

High-Performance PCM Repeater

GENERAL DESCRIPTION

The XR-C262 is a high-performance monolithic repeater IC for pulse-code modulated (PCM) telephone lines. It is designed to operate as a regenerative repeater at 1.544 Megabits per second (MBPS) data rates on T1-type PCM lines.

The XR-C262 operates with a single 6.8 volt power supply, and with a typical supply current of 13mA. It provides bipolar output drive with high-current handling capability. The clock-extractor section of XR-C262 uses the resonant-tank circuit principle, rather than the injection-locked oscillator technique used in earlier monolithic repeater designs. The bipolar output drivers are designed to go to their "off" state automatically, when there is no input signal present.

FEATURES

- Contains all Necessary Active Components of a PCM Repeater
- Uses L-C Tank for Clock Recovery
- Low-Voltage Operation (6.8 volts)
- Low-Current Drain (13mA, typical)
- High-Current Bipolar Output Drivers
- On-Chip ALBO Equalizer
- Automatic Zero-input Shutdown
- Increased Reliability Over Discrete Designs
- 2 Megabit Operation Capability

APPLICATIONS

- PCM Repeater for T1 Systems
- Repeater for 2 MBPS PCM Systems

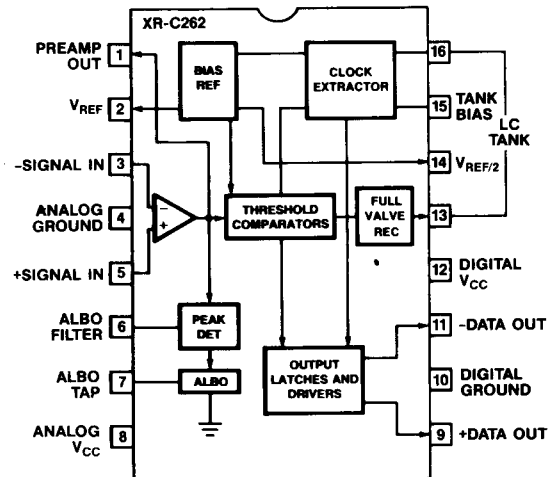
ABSOLUTE MAXIMUM RATINGS

| | |
|--|-----------------|
| Storage Temperature | -65°C to +150°C |
| Operating Temperature | -40°C to +85°C |
| Supply Voltage | -0.5 to +10V |
| Input Voltage (Except Pin 6, 7) | -0.5 to +7V |
| Input Voltage (Pin 6, 7) | -0.5 to +0.5V |
| Data Output Voltage (Pin 9, 11) | +20V |
| Voltage Surge (Pin 3, 5, 9, 11) (10 msec only) | 50V |

ORDERING INFORMATION

| Part Number | Package | Operating Temperature |
|-------------|---------|-----------------------|
| XR-C262 | Ceramic | -40°C to +85°C |

PIN ASSIGNMENT



SYSTEM DESCRIPTION

The XR-C262 contains all the active functions required to build one side of a T1 or 2 MBPS PCM repeater. T1 is the most widely used PCM transmission system, operating at 1.544 MBPS. It can operate on either pulp or plastic insulated twisted pair cables. Although the cable gauge may vary, the total cable loss should not exceed 36dB at 772kHz. For a 22 gauge pulp insulated cable and a bit error rate (BER) of less than 10⁻⁶, the max allowable repeater to repeater spacing is about 6300 feet.

Bipolar PCM signal is attenuated and dispersed in time as it travels along a transmission cable. This signal, when received, is amplified and reconstructed by the preamplifier Automatic Line Build Out (ALBO), clock and data threshold detector circuits contained within the XR-C262. Amplitude equalization and frequency spectrum shaping is achieved through the variable impedance of the ALBO port and its associated ALBO network.

Incoming pulse stream is full wave rectified and timing information is extracted by the clock threshold detector. Clock recovery is then achieved by pulsing a tank circuit tuned to 1.544MHz.

Data is sampled and stored in the output data latches. Buffer drivers are then enabled to produce precisely timed output pulses whose width and time of occurrence are controlled by the regenerated clock signal.

ELECTRICAL CHARACTERISTICS

Test Conditions: $+V_{CC} = 6.8V$, $T_A = -40^{\circ}C$ to $+85^{\circ}C$.

| PARAMETERS | LIMITS | | | UNITS | CONDITIONS |
|------------------------------------|--------|------|-------|----------|--------------------------------------|
| | MIN | TYP | MAX | | |
| Supply Current | | | | | |
| Digital Current | 7 | 10 | 13 | mA | Measured at Pin 12 |
| Analog Current | 2 | 3.5 | 5 | mA | Measured at Pin 8 |
| Total Current | | 13 | 17 | mA | |
| Preamplifier | | | | | |
| Input Offset Voltage | -15 | | +15 | mV | Measured between Pins 3 and 5 |
| DC Gain | 60 | 69 | 74 | dB | |
| Output High Level | 4.3 | | | V | Measured at Pin 1 |
| Output Low Level | | | 0.5 | V | Measured at Pin 1 |
| Clock Recovery Section | | | | | |
| Clock Drive Swing (High) | 5.1 | | | V | Measured at Pin 13 |
| Clock Drive Swing (Low) | | | 3.8 | V | Measured at Pin 13 |
| Clock Bias | 3.8 | 4 | 4.2 | V | Measured at Pin 15 |
| Clock Source Input Current | | 0.5 | 4 | μA | Measured at Pin 16 |
| Comparator Thresholds | | | | | |
| ALBO Threshold | 0.75 | 0.9 | 1.1 | V | Measured at Pin 1 relative to Pin 14 |
| Clock Threshold | 0.323 | 0.4 | 0.517 | V | |
| Data Threshold | 0.323 | 0.4 | 0.517 | V | |
| Internal Reference Voltages | | | | | |
| Reference Voltage | 5.2 | 5.45 | 5.55 | V | Measured at Pin 2 |
| Divider Center Tap | 2.6 | 2.78 | 2.85 | V | Measured at Pin 14 |
| ALBO Section | | | | | |
| Off Voltage | | 10 | 75 | mV | Measured at Pin 7 |
| On Voltage | 1.2 | | 1.7 | V | Measured at Pin 7 |
| On Impedance | | | 15 | Ω | Measured at Pin 7 |
| Filter Drive Current | 0.7 | 1 | 1.5 | mA | Drive current available at Pin 6 |
| Output Driver Section | | | | | |
| Output High Swing | 5.9 | 6.8 | | V | Measured at Pins 9 and 11 |
| Output Low Swing | 0.6 | 0.7 | 0.9 | V | $R_L = 400\Omega$ |
| Leakage Current | | | 100 | μA | $I_L = 15mA$ |
| Output Pulse Width | 294 | 324 | 354 | nsec | Measured with output in off state |
| Output Rise Time | | | 100 | nsec | |
| Output Fall Time | | | 100 | nsec | |
| Pulse Width Unbalance | | | 15 | nsec | |