



# CDuD1200\_CDuD1201

Dual-Channel Digital Isolator

Version: Rev 1.0.0 Date: 2025-5-26

## Features ■■

- 2.5V-5.5V power supply
- Isolation voltage is 3kV RMS
- The CMTI of common mode
- transient suppression was up to 150KV/uS
- 2.1V undervoltage protection
- Maximum signal transmission is 90Mbps
- Transmission latency is as low as 10ns
- Pulse width distortion was as low as 5ns
- Static power consumption is as low as 300uA
- The dynamic power consumption is 6mA / channel
- Operating temperature support from -40°C to +85°C

## Application ■■

- Industrial control
- Grid relay protection device
- Isolated power control
- Replace Optocoupler
- Industrial motor control
- Solar inverter

## Description ■■

The CDuD120X series is a high-speed 2-channel digital isolator. Integrated high-performance capacitive isolation technology. The maximum signal transmission rate is up to 90Mbps, with small pulse width distortion. The device can withstand a high isolation voltage and meets the conventional one Test Specifications (UL Standards). No requirements for the external electromagnetic field environment.

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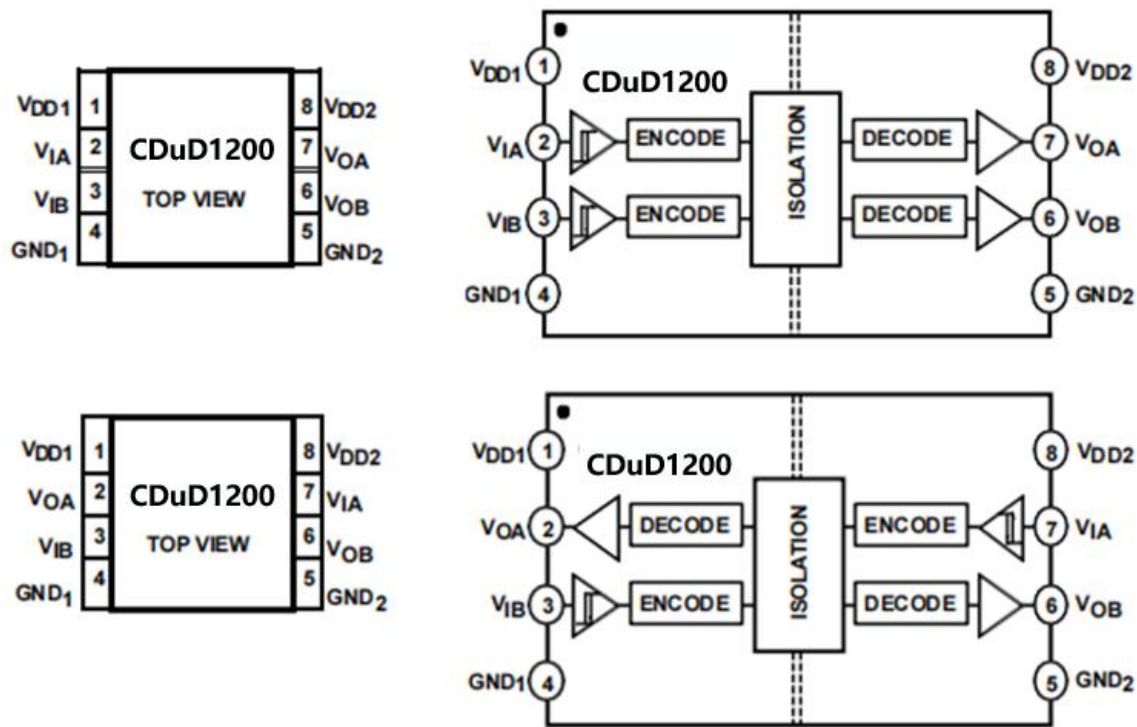
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Pin Configurations



pin assignment and block diagram

Truth Table

CDuD1200H, CDuD1201H Truth Table

| VIA Input | VIB Input | VDD1 Status    | VDD2 Status    | VOA Output | VOB Output |
|-----------|-----------|----------------|----------------|------------|------------|
| H         | H         | Power on       | Power on       | H          | H          |
| L         | L         | Power on       | Power on       | L          | L          |
| H         | L         | Power on       | Power on       | H          | L          |
| L         | H         | Power on       | Power on       | L          | H          |
| X         | X         | Not powered on | Power on       | H          | H          |
| X         | X         | Power on       | Not powered on | X          | X          |

CDuD1200L, CDuD1201L Truth Table

| VIA 输入 | VIB 输入 | VDD1 状态 | VDD2 状态 | VOA 输出 | VOB 输出 |
|--------|--------|---------|---------|--------|--------|
| H      | H      | 上电      | 上电      | H      | H      |
| L      | L      | 上电      | 上电      | L      | L      |
| H      | L      | 上电      | 上电      | H      | L      |
| L      | H      | 上电      | 上电      | L      | H      |
| X      | X      | 未上电     | 上电      | L      | L      |
| X      | X      | 上电      | 未上电     | X      | X      |

Absolute Maximum Ratings

| Parameters                    | Range                  |
|-------------------------------|------------------------|
| VCC                           | -0.3~6V                |
| I/O service voltage           | GND- 0.3 to VCC + 0.5V |
| IOport maximum output current | ±50mA                  |
| Junction temperature          | -50°C to +150°C        |
| Storage temperature           | -40°C to +85°C         |
| Junction temperature          | 150°C                  |
| HBM                           | ±3000V                 |
| MM                            | ±500V                  |

Recommended Operating Condition

| Parameter                           | Condition                                                     | Min     | Typ | Max | Unit    |
|-------------------------------------|---------------------------------------------------------------|---------|-----|-----|---------|
| Supply Voltage                      |                                                               | 2.5     | --  | 5.5 | V       |
| Logic input is a high level         |                                                               | 0.7xVDD |     |     | V       |
| Logic low level                     |                                                               |         |     |     | 0.3xVDD |
| Rated electrolyte isolation voltage | For 1 mimute                                                  | 3000    |     |     | V RMS   |
| Minmum external creepage distance   | Measure input to output,the shortest distance along the shell | 3.9     |     |     | mm      |
| Minimum gap bewteen PCB layers      | The shortest distance of each layer of PCB power domain       | 3.9     |     |     | mm      |

## Insulation Certification

| Item | Electrical safety standard               | Description                                                                                                          |
|------|------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| 1    | UL 1577                                  | Standard for safety: Optical isolators                                                                               |
| 2    | IEC 60601-1                              | Medical electrical equipment-Part 1: General requirements for basic safety and essential performance                 |
| 3    | IEC 61010-1                              | Safety requirements for electrical equipment for measurement, control and laboratory use-Part1: General requirements |
| 4    | IEC 60950-1                              | Information technology equipment-Safety -Part 1: General requirements                                                |
| 5    | GB 4943.1-2011                           | Information technology equipment-Safety -Part 1: General Requirements                                                |
| 6    | DIN VDE V 0884-11(VDE V 0884-11):2017-01 | Magnetic and capacitive coupler for basic and reinforced isolation                                                   |

## Electrical characteristics

Performance parameters under 2.5V power supply (At  $T_A = -40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$ ,  $V_{DD1}=V_{DD2}=2.5\text{V}$ )

| Parameter                        | Symbol       | Min | Max |     | Test Condition                                | Units      |
|----------------------------------|--------------|-----|-----|-----|-----------------------------------------------|------------|
| Data rate                        | DR           | --  | 90  | --  |                                               | Mbps       |
| High to low transmission latency | $t_{PHL}$    | --  | 10  | 13  | 50% input to 50% output                       | ns         |
| Low to high transmission latency | $t_{PLH}$    | --  | 10  | 13  | 50% input to 50% output                       | ns         |
| Minimum pulse width              | PW           | 10  | --  | --  |                                               | ns         |
| Channel matching                 | $t_M$        | --  | --  | 3   |                                               | ns         |
| Pulse distortion                 | PWD          | --  | --  | 6   |                                               | ns         |
| Output up time                   | $t_r$        | 1.5 | 2   | 3   | Output rise time, 10%~90% 10pF load           | ns         |
| Output drop time                 | $t_f$        | 1.5 | 2   | 3   | Lower up time, 90%~10% 10pF load              | ns         |
| Power static current             | $I_{DDI(Q)}$ | --  | 280 | --  | Enter the suspension                          | uA/channel |
| Dynamic power current            | $I_{DDI(D)}$ | --  | 5.4 | 6.4 | The input signal is 2Mbps, $C_L=10\text{pF}$  | mA/channel |
| Dynamic power                    | $I_{DDI(D)}$ | --  | 8   | 9.2 | The input signal is 20Mbps, $C_L=10\text{pF}$ | mA/ch      |

|                            |                    |                                           |       |                                         |                                                             |                |
|----------------------------|--------------------|-------------------------------------------|-------|-----------------------------------------|-------------------------------------------------------------|----------------|
| current                    |                    |                                           |       |                                         |                                                             | annel          |
| Dynamic power current      | $I_{DDI(D)}$       | --                                        | 12.7  | 15.2                                    | The input signal is 60Mbps, $C_L=10pF$                      | mA/ch<br>annel |
| Input Currents             | $I_{IA}, I_{IB}$   | -10                                       | +0.01 | +10                                     | $0V \leq V_{IA}, V_{IB} \leq (V_{DD1} \text{ or } V_{DD2})$ | $\mu A$        |
| Logic High Input Threshold | $V_{IH}$           | 0.7<br>( $V_{DD1}$<br>or<br>$V_{DD2}$ )   | --    | --                                      | --                                                          | V              |
| Logic Low Input Threshold  | $V_{IL}$           | --                                        | --    | 0.3<br>( $V_{DD1}$<br>or<br>$V_{DD2}$ ) | --                                                          | V              |
| Logic High Output Voltages | $V_{OAH}, V_{OBH}$ | $V_{DD1}$<br>or<br>$V_{DD2}$<br>- 0.1     | 2.5   | --                                      | $I_{Ox} = -20 \mu A, V_{Ix} = V_{IxH}$                      | V              |
|                            |                    | ( $V_{DD1}$<br>or<br>$V_{DD2}$ )<br>- 0.5 | 2.3   | --                                      | $I_{Ox} = -4 mA, V_{Ix} = V_{IxH}$                          | V              |
| Logic Low Output Voltages  | $V_{OAL}, V_{OBL}$ | --                                        | 0     | 0.1                                     | $I_{Ox} = 20 \mu A, V_{Ix} = V_{IxL}$                       | V              |
|                            |                    | --                                        | 0.04  | 0.1                                     | $I_{Ox} = 400 \mu A, V_{Ix} = V_{IxL}$                      | V              |
|                            |                    | --                                        | 0.2   | 0.4                                     | $I_{Ox} = 4 mA, V_{Ix} = V_{IxL}$                           | V              |

Performance parameters under 3.3V power supply (At  $T_A = -40^\circ C$  to  $85^\circ C$ ,  $V_{DD1}=V_{DD2}=3.3V$ )

| Parameter                        | Symbol       | Min | Max |    | Test Condition                      | Units                |
|----------------------------------|--------------|-----|-----|----|-------------------------------------|----------------------|
| Data rate                        | DR           | --  | 90  | -- |                                     | Mbps                 |
| High to low transmission latency | $t_{PHL}$    | --  | 7   | 12 | 50% input to 50% output             | ns                   |
| Low to high transmission latency | $t_{PLH}$    | --  | 7   | 12 | 50% input to 50% output             | ns                   |
| Minimum pulse width              | PW           | 10  | --  | -- |                                     | ns                   |
| Channel matching                 | $t_M$        | --  | --  | 3  |                                     | ns                   |
| Pulse distortion                 | PWD          | --  | --  | 6  |                                     | ns                   |
| Output up time                   | $t_r$        | 1.5 | 2   | 3  | Output rise time, 10%~90% 10pF load | ns                   |
| Output drop time                 | $t_f$        | 1.5 | 2   | 3  | Lower up time, 90%~10% 10pF load    | ns                   |
| Power static current             | $I_{DDI(Q)}$ | --  | 290 | -- | Enter the suspension                | $\mu A$ /cha<br>nnel |

|                            |                    |                                           |       |                                         |                                                             |                |
|----------------------------|--------------------|-------------------------------------------|-------|-----------------------------------------|-------------------------------------------------------------|----------------|
| Dynamic power current      | $I_{DDI(D)}$       | --                                        | 6.1   | 7.2                                     | The input signal is 2Mbps, $C_L=10pF$                       | mA/ch<br>annel |
| Dynamic power current      | $I_{DDI(D)}$       | --                                        | 9.3   | 11                                      | The input signal is 20Mbps, $C_L=10pF$                      | mA/ch<br>annel |
| Dynamic power current      | $I_{DDI(D)}$       | --                                        | 16.2  | 19                                      | The input signal is 60Mbps, $C_L=10pF$                      | mA/ch<br>annel |
| Input Currents             | $I_{IA}, I_{IB}$   | -10                                       | +0.01 | +10                                     | $0V \leq V_{IA}, V_{IB} \leq (V_{DD1} \text{ or } V_{DD2})$ | $\mu A$        |
| Logic High Input Threshold | $V_{IH}$           | 0.7<br>( $V_{DD1}$<br>or<br>$V_{DD2}$ )   | --    | --                                      | --                                                          | V              |
| Logic Low Input Threshold  | $V_{IL}$           | --                                        | --    | 0.3<br>( $V_{DD1}$<br>or<br>$V_{DD2}$ ) | --                                                          | V              |
| Logic High Output Voltages | $V_{OAH}, V_{OBH}$ | $V_{DD1}$<br>or<br>$V_{DD2}$<br>- 0.1     | 3.3   | --                                      | $I_{Ox} = -20 \mu A, V_{Ix} = V_{IxH}$                      | V              |
|                            |                    | ( $V_{DD1}$<br>or<br>$V_{DD2}$ )<br>- 0.5 | 3.1   | --                                      | $I_{Ox} = -4 mA, V_{Ix} = V_{IxH}$                          | V              |
| Logic Low Output Voltages  | $V_{OAL}, V_{OBL}$ | --                                        | 0     | 0.1                                     | $I_{Ox} = 20 \mu A, V_{Ix} = V_{IxL}$                       | V              |
|                            |                    | --                                        | 0.04  | 0.1                                     | $I_{Ox} = 400 \mu A, V_{Ix} = V_{IxL}$                      | V              |
|                            |                    | --                                        | 0.2   | 0.4                                     | $I_{Ox} = 4 mA, V_{Ix} = V_{IxL}$                           | V              |

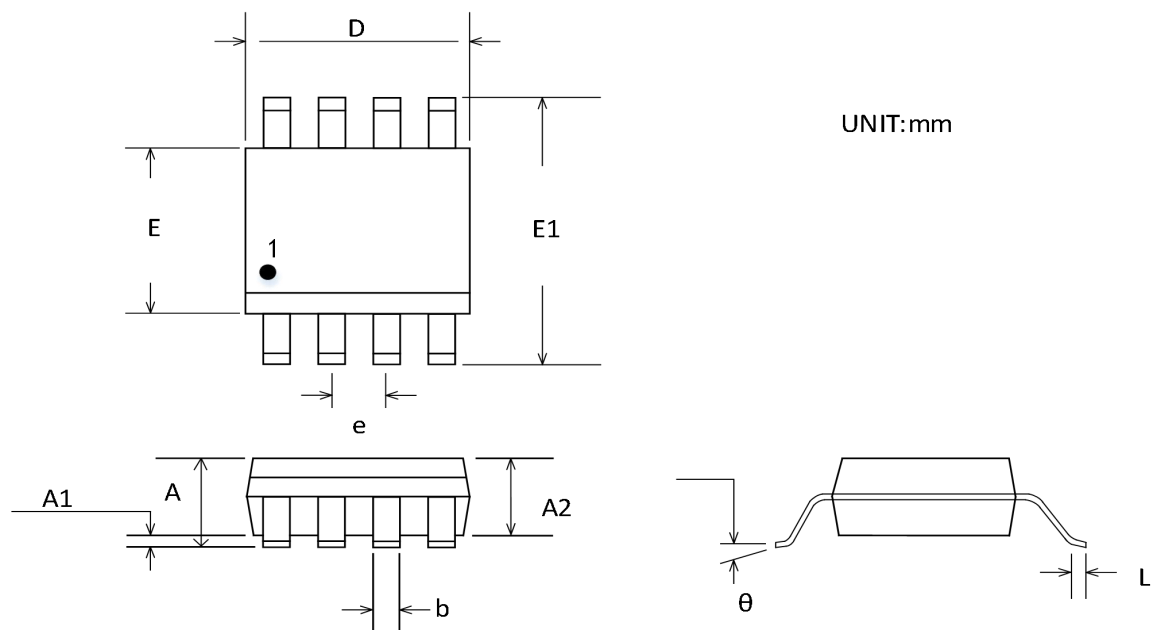
Performance parameters under 5V power supply (At  $T_A = -40^\circ C$  to  $85^\circ C$ ,  $V_{DD1}=V_{DD2}=5V$ )

| Parameter                        | Symbol    | Min | Max |    | Test Condition                      | Units |
|----------------------------------|-----------|-----|-----|----|-------------------------------------|-------|
| Data rate                        | DR        | --  | 90  | -- |                                     | Mbps  |
| High to low transmission latency | $t_{PHL}$ | --  | 5   | 8  | 50% input to 50% output             | ns    |
| Low to high transmission latency | $t_{PLH}$ | --  | 5   | 8  | 50% input to 50% output             | ns    |
| Minimum pulse width              | PW        | 10  | --  | -- |                                     | ns    |
| Channel matching                 | $t_M$     | --  | --  | 3  |                                     | ns    |
| Pulse distortion                 | PWD       | --  | --  | 6  |                                     | ns    |
| Output up time                   | tr        | 1.5 | 2   | 3  | Output rise time, 10%~90% 10pF load | ns    |

|                            |                    |                                  |       |                                |                                                             |            |
|----------------------------|--------------------|----------------------------------|-------|--------------------------------|-------------------------------------------------------------|------------|
| Output drop time           | $t_f$              | 1.5                              | 2     | 3                              | Lower up time, 90%~10% 10pF load                            | ns         |
| Power static current       | $I_{DDI(Q)}$       | --                               | 300   | --                             | Enter the suspension                                        | uA/channel |
| Dynamic power current      | $I_{DDI(D)}$       | --                               | 9.4   | 11.4                           | The input signal is 2Mbps, $C_L=10pF$                       | mA/channel |
| Dynamic power current      | $I_{DDI(D)}$       | --                               | 12.1  | 14.5                           | The input signal is 20Mbps, $C_L=10pF$                      | mA/channel |
| Dynamic power current      | $I_{DDI(D)}$       | --                               | 22    | 26                             | The input signal is 60Mbps, $C_L=10pF$                      | mA/channel |
| Input Currents             | $I_{IA}, I_{IB}$   | -10                              | +0.01 | +10                            | $0V \leq V_{IA}, V_{IB} \leq (V_{DD1} \text{ or } V_{DD2})$ | $\mu A$    |
| Logic High Input Threshold | $V_{IH}$           | 0.7 ( $V_{DD1}$ or $V_{DD2}$ )   | --    | --                             | --                                                          | V          |
| Logic Low Input Threshold  | $V_{IL}$           | --                               | --    | 0.3 ( $V_{DD1}$ or $V_{DD2}$ ) | --                                                          | V          |
| Logic High Output Voltages | $V_{OAH}, V_{OBH}$ | $V_{DD1}$ or $V_{DD2}$ - 0.1     | 5     | --                             | $I_{Ox} = -20 \mu A, V_{Ix} = V_{IxH}$                      | V          |
|                            |                    | ( $V_{DD1}$ or $V_{DD2}$ ) - 0.5 | 4.8   | --                             | $I_{Ox} = -4 mA, V_{Ix} = V_{IxH}$                          | V          |
| Logic Low Output Voltages  | $V_{OAL}, V_{OBL}$ | --                               | 0     | 0.1                            | $I_{Ox} = 20 \mu A, V_{Ix} = V_{IxL}$                       | V          |
|                            |                    | --                               | 0.04  | 0.1                            | $I_{Ox} = 400 \mu A, V_{Ix} = V_{IxL}$                      | V          |
|                            |                    | --                               | 0.2   | 0.4                            | $I_{Ox} = 4 mA, V_{Ix} = V_{IxL}$                           | V          |

Package Outline Dimensions

SOP-8



| Symbol   | Dimensions In Millimeters |       |
|----------|---------------------------|-------|
|          | Min                       | Max   |
| A        | 1.350                     | 1.750 |
| A1       | 0.100                     | 0.250 |
| A2       | 1.350                     | 1.550 |
| b        | 0.310                     | 0.510 |
| D        | 4.800                     | 5.000 |
| E        | 3.800                     | 4.000 |
| E1       | 5.800                     | 6.200 |
| e        | 1.270 BSC                 |       |
| L        | 0.400                     | 1.270 |
| $\theta$ | 0°                        | 8°    |

Package/Ordering Information

| MODEL           | TEMPERATURE | PACKAGE DESCRIPTION | PACKAGE OPTION     |
|-----------------|-------------|---------------------|--------------------|
| CDuD1200LAS8    | -40°C~85°C  | SOP-8               | Tape and reel,2500 |
| CDuD1200LAS8-RL | -40°C~85°C  | SOP-8               | Tape and reel,3000 |
| CDuD1200LAS8-RL | -40°C~85°C  | SOP-8               | Tape and reel,4000 |
| CDuD1200HAS8    | -40°C~85°C  | SOP-8               | Tape and reel,2500 |
| CDuD1200HAS8-RL | -40°C~85°C  | SOP-8               | Tape and reel,3000 |
| CDuD1200HAS8-RL | -40°C~85°C  | SOP-8               | Tape and reel,4000 |
| CDuD1201LAS8    | -40°C~85°C  | SOP-8               | Tape and reel,2500 |
| CDuD1201LAS8-RL | -40°C~85°C  | SOP-8               | Tape and reel,3000 |
| CDuD1201LAS8-RL | -40°C~85°C  | SOP-8               | Tape and reel,4000 |
| CDuD1201HAS8    | -40°C~85°C  | SOP-8               | Tape and reel,2500 |
| CDuD1201HAS8-RL | -40°C~85°C  | SOP-8               | Tape and reel,3000 |
| CDuD1201HAS8-RL | -40°C~85°C  | SOP-8               | Tape and reel,4000 |

Revision Log

| Version | Revision date | Change content  | Reason for Change | Modified by | Reviewed By | Note |
|---------|---------------|-----------------|-------------------|-------------|-------------|------|
| V1.0    | 2025.5.26     | Initial version | Regular update    | WW          | LYL         |      |