SD034EVK

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1. Introduction

The Texas Instruments SD034EVK evaluation kit (EVK) helps designers evaluate the operation and performance of the LMH0034 HD/SD SDI Adaptive Cable Equalizer.

2. Setup

This section describes the connectors and jumpers on the board as well as how to properly connect, set up, and use the SD034EVK.

2.1. Connector Description

Conn1, Conn2 – VCC, GND are the DC power connectors. Conn1 and Conn2 should be powered with a DC voltage of 3.3V ± 5%.

Conn3, Conn6 – SDI, $\overline{\text{SDI}}$ are the 75Ω BNC input connectors for the LMH0034 data input. This input is intended to receive a single-ended input signal via a 75Ω coaxial cable. The unused input should be terminated with a 75Ω BNC termination.

Conn4, Conn5 – SDO, $\overline{\text{SDO}}$ are the 50Ω SMA output connectors for the LMH0034 data outputs. These outputs have onboard 4.7 μF AC-coupling capacitors (C7 and C8). The LMH0034 has a differential 50Ω CML output driver, and when using only one output (one half of the differential pair), the unused output should be terminated with a 50Ω SMA termination.

J1 – CLI is the jumper for monitoring the CLI (Cable Length Indicator). CLI provides a voltage proportional to the cable length attached to the input.

J2 – MUTE_{REF} is the jumper for controlling the MUTE_{REF} function. MUTE_{REF} is an input voltage used to set the threshold for $\overline{\text{CD}}$ /MUTE. This DC input voltage should be between 0V and 3.3V. Leave J2 unconnected for normal operation.

J3 – BYPASS is the jumper for controlling the equalization bypass function. To put the device into bypass mode, set the jumper to tie BYPASS to V_{CC}. To turn off bypass (for normal operation) set the jumper to tie BYPASS to GND.

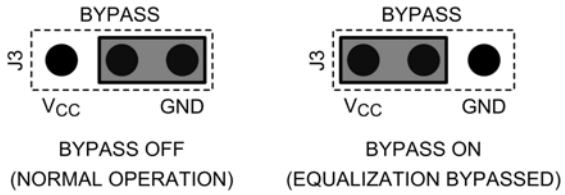

Figure 1: BYPASS Settings (J3)

J4 – $\overline{\text{CD}}$ /MUTE is the jumper for monitoring $\overline{\text{CD}}$ and controlling MUTE. $\overline{\text{CD}}$ /MUTE is asserted high when no signal is present at the LMH0034 input. $\overline{\text{CD}}$ /MUTE may be used to force the LMH0034 outputs on or off, or left open to allow automatic mute operation. To force the outputs off, set the jumper to tie $\overline{\text{CD}}$ /MUTE to V_{CC}. To force the outputs to be always on, set the jumper to tie $\overline{\text{CD}}$ /MUTE to GND.

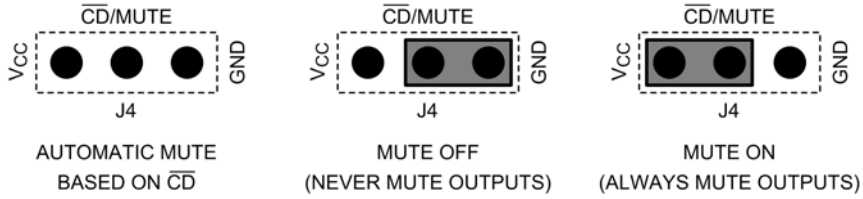

Figure 2: $\overline{\text{CD}}$ /MUTE Settings (J4)

2.2. Operation

Begin by applying 3.3V DC power to the Conn1 and Conn2 connectors on the board.

Set the J3 jumper to configure the BYPASS function as desired, and set the J4 jumper to configure the $\overline{\text{CD}}$ /MUTE function as desired (or leave J4 open).

Apply a test signal via 75Ω coaxial cable to the Conn3 or Conn6 75Ω BNC input connector. Terminate the unused input with a 75Ω BNC termination. The signal characteristics should be within the LMH0034 input specifications (typically the signal going into the cable will be a SMPTE 292M or 259M compliant serial SDI signal). The LMH0034 will automatically adjust its gain to reverse the effects of the cable loss and restore the original signal.

The equalized output may be observed via the Conn4 or Conn5 50Ω SMA output connector. Connect a matched pair of 50Ω SMA cables to Conn4 and Conn5 to observe the differential output, or connect the cable to either Conn4 or Conn5 to view the single-ended output. If only one output is used, the other output should be terminated with a 50Ω SMA termination.

3. Board Layout

The SD034EVK is a 4-layer board (TOP / GND / VCC / BOTTOM). Figure 3, Figure 4, Figure 5, and Figure 6 show the board layout for the SD034EVK.

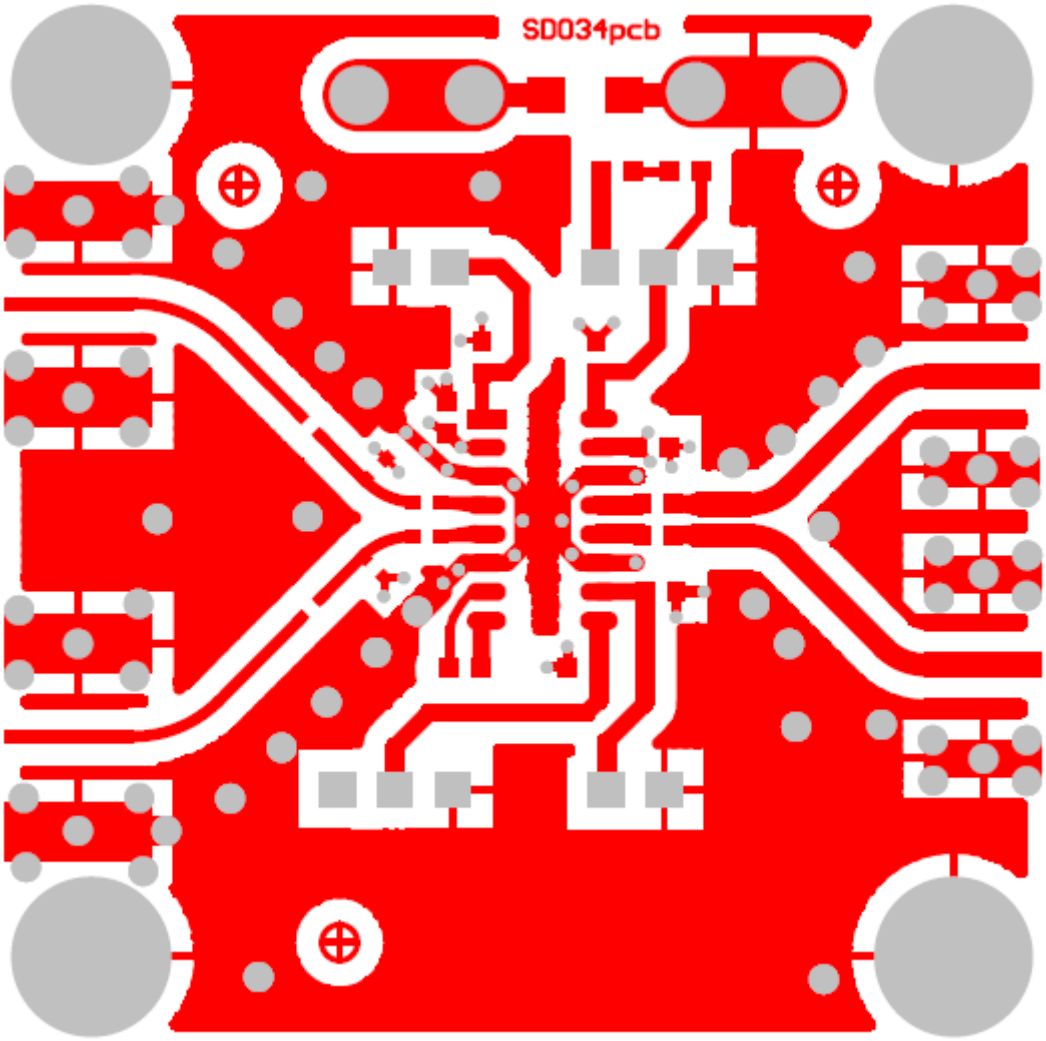

Figure 3: TOP Layer

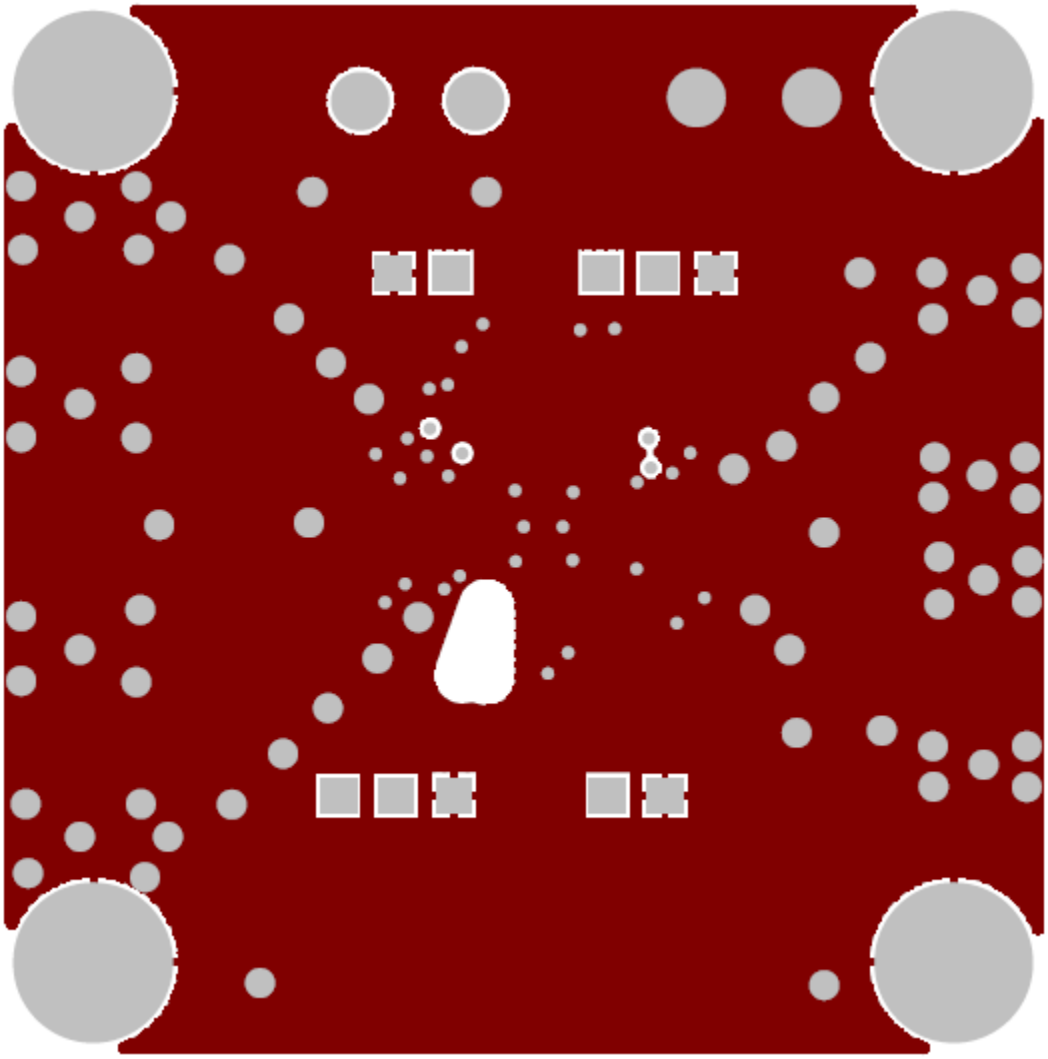

Figure 4: GND Layer

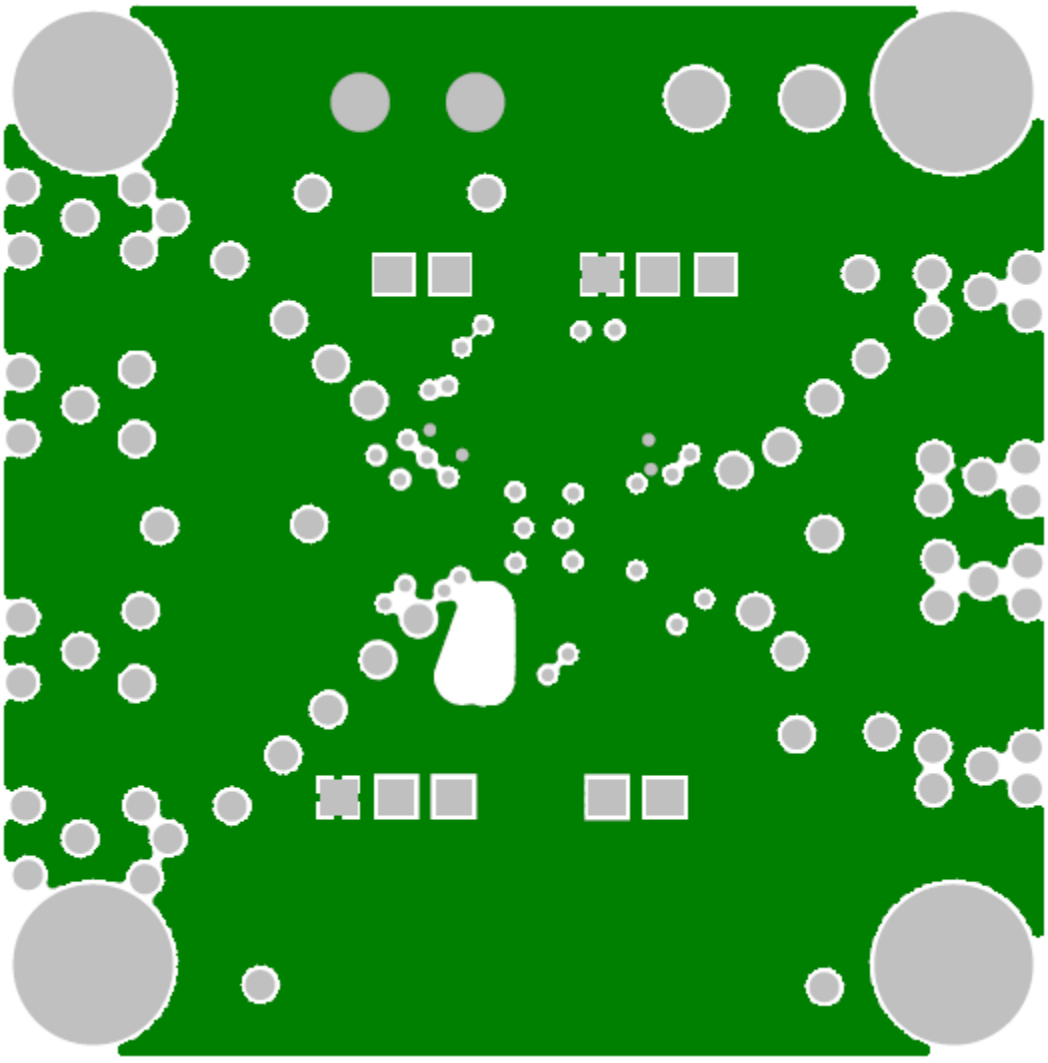

Figure 5: VCC Layer

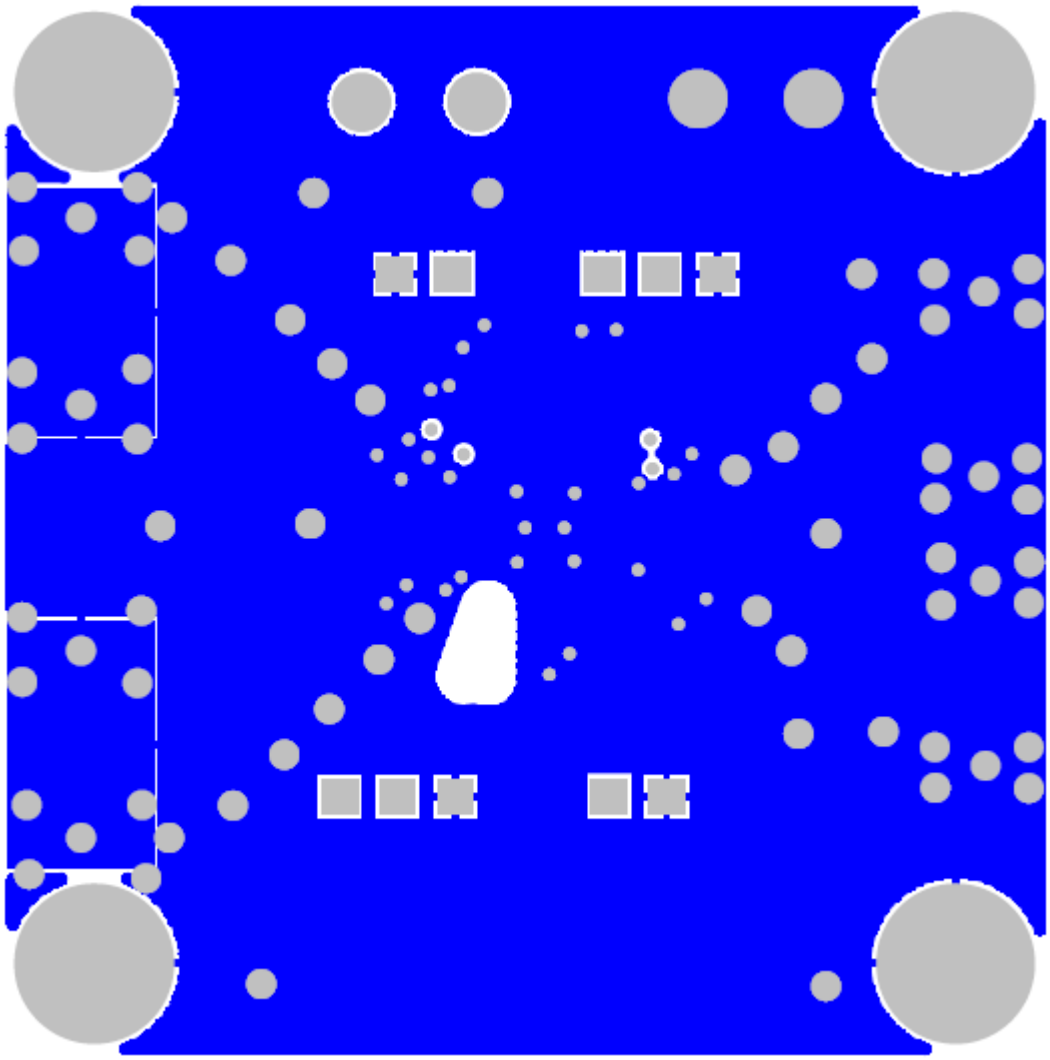

Figure 6: BOTTOM Layer

4. Schematic

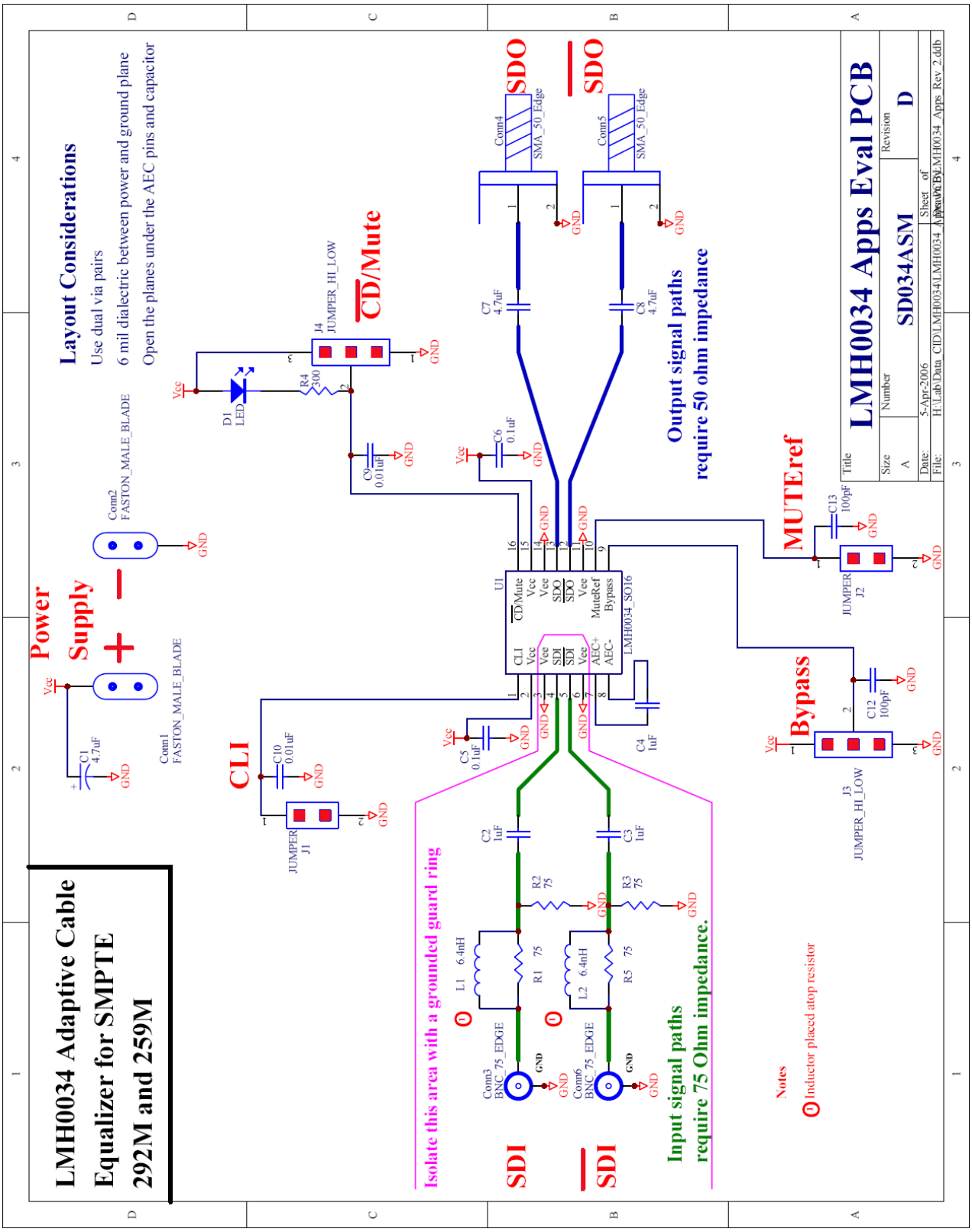

Figure 7: Schematic

5. Bill of Materials

Table 1: Bill of Materials

REF DES	QTY	DESCRIPTION	MFR	PART NUMBER
C1	1	Capacitor, 4.7uF, 1206	TDK	C3216X7R1C475K
C2 C3	2	Capacitor,1uF, 0402	Panasonic - ECG	ECJ-0EB0J105M
C4	1	Capacitor,1uF, 0603	Panasonic - ECG	ECJ-1VB1C105K
C5 C6	2	Capacitor, 0.1uF, 0603	Kemet	C0603C104J3RACTU
C7 C8	2	Capacitor, 4.7uF, 0603	Panasonic - ECG	ECJ-1VB0J475M
C9 C10	2	Capacitor, 0.01uF, 0603	Kemet	C0603C103K5RACTU
C12 C13	2	Capacitor, 100pF, 0603	Kemet	C0603C101J5GACTU
Conn1 Conn2	2	Connector, Faston, Blade, Male	Keystone	1287-ST
Conn3 Conn6	2	Connector, Edge, BNC, Female, 75Ω, 0.032"	Trompeter	UCBJE20-2
Conn4 Conn5	2	Connector, Edge, SMA, 50Ω, Female, 0.032"	Johnson	142-0701-881
D1	1	LED, Green, 0603	LITE-ON INC	LTST-C190GKT
J1 J2	2	Pin Jumper, 1x2	3M/ESD	929834-02-36
J3 J4	2	Pin Jumper, 1x3	3M/ESD	929834-02-36
L1, L2	2	Inductor, 6.8nH, 0402	VISHAY DALE	ILC-0402 6.8NH 5%
R1 R2 R3 R5	4	Resistor, 75Ω, 0402	Yageo America	RC0402FR-0775RL
R4	1	Resistor, 300Ω, 0603	Panasonic - ECG	ERJ-3GEYJ301V
U1	1	LMH0034 Equalizer, SOIC16	Texas Instruments	LMH0034MA

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EVM WARNINGS AND RESTRICTIONS

It is important to operate this EVM within the input voltage range of -0.3 V to VCC +0.3 V and the output voltage range of -0.3 V to VCC +0.3 V.

Exceeding the specified input range may cause unexpected operation and/or irreversible damage to the EVM. If there are questions concerning the input range, please contact a TI field representative prior to connecting the input power.

Applying loads outside of the specified output range may result in unintended operation and/or possible permanent damage to the EVM. Please consult the EVM User's Guide prior to connecting any load to the EVM output. If there is uncertainty as to the load specification, please contact a TI field representative.

During normal operation, some circuit components may have case temperatures greater than 85° C. The EVM is designed to operate properly with certain components above 85° C as long as the input and output ranges are maintained. These components include but are not limited to linear regulators, switching transistors, pass transistors, and current sense resistors. These types of devices can be identified using the EVM schematic located in the EVM User's Guide. When placing measurement probes near these devices during operation, please be aware that these devices may be very warm to the touch.

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