

ELECTRONIC COMPONENTS

CES 2012

Toshiba America Electronic Components, Inc.

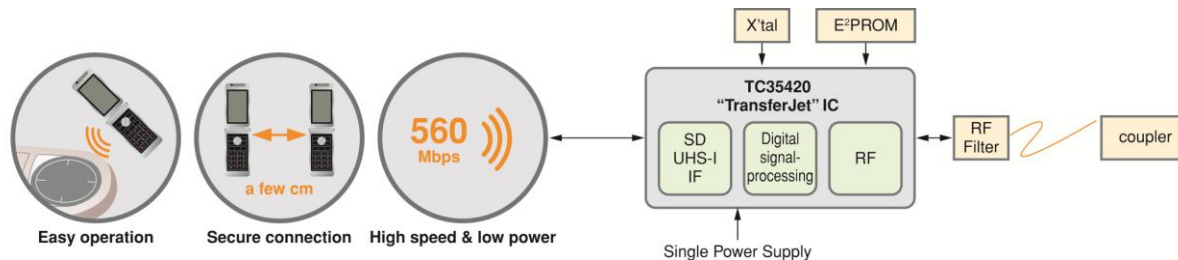
January, 2012

■ About Toshiba America Electronic Components, Inc. (TAEC)

- Wholly-owned U.S subsidiary of Toshiba America, Inc. established in March, 1989
- Approximately 400 people
- Locations: 14 Total (US) and 1 in Brazil
- Quality: ISO9001:2008 Certification
ISO TS 16949 Certification*
ISO 14001:2004 Certification
Management Innovations/Six Sigma Program
- Geographic Responsibility: The Americas
- Functional Responsibility: Engineering, Marketing and Sales

■ TAEC News for CES 2012

- **TAEC Announces Availability of TransferJet™ LSI**
 - Single-chip, mixed-signal TransferJet solution
 - Fast data rates (~375 Mbps), can transfer a 100 MB HD video file in 2 seconds
 - Small form factor (4.0mm x 4.0mm x 0.5mm)
 - Low-power consumption
 - TAEC solutions offer heightened signal sensitivity for more stable connection and greater range compared to other TransferJet enabled products.
- **Price: \$5 Sampling: Now**



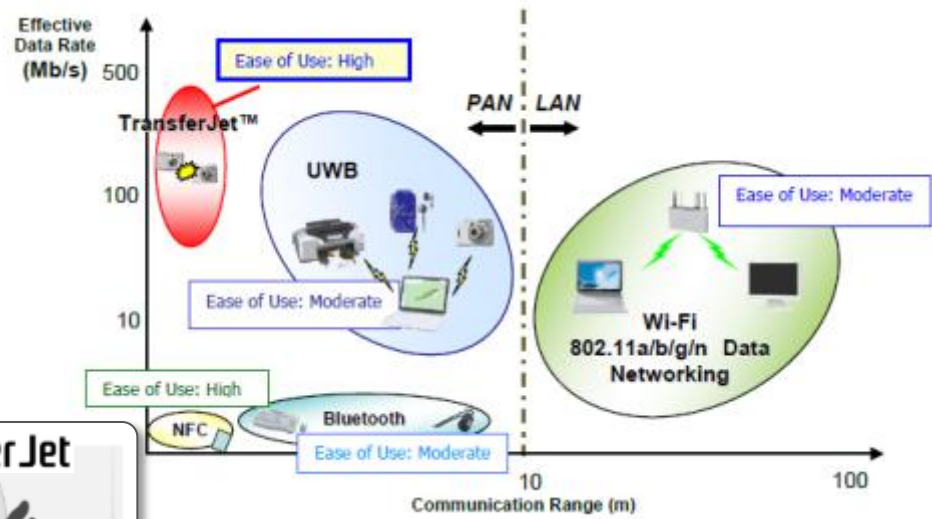
What is TransferJet™?

TransferJet is a Close Proximity Wireless Transfer technology.

- Easy** Data transfer between two devices is initiated by only touching them.
- High Speed** Effective data rate is 375Mbps.
- Low power** Very short transmission distance helps to minimize power consumption and data security issues.
- Secure**



Positioning of TransferJet



Effective Data Rate is 375Mbps.

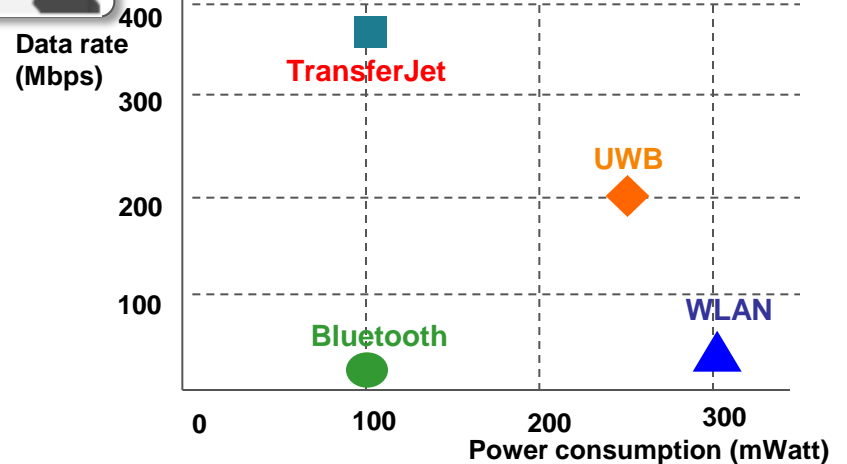
0.06 sec. for 10M pixel photo

2.0 sec. for 100Mbytes of video clip

0.2 sec. for 15Mbytes of news paper

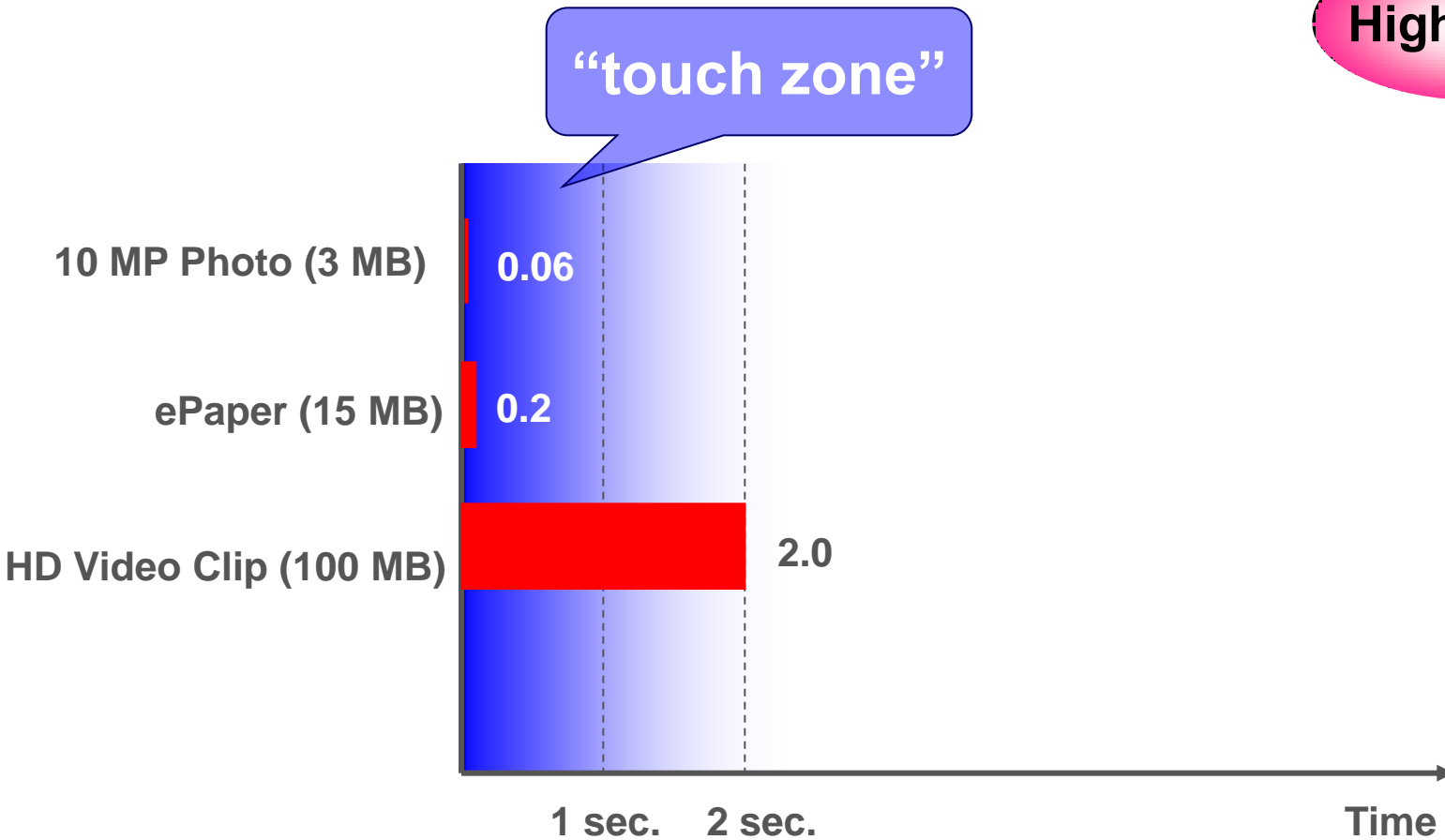
Video

Very high speed and low power



TransferJet™ Moves Large Files Fast

High speed



Toshiba Demonstrates TransferJet™ Tablet



Toshiba demonstrates applications running on Android 3.x:

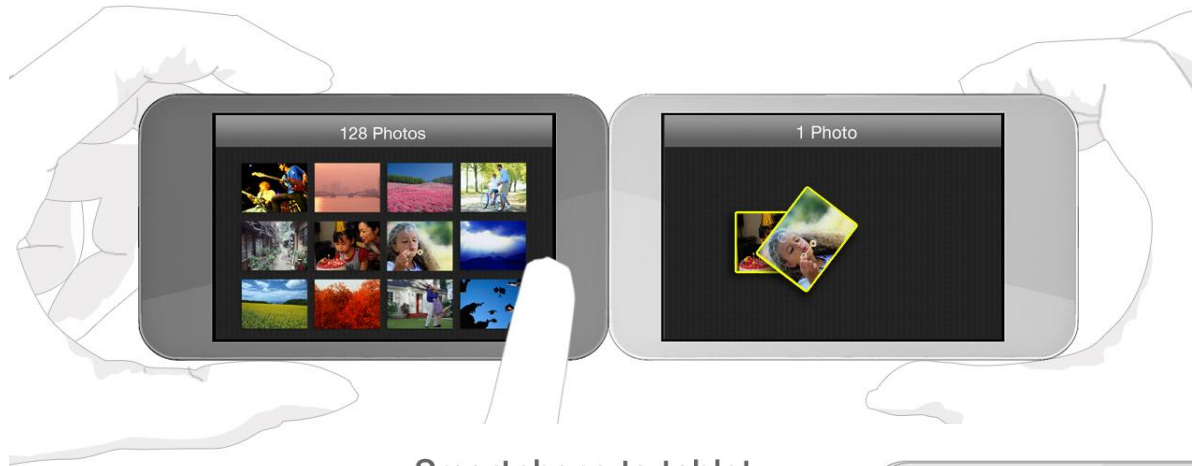
- Profile exchange
- Video file transfer
- Music file transfer
- Bookmark sharing
- Photo or other large data file transfer
- Ultra, high-speed data transfer between tablets

The Tablet Device Uses TransferJet™
Technology
(Toshiba Prototype)



TransferJet™ Applications

Smartphone to smartphone



Smartphone to tablet



TransferJet™ Applications

Home



Office



Mobile



Vehicle



■ Broad Industry Support for TransferJet™

Consortium Promoters

Sony Corporation (TransferJet Consortium Administrator)
Canon Inc.
CASIO COMPUTER CO.,LTD.
Hitachi Ltd.
JVC KENWOOD Holdings, Inc.
KDDI Corporation
NIKON CORPORATION
NTT DOCOMO, INC.
Olympus Imaging Corporation
Panasonic Corporation
Pioneer Corporation
SAMSUNG ELECTRONICS CO., LTD.
Seiko Epson Corporation
SOFTBANK MOBILE Corp.
Sony Ericsson Mobile Communications
Toshiba Corporation

Consortium Adopters

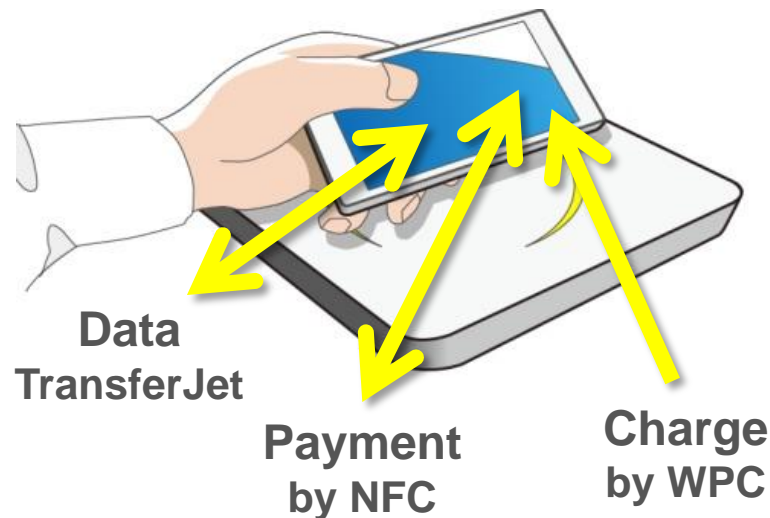
ADVANEX INC.
Agilent Technologies Japan, Ltd.
Allion Test Labs, Inc.
Askey Computer Corp.
Cambridge Silicon Radio Limited
CyberLink Corporation
d-broad, Inc.
E-Globaledge Corporation
FUJIFILM Corporation
Fujitsu Limited
Genesys Logic, Inc.
HOYA CORPORATION
Huawei Technologies Co., Ltd.
I-O DATA DEVICE, INC.
Japan Circuit Co., Ltd.
LeCroy Corporation
MediaTek Inc.
Murata Manufacturing Co., Ltd.
NEC Corporation
NHK Media Technology, Inc
NISSEI ELECTRIC CO., LTD.
NKB.INC
Renesas Electronics Corporation
RICOH Co., Ltd.
Seers Technology Co., Ltd
Sharp Corporation
SK Telesys Co., Ltd.
SMK Corporation

TAIYO YUDEN CO., LTD.
Tateno Dennou, Inc.
TOKO, INC.
TOTOKU Electric Co., Ltd.
Tyco Electronics Japan G.K.
TYO Inc.
UKC Electronics Corporation
XXCAL Japan Inc.

(List current as of Sept. 2011)

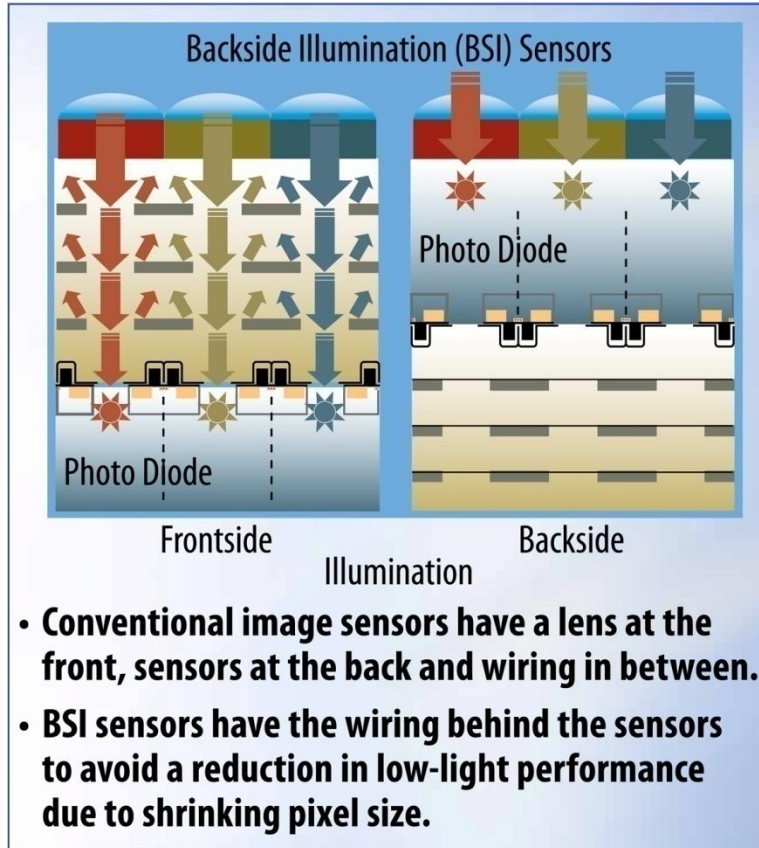
■ Toshiba Wireless ICs for Proximity *TransferJet™ + NFC + WPC*

- Data transfer, payment and battery charge at the same time with just a touch
- Ultra, high-speed data transfer by TransferJet provides data synchronization and instant HD video DL
- Secured transaction by NFC enables easy, contactless payment
- Cableless power charge by WPC everywhere
- Toshiba wireless IC enables new-generation applications that require only a “touch” to transfer files



■ BSI Technology at CES 2012

- Toshiba CMOS Image Sensors with Backside Illumination (BSI) Technology



- Improves light sensitivity and absorption by up to 40% compared to conventional designs
- Ideal for CE devices with small form factors

■ Toshiba BSI CMOS Image Sensors - Highlights

- Planning products up to the 24 MP for digital still camera applications and up to 16 MP for smartphones, tablets and new automotive applications
- Last announcement was for an 8 MP BSI CMOS image sensor with the industry's smallest pixel size (1.12 micrometers) as of 7/7/2011
- Toshiba makes its BSI image sensors in house on 300mm wafers



■ BSI Image Sensor Applications/Market Size

- Smartphones
- Tablets
- Laptops



- **Global CMOS camera module market expected to hit 1,989 million units in 2011, up 24.5% from 2010***
 - Numbers growing because more consumer devices are now using cameras

*Source: Research in China

<http://www.researchinchina.com/Htmls/Report/2011/6221.html>

■ Toshiba BSI Pixel Technology

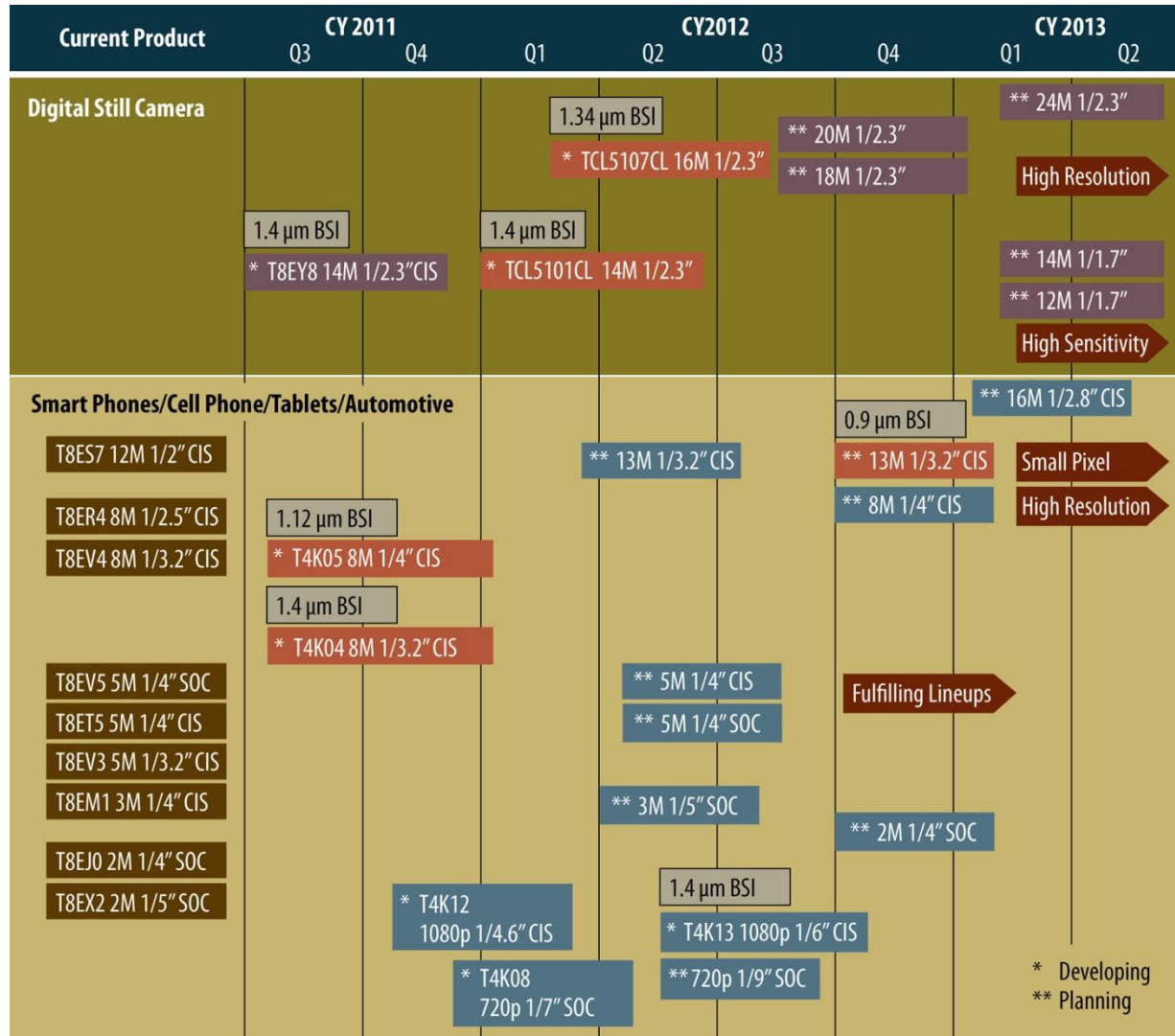
- First-generation BSI sensor in production (14 MP, 1.4 μm)
 - Delivers best-in class image quality
 - Recognized pixel technology and performance for DSC market



- Developing second-generation BSI sensor
 - Optimized pixel design and process for mobile device market
 - Pixel shrinkage for small form factor 1.4 μm \rightarrow 1.12 μm



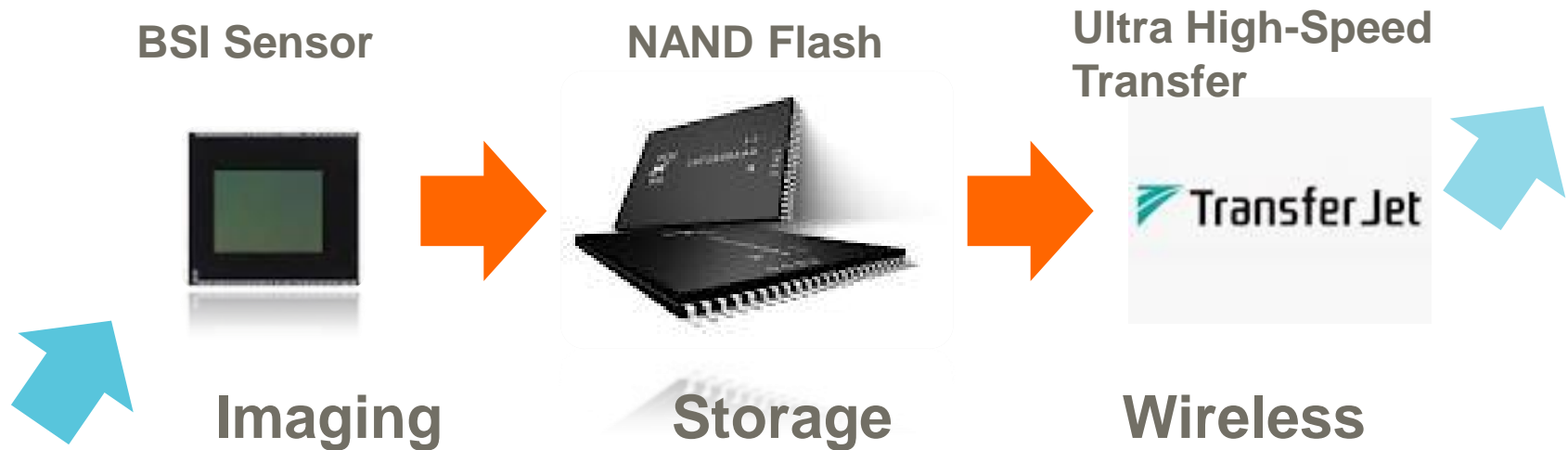
Toshiba BSI Image Sensor Roadmap



■ Core Technologies for CE

Sensor → Storage → Transfer

- HD video and photos are taken using a Toshiba sensor, stored using Toshiba memory and then transferred using Toshiba TransferJet™ technology
- Toshiba provides a total IC solution for CE products





TOSHIBA

Leading Innovation >>>