TMS320C6000 DSP Peripherals Overview

Reference Guide

TEXAS
INSTRUMENTS

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TMS320C6000 DSP Peripherals Overview

This document provides an overview of the peripherals available on the TMS320C6000™ family of digital signal processors (DSPs).

1 Overview

The C6000™ platform of devices consists of the first off-the-shelf DSPs that use advanced very long instruction word (VLIW) to achieve high performance through increased instruction-level parallelism. The VelociTI™ VLIW architecture uses multiple execution units operating in parallel to execute multiple instructions during a single clock cycle. Parallelism is the key to extremely high performance, taking these DSPs well beyond the performance capabilities of traditional designs.

The user-accessible peripherals available on the C6000 devices are configured using a set of memory-mapped control registers.

2 TMS320C62x DSP Peripherals

Peripherals available on the TMS320C62x™ DSP and their associated literature number are listed in Table 1.

Table 1. TMS320C62x DSP Peripherals Documentation

Peripheral/Module	Acronym	Lit #	C62x					
			01	02	03	04	05	11
Boot Modes and Configuration	-	SPRU642	√	√	√	√	√	
Enhanced Direct Memory Access Controller	EDMA	SPRU234						√
Expansion Bus	XBUS	SPRU579		√	√	√		
External Memory Interface	EMIF	SPRU266	√	√	√	√	√	√
Host Port Interface	HPI	SPRU578	√					√
Interrupt Selector	Interrupts	SPRU646	√	√	√	√	√	√
Multichannel Buffered Serial Port	McBSP	SPRU580	√	√	√	√	√	√
Peripheral Component Interconnect	PCI	SPRU581					√	
Power-Down Logic and Modes	-	SPRU728	√	√	√	√	√	√
Program and Data Memory Controller/Direct Memory Access Controller	DMA	SPRU577	√	√	√	√	√	
Timer, 32-bit	Timer	SPRU582	√	√	√	√	√	√
Two-Level Internal Memory	Cache	SPRU609						√

3 TMS320C64x DSP Peripherals

Peripherals available on the TMS320C64x™ DSP and their associated literature number are listed in Table 2.

Table 2. TMS320C64x DSP Peripherals Documentation

Peripheral/Module	Acronym	Lit #	C64x								DM64x			
			10	11	12	13	14	15	16	18	0	1	2	3
Enhanced Direct Memory Access Controller	EDMA	SPRU234	√	√	√	√	√	√	√	√	√	√	√	√
Ethernet Media Access Controller/ Management Data Input/Output Module	EMAC	SPRU628			√						√	√	√	√
External Memory Interface	EMIF	SPRU266	√	√	√	√	√	√	√	√	√	√	√	√
General-Purpose Input/Output	GPIO	SPRU584	√	√	√	√	√	√	√	√	√	√	√	√
Host Port Interface	HPI	SPRU578	√	√	√	√	√	√	√	√		√	√	√
Inter-Integrated Circuit	I2C	SPRU175	√		√	√				√	√	√	√	√
Inter-Integrated Circuit Addendum	-	SPRZ221	√			√				√				
Interrupt Selector	Interrupts	SPRU646	√	√	√	√	√	√	√	√	√	√	√	√
Multichannel Audio Serial Port	McASP	SPRU041	√			√				√	√	√	√	√
Multichannel Buffered Serial Port	McBSP	SPRU580	√	√	√	√	√	√	√	√	√	√	√	√
Peripheral Component Interconnect	PCI	SPRU581		√	√			√	√				√	
Power-Down Logic and Modes	-	SPRU728	√	√	√	√	√	√	√	√	√	√	√	√
Timer, 32-bit	Timer	SPRU582	√	√	√	√	√	√	√	√	√	√	√	√
Turbo Decoder Coprocessor	TCP	SPRU534							√					
Two-Level Internal Memory	Cache	SPRU610	√	√	√	√	√	√	√	√	√	√	√	√
Universal Test and Operations Interface for ATM	UTOPIA	SPRU583						√	√					
Video Port/VCXO Interpolated Control Port	Video Port	SPRU629									√	√	√	√
Viterbi Decoder Coprocessor	VCP	SPRU533						√	√					

4 TMS320C645x DSP Peripherals

Peripherals available on the TMS320C645x™ DSP and their associated literature numbers are listed in Table 3.

Table 3. TMS320C645x DSP Peripherals Documentation

Peripheral/Module	Acronym	Lit #
DDR2 Memory Controller	DDR2	SPRU970
Enhanced Direct Memory Access (EDMA3) Controller	EDMA	SPRU966
Ethernet Media Access Controller/Management Data Input/Output Module	EMAC/MDIO	SPRU975
External Memory Interface	EMIF	SPRU971
General-Purpose Input/Output	GPIO	SPRU724
Host Port Interface	HPI	SPRU969
Inter-Integrated Circuit Module	I2C	SPRU974
Peripheral Component Interconnect	PCI	SPRUE60
Serial Rapid IO	SRIO	SPRU976
Software-Programmable Phase-Locked Loop	PLL	SPRUE56
Timer, 64-bit	Timer	SPRU968
Universal Test & Operations PHY Interface for ATM 2	UTOPIA2	SPRUE48

5 TMS320C67x DSP Peripherals

Peripherals available on the TMS320C67x™ DSP and their associated literature number are listed in Table 4.

Table 4. TMS320C67x DSP Peripherals Documentation

Peripheral/Module	Acronym	Lit #	C67x				DA6x			
			01	11	12	13	01	05	07	10
Boot Modes and Configuration	-	SPRU642	√							
Enhanced Direct Memory Access Controller	EDMA	SPRU234		√	√	√	√	√	√	√
External Memory Interface	EMIF	SPRU266	√	√	√	√	√		√	√
General-Purpose Input/Output	GPIO	SPRU584		√	√	√	√	√	√	√
Host Port Interface	HPI	SPRU578	√	√		√	√			√
Inter-Integrated Circuit	I2C	SPRU175				√	√			√
Interrupt Selector	Interrupts	SPRU646	√	√	√	√	√	√	√	√
Multichannel Audio Serial Port	McASP	SPRU041				√	√	√	√	√
Multichannel Buffered Serial Port	McBSP	SPRU580	√	√	√	√	√	√	√	√
Phase-Locked Loop Controller	PLL	SPRU233		√	√	√	√	√	√	√
Power-Down Logic and Modes	-	SPRU728	√	√	√	√				
Program and Data Memory Controller/Direct Memory Access Controller	DMA	SPRU577	√							
Timer, 32-bit	Timer	SPRU582	√	√	√	√	√	√	√	√
Two-Level Internal Memory	Cache	SPRU609		√	√	√	√	√	√	√

6 TMS320C672x DSP Peripherals

Peripherals available on the TMS320C672x™ DSP and their associated literature number are listed in Table 5.

Table 5. TMS320C672x DSP Peripherals Documentation

Peripheral/Module	Acronym	Lit #	C672x			DA7x			
			2	6	7	05	07	08	10
Dual Data Movement Accelerator	dMAX	SPRU795	√	√	√	√	√	√	√
External Memory Interface	EMIF	SPRU711	√	√	√		√	√	√
Inter-Integrated Circuit	I2C	SPRU877	√	√	√	√	√	√	√
Multichannel Audio Serial Port	McASP	SPRU878	√	√	√	√	√	√	√
Phase-Locked Loop Controller and Clock Generation	PLL	SPRU879	√	√	√	√	√	√	√
Program and Data Memory Controller	–	SPRU720	√	√	√	√	√	√	√
Real-Time Interrupt Timer	RTI	SPRU717	√	√	√	√	√	√	√
Serial Peripheral Interface	SPI	SPRU718	√	√	√	√	√	√	√
Universal Host Port Interface	UHPI	SPRU719			√				√

7 TMS320DM644x DMSoC Peripherals

Peripherals available on the TMS320DM644x™ Digital Media System-on-Chip (DMSoC) and their associated literature number are listed in Table 6.

Table 6. TMS320DM644x DMSoC Peripherals Documentation

Peripheral/Module	Acronym	Lit #
Asynchronous External Memory Interface	EMIF	SPRUE20
ATA Controller	ATA	SPRUE21
Audio Serial Port	ASP	SPRUE29
DDR2 Memory Controller	DDR2	SPRUE22
DSP Subsystem Interrupt Controller	INTC	SPRU871
DSP Subsystem Internal Direct Memory Access Controller	IDMA	SPRU871
DSP Subsystem Power-Down Controller	PDC	SPRU871
Enhanced Direct Memory Access Controller	EDMA	SPRUE23
Ethernet Media Access Controller/Management Data Input/Output Module	EMAC/MDIO	SPRUE24
General-Purpose Input/Output	GPIO	SPRUE25
Inter-Integrated Circuit Module	I2C	SPRUE27
Multimedia Card/Secure Digital Card Controller	MMC/SD	SPRUE30
Pulse-Width Modulator	PWM	SPRUE31
Serial Peripheral Interface	SPI	SPRUE32
Timer, 64-bit	Timer	SPRUE26
Universal Asynchronous Receiver/Transmitter	UART	SPRUE33
Universal Serial Bus	USB	SPRUE35
Video Processing Back End	VPBE	SPRUE37
Video Processing Front End	VPFE	SPRUE38
VLYNQ Port	VLYNQ	SPRUE36

Appendix A Revision History

Table A-1 lists the changes made since the previous version of this document.

Table A-1. Document Revision History

Reference	Additions/Modifications/Deletions
Table 3	Updated Table 3.

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