OMAP-L1x ARM-based processors

One Day, Multiple Solutions
TI embedded processors

Low Power DSPs
Low Power, Low Cost Signal Processing

High Performance DSPs
High MHz / Multi-Core Signal Processing

Digital Media Processors
Video Performance; Arm Ease of Use

Applications Processors
Low Power, High Performance GUI/Browser Apps

Low Power DSPs
Low Power, Low Cost Signal Processing

Microcontrollers
Ultra-Low Power, General, and Real-Time Control

ARM embedded processors
Cortex A8
Cortex M3
ARM9

DSP
C6000
C64x
Multi-core
DM3xx
DM644x
DM646x
OMAP-L1X
OMAP35x
OMAP4
C5000
C674x
C2000
M3
MSP430

ARM Core
Code Compatibility (ISA)
ARM
DSP 64x

Texas Instruments
OMAP-L1x: Unmatched connectivity options with power-efficient ARM9 and optional C674x DSP Core

Flexible system interfaces & networking
- SATA, uPP, EMAC, USB PHY
- System cost savings in the range of 15%

Optimize your system for performance and power
- Industry’s lowest power floating-point DSP
- Power management software
- Dynamic voltage frequency scaling

Development made easier
- Fixed- & floating-point with C674x core
- C67x+ & C64x+ code reuse
- Pin-to-pin compatibility
OMAP-L1x Roadmap—Under $15 (10Ku)

- **Applications Software Compatibility**
  - OMAP-L137
  - OMAP-L107
  - C6747/5/3

- **CoProcessor**
  - OMAP-L137
  - OMAP-L107
  - C6747/5/3
  - OMAP-L118
  - OMAP-L108
  - Texas Instruments

- **DSP Processing**
  - OMAP-L137
  - OMAP-L107
  - C6747/5/3
  - OMAP-L118
  - OMAP-L108
  - Texas Instruments
  - C674x 300+ Mhz

**EMIF (SDRAM and flash)**
  - McASP, Ethernet etc

**Standby Power**
- 60mW

**Total Power**
- 465mW

**mDDR/DDR2, McASP/McBSP, SATA, UPP, VPIF - DFVS -**

**Standby Power**
- 12mW

**Total Power**
- 420mW

**C674x** — DSP only
- OMAP-L13x — ARM + Floating-Point DSP
- OMAP-L118 — ARM + Co-Processor
- OMAP-L10x — ARM only
TI’s OMAP-L1x Applications Processors are ideal for:

**Applications such as**
- Bar code scanners
- Test and measurement
- Portable medical
- Industrial monitoring
- Medical monitoring
- Sonar
- SDR
- Portable apps: 12mW – 465mW*

**Design requirements**
- Highly integrated SoC
- Unique peripheral combinations
- Low power for portable apps: 12mW – 465mW*
- Support for various high-level OSs

* For typical use case scenarios
C674x DSP Core: Floating-Point Ease and Fixed-Point Performance

- **C67x**: Native instructions for IEEE 754, SP & DP
  - Advanced VLIW architecture

- **C67x+**: 2x registers
  - Enhanced floating point add capabilities
  - Audio-specific and mixed precision instructions

- **C674x**: Enhanced flexibility
  - Fixed point for performance
  - Floating point for precision & dynamic range

- **C64x+**: SPLOOP and 16-bit instructions for smaller code size
  - Flexible level one memory architecture

- **C64x**: Advanced fixed-point instructions
  - Four 16-bit or eight 8-bit MACs
  - Two-level cache

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**FLOATING POINT VALUE**

**BINARY COMPATIBLE**

**FIXED POINT VALUE**

- **Superior debug**
  - Exception handling
  - Cache coherency visibility

- **Higher system performance**
  - 5x more efficient EDMA 3.0 engine and iDMA engine

- **Smaller code size**
  - 16-bit compact instructions
  - SPLOOP buffer

- **100% upward object code compatible w/C6000 fixed & floating**

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**Flexible level one memory architecture**

**IDMA for rapid data transfers b/w local memories**

**EDMA 3.0 engine and iDMA engine**

**16-bit compact instructions**

**SPLOOP buffer**

**100% upward object code compatible w/C6000 fixed & floating**
OMAP-L107 Processor (ARM9)—Preliminary Schedule: TMX – Oct 09; TMS – 1Q10

CPU core
- ARM926E-JS™ up to 300 MHz

Memory
- ARM: 16K L1D, 16K L1P, 64K ROM, 128 KB L3 RAM

Power (1.2V core, 1.8/3.3V IOs)
- Active < 490 mW @ 300MHz/1.2V/70C
- Standby < 60 mW @ 300MHz/1.2V/25C

Package
- 17 x17mm BGA (1.0mm pitch)
- Pin-to-pin compatible with OMAP-L137, C6743/5/7

Temperature ranges
- Commercial Temp Devices
  - Junction Temp, TJ: 0 – 90 C
  - Ambient Temp, TA: 0 – 70 C
- Automotive Temp Devices
  - Junction Temp, TJ: -40 – 125 C
  - Ambient Temp, TA: -40 – 105 C

Pricing: $7.85 @ 1Ku
OMAP-L137 processor (C674x DSP + ARM9)
Schedule: TMX – Now; TMS – 1Q10

CPU core
• ARM926E-JS™ up to 300 MHz
• C674x DSP core up to 300 MHz

Memory
• ARM: 16K L1D, 16K L1P, 64K ROM
• DSP: 32 KB L1D, 32 KB L1P, 256 KB L2
• Shared: 128 KB RAM

Power (1.2V core, 1.8/3.3V IOs)
• Active < 465 mW @ 300MHz/1.2V/70C
• Standby < 60 mW @ 300MHz/1.2V/25C

Package
• 17 x17mm BGA (1.0mm pitch)
• Pin-to-pin compatible with C6743/7

Temperature ranges
• Commercial Temp Devices
  – Junction Temp, TJ: 0 – 90 C
  – Ambient Temp, TA: 0 – 70 C
• Automotive Temp Devices
  – Junction Temp, TJ: -40 – 125 C
  – Ambient Temp, TA: -40 – 105 C

Pricing: $16.35 @ 1Ku
OMAP-L108 Processor (ARM9)—Preliminary Schedule: TMX – Oct 09; TMS – 1Q10

Power
(1.0-1.2V Core, 1.8/3.3V IOs)
• Total Power < 440 mW @ 300Mhz, 1.2V, 25C
• Standby Power
  < 15mW @ 1.0V/25C;
  < 20mW @ 1.2V/25C

• Package Options
  13 x13mm nFBGA (65nm)
  16x16mm BGA (0.8mm)
  Pin to pin compatible with OMAP-L138,L118, C6748/6/2

• Applications
  SDR, Portable Catalog, Bar Code Scanners, Portable Communications, Portable Medical, Portable Audio
  Temperature ranges
  – Commercial Temp Devices
  – Junction Temp, TJ: 0 – 90 C
  – Ambient Temp, TA: 0 – 70 C
  – Automotive Temp Devices
  – Junction Temp, TJ: -40 – 125 C
  – Ambient Temp, TA: -40 – 105 C

• Pricing: $9.00 @ 1Ku
NEW OMAP-L138 (ARM9 + C674x DSP)
Schedule: TMX – Now; TMS – 1Q10

**Power**
(1.0-1.2V Core, 1.8/3.3V IOs)
- Total Power < 440 mW @ 300Mhz, 1.2V, 25C
- Standby Power
  - < 12mW @ 1.0V/ 25C;
  - < 20mW @ 1.2V/25C

**Package Options**
- 13 x13mm nFBGA (65nm)
- 16x16mm BGA (0.8mm)
- Pin to pin compatible with OMAP-L118/108, C6748/6/2

**Applications**
- SDR, Portable Catalog, Bar Code Scanners, Portable Communications, Portable Medical, Portable Audio
- Temperature ranges
  - Commercial Temp Devices
  - Junction Temp, TJ: 0 – 90 C
  - Ambient Temp, TA: 0 – 70 C
- Automotive Temp Devices
  - Junction Temp, TJ: -40 – 105 C
  - Ambient Temp, TA: -40 – 85 C

**Pricing:** $18.60 @ 1Ku
Universal Parallel Port (uPP) Extends System Interconnect Options

What Is uPP?

- High Speed parallel data port
- Two Bidirectional and Independent 16bit channels
- Internal dedicated DMA to streamline data I/O
- Simple I/O Protocol

Value of uPP

- Efficient DSP+FPGA systems enabled by high speed data I/O
- Enable multi-DSP system design in various topologies
- Interface with high speed ADCs and DACs

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Throughput (MB/s)</th>
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<tbody>
<tr>
<td>1 Ch, 16-bit</td>
<td>120</td>
</tr>
<tr>
<td>2 Ch, 1 Way, 8-bit</td>
<td>120</td>
</tr>
<tr>
<td>2 Ch, 1 Way, 16-bit</td>
<td>160</td>
</tr>
<tr>
<td>2 Ch, 2 Way, 16-bit</td>
<td>240</td>
</tr>
<tr>
<td>HPI (16-bit)</td>
<td>50</td>
</tr>
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OMAP-L137/TMS320C6747 Floating Point Starter Kit
Use for Development on: OMAP-L137, OMAP-L107, C6747, C6745 & C6743

- OMAP-L137 – ARM9 + C674x DSP
- 24-bit stereo CODEC
- Four 3.5 millimeter audio jacks
- 64Mb SPI Flash memory
- 512Mb SDRAM
- ETH MAC, USB 2.0, USB 1.1, MMC/SD, LCDc
- HPI, McASP & I2C interface header emulation
- On-board standard JTAG interface
- Embedded JTAG support via USB
- +5V universal power supply
- Expansion ports for plug-in modules

Hardware

Software

- Code Composer Studio™ IDE
- Simulator included
- DSP/BIOS™ RTOS, eXpressDSP, and Monta Vista Linux Pro 5.0 Software support
- Fast run-time library available on the web
- MATLAB/Simulink Support (FUTURE)
- LabVIEW for Embedded Applications Support (FUTURE)
- Quick Start Guide and technical reference

Part Number: TMDXOSKL137BET

Available Now: $399 - $349

$50 MCU Day Discount

Spectrum Digital Incorporated

Texas Instruments
OMAP-L138: Tools for varying customer requirements

System-on-Module
- OMAP-L138 processor
- 64 or 128MB mDDR
- Ethernet PHY
  *Available from Logic for ~$99

Small FF Confirmed mDDR design
PN: SOMOMAPL138-10-1602AHCR for 128MB mDDR support
PN: SOMOMAPL138-10-1502AHCR For 64MB mDDR support

Experimenter board
- OMAP-L138 SOM
- 64MB mDDR
- Access to key peripherals:
  - SATA, USB, EMAC, Audio
  - TPS65070 power management
  - DSP/BIOS™ peripheral drivers
  - CCStudio™ 3.3
- Community supported
  *Available from TI & Logic for $149, $99

OMAP-L138/C6748 EVM
- Full peripheral access:
  SATA, uPP, EMAC, USB 2.0/1.1 and MMC/SD, VPIF, LCDC
- Software included
- TI supported
- LCD display option
  *Available from TI for $849 $799

TI PN: TMDXOSKL138BET
Logic PN: SDK-OMAPL138-10-6408R

$50 MCU Day Discount
Only $149

Open source Linux peripheral drivers

2x the memory w/128MB

Additional C6748 SOM

TI PN: TMDXOSKL138BET
**HawkBoard:** Ultra Low Cost OMAPL-138 Open Community Platform Board

- Visit hawkboard.org
- Available: Oct 2009
- Part number: TBD
- Web page to consolidate
  - Software availability
  - Tools
  - Documentation
  - Support
  - Community enablement

Subject to change

**MCU Day Special:**
Only $39 ($50 Discount!!)
OMAP-L1x: Unmatched connectivity options with power-efficient ARM9 and optional C674x DSP Core

Flexible system interfaces & networking
- SATA, uPP, EMAC, USB PHY
- System cost savings in the range of 15%

Optimize your system for performance and power
- Industry’s lowest power floating-point DSP
- Power management software
- Dynamic voltage frequency scaling

Development made easier
- Fixed- & floating-point with C674x core
- C67x+ & C64x+ code reuse
- Pin-to-pin compatibility
Backup
TI’s C674x Low Power Floating Point DSPs are ideal for:

**Applications such as**
- Fingerprint identification
- Test and measurement
- Robotics
- Audio Effects
- Audio applications

**Design requirements**
- Performance up to 2400MMACs
- Low active power
- Low standby power
- High precision
- Floating & fixed-point in a single core
- Code reuse
Low Power C674x Floating-Point DSP roadmap
TMS320C674x DSP Core