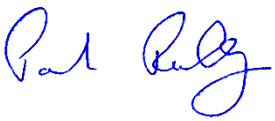
COMPLIANCE ENGINEERING IRELAND LTD

ISO 17025 IVNAB ACCREDITED TESTING DETAILED IN SCOPE REG NO.088T

Compliance Engineering Ireland Ltd
Clonross Lane, Derrockstown, Dunshaughlin
Co. Meath, Ireland A85 XN59
Ph +353 1 8017000 , 8256722

Project No.	**23E10540-3b**
Quotation	**Q23-1805-1**
Prepared For	**Sensoteq Ltd**
Company Address	**Unit 23, Ormeau Business Park, Cromac Ave, BT7 2JA Belfast**
Contact	**Alan McCall**
Contact Email	**amccall@sensoteq.co.uk**
Contact Phone	**+44 2896 208 453**
Prepared By	**Compliance Engineering Ireland**
Test Lab Address	**Clonross Lane, Derrockstown, Dunshaughlin, Co. Meath, Ireland**
Tested By	**Joy Dalayap**
Test Report By	**Michael Kirby**
FCC Designation number	**IE0002**
ISED CAB identifier:	**IE0001**
Date	**18th Dec 2023**
EUT Description	**RF Sensor**
FCC ID	**2ANL3SPR433TA**
IC ID	**23633-SPR433TA**
Authorised by	**Paul Reilly**
Authorised Signature:	

RF Exposure Exhibit– Technical Report

1.0 Overview

The EUT is designed for fixed / mobile applications application environments.

1.1 Fixed / Mobile Application

MPE for bystanders which are considered to be ≥20cm away from the front of the transmit antenna

2 Overview FCC MPE

47 CFR Sections 1.1307, 1.1310, 2.1091,

447498 D01 General RF Exposure Guidance v06

2.1 Maximum Permissible Exposure 433.4MHz

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

where:
S = power density
P = power input to the antenna
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

Note the Radiated field strength was measured at 3 metres and
the conversion formula below was used to determine the EIRP in dBm

EIRP (dBm) = E_{3m} (dBuV/m) – 95.2

Radiated Field Strength at 3m	69	dBuV/m
Power Conversion factor for antenna distance 3m	-95.2	dB
Time Averaging Factor	0	dB
Tune up factor	0	dB
EIRP Peak	-26.20	dBm
EIRP Peak	0	mW
Prediction distance:	20	cm
Prediction frequency:	433.4	MHz
Power density at prediction frequency:	0.000	mW/cm^2
Power density at prediction frequency:	0.000	W/m^2
MPE limit for Uncontrolled/General Population exposure at prediction frequency:	0.290	mW/cm^2
Result => Exempt from RF Exposure evaluation		

Notes

The table above shows that for a prediction distance of 20cm, RF exposure evaluation is not required.

2.2 Maximum Permissible Exposure BLE

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

where:
S = power density
P = power input to the antenna
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

Note the Radiated field strength was measured at 3 metres and
the conversion formula below was used to determine the EIRP in dBm

$$EIRP\ (dBm) = E_{3m}\ (dBuV/m) - 95.2$$

Radiated Field Strength at 3m	83.5	dBuV/m
Power Conversion factor for antenna distance 3m	-95.2	dB
Time Averaging Factor	0	dB
Tune up factor	0	dB
EIRP Peak	-11.70	dBm
EIRP Peak	0	mW
Prediction distance:	20	cm
Prediction frequency:	2480	MHz
Power density at prediction frequency:	0.000	mW/cm^2
Power density at prediction frequency:	0.000	W/m^2
MPE limit for Uncontrolled/General Population exposure at prediction frequency:	1.000	mW/cm^2
Result => Exempt from RF Exposure evaluation		

The table above shows that for a prediction distance of 20cm, RF exposure evaluation is not required.

2.3 Maximum Permissible Exposure 433.4MHz and BLE co-locating

Adding the individual fractions of the respective limits, the combined total is less than 1.

0/0.29 + 0/1 = 0 <1

This result shows that for a prediction distance of 20cm, RF exposure evaluation is not required when the 433.4 and BLE transmitters are co-locating.

3.0 Maximum Permissible Exposure IC

Limits for Routine Evaluation — RF Exposure Evaluation

Limits as per RSS 102 Issue 5 (Mar 2015) Section 2.5.2 Amd 1 Feb 2021

3.1 Maximum Permissible Exposure 433.4MHz

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

where:
S = power density
P = power input to the antenna
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

Note the Radiated field strength was measured at 3 metres and
the conversion formula below was used to determine the EIRP in dBm

EIRP (dBm) = E_{3m} (dBuV/m) – 95.2

Radiated Field Strength at 3metres	69	dBuV/m
Adjustment for antenna distance 3m	-95.2	dB
EIRP Peak	-26.2	dBm
Time Averaging Factor	0.00	dB
Tune up factor	0	dB
EIRP Peak	-26.20	dBm
EIRP Peak	2.40	uW
Prediction frequency:	433.4	MHz
RSS102 2.5.2 Limit for Routine Evaluation	0.83	W
Exempt from Routine RF Exposure Evaluation		

Notes

The table above shows that for a prediction distance of 20cm, RF exposure evaluation is not required.

3.2 Maximum Permissible Exposure BLE

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

where:
S = power density
P = power input to the antenna
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

Note the Radiated field strength was measured at 3 metres and
the conversion formula below was used to determine the EIRP in dBm

EIRP (dBm) = E_{3m} (dBuV/m) – 95.2

Radiated Field Strength at 3metres	83.5	dBuV/m
Adjustment for antenna distance 3m	-95.2	dB
EIRP Peak	-11.7	dBm
Time Averaging Factor	0.00	dB
Tune up factor	0	dB
EIRP Peak	-11.70	dBm
EIRP Peak	0.07	mW
Prediction frequency:	2480	MHz
RSS102 2.5.2 Limit for Routine Evaluation	2.74	W
Exempt from Routine RF Exposure Evaluation		

3.3 Maximum Permissible Exposure 433.4MHz and BLE co-locating

Adding the individual fractions of the respective limits, the combined total is less than 1.

0/0.83 + 0.0007/2.74 = 0 <1

This result shows that for a prediction distance of 20cm, RF exposure evaluation is not required when the 433.4MHz and BLE transmitters are co-locating.

End of Report