Assessment Notes by BABT as TCB for the Symbol Technologies Inc. H9P4121GPRS Mobile Computer under FCC ID number H9P4121GPRS

BABT file number US/000084

I have reviewed the TÜV-PS SAR test report WS612329-001 Issue 1 in respect of the above product and I have the following comments:

The expanded measurement uncertainty is shown on page 14 of the report at 22.2%, which is acceptable for this kind of measurement. The head and body simulant fluids were correctly calibrated within 5% of the target values and the measurements were taken within 100MHz of the calibrated frequency of the fluids.

Important note to FCC reviewer:

The device is a portable computer intended to be normally hand-held and used for data entry applications. The device incorporates a GSM module 802.11b RLAN module and a Bluetooth™ radio module. The testing programme adequately reflects this complexity and was performed using body (box) phantoms and includes a representative set body-worn test configurations. The Bluetooth™ module is set to a low output power of 1 mW and is the subject of a separate, existing FCC grant under FCC ID H9P2164381. The RLAN module is the subject of a separate, existing FCC Grant under FCC ID H9PLA4137. The GSM/GPRS 850/1800/1900 module is the subject of a separate, existing FCC Grant under FCC ID IHDT6AC1

This device may contain a maximum number of three transmitters, one Bluetooth™ radio, One RLAN module and a GSM/GPRS 850/1800/1900 module. The device also contains a GPS receiver and an acoustic modem and dialler. There is a microphone for voice capture and a speaker but the device **cannot** be used as a mobile telephone. The manufacturer has declared that the composite device is **not** capable of co-transmission using the 802.11b RLAN at the same time as the GSM/GPRS module and the Bluetooth™ and has applied software controls to prevent this. The GSM/GPRS and Bluetooth™ modules **are** capable of co-transmission. This situation is regarded as being acceptable for TCB approval because of the low power of the Bluetooth™ module relative to the GSM/GPRS module. The separate, worst-case SAR values for normal General Population uncontrolled exposure use are summarised below. It must also be noted that the Bluetooth module falls below the 60/f GHz limit of 24mW above which routine SAR evaluation would be required and no scans of the Bluetooth™ device have been provided because of the low power of this module.

Summary of highest measured SAR Values in Normal Positions

Band	Position	Channel	Frequency (MHz)	Max Spot SAR (W/kg)	1g SAR (W/kg)	SAR drift dB	Area Scan (Figure #)
GSM/GPRS 850MHz	Side touch front	37	897.5	0.2	0.177	0.07	Figure 17
GSM/GPRS 1800MHz	Side touch front	885	1784.8	0.16	0.131	0.10	Figure 25
GSM 1900MHz	Side touch front - Top	512	1850.2	0.15	0.127	0.12	Figure 29
DSSS 2450	Side touch front - Top	1	2412	0.17	0.14	0.12	Figure 34
Limit for General Population (uncontrolled exposure) 1.6 W/kg (1g)							

Justification:

The maximum measured SAR value is obtained at 1784.8 MHz and is 0.131 W/kg for 1g averaging. This is less than the limit for the general population of 1.6W/kg averaged over 1g. The maximum SAR values obtained for the RLAN module is obtained at 2412 MHz and is 0.14 W/kg for 1g averaging. Also it should be noted that these results are obtained under CW mode working which will not occur in practice.

The device will normally be hand-held. Measurements results for headset use are not shown but were found to be all below the noise floor. No special training is required to use the device to limit RF exposure therefore this equipment has been tested for general population usage. When carrying the device the user will either hand carry the equipment or use a belt-clip, which contains **no metal parts** and maintains a distance of 0.0 cm from the user's body. It is viewed that this device **DOES MEET** the SAR requirements for a body-worn device for use by the general population even allowing for worst-case measurement uncertainties. Appropriate Grant conditions have been applied to this submission.

I confirm that I have undergone SAR awareness training by the FCC at the TCB Council workshops in August 2001, February 2002, April 2002, October 2002 and May 2004.

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13h August 2004