Western Digital

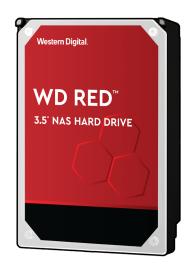# WD Red™

Highlights

- Specifically designed for use in NAS systems with up to 8 bays
- Supports up to 180 TB/yr workload rate*
- NASware technology for compatibility
- 3-year limited warranty
- Small and home office NAS systems in a 24×7 environment

INTERFACE
SATA 6 Gb/s

FORM FACTOR
3.5 and 2.5-inch

CAPACITIES
3.5-inch: 1TB to 14TB

2.5-inch: 1TB

MODEL NUMBERS
3.5-inch:
WD140EFFX
WD120EFAX
WD100EFAX
WD80EFAX
WD60EFAX
WD60EFRX
WD40EFRX
WD30EFRX
WD20EFAX
WD20EFRX
WD10JFCX
2.5-inch:
WD10EFRX

THE WESTERN DIGITAL ADVANTAGE

Western Digital puts our products through extensive Functional Integrity Testing (F.I.T.) prior to any product launch. This testing ensures our products consistently meet the quality and reliability standards of the Western Digital brand. WD also has a detailed Knowledge Base with more than 1,000 helpful articles as well as helpful software and utilities. Our toll-free customer support lines are here to help or you can access our WD Support site for additional details.

There's a leading edge WD Red drive for every compatible NAS system to help fulfill your data storage needs. With drives up to 14TB, WD Red drives offer a wide array of solutions for customers looking to build a NAS storage solution. Built for single-bay to 8-bay NAS systems, WD Red drives pack the power to store your precious data in one powerhouse unit. With WD Red drives, you're ready for what's next.

Exclusive NASware™ 3.0

Not just any drive will do. In single-bay to 8-bay NAS systems, WD Red drives raise the bar. Get as much as 96TB capacity, and with WD's exclusive NASware™ technology, you can optimize every single one of them. Built into every WD Red hard drive, NASware 3.0's advanced technology improves your system's storage performance by increasing compatibility, integration, upgradeability, and reliability.

Built for optimum NAS compatibility

Desktop drives aren't purpose-built for NAS. But WD Red drives with NASware technology are. Our exclusive technology takes the guesswork out of selecting a drive. WD Red drives are for small NAS systems, and our unique algorithm balances performance and reliability in NAS and RAID environments. Simply put, a WD Red drive is one of the most compatible drives available for NAS enclosures. But don't take our word for it. WD Red drives are a reflection of extensive NAS partner technology engagement and compatibility-testing resulting in a leading compatibility list for NAS systems.

Desktop Drives vs. WD Red

In a Network Attached Storage device, a desktop hard drive is not typically designed for NAS environments. Do right by your NAS and choose the drive designed for NAS with an array of features to help preserve your data and maintain optimum performance. Take the following into consideration when choosing a hard drive for your NAS:

- Compatibility: Without being tested for compatibility with your NAS system, optimum performance is not guaranteed.

- Reliability: The always-on environment of a NAS or RAID is a challenging one. And desktop drives aren't typically designed and tested under those conditions. WD Red drives are.

- Error recovery controls: WD Red NAS hard drives are specifically designed with RAID error recovery control to help reduce failures within the NAS system. Desktop drives are not typically designed for RAID environments.

- Noise and Vibration Protection: Designed to operate solo, desktop drives typically offer little or no protection from the noise and vibration present in a multi-drive system. WD Red drives are designed for multi-bay NAS systems.

WD Red for Home

Stream, backup, share, and organize your digital content at home with a NAS and WD Red drives designed to effortlessly share content with the devices in your home. NASware 3.0 technology increases your drives' compatibility with your devices, TV, stereo, and more. Live in a connected world.

WD Red for Small Business

Businesses thrive on productivity and efficiency—two of the guiding principles built into the design of WD Red drives. It's the hard drive of choice for 1 to 8 bay systems. NASware 3.0 technology allows for seamless integration with your existing network so WD Red can share and backup files at the speed of your business. And for larger businesses with up to 24-bays, count on WD Red Pro™ drives.

WD Red Pro for Big Business

If you're looking for maximum performance in a heavy use NAS, WD Red Pro drives deliver the same exceptional performance for the business customer. For NAS environments with 8 to 24 bays, WD Red Pro drives are designed to handle an increase in workload and comes with a 5-year limited warranty.

*Workload Rate is defined as the amount of user data transferred to or from the hard drive. Workload Rate is annualized (TB transferred X (8760 / recorded power-on hours)). Workload Rate will vary depending on your hardware and software components and configurations.

WD Red™

Specifications

	14TB	12TB	10TB	8TB	6TB	6TB
Model Number[1]	WD140EFAX	WD120EFAX	WD100EFAX	WD80EFAX	WD60EFAX	WD60EFRX
Interface[2]	SATA 6 Gb/s	SATA 6 Gb/s	SATA 6 Gb/s	SATA 6 Gb/s	SATA 6 Gb/s	SATA 6 Gb/s
Formatted capacity[2]	14TB	12TB	10TB	8TB	6TB	6TB
Form factor	3.5-inch	3.5-inch	3.5-inch	3.5-inch	3.5-inch	3.5-inch
Native command queuing	Yes	Yes	Yes	Yes	Yes	Yes
Advanced Format (AF)	Yes	Yes	Yes	Yes	Yes	Yes
RoHS compliant[3]	Yes	Yes	Yes	Yes	Yes	Yes
Performance						
Interface Transfer Rate[2] up to	210 MB/s	196 MB/s	210 MB/s	198 MB/s	180 MB/s	175 MB/s
Cache (MB)[2]	512	256	256	256	256	64
Performance Class	5400 RPM Class	5400 RPM Class	5400 RPM Class	5400 RPM Class	5400 RPM Class	5400 RPM Class
Reliability/Data Integrity						
Load/unload cycles[4]	600,000	600,000	600,000	600,000	600,000	600,000
Non-recoverable errors per bits read	<1 in 10^{14}	<1 in 10^{14}	<1 in 10^{14}	<1 in 10^{14}	<1 in 10^{14}	<1 in 10^{14}
MTBF (hours)[5]	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Workload Rate (TB/year)[6]	180	180	180	180	180	180
Limited warranty (years)[7]	3	3	3	3	3	3
Power Management[8]						
12VDC ±5% (A, peak)	1.85	1.84	1.79	1.85	1.75	1.75
5VDC ±5% (A, peak)						
Average power requirements (W)						
Read/Write	6.5	6.3	5.7	8.8	4.8	5.3
Idle	3.0	2.9	2.8	5.3	3.1	3.4
Standby and Sleep	0.8	0.6	0.5	0.8	0.6	0.4
Environmental Specifications[9]						
Temperature (ºC)						
Operating	0 to 65	0 to 65	0 to 65	0 to 65	0 to 60	0 to 60
Non-operating	-40 to 70	-40 to 70	-40 to 70	-40 to 70	-40 to 70	-40 to 70
Shock (Gs)						
Operating, (2 ms, read/write)	30	30	30	30	30	30
Operating, (2 ms, read)	65	65	65	65	65	65
Non-operating (2 ms)	300	300	300	300	250	250
Acoustics (dBA)[10]						
Idle	20	20	20	27	23	25
Seek (average)	29	29	29	29	27	28
Physical Dimensions						
Height (in./mm, max)	1.028/26.1	1.028/26.1	1.028/26.1	1.028/26.1	1.028/26.1	1.028/26.1
Length (in./mm, max)	5.787/147	5.787/147	5.787/147	5.787/147	5.787/147	5.787/147
Width (in./mm, ± .01 in.)	4/101.6	4/101.6	4/101.6	4/101.6	4/101.6	4/101.6
Weight (lb/kg , ± 10%)	1.52/0.69	1.46/0.66	1.43/0.65	1.58/0.715	1.40/0.64	1.65/0.75

Specifications subject to change without notice.

[1] Not all products may be available in all regions of the world

[2] As used for storage capacity, one megabyte (MB) = one million bytes, one gigabyte (GB) = one billion bytes, and one terabyte (TB) = one trillion bytes. Total accessible capacity varies depending on operating environment. As used for buffer or cache, one megabyte (MB) = 1,048,576 bytes. As used for transfer rate or interface, megabyte per second (MB/s) = one million bytes per second, and gigabit per second (Gb/s) = one billion bits per second. Effective maximum SATA 6 Gb/s transfer rate calculated according to the Serial ATA specification published by the SATA-IO organization as of the date of this specification sheet. Visit www.sata-io.org for details. Performance will vary depending on your hardware and software components and configurations.

[3] WD hard drive products manufactured and sold worldwide after June 8, 2011, meet or exceed Restriction of Hazardous Substances (RoHS) compliance requirements as mandated by the RoHS Directive 2011/65/EU.

[4] Controlled unload at ambient condition.

[5] MTBF specifications are based upon internal testing using a 40°C base casting temperature. MTBF is based on a sample population and is estimated by statistical measurements and acceleration algorithms. MTBF does not predict an individual drive's reliability and does not constitute a warranty.

[6] Workload Rate is defined as the amount of user data transferred to or from the hard drive. Workload Rate is annualized (TB transferred X (8760 / recorded power-on hours)). Workload Rate will vary depending on your hardware and software components and configurations.

[7] See support.wdc.com/warranty for regionally specific warranty details.

[8] Power measurements at room-ambient temperature.

[9] No non-recoverable errors during operating tests or after non-operating tests.

[10] Sound power level.

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WD Red™

Specifications

	4TB	3TB	2TB	2TB	1TB	1TB
Model Number[1]	WD40EFRX	WD30EFRX	WD20EFAX	WD20EFRX	WD10JFCX	WD10EFRX
Interface[2]	SATA 6 Gb/s	SATA 6 Gb/s	SATA 6 Gb/s	SATA 6 Gb/s	SATA 6 Gb/s	SATA 6 Gb/s
Formatted capacity[2]	4TB	3TB	2TB	2TB	1TB	1TB
Form factor	3.5-inch	3.5-inch	3.5-inch	3.5-inch	3.5-inch	2.5-inch
Native command queuing	Yes	Yes	Yes	Yes	Yes	Yes
Advanced Format (AF)	Yes	Yes	Yes	Yes	Yes	Yes
RoHS compliant[3]	Yes	Yes	Yes	Yes	Yes	Yes
Performance						
Interface Transfer Rate[2] up to	150 MB/s	147 MB/s	180 MB/s	147 MB/s	150 MB/s	144 MB/s
Cache (MB)[2]	64	64	256	64	64	16
Performance Class	5400 RPM Class	5400 RPM Class	5400 RPM Class	5400 RPM Class	5400 RPM Class	5400 RPM Class
Reliability/Data Integrity						
Load/unload cycles[4]	600,000	600,000	600,000	600,000	600,000	600,000
Non-recoverable read errors per bits read	<1 in 10^{14}	<1 in 10^{14}	<1 in 10^{14}	<1 in 10^{14}	<1 in 10^{14}	<1 in 10^{14}
MTBF (hours)[5]	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Workload Rate (TB/year)[6]	180	180	180	180	180	180
Limited warranty (years)[7]	3	3	3	3	3	3
Power Management[8]						
12VDC ±5% (A, peak)	1.75	1.73	1.31	1.73	1.20	
5VDC ±5% (A, peak)						1.00
Average power requirements (W)						
Read/Write	4.5	4.1	4.1	4.1	3.3	1.4
Idle	3.3	2.7	2.3	2.7	2.3	0.6
Standby and Sleep	0.4	0.4	0.6	0.4	0.4	0.2
Environmental Specifications[9]						
Temperature (ºC)						
Operating	0 to 60	0 to 65	0 to 65	0 to 65	0 to 60	0 to 60
Non-operating	-40 to 70	-40 to 70	-40 to 70	-40 to 70	-40 to 70	-40 to 70
Shock (Gs)						
Operating, (2 ms, read/write)	30	30	30	30	30	400
Operating, (2 ms, read)	65	65	65	65	65	
Non-operating (2 ms)	250	250	250	250	250	1000
Acoustics (dBA)[10]						
Idle	25	23	21	23	21	24
Seek (average)	28	24	26	24	22	25
Physical Dimensions						
Height (in./mm, max)	1.028/26.1	1.028/26.1	1.028/26.1	1.028/26.1	1.028/26.1	0.374/9.50
Length (in./mm, max)	5.787/147	5.787/147	5.787/147	5.787/147	5.787/147	3.94/100.2
Width (in./mm, ± .01 in.)	4/101.6	4/101.6	4/101.6	4/101.6	4/101.6	2.75/69.85
Weight (lb/kg , ± 10%)	1.50/0.68	1.40/0.64	1.32/0.60	0.99/0.45	0.99/0.45	0.25/0.115

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[7] See support.wdc.com/warranty for regionally specific warranty details.

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[9] No non-recoverable errors during operating tests or after non-operating tests.

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