

# AURIX™ TC36x variants

## About this document

### Scope and purpose

This document is an addendum to the TC36x 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 and RIF 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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## 1 TC36x AA step variants

## 1 TC36x AA step variants

## 1.1 TC36x AA step (part 1)

A table listing the TC36x AA step variants.

Table 1 TC36x AA step (part 1)

SAK-TC365DP-64F 300W	SAK-TC364DP-64F 300W	SAL-TC360DP-64F 300	SAK-TC367DP-64F 300S	SAL-TC367DP-64F 300S	SAL-TC365DP-64F 300W	SAK-TC365DP-64F 200W
<b>Step</b>						
AA	AA	AA	AA	AA	AA	AA
<b>Production Status</b>						
Standard	Standard	Standard	Standard	Standard	Standard	Customer Specific
<b>Package Type</b>						
PG-QFP-176	PG-QFP-144	Bare Die	PG-LFBGA-292	PG-LFBGA-292	PG-QFP-176	PG-QFP-176
<b>Pinout</b>						
LQFP 0.5 mm	LQFP 0.5 mm	BD	LFBGA 0.8 mm	LFBGA 0.8 mm	LQFP 0.5 mm	LQFP 0.5 mm
<b>Reference Silicon</b>						
TC36x	TC36x	TC36x	TC36x	TC36x	TC36x	TC36x
<b>Temperature Range (Ambient)</b>						
SAK	SAK	SAL	SAK	SAL	SAL	SAK
<b>Chip ID</b>						
<b>Attention:</b> The value of SCU_CHIPID in the UCODE field contains the default value 0 not the µCode version.						
0x87006580	0x87006480	0x87006080	0x87006780	0x87006780	0x87006580	0x87006580
<b>Cores / Checker Cores</b>						
2/2	2/2	2/2	2/2	2/2	2/2	2/2
<b>Max. Freq. (MHz)</b>						
300	300	300	300	300	300	200
<b>Program Flash (MB)</b>						
4	4	4	4	4	4	4
<b>Data Flash0 (single-ended) (KB)</b>						
128	128	128	128	128	128	128
<b>Total SRAM (without EMEM and Cache) (KB)</b>						
576	576	576	576	576	576	576
<b>EMEM Size (KB)</b>						
0	0	0	0	0	0	0

## 1 TC36x AA step variants

Table 1 TC36x AA step (part 1) (continued)

SAK-TC365DP-64F 300W	SAK-TC364DP-64F 300W	SAL-TC360DP-64F 300	SAK-TC367DP-64F 300S	SAL-TC367DP-64F 300S	SAL-TC365DP-64F 300W	SAK-TC365DP-64F 200W
<b>DSPR (KB)</b>						
192 per CPU	192 per CPU	192 per CPU	192 per CPU	192 per CPU	192 per CPU	192 per CPU
<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>						
32	32	32	32	32	32	32
<b>LMU (KB)</b>						
0	0	0	0	0	0	0
<b>DAM (KB)</b>						
0	0	0	0	0	0	0
<b>AMU<sup>1)</sup></b>						
No	No	No	No	No	No	No
<b>ADC (Primary Groups/Channels)</b>						
4/25	4/19	4/32	4/32	4/32	4/25	4/25
<b>ADC (Secondary Groups/Channels)</b>						
2/25	2/21	2/28	2/28	2/28	2/25	2/25
<b>ADC (Fast Compare Channels)</b>						
2	2	2	2	2	2	2
<b>ADC (EDSADC Channels)</b>						
4	4	4	4	4	4	4
<b>CAN (Modules/Nodes)</b>						
2/2x4	2/2x4	2/2x4	2/2x4	2/2x4	2/2x4	2/2x4
<b>FlexRay (Modules/Channels)</b>						
1/1x2	1/1x2	1/1x2	1/1x2	1/1x2	1/1x2	1/1x2
<b>HSSL Modules</b>						
1	1	1	1	1	1	1
<b>ASCLIN Modules / with ASC &amp; LIN / with 3-wire SPI</b>						
12/12/10	12/12/8	12/12/10	12/12/10	12/12/10	12/12/10	12/12/10
<b>QSPI Modules / with LVDS</b>						
4/1	4/1	4/1	4/1	4/1	4/1	4/1

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

## 1 TC36x AA step variants

Table 1 TC36x AA step (part 1) (continued)

SAK-TC365DP-64F 300W	SAK-TC364DP-64F 300W	SAL-TC360DP-64F 300	SAK-TC367DP-64F 300S	SAL-TC367DP-64F 300S	SAL-TC365DP-64F 300W	SAK-TC365DP-64F 200W
<b>SENT Channels</b>						
10	10	10	10	10	10	10
<b>MSC Modules</b>						
1	1	1	1	1	1	1
<b>PSI5 Channels</b>						
2	2	2	2	2	2	2
<b>PSI5-S Module</b>						
Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>SDMMC Module</b>						
No	No	No	No	No	No	No
<b>Max. Ethernet Availability: 1Gbit/100Mbit/No</b>						
100Mbit/s (RMII)	100Mbit/s (RMII)	1Gbit/s	1Gbit/s	1Gbit/s	100Mbit/s (RMII)	100Mbit/s (RMII)
<b>MCDS Availability</b>						
No	No	No	No	No	No	No
<b>ADAS Cluster Available</b>						
No	No	No	No	No	No	No
<b>CIF</b>						
No	No	No	No	No	No	No
<b>HSM Available</b>						
Yes	Yes	Yes	Yes	Yes	Yes	Yes

## 1 TC36x AA step variants

## 1.2 TC36x AA step (part 2)

Table 2 TC36x AA step (part 2)

SAK-TC367DP-48F200S	SAL-TC360DP-64F200	SAK-TC364DP-64F300F	SAL-TC364DP-64F300F	SAK-TC364DP-48F300F
<b>Step</b>				
AA	AA	AA	AA	AA
<b>Production Status</b>				
Customer Specific	Customer Specific	Standard	Standard	Customer Specific
<b>Package Type</b>				
PG-LFBGA-292	Bare Die	PG-QFP-144	PG-QFP-144	PG-QFP-144
<b>Pinout</b>				
LFBGA 0.8 mm	BD	TQFP 0.4 mm	TQFP 0.4 mm	TQFP 0.4 mm
<b>Reference Silicon</b>				
TC36x	TC36x	TC36x	TC36x	TC36x
<b>Temperature Range (Ambient)</b>				
SAK	SAL	SAK	SAL	SAK
<b>Chip ID</b>				
<b>Attention:</b> The value of SCU_CHIPID in the UCODE field contains the default value 0 not the µCode version.				
0x86006780	0x87006080	0x87006480	0x87006480	0x86006480
<b>Cores / Checker Cores</b>				
2/2	2/2	2/2	2/2	2/2
<b>Max. Freq. (MHz)</b>				
200	200	300	300	300
<b>Program Flash (MB)</b>				
3	4	4	4	3
<b>Data Flash0 (single-ended) (KB)</b>				
128	128	128	128	128
<b>Total SRAM (without EMEM and Cache) (KB)</b>				
576	576	576	576	576
<b>EMEM Size (KB)</b>				
0	0	0	0	0
<b>DSPR (KB)</b>				
192 per CPU	192 per CPU	192 per CPU	192 per CPU	192 per CPU
<b>DLMU (KB)</b>				
64 per CPU	64 per CPU	64 per CPU	64 per CPU	64 per CPU

## 1 TC36x AA step variants

Table 2 TC36x AA step (part 2) (continued)

SAK-TC367DP-48F200S	SAL-TC360DP-64F200	SAK-TC364DP-64F300F	SAL-TC364DP-64F300F	SAK-TC364DP-48F300F
<b>PSPR (KB)</b>				
32	32	32	32	32
<b>LMU (KB)</b>				
0	0	0	0	0
<b>DAM (KB)</b>				
0	0	0	0	0
<b>AMU<sup>2)</sup></b>				
No	No	No	No	No
<b>ADC (Primary Groups/Channels)</b>				
4/32	4/32	4/16	4/16	4/16
<b>ADC (Secondary Groups/Channels)</b>				
2/28	2/28	2/21	2/21	2/21
<b>ADC (Fast Compare Channels)</b>				
2	2	2	2	2
<b>ADC (EDSADC Channels)</b>				
4	4	4	4	4
<b>CAN (Modules/Nodes)</b>				
2/2x4	2/2x4	2/2x4	2/2x4	2/2x4
<b>FlexRay (Modules/Channels)</b>				
1/1x2	1/1x2	1/1x2	1/1x2	1/1x2
<b>HSSL Modules</b>				
1	1	1	1	1
<b>ASCLIN Modules / with ASC &amp; LIN / with 3-wire SPI</b>				
12/12/10	12/12/10	12/12/8	12/12/8	12/12/8
<b>QSPI Modules / with LVDS</b>				
4/1	4/1	4/1	4/1	4/1
<b>SENT Channels</b>				
10	10	10	10	10
<b>MSC Modules</b>				
1	1	1	1	1
<b>PSI5 Channels</b>				

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

1 TC36x AA step variants

Table 2 TC36x AA step (part 2) (continued)

SAK-TC367DP-48F200S	SAL-TC360DP-64F200	SAK-TC364DP-64F300F	SAL-TC364DP-64F300F	SAK-TC364DP-48F300F
2	2	2	2	2
<b>PSI5-S Module</b>				
Yes	Yes	Yes	Yes	Yes
<b>SDMMC Module</b>				
No	No	No	No	No
<b>Max. Ethernet Availability: 1Gbit/100Mbit/No</b>				
1Gbit/s	1Gbit/s	100Mbit/s (RMII)	100Mbit/s (RMII)	100Mbit/s (RMII)
<b>MCDS Availability</b>				
No	No	No	No	No
<b>ADAS Cluster Available</b>				
No	No	No	No	No
<b>CIF</b>				
No	No	No	No	No
<b>HSM Available</b>				
Yes	Yes	Yes	Yes	Yes



## 1 TC36x AA step variants

## 1.3 TC36x AA step (part 3)

A Continuation table listing the TC36x AA step variants.

Table 3 TC36x AA step (part 3)

SAK-TC364DP-48F200F	SAK-TC366DP-64F300S	SAL-TC366DP-64F300S	SAK-TC367DP-48F300S
<b>Step</b>			
AA	AA	AA	AA
<b>Production Status</b>			
Customer Specific	Standard	Standard	Customer Specific
<b>Package Type</b>			
PG-QFP-144	PG-LFBGA-180	PG-LFBGA-180	PG-LFBGA-292
<b>Pinout</b>			
TQFP 0.4 mm	LFBGA 0.8 mm	LFBGA 0.8 mm	LFBGA 0.8 mm
<b>Reference Silicon</b>			
TC36x	TC36x	TC36x	TC36x
<b>Temperature Range (Ambient)</b>			
SAK	SAK	SAL	SAK
<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>			
0x86006480	0x87006680	0x87006680	0x86006780
<b>Cores / Checker Cores</b>			
2/2	2/2	2/2	2/2
<b>Max. Freq. (MHz)</b>			
200	300	300	300
<b>Program Flash (MB)</b>			
3	4	4	3
<b>Data Flash0 (single-ended) (KB)</b>			
128	128	128	128
<b>Total SRAM (without EMEM and Cache) (KB)</b>			
576	576	576	576
<b>EMEM Size (KB)</b>			
0	0	0	0
<b>DSPR (KB)</b>			
192 per CPU	192 per CPU	192 per CPU	192 per CPU
<b>DLMU (KB)</b>			
64 per CPU	64 per CPU	64 per CPU	64 per CPU

## 1 TC36x AA step variants

Table 3 TC36x AA step (part 3) (continued)

SAK-TC364DP-48F200F	SAK-TC366DP-64F300S	SAL-TC366DP-64F300S	SAK-TC367DP-48F300S
<b>PSPR (KB)</b>			
32	32	32	32
<b>LMU (KB)</b>			
0	0	0	0
<b>DAM (KB)</b>			
0	0	0	0
<b>AMU<sup>3)</sup></b>			
No	No	No	No
<b>ADC (Primary Groups/Channels)</b>			
4/16	4/19	4/19	4/32
<b>ADC (Secondary Groups/Channels)</b>			
2/21	2/18	2/18	2/28
<b>ADC (Fast Compare Channels)</b>			
2	2	2	2
<b>ADC (EDSADC Channels)</b>			
4	4	4	4
<b>CAN (Modules/Nodes)</b>			
2/2x4	2/2x4	2/2x4	2/2x4
<b>FlexRay (Modules/Channels)</b>			
1/1x2	1/1x2	1/1x2	1/1x2
<b>HSSL Modules</b>			
1	1	1	1
<b>ASCLIN Modules / with ASC &amp; LIN / with 3-wire SPI</b>			
12/12/8	12/12/9	12/12/9	12/12/10
<b>QSPI Modules / with LVDS</b>			
4/1	4/1	4/1	4/1
<b>SENT Channels</b>			
10	10	10	10
<b>MSC Modules</b>			
1	1	1	1
<b>PSI5 Channels</b>			
2	2	2	2

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

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**1 TC36x AA step variants**
**Table 3 TC36x AA step (part 3) (continued)**

<b>SAK-TC364DP-48F200F</b>	<b>SAK-TC366DP-64F300S</b>	<b>SAL-TC366DP-64F300S</b>	<b>SAK-TC367DP-48F300S</b>
<b>PSI5-S Module</b>			
Yes	Yes	Yes	Yes
<b>SDMMC Module</b>			
No	No	No	No
<b>Max. Ethernet Availability: 1Gbit/100Mbit/No</b>			
100Mbit/s (RMII)	100Mbit/s (RMII)	100Mbit/s (RMII)	1Gbit/s
<b>MCDS Availability</b>			
No	No	No	No
<b>ADAS Cluster Available</b>			
No	No	No	No
<b>CIF</b>			
No	No	No	No
<b>HSM Available</b>			
Yes	Yes	Yes	Yes

2 Memory maps of TC36x variants

## 2 Memory maps of TC36x variants

This section describes the influence of the available feature variants on the memory map.

### Program flash

Variants:

- 4 MB: umbrella (2 x 2 MB), see User's Manual.
- 3 MB: 2 + 1 MB (see Figure below).

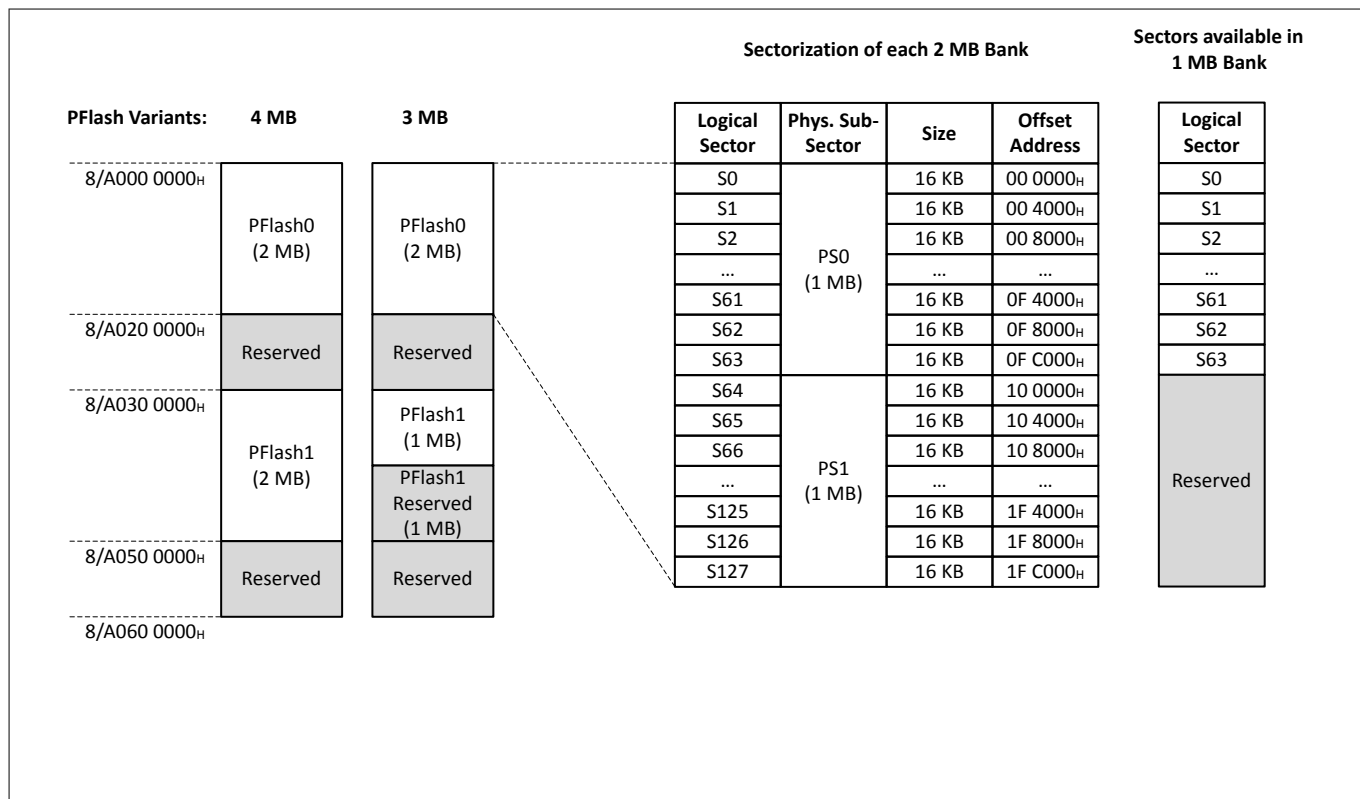


Figure 1 TC36x PFlash variants

### Ethernet availability

- 1Gbit/s: umbrella for TC36x, see User's Manual.
- 100Mbit/s (RMII): due to pin limitations in this package the GETH module can be only used in RMII mode.

### 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	2019-03-01	<ul style="list-style-type: none"> <li>First release.</li> </ul>
V1.1	2019-06-13	<ul style="list-style-type: none"> <li>Added new Variants SAK-TC365DP-64F200W,SAK-TC365DP-64F200F, SAK-TC365DP-64F200S,SAK-TC365DP-64F200.</li> <li>Chapter 1: 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>
V1.2	2019-08-02	<ul style="list-style-type: none"> <li>For the Product Variants SAK-TC364DP-64F300F, SAL-TC364DP-64F300F , SAK-TC364DP-48F300F ,SAK-TC364DP-48F200F - Number of ADC (Secondary Groups/ Channels) were corrected from 2/24 to 2/21.</li> <li>For the Product Variants SAK-TC366DP-64F300S , SAL-TC366DP-64F300S - Number of ADC (Secondary Groups/ Channels) were corrected from 2/21 to 2/18.</li> </ul>
V1.3	2020-01-10	<ul style="list-style-type: none"> <li>Chapter 1: Updated the "Production status" for SAK-TC367DP-48F300S, SAK-TC364DP-48F300F to "Customer Specific".</li> <li>Page 1: About the document:Feature Package 'X' definition is updated to remove CIF.</li> <li>Chapter 1 and 2:Added new row in the variant tables called "CIF" indicating the Camera Interface availability.</li> </ul>

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