CYG2100
CYBERGATE™ DAA Module

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 European 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

Description
Clare's CYG2100 DAA Module, designed for use in most European Union (EU) countries, 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.

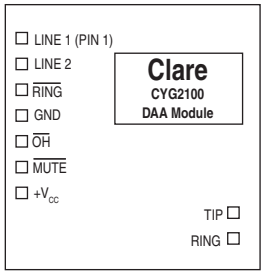
The CYG2100 is designed to meet PTT and safety regulations in most EU nations. Select the CYG2110 for use in France, and the CYG2120 for use in Spain.

Approvals
- EN/IEC 60950 Compliant

Ordering Information

Part #	Description
CYG2100	CYBERGATE Module for the European Union, except France and Spain, (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	-	-	MΩ
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) ≤ 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					
Transmit	$\overline{OH}$ = GND, 300Hz to 3500Hz (600Ω)	-	-	7	dB
Receive		-	-	7	
Frequency Response	$\overline{OH}$ = GND, 300Hz to 3500Hz	-0.25	-	+0.25	dB
Longitudinal Balance					
On-Hook	$\overline{OH}$ = V_{CC}	60	-	--	dB
Off-Hook	$\overline{OH}$ = GND	40	-	-	
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}

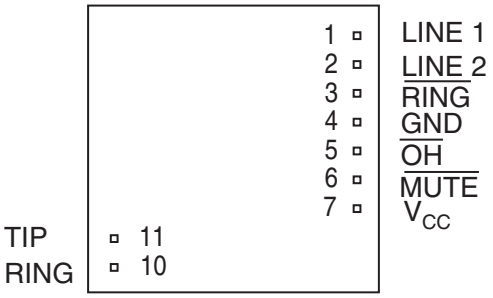
Parameter	Conditions	Min	Typ	Max	Units
Ringing Voltage Detection Range	-	29	-	150	V_{rms}
Ringing Frequency Detection Range	-	15	-	70	Hz
Ringing Impedance	f = 25Hz	-	18	-	kΩ
RING (Pin 9) Output Voltage (Pulsed)					
Logic '0' (Ring Present)	-	-	-	0.8	V
Logic '1' (Ring Not Present)		-	-	V_{CC}	

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

CYG2100

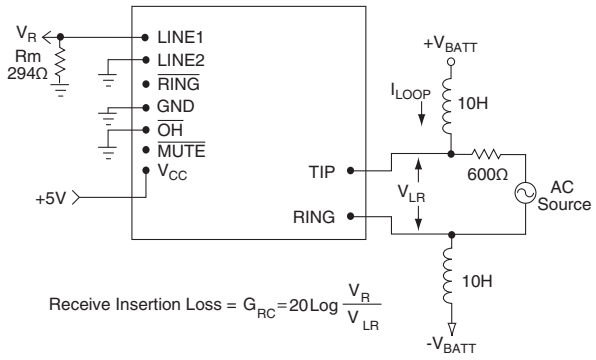


Bottom View

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	$\overline{\text{MUTE}}$	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.

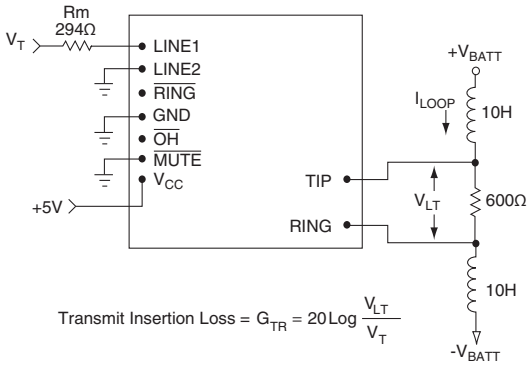
Test Circuits

CYG2100 Receive Insertion Loss



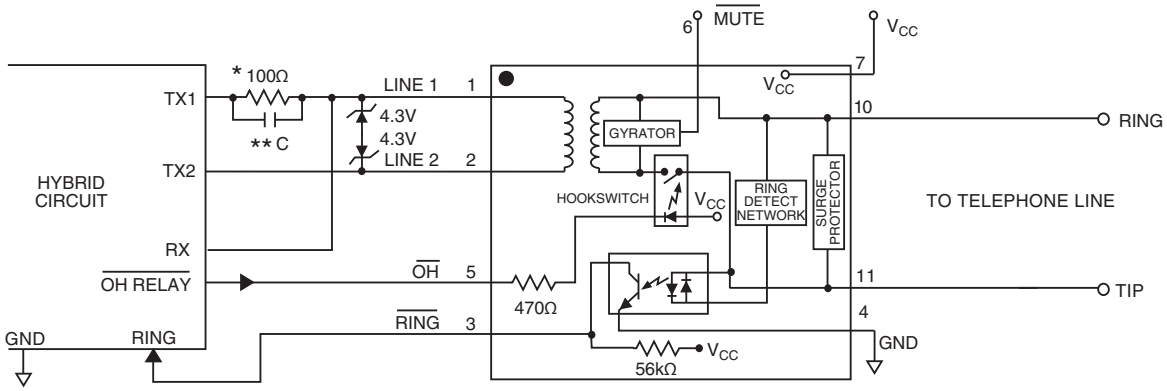
$$\text{Receive Insertion Loss} = G_{RC} = 20\,\text{Log}\,\frac{V_R}{V_{LR}}$$

CYG2100 Transmit Insertion Loss



$$\text{Transmit Insertion Loss} = G_{TR} = 20\,\text{Log}\,\frac{V_{LT}}{V_T}$$

Typical Application



* UK/Sweden = 350Ω All other countries = 100Ω
** Installed for German/Swiss DAA Module

MANUFACTURING INFORMATION

Soldering

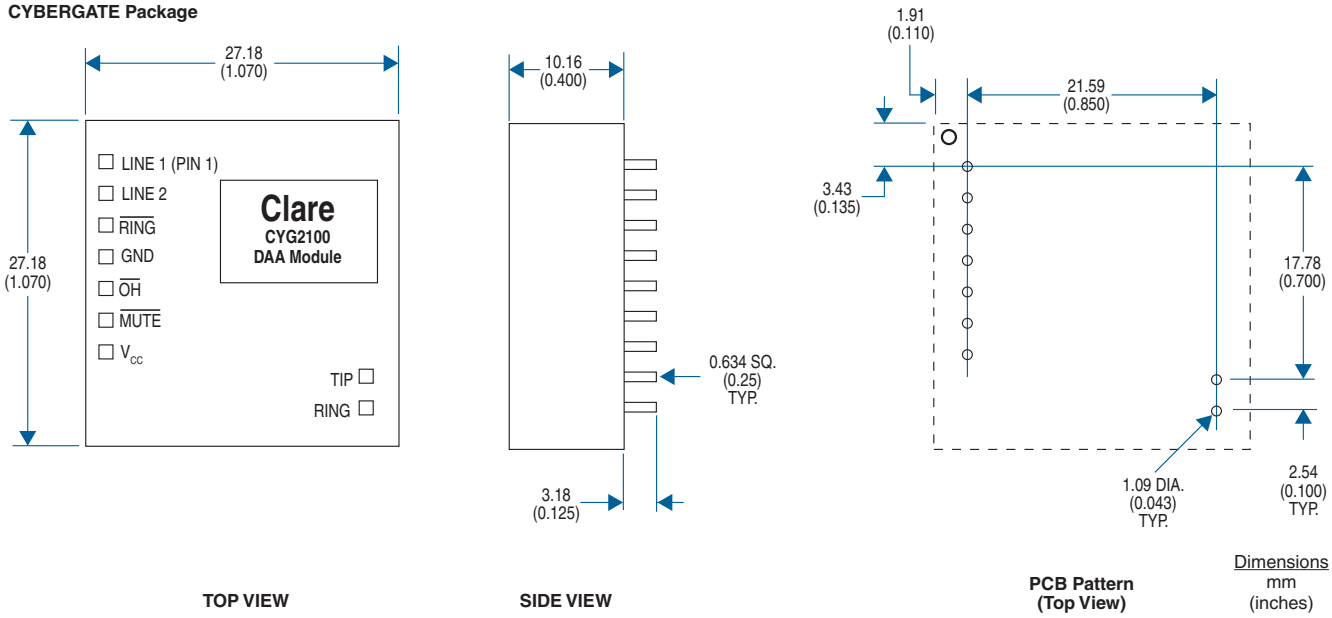
For proper assembly, the component must be processed in accordance with the current revision of IPC/JEDEC standard J-STD-020. Failure to follow the recommended guidelines may cause permanent damage to the device resulting in impaired performance and/or a reduced lifetime expectancy.

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)

For additional information please visit our website at: www.clare.com

Specification: DS-CYG2100-R01

12/8/08