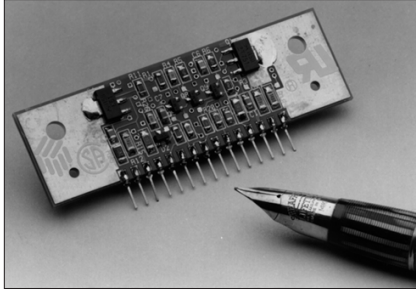


PLA-21 Power Line Amplifier Model 53001-01



Description

The LONWORKS® PLA-21 Power Line Amplifier is designed to boost the output level of a PLT-22 Power Line Transceiver. The boost function is intended for commercial and industrial

- ▼ Capable of transmitting a 10V p-p signal with 2A p-p current drive
- ▼ UL, CSA, TÜV recognized

applications in high rises, manufacturing plants, utility substations, and other large facilities. Capable of transmitting a signal of 10V peak-to-peak (p-p) with 2A p-p current drive, the PLA-21 amplifier is ideal for driving multiple-phase coupling circuits, high attenuation power circuits, and very low impedance loads near circuit breaker panels and distribution transformers.

The PLA-21 amplifier consists of a single in-line package (SIP) containing the amplifier circuitry and connector pins (actual appearance may differ from photo).

PLA-21 AMPLIFIER PINOUT

The table which follows lists the functions of the PLA-21 amplifier pins.

Pin #	Pin Name	Function
1	HS1	Heat sink connection (leave floating)
2	ILIM1	1A/2A TX current limit control pin
3	VA	15VDC power supply
4	TXIN	Transmit signal input from PLT-21 (TXOUT pin)
5	VA	15VDC power supply
6	TXON	Transmit enable signal from PLT-21 (CLKSEL1/TXON pin)
7	GND	Ground
8	TXOUT	Transmit signal output to line coupling circuit
9	TXOUT	Transmit signal output to line coupling circuit
10	GND	Ground
11	RXSUM	TXOUT buffered by 650. (leave floating)
12	GND	Ground
13	GND	Ground
14	ILIM2	1A/2A TX current limit control pin
15	HS2	Heat sink connection (leave floating)

Pins 8 and 9 are connected internally, but should always be connected externally as well.

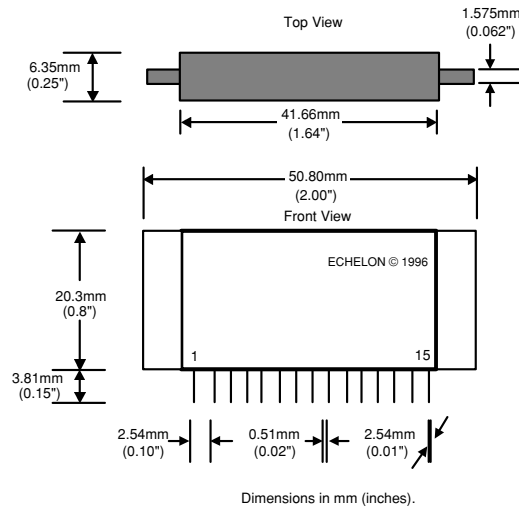
Shorting ILIM1 (pin 2) and ILIM2 (pin 14) to TXOUT (pins 8 and 9) places the PLA-21 into 2A p-p output current limit mode. Leaving pin 2 and pin 14 open places the PLA-21 in 1A p-p output current limit mode.

Pin 11, RXSUM, is for special applications where separate TXOUT and RXIN signals on the PLT-22 transceiver are not available. This pin should be left floating.

HS1 (pin 1) and HS2 (pin 15) are connected to the collectors of the respective output power transistors and to the heat sink copper areas of the PLA-21 amplifier. Pin 1, pin 15, and the heat sink areas should always be left floating.

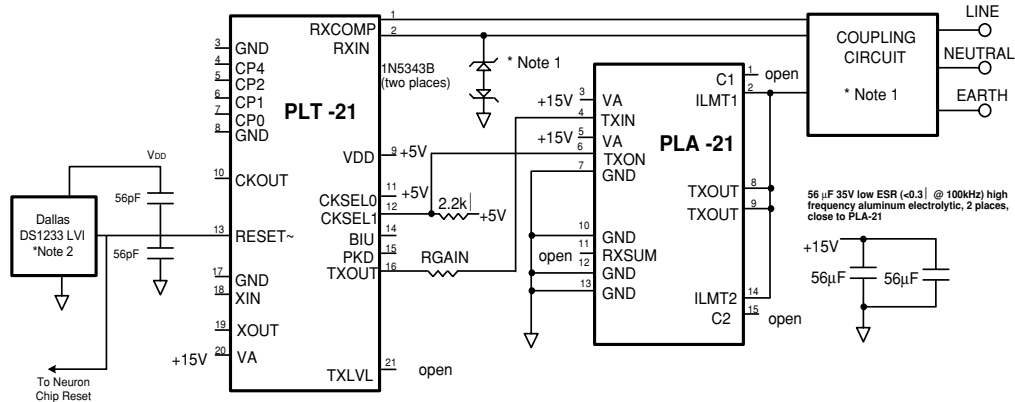
Mechanical Dimensions

The figure which follows presents the mechanical dimensions of the PLA-21 amplifier.



Application Schematic

The following schematic shows a typical interconnection between a PLT-22 transceiver and a PLA-21 amplifier where the output current limit is set to 2Ap-p.



Note 1: The PLA-21 amplifier is compatible with the coupling circuits shown in the PLT-22 Transceiver User's Guide with the addition of the two 1N5343B zener diodes shown above.

The PLA-21 amplifier is also compatible with all of the coupling circuits described in the PLT-22 Power Line Transceiver User's Guide, Demand Side Management Coupling Circuits Recommendations, Centralized Commercial Building Applications with LONWORKS PLT-21 Power Line Transceiver, and Demand Side Management with the LONWORKS Power Line Transceivers. The two 1N5343B zener diodes shown above are only required if the coupling circuit chosen does not already include them.

In order to satisfy conducted emissions regulations, the current rating of the series resonating inductor (L2 in the documents referenced above) should be increased to 2 Amperes. This change will prevent these inductors from generating distortion products due to inductor saturation.

Note 2: A Dallas .DS1233 reset-sensing pulse-stretching low voltage indicator must be used when CKSELI is pulled up to +5V.

External Components

The output level of the PLA-21 amplifier can be set to 3.5Vp-p, 7Vp-p, or 10Vp-p by adjusting the value of resistor RGAIN. The table below presents the RGAIN values for each output level. Note that the TXLVL pin of the PLT-22 transceiver is left open when driving the PLA-21 amplifier.

Output Level (into 50 Ω)	RGAIN
10V p-p	499 Ω
7V p-p	953 Ω
3.5V p-p	2.43k Ω

The PLA-21 amplifier is compatible with the coupling circuits shown in the PLT-22 Transceiver User's Guide with the addition of the two 1N5343B zener diodes shown above.

The PLA-21 amplifier is also compatible with all of the coupling circuits described in the *PLT-22 Power Line Transceiver User's Guide*, *Demand Side Management Coupling Circuits Recommendations*, *Centralized Commercial Building Applications with LONWORKS PLT-21 Power Line Transceiver*, and *Demand Side Management with the LONWORKS Power Line Transceivers*. When the PLA-21 amplifier is used with these coupling circuits the two 1N5343B zener diodes shown above are not required since they are already included in the coupling circuits.

In order to satisfy conducted emissions regulations, the current rating of the series resonating inductor (L2 in the documents referenced above) should be increased to 2 Amperes. This change will prevent these inductors from generating distortion products due to inductor saturation.

Specifications

V _A Input supply voltage ¹	14.25V minimum, 15V typical, 15.75 maximum
IA Input supply current	
receive	4mA typical, 7mA maximum
transmit (2A p-p mode)	220mA typical, 600mA maximum
TXOUT signal level: RGAIN = 499 Ω , into 50 Ω load	10V p-p typical
Output impedance, in-band (transmit, 2A p-p mode)	.2 Ω typical, 0.5 Ω maximum
Input impedance, in-band (receive)	500 Ω minimum
EMI	FCC B demonstrated (at 10Vp-p) and EN 50065-1 demonstrated (Class 116 at 3.5Vp-p, Class 134 at 7Vp-p—Line-to-Neutral coupling only)
Safety Agency	UL 1950, CSA C22.2 No. 950, TÜV EN 60 950
Temperature	
Operating	-40 to +85°C
Storage	-40 to +85°C
Humidity (non-condensing)	
Operating	25 to 90%RH @ 50°C
Non-operating (12 hour)	90%RH @ 85°C

1. This same power supply may be used to power both the PLT-22 transceiver and the PLA-21 amplifier when the amplifier is the only load driven by the transceiver. The *LONWORKS PLT-22 Power Line Transceiver User's Guide* shows a temperature derating curve for supply voltages above 12.6V (figure 2.2). This derating curve is applicable when the PLT-22 transceiver drives low impedance loads and thus generates significant internal heat. In this application, due to the light loading presented by the amplifier, the PLT-22 transceiver will work over the full -40° to 85° C operating temperature range with a 15V supply.

Ordering Information

The PLT-22 Transceiver (Model 50090-03) must be purchased separately.

Product	Echelon Model Number
PLA-21 Amplifier	53001-01

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