



**To:** Gregory Czumak/ PCTEST TCB  
**From:** Mr. Andrew Bachler/ MOTOROLA Inc.

**Applicant:** Motorola, Inc.  
**Date:** March 29, 2006

**Subject:** Request for additional information regarding FCC ID: IHDT56GE1 (Portable PCS CDMA transceiver)

**Reference:**

|                                  |             |
|----------------------------------|-------------|
| Application Received:            | 02/27/2006  |
| Correspondence Reference Number: | 160227A.IHD |
| Confirmation Number:             | 1602270096  |
| Date of Original Email:          | 03/27/2006  |

**Questions and responses follow:**

1. Regarding the use of cdma2000, filings should be clear about transmitter setup & operation capabilities to ensure devices are configured properly according to communication protocol and operating requirements in order to obtain valid SAR results. Please address the following questions.

- a. What is the CDMA MS Protocol Revision number?
- b. Please identify the CDMA Radio Configurations, Service Options, multiplex options, voice/data, code channel combinations and options available to the EUT.
- c. Please identify the CDMA Radio Configurations, Service Options, multiplex options, voice/data, code channel combinations and options used for the SAR tests.
- d. Because of the different RC's, SO's, data rates, channel combinations and modulations, the filing should include justification for the selection of applicable configurations used to establish and maintain maximum output in order to demonstrate SAR compliance for other configurations that were not tested. Please provide the justification for the specific combination(s) used during the SAR tests (e.g., a table indicating the various RC/SO options available and the measured output power of each such combination).

**RESPONSE:**

- a. Protocol revision 6 (complaint to IS-2000 Rev 0).
- b. To test voice calls on the DUT, the test equipment was configured to use "all up bits" for RC1 / SO2 on J-STD-008 for CDMA 1900MHz and TSB-74 for CDMA 800MHz on the Agilent E8285A CDMA Mobile Station test set.
- c. See response in d. below.
- d. Motorola IS2000 CDMA cellular phones does not use different data rates or concurrent channels (supplemental channels) while in the voice mode, thus testing voice modes using RC1 is applicable. Motorola IS2000 CDMA products do use supplemental channels and different data rates for data mode. The output power of the DUT is controlled by a power control loop within the DUT. This power control loop measures the total RF power supplied into the antenna match network for emission. This output power measurement will include the power from different data rates and concurrent channels. The measured power level is controlled and limited to the maximum output power setting for the phone. Motorola performs SAR tests of IS2000 CDMA phones at this maximum power level using RC1 / SO2, thus the output power under this test setup is equivalent to the maximum output power for any data rate and/or concurrent channel capability of the DUT. The Motorola IS2000 CDMA cellular phones were measured in voice calls only.

2. Does the EUT employ EV-DO? If so, body-worn SAR should be repeated in EV-DO (Rev. 0 only) using the CDMA 2000 body-worn channel configuration that resulted in the highest SAR among the various Radio Configurations in this frequency band (that is, just a single SAR test for EV-DO, as a sanity check). If this EV-DO SAR is greater than the highest body-worn SAR in CDMA 2000, perform body-worn SAR for the other 2 channels (among the required H, M, L channels).

Note: EV-DO operates independently of CDMA 2000 with different modulation, channel and protocol structures. It is not an integral part (seamless) of the CDMA 2000 structure, but overlays the 1x structure. EV-DO Rev A allows 307 kbps and higher order modulations; therefore, may need additional considerations. The above procedures applies to single band CDMA 2000 1x handsets with built-in EV-DO (Rev. 0) using the same transmit path hardware. Please contact us if the device in question operates in other configurations or EV-DO does not apply to body-worn conditions.

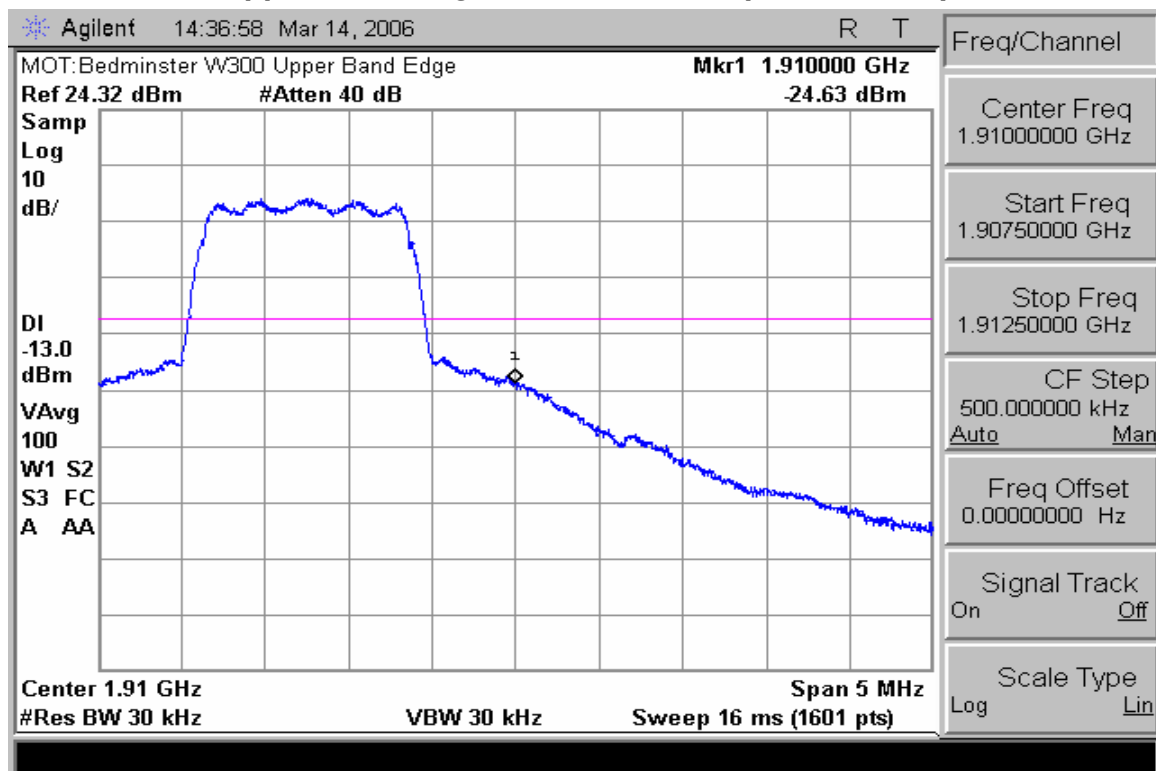
**RESPONSE:**

**No EV-DO employed in the unit.**

3. Please submit the PCS upper bandedge plot.

**RESPONSE:**

**CDMA 1900 – Upper Band Edge – Channel 1175 (1908.75 MHz)**



4. Please indicate the spec an settings used to perform cellular CDMA occupied bandwidth and band edge measurements.

**RESPONSE:**

| Plot                        | Equipment Settings         |                       |                    |            |          |                 |
|-----------------------------|----------------------------|-----------------------|--------------------|------------|----------|-----------------|
|                             | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Sweep Points ( # ) | Trace Mode | Detector | Samples ( ≥ # ) |
| Reference Plot - CDMA 800   | 3000                       | Auto                  | 2001               | Max Hold   | Peak     | 100             |
| OCBW - CDMA 800             | 30                         | Auto                  | 1601               | Max Hold   | Peak     | 100             |
| Lower Band Edge - CDMA 800  | 1                          | Auto                  | 2004               | Max Hold   | Peak     | 30              |
| Upper Band Edge - CDMA 800  | 1                          | Auto                  | 2004               | Max Hold   | Peak     | 30              |
| Reference Plot - CDMA 1900  | 300                        | Auto                  | 1001               | Max Hold   | Peak     | 30              |
| OCBW - CDMA 1900            | 3                          | Auto                  | 1001               | Max Hold   | Peak     | 30              |
| Lower Band Edge - CDMA 1900 | 1                          | Auto                  | 2004               | Max Hold   | Peak     | 30              |
| Upper Band Edge - CDMA 1900 | 1                          | Auto                  | 2004               | Max Hold   | Peak     | 30              |

Notes: 1) When the video bandwidth is set to Auto the video bandwidth self adjusts for <sup>3</sup> the resolution bandwidth.  
 2) The plotted data shown for the band edge measurements is representative of data taken with a true 3 kHz resolution bandwidth filter. The raw data was taken using a 1 kHz resolution bandwidth and was integrated to produce a response representative of data taken using a true 3 kHz resolution bandwidth filter.

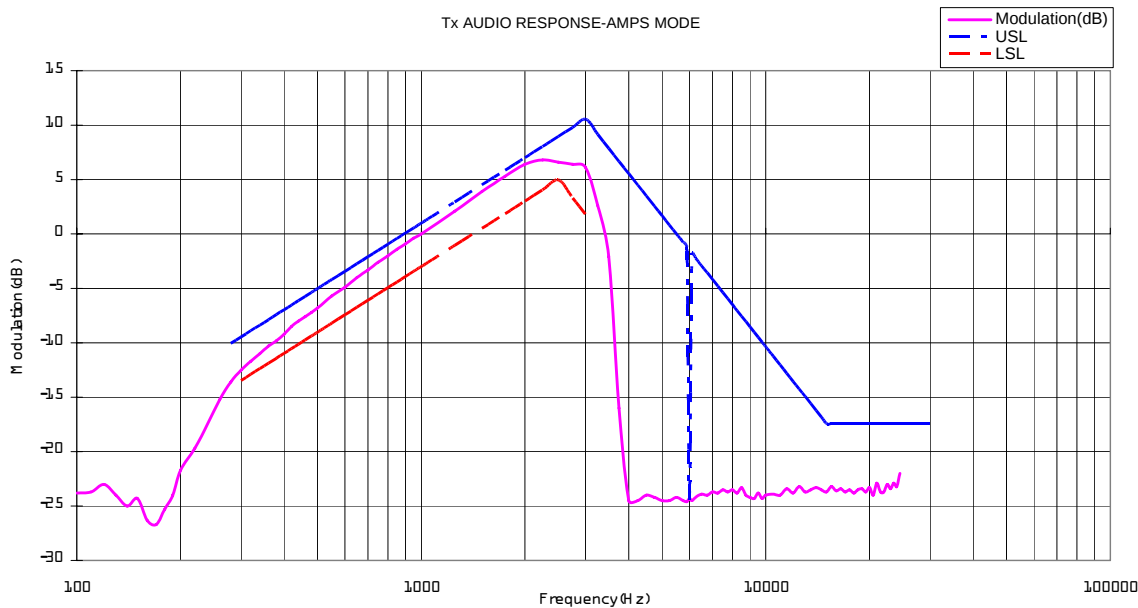
CONTINUED ON NEXT PAGE ...

5. Please provide the required AMPS frequency response plots.

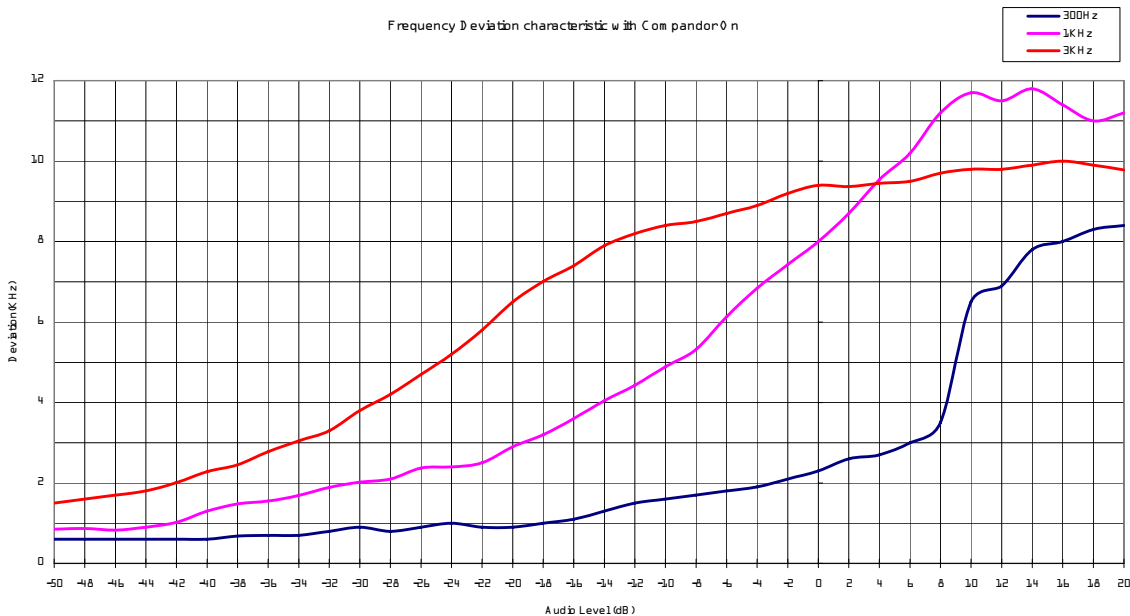
RESPONSE:

AMPS Audio Response

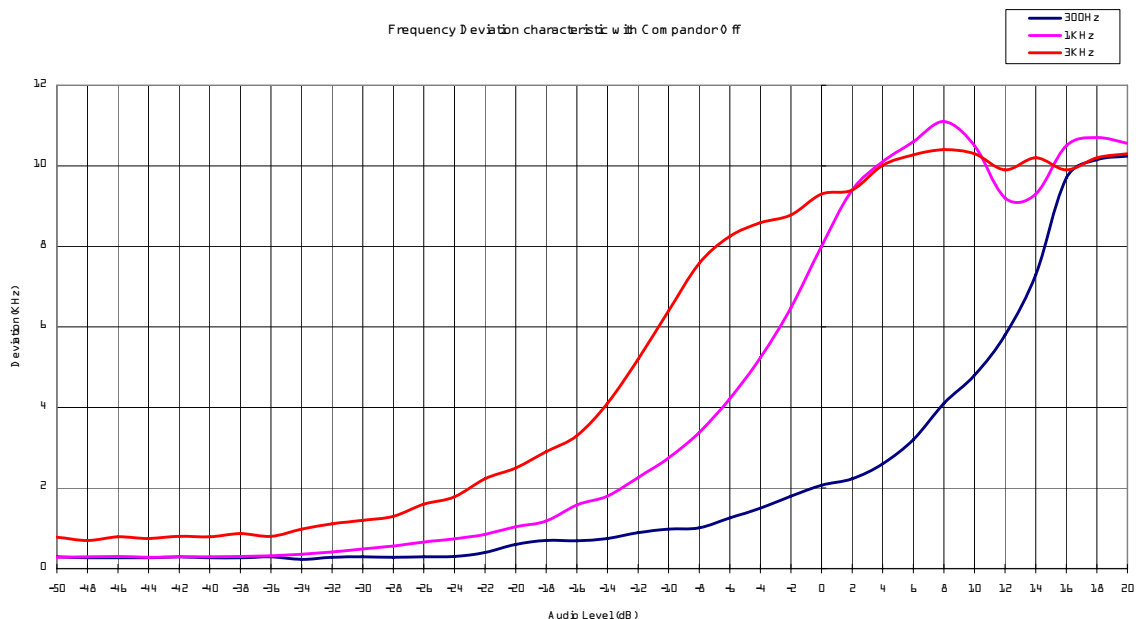
Tx Audio Response – AMPS Mode



Frequency Deviation with Compander On



## Frequency Deviation with Compander Off



6. Because it is designed to connect to a pc, the EUT is also a computer peripheral, subject to either DoC or Certification. Please submit either a new label bearing the DoC logo, or else a Part 15B test report for Certification.

**RESPONSE:**

The DoC logo and applicable text will be entered in the User's Manual.

7. The HAC report indicates that the EUT also contains a Bluetooth transmitter and a WLAN transmitter. These are not referenced anywhere else in the application. Please address.

**RESPONSE:**

See Supplemental HAC Report dated March 29, 2006.

8. Because the EUT is also a pc peripheral, the statement from Section 15.105 must also be in the user's manual. Please confirm that it will be included in the manual prior to shipment of the EUT.

**RESPONSE:**

The following text will be entered into the User's Manual prior to shipment of the EUT:

"NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- . Reorient or relocate the receiving antenna.
- . Increase the separation between the equipment and receiver.
- . Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- . Consult the dealer or an experienced radio/TV technician for help."

9. Please note the following typos: on p.8 of the EMC test report, the ERP levels for AMPS and cellular CDMA operation are both incorrectly calculated. In addition, it is stated that “BAP” mode was used for the tests.

**RESPONSE:**

Please refer to the following updated section:

## **RADIATED (ERP)**

### **Measurement Procedure**

The phone was tested in a 16' anechoic chamber with a 2-axis position system that permits taking complete spherical scans of the EUT's radiation patterns. For all tests, the phone was supported in a free space type environment, vertically oriented in the chamber. Tests were done for AMPS 800 three frequencies (824.04, 836.52 and 848.97MHz) CDMA 800 three frequencies (824.04, 836.52 and 848.97 MHz) and CDMA 1900(1851.25, 1880.00, 1908.75).

CDMA measurements were made with the phone placed in a call using the HP8922M mobile station test set. The phone was weakly coupled to the test set and configured to transmit in full data rate mode. Radiated power was measured at each 15 degree step. The radiated power was measured using a Gigatronics 8542C power meter in “Mod Avg” mode for CDMA. Analog measurements were made using a HP E5071B Network analyzer. From these measurements, the software calculates the angle at which maximum radiated power occurs for each case, and the radiated power at this angle was extracted from the data. The max radiated power results for the IHDT56GE1 follows, as EIRP in dBm. To get ERP (effective radiated power referenced to a half-wave dipole), subtract 2.1 dB from these numbers.

### **Measurement Results**

**CDMA 800:**

|             |       |     |
|-------------|-------|-----|
| 824.70 MHz: | 24.48 | dBm |
| 836.52 MHz: | 24.58 | dBm |
| 848.31 MHz: | 24.52 | dBm |

**CDMA 1900:**

|              |       |     |
|--------------|-------|-----|
| 1851.25 MHz: | 27.39 | dBm |
| 1880.00 MHz: | 27.42 | dBm |
| 1908.75 MHz: | 26.49 | dBm |

**800 Analog:**

|             |       |     |
|-------------|-------|-----|
| 824.04 MHz: | 28.22 | dBm |
| 836.52 MHz: | 26.89 | dBm |
| 848.97 MHz: | 27.90 | dBm |

For all measurement, calibration was performed via gain substitution with a half-wave dipole.

The max EIRP is 24.58 dBm in 800 CDMA mode (max ERP is 22.48 dBm).

**The max EIRP is 27.42 dBm in 1900 CDMA mode** (max ERP is 25.32 dBm).

The max EIRP is 28.22 dBm in Analog mode (**max ERP is 26.12 dBm**).

10. The CDMA800 plots in the EMC report do not indicate actual measured levels and BW info. Please provide as provided for the PCS band.

**RESPONSE:**

| Plot                        | Equipment Settings         |                       |                    |            |          |                 |
|-----------------------------|----------------------------|-----------------------|--------------------|------------|----------|-----------------|
|                             | Resolution Bandwidth (kHz) | Video Bandwidth (kHz) | Sweep Points ( # ) | Trace Mode | Detector | Samples ( ≥ # ) |
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| Upper Band Edge - CDMA 800  | 1                          | Auto                  | 2004               | Max Hold   | Peak     | 30              |
| Reference Plot - CDMA 1900  | 300                        | Auto                  | 1001               | Max Hold   | Peak     | 30              |
| OCBW - CDMA 1900            | 3                          | Auto                  | 1001               | Max Hold   | Peak     | 30              |
| Lower Band Edge - CDMA 1900 | 1                          | Auto                  | 2004               | Max Hold   | Peak     | 30              |
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11. The power level in the EMC report appears to be lower than page 7 Exh. 6 spec. Please check.

**RESPONSE:**

The differences between the power levels for CDMA1900 on pages 7 and 16 of the EMC report is 0.66dBm. The Combined Standard Uncertainty for the Occupied Bandwidth measurement is 0.98dBm. The difference between these two values is within error.

**Prepared by:**

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