

SBC6711

Stand Alone Supercontroller
Dual OMNIBUS I/O Module Sites
900/1200 MFLOPS Floating-Point
TMS320C6711 DSP

Features

TMS320C6711 DSP (floating-point)
Two OMNIBUS I/O Expansion Sites
High Speed USB port (12Mbit/sec)
Multi-board Synchronization (ClockLink, SyncLink)

Applications

Noise Cancellation
Embedded Control
Wide-Channel Audio
Precision Motion Control

Hardware Options

FIFOCable	pg 130
100 Pin MDR Breakout	pg 131
Low Noise Power Supply	pg 132
RS232 Cable	pg 132
USB Cable	pg 132



OMNIBUS Compatible

see page 47 for a complete list of OMNIBUS modules.

Software Development Tools

Zuma Toolset	pg 94
TI Code Composer Studio	pg 91
CodeHammer	pg 102

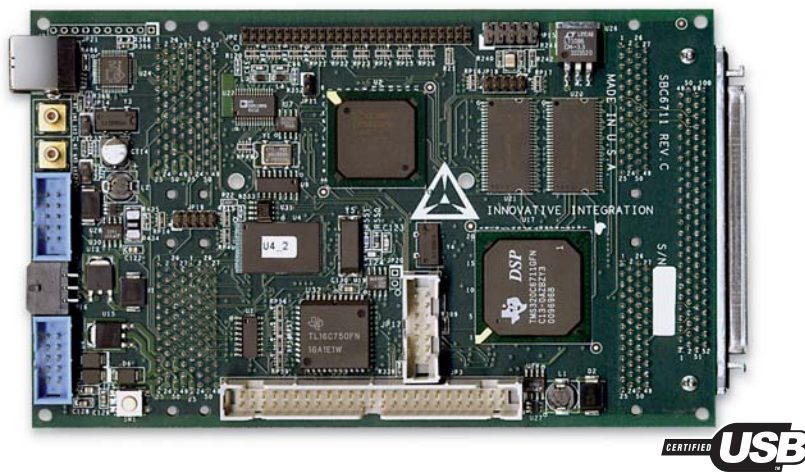
Ordering Information

SBC6711	80055-0
SBC6711 DevPack	90055-xx



DevPack Available

See page 91 for details



Overview

The SBC6711 is a high-performance, stand-alone DSP single-board computer featuring dual OMNIBUS I/O module sites. This 160 mm x 100 mm card operates independently from a host PC and may be freely embedded in custom target systems to perform autonomous data acquisition or control functions. This single-board computer is perfect for a wide variety of embedded applications requiring fast, multichannel data collection coupled with onboard processing.

Processor Core

The SBC6711 employs a TMS320C6711 32-bit DSP as a data movement/data processing engine. On-chip peripherals include cache memory controller, two 32-bit counter/timers, sixteen DMA channels, 64 Kbytes of dual-access SRAM, and a prioritized interrupt controller. Memory on the SBC6711 includes 32 Mbytes of 1 wait-state synchronous DRAM (SDRAM).

Onboard Peripherals

A simple high-speed memory-mapped, 32-bit latch is available to support general-purpose digital I/O. Direction is software-configurable in banks of eight bits. The port may be software or externally clocked at rates to 20 MHz.

The output of an AD9851 digital synthesizer is routed to each of two OMNIBUS sites, providing a time base spanning DC to 25 MHz programmable in increments of 0.02 Hz.

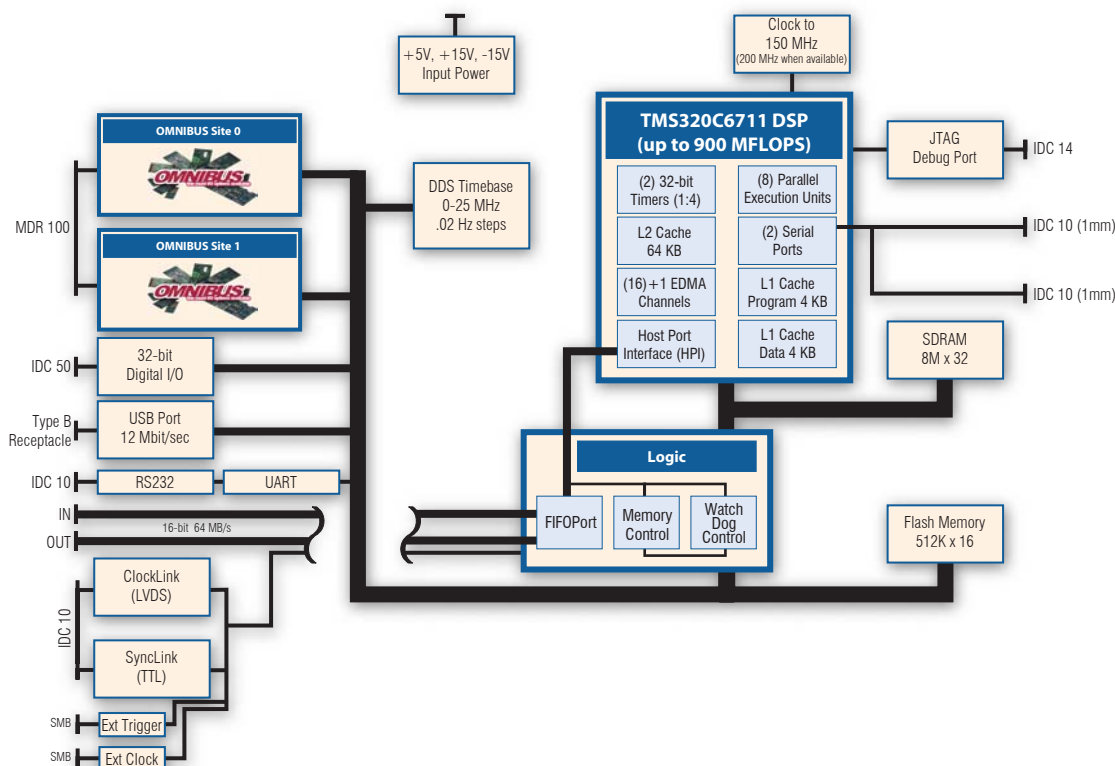
The SBC6711 provides a PC-compatible USB interface capable of sustaining 6.4 Mbits/sec packet transfers over a 12Mbit/sec bus. Full USB plug-n-play support is provided for windows environments. An RS232 serial port allows interfacing with a dumb terminal and other hardware.

Expansion

Two OMNIBUS sites provide a flexible I/O expansion mechanism. Available modules include multichannel analog I/O at a variety of rates and resolutions, digital I/O, RS232/422 serial communication. Since OMNIBUS is an elegant, open-architecture bus, custom modules may be designed easily and cost effectively to address unique application requirements.

The SBC6711's FIFOPort offers high-speed dedicated parallel board-to-board communications between multiple SBC6711 cards and other FIFOPort compatible cards at rates to 50Mbytes/sec.

The SBC6711 provides other features that make system-level integration fast and easy, such as SyncLink/CikLink for multiple card synchronization, RS232 serial port and Plug-n-Play USB. The SyncLink/CikLink interface allows up to four unique timing signals and event triggers to be shared between up to 16 cards. Each SBC6711 card has a switch matrix that routes any event trigger to any SyncLink/CikLink port, completely under software control. There is no complex cabling, just a simple connection and software configuration.



Host PC Interface

The SBC6711 communicates with a PC during the development phase using a standard USB port. The USB interface provides high-speed data transfer between the SBC6711 and USB-enabled PCs running Windows2000/XP.

Development Tools

First time buyers of the SBC6711 will need to purchase the SBC6711 DevPack. The DevPack includes the SBC6711 card, Code Composer Studio Integrated Development Environment, CodeHammer JTAG Emulator and Zuma Toolset for the SBC6711.

Innovative Integration's Zuma Toolset makes DSP development and complex peripheral integration fast and simple with easy-to-use, single command functions. A 300+ target-specific DSP functions and peripheral library is provided in source form and is fully documented in an on-line Windows help file.

The Zuma Toolset includes everything from convenient utility applets allowing download, execution and high level debugging of DSP applications to a complete set of source code examples demonstrating full operation of all hardware resources.

The Zuma Toolset is fully supported from within Texas Instruments' Code Composer Studio. This state of the art integrated development environment not only provides editing, compiling, linking, downloading and low level debugging, but also gives access to specific DSP registers and functions when used in conjunction with Innovative Integration's Code Hammer JTAG emulator.

Zuma support extends beyond target DSP development to include host PC code development as well. The toolset includes a DLL which supports optimal-performance communications with the DSP board. The DLL provides all of the support functions needed to download code to the embedded DSP, control the card operation and implement bidirectional data communications.

A number of examples illustrating use of the DLL are supplied in Zuma. The example programs highlight everything ranging from host-to-target/target-to-host interrupts to common data passing techniques. The supplied DLL may be readily accessed from within popular PC programming environments like Visual C/C++, Visual Basic, Borland C++ Builder and Delphi to name just a few.

OEM Configurations

The SBC6711 can be configured to fit your specific requirements and provide an optimal mix of performance, cost and features. Contact Innovative Integration with your specific OEM requirements.

Digital Signal Processor

150/200MHz Texas Instruments TMS320C6711 floating-point DSP

On-chip resources

L1 cache 4KB data/4KB program

L2 cache 64 KB

Two multichannel buffered serial ports

Two 32-bit timers

Sixteen DMA channels 32-bit external memory interface

Memory

32 Mbytes synchronous DRAM (one wait-state)

1 Mbyte Flash ROM

Debug Port

JTAG 1149.1 compliant emulation port

Compatible with Innovative Code Hammer, TI XDS-510, or equivalent debugger using TI Code Composer Studio.

Universal Serial Bus Port

ScanLogic SL811

12 Mbit/sec port

Compatible with USB specification Plug-n-Play under Win2000/XP

Typical 800 kB/sec sustained under Win2000

Digital I/O

32-bit programmable as input or output in groups of 8 TTL compatible with 32/-64 mA current capability

Memory-mapped

FIFOPort

50 Mbytes/sec bidirectional data path 256x32 FIFO memory

16-bit data path 32-bit interface to the DSP (requires FIFOCable for proper operation for LVDS signal conditioning)

Timers/Counters

Two on-chip, 32-bit timers

Three 24-bit timer/counters in external logic

Clock Generation

One programmable digital frequency synthesizer 0-25 MHz range in 0.02 Hz steps.

Multi Card Synchronization

Synchronize multiple SyncLink cards to a common trigger or clock

Software selection for master/slave card function

Two High speed LVDS signals for clocks

2 TTL compatible signals for triggers.

OMNIBUS I/O Module Sites



Two OMNIBUS module sites

Expansion using OMNIBUS modules for analog and digital I/O Compatible with all OMNIBUS modules.

50 module-specific I/O connections per module.

OMNIBUS Bandwidth

Up to 12 MHz accesses on 32-bit bus

Connectors

50-pin polarized male pin header for digital I/O
14-pin polarized male pin header for emulation
USB male 6-pin latching power connector - Molex 43045-0602

One 100-pin MDR connector for I/O modules
10 pin polarized male pin header for SyncLink/ClockLink

2 BNC connectors for external clock & interrupt
6 pin power connector

Physical Description

3U card - 100 mm x 160 mm

Max card height with modules - 1.5 in

Power Requirements

+5 V @ 0.75 A, ±15 V for modules (see module specs)

Operating Conditions

10-55 degrees C

Some configurations may require forced air

Development Languages

DSP

C or Assembler for DSP

Code Composer Studio

Zuma Toolset

PC

Borland C++ Builder Visual Environment

Microsoft Visual C++

C/Assy Source Debugger

Code Hammer with Code Composer Studio Debugger

Operating System

DSP/BIOS II

TMS320C6711 Benchmarks @ 150 MHz

Benchmark Algorithm	Speed
1024 Point Complex FFT (Radix 4, with reversal)	115µsec
FIR Filter (per tap)	13nsec
IIR Filter (per biquad)	27nsec
Matrix Multiply	
[3x3] * [3x1]	446nsec
[4x4] * [4x1]	800nsec
Divide (y/x)	187nsec
Inverse Square Root	227nsec



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Software Selection Guide for SBC6711

Software Package	Description	Usage/Requirements	Page	Recommendations
Zuma Toolset	Peripheral libraries needed for developing code on this card. Includes host applications and target examples in source form demonstrating use of peripherals on the card.	Requires CCStudio ver 2.x*. Windows2000/XP compatible.	94	Required for all first time users. Includes 1 year of technical support.
SBC6711 DLL	Dynamic link library (DLL) for the SBC6711.	Requires ANSI-compliant C/C++ compiler. For example, Microsoft Visual C/C++. Windows2000/XP compatible.	71	Required for interfacing Host side code to DSP.
CCStudio 'C6000	Integrated development environment (IDE) for Target side development/debugging from Texas Instruments.	Requires XDS-510 compatible JTAG emulator for debugging capabilities.	91	Required for all first time users. Recommend use with Innovative Integration plug-n-play PCI JTAG emulator.
Code Hammer	Plug-n-play PCI JTAG emulator.	Code Composer Studio.	102	Recommended for all developers of code on the SBC6711.

The SBC6711 Development Package contains all software packages listed above.

*Contact Innovative Integration for latest version information.

Stand Alone DSP