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# Latch-up Characterization Report for NRC EVLA

| | |
|---|---|
| **Job No :** | 80013 |
| **Customer :** | Brent Carlson |
| **Company :** | NRC |
| **Author :** | Joanne Woodward Jack |
| **Date :** | July 31, 2008 |
| **Request :** | Characterize the latch-up sensitivity of the EVLA in 672 BGA. |

# 1. Purpose

The purpose of the assessment is to characterize latch-up sensitivity of EVLA in 672 BGA.

# 2. Results summary

One device was stressed at 125 deg. C, 5 at 100 deg. C, with no indications of latch-up.

# 3. Test method

## 3.1. Equipment

UTI Multi-Trace tester

## 3.2. Test method

The test was performed on the Ultra-Test International Multi-Trace tester according to JESD78A for each device in the following procedures:

The device under test was biased with power to the supply pins and 0 V to ground pins (more details below in the appendix). Inputs are tied to a certain state, either high or low. The rise time on the pulse is approximately 50 microseconds. The pulse width remained constant at 10 ms. Cool down after the pulse was 100 ms. Delay before the post-pulse IDD measurement was 10 ms. The vector (program in appendix) was sent for each pulse.

See Appendix for set-up

### 3.2.2. Overcurrent Test

During the overcurrent test, current pulses were applied to the pin tested to induce latch-up.

1. Constant steps of 25 milliamperes were applied to the pin under test (refer to table 3.2.2.). The supply currents (1.2V supply and 2.5V supply) of the device under test were measured 10 milliseconds after the end of the current pulse. Latch-up will be detected by a graphical output from the Multi-Trace and criterion for failure is an overcurrent of 10 mA or 1.4 times the supply current, whichever is greater. With inputs low, the current on +1.2V supply is approximately 1 mA, on the +2.5 V supply it is approximately 4 mA. With inputs high, the current on +1.2V supply is approximately 17 mA, on the +2.5V supply it is approximately 12 mA.

2. The current stimulation was repeated with negative current pulses.

3. To protect the device under test, the compliance voltage of the constant current pulses were limited to –1.375/+4.1 volts. The maximum constant trigger current was limited to ±100 milliamperes. The supply currents were limited to 300 mA.

4. For device 8 the cooldown time between pulses was 100 ms. After the test of device 8 at 125 deg. C, the socket lost its travel and therefore connectivity. The socket manufacturer suggested a longer cooldown time, so this was increased to 300 ms between pulses. Also, the test temperature was reduced to 100 deg. C.

### 3.2.3. Supply Overvoltage test

The supplies of the device under test were increased in approximate steps of 0.1 volts. The supply currents were measured 10 milliseconds after the supply voltage was returned to the maximum operating voltage. The maximum supply stress for are presented in table 3.2.3. During the test, the device under test was set as indicated in table 3.2.1. The cooldown time was increased to 1 second between pulses to prevent socket damage as this was the highest current the device would see.

## 4. Test Samples Identification

| | |
|---|---|
| Reference | 80013 |
| Brand | CA2048CL-F672C256-A<br>WIDAR Correlator<br>iSine, Inc.<br>N63944.12<br>0810<br>USA<br>Devices 1-6 |
| Package type | 672BGA |

# 5. Results

## 5.1. Summary by Device

**Table 5.1.1.** Over/undercurrent test results.
Note: only 1 device was tested at 125 deg. C, as there was a problem with the socket. The socket was replaced, and the test temperature reduced and cooldown times increased for devices 7, 9-12

| Max. Current pulse (mA) | Step (mA) | Dev. No. | Temp. | Input state | Pins Latching up | Current pulse where LU occurred (mA) | Voltage during pulse before LU (V) | 1.2 V supply current (mA) | 2.75 V supply current (mA) |
|---|---|---|---|---|---|---|---|---|---|
| 100 | 25 | 8 | 125 | Low | - | - | - | 35 | 3 |
| -100 | -25 | 8 | 125 | Low | - | - | - | 34 | 4 |
| 100 | 25 | 8 | 125 | High | - | - | - | 44 | 12 |
| -100 | -25 | 8 | 125 | High | - | - | - | 44 | 12 |
| 100 | 25 | 7 | 100 | Low | - | - | - | 16 | 4 |
| -100 | -25 | 7 | 100 | Low | - | - | - | 16 | 4 |
| 100 | 25 | 7 | 100 | High | - | - | - | 26 | 9 |
| -100 | -25 | 7 | 100 | High | - | - | - | 26 | 9 |
| 100 | 25 | 9 | 100 | Low | - | - | - | 19 | 4 |
| -100 | -25 | 9 | 100 | Low | - | - | - | 19 | 6 |
| 100 | 25 | 9 | 100 | High | - | - | - | 29 | 16 |
| -100 | -25 | 9 | 100 | High | - | - | - | 29 | 16 |
| 100 | 25 | 10 | 100 | Low | - | - | - | 16 | 4 |
| -100 | -25 | 10 | 100 | Low | - | - | - | 16 | 5 |
| 100 | 25 | 10 | 100 | High | - | - | - | 25 | 12 |
| -100 | -25 | 10 | 100 | High | - | - | - | 26 | 12 |
| 100 | 25 | 11 | 100 | Low | - | - | - | 16 | 4 |
| -100 | -25 | 11 | 100 | Low | - | - | - | 16 | 4 |
| 100 | 25 | 11 | 100 | High | - | - | - | 27 | 11 |
| -100 | -25 | 11 | 100 | High | - | - | - | 27 | 11 |
| 100 | 25 | 12 | 100 | Low | - | - | - | 18 | 4 |
| -100 | -25 | 12 | 100 | Low | - | - | - | 18 | 5 |
| 100 | 25 | 12 | 100 | High | - | - | - | 29 | 17 |
| -100 | -25 | 12 | 100 | High | - | - | - | 29 | 17 |

-Notes
1. Dev 7 undercurrent ip low pin 534 Y_DUMP_EN_I_pad[6] showed high current before and after pulse – the test was repeated and the current looked normal.
2. Dev 7 Overcurrent ip high pin 102 HIZ_pad showed variable current, probably due to the fact that it was no longer held low during its trigger. Pin 208 MCB_CS_pad_ also showed variable current, pin 314 X_CLOCK_O_pad shows variable current when being triggered
3. Dev 10 undercurrent ip low showed some high current on several pins. Test was repeated and most pins showed lower current. This is possibly a device state issue and not latch-up as the same current level is seen before and after latch-up pulse.
4. Dev 11 pin 236 Y_CLOCK_O_pad shows variable current during trigger in overcurrent ip high.

**Table 5.1.2.** Supply overvoltage test results.

| Supply Tested | Max. Voltage (V) | Step (mV) Approx. | Temp. | Dev. No. | Input State | Voltage pulse where LU occurred (V) | 1.2 V supply current (mA) | 3.3 V supply current (mA) |
|---|---|---|---|---|---|---|---|---|
| +1.2 V 1.2 VDD DVDD_PLL | 1.98 | 100 | 125 | 8 | low | - | 34 | 3 |
| | 1.98 | 100 | 125 | 8 | high | - | 43 | 13 |
| | 1.98 | 220 | 100 | 7 | low | - | 15 | 3 |
| | 1.98 | 220 | 100 | 7 | high | - | 25 | 9 |
| | 1.98 | 220 | 100 | 9 | low | - | 19 | 4 |
| | 1.98 | 220 | 100 | 9 | high | - | 29 | 15 |
| | 1.98 | 220 | 100 | 10 | low | - | 16 | 4 |
| | 1.98 | 220 | 100 | 10 | high | - | 27 | 15 |
| | 1.98 | 220 | 100 | 11 | low | - | 16 | 4 |
| | 1.98 | 220 | 100 | 11 | high | - | 26 | 11 |
| | 1.98 | 220 | 100 | 12 | low | - | 18 | 4 |
| | 1.98 | 220 | 100 | 12 | high | - | 28 | 12 |

Note: the 3.3 V supply current shows a slight increase in the last 2 steps with inputs high, but is not high enough to fail latch-up criteria and the device is not damaged.

| Supply Tested | Max. Voltage (V) | Step (mV) Approx. | Temp. | Dev. No. | Input State | Voltage pulse where LU occurred (V) | 1.2 V supply current (mA) | 3.3 V supply current (mA) |
|---|---|---|---|---|---|---|---|---|
| 2.5 V supply AHVDD_PLL AHVDD_PLL_AHVDDG_PLL | 4.1 | 100 | 125 | 8 | low | - | 33 | 3 |
| | 4.1 | 100 | 125 | 8 | high | - | 43 | 11 to 17 (gradual increase) |
| | 4.1 | 350 | 100 | 7 | low | - | 15 | 3 |
| | 4.1 | 350 | 100 | 7 | high | - | 25 | 8 |
| | 4.1 | 350 | 100 | 9 | low | - | 18 | 3 |
| | 4.1 | 350 | 100 | 9 | high | - | 28 | 13 |
| | 4.1 | 350 | 100 | 10 | low | - | 16 | 3 |
| | 4.1 | 350 | 100 | 10 | high | - | 26 | 15 (slight increase at last step) |
| | 4.1 | 350 | 100 | 11 | low | - | 16 | 3 |
| | 4.1 | 350 | 100 | 11 | high | - | 26 | 11 |
| | 4.1 | 350 | 100 | 12 | low | - | 18 | 4 |
| | 4.1 | 350 | 100 | 12 | high | - | 29 | 13 |

**Notes:**

**Table 5.1.3.** Stand alone tester results

| Device | Point of test | Results |
|---|---|---|
| 7 | Pre latch-up and post latch-up test | Pass |
| 8 | Pre latch-up and post latch-up test | Pass |
| 9 | Pre latch-up and post latch-up test | Pass |
| 10 | Pre latch-up and post latch-up test | Pass |
| 11 | Pre latch-up and post latch-up test | Pass |
| 12 | Pre latch-up and post latch-up test | pass |

## 6. Conclusion

Under the conditions stated in this report, no latch-up was observed on the EVLA at room temperature or at 125 deg. C up to -/+ 100 mA. With inputs low, the currents were stable; however with the inputs high condition, some pins show some variability in the currents, but does not indicate latch-up.

## 7. Appendix

No more than 50 mA of the trigger current could be injected or removed, given the voltage clamps. See individual raw data for current injected for each pin.

Device set-up

| NC | | means not connected in the socket | | | | | |
|---|---|---|---|---|---|---|---|
| **UTI pin** | **SIGNAL** | **BALL** | **BALL** | ip high voltage | ip low voltage | ip high drive | ip low drive |
| 62 | DVDD_PLL | G | 13 | 1.32 | 1.32 | 4 | 4 |
| 413 | DVDD_PLL | Y | 14 | 1.32 | 1.32 | 4 | 4 |
| 139 | 1.2V VDD | K | 15 | 1.32 | 1.32 | 4 | 4 |
| 141 | 1.2V VDD | K | 17 | 1.32 | 1.32 | 4 | 4 |
| 212 | 1.2V VDD | K | 11 | 1.32 | 1.32 | 4 | 4 |
| 213 | 1.2V VDD | K | 13 | 1.32 | 1.32 | 4 | 4 |
| 229 | 1.2V VDD | K | 8 | 1.32 | 1.32 | 4 | 4 |
| 257 | 1.2V VDD | L | 8 | 1.32 | 1.32 | 4 | 4 |
| 283 | 1.2V VDD | N | 8 | 1.32 | 1.32 | 4 | 4 |
| 286 | 1.2V VDD | K | 9 | 1.32 | 1.32 | 4 | 4 |
| 293 | 1.2V VDD | L | 18 | 1.32 | 1.32 | 4 | 4 |
| 294 | 1.2V VDD | N | 18 | 1.32 | 1.32 | 4 | 4 |
| 328 | 1.2V VDD | R | 8 | 1.32 | 1.32 | 4 | 4 |
| 342 | 1.2V VDD | R | 18 | 1.32 | 1.32 | 4 | 4 |
| 388 | 1.2V VDD | U | 14 | 1.32 | 1.32 | 4 | 4 |
| 394 | 1.2V VDD | U | 18 | 1.32 | 1.32 | 4 | 4 |
| 406 | 1.2V VDD | U | 10 | 1.32 | 1.32 | 4 | 4 |
| 408 | 1.2V VDD | U | 8 | 1.32 | 1.32 | 4 | 4 |
| 416 | 1.2V VDD | U | 16 | 1.32 | 1.32 | 4 | 4 |
| 437 | 1.2V VDD | U | 12 | 1.32 | 1.32 | 4 | 4 |
| 563 | 1.2V VDD | U | 13 | 1.32 | 1.32 | 4 | 4 |
| NC | 1.2V VDD | K | 10 | 1.32 | 1.32 | 4 | 4 |
| NC | 1.2V VDD | K | 12 | 1.32 | 1.32 | 4 | 4 |
| NC | 1.2V VDD | K | 14 | 1.32 | 1.32 | 4 | 4 |
| NC | 1.2V VDD | K | 16 | 1.32 | 1.32 | 4 | 4 |
| NC | 1.2V VDD | K | 18 | 1.32 | 1.32 | 4 | 4 |
| NC | 1.2V VDD | M | 8 | 1.32 | 1.32 | 4 | 4 |
| NC | 1.2V VDD | M | 18 | 1.32 | 1.32 | 4 | 4 |
| NC | 1.2V VDD | P | 8 | 1.32 | 1.32 | 4 | 4 |
| NC | 1.2V VDD | P | 18 | 1.32 | 1.32 | 4 | 4 |
| NC | 1.2V VDD | T | 8 | 1.32 | 1.32 | 4 | 4 |
| NC | 1.2V VDD | T | 18 | 1.32 | 1.32 | 4 | 4 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| NC | 1.2V VDD | U | 9 | 1.32 | 1.32 | 4 | 4 |
| NC | 1.2V VDD | U | 11 | 1.32 | 1.32 | 4 | 4 |
| NC | 1.2V VDD | U | 15 | 1.32 | 1.32 | 4 | 4 |
| NC | 1.2V VDD | U | 17 | 1.32 | 1.32 | 4 | 4 |
| 63 | 2.5 V VCC | H | 14 | 2.75 | 2.75 | 2 | 2 |
| 105 | 2.5 V VCC | H | 8 | 2.75 | 2.75 | 2 | 2 |
| 112 | 2.5 V VCC | H | 12 | 2.75 | 2.75 | 2 | 2 |
| 166 | 2.5 V VCC | H | 16 | 2.75 | 2.75 | 2 | 2 |
| 167 | 2.5 V VCC | H | 17 | 2.75 | 2.75 | 2 | 2 |
| 184 | 2.5 V VCC | H | 9 | 2.75 | 2.75 | 2 | 2 |
| 192 | 2.5 V VCC | H | 18 | 2.75 | 2.75 | 2 | 2 |
| 202 | 2.5 V VCC | K | 6 | 2.75 | 2.75 | 2 | 2 |
| 211 | 2.5 V VCC | H | 10 | 2.75 | 2.75 | 2 | 2 |
| 221 | 2.5 V VCC | J | 19 | 2.75 | 2.75 | 2 | 2 |
| 245 | 2.5 V VCC | K | 20 | 2.75 | 2.75 | 2 | 2 |
| 253 | 2.5 V VCC | M | 6 | 2.75 | 2.75 | 2 | 2 |
| 256 | 2.5 V VCC | L | 6 | 2.75 | 2.75 | 2 | 2 |
| 259 | 2.5 V VCC | J | 7 | 2.75 | 2.75 | 2 | 2 |
| 261 | 2.5 V VCC | H | 11 | 2.75 | 2.75 | 2 | 2 |
| 264 | 2.5 V VCC | H | 15 | 2.75 | 2.75 | 2 | 2 |
| 291 | 2.5 V VCC | M | 20 | 2.75 | 2.75 | 2 | 2 |
| 292 | 2.5 V VCC | L | 20 | 2.75 | 2.75 | 2 | 2 |
| 298 | 2.5 V VCC | N | 20 | 2.75 | 2.75 | 2 | 2 |
| 346 | 2.5 V VCC | R | 20 | 2.75 | 2.75 | 2 | 2 |
| 350 | 2.5 V VCC | P | 20 | 2.75 | 2.75 | 2 | 2 |
| 362 | 2.5 V VCC | W | 12 | 2.75 | 2.75 | 2 | 2 |
| 373 | 2.5 V VCC | T | 20 | 2.75 | 2.75 | 2 | 2 |
| 395 | 2.5 V VCC | U | 20 | 2.75 | 2.75 | 2 | 2 |
| 396 | 2.5 V VCC | W | 19 | 2.75 | 2.75 | 2 | 2 |
| 414 | 2.5 V VCC | W | 15 | 2.75 | 2.75 | 2 | 2 |
| 424 | 2.5 V VCC | V | 20 | 2.75 | 2.75 | 2 | 2 |
| 431 | 2.5 V VCC | V | 8 | 2.75 | 2.75 | 2 | 2 |
| 436 | 2.5 V VCC | W | 11 | 2.75 | 2.75 | 2 | 2 |
| 442 | 2.5 V VCC | W | 17 | 2.75 | 2.75 | 2 | 2 |
| 443 | 2.5 V VCC | W | 18 | 2.75 | 2.75 | 2 | 2 |
| 542 | 2.5 V VCC | W | 16 | 2.75 | 2.75 | 2 | 2 |
| 162 | AHVDD_PLL | H | 13 | 2.75 | 2.75 | 2 | 2 |
| 513 | AHVDD_PLL_AHVDDG_PLL | V | 14 | 2.75 | 2.75 | 2 | 2 |
| 137 | AHVSS_PLL | J | 13 | 0 | 0 | 3 | 3 |
| 613 | AHVSS_PLL_AHVSSG_PLL | W | 14 | 0 | 0 | 3 | 3 |
| 163 | DVSS_PLL | J | 14 | 0 | 0 | 3 | 3 |
| 338 | DVSS_PLL | V | 13 | 0 | 0 | 3 | 3 |
| 114 | VSS | M | 15 | 0 | 0 | 3 | 3 |
| 214 | VSS | N | 14 | 0 | 0 | 3 | 3 |
| 239 | VSS | L | 16 | 0 | 0 | 3 | 3 |
| 262 | VSS | L | 12 | 0 | 0 | 3 | 3 |
| 263 | VSS | L | 14 | 0 | 0 | 3 | 3 |
| 280 | VSS | N | 10 | 0 | 0 | 3 | 3 |
| 281 | VSS | M | 9 | 0 | 0 | 3 | 3 |
| 285 | VSS | L | 10 | 0 | 0 | 3 | 3 |
| 287 | VSS | M | 13 | 0 | 0 | 3 | 3 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 289 | VSS | N | 16 | 0 | 0 | 3 | 3 |
| 290 | VSS | M | 17 | 0 | 0 | 3 | 3 |
| 307 | VSS | N | 12 | 0 | 0 | 3 | 3 |
| 312 | VSS | M | 11 | 0 | 0 | 3 | 3 |
| 316 | VSS | R | 16 | 0 | 0 | 3 | 3 |
| 334 | VSS | T | 9 | 0 | 0 | 3 | 3 |
| 335 | VSS | R | 10 | 0 | 0 | 3 | 3 |
| 336 | VSS | P | 11 | 0 | 0 | 3 | 3 |
| 337 | VSS | P | 9 | 0 | 0 | 3 | 3 |
| 341 | VSS | T | 17 | 0 | 0 | 3 | 3 |
| 343 | VSS | P | 17 | 0 | 0 | 3 | 3 |
| 354 | VSS | T | 11 | 0 | 0 | 3 | 3 |
| 363 | VSS | P | 13 | 0 | 0 | 3 | 3 |
| 365 | VSS | P | 15 | 0 | 0 | 3 | 3 |
| 439 | VSS | T | 15 | 0 | 0 | 3 | 3 |
| 463 | VSS | R | 12 | 0 | 0 | 3 | 3 |
| 488 | VSS | R | 14 | 0 | 0 | 3 | 3 |
| 588 | VSS | T | 13 | 0 | 0 | 3 | 3 |
| NC | VSS | L | 9 | | | | |
| NC | VSS | L | 11 | | | | |
| NC | VSS | L | 13 | | | | |
| NC | VSS | L | 15 | | | | |
| NC | VSS | L | 17 | | | | |
| NC | VSS | M | 10 | | | | |
| NC | VSS | M | 12 | | | | |
| NC | VSS | M | 14 | | | | |
| NC | VSS | M | 16 | | | | |
| NC | VSS | N | 9 | | | | |
| NC | VSS | N | 11 | | | | |
| NC | VSS | N | 13 | | | | |
| NC | VSS | N | 15 | | | | |
| NC | VSS | N | 17 | | | | |
| NC | VSS | P | 10 | | | | |
| NC | VSS | P | 12 | | | | |
| NC | VSS | P | 14 | | | | |
| NC | VSS | P | 16 | | | | |
| NC | VSS | R | 9 | | | | |
| NC | VSS | R | 11 | | | | |
| NC | VSS | R | 13 | | | | |
| NC | VSS | R | 15 | | | | |
| NC | VSS | R | 17 | | | | |
| NC | VSS | T | 10 | | | | |
| NC | VSS | T | 12 | | | | |
| NC | VSS | T | 14 | | | | |
| NC | VSS | T | 16 | | | | |
| 18 | VSSPST | J | 17 | 0 | 0 | 3 | 3 |
| 22 | VSSPST | A | 25 | 0 | 0 | 3 | 3 |
| 27 | VSSPST | A | 2 | 0 | 0 | 3 | 3 |
| 41 | VSSPST | G | 16 | 0 | 0 | 3 | 3 |
| 48 | VSSPST | B | 26 | 0 | 0 | 3 | 3 |
| 51 | VSSPST | B | 1 | 0 | 0 | 3 | 3 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 64 | VSSPST | J | 15 | 0 | 0 | 3 | 3 |
| 104 | VSSPST | G | 5 | 0 | 0 | 3 | 3 |
| 106 | VSSPST | D | 5 | 0 | 0 | 3 | 3 |
| 128 | VSSPST | F | 5 | 0 | 0 | 3 | 3 |
| 131 | VSSPST | J | 10 | 0 | 0 | 3 | 3 |
| 152 | VSSPST | J | 8 | 0 | 0 | 3 | 3 |
| 156 | VSSPST | E | 5 | 0 | 0 | 3 | 3 |
| 187 | VSSPST | J | 11 | 0 | 0 | 3 | 3 |
| 190 | VSSPST | J | 16 | 0 | 0 | 3 | 3 |
| 217 | VSSPST | J | 18 | 0 | 0 | 3 | 3 |
| 226 | VSSPST | M | 7 | 0 | 0 | 3 | 3 |
| 237 | VSSPST | J | 12 | 0 | 0 | 3 | 3 |
| 255 | VSSPST | J | 9 | 0 | 0 | 3 | 3 |
| 258 | VSSPST | K | 7 | 0 | 0 | 3 | 3 |
| 267 | VSSPST | K | 19 | 0 | 0 | 3 | 3 |
| 295 | VSSPST | M | 19 | 0 | 0 | 3 | 3 |
| 347 | VSSPST | P | 19 | 0 | 0 | 3 | 3 |
| 369 | VSSPST | T | 19 | 0 | 0 | 3 | 3 |
| 387 | VSSPST | V | 11 | 0 | 0 | 3 | 3 |
| 393 | VSSPST | V | 18 | 0 | 0 | 3 | 3 |
| 397 | VSSPST | V | 19 | 0 | 0 | 3 | 3 |
| 412 | VSSPST | V | 12 | 0 | 0 | 3 | 3 |
| 433 | VSSPST | V | 9 | 0 | 0 | 3 | 3 |
| 467 | VSSPST | V | 17 | 0 | 0 | 3 | 3 |
| 477 | VSSPST | AE | 1 | 0 | 0 | 3 | 3 |
| 491 | VSSPST | V | 16 | 0 | 0 | 3 | 3 |
| 515 | VSSPST | V | 15 | 0 | 0 | 3 | 3 |
| 538 | VSSPST | Y | 13 | 0 | 0 | 3 | 3 |
| 550 | VSSPST | AF | 25 | 0 | 0 | 3 | 3 |
| 575 | VSSPST | AE | 26 | 0 | 0 | 3 | 3 |
| 579 | VSSPST | AE | 2 | 0 | 0 | 3 | 3 |
| 601 | VSSPST | AA | 7 | 0 | 0 | 3 | 3 |
| 602 | VSSPST | AF | 2 | 0 | 0 | 3 | 3 |
| 603 | VSSPST | AC | 5 | 0 | 0 | 3 | 3 |
| NC | VSSPST | L | 7 | | | | |
| NC | VSSPST | L | 19 | | | | |
| NC | VSSPST | N | 19 | | | | |
| NC | VSSPST | R | 19 | | | | |
| NC | VSSPST | U | 19 | | | | |
| 1 | NOCONNECT | B | 2 | | | | |
| 3 | NOCONNECT | B | 5 | | | | |
| 4 | NOCONNECT | E | 6 | | | | |
| 9 | NOCONNECT | A | 4 | | | | |
| 10 | NOCONNECT | B | 4 | | | | |
| 23 | NOCONNECT | A | 23 | | | | |
| 29 | NOCONNECT | C | 4 | | | | |
| 30 | NOCONNECT | F | 7 | | | | |
| 35 | NOCONNECT | C | 2 | | | | |
| 50 | NOCONNECT | C | 24 | | | | |
| 53 | NOCONNECT | D | 3 | | | | |
| 54 | NOCONNECT | G | 8 | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 60 | NOCONNECT | C | 5 | | | | |
| 76 | NOCONNECT | D | 2 | | | | |
| 78 | NOCONNECT | C | 1 | | | | |
| 85 | NOCONNECT | D | 4 | | | | |
| 103 | NOCONNECT | G | 7 | | | | |
| 123 | NOCONNECT | D | 26 | | | | |
| 130 | NOCONNECT | D | 1 | | | | |
| 149 | NOCONNECT | B | 25 | | | | |
| 179 | NOCONNECT | J | 6 | | | | |
| 376 | NOCONNECT | AD | 3 | | | | |
| 426 | NOCONNECT | AB | 5 | | | | |
| 451 | NOCONNECT | AC | 1 | | | | |
| 476 | NOCONNECT | AB | 1 | | | | |
| 478 | NOCONNECT | AE | 3 | | | | |
| 486 | NOCONNECT | AC | 11 | | | | |
| 496 | NOCONNECT | AD | 26 | | | | |
| 503 | NOCONNECT | AC | 2 | | | | |
| 506 | NOCONNECT | AF | 3 | | | | |
| 520 | NOCONNECT | AE | 20 | | | | |
| 521 | NOCONNECT | AD | 21 | | | | |
| 523 | NOCONNECT | AC | 25 | | | | |
| 524 | NOCONNECT | AC | 26 | | | | |
| 530 | NOCONNECT | AE | 5 | | | | |
| 541 | NOCONNECT | AF | 21 | | | | |
| 547 | NOCONNECT | AB | 20 | | | | |
| 548 | NOCONNECT | AC | 24 | | | | |
| 549 | NOCONNECT | AD | 25 | | | | |
| 552 | NOCONNECT | AC | 3 | | | | |
| 553 | NOCONNECT | AD | 2 | | | | |
| 554 | NOCONNECT | AD | 5 | | | | |
| 555 | NOCONNECT | AE | 4 | | | | |
| 557 | NOCONNECT | AF | 5 | | | | |
| 566 | NOCONNECT | AF | 22 | | | | |
| 571 | NOCONNECT | AC | 21 | | | | |
| 572 | NOCONNECT | AC | 20 | | | | |
| 576 | NOCONNECT | AC | 4 | | | | |
| 577 | NOCONNECT | AD | 4 | | | | |
| 578 | NOCONNECT | AD | 1 | | | | |
| 581 | NOCONNECT | AF | 4 | | | | |
| 590 | NOCONNECT | AD | 20 | | | | |
| 591 | NOCONNECT | AC | 23 | | | | |
| 595 | NOCONNECT | AF | 24 | | | | |
| 596 | NOCONNECT | AE | 22 | | | | |
| 597 | NOCONNECT | AC | 22 | | | | |
| 600 | NOCONNECT | AE | 25 | | | | |
| 604 | NOCONNECT | AB | 6 | | | | |
| 615 | NOCONNECT | AF | 20 | | | | |
| 616 | NOCONNECT | AB | 21 | | | | |
| 619 | NOCONNECT | AD | 22 | | | | |
| 620 | NOCONNECT | AF | 23 | | | | |
| 621 | NOCONNECT | AE | 21 | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 622 | NOCONNECT | AE | 23 | | | | |
| 624 | NOCONNECT | W | 20 | | | | |

| BGA | PGA | UTI pin | SIGNAL | BALL | BALL | PAD CELL | | ip high voltage | ip low voltage | ip high drive | ip low drive |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **C03** | **A02** | **2** | **TESTMODE_1_pad** | **C** | **3** | **PDIDGZ** | **I** | **0** | **0** | **5** | **5** |
| **B03** | **B03** | **28** | **TESTMODE_0_pad** | **B** | **3** | **PDIDGZ** | **I** | **0** | **0** | **5** | **5** |
| **A20** | **B20** | **45** | **TESTMODE_pad** | **A** | **20** | **PDIDGZ** | **I** | **0** | **0** | **5** | **5** |
| **D22** | **C24** | **74** | **SCAN_EN_pad** | **D** | **22** | **PDIDGZ** | **I** | **0** | **0** | **5** | **5** |
| **E22** | **D22** | **97** | **SCAN_CLK_pad** | **E** | **22** | **PDIDGZ** | **I** | **0** | **0** | **5** | **5** |
| **G06** | **E02** | **102** | **HIZ_pad** | **G** | **6** | **PDIDGZ** | **I** | **0** | **0** | **5** | **5** |
| **AD24** | **AE17** | **617** | **TMS_pad** | **AD** | **24** | **PDUWDGZ** | **I** | **2.75** | **2.75** | **6** | **6** |
| **AD23** | **AE18** | **618** | **TCK_pad** | **AD** | **23** | **PDIDGZ** | **I** | **vector low to high 8 times** | **vector low to high 8 times** | **5 to 6** | **5 to 6** |
| E02 | B01 | 26 | MCB_ADDR_pad[1] | E | 2 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| E04 | B06 | 31 | MCB_ADDR_pad[3] | E | 4 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| E21 | B24 | 49 | LCI_DATA_OE_pad_ | E | 21 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| F03 | C06 | 56 | MCB_DATA_pad[2] | F | 3 | PDB16DGZ | B | 2.75 | 0 | 6 | 5 |
| D20 | C20 | 70 | LCI_DATA_CS_pad_ | D | 20 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| E03 | D02 | 77 | MCB_ADDR_pad[2] | E | 3 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| B20 | D21 | 96 | PLL_RESET_pad_ | B | 20 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| H04 | E01 | 101 | X_DUMP_EN_I_pad[0] | H | 4 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| G03 | F01 | 126 | MCB_DATA_pad[6] | G | 3 | PDB16DGZ | B | 2.75 | 0 | 6 | 5 |
| G04 | F02 | 127 | MCB_DATA_pad[7] | G | 4 | PDB16DGZ | B | 2.75 | 0 | 6 | 5 |
| G01 | F04 | 129 | MCB_DATA_pad[4] | G | 1 | PDB16DGZ | B | 2.75 | 0 | 6 | 5 |
| C20 | F18 | 143 | RESET_pad_ | C | 20 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| H07 | G01 | 151 | X_PHASE2_I_pad[3] | H | 7 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| H06 | G03 | 153 | X_SDATA3_I_pad[2] | H | 6 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| G02 | G04 | 154 | MCB_DATA_pad[5] | G | 2 | PDB16DGZ | B | 2.75 | 0 | 6 | 5 |
| F02 | G05 | 155 | MCB_DATA_pad[1] | F | 2 | PDB16DGZ | B | 2.75 | 0 | 6 | 5 |
| K05 | H01 | 176 | X_SE_CLK_I_pad[1] | K | 5 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| J03 | H02 | 177 | X_SE_CLK_I_pad[5] | J | 3 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| H05 | H03 | 178 | X_DUMP_EN_I_pad[7] | H | 5 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| F01 | H05 | 180 | MCB_DATA_pad[0] | F | 1 | PDB16DGZ | B | 2.75 | 0 | 6 | 5 |
| E01 | H06 | 181 | MCB_ADDR_pad[0] | E | 1 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| F04 | H07 | 182 | MCB_DATA_pad[3] | F | 4 | PDB16DGZ | B | 2.75 | 0 | 6 | 5 |
| L03 | J01 | 201 | X_PHASE1_I_pad[1] | L | 3 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| K01 | J03 | 203 | X_SDATA4_I_pad[3] | K | 1 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| J04 | J04 | 204 | X_SE_CLK_I_pad[2] | J | 4 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| J01 | J05 | 205 | X_SCHID_FRAME_I_pad_ | J | 1 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| H01 | J06 | 206 | MCB_RD_WR_pad_ | H | 1 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| J02 | J07 | 207 | X_SDATA0_I_pad[3] | J | 2 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| H02 | J08 | 208 | MCB_CS_pad_ | H | 2 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| L02 | K02 | 227 | X_SDATA1_I_pad[1] | L | 2 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| L04 | K03 | 228 | X_TIMESTAMP_I_pad | L | 4 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| K02 | K05 | 230 | X_SDATA3_I_pad[1] | K | 2 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| K03 | K06 | 231 | X_PHASE4_I_pad[1] | K | 3 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| J05 | K07 | 232 | X_SDATA6_I_pad[0] | J | 5 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| K04 | K08 | 233 | X_SDATA3_I_pad[3] | K | 4 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| H03 | K09 | 234 | MCB_CLK_pad | H | 3 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| C25 | K25 | 250 | LCI_FRAME_ABORT_pad_ | C | 25 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| M03 | L01 | 251 | X_DVALID_I_pad[3] | M | 3 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| M05 | L02 | 252 | X_SDATA6_I_pad[3] | M | 5 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| L01 | L04 | 254 | X_DVALID_I_pad[2] | L | 1 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| L05 | L10 | 260 | X_SE_CLK_I_pad[6] | L | 5 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| N05 | M01 | 276 | X_SDATA7_I_pad[3] | N | 5 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| M01 | M02 | 277 | X_PHASE0_I_pad[2] | M | 1 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| M02 | M03 | 278 | X_DUMP_EN_I_pad[3] | M | 2 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| N06 | M04 | 279 | X_SE_CLK_I_pad[4] | N | 6 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| M04 | M07 | 282 | X_PHASE4_I_pad[3] | M | 4 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| N07 | M09 | 284 | X_DUMP_EN_I_pad[6] | N | 7 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| G14 | M13 | 288 | X_CLOCK_I_pad | G | 14 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| P04 | N01 | 301 | X_SDATA2_I_pad[1] | P | 4 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| P01 | N02 | 302 | X_PHASE1_I_pad[3] | P | 1 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| N01 | N03 | 303 | X_SDATA5_I_pad[2] | N | 1 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| N02 | N04 | 304 | X_SDATA0_I_pad[0] | N | 2 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| P05 | N05 | 305 | X_PHASE2_I_pad[1] | P | 5 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| P02 | N06 | 306 | X_PHASE6_I_pad[0] | P | 2 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| N03 | N08 | 308 | X_SDATA7_I_pad[0] | N | 3 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| P06 | N09 | 309 | X_SE_CLK_I_pad[0] | P | 6 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| P03 | N10 | 310 | X_SDATA4_I_pad[2] | P | 3 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| N04 | N11 | 311 | X_DVALID_I_pad[4] | N | 4 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| R02 | P01 | 326 | X_DUMP_EN_I_pad[4] | R | 2 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| R05 | P02 | 327 | X_PHASE7_I_pad[2] | R | 5 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| P07 | P04 | 329 | X_SDATA7_I_pad[1] | P | 7 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| R03 | P05 | 330 | X_SE_CLK_I_pad[7] | R | 3 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| R07 | P06 | 331 | X_PHASE7_I_pad[3] | R | 7 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| R06 | P07 | 332 | X_SDATA2_I_pad[0] | R | 6 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| T06 | P08 | 333 | X_SDATA0_I_pad[2] | T | 6 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AC14 | P14 | 339 | Y_PHASE7_I_pad[0] | AC | 14 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| Y02 | R01 | 351 | X_SDATA1_I_pad[2] | Y | 2 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| Y05 | R02 | 352 | X_PHASE5_I_pad[1] | Y | 5 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| U01 | R03 | 353 | X_SDATA1_I_pad[0] | U | 1 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| T02 | R05 | 355 | X_SE_CLK_I_pad[3] | T | 2 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| T03 | R06 | 356 | X_SDATA5_I_pad[3] | T | 3 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| T07 | R07 | 357 | X_SDATA2_I_pad[2] | T | 7 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| R01 | R08 | 358 | X_DVALID_I_pad[7] | R | 1 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| U02 | R09 | 359 | X_DVALID_I_pad[0] | U | 2 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| T05 | R10 | 360 | X_DUMP_EN_I_pad[5] | T | 5 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| R04 | R11 | 361 | X_DUMP_EN_I_pad[2] | R | 4 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AE15 | R14 | 364 | Y_SDATA3_I_pad[0] | AE | 15 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| W09 | T02 | 377 | Y_SE_CLK_I_pad[4] | W | 9 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AA03 | T03 | 378 | X_PHASE5_I_pad[0] | AA | 3 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| Y01 | T04 | 379 | X_PHASE7_I_pad[1] | Y | 1 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| U03 | T05 | 380 | X_SDATA3_I_pad[0] | U | 3 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| U04 | T06 | 381 | X_PHASE4_I_pad[2] | U | 4 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| T01 | T07 | 382 | X_PHASE7_I_pad[0] | T | 1 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| T04 | T08 | 383 | X_SDATA6_I_pad[1] | T | 4 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| U05 | T09 | 384 | X_PHASE6_I_pad[1] | U | 5 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| V03 | T10 | 385 | X_PHASE3_I_pad[3] | V | 3 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| Y10 | T11 | 386 | Y_DVALID_I_pad[4] | Y | 10 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AB15 | T14 | 389 | Y_SDATA5_I_pad[1] | AB | 15 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AC16 | T15 | 390 | Y_PHASE2_I_pad[0] | AC | 16 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AC17 | T16 | 391 | Y_DVALID_I_pad[6] | AC | 17 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| Y08 | U01 | 401 | X_PHASE3_I_pad[0] | Y | 8 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| V04 | U02 | 402 | X_DUMP_SYNC_I_pad | V | 4 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| V01 | U03 | 403 | X_PHASE2_I_pad[2] | V | 1 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| U06 | U04 | 404 | X_SDATA2_I_pad[3] | U | 6 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| V02 | U05 | 405 | X_PHASE6_I_pad[3] | V | 2 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| U07 | U07 | 407 | X_DVALID_I_pad[1] | U | 7 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| V06 | U09 | 409 | X_DUMP_EN_I_pad[1] | V | 6 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AC09 | U10 | 410 | Y_SDATA1_I_pad[1] | AC | 9 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| Y11 | U11 | 411 | Y_SDATA2_I_pad[0] | Y | 11 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| Y16 | U15 | 415 | Y_PHASE3_I_pad[3] | Y | 16 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AD17 | U17 | 417 | Y_PHASE5_I_pad[3] | AD | 17 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| W01 | V02 | 427 | X_PHASE0_I_pad[1] | W | 1 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| V07 | V03 | 428 | X_SDATA5_I_pad[1] | V | 7 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| W05 | V04 | 429 | X_SDATA6_I_pad[2] | W | 5 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| W02 | V05 | 430 | X_DVALID_I_pad[5] | W | 2 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| V05 | V07 | 432 | X_PHASE6_I_pad[2] | V | 5 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| AA09 | V09 | 434 | Y_SDATA4_I_pad[3] | AA | 9 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AD10 | V10 | 435 | Y_PHASE1_I_pad[3] | AD | 10 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| W13 | V13 | 438 | Y_CLOCK_I_pad | W | 13 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AC15 | V15 | 440 | Y_PHASE6_I_pad[2] | AC | 15 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AD16 | V16 | 441 | Y_DUMP_EN_I_pad[1] | AD | 16 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| W07 | W02 | 452 | X_PHASE5_I_pad[2] | W | 7 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| W04 | W03 | 453 | X_DVALID_I_pad[6] | W | 4 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| W08 | W04 | 454 | X_PHASE3_I_pad[2] | W | 8 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| W03 | W05 | 455 | X_PHASE5_I_pad[3] | W | 3 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| W06 | W06 | 456 | X_PHASE2_I_pad[0] | W | 6 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| V10 | W07 | 457 | Y_SE_CLK_I_pad[0] | V | 10 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AA08 | W08 | 458 | Y_SDATA3_I_pad[3] | AA | 8 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| Y09 | W09 | 459 | Y_SDATA6_I_pad[3] | Y | 9 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AB10 | W10 | 460 | Y_DUMP_EN_I_pad[3] | AB | 10 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AB12 | W11 | 461 | Y_DUMP_EN_I_pad[4] | AB | 12 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| Y12 | W12 | 462 | Y_DUMP_EN_I_pad[2] | Y | 12 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AA14 | W14 | 464 | Y_PHASE3_I_pad[2] | AA | 14 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| Y15 | W15 | 465 | Y_PHASE6_I_pad[3] | Y | 15 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AA16 | W16 | 466 | Y_PHASE0_I_pad[3] | AA | 16 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AE17 | W18 | 468 | Y_DVALID_I_pad[5] | AE | 17 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AA19 | W19 | 469 | Y_SDATA4_I_pad[0] | AA | 19 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| Y06 | Y04 | 479 | X_PHASE3_I_pad[1] | Y | 6 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| Y03 | Y05 | 480 | X_PHASE1_I_pad[2] | Y | 3 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| Y04 | Y06 | 481 | X_SDATA7_I_pad[2] | Y | 4 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AD06 | Y07 | 482 | Y_SDATA0_I_pad[3] | AD | 6 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AD07 | Y08 | 483 | Y_DUMP_EN_I_pad[7] | AD | 7 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AE08 | Y09 | 484 | Y_SDATA3_I_pad[1] | AE | 8 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AA10 | Y10 | 485 | Y_DVALID_I_pad[3] | AA | 10 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AE13 | Y12 | 487 | Y_SDATA6_I_pad[1] | AE | 13 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AD14 | Y14 | 489 | Y_SDATA2_I_pad[2] | AD | 14 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AA15 | Y15 | 490 | Y_PHASE5_I_pad[2] | AA | 15 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| Y17 | Y17 | 492 | Y_PHASE7_I_pad[1] | Y | 17 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| Y18 | Y18 | 493 | Y_SDATA0_I_pad[1] | Y | 18 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AD19 | Y20 | 495 | Y_SDATA5_I_pad[2] | AD | 19 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AA01 | AA01 | 501 | X_PHASE0_I_pad[3] | AA | 1 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AA04 | AA02 | 502 | X_SDATA0_I_pad[1] | AA | 4 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| Y07 | AA04 | 504 | X_PHASE1_I_pad[0] | Y | 7 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AA02 | AA05 | 505 | X_SDATA1_I_pad[3] | AA | 2 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AE06 | AA07 | 507 | Y_SCHID_FRAME_I_pad_ | AE | 6 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| AC07 | AA08 | 508 | Y_SDATA3_I_pad[2] | AC | 7 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AD09 | AA09 | 509 | Y_DVALID_I_pad[2] | AD | 9 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AE10 | AA10 | 510 | Y_SDATA7_I_pad[1] | AE | 10 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AA11 | AA11 | 511 | Y_PHASE2_I_pad[1] | AA | 11 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AC13 | AA12 | 512 | Y_SDATA2_I_pad[3] | AC | 13 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AF15 | AA14 | 514 | Y_DVALID_I_pad[0] | AF | 15 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AB16 | AA16 | 516 | Y_PHASE5_I_pad[1] | AB | 16 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AB17 | AA17 | 517 | Y_PHASE1_I_pad[0] | AB | 17 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AC18 | AA18 | 518 | Y_PHASE3_I_pad[1] | AC | 18 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AB18 | AA19 | 519 | Y_SDATA1_I_pad[3] | AB | 18 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AB02 | AB01 | 526 | X_SDATA5_I_pad[0] | AB | 2 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AA06 | AB02 | 527 | X_SDATA4_I_pad[1] | AA | 6 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AA05 | AB03 | 528 | X_PHASE0_I_pad[0] | AA | 5 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AB04 | AB04 | 529 | X_SDATA4_I_pad[0] | AB | 4 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AB09 | AB06 | 531 | Y_PHASE1_I_pad[1] | AB | 9 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AC08 | AB07 | 532 | Y_TIMESTAMP_I_pad | AC | 8 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AF06 | AB08 | 533 | Y_DUMP_EN_I_pad[0] | AF | 6 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AE09 | AB09 | 534 | Y_DUMP_EN_I_pad[6] | AE | 9 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AC10 | AB10 | 535 | Y_PHASE0_I_pad[2] | AC | 10 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AE12 | AB11 | 536 | Y_SDATA4_I_pad[2] | AE | 12 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AA13 | AB12 | 537 | Y_PHASE2_I_pad[2] | AA | 13 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AB14 | AB14 | 539 | Y_DVALID_I_pad[1] | AB | 14 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AF16 | AB15 | 540 | Y_DUMP_SYNC_I_pad | AF | 16 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AF19 | AB18 | 543 | Y_PHASE0_I_pad[0] | AF | 19 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AE19 | AB19 | 544 | Y_SDATA4_I_pad[1] | AE | 19 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AC19 | AB20 | 545 | Y_SDATA5_I_pad[0] | AC | 19 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AB19 | AB21 | 546 | Y_PHASE4_I_pad[0] | AB | 19 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AB03 | AC01 | 551 | X_PHASE4_I_pad[0] | AB | 3 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AC06 | AC06 | 556 | Y_SE_CLK_I_pad[5] | AC | 6 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| W10 | AC08 | 558 | Y_SDATA7_I_pad[3] | W | 10 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AF09 | AC09 | 559 | Y_SE_CLK_I_pad[1] | AF | 9 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AF11 | AC10 | 560 | Y_SDATA0_I_pad[2] | AF | 11 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AC12 | AC11 | 561 | Y_DVALID_I_pad[7] | AC | 12 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AF13 | AC12 | 562 | Y_SDATA5_I_pad[3] | AF | 13 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AE14 | AC14 | 564 | Y_PHASE6_I_pad[1] | AE | 14 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AE16 | AC15 | 565 | Y_SDATA6_I_pad[2] | AE | 16 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AA17 | AC17 | 567 | Y_PHASE3_I_pad[0] | AA | 17 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AA18 | AC18 | 568 | Y_PHASE5_I_pad[0] | AA | 18 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AF18 | AC19 | 569 | Y_SDATA1_I_pad[2] | AF | 18 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |

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| AE24 | AC24 | 574 | TDI_pad | AE | 24 | PDUWDGZ | I | 2.75 | 0 | 6 | 5 |
| AB07 | AD05 | 580 | Y_PHASE2_I_pad[3] | AB | 7 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AE07 | AD07 | 582 | Y_SDATA6_I_pad[0] | AE | 7 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AF08 | AD08 | 583 | Y_PHASE4_I_pad[3] | AF | 8 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AF10 | AD09 | 584 | Y_PHASE7_I_pad[3] | AF | 10 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AB11 | AD10 | 585 | Y_SDATA2_I_pad[1] | AB | 11 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AD12 | AD11 | 586 | Y_PHASE7_I_pad[2] | AD | 12 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AD13 | AD12 | 587 | Y_DUMP_EN_I_pad[5] | AD | 13 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AF14 | AD14 | 589 | Y_SDATA1_I_pad[0] | AF | 14 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AF17 | AD17 | 592 | Y_PHASE0_I_pad[1] | AF | 17 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AD18 | AD18 | 593 | Y_SDATA7_I_pad[2] | AD | 18 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AE18 | AD19 | 594 | Y_PHASE1_I_pad[2] | AE | 18 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AD08 | AE05 | 605 | Y_PHASE4_I_pad[1] | AD | 8 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AB08 | AE06 | 606 | Y_SE_CLK_I_pad[6] | AB | 8 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AF07 | AE07 | 607 | Y_SE_CLK_I_pad[2] | AF | 7 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AE11 | AE08 | 608 | Y_SDATA0_I_pad[0] | AE | 11 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AD11 | AE09 | 609 | Y_SDATA7_I_pad[0] | AD | 11 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AF12 | AE10 | 610 | Y_PHASE6_I_pad[0] | AF | 12 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AA12 | AE11 | 611 | Y_SE_CLK_I_pad[7] | AA | 12 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AB13 | AE12 | 612 | Y_SE_CLK_I_pad[3] | AB | 13 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| AD15 | AE14 | 614 | Y_PHASE4_I_pad[2] | AD | 15 | PDIDGZ | I | 2.75 | 0 | 6 | 5 |
| E07 | A05 | 5 | Y_SE_CLK_O_pad[2] | E | 7 | PDB12DGZ | O | floating | floating | - | - |
| A07 | A06 | 6 | Y_SDATA3_O_pad[3] | A | 7 | PDB12DGZ | O | floating | floating | - | - |
| A06 | A07 | 7 | Y_PHASE2_O_pad[3] | A | 6 | PDB12DGZ | O | floating | floating | - | - |
| A05 | A08 | 8 | Y_SE_CLK_O_pad[5] | A | 5 | PDB12DGZ | O | floating | floating | - | - |
| C07 | A11 | 11 | Y_DUMP_EN_O_pad[7] | C | 7 | PDB12DGZ | O | floating | floating | - | - |
| E12 | A12 | 12 | Y_SDATA2_O_pad[1] | E | 12 | PDB12DGZ | O | floating | floating | - | - |
| D13 | A13 | 13 | Y_SDATA6_O_pad[1] | D | 13 | PDB12DGZ | O | floating | floating | - | - |
| B14 | A14 | 14 | Y_SDATA1_O_pad[0] | B | 14 | PDB12DGZ | O | floating | floating | - | - |
| F15 | A15 | 15 | Y_SDATA3_O_pad[0] | F | 15 | PDB12DGZ | O | floating | floating | - | - |
| A15 | A16 | 16 | Y_PHASE6_O_pad[3] | A | 15 | PDB12DGZ | O | floating | floating | - | - |
| B16 | A17 | 17 | Y_PHASE3_O_pad[2] | B | 16 | PDB12DGZ | O | floating | floating | - | - |
| A18 | A19 | 19 | Y_SDATA0_O_pad[1] | A | 18 | PDB12DGZ | O | floating | floating | - | - |
| D19 | A20 | 20 | Y_SDATA5_O_pad[2] | D | 19 | PDB12DGZ | O | floating | floating | - | - |
| F19 | A21 | 21 | Y_PHASE0_O_pad[0] | F | 19 | PDB12DGZ | O | floating | floating | - | - |
| A24 | A24 | 24 | LCI_ACCDATA_pad[10] | A | 24 | PDB12DGZ | O | floating | floating | - | - |
| B22 | A25 | 25 | LCI_ACCDATA_pad[5] | B | 22 | PDB12DGZ | O | floating | floating | - | - |
| B08 | B07 | 32 | Y_SE_CLK_O_pad[6] | B | 8 | PDB12DGZ | O | floating | floating | - | - |
| A08 | B08 | 33 | Y_SE_CLK_O_pad[4] | A | 8 | PDB12DGZ | O | floating | floating | - | - |

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| D10 | B09 | 34 | Y_DUMP_EN_O_pad[3] | D | 10 | PDB12DGZ | O | floating | floating | - | - |
| G09 | B11 | 36 | Y_SE_CLK_O_pad[1] | G | 9 | PDB12DGZ | O | floating | floating | - | - |
| G12 | B12 | 37 | Y_SDATA0_O_pad[2] | G | 12 | PDB12DGZ | O | floating | floating | - | - |
| A13 | B13 | 38 | Y_PHASE6_O_pad[1] | A | 13 | PDB12DGZ | O | floating | floating | - | - |
| A14 | B14 | 39 | Y_PHASE3_O_pad[3] | A | 14 | PDB12DGZ | O | floating | floating | - | - |
| C15 | B15 | 40 | Y_DVALID_O_pad[1] | C | 15 | PDB12DGZ | O | floating | floating | - | - |
| F17 | B17 | 42 | Y_PHASE5_O_pad[3] | F | 17 | PDB12DGZ | O | floating | floating | - | - |
| D17 | B18 | 43 | Y_PHASE2_O_pad[0] | D | 17 | PDB12DGZ | O | floating | floating | - | - |
| D18 | B19 | 44 | Y_PHASE0_O_pad[3] | D | 18 | PDB12DGZ | O | floating | floating | - | - |
| E20 | B21 | 46 | LCI_DATA_RDY_pad_ | E | 20 | PDB12DGZ | O | floating | floating | - | - |
| C23 | B22 | 47 | LCI_ACCDATA_pad[8] | C | 23 | PDB12DGZ | O | floating | floating | - | - |
| A03 | C02 | 52 | SENSEOUT_pad | A | 3 | PDB12DGZ | O | floating | floating | - | - |
| B06 | C05 | 55 | Y_SDATA0_O_pad[3] | B | 6 | PDB12DGZ | O | floating | floating | - | - |
| D07 | C07 | 57 | Y_SDATA6_O_pad[0] | D | 7 | PDB12DGZ | O | floating | floating | - | - |
| D09 | C08 | 58 | Y_SDATA1_O_pad[1] | D | 9 | PDB12DGZ | O | floating | floating | - | - |
| B10 | C09 | 59 | Y_DVALID_O_pad[4] | B | 10 | PDB12DGZ | O | floating | floating | - | - |
| A11 | C11 | 61 | Y_SE_CLK_O_pad[0] | A | 11 | PDB12DGZ | O | floating | floating | - | - |
| D15 | C15 | 65 | Y_PHASE6_O_pad[2] | D | 15 | PDB12DGZ | O | floating | floating | - | - |
| A16 | C16 | 66 | Y_SDATA5_O_pad[1] | A | 16 | PDB12DGZ | O | floating | floating | - | - |
| A17 | C17 | 67 | Y_PHASE7_O_pad[1] | A | 17 | PDB12DGZ | O | floating | floating | - | - |
| B18 | C18 | 68 | Y_PHASE5_O_pad[0] | B | 18 | PDB12DGZ | O | floating | floating | - | - |
| A19 | C19 | 69 | Y_SDATA4_O_pad[0] | A | 19 | PDB12DGZ | O | floating | floating | - | - |
| A21 | C21 | 71 | LCI_ACCDATA_pad[0] | A | 21 | PDB12DGZ | O | floating | floating | - | - |
| A22 | C22 | 72 | LCI_ACCDATA_pad[4] | A | 22 | PDB12DGZ | O | floating | floating | - | - |
| B24 | C23 | 73 | LCI_ACCDATA_pad[11] | B | 24 | PDB12DGZ | O | floating | floating | - | - |
| D25 | C25 | 75 | LCI_ACCDATA_VALID_pad_ | D | 25 | PDB12DGZ | O | floating | floating | - | - |
| F06 | D04 | 79 | TDO_pad | F | 6 | PDB12DGZ | O | floating | floating | - | - |
| C06 | D05 | 80 | Y_SCHID_FRAME_O_pad_ | C | 6 | PDB12DGZ | O | floating | floating | - | - |
| B07 | D06 | 81 | Y_SDATA3_O_pad[2] | B | 7 | PDB12DGZ | O | floating | floating | - | - |
| B09 | D07 | 82 | Y_SDATA4_O_pad[3] | B | 9 | PDB12DGZ | O | floating | floating | - | - |
| C09 | D08 | 83 | Y_PHASE1_O_pad[1] | C | 9 | PDB12DGZ | O | floating | floating | - | - |
| A09 | D09 | 84 | Y_SDATA6_O_pad[3] | A | 9 | PDB12DGZ | O | floating | floating | - | - |
| E11 | D11 | 86 | Y_SDATA0_O_pad[0] | E | 11 | PDB12DGZ | O | floating | floating | - | - |
| F13 | D12 | 87 | Y_PHASE7_O_pad[2] | F | 13 | PDB12DGZ | O | floating | floating | - | - |
| E14 | D13 | 88 | Y_SDATA5_O_pad[3] | E | 14 | PDB12DGZ | O | floating | floating | - | - |
| C14 | D14 | 89 | Y_SE_CLK_O_pad[3] | C | 14 | PDB12DGZ | O | floating | floating | - | - |
| B15 | D15 | 90 | Y_PHASE2_O_pad[2] | B | 15 | PDB12DGZ | O | floating | floating | - | - |
| G17 | D16 | 91 | Y_DVALID_O_pad[5] | G | 17 | PDB12DGZ | O | floating | floating | - | - |
| E17 | D17 | 92 | Y_PHASE5_O_pad[1] | E | 17 | PDB12DGZ | O | floating | floating | - | - |

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| E18 | D18 | 93 | Y_PHASE1_O_pad[0] | E | 18 | PDB12DGZ | O | floating | floating | - | - |
| C19 | D19 | 94 | Y_SDATA5_O_pad[0] | C | 19 | PDB12DGZ | O | floating | floating | - | - |
| B19 | D20 | 95 | Y_PHASE4_O_pad[0] | B | 19 | PDB12DGZ | O | floating | floating | - | - |
| E24 | D23 | 98 | LCI_ACCDATA_pad[14] | E | 24 | PDB12DGZ | O | floating | floating | - | - |
| D23 | D24 | 99 | LCI_ACCDATA_pad[9] | D | 23 | PDB12DGZ | O | floating | floating | - | - |
| E23 | D25 | 100 | LCI_ACCDATA_pad[13] | E | 23 | PDB12DGZ | O | floating | floating | - | - |
| D08 | E07 | 107 | Y_PHASE4_O_pad[1] | D | 8 | PDB12DGZ | O | floating | floating | - | - |
| F08 | E08 | 108 | Y_PHASE4_O_pad[3] | F | 8 | PDB12DGZ | O | floating | floating | - | - |
| C10 | E09 | 109 | Y_DVALID_O_pad[3] | C | 10 | PDB12DGZ | O | floating | floating | - | - |
| A10 | E10 | 110 | Y_SDATA7_O_pad[3] | A | 10 | PDB12DGZ | O | floating | floating | - | - |
| A12 | E11 | 111 | Y_SDATA4_O_pad[2] | A | 12 | PDB12DGZ | O | floating | floating | - | - |
| E13 | E13 | 113 | Y_DVALID_O_pad[7] | E | 13 | PDB12DGZ | O | floating | floating | - | - |
| E16 | E15 | 115 | Y_DUMP_SYNC_O_pad | E | 16 | PDB12DGZ | O | floating | floating | - | - |
| B17 | E16 | 116 | Y_PHASE3_O_pad[0] | B | 17 | PDB12DGZ | O | floating | floating | - | - |
| C18 | E17 | 117 | Y_SDATA1_O_pad[3] | C | 18 | PDB12DGZ | O | floating | floating | - | - |
| G19 | E18 | 118 | Y_SDATA1_O_pad[2] | G | 19 | PDB12DGZ | O | floating | floating | - | - |
| E19 | E19 | 119 | Y_SDATA4_O_pad[1] | E | 19 | PDB12DGZ | O | floating | floating | - | - |
| C21 | E20 | 120 | LCI_ACCDATA_pad[2] | C | 21 | PDB12DGZ | O | floating | floating | - | - |
| F23 | E21 | 121 | LCI_ACCDATA_pad[19] | F | 23 | PDB12DGZ | O | floating | floating | - | - |
| F21 | E22 | 122 | LCI_ACCDATA_pad[17] | F | 21 | PDB12DGZ | O | floating | floating | - | - |
| E25 | E24 | 124 | LCI_ACCDATA_pad[15] | E | 25 | PDB12DGZ | O | floating | floating | - | - |
| F24 | E25 | 125 | LCI_ACCDATA_pad[20] | F | 24 | PDB12DGZ | O | floating | floating | - | - |
| C08 | F07 | 132 | Y_TIMESTAMP_O_pad | C | 8 | PDB12DGZ | O | floating | floating | - | - |
| E08 | F08 | 133 | Y_SDATA3_O_pad[1] | E | 8 | PDB12DGZ | O | floating | floating | - | - |
| B11 | F09 | 134 | Y_PHASE6_O_pad[0] | B | 11 | PDB12DGZ | O | floating | floating | - | - |
| D11 | F10 | 135 | Y_PHASE2_O_pad[1] | D | 11 | PDB12DGZ | O | floating | floating | - | - |
| C12 | F11 | 136 | Y_SE_CLK_O_pad[7] | C | 12 | PDB12DGZ | O | floating | floating | - | - |
| B13 | F13 | 138 | Y_SDATA2_O_pad[3] | B | 13 | PDB12DGZ | O | floating | floating | - | - |
| C16 | F15 | 140 | Y_DUMP_EN_O_pad[1] | C | 16 | PDB12DGZ | O | floating | floating | - | - |
| G18 | F17 | 142 | Y_SDATA7_O_pad[2] | G | 18 | PDB12DGZ | O | floating | floating | - | - |
| D21 | F19 | 144 | LCI_ACCDATA_pad[3] | D | 21 | PDB12DGZ | O | floating | floating | - | - |
| G23 | F20 | 145 | LCI_ACCDATA_pad[25] | G | 23 | PDB12DGZ | O | floating | floating | - | - |
| G24 | F21 | 146 | LCI_ACCDATA_pad[26] | G | 24 | PDB12DGZ | O | floating | floating | - | - |
| F22 | F22 | 147 | LCI_ACCDATA_pad[18] | F | 22 | PDB12DGZ | O | floating | floating | - | - |
| B23 | F23 | 148 | LCI_ACCDATA_pad[7] | B | 23 | PDB12DGZ | O | floating | floating | - | - |
| F26 | F25 | 150 | LCI_ACCDATA_pad[22] | F | 26 | PDB12DGZ | O | floating | floating | - | - |
| D06 | G07 | 157 | Y_DUMP_EN_O_pad[0] | D | 6 | PDB12DGZ | O | floating | floating | - | - |
| E10 | G08 | 158 | Y_PHASE0_O_pad[2] | E | 10 | PDB12DGZ | O | floating | floating | - | - |
| C11 | G09 | 159 | Y_SDATA2_O_pad[0] | C | 11 | PDB12DGZ | O | floating | floating | - | - |

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| F11 | G10 | 160 | Y_PHASE7_O_pad[3] | F | 11 | PDB12DGZ | O | floating | floating | - | - |
| D12 | G11 | 161 | Y_DUMP_EN_O_pad[4] | D | 12 | PDB12DGZ | O | floating | floating | - | - |
| G15 | G14 | 164 | Y_DVALID_O_pad[0] | G | 15 | PDB12DGZ | O | floating | floating | - | - |
| E15 | G15 | 165 | Y_PHASE4_O_pad[2] | E | 15 | PDB12DGZ | O | floating | floating | - | - |
| F20 | G18 | 168 | Y_PHASE1_O_pad[2] | F | 20 | PDB12DGZ | O | floating | floating | - | - |
| G22 | G19 | 169 | LCI_ACCDATA_pad[24] | G | 22 | PDB12DGZ | O | floating | floating | - | - |
| G21 | G20 | 170 | LCI_ACCDATA_pad[23] | G | 21 | PDB12DGZ | O | floating | floating | - | - |
| G20 | G21 | 171 | Y_PHASE0_O_pad[1] | G | 20 | PDB12DGZ | O | floating | floating | - | - |
| H25 | G22 | 172 | LCI_ACCDATA_pad[31] | H | 25 | PDB12DGZ | O | floating | floating | - | - |
| H23 | G23 | 173 | LCI_ACCDATA_pad[29] | H | 23 | PDB12DGZ | O | floating | floating | - | - |
| H24 | G24 | 174 | LCI_ACCDATA_pad[30] | H | 24 | PDB12DGZ | O | floating | floating | - | - |
| E26 | G25 | 175 | LCI_ACCDATA_pad[16] | E | 26 | PDB12DGZ | O | floating | floating | - | - |
| F09 | H08 | 183 | Y_DUMP_EN_O_pad[6] | F | 9 | PDB12DGZ | O | floating | floating | - | - |
| B12 | H10 | 185 | Y_DUMP_EN_O_pad[2] | B | 12 | PDB12DGZ | O | floating | floating | - | - |
| F12 | H11 | 186 | Y_SDATA7_O_pad[0] | F | 12 | PDB12DGZ | O | floating | floating | - | - |
| F14 | H13 | 188 | Y_SDATA2_O_pad[2] | F | 14 | PDB12DGZ | O | floating | floating | - | - |
| D14 | H14 | 189 | Y_PHASE7_O_pad[0] | D | 14 | PDB12DGZ | O | floating | floating | - | - |
| C17 | H16 | 191 | Y_PHASE5_O_pad[2] | C | 17 | PDB12DGZ | O | floating | floating | - | - |
| H19 | H18 | 193 | X_SCHID_FRAME_O_pad_ | H | 19 | PDB12DGZ | O | floating | floating | - | - |
| J20 | H19 | 194 | X_PHASE4_O_pad[3] | J | 20 | PDB12DGZ | O | floating | floating | - | - |
| J22 | H20 | 195 | X_SE_CLK_O_pad[2] | J | 22 | PDB12DGZ | O | floating | floating | - | - |
| H20 | H21 | 196 | X_SDATA3_O_pad[1] | H | 20 | PDB12DGZ | O | floating | floating | - | - |
| H22 | H22 | 197 | X_SE_CLK_O_pad[5] | H | 22 | PDB12DGZ | O | floating | floating | - | - |
| J23 | H23 | 198 | X_SDATA6_O_pad[0] | J | 23 | PDB12DGZ | O | floating | floating | - | - |
| H21 | H24 | 199 | X_SDATA0_O_pad[3] | H | 21 | PDB12DGZ | O | floating | floating | - | - |
| D24 | H25 | 200 | LCI_ACCDATA_pad[12] | D | 24 | PDB12DGZ | O | floating | floating | - | - |
| E09 | J09 | 209 | Y_DVALID_O_pad[2] | E | 9 | PDB12DGZ | O | floating | floating | - | - |
| G10 | J10 | 210 | Y_SDATA7_O_pad[1] | G | 10 | PDB12DGZ | O | floating | floating | - | - |
| F16 | J15 | 215 | Y_DVALID_O_pad[6] | F | 16 | PDB12DGZ | O | floating | floating | - | - |
| F18 | J16 | 216 | Y_PHASE3_O_pad[1] | F | 18 | PDB12DGZ | O | floating | floating | - | - |
| K24 | J18 | 218 | X_SDATA3_O_pad[3] | K | 24 | PDB12DGZ | O | floating | floating | - | - |
| K23 | J19 | 219 | X_SE_CLK_O_pad[6] | K | 23 | PDB12DGZ | O | floating | floating | - | - |
| K25 | J20 | 220 | X_SE_CLK_O_pad[1] | K | 25 | PDB12DGZ | O | floating | floating | - | - |
| J26 | J22 | 222 | X_PHASE2_O_pad[3] | J | 26 | PDB12DGZ | O | floating | floating | - | - |
| J24 | J23 | 223 | X_DUMP_EN_O_pad[7] | J | 24 | PDB12DGZ | O | floating | floating | - | - |
| J21 | J24 | 224 | X_PHASE4_O_pad[1] | J | 21 | PDB12DGZ | O | floating | floating | - | - |
| C26 | J25 | 225 | LCI_DATA_CLKOUT_pad | C | 26 | PDB12DGZ | O | floating | floating | - | - |
| F10 | K10 | 235 | Y_PHASE1_O_pad[3] | F | 10 | PDB12DGZ | O | floating | floating | - | - |
| G11 | K11 | 236 | Y_CLOCK_O_pad | G | 11 | PDB12DGZ | O | floating | floating | - | - |

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| C13 | K13 | 238 | Y_DUMP_EN_O_pad[5] | C | 13 | PDB12DGZ | O | floating | floating | - | - |
| D16 | K15 | 240 | Y_SDATA6_O_pad[2] | D | 16 | PDB12DGZ | O | floating | floating | - | - |
| J25 | K16 | 241 | X_SDATA3_O_pad[2] | J | 25 | PDB12DGZ | O | floating | floating | - | - |
| K22 | K17 | 242 | X_TIMESTAMP_O_pad | K | 22 | PDB12DGZ | O | floating | floating | - | - |
| L22 | K18 | 243 | X_SDATA4_O_pad[3] | L | 22 | PDB12DGZ | O | floating | floating | - | - |
| L25 | K19 | 244 | X_PHASE7_O_pad[3] | L | 25 | PDB12DGZ | O | floating | floating | - | - |
| K26 | K21 | 246 | X_DUMP_EN_O_pad[6] | K | 26 | PDB12DGZ | O | floating | floating | - | - |
| G26 | K22 | 247 | LCI_ACCDATA_pad[28] | G | 26 | PDB12DGZ | O | floating | floating | - | - |
| F25 | K23 | 248 | LCI_ACCDATA_pad[21] | F | 25 | PDB12DGZ | O | floating | floating | - | - |
| C22 | K24 | 249 | LCI_ACCDATA_pad[6] | C | 22 | PDB12DGZ | O | floating | floating | - | - |
| L21 | L15 | 265 | X_SDATA1_O_pad[1] | L | 21 | PDB12DGZ | O | floating | floating | - | - |
| L24 | L16 | 266 | X_SE_CLK_O_pad[4] | L | 24 | PDB12DGZ | O | floating | floating | - | - |
| M23 | L18 | 268 | X_DVALID_O_pad[4] | M | 23 | PDB12DGZ | O | floating | floating | - | - |
| M25 | L19 | 269 | X_SE_CLK_O_pad[0] | M | 25 | PDB12DGZ | O | floating | floating | - | - |
| M26 | L20 | 270 | X_SDATA0_O_pad[2] | M | 26 | PDB12DGZ | O | floating | floating | - | - |
| L23 | L21 | 271 | X_SDATA6_O_pad[3] | L | 23 | PDB12DGZ | O | floating | floating | - | - |
| L26 | L22 | 272 | X_SDATA7_O_pad[1] | L | 26 | PDB12DGZ | O | floating | floating | - | - |
| K21 | L23 | 273 | X_PHASE1_O_pad[1] | K | 21 | PDB12DGZ | O | floating | floating | - | - |
| G25 | L24 | 274 | LCI_ACCDATA_pad[27] | G | 25 | PDB12DGZ | O | floating | floating | - | - |
| H26 | L25 | 275 | X_DUMP_EN_O_pad[0] | H | 26 | PDB12DGZ | O | floating | floating | - | - |
| M21 | M21 | 296 | X_PHASE0_O_pad[2] | M | 21 | PDB12DGZ | O | floating | floating | - | - |
| N21 | M22 | 297 | X_PHASE1_O_pad[3] | N | 21 | PDB12DGZ | O | floating | floating | - | - |
| M22 | M24 | 299 | X_DUMP_EN_O_pad[3] | M | 22 | PDB12DGZ | O | floating | floating | - | - |
| M24 | M25 | 300 | X_SDATA7_O_pad[3] | M | 24 | PDB12DGZ | O | floating | floating | - | - |
| B21 | N13 | 313 | LCI_ACCDATA_pad[1] | B | 21 | PDB12DGZ | O | floating | floating | - | - |
| P21 | N14 | 314 | X_CLOCK_O_pad | P | 21 | PDB12DGZ | O | floating | floating | - | - |
| P24 | N15 | 315 | X_SDATA4_O_pad[2] | P | 24 | PDB12DGZ | O | floating | floating | - | - |
| N22 | N17 | 317 | X_DVALID_O_pad[3] | N | 22 | PDB12DGZ | O | floating | floating | - | - |
| P22 | N18 | 318 | X_DVALID_O_pad[2] | P | 22 | PDB12DGZ | O | floating | floating | - | - |
| P25 | N19 | 319 | X_PHASE7_O_pad[2] | P | 25 | PDB12DGZ | O | floating | floating | - | - |
| N25 | N20 | 320 | X_SDATA2_O_pad[1] | N | 25 | PDB12DGZ | O | floating | floating | - | - |
| N23 | N21 | 321 | X_SDATA0_O_pad[0] | N | 23 | PDB12DGZ | O | floating | floating | - | - |
| P23 | N22 | 322 | X_PHASE6_O_pad[0] | P | 23 | PDB12DGZ | O | floating | floating | - | - |
| P26 | N23 | 323 | X_SDATA2_O_pad[0] | P | 26 | PDB12DGZ | O | floating | floating | - | - |
| N26 | N24 | 324 | X_PHASE2_O_pad[1] | N | 26 | PDB12DGZ | O | floating | floating | - | - |
| N24 | N25 | 325 | X_SDATA7_O_pad[0] | N | 24 | PDB12DGZ | O | floating | floating | - | - |
| R24 | P15 | 340 | X_DUMP_EN_O_pad[4] | R | 24 | PDB12DGZ | O | floating | floating | - | - |
| R25 | P19 | 344 | X_SE_CLK_O_pad[7] | R | 25 | PDB12DGZ | O | floating | floating | - | - |
| R22 | P20 | 345 | X_SDATA6_O_pad[1] | R | 22 | PDB12DGZ | O | floating | floating | - | - |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R23 | P23 | 348 | X_DVALID_O_pad[7] | R | 23 | PDB12DGZ | O | floating | floating | - | - |
| R21 | P24 | 349 | X_SDATA5_O_pad[3] | R | 21 | PDB12DGZ | O | floating | floating | - | - |
| U23 | R16 | 366 | X_SDATA3_O_pad[0] | U | 23 | PDB12DGZ | O | floating | floating | - | - |
| U26 | R17 | 367 | X_DVALID_O_pad[1] | U | 26 | PDB12DGZ | O | floating | floating | - | - |
| T22 | R18 | 368 | X_DVALID_O_pad[0] | T | 22 | PDB12DGZ | O | floating | floating | - | - |
| U24 | R20 | 370 | X_PHASE4_O_pad[2] | U | 24 | PDB12DGZ | O | floating | floating | - | - |
| T25 | R21 | 371 | X_PHASE6_O_pad[1] | T | 25 | PDB12DGZ | O | floating | floating | - | - |
| T23 | R22 | 372 | X_DUMP_EN_O_pad[5] | T | 23 | PDB12DGZ | O | floating | floating | - | - |
| T21 | R24 | 374 | X_SDATA1_O_pad[0] | T | 21 | PDB12DGZ | O | floating | floating | - | - |
| R26 | R25 | 375 | X_DUMP_EN_O_pad[2] | R | 26 | PDB12DGZ | O | floating | floating | - | - |
| V22 | T17 | 392 | X_DUMP_SYNC_O_pad | V | 22 | PDB12DGZ | O | floating | floating | - | - |
| U22 | T23 | 398 | X_SE_CLK_O_pad[3] | U | 22 | PDB12DGZ | O | floating | floating | - | - |
| T26 | T24 | 399 | X_SDATA2_O_pad[2] | T | 26 | PDB12DGZ | O | floating | floating | - | - |
| T24 | T25 | 400 | X_SDATA2_O_pad[3] | T | 24 | PDB12DGZ | O | floating | floating | - | - |
| Y22 | U18 | 418 | X_SDATA1_O_pad[2] | Y | 22 | PDB12DGZ | O | floating | floating | - | - |
| W22 | U19 | 419 | X_DVALID_O_pad[6] | W | 22 | PDB12DGZ | O | floating | floating | - | - |
| W24 | U20 | 420 | X_PHASE2_O_pad[0] | W | 24 | PDB12DGZ | O | floating | floating | - | - |
| W26 | U21 | 421 | X_PHASE3_O_pad[0] | W | 26 | PDB12DGZ | O | floating | floating | - | - |
| V23 | U22 | 422 | X_SDATA6_O_pad[2] | V | 23 | PDB12DGZ | O | floating | floating | - | - |
| V21 | U23 | 423 | X_PHASE3_O_pad[3] | V | 21 | PDB12DGZ | O | floating | floating | - | - |
| U25 | U25 | 425 | X_PHASE6_O_pad[2] | U | 25 | PDB12DGZ | O | floating | floating | - | - |
| AB24 | V19 | 444 | X_SDATA5_O_pad[0] | AB | 24 | PDB12DGZ | O | floating | floating | - | - |
| AB25 | V20 | 445 | X_PHASE4_O_pad[0] | AB | 25 | PDB12DGZ | O | floating | floating | - | - |
| AA22 | V21 | 446 | X_SDATA1_O_pad[3] | AA | 22 | PDB12DGZ | O | floating | floating | - | - |
| Y26 | V22 | 447 | X_PHASE1_O_pad[0] | Y | 26 | PDB12DGZ | O | floating | floating | - | - |
| V25 | V23 | 448 | X_SDATA5_O_pad[1] | V | 25 | PDB12DGZ | O | floating | floating | - | - |
| V24 | V24 | 449 | X_DUMP_EN_O_pad[1] | V | 24 | PDB12DGZ | O | floating | floating | - | - |
| U21 | V25 | 450 | X_PHASE7_O_pad[0] | U | 21 | PDB12DGZ | O | floating | floating | - | - |
| AB23 | W20 | 470 | X_SDATA5_O_pad[2] | AB | 23 | PDB12DGZ | O | floating | floating | - | - |
| Y24 | W21 | 471 | X_SDATA7_O_pad[2] | Y | 24 | PDB12DGZ | O | floating | floating | - | - |
| AA26 | W22 | 472 | X_SDATA4_O_pad[1] | AA | 26 | PDB12DGZ | O | floating | floating | - | - |
| W23 | W23 | 473 | X_PHASE5_O_pad[1] | W | 23 | PDB12DGZ | O | floating | floating | - | - |
| W25 | W24 | 474 | X_PHASE5_O_pad[2] | W | 25 | PDB12DGZ | O | floating | floating | - | - |
| V26 | W25 | 475 | X_PHASE3_O_pad[2] | V | 26 | PDB12DGZ | O | floating | floating | - | - |
| Y19 | Y19 | 494 | X_PHASE2_O_pad[2] | Y | 19 | PDB12DGZ | O | floating | floating | - | - |
| Y25 | Y22 | 497 | X_PHASE3_O_pad[1] | Y | 25 | PDB12DGZ | O | floating | floating | - | - |
| AB26 | Y23 | 498 | X_SDATA4_O_pad[0] | AB | 26 | PDB12DGZ | O | floating | floating | - | - |
| AA24 | Y24 | 499 | X_SDATA0_O_pad[1] | AA | 24 | PDB12DGZ | O | floating | floating | - | - |
| AA25 | Y25 | 500 | X_PHASE0_O_pad[0] | AA | 25 | PDB12DGZ | O | floating | floating | - | - |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AA23 | AA22 | 522 | X_PHASE5_O_pad[0] | AA | 23 | PDB12DGZ | O | floating | floating | - | - |
| Y23 | AA25 | 525 | X_PHASE1_O_pad[2] | Y | 23 | PDB12DGZ | O | floating | floating | - | - |
| AB22 | AC20 | 570 | X_PHASE0_O_pad[3] | AB | 22 | PDB12DGZ | O | floating | floating | - | - |
| AA21 | AC23 | 573 | X_DVALID_O_pad[5] | AA | 21 | PDB12DGZ | O | floating | floating | - | - |
| Y20 | AD23 | 598 | X_PHASE7_O_pad[1] | Y | 20 | PDB12DGZ | O | floating | floating | - | - |
| Y21 | AD24 | 599 | X_PHASE6_O_pad[3] | Y | 21 | PDB12DGZ | O | floating | floating | - | - |
| AA20 | AE23 | 623 | X_PHASE0_O_pad[1] | AA | 20 | PDB12DGZ | O | floating | floating | - | - |
| W21 | AE25 | 625 | X_PHASE5_O_pad[3] | W | 21 | PDB12DGZ | O | floating | floating | - | - |

Vector program

```
'
'
'
'This vector file is used to send a sequence of reset to the
'NRC EVLA. These vectors place the device in
'reset mode initially. Bus 5 is the low bus, Bus 6 is the high bus,
'Bus 3 is the Ground bus, and Bus 2 is the Vdd2.5 bus, Bus 4 is VDD12 bus.
' File:NRC_EVLA.VCO
'
#SaveResults
C:\WINDOWS\desktop\VECOUT.VC0, EchoCommand
#Vector
NRC_EVLA Reset Sequence,ResetOn
#SetBus
5,6,3,4       'low, high, Gnd, Vdd2.75
#Group
Inputs1,"618"
#GroupOrder
"Inputs1"
#InitPinByGroup
Inputs1,"1"
#PatternStart
"0"
"1"
"0"
"1"
"0"
"1"
"0"
"1"
"0"
"1"
```

```
"0"
"1"
"0"
"1"
"0"
"1"
#PatternEnd
#End
NRC_EVLA Reset Sequence
```