

Information Meeting 2012

December 7 2012

Murata Manufacturing Co., Ltd.



Murata's Focus Areas

**1) Growing
Markets**

**2) M&As /
Alliances**

**4) Emerging
Markets**

**3) State-of-the-
Art Technologies
& Products**

1) Growing Markets

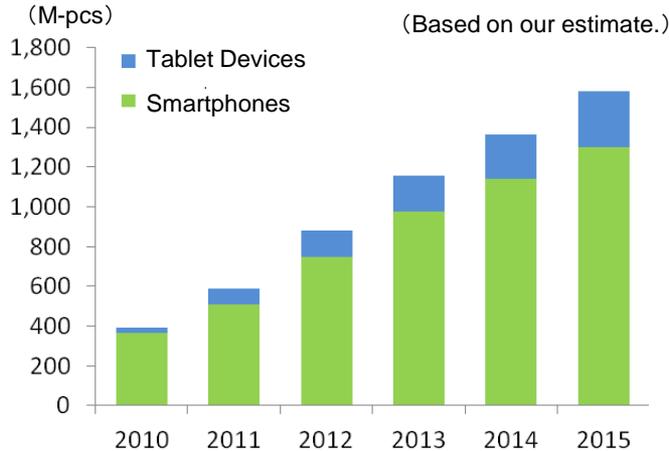
Growing Target Markets



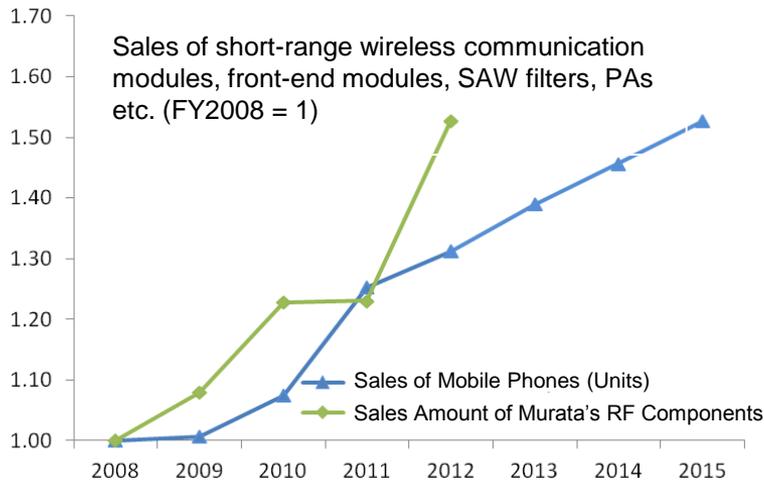
Murata is focusing on capturing new demand while reinforcing sales for the core markets such as wireless communications and computers.

Rapid Expansion of Mobile Cloud Devices

Demand Forecast of Smartphones & Tablet Devices



Sales Trend of Murata's RF Components



Mobile & Short-Range Wireless Communications

- Internet connection thru cellular or/and WiFi communication becomes indispensable.
- Increase in # of frequency bands with the spread of LTE
⇒ Growing demand for RF components such as SAW devices, RF chip inductors, PAs, front-end modules, and WiFi modules
⇒ Demand for highly-efficient PAs on the rise to lower power consumption
- Emerging demand for components for NFC with the prevalence of NFC-equipped phones

Larger Battery Space inside Thin/Compact Device

- Limited space for components in order to pack a larger battery in a thin/compact device
- ⇒ Growing demand for ultra-compact 0402 MLCCs (0.4x0.2x0.2mm), and ultra-low profile MLCCs used with component built-in substrates
 - ⇒ Accelerating demand for our communication modules

Faster Processing Speed

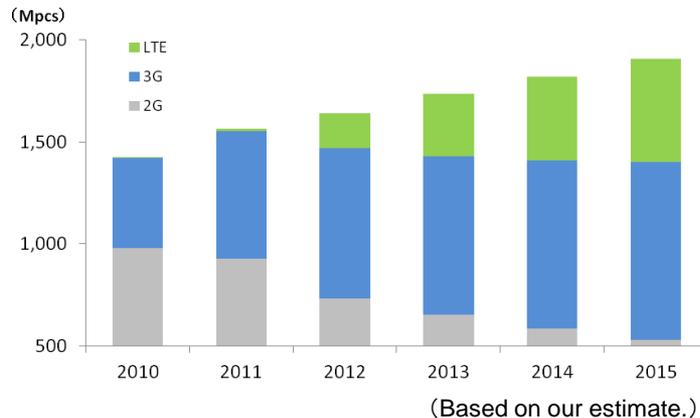
- Increase in # of cores in CPUs and GPUs (Dual-Core/Quad-Core)
- ⇒ Rise in # of MLCCs used
 - ⇒ Growing demand for EMI suppression components in response to the increase in operating frequencies



Progress of LTE ⇒ Exploding Demand for Murata's Components

Growing LTE Markets All Over the World

Demand Forecast of LTE Devices



- ✓ Rising demand for LTE, highly efficient in spectrum use, with the rapid spread of smartphones
- ✓ Growing demand for Murata's high value-added components with the demand shift to sophisticated LTE devices
- ✓ Diffusion of LTE Tablets, notebook PCs, and data cards in addition to LTE smartphones

1

Increase in # of frequency bands per device with multiband connections to 2G+3G+LTE networks

⇒ Rise in # of SAW devices and RF chip inductors

2

Growth in # of antennas and RF circuits when diversity feature is applied

⇒ Increase in # of communication modules and connectors

3

Growing demand for ultra-compact components such as 0402/0603 MLCCs in response to increasing complexity of circuits

⇒ Sales expansion of ultra-compact components Murata has high market shares

More Complicated RF Circuits ⇒ Increase in # of Frequency Bands

Main RF Circuit of
an LTE Device

of Frequency
Bands

10

(e.g.)
2G devices 2~3 Bands
3G devices 6~7 Bands



Main RF Circuit
+ Diversity

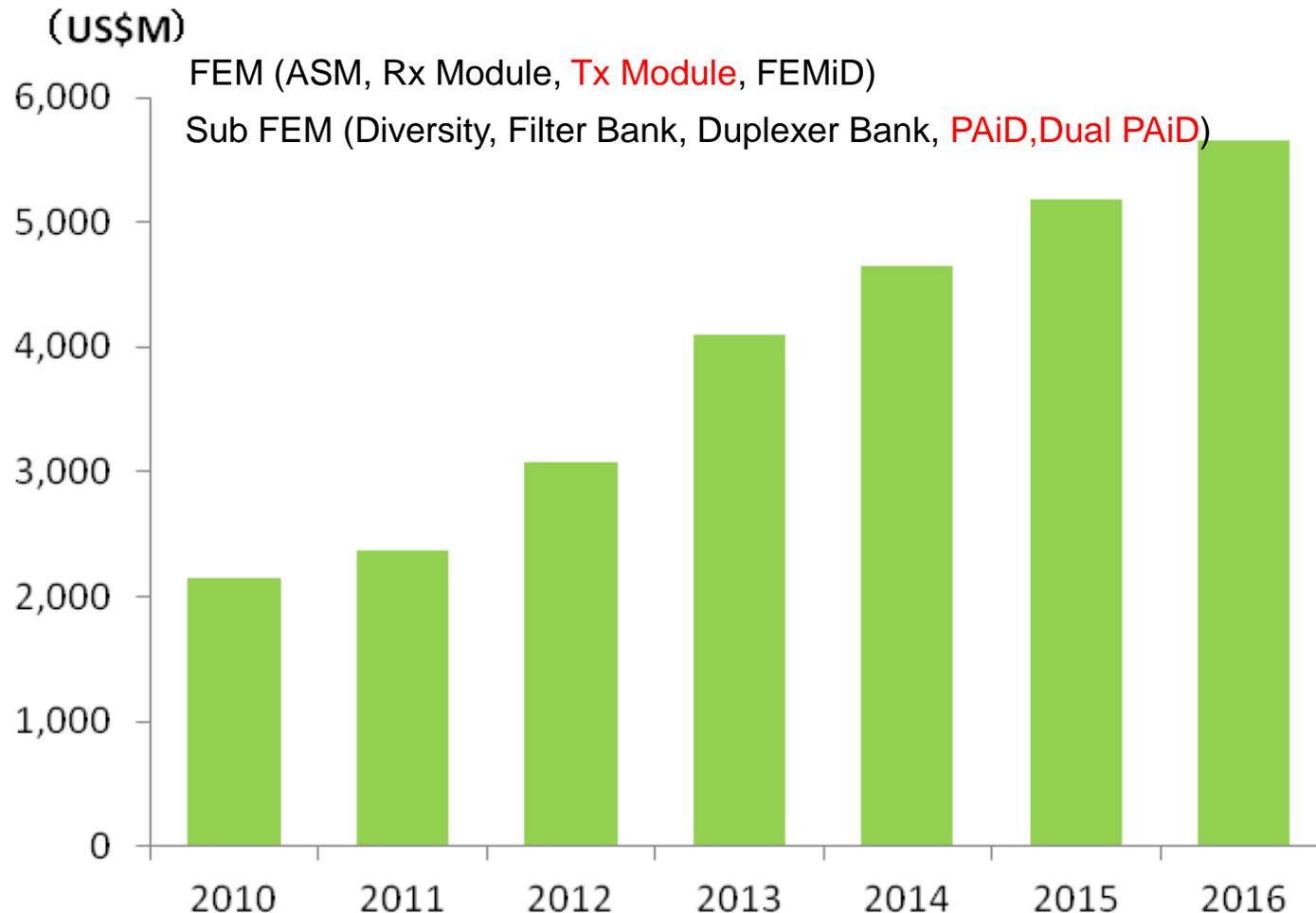
1.5x

of frequency bands
becomes 1.5x when
diversity feature is
applied to an LTE
device.

(Based on our estimate.)

More Complicated RF Circuits ⇒ Growing Demand for FEMs

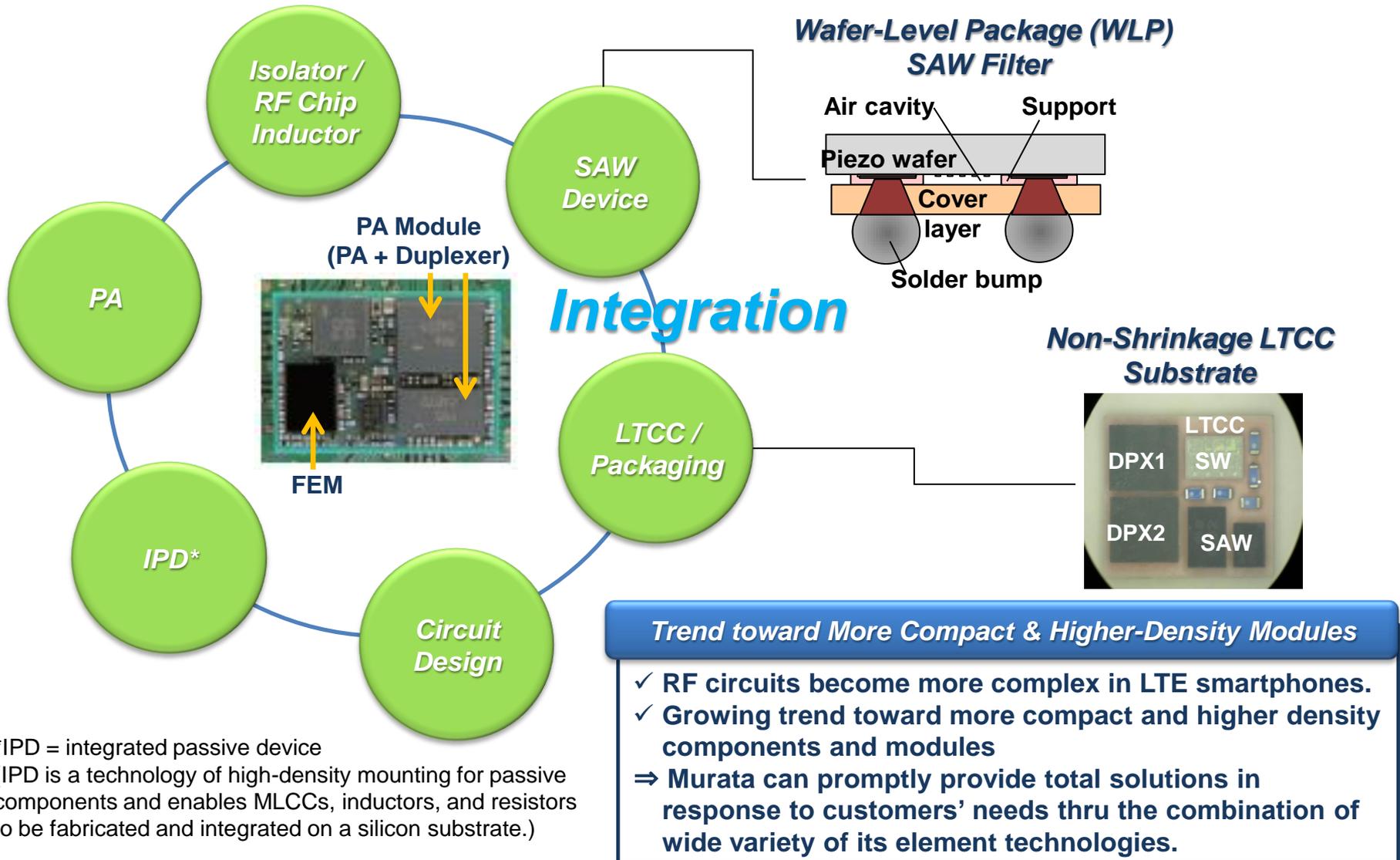
Demand Forecast of FEMs (Front-End Modules)& Sub FEMs (Sub Front-End Modules)



(Source: Navian / RF Devices/Modules For Cellular Terminal 2012-2013)

Murata's Strengths in FEM Market

~ Module Technologies ~



*IPD = integrated passive device
(IPD is a technology of high-density mounting for passive components and enables MLCCs, inductors, and resistors to be fabricated and integrated on a silicon substrate.)

Smartphones Get Smarter ⇒ Growing Demand for Murata's High Value-Added Components

	2G Feature Phone	3G Feature Phone / Low-End Smartphone	High-End Smartphone (3G)	High-End Smartphone (LTE)
MLCC	100 to 200	300 to 400	400 to 500	500 to 700
(Ultra-Compact MLCC)	—	100 to 200	300 to 400	400 to 500
SAW Device (w/o Diversity & MIMO)	2 to 3	3 to 6	6 to 8	10
WiFi Module	—	Yes/No	Yes	Yes

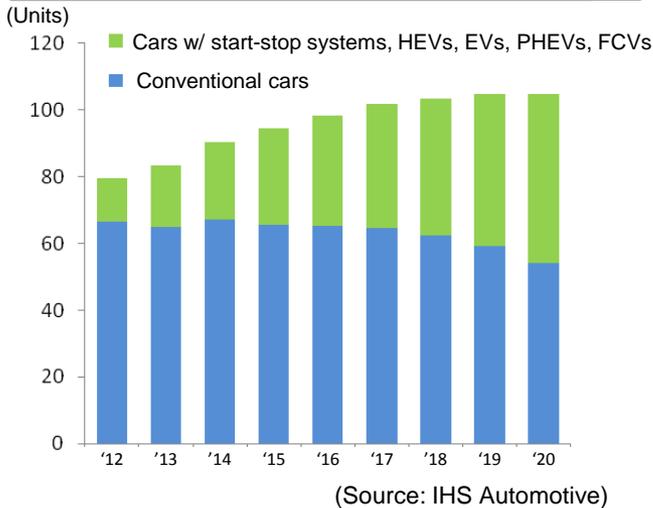
	Notebook PC	Tablet Device (3G)	Tablet Device (LTE)
MLCC	700 to 800	500 to 600	600 to 800
(Ultra-Compact MLCC)	100	200 to 300	300 to 500
SAW Device (w/o Diversity & MIMO)	—	6 to 8	10
WiFi Module	Yes/No	Yes	Yes

(All figures in this page are based on our estimate.)

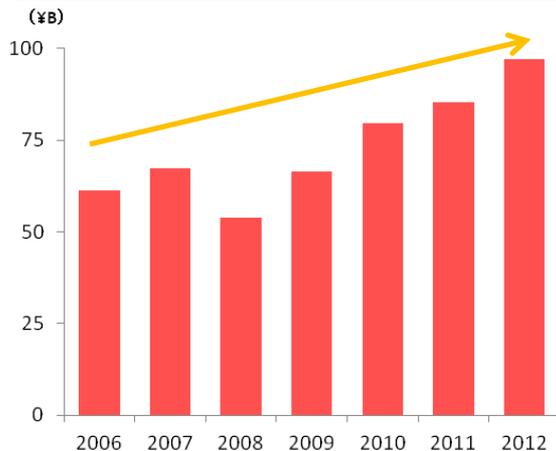
Automotive Market

~ Progress of Electronic Control ~

Sales Forecast of Worldwide Vehicles



Murata's Sales Trend for Automotive



Electrification

Improvement in Automobile Functions thru Electronic Control

Safety

Improvement in Safety Functions thru Sensing Technologies

Telematics

Wireless Networks Inside & Outside Vehicles

Growing demand for electronic components for the automotive market with the progress of electronic control of vehicles

Electrification

~ Increase in Use of ECUs ~



Power Train

- Engine
- Transmission
- Idling Stop

Underbody

- Power Steering
- Brake
- Suspension

Safety

- Parking Assist
- ESC
- Collision Prevention
- TPMS

HEV / EV

- HEV / EV Motor
- Inverter
- Battery Management
- Wireless Power Feed

Information

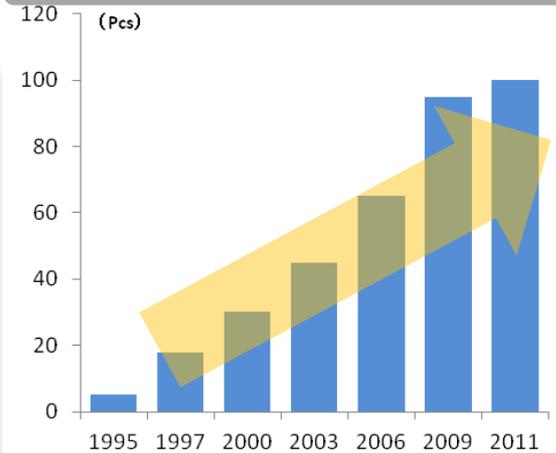
- ETC
- Navigation
- Center Information Display

Body

- Air Conditioning
- Smart Key
- Power Window
- Airbag



Use of ESCs per Luxury Car



(Source: JEITA)



Dozens to hundreds of MLCCs per ECU

Growing Demand for Electronic Components for Automotive

- ✓ The # of ECUs used will increase, as the electrification of vehicles will progress for gasoline/diesel vehicles such as ones equipped with start-stop systems, in addition to HEVs, PHEVs, and EVs.
- ✓ One to three thousands of MLCCs are used per vehicle.
- ⇒ The more ECUs are used, the more electronic components for automotives with high-temperature guarantee and high reliability are used.

Telematics

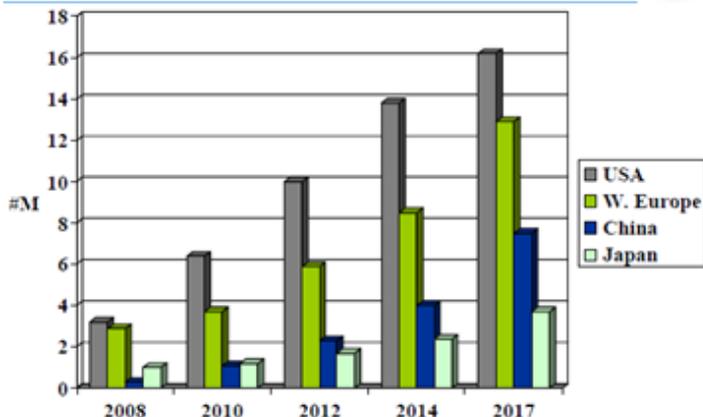
~ Networks Inside & Outside Vehicles ~



Product Lineup

- LTE Module
- BT/WiFi/GPS Combo Module

OEM Mobile Device Telematics Sales



(Includes content supplied by IHS; Copyright© IHS, 2011.
All rights reserved)

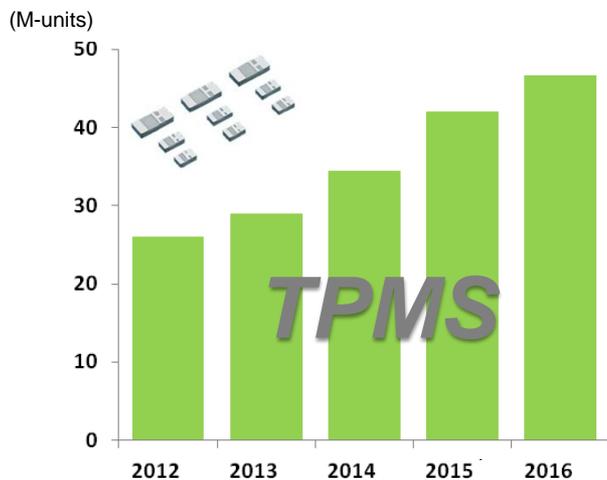
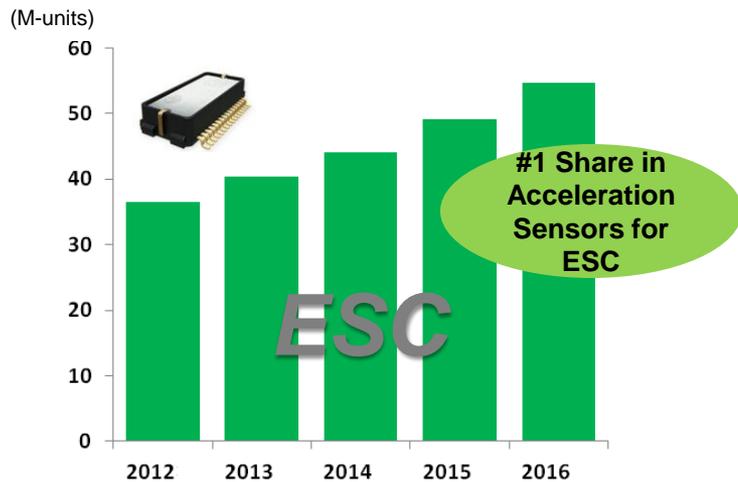
High Potentiality for Automotive Wireless Communications

- ✓ Infotainment in vehicles accelerates wireless communication functions.
 - ✓ Automotive wireless communications will prevail in response to the legislations for the eCall in the EU (automated emergency calls from cars in case of serious road accidents) and stolen vehicle tracking systems using GPS.
- ⇒ Murata will capture growing demand for the automotive wireless communication market with RF technologies, software technologies, and consistent support incl. authentication services we have fostered in the consumer electronic market.

Safety

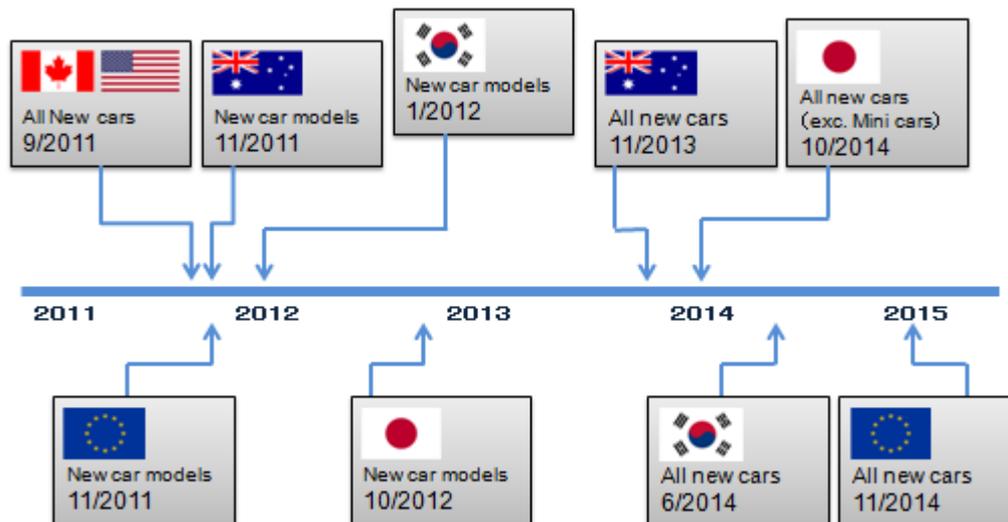
~ Improvements in Automobile Safety ~

Demand for Vehicles Equipped with Safety Features



(Source: Fuji Chimera Research Institute, Inc.)

Legislation Schedule of ESC (Electronic Stability Control)



Legislation for Safety Features Using Sensing Technologies

- Legislations for mandatory use of ESCs are being implemented to prevent sideslip and rollover of vehicles.
 - Increase in use of safety functions using sensors such as crash prevention, ABS* and TPMS*.
- ⇒ We will reinforce our competitiveness in high reliability and high performance MEMS sensors through the acquisition of VTI Technologies Oy.

* ABS = Anti-lock Braking System

TPMS = Tire Pressure Monitoring System

MEMS = Micro Electro Mechanical System

2) M&As / Alliances

PA (Power Amplifier) Business

Authentication Support for Platform Companies

- We will strengthen support activities to realize new entries.
- ⇒ Organized a dedicated development team to build up a support system in close contact with customers.
- ⇒ Established a lab to respond to customers' requests in an expeditious way.

Development of Highly-Efficient PAs

- High-efficiency in power-consuming RF circuits is #1 priority for the spread of LTE devices.
- ⇒ Focus on developing PAs with low power consumption

Total Solution Services

- Maximizing synergies with our SAW devices, multilayer modules etc.
- ⇒ We can provide a wealth of solutions such as the improvement in efficiency of PAs through the integration with our competitive RF components and module technologies.



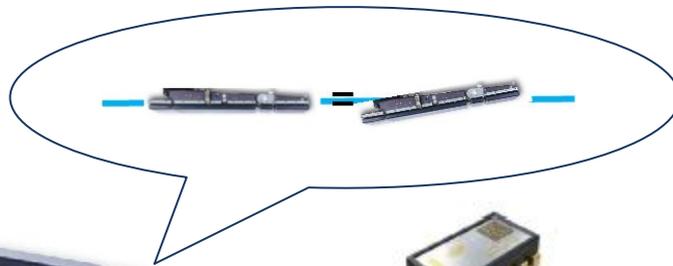
MEMS Sensor Business

Medical / Healthcare

Acceleration sensors with low power consumption and high precision for cardiac pacemakers



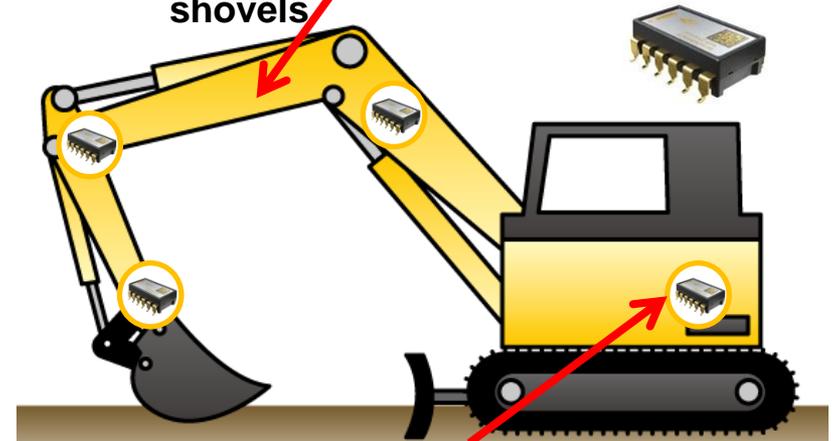
#1 Share
for CRM



Inclination sensors for high-precision positioning of diagnostic and therapeutic devices

Industrial Equipment

High-precision inclination sensors for detecting angle and tilt of power shovels



In Europe, it is mandatory to install a function to detect inclination of construction equipment .



Murata's MEMS sensors are used for wide variety of industrial equipment such as airplanes and seismic instruments.

Murata is deeply cultivating demand for its MEMS sensors used for various applications in the automotive and medical markets.

Other M&A and Alliances

Acquisition



- ✓ RFM has strength in wireless communication modules and SAW devices for the medical, automotive, industrial, and energy markets.
- ✓ Integration of RFM's proprietary protocol technologies such as FHSS (frequency hopping spread spectrum) and know-how for system development in the area of Machine to Machine (M2M) with varieties of Murata's hardware and software technologies
- ✓ Murata has acquired 100% shares of RFM, Inc.

Alliance



- ✓ Toko and Murata are promoting sales of metal alloy power inductors thru mutual collaboration.
- ✓ Target markets: Communication, AV, Computer, Automotive
- ✓ Both are jointly developing next-generation power inductors.
- ✓ Murata has invested ¥3.5B in Toko (¥2B allocation of new shares and ¥1.5B bond with warrant).

Alliance



- ✓ TEW (Tokyo Denpa) and Murata have jointly developed HCR[®], crystal resonators that are less expensive than conventional crystal resonators and more precise than ceramic resonators.
- ✓ Both are promoting sales in the HDD, ODD and USB markets where high precision is required, by utilizing quality crystal elements of TEW with Murata's sophisticated production technologies.
- ✓ Murata has acquired 31.9% of TEW's shares.

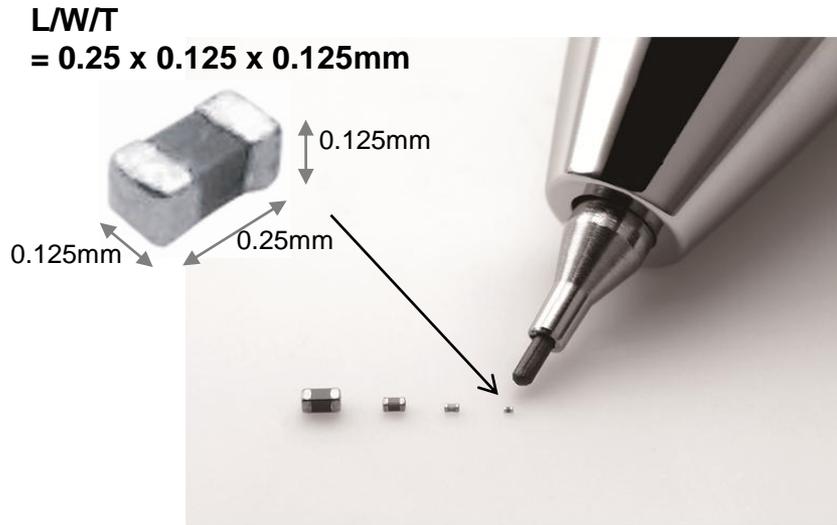
We are promoting M&As and alliances to gain technologies and markets unfamiliar to us.

3) State-of-the-Art Technologies and Products

Top Runner in MLCCs

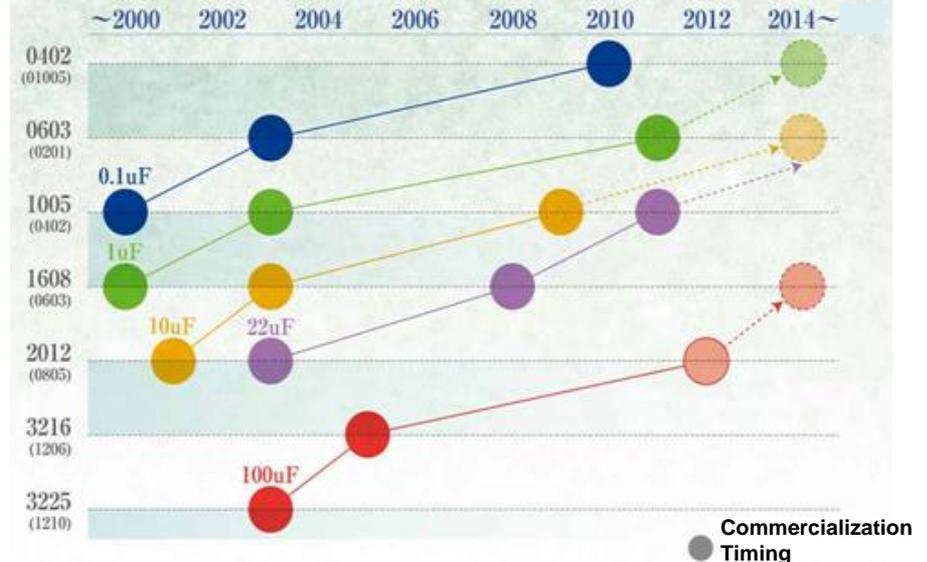
~ Technology Breakthrough ~

Development of World's Smallest 0201 MLCC



- ✓ Murata has developed the world's smallest 0201 MLCC (0.25 x 0.125 x 0.125mm).
- ✓ 75% reduction in volume compared with 0402 MLCC (0.4 x 0.2 x 0.2 mm)
- ✓ Expected to provide a sample by March 2014.

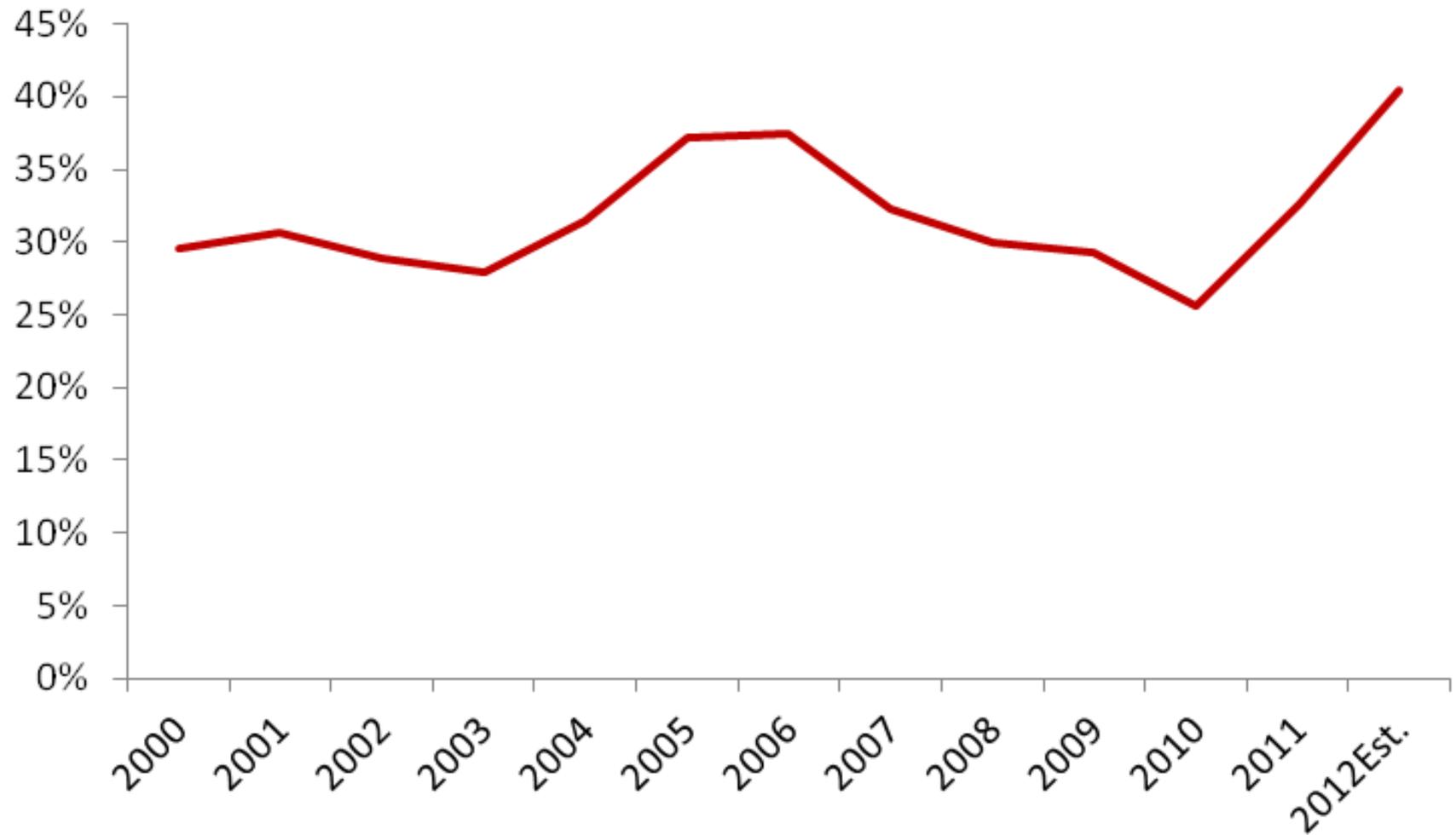
Trend toward Compact & High-Capacitance MLCCs



- ✓ Continued trend toward ultra-compact and high capacitance MLCCs
- ✓ We are shifting our product mix to state-of-the-art products in order to expand value-added.

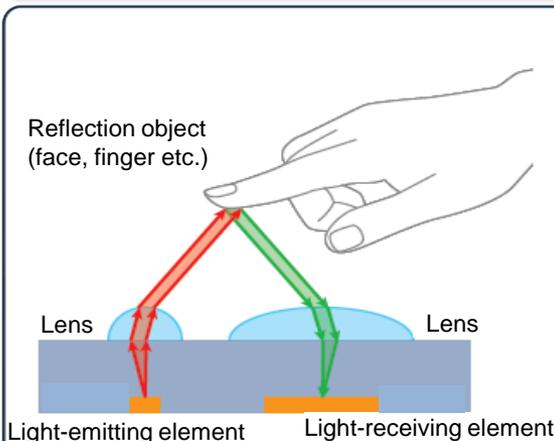
We are pursuing trend toward ultra-compact and high capacitance MLCCs as the top runner and continuing to lead the electronics industry.

Trend of New Product Sales Ratio



State-of-the-Art Products for Smartphones and Tablet Devices

Optical Interface



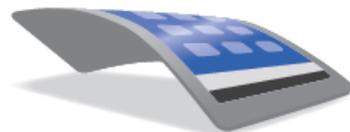
- ✓ Senses reflected light from an object and detects up-and-down, right-and-left, and perspective motion.
- ✓ Enables swipe and page-flipping without touching a panel display.
- ✓ Realizes multidimensional detection using a motion detection feature in addition to a proximity and illuminance sensor function.

Sensor Device Using High-Transparency Piezoelectric Film

Flexible device



Piezoelectric film that detects bending & twisting



Flexible Device

Touch panel



Piezoelectric film that detects pressure



Touch Panel Display

- ✓ Sensor device using high-transparency piezoelectric film that detects pressure, bending, and twisting without pyroelectric effect
- ✓ Enables zoom-in/out with one finger and improves user interface of smartphones.

※ This piezoelectric film has been developed jointly by Mitsui Chemicals, Inc., Mitsui Chemicals Tohcello, Inc., Kansai University, and Murata Manufacturing Co.

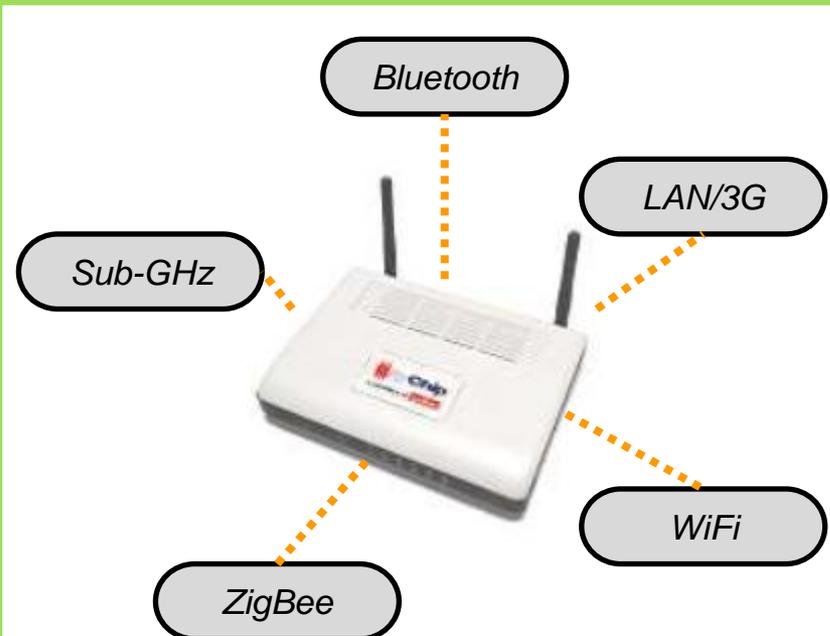
Solutions for Energy Management

WiFi Solution for HEMS



- ✓ Easily enables wireless communications among home appliances using complete modules equipped with all functions necessary for wireless communications.
- ✓ Provides WiFi solutions most suitable for Smart House and HEMS.

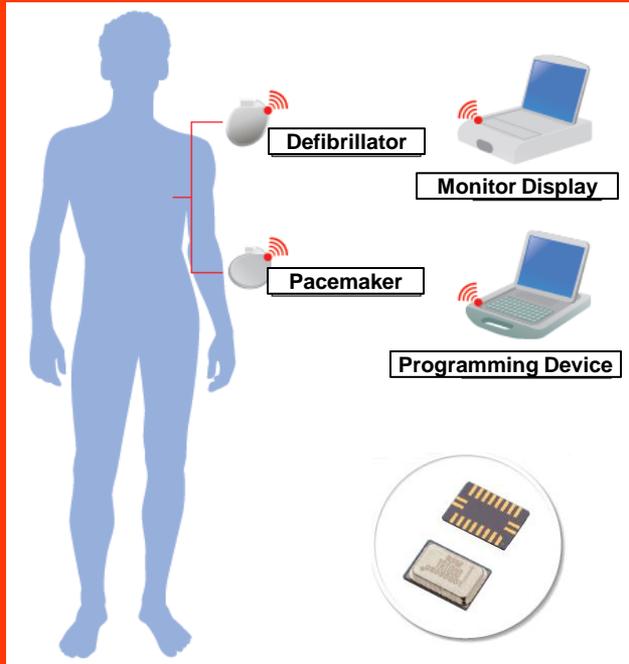
Home Gateway



- ✓ Compatible with multiple wireless communication standards and enables connections among lighting devices, home appliances etc.
- ✓ Allows monitoring and control of home appliances from outside thru 3G or LAN.

Solutions for Medical / Healthcare Devices

SAW-Embedded Modules for Short-Range Wireless Communication



Our SAW-embedded modules:

- ✓ Are developed by RFM, Inc., which Murata acquired in July 2012;
- ✓ Contribute to longer operating life of electronic medical equipment thru ultra-compactness and low power consumption; and
- ✓ Integrate RFIC, SAW filter, and frequency control unit and can be implanted in a human body.

MEMS Solutions for Medical / healthcare Applications

Acceleration Sensor

Digital 1/2/3-Axis
Acceleration
Sensor



Inclination Sensor

Analog 1/2-Axis
Inclination
Sensor



Gyroscope

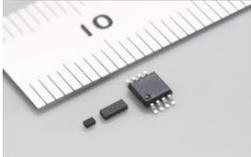
1-Axis Angular
Rate Sensor



Our MEMS sensors:

- ✓ Are compact, consumes little power, and used for medical and healthcare applications;
- ✓ Can sense activities of pacemakers;
- ✓ Can measure pressures such as blood pressure, pressure in a brain, intraocular pressure, and abdominal pressure; and
- ✓ Enable high-precision positioning of surgical tables and medical imaging devices.

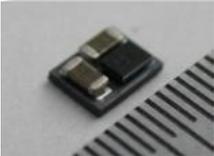
ESD* Protection Device



- ✓ Wide variety of lineup with high durability for ESD protection of antennas and terminals

*ESD = electrostatic discharge

Micro DC-DC Converter



- ✓ Provides individual power to each functional circuit with the trend toward more sophisticated mobile devices.
- ✓ Can reduce mounting space drastically compared with a set of discrete components.

RFID* Device



- ✓ Readable and writable RFID chips (MAGICSTRAP®) and modules used for traceability

*RFID = radio-frequency identification

NFC* Device



- ✓ Provides module solutions with ultra-compact antennas most suitable for mobile devices.

*NFC = near field communication

4) Actions in Emerging Markets

Capturing Demand in Emerging Countries

Increase in Production Ratio outside Japan

- Constructed a Philippine factory in Oct. 2012 and expected to start operations in Jan. 2013.
- Continuing to shift production to China (Wuxi, Shenzhen), Thailand and Malaysia
- Increase in production ratio outside Japan (FY2010: 15% ⇒ FY2012 (est.): 25%)

Expansion of Sales Facilities in Emerging Countries

- Established sales companies in India and Vietnam.
- Established sales facilities in inland China (Chengdu, Wuhan, Chongqing, Xian)
- Focusing on exploiting demand in emerging countries.

Seizing growing demand in emerging countries where upper/middle-class population is exploding.

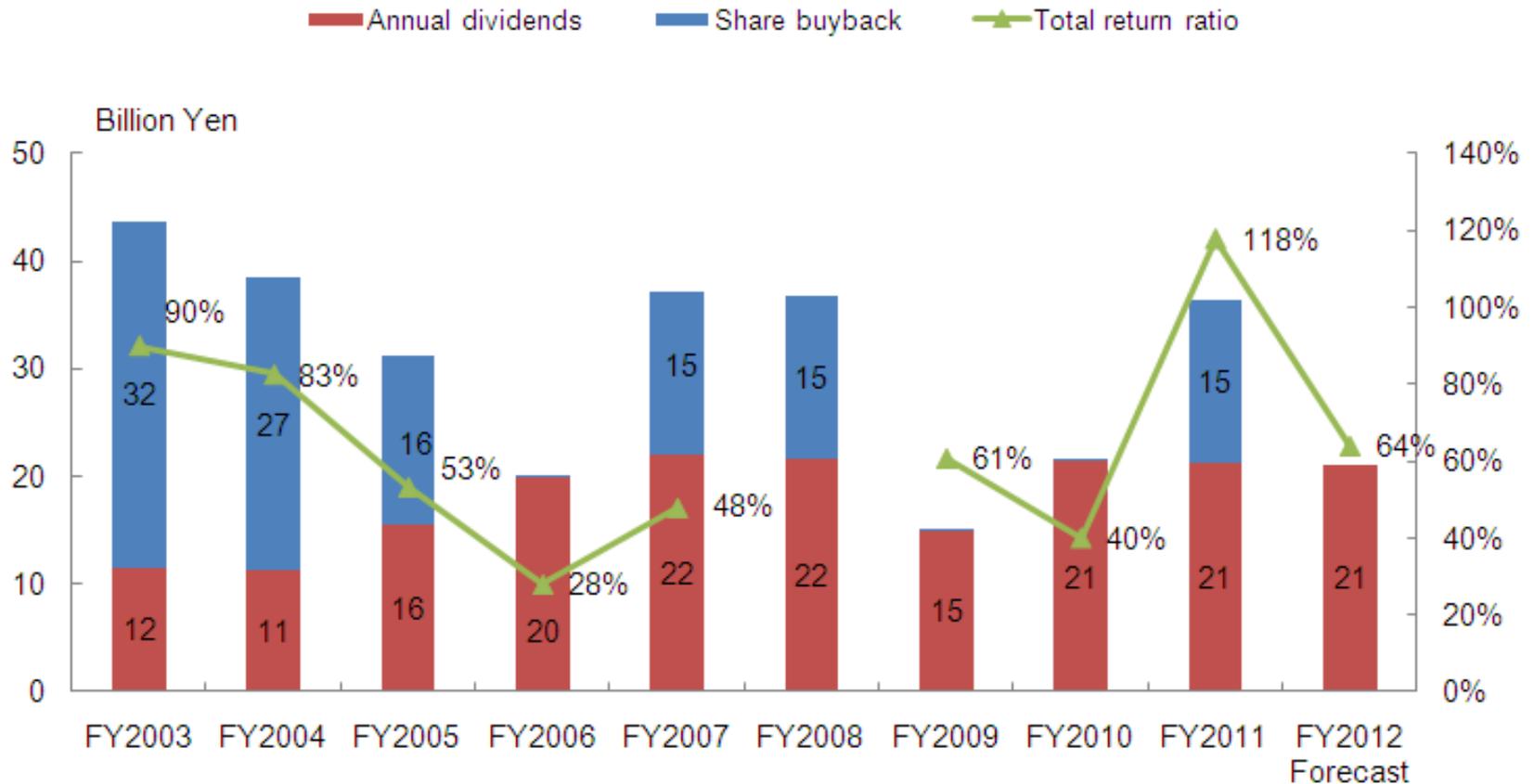
Amplification of Design Supports

- Established a shielded room in Beijing to promote EMC solutions in China.
- Reinforcing support systems in addition to the Murata EMC Support Center in Shanghai.



New Philippine Factory

Return to Shareholders



Our basic policy of profit distribution to shareholders is to prioritize the sharing of gains through payment of dividends, and to steadily raise them by increasing profit per share.

This report contains forward-looking statements concerning Murata Manufacturing Co., Ltd. and its group companies' projections, plans, policies, strategies, schedules, and decisions. These forward-looking statements are not historical facts; rather, they represent the assumptions of the Murata Group (the "Group") based on information currently available and certain assumptions we deem as reasonable. Actual results may differ materially from expectations due to various risks and uncertainties. Readers are therefore requested not to rely on these forward-looking statements as the sole basis for evaluating the Group. The Company has no obligation to revise any of the forward-looking statements as a result of new information, future events or otherwise.

Risks and uncertainties that may affect actual results include, but are not limited to, the following: (1) economic conditions of the Company's business environment, and trends, supply-demand balance, and price fluctuations in the markets for electronic devices and components; (2) price fluctuations and insufficient supply of raw materials; (3) exchange rate fluctuations; (4) the Group's ability to provide a stable supply of new products that are compatible with the rapid technical innovation of the electronic components market and to continue to design and develop products and services that satisfy customers; (5) changes in the market value of the Group's financial assets; (6) drastic legal, political, and social changes in the Group's business environment; and (7) other uncertainties and contingencies.

The Company undertakes no obligation to publicly update any forward-looking statements included in this report.

