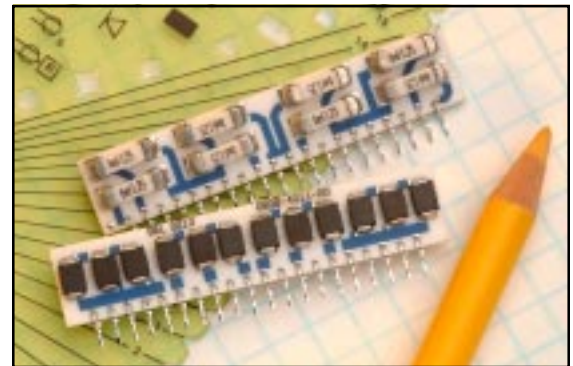
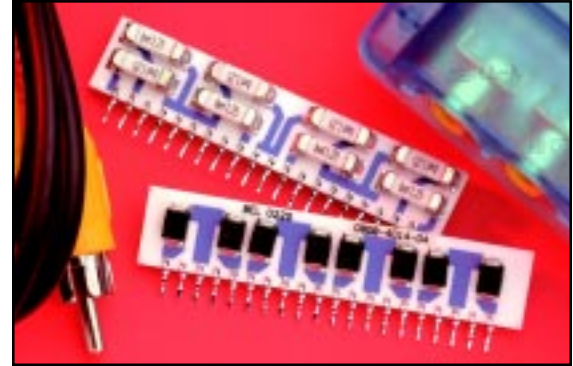
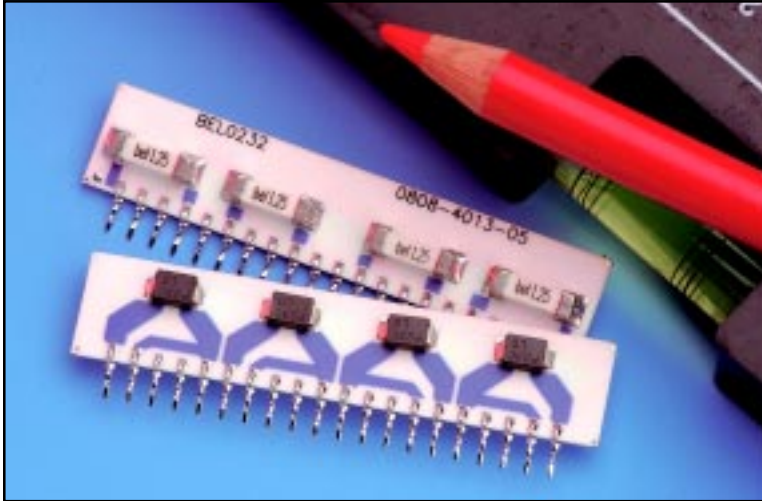


Fuse Products

Circuit Protection SIP Modules

CPSIP1002



Features

- Space-saving, vertical, through hole configuration
- Tip and Ring protection schemes consist of voltage protectors (SIDACTor®, TISP®, thyristor, etc.) in combination with Bel's 1.25A SMP fuses
- Customized designs provide solutions for a wide variety of voltages
- Two and four channel packaging on ceramic substrate
- Standard designs also available
- Fully integrated design helps accelerate time to market for telecommunication devices

Applications

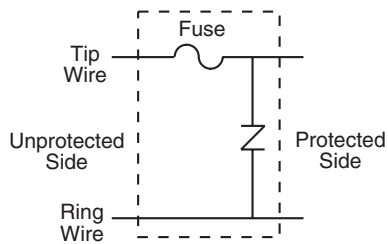
- Digital Subscriber Line (DSL)
- Analog Line Cards
- T1/E1 Interface Circuits
- Digital Line Cards

Bel's value-added modules provide circuit protection in a space-saving, vertical-mount, SIP configuration. Designed for use in a variety of telecom applications, the modules incorporate voltage protectors with Bel's 1.25A, surface mount SMP fuses. These fuses comply with the Power Cross test requirements UL 1950/60950 and Bellcore/Telcordia GR-1089 for Tip and Ring protection and withstand lightning surges specified in FCC 47 Part 68.

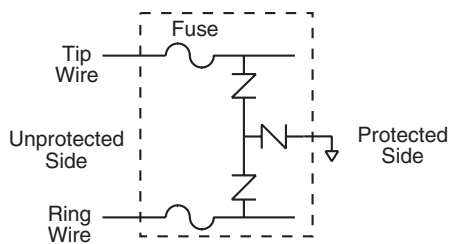
These Bel modules are ideal for use where high density chipsets are being implemented as they provide an integrated protection scheme to support the greater number of protection components required. Packaged on ceramic substrate via Bel's high volume manufacturing techniques, these circuit protection modules utilize minimal board space, while maximizing manufacturing throughput.

The design of these modules can be customized according to the requirements of board design and voltage protection, offering the flexibility to accommodate a wide range of voltage protection schemes.

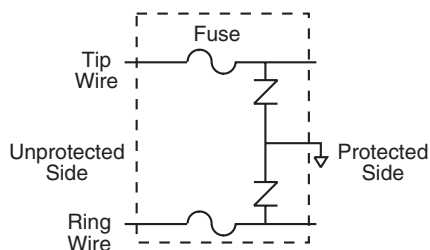
TYPICAL PROTECTION CIRCUITS



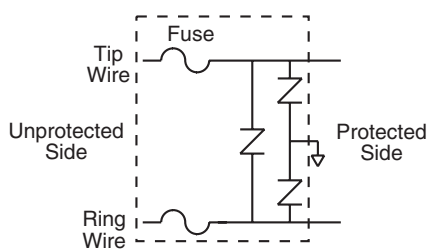
2-Wire Protection



"Y" Inter-wire and Ground Protection



Wire to Ground Protection
or "V" Protection



"Delta" Inter-wire and Ground Protection

The circuit protection schemes shown here have been used for many years in nearly every telecommunications product sold in the U.S. Equipment such as fax machines, modems and central office switchers designed for use in Customer Premises Equipment (CPE) or Central Office (CO) locations must comply with requirements established by multiple standards such as:

- **FCC 47, Part 68**
- **Telcordia/Bellcore GR-1089**
- **UL/IEC 60950**

These standards prescribe various tests to simulate two basic abnormal field conditions:

Lightning - To protect equipment from the effects of surges caused by lightning, overvoltage protectors including SIDACtor®, TISP®, thyristor, etc. are utilized in various configurations.

Power Cross - Equipment certified to GR-1089 and UL/IEC 60950 must also comply with tests simulating contact of a power line with a telephone line. In these 600 volt tests, protection must be provided to prevent shock and fire hazard, as well as maintain integrity of the overvoltage protector.

Bel's SMP fuses provide stand-alone power cross protection and are rated to withstand the various lightning surge conditions that are applied to telecommunications equipment.

Most designs typically employ discrete fuses and overvoltage protectors, usually in surface mount packages, on the main circuit board. As higher density chipsets are introduced, the number of Tip and Ring channels per board has increased dramatically, requiring a greater number of components to be placed.

Bel's integrated SIP protection modules combine fuses, overvoltage protectors and resistor networks in space-saving, vertical mount configurations, freeing up valuable lateral board space.

Fuse Products

Circuit Protection SIP Modules

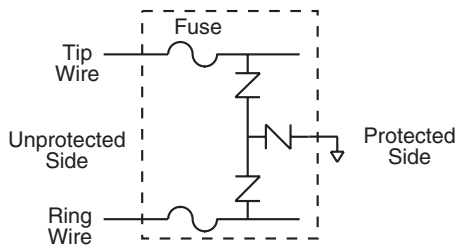


CPSIP1002

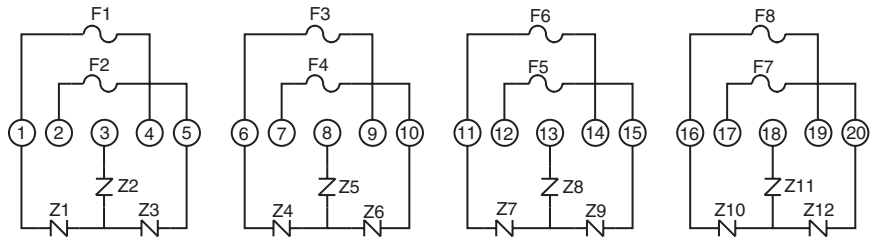
SCHEMATIC

STANDARD 4-CHANNEL DESIGNS

0808-4011-xx "Y" Protection Scheme

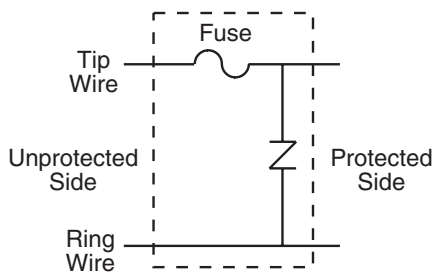


"Y" Inter-wire and Ground Protection

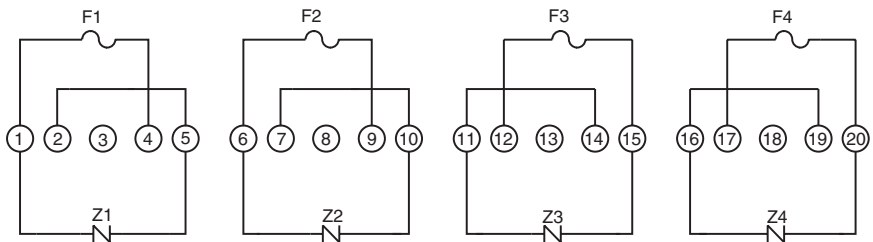


F1 - F8 = Bel SMP 1.25A
Z1 - Z12 = SIDACtor®, TISP®, thyristor, etc. as specified by customer.

0808-4013-xx 2-Wire Protection Scheme

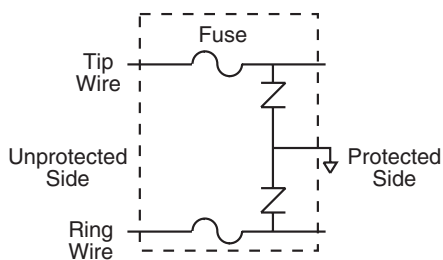


2-Wire Protection

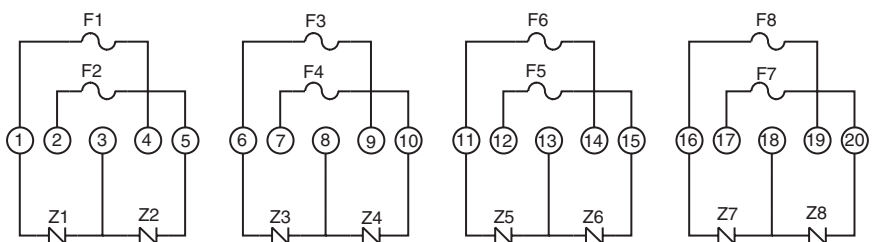


F1 - F4 = Bel SMP 1.25A
Z1 - Z4 = SIDACtor®, TISP®, thyristor, etc. as specified by customer.

0808-4014-xx Wire to Ground Protection Scheme



Wire to Ground Protection
or "V" Protection

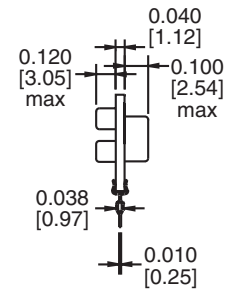
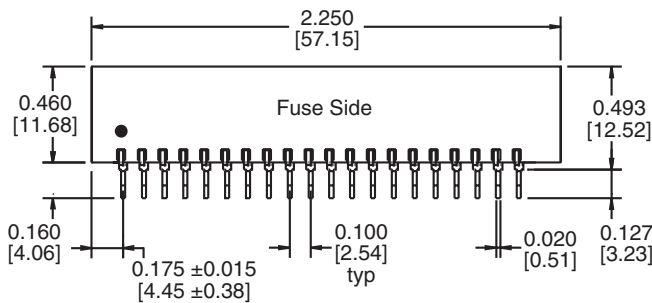


F1 - F8 = Bel SMP 1.25A
Z1 - Z8 = SIDACtor®, TISP®, thyristor, etc. as specified by customer.

MECHANICALS

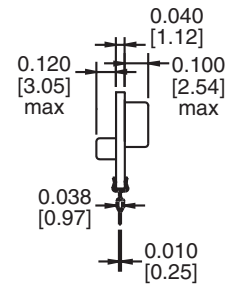
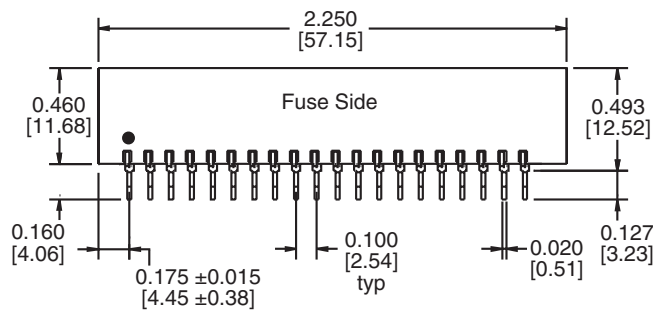
STANDARD 4-CHANNEL DESIGNS

0808-4011-xx
0808-4014-xx



Dimensions are in inches [millimeters].
Standard dimension tolerance is ±0.005 [0.13] unless otherwise noted.

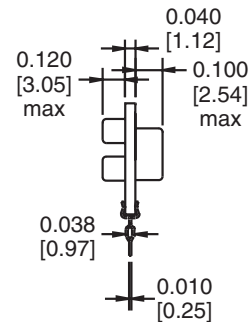
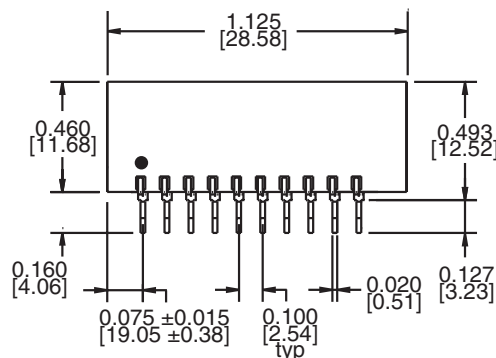
0808-4013-xx



Dimensions are in inches [millimeters].
Standard dimension tolerance is ±0.005 [0.13] unless otherwise noted.

STANDARD 2-CHANNEL DESIGN

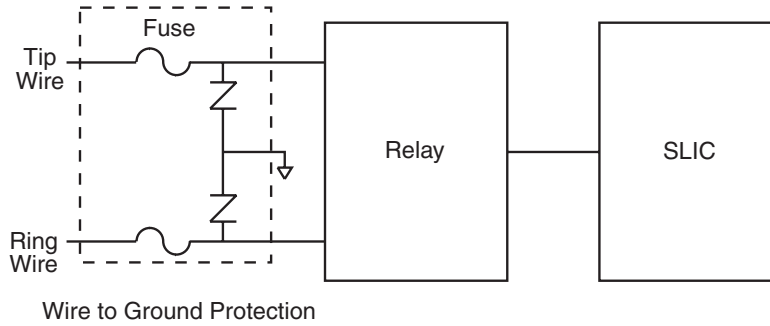
0808-2011-xx



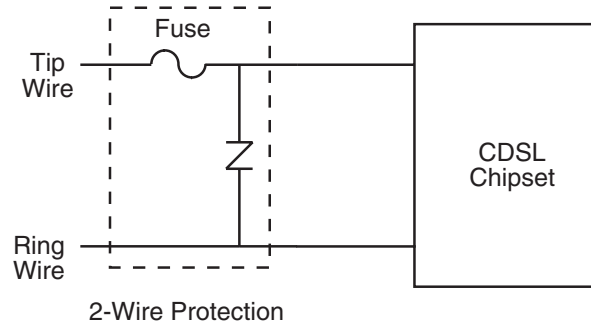
Dimensions are in inches [millimeters].
Standard dimension tolerance is ±0.005 [0.13] unless otherwise noted.

TYPICAL APPLICATION CIRCUITS

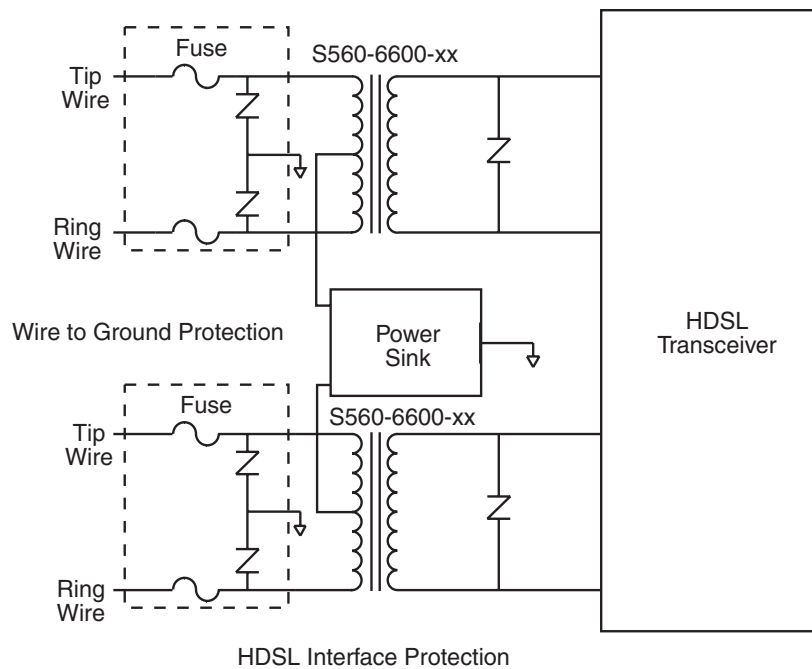
**Analog Line Card
Circuit Protection**



**Digital Line Card
2-Wire Protection**



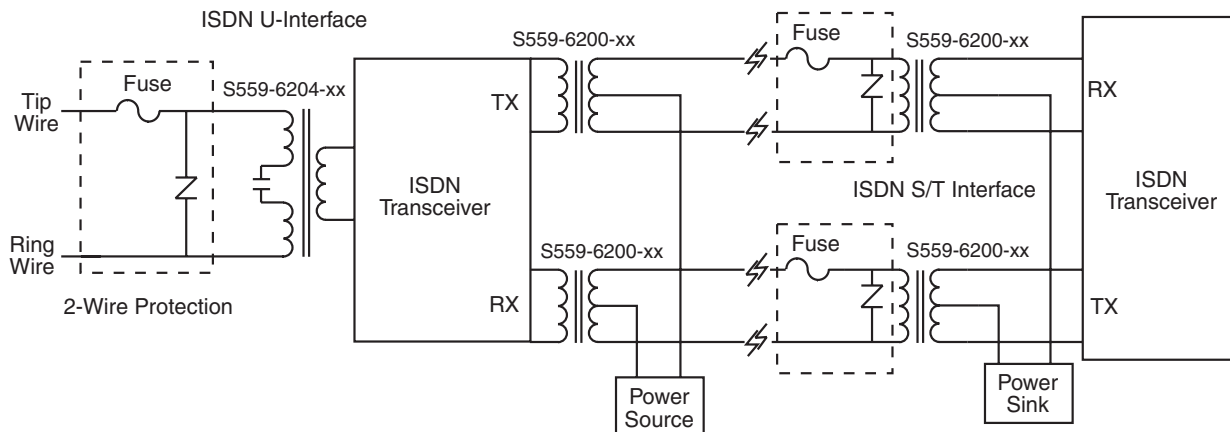
**HDSL
Interface Protection**



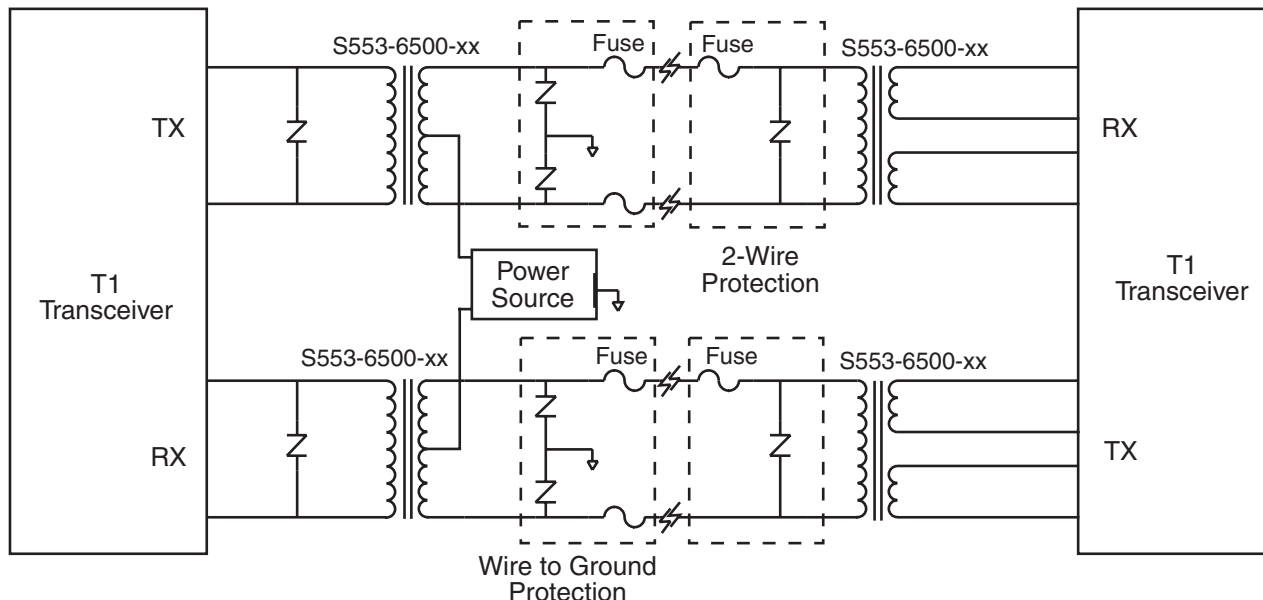
Fuse Products Circuit Protection SIP Modules

TYPICAL APPLICATION CIRCUITS

ISDN Digital Line Card Circuit Protection



T1/E1 Circuit Protection



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