

ECN 70101 Series 2 Antenna Specifications

The ECN 70101 series 2 incorporates nine antennas as shown in figure 1.

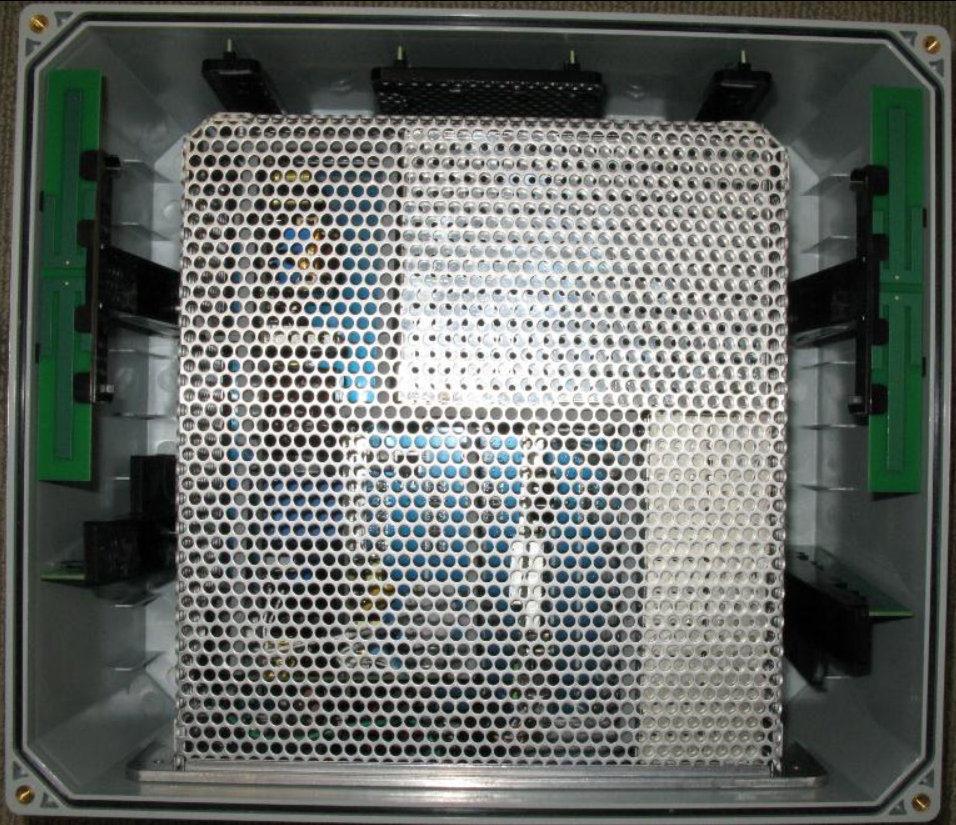
	Top					
	(3)	(4)	(9)	(5)	(6)	
	2.4 GHz Antenna B	5 GHz Antenna B	GPS V	5 GHz Antenna A	2.4 GHz Antenna A	
EV-DO Dual Band Antenna B (2) 900 MHz ISM Band RX Antenna B (1)						EV-DO Dual Band Antenna A (7) 900 MHz ISM Band RX Antenna A (8)
	Bottom					

Figure 1 – ECN 70101 Antenna Placement

Antennas 1, 2, 7, and 8 are Echelon part number 801-0689-51 (PCB 373-1351-51) (EV-DO Triband Antenna).

Antennas 3, and 6 are Echelon part number 801-0775-51 (PCB 373-1409-51) (2425 MHz Wi-Fi Antenna).

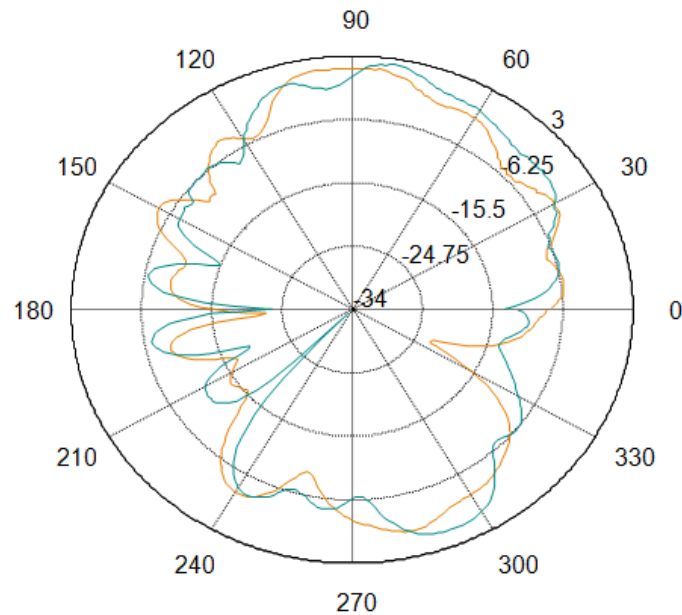
Antennas 4, and 5 are Echelon part number 801-0688-51 (PCB 373-1350-51) (Dual Band Wi-Fi Antenna).

Antenna 9 is a GPS Patch Antenna, Hankook Antenna HAG-130-1-PA.

2425 MHz Wi-Fi Antenna Specification.

Echelon part number 801-0775-51 (PCB 373-1409-51)

- 1) 2.4 GHz to 2.5 GHz. Return loss -10db minimum across the band, minimum efficiency 95% across the band. Maximum peak directive gain of +4.3 dBi.



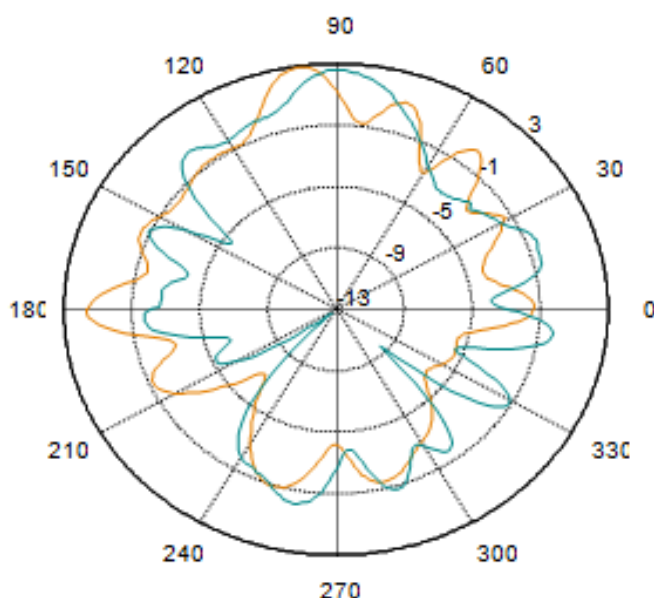
Plot 1. WiFi @ 2.45 GHz – elevation, co-polarization, 1-deg resolution

run	trace	AUT	GHz	dBi gain - elevation		
				max	min	ave
26	orange	6	2.45	1.4	-22.7	-6.8
27	aqua	7	2.45	2.2	-33.3	-6.4

Plot is a “side-view” of the EUT with nose at 0 deg, top-of-head at 90 deg, back-of-head at 180 deg, and neck or bottom of EUT at 270 deg. Both AUT lie along the horizontal (180 to 0 degree) line segment in the above plot.

The antenna gain in the table above includes 1.4 dB of cable loss at 2.45 GHz.

This loss was removed when computing the peak directed gain.



Plot 2. WiFi @ 2.45 GHz – azimuth, co-polarization, 1-deg resolution
(for aqua trace, data point at 180 degrees is average of two acquisition values; one at 180 degrees and the other at 540 degrees)

run	trace	AUT	GHz	dBi gain - azimuth		
				max	min	ave
24	orange	6	2.45	2.9	-7.0	-2.1
21	aqua	7	2.45	2.6	-12.7	-2.4

Note that plot is a “front-view” of the EUT, looking at the nose (front face) of the EUT, with left ear at 0 deg, top-of-head at 90 deg, right ear at 180 deg, and neck (chin) at 270 deg. AUT 6 (orange) is proximal to the right ear, which from the observer’s standpoint is toward the left side of the box (the 180-degree side in the above plot). AUT 7 (aqua) is proximal to the left ear, which from the observer’s standpoint is on the right side of the box (the 0-degree side in the above plot).

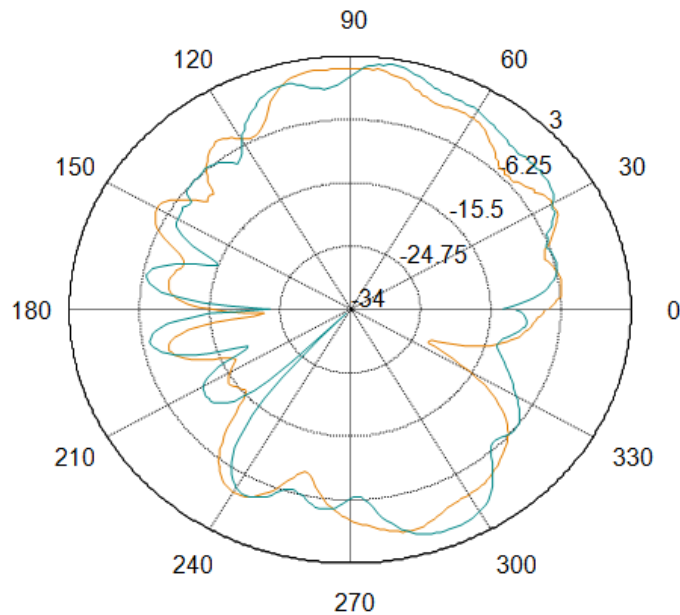
The antenna gain in the table above includes 1.4 dB of cable loss at 2.45 GHz.

This loss was removed when computing the peak directed gain.

Dual Band Wi-Fi Antenna Specification.

Echelon part number 801-0688-51 (PCB 373-1350-51)

- 2) 2.4 GHz to 2.5 GHz. Return loss -10db minimum across the band, minimum efficiency 95% across the band. Maximum peak directive gain of +4.3 dBi.



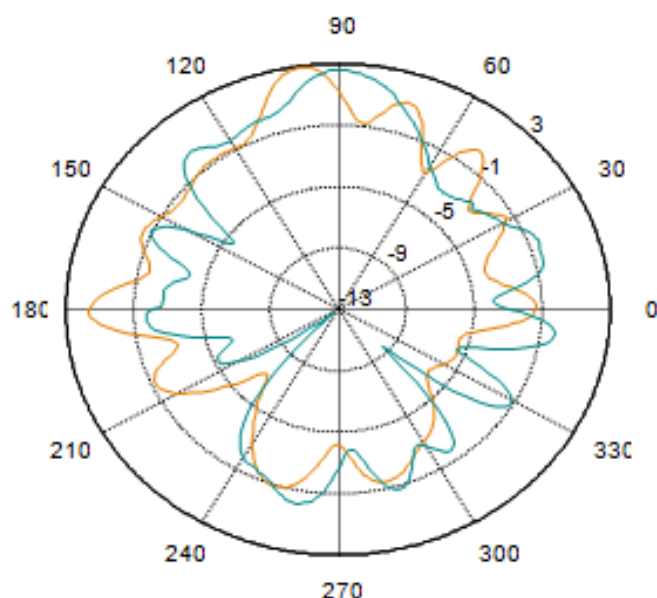
Plot 1. WiFi @ 2.45 GHz – elevation, co-polarization, 1-deg resolution

run	trace	AUT	GHz	dBi gain - elevation		
				max	min	ave
26	orange	6	2.45	1.4	-22.7	-6.8
27	aqua	7	2.45	2.2	-33.3	-6.4

Plot is a “side-view” of the EUT with nose at 0 deg, top-of-head at 90 deg, back-of-head at 180 deg, and neck or bottom of EUT at 270 deg. Both AUT lie along the horizontal (180 to 0 degree) line segment in the above plot.

The antenna gain in the table above includes 1.4 dB of cable loss at 2.45 GHz.

This loss was removed when computing the peak directed gain.



Plot 2. WiFi @ 2.45 GHz – azimuth, co-polarization, 1-deg resolution
(for aqua trace, data point at 180 degrees is average of two acquisition values; one at 180 degrees and the other at 540 degrees)

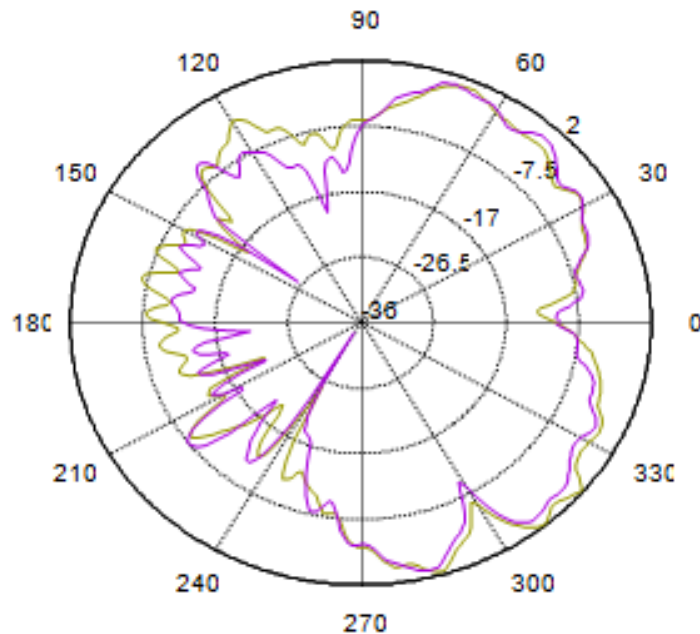
run	trace	AUT	GHz	dBi gain - azimuth		
				max	min	ave
24	orange	6	2.45	2.9	-7.0	-2.1
21	aqua	7	2.45	2.6	-12.7	-2.4

Note that plot is a “front-view” of the EUT, looking at the nose (front face) of the EUT, with left ear at 0 deg, top-of-head at 90 deg, right ear at 180 deg, and neck (chin) at 270 deg. AUT 6 (orange) is proximal to the right ear, which from the observer’s standpoint is toward the left side of the box (the 180-degree side in the above plot). AUT 7 (aqua) is proximal to the left ear, which from the observer’s standpoint is on the right side of the box (the 0-degree side in the above plot).

The antenna gain in the table above includes 1.4 dB of cable loss at 2.45 GHz.

This loss was removed when computing the peak directed gain.

- 3) 5.0 GHz to 6.0 GHz. Return loss -10db minimum across the band, minimum efficiency 95% across the band. Maximum peak directive gain +4dBi.



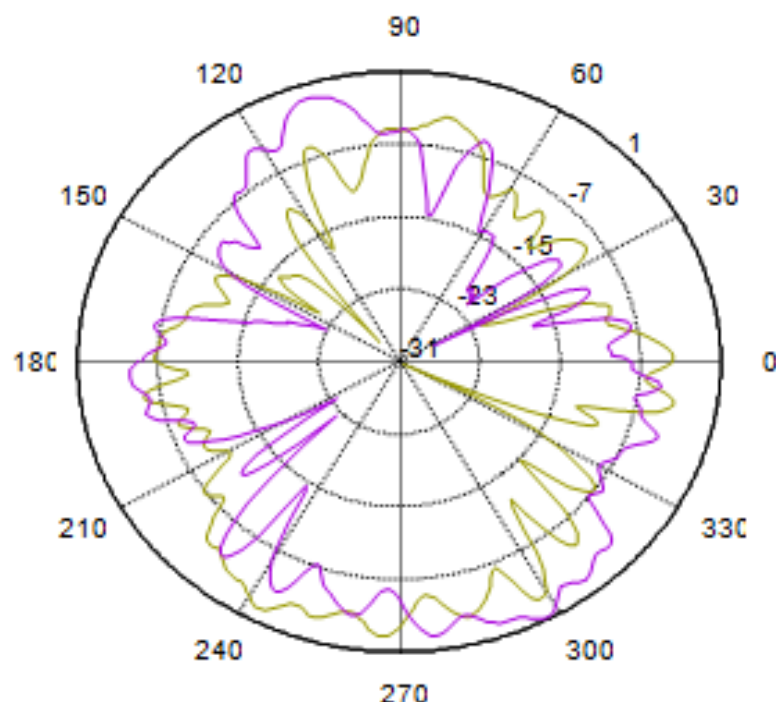
Plot 3. WiFi @ 5.7 GHz – elevation, co-polarization, 1-deg resolution

run	Trace	AUT	GHz	dBi gain - elevation		
				max	m/n	ave
30	mustard	5	5.7	1.7	-25.7	-6.6
31	purple	8	5.7	1.0	-34.2	-7.9

Plot is a "side-view" of the EUT with nose at 0 deg, top-of-head at 90 deg, back-of-head at 180 deg, and neck or bottom of EUT at 270 deg. Both AUT lie along the horizontal (180 to 0 degree) line segment in the above plot.

The antenna gain in the table above includes 2.3 dB of cable loss at 5.7 GHz.

This loss was removed when computing the peak directed gain.



Plot 4. WiFi @ 5.7 GHz – azimuth, co-polarization, 1-deg resolution

run	Trace	AUT	GHz	dBi gain - azimuth		
				max	min	ave
17b	mustard	5	5.7	-0.4	-30.5	-8.5
20	purple	8	5.7	0.8	-27.0	-8.1

Note that plot is a “front-view” of the EUT, looking at the nose (front face) of the EUT, with left ear at 0 deg, top-of-head at 90 deg, right ear at 180 deg, and neck (chin) at 270 deg. AUT 5 (mustard) is proximal to the right ear, which from the observer’s standpoint is toward the left side of the box (the 180-degree side in the above plot). AUT 8 (purple) is proximal to the left ear, which from the observer’s standpoint is on the right side of the box (the 0-degree side in the above plot).

The antenna gain in the table above includes 2.3 dB of cable loss at 5.7 GHz.

This loss was removed when computing the peak directed gain.
