PCN Number:	20230702011.0	PCN Date:	July 12, 2023
Title:	Datasheet for TMS320F2838x		
Customer Contact:	Change Management team	Dept:	Quality Services
Change Type:	Electrical Specification		

PCN Details

Description of Change:

Texas Instruments Incorporated is announcing an information only notification.
The product datasheet(s) is being updated as summarized below.
The following change history provides further details.

TEXAS INSTRUMENTS

TMS320F28388D, TMS320F28386D, TMS320F28386D-Q1
TMS320F28384D, TMS320F28384D-Q1, TMS320F28388S
TMS320F28386S, TMS320F28386S-Q1, TMS320F28384S, TMS320F28384S-Q1
SPRSP14E – MAY 2019 – REVISED JUNE 2023

Changes from February 2, 2021 to June 28, 2023 **Page**

- **This Revision History lists the changes from SPRSP14D to SPRSP14E.** 1
- **Global:** Changed "CAN-FD" to "CAN FD"....1
- **Global:** Changed the Pin Type of ESC_TX0_ENA and ESC_TX1_ENA from "I/O" to "O"....1
- *Features* section: Added "Functional Safety-Compliant" feature and "Safety-related certification" feature. Added "Hardware Built-in Self Test (HWBIST)" feature. Deleted "MCAN (CAN FD)" feature from "Connectivity Manager (CM)" group. Added "MCAN (CAN FD)" to "CM-C28x shared communications peripherals" group....1
- *Description* section: Added reference paragraph to *Getting Started With C2000™ Real-Time Control Microcontrollers (MCUs) Getting Started Guide*....2
- *Package Information* table: Changed table title from *Device Information* to *Package Information*. Updated table....2
- *Functional Block Diagram* figure: Changed blue MUX arrow of "1x CAN FD"....4
- *Device Comparison* table: Updated CAN with Flexible Data-Rate (CAN FD) by changing value to "1 **(can be assigned to CPU1 or CM)**"....8
- *Pin Attributes* table: Updated table. Changed Ball H4 on 337-ball ZWT package from "NC" to "NC1" and removed pin assignment 119 from 176-pin PTP package. Added "NC2" (Ball J18 on 337-ball ZWT package; pin 119 on 176-pin PTP package). Changed the description of TRSTn. Deleted duplicate sentence from the description of XRSn. Changed the VSS Description and pin number for the 176-pin package. 18
- *Analog Signals* table: Updated table....51
- *Digital Signals* table: Updated table....51
- *Power and Ground* table: Updated table. Changed the VSS Description and pin number for the 176-pin package....51
- *Test, JTAG, and Reset* table: Updated table. Changed "NC" to "NC1". Changed "337 BGA" ball number from "H4, J18" to "H4". Deleted "176 Pin" pin number 119. Added "NC2" (337 BGA ball number J18, 176 Pin number 119). Changed the description of TRSTn. Deleted duplicate sentence from the description of XRSn....51
- *Specifications* section: Moved "Stresses beyond those listed under *Absolute Maximum Ratings* ..." paragraph text to *Absolute Maximum Ratings* table as footnotes....90

- *Absolute Maximum Ratings* table: Added "Stresses beyond those listed under *Absolute Maximum Ratings* ..." footnote and "All voltage values are with respect to VSS, unless otherwise noted" footnote....90
- *Recommended Operating Conditions* table: Deleted $t_{VDDIO-RAMP}$....90
- *ESD Ratings – Commercial* table: Removed JEDEC specification JESD22-C101 from Charged-device model (CDM) description. Added CDM values for corner pins....90
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- *Power Sequencing* section: Changed section....100
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- *Reset Sources* section: Updated lead-in paragraph. Added Reset Signals table....106
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- *Internal Clock Frequencies* table: Changed MIN $f_{(INTCLK)}$ and MIN $f_{(AUXINTCLK)}$ from 10 MHz to 2 MHz. Added $f_{(CLBTILECLK)}$ and $f_{(CLBREGCLK)}$....114
- *XTAL Oscillator* section: Changed section title from *Crystal Oscillator* to *XTAL Oscillator*. Updated section. 115
- *Flash Parameters* table: Changed "N_{wec} Write/Erase Cycles" to "N_{wec} Write/Erase Cycles per sector". Added "N_{wec} Write/Erase Cycles for entire Flash (combined all sectors)" and its associated footnote. Added "$t_{retention}$ Data retention duration at T_J = 125°C" and its associated footnote....123
- *RAM Specifications* section: Added section....124
- *ROM Specifications* section: Added section....125
- *Connecting to the 14-Pin JTAG Header* figure: Added 2.2-kΩ pullup resistor on TMS....126
- *Connecting to the 20-Pin JTAG Header* figure: Added 2.2-kΩ pullup resistor on TMS....126
- *EMIF Asynchronous Memory Switching Characteristics* table: Updated MIN and MAX values of parameters 3, 10, 15, and 24 for EW = 1. Added "Maximum wait timeout condition" footnote....139
- *Single-Ended Input Model* section: Added "The user should analyze the ADC input setting assuming worst-case initial conditions on C_h ..." paragraph....160

- *Differential Input Model* section: Added references to the *Charge-Sharing Driving Circuits for C2000 ADCs (using TINA-TI simulation tool)* Application Note and the *ADC Input Circuit Evaluation for C2000 MCUs (using TINA-TI simulation tool)* Application Note....161
- *Differential Input Model* section: Deleted "The user should analyze the ADC input setting assuming worst-case initial conditions on C_h ..." paragraph....161
- *ADC Timings in 12-Bit Mode (SYSCLK Cycles)* table: Added footnote about t_{INT}....163
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- *Universal Serial Bus (USB) Controller* section: Changed **Note** about the accuracy of the on-chip zero-pin oscillator....239
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- *MCAN Module Overview* figure: Changed figure....241
- *Functional Block Diagram* figure: Changed blue MUX arrow of "1x CAN FD"....263
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- *Peripheral Registers Memory Map* section: Added section....267
- *CM Memory Map* table: Changed the START ADDRESS and END ADDRESS of "EtherCAT RAM (direct access)"....274
- *Peripheral Registers Memory Map (CM)* section: Added section....276
- *CM Bus Master Peripheral Access* table: Added "Y" to "CPU1 SUBSYSTEM" column of "MCAN (CAN FD)" row....280
- *All Available Boot Modes* table: Added footnote about USB Bootloader....285
- *Configurable Logic Block (CLB)* section: Added "For normal operation, the clock frequency of the CLB peripheral is derived from device SYSCLK ..." paragraph....304
- *CM Clocking System* figure: Changed figure title from "Clocking System" to "**CM** Clocking System". Removed MCAN....313
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- *Applications, Implementation, and Layout* section: Updated section....317
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The datasheet number will be changing.

Device Family	Change From:	Change To:
TMS320F2838x	SPRSP14D	**SPRSP14E**

These changes may be reviewed at the datasheet links provided.
http://www.ti.com/product/TMS320F28388D

Reason for Change:

To accurately reflect device characteristics.

Anticipated impact on Fit, Form, Function, Quality or Reliability (positive / negative):

No anticipated impact. This is a specification change announcement only. There are no changes to the actual device

Changes to product identification resulting from this PCN:

None.

Product Affected:

F28384DPTPQR	F28384SZWTS	F28386DZWTS	F28388DZWTS
F28384DPTPS	F28386DPTPQ	F28386SPTPQR	F28388DZWTSR
F28384DZWTQR	F28386DPTPQR	F28386SPTPS	F28388SPTPS
F28384DZWTS	F28386DPTPS	F28386SZWTS	F28388SPTPSR
F28384SPTPQR	F28386DZWTQ	F28388DPTPS	F28388SZWTS
F28384SPTPS	F28386DZWTQR	F28388DPTPSR	F28388SZWTSR

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