

## TDA Series CATV Distribution Amplifiers

Model	Bandwidth	Powering
TDA40D31 - 1.2GHz	5-85 MHz / 102-1218 MHz	12 to 15VDC External Powering (min. 1500mA adapter)

TDA series CATV Distribution Amplifiers are designed for RF distribution systems such as those in Cable Television Apartments, Hotels, Hospitals and other applications where a high quality low noise figure amplifier is necessary to amplify the signals in both the forward and return paths.

The TDA40D31 fills out the selection of 1.2 GHz Distribution Amplifiers giving you extra reach and higher output. Designed with flat operational gain of 38 dB in the forward band and 24 dB in the reverse band.

The TDA40D31 has sockets for JXP style plug-in controls, including input and mid-stage pad and equalizer for forward bandwidth balancing, and input pad plus output pad and equalizer for reverse path balancing. Universal JXP style pads are used for both attenuator and equalizer functions. Upstream frequency is flexible and can be upgraded to 204 MHz with field replaceable diplex filters and equalizer sub-board.

The amplifiers are externally powered via separate DC input (12 to 15 VDC /min. 1500mA).

### FEATURES

- Fully meets the requirements of DOCSIS 3.1,
- Downstream frequency bandwidth extends to 1.2 GHz,
- Multiple diplex filter frequency split options,
- GaAs-FET Push Pull for high output levels with low distortions,
- JXP style plug-in controls,
- RFI housing,
- SCTE compliant F type connectors,
- Surge protection on all ports,
- Diecast aluminum housing for heat dissipation.



The Lightning flash with arrowhead symbol within an equilateral triangle is intended to alert you to the presence of uninsulated "dangerous voltage" within the products supplementary external power supply enclosure that may be of sufficient magnitude to constitute a risk of electrical shock to persons.



## CAUTION

Risk of Electric Shock  
Do not Open



The exclamation point within an equilateral triangle is intended to alert you to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

REMEMBER TO REPLACE COVER AFTER ADJUSTING.  
COVER MUST BE IN PLACE FOR CE, SAFETY AND PROTECTION.

NO SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

**WARNING:** TO PREVENT SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE. THIS APPARATUS SHALL NOT BE EXPOSED TO DRIPPING OR SPLASHING WATER AND NO OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHALL BE PLACED ON THE APPARATUS.  
**WARNING:** THIS PRODUCT IS A CLASS-I CONSTRUCTION. PLEASE ENSURE A CONNECTION TO POWER SOURCE INCLUDES A PROTECTIVE EARTHING CONNECTION.

### NOTE TO AMPLIFIER INSTALLER

This reminder is provided to call the Amplifier installers attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

### INSTALLATION AND SETUP GUIDELINES

1. Diplex Filter modules and board assembly are inside the amplifier and assessable by opening the cover, plug in Pads and EQ's are also found here. Remember to tightly close the cover when finished.
2. This product is shipped with default 0 dB pad for all plug-in attenuator and equalizer sub-board.
3. Before plugging in the amplifier make sure the RF input level is less than 20 dBmV or damage to the amplifier may occur, if need be plug in a high value pad to reduce the input level so it is below 20 dBmV (optimal input level is 12 dBmV).
4. Once the Amplifier is connected and powered up, read the input on the -20dB test point.
5. Install the correct value JXP Pad in the input equalizer socket to level the input signal from low to high frequency to within 1 dB. Remember the actual input level is 20 dB higher than on the -20 dB test point. This will ensure the best CNR.
6. Once you know the necessary output slope, plug a JXP pad into the mid-stage Equalizer socket. (Typically output should be sloped 10 dB or 36/46 dBmV for optimum performance. Remember 36 dBmV is on the lowest channel and 46 dBmV is on the highest channel).
7. Now your output levels should be set as needed, if you are having issues double check for the correct input levels.
8. For the reverse path, set up it is easiest to use test carriers at the proper levels remembering that the test point is 20 dB below actual levels. Ideal reverse input levels are 9 dBmV with a flat or 0 dB slope, (do not exceed 20 dBmV) use a JXP pad as needed to adjust the reverse input slope. Use a output pad as needed to adjust the reverse output level. For best performance the reverse output level should be 33 dBmV for 5-42 and 5-85 MHz reverse frequencies and 31 dBmV for 5-204 MHz reverse.
9. Verify that the upstream reference test point (Note: this is commonly called the "X point" and it is measured at your node, or optical receiver, or at the 1<sup>st</sup> downstream amplifier. Consult with your system designer) has the proper upstream output signal levels. If it does not then select the appropriate fixed attenuator and equalizer and install them in the reverse amplifier output sockets.
10. Record the in/out operating levels and the pad and equalizers used in this station.

### INSTALLATION PRECAUTIONS TABLE

CONDITION	REQUIREMENT
Installation	Provide a minimum of 35" in front of the amplifier for access, install horizontally to allow for air movement over the cooling fins.
Ventilation	Make sure the area or room has proper ventilation to prevent overheating of the amplifier leave 6" of space on all 4 sides.
AC Power	This amplifier uses a universal power transformer 90-230VAC with a 6' long cord, do not extend the cord, locate the amplifier within 6' of the electrical socket.
Moisture	Make sure the amplifier is installed in a location where it is not exposed to water or condensation.

**Ordering Information Toner TDA40D31 series Amplifier accessories**

**Note:**

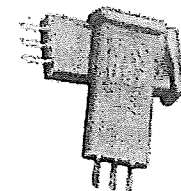
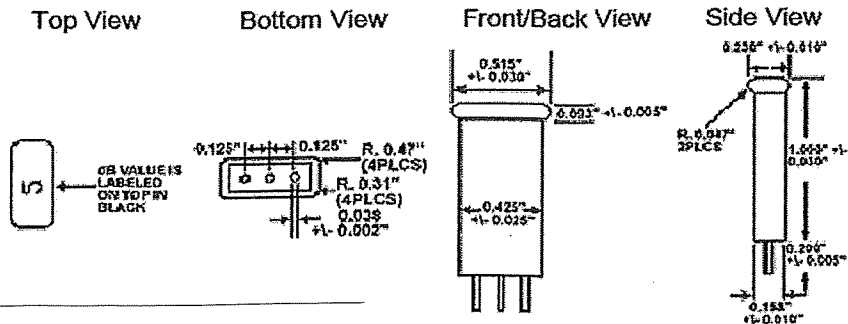
Amplifiers are supplied with 0 dB pads installed in all locations as the JXP Pad is used as both a Pad and as a Equalizer

Model	Description
JXP-L00	0 dB Pad, Long, Orange
JXP-L01	1 dB Pad, Long, Orange
JXP-L02	2 dB Pad, Long, Orange
JXP-L03	3 dB Pad, Long, Orange
JXP-L04	4 dB Pad, Long, Orange
JXP-L05	5 dB Pad, Long, Orange
JXP-L06	6 dB Pad, Long, Orange
JXP-L07	7 dB Pad, Long, Orange
JXP-L08	8 dB Pad, Long, Orange
JXP-L09	9 dB Pad, Long, Orange
JXP-L10	10 dB Pad, Long, Orange
JXP-L11	11 dB Pad, Long, Orange
JXP-L12	12 dB Pad, Long, Orange
JXP-L13	13 dB Pad, Long, Orange
JXP-L14	14 dB Pad, Long, Orange
JXP-L15	15 dB Pad, Long, Orange
JXP-L16	16 dB Pad, Long, Orange
JXP-L17	17 dB Pad, Long, Orange
JXP-L18	18 dB Pad, Long, Orange
JXP-L19	19 dB Pad, Long, Orange
JXP-L20	20 dB Pad, Long, Orange
TDA40D31-42	Diplex Filter set 42/54 MHz
TDA40D31-85	Diplex Filter set 85/102 MHz
TDA40D31-204	Diplex Filter set 204/258 MHz

Diplex filter kits include the proper plug in EQ sub board in the return path

**Remember the JXP Pad is both a pad and the EQ**

**MECHANICAL DIMENSIONS: JXP TALL ATTENUATOR**



Toner Cable Equipment Inc

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800-523 5947, 215 675 2053,

[www.tonercable.com](http://www.tonercable.com)  
info@tonercable.com

**SPECIFICATIONS**

Typical, for T=20degC, Zin= Zout= 75 ohms

Parameter	Notes	Forward			Reverse			Units
		54-1218	102-1218	258-1218	5-42	5-85	5-204	
Bandwidth	(1)							MHz
Technology		GaAs			GaAs			
Average Full Gain			38		24	24	22	dB
Flatness		<+/-1 (Gain at 102MHz: min.36.5dB)			<+/-1			"
Return Loss, IN/OUT		-16 (<1GHz), -14 (1 to 1.2GHz)			-16			"
Test Points, Fw IN/Rev OUT	bidirectional	-20			-20			"
Test Points, Fw OUT/Rev IN	bidirectional	-20			-20			"
Gain Control	JXP plug-in (2)	in / mid			in / out			
Slope Control	JXP plug-in (2),(3),(4)	in / mid			out			
Noise Figure (Forward)	with 0 dB jumpers	6 (<1GHz), 7 (1 to 1.2GHz)						dB
Forward Distortions:	40/50dBmV output level (77 NTSC analog channels plus 111 equivalent digital SC-256-QAM channels to 1218MHz)							
CTB	on ch78	-67						dBc
CSO	on ch78	-69						"
Xmod	on ch2	-73						"
CIN		-57						"
Forward Distortions:	36/46dBmV output level (77 NTSC analog channels plus 111 equivalent digital SC-256-QAM channels to 1218MHz)							
CTB	on ch78	-83						dBc
CSO	on ch78	-74						"
Xmod	on ch2	-80						"
CIN		-70						"
Reverse Distortions:	52dBmV flat output, 2 ch according to ANSISCTE1152006							
DTO on 7MHz					-68			dBc
DSO on 6MHz					-75			"
Xmod on T1D					-66			"
Noise Figure (Reverse)	with 0 dB jumpers				6			dB
Recommended RF Input Level		9 (single) 13 (cascaded)						dBmV
Group Delay	CH2 (55,25-58,83 MHz)							nsec
	CH98 (109,25-112,83 MHz)							
	CH15 (259,25-263,08 MHz)							
	204-203 MHz							
	41-42 MHz							
	84-85 MHz							
5-6 MHz								
Hum Modulation		-80						dBc
RFI Isolation		-100						"
Surge Withstand		IEEE C62.41-Cat B3, Combination Wave 6KV, 3KA						
Powering		External Powering, 12 to 15VDC (min 1500mA) over F-type connector						Vac
Power Consumption		15						Watts
Temperature		-20 to +55						degC
Enclosure		IP54 Category, Diecast Aluminium						
Weight		2.8 (6.2)						kg (lb)
Dimensions		21 x 17 x 9 (7-5/8 x 5-3/8 x 3)						cm(in)

**NOTES**

(1) Reverse frequency can be changed by replacing the diplex filters and EQ Board. Please contact us for more information.

(2) Universal JXP type pads. 0dB jumper pads are factory default.

(3) On-board equalizer circuit on forward path. Slope (dB) is selected via universal JXP type plug-in pads.

(4) Plug-in equalizer board on return path. Slope (dB) is selected via universal JXP type plug-in pads.

**BLOCK DIAGRAM**

