Uppgjord – *Prepared*	Tfn-*Telephone*	Datum – *Date*	Rev	Dokumentnr – *Document no*
ERA/TFF Martin Siegbahn	+46 8 7570811	2002-08-30	A	TF-02:091
Godkänd – *Approved*	Kontr – *Checked*	Ert datum – *Your date*		Tillhör reference – *File/reference*
ERA/TF (Christer Törnevik)				

Justification of linear power scaling of SAR for the Sony Ericsson type 7130501-BV/CN mobile telephone (FCC ID: PY77130501)

1 Background

Sony Ericsson has received a question from the FCC on linear power scaling of SAR for the type 7130501-BV/CN phone (FCC ID: PY77130501). To address this question, SAR measurements have been carried out at 1900 MHz, on the same phone unit that SAR data was reported for earlier. Measurements were carried out for several power levels in order to show that a linear power scaling provides an accurate estimate of the SAR at the stated maximum power level.

2 SAR measurements

The same unit (S/N A6101TR9HJ) that was tested for the submitted SAR data [1] was tested again with the same DASY3 SAR measurement system. The phone unit was tested for the nominal power settings 26, 28 and 30 dBm and the corresponding output power levels at these three settings were measured. Additionally, a measurement was conducted on the phone when it was tuned to a higher power setting, 29.4 dBm, which is as close as possible to the rated maximum level of 29.5 dBm.

The SAR measurements were conducted for the test configuration that showed the maximum 1g averaged SAR in the 1900 MHz band obtained in the earlier tests; with flip mounted on the phone, for right side usage, in the tilt position and at channel 512 corresponding to 1850.2 MHz.

3 Results

The plot below shows the obtained 1g averaged SAR data for the tested unit at the different output power levels.

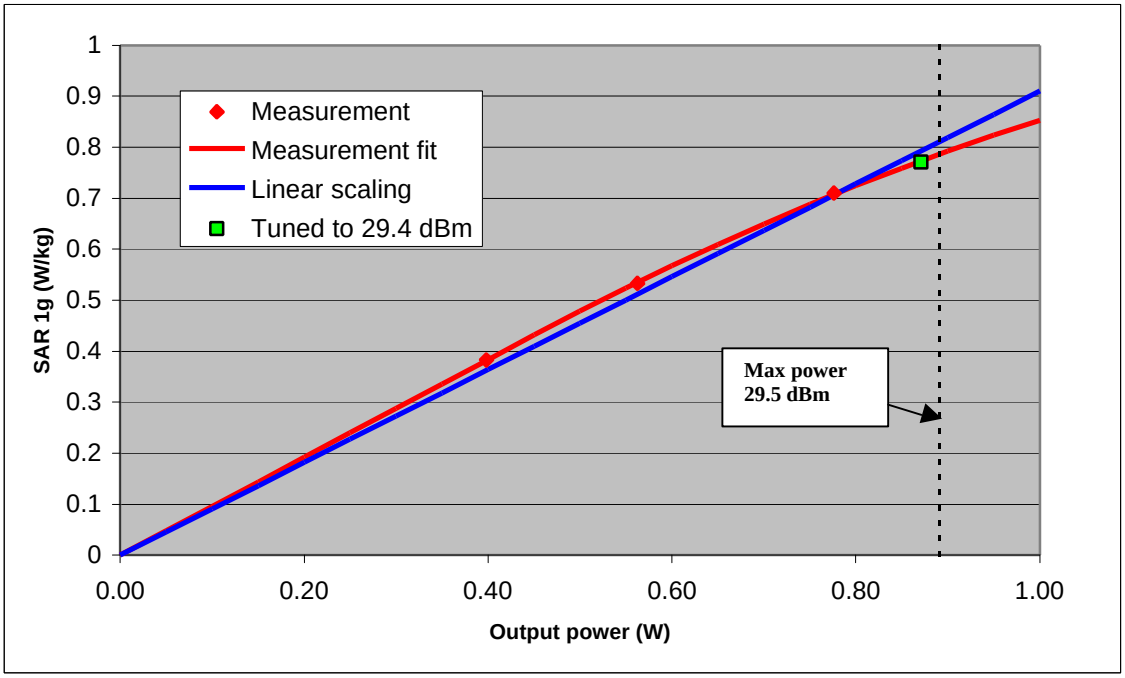

Figure 1. 1g averaged SAR versus output power level at 1850.2 MHz for the type 7130501-BV/CN (FCC ID: PY77130501) phone (S/N A6101TR9HJ).

The 1g averaged SAR for the normal power tuning shows a slowly decreasing curve with respect to output power, at maximum nominal output power setting 30 dBm (corresponding to 28.9 dBm measured power) the obtained SAR is slightly lower than what would be expected from linear relation. The reason for this is that the phone power amplifier is saturated by reflections due to the nearby phantom, to a higher extent at the maximum power level than what is the case at lower output power levels. A polynomial curve has been fitted to the measurement data, the red line in the plot. At the stated maximum output power 29.5 dBm, which equals the nominal maximum power plus factory tolerances, the 1g averaged SAR given by this fit is about 0.79 W/kg.

This output power behaviour is further confirmed by the measurement result obtained for the higher output power tuning, in the plot above displayed by a green square. At 29.4 dBm output power level, the 1g averaged SAR of 0.77 W/kg is very close to the red line fitting the data for the normal power tuning.

The reported maximum 1g averaged SAR, 0.80 W/kg, was calculated by linear scaling of the measured maximum SAR value at 28.9 dBm to the maximum output power of 29.5 dBm. In the diagram above this way of calculation is indicated by the blue line. This scaled maximum 1g SAR value is thus slightly higher than the value given by the red fitted measurement data curve.

4 Conclusions

SAR measurements on a mobile phone unit of the type 7130501-BV/CN (FCC ID: PY77130501) for different power settings showed that a linear power scaling for obtaining the SAR at the maximum stated power level is accurate and corresponds to a slight overestimation of the maximum SAR.

5 References

[1] Martin Siegbahn, “SAR Test Report: Sony Ericsson P800 mobile telephone model for GSM900, GSM1800 and GSM1900”, ERA/TF-02:061, Rev. A, June 13, 2002.