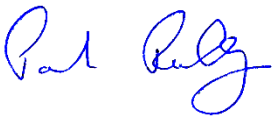
Compliance Engineering Ireland Ltd

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

Project Num	20E8928-5c
Quotation	Q20-1410-1
Prepared For	Sensata Technologies Ltd
Company Address	11 Technology Park, Belfast Road, Antrim, Northern Ireland BT41 1QS
Contact	James Kyle
Contact Email	jakyle@sensata.com
Contact Phone	+44 28 9448 3067
Prepared By	Compliance Engineering Ireland
Test Lab Address	Clonross Lane, Derrockstown, Dunshaughlin, Co. Meath, Ireland
Tested By	Joy Dalayap Michael Kirby
Test Report By	Michael Kirby
FCC Test Firm Registration	409640
IC Site Registration	IE0001
Date	1st Apr 2021
EUT Description	Wireless Gateway
FCC ID	2ATIMHUBA
IC ID	25094-HUBA
Authorised by	**Paul Reilly**
Authorised Signature:	

RF Exposure Exhibit– Technical Report

1.0 Overview

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

2. Maximum Permissible Exposure FCC

2.1 Limits /guidelines

47 CFR Sections 1.1307, 1.1310, 2.1091

447498 D01 General RF Exposure Guidance v06

2.2 Results

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

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

As Wifi pcb antenna can transmit at the same time as the Thread, each with max power (including the tune up tolerances)and using the conducted powers in a worst case scenario

11 dBm for Wifi pcb antenna @ 2.437 GHz 16dBm for Thread @ 2.44GHz
Converting all powers to mW using the formula X mW = 10^(YdBm/10)
12.59mW +39.81mW respectively giving a total of 52.4mW

Prediction frequency:	2437	MHz
Time Averaging Factor	0	dB
EIRP Peak	17	dBm
EIRP Peak	52.40	mW
Maximum antenna gain:		
	20	cm
MPE limit for Uncontrolled/General Population exposure at prediction frequency:	1	mW/cm^2
Power density at prediction frequency:	0.01042465	mW/cm^2
Power density at prediction frequency:	0.104246	W/m^2
Test Result: Exempt from RF exposure test	Pass	

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

3.0 Maximum Permissible Exposure IC

3.1 Limits /guidelines

Limits for Routine Evaluation — RF Exposure Evaluation

Limits as per RSS 102 Issue 5 Section 2.5.2

3.2 Results

As Wifi pcb antenna can transmit at the same time as the Thread, each with max power (including the tune up tolerances) and using the conducted powers in a worst case scenario

11 dBm for Wifi pcb antenna @ 2.437 GHz 16dBm for Thread @ 2.44GHz
Converting all powers to mW using the formula X mW = 10^(YdBm/10)
12.59mW +39.81mW respectively giving a total of 52.4mW

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

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

Prediction frequency:	2437	MHz
Time Averaging Factor	0.00	dB
Tune up factor	1	dB
EIRP Peak	52.4	mW
Exemption limit for Routine Evaluation :	2703	mW
Exempt from RF Exposure Evaluation		

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

End of Report