Date: September 1, 2005

Subject: Request for additional information regarding FCC ID: IHDT6FF1 (Portable PCS GSM transceiver)

Reference:

Application Received:	08/25/2005
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Questions and responses follow:

A) Please detail how drift was measured.

RESPONSE: Drift was measured using the typical DASY4 v4.5 measurement routines. The field is measured at the reference location (center of the ear piece) at the beginning of the test. Then after completion of the E or H field measurement, the probe returns to the same reference location and takes another measurement. The drift is the delta between these two values and is included in the test report scans.

B) The Speag DASY4 typically measures to the center of the sensor. C63.19 recommends device measurement to the nearest point. Please justify. Please include additional illustrations of the probe/elements showing more detail of the probe tip area.

RESPONSE: Per Annex C.4.3 of the standard, Motorola measures the 10mm distance to the nearest point on the probe element. While we are aware that some test equipment manufacturers use the center of the sensor as a measurement reference, Motorola follows the C63.19 standard using the nearest point of the probe sensor as the 10mm separation reference for all WD tests. For system validation only, the center point of the sensors was utilized. This is justified because the targets for planar dipoles published in C63.19 were derived via theoretical numerical analysis from FDTD using the calibration point of the probe sensors (ie – the center of the sensors). Therefore, when using these targets, it is appropriate to measure the 10mm separation distance to the center of the sensors. Illustrations of the probe tip areas are included in Figures B-1 and B-2 below. A clarification of Figure A-2 from the standard is provided below for quick reference, and accurately describes the references used in the Motorola measurement.

Figure B-1: H-Field H3DV6 Probe Tip

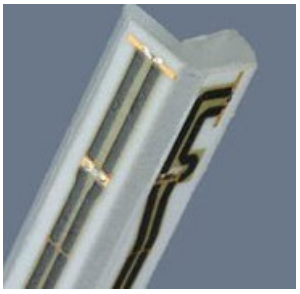
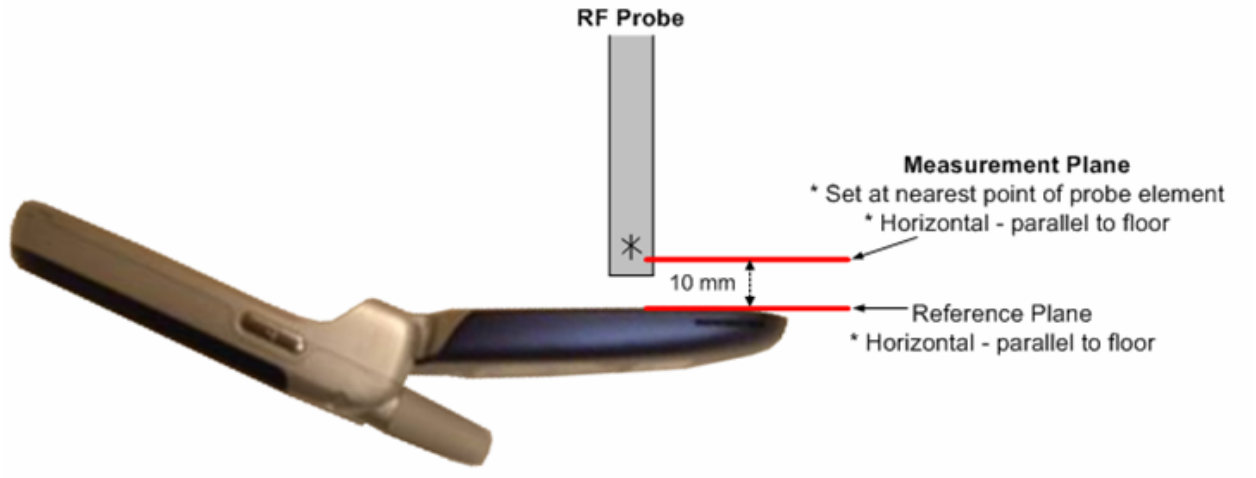


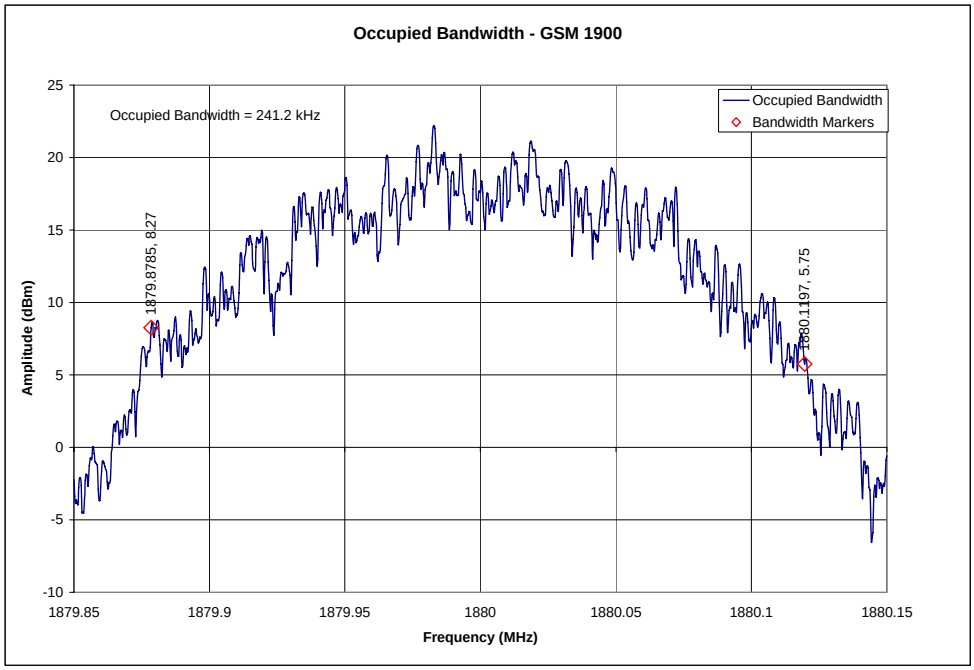
Figure B-2: E-Field ER3DV6R Probe Tip



Clarification of Figure A-2

C) Please provide details of the WD's signal. Include wideband and 0 span spectrum analyzer plots. How was the signal set up and controlled? What settings were used i.e. power control modes, and radio service mode. Also, please include details of what exact standard the CDMA radio is capable of using i.e. IS-95.

RESPONSE: The WD's signal is the typical GMSK modulated signal used for GSM calls and connections in a cellular network. Below is the wideband spectrum analyzer plot.



The signal was setup by creating and maintaining an over the air connection between the DUT and an Agilent 8960 Wireless Communications Test Set. This allows direct control over the DUT's transmit channel, power step and data rate. This DUT is capable of only GMSK and 8PSK modulations and is not capable of any CDMA modes.

D) Please provide additional details justifying the conversion to peak; particularly the procedure used to measure power. Provide 0 span spectrum plots or power meter details if applicable.

RESPONSE: The peak power was measured substituting the CW signal with a GSM signal at the intended frequency using a Signal Generator. With a peak power meter the peak amplitude of the GSM signal was set equal to the amplitude of the CW signal. The following details the procedure used to measure power:

1. Setup the HAC validation rack as you would for a normal CW HAC validation with forward power = 100mW.

1.1 Configure the peak power meter to read peak power.

2. Setup the dipole and phantom as you would for a normal CW HAC validation.

3. Open the "HAC Probe Mod Factor" template and verify the following parameters, which are used for the entire probe modulation measurement procedure:

- Medium = Air
- Communication System = CW – Dipole
- Crest factor = 1, modulation frequency = 0
- Ensure the proper probe & DAE are installed and laser aligned

3.1 MEASURE CW:

Per the prompt, move the appropriate HAC PMF area scan (either E-field or H-field) to the beginning of the main procedure.

3.1.1 Update the Robot Command – "Move Interpolated Maximum of xxxx" (xxxx must be updated to refer to the area scan being run).

3.1.2 Using the original CW signal, run the Area Scan, Robot Command, & CW Reference jobs.

3.1.3 Note the values of PM1 Power and the offset. These values will be used in later steps.

4 MEASURE GSM:

4.1 Change the validation rack to GSM modulation

4.2 Configure the peak power meter to read peak power of the GSM signal.

4.2.1 When using the Agilent E4416A EPM-P Series Power Meter:

[Preset/Local]
Select the appropriate modulation to measure, ie GSM, CDMA, etc.
DEFAULT = average power of the signal.
[Meas Setup]
(Meas Select)
(Change) - the selection toggles between AVE, PK-Ave, and Peak. Select AVE.
Update the display to show Average (of the Pulse).

Verify that the frequency of the power meter is correct. Change if necessary.
Enter the offset value noted earlier from the CW setup.

4.3 Using the peak power meter, look at the "Average of Pulse" peak power and adjust to 100mW. This should be a minor adjustment.

4.4 Run the GSM Reference job.

E) Please provide details of the dipoles used and justification of target values.

RESPONSE: Dipoles used were the planar dipoles described in section 4.2.2.1.4 of the validation procedure and exemplified in Annex D.5.2. The photograph from this annex is included below for quick reference. Because these dipoles are the exact specification of the planar dipoles used to develop the targets in the standard, the exact target values listed in Table 4-1 of the standard for planar dipoles are in fact appropriate for this specific case and were used in the IHDT6FF1 application.

Example of Freespace Planar Dipole used in Motorola Validations

F) Please also justify dipole verification deviation of greater than 10%.

RESPONSE: Per Section 4.2.2.1 of the C63.19 standard, "Values within +/-25% are acceptable, of which 12% is deviation and 13% is measurement uncertainty." The E- and H- dipole verification deviation measurements for E- and H- were 11.6% and 9.6%, respectively, which are in complete accordance with the acceptable parameters defined by the standard.

G) To help clarify dynamic range issues, if possible, please state the highest measured voltage at the diode compared to it compression point.

RESPONSE: The highest voltage measured during the scan was 0.711 mV. This occurred on the X channel. The diode compression point for this channel is at 97 mV. Thus the measurement was taken below the compression point.

H) Please discuss how the composite DSS is addressed in this filing.

RESPONSE: The composite DSS is a Part 15c low power (class 2) Bluetooth device. This secondary transmitter was not enabled during testing, since the intended use of the PCS transmitter does not include simultaneous operation when held to ear.

I) Please describe how probe rotation was accounted for in the filing. Probe rotation should take place at the peak after exclusion for at least the worst case configuration. Reported result should account for this rotation.

RESPONSE: Probe rotation data was taken "for special focus on spherical isotropicity in measurement uncertainty and perturbation of EM fields." This data was taken at the interpolated maximum and directly accounted for in the uncertainty budget Table A4.1 as "Axial Isotropy." Section A4.2 of the IHDT6FF1 application details this and this section is included below for quick reference.

A4.2 Probe Rotation Contributions to Isotropy Error

Probe is rotated for maximum reading at the interpolated maximum location. Thirteen mobile devices were used to determine the probe isotropy uncertainty factors in section A4.1. Based on the resulting 82 E-Field probe rotations and 82 H-Field probe rotations, the upper 95% confidence interval value was calculated for each. These values represent a conservative assessment of the effect of the probe isotropy and have been appropriately included in the respective E- and H-uncertainty budgets.

TABLE A4.2: Probe Rotation Data Summary

	AVE	ST.DEV	Sample Size (n)	2σ	(ci)	Standard Uncertainty
E-field	4.4%	1.7%	82	7.8%	1	4.5%
H-field	3.8%	1.2%	82	6.1%	0.786	3.5%

Isotropy error measurements were taken for 13 products across the respective frequency bands. The +2σ values of all measurements was used as a worst case value for the uncertainty budget. Any significant differences between bands was also evaluated.

J) Please describe how the measurement plane was established and maintained.

RESPONSE: The measurement plane is set at the bottom point of the probe sensor at a distance of 10mm from the WD. The distance from this device reference point to the measurement plane is established by inserting the appropriate height offset value (Z) in the DASY4 HAC scan. This is in accordance with section 4.3 of the standard, which states that "The WD reference plane is a plane parallel with the front "face" of the WD and containing the highest point on its contour in the area of the phone that normally rests against the user's ear."

K) Please demonstrate that 5 mm step size is sufficient for both verification and WD measurement. One means might be though use of a two dimensional plot of field strength versus distance in a direction perpendicular to the length of the dipole. Was any interpolation used?

RESPONSE: Per section 4.3 of the standard, step sizes of 5mm or less are acceptable for standard DASY probe positioner uncertainty of 1.2% as stated in Appendix 4 Table A4.1 of the IHDT6FF1 application.

L) Please include a discussion regarding measurement of peak power in Page 5, Exhibit 6B. How was

RESPONSE: The peak power was measured substituting the CW signal with a GSM signal at the intended frequency using a Signal Generator. With a peak power meter the peak amplitude of the GSM signal was set equal to the amplitude of the CW signal.

M) Please justify duty cycles used during HAC evaluation. Page 3, Exhibit 6B and the duty cycles indicated on the plots appear to vary.

RESPONSE: Duty cycle on page 3 is the standard GSM transmitter ratio of 1:8. The phone plots in Appendix 2 use the term “Duty Cycle” as well due to terminology of the software, but this actually refers to the Crest Factor which accounts for probe modulation response. Thus the ratio is 1:9.33 to account for PMF in the system. Actual GSM duty cycle is more appropriately termed on page 3, whereas Appendix 2 references to Duty Cycle would be more appropriately termed “Crest Factor.”

N) Please supply data plots for the cellular band of operation of the device.

RESPONSE: This WD does not operate in the cellular (800 MHz) frequency band.

O) Please supply test setup photographs

RESPONSE:

Figure 1. View from the side

Figure 2. View from the side

Figure 3. View from the front

Figure 4. View from above

P) Please provide means of peak power measurement used for determination of PMF on Page 5, Exhibit 6B.

RESPONSE: Please refer to the information provided in answer to question "L" above.