Developing the right system & silicon roadmap to enable the future of Digital Radio

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AGENDA

1. Introduction to Frontier Silicon
2. DAB market overview
3. Today’s technology solutions
4. DAB Receiver technology going forward
5. Our vision of the Next Generation radio’s

Introducing Frontier Silicon

FRONTIER SILICON

The Company

- UK based IC & System company operating in the Digital Consumer & Mobile Digital TV arena
- Supports DAB, DAB+, T-DMB, DVB-H
- Standard agnostic



Proven Execution

- Over 250 design wins with leading CE Brands. 5M DAB solutions shipped in 5 years
- Over 75% of EUREKA-147 audio-based products use Frontier Technology
- Leading MDTV supplier with over 1M receiver IC's shipped

SONY JVC SANYO SAMSUNG SHARP PHILIPS PURE DIGITAL GRUNDIG BOSE HITACHI BANG & OLUFSEN

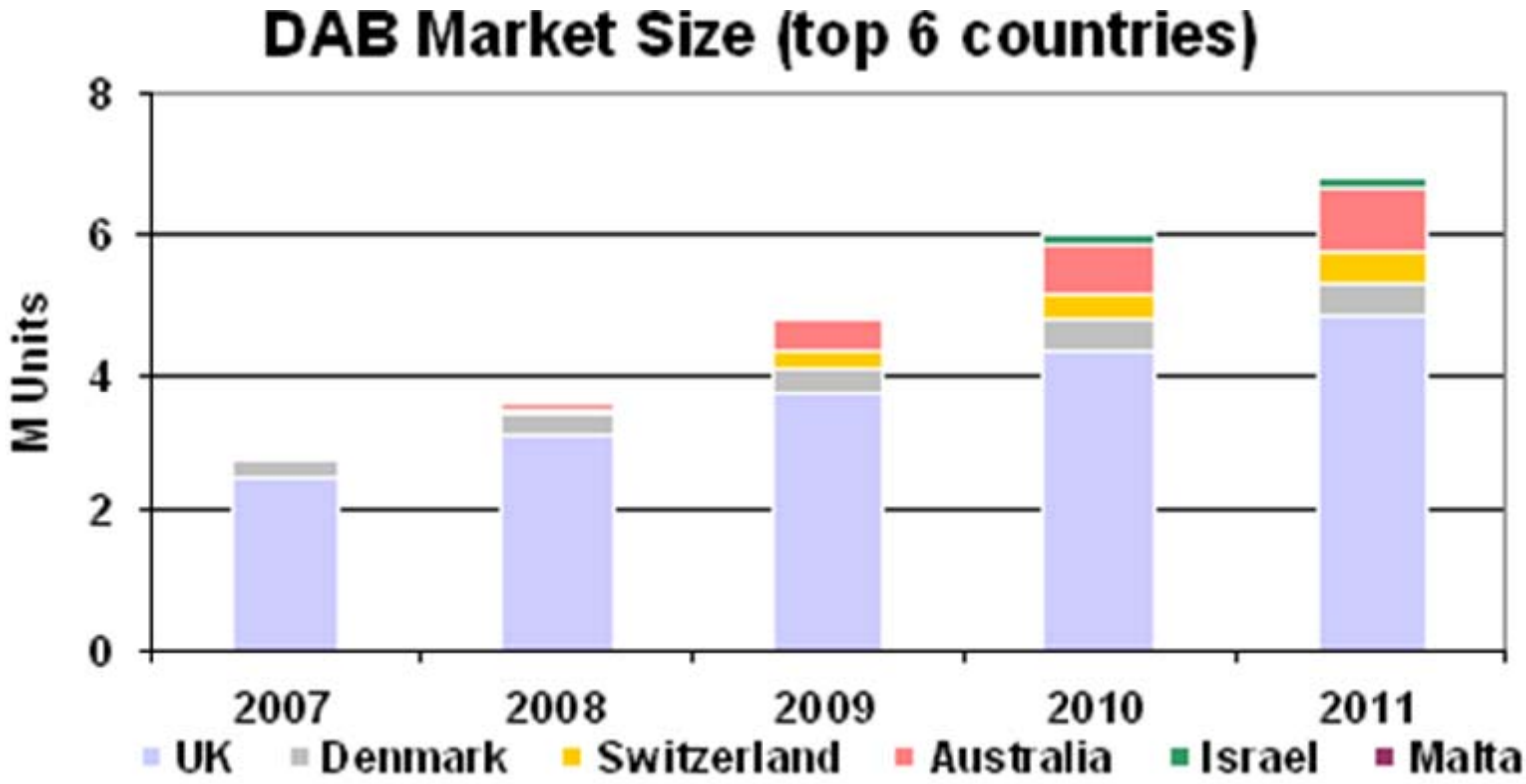


Established Infrastructure

Committed investment

- Sales & technical support offices in Shenzhen, Hong Kong & Seoul
- Development centres in Cambridge and Dublin
- Optimised Multi-standard roadmap


DAB Market Overview

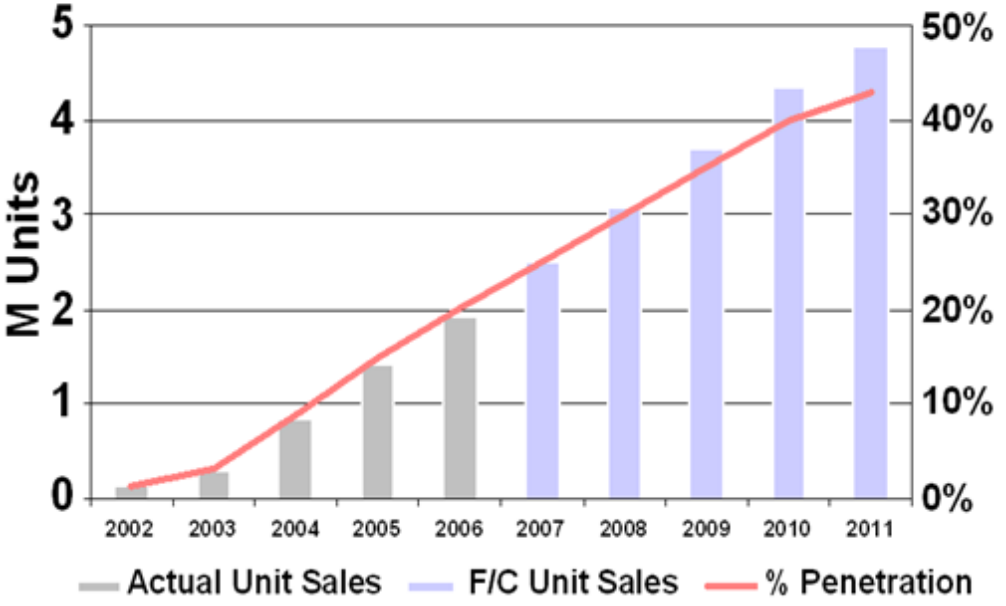


- UK expected to dominate DAB market for next 5 years
- Australia is the next significant market driven by DAB+
- Switzerland and Israel have strong potential for DAB adoption
- Germany does not figure on the DAB radar today

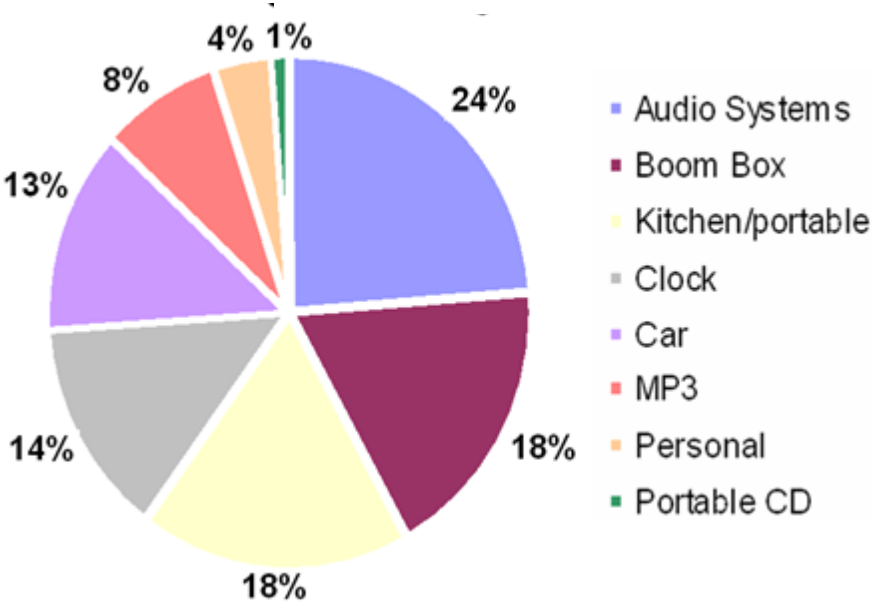
Source: Frontier Silicon Q4 07

DAB Market Overview: UK
89% total market

Annual UK DAB Sales



UK Market Segmentation



- **Approx 10M Radios sold each year in the UK**
- **2.5M DAB radio sales forecast for 2007**
- **DAB penetration of 5% p/a reaching 25% in 2007**
- **New national multiplex (Channel 4) will help continued adoption**

Source: DRDB/Gfk

Other markets

- **Denmark next most advanced market after UK**
  - DR estimate 500K receivers sold so far
- **Norway estimate 170k**
- **Australia announced that they will launch DAB+ in Jan 2009**
  - Trial broadcasts on the air now
  - Initial on air promotion planned for June 2008
- **Switzerland, Israel and Malta seen as high probability for DAB+**
- **Sweden, Italy & Switzerland considering re-launch using DAB+**
- **Canada, Czech Republic, Israel, Hungary, Kuwait, Malaysia, Singapore, New Zealand and Slovakia evaluating DAB+**
- **France still considering options for Digital Broadcast**
  - DMB Audio is favourite (broadcasters looking for rich media options)
  - Still under discussion with various parts of the CE industry lobbying for DAB+

DAB Market: Germany

- **Very good DAB infrastructure but based on LBAND**
  - Fewer receivers available at higher prices
  - More dual band solutions expected in future
- **Signal strength concerns**
  - Transmission power limited by NATO
  - Higher sensitivity receivers becoming available
- **Lack of original content on DAB compared to FM**
- **No space for new programmes before RRC**
  - DAB+ would enable 3x stations compared to DAB
- **Result – little draw for consumers to move to DAB**
- **DAB+ offers a great opportunity to kick-start Digital Radio again**

Huge variety of products on sale, all major brands

From £20 - £2000

FRONTIER SILICON

SANYO

HITACHI

SONY

GRUNDIG

PHILIPS

JVC

SHARP

PURE DIGITAL

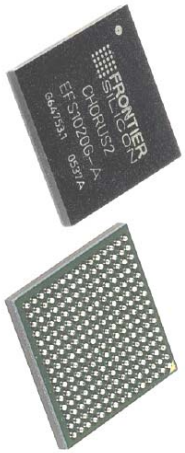
BOSE®

BANG & OLUFSEN B&O

Providing the technology to drive the market
Chips, modules, platforms

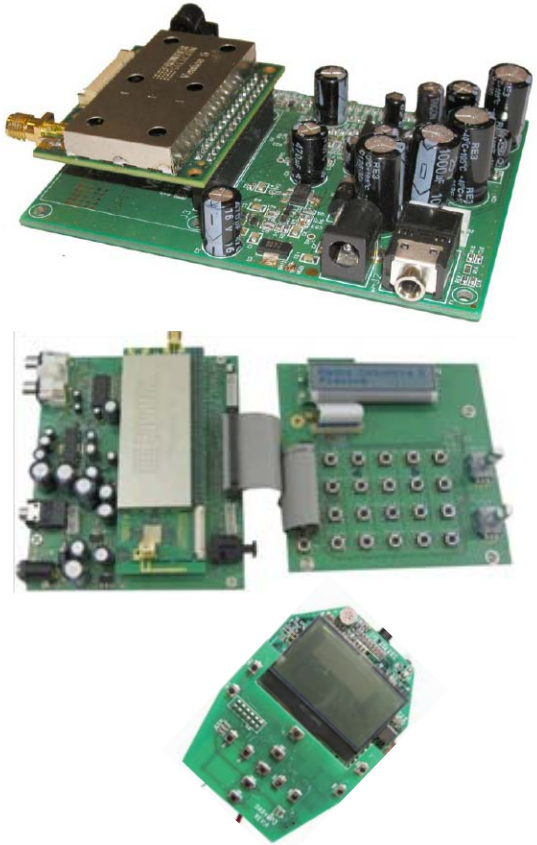
FRONTIER SILICON

RF Baseband



FM/DAB/DAB+ WiFi

Kitchen/Pocket/…



- FM / RDS
- DAB / DAB+
- CODECs
- EPG
- Clock Radio
- WiFi iRadio
- Field upgrades
- Streaming Audio

Chipsets

Modules

Platforms

Software

DAB Receiver technology going forward

- **Lower power enabling increased battery life**
  - 80Hr today (6 C cells) going to 120Hrs
- **Lower technology cost**
  - enabling sub 30 Euro today going to sub 20 Euros with 2 years
- **Increasing functionality & capability**
  - Integrated DAB+ within this year (available as software upgrade)
  - Slide show, EPG and TPEG (traffic)
  - Increasing RF Sensitivity enabling better coverage (lower returns)
- **Single Chip for DAB & FM decoding with iPOD docking**
  - Lower silicon geometries 0.13 moving to 65nm
  - Lower power & price with higher component integration and reduced BOM
- **2 line displays moving to TFT (new services & revenue streams)**
- **DAB with FM transmission enabling Automotive after market**

DAB+ : Benefits for the entire ecosystem

Broadcasters

+ Standard optimised for AUDIO
+ More stations per multiplex
+ Lower **transmission costs**
+ **DLS,** PAD, service-linking
+ International adoption → more receivers → more listeners!

Consumer

+ **Greater station** choice
+ Fast **channel retuning** / zapping
+ **Better quality** audio
+ **Data** services possible
+ Lower IP costs, lower radio costs
+ International adoption → receivers usable in more countries

Technology provider

+ Technology similar to DAB
+ More efficient standard, **trigger for new** markets
+ **Easy to implement** given ETSI standardisation
+ International adoption → wider TAM → incentive to develop

Manufacturer

+ Solutions available now
+ Can **easily convert** existing radios to DAB+ capable
+ **Economies of scale** makes cost of development lower
+ International adoption → wider TAM → incentive to develop

The Audio Centric Radio of the Future
Product vision

Broadcast

DAB/DAB+ (Europe / Asia)

AM/FM (All)

HD (USA)

Function/ Mode

i-radio

Sirius/XM (USA)

Streaming – Jukebox Napster /Rhapsody

Internet / Wifi

The Audio Centric Radio of the Future
Product vision

Broadcast

DAB/DAB+ (Europe / Asia)

i-radio

Internet / Wifi

AM/FM (All)

Sirius/XM (USA)

Venice 6

HD (USA)

Streaming – Jukebox Napster /Rhapsody

Thank you

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