

AURIX™ TC27x variants

Data Sheet Addendum

TC277 / TC275 / T270

AURIX™

32-bit microcontroller

Addendum

v1.3, 2015-10-01

Microcontrollers

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About this document

Scope and purpose

This document is an addendum to the TC27x data sheet listing all intended product variants, key parameters such as memory size, and optional features..

Naming Conventions

Prefix

- SAK: T_{ambient} Temperature Range from -40 °C up to +125 °C
- SAL: T_{ambient} Temperature Range from -40 °C up to +150 °C (packaged device)

Feature Package

- T – Standard type without HSM
- TP – Standard type with HSM enabled
- TC – customer specific feature set

1. Variants BC Step

| Derivative | Production Status | Package Type | Temp. Range | Chip ID | Freq. (MHz) | Flash (MB) 1) | EEPROM (KB) 2) | Total SRAM (KB) | Core 1&2 TC16P 1) | | Core 0 TC16E 1) | | LMU (KB) | ADC Chan. | FlexRay (#/ch.) | ETH | HSM | CAN FD |
|------------------------|-------------------|----------------|----------------|---|-------------|------------------|-------------------|-----------------|----------------------|-----------|--------------------|-----------|----------|-----------|-----------------|-----|-----|--------|
| | | | | | | | | | DSPR (KB) | PSPR (KB) | DSPR (KB) | PSPR (KB) | | | | | | |
| SAK-TC277TP-64F200S BC | on request | PG-LFBGA-292-6 | -40°C – +125°C | 4740 7153 _H 4746 7153 _H 3) | 200 | 4 | 64 @ 500k | 472 | 120 | 32 | 112 | 24 | 32 | 60 | 1 / 2 | Yes | Yes | No |
| SAK-TC275TP-64F200W BC | on request | PG-LQFP-176-19 | -40°C – +125°C | 4740 7053 _H 4746 7053 _H 3) | 200 | 4 | 64 @ 500k | 472 | 120 | 32 | 112 | 24 | 32 | 48 | 1 / 2 | Yes | Yes | No |

- 1) The address range starts at the lowest address defined in the User's Manual (See the Memory Maps chapter).
- 2) Based on an EEPROM emulation algorithm with a wear levelling factor of 6 (size scales with number of program/erase cycles, for more details see User Manual).
- 3) Featuring flash firmware (µCode) version 23_H

2. Variants CA Step

| Derivative | Production Status 1) | Package Type | Temp. Range | Chip ID | Freq. (MHz) | PFlash (MB) 2) | EEPROM (KB) 3) | Total SRAM (KB) | Core 1&2 TC16P 2) | | Core 0 TC16E 2) | | LMU (KB) | ADC Chan. | FlexRay (#/ch.) | ETH | HSM | CAN FD | CAN FD DIS 2015 |
|------------------------|-------------------------|----------------|----------------|---|----------------|----------------------|----------------------|-----------------------|-------------------------|--------------|-----------------------|--------------|-------------|--------------|--------------------|-----|-----|-----------|--------------------------|
| | | | | | | | | | DSPR (KB) | PSPR (KB) | DSPR (KB) | PSPR (KB) | | | | | | | |
| SAK-TC277TP-64F200S CA | STANDARD | PG-LFBGA-292-6 | -40°C – +125°C | 4742 7160 _H 4746 7160 _H 4) | 200 | 4 | 64 @ 500k | 472 | 120 | 32 | 112 | 24 | 32 | 60 | 1 / 2 | Yes | Yes | Yes | No |
| SAK-TC277TC-64F200S CA | on request | PG-LFBGA-292-6 | -40°C – +125°C | 4742 7560 _H 4746 7560 _H 4 | 200 | 4 | 24 @ 500k | 424 | 120 | 24 | 112 | 24 | - | 60 | 1 / 2 | No | Yes | No | No |
| SAK-TC277T-64F200S CA | STANDARD | PG-LFBGA-292-6 | -40°C – +125°C | 0742 7160 _H 0746 7160 _H 4 | 200 | 4 | 64 @ 500k | 472 | 120 | 32 | 112 | 24 | 32 | 60 | 1 / 2 | Yes | No | Yes | No |
| SAK-TC275TP-64F200W CA | STANDARD | PG-LQFP-176-22 | -40°C – +125°C | 4742 7060 _H 4746 7060 _H 4 | 200 | 4 | 64 @ 500k | 472 | 120 | 32 | 112 | 24 | 32 | 48 | 1 / 2 | Yes | Yes | Yes | No |
| SAK-TC275TC-64F200W CA | on request | PG-LQFP-176-22 | -40°C – +125°C | 4742 7460 _H 4746 7460 _H 4 | 200 | 4 | 24 @ 500k | 424 | 120 | 24 | 112 | 24 | - | 48 | 1 / 2 | No | Yes | No | No |
| SAK-TC275T-64F200W CA | STANDARD | PG-LQFP-176-22 | -40°C – +125°C | 0742 7060 _H 0746 7060 _H 4 | 200 | 4 | 64 @ 500k | 472 | 120 | 32 | 112 | 24 | 32 | 48 | 1 / 2 | Yes | No | Yes | No |
| SAL-TC275TP-64F200W CA | on request | PG-LQFP-176-22 | -40°C – +150°C | 4742 7060 _H 4746 7060 _H 4 | 200 | 4 | 64 @ 500k | 472 | 120 | 32 | 112 | 24 | 32 | 48 | 1 / 2 | Yes | Yes | Yes | No |
| SAL-TC275T-64F200W CA | on request | PG-LQFP-176-22 | -40°C – +150°C | 0742 7060 _H 0746 7060 _H 4 | 200 | 4 | 64 @ 500k | 472 | 120 | 32 | 112 | 24 | 32 | 48 | 1 / 2 | Yes | No | Yes | No |

- 1) STANDARD = serial production planned.
- 2) The address range starts at the lowest address defined in the User's Manual (See the Memory Maps chapter).
- 3) Based on an EEPROM emulation algorithm with a wear levelling factor of 6 (size scales with number of program/erase cycles, for more details see User Manual).
- 4) Featuring flash firmware (µCode) version 23_H

3. Variants DB Step

| Derivative | Production Status 1) | Package Type | Temp. Range | Chip ID | Freq. (MHz) | Flash (MB) 2) | EEPROM (KB) 3) | Total SRAM (KB) | Core 1&2 TC16P 2) | | Core 0 TC16E 2) | | LMU (KB) | ADC Chan. | FlexRay #/ch.) | ETH | HSM | CAN FD | CAN FD | DIS 2015 |
|------------------------|-------------------------|----------------|----------------|---|----------------|---------------------|----------------------|-----------------------|-------------------------|--------------|-----------------------|--------------|-------------|--------------|-------------------|-----|-----|-----------|-----------|-------------|
| | | | | | | | | | DSPR (KB) | PSPR (KB) | DSPR (KB) | PSPR (KB) | | | | | | | | |
| SAK-TC277TP-64F200S DB | STANDARD | PG-LFBGA-292-6 | -40°C – +125°C | 4744 7171 _H 4746 7171 _{H4}) | 200 | 4 | 64 @ 500k | 472 | 120 | 32 | 112 | 24 | 32 | 60 | 1 / 2 | Yes | Yes | Yes | No | |
| SAK-TC277TC-64F200S DB | on request | PG-LFBGA-292-6 | -40°C – +125°C | 4744 7571 _H 4746 7571 _{H4}) | 200 | 4 | 24 @ 500k | 424 | 120 | 24 | 112 | 24 | - | 60 | 1 / 2 | No | Yes | No | No | |
| SAK-TC277T-64F200S DB | on request | PG-LFBGA-292-6 | -40°C – +125°C | 0744 7171 _H 0746 7171 _{H4}) | 200 | 4 | 64 @ 500k | 472 | 120 | 32 | 112 | 24 | 32 | 60 | 1 / 2 | Yes | No | Yes | No | |
| SAK-TC275TP-64F200W DB | STANDARD | PG-LQFP-176-22 | -40°C – +125°C | 4744 7071 _H 4746 7071 _{H4}) | 200 | 4 | 64 @ 500k | 472 | 120 | 32 | 112 | 24 | 32 | 48 | 1 / 2 | Yes | Yes | Yes | No | |
| SAK-TC275TC-64F200W DB | on request | PG-LQFP-176-22 | -40°C – +125°C | 4744 7471 _H 4746 7471 _{H4}) | 200 | 4 | 24 @ 500k | 424 | 120 | 24 | 112 | 24 | - | 48 | 1 / 2 | No | Yes | No | No | |
| SAK-TC275T-64F200W DB | on request | PG-LQFP-176-22 | -40°C – +125°C | 0744 7071 _H 0746 7071 _{H4}) | 200 | 4 | 64 @ 500k | 472 | 120 | 32 | 112 | 24 | 32 | 48 | 1 / 2 | Yes | No | Yes | No | |
| SAL-TC277TP-64F200S DB | on request | PG-LFBGA-292-6 | -40°C – +150°C | 4744 7171 _H 4746 7171 _{H4}) | 200 | 4 | 64 @ 500k | 472 | 120 | 32 | 112 | 24 | 32 | 60 | 1 / 2 | Yes | Yes | Yes | No | |
| SAL-TC277T-64F200S DB | on request | PG-LFBGA-292-6 | -40°C – +150°C | 0744 7171 _H 0746 7171 _{H4}) | 200 | 4 | 64 @ 500k | 472 | 120 | 32 | 112 | 24 | 32 | 60 | 1 / 2 | Yes | No | Yes | No | |
| SAL-TC275TP-64F200W DB | on request | PG-LQFP-176-22 | -40°C – +150°C | 4744 7071 _H 4746 7071 _{H4}) | 200 | 4 | 64 @ 500k | 472 | 120 | 32 | 112 | 24 | 32 | 48 | 1 / 2 | Yes | Yes | Yes | No | |
| SAL-TC275T-64F200W DB | on request | PG-LQFP-176-22 | -40°C – +150°C | 0744 7071 _H 0746 7071 _{H4}) | 200 | 4 | 64 @ 500k | 472 | 120 | 32 | 112 | 24 | 32 | 48 | 1 / 2 | Yes | No | Yes | No | |
| SAL-TC270TP-64F200 DB | on request | Bare Die | -40°C – +170°C | 4744 7F71 _H 4746 7F71 _{H4}) | 200 | 4 | 64 @ 500k | 472 | 120 | 32 | 112 | 24 | 32 | 60 | 1 / 2 | Yes | Yes | Yes | No | |

1) STANDARD = serial production planned.

2) The address range starts at the lowest address defined in the User's Manual (See the Memory Maps chapter).

3) Based on an EEPROM emulation algorithm with a wear levelling factor of 6 (size scales with number of program/erase cycles, for more details see User Manual).

4) Featuring flash firmware (µCode) version 23_H

4. Variants DC Step

| Derivative | Production Status 1) | Package Type | Temp. Range | Chip ID 4) | Freq. (MHz) | Flash (MB) 2) | EEPROM (KB) 3) | Total SRAM (KB) | Core 1&2 TC16P 2) | | Core 0 TC16E 2) | | LMU (KB) | ADC Chan. | FlexRay (#/ch.) | ETH | HSM | CAN FD | CAN FD DIS 2015 |
|------------------------|-------------------------|----------------|----------------|------------------------|----------------|---------------------|----------------------|-----------------------|-------------------------|--------------|-----------------------|--------------|-------------|--------------|--------------------|-----|-----|-----------|--------------------------|
| | | | | | | | | | DSPR (KB) | PSPR (KB) | DSPR (KB) | PSPR (KB) | | | | | | | |
| SAK-TC277TP-64F200N DC | STANDARD | PG-LFBGA-292-6 | -40°C – +125°C | XXXX XXXX _H | 200 | 4 | 64 @ 500k | 472 | 120 | 32 | 112 | 24 | 32 | 60 | 1 / 2 | Yes | Yes | Yes | Yes |
| SAK-TC277TC-64F200S DC | on request | PG-LFBGA-292-6 | -40°C – +125°C | XXXX XXXX _H | 200 | 4 | 24 @ 500k | 424 | 120 | 24 | 112 | 24 | - | 60 | 1 / 2 | No | Yes | No | No |
| SAK-TC277T-64F200S DC | on request | PG-LFBGA-292-6 | -40°C – +125°C | XXXX XXXX _H | 200 | 4 | 64 @ 500k | 472 | 120 | 32 | 112 | 24 | 32 | 60 | 1 / 2 | Yes | No | Yes | No |
| SAK-TC275TP-64F200N DC | STANDARD | PG-LQFP-176-22 | -40°C – +125°C | XXXX XXXX _H | 200 | 4 | 64 @ 500k | 472 | 120 | 32 | 112 | 24 | 32 | 48 | 1 / 2 | Yes | Yes | Yes | Yes |
| SAK-TC275TC-64F200W DC | on request | PG-LQFP-176-22 | -40°C – +125°C | XXXX XXXX _H | 200 | 4 | 24 @ 500k | 424 | 120 | 24 | 112 | 24 | - | 48 | 1 / 2 | No | Yes | No | No |
| SAK-TC275T-64F200W DC | on request | PG-LQFP-176-22 | -40°C – +125°C | XXXX XXXX _H | 200 | 4 | 64 @ 500k | 472 | 120 | 32 | 112 | 24 | 32 | 48 | 1 / 2 | Yes | No | Yes | No |
| SAL-TC277TP-64F200N DC | on request | PG-LFBGA-292-6 | -40°C – +150°C | XXXX XXXX _H | 200 | 4 | 64 @ 500k | 472 | 120 | 32 | 112 | 24 | 32 | 60 | 1 / 2 | Yes | Yes | Yes | Yes |
| SAL-TC277T-64F200S DC | on request | PG-LFBGA-292-6 | -40°C – +150°C | XXXX XXXX _H | 200 | 4 | 64 @ 500k | 472 | 120 | 32 | 112 | 24 | 32 | 60 | 1 / 2 | Yes | No | Yes | No |
| SAL-TC275TP-64F200N DC | on request | PG-LQFP-176-22 | -40°C – +150°C | XXXX XXXX _H | 200 | 4 | 64 @ 500k | 472 | 120 | 32 | 112 | 24 | 32 | 48 | 1 / 2 | Yes | Yes | Yes | Yes |
| SAL-TC275T-64F200W DC | on request | PG-LQFP-176-22 | -40°C – +150°C | XXXX XXXX _H | 200 | 4 | 64 @ 500k | 472 | 120 | 32 | 112 | 24 | 32 | 48 | 1 / 2 | Yes | No | Yes | No |
| SAL-TC270TP-64F200N DC | on request | Bare Die | -40°C – +170°C | XXXX XXXX _H | 200 | 4 | 64 @ 500k | 472 | 120 | 32 | 112 | 24 | 32 | 60 | 1 / 2 | Yes | Yes | Yes | Yes |

1) STANDARD = serial production planned.

2) The address range starts at the lowest address defined in the User's Manual (See Memory Maps chapter).

3) Based on an EEPROM emulation algorithm with a wear levelling factor of 6 (size scales with number of program/erase cycles, for more details see User Manual).

4) To be defined.

Memory Maps of Variants

This section shows the influence of above feature variants on the memory map.

DF_EEPROM Variants:

Exemplary EEPROM size:

384 KB

64 KB @ 500k

144 KB

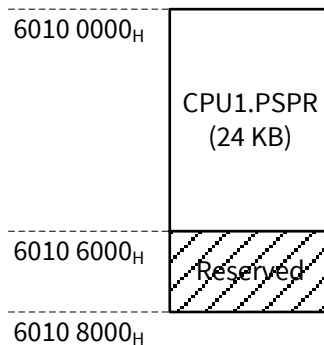
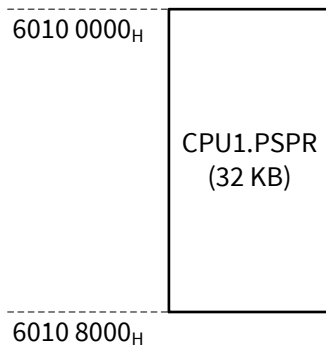
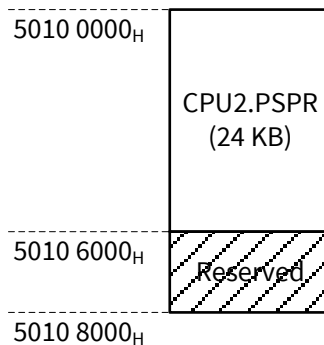
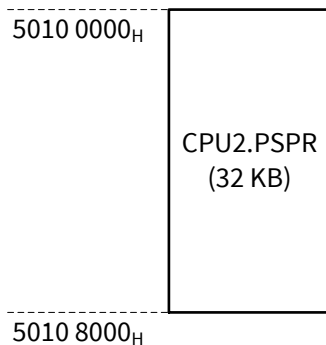
24 KB @ 500k

| | Logical Sector | Size | Offset Address |
|------------------------|----------------|------|----------------------|
| AF00 0000 _H | EEPROM0 | 8 KB | 00 0000 _H |
| | EEPROM1 | 8 KB | 00 2000 _H |
| | EEPROM2 | 8 KB | 00 4000 _H |
| | ... | ... | ... |
| AF06 0000 _H | EEPROM47 | 8 KB | 05 E000 _H |

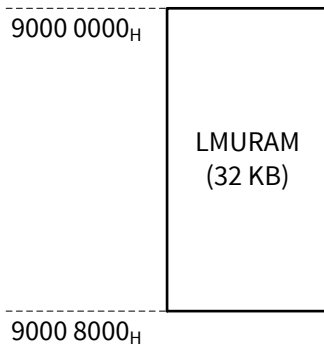
| | Logical Sector | Size | Offset Address |
|------------------------|----------------|------|----------------------|
| AF00 0000 _H | EEPROM0 | 8 KB | 00 0000 _H |
| | EEPROM1 | 8 KB | 00 2000 _H |
| | EEPROM2 | 8 KB | 00 4000 _H |
| | ... | ... | ... |
| | EEPROM17 | 8 KB | 02 2000 _H |
| AF02 4000 _H | Reserved | | |
| AF06 0000 _H | | | |

Core1/2 PSPR Variants: 32 KB

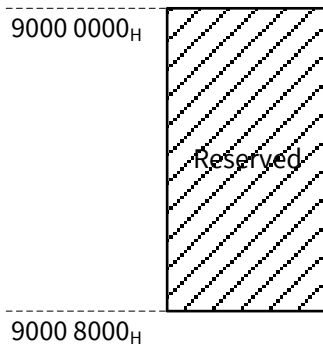
24 KB



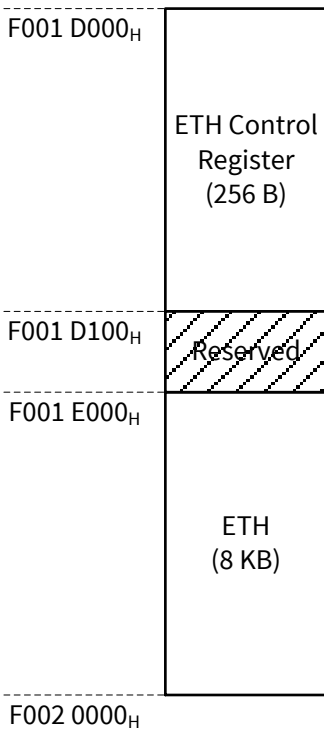
LMU Variants: 32 KB



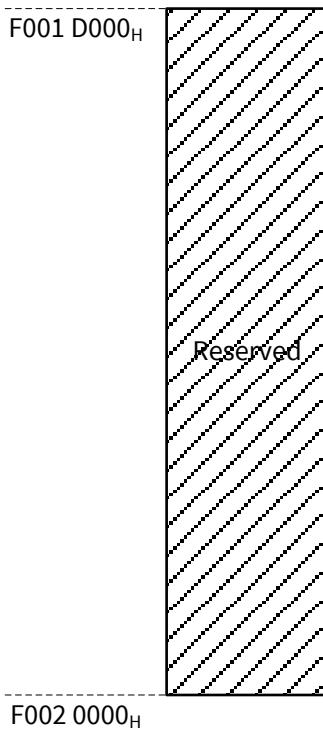
0 KB

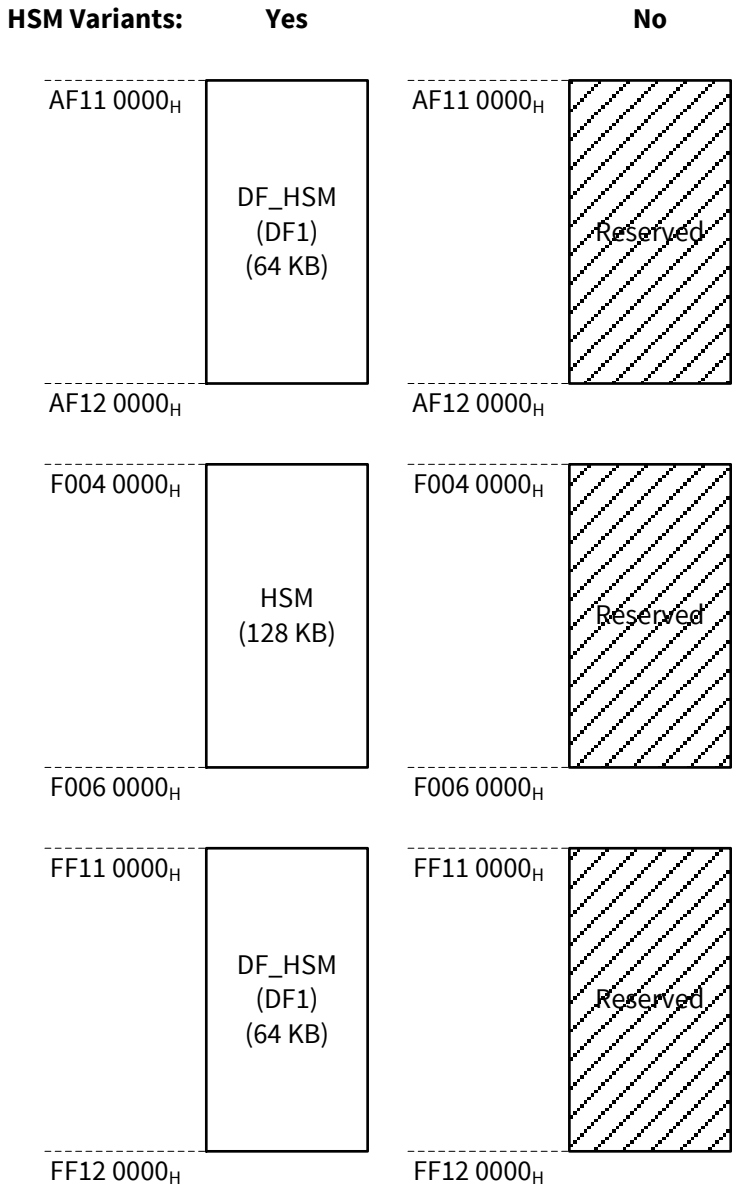


ETH Variants: Yes



No





CAN FD Variants:

No influence on Memory Map.

CAN FD = “No” variants: all CAN register fields NCRx.FDEN have to be kept 0_B.

Revision History

Major changes since the last revision

| Page or Reference | Description of change |
|--------------------------|---|
| V1.1 | |
| 5, 6 | Chip IDs for CA & DC steps corrected Bugs in HSM (Y/N) and CAN FD (Y/N) corrected |
| V1.2 | |
| | Memory maps added CAN FD DIS2015 markings added µCode 23 _H ChipIDs added |
| V1.3 | Memory maps corrections |

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Last Trademarks Update 2014-07-17

www.infineon.com

Edition 2015-10-01

Published by

Infineon Technologies AG

81726 Munich, Germany

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Document reference

ifxDSA0002

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