IEEE P802.11
Wireless LANs

Letter to Secretary of FCC on Microwave Lighting Devices

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Abstract

The proposed rules change now before the FCC would result in the proliferation of lighting devices which employ magnetrons as sources of RF energy. These devices would operate in the 2450 MHz band with no limit on RF emissions. IEEE 802.11 has already provided comments to the Commission on this subject. However, due to the serious nature of this issue, a second round of comments may be appropriate. The issue is expected to come before the Commission for a ruling before the end of this year. A draft of text for additional comment to the Commission is presented for discussion by the Working Group.

Draft Text

November 12, 1998

Magalie R. Salas, Esquire
Secretary
Federal Communications Commission
1919 M Street NW
Room 222
Washington DC 20554

Re: ET Docket No. 98-42

Dear Ms. Salas:

IEEE 802, the LAN/MAN Standards Committee ("the Committee"), is writing in regard to ET Docket No. 98-42: 1998 Biennial Regulatory Review, Amendment of Part 18 of the Commission's Rules to Update Regulations for RF Lighting Devices. The Committee submitted comments in the Commission's Notice of Proposed Rulemaking ("the Notice"), FCC 98-42 in July. The Committee respectfully submits this further statement in the matter to address concerns of the members that have subsequently arisen.

The Institute of Electrical and Electronics Engineers, Inc. (IEEE) is a USA-based international professional organization with more than 325,000 members representing a broad segment of the computer and communications industries. The IEEE 802.11 Working Group has developed a standard for Wireless Local Area Networking (WLAN) in the 2400-2483.5 MHz band ("the 2450 MHz band"). The number of individuals and corresponding company sponsorships in the IEEE 802.11 Working Group evidences the strong interest in wireless local area networking. The Working Group currently has 86 voting members employed by 58 companies. The attachment is a partial list of the organizations in the working group that are already offering or have announced products which comply with the Committee's standard. The Committee estimated in July that there was then an installed base of approximately 6 million radios operating in this band and the current growth rate is 40 – 60 % annually. Previous experience with IEEE 802 indicates that the growth rate will increase with the introduction of the standard.

It has become evident that there is some likelihood that microwave lighting devices will seriously interfere with wireless LAN systems. Any decision permitting widespread operation of these devices should be postponed until

the subject is further studied and the committee members have had an opportunity to engage in direct discussion with promoters of RF lighting devices.

The Committee's standard on Wireless LAN Media Access Control and Physical Layer Specification, IEEE Std 802.11 - 1997, operates in the 2450 MHz band using spread spectrum procedures under 47 CFR 15.247. Thus, systems conforming to the Committee's standard and operating in compliance with FCC rules will be affected by Part 18 devices in the 2450 MHz ISM band.

The Committee's standard was developed with a clear understanding of the effects of current ISM devices on its operation. However, microwave lighting devices are likely to become much more pervasive than current ISM devices such as microwave ovens. These lighting devices will tend to operate a much larger percentage of the time, since they are left on many hours per day and operate at their full power setting all of the time. Therefore the two factors mitigating the impact of microwave ovens on such systems – first, that the ovens are only used intermittently, secondly, that they operate with less than 100% duty-cycle – may not apply to microwave lighting devices.

By adoption of Part 15 Spread Spectrum Rules, the Commission invited industry to develop equipment for use in the 2450 MHz band. While it is understood that Part 15 equipment must accept interference generated by authorized ISM equipment, we do not feel that this requirement should be interpreted to mean that the Commission should ignore the impact on Part 15 equipment when considering authorization of *new types of devices under Part 18 Rules.* In reviewing the Notice, we do not feel that adequate consideration has been given to the public interest in Part 15 spread spectrum equipment.

The Commission has already explicitly noted that "*the existing rules did not specifically contemplate RF lighting products that operate at microwave frequencies*." (NPRM paragraph 0.0.11). RF lighting devices are, in fact, far different from other types of equipment now operating under ISM rules, including microwave ovens. Unlike microwave ovens, RF lighting devices may be installed in appreciable numbers at a given location and operate in a nearly continuous manner. Even industrial microwave ovens are essentially a point source of radiation and are not found in the majority of environments envisioned as suitable for RF lighting.

In the Notice, the Commission specifically sought comments as to whether or not it may be necessary to establish in-band limits for RF lighting technology. Based on our further understanding of RF lighting emissions, we agree with the Commission that in-band limits for RF lighting devices should be considered. The Committee, in its earlier comments, proposed that microwave lighting devices be controlled with respect to out-of-band emissions using the same strict rules that are applied to Part 15 intentional and unintentional radiators. In addition, the Committee recommended that the microwave lighting interests be required to show what level of in-band emissions are necessary in order to achieve the benefits of the technology.

The ISM Rules were adopted in 1946. A great deal has changed since that time. At the minimum, RF lighting devices operating at microwave frequencies should be evaluated as a new type of device, and not an existing ISM device that is automatically entitled to unlimited in-band RF emissions. Part 15 communications services are now of significant commercial importance to the US economy and should be taken into account in this matter. In addition to the substantial base of installed radios operating in the 2450 MHz band, IEEE 802.11 is now drafting a standard for high speed wireless networking at speeds up to 11 Mbps, thereby stimulating a new range of communication services in the band. A new industry led initiatives, Bluetooth, is also currently developing wide spread commercial and consumer products to facilitate wireless data networking in the 2450 MHz band. Finally, there are countless low power analog radios being used in residential environments for cordless telephony and audio/video distribution.

It has subsequently become clearer that there is a strong potential for interference from microwave lighting devices into wireless LANs. The potentially high proliferation of microwave lighting devices and the widespread use of wireless LANs makes it necessary that all possible efforts be made to assure that the emissions of the lighting devices be better understood. The emissions should interfere no more with wireless LAN devices than is necessary consistent with the potential economic and environmental benefits which the Commission recognizes in the lighting technology.

More study is needed of the emission characteristics of microwave lighting devices and their effect on systems operating in conformance with the Committee's standard. The Committee recommends that a joint study of the

characteristics of the emissions be undertaken before any decision permitting operation widespread operation of microwave lighting devices. Such a study would take about six months with the full cooperation of the microwave lighting industry.

Respectfully,

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