



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 Ω (Typ.) at 1.8 V
- THD+N = -115 dB; 2 V_{RMS}, 20 Ω Load; f = 1 kHz
- X_{TALK} = -122 dB at 1 V_{RMS}, 50 Ω Load; f = 1 kHz
- Off Isolation = -115 dB at 1 V_{RMS}, 50 Ω Load; f = 1 kHz
- 12-Lead UMLP 1.8 mm x 1.8 mm

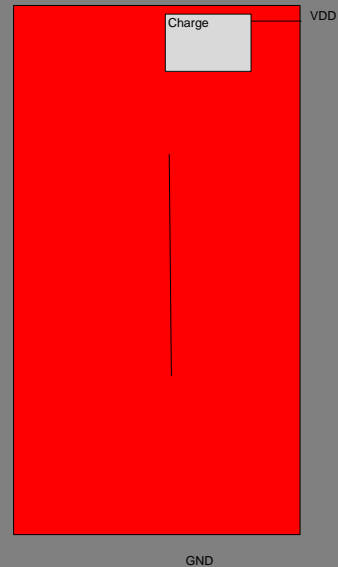
Description

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 Ω (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 Ω headphones and line out type loads (>600 Ω).

Applications

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



Ordering Information

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

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

Pin Configuration

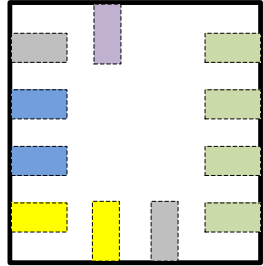


Figure 2. Pin Assignment (Top Through View)

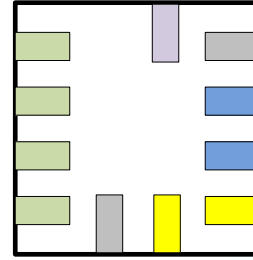


Figure 3. Pin Assignment (Bottom View)

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 | | -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 | | -3.0 | | | |

DC Characteristics

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



AC Characteristics

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

| Symbol | Parameter | Condition | V_{DD} (V) | $T_A = -40^\circ\text{C to }+85^\circ\text{C}$ | | | Unit |
|--------|-----------|-----------|--------------|--|------|------|------|
| | | | | Min. | Typ. | Max. | |

| | | | | | | |
|-----------------------|------------------------------|---|--|--|--|--|
| $t_{\text{MUTE_ON}}$ | Enable Time (MUTE to Output) | $L1 = R1 = L2 = R2 = 1.5\text{ V}$, $L_{\text{SPKR}}, R_{\text{SPKR}} = 50$ to GND $\text{SEL} = 0$ or V_{DD} ; See Figure 7 | | | | |
|-----------------------|------------------------------|---|--|--|--|--|

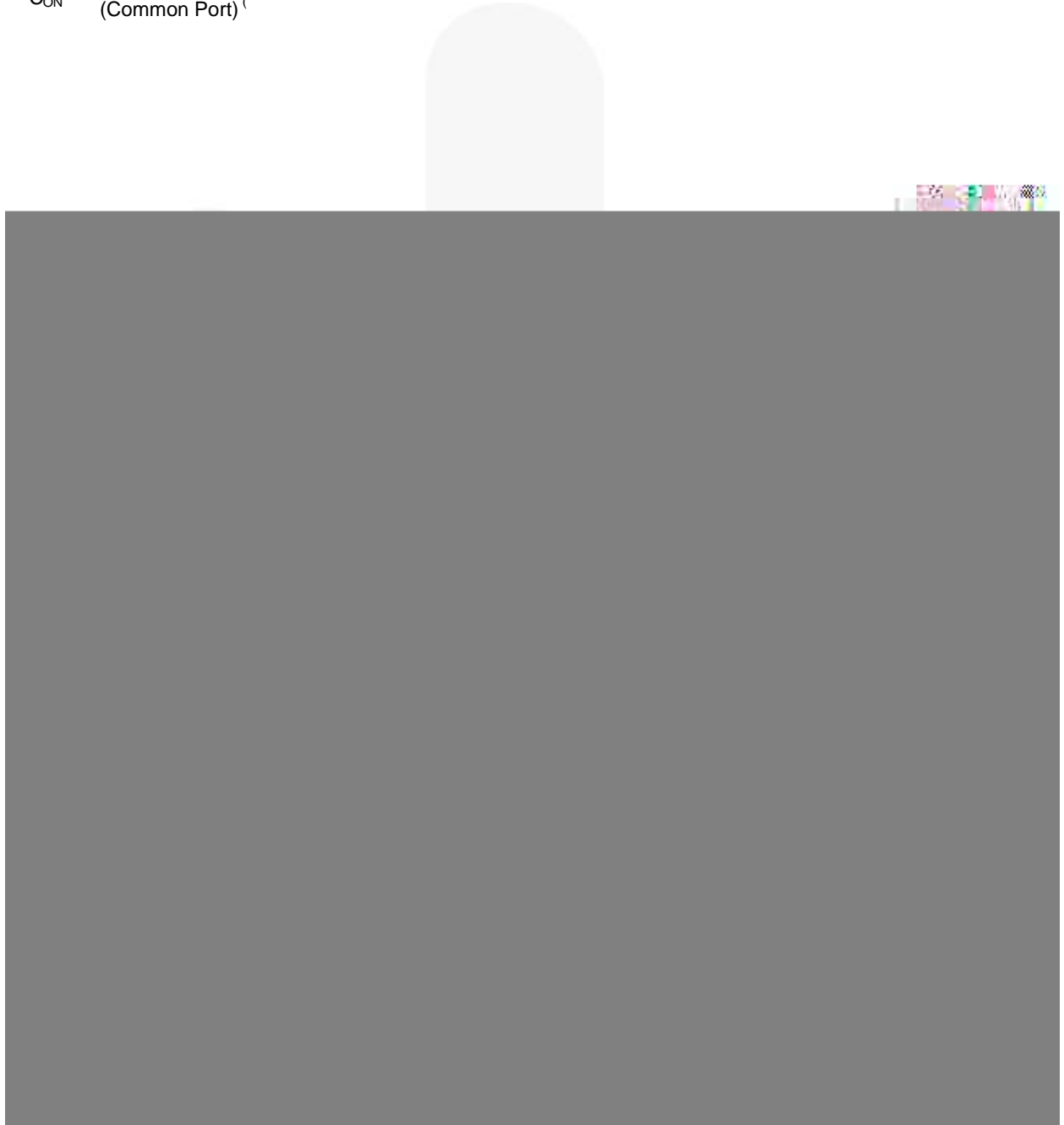


Capacitance

Unless otherwise stated, $V_{DD} = 1.65\text{ V to }5.5\text{ V}$, $V_{DD}(\text{Typ.}) = 1.8\text{ V}$, $T_A = -40^\circ\text{C to }85^\circ\text{C}$, and $T_A(\text{Typ.}) = 25^\circ\text{C}$.⁽⁵⁾

| Symbol | Parameter | Condition | V_{DD} (V) | $T_A = -40^\circ\text{C to }+85^\circ\text{C}$ | | | Unit |
|--------|-----------|-----------|--------------|--|------|------|------|
| | | | | Min. | Typ. | Max. | |

| | | | | | | | |
|----------|--|--|--|--|--|--|--|
| C_{ON} | On Capacitance (Common Port) ⁽⁶⁾ | | | | | | |
|----------|--|--|--|--|--|--|--|



Test Diagrams

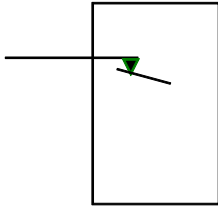
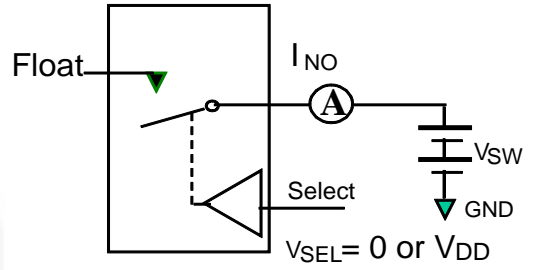


Figure 4. On Resistance



**Each switch port is tested separately

Figure 5. Off Leakage

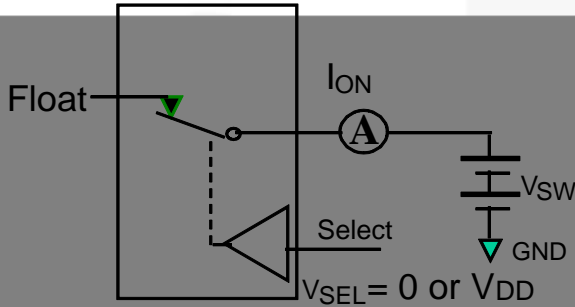


Figure 6. On Leakage

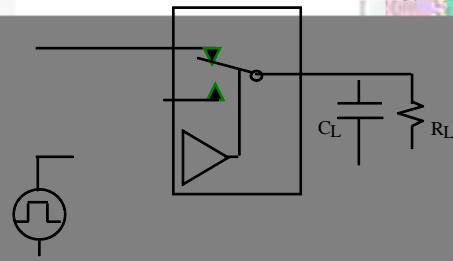


Figure 7. Test Circuit Load

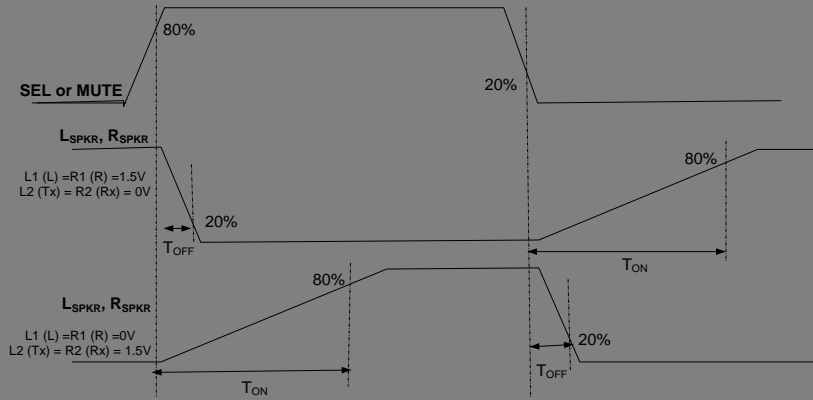
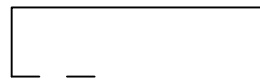
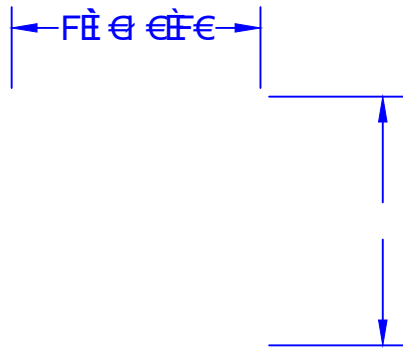


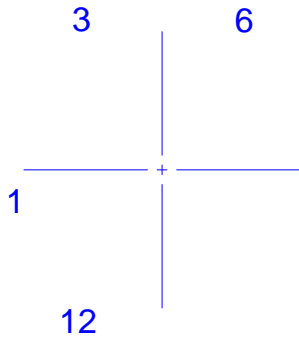
Figure 8. Turn On/Off Waveforms (SEL or MUTE to Output)





RECOMMENDED LAND PATTERN

SIDE VIEW



BOTTOM VIEW

| | | | | |
|----------|------|---|---|---|
| \oplus | 0.10 | C | A | B |
| | 0.05 | C | | |

DETAIL A
SCALE 2:1

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

ON Semiconductor and are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada

Europe, Middle East and Africa Technical Support:

Phone: 421 33 790 2910

Japan Customer Focus Center

Phone: 81-3-5817-1050