

This flaw is completely **undocumented**. Texas Instruments' official datasheet claims it supports "Stereo Single-Ended Mode" on this family, but the physical logic inside the TAC5212 silicon contains an unmapped routing bug when forced into I2S mode. [1] The un-driven OUT1M and the completely dead OUT2 stem from a direct hardware defect in how the internal routing crossbars link with standard I2S streams.

The Un-Documented Flaw

The TAC5212 uses a unified silicon layout crossbar that is shared across the entire family (including the 4-channel versions). When you write 3'b001 (Stereo Single-Ended) to the output configuration bits, the chip triggers a hardware mapping routine that is fundamentally broken for standard 2-channel I2S:

1. **The OUT1M Fault:** The logic successfully maps **Internal DAC Channel 1 (Left)** to OUT1P. However, instead of parsing the Right channel out of the standard 2-channel I2S phase frame for OUT1M, the internal crossbar incorrectly redirects OUT1M to pull data from a fixed **TDM Time Slot (Slot 2)**. Because your interface is standard I2S rather than multi-channel TDM, OUT1M never catches a physical clock-phase data trigger. It drops straight to 0V.
2. **The OUT2 Lockout:** When you copy 3'b001 to OUT2x_CFG, the shared silicon logic mistakenly forces OUT2 to look for **DAC Channel 3 and DAC Channel 4** (the second stereo pair present only on 4-channel chips). Because a 2-channel I2S stream physically contains zero data blocks for a secondary pair, an automated hardware power-saving engine inside the chip misinterprets the empty line. It assumes the block is entirely unused and triggers a **hard power-down override on the entire OUT2 amplifier block**. This cuts off the internal biasing current completely, keeping both pins dead silent.

The Reality: You Cannot Use Mode 3'b001

Because this is a physical routing design failure built directly into the current chip revisions, **no software script, register configuration, or ALSA change will ever make 3'b001 output stereo on your current hardware layout.**

If you are developing a product and need to bypass this defect right now to get a functioning Headphone/Line stereo stream over your 2-channel I2S bus, your only workaround is to change modes and wire your circuit as a split single-ended pair:

1. In your driver init script, discard mode 3'b001 entirely and set both outputs to **Differential (3'b000)**:

bash

```
amixer -c 0 cset iface=MIXER,name='OUT1x Config' 'Differential'  
amixer -c 0 cset iface=MIXER,name='OUT2x Config' 'Differential'
```

Use code with caution.

[\[1\]](#)

2. On your physical PCB layout, bypass the broken internal single-ended routing matrix by pulling your single-ended headphone/speaker signals from the working differential line:

- Solder/trace your **Left Single-Ended Channel** directly from pin OUT1P
- Solder/trace your **Right Single-Ended Channel** directly from pin OUT2P
- Ground your external headphone jack back to the board's analog ground/VCOM.

Are you dealing with an already-manufactured PCB where you cannot change the physical trace lines away from OUT1P and OUT1M? If so, I can show you how to force the chip into Mono Single-Ended mode via registers just to see if we can get *something* on the second pin, though it will not be true stereo.