ODROID-H2 RAM Compatibility List

We're testing in order to know which RAM modules work well on our ODROID-H2.

We have been checked 2 factors for that.
One is that whether it recognized or not and the other is that how transcoding performance with VAAPI H/W acceleration is fast.

Transcoding Performance with VAAPI H/W Acceleration

Manufacturer, GB	Channel Type	Transcoding Rate (4K HEVC 10Bits to 720p H264)
Original Play Speed		1.00
Samsung 4 + 8	Single	3.07
Samsung 4 + 16	Single	3.08
Samsung 8 + 16	Single	3.21
KLEVV 4 + Samsung 4	Dual	3.51
Samsung 4	Single	2.72
KLEVV 4	Single	3.12
Samsung 4 + 4	Dual	3.52
KLEVV 4 + 4	Dual	3.67
Samsung 8 + 8	Dual	3.62
Samsung 16 + 16	Dual	3.68

The results give us a few noticeable big factors.

Transcoding rate means encoding speed. If the rate is 3.00, it encodes the video 3 times faster than the original play speed 1.
So, if the rate is 0.90, it will cause buffering when playing to prepare encoded screens.

Dual Channel Is Faster Than Single Channel

It was around 15% faster when we configured dual channel memory than single channel.
Even if you have 24 GB memory configured with a 8GB RAM and 16 GB RAM, it is about 10 percent slower than dual 4GB RAMs.
So if you want to have faster VAAPI machine, you should install with 2 memories of the same capacity for the sake of dual channel.

And as you can see, VAAPI is getting faster with more RAM capacity.
Dual 16GB is about 5 percent faster than Dual 4GB on transcoding. This could too little but it still a factor.

But the other benchmarks that have nothing to do with GPU/VAAPI, there would not be noticeable performance improvements of dual channel.
For example, Wii emulation performance on dual channel configuration didn't show any noticeable performance difference against single channel.

Confirmed RAM Modules

Manufacturer (Brand)	Capacity (GB)	Module Grade	Part No.	Informed Data rate (MT/s)	Recognized Data rate (MT/s)	Informed Timings	Comment
Samsung	2G	PC4-19200	M471A5644EB0-CRC	2400	2400	17-17-17-39	
Samsung	4G	PC4-19200	M471A5244CB0-CRC	2400	2400	17-17-17-39	
Samsung	8G	PC4-19200	M471A1K43CB1-CRC	2400	2400	17-17-17-39	
Samsung	8Gx2	PC4-21300	M47A1K43CB1-CTD	2666	2400	19-19-19-43	Confirmed by @mansuiki
Samsung	16G	PC4-19200	M471A2K43CB1-CRC	2400	2400	17-17-17-39	
Essencore (KLEVV)	4G	PC4-19200	IM44GS48N24-FFFHA0	2400	2400	15-15-15-35	
SK Hynix	4G	PC4-21333	HMA851S6CJR6N-VK	2666	2400	19-19-19-43	
G.Skill RIPJAWS	4Gx2	PC4-19200	F4-2400C16D-8GRS	2400	2400	16-16-16-39	Confirmed by @Blue_TM
G.Skill RIPJAWS	8Gx2	PC4-19200	F4-2400C16D-16GRS	2400	2400	16-16-16-39	Confirmed by @venkatbo
G.Skill RIPJAWS	16Gx2	PC4-19200	F4-2400C16D-32GRS	2400	2400	16-16-16-39	Confirmed by @aw_
Crucial	4Gx2 and 4Gx1	PC4-19200	CT4G4SFS824A	2400	2400	17-17-17-??	Confirmed by @Francisco & @RomaT
Crucial	8Gx1	PC4-19200	CT8G4SFD824A	2400	2400	17-17-17-??	Confirmed by @n2qcn
Crucial	16Gx2 and 16Gx1	PC4-19200	CT2K16G4SFD824A	2400	2400	17-17-17-??	Confirmed by @WoHo
Crucial	16Gx1	PC4-19200	CT16G4SFD824A	2400	2400	17-17-17-??	Confirmed by @SuperMMX
Crucial	16Gx2	PC4-19200	BLS16G4S240FSD	2400	2400	16-16-16-??	Confirmed by @spitefulmonkey
Corsair	8Gx2	PC4-19200	CMSX16GX4M2A2400C16	2400	2400	16-16-16-39	Confirmed by @venkatbo
Corsair	8G	PC4-17000	CMSO8GX4M1A2133C15	2133	2133	15-15-15-36	Confirmed by @brad
Kingston	8Gx2	PC4-19200	KVR24S17S8/8	2400	2400	17-17-17-32	Confirmed by @SirDigi
Kingston (HyperX)	4G	PC4-17000	HX421S13IB/4	2133	2133	13-13-13-33	Works after updating BIOS to 1.03
Kingston (HyperX)	4G	PC4-19200	HX424S14IB/4	2400	2400	14-14-14-46	Works after updating BIOS to 1.03
Kingston (HyperX)	4Gx2	PC4-19200	HX424S14IBK2/8	2400	2400	14-14-14-46	Works after updating BIOS to 1.03 Confirmed by @Trupik
Kingston (HyperX)	16Gx2	PC4-19200	HX424S14IBK2/32	2400	2400	14-14-14-35	Confirmed by @RomaT
Kingston (HyperX)	8Gx2	PC4-19200	HX424S14IB2K2/16	2400	2400	14-14-14-35	Confirmed by @haha
TEAMGROUP Elite	16Gx2	PC4-21300	TED432G2666C19DC-S01	2666	2400	19-19-19-43	Confirmed by @fromport
KingSpec	16G	PC4-19200	2018 NEW KingSpec	2400	2400	17-17-17-?	Confirmed by @Moricio78
Zeppelin	8G	PC4-19200	ZE-SD4-8G2400	2400	2400	17-17-17-?	Confirmed by @tmihai20

We have noticed that high-speed RAM above DDR4-2400 is not recognized as it intended.
This because Gemini Lake SoC only supports DDR4-1600, DDR4-1866, DDR4-2133, DDR4-2400 SDRAM.
So it isn't needed to purchase/install higher than DDR4-2400.

Incompatible RAM Modules

* One forum user@DaleChatham reported **Veteke Performance RAM 8GB DDR4 2400MHZ PC4-19200 CL17 260-PIN SODIMM** is not compatible with H2 even with BIOS v1.03.
* HyperX HX426S15IB2K2/16 Impact DDR4 16GB. If you install two modules, it doesn't boot. Single module seems to work fine though. Reported by @Jowi
* Corsair CMSX16GX4M2A2666C18 DDR$ 16GB. It doesn't boot even with a single channel configuration. Reported by @teraflop

Faster than CL15 RAM didn't work stably until updating the BIOS to 1.03 or higher.
You have to update the BIOS first to override the speed.
Note that the recent production batch Rev-B has BIOS 1.05 and you don't need to update it.

SO-DIMM socket Durability (mating cycles)

According to the socket datasheet, the number of mating cycles is 25 only.
It seems to be a JEDEC standard. So do not install/uninstall your memory cards frequently.