MPE CALCULATION REPORT
FROM
RFI GLOBAL SERVICES LTD

Evaluation of: Harris Stratex Networks
StarMAX 8200-25 and StarMAX 8200-26 Base Stations

To:
FCC OET Bulletin 65

Report Serial No:
RFI/REGA2/TP75361D01C

This Test Plan Is Issued Under The Authority Of Nick Hooper, Head of Inspection 	
Written By: John Bellairs 	**Checked By:** 
Report Copy No: PDF01	**Issue Date: 18 December 2009**

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1. Client Information

Company Name:	Harris Stratex Networks
Address:	4 Bell Drive Hamilton International Technology Park Blantyre 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

Brand Name:	Harris Stratex StarMAX
Model Name or Number:	StarMAX 8200-25; FCC ID: VPX-8200-25A StarMAX 8200-26; FCC ID: VPX-8200-26A
Equipment Category:	WiMax™ Base Station
Serial Number:	No specific equipment
Frequency of Operation:	2.496 – 2.690GHz.
Transmitting Power:	+36dBm standard (+40dBm high power on request)
Antenna Gain	+18.0dBi 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 8200-25 and StarMAX 8200-26 base stations. This evaluation covers operation at 2.5 - 2.7GHz.

The StarMAX 8200-25 and StarMAX 8200-26 base stations can utilise single or two antenna operation and is intended to be used in fixed outdoor installations.

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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.
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4. MPE Calculation for the StarMAX 8200-25 and StarMAX 8200-26 BS

Maximum antenna gain specified is 18.0dBi

Maximum transmitter power specified is 40dBm (10W)

For 2 transmitters @ 40dBm and 74% TDD duty cycle:

$$P = 10 \times 2 \times 0.74 = 14.8W$$

4.1 Calculation for 2.5 – 2.7GHz.

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

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

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 6000 BS :

P = 14.8W

G = 18.0dBi (63.1)

S = 1.0 mW/cm^2

$S = PxG/4 \pi R^2$

$1 = 14.8 \times 10^3 \times 63.1/(12.56 \times R^2)$

$R^2 = 14.8 \times 10^3 \times 63.1/12.56$

R = 272.7cm

R = 2.73m

4.2 Calculation for Maximum radiated power output

For 18.0dBi gain antenna, considering 2 transmitters with simultaneous transmission

Power = 2 x10 x 63.1 = 1262W EIRP (31.0dBW)

This meets the Part 27.50(h) (1) (ii) 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 8200-25 and StarMAX 8200-26 BS at 2.5 to 2.7GHz operation using antennas having a maximum gain of 18.0dBi at safe operating distances greater than 2.73 metres