Biwin
Storage Technology

BIWIN TDE408-R eMMC 5.1



The BIWIN TDE408-R is an industrial-grade eMMC solution built with an in-house-developed controller and proprietary firmware architecture and algorithms. Featuring a 153-ball FBGA package, it leverages the eMMC 5.1 standard, supports HS400 high-speed mode, and operates reliably across a wide temperature range of –25°C to 85°C. Advanced firmware features, including bad block management, dynamic and static wear leveling, garbage collection (GC), 4K LDPC error correction, and power-loss protection (PLP), help maintain data integrity, endurance, and reliable operation in demanding industrial environments. The TDE408-R also offers an optional Enhanced Mode that enables system and application data to be consolidated within a single storage device, combining reliable system read/write performance with high-capacity data storage. Designed for data-intensive embedded applications, it provides a robust and efficient storage solution for automotive and industrial systems.

Key Features

Single-Drive Architecture and AOV Efficiency

Video-intensive edge devices such as automotive DVRs and dashcams often rely on separate storage devices for the operating system and high-throughput video recording. The BIWIN TDE408-R simplifies storage architecture by combining OS and application data storage on a single drive, delivering the reliability and stability required for system operation alongside the capacity needed for video-intensive workloads. Always-On Video (AOV) power optimization reduces frame rates when scenes remain static, helping lower power consumption during continuous 24/7 recording.

Continuous Multi-Stream Video Recording

Powered by BIWIN's proprietary firmware, the TDE408-R intelligently optimizes data distribution for concurrent video streams, enabling simultaneous recording of up to eight 1080p 30 fps video streams with sustained throughput of over 10 MB/s. This ensures stable, continuous video capture for surveillance applications across smart campuses, rail transit systems, and residential security environments.

Ensuring Data Integrity and Consistency

Powered by BIWIN's in-house-developed controller, the TDE408-R integrates a 4K LDPC parallel error-correction engine with support for Soft LDPC decoding for enhanced error recovery, helping ensure data integrity and transactional consistency even under demanding operating conditions.

End-to-End In-House Development and Application-Specific Customization

The TDE408-R is built on BIWIN's in-house-developed controller and proprietary firmware algorithms and manufactured in-house, providing end-to-end control from development through production. Application-specific customization is also available, including features such as S.M.A.R.T. health monitoring and comprehensive configuration information retrieval.

Technologies

Bad Block Management	Power Loss Protection (PLP)	Global Wear Leveling	RPMB Partition	FFU (Field Firmware Upgrade)	ECC (Error Correction Code)

Applications

In-Vehicle DVR	Drive Data Recorders	Dash Cam	Security Surveillance	Industrial Drone	Industrial Robots

Specifications

Model Name	TDE408-R
Interface	eMMC 5.1
Flash Type	TLC
Capacity	64 GB / 128 GB / 256 GB
Sequential Read (Up to)	330 MB/s
Sequential Write (Up to)	290 MB/s
Operation Current (Max.)	160 mA
Standby Current (Max.)	150 μA
Dimensions	11.50 x 13.00 x 1.10 mm
Packaging	FBGA 153 Ball
Operating Temperature	-25°C to +85°C
Storage Temperature	-40°C to +85°C
Endurance	3,000 P/E cycles (TLC Mode) 50,000 P/E cycles (Enhanced Mode)
MTBF	>2,000,000 hours
Certifications	RoHS, REACH
Warranty	3-Year Limited

Order Information

Capacity	Part Number	Power Loss Protection
64 GB	BWEFMD064GR7KC	Firmware Based
128 GB	BWEFMD128GR9S9	Firmware Based
256 GB	BWEFMD256GR9S9	Firmware Based

1. Tested by BIWIN labs. Actual performance may vary due to systems, devices, or environment.
2. Maintenance and future updates are required throughout the product life cycle. Specifications are subject to change without notice.
3. The pictures are for illustration only. Actual products may vary due to product enhancements or changes.
4. Not all products are sold in all regions of the world.
5. 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 the 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 gigabyte per second (GB/s) = one billion bytes per second.
6. MTBF = Mean Time Between Failures based on internal testing using the Telcordia stress testing standard.
7. Please visit www.biwintechnology.com for warranty details in your region.
8. For more information, please contact sales@biwintech.com.

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