



ASNT5012-PQC is available on two evaluation boards: one with negative supply and one with positive supply. Application notes for these two evaluation boards are presented in order of:

- Negative supply on ASNT05_12
- Positive supply on ASNT05_11

By default, ADSANTEC will ship the positive supply evaluation board. Please send us a message through the DigiKey marketplace website if you would like to receive the negative supply version.

The datasheet for ASNT5012-PQC can be accessed through the following [LINK](#).



ASNT5012-PQC on ASNT05_12 Evaluation Board DC-17Gbps High Sensitivity D-Type Flip-Flop Application Note

Part Description

The ASNT5012-PQC high sensitivity D-type flip-flop accepts a broadband data signal at its differential input port **dp/dn** and delivers a retimed version of it to its differential output port **outp/outn**. Retiming of the input data is accomplished by applying a full rate input clock signal to the differential input port **cp/cn**.

The part is mounted on an ASNT05_12 evaluation board with 50Ω transmission lines to transfer signals to/from the chip to 6 high-speed edge-mount female connectors (Southwest or similar) as shown in Fig. 1. The board has a MOLEX connector for the power supply, as well as signal filters, supply filters, and decoupling networks. The board measures approximately 2.0x2.0 inches, without connectors.

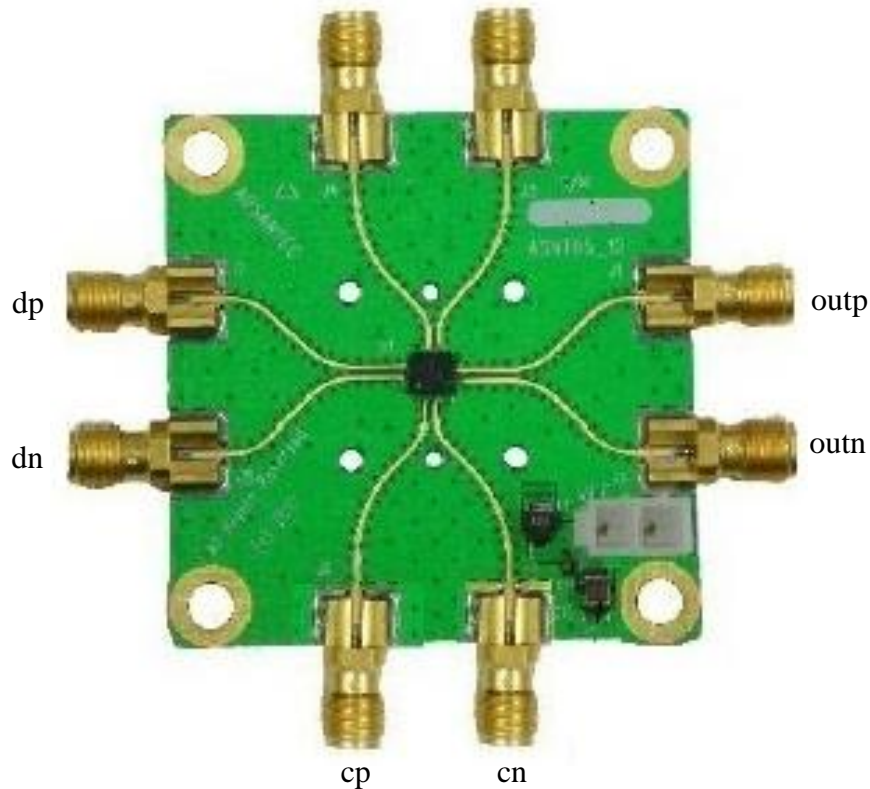


Fig. 1. Layout of ASNT05_12 PCB



The signal and power connectors are described in Table 1 and Table 2 below.

Table 1. Signal Connectors

| Name on PCB | Name on Chip | Signal description | Signal polarity | I/O type |
|-------------|--------------|--|-----------------|------------|
| J7 | dp | Differential data inputs with internal SE 50Ohm termination to VCC | Direct | CML input |
| J8 | dn | | Inverted | |
| J1 | outp | Differential outputs with internal SE 50Ohm termination to VCC; require external SE 50Ohm termination to VCC | Direct | CML output |
| J2 | outn | | Inverted | |
| J6 | cp | Differential clock inputs with internal SE 50Ohm termination to VCC | Direct | CML input |
| J5 | cn | | Inverted | |

Table 2. Power Supply Connectors

| Name on PCB | Name on Chip | Supply type | Supply voltage, V |
|-------------|--------------|----------------------------|-------------------|
| GND | vcc | External ground | 0 |
| VEE | vee | Main negative power supply | -3.3 |

Initial Setup and Basic Functionality

1. The part is static sensitive. **Please observe anti-static protection procedures!**
2. Measure the resistance of all connector pins to VCC, including the power supply, while making sure the board is grounded. All I/O ports should measure 50Ohms while on the power supply connector, VEE should be high impedance and GND should be a short. Fig. 2 shows the resistance values of the described I/O connectors.

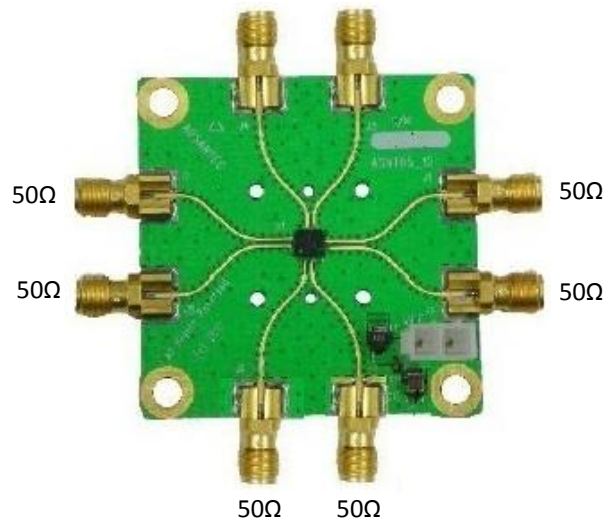


Fig. 2. Impedance of I/O Connectors



3. Switch on the first external power supply unit and set it to a negative supply voltage with a value of $-0.0V$ (positive output pin of the unit must be shorted to ground).
4. Connect the supply unit's output pins to the PCB's Molex connector marked VEE GND so that the negative output pin is connected to VEE connector pin.
5. Gradually increase the negative supply voltage to $-3.3V$.
6. Monitor the supply current in accordance with the part's specifications. Current should be approximately $140mA$.
7. Apply a differential or SE high-speed data signal to connectors J7/J8. DC blocks or the appropriate shift of voltage levels may be required!
8. Apply a differential or SE high-speed full rate clock signal to connectors J1/J2. DC blocks or the appropriate shift of voltage levels may be required!
9. Observe a high-speed sampled data signal at connectors J5/J6. Connect them to an oscilloscope or similar device with 50Ω termination to ground either directly or through DC blocks. If a sampled version of the input data signal is not observed, adjust the phase of the input data or clock accordingly.

Board Dimension

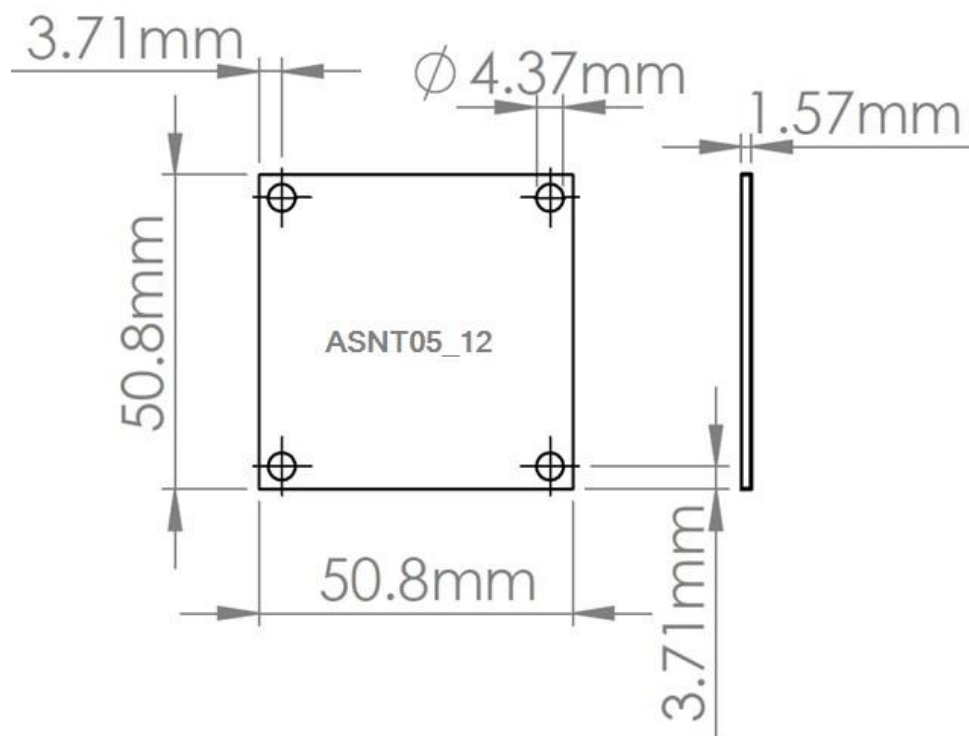


Fig. 3. ASNT05_12 Board Dimensions



ASNT5012-PQC on ASNT05_11 Evaluation Board DC-17Gbps High Sensitivity D-Type Flip-Flop Application Note

Part Description

The ASNT5012-PQC high sensitivity D-type flip-flop accepts a broadband data signal at its differential input port *dp/dn* and delivers a retimed version of it to its differential output port *outp/outn*. Retiming of the input data is accomplished by applying a full rate input clock signal to the differential input port *cp/cn*.

The part is mounted on an ASNT05_11 evaluation board with 50Ω transmission lines to transfer signals to/from the chip to 6 high-speed edge-mount female connectors (Emerson or similar) as shown in Fig. 4. The board has a MOLEX connector for the power supply, as well as signal filters, supply filters, and decoupling networks. The board measures approximately 2.0x2.0 inches, without connectors.

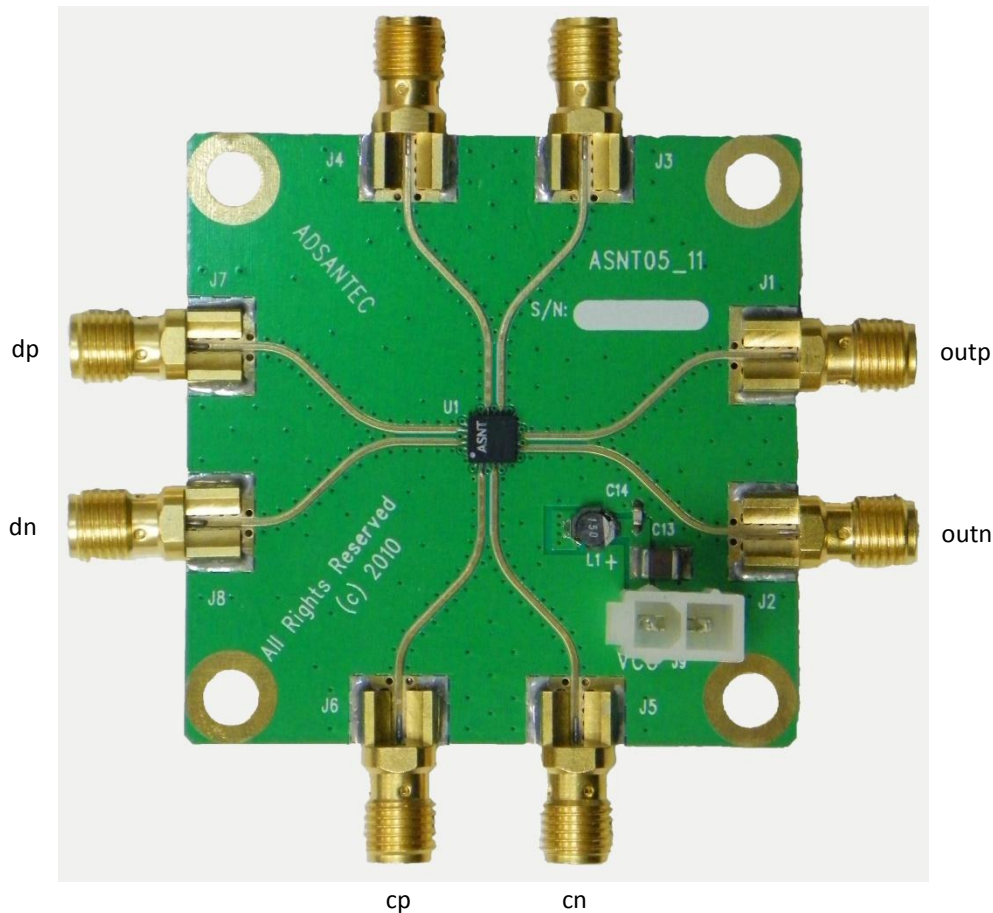


Fig. 4. Layout of ASNT05_11 PCB

The signal and power connectors are described in Table 1 and Table 2 below.

Table 3. Signal Connectors

| Name on PCB | Name on Chip | Signal description | Signal polarity | I/O type |
|-------------|--------------|--|-----------------|------------|
| J7 | dp | Differential data inputs with internal SE 50Ohm termination to VCC | Direct | CML input |
| J8 | dn | | Inverted | |
| J1 | outp | Differential outputs with internal SE 50Ohm termination to VCC; require external SE 50Ohm termination to VCC | Direct | CML output |
| J2 | outn | | Inverted | |
| J6 | cp | Differential clock inputs with internal SE 50Ohm termination to VCC | Direct | CML input |
| J5 | cn | | Inverted | |

Table 4. Power Supply Connectors

| Name on PCB | Name on Chip | Supply type | Supply voltage, V |
|-------------|--------------|----------------------------|-------------------|
| VCC | vcc | Main positive power supply | +3.3 |
| GND | vee | External ground | 0 |

Initial Setup and Basic Functionality

- The part is static sensitive. **Please observe anti-static protection procedures!**
- Measure the resistance of all connector pins to VCC, including the power supply, while making sure the board is grounded. All I/O ports should measure 50Ohms while on the power supply connector, VCC should be a short, and GND should be high impedance. Fig. 5 shows the resistance values of the described I/O connectors.

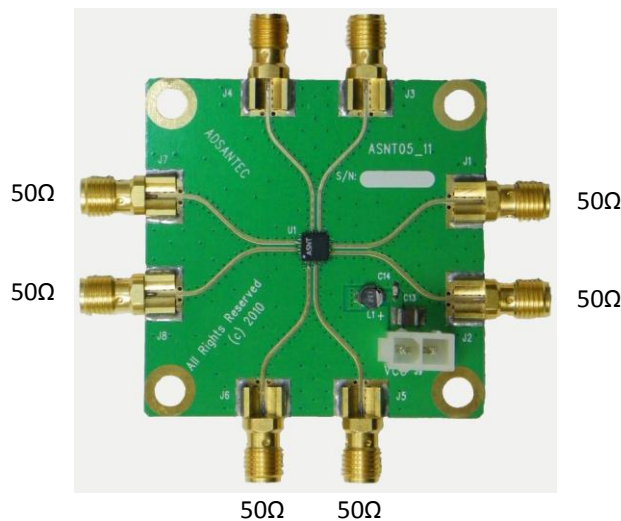


Fig. 5. Impedance of I/O Connectors



12. Switch on the first external power supply unit and set it to a positive supply voltage with a value of +0.0V (negative output pin of the unit must be shorted to ground).
13. Connect the supply unit's output pins to the PCB's Molex connector marked VCC GND so that the positive output pin is connected to the VCC connector pin.
14. Gradually increase the positive supply voltage to +3.3V.
15. Monitor the supply current in accordance with the part's specifications. Current should be approximately 140mA.
16. Apply a differential or SE high-speed data signal to connectors J7/J8. DC blocks or the appropriate shift of voltage levels may be required!
17. Apply a differential or SE high-speed full rate clock signal to connectors J6/J5. DC blocks or the appropriate shift of voltage levels may be required!
18. Observe a high-speed sampled data signal at connectors J1/J2. Connect them to an oscilloscope or similar device with 50Ohm termination to ground through DC blocks. If a sampled version of the input data signal is not observed, adjust the phase of the input data or clock accordingly.

Board Dimensions

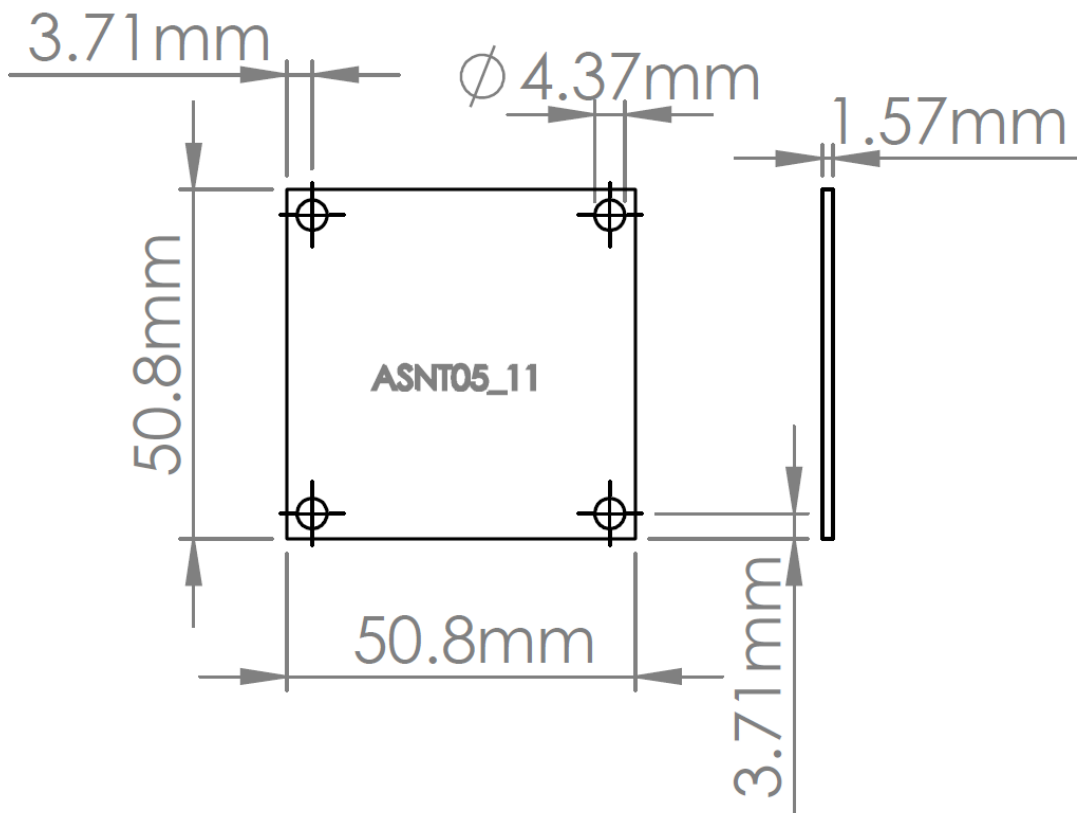


Fig. 6. ASNT05_11 Board Dimensions



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Revision History

| Revision | Date | Changes |
|-----------------|-------------|-----------------|
| 1.0.1 | 09-2020 | Initial Release |