

## CLASS D AUDIO AMPLIFIER REFERENCE DESIGN USER'S GUIDE

### 1. Kit Contents

The Si824x Class D Audio Amplifier Reference Design Kit contains the following items:

- Audio Class D Amplifier reference design board featuring:
  - Si8241 ISOdriver
  - Si8410 Digital Isolator

### 2. Introduction

This User's Guide discusses the Silicon Labs Audio Class D amplifier reference design, a stereo, two-state, half-bridge Class D amplifier leveraging the performance advantages of the Si8241 ISOdriver. This two-channel Class D Audio Amplifier delivers 120 W per channel into 8  $\Omega$ , while enabling < 0.02% THD at 60 W and > 95 dB SNR.

High-power audio systems are adopting digital audio technology and evolving toward lower-power, “green” products that meet Energy Star™ guidelines. Class-D audio systems have started penetrating the high-end markets where low noise, extremely good THD performance, and very high output power are required in consumer and industrial applications. The Si824x audio driver family consists of single-chip, isolated, Class-D gate drivers powering audio systems delivering from 30 W up to 1000 W of audio power.

Occasionally, a new IC is introduced that challenges the current technological hegemony. With features that make these products the perfect drivers for Class D amplification, the Silicon Labs Si8241/44 Audio Gate Drivers represent a new standard for the Class D amplifier industry. Based on Silicon Labs' proprietary isolation technology, the Si824x audio drivers incorporate input-to-output isolation that enables level-translation of signals without additional external circuits. The Si824x audio drivers feature adjustable dead-time control for achieving optimal THD, overlap protection that safeguards against shoot-through current damage, robust immunity to latch-up and high-voltage transients, and lower BOM costs and PCB footprints compared to non-isolated gate drive solutions. A typical audio driver application using the Si824x is shown in Figure 1. For more information on the Si824x audio driver, refer to the Si824x datasheet at [www.silabs.com/audio](http://www.silabs.com/audio).

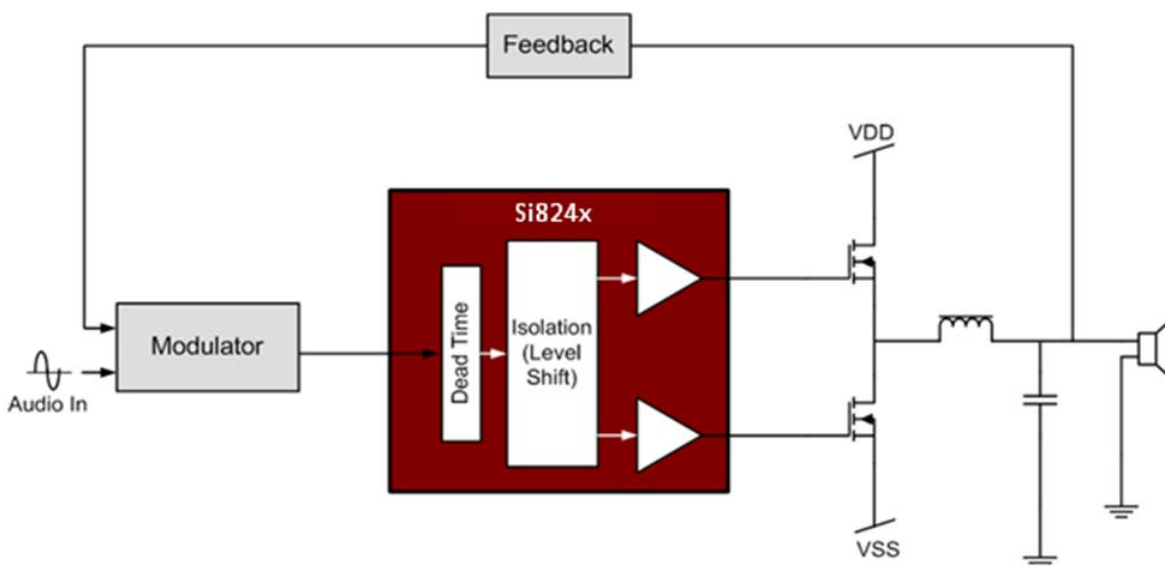


Figure 1. Si824x-Based Class D Audio Driver Block Diagram

# Si824xClassD-KIT

## 3. Hardware Overview and Demo

### 3.1. Reference Design Board Architecture

The Silicon Labs Class D reference design architecture uses a phase-shift, self-oscillating modulation approach that is capable of achieving far greater signal-to-noise ratio than clock driven amplifiers (see Figure 2). This self-oscillating implementation eliminates the circuitry necessary to generate the triangle waveform. To keep the circuit as simple as possible, a two-state, half-bridge is implemented and exemplifies the benefits of using the Si8241 Audio Gate Driver.

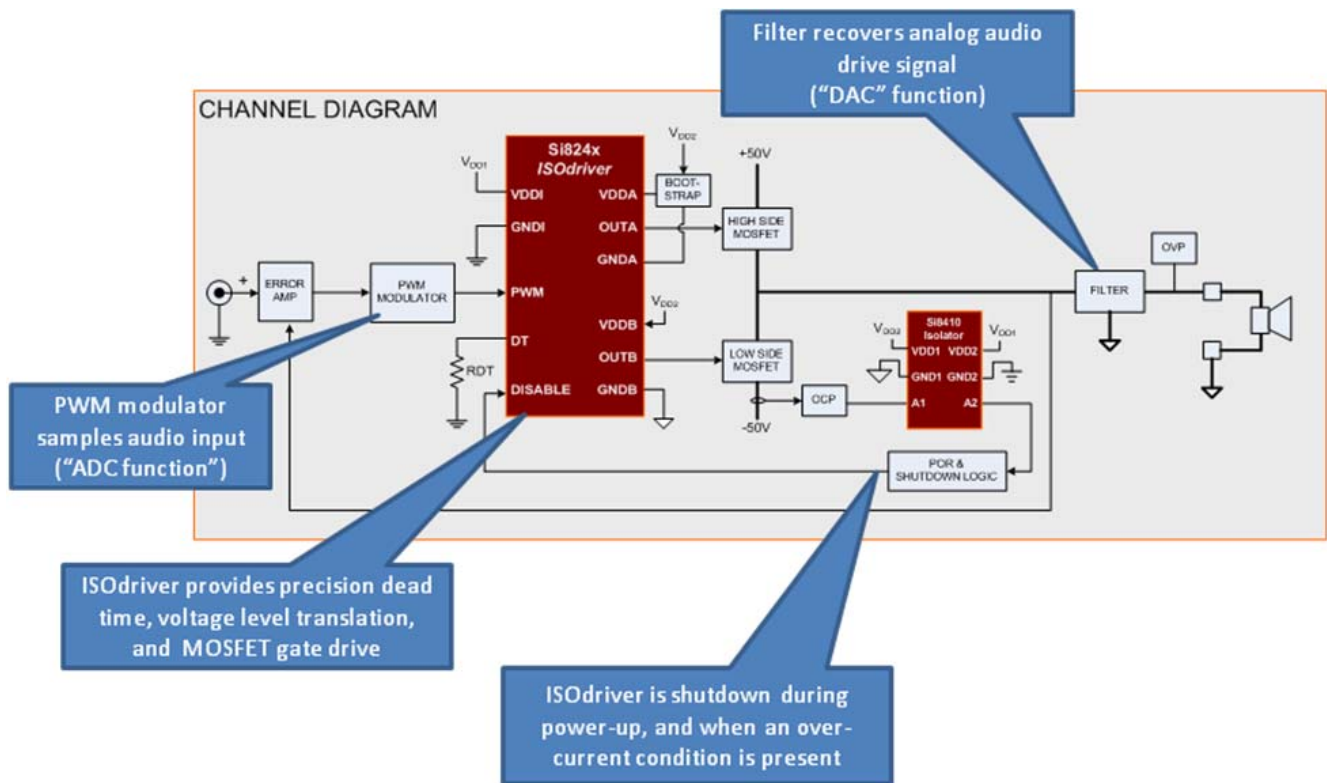


Figure 2. Block Diagram of Si8241-Based Class D Amplifier

### 3.2. Setting up the Class D Amplifier

Figure 3 illustrates connections necessary to power the Class D amplifier. The user will need the following items:

- MP3 player (or equivalent line out audio source)
- Audio Y-Cable (stereo male to Dual RCA Male)
- $\pm 50$  V supply capable of sourcing 3 Amps
- $\pm 12$  V supply capable of sourcing 500 mA
- Two speakers (up to 150 W)
- Silicon Labs Class D reference design board

#### Warning:

1. To protect the amplifier and speakers, before turning on the main power (the  $\pm 50$  V supplies) to the amplifier, ensure that the audio source from the MP3 player has its volume set to the lowest possible level.
2. The L-bracket can heat up to 80 °C and should be handled with care.

## 3.3. Powering up the Class D Amplifier and Playing Music

After the audio source, audio Y-cable, supplies, and speakers have been properly connected as shown in Figure 3.

1. Turn on the  $\pm 12$  V supplies.
2. Then, turn on the  $\pm 50$  V supplies. Notice that LED1 should turn on for about 1 sec and then turn off. This on and off sequence clears any overcurrent protection faults and indicates to the user that the amplifier is ready to amplify the audio input signal. If the LED does not turn off after about 1 sec, cycle on and off the  $\pm 12$  V supplies. Repeat this step until the LED turns off. If the LED never turns off, the board has probably been damaged.
3. With the audio source's volume turned down to its lowest output level, start the audio source.
4. Adjust the volume to the desired listening level.
5. Enjoy your music!

**Note:** If the power being delivered to the speakers is too great, the overcurrent protection circuitry will trip and shut off audio to the speakers, protecting the amplifier. LED1 will turn on in this condition. See "4.4. Overcurrent Protection" on page 4 for more details on clearing this fault condition.

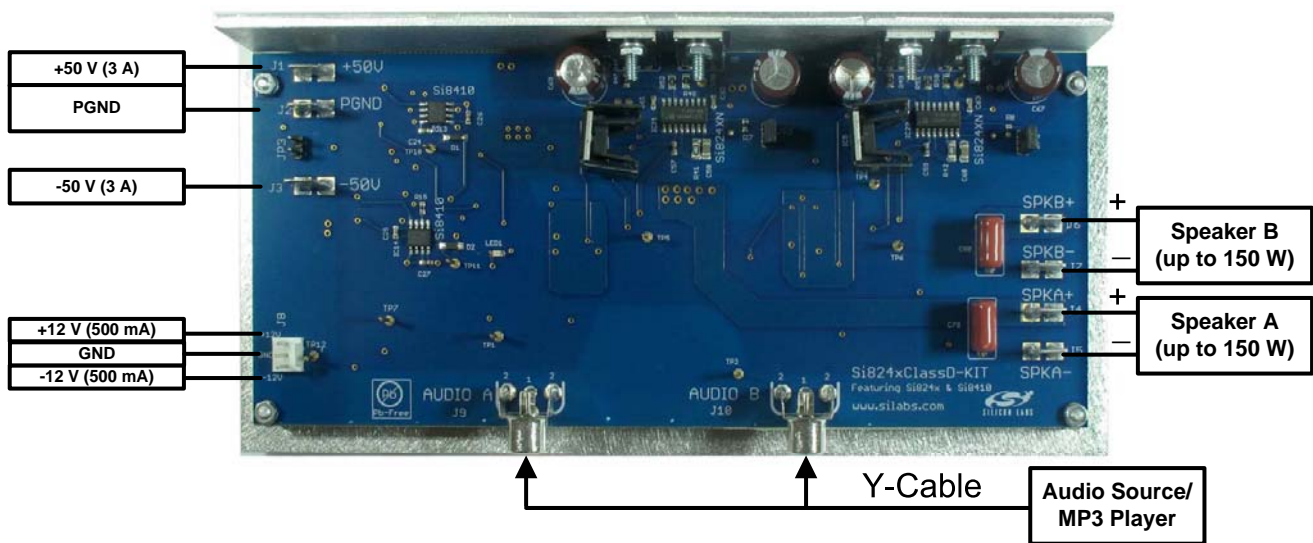


Figure 3. Si824xClassD-KIT (Top View)

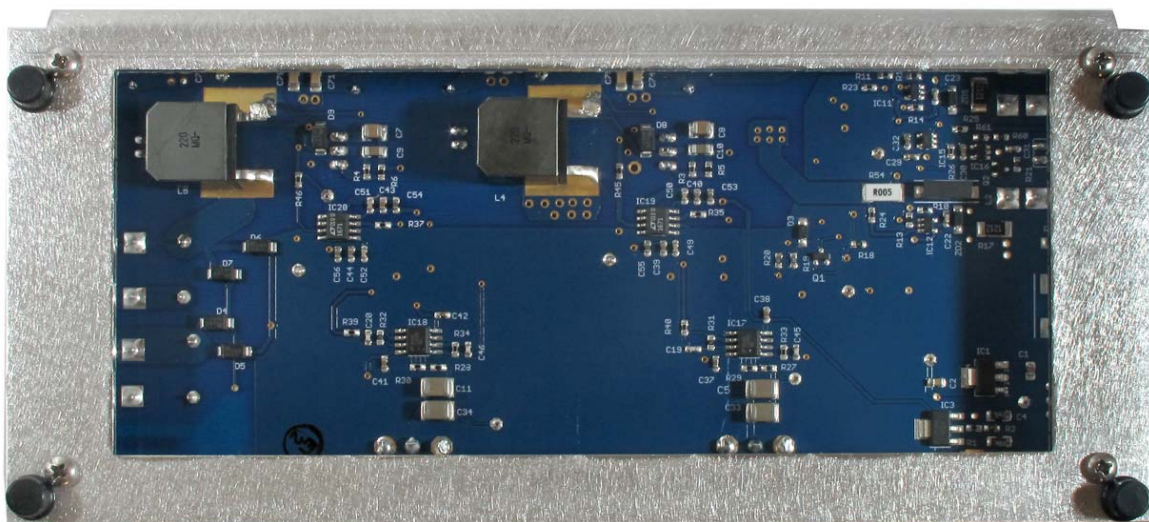


Figure 4. Si824xClassD-KIT (Bottom View)

# Si824xClassD-KIT

## 4. Additional Features and Architectural Considerations

### 4.1. Gate Drive Structure

Figure 5 illustrates the ease with which the Si8241 can drive a two-state, half-bridge class D amplifier. The boot supply tied to D1 must be 12 V higher than the  $-50\text{ V}$  reference ( $-38\text{ V}$ ) so that the MOSFETs each have a 12 V drive signal. The closed loop gain of the Silicon Labs Class D reference design is implemented such that approximately 1 Vpp input will yield full output power into an  $8\ \Omega$  load.

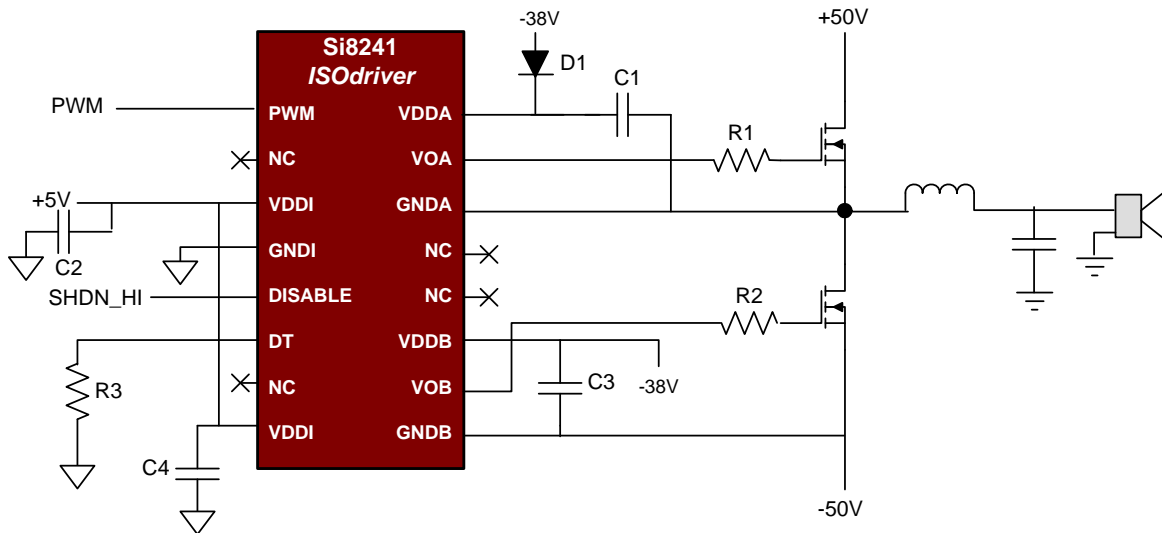


Figure 5. Si8241 Audio Gate Driver Gate Drive Circuit

### 4.2. Self Oscillation

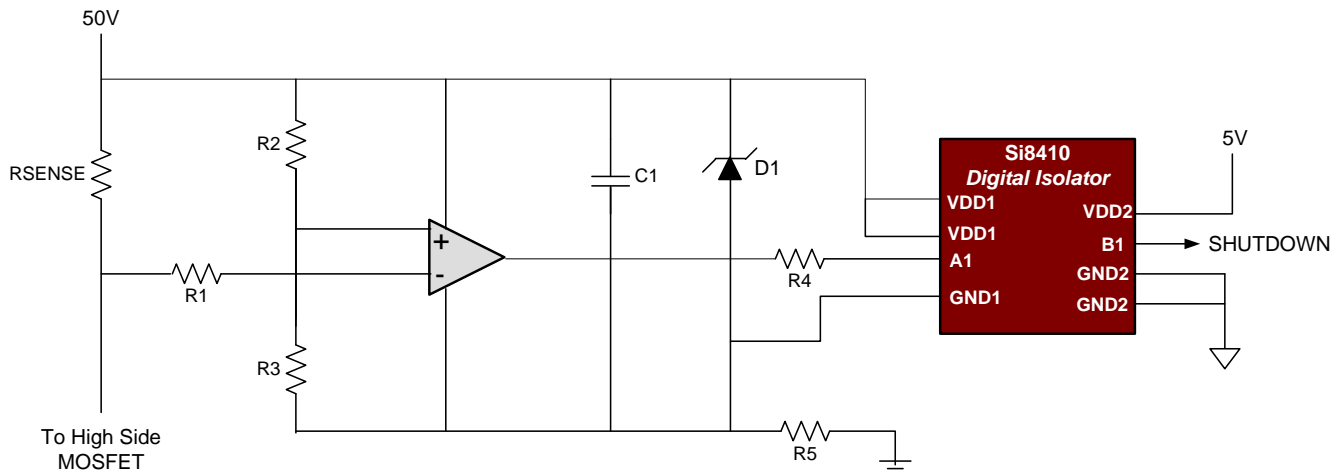
The amplifier is self-oscillating, enabling its signal-to-noise ratio to far exceed that of a clock driven system. The main mechanism for this is the delta-sigma effect of shifting in-band noise to a much higher out-of-band frequency. The amplifier is a basic, phase-shift type, which has significant advantages over an amplifier running as a hysteretic oscillator. There is a pole in the forward path  $G(s)$  and a pole in the feedback path  $H(s)$ . The  $180^\circ$  phase shift, coupled with the transport delay, yields an oscillation frequency of nearly 500 kHz. The frequency of oscillation is set by capacitors in each audio channel where reducing capacitance value increases oscillation frequency. Tight tolerance capacitors are used to keep the channel frequencies as close to each other as possible.

### 4.3. Heat Sink L-Bracket

The amplifier design includes an L-bracket to sink excess heat from the power transistors. At full power, the L-bracket's temperature should increase to no higher than 80 degrees Celsius.

### 4.4. Overcurrent Protection

The Silicon Labs Class D reference design has an overcurrent protection circuit consisting of a low-power comparator floating off the upper and lower bus voltages. The upper rail circuit is shown in Figure 6 and is duplicated on the lower rail. It monitors the current flowing through the  $0.005\ \Omega$  resistor (RSENSE). Zener diode D1 and resistor R4 supply power to the comparator and the Silicon Labs Si8410 digital isolator. The Si8410 performs the necessary level shifting to interface to the shutdown circuitry. The circuit is set to trip at roughly a 20 A fault, usually caused by a short-circuit across the speaker terminals or a large overdrive signal at the audio inputs. Note the upper and lower overcurrent circuits are ORed together through a pair of diodes and sent to the reset control circuit. The normally low Si8410 A1 input is driven high upon detection of an overcurrent condition and asserts the SHUTDOWN signal, forcing the reset controller to assert a reset signal, momentarily halting amplifier operation. The reset control circuit attempts restart after one second, and, if the fault is still present, again cycles reset in "hiccup" mode with a frequency of one second. This process continues until the fault is removed. Overcurrent protection can be removed by uninstalling JP1 and JP2.



**Figure 6. Over Current Protection Circuit**

## 4.5. Undervoltage Protection

The undervoltage protection comparator monitors the positive bus voltage and releases the undervoltage lockout when the voltage is above 37 V. The amplifier starts up after a one-second delay. Note that the red LED remains lit when the amplifier is in shutdown mode and turns off when the amplifier is enabled.

## 4.6. Other Features

A protection circuit jumper (JP 3) option is included that allows the amplifier to be manually shut down. This jumper can be replaced with a switch or other control circuit, allowing the amplifier to be muted. The one-second undervoltage lockout delay allows the op-amps and comparator to settle before the shut-down circuit is released, thereby preventing speaker pops. To aid in system performance evaluation, there are individual jumper options (JP1 and JP2) on each channel that allow the user to enable or disable each channel independently of the other.

## 4.7. Performance

The Silicon Labs Class D reference design board was tested for THD + N, SNR, DFD, and IFD with an Audio Precision analyzer. During these tests, the main power (the  $\pm 50$  V supplies) used a TR180 from Hypex electronics (a low-noise supply) to maximize the amplifier's measured performance. Refer to "AN542: Performance Improvements in Class D Audio Amplifiers using Si824x Audio Drivers" for additional information concerning the amplifier's noise and efficiency performance and a more in-depth discussion concerning the amplifier's architectural design. Please visit [www.silabs.com/audio](http://www.silabs.com/audio).



# Si824xClassD-KIT

## 5. Si8241-Based Class D Amplifier Connection Description

The Si8241-based Class D Amplifier has two Si8241 ISOdrivers and two Si8410 digital isolators installed. Refer to Figure 7 for the locations of the various I/O connectors and major components. Relevant user connection points are detailed below.

- |        |          |  |
|--------|----------|--|
| ■ J1   | +50 V    | Positive Input Power: Input power connection +50 V, 3 A. |
| ■ J2   | PGND     | Power Ground Return, 0 V.                                |
| ■ J3   | -50 V    | Negative Input Power: Input power connection -50 V, 3 A. |
| ■ J4   | SPKA+    | Speaker A positive terminal                              |
| ■ J5   | SPKA-    | Speaker A negative terminal                              |
| ■ J6   | SPKB+    | Speaker B positive terminal                              |
| ■ J7   | SPKB-    | Speaker B negative terminal                              |
| ■ J8   | VBIAS    | ±12 V Bias supply connector (500 mA)                     |
| ■ J9   | AUDIO A  | RCA input female connector channel A                     |
| ■ J10  | AUDTIO B | RCA input female connector channel B                     |
| ■ JP1  | OCPDISA  | Over current protection disable channel A channel        |
| ■ JP2  | OCPDISB  | Over current protection disable channel B channel        |
| ■ JP3  | MUTE     | Amplifier Mute or manual shut down                       |
| ■ LED1 | FAULT    | Over current protection fault indicator LED              |

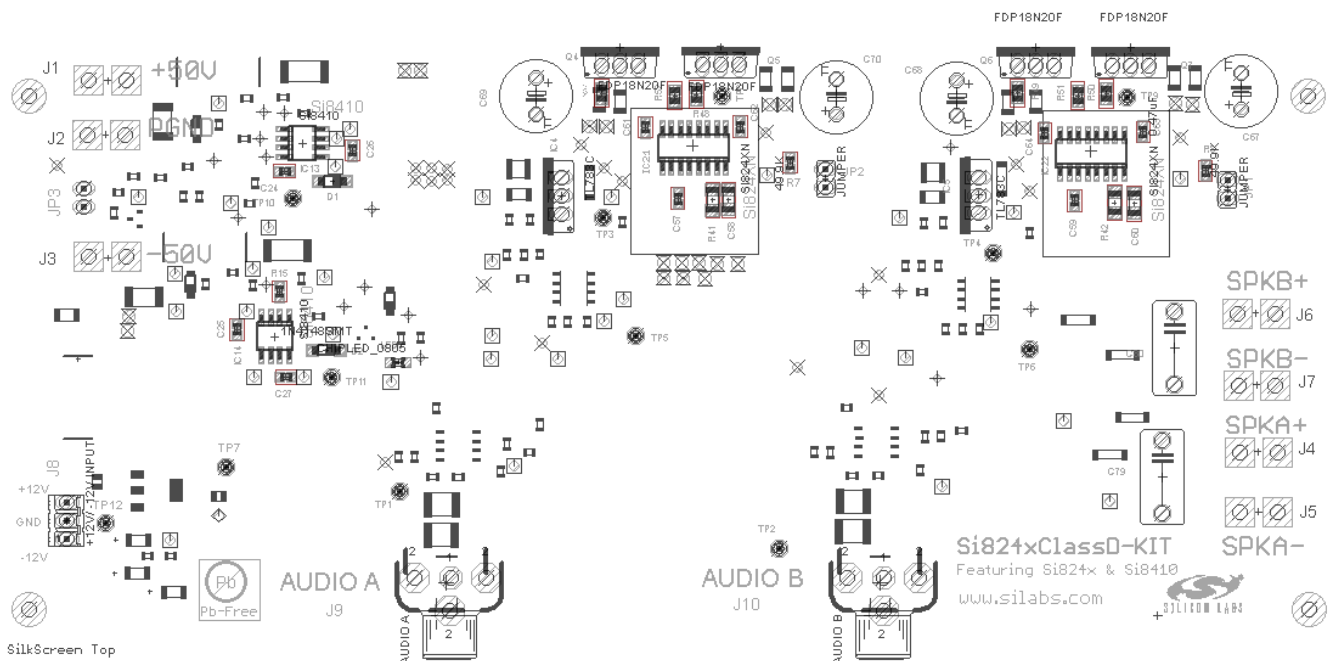


Figure 7. Si8241 Si8241-Based Class D Amplifier Silkscreen

### 5.1. Voltage and Current Sense Test Points

The Si824x Class D Audio Amplifier reference design has several test points. These test points correspond to the respective pins on the Si8241, Si8410 as well as other useful inspection points. See “6. Schematics” for more details.

## 6. Schematics

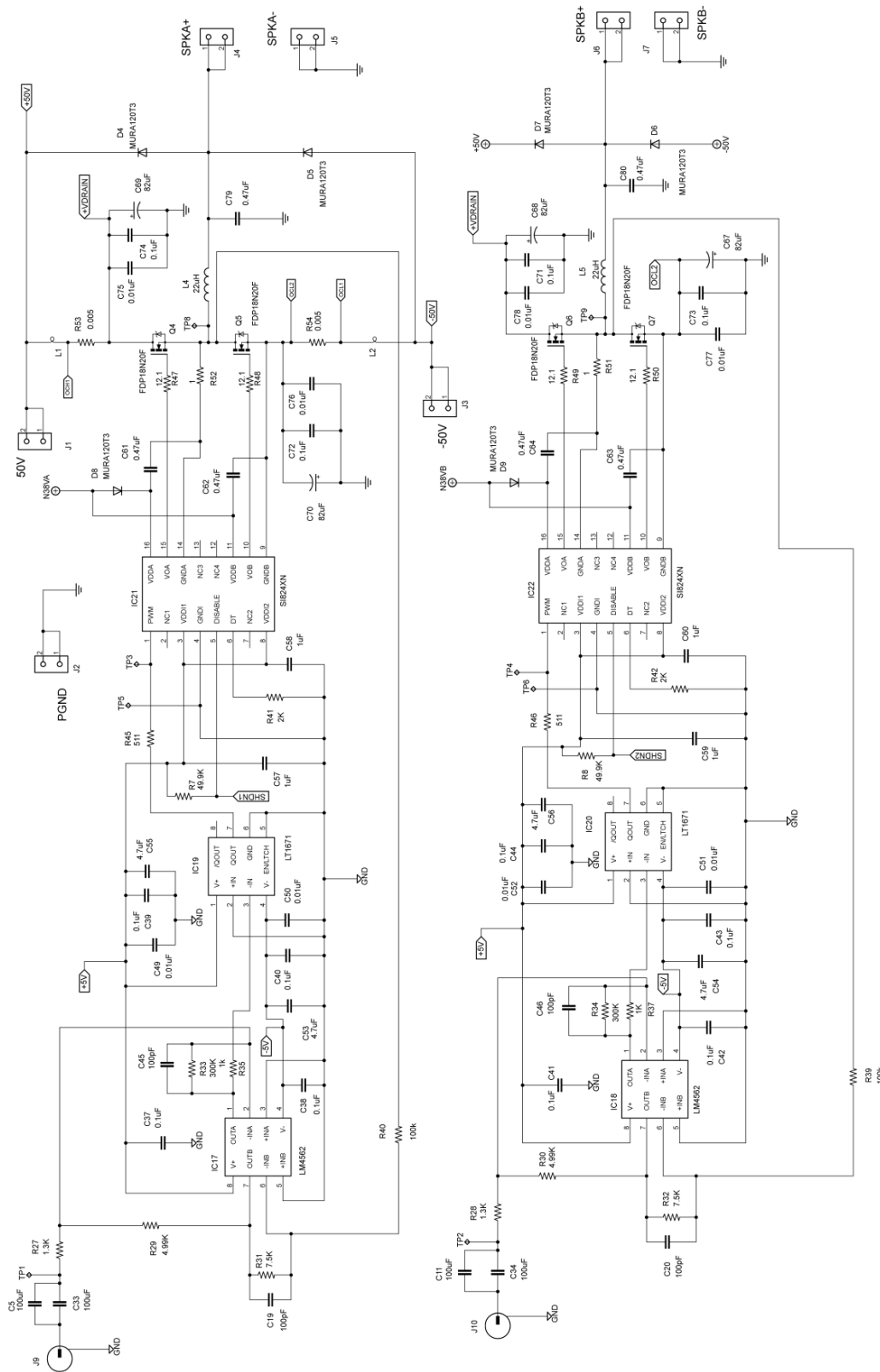


Figure 8. Si824x Class D Audio Amplifier Reference Design Schematic (1 of 2)

# Si824xClassD-KIT

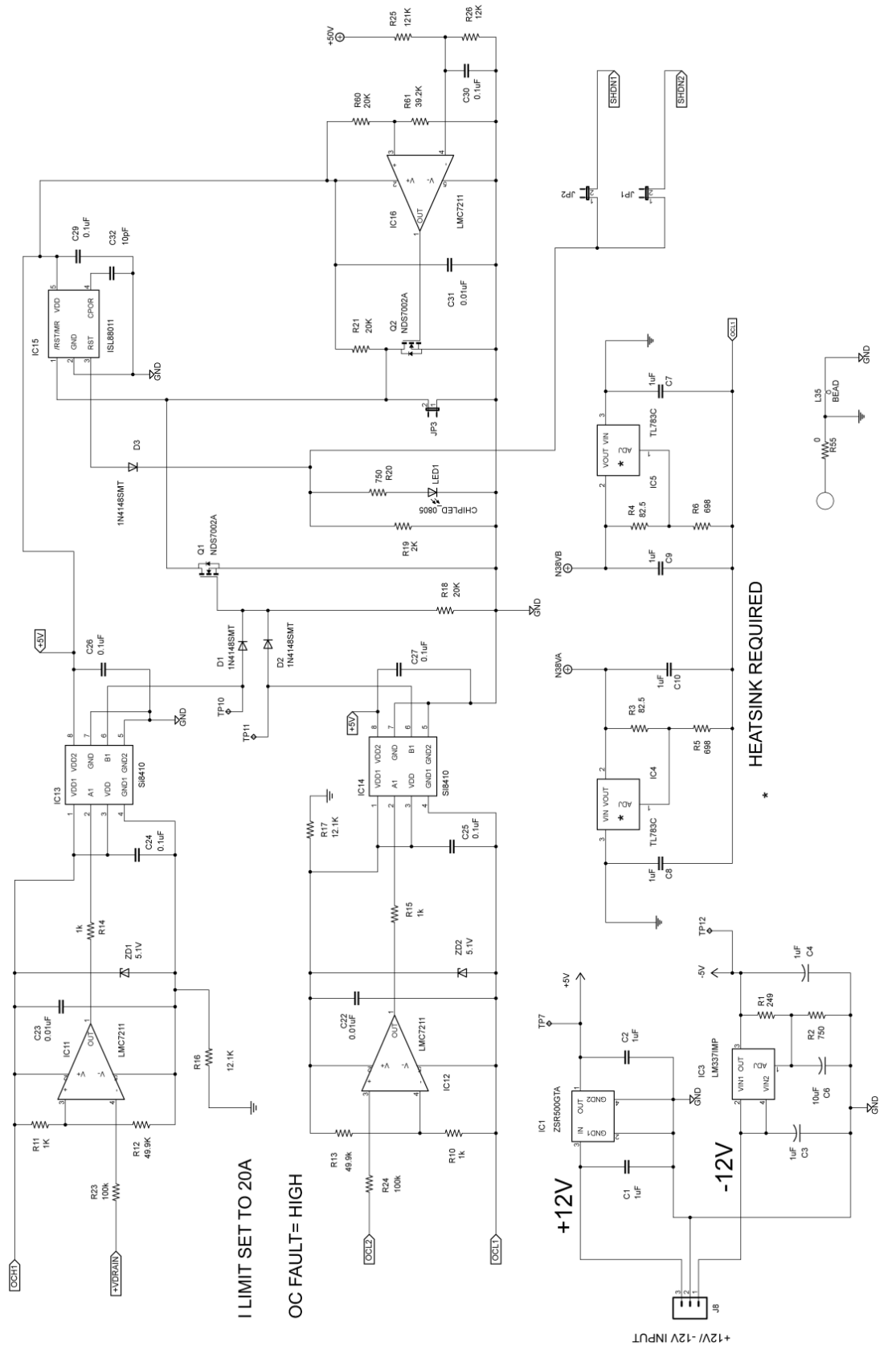


Figure 9. Si824x Class D Audio Amplifier Reference Design Schematic (2 of 2)



## 7. Bill of Materials

Table 1. Si824x Class D Audio Amplifier Reference Design Bill of Materials

| Qty | Ref                              | Description   | Mfr. Part Number       | Mfr    | Digikey Part Number |
|-----|----------------------------------|---|------------------------|--------|---------------------|
| 2   | C1, C2                           | 1 $\mu$ F, 25 V, X5R,<br>0805 Ceramic<br>Capacitor    | 08053D105KAT2A         | AVX    | 478-1409-6-ND       |
| 2   | C3, C4                           | 1 $\mu$ F, 16 V, 3216<br>Tantalum Capacitor           | T491A105M016AT         | Kemet  | 399-3681-6-ND       |
| 14  | C24–C27,<br>C29, C30,<br>C37–C44 | 0.1 $\mu$ F, 50 V, X7R,<br>0603 Ceramic<br>Capacitor  | GRM188R71H104<br>KA93D | Murata | 490-1519-6-ND       |
| 1   | C6                               | 10 $\mu$ F, 10 V, 3216<br>Tantalum Capacitor          | T491A106M010AT         | Kemet  | 399-3686-6-ND       |
| 2   | C7,C8                            | 1 $\mu$ F, 100 V, X7R,<br>1210 Ceramic<br>Capacitor   | GRM32ER72A105<br>KA01L | Murata | 490-1857-1-ND       |
| 4   | C9, C10,<br>C58, C60             | 1 $\mu$ F, 25 V, X5R,<br>1206 Ceramic<br>Capacitor    | GRM319R61E105K<br>C36D | Murata | 490-1807-6-ND       |
| 2   | C57, C59                         | 1 $\mu$ F, 10 V, X5R,<br>0603 Ceramic<br>Capacitor    | GRM188R61A105K<br>A61D | Murata | 490-1543-6-ND       |
| 7   | C22, C23,<br>C31,<br>C49–C52     | 0.01 $\mu$ F, 50 V, X7R,<br>0603 Ceramic<br>Capacitor | 06035C103KAT2A         | AVX    | 478-1227-6-ND       |
| 1   | C32                              | 10 pF, 50 V, COG,<br>0603 Ceramic<br>Capacitor        | 06035A100JAT2A         | AVX    | 478-1163-6-ND       |
| 4   | C5, C11,<br>C33, C34             | 100 $\mu$ F, 6.3 V, X5R,<br>1812 Ceramic<br>Capacitor | C4532X5R0J107M         | TDK    | 445-1413-2-ND       |
| 4   | C19, C20,<br>C45, C46            | 100 pF, 50 V, COG,<br>0603 Ceramic<br>Capacitor       | GRM1885C1H101J<br>A01D | Murata | 490-1427-6-ND       |
| 4   | C53–C56                          | 4.7 $\mu$ F, 6.3 V, X5R,<br>0603 Ceramic<br>Capacitor | 06036D475MAT2A         | AVX    | 478-2582-6-ND       |
| 4   | C61–C64                          | 0.47 $\mu$ F, 16 V, X5R,<br>0603 Ceramic<br>Capacitor | C0603X7R160-<br>474MNE | AVX    | 478-1248-6-ND       |

# Si824xClassD-KIT

**Table 1. Si824x Class D Audio Amplifier Reference Design Bill of Materials (Continued)**

| Qty | Ref              | Description   | Mfr. Part Number       | Mfr                  | Digikey Part Number     |
|-----|------------------|---|------------------------|----------------------|-------------------------|
| 4   | C67–C70          | 82 $\mu$ F, 63 V, KZE Series Electrolytic Cap             | EKZE630ESS820M<br>JC5S | Chemi-Con            | 565-1721-ND             |
| 4   | C71–C74          | 0.1 $\mu$ F, 100 V, X7R, 1206 Ceramic Capacitor           | 12061C104MAT2A         | AVX                  | 478-3786-6-ND           |
| 4   | C75–C78          | 0.01 $\mu$ F, 100 V, COG, 1206 Ceramic Capacitor          | 12061C103JAT2A         | AVX                  | 478-3783-6-ND           |
| 2   | C79, C80         | 0.47 $\mu$ F, 250 V Film Capacitor                        | ECQ-E2474KB            | Panasonic ECG        | P10975-ND               |
| 3   | D1–D3            | 100 V 150 mA SOD123 Diode                                 | 1N4148W-13-F           | Diodes Inc.          | 1N4148W-13-FDIDKR-ND    |
| 6   | D4–D9            | Fast Recovery 200 V 2 A Diode SMA                         | MURA120T3G             | On Semi              | MURA120T3GOSCT-ND       |
| 2   | ZD1, ZD2         | Diode Zener 500 mW 5.1 V SOD-123                          | MMSZ4689-TP            | Micro Commercial Co. | MMSZ4689-TPMSCT-ND      |
| 1   | IC1              | IC Voltage Reg 5.0 V 200 mA SOT223                        | ZSR500GTA              | ZETEX                | ZSR500GCT-ND            |
| 1   | IC3              | Adjustable Negative Regulators SOT-223                    | LM337IMP               | National Semi        | LM337IMPDKR-ND          |
| 2   | IC4, IC5         | High-Voltage Adjustable Regulator TO220                   | TL783CKCSE3            | TI                   | 296-20687-5-ND          |
| 3   | IC11, IC12, IC16 | CMOS Comparator SOT23-5                                   | LMC7211BIM5/<br>NOPB   | National Semi        | LMC7211BIM5CT-ND        |
| 2   | IC13, IC14       | Single Channel Digital Isolator SOIC8                     | Si8410BB-D-IS          | Silabs               |                         |
| 1   | IC15             | Voltage Supervisor with Adjustable Power-on Reset SOT23-5 | ISL88011IH531Z-<br>TK  | Intersil             | ISL88011IH531Z-TKDKR-ND |
| 2   | IC17, IC18       | IC Opamp Audio Ster AB 8SOIC                              | LM4562MA/NOPB          | National Semi        | LM4562MA-ND             |

**Table 1. Si824x Class D Audio Amplifier Reference Design Bill of Materials (Continued)**

| Qty | Ref                          | Description                              | Mfr. Part Number      | Mfr              | Digikey Part Number |
|-----|------------------------------|--|-----------------------|------------------|---------------------|
| 2   | IC19, IC20                   | IC Comp Grnd-sensing LowPwr 8SOIC        | LT1671CS8#PBF         | Linear Tech      | LT1671CS8#PBF-ND    |
| 2   | IC21, IC22                   | Isodriver Narrow Body                    | Si8241BB-B-IS1        | Silabs           |                     |
| 7   | J1–J7                        | 1/4 inch-Faston                          | 62409-1               | Tyco Electronics | A24742-ND           |
| 1   | J8                           | 3 Pin Conn Header                        | 22-23-2031            | Molex Inc.       | WM4201-ND           |
| 2   | J9, J10                      | Conn RCA Jack Metal R/A YEL PCB          | RCJ-014               | CUI Inc.         | CP-1403-ND          |
| 3   | JP1–JP3                      | Jumper                                   | TSW-102-07-T-S        | Samtec           | SAM1035-02-ND       |
| 3   | L1, L2, L35                  | Ferrite Bead                             | 2773021447            | Fair-Rite        |                     |
| 2   | L4, L5                       | 22 $\mu$ H, 7 A, 8.3 m $\Omega$ Inductor | 7G14A-220M-R          | Sagami           |                     |
| 1   | LED1                         | LED Chip LED 645NM Red Diff 0805         | LH R974-LP-1-0-20-R18 | Osram            | 475-1415-6-ND       |
| 2   | Q1, Q2                       | MOSFET N-CH 60 V 280 mA SOT-23           | NDS7002A              | Fairchild Semi   | NDS7002ACT-ND       |
| 4   | Q4–Q7                        | 200V, 18A N-Channel MOSFET               | FDP18N20F             | Fairchild Semi   | FDP18N20F-ND        |
| 1   | R1                           | 249 $\Omega$ , 0603 1% SMT Resistor      | ERJ-3EKF2490V         | Panasonic ECG    | P249HDKR-ND         |
| 2   | R2, R20                      | 750 $\Omega$ , 0603 1% SMT Resistor      | ERJ-3EKF7500V         | Panasonic ECG    | P750HCT-ND          |
| 2   | R3, R4                       | 82.5 $\Omega$ , 0603 1% SMT Resistor     | ERJ-3EKF82R5V         | Panasonic ECG    | P82.5HDKR-ND        |
| 2   | R5, R6                       | 698 $\Omega$ , 0603 1% SMT Resistor      | ERJ-3EKF6980V         | Panasonic ECG    | P698HDKR-ND         |
| 4   | R7, R8, R12, R13             | 49.9 k $\Omega$ , 0603 1% SMT Resistor   | ERJ-3EKF4992V         | Panasonic ECG    | P49.9KHCT-ND        |
| 1   | R26                          | 12 k $\Omega$ , 0603 1% SMT Resistor     | ERJ-3EKF1202V         | Panasonic ECG    | P12.0KHCT-ND        |
| 6   | R10, R11, R14, R15, R35, R37 | 1 k $\Omega$ , 0603 1% SMT Resistor      | ERJ-3EKF1001V         | Panasonic ECG    | P1.00KHCT-ND        |

# Si824xClassD-KIT

**Table 1. Si824x Class D Audio Amplifier Reference Design Bill of Materials (Continued)**

| Qty | Ref                | Description                            | Mfr. Part Number        | Mfr              | Digikey Part Number |
|-----|--------------------|--|-------------------------|------------------|---------------------|
| 2   | R16, R17           | 12.1 k $\Omega$ , 2010 1% SMT Resistor | ERJ-12SF1212U           | Panasonic ECG    | P12.1KACCT-ND       |
| 3   | R18, R21, R60      | 20 k $\Omega$ , 0603 1% SMT Resistor   | ERJ-3EKF2002V           | Panasonic ECG    | P20.0KHCT-ND        |
| 2   | R29, R30           | 4.99 k $\Omega$ , 0603 1% SMT Resistor | ERJ-3EKF4991V           | Panasonic ECG    | P4.99KHCT-ND        |
| 4   | R23, R24, R39, R40 | 100 k $\Omega$ , 0603 1% SMT Resistor  | ERJ-3EKF1003V           | Panasonic ECG    | P100KHCT-ND         |
| 1   | R25                | 121 k $\Omega$ , 0603 1% SMT Resistor  | ERJ-3EKF1213V           | Panasonic ECG    | P121KHCT-ND         |
| 2   | R27, R28           | 1.3 k $\Omega$ , 0603 1% SMT Resistor  | ERJ-3EKF1301V           | Panasonic ECG    | P1.30KHCT-ND        |
| 2   | R31, R32           | 7.5 k $\Omega$ , 0603 1% SMT Resistor  | ERJ-3EKF7501V           | Panasonic ECG    | P7.50KHCT-ND        |
| 2   | R33, R34           | 300 k $\Omega$ , 0603 1% SMT Resistor  | ERJ-3EKF3003V           | Panasonic ECG    | P300KHCT-ND         |
| 3   | R19, R41, R42      | 2 k $\Omega$ , 0603 1% SMT Resistor    | ERJ-3EKF2001V           | Panasonic ECG    | P2.00KHCT-ND        |
| 2   | R45, R46           | 511 $\Omega$ , 0603 1% SMT Resistor    | ERJ-3EKF5110V           | Panasonic ECG    | P511HCT-ND          |
| 4   | R47-R50            | 12.1 $\Omega$ , 0805 1% SMT Resistor   | ERJ-6ENF12R1V           | Panasonic ECG    | P12.1CCT-ND         |
| 2   | R51, R52           | 1 $\Omega$ , 0805 1% SMT Resistor      | RC0805FR-071RL          | Yageo            | 311-1.00CRCT-ND     |
| 2   | R53, R54           | 0.005 $\Omega$ , 3264 1% SMT Resistor  | MCS3264R005FE           | Panasonic ECG    | MCS3264R005FERCT-ND |
| 1   | R55                | 0 $\Omega$ , 1206 1% SMT Resistor      | ERJ-8GEY0R00V           | Panasonic ECG    | P0.0ECT-ND          |
| 1   | R61                | 39.2 k $\Omega$ 0603 1% SMT Resistor   | ERJ-3EKF3922V           | Panasonic ECG    | P39.2KHCT-ND        |
| 2   | HS1                | Heatsink TO-220 5W BLK                 | 576802B00000G           | AAVID Thermalloy | HS121-ND            |
| 12  | TP1-TP12           | Test Pad                               | 3103-2-00-21-00-00-08-0 | MILL-MAX MAN.    | ED5052-ND           |
| 4   | Shoulder Washer    | Washer/bushing #4 X .031"L NYLON       | 3049                    | Keystone         | 3049-ND             |

**Table 1. Si824x Class D Audio Amplifier Reference Design Bill of Materials (Continued)**

| Qty | Ref                              | Description  | Mfr. Part Number | Mfr                               | Digikey Part Number |
|-----|----------------------------------|--|------------------|-----------------------------------|---------------------|
| 4   | Insulator                        | Insulator Mica<br>.860X.520" .141"<br>TO-220           | 4672             | Keystone                          | 4672K-ND            |
| 4   | Screw                            | Hdwr Mtg Screw TO-<br>220CASE 4/40 THR<br>1PC          | 4690             | Keystone                          | 4690K-ND            |
| 4   | Screw                            | Hdwr Mtg Screw 1/<br>4" 4/40 , PCB L-<br>Bracket Mount | 9900             | Keystone                          | 9900K-ND            |
| 4   | Lock Washer                      | Hdwr Mtg Lock-<br>washer Plastic 2PC                   | 4693             | Keystone                          | 4693K-ND            |
| 4   | Nut                              | Hdwr Mtg Nut 4/40<br>Thread 2PC                        | 4694             | Keystone                          | 4694K-ND            |
|     | Heat Compound                    | Heat Trans<br>Compound Silicone                        | 860-150G         | MG Chemicals                      | 473-1097-ND         |
| 4   | Standoff                         | Stdoff Hex M/F 4-40<br>.375"L Alum                     | 8400             | Keystone                          | 8400K-ND            |
| 1   | HTSNK                            | L Bracket Heat Sink                                    | SIHS-1           | Red River PRC<br>MFG              |                     |
| 4   | Bumpons,<br>Feet, Pads,<br>Grips | Bumpon Cylindrical<br>.312X.215 BLK                    | SJ61A6           | 3M                                | SJ5744-0-ND         |
| 7   | J1-J7                            | Conn Fast Recept<br>18-22 AWG .250                     | 2-520264-2       | Tyco<br>Electronics               | A27821-ND           |
| 2   | JP1, JP2<br>Shorting<br>Jumper   | Conn Jumper<br>Shorting Gold Flash                     | SPC02SYAN        | Sullins<br>Connector<br>Solutions | S9001-ND            |

# Si824xClassD-KIT

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## 8. Ordering Guide

| Ordering Part Number | Type   |
|----------------------|--|
| Si824xClassD-KIT     | Audio Class D Amplifier reference design kit using Si8241BB-B-IS1. |



## DOCUMENT CHANGE LIST

### Revision 0.1 to Revision 0.2

- Updated Table 1, “Si824x Class D Audio Amplifier Reference Design Bill of Materials,” on page 9.

# Si824xClassD-KIT

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## CONTACT INFORMATION

### Silicon Laboratories Inc.

400 West Cesar Chavez  
Austin, TX 78701  
Tel: 1+(512) 416-8500  
Fax: 1+(512) 416-9669  
Toll Free: 1+(877) 444-3032

Please visit the Silicon Labs Technical Support web page:  
<https://www.silabs.com/support/pages/contacttechnicalsupport.aspx>  
and register to submit a technical support request.

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- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
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- Поставка сложных, дефицитных, либо снятых с производства позиций;
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- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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## JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

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«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: [ocean@oceanchips.ru](mailto:ocean@oceanchips.ru)

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А