LIU-02

SERIAL DATA
COMMUNICATION TRANSCEIVER

ADVANCE PRODUCT INFORMATION

FEATURES

- **Low Power (<10mA)**
- **Single +5V Operation**
- **Crystal Driven Clock Recovery**
- **Data Rates from < 64kbit/s to 10Mbit/s**
- **Accepts Manchester or AMI Data Format**
- **Dual ALBO Ports Allow >60dB Dynamic Range**
- **Built-In Analog Jitter Attenuator**
- **On-Chip Loop-Back**
- **Independent Transmit and Receive Functions**
- **On-Chip Zero Suppression, B8ZS/HDB3**
- **Bipolar Violation Alarm**
- **Loss of Carrier Alarm**

GENERAL DESCRIPTION

The LIU-02 is a high performance serial data transceiver that is capable of transmitting as well as receiving over a wide range of serial data formats, including T1 (1.544Mbit/s), T148 (2.048Mbit/s), T1C (3.152Mbit/s), T2 (6.312Mbit/s) and 8.448Mbit/s standards. It is also usable at the ISDN basic data rate of 64kbit/s as well as LAN data rates up to 10Mbit/s.

A crystal driven phase-locked type oscillator provides reliable clock recovery and ease of use. The receiver contains a wide bandwidth, low noise preamplifier that can work with signal dynamic range of up to 60dB. With appropriate line equalization, the LIU-02 can accurately recover data that has been transmitted over 6,000 feet (2,000 meters) at 1.544Mbit/s data rate.

The LIU-02 contains a transmitter with built-in line drivers. It normally accepts NRZ data input from a host system with the data transfer timed by the on-board crystal oscillator. However, a loop-back control feature allows the received data to be internally connected directly to the transmitter timed by the recovered clock. A standard zero substitution, B8ZS or HDB3, is automatically performed on all incoming and outgoing data. The LIU-02 also provides an alarm ouput anytime a bipolar violation is received not corresponding to the zero suppression standards. Similarly, the ALBO circuit will issue an alarm whenever there is insufficient signal strength.

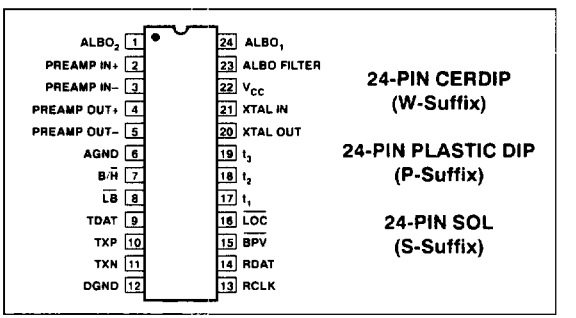
ORDERING INFORMATION †

PACKAGE		OPERATING TEMPERATURE RANGE
CERDIP	PLASTIC	
LIU02FW	LIU02FP	XIND
—	LIU02FS††	XIND

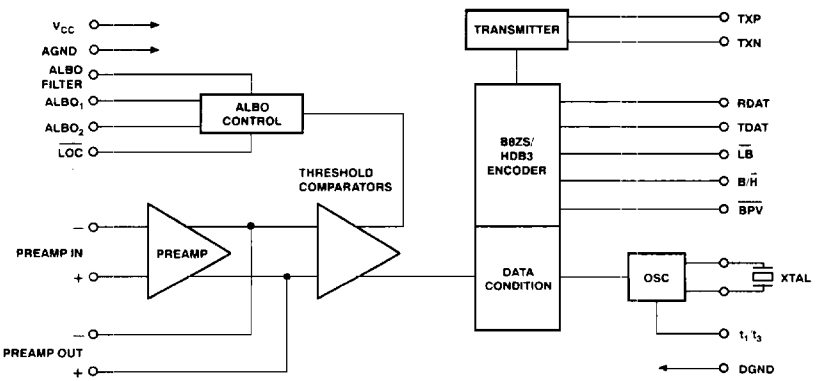
† Burn-in is available on commercial and industrial temperature range parts in CerDIP, plastic DIP, and TO-can packages. For ordering information, see PMI's Data Book Section 2.

†† For availability and burn-in information on SO and PLCC packages, contact your local sales office.

PIN CONNECTIONS



FUNCTIONAL BLOCK DIAGRAM



is advance product information describes a product in development at the time of this printing. Final specifications may vary. Please contact local sales office distributor for final data sheet.

ABSOLUTE MAXIMUM RATINGS

Maximum Voltage, Pin 3 to Pin 11 ..... 6.5V, –0.5V
Maximum Voltage, Any Pin Except 12 and 13 ..... V_{CC}
Maximum Sinking Current, Any Pin 20mA
Operating Temperature Range ..... –40°C to +85°C
Storage Temperature Range ..... –65°C to +150°C
Lead Soldering Temperature ..... 300°C
Junction Temperature ..... 150°C

PACKAGE TYPE	Θ_{JA} (Note 1)	Θ_{JC}	UNITS
24-Pin Hermetic DIP (W)	69	10	°C/W
24-Pin Plastic DIP (P)	62	32	°C/W
24-Pin SOL (S)	72	24	°C/W

NOTE:
1. Θ_{JA} is specified for worst case mounting conditions, i.e., Θ_{JA} is specified for device in socket for CerDIP and P-DIP packages; Θ_{JA} is specified for device soldered to printed circuit board for SOL package.

ELECTRICAL CHARACTERISTICS at V_{CC} = 5V, –40°C ≤ T_A ≤ +85°C, unless otherwise noted.

PARAMETER	SYMBOL	CONDITIONS	LIU-02 TYP	UNITS
SUPPLY				
Supply Voltage	V_{CC}		5.0	V
Supply Current	I_{CC}		10	mA
PREAMPLIFIER				
Preamplifier Open-Loop Gain	A_O		56	dB
Preamplifier Bandwidth	B_W	–3dB	10	MHz
Input Offset Voltage	V_{OS}		5	mV
Output High Swing	V_{OHA}		4	V
Output Low Swing	V_{OLA}		1.2	V
Output Impedance	Z_{OUT}		50	Ω
Output Self Bias Voltage	V_{DC}		2.6	V
TRANSMITTER				
Output Drive Current	I_{OT}	Sinking	30	mA
Output Low Voltage	V_{OL}	I_O = 30mA	0.4	V
Output Fall Time	T_{OF}	I_O = 30mA	20	ns
CLOCK CIRCUIT				
Maximum Clock Frequency			20	MHz
RCLK Duty Cycle			50	%
DIGITAL CHARACTERISTICS				
High Level Input Voltage	V_{IN}		2.0	V MIN
Low Level Input Voltage	V_{IL}		0.8	VMAX
High Level Output Voltage	V_{OHD}		3.5	V MIN
Low Level Output Voltage	V_{OLD}		0.4	V MAX
Input Leakage Current	I_{ID}		±10	µA
RDAT Output Pulse Width	P_{WD}	f = 1.544MHz	648	ns
RCLK Output Pulse Width	P_{WC}	f = 1.544MHz	324	ns
ALBO				
ALBO Threshold	V_{TA}		1.6	V
Threshold Tolerance			±10	%
ALBO ON Resistance	R_DMIN		10	Ω
ALBO OFF Resistance	R_DMAX		20	kΩ
DATA/CLOCK THRESHOLD				
Data Threshold	V_{TD}%		50	%
Clock Threshold	V_{TC}%		50	%