THTA6482

Octal 32GBaud PAM4/NRZ TIA

General Description

The THTA6482 is a high performance linear Octal TIA for optical links with data rates up to 32GBaud PAM4/NRZ.

Features include RSSI for photo-alignment and power monitoring, and I2C control of bandwidth, output amplitude, peaking, LOS, gain and other parameters.

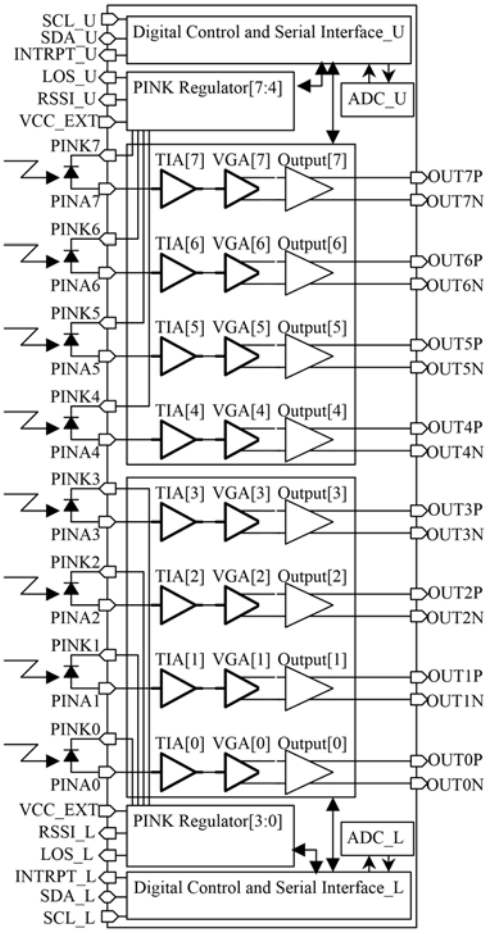
Applications

PCI Express 6.0 Optical Modules for MMF links

Features

- Octal 32GBaud PAM4/NRZ TIA
- Ultra-low Power: 210mW/Ch (@3.3V)
- 250μm anode to anode spacing
- Wide Bandwidth with Low Noise
- Integrated AGC loop
- RSSI for photo-alignment and monitoring
- Flexible, integrated PINK regulator enabling very large and small reverse bias voltage on PD.
- Support squelch function
- Support PCI Express 6.0 Low Power States
- Supports 0 °C to +95 °C die temperature

Block Diagram



Chip Dimensions

Die Thickness: 108 µm +-12.5 µm , Pad Material: Aluminum. Data Base Size: 3800 x 3600.

Table 1 Die Detail. All Dimensions in µm.

Part Number	Minimum Die Size	Maximum Die Size	Pad Openings	Pad Openings For PINA & OUTP/N	Pad opening for PINK pads
THTA6482	3870 x 3670	3920 x 3720	70.2 x 70.2 square	70.2 x 70.2 octagon	81 x 60 rectangular

Absolute Maximum Ratings

Table 2 Absolute Maximum Ratings

Parameter		Min	Typ	Max	Unit
PINA Input Current (Average)		-	-	4	mA
ESD Rating	HBM at high-speed pins	±500	-	-	V
	HBM at all other pins	±2000	-	-	V

Recommended Operating Conditions

Table 3 Recommended Operating Conditions

Parameter	Min	Typ	Max	Unit
Core Power Supply Voltage (VCC25)	2.4	2.5	2.6	V
TIA Power Supply Voltage (VCC33)	3.1	3.3	3.6	V

Performance Specification

Table 4 TIA Input DC / AC specifications

Over recommended operating supply and temperature range unless otherwise specified

Symbol	Parameter	Condition	Min	Typ	Max	Unit
ICCW33	3.3V Active Supply Current	Normal state	-	34	-	mA
ICCW25	2.5V Active Supply Current	Normal state	-	37	-	mA
$I_{SENSPAM}$	Input Sensitivity	BER < 10^{-6} at 32Gbaud PAM4	-	130	-	µApp
I_{EIN}	Equivalent Input Noise	At 6.2 kΩ differential transimpedance gain	-	3.0	-	μA_{RMS}
B_{RATE}	PAM4/NRZ Input Data Rate		1	-	32	GBaud
SS_{TZMAX}	Maximum Differential Transimpedance	-	-	6.3	-	kΩ
SS_{TZMIN}	Minimum Differential Transimpedance	-	-	0.45	-	kΩ
I_{OL}	Overload Input Current	-	-	1.8	-	mApp
$T_{AMP\_LOS\_SLOW}$	Assert/De-assert Time for an AMP LOS Event from any channel in Slow LOS mode	-	-	-	1	µs
$R_{TX-DIFF-DC}$	DC Differential Impedance	-	80	-	120	Ω
$V_{TX-DIFF-PP-SWING}$	Target Output Amplitude Range	-	-	575 to 950	-	mVpp

Notices and Requests

1. The product specifications described in this material are subject to change without prior notice.

2. The circuit diagrams described in this material are examples of the application which may not always apply to the customer's design. THine Electronics, Inc. (“THine”) is not responsible for possible errors and omissions in this material. Please note even if errors or omissions should be found in this material, THine may not be able to correct them immediately.

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5. Product Application

5.1 Application of this product is intended for and limited to the following applications: audio-video device, office automation device, communication device, consumer electronics, smartphone, feature phone, and amusement machine device. This product must not be used for applications that require extremely high-reliability/safety such as aerospace device, traffic device, transportation device, nuclear power control device, combustion chamber device, medical device related to critical care, or any kind of safety device.

5.2 This product is not intended to be used as an automotive part, unless the product is specified as a product conforming to the demands and specifications of IATF16949 ("the Specified Product") in this data sheet. THine accepts no liability whatsoever for any product other than the Specified Product for it not conforming to the aforementioned demands and specifications.

5.3 THine accepts liability for demands and specifications of the Specified Product only to the extent that the user and THine have been previously and explicitly agreed to each other.

6. Despite our utmost efforts to improve the quality and reliability of the product, faults will occur with a certain small probability, which is inevitable to a semi-conductor product. Therefore, you are encouraged to have sufficiently redundant or error preventive design applied to the use of the product so as not to have our product cause any social or public damage.

7. Please note that this product is not designed to be radiation-proof.

8. Testing and other quality control techniques are used to this product to the extent THine deems necessary to support warranty for performance of this product. Except where mandated by applicable law or deemed necessary by THine based on the user’s request, testing of all functions and performance of the product is not necessarily performed.

9. Customers are asked, if required, to judge by themselves if this product falls under the category of strategic goods under the Foreign Exchange and Foreign Trade Act.

10. The product or peripheral parts may be damaged by a surge in voltage over the absolute maximum ratings or malfunction, if pins of the product are shorted by such as foreign substance. The damages may cause a smoking and ignition. Therefore, you are encouraged to implement safety measures by adding protection devices, such as fuses.

THine Electronics, Inc.

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