TIMEWAY TESTING LABORATORIES

1.9 Tests or Witness Test Engineering

Test By: _____

Printing Name: Andy Xing

2. Technical Test

2.1 Summary of Test Results

No deviations from the technical specification(s) were ascertained in the course of the tests Performed	
Final Verdict: (Only “Passed” if all Measurements are “Passed”)	**Pass**

2.2 Test Report

Test Report Reference

List of Measurements		
Parameter to be measured	**Clause**	**Result**
Transmitter Parameters		
RF output power	Clause 4.3.1.2	Pass
Duty Cycle, Tx-sequence, Tx-gap	Clause 4.3.1.3	N/A
Accumulated Transmit Time, Frequency Occupation and Hopping Sequence	Clause 4.3.1.4	Pass
Hopping Frequency Separation	Clause 4.3.1.5	Pass
Medium Utilisation (MU) Factpr	Clause 4.3.1.6	N/A
Adaptivity (Adaptive Frequency Hopping)	Clause 4.3.1.7	N/A
Occupied Channel Bandwidth	Clause 4.3.1.8	Pass
Transmitter unwanted emissions in the out-of-band domain	Clause 4.3.1.9	Pass
Transmitter unwanted emissions in the spurious domain	Clause 4.3.1.10	Pass
Receiver Parameters		
Receiver Spurious Emissions	Clause 4.3.1.11	Pass
Receiver Blocking	Clause 4.3.1.12	Pass
Geo-location capability	Clause 4.3.1.13	N/A*

Note: The clause numbers are referenced to ETSI EN 300 328 v2.2.2 (2019-07)

Note: 1.N/A= Not applicable. Because these requirements do not apply for equipment with a maximum declared RF Output power of less than 10 dBm e.i.r.p. or for equipment when operating in a mode where the RF Output power is less than 10 dBm e.i.r.p. For the EUT, the RF output power less than 10dBm.

2. N/A*: EUT without Geo-location capability

Clause 4.3.1.2 RF output Power (Conducted)

Test Method according to clause 5.4.2.2.1

GFSK Mode

Test Conditions	Transmitter Power （dBm) EIRP				
	T_{nom} (25℃)	T_{min} (-20℃)		T_{max} (40℃)	
	DC3.7V	DC4.2V	DC3.3V	DC4.2V	DC3.3V
Low Freq.2402MHz	-1.69	-1.61	-1.73	-1.57	-1.77
Mid Freq.2441MHz	-1.77	-1.72	-1.84	-1.66	-1.88
High Freq.2480MHz	-1.62	-1.53	-1.66	-1.50	-1.72

Limits: Clause 4.3.1.2.3

The maximum RF output power for adaptive Frequency Hopping equipment shall be equal to or less than 20 dBm.

Clause 4.3.1.4 Accumulated Transmit Time, Minimum Frequency Occupation and Hopping Sequence

For Adaptive frequency hopping system

Test method according to Clause 5.4.4.2.1

2402 MHz

Accumulated Transmit Time								
Mode	Number of Hopping Channel	Number of transmission in a period (Channel Number * 0.4sec)				Length of transmissions Time (ms)	Result (ms)	Limit (ms)
		Period (Sec)	Sweep Time (Sec)	Times in a sweep	Times in a period			
DH1	79	31.6	6	70	368.7	0.541	199.5	400
DH3	79	31.6	6	32	168.5	1.764	297.2	400
DH5	79	31.6	6	22	115.9	2.986	346.1	400

Minimum Frequency Occupation Time					
Mode	Number of Hopping Channel	Number of transmission in a period of 4* Dwell * number of hopping channel	Length of transmissions Time (ms)	Result (ms)	Minimum Limit (ms)
DH1	79	2	0.541	1.082	0.541
DH3	79	3	1.764	5.292	1.764
DH5	79	3	2.986	8.958	2.986

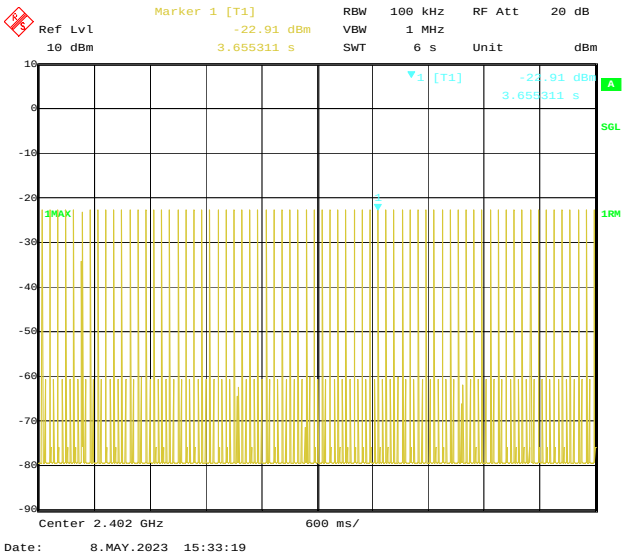
2480 MHz

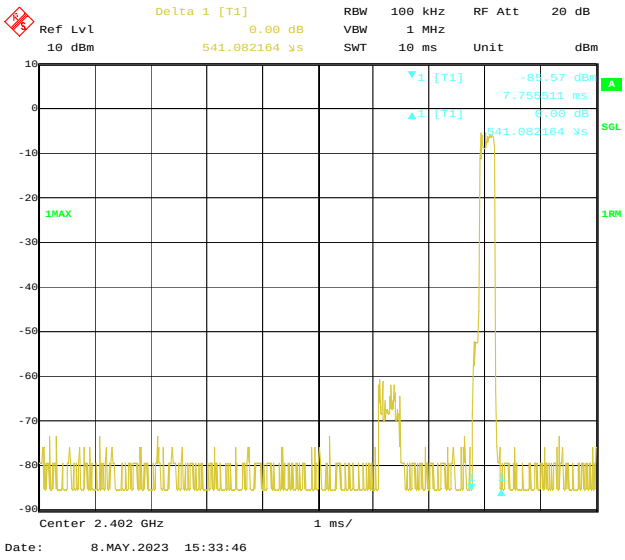
Accumulated Transmit Time								
Mode	Number of Hopping Channel	Number of transmission in a period (Channel Number * 0.4sec)				Length of transmissions Time (ms)	Result (ms)	Limit (ms)
		Period (Sec)	Sweep Time (Sec)	Times in a sweep	Times in a period			
DH1	79	31.6	6	70	368.7	0.521	192.1	400
DH3	79	31.6	6	32	168.5	1.784	300.6	400
DH5	79	31.6	6	21	110.6	2.946	325.8	400

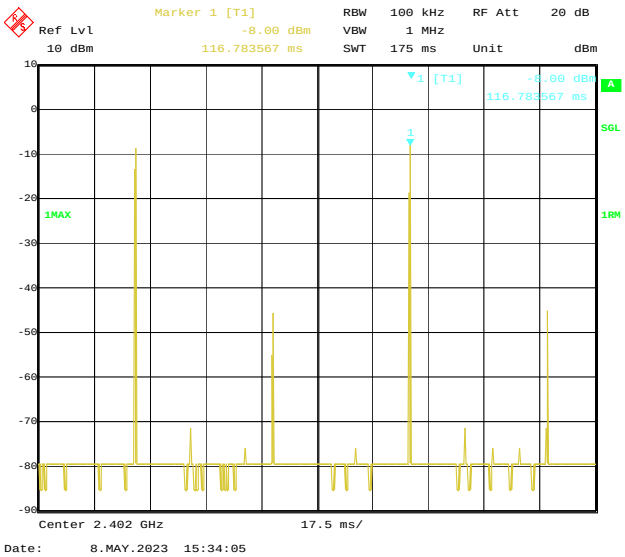
Minimum Frequency Occupation Time					
Mode	Number of Hopping Channel	Number of transmission in a period of 4* Dwell * number of hopping channel	Length of transmissions Time (ms)	Result (ms)	Minimum Limit (ms)
DH1	79	2	0.521	1.042	0.521
DH3	79	3	1.784	5.352	1.784
DH5	79	3	2.946	8.838	2.946

2402 MHz

DH1







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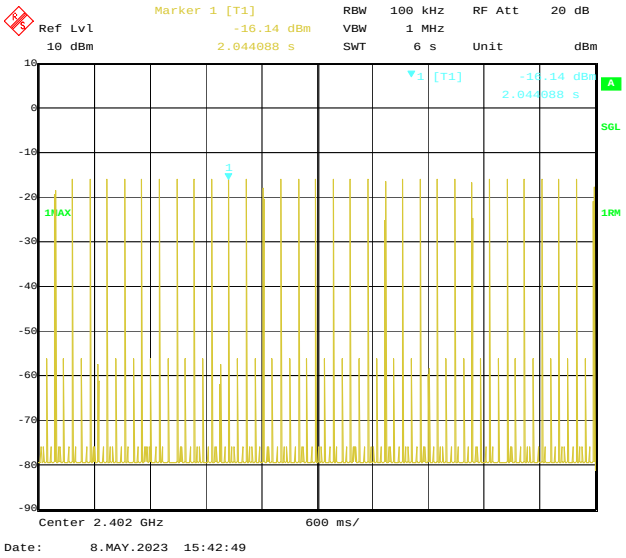

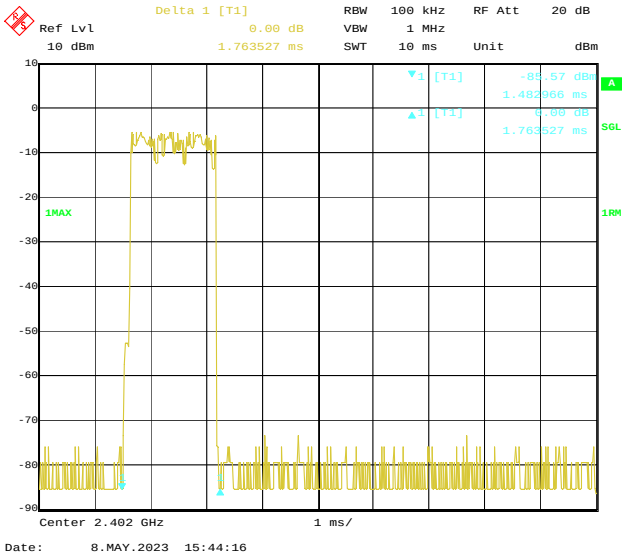

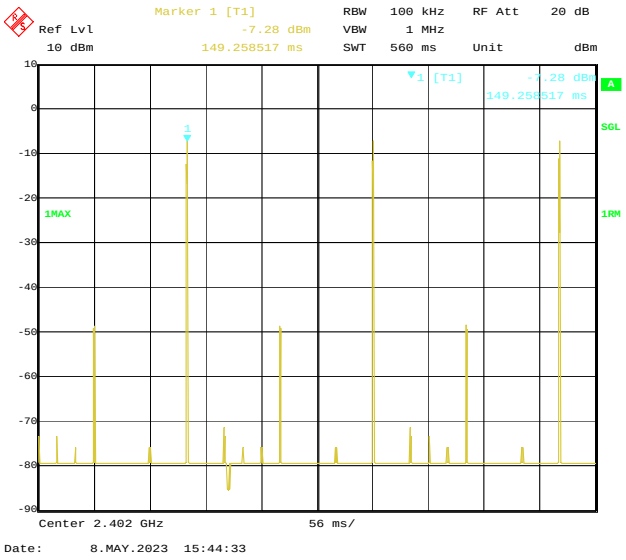

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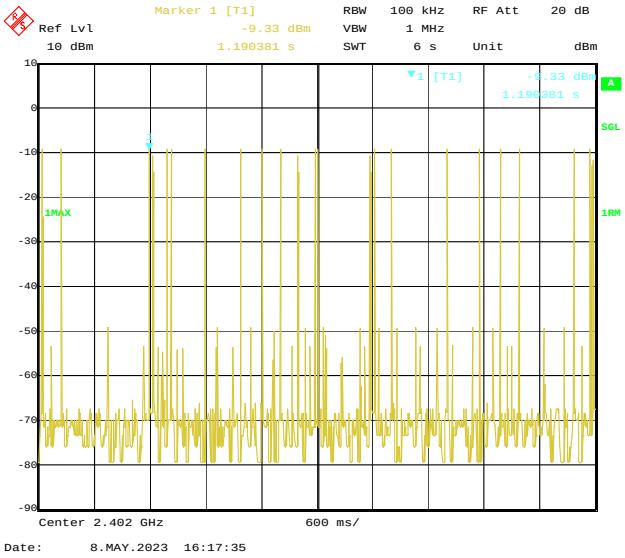
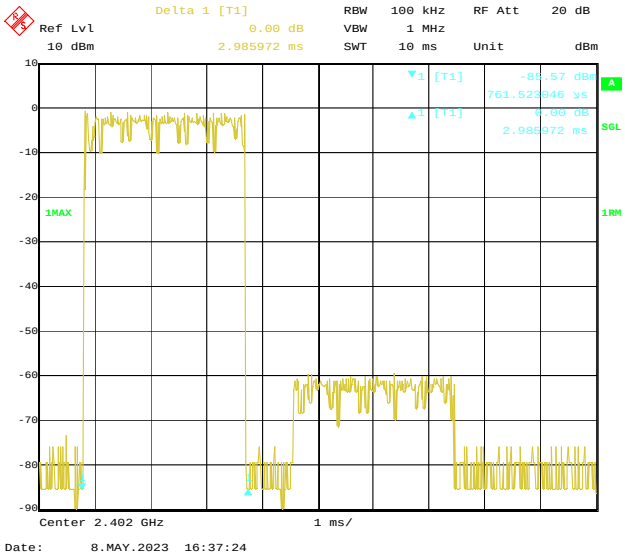
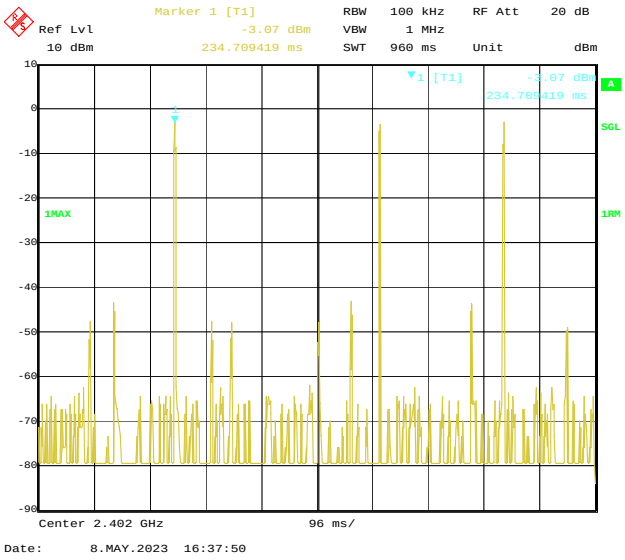
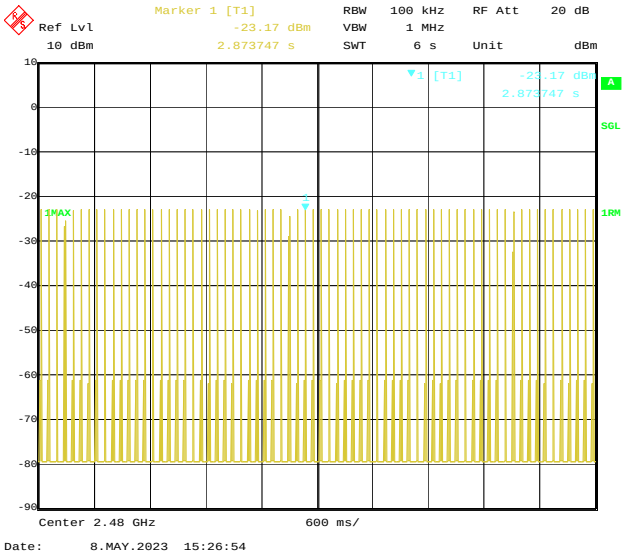


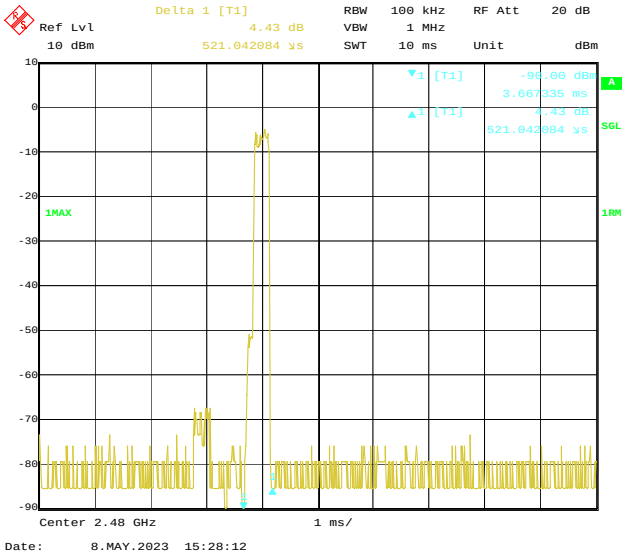


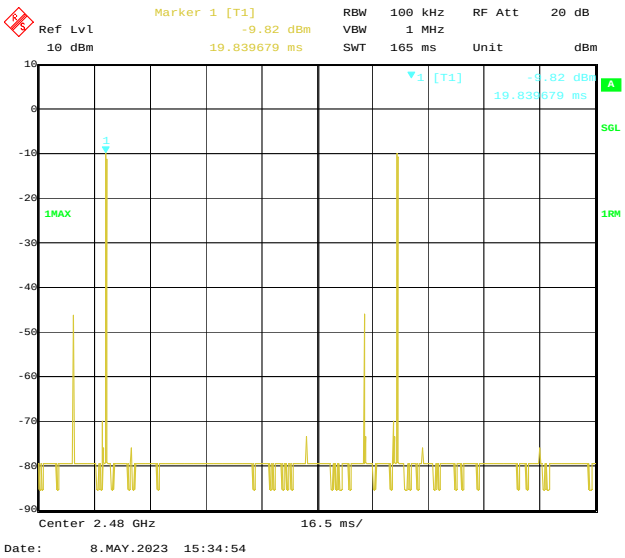


2480 MHz

DH1







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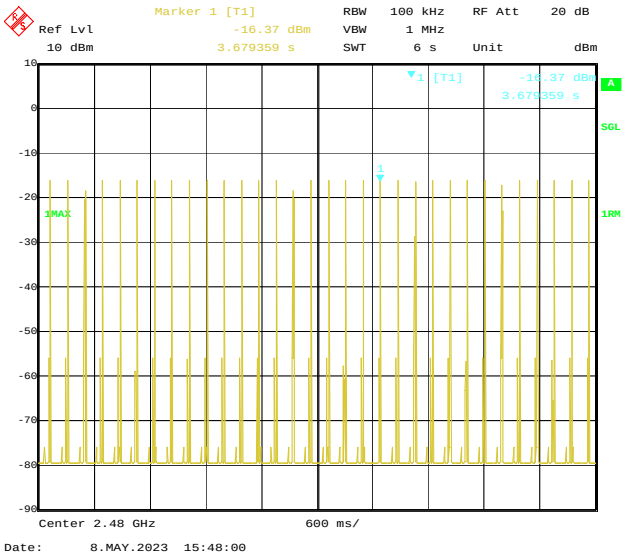

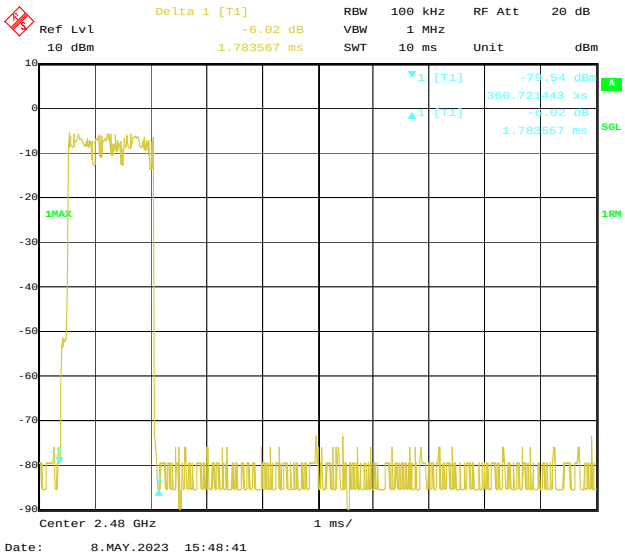

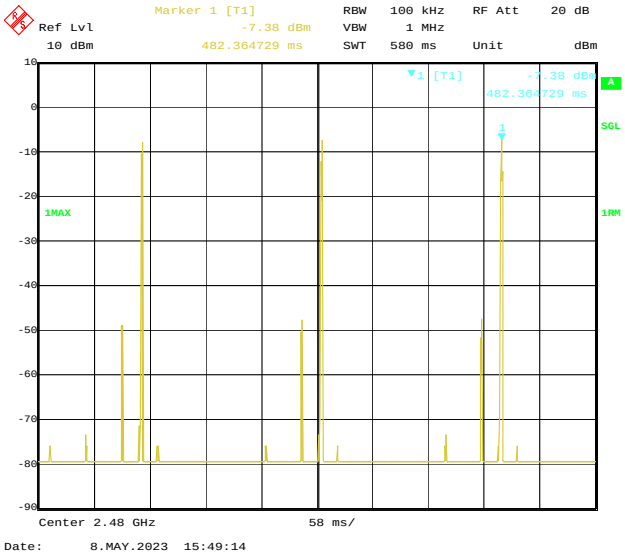

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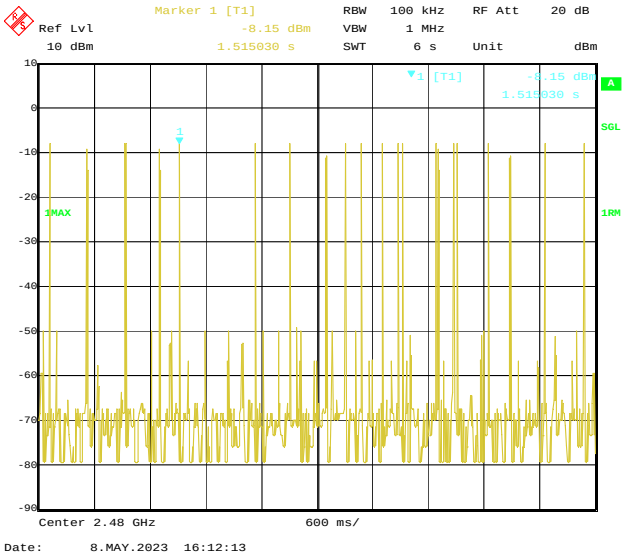
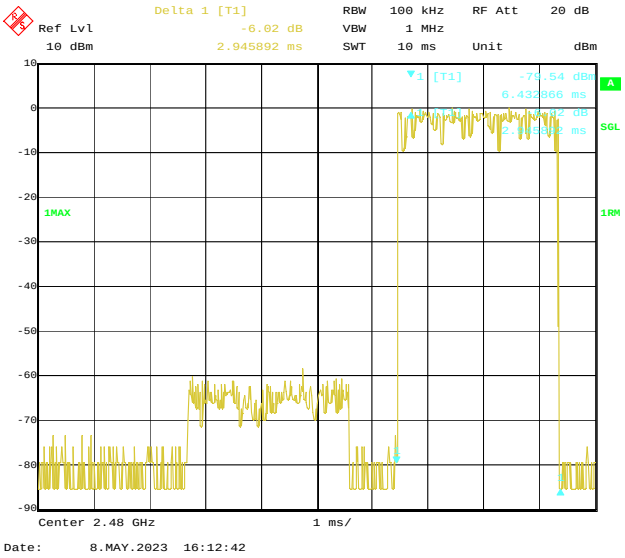
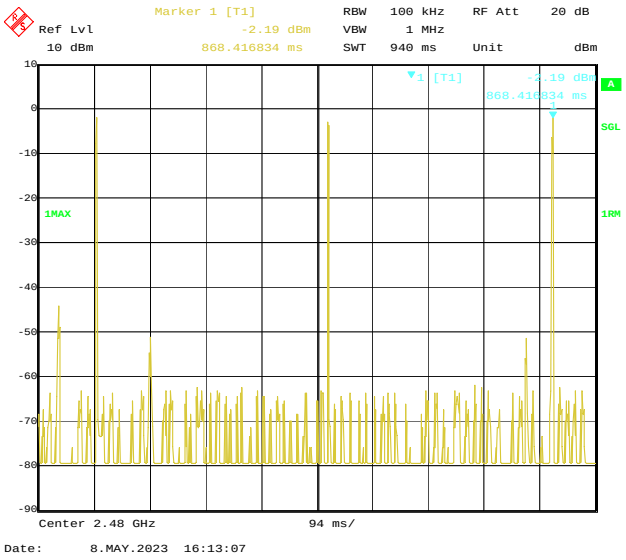


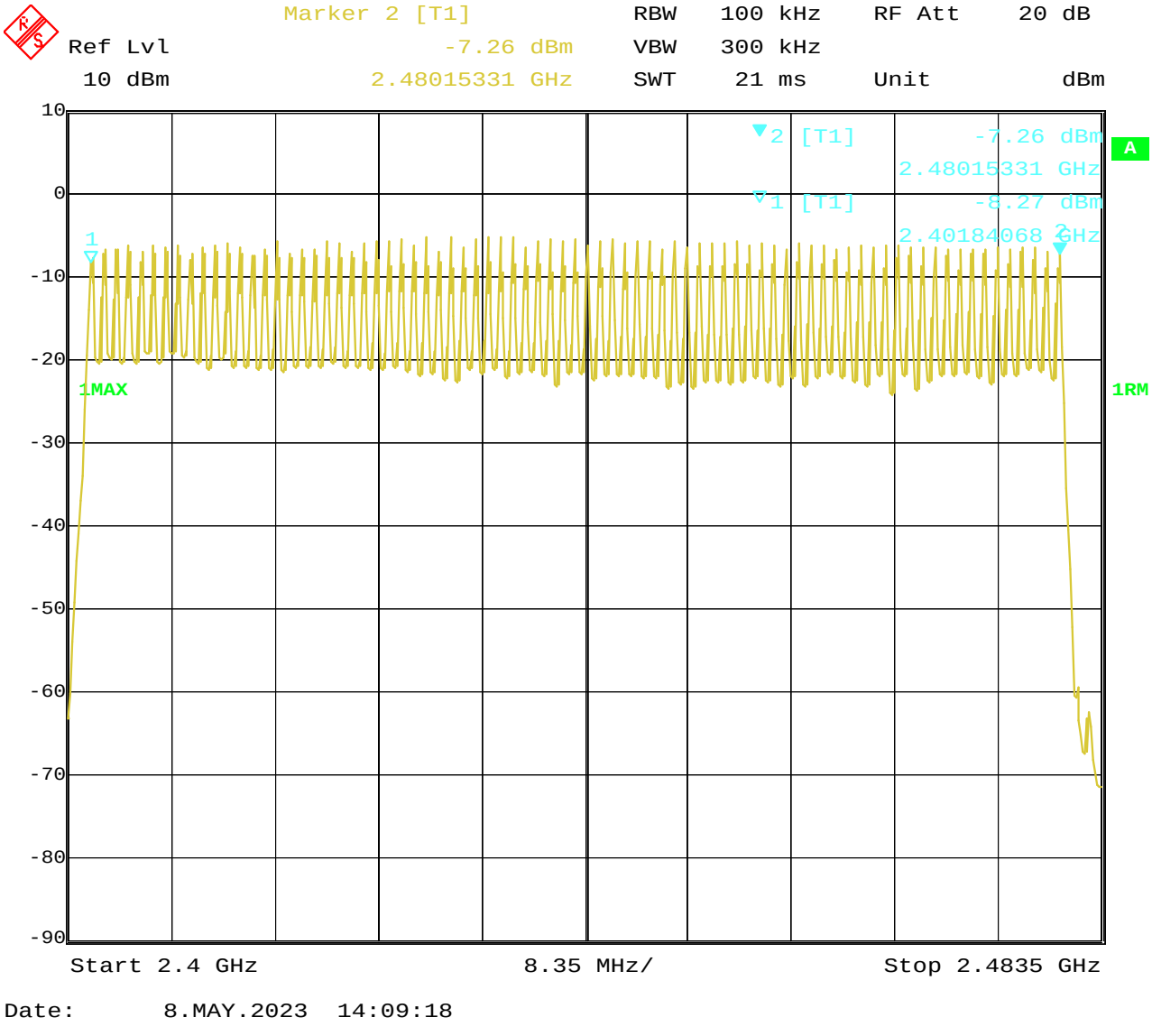




Hopping sequence

EUT	REDRAGON 75% LOW-PROFILE WIRELESS MECHANICAL KEYBOARD	Model	K652-RGB-PRO
Mode	Hopping On	Input Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH

Operating Frequency	Number of hopping channels	Limit	Pass/ Fail
2402-2480MHz	79	≥ 15	Pass

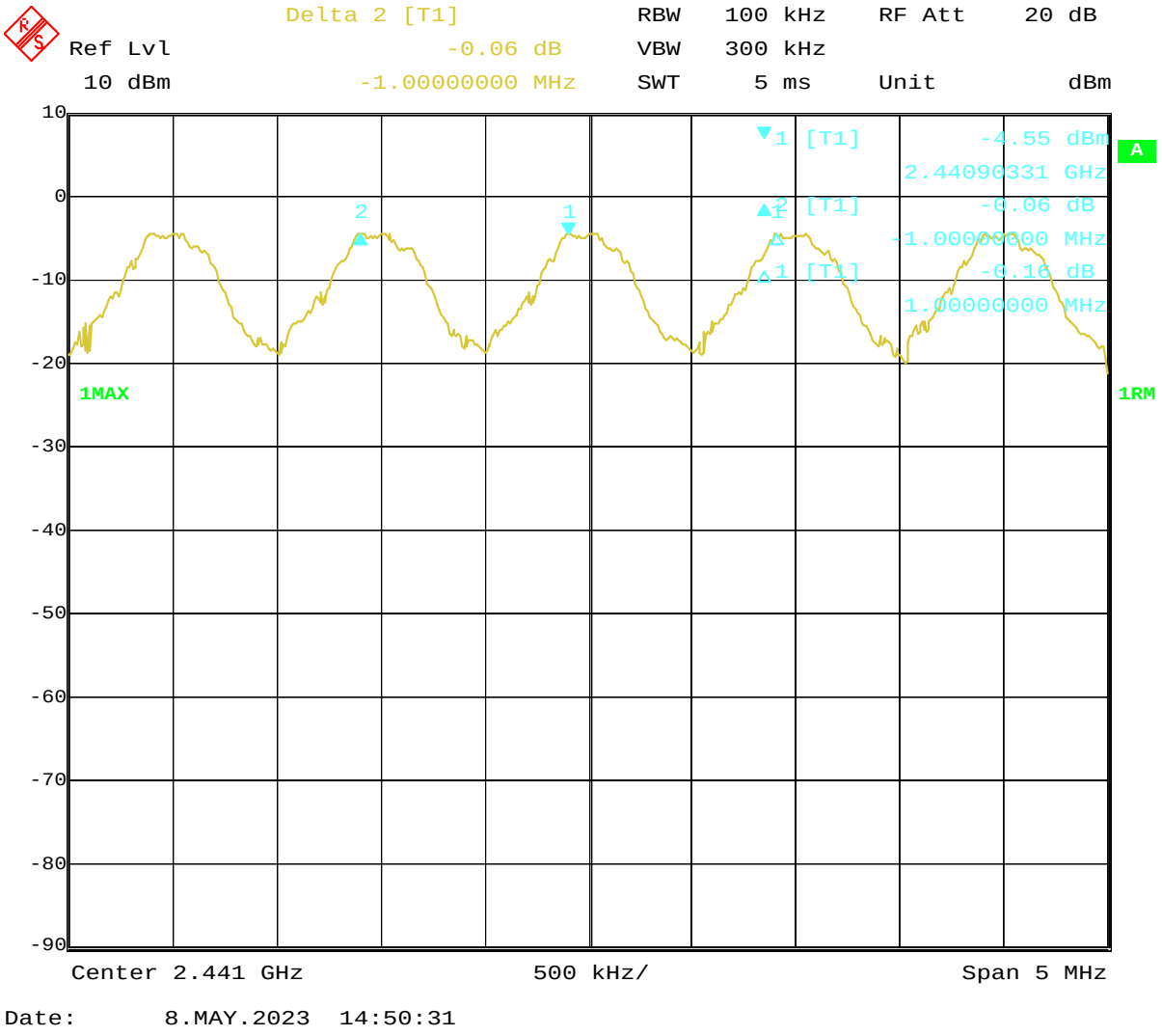


Date: 8.MAY.2023 14:09:18

Clause 4.3.1.5 Hopping Frequency Separation

Test method according to Clause 5.4.5.2.1.3

EUT	REDRAGON 75% LOW-PROFILE WIRELESS MECHANICAL KEYBOARD		Model	K652-RGB-PRO
Mode	Hopping On		Input Voltage	DC3.7V
Temperature	24 deg. C,		Humidity	56% RH
Channel	Channel Frequency (MHz)	Carrier Frequency Separation	Limit	Pass/ Fail
Middle	2441	1.000MHz	≥100kHz	Pass



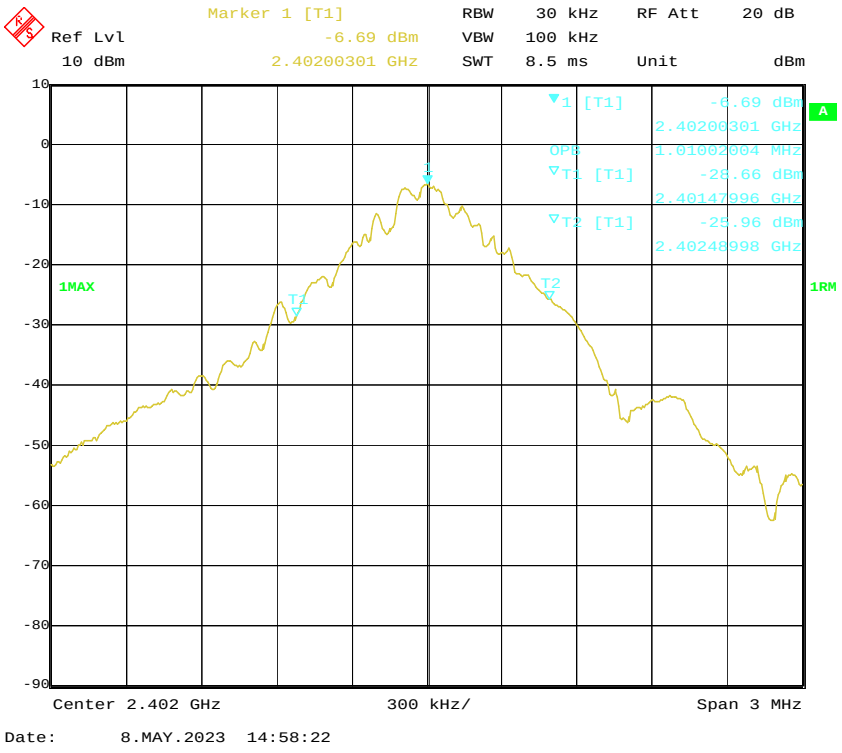
Clause 4.3.1.8 Occupied Channel Bandwidth

Test method according to Clause 5.4.7.2.1

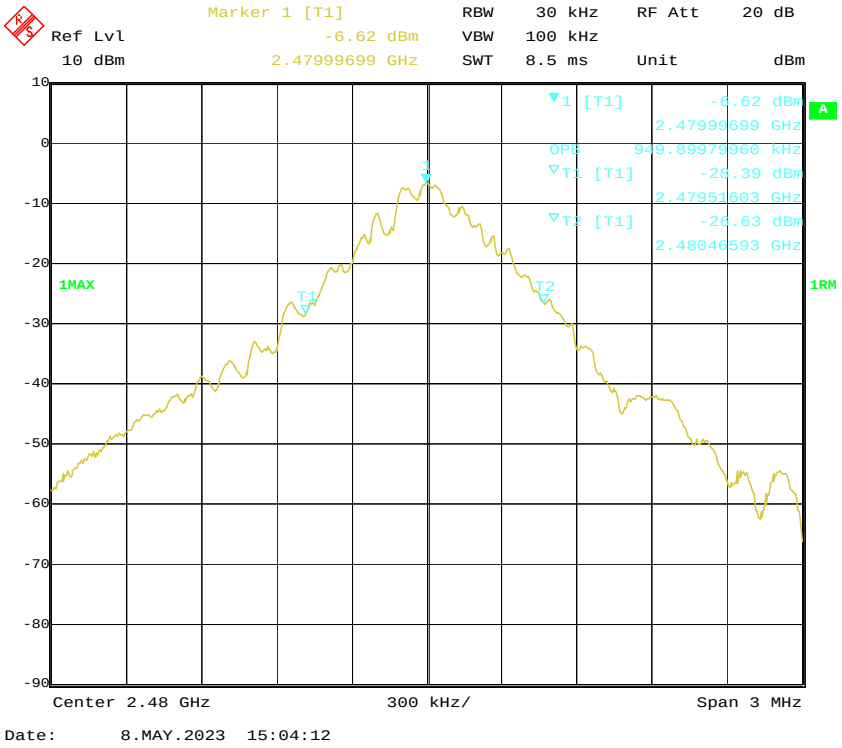
EUT	REDRAGON 75% LOW-PROFILE WIRELESS MECHANICAL KEYBOARD	Model	K652-RGB-PRO
Mode	Hopping On	Input Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH

Channel	Channel Frequency (MHz)	99% Channel Bandwidth (kHz)	Measured Frequency (MHz)	Limit (MHz)
Low	2402	1010	2401.48	≥2400
High	2480	950	2480.47	≤2483.5
Result: Pass				

Low Channel



High Channel



Clause 4.3.1.9 Transmitter unwanted emissions in the out-of-band domain

Test method according to Clause 5.4.8.2.1

EUT	REDRAGON 75% LOW-PROFILE WIRELESS MECHANICAL KEYBOARD	Model	K652-RGB-PRO
Mode	Hopping On	Input Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH

Channel Frequency		2402MHz (OCB:1.010MHz)		2480MHz (OCB: 0.950MHz)	
Test Condition		OOB Emission (MHz)		OOB Emission (MHz)	
		2398.99-2400	2397.98-2398.99	2483.5-2484.45	2484.45-2485.40
		Max. Power (dBm/MHz	Max. Power (dBm/MHz	Max. Power (dBm/MHz	Max. Power (dBm/MHz
T_{nor} 25℃	V_{nor} (V)	-47.62	-52.24	-48.67	-53.47
T_{min} -20℃	V_L (V)	-47.68	-52.39	-48.83	-53.62
T_{max} 40℃	V_L (V)	-47.48	-52.18	-48.74	-53.60
T_{min} -20℃	V_H (V)	-47.63	-52.15	-48.62	-53.35
T_{max} 40℃	V_H (V)	-47.58	-51.21	-48.58	-53.43
Limit (dBm)		-10	-20	-10	-20
Pass/Fail		Pass	Pass	Pass	Pass

Clause 4.3.1.10 Transmitter unwanted emissions in the spurious domain

(Radiated)

Transmitter Operating

Note:

1. Measurements were done on low & high channels, but depicting the worst case are submitted in the report.
2. The spurious emissions were done with different settings, using the relevant pre-amplifiers for the relevant frequency ranges.
3. The test frequency range is from 30M-12.75G and please see clause 5.4.9.2.2 of EN 300 328 for the test method.

Lowest Frequency （2402MHz）			Highest Frequency (2480MHz)		
f(MHz)	Band-Width (kHz)	Level (dBm)	f(MHz)	Band-Width (kHz)	Level (dBm)
4804	1000	-45.6	4960	1000	-44.9
Measurement Uncertainty		±6dB			

Limits Clause 4.3.1.10.3

Table 4: Transmitter limits for spurious emissions

Frequency range	Maximum power	Bandwidth
30 MHz to 47 MHz	-36 dBm	100 kHz
47 MHz to 74 MHz	-54 dBm	100 kHz
74 MHz to 87,5 MHz	-36 dBm	100 kHz
87,5 MHz to 118 MHz	-54 dBm	100 kHz
118 MHz to 174 MHz	-36 dBm	100 kHz
174 MHz to 230 MHz	-54 dBm	100 kHz
230 MHz to 470 MHz	-36 dBm	100 kHz
470 MHz to 694 MHz	-54 dBm	100 kHz
694 MHz to 1 GHz	-36 dBm	100 kHz
1 GHz to 12,75 GHz	-30 dBm	1 MHz

Clause 4.3.1.11 Receiver Spurious Emissions
(Radiated)

Note:
1. Measurements were done on low & high channels, but depicting the worst case are submitted in the report.
2. The receiver spurious emissions were done with different settings, using the relevant and pre-amplifiers for the relevant frequency ranges.
3. The test frequency range is from 30M-12.75G and please see clause 5.4.10.2.2 of EN 300 328 for the test method.

Low Channel			High Channel		
f(MHz)	Band-Width (kHz)	Level (dBm)	f(MHz)	Band-Width (kHz)	Level (dBm)
319.35	120	-70.2	259.08	120	-70.8
Measurement Uncertainty		±6dB			

Limits Clause 4.3.1.11.3

Table 5: Spurious emission limits for receivers

Frequency range	Maximum power	Bandwidth
30 MHz to 1 GHz	-57 dBm	100 kHz
1 GHz to 12,75 GHz	-47 dBm	1 MHz

Clause 4.3.1.12 Receiver Blocking

Definition

Receiver blocking is a measure of the ability of the equipment to receive a wanted signal on its operating channel without exceeding a given degradation due to the presence of an unwanted input signal (blocking signal) at frequencies other than those of the operating band and spurious responses.

Performance Criteria

For equipment that supports a PER or FER test to be performed, the minimum performance criterion shall be a PER or FER less than or equal to 10 %.

For equipment that does not support a PER or a FER test to be performed, the minimum performance criterion shall be no loss of the wireless transmission function needed for the intended use of the equipment.

Limits

While maintaining the minimum performance criteria as defined in clause 4.3.2.11.3, the blocking levels at specified frequency offsets shall be equal to or greater than the limits defined for the applicable receiver category provided in table 14, table 15 or table 16.

Receiver Category 1

Table 14 contains the Receiver Blocking parameters for Receiver Category 1 equipment.

Table 14: Receiver Blocking parameters for Receiver Category 1 equipment

Wanted signal mean power from companion device (dBm) (see notes 1 and 4)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 4)	Type of blocking signal
(-133 dBm + 10 × $\log_{10}$(OCBW)) or -68 dBm whichever is less (see note 2)	2 380 2 504	-34	CW
(-139 dBm + 10 × $\log_{10}$(OCBW)) or -74 dBm whichever is less (see note 3)	2 300 2 330 2 360 2 524 2 584 2 674		

NOTE 1: OCBW is in Hz.

NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P_{min} + 26 dB where P_{min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.

NOTE 3: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P_{min} + 20 dB where P_{min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.

NOTE 4: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.

Receiver Category 2

Table 15 contains the Receiver Blocking parameters for Receiver Category 2 equipment.

Table 15: Receiver Blocking parameters receiver Category 2 equipment

Wanted signal mean power from companion device (dBm) (see notes 1 and 3)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 3)	Type of blocking signal
(-139 dBm + 10 × $\log_{10}$(OCBW) + 10 dB) or (-74 dBm + 10 dB) whichever is less (see note 2)	2 380 2 504 2 300 2 584	-34	CW

NOTE 1: OCBW is in Hz.

NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P_{min} + 26 dB where P_{min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.

NOTE 3: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.

Receiver Category 3

Table 16 contains the Receiver Blocking parameters for Receiver Category 3 equipment.

Table 16: Receiver Blocking parameters receiver Category 3 equipment

Wanted signal mean power from companion device (dBm) (see notes 1 and 3)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 3)	Type of blocking signal
(-139 dBm + 10 × $\log_{10}$(OCBW) + 20 dB) or (-74 dBm + 20 dB) whichever is less (see note 2)	2 380 2 504 2 300 2 584	-34	CW
NOTE 1: OCBW is in Hz. NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to P_{min} + 30 dB where P_{min} is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal. NOTE 3: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.			

Test Conditions

See clause 5.1 for the environmental test conditions. These measurements shall only be performed at normal test conditions. For non-FHSS equipment, having more than one operating channel, the operating channels on which the testing has to be performed shall be selected as follows:

• For testing blocking frequencies less than 2 400 MHz, the equipment shall operate on the lowest operating channel.

• For testing blocking frequencies greater than 2 500 MHz, the equipment shall operate on the highest operating channel.

Equipment which can change their operating channel automatically (adaptive channel allocation), and where this function cannot be disabled, shall be tested as a FHSS equipment.

If the equipment can be configured to operate with different Nominal Channel Bandwidths (e.g. 20 MHz and 40 MHz) and different data rates, then the combination of the smallest channel bandwidth and the lowest data rate for this channel bandwidth which still allows the equipment to operate as intended shall be used. This mode of operation shall be aligned with the performance criteria defined in clause 4.3.1.12.3 or clause 4.3.2.11.3 and shall be described in the test report.

Test Configuration

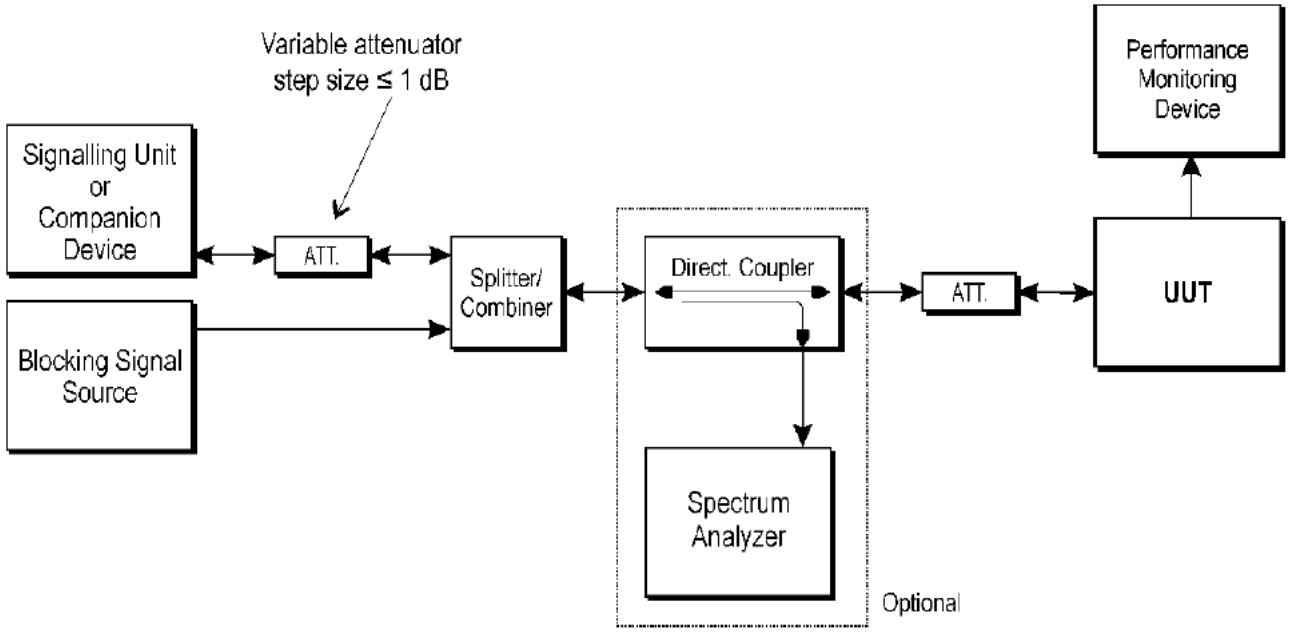


Figure 6: Test Set-up for receiver blocking

Test Method

For systems using multiple receive chains only one chain (antenna port) need to be tested. All other receiver inputs shall be terminated.
The procedure in step 1 to step 6 below shall be used to verify the receiver blocking requirement as described in clause 4.3.1.12 or clause 4.3.2.11. The performance monitoring device is capable of verifying the performance criteria as defined in clause 4.3.1.12.3 or clause 4.3.2.11.3.

Table 6, table 7 and table 8 in clause 4.3.1.12.4 contain the applicable blocking frequencies and blocking levels for each of the receiver categories for testing Receiver Blocking on FHSS equipment.

Table 14, table 15 and table 16 in clause 4.3.2.11.4 contain the applicable blocking frequencies and blocking levels for each of the receiver categories for testing Receiver Blocking on non-FHSS equipment.

Step1:

• For non-FHSS equipment, the UUT shall be set to the lowest operating channel on which the blocking test has to be performed (see clause 5.4.11.1).

Step 2:

• The blocking signal generator is set to the first frequency as defined in the appropriate table corresponding to

the receiver category and type of equipment.

Step 3:

• With the blocking signal generator switched off, a communication link is established between the UUT and the associated companion device using the test setup shown in figure 6.

• Unless the option provided in note 2 of the applicable table referred to in clause 5.4.11.2.1 is used, the level of the wanted signal shall be set to the value provided in the table corresponding to the receiver category and type of equipment. The test procedure defined in clause 5.4.2, and more in particular clause 5.4.2.2.1.2, can be used to measure the (conducted) level of the wanted signal however no correction shall be made for antenna gain of the companion device (step 6 in clause 5.4.2.2.1.2 shall be ignored). This level may be measured directly at the output of the companion device and a correction is made for the coupling loss into the UUT. The actual level for the wanted signal shall be recorded in the test report.

• When the option provided in note 2 of the applicable table referred to in clause 5.4.11.2.1 is used, the attenuation of the variable attenuator shall be increased in 1 dB steps to a value at which the minimum performance criteria as specified in clause 4.3.1.12.3 or clause 4.3.2.11.3 is still met. The resulting level for the wanted signal at the input of the UUT is Pmin. This signal level (Pmin) is increased by the value provided in note 2 of the applicable table corresponding to the receiver category and type of equipment.

Step 4:

• The blocking signal at the UUT is set to the level provided in the table corresponding to the receiver category and type of equipment.

• If the performance criteria as specified in clause 4.3.1.12.3 or clause 4.3.2.11.3 are met then proceed to step 6.

Step 5:

• If the performance criteria as specified in clause 4.3.1.12.3 or clause 4.3.2.11.3 is not met, step 3 and step 4 shall be repeated after that the frequency of the blocking signal set in step 2 has been increased with a value equal to the Occupied Channel Bandwidth except:

- For the blocking frequency 2 380 MHz, where this frequency offset shall be less than or equal to 10 MHz. If this frequency offset is more than 7 MHz, the level of the wanted signal shall be increased by 3 dB.

- For the blocking frequency 2 503,5 MHz, where this frequency offset shall be less than or equal to 10 MHz. If this frequency offset is more than 7 MHz, the level of the wanted signal shall be decreased by 3 dB.

• If the performance criteria as specified in clause 4.3.1.12.3 or clause 4.3.2.11.3 is still not met, step 3 and step 4 shall be repeated after that the frequency of the blocking signal set in step 2 has been decreased with a value equal to the Occupied Channel Bandwidth except:

- For the blocking frequency 2 380 MHz, where this frequency offset shall be less than or equal to 10 MHz. If this frequency offset is more than 7 MHz, the level of the wanted signal shall be decreased by 3 dB.

- For the blocking frequency 2 503,5 MHz, where this frequency offset shall be less than or equal to 10 MHz. If this frequency offset is more than 7 MHz, the level of the wanted signal shall be increased by 3 dB.

• If the performance criteria as specified in clause 4.3.1.12.3 or clause 4.3.2.11.3 is still not met, the UUT fails to comply with the Receiver Blocking requirement and step 6 and step 7 are no longer required.
• It shall be recorded in the test report whether the shift of blocking frequencies as described in the present step was used.

Step 6:
• Repeat step 4 and step 5 for each remaining combination of frequency and level for the blocking signal as provided in the table corresponding to the receiver category and type of equipment.

Step 7:
• For non-FHSS equipment, repeat step 2 to step 6 with the UUT operating at the highest operating channel on which the blocking test has to be performed (see clause 5.4.11.1).

Step 8:
• It shall be assessed and recorded in the test report whether the UUT complies with the Receiver Blocking requirement.

Test Result

The EUT is regarded as category 3 Receiver

Hopping Mode

Wanted signal mean power from companion device(dBm)	Blocking signal frequency (MHz)	Blocking signal power(dBm)	PER	Result
-58.96	2380	-35.85	0%	Pass
-58.96	2300	-35.85	0%	Pass
-59.22	2504	-35.85	0%	Pass
-59.22	2584	-35.85	0%	Pass

3.0 Product Labelling

CE Mark label specification

Text of the mark is black or white in color and is left justified. Labels are printed in indelible ink on permanent adhesive backing and shall be affixed at a conspicuous location on the EUT or silk-screened onto the EUT.

Mark Location: Rear enclosure

4.0 Photographs – Test Setup

Spurious Radiated emission test view

5.0 Photographs – EUT

Please refer test report TW2304096-01E

6.0 Test Equipment					
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	R&S	ESPI 3	100379	2022-07-15	2023-07-14
TWO Line-V-NETW	R&S	EZH3-Z5	100294	2022-07-18	2023-07-17
TWO Line-V-NETW	R&S	EZH3-Z5	100253	2022-07-18	2023-07-17
Ultra Broadband ANT	R&S	HL562	100157	2022-07-18	2023-07-17
ESVB Test Receiver	R&S	ESVB	826156/011	2022-07-15	2023-07-14
Impuls-Begrenzer	R&S	ESH3-Z2	100281	2022-07-18	2023-07-17
5K VA AC Power Source	California Instruments	5001iX	56060	2022-07-15	2023-07-14
CDN	EM TEST	CDN M2/M3	-	2022-07-15	2023-07-14
Attenuation	EM TEST	ATT6/75	-	2022-07-15	2023-07-14
Resistance	EM TEST	R100	-	2022-07-15	2023-07-14
Electromagnetic Injection Clamp	LITTHI	EM101	35708	2022-07-15	2023-07-14
Inductive Components	EM TEST	MC2630	-	2022-07-15	2023-07-14
Antenna	EM TEST	MS100	-	2022-07-15	2023-07-14
Signal Generator	R&S	SMT03	100029	2022-07-15	2023-07-14
Power Amplifier	AR	150W1000	300999	2022-07-15	2023-07-14
Field probe	Holaday	HI-6005	105152	2022-07-15	2023-07-14
Bilog Antenna	Chase	CBL6111C	2576	2022-07-18	2025-07-17
Loop Antenna	EMCO	6507	00078608	2022-07-18	2025-07-17
Test Receiver	R&S	ESI26	838786/013	2022-07-15	2023-07-14
966 Chamber	YIHENG	--	N/A	2022-07-26	2025-07-25
Vector Signal Generator	AGILENT	E4438C	MY49070163	2023-01-12	2024-01-11
Splitter	Mini-Circuits	ZAP-50W	NN256400424	2023-01-12	2024-01-11
Directional Coupler	AGILENT	87300C	MY44300299	2023-01-12	2024-01-11
vector Signal Generator	AGILENT	E4438C	US44271917	2023-01-12	2024-01-11

4 Ch.Simultaneous Sampling 14 Bits 2 MS/s	AGILENT	U2531A	TW54063507	2023-01-12	2024-01-11
4 Ch.Simultaneous Sampling 14 Bits 2 MS/s	AGILENT	U2531A	TW54063513	2023-01-12	2024-01-11
Splitter	Mini	PS3-7	4463	2023-01-12	2024-01-11
Spectrum Analyzer	AGILENT	E7405A	US44210471	2023-01-12	2024-01-11
Attenuator	Resnet	20dB	(n.a)	2023-01-12	2024-01-11
Signal Analyzer	AGILENT	N9010A	MY48030494	2023-01-12	2024-01-11
ESD Simulator	NoiseKen	ESS-2002	ESS06Y6394	2022-07-18	2023-07-17
Continuous Wave Simulator	EM TEST	CWS 500N	0704-05	2022-07-15	2023-07-14
Ultra Compact Simulator	EM TEST	UCS 500 M4	0304-42	2022-07-15	2023-07-14
Pre-Amplifier	HP	8447B	--	2022-07-15	2023-07-14
Horn Antenna	SchwarzBeck	BBHA9120D	01919	2022-07-18	2023-07-17
BiConiLog Antenna	SchwarzBeck	9163	1139	2022-07-18	2023-07-17
Pre-Amplifier	SchwarzBeck	BBV 9743	#218	2022-07-15	2023-07-14

7.0 Measurement Uncertainty

Test Item	Uncertainty
Occupied Channel Bandwidth	±5%
RF output power, conducted	±5%
Power Spectral Density, conducted	±3dB
Unwanted Emissions, conducted	±3dB
All emissions, radiated	±6dB
Temperature	±3℃
Humidity	±5%
DC and low frequency voltages	±3%
Time	±5%
Duty Cycle	±5%

End of the Report