

Very-Low Profile V.34 Compatible Telephone Line Interface**Description**

Xecom's XE0071, Slim-Link DAA, is a miniature, high-performance telephone interface module for applications with extreme space restrictions. The XE0071 meets FCC Part 68 rules for direct connection to the public telephone network and supports V.34 data transfer.

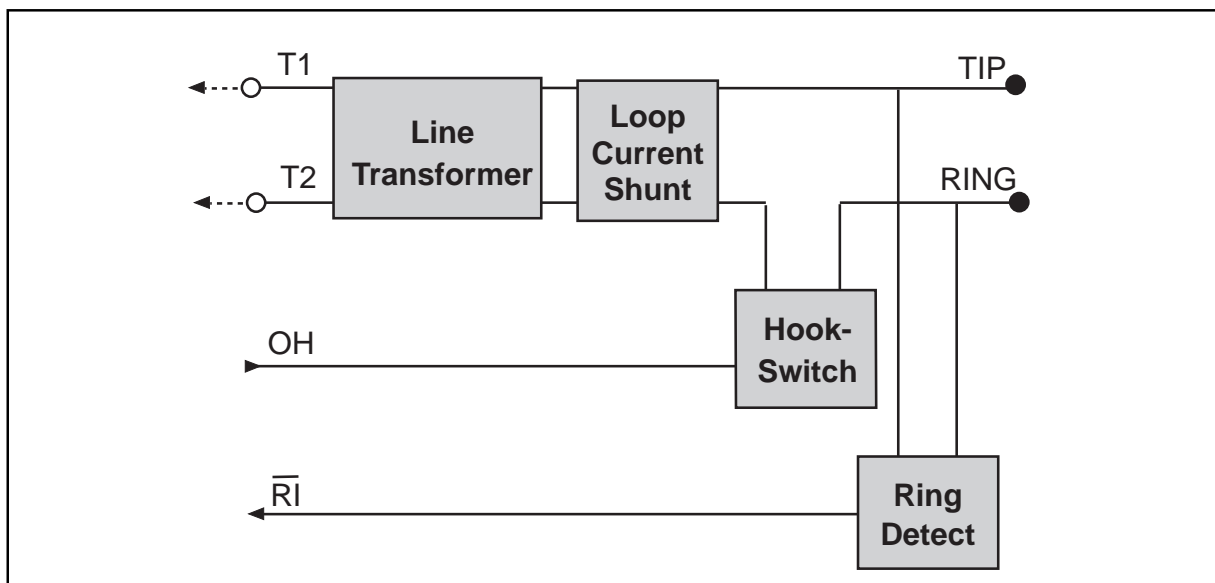
Xecom offers the XE0071 in two pin configurations. The XE0071T pins extend perpendicularly for through-hole insertion. The XE0071L pins extended laterally so that the DAA can be surface mounted into a cutout in the host printed circuit board.

Both XE0071 models provide a complete telephone line interface including the line transformer, ring detect circuit and switch hook control. Slim-Link supplies a minimum of 1500 volts isolation from the telephone line.

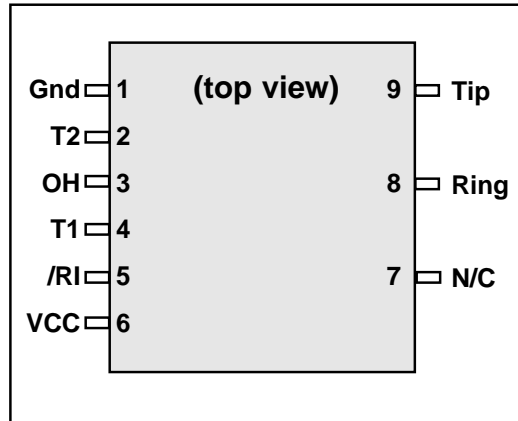
The XE0071 operates from a single power supply of either +5 volts or +3.3 volts for low power applications.

Features

- * Miniature Size: 0.75" long 0.75" wide 0.159" thin (maximum);
 - * V.34 compatible for data transfer at 33,600 bps;
 - * FCC Part 68 Compliant;
 - * Low Total Harmonic Distortion;
 - * Ring Detection;
 - * 3.3 Volt or 5 Volt Operation
 - * Integral Hookswitch
 - * 2 Available Pin Styles
- XE0071L - Pins extend laterally for mounting within PCB cutout
- XE0071T - Through-Hole Pins

XE0071 Block Diagram

XE0071 Pin Configuration

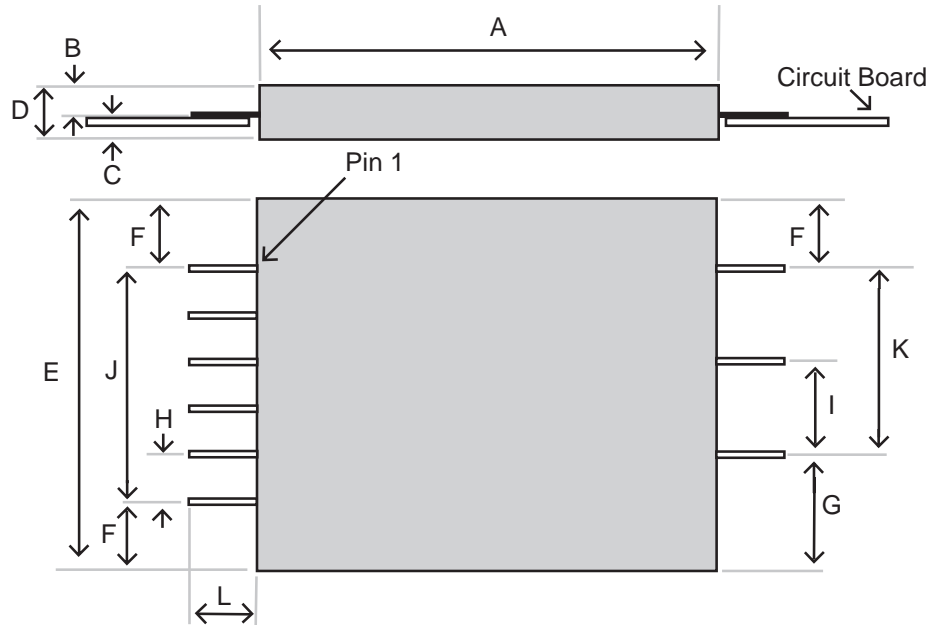


XE0071 Pin Descriptions

| Pin Name | Description |
|----------|--|
| 1 GND | This signal acts as common reference for all control signals. Signals on T1 and T2 are not referenced to ground. |
| 2 T2 | T2 connects directly to the secondary side of the telephone line transformer. |
| 3 OH | Hook-switch relay control. A high on OH closes the internal relay and connects the equipment to the telephone line. |
| 4 T1 | T1 connects directly to the secondary side of the telephone line transformer. |
| 5 /RI | Ring Indicate, output, active low, TTL, /RI provides a half-wave representation of the Ring as it appears on the telephone line. |
| 6 VCC | VCC provides the power source for the hook-switch control. The XE0071 operates with either 3.3 volt or 5 volt power. |
| 7 N/C | No Connect |
| 8 Ring | Ring (RJ11 Pin 4), one of two signals which form the telephone network connection. This device is not sensitive to the polarity of the telephone line's battery voltage. Ring has 1500 volts isolation from the rest of the circuitry. This isolation must be preserved throughout the system. |
| 9 Tip | Tip (RJ11 Pin 3) provides the second connection to the telephone network. Tip has 1500 volts isolation from the rest of the circuitry. This isolation must be preserved throughout the system. |

Note: Xecom placed the telephone and control leads on opposite sides of the device to assist the user in maintaining the necessary isolation between the telephone network and the user equipment. FCC Part 68 rules require 1500 volts isolation between the telephone line and all other circuits.

XE0071L Mechanical Specifications

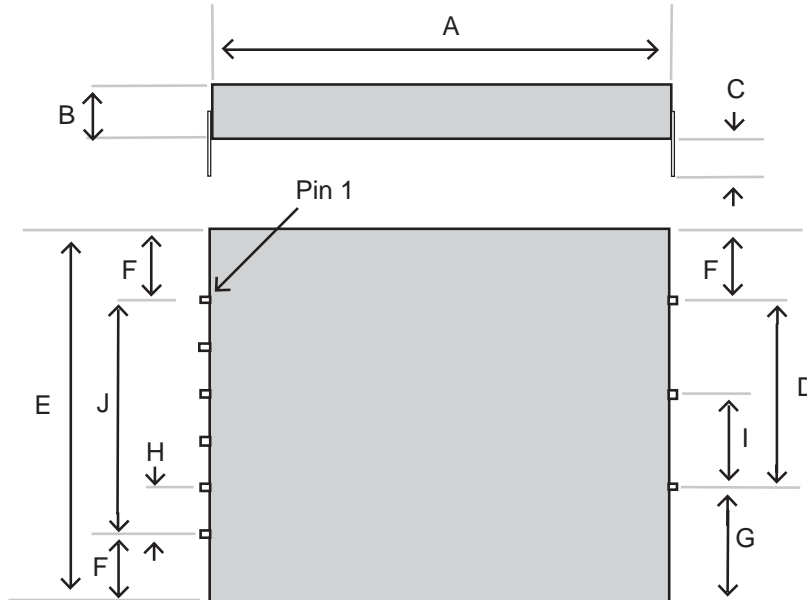


| Dim | Description | Inches | | Millimeters | |
|-----|--|--------|-------|-------------|-------|
| | | Min | Max | Min | Max |
| A | Module Width | 0.745 | 0.755 | 18.92 | 19.18 |
| B | Top of module to underside of Pin | 0.084 | 0.094 | 2.13 | 2.39 |
| C | Underside of Pin to bottom of module | 0.065 | 0.075 | 1.65 | 1.91 |
| D | Module height at thickest point | 0.149 | 0.159 | 3.78 | 4.04 |
| E | Module Length | 0.745 | 0.755 | 18.92 | 19.18 |
| F | End of Pin Row to module edge | 0.120 | 0.130 | 3.05 | 3.30 |
| G | Pin 7 to module edge | 0.220 | 0.230 | 5.59 | 5.84 |
| H | Pin Spacing (control side, center to center) | 0.095 | 0.105 | 2.41 | 2.67 |
| I | Pin Spacing (Telco side, center to center) | 0.195 | 0.205 | 4.95 | 5.21 |
| J | Pin Row Length (control side) | 0.495 | 0.505 | 12.57 | 12.83 |
| K | Pin Row Length (Telco side) | 0.395 | 0.405 | 10.03 | 10.29 |
| L | Pin Length | 0.045 | 0.055 | 1.14 | 1.40 |

Notes: Dimension D is not uniform. This drawing shows the module's maximum envelope.

Pins are 0.010 inches by 0.020 inches, tin plated.

XE0071T Mechanical Specifications



| Dim | Description | Inches | | Millimeters | |
|-----|--|--------|-------|-------------|-------|
| | | Min | Max | Min | Max |
| A | Module Width | 0.745 | 0.755 | 18.92 | 19.18 |
| B | Module height at thickest point | 0.149 | 0.159 | 3.78 | 4.04 |
| C | Pin Length | 0.125 | 0.200 | 3.18 | 5.08 |
| D | Pin Row Length (Telco side) | 0.395 | 0.405 | 10.03 | 10.29 |
| E | Module Length | 0.745 | 0.755 | 18.92 | 19.18 |
| F | End of Pin Row to module edge | 0.120 | 0.130 | 3.05 | 3.30 |
| G | Pin 7 to module edge | 0.220 | 0.230 | 5.59 | 5.84 |
| H | Pin Spacing (control side, center to center) | 0.095 | 0.105 | 2.41 | 2.67 |
| I | Pin Spacing (Telco side, center to center) | 0.195 | 0.205 | 4.95 | 5.21 |
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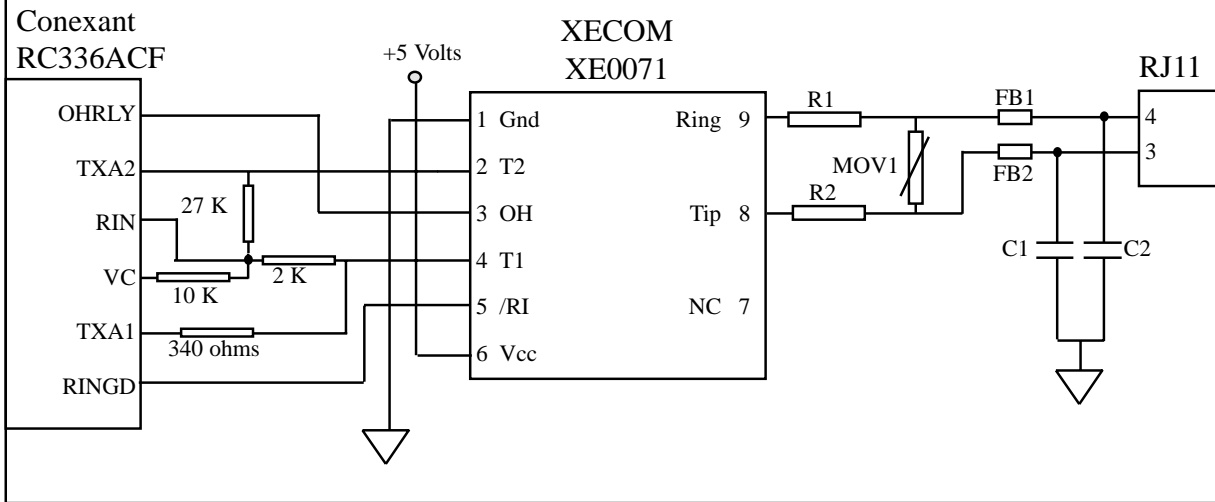
XE0071 Electrical Specifications ($T_a = 0$ to 70 degrees C)

| Parameter | Conditions | Min | Typ | Max | Units |
|-----------------------------|--|-----|-----|-----|-------|
| Power Supply Current | Off Hook, 5.0 Volts | | 10 | 15 | mA |
| | Off Hook, 3.3 Volts | | 6.5 | 10 | mA |
| Transmit Insertion loss | 600 Ohm Impedance, 1000 Hz | 1.7 | 2.7 | 3.7 | dB |
| Receive Insertion loss | 600 Ohm Impedance, 1000 Hz | 1.7 | 2.7 | 3.7 | dB |
| Line Impedance | At 1000 Hz, Rm 340 ohms | 540 | 600 | 660 | Ohms |
| Coupler Matching Impedance | Input impedance to T1 & T2 | 320 | 340 | 360 | Ohms |
| Ring Detect Sensitivity | Min. AC voltage between Tip & Ring Type B ringer (on-hook) | 38 | | 150 | Vrms |
| Ring Detect Peak Current | Ring voltage of 40 Vrms | 100 | | | uA |
| Ring Detect Idle Current | No Ringing Voltage present | | | 10 | uA |
| Ring Indicate Output | Ring Voltage present | | 0.2 | 0.5 | Volts |
| Hook Switch Control Voltage | ON: (off-hook), VCC = 5 Volts | 2.0 | 3.0 | | Volts |
| | OFF: (on-hook) | | 0.2 | 0.5 | Volts |
| Hook Switch Control Current | VCC = 5 Volts | | 15 | 25 | mA |

Absolute Maximum Ratings

| | |
|---|----------------|
| Storage Temperature | -25°C to +85°C |
| Operating Temperature Range | 0°C to +70°C |
| Maximum Lead Temperature (soldering 2 seconds per wave) | 260°C |

XE0071 Typical Connection Diagram



Recommended Parts

| <u>Designation</u> | <u>Description</u> |
|--------------------|--|
| C1, C2 | 470 picofarad, 3000 Volts (Sprague Part Number 30GA-T47) |
| FB1, FB2 | Ferrite Beads (TDK Part Number CB30-453215B) |
| MOV1 | Typical Breakover 310 volts (Teccor Part Number P3100BA70) |
| R1, R2 | Resistor 10 ohms, 1/2 Watt |

FCC Part 68 Instructions

When developing a product to be connected to the telephone line, it is necessary to use a circuit known as a Data Access Arrangement (DAA) approved by the appropriate governmental agency. In the US this agency is the Federal Communications Commission (FCC), while in Canada it is Industry Canada (IC). These agencies test and approve the product to ensure that it meets their specifications, thereby protecting the telephone system from damage and protecting the user from high voltage transients (such as lightning strikes) which may come down the telephone line.

The XE0071 has been designed to meet all FCC Part 68 requirements for hazardous voltage, line impedance and leakage current. If the system transmits data, synthesized voice, or DTMF tones on the telephone line, the user must certify that the signals transmitted meet basic FCC requirements for maximum transmission levels, out of band energy and billing delay. Full details may be obtained from the FCC under Part 68 of the FCC Rules and Regulations, or in Title 47 of the Code of Federal Regulations, however the basic requirements are as follows:

1. Maximum Transmit Level

For the normal “permissive” (standard) telephone line, equipment which transmits data (such as a modem) must not exceed a transmission level of -9 dBm.

2. Out of Band Energy

Data equipment must not transmit “out of band” energy on the telephone line which exceeds the following limits:

| Frequency | | Range | Max. Power |
|-----------|----|---------|------------|
| 3995 Hz | to | 4005 Hz | -27 dBm |
| 4005 Hz | to | 12 kHz | -20 dBm |
| 12 kHz | to | 90 kHz | -55 dBm |
| 90 kHz | to | 270 kHz | -55 dBm |
| 270 kHz | to | 6 MHz | -15 dBm |

3. DTMF Transmission Level

If the system is capable of DTMF dialing, the maximum DTMF transmission level must be less than 0 dBm averaged over a 3 second interval.

4. Billing Delay

A delay of 2 seconds or greater is required after the time the XE0071 is taken “off hook” and before any information is transmitted. This is required to ensure that billing information may be exchanged between telephone company central offices without interference.

The user of the XE0071 must certify to the FCC that the final system meets the requirements of Part 68 which include the criteria above as well as the high voltage protection provided by the XE0071. This is generally accomplished through an independent testing lab which tests the System and submits the proper paperwork to the FCC for approval. Since the XE0071 already complies with FCC Part 68 rules, this is a relatively simple process.

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Life Support Devices or Systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform, when properly used in accordance with instructions provided in the labeling, can be reasonably expected to result in significant injury to the user.

A Critical Component is any component of a life support device or system whose failure to perform can be reasonably expected to cause failure of the life support device or system, or to affect its safety or effectiveness.

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