

## Product Specification File

**Model Name: NSP-002**

**Product Name : VDSL Universal Splitter**



**\*Netsys reserves the right to change specifications without prior notice.**

Revision	Realized By	Modification Description	Date	Last Pages
A01	Johnny	Datasheet updated	JUN-13-2008	8
A02	Johnny	Datasheet updated	MAR-3-2009	8
A03	Johnny	Datasheet updated	JUN-26-2009	8

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### **1 Preliminary:**

The NSP-002 is a splitter module that has been specifically designed to implement the functionality of low pass filter in VDSL over ISDN application.

NSP-002 had also included protection circuit to provide additional protection against line overstress which could damage the splitter itself .

### **2 Customer reference documents:**

None

### **3 Standard reference documents:**

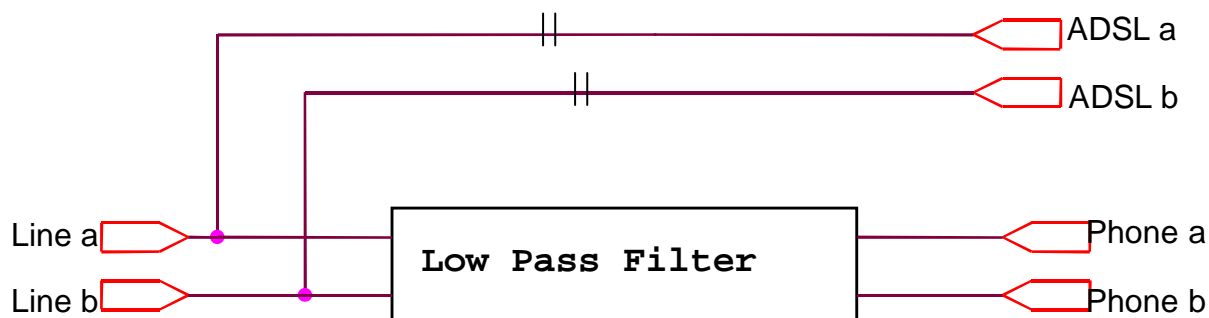
- ETSI TS 101 952-2-3
- ETSI TS 101 952-1-4

### **4 Features**

- Comply to K21
- Compact package, includes connectors for ease of installation
- 100 mA DC Loop Current Capacity

## 5 Design Requirement

### 5.1 Schematic



### 5.2 Electrical Performance

#### 5.2.1 General conditions

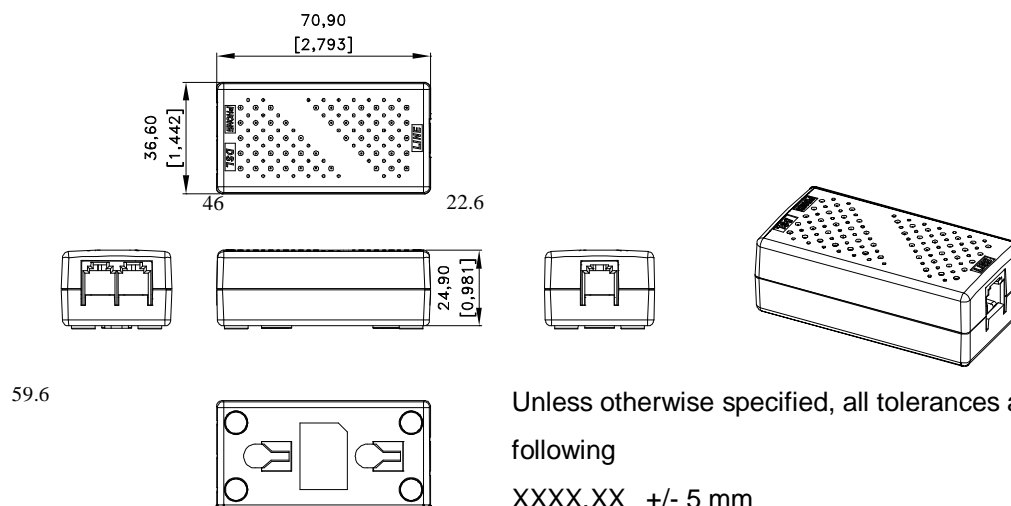
General conditions		
	Conditions	Values
Splitter bandwidth		DC-94KHz
Nominal impedance ISDN	$Z_{ISDN}$	150 ohms
Nominal impedance LINE	$Z_{LINE}$	135 ohms
Modem impedance		100 ohms
POTS impedance		270 ohms , 600 ohms
$Z_{VDSL-I}$	0Hz ~ 4KHz	<p><math>L = 82 \mu H</math>     <math>R = 100 \Omega</math></p>
VDSL band impedance	150KHz ~ 30MHz	100Ω
Max. operating voltage to ground		250VDC
DC Loop current		<80mA

### 5.2.2 Electrical Requirement

Electrical Requirement		
DC requirements		
	Conditions	Values
TIP to RING	100VDC	> 5 MΩ
TIP to RING	ISDN port shorted	<12.5Ω
DC feeding current		< 60 mA
ISDN Pass band loss requirements		
Insertion loss w/ ZVDSL-I	(Z <sub>ISDN</sub> )/1 kHz to 60 kHz	<1.2 dB
	(Z <sub>ISDN</sub> )/60kHz to 80 kHz	<2.0 dB
Return loss w/ ZVDSL-I	(Z <sub>ISDN</sub> )/1 kHz to 60 kHz	<16 dB
	(Z <sub>ISDN</sub> )/60kHz to 80 kHz	<14 dB
Delay distortion	300 Hz to 80 kHz	< 20 usec.
POTS Pass band loss requirements		
Insertion loss (w/ and w/o ZVDSL-I)	1000Hz	<1.0 dB
Insertion loss (w/ and w/o ZVDSL-I)	11.94Hz–17KHz(Load 200ohms)	<3.0 dB
Attenuation distortion (w/ and w/o ZVDSL-I)	600Hz-1.6KHz (Ref 1KHz)	<+/-0.5 dB
	300Hz-3.4KHz (Ref 1KHz)	<±1.0 dB
	200 Hz<f<4 kHz	<±1.0 dB

Stop band requirements					
Splitter parameter	Range	Value	Port		
			VDSL	ISDN	LINE
Isolation requirements	138 kHz to 150 kHz	>55dB			
	150 kHz to 1.1MHz	>65dB	ZVDSL-I	ZISDN	ZLINE
	1.1MHz to 30MHz	>55dB			
VDSL Insertion Loss	120 kHz to 170 kHz	<3 dB	ZVDSL-I	ZISDN	ZLINE
	170 kHz to 30MHz	<1dB		ZPOTS	
Longitudinal conversion loss LCL	3.4KHz to 30kHz	> 40 dB	-	-	-
	30KHz to 1104kHz	> 50 dB	-	-	-
	1104KHz to 30MHz	> 30 dB	-	-	-

### 5.3 Mechanical



Unless otherwise specified, all tolerances are as following

- XXXX.XX +/- 5 mm
- XXX.XX +/- 2 mm
- XX.XX +/- 1mm
- X.XX +/- 0.25 mm
- 0.XX +/- 0.05 mm

### 5.4 Pin Assignments

Connector	Function	Style	Tip	Ring
J1	Line	RJ11	Pin3	Pin4
J2	Modem	RJ11	Pin3	Pin4
J3	Phone	RJ11	Pin3	Pin4

## 6 Environmental conditions:

### 6.1 Resistibility to over voltages and over currents:

Comply with the resistibility requirements per ITU-T Recommendation K.21 electrical safety requirements

### 6.2 Climatic conditions:

#### 6.2a. Operating temperature:

-20 °C to +60°C

#### 6.2b. Storage and transportation:

Low ambient temperature - 40°C

High ambient temperature +80°C

#### 6.2c. Operation humidity:

0 to 95% (non-condensing)

## 7 Reliability conditions:

### 7.1 Thermal shock:

Temperature from -20 °C to +85 °C for 5 cycles

### 7.2. Temperature humidity exposure:

+50 °C / 95 RH, 96hrs

### 7.3. Vibration test:

Random vibration / Overall: 1.15 g rms

Freq. (Hz): 1 → 4 → 100 → 200

PSD (g<sup>2</sup>/ Hz): 0.0001 → 0.01 → 0.01 → 0.001

Test Axis / Time: Top / 30 mins Bottom / 10 mins

X axis / 10 mins Y axis / 10 mins

## 8 Note: