

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554**

In the Matter of )  
 )  
Revision of Part 15 of the Commission’s ) ET Docket No. 98-153  
Rules Regarding Ultra-Wideband )  
Transmission Systems )  
 )

**REPLY TO OPPOSITIONS  
TO PETITIONS FOR RECONSIDERATION  
of  
SIEMENS VDO AUTOMOTIVE AG**

Siemens VDO Automotive AG (“Siemens VDO”) 1/ hereby submits this Reply to Oppositions to Petitions for Reconsideration filed in the above-referenced matter. Siemens VDO is pleased to note that not a single opposition was filed expressing the slightest concern regarding the minor changes to the Commission’s ultra-wideband (“UWB”) rules sought by Siemens VDO in its Petition for Reconsideration (“Petition”). Of course, this lack of opposition comes as little surprise. The rule amendments Siemens VDO is requesting are narrowly tailored to apply only to vehicular radars operating in the 22 – 29 GHz band and, importantly, present no possibility of increasing the risk of harmful interference to any user or service. Moreover, the industry association representing a wide range of 24 GHz vehicular radar interests – including Siemens VDO’s competitors – is on record as

---

1/ Siemens VDO Automotive AG is one of the world’s leading suppliers of high-tech electronics for automotive applications. The company is active in fields such as cockpit and car communication systems, airbag and ABS electronics, and motor control and fuel injection technology.

strongly supporting the Petition. <sup>2/</sup> Given the consensus on this issue, the Commission should act promptly to grant the Siemens VDO Petition.

**I. MINOR RULE CHANGES ARE NEEDED TO PERMIT THE OPERATION OF PULSED FREQUENCY HOPPING VEHICULAR RADARS**

As explained and fully supported by technical data in its Petition, Siemens VDO seeks three minor changes that would permit pulsed frequency hopping vehicular radars to qualify as UWB devices:

**A. Allow vehicular radars up to 10 milliseconds in which to satisfy the 500 MHz UWB bandwidth requirement.**

Pulsed frequency hopping radars such as the Siemens VDO radar cannot satisfy the requirement contained in Section 15.503(d) that UWB devices occupy 500 MHz “at any point in time,” as these radars do not instantaneously occupy the minimum UWB bandwidth, but rather, fill the required block of spectrum over a period of time, such as a few milliseconds. It is important to understand that, despite the frequency hopping aspects of the modulation technique, it is not technically feasible for these radars to “hop over” the restricted band at 23.6 – 24.0 GHz. <sup>3/</sup> Nevertheless, as explained below, pulsed frequency hopping systems pose no greater interference risk to the passive Earth Exploration Satellite Service (“EESS”)

---

<sup>2/</sup> See Short Range Automotive Radar Frequency Allocation Group (“SARA”), Opposition to Petitions to Deny (filed July 21, 2002) at 7. SARA represents automobile manufacturers as well as vehicle component manufacturers, including Siemens VDO.

<sup>3/</sup> Moreover, forcing the Siemens VDO radar to operate with a center frequency different than 24.125 GHz (in order to avoid the restricted band) would place the Siemens VDO device at a serious commercial disadvantage relative to the other vehicular radar manufacturers.

satellites located in this band than the pure pulsed modulation systems that are capable of satisfying the UWB bandwidth requirement under existing rules. Thus, no party's interests would be harmed by amending Section 15.515(b) to permit vehicular radars to qualify as UWB devices if they occupy a UWB bandwidth of 500 MHz *during any 10 millisecond period*, notwithstanding the provisions contained in Section 15.503(d).

**B. Permit measurements to be taken with the frequency hop active.**

In paragraph 32 of the UWB Report and Order, the Commission stated that, for frequency hopping devices, measurements are to be taken with the frequency hopping stopped. Like the “at any point in time” language in Section 15.503(d), this limitation also prevents pulsed frequency hopping systems from satisfying the UWB minimum bandwidth. As Siemens VDO demonstrated in the technical Appendix to its Petition, this limitation is not necessary because accurate mean power measurements can be made with the frequency hop active, by using a spectrum analyzer equipped with a root mean square detector (“RMS”). Moreover, Siemens VDO also demonstrated that its device operates within the vehicular radar emission limits established in the Commission’s UWB rules, and has no higher harmful interference potential than transmitters employing pure pulsed or burst-like modulations.

**C. Permit a measurement averaging time of up to 10 milliseconds.**

Section 15.521(d) requires that the RMS detector measurement of average emissions be based on a one millisecond or less averaging time, an interval that is too short to permit an accurate RMS power measurement of pulsed frequency

hopping systems, which require longer periods of time to complete one entire hopping cycle (the “frame time”). An averaging time that is too short results in measurement values that are higher than the true average value. <sup>4/</sup> Accordingly, Section 15.515(d) should be amended to permit an averaging time of up to 10 milliseconds for pulsed frequency hopping radars, thereby sharply reducing the error margin of the RMS measurements. Moreover, the longer averaging time comes closer to the typically long averaging times used by most EESS systems at 24 GHz.

## **II. GRANT OF THE PETITION WOULD NOT INCREASE ANY POTENTIAL FOR HARMFUL INTERFERENCE**

Grant of the Siemens VDO Petition would do nothing to increase the threat of harmful interference. EESS is the only service regarding which the National Telecommunications and Information Administration (“NTIA”) expressed any concern relative to 24 GHz vehicular radar emissions. The receivers in this service integrate signals over both long time periods and large geographic areas, making them unable to distinguish between pulsed frequency hopping and pure pulsed modulation techniques. More importantly, the Siemens VDO radars will still be subject to the existing attenuation requirements for emissions appearing 30 degrees or more above the horizon. Finally, grant of the Petition will do nothing to

---

<sup>4/</sup> In fact, since filing its Petition, Siemens VDO has had discussions with the spectrum analyzer manufactures (Agilent and Rohde & Schwartz) and has learned that the upper bound (*i.e.*, worst case) of RMS errors resulting from an inadequate averaging time can be expressed by a mathematical relationship for Dirac-like modulation of the signal. For example, Siemens VDO calculates that an averaging time that is only 1/10<sup>th</sup> the frame time could result in RMS reading errors that are 10 dB higher than the true RMS value.



## CERTIFICATE OF SERVICE

I, Jean Claire Meikle, do hereby certify that the foregoing Opposition of Siemens VDO Automotive AG was served this 13th day of August, 2002, hand delivery on:

The Honorable Michael Powell  
Chairman  
Federal Communications Commission  
445 12<sup>th</sup> Street, S.W.  
Washington, D.C. 20554

Bryan Tramont, Senior Legal Advisor  
Office of Commissioner Kathleen  
Abernathy  
Federal Communications Commission  
445 12<sup>th</sup> Street, S.W.  
Washington, D.C. 20554

The Honorable Kathleen Abernathy  
Commissioner  
Federal Communications Commission  
445 12<sup>th</sup> Street, S.W.  
Washington, D.C. 20554

Sam Feder, Legal Advisor  
Office of Commissioner Kevin Martin  
Federal Communications Commission  
445 12<sup>th</sup> Street, S.W.  
Washington, D.C. 20554

The Honorable Michael Copps  
Commissioner  
Federal Communications Commission  
445 12<sup>th</sup> Street, S.W.  
Washington, D.C. 20554

Paul Margie, Legal Advisor  
Office of Commissioner Michael J.  
Copps  
Federal Communications Commission  
445 12<sup>th</sup> Street, S.W.  
Washington, D.C. 20554

The Honorable Kevin Martin  
Commissioner  
Federal Communications Commission  
445 12<sup>th</sup> Street, S.W.  
Washington, D.C. 20554

Ed Thomas, Chief  
Office of Engineering and Technology  
Federal Communications Commission  
445 12<sup>th</sup> Street, S.W.  
Washington, D.C. 20554

Peter A. Tenhula, Senior Legal Advisor  
Office of Chairman Michael Powell  
Federal Communications Commission  
445 12<sup>th</sup> Street, S.W.  
Washington, D.C. 20554

Julius Knapp, Deputy Chief  
Office of Engineering and Technology  
Federal Communications Commission  
445 12<sup>th</sup> Street, S.W.  
Room 7-B133  
Washington, D.C. 20554

John Reed  
Office of Engineering and Technology  
Federal Communications Commission  
445 12<sup>th</sup> Street, SW  
Washington, D.C. 20554

Karen Rackley  
Office of Engineering and Technology  
Federal Communications Commission  
445 12<sup>th</sup> Street, SW  
Washington, D.C. 20554

Ron Chase  
Office of Engineering and Technology  
Federal Communications Commission  
445 12<sup>th</sup> Street, SW  
Washington, D.C. 20554

Fred Thomas  
Office of Engineering and Technology  
Federal Communications Commission  
445 12<sup>th</sup> Street, SW  
Washington, D.C. 20554

Ari Fitzgerald  
Counsel to Short Range Automotive  
Radar Frequency Allocation Group  
Hogan & Hartson LLP  
555 13<sup>th</sup> Street, N.W.  
Washington, DC 20004

Qualex International  
Room CY-B-402  
445 12<sup>th</sup> Street, SW  
Washington, DC 20036

/s/ Jean Claire Meikle  
Jean Claire Meikle  
Hogan & Hartson LLP