RFID

According to §15.247(e)(i) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.
According to KDB 447498, no SAR required if power is lower than the flowing threshold:

Frequency Range		Center frequency (MHz)	60/f SAR Limitation (mw)
Low Frequency (MHz)	High Frequency(MHz)		
902.75	927.25	915.25	66.67

Maximum measured transmitter power:

Average Source Based Calculated Power (mw)
55.02

Threshold at which no SAR required is 66.67 mw.
Average Source Based Calculated Power is 55.02mW.
Conclusion: No SAR is required.

WLAN

Frequency Range		Center frequency (MHz)	60/f SAR Limitation (mw)
Low Frequency (MHz)	High Frequency(MHz)		
2412	2462	2437	25

Maximum measured transmitter power: 802.11b

Conducted Power (dBm)	(mW)
10.6	11.50

Maximum measured transmitter power: 802.11g

Conducted Power (dBm)	(mW)
10.8	12.00

Threshold at which no SAR required is 25 mw.
Maximum Tx power is 12.00 mw .
Conclusion: No SAR is required.

SIMULTANEOUS TRANSMISSION EVALUATION

EUT has meet KDB447498 (3)(b)(ii)(1) requirement so that No Simultaneous SAR is required.
(a) Antennas separation is at least 5 cm.
(b) Sum of 1-g SAR is less than 1.6W/KG for all simultaneous transmitting antennas pair.
(c) Output Power is < $60/f_{(GHz)}$ for any simultaneous transmitting antenna for which stand alone SAR is not required.

August 21, 2008

To:
Federal Communications Commission
Authorization and Evaluation Division

Average Power-Source Based Calculation P4T RFID Radio certification **(RFID)**

1- Typical worst case:
Label length: 1"
Max print speed: 3ips
Typical encode time: 120ms
Power= 233mW (23.7dBm)
Encode time = 120ms
Print time = 403 ms
Print and encode time = 523ms
Duty cycle = 120/523
=> typical worst case .2294 x 233mW = **53.45mW** Average.

2- SW default error case:
Label length: 1"
Max print speed: 3ips
Typical encode time: 120ms
Power= 233mW (23.7dBm)
Encode time = 4 attempts (1 initial attempt@200ms and 3 retries@200ms)- So 800ms for SW default error case encode time for a bad RFID Tag.
Print time = 613 ms [333ms for printing itself + the initial packet and response packet overhead (typically 70ms).]
Print and encode time = 1413ms
Duty cycle = 800/1413
=> SW default error case .5662 x 233mW or **131.92mW** Average

3- The worst case encoding errors:
On a roll, 98% of the time, encoding is successful.

Thus

Average Power Source Based Calculation is 55.02mW (53.45mWx98% + 131.92*mWx2%)

This demonstrates the P4T RFID Radio is below applicable SAR thresholds.

Sincerely,

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