




Canada

## **Exhibit: RF Exposure – FCC / ISED**

FCC ID: 2AR26-SWIDGETW100

IC: IC: 24603-SWDTZW10100

7169008247FCCRFEXP-002

Client	Swidget	
Product	Swidget WIFI/BT module (PNS50E0179)	
Standard(s)	FCC Part 15 Subpart 15.249	

## RF Exposure – FCC

The device is a mobile device intended to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure and the body of the user or nearby persons.

### General SAR test exclusion guidance:

As per FCC KDB 447498 Section 4.3.1 b), the SAR Test Exclusion Threshold for 100 MHz to 6 GHz at test separation distances > 50 mm is determined by:

- 1) {[Power allowed at *numeric threshold* for 50 mm]} + [(test separation distance – 50 mm) (f<sub>(MHz)</sub>/150)]} mW, for 100 MHz to 1500 MHz
- 2) {[Power allowed at *numeric threshold* for 50 mm]} + [(test separation distance – 50 mm)\*10]} mW, for > 1500 MHz and ≤ 6 GHz


Where:

Power allowed at *numeric threshold* for 50 mm (for 1-g SAR) is given by:

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] [\sqrt{f_{(\text{GHz})}}] \leq 3.0$$

$$(\text{max power of channel, including tune-up tolerance, mW}) \leq [3.0 / \sqrt{f_{(\text{GHz})}}] * [\text{min. test separation distance, mm}]$$

f<sub>(GHz)</sub> is the RF channel transmit frequency in GHz

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### MPE Calculation:908 – 916 MHz DTS transmitter

The maximum field strength received was 89.3 dBuV/m at 3 meters. As per FCC guidance a factor of 95.2 is used to convert to EIRP, and presumes a gain of 0 dBi as a field strength measurement was used to convert to EIRP.


The DTS transmitter has a maximum conducted output power of -5.9 dBm or 0.257 mW and an antenna gain of 0.0 dBi or 1.0 numerically.

For a distance of 20cm, the power density is:

$$P_d = (0.257 \text{ mW} * 1.26) / (4 * 3.1416 * (20\text{cm})^2)$$

$$P_d = 25.77 \text{ uW/cm}^2$$

The device passes the requirement. The calculated power density of 25.77 uW/cm<sup>2</sup> is below the 1.0 mW/cm<sup>2</sup> limit.

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Prediction of MPE limit at a given distance	
Equation from page 18 of OET Bulletin 65, Edition 97-01	
$S = \frac{PG}{4\pi R^2}$	
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
Maximum peak output power at antenna input terminal:	-5.90 (dBm)
Maximum peak output power at antenna input terminal:	0.257039578 (mW)
Number of Ports	1
Antenna gain(typical):	0
Antenna gain(total):	0 (dBi)
Maximum antenna gain:	1 (numeric)
Time Averaging:	100 (%)
Prediction distance:	20 (cm)
Prediction frequency:	908.4 (MHz)
FCC MPE limit for uncontrolled exposure at prediction frequency:	0.6 (mW/cm <sup>2</sup> )
Power density at prediction frequency:	0.000051 (mW/cm <sup>2</sup> )
Margin of compliance:	-40.7 (dB)
This equates to	0.000511364 W/m <sup>2</sup>
RSS-102 Issue 5 limit	2.753100631 W/m <sup>2</sup>
FCC Percentage of limit	0.00852%
RSS-102 Percentage of limit	0.01857%
Note: This device does not exceed the 60 / f (GHz) in mW limit as per FCC KDB 447498 2(a)(i), so it is allowable to be used in portable exposure conditions with no restrictions on host platforms	