

100Base-TX/FX Converter

Features

- 100Base-TX IEEE 802.3u compatible
- Full and Half duplex with Auto-negotiation
- Fully integrated adaptive equalizers
- 125MHz clock generator and clock recovery
- Include transmit waveform shaping to reduce EMI and filter
- Include baseline wander correction
- Support one TX interface and one Fiber module interface (ECL interface).
- Support transmit, receive/link, full duplex LED
- Single 5 Voltage supply operation
- 128-pin PQFP

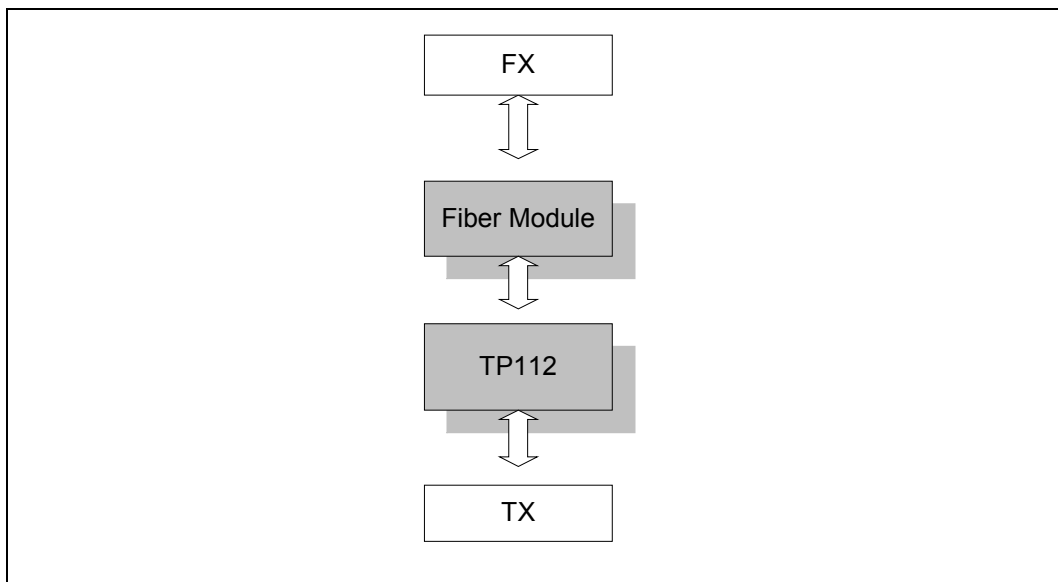
General Description

The TP112 is a single chip media converter for 100Base-TX to 100Base-FX. The TP112 supports one 100Base-TX port over CAT5 twisted pair cable and one ECL interface to connect with fiber module to apply in 100Base-TX/FX converter application. On the 100Base-TX part, The TP112 is directly connected to external transformers.

The chip performs data recovery, clock recovery, adaptive equalization, auto negotiation, and baseline wander correction function. The TP112 is compliant with the IEEE 802.3u standard.

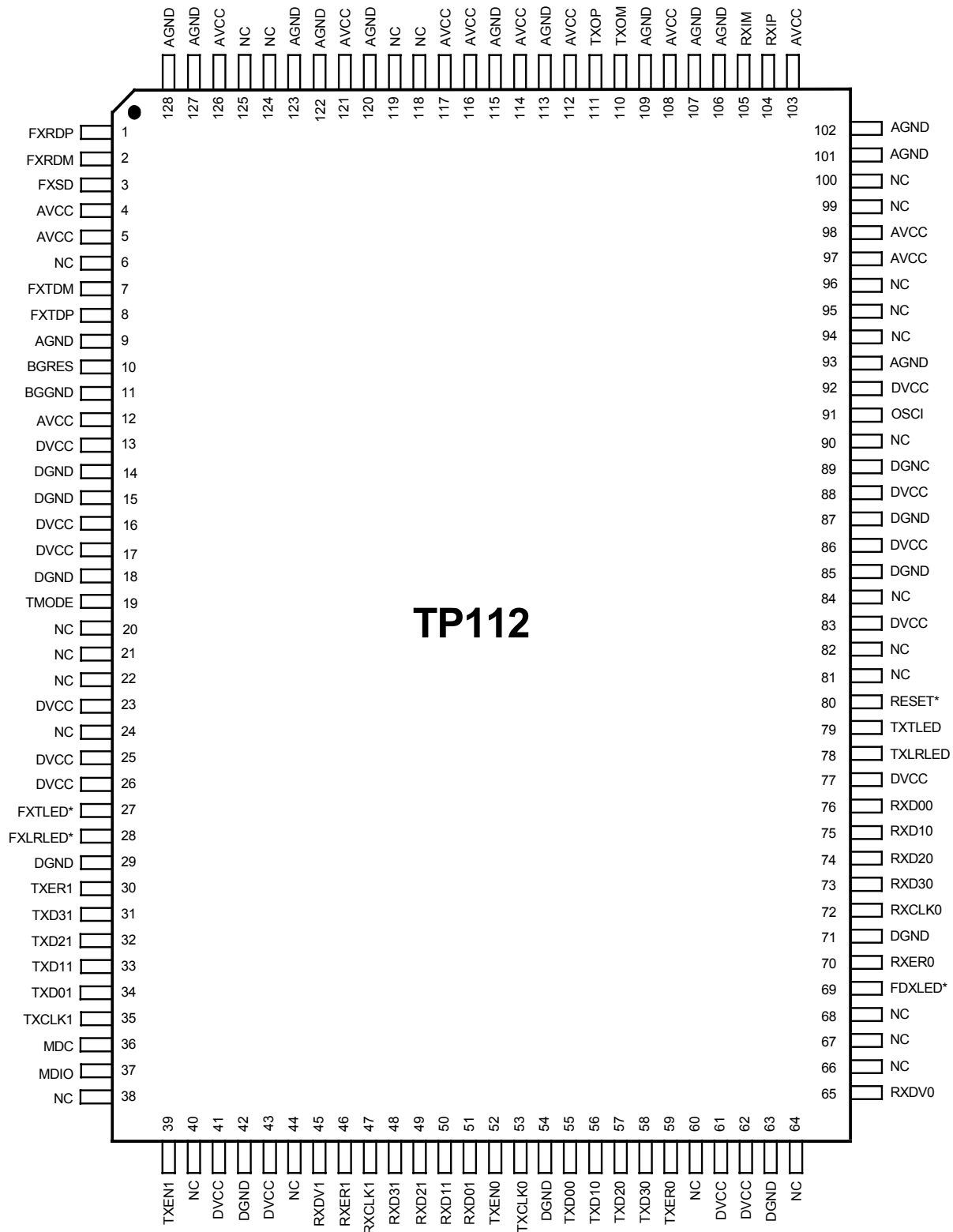
Typical Application

100Base-TX to 100Base-FX Converter





PIN Assignments



1 PIN Description

TYPE	DESCRIPTION
I	Used as Input pin
O	Used as Output pin
I/O	Used as Input and Output pin
O	Used as Output with Open Drain

PIN NO.	LABEL	TYPE	DESCRIPTION
Media Connections			
104,105	RXIP, RXIM	I	Receiver Pair Differential data from external transformers RD± pair.
111,110	TXOP, TXOM	O	Transmit Pair Differential data to external transformers TD± pair.
1,2	FXRDP, FXRDM	I	Fiber Receiver Data Pair These 2 pins are used to receiver the data from the fiber transceiver module. These 2 pins need external pull high resistor and pull low resistor, depend on impedance match of the fiber transceiver module.
8,7	FXTDP, FXTDM	O	Fiber Transmit Data Pair These 2 pins are used as data transmission outputs from IC into the fiber transceiver module. They need external pull high resistor and pull low resistor, depend on impedance match of the fiber transceiver module.
3	FXSD	I	Fiber Signal Detect This pin is used as an input pin from the Fiber transceiver module to indicate a valid signal quality had been detect.
MII Interface			
59 30	TXER0 TXER1	I	Transmit Error Active high. When an error happened in the transmit data stream.
52 39	TXEN0 TXEN1	I	Transmit Enable Active high. Indicate 4B data valid on TXD[3:0]
53 35	TXCLK0 TXCLK1	I/O	Transmit Clock Output is 25MHz continuous clock.
58, 57, 56, 55, 31, 32, 33, 34	TXD[3:0]0 TXD[3:0]1	I	Transmit Data Input 4B transmit data.
65 45	RXDV0 RXDV1	O	Receive Data valid Active high. Indicates that a received frame is in progress, and data on RXD pin is valid
70 46	RXER0 RXER1	O	Receive Error It Indicate that there's an error during a receive frame when high
72 47	RXCLK0 RXCLK1	O	Receive Clock 25MHz output. The clock is recovered from the incoming data on the cable inputs
73, 74, 75, 76, 48, 49, 50, 51	RXD[3:0]0 RXD[3:0]1	O	Receive Data Output 4B data output and synchronously to RXCLK.



PIN Description (continued)

PIN NO.	LABEL	TYPE	DESCRIPTION
Modes			
36	MDC	I	Management Data Clock MII management data clock input, maximum clock rate is 2.5MHz
37	MDIO	I/O	Management Data I/O MII management data input/output
19	TMODE	I	Test Mode Active high. Set TP112 into test mode, and low for normal operation. There's an internal pull low resistor so default is normal operation
LEDs			
69	FDXLED*	O	Full Duplex LED Before link OK, this pin is tri-stated. After link OK this pin indicate current duplex operation for TP112. High for half duplex and low for full duplex
78 28	TXLRLED* FXLRLED*	O	Link/Receive LED Active low. Indicates the link status of the TP112, driven low when link to the TP112 is good.
79 27	TXTLED* FXTLED*	O	Transmit LED Active low. Indicates that data is being transmitting
Reset & Clock			
80	RESET*	I	Reset Active low. Reset TP112, remain low at least 1us.
91	OSCI	I	Oscillator Input 25MHz $\pm$ 50 ppm oscillator input
Current Reference			
10	BGRES	I	Band Gap Resistor A 6.2K ohms 1% resistor that supplies 200uA reference current for receive
11	BGGND	I	Band Gap Resistor Ground Band gap resistor ground for reference input

Note: * means it's a low active signal



PIN Description (continued)

PIN NO.	LABEL	TYPE	DESCRIPTION
Power & Ground			
4, 5, 12, 97, 98, 103, 108, 112, 114, 117, 116 121, 126	AVCC	I	Analog VCC +5V
9, 93, 101, 102, 106, 107, 109, 113, 115, 120, 122, 123, 127, 128	AGND	I	Analog Ground 0V
13, 16, 17, 23, 25, 26, 41, 43, 61, 62, 77, 83, 86, 88, 92,	DVCC	I	Digital VCC +5V
14, 15, 18, 29, 42, 54, 63, 71, 85, 87, 89	DGND	I	Digital Ground 0V
6, 20, 21, 22, 24, 38, 40, 44, 60, 64, 66, 67, 68, 81, 82, 84, 90, 94, 95, 96, 99, 100, 118, 119, 124, 125	NC		No Connection



2 Absolute Maximum Rating

Supply Voltage.....VCC -0.25 to VDD +0.25V
Storage Temperature.....-65 to 150°C
Ambient Operating Temperature (Ta)..... to 70°C

Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device. Functional operation under these conditions is not implied. Exposure to Absolute Maximum Rating conditions for extended periods may affect product reliability.

3 Electrical

Operating Conditions

Parameter	Sym.	Min.	Typ.	Max.	Unit	Conditions
Supply Voltage	AVCC	4.75	5	5.25	V	
	DVCC	4.75	5	5.25	V	VCC=5.0V
Power Consumption	ICC		TBD		W	

Input Clock

Parameter	Sym.	Min.	Typ.	Max.	Unit	Conditions
Frequency			25		MHz	
Frequency Tolerance		-50		+50	PPM	

I/O Electrical Characteristics

Parameter		Sym.	Min.	Typ.	Max.	Unit	Conditions
Input Low Voltage	I	V _{IL}			0.8	V	
Input High Voltage	I	V _{IH}	2.0			V	
Output Low Voltage	O	V _{OL}			0.4	V	I _{OH} =4mA, VCC=5.0V
Output High voltage	O	V _{OH}	2.4			V	I _{OL} =4mA, VCC=5.0V

TX Transceiver Electrical Characteristics

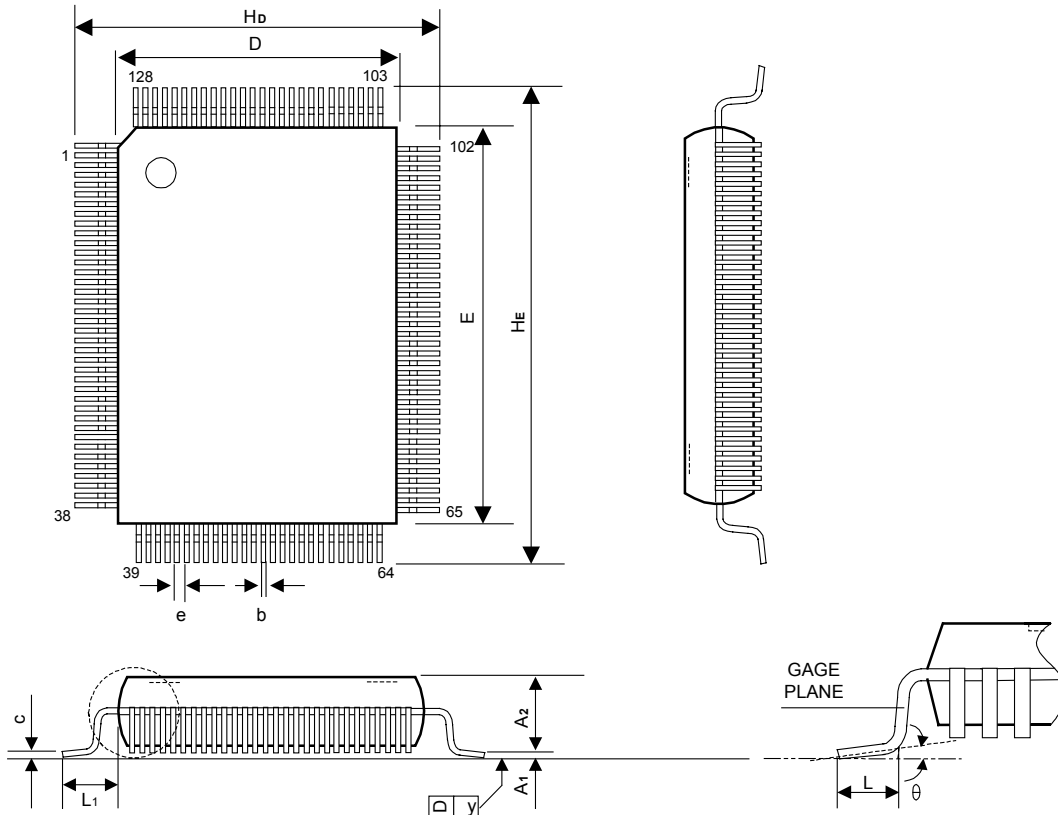
Parameter	Sym.	Min.	Typ.	Max.	Unit	Conditions
Transmitter						
Peak Differential Output Voltage	V _P	0.95	1.0	1.05	V	
Signal Amplitude Symmetry	-	98	100	102	%	
Signal Rise/Fall Time	TRF	3	4	5	ns	
Rise/Fall Time Symmetry	TRFS			0.5	ns	
Duty Cycle Distortion	-			0.5	ns	
Overshoot	V _O			5	%	

Order Information

Part No.	Package	Notice
TP112	128 PIN PQFP	-

4 Package Detail

128 PQFP Outline Dimensions



Symbol	Dimensions In Inches			Dimensions In mm		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A1	0.010	0.014	0.018	0.25	0.35	0.45
A2	0.107	0.112	0.117	2.73	2.85	2.97
b	0.007	0.009	0.011	0.17	0.22	0.27
c	0.004	0.006	0.008	0.09	0.15	0.20
HD	0.669	0.677	0.685	17.00	17.20	17.40
D	0.547	0.551	0.555	13.90	14.00	14.10
HE	0.906	0.913	0.921	23.00	23.20	23.40
E	0.783	0.787	0.791	19.90	20.00	20.10
e	-	0.020	-	-	0.50	-
L	0.025	0.035	0.041	0.65	0.88	1.03
L1	-	0.063	-	-	1.60	-
y	-	-	0.004	-	-	0.10
θ	0°	-	12°	0°	-	12°

Note:

1. Dimension D & E do not include mold protrusion.
2. Dimension B does not include dambar protrusion.
Total in excess of the B dimension at maximum material condition.
Dambar cannot be located on the lower radius of the foot.

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