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|---|---|---------------------------------------|----------------------------------|
| PCN Number: | 20180523001.1 | PCN Date: | May 29, 2018 |
| Title: | Qualification of UMC12i and DMOS6 as additional Fab site options and Design Change for select devices | | |
| Customer Contact: | PCN Manager | Dept: | Quality Services |
| Proposed 1st Ship Date: | Aug 29, 2018 | Estimated Sample Availability: | Date provided at sample request. |
| Change Type: | | | |
| <input type="checkbox"/> | Assembly Site | <input type="checkbox"/> | Assembly Process |
| <input checked="" type="checkbox"/> | Design | <input checked="" type="checkbox"/> | Electrical Specification |
| <input type="checkbox"/> | Test Site | <input type="checkbox"/> | Packing/Shipping/Labeling |
| <input type="checkbox"/> | Wafer Bump Site | <input type="checkbox"/> | Wafer Bump Material |
| <input checked="" type="checkbox"/> | Wafer Fab Site | <input type="checkbox"/> | Wafer Fab Materials |
| | | <input type="checkbox"/> | Part number change |

PCN Details

Description of Change:

Texas Instruments is pleased to announce the qualification of UMC12i and DMOS6 as additional Wafer Fab sources for the selected devices listed in the "Product Affected" section. In support of the qualification the devices will undergo a flash design library change as described below.

| Current Fab Site | | | Additional Fab Site | | |
|------------------|---------|----------------|---------------------|---------|----------------|
| Current Fab Site | Process | Wafer Diameter | New Fab Site | Process | Wafer Diameter |
| TSMC-F14 | F021 | 300mm | UMC12i | F65 | 300mm |
| TSMC-F14 | F021 | 300mm | DMOS6 | F65 | 300mm |

In addition, the datasheet number will be changing.

| Device Family | Change From: | Change To: |
|---------------|--------------|------------|
| TMS320F2837xD | SPRS880I | SPRS880J |
| TMS320F2837xS | SPRS881E | SPRS881F |
| TMS320F2807x | SPRS902E | SPRS902F |

The product datasheet(s) is updated as seen in the change revision history below.



TMS320F28379D, TMS320F28377D
TMS320F28376D, TMS320F28375D, TMS320F28374D
SPRS880J – DECEMBER 2013 – REVISED MAY 2018

TMS320F2837xD Dual-Core Delfino™ Microcontrollers

TMS320F28379D, TMS320F28377D
TMS320F28376D, TMS320F28375D, TMS320F28374D
SPRS880J – DECEMBER 2013 – REVISED MAY 2018



2 Revision History

| Changes from March 15, 2018 to May 8, 2018 (from I Revision (March 2018) to J Revision) | Page |
|--|---------------------|
| • Section 1.3 (Description): Updated links of advanced closed-loop control applications..... | 2 |
| • Section 5.8 (Thermal Design Considerations): Added section. | 59 |
| • Section 6.1 (Overview): Updated links of advanced closed-loop control applications..... | 176 |
| • Table 6-9 (Device Identification Registers): Updated PARTIDH. Added footnote about PARTIDH. | 186 |
| • Section 8.2 (Device Markings): Added section. | 202 |
| • Section 8.3 (Tools and Software): Added UniFlash Standalone Flash Tool. | 203 |

These changes may be viewed at: <http://www.ti.com/lit/ds/symlink/tms320f28377d.pdf>

TMS320F2837xS Delfino™ Microcontrollers

SPRS881F – AUGUST 2014 – REVISED MAY 2018

www.ti.com

2 Revision History

Changes from March 15, 2018 to May 8, 2018 (from E Revision (March 2018) to F Revision) Page

| | |
|--|---------------------|
| • Section 1.3 (Description): Updated links of advanced closed-loop control applications..... | 2 |
| • Section 5.8 (Thermal Design Considerations): Added section. | 59 |
| • Section 6.1 (Overview): Updated links of advanced closed-loop control applications. | 175 |
| • Table 6-8 (Device Identification Registers): Updated PARTIDH. Added footnote about PARTIDH. | 185 |
| • Section 8.2 (Device Markings): Added section. | 200 |
| • Section 8.3 (Tools and Software): Added UniFlash Standalone Flash Tool. | 201 |

 These changes may be viewed at: <http://www.ti.com/lit/ds/symlink/tms320f28377s.pdf>

TMS320F2807x Piccolo™ Microcontrollers

2 Revision History

Changes from March 15, 2018 to May 8, 2018 (from E Revision (March 2018) to F Revision) Page

| | |
|---|---------------------|
| • Section 1.3 (Description): Updated links of advanced closed-loop control applications..... | 2 |
| • Section 5.7 (Thermal Design Considerations): Added section. | 45 |
| • Section 6.1 (Overview): Updated links of advanced closed-loop control applications. | 150 |
| • Table 6-7 (Device Identification Registers): Updated PARTIDH. Added footnote about PARTIDH..... | 159 |
| • Section 8.2 (Device Markings): Added section. | 172 |
| • Section 8.3 (Tools and Software): Added UniFlash Standalone Flash Tool. | 173 |

 These changes may be viewed at: <http://www.ti.com/lit/ds/symlink/tms320f28075.pdf>

In support of the qualification of UMC12i and DMOS6 Wafer Fab sites, the devices will undergo a change of the flash design library to allow production in the new fab sites.

- The change does not impact device performance or datasheet specifications (except PARTIDH), and the updated flash design libraries remain on 65nm technology.

The device datasheet will be updated with the following information:

- The device electrical part identification number PARTIDH may now have one of two values for each part number, with the eight most significant bits being 0x00 or 0x02.

TMS320F2837xD – Literature number SPRS880

| NAME | ADDRESS | SIZE (x16) | DESCRIPTION | |
|---------|--|------------|--|-------------|
| PARTIDH | 0x0005 D00A (CPU1) 0x0007 0202 (CPU2) | 2 | Device part identification number ⁽¹⁾ | |
| | | | TMS320F28379D | 0x**F9 0300 |
| | | | TMS320F28377D | 0x**FF 0300 |
| | | | TMS320F28376D | 0x**FE 0300 |
| | | | TMS320F28375D | 0x**FD 0300 |
| | | | TMS320F28374D | 0x**FC 0300 |

(1) PARTIDH may have one of two values for each part number, with the eight most significant bits identified with '**' above being 0x00 or 0x02.

TMS320F2837xS – Literature number SPRS881

| NAME | ADDRESS | SIZE (x16) | DESCRIPTION |
|---------|-------------|------------|--|
| PARTIDH | 0x0005 D00A | 2 | Device part identification number ⁽¹⁾ |
| | | | TMS320F28379S 0x**F9 0400 |
| | | | TMS320F28377S 0x**FF 0400 |
| | | | TMS320F28376S 0x**FE 0400 |
| | | | TMS320F28375S 0x**FD 0400 |
| | | | TMS320F28374S 0x**FC 0400 |

(1) PARTIDH may have one of two values for each part number, with the eight most significant bits identified with '**' above being 0x00 or 0x02.

TMS320F2807x – Literature number SPRS902

| NAME | ADDRESS | SIZE (x16) | DESCRIPTION |
|---------|-------------|------------|--|
| PARTIDH | 0x0005 D00A | 2 | Device part identification number ⁽¹⁾ |
| | | | TMS320F28075 0x**FF 0500 |

(1) PARTIDH may have one of two values for each part number, with the eight most significant bits identified with '**' above being 0x00 or 0x02.

Flash programming tools may need to be updated as a result of the change to PARTIDH, depending on the programming solution currently used.

- Code Composer Studio (CCS) will need a minimum version of:
 - CCSv8.1 – no further update required
 - CCSv8.0 – update to 8.1
 - CCSv7.4 – use 'Help → Check for Updates' and install following:
 - TI C2000 Device Support 4.2.5.0 or higher
 - CCS Flash Content version 8.1.0.1297 or higher
 - Debug Server 7.4.0.1313 or higher.
 - (For update help: http://software-dl.ti.com/ccs/esd/documents/ccsv7_updates.html)
 - Prior CCS versions – Update to CCSv8.1 or CCS7.4 with above patches
- UniFlash will need
 - UniFlash v4.3 – no patch required
 - UniFlash all prior versions – install the latest UniFlash v4.3 or later
- Users of other third party programmers will need to ask the vendor to contact TI.

Qual details are provided in the Qual Data Section.

Reason for Change:

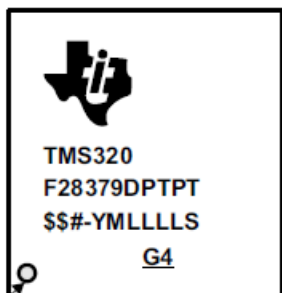
Continuity of supply

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

None

Changes to product identification resulting from this PCN:

Device Symbol:



- YMLLLLS = Lot Trace Code
- YM = 2-Digit Year/Month Code
- LLLL = Assembly Lot
- S = Assembly Site Code
- \$\$ = Wafer Fab Code as applicable
- # = Silicon Revision Code
- G4 = Green (Low Halogen and RoHS-compliant)

Original Fab Field:

\$\$ = YF → TSMC-F14

Updated Fab Field:

\$\$ = YF → TSMC-F14
 Or
 \$\$ = \$7 → UMC 12i
 Or
 \$\$ = \$4 → DMOS6

Current:

| Current Chip Site | Chip Site Origin Code (20L) | Chip Site Country Code (21L) | Chip Site City |
|-------------------|-----------------------------|------------------------------|----------------|
| TSMC-F14 | T14 | TWN | Tainan City |

New Fab Site:

| New Chip Site | Chip Site Origin Code (20L) | Chip Site Country Code (21L) | Chip Site City |
|---------------|-----------------------------|------------------------------|----------------|
| UMC 12i | UMI | SGP | Singapore |
| DMOS6 | DM6 | USA | Dallas |

Sample product shipping label (not actual product label)



MADE IN: Malaysia
 2DC: 20:

| | |
|--------------------|----------|
| MSL 2 /260C/1 YEAR | SEAL DT |
| MSL 1 /235C/UNLIM | 03/29/04 |

OPT:
 ITEM: 39
LBL: 5A (L)TO:1750





(1P) SN74LS07NSR
 (Q) 2000 (D) 0336
 (31T) LOT: 3959047MLA
 (4W) TKY (1T) 7523483S12
 (P)
 (2P) REV: (V) 0033317
 (20L) CSO: SHE (21L) CCO:USA
 (22L) ASO: MLA (23L) ACO: MYS

Product Affected:

| | | | |
|-------------------|-------------------|-------------------|-------------------|
| TMS320F28075PTPS | TMS320F28374SZWTR | TMS320F28376DZWTS | TMS320F28377SPZPS |
| TMS320F28075PTPT | TMS320F28375DPTPS | TMS320F28376DZWTT | TMS320F28377SPZPT |
| TMS320F28075PZPS | TMS320F28375DPTPT | TMS320F28376SPTPS | TMS320F28377SZWTS |
| TMS320F28075PZPT | TMS320F28375DPZPS | TMS320F28376SPTPT | TMS320F28377SZWTT |
| TMS320F28374DPTPS | TMS320F28375DZWTS | TMS320F28376SPZPS | TMS320F28379DPTPS |
| TMS320F28374DPTPT | TMS320F28375DZWTT | TMS320F28376SPZPT | TMS320F28379DPTPT |
| TMS320F28374DZWTS | TMS320F28375SPTPS | TMS320F28376SZWTS | TMS320F28379DZWTS |
| TMS320F28374DZWTT | TMS320F28375SPTPT | TMS320F28376SZWTT | TMS320F28379DZWTT |
| TMS320F28374SPTPS | TMS320F28375SPZPS | TMS320F28377DPTPS | TMS320F28379SPTPS |
| TMS320F28374SPTPT | TMS320F28375SPZPT | TMS320F28377DPTPT | TMS320F28379SPTPT |
| TMS320F28374SPZPS | TMS320F28375SZWTS | TMS320F28377DZWTS | TMS320F28379SPZPS |
| TMS320F28374SPZPT | TMS320F28375SZWTT | TMS320F28377DZWTT | TMS320F28379SPZPT |
| TMS320F28374SZWTS | TMS320F28376DPTPS | TMS320F28377SPTPS | TMS320F28379SZWTS |
| TMS320F28374SZWTT | TMS320F28376DPTPT | TMS320F28377SPTPT | TMS320F28379SZWTT |

Qualification Report

TMS320F2837x commercial products: Addition of UMC and DMOS6 wafer Fab's
 Approve Date 16-May-2018

Product Attributes

| Attributes | Qual Device: (DM6) TMS320F2837XP2P | Qual Device: (DM6) TMS320F2837XPZP | Qual Device: (DM6) TMS320F2837XZWT | Qual Device: (DM6) TXN PROPRIETARY MICRO | Qual Device: (UMC) TMS320F2837XP2P | Qual Device: (UMC) TMS320F2837XPZP | Qual Device: (UMC) TMS320F2837XZWT | Qual Device: (UMC) TXN PROPRIETARY AUTO MICRO |
|---------------------|------------------------------------|------------------------------------|------------------------------------|--|------------------------------------|------------------------------------|------------------------------------|---|
| Assembly Site | PHI (TIPI) | PHI (TIPI) | PHI (TIPI) | PHI (TIPI) | PHI (TIPI) | PHI (TIPI) | PHI (TIPI) | PHI (TIPI) |
| Package Family | Powerpad QFP | Powerpad QFP | BGA | BGA | Powerpad QFP | Powerpad QFP | BGA | BGA |
| Flammability Rating | UL 94 V-0 | UL 94 V-0 | UL 94 V-0 | UL 94 V-0 | UL 94 V-0 | UL 94 V-0 | UL 94 V-0 | UL 94 V-0 |
| Wafer Fab Supplier | DMOS6 | DMOS6 | DMOS6 | DMOS6 | UMC FAB12I | UMC FAB12I | UMC FAB12I | UMC FAB12I |
| Wafer Process | 12F66 | 12F65 | 12F66 | 12F65 | 12F65 | 12F65 | 12F65 | 12F65 |

- Qual Devices qualified at LEVEL3-260C: (DM6) TMS320F2837XZWT, (UMC) TMS320F2837XPZP, (UMC) TMS320F2837XZWT, (DM6) TMS320F2837XP2P, (UMC) TXN PROPRIETARY AUTO MICRO, (DM6) TMS320F2837XP2P, (UMC) TMS320F2837XP2P

Qualification Results

Data Displayed as: Number of lots / Total sample size / Total failed

| Type | Test Name / Condition | Duration | Qual Device: (DM6) TMS320F2837XP2P | Qual Device: (DM6) TMS320F2837XPZP | Qual Device: (DM6) TMS320F2837XZWT | Qual Device: (DM6) TXN PROPRIETARY MICRO | Qual Device: (UMC) TMS320F2837XP2P | Qual Device: (UMC) TMS320F2837XPZP | Qual Device: (UMC) TMS320F2837XZWT | Qual Device: (UMC) TXN PROPRIETARY AUTO MICRO |
|-------|----------------------------------|------------|------------------------------------|------------------------------------|------------------------------------|--|------------------------------------|------------------------------------|------------------------------------|---|
| HAST | Biased HAST, 130C/85%RH | 96 Hours | 2/231/0 | - | - | - | 3/231/0 | - | - | - |
| HBM | ESD - HBM | 2000 V | 1/3/0 | - | 1/3/0 | - | 1/3/0 | - | 1/3/0 | - |
| CDM | ESD - CDM | 500 V | 1/3/0 | - | 1/3/0 | - | 1/3/0 | - | 1/3/0 | - |
| HTOL | Life Test, 125C [a] | 1000 Hours | 3/231/0 | - | - | - | 3/231/0 | - | - | - |
| HTSL | High Temp. Storage Bake, 150C[a] | 1000 Hours | 3/231/0 | - | - | - | 3/231/0 | - | - | - |
| LU | Latch-up (per JESD78) | 1/6/0 | - | - | 1/6/0 | - | 1/6/0 | - | 1/6/0 | - |
| TC | Temperature Cycle, -55/125C | 700 Cycles | - | - | - | 2/154/0 | - | - | - | 3/231/0 |
| TC | Temperature Cycle, -65/150C | 500 Cycles | 3/231/0 | - | - | - | 3/231/0 | - | - | - |
| UHAST | Unbiased HAST, 110C/85%RH | 264 Hours | - | - | - | 3/231/0 | - | - | - | 3/231/0 |
| UHAST | Unbiased HAST, 130C/85%RH | 96 Hours | 3/231/0 | - | - | - | 3/231/0 | - | - | - |

[a] flash memory was cycled with programming/erasing operations prior to HTOL and HTSL which serves as flash memory data retention tests.

- Preconditioning was performed for Auto Dave, Unbiased HAST, THB/Biased HAST, Temperature Cycle, Thermal Shock, and HTSL, as applicable
 - The following are equivalent HTOL options based on an activation energy of 0.7eV: 125C/1k Hours, 140C/480 Hours, 160C/300 Hours, and 155C/240 Hours
 - The following are equivalent HTSL options based on an activation energy of 0.7eV: 150C/1k Hours, and 170C/420 Hours
 - The following are equivalent Temp Cycle options per JESD47: -55C/125C/700 Cycles and -65C/150C/500 Cycles
 Quality and Environmental data is available at TI's external Web site: <http://www.ti.com/>

Green/Pb-free Status:

Qualified Pb-Free (SMT) and Green

For questions regarding this notice, e-mails can be sent to the regional contacts shown below, or you can contact your local Field Sales Representative.

| Location | E-Mail |
|--------------|--|
| USA | PCNAmericasContact@list.ti.com |
| Europe | PCNEuropeContact@list.ti.com |
| Asia Pacific | PCNAsiaContact@list.ti.com |
| Japan | PCNJapanContact@list.ti.com |