



Features

- Low-Distortion Transformer Signal Coupling (0.01% max)
- Complete Ringing Detector Circuit
- Low-Power Hook Switch
- Electronic Inductor/Gyrator Circuit
- Surge Protection
- V.32 bis / V.34 Compatible
- PTT and Safety Regulations in Spain
- 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

Description

Clare's CYG2120 DAA Module, designed for use in Spain, provides a complete telephone line interface circuit in a small (1.07" x 1.07" x 0.4") package. The module provides a fast and cost-effective solution for designs that require an interface to the telephone line.

The CYG2120 is designed to meet PTT and safety regulations in Spain. Select the CYG2100 for use in most other EU nations, except France, and select the CYG2110 for use in France.

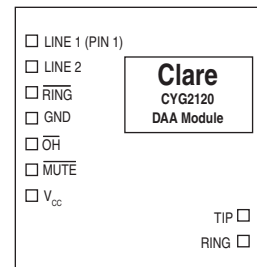
Approvals

- EN/IEC 60950 Compliant

Ordering Information

| Part # | Description |
|---------|---|
| CYG2120 | CYBERGATE (Spain only) Module (18/Tube) |

Pin Configuration



Top View

Absolute Maximum Ratings (@ 25°C)

| Parameter | Ratings | Units |
|---|-----------|-----------|
| Tip/Ring Load Current (continuous) | 120 | mA |
| Hook Switch LED Drive Current | 50 | mA |
| Hook Switch LED Reverse Voltage | 5 | V |
| Ring Detect Phototransistor Voltage V_{CEO} | 20 | V |
| Isolation Voltage, Input to Output | 1500 | V_{rms} |
| Relative Humidity (non-condensing) | 10 to 85 | % |
| Operational Temperature | 0 to +70 | °C |
| Storage Temperature | 0 to +100 | °C |

Absolute Maximum Ratings are stress ratings. Stresses in excess of these ratings can cause permanent damage to the device. Functional operation of the device at conditions beyond those indicated in the operational sections of this data sheet is not implied.

DC Electrical Characteristics

| Parameter | Conditions | Min | Typ | Max | Units |
|--|--|------|-----|-----|-----------|
| On-Hook Impedance | $100V_{DC}$ Across Pins 11, 10 (T, R) | 10 | - | - | $M\Omega$ |
| On-Hook Line Leakage Current | $100V_{DC}$ Across Pins 11, 10 (T, R) | - | - | 10 | μA |
| Hook Switch Resistance | $\overline{OH} = GND, V_{CC} = +5V_{DC}$ | - | - | 35 | Ω |
| Off-Hook Supply Current | $\overline{OH} = GND, V_{CC} = +5V_{DC}$ | 7 | 8 | 9 | mA |
| Hook Switch Power Source, Pin 5 ¹ | - | 4.75 | 5 | 12 | V |
| DC Loop Current | $\overline{OH} = GND, V_{CC} = +5V_{DC}$ | 5 | - | 120 | mA |
| Mute Relay Supply Current | $\overline{OH} = GND, V_{CC} = +5V_{DC}$ | 7 | 8 | 9 | mA |

¹ For $V_{CC} > +12V$, select an external resistor (R) such that $(V_{CC} - 1.4) / R \leq 50mA$

AC Signal Path Electrical Characteristics

| Parameter | Conditions | Min | Typ | Max | Units |
|---------------------------|--|-------|-----|-------|----------|
| Return Loss | $\overline{OH} = GND, 300Hz$ to $3500Hz$ (600Ω) | 14 | 25 | - | dB |
| Insertion Loss | $\overline{OH} = GND, 300Hz$ to $3500Hz$ (600Ω) | - | - | 7 | dB |
| Transmit | | | | 7 | |
| Receive | $\overline{OH} = GND, 300Hz$ to $3500Hz$ | -0.25 | - | +0.25 | dB |
| Frequency Response | $\overline{OH} = GND, 300Hz$ to $3500Hz$ | -0.25 | - | +0.25 | dB |
| Longitudinal Balance | $\overline{OH} = GND$ | 40 | - | - | dB |
| On-Hook | | | | | |
| Off-Hook | $\overline{OH} = GND$ | 40 | - | - | dB |
| Total Harmonic Distortion | $\overline{OH} = GND, -10dBm, f = 350Hz$ | - | - | 0.01 | % |
| Secondary Load Impedance | Line 1 & Line 2 | - | 100 | - | Ω |
| Primary Source Impedance | Tip & Ring | - | 600 | - | Ω |

Ring Detection Circuit Characteristics, $\overline{OH} = V_{CC}$

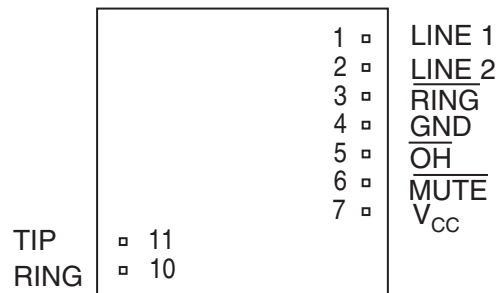
| Parameter | Conditions | Min | Typ | Max | Units |
|--------------------------------------|------------|-----|-----|----------|-----------|
| Ringing Voltage Detection Range | - | 28 | - | 150 | V_{rms} |
| Ringing Frequency Detection Range | - | 15 | - | 70 | Hz |
| Ringing Impedance | $f = 25Hz$ | - | 18 | - | $k\Omega$ |
| RING (Pin 9) Output Voltage (Pulsed) | - | - | - | 0.8 | V |
| Logic '0' (Ring Present) | | | | V_{CC} | |
| Logic '1' (Ring Not Present) | - | - | - | V_{CC} | V |

Surge, Transient, and Isolation Characteristics

| Parameter | Conditions | Min | Typ | Max | Units |
|--|------------|-----|-----|------|------------------|
| Surge Protection Voltage, Tip & Ring (Pins 11, 10) | - | - | - | 300 | V |
| Isolation Voltage (Pins 1-7 to 10-11) | - | - | - | 1500 | V _{rms} |

Pin Descriptions

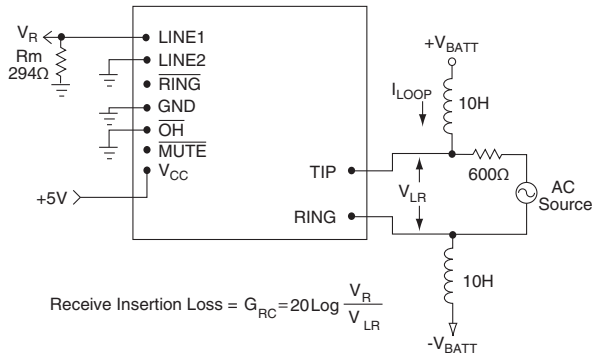
CYG2120



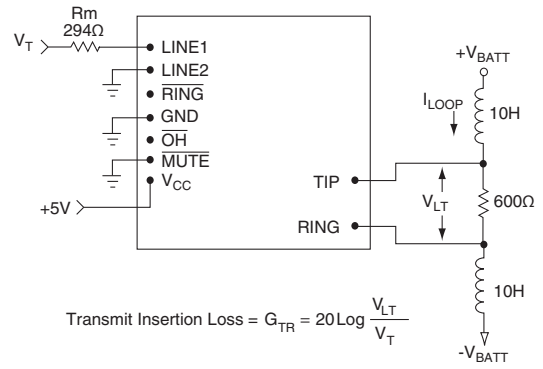
| Pin # | I/O | Name | Function |
|-------|-----|--------------------------|---|
| 1 | I/O | LINE 1 | Transformer isolated winding connection 1. |
| 2 | I/O | LINE 2 | Transformer isolated winding connection 2. |
| 3 | O | $\overline{\text{RING}}$ | Active low indicates incoming ring signal. This is pulsed low by the AC ring signal, and is not a steady-state low during ringing. |
| 4 | I | GND | Return path for V _{CC} . |
| 5 | I | $\overline{\text{OH}}$ | Driving this pin low asserts the off-hook condition. The hook switch LED is current limited by an internal 470Ω resistor. |
| 6 | I | MUTE | Mute relay activation, active low. LED current is limited by an internal 470Ω resistor. |
| 7 | I | V _{CC} | Provides power to the hook switch LED. Voltage is usually +5V (for 8mA LED current), but can be higher if an external resistor is placed in series with the internal 470Ω resistor. |
| 10 | I/O | Ring | Connection to telephone line Ring conductor. |
| 11 | I/O | Tip | Connection to telephone line Tip conductor. |

Test Circuits

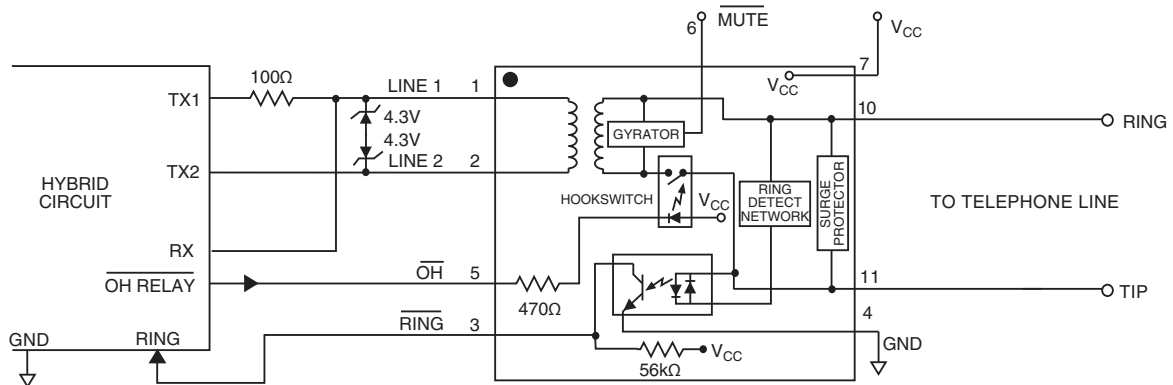
CYG2120 Receive Insertion Loss



CYG2120 Transmit Insertion Loss



Typical Application



MANUFACTURING INFORMATION

Soldering

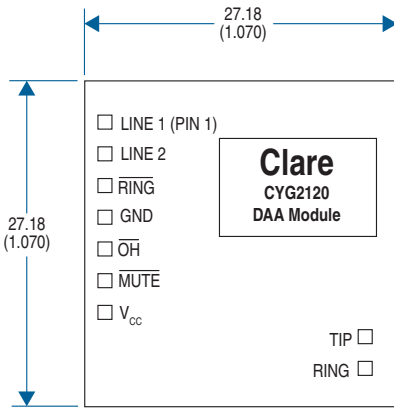
For proper assembly, the component must be processed in accordance with the current revision of IPC/JEDEC standard J-STD-020. Failure to follow the recommended guidelines may cause permanent damage to the device resulting in impaired performance and/or a reduced lifetime expectancy.

Washing

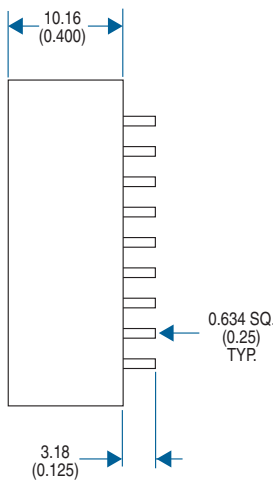
Clare does not recommend ultrasonic cleaning or the use of chlorinated solvents.

MECHANICAL DIMENSIONS

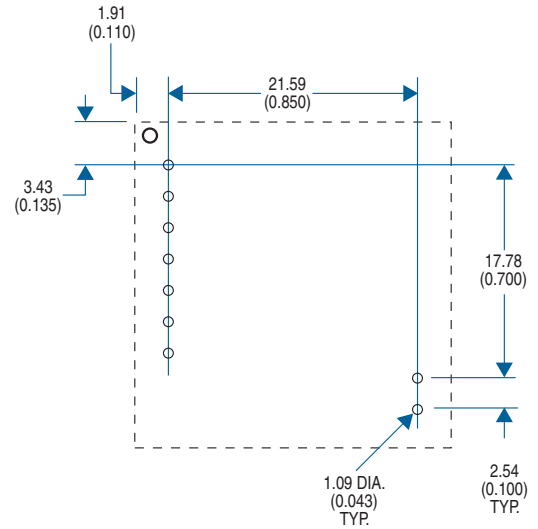
CYBERGATE Package



TOP VIEW



SIDE VIEW



PCB Pattern (Top View)

Dimensions mm (inches)

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