RF EXPOSURE EVALUATION REPORT

For: Eseye Ltd.

Product: HERA604Series Router

FCC ID: 2AASBH604V4

RF Exposure Evaluation Report Serial No.:
UL/REGA2/MPE12970370A

This RF Exposure Evaluation Report Is Issued Under The Authority Of Alan Binks, Head of Inspection: **PP:**	
Written By: John Bellairs	**Checked By: Andrew Hoare**
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UL VS Ltd
Unit 1-3, Horizon, Wade Road, Kingsland Business Park, Basingstoke, Hampshire, RG24 8AH, UK
T: +44 (0)1256 312000 W: www.ul.com

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RF Exposure and Transmitter Power Considerations for the HERA604 Series Router

The HERA600 Series Router WLAN operates in the 5180 - 5240MHz and 5745 - 5825MHz frequency bands and uses 802.11a/n technologies. It supports 2x2 MIMO.

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Additionally, the Router contains a pre-approved 3G/ 4G, cellular module with FCC ID: N7NEM7455.

This has been certified for the following operating bands:

CDMA850/ LTE B5: 824-849MHz

CDMA1900/ LTE B2: 1850-1910MHz

LTE B4: 1710 – 1755MHz

LTE B7: 2500 – 2570MHz

LTE B12: 698 - 716MHz

LTE B13: 777 – 787MHz

LTE B25: 1850 – 1915MHz

LTE B26: 814 - 849MHz

LTE B30: 2305 – 2315MHz

LTE B41: 2496 – 2690MHz

The FCC requires that the calculated MPE be equal to or less than a given limit dependent on frequency at a distance of 20 cm from a device to the body of a user.

The following FCC Rule Parts and procedures are applicable:

Part 1.1310 – Radiofrequency radiation exposure limits

Part 2.1091 – Radiofrequency radiation exposure evaluation: mobile devices

KDB447498 D01 v06
Mobile and Portable Devices RF Exposure Procedures and Equipment Authorisation Policies

MPE CALCULATIONS

The MPE calculation used to calculate the safe operating distance for the user is:

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

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 (safe operating distance)

Power Density Requirement

From table 1 (b) - Limits for General Population/ Uncontrolled Exposure of FCC §1.1310 (e) **for f >1500MHz , S_{req} = 1.0 mW/cm²**

From table 1 (b) - Limits for General Population/ Uncontrolled Exposure of FCC §1.1310 (e) **for f <1500MHz, S_{req} = f/1500 mW/cm²**
(f = operating frequency)

VALUES

WLAN worst case power is 24dBm (MIMO) at 5725 – 5825MHz

WLAN antenna gain = 2.0dBi

CDMA and LTE conducted power values are taken from module grant FCC ID:N7NEM7455

Cellular antenna gain = 3.5dBi

Frequency Range (MHz)	Operating Band	TX Conducted Power Average (dBm)	Antenna Gain (dBi)	EIRP (mW)	Calculated Distance R @ S_{req} (cm)	Power Density S mw/ cm²		
						Limit S_{req}	Calculated S_n @ 20cm	S_n/S_{req}
5725-5825	WLAN	24.0	+2.0	398	5.6	1.0	0.08	0.08
824 - 849	CDMA V LTE 5	24.0	+3.5	562.3	8.9	0.57	0.11	0.19
1850 - 1910	CDMA II LTE 2	24.0	+3.5	562.3	6.7	1.0	0.11	0.11
1710 - 1755	CDMA IV LTE 4	24.0	+3.5	562.3	6.7	1.0	0.11	0.11
2500 - 2570	LTE 7	23.0	+3.5	562.3	6.7	1.0	0.11	0.11
699 - 716	LTE 12	24.0	+3.5	562.3	9.8	0.47	0.11	0.23
777 - 787	LTE 13	24.0	+3.5	562.3	9.3	0.52	0.11	0.21
1850 - 1950	LTE 25	24.0	+3.5	562.3	6.7	1.0	0.11	0.11

814 - 849	LTE 26	24.0	+3.5	562.3	9.1	0.54	0.11	0.20
2305 - 2315	LTE 30	23.0	+3.5	446.7	6.0	1.0	0.09	0.09
2496 - 2690	LTE 41	23.0	+3.5	446.7	6.0	1.0	0.09	0.09

KDB447498 D01 v05 Section 7.2 SIMULTANEOUS TRANSMISSION CONSIDERATIONS

Ref. KDB447498 Section 7.2: Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in a host device is ≤ 1.0,

For the 604 Series router, summation of worst case calculated MPE ratios is

WCDMA and WLANoperation:

ie: $\Sigma MPE_{ratios} = (S_1 / S_{req1}) + (S_2 / S_{req2})$

= 0.08 + 0.19

= 0.27

LTE and WLAN operation:

ie: $\Sigma MPE_{ratios} = (S_1 / S_{req1}) + (S_6 / S_{req6})$

= 0.08 + 0.23

= 0.31

Σ of MPE ratios<1.0, so in accordance with KDB447498 Section 7.2, simultaneous transmission test exclusion applies for the WLAN and Cellular transmitters.

Conclusion

The required 20cm RF exposure limits for General Population / Uncontrolled Exposure will not be exceeded for the HERA604 Series router using antennas having a maximum gain of 2.0 dBi for 5GHz WLAN and 3.5dBi cellular operation.