American Telecommunications Certification Body Inc.
6731 Whittier Ave, McLean, VA 22101

February 6, 2007

RE: FCC ID: PHX-RSU2510R_ATCB004501 – Reply (02/08/2007)

Attention: Tim Blom
Reply Attention: Dennis Ward

I have a few comments on this Application. Please note that further comments may arise in response to answers provided to the questions below.

Replies listed below questions.

1. Please note that 27.50(i) states that the transmit power is to be measured using an analyzer of power meter calibrated in terms of rms-equivalent voltage. It is not clear from the data if the analyzer used has been calibrated in terms of rms-equivalent. While this is probably the case, it must be clearly indicated. Please provide a clear statement if the analyzer was calibrated in terms of rms-equivalent voltage.
    a. The first sentence in the "Test Procedure" for the power output measurement details the spectrum analyzer configuration. This statement is repeated here: "The peak conducted RF output power is measured over an interval of continuous transmission using a spectrum analyzer that has been calibrated in terms of rms-equivalent voltage".
    b. The spectrum analyzer used for the measurement of the peak power is configured to utilize the power measurement function that is integrated into the analyzer. The selected detector used in conjunction with the power measurement function is described by Agilent as the "Average (Log/RMS/V)" detector and is contained within the Agilent E4440A spectrum analyzer. The indication of this detector being used for the measurement is shown in the display screen on the right side under the "Ref" label and is shown as "#Avg". See Figure 1.1
    c. The help menu description contained within the Agilent E4440A spectrum analyzer describes the detection method as "RMS because the resulting voltage is proportional to the square root of the mean of the square of the voltage". My interpretation of this statement is "calibrated in terms of rms-equivalent voltage". See Figure 1.2

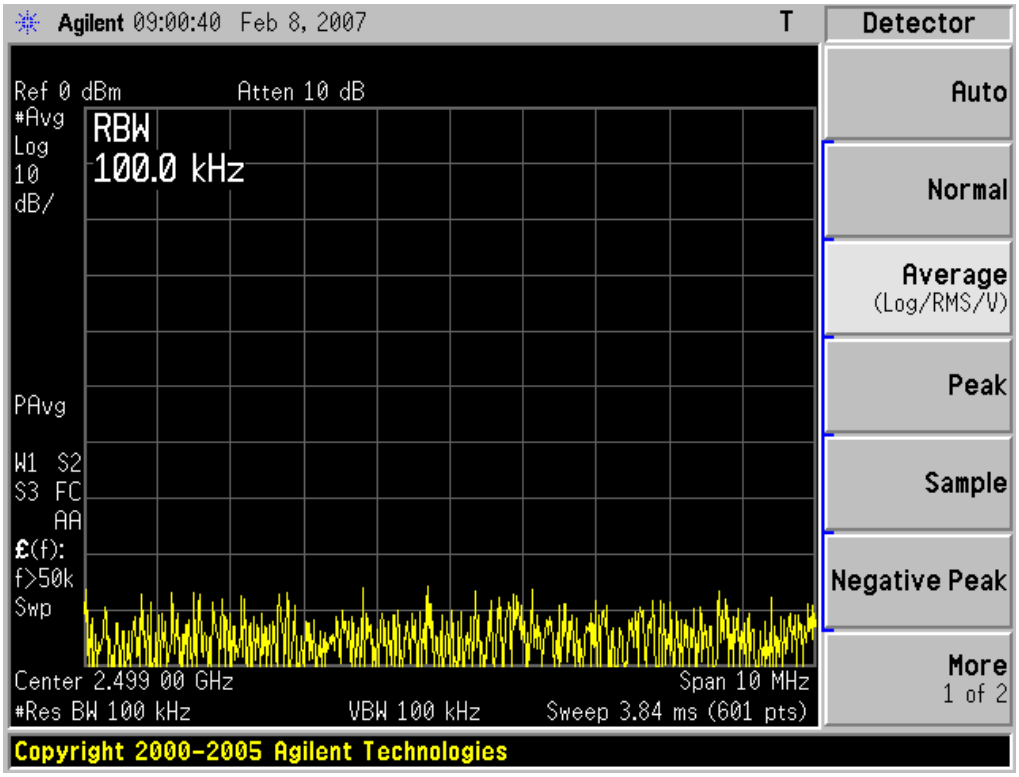


Figure 1.1

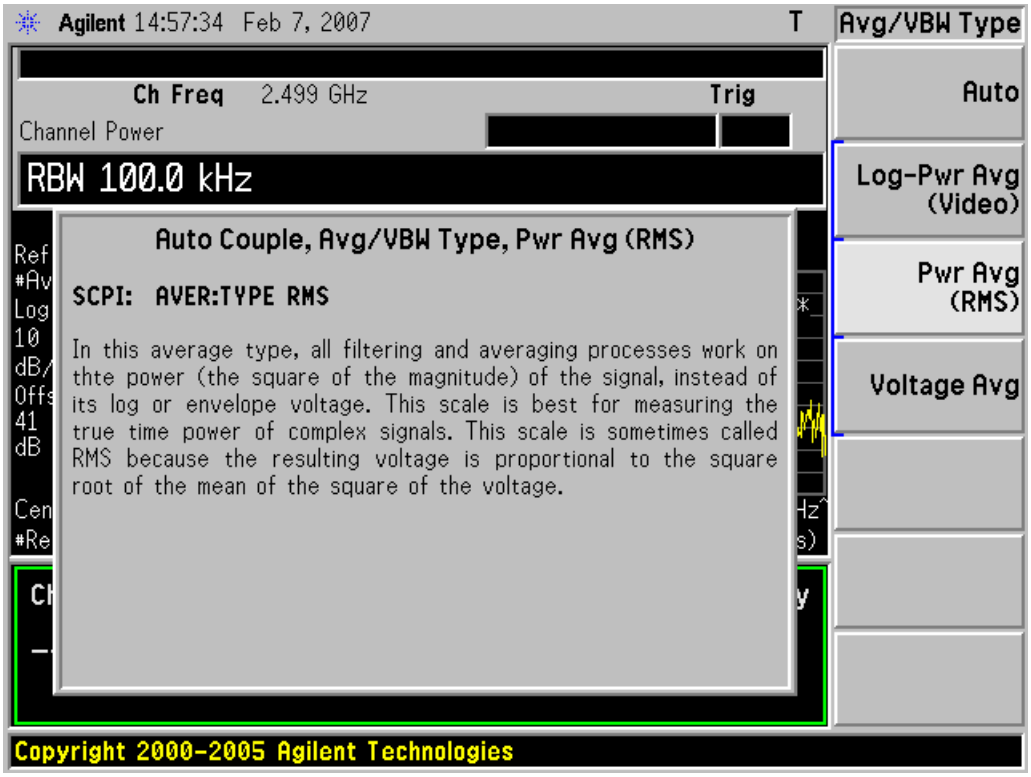
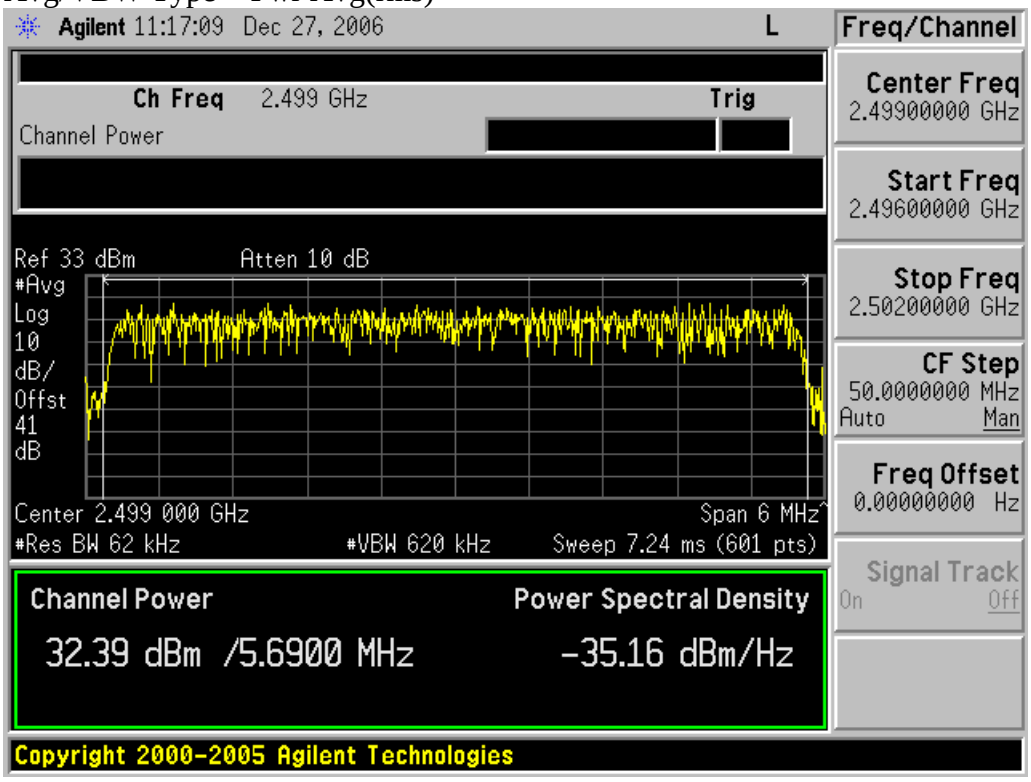


Figure 1.2

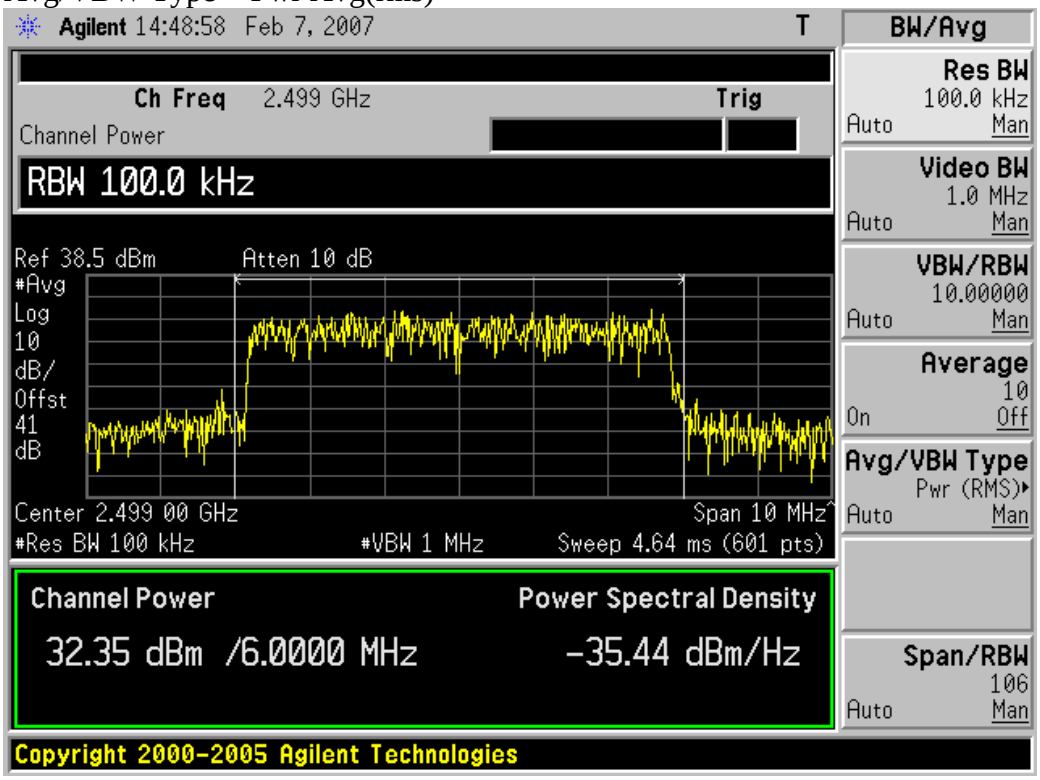
2. Please note that power measurements in accordance with 27.50(i) are for peak transmit power. Please note that the FCC has stated that when power measurements above 1GHz are made the resolution bandwidth needs to be set to at least 1MHz. Please note that peak transmit power also needs to be measured with the resolution bandwidth equal to or greater than the occupied bandwidth of the signal being measured. Please note that the resolution bandwidths for the measurements in the report appear to be close to 1% of this value rather than the equal to or greater than value typically accepted for power measurements. While newer analyzers may do some auto correction for resolution bandwidths less than the occupied bandwidth, the fact that the chosen resolution bandwidth is only 56kHz or 62kHz (i.e. 1%), the stated FCC resolution bandwidth above 1GHz is 1MHz and the fact that the power measured is at the 2W limit, there is some question as to the accuracy of the measurement. Because the device is exactly at 2 watts transmit power and because the 1MHz resolution bandwidth stated by the FCC above 1GHz was not used compliance of the device is in question due to the possible correction factors errors resulting from the use of such low resolution bandwidth. Please re-measure the power of the device using at least the stated FCC resolution bandwidth for measurements of power above 1GHz.
    a. The procedure I have used appears to be consistent with procedures that other vendors have used to certified products within the part 27 rules. My interpretation of the requirements listed in 27.50(i) is that the final reported data needs to be adjusted when the measured results are not accurate due to any instrument limitations “such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, etc., . A series of measurements is shown below using different resolution bandwidths to show the variation in the measurement and in support of my submitted data.

b. Test 1, procedure from submitted test report
   i. RBW = 62 kHz
   ii. Sweep = auto = 7.24 msec
   iii. Span = 6 MHz
   iv. Power Measurement BW = 5.69 MHz
   v. Trigger Delay = 40 usec
   vi. Trigger Length = 164 usec
   vii. Detector = Average (Log/RMS/V)
   viii. Avg/VBW Type = Pwr Avg(rms)
   ix.



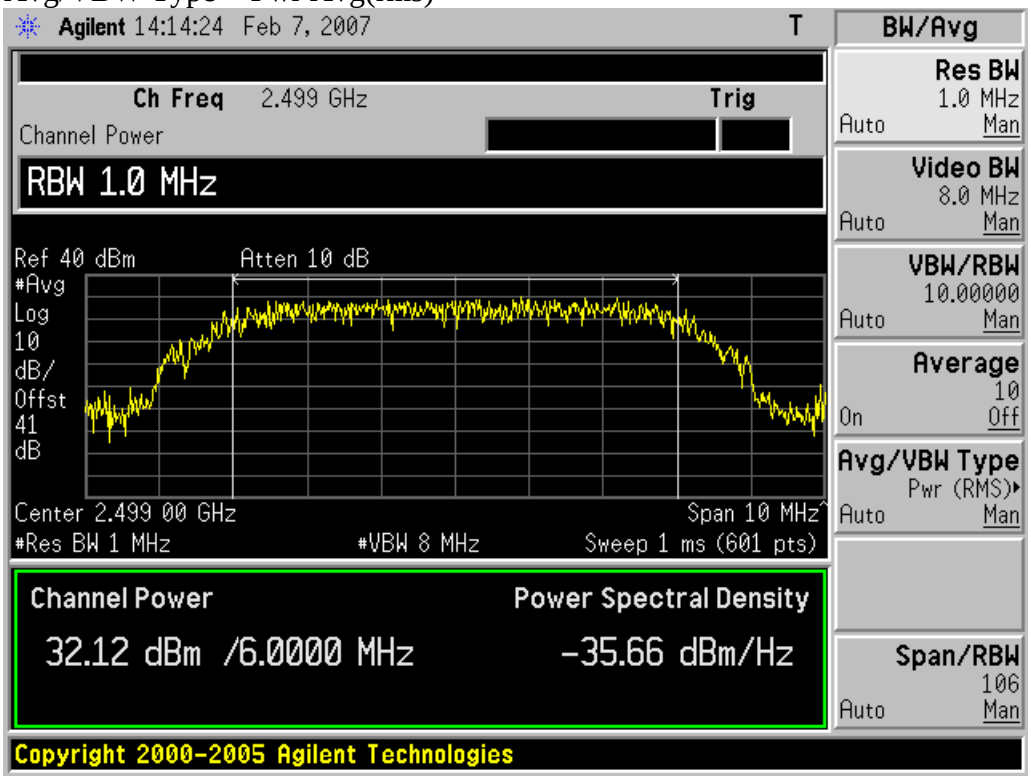
c. Test 2

i. RBW = 100 kHz
ii. Sweep = auto = 4.64 msec
iii. Span = 10 MHz
iv. Power Measurement BW = 6 MHz
v. Trigger Delay = 24 usec
vi. Trigger Length = 164 usec
vii. Detector = Average (Log/RMS/V)
viii. Avg/VBW Type = Pwr Avg(rms)



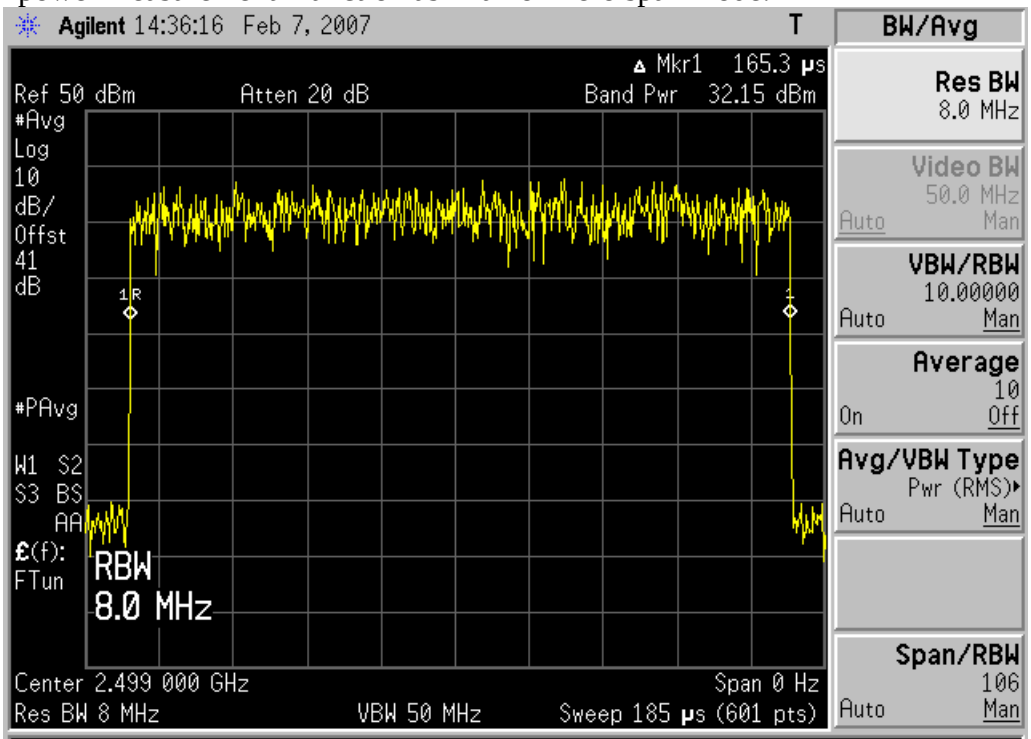
ix.

d. Test 3
   i. RBW = 1 MHz
   ii. Sweep = auto = 1 msec
   iii. Span = 10 MHz
   iv. Power Measurement BW = 6 MHz
   v. Trigger Delay = 5 usec
   vi. Trigger Length = 164 usec
   vii. Detector = Average (Log/RMS/V)
   viii. Avg/VBW Type = Pwr Avg(rms)



   ix.

e. Test 4
   i. RBW = 8 MHz
   ii. Sweep = 185 usec
   iii. Span = 0 MHz
   iv. Trigger = RF Burst
   v. Trigger Delay = -10 usec
   vi. Detector = Average (Log/RMS/V)
   vii. Avg/VBW Type = Pwr Avg(rms)
   viii. Power measured with the delta marker power measurement function contained within the spectrum analyzer. This method integrates the power between the markers that is contained within each bin. The power integration method is performed the same as is done with the "power measurement" function as in a non-zero span mode.



   ix.

f. Test 5
    i. Power meter
    ii. Agilent 8481A power sensor (cal due 4/5/2007)
    iii. Agilent EPM-441A meter
    iv. Measured power for 164 usec burst = 32.28 dBm

g. Power measurement summary

Test	RBW (MHz)	Power (dBm)
1	0.062	32.39
2	0.1	32.35
3	1.0	32.12
4	8.0	32.15
5	17900	32.28

h. The above measurements indicate that the Agilent E4440A spectrum analyzer measures and reports a valid peak power when using a RBW that is at least 1% of the emissions bandwidth and no corrections are required to be applied to the reported data contained within the submitted test report.

3. Please note that the calculated MPE for the device is 21+cm. As the statement in the manual is being justified by measured MPE at 20cm, please provide some information on how this measurement was performed (i.e. EUT and probe setup; where was the measurement made in relation to EUT orientation etc)..
    a. The maximum MPE measured and reported in the report is found to be in front of the patch array antenna. To ensure that the probe is at 20 cm from the product being tested, a laser level is positioned on the floor such that the laser beam is 20 cm in front of the surface being measured. See Figure 3.1 MPE measurements are then recorded with the radiation hazard probe placed at the center of the “sensor ball” with the laser line image. See Figure 3.2. (Laser is shown in test setup photos) The probe is utilized to be consistent with the requirements of the calibration data. The maximum MPE measurement is reported in the submitted test data.

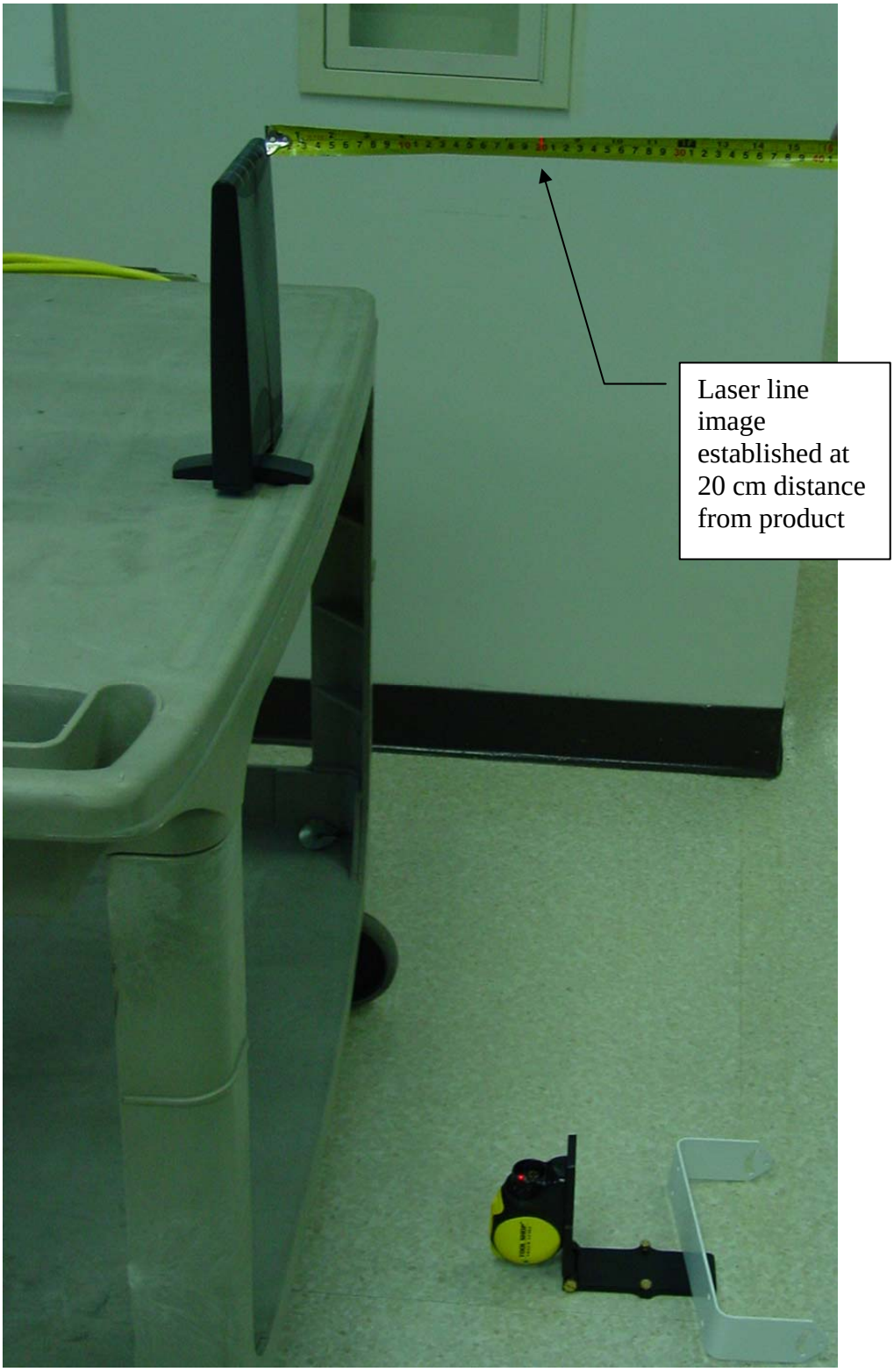

Laser line image established at 20 cm distance from product

Figure 3.1

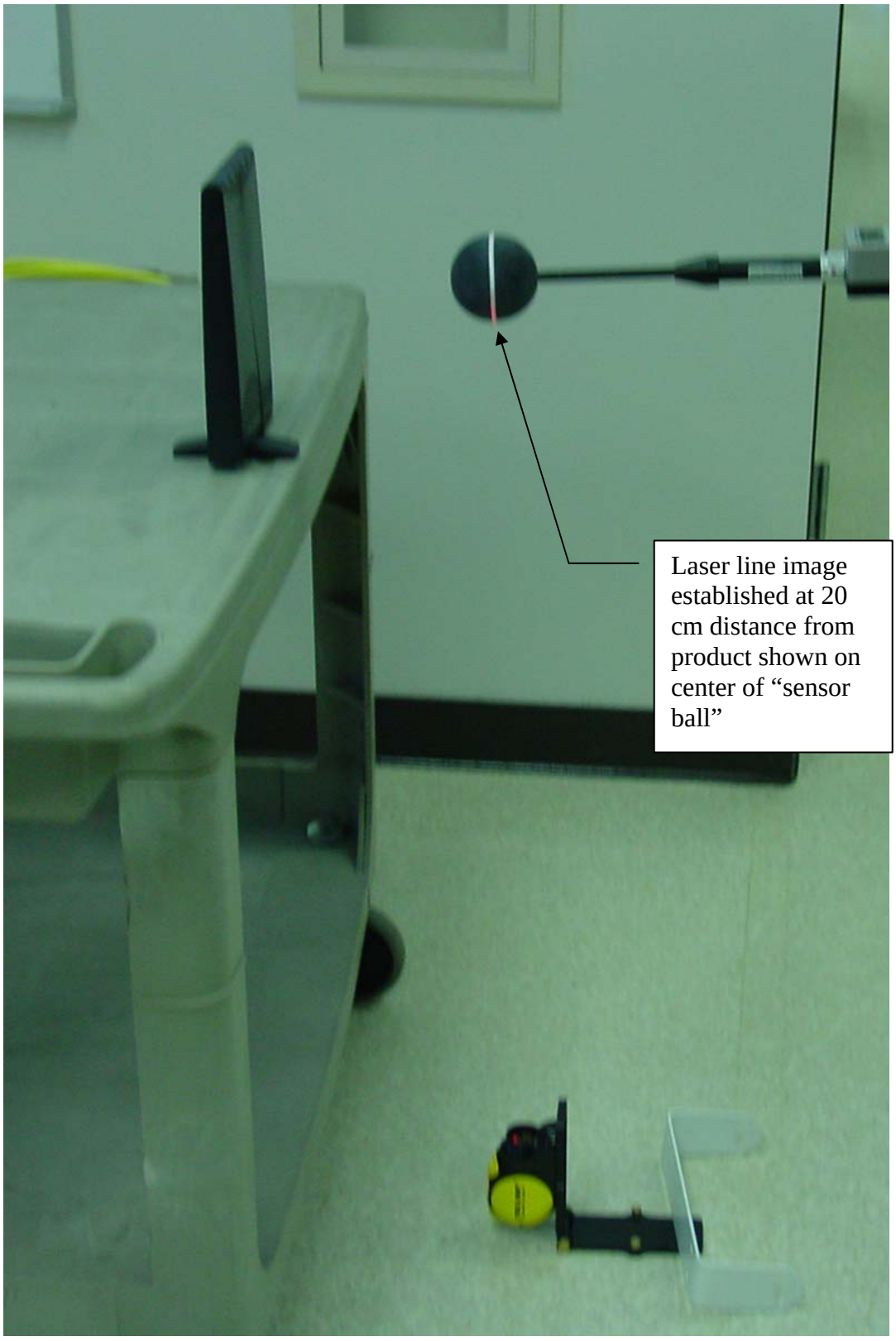

Laser line image established at 20 cm distance from product shown on center of “sensor ball”

Figure 3.2