

Advanced

T-41-91



RCV1201-622 FIBER OPTIC "LIGHT TO LOGIC"™ RECEIVER

Features:

- Light to Logic 28-pin DIP receiver offers ECL compatibility
- High sensitivity at bit rates up to 622 Mb/s
- Hermetically sealed package
- Overload > -7dBm

Applications:

- Telecommunications networks
- SONET OC12 compatible
- Local area and metropolitan area networks
- Military communications and control systems
- Digital cable TV networks

RCV1201-622

The RCV1201-622 is a high speed member of the RCV1200 family. It converts 1200 to 1600 nanometer wavelength lightwave information into an electrical signal for rates up to 622Mb/s.

The receiver includes an InGaAsP PIN photodiode, a GaAs transimpedance amplifier and supporting integrated circuit electronics to provide ECL-compatible complementary outputs.



Publication No.	Revision	Issue date:	Page
DS058	1	Dec 4, 1992	1

FUNCTIONAL DESCRIPTION RCV1201-622

Design

The RCV1201-622 receiver contains a InGaAsP photodiode, GaAs IC transimpedance amplifier and interface amplifier circuit. The receiver is designed with a 50/125 micron fiber pigtail to allow maximum flexibility in connector options.

The interface amplifier is capacitively coupled to the preamplifier circuit. The coupling capacitor values are large enough to allow good sensitivity down to 50KHz.

Noise Immunity

The RCV1201-622 receiver has internal components to filter power supply noise from the gain circuits. To obtain maximum performance, it is highly recommended that external filter networks be utilized as well. The photodiode bias pin is especially sensitive to extraneous noise and a separate decoupling network is shown. The current drain on pin 1 is directly proportional to the incoming optical signal. This current will range from approximately 1uA on a small optical signal to 500 μ A on a large optical signal.

Additional external circuitry may be added to monitor the photodiode current for use as a simple signal detection circuit.

As a practical consideration, the majority of current drawn from the positive supply is used in the preamplifier IC. The interface amplifier draws the majority of the current from the negative supply. The series RC networks attached to each pin are intended to insure maximum stability.

Terminating the Outputs

The data outputs of the RCV1201-622 are 10K ECL compatible. Care should be taken to match termination impedances to the interconnect to minimize reflection effects. More information on ECL interconnection, biasing and termination can be found in most ECL manufacturer's data books.

Circuit Layout

The RCV1201-622 uses very high bandwidth circuitry to achieve its high level of performance. Care must be taken to ensure stable operation. The use of ground planes and transmission line interconnects is required. The use of a standard evaluation board is highly recommended for those users who are not familiar with these techniques.

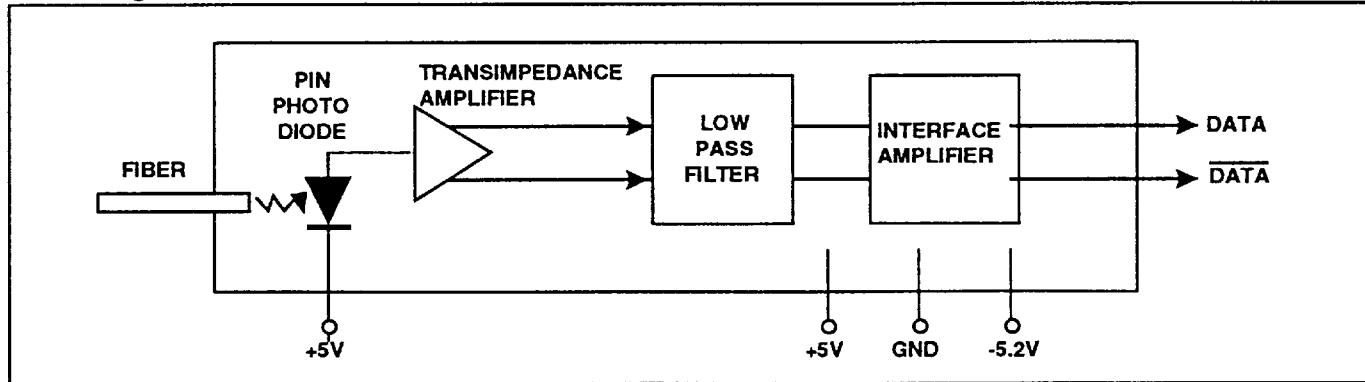
Evaluation boards for the RCV1201 - 622 are available from BT&D. Please contact your representative for details.

Manufacturing

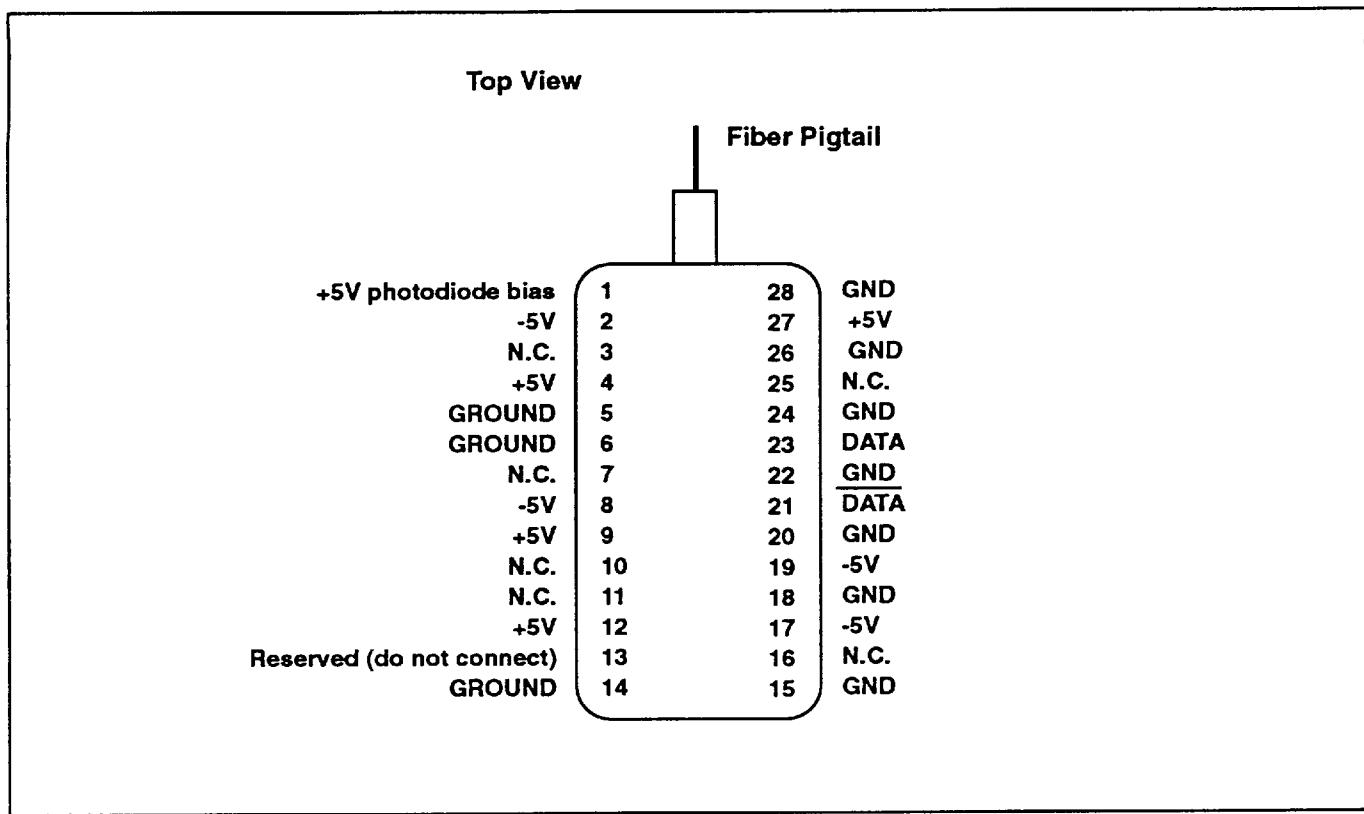
The RCV1201-622 is a fully hermetically sealed component. The fiber pigtail on the device requires normal fiber handling considerations. Care should be taken to avoid tight bends as well as excessive tension on the fiber pigtail.

The allowable temperature range for the RCV1201-622 is limited by the material used in the pigtail. Exposure to temperatures over 85°C is not recommended. Low profile sockets or hand soldering is recommended for this part.

Block Diagram RCV1201 - 622



RCV1201-622 CONNECTION DIAGRAM



PIN DESCRIPTIONS

Pin 1 Photodiode Bias:

This pin is connected to the PIN photodiode cathode. It is normally reverse biased with +5 Volts through an appropriate decoupling network. Current drawn will be directly proportional to input optical signal level.

Pins 2, 8, 17, 19 -5 Volt Supply:

These pins are connected to the -5 Volt supply. Each pin should be bypassed with a series network of $22\Omega/100\text{nF}$ (See Figure 2).

Pins 4, 9, 12, 27 +5 Volt Supply:

These pins are connected to the +5 Volt supply. Each pin should be bypassed with a series network of $22\Omega/100\text{nF}$ (See Figure 2).

Pins 5, 6, 14, 15, 18, 20, 22, 24, 26, 28 GND:

These pins are connected to the circuit board ground plane.

Pins 3, 7, 10, 11, 16, 25 N.C. :

These pins are not used in the present RCV1201-622 design. They should be left as an open circuit.

Pin 13 Reserved:

This pin is reserved for future product enhancements. It should be left as an open circuit.

Pin 21 DATA OUTPUT:

This pin is the inverted data output. It is at ECL Logic LOW during an input optical pulse. It must be terminated to a negative supply.

Pin 23 DATA OUTPUT:

This pin is the data output. It is at ECL Logic HIGH during an input optical pulse. It must be terminated to a negative supply.

RCV1201-622 ABSOLUTE LIMITING RATINGS

PARAMETER	SYMBOL	MIN	MAX	UNITS
Case Operating Temperature		0	65	°C
Storage Temperature		-40	85	°C
Supply Voltage	+V	-0.5	7.0	V
	-V	-7.0	0.5	V

PERFORMANCE SPECIFICATIONS

Electrical

PARAMETER	MIN	TYP	MAX	UNITS
Digital Output	10K ECL			
Power Requirements				
-5.0V			200	mA
5.0V			50	mA
MTTF (at 40°C case Temperature)			500,000	Hrs

Optical [3]

PARAMETER	MIN	TYP	MAX	UNITS
Wavelength Range	1200	—	1600	μm
Receiver Sensitivity [1] (622Mb/s)	-	—	-29	dBm
Maximum Input Power [2] (622Mb/s)	-7.0	—	—	dBm
Fiber Specifications	50/125μm core/cladding (multimode) 900μm OD silicone/nylon tight jacket			
Fiber Length	1 meter (typical)			

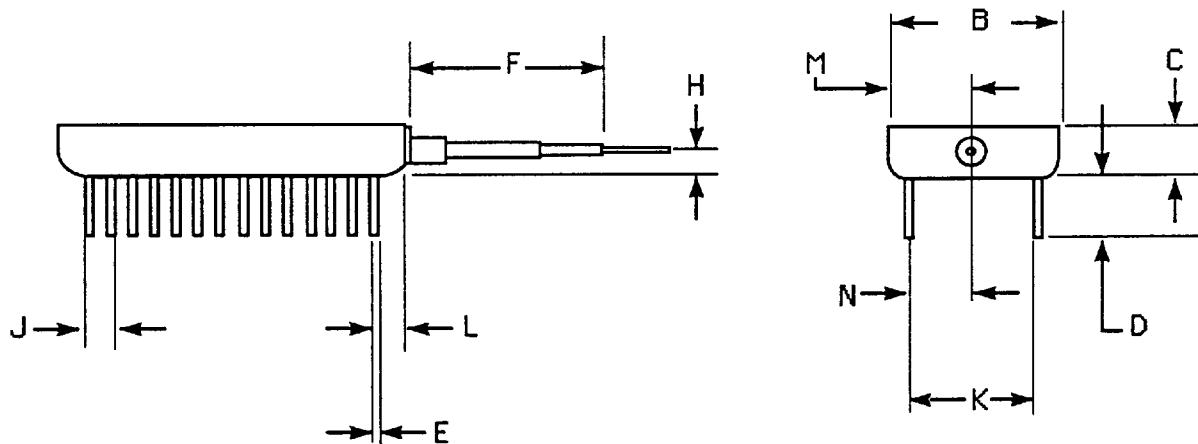
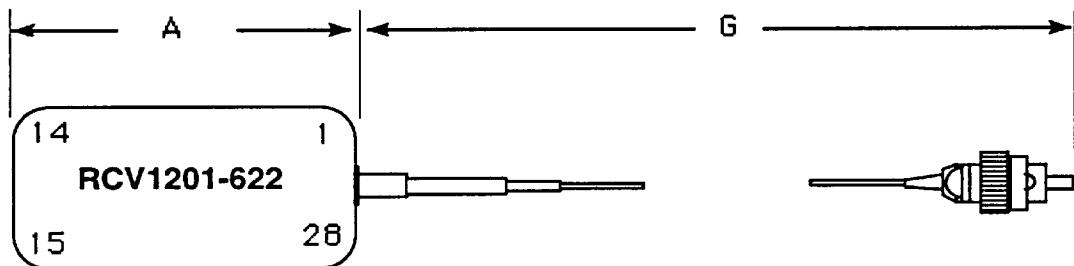
Notes:

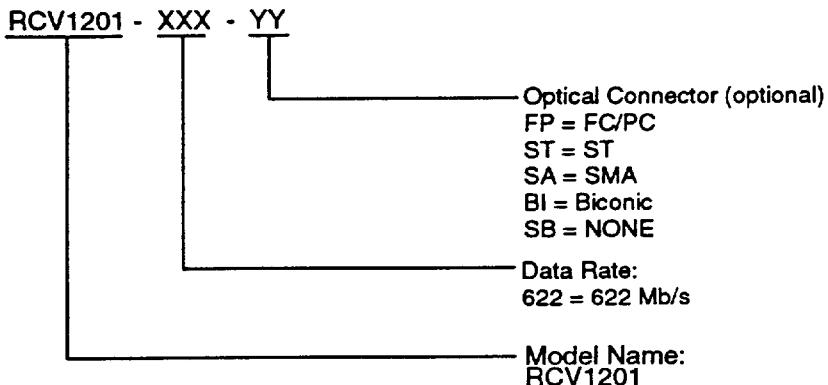
1. At 1300μm wavelength; NRZ; 10⁻¹¹ BER; 100% modulation depth; 2¹⁵-1 pseudo-random pattern.
2. For 10⁻¹¹ BER.
3. Over operating temperature range unless noted otherwise.

RCV1201-622 Dimensions

DIM	MIN	NOM	MAX
A	42.90	-	43.20
B	19.50	-	19.80
C	5.90	-	6.60
D	5.10	-	-
E	-	0.44	-
F	-	25.0	25.0
G	400	-	1200
H	3.20	-	800
I	-	-	3.60
J	-	2.54	-
K	-	15.20	-
L	-	5.00	-
M	-	9.80	-
N	-	7.60	-

All dimensions in mm



Ordering Information**Americas**

BT&D Technologies
500 North Walnut Road
Kennett Square
PA 19348

Telephone:
(800) 545-4306 (U.S. only)
(215) 444-6888

Fax:
(215) 444-6868

Boston, MA
(617) 229-5805

San Jose, CA
(408) 428-9377
(800) 848-1923 (U.S. only)

Irvine, CA
(714) 453-8111

Dallas, TX
(214) 503-0085

Asia Pacific

BT&D Technologies
Du Pont Japan Technical Center
4997 Shin-Yoshida-Cho
Kohoku-Ku, Yokohama-Shi
Kanagawa 223, Japan

Telephone:
(045) 593-4870
Int: +81-45-593-4870

Fax:
(045) 593-4852
Int: +81-45-593-4852

Europe

BT&D Technologies, Ltd.
Whitehouse Road
Ipswich, Suffolk
IP1 5PB
England

Telephone:
0473-742250
Int: +44-473-742250

Fax:
0473-241110
Int: +44-473-241110

BT&D Technologies reserves the right to make changes to the products described herein without notice. No liability is assumed as a result of their use or application. No rights under any patent accompany the sale of any such product. All rights reserved. BT&D Technologies.
©BT&D 1992