PDM Line Driver User's Guide

The PDM Line Driver (model PDM-DRVR) enables long cable runs between a PDM Device Under Test (DUT) and the PDM input on an Audio Precision analyzer.
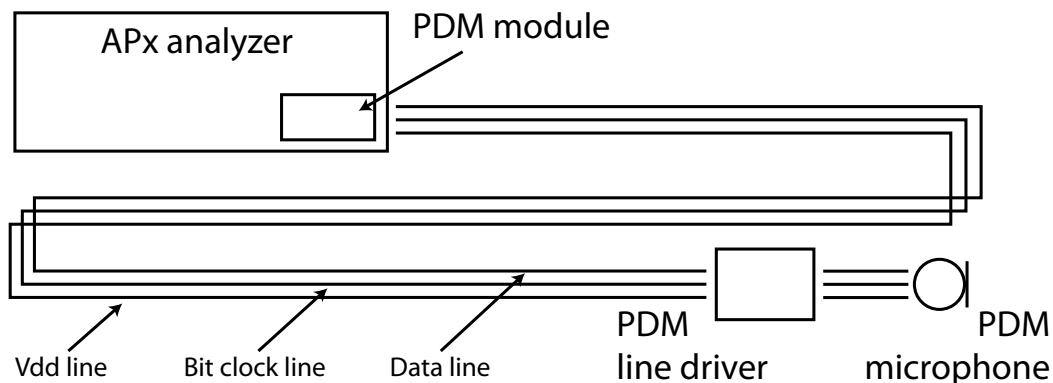

Overview

PDM microphones typically have low power output drivers, designed for the very short wiring connection to a downstream circuit within a device.
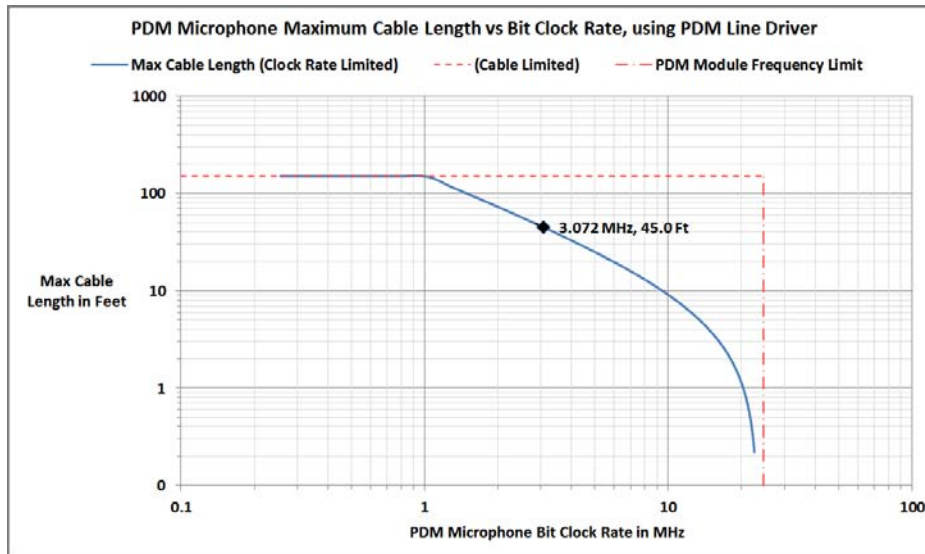
Many testing situations require relatively long cable runs between the PDM DUT and the analyzer. A typical example is the testing of a PDM microphone within an acoustic chamber, while the analyzer is located outside of the chamber at some distance. The PDM Line Driver boosts the PDM data signal from the microphone to enable this longer cable run while maintaining data integrity.

Using the PDM Line Driver

Place the PDM Line Driver near the PDM DUT. Connect the PDM DUT to the PDM Line Driver using three short 50 Ω coaxial cables. We recommend using the 36 cm (14 in.) BNC to BNC cables provided with the PDM Line Driver.

PDM Microphone Maximum Cable Length vs Bit Clock Rate, using PDM Line Driver

— Max Cable Length (Clock Rate Limited)   - - - (Cable Limited)   — PDM Module Frequency Limit

♦ 3.072 MHz, 45.0 Ft

Max Cable Length in Feet

PDM Microphone Bit Clock Rate in MHz

Connections to the PDM device under test.

Connections to the APx PDM module.

Connect the output of the PDM Line Driver to the PDM input in the APx analyzer, using three 50 Ω coaxial cables no longer than indicated in the chart shown above, taking the data rate into consideration. The cables must each be of the same length, to maintain synchronization between the PDM data and the clock signal.

Cable length versus data rate

The maximum cable length is dependent upon the data rate of the PDM signal, which is the Bit Clock rate. At the lowest bit clock rates (below 1 MS/s), the cable run can be up to 46 m (150 ft.) At a typical data rate of 3.072 MS/s (baseband audio rate of 48 kS/s oversampled at x64), the cable run can be as long as 14 m (45 ft.). At rates above about 11 MS/s, the recommended cable length is 30 cm (12 in.) or less, and the advantage of using the PDM Line Driver is lost. See the chart at the top of the page.
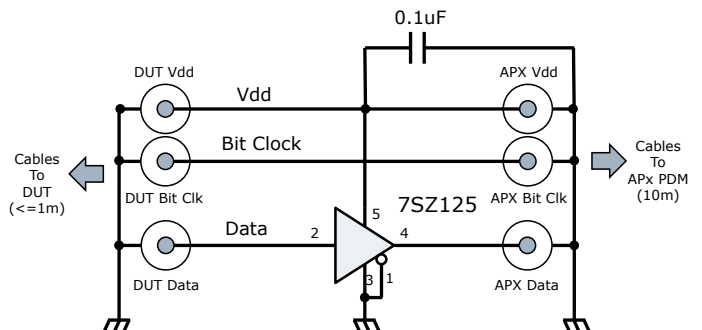
Cable length performance predictions

- 1.57 ns/ft, propagation delay of the cable
- 5 ns, propagation delay of the cable driver at the PDM microphone.
- 5 ns, setup time requirement for the PDM module.
- 11.5 ns offset, PDM clock to data
- 3.072 MHz, PDM microphone bit clock rate
- 150 feet, practical maximum cable length

Block Diagram

PDM Line Driver Block Diagram.

The PDM Line Driver is powered from the Vdd supplied by the APx PDM module.

Audio Precision®

5750 SW Arctic Drive
Beaverton, Oregon USA
ap.com