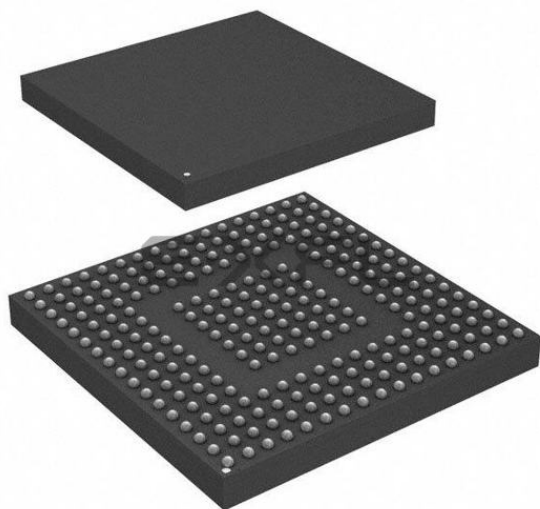




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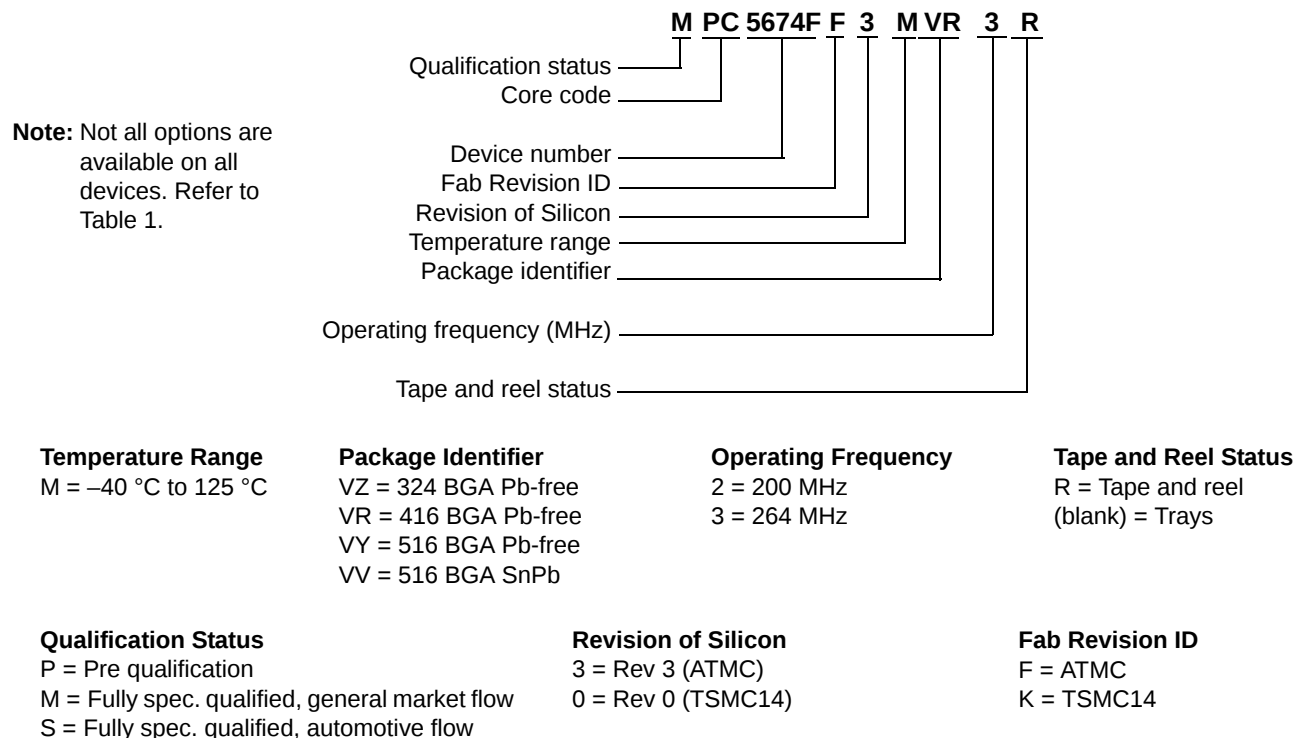
#### Details

|                            |                                                                                                                                                             |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Status             | Active                                                                                                                                                      |
| Core Processor             | e200z7d                                                                                                                                                     |
| Core Size                  | 32-Bit Dual-Core                                                                                                                                            |
| Speed                      | 150MHz                                                                                                                                                      |
| Connectivity               | CANbus, EBI/EMI, Ethernet, FlexRay, I <sup>2</sup> C, LINbus, SPI                                                                                           |
| Peripherals                | DMA, POR, PWM, WDT                                                                                                                                          |
| Number of I/O              | -                                                                                                                                                           |
| Program Memory Size        | 1MB (1M x 8)                                                                                                                                                |
| Program Memory Type        | FLASH                                                                                                                                                       |
| EEPROM Size                | 64K x 8                                                                                                                                                     |
| RAM Size                   | 256K x 8                                                                                                                                                    |
| Voltage - Supply (Vcc/Vdd) | 1.14V ~ 5.5V                                                                                                                                                |
| Data Converters            | A/D 22x12b                                                                                                                                                  |
| Oscillator Type            | Internal                                                                                                                                                    |
| Operating Temperature      | -40°C ~ 105°C (TA)                                                                                                                                          |
| Mounting Type              | Surface Mount                                                                                                                                               |
| Package / Case             | 257-LFBGA                                                                                                                                                   |
| Supplier Device Package    | 257-LFBGA (14x14)                                                                                                                                           |
| Purchase URL               | <a href="https://www.e-xfl.com/product-detail/nxp-semiconductors/spc5673kavmm1r">https://www.e-xfl.com/product-detail/nxp-semiconductors/spc5673kavmm1r</a> |

# 1 Ordering Information

## 1.1 Orderable Parts

Figure 1 and Table 1 describe and list the orderable part numbers for the MPC5674F.



**Figure 1. MPC5674F Orderable Part Number Description**

**Table 1. Orderable Part Numbers**

| Freescale Part Number | Package Description       | Speed (MHz) <sup>1</sup> |                                      | Operating Temperature <sup>2</sup> |                       |
|-----------------------|---------------------------|--------------------------|--------------------------------------|------------------------------------|-----------------------|
|                       |                           | Nominal                  | Max <sup>3</sup> (f <sub>MAX</sub> ) | Min (T <sub>L</sub> )              | Max (T <sub>H</sub> ) |
| SPC5674FK0MVR3        | 416 PBGA, no EBI, Pb-free | 264                      | 270                                  | -40 °C                             | 125 °C                |
| SPC5674FK0MVY3        | 516 PBGA, w/EBI, Pb-free  | 264                      | 270                                  | -40 °C                             | 125 °C                |
| SPC5674FK0MVR3R       | 516 PBGA, w/EBI, SnPb     | 264                      | 270                                  | -40 °C                             | 125 °C                |
| SPC5674FK0MVR3        | 516 PBGA, w/EBI, SnPb     | 264                      | 200                                  | -40 °C                             | 125 °C                |
| SPC5674FK0MVY3R       | 516 PBGA, w/EBI, Pb-free  | 264                      | 270                                  | -40 °C                             | 125 °C                |
| SPC5674FK0MVY3        | 516 PBGA, w/EBI, Pb-free  | 264                      | 270                                  | -40 °C                             | 125 °C                |
| SPC5673FK0MVR2R       | 416 PBGA, no EBI, Pb-free | 200                      | 200                                  | -40 °C                             | 125 °C                |
| SPC5673FK0MVR2        | 416 PBGA, no EBI, Pb-free | 200                      | 200                                  | -40 °C                             | 125 °C                |
| SPC5673FK0MVR2R       | 324 PBGA, no EBI, Pb-free | 200                      | 200                                  | -40 °C                             | 125 °C                |
| SPC5673FK0MVR2        | 324 PBGA, no EBI, Pb-free | 200                      | 200                                  | -40 °C                             | 125 °C                |

<sup>1</sup> For the operating mode frequency of various blocks on the device, see Table 28.

|   | 14   | 15   | 16      | 17         | 18       | 19    | 20   | 21    | 22    | 23      | 24      | 25      | 26      |   |
|---|------|------|---------|------------|----------|-------|------|-------|-------|---------|---------|---------|---------|---|
| A | AN32 | AN36 | VDDA_B0 | REFBYP-CB1 | VRL_B    | VRH_B | ANB7 | ANB11 | ANB14 | ANB17   | ANB21   | ANB23   | VSS     | A |
| B | AN29 | AN33 | VDDA_B1 | VSSA_B0    | REFBYPCB | ANB6  | ANB8 | ANB10 | ANB15 | ANB18   | ANB22   | VSS     | TCRCLKC | B |
| C | AN30 | AN34 | AN37    | AN38       | ANB0     | ANB4  | ANB5 | ANB12 | ANB16 | ANB19   | VSS     | ETPUC0  | ETPUC1  | C |
| D | AN31 | AN35 | AN39    | ANB1       | ANB2     | ANB3  | ANB9 | ANB13 | ANB20 | VSS     | VDDEH7  | ETPUC2  | ETPUC3  | D |
| E |      |      |         |            |          |       |      |       |       | VDDEH7  | ETPUC4  | ETPUC5  | ETPUC6  | E |
| F |      |      |         |            |          |       |      |       |       | ETPUC7  | ETPUC8  | ETPUC9  | ETPUC10 | F |
| G |      |      |         |            |          |       |      |       |       | ETPUC11 | ETPUC12 | ETPUC13 | ETPUC14 | G |
| H |      |      |         |            |          |       |      |       |       | ETPUC15 | ETPUC16 | ETPUC17 | ETPUC18 | H |
| J |      |      |         |            |          |       |      |       |       | ETPUC19 | ETPUC20 | ETPUC21 | ETPUC22 | J |
| K | VSS  | VSS  | VSS     | VSS        |          |       |      |       |       | ETPUC23 | ETPUC24 | ETPUC25 | ETPUC26 | K |
| L | VSS  | VSS  | VSS     | VSS        |          |       |      |       |       | ETPUC27 | ETPUC28 | ETPUC29 | ETPUC30 | L |
| M | VSS  | VSS  | VSS     | VSS        |          |       |      |       |       | ETPUC31 | ETPUB15 | ETPUB14 | VDDEH7  | M |
| N | VSS  | VSS  | VSS     | VSS        |          |       |      |       |       | VDDEH6  | ETPUB11 | ETPUB12 | ETPUB13 | N |
|   | 14   | 15   | 16      | 17         | 18       | 19    | 20   | 21    | 22    | 23      | 24      | 25      | 26      |   |

**MPC5674F 416-ball TEPBGA**  
(as viewed from top through the package)  
(2 of 4)

**Figure 8. MPC5674F 416-ball TEPBGA (2 of 4)**

## Pin Assignments

|    | 1      | 2       | 3          | 4          | 5       | 6     | 7     | 8     | 9     | 10     | 11     | 12     | 13      |    |
|----|--------|---------|------------|------------|---------|-------|-------|-------|-------|--------|--------|--------|---------|----|
| P  | TXDB   | PLLCFG1 | PLLCFG2    | VDDEH1     |         |       |       |       |       | VDDE2  | VDDE2  | VSS    | VSS     | P  |
| R  | JCOMP  | RESET   | PLLCFG0    | RDY        |         |       |       |       |       | VDDE2  | VDDE2  | VSS    | VSS     | R  |
| T  | VDDE2  | MCKO    | MSEO1      | EVTI       |         |       |       |       |       | VDDE2  | VDDE2  | VDDE2  | VSS     | T  |
| U  | EVT0   | MSEO0   | MDO0       | MDO1       |         |       |       |       |       | VDDE2  | VDDE2  | VDDE2  | VSS     | U  |
| V  | MDO2   | MDO3    | MDO4       | MDO5       |         |       |       |       |       |        |        |        |         | V  |
| W  | MDO6   | MDO7    | MDO8       | VDDE2      |         |       |       |       |       |        |        |        |         | W  |
| Y  | MDO9   | MDO10   | MDO11      | MDO15      |         |       |       |       |       |        |        |        |         | Y  |
| AA | MDO12  | MDO13   | MDO14      | VDD33_2    |         |       |       |       |       |        |        |        |         | AA |
| AB | TDO    | TCK     | TMS        | VDD        |         |       |       |       |       |        |        |        |         | AB |
| AC | VDDE2  | TDI     | VDD        | VSS        | VDDE2   | PCSA1 | PCSA2 | PCSB4 | PCSB1 | VDDEH3 | VDDEH4 | VDD    | EMIOS8  | AC |
| AD | ENGCLK | VDD     | VSS        | FR_A_TX    | FR_B_TX | PCSA5 | SOUTA | SCKA  | PCSB0 | PCSB3  | EMIOS2 | EMIOS5 | EMIOS9  | AD |
| AE | VDD    | VSS     | FR_A_RX    | FR_B_RX    | PCSA4   | PCSA0 | PCSA3 | SCKB  | SINB  | EMIOS0 | EMIOS3 | EMIOS6 | EMIOS10 | AE |
| AF | VSS    | VDDE2   | FR_A_TX_EN | FR_B_TX_EN | VDDEH3  | PCSB5 | SINA  | PCSB2 | SOUTB | EMIOS1 | EMIOS4 | EMIOS7 | EMIOS11 | AF |
|    | 1      | 2       | 3          | 4          | 5       | 6     | 7     | 8     | 9     | 10     | 11     | 12     | 13      |    |

**MPC5674F 416-ball TEPBGA**  
(as viewed from top through the package)  
(3 of 4)

**Figure 9. MPC5674F 416-ball TEPBGA (3 of 4)**

|   | 1       | 2       | 3        | 4        | 5       | 6       | 7     | 8     | 9       | 10         | 11       | 12    | 13   |   |
|---|---------|---------|----------|----------|---------|---------|-------|-------|---------|------------|----------|-------|------|---|
| A |         | VDD     | RSTOUT   | ANA0     | ANA4    | ANA9    | ANA11 | ANA15 | VDDA_A0 | REF-BYPCA1 | VRL_A    | VRH_A | AN28 | A |
| B | VDDEH1  | VSS     | VDD      | TEST     | ANA1    | ANA5    | ANA10 | ANA14 | VDDA_A1 | VSSA_A1    | REFBYPCA | AN24  | AN27 | B |
| C | ETPUA30 | ETPUA31 | VSS      | VDD      | ANA2    | ANA6    | ANA7  | ANA13 | ANA17   | ANA19      | ANA21    | ANA22 | AN25 | C |
| D | ETPUA27 | ETPUA28 | ETPUA29  | VSS      | VDD     | ANA3    | ANA8  | ANA12 | ANA16   | ANA18      | ANA20    | ANA23 | AN26 | D |
| E | ETPUA23 | ETPUA24 | ETPUA25  | ETPUA26  | VSS     | VDD     | VSS   | VSS   | VSS     | VSS        | VSS      | VSS   | VSS  | E |
| F | ETPUA19 | ETPUA20 | ETPUA21  | ETPUA22  | VSS     | VDDE8   |       | VDDE8 |         | VDDE8      | VDDE8    |       | VSS  | F |
| G | ETPUA11 | ETPUA13 | ETPUA15  | ETPUA17  | ETPUA18 |         |       |       |         |            |          |       |      | G |
| H | ETPUA5  | ETPUA7  | ETPUA8   | ETPUA3   | ETPUA14 | ETPUA16 |       |       |         |            |          |       |      | H |
| J | ETPUA1  | ETPUA2  | ETPUA9   | ETPUA4   | ETPUA12 |         |       |       |         |            |          |       |      | J |
| K | TXDB    | TXDA    | RXDA     | TCRCLKA  | ETPUA6  | ETPUA10 |       |       |         | VSS        | VSS      | VSS   | VSS  | K |
| L | PLLCFG1 | PLLCFG2 | BOOTCFG1 | BOOTCFG0 | RXDB    | ETPUA0  |       |       |         | VSS        | VSS      | VSS   | VSS  | L |
| M | VDD33_1 | D_BDIP  | PLLCFG0  | VSTBY    | WKPCFG  |         |       |       |         | VSS        | VSS      | VSS   | VSS  | M |
| N | D_WE0   | D_WE2   | D_WE3    | VDD      | RESET   | VDDE8   |       |       |         | VDDE2      | VSS      | VSS   | VSS  | N |
|   | 1       | 2       | 3        | 4        | 5       | 6       | 7     | 8     | 9       | 10         | 11       | 12    | 13   |   |

**MPC5674F 516-ball TEPBGA**  
(as viewed from top through the package)  
(1 of 4)

**Figure 12. MPC5674F 516-ball TEPBGA (1 of 4)**

**Table 10. PMC Operating conditions**

| Name               | Parameter                                                 | Condition           | Min  | Typ | Max  | Unit | Note         |
|--------------------|-----------------------------------------------------------|---------------------|------|-----|------|------|--------------|
| V <sub>DDREG</sub> | Supply voltage VDDREG<br>5V nominal                       | LDO5V / SMPS5V mode | 4.5  | 5   | 5.5  | V    | <sup>1</sup> |
| V <sub>DDREG</sub> | Supply voltage VDDREG<br>3V nominal                       | LDO3V mode          | 3.0  | 3.3 | 3.6  | V    | <sup>1</sup> |
| V <sub>DD33</sub>  | Supply voltage VDDSYN /<br>V <sub>DD33</sub> 3.3V nominal | LDO3V mode          | 3.0  | 3.3 | 3.6  | V    | <sup>2</sup> |
| V <sub>DD</sub>    | Core supply voltage                                       | —                   | 1.14 | 1.2 | 1.32 | V    | <sup>3</sup> |

<sup>1</sup> Voltage should be higher than maximum V<sub>LVDREG</sub> to avoid LVD event

<sup>2</sup> Applies to both V<sub>DD33</sub> (flash supply) and VDDSYN (PLL supply) pads. Voltage should be higher than maximum V<sub>LVD33</sub> to avoid LVD event

<sup>3</sup> Voltage should be higher than maximum V<sub>LVD12</sub> to avoid LVD event

### NOTE

In the following table, "untrimmed" means "at reset" and "trimmed" means "after reset".

**Table 11. PMC Electrical Specifications**

| ID | Name                 | Parameter                                                                                                                                                       | Min                        | Typ                  | Max                        | Unit |
|----|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------|----------------------------|------|
| 1  | V <sub>BG</sub>      | Nominal bandgap reference voltage                                                                                                                               | 0.608                      | 0.620                | 0.632                      | V    |
| 1a | —                    | Untrimmed bandgap reference voltage                                                                                                                             | V <sub>BG</sub> – 5%       | V <sub>BG</sub>      | V <sub>BG</sub> + 5%       | V    |
| 2  | V <sub>DD12OUT</sub> | Nominal VRC regulated 1.2V output VDD                                                                                                                           | —                          | 1.27                 | —                          | V    |
| 2a | —                    | Untrimmed VRC 1.2V output variation before band gap trim (unloaded)<br><b>Note:</b> Voltage should be higher than maximum V <sub>LVD12</sub> to avoid LVD event | V <sub>DD12OUT</sub> – 14% | V <sub>DD12OUT</sub> | V <sub>DD12OUT</sub> + 10% | V    |
| 2b | —                    | Trimmed VRC 1.2V output variation after band gap trim (REGCTL load max. 20mA, VDD load max. 1A) <sup>1</sup>                                                    | V <sub>DD12OUT</sub> – 10% | V <sub>DD12OUT</sub> | V <sub>DD12OUT</sub> + 5%  | V    |
| 2c | V <sub>STEPV12</sub> | Trimming step V <sub>DD12OUT</sub>                                                                                                                              | —                          | 10                   | —                          | mV   |
| 3  | V <sub>PORC</sub>    | POR rising VDD 1.2V                                                                                                                                             | —                          | 0.7                  | —                          | V    |
| 3a | —                    | POR VDD 1.2V variation                                                                                                                                          | V <sub>PORC</sub> – 30%    | V <sub>PORC</sub>    | V <sub>PORC</sub> + 30%    |      |
| 3b | —                    | POR 1.2V hysteresis                                                                                                                                             | —                          | 75                   | —                          | mV   |
| 4  | V <sub>LVD12</sub>   | Nominal rising LVD 1.2V<br><b>Note:</b> ~V <sub>DD12OUT</sub> × 0.87                                                                                            | —                          | 1.100                | —                          | V    |
| 4a | —                    | Untrimmed LVD 1.2V variation before band gap trim<br><b>Note:</b> Rising VDD                                                                                    | V <sub>LVD12</sub> – 6%    | V <sub>LVD12</sub>   | V <sub>LVD12</sub> + 6%    | V    |
| 4b | —                    | Trimmed LVD 1.2V variation after band gap trim<br>Rising VDD                                                                                                    | V <sub>LVD12</sub> – 3%    | V <sub>LVD12</sub>   | V <sub>LVD12</sub> + 3%    | V    |

## 4.9.1 ADC Internal Resource Measurements

Table 21. Power Management Control (PMC) Specification

| Spec                   | Characteristic                                             | Symbol       | Min | Typical                                    | Max | Unit |
|------------------------|------------------------------------------------------------|--------------|-----|--------------------------------------------|-----|------|
| <b>PMC Normal Mode</b> |                                                            |              |     |                                            |     |      |
| 1                      | Bandgap 0.62 V<br>ADC0 channel 145                         | $V_{ADC145}$ | —   | 0.62                                       | —   | V    |
| 2                      | Bandgap 1.2 V<br>ADC0 channel 146                          | $V_{ADC146}$ | —   | 1.22                                       | —   | V    |
| 3                      | Vreg1p2 Feedback<br>ADC0 channel 147                       | $V_{ADC147}$ | —   | $V_{DD} / 2.045$                           | —   | V    |
| 4                      | LVD 1.2 V<br>ADC0 channel 180                              | $V_{ADC180}$ | —   | $V_{DD} / 1.774$                           | —   | V    |
| 5                      | Vreg3p3 Feedback<br>ADC0 channel 181                       | $V_{ADC181}$ | —   | $V_{reg3p3} / 5.460$                       | —   | V    |
| 6                      | LVD 3.3 V<br>ADC0 channel 182                              | $V_{ADC182}$ | —   | $V_{reg3p3} / 4.758$                       | —   | V    |
| 7                      | LVD 5.0 V<br>ADC0 channel 183<br>— LDO mode<br>— SMPS mode | $V_{ADC183}$ | —   | $V_{DDREG} / 4.758$<br>$V_{DDREG} / 7.032$ | —   | V    |

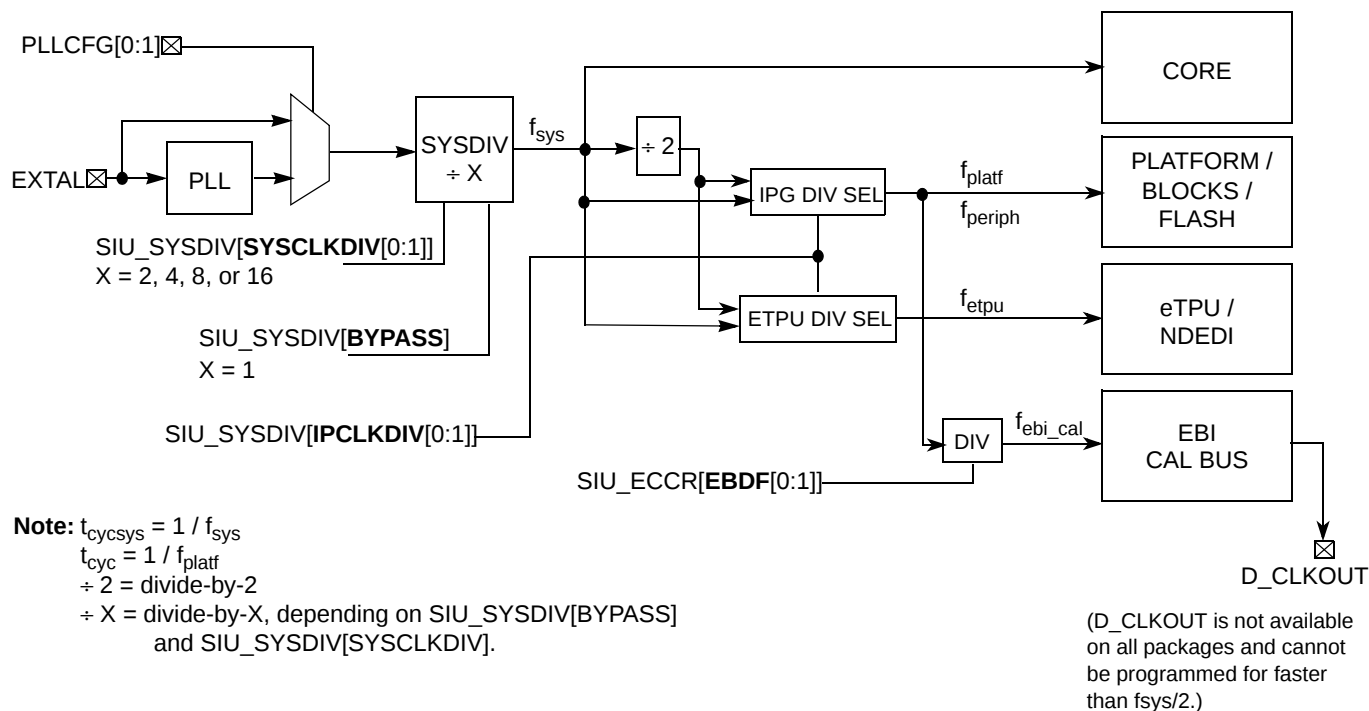
Table 22. Standby RAM Regulator Electrical Specifications

| Spec               | Characteristic                                                                                                                         | Symbol       | Min | Typ | Max | Unit |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------|--------------|-----|-----|-----|------|
| <b>Normal Mode</b> |                                                                                                                                        |              |     |     |     |      |
| 1                  | Standby Regulator Output<br>ADC1 channel 194                                                                                           | $V_{ADC194}$ | —   | 1.2 | —   | V    |
| 2                  | Standby Source Bias<br>150 mV to 360 mV (30mV Increment @<br>vref_sel)<br>ADC1 channel 195<br>Default Value 150 mV (@vref_sel = 1 1 1) | $V_{ADC195}$ | 150 | —   | 360 | mV   |
| 3                  | Standby Brownout Reference<br>ADC1 channel 195                                                                                         | $V_{ADC195}$ | 500 | —   | 850 | mV   |

## 4.11 AC Specifications

### 4.11.1 Clocking

The Figure 16 shows the operating frequency domains of various blocks on MPC5674F.



**Figure 16. MPC5674F Block Operating Frequency Domain Diagram**

Table 28 shows the operating frequencies of various blocks depending on the device's clocking mode configuration settings (see Table 29 and Table 30 for descriptions of bit settings).

**Table 28. MPC5674F Operating Frequencies<sup>1, 2</sup>**

| Mode     | SIU_ECCR [EBDF[0:1]] <sup>3</sup> | $f_{sys}$ (core) | $f_{platt}$ (platform and all blocks except eTPU) | $f_{etpu}$ (eTPU, eTPU RAM, and NDEDI) | $f_{ebi\_cal}$ <sup>4,5</sup> | Unit |
|----------|-----------------------------------|------------------|---------------------------------------------------|----------------------------------------|-------------------------------|------|
| Enhanced | 01                                | 264              | 132                                               | 132                                    | 66                            | MHz  |
|          | 11                                | 264              | 132                                               | 132                                    | 33                            |      |
| Full     | 01                                | 200              | 100                                               | 200                                    | 50                            | MHz  |
|          | 11                                | 200              | 100                                               | 200                                    | 25                            |      |
| Legacy   | 01                                | 132              | 132                                               | 132                                    | 66                            | MHz  |
|          | 11                                | 132              | 132                                               | 132                                    | 33                            |      |

<sup>1</sup> The values in the table are specified at:  
 $V_{DD} = 1.02 \text{ V to } 1.32 \text{ V}$   
 $V_{DDE} = 3.0 \text{ V to } 3.6 \text{ V}$   
 $V_{DDEH} = 4.5 \text{ V to } 5.5 \text{ V}$   
 $V_{DD33}$  and  $V_{DDSYN} = 3.0 \text{ V to } 3.6 \text{ V}$   
 $T_A = T_L \text{ to } T_H$ .

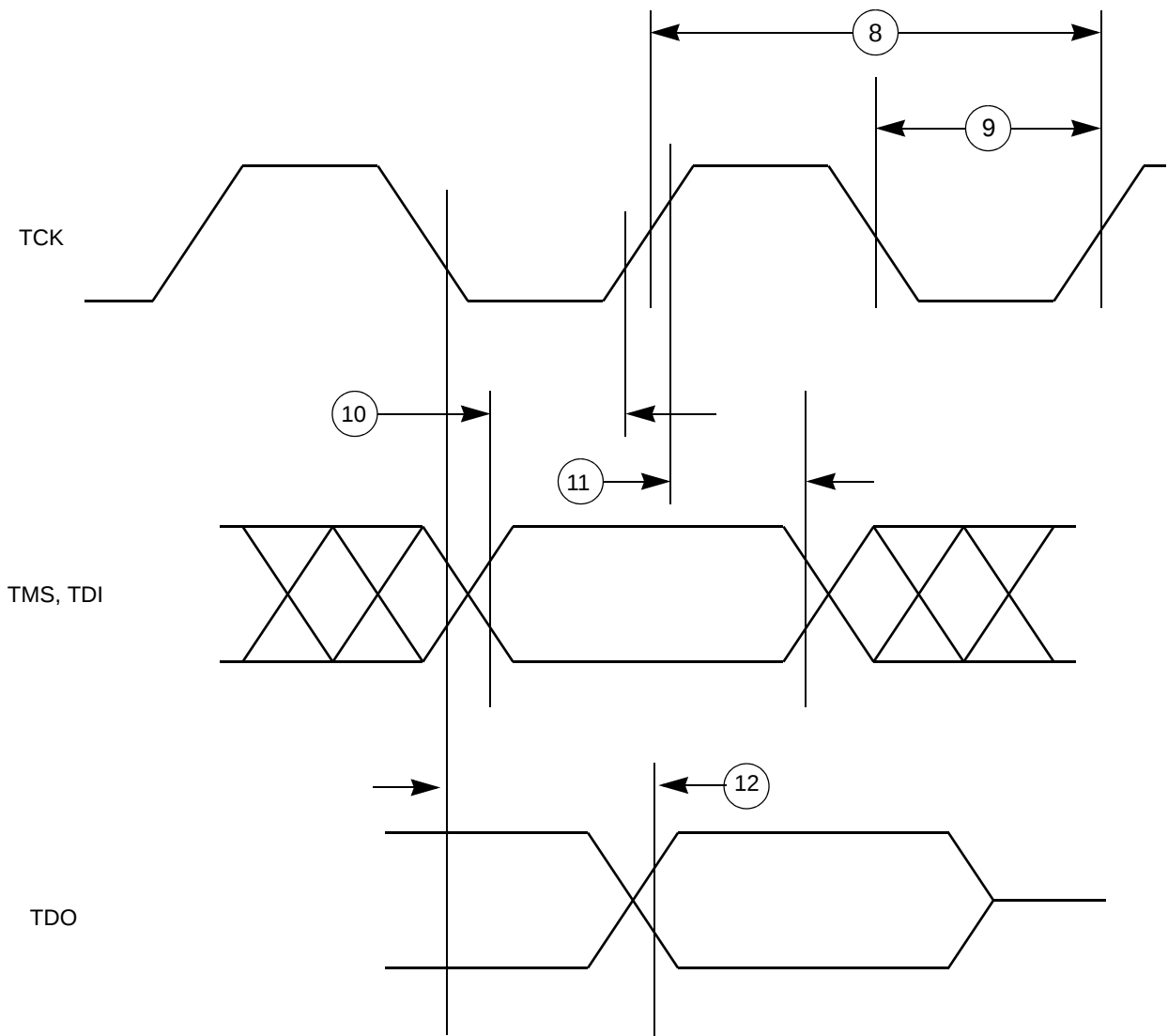


Figure 26. Nexus TCK, TDI, TMS, TDO Timing

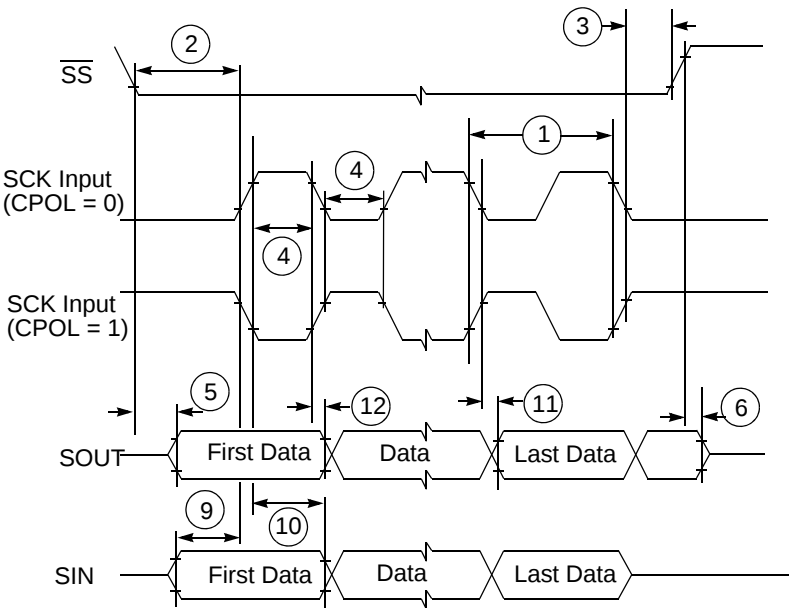


Figure 36. DSPI Classic SPI Timing — Slave, CPHA = 0

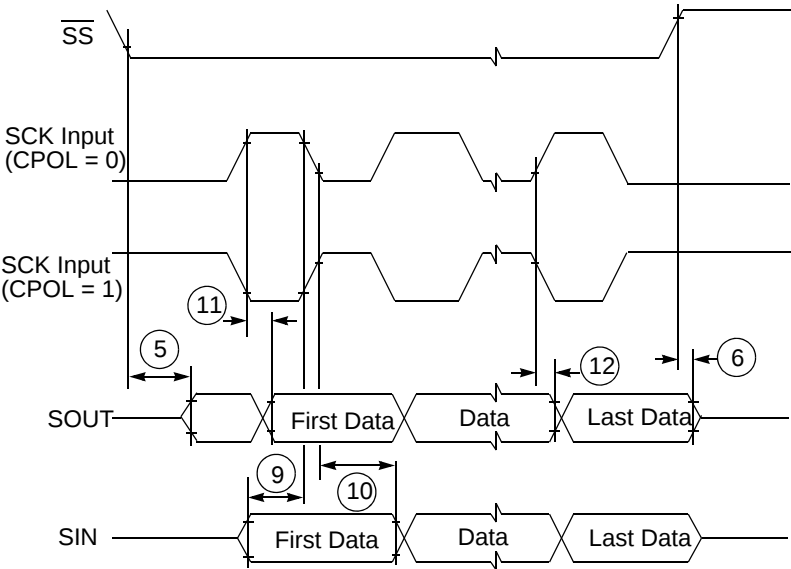


Figure 37. DSPI Classic SPI Timing — Slave, CPHA = 1

## 5.1 324-Pin Package

The package drawings of the 324-pin TEPBGA package are shown in Figure 43 and Figure 44.

**Figure 43. 324 TEPBGA Package (1 of 2)**

## 5.3 516-Pin Package

The package drawings of the 516-pin TEPBGA package are shown in Figure 47 and Figure 48.

**Figure 47. 516 TEPBGA Package (1 of 2)**

### Table 43. Signal Properties and Muxing Summary

| GPIO/PCR <sup>1</sup> | Signal Name <sup>2</sup>   | P/A/G <sup>3</sup> | Function <sup>4</sup> | Function Summary             | Direction | Pad Type <sup>5</sup> | Voltage <sup>6</sup> | State during RESET <sup>7</sup> | State after RESET <sup>8</sup> | Package Location |     |     |
|-----------------------|----------------------------|--------------------|-----------------------|------------------------------|-----------|-----------------------|----------------------|---------------------------------|--------------------------------|------------------|-----|-----|
|                       |                            |                    |                       |                              |           |                       |                      |                                 |                                | 324              | 416 | 516 |
| eTPU_A                |                            |                    |                       |                              |           |                       |                      |                                 |                                |                  |     |     |
| 113                   | TCRCLKA_IRQ7_<br>GPIO113   | P                  | TCRCLKA               | eTPU A TCR clock             | I         | MH                    | V <sub>DDEH1</sub>   | —/Up                            | —/Up                           | K1               | L1  | K4  |
|                       |                            | A1                 | IRQ7                  | External interrupt request   | I         |                       |                      |                                 |                                |                  |     |     |
|                       |                            | A2                 | —                     | —                            | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                            | G                  | GPIO113               | GPIO                         | I/O       |                       |                      |                                 |                                |                  |     |     |
| 114                   | ETPUA0_ETPUA12_<br>GPIO114 | P                  | ETPUA0                | eTPU A channel               | I/O       | MH                    | V <sub>DDEH1</sub>   | —/WKPCFG                        | —/WKPCFG                       | K2               | L2  | L6  |
|                       |                            | A1                 | ETPUA12               | eTPU A channel (output only) | O         |                       |                      |                                 |                                |                  |     |     |
|                       |                            | A2                 | —                     | —                            | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                            | G                  | GPIO114               | GPIO                         | I/O       |                       |                      |                                 |                                |                  |     |     |
| 115                   | ETPUA1_ETPUA13_<br>GPIO115 | P                  | ETPUA1                | eTPU A channel               | I/O       | MH                    | V <sub>DDEH1</sub>   | —/WKPCFG                        | —/WKPCFG                       | J1               | L3  | J1  |
|                       |                            | A1                 | ETPUA13               | eTPU A channel (output only) | O         |                       |                      |                                 |                                |                  |     |     |
|                       |                            | A2                 | —                     | —                            | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                            | G                  | GPIO115               | GPIO                         | I/O       |                       |                      |                                 |                                |                  |     |     |
| 116                   | ETPUA2_ETPUA14_<br>GPIO116 | P                  | ETPUA2                | eTPU A channel               | I/O       | MH                    | V <sub>DDEH1</sub>   | —/WKPCFG                        | —/WKPCFG                       | J2               | L4  | J2  |
|                       |                            | A1                 | ETPUA14               | eTPU A channel (output only) | O         |                       |                      |                                 |                                |                  |     |     |
|                       |                            | A2                 | —                     | —                            | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                            | G                  | GPIO116               | GPIO                         | I/O       |                       |                      |                                 |                                |                  |     |     |
| 117                   | ETPUA3_ETPUA15_<br>GPIO117 | P                  | ETPUA3                | eTPU A channel               | I/O       | MH                    | V <sub>DDEH1</sub>   | —/WKPCFG                        | —/WKPCFG                       | J3               | K1  | H4  |
|                       |                            | A1                 | ETPUA15               | eTPU A channel (output only) | O         |                       |                      |                                 |                                |                  |     |     |
|                       |                            | A2                 | —                     | —                            | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                            | G                  | GPIO117               | GPIO                         | I/O       |                       |                      |                                 |                                |                  |     |     |
| 118                   | ETPUA4_ETPUA16_<br>GPIO118 | P                  | ETPUA4                | eTPU A channel               | I/O       | MH                    | V <sub>DDEH1</sub>   | —/WKPCFG                        | —/WKPCFG                       | J4               | K2  | J4  |
|                       |                            | A1                 | ETPUA16               | eTPU A channel (output only) | O         |                       |                      |                                 |                                |                  |     |     |
|                       |                            | A2                 | —                     | —                            | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                            | G                  | GPIO118               | GPIO                         | I/O       |                       |                      |                                 |                                |                  |     |     |

Table 43. Signal Properties and Muxing Summary (continued)

| GPIO/PCR <sup>1</sup> | Signal Name <sup>2</sup> | P/A/G <sup>3</sup> | Function <sup>4</sup> | Function Summary              | Direction | Pad Type <sup>5</sup> | Voltage <sup>6</sup> | State during RESET <sup>7</sup> | State after RESET <sup>8</sup> | Package Location |     |     |
|-----------------------|--------------------------|--------------------|-----------------------|-------------------------------|-----------|-----------------------|----------------------|---------------------------------|--------------------------------|------------------|-----|-----|
|                       |                          |                    |                       |                               |           |                       |                      |                                 |                                | 324              | 416 | 516 |
| 137                   | ETPUA23_IRQ11_ GPIO137   | P                  | ETPUA23               | eTPU A channel                | I/O       | MH                    | V <sub>DDEH1</sub>   | —/WKPCFG                        | —/WKPCFG                       | D1               | E1  | E1  |
|                       |                          | A1                 | IRQ11                 | External interrupt request    | I         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | A2                 | —                     | —                             | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | G                  | GPIO137               | GPIO                          | I/O       |                       |                      |                                 |                                |                  |     |     |
| 138                   | ETPUA24_IRQ12_ GPIO138   | P                  | ETPUA24               | eTPU A channel                | I/O       | MH                    | V <sub>DDEH1</sub>   | —/WKPCFG                        | —/WKPCFG                       | E3               | E2  | E2  |
|                       |                          | A1                 | IRQ12                 | External interrupt request    | I         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | A2                 | —                     | —                             | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | G                  | GPIO138               | GPIO                          | I/O       |                       |                      |                                 |                                |                  |     |     |
| 139                   | ETPUA25_IRQ13_ GPIO139   | P                  | ETPUA25               | eTPU A channel                | I/O       | MH                    | V <sub>DDEH1</sub>   | —/WKPCFG                        | —/WKPCFG                       | D2               | E3  | E3  |
|                       |                          | A1                 | IRQ13                 | External interrupt request    | I         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | A2                 | —                     | —                             | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | G                  | GPIO139               | GPIO                          | I/O       |                       |                      |                                 |                                |                  |     |     |
| 140                   | ETPUA26_IRQ14_ GPIO140   | P                  | ETPUA26               | eTPU A channel                | I/O       | MH                    | V <sub>DDEH1</sub>   | —/WKPCFG                        | —/WKPCFG                       | C2               | E4  | E4  |
|                       |                          | A1                 | IRQ14                 | External interrupt request    | I         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | A2                 | —                     | —                             | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | G                  | GPIO140               | GPIO                          | I/O       |                       |                      |                                 |                                |                  |     |     |
| 141                   | ETPUA27_IRQ15_ GPIO141   | P                  | ETPUA27               | eTPU A channel                | I/O       | MH                    | V <sub>DDEH1</sub>   | —/WKPCFG                        | —/WKPCFG                       | F4               | D1  | D1  |
|                       |                          | A1                 | IRQ15                 | External interrupt request    | I         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | A2                 | —                     | —                             | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | G                  | GPIO141               | GPIO                          | I/O       |                       |                      |                                 |                                |                  |     |     |
| 142                   | ETPUA28_PCSC1_ GPIO142   | P                  | ETPUA28               | eTPU A channel                | I/O       | MH                    | V <sub>DDEH1</sub>   | —/WKPCFG                        | —/WKPCFG                       | —                | D2  | D2  |
|                       |                          | A1                 | PCSC1                 | DSPI C peripheral chip select | O         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | A2                 | —                     | —                             | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | G                  | GPIO142               | GPIO                          | I/O       |                       |                      |                                 |                                |                  |     |     |

Table 43. Signal Properties and Muxing Summary (continued)

| GPIO/PCR <sup>1</sup> | Signal Name <sup>2</sup>   | P/A/G <sup>3</sup> | Function <sup>4</sup> | Function Summary              | Direction | Pad Type <sup>5</sup> | Voltage <sup>6</sup> | State during RESET <sup>7</sup> | State after RESET <sup>8</sup> | Package Location |     |     |
|-----------------------|----------------------------|--------------------|-----------------------|-------------------------------|-----------|-----------------------|----------------------|---------------------------------|--------------------------------|------------------|-----|-----|
|                       |                            |                    |                       |                               |           |                       |                      |                                 |                                | 324              | 416 | 516 |
| 143                   | ETPUA29_PCSC2_<br>GPIO143  | P                  | ETPUA29               | eTPU A channel                | I/O       | MH                    | V <sub>DDEH1</sub>   | —/WKPCFG                        | —/WKPCFG                       | —                | D3  | D3  |
|                       |                            | A1                 | PCSC2                 | DSPI C peripheral chip select | O         |                       |                      |                                 |                                |                  |     |     |
|                       |                            | A2                 | —                     | —                             | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                            | G                  | GPIO143               | GPIO                          | I/O       |                       |                      |                                 |                                |                  |     |     |
| 144                   | ETPUA30_PCSC3_<br>GPIO144  | P                  | ETPUA30               | eTPU A channel                | I/O       | MH                    | V <sub>DDEH1</sub>   | —/WKPCFG                        | —/WKPCFG                       | E4               | C1  | C1  |
|                       |                            | A1                 | PCSC3                 | DSPI C peripheral chip select | O         |                       |                      |                                 |                                |                  |     |     |
|                       |                            | A2                 | —                     | —                             | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                            | G                  | GPIO144               | GPIO                          | I/O       |                       |                      |                                 |                                |                  |     |     |
| 145                   | ETPUA31_PCSC4_<br>GPIO145  | P                  | ETPUA31               | eTPU A channel                | I/O       | MH                    | V <sub>DDEH1</sub>   | —/WKPCFG                        | —/WKPCFG                       | D3               | C2  | C2  |
|                       |                            | A1                 | PCSC4                 | DSPI C peripheral chip select | O         |                       |                      |                                 |                                |                  |     |     |
|                       |                            | A2                 | —                     | —                             | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                            | G                  | GPIO145               | GPIO                          | I/O       |                       |                      |                                 |                                |                  |     |     |
| eTPU_B                |                            |                    |                       |                               |           |                       |                      |                                 |                                |                  |     |     |
| 146                   | TCRCLKB_IRQ6_<br>GPIO146   | P                  | TCRCLKB               | eTPU B TCR clock              | I         | MH                    | V <sub>DDEH6</sub>   | —/Up                            | —/Up                           | P19              | T23 | V25 |
|                       |                            | A1                 | IRQ6                  | External interrupt request    | I         |                       |                      |                                 |                                |                  |     |     |
|                       |                            | A2                 | —                     | —                             | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                            | G                  | GPIO146               | GPIO                          | I/O       |                       |                      |                                 |                                |                  |     |     |
| 147                   | ETPUB0_ETPUB16_<br>GPIO147 | P                  | ETPUB0                | eTPU B channel                | I/O       | MH                    | V <sub>DDEH6</sub>   | —/WKPCFG                        | —/WKPCFG                       | N19              | T24 | V26 |
|                       |                            | A1                 | ETPUB16               | eTPU B channel (output only)  | O         |                       |                      |                                 |                                |                  |     |     |
|                       |                            | A2                 | —                     | —                             | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                            | G                  | GPIO147               | GPIO                          | I/O       |                       |                      |                                 |                                |                  |     |     |
| 148                   | ETPUB1_ETPUB17_<br>GPIO148 | P                  | ETPUB1                | eTPU B channel                | I/O       | MH                    | V <sub>DDEH6</sub>   | —/WKPCFG                        | —/WKPCFG                       | R19              | T25 | U22 |
|                       |                            | A1                 | ETPUB17               | eTPU B channel (output only)  | O         |                       |                      |                                 |                                |                  |     |     |
|                       |                            | A2                 | —                     | —                             | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                            | G                  | GPIO148               | GPIO                          | I/O       |                       |                      |                                 |                                |                  |     |     |

| GPIO/PCR <sup>1</sup> | Signal Name <sup>2</sup> | P/A/G <sup>3</sup> | Function <sup>4</sup> | Function Summary              | Direction | Pad Type <sup>5</sup> | Voltage <sup>6</sup> | State during RESET <sup>7</sup> | State after RESET <sup>8</sup> | Package Location |     |     |
|-----------------------|--------------------------|--------------------|-----------------------|-------------------------------|-----------|-----------------------|----------------------|---------------------------------|--------------------------------|------------------|-----|-----|
|                       |                          |                    |                       |                               |           |                       |                      |                                 |                                | 324              | 416 | 516 |
| 161                   | ETPUB14_ETPUB30_ GPIO161 | P                  | ETPUB14               | eTPU B channel                | I/O       | MH                    | V <sub>DDEH6</sub>   | —/WKPCFG                        | —/WKPCFG                       | L21              | M25 | R24 |
|                       |                          | A1                 | ETPUB30               | eTPU B channel (output only)  | O         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | A2                 | —                     | —                             | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | G                  | GPIO161               | GPIO                          | I/O       |                       |                      |                                 |                                |                  |     |     |
| 162                   | ETPUB15_ETPUB31_ GPIO162 | P                  | ETPUB15               | eTPU B channel                | I/O       | MH                    | V <sub>DDEH6</sub>   | —/WKPCFG                        | —/WKPCFG                       | —                | M24 | R25 |
|                       |                          | A1                 | ETPUB31               | eTPU B channel (output only)  | O         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | A2                 | —                     | —                             | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | G                  | GPIO162               | GPIO                          | I/O       |                       |                      |                                 |                                |                  |     |     |
| 163                   | ETPUB16_PCSA1_ GPIO163   | P                  | ETPUB16               | eTPU B channel                | I/O       | MH                    | V <sub>DDEH6</sub>   | —/WKPCFG                        | —/WKPCFG                       | P20              | U26 | V24 |
|                       |                          | A1                 | PCSA1                 | DSPI A peripheral chip select | O         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | A2                 | —                     | —                             | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | G                  | GPIO163               | GPIO                          | I/O       |                       |                      |                                 |                                |                  |     |     |
| 164                   | ETPUB17_PCSA2_ GPIO164   | P                  | ETPUB17               | eTPU B channel                | I/O       | MH                    | V <sub>DDEH6</sub>   | —/WKPCFG                        | —/WKPCFG                       | R20              | U25 | T21 |
|                       |                          | A1                 | PCSA2                 | DSPI A peripheral chip select | O         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | A2                 | —                     | —                             | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | G                  | GPIO164               | GPIO                          | I/O       |                       |                      |                                 |                                |                  |     |     |
| 165                   | ETPUB18_PCSA3_ GPIO165   | P                  | ETPUB18               | eTPU B channel                | I/O       | MH                    | V <sub>DDEH6</sub>   | —/WKPCFG                        | —/WKPCFG                       | T20              | U24 | W26 |
|                       |                          | A1                 | PCSA3                 | DSPI A peripheral chip select | O         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | A2                 | —                     | —                             | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | G                  | GPIO165               | GPIO                          | I/O       |                       |                      |                                 |                                |                  |     |     |
| 166                   | ETPUB19_PCSA4_ GPIO166   | P                  | ETPUB19               | eTPU B channel                | I/O       | MH                    | V <sub>DDEH6</sub>   | —/WKPCFG                        | —/WKPCFG                       | T19              | U23 | W25 |
|                       |                          | A1                 | PCSA4                 | DSPI A peripheral chip select | O         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | A2                 | —                     | —                             | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | G                  | GPIO166               | GPIO                          | I/O       |                       |                      |                                 |                                |                  |     |     |

Table 43. Signal Properties and Muxing Summary (continued)

| GPIO/PCR <sup>1</sup> | Signal Name <sup>2</sup>                 | P/A/G <sup>3</sup> | Function <sup>4</sup> | Function Summary           | Direction | Pad Type <sup>5</sup> | Voltage <sup>6</sup> | State during RESET <sup>7</sup> | State after RESET <sup>8</sup> | Package Location |     |     |
|-----------------------|------------------------------------------|--------------------|-----------------------|----------------------------|-----------|-----------------------|----------------------|---------------------------------|--------------------------------|------------------|-----|-----|
|                       |                                          |                    |                       |                            |           |                       |                      |                                 |                                | 324              | 416 | 516 |
| 452                   | ETPUC11_IRQ2_<br>GPIO452 <sup>9</sup>    | P                  | —                     | —                          | —         | MH                    | V <sub>DDEH7</sub>   | —/WKPCFG                        | —/WKPCFG                       | E21              | G23 | G22 |
|                       |                                          | A1                 | IRQ2                  | External interrupt request | I         |                       |                      |                                 |                                |                  |     |     |
|                       |                                          | A2                 | —                     | —                          | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                                          | G                  | GPIO452               | GPIO                       | I/O       |                       |                      |                                 |                                |                  |     |     |
| 453                   | ETPUC12_IRQ3_<br>GPIO453 <sup>9</sup>    | P                  | —                     | —                          | —         | MH                    | V <sub>DDEH7</sub>   | —/WKPCFG                        | —/WKPCFG                       | F19              | G24 | G23 |
|                       |                                          | A1                 | IRQ3                  | External interrupt request | I         |                       |                      |                                 |                                |                  |     |     |
|                       |                                          | A2                 | —                     | —                          | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                                          | G                  | GPIO453               | GPIO                       | I/O       |                       |                      |                                 |                                |                  |     |     |
| 454                   | ETPUC13_3_IRQ4_<br>GPIO454 <sup>9</sup>  | P                  | —                     | —                          | —         | MH                    | V <sub>DDEH7</sub>   | —/WKPCFG                        | —/WKPCFG                       | F21              | G25 | G24 |
|                       |                                          | A1                 | IRQ4                  | External interrupt request | I         |                       |                      |                                 |                                |                  |     |     |
|                       |                                          | A2                 | —                     | —                          | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                                          | G                  | GPIO454               | GPIO                       | I/O       |                       |                      |                                 |                                |                  |     |     |
| 455                   | ETPUC14_4_IRQ5_<br>GPIO455 <sup>9</sup>  | P                  | —                     | —                          | —         | MH                    | V <sub>DDEH7</sub>   | —/WKPCFG                        | —/WKPCFG                       | F20              | G26 | G25 |
|                       |                                          | A1                 | IRQ5                  | External interrupt request | I         |                       |                      |                                 |                                |                  |     |     |
|                       |                                          | A2                 | —                     | —                          | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                                          | G                  | GPIO455               | GPIO                       | I/O       |                       |                      |                                 |                                |                  |     |     |
| 456                   | ETPUC15_<br>GPIO456 <sup>9</sup>         | P                  | —                     | —                          | —         | MH                    | V <sub>DDEH7</sub>   | —/WKPCFG                        | —/WKPCFG                       | —                | H23 | G26 |
|                       |                                          | A1                 | —                     | —                          | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                                          | A2                 | —                     | —                          | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                                          | G                  | GPIO456               | GPIO                       | I/O       |                       |                      |                                 |                                |                  |     |     |
| 457                   | ETPUC16_FR_A_TX_<br>GPIO457 <sup>9</sup> | P                  | —                     | —                          | —         | MH                    | V <sub>DDEH7</sub>   | —/WKPCFG                        | —/WKPCFG                       | —                | H24 | H22 |
|                       |                                          | A1                 | FR_A_TX               | FlexRay A transfer         | O         |                       |                      |                                 |                                |                  |     |     |
|                       |                                          | A2                 | —                     | —                          | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                                          | G                  | GPIO457               | GPIO                       | I/O       |                       |                      |                                 |                                |                  |     |     |

**Table 43. Signal Properties and Muxing Summary (continued)**

| GPIO/PCR <sup>1</sup> | Signal Name <sup>2</sup>                    | P/A/G <sup>3</sup> | Function <sup>4</sup> | Function Summary          | Direction | Pad Type <sup>5</sup> | Voltage <sup>6</sup> | State during RESET <sup>7</sup> | State after RESET <sup>8</sup> | Package Location |     |     |
|-----------------------|---------------------------------------------|--------------------|-----------------------|---------------------------|-----------|-----------------------|----------------------|---------------------------------|--------------------------------|------------------|-----|-----|
|                       |                                             |                    |                       |                           |           |                       |                      |                                 |                                | 324              | 416 | 516 |
| 458                   | ETPUC17_FR_A_RX_<br>GPIO458 <sup>9</sup>    | P                  | —                     | —                         | —         | MH                    | V <sub>DDEH7</sub>   | —/WKPCFG                        | —/WKPCFG                       | G22              | H25 | H23 |
|                       |                                             | A1                 | FR_A_RX               | FlexRay A receive         | I         |                       |                      |                                 |                                |                  |     |     |
|                       |                                             | A2                 | —                     | —                         | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                                             | G                  | GPIO458               | GPIO                      | I/O       |                       |                      |                                 |                                |                  |     |     |
| 459                   | ETPUC18_FR_A_TX_EN_<br>GPIO459 <sup>9</sup> | P                  | —                     | —                         | —         | MH                    | V <sub>DDEH7</sub>   | —/WKPCFG                        | —/WKPCFG                       | G20              | H26 | H24 |
|                       |                                             | A1                 | FR_A_TX_EN            | FlexRay A transfer enable | O         |                       |                      |                                 |                                |                  |     |     |
|                       |                                             | A2                 | —                     | —                         | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                                             | G                  | GPIO459               | GPIO                      | I/O       |                       |                      |                                 |                                |                  |     |     |
| 460                   | ETPUC19_TXDA_<br>GPIO460 <sup>9</sup>       | P                  | —                     | —                         | —         | MH                    | V <sub>DDEH7</sub>   | —/WKPCFG                        | —/WKPCFG                       | G21              | J23 | H21 |
|                       |                                             | A1                 | TXDA                  | eSCI A transmit           | O         |                       |                      |                                 |                                |                  |     |     |
|                       |                                             | A2                 | —                     | —                         | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                                             | G                  | GPIO460               | GPIO                      | I/O       |                       |                      |                                 |                                |                  |     |     |
| 461                   | ETPUC20_RXDA_<br>GPIO461 <sup>9</sup>       | P                  | —                     | —                         | —         | MH                    | V <sub>DDEH7</sub>   | —/WKPCFG                        | —/WKPCFG                       | G19              | J24 | H25 |
|                       |                                             | A1                 | RXDA                  | eSCI A receive            | I         |                       |                      |                                 |                                |                  |     |     |
|                       |                                             | A2                 | —                     | —                         | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                                             | G                  | GPIO461               | GPIO                      | I/O       |                       |                      |                                 |                                |                  |     |     |
| 462                   | ETPUC21_TXDB_<br>GPIO462 <sup>9</sup>       | P                  | —                     | —                         | —         | MH                    | V <sub>DDEH7</sub>   | —/WKPCFG                        | —/WKPCFG                       | H22              | J25 | H26 |
|                       |                                             | A1                 | TXDB                  | eSCI B transmit           | O         |                       |                      |                                 |                                |                  |     |     |
|                       |                                             | A2                 | —                     | —                         | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                                             | G                  | GPIO462               | GPIO                      | I/O       |                       |                      |                                 |                                |                  |     |     |
| 463                   | ETPUC22_RXDB_<br>GPIO463 <sup>9</sup>       | P                  | —                     | —                         | —         | MH                    | V <sub>DDEH7</sub>   | —/WKPCFG                        | —/WKPCFG                       | H21              | J26 | J22 |
|                       |                                             | A1                 | RXDB                  | eSCI B receive            | I         |                       |                      |                                 |                                |                  |     |     |
|                       |                                             | A2                 | —                     | —                         | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                                             | G                  | GPIO463               | GPIO                      | I/O       |                       |                      |                                 |                                |                  |     |     |

Table 43. Signal Properties and Muxing Summary (continued)

| GPIO/PCR <sup>1</sup> | Signal Name <sup>2</sup> | P/A/G <sup>3</sup> | Function <sup>4</sup> | Function Summary                                                | Direction | Pad Type <sup>5</sup> | Voltage <sup>6</sup> | State during RESET <sup>7</sup> | State after RESET <sup>8</sup> | Package Location |     |     |
|-----------------------|--------------------------|--------------------|-----------------------|-----------------------------------------------------------------|-----------|-----------------------|----------------------|---------------------------------|--------------------------------|------------------|-----|-----|
|                       |                          |                    |                       |                                                                 |           |                       |                      |                                 |                                | 324              | 416 | 516 |
| 288                   | D_ADD_DAT10_<br>GPIO288  | P                  | D_ADD_DAT10           | EBI data only in non-mux mode.<br>Address and data in mux mode. | I/O       | F                     | V <sub>DDE10</sub>   | —/Up                            | —/Up                           | —                | —   | L26 |
|                       |                          | A1                 | —                     | —                                                               | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | A2                 | —                     | —                                                               | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | G                  | GPIO288               | GPIO                                                            | I/O       |                       |                      |                                 |                                |                  |     |     |
| 289                   | D_ADD_DAT11_<br>GPIO289  | P                  | D_ADD_DAT11           | EBI data only in non-mux mode.<br>Address and data in mux mode. | I/O       | F                     | V <sub>DDE10</sub>   | —/Up                            | —/Up                           | —                | —   | L25 |
|                       |                          | A1                 | —                     | —                                                               | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | A2                 | —                     | —                                                               | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | G                  | GPIO289               | GPIO                                                            | I/O       |                       |                      |                                 |                                |                  |     |     |
| 290                   | D_ADD_DAT12_<br>GPIO290  | P                  | D_ADD_DAT12           | EBI data only in non-mux mode.<br>Address and data in mux mode. | I/O       | F                     | V <sub>DDE10</sub>   | —/Up                            | —/Up                           | —                | —   | L24 |
|                       |                          | A1                 | —                     | —                                                               | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | A2                 | —                     | —                                                               | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | G                  | GPIO290               | GPIO                                                            | I/O       |                       |                      |                                 |                                |                  |     |     |
| 291                   | D_ADD_DAT13_<br>GPIO291  | P                  | D_ADD_DAT13           | EBI data only in non-mux mode.<br>Address and data in mux mode. | I/O       | F                     | V <sub>DDE10</sub>   | —/Up                            | —/Up                           | —                | —   | L23 |
|                       |                          | A1                 | —                     | —                                                               | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | A2                 | —                     | —                                                               | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | G                  | GPIO291               | GPIO                                                            | I/O       |                       |                      |                                 |                                |                  |     |     |
| 292                   | D_ADD_DAT14_GPIO292      | P                  | D_ADD_DAT14           | EBI data only in non-mux mode.<br>Address and data in mux mode. | I/O       | F                     | V <sub>DDE10</sub>   | —/Up                            | —/Up                           | —                | —   | L22 |
|                       |                          | A1                 | —                     | —                                                               | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | A2                 | —                     | —                                                               | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                          | G                  | GPIO292               | GPIO                                                            | I/O       |                       |                      |                                 |                                |                  |     |     |

**Table 43. Signal Properties and Muxing Summary (continued)**

| GPIO/PCR <sup>1</sup> | Signal Name <sup>2</sup>                                                             | P/A/G <sup>3</sup> | Function <sup>4</sup> | Function Summary       | Direction | Pad Type <sup>5</sup> | Voltage <sup>6</sup> | State during RESET <sup>7</sup> | State after RESET <sup>8</sup> | Package Location |     |     |
|-----------------------|--------------------------------------------------------------------------------------|--------------------|-----------------------|------------------------|-----------|-----------------------|----------------------|---------------------------------|--------------------------------|------------------|-----|-----|
|                       |                                                                                      |                    |                       |                        |           |                       |                      |                                 |                                | 324              | 416 | 516 |
| 220                   | MDO0_GPIO220<br>(GPIO function on this pin is only available on Rev.2 of the device) | _13                | MDO0 <sup>15</sup>    | Nexus message data out | O         | F                     | V <sub>DDE2</sub>    | O/Low                           | MDO0/Low                       | P3               | U3  | V3  |
|                       |                                                                                      | A1                 | —                     | —                      | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                                                                                      | A2                 | —                     | —                      | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                                                                                      | G                  | GPIO220               | GPIO                   | I/O       |                       |                      |                                 |                                |                  |     |     |
| 221                   | MDO1_GPIO221<br>(GPIO function on this pin is only available on Rev.2 of the device) | _13                | MDO1 <sup>15</sup>    | Nexus message data out | O         | F                     | V <sub>DDE2</sub>    | O/Low                           | —/Down                         | P4               | U4  | W6  |
|                       |                                                                                      | A1                 | —                     | —                      | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                                                                                      | A2                 | —                     | —                      | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                                                                                      | G                  | GPIO221               | GPIO                   | I/O       |                       |                      |                                 |                                |                  |     |     |
| 222                   | MDO2_GPIO222<br>(GPIO function on this pin is only available on Rev.2 of the device) | _13                | MDO2 <sup>15</sup>    | Nexus message data out | O         | F                     | V <sub>DDE2</sub>    | O/Low                           | —/Down                         | R1               | V1  | V4  |
|                       |                                                                                      | A1                 | —                     | —                      | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                                                                                      | A2                 | —                     | —                      | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                                                                                      | G                  | GPIO222               | GPIO                   | I/O       |                       |                      |                                 |                                |                  |     |     |
| 223                   | MDO3_GPIO223<br>(GPIO function on this pin is only available on Rev.2 of the device) | _13                | MDO3 <sup>15</sup>    | Nexus message data out | O         | F                     | V <sub>DDE2</sub>    | O/Low                           | —/Down                         | R2               | V2  | V5  |
|                       |                                                                                      | A1                 | —                     | —                      | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                                                                                      | A2                 | —                     | —                      | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                                                                                      | G                  | GPIO223               | GPIO                   | I/O       |                       |                      |                                 |                                |                  |     |     |
| 75                    | MDO4_GPIO75<br>(GPIO function on this pin is only available on Rev.2 of the device)  | _13                | MDO4 <sup>15</sup>    | Nexus message data out | O         | F                     | V <sub>DDE2</sub>    | O/Low                           | —/Down                         | R3               | V3  | W1  |
|                       |                                                                                      | A1                 | —                     | —                      | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                                                                                      | A2                 | —                     | —                      | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                                                                                      | G                  | GPIO75                | GPIO                   | I/O       |                       |                      |                                 |                                |                  |     |     |
| 76                    | MDO5_GPIO76<br>(GPIO function on this pin is only available on Rev.2 of the device)  | _13                | MDO5 <sup>15</sup>    | Nexus message data out | O         | F                     | V <sub>DDE2</sub>    | O/Low                           | —/Down                         | R4               | V4  | W2  |
|                       |                                                                                      | A1                 | —                     | —                      | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                                                                                      | A2                 | —                     | —                      | —         |                       |                      |                                 |                                |                  |     |     |
|                       |                                                                                      | G                  | GPIO76                | GPIO                   | I/O       |                       |                      |                                 |                                |                  |     |     |

Table 46 lists the pin locations of the power and ground signals on the 516 TEPBGA package.

**Table 46. 516-pin Power Supply Locations**

**VDD**

|    |    |    |    |    |    |     |      |     |      |      |     |      |     |      |
|----|----|----|----|----|----|-----|------|-----|------|------|-----|------|-----|------|
| A2 | B3 | C4 | D5 | E6 | N4 | AB4 | AB23 | AC3 | AC12 | AC24 | AD2 | AD25 | AE1 | AE26 |
|----|----|----|----|----|----|-----|------|-----|------|------|-----|------|-----|------|

**VDD33**

|    |    |     |     |      |      |      |
|----|----|-----|-----|------|------|------|
| M1 | P6 | L21 | AA4 | AA11 | AA14 | AA23 |
|----|----|-----|-----|------|------|------|

**VDDE10**

|     |     |     |     |     |     |      |
|-----|-----|-----|-----|-----|-----|------|
| F16 | F17 | F19 | F21 | N21 | P21 | AA22 |
|-----|-----|-----|-----|-----|-----|------|

**VDDE2**

|     |     |     |     |     |    |     |     |     |     |     |     |    |     |     |     |
|-----|-----|-----|-----|-----|----|-----|-----|-----|-----|-----|-----|----|-----|-----|-----|
| N10 | P10 | P11 | R10 | R11 | T1 | T10 | T11 | T12 | U10 | U11 | U12 | W4 | AC1 | AC5 | AF2 |
|-----|-----|-----|-----|-----|----|-----|-----|-----|-----|-----|-----|----|-----|-----|-----|

**VDDE8**

|    |    |     |     |    |     |
|----|----|-----|-----|----|-----|
| F6 | F8 | F10 | F11 | N6 | AA5 |
|----|----|-----|-----|----|-----|

**VDDE9**

|      |     |     |      |      |      |      |
|------|-----|-----|------|------|------|------|
| AA13 | AB6 | AB7 | AB18 | AB19 | AB20 | AB21 |
|------|-----|-----|------|------|------|------|

**VDDEH1**

|    |    |
|----|----|
| B1 | P4 |
|----|----|

**VDDEH3**

|      |     |
|------|-----|
| AC10 | AF5 |
|------|-----|

**VDDEH4**

|      |      |
|------|------|
| AC11 | AF22 |
|------|------|

**VDDEH5**

|      |      |
|------|------|
| AC21 | AF25 |
|------|------|

**VDDEH6**

|     |      |
|-----|------|
| N23 | AC25 |
|-----|------|

**VDDEH7**

|     |     |     |
|-----|-----|-----|
| D24 | E23 | M26 |
|-----|-----|-----|

**VSS**

|     |     |     |     |     |     |     |     |     |      |     |      |     |      |     |      |     |      |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|------|-----|------|-----|------|-----|------|
| A25 | B2  | B25 | B26 | C3  | C24 | D4  | D23 | E5  | E7   | E8  | E9   | E10 | E11  | E12 | E13  | E14 | E15  |
| E16 | E17 | E18 | E19 | E21 | E22 | F5  | F13 | F14 | K10  | K11 | K12  | K13 | K14  | K15 | K16  | K17 | L10  |
| L11 | L12 | L13 | L14 | L15 | L16 | L17 | M10 | M11 | M12  | M13 | M14  | M15 | M16  | M17 | N11  | N12 | N13  |
| N14 | N15 | N16 | N17 | P12 | P13 | P14 | P15 | P16 | P17  | R12 | R13  | R14 | R15  | R16 | R17  | T13 | T14  |
| T15 | T16 | T17 | U13 | U14 | U15 | U16 | U17 | AA6 | AA21 | AB5 | AB22 | AC4 | AC23 | AD3 | AD24 | AE2 | AE25 |