

Revision: A

Source/Specification Control Document  Description: Antenna, 9dBi, Omnidirectional		
Prepared by: Tim Bliss	Date:	Signed: Tim Bliss
Checked by:	Date:	Signed:
Configuration Manager:	Date:	Signed:
Approved by: Alex Parnes  Engineering Manager approval only required for items over \$500.00 (ex. Speakers, antennas, circuit board assemblies)	Date:	Signed: Alex Parnes

# 1. Specifications

The item shall be one of the following:

Manufacturer	Manufacturer's Part Number	Reference
Mobile Mark	OD9-2400	See Attached
TESSCO	41525	See Attached

# 2. Engineering approved equivalents only? Yes No

If YES is checked, only items approved by Engineering as equivalent can be used. If NO is checked, Engineering approval is not required to use equivalent items.

# 3. Inspection / Acceptance Test

SCD Revision History			
Rev.	Effective Date	Change Reference	Engineer
-	Dec. 1, 2003	Initial Release	Tim Bliss
A Nov. 3, 2008 No change. Rev clarification for MRP implementation only		Raylon Smith	

Form Revision History				
Rev.	Rev. Effective Date Change Reference Engineer			
D	October 20, 2008	P. Lehman/L.Prymmer		



# The OD Series Antennas are optimized for use in a wide variety of wireless systems. Typical uses include WLAN access points or bridge (802.11b/g), and surveillance transmitters.

These antennas consist of a collinear array with elements stacked vertically. Unique phasing cancels out-of-phase current distribution, improving system performance. This design maintains an omni pattern in the horizontal plane. The OD Series are free space antennas; no ground plane is required.

An option for the OD series is a reflector kit that beam shapes the omni pattern into a directional cardioid shape. This can result in improved directional gain, and isolation for reduced interference.

The low profile black radome (1" diameter) makes the antennas durable and rugged. They can withstand the harshest environments of snow, wind, rain and ice. The feed assembly is made of precision machined aluminum components and is irridited for weather protection. The antennas comes with all the hardware needed to install it to a mast. The OD antennas normally terminate with a

# OD Series Omni Antenna

For WLAN, Video and Data Systems

- 3 dBi, 6 dBi, 9 dBi & 12 dBi antennas provide uniform omni coverage
- Unique design allows economical build out
- Mounting kit includes all hardware needed
- Reflector option provides directional beamshaping & increased performance

female N connector. Optional models include pigtail cable with connector. For ISM, Part 15 compliant connectors are available (reverse polarized), please consult factory.

Model Numbers				
Model	Freq.(MHz)	<u>Gain</u>	<b>Applications</b>	
OD3-2400	2400-2485	3 dBi	WLAN, ISM, Video	
OD6-2400	2400-2485	6 dBi	WLAN, ISM, Video	
OD9-2400	2400-2485	9 dBi	WLAN, ISM, Video	
OD12-2400	2400-2485	12 dBi	WLAN, ISM, Video	

For pigtail cable options and special frequencies, please consult factory for latest model numbers and configurations.

Options	Model
Add-on kit for 6 dBi models	ODR6-Kit
Add-on kit for 9 dBi models	ODR9-Kit
Add-on kit for 12 dBi models	ODR12-Kit
Rev TNC with 1 ft Cable option	add -PTA to OD model
Rev BNC with 4 ft Cable option	add -PT2 to OD model

Specifications			
Frequency & Gain:	See above	Length/Weight:	
Bandwidth @2:1 VSWR:	See above	3 dBi Models	16 inches, 1.5 lbs
Nominal Impedance:	50 ohms	6 dBi Models	19 inches, 1.5 lbs
Max. Power (continuous):	100 watts	9 dBi Models	27 inches, 2.0 lbs
Vertical Beamwidth (-3 dB point):		12 dBi Model	41 inches, 2.5 lbs
3 dBi Model	55 degrees	OD Series Interface:	N female connector
6 dBi Model	25 degrees	Mounting Kit:	Mast mount kit included
9 dBi Model	14 degrees	<b>Mounting Dimensions:</b>	Use mast up to 2" OD
12 dBi Model	7 degrees	Material:	Polycarbonate with aluminum
Wind Loading (flat plate equiv.):	30-40 sq. inches		body, fiberglass radome on
Rated Wind Velocity:	100+ mph		OD12 with aluminum body
Lightning Protection:	External suggested	Options:	Reflector Option Kit
Antenna Diameter:	1", main mast	•	Pigtail Cable Option
			Part 15 Reverse Connectors

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# Antennas, Microwave Products (See more) 2400-2500 MHz Fiberglass/Omni Antennas [345-61] (See

Please LOGIN to see the "Add to Worksheet" button.

Manufacturer	Mobile Mark, Inc.	
Table	OD9-2400	
TESSCO Part No.	41525 In Stock	
Drawing		
Specific Freq. (MHz)	2400-2500	
Gain (dBd)	7	
Maximum Input Power (Watts)	100	
Туре	Omnidirectional	
Product Narrative	Omnidirectional ABS antenna for spread spectrum (I systems.	
Bandwidth (MHz)	100	
Gain (dBi)	9	
H. Beamwidth	N/A	
Vert. Beamwidth	14 Deg.	
Front to Back Ratio (dB)	N/A	
VSWR	1.5:1	
Polarization	Vertical	
Lightning Prot.	N/A	
Overall Size	17" x 1.15"	
Weight	2.0	

Rated Wind Velocity (MPH)	100
Wind Load, (sq ft)	0.5
Lateral Thrust @ RWV (lbs)	N/A
Bending Moment @ RWV (ft lbs)	N/A
Termination	N Female
Jumper Included	None
Mounting Style	For up to 2" pipe
Mount Hdw. Incl.	Yes
Warranty	1 Year
Qty/Uom	1 EACH
List (\$)	168.00

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TESSCO Technologies Incorporated - North America: 800 472 7373; fax 410 427 0005 - International +1 410 229 1200; fax +1 410-2:

Global Logistics Center - 11126 McCormick Road - Hunt Valley, Maryland USA 210:

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TESSCO	41525	See Attached

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3 dBi Model	55 degrees	OD Series Interface:	N female connector
6 dBi Model	25 degrees	Mounting Kit:	Mast mount kit included
9 dBi Model	14 degrees	<b>Mounting Dimensions:</b>	Use mast up to 2" OD
12 dBi Model	7 degrees	Material:	Polycarbonate with aluminum
Wind Loading (flat plate equiv.):	30-40 sq. inches		body, fiberglass radome on
Rated Wind Velocity:	100+ mph		OD12 with aluminum body
Lightning Protection:	External suggested	Options:	Reflector Option Kit
Antenna Diameter:	1", main mast	•	Pigtail Cable Option
			Part 15 Reverse Connectors

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Product Narrative	Omnidirectional ABS antenna for spread spectrum (I systems.	
Bandwidth (MHz)	100	
Gain (dBi)	9	
H. Beamwidth	N/A	
Vert. Beamwidth	14 Deg.	
Front to Back Ratio (dB)	N/A	
VSWR	1.5:1	
Polarization	Vertical	
Lightning Prot.	N/A	
Overall Size	17" x 1.15"	
Weight	2.0	

Rated Wind Velocity (MPH)	100
Wind Load, (sq ft)	0.5
Lateral Thrust @ RWV (lbs)	N/A
Bending Moment @ RWV (ft lbs)	N/A
Termination	N Female
Jumper Included	None
Mounting Style	For up to 2" pipe
Mount Hdw. Incl.	Yes
Warranty	1 Year
Qty/Uom	1 EACH
List (\$)	168.00

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TESSCO Technologies Incorporated - North America: 800 472 7373; fax 410 427 0005 - International +1 410 229 1200; fax +1 410-2:

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Source/Specification Control Document  Description: Antenna, 15dBi, Omnidirectional					
Prepared by: T. Bliss	Date:	Signed:			
Checked by:	Date:	Signed:			
Configuration Manager:	Date:	Signed:			
Approved by: Alex Parnes  Engineering Manager approval only required for items over \$500.00 (ex. Speakers, antennas, circuit board assemblies)  Date:  Signed: Alex Parnes					

# 1. Specifications

The item shall be one of the following:

Manufacturer	Manufacturer's Part Number	Reference
HyperLink Technologies	HG2415U-PRO	See Attached

# 2. Engineering approved equivalents only? Yes No

If YES is checked, only items approved by Engineering as equivalent can be used. If NO is checked, Engineering approval is not required to use equivalent items.

# 3. Inspection / Acceptance Test

SCD Revision History				
Rev.	Effective Date	Change Reference	Engineer	
-	Feb. 10, 2004	Initial Release	Tim Bliss	
А	Feb. 6, 2009	No Change. Rev Clarification for MRP implementation only	R. Smith	

Form Revision History					
Rev.	Rev. Effective Date Change Reference Engineer				
D	October 20, 2008	Initial Release	P. Lehman/L.Prymmer		

# HyperGain® HG2415U-PRO 2.4 GHz Professional 15 dBi Omnidirectional Antenna

#### **Professional Performance**

The HyperGain® HG2415U-PRO is a high gain omnidirectional base station antenna designed and optimized for the 2.4 GHz ISM band. This antenna is ideally suited for IEEE 802.11b/g wireless LANs, Bluetooth and other multipoint applications where long range and wide coverage is desired.

This antenna features an integral N-Female connector. The mounting system consists of a pair of steel brackets and 2.7 inch U-bolts, allowing installation on masts up to 2.0 inches in diameter.

#### **Electrical Specifications**

Model	HG2415U-PRO
Frequency	2400-2500 MHz
Gain	15 dBi
Polarization	Vertical
Vertical Beam Width	8°
Horizontal Beam Width	360°
Impedance	50 Ohm
Max. Input Power	100 Watts
VSWR	< 1.5:1 avg.
Weight	3.3 lbs (1.5kg)
Length	40.5 in. (1.03m)
Radome Material	Gray Fiberglass
Mounting	2.0" diameter mast max.
Wind Survival	up to 150 MPH
Operating Temperature	-45° C to +80° C
Connector	Integral N-Female

#### **Guaranteed Quality**

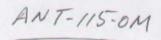
This product is backed by Hyperlink's Limited Warranty.











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# 2.4 GHz 15 dBi Omnidirectional Antenna

Features for this Antenna product

- · Lightweight fiberglass radome
- · Heavy-duty steel mounting brackets
- · Integral N-Female connector
- · All weather operation





List Price

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Quantity

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Click here for a larger image of this Antennas product

The HyperGain® HG2415U-PRO is a high gain omnidirectional base station WiFi antenna designed and optimized for the 2.4GHz ISM band. This antenna is ide suited for IEEE 802.11b, 802.11g and 802.11n wireless L Bluetooth® and other multipoint applications where lon range and wide coverage is desired.

Details for this Antenna product

HyperLink Item # Manufacturer UPC # (More) RoHS Status

HG2415U-PRO Hyperlink 656771101448 RoHS Compliant (More)

## Applications for this Antenna product

- · 2.4 GHz ISM Band
- IEEE 802.11b, 802.11g, 802.11n (Pre-N, Draft-N, MIMO) Applications
- Bluetooth® & Public Wireless Hotspot
- · WiFi, Wireless Video Systems, Multipoint Applications

Datasheets

Diagram

od Diagram

Specifications

# **Electrical Specifications**

2400-2500 MHz Frequency

Gain 15 dBi Polarization Vertical

Vertical Beam Width 80 Horizontal Beam Width 360°

50 Ohm Impedance Max. Input Power 100 Watts **VSWR** < 1.5:1 avg.

**Lightning Protection** DC Short

# **Mechanical Specifications**

Connector Integral N-Female Weight 3.3 lbs (1.5kg) Length 40.5 in. (1.03m) **Base Diameter** 1.69 in. (42.9mm) Radome Diameter 1.52 in. (38.6mm)

Radome Material Gray Fiberglass

Mounting 2.0" diameter mast max.

Wind Survival up to 150 MPH -40° C to to 85° C **Operating Temperature** (-40° F to 185° F)

**RoHS Compliant** Yes

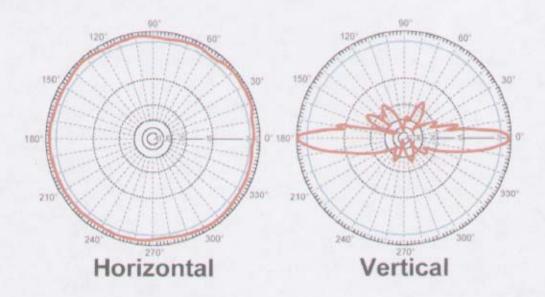
# Wind Loading Data

Wind Speed (MPH) Loading 14 lb.

100

22 lb.

# RF Antenna Patterns



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5.8 GHz 27 dBi Grid Antenna N Female Connector - Antenna with RP

2.4 GHz 9 dBi Rubber Duck SMA Connector



for RG8, 400-Series



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# 1. Specifications

The item shall be one of the following:

Manufacturer	Manufacturer's Part Number	Reference
HyperLink Technologies	HG2403RD-NM	See Attached

# 2. Engineering approved equivalents only? Yes No

If YES is checked, only items approved by Engineering as equivalent can be used. If NO is checked, Engineering approval is not required to use equivalent items.

# 3. Inspection / Acceptance Test

SCD Revision History			
Rev.	Effective Date	Change Reference	Engineer
-	August 9, 2004	Initial Release	T. Bliss
А	Feb. 6, 2009	No change. Rev clarification for MRP implementation only	R. Smith

Form Revision History			
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D	October 20, 2008	Initial Release	P. Lehman/L.Prymmer



This antenna is also available with RP-SMA and RP-TNC connectors.

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2.4 to 5.8 GHz 2-Way

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# This compact omni-directional "rubber-duck" antenna provides broad coverage and 3 dBi gain. It is a coaxial

Only 5.8" long, this flexible antenna features a tilt-and-swivel N-Type Male connector, allowing them to be used vertically, at a right angle, or any angle in-between. This antenna can be directly connected to wireless devices equipped with N-Type Female connectors including many amplifiers and bridges.

#### **Electrical Specifications**

**Features** 

Frequency 2400-2500 MHz

sleeve design with an omni-directional pattern.

 Gain
 3 dBi

 Impedance
 50 Ohm

 VSWR
 < 2.0</td>

#### Mechanical Specifications

 Weight
 1.4 oz. (4 g)

 Length
 5.8" (147 mm)

 Diameter
 0.5" (13 mm)

 Finish
 Matte Black

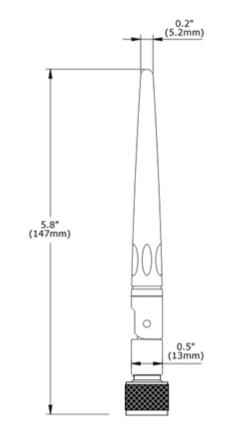
 Connector
 N-Type Male

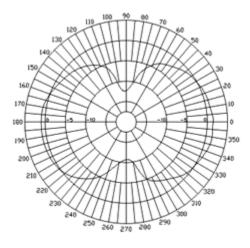
 Operating
 -40° C to to 85° C

 Temperature
 (-40° F to 185° F)

Polarization Vertical

#### Antenna Gain Pattern





# Vertical

#### **Guaranteed Quality**

This product is backed by Hyperlink's Limited Warranty





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Source/Specification Control Doc Description: Antenna, Fixed, 15dBi	ument	
Prepared by: T. Bliss	Date:	Signed:
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The item shall be one of the following:

Manufacturer	Manufacturer's Part Number	Reference
HyperLink Technologies	HG24-16P	See Attached

# 2. Engineering approved equivalents only? Yes No

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#### **HG2416P**

### 2.4 GHz 15.5 dBi Flat Planar Array Antenna

The HG2416P is a high gain planar array antenna designed specifically for IEEE 802.11b and 802.11g applications in the 2.4 GHz ISM band. It offers superior performance in a compact and easy to install package. This antenna's innovative reflector system provides excellent front-to-back ratio, significantly reducing background noise and interference.

This antenna is ideal for use at subscriber sites, and offers a cost-effective CPE (Customer Premise Equipment) solution. It is also suitable for small base station "micro-cell" sites.

Hyperlink's unique design offers a 30% lower profile than similar antennas from other vendors, offering a more compact alternative to yagi or flat patch antennas for medium range point-to-point links.

# EZ

#### **Features and Options**

- o Superior performance
- Light weight
- Excellent front-to-back ratio
- Compact size
- Minimal wind loading
- Low wind load
- o 60 degree tilt and swivel mast mount kit
- Optional tilt and swivel wall mount bracket

#### **Electrical Specifications**

Gain ( dBi )	15.5 dBi
Polarization Isolation	>30 dBi
Sidelobe Suppression	>18 dBi
-3 dBi Beamwidth	25° Vertical : 25° Horizontal
-10 dBi Beamwidth	45° Vertical : 45° Horizontal
Front/Back Ratio	>30 dBi
Impedance	50 Ohms
VSWR	1.5:1

#### Wind Loading Data

Wind Speed (MPH)	Loading (.82 sq. ft.)
40	5.8 lb.
60	12.8 lb.
80	22.5 lb.
100	35.5 lb.
120	51.7 lb.
140	70.1 lb.

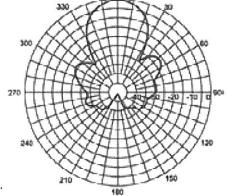
## **Mechanical Specifications**

<b>Output Connector</b>	"N" type female	
Mounting	Up to 2 in. O.D. pipe	
Vertical Tilt	0-60° (optional)	
Radome	UV-Inhibited ABS	
Reflector Type	Planar array	
Reflector Material	Aluminum Alloy	
Dimensions	10.75" x 11"	
Weight - Antenna	2 lb	
Weight - Mount	< 0.5 lb	

## **Guaranteed Quality**

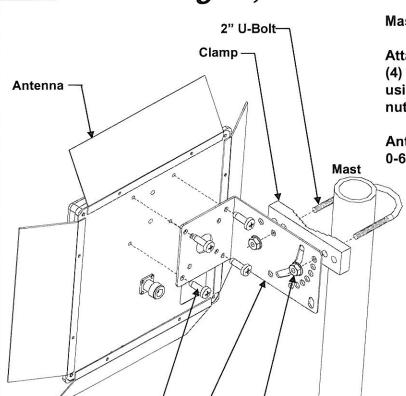
All HyperGain<sup>®</sup> antennas are tested and backed by Hyperlink's Limited Warranty.







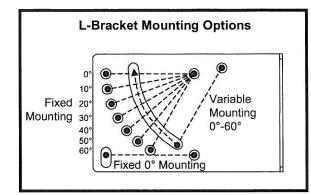
# **MOUNTING INSTRUCTIONS - HG2416P**



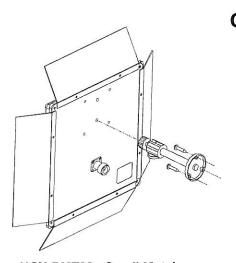
Mast Mounting Kit (Supplied):

Attach L-Bracket to antenna back as shown using (4) 10-24x5/8" pan head screws. Then secure to mast using 2" U-bolt, clamp and (2) 1/4-20 serrated flange nuts.

Antenna can be mounted in a tilted position from 0-60 degrees. See below for mounting options.

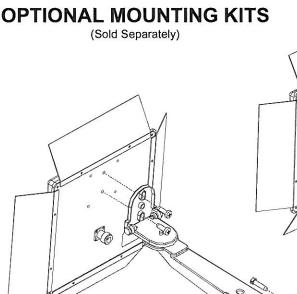


L-Bracket shown for down-tilt mounting. For up-tilt, rotate bracket 180 degrees when attaching to antenna.



HGX-PMT02 - Small Metal Tilt-and-Swivel Wall Mounting Bracket

IP-00004 Rev. A - 05/29 Page 1/2





HGX-PMT04 - Large Metal
Tilt-and-Swivel Mounting
Bracket for Wall or Mast mounting

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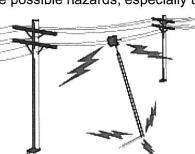


# **IMPORTANT SAFETY PRECAUTIONS:**

**LIVES MAY BE AT RISK!** Carefully observe these instructions and any special instructions that are included with the equipment you are installing.

**IMPORTANT:** Look over the site before beginning any installation, and anticipate possible hazards, especially these:

CONTACTING POWER LINES CAN BE LETHAL. Make sure no power lines are anywhere where possible contact can be made. Antennas, masts, towers, guy wires or cables may lean or fall and contact these lines. People may be injured or killed if they are touching or holding any part of equipment when it contacts electric lines. Make sure there is NO possibility that equipment or personnel can come in contact directly or indirectly with power lines.



Assume all overhead lines are power lines.

The horizontal distance from a tower, mast or antenna to the nearest power line should be at least twice the total length of the mast/antenna combination. This will ensure that the mast will not contact power if it falls either during installation or later.

#### TO AVOID FALLING, USE SAFE PROCEDURES WHEN WORKING AT HEIGHTS ABOVE GROUND.

- Select equipment locations that will allow safe, simple equipment installation.
- Don't work alone. A friend or co-worker can save your life if an accident happens.
- Use approved non-conducting ladders and other safety equipment. Make sure all equipment is in good repair.
- If a tower or mast begins falling, don't attempt to catch it. Stand back and let it fall.
- If anything such as a wire or mast does come in contact with a power line, DON'T TOUCH IT OR ATTEMPT TO
   MOVE IT. Instead, save your life by calling the power company.
- Don't attempt to erect antennas or towers on windy days.

MAKE SURE ALL TOWERS AND MASTS ARE SECURELY GROUNDED, AND ELECTRICAL CABLES CONNECTED TO ANTENNAS HAVE LIGHTNING ARRESTORS. This will help prevent fire damage or human injury in case of lightning, static build-up, or short circuit within equipment connected to the antenna.

- The base of the antenna mast or tower must be connected directly to the building protective ground or to one or more approved grounding rods, using 1 OAWG ground wire and corrosion-resistant connectors.
- Refer to the National Electrical Code for grounding details.
- Lightning arrestors for antenna feed coaxial cables are available from HyperLink Technologies, Inc.

### IF A PERSON COMES IN CONTACT WITH ELECTRICAL POWER, AND CANNOT MOVE:

- DON'T TOUCH THAT PERSON, OR YOU MAY BE ELECTROCUTED.
- Use a non-conductive dry board, stick or rope to push or drag them so they no longer are in contact with electrical power.
- Once they are no longer contacting electrical power, administer CPR if you are certified, and make sure that emergency medical aid has been requested.

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Revision: A

Source/Specification Control Document	
Description: Antenna, 2.4 GHz 15dBi, Grid, N-Fem Con	า

Prepared by: Patty Lehman	Date: 4/28/09	Signed: Patty Lehman
Checked by: Tyler Johnston	Date:4/29/2009	Signed: Tyler Johnston

# 1. Specifications

The item shall be one of the following:

Manufacturer	Manufacturer's Part Number	Reference
Hyperlink Technologies	HG2415G-NF	See Attached

# 2. Engineering approved equivalents only? Yes No

If YES is checked, only items approved by Engineering as equivalent can be used. If NO is checked, Engineering approval is not required to use equivalent items.

# 3. Inspection / Acceptance Test

SCD Revision History				
Rev. Effective Date Change Reference Engineer				
А	April 29, 2009	Initial Release	See Above	

Form Revision History					
Rev.	Rev. Effective Date Change Reference Engineer				
D	October 20, 2008	Initial Release	P. Lehman/L.Prymmer		
E	April 21, 2009	Revised approvals	Raylon Smith		

# 2.4 GHz 15 dBi Die-cast Grid Antenna - 12in N-Female Connector

#### Features for this Antenna product

- Die-cast aluminum construction
- UV stable light gray powder coat finish
- 16° beam-width & 12 inch coax lead
- Easy to assemble
- All weather operation





The HyperGain® Directional Mini-Reflector Grid WiFi Antenna provides 15 dBi gain with a 16° horizontal beam-width for directional applications. Its compact design makes it nearly invisible in most installations, and it can be installed for either vertical or horizontal polarization. It is ideally suited for 2.4GHz ISM band applications such as IEEE 802.11b, 802.11g and 802.11n wireless LAN systems.

#### **Rugged and Weatherproof**

This antenna's construction features a rust-proof die cast aluminum reflector grid for superior strength and light weight. This antenna's 2-piece reflector grid is simple to assemble and significantly reduces shipping costs. The grid surface is UV powder coated for durability and aesthetics. The open-frame grid design minimizes wind loading.

The HG2415G antenna is supplied with a 60 degree tilt and swivel mast mount kit. This allows installation at various degrees of incline for easy alignment. It can be adjusted up or down from 0° to 60°.

Custom connectors can be ordered. Contact Sales for more information.

#### Details for this product

L-com Item #	HG2415G-NF
Manufacturer	Hyperlink Technologies
Mfg.'s Item #	HG2415G-NF
RoHS Status	RoHS Compliant (More)

#### Applications for this Antenna product

- 2.4 GHz ISM Band
- IEEE 802.11b, 802.11g Wireless LAN & IEEE 802.11n (Pre-N, Draft-N) Applications
- WiFi Systems & Long-range Directional Applications

- Point to Point Systems & Point to Multi-point Systems
- Wireless Bridges, Backhaul Applications & Wireless Video Systems



# **Specifications**

# **Electrical Specifications**

Frequency	2400-2500 MHz
Gain	15 dBi
Horizontal Beam Width	16°
Vertical Beam Width	21°
Polarization	Horizontal or Vertical
Front to Back Ratio	20 dB
Impedance	50 Ohm
Max. Input Power	100 Watts
VSWR	< 1.5:1 avg.
Lightning Protection	DC Short

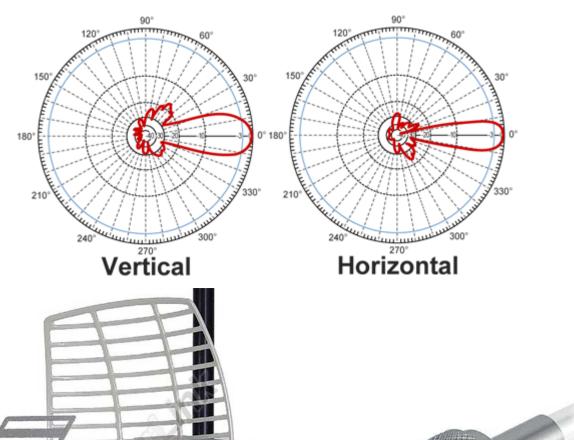
# **Mechanical Specifications**

Weight	3 lbs. (1.4 kg)
Grid Dimensions	11.8" (300 mm) x 15.7" (400 mm)
Mounting	1.25 in. thru 2 in. (31.8 - 50.8 mm) diameter mast max.
Elevation Angle	$0 \text{ to } +15^{\circ}$
Operating Temperature	-40° C to to 85° C (-40° F to 185° F)
RoHS Compliant	Yes

# **Wind Loading Data**

Wind Speed (MPH)	Loading
100	10.0 lb.
120	15.6 lb.

## **RF Antenna Patterns**









Revision: B

Source/Specification Control Document  Description: Antenna, Directional, 8dBi				
Prepared by: Tim Bliss	Date:	Signed:		
Checked by:	Date:	Signed:		
	1	-		

## 1. Specifications

The item shall be one of the following:

Manufacturer	Manufacturer's Part Number	Reference
HyperLink Technologies	RE09P-NM	See Attached

	2.	Engineering	approved eq	uivalents or	nly?	⊠Yes	No
--	----	-------------	-------------	--------------	------	------	----

If YES is checked, only items approved by Engineering as equivalent can be used. If NO is checked, Engineering approval is not required to use equivalent items.

# 3. Inspection / Acceptance Test

SCD Revision History				
Rev.	Effective Date	Change Reference	Engineer	
-	March 8, 2004	Initial Release	T. Bliss	
А	Feb. 6, 2009	No Change. Rev clarification for MRP implementation only	R. Smith	
		for MRP implementation only		
В	May 11, 2009	ECN 90055	Stan Crafts	

Form Revision History					
Rev.	Rev. Effective Date Change Reference Engineer				
D	October 20, 2008	Initial Release	P. Lehman/L.Prymmer		
Е	April 21, 2009	Revised approvals	Raylon Smith		

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Custom / OEM

# 2.4 GHz 8 dBi Flat Patch Antenna - 4ft N-Male Connector

**New Products** 

#### Features for this Antenna product

- Compact size, 4.5" Square with low-loss coax cable
- Durable UV-stable, UL flame rated radome
- Low-loss solid brass element & DC Short lightning protecting
- 4 feet low-loss coax cable for direct connection to radio without the need of a pigtail
- Can be installed for either vertical or horizontal polarization



The HyperGain® RE09P is a compact flat patch Wi-Fi range extender antenna providing 8 dBi gain with very broad coverage. It is suitable for both indoor and outdoor applications in the 2.4GHz ISM band, including IEEE 802.11b, 802.11g and 802.11n, and for public wireless hotspot applications.

Similar to the features of the HG2409P series, the RE09P series antennas feature 4 feet of low-loss coax cable enabling them to be directly connected to a radio connection without the additional expense of a pigtail cable.

1 of 2 5/7/2009 10:12 AM

The RE09P WiFi antenna is lightweight and features an aesthetic UV-stable, UL flame rated white plastic radome which can also be painted to match the room or building structure. The RE09P can be installed for horizontal or vertical polarization. It can be wall or ceiling mounted, as well as mast-mounted using U-bolts. Optional mounting brackets are available.

## **Custom Connectors**

If you need a custom connector for this antenna, please contact sales for connector options, prices and availability.

## This item is non-cancelable / non-returnable.

Details for this produ	ct	
L-com Item #	RE09P-NM	
Manufacturer	L-com	
UPC # (More)	822335065482	
RoHS Status	RoHS Compliant <b>⊘</b> (More)	

#### Applications for this Antenna product

- 2.4 GHz ISM Band
- IEEE 802.11b, 802.11g, 802.11n (Pre-N, Draft-N) Wireless LAN Applications
- Bluetooth® & Public Wireless Hotspot
- WiFi & Wireless Video Systems

2 of 2 5/7/2009 10:12 AM





# HyperGain® 2.4 GHz 8 dBi Wireless LAN Flat Patch Range Extender Antenna

#### **Applications and Features**

Applications:

- 2.4 GHz ISM Band
- IEEE 802.11b and 802.11g Wireless LAN
- Bluetooth®
- Public Wireless Hotspot
- WiFi

Features:

- · Superior performance
- Compact size, 4.5" Square
- Durable UV-stable, UL flame rated radome
- Low loss solid brass element
- DC Short lightning protection
- 4 foot coax lead
- Can be installed for either vertical or horizontal polarization
- · Optional mounting brackets available



Model: RE09P

#### Description

#### **Directional Range-Extender Antenna**

This flat patch range extender WiFi antenna provides 8 dBi gain with very broad coverage. It is suitable for both indoor and outdoor use in the 2.4GHz ISM band including IEEE 802.11b, 802.11g and Bluetooth® applications. This antenna's construction is very lightweight and features an aesthetic UV-stable white plastic radome which can also be painted to match the room or building structure. The RE09P can be wall or ceiling mounted, as well as mast-mounted using U-bolts.







#### **Antenna Specifications**

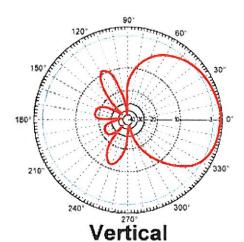
#### **Electrical Specifications**

Frequency	2400-2500 MHz	
Gain	8 dBi	
Horizontal Beam Width	75 degrees	
Vertical Beam Width	65 degrees	
Impedance	50 Ohm	
VSWR	< 1.5:1 avg.	
Lightning Protection	DC Short	

#### **Mechanical Specifications**

Weight	0.4 lbs. (.18 Kg)	
Dimensions	4.5 x 4.5 x .9 inches 114 x 114 x 23 mm	
Radome Material	UV-inhibited Polymer	
Mounting	Four ¼ in. (6.3 mm) Holes	
Polarization	Horizontal or Vertical	
Operating Temperature	-40° C to to 85° C (-40° F to 185° F)	
Wind Survival >150 MPH (241 KPH)		

#### RF Antenna Patterns



Horizontal







#### **Mounting Options**

Hyperlink's patch antennas offer several unique mounting options. They can be mounted flat against a wall, or to a mast using a pair of 2 inch U-bolts. The antennas also accept most tilt-and-swivel security camera brackets equipped with standard 1/4-20 threads.

J.	Description	Part Number
17	Small Metal Tilt-and-Swivel Mounting Bracket for indoor wall mounting. Includes wall-mounting hardware.	HGX-PMT02
	Medium Plastic Tilt-and-Swivel Mounting Bracket for indoor wall mounting. Includes wall-mounting hardware.	HGX-PMT03
	Large Metal Tilt-and-Swivel Mounting Bracket for indoor and outdoor wall or mast mounting. Includes wall-mounting hardware. Can be mast-mounted using U-Bolt Kit (sold separately).	HGX-PMT04
2	Universal Antenna Mount powder coated galvanized steel "DSS-style" arm for outdoor wall mounting. Requires a pair of 2 inch U-bolts (sold separately).	HGX-UMOUNT
	Stationary Mounting Kit for mounting to 1-1/4" to 2" dia. masts. Includes U-Bolts, nuts and mast clamp.	HGX-PMT07
	60 Degree Tilt-and-Swivel Mounting Kit for mounting to 1-1/4" to 2" dia. masts. Mounting hardware included.	HGX-PMT06
	Ceiling/Wall Universal Antenna Mount can be used with HyperLink's 4.5" sq and 8.5" sq. patch antennas as well as N-Type bulkhead and TNC/BNC bulkhead omni directional antennas. Includes ceiling/wall mounting hardware.	HGX-UMOUNT02
	Universal Corner Mounting Bracket: This bracket is designed to mount to an outside corner of a structure. It can be used with HyperLink's 4.5" and 8.5" sq. patch antennas, radome enclosed Yagi antennas, the HGX-PMT02 tilt & swivel bracket and can also accommodate the SC2402N and SC5802N 2-Way signal splitters as well as HyperAmp outdoor amplifiers.	HGX-UMOUNT03
	Window Mounting Kit Includes suction cups and mounting hardware.	HGX-PMT08





Revision: A

Source/Specification Control Document		
Description:	Antenna, 2.4 GHz, 13.9 dBi, Yagi	

Prepared by: Patty Lehman	Date: 8/6/09	Signed: Patty Lehman
Checked by: Brian McDonald	Date: 8/6/09	Signed: Brian McDonald

# 1. Specifications

The item shall be one of the following:

Manufacturer	Manufacturer's Part Number	Reference
Laird Technologies	PC2415N	See Attached
Tessco	14571	See Attached

2. Engineering approved equivalents only?	Yes	ПNо
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If YES is checked, only items approved by Engineering as equivalent can be used. If NO is checked, Engineering approval is not required to use equivalent items.

# 3. Inspection / Acceptance Test

SCD Revision History			
Rev.	Effective Date	Change Reference	Engineer
Α	Aug 6, 2009	Initial Release	See Above

Form Revision History			
Rev.	Effective Date	Change Reference	Engineer
D	October 20, 2008	Initial Release	P. Lehman/L.Prymmer
E	April 21, 2009	Revised approvals	Raylon Smith

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# Antennas, WLAN, Wi-Fi & Microwave 2.4 GHz Band, Yagi & Corner Reflector [345-64]



GSA		chedule: D - Information Technology	
TESSCO Part No.	14571		
Product Narrative	15 element yagi antenna for point to point bridges and an access point antenna for long, narrow areas such as tunne installed in either horizontal or vertical polorization.		
Frequency (MHz)	2.4-2.5 GHz		
Gain (dBi)	13.9		
Gain (dBd)	11.75		
Max. Input Power	200		
Туре	Directional Yagi		
Bandwidth	100		
H. Beamwidth	34 Deg.		
V. Beamwidth	30 Deg.		
Front to Back Ratio (dB)	18		
VSWR	1.5:1		
Polarization	Vertical		
Lightning Protection	DC Ground		
Overall Size	26.5" × 3.75" × 1.5"		
Weight	1.25 lba (0.56 Kg)		
Rated Wind Velocity (MPH)	125		
Wind Load, (sq ft)	N/A		
Lateral Thrust @ RWV (lbs)	N/A		
Bending Moment @ RWV (ft lbs)	N/A		
Termination	N Female		
Jumper Included	12" Ultralink Pigtail		
Mounting Style	Pipe Mount		
Mount Hdw. Incl.	U-bolts and Brackets :.,		
Advise Customer			
Mfg.	2 Years		

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TESSCO Technologies Incorporated

Loading



Revision: A

Source/Specification Control Document				
Description: Antenna, 2.4 GHZ, 15 DBI, Yagi N Female				
Prepared by: Patty Lehman	Date: <u>1/22/10</u>	Signed: Patty Lehman		
Checked by: Rob McNeal	Date: <u>1/20/10</u>	Signed: Rob McNeal		

# 1. Specifications

The item shall be one of the following:

Manufacturer	Manufacturer's Part Number	Reference
Hyperlink Technologies	HG2415Y-NF	See Attached

2.	Engineering approved equivalents only	<b>/?</b>	⊠Yes [	No
	Engineering approved equivalence em	<b>,</b>	/ \  I \ \ \	•

If YES is checked, only items approved by Engineering as equivalent can be used. If NO is checked, Engineering approval is not required to use equivalent items.

# 3. Inspection / Acceptance Test

	SCD Revision History			
Rev.	Effective Date	Change Reference	Engineer	
А	Jan. 22, 2010	Initial Release	See Above	

Form Revision History			
Rev.	Effective Date	Change Reference	Engineer
D	October 20, 2008	Initial Release	P. Lehman/L.Prymmer
Ē	April 21, 2009	Revised approvals	Raylon Smith



# 2.4 GHz 14.5 dBi Radome Enclosed Wireless LAN Yagi Antenna

#### **Applications and Features**

#### **Applications:**

- 2.4 GHz ISM Band
- IEEE 802.11b and 802.11g
   Wireless LAN
- Directional and multipoint applications
- Bluetooth®
- Public Wireless Hotspot
- WiFi

#### Features:

- Superior performance
- Light weight
- All weather operation
- UV-stable, UL flame rated radome
- 30 ° beam-width
- DC Short lightning protection
- Can be installed for either vertical or horizontal polarization

Model:

**HG2415Y** 

- Includes tilt and swivel mast mount
- Optional wall/ceiling mount available



#### **Product Description**

#### **Superior Performance**

The HyperGain® HG2415Y Radome Enclosed Yagi WiFi Antenna features high gain and a 30° beam-width. It is ideally suited for directional and multipoint IEEE 802.11b and 802.11g wireless LANs, Bluetooth®, public wireless hotspot applications and other systems operating in the 2.4GHz ISM band. The unique design of this antenna allows it to be installed for either vertical or horizontal polarization.

#### **Rugged and Weatherproof**

This WiFi antenna is enclosed within a UV-stable, UL flame rated radome for all-weather operation. The HG2415Y antenna is supplied with a 60 degree tilt and swivel mast mount kit.







#### **Specifications**

#### **Electrical Specifications**

Frequency	2400-2500 MHz
Gain	14.5 dBi
-3 dB Beam Width	30 degrees
Impedance	50 Ohm
Max. Input Power	50 Watts
VSWR	< 1.5:1 avg.
Lightning Protection	DC Short

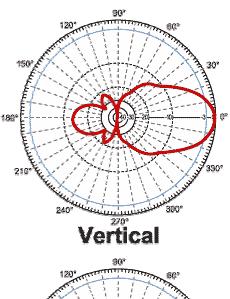
#### **Mechanical Specifications**

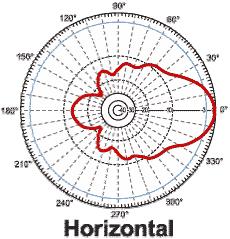
Weight	1.8 lbs. (.81 kg)
Dimensions Length x Diameter	18.2 x 3 (inches) 462 x 76 (mm)
Radome Material	UV-inhibited Polymer
Flame Rating	UL 94HB
Operating Temperature	-40° C to to 85° C (-40° F to 185° F)
Mounting	1-1/4" (32 mm) to 2" (51 mm) dia. masts
Polarization	Vertical and Horizontal
Wind Survival	>150 MPH

#### Antenna Gain Patterns









#### **Mounting Options**

Description	Part Number
Ceiling/Wall Universal Antenna Mount can be used with HyperLink's 4.5" sq and 8.5" sq. patch antennas as well as N-Type bulkhead and TNC/BNC bulkhead omni directional antennas. Includes ceiling/wall mounting hardware.	HGX-UMOUNT02
Universal Corner Mounting Bracket: This bracket is designed to mount to an outside corner of a structure. It can be used with HyperLink's 4.5" and 8.5" sq. patch antennas, radome enclosed Yagi antennas, the HGX-PMT02 tilt & swivel bracket and can also accommodate the SC2402N and SC5802N 2-Way signal splitters as well as HyperAmp outdoor amplifiers.	HGX-UMOUNT03

