

RF Exposure Evaluation Declaration

Product Name : UHD651-L
Trade Name : Vestel
Model No. : UHD651-L
FCC ID. : XU6-UHD651-L

Applicant : VESTEL TRADE CO.

Address : Organize Sanayi Bölgesi (45030) Manisa/Türkiye

Date of Receipt : Feb. 18, 2017
Issued Date : Apr. 17, 2017
Report No. : 1720411R-RF-US-EXP
Report Version : V1.0



The declaration results relate only to the samples calculated.

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1. RF Exposure Evaluation

1.1. Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

| Frequency Range (MHz) | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density (mW/cm ²) | Average Time (Minutes) |
|---|-------------------------------|-------------------------------|-------------------------------------|------------------------|
| (A) Limits for Occupational/ Control Exposures | | | | |
| 300-1500 | -- | -- | F/300 | 6 |
| 1500-100,000 | -- | -- | 5 | 6 |
| (B) Limits for General Population/ Uncontrolled Exposures | | | | |
| 300-1500 | -- | -- | F/1500 | 6 |
| 1500-100,000 | -- | -- | 1 | 30 |

F= Frequency in MHz

Friis Formula

Friis transmission formula: $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d is the limit of MPE, 1 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

1.2. Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

The temperature and related humidity: 18°C and 78% RH.

1.3. Test Result of RF Exposure Evaluation

| | |
|----------------|------------------------|
| Product | UHD651-L |
| Test Mode | Transmit_SISO Mode |
| Test Condition | RF Exposure Evaluation |

Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber are 2dBi or 1.58 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

| BT2.0 GFSK | | | |
|------------|-------------------------|------------------------------|--|
| Channel | Channel Frequency (MHz) | Output Power to Antenna (mW) | Power Density at R = 20 cm (mW/cm ²) |
| 0 | 2402 | 1.6558 | 0.00052 |
| 39 | 2441 | 1.7258 | 0.00054 |
| 78 | 2480 | 1.7947 | 0.00056 |

The power density Pd (4th column) at a distance of 20 cm calculated from the Friis transmission formula is far below the limit of 1 mW/cm².

| | |
|----------------|------------------------|
| Product | UHD651-L |
| Test Mode | Transmit_SISO Mode |
| Test Condition | RF Exposure Evaluation |

Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber are 2dBi or 1.58 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

| BT4.0 | | | |
|---------|-------------------------|------------------------------|--|
| Channel | Channel Frequency (MHz) | Output Power to Antenna (mW) | Power Density at R = 20 cm (mW/cm ²) |
| 0 | 2402 | 1.9454 | 0.00061 |
| 19 | 2440 | 2.0370 | 0.00064 |
| 39 | 2480 | 2.0370 | 0.00064 |

The power density Pd (4th column) at a distance of 20 cm calculated from the Friis transmission formula is far below the limit of 1 mW/cm².

| | |
|----------------|------------------------|
| Product | UHD651-L |
| Test Mode | Transmit_SISO Mode |
| Test Condition | RF Exposure Evaluation |

Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber are 4.5dBi or 2.82 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

| IEEE 802.11b | | | |
|---------------|-------------------------|------------------------------|--|
| WLAN Function | | | |
| Channel | Channel Frequency (MHz) | Output Power to Antenna (mW) | Power Density at R = 20 cm (mW/cm ²) |
| 1 | 2412 | 51.7607 | 0.02904 |
| 6 | 2437 | 49.6592 | 0.02786 |
| 11 | 2462 | 47.3151 | 0.02654 |

The power density Pd (4th column) at a distance of 20 cm calculated from the Friis transmission formula is far below the limit of 1 mW/cm².

| IEEE 802.11g | | | |
|---------------|-------------------------|------------------------------|--|
| WLAN Function | | | |
| Channel | Channel Frequency (MHz) | Output Power to Antenna (mW) | Power Density at R = 20 cm (mW/cm ²) |
| 1 | 2412 | 294.4422 | 0.16519 |
| 6 | 2437 | 290.4023 | 0.16292 |
| 11 | 2462 | 256.4484 | 0.14387 |

The power density Pd (4th column) at a distance of 20 cm calculated from the Friis transmission formula is far below the limit of 1 mW/cm².

| | |
|----------------|------------------------|
| Product | UHD651-L |
| Test Mode | Transmit_MIMO Mode |
| Test Condition | RF Exposure Evaluation |

Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber are 4.5dBi or 2.82 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

| IEEE 802.11n (20MHz) | | | |
|----------------------|-------------------------|------------------------------|--|
| WLAN Function | | | |
| Channel | Channel Frequency (MHz) | Output Power to Antenna (mW) | Power Density at R = 20 cm (mW/cm ²) |
| 1 | 2412 | 246.3770 | 0.13822 |
| 6 | 2437 | 201.3713 | 0.11297 |
| 11 | 2462 | 206.5368 | 0.11587 |

The power density Pd (4th column) at a distance of 20 cm calculated from the Friis transmission formula is far below the limit of 1 mW/cm².

| IEEE 802.11n (40MHz) | | | |
|----------------------|-------------------------|------------------------------|--|
| WLAN Function | | | |
| Channel | Channel Frequency (MHz) | Output Power to Antenna (mW) | Power Density at R = 20 cm (mW/cm ²) |
| 3 | 2422 | 128.5225 | 0.07210 |
| 6 | 2437 | 207.2737 | 0.11628 |
| 9 | 2452 | 190.1935 | 0.10670 |

The power density Pd (4th column) at a distance of 20 cm calculated from the Friis transmission formula is far below the limit of 1 mW/cm².

| | |
|----------------|------------------------|
| Product | UHD651-L |
| Test Mode | Transmit _SISO Mode |
| Test Condition | RF Exposure Evaluation |

Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber are 6.75dBi or 4.73 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

| IEEE 802.11a | | | |
|---------------|-------------------------|------------------------------|--|
| WLAN Function | | | |
| Channel | Channel Frequency (MHz) | Output Power to Antenna (mW) | Power Density at R = 20 cm (mW/cm ²) |
| 36 | 5180 | 15.1356 | 0.01424 |
| 44 | 5220 | 15.3462 | 0.01444 |
| 48 | 5240 | 15.5597 | 0.01464 |

The power density Pd (4th column) at a distance of 20 cm calculated from the Friis transmission formula is far below the limit of 1 mW/cm².

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|----------------|------------------------|
| Product | UHD651-L |
| Test Mode | Transmit _MIMO Mode |
| Test Condition | RF Exposure Evaluation |

Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber are 6.75dBi or 4.73 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

| IEEE 802.11 n(20MHz) | | | |
|----------------------|-------------------------|------------------------------|--|
| WLAN Function | | | |
| Channel | Channel Frequency (MHz) | Output Power to Antenna (mW) | Power Density at R = 20 cm (mW/cm ²) |
| 36 | 5180 | 19.2547 | 0.01812 |
| 44 | 5220 | 17.5232 | 0.01649 |
| 48 | 5240 | 17.8868 | 0.01683 |

The power density Pd (4th column) at a distance of 20 cm calculated from the Friis transmission formula is far below the limit of 1 mW/cm².

| IEEE 802.11 n(40MHz) | | | |
|----------------------|-------------------------|------------------------------|--|
| WLAN Function | | | |
| Channel | Channel Frequency (MHz) | Output Power to Antenna (mW) | Power Density at R = 20 cm (mW/cm ²) |
| 38 | 5190 | 24.1321 | 0.02271 |
| 46 | 5230 | 23.4579 | 0.02207 |

The power density Pd (4th column) at a distance of 20 cm calculated from the Friis transmission formula is far below the limit of 1 mW/cm².

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| Test Condition | RF Exposure Evaluation |

Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber are 6.75dBi or 4.73 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

| IEEE 802.11a | | | |
|---------------|-------------------------|------------------------------|--|
| WLAN Function | | | |
| Channel | Channel Frequency (MHz) | Output Power to Antenna (mW) | Power Density at R = 20 cm (mW/cm ²) |
| 52 | 5270 | 16.0325 | 0.01509 |
| 60 | 5300 | 15.4525 | 0.01454 |
| 64 | 5320 | 15.1705 | 0.01428 |

The power density Pd (4th column) at a distance of 20 cm calculated from the Friis transmission formula is far below the limit of 1 mW/cm².

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Antenna Gain

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Output Power into Antenna & RF Exposure Evaluation Distance:

| IEEE 802.11 n(20MHz) | | | |
|----------------------|-------------------------|------------------------------|--|
| WLAN Function | | | |
| Channel | Channel Frequency (MHz) | Output Power to Antenna (mW) | Power Density at R = 20 cm (mW/cm ²) |
| 52 | 5270 | 15.6514 | 0.01473 |
| 60 | 5300 | 14.9126 | 0.01403 |
| 64 | 5320 | 13.8057 | 0.01299 |

The power density Pd (4th column) at a distance of 20 cm calculated from the Friis transmission formula is far below the limit of 1 mW/cm².

| IEEE 802.11 n(40MHz) | | | |
|----------------------|-------------------------|------------------------------|--|
| WLAN Function | | | |
| Channel | Channel Frequency (MHz) | Output Power to Antenna (mW) | Power Density at R = 20 cm (mW/cm ²) |
| 54 | 5270 | 22.4125 | 0.02109 |
| 62 | 5310 | 21.9287 | 0.02063 |

The power density Pd (4th column) at a distance of 20 cm calculated from the Friis transmission formula is far below the limit of 1 mW/cm².

| | |
|----------------|------------------------|
| Product | UHD651-L |
| Test Mode | Transmit _SISO Mode |
| Test Condition | RF Exposure Evaluation |

Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber are 7.5dBi or 5.62 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

| IEEE 802.11a | | | |
|---------------|-------------------------|------------------------------|--|
| WLAN Function | | | |
| Channel | Channel Frequency (MHz) | Output Power to Antenna (mW) | Power Density at R = 20 cm (mW/cm ²) |
| 100 | 5500 | 11.2980 | 0.01263 |
| 116 | 5580 | 10.6660 | 0.01193 |
| 140 | 5700 | 10.1158 | 0.01131 |

The power density Pd (4th column) at a distance of 20 cm calculated from the Friis transmission formula is far below the limit of 1 mW/cm².

| | |
|----------------|------------------------|
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| Test Mode | Transmit _MIMO Mode |
| Test Condition | RF Exposure Evaluation |

Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber are 7.5dBi or 5.62 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

| IEEE 802.11 n(20MHz) | | | |
|----------------------|-------------------------|------------------------------|--|
| WLAN Function | | | |
| Channel | Channel Frequency (MHz) | Output Power to Antenna (mW) | Power Density at R = 20 cm (mW/cm ²) |
| 100 | 5500 | 10.2123 | 0.01142 |
| 116 | 5580 | 9.2304 | 0.01032 |
| 140 | 5700 | 8.8409 | 0.00988 |

The power density Pd (4th column) at a distance of 20 cm calculated from the Friis transmission formula is far below the limit of 1 mW/cm².

| IEEE 802.11 n(40MHz) | | | |
|----------------------|-------------------------|------------------------------|--|
| WLAN Function | | | |
| Channel | Channel Frequency (MHz) | Output Power to Antenna (mW) | Power Density at R = 20 cm (mW/cm ²) |
| 102 | 5510 | 15.6321 | 0.01748 |
| 110 | 5550 | 14.7505 | 0.01649 |
| 134 | 5670 | 13.2925 | 0.01486 |

The power density Pd (4th column) at a distance of 20 cm calculated from the Friis transmission formula is far below the limit of 1 mW/cm².