

## Purpose

This Application Note describes the recommend Line Protection Circuitry for the MT9076B device.

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## Scope

This document will cover the Line Protection Circuitry for the MT9076B device. It does not cover any other aspects of the MT9076B circuitry. The reader should be familiar with the MT9076B data sheet before reading this application note.

## 1.0 Protection Circuitry

The E1/T1 line protection circuit must protect the E1/T1 interface circuit from lightning strikes, EMC conducted emissions, AC mains cross, line induction from electric motors and power lines, shorts to ground and TIP to RING shorts on the transmit side.

### 1.1 Lightning Protection

The primary protection against lightning strikes is a Sidactor (P2703AB). This Sidactor is a high impedance, low capacitance (when not in an active state) device, which will fire (start conducting current) when a voltage impulse of 240V or more is applied across TIP and RING.

### 1.2 EMC Conducted Emissions

Common mode chokes (Pulse PE-65554) have been included to block high frequency voltages (EMC conducted emissions requirements).

### 1.3 Over Current Protection

Current limitation and over current protection is provided by an in line slow blow fuse (Littlefuse 230/800mA). This in-line fuse can be replaced with either a fusible resistor or a PTC resistor (TR600-150).

### 1.4 Excessive Differential Voltage Protection

Differential voltages on TIP and RING are limited with a Sidactor (P0300SA). Additional over-voltage protection in the form of clamping Schottky diodes (MUR420) are required for the low impedance output drivers on the transmit side. These diodes are not required on the receive side owing to the high impedance input.

### 1.5 AC Line Cross Protection (Common Mode Voltage)

Protection against an AC line cross (both TIP and RING are shorted to the same voltage source) and induced sources from power line and electric motors is provided by the 1.5KV isolation of the transmit and receive transformers.

## 2.0 Resistors

The remaining resistors provide impedance matching.



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