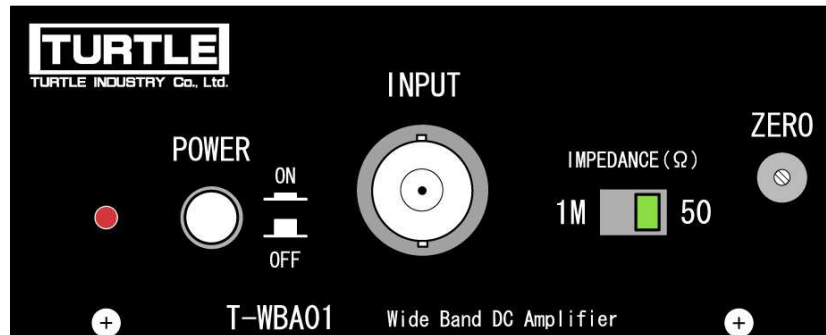


T-WBA01Z

Broadband Direct Current Amplifier



Operating Instruction Manual



Warnings and Cautions (Ensure to Read Before Use)

This operating instructions manual describes how to prevent any physical injury or damage to property and ensures safe use of the product.

The indications and labels used in this document have the following meanings. Please ensure you have carefully read and understand the content before reading the main text.

 Warning	Any failure to observe this warning or mishandling the product could result in death or severe injury.
 Caution	Any failure to observe this caution or mishandling the product could result in physical injury or damage to property.

- (1) The specifications of the product and content of this operating instructions manual are both subject to change without prior notice.
- (2) No individual parts or all of the product or this operating instructions manual can be reprinted without prior permission.
- (3) This operating instructions manual was created to be thorough but if anything is unclear or requires correction please contact the Service Support Section of Turtle Industry.
- (4) We will bear no responsibility for any claims for losses or lost earnings allegedly due to operation of the product, notwithstanding the above.
- (5) The product was not intended to be incorporated in or to control any facilities or equipment that could involve human lives or that require a high level of reliability. We will bear absolutely no responsibility for any fatal accidents or damage to property that occur because the product was used in any such facilities or equipment.
- (6) If the product and software fall under the category of being strategic goods (or services) according to the provisions of the Foreign Exchange and Foreign Trade Control Law an export permit issued by the Japanese government will be required in exporting the product abroad.

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Warnings and Cautions on Use



Warning

Ensure to cut off all the power supply to any equipment before attaching or removing it. Failure to do so could pose the hazard of an electric shock depending on the equipment used.



Caution

Ensure to observe the indicated range of voltage and current in the specifications with the terminals. Failure to do so could result in overheating and fire or electricity leaking.

Do not use the product anywhere it could be exposed to water or chemicals. Failure to do so could result in fire or other type of disaster.

Do not use the product anywhere inflammable gases could be present. Failure to do so could result in fire or explosion.

Do not install the product anywhere unstable or it could fall over and cause physical injury.

If any smoke or abnormal odor is generated immediately cease use of the product. Remove the cable and consult our Service Support Section.

1. Introduction.....	4
1.1 Product Outline	4
1.2 Product Structure	4
2. Names of Each Part	5
2.1 Front.....	5
2.2 Rear	5
3. Description of Each Part.....	7
3.1 Input Terminal (INPUT)	7
3.2 Output Terminal (OUTPUT)	7
3.3 Zero Adjustment (ZERO)	7
3.4 Input Resistance Selection	8
3.5 Power Supply Input Terminal (DC 5V).....	8
4. Property Data Sample	8
4.1 Amplification Factor, Phase Property	8
5. Other	9
5.1 Limited Warranty	9
5.2 Contact Information	9
6. Specifications.....	11
6.1 Summary of Specifications	11
6.2 Outline of Dimensions.....	12

1. Introduction

Thank you very much for purchasing the Broadband Direct Current Amplifier T-WBA01Z made by Turtle Industry Co., Ltd.

This document describes what you will need to know to use the product, including its special features, how to use it, handling instructions, and other related information.

To ensure correct use of the product you will need to be familiar with electronic circuits because of its inherent nature. Any wrong usage or mishandling could not only result in damage to the product but also lead to a serious accident. Please ensure to thoroughly read and understand this document in thereby enabling correct use of the product.

1.1 Product Outline

The product is a signal amplifier for amplifying broadband signals, including direct current signals. The product has a 20dB amplification factor at a transmission impedance of 50Ω, and therefore is suitable as an amplifier in front of an AD convertor. The product runs on a single power supply of 5 V and thus is easy to handle.

1.2 Product Structure

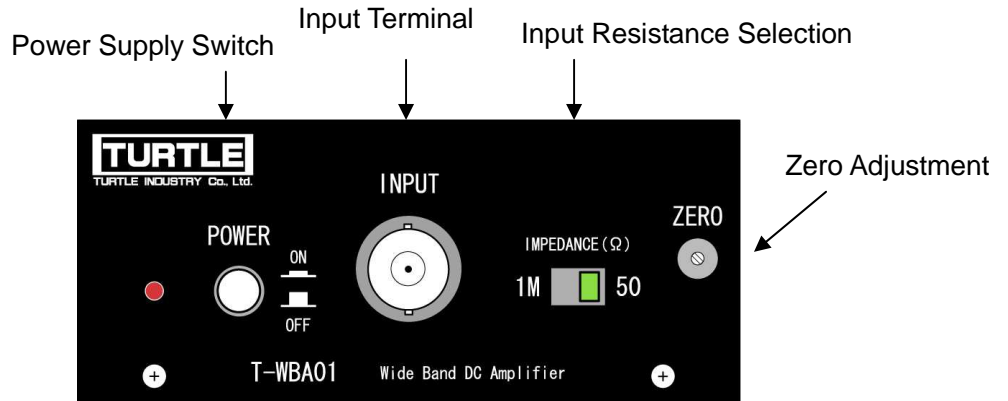
The product packaging contains:

- (1) Main T-WBA01Z body
- (2) Dedicated AC/DC adaptor
- (3) Four case feet to be attached

* If anything is missing please ensure to contact our Service Support Section. (Refer to page 9 for contact information.)

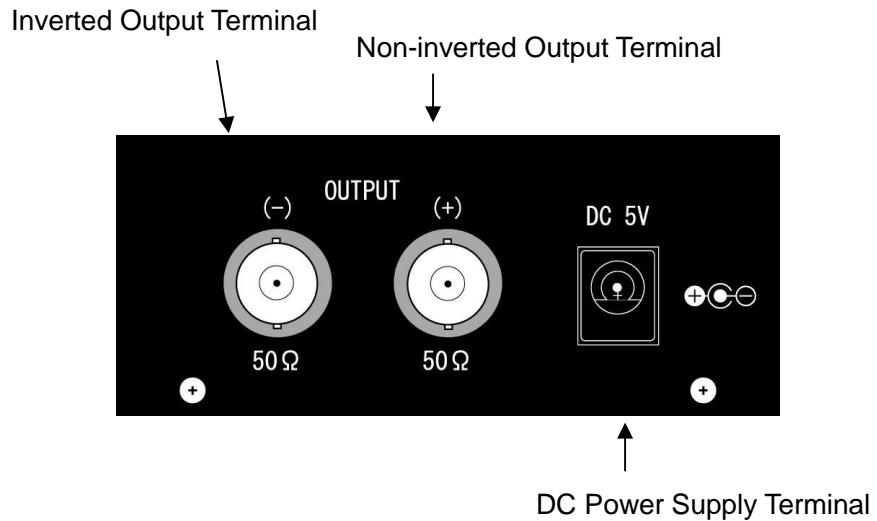
2. Names of Each Part

2.1 Front



Power Supply Switch	A push button switch for supplying power.
Input Terminal	The terminal for inputting signals. (BNC)
Input Resistance Selection	This allows an input resistance of between 1M and 50Ω to be selected.
Zero Adjustment	The offset adjustment volume.

2.2 Rear



Inverted Terminal	Output	The terminal used for outputting inverted signals after amplification. (BNC)
Non-inverted Terminal	Output	The terminal used for outputting non-inverted signals after amplification. (BNC)
DC Power Terminal	Supply	Used to connect the accompanying AC/DC adaptor to the power supply.

3. Description of Each Part

3.1 Input Terminal (INPUT)

The terminal for input of the signals to be amplified.

A BNC connector is used here. An input resistance of between 1M (mega) ohm and 50 ohms can be selected using the input resistance selection switch.



Warning

The maximum value for any input voltage is $\pm 5V$. Exceeding that voltage could not only damage the product but also pose the risk of fire or electric shock.

- * The DC power supply terminal (DC 5V) and current input terminal (INPUT) are isolated. (The insulation withstanding voltage is not guaranteed)
- * The INPUT shield and OUTPUT shield sides have common potentiality (electrically connected).
- * The INPUT shield and case have common potentiality (electrically connected).

3.2 Output Terminal (OUTPUT)

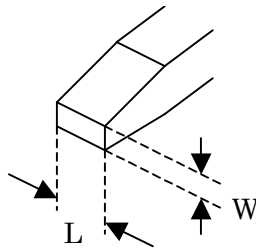
The terminal will output amplified voltage. Connect it with, for example, an instrument that measures the voltage input. Both (+) non-inverted and (-) inverted output are supported.

- * The OUTPUT shield and INPUT shield have common potentiality (electrically connected).
- * The OUTPUT shield and case have common potentiality (electrically connected).

3.3 Zero Adjustment (ZERO)

Used to make any necessary zero adjustments. The adjustable range is $\pm 100mV$ of the output (at 50Ω , $\pm 50mV$).

(Concerning the driver for use in making adjustments)



Please use a driver that is (W) 0.3 ~ 0.5 mm thick at the tip which is (L) 1.6 ~ 2.0 mm wide.

3.4 Input Resistance Selection

Used for selecting an input resistance of between 1M (mega) ohm and 50 ohm.

Selecting 50 ohm will result in the head of the switch lighting up green.

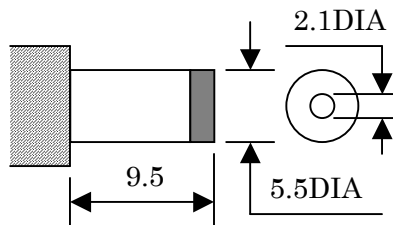
* When switching ensure to cut off the power supply first.

3.5 Power Supply Input Terminal (DC 5V)

Connect the accompanying AC/DC adaptor here.

The power supply input terminal is isolated from the ground used for the signal processing circuit. However, the insulation withstanding voltage is not guaranteed.

Shape of Compatible Plug



Polarity: Center (negative), Outside (positive)



Warning

Reversing the power supply input polarity could damage the product or lead to a fire.

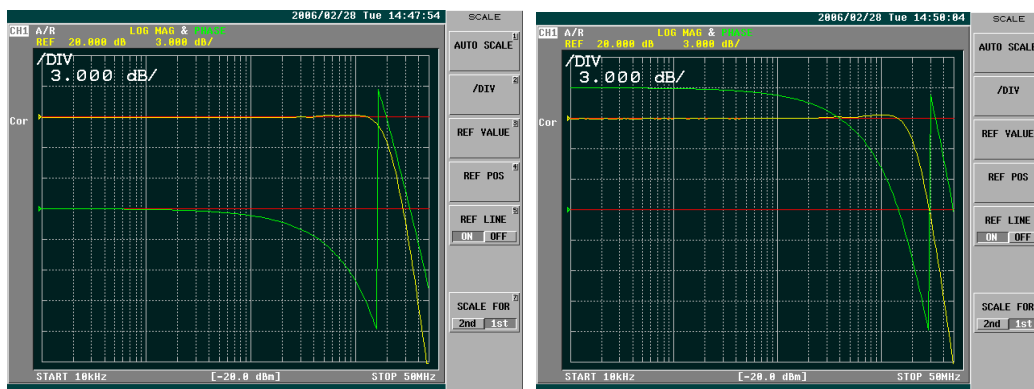
4. Property Data Sample

4.1 Amplification Factor, Phase Property

* Input/Output 50Ω, 10k - 50MHz

[Non-inverted Output]

[Inverted Output]



5. Other

5.1 Limited Warranty

The Turtle Industry (Turtle-Ind) warrants each product of its manufacture to be free from defects in material and workmanship subject to the following terms and conditions. The warranty is effective for half a year after the shipment by Turtle-Ind to the original purchaser.

The obligation of Turtle-Ind under the warranty is limited to servicing or adjusting any product returned to the head office of Turtle-Ind for this purpose and to replacing any defective part thereof. Such product must be returned by the original purchaser, transportation charges prepaid, with sufficient and detailed proof in writing of the defect. If the fault has been caused by misuse or abnormal conditions of operation, repairs must be paid for. Prior to repair, in this instance, a quotation will be submitted. Service or shipping information will be notified depending on the difficulty encountered. Model and serial numbers must be supplied by user. Batteries are specifically excluded under warranty.

Turtle-Ind shall not be liable for any injury to persons or property or for expenses incurred by the use of any Turtle-Ind product.

5.2 Contact Information

If you have any operating problems or questions please contact us at the following.
We will investigate the cause of the problem before getting back to you.

When making any inquiries please provide as detailed information as possible, including the operating environment.

Turtle Industry Co., Ltd.

~ Service Support Section,

Technical Division, Technical Department ~

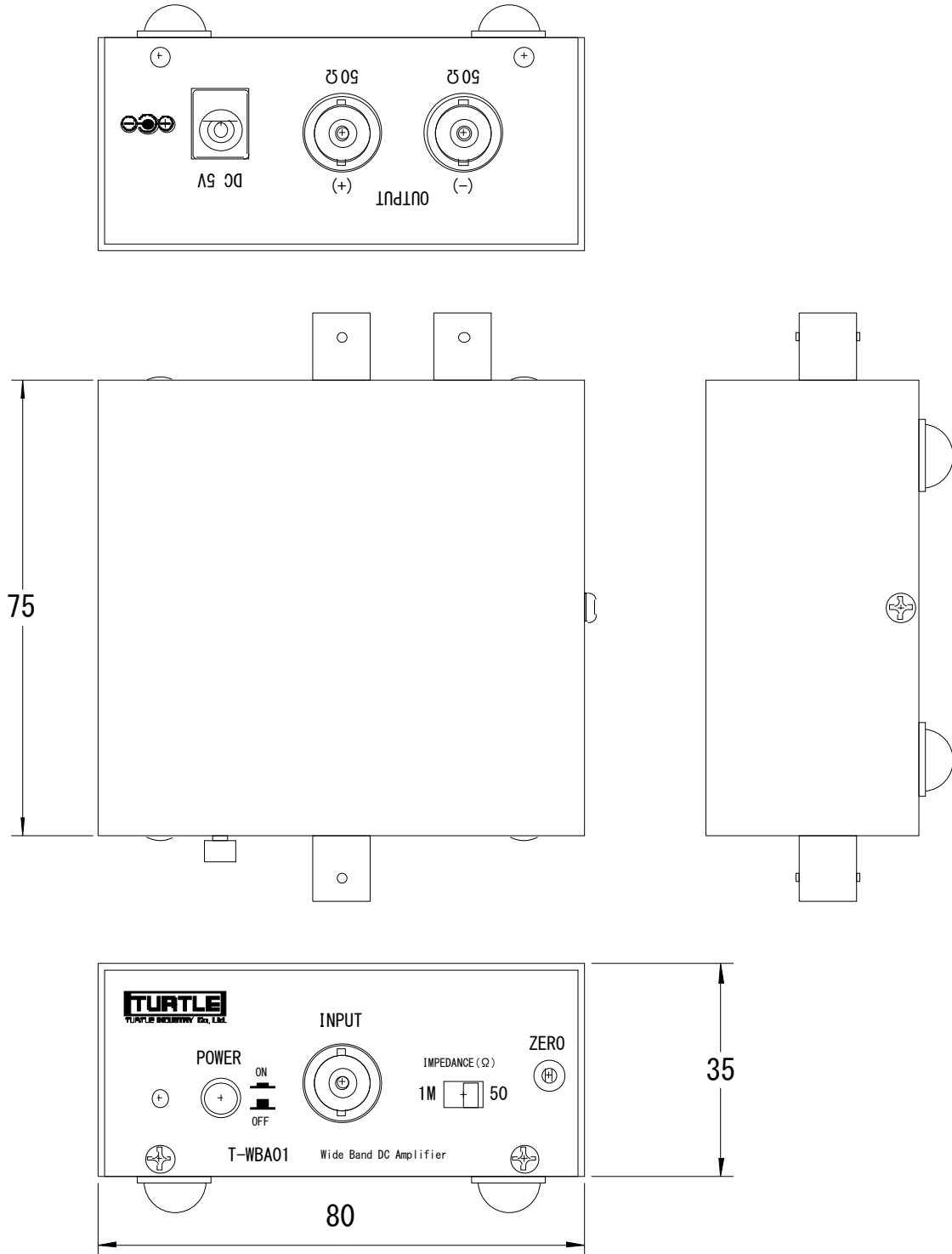
E-mail	tokyo@turtle-ind.co.jp
FAX	+81-29-843-2024
Address	1-12-4 Nishineminami, Tsuchiura-shi, Ibaraki, Japan, 300-0842

6. Specifications

6.1 Summary of Specifications

Number of Input Channels	1
Input Resistance	Switchable between 50Ω and 1M (mega) Ω
Allowable Input Voltage	±5Vp
Gain	26dB (high resistance load)/ 20dB (50Ω load), all ±0.3dB
Maximum Output Voltage	approx. ±4.9Vp (high resistance load)/approx. ±2Vp (50Ω load)
Maximum Output Current	approx. ±50mA _p
Frequency Band	DC ~ 20MHz (-3dB)
Noise Voltage	approx. 2.5mV _{rms} (output value with input short of 50Ω and load of 1MΩ from 3Hz to 20MHz)
Offset Voltage Adjustable Range	approx. ±100mV (output value with high resistance load)
Output Resistance	50Ω (BNC x 2) each with both inverted and non-inverted
Power Supply Voltage	DC 5V (using the accompanying AC/DC adaptor, insulated from internal circuit)
Consumption Current	approx. 200mA (5V)
Operating Temperature	5C ~ 45C
Dimensions	80 (w) x 35 (h) x 75 (d) mm (protrusions such as connectors not included)
Weight	approx. 170g (AC/DC adaptor and connection cable not included)

6.2 Outline of Dimensions



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T-WBA01Z**

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