

RF Exposure Evaluation declaration

Product Name : LTE Router
Model No. : WLD71-T3
FCC ID : NKR-WLD71-T3A

Applicant : Wistron NeWeb Corporation

Address : 20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan, R.O.C.

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The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	LTE Router
Model No.	WLD71-T3
Trade Name	WNC
IMEI No.	35526808
FCC ID	NKR-WLD71-T3A
TX Frequency	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8MHz WCDMA Band 2: 1852.4 MHz ~ 1907.6 MHz WCDMA Band 5: 826.4 MHz ~ 846.6 MHz LTE Band 2: 1850 MHz ~1910 MHz LTE Band 4: 1710 MHz~1755 MHz
Rx Frequency	GSM850: 869.2 MHz ~ 893.8 MHz GSM1900: 1930.2 MHz ~ 1989.8 MHz WCDMA Band 2: 1932.4 MHz ~ 1987.6 MHz WCDMA Band 5: 871.4 MHz ~ 891.6 MHz LTE Band 2: 1930 MHz ~1990 MHz LTE Band 4: 2110 MHz ~2155 MHz
WIFI Frequency	2412-2462MHz for 802.11b/g/n-20BW,2422-2452MHz for 802.11n-40BW
HW Version	48WLD711.0GAPAL
SW Version	AR_WLD71-T3_v2.0 MPSS:M18QW_v07.05
Antenna Type	Inverted-F Antenna (Internal Antenna) Dipole Antenna (External Antenna)

1.2. Antenna List :

No	Manufacturer	Part No	Antenna Type	Peak Gain
1	WNC	3AWLD7501S1-111 (WWAN Main)	Inverted-F Antenna (Internal Antenna)	1.90 dBi for 824-894 MHz 3.10 dBi for 1710-2170 MHz
2	WNC	3AWLD7501S1-111 (WWAN Diversity)	Inverted-F Antenna (Internal Antenna)	1.50 dBi for 824-894 MHz 3.00 dBi for 1710-2170 MHz
3	WIESON	GY115HT0330-027 (WWAN Main)	Dipole Antenna (External Antenna)	2.78 dBi for 698-960 MHz 2.16 dBi for 1710-2170 MHz
4	WIESON	GY115HT0330-027 (WWAN Diversity)	Dipole Antenna (External Antenna)	2.78 dBi for 698-960 MHz 2.16 dBi for 1710-2170 MHz
5	WNC	95XKAB15.G21 (WLAN-Main)	Dipole Antenna	2.00 dBi for 2.4 GHz
6	WNC	WLD71 (WLAN-Aux)	Inverted-F Antenna	2.10 dBi for 2.4 GHz

2. RF Exposure Evaluation

2.1. 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	30
1500-100,000	--	--	1	30

F= Frequency in MHz

Friis Formula

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

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.

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

2.2. 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: 22°C and 58% RH.

2.3. Test Result of RF Exposure Evaluation

Product : LTE Router
 Test Item : RF Exposure Evaluation
 Test Site : N/A

GSM 850 GPRS-Peak Gain: 2.78dBi

Frequency (MHz)	Conducted Peak Power (dBm)	Maximum ERP (W)	Maximum ERP Limit(W)	Duty Cycle (%)	Conducted Average Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Pass/Fail
848.8	32.43	2.0230	7	12.5	23.40	218.7	0.08	0.57	Pass
848.8	32.25	1.9409	7	25	26.23	419.7	0.16	0.57	Pass
836.4	32.07	1.8621	7	37.5	27.81	604.0	0.23	0.56	Pass
836.4	32.39	2.0045	7	50	29.38	866.9	0.33	0.56	Pass

GSM 850 EGPRS-Peak Gain: 2.78dBi

Frequency (MHz)	Conducted Peak Power (dBm)	Maximum ERP (W)	Maximum ERP Limit(W)	Duty Cycle (%)	Conducted Average Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Pass/Fail
848.8	26.17	0.4786	7	12.5	17.14	51.7	0.02	0.57	Pass
848.8	26.09	0.4699	7	25	20.07	101.6	0.04	0.57	Pass
848.8	26.01	0.4613	7	37.5	21.75	149.6	0.06	0.57	Pass
848.8	25.96	0.4560	7	50	22.95	197.2	0.07	0.57	Pass

PCS 1900 GPRS-Peak Gain: 3.1dBi

Frequency (MHz)	Conducted Peak Power (dBm)	Maximum EIRP (W)	Maximum EIRP Limit(W)	Duty Cycle (%)	Conducted Average Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Pass/Fail
1850.2	29.89	1.9907	2	12.5	20.86	121.9	0.05	1	Pass
1850.2	29.64	1.8793	2	25	23.62	230.1	0.09	1	Pass
1850.2	29.77	1.9364	2	37.5	25.51	355.7	0.14	1	Pass
1850.2	29.47	1.8072	2	50	26.46	442.6	0.18	1	Pass

PCS 1900 EGPRS-Peak Gain: 3.1dBi

Frequency (MHz)	Conducted Peak Power (dBm)	Maximum EIRP (W)	Maximum EIRP Limit(W)	Duty Cycle (%)	Conducted Average Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Pass/Fail
1850.2	25.54	0.7311	2	12.5	16.51	44.8	0.02	1	Pass
1850.2	25.52	0.7278	2	25	19.50	89.1	0.04	1	Pass
1850.2	25.37	0.7031	2	37.5	21.11	129.1	0.05	1	Pass
1850.2	25.28	0.6887	2	50	22.27	168.6	0.07	1	Pass

WCDMA Band 2-Peak Gain: 3.1dBi ; WCDMA Band 5-Peak Gain: 2.78dBi

Band	Frequency (MHz)	Conducted Peak Power (dBm)	Maximum ERP/EIRP (W)	Maximum ERP/EIRP Limit(W)	Duty Cycle (%)	Conducted Average Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Pass/Fail
2	1852.4	23.41	0.4477	2	100	23.41	219.3	0.09	1	Pass
5	826.4	23.14	0.2382	7	100	23.14	206.1	0.08	0.55	Pass

LTE Band 2 QPSK-Peak Gain: 3.1dBi

Band width	Frequency (MHz)	Conducted Peak Power (dBm)	Maximum EIRP (W)	Maximum EIRP Limit(W)	Duty Cycle (%)	Conducted Average Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Pass/Fail
1.4M	1850.7	23.26	0.4325	2	100	23.26	211.8	0.09	1	Pass
3M	1851.5	23.24	0.4305	2	100	23.24	210.9	0.09	1	Pass
5M	1852.5	23.35	0.4416	2	100	23.35	216.3	0.09	1	Pass
10M	1855.0	23.26	0.4325	2	100	23.26	211.8	0.09	1	Pass
15M	1857.5	23.22	0.4285	2	100	23.22	209.9	0.09	1	Pass
20M	1880.0	23.26	0.4325	2	100	23.26	211.8	0.09	1	Pass

LTE Band 2 16QAM-Peak Gain: 3.1dBi

Band width	Frequency (MHz)	Conducted Peak Power (dBm)	Maximum EIRP (W)	Maximum EIRP Limit(W)	Duty Cycle (%)	Conducted Average Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Pass/Fail
1.4M	1850.7	22.44	0.3581	2	100	22.44	175.4	0.07	1	Pass
3M	1851.5	22.43	0.3573	2	100	22.43	175.0	0.07	1	Pass
5M	1880.0	22.19	0.3381	2	100	22.19	165.6	0.07	1	Pass
10M	1880.0	22.21	0.3396	2	100	22.21	166.3	0.07	1	Pass
15M	1857.5	22.09	0.3304	2	100	22.09	161.8	0.07	1	Pass
20M	1860.0	22.06	0.3281	2	100	22.06	160.7	0.07	1	Pass

LTE Band 4 QPSK-Peak Gain: 3.1dBi

Band width	Frequency (MHz)	Conducted Peak Power (dBm)	Maximum EIRP (W)	Maximum EIRP Limit(W)	Duty Cycle (%)	Conducted Average Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Pass/Fail
1.4M	1710.7	23.64	0.4721	1	100	23.64	231.2	0.09	1	Pass
3M	1711.5	23.80	0.4898	1	100	23.80	239.9	0.10	1	Pass
5M	1712.5	23.58	0.4656	1	100	23.58	228.0	0.09	1	Pass
10M	1715.0	23.36	0.4426	1	100	23.36	216.8	0.09	1	Pass
15M	1717.5	23.43	0.4498	1	100	23.43	220.3	0.09	1	Pass
20M	1720.0	23.31	0.4375	1	100	23.31	214.3	0.09	1	Pass

LTE Band 4 16QAM-Peak Gain: 3.1dBi

Band width	Frequency (MHz)	Conducted Peak Power (dBm)	Maximum EIRP (W)	Maximum EIRP Limit(W)	Duty Cycle (%)	Conducted Average Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Pass/Fail
1.4M	1710.7	22.90	0.3981	1	100	22.90	195.0	0.08	1	Pass
3M	1732.5	22.86	0.3945	1	100	22.86	193.2	0.08	1	Pass
5M	1712.5	22.55	0.3673	1	100	22.55	179.9	0.07	1	Pass
10M	1715.0	22.30	0.3467	1	100	22.30	169.8	0.07	1	Pass
15M	1717.5	22.30	0.3467	1	100	22.30	169.8	0.07	1	Pass
20M	1732.5	22.27	0.3443	1	100	22.27	168.7	0.07	1	Pass

WLAN 2.4G Peak Gain: 2.1dBi

Band	Frequency	Conducted Peak Power (dBm)	Duty Cycle (%)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Pass/Fail
802.11b	2437	25.12	100	325.1	0.105	1	Pass
802.11g	2437	25.86	100	385.5	0.124	1	Pass
802.11n-20M	2437	28.11	100	647.1	0.209	1	Pass
802.11n-40M	2437	28.13	100	650.1	0.210	1	Pass

2.4. calculations for Multi-Transmitter

Mode	Exposure Calculations	result	Limit	Pass/Fail
WLAN	0.21	0.80	1	Pass
WWAN	0.59			

Note: The conducted output power is refer to report No.: 1720437R-HPUSP17V00, 1720437R-HPUSP40V00, 1720437R-RFUSP01V00 from the DEKRA.