MicroLAB Systems

TORNADO-3x/4x/54x/6x

DSP Systems and TMS320 Emulators
for IBM PC and MicroPC® Host Computers

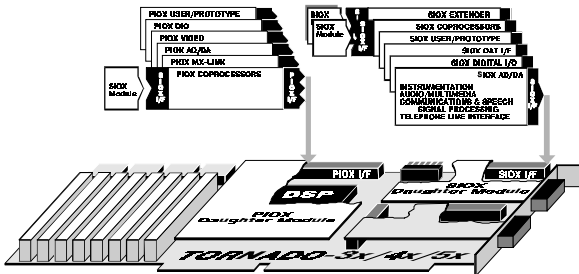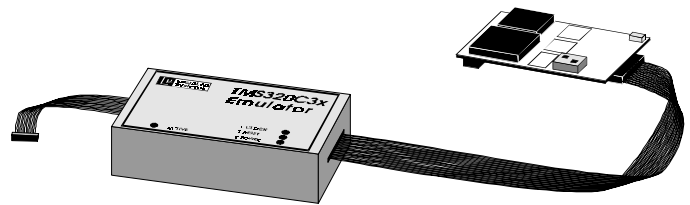*TORNADO-3x/4x/54x/6x DSP Systems*

features

- floating/fixed point TMS320C3x/C4x/C54x/C6x DSPs
- single and multiprocessor configuration
- flexible modular system architecture
- on-board shared bus (SB) architecture with shared SRAM/PIOX resources and SB masters comprising of DSPs and host ISA/PCI-bus memory I/F
- SB access from host via ISA/PCI-bus memory pages
- universal emulators for external TMS320 DSP
- low cost

system expansion I/F

- parallel (PIOX), serial (SIOX) and link (LIOX) I/O expansion I/F sites for daughter card modules
- AD/DA/DIO/Coprocessor daughter-card modules

development tools

- MPSD and JTAG emulation ports for scan-emulators *MIRAGE-510D* and XDS510
- optional low cost universal emulation control module *UECM* and emulation controller chip *ECC:*
  - þ identical to XDS510 and *MIRAGE-510D* emulators
  - þ emulation of the on-board DSPs
  - þ *UECM* provides optional MPSD/JTAG active buffer pod facility for emulation of external TMS320 DSPs
  - þ TI C Debuggers and Go DSP Code Composer IDE
- SPOX, Nucleus and Virtuoso real-time OS tools
- DSP, math and vector function libraries
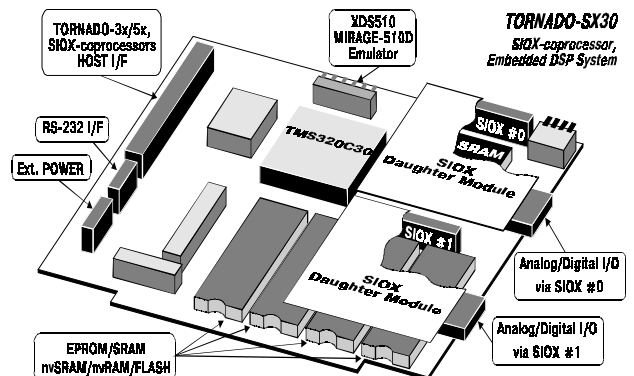- Hypersignal and QEDesign DSP development tools

DSP coprocessors

- single-/multiprocessor plug-in PIOX-coprocessors with TMS320C3x/C4x/C54x/C6x DSPs and communication with host *TORNADO* DSP via dual-port memory
- external SIOX-coprocessors with TMS320C30/C54x DSPs and communicates with host *TORNADO* DSP via DSP on-chip serial ports
- plug-in SIOX-coprocessors with speech quality AD/DA
- daizy-chaing of SIOX-coprocessors for pipelined multiprocessing
- secondary SIOX I/F site on PIOX/SIOX-coprocessors
- standalone operation for external SIOX-coprocessors

I/O daughter card modules

- PIOX/SIOX AD/DA/DIO instrumentation modules
- high speed AD/DA PIOX/LIOX modules
- SIOX modules for speech and audio processing
- SIOX modules with SLIC/DAA telephone line I/F
- SIOX-bus architecture for multiple SIOX-modules in one SIOX-path
- SIOX extenders
- user prototype daughter card modules

applications

- speech processing
- digital audio
- multimedia
- communications
- radar, sonar and digital radio
- image processing
- instrumentation
- medical controllers
- TMS320 system development

TORNADO **DSP Systems for IBM PC and MicroPC®**

System	Host PC I/F	DSP	Memory			I/O Expansion	Emu-lation
			SRAM	EPROM / FLASH	DPRAM	I/F sites	
TORNADO-30	ISA	TMS320C30 40 MFLOPS	2Mx32		8Kx32 (host I/F)	SIOX (2) PIOX (1)	UECM +pod
TORNADO-31	ISA, PCI	TMS320C31 60 MFLOPS	1Mx32			SIOX (1) PIOX (1)	UECM +pod
TORNADO-31Z	ISA	TMS320C31 60 MFLOPS	1Mx32			SIOX (1)	UECM +pod
TORNADO-32L	ISA	TMS320C32 60 MFLOPS	256Kx32 (DIP)			SIOX (1)	ECC
TORNADO-31M (industrial TR)	MicroPC® ISA 8 bit	TMS320C31 50/60 MFLOPS	1Mx32			SIOX (1)	ECC
TORNADO-31MX (industrial TR)	MicroPC® ISA 8 bit	TMS320C31 50/60 MFLOPS	512K x 32			SIOX (1) PIOX-16	ECC
TORNADO-44	ISA	TMS320C44 60 MFLOPS	1Mx32 (Gbus) 1Mx32 (Lbus)	1Mx8 EPROM		LIOX (1) PIOX (1)	UECM +pod
TORNADO-40D/1	ISA, PCI	TMS320C40 60 MFLOPS	1Mx32 (Gbus) 1Mx32 (Lbus)	1Mx8 EPROM		LIOX (1) PIOX (2)	UECM +pod
TORNADO-40D	ISA, PCI	2 x TMS320C40 120 MFLOPS	1Mx32 (Gbus) 2x1Mx32 (LBus)	2x1Mx8 EPROM	8Kx32 (DSPs Lbus)	LIOX (2) PIOX (2)	UECM +pod
TORNADO-542L	ISA (+HPI)	TMS320C542 40 MIPS	128Kx16			SIOX (2) PIOX-16	ECC
TORNADO-548	ISA (+HPI)	TMS320C548 66 MIPS	256Kx16			SIOX (2) PIOX-16	UECM +pod
TORNADO-62/67	ISA, PCI (+HPI)	TMS320C6201 1600 MIPS TMS320C6701 1000 MFLOPS	512Kx32 SBSRAM	1Mx8	32Kx32 (host I/F)	SIOX (2) PIOX (1)	UECM +pod
TORNADO-62MX *TORNADO-67MX*	MicroPC® ISA 8 bit (+HPI)	TMS320C6201 1600 MIPS TMS320C6701 1000 MFLOPS	256Kx32 SBSRAM			SIOX (1) PIOX-16	ECC

DSP Coprocessor Daughter Card Modules for *TORNADO* Systems

Coprocessor	Host I/F	DSP	Memory			I/O Expansion
			SRAM	EPROM	DPRAM	I/F sites
TORNADO-PX31DP	PIOX	TMS320C31 (60 MFLOPS)	1024Kx32		8Kx32	SIOX (1)
TORNADO-PX44DDP	PIOX	2xTMS320C44 (120 MFLOPS)	512Kx32 (Gbus) 2x512Kx32 (LBus)		8Kx32	Links (4)
TORNADO-PX548DP	PIOX	TMS320C50 (66 MIPS)	256Kx16		8Kx16	SIOX (2)
TORNADO-SX30DP	SIOX, RS232	TMS320C30 (40 MFLOPS)	512Kx32	1Mx32		SIOX (2)

AD/DA/DIO Daughter Card Modules for *TORNADO* DSP Systems

Module	I/F	Description
T/SDAS-4215	SIOX	programmable stereo audio codec for digital audio and multimedia (Fs<=48 kHz)
T/SDAT	SIOX	programmable 24-bit AES/EBU and S/PDIF DAT I/F module (Fs=32/44/48 kHz)
T/SDAS-SCOM1/SCOM2	SIOX	Universal single-/multi-channel speech/fax/modem AD/DA module with external telephone line/station i/f (1/2ch., 14 bit, Fs<=43 kHz)
T/SBDAS-DDC1	SIOX-bus	programmable digital radio DDC module (12bit, 50MHz, 115kBaud UART/RS232C, AGC-DAC)
T/SBDAS-AI16/16/100	SIOX-bus	high speed/accuracy multichannel instrumentation A/D module (16ch., 16 bit, Fs<=100kHz)
T/PDAS-16/1.25	PIOX	high-speed A/D instrumentation module (16SE/8DE, 12 bits, Fs<=1.25MHz), 2K FIFO, 3 timers