



# TI CC253x (2-Wire) Mass ISP Programming

Application Note

DC04026

## NanoPlex™ general description

NanoPlex NPS-06-01-04A Universal Relay ISP-Channel Multiplier allows the expansion of the number of channels of ISP-Programming tools, while also offering galvanic isolation. The total number of switched signals is 28. NanoPlex is used on PCBAs production lines, in ATE-controlled ISP programming. Thanks to its ultra-small size (only 51.0- x 66.5-mm), this NanoPlex model takes easily place in Test Fixtures. Designed for piggyback mounting, NanoPlex is universal and compatible with all types of ISP Programming tools.

## Recommended Readings - Further Documentation

Before starting, please study the following essential papers:

- *NanoPlex NPS-06-01-04A Data Sheet*
- *NanoPlex NPS-06-01-04A Flexibility Application Note*

'*NanoPlex NPS-06-01-04A Flexibility Application Note*' clearly describes NanoPlex **modularity** and how to deploy **multiple units** in order to create high-density ISP Programming Multipliers with an **unlimited number of channels**.

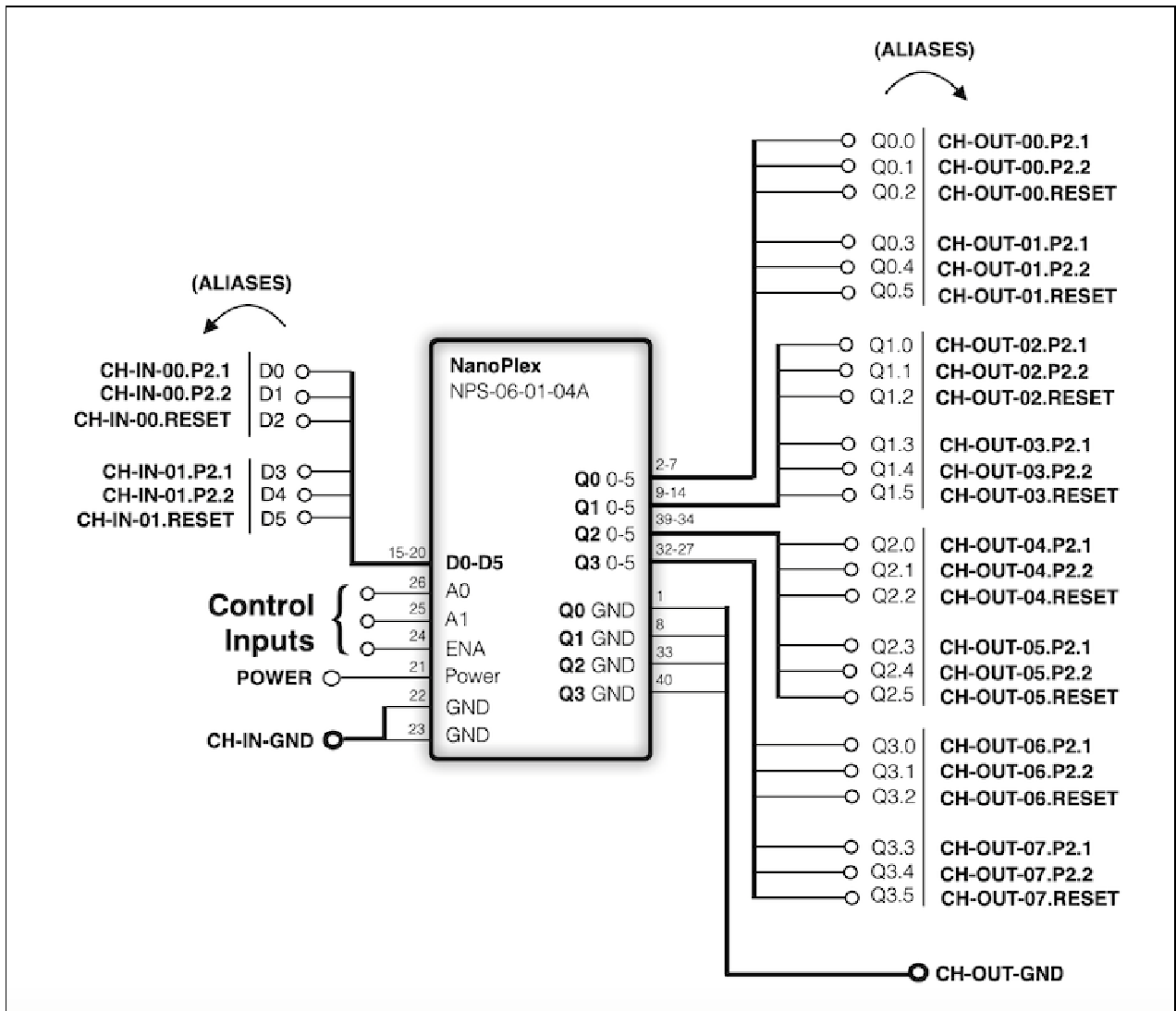
## Texas Instrument CC253x (2-Wire)

Signals required for ISP Programming are:

- P2.1 (Debug Data)
- P2.2 (Debug Clock)
- RESET

The most convenient way to ISP program multiple instances of this device through NanoPlex is using this model in **2x8 operating mode**. 2 NanoPlex input channel are multiplied to 8 separated, galvanic isolated output channels.

On the following mode examples diagram, NanoPlex signal names are assigned with aliases (texts are in **bold**).



## Truth table

(the symbol ► stands for “connected to”)

ENA	A1	A0	CH-IN-	00.P2.1 ►	00.P2.2 ►	00.RESET ►	01.P2.1 ►	01.P2.2 ►	01.RESET ►
1	0	0	CH-OUT-	00.P2.1	00.P2.2	00.RESET	01.P2.1	01.P2.2	01.RESET
1	0	1	CH-OUT-	02.P2.1	02.P2.2	02.RESET	03.P2.1	03.P2.2	03.RESET
1	1	0	CH-OUT-	04.P2.1	04.P2.2	04.RESET	05.P2.1	05.P2.2	05.RESET
1	1	1	CH-OUT-	06.P2.1	06.P2.2	06.RESET	07.P2.1	07.P2.2	07.RESET
0	X	X	CH-OUT-	HI-Z	HI-Z	HI-Z	HI-Z	HI-Z	HI-Z

## Operating sequence

ENA = 1

A1-A0 = "00"

CH-IN-00.P2.1 ▶ CH-OUT-00.P2.1  
CH-IN-00.P2.2 ▶ CH-OUT-00.P2.2  
CH-IN-00.RESET ▶ CH-OUT-00.RESET

CH-IN-01.P2.1 ▶ CH-OUT-01.P2.1  
CH-IN-01.P2.2 ▶ CH-OUT-01.P2.2  
CH-IN-01.RESET ▶ CH-OUT-01.RESET

A1-A0 = "01"

CH-IN-00.P2.1 ▶ CH-OUT-02.P2.1  
CH-IN-00.P2.2 ▶ CH-OUT-02.P2.2  
CH-IN-00.RESET ▶ CH-OUT-02.RESET

CH-IN-01.P2.1 ▶ CH-OUT-03.P2.1  
CH-IN-01.P2.2 ▶ CH-OUT-03.P2.2  
CH-IN-01.RESET ▶ CH-OUT-03.RESET

A1-A0 = "10"

CH-IN-00.P2.1 ▶ CH-OUT-04.P2.1  
CH-IN-00.P2.2 ▶ CH-OUT-04.P2.2  
CH-IN-00.RESET ▶ CH-OUT-04.RESET

CH-IN-01.P2.1 ▶ CH-OUT-05.P2.1  
CH-IN-01.P2.2 ▶ CH-OUT-05.P2.2  
CH-IN-01.RESET ▶ CH-OUT-05.RESET

A1-A0 = "11"

CH-IN-00.P2.1 ▶ CH-OUT-06.P2.1  
CH-IN-00.P2.2 ▶ CH-OUT-06.P2.2  
CH-IN-00.RESET ▶ CH-OUT-06.RESET

CH-IN-01.P2.1 ▶ CH-OUT-07.P2.1  
CH-IN-01.P2.2 ▶ CH-OUT-07.P2.2  
CH-IN-01.RESET ▶ CH-OUT-07.RESET

## Connector pinout (aliases signals, top view)

Pin	Signal
01	CH-OUT-GND
02	CH-OUT-00.P2.1
03	CH-OUT-00.P2.2
04	CH-OUT-00.RESET
05	CH-OUT-01.P2.1
06	CH-OUT-01.P2.2
07	CH-OUT-01.RESET
08	CH-OUT-GND
09	CH-OUT-02.P2.1
10	CH-OUT-02.P2.2
11	CH-OUT-02.RESET
12	CH-OUT-03.P2.1
13	CH-OUT-03.P2.2
14	CH-OUT-03.RESET
15	CH-IN-00.P2.1
16	CH-IN-00.P2.2
17	CH-IN-00.RESET
18	CH-IN-01.P2.1
19	CH-IN-01.P2.2
20	CH-IN-01.RESET

Signal	Pin
CH-OUT-GND	40
CH-OUT-04.P2.1	39
CH-OUT-04.P2.2	38
CH-OUT-04.RESET	37
CH-OUT-05.P2.1	36
CH-OUT-05.P2.2	35
CH-OUT-05.RESET	34
CH-OUT-GND	33
CH-OUT-06.P2.1	32
CH-OUT-06.P2.2	31
CH-OUT-06.RESET	30
CH-OUT-07.P2.1	29
CH-OUT-07.P2.2	28
CH-OUT-07.RESET	27
A0	26
A1	25
ENA	24
GND (*)	23
GND (*)	22
Power	21

(\*) GND at pins 22/23 is used for both Power GND and CH-IN-GND.

### Using multiple NanoPlex NPS-06-01-04A units

NanoPlex NPS-06-01-04A product is modular by design. Several units can be deployed in order to set-up a very large, limitless channel-multiplier. The advantage of using more units is a faster and less expensive substitution.

Please read '[NanoPlex NPS-06-01-04A Flexibility Application Note](#)' to discover how to set-up a switching system with the **number of channels as high as your application requires**.

## About Manta Systems

Manta Systems is a high-tech company, global leader in high-density signal switching for In-System Programming (ISP) and Testing Systems. The company targets the electronic boards assembly market, where a high number of connections is required. Manta Systems flagship product is NanoPlex™, a series of Channels Multipliers for In-System Programming (ISP) and Testing instruments. NanoPlex is the **world's first universal tool** providing end-user with the possibility of having compact, easy-to-use, professional, reliable In-System Programming (ISP) and Testing Channel Multiplication functionality.

## Warranty

All Manta Systems products are covered by a **three-year warranty** against defects and workmanship from the purchase date. The warranty only covers products when properly installed and used.

## Orders

All NanoPlex™ Series products are generally **off-the-shelf**.

Shipping is within **24 hours** from order reception.

**Free shipping** & 30-day money back guarantee.

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