

Amplifier for Versatile Fiber-Optic Links

Application	Amplifier for versatile fiber-optic links
Specification	Suitable for extending the optical transmission distance between gate drivers with versatile fiber-optic interfaces and the corresponding control board
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Document Number	RDHP-1614
Revision¹	A.1



¹ The letter refers to the hardware revision. The number refers to the documentation revision.

Scope

The main features of the design are:

- Suitable for extending the optical transmission distance between gate drivers with versatile fiber-optic interfaces and the corresponding control board
- Adjustable optical output power
- 15V supply voltage

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Application Conditions

The design is proposed for the following application conditions:

- Amplification of the optical power for long distance transmissions
- Amplification of the optical power for transmission lines with attenuators (e.g. fiber-optic coupling elements)

Design Description

Adjustable Fiber-Optic Output Power

The fiber-optic output power depends on the current through the optical transmitter D2. This current can be adjusted by THT resistor R5 (size PR02). The actual current can be estimated by the following formula:

$$I_{D2} = (15V - V_{fmax,D2}) / R5 \text{ with } V_{fmax,D2} = 2.02V$$

Recommended current levels of I_{D2} are in the range of $\sim 17\text{mA}$ ($R5 = 750\Omega$) to $\sim 60\text{mA}$ ($R5 = 220\Omega$). The default value is set to $\sim 30\text{mA}$ ($R5 = 430\Omega$).

Interfaces

Electrical Interfaces

X1		
Pin	Designation	Description
1	V15	15V supply (referenced to GND)
2	GND	Ground

Optical Interfaces

IC2	
Pin	Designation
Rx	Fiber-optic input

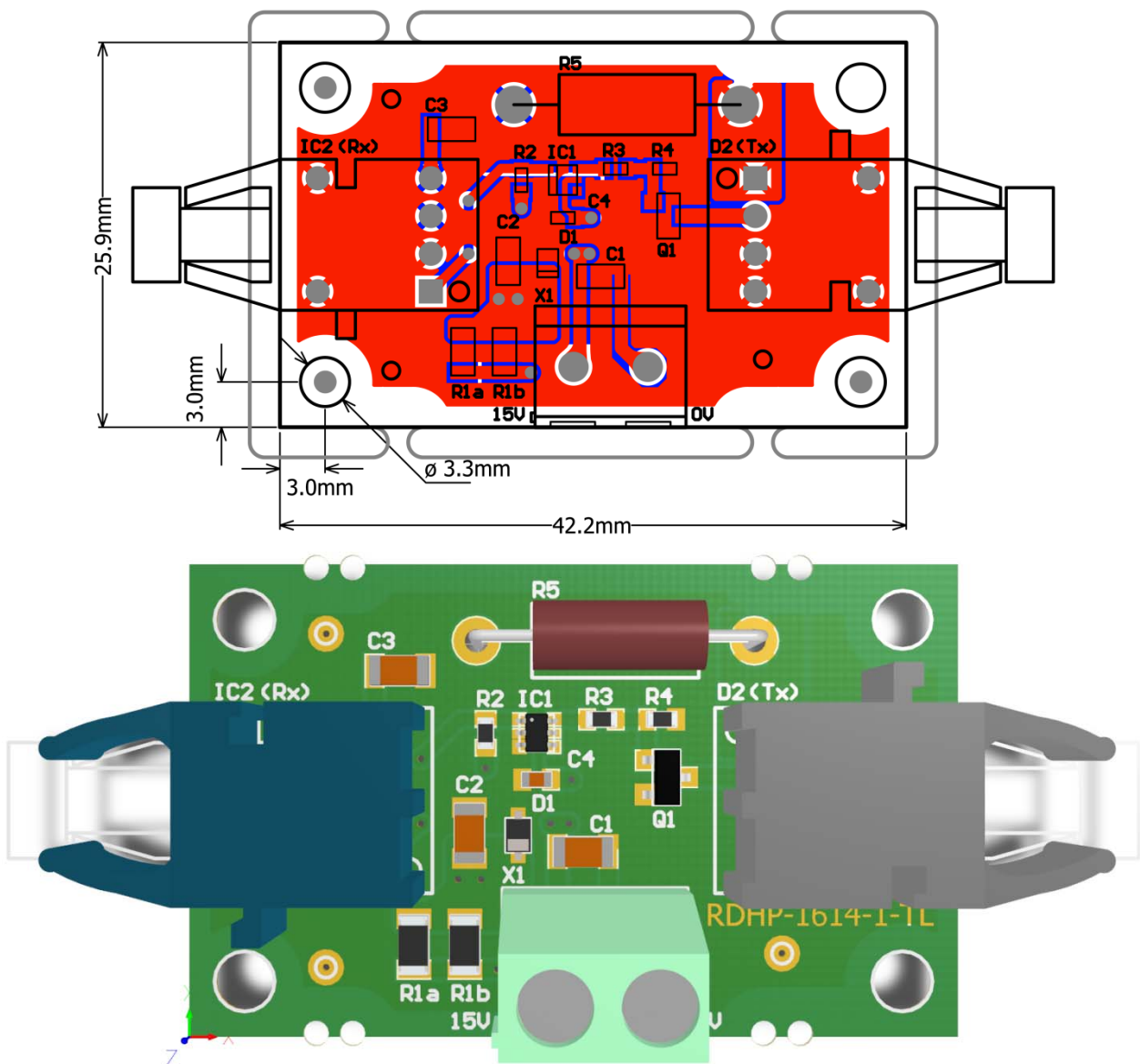
D2	
Pin	Designation
Tx	Fiber-optic output

CAD Data

The set of CAD data, which includes the circuit schematics, Gerber files, BOM and Pick-and-Place file are available as separate documents bundled together with this documentation.

Layout Example

An example for a suitable layout is shown in the following picture. The recommended PCB thickness is 1.55mm.



Handling

To avoid possible failures caused by ESD, a handling- and assembly-process with persistent ESD protection is necessary /1/.

References

/1/ Application Note AN-0902, "Avoiding ESD with CONCEPT Drivers", Power Integrations

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