November 21, 2002

To: Stan Lyles
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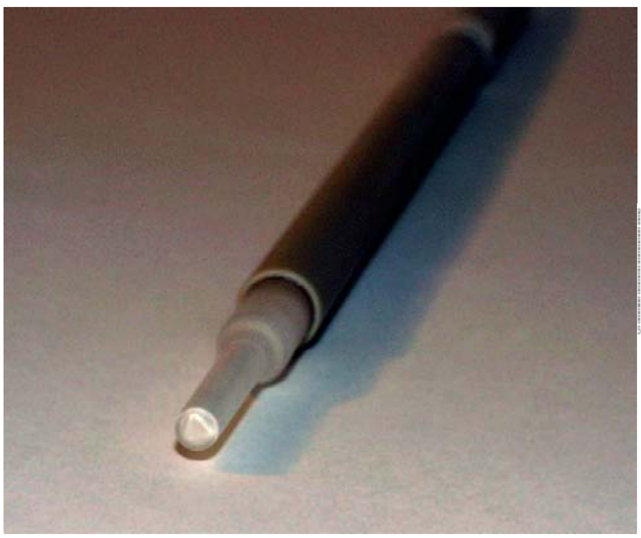
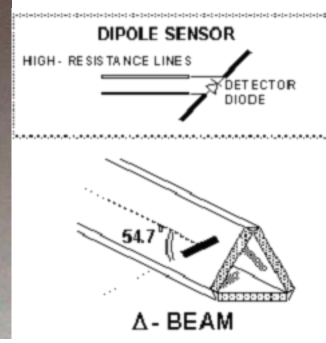
FCC Application Processing Branch

Re: FCC ID GM3WLPC24HN
Applicant: Psion Teklogix Inc
Correspondence Reference Number: 24384
731 Confirmation Number: EA235972

1.) Regarding your answer to question 1, please provide additional drawings, and information of the probe used. Photographs provided suggest the probe is a signal channel/polarization device while calibration suggests a three channel/polarization device.





Probe Type	E-Field Triangle, Isotropic
Model Number	E-TR
Serial Number	UT-0200-01
Manufacturer	3D-EMC Laboratory Inc.
Manufactured Date	February 2000
Probe Length [mm]	270
Probe offset [mm]	2.0
Probe Tip diameter [mm]	4.0
Sensor size [mm]	2.0
Sensor Factor (η_{Pd}) [mV/(mW/cm^2)]	10.8
Sensor Factor (η_{E2}) [mV/(V/m)^2]	10.8 / 3770

2.) Regarding your answer to question 2. Justification provided is not considered sufficient. Please provide SAR data with probe calibrated in test tissue.

The conversion factor (γ_{muscle}) for the muscle tissue at 2450 MHz was 4.028. Thus sensitivity (ζ_{muscle}) in the test tissue (σ_{muscle}: 1.91 [S/m], ε_{muscle}: 55.5) was 0.166 [W/Kg/mV] instead of 0.183 [W/Kg/mV]. Using the sensitivity in the test tissue, the new SAR data are shown below.

Maximum Peak Spatial-average SAR Data

#	Configuration	Device Test Positions	Antenna Position	Freq. [MHz]	Channel	MAX. SAR [W/Kg]
05	**Top-End-On** The edge of the DUT in contact with the phantom 11 MBPS data rate 17.70 dBm conducted power	Body-worn (By stander)	Integrated (Fixed)	2437	CH6	0.307

Display faced outward from the phantom

#	Configuration	Device Test Positions	Antenna Position	Freq. [MHz]	Channel	MAX SAR [W/Kg]
01	11 MBPS data rate	0 mm separation	Integrated (Fixed)	2412	CH1	-
02				2437	CH6	0.003
03				2462	CH11	-

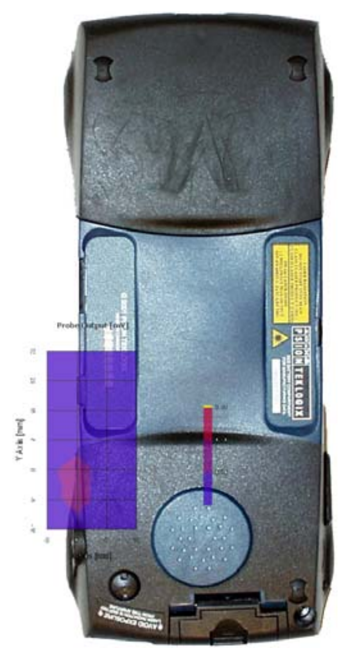
Top-End-On

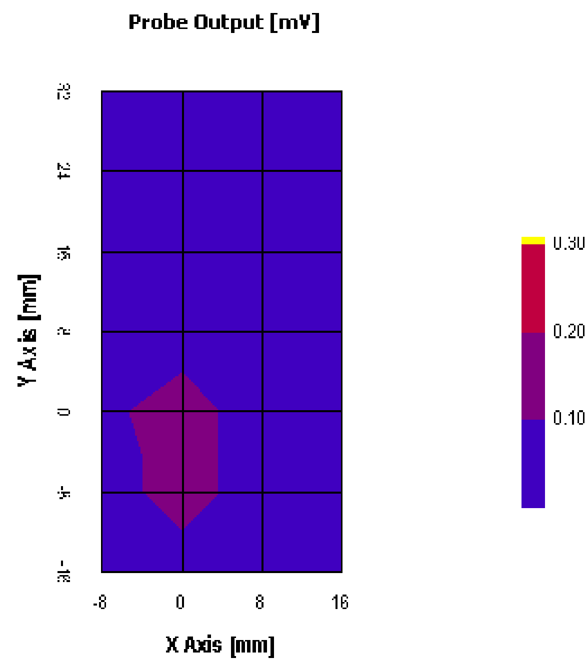
#	Configuration	Device Test Positions	Antenna Position	Freq. [MHz]	Channel	MAX SAR [W/Kg]
04	11 MBPS data rate	0 mm separation	Integrated (Fixed)	2412	CH1	-
05				2437	CH6	0.307
06				2462	CH11	-

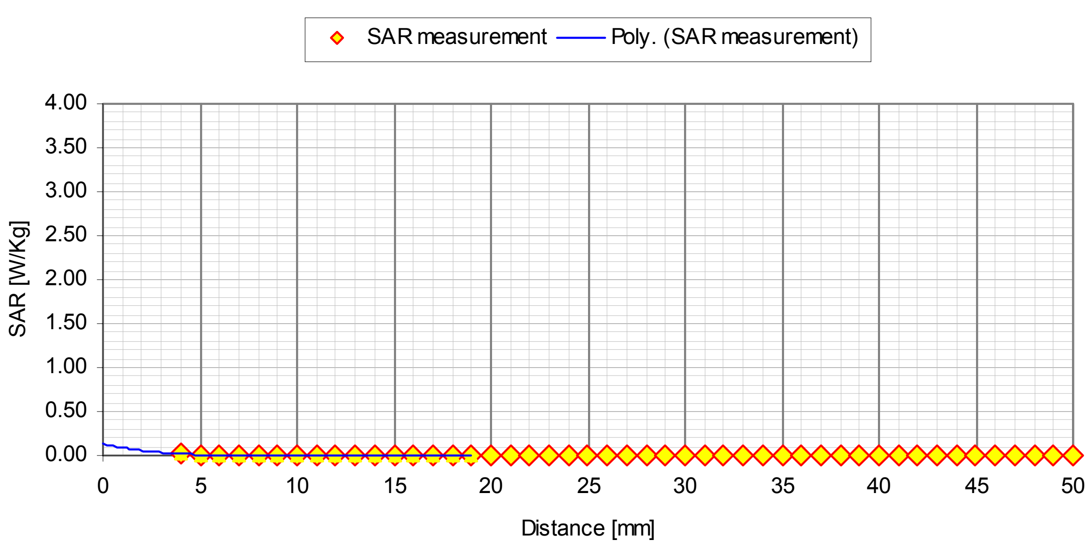
Display faced outward from the phantom, CH6, 2437 MHz

Test date [MM/DD/YYYY]	09/27/2002
Test by	JaeWook Choi
Room temperature [°C]	24
Room humidity [%]	50
Simulated tissue temperature [°C]	24
Separation distance, d [mm]	0

Test frequency [MHz]	2437
E-field Probe	M/N: E-TR, S/N: UT-0200-1, Sensor Offset: 2.0 mm
Sensor Factor (η_{Pd}) [mV/(mW/cm^2)]	10.8
Amplifier Settings (AS_1, AS_2, AS_3)	0.00660854, 0.00622568, 0.00854093
Tissue Type	Muscle
Measured conductivity [S/m]	1.91 (-2.1 %)
Measured dielectric constant	55.5 (+5.0 %)
Conversion Factor (γ)	4.028
Sensitivity (ζ) [W/Kg/mV]	0.166
Power [mW]	17.70 conducted
Measurement Volume Specification (X × Y × Z)	5 pts × 5 pts × 9 pts, 16 mm × 16 mm × 32 mm; Resolution: 4 mm × 4 mm × 4 mm
SAR_{1g} [W/Kg]	0.003

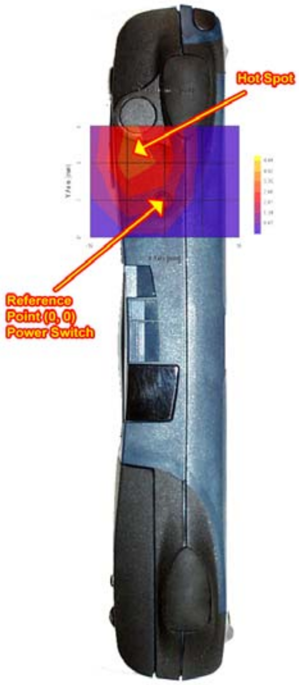


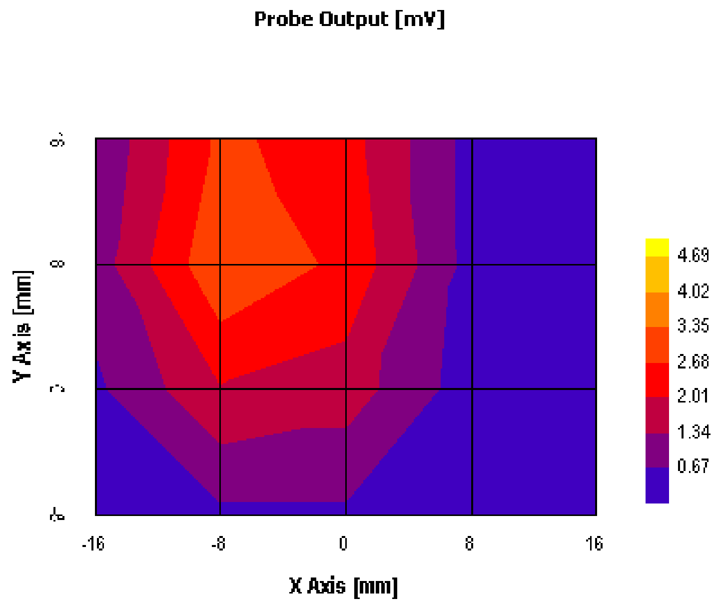


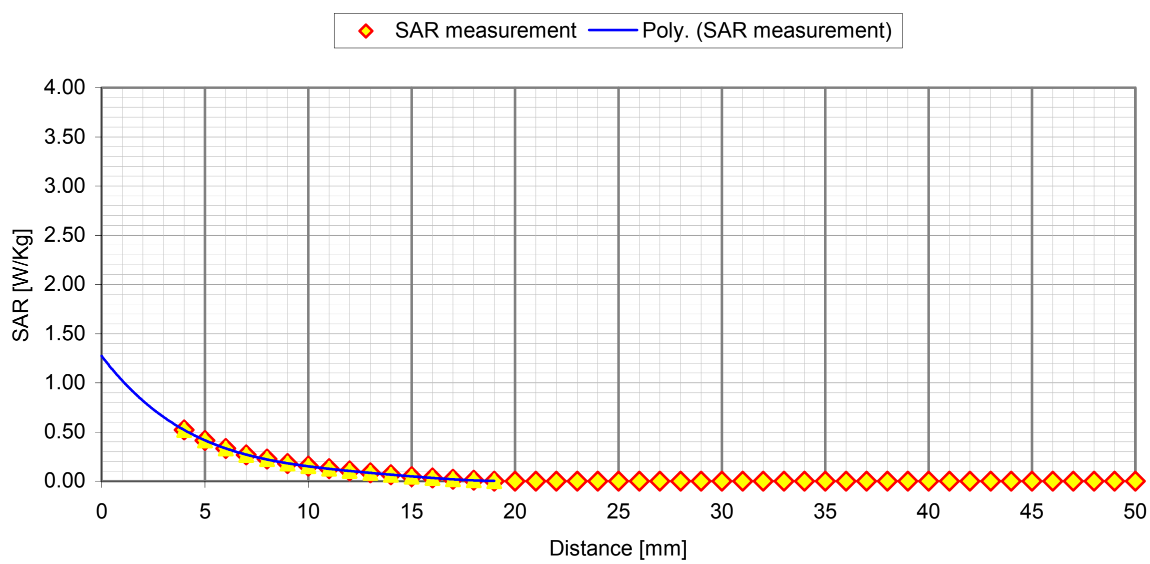


Top-End-On, CH6, 2437 MHz

Test date [MM/DD/YYYY]	09/27/2002
Test by	JaeWook Choi
Room temperature [°C]	24
Room humidity [%]	50
Simulated tissue temperature [°C]	24
Separation distance, d [mm]	0
Test frequency [MHz]	2437
E-field Probe	M/N: E-TR, S/N: UT-0200-1, Sensor Offset: 2.0 mm
Sensor Factor (η_{Pd}) [mV/(mW/cm^2)]	10.8
Amplifier Settings (AS_1, AS_2, AS_3)	0.00660854, 0.00622568, 0.00854093
Tissue Type	Muscle
Measured conductivity [S/m]	1.91 (-2.1 %)
Measured dielectric constant	55.5 (+5.0 %)
Conversion Factor (γ)	4.028
Sensitivity (ζ) [W/Kg/mV]	0.166
Power [dBm]	17.70 conducted
Measurement Volume Specification (X × Y × Z)	5 pts × 5 pts × 9 pts, 16 mm × 16 mm × 32 mm; Resolution: 4 mm × 4 mm × 4 mm
SAR_{1g} [W/Kg]	0.307

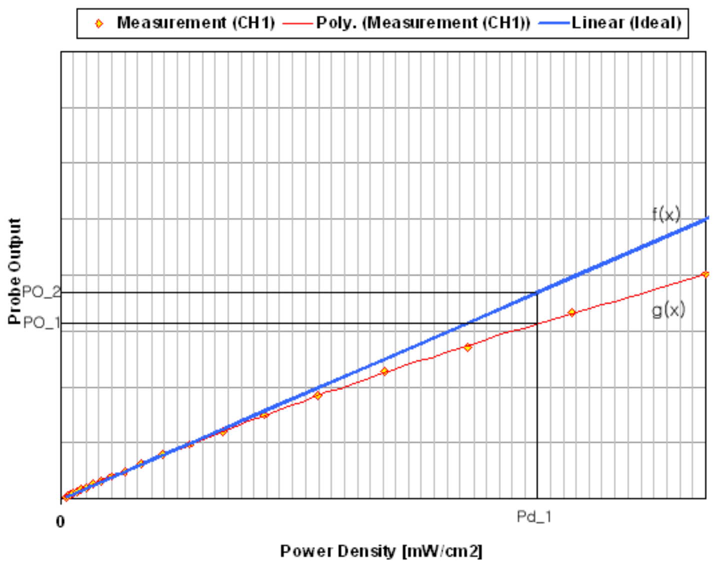

Hot Spot
Reference Point (0, 0) Power Switch


Probe Output [mV]
Y Axis [mm]
X Axis [mm]
-16
-8
0
8
16
4.69
4.02
3.35
2.68
2.01
1.34
0.67


SAR measurement
Poly. (SAR measurement)
SAR [W/Kg]
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0
5
10
15
20
25
30
35
40
45
50
Distance [mm]

3.) Regarding your answer to question 3. Please address how the significant error noted on the diode dynamic range plots (pg 58) is addressed during measurement of SAR.

The data of the plot in page 58 is recorded and stored as a diode compensation table for each channel to yield the polynomial equations for the ideal diode response (linear) and the saturated diode response (the 3rd order) respectively using the curve fitting algorithm. The linear equation and the inverse of the 3rd order polynomial equation are used to compensate for the saturated diode response to the ideal diode response.



For example, Providing that linear equation, f, the 3rd order polynomial equation, g, and its inverse, g^{-1}, the saturated diode output $PO_{\_1}$ can be compensated to the ideal diode output $PO_{\_2}$ by the calculation as shown below.

$$Pd_{\_1} = g^{-1}(PO_{\_1}),$$
$$PO_{\_2} = f(Pd_{\_1}) = f(g^{-1}(PO_{\_1}))$$

4.) Regarding your answer to question 5. The answer provided did not seem to address our concern of whether the device was designed to operate at the duty factor (100%) used for SAR testing. Please demonstrate that the device behaves linearly from 19 to 100 % duty factor. A plot of burst average power for increasing duty factor would suffice.

{Explanation from Psion Teklogix} The radio was approved by using a special test software that force the transmitter to output either a continuous tone or a modulated carrier at full power. Hence the device will operate linearly even if duty cycle approaches 100%

5.) Regarding your answer to question 6. Please address the question.

{Explanation from Psion Teklogix} Yes, we confirm that the bit rate to the user remain same irrespective of he data rate mode selected

Best Regards
JaeWook Choi.
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