

**Assessment Notes by BABT as TCB for the Symbol Technologies Inc MC9062A
Mobile Computer.**

For Symbol Technologies Inv. under FCC ID number H9PMC9062A

BABT file number US/000060

I have reviewed the TÜV-PS SAR test report WS611524-001 issue 2 in respect of the above product and I have the following comments:

The expanded measurement uncertainty is shown on page 15 of the report at 27.6%, 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 can also be used with a headset. The device incorporates an 802.11 RLAN card and optionally a Bluetooth™ radio module. The testing programme adequately reflects this complexity and was performed using both head and body (box) phantoms and includes a representative set of headset and body-worn test configurations. The Bluetooth™ module is of a low output power 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 H9P2164436.

This device may contain a maximum number of three transmitters, one Bluetooth™ radio (FCC ID H9P2164381), One RLAN module (FCC ID H9P2164436) and a GSM/GPRS 850/1900 module (FCC ID QIPMC46). The manufacturer has declared that the composite device is **not** capable of co-transmission and has applied software controls to prevent this. The separate, worst-case SAR values for normal General Population uncontrolled exposure use are summarised below. It must also be noted that both the Bluetooth and the RLAN modules are of low power and would individually fall below the 60/f GHz limit of 24mW above which routine SAR evaluation would be required.

Summary of highest measured SAR Values in Abnormal Positions

Band	Position	Channel	Frequency (MHz)	Max Spot SAR (W/kg)	1g SAR (W/kg)	SAR drift dB	Area Scan (Figure #)
GSM/GPRS 850MHz	Rear to Phantom in Holster *	128	824.2	0.21	0.195	-0.05	Figure 21
GSM/GPRS 1800MHz	Rear to Phantom in Holster *	885	1784.8	0.59	0.462	0.05	Figure 25
GSM 1900MHz	Rear to Phantom in Holster *	512	1850.2	0.90	0.695	0.07	Figure 29
Bluetooth™	MC9062 placed 1.0cm from phantom 2.0mm side	39	2441	0.06	0.030	0.09	Figure 31
DSSS 2450	MC9062 placed 1.0cm from phantom 2.0mm side	13	2472	0.69	0.516	-0.03	Figure 36
Limit for General Population (uncontrolled exposure) 1.6 W/kg (1g)							
* Note these are worse case results in a position not designated for normal use.							

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	LCD to Phantom in Holster	128	824.2	0.06	0.053	-0.13	Figure 18
GSM/GPRS 1800MHz	LCD to Phantom in Holster	885	1784.8	0.02	0.020	0.00	Figure 24
GSM 1900MHz	LCD to Phantom in Holster	512	1850.2	0.02	0.022	0.23	Figure 26
Bluetooth™	MC9062 placed 1.0cm from phantom 2.0mm side	39	2441	0.06	0.030	0.09	Figure 31
DSSS 2450	MC9062 placed 1.0cm from phantom 2.0mm side	13	2472	0.69	0.516	-0.03	Figure 36
Limit for General Population (uncontrolled exposure) 1.6 W/kg (1g)							
These figures are worst case in normally designated position.							

Justification:

The maximum measured SAR value for the GSM1900 is obtained at 1850.2 MHz and is 0.695W/kg for 1g averaging. This is less than the limit for the general population of 1.6W/kg averaged over 1g. This is also obtained under the worst case positioning in the holster which is not designated for normal use. The maximum SAR values obtained for the Bluetooth™ module is obtained at 2441 MHz and is 0.030W/kg for 1g averaging. The maximum SAR values obtained for the RLAN module is obtained at 2472 MHz and is 0.516W/kg for 1g averaging. If the Bluetooth™ values are added to the RLAN values the absolute maximum value of SAR would not exceed 0.546W/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 but could be used with a headset. 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 metal parts and maintains a distance of 4.0cm 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.



Alan Binks
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4th August 2004