Client	**Ecobee Inc**	
Product	**RS Gen 2**	
Standard(s)	RSS 247 / FCC Part 15 Subpart C 15:2016	

TÜV SÜD Canada

RF Exposure

Purpose

The purpose of this test is to ensure that the RF energy intentionally transmitted, in terms of power density emitted from the EUT at a stated operating distance does not exceed the limits listed below as defined in the applicable test standard, as calculated based upon readings obtained during testing.   This helps protect human exposure to excessive RF fields.

Limit(s) and Method

The limits, as defined FCC 1.1310 Table 1 (B) limits for general public exposure was applied. The limits for the frequency ranges 300 MHz to 1.5 GHz and 1.5 GHz to 100 GHz was applied. The limits are f/1500 mW/cm^2 and 1.0 mW/cm^2 respectively.

As per FCC KDB 447498, Clause 4.3.1 b), the 1-g SAR exclusion threshold for 200 mm test distance is 1060 mW (see below for calculations).

For RSS 102 the RF exposure exemption limit for a 902 MHz transmitter is $1.31 \times 10^{-2} f^{0.6834}$ W which is 1.37 W.

The distance used for calculations was 20 cm, as this is the minimum distance an operator will be from the EUT during normal operation, as stated by the manufacturer.

Results

The EUT meets the requirements.

For FCC, the worst case calculated power density was 0.005 mW/cm^2, this is significantly under the 0.6 mW/cm^2 requirement.

For FCC SAR exemption, the maximum power the device transmits is 12.16 mW which is less than 1060 mW; therefore, the EUT meets SAR testing exclusion requirements.

For RSS 102, the E.I.R.P of the EUT is 12.16 dBm + 2 dBi = 14.16 dBm (0.026 W) which is significantly less than the 1.37 W exemption limit.

Client	**Ecobee Inc**
Product	**RS Gen 2**
Standard(s)	RSS 247 / FCC Part 15 Subpart C 15:2016

TÜV
SÜD

Canada

Calculations – Power Density

Method 1 (conducted power)
Internal antenna

$P_d = (P_t * G) / (4 * pi * R^2)$
Where Pt = 12.16 dBm or 16.44 mW as per Peak power conducted output
Where G =2 dBi, or numerically 1.58
Where R = 20 cm

$P_d = (16.44 \text{ mW} * 1.58) / (4 * pi * 20cm^2)$
$P_d = 25.97 \text{ mW} / 5026 \text{ cm}^2$
$P_d = 0.005 \text{ mW/cm}^2$

Calculations – SAR Exclusion Limit

According to FCC KDB 447498, Clause 4.3.1 a) the exclusion power for up to 50 mm is

Power @ 50 mm= (3 * distance)/ $\sqrt{f(GHz)}$
Power @ 50 mm= (3 * 50)/ $\sqrt{(0.902)}$
Power @ 50 mm= 158 mW

According to FCC KDB 447498, Clause 4.3.1 b), the test exclusion power for above 50 mm is

$$\text{Power @ 50 mm} + \left(\text{dist} - 50 \text{ mm}\right) \times \left(\frac{\text{f(MHz)}}{150}\right)$$

The exclusion power for 200 mm is therefore

158 mW + ((200 mm – 50 mm)*(902 MHz / 150)) = 1060 mW