

# Signal Booster Installation Guide

## In-Line

17dB Adjustable Gain  
800/1900 MHz  
Smart Technology II™  
Signal Booster



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Appearance of device and accessories may vary.

**Note:** This manual contains important safety and operating information. Please read and follow the instructions in this manual. Failure to do so could be hazardous and result in damage to your Signal Booster.

# Installation Instructions for the Following Wilson Signal Booster:

**In-Line**, 17dB Adjustable Gain 800/1900 MHz

Smart Technology II™ Signal Booster

Model # 276215    FCC ID: PWO276215    IC: 4726A-276215

The term "IC" before the radio certification number only signifies that Industry Canada technical specifications were met.

## How it Works

Wilson Electronics Signal Boosters are bi-directional devices that deliver service levels consistent with what would be expected in areas of high cell network coverage. They amplify a weak or shadowed signal in mobile, marine and in-building applications. When using a Wilson Electronics Signal Booster in conjunction with Wilson Electronics antennas, the Outside Antenna will collect the cell tower signal and send it through the cable to the Signal Booster. The signal is then amplified and re-transmitted through the Inside Antenna into the room. Cell phones and cellular data cards in that area then communicate with the improved signal. When a cell phone or cellular device transmits, the signal is received by the Inside Antenna, amplified by the Signal Booster and broadcasted back to the cell tower through the Outside Antenna. The In-Line Signal Booster (806215) is designed to offset cable and splitter/tap loss for in-building installations. It should be used on the Inside Antenna side of a Wilson Electronics In-Building Signal Booster such as the AG Pro 75.

## Inside this Package

*Note: Kits may contain different accessories*



AC/DC  
Power  
Supply



In-Line  
Signal Booster  
(806215)



### Indoor Antenna Option

Wide-Band Panel Antenna  
700-2700MHz (301135 50 ohm,  
301155 75 ohm, 304451 50 ohm,  
304452, 304453, 304471 75 ohm,  
304472, 304473)

### Splitter Options



2-Way (859957)



3-Way (859980)



4-Way (859981)

### Tap Option



(859907)

Appearance of device and accessories may vary.

To purchase, call Wilson Electronics Sales Department at: 800-204-4104


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Contact Wilson Electronics Technical Support Team with any questions at 866-294-1660 or email: [tech@wilsonelectronics.com](mailto:tech@wilsonelectronics.com). Mon.- Fri. Hours: 7 am to 6 pm MST.

## Quick Install Overview

See Installation Diagram on page 3. Contact Wilson Electronics Technical Support Team with any questions at 866-294-1660.

1. Install In-Building Signal Booster (such as the AG Pro 75 sold separately). Use the installation guide for the model you purchased to install.
2. Select a location to install the In-Line Signal Booster that is away from excessive heat, direct sunlight, moisture and has proper ventilation. Do not place the Signal Booster in an air-tight enclosure.
3. The In-Line Signal Booster should be placed where it can make up for installation gain loss due to cable, taps or splitters. Optimal location is near or directly connected to the Inside Antenna.
4. a) Connect a cable to the in-building Signal Booster at the connector labeled "Inside Antenna."  
b) Run the cable to the In-Line Signal Booster, attach to the connector labeled "Outside Antenna."  
c) From the In-Line Signal Booster connector marked "Inside Antenna" run a cable to the Inside Antenna. For more information on running cable (see diagram on pages 3 & 4).
5. Before powering up the In-Line Signal Booster, verify that all cables are connected and check that all connections are tight. **Note:** *Be careful when plugging the connectors in so as not to bend the center pins on the connectors (see page 7).*
6. The In-Line Signal Booster has been packaged with the gain control knobs adjusted to the highest gain position. If one or both of the lights are not green (see pages 9 & 10).

 **Warning:** Connecting the Signal Booster directly to a cell phone with use of an adapter may damage the cell phone and/or the Signal Booster.

# Installation Diagram

**Note:** Do not install the In-Line without an In-Building Signal Booster between the Outside Antenna and In-Line.

**Note:** Install the In-Line close as possible to Inside Antenna for optimal performance.

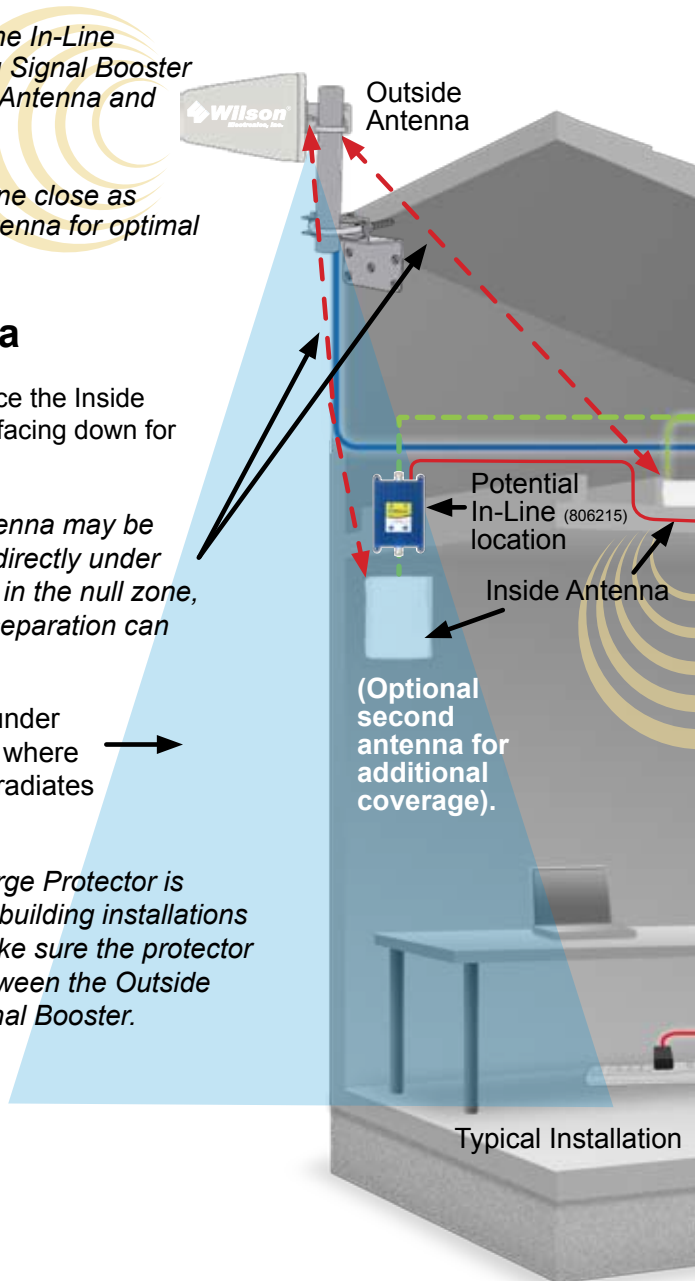
## Inside Antenna

Preferred Method: Place the Inside Antenna in the ceiling facing down for the best coverage.

**Note:** The Inside Antenna may be mounted on the wall directly under the Outside Antenna, in the null zone, if 20 feet of **vertical** separation can be maintained.

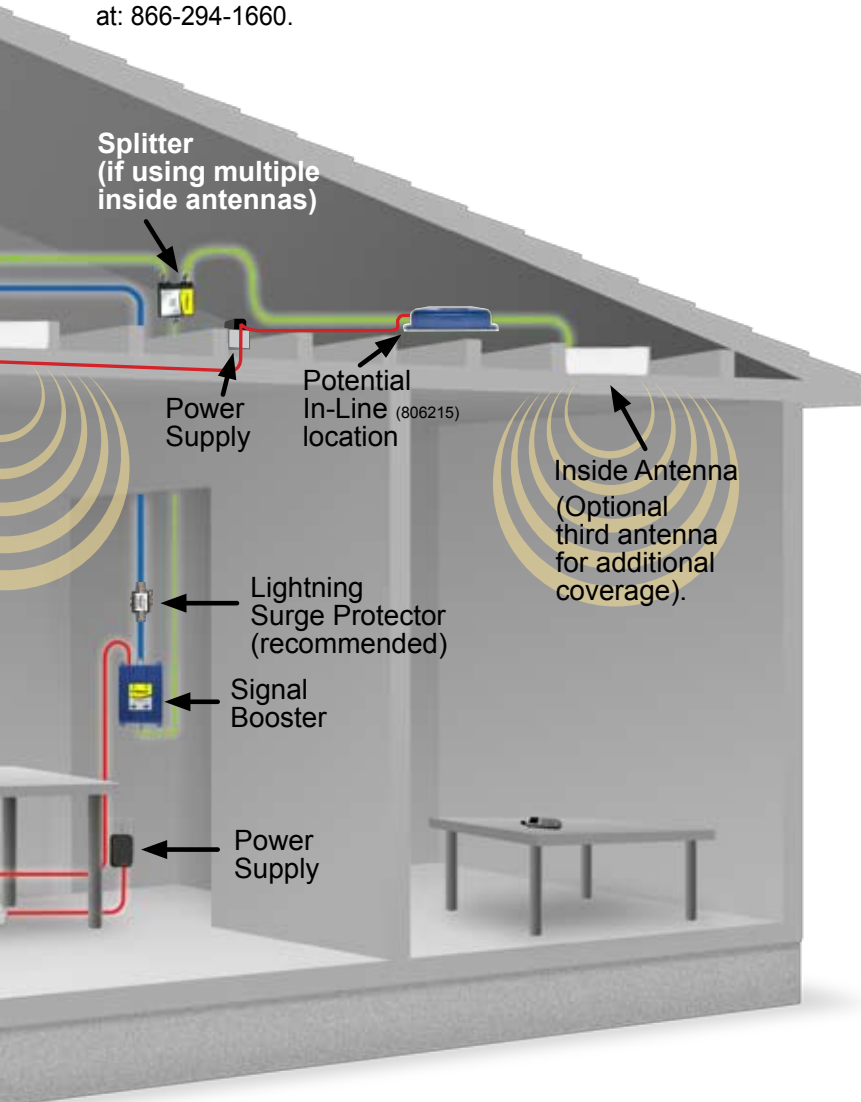
Null Zone: The area under the Outside Antenna, where the Outside Antenna radiates the least.

**Note:** A Lightning Surge Protector is recommended for all building installations (sold separately). Make sure the protector is installed in line between the Outside Antenna and the Signal Booster.



# Before Getting Started

This guide will help you properly install your Wilson Electronics Signal Booster. **It is important to read through all of the installation steps for your particular application prior to installing any equipment.** Read through the instructions, visualize where all the equipment will need to be installed and do a soft installation before mounting any equipment. Contact Wilson Electronics Technical Support with any questions at: 866-294-1660.



# Reasons for Using a In-Line Signal Booster with In-Building Installations

Covering multiple rooms or even floors of a building can be challenging as each is a different size and shape. Balancing the signal coverage can require multiple attenuators, cables, taps and splitters. All of these can decrease your system gain and coverage. Reasons to install an In-Line Signal Booster include:

1. Cable loss – Long runs of cable from the Inside Antenna to the main Signal Booster may have significant loss or require expensive low-loss cable.
2. Splitter loss – When multiple rooms must be evenly covered, a splitter evenly divides the signal for separate Inside Antennas. Each division reduces system gain and inside coverage area.
3. Tap loss – Taps pass the signal with low attenuation out one port and pass the signal with high attenuation port continues on to another location possibly with more splitters and taps downstream. The attenuation port typically runs directly to an Inside Antenna.
4. Increased system dynamic range – A user who gets too near an Inside Antenna can lower the gain and coverage area for all other users. The In-Line Signal Booster adds dynamic range to the in-building installation and reduces use of the main Signal Booster automatic gain control.

The In-Line Signal Booster overcomes the losses associated with large in-building installations. The Signal Booster recovers inside coverage area that is normally lost due to cable, splitter and tap loss. By installing the Signal Booster near an Inside Antenna, uplink noise figure is minimized and downlink power is maximized. Additionally, the In-Line Signal Booster enhances performance of the main Signal Booster by increasing the system gain and input signal dynamic range. The variable gain knobs on the In-Line allow for simple, quick signal level balancing and installation.

# Installing a Wilson Electronics In-Line Signal Booster

Select a location to install the In-Line Signal Booster that is away from excessive heat, direct sunlight, moisture and has proper ventilation. Do not place the Signal Booster in an air-tight enclosure. Recommended installation locations for In-Line Signal Booster are:

- On a shelf
- In a closet
- Near a power outlet
- Near the Inside Antenna
- Where there is more than 5dB loss between In-Building Signal Booster and Inside Antenna

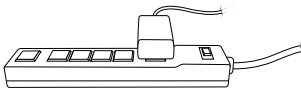
**Note:** *It is important to have adequate air ventilation. Maintain at least 6 inches of clearance from surrounding objects.*

The In-Line should be placed where it can make up for installation gain loss due to cable, taps or splitters. Optimal location is near or directly connected to the Inside Antenna.

**Note:** *For distances of 20 feet or more, use Wilson low loss cable to prevent significant signal loss or contact Wilson Electronics Technical Support Team for assistance: 866-294-1660.*

**Note:** *Be careful when plugging the connector in so as not to damage the center pins on the connectors.*

## IMPORTANT NOTICE



- It is very important to power your Signal Booster using a surge protected AC Power Strip with at least a **1000 Joule rating**.
- Failure to do this will void your warranty in the event of a power surge or lightning strike.

# Powering up a Wilson Electronics In-Line Signal Booster

1. Never point the front of a Directional Outside Antenna toward the Inside Antenna. See Figures 1 & 2 on page 8.
2. Run the antenna cable from the In-Building “Inside Antenna” connector to the In-Line Signal Booster “Outside Antenna” connector and attach to both connectors. Run the Inside Antenna cable to the In-Line Signal Booster and attach it to the connector labeled “Inside Antenna” on the In-Line Signal Booster. For more information on running cable (see page 3 & 4).
3. Plug the 6-volt power supply into the Signal Booster input marked “6V DC” (carefully, to avoid damaging the center pin) and then into a surge protected AC Power Strip with at least a **1000 Joule rating**.
4. If the Signal Booster does not have a green light(s), please see pages 9 & 10.
5. If you know that only one frequency band (800 or 1900) is available in your coverage area (or going to be used), reduce the gain control on the frequency band that is NOT in use to the lowest setting. This will reduce the power consumption of the Signal Booster.
6. Using multiple Signal Boosters other than the In-Line in one installation could cause interference to the cell tower.
7. Contact Wilson Electronics Technical Support Team with any questions at 866-294-1660 or email [tech@wilsonelectronics.com](mailto:tech@wilsonelectronics.com). Technical Support hours are Mon.- Fri. 7 am to 6 pm MST.



Figure 1

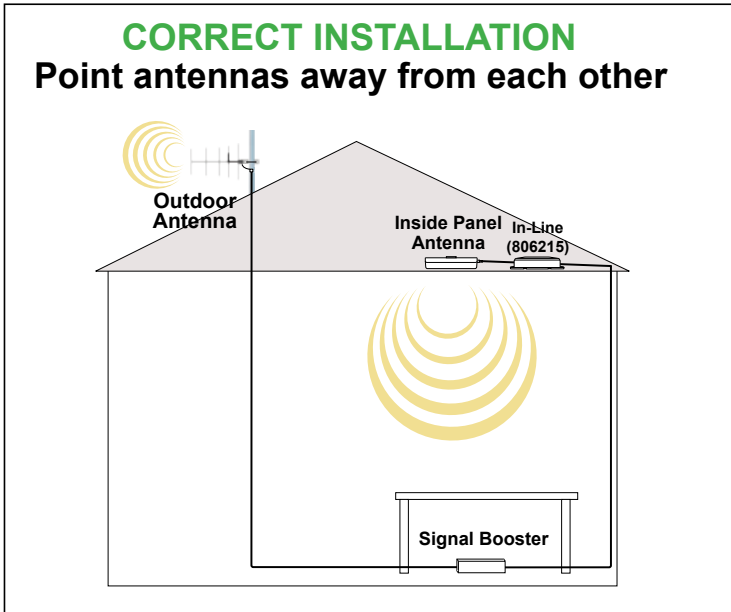
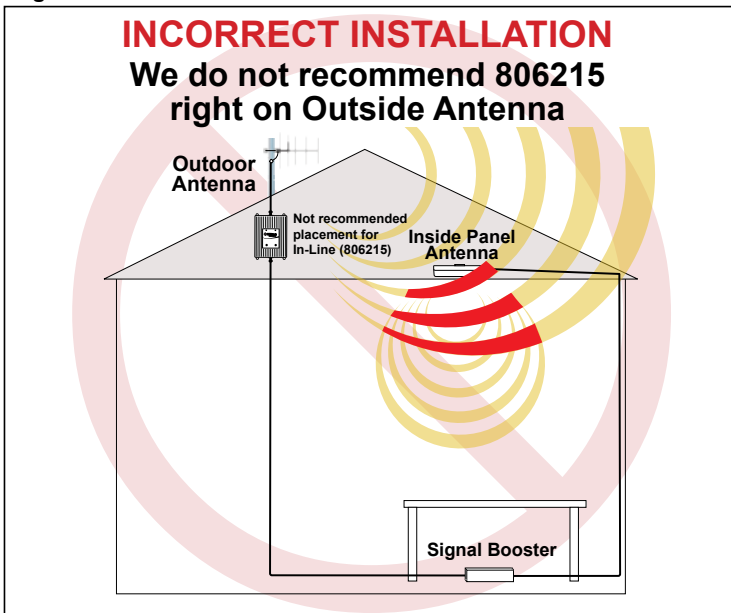


Figure 2



# Understanding the Signal Booster Lights and Troubleshooting

During installation mode the Signal Booster is resetting itself very quickly to aid the installer. The Signal Booster is equipped with two indicator lights, one for the 800 MHz band and the other for the 1900 MHz band. For the first 15 minutes that the Signal Booster is plugged in, it is programmed for a test and alignment period. During this time, both lights will do one of the following 3 things:



**Note:** *If after the initial 15 minutes you are not done with the installation, the Signal Booster can be reset and enter installation mode again by disconnecting and reconnecting the power supply from the Signal Booster.*

## 1. BLINKING GREEN

If the Signal Booster is blinking green, the Signal Booster is operating properly. If you are happy with the coverage area in your building, then you are done. Blinking will stop after the 15 minute installation period.

## **2. SOLID RED**

If either of the two lights on the Signal Booster are solid red, this indicates that the Signal Booster has shut down on that frequency to prevent an oscillation (feedback). First, make sure that all the connections are tight. Then reduce the gain of the Signal Booster in small increments by rotating the gain control, counter clockwise, waiting 5 seconds between each adjustment for the Signal Booster to reset. Continue this adjustment until the light turns blinking or solid green. When you are turning down the gain, you are reducing the inside coverage area. If the amount of coverage area is sufficient for your needs and the light is green the installation is complete. If the coverage area is not large enough, it is necessary to increase the separation distance of the antennas by moving them horizontally or vertically farther apart, or both. Then increase the gain until the red light comes on, and then slightly keep decreasing the gain until the green or blinking green light appears. If after separating the antennas your coverage area is still too small, contact Wilson Electronics Technical Support Team for assistance: 866-294-1660.

If your installation takes longer than 15 minutes, it is possible to re-enter the installation mode by disconnecting and reconnecting the power supply from the Signal Booster.

## **3. SOLID GREEN**

The indicator lights on the Signal Booster will be a solid green after the first 15 minute installation period, if the unit is powered up and working properly.



## Warnings and Recommendations

- ⚠ Warning:** The Directional Antenna must always be located so the back or side points to the Inside Antenna. Never point the front of the Outside Antenna toward the Inside Antenna – this is to prevent oscillation.
- ⚠ Warning:** Connecting the Signal Booster directly to the cell phone with use of an adapter will damage the cell phone.
- ⚠ Warning:** Use only the power supply provided. Use of a non-Wilson Electronics product may damage your equipment.
- ⚠ Warning:** **RF Safety:** FCC regulations require that the Inside Antenna used with this Signal Booster be listed on page 1 of this installation guide. Use of other antennas is not permitted. The antenna must be located 8 inches or more from all persons.
- ⚠ Warning:** Verify that both the Outside Antenna and the Inside Antenna are connected to the Signal Booster before powering up the Signal Booster.

**Recommendation:** *Lightning Surge Protection is recommended for all in-building installations.*



## About Wilson Electronics

Wilson Electronics, Inc. has been a leader in the wireless communications industry for over 40 years. The company designs and manufactures Signal Boosters, antennas and related components that significantly improve cellular phone signal reception and transmission in a wide variety of applications, both mobile (vehicle, RV, marine) and in-building (home, office, M2M).

With extensive experience in antenna and Signal Booster research and design, the company's engineering team uses a state-of-the-art testing laboratory, including an anechoic chamber and network analyzers, to fine-tune antenna designs and performance. For its Signal Boosters, Wilson Electronics uses a double electrically insulated RF enclosure and cell tower simulators for compliance testing.

Wilson Electronics Signal Boosters feature patented Smart Technology II™ that enables them to automatically adjust their power based on cell tower requirements. By detecting and preventing oscillation (feedback), signal overload and interference with other users, these Smart Technology II™ Signal Boosters improve network cell phone areas without compromising carrier systems.

All products are engineered and assembled in the company's 55,000-square-foot headquarters in St. George, Utah. Wilson Electronics has product dealers in all 50 states as well as in countries around the world.

## 30-Day Money-Back Guarantee

All Wilson Electronics products are protected by Wilson Electronics 30-day money-back guarantee. If for any reason the performance of any product is not acceptable, simply return the product directly to the reseller with a dated proof of purchase.

## 1-Year Warranty

Wilson Electronics Signal Boosters are warranted for one (1) year against defects in workmanship and/or materials. Warranty cases may be resolved by returning the product directly to the reseller with a dated proof of purchase.

Signal Boosters may also be returned directly to the manufacturer at the consumer's expense, with a dated proof of purchase and a Returned Material Authorization (RMA) number supplied by Wilson Electronics. Wilson Electronics shall, at its option, either repair or replace the product. Wilson Electronics will pay for delivery of the repaired or replaced product back to the original consumer if located within the continental U.S.

This warranty does not apply to any Signal Booster determined by Wilson Electronics to have been subjected to misuse, abuse, neglect, or mishandling that alters or damages physical or electronic properties.

Failure to use a surge protected AC Power Strip with at least a 1000 Joule rating will void your warranty.

RMA numbers may be obtained by phoning Technical Support at 866-294-1660.

**Disclaimer** : The information provided by Wilson Electronics, Inc. is believed to be complete and accurate. However, no responsibility is assumed by Wilson Electronics, Inc. for any business or personal losses arising from its use, or for any infringements of patents or other rights of third parties that may result from its use.



This device complies with Part 15 of FCC rules. The transaction is subject to two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications not expressly approved by Wilson Electronics could void the authority to operate this equipment.

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One or more of the following U.S. Patent numbers may apply to the Signal Booster in this product – D596,614; D596,615; D563,381; 7,729,669; 7,486,929; 7,729,656; 7,409,186; 7,783,318; 7,684,838; 12,714,994.

## In-Line 17 dB Specifications

<b>Model Number</b>	276215		
<b>Antenna connectors</b>	N-Female		
<b>Antenna impedance</b>	50 ohms		
<b>Dimensions</b>	5.7 x 4.2 x 1.5 inch (14.0 x 10.8 x 3.9 cm)		
<b>Weight</b>	1.27 lbs (0.544 kg)		
<b>Frequency</b>	824-894 MHz / 1850-1900 MHz		
<b>*Passband Gain (nominal)</b>			
	800 MHz	uplink / downlink	17 dB typical, 18 dB max / 19 dB typical, 21 dB max
	1900 MHz	uplink / downlink	16 dB typical, 18 dB max / 18 dB typical, 21 dB max
<b>*20 dB Bandwidth (nominal)</b>			
		Uplink	Downlink
	800 MHz	26 MHz typical, 29 MHz maximum	29 MHz typical, 32 MHz max
	1900 MHz	63 MHz typical, 69 MHz maximum	63 MHz typical, 70 MHz max
<b>Power Output</b>			
		800 MHz	1900 MHz
	Power output for single cell phone (uplink)	-3.7 dBm	-2 dBm
	Power output for single received channel (downlink)	30.2 dBm	30.5 dBm
<b>*Power output for multiple transmitted channels (uplink)</b>			
		Maximum Power	
The maximum power is reduced by the number of channels:	Number of channels	800 MHz	1900 MHz
	2	-10.6 dBm	-9.4 dBm
	3	-14.1 dBm	-12.9 dBm
	4	-16.6 dBm	-15.4 dBm
	5	-18.5 dBm	-17.4 dBm
	6	-20.1 dBm	-19.0 dBm
<b>*Power output for multiple received channels (downlink)</b>			
		Maximum Power	
The maximum power is reduced by the number of channels:	Number of channels	800 MHz	1900 MHz
	2	22.3 dBm	21 dBm
	3	18.8 dBm	17.4 dBm
	4	16.3dBm	14.9 dBm
	5	14.4 dBm	13.0 dBm
	6	12.8 dBm	11.4 dBm
<b>Noise Figure (typical downlink/uplink)</b>	3.5 dB nominal / 6 dB nominal		
<b>Isolation</b>	> 90 dB		
<b>Power Requirements</b>	110-240 V AC, 50-60 Hz, 8 W		

**Notes:**

- Nominal gain is the maximum gain at any frequency in the passband.
- Nominal bandwidth is the difference between two frequencies that are adjacent to the passband where the amplification is 20 dB lower than the passband amplification. One of the frequencies is lower than the passband and the other is higher.
- The Manufacturer's rated output power of this equipment is for single carrier operation. For situations when multiple carrier signals are present, the rating would have to be reduced by 3.5 dB, especially where the output signal is re-radiated and can cause interference to adjacent band users. This power reduction is to be by means of input power or gain reduction and not by an attenuator at the output of the device.
- The maximum power for 2 or more simultaneous signals will be reduced by 6 dB every time the number of signals is doubled.



3301 East Deseret Drive, St. George, UT 84790

For additional Technical Support visit [www.WilsonElectronics.com](http://www.WilsonElectronics.com)

or email at: [tech@wilsonelectronics.com](mailto:tech@wilsonelectronics.com)

Phone: 866-294-1660 Local: 435-673-5021 Fax: 435-656-2432

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