Introduction to Freescale i.MX Processors based on ARM® Cortex™-A9 Core
APF-CON-T0838

Vincent Wang
Marketing BD Manager, APAC
Freescale gives you the market’s widest range of ARM-based solutions for automotive, industrial, consumer and networking applications. Find your ideal solution at the price, performance and power level you desire and leverage the extensive software and tool bundles available to speed and ease your design process.
Expanding the Freescale ARM Portfolio

- **i.MX35**
  - ARM® 11
- **i.MX2xx**
  - ARM 9
- **Kinetis**
  - **L Series MCU**
    - ARM Cortex-M0+
  - **K Series MCU**
    - ARM Cortex-M4(F)
- **Kinetis X Series MCU/MPU**
- **Vybrid**
  - ARM Cortex-A7
  - ARM Cortex-A5
  - ARM Cortex-M4F
- **i.MX6 Series**
  - ARM Cortex-A9
- **i.MX5x**
  - ARM Cortex-A8
- **i.MX7 Series**
  - ARM Cortex-A7
- **i.MX8 Series**
  - ARM Cortex-A53
- **i.MX8 Series**
  - ARM Cortex-A53

**Performance**

**Integration**
i.MX Applications Processor Roadmap

**i.MX 8 Series**
ARM®v8-A

**Driver Information Systems**
General Embedded

**i.MX 6 Next**
ARM®v7-A

**Telematics**
General Embedded

**Energy Efficiency**

**i.MX 7 Series**
ARM®v7-A

**General Embedded**
Point of Sale
Internet of Things

**Advanced Graphics & Performance**

**Automotive**
**Consumer**
**Industrial**

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**i.MX 7 Family of Application Processors**

Two new i.MX family members built on One 28nm Low Power Platform

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**i.MX 7Solo**

- Single Cortex A7, 500-800MHz
- Cortex M0+; 16bit DDR; 2x GigE
- Full Security w/ Tamper resist

**Industrial HMI Control**
- Mainstream Point of Sale
- Low end Home Control
- Basic Wearables
- General Embedded Control

Add:
- A7 Core, 32bit DDR, M4 core
- EPD Display, PCIe

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**i.MX 7Dual**

- Dual Cortex A7, 800MHz
- Cortex M4/M0+, 2xGigE, 32bit DDR
- Full Security w/ Tamper resist

**eReaders**
- High End Point of Sale
- Home Automation
- Industrial HMI with Security
- Wearables
i.MX Markets and Applications

Automotive
- Infotainment
- Telematics
- Instrument Clusters
- Vision/Camera Systems

eReaders
- Monochrome eReader
- Color eReaders

Smart Devices
- Media Tablets
- IPTV/Streaming Media
- Smart Monitors
- Media Phones
- Printers
- Appliances
- Scanners
- Medical – Patient Monitoring
- Medical tablets
- Industrial tablets
- Smart Energy
- Factory Automation
- HMI
- Aerospace and Defense
- Digital Signage
Smart Devices, 2 of 2

- 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
- Televic in Belgium trams using MX51
- Gigaset DECT phone with i.MX233
- i.MX25 based picking application, logistics market system in warehouses

- Maxtrack tablet for Brazilian Police with i.MX51
- Avaak Vue Personal Video Network with the i.MX25
- Invoxia IP Phone - i.MX503
- i.MX233 based i’mWatch
- AMX 20.3” Modero X Series Panoramic Table Top Touch Panel with i.MX53
- Japanese Boarding Gate Pass Reader with i.MX27
- Self service touch screen terminal

- Sharp e-Dictionary with i.MX28
- Sophia systems’ non-contact card Reader/Writer for DoCoMo with i.MX51
- Harris military communication equipment with i.MX27
- Gigaset DECT phone with i.MX51
- AMX 20.3” Modero X Series Panoramic Table Top Touch Panel with i.MX53
- Japanese Boarding Gate Pass Reader with i.MX27
Some i.MX Smart Devices with telephony features

- China Telecom P7 Media Phone – i.MX51
- Telstra T-hub – i.MX51
- Huawei MC850 – i.MX51
- ACN IP Phone – i.MX27
- BlackBerry Curve - MXC
- Yulong smartphone – i.MX31
- Coship E89 smartphone – i.MX31
- Coolpad 8910 smartphone – i.MX51
- Icephone Medical Phone – i.MX31
- Skype DECT phone – i.MX28
- Gigaset DECT phone – i.MX233
- Invoxia HD Phone - i.MX50
- Yulong TV phone – i.MX31
- Orange Livephone Touch – i.MX31
- Avaak Vue Personal Video Network – i.MX25
- PCCW Eye – i.MX21
- PCCW Eye Home Smartphone – i.MX51
- Galentia Liverpool FC phone – i.MX31
Freescale-based E Ink eReaders

Amazon
- Kindle DX & Kindle 2
  - i.MX31
- Kindle 3
  - i.MX35
- Kindle
  - i.MX51
  - i.MX50

Kobo (Fnac/WHSmith)
- i.MX35
- i.MX50

Google / iRiver
- i.MX50

Sony
- i.MXL
- i.MX31
- i.MX50

Ectaco
- i.MX50

Hanvon
- i.MX51
- i.MX50

Pocketbook
- i.MX35
- i.MX50

Bebook
- Booq
  - i.MX31
- Acer
- Medion
  - i.MX35

Onyx
- Greenbook
- Jinke
  - i.MX50
Freescale Product Longevity Program

- The embedded market needs long-term product support
- Freescale has a longstanding track record of providing long-term production support for our products
- Freescale is pleased to provide a formal product longevity program for the market segments we serve
- For the automotive and medical segments, Freescale makes a broad range of devices available for a minimum of 15 years
- For all other market segments in which Freescale participates, Freescale makes a broad range of devices available for a minimum of 10 years
- Life cycles begin at the time of launch
- A list of participating Freescale products is available at: www.freescale.com/productlongevity
Freescale Quality Commitment

Screened Reliability

- Concept
- Process Development
- Product Development
- Product Reliability
- Reliability Analysis
- High Risk, Product Specific

Reliability Resources

Built-in Reliability

- Reliability Expectations
- Design for Reliability
- Reliability
- Reliability Learning
- Process Certification
- Data Reuse
- Reliability Verification
- Qualification
- Low-Risk Quality and Verification
- Reliability Risks
Six Generations of Applications Processors

1995
Dragonball
1st FSL Apps Processor

2001
i.MX1
1st FSL ARM9 Apps Processor

2003
i.MX2 Series
90nm LP HW Video Accel Analog Integration

2005
i.MX3 Series
ARM11 GPU Integration

2009
i.MX5 Series
65nm LP/GP ARM Cortex-A8 >1GHz

2011
i.MX 6 Series
40nm LP ARM Cortex-A9 Multi-core family

• **Clear market leader** for eReader applications processors (IDC)
• **No. 1** in Applications Processors (IDC 12/2011)
• **No. 2** in Auto Infotainment (Strategy Analytics)
## Freescale i.MX Applications Processors

<table>
<thead>
<tr>
<th>Processor</th>
<th>High Performance Tablet</th>
<th>Media Box</th>
<th>Luxury Infotainment</th>
<th>Advanced HMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>i.MX 6Quad</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i.MX 6Dual</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i.MX 6DualLite</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i.MX 6Solo</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i.MX 6SoloLite</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i.MX28, i.MX233, i.MX25, i.MX35, i.MX50</td>
<td>Monochrome eReader</td>
<td>Single Function Tablet</td>
<td>Connected Radio</td>
<td>Smart Energy Meter</td>
</tr>
</tbody>
</table>

### Performance/Multimedia Capability
- Good, Better, Best Differentiation
- Content Creation, Technology Driver
- High Performance Tablet

### Application Areas
- Advanced HMI
- Medical
- Business Tablet
- Mainstream Infotainment
- Monochrome eReader
- Single Function Tablet
- Connected Radio
- Smart Energy Meter
- Color eReader
- Media Box
- Luxury Infotainment
i.MX 6 Series

Industry’s Most Scalable ARM Processors

Build **scalable product lines** with **ultimate versatility**

**Software and hardware compatibility** across single, dual and quad core devices

**Easy to use** development kits

**Best-in-class performance**, low power consumption and bleeding-edge multimedia and graphics

**Optimized peripheral sets** tailored to serve automotive, industrial and consumer markets
i.MX 6: One Platform, Differentiated Products

Saves **development costs** and **improves time to market**. **Scalability with multiple cores** is **key** to implement this strategy.

<table>
<thead>
<tr>
<th>Core Type</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quad Core</strong></td>
<td>High-End (6Quad) IPTV High Performance Tablet Auto Infotainment</td>
</tr>
<tr>
<td><strong>Dual Core</strong></td>
<td>High-End (6Dual) Smart Monitor Business Tablet Media Tablet IP Phone Tablets for Kids Mainstream Infotainment Color eReaders</td>
</tr>
<tr>
<td><strong>Single Core</strong></td>
<td>High-End (6Solo) Smart Energy eReaders Entry Auto Infotainment</td>
</tr>
<tr>
<td></td>
<td>Low-End (6DualLite)</td>
</tr>
<tr>
<td></td>
<td>Low-End (6SoloLite)</td>
</tr>
</tbody>
</table>
Enabling Next Generation Multimedia Products

i.MX 6 Series
Built on ARM® Cortex™-A9

1. Being the Same Is Different
Scalable multicore processors enables one software design for a portfolio of products.

2. Do More with Less Power
24 hours of video playback, 30+ days of standby time through unique low-power design and multicore utilization.

3. Make It Look Good
Get clean, crisp and complex graphics powered by 200MT/s. Three dedicated graphics engines for uncompromised user experience.

4. Make It Pop

Industry’s most scalable and powerful platform for multimedia and display applications
i.MX 6 Series Differentiated Features

- **ARM® Cortex™-A9 based solutions** with up to 1.2 GHz
- **3D video playback in high definition** for stunning visual experience
- **Triple Play graphics architecture** enables ultra-vivid graphics with separate 3D, 2D, and OpenVG graphics engines
- Display interfaces **LVDS and HDMI** plus support for **eInk** low-power display technology
- **Optimized peripheral sets:** PCIe/SATA/GbE, USB/SD/MIPI and CAN/MLB150 tailored for the auto infotainment, consumer and industrial markets
- **64-bit memory bus for optimal performance**, and memory interfaces support DDR3, DDR3L and LP-DDR2
- **Integrated power management** simplifies design and reduces external components
- **Specialized support for harsh conditions** unique to automotive and industrial environments (i.e. extreme temperatures)

*Features vary by product family*
# MX 6 Series At a Glance

## Scalable series of five ARM Cortex A9-based SoC families

<table>
<thead>
<tr>
<th>Model</th>
<th>ARM Cortex-A9</th>
<th>L2 cache</th>
<th>Neon</th>
<th>VFPvd16</th>
<th>Trustzone</th>
<th>3D graphics</th>
<th>2D graphics</th>
<th>DDR3/LPDDR2</th>
<th>SATA-II</th>
<th>EPD controller</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>i.MX 6Solo</strong></td>
<td>• Single ARM Cortex-A9 at 1.0GHz</td>
<td>• 512KB L2 cache, Neon, VFPvd16, Trustzone</td>
<td>• 3D graphics with 1 shader</td>
<td>• 2D graphics</td>
<td>• 32-bit DDR3 and LPDDR2 at 400MHz</td>
<td>• Integrated EPD controller</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>i.MX 6DualLite</strong></td>
<td>• Dual ARM Cortex-A9 at 1.0GHz</td>
<td>• 512KB L2 cache, Neon, VFPvd16, Trustzone</td>
<td>• 3D graphics with 1 shader</td>
<td>• 2D graphics</td>
<td>• 64-bit DDR3 and 2-channel 32-bit LPDDR2 at 400MHz</td>
<td>• Integrated EPD controller</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>i.MX 6Dual</strong></td>
<td>• Dual ARM Cortex-A9 at 1/1.2GHz</td>
<td>• 1 MB L2 cache, Neon, VFPvd16, Trustzone</td>
<td>• 3D graphics with 4 shaders</td>
<td>• Two 2D graphics engines</td>
<td>• 64-bit DDR3 and 2-channel 32-bit LPDDR2 at 533MHz</td>
<td>• Integrated SATA-II</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>i.MX 6Quad</strong></td>
<td>• Quad ARM Cortex-A9 at 1.2GHz</td>
<td>• 1 MB L2 cache, Neon, VFPvd16, Trustzone</td>
<td>3D graphics with 4 shaders</td>
<td>Two 2D graphics engines</td>
<td>64-bit DDR3 and 2-channel 32-bit LPDDR2 at 533MHz</td>
<td>Integrated SATA-II</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Features vary by product family**

- ARM Cortex-A9 based solutions ranging up to 1.2GHz
- HD 1080p encode and decode (except 6SL)
- 3D video playback in High definition (except 6SL)
- SW support: Google Android™, Windows® Embedded CE, Linux®

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*Red indicates change from column to the left*
Intelligent Integration of Multimedia

**i.MX 6Dual/6Quad VPU**
- H.264 MVC1080p60 decode
- H.264 MVC 720p60 encode
- 350mW power consumption for single video!

**i.MX 6Dual/6Quad IPU**
- Four Display support (2x MIPI-DSI, Parallel, HDMI v1.4a)
- Stereoscopic camera input
- Color adjustments and gamut mapping
- Gamma correction and contrast stretching
- Compensation for low-light conditions & backlight reduction

**i.MX 6Dual/6Quad Triple-Play Graphics**
- 3 engines: 3D, OpenVG and BLT
- 200 MT/s, 4 shaders, 3 separate engines
- High quality 3D games optimized for mobile
- Augmented reality views (real world + 3D objects)
- Advanced 3D video formats (source/depth format)

**i.MX 6Dual/6Quad— 2x/4x cores**
- Create, transform, enhance, & publish multimedia fast!
- Intuitive User Interfaces for content viewing
- Scalability for ‘the next big use case’
### i.MX 6 Series Triple-Play Graphics support

<table>
<thead>
<tr>
<th>Processor</th>
<th>3D GPU</th>
<th>Vector Graphics</th>
<th>Same GPU drivers for all i.MX 6 Processors</th>
</tr>
</thead>
<tbody>
<tr>
<td>i.MX 6SoloLite</td>
<td>GC320</td>
<td>GC355</td>
<td></td>
</tr>
<tr>
<td>i.MX 6Solo / 6DualLite</td>
<td>GC320</td>
<td>GC355</td>
<td></td>
</tr>
<tr>
<td>i.MX 6Quad / 6Dual</td>
<td>GC320</td>
<td>GC355</td>
<td></td>
</tr>
</tbody>
</table>

- **Composition (2D BLIT)**
- **3D GPU**
  - 1 shader core
- **3D + GP GPU**
  - 4 shader cores

**i.MX 6 Solo Lite**
- i.MX 6SoloLite
- GC320 Composition
- GC355 Vector Graphics

**i.MX 6 Solo / 6 Dual Lite**
- i.MX 6Solo / 6DualLite
- GC320 Composition
- GC355 Vector Graphics

**i.MX 6 Quad / 6 Dual**
- i.MX 6Quad / 6Dual
- GC320 Composition
- GC355 Vector Graphics
Cortex-A, Classic ARM Comparison

<table>
<thead>
<tr>
<th></th>
<th>ARM9</th>
<th>ARM11</th>
<th>Cortex-A5</th>
<th>Cortex-A8</th>
<th>Cortex-A9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architecture</td>
<td>ARMV5</td>
<td>ARMV6</td>
<td>ARMv7 + MP</td>
<td>ARMv7</td>
<td>ARMv7 + MP</td>
</tr>
<tr>
<td>Multi-Core Capable</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Pipeline and Machine</td>
<td>5-stage</td>
<td>8-stage</td>
<td>8-stage, Single issue, In-Order</td>
<td>13-stage, Dual Issue, in-order</td>
<td>8-Stage, Dual issue, Out of Order</td>
</tr>
<tr>
<td>Frequency Range (40nm)</td>
<td>366MHz</td>
<td>483MHz</td>
<td>300-950+MHz</td>
<td>600-2000 MHz</td>
<td>600-1900+ MHz</td>
</tr>
<tr>
<td>Power Efficiency (DMIPS/mW)</td>
<td>4.5</td>
<td>3.9</td>
<td>14.4</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>DMIPS/MHz</td>
<td>1.1</td>
<td>1.26</td>
<td>1.6 per CPU</td>
<td>2.0</td>
<td>2.5 per CPU</td>
</tr>
</tbody>
</table>

Source: ARM™ Presentation
The Home Health Hub Platform

Optional Tablet with Medical User Interface
i.MX6

HHH Ref Platform Gateway
i.MX28

HHH Panic Alarm
MC12311

Nonin Pulse Ox
MC9S08GP32

868MHz RF

Bluetooth HDP

Bluetooth SPP

Bluetooth Low Energy

Physician Monitoring Center
Loved Ones Social Network

Wired connection

Wireless connection

Medical monitoring

WWW connection

HHH Ref Platform Expansion Capabilities
Smart Plugs
Smart Appliances
Safety/Security
Lighting Control
Local Display

868MHz RF

Bluetooth HDP

Bluetooth SPP

Bluetooth Low Energy

Blood Pressure Monitor

Weight Scale

Thermometer

Blood Glucose Meter

HHH Ref Platform Expansion Capabilities

Smart Plugs
Smart Appliances
Safety/Security
Lighting Control
Local Display

Wired connection

Wireless connection

Medical monitoring

WWW connection

Physician Monitoring Center
Loved Ones Social Network
Multimedia ePOS

A7
- High Level OS i.e. Linux
- Human machine interfaces
  - Display, Camera, keypad
- Connectivity
  - Ethernet, WiFi, USB
- Security
  - TrustZone, Boot

M4
- Real-Time OS i.e. MQX
  - Power Mgmt
  - Control of I/O peripherals
  - ADC/PWM for motor control
  - Audio control for Alarm & information

• High Level OS i.e. Linux
• Human machine interfaces
  – Display, Camera, keypad
• Connectivity
  – Ethernet, WiFi, USB
• Security
  – TrustZone, Boot

• Real-Time OS i.e. MQX
  – Power Mgmt
  – Control of I/O peripherals
  – ADC/PWM for motor control
  – Audio control for Alarm & information

Audio CODEC
Touch Screen

Trigger

Motor Control
Audio Out

Analyzer
ADC
DAC
Memory I/F
Q SPI
Quad SPI
DDRC
DAC
NAND
NAND-C
External Bus

Core
ARM® Cortex-A7
Up to 500 MHz

Core
ARM® Cortex-M4
Up to 167 MHz

Communication
UART
I2C
CAN
I2C
SDIO
Ethernet
SDIO
USB Host
USB
USB OTG
USB
GPIO

Security
Crypto
Real Time
Symmetrix
Tamper Detection
Secure Fuse
HAB
Secure JTAG

Audio
I2S
ESAI
SPDIF

Display and Imaging
Display
Seg LCD
Imaging
Video
Still

Audio In

Tamper Detection
Wi-Fi
LAN
USB
Keypad
### i.MX 6 Reference Designs (with Production Silicon)

- **All Boards FSL designed**
- **All Boards FSL supported**
- **Common set of boards for 6Q/D/DL/S**
- **SoloLite will have its own EVK**

<table>
<thead>
<tr>
<th>i.MX 6Quad</th>
<th>i.MX 6Dual</th>
<th>i.MX 6Dual Lite</th>
<th>i.MX 6Solo</th>
<th>i.MX 6SoloLite</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Dual DDR</td>
<td>• Dual DDR</td>
<td>• Dual DDR</td>
<td>• Single DDR</td>
<td>• Single DDR</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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</tr>
</tbody>
</table>

#### Products

- **SABRE—AI for Auto** ($1499)
- **SABRE Platform for Smart Devices** ($999)
- **SABRE Board for Smart Devices** ($399)
- **i.MX 6SLEVK** ($599)

- **i.MX 6 maximizes use of reference boards across derivative parts**

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**freescale**

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**Note:** The table may not display correctly due to the limitations of the text-based format.
SABRE Board for Smart Devices

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

P/N: MCIMX6Q-SDB

SABRE Platform for Smart Devices

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

P/N: MCIMX6Q-SDP
MCIMX6DL-SDP

SABRE Platform for Automotive Infotainment

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

P/N: MCIMXABASEV1
MCIMX6SAICPU1
MCIMX6QAICPU1

Freescale i.MX 6 Series Development Systems
### SABRE Platform for Automotive Infotainment (AI)

#### CPU Card Details
- **Power and Memory**
  - Freescale MMPF0100 PMIC
  - 2 GB DDR3 memory (i.MX 6Dual/Quad)
  - 1GB DDR3 memory (i.MX 6Solo)
  - 32GB Parallel NOR Flash
  - NAND Socket

- **Display**
  - LVDS connector
    - compatible with MCIMX-LVDS1
  - Parallel RGB display interface
  - HDMI output connector

- **Debug**
  - JTAG connector
  - Debug UART connector

- **Connectivity and Expansion**
  - SD Card Slot
  - High Speed USB OTG
  - Ethernet
  - SATA
  - MIPI CSI
  - PCIe
  - MLB150 INIC connector
  - 281-pin MXM card edge connector for main board expansion

- **Expansion Modules from 3rd party planned availability in Q4 2012**

- **SABRE AI boards will only be supported at automotive customers**

#### Part Numbers
- **Base Board:** MCIMXABASEV1 ($699)
- **CPU Cards:**
  - MCIMX6SAICPU1 ($799)
  - MCIMX6QAICPU1 ($799)
- **Display:** MCIMX-LVDS1 ($499)

#### Base Board Details
- **Can be reused from i.MX53 SABRE AI**
- **Connectivity and Expansion**
  - SD card slot (WiFi module or SD)
  - Bluetooth or Bluetooth+WiFi header
  - AM/FM tuner header
  - Sirius XM Module header (de-pop"d)
  - GPS (UART) module connector
  - 2x CAN
  - Dual High Speed USB Host connectors
  - MLB 25/50 INIC connector
  - SPI NOR flash

- **Display I/O**
  - LVDS connector
    - compatible with MCIMX-LVDS1
  - Analog Video Input
  - LVDS Input

- **Audio**
  - Cirrus multichannel audio codec
    - Up to 8 outputs
  - Dual microphone inputs
  - Stereo Line Level Input
  - SPDIF receiver

- **OS Support**
  - Linux
  - Others: future support by 3rd parties

#### Part Numbers
- **Base Board:** MCIMXABASEV1 ($699)
- **CPU Cards:**
  - MCIMX6SAICPU1 ($799)
  - MCIMX6QAICPU1 ($799)
- **Display:** MCIMX-LVDS1 ($499)

### Base Board Details
- **Can be reused from i.MX53 SABRE AI**
- **Connectivity and Expansion**
  - SD card slot (WiFi module or SD)
  - Bluetooth or Bluetooth+WiFi header
  - AM/FM tuner header
  - Sirius XM Module header (de-pop"d)
  - GPS (UART) module connector
  - 2x CAN
  - Dual High Speed USB Host connectors
  - MLB 25/50 INIC connector
  - SPI NOR flash

- **Display I/O**
  - LVDS connector
    - compatible with MCIMX-LVDS1
  - Analog Video Input
  - LVDS Input

- **Audio**
  - Cirrus multichannel audio codec
    - Up to 8 outputs
  - Dual microphone inputs
  - Stereo Line Level Input
  - SPDIF receiver

- **OS Support**
  - Linux
  - Others: future support by 3rd parties

---

**Expansion Modules from 3rd party planned availability in Q4 2012**

**SABRE AI boards will only be supported at automotive customers**
## i.MX 6 Series Software – Current BSP Releases

All public software releases are available at [www.freescale.com/imx6tools](http://www.freescale.com/imx6tools)

<table>
<thead>
<tr>
<th>BSP</th>
<th>Distribution</th>
<th>Kernel</th>
<th>SoC Supported</th>
<th>Release Date</th>
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<tbody>
<tr>
<td>L3.0.35_4.0.0</td>
<td>LTIB</td>
<td>3.0.35</td>
<td>i.MX 6Quad i.MX 6Dual i.MX 6DualLite i.MX 6Solo</td>
<td>5/13/2013</td>
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<tr>
<td>L3.0.35_2.1.0</td>
<td>LTIB</td>
<td>3.0.35</td>
<td>i.MX 6SoloLite</td>
<td>6/4/2013</td>
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<td>JB4.2.2_1.1.0</td>
<td>Android JB 4.2.2</td>
<td>3.0.35</td>
<td>i.MX 6Quad i.MX 6Dual i.MX 6DualLite i.MX 6Solo</td>
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<td>R13.4.1</td>
<td>Android ICS 4.0.4</td>
<td>3.0.35</td>
<td>i.MX 6Quad i.MX 6Dual i.MX 6DualLite i.MX 6Solo</td>
<td>12/12/12</td>
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<tr>
<td>R13.5.0</td>
<td>Android ICS 4.0.4</td>
<td>3.0.35</td>
<td>i.MX 6SoloLite</td>
<td>11/16/12</td>
</tr>
</tbody>
</table>
Legacy Distribution

LTIB (Xorg X-Server 1.6.1, GStreamer 0.10.35)
Ubuntu 11.10 (Xorg X-Server 1.10.4, GStreamer 0.10.35)

3.0.35 GA
L3.0.35 GA
L3.0.35_1.1.0
L3.0.35_2.1.0
L3.0.35_4.0.0
L3.0.35_4.1.0
Sept 6, 2013

Yocto 1.4 – Poky 9.0 “Dylan”

X server 1.11.4
GStreamer 0.10.36
Qt4-embedded 4.8.4
HW Floating point
U-Boot v2013.04
Device Tree

L3.5.7_1.0.0-alpha
25-Jul-13

Yocto 1.5

X server 1.14.0
Qt4-embedded 4.8.5
Wayland 1.1
Mesa 9.1.5
DRM 2.4-45
DirectFB 1.6.3

L3.10.9_1.0.0 GA

Yocto “Next”

L3.10.9_1.1.0 beta
L3.10.9_1.1.0 alpha
31-Oct-13

3.0.35 GA

4Q 1Q 2Q 3Q 4Q 1Q 2Q 3Q 4Q

2012 2013 2014

GA – Support for 1 year
Alpha & Beta – Support until next release

▼ Execution
▼ Planning
▼ Proposed

i.MX6Q/i.MX6D SabreSDB/SDP, SabreAI
i.MX6DL/i.MX6S SabreSDP, SabreAI
i.MX6SL EVK
i.MX6SoloX SabreSDB
# Android Roadmap

## Google Android Releases

<table>
<thead>
<tr>
<th>Release</th>
<th>Model</th>
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</thead>
<tbody>
<tr>
<td>Jellybean 4.1</td>
<td>i.MX6Q/i.MX6D SabreSDB/SDP, SabreAI</td>
</tr>
<tr>
<td>Jellybean 4.2</td>
<td>i.MX6DL/i.MX6S SabreSDB, SabreAI</td>
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<tr>
<td>Jellybean 4.3</td>
<td>i.MX6SL EVK</td>
</tr>
<tr>
<td>Kit-Kat 4.4</td>
<td>i.MX6SoloX SabreSDB</td>
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<tr>
<td>“L” Android (Est.)</td>
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</table>

## Releases

<table>
<thead>
<tr>
<th>Model</th>
<th>Release</th>
<th>Kernel</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>i.MX6Q</td>
<td>JB4.2.1_1.0.0</td>
<td>3.0.35 Kernel</td>
<td>30-Sep-13</td>
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<tr>
<td>i.MX6D</td>
<td>JB4.3.0_1.0.0</td>
<td>3.0.35 Kernel</td>
<td>12-Nov-13</td>
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<tr>
<td>i.MX6D</td>
<td>JB4.2.2_1.0.0</td>
<td>3.0.35 Kernel</td>
<td></td>
</tr>
<tr>
<td>i.MX6S</td>
<td>JB4.3.0_1.0.0</td>
<td>3.0.35 Kernel</td>
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<tr>
<td>i.MX6S</td>
<td>JB4.1.2_1.0.0-beta</td>
<td>3.0.35 Kernel</td>
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<tr>
<td>i.MX6S</td>
<td>JB4.3.0_1.0.0-alpha</td>
<td>3.0.35 Kernel</td>
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<td>3.0.35 Kernel</td>
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</table>

## Timeline

<table>
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<th>Year</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Year</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
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<tr>
<td>2012</td>
<td>3Q</td>
<td>4Q</td>
<td>1Q</td>
<td>2Q</td>
<td>2013</td>
<td>3Q</td>
<td>4Q</td>
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<tr>
<td>2014</td>
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</tbody>
</table>

**Extended Android Release**
- i.MX6Q/i.MX6D SabreSDB/SDP, SabreAI
- i.MX6DL/i.MX6S SabreSDB, SabreAI
- i.MX6SL EVK
- i.MX6SoloX SabreSDB

**Core Android Release**
- Planning
- Execution
- Proposed

**GA – Support for 1 year**
- Alpha & Beta – Support until next release
Origin of Android Components

Applications
- Home / Widget
- Phone
- Browser
- Camera
- 3D Media Player
- Live Wallpaper
- Input
- Providers

Application Framework
- Activity Manager
- Window Manager
- View System
- Package Manager
- Telephony Manager
- Location Manager
- WiFi Manager
- Tethering
- Content Provider
- Notification Manager
- Resource Manager

Libraries
- Surface Manager
- OpenGL/ES
- Skia
- Media Framework
- SQLite
- Daemons
- Webkit
- LibC
- Audio Manager
- FreeType
- SSL
- Core Libraries
- Dalvik Virtual Machine
- Daemons
- Webkit
- Audio Manager
- Audio
- Camera
- Bluetooth
- GPS
- Sensors
- Audio Driver
- SQLite
- Core Libraries
- Dalvik Virtual Machine
- Audio
- Camera
- Bluetooth
- GPS
- Sensors
- Audio Driver

Hardware Abstraction Layer
- Graphics
- Audio
- Camera
- Bluetooth
- GPS
- Sensors
- WiFi
- Radio (RIL)

Linux Kernel
- Kernel Upgrade
- Display / Camera Drivers
- Audio Driver
- USB Gadget
- Power management

Freescale Customized
Freescale Internal Developed
Community
Support Structure: The Community
Join the community! community.freescale.com
i.MX Community – Multi-level Customer Engagement

- TIC Team
- Marketing
- Freescale Support Members
- Apps, Design & SW Teams
- GSM
- Public Communities
- Private Communities
- Projects
- i.MX Repository and Information Exchange
- Freescale.com
- General Customers
- Channel Partners
- Ecosystem Partners
- Program-managed Customers
- NPI Customers

Freescale.com
The Benefit to our Customers

Faster Time to Market
Time To Market = Time to Revenue

Ability to find answers quickly

i.MX experts contributing answers/content to questions

Training videos loaded / linked to community

Search capability throughout community and Freescale.com

Collateral frequently loaded onto community to help answer questions

Partners / customer contributions
Freescale EcoMAPS

**Dev Tools**
- ARM
- IAR Systems
- Mentor Graphics
- Segger
- Lauterbach
- Macraigor Systems
- Timesys

**Customer Application**
- Application Specific
  - Apple
  - Samsung
  - IXAT
  - fast boot
- Middleware
  - Infineon
  - Green Hills Software
  - Qt
- Operating Systems
  - Android
  - Windows CE
  - QNX
  - Linux
  - Ubuntu
- i.MX Processors
  - ARM
  - E Ink
  - Chips & Media
  - Vivante

**HW & SW Engineering Services**
- EBS: Embedded Board Solutions
  - Advantech
  - Boundary Devices
  - Congatec
  - Digi International
  - iWave
  - Kontron
  - NovTech
  - SECO
  - TQ
- IDH: Independent Design House
  - Compal
  - FIC
  - Foxconn
  - HMS
  - Letou
  - Netronix
- ODM: Original Design Manufacturer
- SSI: Software & Solution Integrators
  - AllGo
  - Canonical
  - Green Hills Software
  - iWave
  - Intrinsyc
  - THINX

**Training**
- Training Partners
  - Acsys
  - Adeneo
  - iWave

**IDE**: Integrated Development Environment
**BDM**: Background Debug Module
**EBS**: Embedded Board Solutions
**IDH**: Independent Design House
**ODM**: Original Design Manufacturer
**SSI**: Software & Solution Integrators

More Standard
More Custom