

3.1 802.11a/b/g/n Radio

The 802.11 a/b/g/n WLAN radio will be incorporated through the use of a Jorjin WG7351 radio module containing the Texas Instruments WL1273L chipset. The 802.11 radio shall have two internal PIFA style antennas on the same carrier, one for the 2.4GHz band and one for the 5GHz band is mounted on system frame with screws. For the 5Ghz band the antenna system has 1 transmit & 1 receive chain. The WL1273L is a complete SOC consisting of an embedded ARM9 microprocessor, SRAM, ROM, MAC, Baseband, and RF transceiver. Interface to the WL1273L is through the integrated SDIO controller in the main processor (OMAP3715).

The 802.11 radio supports the following channels:

- 2.4 GHz band – Channels 2,412 – 2,462 Ghz (channels 1-11)
- 5.0 GHz band –Channels 36,38,40,42,44,46,48,52,56,60,64,100, 104,108,112,116, 132,136,140,149,153,157,161,165.

The 802.11 radio does not and cannot act as an access point. The device cannot create an Ad-hoc network on any 5Ghz channel and cannot ever join an Ad-hoc connection on any of the DFS channels

In order to ensure compliance to global standards, by default the 802.11 radio will only perform active transmissions on a few channels as listed below in the channel maps section of this document. However, all remaining channels will still be passively scanned for the presence of an access point (or another ad-hoc device), and when an access point (or another ad-hoc device) is found to be transmitting on a passively scanned channel, this channel will be marked within the 802.11 radio driver channel configuration for active transmission use. This mechanism does not apply to DFS channels 52-116 & 132-140 and radio operation within this channel range strictly adheres to the 802.11h standard hardcoded in the 802.11 radio driver.

This configuration of channels allowed for active transmission and passive scanning is stored on the device as a bit-mask (8-bits per channel). It is possible that an end user can gain access to this configuration information; however, it would require special software and knowledge of the bit-mask scheme to manually alter the channel configuration. Again, however, the alteration of the configuration in the DFS channel range (52-116 & 132-140) is not possible by any means since it is hardcoded in the 802.11 radio driver.

Ad-hoc mode operation by the PACIFICO 802.11 radio follows the same channel configuration mechanism as above. That is, when searching for an Ad-hoc network, the 802.11 radio will perform a mix of active and passive scans based on the 802.11 radio

driver channel configuration. If an existing Ad-hoc network is found during the scans, the PACIFICO will join that network.

If no Ad-hoc network is found during the scan, the PACIFICO will create an Ad-hoc network by default on channel 11. This default channel is user-selectable, however, if the user selection is not marked as an active transmission channel in the 802.11 radio driver channel configuration, then the 802.11 radio driver will default back to channel 11 and the user selection will be ignored. Once again, the PACIFICO will not be able to create an Ad-hoc network on channels 52-116 & 132-140 since these channels can never be marked for active transmission in the 802.11 radio driver channel configuration.

Radio Specifications

802.11b Specifications:

IC Chip Set	TI 1273L
Data Rate:	1, 2, 5.5, 11 Mbps 802.11b
Ad Hoc mode	Support on Channel 1 - 11
Modulation	DSSS, CCK
RF Average Output Power:	14 dBm ~ 15.1dBm
Operating Temperature:	-20 to 50 deg C
Antenna	Single antenna, 1 transmit & 1 receive chains, no beam forming
Frequency:	2401 – 2473 Mhz band

Channel	Center Freq. (Ghz)	Channel Width	Beacon scanning type	Create Ad-hoc mode connection support
1	2.412	20 Mhz	Active	Yes
2	2.417	20 Mhz	Active	Yes
3	2.422	20 Mhz	Active	Yes
4	2.427	20 Mhz	Active	Yes
5	2.432	20 Mhz	Active	Yes
6	2.437	20 Mhz	Active	Yes
7	2.442	20 Mhz	Active	Yes
8	2.447	20 Mhz	Active	Yes
9	2.452	20 Mhz	Active	Yes
10	2.457	20 Mhz	Active	Yes
11	2.462	20 Mhz	Active	Yes

802.11g Specifications:

IC Chip Set	TI 1273L
Data Rate:	6, 9, 12, 18, 36, 48, 54 Mbps 802.11g
Modulation	OFDM

RF Average Output Power:	12dBm~15dBm
Operating Temperature:	-20 to 50 deg C
Antenna	Single Antenna, 1 transmit & 1 receive chains, no beam forming
Frequency:	2401 – 2473 Mhz band

Channel	Center Freq. (Ghz)	Channel Width	Beacon scanning type	Create Ad-hoc mode connection support
1	2.412	20Mhz	Active	Yes
2	2.417	20Mhz	Active	Yes
3	2.422	20Mhz	Active	Yes
4	2.427	20Mhz	Active	Yes
5	2.432	20Mhz	Active	Yes
6	2.437	20Mhz	Active	Yes
7	2.442	20Mhz	Active	Yes
8	2.447	20Mhz	Active	Yes
9	2.452	20Mhz	Active	Yes
10	2.457	20Mhz	Active	Yes
11	2.462	20Mhz	Active	Yes

802.11a Specifications:

IC Chip Set	TI 1273L
Data Rate:	6, 9, 12, 18, 36, 48, 54 Mbps 802.11a
Ad Hoc mode	Create Ad-Hoc mode not supported
Modulation	OFDM
RF Average Output Power:	8dBm ~13dBm (5180Mhz~5470Mhz) 8dBm ~11dBm (5470Mhz~5850Mhz)
Operating Temperature:	-20 to 50 deg C
Antenna	Single Antenna, 1 transmit & 1 receive chains, no beam forming
DFS	5.250 – 5.590Ghz & 5.650-5.710 Ghz (Channel 52-116 & 132-140) support DFS slave without radar detection. DFS is enabled by default and can not be disabled by the user.
Frequency:	5170–5330Mhz, 5490-5590Mhz 5650-5710Mhz, 5735-5835Mhz

TPC

5.250-5.590Ghz & 5.650-5.710

Ghz, 8dBm ~13dBm

Channel	Center Freq. (Ghz)	Channel Width	Beacon scanning type	Ad-hoc mode support
36	5.180	20 Mhz	Passive	No
38	5.190	20 Mhz	Passive	No
40	5.200	20 Mhz	Passive	No
42	5.210	20 Mhz	Passive	No
44	5.220	20 Mhz	Passive	No
46	5.230	20 Mhz	Passive	No
48	5.240	20 Mhz	Passive	No
52	5.260	20 Mhz	Passive	No
56	5.280	20 Mhz	Passive	No
60	5.300	20 Mhz	Passive	No
64	5.320	20 Mhz	Passive	No
100	5.500	20 Mhz	Passive	No
104	5.520	20 Mhz	Passive	No
108	5.540	20 Mhz	Passive	No
112	5.560	20 Mhz	Passive	No
116	5.580	20 Mhz	Passive	No
132	5.660	20 Mhz	Passive	No
136	5.680	20 Mhz	Passive	No
140	5.700	20 Mhz	Passive	No
149	5.745	20 Mhz	Passive	No
153	5.765	20 Mhz	Passive	No
157	5.785	20 Mhz	Passive	No
161	5.805	20 Mhz	Passive	No
165	5.825	20 Mhz	Passive	No

802.11n Specifications:

IC Chip Set

TI 1273L

Data Rate:

6.5, 13, 19.5, 26, 39, 52, 58.5, 65
Mbps 802.11n - 2.4G/5G

Modulation

OFDM

RF Average Output Power:

10dBm ~ 15dBm@2.4G
7dBm ~13dBm @ 5180Mhz~5470Mhz
7dBm ~11.5dBm @ 5470Mhz~5850Mhz

Operating Temperature:

-20 to 50 deg C

Antenna

Single Antenna, 1 transmit & 1
receive chains, no beam forming

DFS

5.250 – 5.590 Ghz & 5.650-5.710
(Channel 52-116 & 132-140) support
DFS slave without radar detection.
DFS is enabled by default and can
not be disabled by the user.

TPC

5.250-5.590 Ghz & 5.650-5.710Ghz,
7dBm~13dBm

Frequency:

2401-2473.5Mhz 5170–5330Mhz,
5490-5590Mhz, 5650-5710Mhz, 5735-
5835Mhz

Channel	Lower Freq. (Ghz)	Center Freq. (Ghz)	Upper Freq. (Ghz)	Beacon scanning type	Ad-hoc mode support
1	2.401	2.412	2.423	Active	No
2	2.404	2.417	2.428	Active	No
3	2.411	2.422	2.433	Active	No
4	2.416	2.427	2.438	Active	No
5	2.421	2.432	2.443	Active	No
6	2.426	2.437	2.448	Active	No
7	2.431	2.442	2.453	Active	No
8	2.436	2.447	2.458	Active	No
9	2.441	2.452	2.463	Active	No
10	2.451	2.457	2.468	Active	No
11	2.451	2.462	2.473	Active	No

Channel	Center Freq. (Ghz)	Channel Width	Beacon scanning type	Ad-hoc mode support
36	5.180	20 Mhz	Active	No
38	5.190	20 Mhz	Passive	No
40	5.200	20 Mhz	Active	No
42	5.210	20 Mhz	Passive	No
44	5.220	20 Mhz	Active	No
46	5.230	20 Mhz	Passive	No
48	5.240	20 Mhz	Passive	No
52	5.260	20 Mhz	Passive	No
56	5.280	20 Mhz	Passive	No
60	5.300	20 Mhz	Passive	No
64	5.320	20 Mhz	Passive	No
100	5.500	20 Mhz	Passive	No
104	5.520	20 Mhz	Passive	No
108	5.540	20 Mhz	Passive	No
112	5.560	20 Mhz	Passive	No

116	5.580	20 Mhz	Passive	No
132	5.660	20 Mhz	Passive	No
136	5.680	20 Mhz	Passive	No
140	5.700	20 Mhz	Passive	No
149	5.745	20 Mhz	Passive	No
153	5.765	20 Mhz	Passive	No
157	5.785	20 Mhz	Passive	No
161	5.805	20 Mhz	Passive	No
165	5.825	20 Mhz	Passive	No