Garkavenko Ivan [BD\_212] 30/11/2022

Technology and voltage of different gens of RAM.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DDR  Generation | Technology | JEDEC reference  voltage | Max V | Dev/Release year |
| **DDR** | 130 - 90 nm | 2.50 - 2.85V | 3.3V **\*** | 1990 / 1998 |
| **DDR2** | 90 nm | 1.80V | Up to 2.30V **\*** | 2001 produced by Samsung  **2003** gets JEDEC award |
| **DDR3** | 90 -> 65 -> 50 ->  -> 40 nm | 1.5V  ( “golden” voltage is 1.575V ) | Up to 1.80V**\*\*** | 2005 / 2007 |
| **DDR3L** | 50 -> 40 nm | 1.25V | 1.35V | xxxx / 2010 |
| **DDR3U** | 50 -> 40 nm | 1.20V | 1.35V | xxxx / 2011 |
| **DDR4** | 39->30 nm @ 2011  20 nm @ 2012  19->16 nm @ 2016 | 1.20V | 1.35V | 2005-2012 / 2014 |
| **DDR5** | 14 nm | 1.10V | 1.35V  1.50V [OC] | 2018 / 2020 |
| **DDR6** | <3 nm [1 nm]**\*\*\*** | NYA | NYA | 2024 - 2025**\*\*\*** |
| **DDR7** | <3 [1 nm]**\*\*\*** | NYA | NYA | TBA |

NYA – not yet available.

TBA – to be announced.

**\* Based on JEDEC research.**

**\*\*Quote: “***JEDEC states that memory modules must withstand up to 1.80 volts before incurring permanent damage, although they are not required to function correctly at that level***.”**

**\*\*\*According to Samsung representatives.**