

Features

- Low distortion transformer signal coupling (0.01% max)
- Complete ring detector circuit
- Low power hookswitch
- Electronic inductor/gyrator circuit
- Solid state surge protection
- Transient protection zeners
- Complete hybrid circuit (2-4 wire converter) included
- Compatible with all modem chip sets
- V.32 bis/V.34 compatible

Applications

- Modems
- Fax machines
- Remote data acquisition
- Security systems
- Voice mail systems
- PC motherboard
- Computer telephony
- Process control
- Medical
- PBX
- Direct broadcast satellite

Description

Clare's Cybergate™ CYG2217 DAA module provides a complete telephone line interface circuit, including a 2-4 wire converter for transmit and receive signal separation 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 module is designed to meet FCC part 68 requirements thus providing a low risk design solution.

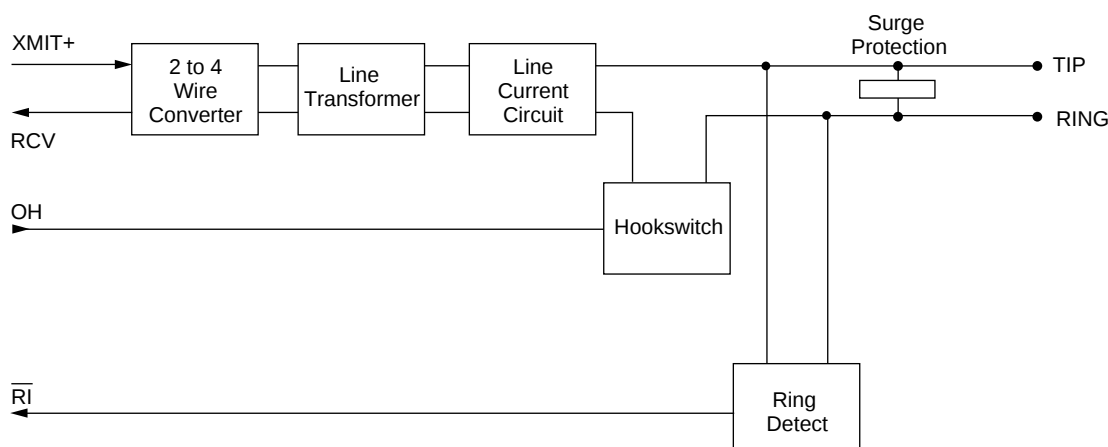
Approvals

- UL recognized file #: E174201

Ordering Information

Part #	Description
CYG2217	DAA Module (18/Tube)

Block Diagram



Handling and Assembly Recommendations

The CYG2217 products are not hermetically sealed and should not be exposed to any liquid-based rinsing processes. Clare recommends two (2) approaches. The modem should either use a no clean soldering flux that would mostly evaporate during the normal wave soldering processes, or be soldered in by hand after the rest of the card is wave soldered.

Absolute Maximum Ratings (@ 25° C)

Parameter	Min	Typ	Max	Units
Isolation Voltage	-	-	1000	V _{RMS}
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 _{CC}	-	-	20	V

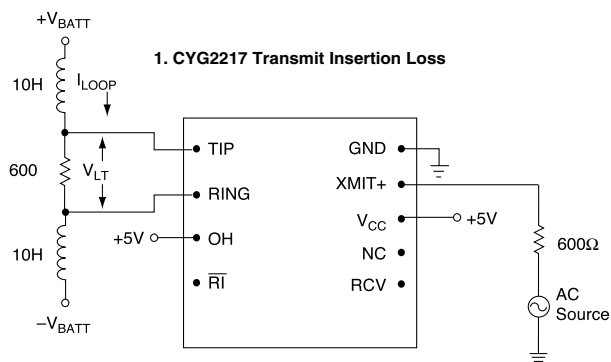
¹ Derate Linearly 1.33 mw / oC² Derate Linearly 3.67 mw / oC

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 these or any other conditions beyond those indicated in the operational sections of this data sheet is not implied. Exposure of the device to the absolute maximum ratings for an extended period may degrade the device and effect its reliability.

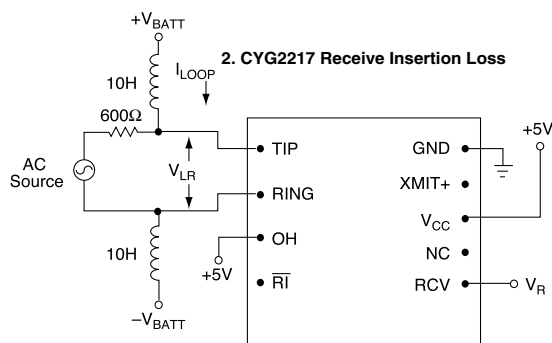
Electrical Characteristics

Parameter	Conditions	Min	Typ	Max	Units
DC Electrical Characteristics					
On-Hook Impedance 2,1 (R,T) per FCC 68.312	@100V V _{DC} across pins 1,2	10	-	-	MΩ
Off-Hook Line Leakage Current 2,1 (R,T) per FCC 68.312	@100V V _{DC} across pins 1,2	-	-	10	μA
Power Supply Current @ VCC	V _{CC} =5V	4	5	6	mA
Hookswitch Control Current @ (OH)	@V _{OH} =2.4V	3.5	4.1	5.0	mA
	@V _{OH} =5.0V	11.8	12.4	13	mA
Hookswitch Control Voltage					
Off-Hook	-	2.0	3.0	20	V
On-Hook	-	-	0.2	0.5	V
AC Signal Path Electrical Characteristics					
Return Loss	600Ω, 1800Hz	39	40	-	dB
Insertion Loss	600Ω, 1800Hz				
Transmit	Test Circuit 1	6.0	6.5	7	dB
Receive	Test Circuit 2	-1.0	0	+1.0	dB
Frequency Response	300-3500Hz	-0.25	-	+0.25	dB
Longitudinal Balance					
On-Hook	Per FCC 68.310	60	-	-	dB
Off-Hook	Per FCC 68.310	40	-	-	dB
Transhybrid Loss	600Ω, 1800Hz	-	-32	-10	dB
Total Harmonic Distortion	600Ω, 1800Hz	-	-80	-	dB
DC Loop Current	-	20	-	120	mA
Ring Detection Circuit Characteristics					
Ringing Voltage Detection Range	-	20	-	150	V _{RMS}
Ringing Frequency Detection Range	-	15	-	70	Hz
Ringer Equivalence Number	-	-	0.8B	-	-
RING (Pin 5) Output Voltage (Pulsed)	V _{CC} =+5V				
Logic '0', Ring present		-	-	0.8	V
Logic '1', Ring not present		-	-	V _{CC}	V
Surge and Isolation Characteristics					
Surge Protection Voltage Tip and Ring (Pins 1,2)	-	-	-	300	V
Isolation Voltage (Pins 18,17,16,15,14,5,4,to1,2)	Per FCC 68.302	1000	-	-	V _{RMS}

Test Circuits



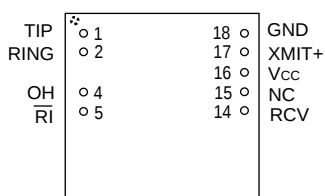
$$\text{Transmit Insertion Loss} = G_{TR} = 20 \log \frac{V_{LT}}{V_T}$$



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

Package Pinout

**CYG2217
CYG22XX**



CYG2217 Pinouts & Definitions

PIN#	Name	Function
1	TIP	Connection to telephone line Tip connected through an external fuse.
2	RING	Connection to telephone line Ring conductor.
4	OH	Driving this pin high asserts the off-hook condition. The hookswitch LED is current limited by an internal 300Ω resistor.
5	RI	Active LOW indicates an incoming ring signal. This is pulsed LOW by the AC ring signal and is not a steady state LOW during ringing.
14	RCV	Provides the analog output signal from the 2-4 wire converter of the CYG2217. RCV uses a 2.5 volt reference signal and therefore must be capacitively coupled to host equipment which uses a ground reference.
15	NC	No connection.
16	V _{CC}	Provides power to the CYG2217. Typically +5V, V _{CC} should not exceed 20V.
17	XMIT+	Provides the analog input signal from the 2-4 wire converter of the CYG2217. XMIT+ uses a 2.5 volt reference signal and therefore must be capacitively coupled to host equipment which uses a ground reference.
18	GND	Connection to host system ground.



CLARE

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

Clare, Inc. makes no representations or warranties with respect to the accuracy or completeness of the contents of this publication and reserves the right to make changes to specifications and product descriptions at any time without notice. Neither circuit patent licenses nor indemnity are expressed or implied. Except as set forth in Clare's Standard Terms and Conditions of Sale, Clare, Inc. assumes no liability whatsoever, and disclaims any express or implied warranty, relating to its products including, but not limited to, the implied warranty of merchantability, fitness for a particular purpose, or infringement of any intellectual property right.

The products described in this document are not designed, intended, authorized or warranted for use as components in systems intended for surgical implant into the body, or in other applications intended to support or sustain life, or where malfunction of Clare's product may result in direct physical harm, injury, or death to a person or severe property or environmental damage. Clare, Inc. reserves the right to discontinue or make changes to its products at any time without notice.

Specification: DS-CYG2217-R1.0
©Copyright 2002, Clare, Inc.
All rights reserved. Printed in USA.
6/25/02