Product Overview
How to Communicate I2S Signals Between MCU, DSPs, and Amplifiers Using Multiplexers

👐 TEXAS INSTRUMENTS

I2S (Inter-IC Sound Bus) is a serial bus interface used for connecting audio devices together. Typically, a three-line protocol consisting of a Serial Clock (SCK), Word Select (WS) and Serial Data (SD) lines is used for these applications, though the need for a Word Select line is not always needed. A multiplexer can be used to help support multiple audio peripherals using a single I2S bus. Since these are passive, bidirectional parts they give the user the ability to either multiplex (MUX) or demultiplex (DEMUX) the respective signals.
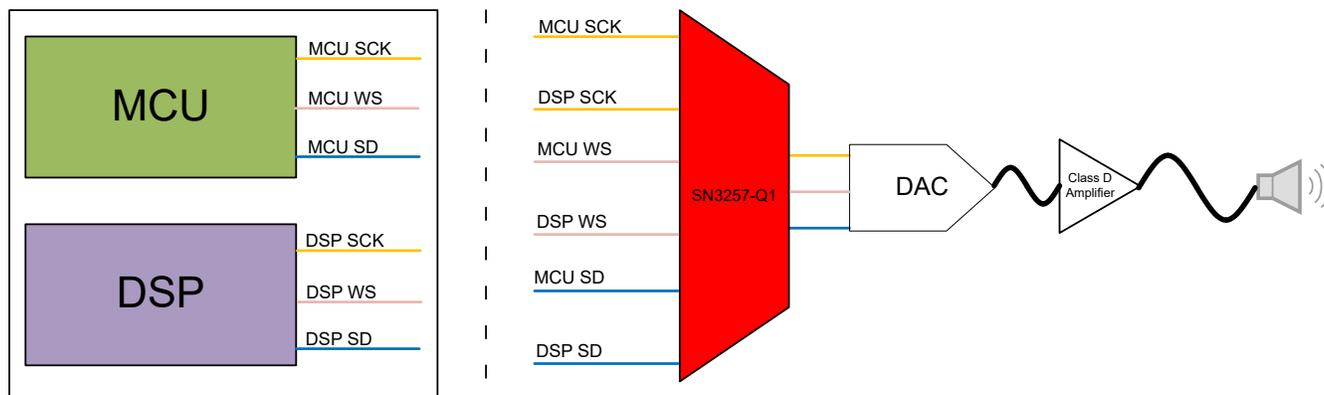
Figure 1. 2-Channel Implementation of I2S Using SN3257-Q1
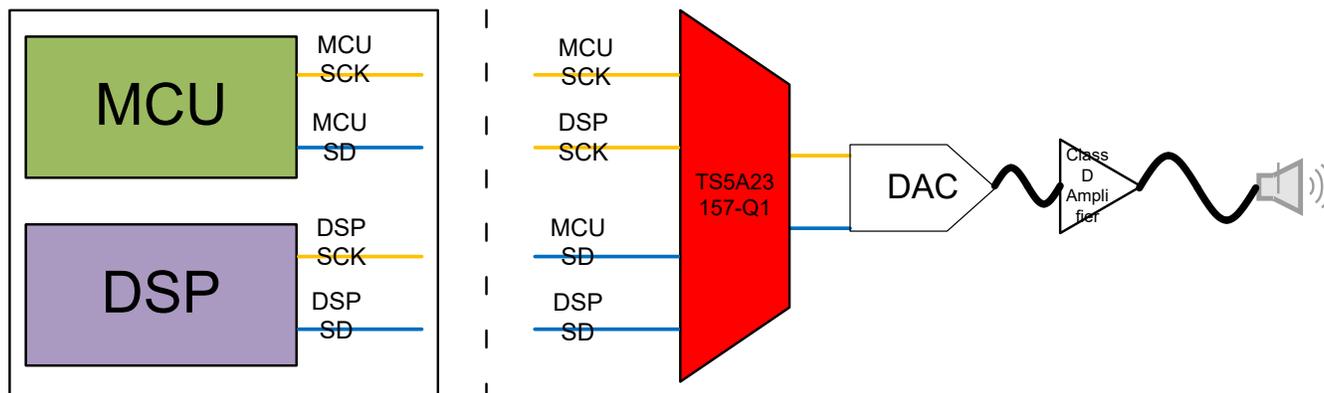
Figure 2. 3-Channel Implementation of I2S Using TS5A23157-Q1

Design Considerations

- Select multiplexers with enough bandwidth and the appropriate channel count to support the needs of the application.
- Powered-off protection can help protect against voltages present on the inputs when the multiplexer is not powered.
- For battery powered systems, select multiplexers with low supply current to maximize battery life.
- Learn about multiplexer parameters with *TI Precision Labs Videos*.
- Ask a question on our *TI E2E™ Design Support Forum*.

Table 1. Recommended Parts

Part Number	VCC Range (V)	Configuration	Bandwidth	R_{ON} (Ω)	Supply Current (µA)	Features
SN3257-Q1	1.5 to 5.5	2:1 4-channel	2.0 GHz	5	40	1.8-V compatible control inputs, break-before-make, fail-safe logic, powered-off protection
TS3A27518E-Q1	1.65 to 3.6	2:1 6-channel	240 MHz	4.4	0.04	1.8-V compatible control inputs, break-before-make, powered-off protection
TMUX1574	1.5 to 5.5	2:1 4-channel	2.0 GHz	2	40	1.8-V compatible control inputs, fail-safe logic, Integrated pulldown resistor on logic pin, powered-off protection, supports input voltage beyond supply
TS5A23157-Q1	1.65 to 5.5	2:1 2-channel	220 MHz	15	0.01	Break-before-make, low charge injection, functional safety capable

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