ENVISIONING • EMPOWERING • EXCELLING

MxL83433 and MxL83434 RS-485/422 Quad Receiver

EVK User Manual

Revision History

Document No.	Release Date	Change Description
031UMR00	June 14, 2024	Initial release.

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Introduction

This document is used for the evaluation kits (EVKs) of the MxL83433 and MxL83434 (MxL8343x) devices. These EVKs provide a platform to evaluate the features and performance of the MxL8343x.

MxL83433 EVK Setup and Pre-Configuration

- The MxL83433 EVK is pre-configured for global enable with RE = V_{CC} and REb = GND. All four receiver outputs are enabled simultaneously in this configuration.
- Apply V_{CC} = 5.0V bench power supply to header J1 at pin 2 (J1.2) or pin 3 (J1.3).
- Apply GND connection to J1 at pin 1 (J1.1).
- J14 and J16 are GND probe points on the EVK.
- When the power V_{CC} is applied at header J1, the LED at location D1 is ON.
- Screw terminal block J5, J30, J26, and J18 are inputs to receiver channel 1, channel 2, channel 3, and channel 4, respectively.
- Apply differential signals at J5, J30, J26, and J18. Monitor the receiver outputs at J7, J10, J23, and J20.
- Figure 5 on page 4 shows the schematic of the EVK.

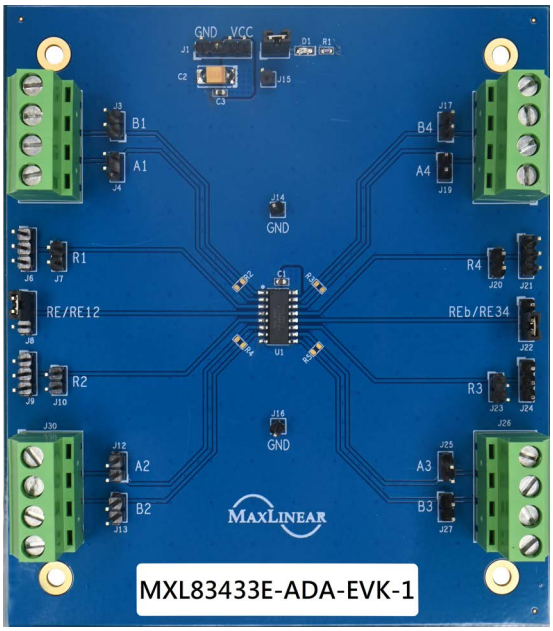


Figure 1: Top View of the MxL83433 (NSOIC16) EVK

MxL83434 EVK Setup and Pre-Configuration

- The MxL83434 EVK is pre-configured for paired enable with R12 = V_{CC} and R34 = V_{CC}. All four receiver outputs are enabled simultaneously in this configuration.
- Apply V_{CC} = 5.0V bench power supply to header J1 at pin 2 (J1.2) or pin 3 (J1.3).
- Apply GND connection to J1 at pin 1 (J1.1).
- J14 and J16 are GND probe points on the EVK.
- When the power V_{CC} is applied at header J1, the LED at location D1 is ON.
- Screw terminal block J5, J30, J26, and J18 are inputs to receiver channel 1, channel 2, channel 3, and channel 4, respectively.
- Apply differential signals at J5, J30, J26, and J18. Monitor the receiver outputs at J7, J10, J23, and J20.
- Figure 5 on page 4 shows the schematic of the EVK.

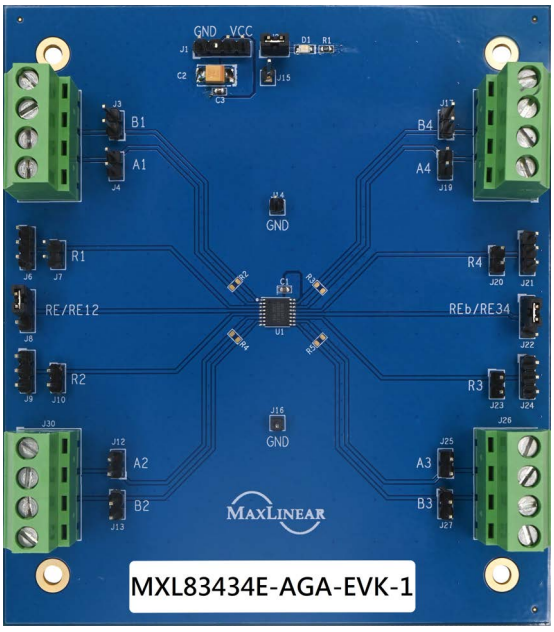


Figure 2: Top View of the MxL83434 (TSSOP16) EVK

For more information about the MxL8343x devices, refer to the *MxL83433 and MxL83434 Data Sheet* (275DS).

Ordering Information

The following table lists the ordering part numbers for the evaluation kits.

Table 1: EVK Ordering Part Numbers

EVK Part Number	Description
MXL83433E-ADA-EVK-1	MxL83433 evaluation kit NSOIC16
MXL83434E-AGA-EVK-1	MxL83434 evaluation kit TSSOP16

Evaluation Kit Overview

The following figure shows the pin configuration and logic diagram of the MxL83433 device.

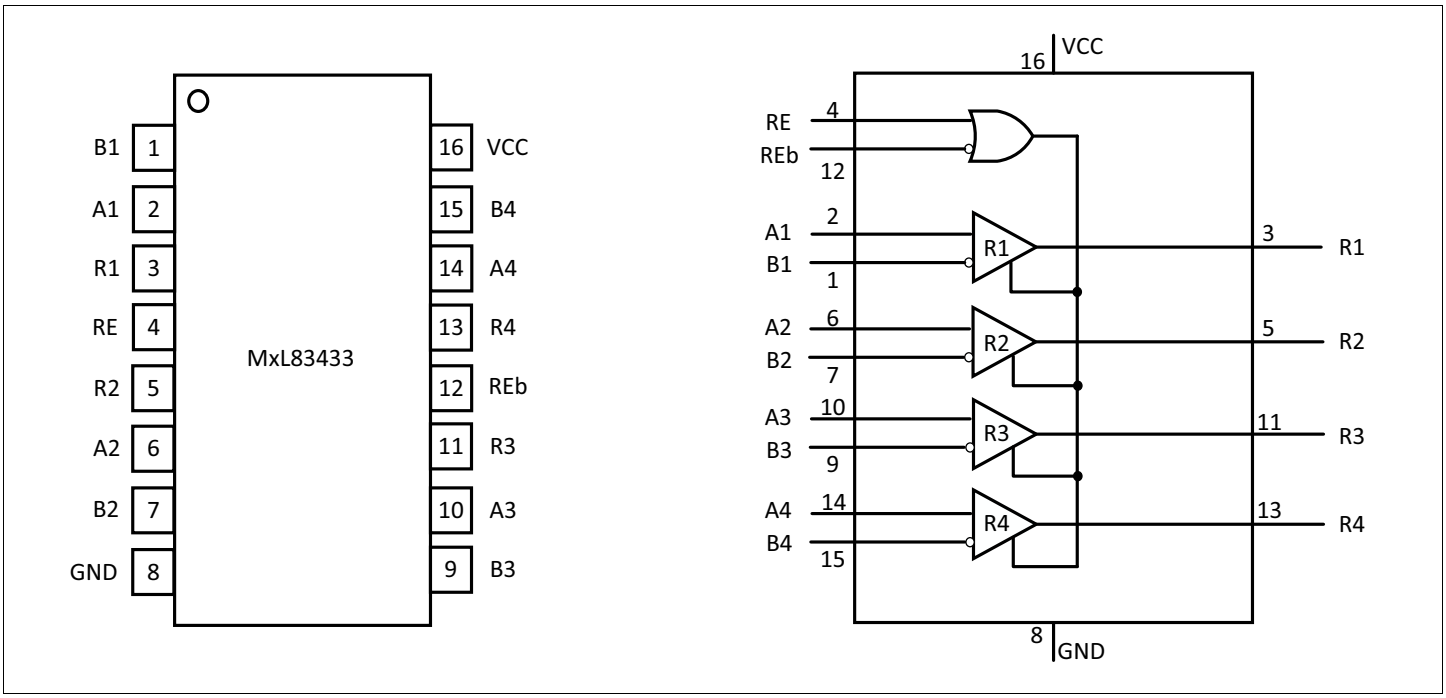


Figure 3: MxL83433 Quad Receiver

The following figure shows the pin configuration and logic diagram of the MxL83434 device.

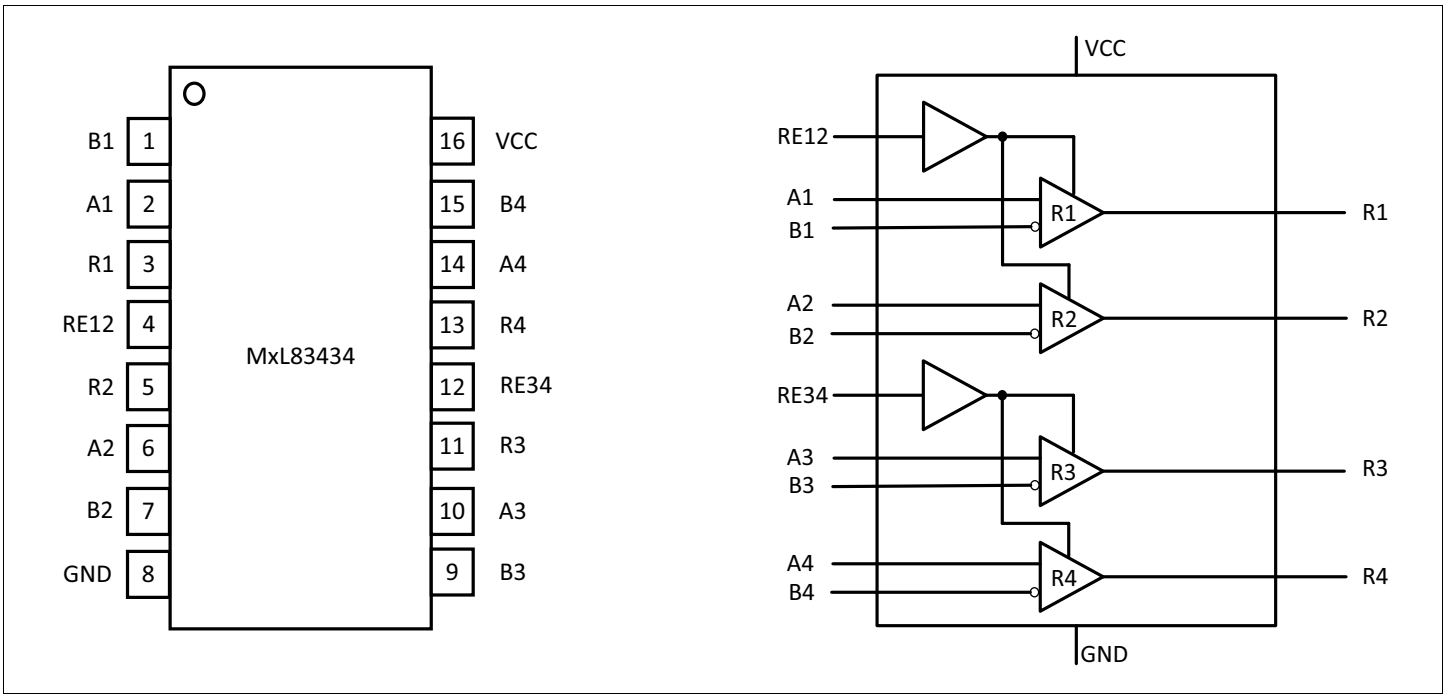


Figure 4: MxL83434 Quad Receiver

EVK Schematic

The following figure shows the EVK schematic design of the MxL8343x devices.

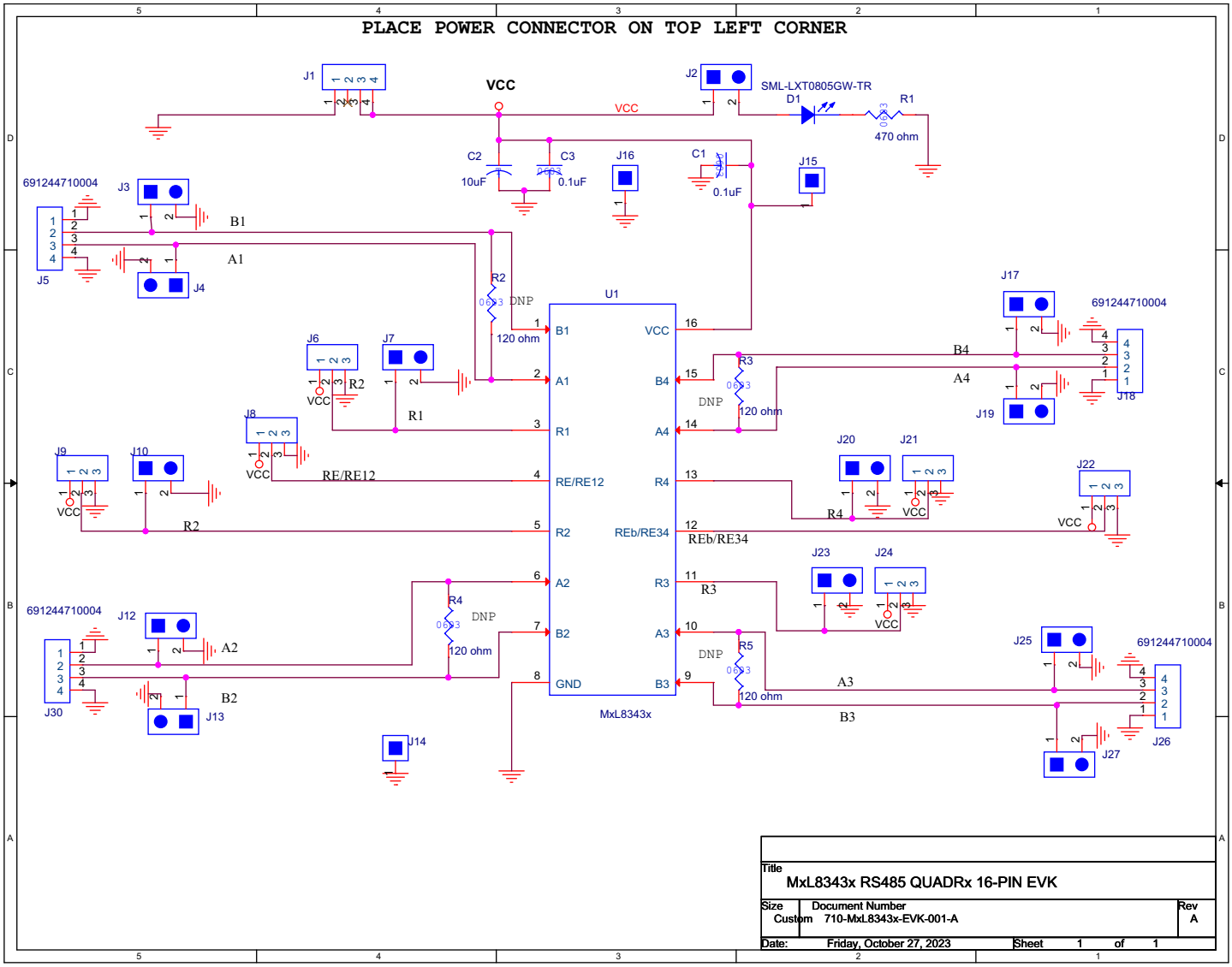


Figure 5: MxL8343x EVK Schematic

EVK PCB Layers (NSOIC16 Package)

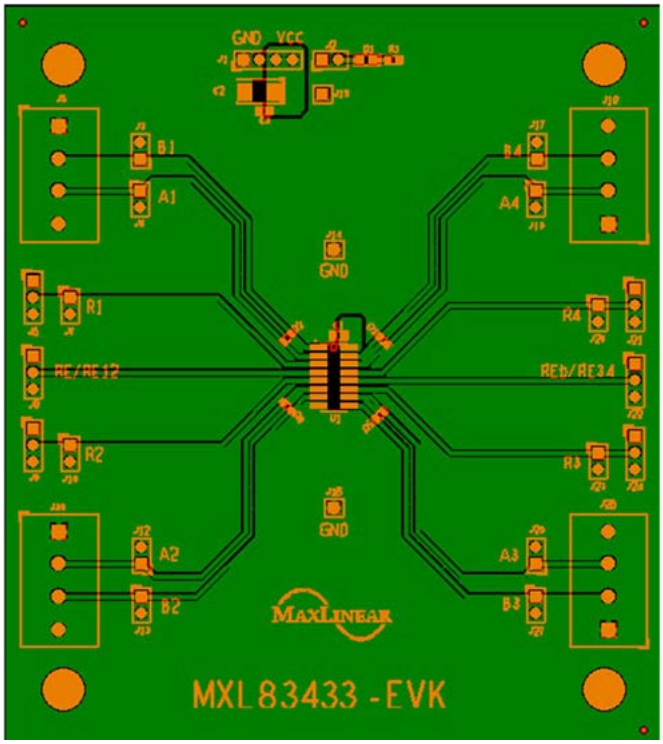


Figure 6: EVK PCB Layer 1—Top View (NSOIC16)

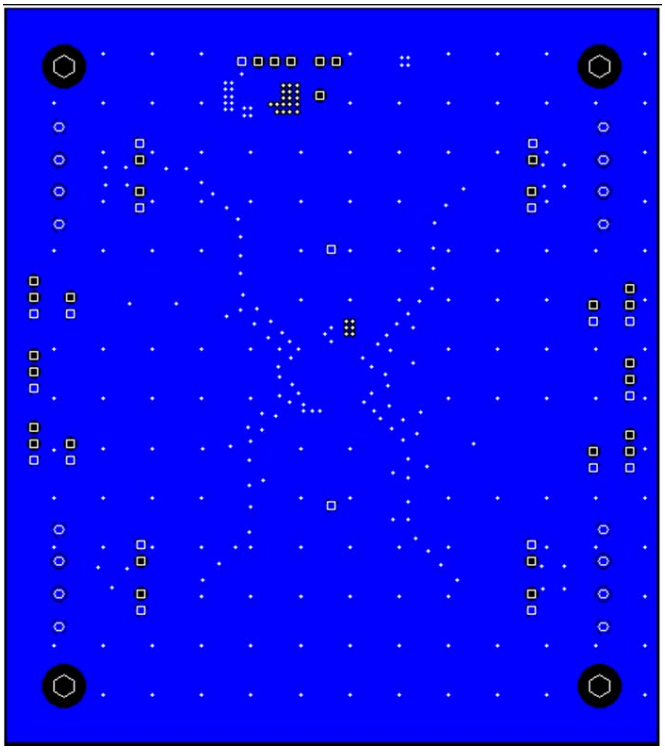


Figure 7: EVK PCB Layer 2—GND Plane (NSOIC16)

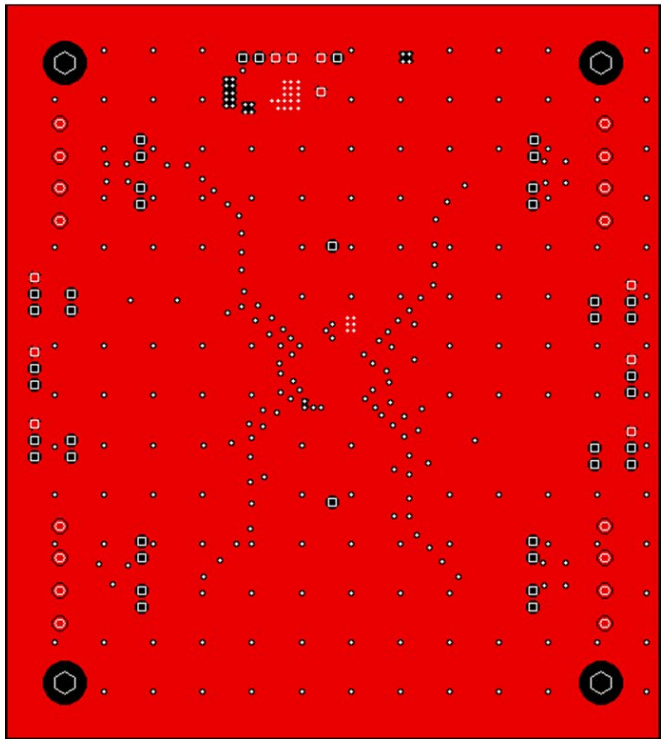


Figure 8: EVK PCB Layer 3—Power Plane (NSOIC16)

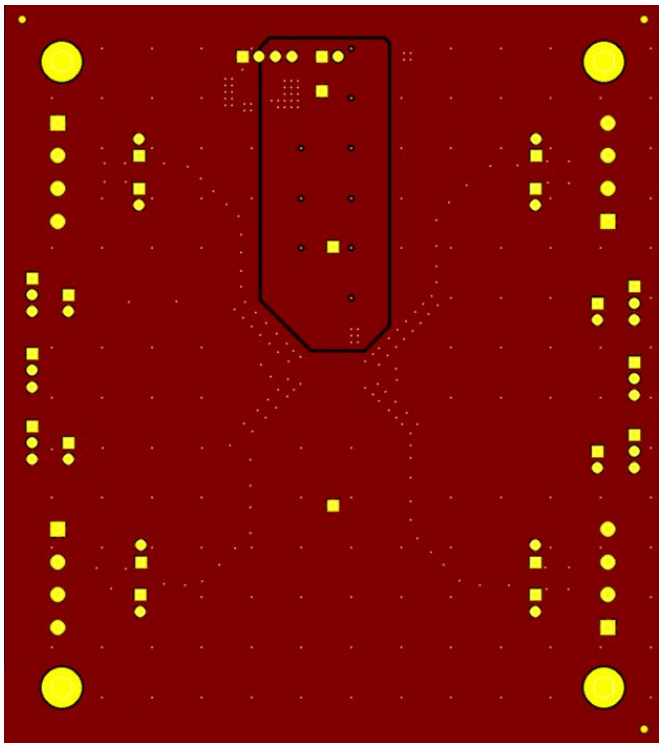


Figure 9: EVK PCB Layer 4—Bottom View (NSOIC16)

EVK PCB Layers (TSSOP16 Package)

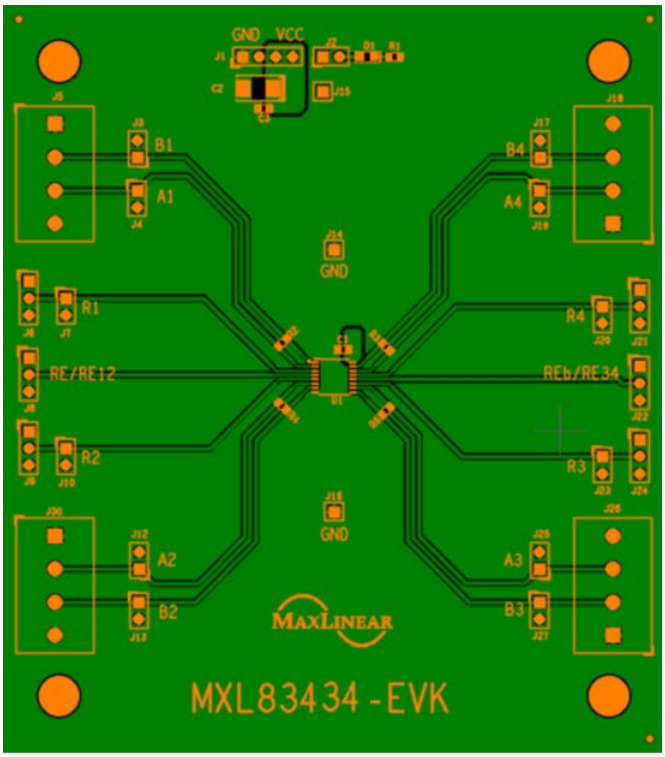


Figure 10: EVK PCB Layer 1—Top View (TSSOP16)

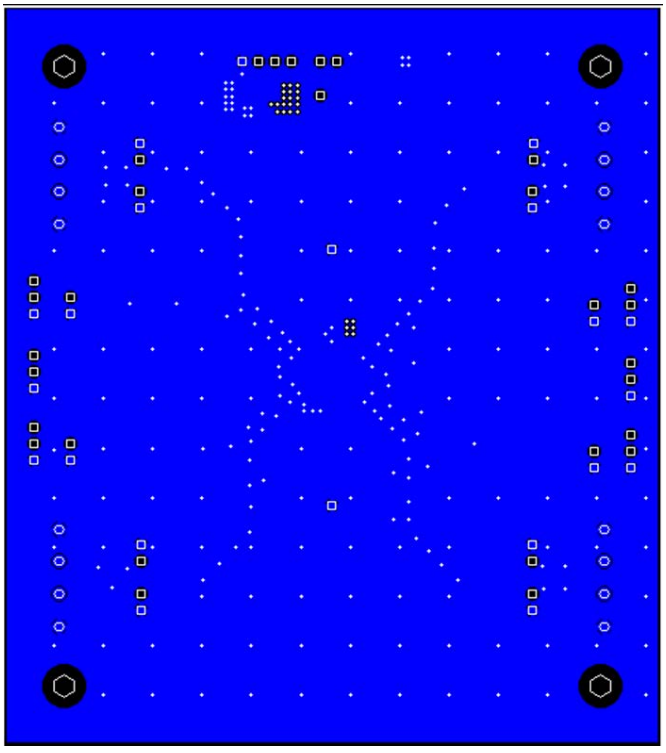


Figure 11: EVK PCB Layer 2—GND Plane (TSSOP16)

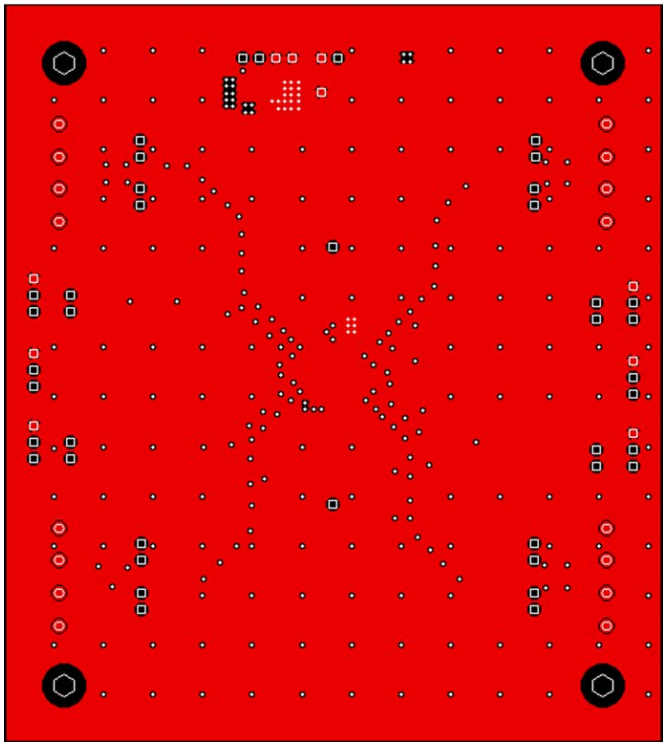


Figure 12: EVK PCB Layer 3—Power Plane (TSSOP16)

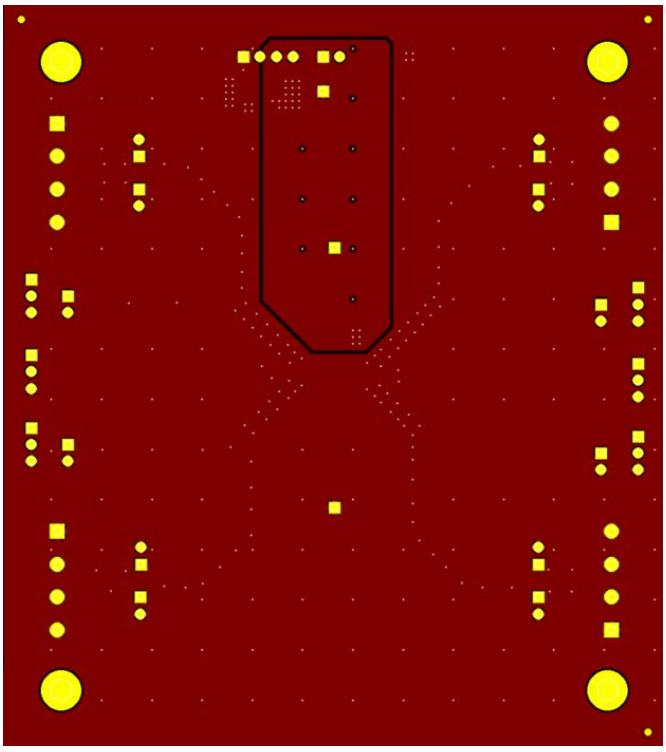


Figure 13: EVK PCB Layer 4—Bottom View (TSSOP16)

EVK Bill of Materials

Table 2: EVK Bill of Materials for NSOIC16

Item	Quantity	Reference	Manufacturer	Part
1	2	C1, C3	Kemet	C0603C104K5RAC7081, 0.1UF 50V, 0603 X7R
2	1	C2	AVX	478-5235-1-ND, TANTALUM, 10μF, 16V, 500mΩ, 2312
3	1	D1	Lumex	67-1553-1-ND LED GREEN DEFUSED SMD, 0805
4	1	J1	Wurth Eletronics	613 004 111 21 CONN. HEADER 1X4, 2.54mm, 4PIN
5	13	J2, J3, J4, J7, J10, J12, J13, J17, J19, J20, J23, J25, J27	Wurth Eletronics	613 002 111 21 CONN. HEADER 1X2, 2.54mm, 2PIN
6	4	J5, J18, J26, J30	Wurth Electronics	691 244 710 004 TERMINAL BLOCK, HORIZONT 4POS
7	6	J6, J8, J9, J21, J22, J24	Wurth Eletronics	613 003 111 21 CONN. HEADER 1X3, 2.54mm, 3PIN
8	3	J14, J15, J16	Wurth Eletronics	613 001 111 21 CONN. HEADER, 1X1, 2.54mm, 1PIN
9	1	R1	Xicon	ERJ-3EKF4700V RES SMD, 470Ω, 1%, 1/10W, 0603
10	4	R2, R3, R4, R5. Termination resistors. Optional, not stuff by default.	Xicon	ERJ-3EKF1200V RES SMD, 120Ω, 1%, 1/10W, 0603
11	1	U1	MaxLinear	MXL83433E-ADA-R (NSOIC16)

Table 3: EVK Bill of Materials for TSSOP16

Item	Quantity	Reference	Manufacturer	Part
1	2	C1, C3	Kemet	C0603C104K5RAC7081, 0.1UF 50V, 0603 X7R
2	1	C2	AVX	478-5235-1-ND, TANTALUM, 10μF, 16V, 500mΩ, 2312
3	1	D1	Lumex	67-1553-1-ND LED GREEN DEFUSED SMD, 0805
4	1	J1	Wurth Electronics	613 004 111 21 CONN. HEADER 1X4, 2.54mm, 4PIN
5	13	J2, J3, J4, J7, J10, J12, J13, J17, J19, J20, J23, J25, J27	Wurth Electronics	613 002 111 21 CONN. HEADER 1X2, 2.54mm, 2PIN
6	4	J5, J18, J26, J30	Wurth Electronics	691 244 710 004 TERMINAL BLOCK, HORIZONT 4POS
7	6	J6, J8, J9, J21, J22, J24	Wurth Electronics	613 003 111 21 CONN. HEADER 1X3, 2.54mm, 3PIN
8	3	J14, J15, J16	Wurth Electronics	613 001 111 21 CONN. HEADER, 1X1, 2.54mm, 1PIN
9	1	R1	Xicon	ERJ-3EKF4700V RES SMD, 470Ω, 1%, 1/10W, 0603
10	4	R2, R3, R4, R5. Termination resistors. Optional, not stuff by default.	Xicon	ERJ-3EKF1200V RES SMD, 120Ω, 1%, 1/10W, 0603
11	1	U1	MaxLinear	MXL83434E-AGA-R (TSSOP16)

EVK Setup and Configurations

The following table lists the header pin descriptions of the MxL8343x.

Table 4: EVK Header Pin Description

J1	J1-Pin 1	J1-Pin 2	J1-Pin 3	J1-Pin 4
Name 	GND	NC	V_{CC}[1]	V_{CC}[1]

1. V_{CC} = 3.0V to 5.5V.

The following table lists the header pin factory settings and descriptions of the MxL8343x. For a complete view of the MxL83433 EVK, see Figure 1 on page 1. For a complete view of the MxL83434 EVK, see Figure 2 on page 2.

Table 5: EVK Header Pin Description and Default Settings

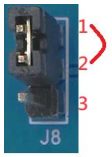
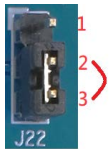
Header	Factory Setting	Description
MxL83433 (NSOIC16)		
J8 	Jumper 1-2	Enables all receivers, RE = V_{CC}.
J22 	Jumper 2-3	Enables all receivers, REb = GND.
MxL83434 (TSSOP16)		
J8 	Jumper 1-2	Enables the channel 1 and channel 2 receivers when RE12 = V_{CC}. Disables the channel 1 and channel 2 receivers when RE12 = GND.
J22 	Jumper 2-3	Enables the channel 3 and channel 4 receivers when RE34 = V_{CC}. Disables the channel 3 and channel 4 receivers when RE34 = GND.

Table 5: EVK Header Pin Description and Default Settings (Continued)

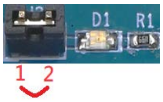
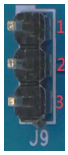
Header	Factory Setting	Description
MxL83433 (NSOIC16) and MxL83434 (TSSOP16)		
J2 	Jumper 1-2	Enables power LED.
R2, R3, R4, R5	Not stuff	Receiver termination resistor. Optional, not stuff by default.
J3 	Header 2 pins	■ J3.1: B1 inverting input (test point). ■ J3.2: GND.
J4 	Header 2 pins	■ J4.1: A1 non-inverting input (test point). ■ J4.2: GND.
J5 	4-pin terminal block	■ J5.1: GND. ■ J5.2: B1 inverting input. ■ J5.3: A1 non-inverting input. ■ J5.4: GND.
J6 	Header 3 pins	■ J6.1: V_{CC}. ■ J6.2: R1 output. ■ J6.3: GND.
J7 	Header 2 pins	■ J7.1: R1 output (test point). ■ J7.2: GND.
J9 	Header 3 pins	■ J9.1: V_{CC} ■ J9.2: R2 output. ■ J9.3: GND.
J10 	Header 2 pins	■ J10.1: R2 output (test point). ■ J10.2: GND.
J12 	Header 2 pins	■ J12.1: A2 non-inverting input (test point). ■ J12.2: GND.

Table 5: EVK Header Pin Description and Default Settings (Continued)

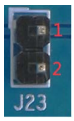
Header	Factory Setting	Description
J13 	Header 2 pins	■ J13.1: B2 inverting input (test point). ■ J13.2: GND.
J30 	4-pin terminal block	■ J30.1: GND. ■ J30.2: A2 non-inverting input. ■ J30.3: B2 inverting input. ■ J30.4: GND.
J25 	Header 2 pins	■ J25.1: A3 non-inverting input (test point). ■ J25.2: GND.
J27 	Header 2 pins	■ J27.1: B3 inverting input (test point). ■ J27.2: GND.
J26 	4-pin terminal block	■ J26.1: GND. ■ J26.2: B3 inverting input. ■ J26.3: A3 non-inverting input. ■ J26.4: GND.
J23 	Header 2 pins	■ J23.1: R3 output (test point). ■ J23.2: GND.
J24 	Header 3 pins	■ J24.1: V_{CC}. ■ J24.2: R3 output. ■ J24.3: GND.
J20 	Header 2 pins	■ J20.1: R4 output (test point). ■ J20.2: GND.
J21 	Header 3 pins	■ J21.1: V_{CC}. ■ J21.2: R4 output. ■ J21.3: GND.

Table 5: EVK Header Pin Description and Default Settings (Continued)

Header	Factory Setting	Description
J19 	Header 2 pins	■ J17.1: B4 inverting input (test point). ■ J17.2: GND.
J19 	Header 2 pins	■ J19.1: A4 non-inverting input (test point). ■ J19.2: GND.
J18 	4-pin terminal block	■ J18.1: GND. ■ J18.2: A4 non-inverting input. ■ J18.3: B4 inverting input. ■ J18.4: GND.
J14 	Header 1 pin	J14.1: GND.
J15 	Header 1 pin	J15.1: V_{CC}.
J16 	Header 1 pin	J16.1: GND.

MxL83433

The MxL83433 device offers a global enable configuration.

All four receiver outputs are enabled simultaneously when RE = V_{CC} or REb = GND.

When RE = GND and REb = V_{CC}, all four receiver outputs are in a high impedance state.

MxL83434

The MxL83434 device offers a paired enable configuration.

The channel 1 and channel 2 receiver outputs are enabled simultaneously when RE12 = V_{CC}.
The channel 3 and channel 4 receiver outputs are enabled simultaneously when RE34 = V_{CC}.

When RE12 = GND, the channel 1 and channel 2 receiver outputs are in high impedance state.
When RE34 = GND, the channel 3 and channel 4 receiver outputs are in high impedance state.

Layout Recommendations

The following are recommended layout practices that are already applied in the EVK:

- Application of bypass capacitors of at least 100nF as close as possible to the V_{CC} terminal of the device.

  Note: If the supply source is generated from a linear power supply or regulator, MaxLinear recommends that you use additional 10µF (C2) and 100nF (C3) ceramic capacitors.

- Use of at least two vias for the V_{CC} and ground connections of the bypass capacitors to minimize effective via inductance.
- When possible, use of a V_{CC} and ground plane to provide low-inductance traces and signal path.

For more information and tips on layout, refer to the *RS-232 and RS-485 PCB Layout Application Note* (293AN).

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