

TMS320F28x Simulator Datasheet (v1.10)

FEATURES

- **Integrated into the Code Composer Studio™**
- **Supports Pipeline Stall Analyzer on F28xx simulator**
- **Supports Full ISA for F2800**
- **Configurable Memory Simulation**
- **Cycle Accurate Simulation of CPU Hazards, On-Chip and External Memory**
- **Supports Memory Block Protection**
- **Supports external Data and Interrupt Simulation through Probe Points, Port Connect and Pin Connect on F28xx simulator**

DESCRIPTION

- The TMS320F28x Instruction Set Simulator is available within the Code Composer Studio for TMS320F2000. This document was published earlier as *TMS320C28x Instruction Set Simulator Technical Overview* ([SPRU608](#))

- The complete instruction set including the pipeline protection and memory block protection is modeled.
- Pipeline display plug-in provides a graphical display of instructions in various phases of the pipeline. This can be used for aggressive optimizations.
- The simulator can be configured to match the On-Chip SARAM spaces.
- The simulators for various memory configurations have been validated for correctness and cycle accuracy against hardware.
- External data inputs, not directly supported with the simulated peripherals, can be supported through the probe point or port connect feature (Code Composer Studio online help details the usage of probe point and port connect features).
- External control signals, like interrupts, can be modeled through the pin connect feature. (Code Composer Studio online help details the pins supported and the usage of pin connect feature)



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

Code Composer Studio is a trademark of Texas Instruments.

Windows is a registered trademark of Microsoft Corporation in the United States and/or other countries.

Summary of Architecture Features

Table 1. Architecture Features

FEATURE	F28xx	F283xx
Wait stated memory	Yes	No
Memory protection unit	Yes	No

Summary of Simulator Configurations

Table 2. Simulator Configuration

DEVICE SIMULATED	CODE COMPOSE STUDIO CONFIGURATION	CYCLE ACCURACY ⁽¹⁾	SPEED IN KCPS ⁽²⁾
F28xx Cycle Accurate Simulator	sim28xx.cfg	CPU Level	24
F283xx Simulator	simf283xx.cfg	CPU Level	952

(1) Measured against hardware using application suite.

(2) Using GSMEFR application on 3.2 GHz PIV with 2 GB RAM running Windows® XP.

Summary of Capabilities

Table 3. Capabilities of Simulator Configurations

CODE COMPOSER STUDIO CONFIGURATION	CYCLE ACCURACY	PROFILER	PIN CONNECT	PORT CONNECT
F28xx	Yes	Yes	Yes	Yes
F283xx	Yes	No	No	No

Pin Supported for Pin Connect

Table 4. Pins Supported

PIN NAME	F28xx	F283xx
INT1–INT14	Yes	No
DLOGINT	Yes	No
RTOSINT	Yes	No
NMI	Yes	No
EMUINT	Yes	No

Performance Numbers

Table 5. Performance Numbers

SIMULATOR CONFIGURATION	TEST CASE	KCPS
F28xx	GSMEFR	24
F283xx	GSMEFR	952

F283xx Simulator Cycle Accuracy

Table 6. F283xx Simulator Cycle Accuracy

Test Case	% Deviation
bdti_c28_lum.out	2.36
connor_c28_lum.out	1.11
dhry21_c28_lum.out	0.00
estone_c28_lum.out	1.39
pid16_c28_lum.out	0.62
pid32_c28_lum.out	0.00
pidiq_c28_lum.out	0.00
RS_c28_lum.out	-0.01
sea98_c28_lum.out	0.23

Glossary

TERM	DESCRIPTION
Cycle Accuracy	Correlation between cycles reported by simulator verses the real hardware.

Acronyms

ACRONYM	DESCRIPTION
CCS	Code Composer Studio
ISS	Instruction Set Simulator
RAM	Random Access Memory
KIPS	Kilo Instructions per Second

PRODUCT PREVIEW

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

TI products are not authorized for use in safety-critical applications (such as life support) where a failure of the TI product would reasonably be expected to cause severe personal injury or death, unless officers of the parties have executed an agreement specifically governing such use. Buyers represent that they have all necessary expertise in the safety and regulatory ramifications of their applications, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of TI products in such safety-critical applications, notwithstanding any applications-related information or support that may be provided by TI. Further, Buyers must fully indemnify TI and its representatives against any damages arising out of the use of TI products in such safety-critical applications.

TI products are neither designed nor intended for use in military/aerospace applications or environments unless the TI products are specifically designated by TI as military-grade or "enhanced plastic." Only products designated by TI as military-grade meet military specifications. Buyers acknowledge and agree that any such use of TI products which TI has not designated as military-grade is solely at the Buyer's risk, and that they are solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI products are neither designed nor intended for use in automotive applications or environments unless the specific TI products are designated by TI as compliant with ISO/TS 16949 requirements. Buyers acknowledge and agree that, if they use any non-designated products in automotive applications, TI will not be responsible for any failure to meet such requirements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

Products

Amplifiers	amplifier.ti.com
Data Converters	dataconverter.ti.com
DSP	dsp.ti.com
Clocks and Timers	www.ti.com/clocks
Interface	interface.ti.com
Logic	logic.ti.com
Power Mgmt	power.ti.com
Microcontrollers	microcontroller.ti.com
RFID	www.ti-rfid.com
RF/IF and ZigBee® Solutions	www.ti.com/lprf

Applications

Audio	www.ti.com/audio
Automotive	www.ti.com/automotive
Broadband	www.ti.com/broadband
Digital Control	www.ti.com/digitalcontrol
Medical	www.ti.com/medical
Military	www.ti.com/military
Optical Networking	www.ti.com/opticalnetwork
Security	www.ti.com/security
Telephony	www.ti.com/telephony
Video & Imaging	www.ti.com/video
Wireless	www.ti.com/wireless

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2008, Texas Instruments Incorporated