

Industrial & Multi-Segment Solutions

MPA (Micro, Power, Analog) Group



Carmelo Papa
Corporate Vice President
MPA

The MPA Group

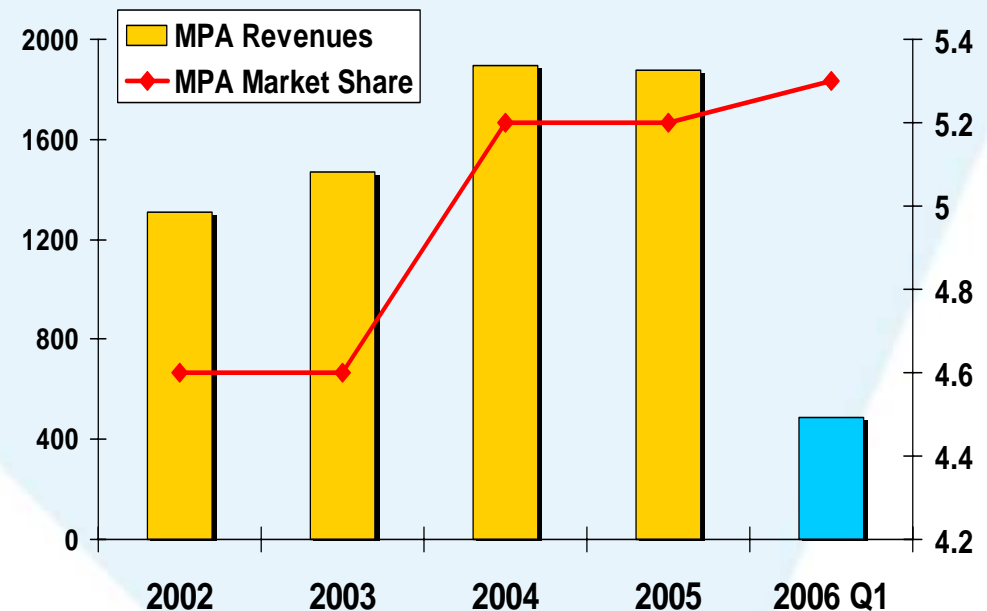
■ Addressing multi-segments

- ◆ Designing Advanced Products for key Customers
- ◆ Offering System Solutions to small & medium Customers

■ Focusing on value-added solutions

- ◆ Advanced Analog Products
- ◆ 32-bit ARM based Micros
- ◆ Leveraging on Power Conversion Leadership

2005 Revenues : \$1,881 M



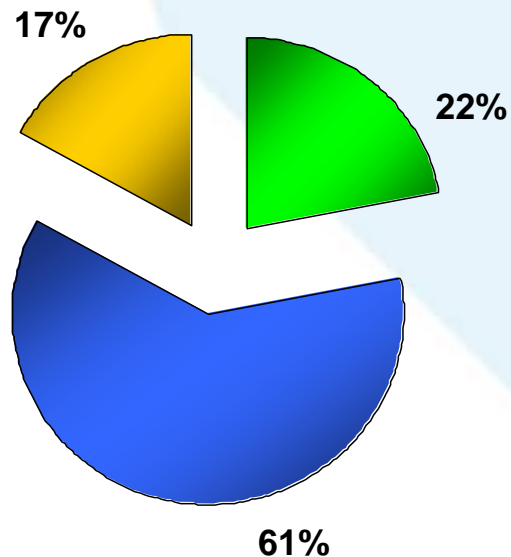
**Q1'06 Revenues : \$491 M
+ 7% vs. Q1'05**

Source : WSTS (TAM excl. Small Signal)



Market and MPA 2005 Revenues Breakdown

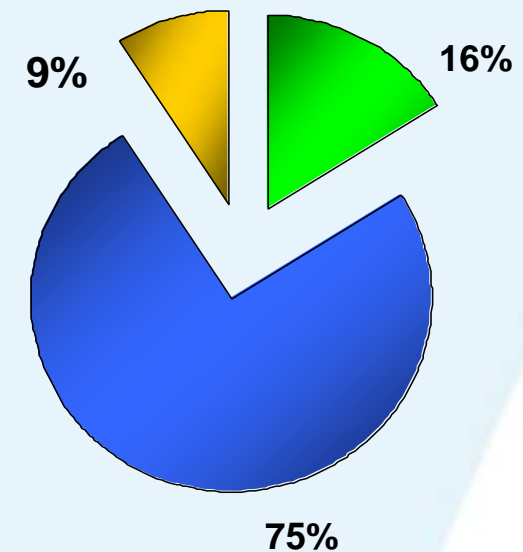
MARKET TAM : \$38.3 B



Micro
4/8/16/32-bit Micro

Power Conversion
Discrete, Power MOSFET,
Power Bipolar, Power Supply,
Voltage Regulator

MPA : \$1.9 B



Analog
Advanced Analog,
Industrial Analog,
Interfaces, Standard
Linear

Source : WSTS



MPA # 1 in the 'Power Conversion' Market

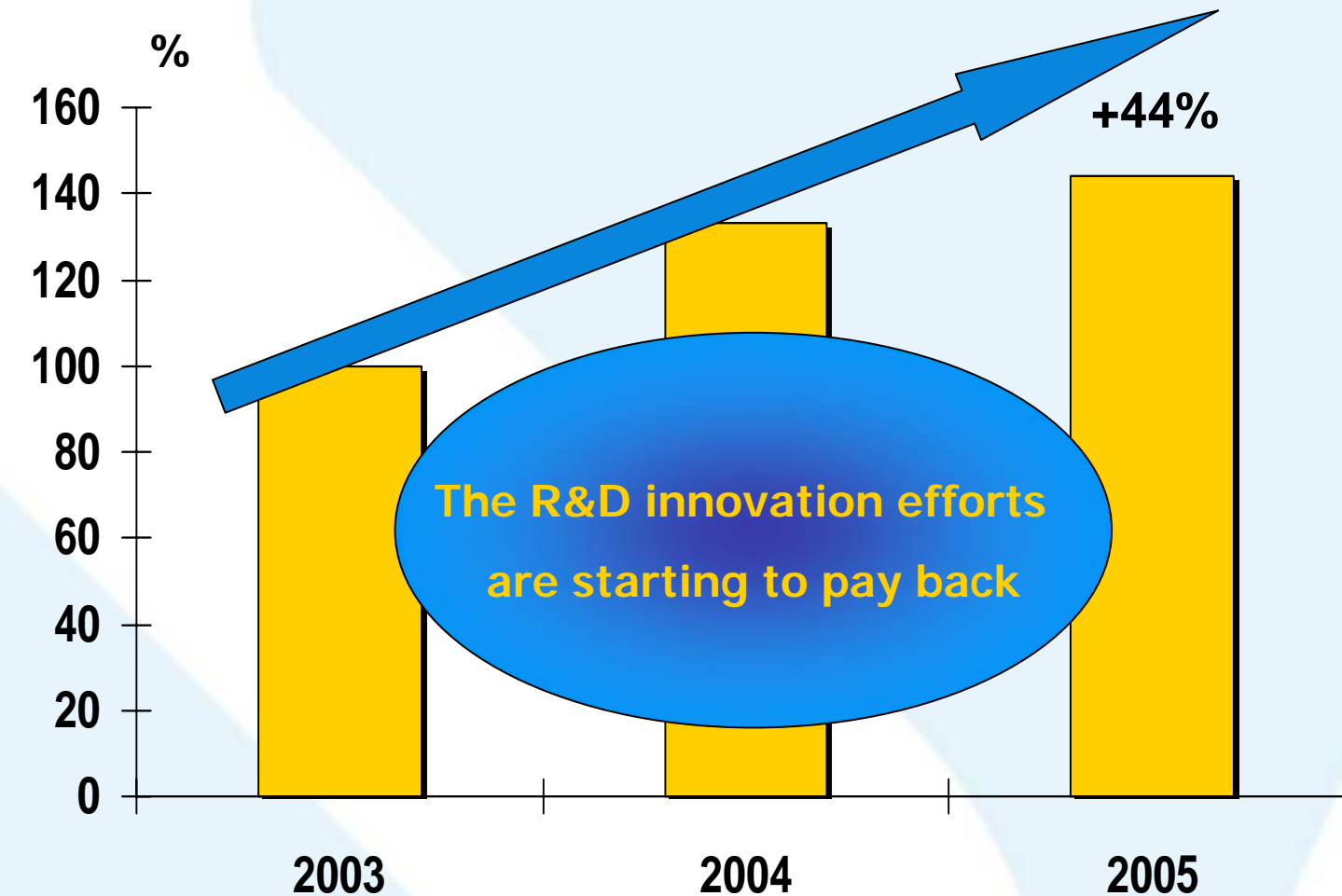
2004 Rank	2005 Rank	Company Name	2005 Revenue	2004 Revenue	Percent Change	Percent of Total
1	1	STMicroelectronics	1,421	1,382	2.8%	7.8%
2	2	Fairchild Semiconductor	1,074	1,216	-11.7%	5.9%
3	3	International Rectifier	933	1,023	-8.8%	5.1%
4	4	Toshiba	923	929	-0.6%	5.0%
6	5	National Semiconductor	839	774	8.4%	4.6%
10	6	Texas Instruments	815	685	19.0%	4.4%
9	7	Infineon Technologies	720	695	3.6%	3.9%
7	8	Vishay Intertechnology	698	713	-2.1%	3.8%
11	9	Maxim Integrated Products	696	634	9.8%	3.8%
5	10	Renesas Technology	695	783	-11.2%	3.8%
8	11	ON Semiconductor	677	703	-3.7%	3.7%
13	12	Mitsubishi	633	503	25.8%	3.5%
16	13	Linear Technology	503	467	7.7%	2.7%
12	14	Fuji Electric	486	558	-12.9%	2.7%
18	15	Rohm	474	382	24.1%	2.6%
Other Companies:			6,728	6,900	-2.5%	36.7%
Total Revenue:			18,315	18,347	-0.2%	100.0%

'Power Conversion' Market is defined as: Voltage Regulator/Reference, Industrial & Other , Power RF Transistor, Bipolar PT, FET PT, IGBT PT, Thyristor, Rectifier & Power Diodes

Source: iSuppli, March 2006



Analog Sales Expansion



INDEX 2003 = 100



MPA a Leading Global Supplier of the Industrial and Multi-Segment Markets

Product families	Ranking
 AC Switches / Thyristors	1
 Protection & IPAD	1
 Electronic Lighting Controllers	1
 RTC, NVRAM	2
 Intelligent Power Switches	2
 Power Bipolar Transistors	2
 Power MOSFET	3
 Rectifiers	3

Source: iSuppli 2005, MRCI



Industrial & Multi-Segment 2005 MPA Major Customers

Astec

Liteon

Delta

Siemens

Bosch

Philips

LG

Thomson

HP

Western Digital

Alcatel

Sony-Ericsson

Nokia

Samsung

Flextronics

Foxconn

Arrow

Avnet

Future

Industrial

Automotive

Consumer

Computer

Telecom

E.M.S.

Distribution

Industrial & Multi-Segment Solutions

Carmelo Papa



Customer Base Expansion

■ World Wide Technical Support Centers



■ Tailored Customer Approach

Partnering for Technology and Design Leadership



Ready-to-use Reference Designs



MPA's Industrial & Multi-Segment Solutions Approach

WAVE OF NEW PRODUCTS

Solutions for the most demanding applications on the market

TURNKEY SYSTEM SOLUTIONS

The suitable approach for small and medium Customers with limited technical resources

EXPLOITING NEW OPPORTUNITIES

Expanding the TAM of the Group

**More than 200 design/application engineers
added to MPA in 2005**



Wave of New Products

Power



Micro



Analog



**More than 1,000
new commercial
products in
2005**

**Targeting high growth markets such as:
digital consumer, automotive, wireless**



Wave of New Products: Micro

32-bit Micros for High-performance and Professional Equipment

The new market standards in microcontrollers combining ARM and RISC cores with embedded Flash technology and a comprehensive set of peripherals



8-bit low-power Micros for Battery-operated Appliances

The new 8-bit MCUs available in a variety of surface-mounted packages

Amazingly small...



...tremendously useful!

DFN8, less than 16mm²



Wave of New Products: Power

Filtering & ESD Protection IPADs for LCD Monitors and Cameras

Replacing 12 discrete devices in an extremely low profile and small size μ QFN package



Ultra-low Capacitance Protection Devices for PC and Home Theater

The lowest capacitance ESD arrays on the market (0.6 pF typical value)



Wave of New Products: Power

Radio Frequency Power Switches for Base Stations

Available in a wide range of highly-reliable packages



Rectifiers for Welding Machines

Very low leakage current and ultra-fast recovery devices for reduced switching power losses



SuperFRED MOSFETs for Electronic Lighting

Outstanding diode recovery, ideal for high-end energy saving ballast ($dv/dt = 15 \text{ V/ns}$)



Wave of New Products: Power

SAFeFET MOSFETs Switches for Industrial & Automotive

A new generation of MOSFETs with embedded temperature sensing



SuperMESH III MOSFETs for Power Supplies

Optimal silicon efficiency ensuring reduced power consumption



Very high-voltage MOSFETs for 3-phase Auxiliary Power Supplies

The new MOSFET series breaking the paradigm of the 1500V limit



Wave of New Products: Advanced Analog

Power Management Control IC for Single Tuner STB

An integrated solution with very high efficiency supporting DTV application requirements



Advanced Voltage Regulators for Video Phones and Large Displays

Power Supply for passive matrix OLED and large size Display Backlighting.



Wave of New Products: Advanced Analog

Temperature Detectors for 3G Phones

World's lowest current (4 μ A) and smallest package (1x1.3mm μ DFN) for portable, consumer applications



Voltage Supervisors for STB and Multi-voltage Systems

Efficiently protecting appliances from voltage spikes



Precision Voltage Detectors for Portable Equipment

A simple way of monitoring and limiting specific voltages for reliable system protection



Wave of New Products: Advanced Analog

Xpress Card Power Switch for Notebooks

Complete Xpress card power management IC compliant with PMCIA and UI certification



Front Panel Controllers for DVD Recorders

Vacuum fluorescent display controller integrating RTC and stand-by power management



I/Os Expanders for Mobile Phones

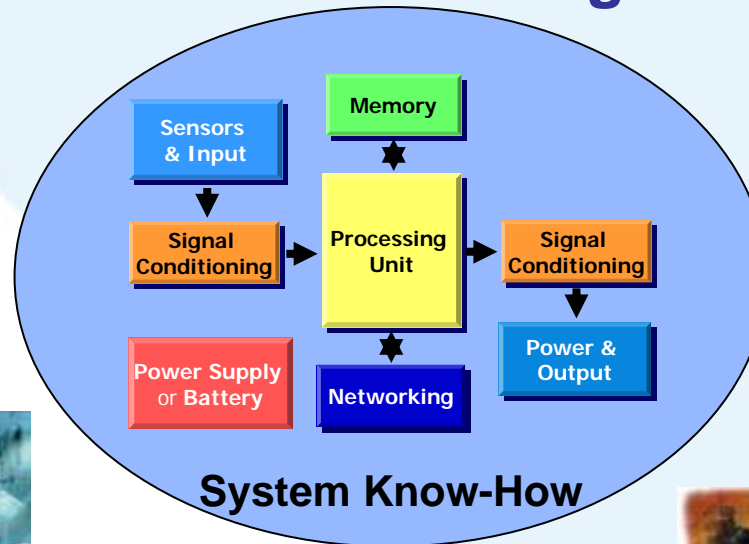
Supporting 96-key scanning and three independent “smart” Pulse Width Modulation controllers



Turnkey System Solutions

Innovative and scalable solutions accelerate time to market and revenue growth

New Solutions



New Value-added Products



New Technologies



MPA System Solutions for the Industrial & Multi-Segment Markets

Lighting

- Driver for HIDs
- Multi Power for Digital Ballast
- High Efficiency LED Panels

POS

- Cash Registers
- Smart Card Readers

Video

- Plasma Display Panels
- Energy Recovery Systems

Metering

- Single Phase Meters
- Three Phase Meters
- Power Line Modems
- ZigBee

**More than 50 new
complex "Solutions"
introduced in 2005**

Digital Consumer

- USB 2.0 Pocket Flash
- Front Panel Displays

Power Management

- 600VA/450W UPS
- Battery Chargers
- Resonant Converters

Home Appliances

- White Goods
- Air Conditioning
- Alarm Systems
- Small Appliances

Factory Automation

- Vector Drives
- Real Time Ethernet
- Motion Control Systems



Turnkey System Solutions

A Large Variety of System Solutions

Expandable Platform for the Industrial & Multi-Segment Applications

This ARM-based solution has been developed to address a wide range of applications and to cover several market segments.



Point of Sale



Power Line Modem



Cash Register



Smart Card Reader



Access Control



RFID Reader



Electronic Scale

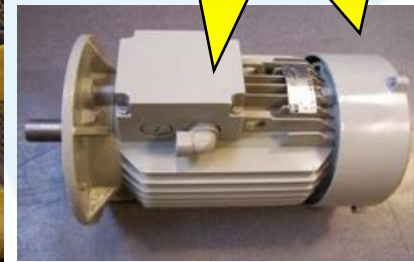


Turnkey System Solutions

High-end 1200V Motor Control Platform for Factory Automation

**Very high-power
Vector Drive solution for:**

- Factory Automation
- Robotics
- Lifts
- Pumps
- Industrial Motor Control
- High Voltage Air Conditioning



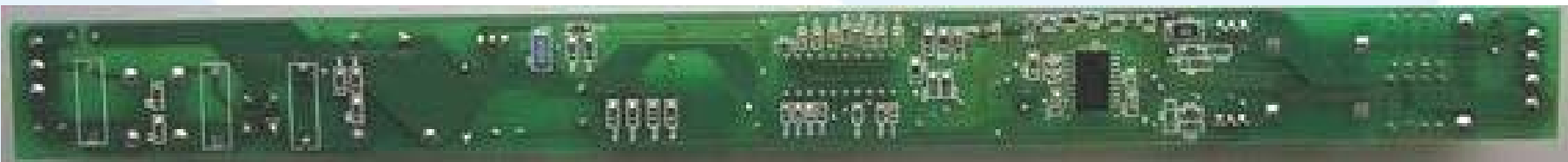
\$28
ST silicon value

Turnkey System Solutions

Fluorescent tube lamps

Digital driver for Fluorescent T5 and T8 tubes. A flexible, fixed output, cost effective solution for the digital control of lighting ballasts. The system can support communication protocols for the remote control

\$4
ST silicon value



Application Segments:

- ▣ **Electronic Ballast**
- ▣ **Connectivity (DALI protocol)**

Exploiting New Opportunities: Sensors

Temperature Sensors

**2007 TAM
\$50 M**

New digital and analog devices suitable for LCD panels, fan controls, 3G mobile phones



*Source: WSTS

Pressure Sensors

**2007 US TAM
\$1.5 B**

A single sensor capable to work up to 20 Megapascal and 400°C suitable for automotive, industrial control, weather stations and medical applications



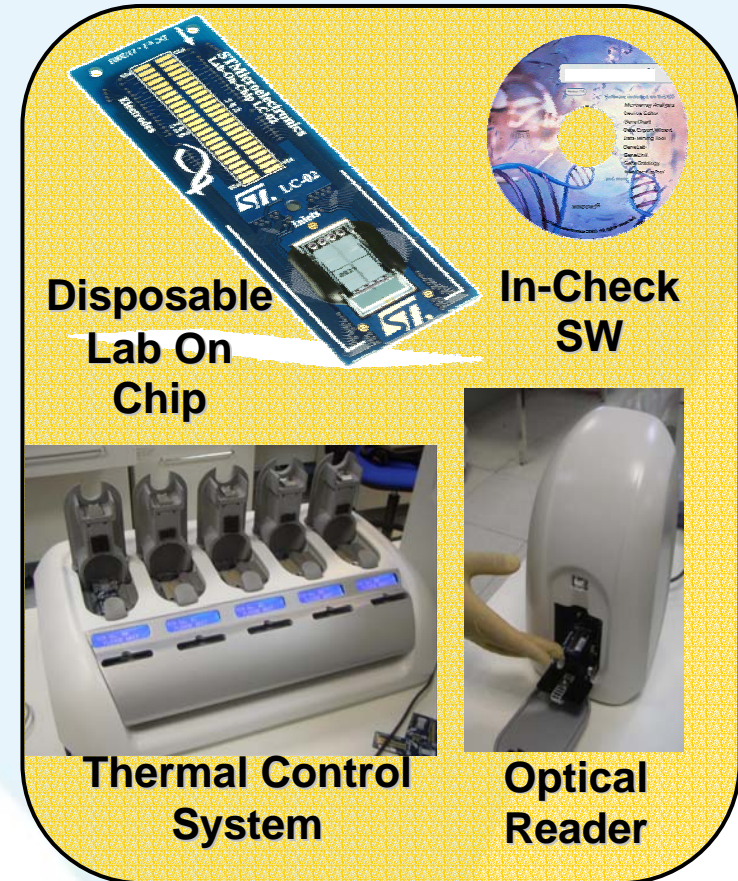
Source: Venture Development Corporation

Exploiting New Opportunities:

In-Check™, the first Platform for Molecular Diagnostics on Silicon

- Low Cost disposable silicon Lab-on-Chip
- High Volume diagnosis of infectious Diseases
- Capable of testing multiple diseases in a single measurement
- First partnerships already signed :
 - ◆ Sepsis panel by Mobidiag
 - ◆ Flu panel (including Avian Flu) by Veredus

Lab-on-chip is included in CPG perimeter



Exploiting New Opportunities: MEMS

Accelerometers

Innovative inertial sensors suitable for mobile phones, vibration monitoring, antitheft systems, free-fall detection, game controllers



Gyroscopes

Sensors capable of detecting the angular rate for applications in mobile phones

MEMS are reported in Others

2006 TAM: \$2 B
CAGR 2005-2010: 15%



Source: In-Stat

Industrial & Multi-Segment Solutions

Carmelo Papa



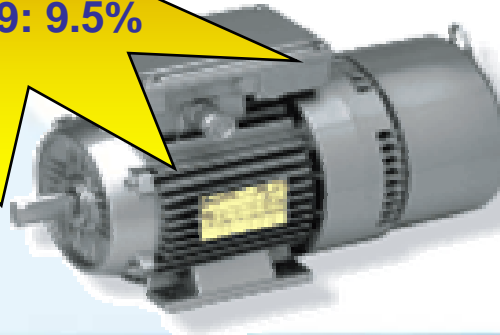
Exploiting New Opportunities: Power Modules

IGBT Power Modules

The new 3-phase Inverter in a single package completes the product family (from 3A/600V to 50A/600V). Suitable for industrial motor control and white goods

- Up to 75% board space saving
- High-performance package

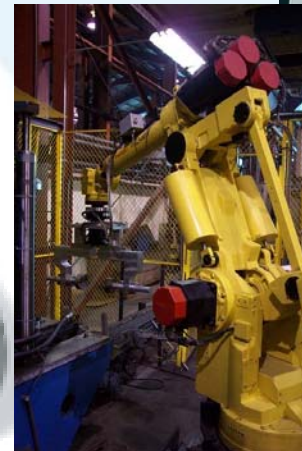
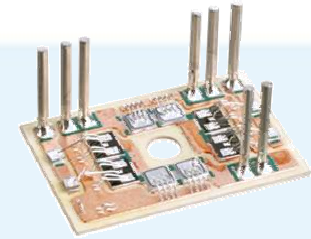
2007 TAM: \$1.2 B
CAGR 2004-2009: 9.5%



Source: WSTS & ST

Industrial & Multi-Segment Solutions

Carmelo Papa



Exploiting New Opportunities: ZigBee

ZigBee/IEEE 802.15.4 SoC Solution

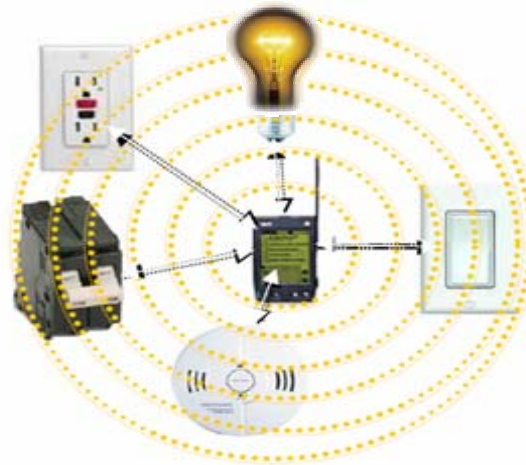
The new open standard for low-power, cost-effective wireless networking in industrial applications

2011 TAM: \$3- \$5 B

Cooperation with Ember on hardware, software stack and development tools

Applications:

- Building Automation
- Industrial Automation
- Domotics (Home Electronics)
- Security
- Medical
- Power Metering



Source: ST

The Two Souls of MPA

STANDARD PRODUCTS

- Discrete
- Standard Logic
- Standard Linear
- Standard Micros
- Limited Investment
- Extending Fab Life
- Back-end Cost Driver

INNOVATIVE PRODUCTS

- Advanced Analog & Logic
- Sensors
- Industrial Products
- High-end Micros
- Technology Portfolio
- Design Expertise
- System Knowledge

~ 80 %
Below Company average
Double - digit

← % of Sales
GM
RONA →

~ 20 %
Above Company average
Much higher

**MPA combines the stability of revenues
provided by large volume applications
with the profitability expansion
driven by innovative products**

