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 easly 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**.
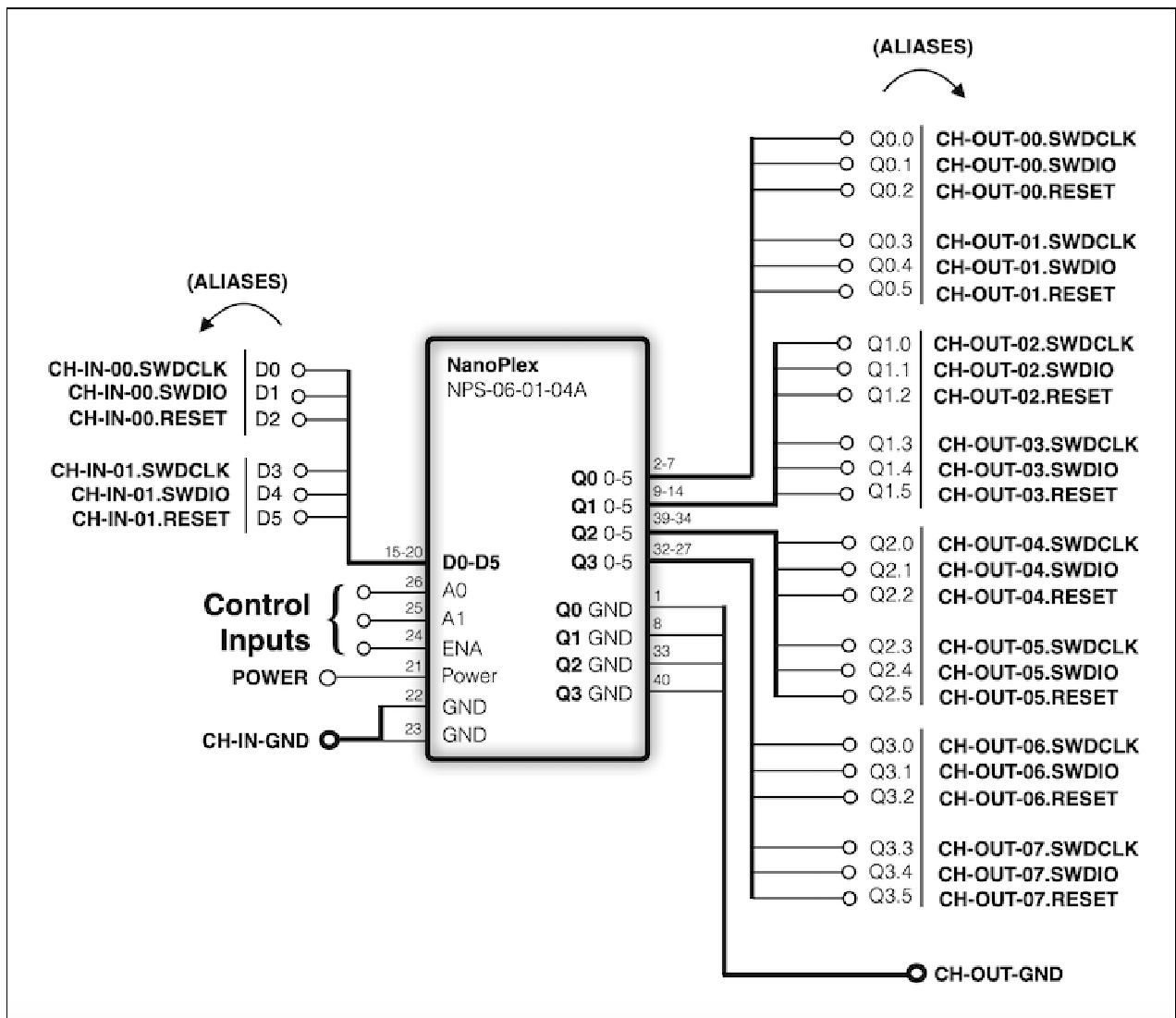
Cypress PSoC4 (SWD)

Signals required for ISP Programming are:

- SWDCLK
- SWDIO
- 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 channels 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**).

(ALIASES)

NanoPlex
NPS-06-01-04A

CH-IN-00.SWDCLK — D0
CH-IN-00.SWDIO — D1
CH-IN-00.RESET — D2

CH-IN-01.SWDCLK — D3
CH-IN-01.SWDIO — D4
CH-IN-01.RESET — D5

(ALIASES)

D0-D5

Control Inputs { 26 A0, 25 A1, 24 ENA }
POWER — 21 Power
22 GND
CH-IN-GND — 23 GND

Q0 0-5
Q1 0-5
Q2 0-5
Q3 0-5

Q0 GND
Q1 GND
Q2 GND
Q3 GND

Q0.0 — CH-OUT-00.SWDCLK
Q0.1 — CH-OUT-00.SWDIO
Q0.2 — CH-OUT-00.RESET

Q0.3 — CH-OUT-01.SWDCLK
Q0.4 — CH-OUT-01.SWDIO
Q0.5 — CH-OUT-01.RESET

Q1.0 — CH-OUT-02.SWDCLK
Q1.1 — CH-OUT-02.SWDIO
Q1.2 — CH-OUT-02.RESET

Q1.3 — CH-OUT-03.SWDCLK
Q1.4 — CH-OUT-03.SWDIO
Q1.5 — CH-OUT-03.RESET

Q2.0 — CH-OUT-04.SWDCLK
Q2.1 — CH-OUT-04.SWDIO
Q2.2 — CH-OUT-04.RESET

Q2.3 — CH-OUT-05.SWDCLK
Q2.4 — CH-OUT-05.SWDIO
Q2.5 — CH-OUT-05.RESET

Q3.0 — CH-OUT-06.SWDCLK
Q3.1 — CH-OUT-06.SWDIO
Q3.2 — CH-OUT-06.RESET

Q3.3 — CH-OUT-07.SWDCLK
Q3.4 — CH-OUT-07.SWDIO
Q3.5 — CH-OUT-07.RESET

CH-OUT-GND

Truth table

(the symbol ► stands for "connected to")

ENA	A1	A0	CH-IN-	00.SWDCLK ►	00. SWDIO ►	00.RESET ►	01.SWDCLK ►	01. SWDIO ►	01.RESET ►
1	0	0	CH-OUT-	00.SWDCLK	00.SWDIO	00.RESET	01.SWDCLK	01.SWDIO	01.RESET
1	0	1	CH-OUT-	02.SWDCLK	02.SWDIO	02.RESET	03.SWDCLK	03.SWDIO	03.RESET
1	1	0	CH-OUT-	04.SWDCLK	04.SWDIO	04.RESET	05.SWDCLK	05.SWDIO	05.RESET
1	1	1	CH-OUT-	06.SWDCLK	06.SWDIO	06.RESET	07.SWDCLK	07.SWDIO	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.SWDCLK ▶ CH-OUT-00.SWDCLK
    CH-IN-00.SWDIO  ▶ CH-OUT-00.SWDIO
    CH-IN-00.RESET  ▶ CH-OUT-00.RESET

    CH-IN-01.SWDCLK ▶ CH-OUT-01.SWDCLK
    CH-IN-01.SWDIO  ▶ CH-OUT-01.SWDIO
    CH-IN-01.RESET  ▶ CH-OUT-01.RESET

A1-A0 = "01"

    CH-IN-00.SWDCLK ▶ CH-OUT-02.SWDCLK
    CH-IN-00.SWDIO  ▶ CH-OUT-02.SWDIO
    CH-IN-00.RESET  ▶ CH-OUT-02.RESET

    CH-IN-01.SWDCLK ▶ CH-OUT-03.SWDCLK
    CH-IN-01.SWDIO  ▶ CH-OUT-03.SWDIO
    CH-IN-01.RESET  ▶ CH-OUT-03.RESET

A1-A0 = "10"

    CH-IN-00.SWDCLK ▶ CH-OUT-04.SWDCLK
    CH-IN-00.SWDIO  ▶ CH-OUT-04.SWDIO
    CH-IN-00.RESET  ▶ CH-OUT-04.RESET

    CH-IN-01.SWDCLK ▶ CH-OUT-05.SWDCLK
    CH-IN-01.SWDIO  ▶ CH-OUT-05.SWDIO
    CH-IN-01.RESET  ▶ CH-OUT-05.RESET

A1-A0 = "11"

    CH-IN-00.SWDCLK ▶ CH-OUT-06.SWDCLK
    CH-IN-00.SWDIO  ▶ CH-OUT-06.SWDIO
    CH-IN-00.RESET  ▶ CH-OUT-06.RESET

    CH-IN-01.SWDCLK ▶ CH-OUT-07.SWDCLK
    CH-IN-01.SWDIO  ▶ CH-OUT-07.SWDIO
    CH-IN-01.RESET  ▶ CH-OUT-07.RESET
```

Connector pinout (aliases signals, top view)

Pin	Signal	Signal	Pin
01	CH-OUT-GND	CH-OUT-GND	40
02	CH-OUT-00.SWDCLK	CH-OUT-04.SWDCLK	39
03	CH-OUT-00.SWDIO	CH-OUT-04.SWDIO	38
04	CH-OUT-00.RESET	CH-OUT-04.RESET	37
05	CH-OUT-01.SWDCLK	CH-OUT-05.SWDCLK	36
06	CH-OUT-01.SWDIO	CH-OUT-05.SWDIO	35
07	CH-OUT-01.RESET	CH-OUT-05.RESET	34
08	CH-OUT-GND	CH-OUT-GND	33
09	CH-OUT-02.SWDCLK	CH-OUT-06.SWDCLK	32
10	CH-OUT-02.SWDIO	CH-OUT-06.SWDIO	31
11	CH-OUT-02.RESET	CH-OUT-06.RESET	30
12	CH-OUT-03.SWDCLK	CH-OUT-07.SWDCLK	29
13	CH-OUT-03.SWDIO	CH-OUT-07.SWDIO	28
14	CH-OUT-03.RESET	CH-OUT-07.RESET	27
15	CH-IN-00.SWDCLK	A0	26
16	CH-IN-00.SWDIO	A1	25
17	CH-IN-00.RESET	ENA	24
18	CH-IN-01.SWDCLK	GND (*)	23
19	CH-IN-01.SWDIO	GND (*)	22
20	CH-IN-01.RESET	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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