

APPLICATION NOTE

March 2001

This application note describes a protection circuitry for DS3, STS-1 or E3 system.

Before implementing this protection circuitry, two items should be considered:

1. The 78P7200 and the 78P2241B are protected against ESD (Electric Static Discharge) (see Figure 3 for test method reference). The protection is internal and is composed of two diodes per input or output, and the diodes are connected between the pad and either the positive supply or the ground pad. These protection diodes will protect the internal circuitry against a discharge of a human body charged with static electricity. The specification is outlined in the CCITT recommendation. This protection may be sufficient if the connection is in the same building and no lightning, or high differential induced energy is expected.

2. The transceiver should be isolated from the line via a transformer which will prevent common mode spikes from damaging the transceiver.

If after the previous discussion it is found necessary to add an external protection circuitry, one can implement the suggested schematic of Figure 1.

The diodes 1N914 are general-purpose diodes that will accept a current of 500 mA. Two diodes in series are needed because the amplitude of the signal vary from 600mV to 1V peak. The voltage of conduction of two 1N914 is 2.4V. If more severe current is expected then diodes like 1N4001 can be used instead of the 1N914. The 1N4001 is rated at 30A surge.

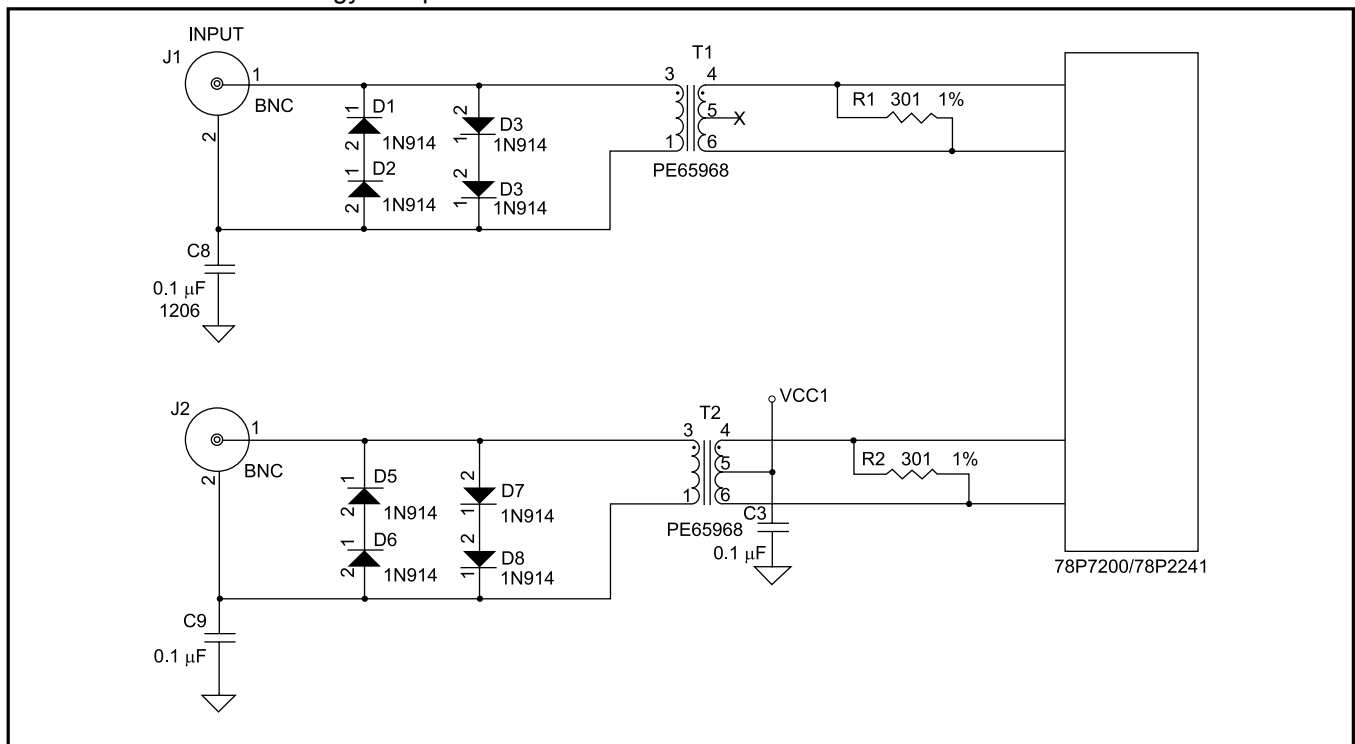


FIGURE 1: Implementation Schematic

Protection Circuitry for 78P7200 and 78P2241B

Figure 2. Shows a received AMI signal at the secondary of the T1 transformer, the signal is double in amplitude because the receive transformer is of a

ratio of 1 to 2, the picture shows that with or without protection diodes the incoming signal is not changed.

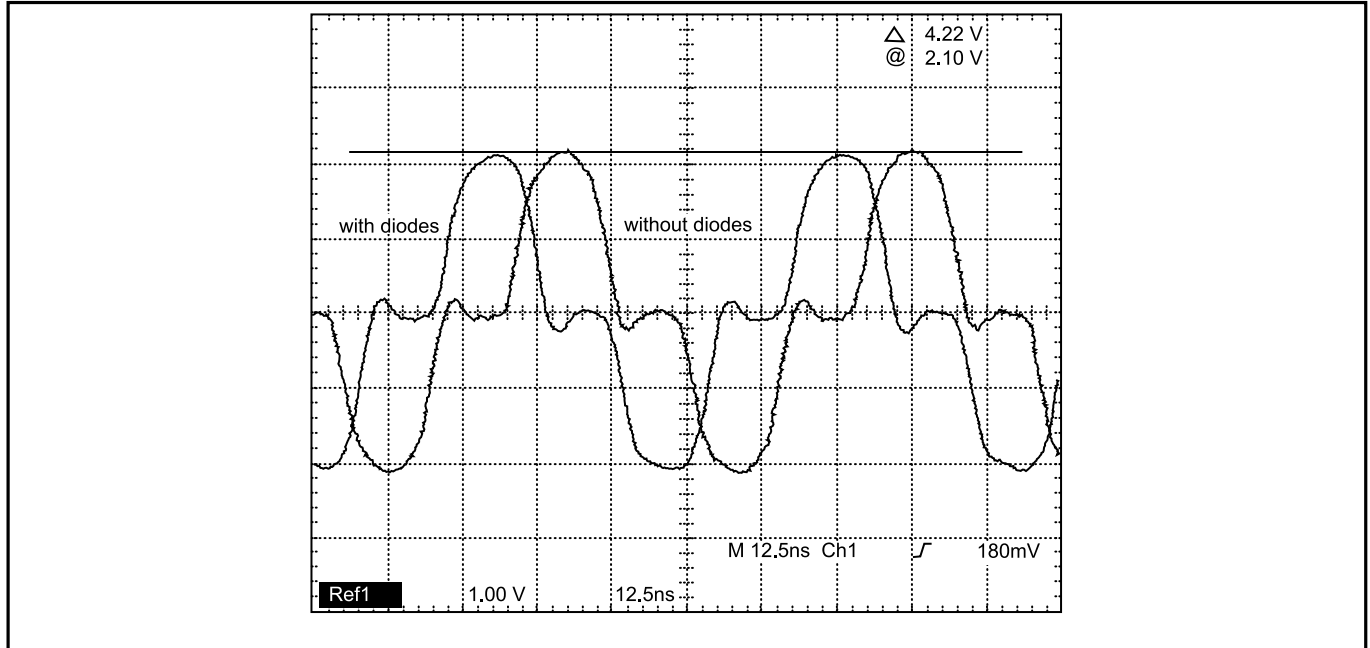


FIGURE 2: Oscilloscope Picture

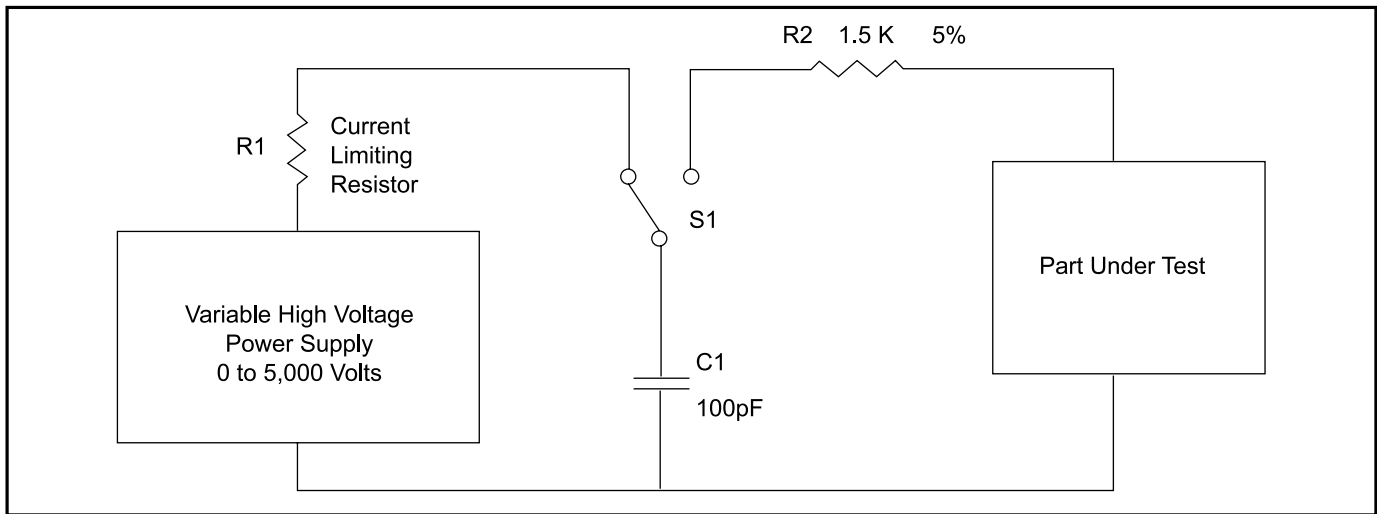


FIGURE 3: ESD Human Body Model

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