

TINY-Tiger® *plus* - Data Sheet

Tiny-Tiger® *plus*

Generation 3

Tiny, high speed multitasking computers in the size of a component. Tiny-Tiger® *plus* are universal, full featured control computers used in numerous projects and series products as:

- medical equipment
- GPS systems
- communication equipment
- industrial control
- alarm systems
- vending machines
- container tracking
- power plants ... and many more

Tiny-Tiger® *plus* offers

- short development cycles
- highest product reliability
- low cost
- innovative features



For further information, detailed literature and manuals in printed or downloadable formats visit:

<https://www.wilke.de/>

or

<https://www.wilke.de/en.html>

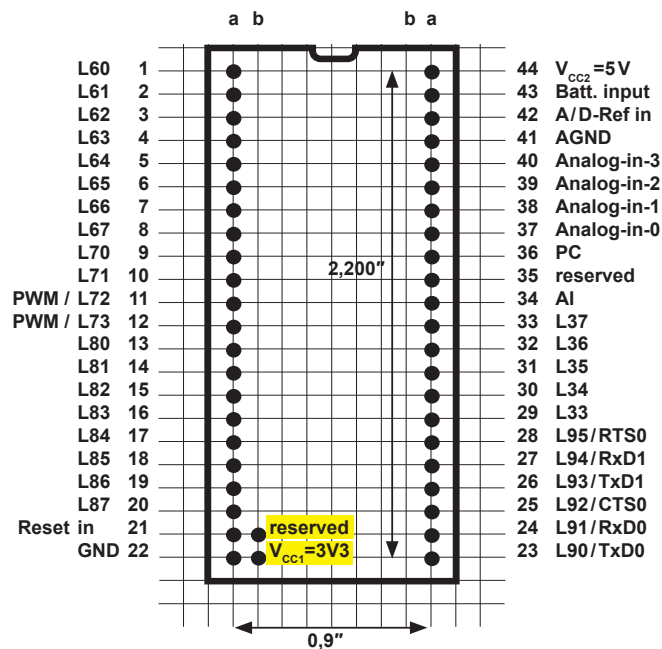
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Pinout



Yellow Areas changed compared to TTI-TCN-X/X-R

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Electrical Specifications

- **Operating voltage:** a) $V_{CC2}=5V$ (integrated regulator to 3.3V) to pin 44a
abs. max. rating +5.5V
b) Alternatively $V_{CC1}=3.3V$ to pin 22b $3.5V_{max}$

- **Typ. power draw:** max. 300 mA (for power supply layout incl. external load on module pins)

	Syntax/Pseudo code	Speed	Typ. power consumption*)		
			Tiger 1	Tiger 2	Tiger plus
Default ▶	USER_FREQUENCY SPEED_25	25%			44 mA 220mW
	USER_FREQUENCY SPEED_50	50%	36 mA 180 mW	82 mA 410 mW	74 mA 370mW
	USER_FREQUENCY SPEED_100	100%			135 mA 675 mW

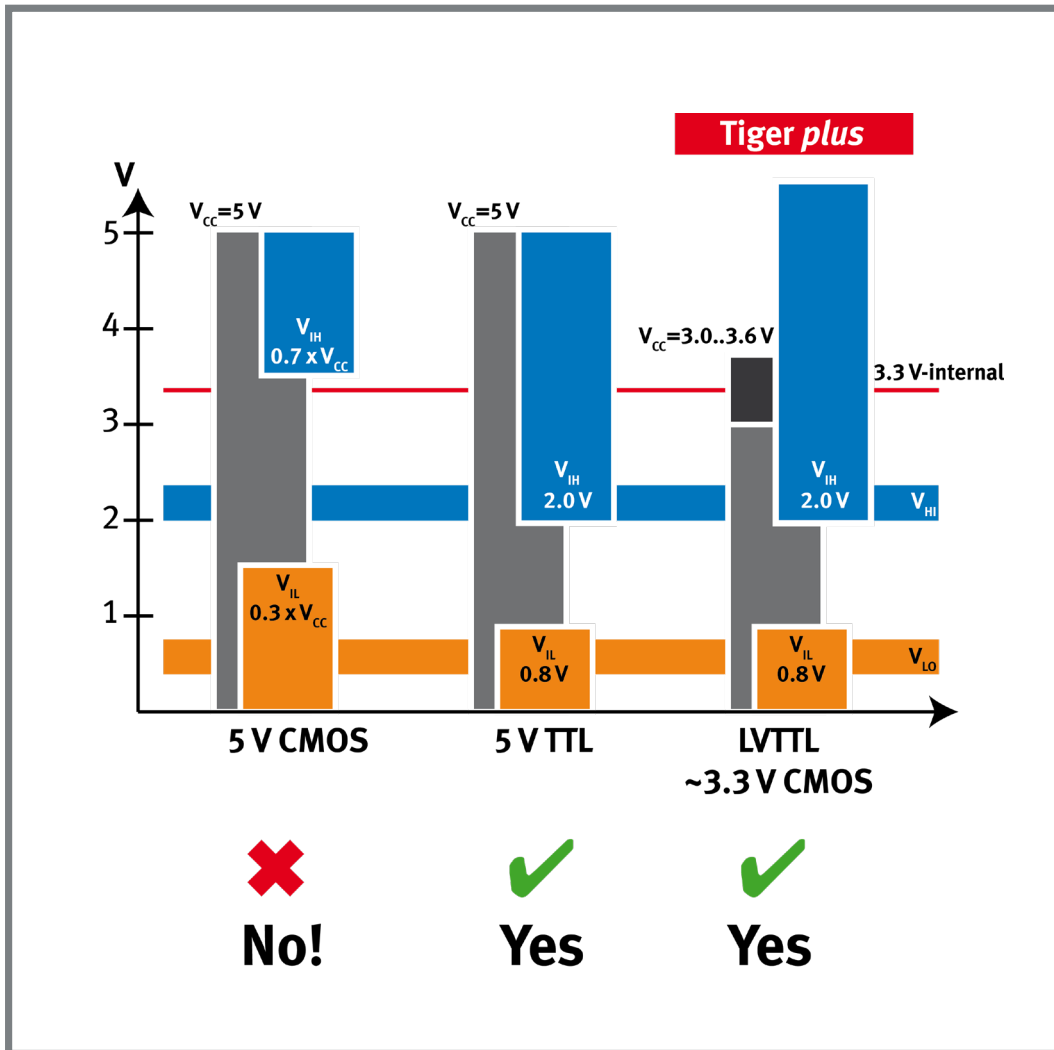
*) with no external load.

Depends on application from 50 to 200 mA

Absolut max. ratings:	Max. sink capability:	-5 mA per pin (5.0V tolerant output) -3 mA @ Alarm pin
	Max. sink over all pins:	-25 mA (5.0V tolerant output)
	Max. source/sink capability:	±25mA per pin (3.3V output)
	Max. source/sink over all pins:	±125 mA (3.3V output) -0.3V to + 5.5V in I/O mode 3 mA @ Alarm pin
	Max. voltage	-0.3V to +5.5V in I/O mode
	Pin 37-40 used as Analog-IN:	-0.3V.. 5.5V
	Analog Reference:	+3.3V.. 5.5V
	RTC-Sleep	1-2µA typ.
	RAM-Sleep	200-500µA typ.

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Specifications of Signal Levels



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Electrical Specifications

Impedance digital Inputs:	Pull-up resistor:	40 kΩ typ.
Digital Inputs:	Input voltage „high“:	2.0Vmin
	Input voltage „low“:	0.8Vmax
Analog:	Inputs:	4 channels
	Vref Input:	3.5V .. 5.0V
	Impedance inputs:	375 kΩ typ.
	Input Range:	0 .. 5V (abs. max. = -0.3 .. 5.5V)
	Input resolution:	to be selected by the according device driver
		12 bit (physical resolution of A/D converter)
		10 bit
		8 bit
		14 bit (oversample)
	Input accuracy:	typ. ± 2 LSB, ± Vref accuracy
	Sampling rate:	up to ~160 kS/sec
		depending on Device Driver used
	USER_FREQUENCY SPEED_25	80 kS/sec. max
	USER_FREQUENCY SPEED_50	160 kS/sec. max
	USER_FREQUENCY SPEED_100	160 kS/sec. max
	Sampling buffer:	up to 2 MB

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Electrical Specifications

- Serial channels:
 - 2 UART channels:
 - CH-0:
 - RxD, TxD, CTS, [RTS]
 - Baudrates: up to 614 400 Bd
 - Data/Parity: 7E, 7O, 8N, 8E, 8O, 9N
 - CH-1:
 - as above, RxD and TxD lines
 - Level systems: **3.3V TTL level, 5V tolerant**
 - Variable buffer-size: Up to 8 KB

- Serial channels (soft UARTs):
 - Up to 8 additional serial I/O channels through software driver SER2_pp_xx.TD3.
 - Selectable PIN functions:

RxD	RTS, CTS
TxD	TE (RS 485)
RxD + TxD	

- System timebase accuracy:
 - ± 50 ppm base tolerance,
 - ± 30 ppm over temp. range -20°C to +70°C add.drift.
 - ± 5 ppm per year max. aging

- Reset:
 - Reset input: LOW-active, internal pull-up R = 10 kΩ typ.

- I/O pins:
 - 36 universal I/O-pins

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Serial channels

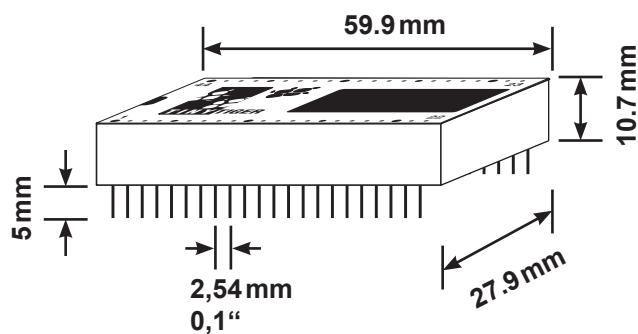
Baudrates

	Syntax	Setting [Bd]	Actual Value	Deviation [%]
	BD_1_800	1 800	1 800,02	0,00
	BD_2_400	2 400	2 400,10	0,00
	BD_3_600	3 600	3 600,04	0,00
	BD_4_800	4 800	4 800,20	0,00
	BD_7_200	7 200	7 200,72	0,01
	BD_9_600	9 600	9 601,54	0,20
	BD_10_400	10 400	10 400,42	0,00
	BD_14_400	14 400	14 404,03	0,03
	BD_19_200	19 200	19 203,72	0,02
	BD_26_040	26 040	26 041,67	0,01
	BD_28_800	28 800	28 818,44	0,06
	BD_31_250	31 250	31 250,00	0,00
	BD_38_400	38 400	38 424,59	0,06
	BD_41_600	41 600	41 623,31	0,06
	BD_57_600	57 600	57 636,89	0,06
	BD_62_500	62 500	62 500,00	0,00
	BD_76_800	76 800	76 923,08	0,16
PC-Mode/ Standard Download ▶	BD_100_000	100 000	100 000,00	0,00
	BD_115_200	115 200	115 273,78	0,06
	BD_153_600	153 600	153 846,15	0,16
	BD_230_400	230 400	231 213,87	0,35
Fast Download ▶	BD_250_000	250 000	250 000,00	0,00
	BD_307_200	307 200	307 692,31	0,16
xFast Download ▶	BD_312_500	312 500	312 500,00	0,00
	BD_614_400	614 400	615 384,62	0,16
	BD_625_000	625 000	625 000,00	0,00
	BD_631_579	631 579	634 920,63	0,53

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Physical Specifications

- Dimensions: approx. 28.1 x 59.8 x 10.7 mm / 1.11 x 2.35 x 0.42“
46-pin DIP type case
- Case type pin to pin clearance 2.54 mm / 0.10“,
row distance 22.86 mm / 0.9“
- Pin size square pins 0.64 x 0.64 mm / 0.025 x 0.025“
- Case Dimensions:



Dimensions identical with Tiny Tiger moduls of Generation 1 Product

- Weight: approx. 26 g / 0,92 ounces
- Operating temperature: -40 to 70°C
Expanded: expanded temperature ranges on request
- Flash erase cycles: Min. 10.000 cycles, typ. ~ 500.000
- Flash data retention: > 10 years
- Flash sector size: 64 kB

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Physical Specifications

Memory constellation overview for TINY-Tiger plus module types

TNN-series	TCN-series	TINY-Tiger Pico
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SDRAM	32 kByte
Program Flash	1 MByte
Data Flash	1 MByte
TTI-TNN-R/4-PLUS	

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Physical Specifications

Memory constellation overview for TINY-Tiger plus module types



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Physical Specifications

Memory constellation overview for TINY-Tiger Pico module types

TNN-series

TCN-series

TINY-Tiger Pico

SDRAM	64	kByte
Program Flash	512	kByte
Data Flash	512	kByte

TINY-TIGER-PICO

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Cross References/Order Codes

Previous TINY-Tiger Modules

TINY-Tiger		
Product Code	RAM	FLASH
TTI-TNN-R/4-R	32 kByte	512 kByte
TTI-TCN-1/4-R	128 kByte	512 kByte
TTI-TCN-4/4-R	512 kByte	512 kByte
TTI-TCN-4/16-R	512 kByte	2 MByte
New Module →		

NEW TINY-Tiger Modules

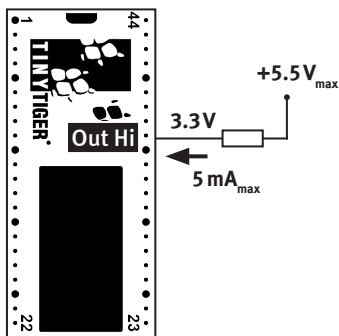
TINY-Tiger <i>plus</i>			
Product-Code	RAM	Program Flash	Data Flash
TTI-TNN-R/4-PLUS	32 kByte	1 MByte	1 MByte
TTI-TCN-1/4-PLUS	128 kByte	1 MByte	1 MByte
TTI-TCN-4/4-PLUS	512 kByte	1 MByte	1 MByte
TTI-TCN-4/16-PLUS	512 kByte	4 MByte	4 MByte
TTI-TCN-64/32-PLUS	8 MByte	8 MByte	8 MByte

Note: *plus* Series products offer and use more firmware resources, so at least use the recommended replacement type or larger part.
10+ years delivery guarantee.

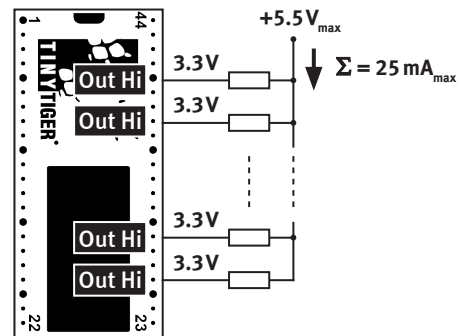
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5 Volt I/O-Tolerance Conditions

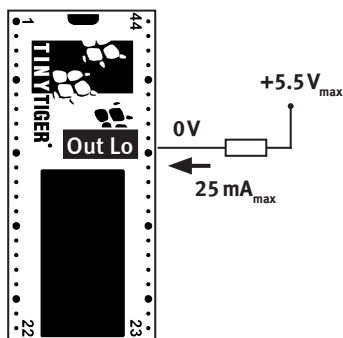
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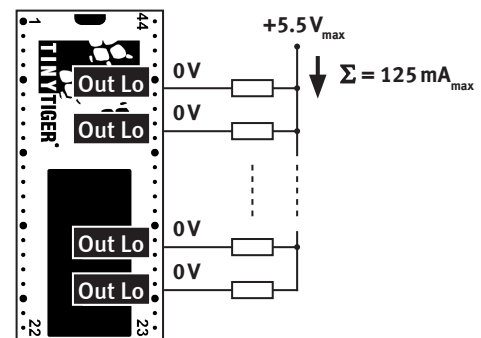
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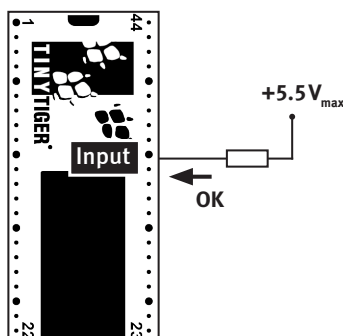
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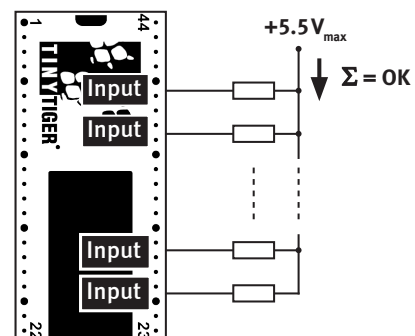
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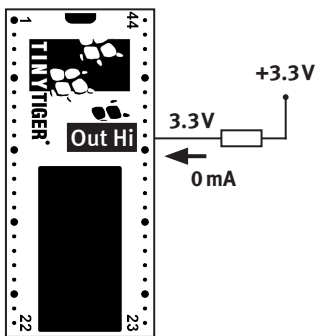
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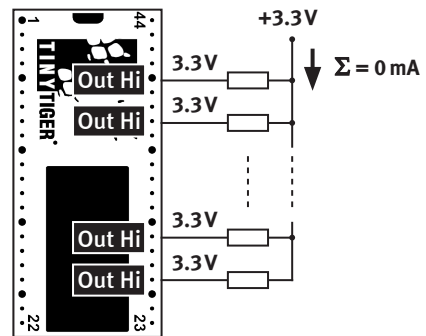
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3.3 Volt I/O Conditions

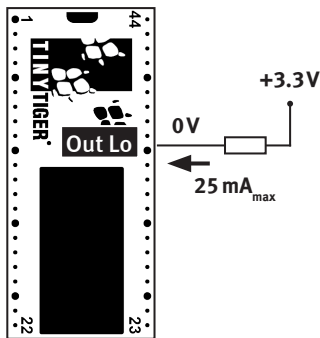
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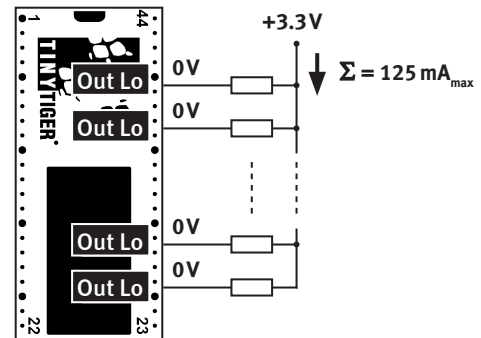
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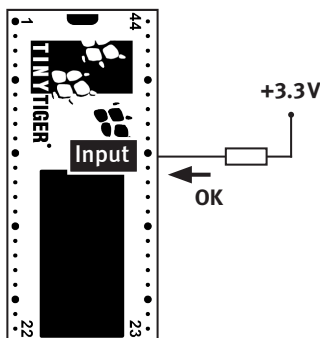
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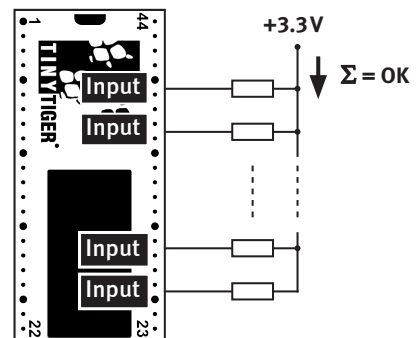
$V_{CC1} = +3.3V$ OR $V_{CC2} = +5.0V$



$V_{CC1} = +3.3V$ OR $V_{CC2} = +5.0V$



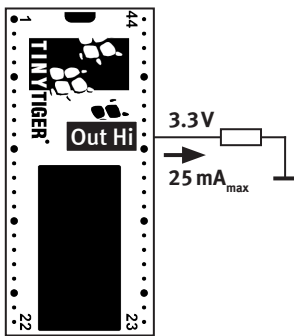
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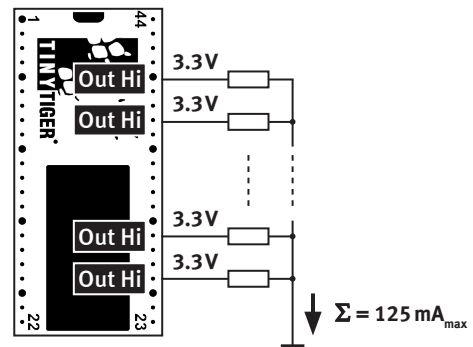
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I/O Conditions to GND

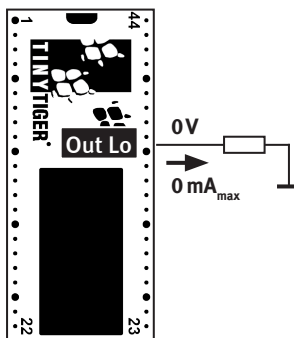
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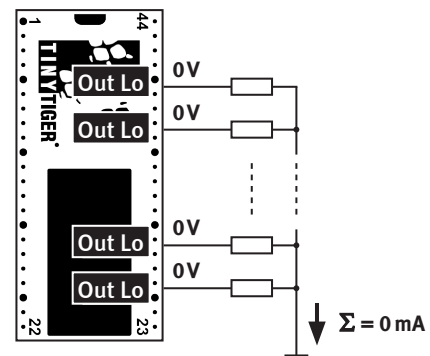
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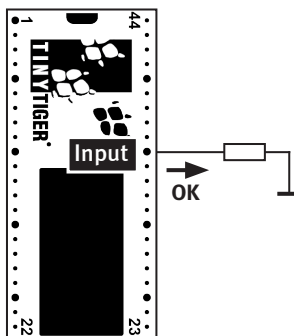
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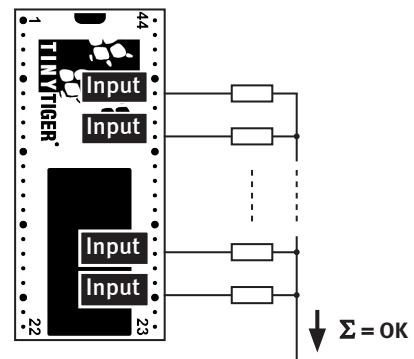
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Document Version History

V01	Electrical and physical specifications	November 3, 2015
V02	New electrical specifications	February 23, 2016
V03	Cross references	March 24, 2016
V04	Preliminary Data-Sheet	February 17, 2017
V05	First official release	September 20, 2017
V06	Small Corrections and Design	October 27, 2017
V07	Design Corrections	November 09, 2017
V08	Corrections	August 13, 2018
V09	Physical Specifications: Flash sector size, Cross References/Order Codes	November 23, 2018
V10	Physical Specifications: Pico-series	April 18, 2019

Notes:

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