High-speed TTL Receiver

HFD7000-2XX Series

FEATURES

- Designed to meet industrial LAN (Local Area Network) specifications
- · Converts optical input into an electrical signal
- Typical sensitivity at 660 nm is -21 dBm
- Single 5 V supply
- High-speed (dc to 16 Mbps)
- Metal SMA barrel for high mechanical stability
- Separate grounding of the barrel provides excellent RFII/EMI/ESD shielding
- Low-cost plastic version (HFD7000-212) available
- PIN-compatible with Honeywell's HFD3403 5 Mbps receiver



The HFD7000 Series are high-speed optical receivers designed for data transmission in industrial LAN applications. The monolithic CMOS chip consists of a large area photodiode, pre-amplifier with controlled gain, a post amplifier, a comparator and TTL output stage. The integrated voltage regulator provides easy use in many applications.

The chip's silicon material is optimized for 660 nm operation The on-chip controlled gain provides a wide dyanmic range and low pulse width distortion (PWD).

The chip is mounted in a metal TO-18 package. In addition, the outer package of the HFD7000-202 has a metal barrel for high mechanical stability and excellent shielding against RFI/EMI and ESD. This feature allows the receiver to operate in harsh environments.

The receiver is designed to work with Honeywell's high-speed 660 nm transmitter, the HFE 7000.

For maximum performance of this receiver, a 0.1 µF capacitor must be mounted between Vcc and ground no more than 3,0 mm [0.12 in] away from the housing. A 4.7 Ω resistor in series with Vcc increases the filter's performance. This minimizes external noise and allows the maximum sensitivity to be maintained.

▲ WARNING

PERSONAL INJURY

DO NOT USE these products as safety or emergency stop devices, or in any other application where failure of the product could result in personal injury.

Failure to comply with these instructions could result in death or serious injury.

WARNING

MISUSE OF DOCUMENTATION

- The information presented in this product sheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

Failure to comply with these instructions could result in death or serious injury.

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OPERATION

Optical power (photons) from the fiber strikes the active area of the photodiode and is converted to an electrical signal. The current is then converted to a voltage in the transimpedance pre-amplifier. The controlled gain limits the light current created by the photodiode in both the transimpedance pre-amplifier and in the post-amplifier. This avoids a possible overcharge of the amplifier and assures optimum PWD performance.

The signal is compared with a threshold defining the system's sensitivity limit. A final buffer provides a TTL output. The level sensitive behavior makes the system robust with respect to the external interference (e.g. current/voltage spikes). The regulator supplies the entire system to ensure high rejection of power supply noise.

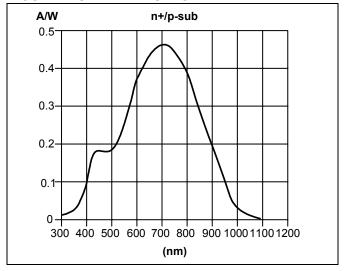
ABSOLUTE MAXIMUM RATINGS (25 °C [77 °F] free air temperature unless otherwise noted.)

Storage	-40 °C to 100 °C [-40 °F to 212 °F]			
temperature				
Lead solder	10 s at 260 °C [500 °F]			
temperature				
Supply voltage	6 V			
Junction	150 °C [302 °F]			
temperature				

RECOMMENDED OPERATING CONDITIONS

Operating	0 °C to 70 °C [32 °F to 158 °F]
Temperature	
Supply voltage	4.75 V to 5.25 V
Optical input	-20 dBm to -5 dBm
power	

FIGURE 1: SPECTRAL SENSITIVITY



NOTICE

- Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device.
- This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational section of this specification is not implied.
- Exposure to absolute maximum rating conditions for extended periods of time may affect reliability.

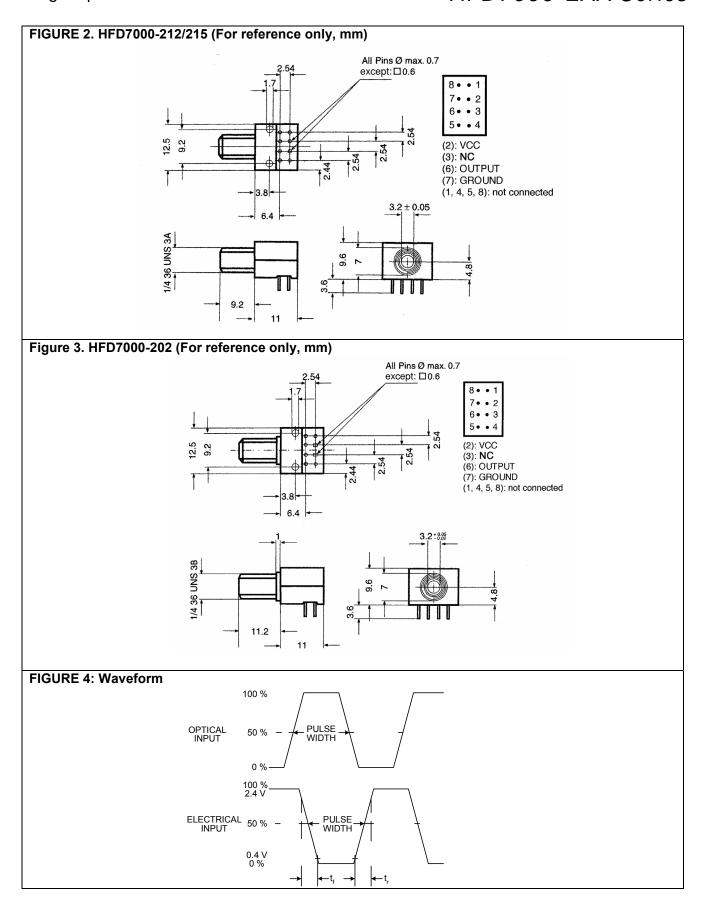
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TABLE 1: ELECTRO-OPTICAL CHARACTERISTICS (T_c = 25 °C [77 °F], V_{cc} = 5 V unless noted)

Parameter	Test Condition	Symbol	Min.	Typical	Max	Unit
Data rate	_	dc	dc	_	16	Mbps
Current consumption	_	Icc	_	_	45	mA
660 nm						
Max. received power/optical level LOW	1 mm/POF	P _{Rmaxl}	_	_	-31	dBm
Max. received power/optical level HIGH	1 mm/POF	P _{Rmaxl}	_	_	-5	dBm
Max. received power/optical level HIGH	1 mm/POF	P _{BminH}	-20	_	_	dBm
Output voltage high	$I_{OH} = 2 \text{ mA}@20 \text{ pf load}$	$V_{_{\mathrm{OHIGH}}}$	2.4	_	_	V
Output voltage low	$I_{OI} = 2 \text{ mA}@20 \text{ pf load}$	V _{oLow}	_	_	0.4	V
Rise time	10 % - 90 %	t,	_	6	10	ns
Fall time	90 % - 10 %	t,	_	8	10	ns
Pulse width distortion	f = 8 MHz, 50 % duty	PWD	_	_	±22	ns
	cycle, P _{olN} = -20 dBm					
	to -5 dBm (average)					
Dynamic range	_		15	_	_	dB
Bit error rate	_	BER	_	_	<10-9	_

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ORDER GUIDE

Catalog Listing	ing Description		
HFD7000-202	Metal barrel		
HFD7000-212	Fiberglass reinforced, non-conductive barrel		
HFD7000-215	Carbon-fiber reinforced, conductive barrel		

WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Contact your local sales office for warranty information. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace without charge those items it finds defective. The foregoing is Buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application. For application assistance, current specifications, or name of the nearest Authorized Distributor, contact a nearby sales office. Or call:

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