Product Technical Brief

Designing a Circuit Board for Both the CS61881 and the LXT381

1. INTRODUCTION

This technical brief describes how to design a circuit board for the Cirrus Logic CS61881 and also accommodate the LXT381. The Cirrus Logic device makes this possible with a minimum of changes; some changes are necessary due to the increased performance and functionality of the Cirrus Logic device.

1.1 Circuit Differences

The differences in the support circuitry are summarized in the following list. Detailed schematics are shown in the figures below.

- The CS61881 uses a turns ratio of 1:1.15 on the transmit transformer. The transmit transformer for the LXT381 has a ratio of 1:2. (See the figures below and Table 1.) The reduced transformer ratio is the result of a more efficient transmitter design which produces significant power savings.
- The resistors on TTIP and TRING of the Level One part are not used on the CS61881 circuit. In the following figures, this is shown with jumpers on the transmit lines, which would be removed for the Level One device and inserted for the Cirrus Logic LIU.
- The Cirrus Logic LIU doesn't need the capacitor on the transmit circuit of the Level One device.
- The CS61881 uses a turns ratio of 1:2 on the receive transformer. The LXT381 uses a 1:1 receive transformer. (See the figures and Table 1.) The increased transformer ratio is needed to prevent the receiver from getting over driven on short cables.
- The values of R1 and R2 for the CS61881 are different from the equivalent resistors on the LXT381. In the internal impedance matching circuit (Figure 1), the CS61881 uses the same resistor values for all cable impedances. The filter capacitor is also a different value (see Table 1).
- The Level One part needs 1 kΩ resistors on the receive pins to limit over current conditions. The Cirrus Logic LIUs have internal latch up protection which makes the resistors unnecessary (See Figure 1 and Table 1). For additional latchup protection, the 1 kΩ resistors can be used with the CS61881, but the values of R1 and R2 would then need to be changed according to the impedance of the cable. This is shown in Figure 2 with the values for R1 and R2 in Table 1.
- The analog JTAG pins on the LXT devices (AT1, AT2) have been replaced by the REF and CBLSEL pins on the Cirrus Logic LIUs.

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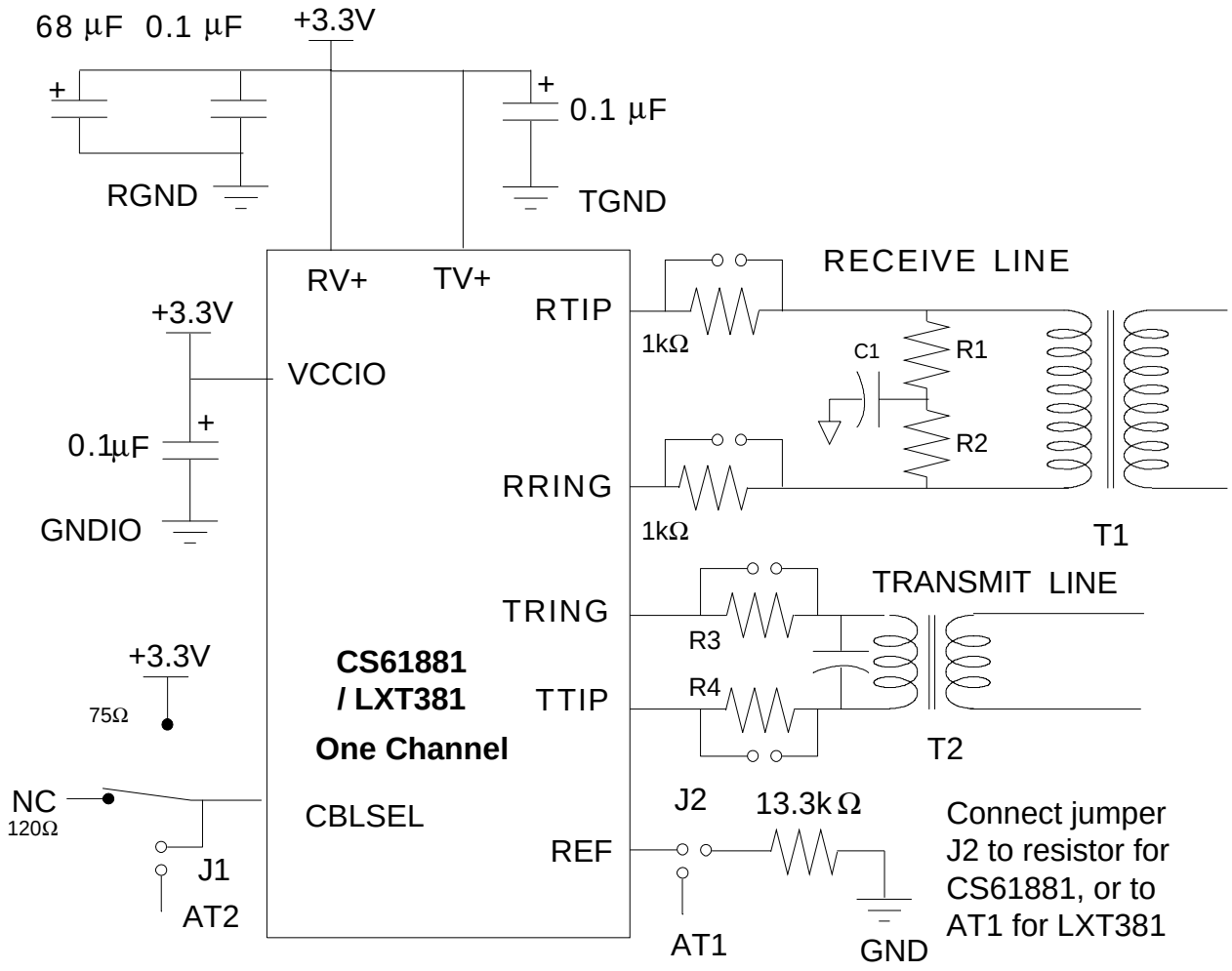
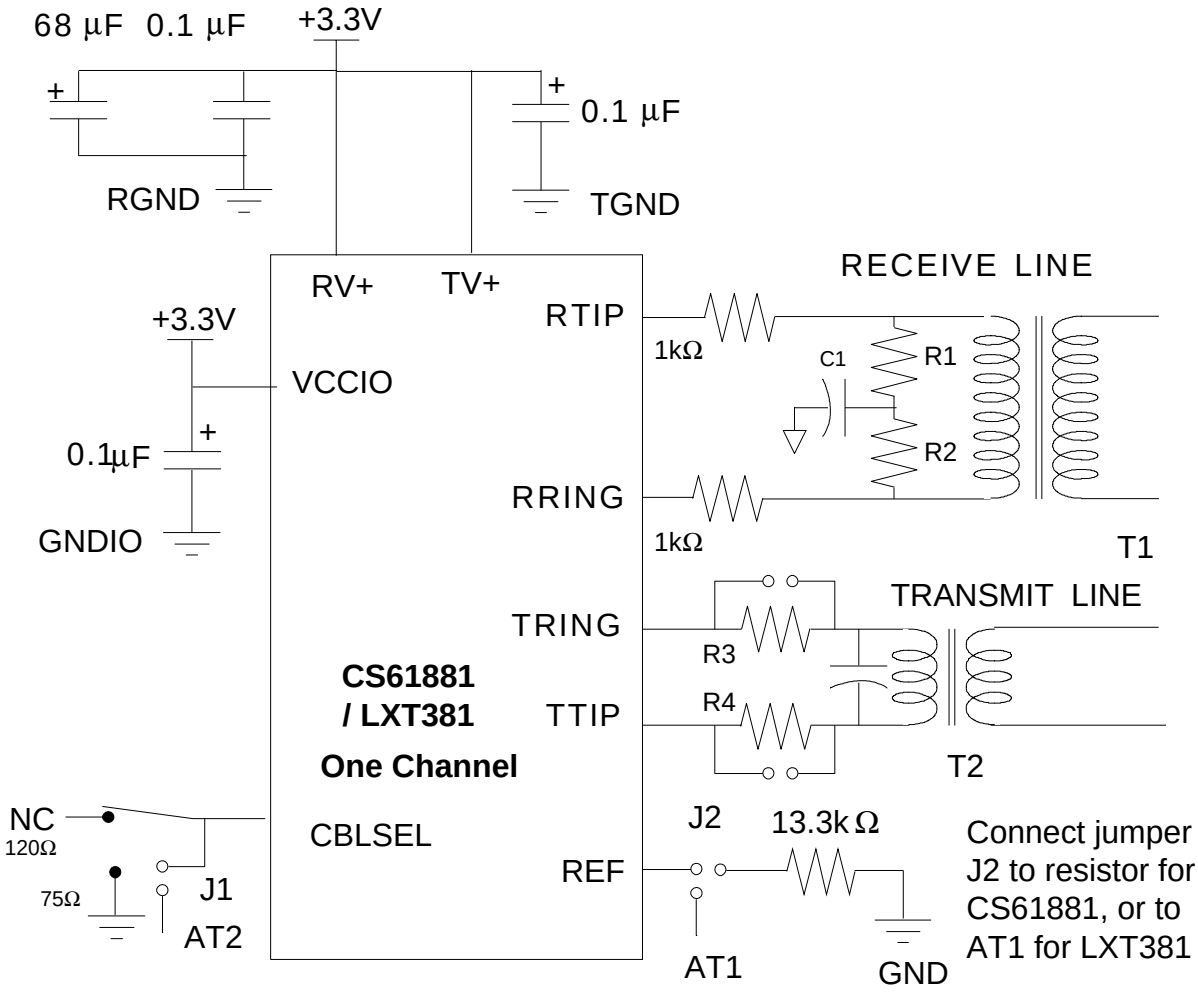


For CS61881, disconnect jumper J1 and set switch for cable type.
For LXT381, set switch to NC and connect J1 to AT2.

Figure 1. Circuit for CS61881 (Internal Impedance Matching) or LXT381

Component	CS61881		LXT381	
	75 Ω	**120 Ω**	**75 Ω**	**120 Ω**
R1, R2 - internal impedance matching	15 Ω	15 Ω	N/A	N/A
R1, R2 - external impedance matching	9.31Ω	15 Ω	37.5 Ω	60 Ω
R3, R4	-	-	11Ω	11Ω
C1	0.1µF	0.1µF	560 pF	560 pF
T1	1:2	1:2	1:1	1:1
T2	1:1.15	1:1.15	1:2	1:2

Table 1. Component Values



For CS61881, disconnect jumper J1 and set switch for cable type.
For LXT381, set switch to NC and connect J1 to AT2.

Figure 2. Circuit for CS61881 (External Impedance Matching) or LXT381

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