

Attention: If only one DDR3/-L memory module is to be installed, be sure to install it in the DIMM\_A1.

| DDR3 1333 Downgrade to 1066 Qualified Vendors List (QVL) |                                  |              |       |              |                     |             |           |                                |        |
|--|----------------------------------|--------------|-------|--------------|---------------------|-------------|-----------|--------------------------------|--------|
| Vendors  | Part No.                         | Size         | SS/DS | Chip Brand   | Chip NO.            | Timing      | Voltage   | DIMM socket support (Optional) |        |
|  |                                  |              |       |              |                     |             |           | 1 DIMM                         | 2 DIMM |
| A-DATA   | AD3U1333C2G9                     | 2GB          | SS    | A-DATA       | 3CCD-1509HNA1126L   | 9-9-9-24-33 | 1.5V      | •                              | •      |
| A-DATA   | AX3U1333C2G9-BP                  | 2GB          | SS    | N/A          | N/A                 | 9-9-9-24-33 | 1.5V      | •                              | •      |
| Apacer   | AU02GFA33C9NBGC                  | 2GB          | DS    | Apacer       | AM5D5808APQSBG      | 9-9-9-24-33 | 1.5V      | •                              | •      |
| Apacer   | 78.B1GDE.9L10C                   | 4GB          | DS    | Apacer       | AM5D5908CEHSBG      | 9-9-9-24-33 | 1.5V      | •                              | •      |
| CORSAIR  | TR3X6G1333C9 G                   | 6GB(3x 2GB)  | SS    | N/A          | N/A                 | 9-9-9-24    | 1.50V     | •                              | •      |
| CORSAIR  | CMD24GX3M6A1333C9(XMP)           | 24GB(6x4GB)  | DS    | N/A          | N/A                 | 9-9-9-24    | 1.60V     | •                              | •      |
| CORSAIR  | TW3X4G1333C9D G                  | 4GB(2 x 2GB) | DS    | N/A          | N/A                 | 9-9-9-24    | 1.50V     | •                              | •      |
| CORSAIR  | CM3X4GA1333C9N2                  | 4GB          | DS    | CORSAIR      | 256MBDCJGELCO401136 | 9-9-9-24    | 1.5V      | •                              | •      |
| CORSAIR  | CMX4GX3M1A1333C9                 | 4GB          | DS    | N/A          | N/A                 | 9-9-9-24    | 1.50V     | •                              | •      |
| CORSAIR  | CMD8GX3M4A1333C7                 | 8GB(4 x 2GB) | DS    | N/A          | N/A                 | 7-7-7-20    | 1.60V     | •                              | •      |
| CORSAIR  | CMV8GX3M1A1333C9                 | 8GB          | DS    | CORSAIR      | 512M8DCJGELAO401213 | 9-9-9-24-33 | 1.50V     | •                              | •      |
| CORSAIR  | CMX16GX3M2A1333C9(Ver7.21)       | 8GB          | DS    | N/A          | N/A                 | 9-9-9-24    | 1.50V     | •                              | •      |
| G.SKILL  | F3-10666CL8D-4GBECC(XMP)         | 4GB(2 x 2GB) | DS    | N/A          | N/A                 | 8-8-8-8-24  | XMP 1.35V | •                              | •      |
| G.SKILL  | F3-10666CL7D-8GBRH(XMP)          | 8GB(2 x 4GB) | DS    | N/A          | N/A                 | 7-7-7-21    | 1.5V      | •                              | •      |
| G.SKILL  | F3-1333C9D-16GISL                | 8G           | DS    | N/A          | Heat-Sink Package   | 9-9-9-24    | 1.35V     | •                              | •      |
| GEIL   | GVP34GB1333C7DC                  | 4GB(2 x 2GB) | DS    | N/A          | N/A                 | 7-7-7-24    | 1.5V      | •                              | •      |
| Hynix  | HMT351U6BFR8C-H9                 | 4GB          | DS    | Hynix        | H5TQ2G83BFRH9C      | 9-9-9-24-33 | 1.5V      | •                              | •      |
| KINGMAX  | FLFE85F-C8KL9 NAES               | 2GB          | SS    | KINGMAX      | KFC8FNLXF-DXX-15A   | 9-9-9-24-33 | 1.5V      | •                              | •      |
| KINGMAX  | FLFF65F-C8KL9 NEES               | 4GB          | DS    | KINGMAX      | KFC8FNLXF-DXX-15A   | 9-9-9-24-33 | 1.5V      | •                              | •      |
| KINGMAX  | FLFF65F-C8KM9 NEES               | 4GB          | DS    | KINGMAX      | KFC8FNMXF-BXX-15A   | 9-9-9-24-33 | 1.5V      | •                              | •      |
| KINGSTON   | KVR1333D3S8N9/2G                 | 2GB          | SS    | Micron       | IID77 D9LGK         | 9-9-9-24-33 | 1.5V      | •                              | •      |
| KINGSTON   | KVR1333D3S8N9/2G-SP(Low Profile) | 2GB          | SS    | ELPIDA       | J2108BCSE-DJ-F      | 9-9-9-24-33 | 1.5V      | •                              | •      |
| KINGSTON   | KVR13N9S8/4-SP (Low Profile)     | 4GB          | DS    | NANYA        | NT5CC512MDDN-CG     | 9-9-9-24-33 | 1.5V      | •                              | •      |
| KINGSTON   | KVR13N9S8/4(Low Profile)         | 4GB          | DS    | KINGSTON     | D5128GC28PGG8U      | 9-9-9-24-33 | 1.5V      | •                              | •      |
| KINGSTON   | KVR1333D3N9/2G(Low Profile)      | 2GB          | DS    | ELPIDA       | J1108BFBG-DJ-F      | 9           | 1.5V      | •                              | •      |
| KINGSTON   | KVR1333D3N9/2G-SP(Low Profile)   | 2GB          | DS    | KINGSTON     | D1288JPSFPDG9U      | 9-9-9-24-33 | 1.5V      | •                              | •      |
| KINGSTON   | KHX1333C7D3K2/4GX(XMP)           | 4GB(2 x 2GB) | SS    | N/A          | N/A                 | 7           | 1.65V     | •                              | •      |
| KINGSTON   | KVR1333D3N9/4G(Low Profile)      | 4GB          | DS    | ELPIDA       | J2108BCSE-DJ-F      | 9-9-9-24-33 | 1.5V      | •                              | •      |
| KINGSTON   | KVR1333D3N9/4G                   | 4GB          | SS    | KTC          | D2568JENCNGD9U      | 9-9-9-24-33 | 1.5V      | •                              | •      |
| KINGSTON   | KVR1333D3N9/4G-SP(Low Profile)   | 4GB          | DS    | KINGSTON     | D2568JENCPCD9U      | 9-9-9-24-33 | 1.5V      | •                              | •      |
| Micron   | MT8JTF25664AZ-1G4M1              | 2GB          | SS    | MICRON       | IJM22 D9PFJ         | 9-9-9-24-33 | 1.5V      | •                              | •      |
| Micron   | MT16JTF51264AZ-1G4D1             | 4GB          | DS    | Micron       | OLD22D9LGK          | 9-9-9-24-33 | 1.5V      | •                              | •      |
| NANYA  | NT4GC64B8HG0NF-CG                | 4GB          | DS    | NANYA        | NT5CB256M8GN-CG     | 9-9-9-24-33 | 1.5V      | •                              | •      |
| SAMSUNG  | M378B5773DH0-CH9                 | 2GB          | SS    | SAMSUNG      | K4B2G0846D          | 9-9-9-24-33 | 1.5V      | •                              | •      |
| SAMSUNG  | M378B1G73AH0-CH9                 | 8GB          | DS    | SAMSUNG      | K4B4G0846A-HCH9     | 9-9-9-24-33 | 1.5V      | •                              | •      |
| Super Talent   | W1333UB4GS                       | 4GB          | DS    | SAMSUNG      | K4B2G0846C          | 9-9-9-24-33 | 1.5V      | •                              | •      |
| Transcend  | JM1333KLN-2G                     | 2GB          | SS    | HYNIX        | H5TQ2G83BZRH9C      | 9-9-9-24-33 | 1.5V      | •                              | •      |
| AMD  | AE32G1339U1-U                    | 2GB          | SS    | AMD          | 23EY4587MB3H11503M  | 9-9-9-24    | 1.5V      | •                              | •      |
| AMD  | AE34G1339U2-U                    | 4GB          | DS    | AMD          | 23EY4587MB3H11503M  | 9-9-9-24    | 1.5V      | •                              | •      |
| ASint  | SLZ302G08-EDJ1C                  | 2GB          | SS    | Asint        | SLZ302G08-DJ1C      | 9-9-9-24-33 | 1.5V      | •                              | •      |
| Asint  | SLA304G08-EDJ1B                  | 4GB          | SS    | Asint        | 304G08-DJ1B1301     | 9-9-9-24-33 | 1.5V      | •                              | •      |
| ASint  | SLA302G08-EDJ1C                  | 4GB          | DS    | Asint        | SLA302G08-DJ1C      | 9-9-9-24-33 | 1.5V      | •                              | •      |
| ASint  | SLB304G08-EDJ1B                  | 8GB          | DS    | Asint        | SLB304G08-DJ1B      | 9-9-9-24-33 | 1.5V      | •                              | •      |
| ASint  | SLA304G08-EDJ6A                  | 4GB          | SS    | ASINT        | 304G08-DJ6A         | 9-9-9-24-33 | 1.5V      | •                              | •      |
| ASint  | SLA304G08-EDJ6B                  | 4GB          | SS    | ASINT        | 304G08-DJ6B         | 9-9-9-24-33 | 1.5V      | •                              | •      |
| Elixir   | M2F2G64CB88D7N-CG                | 2GB          | SS    | Elixir       | N2CB2G80DN-CG       | 9-9-9-24-33 | 1.5V      | •                              | •      |
| Elixir   | M2F2G64CB88G7N-CG                | 2GB          | SS    | Elixir       | N2CB2G80GN-CG       | 9-9-9-24-33 | 1.5V      | •                              | •      |
| Elixir   | M2F4G64CB88D5N-CG                | 4GB          | DS    | Elixir       | N2CB2G80DN-CG       | 9-9-9-24-33 | 1.5V      | •                              | •      |
| HMD  | H added302GU648S1B9C-MEX         | 2GB          | SS    | ERTH         | 256X8DDR3 WT        | 9-9-9-24-33 | 1.5V      | •                              | •      |
| HMD  | H added304GU648S1B9C-MEX         | 4GB          | SS    | UUJK         | 512X8DDR3 WT        | 9-9-9-24-33 | 1.5V      | •                              | •      |
| HMD  | H added308GU648D1B9C-MEX         | 8GB          | DS    | FFCT         | 512X8DDR3 WT        | 9-9-9-24-33 | 1.5V      | •                              | •      |
| KINGSTEK   | KSTD3PC-10600                    | 2GB          | SS    | MICRON       | PE911-125E          | 9-9-9-24-33 | 1.5V      | •                              | •      |
| MARKVISION   | BMD32048M1333C9-1123             | 2GB          | DS    | MARKVISION   | M3D1288P-13         | 9-9-9-24-33 | 1.50V     | •                              | •      |
| MARKVISION   | BMD34096M1333C9-1124             | 4GB          | DS    | MARKVISION   | M3D2568E-13         | 9-9-9-24-33 | 1.50V     | •                              | •      |
| MUSHKIN  | PC3-10666                        | 4GB          | SS    | N/A          | Heat-Sink Package   | 9-9-9-24    | 1.50V     | •                              | •      |
| MUSHKIN  | PC3-10600                        | 2GB          | SS    | SEC 410 HC15 | K4W2GO846P          | 9-9-9-24    | 1.50V     | •                              | •      |
| PATRIOT  | PG38G1333EL(XMP)                 | 8GB          | DS    | N/A          | N/A                 | 9-9-9-24    | 1.5V      | •                              | •      |
| RAMAXEL  | RMR1870EC58E9F-1333              | 4GB          | DS    | ELPIDA       | J2108BCSE-DJ-F      | 9-9-9-24-33 | 1.50V     | •                              | •      |
| RIDATA   | C304627CB1AG22Fe                 | 2GB          | DS    | RIDATA       | N/A                 | 9           | 1.5V      | •                              | •      |
| RIDATA   | E304459CB1AG32Cf                 | 4GB          | DS    | RIDATA       | N/A                 | 9           | 1.5V      | •                              | •      |
| Silicon Power  | SP002GBLTU133V02                 | 2GB          | SS    | S-POWER      | 20YT3NG-1202        | 9-9-9-24-33 | 1.5V      | •                              | •      |
| Silicon Power  | SP004GBLTU133V02                 | 4GB          | DS    | S-POWER      | 20YT3NG-1201        | 9-9-9-24-33 | 1.5V      | •                              | •      |

|                      |                  |     |    |                 |                 |             |      |   |   |
|----------------------|------------------|-----|----|-----------------|-----------------|-------------|------|---|---|
| <b>Silicon Power</b> | SP002GBLTU133S02 | 2GB | SS | SP              | 3N2083EFDE1424H | 1.5V        | •    | • |   |
| <b>SMART</b>         | SH5126UD325893HE | 4GB | DS | SEC 343<br>BYKO | K4B2GO8460      | 9-9-9-24-33 | 1.5V | • | • |
| <b>SMART</b>         | SH5126UD325893SQ | 4GB | DS | SEC 343<br>BYKO | K4B2GO8460      | 9-9-9-24-33 | 1.5V | • | • |

**DDR3 1600 Qualified Vendors List (QVL)**

| Vendors  | Part No.                   | Size            | SS/DS | Chip Brand      | Chip NO.            | Timing         | Voltage      | DIMM socket support (Optional) |        |
|----------|----------------------------|-----------------|-------|-----------------|---------------------|----------------|--------------|--------------------------------|--------|
|          |                            |                 |       |                 |                     |                |              | 1 DIMM                         | 2 DIMM |
| APACER   | 78.B1GET.9K00C             | 4GB             | SS    | APACER          | AM5D6008BQQSCK      | 11-11-11-28-39 | 1.50V        | •                              | •      |
| APACER   | AU04GFA60CATBGC            | 4GB             | SS    | APACER          | AM5D60080QJMCK1336F | 11-11-11-28-39 | 1.50V        | •                              | •      |
| APACER   | 78.B1GE3.9L10C             | 4GB             | DS    | Apacer<br>KZZC  | AM5D5908DEQSCK      | 11-11-11-28-39 | 1.50V        | •                              | •      |
| APACER   | 78.BAQEJ.9LK0C (XMP)       | 4GB             | DS    | N/A             | N/A                 | 9-9-9-27       | -            | •                              | •      |
| APACER   | 78.C1GET.9K10C             | 8GB             | DS    | APACER          | AM5D6008BQQSCK      | 11-11-11-28-39 | 1.50V        | •                              | •      |
| CORSAIR  | CMV4GX3M1A1600C11          | 4GB             | SS    | CORSAIR         | 512M8DDLGPB0381320  | 9-9-9-30-39    | 1.50V        | •                              | •      |
| CORSAIR  | CMY8GX3M2A1600C9           | 4GB             | SS    | N/A             | N/A                 | 9-9-9-24       | 1.50V        | •                              | •      |
| CORSAIR  | CMD12GX3M6A1600C8(XMP)     | 12GB(6x2GB)     | DS    | N/A             | N/A                 | 8-8-8-24       | 1.65V        | •                              | •      |
| CORSAIR  | CMZ32GX3M4X1600C10(XMP)    | 32GB(8GBx4)     | DS    | N/A             | N/A                 | 10-10-10-27    | 1.50V        | •                              | •      |
| CORSAIR  | CMP4GX3M2A1600C8(XMP)      | 4GB(2 x 2GB)    | DS    | N/A             | N/A                 | 8-8-8-24       | 1.65V        | •                              | •      |
| CORSAIR  | CMP4GX3M2C1600C7(XMP)      | 4GB(2 x 2GB)    | DS    | N/A             | N/A                 | 7-8-7-20       | 1.65V        | •                              | •      |
| CORSAIR  | CML8GX3M2A1600C9           | 4GB             | DS    | N/A             | N/A                 | 9-9-9-24       | 1.50V        | •                              | •      |
| CORSAIR  | CMZ4GX3M1A1600C9           | 4GB             | DS    | N/A             | N/A                 | 9-9-9-24       | 1.50V        | •                              | •      |
| CORSAIR  | CMZ8GX3M2A1600C9           | 4GB             | DS    | N/A             | N/A                 | 9-9-9-24       | 1.50V        | •                              | •      |
| CORSAIR  | TR3X6G1600C8D G(XMP)       | 6GB(3 x 2GB)    | DS    | N/A             | N/A                 | 8-8-8-24       | 1.65V        | •                              | •      |
| CORSAIR  | TR3X6G1600C9 G(XMP)        | 6GB(3 x 2GB)    | DS    | N/A             | N/A                 | 9-9-9-24       | 1.65V        | •                              | •      |
| CORSAIR  | CMP8GX3M2A1600C9(XMP)      | 8GB(2 x 4GB)    | DS    | N/A             | N/A                 | 9-9-9-24       | 1.65V        | •                              | •      |
| CORSAIR  | CMZ8GX3M2A1600C7R(XMP)     | 8GB(2 x 4GB)    | DS    | N/A             | N/A                 | 7-8-7-20       | 1.50V        | •                              | •      |
| CORSAIR  | CML16GX3M2A1600C10         | 8GB             | DS    | N/A             | N/A                 | 10-10-10-27    | 1.50V        | •                              | •      |
| CORSAIR  | CMY16GX3M2A1600C9          | 8GB             | DS    | N/A             | N/A                 | 9-9-9-24       | 1.50V        | •                              | •      |
| CORSAIR  | CMY32GX3M4A1600C9          | 8GB             | DS    | N/A             | N/A                 | 9-9-9-24       | 1.50V        | •                              | •      |
| CORSAIR  | CMZ8GX3M1A1600C10(XMP)     | 8GB             | DS    | N/A             | N/A                 | 10-10-10-27    | 1.50V        | •                              | •      |
| CORSAIR  | CMZ16GX3M4X1600C9G         | 4G              | SS    | N/A             | Heat-Sink Package   | 9-9-9-24       | XMP<br>1.35V | •                              | •      |
| CRUCIAL  | CT102464BA160B.C16FED      | 8GB             | DS    | CRUCIAL         | CT512X8-160B        |                | 1.50V        | •                              | •      |
| CRUCIAL  | BLT4G3D1608ET3LX0.16FER2   | 4GB             | DS    | N/A             | Heat-Sink Package   | 8-8-8-24       | 1.35V        | •                              | •      |
| CRUCIAL  | BLS4G3D1609ES2LX0.16FER2   | 4G              | DS    | N/A             | Heat-Sink Package   | 9-9-9-24       | 1.35V        | •                              | •      |
| G.SKILL  | F3-1600C11S-4GNT           | 4GB             | SS    | SEC 343<br>XYKO | K4B4GO846D          | 11-11-11-28    | 1.5V         | •                              | •      |
| G.SKILL  | F3-12800CL9D-4GBRL(XMP)    | 4GB(2 x 2GB)    | DS    | N/A             | N/A                 | 9-9-9-24       | 1.5V         | •                              | •      |
| G.SKILL  | F3-12800CL7D-8GBRH(XMP)    | 8GB(2 x 4GB)    | DS    | N/A             | N/A                 | 7-8-7-24       | 1.6V         | •                              | •      |
| G.SKILL  | F3-12800CL8D-8GBECO(XMP)   | 8GB(2 x 4GB)    | DS    | N/A             | N/A                 | 8-8-8-24       | XMP<br>1.35V | •                              | •      |
| G.SKILL  | F3-12800CL9D-8GBRL(XMP)    | 8GB(2 x 4GB)    | DS    | N/A             | N/A                 | 9-9-9-24       | 1.5V         | •                              | •      |
| G.SKILL  | F3-12800CL10S-8GBXL(XMP)   | 8GB             | DS    | N/A             | N/A                 | 10-10-10-30    | 1.50V        | •                              | •      |
| G.SKILL  | F3-1600C11D-16GISL         | 8G              | DS    | ELPIDA          | J4208EFBG-GNL-F     |                | 1.35V        | •                              | •      |
| G.SKILL  | F3-12800CL9Q-16GBSR1       | 4G              | DS    | N/A             | Heat-Sink Package   | 9-9-9-24       | XMP<br>1.35V | •                              | •      |
| GEIL     | GET316GB1600C9QC(XMP)      | 16GB ( 4x 4GB ) | DS    | N/A             | N/A                 | 9-9-9-28       | 1.6V         | •                              | •      |
| GEIL     | GB34GB1600C11DC (XMP)      | 4GB             | DS    | GEIL            | GL1L256M88BA15GL    | 11-11-28-39    | 1.5V         | •                              | •      |
| GEIL     | GVP38GB1600C9SC (XMP)      | 4GB             | DS    | N/A             | N/A                 | 11-11-11-28    | 1.5V         | •                              | •      |
| HYNIX    | HMT351U6CFR8C-PB           | 4GB             | DS    | HYNIX           | H5TQ2G83CFR PBC     | 11-11-11-28-39 | 1.50V        | •                              | •      |
| KINGSTON | KHX1600C9D3P1K2/4G         | 4GB(2 x 2GB)    | SS    | N/A             | N/A                 | -              | 1.5V         | •                              | •      |
| KINGSTON | KHX1600C9D3K2/8GX (XMP)    | 4GB             | SS    | N/A             | N/A                 | 11-11-28-39    | 1.65V        | •                              | •      |
| KINGSTON | KVR16N11S8/4(Low Profile)  | 4GB             | SS    | KINGSTON        | U317X8BRRA19        | 11-11-11-28-39 | 1.50V        | •                              | •      |
| KINGSTON | KHX1600C9D3K3/12GX(XMP)    | 12GB(3x4GB)     | DS    | N/A             | N/A                 | 9-9-9-27       | 1.65V        | •                              | •      |
| KINGSTON | KHX1600C9D3T1BK3/12GX(XMP) | 12GB(3x4GB)     | DS    | N/A             | N/A                 | 9-9-9-27       | 1.65V        | •                              | •      |
| KINGSTON | KHX1600C9D3K4/16GX(XMP)    | 16GB ( 4GB x4 ) | DS    | N/A             | N/A                 | 9-9-9-24-33    | 1.65V        | •                              | •      |
| KINGSTON | KHX1600C10D3B1K2/16G       | 16GB(8GBx2)     | DS    | N/A             | N/A                 | 9-9-9-24-33    | 1.5V         | •                              | •      |
| KINGSTON | KHX16C9K2/16               | 16GB(8GBx2)     | DS    | N/A             | N/A                 | 9-9-9-24-33    | 1.5V         | •                              | •      |
| KINGSTON | KHX1600C9AD3/2G            | 2GB             | DS    | N/A             | N/A                 | 9-9-9-24-33    | 1.65V        | •                              | •      |
| KINGSTON | KHX1600C9D3X2K2/4GX(XMP)   | 4GB(2 x 2GB)    | DS    | N/A             | N/A                 | 9-9-9-27       | 1.65V        | •                              | •      |
| KINGSTON | KHX1600C9D3/4G             | 4GB             | DS    | N/A             | N/A                 | 9-9-9-24-33    | 1.65V        | •                              | •      |

|          |                           |                 |    |              |                      |                |             |   |   |
|----------|---------------------------|-----------------|----|--------------|----------------------|----------------|-------------|---|---|
| KINGSTON | KVR16N11/4(Low Profile)   | 4GB             | DS | KINGSTON     | D2568GEROPGGBU       | 11-11-28-39    | 1.5V        | • | • |
| KINGSTON | KHX1600C9D3T1BK3/6GX(XMP) | 6GB(3 x 2GB)    | DS | N/A          | N/A                  | 9-9-9-27       | 1.65V       | • | • |
| KINGSTON | KHX1600C9D3P1K2/8G        | 8GB(2 x 4GB)    | DS | N/A          | N/A                  | 9-9-9-27-39    | 1.5V        | • | • |
| KINGSTON | KHX16C10B1K2/16X(XMP)     | 8GB             | DS | N/A          | N/A                  | 9-9-9-24-33    | 1.5V        | • | • |
| KINGSTON | KHX16C9P1K2/16(XMP)       | 8GB             | DS | N/A          | N/A                  | 9-9-9-27-39    | 1.5V        | • | • |
| KINGSTON | KVR16N11S/4               | 4GB             | SS | KINGSTON     | D5128EC4BPGGBU       |                | 1.5V        | • | • |
| KINGSTON | KVR16N11/4                | 4GB             | SS | KINGSTON     | D5128EC4BPGGBU       |                | 1.35V       | • | • |
| KINGSTON | KVR16N11/4                | 4GB             | SS | KINGSTON     | D5128EC4BPGGBU       |                | 1.5V        | • | • |
| KINGSTON | HX316C10F/4               | 4GB             | SS | N/A          | Heat-Sink Package    |                | 1.5V        | • | • |
| KINGSTON | HX316C10F/4               | 8GB             | DS | N/A          | Heat-Sink Package    |                | 1.5V        | • | • |
| MICRON   | MT8JTF51264AZ-1G6E1       | 4GB             | SS | MICRON       | D9QBJ                | 11-11-11-28-39 | 1.50V       | • | • |
| MICRON   | MT16JTF1G64AZ-1G6E1       | 8GB             | DS | MICRON       | D9QBJ                | 11-11-11-28-39 | 1.50V       | • | • |
| MUSHKIN  | PC3-12800                 | 4GB             | DS | N/A          | Heat-Sink Package    | 9-9-9-24       | 1.50V       | • | • |
| MUSHKIN  | PC3-12800                 | 4GB             | DS | N/A          | Heat-Sink Package    | 9-9-9-24       | 1.50V       | • | • |
| MUSHKIN  | PC3L-12800                | 4G              | DS | N/A          | Heat-Sink Package    | 9-9-9-24       | XMP 1.35V   | • | • |
| MIRA     | PLAF8L93B-GN2             | 8GB             | DS | N/A          | BJE159C3G-M          | 9-9-9-24       | 1.50V       | • | • |
| PSC      | AL9F8L93B-GN2E            | 4GB             | SS | PSC          | XHP284C3G-M          | 11-11-11-28-39 | 1.50V       | • | • |
| PSC      | ALAF8L93B-GN2E            | 8GB             | DS | PSC          | XHR425C3G-M          | 11-11-11-28-39 | 1.50V       | • | • |
| TEAM     | TLD38G1600HC9BK           | 8GB             | DS | -            | -                    | 9-9-9-24       | 1.5V        | • | • |
| TEAM     | TED38G1600C11BK           | 8G              | SS | TEAM         | T3D10248HT-16        |                | 1.5V        | • | • |
| TEAM     | TED3L8G1600C11BK          | 8G              | DS | TEAM         | T3D5128HT-16         |                | 1.35V       | • | • |
| TEAM     | TED3L4G1600C11BK          | 4G              | SS | TEAM         | T3D5128HT-16         |                | 1.35V       | • | • |
| ADATA    | ADDU1600W4G11-B           | 4GB             | SS | ADATA        | DWND-1211A           | 11-11-11-28-39 | 1.35V       | • | • |
| ADATA    | N/A                       | 4GB             | SS | ADATA        | 3WCD-12IIA EL1348V   | -              | -           | • | • |
| ADATA    | AX3U1600W4G9-DB(XMP)      | 8GB ( 2x 4GB )  | SS | N/A          | N/A                  | 9-9-9-24       | 1.5V        | • | • |
| ADATA    | AX3U1600W8G9-DB           | 16GB ( 2x 8GB ) | DS | N/A          | N/A                  | 9-9-9-24       | 1.5V        | • | • |
| ADATA    | ADDU1600W8G11-B           | 8GB             | DS | ELPIDA       | J4208EBBG-GN-F       | 11-11-11-28-39 | 1.35V       | • | • |
| AMD      | AE32G1609U1-U             | 2GB             | SS | N/A          | 23EY4587MB6H11503M   | 9-9-9-24       | 1.5V        | • | • |
| AMD      | AE38G1609U1K              | 4GB             | SS | N/A          | N/A                  | 9-9-9-28       | 1.5V        | • | • |
| AMD      | AE34G1609U2-U             | 4GB             | DS | AMD          | 23EY4587MB6H11503M   | 9-9-9-24       | 1.5V        | • | • |
| ASint    | SLZ302G08-EGN1C           | 2GB             | SS | Asint        | SLZ302G08-GN1C       | 11-11-11-28-39 | 1.5V        | • | • |
| Asint    | SLA304G08-ENG1B           | 4GB             | SS | Asint        | 304G08-GN1B1301      | 11-11-11-28-39 | 1.5V        | • | • |
| Asint    | SLA302G08-EGG1C(XMP)      | 4GB             | DS | Asint        | 302G08-GG1C          | -              | 1.5V-1.6V   | • | • |
| Asint    | SLA302G08-EGJ1C(XMP)      | 4GB             | DS | Asint        | 302G08-GJ1C          | -              | 1.5V-1.6V   | • | • |
| ASint    | SLA302G08-EGN1C           | 4GB             | DS | Asint        | SLA302G08-GN1C       | 11-11-11-28-39 | 1.5V        | • | • |
| Asint    | SLB304G08-EGJ1B           | 8GB             | DS | N/A          | N/A                  | 11-11-11-28-39 | 1.5V-1.6V   | • | • |
| ASint    | SLB304G08-EGN1B           | 8GB             | DS | Asint        | SLB304G08-GN1B       | 11-11-11-28-39 | 1.5V        | • | • |
| ASint    | SLA304G08-EGN6A           | 4GB             | SS | ASINT        | 304G08-GN6A          | 11-11-11-28-39 | 1.5V        | • | • |
| ASint    | SLA304G08-EGN6B           | 4GB             | SS | ASINT        | 304G08-GN6B          | 11-11-11-28-39 | 1.5V        | • | • |
| AVEXIR   | AVD3U16000904G-4CI        | 4GB             | SS | N/A          | N/A                  |                | 1.5V        | • | • |
| AVEXIR   | AVD3U16001008G-4CI        | 8GB             | DS | N/A          | N/A                  |                | 1.5V        | • | • |
| AVEXIR   | AVD3U16001108G-1LW        | 8G              | DS | HYNIX        | H5TQ4G83MFR          |                | 1.35v       | • | • |
| AVEXIR   | AVD3U16001104G-1LW        | 4G              | SS | SEC 431 BYKO | K4B4G0846D           |                | 1.35V       | • | • |
| AVEXIR   | AVD3U16001108G-1BW        | 8G              | SS | N/A          | Heat-Sink Package    |                | 1.5V        | • | • |
| AVEXIR   | AVD3U16001104G-1BW        | 4G              | SS | N/A          | Heat-Sink Package    |                | 1.5V        | • | • |
| APOTPO   | L3A4G*2-16CBDA            | 4G              | DS | APOTPO       | CA32G08E3D-13BL      |                | 1.35V       | • | • |
| Elixir   | M2P2G64CB8HC9N-DG(XMP)    | 2GB             | DS | N/A          | N/A                  | 10-10-10-28-38 | 1.65V/1.65V | • | • |
| Elixir   | M2P2G64CB8HC9N-DG         | 2GB             | DS | N/A          | N/A                  | 10-10-10-28-38 | 1.5V-1.6V   | • | • |
| Elixir   | M2X8G64CB8HBSN-DG(XMP)    | 8GB             | DS | Elixir 1213  | N2CB4G8BOBN-DG       | 11-11-11-28-39 | 1.5V-1.65V  | • | • |
| MIRAGES  | KMD3U1600V4G(PC3-12/00U)  | 4GB             | SS | N/A          | SEC246BCKOK4B4G0846C | 11-11-11-28-39 | 1.5V        | • | • |
| PATRIOT  | PGD316G1600ELK(XMP)       | 32GB(8GBx4)     | DS | N/A          | N/A                  | 9-9-9-24       | 1.65V       | • | • |
| PATRIOT  | PV332G160C9QK             | 8GB             | DS | N/A          | N/A                  | 9-9-9-24-39    | 1.5V        | • | • |
| PANRAM   | PUD31600C118GPSB          | 8GB             | DS | DS           | N/A                  | 11-11-28-39    | 1.5V        | • | • |
| SANMAX   | SMD-4G28N1P-16KM          | 4GB             | SS | ELPIDA       | J4208BBBG-GN-F       | 11-11-28-39    | 1.50V       | • | • |
| SANMAX   | SMD-4G68HP-16KZ           | 4GB             | DS | HYNIX        | H5TQ2G83BFR PBC      | 11-11-11-28-39 | 1.5V        | • | • |

|                      |                        |     |    |                 |                 |                |       |   |   |
|----------------------|------------------------|-----|----|-----------------|-----------------|----------------|-------|---|---|
| <b>SAMSUNG</b>       | M379B5273DHO-YKO 1325  | 4GB | DS | SEC 312<br>BJKO | J4208BBBG-GN-F  | 11-11-28-39    | 1.35V | • | • |
| <b>SK HYNIX</b>      | HMT41GU6BFR8A-PB NO AA | 8GB | DS | SK HYNIX        | H5TC4GB3BFR     | 11-11-28-39    | 1.35V | • |   |
| <b>SK HYNIX</b>      | HMT451U6BFR8A-PB NO AA | 4GB | SS | SK HYNIX        | H5TC4GB3BFR     | 11-11-28-39    | 1.35V | • | • |
| <b>Silicon Power</b> | SP002GBLTU160V02(XMP)  | 2GB | SS | S-POWER         | 20YT5NG-1201    | 11-11-11-28-39 | 1.5V  | • | • |
| <b>Silicon Power</b> | SP004GBLTU160V02(XMP)  | 4GB | DS | S-POWER         | 20YT5NG-1201    | 11-11-11-28-39 | 1.50V | • |   |
| <b>Silicon Power</b> | SP004GLLTU160N01       | 4G  | SS | NANYA           | NT5CB512M8CN-DI |                | 1.35V | • | • |
| <b>Silicon Power</b> | SP008GLLTU160N01       | 8G  | DS | NANYA           | NT5CB512M8CN-DI |                | 1.35V | • |   |
| <b>Silicon Power</b> | SP004GLLTE160N01       | 4G  | SS | NANYA           | NT5CB512M8CN-DI |                | 1.35V | • | • |
| <b>Silicon Power</b> | SP008GLLTE160N01       | 8G  | DS | NANYA           | NT5CB512M8CN-DI |                | 1.35V | • |   |
| <b>Silicon Power</b> | SP004GLLTU160N02       | 4G  | SS | SP              | 3L4085HLBE      |                | 1.35V | • | • |
| <b>Silicon Power</b> | SP008GLLTU160N02       | 8G  | DS | SP              | 3L4085HLBE      |                | 1.35V | • |   |
| <b>V-COLOR</b>       | TD4G8C11-H11           | 4GB | SS | HYNIX           | H5TQ4G83MFR     | 11-11-11-28-39 | 1.5V  | • | • |
| <b>V-COLOR</b>       | TD8G8C11-H11D          | 8G  | SS | V-COLOR         | 8G8HY-16CD      |                | 1.5V  | • |   |
| <b>VENTURA</b>       | D3-55DK1145V-11        | 2GB | SS | SEC 404<br>BCKO | K4B2G0846Q      | 11-11-44-28-39 | 1.5V  | • | • |
| <b>VENTURA</b>       | D3 57DN1145V-11        | 4G  | SS | SEC 422<br>HCKO | K4B4G0846Q      |                | 1.5V  | • | • |

#### DDR3 1866 Downgrade to 1600 Qualified Vendors List (QVL)

| Vendors         | Part No.                       | Size            | SS/DS | Chip Brand      | Chip NO.          | Timing         | Voltage      | DIMM socket support (Optional) |        |
|-----------------|--------------------------------|-----------------|-------|-----------------|-------------------|----------------|--------------|--------------------------------|--------|
|                 |                                |                 |       |                 |                   |                |              | 1 DIMM                         | 2 DIMM |
| <b>CORSAIR</b>  | CMY8GX3M2A1866C9               | 4GB             | SS    | N/A             | N/A               | 9-10-9-27      | 1.50V        | •                              | •      |
| <b>CORSAIR</b>  | CMT6GX3MA1866C9(XMP)           | 6GB(3 x 2GB)    | DS    | N/A             | N/A               | 9-9-9-24       | 1.65V        | •                              | •      |
| <b>CORSAIR</b>  | CMZ8GX3M2A1866C9(XMP)          | 8GB(2 x 4GB)    | DS    | N/A             | N/A               | 9-10-9-27      | 1.50V        | •                              | •      |
| <b>CORSAIR</b>  | CMD32GX3M4A1866C9(Ver3.24)     | 8GB             | DS    | N/A             | N/A               | 9-10-9-27      | 1.50V        | •                              |        |
| <b>CORSAIR</b>  | CMY16GX3M2A1866C9(Ver3.24)     | 8GB             | DS    | N/A             | N/A               | 9-10-9-27      | 1.50V        | •                              |        |
| <b>CORSAIR</b>  | CMY32GX3M4A1866C9              | 8GB             | DS    | N/A             | N/A               | 9-10-9-27      | 1.50V        | •                              |        |
| <b>CORSAIR</b>  | CMZ16GX3M2A1866C10(Ver4.21)    | 8GB             | DS    | N/A             | N/A               | 10-11-10-30    | 1.50V        | •                              |        |
| <b>CRUCIAL</b>  | BLE4G3D1869DE1TX0.16FMD(XMP)   | 4GB             | DS    | N/A             | N/A               | 9-9-9-27       | 1.5V         | •                              | •      |
| <b>CRUCIAL</b>  | BLT4G3D1869DT1TX0.13FKD(XMP)   | 4GB             | DS    | N/A             | N/A               | 9-9-9-27       | 1.5V         | •                              | •      |
| <b>CRUCIAL</b>  | BLT4G3D1869DT2TXOB.16FMR(XMP)  | 4GB             | DS    | N/A             | N/A               | 9-9-9-27       | 1.5V         | •                              | •      |
| <b>CRUCIAL</b>  | BLS8G3D18ADS3.16FED            | 8GB             | DS    | N/A             | N/A               | 10-10-10-30    | 1.5V         | •                              |        |
| <b>CRUCIAL</b>  | BLE4G3D1869DE1TX0.16FKR        | 4GB             | DS    | N/A             | N/A               | 9-9-9-27       | 1.5V         | •                              | •      |
| <b>CRUCIAL</b>  | BLE8G3D1869DE1TX0.16FED        | 8GB             | DS    | N/A             | N/A               | 9-9-9-27       | 1.5V         | •                              |        |
| <b>CRUCIAL</b>  | BLT8G3D1869DT1TX0.16FED        | 8GB             | DS    | N/A             | N/A               | 9-9-9-27       | 1.5V         | •                              |        |
| <b>G.SKILL</b>  | F3-14900CL9Q-16GBZL(XMP1.3)    | 16GB ( 4GB x4 ) | DS    | N/A             | N/A               | 9-10-9-28      | 1.5V         | •                              | •      |
| <b>G.SKILL</b>  | F3-14900CL10Q2-64GBZLD(XMP1.3) | 64GB ( 8GBx 8 ) | DS    | N/A             | N/A               | 10-11-10-30    | 1.5V         | •                              |        |
| <b>G.SKILL</b>  | F3-14900CL9D-8GBXL(XMP)        | 8GB(2 x 4GB)    | DS    | N/A             | N/A               | 9-10-9-28      | 1.5V         | •                              | •      |
| <b>G.SKILL</b>  | F3-14900CL9Q-8GBXL(XMP)        | 8GB(2GBx4)      | DS    | N/A             | N/A               | 9-9-9-24       | 1.6V         | •                              | •      |
| <b>KINGSTON</b> | KHX1866C9D3K4/16GX(XMP)        | 16GB ( 4GB x4 ) | DS    | N/A             | N/A               | 9-9-9-24-33    | 1.65V        | •                              | •      |
| <b>KINGSTON</b> | KHX18C9T2K2/8X                 | 8GB ( 2x 4GB )  | DS    | N/A             | N/A               | 9-9-9-24-33    | 1.65         | •                              | •      |
| <b>KINGSTON</b> | KHX1866C11D3P1K2/8G            | 8GB ( 4GB x 2)  | DS    | N/A             | N/A               | -              | 1.5V         | •                              | •      |
| <b>KINGSTON</b> | KHX1866C9D3K2/8GX(XMP)         | 8GB(4GBX2)      | DS    | N/A             | N/A               | 9-9-9-24-33    | 1.65V        | •                              | •      |
| <b>KINGSTON</b> | KHX18C10T3K4/32X               | 8GB             | DS    | N/A             | N/A               | 11-11-11-28-39 | 1.5V         | •                              |        |
| <b>AMD</b>      | AP38G1869U1K(XMP)              | 4GB             | SS    | N/A             | N/A               | 9-10-9-27      | 1.5V         | •                              | •      |
| <b>AMD</b>      | AP38G1869U2K                   | 8GB(4GBX2)      | DS    | HYNIX           | H5TQ2GB3CFR       | 9-10-9-27      | 1.5V         | •                              | •      |
| <b>AMD</b>      | AP38G1869U2K                   | 8GB(4GBX2)      | DS    | N/A             | N/A               | 9-10-9-27      | 1.5V         | •                              | •      |
| <b>PATRIOT</b>  | PV138G186C9KPD000326           | 4GB             | DS    | N/A             | N/A               | 9-9-9-24-39    | 1.5V         | •                              | •      |
| <b>PANRAM</b>   | PUD31866C94G2PSB               | 4GB             | SS    | N/A             | N/A               | 9-10-9-27      | 1.65V        | •                              | •      |
| <b>PANRAM</b>   | PUD31866C98GPSB                | 8GB             | DS    | N/A             | N/A               | 9-10-9-27      | 1.65V        | •                              |        |
| <b>TEAM</b>     | TED38GM1866C13BK               | 8GB             | DS    | HYNIX           | H5TQ4G83AFY       | 13-13-13-31    | 1.5V         | •                              |        |
| <b>AVEXIR</b>   | AVD3U0904G-4CI                 | 4GB             | SS    | N/A             | N/A               | 9-9-9-28-39    | 1.65V        | •                              | •      |
| <b>AVEXIR</b>   | AVD3U0908G-4CI                 | 8GB             | DS    | N/A             | N/A               | 9-9-9-28-39    | 1.5V         | •                              |        |
| <b>AVEXIR</b>   | AVD3U18661108G-1LW             | 8G              | DS    | HYNIX           | H5TQ4G83MFR       |                | 1.35V        | •                              |        |
| <b>AVEXIR</b>   | AVD3U18661104G-1LW             | 4G              | SS    | SEC 431<br>BYKO | K4B4G0846D        |                | 1.35V        | •                              |        |
| <b>MUSHKIN</b>  | PC3-14900                      | 8GB             | DS    | N/A             | Heat-Sink Package | 9-9-9-27       | 1.5V         | •                              |        |
| <b>MUSHKIN</b>  | PC3L-14900                     | 8G              | DS    | N/A             | Heat-Sink Package | 11-11-11-27    | XMP<br>1.35V | •                              |        |
| <b>EPICGEAR</b> | YE1410-L8M280381               | 8G              | DS    | N/A             | CL1L512M088BA11Y  |                | 1.5V         | •                              |        |

#### DDR3 2000 Downgrade to 1600 Qualified Vendors List (QVL)

| Vendors        | Part No.               | Size         | SS/DS | Chip Brand | Chip NO.        | Timing         | Voltage        | DIMM socket support (Optional) |        |
|----------------|------------------------|--------------|-------|------------|-----------------|----------------|----------------|--------------------------------|--------|
|                |                        |              |       |            |                 |                |                | 1 DIMM                         | 2 DIMM |
| <b>CORSAIR</b> | CMZ4GX3M2A2000C10(XMP) | 4GB(2 x 2GB) | SS    | N/A        | N/A             | 10-10-10-27    | 1.50V          | •                              | •      |
| <b>CORSAIR</b> | CMT6GX3M3A2000C8(XMP)  | 6GB(3 x 2GB) | DS    | N/A        | N/A             | 8-8-8-24       | 1.65V          | •                              | •      |
| <b>GEIL</b>    | GUP34GB2000C9DC(XMP)   | 4GB(2 x 2GB) | DS    | N/A        | N/A             | 9-9-9-28       | 1.65V          | •                              | •      |
| <b>Asint</b>   | SLA302G08-ML2HB(XMP)   | 4GB          | DS    | HYNIX      | H5TQ2G83BFR H9C | 9-9-9-24-33    | 1.5V-<br>1.65V | •                              |        |
| <b>AVEXIR</b>  | AVD3U20000904G-4CI     | 4GB          | SS    | N/A        | N/A             | 11-11-11-28-39 | 1.65V          | •                              | •      |
| <b>AVEXIR</b>  | AVD3U20000908G-4CI     | 8GB          | DS    | N/A        | N/A             | 11-11-11-28-39 | 1.65V          | •                              |        |

#### DDR3 2133 Downgrade to 1600 Qualified Vendors List (QVL)

| Vendors  | Part No.                    | Size            | SS/DS | Chip Brand       | Chip NO.    | Timing         | Voltage | DIMM socket support (Optional) |        |
|----------|-----------------------------|-----------------|-------|------------------|-------------|----------------|---------|--------------------------------|--------|
|          |                             |                 |       |                  |             |                |         | 1 DIMM                         | 2 DIMM |
| CORSAIR  | CMZ8GX3M2A2133C11(Ver4.21)  | 4GB             | SS    | N/A              | N/A         | 11-11-11-27    | 1.50V   | •                              | •      |
| CORSAIR  | CMY8GX3M2A2133C11R          | 8GB(4 x 2GB)    | SS    | N/A              | N/A         | 11-11-11-27    | 1.50V   | •                              | •      |
| CORSAIR  | CMT16GX3M4X2133C9(XMP 1.3)  | 16GB ( 4GB x4 ) | DS    | N/A              | N/A         | 9-11-10-27     | 1.50V   | •                              | •      |
| CORSAIR  | CMT4GX3M2A2133C9(XMP)       | 4GB(2x 2GB)     | DS    | N/A              | N/A         | 9-10-9-24      | 1.65V   | •                              | •      |
| CORSAIR  | CMT4GX3M2B2133C9(XMP)       | 4GB(2x 2GB)     | DS    | N/A              | N/A         | 9-10-9-27      | 1.50V   | •                              | •      |
| CORSAIR  | CMD8GX3M2B2133C9(Ver5.12)   | 4GB             | DS    | N/A              | N/A         | 9-11-11-31     | 1.65V   | •                              | •      |
| CORSAIR  | CMT8GX3M2B2133C9(XMP)       | 8GB ( 4GB x 2)  | DS    | N/A              | N/A         | 9-11-9-27      | 1.50V   | •                              | •      |
| CORSAIR  | CMD16GX3M2A2133C9(Ver4.21)  | 8GB             | DS    | N/A              | N/A         | 9-11-11-31     | 1.65V   | •                              | •      |
| CORSAIR  | CMD32GX3M4A2133C9(Ver4.21)  | 8GB             | DS    | N/A              | N/A         | 9-11-11-31     | 1.65V   | •                              | •      |
| G.SKILL  | F3-17000CL9Q-16GBZH(XMP1.3) | 16GB ( 4GB x4 ) | DS    | N/A              | N/A         | 9-11-10-28     | 1.65V   | •                              | •      |
| G.SKILL  | F3-2133C11Q-32GZL(XMP)      | 8GB             | DS    | N/A              | N/A         | 11-11-11-31    | 1.5V    | •                              | •      |
| G.SKILL  | F3-2133C10D-16GAB           | 8GB             | DS    | N/A              | N/A         | 10-12-12-31    | 1.6V    | •                              | •      |
| GEIL     | GE34GB2133C9DC(XMP)         | 2GB             | DS    | N/A              | N/A         | 9-9-9-28       | 1.65V   | •                              | •      |
| KINGSTON | KHX21C11T2K2/8X             | 8GB ( 2x 4GB )  | SS    | N/A              | N/A         | 11-11-11-28-39 | 1.6V    | •                              | •      |
| KINGSTON | KHX2133C11D3K4/16GX(XMP)    | 16GB ( 4GB x4 ) | DS    | N/A              | N/A         | 9-9-9-24-33    | 1.65V   | •                              | •      |
| KINGSTON | KHX2133C11D3T1K2/16GX(XMP)  | 16GB(8GB x 2)   | DS    | N/A              | N/A         | 9-9-9-24-33    | 1.6V    | •                              | •      |
| KINGSTON | KHX21C11T1BK2/16X(XMP)      | 16GB(8GBx2)     | DS    | N/A              | N/A         | 9-9-9-24-33    | 1.6V    | •                              | •      |
| KINGSTON | KHX2133C9AD3X2K2/4GX(XMP)   | 4GB(2 x 2GB)    | DS    | N/A              | N/A         | 9-11-9-27      | 1.65V   | •                              | •      |
| KINGSTON | KHX2133C9AD3T1K4/8GX(XMP)   | 8GB(4 x 2GB)    | DS    | N/A              | N/A         | 9-11-9-27      | 1.65V   | •                              | •      |
| KINGSTON | KHX21C11T1BK2/8X(XMP)       | 8GB(4GBx2)      | DS    | N/A              | N/A         | 9-9-9-24-33    | 1.6V    | •                              | •      |
| KINGSTON | KHX2133C9AD3T1FK4/8GX(XMP)  | 8GB(4x 2GB)     | DS    | N/A              | N/A         | 9-9-9-24-33    | 1.65V   | •                              | •      |
| KINGSTON | KHX21C11T3K4/32X            | 8GB             | DS    | N/A              | N/A         | 9-9-9-24-33    | 1.65V   | •                              | •      |
| ADATA    | AX3U2133W4G10-DR            | 8GB ( 2x 4GB )  | SS    | N/A              | N/A         | 10-11-11-30    | 1.65V   | •                              | •      |
| ADATA    | AX3U2133W8G10-DR            | 16GB ( 2x 8GB ) | DS    | N/A              | N/A         | 10-11-11-30    | 1.65V   | •                              | •      |
| AMD      | AG316G2130U1S               | 4GB             | SS    | N/A              | N/A         | 10-11-11-30    | 1.65V   | •                              | •      |
| AMD      | AG34G2130UI                 | 4GB             | SS    | N/A              | N/A         | 10-11-11-30    | 1.65V   | •                              | •      |
| AMD      | AP38G2133U2K                | 4GB             | DS    | N/A              | N/A         | 11-12-11-30    | 1.65V   | •                              | •      |
| AVEXIR   | AVD3U21330908G-4BZ1         | 8GB             | DS    | N/A              | N/A         |                | 1.65V   | •                              | •      |
| AVEXIR   | AVD3U21330908G-4BZ1         | 4GB             | SS    | N/A              | N/A         |                | 1.65V   | •                              | •      |
| AVEXIR   | AVD3U21331104G-4CI          | 4GB             | SS    | N/A              | N/A         |                | 1.5V    | •                              | •      |
| AVEXIR   | AVD3U21331108G-4CI          | 8GB             | DS    | N/A              | N/A         |                | 1.5V    | •                              | •      |
| AVEXIR   | AVD3U21331308G-1LW          | 8G              | DS    | HYNIX            | H5TC4G83MFR |                | 1.35V   | •                              | •      |
| AVEXIR   | AVD3U21331304G-1LW          | 4G              | SS    | SEC 431<br>BYKKO | K4B4G0846D  |                | 1.35V   | •                              | •      |
| PATRIOT  | PGD38G2133C11K(XMP)         | 16GB ( 4GB x4 ) | DS    | N/A              | N/A         | 11-11-11-30    | 1.65V   | •                              | •      |

#### DDR3 2200 Downgrade to 1600 Qualified Vendors List (QVL)

| Vendors | Part No.              | Size | SS/DS | Chip Brand | Chip NO. | Timing    | Voltage | DIMM socket support (Optional) |        |
|---------|-----------------------|------|-------|------------|----------|-----------|---------|--------------------------------|--------|
|         |                       |      |       |            |          |           |         | 1 DIMM                         | 2 DIMM |
| GEIL    | GET34GB2200C9DC(XMP)  | 2GB  | DS    | N/A        | N/A      | 9-10-9-28 | 1.65V   | •                              | •      |
| GEIL    | GET38GB2200C9ADC(XMP) | 4GB  | DS    | N/A        | N/A      | 9-11-9-28 | 1.65V   | •                              | •      |

#### DDR3 2400 Downgrade to 1600 Qualified Vendors List (QVL)

| Vendors  | Part No.                     | Size            | SS/DS | Chip Brand | Chip NO. | Timing      | Voltage | DIMM socket support (Optional) |        |
|----------|------------------------------|-----------------|-------|------------|----------|-------------|---------|--------------------------------|--------|
|          |                              |                 |       |            |          |             |         | 1 DIMM                         | 2 DIMM |
| CORSAIR  | CMGTX8(XMP)                  | 8GB (2GBx 4)    | SS    | N/A        | N/A      | 10-12-10-27 | 1.65V   | •                              | •      |
| CORSAIR  | CMD16GX3M2A2400C9(Ver4.21)   | 8GB             | DS    | N/A        | N/A      | 10-12-12-31 | 1.65V   | •                              | •      |
| CORSAIR  | CMD32GX3M4A2400C10(Ver5.29)  | 8GB             | DS    | N/A        | N/A      | 10-12-12-31 | 1.65V   | •                              | •      |
| CORSAIR  | CMY16GX3M2A2400C10R(Ver4.21) | 8GB             | DS    | N/A        | N/A      | 10-12-12-31 | 1.65V   | •                              | •      |
| G.SKILL  | F3-2400C10D-8GTX(XMP)        | 8GB(2x 4GB)     | SS    | N/A        | N/A      | 10-12-12-31 | 1.65V   | •                              | •      |
| G.SKILL  | F3-19200CL11Q-16GBZH(XMP1.3) | 16GB ( 4GB x4 ) | DS    | N/A        | N/A      | 11-11-11-31 | 1.65V   | •                              | •      |
| G.SKILL  | F3-19200CL9D-4GBPIS(XMP)     | 4GB(2x 2GB)     | DS    | N/A        | N/A      | 9-11-9-28   | 1.65V   | •                              | •      |
| G.SKILL  | F3-19200CL 10Q-32GBZH(XMP)   | 8GB             | DS    | N/A        | N/A      | 10-12-12-31 | 1.65V   | •                              | •      |
| G.SKILL  | F3-2400C11D-8GRS             | 4GB             | DS    | N/A        | N/A      | 11-11-13-31 | 1.65V   | •                              | •      |
| GEIL     | GET34GB2400C9DC(XMP)         | 2GB             | DS    | N/A        | N/A      | 9-11-9-27   | 1.65V   | •                              | •      |
| KINGMAX  | FLLE88F-C8KAA HAI5(XMP)      | 2GB             | SS    | N/A        | N/A      | 10-11-10-30 | 1.8V    | •                              | •      |
| KINGSTON | KHX2400C11D3K4/8GX(XMP)      | 8GB(4GBx2)      | SS    | N/A        | N/A      | 9-9-9-24-33 | 1.65V   | •                              | •      |
| KINGSTON | KHX24C11T2K2/8X(XMP)         | 4GB             | DS    | N/A        | N/A      | 9-9-9-24-33 | 1.65V   | •                              | •      |
| ADATA    | AX3U2400W4G11-DMV            | 8GB ( 2x 4GB )  | SS    | N/A        | N/A      | 11-13-13-35 | 1.65V   | •                              | •      |
| ADATA    | AX3U2400W8G11-DMV            | 16GB ( 2x 8GB ) | DS    | N/A        | N/A      | 11-13-13-35 | 1.65V   | •                              | •      |
| AMD      | AG34G2401G1S                 | 4GB             | SS    | N/A        | N/A      | 11-12-12-31 | 1.65V   | •                              | •      |
| AVEXIR   | AVD3U24001008G-4BZ1          | 8GB             | DS    | N/A        | N/A      |             | 1.65V   | •                              | •      |
| AVEXIR   | AVD3U24001004G-4BZ1          | 4GB             | SS    | N/A        | N/A      |             | 1.65V   | •                              | •      |
| AVEXIR   | AVD3U24001104G-4CI           | 4GB             | SS    | N/A        | N/A      |             | 1.65V   | •                              | •      |
| AVEXIR   | AVD3U24001108G-4CI           | 8GB             | DS    | N/A        | N/A      |             | 1.65V   | •                              | •      |
| PATRIOT  | PVV34G2400C9K(XMP)           | 4GB(2x 2GB)     | DS    | N/A        | N/A      | 9-11-9-27   | 1.65V   | •                              | •      |
| PANRAM   | PUD32400C118G2LSK            | 8GB             | DS    | N/A        | N/A      | 11-13-13-35 | 1.65V   | •                              | •      |
| TEAM     | TLD38G2400HC11CBK            | 8GB             | DS    | -          | -        | 11-13-13-35 | 1.65V   | •                              | •      |

#### DDR3 2600 Downgrade to 1600 Qualified Vendors List (QVL)

| Vendors | Part No.                  | Size            | SS/DS | Chip Brand | Chip NO. | Timing      | Voltage | DIMM socket support (Optional) |        |
|---------|---------------------------|-----------------|-------|------------|----------|-------------|---------|--------------------------------|--------|
|         |                           |                 |       |            |          |             |         | 1 DIMM                         | 2 DIMM |
| G.SKILL | F3-2600CL10Q-16GBZMD(XMP) | 16GB(4x 4GB)    | DS    | N/A        | N/A      | 10-12-12-31 | 1.65V   | •                              | •      |
| G.SKILL | F3-2600CL11Q-32GBZHD(XMP) | 32GB(8GBx4)     | DS    | N/A        | N/A      | 11-13-13-35 | 1.65V   | •                              | •      |
| ADATA   | AX3U2600GW8G11            | 16GB ( 2x 8GB ) | DS    | N/A        | N/A      | 11-13-13-35 | 1.65V   | •                              | •      |

| DDR3 2666 Downgrade to 1600 Qualified Vendors List (QVL) |  |             |       |            |          |             |         |                                |        |
|--|--|-------------|-------|------------|----------|-------------|---------|--------------------------------|--------|
| Vendors  | Part No.                                       | Size        | SS/DS | Chip Brand | Chip NO. | Timing      | Voltage | DIMM socket support (Optional) |        |
|  |  |             |       |            |          |             |         | 1 DIMM                         | 2 DIMM |
| CORSAIR  | CMD16GX3M4A2666C10<br><small>(Ver4.13)</small> | 4GB         | DS    | N/A        | N/A      | 10-12-12-31 | 1.65V   | •                              | •      |
| CORSAIR  | CMD16GX3M4A2666C11 (XMP)                       | 4GB         | DS    | N/A        | N/A      | 11-13-13-35 | 1.65V   | •                              | •      |
| G.SKILL  | F3-2666C11Q-16GTXD(XMP)                        | 16GB(4GBx4) | DS    | N/A        | N/A      | 11-13-13-35 | 1.65V   | •                              | •      |
| AVEXIR   | AVD3U26661204G-4C1                             | 4GB         | SS    | N/A        | N/A      |             | 1.65V   | •                              | •      |
| AVEXIR   | AVD3U26661208G-4C1                             | 8GB         | DS    | N/A        | N/A      |             | 1.65V   | •                              | •      |
| AVEXIR   | AVD3U26661104G-4BZ1                            | 4GB         | SS    | N/A        | N/A      |             | 1.65V   | •                              | •      |
| AVEXIR   | AVD3U26661108G-4BZ1                            | 8GB         | DS    | N/A        | N/A      |             | 1.65V   | •                              | •      |

| DDR3 2800 Downgrade to 1600 Qualified Vendors List (QVL) |                          |             |       |            |          |                |         |                                |        |
|--|--------------------------|-------------|-------|------------|----------|----------------|---------|--------------------------------|--------|
| Vendors  | Part No.                 | Size        | SS/DS | Chip Brand | Chip NO. | Timing         | Voltage | DIMM socket support (Optional) |        |
|  |                          |             |       |            |          |                |         | 1 DIMM                         | 2 DIMM |
| CORSAIR  | CMD16GX3M4A2800C12 (XMP) | 4GB         | DS    | N/A        | N/A      | 12-14-14-36    | 1.65V   | •                              | •      |
| G.SKILL  | F3-2800C11Q-16GTXD(XMP)  | 16GB(4GBx4) | DS    | N/A        | N/A      | 11-13-13-35    | 1.65V   | •                              | •      |
| G.SKILL  | F3-2800C12Q-32GGTXDG     | 8GB         | DS    | N/A        | N/A      | 12-14-14-35    | 1.65V   | •                              | •      |
| ADATA  | AX3U2800W4G12-DGV        | 4GB         | SS    | N/A        | N/A      | 12-12-14-36    | 1.65V   | •                              | •      |
| ADATA  | AX3U2800W8G12-DGV        | 8GB         | DS    | N/A        | N/A      | 12-12-14-36    | 1.65V   | •                              | •      |
| AVEXIR   | AVD3UH28001204G-4BZ1     | 4GB         | SS    | N/A        | N/A      | 11-11-11-28-39 | 1.65V   | •                              | •      |
| AVEXIR   | AVD3UH28001208G-4BZ1     | 8GB         | DS    | N/A        | N/A      |                | 1.65V   | •                              | •      |

| DDR3 2933 Downgrade to 1600 Qualified Vendors List (QVL) |                      |      |       |            |          |             |         |                                |        |
|--|----------------------|------|-------|------------|----------|-------------|---------|--------------------------------|--------|
| Vendors  | Part No.             | Size | SS/DS | Chip Brand | Chip NO. | Timing      | Voltage | DIMM socket support (Optional) |        |
|  |                      |      |       |            |          |             |         | 1 DIMM                         | 2 DIMM |
| G.SKILL  | F3-2933C12Q-16GTXDG  | 4GB  | SS    | N/A        | N/A      | 12-14-14-35 | 1.65V   | •                              | •      |
| AVEXIR   | AVD3UH29331204G-4BZ1 | 4GB  | SS    | N/A        | N/A      | 9-9-9-28-39 | 1.65V   | •                              | •      |
| AVEXIR   | AVD3UH29331208G-4BZ1 | 8GB  | DS    | N/A        | N/A      | 9-9-9-28-39 | 1.65V   | •                              | •      |

| DDR3 3000 Downgrade to 1600 Qualified Vendors List (QVL) |                      |      |       |            |          |             |         |                                |        |
|--|----------------------|------|-------|------------|----------|-------------|---------|--------------------------------|--------|
| Vendors  | Part No.             | Size | SS/DS | Chip Brand | Chip NO. | Timing      | Voltage | DIMM socket support (Optional) |        |
|  |                      |      |       |            |          |             |         | 1 DIMM                         | 2 DIMM |
| G.SKILL  | F3-3000C12Q-16GTXDG  | 4GB  | SS    | N/A        | N/A      | 12-14-14-35 | 1.65V   | •                              | •      |
| AVEXIR   | AVD3UH31001204G-4BZ1 | 4GB  | SS    | N/A        | N/A      | 12-14-14-35 | 1.65V   | •                              | •      |

| DDR3 3100 Downgrade to 1600 Qualified Vendors List (QVL) |                      |      |       |            |          |             |         |                                |        |
|--|----------------------|------|-------|------------|----------|-------------|---------|--------------------------------|--------|
| Vendors  | Part No.             | Size | SS/DS | Chip Brand | Chip NO. | Timing      | Voltage | DIMM socket support (Optional) |        |
|  |                      |      |       |            |          |             |         | 1 DIMM                         | 2 DIMM |
| AVEXIR   | AVD3UH31001204G-2C1R | 4GB  | SS    | N/A        | N/A      | 11-11-28-39 | 1.65V   | •                              | •      |
| AVEXIR   | AVD3UH31001204G-4BZ1 | 4GB  | SS    | N/A        | N/A      | 11-11-28-39 | 1.65V   | •                              | •      |
| ADATA  | AX3U3100W4G12-DGV    | 4GB  | SS    | N/A        | N/A      | 12-14-14-36 | 1.65V   | •                              | •      |
| ADATA  | AX3U3100W4G12-DMV    | 4GB  | SS    | N/A        | N/A      | 12-14-14-36 | 1.65V   | •                              | •      |

2 DIMM Slots

- **1 DIMM**: Supports one module inserted in any slot as Single-channel memory configuration
  - **2 DIMM**: Supports 2 modules inserted into both the blue or black slots as two pairs of Dual-channel memory configuration
- When installing total memory of 4GB capacity or more, Windows 32-bit operation system may only recognize less than 3GB. Hence, a total installed memory of less than 3GB is recommended.
- It is recommended to install the memory modules from the slots for better overclocking capability.
- The default DIMM frequency depends on its Serial Presence Detect (SPD), which is the standard way of accessing information from a memory module. Under the default state, some memory modules for overclocking may operate at a lower frequency than the vendor-marked value.