SAR Exemption/Evaluation For Federal Communications Commission and Industry Canada

The purpose of this exhibit is to document the SAR Exemption/Evaluation of the Scott Safety EPIC 3 TA and EPIC 3 RA products.

For FCC purposes, this evaluation has been done according to the procedures outlined in FCC KDB 447498.

The distance between the antennas and the head is measured at 50mm. This distance is fixed by the physical mounting location of the transmitter to the Scott Safety Respirator to which it attached during use. The location of the mounting point of the transmitter can be seen in the User Manual exhibit which is a part of this submission.

There are two transmitters located in this device. The two transmitters were each individually evaluated and then combined to determine compliance with the SAR Exemption limit for routine evaluation based on frequency and separation distance. The limits are shown in the table below.

Table 1: SAR evaluation – Exemption limits for routine evaluation based on frequency and separation distance[4,5]

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of ≤5 mm	At separation distance of 10 mm	At separation distance of 15 mm	At separation distance of 20 mm	At separation distance of 25 mm
≤300	71 mW	101 mW	132 mW	162 mW	193 mW
450	52 mW	70 mW	88 mW	106 mW	123 mW
835	17 mW	30 mW	42 mW	55 mW	67 mW
1900	7 mW	10 mW	18 mW	34 mW	60 mW
2450	4 mW	7 mW	15 mW	30 mW	52 mW
3500	2 mW	6 mW	16 mW	32 mW	55 mW
5800	1 mW	6 mW	15 mW	27 mW	41 mW

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of 30 mm	At separation distance of 35 mm	At separation distance of 40 mm	At separation distance of 45 mm	At separation distance of ≥50 mm
≤300	223 mW	254 mW	284 mW	315 mW	345 mW
450	141 mW	159 mW	177 mW	195 mW	213 mW
835	80 mW	92 mW	105 mW	117 mW	130 mW
1900	99 mW	153 mW	225 mW	316 mW	431 mW
2450	83 mW	123 mW	173 mW	235 mW	309 mW
3500	86 mW	124 mW	170 mW	225 mW	290 mW
5800	56 mW	71 mW	85 mW	97 mW	106 mW

Output power level shall be the higher of the maximum conducted or equivalent isotropically radiated power (e.i.r.p.) source-based, time-averaged output power. For controlled use devices where the 8 W/kg for 1 gram of tissue applies, the exemption limits for routine evaluation in Table 1 are multiplied by a factor of 5. For limb-worn devices where the 10 gram value applies, the exemption limits for routine evaluation in Table 1 are multiplied by a factor of 2.5. If the operating frequency of the device is between two frequencies located in Table 1, linear interpolation shall be applied for the applicable separation distance. For test separation distance less than 5 mm, the exemption limits for a separation distance of 5 mm can be applied to determine if a routine evaluation is required.

For medical implant devices, the exemption limit for routine evaluation is set at 1 mW. The output power of a medical implants device is defined as the higher of the conducted or e.i.r.p to determine whether the device is exempt from the SAR evaluation.

EPIC 3 Transceiver			
Measured output power (ERP - dBm) @ 2402 MHz	16.83	Antenna gain (dBi)	-4.95
Total output power (EIRP - mW)		15.42	
Duty cycle		100 %	
Calculated source-based, time-averaged output power (mW)		15.42	
Limit from Table 1 @ ≤ 50mm Separation Distance (mW - Linearly Interpolated)		318.49	
Delta (margin)		-303.07	

Bluegiga BLE Transceiver			
Measured output power (ERP - dBm)	1.67	Antenna gain (dBi)	0.5
Total output power (EIRP - mW)		1.65	
Duty cycle		100 %	
Calculated source-based, time-averaged output power (mW)		1.65	
Limit from Table 1 @ ≤ 50mm Separation Distance (mW - Linearly Interpolated)		318.49	
Delta (margin)		-316.84	

Combined Power			
EPIC 3 output power (mW)	15.42	Bluegiga output power (mW)	1.65
Total combined output power (EIRP - mW)		17.07	
Limit from Table 1 @ ≤ 50mm Separation Distance (mW - Linearly Interpolated)		318.49	
Delta (margin)		-301.42	

The combined power as calculated above is less than the required limit for exemption. Therefore, no addition SAR testing is required on the device.