Simultaneous Transmission SAR exclusion considerations

Since the ANT+ and Bluetooth 4.0 transmitters of this device may operate simultaneously, simultaneous transmission analysis is required. Per KDB 447498, 10-g extremity simultaneous transmission SAR test exclusion can be applied when the sum of 10-g extremity SAR of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit (≤ 4.0 W/kg). When the standalone 10-g extremity SAR test exclusion is applied, the standalone 10-g extremity SAR must be estimated according to the following equation,

$$\text{Estimated 10-g Extremity SAR} = (\sqrt{F(GHz)}/18.75)x(P\max/TD)$$

where
F(GHz) is the RF channel transmit frequency in GHz
Pmax is the max. power of channel, including tune-up tolerance, mW
TD is the min. test separation distance, mm

For ANT+ operation,

Maximum Time-averaged Conducted Power of this device = **0.40 mW**

Therefore, the Estimated 10-g extremity SAR will be determined as follow,

$$\text{Estimated 10-g Extremity SAR} = (\sqrt{F(GHz)}/18.75)x(P\max/TD)$$
$$= \textbf{0.007 W/kg}$$

where *Pmax* = 0.40mW, *TD* = 5 mm and *F(GHz)* = 2.457 GHz

For Bluetooth 4.0 operation,

Maximum Time-averaged Conducted Power of this device = **0.50 mW**

Therefore, the Estimated SAR will be determined as follow,

$$\text{Estimated 10-g Extremity SAR} = (\sqrt{F(GHz)}/18.75)x(P\max/TD)$$
$$= \textbf{0.008 W/kg}$$

where *Pmax* = 0.50mW, *TD* = 5 mm and *F(GHz)* = 2.480 GHz

Simultaneous Transmission Analysis

ANT+ Estimated SAR (W/kg)	Bluetooth 4.0 Estimated SAR (W/kg)	Σ SAR (W/kg)	Simultaneous SAR Required
0.007	0.008	0.015	No

Conclusion

Since the above summed estimated 10g extremity SAR result for all simultaneous transmission conditions were below the 10g extremity SAR limit (4.0 W/kg), 10g extremity SAR evaluation for simultaneous transmission configuration are not required.