Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Request For Updated Information And Comment on Wireless Hearing Aid Compatibility Regulations	)	WT Docket No. 07-250, 10-254
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COMMENTS OF THE TELECOMMUNICATIONS INDUSTRY ASSOCIATION

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I. INTRODUCTION AND SUMMARY

The Telecommunications Industry Association ("TIA")[1] hereby submits comments in response to the Federal Communications Commission's ("Commission") Public Notice[2] seeking updated information about whether the Commission's hearing aid compatibility ("HAC") rules for wireless handsets[3] are effectively meeting the needs of deaf and hard of hearing individuals considering today's mobile landscape developments. TIA is a member of American National Standards Institute C63.19®

[1] TIA is the leading trade association for the information and communications technology ("ICT") industry, representing companies that manufacture or supply the products and services used in global communications across all technology platforms. TIA represents its members on the full range of policy issues affecting the ICT industry and forges consensus on industry standards. Among their numerous lines of business, TIA member companies design, produce, and deploy a wide variety of devices with the goal of making technology accessible to all Americans. TIA's standards committees, which operate under an American National Standards Institute-accredited process, create consensus-based voluntary standards for numerous facets of the ICT industry.

[2] *Request for Updated Information and Comment on Wireless Hearing Aid Compatibility Regulations*, Public Notice, WT Docket No. 07-250, 10-254, DA 14-1688 (rel. Nov. 21, 2014) ("PN").

[3] 47 C.F.R. § 20.19

("ANSI C63.19"),[4] and was fully supportive[5] of the Commission's adoption of ANSI C63.19's 2011 update to its standard for the measurement of compatibility between wireless communications devices and hearing aids.[6] In addition, TIA itself serves as a standards development organization for the ICT industry, and develops and maintains voluntary standards for the performance and accessibility of communications products, specifically wireline telephones with handsets, headsets, and speakerphones, communications gateways, and other products that are typically installed at the user's premises.[7]

In the PN, the Commission raises possible revisions[8] to the HAC rules that would expand coverage and compliance requirements. However, it is not clear what the problems are with HAC that the FCC has identified as needing additional regulations. Hearing aid compatibility involves a complex ecosystem that requires the interaction of both the wireless handset and the hearing aid. In addition, testing for compatibility is specific to technologies and to frequency bands. To achieve the goal of ensuring that new products and services are accessible to people with hearing loss, it is important to understand with technical specificity where the issues the Commission is concerned with lie. While supportive of HAC for consumers who are hard of hearing, TIA has concerns with the proposals proffered in

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[4] *See* http://www.c63.org/.

[5] *See* Comments of TIA, WT Docket No. 07-250 (filed Jan. 13, 2012).

[6] *See Amendment of the Commission's Rules Governing Hearing Aid-Compatible Mobile Handsets*, WT Docket No. 07-250, *Third Report and Order*, 27 FCC Rcd 3732 (2012).

[7] *See* TR-41Standards, http://www.tiaonline.org/all-standards/committees/tr-41.

[8] PN ¶ 2 ("First should the Commission revise the hearing aid compatibility requirement to apply in a technologically neutral way to all mobile wireless devices that can be used for voice communications? Second, should the Commission consider moving away from the fractional compliance regime that exists today and implement a requirement that all mobile devices must comply with the hearing aid compatibility rules?").

the PN, which are broad and may go beyond the HAC statutory language as well as negatively impact choices in the marketplace for all consumers. If the Commission wants to make any significant changes to the existing HAC regulatory framework, TIA urges the agency to promulgate a notice of proposed rulemaking to ensure there can be a full record to understand and support any changes.

In the comments below, TIA explains its understanding of what types of wireless handsets are within the current purview of the Section 20.19 HAC requirements and urges the Commission not to inappropriately expand the scope beyond the existing parameters by including in HAC regulations other wireless devices, which would create regulatory uncertainty and obstacles to product development and innovation. We also discuss the technical challenges that the Commission's adoption of a 100 percent compliance regime for mobile wireless handsets would present for handset manufacturers and the negative impact such a change would have on the choice available to consumers through decreased portfolio flexibility. Finally, we explain that 100 percent compliance will not guarantee an improved consumer experience with HAC handsets because there are numerous other factors at play in this ecosystem.

II. A TAILORED APPROACH TO THE APPLICATION OF HAC RULES REMAINS APPROPRIATE.

The Commission seeks comment on "whether Section 20.19 should apply to all wireless handsets, regardless of the service, frequency, or technology with which they are used."[9] TIA supports the Commission's goal of ensuring that new products and services are accessible to

[9] PN ¶ 8.

people with hearing loss. In fact, TIA members, as manufacturers of wireless handsets with CMRS capabilities that are currently covered by the scope of the Section 20.19 rules, are already making a high percentage of those handsets HAC-compliant. Overall, 82 percent of wireless CMRS handsets are HAC-rated,[10] demonstrating that manufacturers are already taking steps to incorporate HAC into the design of their wireless handsets whenever it is feasible. New technologies, however, raise unique technical feasibility and product marketability issues that the Commission must consider in any proposed expansion of the HAC rules.[11]

A. The Commission Should Continue Collaborative Efforts with Industry Regarding the Application of HAC Requirements to VoLTE and Not Seek to Expand its HAC Rules at this Time.

In the PN, the Commission asks whether the rules should be applied "to other packet-based modes of voice access such as Voice over LTE (VoLTE) that may not use an in-network switching facility."[12] TIA believes that VoLTE handsets are already within the scope of the Commission's HAC rules because VoLTE is a CMRS IP voice service.[13] TIA has worked closely with Commission staff to address the practical aspects of the application of HAC

[10] Based on data in manufacturer's July 2014 hearing aid compatibility reports filed with the Commission, *available at* http://wireless.fcc.gov/hac/index.htm?job=rpt_dm_c.

[11] *See* 47 U.S.C. §§ 610(b)(2)(C)(iii)-(iv), (e).

[12] PN ¶ 9.

[13] *See In the Matter of Amendment of Commission's Rules Governing Hearing Aid-Compatible Mobile Handsets*, Third Report and Order, WT Docket 07-250, DA 12-550 (rel. Apr. 9, 2012), fn. 62 (explaining that service providers and manufacturers need to meet the portfolio benchmarks for LTE once the 2011 ANSI standard goes into effect.); *see also* OET KDB, Oct. 31, 2013, *available at* https://apps.fcc.gov/kdb/GetAttachment.html?id=unTjPJBfcYUxDO2czc1S8g%3D%3D&desc=285076%20D02%20T%20Coil%20testing%20for%20CMRS%20IP%20v01r01&tracking_number=36388 (stating that VoIP over LTE is a "CMRS packet based telephone service" and referencing "VoLTE or other CMRS voice over IP transport" therefore, indicating that VoLTE itself is a form of CMRS voice over IP.

requirements to new air interfaces, including VoLTE.[14] The availability of laboratory equipment for T-Coil testing over LTE air interfaces has already been addressed by the OET Laboratory, with an exemption currently in place based on laboratory test equipment not being widely available.[15] TIA commends the Commission for taking a careful and informed approach to the application of HAC to VoLTE, and we urge deference to this collaborative process going forward.

B. The Commission Should Continue Collaborative Efforts with Industry Regarding the Application of HAC Requirements to Voice over Wi-Fi and Not Seek to Expand its HAC Rules at this Time.

The Commission also asks whether the HAC rules should be applied to voice over Wi-Fi.[16] The current version of ANSI C63.19 was revised with consideration of the negligible

[14] For example, in mid-2014, TIA formed a task group of ICT manufacturer experts to examine HAC testing issues specific to VoLTE and voice over WiFi. TIA learned that the Commission had already accepted submissions addressing the HAC VoLTE M-rating thus, the task group effort concluded that no further action is needed at this time and that industry should defer to the direction provided by the Commission during recurring Telecommunications Certification Body Council ("TCBC") workshops. This task group stands ready to address emerging issues within TIA's Technical Regulatory Policy Committee ("TRPC"), the TIA member-driven effort to address device certification issues. The TRPC meets regularly with technical experts at the Commission's Office of Engineering and Technology ("OET") Laboratories on a variety of conformity assessment-related topics, and serves as an informal and ongoing government-industry conversation.

[15] *See* FCC HAC Update presentation at Oct 2014 TCBC Workshop at Slide 2. The OET notes that currently, a limited amount of laboratory test equipment is available with some handsets being approved without the exemption.

[16] *See* PN ¶ 9. In considering this matter, TIA encourages the Commission to clearly maintain the needed differentiation between wireless and **wireline** HAC requirements. **Wireline** terminal equipment is significantly different from wireless equipment and is currently covered by the HAC requirements under the Commission's Part 68 rules. Part 68 of the Commission's rules govern the connection of terminal equipment to the telephone network including the HAC volume control requirements. TIA's Conversational Gain ANSI/TIA-4965 standard, Receive Volume Control Requirements for Digital and Analog **Wireline** Terminals, is the industry standard governing HAC volume control for Part 68 customer premises equipment ("CPE") for analog and digital telephones. TIA-4965 is not a CMRS standard and TIA does not believe that TIA-4965 should be applied to CMRS wireless handsets. Any consideration of conversational gain in wireless HAC requirements should be appropriately channeled through the ANSI C63.19 standards committee. The conversational gain standard was developed specifically for digital and analog **wireline** handset terminals and does not include test procedures applicable to CMRS wireless handsets. The receive loudness ratings for CMRS wireless handsets are governed by 3GPP and 3GPP2 standards that have been developed and are specifically applicable for mobile wireless handsets. We believe the Commission should be wary of blurring the bright line that currently exists between wireless and **wireline** HAC requirements, which could cause confusion or uncertainty to those looking to comply with the Commission's regulations. TIA currently has a Petition for Rulemaking before the Commission that urges it to improve the access and experience of hard-of-hearing users

impact certain low-power and low-interference transmission protocols have on a hearing aid user's experience. Typical Wi-Fi transmitters operate at such low output power as to fall under the C63.19 standard's test exemption and therefore are given an M-rating for HAC without testing. However, voice over Wi-Fi presents unique technical challenges for HAC testing; as the Commission itself has explained: "Wi-Fi is a technology that has a plethora of options, protocols and configurations" that "requires established engineered definitions of the specific options, protocols, configurations" in use in order to conduct hearing aid compatibility testing.[17] Consequently, OET has stated that the concept of "testing HAC over Wi-Fi" has "no meaning."[18] Accordingly, based on this current landscape, the Commission should refrain from requiring HAC testing of CMRS IP voice over Wi-Fi[19] until appropriate technical guidance can be provided from the Commission on this matter.[20]

C. Current Categories of Wireless Handsets Continue to be Appropriate for HAC.

The Commission should not expand the application of the HAC requirements beyond the current scope of consumer wireless handsets with CMRS functionality until there is a better understanding of the obstacles in making the products and services proposed for expanded regulation HAC-compliant, and of the potential impact, which could result from expanding the

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of terminal equipment by undertaking a rulemaking to update references in Part 68 of the Commission's rules to TIA standards which set HAC volume control requirements.

[17] OET KDB Publication 285076 D02 T-Coil testing for CMRS IP v01r01, fn. 4

[18] *Id.*

[19] *See* FCC Consumer Guide for Hearing Aid Compatibility for Wireline/Wireless Telephones, *available at* http://transition.fcc.gov/cgb/consumerfacts/hac-telephone.pdf (explaining that the FCC has not yet adopted hearing aid compatibility technical standards for some wireless technologies "such as Wi-Fi" and "these operations cannot be tested").

[20] *See* FCC HAC Update presentation at Oct. 2014 TCBC Workshop at Slide 3.

current scope of HAC requirements. TIA notes that some wireless handsets may not be appropriate for HAC obligations based on their design intent, for example, those designed for occupational use such as in public safety, and therefore, these devices are exempt from HAC requirements today. Furthermore, any wireless device that is not designed to be used in a statutorily designated manner, as a device typically held to the ear[21] is not appropriate for inclusion in the HAC rules. TIA believes that the open-ended application of the HAC rules to other types of wireless handsets or devices with voice capability, but which are not typically held to the ear would not serve the overarching public interest goals of the HAC rules in addition to imposing undue technical and financial burdens.

Without further specificity from the Commission as to what other services, frequencies, or technologies HAC rules could be applied to, but which are not already covered, TIA cannot comment on the costs and benefits of revising Section 20.19 to be "technologically neutral." The issues discussed above related to the complexities of applying HAC rules to VoLTE and voice over Wi-Fi on handsets with CMRS functionality well illustrate that emerging technologies create new and previously unanticipated technical challenges. TIA cautions the Commission not to stifle innovation by considering "technological neutrality" as solely a consumer-facing issue; consideration of the complexity of industry implementation is also a technological neutrality factor.

[21] *See* Twenty-First Century Communications and Video Accessibility Act of 2010, Pub. L. No. 111-260, 124 Stat. 2751 (2010) (as codified in various sections of 47 U.S.C.) ("CVAA"). 47 U.S.C. § 610(b)(1)(C); 47 C.F.R. § 20.19(a)(3)

III. ELIMINATING THE EXISTING COMPLIANCE REGIME WOULD REDUCE FLEXIBILITY KEY TO ACCESSIBILITY REGULATIONS AND RESULT IN INCREASED COSTS FOR THE ENTIRE ECOSYSTEM.

In the PN, the Commission inquires about whether it should move away from the fractional compliance regime and require all mobile wireless devices to comply with the HAC rules.[22] The Commission "seeks comment on the costs and benefits associated with requiring all handsets to be hearing aid compatible."[23] They also seek input about what economies of scale would accrue to manufacturers.[24]

TIA opposes the adoption of a 100 percent compliance regime because it would have a negative impact on the entire device ecosystem. The Commission's assumption that economies of scale might result with 100 percent HAC compliance is false. Every HAC-compliant handset must be designed and tested individually due to the unique placement of the RF antennae, battery, speaker, and other components that impact the HAC rating of a given device, thus no economies of scale can be gained. Requiring all handsets to be hearing aid compatible will result in increased costs for manufacturers at the testing, design, and manufacturing stages of the product development process. It is not clear in the PN if 100 percent means that all handsets would be required to be both M and T-rated. In this respect, TIA further notes that it would be particularly burdensome to manufacturers were the Commission to adopt a 100 percent compliance rule that would imply wireless handsets are required to be both M and T-rated. Ensuring telecoil compatibility on 100 percent of models would simultaneously heighten the complexity of the design process and raise the manufacturing costs for wireless handsets.

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[22] PN ¶ 2.

[23] *Id.* ¶ 17.

[24] *Id.*

In addition, 100 percent compliance will decrease the flexibility of the portfolio of products that are offered in the United States; any such decrease in portfolio flexibility could impact the ability to offer products with a range of price points.[25] There are also technical difficulties presented by designing compliant devices across the entire portfolio of products in the marketplace as it is more difficult to achieve a HAC rating for smaller form factor devices.[26] Moreover, technical challenges remain and are still inherent to the GSM 1900 MHz technology that would make meeting a full compliance requirement difficult. In the future, it is expected that wireless carriers will completely phase out the use of this frequency band. However, while it remains in use it serves as a major impediment to having 100 percent HAC compliance.

Hearing aid manufacturers are starting to incorporate new wireless technologies that would support coupling between hearing aids and wireless handsets.[27] For example, Bluetooth Smart can extend the use of Bluetooth wireless technology to devices that are powered by small, coin-cell batteries (e.g. hearing aids) and it is compatible with applications on existing smartphones. [28] To enable such innovation in new wireless connections to continue, the

[25] TIA notes that requiring all handsets to be hearing aid compatible could be detrimental to the market of phones available to consumers with non-hearing disabilities. There may be a reduction in the overall number of models offered for sale in the U.S. market if 100% HAC compliance was required, which could have the unintended consequence of removing models that offer features that improve accessibility for consumers with other types of disabilities. Thus, it is imperative that the Commission not take actions that could result in negative externalities for the disability community as a whole.

[26] In the Appendix is a simulation of the E-field from a mobile device to a hearing aid for a range of separation distances from the antenna. A 100 percent compliance regime could eliminate the possibility of smaller form factor devices as the separation required to ensure compliance may not be technically achievable. Furthermore as more bands and features (such as uplink MIMO) are introduced into the handset it will be increasingly difficult to find new locations in the device for additional antennas.

[27] *See* Tricia Romano, *Better Hearing Through Bluetooth*, The New York Times (Jan. 15, 2014), http://well.blogs.nytimes.com/2014/01/15/better-hearing-through-bluetooth/?_r=0.

[28] *See Bluetooth Smart,* http://www.bluetooth.com/Pages/Bluetooth-Smart.aspx.

Commission should not require 100 percent compliance, but give space for the development of affordable new technologies that will benefit hearing-impaired consumers.[29]

The Commission also seeks comment on how consumers with hearing loss would benefit[30] from such a rule change and if it would make it easier to purchase handsets.[31] Adopting a full compliance regime will not guarantee consumers a better experience because the hearing aid device itself is a key component of the wireless HAC equation, and there are several factors that impact the overall user experience depending on the combination of the specific hearing aid and HAC-rated wireless handset that the individual user has. Often consumers do not know the rating of their hearing aid and this information may not be obvious to the user since the hearing aid rating is rarely published. Likewise, even if all wireless phones were HAC-compliant, there still may be differences in the ratings (e.g., between M3 and M4, T3 and T4) such that certain models will work better for them than others. The user experience is tied to the system equation of the wireless phone working in the appropriate mode in conjunction with the hearing aid in the appropriate mode. Thus, that experience is affected by whether or not the consumer has a telecoil-equipped hearing aid, and for example, whether or not they are utilizing their hearing aid in the appropriate mode with their wireless handset on the handset telecoil setting. Having a 100 percent compliance regime does not address these considerations, which can be more effectively addressed via increased consumer education and awareness concerning hearing aid ratings and modes and the interaction with wireless devices, which are HAC-compliant. Given that a high percentage of wireless mobile phones are already hearing aid compatible, as noted above,

[29] *See* John Ydstie, *To Make Hearing Aids Affordable, Firm Turns On Bluetooth,* NPR (July 2, 2013), http://www.npr.org/blogs/health/2013/07/02/197639536/to-make-hearing-aids-affordable-firm-turns-on-bluetooth.

[30] PN ¶ 14.

[31] *Id.* ¶ 15.

consumer awareness of the type of hearing aid they are using and its HAC rating will have more impact on their experience than requiring 100 percent HAC compliance for wireless handsets.

In the PN, the Commission also seeks input about whether adopting a 100 percent compliance regime would improve emergency access for the increasing number of wireless-only households.[32] As discussed above, there are currently a high percentage of wireless handsets on the market that are HAC-compliant. Therefore, TIA believes that the use of wireless-only handsets in a household would not be a constraint with respect to accessing emergency services for deaf or hard of hearing consumers as there are hundreds of HAC-rated models on the market today for consumers to choose from.

Wireless handset manufacturers have worked diligently to ensure compliance with existing HAC regulations and are committed to ensuring that there is a wide selection of HAC-compliant phones are available to consumers. However, the ability to provide an increasing number and diverse portfolio of HAC-compliant wireless handsets is largely due to the flexibility that the Commission has used thus far in implementing accessibility regulations. A rigid 100 percent compliance requirement would eliminate this flexibility to the detriment of both consumers and manufacturers. This approach would also be contrary to the spirit of flexibility and reasonableness that is built into the framework of the Twenty-First Century Communications and Video Accessibility Act ("CVAA").[33]

[32] *Id.*

[33] *See e.g.*,CVAA, 47 U.S.C. § 716 (incorporating considerations for industry flexibility in statutory obligations).

IV. CONCLUSION

TIA appreciates the Commission's consultation regarding these possible rule revisions, and urges consideration of the recommendations above. We stand ready to work with the Commission in ensuring that HAC requirements are applied in the most appropriate and feasible way while ensuring that consumer expectations regarding HAC are met.

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Appendix: Simulation of E-Field experienced by a hearing aid with respect to separation distance from mobile device antenna

This analysis demonstrates the difficulty in placing an antenna within a mobile device to ensure compatibility with RF-emission requirements for HAC. The study analyzes the separation distance between the mobile device antenna and the ear point location on the device as shown below in figure 1. This analysis is for a GSM signal at 1880 MHz with the ear point location ranging from a separation distance of 1.6" (1/4 λ) to 6.3" (λ).

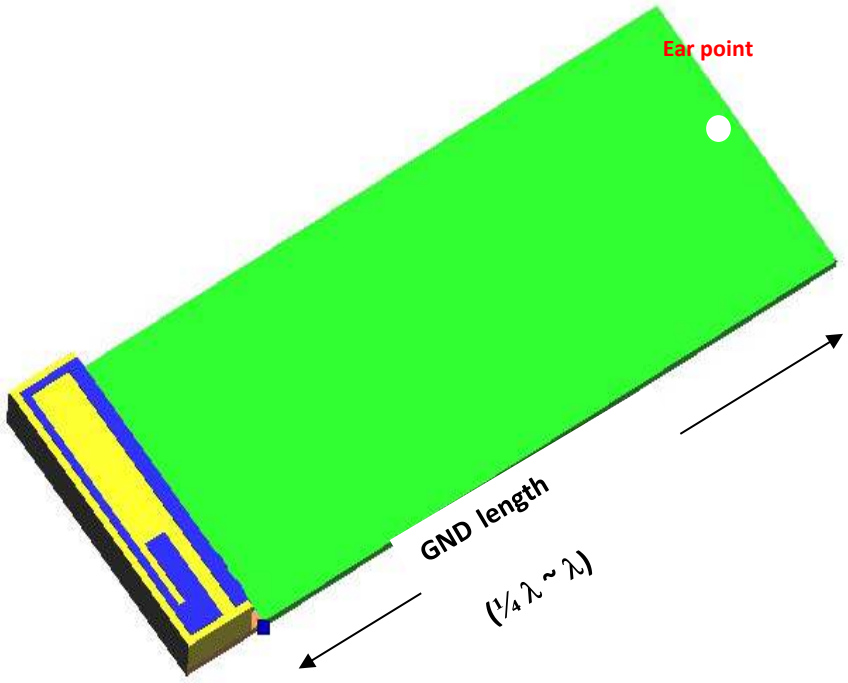

Figure 1: Simulation geometry

Shown below is a sample of the results of the simulation showing the relative field strength in the area of the device, as expected the strongest fields are near the location of the transmitting antenna.

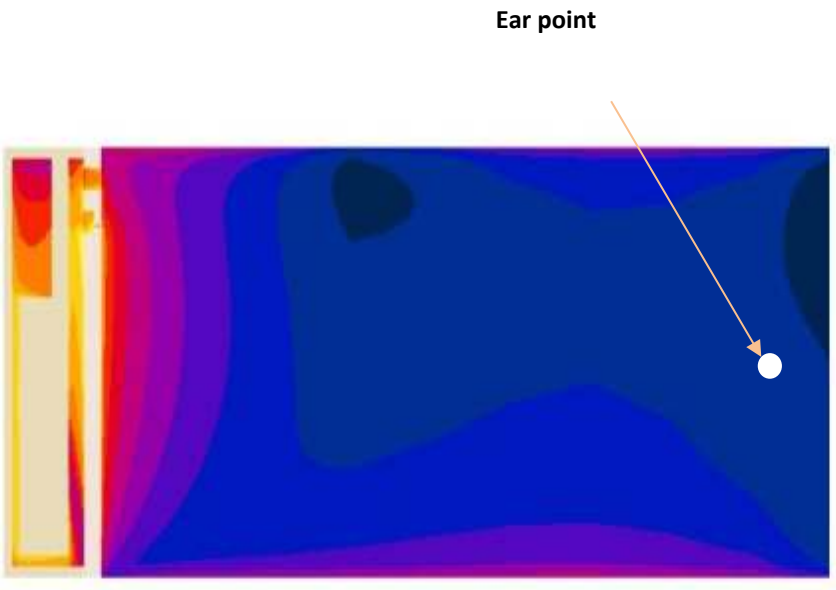

Figure 2: Sample simulation results

Shown below in Figure 3 are the simulation results. The results indicate the difficulty in finding an appropriate separation distance between the ear location and the antenna location. This is further complicated as devices become physically smaller or as additional antennas are required in the device to support multiple bands or new features such as uplink MIMO.

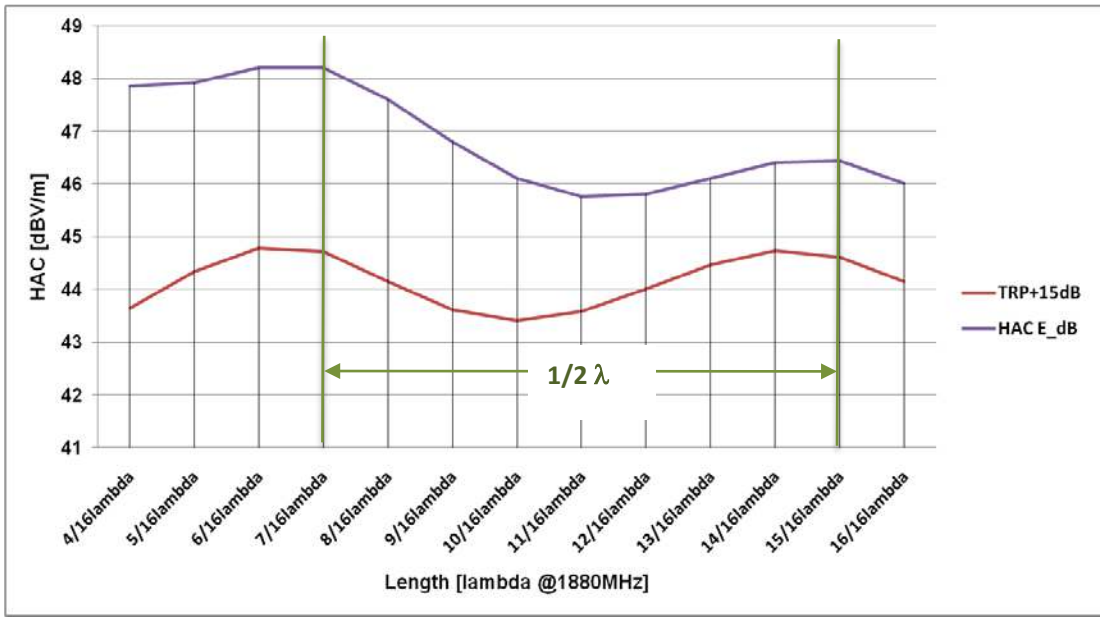

Figure 3: Simulation Result.