ADSL / VDSL
Low Pass Filter LCR Modules
Introduction

The market of the telecommunication is dominated by the XDSL technology (Digital Subscriber Line). Under the different XDSL variations the ADSL/VDSL gets an outstanding part. ADSL with its asymmetric performance, a high download rate and a small upload rate optimized for Internet use, needs its special hardware on the CO (Central Office) and CPE (Customer Premised Equipment) side. ADSL linecards installed by the provider at the central relay facilities and an ADSL modem for the subscriber require a POTS- (Plain Old Telephone Service, analogue telephone) or ISDN-Splitter to separate the telephone and ADSL signals, which are transmitted along one cable. Inductive components are used in ADSL for various applications. VDSL is the reasonable further development of the XDSL technology, driven by extremely high downloads up to 50Mb/s for several applications, like TV. Especially HDTV with its high data rates VDSL gives a possibility to manage all these demands in one technical solution for a high reachability of the customers.

VAC’s current product spectrum for the ADSL/VDSL system fulfils the market demands and the customers needs. Besides the established filter components, splitters CPE and splittercards CO for ADSL/VDSL, VAC also produces for ADSL/VDSL the new low pass filter LCR modules. Besides the LCR Modules designed according the international ITU-T and ETSI ATA standards, VAC also develops customized LCR modules with additional requirements. Development work is based on a close cooperation between the customer and VAC and on the specifications of the customer. Afterwards the modules are manufactured by VAC in process and cost optimized plants. Our in-depth knowledge of the application fields and technical requirements puts us in a position to find the ideal solution and turns this into an innovative product. The VAC ADSL/VDSL LCR modules are developed with a maximum reduction of PCB space, including all components for a splitter and no need for additional capacitors or resistors. They were all delivered with a fully tested filter performance.

The advantages of using VAC ADSL/VDSL LCR modules including all inductors, capacitors and resistors are:

- simple PCB layout (2 pins for Line in and 2 pins for Line out)
- very compact designs for increasing the line density
- cost optimized designs and production
- fully RoHS compliant
- completely tested filter with excellent insertion loss, return loss and attenuation characteristics
- designed according to the international ITU-T and ETSI ATA standards
ADSL/VDSL low pass filter LCR modules of following applications are available. Technical details on request. Designed according to:

<table>
<thead>
<tr>
<th>ITU-T G992.1 Annex B (ISDN) + E3</th>
<th>PTH</th>
<th>SMD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>casing typ →</strong></td>
<td>upright</td>
<td>flat</td>
</tr>
<tr>
<td>- 4B3T (150Ω)</td>
<td>5081-101**</td>
<td>5055-008**</td>
</tr>
<tr>
<td>- 2B1Q (135Ω)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ETSI TS 101 952-1-4 Combi (ISDN/POTS)</th>
<th>PTH</th>
<th>SMD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>casing typ →</strong></td>
<td>upright</td>
<td>flat</td>
</tr>
<tr>
<td>- 4B3T (150Ω) + (220 Ω + (820 Ω // 115 nF))</td>
<td>5081-101**</td>
<td>5055-008**</td>
</tr>
<tr>
<td>- 2B1Q (135Ω) + (220 Ω + (820 Ω // 115 nF))</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 4B3T (150Ω) + (270 Ω + (750 Ω // 150 nF))</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 2B1Q (135Ω) + (270 Ω + (750 Ω // 150 nF))</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Combi (ISDN/POTS)</th>
<th>PTH</th>
<th>SMD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>casing typ →</strong></td>
<td>upright</td>
<td>flat</td>
</tr>
<tr>
<td>- 2B1Q (135Ω) + (600Ω)</td>
<td>5081-101**</td>
<td>5055-008**</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ITU-T G992.1 Annex A (POTS) + E1</th>
<th>PTH</th>
<th>SMD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>casing typ →</strong></td>
<td>upright</td>
<td>flat</td>
</tr>
<tr>
<td>- 600Ω, real without BT</td>
<td>K24816* / 5081-803** / 5081-503*</td>
<td>K24607*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ETSI ATA TS 101 952-1-1 (POTS)</th>
<th>PTH</th>
<th>SMD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>casing typ →</strong></td>
<td>upright</td>
<td>flat</td>
</tr>
<tr>
<td>- option (A) 270 Ω + (750 Ω // 150 nF) + 600 Ω</td>
<td>5081-801** / 5081-501**</td>
<td>-</td>
</tr>
<tr>
<td>- option (B) 270 Ω + (750 Ω // 150 nF)</td>
<td>5081-802** / 5081-502**</td>
<td>-</td>
</tr>
</tbody>
</table>

- Other filter characteristics are available on request -

---

**Europe**
VACUUMSCHMELZE GMBH & Co. KG
P.O. Box 2253
D-63412 Hanau, Germany
Tel. +49 6181 38-0
Fax +49 6181 38-2780

**America**
VAC Magnetics Corporation
101 Magnet Drive
Elizabethtown, KY 42701
Tel.: ++1 270/769-13 33
Fax: ++1 270/765-31 18

**Asia/Pacific**
VACUUMSCHMELZE Singapore Pte Ltd
300 Beach Road, #31-03 The Concourse
Singapore 199555
Tel. +65 3912 600
Fax +65 3912 601

---

Product Information
PI-XDSL_11 08/06
ADSL/VDSL Low Pass Filter LCR Modules

- casing PTH upright (5081-8xx)

- casing PTH upright (5081-5xx)

- casing PTH upright (5081-1xx)

- casing PTH flat (5055-xxx)

- casing SMD flat (5052-xxx)
ADSL/VDSL Filter Characteristics

- ITU-T G.992.1 Annex B (ISDN) + E3; 5081-101 or 5055-008 or 5052-145
  ETSI TS 101 952-1-3 , -1-4
  ISDN port 4B3T (150 Ω)
  - Insertion loss

- ITU-T G.992.1 Annex B (ISDN) + E3; 5081-101 or 5055-008 or 5052-145
  ETSI TS 101 952-1-3 , -1-4
  ISDN port 2B1Q (135 Ω)
  - Insertion loss

- Attenuation

- Return loss

- Attenuation

- Return loss
- ETSI TS 101 952 -1-4 ;  5081-101 or 5055-008 or 5052-145
  POTS port (220Ω+(820Ω//115nF))
  - Insertion loss

- ETSI TS 101 952 -1-4 ;  5081-101 or 5055-008 or 5052-145
  POTS port (270Ω+(750Ω//150nF))
  - Insertion loss

- Return loss

- Attenuation

- Attenuation

- Return loss

- Other filter characteristics are available on request
ADSL/VDSL Filter Characteristics

- ETSI ATA TS 101 952 -1-1 ; 5081-801
  POTS port (270Ω+(750Ω//150nF)+ 600Ω) option (A)
  - Insertion loss

- ETSI ATA TS 101 952 -1-1 ; 5081-802
  POTS port (270Ω+(750Ω//150nF)) option (B)
  - Insertion loss

- ITU-T G992.1 Annex A POTS +E1 ; 5081-803
  POTS port (600Ω) with BT
  - Insertion loss

- Attenuation
- ETSI ATA TS 101 952 -1-1 ; 5081-501
  POTS port (270Ω+(750Ω//150nF)+ 600Ω) option (A)
  - Insertion loss

- ETSI ATA TS 101 952 -1-1 ; 5081-502
  POTS port (270Ω+(750Ω//150nF)) option (B)
  - Insertion loss

- Other filter characteristics are available on request