Intel WLAN antenna guide

WW07 23’

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Highlights

- Intel is obtaining modular approval for WLAN/ BT modules cross ~200 worldwide countries.
- Based on the initial approval (include reference antenna been certified), the result maybe valid for following antennas conditionally according to country regulations.
- This material is sharing antenna information of the antennas been certified with the initial approval.
- Host integrators should consult with your regulatory compliance interfaces when doubt.

Antennas been certified in the initial approval

Intel® Reference Antenna Type/ Gain (in dBi)*

Antenna Type	2.4GHz 2400-2483.5 MHz	5.2GHz 5150-5250MHz	5.3GHz 5250-5350MHz	5.6GHz 5470-5725MHz	5.8GHz 5725-5850MHz	5.9GHz 5850-5895MHz	6.2GHz 5925-6425MHz	6.5GHz 6425-6525MHz	6.7GHz 6525-6875MHz	7.0GHz 6875-7125MHz
Design target	3.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
PIFA	3.24	3.64	3.73	4.77	4.97	4.97	4.83	4.30	5.37	5.59
Dipole for legacy only modules	2.89	2.92	3.19	4.41	4.22					
Dipole for WiFi 6 Modules	2.89	2.92	3.19	4.41	4.22	5.12				
Dipole for WiFi 6E modules	3.10	4.03	4.11	5.17	5.17	5.12	5.06	4.71	4.49	5.34
Monopole	3.22	3.35	3.42	4.77	4.72	4.71	4.75	4.29	4.81	4.74

- 3D Peak Antenna tested within the host. Should be equal or greater than -2 dBi. If a host integrator plans to use a lower gain antenna of the same type, additional CBP(FCC)/EDT(EU) testing need to be performed while the module is installed in the host.
- PIFA and Dipole type reference antennas were certified for all Intel modules*; Monopole type reference antenna has certified for AX211NGW and AX211D2W.

Notes: Beside Dipole for 3165D2W and AX211D2WL

Antenna information of the certified antennas

Notes: Customer should do own selection, evaluation, and certification based on their requirement.

Antenna type	Vender	Part numbers
PIFA- Legacy	SKYCROSS	WTCC-PIFA-REF-1
PIFA- 6E	WRF	WRF-BR-PIFA-V3.2
Dipole for legacy only modules	Wieson	GY121HT0321-003-H/GY121C888-001-H
Dipole for WiFi 6 modules	Wieson (Legacy)	GY121HT0321-003-H/GY121C888-001-H
	Wieson (6E)	ARY121-0009-002-H0/AR9851-0009-005-H0
Dipole for WiFi 6E modules	Wieson	ARY121-0009-002-H0/AR9851-0009-005-H0
Monopole	Hongbo	260-25083

Backup

Antenna information per module

SAR separation and peak antenna gain per module

Module	type	SAR Separation (mm)	2.4GHz 2400-2483.5MHz	5.2GHz 5150-5250MHz	5.3GHz 5250-5350MHz	5.6GHz 5470-5725MHz	5.8GHz 5725-5850MHz
7265NGW	PIFA	8	3.24	3.64	3.73	4.77	4.97
	Dipole	200	2.89	2.92	3.19	4.41	4.22
3165NGW	PIFA	8	3.24	3.64	3.73	4.77	4.97
	Dipole	200	2.89	2.92	3.19	4.41	4.22
8260NGW	PIFA	14	3.24	3.64	3.73	4.77	4.97
	Dipole	200	2.89	2.92	3.19	4.41	4.22
8260D2W	PIFA	12	3.24	3.64	3.73	4.77	4.97
	Dipole	200	2.89	2.92	3.19	4.41	4.22
3165D2W	PIFA	8	3.24	3.64	3.73	4.77	4.97
3168NGW	PIFA	8	3.24	3.64	3.73	4.77	4.97
	Dipole	200	2.89	2.92	3.19	4.41	4.22
8265NGW	PIFA	13	3.24	3.64	3.73	4.77	4.97
	Dipole	200	2.89	2.92	3.19	4.41	4.22
8265D2W	PIFA	14	3.24	3.64	3.73	4.77	4.97
	Dipole	200	2.89	2.92	3.19	4.41	4.22
9560NGW	PIFA	18	3.24	3.64	3.73	4.77	4.97
	Dipole	200	2.89	2.92	3.19	4.41	4.22
9560NGW R	PIFA	18	3.24	3.64	3.73	4.77	4.97
	Dipole	200	2.89	2.92	3.19	4.41	4.22
9260NGW	PIFA	14	3.24	3.64	3.73	4.77	4.97
	Dipole	200	2.89	2.92	3.19	4.41	4.22
9461NGW	PIFA	14	3.24	3.64	3.73	4.77	4.97
	Dipole	200	2.89	2.92	3.19	4.41	4.22
9461D2W	PIFA	12	3.24	3.64	3.73	4.77	4.97
	Dipole	200	2.89	2.92	3.19	4.41	4.22
9462NGW	PIFA	14	3.24	3.64	3.73	4.77	4.97
	Dipole	200	2.89	2.92	3.19	4.41	4.22
9462D2W	PIFA	15	3.24	3.64	3.73	4.77	4.97
	Dipole	200	2.89	2.92	3.19	4.41	4.22
9560D2W	PIFA	15	3.24	3.64	3.73	4.77	4.97
	Dipole	200	2.89	2.92	3.19	4.41	4.22
9560D2W R	PIFA	15	3.24	3.64	3.73	4.77	4.97
	Dipole	200	2.89	2.92	3.19	4.41	4.22
9560D2WL	PIFA	15	3.24	3.64	3.73	4.77	4.97
	Dipole	200	2.89	2.92	3.19	4.41	4.22

Module	type	SAR Separation (mm)	2.4GHz 2400-2483.5MHz	5.2GHz 5150-5250MHz	5.3GHz 5250-5350MHz	5.6GHz 5470-5725MHz	5.8GHz 5725-5850MHz	5.9GHz 5850-5895MHz	6.2GHz 5925-6425MHz	6.5GHz 6425-6525MHz	6.7GHz 6525-6875MHz	7.0GHz 6875-7125MHz
9260D2WL	PIFA	19	3.24	3.64	3.73	4.77	4.97					
	Dipole	200	2.89	2.92	3.19	4.41	4.22					
AX201NGW	PIFA	17	3.24	3.64	3.73	4.77	4.97	4.97				
	Dipole	200	2.89	2.92	3.19	4.41	4.22	5.12				
AX201D2W	PIFA	12	3.24	3.64	3.73	4.77	4.97	4.97				
	Dipole	200	2.89	2.92	3.19	4.41	4.22	5.12				
AX201D2WL	PIFA	15	3.24	3.64	3.73	4.77	4.97	4.97				
	Dipole	200	2.89	2.92	3.19	4.41	4.22	5.12				
AX200NGW	PIFA	18	3.24	3.64	3.73	4.77	4.97	4.97				
	Dipole	200	2.89	2.92	3.19	4.41	4.22	5.12				
AX200D2WL	PIFA	19	3.24	3.64	3.73	4.77	4.97	4.97				
	Dipole	200	2.89	2.92	3.19	4.41	4.22	5.12				
AX101NGW	PIFA	18	3.24	3.64	3.73	4.77	4.97	4.97				
	Dipole	200	3.10	4.03	4.11	5.17	5.17	5.12				
AX101D2W	PIFA	13	3.24	3.64	3.73	4.77	4.97	4.97				
	Dipole	200	3.10	4.03	4.11	5.17	5.17	5.12				
AX203NGW	PIFA	18	3.24	3.64	3.73	4.77	4.97	4.97				
	Dipole	200	3.10	4.03	4.11	5.17	5.17	5.12				
AX203D2W	PIFA	16	3.24	3.64	3.73	4.77	4.97	4.97				
	Dipole	200	3.10	4.03	4.11	5.17	5.17	5.12				
AX210NGW	PIFA	13	3.24	3.64	3.73	4.77	4.97	4.97	4.83	4.30	5.37	5.59
	Dipole	200	3.10	4.03	4.11	5.17	5.17	5.12	5.06	4.71	4.49	5.34
AX210D2W	PIFA	17	3.24	3.64	3.73	4.77	4.97	4.97	4.83	4.30	5.37	5.59
	Dipole	200	3.10	4.03	4.11	5.17	5.17	5.12	5.06	4.71	4.49	5.34
AX211NGW	PIFA	14	3.24	3.64	3.73	4.77	4.97	4.97	4.83	4.30	5.37	5.59
	Dipole	200	3.10	4.03	4.11	5.17	5.17	5.12	5.06	4.71	4.49	5.34
	Monopole	200	3.22	3.35	3.42	4.77	4.72	4.71	4.75	4.29	4.81	4.74
AX211D2W	PIFA	14	3.24	3.64	3.73	4.77	4.97	4.97	4.83	4.30	5.37	5.59
	Dipole	200	3.10	4.03	4.11	5.17	5.17	5.12	5.06	4.71	4.49	5.34
	Monopole	200	3.22	3.35	3.42	4.77	4.72	4.71	4.75	4.29	4.81	4.74
AX211D2WL	PIFA	15	3.24	3.64	3.73	4.77	4.97	4.97	4.83	4.30	5.37	5.59
AX411NGW	PIFA	15	3.24	3.64	3.73	4.77	4.97	4.97	4.83	4.30	5.37	5.59
	Dipole	200	3.10	4.03	4.11	5.17	5.17	5.12	5.06	4.71	4.49	5.34
AX411E2W	PIFA	15	3.24	3.64	3.73	4.77	4.97	4.97	4.83	4.30	5.37	5.59
	Dipole	200	3.10	4.03	4.11	5.17	5.17	5.12	5.06	4.71	4.49	5.34

- Intel® has completed necessary modular SAR certification base on full output power condition, also certified different configurations to cover lower distance conditions (8/ 5mm modular SAR).
- Host output power should align with modular SAR result when leveraging certain configurations.
- Modular SAR distances and output power information are available in the External Product Specification (EPS) document.


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