

# Clocks for NXP QorIQ and Layerscape CPUs

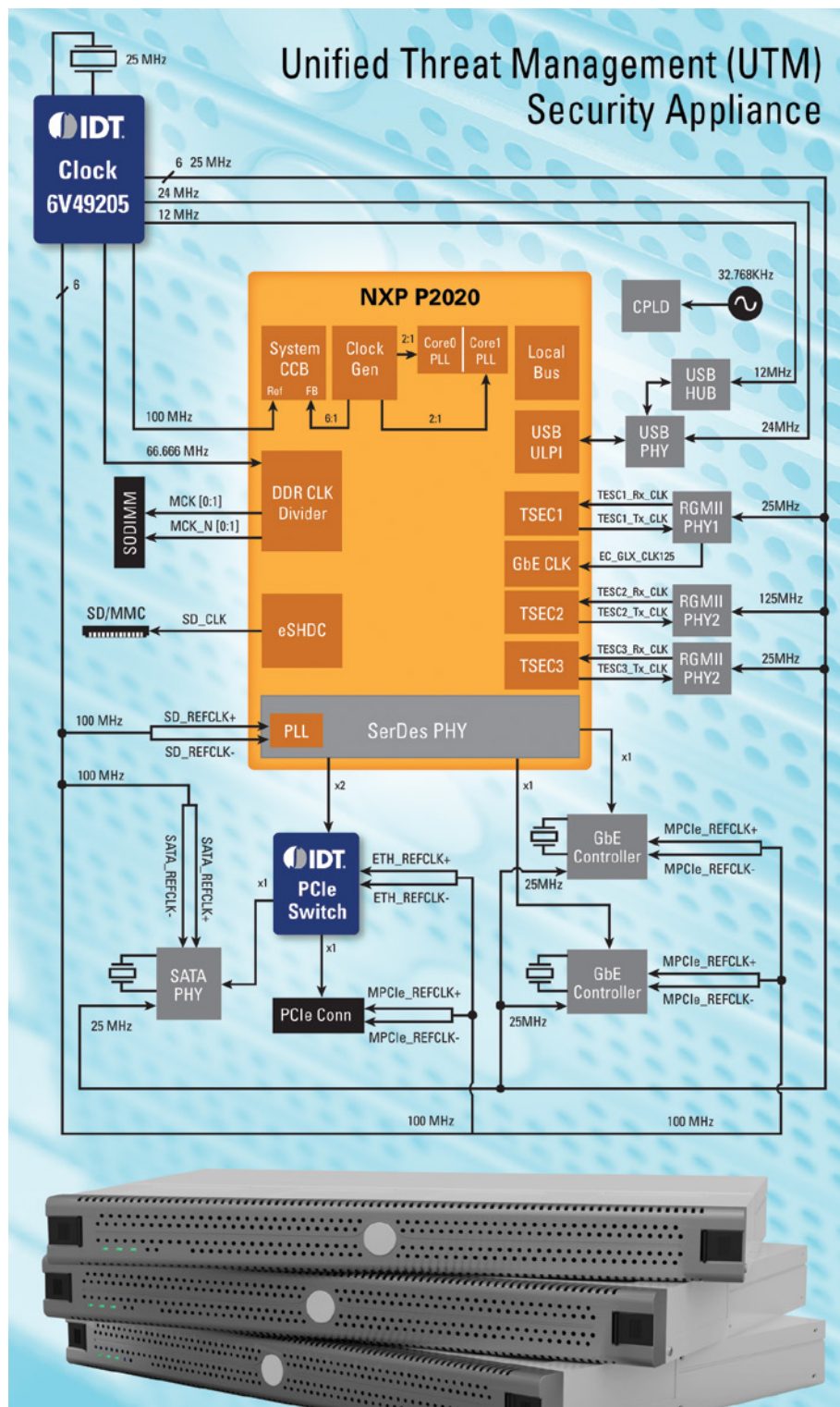
IDT has the industry's broadest portfolio of timing solutions for industrial, networking, consumer and embedded applications. With products uniquely complementing the NXP™ QorIQ™ and Layerscape™ processors, IDT provides the performance, flexibility, design expertise, reliability and manufacturing capabilities to ensure customer success.

## All-in-One Clock Solutions

- Spread-spectrum capable for EMI reduction
- Highly integrated single-chip solutions replace up to
  - 11 crystals
  - 2 oscillators
  - 3 clock synthesizers
- Low-power PCIe® outputs with integrated terminations
- PCIe Gen1/2/3 compliant PCIe outputs
- < 700fs RMS phase jitter
- Signal integrity tuning
- As little as 400mW power dissipation

## Building Block Clock Solutions

- Mix and match various clocks to support desired frequencies and data rates
- Clock generators
  - System and DDR clocks
  - SERDES clocks for PCIe Gen1-4 and 100GbE
- Clock distribution
  - Fanout buffers with < 50fs RMS additive phase jitter
  - PCIe fanout and zero delay buffers for PCIe Gen1-4
  - PCIe clock multiplexers for PCIe Gen1-4
  - Supports HCSL, HSTL, LVPECL, LVDS and LVCMOS signaling standards





# Clocks for NXP QorIQ and Layerscape CPUs

Selecting clocks for QorIQ designs is straightforward. Once the “Qor” clocking requirements of the NXP QorIQ processors are satisfied (SYS\_CCB clock, etc.), product selection proceeds to other required clocks, such as USB or 25M for Ethernet. Then the desired data rates, frequencies and number of SERDES links are factored into the clock selection. IDT offers both integrated and building block approaches to QorIQ timing solutions as shown in the product selector tables.

| Clocking Solutions for NXP QorIQ and Layerscape Processors |                                               |            |                                   |              |                  |                               |                    |                                                     |                                                                                   |
|------------------------------------------------------------|-----------------------------------------------|------------|-----------------------------------|--------------|------------------|-------------------------------|--------------------|-----------------------------------------------------|-----------------------------------------------------------------------------------|
| “All-in-One” Clock Solutions                               |                                               |            |                                   |              |                  |                               |                    |                                                     |                                                                                   |
|                                                            | NXP Clock Modes<br>(only 1 at a time is used) |            |                                   | Other Clocks |                  |                               | SERDES Clock Pairs |                                                     |                                                                                   |
| Part Number                                                | SYS_CLK/<br>DDR_CLK                           | DIFSYS_CLK | PS_XI                             | GTX_CLK      | USB_CLK<br>(MHz) | Other LVCMOS<br>Outputs (MHz) | Pairs (MHz)        | App Jitter<br>Compliance                            |                                                                                   |
| 6V49205                                                    | Yes                                           | Yes        | Yes<br>(24M Only)                 | Yes          | 2 x 12/24        | 6 x 25<br>2 x 2.048           | 6 x 100/125        | PCIe Gen1-2,<br>SGMII, sRIO<br>1x-2x<br>SATA/SATA3G |                                                                                   |
| 5P49V5907                                                  |                                               |            | Yes                               |              | Yes              | Yes                           | 1 x REF            | 4 x 50 - 167                                        | PCIe Gen1-3,<br>SGMII 1x-2.5x,<br>sRIO 1x-2x<br>SATA/SATA3G,<br>XAUI, XAUI<br>10G |
| 5P49V5908                                                  |                                               |            |                                   |              |                  |                               |                    | 8 x 50 - 167                                        |                                                                                   |
| “Building Block” Clock Generators                          |                                               |            |                                   |              |                  |                               |                    |                                                     |                                                                                   |
| Part Number                                                | SYS_CLK/<br>DDR_CLK                           | DIFSYS_CLK | PS_XI                             | GTX_CLK      | USB_CLK<br>(MHz) | Other LVCMOS<br>Outputs (MHz) | Pairs (MHz)        | App Jitter<br>Compliance                            |                                                                                   |
| 5P30521                                                    | Yes                                           | Yes        | Yes                               | Yes          | Yes              | 1 x 32.768KHz                 | 2 x 1 - 500        | PCIe Gen1-3                                         |                                                                                   |
| 5P30523                                                    |                                               |            |                                   |              |                  | 1 x REF                       | 4 x 1 - 350        | 500fs RMS                                           |                                                                                   |
| 5P49V69xx                                                  |                                               |            |                                   |              |                  | No                            | No                 | -                                                   | -                                                                                 |
| 840S07                                                     |                                               | -          | 2x 25                             |              | -                |                               |                    | -                                                   |                                                                                   |
| MP9855                                                     |                                               | -          | 1 x 25<br>1 x 3.125<br>1 x 1.5625 |              | -                |                               |                    | -                                                   |                                                                                   |
| 840NT4                                                     |                                               | -          | -                                 |              | -                | -                             | -                  | -                                                   | -                                                                                 |
| 840NT4-01                                                  | -                                             | -          | -                                 | -            | 1 x 24           | 1 x 25<br>8 x 125             | -                  | -                                                   |                                                                                   |
| 8T49N222                                                   | -                                             | -          | -                                 | -            | -                | -                             | 2 x 7.7 - 1200     | 300fs RMS                                           |                                                                                   |
| 8T49N004                                                   | -                                             | -          | -                                 | -            | -                | -                             | 4 x 15.16 - 1250   | 212fs RMS                                           |                                                                                   |
| 8T49N006                                                   | -                                             | -          | -                                 | -            | -                | -                             | 6 x 15.16 - 1250   |                                                     |                                                                                   |
| 8T49N008                                                   | -                                             | -          | -                                 | -            | -                | -                             | 8 x 15.16 - 1250   |                                                     |                                                                                   |
| 8T49N012                                                   | -                                             | -          | -                                 | -            | -                | -                             | 12 x 15.16 - 1250  |                                                     |                                                                                   |
| 8T49NS0312                                                 | -                                             | Yes        | Yes                               | -            | -                | -                             | 12 x 10.9 - 2500   | 89fs RMS                                            |                                                                                   |



# Clocks for NXP QorIQ and Layerscape CPUs

| “Building Block” Non-PLL Fanout Buffers and Multiplexers (< 50fs RMS additive phase jitter) |             |                                        |             |                           |                   |                   |                    |                       |
|---------------------------------------------------------------------------------------------|-------------|----------------------------------------|-------------|---------------------------|-------------------|-------------------|--------------------|-----------------------|
| Part Number                                                                                 | Inputs (#)  | Input Type                             | Outputs (#) | Output Type               | Output Freq (MHz) | Input Freq (MHz)  | Core Supply (V)    | Output Supply (V)     |
| 5PB1104                                                                                     | 1           | LVCMOS                                 | 4           | LVCMOS                    | 0 - 200           | 0 - 200           | 1.8, 2.5, 3.3      | 1.8, 2.5, 3.3         |
| 5PB1106                                                                                     |             |                                        | 6           |                           |                   |                   |                    |                       |
| 5PB1108                                                                                     |             |                                        | 8           |                           |                   |                   |                    |                       |
| 5PB1110                                                                                     |             |                                        | 10          |                           |                   |                   |                    |                       |
| 8312I                                                                                       |             |                                        | 12          |                           |                   |                   |                    |                       |
| 8P34S1102I                                                                                  |             | CML, LVDS, LVPECL                      | 2           | LVDS                      | 0 - 1200          | 0 - 1200          | 1.8                | 1.8                   |
| 8P34S1106i                                                                                  |             |                                        | 6           |                           |                   |                   |                    |                       |
| 8SLVP1102I                                                                                  |             |                                        | 2           |                           | 0 - 2000          | 0 - 2000          | 2.5, 3.3           | 2.5, 3.3              |
| 8SLVP1104I                                                                                  |             |                                        | 4           |                           |                   |                   |                    |                       |
| 8530-01                                                                                     |             | HCSL, HSTL, LVDS, LVPECL, SSTL         | 16          |                           |                   |                   |                    |                       |
| 8SLVP2102I                                                                                  | 2           | CML, LVDS, LVPECL                      | 4           | LVPECL                    | 0 - 2000          | 0 - 2000          | 2.5, 3.3           | 2.5, 3.3              |
| 8SLVP2104I                                                                                  |             |                                        | 8           |                           |                   |                   |                    |                       |
| 8SLVP2106I                                                                                  |             | LVDS, LVPECL                           | 12          |                           |                   |                   |                    |                       |
| 8SLVP2108I                                                                                  |             | LVPECL                                 | 16          |                           |                   |                   |                    |                       |
| 8T39S04A                                                                                    | 3           | Xtal, HCSL, HSTL, LVCMOS, LVDS, LVPECL | 4           | HCSL, LVDS, LVPECL        |                   |                   |                    |                       |
| 8T39S06A                                                                                    |             |                                        | 6           |                           |                   |                   |                    |                       |
| 8T39S08A                                                                                    |             |                                        | 8           |                           |                   |                   |                    |                       |
| “Building Block” PCI Express Clock Generators (LP-HCSL outputs)                             |             |                                        |             |                           |                   |                   |                    |                       |
| Part Number                                                                                 | Input (MHz) | Spread Spectrum Support                | Outputs (#) | Operating Frequency (MHz) | Lead Count (#)    | Package Size (mm) | Supply Voltage (V) | App Jitter Compliance |
| 9FGV0241                                                                                    | 25          | Yes                                    | 2           | 100                       | 24                | 4 x 4             | 1.8                | PCIe Gen1-4           |
| 9FGV0441                                                                                    |             |                                        | 4           |                           | 32                | 5 x 5             |                    |                       |
| 9FGV0641                                                                                    |             |                                        | 6           |                           | 40                | 5 x 5             |                    |                       |
| 9FGV0841                                                                                    |             |                                        | 8           |                           | 48                | 6 x 6             |                    |                       |
| 9FGL0241                                                                                    |             |                                        | 2           |                           | 24                | 4 x 4             | 3.3                |                       |
| 9FGL0441                                                                                    |             |                                        | 4           |                           | 32                | 5 x 5             |                    |                       |
| 9FGL0641                                                                                    |             |                                        | 6           |                           | 40                | 5 x 5             |                    |                       |
| 9FGL0841                                                                                    |             |                                        | 8           |                           | 48                | 6 x 6             |                    |                       |
| “Building Block” non-PLL Fanout Buffers and Multiplexers (HCSL inputs and LP-HCSL outputs)  |             |                                        |             |                           |                   |                   |                    |                       |
| Part Number                                                                                 | Inputs      | Spread Spectrum Support                | Outputs (#) | Operating Frequency (MHz) | Lead Count (#)    | Package Size (mm) | Supply Voltage (V) | App Jitter Compliance |
| 9DBV0541                                                                                    | 1           | Yes                                    | 5           | 1 - 200                   | 32                | 5 x 5             | 1.8                | PCIe Gen1-4           |
| 9DBV0741                                                                                    |             |                                        | 7           |                           | 40                | 5 x 5             |                    |                       |
| 9DBV0941                                                                                    |             |                                        | 9           |                           | 48                | 6 x 6             |                    |                       |
| 9DMV0141                                                                                    | 2           |                                        | 1           |                           | 16                | 3 x 3             |                    |                       |
| 9DMV0441                                                                                    |             |                                        | 4           |                           | 24                | 4 x 4             | 3.3                |                       |
| 9DBL0741                                                                                    | 1           |                                        | 7           |                           | 40                | 5 x 5             |                    |                       |
| 9DBL0941                                                                                    |             |                                        | 9           |                           | 48                | 6 x 6             |                    |                       |
| 9DMV0441                                                                                    | 2           |                                        | 4           |                           | 24                | 4 x 4             |                    |                       |



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| “Building Block” PCI Express PLL Zero-Delay Buffers (HCSL inputs and LP-HCSL outputs) |        |                         |             |                           |                |                   |                    |                       |
|---------------------------------------------------------------------------------------|--------|-------------------------|-------------|---------------------------|----------------|-------------------|--------------------|-----------------------|
| Part Number                                                                           | Inputs | Spread Spectrum Support | Outputs (#) | Operating Frequency (MHz) | Lead Count (#) | Package Size (mm) | Supply Voltage (V) | App Jitter Compliance |
| 9DBV0241                                                                              | 1      | Yes                     | 2           | 30 - 175                  | 24             | 4 x 4             | 1.8                | PCIe Gen1-4           |
| 9DBV0441                                                                              |        |                         | 4           |                           | 32             | 5 x 5             |                    |                       |
| 9DBV0641                                                                              |        |                         | 6           |                           | 40             | 5 x 5             |                    |                       |
| 9DBV0841                                                                              |        |                         | 8           |                           | 48             | 6 x 6             |                    |                       |
| 9DBL0242                                                                              |        |                         | 2           |                           | 24             | 4 x 4             | 3.3                |                       |
| 9DBL0442                                                                              |        |                         | 4           |                           | 32             | 5 x 5             |                    |                       |
| 9DBL0641                                                                              |        |                         | 6           |                           | 40             | 5 x 5             |                    |                       |
| 9DBL0841                                                                              |        |                         | 8           |                           | 48             | 6 x 6             |                    |                       |

To request samples, download documentation, or learn more visit: [idt.com/go/clocks](http://idt.com/go/clocks)