# MPE CALCULATION REPORT
# FROM
# RFI GLOBAL SERVICES LTD

Evaluation of: Harris Stratex Networks
StarMax 3160 Series 2.5 to 2.7GHz WiMax™ SS

To:
FCC OET Bulletin 65

**Report Serial No:**
RFI/REGA3/TP75361D01E

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| **This Test Plan Is Issued Under The Authority Of Nick Hooper, Head of Inspection**  | |
| **Written By:** John Bellairs  | **Checked By:** Tony Henriques  |
| **Report Copy No: PDF01** | **Issue Date: 01 April 2010** |

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**For:** Harris Stratex Networks
**Product:** StarMax 3160 Series 2.5 to 2.7GHz WiMax™ SS

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# 1. Client Information

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| **Company Name:** | Harris Stratex Networks |
| **Address:** | 4 Bell Drive<br>Hamilton International Technology Park<br>Blantyre<br>G72 0FB, Scotland |
| **Contact Name:** | Ms R French |

# 2. Equipment Under Evaluation

The following information has been supplied by the client:

## 2.1. Identification of Equipment Under Evaluation

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|---|---|
| **Brand Name:** | Harris Stratex Networks. |
| **Model Name or Number:** | StarMax 3160 Series |
| **FCC ID:** | VPX-3160-25A |
| **Equipment Category:** | WiMax™ Subscriber Station |
| **Serial Number:** | No specific equipment |
| **Frequency of Operation:** | 2.5 – 2.7GHz. |
| **Transmitting Power:** | +28dBm |
| **Antenna Gain** | +12dBi maximum |
| **Channel Bandwidth:** | 5 and 10MHz |
| **Duplex Method** | TDD |
| **Max. TDD TX Duty Cycle** | 74% |

## 2.2. Description of EUT

The equipment under evaluation is the Harris Stratex StarMax 3160 Series WiMax™ SS. This evaluation covers operation at 2.5 - 2.7GHz.

The StarMax WiMax™ 3160 SS can utilises single antenna operation and is intended to be used in fixed outdoor installations.

Antenna gain details have been supplied by Harris Stratex.

## 3. Applicable FCC Rule Parts:

Part 27.52. Licensees and manufacturers are subject to the radio frequency radiation exposure requirements specified in sections 1.1307(b), 2.1091, and 2.1093.

Part 1.1310. Radiofrequency radiation exposure limits.

Part 27.50(h)(1).Main, booster and base stations. (i) The maximum EIRP of a main, booster or base station shall not exceed 33 dBW + 10log(X/Y) dBW, where X is the actual channel width in MHz and Y is either 6 MHz if prior to transition or the station is in the MBS following transition or 5.5 MHz if the station is in the LBS and UBS following transition, except as provided in paragraph (h)(1)(ii) of this section.

(ii) If a main or booster station sectorizes or otherwise uses one or more transmitting antennas with a non-omnidirectional horizontal plane radiation pattern, the maximum EIRP in dBW in a given direction shall be determined by the following formula: EIRP = 33 dBW + 10 log(X/Y) dBW + 10 log(360/beamwidth) dBW, where X is the actual channel width in MHz, Y is either (i) 6 MHz if prior to transition or the station is in the MBS following transition or (ii) 5.5 MHz if the station is in the LBS and UBS following transition, and beamwidth is the total horizontal plane beamwidth of the individual transmitting antenna for the station or any sector measured at the half-power points.

## 4. MPE Calculation for the StarMax 3160 SS

Maximum antenna gain specified is 12.0dBi

Maximum transmitter power specified is 28dBm (0.63W)

At 0.63W and 74% TDD duty cycle:

$$P = 0.63 \times 0.74 = 0.47 \text{ W}$$

### 4.1 Calculation for 2.5 – 2.7GHz.

From FCC Rule Part 1.1310 table 1 (b) - Limits for General Population/ Uncontrolled Exposure:

$$\mathbf{S = 1.0 \text{ mW/cm}^2}$$

The MPE calculation as given in FCC OET Bulletin 65, page 19 is used to calculate the safe operating distance for the user.

$$\mathbf{S = EIRP/4 \pi R^2}$$

**Where** S = Power density

EIRP = Effective Isotropic Radiated Power (EIRP = P x G)

P = Conducted Transmitter Power

G = Antenna Gain (relative to an isotropic radiator)

R = distance to the centre of radiation of the antenna

Values for StarMax 3160 SS :

P = 0.47W

G = 12.0dBi (15.85)

S = 1.0 mW/cm$^2$

**S = EIRP/4 π R$^2$**

1 = 0.47 x 10$^3$ x 15.85/(12.56 x R$^2$)

R$^2$ = 0.47 x 10$^3$ x 15.85/12.56

R = 24.35cm

**R = 0.24m**

**4.2 Calculation for Maximum radiated power output**

For 12.0dBi gain antenna:

Power = 0.47 x 15.85 = 7.42W EIRP (8.7dBW)

This meets the Part 27.50(h) (1) limit

## 5. Conclusion

The required RF exposure limits for General Population/ Uncontrolled Exposure FCC Rule Part 1.1310, and Part 27.50(h) (1) maximum transmitter power limits will not be exceeded for the StarMax 3160 SS at 2.5 to 2.7GHz operation using antennas having a maximum gain of 12.0dBi at safe operating distances greater than 0.24 metres.

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