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Subject: Clarify RF exposure limits and measurement methods at >6 GHz for WLANs

Objective
Currently, in the WLAN 6 GHz band, ARPANSA's RF exposure limits are given as 20 W/m2 absorbed power density in Table 1 as Basic restrictions and 55/(fGHz^0.177)W/m2 incident power density in Table 5 as Reference levels.

Normally, measurement and evaluation should be conducted using the absorbed power density of basic restrictions, but the Radiocommunications Equipment (General) Rules 2021_F2021C01207 only describes the measurement method of Incident Power Density in IEC TR 63170/ SA TR IEC 63170.
Therefore, RF exposure is measured and evaluated by both Absorbed Power Density and Incident Power Density.

To simplify this issue, I would ask you to consider the following
It is not very practical to measure Incident Power Density in the WLAN 6 GHz band with a 2 mm near-field electromagnetic field. For this reason, I propose the following measurement and evaluation methods 1) or 2).

1) Apply SA/SNZ TS IEC 63446 as the evaluation method for RF exposure in the WLAN 6 GHz band, and only measure and evaluate the absorbed power density, with the limit being 20 W/m2 as in Table 1 of ARPANSA.
This is the same requirement level as RSS-102 issue 6 of Canada.

2) As an evaluation method for RF exposure in the WLAN 6 GHz band only, IEC/IEEE 62209-1528 shall be applied to measure and evaluate 10 g SAR as in <6 GHz, and the limit shall be extended to 2 W/kg (4 w/kg for limbs) in Table 1 of ARPANSA. However, Incident Power Density according to IEC TR 63170/ SA TR IEC 63170 shall also be measured and its value shall be for reference purpose.
This is the same as the concept of OVER6G in the FCC's KDB388624 D02 v18r06.

In any case, I would like you to clarify the measurement method and evaluation criteria for RF exposure in the WLAN 6GHz band as soon as possible, and please publish them officially.

It is hoped that the above will be useful in measuring and evaluating RF exposure in the AS/NZ WLAN 6GHz band.

ARPANSA

Table 1. Basic restrictions for RF electromagnetic field exposure from 100 kHz to 300 GHz, for averaging intervals ≥ 6 minutes

Exposure Scenario	Frequency Range	Whole Body Average SAR (W kg^{-1})	Local Head/Torso SAR (W kg^{-1})	Local Limb SAR (W kg^{-1})	Local S_{ab} (W m^{-2})
Occupational	100 kHz – 6 GHz	0.4	10	20	NA
	>6 GHz – 300 GHz	0.4	NA	NA	100
General Public	100 kHz – 6 GHz	0.08	2	4	NA
	>6 GHz – 300 GHz	0.08	NA	NA	20

Notes:
1. 'NA' signifies 'not applicable' and does not need to be taken into account when determining compliance.
2. Whole body average SAR is to be averaged over 30 minutes.
3. Local SAR and S_{ab} exposures are to be averaged over 6 minutes.
4. Local SAR is to be averaged over a 10 g cubic mass.
5. Local S_{ab} is to be averaged over a square 4-cm^2 surface area of the body. Above 30 GHz, an additional constraint is imposed, such that exposure averaged over a square 1-cm^2 surface area of the body is restricted to two times that of the S_{ab} restriction.

Table 5. Reference levels for local exposure, averaged over 6 minutes, to RF electromagnetic fields from 100 kHz to 300 GHz (unperturbed rms values)

Exposure Scenario	Frequency Range	Incident E-field Strength E_{inc} (V m^{-1})	Incident H-field Strength H_{inc} (A m^{-1})	Incident Power Density S_{inc} (W m^{-2})
Occupational	0.1-0.135 MHz	ES	ES	NA
	>0.135-10 MHz	ES	$10.8/f_M$	NA
	>10-30 MHz	$1504/f_M^{0.7}$	$10.8/f_M$	NA
	>30-400 MHz	139	0.36	50
	>400-2,000 MHz	$10.58f_M^{0.43}$	$0.0274f_M^{0.43}$	$0.29f_M^{0.86}$
	>2 – 6 GHz	NA	NA	200
	>6 – <300 GHz	NA	NA	$275/f_G^{0.177}$
	300 GHz	NA	NA	100
General Public	0.1-0.233 MHz	ES	ES	NA
	>0.233-10 MHz	ES	$4.9/f_M$	NA
	>10-30 MHz	$671/f_M^{0.7}$	$4.9/f_M$	NA
	>30-400 MHz	62	0.163	10
	>400-2,000 MHz	$4.72f_M^{0.43}$	$0.0123f_M^{0.43}$	$0.058f_M^{0.86}$
	>2 – 6 GHz	NA	NA	40
	>6 – <300 GHz	NA	NA	$55/f_G^{0.177}$
	300 GHz	NA	NA	20