



Cisco Compact Micro Amplifier A93262







Installation and Operation Guide

For Your Safety

Explanation of Warning and Caution Icons

 **Avoid personal injury and product damage! Do not proceed beyond any symbol until you fully understand the indicated conditions.**

The following warning and caution icons alert you to important information about the safe operation of this product:

-  You may find this symbol in the document that accompanies this product. This symbol indicates important operating or maintenance instructions.
-  You may find this symbol affixed to the product. This symbol indicates a live terminal where a dangerous voltage may be present; the tip of the flash points to the terminal device.
-  You may find this symbol affixed to the product. This symbol indicates a protective ground terminal.
-  You may find this symbol affixed to the product. This symbol indicates a chassis terminal (normally used for equipotential bonding).
-  You may find this symbol affixed to the product. This symbol warns of a potentially hot surface.
-  You may find this symbol affixed to the product and in this document. This symbol indicates an infrared laser that transmits intensity-modulated light and emits invisible laser radiation or an LED that transmits intensity-modulated light.

Important

Please read this entire guide. If this guide provides installation or operation instructions, give particular attention to all safety statements included in this guide.

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Important Safety Instructions

Read and Retain Instructions

Carefully read all safety and operating instructions before operating this equipment, and retain them for future reference.

Follow Instructions and Heed Warnings

Follow all operating and use instructions. Pay attention to all warnings and cautions in the operating instructions, as well as those that are affixed to this equipment.

Terminology

The terms defined below are used in this document. The definitions given are based on those found in safety standards.

Service Personnel-The term service personnel applies to trained and qualified individuals who are allowed to install, replace, or service electrical equipment. The service personnel are expected to use their experience and technical skills to avoid possible injury to themselves and others due to hazards that exist in service and restricted areas.

User and Operator-The terms user and operator apply to persons other than service personnel.

Ground(ing) and Earth(ing)-The terms ground(ing) and earth(ing) are synonymous. This document uses ground(ing) for clarity, but it can be interpreted as having the same meaning as earth(ing).

Electric Shock Hazard

This equipment meets applicable safety standards. Refer to this equipment's data sheet for details about regulatory compliance approvals.



WARNING:

Avoid electric shock! Opening or removing the equipment cover may expose you to dangerous voltages. Refer all servicing to qualified service personnel only.

Electric shock can cause personal injury or even death. Avoid direct contact with dangerous voltages at all times.

Know the following safety warnings and guidelines:

- Only qualified service personnel are allowed to perform equipment installation or replacement.
- Only qualified service personnel are allowed to remove equipment covers and access any of the components inside the chassis.

Continued on next page

Important Safety Instructions

Equipment Placement



WARNING:

Avoid personal injury and damage to this equipment. An unstable mounting surface may cause this equipment to fall.

To protect against equipment damage or injury to personnel, comply with the following:

Install this equipment in a restricted access location (access restricted to service personnel).

Make sure the mounting surface or rack is stable and can support the size and weight of this equipment.

Strand (Aerial) Installation



CAUTION:

Be aware of the size and weight of strand-mounted equipment during the installation operation.

Ensure that the strand can safely support the equipment's weight.

Pedestal Installation



WARNING:

Avoid possibility of personal injury. Ensure proper handling/lifting techniques are employed when working in confined spaces with heavy equipment.

Ensure this equipment is securely fastened to the mounting surface or rack where necessary to protect against damage due to any disturbance and subsequent fall.

Ensure the mounting surface or rack is appropriately anchored according to manufacturer's specifications.

Ensure the installation site meets the ventilation requirements given in the equipment's data sheet to avoid the possibility of equipment overheating.

Ensure the installation site and operating environment is compatible with the equipment's International Protection (IP) rating specified in the equipment's data sheet.

Connecting to Utility AC Power

Important: If this equipment is a Class I equipment, it must be grounded.

If this equipment plugs into an outlet, the outlet must be near this equipment, and must be easily accessible.

Connect this equipment only to the power sources that are identified on the equipment-rating label, which is normally located close to the power inlet connector(s).

Continued on next page

Important Safety Instructions, Continued

- Be sure to disconnect all power sources before working on this equipment.
- If this equipment **does not** have a main power switch, the power plug serves as a readily operable disconnect device.
- Always pull on the plug or the connector to disconnect a cable. Never pull on the cable itself.

Connection to Network Power Sources

Refer to this equipment's specific installation instructions in this manual or in companion manuals in this series for connection to network ferro-resonant AC power sources.

Grounding (Utility AC Powered Equipment in Pedestals, Service Closets, etc.)

This section provides instructions for verifying that the equipment is properly grounded.

Safety Plugs (USA Only)

This equipment is equipped with either a 3-terminal (grounding-type) safety plug or a 2-terminal (polarized) safety plug. The wide blade or the third terminal is provided for safety. Do not defeat the safety purpose of the grounding-type or polarized safety plug.

To properly ground this equipment, follow these safety guidelines:

Grounding-Type Plug

For a 3-terminal plug (one terminal on this plug is a protective grounding pin), insert the plug into a grounded main, 3-terminal outlet.

Note: This plug fits only one way. If this plug cannot be fully inserted into the outlet, contact an electrician to replace the obsolete 3-terminal outlet.

Polarized Plug

For a 2-terminal plug (a polarized plug with one wide blade and one narrow blade), insert the plug into a polarized mains, 2-terminal outlet in which one socket is wider than the other.

Note: If this plug cannot be fully inserted into the outlet, try reversing the plug.

Continued on next page

Important Safety Instructions, Continued

If the plug still fails to fit, contact an electrician to replace the obsolete 2-terminal outlet.

Grounding Terminal

If this equipment is equipped with an external grounding terminal, attach one end of an 18-gauge wire (or larger) to the grounding terminal; then, attach the other end of the wire to a ground, such as a grounded equipment rack.

Safety Plugs (European Union)

Class I Mains Powered Equipment

Provided with a 3-terminal AC inlet and requires connection to a 3-terminal mains supply outlet via a 3-terminal power cord for proper connection to the protective ground.


Note: The equipotential bonding terminal provided on some equipment is not designed to function as a protective ground connection.

Class II Mains Powered Equipment

Provided with a 2-terminal AC inlet that may be connected by a 2-terminal power cord to the mains supply outlet. No connection to the protective ground is required as this class of equipment is provided with double or reinforced and/or supplementary insulation in addition to the basic insulation provided in Class I equipment.

Note: Class II equipment, which is subject to EN 50083-1, is provided with a chassis mounted equipotential bonding terminal. See the section titled Equipotential Bonding for connection instructions.

Equipotential Bonding

If this equipment is equipped with an external chassis terminal marked with the IEC 60417-5020 chassis icon () , the installer should refer to CENELEC standard EN 50083-1 or IEC standard IEC 60728-11 for correct equipotential bonding connection instructions.

Continued on next page

Important Safety Instructions, Continued

General Servicing Precautions



WARNING:

Avoid electric shock! Opening or removing the equipment cover may expose you to dangerous voltages. Refer all servicing to qualified service personnel only.



CAUTION:

These servicing precautions are for the guidance of qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing other than contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

Be aware of the following general precautions and guidelines:

- Servicing - Servicing is required when this equipment has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into this equipment, this equipment has been exposed to rain or moisture, does not operate normally, or has been dropped. Do not work on this equipment, or connect or disconnect cables, when unused for long periods of time.
- Wristwatch and Jewelry - For personal safety and to avoid damage of this equipment during service and repair, do not wear electrically conducting objects such as a wristwatch or jewelry.
- Lightning - Do not work on this equipment, or connect or disconnect cables, during periods of lightning.
- Labels - Do not remove any warning labels. Replace damaged or illegible warning labels with new ones.
- Covers - Do not open the cover of this equipment and attempt service unless instructed to do so in the instructions. Refer all servicing to qualified service personnel only.
- Moisture - Do not allow moisture to enter this equipment.
- Cleaning - Use a damp cloth for cleaning.
- Safety Checks - After service, assemble this equipment and perform safety checks to ensure it is safe to use before putting it back into operation.

Electrostatic Discharge

Electrostatic discharge (ESD) results from the static electricity buildup on the human body and other objects. This static discharge can degrade components and cause failures.

Take the following precautions against electrostatic discharge:

- Use an anti-static bench mat and a wrist strap or ankle strap designed to safely ground ESD potentials through a resistive element.
- Keep components in their anti-static packaging until installed.
- Avoid touching electronic components when installing a module.

Continued on next page

Important Safety Instructions, Continued

Fuse Replacement

- To replace a fuse, comply with the following:
- Disconnect the power before changing fuses.
- Identify and clear the condition that caused the original fuse failure.
- Always use a fuse of the correct type and rating. The correct type and rating are indicated on this equipment.

Modifications

This equipment has been designed and tested to comply with applicable safety, laser safety, and EMC regulations, codes, and standards to ensure safe operation in its intended environment. Refer to this equipment's data sheet for details about regulatory compliance approvals.

Do not make modifications to this equipment. Any changes or modifications could void the user's authority to operate this equipment.

Modifications have the potential to degrade the level of protection built into this equipment, putting people and property at risk of injury or damage. Those persons making any modifications expose themselves to the penalties arising from proven non-compliance with regulatory requirements and to civil litigation for compensation in respect of consequential damages or injury.

Accessories

Use only attachments or accessories specified by the manufacturer.

Preface

About This Guide

Introduction

The Cisco Compact Micro Amplifier addresses the needs of today's broadband networks. The amplifier provides superior performance and reliability combined with a user-friendly layout.

Purpose

This guide provides instructions for installing, configuring, setting up, and troubleshooting the amplifier.

Who Should Use This Document

This document is intended for authorized service personnel who have experience working with similar equipment. The service personnel should have appropriate background and knowledge to complete the procedures described in this document.

Qualified Personnel



CAUTION:

Allow only qualified and skilled personnel to install, operate, maintain, and service this product. Otherwise, personal injury or equipment damage may occur.

Only appropriately qualified and skilled personnel should attempt to install, operate, maintain, and service this product.

Scope

This guide discusses the following topics.

- Description
- Installation
- Configuration
- Troubleshooting
- Customer Support Information

Document Version

This is the second third of this guide (Rev C).

Chapter 1

Introduction

Overview

This chapter provides an overview of this guide and of the Cisco Compact Micro Amplifier, including general descriptions, main components, power supply information, and test points.

In This Chapter

Topic	See Page
Description	1-2
Overview Diagram	1-3
Test Points	1-4

Description

General Description

The amplifier is available in 1 GHz forward bandwidth and the following reverse/forward path splits.

- 42/54 MHz
- 65/87 MHz
- 85/105 MHz

The amplifier is composed of a base and a lid. The base houses the RF mainboard and the power supply. The lid contains the cover of the amplifier and the Allen screw to open and close the housing.

Features

The amplifier has the following features.

- 1 GHz forward bandwidth
- Thermal compensation for both forward and reverse path
- Uses variable attenuator and equalizer at both forward and reverse path
- Uses tri-state switch for forward and reverse configuration
- On board diplexer module
- Product power consumption < 11 W
- Unique main board compatible with forward/reverse frequency splits including: 42/54 MHz, 65/87 MHz and 85-105 MHz

Part Number List

For the latest available Cisco Compact Micro Amplifier part number, contact your customer service representative for details.

Description	Part Number
Cisco Compact Micro Amplifier, 42/54 MHz, for US	A93262.1023642
Cisco Compact Micro Amplifier, 42/54 MHz, for Brazil	A93262.1123642
Cisco Compact Micro Amplifier, 42/54 MHz, for Argentina	A93262.1723642
Cisco Compact Micro Amplifier, 65/87 MHz, for EU	A93262.1123665
Cisco Compact Micro Amplifier, 85/105 MHz, for US	A93262.1023685
Cisco Compact Micro Amplifier, 85/105 MHz, for Brazil	A93262.1223685
Cisco Compact Micro Amplifier, 85/105 MHz, for Argentina	A93262.1723685
Cisco Compact Micro Amplifier, 85/105 MHz, for EU	A93262.1123685

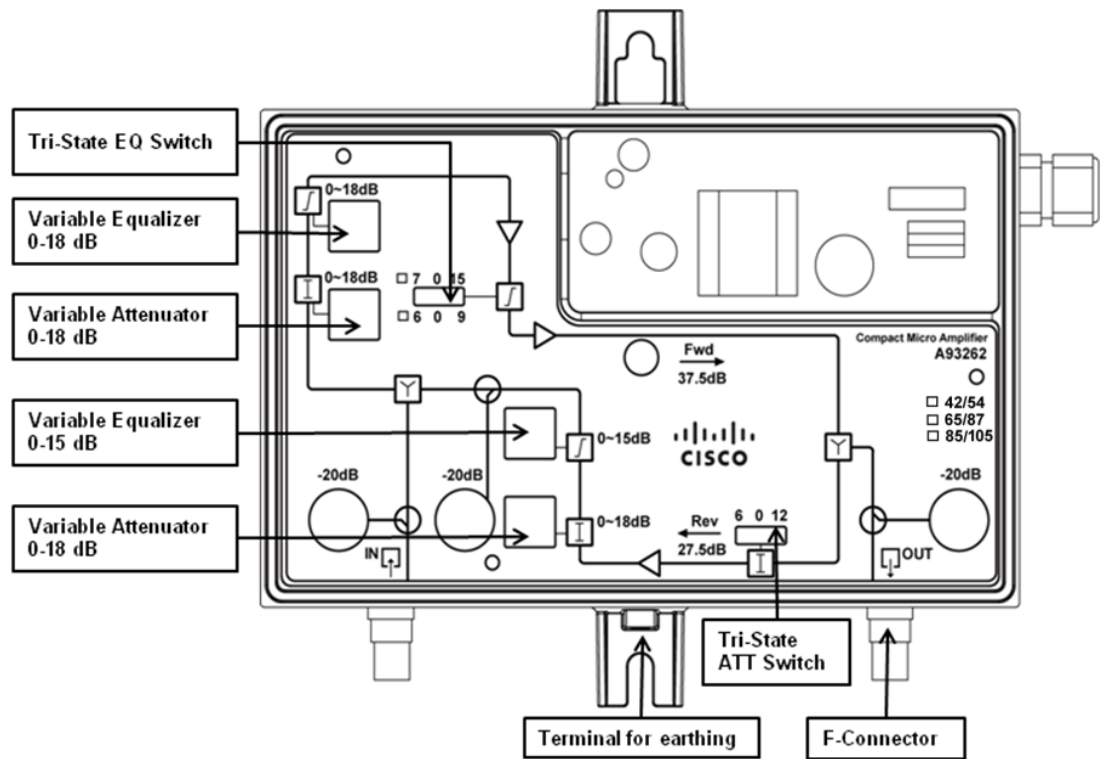
Overview Diagram

Customer Accessible Components

The amplifier contains the following customer accessible components:

- Variable attenuator, variable equalizer, and tri-state switch are used to adjust the forward or the reverse level to the desired value.
- Terminal for earthing is used to ground the amplifier.
- The F-Connector is used to connect the amplifier to the input and output COAX cables.

See the following diagram for all the components described above.



System Power (100 to 240 VAC)

The amplifier is delivered with a mains cable and mains plug. Changes are not recommended. The power supply is supplied only in this amplifier.

Rating labels of mains power supply

	Compact Micro Amplifier Cisco Systems, Inc		IP54 Made in China
	PN: A93262 Input : 100-240 V~ ,50/60Hz, 12W		

Chapter 2 Installation

Overview

Introduction

This chapter provides instructions for installing and configuring the Cisco Compact Micro Amplifier in your cable system.

In This Chapter

Topic	See Page
Before You Begin	2-2
Dimensions	2-3
Mounting	2-4

Before You Begin

The procedures in this chapter assume that you have completed the following:

- Prepared the installation site
- Located the coaxial cable with or without the pin-type coaxial connectors mounted on the cable

Required Tools

Before you start, make sure that you have the following tools:

Fastener	Where use
Flat pin driver	To tighten the mounting screw
Heavy-duty wire cutters	To cut the COAX cables and the grounding cables.

Torque Specifications

The following table gives the torque specifications for the Amplifier.

Fastener	Specs
Mounting Screw	Size: M5

The Cover of the Amplifier

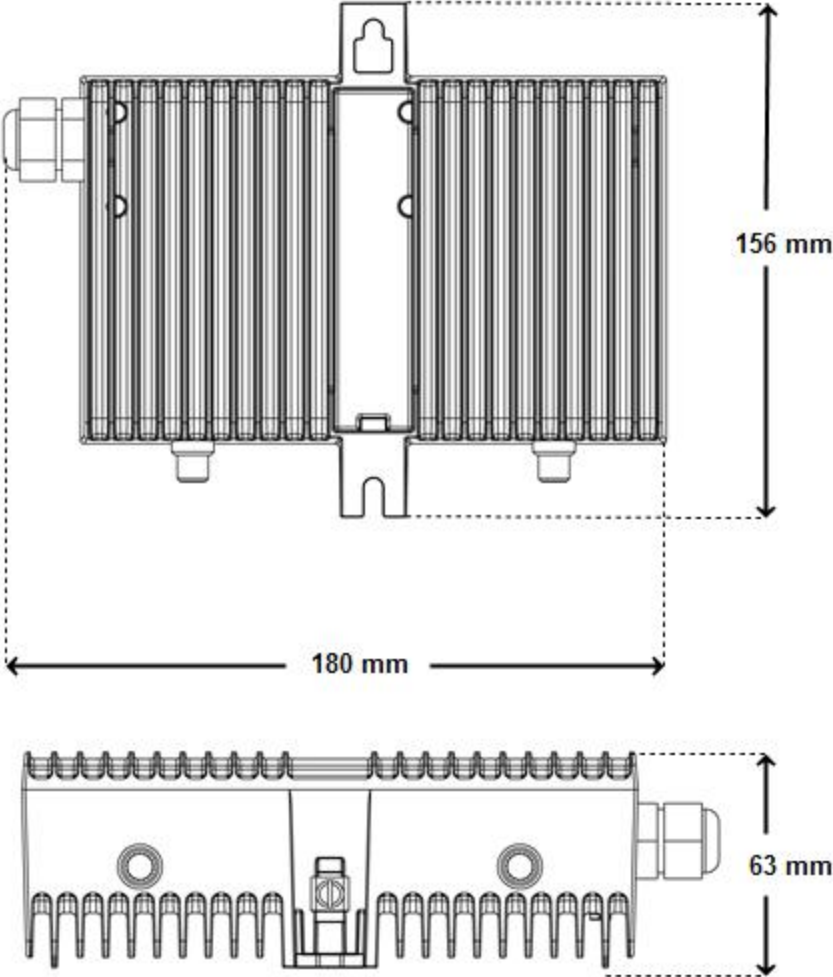
The cover of the amplifier is in aluminum. To perform mounting and normal field maintenance, the cover does not have to be removed.

Dimensions

Housing Dimensions

The standard housing dimensions are 7.1 inches/180 mm x 6.1 inches/156 mm x 2.5 inches/63 mm.

The diagram below shows the dimensions of the amplifier housing.



Mounting

To Mount the Amplifier



CAUTION:

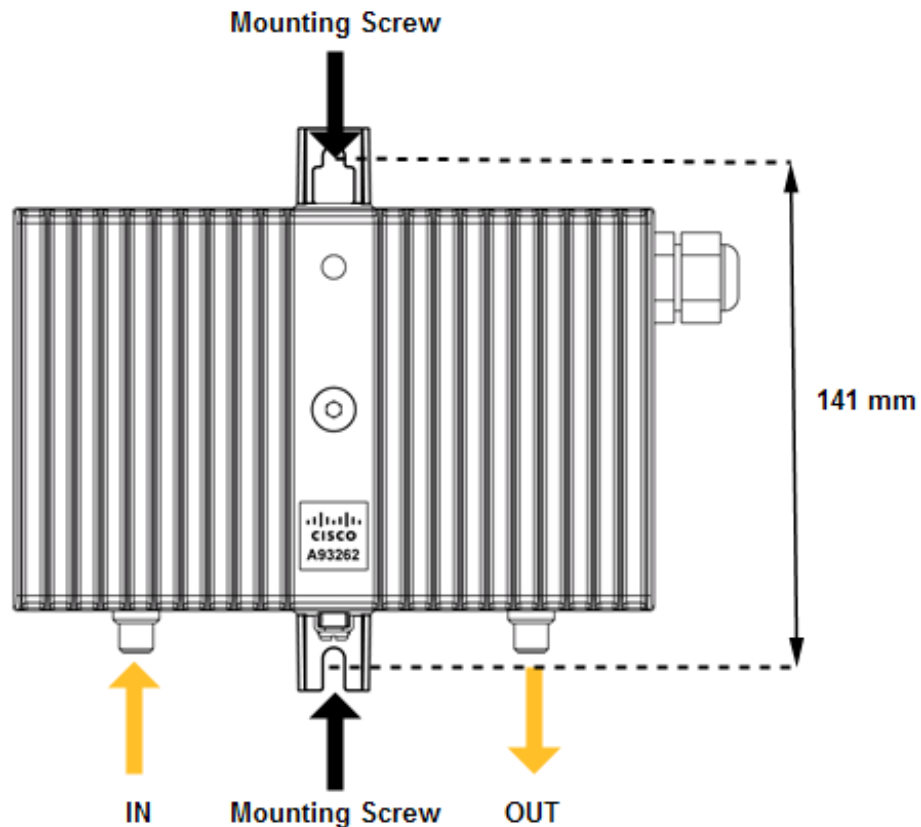
Be aware of the size and weight of the amplifier when mounting. Ensure that the mounting location has a stable flat surface, and can safely support the amplifier's maximum weight. Please use the appropriate type of screws and screwdrivers, depending on the mounting method.

Mounting Material:

The amplifier's housing with its compact dimensions is designed for wall/cabinet mounting. It is mounted vertically and cables are routed through the bottom of the housing to allow natural ventilation and to secure the best possible operation conditions. The amplifier can be mounted on the wall of concrete, brick, wood, metal, etc., or in the cabinet.

Mounting Steps:

- 1 Use two mounting screws to mount the amplifier. The screw size is M5 and the distance between two mounting screws is 141 mm.
- 2 Tighten the two mounting screws. Make sure the amplifier is fixed steadily. See the following diagram for instructions:



Chapter 3 Configuration

Overview

This chapter provides instructions for selecting and implementing the correct configuration for the amplifier in your cable system. Through configuring the accessible component, you can set the operating gains and equalizations of the amplifier to ensure proper performance.

In This Chapter

Topic	See Page
Preparation	3-2
Opening the Housing	3-3
Configuring the Forward Path	3-4
Configuring the Reverse Path	3-6
Closing the Housing	3-8

Preparation

Before You Begin

Before you begin, it is important to review and understand the following information.



CAUTION:

Make sure the amplifier is receiving proper input signals before you configure the amplifier.

Required Tools

Before you start, make sure that you have the following tools:

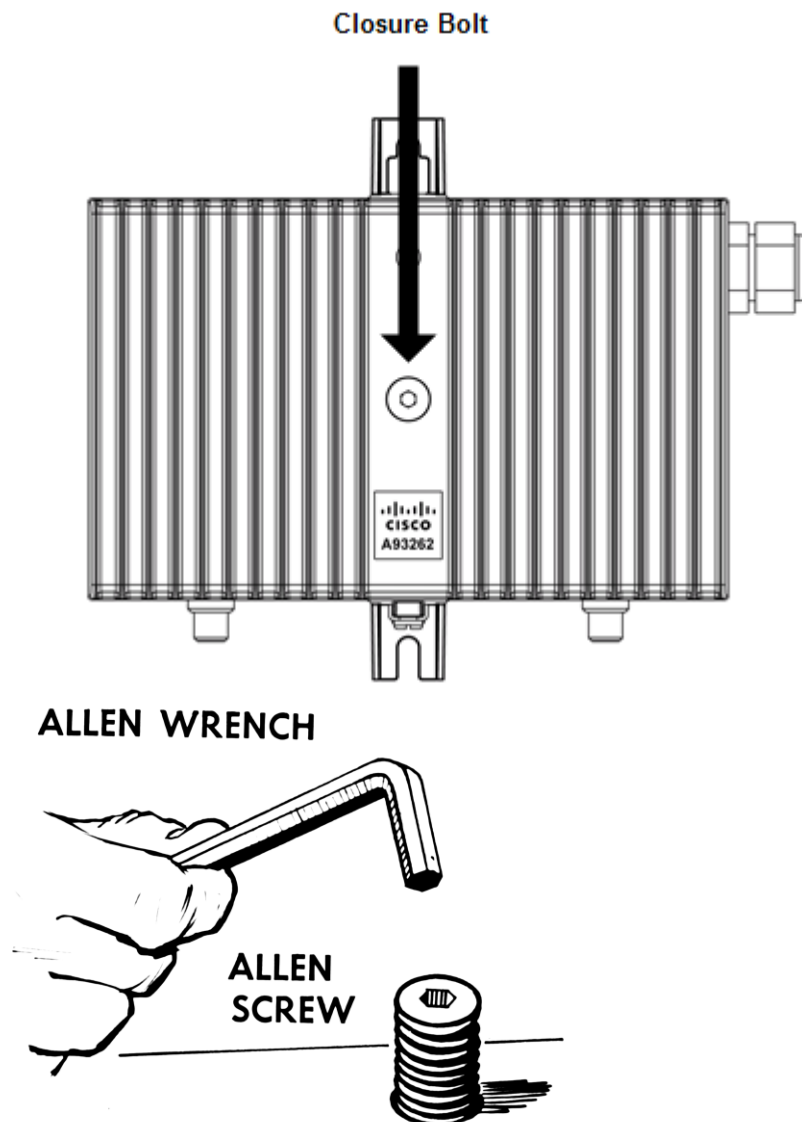
You need a ...	To ...
4 mm Allen wrench	Open and close the amplifier housing.
spectrum analyzer or signal analysis meter capable of working with frequencies up to the highest design frequency	Determine absolute and relative signal levels.
test probe (part number 1010409)	Access the test points.
75 ohm coaxial cable with F-connectors on each end	Connect the test point probe to the test equipment.

Opening the Housing

To Open the Housing

Complete the following steps to open the housing.

- 1 Using the Allen wrench, loosen the housing closure bolt on the housing lid.



- 2 Open the housing.

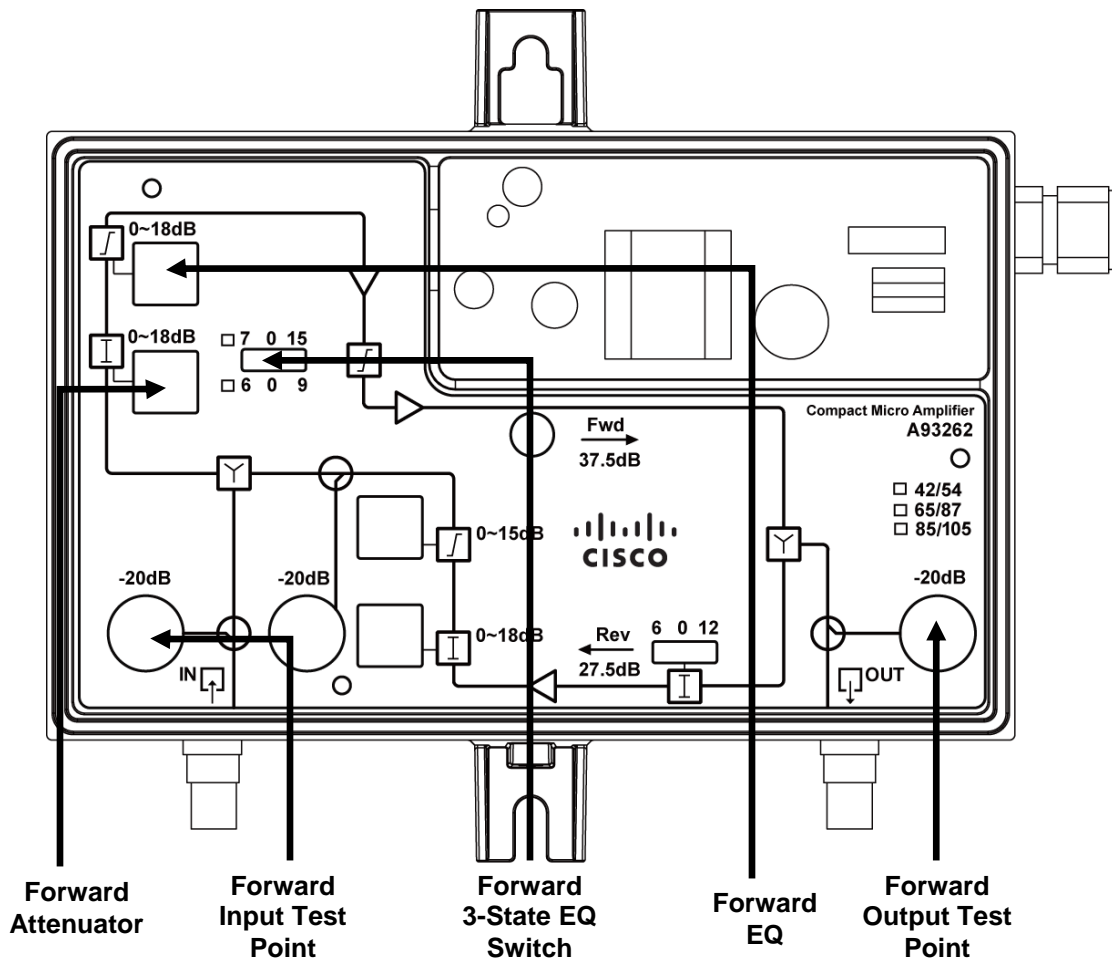
Note: The closure bolt should remain attached to the housing.

Configuring the Forward Path

Overview of the Forward Path

The forward path includes the following test points and accessible components:

- Forward input test point
- Forward output test point
- Forward attenuator
- Forward equalizer
- Tri-state EQ switch



Note:

- 1 The levels measured at test points are 20 dB lower than the real value due to the attenuation of the test point.
- 2 The amplifier is delivered with forward attenuator switched to the maximum value (18 dB).
- 3 The gain of forward path is 37.5 dB when all the accessible components are set to 0.

Configuring the Forward Path, Continued

To Configure the Forward Attenuator

- 1 Connect the test probe to the forward output test point. Record the measured output level.
- 2 If the output level matches the desired value, proceed to **To Configure the Forward EQ**.
- 3 If the output level is lower than the desired value, turn up the forward attenuator to a higher value in the “**U**” direction.
- 4 Verify the value from the test probe. If the output level is higher than the desired value, turn down the forward attenuator to a lower value in the “**U**” direction.
- 5 Proceed to the next step after the desired level is achieved.

To Configure the Forward EQ

- 1 Connect the test probe to the reverse output test point. Record the measured output equalization.
- 2 If the output equalization matches the desired value, proceed to **To Configure the Forward EQ**.
- 3 If the output equalization is lower than the desired value, turn up the forward EQ to a higher value in the “**U**” direction.
- 4 Verify the value from the test probe. If the output equalization is lower than the desired value, turn down the forward EQ to a higher value in the “**U**” direction.
- 5 Remove the test probe from the test point.

To Configure the 3-State EQ Switch

Apply the same steps from **To Configure the Forward EQ** to configure the 3-state EQ switch. Please make sure the forward EQ is set to 0 while configuring. The 3-state EQ switch is used to specify three frequently used values of equalizers for the instant configuration of interstage equalization. The values of the switch are described in the following table.

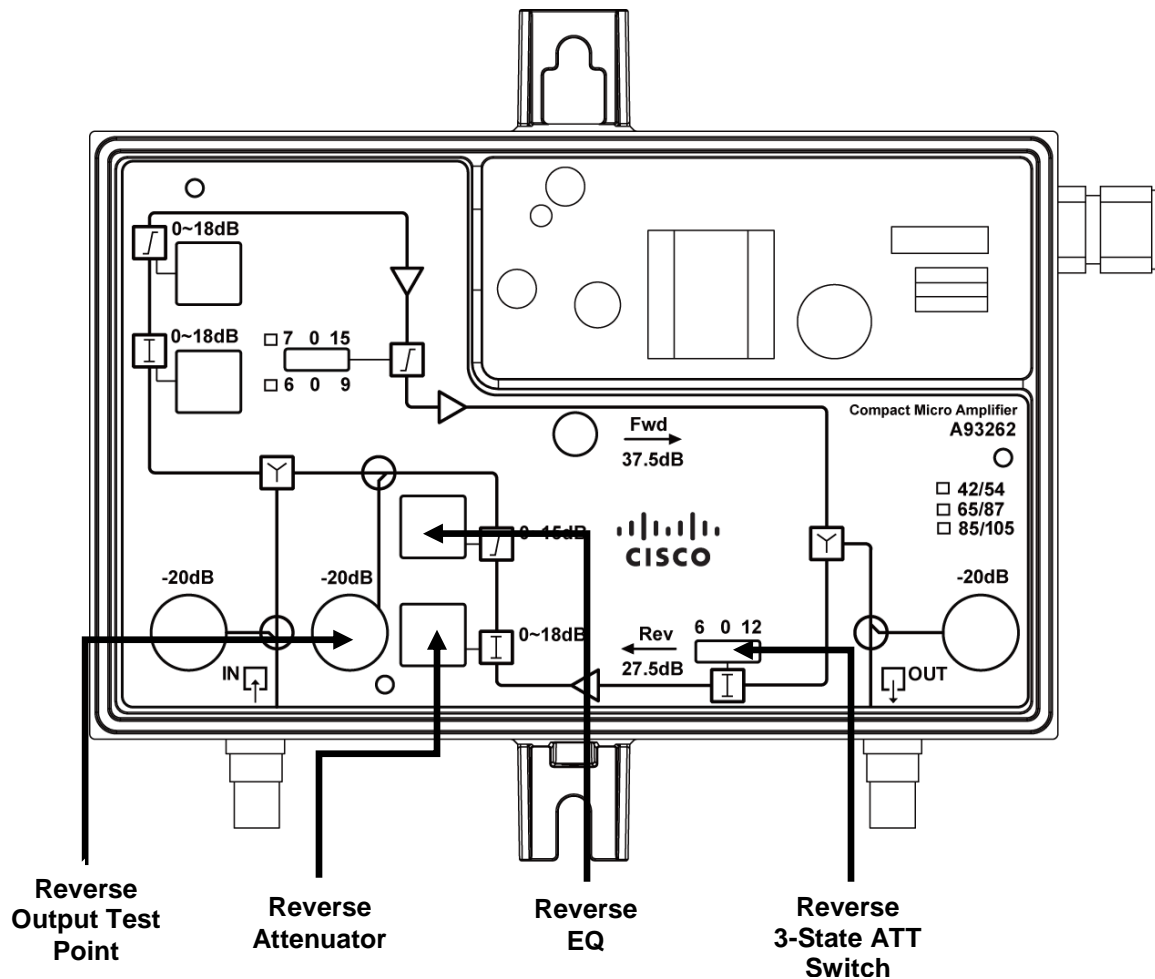
Part Number	Frequency (MHz)	EQ Value (dB)
A93262.1023642 A93262.1123642 A93262.1623642	42/54	0/7/15
A93262.1023665	65/87	0/6/9
A93262.1023685 A93262.1123642 A93262.1223685 A93262.1723685	85/105	0/6/9 (For Europe) 0/7/15 (For all other region)

Configuring the Reverse Path

Overview of the Reverse Path

The reverse path includes the following test points and accessible components:

- Reverse output test point
- Reverse attenuator
- Reverse equalizer
- Tri-state attenuation switch



Note:

- 1 The levels measured at test points are 20 dB lower than the real value due to the attenuation of the test point.
- 2 The amplifier is delivered with reverse attenuator turned up to the maximum value (18 dB).
- 3 The gain of reverse path is 27.5 dB when all the accessible components are set to 0.

Configuring the Reverse Path, Continued

To Configure the Reverse Attenuator

- 1 Connect the test probe to the reverse output test point. Record the measured output level.
- 2 If the output level matches the desired value, proceed to **To Configure the Reverse EQ**.
- 3 If the output level is lower than the desired value, turn up the reverse attenuator to a higher value in the “**U**” direction.
- 4 Verify the value from the test probe. If the output level is higher than the desired value, turn down the reverse attenuator to a lower value in the “**U**” direction.
- 5 Proceed to the next step after the desired level is achieved.

To Configure the 3-State ATT Switch

Apply the same steps from **To Configure the Reverse Attenuator** to configure the 3-state ATT switch. Please make sure the forward EQ is set to 0 while configuring.

The 3-state ATT switch is used to specify three frequently used values of attenuators for the instant configuration of interstage equalization.

To Configure the Reverse EQ

- 1 Connect the test probe to the reverse output test point. Record the measured output equalization.
- 2 If the output equalization matches the desired value, proceed to step 5.
- 3 If the output equalization is lower than the desired value, turn up the reverse EQ to a higher value in the “**U**” direction.
- 4 Verify the value from the test probe. If the output equalization is lower than the desired value, turn down the reverse EQ to a higher value in the “**U**” direction.
- 5 Remove the test probe from the test point.

Closing the Housing

To Close the Housing

Complete the following steps to close the housing.



CAUTION:

Avoid moisture damage and RF leakage! Follow the procedure exactly as shown below to ensure a proper seal.

Ensure that all the cables are out of the way when closing the housing.

- 1 Make sure that the housing gaskets are clean and in the correct position. Wipe off any excess dirt and debris.
 - 2 Close the housing.
 - 3 Insert the closure bolt into the closure hole.
 - 4 Using a 4 mm Allen wrench, tighten the closure bolt to 5 Nm. Refer to *Opening the Housing* on page 3-3 for details.
-

Chapter 4

Troubleshooting

Overview

This chapter describes the steps you may take to troubleshoot the Cisco Compact Micro Amplifier.

In This Chapter

Topic	See Page
No Forward RF Signal	4-2
Low or Degraded Forward RF Signal	4-3
No Reverse RF Signal	4-4
Low or Degraded Reverse RF Signal	4-5
No Power Supply	4-6

Preparation

Required Tools

The following equipment is necessary to perform the troubleshooting procedures.

You need a ...	To ...
4 mm Allen wrench	Open and close the amplifier housing.
spectrum analyzer or signal analysis meter capable of working with frequencies up to the highest design frequency	Determine absolute and relative signal levels.
test probe (part number 1010409)	Access the test points.
75 ohm coaxial cable with F-connectors on each end	Connect the test point probe to the test equipment.
Compressed air	Clean the amplifier.

To open the housing

Refer to **To Open the Housing** on page 3-3 to open the amplifier housing before troubleshooting.

Contact Cisco for Support

If you still cannot find the appropriate solution after performing the recommended solutions in this chapter, contact Cisco for support. Refer to Chapter 5, **Customer Support Information**.

No Forward RF Signal

The forward RF signal can be measured at the forward input and at the forward output test point.

No Forward RF Signal Troubleshooting Table

Problem Description	Solution
No forward RF signal at the forward input test point.	Verify the connection of the RF cable connector. Verify that the amplifier is receiving the proper forward RF input signal.
There is forward RF signal at the forward input test point, but no signal at the forward output test point.	Verify the connection of the RF cable connector. Verify that the amplifier is receiving the proper forward RF input signal. Verify that all the forward customer accessible components are set to 0.

Low or Degraded Forward RF Signal

The forward RF signal can be measured at the forward input and forward output test points.

Low or Degraded Forward RF Signal Troubleshooting Table

Make sure you are using the proper tilt reference when setting levels. A 1 GHz design balanced at 550 MHz requires a correct tilt reference to compensate for the difference in carrier levels between 550 MHz and 1 GHz. The tilt reference at 550 MHz is lower than the tilt reference at 1 GHz.

Problem Description	Solution
Low or degraded forward RF signal at the forward input test point.	Verify the connection of the RF cable connector. Verify that the amplifier is receiving the proper forward RF input signal.
There is a proper forward RF signal at the forward input test point, but a low or degraded signal at the forward output test point.	Verify the connection of the RF cable connector. Verify that the amplifier is receiving the proper forward RF input signal. Verify that all the forward customer accessible components are set to 0.

No Reverse RF Signal

The reverse RF signal can be measured at the reverse output test point.

No Reverse RF Signal Troubleshooting Table

Problem Description	Solution
No signal at the reverse output test point.	Verify the connection of the RF cable connector. Verify that the amplifier is receiving the proper reverse RF input signal. Verify that all the reverse accessible components are set to 0.

Low or Degraded Reverse RF Signal

The reverse RF signal can be measured at the amplifier module reverse output test point.

Low or Degraded Reverse RF Signal Troubleshooting Table

Make sure you are using the proper total tilt reference when setting reverse levels.

Problem Description	Solution
There are low or degraded signal at the reverse output test point.	Verify that all the reverse customer accessible components are set to 0. Verify that the amplifier is receiving the proper reverse RF input signal. Verify that all the reverse accessible components are set to 0.

No Power Supply

No Power Supply

Before you begin troubleshooting the power supply, verify that the power cord is receiving power.

Important: You cannot balance the amplifier without the proper power supply.

Problem Description	Solution
No Power supply	Verify that the power cord is connected.

Chapter 5

Customer Support Information

Overview

This chapter contains information on obtaining product support.

In This Chapter

Topic	See Page
Obtaining Product Support	5-2

Obtaining Product Support

IF...	THEN...
you have general questions about this product	Contact your distributor or sales agent for product information or refer to product data sheets at www.cisco.com .
you have technical questions about this product	Call the nearest Technical Service center or Cisco office.
you have customer service questions or need a return material authorization (RMA) number	Call the nearest Customer Service center or Cisco office.

Support Telephone Numbers

This table lists the Technical Support and Customer Service numbers for your area.

Region	Centers	Telephone and Fax Numbers
North America	Cisco Services Atlanta, Georgia United States	For <i>Technical Support</i> , call: Toll-free: 1-800-722-2009 Local: 678-277-1120 (Press 2 at the prompt) For <i>Customer Service</i> , call: Toll-free: 1-800-722-2009 Local: 678-277-1120 (Press 3 at the prompt) Fax: 770-236-5477 E-mail: customer-service@cisco.com
Europe, Middle East, Africa	Belgium	For <i>Technical Support</i> , call: Telephone: 32-56-445-197 or 32-56-445-155 Fax: 32-56-445-061 For <i>Customer Service</i> , call: Telephone: 32-56-445-444 Fax: 32-56-445-051 E-mail: service-elc@cisco.com

Obtaining Product Support

Region	Centers	Telephone and Fax Number
Japan	Japan	Telephone: 82-2-3429-8800 Fax: 82-2-3452-9748 E-mail: songk@cisco.com
Korea	Korea	Telephone: 82-2-3429-8800 Fax: 82-2-3452-9748 E-mail: songk@cisco.com
China (mainland)	China	Telephone: 86-400-8108886 Press 4 at the prompt E-mail: repaircentercn@external.cisco.com
All other Asia-Pacific countries & Australia	Hong Kong	Telephone: 852-2588-4746 Fax: 852-2588-3139 E-mail: support.apr@sciatl.com
Brazil	Brazil	Telephone: 11-55-08-9999 Fax: 11-55-08-9998 E-mail: fattinl@cisco.com/ecavalhe@cisco.com
Mexico, Central America, Caribbean	Mexico	For <i>Technical Support</i> , call: Telephone: 52-3515152599 Fax: 52-3515152599 For <i>Customer Service</i> , call: Telephone: 52-55-50-81-8425 Fax: 52-55-52-61-0893
All other Latin America countries	Argentina	For <i>Technical Support</i> , call: Telephone: 54-23-20-403340 ext 109 Fax: 54-23-20-403340 ext 103 For <i>Customer Service</i> , call: Telephone: 770-236-5662 Fax: 770-236-5888 E-mail: keillov@cisco.com



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