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## **Certification Exhibit**

**FCC ID: VKF-IRISA1**

**FCC Rule Part: 47 CFR Part 2.1091**

**TÜV SÜD Project Number: 72157766**

Applicant: Masimo Corporation  
Model: Sterling-LWB5

## **RF Exposure**

TÜV SÜD America  
5610 West Sligh Ave., Suite 100  
Tampa, FL 33634

Phone: 813-284-2715  
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**General Information:**

Applicant: Masimo Corporation  
Device Category: Mobile  
Environment: General Population/Uncontrolled Exposure

**Technical Information:**

Mode of Operation: Bluetooth+EDR (Frequency Hopping Spread Spectrum)  
Frequency Range: 2402 MHz - 2480 MHz  
Number of Channels: 79  
Channel Separation: 1 MHz  
Data Rate: 1 Mbps (GFSK), 2 Mbps (EDR2), 3 Mbps (EDR3)  
Modulations: GFSK,  $\pi/4$  DQPSK (EDR2), 8 DPSK (EDR3)

Mode of Operation: Bluetooth Low Energy (BLE)  
Frequency Range: 2402 MHz - 2480 MHz  
Number of Channels: 40  
Channel Separation: 2 MHz  
Data Rate: 1 Mbps  
Modulations: GFSK

Mode of Operation: IEEE 802.11b/g/n  
Frequency Range: 802.11b/g/n 20 MHz: 2412 MHz - 2462 MHz  
802.11n 40 MHz: 2422 MHz - 2462 MHz  
Number of Channels: 802.11b/g/n 20 MHz: 13  
802.11n 40 MHz: 11  
Channel Separation: 5 MHz  
Data Rate: 802.11b: 1, 2, 5.5, 11 Mbps  
802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps  
802.11n 20 MHz: 6.5, 13, 19.5, 26, 39, 52, 58.5, 65 Mbps  
802.11n 40 MHz: 13.5, 27, 40.5, 54, 81, 108, 121.5, 135 Mbps  
Modulations: 802.11b: CCK, DSSS  
802.11g/n: OFDM

Antenna Type/Gain: Molex Antenna Model 1461531100 / 3 dBi

Mode of Operation:	IEEE 802.11a/n/ac
Frequency Range:	802.11a/n 20 MHz/ac 20 MHz: 5180 MHz - 5240 MHz, 5260 MHz - 5320 MHz, 5500 MHz - 5720 MHz, 5745 MHz - 5825 MHz 802.11n 40 MHz/ac 40 MHz: 5190 MHz - 5230 MHz, 5270 MHz - 5310 MHz, 5510 MHz- 5710 MHz, 5755 MHz - 5795 MHz 802.11ac 80 MHz: 5210 MHz, 5290 MHz, 5530 MHz - 5690 MHz, 5775 MHz
Number of Channels:	802.11a/n 20 MHz/ac 20 MHz: 25 802.11n 40 MHz/ac 40 MHz: 12 802.11ac 80 MHz: 6
Channel Separation:	802.11a/n 20 MHz/ac 20 MHz: 20 MHz 802.11n 40 MHz/ac 40 MHz: 40 MHz 802.11ac 80 MHz: 80 MHz
Data Rate:	802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n 20 MHz: 6.5, 13, 19.5, 26, 39, 52, 58.5, 65 Mbps 802.11n 40 MHz: 13.5, 27, 40.5, 54, 81, 108, 121.5, 135 Mbps 802.11ac 20 MHz: 6.5, 13, 19.5, 26, 39, 52, 58.5, 65, 78 Mbps 802.11ac 40 MHz: 13.5, 27, 40.5, 54, 81, 108, 121.5, 135, 162, 180 Mbps 802.11ac 80 MHz: 29.3, 58.5, 87.8, 117, 175.5, 234, 263.3, 292.5, 351, 390 Mbps
Modulations:	OFDM
Antenna Type/Gain:	Molex Antenna Model 1461531100 / 4 dBi

Note: The radios are not capable of transmitting simultaneously.

#### **MPE Calculations:**

The Power Density (mW/cm<sup>2</sup>) is calculated as follows:

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = power density (in appropriate units, e.g. mW/cm<sup>2</sup>)

P = power input to the antenna (in appropriate units, e.g., mW)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

Mode of Operation: Bluetooth + EDR  
 Radio Type: Frequency Hopping Spread Spectrum (FHSS)  
 Transmit Frequency Range (MHz): 2402 - 2480  
 Antenna Gain (dBi): 3  
 Maximum Transmitter Conducted Power (dBm): 9.8  
 Maximum System EIRP (dBm): 12.8  
 Maximum System EIRP (mW): 19.05  
 Maximum Duty Cycle (%): 100  
 Exposure Conditions: General Population / Uncontrolled Exposure  
 Minimum Distance (cm): 20

**Table 1: MPE Calculation – Bluetooth + EDR**

Transmit Frequency (MHz)	Radio Power (dBm)	Power Density Limit (mW/Cm2)	Radio Power (mW)	Antenna Gain (dBi)	Antenna Gain (mW eq.)	Distance (cm)	Power Density (mW/cm^2)
2441	9.8	1.00	9.55	3	1.995	20	0.004

Mode of Operation: Bluetooth Low Energy (BLE)  
 Radio Type: Digital Transmission System (DTS)  
 Transmit Frequency Range (MHz): 2402 - 2480  
 Antenna Gain (dBi): 3  
 Maximum Transmitter Conducted Power (dBm): 6.9  
 Maximum System EIRP (dBm): 9.9  
 Maximum System EIRP (mW): 9.77  
 Maximum Duty Cycle (%): 100  
 Exposure Conditions: General Population / Uncontrolled Exposure  
 Minimum Distance (cm): 20

**Table 2: MPE Calculation – Bluetooth Low Energy (BLE)**

Transmit Frequency (MHz)	Radio Power (dBm)	Power Density Limit (mW/Cm2)	Radio Power (mW)	Antenna Gain (dBi)	Antenna Gain (mW eq.)	Distance (cm)	Power Density (mW/cm^2)
2440	6.9	1.00	4.90	3	1.995	20	0.002

Mode of Operation: IEEE 802.11 2.4 GHz WLAN  
 Radio Type: Digital Transmission System (DTS)  
 Transmit Frequency Range (MHz): 2412 - 2462 MHz  
 Antenna Gain (dBi): 3  
 Maximum Transmitter Conducted Power (dBm): 21.5  
 Maximum System EIRP (dBm): 24.5  
 Maximum System EIRP (mW): 281.84  
 Maximum Duty Cycle (%): 100  
 Exposure Conditions: General Population / Uncontrolled Exposure  
 Minimum Distance (cm): 20

**Table 3: MPE Calculation – 2.4 GHz WLAN**

Transmit Frequency (MHz)	Radio Power (dBm)	Power Density Limit (mW/Cm2)	Radio Power (mW)	Antenna Gain (dBi)	Antenna Gain (mW eq.)	Distance (cm)	Power Density (mW/cm^2)
2437	21.5	1.00	141.25	3	1.995	20	0.056

Mode of Operation: IEEE 802.11 5-GHz WLAN  
 Radio Type: Unlicensed Information Infrastructure (U-NII)  
 Transmit Frequency Range (MHz): 5180 - 5825  
 Antenna Gain (dBi): 4  
 Maximum Transmitter Conducted Power (dBm): 15.8  
 Maximum System EIRP (dBm): 19.8  
 Maximum System EIRP (mW): 95.5  
 Maximum Duty Cycle (%): 100  
 Exposure Conditions: General Population / Uncontrolled Exposure  
 Minimum Distance (cm): 20

**Table 4: MPE Calculation – 5 GHz WLAN**

Transmit Frequency (MHz)	Radio Power (dBm)	Power Density Limit (mW/Cm2)	Radio Power (mW)	Antenna Gain (dBi)	Antenna Gain (mW eq.)	Distance (cm)	Power Density (mW/cm^2)
5500	15.8	1.00	38.02	4	2.512	20	0.019