



# Amplifiers

DATA SHEET

## AWS/PCS Dual Band TMA with Bypass

TSB-1921-xxx



- AWS/PCS Dual Band TMA with 600/700/850 band bypass available in single or twin configurations
- Configurable CWA/AISG 2.0 Control
- Fail-safe bypass mode and multi-strike lightning protection
- Small lightweight unit offers high reliability of >500K Hours MTBF
- Highly linear amplifier with low intermodulation

### Overview

CCI's Dual Band TMA (AWS/PCS), includes AWS-3 and 600/700/850 bypass is available in a single or twin configuration. Each TMA is fully duplexed and shares a single LNA for both bands. The bypass path provides excellent isolation to the TMA path. Separate antenna ports for the bypass and TMA paths are combined onto a single BTS port. The TMA's low noise, highly linear amplifiers improve the uplink sensitivity and the receive performance of the base station. The TMA is configurable to operate using either CWA or AISG 2.0 communication protocols. The TMA supports CDMA, EDGE/GSM, UMTS and LTE BTS equipment. The unit is ideally suited for sites upgraded to dual-band using the existing infrastructure. The TMA allows the sharing of feeder lines for all bands thus reducing tower loading, leasing, and installation costs. Input and output connectors are located inline for ease of installation in space constrained areas such as uni-pole structures and stealth antennas.

### Technical Description:

The TMA system is an outdoor dual band tower mount unit which provides low noise amplification of PCS and AWS uplink signals combined with 600/700/850 bypassed signals from separate antenna ports to a common BTS port. Each unit consists of multiple band-pass filters, one low noise amplifier (LNA) with bypass failure circuitry, one bias tee, AISG control circuitry, and lightning protection circuitry all housed in an IP67 enclosure suited to long life masthead mounting. The AWS and PCS paths are dual duplexed to separate the low power uplink signals from the high power down link signals at the BTS and antenna ports. The AWS and PCS uplink signals are amplified with a dedicated ultra-low noise PHEMT LNA with adjustable gain control. The unit provides protection against lightning strikes via a multistage surge protection circuit. DC power and AISG 2.0 control are provided via the BTS feeder cable. The unit is capable of switching between AISG and CWA modes as follows. On power up, the unit restores the previous mode at power down. The unit will switch from AISG to CWA mode by applying DC to both BTS ports. The unit will switch from CWA to AISG mode when it detects an AISG message on either BTS port. The unit can also be locked to a specific mode by entering keywords in specific device data fields as outlined. In CWA mode, the unit requires 12VDC at each BTS port and follows typical current window convention (see specifications in "General Characteristics"). In AISG mode, the unit will accept 10-30 VDC from either BTS port. In AISG mode, the unit does not require an AISG 2.0 compatible site control unit (SCU) and may also be powered by a standard power distribution unit (PDU). This TMA can be configured with either 7-16 or 4.3-10 connectors and also has the option of providing DC/AISG pass through to the antenna.

An optional Site Control Unit (SCU) is available to power up to 32 AISG modules per sector and to provide the monitoring and alarm functions for the system. The SCU is housed in a single (1U) 1.75" x 19" rack and contains dual redundant power supplies capable of being "hot swapped" that provide a regulated DC supply voltage on the RF coax for the tower mount amplifiers.



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## SPECIFICATIONS

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#### Electrical

RF Parameters	Ports	Frequency(MHz)	Specification	
Return Loss	ANT	1710 - 1780	18 dB min. (15 dB bypass mode)	
		2110 - 2180	18 dB min.	
		1850 - 1915	18 dB min. (15 dB bypass mode)	
		1930 - 1995	18 dB min.	
	600/700/850	555 - 960	18 dB min.	
	BTS	1710 - 1780	18 dB min. (15 dB bypass mode)	
		2110 - 2180	18 dB min.	
		1850 - 1915	18 dB min. (15 dB bypass mode)	
		1930 - 1995	18 dB min.	
	555 - 960	18 dB min.		
	Gain	ANT - BTS	1710 - 1780	7 to 13 dB adjustable in 0.25 dB steps via AISG ( $\pm 1.0$ dB) See Note 1
			1850 - 1910	6 to 12 dB adjustable in 0.25 dB steps via AISG ( $\pm 1.0$ dB)
1910 - 1915			5 to 11 dB adjustable in 0.25 dB steps via AISG ( $\pm 1.0$ dB) See Note 2	
Insertion Loss	ANT - BTS (RX Bypass mode)	1710 - 1780	1.4 typ. dB @25°C, 1.6 dB @65°C ( $\pm 0.1$ dB)	
		1850 - 1910	1.8 typ. dB @25°C, 2.0 dB @65°C ( $\pm 0.5$ dB)	
		1910 - 1915	2.5 typ. dB @25°C, 3.1 dB @65°C ( $\pm 0.5$ dB)	
	BTS - ANT	2110 - 2180	0.2 dB typ. ( $\pm 0.05$ dB)	
		1930 - 1995	0.3 dB typ., 0.75 dB max	
Isolation	600/700/850 - ANT	555 - 960	0.1 dB typ.	
		1710 - 2180	80 dB min.	
Noise Figure	ANT - BTS	1710 - 1780	1.2 dB typ. @ 25°C, 1.4 dB @ 65°C	
		1850 - 1910	1.3 dB typ. @ 25°C, 1.5 dB @ 65°C	
		1910 - 1915	1.7 dB typ. @ 25°C, 1.9 dB @ 65°C	
Input Third Order Intercept Point	ANT - BTS	1710 - 1780	+12 dBm min. at max. gain	
		1850 - 1915	+12 dBm min. at max. gain	

Note 1: The gain at 1710-1780 will be 1 dB higher than the set gain.

Note 2: The gain at 1910-1915 will be 1 dB lower than the set gain.

General Characteristics	
Impedance	50 ohms
Continuous Average Power	200 W max.
Peak Envelope Power	2 kW max.
Intermodulation Performance(all ports)	<-117 dBm (-160 dBc) typical (2 x +43 dBm tones) all bands
Operating Voltage (AISG Mode)	+10 VDC to +30 VDC provided via coax
Operating Voltage (CWA Mode)	+10 VDC to +18 VDC, +12 VDC Nominal provided via coax
AISG 2.0 Mode Single Power Consumption	< 2.0 W
AISG 2.0 Mode Twin Power Consumption	< 3.0 W
CWA Mode Current Consumption - Normal	< 140 mA per TMA
CWA Mode Current Consumption - Alarm	> 200 mA per TMA



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#### Environmental

<b>Operating Temperature</b>	-40° C to +65° C
<b>Ingress Protection</b>	IP67
<b>MTBF</b>	>500,000 hours
<b>Lightning Protection</b>	8/20us, ±10KA max, 10 strikes each per IEC61000-4-5

#### Mechanical

Model	Single	Twin
<b>Connectors</b>	3 × 7-16 DIN female or 3 × 4.3-10 female	6 × 7-16 DIN female or 6 × 4.3-10 female
<b>Dimensions w/Bracket</b>	8.07 × 18.07 × 3.19 in. (205.0 × 459.0 × 81.0 mm)	8.07 × 18.07 × 5.51 in. (205.0 × 459.0 × 140.0 mm)
<b>Housing Dimensions</b>	7.68 × 13.03 × 2.68 in. (195.0 × 331.0 × 68.0 mm)	7.68 × 13.03 × 5.0 in. (195.0 × 331.0 × 127.0 mm)
<b>Weight</b>	16.0 lbs (7.3 kg)	29.0 lbs (13.2 kg)
<b>Frontal Wind Load</b>	304.1 N @150km/hour	304.1 N @150km/hour
<b>Lateral Wind Load</b>	76.5 N @150km/hour	143.0 N @150km/hour

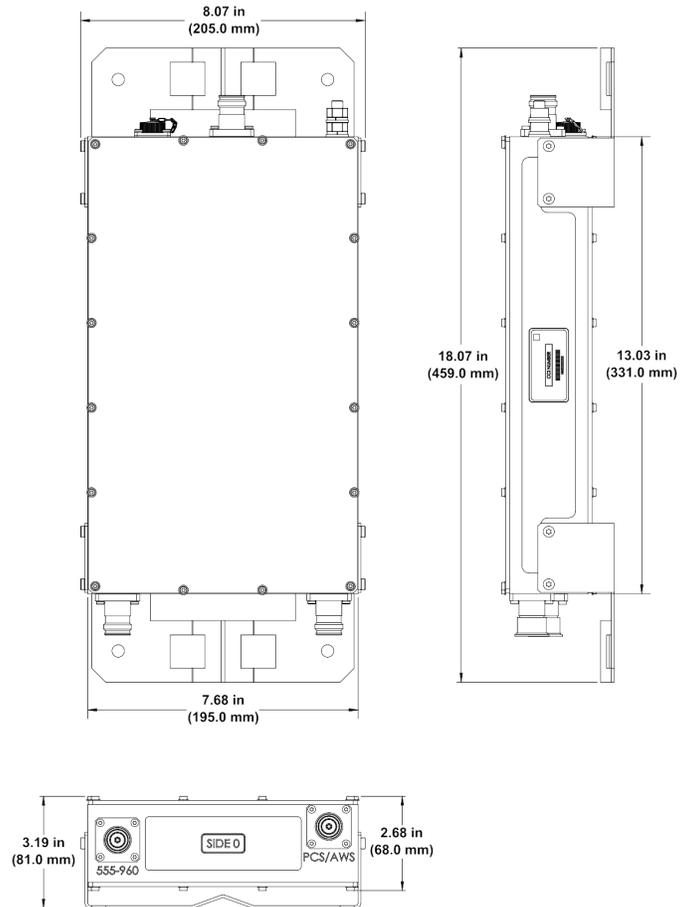


# Amplifiers

SPECIFICATIONS

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PCS/AWS Single TMA with 600/700/850 band bypass Outline Drawing

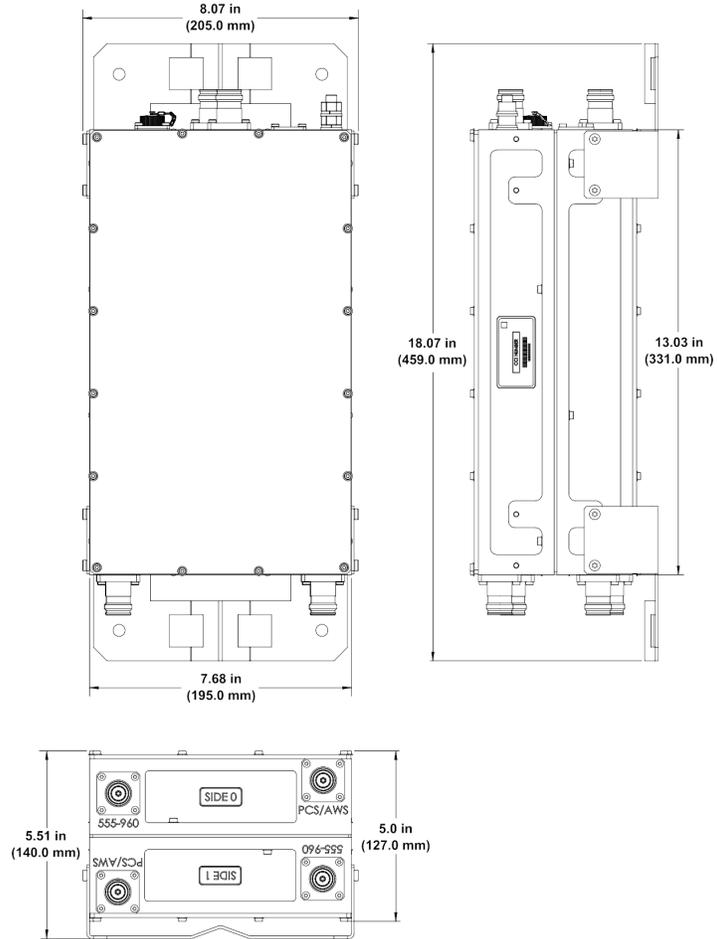


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SPECIFICATIONS

AWS/PCS Dual Band TMA with Bypass

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PCS/AWS Twin TMA with 600/700/850 band bypass Outline Drawing



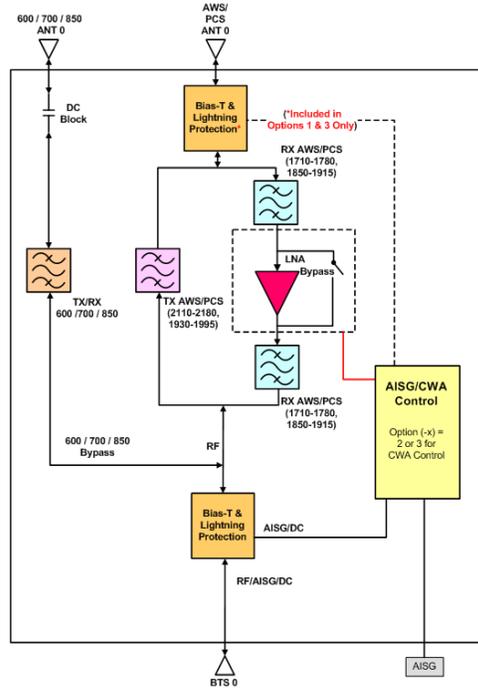
# Amplifiers

SPECIFICATIONS

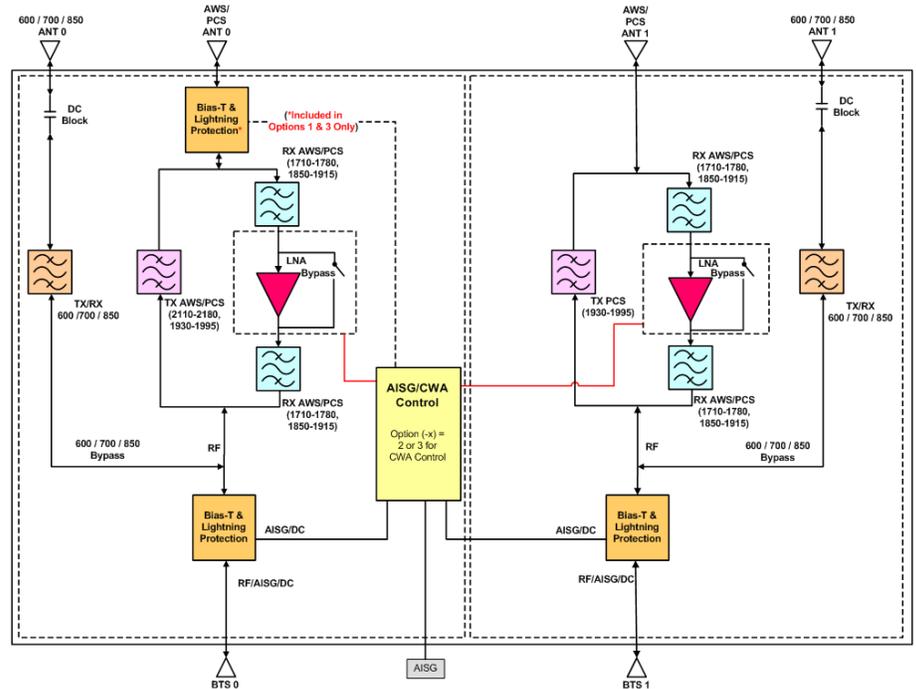
AWS/PCS Dual Band TMA with Bypass

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Block Diagram



PCS/AWS Single TMA with 600/700/850 band bypass Block Diagram



PCS/AWS TwinTMA with 600/700/850 band bypass Block Diagram



# Amplifiers

## STANDARDS & CERTIFICATIONS

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#### Parts & Accessories

<b>TSB-1921-xS1</b>	AWS/PCS Single TMA with bypass and 7-16 connectors
<b>TSB-1921-xS2</b>	AWS/PCS Single TMA with bypass and 4.3-10 connectors
<b>TSB-1921-xT1</b>	AWS/PCS Twin TMA with bypass and 7-16 connectors
<b>TSB-1921-xT2</b>	AWS/PCS Twin TMA with bypass and 4.3-10 connectors

Option (-x)	Description
0	AISG/CWA control with no AISG pass through antenna port
1	AISG/CWA control with AISG pass through antenna port
2	AISG control with no AISG pass through antenna port
3	AISG control with AISG pass through antenna port

#### Standards & Compliance

<b>Safety</b>	EN 60950-1, UL 60950-1
<b>Emission</b>	EN 55022
<b>Immunity</b>	EN 55024
<b>Environmental</b>	IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-5, IEC 60068-2-6, IEC-60068-2-11, IEC 60068-2-14, IEC 60068-2-18, IEC 60068-2-27, IEC 60068-2-29, IEC 60068-02-30, IEC 60068-2-52, IEC 60068-2-64, IEC61000-4-5, GR-63-CORE 4.3.1, EN 60529 IP68

#### Certifications

Antenna Interface Standards Group (AISG), Federal Communication Commission (FCC) Part 15 Class B, CE, CSA US, ISO 9001



**CCI** Communication Components Inc.  
EXTENDING WIRELESS PERFORMANCE