



## AC Protection

The tii HNP proprietary AC protection circuit imparts very low capacitance between the Line and Neutral conductors, which in turn maximizes the data rate transmission characteristics of a HomePlug network. The capacitance of tii HNP and a competitor product is shown below:

Capacitance (Line to Neutral)	
tii HNP	0.000258 $\mu$ F (or 258 pF)
Competitor Product	0.668 $\mu$ F (or 668,000 pF)

The tii HNP AC protection is provided by a proprietary hybrid protection circuit that coordinates Metal Oxide Varistors (MOV) in series with tii's fast responding, high surge handling, 3-electrode Gas Discharge Tube (GDT). The MOVs are specifically selected with a lower clamping voltage rating than conventional (MOV only) protectors currently available. The tii heavy duty GDT has years of unparalleled service in the telecommunications' industry as a primary signal-line protector.

The unique combination of MOVs in series with a GDT allows the tii HNP to respond to hazardous incoming surges within a micro-second. Once the GDT is activated, the steady state clamping voltage is approximately 280 volts, or approximately 50 volts lower than competitive products.

## Insertion Loss

The tii HNP proprietary hybrid protection circuit not only provides the best protection it has also demonstrated superior insertion loss characteristics when compared to other HomePlug compliant protectors. HomePlug technology version 1.0 uses carrier frequencies from 4.00 MHz to 21 MHz while the next generation HomePlug technology version 2.0-AV uses carrier frequencies from 2.00 MHz to 27 MHz. The HNP meets both version 1.0 as well as 2.0-AV.

The following chart compares the insertion loss characteristics of the tii HNP against a competitors' Home Plug compatible product:

Insertion Loss					
	2 MHz	5 MHz	10 MHz	20 MHz	30 MHz
<b>tii HNP (dB)</b>	1.50	0.55	1.25	0.5	1.3
<b>Competitor (dB)</b>	0.5	1.74	6.86	16.26	17.1

Note : In order to improve the insertion loss characteristics, some competitive powerline protector suppliers have compromised on the level of protection on the HomePlug circuit in order to reduce the resultant capacitance on the powerline. While this does somewhat improve their insertion loss performance as seen in the table above, it significantly degraded the protection.

