



**Neutron Engineering Inc.**

# **FCC RF EXPOSURE REPORT**

## **FCC ID: QIS-WS331B**

**Project No.** : 1312C139  
**Equipment** : 300Mbps Mini Wireless Router  
**Model** : WS331b; WS333b  
**Applicant** : Huawei Technologies Co., Ltd.  
**Address** : Administration Building, Headquarters of Huawei, Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, China

**According:** : **FCC Guidelines for Human Exposure IEEE C95.1**

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### MPE CALCULATION METHOD:

Calculation Method of RF Safety Distance:

$$S = \frac{PG}{4\pi r^2} = \frac{EIRP}{4\pi r^2}$$

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

Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Monopole	N/A	1
2	N/A	N/A	Monopole	N/A	1

The EUT incorporates a MIMO function. Physically, the EUT provides two completed two transmitters and two receivers (2T2R).

Operating Mode TX Mode	1TX	2TX
	802.11b	V (ANT 1 or ANT 2)
802.11g	-	V (ANT 1 + ANT 2)
802.11n(20MHz)	-	V (ANT 1 + ANT 2)
802.11n(40MHz)	-	V (ANT 1 + ANT 2)



## TEST RESULTS

EUT:	300Mbps Mini Wireless Router	Model Name :	WS331b
Temperature:	24 °C	Relative Humidity:	60 %
Pressure:	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B MODE /CH01, CH06, CH11		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
1	1.2589	22.35	171.7908	0.04304774	1	Complies
1	1.2589	22.31	170.2159	0.04265308	1	Complies
1	1.2589	22.36	172.1869	0.04314698	1	Complies

EUT:	300Mbps Mini Wireless Router	Model Name :	WS331b
Temperature:	24 °C	Relative Humidity:	60 %
Pressure:	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX G MODE /CH01, CH06, CH11 ANT1		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
1	1.2589	25.25	334.9654	0.08393641	1	Complies
1	1.2589	25.12	325.0873	0.08146112	1	Complies
1	1.2589	25.13	325.8367	0.08164891	1	Complies

EUT:	300Mbps Mini Wireless Router	Model Name :	WS331b
Temperature:	24 °C	Relative Humidity:	60 %
Pressure:	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX G MODE /CH01, CH06, CH11 ANT2		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
1	1.2589	25.08	322.1069	0.08071428	1	Complies
1	1.2589	25.11	324.3396	0.08127376	1	Complies
1	1.2589	25.1	323.5937	0.08108684	1	Complies



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Temperature:	24 °C	Relative Humidity:	60 %
Pressure:	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX G MODE /CH01, CH06, CH11 ANT1+ANT2		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
1	1.2589	28.18	657.6578	0.16479741	1	Complies
1	1.2589	28.13	650.1297	0.16291098	1	Complies
1	1.2589	28.13	650.1297	0.16291098	1	Complies

EUT:	300Mbps Mini Wireless Router	Model Name :	WS331b
Temperature:	24 °C	Relative Humidity:	60 %
Pressure:	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N-20M MODE /CH01, CH06, CH11 ANT1		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
1	1.2589	24.13	258.8213	0.06485603	1	Complies
1	1.2589	24.12	258.2260	0.06470687	1	Complies
1	1.2589	24.16	260.6154	0.06530559	1	Complies

EUT:	300Mbps Mini Wireless Router	Model Name :	WS331b
Temperature:	24 °C	Relative Humidity:	60 %
Pressure:	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N-20M MODE /CH01, CH06, CH11 ANT2		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
1	1.2589	24.13	258.8213	0.06485603	1	Complies
1	1.2589	24.12	258.2260	0.06470687	1	Complies
1	1.2589	24.15	260.0160	0.06515539	1	Complies



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EUT:	300Mbps Mini Wireless Router	Model Name :	WS331b
Temperature:	24 °C	Relative Humidity:	60 %
Pressure:	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N-20M MODE /CH01, CH06, CH11 ANT1+ANT2		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
1	1.2589	27.14	517.6068	0.12970310	1	Complies
1	1.2589	27.13	516.4164	0.12940480	1	Complies
1	1.2589	27.17	521.1947	0.13060216	1	Complies

EUT:	300Mbps Mini Wireless Router	Model Name :	WS331b
Temperature:	24 °C	Relative Humidity:	60 %
Pressure:	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N-40M MODE /CH03, CH06, CH09 ANT1		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
1	1.2589	24.16	260.6154	0.06530559	1	Complies
1	1.2589	24.12	258.2260	0.06470687	1	Complies
1	1.2589	24.13	258.8213	0.06485603	1	Complies

EUT:	300Mbps Mini Wireless Router	Model Name :	WS331b
Temperature:	24 °C	Relative Humidity:	60 %
Pressure:	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N-40M MODE /CH03, CH06, CH09 ANT2		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
1	1.2589	24.2	263.0268	0.06590986	1	Complies
1	1.2589	24.12	258.2260	0.06470687	1	Complies
1	1.2589	24.21	263.6331	0.06606179	1	Complies



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Temperature:	24 °C	Relative Humidity:	60 %
Pressure:	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX N-40M MODE /CH03, CH06, CH09 ANT1+ANT2		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
1	1.2589	27.19	523.6004	0.13120500	1	Complies
1	1.2589	27.13	516.4164	0.12940480	1	Complies
1	1.2589	27.18	522.3962	0.13090323	1	Complies

The calculated distance is 20 cm