



## JS-E02\_AX720\_R32\_3\_1

ARMv8 rev 0 testing with a Jetson-AGX and NVIDIA Tegra Xavier on Ubuntu 18.04 via the Phoronix Test Suite.

### Automated Executive Summary

*Digifusion M.2 SSD had the most wins, coming in first place for 50% of the tests.*

## Test Systems:

### eMMC

Processor: ARMv8 rev 0 @ 2.27GHz (8 Cores), Motherboard: Jetson-AGX, Memory: 16GB, Disk: 62GB Ultra USB 3.0 + 31GB HBG4a2, Graphics: NVIDIA TEGRA, Monitor: PHL 247E6, Network: 2 x Intel I210

OS: Ubuntu 18.04, Kernel: 4.9.140-tegra (aarch64), Desktop: Unity 7.5.0, Display Server: X Server 1.19.6, Display Driver: NVIDIA 1.0.0, Vulkan: 1.1.85, Compiler: GCC 7.5.0 + CUDA 10.0, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=aarch64-linux-gnu --disable-libquadmath --disable-libquadmath-support --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-fix-cortex-a53-843419 --enable-gnu-unique-object --enable-languages=c,ada,c++,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-plugin --enable-shared --enable-threads=posix --host=aarch64-linux-gnu --program-prefix=aarch64-linux-gnu- --target=aarch64-linux-gnu --with-default-libstdcxx-abi=new --with-gcc-major-version-only -v  
Disk Notes: CFQ / data=ordered,relatime,rw  
Processor Notes: Scaling Governor: tegra\_cpufreq schedutil

## USB3.0 Innodisk

## USB2.0 Innodisk

## SD Card innodisk

Processor: ARMv8 rev 0 @ 2.27GHz (8 Cores), Motherboard: Jetson-AGX, Memory: 16GB, Disk: 62GB Ultra USB 3.0 + 31GB HBG4a2, Graphics: NVIDIA Tegra Xavier, Monitor: PHL 247E6, Network: 2 x Intel I210

OS: Ubuntu 18.04, Kernel: 4.9.140-tegra (aarch64), Desktop: Unity 7.5.0, Display Server: X Server 1.19.6, Display Driver: NVIDIA 32.3.1, OpenGL: 4.6.0, Vulkan: 1.1.85, Compiler: GCC 7.5.0 + CUDA 10.0, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=aarch64-linux-gnu --disable-libquadmath --disable-libquadmath-support --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-fix-cortex-a53-843419 --enable-gnu-unique-object --enable-languages=c,ada,c++,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-plugin --enable-shared --enable-threads=posix --host=aarch64-linux-gnu --program-prefix=aarch64-linux-gnu- --target=aarch64-linux-gnu --with-default-libstdcxx-abi=new --with-gcc-major-version-only -v  
Disk Notes: CFQ / data=ordered,relatime,rw  
Processor Notes: Scaling Governor: tegra\_cpufreq schedutil

## mSATA Innodisk

Processor: ARMv8 rev 0 @ 2.27GHz (8 Cores), Motherboard: Jetson-AGX, Memory: 16GB, Disk: 63GB M.2 (S80) 3MG2-P + 31GB HBG4a2 + 15GB i-TF, Graphics: NVIDIA Tegra Xavier, Monitor: PHL 247E6, Network: 2 x Intel I210

OS: Ubuntu 18.04, Kernel: 4.9.140-tegra (aarch64), Desktop: Unity 7.5.0, Display Server: X Server 1.19.6, Display Driver: NVIDIA 32.3.1, OpenGL: 4.6.0, Vulkan: 1.1.85, Compiler: GCC 7.5.0 + CUDA 10.0, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=aarch64-linux-gnu --disable-libquadmath --disable-libquadmath-support --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-fix-cortex-a53-843419 --enable-gnu-unique-object --enable-languages=c,ada,c++,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-plugin --enable-shared --enable-threads=posix --host=aarch64-linux-gnu --program-prefix=aarch64-linux-gnu- --target=aarch64-linux-gnu --with-default-libstdcxx-abi=new --with-gcc-major-version-only -v  
Disk Notes: CFQ / data=ordered,relatime,rw  
Processor Notes: Scaling Governor: tegra\_cpufreq schedutil

## Digifusion M.2 SSD

## Micro AB USB2.0\_inno

## Type C Digifusion

Processor: ARMv8 rev 0 @ 2.27GHz (8 Cores), Motherboard: Jetson-AGX, Memory: 16GB, Disk: 256GB PLEXTOR PX-256M9PeGN + 31GB HBG4a2 + 15GB i-TF, Graphics: NVIDIA Tegra Xavier, Monitor: PHL 247E6, Network: 2 x Intel I210

OS: Ubuntu 18.04, Kernel: 4.9.140-tegra (aarch64), Desktop: Unity 7.5.0, Display Server: X Server 1.19.6, Display Driver: NVIDIA 32.3.1, OpenGL: 4.6.0, Vulkan: 1.1.85, Compiler: GCC 7.5.0 + CUDA 10.0, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=aarch64-linux-gnu --disable-libquadmath --disable-libquadmath-support --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-fix-cortex-a53-843419 --enable-gnu-unique-object --enable-languages=c,ada,c++,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-plugin --enable-shared --enable-threads=posix --host=aarch64-linux-gnu --program-prefix=aarch64-linux-gnu- --target=aarch64-linux-gnu --with-default-libstdcxx-abi=new --with-gcc-major-version-only -v  
Disk Notes: none / data=ordered,relatime,rw  
Processor Notes: Scaling Governor: tegra\_cpufreq schedutil

## Type C Digifusion run 2

Processor: ARMv8 rev 0 @ 2.27GHz (8 Cores), Motherboard: Jetson-AGX, Memory: 16GB, Disk: 256GB PLEXTOR PX-256M9PeGN + 256GB Generic + 31GB HBG4a2 + 15GB i-TF, Graphics: NVIDIA Tegra Xavier, Monitor: PHL 247E6, Network: 2 x Intel I210

OS: Ubuntu 18.04, Kernel: 4.9.140-tegra (aarch64), Desktop: Unity 7.5.0, Display Server: X Server 1.19.6, Display Driver: NVIDIA 32.3.1, OpenGL: 4.6.0, Vulkan: 1.1.85, Compiler: GCC 7.5.0 + CUDA 10.0, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=aarch64-linux-gnu --disable-libquadmath --disable-libquadmath-support --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-fix-cortex-a53-843419 --enable-gnu-unique-object --enable-languages=c,ada,c++,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-plugin --enable-shared --enable-threads=posix --host=aarch64-linux-gnu --program-prefix=aarch64-linux-gnu- --target=aarch64-linux-gnu --with-default-libstdcxx-abi=new --with-gcc-major-version-only -v  
Disk Notes: none / data=ordered,relatime,rw  
Processor Notes: Scaling Governor: tegra\_cpufreq schedutil

## Type C DIGFAST

### Type C DIGFAST run 2

Processor: ARMv8 rev 0 @ 2.27GHz (8 Cores), Motherboard: Jetson-AGX, Memory: 16GB, Disk: 256GB PLEXTOR PX-256M9PeGN + 256GB Tech + 31GB HBG4a2 + 15GB i-TF, Graphics: NVIDIA Tegra Xavier, Monitor: PHL 247E6, Network: 2 x Intel I210

OS: Ubuntu 18.04, Kernel: 4.9.140-tegra (aarch64), Desktop: Unity 7.5.0, Display Server: X Server 1.19.6, Display Driver: NVIDIA 32.3.1, OpenGL: 4.6.0, Vulkan: 1.1.85, Compiler: GCC 7.5.0 + CUDA 10.0, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=aarch64-linux-gnu --disable-libquadmath --disable-libquadmath-support --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-fix-cortex-a53-843419 --enable-gnu-unique-object --enable-languages=c,ada,c++,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-plugin --enable-shared --enable-threads=posix --host=aarch64-linux-gnu --program-prefix=aarch64-linux-gnu- --target=aarch64-linux-gnu --with-default-libstdcxx-abi=new --with-gcc-major-version-only -v  
Disk Notes: none / data=ordered,relatime,rw  
Processor Notes: Scaling Governor: tegra\_cpufreq schedutil

## Type c USB3.0

### CPU Stress

#### CPU Stress run

Processor: ARMv8 rev 0 @ 2.27GHz (8 Cores), Motherboard: Jetson-AGX, Memory: 16GB, Disk: 256GB PLEXTOR PX-256M9PeGN + 62GB Dual Drive + 31GB HBG4a2 + 15GB i-TF, Graphics: NVIDIA Tegra Xavier, Monitor: PHL 247E6, Network: 2 x Intel I210

OS: Ubuntu 18.04, Kernel: 4.9.140-tegra (aarch64), Desktop: Unity 7.5.0, Display Server: X Server 1.19.6, Display Driver: NVIDIA 32.3.1, OpenGL: 4.6.0, Vulkan: 1.1.85, Compiler: GCC 7.5.0 + CUDA 10.0, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=aarch64-linux-gnu --disable-libquadmath --disable-libquadmath-support --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=glibc --enable-default-pie --enable-fix-cortex-a53-843419 --enable-gnu-unique-object --enable-languages=c,ada,c++,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-plugin --enable-shared --enable-threads=posix --host=aarch64-linux-gnu --program-prefix=aarch64-linux-gnu- --target=aarch64-linux-gnu --with-default-libstdcxx-abi=new --with-gcc-major-version-only -v  
Processor Notes: Scaling Governor: tegra\_cpufreq schedutil

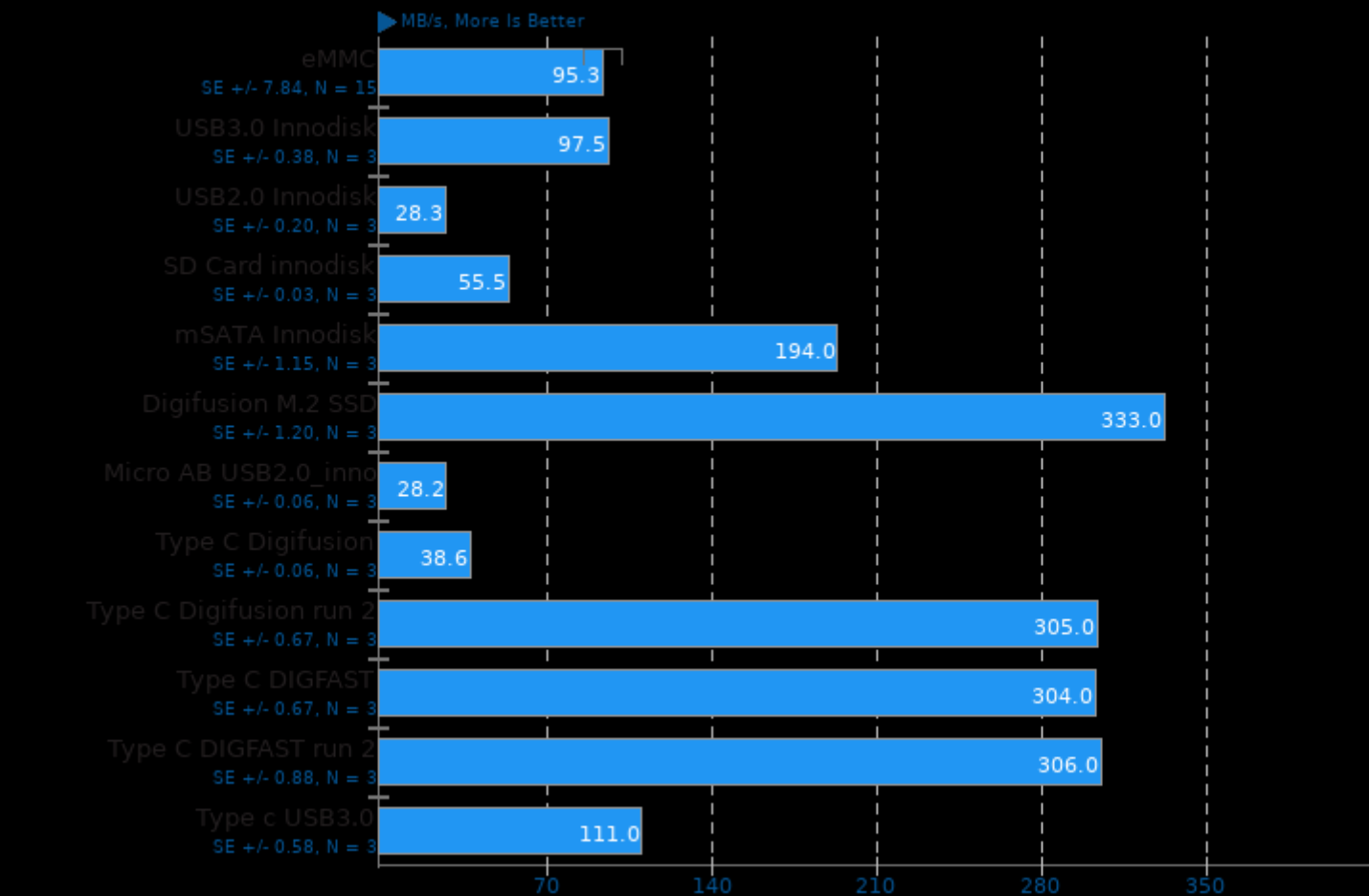
	eMMC	USB3.0	USB2.0	SD Card	mSAT A	Digifusion M.2 SSD	MicroAB USB2.0_inn	Type C Digifusion	Type C Digifusion run 2	Type C DIGFA ST	Type C DIGFA ST run 2	Type c USB3.0	CPU Stress	CPU Stress run
Flexible IO Tester - Seq	95.3	97.5	28.3	55.5	194	333	28.2	38.6	305	304	306	111		
Read - Linux														
AIO - No - Yes														
- 4KB (MB/s)														
Normalized	28.62%	29.28%	8.5%	16.67%	58.26%	100%	8.47%	11.59%	91.59%	91.29%	91.89%	33.33%		
Standard	31.9%	0.7%	1.2%	0.1%	1%	0.6%	0.4%	0.3%	0.4%	0.4%	0.5%	0.9%		
Flexible IO	24340	24967	7242	14200	49733	85333	7217	9878	78100	77533	78200	28367		
Tester - Seq														
Read - Linux														
AIO - No - Yes														
- 4KB (IOPS)														
Normalized	28.52%	29.26%	8.49%	16.64%	58.28%	100%	8.46%	11.58%	91.52%	90.86%	91.64%	33.24%		
Standard	32%	0.6%	1.1%	0.8%	0.8%	0.6%	0.4%	0.2%	0.5%	0.7%	0.5%	0.7%		
Flexible IO	306	121	53.3	102	427	1739	52.6	63.3	822	818	818	169		
Tester - Seq														
Read - Linux														
AIO - No - Yes														
- 8MB (MB/s)														
Normalized	17.6%	6.96%	3.06%	5.87%	24.55%	100%	3.02%	3.64%	47.27%	47.04%	47.04%	9.72%		
Standard			0.1%			0.8%	1.3%	0.2%	0.1%	0.1%	0.1%			
Flexible IO	35	12	3	9	50	214	3	4	99	99	99	18		
Tester - Seq														
Read - Linux														
AIO - No - Yes														
- 8MB (IOPS)														
Normalized	16.36%	5.61%	1.4%	4.21%	23.36%	100%	1.4%	1.87%	46.26%	46.26%	46.26%	8.41%		
Flexible IO	81.2	24.7	25.0	21.9	85.5	268	25.1	39.0	0.621	280	281	21.6		
Tester - Seq														
Write - Linux														
AIO - No - Yes														
- 4KB (MB/s)														
Normalized	28.9%	8.79%	8.9%	7.79%	30.43%	95.37%	8.93%	13.88%	0.22%	99.64%	100%	7.69%		
Standard	0.2%	0.4%	1.2%	1.3%	0.1%	2.1%	1.1%	0.1%	59.4%			11.6%		
Deviation														

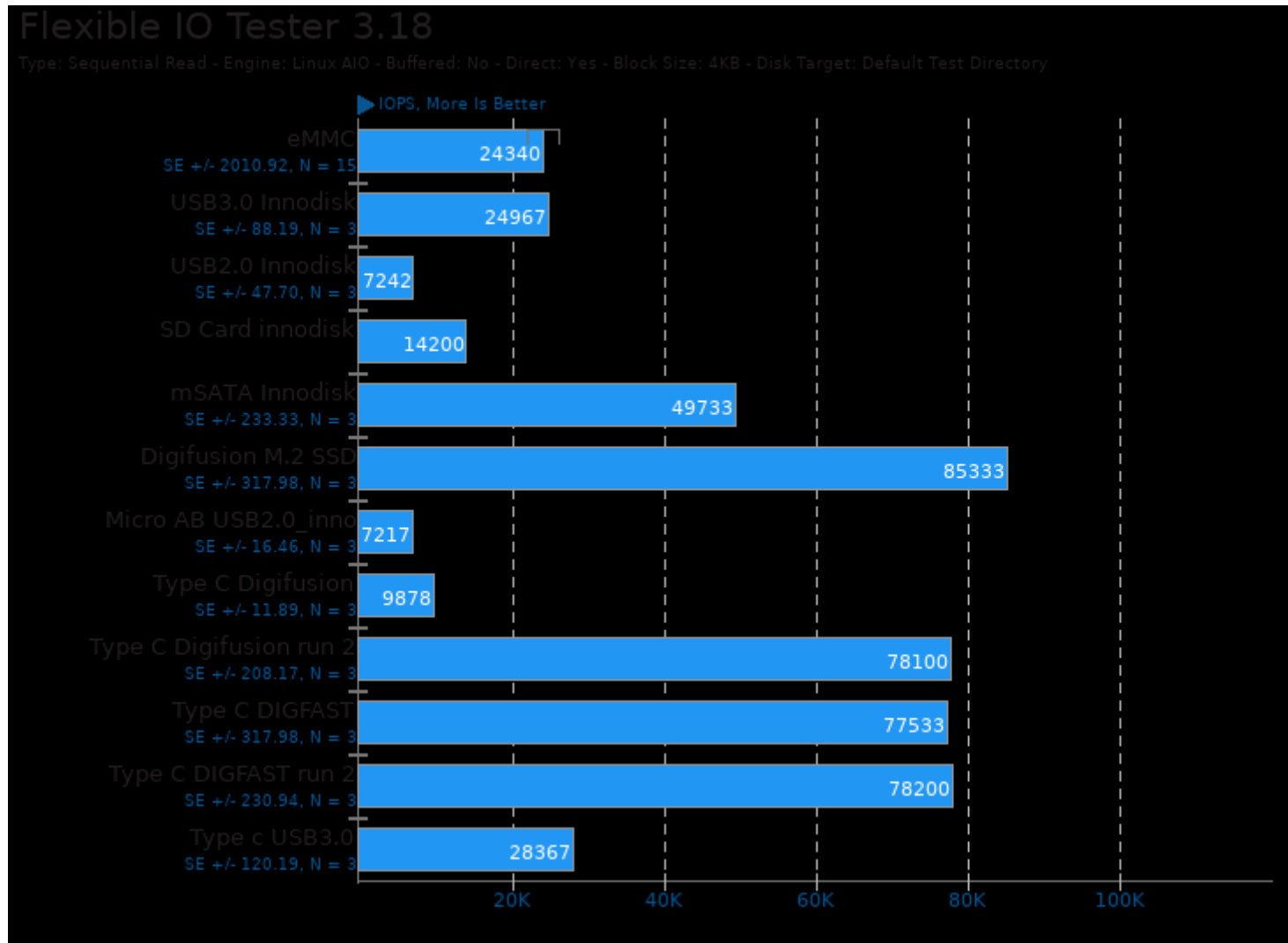
Flexible IO	20767	6320	6399	5594	21867	68300	6432	9990	152	71700	72067	5566
Tester - Seq												
Write - Linux												
AIO - No - Yes												
- 4KB (IOPS)												
Normalized	28.82%	8.77%	8.88%	7.76%	30.34%	94.77%	8.93%	13.86%	0.21%	99.49%	100%	7.72%
Standard	0.3%	0.4%	1.2%	1.4%	0.3%	3%	1.2%	0.1%	60.6%	0.1%	0.2%	11.3%
Flexible IO	135	39.0	49.3	66.3	103	281	49.3	63.7	8.880	300	301	56.1
Tester - Seq												
Write - Linux												
AIO - No - Yes												
- 8MB (MB/s)												
Normalized	44.85%	12.96%	16.38%	22.03%	34.22%	93.36%	16.38%	21.16%	2.95%	99.67%	100%	18.64%
Standard	0.9%	1.9%	0.7%	0.1%		0.7%	1.1%	0.1%	27.2%		1.3%	2.1%
Flexible IO	13	2	3	5	9	32	3	4		34	34	4
Tester - Seq												
Write - Linux												
AIO - No - Yes												
- 8MB (IOPS)												
Normalized	38.24%	5.88%	8.82%	14.71%	26.47%	94.12%	8.82%	11.76%		100%	100%	11.76%
Standard	4.3%					1.8%					1.7%	
Stress-NG -												
Forking (Bogo												
Ops/s)												
Normalized												100%
Standard												98.56%
Stress-NG -												0.5%
CPU Stress												0.4%
(Bogo Ops/s)												
Normalized												98.37%
Standard												100%
Stress-NG -												2.9%
Crypto (Bogo												0.1%
Ops/s)												1212
Standard												
Stress-NG -												1.7%
Matrix Math												14012
(Bogo Ops/s)												
Standard												0.3%
Stress-NG -												52180
Vector Math												
(Bogo Ops/s)												
Standard												0%
Stress-NG -												3251
Memory												
Copying												
(Bogo Ops/s)												
Standard												0.3%
Deviation												

Stress-NG -	22672
G.C.S.F (Bogo	1
Ops/s)	
Standard	1.4%
Stress-NG -	48.63
G.Q.D.S	
(Bogo Ops/s)	
Standard	16.8%
Deviation	

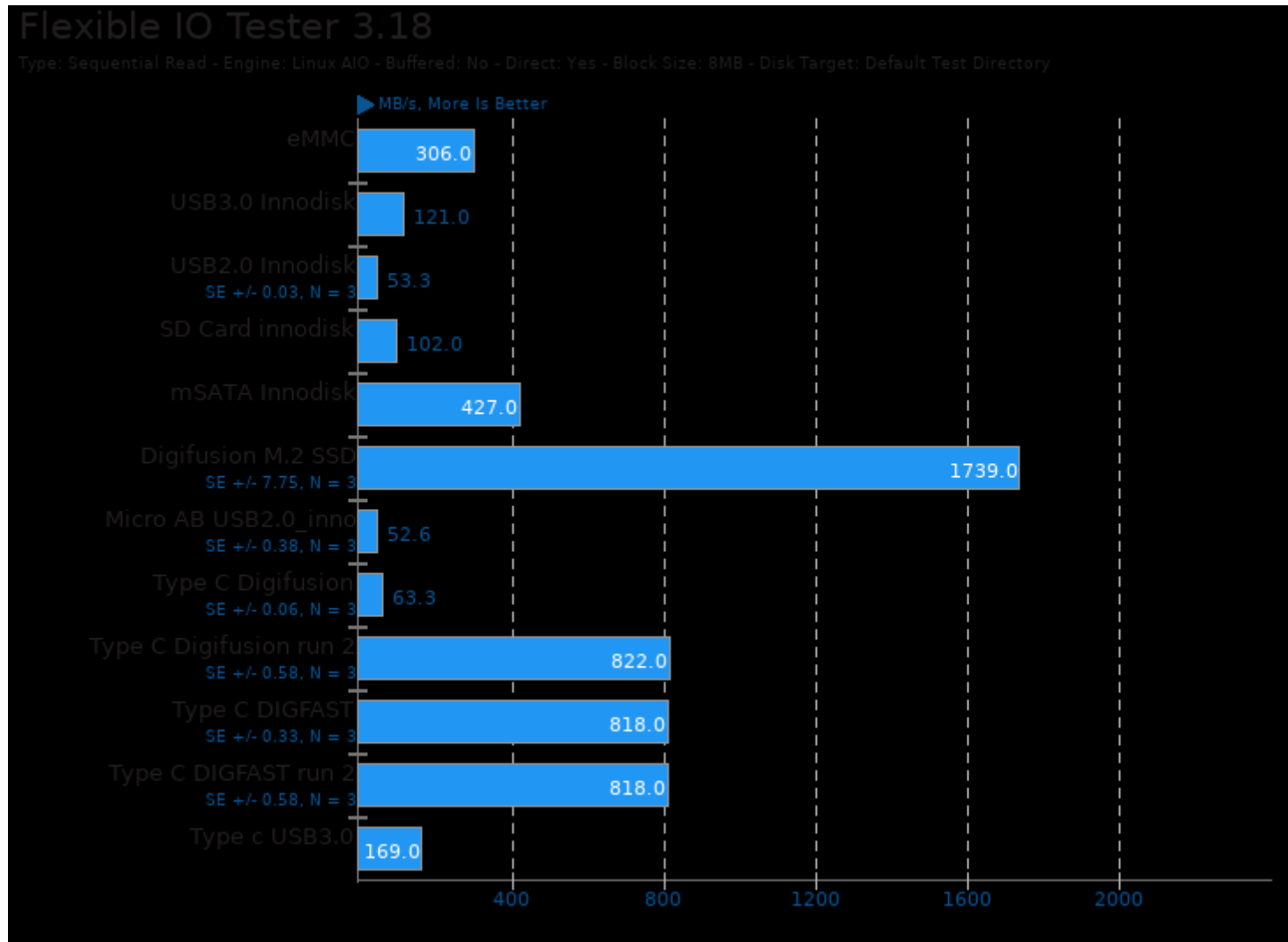
## Flexible IO Tester 3.18

Type: Sequential Read - Engine: Linux AIO - Buffered: No - Direct: Yes - Block Size: 4KB - Disk Target: Default Test Directory



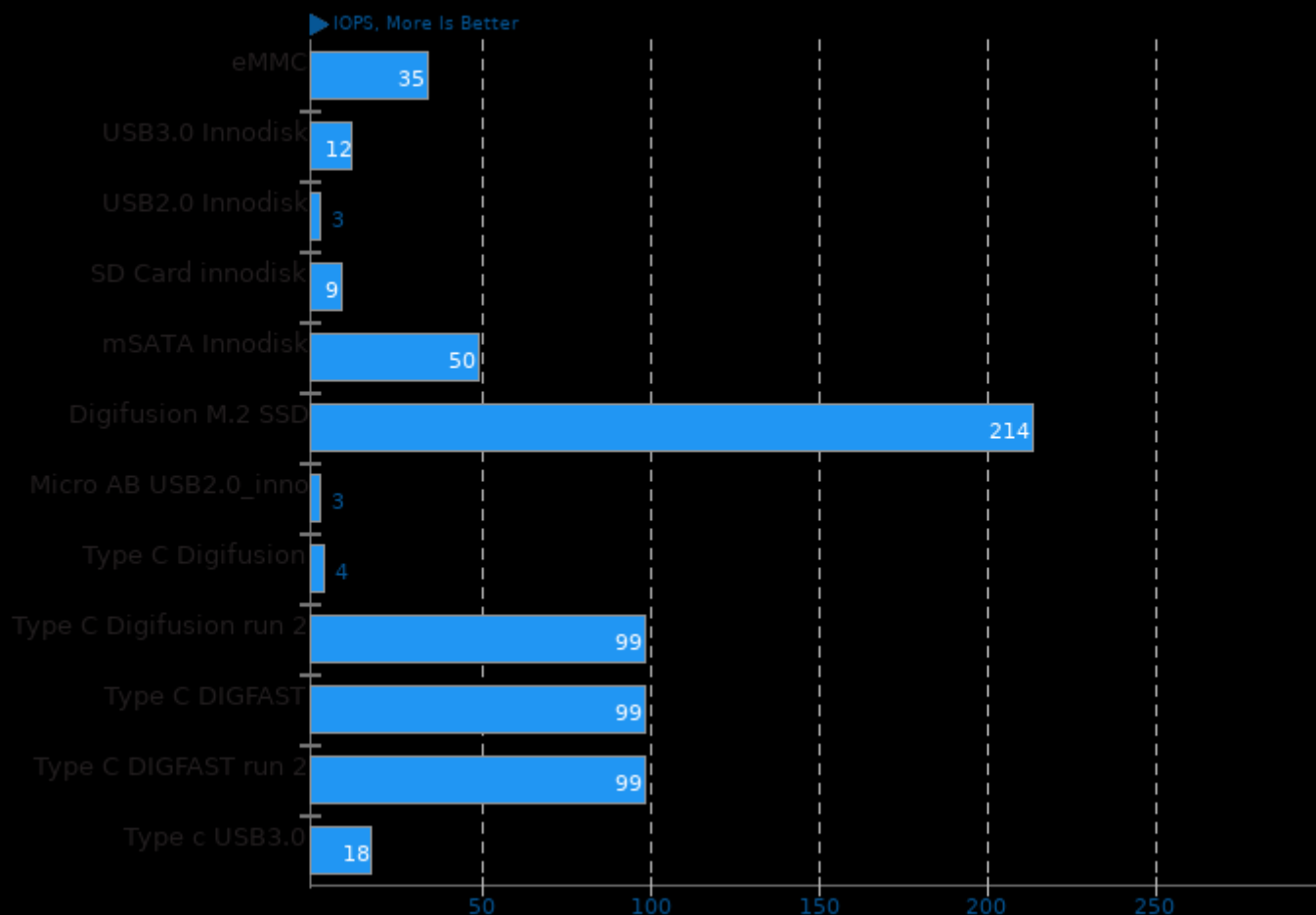


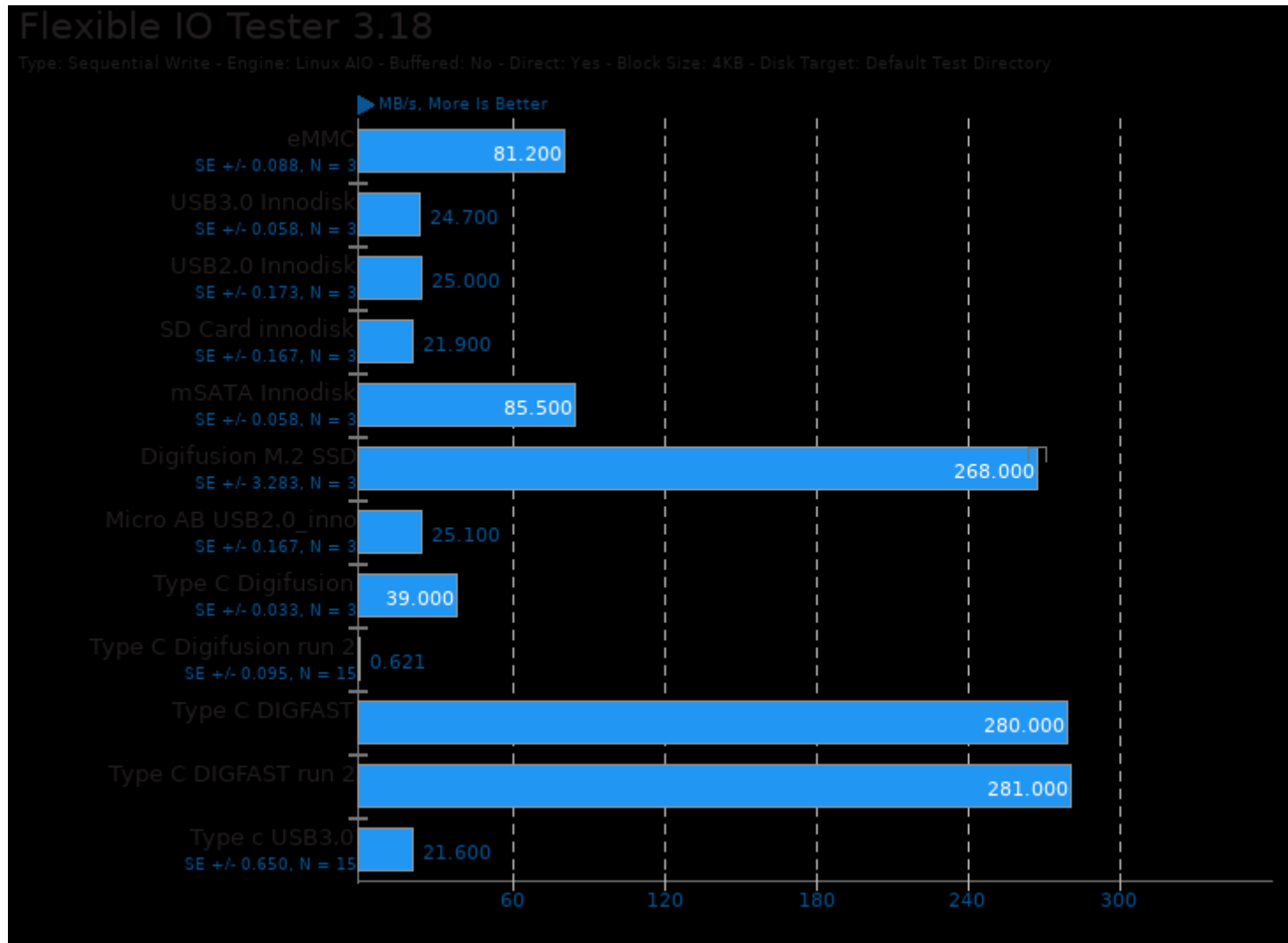


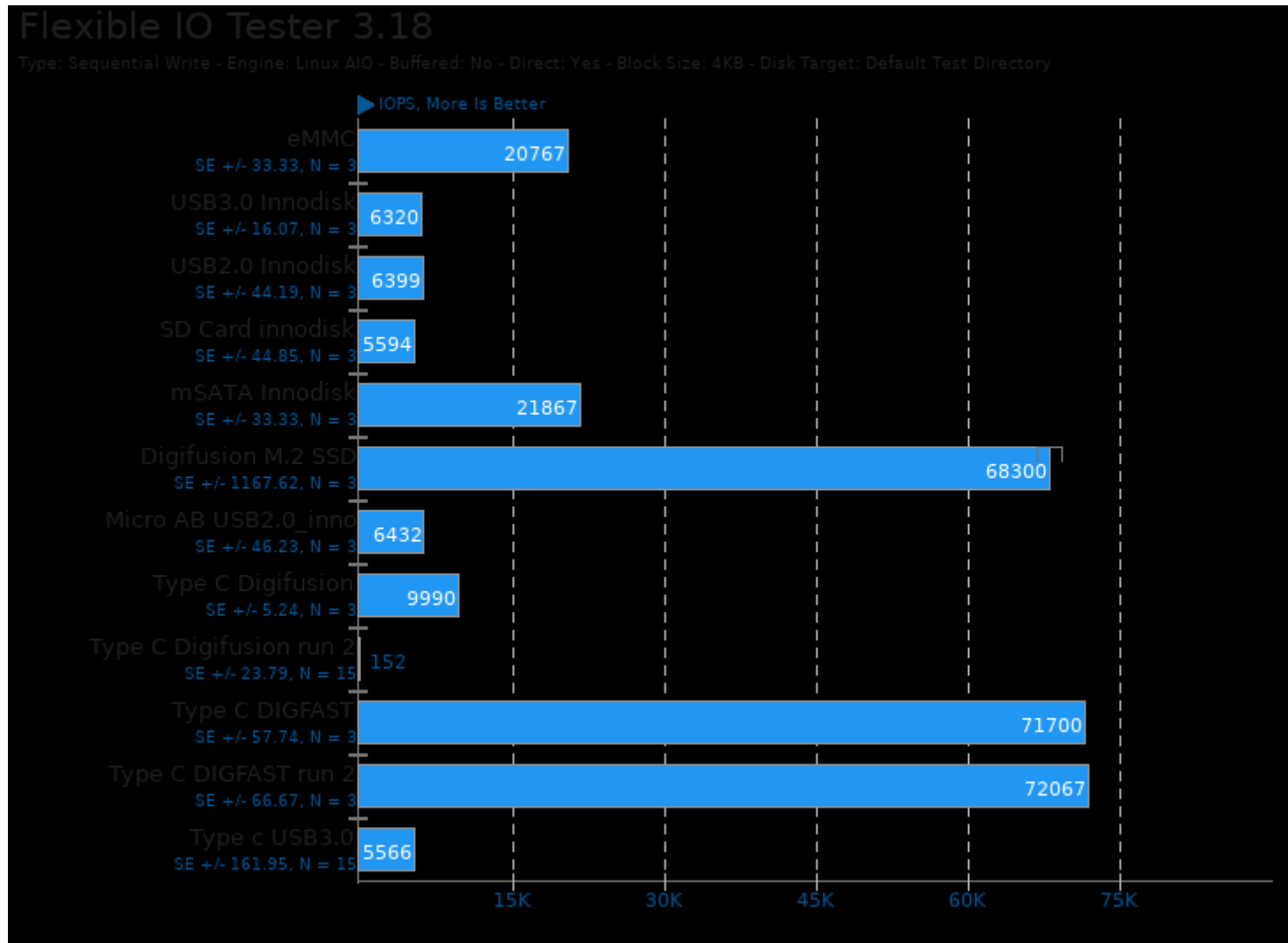


## Flexible IO Tester 3.18

Type: Sequential Read - Engine: Linux AIO - Buffered: No - Direct: Yes - Block Size: 8MB - Disk Target: Default Test Directory

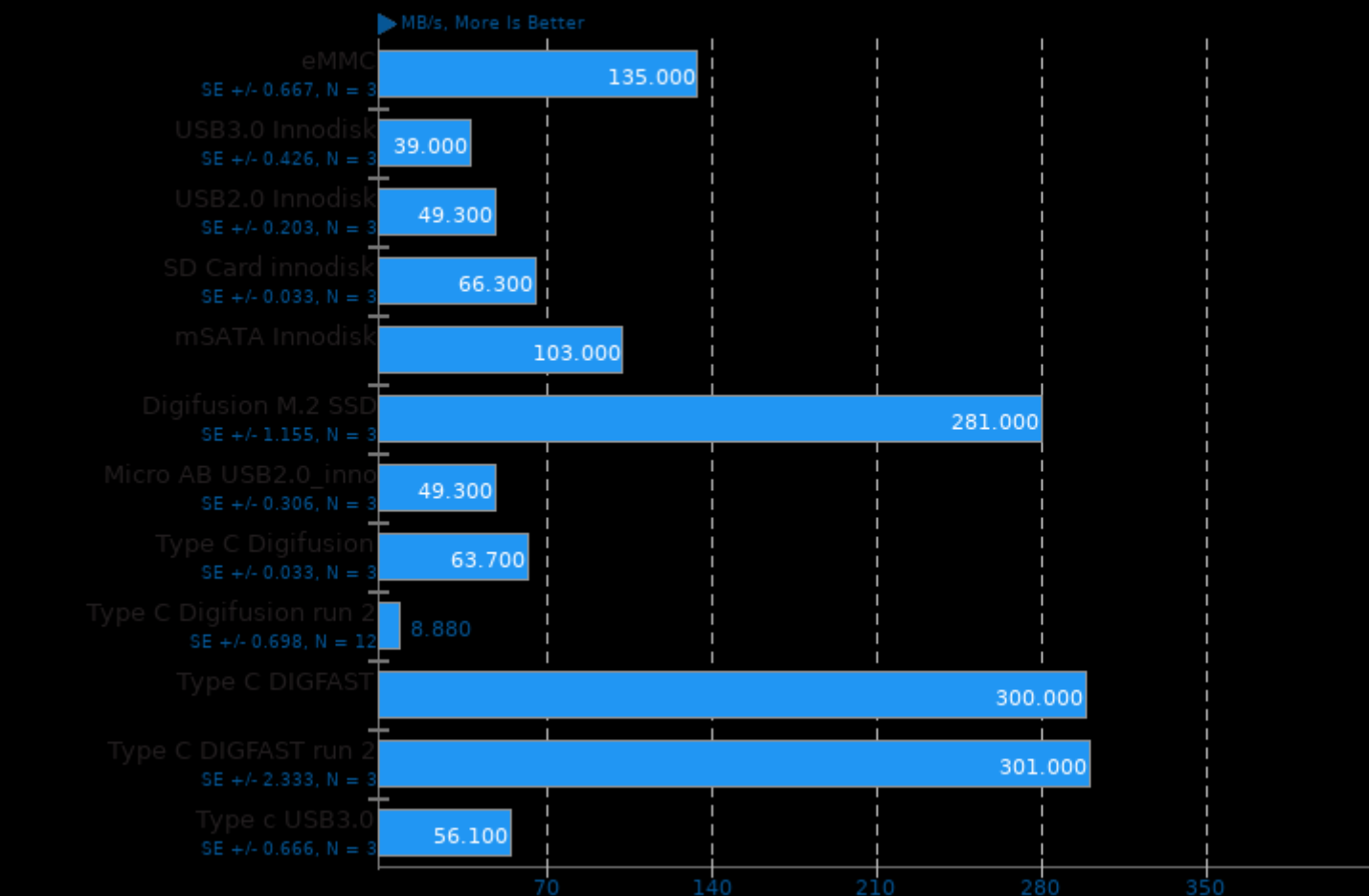






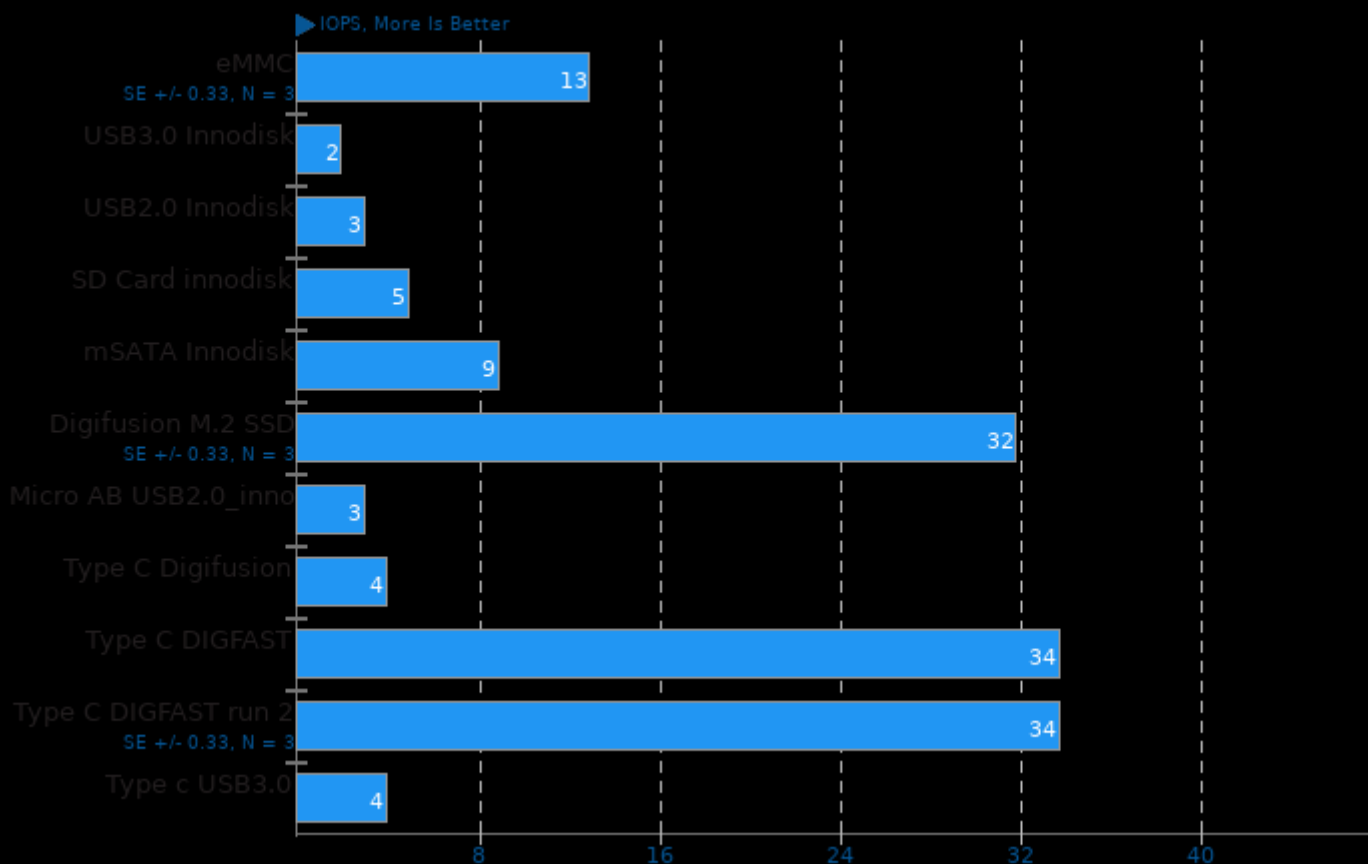
## Flexible IO Tester 3.18

Type: Sequential Write - Engine: Linux AIO - Buffered: No - Direct: Yes - Block Size: 8MB - Disk Target: Default Test Directory



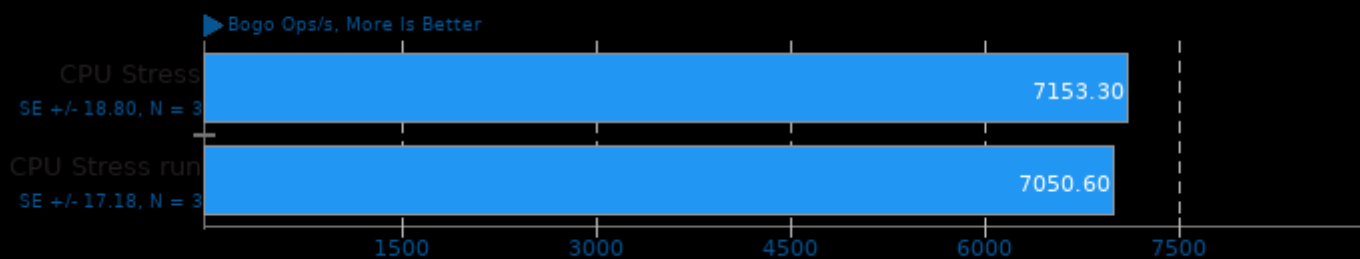
## Flexible IO Tester 3.18

Type: Sequential Write - Engine: Linux AIO - Buffered: No - Direct: Yes - Block Size: 8MB - Disk Target: Default Test Directory



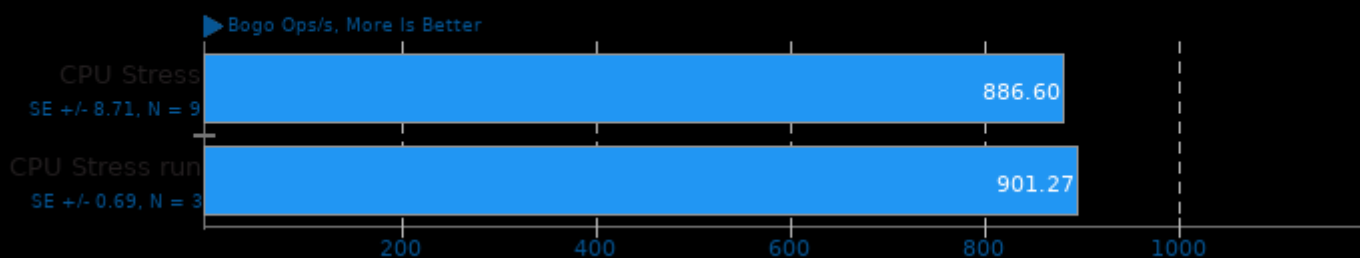
## Stress-NG 0.11.07

Test: Forking



## Stress-NG 0.11.07

Test: CPU Stress



## Stress-NG 0.11.07

Test: Crypto



## Stress-NG 0.11.07

Test: Matrix Math



## Stress-NG 0.11.07

Test: Vector Math



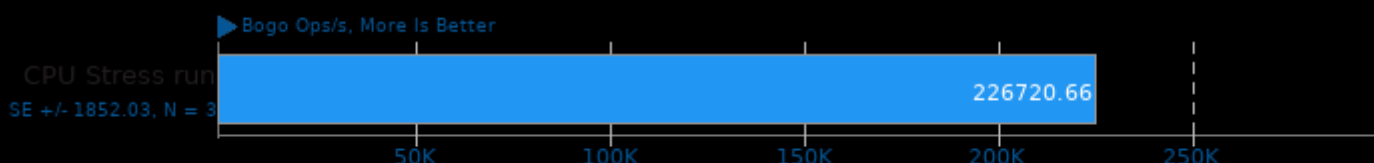
## Stress-NG 0.11.07

Test: Memory Copying



## Stress-NG 0.11.07

Test: Glibc C String Functions



## Stress-NG 0.11.07

Test: Glibc Qsort Data Sorting



This file was automatically generated via the Phoronix Test Suite benchmarking software on Saturday, 28 September

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