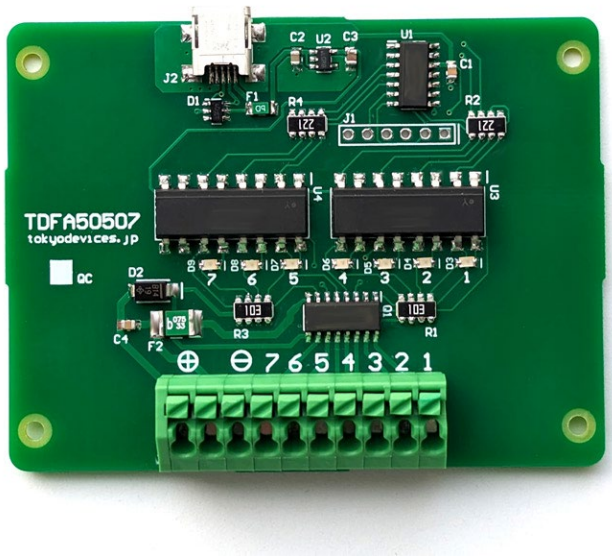
TOKYO DEVICES

TDFA50507

Digital I/O Module, 7 Channels, Current Sink Output

Revision 1.1.1



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1. Specification

Term	Value	Description
Output Scheme	Photocoupler-isolated Open Collector Output, Current Sink.	
Voltage Range	12～24V	
Abs. Max. Input voltage	28V	common plus to common minus terminal voltage
Contact number	7	
Max. Output Current	-80mA (Sink)	per contact
Current Consumption	TBD	per contact, Vcommon=24V
Contact Terminals	Spring-Push 16-24 AWG	
Protection	Over Current Reverse Voltage	
USB Version	2.0	
USB Connector	USB Type.B Mini	
Power Supply (USB Side)	5V	USB Bus powered
Power Consumption (USB Side)	16 mA typ.	Terminals 1-7 are on.
Operating Temp. Range	TBD	
Dimensions	W:78 D:59 H: 18 mm max.	Not including protrusions

2. Board layout

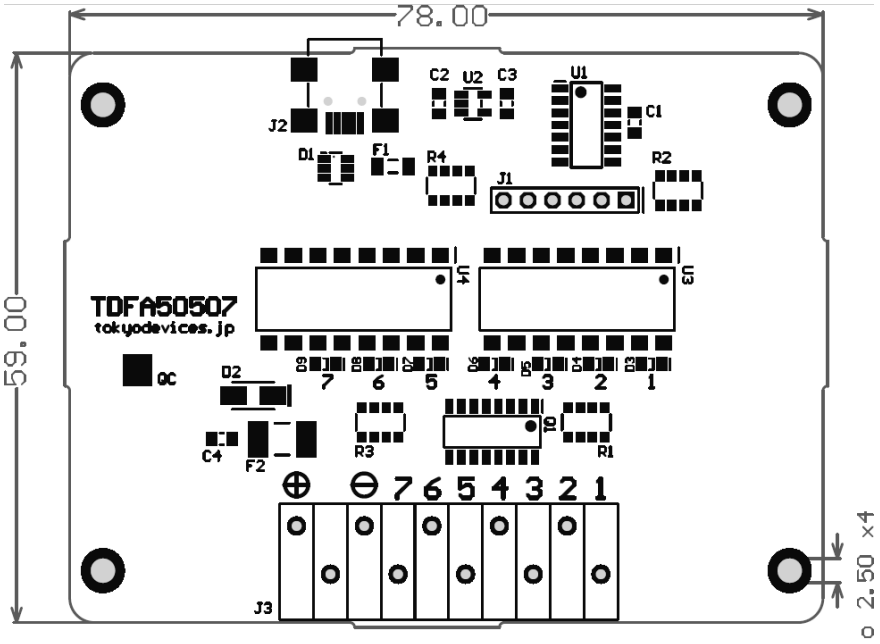

Figure 1 TDFA50507 Board Layout

3. Quick Start

- Prepare an external power supply of 12V or 24V, and connect it to the common negative and common positive.
- Connect the positive side of the target object that needs signal output to the positive side of the external power supply, and connect the negative side to terminals 1 to 7 of this module.
- Connect the USB cable to the computer.
- Use the control command "td-usb" to verify the on/off status of the signal.
- The LED on the board will light up to indicate the channels that are in the "ON" state.

4. Equivalent circuit of the input section

Figure 2 shows an equivalent circuit of input sections. The output of each terminal is an open collector output of a transistor. The primary (USB side) and secondary sides are isolated by a photocoupler. From the common positive terminal, a resistor (10kΩ), a confirmation LED, a photocoupler light-receiving transistor, and a switch transistor are connected to the base of each channel's transistor.

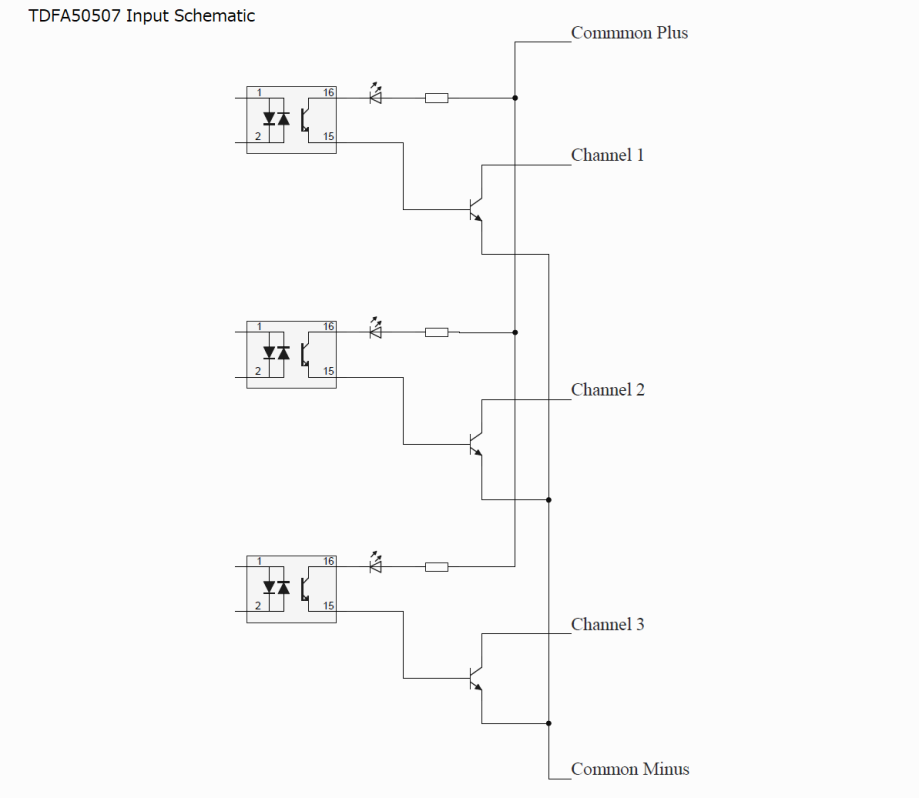

Figure 2 TDFA50507 Equivalent circuit of the input section.

5. Control Commands

This module is controlled by the "td-usb" control command. "td-usb" is a command line program that is executed from

the command prompt/terminal of Windows or Linux. Please search for the keyword "TDFA50507" on the Tokyo Devices website or obtain it from the GitHub repository:

Tokyo Devices Web : https://tokyodevices.com/ (Only Japanese available)
td-usb GitHub repository: https://github.com/tokyodevices/td-usb/

5.1. Setting the Contact State

```
% td-usb tdfa50507 set GPIO_STATUS=N
```

The command has the following arguments: "tdfa50507" is a fixed string to specify the product model number, "set" is a fixed string to specify writing values to the device, and "GPIO_STATUS" is a fixed string to specify the contact output. "N" is a decimal number that represents a binary number of 7 bits indicating the state of the contact. For example, if you specify "3" for "N," "3" becomes "0000011" in binary, and terminals 1 and 2 are turned on while terminals 3 to 7 are turned off.

5.2. Setting the Initial State of Contacts at Power-On

```
% td-usb tdfa50507 set INITIAL_GPIO_STATUS=N
```

By specifying "INITIAL_GPIO_STATUS," you can set the initial state of each contact when the power is turned on. The other command arguments are explained in "5.1 Setting the Contact State."

5.3. Identifying Multiple TDFA50507

```
% td-usb tdfa50507 list
XXXXXXXXXXXXX,YYYYYYYYYYYYY
% td-usb tdfa50507:XXXXXXXXXXX set GPIO_STATUS=N
```

By using the "list" operation of the td-usb command, you can obtain the IDs of multiple TDFA50507s connected to one computer. The serial numbers are output by delimited with comma ‘,’ character. Then, you can specify the module to be configured by specifying a colon and an ID string after the fixed string "tdfa50507," which specifies the product model number.

For the usage of other commands, please refer to the manual of td-usb. In addition, you can also control it from your own application by calling the td-usb command from an external program. Please refer to the manual or documentation of each programming environment for how to call an external program.

6. Option

Model Number	Name
TDAC-USB2B1M5	USB Cable Type A to B Mini 1.5m
TDCS003	Metal Case, Single-side Open
TDCADIN01	Metal Case DIN Mounting Kit

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