

# Product Specifications for model DNUA-93F

802.11n b/g USB Dongle



<Version 1.0>

2010/11/04

by  
Evan Chung

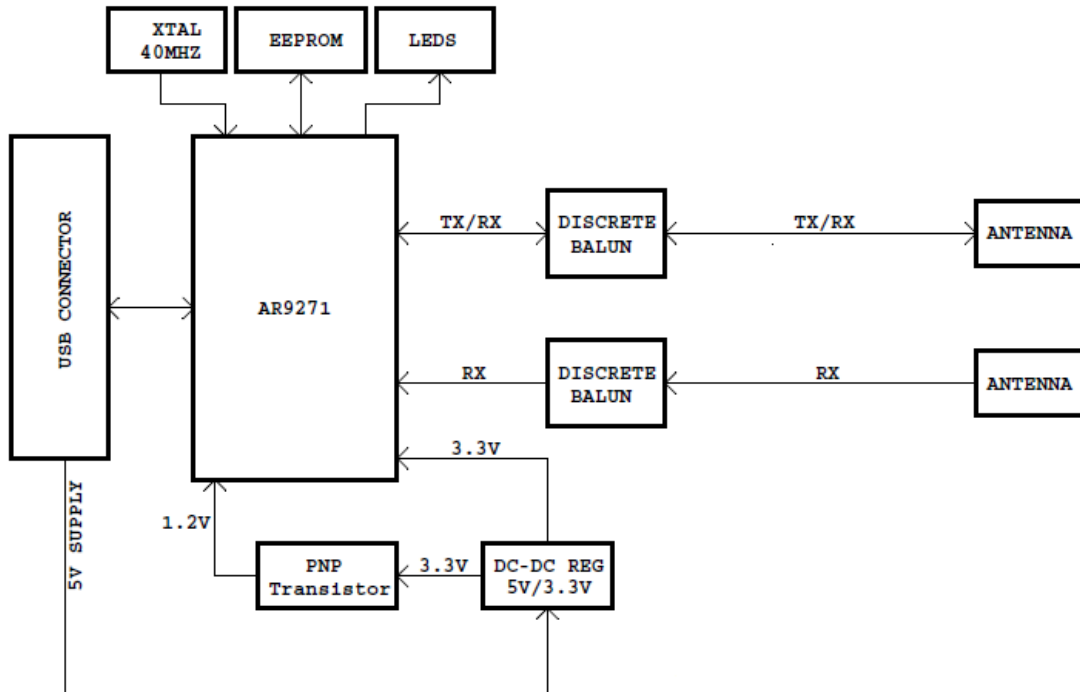
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- **Revision history**

<b>Revision</b>	<b>Change history</b>	<b>Date</b>
1.0	Initial version	2010/11/04

● **Block diagram:**

**DNUA-93F, product specification, 802.11n b/g USB module**

<b>Item</b>	<b>Key specifications</b>
<b>Main chipset</b>	➤ Atheros AR9271
<b>TX/RX</b>	➤ 1T1R/ RX diversity
<b>Frequency range</b>	<ul style="list-style-type: none"> <li>➤ USA: 2.400 ~ 2.483GHz,</li> <li>➤ Europe: 2.400 ~ 2.483GHz,</li> <li>➤ Japan: 2.400 ~ 2.497GHz,</li> <li>➤ China: 2.400 ~ 2.483GHz,</li> </ul>
<b>Modulation technique</b>	<ul style="list-style-type: none"> <li>➤ 802.11 Legacy b/g <ul style="list-style-type: none"> <li>DSSS (DBPSK, DQPSK, CCK)</li> <li>OFDM (BPSK, QPSK, 16-QAM, 64-QAM)</li> <li>DSSS (Direct Sequence Spread Spectrum) with DBPSK (Differential Binary Phase Shift Keying 1Mbps), DQPSK (Differential Quaternary Phase Shift Keying 2Mbps), and CCK (Complementary Code Keying 5.5&amp;11Mbps), and OFDM (Orthogonal Frequency Division Multiplexing with BPSK for 6,9Mbps 、 QPSK for 12,18Mbps 、 16QAM for 24,36Mbps 、 64QAM for 48,54Mbps)</li> </ul> </li> <li>➤ 802.11ng <ul style="list-style-type: none"> <li>OFDM (BPSK, QPSK, 16-QAM, 64-QAM)</li> </ul> </li> </ul>
<b>Host interface</b>	➤ USB 2.0
<b>Channel spacing</b>	➤ 5MHz
<b>Channels support</b>	<ul style="list-style-type: none"> <li>➤ 802.11n b/g <ul style="list-style-type: none"> <li>US/Canada: 11 (1 ~ 11)</li> <li>Major European country: 13 (1 ~ 13)</li> <li>France: 4 (10 ~ 13)</li> <li>Japan: 11b: 14 (1~13 or 14<sup>th</sup>), 11g: 13 (1 ~ 13)</li> <li>China: 13 (1 ~ 13)</li> </ul> </li> </ul>
<b>Operation Voltage</b>	➤ 5V +/-10%
<b>Current Consumption</b>	<ul style="list-style-type: none"> <li>For throughput TX mode:300mA (5V)</li> <li>For throughput RX mode:280 (5V)</li> <li>For 6M Continuous TX mode:310mA (5V)</li> <li>For HT40 MCS0 Continuous TX mode:310mA (5V)</li> <li>For HT20 MCS0 Continuous TX mode:300mA (5V)</li> <li>For HT40 MCS7 Continuous TX mode:300mA (5V)</li> <li>For HT20 MCS7 Continuous TX mode:300mA (5V)</li> </ul>

<b>Output power (for each chain; with ±2dBm tolerance)</b>	➤ <b>802.11b</b> <table border="1"> <thead> <tr> <th>Test Frequencies</th> <th>1/2_Target</th> <th>5.5_Target</th> <th>11_Target</th> </tr> </thead> <tbody> <tr> <td>2412</td> <td>18</td> <td>18</td> <td>18</td> </tr> <tr> <td>2472</td> <td>18</td> <td>18</td> <td>18</td> </tr> <tr> <td>2484</td> <td>18</td> <td>18</td> <td>18</td> </tr> </tbody> </table>	Test Frequencies	1/2_Target	5.5_Target	11_Target	2412	18	18	18	2472	18	18	18	2484	18	18	18																				
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	(MCS1) QPSK	1/2	-10	-24
	(MCS2) QPSK	3/4	-13	-24
	(MCS3) 16-QAM	1/2	-16	-24
	(MCS4) 16-QAM	3/4	-19	-24
	(MCS5) 64-QAM	2/3	-22	-24
	(MCS6) 64-QAM	3/4	-25	-28
	(MCS7) 64-QAM	5/6	-28	-30
	✧ HT40			
	(MCS0) BPSK	1/2	-5	-24
	(MCS1) QPSK	1/2	-10	-24
	(MCS2) QPSK	3/4	-13	-24
	(MCS3) 16-QAM	1/2	-16	-24
	(MCS4) 16-QAM	3/4	-19	-24
	(MCS5) 64-QAM	2/3	-22	-24
	(MCS6) 64-QAM	3/4	-25	-28
	(MCS7) 64-QAM	5/6	-28	-30
<b>Sensitivity (+3/-3 dB tolerance, dBm)</b>	➤ 802.11b			
	Modulation		IEEE Spec (dBm)	Typical (dBm)
	DBPSK		not specified	-92
	DQPSK		not specified	-89
	CCK		not specified	-87
	➤ 802.11g			
	Modulation	Code Rate	IEEE Spec (dBm)	Typical (dBm)
	BPSK	1/2	-82	-90
	BPSK	3/4	-81	-90
	QPSK	1/2	-79	-89
	QPSK	3/4	-77	-88
	16-QAM	1/2	-74	-84
	16-QAM	3/4	-70	-81
	64-QAM	2/3	-66	-76
	64-QAM	3/4	-65	-74
	➤ 802.11ng			
	Modulation	Code Rate	IEEE Spec (dBm)	Typical(dBm)
	✧ HT20			
	(MCS0) BPSK	1/2	-82	-90
	(MCS1) QPSK	1/2	-79	-89
	(MCS2) QPSK	3/4	-77	-88
	(MCS3) 16-QAM	1/2	-74	-83
	(MCS4) 16-QAM	3/4	-70	-80
	(MCS5) 64-QAM	2/3	-66	-77
	(MCS6) 64-QAM	3/4	-65	-73
(MCS7) 64-QAM	5/6	-64	-71	
✧ HT40				
(MCS0) BPSK	1/2	-79	-86	
(MCS1) QPSK	1/2	-76	-85	

	<table border="0"> <tr> <td>(MCS2) QPSK</td> <td>3/4</td> <td>-74</td> <td>-84</td> </tr> <tr> <td>(MCS3) 16-QAM</td> <td>1/2</td> <td>-71</td> <td>-80</td> </tr> <tr> <td>(MCS4) 16-QAM</td> <td>3/4</td> <td>-67</td> <td>-76</td> </tr> <tr> <td>(MCS5) 64-QAM</td> <td>2/3</td> <td>-63</td> <td>-73</td> </tr> <tr> <td>(MCS6) 64-QAM</td> <td>3/4</td> <td>-62</td> <td>-70</td> </tr> <tr> <td>(MCS7) 64-QAM</td> <td>5/6</td> <td>-61</td> <td>-68</td> </tr> </table>	(MCS2) QPSK	3/4	-74	-84	(MCS3) 16-QAM	1/2	-71	-80	(MCS4) 16-QAM	3/4	-67	-76	(MCS5) 64-QAM	2/3	-63	-73	(MCS6) 64-QAM	3/4	-62	-70	(MCS7) 64-QAM	5/6	-61	-68												
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Transmit spectrum mask	<ul style="list-style-type: none"> <li>➤ For transmitted spectral mask for 11a shall be less than -40dBr for <math>f_c - 30\text{MHz} &lt; f &lt; f_c + 30\text{MHz}</math>.</li> <li>➤ For transmitted spectral mask for 11b shall be less than -50dBr for <math>f_c - 22\text{MHz} &lt; f &lt; f_c + 22\text{MHz}</math>.</li> <li>➤ For transmitted spectral mask for 11g shall be less than -40dBr for <math>f_c - 30\text{MHz} &lt; f &lt; f_c + 30\text{MHz}</math>.</li> <li>➤ For transmitted spectral mask for 11n 20MHz shall be less than -45dBr for <math>f_c - 30\text{MHz} &lt; f &lt; f_c + 30\text{MHz}</math>.</li> <li>➤ For transmitted spectral mask for 11n 40MHz shall be less than -45dBr for <math>f_c - 60\text{MHz} &lt; f &lt; f_c + 60\text{MHz}</math>.</li> </ul>																																				
Transmit spectrum flatness	<ul style="list-style-type: none"> <li>➤ For 802.11a/g the average energy of the constellations in each of spectral lines -16..-1 and +1..+16 will deviate no more than +/- 2dB from their average energy. For 802.11n 40MHz mode, the average energy of the constellations in each of spectral lines -42..-2 and +2..+42 will deviate no more than +/- 2dB from their average energy.</li> <li>➤ The transmitted spectral flatness should be with in +/- 4dB.</li> </ul>																																				
Transmit center frequency tolerance	<ul style="list-style-type: none"> <li>➤ The transmitted center frequency tolerance shall be <math>\pm 20</math> ppm maximum.</li> </ul>																																				
Transmit power on ramp and power down ramp time	<ul style="list-style-type: none"> <li>➤ The transmitting power-on ramp for 10% to 90% of maximum power m shall be no greater than 2 <math>\mu</math>s.</li> <li>➤ The transmitting power-down ramp for 90% to 10% of maximum power shall be no greater than 2 <math>\mu</math>s.</li> </ul>																																				
Receiver maximum input level	<table border="0"> <tr> <td>➤ 802.11b</td> <td></td> <td></td> <td>IEEE Spec (1Rx dBm)</td> </tr> <tr> <td>Modulation</td> <td></td> <td></td> <td>&gt;-10</td> </tr> <tr> <td>DBPSK</td> <td></td> <td></td> <td>&gt;-10</td> </tr> <tr> <td>DQPSK</td> <td></td> <td></td> <td>&gt;-10</td> </tr> <tr> <td>CCK</td> <td></td> <td></td> <td>&gt;-10</td> </tr> <tr> <td>➤ 802.11g</td> <td></td> <td></td> <td>IEEE Spec (1Rx dBm)</td> </tr> <tr> <td>Modulation</td> <td>Code Rate</td> <td></td> <td>&gt;-20</td> </tr> <tr> <td>➤ 802.11ng</td> <td></td> <td></td> <td>IEEE Spec (1Rx dBm)</td> </tr> <tr> <td>Modulation</td> <td>Code Rate</td> <td></td> <td>&gt;-20</td> </tr> </table>	➤ 802.11b			IEEE Spec (1Rx dBm)	Modulation			>-10	DBPSK			>-10	DQPSK			>-10	CCK			>-10	➤ 802.11g			IEEE Spec (1Rx dBm)	Modulation	Code Rate		>-20	➤ 802.11ng			IEEE Spec (1Rx dBm)	Modulation	Code Rate		>-20
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PCB dimension	<ul style="list-style-type: none"> <li>➤ 27mm(L) x 12mm(W) , 4 Layers , FR4</li> </ul>																																				
Transfer data rate	<ul style="list-style-type: none"> <li>➤ 802.11b: 1, 2, 5.5, 11Mbps</li> <li>➤ 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps</li> <li>➤ 802.11n: @800GI(400GI) <ul style="list-style-type: none"> <li>● 20MHz BW</li> </ul> </li> </ul>																																				

	<ul style="list-style-type: none"><li>▪ 1 Nss: 65(72.2) Mbps maximal</li><li>● 40MHz BW<ul style="list-style-type: none"><li>▪ 1 Nss: 135(150) Mbps maximal</li></ul></li></ul>
<b>Operation temperature</b>	➤ 0° ~ 60° C
<b>Storage temperature</b>	➤ -10° ~ 80° C



- **USB Dongle dimension (mm)**

