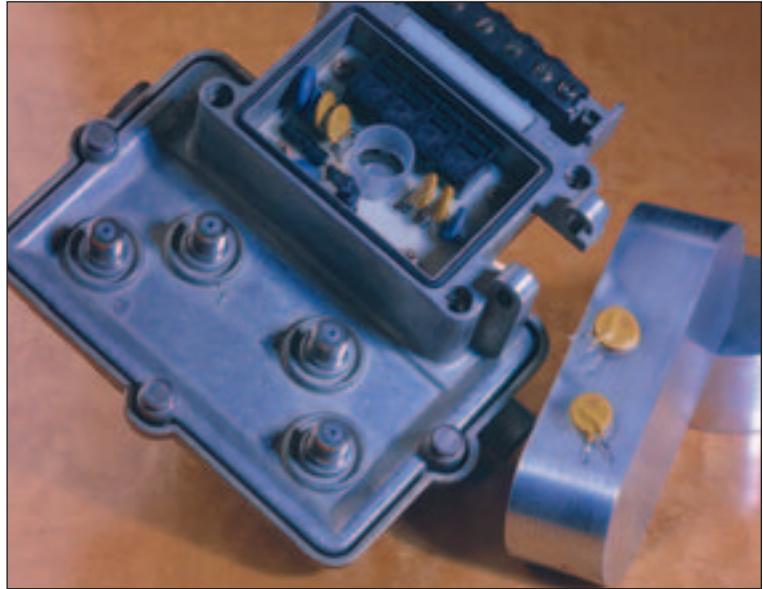


Cable Telephony/ Cable Power Passing Tap

Application Overview

Problem/Solution

Various systems are emerging that will bring more bandwidth to the home for the combined demands of fast internet service, traditional telephone service, and television service. One method uses a single coaxial cable to carry these services. The coax cable connects to the input side of a network interface unit (NIU) at the building entrance. At the NIU, telephone, data, and television signals are separated for delivery to respective equipment in the customer premise. The output ports from the NIU may be one or more twisted pair outputs for telephone service, cable outputs for television service, and/or an additional cable output for cable modem service.



Power for the NIU electronics may be provided from the cable plant via the coax cable or a twisted pair line.

In order to facilitate provision of such services, cable power tap manufacturers need a way to quickly and easily connect services to and from the home. The PolySwitch BBR product series is designed to plug into power passing taps in series with the powered coax or twisted pair wiring to complete the circuit and enable service to the customer premise. In addition to providing the service connection, the PolySwitch device also serves to limit current in the event of power cross faults on the coax, such as might be generated by phase lags in the multi-phase power distribution system.

At the customer site, the copper telephone lines from the NIU

throughout the customer premise are susceptible to faults due to installation errors, such as an errant staple or accidental connection to the home electrical wiring (typically, 120V_{AC} or 240V_{AC} depending on regional power distribution standards), which can cause damage to the equipment or the home if left unprotected.

PolySwitch resettable devices and SiBar thyristors provide coordinated self-resettable protection against these faults, thereby protecting the NIU electronics from damage and minimizing field service and warranty costs.

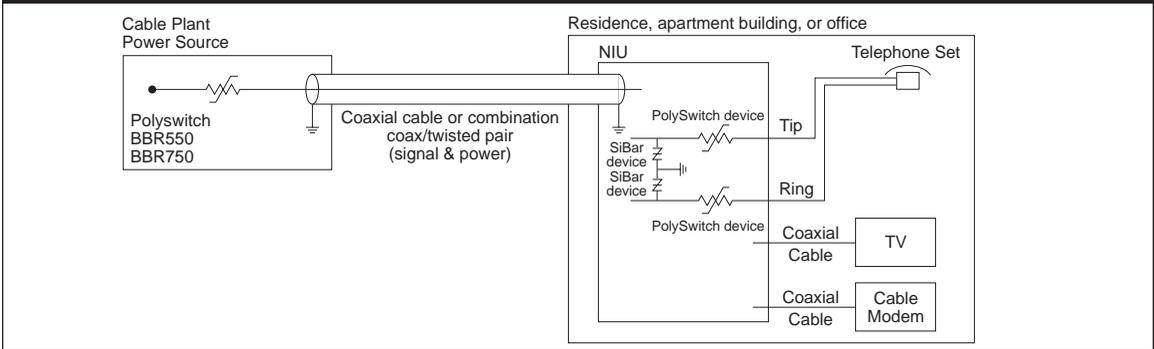
Figure 1 shows the cable power tap and cable telephony NIU applications.

Typical Protection Requirements
Article 830 was added to the 1999

National Electrical Code to dictate requirements for network powered broadband communications systems. Table 830-4 states that maximum power must be limited to 200VA in no greater than 60 seconds. The PolySwitch BBR series of devices can be used as current-limiting devices to meet the maximum current and volt-ampere requirements defined in this table. Typically, power taps for single family residences will supply 350mA through each PTC to the NIU; for apartment buildings, offices and other multi-dwelling units currents of 500mA may be supplied.

At the telecom interface, current systems provide powering either from the network via twisted pair (typically 40-90V_{AC} rms) or from local DC battery power (typically 42-60V_{DC}).

Figure 1. Cable Telephony/Cable Power Architecture



Overvoltage protection requirements depend upon the exact powering and ringing configuration used; however, for most applications, standard POTS voltage and current levels are expected.

Device Selection

For residential cable power tap applications, the BBR550 is the recommended PolySwitch device. It has a hold current of 550mA at 20°C and a 90V maximum rating. This radial leaded device can be inserted by a properly trained technician in the field when cable telephony service to a particular customer is to be activated and may be unplugged to terminate service. For larger cable powering systems, such as those for apartment buildings or small office buildings, higher current levels may be supplied. For these

applications, the BBR750 with a 750mA hold current at 20°C is recommended.

At the NIU, PolySwitch devices should be selected with voltage ratings based on the regulatory standards for which the equipment is being designed. Many cable telephony equipment manufacturers are choosing to comply with the Intrabuilding recommendations in Telcordia GR-1089, since their NIU devices do not directly connect to the PSTN infrastructure. Surface-mount TS250 and TSV250 and radial-leaded TR250 devices are applicable. For manufacturers who choose to comply with the full Telcordia GR-1089 standard or with UL60950 and TIA-968-A, (formerly FCC Part 68), surface-mount TS600, or TSM600 and radial-leaded TR600 devices

are applicable. For ITU-T K.20/21 standards, TR250 and TS250 devices are suitable. TSL250-080 is another alternative for applications requiring GR-1089 intrabuilding protection.

SiBar devices should be selected with surge current ratings based on the regulatory standards for which the equipment is being designed and with off-state voltage ratings based on normal system operation. SiBar TVB270SA, TVB270SB, and TVB270SC devices with off-state voltage V_{DM} ratings of 270V are applicable for most systems.

Table 1 provides recommended PolySwitch and SiBar devices for the phone line interface applications.

Table 1. Recommended Circuit Protection Devices

Regulatory Standard	PolySwitch Device		SiBar Device
ITU-T K.20/21	TS250-130	(SMT)	TVB270SA
Telcordia GR-1089 Intrabuilding	TSV250-130	(SMT)	
	TR250-120	(Thru-hole)	
	TR250-145	(Thru-hole)	
Telcordia GR-1089	TSM600-250	(SMT)	TVB270SC (with TSM600)
	TS600-200	(SMT)	TVB270SB
	TR600-160	(Thru-hole)	
UL 60950 and TIA-968-A, (formerly FCC Part 68)	TSM600-250	(SMT)	TVB270SC (with TSM600)
	TS600-170	(SMT)	TVB270SA (ungrounded)
	TRF600-150	(Thru-hole)	TVB270SB (grounded)
Telcordia GR-1089 Intrabuilding	TSL250-080	(SMT)	TVB270SA

