VIEWPOINT

MWF Mobile & Wireless Forum

SAR Compliance

Recent media reports in France have discussed the Specific Absorption Rate (SAR) value of mobile phones and the exposure of users to radio frequency (RF) energy while using these devices.

The SAR value[1] is a measure of the amount of RF energy absorbed by the body when using a mobile phone. For compliance testing, SAR is measured at maximum power levels under laboratory conditions according to measurement standards which prescribe the testing positions and all operational characteristics of the mobile phone including maximum transmit power. The industry is aware that some parties have tested devices in ways that are not in accordance with the measurement standards, and as such, we cannot comment on those non-standardized test results.

The SAR values reported significantly overstate real-life exposure levels because the applicable standards are very conservative[2]. Furthermore, the devices operate at significantly lower power levels, adapting constantly to use the minimum power required to make and receive a call, to maximize battery life.

Several studies[3] including a French study[4] of mobile phones in everyday use, have shown that when talking on a mobile phone while walking around a major city or inside city buildings, smartphones typically operate at a small fraction of the phones maximum power output. In the French paper the researchers observed that 90% of all the collected measurements, including those taken indoors and outdoors, were less than 4dBm which is about 1% of the maximum emitted power. As a result, they concluded:

> *The real exposure due to mobile phones in terms of Specific Absorption rate (SAR) is well below (100 times below) the normative values given at the maximum powers.*

Similar results have also been found in a recent paper looking at typical power levels of 4G devices[5].

The RF exposure standards have been established to specify the maximum allowed SAR for wireless communication devices such as mobile phones and incorporate additional safety factors to ensure that all users, including children, pregnant women and seniors, can all safely use these devices.

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[1] Detailed information on SAR can be found at http://www.sartick.com

[2] www.mmfai.info/docs/eng/111025__MMF_Viewpoint_SARSAMconservativness_final.pdf

[3] See for example, Persson et al., Output power distributions of terminals in a 3G mobile communication network *Bioelectromagnetics.*, Vol. 33, Pg. 320 - 325, 2012

[4] Wiart et.al. Exposure induced by WCDMA Mobile Phones in Operating Networks, *IEEE Trans on wireless communications* vol 8 No 12 2009

[5] P. Joshi, D. Colombi, B. Thors, L. E. Larsson and C. Törnevik, "Output Power Levels of 4G User Equipment and Implications on Realistic RF EMF Exposure Assessments," in *IEEE Access*, vol. 5, no., pp. 4545-4550, 2017.