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AMD AM3+ FX

BIOS Remarks

Best tradeoff (speed, low power)

HPC Mode Must be ON! If not CPU cannot reach full speed under load (bad multicore performance)

APM Must be ON! If not Turbo Boost won't work (bad singlecore performance)

Best multicore (high power)

APM OFF

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Overclocking

If it's in TDP limit everything is fine, but when you raise voltage you must turn off APM which guard TDP. My advice → don't raise voltage. If APM is not disabled, CPU is throttling to stand in TDP. If disabled, power consumption reach high levels constantly.

Sample Table

Assume 3.5 GHz as base frequency

HPC	APM	Remark
ON	ON	System running on 3.5 GHz, sometimes drops to 1.4 GHz (TDP)
OFF	ON	System running on 3.5 GHz, often drops to 2.9 GHz (TDP)
?	OFF	System cannot use Turbo Core, running at 3.5 GHz with very high power usage

C6, Cool n Quiet - always enabled there's no reason to turn it off

HPC Mode lock CPU in three states Turbo-boost, Normal, Low-power.

Microcode Update AM3+

Microcode update is hard and is located in → **AmdProcessorInitPeim** ← UEFI block

Can be edited directly via Hexa editor (pasting new code over approx 3kB size for newer CPUs)

Tools: MMTTool, UEFITool, MC Extractor

Sample → Updated AMD microcode to 6000852 (Solved NMI bug and SPECTRE)

The screenshot shows the MMTool Aptoio-990XGSLI.ROM interface. On the left, the CPU section displays: AMD FX-8300, 32 nm, Stepping OR-C0 (Orochi), Cores/Threads 8 / 8, Codename Piledriver/Vishera, μCU 600084F, OPN FD8300WMW8KHK, Platform Socket AM3r2, Cache 4x64 + 8x16 + 4x2M + 8M. A table of features lists MMX, SSE4A, SSE4.1, SSE4.2, AVX, AVX2, AVX-512, BMI1, ABM, TBM, FMA4, ADX, XOP, DEP, AMD-V, SMX, SMEP, SMAP, TSX, MPX, EM64T, EIST, TM1, TM2, HTT, CPB, SST, AES-NI, RDRAND, RDSEED, SHA, and SGX. An Operating Point table shows CPU HFM (Max) at 3500.0 MHz, CPU CPB at 4400.0 MHz, and HT Max at 3200.0 MHz. The motherboard is GIGABYTE GA-990X-Gaming SLI-CF and the chipset is AMD 990X (RD980) + SB920/SB950. The BIOS Date is 06/30/2017 and the BIOS Version is F.1.1. On the right, the 'Module file' section includes buttons for Load Image, Save Image, Save Image as..., Create Report, and Close. Below this is a table of BIOS modules:

Volume	Index	FileName	Source size	GUID
01	8C	CRBSMI2	000009F7	69D7C1EA-8932-152E-
01	8D	CrBpxeLoader	00000732	3D1F7415-E14B-44E4-
01	8E	b57undix64	00011CE6	50994E78-18D5-4121-
02	00		000004C9	CC0F8A3F-3DEA-4376
02	01		00000959	9FE7DE69-0AEA-470A
02	02	CryptoPei	00003277	D6D2FBA6-EF60-4C38
02	03	TcgPeiPlatform	00000416	6B84C5B-6B75-42CA
02	04	AmiTcgPlatformPeiAfterMem	00001146	9B3F28D5-10A6-46C8-
02	05	AmiTcgPlatformPeiBeforeMem	00000DAE	E9312938-E56B-4614-
03	00	AmdProcessorInitPeim	00056412	DE3E049C-A218-4891
03	01	CRBPEI	0000173A	0D1ED2F7-E92B-4562
03	02	CORE PEI	00022532	92685943-D810-47FF-
03	03	SR556NPF1	000078CC	C375996F-42F9-421F-

Download GIGABYTE GA-990X-Gaming SLI-CF BIOS with new microcode 6000852

Cinebench

CPU (Single Core)	Details	CPU	Details
1. 4C/8T @ 4.40 GHz, Intel Core i7-4770K CPU	165	1. 12C/24T @ 2.66 GHz, Intel Xeon CPU X5650	1279
2. 6C/12T @ 3.30 GHz, Intel Core i7-3930K CPU	148	2. 6C/12T @ 3.30 GHz, Intel Core i7-3930K CPU	1096
3. 4C/8T @ 3.40 GHz, Intel Core i7-3770 CPU	138	3. 4C/8T @ 4.40 GHz, Intel Core i7-4770K CPU	822
4. 4C/8T @ 2.60 GHz, Intel Core i7-3720QM CPU	122	4. 4C/8T @ 3.40 GHz, Intel Core i7-3770 CPU	662
5. 4C/8T @ 3.52 GHz, AMD FX(tm)-8300 Eight-Core Processor	103	5. 4C/8T @ 2.60 GHz, Intel Core i7-3720QM CPU	590
6. 4C/8T @ 2.79 GHz, Intel Core i7-3840QM CPU	101	6. 4C/8T @ 3.52 GHz, AMD FX(tm)-8300 Eight-Core Processor	556
7. 12C/24T @ 2.66 GHz, Intel Xeon CPU X5650	93	7. 4C/8T @ 2.79 GHz, Intel Core i7-3840QM CPU	505
8. 2C/4T @ 1.70 GHz, Intel Core i5-3317U CPU	91	8. 6C/6T @ 2.91 GHz, AMD Phenom(tm) II X6 1045T Processor	441

CryptoNight Performance

343.100 H/s

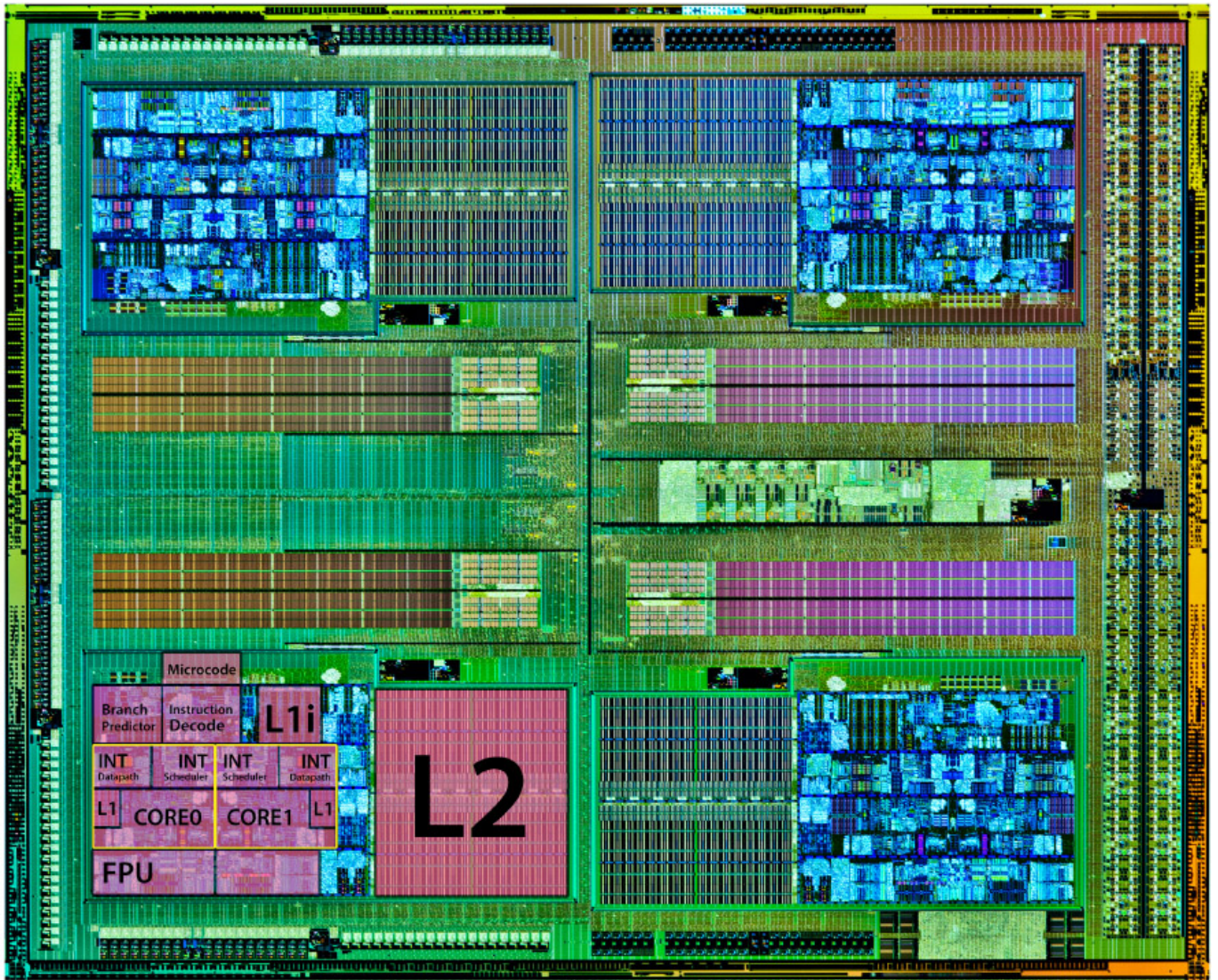
Bulldozer / Piledriver Die

8-core FX-8xxx CPU have 4 modules so in fact this hurts performance.

If you completely load two cores in one module performance is not 200%, but aprox. 160% (Fetch and FPU unit are shared between them).

FPU unit can split into two pieces for most work, but have only one scheduler. L1 instruction cache is shared too

8-core performance gives you not 800% but approx. only 640% (little faster than natural 6 core CPU - Phenom II X6) in full load.



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