S14WI Splitter for Wireless Infrastructure

Technical Product Data

Features

- **Active or Passive Options Available**
- **Optional Antenna Current Monitor and Alarm**
- **Optional Antenna DC Bias Select**
- **Pole-mount Environmental Housing Available (IEC 529 level IP55)**
- **Surge Protection Available (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 S14WI 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 S14WI also features an optional 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 S14WI may be configured as a passive or an active device, giving the network engineer the flexibility to specify the device gain and port-to-port isolation. The S14WI may also be ordered with surge protection on all five ports and in a sealed housing sufficient for many years of operation in external environments

The GPS Source S14WI can be custom designed to fit your unique infrastructure requirements. Please call, fax, email (sales@gpssource.com), or visit our website (www.gpssource.com) for further information on product options & specifications.

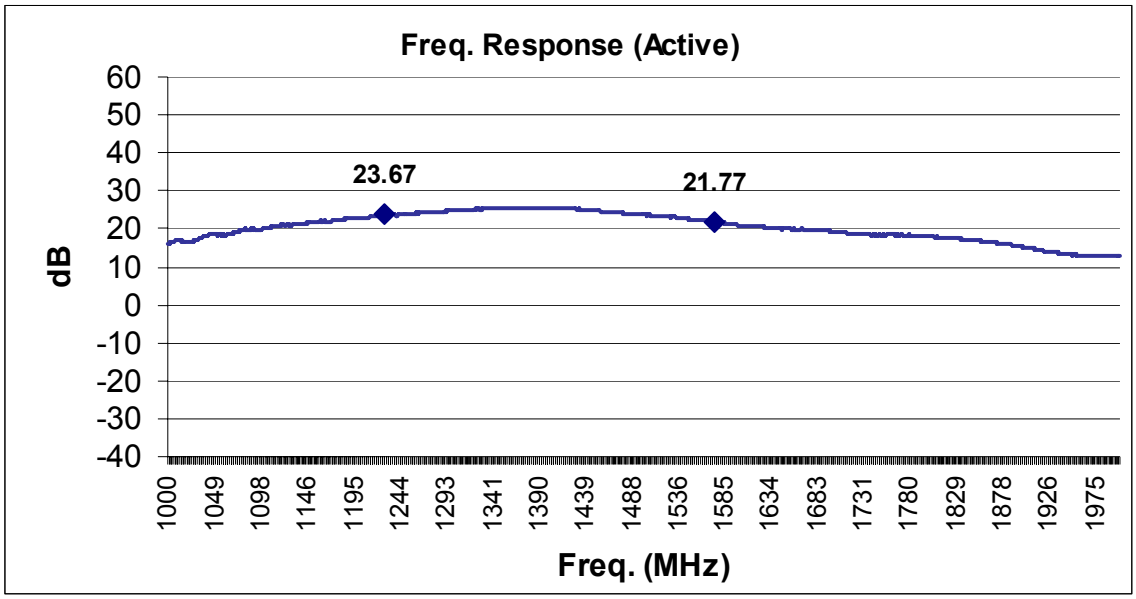
Electrical Specifications, Operating Temperature -40 to 85°C

Parameter		Conditions	Min	Typ	Max	Units
Freq. Range		Ant – Any Port, Unused Ports - 50 Ω[1]	1.2		1.7	GHz
Gain[2]		Ant – Any Port, Unused Ports - 50 Ω[1]				
-Amplified (Norm)		(Gain may be specified by the customer)	20	21	24	dB
-Amplified (Hi Iso.)			9	10	11	
Loss-Passive		Ant – Any Port, Unused Ports - 50 Ω[1]	7	9.0	9.5	dB
Input/Output SWR		All Ports 50Ω[1]		1.3:1	2.0:1	-
Noise Figure-Amplified		Ant – Any Port, Unused Ports - 50 Ω[1], Gain = 20dB			2.0	dB
Amp. Balance		|J1 - J2|, Ant–Any Port, Unused Ports - 50 Ω[1]			0.5	dB
Phase Balance		Phase (J1 - J2), Ant – Any Port, Unused Ports - 50 Ω[1]			1.0	deg
Delay		Ant – Any Port, Unused Ports - 50 Ω[1], L1				
-Passive					3	ns
-Amplified					5	
Isolation						
-Amp/Pass (Norm)		Adjacent Ports: Ant - 50Ω[1]	15			dB
		Alternate Ports: Ant - 50Ω[1]	21			dB
-Amplified (Hi Iso.)		Adjacent Ports: Ant - 50Ω[1]	35			dB
		Alternate Ports: Ant – 50Ω[1]	44			dB
DC IN		DC Input on any RF Output	4		12	VDC
DC Ripple		300 Hz to 1MHz			50	mV_{pk-pk}
Device Current		Current Consumption of Active device, excludes Ant. Cur.		18	20	mA
Ant/Thru Current[3]		Max source DC current through device			250	mA
Antenna Monitor [4]	I_{OC}	Range for Open Circuit Threshold	15		75	mA
	I_{SC}	Range for Short Circuit Threshold[5]	100		180	
Surge Protection		8/20us		4		KA

Notes:

(1). Note that for proper RF performance, the S14WI must have all RF ports terminated into a 50Ohm coaxial cable system or a 50Ohm load.
(2). Custom gain option available.
(3). Maximum current available from the DC source through the S14WI when output of S14WI is short circuited.
(4). Open circuit and Short Circuit Current (I_{OC}, I_{SC}) may be specified by the customer within the specified range.
(5). In-rush current shall not exceed 3A or exceed Isc for greater than 1ms

Performance Data



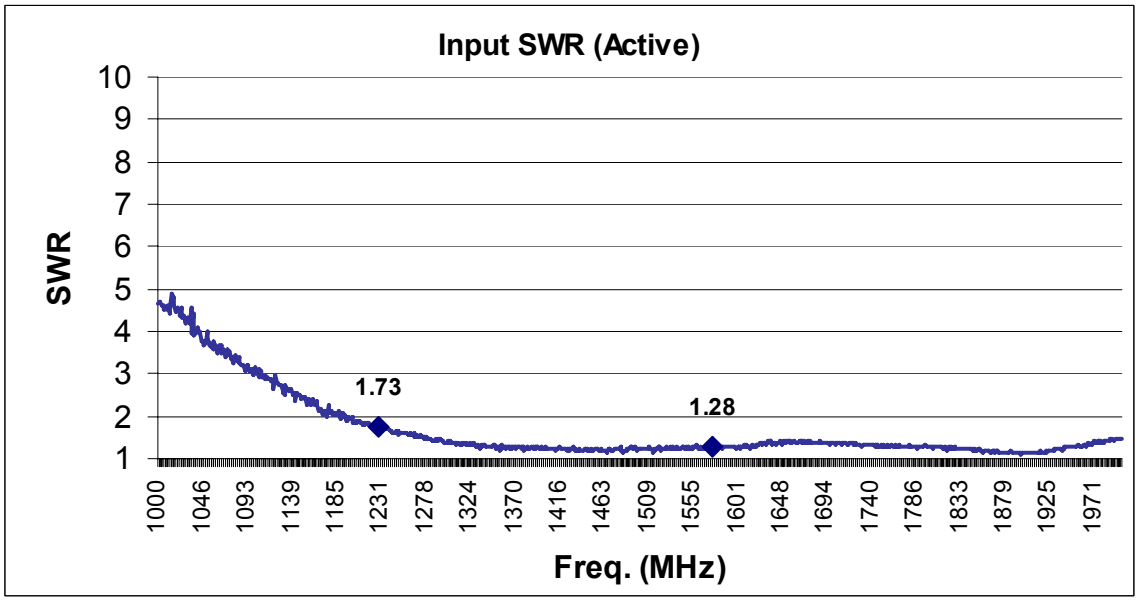
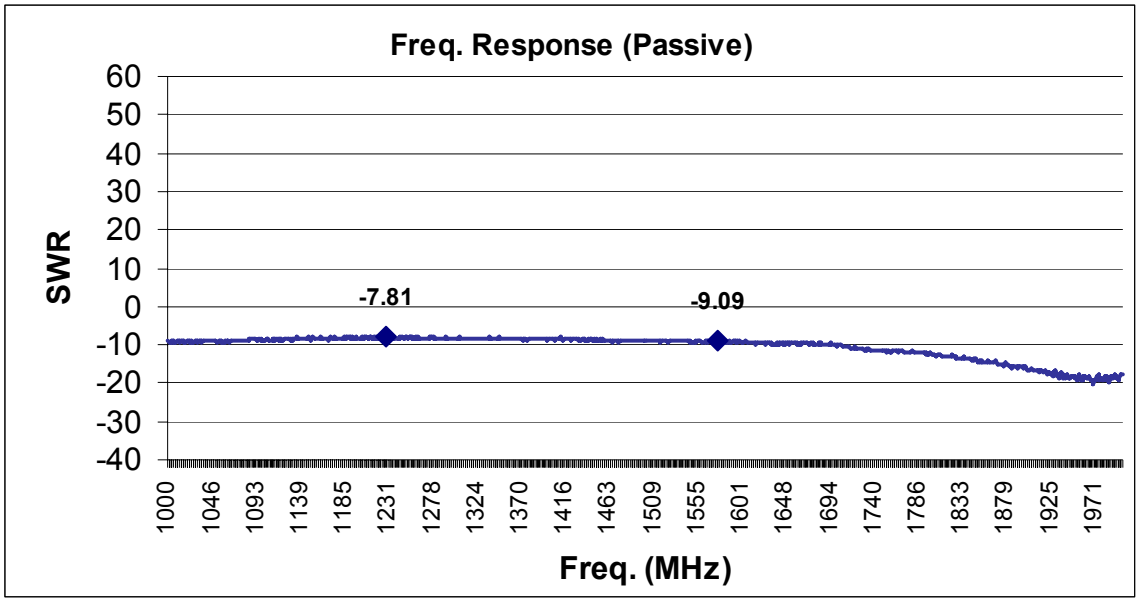


Figure 1. S14WI Active Performance

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



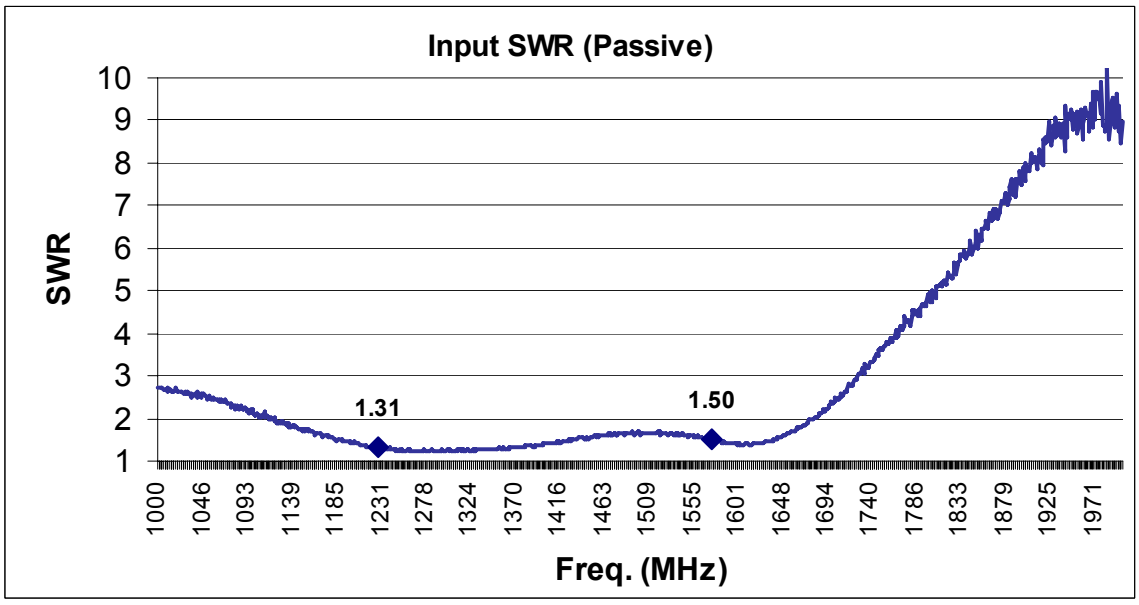


Figure 2. S14WI Passive Performance

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product performance and specifications without prior notification.

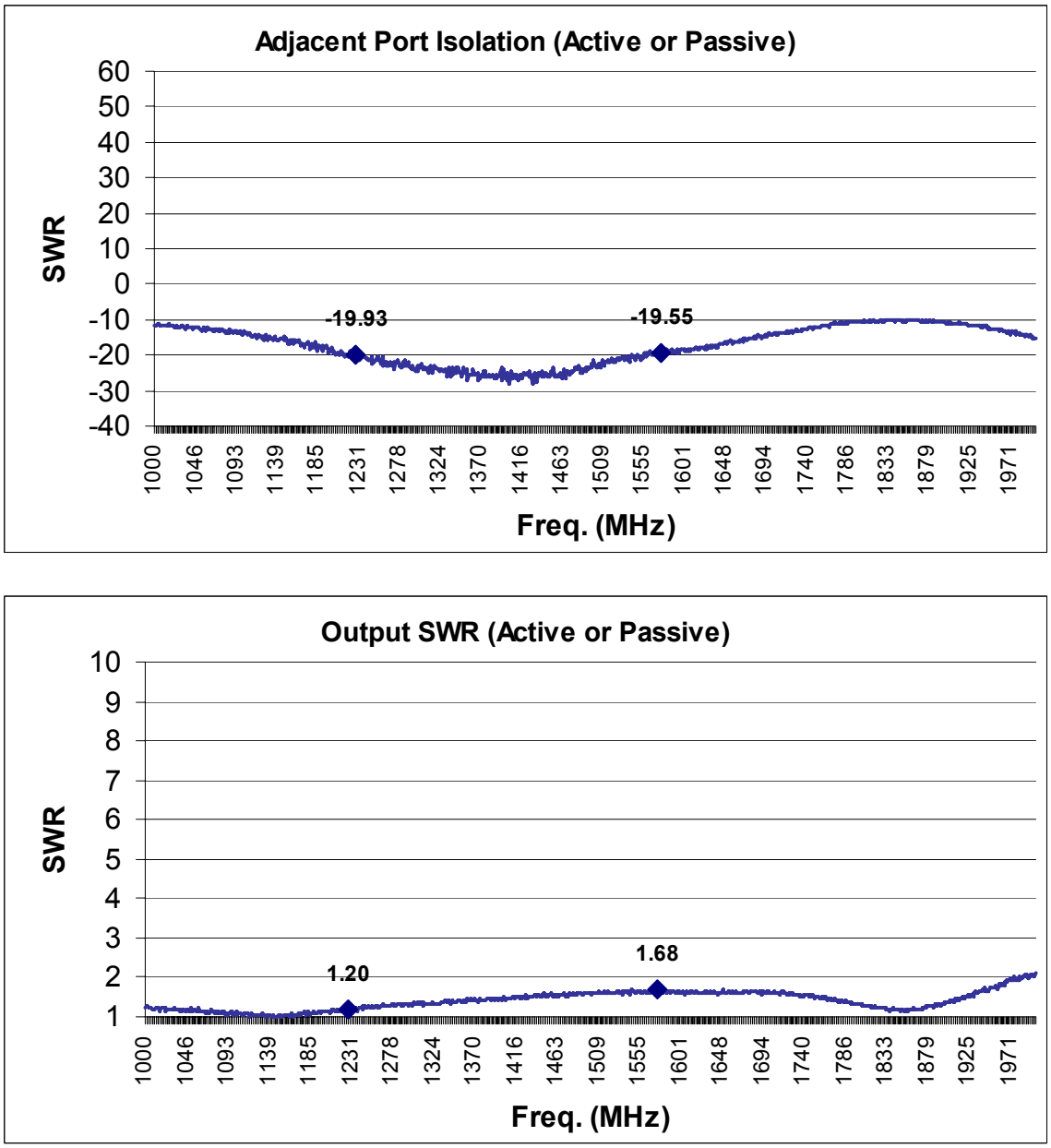

Figure 3. S14WI Active or Passive Output Port Performance

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Operational Description

Antenna DC Bias Select

The S14WI 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 S14WI pick-&-chose circuit will choose one of these DC inputs to power the active circuitry of the S14WI 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-&-choose circuitry will be automatically switched through an RF choke to 200Ohm DC loads. The DC voltages may be applied to any or all of the RF outputs; however, the pick-&-choose circuit will always select the DC voltage on the lowest numbered RF port that has a DC voltage applied to power the S14WI and the application's antenna. If the chosen DC input were to be removed or fail, the pick-&-choose circuit will automatically switch to the next higher numbered RF port to which a DC voltage is applied.

The S14WI 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 three 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 and 4. In this scenario, the DC voltage on port 1 will be used to power the S14WI and the application antenna. Ports 3 & 4 will be switched to 200Ohm DC loads.

Now assume that the DC voltage on port 1 is removed. The S14WI 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 will remained switched to a 200 Ohm load.

Antenna Monitor and Alarm

The S14WI 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 S14WI 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 S14WI samples the antenna current 16 times per second. So long as the average of four samples are within the current window, the S14WI 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 four DC inputs will be at or near zero (less than 0.5mA for the passive configuration and less than 5mA for the active). 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 S14WI will periodically (every 60 seconds) attempt to re-connect DC power to the antenna. If the antenna failure condition persists, the S14WI will re-enter the fault condition, repeating this cycle until the fault condition is removed.

Amplifier and Splitter

The S14WI has the option to be ordered as either a passive device, or to be ordered with amplification. If the amplified option is chosen, additional options are available for specifying the amplifier gain and the port-to-port isolation (see Hi Iso. option in electrical specifications). Amplified versions of the S14WI that also include the High Isolation option do not require 50Ohm termination on unused ports in order for the splitter to operate properly. Passive versions or Amplified versions without the High Isolation option always require 50 Ohm 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

Part Number:

S14WI – A – PC – AM – SRP – SF

Product:
1x4 Splitter for Wireless
(Std: Pass DC J1-Ant, J2,J3,J4 DC Blk.)

Gain Option:
A – Amplified
Axx – Custom Gain
Blank – Passive
H – Hi Isolation

Pick & Choose Option:
PC – Add Pick & Choose
Blank – Std. Config.

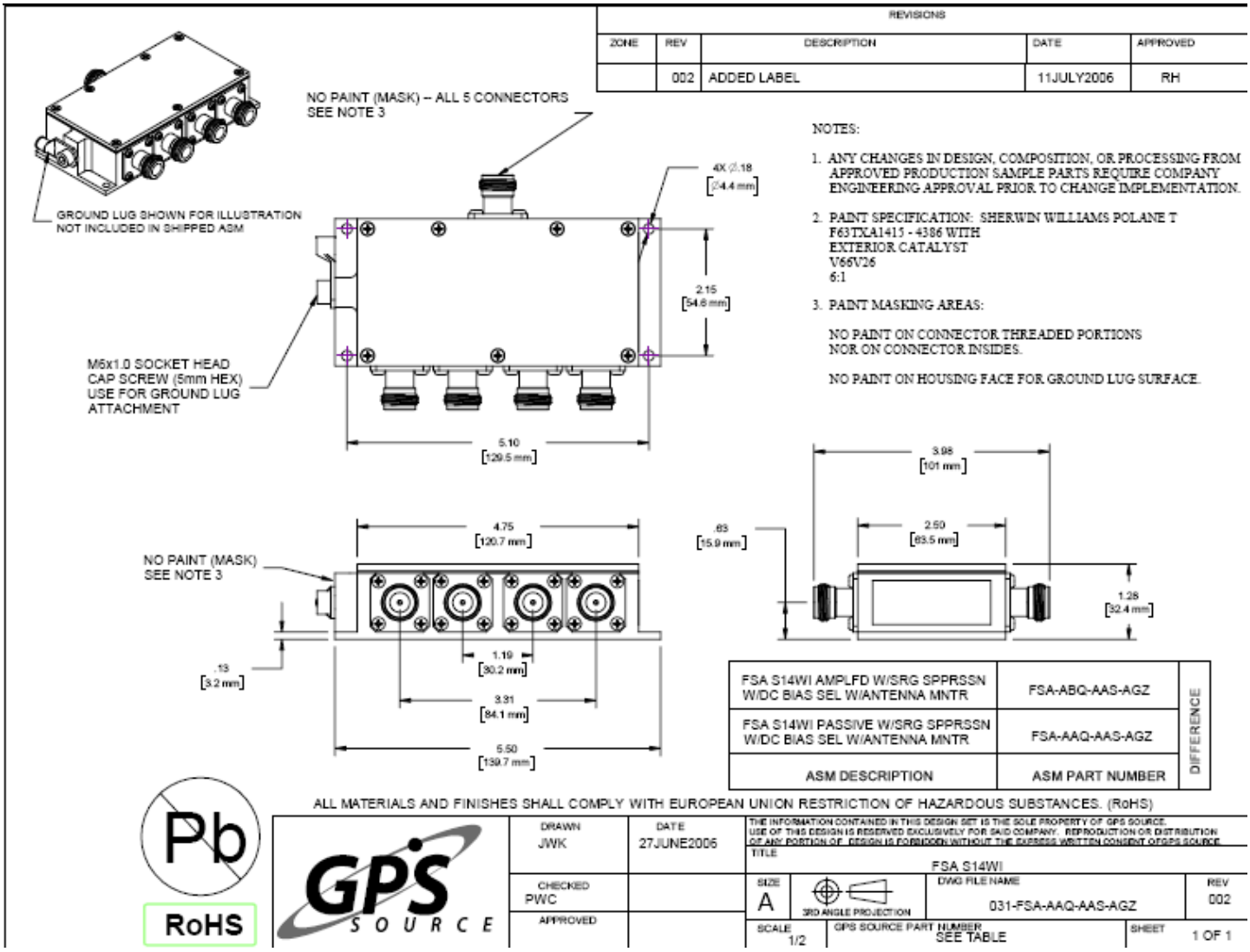
Antenna Monitor Option:
AM – Add Ant. Monitor
Blank – Std. Config.

Surge Protection Option:
SRP – Surge Protection
Blank – Std. Config.

Connector Options:
NM – N, Male
NF – N, Female
SM – SMA, Male
SF – SMA, Female
TM – TNC, Male
TF – TNC, Female
BM – BNC, Male
BF – BNC, Female
SB – SMB Jack, Female
SC – SMC Jack, Female
MX – MCX Jack, Female

For help in creating the part number to meet your exact needs, contact us at Sales@gpssource.com or visit our website at www.gpssource.com .

Mechanical


REVISIONS
ZONE | REV | DESCRIPTION | DATE | APPROVED
002 | ADDED LABEL | 11JULY2006 | RH
NO PAINT (MASK) -- ALL 5 CONNECTORS SEE NOTE 3
GROUND LUG SHOWN FOR ILLUSTRATION NOT INCLUDED IN SHIPPED ASM
M6x1.0 SOCKET HEAD CAP SCREW (5mm HEX) USE FOR GROUND LUG ATTACHMENT
4X Ø.18 [Ø4.4 mm]
2.15 [54.6 mm]
5.10 [129.5 mm]
NOTES:
1. ANY CHANGES IN DESIGN, COMPOSITION, OR PROCESSING FROM APPROVED PRODUCTION SAMPLE PARTS REQUIRE COMPANY ENGINEERING APPROVAL PRIOR TO CHANGE IMPLEMENTATION.
2. PAINT SPECIFICATION: SHERWIN WILLIAMS POLANE T F63TXA1415 - 4386 WITH EXTERIOR CATALYST V66V26 6:1
3. PAINT MASKING AREAS:
NO PAINT ON CONNECTOR THREADED PORTIONS NOR ON CONNECTOR INSIDES.
NO PAINT ON HOUSING FACE FOR GROUND LUG SURFACE.
3.98 [101 mm]
2.50 [63.5 mm]
.63 [15.9 mm]
1.28 [32.4 mm]
4.75 [120.7 mm]
NO PAINT (MASK) SEE NOTE 3
.13 [3.2 mm]
1.19 [30.2 mm]
3.31 [84.1 mm]
5.50 [139.7 mm]
FSA S14WI AMPLFD W/SRG SPPRSSN W/DC BIAS SEL W/ANTENNA MNTR | FSA-ABQ-AAS-AGZ
FSA S14WI PASSIVE W/SRG SPPRSSN W/DC BIAS SEL W/ANTENNA MNTR | FSA-AAQ-AAS-AGZ
ASM DESCRIPTION | ASM PART NUMBER
DIFFERENCE
Pb
RoHS
ALL MATERIALS AND FINISHES SHALL COMPLY WITH EUROPEAN UNION RESTRICTION OF HAZARDOUS SUBSTANCES. (RoHS)
GPS SOURCE
DRAWN JWK
DATE 27JUNE2006
CHECKED PWC
APPROVED
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TITLE FSA S14WI
SIZE A
3RD ANGLE PROJECTION
DWG FILE NAME 031-FSA-AAQ-AAS-AGZ
REV 002
SCALE 1/2
GPS SOURCE PART NUMBER SEE TABLE
SHEET 1 OF 1