

About Laser

Laser Antenna is a leading manufacturer of quality antennas with a focus on product innovation and product excellence. Our outstanding product quality is a direct result of our extensive experience in the design and manufacture of antennas and our extensive field testing regime where we subject our antennas to a range of operational extremes.

Our focus on excellence coupled with a program of research and development is your guarantee that a Laser antenna is a quality antenna. Our complete design and testing service provides you with access to our manufacturing expertise, low cost prototypes, white label and full backup and support.

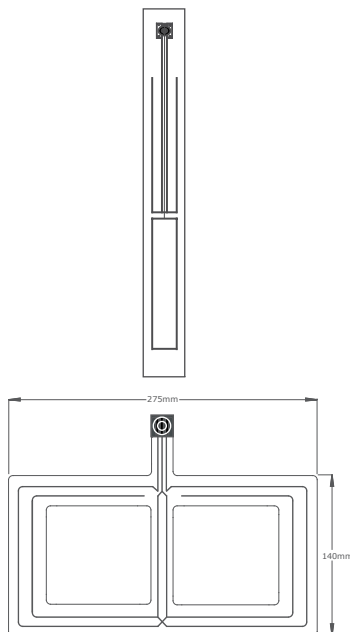
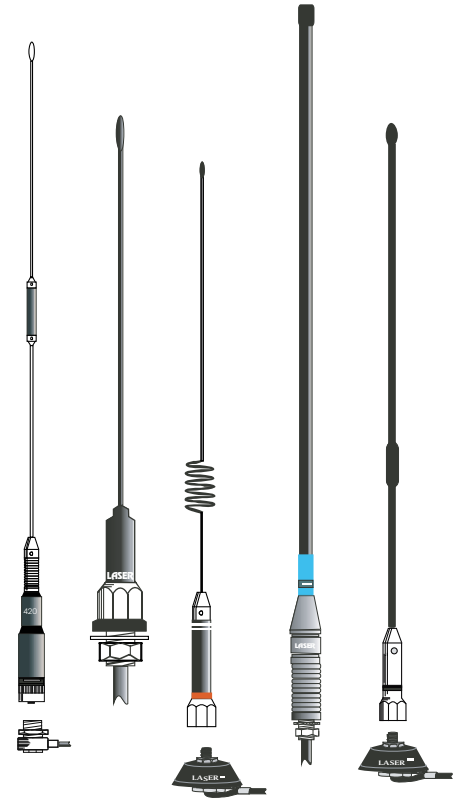
Design Services

Laser Antennas will manufacture antennas to order based on the development of a detailed application specification. Laser Antenna will manufacture the design where that design is within the production capabilities of our manufacturing facility. The Laser Antenna Design Service gives you access to:

- Our extensive technical expertise
- Low Cost Prototypes
- High Quality manufacturing process
- Manufactured and packaged under your label
- A full backup and support service

Our Promise (Warranty)

Great customer service backed up by a quality manufacturing process and a wide range of spare parts is our central service philosophy. In fact we will even repair damaged antennas where economical when the customer requests. The Laser Antenna promise to our customers is that the majority of Laser Antennas are tested before shipment to ensure the antenna performs to the published specification and that it is free from manufacturing defects. Laser Antenna warrants to every user that the antenna will perform to its specified ratings (published specifications) and will be free from defects in materials and workmanship.



Products

Antennas, mounts, braces, brackets, accessories and extenders

Laser Antenna manufactures and supplies a range of radio antenna and accessory products to suit a variety of communication applications. The Laser Antenna Range includes antennas that support the following radio technologies and frequencies.

- 27MHz and Low-band VHF
- VHF Mid-band and High-band
- UHF
- Cellular GSM
- Cellular CDMA
- Dual Digital
- GPS
- Laser Clear GPS/GSM/CDMA

Apart from the Laser Clear range, all Laser Antennas are available as a mix of fiberglass and stainless steel constructions.

UHF - Coaxial Dipole

The **Laser Clear*** transparent antenna is an innovation bought about by the need for discreet and high performance antennas used on wireless communication systems.

Since its original conception as a UHF (460MHz) antenna for unmarked police vehicles, this planar and transparent antenna, designed to be mounted inside the windshield, has been engineered to give exceptional broad-band performance. The design covers the 400 - 500MHz frequency band.

Its patented construction uses a conductive element on a clear and flexible substrate. The proprietary connector interfaces the antenna with RG174 coaxial cable for flexible installation ease.



Silver mylar strip added to antenna



“If you haven’t seen our Laser Clear products, then we’ve done a good job”

www.laser-antenna.com

TRANSPARENT

hence virtually invisible. Using our patented and proprietary manufacturing procedure, which forms a conductive circuit on a clear polyester backing.

THEFT & VANDAL PROOF

being mounted on the inside of the windshield there is no opportunity for theft or vandalism. No problems with wind noise or car wash problems.

EXCELLENT PERFORMANCE

compared to currently available “on-glass” wire antennas, superior performance in the order of 2~3dB is achieved through the geometry of the printed circuit artwork and the direct connection of the antenna to the coaxial cable as against the through-glass capacitive coupling used by external “on-glass” antennas.

MULTI FUNCTION

the versatility of this antenna has found its way into a multitude of applications including but not limited to – trunking radio systems, Citizens Band Radio, data-monitoring stations, vehicle tracking.

* Naming rights for OEM and other situations available
 Features of this antenna are covered by
US Patent No.: 6,252,550 and 6,407,706 B2 **South Africa Patent No.:** 2002 / 5065
EU Patent No.: 0 903 805 **New Zealand Patent No.:** 519 721
Patent Pend.: Australia, China, Japan

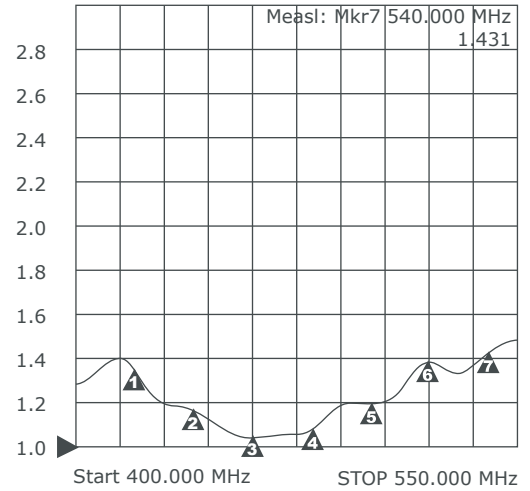
Electrical

- Radiator:** Half-wave coaxial dipole with broadband active element.
- Bandwidth:** >50MHz
- Gain:** Unity (2.2dBi)
- VSWR:** <1.2:1 @ Band Center
- Polarisation:** Linear (vertical or horizontal)
- Max Power:** 25watts

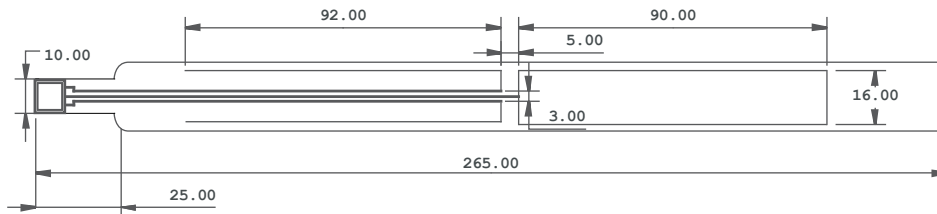
Mechanical

- Radiating Element:** Silver ink track.
- Substrate:** Clear Polyester/Mylar film (180um).
Not affected by UV.
- Adhesive/Dielectric:** 3M 467 Epoxy. This adhesive gets stronger over time and is not affected by UV.

▶ 1: Reflection SWR 0.2 / Ref 1.000 C
 ▷ 2: Off



1: Mkr (MHz)	2: Mkr (MHz) dB
1: 420.000	1.357
2: 440.000	1.186
3: 460.000	1.059
4: 480.000	1.088
5: 500.000	1.199
6: 520.000	1.388
7> 540.000	1.431



Typical Dimensions
 (actual dimension varies for different design center frequencies)



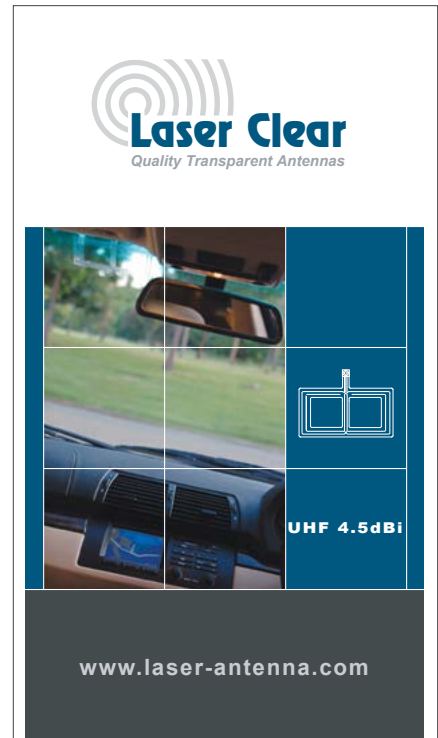
Reverse Side
 (showing peel-off adhesive backing)

UHF - 4.5dBi

The **Laser Clear*** transparent antenna is an innovation bought about by the need for discreet and high performance antennas used on wireless communication systems.

Since its original conception as a UHF (460MHz) antenna for unmarked police vehicles, this planar and transparent antenna, designed to be mounted inside the windshield, has been engineered to give exceptional broad-band performance. The design can be adapted to any 30MHz bandwidth in the 390 ~ 520MHz frequency band.

Its patented construction uses a conductive element on a clear and flexible substrate. The geometrical pattern gives a gain of **4.5dBi** yet with **omni-directional** and **dual polarisation**.



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THEFT & VANDAL PROOF

being mounted on the inside of the windshield there is no opportunity for theft or vandalism. No problems with wind noise or car wash problems.

EXCELLENT PERFORMANCE

compared to currently available “on-glass” wire antennas, superior performance is achieved through the geometry of the printed circuit artwork and the direct connection of the antenna to the coaxial cable as against the through-glass capacitive coupling used by external “on-glass” antennas.

MULTI FUNCTION

the versatility of this antenna has found its way into a multitude of applications including but not limited to – trunking radio systems, Citizens Band Radio, data-monitoring stations, vehicle tracking.

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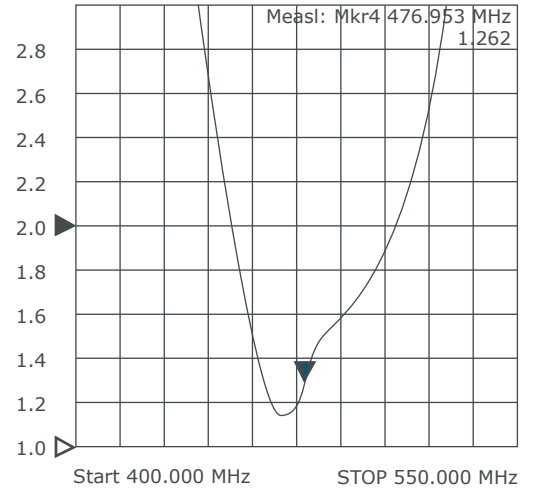
Electrical

- Radiator:** 2 x full-wave loop with common center element.
- Bandwidth:** >30MHz
- Gain:** 4.5dBi
- VSWR:** <1.2:1 @ Band Centers
- Polarisation:** Dual (vertical or horizontal)
- Max Power:** 25watts

Mechanical

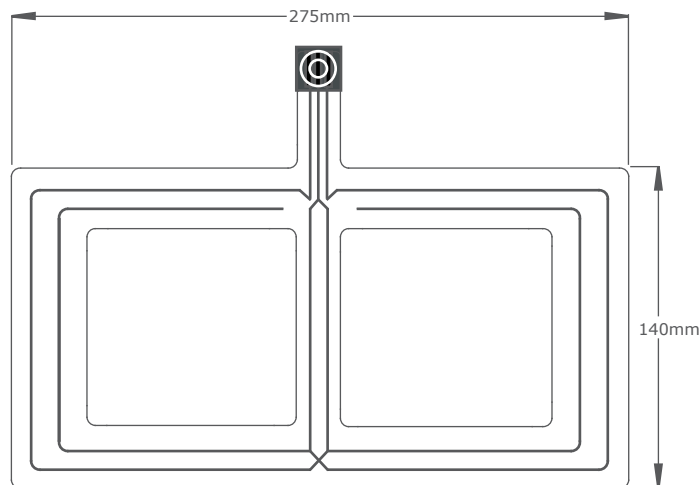
- Radiating Element:** Copper plated (10~15um) silver ink track.
- Substrate:** Clear Polyester/Mylar film (180um).
Not affected by UV.
- Adhesive/Dielectric:** 3M 467 Epoxy. This adhesive gets stronger over time and is not affected by UV.

- ▶ 1: Reflection SWR 0.2 / Ref 1.000
- ▶ 2: Transmission Log Mag 10.0 dB / Ref 0.00 dB



1: Mkr (MHz)	2: Mkr (MHz) dB
1 > 476.9533 1.262	

VSWR
(in this example for antenna with center frequency 470MHz)



Typical Dimensions
(actual dimension varies for different design center frequencies)

GPS

The **Laser Clear*** transparent antenna is an innovation bought about by the need for discreet and high performance antennas used on wireless communication systems.

This planar and transparent antenna, designed to be mounted inside the windshield, has been engineered to give exceptional performance for GPS reception. The connector at the antenna end has a built-in microchip low noise amplifier (LNA) to boost the gain at the source by 23dB.

Its patented construction uses a conductive element on a clear and flexible substrate. The proprietary connector interfaces the antenna with RG174 coaxial cable for flexible installation ease.



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EXCELLENT PERFORMANCE

compared to in-vehicle mounted GPS antennas is achieved through the geometry of the printed circuit artwork and the direct connection of the antenna to the coaxial cable. Being mounted on the windshield gives this antenna a large “view” of the sky and satellites , a feature not possible by dashboard mount antenna systems.

LOW NOISE AMPLIFIER (LNA)

in addition to the passive gain (4.5dBi) of the antenna, the connector at the antenna end has a built-in LNA to boost the gain by an additional 23dB.

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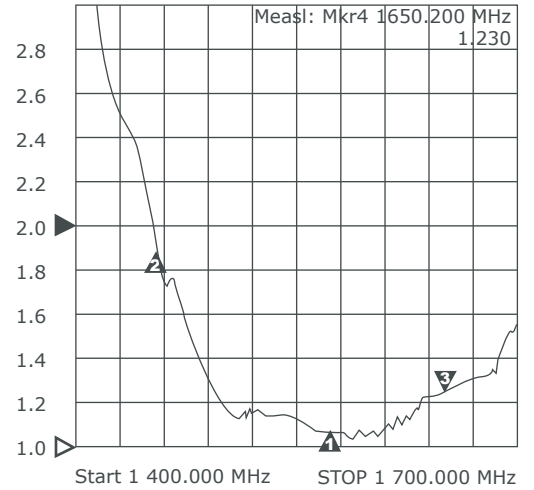
Electrical

- Radiator:** 2 x full-wave loop with common center element @ 1575MHz.
- Bandwidth:** >50MHz
- Antenna Gain:** (Passive) 4.5dBi
- LNA Gain:** (Active) 23dB
- System Gain:** 27.5dB = Antenna + LNA
- VSWR:** << 1.2:1 @ Band Centers
- LNA Operating Voltage:** +3 ~ +5v

Mechanical

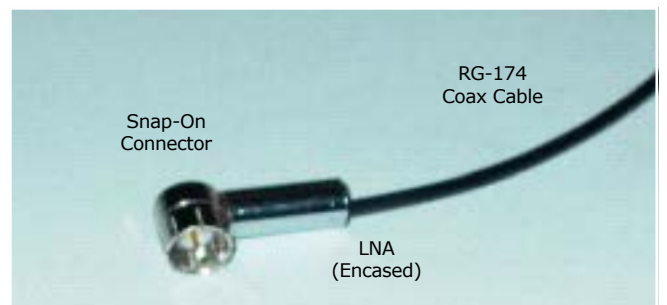
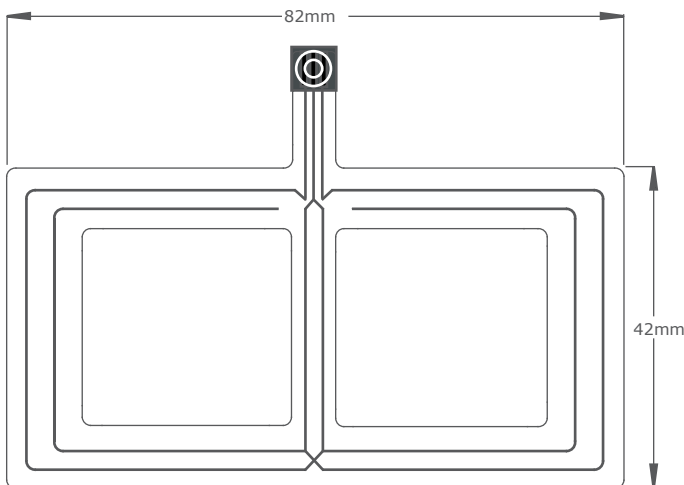
- Radiating Element:** Copper plated (10~15um) silver ink track.
- Substrate:** Clear Polyester/Mylar film (180um). Not affected by UV.
- Adhesive/Dielectric:** 3M 467 Epoxy. This adhesive gets stronger over time and is not affected by UV.

- ▶ 1: Reflection SWR 0.2 / Ref 1.000
- ▶ 2: Transmission Log Mag 10.0 dB / Ref 0.00 dB



1: Mkr (MHz)	2: Mkr (MHz) dB
1: 1575.0000	1.036
2: 1455.8000	1.888
3> 1650.2000	1.230

VSWR



Cellular / GPS

The **Laser Clear*** transparent antenna is an innovation bought about by the need for discreet and high performance antennas used on cellular systems.

Since its original conception as a UHF (460MHz) antenna for unmarked police vehicles, this planar and transparent antenna, designed to be mounted inside the windshield, has been engineered to give exceptional multi-band performance.

Its patented construction uses a conductive element on a clear and flexible substrate. The geometry of the circuit is designed to give broad-band performance on 806-960MHz (CDMA & GSM). There is also a window of low VSWR on the 1575MHz GPS as well as the 1710-1850MHz and 1850-1990MHz bands.

For vehicle tracking and similar functions a low-profile splitter / amplifier is available. The output from this is two separate cables which go to the respective GPS receiver and cell-phone. The GPS side of the circuit has a built-in LNA providing 23dB gain in addition to the antenna's passive gain (4.5dBi).



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EXCELLENT PERFORMANCE

compared to currently available "on-glass" wire antennas, superior performance in the order of 3~10dB is achieved through the geometry of the printed circuit artwork and the direct connection of the antenna to the coaxial cable as against the through-glass capacitive coupling used by external "on-glass" antennas.

MULTI FUNCTION

the multi-band capabilities of this design enable utilising CDMA-GSM-GPS devices and negates the need for multiple antennas. Other uses such as PORTABLE EFTPOS, DATA-MODEMS, VENDING MACHINES, PARKING-METERS, VEHICLE and INVENTORY TRACKING, are being identified on a regular basis.

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EU Patent No.: 0 903 805 **New Zealand Patent No.:** 519 721
Patent Pend.: Australia, China, Japan

Electrical

Radiator: 2 x full-wave loop with common center element @ 900MHz. Multiple wavelengths @ GPS and 1800MHz.

Gain: 4.5dBi @ CDMA - GSM900
6.5dBi @ GSM1800
5.0dBi @ GPS +23dB LNA

VSWR: <2:1 for specified ranges

VSWR: <1.5:1 @ Band Centers (TX & RX)

Polarisation: Mixed

Max Power: 10 Watts

Mechanical

Radiating Element: Copper plated (10~15um) silver ink track.

Substrate: Clear Polyester/Mylar film (180um).
Not affected by UV

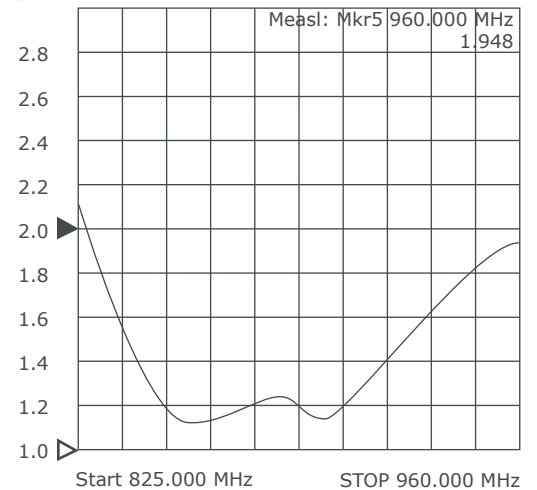
Adhesive/Dielectric: 3M 467 Epoxy. This adhesive gets stronger over time and is not affected by UV.

Cable & Connector

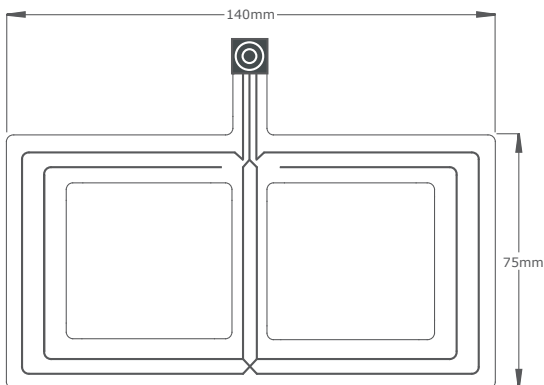
1 metre RG174 terminated with proprietary *Snap-On* coaxial connector for antenna end and FME female for equipment or extension cable.

3 metres RG58 Low Loss extension cable terminated with FME male and FME female.

▶ 1: Reflection SWR 0.2 / Ref 1.000
▶ 2: Transmission Log Mag 10.0 dB / Ref 0.00 dB

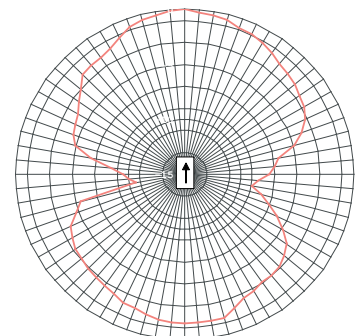
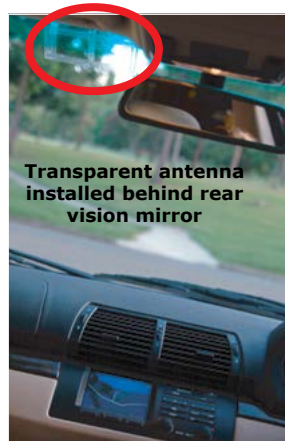


VSWR
825 - 960MHz



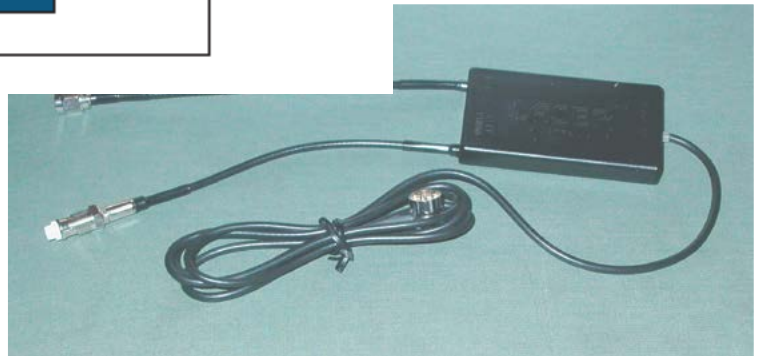
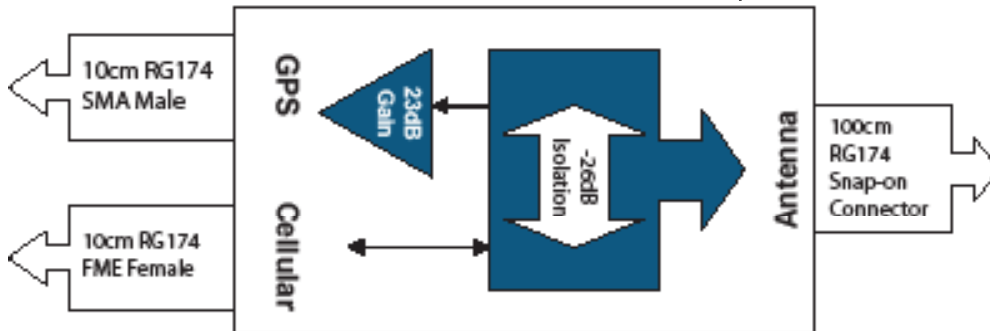
Typical Dimensions
(actual dimension varies for different design center frequencies)

Note: adhesive backing paper on antenna is not yet removed in this photo.



900MHz Azimuth
Typical Front Windshield Location

LNA - Splitter Unit



“If you haven’t seen our Laser Clear products, then we’ve done a good job”

The LNA - Splitter is specifically designed to complement the Laser Clear Transparent Antenna, when used as a multi-band Cellular / GPS unit.

Packaged in a low-profile shell 68mm x 40mm x 8mm, it lends itself to discreet installations in keeping with the covert nature of the Transparent Antenna.

Built-in Low Noise Amplifier (LNA) for GPS (1575MHz) is rated at 23dB and operates with either standard 3v or 5v supplied via the RG174 signal cable.

Isolation between Cell phone port and GPS port is -26dB.