



**ENTERPRISE IRELAND
MEDIA / NETWORK CONVERGENCE
SEMINAR, TOKYO, DEC 2009**



Movidius Introduction

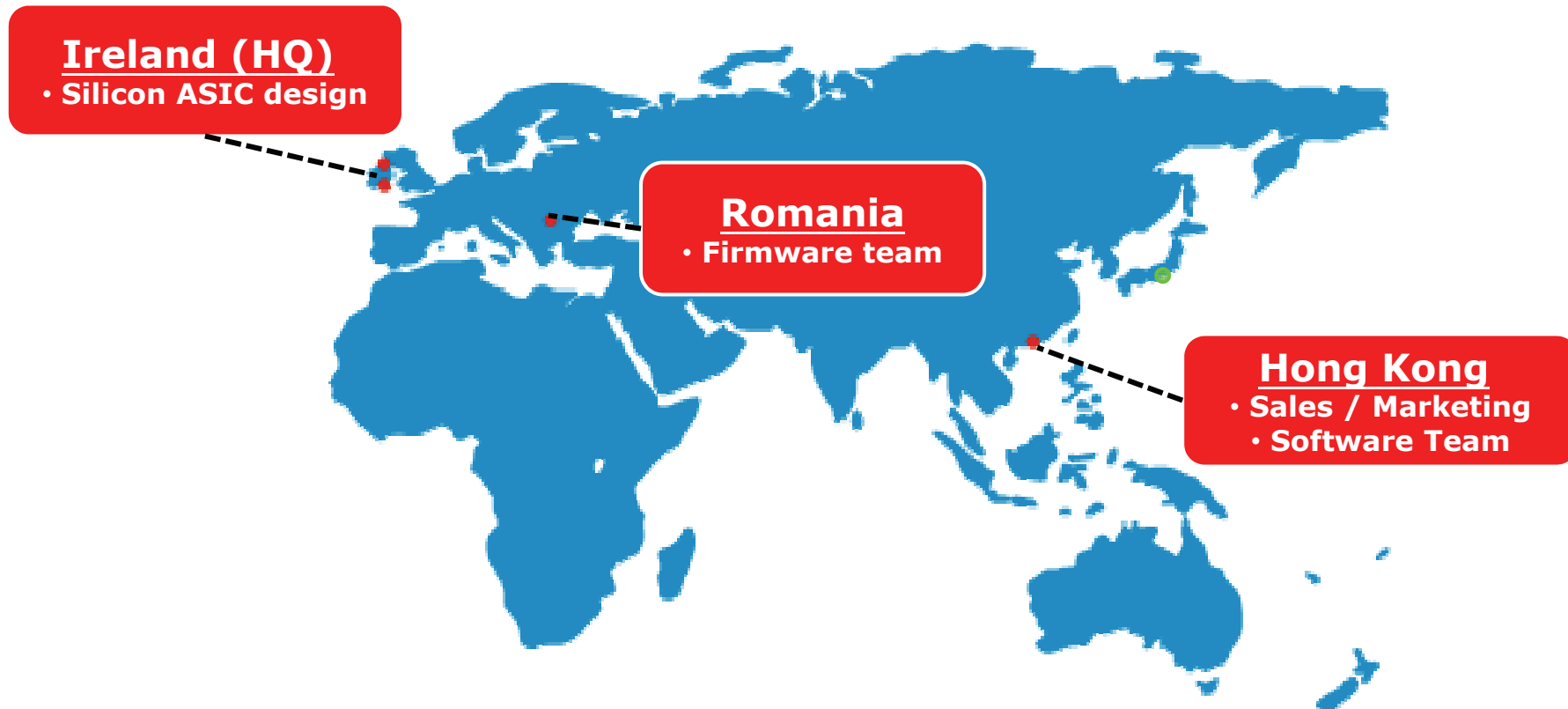
- Fabless Semiconductor Company founded 2005
- Will shortly launch a Mobile Multimedia Processor based on multi-core technology
- Very powerful platform with the flexibility of a software programmable platform
- Enables unique functionality, for instance high quality video





About Movidia

➤ 50 employees worldwide



• Representatives in Japan

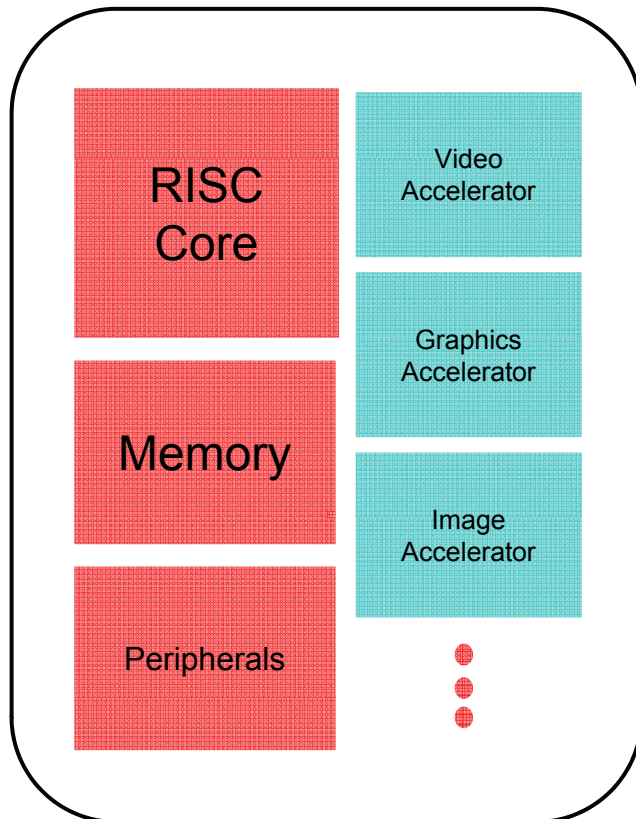


bringing mobile to life
in your Feature Phone

MOVIDIA TECHNOLOGIES OVERVIEW

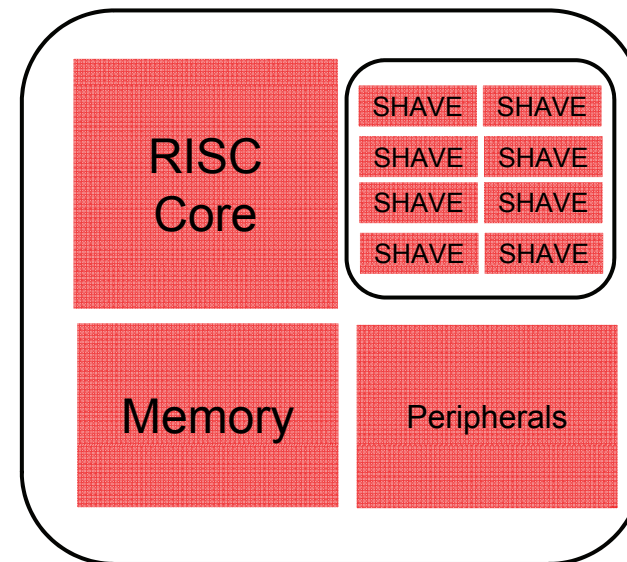
Multicore MPSoC Rationale

Existing Approach



Always dead silicon when not running that application

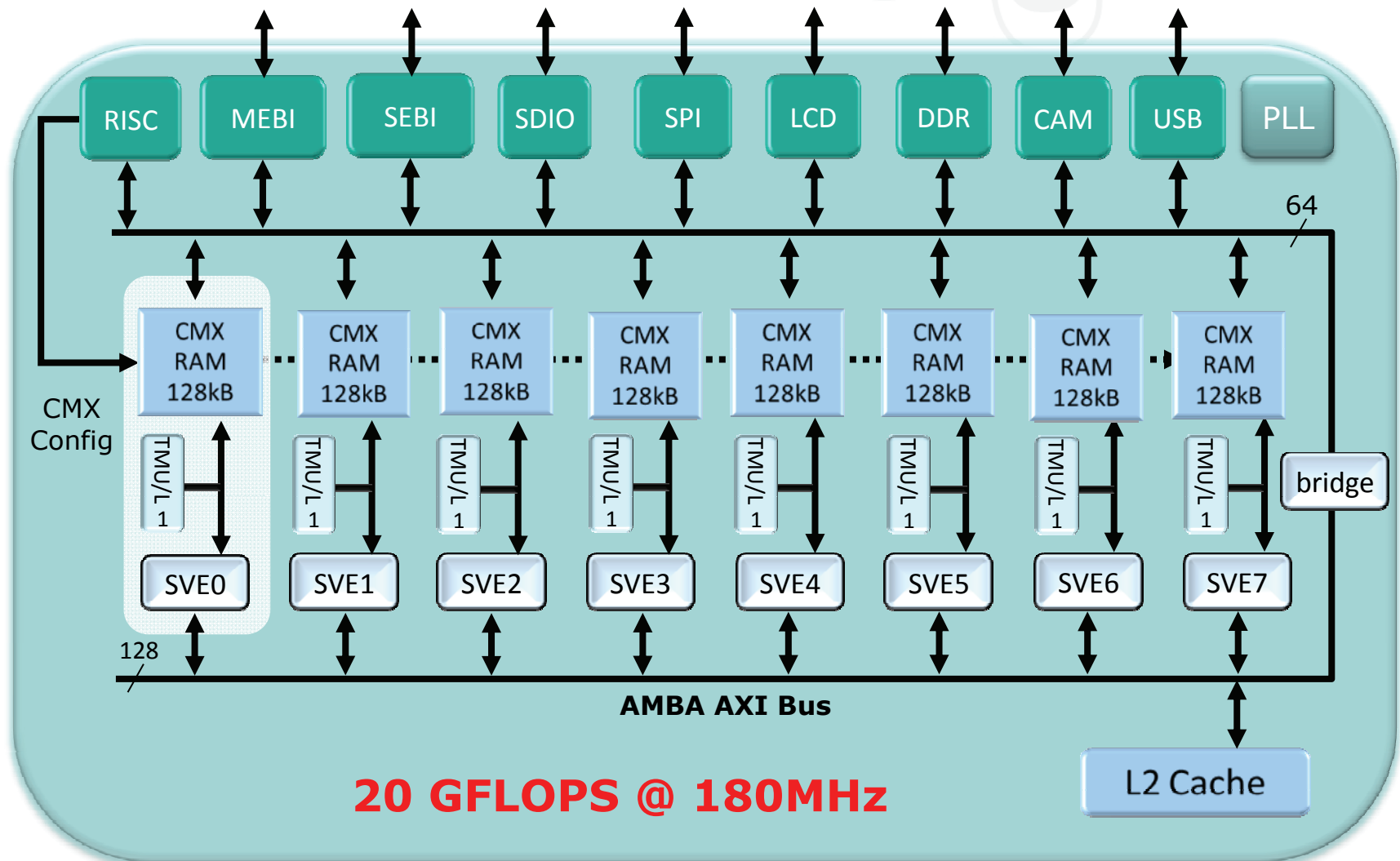
Movidius Approach



Reusable elements

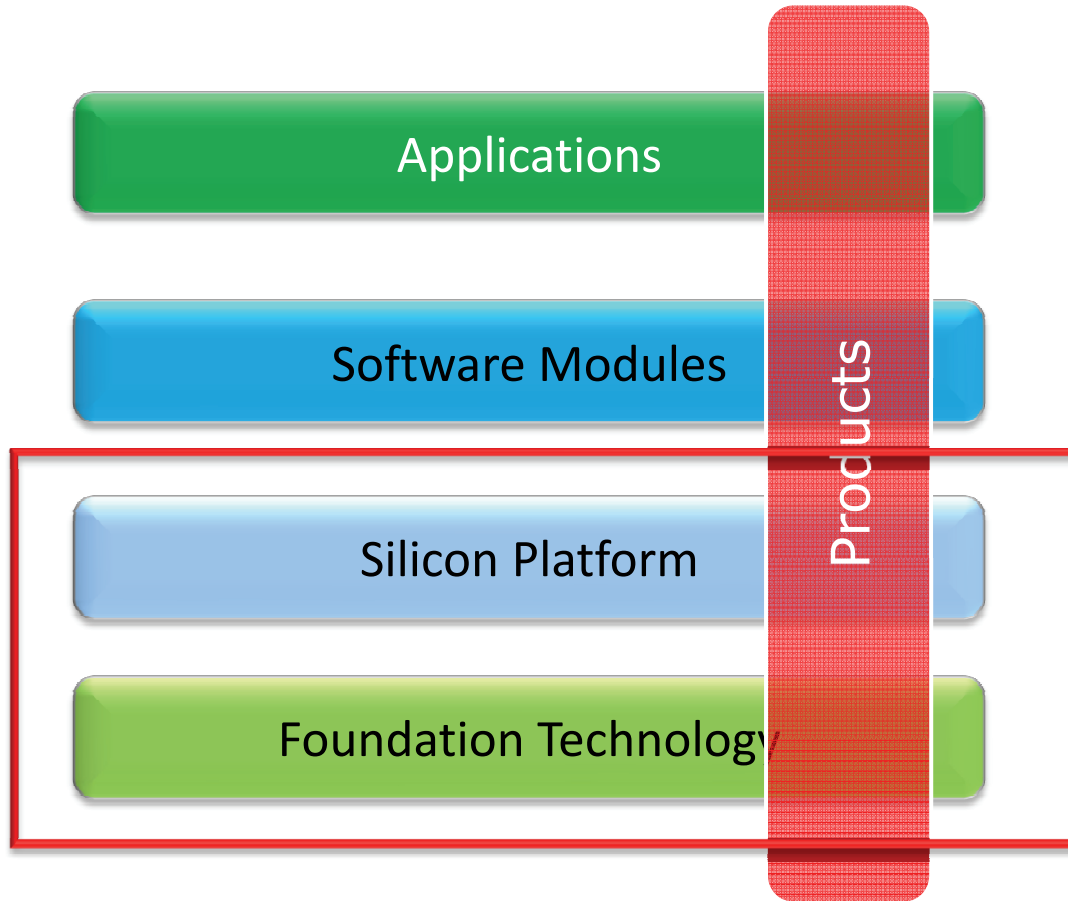
Same hardware is re-used no matter what the application

MA1000 Silicon Platform





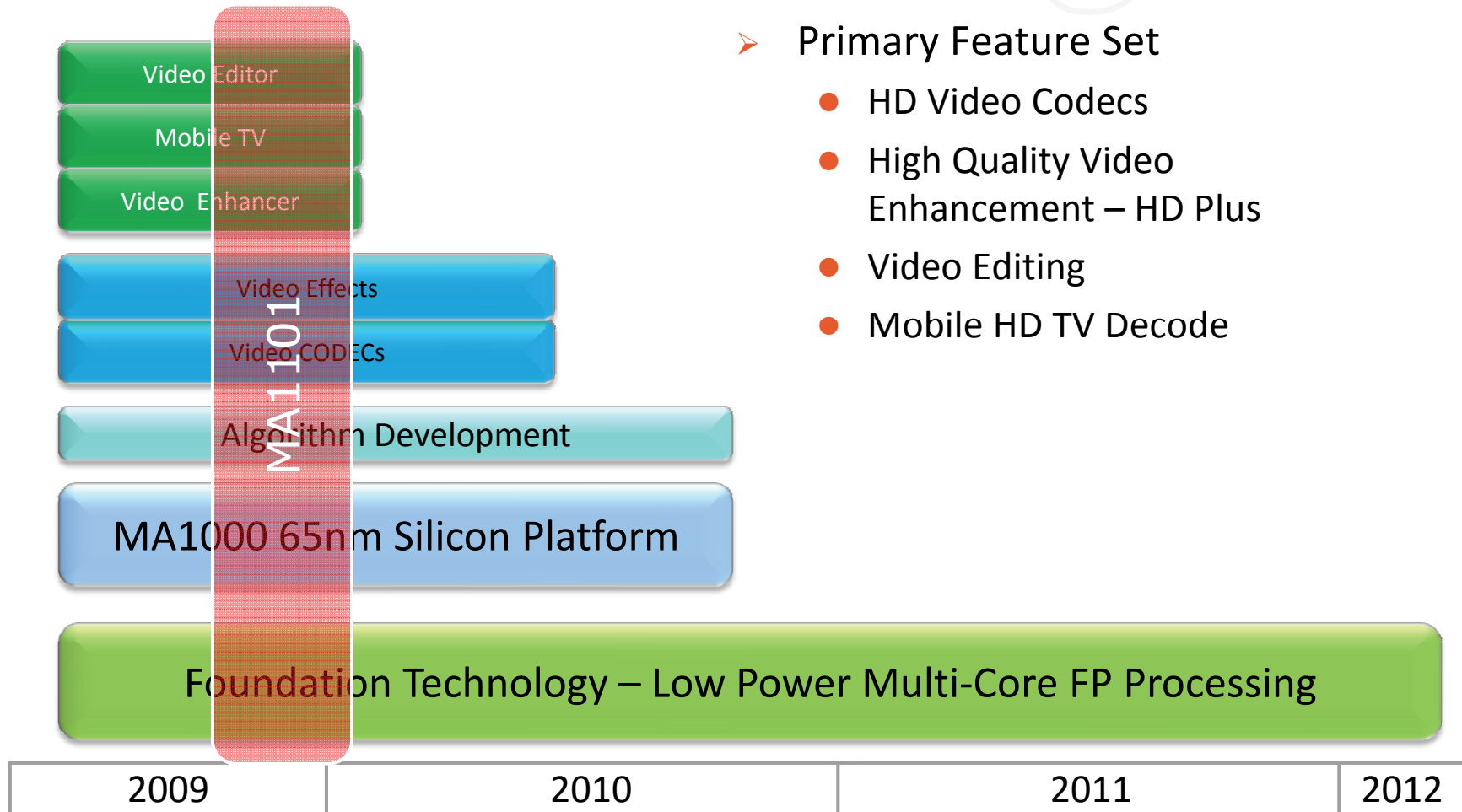
Technology - Platform Approach



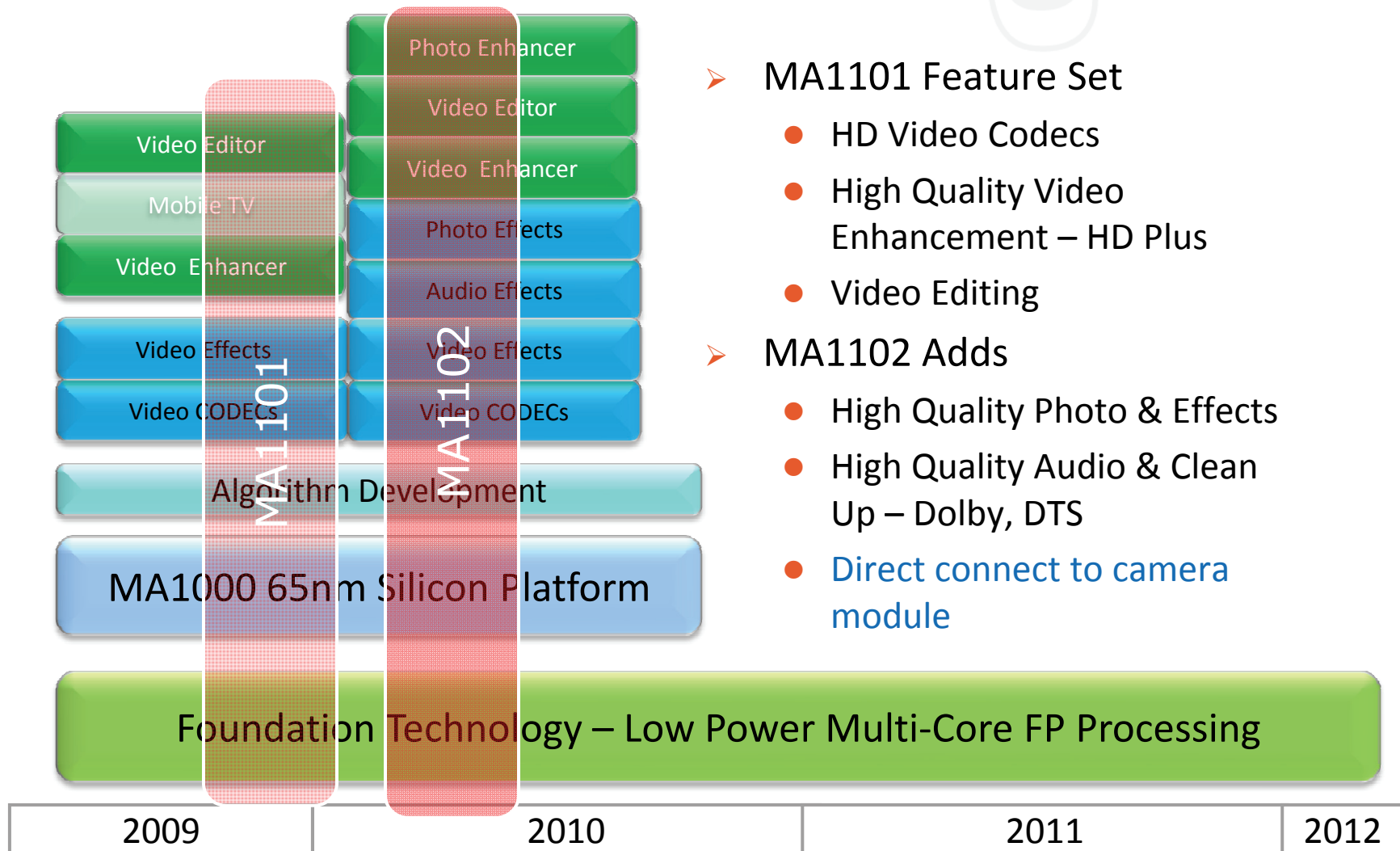
Products are built with a combination of Silicon and Software based on Foundation Technology



Movidius 1st Product – MA1101



Roadmap Extension - MA1102



Applications

➤ Differentiated applications:

- **Video Editing**
- **Video Upscaling & Enhancement**



- MDTV decoder / receiver engine (including Conditional Access System)
- Active LCD Backlight Control
- Image Signal Processing
- Light Field Photography
- Advanced audio effects
- Flash acceleration
- Game Physics

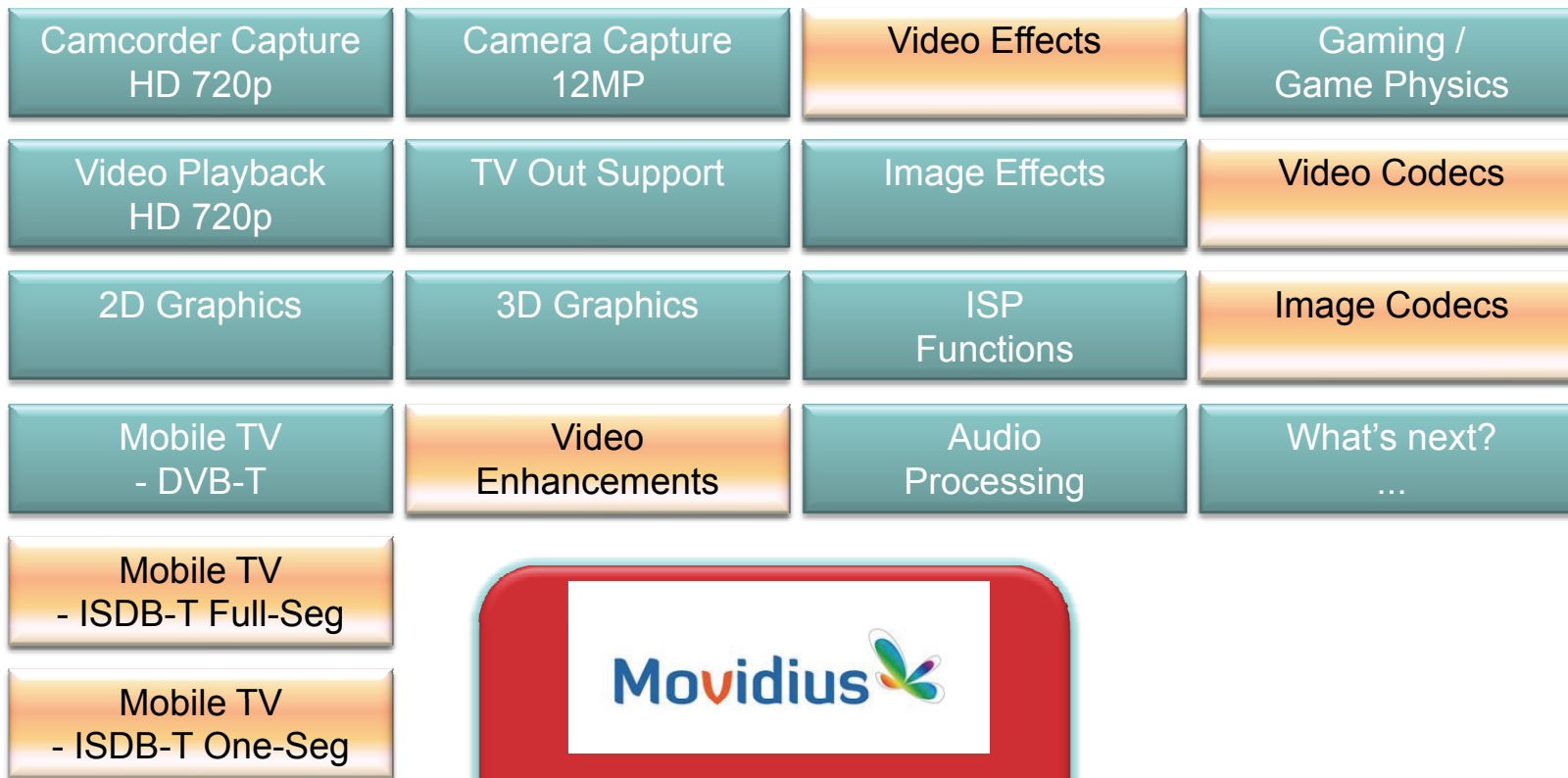
Dynamic loudness control, Karaoke, Mixing desk, Dolby on Mobile virtual surround sound, noise cancellation, positioning audio

➤ Standard Applications:

- Video / Audio / Image codecs
- 2D/3D Graphics (OpenGL ES 2.0), OpenCL

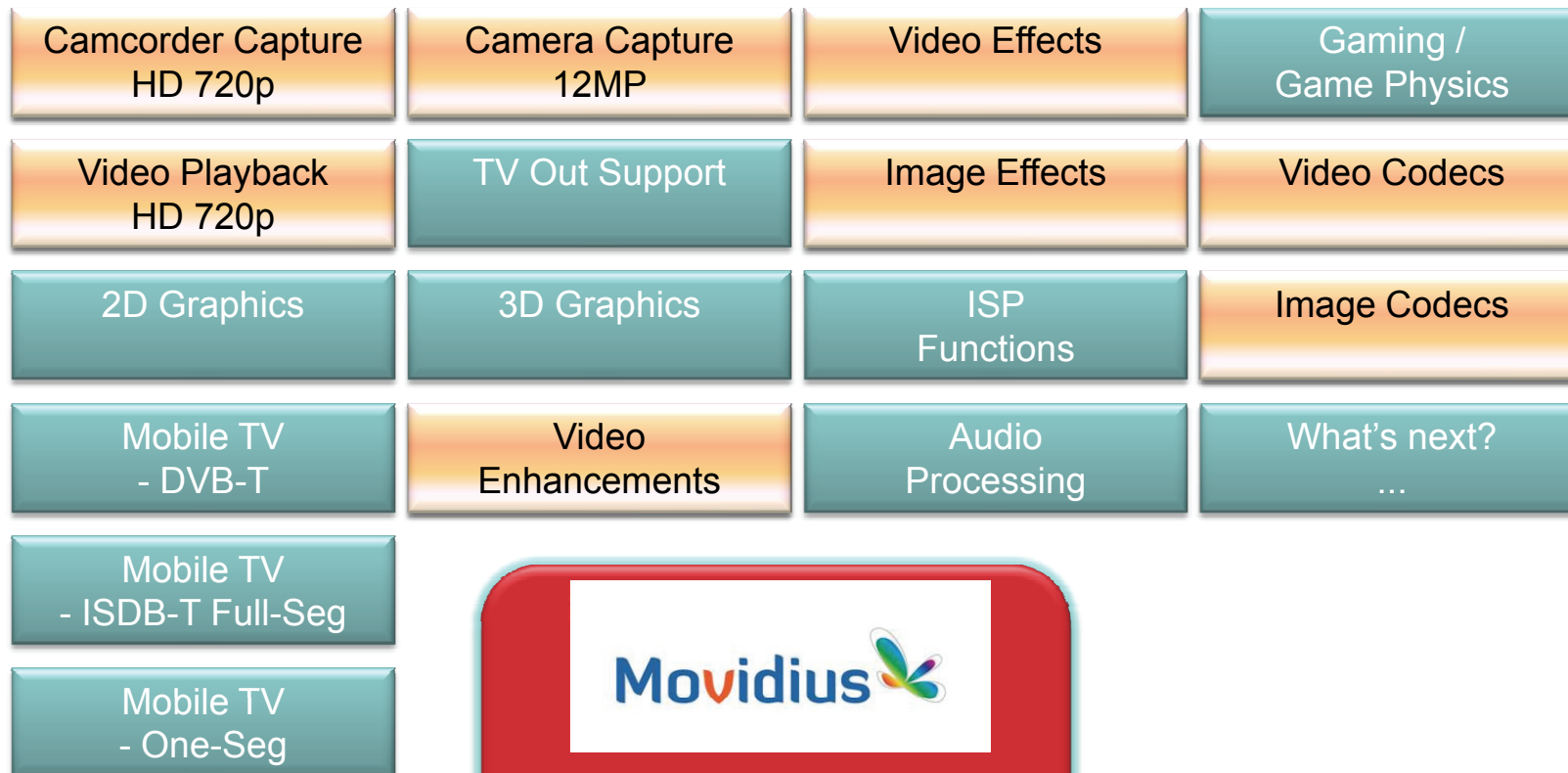


MA1000 Potential Multimedia 'Bundles'





MA1000 Potential Multimedia 'Bundles'



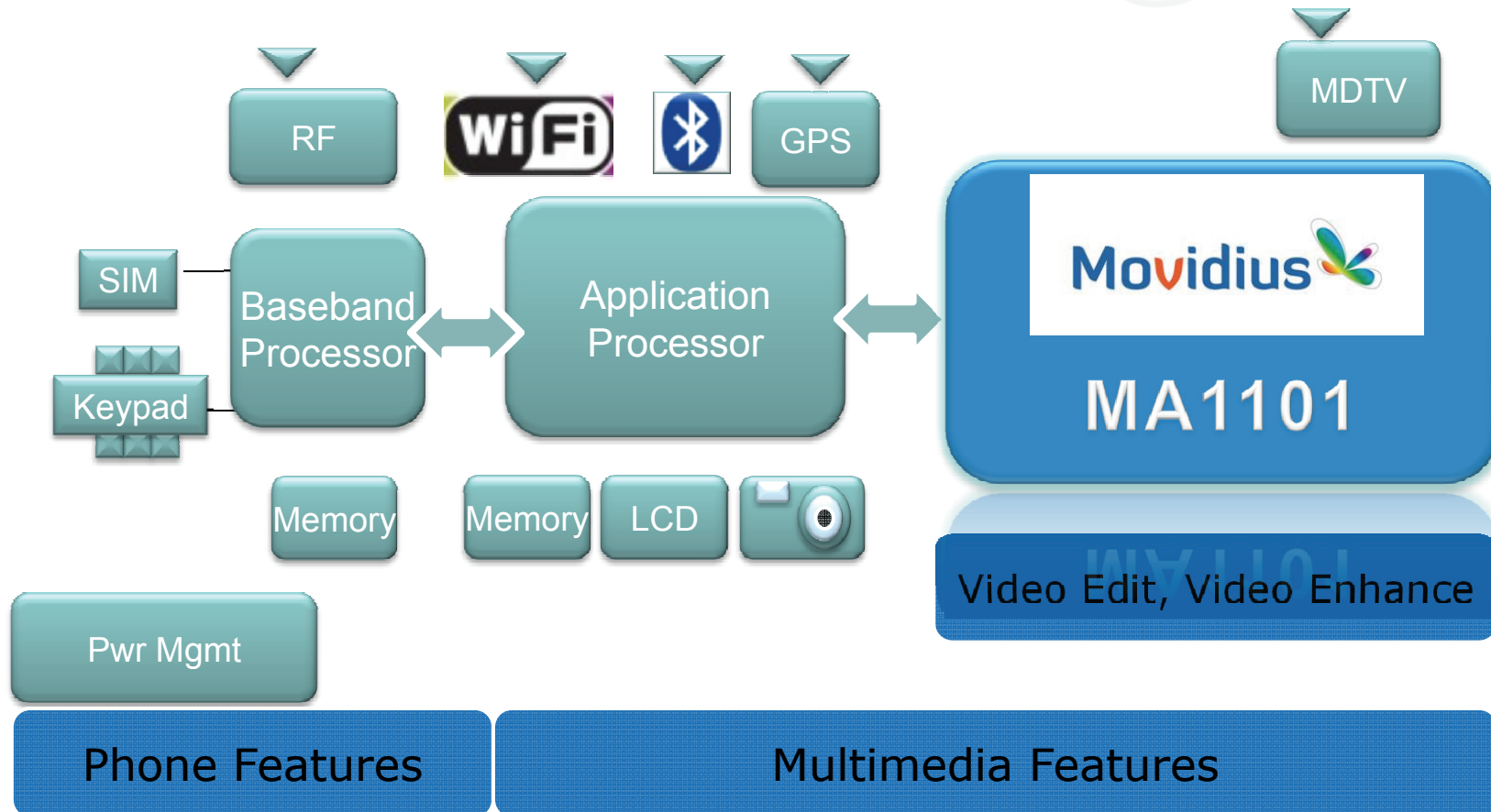


Video Editor & Other Video features

MA1101 PRODUCT OVERVIEW



Video Edit Accelerator – MA1101

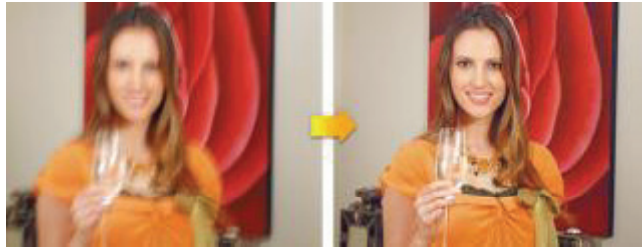




Camcorder – HD is not enough....

- A cellphone based camcorder is not just about HD video resolution
- Handheld camcorders will produce poor quality results because
 - They are mostly held with 1 hand and always very shaky
 - Captured cellphone video often not zoomed or centered in area of interest
 - Poor quality in low light situations
 - Poor quality in high contrast situations (e.g. bright background)
 - Poor audio quality, lots of background noise
 -
- The Movidius solution uniquely solves all these problems delivering a camcorder solution significantly better than competitors
- Also uniquely deliver a capability to add {fun} video effects with a simple UI

1 – Video Editing



Stabilized shaky video



Powerful Motion Based Super Slow Motion

Screen crop / Zoom-in highlighted portion



...the focal distance opposite the focal distance of the lens barrel. If you the depth of field will be to infinity. For camera has a hyperfocal focus at 18 feet.



Original

Results

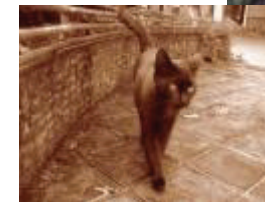
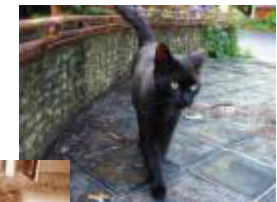


Target Palette

**“Color Transfer”
- Now on video**



**Basic Parameters
(Brightness, Sharpness, Saturation, Hue, etc.)**



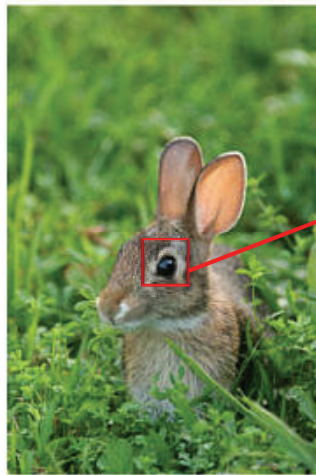
Color Effects



1 – Video Editing (cont.)

- H.264 UGC Video Editor
 - Up to 720p HD
 - Select Segment
 - Select & Preview Effects
- Advanced Video Effects
 - Stabilization
 - Slow Motion
 - Super Resolution Zoom
 - Noise Reduction
 - Brightness and Contrast Adjust
 - Color Transfer
- Basic Video Effects
 - Color Effects
 - Sepia, Negative, Edges, Tint, etc.
 - Clip rotate/pan/zoom
 - Video Transitions
 - Clipart Image/Text Overlay

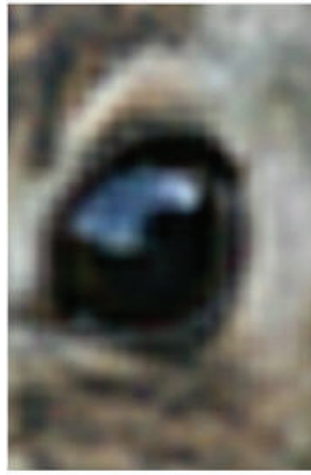
2 – Video Enhancement



Original



Zoom-in (Upscale)



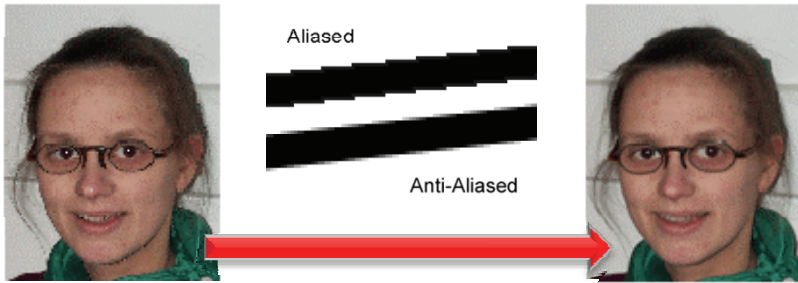
Zoom-in (Original)

Mosquito Noise

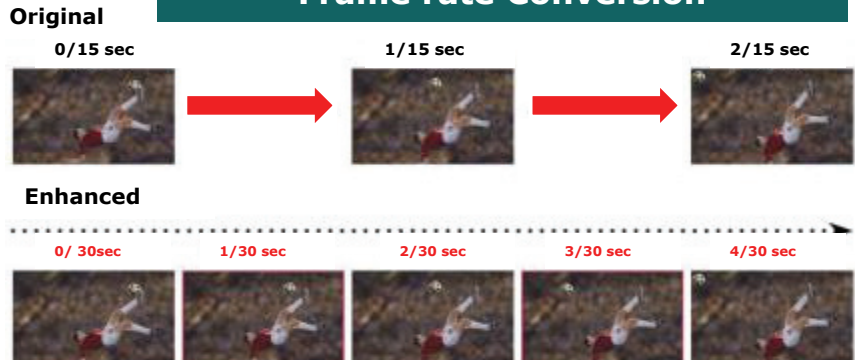
Mosquito Noise Removal



Anti-Aliasing



Frame rate Conversion





2 – Video Enhancement

- Resolution Rescaling
 - “Multiframe Upscaling” techniques for high quality results
 - Motion-compensated pixel estimation across multiple frames
 - Significant quality improvements over competing techniques
 - (W)VGA to XGA, QVGA to (W)VGA
 - Downscaling
 - 1080i & 720p to (W)VGA

- Frame Rate Enhancement
 - 15fps to 30fps frame rate enhancement

- Other Enhancement Features
 - De-noise & Anti-Aliasing



bringing mobile to life
in your Feature Phone

MA1101 PRODUCT SCHEDULE



Eval. / Demo. System Schedule

- MV0113 Apps Host 6410 Platform
 - Evaluation system board
 - With Samsung 6410 AP host daughter board, Android OS
 - This is the first access customers will have to our platform for evaluation and Android host applications development
 - Available in Feb 2010

- MV0116 Demo
 - Phone Form Factor
 - WVGA Screen
 - Touch, USB, SD Card
 - This will be used as our main demo at MWC2010 in Barcelona, Feb 2010



bringing mobile to life
in your Feature Phone

SUMMARY



Why Movidia?

- The Movidia platform enables unique applications that can differentiate customer products such as:
 - Advanced Video Editing for Mobile Social Networking
 - Video Upscaling & Enhancement for best viewing experience
 - Active LCD Backlight power control for longest video playback
 - Enhanced gaming with 3D graphics plus Game Physics

- Software Roadmap
 - As a fully programmable platform:
 - Once the hardware is integrated, a roadmap of products can be developed through software changes alone
 - Fast time to market to address new feature requirements