DFLY GLOBAL LIMITED

TEST REPORT

SCOPE OF WORK
FCC Testing – DF, DFX

REPORT NUMBER
230118025SZN-001

ISSUE DATE **[REVISED DATE]**
17 July 2023 [----------]

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TEST REPORT

Intertek Report No.: 230118025SZN-001

DFLY GLOBAL LIMITED

Application
For
Certification

FCC ID: 2BAVCDF

DRAGONFLY

Model: DF, DFX

2.4GHz Wi-Fi Transceiver

Report No.: 230118025SZN-001

We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 15, Subpart C for Intentional Radiator,
mention 47 CFR [10-1-21]

Prepared and Checked by:

Vito

Vito Pan
Project Engineer

Approved by:

Ryan

Ryan RQ Chen
Project Engineer
Date: 17 July 2023

MEASUREMENT/TECHNICAL REPORT

This report concerns (check one) Original Grant X Class II Change _____

Equipment Type: DTS - Part 15 Digital Transmission Systems (Wi-Fi transmitter portion)

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes _____ No X

If yes, defer until: _____ date

Company Name agrees to notify the Commission by: _____ date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes _____ No X

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [10-01-21] Edition] provision.

Report prepared by:

Vito Pan
Intertek Testing Services Shenzhen Ltd. Longhua Branch
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Table of Contents

1.0 Summary of Test results

Applicant: DFLY GLOBAL LIMITED
Applicant Address: 136 Kensington Church Street, London,England, W8 4BH
Manufacturer: DFLY GLOBAL LIMITED
Manufacturer Address: 136 Kensington Church Street, London,England, W8 4BH

Model: DF, DFX

FCC ID: 2BAVCDF

TEST ITEM	REFERENCE	RESULTS
Max. Output power	15.247(b)(3)	Pass
6 dB Bandwidth	15.247(a)(2)	Pass
Max. Power Density	15.247(e)	Pass
Out of Band Antenna Conducted Emission	15.247(d)	Pass
Radiated Emission in Restricted Bands	15.247(d), 15.209, 15.205	Pass
AC Conducted Emission	15.207	Pass
Antenna Requirement	15.203	Pass (See Notes)

Notes: The EUT uses an Integral Antenna which in accordance to Section 15.203 is considered sufficient to comply with the provisions of this section.

2.0 General Description

2.1 Product Description

The Equipment Under Test (EUT) is a DRAGONFLY with 2.4G Wi-Fi function operating at 2412-2462MHz for 802.11b/g/n HT20 and 2422-2452MHz for 802.11n HT40, Bluetooth function operating at 2402-2480MHz. The EUT is powered by AC 100-240V,50/60Hz,2.5A(MAX.) from adapter or DC 48V19.6Ah 960Wh from Lithium-ion Battery. For more detailed features description, please refer to the user's manual.

Type of Modulation: BPSK, QPSK, 16QAM, 64QAM for OFDM; CCK, DQPSK, DBPSK for DSSS.
Antenna Type: Integral Antenna
Antenna Gain: 3.21dBi

The Model: DFX is the same as the Model: DF in hardware aspect except for model number, tire appearance, and with or without physical structural components (front fender, left and right turn signals), see below for details:

Model	details
DF	without front fender, without left and right turn signals, Type A tire appearance.
DFX	with front fender, with left and right turn signals, Type B tire appearance.

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

2.2 Related Submittal(s) Grants

This is an application for certification of:
This is an application for certification of a transceiver for the DRAGONFLY which has 2.4GHz WIFI function.
For the Bluetooth function was tested and demonstrated in report 230118025SZN-002.
For the other digital function was tested and demonstrated in FCC SDoC report 230118025SZN-003.

2.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013) and KDB 558074 D01 v05r02. Radiated emission measurement was performed in semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

2.4 Test Facility

The Semi-anechoic chamber and shielded room used to collect the radiated data and conducted data are **Intertek Testing Services Shenzhen Ltd. Longhua Branch** and located at 101, 201, Building B, No. 308 Wuhe Avenue, Zhangkengjing Community, GuanHu Subdistrict, LongHua District, Shenzhen, P.R. China. This test facility and site measurement data have been fully placed on file with File Number: CN1188.

3.0 System Test Configuration

3.1 Justification

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables were manipulated to produce worst case emissions. The EUT was powered by AC 100-240V,50/60Hz,2.5A(MAX.) from adapter or DC 48V19.6Ah 960Wh from Lithium-ion Battery during the test.

On 802.11b/g/n-HT20/n-HT40 mode, one antenna is used, and all data rate were tested and only the worst case data is shown in the report.

For maximizing emissions, the EUT was rotated through 360°, the EUT shall be placed either directly on the reference ground-plane or on up to 12 mm of insulating material. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

The EUT and transmitting antenna was centered on the turntable.

Radiated emission measurement were performed the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

3.2 EUT Exercising Software

The EUT exercise program (provided by client) used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The worst case configuration is used in all specified testing.

The parameters of test software setting:
During the test, Channel and power controlling software provided by the applicant was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the application and is going to be fixed on the firmware of the end product.

Test software: PuTTY, Version: 0.67.0.0

3.3 Special Accessories

N/A.

3.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

3.5 Equipment Modification

Any modifications installed previous to testing by DFLY GLOBAL LIMITED will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Longhua Branch.

3.6 Support Equipment List and Description

Description	Manufacturer	Model No.
Portable computer (Provided by Intertek)	DELL	Latitude 5420
Adapter (Provided by applicant)	D-FLY	Model: LBC015480301 Input: AC 100-240V,2.5A(MAX.),50-60Hz Output: DC 54.6V, 3.0A

4.0 Measurement Results

4.1 Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b)(3):

The antenna power of the EUT was connected to the input of a broadband peak RF power meter. The power meter has a video bandwidth that is greater than DTS bandwidth and utilize a fast-responding diode detector. Power was read directly at the EUT antenna terminals with cable loss added.

For antennas with gains of 6 dBi or less, maximum allowed Transmitter output is 1 watt (+30 dBm).

IEEE 802.11b (CCK, 1Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output (mWatt)
Low Channel: 2412	14.2	26.30
Middle Channel: 2437	13.8	23.99
High Channel: 2462	13.4	21.88

IEEE 802.11g (16QAM, 6Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output (mWatt)
Low Channel: 2412	20.4	109.65
Middle Channel: 2437	20.3	107.15
High Channel: 2462	19.8	95.50

IEEE 802.11n-HT20 (64QAM, 6.5Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output (mWatt)
Low Channel: 2412	20.6	114.82
Middle Channel: 2437	20.1	102.33
High Channel: 2462	20.0	100.00

IEEE 802.11n-HT40 (64QAM, 13.5Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output (mWatt)
Low Channel: 2422	19.2	83.18
Middle Channel: 2437	19.1	81.28
High Channel: 2452	18.5	70.79

Cable loss: 1.0 dB External Attenuation: 0 dB

Cable loss, external attenuation has been included in OFFSET function.

EUT max. output level = 20.6dBm
EUT max. E.I.R.P = 20.6dBm + 3.21dBi = 23.81dBm = 240.44mW

For RF Exposure, the information is saved with filename: RF exposure.pdf.

4.2 Minimum 6 dB RF Bandwidth, FCC Rule 15.247(a) (2):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100 KHz according to FCC KDB 558074 D01 v05r02. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6dB bandwidth was determined from where the channel output spectrum intersected the display line.

Limit: The 6 dB Bandwidth is at least 500 kHz.

Test Result: Please refer to Appendix A1 of “230118025SZN-001_ Appendix”

4.3 Maximum Power Density Reading, FCC Rule 15.247(e):

The Measurement Procedure PKPSD was set according to the FCC KDB 558074 D01 v05r02.

Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

Limit: The Power Density does not exceed 8dBm/3 kHz.

Test Result: Please refer to Appendix B of “230118025SZN-001_ Appendix”

4.4 Out of Band Conducted Emissions, FCC Rule 15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. The Measurement Procedure was set according to the FCC KDB 558074 D01 v05r02.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the passband.

Refer to the attached test plots for out of band conducted emissions data with rate of 1Mbps for 802.11b and 6Mbps for 802.11g and 6.5Mbps for 802.11n-HT20 and 13.5Mbps for 802.11n-HT40.

The test plots showed all spurious emission up to the tenth harmonic were measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

Test Result: Please refer to Appendix C & D of “230118025SZN-001_ Appendix”

4.5 Out of Band Radiated Emissions (for emissions in 4.4 above that are less than 20dB below carrier), FCC Rule 15.247(d):

For out of band emissions that are close to or that exceed the 20dB attenuation requirement described in the specification, radiated measurements were performed at a 3m separation distance to determine whether these emissions complied with the general radiated emission requirement.

[×] Not required, since all emissions are more than 20dB below fundamental
[ ] See attached data sheet

4.6 Transmitter Radiated Emissions in Restricted Bands, FCC Rule 15.35(b) (c):

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included. All measurements were performed with peak detection unless otherwise specified.

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

4.7 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

FS = RA + AF + CF - AG + PD

Where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB
PD = Pulse Desensitization in dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

FS = RA + AF + CF - AG + PD

Example

Assume a receiver reading of 62.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB. The net field strength for comparison to the appropriate emission limit is 42 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 62.0 dBμV
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
PD = 0 dB
FS = 62 + 7.4 + 1.6 - 29 + 0 = 42 dBμV/m

Level in mV/m = Common Antilogarithm [(42 dBμV/m)/20] = 125.9 μV/m

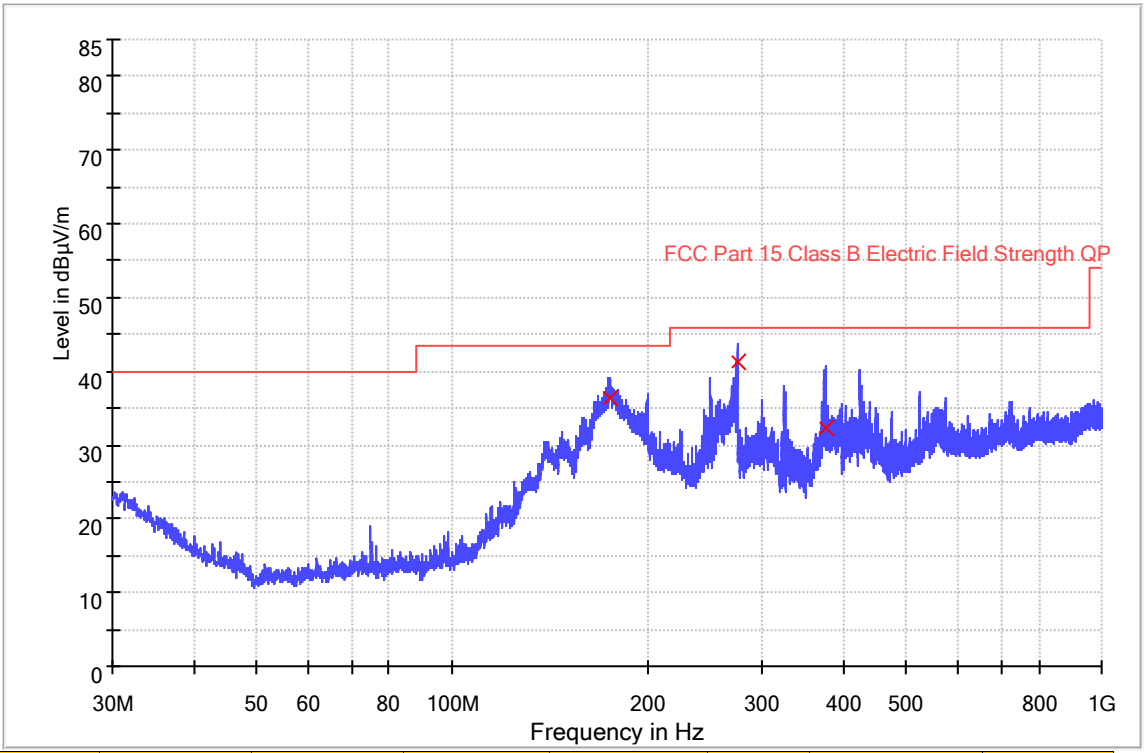
4.8 Radiated Spurious Emission

Worst Case Radiated Spurious Emission
at 2390.000MHz
is passed by 3.3dB margin.

For the electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf.

Applicant: DFLY GLOBAL LIMITED
Date of Test: 26 May 2023 Worst Case Testing Model: DFX
Worst Case Operating Mode: Simultaneous transmission (Wi-Fi+Bluetooth)

ANT Polarity: Horizontal

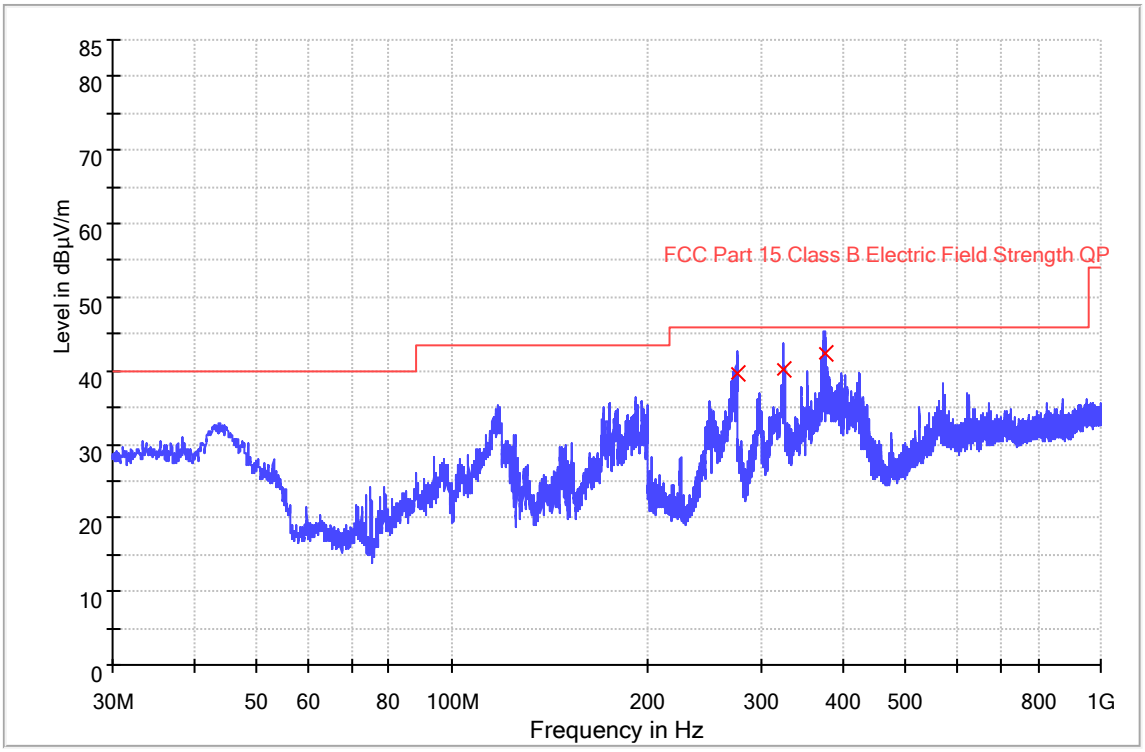


Frequency (MHz)	Quasi Peak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Polarization	Corr. (dB/m)	Margin - QPK (dB)	Limit – QPK (dBµV/m)
174.840000	36.5	1000.0	120.000	H	16.7	7.0	43.5
274.989667	41.4	1000.0	120.000	H	19.7	4.6	46.0
375.481667	32.4	1000.0	120.000	H	24.2	13.6	46.0

Remark:
1. Corr. (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB)
2. Quasi Peak (dBµV/m) = Corr. (dB/m) + Read Level (dBµV)
3. Margin (dB) = Limit Line (dBµV/m) – Level (dBµV/m)

Applicant: DFLY GLOBAL LIMITED
Date of Test: 26 May 2023 Worst Case Testing Model: DFX
Worst Case Operating Mode: Simultaneous transmission (Wi-Fi+Bluetooth)

ANT Polarity: Vertical



Frequency (MHz)	Quasi Peak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Polarization	Corr. (dB/m)	Margin - QPK (dB)	Limit – QPK (dBµV/m)
275.040000	39.7	1000.0	120.000	V	19.7	6.3	46.0
324.600000	40.1	1000.0	120.000	V	21.4	5.9	46.0
374.899667	42.5	1000.0	120.000	V	24.1	3.5	46.0

Remark:
1. Corr. (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB)
2. Quasi Peak (dBµV/m) = Corr. (dB/m) + Read Level (dBµV)
3. Margin (dB) = Limit Line (dBµV/m) – Level (dBµV/m)

Applicant: DFLY GLOBAL LIMITED
Date of Test: 28 March 2023 Worst Case Testing Model: DFX

Radiated Emissions (above 1GHz)

Worst Case Operating Mode: Transmitting (802.11b-Channel 01)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*9648.000	46.6	30.6	37.9	53.9	74.0	-20.1
Vertical	*7236.000	44.7	31.0	37.2	50.9	74.0	-23.1
Vertical	*2390.000	70.1	31.9	27.4	65.6	74.0	-8.4

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*9648.000	38.5	30.6	37.9	45.8	54.0	-8.2
Vertical	*7236.000	34.7	31.0	37.2	40.9	54.0	-13.1
Vertical	*2390.000	34.7	31.9	27.4	49.6	54.0	-4.4

Worst Case Operating Mode: Transmitting (802.11b-Channel 06)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*9748.000	45.4	30.6	37.9	52.7	74.0	-21.3
Vertical	*7311.000	43.8	31.0	37.2	50.0	74.0	-24.0

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*9748.000	37.9	30.6	37.9	45.2	54.0	-8.8
Vertical	*7311.000	35.7	31.0	37.2	41.9	54.0	-12.1

Worst Case Operating Mode: Transmitting (802.11b-Channel 11)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*9848.000	45.4	30.6	37.9	52.7	74.0	-21.3
Vertical	*7386.000	43.6	31.0	37.2	49.8	74.0	-24.2
Vertical	*2483.500	66.8	31.9	27.4	62.3	74.0	-11.7

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*9848.000	36.4	30.6	37.9	43.7	54.0	-10.3
Vertical	*7386.000	34.4	31.0	37.2	40.6	54.0	-13.4
Vertical	*2483.500	54.4	31.9	27.4	49.9	54.0	-4.1

Worst Case Operating Mode: Transmitting (802.11g-Channel 01)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*4824.000	50.6	30.4	32.7	52.9	74.0	-21.1
Vertical	*7236.000	49.2	31.0	37.2	55.4	74.0	-18.6
Vertical	*2390.000	66.9	31.9	27.4	62.4	74.0	-11.6

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*4824.000	42.2	30.4	32.7	44.5	54.0	-9.5
Vertical	*7236.000	41.4	31.0	37.2	47.6	54.0	-6.4
Vertical	*2390.000	54.1	31.9	27.4	49.6	54.0	-4.4

Worst Case Operating Mode: Transmitting (802.11g-Channel 06)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*4874.000	44.0	30.4	32.7	46.3	74.0	-27.7
Vertical	*7311.000	44.0	31.0	37.2	50.2	74.0	-23.8

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*4874.000	33.4	30.4	32.7	35.7	54.0	-18.3
Vertical	*7311.000	34.0	31.0	37.2	40.2	54.0	-13.8

Worst Case Operating Mode: Transmitting (802.11g-Channel 11)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*4924.000	49.8	30.4	32.7	52.1	74.0	-21.9
Vertical	*7386.000	44.2	31.0	37.2	50.4	74.0	-23.6
Vertical	*2483.500	67.1	31.9	27.4	62.6	74.0	-11.4

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*4924.000	40.5	30.4	32.7	42.8	54.0	-11.2
Vertical	*7386.000	33.4	31.0	37.2	39.6	54.0	-14.4
Vertical	*2483.500	53.4	31.9	27.4	48.9	54.0	-5.1

Worst Case Operating Mode: Transmitting (802.11n20-Channel 01)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*4824.000	47.2	30.4	32.7	49.5	74.0	-24.5
Vertical	*7236.000	46.3	31.0	37.2	52.5	74.0	-21.5
Vertical	*2390.000	68.5	31.9	27.4	64.0	74.0	-10.0

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*4824.000	38.2	30.4	32.7	40.5	54.0	-13.5
Vertical	*7236.000	36.4	31.0	37.2	42.6	54.0	-11.4
Vertical	*2390.000	54.5	31.9	27.4	50.0	54.0	-4.0

Worst Case Operating Mode: Transmitting (802.11n20-Channel 06)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*4874.000	53.0	30.4	32.7	55.3	74.0	-18.7
Vertical	*7311.000	45.0	31.0	37.2	51.2	74.0	-22.8

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*4874.000	43.4	30.4	32.7	45.7	54.0	-8.3
Vertical	*7311.000	35.0	31.0	37.2	41.2	54.0	-12.8

Worst Case Operating Mode: Transmitting (802.11n20-Channel 11)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*4924.000	53.1	30.4	32.7	55.4	74.0	-18.6
Vertical	*7386.000	44.7	31.0	37.2	50.9	74.0	-23.1
Vertical	*2483.500	65.9	31.9	27.4	61.4	74.0	-12.6

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*4924.000	42.8	30.4	32.7	45.1	54.0	-8.9
Vertical	*7386.000	34.0	31.0	37.2	40.2	54.0	-13.8
Vertical	*2483.500	53.4	31.9	27.4	48.9	54.0	-5.1

Worst Case Operating Mode: Transmitting (802.11n40-Channel 03)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*4844.000	41.2	30.4	32.7	43.5	74.0	-30.5
Vertical	*7266.000	43.9	31.0	37.2	50.1	74.0	-23.9
Vertical	*2390.000	69.1	31.9	27.4	64.6	74.0	-9.4

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*4844.000	33.9	30.4	32.7	36.2	54.0	-17.8
Vertical	*7266.000	34.4	31.0	37.2	40.6	54.0	-13.4
Vertical	*2390.000	55.2	31.9	27.4	50.7	54.0	-3.3

Worst Case Operating Mode: Transmitting (802.11n40-Channel 06)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*4874.000	54.0	30.4	32.7	56.3	74.0	-17.7
Vertical	*7311.000	45.3	31.0	37.2	51.5	74.0	-22.5

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*4874.000	41.9	30.4	32.7	44.2	54.0	-9.8
Vertical	*7311.000	34.7	31.0	37.2	40.9	54.0	-13.1

Worst Case Operating Mode: Transmitting (802.11n40-Channel 09)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*4904.000	42.5	30.4	32.7	44.8	74.0	-29.2
Vertical	*7356.000	43.5	31.0	37.2	49.7	74.0	-24.3
Vertical	*2483.500	65.8	31.9	27.4	61.3	74.0	-12.7

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Vertical	*4904.000	34.2	30.4	32.7	36.5	54.0	-17.5
Vertical	*7356.000	34.2	31.0	37.2	40.4	54.0	-13.6
Vertical	*2483.500	53.2	31.9	27.4	48.7	54.0	-5.3

NOTES:

1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: DFLY GLOBAL LIMITED
Date of Test: 21 April 2023
Worst Case Testing Model: DFX

4.9 Conducted Emission

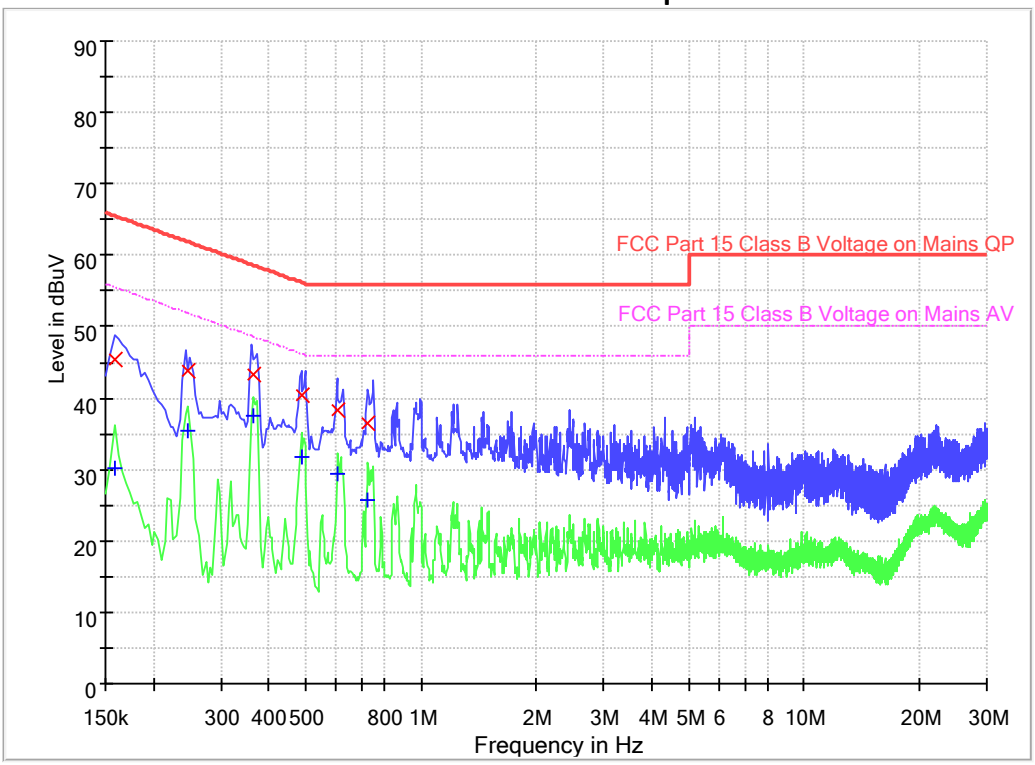
Worst Case Conducted Emission
at 0.366000MHz
is passed by 11.0dB margin.

For the electronic filing, the worst case radiated emission configuration photographs are saved with filename: conducted photos.pdf.

Applicant: DFLY GLOBAL LIMITED
Date of Test: 21 April 2023
Worst Case Testing Model: DFX
Worst Case Operating Mode: Simultaneous transmission
Phase: Live

Graphic / Data Table

Conducted Emissions
Pursuant to FCC 15.207: Emissions Requirement



Limit and Margin QP

Frequency (MHz)	Quasi Peak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	45.3	9.000	L1	9.6	20.3	65.6
0.246000	43.9	9.000	L1	9.6	18.0	61.9
0.366000	43.2	9.000	L1	9.6	15.4	58.6
0.486000	40.3	9.000	L1	9.6	15.9	56.2
0.606000	38.4	9.000	L1	9.6	17.6	56.0
0.726000	36.4	9.000	L1	9.6	19.6	56.0

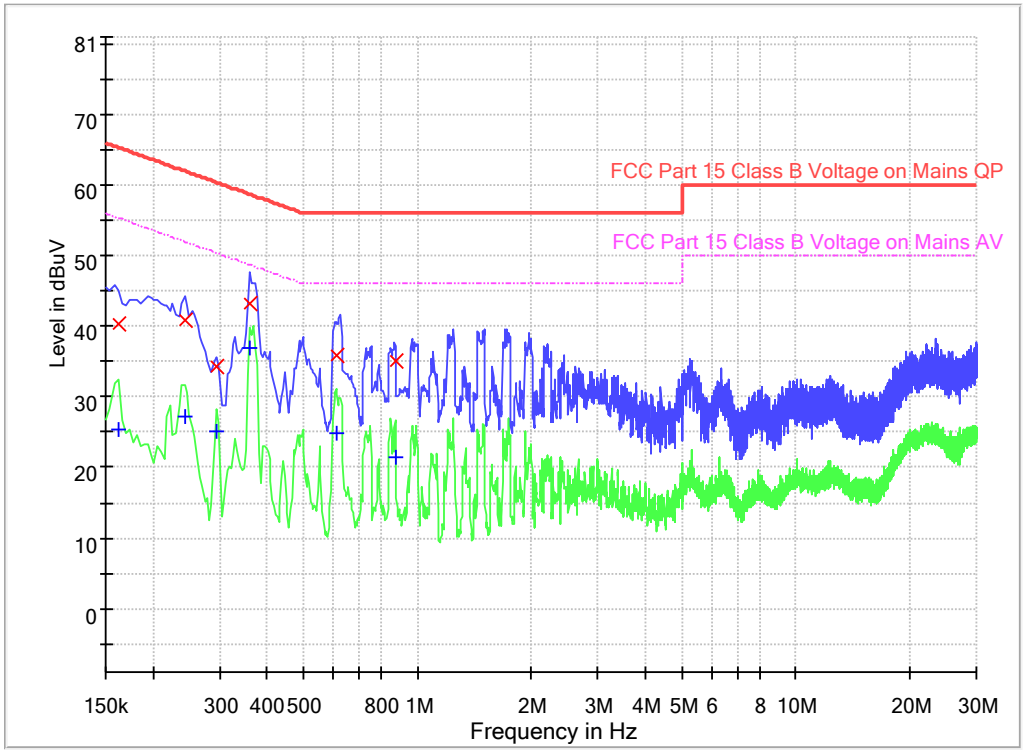
Limit and Margin AV

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	30.1	9.000	L1	9.6	25.5	55.6
0.246000	35.3	9.000	L1	9.6	16.6	51.9
0.366000	37.6	9.000	L1	9.6	11.0	48.6
0.486000	31.7	9.000	L1	9.6	14.5	46.2
0.606000	29.3	9.000	L1	9.6	16.7	46.0
0.726000	25.6	9.000	L1	9.6	20.4	46.0

Applicant: DFLY GLOBAL LIMITED
Date of Test: 21 April 2023
Worst Case Testing Model: DFX
Worst Case Operating Mode: Simultaneous transmission
Phase: Neutral

Graphic / Data Table

Conducted Emissions
Pursuant to FCC 15.207: Emissions Requirement



Limit and Margin QP

Frequency (MHz)	Quasi Peak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.162000	40.3	9.000	N	9.6	25.1	65.4
0.242000	40.9	9.000	N	9.6	21.1	62.0
0.294000	34.4	9.000	N	9.6	26.0	60.4
0.362000	43.1	9.000	N	9.6	15.6	58.7
0.610000	35.9	9.000	N	9.6	20.1	56.0
0.874000	35.2	9.000	N	9.7	20.8	56.0

Limit and Margin AV

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.162000	25.5	9.000	N	9.6	29.9	55.4
0.242000	27.3	9.000	N	9.6	24.7	52.0
0.294000	25.1	9.000	N	9.6	25.3	50.4
0.362000	36.8	9.000	N	9.6	11.9	48.7
0.610000	24.8	9.000	N	9.6	21.2	46.0
0.874000	21.5	9.000	N	9.7	24.5	46.0

4.10 Radiated Emissions from Digital Section of Transceiver, FCC Ref: 15.109

[ ] Not required - No digital part

[ ] Test results are attached

[x] Included in the separated report.

4.11 Transmitter Duty Cycle Calculation and Measurements, FCC Rule 15.35(b), (c)

The EUT antenna output port was connected to the input of the spectrum analyzer. The analyzer center frequency was set to EUT RF channel carrier. The SWEP function on the analyzer was set to ZERO SPAN. The Transmitter ON time was determined from the resultant time-amplitude display:

	See attached spectrum analyzer chart (s) for Transmitter timing
	See Transmitter timing diagram provided by manufacturer
x	Not applicable, duty cycle was not used.

5.0 Equipment Photographs

For electronic filing, the photographs are saved with filename: external photos.pdf & internal photos.pdf.

6.0 Product Labeling

For electronic filing, the FCC ID label artwork and location is saved with filename: label.pdf.

7.0 Technical Specifications

For electronic filing, the block diagram and circuit diagram are saved with filename: block.pdf and circuit.pdf respectively.

8.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.

9.0 Confidentiality Request

For electronic filing, the confidentiality request of the tested EUT is saved with filename: request.pdf.

10.0 Discussion of Pulse Desensitization

The determination of pulse desensitivity was made in accordance with Hewlett Packard Application Note 150-2, *Spectrum Analysis ... Pulsed RF.*

Pulse desensitivity is not applicable for this device since the transmitter transmits the RF signal continuously.

11.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ182-02	RF Power Meter	Anritsu	ML2496A	1302005	2022-05-16 2023-04-28	2023-05-16 2024-04-28
SZ182-02-01	Power Sensor	Anritsu	MA2411B	1207429	2022-05-16 2023-04-28	2023-05-16 2024-04-28
SZ056-06	Signal Analyzer	R&S	FSV 40	101101	2022-10-19	2023-10-19
SZ062-10	RF Cable	Bedea	RG 58	--	2022-11-15	2023-11-15
SZ056-08	Signal Analyzer	R&S	FSV 40	101430	2022-10-19	2023-10-19
SZ185-03	EMI Receiver	R&S	ESR7	101975	2022-10-26	2023-10-26
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	2021-05-18	2024-05-18
SZ061-12	BiConiLog Antenna	ETS	3142E	00166158	2021-08-04	2024-08-04
SZ061-09	Double-Ridged Waveguide Horn Antenna	ETS	3115	00092347	2022-10-14	2025-10-14
SZ061-15	Double-Ridged Waveguide Horn Antenna	ETS	3116C-PA	00224718	2021-07-06	2024-07-06
SZ181-08	Microwave System Amplifier	Agilent	83017A	MY57280108	2022-08-05	2023-08-05
SZ188-05	Anechoic Chamber	ETS	FACT 3-2.0	CT001880-Q1391	2021-05-25	2024-05-25
SZ062-23	RF Cable	RADIALL	SF104PE	MY4262/4PE	2022-10-17	2023-10-17
SZ062-35	RF Cable	Rebes	A50-3.5M3.5M-8M	19100879	2022-10-17	2023-10-17
SZ067-04	Notch Filter	Micro-Tronics	BRM50702-02	015	2022-05-17 2023-04-27	2023-05-17 2024-04-27
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	2022-07-08	2023-07-08
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	2022-10-24	2023-10-24
SZ187-02	Two-Line V-Network	R&S	ENV216	100073	2022-05-09 2023-04-27	2023-05-09 2024-04-27
SZ188-03	Shielding Room	ETS	RFD-100	4100	2022-12-20	2025-12-20

********** End of Report**********