

## Low-Profile, V.34 Compatible Telephone Line Interface

### Description

The XE0017 is fully-integrated, low-profile, high-performance telephone line interface module. It complies with FCC Part 68 requirements for direct connection to the public switched telephone network.

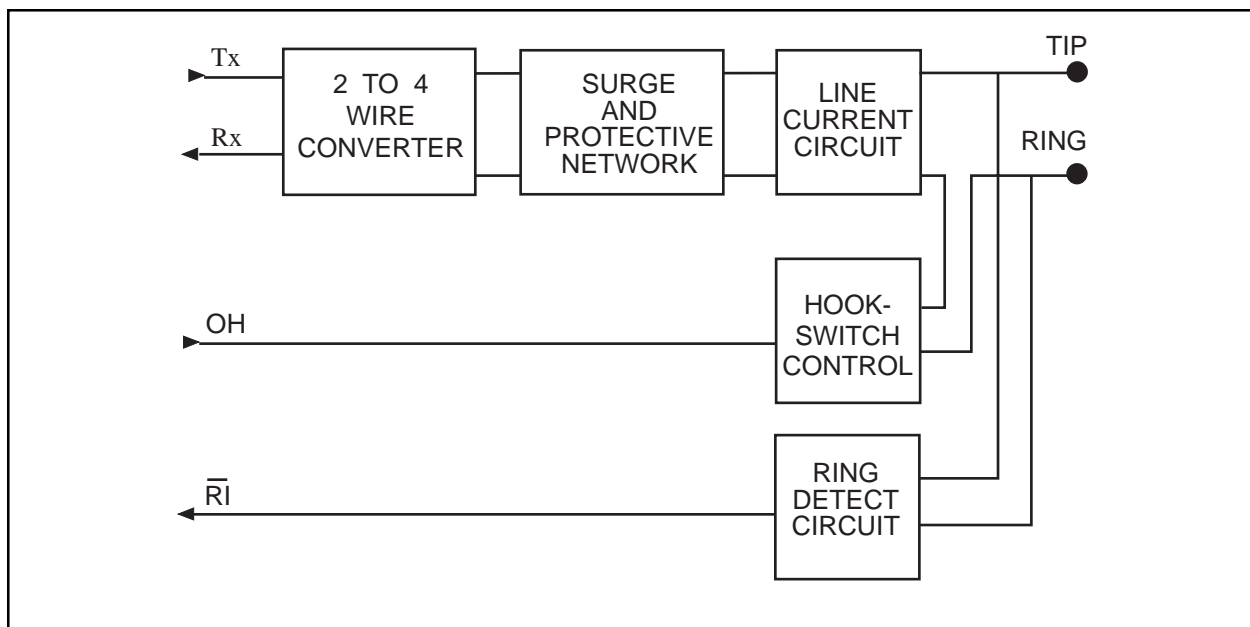
The XE0017 meets the technical requirements for data transmission at rates up to 33,600 bps. It is also suitable for fax and voice communications. The XE0017 was specifically designed to be compatible with Rockwell Socket Modems.

The XE0017 is a complete DAA. It includes a low distortion telephone line transformer, ring detector, hookswitch and 2-4 wire convertor. The 2-4 wire convertor separates transmit and receive signals. The XE0017 operates from a single +5 volt supply and fits in a 0.260 inch high package.

### Features

- \* Small Size:  
0.95 inches by 0.925 inches by 0.260 inches
- \* FCC Part 68 Compliant
- \* V.34 compatible
- \* Compatible with Rockwell's Socket Modems
- \* 2 to 4 Wire Converter
- \* Ring Detection
- \* Single +5V Operation
- \* Hookswitch Control
- \* UL and CSA Recognized
- \* Extended Temperature Range Parts available

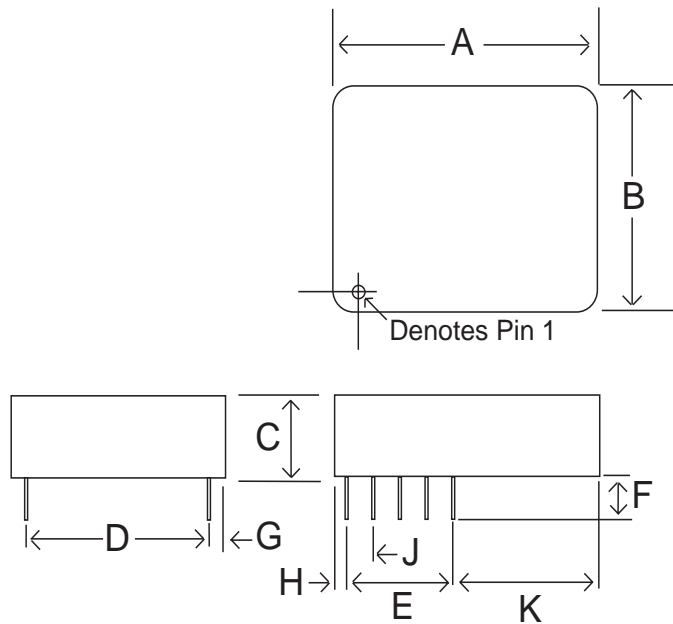
### XE0017 Block Diagram



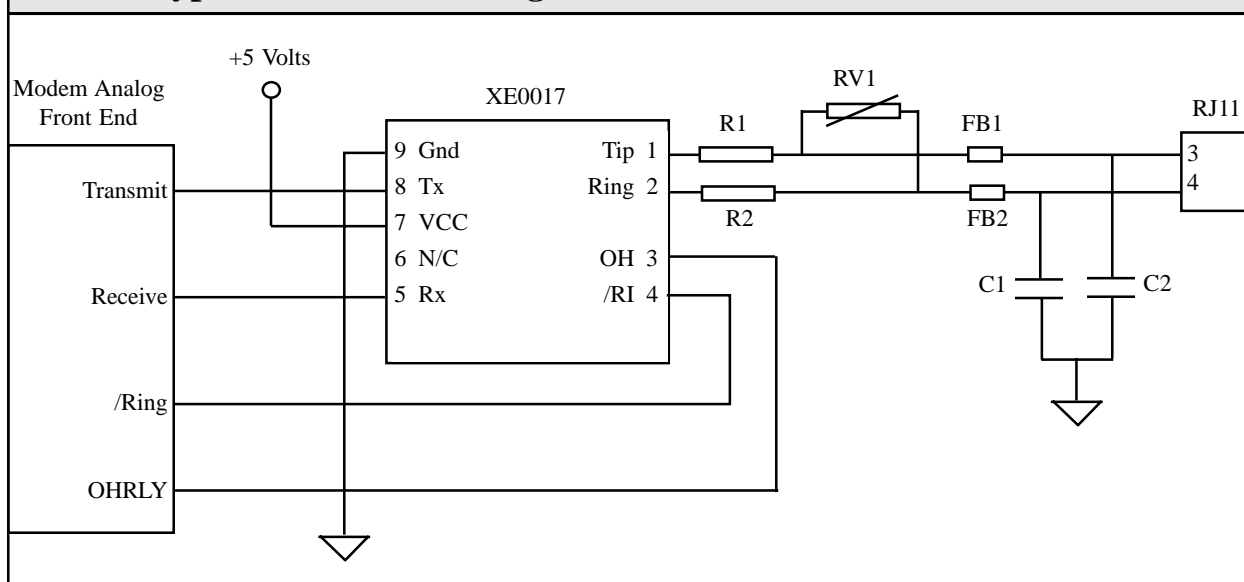
## XE0017 Mechanical Specifications

Dim	Inches		Millimeters	
	Min	Max	Min	Max
A	0.905	0.945	22.99	24.00
B	0.930	0.970	23.62	24.64
C	0.250	0.270	6.35	6.86
D	0.790	0.810	20.07	20.57
E	0.390	0.410	9.91	10.41
F	0.200	0.220	5.08	5.59
G	0.065	0.085	1.65	2.16
H	0.065	0.085	1.65	2.16
J	0.090	0.110	2.29	2.79
K	0.430	0.450	10.92	11.43

Pins are .010 by .020 inches.  
All Pins are tin-plated for solderability



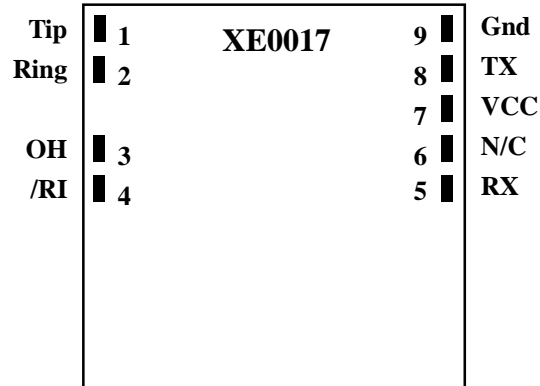
## XE0017 Typical Connection Diagram



### Recommended Parts

Designation	Description
C1, C2	470 pFd, 3000 Volts (Sprague Part Number 30GA-T47)
R1, R2	10 ohm, 1/2 Watt
FB1, FB2	Ferrite Bead (TDK Part Number CB30-453215B)
RV1	Sidactor, Minimum breakover 260 Volts (Teccor Part Number P3100BA70)

## XE0017 Pin Configuration



### XE0017 Pin Descriptions

PIN	NAME	DESCRIPTION
1	Ring	Ring connection to the phone line (RJ11 Pin 4). The Ring pin has 1500 volts isolation from the rest of the circuitry. This isolation must be preserved throughout the system. The XE0017 is not polarity sensitive.
2	Tip	Tip Connection to the phone line (RJ11 Pin 3). The Tip pin has 1500 volts isolation from the rest of the circuitry. This isolation must be preserved throughout the system.
3	OH	Hookswitch relay control. A high on OH closes the internal relay and connects the equipment to the telephone line.
4	/RI	Ring Indicate, output, active low, TTL, indicates that the modem is receiving a ring signal. /RI provides a square wave representation of the Ring signal present at Tip and Ring.
5	RX	RX provides the analog output signal from the 2-4 wire converter of the XE0017.
6	N/C	No Connection
7	VCC	+5 Volt power source
8	TX	TX provides the analog input signal to the 2-4 wire convertor of the XE0017.
9	GND	Ground

**XE0017 Electrical Specifications** (VCC= 5 Volts + 10%, Ta 0 to 70 C)

Parameter	Conditions	Min	Typ	Max	Units
Power Supply Current	XE0017 Off-hook		10	15	mA
	XE0017 On-hook		5	10	mA
XE0017 Tx Insertion loss	600 Ohm Impedance, 1800 Hz	6.0	6.5	7.0	dB
XE0017 Rx Insertion loss	600 Ohm Impedance, 1800 Hz	-0.50	0	0.50	dB
Line Impedance	At 1800 Hz	540	600	660	ohms
XE0017 Transhybrid Loss	600 Ohm Impedance, 1800 Hz	18	23		dB
Total Harmonic Distortion	600 Ohm Impedance, 1800 Hz	-72	-76		dB
Ring Detect Sensitivity	Min. AC voltage between Tip & Ring Type B ringer	38		150	Vrms
Ring Indicate Output Voltage	Ring Voltage present on Tip & Ring		0.2	0.5	Volts
Hook-Switch Control Voltage	ON: (off-hook)	2.0	3.0		Volts
	OFF: (on-hook)		0.2	0.5	Volts
Loop Current Switch Control Current			0.3	0.5	mA
Loop Current	Off-hook	20		100	mA

**Abosulte Maximum Ratings**

Storage Temperature	-25 <sup>o</sup> C to +85 <sup>o</sup> C
Operating Temperature Range	0 <sup>o</sup> C to +70 <sup>o</sup> C
Maximum Lead Temperature (soldering 2 seconds per wave)	260 <sup>o</sup> C

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## FCC Information

When developing a product to be connected to the telephone line, it is necessary to use a circuit described as a Data Access Arrangement (DAA) which is approved by the appropriate governmental agency. In the US, for example, this agency is the Federal Communications Commission (FCC), while in Canada it is the Department of Communications (DOC). 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 XE0017 has been designed to meet all FCC Part 68 requirements for hazardous voltage, surge protection and leakage current. If the system developed transmits data, 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
200Hz	to	3990Hz	-9 dBm
3990Hz	to	4005Hz	-27 dBm
4005Hz	to	16kHz	-16 dBm
8kHz	to	94kHz	-47 dBm
86kHz	to	270kHz	-46 dBm
270kHz	to	6MHz	-6 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 XE0017 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 XE0017 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 XE0017. 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 XE0017 already comply with FCC Part 68 rules, this is a relatively simple process.

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