TMS320x28027, TMS320x28026, TMS320x28025, TMS320x28024, TMS320x28023, TMS320x28022 Piccolo MCU

Silicon Errata

TEXAS INSTRUMENTS

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TMS320x2802x Piccolo MCU Silicon Errata

1   Introduction

This document describes the silicon updates to the functional specifications for the TMS320x2802x microcontrollers (MCUs).

The updates are applicable to:
- 38-pin Plastic Small Outline Package, DA Suffix
- 48-pin Plastic Quad Flatpack, PT Suffix

2   Device and Development Tool Support Nomenclature

To designate the stages in the product development cycle, TI assigns prefixes to the part numbers of all [TMS320] DSP devices and support tools. Each TMS320™ DSP commercial family member has one of three prefixes: TMX, TMP, or TMS (e.g., **TMS**320F28027). Texas Instruments recommends two of three possible prefix designators for its support tools: TMDX and TMDS. These prefixes represent evolutionary stages of product development from engineering prototypes (TMX/TMDX) through fully qualified production devices/tools (TMS/TMDS).

TMX   Experimental device that is not necessarily representative of the final device's electrical specifications

TMP   Final silicon die that conforms to the device's electrical specifications but has not completed quality and reliability verification

TMS   Fully qualified production device

Support tool development evolutionary flow:

TMDX   Development-support product that has not yet completed Texas Instruments internal qualification testing

TMDS   Fully qualified development-support product

TMX and TMP devices and TMDX development-support tools are shipped against the following disclaimer:
"Developmental product is intended for internal evaluation purposes."

TMS devices and TMDS development-support tools have been characterized fully, and the quality and reliability of the device have been demonstrated fully. TI's standard warranty applies.

Predictions show that prototype devices (TMX or TMP) have a greater failure rate than the standard production devices. Texas Instruments recommends that these devices not be used in any production system because their expected end-use failure rate still is undefined. Only qualified production devices are to be used.

TI device nomenclature also includes a suffix with the device family name. This suffix indicates the package type (for example, PBK) and temperature range (for example, A).

3 Device Markings

Figure 1 provides an example of the 2802x device markings and defines each of the markings. The device revision can be determined by the symbols marked on the top of the package as shown in Figure 1. Some prototype devices may have markings different from those illustrated. Figure 2 shows an example of the device nomenclature.
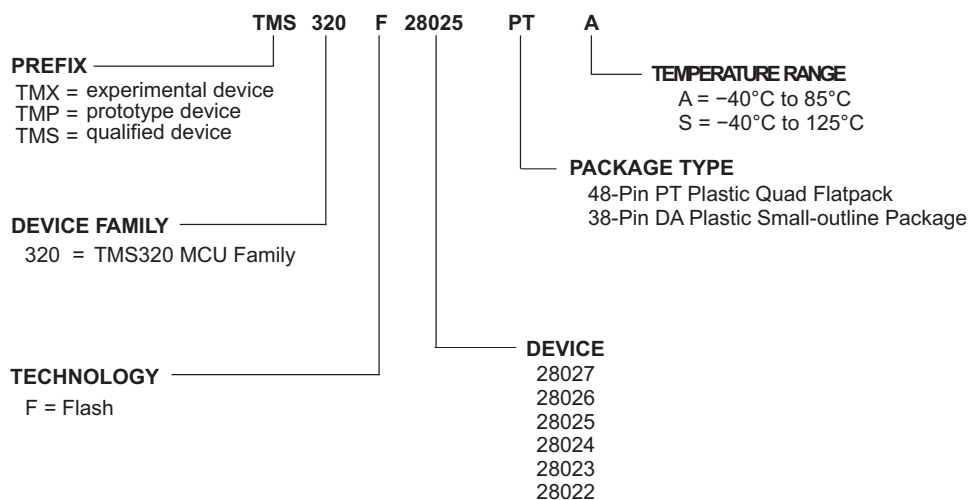
Figure 1. Example of Device Markings

TMS 320 F 28025 PT A

PREFIX
TMX = experimental device
TMP = prototype device
TMS = qualified device

DEVICE FAMILY
320 = TMS320 MCU Family

TECHNOLOGY
F = Flash

DEVICE
28027
28026
28025
28024
28023
28022

PACKAGE TYPE
48-Pin PT Plastic Quad Flatpack
38-Pin DA Plastic Small-outline Package

TEMPERATURE RANGE
A = −40°C to 85°C
S = −40°C to 125°C

Figure 2. Example of Device Nomenclature

Table 1. Determining Silicon Revision From Lot Trace Code 2802x

SECOND LETTER IN PREFIX OF LOT TRACE CODE	SILICON REVISION	REVISION ID (0x0883)	COMMENTS
Blank (no second letter in prefix)	Indicates Revision 0	0x0000	This silicon revision is available as TMX.

4 Rev 0 Known Design Marginality/Exceptions to Functional Specifications

Table 2. Advisory List for Rev 0 Silicon

Advisory	***ADC: Initial Conversion***

Revision(s) Affected	0
Details	When the ADC conversions are initiated by any source of trigger, the first sample may not be the correct conversion result.
Workaround(s)	Discard the first sample at the beginning of every series of conversions. For instance, if the application calls for a given series of conversions, SOC0→SOC1→SOC2, to initiate periodically, then setup the series instead as SOC0→SOC1→SOC2→SOC3 and only use the last three conversions, ADCRESULT1, ADCRESULT2, ADCRESULT3, thereby discarding ADCRESULT0. Each application should validate this as acceptable in their application.

Advisory	***Memory: Prefetching Beyond Valid Memory***

Revision(s) Affected	0
Details	The C28x CPU prefetches instructions beyond those currently active in its pipeline. If the prefetch occurs past the end of valid memory, then the CPU may receive an invalid opcode.
Workaround	The prefetch queue is 8x16 words in depth. Therefore, code should not come within 8 words of the end of valid memory. This restriction applies to all memory regions and all memory types (flash, OTP, SARAM) on the device. Prefetching across the boundary between two valid memory blocks is ok. Example 1: M1 ends at address 0x7FF and is not followed by another memory block. Code in M1 should be stored no farther than address 0x7F7. Addresses 0x7F8-0x7FF should not be used for code. Example 2: M0 ends at address 0x3FF and valid memory (M1) follows it. Code in M0 can be stored up to and including address 0x3FF. Code can also cross into M1 up to and including address 0x7F7.

5 Documentation Support

For device-specific data sheets and related documentation, visit the TI web site at: http://www.ti.com.

To access documentation on the web site:

1. Go to http://www.ti.com
2. Click on *Microcontrollers (MCU)*
3. Under the heading *C2000™ High Performance 32-bit Controllers*, click on the appropriate device family.
4. Click on a device name and then click on the documentation type you prefer.

For further information regarding the Piccolo devices, see the*TMS320x28027/28026/28025/28024/28023/28022 Piccolo MCU Data Manual* (literature number SPRS523).

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