



TOSHIBA LAUNCHES WORLD'S HIGHEST CAPACITY AUTOMOTIVE-GRADE HDD TO SUPPORT INDUSTRY DEMAND FOR ADVANCED IN-VEHICLE STORAGE

200GB Small Form Factor Automotive-Grade HDD Sets a New Industry Standard, Targeting Increasingly Capacity-Intensive On-Board Technical Applications

15. April, 2010, Neuss – Toshiba Storage Device Division (SDD), the pioneer in small form factor hard disk drives (HDDs), today strengthened its position as the world's leading manufacturer of automotive-grade HDDs with the announcement of a new device capable of delivering 200 Gigabytes (GB¹) of storage capacity in a single-platter design. The 4,200 RPM S-ATA MK2060GSC is the highest capacity automotive-grade HDD available. It, therefore, offers an ideal proposition to telematics manufacturers improving the in-vehicle user experience by integrating automotive infotainment systems, self-diagnostic systems, satellite GPS, navigation and communication tools into premium automobiles.

The MK2060GSC's launch builds on Toshiba's existing automotive product line, which in 2009 had 75 per-cent global market share². Its development meets growing auto industry demand for increased capacity HDDs, fuelled by consumer desire for multimedia applications and navigation systems physically integrated into their cars. As of March 2010, Toshiba has cumulatively shipped 14 million automotive-grade HDDs to market, in line with the Berg Insight forecast that by the end of 2009, 3.5 million passenger cars in Europe would have an on-board telematics system³. Similarly, IDC has forecast that automobiles will increasingly have in-dashboard

¹ One Gigabyte (1GB) means $10^9 = 1,000,000,000$ bytes and One Terabyte (1TB) means $10^{12} = 1,000,000,000,000$ bytes using powers of 10. A computer operating system, however, reports storage capacity using powers of 2 for the definition of $1\text{GB} = 2^{30} = 1,073,741,824$ bytes and $1\text{TB} = 2^{40} = 1,099,511,627,776$ bytes, and therefore shows less storage capacity. Available storage capacity (including examples of various media files) will vary based on file size, formatting, settings, software and operating system and other factors.

² Source: Toshiba 2009 Figures

³ Source: Berg Insight report, "Car Telematics and Wireless M2M – 4th Edition"

http://www.geoconnexion.com/geo_news_article/3.5-million-cars-in-Europe-have-telematics-device/6903.

infotainment systems that provide audio, video, and navigation information to passengers by 2012⁴.

The MK2060GSC has been designed to target telematic and infotainment applications where proven performance and capacity are critical, and represents a significant innovation in commercial automotive-grade HDD technology. It doubles the maximum storage capacity available today for automotive-ready HDDs, realising the highest linear recording density of 1,524k BPI for automotive-grade HDDs. Other technical benefits to Original Equipment Manufacturers (OEMs), include a 78 per cent improvement in internal transfer rates, compared to equivalent products on the market, a faster seek time of 12 milliseconds and extremely quiet 'silent seek' operation of 23dB. These features make it ideal for multimedia and navigation applications, which require a combination of high storage capacities and rapid data recall operating to meet users' satisfaction.

The launch of this product also enables manufacturers to deliver high storage capacity systems that offer exceptional levels of reliability. The MK2060GSC has been designed to withstand altitude variations of -300 to 12,000m (non-operating)/-300 to 5,650m (operating) and operating temperatures of -30 +85°C, delivering high levels of operating shock resistance (2,940m/s²) as well as increasing vibration resistance of 29.4m/s² (3G, 8-50Hz), 24.5m/s² (2.5G, 50-200Hz) and 19.6m/s² (2G, 200-500Hz). Therefore, telematics systems manufacturers deploying this product in high quality cars can continue to be confident in their products functioning normally, in extreme environmental conditions.

The MK2060GSC has been launched alongside the MK1060GSC, a further automotive-grade HDD offering storage capacity of 100GB. Both products in this series of HDDs are also suitable for use in industrial settings where extended temperature tolerance is required. In line with Toshiba's commitment to reducing its environmental impact, all drives are fully compliant with RoHS regulation and halogen-free.

"The next generation of automobile infotainment has now reached an entirely new level. The latest market innovations have revolutionised leading-edge infotainment systems in today's vehicle," said Martin Larsson, Vice President, Toshiba Europe,

⁴ Source: IDC report, "Worldwide Hard Disk Drive 2008-2012 Forecast and Analysis: Shrugging off Storage Technology Challenges".

Storage Device Division. "Our commitment to sustained innovation in this market means that Toshiba now works with four out of the five premium European telematics manufacturers. Increasing consumer demand for content-rich multimedia entertainment in the car, along with the growing popularity of GPS navigation systems, have resulted in on-board telematics systems no longer being the preserve of the premium market. With our established lead in this sector, we believe that Toshiba is ideally positioned to provide telematics manufacturers with the high quality, reliable storage technology they need to capitalise on a rising market."

Harman International Automotive Division is a key player in integrating state-of-the-art technology such as the MK2060GSC, to create the future of automobile infotainment systems. Harman International Automotive Division was the first European manufacturer of OEM head/units with HDD navigation and started shipping the first units already in 2005.

"The groundbreaking systems coming to market today herald the future of in-vehicle infotainment, creating an emotional driving experience that touches all the senses. Our designs translate automotive manufacturers' visions of the next generation of auto infotainment into reality," said Marek Neumann, Vice President Advanced Engineering, Harman International Automotive Division. "With the launch of Toshiba's latest automotive-grade HDD, we are now designing the most innovative systems on the market, distinguished by leading-edge technology, intuitive ease of operation and unparalleled quality."

Information and Availability

Toshiba's MK2060GSC series will be commercially available from Q3 2010 for Industrial Distribution and Original Equipment Manufacturers. The devices are currently undergoing shipping to selected automotive partners for qualifications. For more information on Toshiba's line of industry-leading small form factor hard drives, visit www.storage.toshiba.eu

Technical Specifications

Model Number		MKxx60GSC
Capacity (Formatted)		200GB / 100GB ⁵
Number of platters		1
Number of heads		2 / 1
Average seek time		12ms
Interface		Serial ATA 2.6
Interface transfer rate		1.5Gb/s
Rotational speed		4,200RPM
External Dimensions (WxDxH; mm)		69.85mmx100.0mmx9.5mm
Weight		98g (max.)
Energy consumption efficiency		0.0040 W/GB / 0.0080 W/GB ⁶
	Classification	d
Temperature	Operating	-30°C - +85°C
	Non-operating	-40°C - +95°C
Atmospheric Pressure (Altitude)	Operating	495hPa (5,650m*) ~ 1,050hPa (-300m*)
	Non-operating	193hPa (12,000m**) ~ 1,050hPa (-300m*)
Vibration	Operating	29.4m/s ² , 3G(8-50Hz)
		24.5m/s ² , 2.5G(50-200Hz)
		19.6m/s ² , 2G(200-500Hz)
	Non-operating	49m/s ² , 5G(10-500Hz)
Shock resistance	Operating	2,940m/s ² , 300G(2.0ms,1/2sine)
		980m/s ² , 100G(11ms,1/2sine)
	Non-operating	7,840m/s ² , 800G(1.0ms,1/2sine)

⁵ One Gigabyte (1GB) means $10^9 = 1,000,000,000$ bytes and One Terabyte (1TB) means $10^{12} = 1,000,000,000,000$ bytes using powers of 10. A computer operating system, however, reports storage capacity using powers of 2 for the definition of $1\text{GB} = 2^{30} = 1,073,741,824$ bytes and $1\text{TB} = 2^{40} = 1,099,511,627,776$ bytes, and therefore shows less storage capacity. Available storage capacity (including examples of various media files) will vary based on file size, formatting, settings, software and operating system and other factors.

⁶ Energy consumption efficiency is calculated in accordance with the Law Concerning the Rational Use of Energy in Japan, which was enacted in 1979 to promote energy conservation and reduce energy consumption. The Law Concerning the Rational Use of Energy was most recently revised in 2009 with specific measurement criteria reflected in the specification indicated. Calculation of Energy consumption is dividing consumed energy by the capacity. The consumed energy and capacity shall be measured and specified by the Law Concerning the Rational Use of Energy.

* Transfer function by ICAO. Variations can occur depending on conditions such as temperature and other factors

** Chronological Scientific Tables. Variation can occur depending on condition such as temperature and other factors

-ENDS-

About Harman International Automotive Division

The range of services of the Harman International Automotive Division includes the development, design and production of pioneering state-of-the-art systems for audio, entertainment, information and communication technology for the automobile industry. Harman International Industries Incorporated (www.harman.com) develops, produces, markets and distributes a wide range of high-end audio and infotainment systems for the automotive, consumer and professional sector. Harman International is well-established in North and South America, Europe and Asia and employs around 10,000 people worldwide. The Harman International family includes well-known brands such as AKG®, Becker®, BSS®, Crown®, dbx®, DigiTech®, DOD®, Harman Kardon®, Infinity®, JBL®, JBL Professional®, Lexicon®, Mark Levinson®, Revel®, QNX®, Soundcraft® and Studer®. Its shares are traded on the New York Stock Exchange under the code "HAR".

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About Toshiba Europe Storage Device Division

Toshiba Europe Storage Device Division (SDD) has remained at the forefront of the storage industry for over 30 years and markets high quality hard disk drives to original equipment manufacturers (OEMs), system integrators and distributors within the EMEA region. As the only full-range supplier of 3.5-inch, 2.5-inch and 1.8-inch HDDs in the world, Toshiba sets many of today's industry standards for HDD technology. Throughout its history, Toshiba SDD has revolutionized the design and development of small form factor storage devices and its HDDs can be found inside the world's leading GPS navigation systems, portable media players and entertainment systems. The company also pioneered the development of automotive-grade HDDs and to date, leads in the automotive HDD segment with an 75% market share. In addition, Toshiba Storage Device Division offers an extensive range of advanced technology drives such as high durability 24/7, extended temperature and Solid State Drive development for the industrial and enterprise sector applications as well as portable external hard disk drives.

About Toshiba

Toshiba is a world leader and innovator in pioneering high technology, a diversified manufacturer and marketer of advanced electronic and electrical products spanning information & communications systems; digital consumer products; electronic devices and components; power systems, including nuclear energy; industrial and social infrastructure systems; and home appliances. Toshiba was founded in 1875, and today operates a global network of more than 740 companies, with 199,000 employees worldwide and annual sales surpassing 6.6 trillion yen (US\$73 billion). Visit Toshiba's web site at www.toshiba.co.jp/index.htm.

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