



TPE-N150USB Specification

802.11n b/g wifi USB adapter (1T1R), UB93/AR9271



UNIT: CM

Overview:

TPE-N150USB is an 802.11n b/g wifi one-stream USB adapter designed specifically to provide enhanced WiFi performance and value for GNU/Linux, from set-top boxes, gaming consoles, printers, IP cameras, and variety of other products that host processors not originally intended to support WiFi functions. TPE-N150USB's AR9271 single-chip features a new architecture that integrates both a CPU and memory to run more of the WiFi function on-chip. The integrated CPU offloads the wireless processing overhead from the host appliance and enables consumer electronic devices to support WiFi functions seamlessly without change of original host processors.

Key Features:

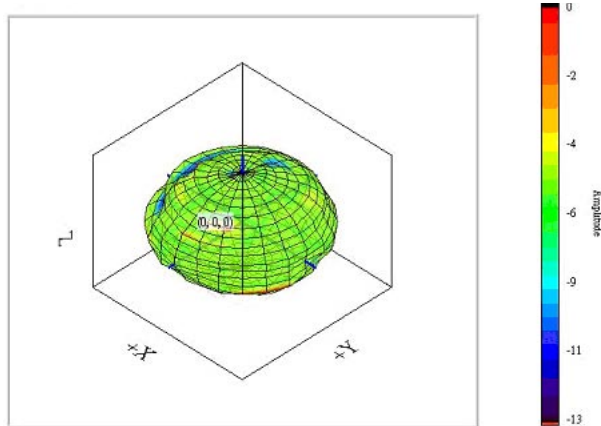
- » Integrated CPU and memory to run more of WiFi function on-chip to offload wireless processing overhead from the host appliance.

CPU Utilization Comparison Between Atheros AR9271 and Competitor

DUT & Driver	Downlink		Uplink	
	Utilization	Throughput	Utilization	Throughput
AR9271 (v7.7.0.77)	36%	105.21Mbps	30%	105.95Mbps
Competitor (v1.4.7.0)	52%	83.24Mbps	30%	97.41Mbps

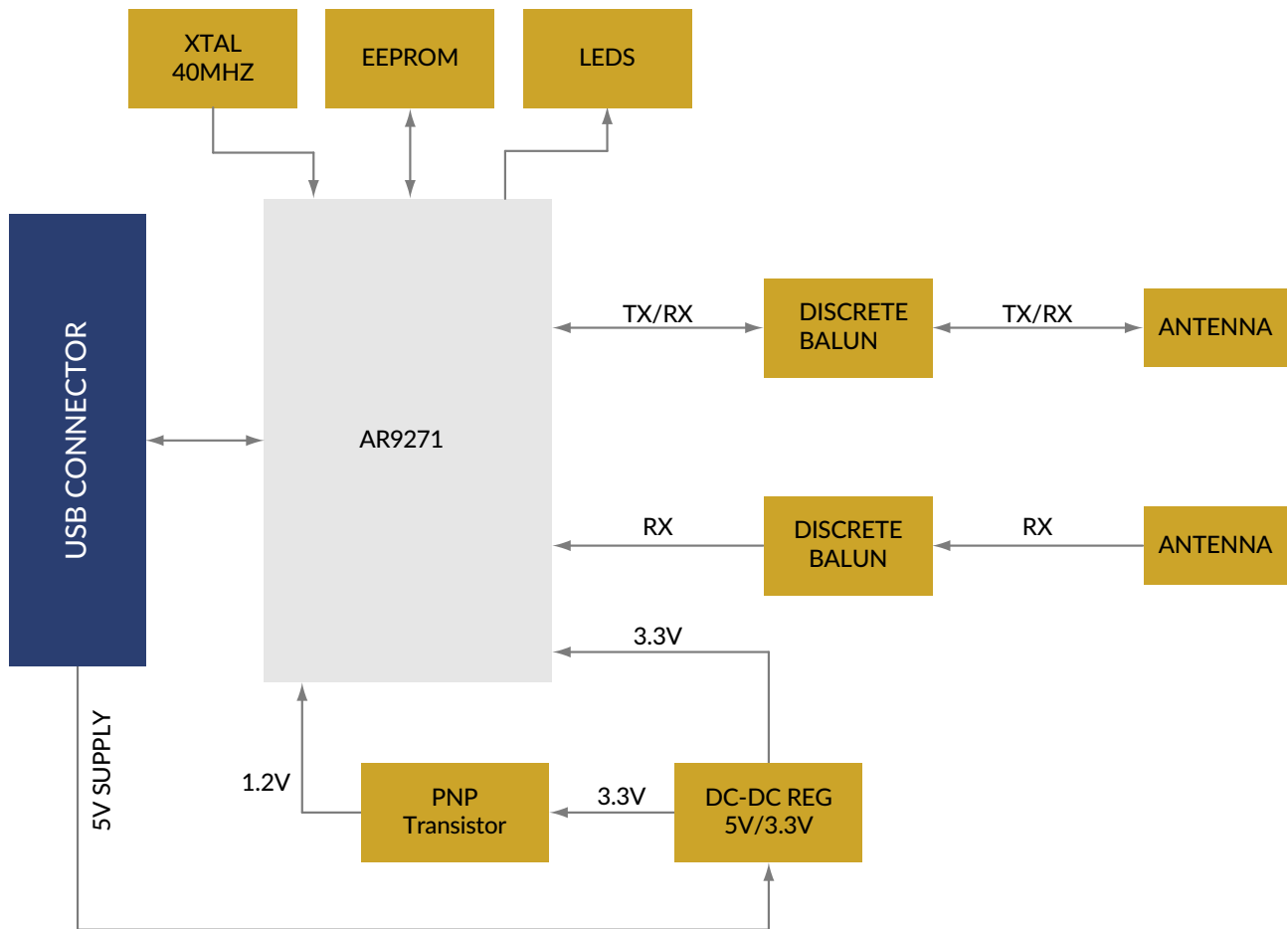
- » Innovative embedded antenna design with perfect 3D radiation pattern enhances at least 15% better Tx power and Rx sensitivity performance than competitors.

3D Radiation Pattern at 2.4GHz

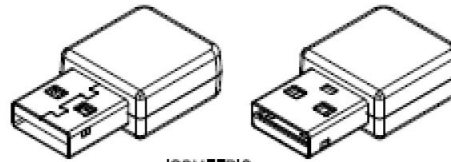
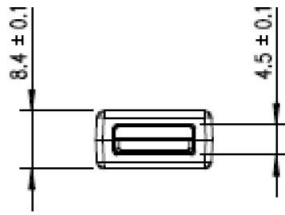


- » 30(L) x 17(W) x 8.5(H) mm small dimension with standard USB connector is ideal for new ergonomic home gateways, set-top boxes, gaming consoles, printers, IP cameras, and variety of other WiFi products that host processors not originally intended to support WiFi functions..
- » Windows XP/Vista/7, and Linux drivers enable manufacturers to quickly and easily bring new bandwidth intensive applications to market with trouble-free WiFi integration.
- » Supported by ath9k providing Linux kernel AP/Station/IBSS/Monitor-mode drivers for industrial, academic, or personal projects at highest flexibility and lowest cost.
- » 802.11n compliance effectively interoperates with other chipsets.
- » Enables bandwidth of up to 150Mbps link rate, three times the throughput of 802.11g.
- » Supports IEEE 802.11b/802.11g backward compatibility allowing inter-operability among multiple wifi networks.
- » Embedded antennas support one-stream 802.11n with Rx diversity.
- » The only one-stream 802.11n solution with two embedded antennas supports WiFi diversity to better throughput over range.
- » RoHS compliance meets environment-friendly requirement.

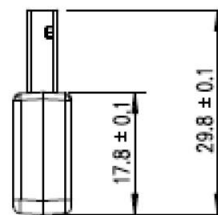
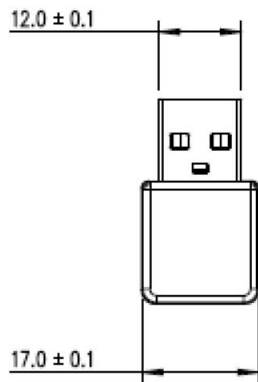
Hardware Block Diagram:



Mechanical Outline:



ISOMETRIC
REFERENCE ONLY



Specifications:

Main Chipset Atheros® AR9271

Embedded CPU 120MHz with off-load capability

Standard Conformance 802.11b, 802.11g, and 802.11

Frequency Range » USA: 2.400 – 2.483GHz
 » Europe: 2.400 – 2.483GHz
 » Japan: 2.400 – 2.497GHz
 » China: 2.400 – 2.483GHz

Interface Universal Serial Bus (USB) revision 2.0

Operation Voltage 5.0V ± 5%

Modulation Technique » DSSS with CCK, DQPSK, DBPSK
 » OFDM with BPSK, QPSK, 16QAM, 64QAM

Channel Spacing 20MHz

Data Rate

- » 802.11b: 1, 2, 5.5 and 11Mbps
 - » 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps
 - » 802.11n:
 - » 20MHz channel: 1Nss: 65Mbps @ 800GI, 72.2Mbps @ 400GI (Max.)
 - » 40MHz channel: 1Nss: 135Mbps @ 800GI, 150Mbps @ 400GI (Max.)
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Operating Channels

- » USA/Canada: 11 (1-11)
 - » Major Europe Countries: 13 (1-13)
 - » France: 4 (10-13)
 - » Japan: 14 for 802.11b (1-13 or 14th), 13 for 802.11g (1-13)
 - » China: 13 (1-13)
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Power Consumption

- » For throughput Tx mode: 300mA
 - » For throughput Rx mode: 280mA
 - » For 6M continuous Tx mode: 310mA
 - » For HT40 MCS0 continuous Tx mode: 310mA
 - » For HT20 MCS0 continuous Tx mode: 300mA
 - » For HT40 MCS7 continuous Tx mode: 300mA
 - » For HT20 MCS7 continuous Tx mode: 300mA
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Transmit Power Settings

- » target power tolerance ± 2 dBm
 - » 802.11b:
 - » +18dBm
 - » 802.11g:
 - » +17dBm @ 6, 9, 12, 18, 24, 36, 48Mbps
 - » +15dBm @ 54Mbps
 - » 802.11n HT20:
 - » +16dBm @ MCS 0/8
 - » +16dBm @ MCS 1/9
 - » +16dBm @ MCS 2/10
 - » +16dBm @ MCS 3/11
 - » +16dBm @ MCS 4/12
 - » +16dBm @ MCS 5/13
 - » +14dBm @ MCS 6/14
 - » +11dBm @ MCS 7/15
 - » 802.11n HT40:
 - » +16dBm @ MCS 0/8
 - » +16dBm @ MCS 1/9
 - » +16dBm @ MCS 2/10
 - » +16dBm @ MCS 3/11
 - » +16dBm @ MCS 4/12
 - » +16dBm @ MCS 5/13
 - » +14dBm @ MCS 6/14
 - » +11dBm @ MCS 7/15
-

Receiver Sensitivity

» 802.11b:

Data Rate	IEEE Spec(1 Rx dBm)	Typical
1M	-82	-92
5.5M	-80	-89
11M	-76	-87

» 802.11g:

Data Rate	IEEE Spec(1 Rx dBm)	Typical
6M	-82	-92
9M	-81	-92
12M	-79	-91
18M	-77	-90
24M	-74	-86
36M	-70	-83
48M	-66	-78
54M	-65	-76

» 802.11b/g/n, H20:

Data Rate	IEEE Spec(1 Rx dBm)	Typical
MCS0	-82	-92
MCS1	-79	-91
MCS2	-77	-90
MCS3	-74	-85
MCS4	-70	-82
MCS5	-66	-79
MCS6	-65	-75
MCS7	-64	-73

» 802.11b/g/n, H40:

Data Rate	IEEE Spec(1 Rx dBm)	Typical
MCS0	-79	-88
MCS1	-76	-87
MCS2	-74	-86
MCS3	-71	-82
MCS4	-67	-78
MCS5	-63	-75
MCS6	-62	-72
MCS7	-61	-70

Operation
Distance

» 802.11b:	
Outdoor	Indoor
» 150m @ 11Mbps	» 30m @ 11Mbps
» 300m @ 1Mbps	» 100m @ 1Mbps
» 802.11g:	
Outdoor	Indoor
» 50m @ 54Mbps	» 30m @ 54Mbps
» 300m @ 6Mbps	» 100m @ 6Mbps
» 802.11n:	
Outdoor	Indoor
» 30m @ 150Mbps	» 20m @ 150Mbps
» 30m @ 65Mbps	» 20m @ 65Mbps
» 250m @ 6.5Mbps	» 100m @ 6.5Mbps

MAC Protocol

CSMA/CA with ACK architecture 32-bit MAC

Operation
System
Supported

» Windows XP/Vista/7 and Linux.

Dimension

30(L)x 17(W) x 8.5(H) mm

Security

- » 64/128/152-bit WEP encryption
- » 802.1x authentication
- » AES-CCM & TKIP encryption
- » WPA & WPA2

Operation
Temperature
Range

0°C ~ +40°C

Storage
Temperature
Range

-10°C ~ +70°C

Operating
Humidity

15% ~ 95%, non-condensing

Storage
Humidity

max. 95%, non-condensing

Environment-
Friendly
Compliance

RoHS

Ordering Information:

TPE-N150USB 802.11n b/g wifi USB adapter (1T1R), UB93/AR9271

Wireless radio modules are ESD sensitive, especially the components such as RF switch and the power amplifier. To avoid damage by electrostatic discharge, the following installation procedure is recommended:

- » Touch your hands and the bag or tray containing the radio module to a ground point on the host board (for example one of the mounting holes).