

## Customer Premises Equipment (CPE)

CPE is defined as any telephone terminal equipment which resides at the customer's site and is connected to the Public Switched Telephone Network (PSTN). Telephones, modems, caller ID adjunct boxes, PBXs, and answering machines are all considered CPE.

### Protection Requirements

CPE should be protected against overvoltages that can exceed 800 V and against surge currents up to 100 A. In Figure 3.1 through Figure 3.6, *SIDACtor* devices were chosen because their associated peak pulse current ( $I_{PP}$ ) rating is sufficient to withstand the lightning immunity test of TIA-968-A (formerly known as FCC Part 68) without the additional use of series line impedance. Likewise, the fuse shown in Figure 3.1 through Figure 3.6 was chosen because the amps<sup>2</sup>time ( $I^2t$ ) rating is sufficient to withstand the lightning immunity tests of TIA-968-A without opening, but low enough to pass UL power cross conditions.

The following regulatory requirements apply:

- TIA-968-A (formerly known as FCC Part 68)
- UL 60950

All CPE intended for connection to the PSTN must be registered in compliance with TIA-968-A. Also, because the National Electric Code mandates that equipment intended for connection to the telephone network be listed for that purpose, consideration should be given to certifying equipment with an approved safety lab such as Underwriters Laboratories.

### CPE Reference Circuits

Figure 3.1 through Figure 3.6 show examples of interface circuits which meet all applicable regulatory requirements for CPE. The P3100SB and P3100EB are used in these circuits because the peak off-state voltage ( $V_{DRM}$ ) is greater than the potential of a Type B ringer superimposed on a POTS (plain old telephone service) battery.

$$150 V_{RMS} \sqrt{2} + 56.6 V_{PK} = 268.8 V_{PK}$$

Note that the circuits shown in Figure 3.1 through Figure 3.6 provide an operational solution for TIA-968-A (formerly known as FCC Part 68). However TIA-968-A allows CPE designs to pass non-operationally as well.

For a non-operational solution, coordinate the  $I_{PP}$  rating of the *SIDACtor* device and the  $I^2t$  rating of the fuse so that (1) both will withstand the Type B surge, and (2) during the Type A surge, the fuse will open. (See Table 5.1, Surge Rating Correlation to Fuse Rating on page 5-8.)

Note: For alternative line interface protection circuits, see "Regulatory Compliant Solutions" on page 4-34.

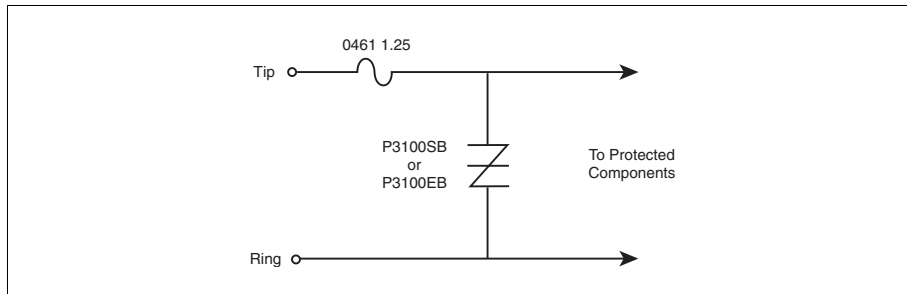


Figure 3.1 Basic CPE Interface

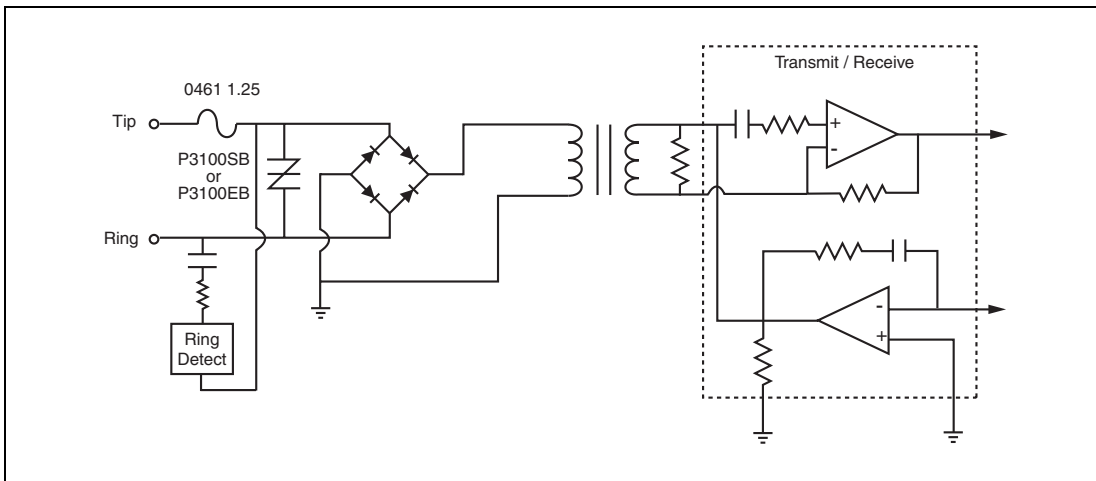


Figure 3.2 Transformer Coupled Tip and Ring Interface

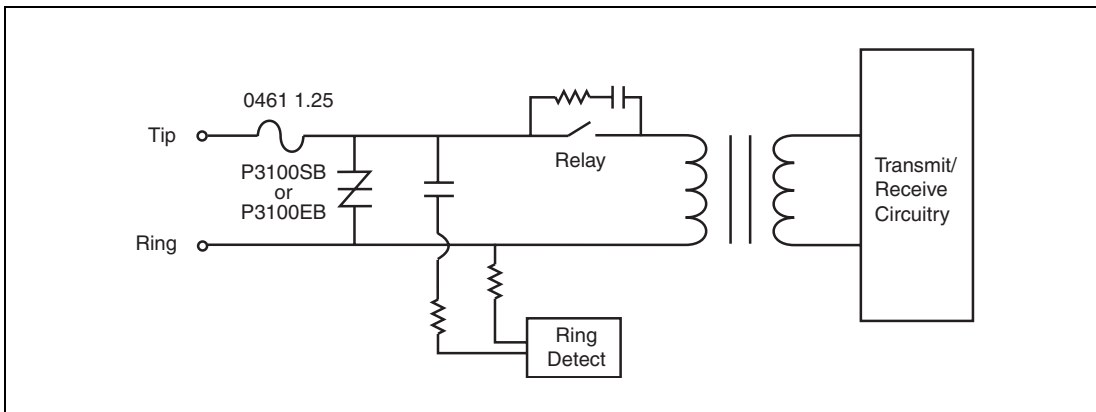


Figure 3.3 Modem Interface

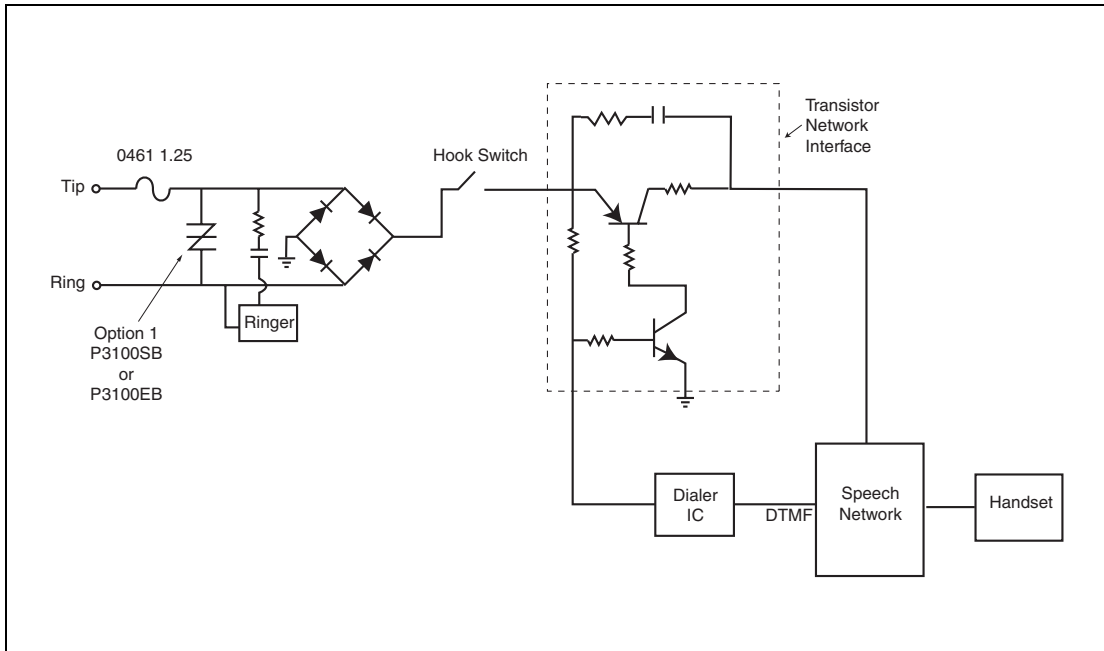


Figure 3.4 CPE Transistor Network Interface — Option 1

Reference Designs

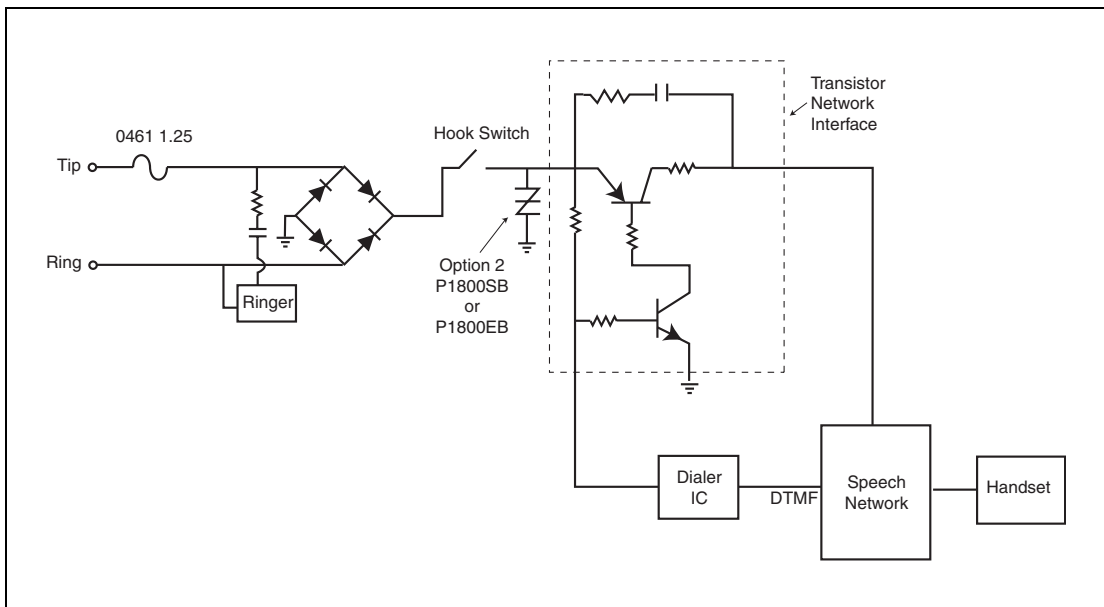


Figure 3.5 CPE Transistor Network Interface — Option 2

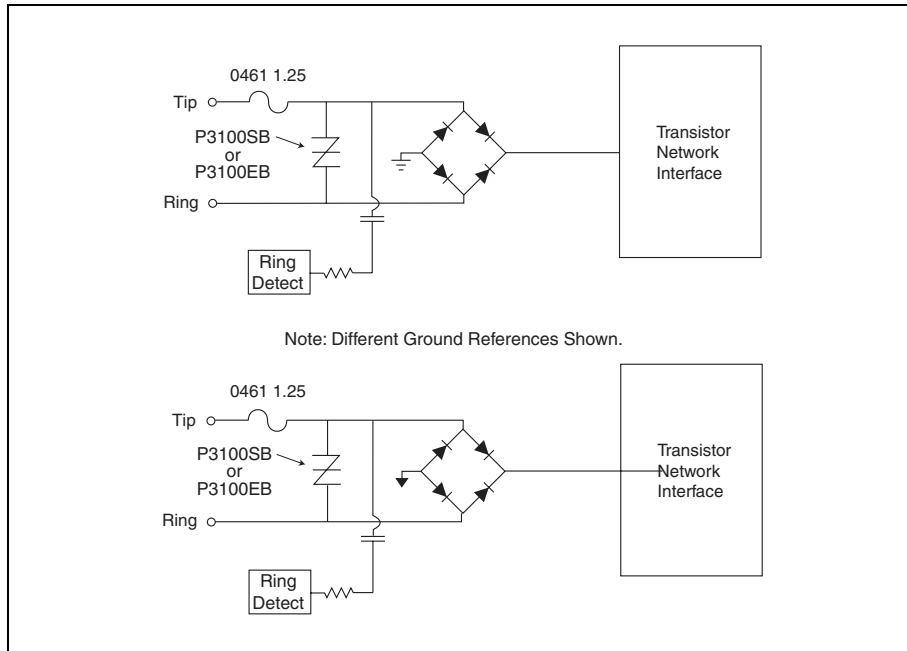


Figure 3.6 Two-line CPE Interface