

Maximum Permissible Exposure Report

1 PRODUCT INFORMATION

EUT	: Drone
Model Number	: U11MINI, U11MINI SE, U11MINI 4K, U11MINI3, U11MINI-3B, U11MINI SE-3B, U11MINI 4K-3B, U11MINI3-3B, U11MINI Fly More, U11MINI 4K Fly More, U11, U11S, U11PRO, U11PRO2, F11GIM2, F11GIM2-3B, F11GIM3, F11GIM3-3B, F11GIM3Fly More, F11PRO 3, F11PRO 3-3B, F11PRO 3 Fly More, F11Air, F11Air-3B, F11Air Fly More
Model Declaration	: All the same except for the model name
Test Model	: U11MINI
Power Supply	: DC 7.6V by battery
Hardware version	: V1.0
Software version	: V1.0

2 LIMIT AND METHOD

2.1 Refer evaluation method

According to KDB447498 D01 General RF Exposure Guidance v06 Section 4.3.1 Standalone SAR test exclusion considerations: "Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Test Exclusion Threshold condition, listed below, is satisfied. These test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.²² The minimum test separation distance is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander (see 5) of section 4.1). To qualify for SAR test exclusion, the test separation distances applied must be fully explained and justified by the operating configurations and exposure conditions of the transmitter and applicable host platform requirements, typically in the SAR measurement or SAR analysis report, according to the required published RF exposure KDB procedures. When no other RF exposure testing or reporting is required, a statement of justification and compliance must be included in the equipment approval, in lieu of the SAR report, to qualify for the SAR test exclusion. When required, the device specific conditions described in the other published RF exposure KDB procedures must be satisfied before applying these SAR test exclusion provisions; for example, handheld PTT two-way radios, handsets, laptops & tablets etc.²³ "[max. power of channel, including tune-up tolerance, mW]/ (min. test separation distance, mm)] • [\sqrt{f} (GHz)] \leq 3.0 for 1-g SAR and \leq 7.5 for 10-g extremity SAR, where:

- f (GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below The test exclusions are applicable only when the minimum test separation distance is \leq 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to 5) in section 4.1 is applied to determine SAR test exclusion.

3 ANTENNA INFORMATION

Antenna Gain and type refer to Antenna specification

4 CONDUCTED POWER

5.2G

Test Mode	Antenna	Frequency[MHz]	Result [dBm]
11A	Ant1	5180	7.13
11A	Ant2	5180	2.08
11A	Ant1	5200	4.67
11A	Ant2	5200	0.34
11A	Ant1	5240	5.11
11A	Ant2	5240	0.82
11N20MIMO	Ant1	5180	4.23
11N20MIMO	Ant2	5180	0.97
11N20MIMO	total	5180	5.91
11N20MIMO	total	5200	6.31
11N20MIMO	Ant1	5200	4.01
11N20MIMO	Ant2	5200	2.45
11N20MIMO	Ant1	5240	4.87
11N20MIMO	Ant2	5240	3.09
11N20MIMO	total	5240	7.08
11AC20MIMO	Ant1	5180	3.91
11AC20MIMO	Ant2	5180	2.56
11AC20MIMO	total	5180	6.30
11AC20MIMO	Ant1	5200	3.87
11AC20MIMO	Ant2	5200	2.19
11AC20MIMO	total	5200	6.12
11AC20MIMO	Ant1	5240	4.75
11AC20MIMO	Ant2	5240	3.09
11AC20MIMO	total	5240	7.01

5.8G

Test Mode	Antenna	Frequency[MHz]	Result [dBm]
11A	Ant1	5745	3.41
11A	Ant2	5745	2.98
11A	Ant1	5785	1.63
11A	Ant2	5785	2.13
11A	Ant2	5825	5.57
11A	Ant1	5825	1.19
11N20MIMO	Ant1	5745	3.28
11N20MIMO	Ant2	5745	2.91
11N20MIMO	total	5745	6.11
11N20MIMO	Ant1	5785	1.94
11N20MIMO	Ant2	5785	2.17
11N20MIMO	total	5785	5.07
11N20MIMO	Ant1	5825	1.22
11N20MIMO	Ant2	5825	1.54
11N20MIMO	total	5825	4.39
11AC20MIMO	Ant1	5745	3.23
11AC20MIMO	Ant2	5745	2.99
11AC20MIMO	total	5745	6.12
11AC20MIMO	Ant1	5785	1.56
11AC20MIMO	Ant2	5785	2.30
11AC20MIMO	total	5785	4.96
11AC20MIMO	Ant2	5825	1.31
11AC20MIMO	total	5825	4.26
11AC20MIMO	Ant1	5825	1.18

5 MANUFACTURING TOLERANCE

UNII-1 Band – Antenna 1

IEEE 802.11a (Average)			
Channel	Channel 36	Channel 40	Channel 48
Target (dBm)	6.5	4	4.5
Tolerance \pm (dB)	1	1	1
IEEE 802.11n HT20 (Average)			
Channel	Channel 36	Channel 40	Channel 48
Target (dBm)	3.5	6	4.5
Tolerance \pm (dB)	1	1	1
IEEE 802.11ac VHT20 (Average)			
Channel	Channel 36	Channel 40	Channel 48
Target (dBm)	3.5	3.5	4.5
Tolerance \pm (dB)	1	1	1

UNII-1 Band – Antenna 2

IEEE 802.11a (Average)			
Channel	Channel 36	Channel 40	Channel 48
Target (dBm)	1.5	0	0.5
Tolerance \pm (dB)	1	1	1
IEEE 802.11n HT20 (Average)			
Channel	Channel 36	Channel 40	Channel 48
Target (dBm)	0.5	3.5	2.5
Tolerance \pm (dB)	1	1	1
IEEE 802.11ac VHT20 (Average)			
Channel	Channel 36	Channel 40	Channel 48
Target (dBm)	2	1.5	2.5
Tolerance \pm (dB)	1	1	1

UNII-3 Band – Antenna 1

IEEE 802.11a (Average)			
Channel	Channel 149	Channel 157	Channel 165
Target (dBm)	3	1	5
Tolerance \pm (dB)	1	1	1
IEEE 802.11n HT20 (Average)			
Channel	Channel 149	Channel 157	Channel 165
Target (dBm)	3	1.5	0.5
Tolerance \pm (dB)	1	1	1
IEEE 802.11ac VHT20 (Average)			
Channel	Channel 149	Channel 157	Channel 165
Target (dBm)	2.5	1	1
Tolerance \pm (dB)	1	1	1

UNII-3 Band – Antenna 2

IEEE 802.11a (Average)			
Channel	Channel 149	Channel 157	Channel 165
Target (dBm)	2.5	1.5	0.5
Tolerance \pm (dB)	1	1	1
IEEE 802.11n HT20 (Average)			
Channel	Channel 149	Channel 157	Channel 165
Target (dBm)	2.5	1.5	1
Tolerance \pm (dB)	1	1	1
IEEE 802.11ac VHT20 (Average)			
Channel	Channel 149	Channel 157	Channel 165
Target (dBm)	2.5	2	4
Tolerance \pm (dB)	1	1	1

6 MEASUREMENT RESULTS

6.1 Standalone Evaluation Result

UNII-1 Band – Ant 1

Modulation Type	Output power		Antenn a Gain (dBi)	Antenn a Gain (linear)	separatio n distance (mm)	Caculatio n Value	SAR Test Exclusion Threshol d	SAR Test Exclusio n
	dBm	mW						
IEEE 802.11a	7.5	5.6234	2.77	1.8923	5	4.844	3.000	No
IEEE 802.11n HT20	7.0	5.0119	2.77	1.8923	5	4.317	3.000	No
IEEE 802.11ac VHT20	5.5	3.5481	2.77	1.8923	5	3.056	3.000	No

UNII-1 Band – Ant 2

Modulation Type	Output power		Antenn a Gain (dBi)	Antenn a Gain (linear)	separatio n distance (mm)	Caculatio n Value	SAR Test Exclusion Threshol d	SAR Test Exclusio n
	dBm	mW						
IEEE 802.11a	2.5	1.7783	2.77	1.8923	5	1.532	3.000	Yes
IEEE 802.11n HT20	4.5	2.8184	2.77	1.8923	5	2.428	3.000	Yes
IEEE 802.11ac VHT20	3.5	2.2387	2.77	1.8923	5	1.928	3.000	Yes

UNII-3 Band – Ant 1

Modulation Type	Output power		Antenn a Gain (dBi)	Antenn a Gain (linear)	separatio n distance (mm)	Caculatio n Value	SAR Test Exclusion Threshol d	SAR Test Exclusio n
	dBm	mW						
IEEE 802.11a	6.0	3.9811	2.97	1.9815	5	3.591	3.000	No
IEEE 802.11n HT20	4.0	2.5119	2.97	1.9815	5	2.266	3.000	Yes
IEEE 802.11ac VHT20	3.5	2.2387	2.97	1.9815	5	2.019	3.000	Yes

UNII-3 Band – Ant 2

Modulation Type	Output power		Antenn a Gain (dBi)	Antenn a Gain (linear)	separatio n distance (mm)	Caculatio n Value	SAR Test Exclusion Threshol d	SAR Test Exclusio n
	dBm	mW						
IEEE 802.11a	3.5	2.2387	2.97	1.9815	5	2.019	3.000	Yes
IEEE 802.11n HT20	3.5	2.2387	2.97	1.9815	5	2.019	3.000	Yes
IEEE 802.11ac VHT20	5.0	3.1623	2.97	1.9815	5	2.852	3.000	Yes

Note: Calculation Value = $P \sqrt{F} / D$

P=Maximum turn-up power plus Antenna Gain in mW

F=Channel frequency in GHz

D=Minimum test separation distance in mm

Remark:

1. Output power including tune-up tolerance;
2. evaluate distance is 5mm from user manual provide by manufacturer;

6.2 Simultaneous Transmission

The highest estimated SAR(1g)		Summary Calculation Value	Limit	Conclusion
Ant.1(W/kg)	Ant.2(W/kg)			
0.341	0.192	0.333	≤1	Pass

The highest estimated SAR = the max Calculation Value / 7.5

Summary Calculation Value = \sum of (the highest measured or estimated SAR_{Ant.1}+SAR_{Ant.2})/1.6

7 CONCLUSION

The measurement results comply with the FCC Limit per 47 CFR 2.1093 for the uncontrolled RF Exposure and SAR Exclusion Threshold per KDB 447498 v06, No SAR is required.

-----THE END OF REPORT-----