BUF634AD Evaluation module

The BUF634ADEVM is an evaluation module (EVM) for the BUF634A high-speed buffer in the D (8-pin SOIC) package. The BUF634ADEVM features two BUF634A devices and is designed to quickly demonstrate the functionality and versatility of the buffer. Optionally, the buffers can be configured as outputs for a dual SOIC amplifier in a composite loop. The EVM is ready to connect to power, signal sources, and test instruments by using onboard connectors. The default configuration uses split supplies and subminiature version A (SMA) input and output connecters with a 50-Ω output impedance for standard test equipment. The EVM can be easily configured for other connections and single-supply operation. Dual-channel path configuration is also available for the RCA™ audio input jacks and a 3.5-mm output jack.

Throughout this document, the terms *EVM* and *evaluation module* are synonymous with the BUF634ADEVM.

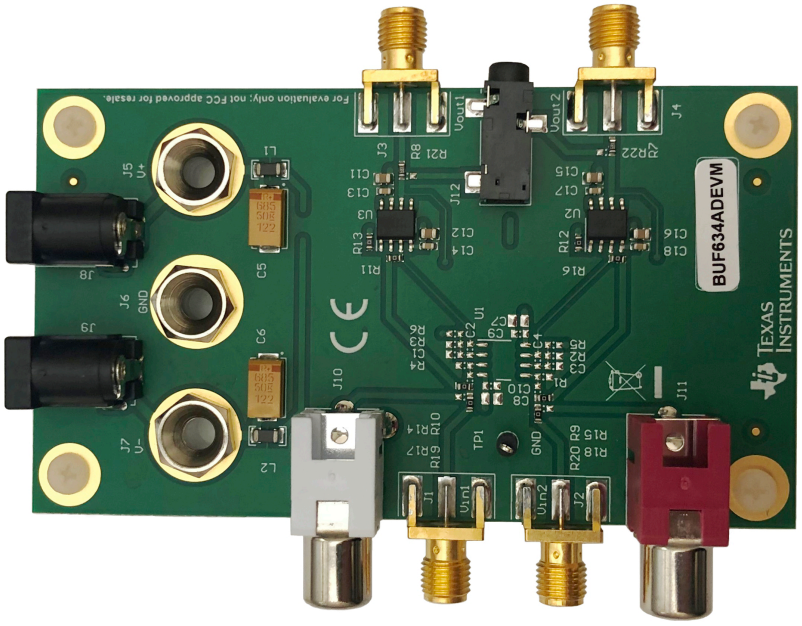

Table 1 lists the related documentation available through the Texas Instruments web site at www.ti.com.

Table 1. Related Documentation

Device	Literature Number
BUF634A	SBOS948
BUF634	SBOS030
OPA2810	SBOS789

Trademarks

RCA is a trademark of Technicolor SA.
All other trademarks are the property of their respective owners.

1 Overview

This section provides a general description of the BUF634ADEVM. Table 2 lists the input and output limits for the BUF634ADEVM.

Table 2. EVM Input and Output Limits

PARAMETERS	MIN	TYP	MAX	UNIT
Split-supply voltage range (VS+ – VS–)	±2.4	±12	±13.5	V
Single-supply voltage range (VS– = ground)	4.75	24	27	V
Supply current, I_S	3	3.7	4.5	mA
Input voltage, V_I		(VS+) + 0.3 to (VS–) –0.3		V
Output drive, I_O with ±12-V or 24-V supply	48	64		mA

1.1 Power Connections

The BUF634ADEVM is equipped with banana jacks for easy connection of power. The positive supply input is labeled V+, the negative supply input is labeled V–, and ground is labeled GND.

1.1.1 Split-Supply Operation

To operate in split supply, apply the positive supply voltage to V+, the negative supply voltage to V–, and the ground reference from supply to GND.

1.1.2 Single-Supply Operation

To operate in single supply, apply jumper V– to GND and apply the positive supply voltage to V+. Inputs and outputs must be biased per data sheet specifications for proper operation.

1.2 Input and Output Connections

The BUF634ADEVM is equipped with SMA connectors for easy connection to benchtop signal generators and analysis equipment. Additionally, the EVM also includes RCA input jacks and a 3.5-mm output jack that can be used with the two BUF634A devices in a differential audio buffer configuration. The connections to the SMA outputs include 50–Ω termination resistors for easy connection to 50–Ω impedance test equipment. The inputs are high impedance but can be easily terminated to 50 Ω as well by populating resistors R1 and R4. For best results in the default configuration, route the outputs to test equipment using cables with a 50–Ω characteristic impedance and the connect the inputs to the signal source with as short of cables as possible.

1.2.1 Use With a Dual SOIC Amplifier in a Composite Loop

The BUF634ADEVM features the option to configure the devices in two composite amplifier loops using a dual SOIC package amplifier, such as the OPA2810. In the composite loop, the BUF634A forms an output driving stage for the chosen input amplifier and, with the dual paths on the EVM, forms a differential composite amplifier useful for applications such as audio amplification. When configuring the EVM to use the composite loop, populate device U1, resistors R2, R3, R4, and R5, and capacitors C2, and C4, and remove resistors R11 and R16.

2 Schematic, Layout, and Bill of Materials

This section provides a complete schematic diagram, board layouts, and bill of materials for the BUF634AEVM.

2.1 Schematic

Figure 1 shows a schematic for the BUF634ADEVM.

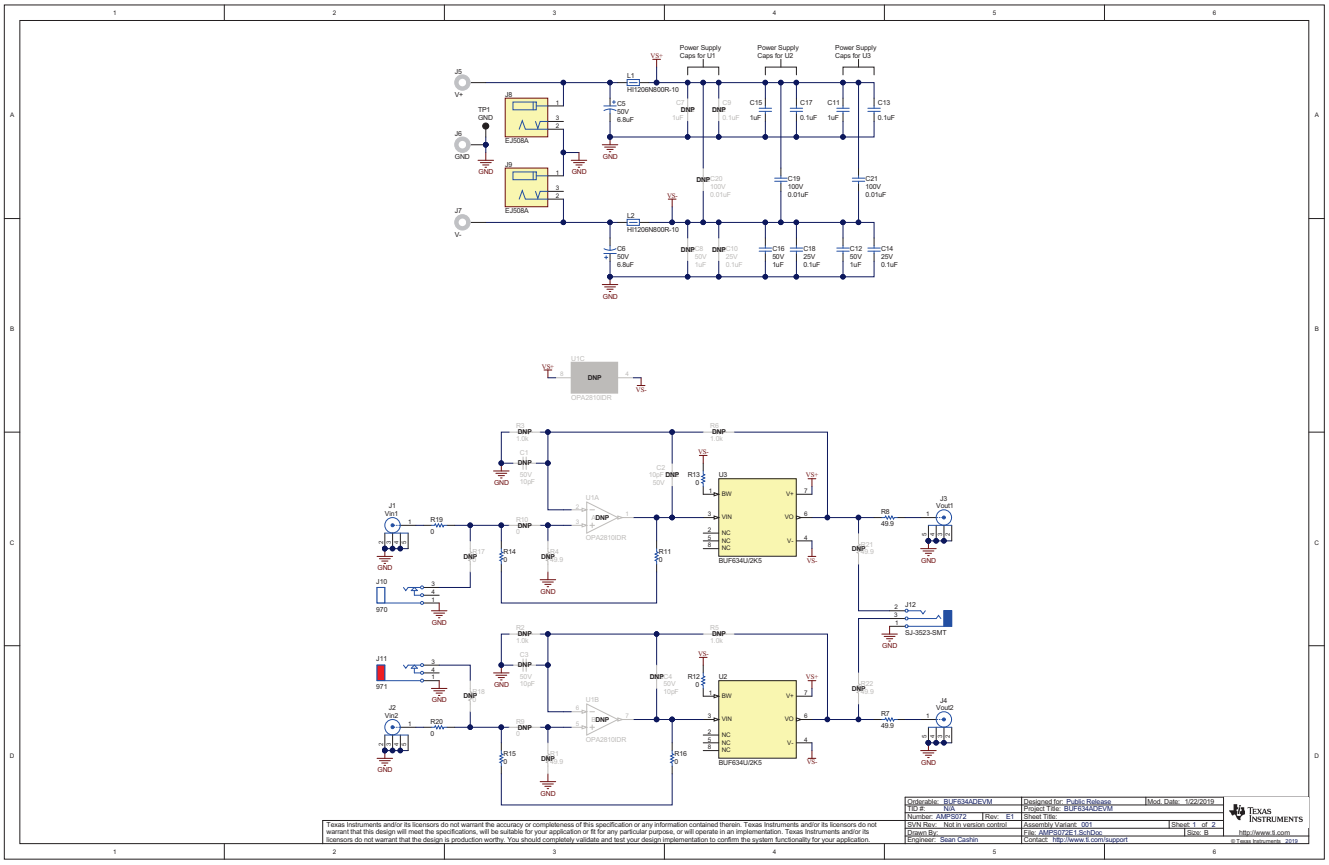

Figure 1. BUF634ADEVM Schematic

2.2 Layout

Figure 2 through Figure 7 illustrate the various layout silk screens for the BUF634ADEVM.

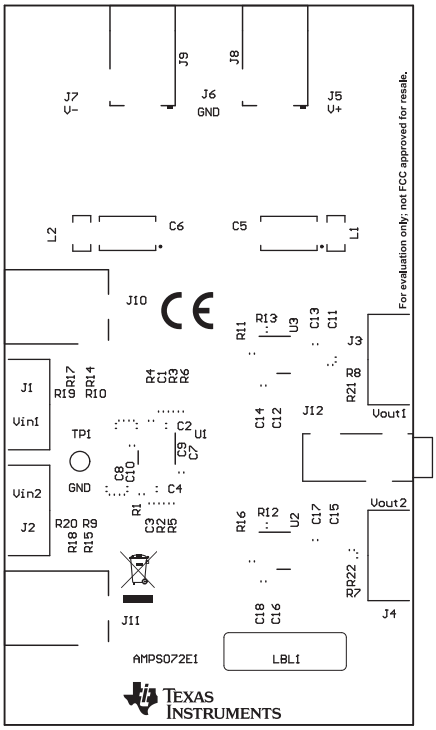

Figure 2. BUF634ADEVM Top Overlay

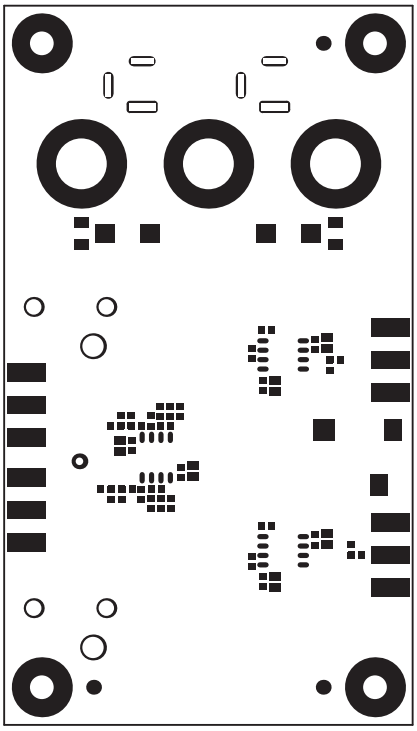

Figure 3. BUF634ADEVM Top Solder

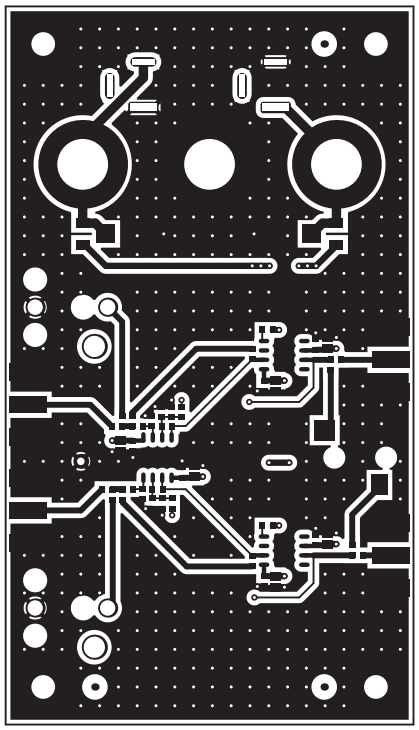

Figure 4. BUF634ADEVM Top Layer

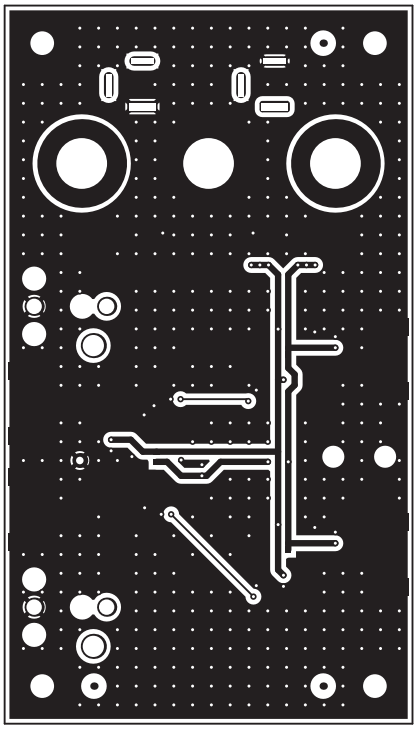

Figure 5. BUF634ADEVM Bottom Layer

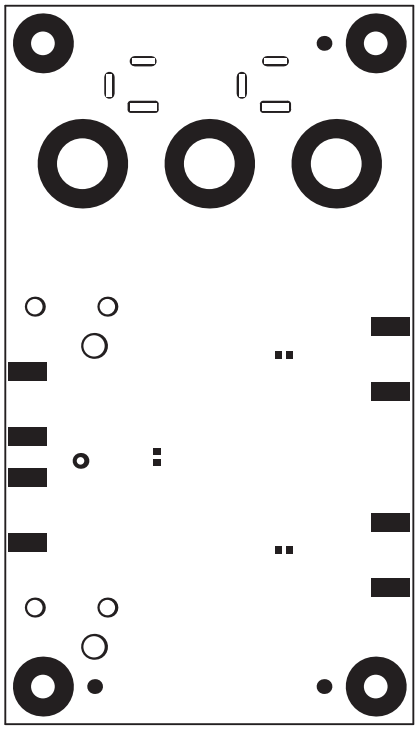

Figure 6. BUF634ADEVM Bottom Solder

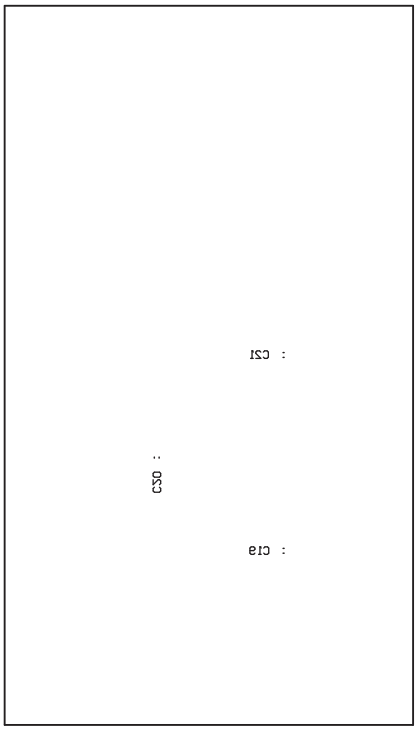

Figure 7. BUF634ADEVM Bottom Overlay

2.3 Bill of Materials

Table 3 lists the bill of materials for the BUF634ADEVM.

Table 3. Bill of Materials

Designator	Qty	Value	Description	Package Reference	Part Number	Manufacturer
C5, C6	2	6.8µF	CAP, TA, 6.8 uF, 50 V, +/- 10%, 0.3 ohm, SMD	7343-31	T495D685K050ATE300	Kemet
C11, C12, C15, C16	4	1µF	CAP, CERM, 1 uF, 50 V, +/- 10%, X5R, 0805	0805	C2012X5R1H105K125AB	TDK
C13, C14, C17, C18	4	0.1µF	CAP, CERM, 0.1 uF, 25 V, +80/-20%, Y5V, 0603	0603	C0603C104Z3VACTU	Kemet
C19, C21	2	0.01µF	CAP, CERM, 0.01 uF, 100 V, +/- 10%, X7R, 0603	0603	06031C103KAT2A	AVX
H1, H2, H3, H4	4		Machine Screw, Round, #4-40 x 1/4, Nylon, Philips panhead	Screw	NY PMS 440 0025 PH	B&F Fastener Supply
H5, H6, H7, H8	4		Standoff, Hex, 0.5"L #4-40 Nylon	Standoff	1902C	Keystone
J1, J2, J3, J4	4		Connector, End launch SMA, 50 ohm, SMT	End Launch SMA	142-0701-801	Cinch Connectivity
J5, J6, J7	3		Standard Banana Jack, Uninsulated	Keystone_6095	6095	Keystone
J8, J9	2		Power Jack, 2.1x5.5mm, R/A, TH	Power Jack, 2.1x5.5mm, R/A, TH	EJ508A	Memory Protection Devices
J10	1		RCA Jack, White, R/A, TH	PC Mount Phono Jack-White, TH	970	Keystone
J11	1		RCA Jack, Red, R/A, TH	PC Mount Phono Jack-Red, TH	971	Keystone
J12	1		Audio Jack, 3.5mm, Stereo, R/A, SMT	Audio Jack SMD	SJ-3523-SMT	CUI Inc.
L1, L2	2	80Ω	Ferrite Bead, 80 ohm @ 100 MHz, 3 A, 1206	1206	HI1206N800R-10	Laird-Signal Integrity Products
LBL1	1		Thermal Transfer Printable Labels, 0.650" W x 0.200" H - 10,000 per roll	PCB Label 0.650 x 0.200 inch	THT-14-423-10	Brady
R7, R8	2	49.9Ω	RES, 49.9, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW060349R9FKEA	Vishay-Dale
R11, R12, R13, R14, R15, R16, R19, R20	8	0Ω	RES, 0, 5%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW06030000Z0EA	Vishay-Dale
TP1	1		Test Point, Miniature, Black, TH	Black Miniature Testpoint	5001	Keystone
U2, U3	2		High-Speed Buffer, D0008A (SOIC-8)	D0008A	BUF634AID	Texas Instruments
C1, C2, C3, C4	0	10pF	CAP, CERM, 10 pF, 50 V, +/- 1%, C0G/NP0, 0603	0603	C0603C100F5GAC7867	Kemet
C7, C8	0	1µF	CAP, CERM, 1 uF, 50 V, +/- 10%, X5R, 0805	0805	C2012X5R1H105K125AB	TDK
C9, C10	0	0.1µF	CAP, CERM, 0.1 uF, 25 V, +80/-20%, Y5V, 0603	0603	C0603C104Z3VACTU	Kemet
C20	0	0.01µF	CAP, CERM, 0.01 uF, 100 V, +/- 10%, X7R, 0603	0603	06031C103KAT2A	AVX
R1, R4, R21, R22	0	49.9Ω	RES, 49.9, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW060349R9FKEA	Vishay-Dale
R2, R3, R5, R6	0	1.0kΩ	RES, 1.0 k, 5%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW06031K00JNEA	Vishay-Dale
R9, R10, R17, R18	0	0Ω	RES, 0, 5%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW06030000Z0EA	Vishay-Dale
U1	0		High Performance Low Cost Rail-to-Rail Input/Output HV FET Op Amps, D0008A (SOIC-8)	D0008A	OPA2810IDR	Texas Instruments

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Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265