

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

In the Matter of	)	
	)	
Viasat, Inc.	)	File No. SES-LIC-20200811-00852
	)	Call Sign E202143
Application for Blanket Earth Station License	)	
Using Ka-band Spectrum	)	
	)	
	)	

**COMMENTS OF VERIZON<sup>1</sup>**

To help meet the increasing consumer demand for wireless services and secure U.S. leadership in 5G technology, Verizon has invested significant resources in the 27.5-28.35 GHz band to deploy 5G Ultra Wideband in cities and other high-density areas across the country. As the Commission has recognized, the 28 GHz band offers the high bandwidth, superior data transfer speeds, and low latency needed to support intensive consumer demands on 5G operations.<sup>2</sup> But, to ensure the utility of this band for 5G operations, Verizon and other mobile carriers must be adequately protected from Part 25 Fixed Satellite Service (“FSS”) operations in the adjacent 28.35-28.6 GHz band. Absent necessary protections, such FSS operations could cause significant harmful interference to mobile carriers’ deployment of 5G.

Viasat, Inc. (“Viasat”) seeks a license to operate 1.8 meter and 2.4 meter FSS earth stations on a blanket-licensed basis in the Ka-band.<sup>3</sup> Viasat’s earth stations will communicate with its ViaSat-3 geostationary orbit satellite system (“GSO”) in the 18.3–19.3 GHz and 19.7–

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<sup>1</sup> The Verizon companies participating in this proceeding are the regulated, wholly owned subsidiaries of Verizon Communications Inc.

<sup>2</sup> Report and Order and Further Notice of Proposed Rulemaking, *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, 31 FCC Rcd 8014, ¶ 7 (2016) (“*Spectrum Frontiers First R&O*”).

<sup>3</sup> See Viasat, Inc. Blanket License Application, File No. SES-LIC-20200811-00852 (filed Aug. 11, 2020).

20.2 GHz downlink frequencies, and the 28.35–29.1 GHz and 29.5–30.0 GHz uplink frequencies.<sup>4</sup> Viasat states that its “proposed operations are compatible with the operation of adjacent GSO systems, as well as co-frequency [non-geostationary satellite (“NGSO”)] systems.”<sup>5</sup> However, it is unclear from the information submitted with Viasat’s application whether its GSO operations of the 1.8 meter earth stations will cause harmful interference to terrestrial Upper Microwave Flexible Use Service (“UMFUS”) operations in the adjacent 27.5-28.35 GHz band.<sup>6</sup>

As Verizon has explained in other proceedings, the existing Part 25 out-of-band-emissions (“OOBE”) limits for FSS services do not adequately protect close-by UMFUS operations.<sup>7</sup> This is because, while UMFUS terminals are required to achieve an OOBE level of -13 dBm/MHz at the edge of their assigned channel or spectrum block, earth station transmitters are not required to achieve this level of attenuation until the emissions reach 250 percent of the channel bandwidth.<sup>8</sup> As such, depending on the bandwidth of the earth station transmitter, there is a strong likelihood that an earth station will place higher levels of OOBE into the 27.5-28.35 GHz band than is allowed by UMFUS transmitters themselves, degrading 5G operations. The major difference between FSS and terrestrial services regarding the effects of such OOBE interference is the distance involved. For FSS in the Ka band, there is significant frequency separation between the transmit and receive bands, thus satellite operators protecting

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<sup>4</sup> *See id.*, Ex. A at 1.

<sup>5</sup> *Id.*

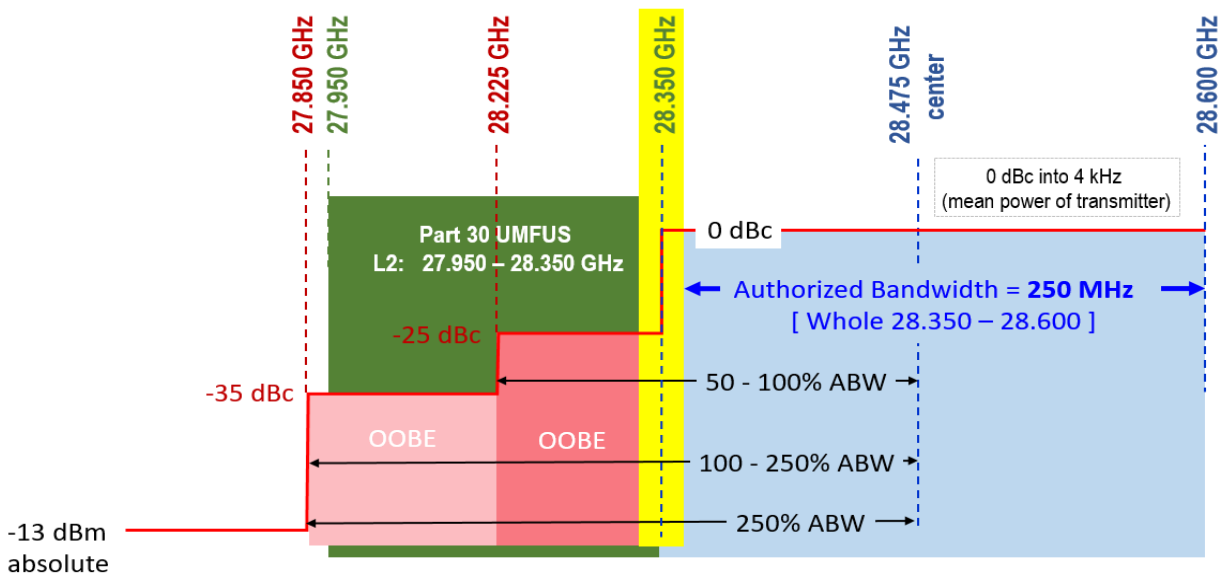
<sup>6</sup> In its Application, Viasat affirms that it plans to operate its NGSO system in the 28.6-29.1 GHz band in the United States. *See id.*, Ex. A at 2. Moreover, based on the information provided in the Application, the 2.4 meter antenna radiates significantly less at the horizon than the 1.8 meter antenna, which would have less potential impact on UMFUS operations. Accordingly, this analysis is limited to GSO operation of the 1.8 meter antenna in the 28.35-28.6 GHz band.

<sup>7</sup> *See, e.g.*, Comments of Verizon & U.S. Cellular, IB Docket Nos. 17-95 & 18-315 at 8-10 (filed Aug. 24, 2020).

<sup>8</sup> *See* 47 C.F.R. § 25.202(f).

space-based victim NGSO satellite receivers from FSS earth station transmitter interference have the advantage of great distance. By contrast, the victim terrestrial UMFUS receiver may be much closer to the FSS earth station transmitter. Figure 1 below illustrates the impact to UMFUS licensees of the existing Part 25 OOB limits.

**Figure 1: Impact of Section 25.202(f) OOB Limits in 27.5-28.35 GHz Band Assuming Adjacent 250 MHz Channel**<sup>9</sup>



As this figure demonstrates, the permitted Part 25 OOB spillover encompasses the entire Part 30 L2 allocation.

Based on the information that Viasat has provided, OOB from Viasat’s 1.8 meter fixed earth stations operating within 3.23 kilometers of Verizon’s 5G 28 GHz network could significantly degrade Verizon’s 5G network depending on how Viasat’s and Verizon’s antennas

<sup>9</sup> This illustration assumes use of the 250 MHz allocation in the 28.35-28.6 GHz band, but if Viasat’s operations extend beyond this allocation into an adjacent band, as contemplated in the Application, the spillover allowance into the 27.5-28.35 GHz band would be even wider.

are oriented toward each other. Table 1 provides an analysis of the interference that Viasat’s operations with respect to its 1.8 meter fixed earth stations could cause.<sup>10</sup>

**Table 1: Viasat Interference Analysis Based on § 25.136 PFD Contour**<sup>11</sup>

§25-136 UMFUS Protection - Viasat E202143 SES-LIC-20200811-00852_1.8M				
Max EIRP at Horizon	PT	9.0	dBW/4kHz	
Channel bandwidth	B	464	MHz	
Transmitter antenna height above ground	HT	2.40	m	
§25-202(f) Emission limitations	GT	-30	dB	
Center frequency of channel	F	28570	MHz	
<b>SES distance to boundary of PFD contour</b>	<b>D</b>	<b>3.23</b>	<b>km</b>	
Atmospheric losses per km	La	0.10	dB/km	
P.2108 clutter loss	CL	29.18	dbm	
Free Space Loss	FSL	131.6968753	db	
Rx Antenna In	RSL	-101.5097	dbm	
PT' = PT - 10 log BMHz	PT'	33.02482019	dBW/MHz	
Spectral Power Density at the boundary	spd	-158.17	dBW/MHz	
Area of Isotropic Receiving Antenna	A	8.77429E-06	m <sup>2</sup>	
SES -77.6 dBm/m <sup>2</sup> /MHz PFD contour	PFD	-77.606977	dBm/m <sup>2</sup> in 1 MHz	

It is also difficult to assess the full extent to which Viasat’s operations will interfere with Verizon’s 5G deployment because Viasat has not provided any information regarding its planned deployments, including whether Viasat intends to deploy earth stations in metropolitan areas or in close proximity to other high-value UMFUS locations, like airports.

In the *Spectrum Frontiers Order*, the Commission acknowledged the importance of “provid[ing] predictability to terrestrial licensees.”<sup>12</sup> And, in its recent *Part 25 Streamlining Order*, the Commission stressed that “adjacent-band terrestrial operators will have an opportunity to . . . request additional information regarding the earth station operations” in

<sup>10</sup> It is important to note that, because 27.5-28.35 GHz UMFUS terrestrial outdoor propagation will be predominantly line-of-sight, the 29.18 dB clutter loss used in Verizon’s analysis is extremely conservative. If this clutter loss were removed, and line-of-sight only were considered, the calculated interference distance would be much greater.

<sup>11</sup> See 47 C.F.R. § 25.136.

<sup>12</sup> *Spectrum Frontiers First R&O* ¶ 60.

response to a satellite operator’s technical submissions.<sup>13</sup> Verizon thus requests that the Commission require Viasat to supplement its Application with additional information regarding its expected deployments, including locations, areas, and densities, and relevant technical details, such as proposed antenna location under Section 101.103(d). This will enable potentially affected terrestrial licensees like Verizon to determine whether additional conditions on Viasat’s license may be necessary to protect UMFUS operations in the adjacent 27.5-28.35 GHz band, such as a requirement that Viasat’s earth stations authorized to operate at or near 28.35 GHz coordinate with UMFUS operators as outlined in Section 25.136(a)(4)(iv).

Granting Verizon’s request for additional information would be consistent with the Commission’s continuing obligation to ensure that each license application it grants serves the public interest.<sup>14</sup> Here the public interest is best served by allowing terrestrial UMFUS operators to unleash the full potential of millimeter wave bands to support high-capacity networks in high-usage areas where consumers will benefit most from “the next generational evolution of wireless technology to so-called 5G.”<sup>15</sup> That Viasat’s operations will comply with the OOB limit in Section 25.202(f) is not sufficient, standing alone, to satisfy the public interest standard. As the Supreme Court held long ago in interpreting Section 309, “[t]he Commission’s licensing function cannot be discharged . . . merely by finding that there are no technological objections to the granting of a license,” because the “‘public interest’ to be served under the Communications Act” is “the interest of the . . . public in ‘the larger and more effective use of radio.’”<sup>16</sup>

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<sup>13</sup> Report and Order, *Further Streamlining Part 25 Rules Governing Satellite Services*, 35 FCC Rcd 13285, ¶ 21 (2020).

<sup>14</sup> See 47 U.S.C. § 309 (“The Commission shall determine, in the case of each application filed with it to which section 308 of this title applies, whether the public interest, convenience, and necessity will be served by the granting of such application.”).

<sup>15</sup> *Spectrum Frontiers First R&O* ¶ 1.

<sup>16</sup> *Nat’l Broad. Co. v. United States*, 319 U.S. 190, 216 (1943) (citing 47 U.S.C. § 303(g)).

Respectfully submitted,

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