# FCC RF EXPOSURE REPORT

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|---|---|
| **EUT** | S-1V Smart Wireless Router Set |
| **Frequency band (Operating)** | ☒ WLAN: 2.412GHz ~ 2.462GHz<br>☒ WLAN: 2.422GHz ~ 2.452GHz<br>☐ WLAN: 5.180GHz ~ 5.240GHz<br>☐ WLAN: 5.190GHz ~ 5.230GHz |
| **Device category** | ☐ Portable (<20cm separation)<br>☒ Mobile (>20cm separation) |
| **Exposure classification** | ☐ Occupational/Controlled exposure (S = 5mW/cm$^2$)<br>☒ General Population/Uncontrolled exposure (S=1mW/cm$^2$) |
| **Antenna diversity** | ☒ Single antenna<br>☐ Multiple antennas<br>☐ Tx diversity<br>☐ Rx diversity<br>☐ Tx/Rx diversity |
| **Max. output power** | 22.51dBm (178.238mW) |
| **Antenna gain (Max)** | 3.2dBi(Numeric gain:2.25) |
| **Evaluation applied** | ☒ MPE Evaluation*<br>☐ SAR Evaluation<br>☐ N/A |

***Note:***

1. *The maximum output power is 22.51dBm (178.238mW) at 2462MHz (with numeric 1.58 antenna gain.)*
2. *DTS device is not subject to routine RF evaluation; MPE estimate is used to justify the compliance.*
3. *For mobile or fixed location transmitters, no SAR consideration applied. The maximum power density is 1.0 mW/cm$^2$ even if the calculation indicates that the power density would be larger.*

## TEST RESULTS

No non-compliance noted.

## Calculation

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{3770}$

*Where* *E = Field strength in Volts / meter*
*P = Power in Watts*
*G = Numeric antenna gain*
*d = Distance in meters*
*S = Power density in milliwatts / square centimeter*

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770 d^2}$$

Changing to units of mW and cm, using:

*P (mW) = P (W) / 1000 and*
*d (cm) = d(m) /100*

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2}$$ ***Equation 1***

*Where* *d = Distance in cm*
*P = Power in mW*
*G = Numeric antenna gain*
*S = Power density in mW / $cm^2$*

## Maximum Permissible Exposure

| Modulation Mode | Frequency band (MHz) | Peak output power(dBm) | Peak output power(mW) | Antenna Gain (dBi) | Antenna gain (*Numeric*) | Distance (cm) | Power density (mW/cm2) | Limit (mW/cm2) |
|---|---|---|---|---|---|---|---|---|
| 802.11b | 2412-2462 | **21.63** | **145.545908** | **3.52** | **2.25** | **20** | **0.0651408** | **1** |
| 802.11g | 2412-2462 | **22.28** | **169.044093** | **3.52** | **2.25** | **20** | **0.07565769** | **1** |
| 802.11n HT20 | 2412-2462 | **22.51** | **178.237877** | **3.52** | **2.25** | **20** | **0.07977248** | **1** |
| 802.11n HT40 | 2422-2452 | **22.31** | **170.215851** | **3.52** | **2.25** | **20** | **0.07618212** | **1** |