MPE Calculations

Control4 Model:

C4-T4IW8-XX
C4-T4IW10-XX

FCC ID: 2AJACT4TS
IC: 7848A-T4TS

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1.0 SCOPE:

This Report Demonstrates Evaluation and Compliance to the following standards:

1. **Code of Federal Regulations Title 47, Volume 1, Section 1.1310 and Title 47, Part 2 Subpart J Section 2.1091**
2. **Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands) – ISED RSS-102 Issue 5, 2.5.2**

2.0 REVISION LEVEL:

DATE	COMMENTS	REVISION
10/10/08	Created.	1.0
08/16/10	Added RSS-102 references	2.0
09/30/20	Update logo, FCC ID grantee code, FCC and ISED standards references	2.1

3.0 REFERANCE DOCUMENTS:

(A) Limits for Maximum Permissible Exposure (MPE). Code of Federal Regulations Title 47, Volume 1, Section 1.1310.
(B) Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields. OET Bulletin 67 Edition 97-01.
(C) Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands) - RSS-102 Issue 5

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4.0 CALCULATIONS:

The following worst-case emissions was calculated by using Method 1 below

Method 1: Based on a PPt (Peak Power Total) measurement of the total power into the antenna and the worst-case antenna gain.

Effective/Equivalent Isotropic Radiated Power [EIRP] dBm = Total power into the antenna [dBm] + antenna gain [dBi]
To convert the values from dBm to mW
$mW = 10^{dBm/10}$

Method 2: Based on the radiated field strength measurement at 3 meters [at a calibrated OATS site, maximizing the antenna polarity and height]

After obtaining the EIRP, the Power density is calculated and compared against the FCC and IC limits. Calculations for 20 cm are shown below.

S_{FCC} = Power density in *mW/cm^2* for FCC
$S_{FCC} = EIRP/4\pi \cdot R^2$
EIRP = Equivalent isotropically radiated power *(mW)*
R = Distance to the center of radiation of the antenna *(20 cm)*
S_{FCC} = see table below

Mode	Channel	Power setting	Total power into the antenna [dBm]	antenna gain [dBi]	Tune-up procedure variance[dB]	EIRP (dBm)	EIRP (mW)	4π	R (cm)	R^2 (cm)	S_{FCC} (mW/cm^2)	S_{FCC} (mW/cm^2) FCC Limit	FCC Margin	Result (Pass/Fail)
B	2437	20	18.9	5.289	0.5	24.73	297.2	12.6	20	400	0.06	1	-0.94	Pass
G	2437	17	16.3	5.289	0.5	22.11	162.4	12.6	20	400	0.03	1	-0.97	Pass
N	2437	18	16.9	5.289	0.5	22.69	185.9	12.6	20	400	0.04	1	-0.96	Pass
UNII N	5260	20	18.8	7.503	0.5	26.83	481.4	12.6	20	400	0.10	1	-0.90	Pass

S_{IC} = Power density in *W/m^2* for IC
$S_{IC} = EIRP/4\pi \cdot R^2$
EIRP = Equivalent isotropically radiated power in watts *(W)*
R = Distance to the center of radiation of the antenna *(0.2 m)*
S_{IC} = see table below

Mode	Channel	Power setting	Total power into the antenna [dBm]	antenna gain [dBi]	Tune-up procedure variance[dB]	EIRP (dBm)	EIRP (W)	4π	R (m)	R^2 (m)	S_{IC} (W/m^2)	S_{IC} (W/m^2) IC Limit	IC Margin	Result (Pass/Fail)
B	2437	20	18.9	5.289	0.5	24.73	0.30	12.6	0.20	0.040	0.59	10.00	-9.41	Pass
G	2437	17	16.3	5.289	0.5	22.11	0.16	12.6	0.20	0.040	0.32	10.00	-9.68	Pass
N	2437	18	16.9	5.289	0.5	22.69	0.19	12.6	0.20	0.040	0.37	10.00	-9.63	Pass
UNII N	5260	20	18.8	7.503	0.5	26.83	0.48	12.6	0.20	0.040	0.96	10.00	-9.04	Pass

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5.0 CONCLUSION:

1. **Based upon the limits for Maximum Permissible Exposure (MPE) given in Table 1 of reference document (A) as 1mW/cm², this device falls under the required limits at 20 cm.**
2. **Based upon the limits given in section 4.2 of the reference document (C) as 10W/m², this device falls under the required limits at 20 cm.**

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