



## DESCRIPTION

Clare's CYG21XX Series DAA modules provide a complete telephone line interface circuit in a small 1.07" x 1.07" x 0.4" package. The modules provide a fast and cost effective solution for designs that require an interface to the telephone line. The CYG2100 is designed to meet PTT and safety regulations in 13 countries.

*The CYG2110 and CYG2120 are designed to meet PTT regulations in France and Spain, respectively.*

## FEATURES

- Low distortion transformer signal coupling (0.01% max)
- Complete ring detector circuit
- Low power hookswitch
- Electronic inductor/gyrator circuit
- Surge protection
- V.32 bis /V.34 compatible
- PTT and safety regulations in 15 countries
- PC board mountable
- FCC Compatible

## APPLICATIONS

- Home medical devices
- Plant monitoring equipment
- Security/alarm systems
- Utility meters
- Modems
- Voicemail systems
- Vending machines
- Elevator control boxes
- Network routers
- PBX Systems
- PC mother boards
- Telephony applications
- Digital telephone answering machines

## APPROVALS

- UL recognized file #: E174201
- BSI certified:
  - BS EN 60950: 1992 Certificate # 8123
- BABT recognized; listing pending

## RATINGS (@ 25° C)

| Parameter   | Min | Typ | Max  | Units            |
|---|-----|-----|------|------------------|
| Isolation Voltage                                   | -   | -   | 1500 | V <sub>RMS</sub> |
| Operational Temperature                             | 0   | -   | 70   | °C               |
| Storage Temperature                                 | 0   | -   | 100  | °C               |
| Relative Humidity (Non-Condensing)                  | 10  | -   | 85   | %                |
| Soldering Temperature                               | -   | -   | 260  | °C               |
| Tip/Ring Load Current (continuous)                  | -   | -   | 120  | mA               |
| Hookswitch LED Drive Current                        | -   | -   | 50   | mA               |
| Hookswitch LED Reverse Voltage                      | -   | -   | 5    | V                |
| Ring Detect Phototransistor Voltage V <sub>CC</sub> | -   | -   | 20   | V                |

**Note: For Mechanical Dimensions See Pages 408-415**

## SPECIFICATIONS

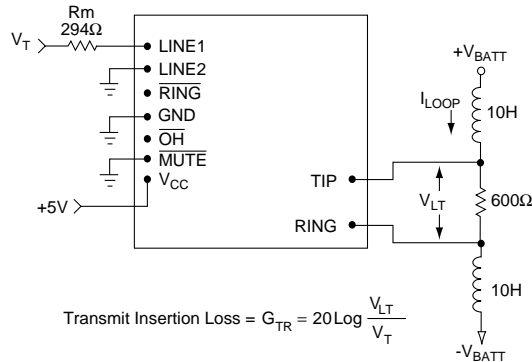
| PARAMETER  | CONDITIONS                    | MIN      | TYP    | MAX             | UNITS                                |
|--|-------------------------------|----------|--------|-----------------|--------------------------------------|
| <b>DC Electrical Characteristics</b>                           |                               |          |        |                 |                                      |
| On-Hook Impedance  | @100VDC across pins 5,6 (R,T) | 10       | -      | -               | MΩ                                   |
| Off-Hook Line Leakage Current                                  | @100VDC across pins 5,6 (R,T) | -        | -      | 10              | μA                                   |
| Hookswitch Resistance  | -                             | -        | -      | 35              | Ω                                    |
| Off-Hook Relay Supply Current                                  | @ V <sub>CC</sub> =5V         | 7        | 8      | 9               | mA                                   |
| Hookswitch Power Source  | -                             | 4.75     | 5.0    | 20              | V                                    |
| DC Loop Current  | -                             | 5        | -      | 120             | mA                                   |
| Mute Relay Supply Current                                      | @ V <sub>CC</sub> =5V         | 7        | 8      | 9               | mA                                   |
| <b>AC Signal Path Electrical Characteristics</b>               |                               |          |        |                 |                                      |
| Return Loss  | 300-3500Hz                    | 14       | 25     | -               | dB                                   |
| Insertion Loss   |                               |          |        |                 |                                      |
| Transmit   | Test Circuit 1                | -        | -      | 7               | dB                                   |
| Receive  | Test Circuit 2                | -        | -      | 7               | dB                                   |
| Frequency Response   | 300-3500Hz                    | -0.25    | -      | +0.25           | dB                                   |
| Longitudinal Balance   |                               |          |        |                 |                                      |
| On-Hook  | -                             | 60       | -      | -               | dB                                   |
| Off-Hook   | -                             | 40       | -      | -               | dB                                   |
| Total Harmonic Distortion                                      | @350Hz and -10dBm             | -        | -      | 0.01            | %                                    |
| Secondary Load Impedance                                       | Line 1 and Line 2             | -        | 100    | -               | Ω                                    |
| Primary Source Impedance                                       | Tip and Ring                  | -        | 600    | -               | Ω                                    |
| <b>Ring Detection Circuit Characteristics</b>                  |                               |          |        |                 |                                      |
| Ringing Voltage Detection Range<br>CYG2100, CYG2110<br>CYG2120 | 20-150-V <sub>RMS</sub>       | 29<br>28 | -<br>- | 150<br>150      | V <sub>RMS</sub><br>V <sub>RMS</sub> |
| Ringing Frequency Detection Range                              | 50-70Hz                       | 15       | -      | 70              | Hz                                   |
| Ringer Impedance   | 25Hz                          | -        | 18     | -               | KΩ                                   |
| RING Output Voltage (Pulsed)                                   | V <sub>CC</sub> @+5V          |          |        |                 |                                      |
| Logic '0', Ring present  |                               | -        | -      | 0.8             | V                                    |
| Logic '1', Ring not present                                    |                               | -        | -      | V <sub>CC</sub> | V                                    |
| <b>Surge, Transient, and Isolation Characteristics</b>         |                               |          |        |                 |                                      |
| Surge Protection Voltage Tip and Ring                          | -                             | -        | -      | 300             | V                                    |
| Isolation Voltage (Pins 1-7 to 10-11)                          | 60 Seconds                    | -        | -      | 1500            | V <sub>RMS</sub>                     |

Note: For Mechanical Dimensions See Pages 408-415

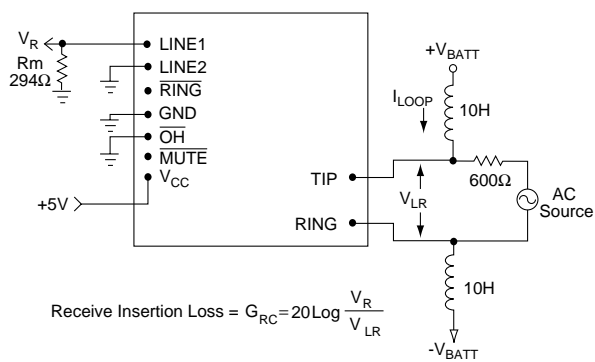
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## TEST CIRCUITS

1. CYG21XX Transmit Insertion Loss

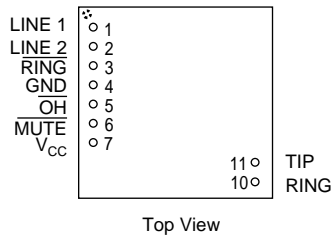


2. CYG21XX Receive Insertion Loss



## PACKAGE PINOUTS

CYG21XX

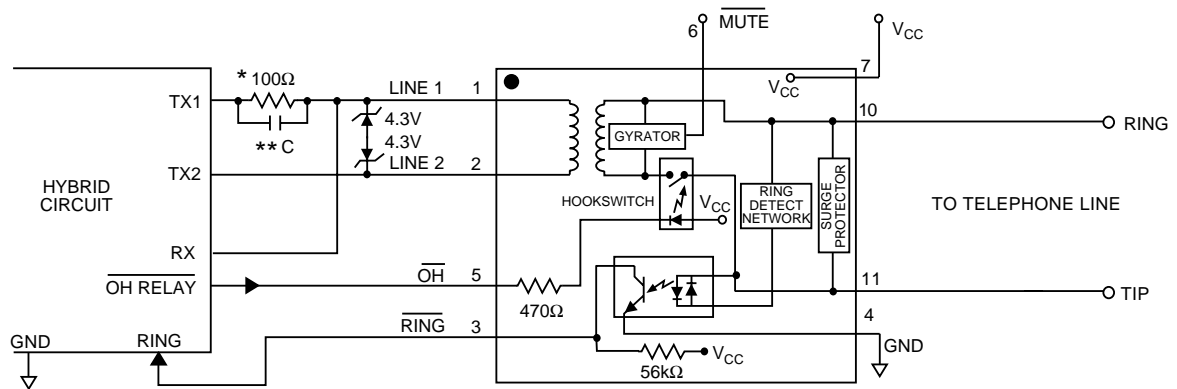


CYG21XX Pinouts & Definitions

| PIN# | I/O | Name                     | Function   |
|------|-----|--------------------------|--|
| 1    | I/O | LINE1                    | Transformer isolated audio signal coupling path for the telephone line.  |
| 2    | I/O | LINE2                    | Transformer isolated audio signal coupling path for the telephone line.  |
| 3    | O   | $\overline{\text{RING}}$ | Active LOW indicates an incoming ring signal. This is pulsed LOW by the AC ring signal at the ring frequency from 15-40Hz.   |
| 4    | I   | GND                      | Connected to host system ground.   |
| 5    | I   | $\overline{\text{OH}}$   | Driving this pin LOW asserts the off-hook condition. The hookswitch LED is current limited by an internal 470Ω resistor.   |
| 6    | I   | $\overline{\text{MUTE}}$ | Driving this pin LOW activates the mute relay for pulse dialing. The mute control is activated on or slightly before (tpms max.) the start of the first dial pulse, then kept active until the end (50ms max.) of the last dial pulse. The mute relay LED is current limited by an internal 470Ω resistor. |
| 7    | I   | V <sub>CC</sub>          | Provides power to the hookswitch LED. Typically +5V for ≈ 8mA LED current. LED is current limited by an internal 470Ω resistor. V <sub>CC</sub> should not exceed 20V.   |
| 11   | I/O | RING                     | Connection to telephone line Ring conductor.   |
| 10   | I/O | TIP                      | Connection to telephone line Tip conductor.  |

*Note: For Mechanical Dimensions See Pages 408-415*

## TYPICAL APPLICATION



\* UK/Sweden =  $350\Omega$  All other countries =  $100\Omega$

\*\* Installed for German/Swiss DAA Module

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