

## **SAR TESTING REQUIREMENTS WITH REGARD TO BYSTANDERS FOR LAPTOP TYPE COMPUTERS WITH ANTENNAS BUILT-IN ON DISPLAY SCREEN (LAPTOP MODE/TABLET MODE)**

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This document provides supplementary information on the requirements and method to perform SAR evaluation with regard to bystanders for laptop type computers (laptop mode<sup>1</sup> /tablet mode<sup>2</sup>) with antennas built-in on display screens.

The definition of Specific absorption rate (SAR) evaluation was revised in Industry Canada's RSS-102 - *Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)* Issue 4, published in March 2010, as follow:

**Specific absorption rate (SAR) evaluation** *is the method used to evaluate the SAR levels from a device by physical measurement or computational modelling techniques. SAR evaluation is required if the separation distance between the user or bystanders and the device is less than or equal to 20 cm.*

Laptop type computers (laptop mode/tablet mode ) with antennas built-in on display screens will sometimes have a separation distance of 20 cm or less from bystanders, and therefore subject to the routine SAR evaluation. A warning that a minimum separation distance of 20 cm must be maintained between the bystanders and the device in the manufacturer's user manual will not suffice.

The following measurement procedure shall be followed:

Unless the side(s)/edge(s) of the laptop type computer (laptop mode/tablet mode) containing the built-in antenna(s) was already tested against the flat phantom to account for the user requirements (e.g. antenna in the laptop base), Industry Canada requires SAR measurements to be performed with the side(s)/edge(s) of the display screen containing the built-in antenna(s) pointing towards the flat phantom. The separation distance shall not exceed 25 mm between the device and the flat phantom to show compliance for bystanders. Additional configurations regarding SAR testing for laptop type computer (laptop mode/tablet mode) are not required if the separation distance of 25 mm for bystanders represents the worst-case configuration.

- i) If the integrated antenna(s) are located in the back side of the display screen, the back side shall be facing towards the flat phantom at a distance not exceeding 25 mm.
- ii) If the integrated antenna(s) are installed along the edge(s) of the display screen, the edge(s) shall be facing towards the flat phantom at a distance not exceeding 25 mm.

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<sup>1</sup> *Laptop Mode* is defined as the operating configuration where the display is open perpendicular to and facing towards the keyboard.

<sup>2</sup> *Tablet Mode* for a convertible tablet computer is defined as the operating configuration where the display is folded over onto the keyboard section and facing outwards. The display orientation may be switched between portrait or landscape configurations for both slate and convertible tablets, allowing one or more of the tablet edges to become closest to the user during normal use.

- iii) If the integrated antenna(s) are installed at the corner of the display, both edges, as well as back side shall be tested to ensure that the worst-case configuration is captured.

The bystander requirement can be demonstrated based on the FCC KDB Publication 447498 and FCC KDB Publication 616217 (host limitation based on measured SAR level) as follow:

- 1) SAR measurement at the module level.
- 2) SAR measurement with a representative host
- 3) SAR measurement with each individual host

Applicants shall include in the RF exposure technical brief all information relevant to the exact test methodology used.

All transmitters are exempt from routine SAR evaluations for bystander requirement in the case of laptop type computers provided that output power complies with the power levels of sections 2.5.1 of RSS-102. If the equipment under test (EUT) meets the requirements of sections 2.5.1, applicants are only required to submit a properly signed declaration of compliance (see Annex C of RSS-102). The information contained in the RF exposure technical brief may be limited to information that demonstrates how the output power of the transmitter was derived. If the EUT does not meet the appropriate exemption limit, a complete SAR evaluation shall be performed. It must be emphasized that the above exemption from routine evaluation is **not** an exemption from compliance.

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