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Supplement to SAR Test Report for Motorola portable cellular phone (FCC ID IHDT56BJ3)

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Summary of FCC request for additional SAR information

There was a request for additional information regarding Motorola's SAR Test Report for Motorola portable cellular phone (FCC ID IHDT56BJ3). The requested information is addressed below in the same numbering sequence received.

1) Details of how conducted power was measured during SAR testing. Reported numbers appear to be ratings or from a single measurement.

RESPONSE: The conducted power was measured on a power measurement bench with the same fully charged battery utilized for SAR testing. The conducted power is measured on the low, mid and high channels for each mode. The output stability of the EUT was verified by measuring the SAR drift before and after the SAR measurement, as suggested during the TCB workshop that the FCC hosted on August 27 – 29, 2001.

2) Statement explaining the large SAR drift reported only for CDMA 1900 ch 25.

RESPONSE: The SAR drift shown for body-worn CDMA 1900 chn 25 was -0.40dB. The drift is calculated by measuring a "reference" point twice, once before the SAR coarse scan and the other immediately after the SAR cube scan. The drift is the delta between the two measured values in dB. The first reference value measured was 12.99 V/m (0.268 W/kg). The second "reference" measurement (taken immediately after the SAR cube measurement) was 12.39 V/m (0.244 W/kg). It can be seen that the difference is only 0.6 V/m, which can be attributed to measurement accuracy and environmental conditions.

3) Justification for 1900 body conversion factor used. No corresponding value could be found in the calibration papers.

RESPONSE: The 1900MHz body tissue conversion factor is the same as the 1800MHz body tissue conversion factor shown in the "Additional Conversion Factors" for probe ET3DV6 Serial number sn1508. Since the conversion factor for both 1800 & 1900 MHz head tissue is the same '5.41' (Original SAR report Probe SN1508 Calibration Certificate), it is also true for body worn that both 1800 and 1900 MHz share the same conversion factor of '5.0'.

4) Manufacturer SAR validation data used to develop the target values.

RESPONSE: Please see included *Interim Dipole Correlation Certificate* for each dipole.

5) Z-axis scan SAR data for the highest SAR test points or photographs demonstrating 15 cm liquid depth for the device measurements.

RESPONSE: The Z-axis scans were performed during the daily system accuracy verification. These scans were done using the same phantoms and tissue simulate as the device SAR measurements. The Z-axis scans are included in the original filing within *Appendix 1 SAR distribution comparison for the system accuracy verification*.

6) Discussion of how the EUT was operated/controlled during the test to assure the testing of all appropriate modes, and maximum power. Supplement C Appendix B part I 2.

RESPONSE: The EUT was operated in a test mode that allows control of the transmitter without the need to place actual phone calls. For the purposes of these tests the unit was commanded to the test mode and manually set to the proper channel, maximum transmitter power level and applicable transmit mode of operation.

7) Additional descriptive information of the SAR measurement system to meet Supplement C Appendix B part II recommendations. Please includes details of the E-field probe, holder, scan procedures, calculations, Robot and computer.

RESPONSE: The DASY v3.1 system specified in section 3.1 of the original filing SAR Test report was utilized within the intended operations as set by the SPEAG™ setup.
The holder was the one received with the DASY v3.1d system. As stated in section *6 – Test Results* of the original filing, the measured dielectric constant of the material used for the holder is less than 2.9 and the loss tangent is less than 0.02 (± 30%) at 850MHz. The default style of “coarse” and “cube” scans were chosen and use for measurements. The grid spacing of the course scan was 15cm as shown in the SAR plots. Please refer to the DASY manual for additional information on SAR scanning procedures and algorithms used.

8) Justification of head test positioning. The device does not appear to touch the ear in photo/figure 11 as required.

RESPONSE: The photo/figures shown in the original filing were taken after the measurements were performed. Motorola affirms that the correct positioning was utilized for the actual measurements. Specifically, the device did touch the ear as required.

9) Detailed uncertainty budget analysis. Information provided is considered insufficient.

RESPONSE: Motorola is working on developing an uncertainty budget per the format shown in IEEE P1528. We have received many suggested values for various line items in the budget from SPEAG™. In order to verify that these values were determined per the methods indicated in IEEE P1528, we have requested, from SPEAG™, how these values were determined. Subsequently, there has been a lot of input from various members of the committee suggesting that certain line items be changed. Also, values for the line items under the *Test Sample Related* section of the budget are device specific and must be determined by the test location. Motorola is currently completing various studies to determine what these values should be for our products. We expect to have a complete uncertainty budget per IEEE P1528 available shortly. The 12% overall RSS uncertainty of measurement stated in the original filing breaks down into the following line items:

Probe Uncertainty	**±%**
Isotropy error	7.2
Calibration error	3.3
Spatial resolution	0.5

SAR Evaluation	**±%**
Conductivity measurement	5.0
Environmental errors	1.0

Peak SAR Evaluation	**±%**
Probe positioning	1.0
Volumetric averaging	4.2
Device positioning	6.0

10) Statement that neither belt clips tested contain any metallic part. Otherwise provide data for both body clips.

RESPONSE: The leather pouch with a wishbone belt-clip does not contain any metal parts and does result in the closest proximity between the phantom and the EUT. The leather pouch with a universal belt-clip does contain a metal clip and spring but results in a significantly larger separation distance between the phantom and the EUT. The closer proximity of the wishbone belt-clip results in a higher SAR measured in the 800MHz band. In the 1900MHz band, the resonance of the metal does show up and results in higher measured SAR. This

fact of having each belt-clip result in higher measurements in different bands is why the data was separated by bands in the original filing.

11) SAR data for body CDMA 800.

RESPONSE: The CDMA 800 conducted power is 2.5dB lower than that of the AMPS mode conducted power. The CDMA 800 body worn data was not reported because OET Bulletin 65 Supplement C 01-01 states "For devices that operate in multiple modes within the same frequency band, all modes with a maximum source-based time-averaged output within 1.0 dB of the mode with the highest output should be tested to demonstrate compliance." The CDMA 800 body worn SAR results are shown below.

f (MHz)	Description	Conducted Output Power (dBm)	CDMA 800 Measured SAR (Body Worn)			
			Ant Fixed			
			Measured (W/kg)	Drift (dB)	Ambient. Temp (°C)	Simulate Temp (°C)
Analog 800MHz	Channel 991	27.45	0.534	-0.13	22.00	22.00
	Channel 384	27.43	0.525	0.02	22.00	22.00
	Channel 799	27.48	**0.546**	**-0.16**	**22.00**	**22.00**

Table 1: SAR measurement results for the portable cellular telephone FCC ID IHDT56BJ3 at highest possible output power. Measured against the body.

Summary of FCC request for additional EMC information

1) Item of non compliance. Band edge for CDMA 800.

RESPONSE: Please find attached the retest of the CDMA 800MHz band edge plot showing compliance of the device provided by PCTEST TCB.

2) Resolution BW used for "Spurious emissions at antenna terminal" data.

RESPONSE:

- Part 22 Public Mobile Services: 30 kHz
- Part 24 Personal Communications Services: 1MHz

3) Additional details for radiated measurements.
-justify use of semi anechoic chamber. ANSI 63.4 requires use of OETs.
-provide photographs of the setup including the substitution antenna.
-provide sample calculation.
-provide new data as appropriate.

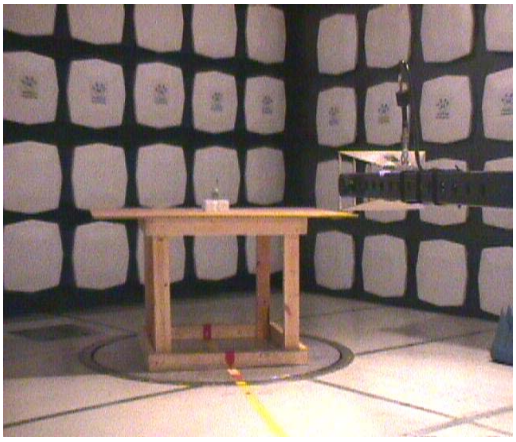
RESPONSE:

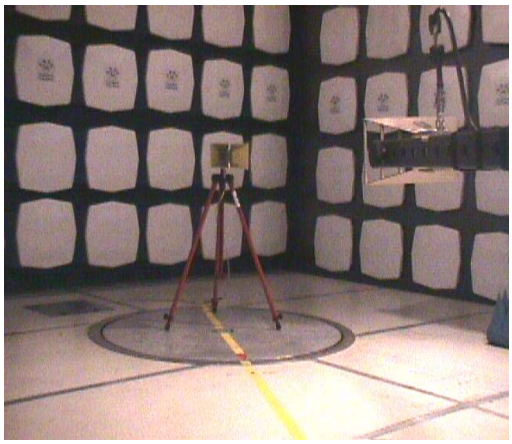
3) Additional details for radiated measurements.
a. justify use of semi anechoic chamber. ANSI 63.4 requires use of OETs.
b. provide photographs of the setup including the substitution antenna.
c. provide sample calculation.
d. provide new data as appropriate.

a. The Motorola semi-anechoic chamber located at 1500 Gateway Blvd, Boynton Beach, FL, does comply with ANSI C63.4 section 5.4.2 for an Alternative test site and is formally listed with the FCC OET. FCC Registration Number: 100000

5.4.2 Alternative test sites – C63.4
"Measurements may be made at facilities that differ from the standard test site. Alternative test sites include RF absorber-lined, metal test chambers, office or factory buildings, and weather-protected OATS with covering structures that are or become significantly reflective with weather. Such alternative sites shall comply with the volumetric NSA requirements of 5.4.6.5 over the volume occupied by the EUT, or the EUT arrangement."

b.





c. Field Strength (dBm) = Signal generator level (dBm) – Cable loss (dB) + Antenna gain (dBd)

Cable Loss is the loss from the output of the Signal Generator to the input of the substitution antenna.

d. NA

4) Additional internal photos. Please include all components such as the case.

RESPONSE: Please refer to the additional photos provided by PCTEST TCB.

5) Statement clarifying conducted power. HPE 4406 measurements report vary from reference line settings in the occupied BW measurements report for all three emissions. Please explain the difference.

RESPONSE: In the test report (exhibit 6), please refer directly to the “RF POWER OUTPUT” section for the maximum conducted power levels. These measurements are taken by equipment specifically designed for precise power measurements using the phone described in exhibit 11. In addition, the ”RF power output” procedure includes precise compensation for connector and adapter losses.

6) Additional detail clarifying discussion of duty cycle vs power given on page 5 of 14 of the operational description.

The use of duty cycle in conjunction with CDMA technology is unexpected. Please clarify.

RESPONSE: The duty cycle refers to the pulse on time for different data transfer rates. No adjustments in the reported data are based on a duty cycle correction.

7) Statement clarifying transmitter tune range. The tech specs andoperational description seem to differ a number of times. Please see op.desc. Transmitter Tech. Charact. 1 B, and General information 4 B. Please clarify.

RESPONSE: Please see attachment provided by PCTEST TCB.