TI Designs

TMS320C6748 Low Cost Development Kit

Design Overview

The low cost development kit (LCDK) design is an easy-to-use development tool for beginners and experienced users alike for creating low power and low cost solutions for biometric, analytics, audio and communication based applications. It features the C6748 DSP processor based on the C674x Fixed/Floating point core along with the board level design and software, enabling embedded developers to quickly start applications development and test.

Design Resources

TIDEP0052	TI Design Folder
TMS320C6748	Product Folder
TMDSLCDKC6748	Tool Folder
Software Defined Radio	Tool Folder
Vision Analytics	Tool Folder

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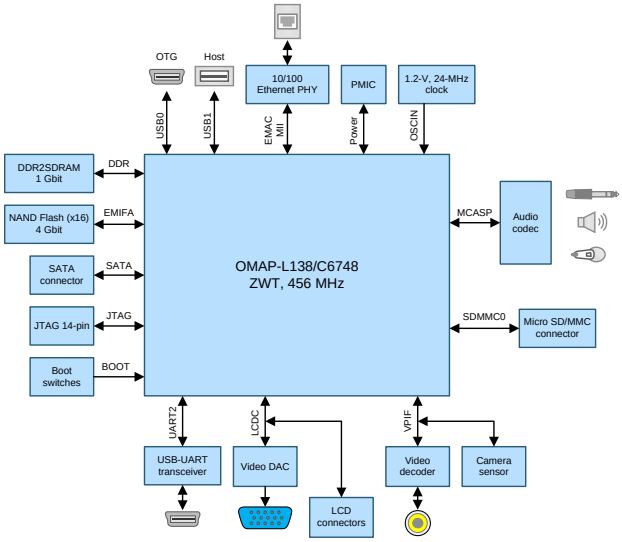
Design Features

- TMS320C6748 DSP Processor
  - 456-MHz C674x Fixed/Floating Point DSP
- SYSBIOS MCSDK With Drivers, Stacks, Protocols, and Algorithm Libraries.
- Comprehensive Development Kit for the C6748 Encompassing All Key Device Peripherals and Enabling Software Development Capability.

Featured Applications

- Communications and Telecom
- Machine Vision: Camera
- Biometrics



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1 System Description

The TMS320C6748 development kit design enables fast and easy real time operation system (RTOS) software and hardware development. This scalable platform will ease and accelerate solution development of everyday applications that require real-time signal processing and control functional, including industrial control, machine vision, audio and communications. A wide variety of standard interfaces for connectivity and storage allow developers to easily bring audio, video and other signals onto the board. Expansion headers such as LCD screen expansion headers allow customers to extend the board's functionality.

This LCDK design also includes a free, downloadable software development kit specifically designed and tested for the C6748, further enabling efficient board bring up and application development.

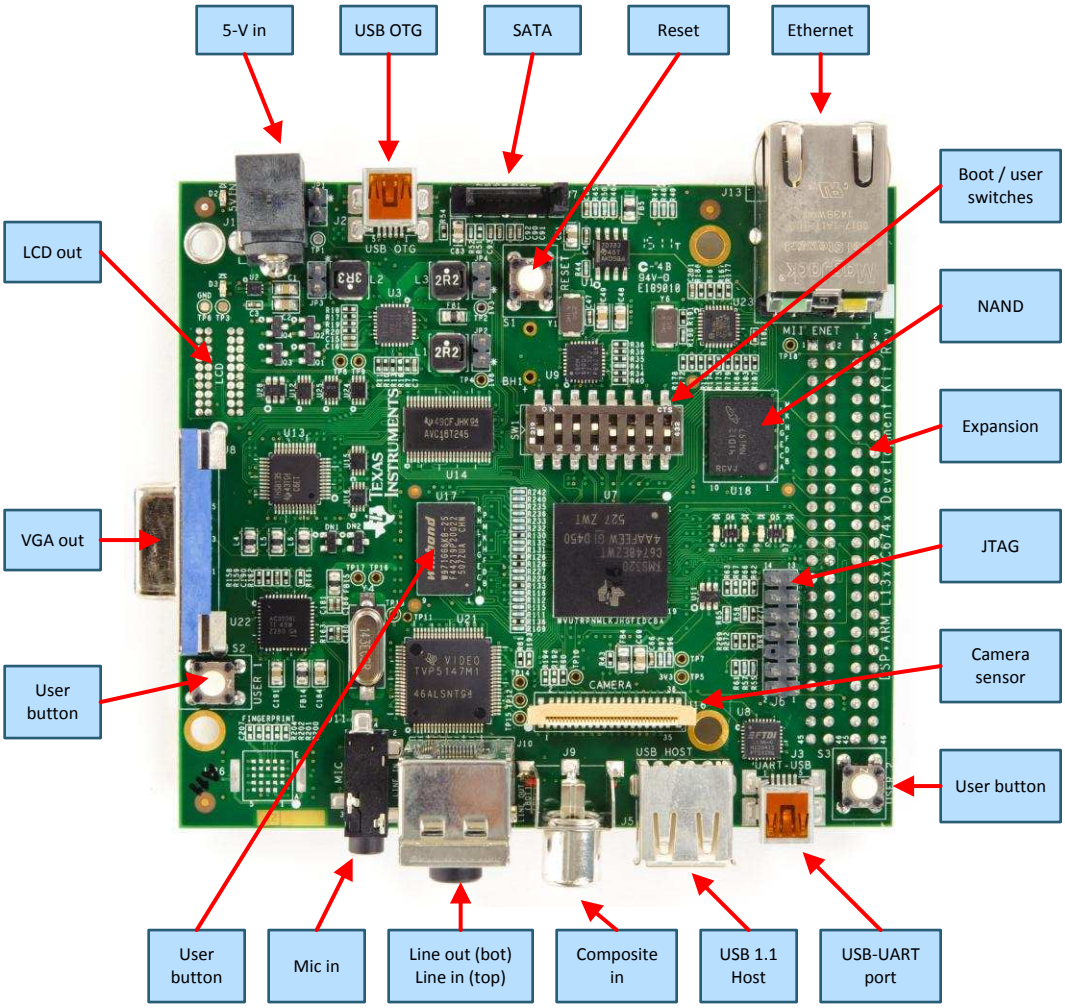

Figure 1. TMS320C6748LCDK Board Placement and Peripherals

2 LCDK Features

- TMS320C6748 DSP Processor
  - 456-MHz C674x fixed/floating Point DSP
- Memory
  - 128 MByte DDR2 SDRAM running at 150MHz
  - 128 MByte 16-bit wide NAND FLASH
- Interfaces
  - One Micro SD/MMC Slot
  - One mini-USB Serial Port (on-board serial to USB)
  - One Fast Ethernet Port (10/100 Mbps) with status LEDs
  - One USB Host port (USB 1.1)
  - One mini-USB OTG port (USB 2.0)
  - One SATA Port (3Gbps)
  - One VGA Port (15 pin D-SUB)
  - One LCD Port
  - One Composite Video Input (RCA Jack)
  - Three AUDIO Ports (1 LINE IN & 1 LINE OUT & 1 MIC IN)
  - 14-pin JTAG header (No onboard emulator; external emulator is required)
- Software
  - SYSBIOS MCSDK software

3 LCDK Block Diagram

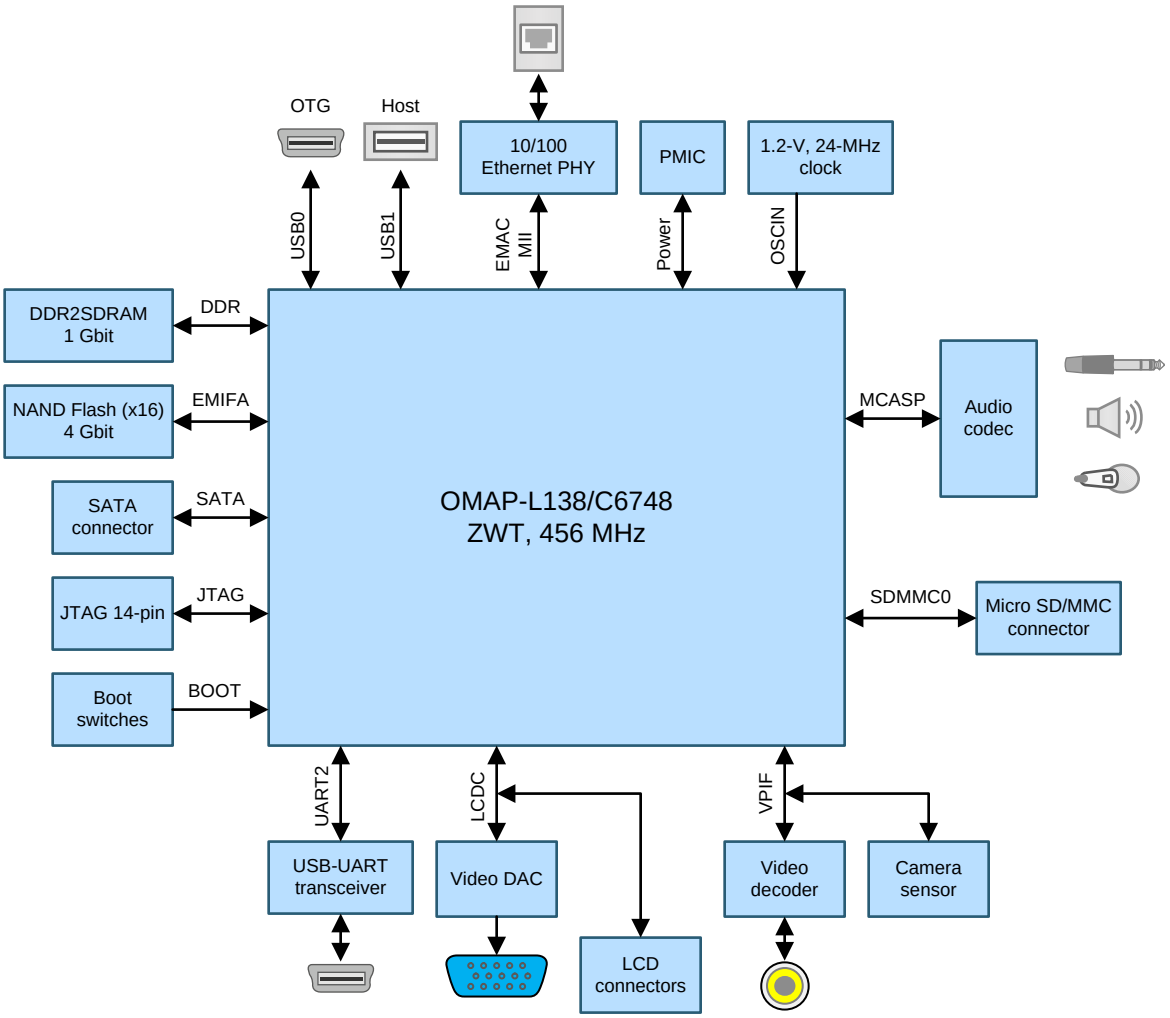

Figure 2. TMS320C6748 LCDK Block Diagram

4 TMS320C6748 Functionality

The C6748 LCDK design is based around the TI OMAP-L138 DSP processor and its associated peripherals and is the engine of the design. The purpose of this design is to enable hardware board design for the OMAP-L138, leveraging the use of all of C6748 peripherals, and to bring up the processor with foundational software.

The C748 C6000 DSP processor is a low-power applications processor based on an a C674x DSP core. This processor provides significantly lower power than other members of the TMS320C6000™ platform of DSPs.

For more information on the C6748; including datasheets, silicon errata, and technical reference manuals; visit http:www.ti.com/product/tms320c6748.

Figure 3 shows the block diagram of the TMS320C6748 design.

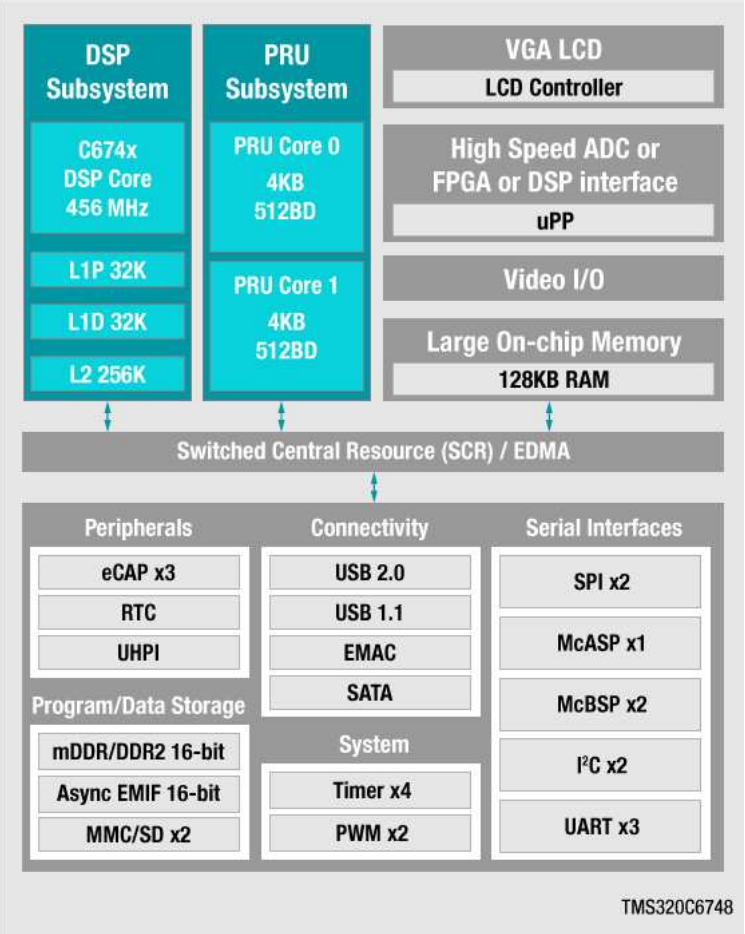

Figure 3. TMS320C6748 Block Diagram

5 Design Files

To download the LCDK HW design files; including schematics, bill of materials, and PCB layout, visit http://www.ti.com/tool/TIDEP0052.

6 Test Results

This design has been tested and validated by several functional tests. Test cases and status are shown in Table 1.

Table 1. LCDK Functional Test Results

No.	TEST NAME	STATUS	No.	TEST NAME	STATUS	No.	TEST NAME	STATUS
1	cache_test	Pass	16	cache_mmu	Pass	31	timer	Pass
2	gpio_test	Pass	17	demo	Pass	32	uart	Pass
3	i2c_test	Pass	18	edma	Pass	33	uart_edma	Pass
4	idma_test	Pass	19	ehrpwn	Pass	34	uart_dev_bulk	Pass
5	intc_test	Pass	20	enet_echo	Pass	35	usb_dev_msc	Pass
6	mddr_test	Pass	21	enet_lwip	Pass	36	usb_host_serial	Pass
7	pllc_test	Pass	22	game	Pass	37	usb_host_kb	Pass
8	spi_test	Pass	23	gpio	Pass	38	usb_host_mouse	Pass
9	timer_test	Pass	24	grlib_demo	Pass	39	usb_host_msc	Pass
10	uart_test	Pass	25	ipc_buffer_io	Pass	40	vpif_lcd_loopback	Pass
11	MCASP_Audio	Pass	26	ipc_interrupt	Pass	41	wdt	Pass
12	MCBSP_DigLpbk	Pass	27	ipc_polling	Pass			
13	MCBSP_Master	Pass	28	nand	Pass			
14	MCBSP_Slave	Pass	29	raster	Pass			
15	bootloader	Pass	30	rtc	Pass			

7 Software

This design leverages the BIOS-MCSDK software. The Multicore Software Development Kit (MCSDK) provides the core foundational building blocks that facilitate application software development on TI's high performance and multicore SOCs. This software release gives developers the ability to evaluate major software capabilities of the C6748 devices.

The MCSDK included in this design enables applications to use SYS/BIOS on one platform. To download the MCSDK software for this reference design, visit http://www.ti.com/tool/biossw-c6748 .

8 References

1. *Power Protection System: Design Considerations for Cost Effective, Easy-to-Integrate SoC-Based Power Line Protection Equipment* (SPRY132)
2. Efficient Fixed- and Floating-Point Code Execution on the TMS320C674x Core Delivers Faster Code Development and Reduces System Cost With Improved Performance (SPRY127)
3. *User Identification Systems Leverage Smarter Biometrics Technologies* (SPRY222)
4. *Introduction to TMS320C6000 DSP Optimization* (SPRABF2)

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