

## features

- ultra-high performance compatible DSP:
  - TMS320C6201, (32 bits, fixed point, 1600 MIPS)
  - TMS320C6701, (32 bits, floating point, 1000 MFLOPS)
- up to 1Mx32 synchronous static RAM (SBSRAM)
- 1Mx8 FLASH/EPROM for stand-alone operation
- on-board shared bus (SB) architecture with shared SBSRAM/FLASH/PIOX resources and SB masters comprising of DSP and host ISA-bus memory I/F
- SB data access from host ISA-bus memory I/F via ISA bus UMB memory mapped page
- host access to the DSP on-chip HPI port
- stand-alone operation
- watch-dog timer and reset monitor
- modular design with daughter-card modules
- universal emulator for all TMS320 DSPs
- compact size

## I/O expansion

- two sites for serial I/O expansion (SIOX) I/F daughter-card modules
- one site for high-speed parallel I/O expansion (PIOX) I/F daughter card module
- a variety of AD/DA/DIO daughter-card modules
- application specific SIOX and PIOX-16 I/O coprocessor daughter-card modules

## multiprocessor expansion

- PIOX and SIOX DSP Coprocessors
- PIOX-Link daughter-card module with link ports

## software development tools

- JTAG port for TI XDS510 and MicroLAB Systems *MIRAGE-510D* emulators
- optional low cost *UECM* daughter card module:
  - installs onto *TORNADO-62/67* mainboard
  - identical to XDS510 and *MIRAGE-510D* emulators
  - emulation of the on-board TMS320C6x DSP
  - optional external MPSP/JTAG pod for emulation of any external TMS320 DSPs
  - TI HLL Debuggers and Code Composer IDE
- TI 'C6x C/Assembler Compiler

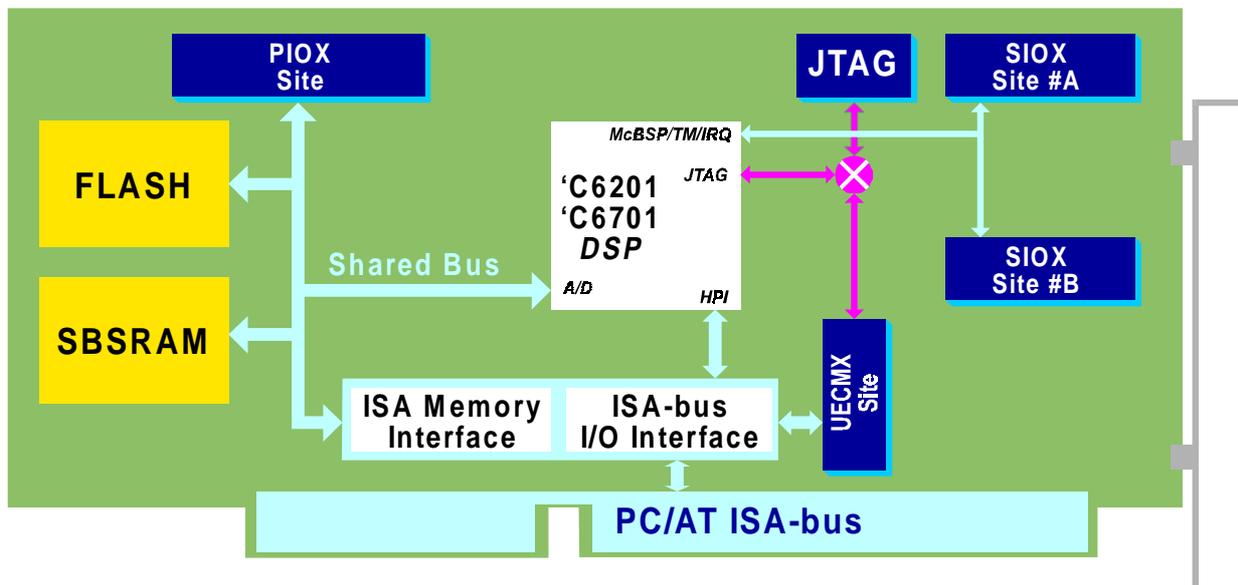
## application software

- Hypersignal tools for DSP algorithm development
- Virtuoso and Nucleus real-time OS tools
- DSP, math, vector and communication functions
- vocoder/fax/modem function libraries
- host control utilities

## applications

- multichannel vocoders, fax and modems
- multichannel telecommunication and telephony
- multimedia and audio processing
- acoustics and radar
- instrumentation and industrial
- digital radio
- image processing
- biomedical
- TMS320 DSP systems development/diagnostics





*TORNADO-62/67* are ultra-high performance DSP platforms for real-time data acquisition and DSP for both PC ISA-bus plug-in and stand-alone applications. Flexible modular construction and a variety of “off-the-shelf” AD/DA/DIO and DSP/IO coprocessor expansion daughter card modules make *TORNADO-62/67* an ideal selection for telecommunication, telephony, multimedia, acoustics, instrumentation, digital radio and many more application as well as for TMS320 DSP systems development and diagnostics.

*TORNADO-62/67* are based around the revolutionary TI compatible fixed-point TMS320C6201 DSP (1600 MIPS) and floating-point TMS320C6701 DSP (1000 MFLOPS), which feature compatible on-chip architecture and are optimized for parallel computing. On-board memory comprises of high-speed synchronous burst SRAM (SBSRAM) and FLASH memory.

An ultimate benefit of *TORNADO-62/67* is the on-board shared bus (SB) architecture that has been optimized for high performance on-board data processing and in-parallel high speed data transfers between the on-board SBSRAM/FLASH/PIOX resources and host ISA-bus memory interface (I/F) without consuming virtually any DSP time. Host software can easily access any SB data via ISA-bus UMB mapped memory page. *TORNADO-62/67* also provides direct access from host ISA-bus interface to the TMS320C6x DSP on-chip HPI port.

Another benefit of *TORNADO-62/67* is a modular construction with daughter-card options, which allows quick “off-the-shelf” system arrangement and to meet requirements of different DSP applications with real-time data acquisition. *TORNADO-62/67*

feature serial (SIOX) and parallel (PIOX/PIOX-16) I/O expansion interface sites compatible with a variety of AD/DA, digital I/O, telecom, DSP coprocessor, multiprocessor and more.. daughter-card modules.

*TORNADO-62/67* come ready for stand-alone operation without host PC. After the on-board DSP software has been debugged and programmed into on-board FLASH memory, the *TORNADO-62/67* can be unplugged from PC and run in a stand-alone mode with external power source. On-board reset monitor and watchdog timer facilities provide reliable functionality in stand-alone operation.

*TORNADO-62/67* on-board JTAG emulation port is compatible with TI XDS510 and MicroLAB Systems *MIRAGE-510D* scan-path emulators and is used to debug the on-board TMS320C6x DSP software. Also, optional low cost *UECM* universal emulation control daughter-card module for *TORNADO* DSP systems is available. *UECM* installs onto *TORNADO-62/67* mainboard, is identical to XDS510/*MIRAGE-510D* emulators, and runs under the industry standard TI HLL Debuggers and Code Composer IDE. *UECM* also delivers optional MPSP/JTAG external pod facility for emulation of any external TMS320 DSP. This converts *TORNADO-62/67* into universal development system for TMS320 DSP.

*TORNADO-62/67* resident software can be developed with the TI ‘C6x DSP C/Assembly tools, a variety of compatible real-time operating systems, DSP algorithm development tools, vocoder/fax/modem and DSP/vector/math function libraries, which are available from multiple software vendors.

### Technical Specifications

#### DSP

- TMS320C6201 fixed-point DSP, 32 bits, 1600 MIPS
- TMS320C6701 floating-point DSP, 32 bits, 1000 MFLOPS

#### on-board memory

up to 1Mx32 1/2x CPU clock SBSRAM, 1Mx8 FLASH/EPROM

#### host ISA interface

ISA bus UMB mapped 32KB memory page. Sixteen ports in ISA bus I/O space. Nine lines for PC IRQ.

#### parallel I/O expansion interface (PIOX)

One site for PIOX daughter card module. Includes SB address and data, SB control, DSP on-chip timer control, IRQ lines, reset, PC power lines.

#### serial I/O expansion interface (SIOX)

Two sites for SIOX daughter card modules. Includes the DSP on-chip serial ports and timer control lines, IRQ lines, reset, PC power lines.

#### physical/power

2/3 PC/AT card. Occupies one PC/AT ISA slot. Maximum power consumption (with 128Kx32 SBSRAM and UECM installed): [5V@4.5A](#)