



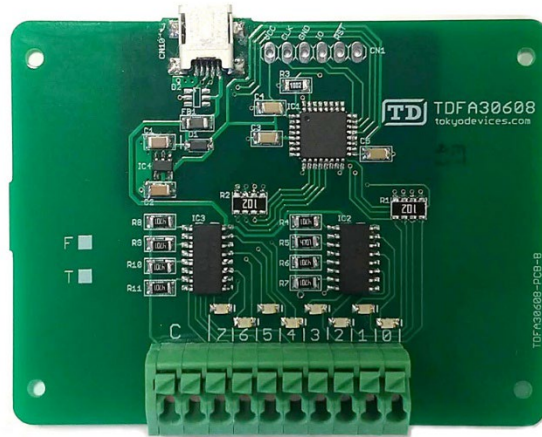
TOKYO DEVICES

TDFA30608

Isolated Digital Input Board 8 Channels Current Source/Sink USB Bus-powered

Revision 1.0.2

.1



The TDFA30608 is a USB digital input module with 8 contacts. It allows easy reading of signals from various external devices through application software. The TDFA30608 is electrically isolated for safety and has excellent noise resistance. It operates on bus power, so no external power source is needed on the USB side.

IMPORTANT NOTICE

Tokyo Devices, Inc. and/or its licensors do not warrant the accuracy or completeness of this specification or any information contained therein. Tokyo Devices, Inc. and/or its licensors do not warrant that this design will meet the specifications, will be suitable for your application or fit for any particular purpose, or will operate in an implementation. Tokyo Devices, Inc. and/or its licensors do not warrant that the design is production worthy. You should completely validate and test your design implementation to confirm the system functionality for your application. Any contents of this document are subject to change without notice. Tokyo Devices and the TD logo are registered trademarks of Tokyo Devices, Inc. in Japan.

注意事項

東京デバイス株式会社(以下、当社)は本製品が本文章で示す設計上の精度・性能を完全に満たすことを保証しません。また当社は、本製品がお客様のアプリケーションに実装された場合に正しく動作することを保証しません。組込み・実装する場合には、お客様の責任において十分な試験・検証を行ってください。本製品は人命や財産に重大な損害が予想される用途には使用できません。本製品を使用することで生じた損害（お客様または第三者いずれに生じた損害も含みます。）に関して当社は一切その責任を負いません。本文章の内容は予告なく変更される場合があります。東京デバイスならびに TD ロゴマークは東京デバイス株式会社の登録商標です。

目次

TDFA30608	1
1. Specification	4
2. Board Layout	4
3. Quick Start.....	5
4. Input Section Equivalent Circuit	5
5. Control Command	6
5.1. Basic Usage of the TD-USB Command	6
5.2. Retrieving the Status of Contact Points.....	6
5.3. Wait for Changes in Input.....	7
5.4. Identify Multiple Modules.....	7
5.5. Change Device Settings	8
6. Compatible Optional Accessories	8
7. Product Customization Services.....	9

1. Specification

Name	Value	Notes
Input Type	Photocoupler Isolated Input Current Source/Sink	
Signal Voltage Range	5~24V	
Max. Input Voltage	28V	
# of contact points	8	
Input Resistance	4.7k Ω typ.	
Power Consumption (Secondary Side)	5V: 4mW 12V: 28mW 24V: 118mW	
Cable Compatibility	Spring-Push style / 16-24 AWG	
Protection	Over Current	
USB Version	USB 2.0	
USB Connector	Type B Mini	
Power Supply (USB Side)	5V USB Bus Powered	
Power Consumption (USB Side)	50 mA max.	
Operation Temp. Range	0~50°C	
Board size	W:78 D:65 H: 20 mm max.	

2. Board Layout

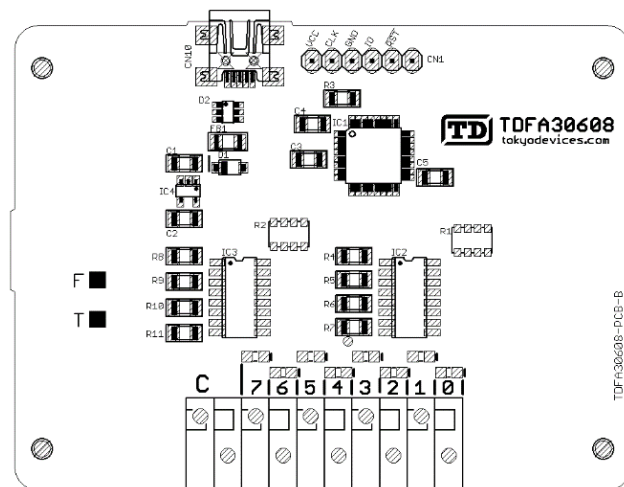


Figure. 1 Board Layout

Table. 1 Terminal Pin Assignment

基板表記	名前	説明
0	CH 0	Contact 0 Input
1	CH 1	Contact 1 Input
2	CH 2	Contact 2 Input
3	CH 3	Contact 3 Input
4	CH 4	Contact 4 Input
5	CH 5	Contact 5 Input
6	CH 6	Contact 6 Input
7	CH 7	Contact 7 Input
	No Connection	Do not connect
C	Common	Connect to the positive or negative terminal of the external power source.

3. Quick Start

1. Connect the USB connector of the board to the USB port of your computer.
2. Prepare an external power source of 5-24V and connect its negative or positive to the common terminal.
3. Connect signal wires to each contact point.
4. Connect the USB cable to your computer.
5. Check that the corresponding LEDs on the board light up for contact points that are in the ON state.
6. Use the control command TD-USB on your computer to retrieve the status of the contact points.

4. Input Section Equivalent Circuit

Figure 2 shows the equivalent circuit of the input section for 3 contact points. The primary side (USB side) and the secondary side are isolated by a photocoupler. Each contact point is connected to the common through the LED of the photocoupler. Since the LEDs of the photocoupler are connected in parallel in both directions, they can handle both current sourcing and sinking.

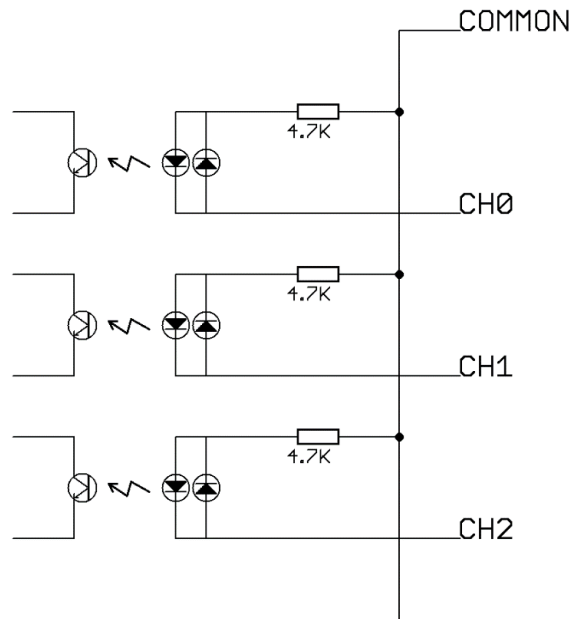


Figure. 2 TDFA30608 Input Section

5. Control Command

The TDFA30608 is controlled by the command "TD-USB". TD-USB is a command-line program executable on Windows or Linux. To obtain TD-USB, search for the keyword "TDFA30608" on the Tokyo Devices website, or download it from the GitHub repository:

Tokyo Devices Website: <https://en.tokyodevices.com/>

TD-USB GitHub Repository: <https://github.com/tokyodevices/td-usb/>

5.1. Basic Usage of the TD-USB Command

The options for the TD-USB command are as follows:

```
> td-usb tdfa30608 (operation) [options]
```

The first argument `tdfa30608` is a fixed string representing the target product model. The second argument `(operation)` is a fixed string representing a specific operation. Specify `options` as needed.

5.2. Retrieving the Status of Contact Points

```
> td-usb tdfa30608 get
3
```

`get` is a fixed string that specifies the operation to read values from the device. On successful retrieval, a numeric value is returned to the standard output as a single line. This number is the decimal representation of the contact states expressed in an 8-bit binary format. For example, the number "3" in binary is 00000011, indicating that contacts 0 and 1 are ON,

while contacts 2 to 7 are OFF.

By specifying the `--loop=N` option, you can continuously retrieve values. In this option, N is the interval for data retrieval in milliseconds. The following example shows how to read the port status every 3 seconds and output it to the standard output:

```
> td-usb tdfa30608 get --loop=3000
3
3
3
```

5.3. Wait for Changes in Input

When you specify the `listen` operation, the output will wait until there is a change in the state of any of the ports.

```
> td-usb tdfa30608 listen
(Wait for Changes in Input)
2,3
```

The `listen` operation returns a line with two comma-separated numerical values. The first number represents the contact point where the change occurred. This value is the decimal representation of a bit array, with a bit set to 1 at the position of the changed contact point. In the example provided, a value of 2 in binary is 00000010, indicating that a change occurred at contact point 1. The second number represents the state of all contact points at the time of the change, in the same format as the number retrieved by the `get` operation.

5.4. Identify Multiple Modules

The TDFA30608 can be connected to a single PC in multiple units. Each TDFA30608 is assigned a unique serial number at the time of shipment. By specifying the serial number in the TD-USB command, you can designate the specific unit you want to operate.

```
> td-usb tdfa30608 list
XXXXXXXXXXXXXXXX, YYYYYYYYYYYYYY
> td-usb tdfa30608:XXXXXXXXXXXX get
3
```

By using the `list` operation of the TD-USB command, you can obtain the serial numbers of multiple devices connected to a single computer. The serial numbers are output separated by commas. If no devices are detected, an empty line will be output. Next, to specify the target device, follow the fixed string indicating the product model ``tdfa30608`` with a colon ``:`` and the serial number. This approach allows you to designate the specific unit you want to operate.

5.5. Change Device Settings

To change the settings of a device, use the `set` operation of the TD-USB command:

```
> td-usb tdfa30608 set (Name)=(Value)
> td-usb tdfa30608 save
```

After changing the settings, you need to use the `save` operation to store the settings in the device. If the settings are not stored, they will not be reflected the next time the power is turned on.

The settings that can be configured in this module are as follows:

設定名	説明
ANTI_CHAT_LEN	Chattering Ignoring Time (milliseconds): A value between 0 and 255. The default is 32.
TRIGGER_RISING	Event Bit Mask in the `listen` Operation: Specify the decimal value of the bit mask for the contact points you want to detect. Set a 1 in the bit position of the contact points for which you want to generate an event at the signal's rising edge. For example, to generate events for the rising signal of contact points 0 and 2, set it to 5 (=0b101). The default is 255 (=0b11111111).
TRIGGER_FALLING	Event Bit Mask in the `listen` Operation: Specify the decimal value of the bit mask for the contact points you want to detect. Set a 1 in the bit position of the contact points for which you want to generate an event at the signal's falling edge.

To read the settings from the device, specify the setting name in the `get` operation.

```
> td-usb tdfa30608 get (Name)
(Value)
```

For information on how to use other commands, please refer to the README of TD-USB. Additionally, you can control the TDFA30608 from a custom application by calling the TD-USB command from an external program. For details on how to call external programs, refer to the manuals or documentation of your programming environment.

6. Compatible Optional Accessories

型番	名称
TDAC-USB2B1M5	Tokyo Devices Compatible USB Cable, Type A - Type B Mini, 1.5m
TDCS003	Tokyo Devices Compatible Universal Metal Case, Single-Side Open Type

7. Product Customization Services

Tokyo Devices offers customization of circuit board exteriors, functionalities, and performance based on customer needs. For more details, please check the "Customization" on the Tokyo Devices website.

Copyright © 2023-2024 Tokyo Devices, Inc. All rights reserved.
tokyodevices.jp