

LICENSABLE  
INTELLECTUAL  
PROPERTY  
FOR FPGA, ASIC OR  
ASSP DESIGNS

# 10G

Ultra-Low Latency  
10G Ethernet MAC  
and PCS

## ULTRA-LOW LATENCY, HIGH-SPEED, FLEXIBILITY AND SCALABILITY.

### APPLICATIONS

- High Frequency Trading
- Smart NIC
- Low-Latency Switches

The Ultra-Low Latency 10G Ethernet MAC and PCS is the industry leading solution for latency critical Ethernet applications. The core is designed using advanced design techniques leading to unmatched ultra-low gate count utilization and amazing latency performances.

The IP core can support full wire line speed with a 64-byte packet length. It also supports back-to-back or mixed length traffic with no dropped packets.

### GENERAL FEATURES

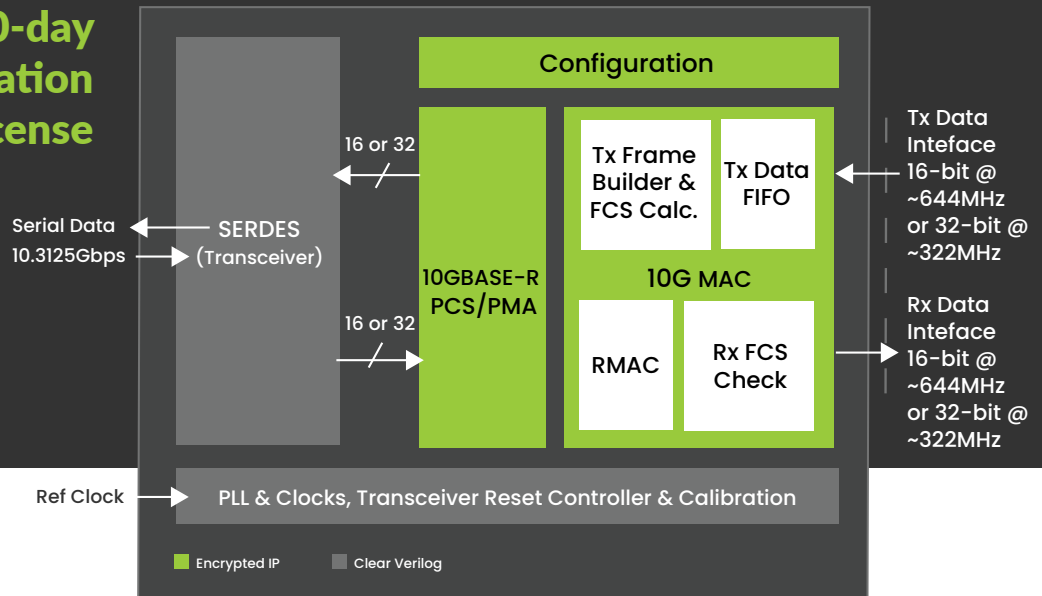
<b>User logic Interface</b> <ul style="list-style-type: none"><li>- AXI-4 Stream 16b @ ~644MHz</li><li>- AXI-4 Stream 32b @ ~322MHz</li></ul>	<b>SERDES Interface</b> <ul style="list-style-type: none"><li>- 16b @ ~644MHz</li><li>- 32b @ ~322MHz</li></ul>	<b>Early SoP Indication (Tx)</b> <b>Early SoF Detection (Rx)</b>
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Free 30-day  
evaluation  
license

## HIGH-LEVEL BLOCK DIAGRAM



## DELIVERABLES

- Datasheet & user guide
- Encrypted Verilog
- Constraints file
- Reference design
- Technical support
- Optional IP design customization

## MAC FEATURES

- Deficit idle counter (DIC) to maintain a 12-byte inter-packet gap (IPG) average
- User facing logic interface 16-bit @ 644.531250MHz or 32-bit @ 322.265625MHz
- Tx Frame Check Sequence (FCS) computation and insertion
- Rx FCS error detection
- Fully compatible with Orthogone 10G TCP/UDP IP core

## PCS FEATURES

- Supports 10GBASE-R PHY based on 64B/66B encoding and scrambling
- Supports block synchronization

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## PERFORMANCES OVERVIEW EXAMPLE

Device Family	Rate [Gbps]	SERDES Width	AXI-4 Stream Width	Resources Utilization			Core clock [MHz]	Wire to Wire Round-Trip Latency <sup>(1)</sup>
				LUTs	FFs	BRAM		
UltraScale +	10-Gbps	16b	32b	1.5k	1.1k	0	644.531	37.2ns
UltraScale +	10-Gbps	16b	16b	1.4k	1.1k	0	644.531	NDA

(1) Latency: GTY + MAC/PCS + CDC (Measured from TxSoP to RxSoP using serial loopback)