

FccID: H9PLA3020

Conf Num: EA97592

Correspondence # 17259

WLAN PC Card, 2 Mbps, Duo

Class II Permissive Change

Date Emailed: 12/5/00

Question 1

The WARNING and CAUTION statements indicated in the reply have some conflicts and inconsistencies. All of the five proposed statements (included in text boxes) should indicate that the operating requirements are for meeting FCC RF exposure compliance; that is, "To comply with FCC ..." instead of "To confirm to ...". Please review the following and revise these statements accordingly:

Question 1(a)

The CAUTION statement for fixed locations is indicating a minimum separation distance of 20 cm. This distance should be at least 20 cm and could be more if high gain antennas are used for certain transmitters with higher outputs. Please review all antennas approved under this FCC ID, including the original and previous Permissive Change filings, to ensure that 20 cm (and not more) is appropriate. If this statement is also intended for used by multiple or different transmitters, as described in the reply, the separation distance should also satisfy the requirements for other transmitters.

Answer:

The word confirm does not appear anywhere in any of the text boxes. The word used is conform. The word conform is a synonym of the word comply. From webster.com "conform: to be obedient or compliant -- usually used with to b : to act in accordance with prevailing standards "

This wording was accepted in the past. The meaning is the same. Please accept it.

Answer:

Our highest power transmitter is 500 mW. Our highest gain antenna has a net gain of 10 dBi with cable.

$$MPE = \sqrt{PxG/4\pi xS}$$

$$S=1mW/cm^2 \quad P=500 \text{ mW} \quad G=10$$

$$MPE = 19.95 \text{ cm}$$

Question 1(b)

The CAUTION statement for antennas that are not mounted at fixed locations requires the antenna to be installed in manners that may be near hands but more than 20 cm from a person's body. Most mobile devices operating with internal antennas or detachable antennas require users to maintain a minimum separation distance because the installation procedures may not automatically provide the needed distance. These mobile devices are not intended for hand-held use, especially the reply has included separate statements for hand-held devices; therefore, it is not always appropriate to advise users that hands may be located near the antenna. If this statement is to be used for different transmitters, how close the hand may be from an antenna would depend on the output power and antenna configuration of the individual transmitter. Even for hand-held devices, the antenna are usually embedded within the device that would automatically provide several centimeters or more from the user's hands.

Answer:

I think you are working under the assumption that my inter office memo included with CRN 15397 directs all of these warnings and cautions to be placed in the same manual. That is not the case. Hand held device manuals will not have the other warnings and cautions etc.

For the case of non hand held mobile devices (of which there are none in this submission) I will change the caution to :

CAUTION: Exposure to Radio Frequency radiation. To comply with FCC RF exposure requirements this antenna shall be installed in such a manner that it will be more than R cm from all hands and more than 20 cm from all bodies during normal operation conditions.

$R = \sqrt{P \cdot G / 4 \cdot \pi}$ rounded up to the next cm.

Question 1c

Two separate WARNING statements have been proposed for body-worn conditions, a statement for users who have access to the RF exposure info in the product manual and another statement for others who have no access to the info in product manuals for meeting compliance requirements. The reply indicates both WARNING statements are placed in the manual and both statements are referring exposed persons to the manual. In order for the warning statements to be useful, both should be placed on the final product operating with the intended transmitter(s). For users who have access to the manual info, the WARNING label should direct users to specific sections of the manual. For persons who have no access to the manual or no knowledge of their exposure, the WARNING label should provide the specific operating instructions for users to comply with FCC RF exposure requirements. Both labels should be located on the final product so that the RF exposure info is visible to persons requiring the info to satisfy compliance, in an easily readable and understandable format.

Question 2

If the transmitter can only operate at 68% duty factor in both access point and remote configurations, the 100% duty factor specified in the antenna table for mobile configurations would not be applicable. The 68% duty factor should be applied to all antenna configurations approved under this FCC ID.

Answer:

Please withdraw body worn antenna #4.

Answer:

I have included a corrected table.

Question 3

Previous info submitted for this filing indicates the antenna for the body-worn printer has less than 5 cm separation from its user's body. The most recent reply indicates 1.5 cm. There are several similar pending filings from the applicant, for other transmitters, using the same antenna configuration and product configuration that have indicated a separation distance of 2.2 cm. Body-worn operating configurations are required to satisfy SAR requirements. Whether SAR test data may be needed to demonstrate compliance is highly dependent on the separation distance between the antenna and its user's body. A difference of 0.5 cm could result in 50% difference in SAR. These discrepancies must be clarified in order to determine if SAR compliance could become an issue. Please provide the smallest measured distance between the antenna and the outer surface of the printer, on the side where it is carried next to the user, or its belt-clip. Please also identify the location of the WARNING label to be placed on this device. An example warning statement for general users may read - WARNING: To comply with FCC RF exposure requirements, this device must be carried at the waist, with a belt to provide a least xx cm between the antenna installed within this device and the user's body during transmission.

Answer:

This antenna is withdrawn.

Question 4

FYI - The revised antenna summary list appears to indicate the hand-held products are for occupational use. This should not be interpreted as occupational exposure limits may apply to these devices. In order for occupational limits to be applicable, persons exposed must operate such transmitters for work related use only and they must have appropriate training so that they will have the knowledge to control their exposure conditions and duration to satisfy the higher occupational exposure limit. This transmitter will require additional supporting info to qualify for occupational exposure requirements.

Note: Peak conducted output is 250 mW

Question 5

Proposed Grant Condition - This Class II Permissive Change filing adds 4 antenna configurations to previous filings, including a mobile terminal, a hand-held only terminal, a vehicle-mount (train) antenna and a body-worn printer. This transmitter must operate with a duty factor not exceeding 68%, according to its design and network protocol requirements, for satisfying RF exposure compliance. An RF exposure label as accepted for this filing must be displayed on the body-worn printer.

Answer:

Please change the Grant Condition to:

This Class II Permissive Change filing adds 3 antenna configurations to previous filings, including a mobile terminal, a hand-held only terminal, and a vehicle-mount (train) antenna. This transmitter must operate with a duty factor not exceeding 68%, according to its design and network protocol requirements, for satisfying RF exposure compliance.



RF Exposure Antenna Summary

Network Systems Organization

FCC ID: **H9PLA3020**

WLAN PC Card, 2 Mbps, Duo

Source Based

Mobile DC Factor: 0.680

Output Power: 250 mW

Class II Permissive Change

Portable DC Factor: 0.680

Mobile Antennas (R>20cm)

Ant No	Model	Symbol P/N	Type	Gain (dBi)	Cabel Loss (dB)	Pout (dBm)	MPE (cm)	TR Status	Device Use
01.	DASH 3000	50-21900-036	Dipole	2.2	0.62	23.36	3.6	Tested	Hand Held Ocp
02.	XP	50-21900-024	Slot	0.0	0.58	23.40	2.8	Tested	Hand Held Ocp
03.	Amtrak Omni	50-21900-027	Dipole	3.0	0.00	23.98	4.3	Tested	Fixed

Portable Antennas (R < 5cm)

Ant No	Model	Symbol P/N	Type	Gain (dBi)	Cabel Loss (dB)	Pout (dBm)	EIRP (mW)	TR Status	Device Use
04.	Oniel MMCX	50-21900-031	Slot	0.0	0.37	23.61	156.1	Withdrawn	Belt Worn 5-

Antenna Gain listed without cable

TR Status refers to whether the antenna was tested. If not refer to the directed antenna test data

Duty Cycle Factors are applied to MPE and EIRP

Tx Limited configurations are for low power versions of the radio. See the specific antenna exhibit for

Friday, February 16, 2001 01:56 PM

Page 1 of 1



RF Exposure Configuration Summary

Network Systems Organization

FCC ID: **H9PLA3020**

WLAN PC Card, 2 Mbps, Duo

Output Power: 250 mW

Class II Permissive Change

Ant #	Antenna Model	Terminal Mfgr.	Terminal Model	Use
01	DASH 3000	GE Marquette Med Sys	DASH-300042	Hand Held Ocp
02	XP	Mitsubishi	XPn	Hand Held Ocp
03	Amtrak Omni	Symbol	AP-3020	Fixed

5- R < 5 cm

5+ 5 cm < R < 20 cm

Ocp Occupational



Antenna List by FCC ID

Network Systems Organization

FCC ID: **H9PLA3020**

WLAN PC Card, 2 Mbps, Duo

Output Power: 250 mW

Grant Date	Ant #:	Model	Symbol P/N	Mfg	Mfg P/N
11/25/98					
	01	Plane	50-21900-008	Tecom	505042C(48IN)
	02	Pipe Bomb 11"x4'	50-11901-048P	Cushcraft	S2403BHPS48RBN
	02.1	Pipe Bomb 11"x15'	50-11901-180P	Cushcraft	S2403BHPS180RB
	03	Rubber Duck	50-21900-007	Cushcraft	RBN2400SXR
	04	Yagi	ML-2499-YGA1-	Cushcraft	PC2415RBN240
	05	Patch	ML-2499-PTA1-	UK	S2406P72PRBN
	06	Panel	ML-2499-PNA1-	Tecom	ML-2499-PNA1-01
	07	End Cap "C"	10-20511-01	Tecom	822319
	08	4140	50-11900-001	Dorne & Margol	DR10-2
	09	4640	21-17486-01	AIL Systems Suf	21-17486-01
	10	2040	10-17577-01	Tecom	703117
	11	6140	10-35305-01	UK	
	12	6840	10-32290-01	UK	
	13	1040	10-32447-01	Tecom	703385-1
	14	HS Dipole	50-21900-030	Huber Suhner	9090.16.0001
	15	Parapolic Grid	ML-2499-PGA1-	Conifer	26T-2400
	16	Vocollect MMCX	50-21900-025	Austin Antenna	200215
	17	Criticare MMCX	50-21900-032	Tecom	703443-2
	18	Corner Patch	ML-2499-DLA1-	Tecom	505126C
	19	Ceiling Panel	50-21900-015	Cushcraft	SQ2403PS72RBN
Applied For					
	01	DASH 3000	50-21900-036	NCC	N2400MMCX1
	02	XP	50-21900-024	Tecom	703611
	03	Amtrak Omni	50-21900-027	Cushcraft	SQ2403PSNF



Environmental Assessment

FCC ID: **H9PLA3020**

WLAN PC Card, 2 Mbps, Duo

Network Systems Organization

Access Point Duty Cycle: 0.68

Remote Duty Cycle: 0.68

Tx Output Power: 250 mW

Grant Date	Ant #:	Model	Symbol P/N	Mfg	Mfg P/N	Type	dBi (w/cabe)	Ant Pout (mW) (at antenna)	EIRP (mW)
11/25/98									
	01	Plane	50-21900-008	Tecom	505042C(48IN)	Plane	-1.0	135	135
	02	Pipe Bomb 11"x4'	50-11901-048P	Cushcraft	S2403BHPS48RBN	Dipole Array	4.2	135	447
	02.1	Pipe Bomb 11"x15'	50-11901-180P	Cushcraft	S2403BHPS180RBN	Dipole Array	1.5	72	237
	03	Rubber Duck	50-21900-007	Cushcraft	RBN2400SXR	Dipole	1.0	170	214
	04	Yagi	ML-2499-YGA1-01	Cushcraft	PC2415RBN240	Yagi	10.0	54	1699
	05	Patch	ML-2499-PTA1-01	UK	S2406P72PRBN	Patch	5.0	120	538
	06	Panel	ML-2499-PNA1-01	Tecom	ML-2499-PNA1-01	Panel	7.5	76	960
	07	End Cap "C"	10-20511-01	Tecom	822319	F-Element	0.0	170	170
	08	4140	50-11900-001	Dorne & Margolin	DR10-2	Whip	-2.0	170	107
	09	4640	21-17486-01	AIL Systems Suffox	21-17486-01	Puck	-2.6	147	92
	10	2040	10-17577-01	Tecom	703117	F-Element	-0.1	167	167
	11	6140	10-35305-01	UK		F-Element	-0.1	165	165
	12	6840	10-32290-01	UK		F-Element	-0.4	155	155
	13	1040	10-32447-01	Tecom	703385-1	F-Element	-0.2	164	164
	14	HS Dipole	50-21900-030	Huber Suhner	9090.16.0001	Dipole	1.5	150	237
	15	Parapolic Grid	ML-2499-PGA1-00	Conifer	26T-2400	Dish	9.5	6	1514
	16	Vocollect MMCX	50-21900-025	Austin Antenna	200215	Dipole	1.8	161	254
	17	Criticare MMCX	50-21900-032	Tecom	703443-2	F-Element	-0.2	163	163
	18	Corner Patch	ML-2499-DLA1-06	Tecom	505126C	Patch	6.0	120	677
	19	Ceiling Panel	50-21900-015	Cushcraft	SQ2403PS72RBN	Plane	1.8	120	257
Applied For									
	01	DASH 3000	50-21900-036	NCC	N2400MMCX1	Dipole	1.6	147	245
	02	XP	50-21900-024	Tecom	703611	Slot	-0.6	149	149
	03	Amtrak Omni	50-21900-027	Cushcraft	SQ2403PSNF	Dipole	3.0	170	339