

## **Toshiba America Electronic Components, Inc.** **-Corporate Fact Sheet-**

### **COMPANY OVERVIEW**

Toshiba is the heartbeat within market-leading designs. Working closely with design engineers to navigate and define the ever-changing need for innovation, Toshiba Corp. (Toshiba) and its subsidiary in the Americas, Toshiba America Electronic Components, Inc. (TAEC), deliver value-added solutions with conviction, passion and artistry.

Toshiba fosters long-lasting relationships with OEMs, ODMs, CMs, VARs, distributors and fabless chip companies, and is committed to enabling product breakthroughs with advanced, reliable electronic components and responsive technical support. With seamless design and manufacturing of high-quality flash memory-based storage solutions, solid state drives (SSDs), hard disk drives (HDDs), discrete devices, advanced materials, medical tubes, custom SoC/ASICs, digital multimedia and imaging products, microcontrollers and wireless components, Toshiba makes possible today's leading smartphones, tablets, ebooks, digital music players, cameras, medical devices, TVs, automotive electronics and more.

### **TOSHIBA AMERICA ELECTRONIC COMPONENTS, INC.**

#### **FACTS AT A GLANCE**

- Wholly-owned U.S subsidiary of Toshiba America, Inc. (TAI)
- Approximately 400 people
- Locations: 14 US, 1 Brazil
- Quality: ISO9001: 2008 Certification, ISO TX16949 Certification (product dependent) and ISO 14001:2004 Certification
- Focused offering of memory, electronic components, storage products and custom chips

### **TOSHIBA CORPORATION**

#### **FACTS AT A GLANCE**

- \$77 billion in net sales (Consolidated basis FY010)<sup>1</sup>
- 203,000 employees (as of May, 2011)
- Japan's largest semiconductor manufacturer, and 3rd largest worldwide (Gartner, 2011 WW Semiconductor Revenue, March, 2012)
- A leader in high-growth market segments

### **WHAT DISTINGUISHES TOSHIBA CORPORATION?**

- *Demonstrated commitment to innovative, advanced technology:*
  - Toshiba Corporation consistently leads in areas of innovation and ranks 5<sup>th</sup> in the world in total number of U.S. utility patents granted between 1963 and 2009 (U.S. Patent Office) and 6<sup>th</sup> for 2010 and 5<sup>th</sup> with 2483 patents in 2011. (IFI's Top-50 Patent Assignees)
  - Toshiba launches an LSI that supports TransferJet™ a revolutionary new wireless technology that allows large files to be transferred between electronic devices by simply touching TransferJet enabled products together.

- A principal innovator of Flash memory, now offers a broad selection of MLC and SLC NAND storage solutions.
- Toshiba acquired Fujitsu HDD business in 2010, creating the broadest portfolio of products in the storage industry.
- An industry leader in providing ASIC and COT services to customers that require advanced CMOS process technologies in 90, 65, 40, and 28 nm.
- A leader in high-quality CMOS image sensors for camera-enabled cellular phones and chip scale camera modules (CSCM) featuring BSI technology.
  
- *Commitment to high-quality, reliable products:*
  - The foundation of Toshiba's business is to provide quality products and services on time to its customers. This goal is supported by Toshiba's policy and basic commitment and core values of service, continual improvement, communications and teamwork with integrity.
  
- *Consistent support of quality standards and achievement:*
  - ISO9001/2008 Certification, ISO TX16949 Certification (product dependent) and ISO 14001:2004 Certification
  
- *Commitment to responsive technical, design and sales support:*
  - TAEC operates two design centers in the U.S., and Toshiba has design centers and technical support worldwide.
  - World-class distributors with strong customer support organizations can service Toshiba customers worldwide. These distributors include Avnet, Inc., Arrow Electronics, Inc., DigiKey, Mouser Electronics and TTI. Distributors of HDD and SDD products include Allplus Computer Systems Corporation, D&H, MA Laboratories, Microland Electronics, Synnex Corporation and others.

## **PRODUCT OVERVIEW**

TAEC offers a broad range of enabling technology solutions that allow OEMs, ODMs, CMs and fabless chip companies to develop advanced integrated products for the computing, networking, communications, digital consumer, automotive and other markets.

### **Analog Components**

A wide selection of LED display drivers and LED backlight/lighting drivers, shock sensor amplifier ICs, audio power amps, motor controller and driver (MCDs) ICs including DC brushed motor drivers, stepping motor drivers, and brushless (BLDC) motor controllers/drivers and more.

### **Automotive ICs**

Toshiba offers single-chip CD-MP3 ICs, audio amps, graphics display chips, Bluetooth® ICs, RFICs for remote keyless entry (RKE), tire pressure monitoring systems (TPMS), and ARM® processor core based microcontrollers for entertainment/information, body/chassis and safety/security applications. These Toshiba system-level solutions reduce cost, design cycles and enhance reliability.

### **Custom System-on-Chip (SoC)/ASIC**

Toshiba is an industry leader in providing ASIC and COT services to customers that require advanced CMOS process technologies. Key offerings from the company include 90nm, 65nm, 40nm and 28nm CMOS process technologies, advanced 300 mm wafer fab, shuttle services that enable an ASIC prototype with low NRE costs, two U.S.-based Design Centers and more.

**Diodes**

Toshiba offers a broad line up of diodes including general-purpose, fast and ultra-fast recovery, Schottky, PiN diodes for RF switch, Varactors for voltage-controlled oscillators (VCO), and diodes for ESD protection.

**Imaging Components**

Toshiba is a leader in imaging solutions and provides a wide range of CMOS sensors that feature Backside Illumination (BSI) technology for better light sensitivity and CCD (charge-coupled device) image sensors. The Toshiba CMOS image sensors employ a low-noise pixel structure that achieves high-picture quality with low-power consumption, even in low-light conditions, for camera phones and other mobile applications. Toshiba also has a line of ultra-compact chip scale camera modules that enable a 64 percent reduction in module size compared to other modules using the same sensor. The CCD linear image sensors provide speed and high-image quality for printers, scanners, and bar-code readers.

**Linear ICs**

Toshiba offer a wide range of general purpose linear ICs including power supply ICs, intelligent power devices, motor drivers, operational amplifier ICs and comparator ICs, interface drivers and small signal MMICs.

**Logic ICs**

As a leader in logic technology, Toshiba offers one of the industry's broadest selections of logic products specializing in low voltage and small packaging options to meet today's design demands for computing, consumer and telecommunications applications.

**Medical and Industrial Tubes**

Toshiba offers imaging system components for a variety of medical, dental and industrial applications. Toshiba also provides microwave tubes used for broadcasting, data communications, radar devices, medical accelerators and industrial heating, along with higher power devices for advanced scientific fields such as large-scale accelerators and nuclear fusion facilities.

**Memory**

Toshiba is the inventor of NAND Flash technology and the principal innovator of both NOR and NAND Flash memory. Today, Toshiba offers one of the industry's broadest line-ups of MLC and SLC NAND Flash-based storage solutions enabling a wide range of applications. The company offers enterprise grade NAND Flash components, solid state drives, embedded NAND Flash solutions such as e-MMC™, SmartNAND™ and BENAND™ and removable SD Cards and USB Flash drives with industry leading performance and capacities. A leading innovator in packaging technology, Toshiba also offers Multi-chip Packages (MCPs) combining NAND and other memory devices in a single component for mobile devices.

**Microcontrollers**

The company offers an extensive line-up of 32-bit microcontrollers based on ARM® processing cores and 8-, 16- and 32-bit CISC and 32-bit RISC microcontrollers using Toshiba's original design CPU cores. Toshiba microcontrollers contain a wide selection of memory options, LCD controllers, power ranges, clock speeds and other popular on-chip peripherals, to cover a wide array of applications such as consumer products, home appliances, home automation, industrial and automotive applications.

**Microwave**

Toshiba is a leading supplier of high-performance gallium nitride (GaN) and gallium arsenide (GaAs) microwave devices that operate in S, C, X, Ku and Ka frequency bands. The company's high power products are used in wireless applications such as, SATCOM (SSPA/BUC/VSAT), microwave link (PTP, PTMP), RADAR, medical equipment, and industrial applications. Toshiba recently introduced the development of Ka-band high power GaN HEMTs to support SATCOM applications and new efficient, high-gain power GaAs FETs, MMICs, and modules.

**Optical Semiconductor Devices**

As a leading Optoelectronics supplier, Toshiba offers a wide range of photocouplers. Housed in a white mold package, the Toshiba photocouplers consist of either a GaAs or GaAlAs infrared LED(s) and a silicon photodetector(s). GaAlAs LEDs are adopted in high-speed photo-IC types due to their high-speed and high-light output. Toshiba's innovative white mold packaging contributes to high sensitivity, high CTR and superb reliability. To meet the space-saving requirements of increasingly smaller and thinner end products, packaging options include mini-flat packages (MFSOPs) and half-pitch (1.27 mm) mini-flat SOP packages. Toshiba also offers a series of fiber optic devices called TOSLINK™ which use optical interconnects to achieve noise-free transmission.

**RF Devices**

Toshiba offers broad line up of Radio-Frequency devices which include MOSFETs, Bipolar transistors, Diodes, RF Cell packs, and RF amplifier ICs. A complete line-up of surface-mounted parts is offered to support miniaturized, higher-performance electronic devices.

**Storage Products**

Toshiba is a leading total storage provider who combines execution agility with the resources of a global technology corporation. Toshiba offers the industry's most comprehensive range of storage technologies, from hard disk drives (HDDs) to solid state drives (SSDs). Toshiba is the world's only storage supplier that owns design, development, manufacturing, sales, and other infrastructure functions spanning the enterprise, mobile, and retail environments for both HDD and SSD products.

**Transistors**

Toshiba offers power semiconductors for computing, consumer, industrial and automotive applications that require high reliability, power efficiency and a compact design. The product line includes low and high voltage MOSFETs, DC-DC MCMs, DTMOS, IGBTs, Bipolar Transistors, Diodes, Regulators, IPDs, Transistor Couplers, IC couplers and System Power Devices.

**Wireless**

Toshiba offers the TransferJet close-proximity wireless data transfer LSI for transfer of large files between electronic devices by simply touching two TransferJet-enabled devices together. As a founding member of the Bluetooth SIG, participation in the TransferJet Consortium and participant in other standards bodies such as MPEG and MIPI, Toshiba products are designed to comply with applicable global standards. Toshiba RFICs for keyless entry and tire pressure monitoring systems, bridge chips, LCD controllers, flexible I/O expanders, and Bluetooth ICs provide the right technology to meet wireless communications design needs. These products enable new features in mobile handsets, portable consumer electronics, tablets, ebooks and other mobile devices.

**TAEC CORPORATE HISTORY**

Toshiba, the Tokyo-based parent company, established American operations in 1965 through the incorporation of TAI. In 1999, Toshiba established eight in-house companies to address major distinct markets. In 2010, the Storage Devices Division became part of Toshiba Semiconductor and the company is now called Toshiba Semiconductor and Storage Products Company. The Storage Devices Division is now a business unit of TAEC.

**COMPANY ACCOMPLISHMENTS**

With more than 130 years of operation, Toshiba has recorded numerous firsts and has made many valuable contributions to technology and society. Some recent milestones follow:

- Toshiba launches breakthrough TransferJet™ LSI for rapid transfer of large files between electronic devices by simply touching them together. A 100 MB file can be transferred or streamed in as little as 2 seconds.
- Reinforcing its leadership in the development and fabrication of cutting-edge, high density NAND flash memories, Toshiba launches 19nm process NAND flash memory and produces the world's finest process yields single chips with a 64 gigabit capacity (4/11)

- Toshiba announced the launch of 8GB (gigabyte) 16GB<sup>3</sup> and 32GB SDHC UHS-I cards compliant with the SD Memory Card Standard Ver. 3.0 (SD 3.0), UHS104. These new SD cards offered the world's fastest<sup>4</sup> SDHC data read and write speeds at the time of release. (9/10)
- Toshiba developed the industry's highest capacity (at the time of release), 128GB e-MMC embedded NAND Flash module with support for both SLC and MLC NAND for Smartphones and CE devices. (6-10)
- Toshiba adds 500GB USB 2.0 portable external hard disk drive (HDD) to personal storage line. (09)
- Toshiba introduces industry's first 64GB SDXC card. (9-09)
- Toshiba announces industry's first 32nm 128GB SSD modules in Half Slim and mSATA form factors to save space compared to HDD form factors (1/10)
- Toshiba adds complete system backup and password-protected encryption to personal storage line. (09)
- Toshiba announces the first 512GB MLC NAND solid state drive for the mobile computing market and other applications. (12/08)
- Toshiba expands its custom chip business with a new Virtual Prototyping tool that lowers design risk by enabling concurrent co-design of a chip, package and system, the availability of 40nm libraries, and new foundry and COT customers. (6/08)
- Toshiba reveals strategic initiative for mobile handset market to speed time-to-market with flexible, modular analog peripheral and mixed-signal building blocks. Toshiba has expanded its product portfolio with I/O expander ICs, an MDDI LCD controller, CMOS image sensors and compact modules for mobile applications. (08)
- Toshiba brings SATA technology to automotive HDDs with 80GB model. (08)
- Toshiba introduces its first commercial GaN semiconductor, a 50W, X-band HEMT for radar and medical applications (6/07), and achieved one of the highest levels of output power (at the time of release) in a Ku-band GaN device: 65.4W at 14.5GHz. (10/07)

## EXECUTIVE OFFICE

Hitoshi Otsuka, president and CEO

Shardul Kazi, senior vice president and technology executive, System LSI Group

Scott Maccabe, vice president, Toshiba America Electronic Components, Inc. and General Manager  
Toshiba Storage Products Business Unit.

## CORPORATE HEADQUARTERS

TAEC is headquartered at 19900 MacArthur Blvd., Suite 400, Irvine, Calif., 92612.

TAEC's System LSI Group is located at 2590 Orchard Parkway, San Jose, Calif., 95131.

TAEC's Storage Products Business Unit is located at 2825 North First Street,  
San Jose, Calif., 95134

For press inquiries related to TAEC, the appropriate contacts are listed below:

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<sup>1</sup>Press Announcement, May 9, 2011, Toshiba Corporation, Consolidated Financial Statement, Fiscal year End, March, 2011. page.2. The U.S. dollar is valued at Y83.

<sup>2</sup>Strategies for Transforming Toshiba into a Global Leader by Accelerating Our Global Business Development in Regional Areas, Norio Sasaki, May 24, 2011. page 34.

<sup>3</sup>Product density is identified based on the maximum density of memory chip(s) within the Product, not the amount of memory capacity available for data storage by the end user. Consumer-usable capacity will be less due to overhead data areas, formatting, bad blocks, and other constraints, and may also vary based on the host device and application.

<sup>4</sup>As of September 2, 2010.

**Legal Note.** These definitions are not intended to interpret the RoHS Directive and/or any other applicable law or regulation and do not constitute legal advice. The RoHS Directive itself and/or any other applicable law or regulation should always be read and understood (as they constitute the law), in contrast with the information contained herein, which is intended to be informative but has no legal authority. You should refer to the RoHS Directive itself and/or any other applicable law or regulation for a full statement of the legal requirements and in the case of any doubt take independent advice, including your own legal advice. The RoHS Directive itself and/or any other applicable law or regulation may be revised from time to time, so users should take care to keep themselves informed.

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