

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_{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:

- 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	SAK-TC367DP-64F 300S	SAL-TC367DP-64F 300S	SAL-TC365DP-64F 300W	SAK-TC365DP-64F 200W	SAK-TC367DP-48F 200S
Step						
AA	AA	AA	AA	AA	AA	AA
Production Status						
Standard	Standard	Standard	Standard	Standard	Customer Specific	Customer Specific
Package Type						
PG-QFP-176	PG-QFP-144	PG-LFBGA-292	PG-LFBGA-292	PG-QFP-176	PG-QFP-176	PG-LFBGA-292
Pinout						
LQFP 0.5 mm	LQFP 0.5 mm	LFBGA 0.8 mm	LFBGA 0.8 mm	LQFP 0.5 mm	LQFP 0.5 mm	LFBGA 0.8 mm
Reference Silicon						
TC36x	TC36x	TC36x	TC36x	TC36x	TC36x	TC36x
Temperature Range (Ambient)						
SAK	SAK	SAK	SAL	SAL	SAK	SAK
Chip ID						
Attention: The value of SCU_CHIPID in the UCODE field contains the default value 0 not the µCode version.						
0x87006580	0x87006480	0x87006780	0x87006780	0x87006580	0x87006580	0x86006780
Cores / Checker Cores						
2/2	2/2	2/2	2/2	2/2	2/2	2/2
Max. Freq. (MHz)						
300	300	300	300	300	200	200
Program Flash (MB)						
4	4	4	4	4	4	3
Data Flash0 (single-ended) (KB)						
128	128	128	128	128	128	128
Total SRAM (without EMEM and Cache) (KB)						
576	576	576	576	576	576	576
EMEM Size (KB)						
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	SAK-TC367DP-64F 300S	SAL-TC367DP-64F 300S	SAL-TC365DP-64F 300W	SAK-TC365DP-64F 200W	SAK-TC367DP-48F 200S
DSPR (KB)						
192 per CPU	192 per CPU	192 per CPU	192 per CPU	192 per CPU	192 per CPU	192 per CPU
DLMU (KB)						
64 per CPU	64 per CPU	64 per CPU	64 per CPU	64 per CPU	64 per CPU	64 per CPU
PSPR (KB)						
32 per CPU	32 per CPU	32 per CPU	32 per CPU	32 per CPU	32 per CPU	32 per CPU
LMU (KB)						
0	0	0	0	0	0	0
DAM (KB)						
0	0	0	0	0	0	0
AMU¹⁾						
No	No	No	No	No	No	No
ADC (Primary Groups/Channels)						
4/25	4/19	4/32	4/32	4/25	4/25	4/32
ADC (Secondary Groups/Channels)						
2/25	2/21	2/28	2/28	2/25	2/25	2/28
ADC (Fast Compare Channels)						
2	2	2	2	2	2	2
ADC (EDSADC Channels)						
4	4	4	4	4	4	4
CAN (Modules/Nodes)						
2/2x4	2/2x4	2/2x4	2/2x4	2/2x4	2/2x4	2/2x4
FlexRay (Modules/Channels)						
1/1x2	1/1x2	1/1x2	1/1x2	1/1x2	1/1x2	1/1x2
HSSL Modules						
1	1	1	1	1	1	1
ASCLIN Modules / with ASC & LIN / with 3-wire SPI						
12/12/10	12/12/8	12/12/10	12/12/10	12/12/10	12/12/10	12/12/10
QSPI Modules / with LVDS						
4/1	4/1	4/1	4/1	4/1	4/1	4/1

¹ 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	SAK-TC367DP-64F 300S	SAL-TC367DP-64F 300S	SAL-TC365DP-64F 300W	SAK-TC365DP-64F 200W	SAK-TC367DP-48F 200S
SENT Channels						
10	10	10	10	10	10	10
MSC Modules						
1	1	1	1	1	1	1
PSI5 Channels						
2	2	2	2	2	2	2
PSI5-S Module						
Yes	Yes	Yes	Yes	Yes	Yes	Yes
SDMMC Module						
No	No	No	No	No	No	No
Max. Ethernet Availability: 1Gbit/100Mbit/No						
100Mbit/s (RMII)	100Mbit/s (RMII)	1Gbit/s	1Gbit/s	100Mbit/s (RMII)	100Mbit/s (RMII)	1Gbit/s
MCDS Availability						
No	No	No	No	No	No	No
ADAS Cluster Available						
No	No	No	No	No	No	No
CIF						
No	No	No	No	No	No	No
HSM Available						
Yes	Yes	Yes	Yes	Yes	Yes	Yes

1 TC36x AA step variants

1.2 TC36x AA step (part 2)

A continuation table listing the TC36x AA step variants.

Table 2 TC36x AA step (part 2)

SAK-TC364DP-64F300F	SAL-TC364DP-64F300F	SAK-TC364DP-48F300F	SAK-TC364DP-48F200F
Step			
AA	AA	AA	AA
Production Status			
Standard	Standard	Customer Specific	Customer Specific
Package Type			
PG-QFP-144	PG-QFP-144	PG-QFP-144	PG-QFP-144
Pinout			
TQFP 0.4 mm	TQFP 0.4 mm	TQFP 0.4 mm	TQFP 0.4 mm
Reference Silicon			
TC36x	TC36x	TC36x	TC36x
Temperature Range (Ambient)			
SAK	SAL	SAK	SAK
Chip ID			
<i>Attention: The value of SCU_CHIPID in the UCODE field contains the default value 0 not the µCode version.</i>			
0x87006480	0x87006480	0x86006480	0x86006480
Cores / Checker Cores			
2/2	2/2	2/2	2/2
Max. Freq. (MHz)			
300	300	300	200
Program Flash (MB)			
4	4	3	3
Data Flash0 (single-ended) (KB)			
128	128	128	128
Total SRAM (without EMEM and Cache) (KB)			
576	576	576	576
EMEM Size (KB)			
0	0	0	0
DSPR (KB)			
192 per CPU	192 per CPU	192 per CPU	192 per CPU
DLMU (KB)			
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-TC364DP-64F300F	SAL-TC364DP-64F300F	SAK-TC364DP-48F300F	SAK-TC364DP-48F200F
PSPR (KB)			
32 per CPU	32 per CPU	32 per CPU	32 per CPU
LMU (KB)			
0	0	0	0
DAM (KB)			
0	0	0	0
AMU²⁾			
No	No	No	No
ADC (Primary Groups/Channels)			
4/16	4/16	4/16	4/16
ADC (Secondary Groups/Channels)			
2/21	2/21	2/21	2/21
ADC (Fast Compare Channels)			
2	2	2	2
ADC (EDSADC Channels)			
4	4	4	4
CAN (Modules/Nodes)			
2/2x4	2/2x4	2/2x4	2/2x4
FlexRay (Modules/Channels)			
1/1x2	1/1x2	1/1x2	1/1x2
HSSL Modules			
1	1	1	1
ASCLIN Modules / with ASC & LIN / with 3-wire SPI			
12/12/8	12/12/8	12/12/8	12/12/8
QSPI Modules / with LVDS			
4/1	4/1	4/1	4/1
SENT Channels			
10	10	10	10
MSC Modules			
1	1	1	1
PSI5 Channels			
2	2	2	2

²⁾ 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-TC364DP-64F300F	SAL-TC364DP-64F300F	SAK-TC364DP-48F300F	SAK-TC364DP-48F200F
PSI5-S Module			
Yes	Yes	Yes	Yes
SDMMC Module			
No	No	No	No
Max. Ethernet Availability: 1Gbit/100Mbit/No			
100Mbit/s (RMII)	100Mbit/s (RMII)	100Mbit/s (RMII)	100Mbit/s (RMII)
MCDS Availability			
No	No	No	No
ADAS Cluster Available			
No	No	No	No
CIF			
No	No	No	No
HSM Available			
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-TC366DP-64F 300S	SAL-TC366DP-64F 300S	SAK-TC367DP-48F 300S	SAL-TC365DP-64F 200W	SAK-TC364DP-64F 200W	SAK-TC367DP-64F 200S	SAL-TC367DP-64F 200S
Step						
AA	AA	AA	AA	AA	AA	AA
Production Status						
Standard	Standard	Customer Specific	Customer Specific	Customer Specific	Customer Specific	Customer Specific
Package Type						
PG-LFBGA-180	PG-LFBGA-180	PG-LFBGA-292	PG-QFP-176	PG-QFP-144	PG-LFBGA-292	PG-LFBGA-292
Pinout						
LFBGA 0.8 mm	LFBGA 0.8 mm	LFBGA 0.8 mm	LQFP 0.5 mm	LQFP 0.5 mm	LFBGA 0.8 mm	LFBGA 0.8 mm
Reference Silicon						
TC36x	TC36x	TC36x	TC36x	TC36x	TC36x	TC36x
Temperature Range (Ambient)						
SAK	SAL	SAK	SAL	SAK	SAK	SAL
Chip ID						
Attention: The value of SCU_CHIPID in the UCODE field contains the default value 0 not the µCode version.						
0x87006680	0x87006680	0x86006780	0x87006580	0x87006480	0x87006780	0x87006780
Cores / Checker Cores						
2/2	2/2	2/2	2/2	2/2	2/2	2/2
Max. Freq. (MHz)						
300	300	300	200	200	200	200
Program Flash (MB)						
4	4	3	4	4	4	4
Data Flash0 (single-ended) (KB)						
128	128	128	128	128	128	128
Total SRAM (without EMEM and Cache) (KB)						
576	576	576	576	576	576	576
EMEM Size (KB)						
0	0	0	0	0	0	0
DSPR (KB)						
192 per CPU	192 per CPU	192 per CPU	192 per CPU	192 per CPU	192 per CPU	192 per CPU

1 TC36x AA step variants

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

SAK-TC366DP-64F 300S	SAL-TC366DP-64F 300S	SAK-TC367DP-48F 300S	SAL-TC365DP-64F 200W	SAK-TC364DP-64F 200W	SAK-TC367DP-64F 200S	SAL-TC367DP-64F 200S
DLMU (KB)						
64 per CPU	64 per CPU	64 per CPU	64 per CPU	64 per CPU	64 per CPU	64 per CPU
PSPR (KB)						
32 per CPU	32 per CPU	32 per CPU	32 per CPU	32 per CPU	32 per CPU	32 per CPU
LMU (KB)						
0	0	0	0	0	0	0
DAM (KB)						
0	0	0	0	0	0	0
AMU³⁾						
No	No	No	No	No	No	No
ADC (Primary Groups/Channels)						
4/19	4/19	4/32	4/25	4/19	4/32	4/32
ADC (Secondary Groups/Channels)						
2/18	2/18	2/28	2/25	2/21	2/28	2/28
ADC (Fast Compare Channels)						
2	2	2	2	2	2	2
ADC (EDSADC Channels)						
4	4	4	4	4	4	4
CAN (Modules/Nodes)						
2/2x4	2/2x4	2/2x4	2/2x4	2/2x4	2/2x4	2/2x4
FlexRay (Modules/Channels)						
1/1x2	1/1x2	1/1x2	1/1x2	1/1x2	1/1x2	1/1x2
HSSL Modules						
1	1	1	1	1	1	1
ASCLIN Modules / with ASC & LIN / with 3-wire SPI						
12/12/9	12/12/9	12/12/10	12/12/10	12/12/8	12/12/10	12/12/10
QSPI Modules / with LVDS						
4/1	4/1	4/1	4/1	4/1	4/1	4/1
SENT Channels						
10	10	10	10	10	10	10

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

1 TC36x AA step variants

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

SAK-TC366DP-64F 300S	SAL-TC366DP-64F 300S	SAK-TC367DP-48F 300S	SAL-TC365DP-64F 200W	SAK-TC364DP-64F 200W	SAK-TC367DP-64F 200S	SAL-TC367DP-64F 200S
MSC Modules						
1	1	1	1	1	1	1
PSI5 Channels						
2	2	2	2	2	2	2
PSI5-S Module						
Yes	Yes	Yes	Yes	Yes	Yes	Yes
SDMMC Module						
No	No	No	No	No	No	No
Max. Ethernet Availability: 1Gbit/100Mbit/No						
100Mbit/s (RMII)	100Mbit/s (RMII)	1Gbit/s	100Mbit/s (RMII)	100Mbit/s (RMII)	1Gbit/s	1Gbit/s
MCDS Availability						
No	No	No	No	No	No	No
ADAS Cluster Available						
No	No	No	No	No	No	No
CIF						
No	No	No	No	No	No	No
HSM Available						
Yes	Yes	Yes	Yes	Yes	Yes	Yes

1 TC36x AA step variants

1.4 TC36x AA step (part 4)

A continuation table listing the TC36x AA step variants.

Table 4 TC36x AA step (part 4)

SAK-TC364DP-64F200F	SAL-TC364DP-64F200F	SAK-TC366DP-64F200S	SAL-TC366DP-64F200S	SAL-TC364DP-64F200W	SAL-TC364DP-64F300W
Step					
AA	AA	AA	AA	AA	AA
Production Status					
Customer Specific	Customer Specific	Customer Specific	Customer Specific	Customer Specific	Customer Specific
Package Type					
PG-QFP-144	PG-QFP-144	PG-LFBGA-180	PG-LFBGA-180	PG-QFP-144	PG-QFP-144
Pinout					
TQFP 0.4 mm	TQFP 0.4 mm	LFBGA 0.8 mm	LFBGA 0.8 mm	LQFP 0.5 mm	LQFP 0.5 mm
Reference Silicon					
TC36x	TC36x	TC36x	TC36x	TC36x	TC36x
Temperature Range (Ambient)					
SAK	SAL	SAK	SAL	SAL	SAL
Chip ID					
Attention: The value of SCU_CHIPID in the UCODE field contains the default value 0 not the µCode version.					
0x87006480	0x87006480	0x87006680	0x87006680	0x87006480	0x87006480
Cores / Checker Cores					
2/2	2/2	2/2	2/2	2/2	2/2
Max. Freq. (MHz)					
200	200	200	200	200	300
Program Flash (MB)					
4	4	4	4	4	4
Data Flash0 (single-ended) (KB)					
128	128	128	128	128	128
Total SRAM (without EMEM and Cache) (KB)					
576	576	576	576	576	576
EMEM Size (KB)					
0	0	0	0	0	0
DSPR (KB)					
192 per CPU	192 per CPU	192 per CPU	192 per CPU	192 per CPU	192 per CPU

1 TC36x AA step variants

Table 4 TC36x AA step (part 4) (continued)

SAK-TC364DP-64F200F	SAL-TC364DP-64F200F	SAK-TC366DP-64F200S	SAL-TC366DP-64F200S	SAL-TC364DP-64F200W	SAL-TC364DP-64F300W
DLMU (KB)					
64 per CPU	64 per CPU	64 per CPU	64 per CPU	64 per CPU	64 per CPU
PSPR (KB)					
32 per CPU	32 per CPU	32 per CPU	32 per CPU	32 per CPU	32 per CPU
LMU (KB)					
0	0	0	0	0	0
DAM (KB)					
0	0	0	0	0	0
AMU⁴⁾					
No	No	No	No	No	No
ADC (Primary Groups/Channels)					
4/16	4/16	4/19	4/19	4/19	4/19
ADC (Secondary Groups/Channels)					
2/21	2/21	2/18	2/18	2/21	2/21
ADC (Fast Compare Channels)					
2	2	2	2	2	2
ADC (EDSADC Channels)					
4	4	4	4	4	4
CAN (Modules/Nodes)					
2/2x4	2/2x4	2/2x4	2/2x4	2/2x4	2/2x4
FlexRay (Modules/Channels)					
1/1x2	1/1x2	1/1x2	1/1x2	1/1x2	1/1x2
HSSL Modules					
1	1	1	1	1	1
ASCLIN Modules / with ASC & LIN / with 3-wire SPI					
12/12/8	12/12/8	12/12/9	12/12/9	12/12/8	12/12/8
QSPI Modules / with LVDS					
4/1	4/1	4/1	4/1	4/1	4/1
SENT Channels					
10	10	10	10	10	10

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

1 TC36x AA step variants

Table 4 TC36x AA step (part 4) (continued)

SAK-TC364DP-64F200 F	SAL-TC364DP-64F200 F	SAK-TC366DP-64F200 S	SAL-TC366DP-64F200 S	SAL-TC364DP-64F200 W	SAL-TC364DP-64F300 W
MSC Modules					
1	1	1	1	1	1
PSI5 Channels					
2	2	2	2	2	2
PSI5-S Module					
Yes	Yes	Yes	Yes	Yes	Yes
SDMMC Module					
No	No	No	No	No	No
Max. Ethernet Availability: 1Gbit/100Mbit/No					
100Mbit/s (RMII)	100Mbit/s (RMII)	100Mbit/s (RMII)	100Mbit/s (RMII)	100Mbit/s (RMII)	100Mbit/s (RMII)
MCDS Availability					
No	No	No	No	No	No
ADAS Cluster Available					
No	No	No	No	No	No
CIF					
No	No	No	No	No	No
HSM Available					
Yes	Yes	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).

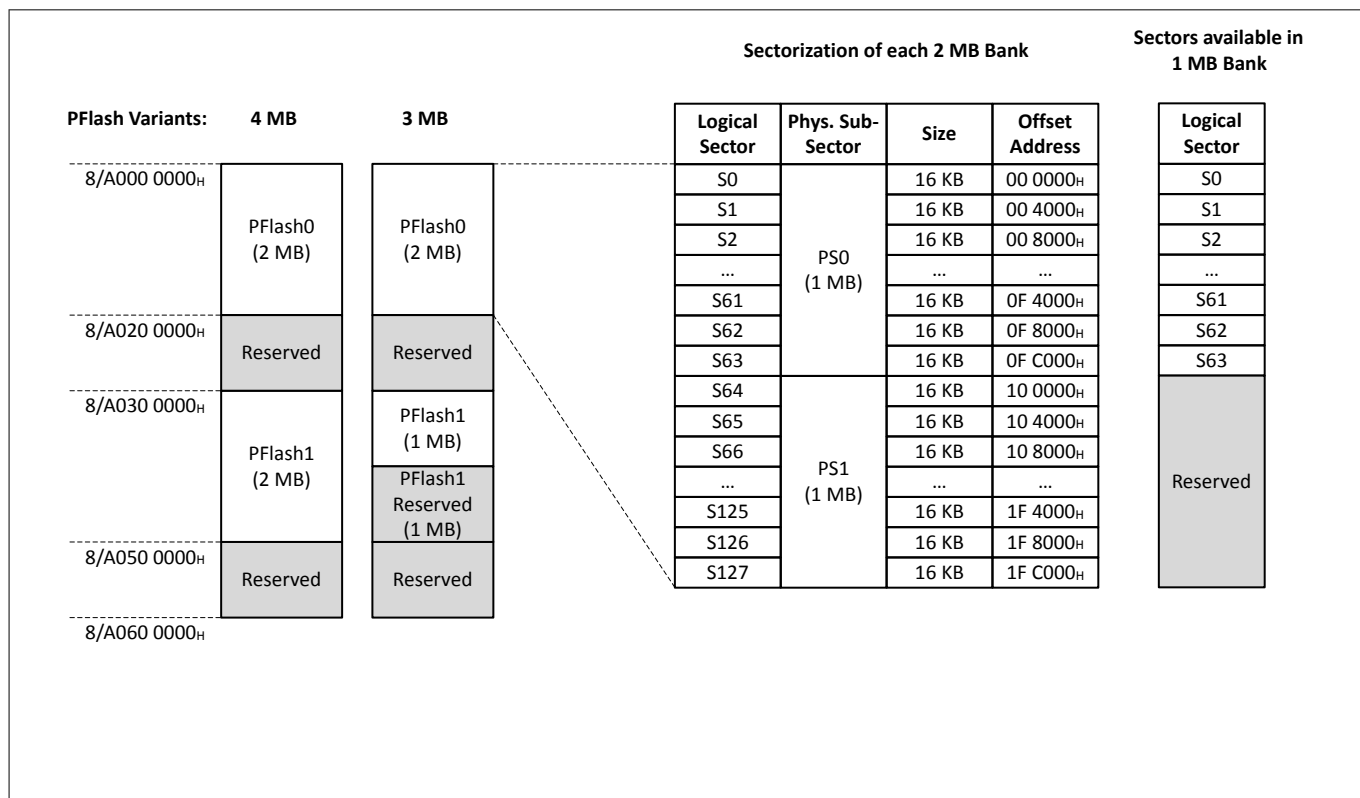


Figure 1 TC36x PFlash variants

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.

Revision history
Revision history

Document version	Date of release	Description of changes
V1.0	2019-03-01	<ul style="list-style-type: none"> First release.
V1.1	2019-06-13	<ul style="list-style-type: none"> Added new Variants SAK-TC365DP-64F200W,SAK-TC365DP-64F200F, SAK-TC365DP-64F200S,SAK-TC365DP-64F200. Chapter 1: Added new row in the variant tables called "AMU" with the footnote for additional details. Chapter: About this document: Feature package definitions are updated to consistent with the product naming nomenclature definition.
V1.2	2019-08-02	<ul style="list-style-type: none"> 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. For the Product Variants SAK-TC366DP-64F300S , SAL-TC366DP-64F300S - Number of ADC (Secondary Groups/ Channels) were corrected from 2/21 to 2/18.
V1.3	2020-01-10	<ul style="list-style-type: none"> Chapter 1: Updated the "Production status" for SAK-TC367DP-48F300S, SAK-TC364DP-48F300F to "Customer Specific". Page 1: About the document:Feature Package 'X' definition is updated to remove CIF. Chapter 1 and 2:Added new row in the variant tables called "CIF" indicating the Camera Interface availability.
V1.4	2020-11-18	<ul style="list-style-type: none"> Chapter 1: Removed Bare Die Marking variants SAL-TC360DP-64F300, SAL-TC360DP-64F200.
V1.5	2021-03-05	<ul style="list-style-type: none"> Chapter 1: Added new Variants SAK-TC364DP-64F200F, SAK-TC364DP-64F200W, SAK-TC366DP-64F200S, SAK-TC367DP-64F200S, SAL-TC364DP-64F200F, SAL-TC364DP-64F200W, SAL-TC364DP-64F300W, SAL-TC365DP-64F200W, SAL-TC366DP-64F200S, SAL-TC367DP-64F200S .

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Edition 2021-03

**Published by
Infineon Technologies AG
81726 Munich, Germany**

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