

## Product Brief: Apodis IPL4202M OTN Processors

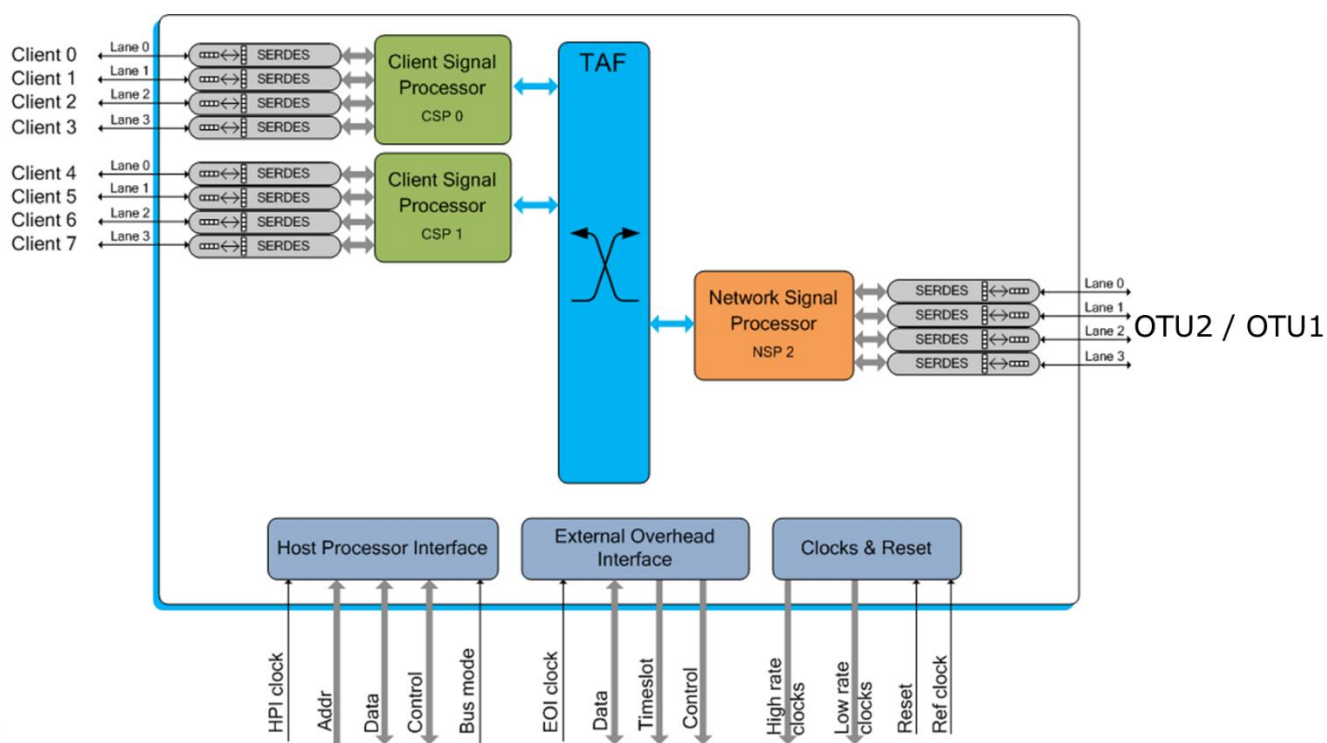
The Apodis IPL4202M OTN processors ASICs are a member of Tera-Pass' product family for access applications. Apodis IPL4202M processors support the functionality required by metro, access and enterprise networks. Apodis IPL4202M's client-side supports up to 8 multi-service, multi-rate ports and multiplexes them to 1 OTU2/OTU1 (10.7/11.1 G or 2.7G) bearers.

| Product Family | Category                                          | Part Number | Technology | Client Ports | Line Ports  | FE/GE | 10GE | STM1 / STM4 | STM16 | EOS | 10G Clients | Low Rate Clients |
|----------------|---------------------------------------------------|-------------|------------|--------------|-------------|-------|------|-------------|-------|-----|-------------|------------------|
| Apodis         | Muxponder                                         | IPL4002M    | ASIC       | 16           | 4 OTU2/OTU1 | v     | v    | v           | v     |     | v           | v                |
|                | Muxponder                                         | IPL4102M    | ASIC       | 16           | 2 OTU2/OTU1 | v     | v    | v           | v     |     | v           | v                |
|                | Muxponder                                         | IPL4102A    | ASIC       | 8            | 2 OTU2/OTU1 | v     | v    | v           | v     |     |             |                  |
|                | Muxponder                                         | IPL4202M    | ASIC       | 8            | 1 OTU2/OTU1 | v     | v    | v           | v     |     | v           | v                |
|                | Transponder                                       | IPL4302F    | ASIC       | 4            | 4 OTU2      |       | v    |             |       |     | v           |                  |
|                | Transponder                                       | IPL4402F    | ASIC       | 2            | 2 OTU2      |       | v    |             |       |     | v           |                  |
|                | Transponder                                       | IPL4402A    | ASIC       | 2            | 2 OTU2      |       | v    |             |       |     |             |                  |
| Gemini         | 2 x Ethernet Muxponder                            | TPS5001MP   | IP Core    | 2            | 2 OTU1/OTU0 | v     |      |             |       |     |             |                  |
|                | 2 x (Ethernet + SDH) Muxponder                    | TPS5101MP   | IP Core    | 2            | 2 OTU1/OTU0 | v     |      | v           |       |     |             |                  |
|                | 2 x (Ethernet + EOS) Muxponder                    | TPS5201MP   | IP Core    | 2            | 2 OTU1/OTU0 | v     |      |             |       | v   |             |                  |
| Zephyr         | 6 x (Ethernet + 2 x Ethernet/SDH) Muxponder       | TPS6001MP   | IP Core    | 8            | 2 OTU2      | v     |      | v           |       |     |             |                  |
|                | 8 x (Ethernet + SDH) Muxponder                    | TPS6101MP   | IP Core    | 8            | 2 OTU2      | v     |      | v           |       |     |             |                  |
|                | (6 x Ethernet + 2 x Ethernet/SDH + EOS) Muxponder | TPS6201MP   | IP Core    | 8            | 2 OTU2      | v     |      | v           |       | v   |             |                  |

**Tera-Pass' product families of OTN processors for access applications**

| Part Number | Application            | Line Signals  |      |      |            | Client Signals |       |     |                               |             |             |      |                      |                |                                    |               |                      |       |
|-------------|------------------------|---------------|------|------|------------|----------------|-------|-----|-------------------------------|-------------|-------------|------|----------------------|----------------|------------------------------------|---------------|----------------------|-------|
|             |                        | No Of Ports . | OTU2 | OTU1 | Strong FEC | No. Of Ports   | FE GE | 10G | STM1 STM4 STM16 OC3 OC12 OC48 | STM64 OC192 | OTU 0 OTU 1 | OTU2 | FC 100 FC 200 FC 400 | FC 800 FC 1200 | CPRI 1 CPRI 2 CPRI 3 CPRI 4 CPRI 5 | CPRI 7 CPRI 8 | CBR 0 CBR 1 CBR flex | CBR 2 |
| IPL4002M    | Muxponder/ Transponder | 4             | ✓    | ✓    | ✓          | 16             | ✓     | ✓   | ✓                             | ✓           | ✓           | ✓    | ✓                    | ✓              | ✓                                  | ✓             | ✓                    | ✓     |
| IPL4102M    | Muxponder/ Transponder | 2             | ✓    | ✓    | ✓          | 16             | ✓     | ✓   | ✓                             | ✓           | ✓           | ✓    | ✓                    | ✓              | ✓                                  | ✓             | ✓                    | ✓     |
| IPL4102A    | Muxponder/ Transponder | 2             | ✓    | ✓    |            | 8              | ✓     | ✓   | ✓                             | ✓           |             | ✓    |                      |                |                                    |               | ✓                    | ✓     |
| IPL4202M    | Muxponder/ Transponder | 1             | ✓    | ✓    | ✓          | 8              | ✓     | ✓   | ✓                             | ✓           | ✓           | ✓    | ✓                    | ✓              | ✓                                  | ✓             | ✓                    | ✓     |
| IPL4302F    | Transponder            | 4             | ✓    |      | ✓          | 4              |       | ✓   |                               | ✓           |             | ✓    |                      | ✓              |                                    | ✓             |                      | ✓     |
| IPL4402F    | Transponder            | 2             | ✓    |      | ✓          | 2              |       | ✓   |                               | ✓           |             | ✓    |                      | ✓              |                                    | ✓             |                      | ✓     |
| IPL4402A    | Transponder            | 2             | ✓    |      |            | 2              |       | ✓   |                               |             |             |      |                      |                |                                    |               |                      |       |

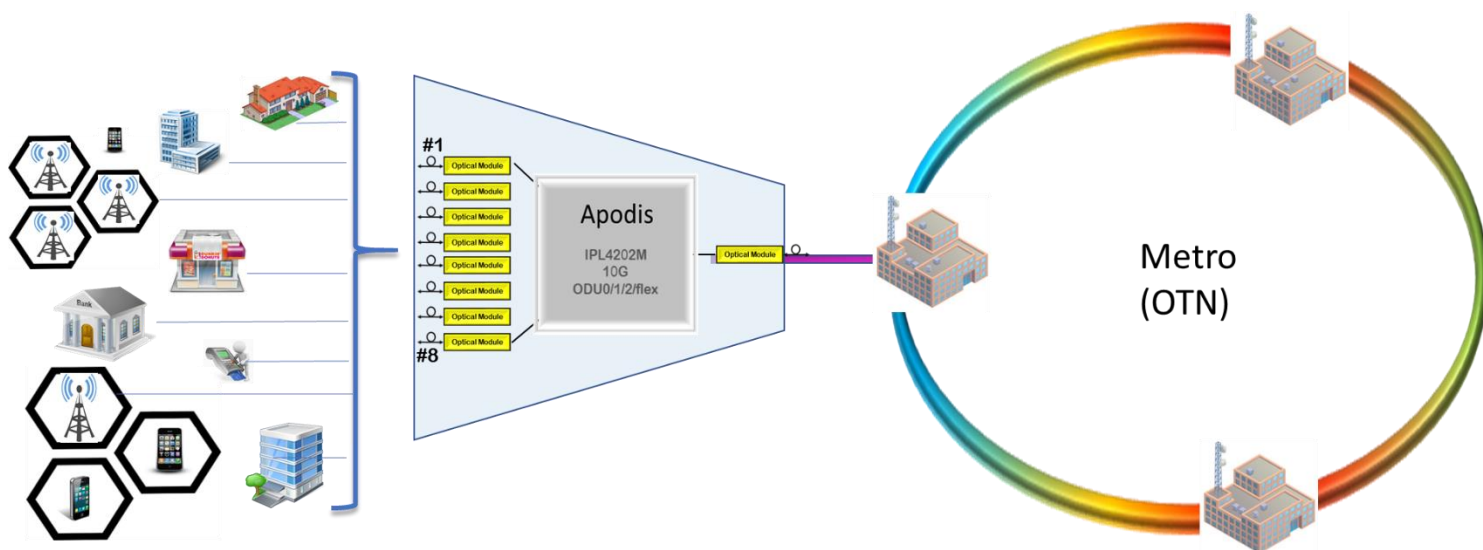
### Apodis product family of ASIC OTN Processors



**IPL4202M Block Diagram**

## Apodis IPL4202M: Key Features

|                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Line Ports:</b> <ul style="list-style-type: none"> <li>• 1 Ports</li> <li>• OTU2 (10.7/11.1 G) w. GFEC or Strong FEC</li> <li>• OTU1 (2.7G) with GFEC</li> </ul>                                                                                                                                                                           | <b>Client Ports:</b> <ul style="list-style-type: none"> <li>• 8 Ports</li> <li>• Multi-Rate</li> <li>• Multi-Service</li> </ul>                                                                                                                                                                                         | <b>Client and Line Signals Interfaces:</b> <ul style="list-style-type: none"> <li>• Multi-Rate signals: 125M to 11.1G</li> <li>• 10G rates I/O: Serial or Parallel (SFI4.2, XAUI)</li> </ul>                                                                                                                                                  |
| <b>OTN:</b> <ul style="list-style-type: none"> <li>• Compliance with ITU-T G.709</li> <li>• Alarm supervision</li> <li>• Access to all GCC channels</li> <li>• OTU Overhead: SM, GCC0</li> <li>• ODU Overhead: PM, Delay Measurement, GCC1/2, 6 TCM</li> <li>• ODU Multiplexing: PT20: ODU0 to ODU1 to ODU2<br/>PT21: ODU0 to ODU2</li> </ul> | <b>Ethernet:</b> <ul style="list-style-type: none"> <li>• FE/GE/10GE</li> <li>• PCS Monitoring (GE/10GE)</li> <li>• RMON (GE/10GE)</li> <li>• SyncE</li> <li>• IEEE 1588 v2 h/w stamping: GE</li> <li>• Mappings: FE – GMP to ODU0<br/>GE – GFP-T to ODU0<br/>10GE – GFP-F to ODU2<br/>or BMP to ODU2e/ODU1e</li> </ul> | <b>Switching Fabric:</b> <ul style="list-style-type: none"> <li>• Fully available, non-blocking</li> <li>• Switching Granularity: ODU2, ODU1, ODU0, ODUflex, native rates</li> <li>• Client-to-Line, Line-to-Line, Client-to-Client, Unrestricted Broadcast</li> <li>• Timing transparent</li> <li>• Negligible pass-through delay</li> </ul> |
| <b>SDH:</b> <ul style="list-style-type: none"> <li>• STM1/STM4/STM16/STM64</li> <li>• Monitoring: Alarms, PM</li> <li>• Access to DCC channels</li> <li>• Mappings: STM1, STM4: GMP to ODU0<br/>STM16: AMP/BMP to ODU1<br/>STM64: AMP/BMP to ODU2</li> </ul>                                                                                  | <b>CPRI:</b> <ul style="list-style-type: none"> <li>• CPRI 1,2,3,4,5,7,8</li> <li>• Meets 2ppb CPRI-over-OTN jitter requirements</li> <li>• Mappings: CPRI 1, 2: GMP to ODU0<br/>CPRI 3: GMP to ODU1<br/>CPRI 4, 5: GMP to ODUflex<br/>CPRI 7: to GMP ODU2<br/>CPRI 8: BMP to ODU2s</li> </ul>                          | <b>SAN (Storage Area Networks):</b> <ul style="list-style-type: none"> <li>• ESCON/FC100/FC200/FC400/FC800/FC1200</li> <li>• Mappings: ESCON, FC100: GMP to ODU0<br/>FC200: GMP to ODU1<br/>FC400, FC800: BMP to ODUflex<br/>FC1200: GFP-T and BMP to ODU2e/ODU1e<br/>or BMP to ODU2f/ODU1f</li> </ul>                                        |
| <b>Client-Side OTN:</b><br>OTU2, OTU1, OTU0, GFEC only                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                         | <b>Infiniband:</b> <ul style="list-style-type: none"> <li>• SDR (2.5G), DDR (5G), QDR (10G)</li> <li>• Mappings: SDR, DDR: BMP to ODUflex<br/>QDR: BMP to ODU2i</li> </ul>                                                                                                                                                                    |
| <b>Maintenance:</b> <ul style="list-style-type: none"> <li>• Line Loopback</li> <li>• Terminal Loopback</li> <li>• PRBS generation, monitoring</li> </ul>                                                                                                                                                                                     | <b>Synchronization:</b><br>Single commercial 155.52Mhz reference clock                                                                                                                                                                                                                                                  | <b>CBR:</b> <ul style="list-style-type: none"> <li>• CBR0, CBR1, CBR2 to ODU0, ODU1, ODU2</li> <li>• CBRflex: Mappings to ODUflex signals of 3,4,5, and 7 Time Slots</li> </ul>                                                                                                                                                               |
|                                                                                                                                                                                                                                                                                                                                               | <b>Control:</b> <ul style="list-style-type: none"> <li>• 32-bit parallel bus</li> <li>• Intel/Freescale modes</li> </ul>                                                                                                                                                                                                | <b>Design Support Tools:</b> <ul style="list-style-type: none"> <li>- Evaluation Board (EVB)               <ul style="list-style-type: none"> <li>o H/W Reference Design</li> </ul> </li> <li>- Software Development Kit (SDK)/APIs</li> <li>- Technical Documentation</li> </ul>                                                             |



**Apodis IPL4202M Application: 10G Muxponder with 8 multi-service client-ports and 1 OTU2/OTU1 line-port**

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