



**THE DATASHEET OF
MCIMX6X3EVK10AB**





i.MX 6 Series Portfolio Overview

AMF-CON-T0060

Pat Stilwell
Product Marketing



August 2013

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Objectives

- Learn about the Freescale i.MX 6 series of application processors' key features, capabilities, uses and market segment targets

- Learn about the Development Ecosystem available for the i.MX 6 Series family of processors

- Understand the power and performance advantages of the 6 Series family



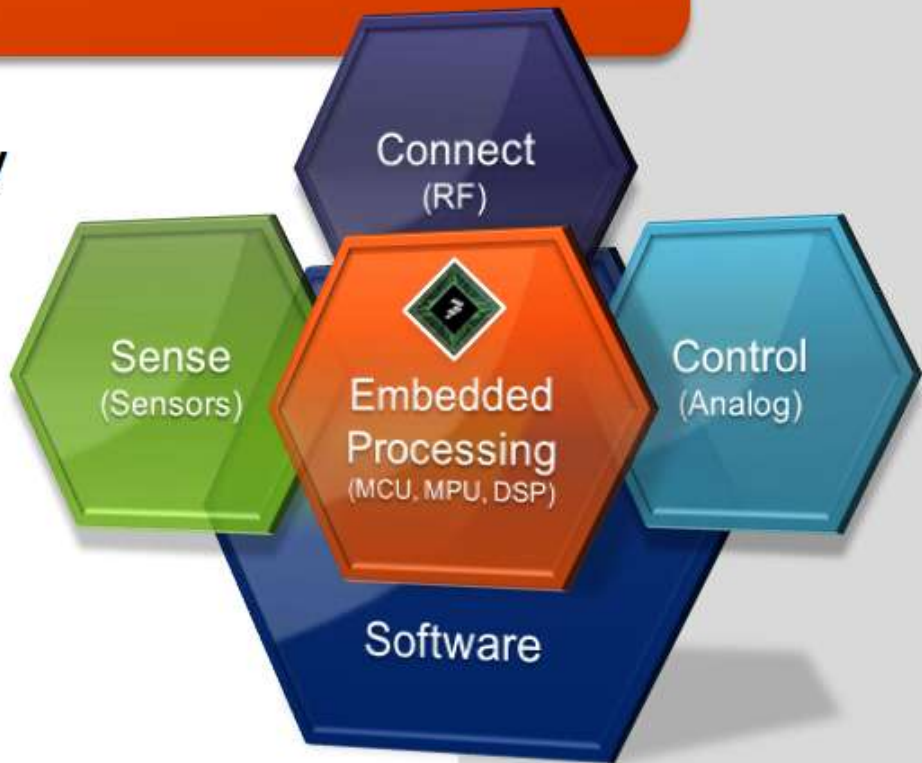
A Global Leader of Embedded Processing Solutions

Two Core Product Groups

- Automotive, Industrial & Multi-Market Solutions
 - Microcontrollers
 - Sensors
 - Analog
- Networking and Multimedia Solutions
 - Communications Processors
 - Applications Processors
 - RF Power

Four Primary Markets

- Automotive
- Industrial
- Networking
- Consumer



Platform-Level Solutions

>50 Year Legacy

>5,500 Engineers

>6,000 Patent Families

>18,000 Customers



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Six Generations of Application Processors

1995	2001	2003	2005	2009	2011
Dragonball 1st FSL Apps Processor	i.MX1 1st FSL ARM9 Apps Processor	i.MX2 Series 90nm LP HW Video Accel Analog Integration	i.MX3 Series ARM11 GPU Integration	i.MX5 Series 65nm LP/GP ARM Cortex-A8 >1GHz	i.MX 6 Series 40nm LP ARM Cortex-A9 Multi-core family

← 50+ Products →
← >150M Units →

- **Clear market leader** for eReader apps processors (IDC)
- **No. 1** in Apps Processors (IDC 12/2011)
- **No. 2** in Auto Infotainment (Strategy Analytics)





i.MX Smart Devices



Giant Waterproof Tablet – i.MX53



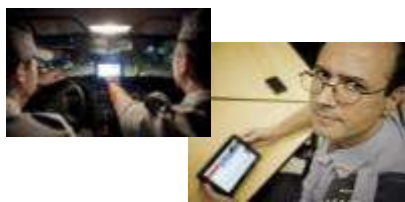
Honeywell Lynx Touch security panel with the i.MX25



Icephone, Medical Phone with i.MX31



Navico Marine Navigation i.MX51



Maxtrack tablet for Brazilian Police with i.MX51



Avaak Vue Personal Video Network With the i.MX25



Invoxia IP Phone - i.MX503

Gigaset DECT phone with i.MX233



Sophia systems' non-contact card Reader/Writer for DoCoMo with i.MX51



AMX 20.3" Modero X Series Panoramic Table Top Touch Panel with i.MX53



Televic in Belgium trams using MX51



Line6 "Stagescape" audio mixing system with i.MX51



i.MX233 based i'mWatch



Sharp e-Dictionary with i.MX28



Japanese Boarding Gate Pass Reader with i.MX27



Harris military communication equipment with i.MX27







Self service touch screen terminal



FreeScale, the FreeScale logo, i.MX, i.MX2, i.MX3, i.MX5, i.MX6, i.MX7, i.MX8, i.MX9, i.MX10, i.MX11, i.MX12, i.MX13, i.MX14, i.MX15, i.MX16, i.MX17, i.MX18, i.MX19, i.MX20, i.MX21, i.MX22, i.MX23, i.MX24, i.MX25, i.MX26, i.MX27, i.MX28, i.MX29, i.MX30, i.MX31, i.MX32, i.MX33, i.MX34, i.MX35, i.MX36, i.MX37, i.MX38, i.MX39, i.MX40, i.MX41, i.MX42, i.MX43, i.MX44, i.MX45, i.MX46, i.MX47, i.MX48, i.MX49, i.MX50, i.MX51, i.MX52, i.MX53, i.MX54, i.MX55, i.MX56, i.MX57, i.MX58, i.MX59, i.MX60, i.MX61, i.MX62, i.MX63, i.MX64, i.MX65, i.MX66, i.MX67, i.MX68, i.MX69, i.MX70, i.MX71, i.MX72, i.MX73, i.MX74, i.MX75, i.MX76, i.MX77, i.MX78, i.MX79, i.MX80, i.MX81, i.MX82, i.MX83, i.MX84, i.MX85, i.MX86, i.MX87, i.MX88, i.MX89, i.MX90, i.MX91, i.MX92, i.MX93, i.MX94, i.MX95, i.MX96, i.MX97, i.MX98, i.MX99, i.MX100, i.MX101, i.MX102, i.MX103, i.MX104, i.MX105, i.MX106, i.MX107, i.MX108, i.MX109, i.MX110, i.MX111, i.MX112, i.MX113, i.MX114, i.MX115, i.MX116, i.MX117, i.MX118, i.MX119, i.MX120, 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Freescale i.MX Applications Processors

<p>i.MX 6Quad</p>	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  High Performance Tablet </div> <div style="text-align: center;">  Media Box </div> <div style="text-align: center;">  Luxury Infotainment </div> <div style="text-align: center;">  Advanced HMI </div> </div>	<div style="display: flex; flex-direction: column; justify-content: space-around;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-weight: bold; color: white;">Performance/ Multimedia Capability</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-weight: bold; color: white;">Content Creation, Technology Driver</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-weight: bold; color: white;">Good, Better, Best Differentiation</div> </div>
<p>i.MX 6Dual i.MX 6DualLite i.MX53</p>	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  Color eReader </div> <div style="text-align: center;">  Business Tablet </div> <div style="text-align: center;">  Mainstream Infotainment </div> <div style="text-align: center;">  Medical </div> </div>	
<p>i.MX 6Solo i.MX 6SoloLite i.MX28, i.MX233, i.MX25, i.MX35, i.MX50</p>	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  Monochrome eReader </div> <div style="text-align: center;">  Single Function Tablet </div> <div style="text-align: center;">  Connected Radio </div> <div style="text-align: center;">  Smart Energy Meter </div> </div>	

Browsing and Image Viewing

Webkit Browser page rendering and scrolling

JPEG decode + encode
1024x768



- All workloads implemented on CPU
- Does not use HW accelerators at all
- Done in order to test CPU capabilities

App	1 Core	2 Core	Dual Core vs Single Core	4 Core	Quad Core vs Dual Core
JPEG	.2 fps	~1fps	5x faster	~4.5 fps	4x faster
Browser Scroll Time	289	36.25	>87% faster	15	>50% faster
Browser FPS	3.45	27.58	8x higher	64.4	>2x higher

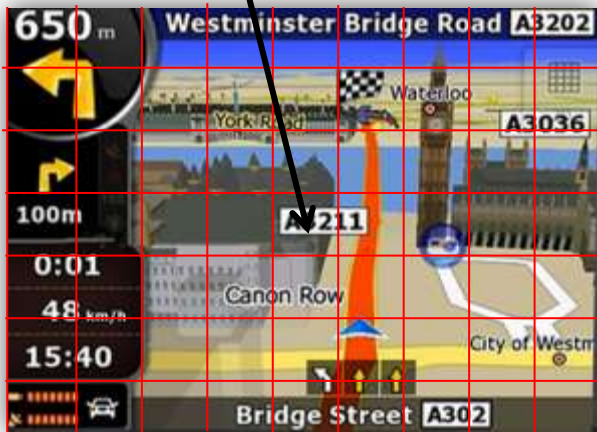
Watch it live!

<http://www.youtube.com/watch?v=JYFmBik3itl#t=2m49s> ...

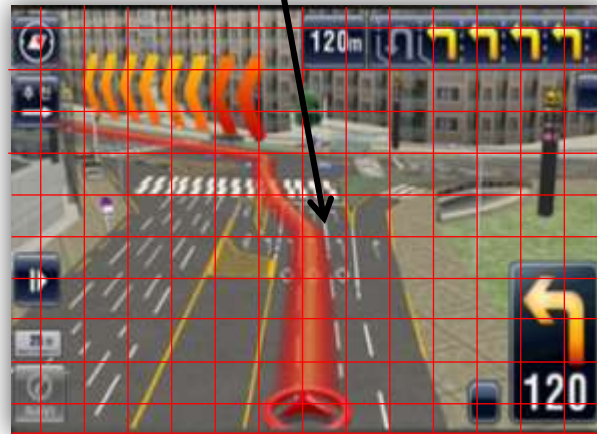
Tile Based Rendering (Chunkers)

- Size of scene buffer unknown before rendering
 - Possible overflow if scene requires more data than expected
- Good rendering method for baseline GUI/3D Apps with smaller object count (less details)
 - More bandwidth efficient than FMR in simple (yesterday) use cases
- For next generation dynamic scenes in new and future applications with lots of objects, details and post-processing effects, tile based Chunkers require multi-pass memory access to constantly process changing 3D/scene data
 - PC Level Applications (Performance, Quality, Effects) → Tablets → Smartphones → Infotainment

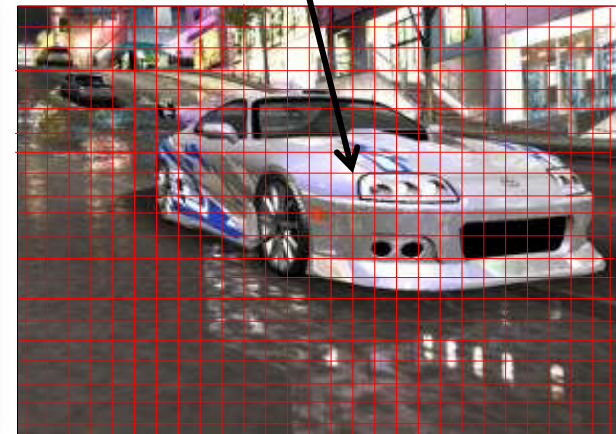
Tile



Tile



Tile (Complex Scene)



i.MX 6Series – Power Consumption Summary



Sleep	3.8mW	Sleep	3.8mW	Sleep	3.9mW	Sleep	3.1mW	Sleep	2.6mW
IDLE	227mW	IDLE	220mW*	IDLE	151mW	IDLE	143mW	IDLE	14.5mW
Video	867mW	Video	867mW	Video	772mW	Video	695mW	Video	n/a
3D	1.6W	3D	1.6W	3D	1.1W	3D	1.1W	3D	n/a
TypMax	3.8W	TypMax	n/a	TypMax	2.4W	TypMax	1.7W	TypMax	n/a

n/a = results pending release june 30th

* 6Dual cores are estimated on 6Quad by clock gating two cores

- All results include power at the chip (cores, accelerators, peripherals, DDR I/O) as well as the power consumption of the external DDR3 ICs.
- Power application notes listed in the presentation contain the full breakouts for the chip and DDR3. Note that use of LPDDR2 memory will substantially reduce memory IC power consumption

**Scalable Performance and Power Consumption
‘One Series fits all’**



i.MX 6 Series feature list (3/4)

Red indicates change from column to the left

	i.MX 6SoloLite	i.MX 6Solo	i.MX 6DualLite	i.MX 6Dual	i.MX 6Quad
Display Resolution (@60Hz)	WXGA (WXGA=1366x768)	2x WXGA	2x WXGA	2x 4XGA or 2x [1080p + WXGA] (4XGA=2048x1536)	2x 4XGA or 2x [1080p + WXGA]
Display Interfaces	2x Outputs • 1x Parallel • EPDC	2x Outputs • 2x Parallel • 2x LVDS • HDMI • MIPI-DSI • EPDC	2x Outputs • 2x Parallel • 2x LVDS • HDMI • MIPI-DSI • EPDC	4x Outputs • 2x Parallel • 2x LVDS • HDMI • MIPI-DSI	4x Outputs • 2x Parallel • 2x LVDS • HDMI • MIPI-DSI
GPU 3D	-	Vivante GC880 • 53Mtri/s • 266Mpxl/s • OpenGL ES 1.1/2.0/3.0	Vivante GC880 • 53Mtri/s • 266Mpxl/s • OpenGL ES 1.1/2.0/3.0	Vivante GC2000 • 176Mtri/s • 1000Mpxl/s • OpenGL ES 1.1/2.0/3.0 • OpenCL 1.1 EP	Vivante GC2000 • 176Mtri/s • 1000Mpxl/s • OpenGL ES 1.1/2.0/3.0 • OpenCL 1.1 EP
GPU 2D (Vector Graphics)	Vivante GC355 • 300Mpxl/s • OpenVG 1.1	via GPU 3D • OpenVG 1.1	via GPU 3D • OpenVG 1.1	Vivante GC355 • 300Mpxl/s • OpenVG 1.1	Vivante GC355 • 300Mpxl/s • OpenVG 1.1
GPU 2D (BLIT)	Vivante GC320 • 600Mpxl/s	Vivante GC320 • 600Mpxl/s	Vivante GC320 • 600Mpxl/s	Vivante GC320 • 600Mpxl/s	Vivante GC320 • 600Mpxl/s
Video Dec	SW Only	1080p30 + D1 MPEG-2, H.264 MVC, VC1, MPEG-4/Xvid, DivX 6, H.263, MJPEG, VP6 / WebM VP8	1080p30 + D1 MPEG-2, H.264 MVC, VC1, MPEG-4/Xvid, DivX 6, H.263, MJPEG, VP6 / WebM VP8	1080p60 + D1 2x 1080p30 MPEG-2, H.264 MVC, VC1, MPEG-4/Xvid, DivX 6, H.263, MJPEG, VP6 / WebM VP8	1080p60 + D1 2x 1080p30 MPEG-2, H.264 MVC, VC1, MPEG-4/Xvid, DivX 6, H.263, MJPEG, VP6 / WebM VP8
Video Enc	-	1080p30 2x 720p H.264, H.263, MPEG-4, MPEG-2, MJPEG	1080p30 2x 720p H.264, H.263, MPEG-4, MPEG-2, MJPEG	1080p30 2x 720p H.264, H.263, MPEG-4, MPEG-2, MJPEG	1080p30 2x 720p H.264, H.263, MPEG-4, MPEG-2, MJPEG



i.MX 6 Series feature list (4/4)

Red indicates change from column to the left

	i.MX 6SoloLite	i.MX 6Solo	i.MX 6DualLite	i.MX 6Dual	i.MX 6Quad
UART SPI I2C	5x UART, 4x SPI 4x I2C	4x SPI 5x UART 4x I2C	4x SPI 5x UART 4x I2C	5x SPI 5x UART 3x I2C	5x SPI 5x UART 3x I2C
ADC	-	-	-	-	-
Temp. Monitor	Yes	Yes	Yes	Yes	Yes
PMU	Partial PMU integration	Partial PMU integration	Partial PMU integration	Partial PMU integration	Partial PMU integration
Security	HAB, Secure RAM, Crypto Acc., TrustZone, NIST approved RNG	HAB, Secure RAM, Crypto Acc., TrustZone, NIST approved RNG	HAB, Secure RAM, Crypto Acc., TrustZone, NIST approved RNG	HAB, Secure RAM, Crypto Acc., TrustZone, NIST approved RNG	HAB, Secure RAM, Crypto Acc., TrustZone, NIST approved RNG
Commercial Qual.	Available	Available	Available	Available	Available
Automotive Qual. AEC-Q100	-	Available	Available	Available	Available
Industrial Qual.	-	Available	Available	Available	Available
Package	13x13 0.5P BGA	21x21 0.8P BGA Pin compatible with i.MX 6Dual/Quad		21x21 0.8P FCBGA Pin compatible with i.MX 6DualLite/Solo	



SABRE Platforms: Enabling Faster Time to Market

i.MX 6 series development tools are **Freescale designed** and **Freescale supported**

SABRE Platform for Smart Devices

- i.MX 6Quad/6DualLite 1 GHz ARM Cortex-A9
- Multiple connectivity options: Wi-Fi®, Bluetooth®, GPS, Ethernet, SD, parallel/serial interfaces, SATA (i.MX 6Quad only), PCIe and MIPI CSI
- SABRE Board plus:
 - 10.1" capacitive multi-touch display
 - Battery charging ICs
 - The SPI NOR Flash
 - MIPI display and MIPI camera connectors
 - 2x MIPI camera sensors
 - Digital microphones
 - Ambient light sensor, GPS
 - EPDC connector (i.MX 6DualLite only)



SABRE for Auto Infotainment

- Available to Tier 1 automotive OEMs
- i.MX 6Quad or i.MX6DualLite CPU card and i.MX 6 series base board
- Support for terrestrial and satellite radio tuners, Wi-Fi, Bluetooth, GPS, cellular modem, iAP authentication modules, MOST vehicle networking, cameras and displays
- Processor capability ranges from single ARM Cortex-A9 core at 800 MHz up to a quad core at up to 1 GHz



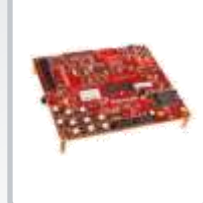
SABRE Board for Smart Devices

- i.MX 6Quad 1 GHz ARM Cortex-A9
- Intelligently designed with connectors on only two sides of board to eliminate 'octopus effect' on lab tables
- Evaluate the smartly integrated features of the i.MX 6Quad processor including an LVDS controller, USB PHYs, HDMI PHYs, SATA, PCI Express®, on-board power management and Ethernet



i.MX 6SoloLite Evaluation Kit

- i.MX 6SoloLite 1 GHz ARM Cortex-A9
- Integrated E Ink® display controller
- Enables EPD and/or LCD or HDMI display, touch control and audio playback, and the ability to add WLAN, a 3G modem or Bluetooth technology
- E Ink display available separately





Freescale i.MX 6 series Development Systems

SABRE Board for Smart Devices



P/N: MCIMX6Q-SDB

- **Cost-effective (\$399)**, open source development platform
- Designed to **simplify product evaluation**



SABRE Platform for Smart Devices



P/N: MCIMX6Q-SDP
MCIMX6DL-SDP

- Smart Device Market-focused
- Form-factor ready to **accelerate design** & time to market (\$999)

SABRE Platform for Automotive Infotainment



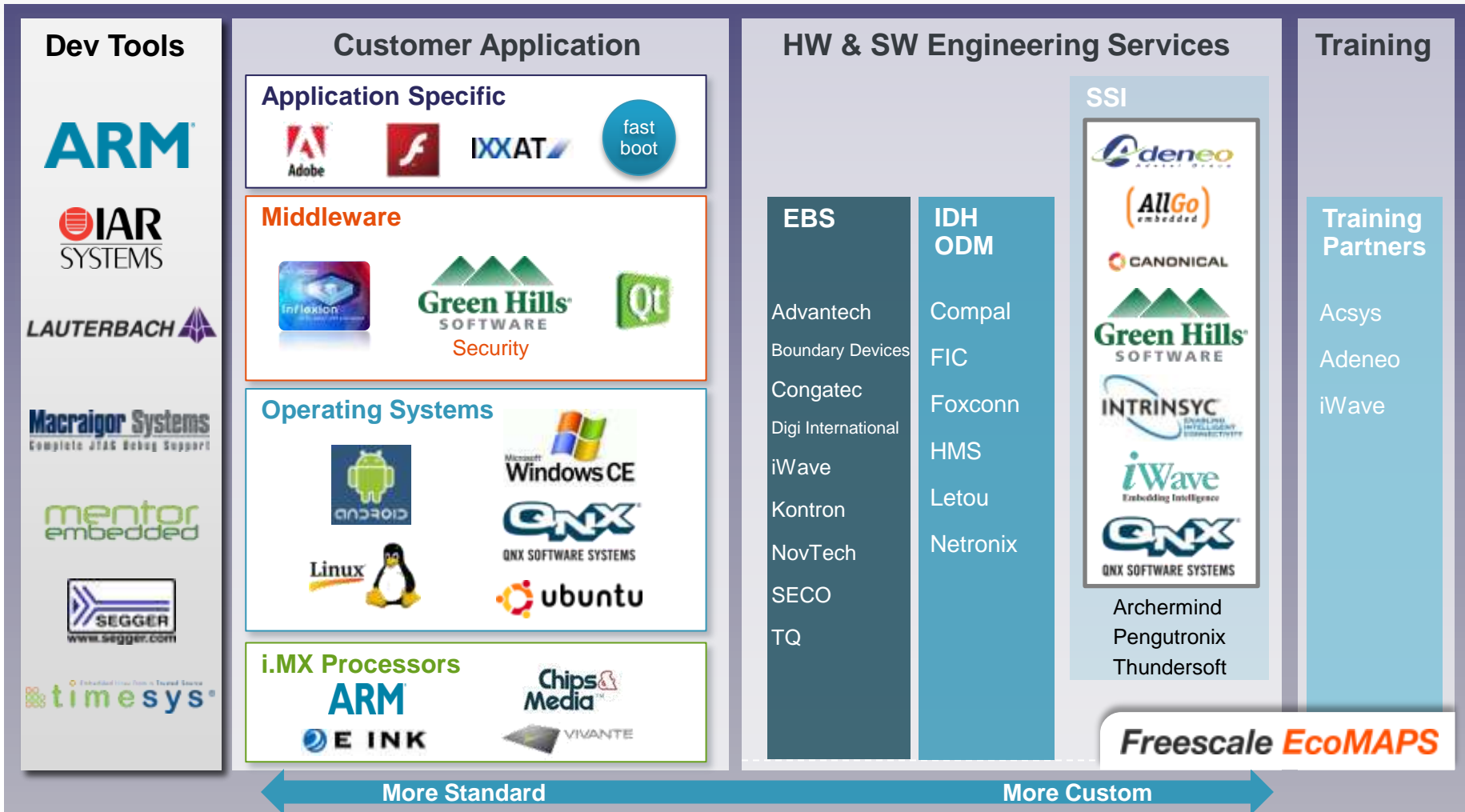
P/N: MCIMXABASEV1
MCIMX6SAICPU1
MCIMX6QAICPU1

- Automotive Market-focused
- Standard base board (\$699) and adaptable CPU card (\$799) system



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Freescale EcoMAPS for i.MX Architectures



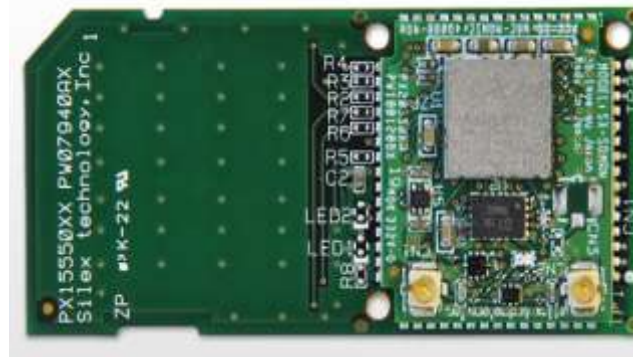
IDE: Integrated Development Environment
BDM: Background Debug Module

EBS: Embedded Board Solutions

IDH: Independent Design House
ODM: Original Design Manufacturer

SSI: Software & Solution Integrators

- 802.11a/b/g/n low power SDIO cad based on Qualcomm Atheros AR6003
- Wi-Fi driver software integrated with Freescale i.MX 6 platform
- Family of hardware solutions available
 - System-in-Package (SiP)
 - Radio Module
 - SD Card Form Factor





Backup



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SABRE Platform for Smart Devices (SDP)

i.MX 6Quad 1GHz Cortex-A9 Processor
i.MX 6DualLite 1GHz Cortex-A9 Processor

- Freescale MMPF0100 PMIC
- 1 GB DDR3 memory (non terminated)
- 3" x 7" 8-layer PCB

Part Numbers:

- MCIMX6Q-SDP (\$999)
- MCIMX6DL-SDP (\$999)

Display (4.3"):
WiFi:

- MCIMX28LCD (\$199)
- Silex WiFi module

Connectivity

- 2x Full-size SD/MMC card slot
- 22-pin SATA connector
- 10/100/1000 Ethernet port
- 1x high-speed USB OTG port
- mPCI-e connector

Display connectors

- Native 1024x768 LVDS display (comes with kit)
- 2nd LVDS connector
- Connector for 24 bit 4.3" 800x480 WVGA with 4-wire touch screen
- HDMI Connector
- MIPI DSI connector

Audio

- Wolfson Audio Codec
- Microphone and headphone jacks
- Dual 1W Speakers

Expansion Connector

- Enables parallel LCD or HDMI output
- Camera CSI port signals
- I2C, SSI, SPI signals

Tools Support

- Lauterbach, ARM (DS-5), Macraigor debug/IDE tool chain



Debug

- JTAG connector
- Serial to USB connector

Additional Features

- 3-axis Freescale accel
- GPS receiver
- Ambient Light Sensor
- eCompass
- Dual 5MP Cameras
- Power supply
- Battery Charger
- Battery connectors

OS Support

- Linux and Android IceCream Sandwich from Freescale;
- Others: support by 3rd parties



Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

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 [NXP / Nexperia Information](#)

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-  Global Sourcing Solution
-  Obsolete Management
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-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management