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# Comments on Public Consultation “Proposed Malaysia’s Position for WRC-19 Agenda Items”

AUGUST 8<sup>TH</sup>, 2019

**SAMSUNG**

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Authorized by HyoungJin CHOI 

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## Template for Response

August 8<sup>th</sup>, 2019

**Samsung Electronics** Co., Ltd (hereinafter Samsung<sup>1</sup>) is very pleased to take this opportunity to submit the response to the MCMC in response to the public consultation on proposed Malaysia's positions for WRC-19 Agenda Items.

Taking into account recent global movements, Samsung would like to emphasize that 5G using bands the 26 GHz (24.25-27.5 GHz) and the 28 GHz (26.5-29.5 GHz) will be essential to realize 5G services envisaged in Recommendation ITU-R M.2083 for IMT-2020 (5G) vision. In particular, Samsung believes that both these bands will be the focus for early equipment eco-system development in several countries around 2020, and then it would be expanded to the 40 GHz frequency range (37-43.5 GHz or portions thereof). Taking into account these, Samsung provides comments for WRC-19 AIs 1.13, 1.4 and 1.14 respectively.

Finally, Samsung thanks the MCMC for this opportunity to comment on the public consultation, and looks forward to working closely with the MCMC in order to take positions on WRC-19 Agenda Items.

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No.	Agenda Item	Proposed Malaysia (MLA) Views and Positions
<b>Working Party 1: Land Mobile and Fixed Services</b>		
3.	1.14	<p>Samsung strongly supports establishing regulatory measures for HAPS services to protect mobile services on a co-primary basis in the 27.9-28.2 GHz frequency band. Some countries are already using or will use the 28 GHz band for their terrestrial mobile service. The 28 GHz band is important as one of the essential millimetre wave bands for mobile services, taking into account global developments and national governmental policies. In this regard, Samsung as one of the mobile industry members is very supportive of the usage of the 28 GHz band to provide mobile services.</p> <p>In addition, the 38-39.5 GHz band as one of the candidate bands for HAPS is overlapped with 37-43.5 GHz band, which is the potential global harmonized band for IMT-2020. Samsung is of the view that the sharing study should be well considered to avoid the potential interference and unexpected limitation to IMT-2020.</p> <p>Samsung supports Method A for no changes to the Radio Regulations in the frequency bands 27.9-28.2 GHz and 38-39.5 GHz in order to ensure protection of the mobile service and its future development in these frequency bands.</p> <p>Meanwhile, if other Methods for the band 27.9-28.2 GHz should be discussed, Samsung can support Option 2 in Method B1 for the band 27.9-28.2 GHz to protect existing services. With regard to regulatory and procedural considerations for 27.9-28.2GHz, Samsung is of the</p>

<sup>1</sup> Further information on Samsung 5G is available at <https://www.samsung.com/global/business/networks/insights/?news>

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		<p>view that the pfd mask to protect mobile service shall be derived based on the receiver characteristics of mobile service stations, such as protection criteria, antenna gain and noise figure. Meanwhile, the pfd mask is an essential limit to protect mobile service regardless of the weather condition.</p> <p>For resolves in a draft new Resolution, taking into account above, Samsung supports option 1 pfd mask in [E114-28+31B1-O2] (WRC 19) to protect mobile service as following.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>Option 1 (Protection of mobile service):</b>  1 that for the purpose of protecting mobile service systems in territory of other administrations in the band 27.9-28.2 GHz, the power flux-density level per HAPS produced at the surface of the Earth in territory of other administrations shall not exceed the following pfd limits, unless the explicit agreement of the affected administrations is provided at the time of notification of HAPS:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right;">-122.7</td> <td style="text-align: center;">dB(W/(m<sup>2</sup> · MHz))</td> <td style="text-align: right;">for</td> <td style="text-align: left;">0° ≤ θ &lt; 2°</td> </tr> <tr> <td style="text-align: right;">-122.7 + 2 (θ - 2)</td> <td style="text-align: center;">dB(W/(m<sup>2</sup> · MHz))</td> <td style="text-align: right;">for</td> <td style="text-align: left;">2° ≤ θ &lt; 2.3°</td> </tr> <tr> <td style="text-align: right;">-122.6 + 1.5 (θ - 2)</td> <td style="text-align: center;">dB(W/(m<sup>2</sup> · MHz))</td> <td style="text-align: right;">for</td> <td style="text-align: left;">2.3° ≤ θ &lt; 7.9°</td> </tr> <tr> <td style="text-align: right;">-113.9</td> <td style="text-align: center;">dB(W/(m<sup>2</sup> · MHz))</td> <td style="text-align: right;">for</td> <td style="text-align: left;">7.9° ≤ θ ≤ 90°</td> </tr> </table> <p>where θ is the elevation angle in degrees (angles of arrival above the horizontal plane);</p> </div> <p>In addition, Resolution 160 (WRC-15) clearly stresses that HAPS would enable wireless broadband deployment in remote areas, including mountains, coastal and sandy desert areas. This means that separation distance as an alternative feasible regulatory condition can be used to protect existing mobile services from HAPS. Therefore, Samsung also supports option 2 as protection distance between HAPS and Mobile Services. Therefore, Samsung is of the view that the required protection distance should be updated to <b>63.5 km</b>.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>Option 2 (Protection of mobile service):</b>  1 that for the purpose of protecting the mobile service systems in the band 27.9-28.2 GHz, <b>63.5 km a protection distance between HAPS nadir and MS stations is required;</b></p> </div>	-122.7	dB(W/(m <sup>2</sup> · MHz))	for	0° ≤ θ < 2°	-122.7 + 2 (θ - 2)	dB(W/(m <sup>2</sup> · MHz))	for	2° ≤ θ < 2.3°	-122.6 + 1.5 (θ - 2)	dB(W/(m <sup>2</sup> · MHz))	for	2.3° ≤ θ < 7.9°	-113.9	dB(W/(m <sup>2</sup> · MHz))	for	7.9° ≤ θ ≤ 90°
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<b>Working Party 2: Broadband Applications in the Mobile Service</b>																		
5.	1.13	<p>Samsung supports the proposed views and positions described in the public consultation paper which Malaysia supports identification of the IMT focusing on the frequency ranges 24.25-27.5 GHz, 37-43.5 GHz. At APG19-5, these frequency ranges in the PACP were agreed to propose to WRC-19 (<b>Method A2 – Alternative 2</b>).</p> <p>With regard to conditions and options under Method A2, C2, D2 and E2, Samsung proposes the followings:</p> <p><b>a. Condition A2a – Option 1</b></p> <p>Samsung strongly proposes <b>-28 dBW/200 MHz for IMT base</b></p>																

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		<p><b>stations and -24 dBW/200 MHz for IMT mobile stations as unwanted emission limits in the active service band 24.25-24.75 GHz</b> to protect EESS (passive) in the 23.6-24 GHz. During APG19-5, Korea (Rep. of) and Singapore jointly proposed these limits. And Samsung would like to stress an news article (<a href="https://www.ctia.org/news/how-a-fake-weather-sensor-could-take-out-5g">https://www.ctia.org/news/how-a-fake-weather-sensor-could-take-out-5g</a>) pointing out a sensor requiring unnecessary over-protected and stringent criteria used for sharing study conducted by ITU-R TG 5/1 never went into use. Moreover, the United State of America proposed these limits to the CITELE meeting on August 2019. Therefore, Samsung would like the MCMC to take positions for the unwanted emission limit and the active service band based on following proposal to revise table 1-1 in Resolution <b>750 (WRC-15)</b>:</p> <p style="text-align: center;">Table 1-1 (in the Res. <b>750</b>)</p> <table border="1" data-bbox="440 869 1401 1146"> <thead> <tr> <th data-bbox="440 869 627 992">EESS (passive service band)</th> <th data-bbox="627 869 778 992">Active service band</th> <th data-bbox="778 869 890 992">Active service</th> <th data-bbox="890 869 1401 992">Limits of unwanted emission power from active service stations in a specified bandwidth within the EESS (passive) band</th> </tr> </thead> <tbody> <tr> <td data-bbox="440 992 627 1025">...</td> <td data-bbox="627 992 778 1025">...</td> <td data-bbox="778 992 890 1025">...</td> <td data-bbox="890 992 1401 1025">...</td> </tr> <tr> <td data-bbox="440 1025 627 1146">23.6-24 GHz</td> <td data-bbox="627 1025 778 1146"><a href="#">24.25-24.75 GHz</a></td> <td data-bbox="778 1025 890 1146"><a href="#">Mobile</a></td> <td data-bbox="890 1025 1401 1146"><a href="#">-28 dBW in any 200 MHz in the EESS (passive) band for IMT base stations</a> <a href="#">-24 dBW in any 200 MHz in the EESS (passive) band for IMT mobile stations</a></td> </tr> </tbody> </table> <p><b>b. Condition A2c to A2g</b></p> <p>It should be noted that almost all of the sharing and compatibility studies conducted by ITU-R TG 5/1 indicate that there is a <b>high and significant margin to protect other services from IMT</b>. Therefore, Samsung would like the MCMC to support Options addressing 'no condition is necessary' under Method A2.</p> <ul style="list-style-type: none"> <li>• Condition A2c: Option 5 (No condition is necessary)</li> <li>• Condition A2d: Option 4 (No condition is necessary)</li> <li>• Condition A2e: Option 9 (No condition is necessary)</li> <li>• Condition A2f: Option 3 (No condition is necessary)</li> <li>• Condition A2g: Option 5 (No condition is necessary)</li> </ul> <p><b>c. Condition C2a to C2e (Bands 37-40.5 GHz)</b></p> <ul style="list-style-type: none"> <li>• Condition C2a: Option 2 (No condition is necessary)</li> <li>• Condition C2b: Option 6 (No condition is necessary)</li> <li>• Condition C2c: Option 3 (No condition is necessary)</li> <li>• Condition C2d: Option 2 (No condition is necessary)</li> <li>• Condition C2e: Option 3 (No condition is necessary)</li> </ul> <p><b>d. Condition D2a to D2c (Bands 40.5-42.5 GHz)</b></p> <ul style="list-style-type: none"> <li>• Condition D2a: Option 6 (No condition is necessary)</li> <li>• Condition D2b: Option 3 (No condition is necessary)</li> <li>• Condition D2c: Option 3 (No condition is necessary)</li> </ul>	EESS (passive service band)	Active service band	Active service	Limits of unwanted emission power from active service stations in a specified bandwidth within the EESS (passive) band	...	...	...	...	23.6-24 GHz	<a href="#">24.25-24.75 GHz</a>	<a href="#">Mobile</a>	<a href="#">-28 dBW in any 200 MHz in the EESS (passive) band for IMT base stations</a> <a href="#">-24 dBW in any 200 MHz in the EESS (passive) band for IMT mobile stations</a>
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		<p><b>e. Condition E2a to E2d (Band 42.5-43.5 GHz)</b></p> <ul style="list-style-type: none"> <li>• Condition E2a: Option 7 (No condition is necessary)</li> <li>• Condition E2b: Option 3 (No condition is necessary)</li> <li>• Condition E2c: Option 5 (No condition is necessary)</li> <li>• Condition E2d: Option 3 (No condition is necessary)</li> </ul>

No.	Agenda Item	Proposed Malaysia (MLA) Views and Positions
<b>Working Party 3: Satellite Services</b>		
11.	1.5	<p>Some countries are already using or will use the 28 GHz band for their terrestrial mobile service. The 28 GHz band is important as one of the essential millimetre wave bands for mobile services, taking into account global developments and national governmental policies. In this regard, Samsung as one of the mobile industry members is very supportive of the usage of the 28 GHz band to provide mobile services.</p> <p>Samsung supports the view in the CPM Report that ESIM needs to protect the existing services to which the 27.5-29.5 GHz frequency band is allocated to, i.e. the mobile service, in accordance with Resolution <b>158 (WRC-15)</b>. Therefore, Samsung strongly supports establishing regulatory measures for ESIM services to protect mobile services on a co-primary basis in the 27.5-29.5 GHz frequency band. In this regard, Samsung supports sharing study results in section 3/1.5/3.2.2 in CPM report mentioning that <i>"ITU-R examined sharing conditions between ESIM and terrestrial services in the 27.5 29.5 GHz frequency band and concluded that there would be potential interference to receiving stations of terrestrial services from ESIM transmitters. Therefore, aeronautical and maritime ESIM should operate under the specified technical, operational and regulatory conditions to avoid causing unacceptable interference to receiving stations of terrestrial services operating in accordance with RR"</i>. Therefore, Samsung is of the view that any types of ESIM services such as aeronautical, maritime and land ESIM should be operated on a non-interference and non-protected to/from terrestrial services basis. And practical measures such as pfd limit, altitude limit and separation distance for ESIM services under the specific technical, operational and regulatory conditions should be considered to avoid causing unacceptable interference to receiving stations of terrestrial services.</p> <p>With regard to provision 2.2 in part 2 of Annex 2 to Draft New Resolution [A15] (WRC-19), Samsung strongly supports option 1 defining altitude limit to protect mobile services from aeronautical ESIM. Samsung is of the view that only complying with the pfd mask will not be sufficient to protect all existing and planned mobile services in 27.5 – 29.5 GHz band due to the fact that the validity and accuracy of pfd is yet to be verified and examined. At CPM19-2, there were inputs (Doc. CPM19-2/<a href="#">85</a> and CPM19-2/<a href="#">88</a>) providing technical rationales for necessity of altitude limit based on technical studies with reasonable assumptions. And this altitude limit was fully discussed at ITU-R WP 4A in preparation for CPM19-2 in accordance with Resolution 158 (WRC-15). Meanwhile, in CPM report there are two options as candidate pfd limits for aeronautical ESIM. Moreover, at APG19-5, Japan, Korea (Rep. of) and Singapore jointly proposed the necessity of the altitude limit to protect terrestrial services (APG19-5/INP-<a href="#">82</a>). Samsung understands that option 1 pfd limit is based on only fixed services. But option 2 pfd limit is based on mobile services, which was defined as a composite pfd limit ensuring protection of mobile services at CPM19-2. Samsung is of the view that option 2 pfd limit is</p>

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		<p>optimized solution as pfd limit to protect mobile services. In order for aeronautical ESIM to protect mobile services, therefore, Samsung fully supports both introduction of altitude limit and option 2 pfd limit. Taking into account above, ensuring protection of mobile services in the 28 GHz band from aeronautical ESIM, Samsung proposes followings:</p> <ul style="list-style-type: none"> <li>With regard to pfd limit, <b>option 2 pfd limit shall be adopted.</b></li> </ul> <div data-bbox="440 629 1401 958" style="border: 1px solid black; padding: 5px;"> <p><b>Option 2</b></p> <p> <math>\text{pfd}(\delta) = -122.7</math> (dBW/m<sup>2</sup>/1 MHz) for <math>0^\circ \leq \delta \leq 2^\circ</math>  <math>\text{pfd}(\delta) = -122.7 + 2 * (\delta - 2)</math> (dBW/m<sup>2</sup>/1 MHz) for <math>2^\circ &lt; \delta \leq 2.3^\circ</math>  <math>\text{pfd}(\delta) = -122.6 + 1.5 * (\delta - 2)</math> (dBW/m<sup>2</sup>/1 MHz) for <math>2.3^\circ &lt; \delta \leq 7.9^\circ</math>  <math>\text{pfd}(\delta) = -113.9</math> (dBW/m<sup>2</sup>/1 MHz) for <math>7.9^\circ &lt; \delta \leq 90^\circ</math> </p> <p>where <math>\delta</math> is the angle of arrival of the radio-frequency wave (degrees above the horizon);</p> </div> <ul style="list-style-type: none"> <li>With regard to altitude limit, <b>6 km of altitude limit shall be adopted to ensure protection of mobile service using the 28 GHz band</b></li> </ul> <div data-bbox="440 1144 1401 1312" style="border: 1px solid black; padding: 5px;"> <p><b>Option 1</b></p> <p>2.2 unless agreement from concerned administrations, aeronautical ESIM shall not transmit below 6 km of altitude above the territory of the administration concerned</p> </div>

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