Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Revision of the Commission's Rules	)	ET Docket No. 07-113
Regarding Operation in the 57-64 GHz Band.	)	

REPLY COMMENTS OF MOTOROLA, INC.

Motorola, Inc. ("Motorola") respectfully submits these reply comments to address issues raised in the above -captioned proceeding concerning the use of the 57-64 GHz band ("60 GHz band").[1] Motorola supports this initiative to develop more flexible technical standards for unlicensed 60 GHz transmitters and urges the FCC to adopt final rules that are consistent with the proposals contained in the Notice subject to certain refinements discussed herein.

The Notice was issued in response to a petition for rulemaking filed by the Wireless Communications Association (WCA) and, in general, proposes to: 1) increase the fundamental radiated emission limit for unlicensed 60 GHz transmitters with very high gain antennas, 2) specify the emission limit as an equivalent isotropically radiated power ("EIRP") level, and 3) eliminate the requirement for a transmitter identification for 60 GHz transmitters.[2] More specifically, the Notice proposes to increase the current Part 15 average power EIRP level from 40 dBm to a new level of 82 dBm minus 2 dB for every dB that antenna gain is below 51 dBi and to increase the current Part 15 peak

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[1] Revision of the Commission's Rules Regarding Operation in the 57-64 GHz Band, Notice of Proposed Rulemaking, 22 FCC Rcd 10505 (rel. June 01, 2007) ("Notice" or "NPRM").

[2] *Id.* at ¶ 1.

power EIRP level from 43 dBm to a new level of 85 dBm minus 2 dB for every dB that the antenna gain is below 51 dBi.[3] These power increases would be limited to 60 GHz transmitters located outdoors or those located indoors with emissions directed outdoors through a window. The Commission believes that these changes would extend the ability of 60 GHz broadband digital systems to supply high speed broadband service to office buildings and other commercial facilities and would therefore further the objective of promoting the availability of broadband connectivity to all Americans.[4]

Motorola supports the purpose of the NPRM and urges adoption of its proposals with only minimal refinement. Motorola supports without reservation the proposal to eliminate the transmitter identification requirement for all 60 GHz transmitting devices.[5] This requirement imposes unnecessary equipment costs and should be eliminated to enable the development of lower cost indoor transceivers. Motorola notes that this proposal was unopposed by any of the seven commenters that have participated in this phase of the proceeding.

Motorola also supports the proposed EIRP limits for outdoor links. Motorola believes that the levels proposed are reasonable and properly balance the need to provide for commercially viable equipment with low interference potential under most scenarios. Motorola does, however, agree with the concerns expressed by the IEEE on the application of these new limits to indoor transmitters directed outdoors through a

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3 *Id.*

4 *Id.*

5 *Id.* at ¶¶ 19-20.

window, *i.e*. the so called "window links".[6] Window links are appropriate options for path lengths that are less than approximately 500 meters and, when properly installed, are unlikely to result in any reflected emissions that have the potential to interfere with other 60 GHz devices. While that is particularly true in most circumstances where the user/operator has control of the operating environment, Motorola is concerned about certain deployment scenarios (*e.g.,* shopping malls, airports, etc.) when this may not be the case. In such environments, improperly installed window links could create reflections that interfere with portable user devices. If, for example, the window link is improperly deployed and the antenna is not orthogonal to the glass, reflectivity of 50 percent for incident angles greater than 30 degrees can be expected and result in reflected signals that could overpower low power devices in near proximity.

To minimize the potential for this type of interference, high powered window links should be installed in locations shielded from publicly accessible locations. This should be enforced through a "professional installation" requirement for the deployment of high powered window links in areas not under the complete control of the user.[7] While a professional installation requirement is admittedly difficult to enforce during initial deployments, it should be useful in resolving post-deployment interference disputes.

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[6] Comments of IEEE 802.18 at 3-5. Unless otherwise stated, all cited comments were filed in ET Docket No. 07-113 on or about October 17, 2007.

[7] Similar provisions are imposed on other Part 15 devices. *See e.g.,* 47 C.F.R. § 15.231(a)(5) of the Commission's Rules.

Motorola also shares IEEE's concern that outdoor or window link units operating at excessive powers will prove to be potential sources of in-band interference. Motorola therefore agrees with the IEEE that the Commission should require some sort of power control to ensure that point-to-point transmitters operate with the minimum power necessary to complete the link.[8] At this time, Motorola is not, however, prepared to support the IEEE's recommendation to limit indoor transmitters to maximum EIRP of 40 dBm average and 43 dBm peak or to specify a maximum signal level for high powered outdoor links of 30 dB above the receiver noise floor. Absent more specific data and justification, Motorola believes that the Commission should simply require the use of the minimum power necessary to complete the link in accordance with good engineering practice and require that all point-to-point devices have the ability to adjust power output downward.[9]

Motorola supports the requirement that systems must be authorized for use with specific antennas, or antennas with a specific range in gain.[10] This rule, which was not opposed by any commenter, is appropriate given the FCC's related proposals to allowing increased EIRP for 60 GHz point-to-point links. Allowing users to substitute antennas with higher gain could render such systems non-compliant with those regulations, if adopted.

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8 *Id.* at 4, 5.

9 For similar reasons, Motorola cannot support at this time the IEEE's recommendation to limit the power density of any outdoor transmitter to 9 $\mu W/cm^2$ at the perimeter of any nearby building absent further justification for this recommended level.

10 *Notice* at ¶ 16.

Finally, Motorola recognizes the concerns of the meteorological interests on the proposed Part 15 power increase and the potential impact to the Earth Exploration Satellite Service (Passive), which is allocated shared access to the 57 – 59.3 GHz band.[11] Motorola notes that these parties have not asserted that the proposed power modifications will surely result in interference to the Earth Exploration Satellite Service. Rather, Space Frequency Coordination Group opines that "[t]he relatively high atmospheric attenuation at these frequencies may allow these changes without impact on EESS (passive)" and asks for additional time to study the issue.[12] Motorola believes that the Commission's proposals will adequately protect this type of spectrum use primarily due to the very high gain, pencil beam, antennas that are used. While Motorola welcomes additional study, we believe that this potential for interference is sufficiently remote that the FCC need not delay it actions in this proceeding.

[11] Comments of World Meteorological Organization; Comments of Space Frequency Coordination Group.

[12] Comments of Comments of Space Frequency Coordination Group at 2.

In summary, Motorola supports the Commission's Notice and urges adoption of final rules consistent with the recommendations made herein.

Respectfully Submitted,

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