

# Cybergate™ 2111

## Data Access Arrangement (DAA) Module



### DESCRIPTION

CP Clare's CYG2111 Series DAA module 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 CYG2111 is specifically designed to meet PTT and safety regulations for CTR-21 regulated countries.

### 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

### FEATURES

- Low distortion transformer signal coupling
- Complete ring detector circuit
- Low power hookswitch
- Electronic inductor/gyrator circuit
- Surge protection
- V.32 bis /V.34 compatible
- PTT and safety regulations for CTR-21 countries
- PC board mountable

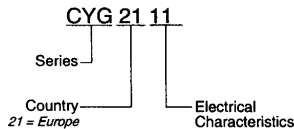
### APPROVALS

- BSI Certified

### 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)	-	-	60	mA
Hookswitch LED Drive Current	-	-	50	mA
Hookswitch LED Reverse Voltage	-	-	5	V
Ring Detect Phototransistor Voltage V <sub>cc</sub>	-	-	20	V

### ORDERING INFORMATION



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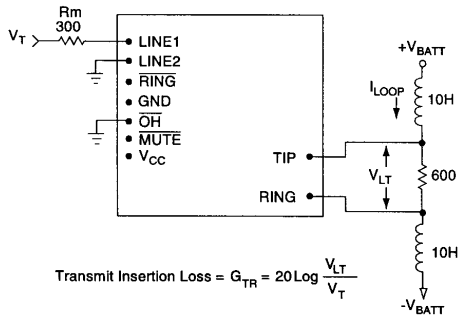
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**SPECIFICATIONS**

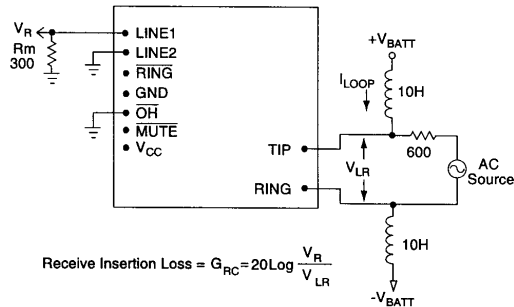
PARAMETERS	CONDITIONS	MIN	TYP	MAX	UNITS
<b>DC Electrical Characteristics</b>					
On-Hook Impedance	$V_{\text{Tip-Ring}}=100\text{VDC}$	10	-	-	$M\Omega$
On-Hook Line Leakage Current	$V_{\text{Tip-Ring}}=100\text{VDC}$	-	-	10	$\mu\text{A}$
Off-Hook Relay Supply Current	$V_{\text{cc}}=5\text{V}$	7	8	9	$\text{mA}$
Hookswitch Power Source	-	4.75	5.0	20	V
DC Loop Current	-	5	-	60	$\text{mA}$
Mute Relay Supply Current	$V_{\text{cc}}=5\text{V}$	7	8	9	$\text{mA}$
<b>AC Signal Path Electrical Characteristics</b>					
Return Loss	$f=300\text{-}3500\text{Hz}$	14	25	-	$\text{dB}$
Insertion Loss					
Transmit	Test Circuit 1	-	-	7.5	$\text{dB}$
Receive	Test Circuit 2	-	-	7.5	$\text{dB}$
Frequency Response	$f=300\text{-}3500\text{Hz}$	-0.25	-	+0.25	$\text{dB}$
Longitudinal Balance					
On-Hook	-	60	-	-	$\text{dB}$
Off-Hook	-	40	-	-	$\text{dB}$
Total Harmonic Distortion	$f=350\text{Hz}$ , $P=-10\text{dBm}$	-	-80	-	$\text{dB}$
Secondary Load Impedance	Line 1 and Line 2	-	300	-	$\Omega$
Primary Source Impedance	Tip and Ring	-	600	-	$\Omega$
<b>Ring Detection Circuit Characteristics</b>					
Ringing Voltage Detection Range	-	29	-	-	$V_{\text{RMS}}$
Ringing Frequency Detection Range	-	15	-	70	$\text{Hz}$
Ringer Impedance	$f=25\text{Hz}$	-	18	-	$K\Omega$
RING Output Voltage (Pulsed)	$V_{\text{cc}}=+5\text{V}$				
Logic '0', Ring present		-	-	0.8	V
Logic '1', Ring not present		-	-	$V_{\text{cc}}$	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	$V_{\text{RMS}}$

**TEST CIRCUITS**

**1. CYG2111 Transmit Insertion Loss**

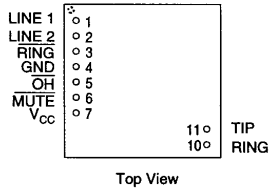


**2. CYG2111 Receive Insertion Loss**



**PACKAGE PINOUTS**

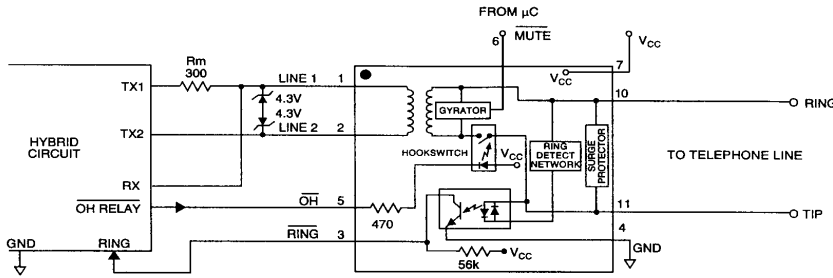
**CYG2111**



**CYG2111 Pinouts & Definitions**

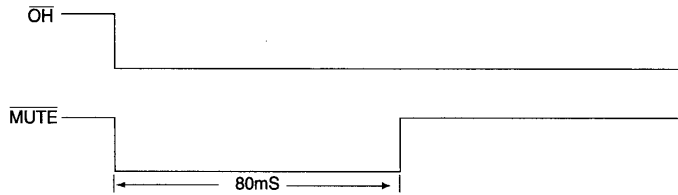
PIN#	I/O	Name	Function
1	I/O	LINE1	Transformer isolated audio signal coupling path for the telephone line.
2	I/O	LINE2	Transformer isolated audio signal coupling path for the telephone line.
3	O	RING	Active LOW indicates an incoming ring signal. This is pulsed LOW by the AC ring signal at the ring frequency.
4	I	GND	Connected to host system ground.
5	I	OH	Driving this pin LOW asserts the off-hook condition. The hookswitch LED is current limited by an internal 470Ω resistor.
6	I	MUTE	Driving this pin LOW activates the mute relay for pulse dialing. See Figure 1. 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.

**TYPICAL APPLICATION**

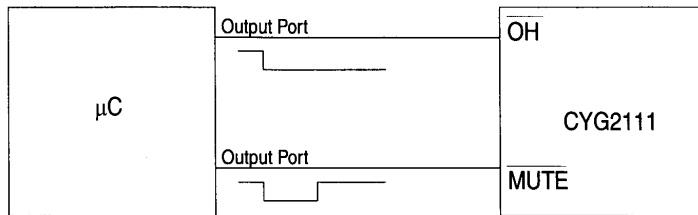


**OFF-HOOK TRANSIENT REQUIREMENT**

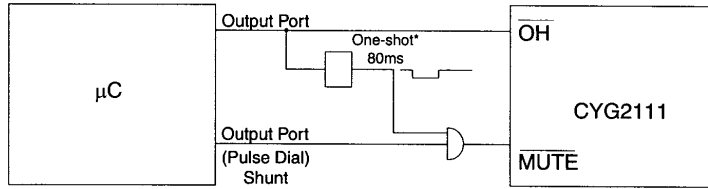
In order to meet Section 4.6.1 of the CTR-21 requirement, it is necessary to assert the  $\overline{\text{MUTE}}$  pin of the CYG2111 for a duration of 80mS after the  $\overline{\text{OH}}$  pin is driven low as shown in Figure 1. This can be accomplished via the host firmware or external hardware as shown in Figures 2 and 3 respectively.



**$\overline{\text{MUTE}}$  and  $\overline{\text{OH}}$  Timing**  
Figure 1



**Figure 2**



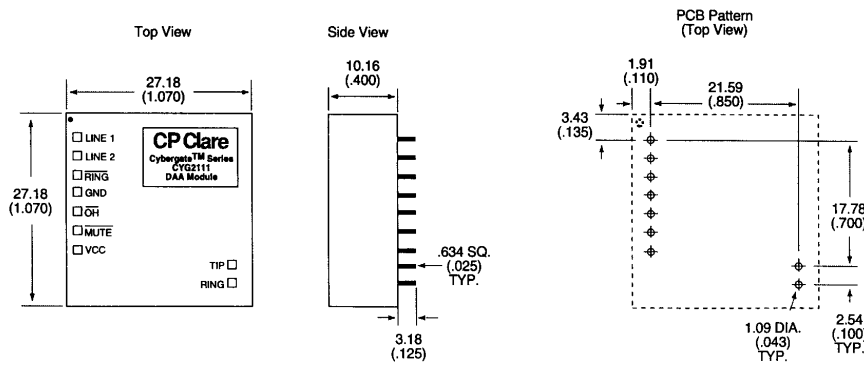
\* Micrel MIC1555 or Equivalent

**Figure 3**

Asserting the MUTE pin causes the internal gyrator circuit in the CYG2111 to be bypassed, allowing low impedance pulse dialing to be performed by pulsing the OH pin. In Figure 2, the microcontroller output port going to the MUTE pin is used as a shunt for low impedance dialing and is asserted for 80mS when the OH signal is asserted. This method is preferred when the user has control of the host firmware and can easily write a subroutine to accomplish this function.

For users that do not have easy access to the modem firmware, some external hardware can be added to accomplish the same function. Figure 3 shows a monostable (one-shot) such as a 555 timer which is designed to generate an 80mS low going pulse upon the assertion of the OH signal. This 80mS pulse is ANDed with the low impedance pulse dial shunt signal which overrides the 80mS signal when pulse dialing is enabled. The pulse dial shunt signal is included as a standard output pin in most modem chipsets. This pin is activated when an ATDP command is issued to the modem.

**MECHANICAL DIMENSIONS**



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