

# S18WI Splitter for Wireless Infrastructure

## Technical Product Data

### Features

- **Amplified to Offset Splitter Losses**
- **Standard Antenna DC Bias Select**
- **Optional Antenna Current Monitor and Alarm**
- **Optional Filtered L1 Output**
- **Pole-mount Environmental Housing Available (IEC 529 level IP55)**
- **Surge Protection Standard (Tested to EN61000-4-5)**



### Description

Eliminate the cost of multiple antennas and long cable runs in your wireless base stations! Designed to meet the demanding, high reliability requirements of the wireless infrastructure market, the GPS Source S18WI is a high performance GPS signal splitter. The device can be configured to monitor the GPS antenna current, providing an alarm indication if the antenna is not operating according to spec. The S18WI also features a standard antenna DC bias “Pick-&-Choose” circuit which allows for the active antenna DC input to be applied to any or all of the RF outputs. With this option, one DC voltage will be chosen to power the antenna while the other inputs will be switched to DC loads. If the selected DC bias input should fail, the DC bias will be automatically switched to another DC input so as to ensure an uninterrupted supply to the active antenna. The S18WI is an active device with customer defined gain, giving the network engineer the flexibility to specify the device gain and port-to-port isolation. The S18WI also features an option for Filtered L1 output that offers excellent selectivity around the L1 band to prevent interference from other high power radio frequency sources, such as cellular transmitter stations. The S18WI offers surge protection on all nine ports and in a sealed housing sufficient for many years of operation in external environments.

The GPS Source S18WI can be custom designed to fit your unique infrastructure requirements. Please call, fax, email ([sales@gpssource.com](mailto:sales@gpssource.com)), or visit our website ([www.gpssource.com](http://www.gpssource.com)) for further information on product options & specifications.

**Electrical Specifications, Operating Temperature -40 to 85 °C**

Parameter	Conditions	Min	Typ	Max	Units
Freq. Range <sup>(1)</sup>	Ant – Any Port, Unused Ports - 50 Ω <sup>(2)</sup>	1.2		1.6	GHz
Bandwidth (3dB) Filtered Option		-15	1575.42	+15	MHz
Selectivity(Filtrd Opt)	+/-50MHz, Ant Output		40		dB
Gain <sup>(3)</sup> -Amplified (Norm) -Amplified (Hi Iso.)	Ant – Any Port, Unused Ports - 50 Ω <sup>(2)</sup> (Gain may be specified by the customer)	13 4	15 6	17 8	dB
Input/Output SWR	All Ports 50Ω <sup>(2)</sup>		1.3:1	2.0:1	-
Gain Compression Point (P1dB)	Filtered Option: -1565MHz < f < 1586MHz - For f <1560MHz and f > 1591MHz Unfiltered Option:	-35 -25 -25			dBm
RF Input (damage Threshold)	1575MHz +/-50MHz, Ant Output			+10	dBm
Noise Figure- Amplified	Ant – Any Port, Unused Ports - 50 Ω <sup>(2)</sup> , Gain = 15dB			3.0	dB
Amp. Balance	J1 - J2 , Ant–Any Port, Unused Ports - 50 Ω <sup>(2)</sup>			1.0	dB
Phase Balance	Phase (J1 - J2), Ant – Any Port, Unused Ports - 50 Ω <sup>(2)</sup>			1.0	deg
Delay	Ant – Any Port, Unused Ports - 50 Ω <sup>(2)</sup> , L1			5	ns
Isolation -Gain = 6dB	Adjacent Ports: Ant – 50Ω <sup>(2)</sup> Alternate Ports: Ant – 50Ω <sup>(2)</sup>	35 35			dB
DC IN	DC Input on any RF Output	4		12	VDC
Out-to-IN V <sub>DROP</sub>	Antenna current of 30mA		0.1	0.25	VDC
Device Current	Current Consumption of Active device, excludes Ant. Cur.		18	20	mA
Ant/Thru Current <sup>(4)</sup>	Max source DC current through device			250	mA
Antenna Monitor <sup>(5)</sup>	I <sub>OC</sub>	Range for Open Circuit Threshold	15		75
	I <sub>SC</sub>	Range for Short Circuit Threshold <sup>(5)</sup>	100		180
Surge Protection	8/20us		4		KA

**Notes:**

- (1). The S18WI supports broad band (L1 & L2) or L1 only filtered options
- (2). For proper RF performance, the Splitter may require all RF ports terminated into a 50Ohm coaxial cable system or a 50Ω load
- (3). Custom gain option available. Gain may be specified by customer between 0 and 15dB.
- (4). Maximum current available from the DC source through the S18WI when output of S18WI is short circuited.
- (5). Open circuit and Short Circuit Current (I<sub>OC</sub>, I<sub>SC</sub>) may be specified by the customer within the specified range.
- (6). In-rush current shall not exceed 3A or exceed I<sub>sc</sub> for greater than 1ms

Performance Data

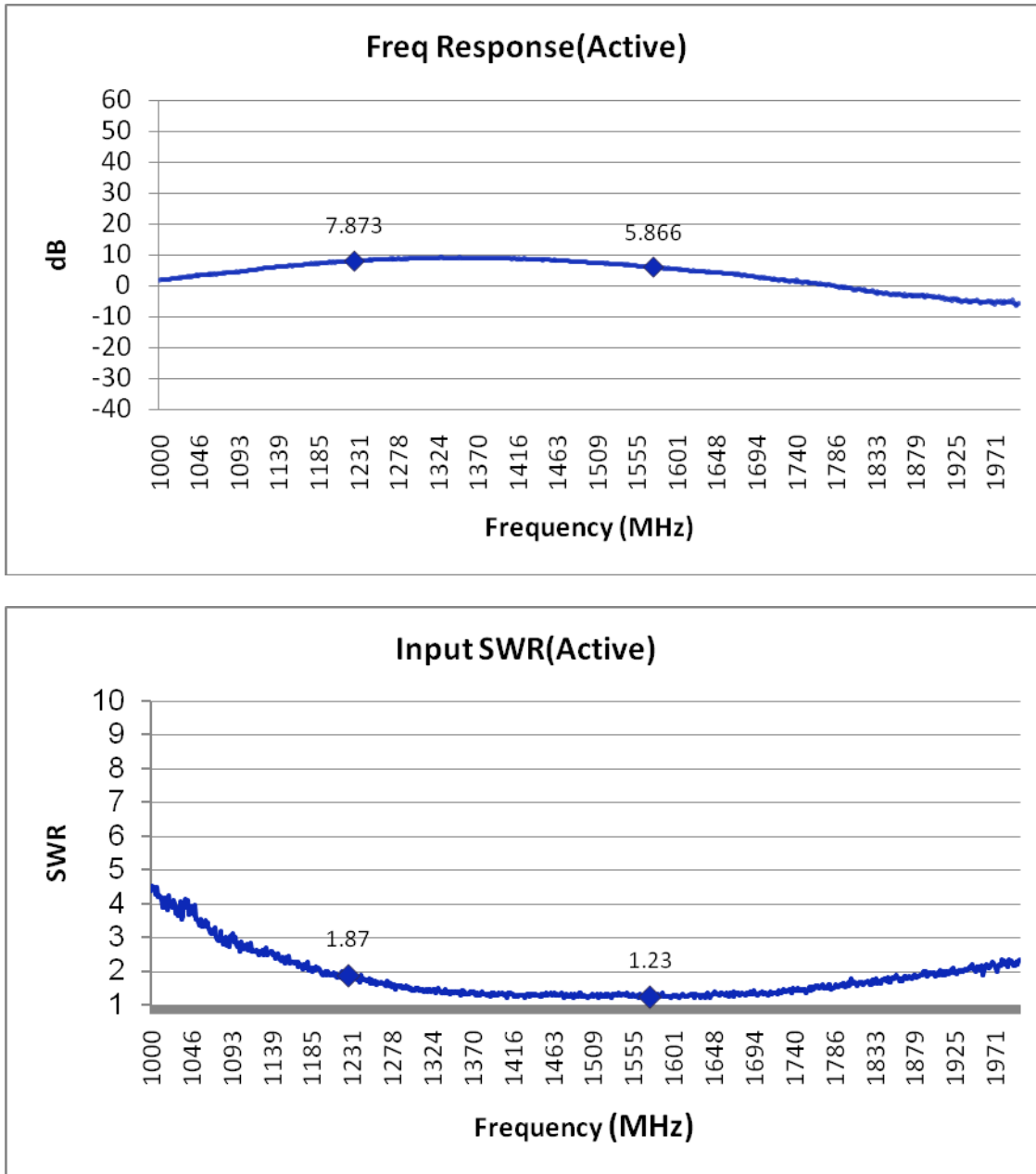


Figure 1. S18WI Active Performance

GPS Source, Inc. reserves the right to change or modify product performance and specifications without prior notification.

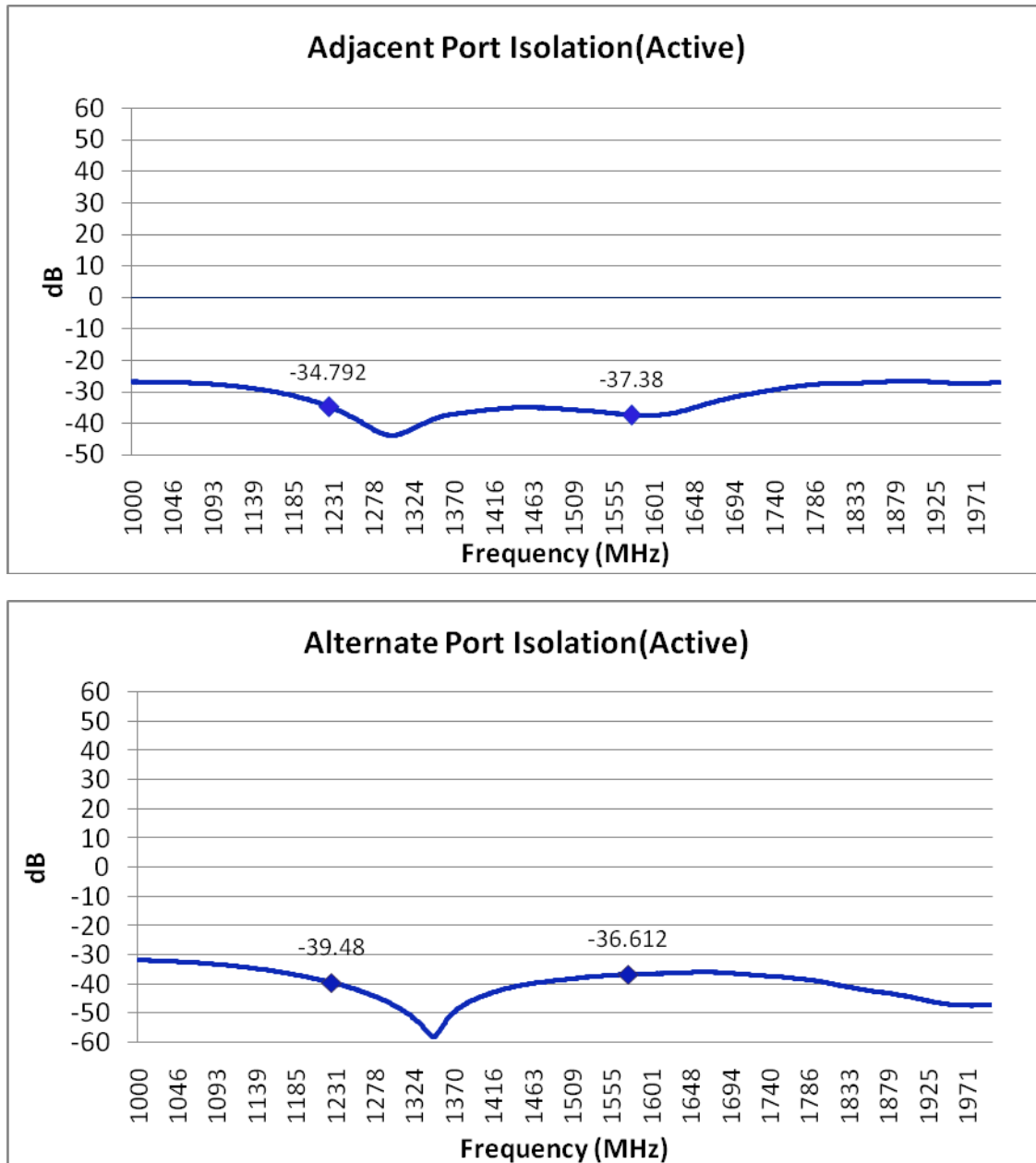


Figure 2. S18WI Active Output Port Performance

GPS Source, Inc. reserves the right to change or modify product performance and specifications without prior notification.

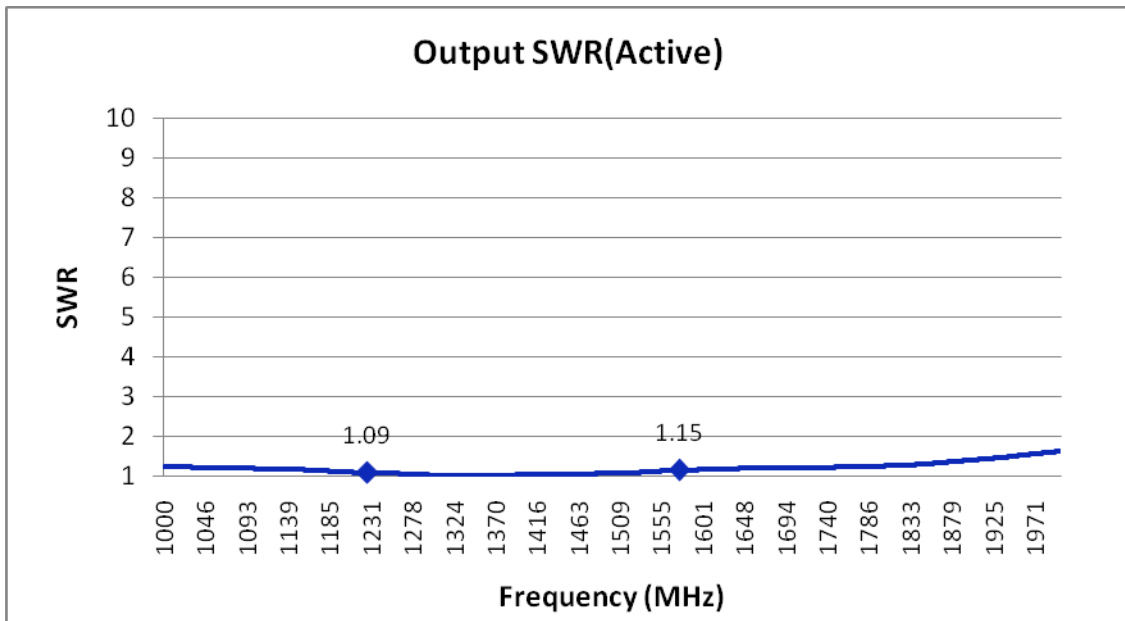


Figure 3. S18WI Active Output Port Performance

GPS Source, Inc. reserves the right to change or modify product performance and specifications without prior notification.

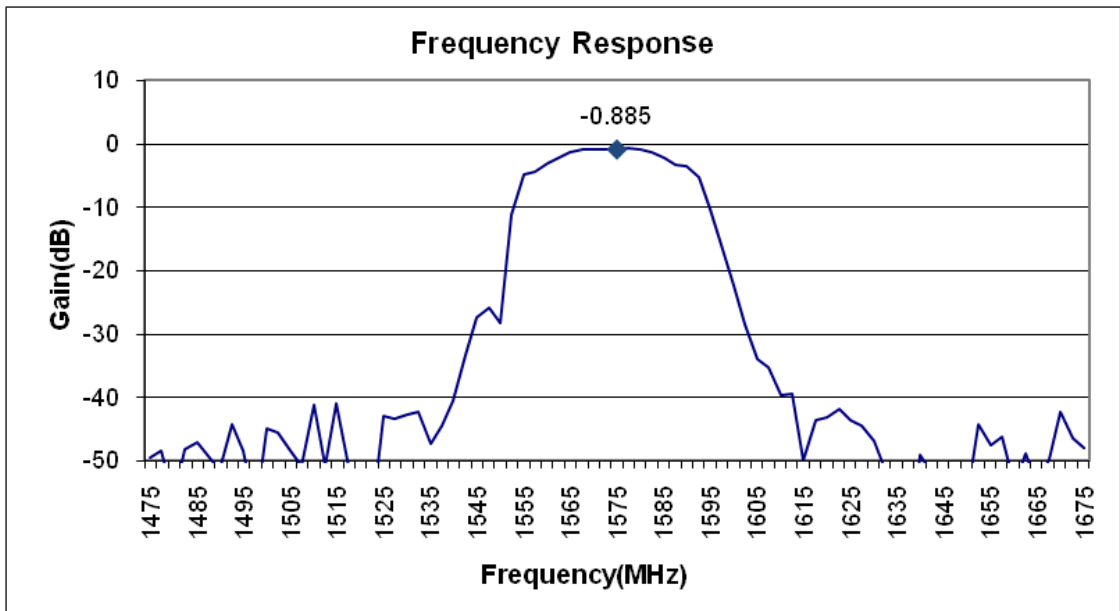
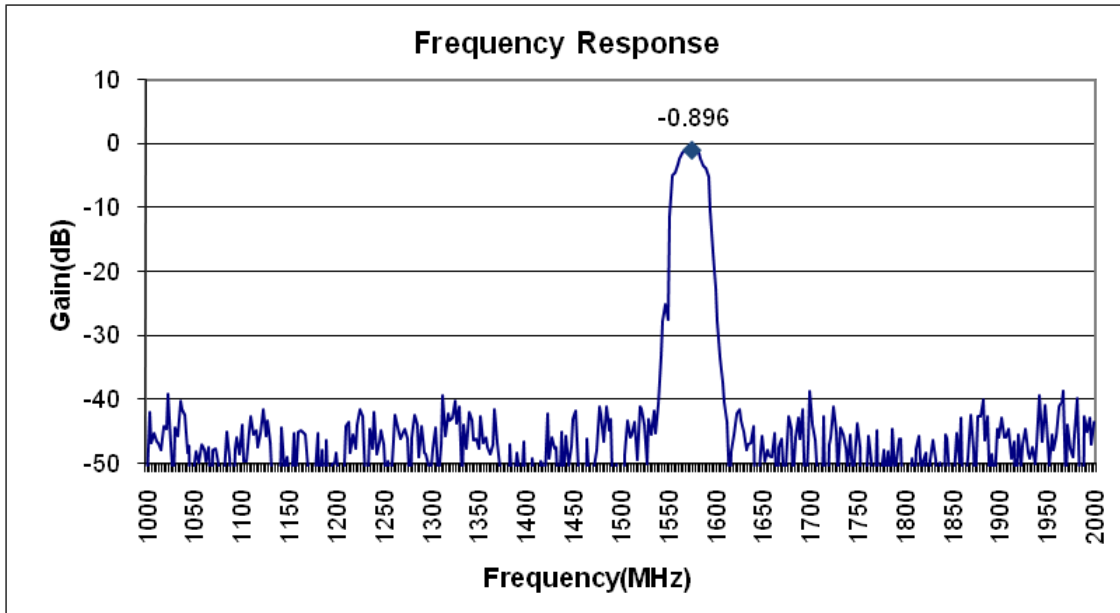


Figure 4. S18WI Output Port Performance (Filtered Option), Optional Gain set to 0dB

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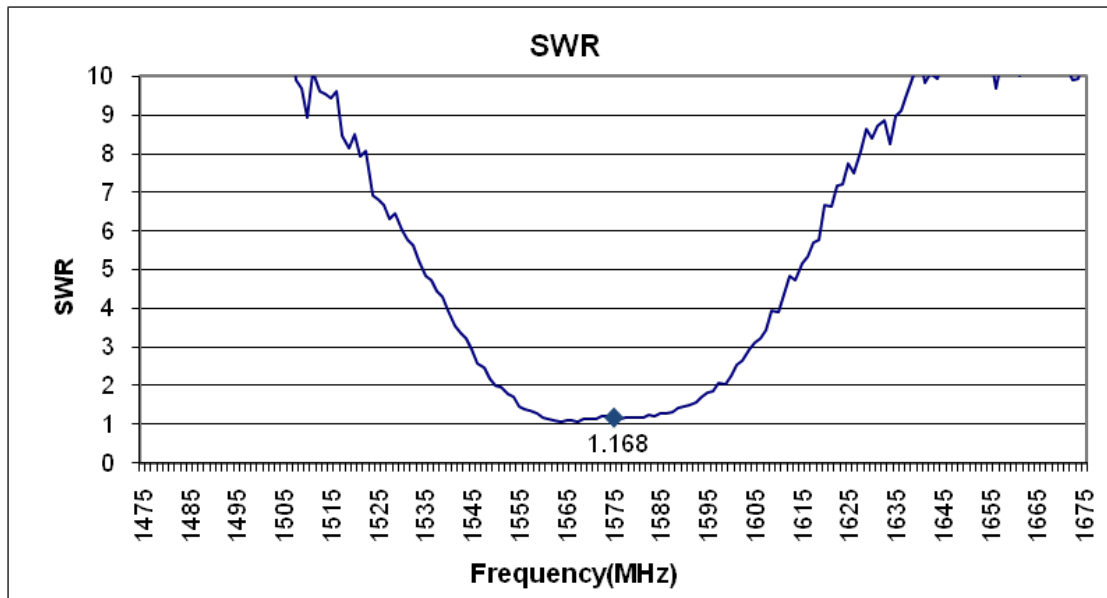


Figure 5. S18WI input SWR Performance (Filtered Option)

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## Operational Description

### Antenna DC Bias Select

The S18WI splitter requires that a DC voltage be applied to one or more of the RF output ports by way of the RF connector center conductor. If DC voltages are applied to more than one of the RF output ports, the S18WI pick-&-chose circuit will choose one of these DC inputs to power the active circuitry of the S18WI and will also pass this DC voltage through the splitter to the center conductor of the RF input port. The DC voltage available on the RF input port can then be used to power the application’s active antenna. The DC voltages applied to the RF outputs that are not chosen by the pick-&-chose circuitry will be automatically switched through an RF choke to 200Ω DC loads. The DC voltages may be applied to any or all of the RF outputs; however, the pick-&-chose circuit will always select the DC voltage on the lowest numbered RF port that has a DC voltage applied to power the S18WI and the application’s antenna. If the chosen DC input were to be removed or fail, the pick-&-chose circuit will automatically switch to the next higher numbered RF port to which a DC voltage is applied.

The S18WI requires that only one RF output port have an external DC voltage applied (i.e. the device will operate properly even if any one, two, or any number up to seven ports do not have a DC voltage applied or if a DC voltage is removed from one of the ports). Ports that do not have an external DC voltage applied or from which an external DC voltage is removed are internally pulled down so as to ensure that false input voltage indications do not occur.

*Example:*

Assume DC voltages are applied to RF outputs 1, 3, 4, 5, 6, 7 and 8. In this scenario, the DC voltage on port 1 will be used to power the S18WI and the application antenna. Ports 3 through 8 will be switched to 200Ohm DC loads.

Now assume that the DC voltage on port 1 is removed. The S18WI will automatically terminate the input internally with a pull down resistor and switch operation of the splitter and antenna to the DC voltage applied to the next high numbered port with a DC voltage applied: port 3. Port 4 through 8 will remain switched to a 200 Ohm load.

### Antenna Monitor and Alarm

The S18WI includes an option to monitor the status of the application's active antenna and to provide an alarm indication if the antenna's current is not within a specified range. The default current window for the S18WI is 10mA to 150mA (e.g. below 10mA indicates an open circuit, above 150mA indicates a short circuit); however, for large volume orders, the antenna current window may be specified to meet the customer's specific requirements.

The S18WI samples the antenna current 16 times per second. So long as the average of four samples are within the current window, the S18WI will continue to operate normally, passing the DC voltage applied to lowest number RF output on to the RF input. In this mode, DC voltages applied to the remaining RF outputs are switched to 200Ohm DC loads. If the average of four antenna current samples falls outside of the antenna monitor current window, the DC voltage to the antenna is removed (open circuit) and all DC inputs are switch to Pass DC. However, since the DC path to the antenna has been opened, the DC current on all eight DC inputs will be at or near zero (less than 5mA). In this alarm condition, all GPS receivers connected to the RF outputs will also see very low antenna current draw, resulting in corresponding antenna alarm conditions within each receiver.

Once in the alarm condition, the S18WI will periodically (every 60 seconds) attempt to re-connect DC power to the antenna. If the antenna failure condition persists, the S18WI will re-enter the fault condition, repeating this cycle until the fault condition is removed.

### Amplifier and Splitter

Due to the excessive splitter losses for an 8 output device, the S18WI is only available with amplification. Additional options are available for specifying the amplifier gain and the port-to-port isolation (see Hi Iso. option in electrical specifications). S18WI configurations that include the High Isolation option do not require 50Ω terminations on unused ports in order for the splitter to operate properly. Versions without the High Isolation option (i.e. gain > 6dB) always require 50Ω terminations on unused ports for proper operation.





## Certifications and Approvals

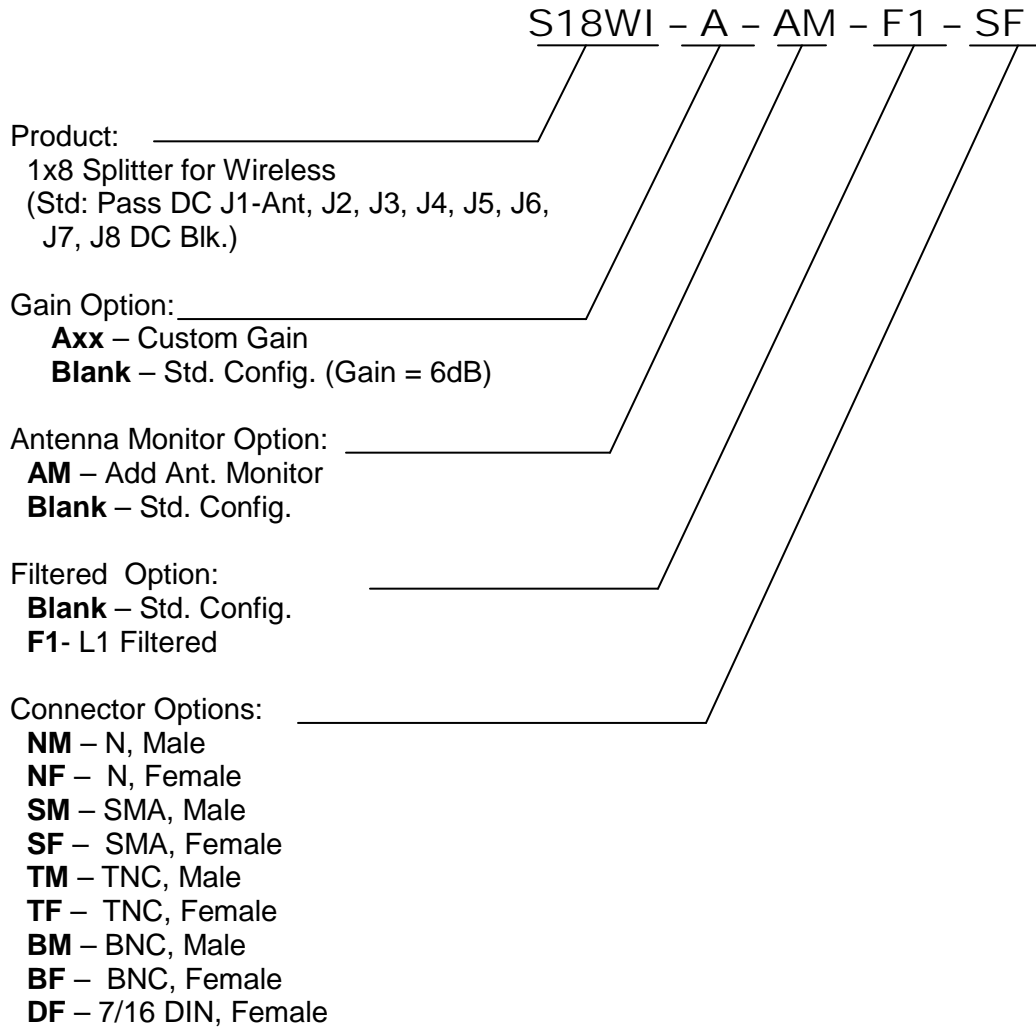
- EMC/Emissions: FCC part 15B and R&TTE equivalent
- Power Line Surge: IEC-61000-4-5
- Safety/Low Voltage: EN60950-1
- Environmental: IEC 60529, IP55



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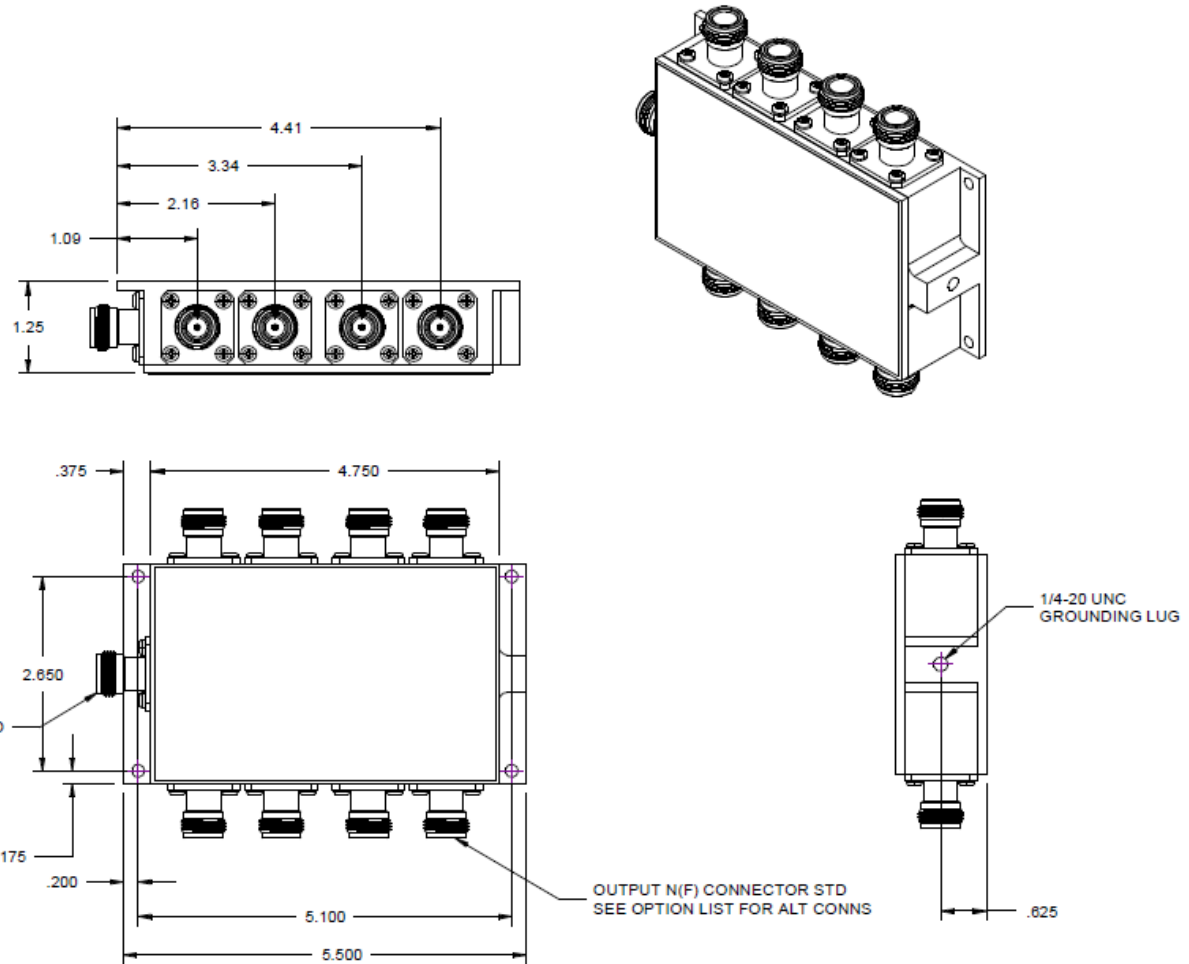
**(719) 561-9520**

Part Number:



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