

# AURIX™ TC38x variants

## About this document

### Scope and purpose

This document is an addendum to the TC38x Product Data Sheet and User's Manual, listing all planned product variants, key parameters such as memory size and optional features.

The User's Manual lists functions implemented on the Silicon, but this document counts functions that are pinning dependent; i.e. functions are counted that are connected to at least one package pin. As pins are overlaid with several functions the pinning needs to be checked (see Product Data Sheet) to determine the number of usable functions in an application.

### Naming conventions

Prefix:

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

Feature Package:

- P: Standard feature.
- E: Emulation device with all features of the emulated standard type, additionally full MCDS, overlay functionality for calibration, AGBT as trace interface for development (depending on the package).
- C,V,Z: Customer Specific.
- A: ADAS ext. Memory.
- T: ADAS + emulation.
- X: Extended Feature device. These products contain the extended memory (EMEM) of the ADAS subsystem. The ADAS peripherals SPU, RIF and CIF are not available.
- M: MotionWise software.
- F: Extended Flash.
- G: Additional Connectivity.
- H: ADAS Standard feature.
- N: Standard feature with AMU.

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**Table of contents****Table of contents**

|          |  |    |
|----------|--|----|
|          | <b>About this document</b> .....           | 1  |
|          | <b>Table of contents</b> .....             | 2  |
| <b>1</b> | <b>TC38x AE step variants</b> .....        | 3  |
| 1.1      | TC38x AE step (part 1) .....               | 3  |
| 1.2      | TC38x AE step (part 2) .....               | 6  |
| <b>2</b> | <b>TC38x AD step variants</b> .....        | 9  |
| 2.1      | TC38x AD step (part 1) .....               | 9  |
| 2.2      | TC38x AD step (part 2) .....               | 12 |
| <b>3</b> | <b>Memory maps of TC38x variants</b> ..... | 15 |
|          | <b>Revision history</b> .....              | 17 |
|          | <b>Disclaimer</b> .....                    | 18 |

## 1 TC38x AE step variants

### 1 TC38x AE step variants

The following tables list the TC38x AE step variants.

#### 1.1 TC38x AE step (part 1)

**Table 1** TC38x AE step (part 1)

| SAL-TC380QP-160 F300   | SAL-TC389QP-160 F300S | SAL-TC387QP-160 F300S | SAK-TC389QP-160 F300S | SAK-TC387QP-160 F300S | SAK-TC387TP-128 F300S | SAL-TC387TP-128 F300S |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| <b>Step</b>  |                       |                       |                       |                       |                       |                       |
| AE   | AE                    | AE                    | AE                    | AE                    | AE                    | AE                    |
| <b>Production status</b>   |                       |                       |                       |                       |                       |                       |
| Standard   | Standard              | Standard              | Standard              | Standard              | Customer specific     | Customer specific     |
| <b>Package type</b>  |                       |                       |                       |                       |                       |                       |
| Bare Die   | PG-LFBGA-516          | PG-LFBGA-292          | PG-LFBGA-516          | PG-LFBGA-292          | PG-LFBGA-292          | PG-LFBGA-292          |
| <b>Pinout</b>  |                       |                       |                       |                       |                       |                       |
| BD   | LFBGA 0.8 mm          | LFBGA 0.8 mm          | LFBGA 0.8 mm          | LFBGA 0.8 mm          | LFBGA 0.8 mm          | LFBGA 0.8 mm          |
| <b>Reference silicon</b>   |                       |                       |                       |                       |                       |                       |
| TC38x  | TC38x                 | TC38x                 | TC38x                 | TC38x                 | TC38x                 | TC38x                 |
| <b>Temperature range (ambient)</b>   |                       |                       |                       |                       |                       |                       |
| -40°C up to +170°C   | -40°C up to +150°C    | -40°C up to +150°C    | -40°C up to +125°C    | -40°C up to +125°C    | -40°C up to +125°C    | -40°C up to +150°C    |
| <b>Chip ID</b>   |                       |                       |                       |                       |                       |                       |
| <i>Attention: The value of SCU_CHIPID in the UCODE field contains the default value 0 not the µCode version.</i> |                       |                       |                       |                       |                       |                       |
| 0x8C008084   | 0x8C008984            | 0x8C008784            | 0x8C008984            | 0x8C008784            | 0xCB008784            | 0xCB008784            |
| <b>Cores / checker cores</b>   |                       |                       |                       |                       |                       |                       |
| 4/2  | 4/2                   | 4/2                   | 4/2                   | 4/2                   | 3/2                   | 3/2                   |
| <b>Maximum frequency (MHz)</b>   |                       |                       |                       |                       |                       |                       |
| 300  | 300                   | 300                   | 300                   | 300                   | 300                   | 300                   |
| <b>Program flash (MB)</b>  |                       |                       |                       |                       |                       |                       |
| 10   | 10                    | 10                    | 10                    | 10                    | 8                     | 8                     |
| <b>Data flash 0 (single-ended) (KB)</b>  |                       |                       |                       |                       |                       |                       |
| 512  | 512                   | 512                   | 512                   | 512                   | 512                   | 512                   |
| <b>Total SRAM (without EMEM and Cache) (KB)</b>  |                       |                       |                       |                       |                       |                       |
| 1376   | 1376                  | 1376                  | 1376                  | 1376                  | 1152                  | 1152                  |
| <b>EMEM Size (KB)</b>  |                       |                       |                       |                       |                       |                       |
| 0  | 0                     | 0                     | 0                     | 0                     | 0                     | 0                     |

## 1 TC38x AE step variants

Table 1 TC38x AE step (part 1) (continued)

| SAL-TC380QP-160 F300                                       | SAL-TC389QP-160 F300S   | SAL-TC387QP-160 F300S   | SAK-TC389QP-160 F300S   | SAK-TC387QP-160 F300S   | SAK-TC387TP-128 F300S   | SAL-TC387TP-128 F300S   |
|--|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| <b>DSPR (KB)</b>   |                         |                         |                         |                         |                         |                         |
| 240 in CPU0&1; 96 other                                    | 240 in CPU0&1; 96 other | 240 in CPU0&1; 96 other | 240 in CPU0&1; 96 other | 240 in CPU0&1; 96 other | 240 in CPU0&1; 96 other | 240 in CPU0&1; 96 other |
| <b>DLMU (KB)</b>   |                         |                         |                         |                         |                         |                         |
| 64 per CPU   | 64 per CPU              | 64 per CPU              | 64 per CPU              | 64 per CPU              | 64 per CPU              | 64 per CPU              |
| <b>PSPR (KB)</b>   |                         |                         |                         |                         |                         |                         |
| 64   | 64                      | 64                      | 64                      | 64                      | 64                      | 64                      |
| <b>LMU (KB)</b>  |                         |                         |                         |                         |                         |                         |
| 128  | 128                     | 128                     | 128                     | 128                     | 128                     | 128                     |
| <b>DAM (KB)</b>  |                         |                         |                         |                         |                         |                         |
| 64   | 64                      | 64                      | 64                      | 64                      | 64                      | 64                      |
| <b>AMU<sup>1)</sup></b>                                    |                         |                         |                         |                         |                         |                         |
| No   | No                      | No                      | No                      | No                      | No                      | No                      |
| <b>ADC (primary groups/channels)</b>                       |                         |                         |                         |                         |                         |                         |
| 8/64   | 8/64                    | 5/40                    | 8/64                    | 5/40                    | 5/40                    | 5/40                    |
| <b>ADC (secondary groups/channels)</b>                     |                         |                         |                         |                         |                         |                         |
| 4/60   | 4/60                    | 4/60                    | 4/60                    | 4/60                    | 4/60                    | 4/60                    |
| <b>ADC (fast compare channels)</b>                         |                         |                         |                         |                         |                         |                         |
| 4  | 4                       | 4                       | 4                       | 4                       | 4                       | 4                       |
| <b>ADC (EDSADC channels)</b>                               |                         |                         |                         |                         |                         |                         |
| 10   | 10                      | 6                       | 10                      | 6                       | 6                       | 6                       |
| <b>CAN (modules/nodes)</b>                                 |                         |                         |                         |                         |                         |                         |
| 3/3x4  | 3/3x4                   | 3/3x4                   | 3/3x4                   | 3/3x4                   | 3/3x4                   | 3/3x4                   |
| <b>FlexRay (modules/channels)</b>                          |                         |                         |                         |                         |                         |                         |
| 2/2x2  | 2/2x2                   | 2/2x2                   | 2/2x2                   | 2/2x2                   | 2/2x2                   | 2/2x2                   |
| <b>HSSL modules</b>  |                         |                         |                         |                         |                         |                         |
| 1  | 1                       | 1                       | 1                       | 1                       | 1                       | 1                       |
| <b>ASCLIN modules / with ASC and LIN / with 3-wire SPI</b> |                         |                         |                         |                         |                         |                         |
| 24/24/12   | 24/24/12                | 24/24/11                | 24/24/12                | 24/24/11                | 24/24/11                | 24/24/11                |
| <b>QSPI modules / with LVDS</b>                            |                         |                         |                         |                         |                         |                         |

<sup>1</sup> AMU is abbreviated as ASC Modeling Unit. For Additional details about AMU, Contact an Infineon Representative

## 1 TC38x AE step variants

Table 1 TC38x AE step (part 1) (continued)

| SAL-TC380QP-160 F300                                   | SAL-TC389QP-160 F300S | SAL-TC387QP-160 F300S | SAK-TC389QP-160 F300S | SAK-TC387QP-160 F300S | SAK-TC387TP-128 F300S | SAL-TC387TP-128 F300S |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 5/2  | 5/2                   | 5/2                   | 5/2                   | 5/2                   | 5/2                   | 5/2                   |
| <b>SENT channels</b>                                   |                       |                       |                       |                       |                       |                       |
| 25   | 25                    | 20                    | 25                    | 20                    | 20                    | 20                    |
| <b>MSC modules</b>                                     |                       |                       |                       |                       |                       |                       |
| 3  | 3                     | 2                     | 3                     | 2                     | 2                     | 2                     |
| <b>PSI5 channels</b>                                   |                       |                       |                       |                       |                       |                       |
| 4  | 4                     | 4                     | 4                     | 4                     | 4                     | 4                     |
| <b>PSI5-S module</b>                                   |                       |                       |                       |                       |                       |                       |
| Yes  | Yes                   | Yes                   | Yes                   | Yes                   | Yes                   | Yes                   |
| <b>SDMMC module</b>                                    |                       |                       |                       |                       |                       |                       |
| No   | No                    | No                    | No                    | No                    | No                    | No                    |
| <b>Maximum Ethernet availability: 1Gbit/100Mbit/No</b> |                       |                       |                       |                       |                       |                       |
| 1Gbit/s  | 1Gbit/s               | 1Gbit/s               | 1Gbit/s               | 1Gbit/s               | 1Gbit/s               | 1Gbit/s               |
| <b>MCDS availability</b>                               |                       |                       |                       |                       |                       |                       |
| miniMCDS   | miniMCDS              | miniMCDS              | miniMCDS              | miniMCDS              | miniMCDS              | miniMCDS              |
| <b>ADAS cluster available</b>                          |                       |                       |                       |                       |                       |                       |
| No   | No                    | No                    | No                    | No                    | No                    | No                    |
| <b>HSM available</b>                                   |                       |                       |                       |                       |                       |                       |
| Yes  | Yes                   | Yes                   | Yes                   | Yes                   | Yes                   | Yes                   |

## 1 TC38x AE step variants

## 1.2 TC38x AE step (part 2)

Table 2 TC38x AE step (part 2)

| SAK-TC387TP-160F300S   | SAL-TC387TP-160F300S                  | SAK-TC387QN-160F300S    | SAK-TC389QN-160F300S    |
|--|---------------------------------------|-------------------------|-------------------------|
| <b>Step</b>  |                                       |                         |                         |
| AE   | AE                                    | AE                      | AE                      |
| <b>Production status</b>   |                                       |                         |                         |
| Customer specific  | Customer specific                     | Customer specific       | Customer specific       |
| <b>Package type</b>  |                                       |                         |                         |
| PG-LFBGA-292   | PG-LFBGA-292                          | PG-LFBGA-292            | PG-LFBGA-516            |
| <b>Pinout</b>  |                                       |                         |                         |
| LFBGA 0.8 mm   | LFBGA 0.8 mm                          | LFBGA 0.8 mm            | LFBGA 0.8 mm            |
| <b>Reference silicon</b>   |                                       |                         |                         |
| TC38x  | TC38x                                 | TC38x                   | TC38x                   |
| <b>Temperature range (ambient)</b>   |                                       |                         |                         |
| -40°C up to +125°C   | -40°C up to +150°C                    | -40°C up to +125°C      | -40°C up to +125°C      |
| <b>Chip ID</b>   |                                       |                         |                         |
| <i>Attention: The value of SCU_CHIPID in the UCODE field contains the default value 0 not the µCode version.</i> |                                       |                         |                         |
| 0xFC008784   | 0xFC008784                            | 0xAC008784              | 0xAC008984              |
| <b>Cores / checker cores</b>   |                                       |                         |                         |
| 3/2  | 3/2                                   | 4/2                     | 4/2                     |
| <b>Maximum frequency (MHz)</b>   |                                       |                         |                         |
| 300  | 300                                   | 300                     | 300                     |
| <b>Program flash (MB)</b>  |                                       |                         |                         |
| 10   | 10                                    | 10                      | 10                      |
| <b>Data flash 0 (single-ended) (KB)</b>  |                                       |                         |                         |
| 512  | 512                                   | 512                     | 512                     |
| <b>Total SRAM (without EMEM and Cache) (KB)</b>  |                                       |                         |                         |
| 768  | 768                                   | 1376                    | 1376                    |
| <b>EMEM Size (KB)</b>  |                                       |                         |                         |
| 0  | 0                                     | 0                       | 0                       |
| <b>DSPR (KB)</b>   |                                       |                         |                         |
| 160 in CPU0; 128 in CPU1;<br>96 other  | 160 in CPU0; 128 in CPU1;<br>96 other | 240 in CPU0&1; 96 other | 240 in CPU0&1; 96 other |
| <b>DLMU (KB)</b>   |                                       |                         |                         |
| 64 per CPU   | 64 per CPU                            | 64 per CPU              | 64 per CPU              |

## 1 TC38x AE step variants

Table 2 TC38x AE step (part 2) (continued)

| SAK-TC387TP-160F300S                                       | SAL-TC387TP-160F300S | SAK-TC387QN-160F300S | SAK-TC389QN-160F300S |
|--|----------------------|----------------------|----------------------|
| <b>PSPR (KB)</b>   |                      |                      |                      |
| 64   | 64                   | 64                   | 64                   |
| <b>LMU (KB)</b>  |                      |                      |                      |
| 128  | 128                  | 128                  | 128                  |
| <b>DAM (KB)</b>  |                      |                      |                      |
| 64   | 64                   | 64                   | 64                   |
| <b>AMU<sup>2)</sup></b>                                    |                      |                      |                      |
| No   | No                   | Yes                  | Yes                  |
| <b>ADC (primary groups/channels)</b>                       |                      |                      |                      |
| 5/40   | 5/40                 | 5/40                 | 8/64                 |
| <b>ADC (secondary groups/channels)</b>                     |                      |                      |                      |
| 4/60   | 4/60                 | 4/60                 | 4/60                 |
| <b>ADC (fast compare channels)</b>                         |                      |                      |                      |
| 4  | 4                    | 4                    | 4                    |
| <b>ADC (EDSADC channels)</b>                               |                      |                      |                      |
| 6  | 6                    | 6                    | 10                   |
| <b>CAN (modules/nodes)</b>                                 |                      |                      |                      |
| 3/3x4  | 3/3x4                | 3/3x4                | 3/3x4                |
| <b>FlexRay (modules/channels)</b>                          |                      |                      |                      |
| 2/2x2  | 2/2x2                | 2/2x2                | 2/2x2                |
| <b>HSSL modules</b>  |                      |                      |                      |
| 1  | 1                    | 1                    | 1                    |
| <b>ASCLIN modules / with ASC and LIN / with 3-wire SPI</b> |                      |                      |                      |
| 24/24/11   | 24/24/11             | 24/24/11             | 24/24/12             |
| <b>QSPI modules / with LVDS</b>                            |                      |                      |                      |
| 5/2  | 5/2                  | 5/2                  | 5/2                  |
| <b>SENT channels</b>                                       |                      |                      |                      |
| 20   | 20                   | 20                   | 25                   |
| <b>MSC modules</b>   |                      |                      |                      |
| 2  | 2                    | 2                    | 3                    |
| <b>PSI5 channels</b>                                       |                      |                      |                      |
| 4  | 4                    | 4                    | 4                    |

<sup>2)</sup> AMU is abbreviated as ASC Modeling Unit. For Additional details about AMU, Contact an Infineon Representative

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**1 TC38x AE step variants**
**Table 2 TC38x AE step (part 2) (continued)**

| <b>SAK-TC387TP-160F300S</b>                             | <b>SAL-TC387TP-160F300S</b> | <b>SAK-TC387QN-160F300S</b> | <b>SAK-TC389QN-160F300S</b> |
|---|-----------------------------|-----------------------------|-----------------------------|
| <b>PSI5-S module</b>                                    |                             |                             |                             |
| Yes   | Yes                         | Yes                         | Yes                         |
| <b>SDMMC module</b>                                     |                             |                             |                             |
| No  | No                          | No                          | No                          |
| <b>Maximum Ethernet: availability: 1Gbit/100Mbit/No</b> |                             |                             |                             |
| 1Gbit/s   | 1Gbit/s                     | 1Gbit/s                     | 1Gbit/s                     |
| <b>MCDS availability</b>                                |                             |                             |                             |
| miniMCDS  | miniMCDS                    | miniMCDS                    | miniMCDS                    |
| <b>ADAS cluster available</b>                           |                             |                             |                             |
| No  | No                          | No                          | No                          |
| <b>HSM available</b>                                    |                             |                             |                             |
| Yes   | Yes                         | Yes                         | Yes                         |



## 2 TC38x AD step variants

### 2 TC38x AD step variants

The following tables list the TC38x AD step variants.

#### 2.1 TC38x AD step (part 1)

**Table 3** TC38x AD step (part 1)

| SAL-TC380QP-160 F300   | SAL-TC389QP-160 F300S | SAL-TC387QP-160 F300S | SAK-TC389QP-160 F300S | SAK-TC387QP-160 F300S | SAK-TC387TP-128 F300S | SAL-TC387TP-128 F300S |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| <b>Step</b>  |                       |                       |                       |                       |                       |                       |
| AD   | AD                    | AD                    | AD                    | AD                    | AD                    | AD                    |
| <b>Production status</b>   |                       |                       |                       |                       |                       |                       |
| Standard   | Standard              | Standard              | Standard              | Standard              | Customer specific     | Customer specific     |
| <b>Package type</b>  |                       |                       |                       |                       |                       |                       |
| Bare Die   | PG-LFBGA-516          | PG-LFBGA-292          | PG-LFBGA-516          | PG-LFBGA-292          | PG-LFBGA-292          | PG-LFBGA-292          |
| <b>Pinout</b>  |                       |                       |                       |                       |                       |                       |
| BD   | LFBGA 0.8 mm          | LFBGA 0.8 mm          | LFBGA 0.8 mm          | LFBGA 0.8 mm          | LFBGA 0.8 mm          | LFBGA 0.8 mm          |
| <b>Reference silicon</b>   |                       |                       |                       |                       |                       |                       |
| TC38x  | TC38x                 | TC38x                 | TC38x                 | TC38x                 | TC38x                 | TC38x                 |
| <b>Temperature range (ambient)</b>   |                       |                       |                       |                       |                       |                       |
| -40°C up to +170°C   | -40°C up to +150°C    | -40°C up to +150°C    | -40°C up to +125°C    | -40°C up to +125°C    | -40°C up to +125°C    | -40°C up to +150°C    |
| <b>Chip ID</b>   |                       |                       |                       |                       |                       |                       |
| <i>Attention: The value of SCU_CHIPID in the UCODE field contains the default value 0 not the µCode version.</i> |                       |                       |                       |                       |                       |                       |
| 0x8C008083   | 0x8C008983            | 0x8C008783            | 0x8C008983            | 0x8C008783            | 0xCB008783            | 0xCB008783            |
| <b>Cores / checker cores</b>   |                       |                       |                       |                       |                       |                       |
| 4/2  | 4/2                   | 4/2                   | 4/2                   | 4/2                   | 3/2                   | 3/2                   |
| <b>Maximum frequency (MHz)</b>   |                       |                       |                       |                       |                       |                       |
| 300  | 300                   | 300                   | 300                   | 300                   | 300                   | 300                   |
| <b>Program flash (MB)</b>  |                       |                       |                       |                       |                       |                       |
| 10   | 10                    | 10                    | 10                    | 10                    | 8                     | 8                     |
| <b>Data flash 0 (single-ended) (KB)</b>  |                       |                       |                       |                       |                       |                       |
| 512  | 512                   | 512                   | 512                   | 512                   | 512                   | 512                   |
| <b>Total SRAM (without EMEM and Cache) (KB)</b>  |                       |                       |                       |                       |                       |                       |
| 1376   | 1376                  | 1376                  | 1376                  | 1376                  | 1152                  | 1152                  |
| <b>EMEM size (KB)</b>  |                       |                       |                       |                       |                       |                       |
| 0  | 0                     | 0                     | 0                     | 0                     | 0                     | 0                     |

## 2 TC38x AD step variants

Table 3 TC38x AD step (part 1) (continued)

| SAL-TC380QP-160 F300                                       | SAL-TC389QP-160 F300S      | SAL-TC387QP-160 F300S      | SAK-TC389QP-160 F300S      | SAK-TC387QP-160 F300S      | SAK-TC387TP-128 F300S      | SAL-TC387TP-128 F300S      |
|--|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| <b>DSPR (KB)</b>   |                            |                            |                            |                            |                            |                            |
| 240 in CPU0&1;<br>96 other                                 | 240 in CPU0&1;<br>96 other | 240 in CPU0&1;<br>96 other | 240 in CPU0&1;<br>96 other | 240 in CPU0&1;<br>96 other | 240 in CPU0&1;<br>96 other | 240 in CPU0&1;<br>96 other |
| <b>DLMU (KB)</b>   |                            |                            |                            |                            |                            |                            |
| 64 per CPU   | 64 per CPU                 | 64 per CPU                 | 64 per CPU                 | 64 per CPU                 | 64 per CPU                 | 64 per CPU                 |
| <b>PSPR (KB)</b>   |                            |                            |                            |                            |                            |                            |
| 64   | 64                         | 64                         | 64                         | 64                         | 64                         | 64                         |
| <b>LMU (KB)</b>  |                            |                            |                            |                            |                            |                            |
| 128  | 128                        | 128                        | 128                        | 128                        | 128                        | 128                        |
| <b>DAM (KB)</b>  |                            |                            |                            |                            |                            |                            |
| 64   | 64                         | 64                         | 64                         | 64                         | 64                         | 64                         |
| <b>AMU<sup>3)</sup></b>                                    |                            |                            |                            |                            |                            |                            |
| No   | No                         | No                         | No                         | No                         | No                         | No                         |
| <b>ADC (primary groups/channels)</b>                       |                            |                            |                            |                            |                            |                            |
| 8/64   | 8/64                       | 5/40                       | 8/64                       | 5/40                       | 5/40                       | 5/40                       |
| <b>ADC (secondary groups/channels)</b>                     |                            |                            |                            |                            |                            |                            |
| 4/60   | 4/60                       | 4/60                       | 4/60                       | 4/60                       | 4/60                       | 4/60                       |
| <b>ADC (fast compare channels)</b>                         |                            |                            |                            |                            |                            |                            |
| 4  | 4                          | 4                          | 4                          | 4                          | 4                          | 4                          |
| <b>ADC (EDSADC channels)</b>                               |                            |                            |                            |                            |                            |                            |
| 10   | 10                         | 6                          | 10                         | 6                          | 6                          | 6                          |
| <b>CAN (modules/nodes)</b>                                 |                            |                            |                            |                            |                            |                            |
| 3/3x4  | 3/3x4                      | 3/3x4                      | 3/3x4                      | 3/3x4                      | 3/3x4                      | 3/3x4                      |
| <b>FlexRay (modules/channels)</b>                          |                            |                            |                            |                            |                            |                            |
| 2/2x2  | 2/2x2                      | 2/2x2                      | 2/2x2                      | 2/2x2                      | 2/2x2                      | 2/2x2                      |
| <b>HSSL modules</b>  |                            |                            |                            |                            |                            |                            |
| 1  | 1                          | 1                          | 1                          | 1                          | 1                          | 1                          |
| <b>ASCLIN modules / with ASC and LIN / with 3-wire SPI</b> |                            |                            |                            |                            |                            |                            |
| 24/24/12   | 24/24/12                   | 24/24/11                   | 24/24/12                   | 24/24/11                   | 24/24/11                   | 24/24/11                   |
| <b>QSPI modules / with LVDS</b>                            |                            |                            |                            |                            |                            |                            |

<sup>3)</sup> AMU is abbreviated as ASC Modeling Unit. For Additional details about AMU, Contact an Infineon Representative

## 2 TC38x AD step variants

Table 3 TC38x AD step (part 1) (continued)

| SAL-TC380QP-160 F300                                   | SAL-TC389QP-160 F300S | SAL-TC387QP-160 F300S | SAK-TC389QP-160 F300S | SAK-TC387QP-160 F300S | SAK-TC387TP-128 F300S | SAL-TC387TP-128 F300S |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 5/2  | 5/2                   | 5/2                   | 5/2                   | 5/2                   | 5/2                   | 5/2                   |
| <b>SENT channels</b>                                   |                       |                       |                       |                       |                       |                       |
| 25   | 25                    | 20                    | 25                    | 20                    | 20                    | 20                    |
| <b>MSC modules</b>                                     |                       |                       |                       |                       |                       |                       |
| 3  | 3                     | 2                     | 3                     | 2                     | 2                     | 2                     |
| <b>PSI5 channels</b>                                   |                       |                       |                       |                       |                       |                       |
| 4  | 4                     | 4                     | 4                     | 4                     | 4                     | 4                     |
| <b>PSI5-S module</b>                                   |                       |                       |                       |                       |                       |                       |
| Yes  | Yes                   | Yes                   | Yes                   | Yes                   | Yes                   | Yes                   |
| <b>SDMMC module</b>                                    |                       |                       |                       |                       |                       |                       |
| No   | No                    | No                    | No                    | No                    | No                    | No                    |
| <b>Maximum Ethernet availability: 1Gbit/100Mbit/No</b> |                       |                       |                       |                       |                       |                       |
| 1Gbit/s  | 1Gbit/s               | 1Gbit/s               | 1Gbit/s               | 1Gbit/s               | 1Gbit/s               | 1Gbit/s               |
| <b>MCDS availability</b>                               |                       |                       |                       |                       |                       |                       |
| miniMCDS   | miniMCDS              | miniMCDS              | miniMCDS              | miniMCDS              | miniMCDS              | miniMCDS              |
| <b>ADAS cluster available</b>                          |                       |                       |                       |                       |                       |                       |
| No   | No                    | No                    | No                    | No                    | No                    | No                    |
| <b>HSM available</b>                                   |                       |                       |                       |                       |                       |                       |
| Yes  | Yes                   | Yes                   | Yes                   | Yes                   | Yes                   | Yes                   |

## 2 TC38x AD step variants

## 2.2 TC38x AD step (part 2)

Table 4 TC38x AD step (part 2)

|  | SAK-TC387TP-160F300S               | SAL-TC387TP-160F300S               |
|--|------------------------------------|------------------------------------|
| <b>Step</b>  | AD                                 | AD                                 |
| <b>Production status</b>   | Customer specific                  | Customer specific                  |
| <b>Package type</b>  | PG-LFBGA-292                       | PG-LFBGA-292                       |
| <b>Pinout</b>  | LFBGA 0.8 mm                       | LFBGA 0.8 mm                       |
| <b>Reference silicon</b>   | TC38x                              | TC38x                              |
| <b>Temperature range (ambient)</b>   | -40°C up to +125°C                 | -40°C up to +150°C                 |
| <b>Chip ID</b>   | 0xFC008783                         | 0xFC008783                         |
| <b>Attention:</b> The value of SCU_CHIPID in the UCODE field contains the default value 0 not the µCode version. |                                    |                                    |
| <b>Cores / checker cores</b>   | 3/2                                | 3/2                                |
| <b>Maximum frequency (MHz)</b>   | 300                                | 300                                |
| <b>Program flash (MB)</b>  | 10                                 | 10                                 |
| <b>Data flash 0 (single-ended) (KB)</b>  | 512                                | 512                                |
| <b>Total SRAM (without EMEM and Cache) (KB)</b>  | 768                                | 768                                |
| <b>EMEM size (KB)</b>  | 0                                  | 0                                  |
| <b>DSPR (KB)</b>   | 160 in CPU0; 128 in CPU1; 96 other | 160 in CPU0; 128 in CPU1; 96 other |
| <b>DLMU (KB)</b>   | 64 per CPU                         | 64 per CPU                         |
| <b>PSPR (KB)</b>   |                                    |                                    |

## 2 TC38x AD step variants

Table 4 TC38x AD step (part 2) (continued)

|  | SAK-TC387TP-160F300S | SAL-TC387TP-160F300S |
|--|----------------------|----------------------|
|  | 64                   | 64                   |
| <b>LMU (KB)</b>  |                      |                      |
|  | 128                  | 128                  |
| <b>DAM (KB)</b>  |                      |                      |
|  | 64                   | 64                   |
| <b>AMU<sup>4)</sup></b>                                    |                      |                      |
|  | No                   | No                   |
| <b>ADC (primary groups/channels)</b>                       |                      |                      |
|  | 5/40                 | 5/40                 |
| <b>ADC (secondary groups/channels)</b>                     |                      |                      |
|  | 4/60                 | 4/60                 |
| <b>ADC (fast compare channels)</b>                         |                      |                      |
|  | 4                    | 4                    |
| <b>ADC (EDSADC channels)</b>                               |                      |                      |
|  | 6                    | 6                    |
| <b>CAN (modules/nodes)</b>                                 |                      |                      |
|  | 3/3x4                | 3/3x4                |
| <b>FlexRay (modules/channels)</b>                          |                      |                      |
|  | 2/2x2                | 2/2x2                |
| <b>HSSL modules</b>  |                      |                      |
|  | 1                    | 1                    |
| <b>ASCLIN modules / with ASC and LIN / with 3-wire SPI</b> |                      |                      |
|  | 24/24/11             | 24/24/11             |
| <b>QSPI modules / with LVDS</b>                            |                      |                      |
|  | 5/2                  | 5/2                  |
| <b>SENT channels</b>                                       |                      |                      |
|  | 20                   | 20                   |
| <b>MSC modules</b>   |                      |                      |
|  | 2                    | 2                    |
| <b>PSI5 channels</b>                                       |                      |                      |
|  | 4                    | 4                    |
| <b>PSI5-S module</b>                                       |                      |                      |

<sup>4</sup> AMU is abbreviated as ASC Modeling Unit. For Additional details about AMU, Contact an Infineon Representative

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**2 TC38x AD step variants**
**Table 4 TC38x AD step (part 2) (continued)**

|  | <b>SAK-TC387TP-160F300S</b> | <b>SAL-TC387TP-160F300S</b> |
|--|-----------------------------|-----------------------------|
|  | Yes                         | Yes                         |
| <b>SDMMC module</b>                                    |                             |                             |
|  | No                          | No                          |
| <b>Maximum Ethernet availability: 1Gbit/100Mbit/No</b> |                             |                             |
|  | 1Gbit/s                     | 1Gbit/s                     |
| <b>MCDS availability</b>                               |                             |                             |
|  | miniMCDS                    | miniMCDS                    |
| <b>ADAS cluster available</b>                          |                             |                             |
|  | No                          | No                          |
| <b>HSM available</b>                                   |                             |                             |
|  | Yes                         | Yes                         |

3 Memory maps of TC38x variants

### 3 Memory maps of TC38x variants

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

#### Program Flash

Variants:

- 10 MB: umbrella (3 x 3 MB, 1 x 1 MB), see User's Manual.
- 8 MB: 3 MB + 1 MB + 3 MB + 1 MB (see Figure below).

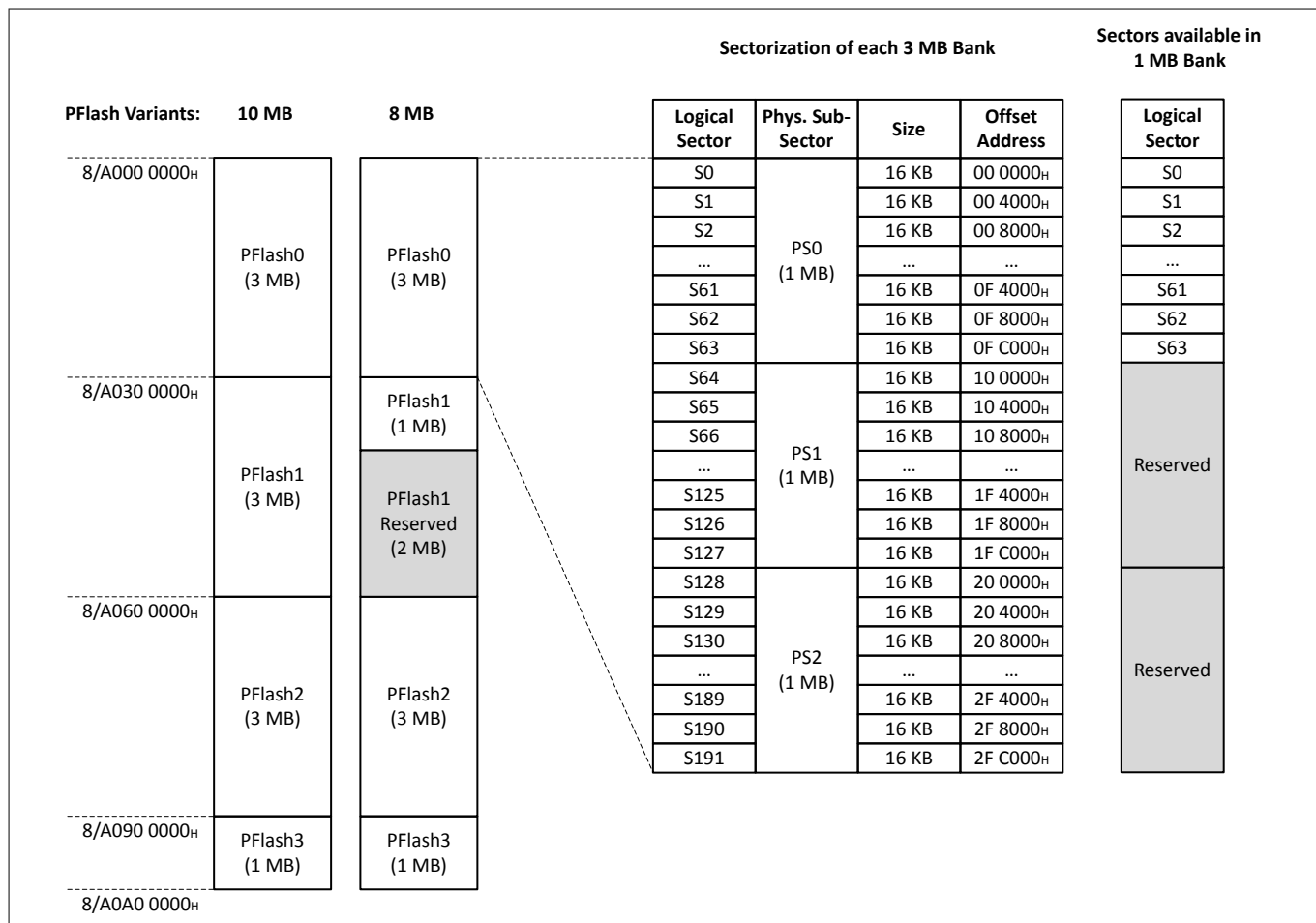


Figure 1 TC38x PFlash variants

#### Cores / Checker cores

Variants:

- 4/2: umbrella, see User's Manual
- 3/2: not available is CPU3 including its RAMs (DSPR, DCACHE, DTAG, PSPR, PCACHE, PTAG, DLMU)

#### CPU RAMs

Variants:

- DSPR: 240 KB in CPU0 & CPU1, 96 KB in CPU2 & CPU3: umbrella, see User's Manual
- DSPR: 240 KB in CPU0 & CPU1, 96 KB in CPU2: default for 3/2 Cores/Checker Cores configuration (see Figure below for available DSPR address ranges).
- DSPR: 160 KB in CPU0, 128 KB in CPU1, 96 KB in CPU2: reduced RAM variant of 3/2 Cores/Checker Cores configuration (see Figure below for available DSPR address ranges).

3 Memory maps of TC38x variants

| Core / Checker Core:   | 4/2                | 3/2                | 3/2                            |
|------------------------|--------------------|--------------------|--------------------------------|
| DSPR Variant:          | 240/240/96/96      | 240/240/96         | 160/128/96                     |
| 4000 0000 <sub>H</sub> | CPU3 DSPR (96 KB)  | Reserved           | Reserved                       |
| 4001 8000 <sub>H</sub> |                    |                    |                                |
| 4010 0000 <sub>H</sub> | CPU3 PSPR (64 KB)  | Reserved           | Reserved                       |
| 4011 0000 <sub>H</sub> |                    |                    |                                |
| 5000 0000 <sub>H</sub> | CPU2 DSPR (96 KB)  | CPU2 DSPR (96 KB)  | CPU2 DSPR (96 KB)              |
| 5001 8000 <sub>H</sub> |                    |                    |                                |
| 5010 0000 <sub>H</sub> | CPU2 PSPR (64 KB)  | CPU2 PSPR (64 KB)  | CPU2 PSPR (64 KB)              |
| 5011 0000 <sub>H</sub> |                    |                    |                                |
| 6000 0000 <sub>H</sub> | CPU1 DSPR (240 KB) | CPU1 DSPR (240 KB) | CPU1 DSPR (128 KB)             |
| 6002 0000 <sub>H</sub> |                    |                    | CPU1 DSPR (112 KB)<br>Reserved |
| 6003 C000 <sub>H</sub> |                    |                    |                                |
| 6010 0000 <sub>H</sub> | CPU1 PSPR (64 KB)  | CPU1 PSPR (64 KB)  | CPU1 PSPR (64 KB)              |
| 6011 0000 <sub>H</sub> |                    |                    |                                |
| 7000 0000 <sub>H</sub> | CPU0 DSPR (240 KB) | CPU0 DSPR (240 KB) | CPU0 DSPR (160 KB)             |
| 7002 8000 <sub>H</sub> |                    |                    | CPU0 DSPR (80 KB)<br>Reserved  |
| 7003 C000 <sub>H</sub> |                    |                    |                                |
| 7010 0000 <sub>H</sub> | CPU0 PSPR (64 KB)  | CPU0 PSPR (64 KB)  | CPU0 PSPR (64 KB)              |
| 7011 0000 <sub>H</sub> |                    |                    |                                |

Figure 2 DSPR variants

ADC availability

- Limitation on availability of ADC channels are caused by pin limitations. See Data Sheet for the pinning table of the package.



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**Revision history**
**Revision history**

| Document version | Date of release | Description of changes   |
|------------------|-----------------|--|
| V1.0             | 2018-06-08      | <ul style="list-style-type: none"> <li>First release.</li> </ul>   |
| V1.1             | 2018-08-06      | <ul style="list-style-type: none"> <li>Added row "Reference Silicon" (needed e.g. for TC37x) to refer user to User's Manual Appx.</li> </ul>   |
| V1.2             | 2019-02-04      | <ul style="list-style-type: none"> <li>Removed from "Memory Maps" the description for LMU and DAM variations as these are not varied.</li> <li>"Variant Tables": added SAL-TC387TP-128F300S</li> </ul>   |
| V1.3             | 2019-03-01      | <ul style="list-style-type: none"> <li>"About this document": reduced list of described Feature Package to the used ones.</li> <li>"Memory Maps": added hint to understand ADC device specific differences.</li> <li>"Variant Tables": changed Production Status of several devices.</li> <li>"Variant Tables": clarified Total SRAM value is without cache memories.</li> </ul>   |
| V1.4             | 2019-06-12      | <ul style="list-style-type: none"> <li>Chapter 1: Added the TC38x AE step variants table.</li> <li>Chapter 1 and 2: TC38x Ax step variants table format changed to fit all the contents.</li> <li>Chapter 1 and 2: Added new row in the variant tables called "AMU" with the footnote for additional details.</li> <li>Chapter: About this document: Feature package definitions are updated to consistent with the product naming nomenclature definition.</li> </ul> |

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