# Mariko Overclock Guide

*Made with love by Dominatorul, ChanseyIsTheBest and Souldbminer.*

> **Unstable RAM overclocking can cause NAND and SD card corruption, particularly if done on sysNAND. Test your overclock settings on emuNAND.**

> **Unsafe voltages**
>
> **DO NOT** enable unsafe voltages to prevent hardware degradation, as many of them can damage your console even with only short periods of usage

# CPU overclock settings

To avoid overloading the power delivery system of the switch, CPU Overclocking is dependent on the CPU Speedo. The CPU UV option can help with this, as it delivers slightly less voltage to the CPU which reduces heat output and current draw. Try to set the values as high as possible.

## Without undervolt

Power limit reached at 2295mhz on most systems (1963 on Lite)

## With high undervolt

Power limit is reached at 2397mhz on lower speedo systems, and 2601mhz on a speedo above 1650. (2091 on Lite)

> **WARNING**
>
> Anything above 2397mhz is not reccomended outside of Boost Mode (which is used to speed up loading times).

# GPU overclock settings

The GPU is highly sensitive to undervolting, and RAM clocks are highly dependant on it's voltage, so it is highly reccomended to not use a static table

## GPU Scheduling

GPU Scheduling limits GPU utilization to conserve power. It can be disabled by pressing RIGHT in the EOS menu, going to the system settings and turning it off

## 1305mhz GPU

1305mhz GPU is only recommended with a large undervolt and GPU Scheduling. 1305MHZ can be used without GPU scheduling safely, but it requires a very high speedo.

## Without undervolting

Power limit reached at 1152mhz

## With undervolting

Power limit reached at 1267mhz (UV1 or UV2, with <15mv Volt offset), with aggressive undervolt, and 1305 with a insane undervolt (UV2, >25-40mv Volt Offset) and high speedo

# RAM Overclock settings

> **MAKE SURE TO HAVE A NAND BACKUP BEFORE ATTEMPTING RAM OVERCLOCKING**

Nintendo ships many different RAM chips along with switches. Naturally, some are better than others, and can be overclocked further. The tiers of ram are shown in this table. Then, follow the overclock settings in the table. Try to aim for ST timings and HP mode, both of which significantly improve performance.

## RAM Tiers (Higher is better)

| Tier | RAM ID |
| --- | --- |

| Tier | RAM ID |
|---|---|
| GOD-tier | NEI/NEE, WT:B |
| S-tier | AA-MGCR, AA-MGCL |
| A-tier | WT:F |
| B-tier | AM-MGCJ, WT:E |
| C-tier | AB-MGCL |
| D-tier | NME |

**Note: Nintendo has now started to ship worse RAM with new consoles as part of end-of-life cost cutting. Upgrading the RAM is possible, but very difficult.**

# RAM overclock settings

| Tier | RAM ID | Ram Clock | VDD2 | VDDQ | Timings (Common) | Timings (Super Tight) |
|---|---|---|---|---|---|---|
| GOD | NEI/NEE | 2500-2933 | 1175mv | 640mv | (3-3-2) 2-5-5-4-6 | (4-4-4) 3-7-6-5-6 |
| GOD | WT:B | 2466-2600 | 1175mv | 600mv | (4-4-5) 5-2-6-5-6 | (6-6-7) 7-2-6-5-6 |
| S | AA-MGCL/MGCR | 2300-2600 | 1175mv | 640mv | (4-4-5) 5-5-6-7-6 | (4-4-8) 6-5-7-8-6 |
| A | WT:F | 2400-2533 | 1175mv | 600mv | (4-4-2) 5-4-6-3-6 | (5-5-4) 5-5-6-5-6 |
| B | AM-MGCJ | 2300-2466 | 1175mv | 640mv | (3-2-4) 2-4-4-4-6 | ((4-3-8) 2-5-4-4-6 |
| B | WT:E | 2300-2466 | 1175mv | 600mv | (2-2-2) 2-4-4-4-6 | (3-5-3) 3-5-4-5-6 |
| C | AB-MGCL | 2133-2500 | 1175mv | 640mv | (4-4-4) 4-4-5-6-6 | (4-4-8) 5-5-6-8-6 |
| D | NME | 2133-2333 | 1175mv | 640mv | (2-2-1) 0-1-4-3-6 | (3-3-4) 0-1-4-4-6 |

**Note: Lower T5 or T6 in case you have issues.**

**WARNING**

Going above 1175mv for the RAM VDD2 will cause hardware damage, as that is the highest which the chips are rated for.

**Micron WT:B vs NEI**

Micron WT:B RAM is placed in god tier due to the high timings, which significantly increases performance.

# Testing Stability

Follow this guide:
https://rentry.co/howtoteststability

# 100% Safe clocks

**Information**

These clocks are safe in both handheld and docked mode

- **CPU:** 1963MHz (Tegra X1+ official max)
- **GPU:** 998MHz
- **RAM:** 1996MHz (No increase in voltages, no RAM courupption)

## Mariko Max Safe on Battery [V2, OLED]

*Switch units available from August 2019 and beyond, includes OLED & requires modchip*

- **CPU:** 1963MHz
- **GPU:** 998MHz
- **RAM:** 2133MHz-2500MHz+ (whatever is stable and within 1175mv VDD2)

⚠ **Note: Drawing over 8W on battery will cause battery issues. Please avoid doing that for extended periods!**

## Switch Lite Max Safe Clocks on Battery

- **CPU:** 1785MHz
- **GPU:** 921MHz
- **RAM:** 2133MHz-2500MHz+ (whatever is stable and within 1175mv VDD2)

⚠ **Note: Drawing over 6.5W on battery will cause battery issues. Please avoid doing that for extended periods!**

ℹ **Switch Lite limits are lower due to the 12W board power limit, but counts as Mariko for all other purposes.**

## Mariko Max Clocks Docked and Plugged [V2, OLED]

- **CPU:** 2295MHz on CPU speedo < 1650, 2601MHz on CPU speedo ≥ 1650 with undervolt
- **GPU:** 1152MHz (1228MHz and above on GPU speedo ≥ 1650 with undervolt, otherwise lower)
- **RAM:** 2133MHz-2500MHz+ (whatever is stable and within 1175mv VDD2)

## Switch Lite Max Clocks Plugged

- **CPU:** 1963MHz (2295MHz on CPU speedo < 1650, 2397 on CPU speedo ≥ 1650 with undervolt)
- **GPU:** 998MHz (1228MHz on GPU speedo ≥ 1650 with undervolt, otherwise lower)
- **RAM:** 2133MHz-2500MHz+ (whatever is stable and within 1175mv VDD2)

ℹ **Switch Lite limits are lower due to the 12W board power limit, but counts as Mariko for all other purposes.**