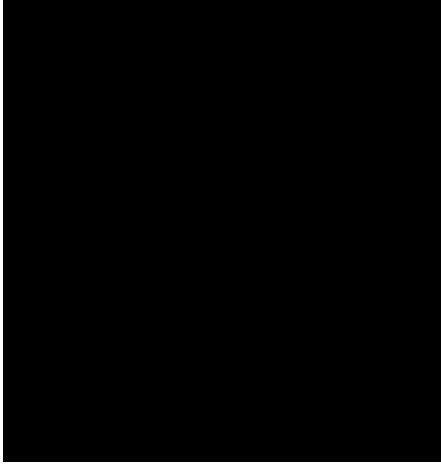


June 2016

# FSA2276 — DPDT (0.5 ) HiFi Audio Switch w/ Negative Swing

## Features

- $V_{DD}$ Operating Range: 1.65 to 5.5 V
- External Capacitor Connection for Pop and Click Noise Suppression
- Power-Off Protection on Common Ports
- $R_{ON}$ = 0.5 Ý (Typ.) at 1.8 V
- THD+N = -115 dB; 2 $V_{RMS}$, 20 kÝ Load; f = 1 kHz
- $X_{TALK}$ = -122 dB at 1 $V_{RMS}$, 50 Ý Load; f = 1 kHz
- Off Isolation = -115 dB at 1 $V_{RMS}$, 50 Ý Load; f = 1 kHz
- 12-Lead UMLP 1.8 mm x 1.8 mm

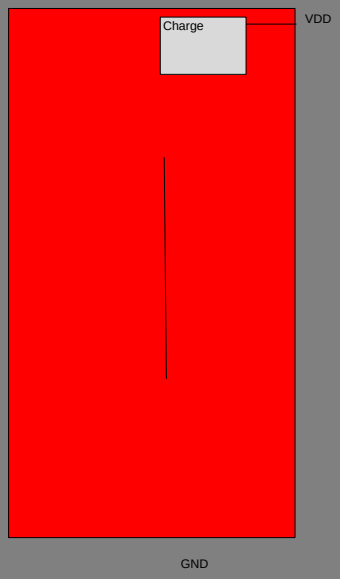
## Applications

- Mobile Phone, Tablet, Notebook PC, Media Player
- Docking Station, TV, Set-Top Box, LCD Monitor

## Description

The FSA2276 is a high-performance, Double-Pole Double-Throw (DPDT) analog switch with negative swing audio capability. The FSA2276 features ultra-low audio $R_{ON}$ of 0.5 (typical) at 1.8 V $V_{DD}$. The FSA2276 operates over a $V_{DD}$ range of 1.65 V to 5.5 V, is fabricated with sub-micron CMOS technology to achieve fast switching speeds, and is designed for break-before-make operation. To minimize pop and click during operation, the turn on ramp time is selectable using an external capacitor (C_EXT).

The FSA2276 features THD+N specifications that target a Hi-Fidelity audio quality into both 32 Ý headphones and line out type loads (>600 Ý).




## Ordering Information

| Part Number | Top Mark | Package Description |
|---|---|---|
| FSA2276UMX | EN | 12-Lead, UMLP, Quad, JEDEC MO252, 1.8 mm x 1.8 mm |

## Pin Configuration

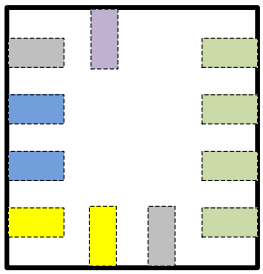


Figure 2. Pin Assignment (Top Through View)

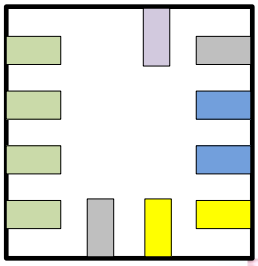


Figure 3. Pin Assignment (Bottom View)

## Pin Descriptions

| Pin | Name | Description |
|---|---|---|
| 1 | VDD | Power Supply (1.65 to 5.5 V) |
| 2 | C_EXT | Slow Turn On External Capacitor |
| 3 | GND | |

## Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

| Symbol | Parameter | | Min. | Max. | Unit |
|---|---|---|---|---|---|
| $V_{DD}$ | Supply/Control Voltage | | -0.3 | 6.0 | V |
| $V_{CNTRL}$ | Control Input Voltage | SEL, MUTE | -0.3 | 6.0 | V |
| $V_{SW}$ | DC Switch I/O Voltage | L1, L2, R1, R2, $L_{SPKR}$, $R_{SPKR}$ | -3.5 | 3.5 | V |
| $I_{IK}$ | ESD Input Diode Current | | | -50 | mA |
| $I_{SW}$ | Switch I/O Current | | | 700 | mA |
| ESD | Human Body Model, ANSI/ESDA/ JEDEC JS-001-2012 | All Pins | 5 | | kV |
| | Charged Device Model, JEDEC: JESD22-C101 | | 2 | | |
| | IEC 61000-4-2 System | Contact | 8 | | |
| | | Air Gap | 15 | | |
| $T_A$ | Absolute Maximum Operating Temperature | | -40 | +85 | °C |
| $T_{STG}$ | Storage Temperature | | -65 | +150 | °C |

## Recommended Operating Conditions

The Recommended Operating Conditions table defines the conditions for actual device operation. Recommended operating conditions are specified to ensure optimal performance. Fairchild does not recommend exceeding them or designing to Absolute Maximum Ratings.

| Symbol | Parameter | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_{DD}$ | Supply Voltage | | 1.65 | 1.80 | 5.50 | V |
| $V_{SW}$ | DC Switch I/O Voltage | L1, L2, R1, R2, $L_{SPKR}$, $R_{SPKR}$ | -3.0 | | | |

## DC Characteristics

$V_{DD}$ = 1.65 V to 5.5 V, $V_{DD}$ (Typ.) = 1.8 V, $T_A$ = -40°C to 85°C, and $T_A$

## AC Characteristics

$V_{DD}$ = 1.65 V to 5.5 V, $V_{DD}$ (Typ.) = 1.8 V. $T_A$ = -40°C to 85°C. $T_A$ (Typ.) = 25°C, unless otherwise specified.

| Symbol | Parameter | Condition | $V_{DD}$ (V) | $T_A$=- 40°C to +85°C | | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | |
| $t_{MUTE\_ON}$ | Enable Time (MUTE to Output) | L1 = R1 = L2 = R2 = 1.5 V, $L_{SPKR}$ , $R_{SPKR}$ = 50 Ω to GND SEL= 0 or $V_{DD}$; See Figure 7 | | | | | |

## Capacitance

Unless otherwise stated, $V_{DD}$ = 1.65 V to 5.5 V, $V_{DD}$ (Typ.) = 1.8 V, $T_A$ = -40°C to 85°C, and $T_A$ (Typ.) = 25°C.[5]

| Symbol | Parameter | Condition | $V_{DD}$ (V) | $T_A$=- 40°C to +85°C | | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | |
| $C_{ON}$ | On Capacitance (Common Port) ( | | | | | | |

## Test Diagrams

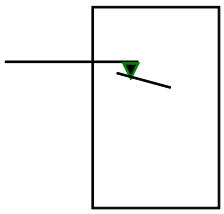
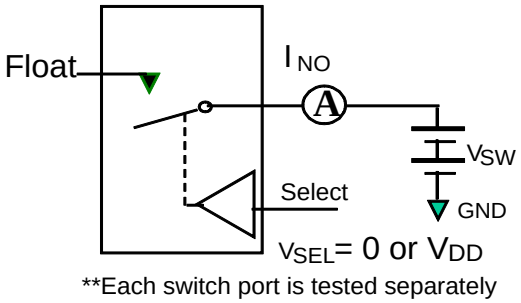


Figure 4. On Resistance




**Each switch port is tested separately

Figure 5. Off Leakage

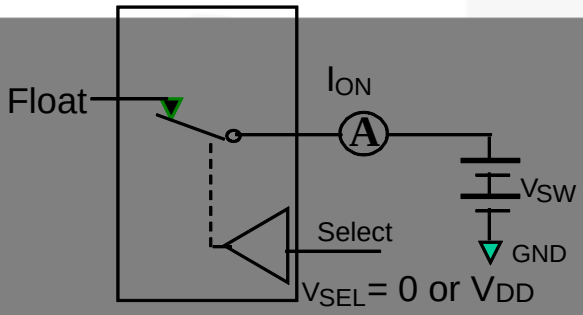



Figure 6. On Leakage

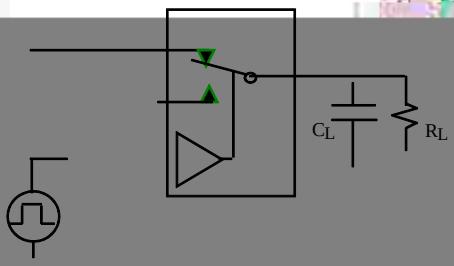



Figure 7. Test Circuit Load

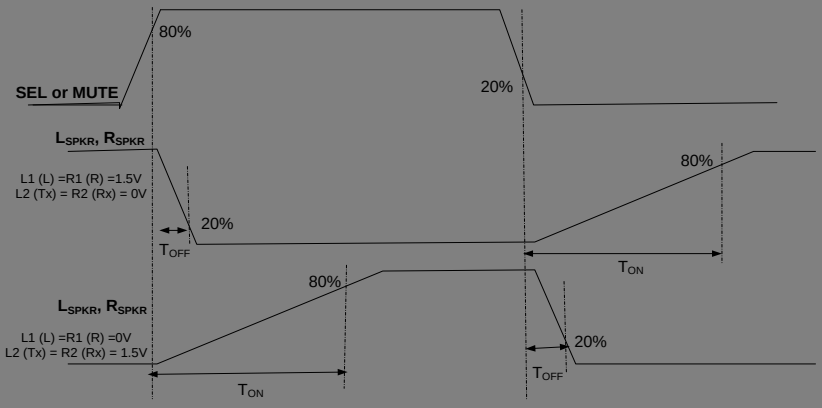
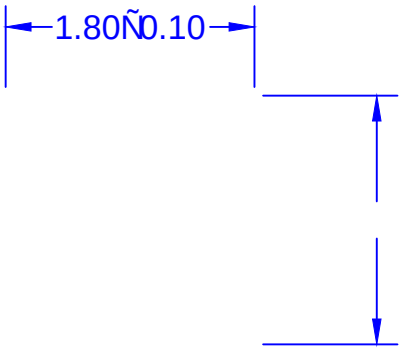
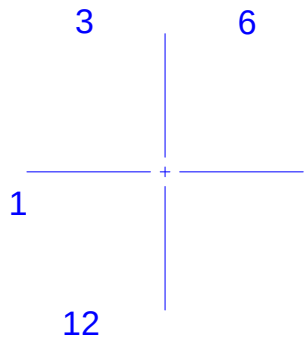



Figure 8. Turn On/Off Waveforms (SEL or MUTE to Output)




RECOMMENDED LAND PATTERN

SIDE VIEW




BOTTOM VIEW

DETAIL A
SCALE 2:1

| | | | | |
|---|---|---|---|---|
| ⌖ | 0.10 | C | A | B |
| | 0.05 | C | | |

NOTES:

A. PACKAGE DOES NOT CONFORM TO ANY JEDEC STANDARD.
B. DIMENSIONS ARE IN MILLIMETERS.
C. LAND PATTERN RECOMMENDATION IS EXISTING INDUSTRY LAND PATTERN.
D. DRAWING FILENAME: MKT-UMLP12ArevF

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