

4 Distance Considerations

When designing a system to connect two Ethernet devices without transformers, the distance between the two devices impacts the hardware required.

4.1 Connecting Two Devices Over Short Distances

As a general guideline, any distances less than approximately one meter would fall into the short distance category, and any distances over one meter would fall into the long distance category.

For short distances, the 50ohm resistors can be combined to give a single 25ohm resistor as illustrated in [Figure 4.1, "Load Resistors for Short Distances"](#).

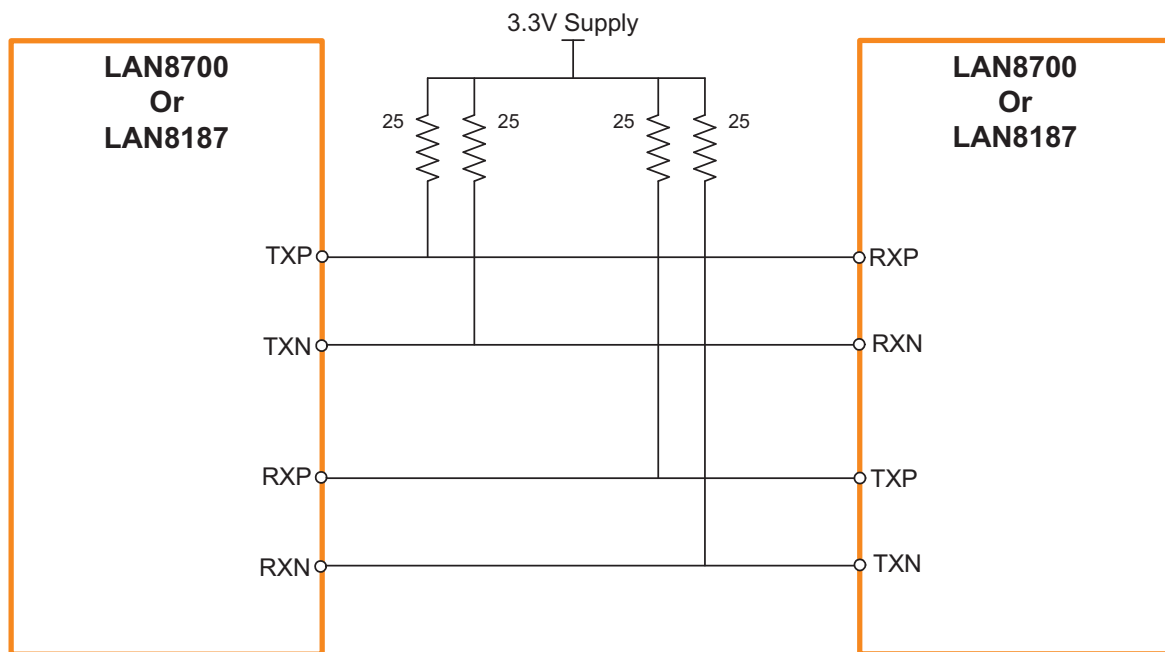


Figure 4.1 Load Resistors for Short Distances

4.2 Connecting Two Devices Over Long Distances

For long distance communications, SMSC recommends that both ethernet devices have terminating resistors on each analog pin. Examples of long distance configurations include backplane connected devices, or long cable connected cards. Proper lab validation should be performed to provide optimum resistor placement using the configuration shown in [Figure 4.2, "Resistors at Both Ends for Long Distances"](#).

Cable connections over very long distances without transformers are not encouraged because of the risk for potential high voltage build-up and noise effects.