

ECONO-Tiger™ *plus* - Data Sheet (v11)

Econo-Tiger™ *plus*

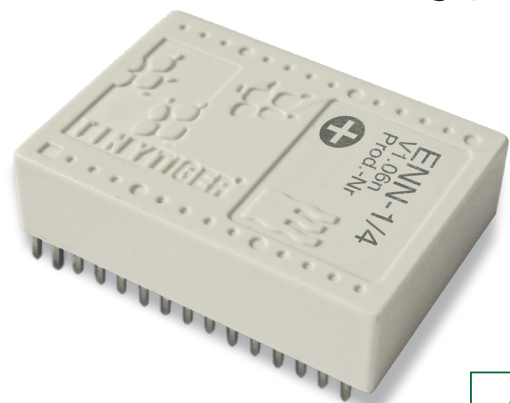
Generation 3

Tiny, high speed multitasking computers in the size of a component. Econo-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

Econo-Tiger™ *plus* offers

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



New: Pico-series

**Highly compatible
to Tiny-Tiger**

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

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

or

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

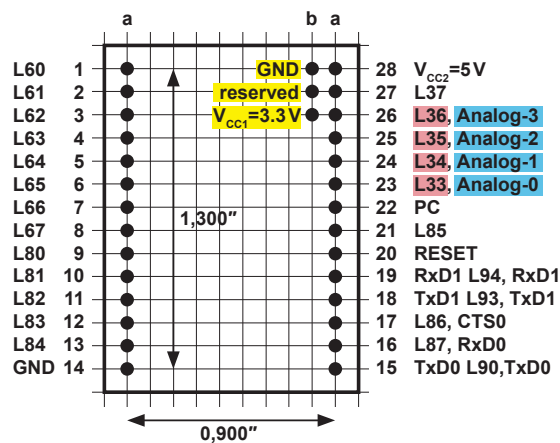
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Pinout



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

Note: When used as digital in- or outputs these PINs are fully 5V tolerant as all other in- and output-PINs of the modul.

If PIN 23a .. PIN 26a are used as analog inputs Analog-0 .. Analog-3:
Please disable the E-Port system and set L33 .. L36 to input direction.

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Electrical Specifications

- Operating voltage:
 - a) $V_{CC2}=5V$ (integrated regulator to 3.3V) to pin 28a
abs. max. rating +5.5V
 - b) Alternatively $V_{CC1}=3.3V$ to pin 26b 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%	36 mA	82 mA	44 mA
	USER_FREQUENCY SPEED_50	50%			74 mA
	USER_FREQUENCY SPEED_100	100%			135 mA

*) 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: $\pm 25mA$ per pin (3.3V out put)
 - Max. source/sink over all pins: $\pm 125 mA$ (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 23-26a used as Analog-IN: -0.3V ..5.5V
 - Analog Reference: internal 5 V $\pm$ 3%

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Electrical Specifications

- Impedance Digital Inputs: Pull-up resistor: 40 kΩ typ.
- Digital Inputs:
 - Input voltage „high“: $2.0V_{\min}$
 - Input voltage „low“: $0.8V_{\max}$
- Analog:
 - Inputs: 4 channels
 - Vref Input: internal pseudo 5 V ± 3%
 - Impedance inputs: 375 kΩ typ.
 - Input Range: 0 .. 5 V (abs. max. = -0.3 .. 5.5 V)
 - 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, ± V_{CC1} accuracy
 - Sampling rate: up to ~160 kS/sec
depending on Device Driver used

USER_FREQUENCY SPEED_25	80 kS/sec. max
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USER_FREQUENCY SPEED_50	160 kS/sec. max
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USER_FREQUENCY SPEED_100	160 kS/sec. max
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Sampling buffer: up to 2 MB

Attention: Note: To use the analog inputs, the E-Port System has to be deactivated. (full compatibility to existing Tiger 1)

Syntax: USER_EPORT ACT, NO ACTIVE
DIR_PIN 3,3,1
DIR_PIN 3,4,1
DIR_PIN 3,5,1
DIR_PIN 3,6,1

Note: Even with analog inputs being used, this also can read in digital information from bits 3 to 6.

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Electrical Specifications

- Serial channels:

2 UART channels:	RxD, TxD, CTS [RTS]
CH-0:	Baudrates: 1 800 Bd 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.TD3P.

Selectable PIN functions:	RxD	RTS, CTS
	TxD	TE (RS 485)
	RxD + TxD	

- System timebase accuracy:

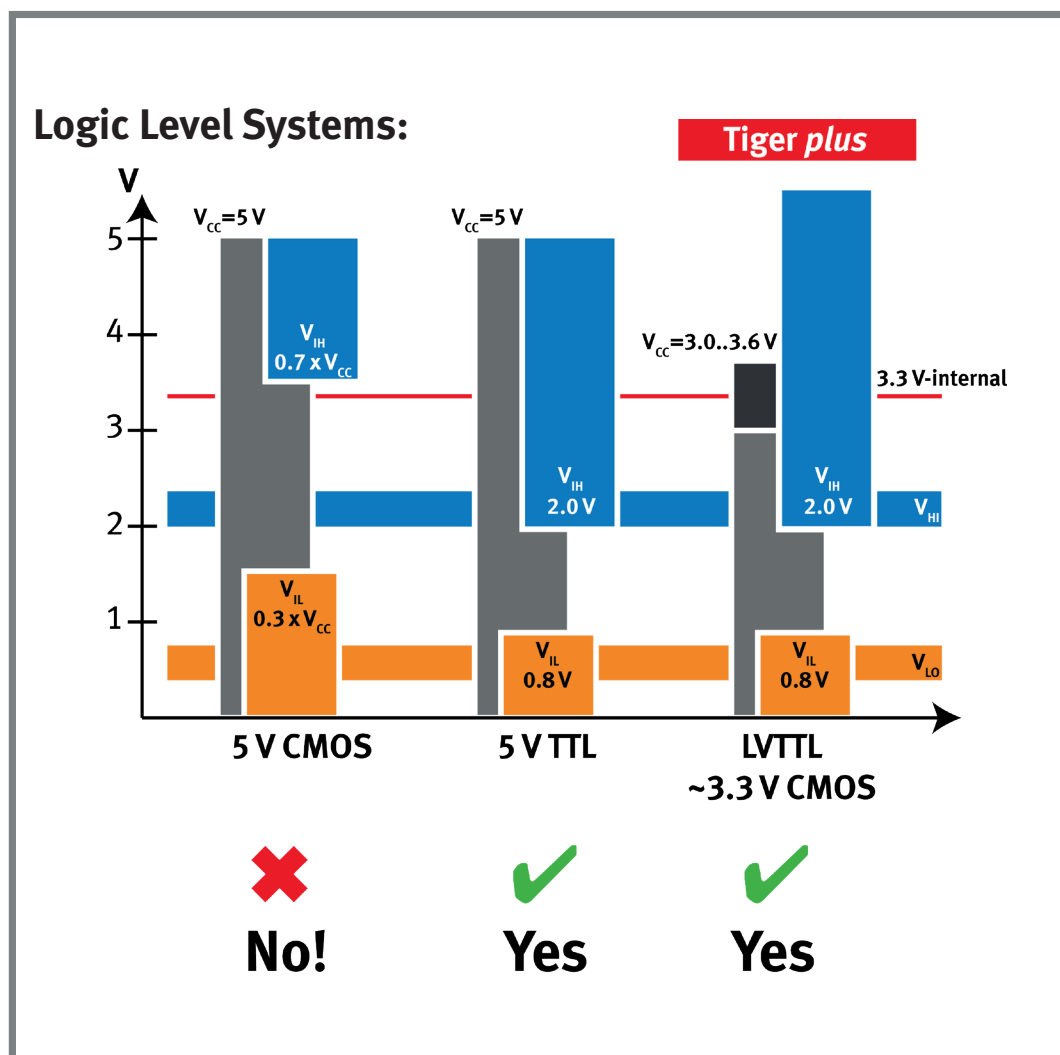
± 50 ppm base tolerance,
± 30 ppm over temp. range -20°C to +70°C
± 5 ppm per year max. aging

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

- I/O pins: 24 universal I/O-pins

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Electrical Specifications



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Serial Channels

Baudrates

PC-Mode/
Standard Download ►

Fast Download ►

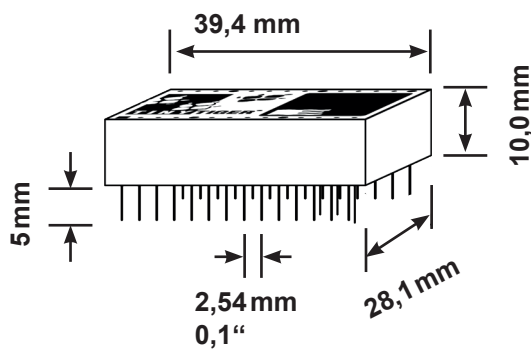
xFast Download ►

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
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
BD_250_000	250 000	250 000,00	0,00
BD_307_200	307 200	307 692,31	0,16
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 39.4 x 10.0 mm / 1.11 x 1.55 x 0.39"
31-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 Econo Tiger moduls of Generation 1 Product

- Weight: approx. 16 g / 0.56 ounces
- Operating temperature: -40 to 85 °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

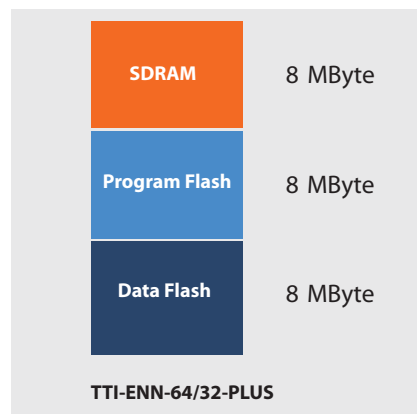
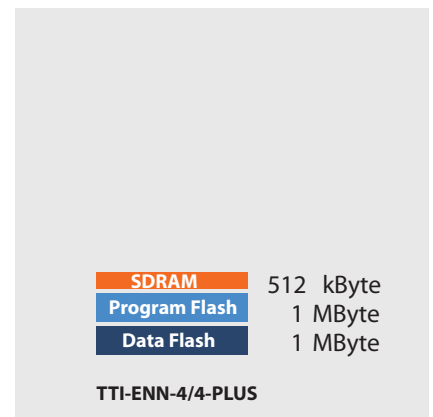
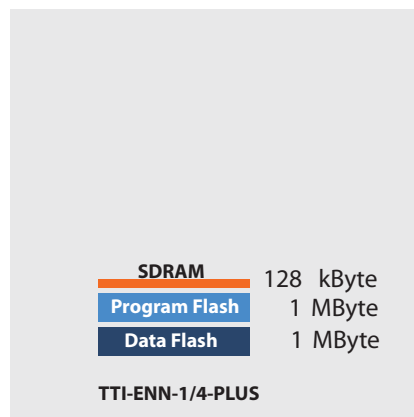
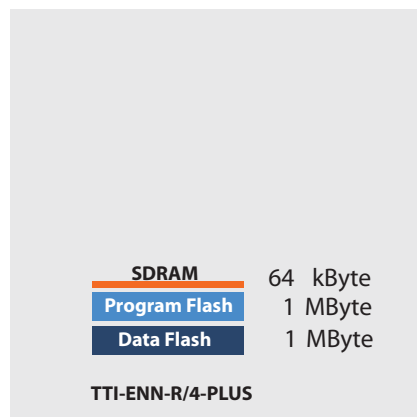
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Physical Specifications

Memory constellation overview for ECONO-Tiger plus module types

ENN-series

ECONO-Tiger Pico



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Physical Specifications

Memory constellation overview for ECONO-Tiger Pico module types

ENN-series

ECONO-Tiger Pico

SDRAM	64 kByte
Program Flash	512 kByte
Data Flash	512 kByte
ECONO-TIGER-PICO	

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Cross References/Order Codes

Previous ECONO-Tiger Modules

ECONO-Tiger		
Product Code	RAM	FLASH
TTI-ENN-R/4-R	32 kByte	512 kByte
TTI-ENN-1/4-R	128 kByte	512 kByte
TTI-ENN-4/4-R	512 kByte	512 kByte
New Module →		
New Pico Module →		

NEW ECONO-TIGER Modules

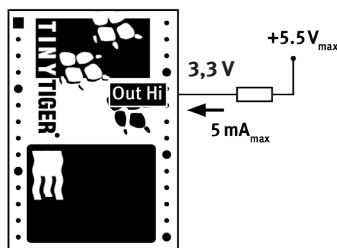
ECONO-Tiger <i>plus</i>			
Product-Code	RAM	Program Flash	Data Flash
TTI-ENN-R/4-PLUS	64 kByte	1 MByte	1 MByte
TTI-ENN-1/4-PLUS	128 kByte	1 MByte	1 MByte
TTI-ENN-4/4-PLUS	512 kByte	1 MByte	1 MByte
TTI-ENN-64/32-PLUS	8 MByte	8 MByte	8 MByte
ECONO-TIGER-PICO	64 kByte	512 kByte	512 kByte

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.

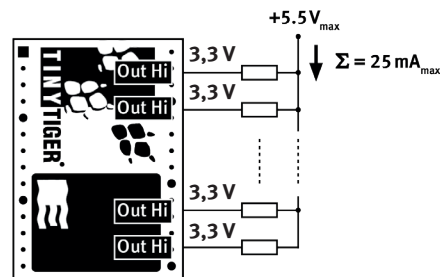
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5 Volt I/O-Tolerance Conditions

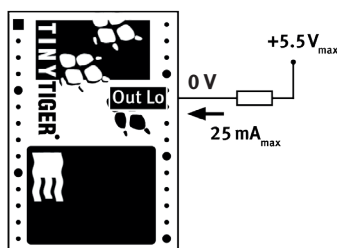
Econo-Tiger™ plus
 $V_{CC1} = +3.3V$ OR $V_{CC2} = +5.0V$



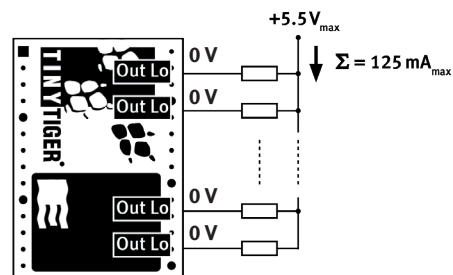
Econo-Tiger™ plus
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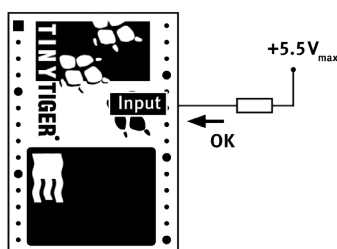
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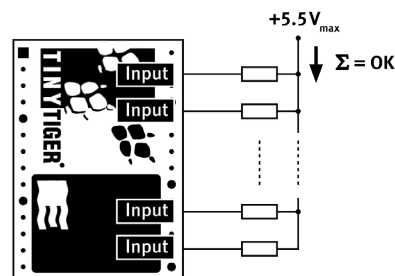
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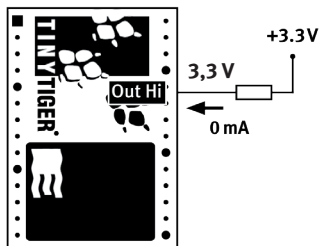
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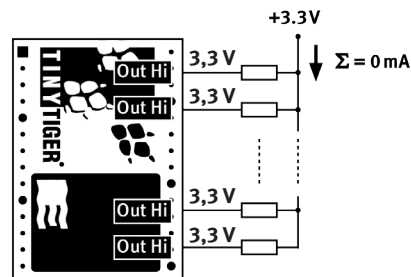
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3.3 Volt I/O Conditions

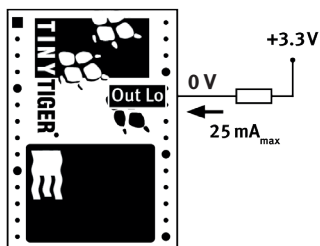
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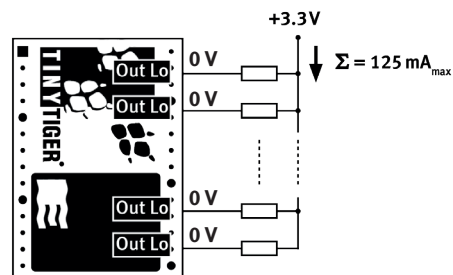
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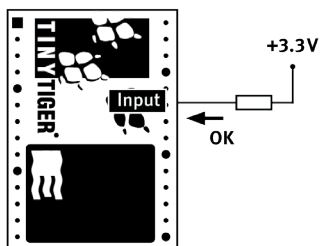
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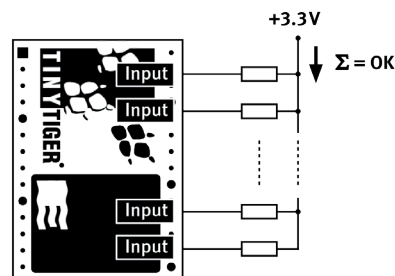
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Econo-Tiger™ plus
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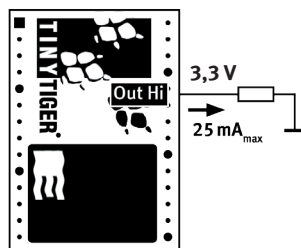
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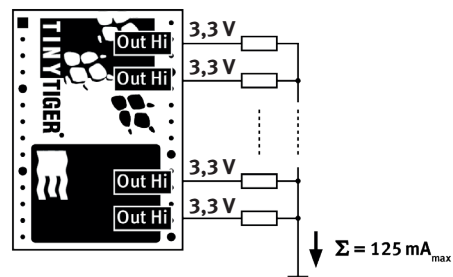
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I/O Conditions to GND

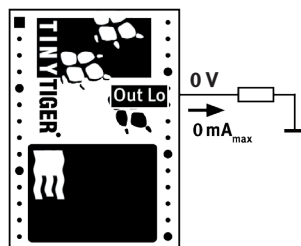
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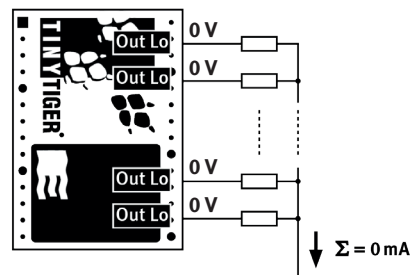
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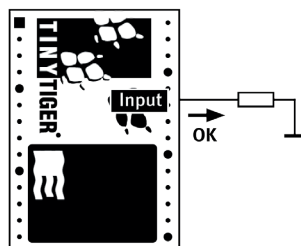
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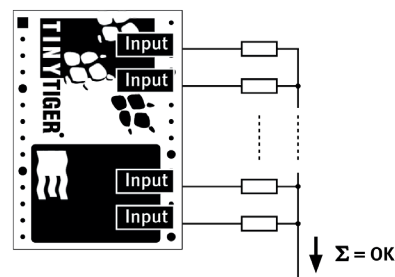
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Econo-Tiger™ plus
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Document Version History

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	Physical Specifications: Flash sector size, Cross References/Order Codes	November 23, 2018
V09	Physical Specifications: Pico-series	April 18, 2019
V10	Correction in Data Sheet	October 09, 2019
V11	Physical specification correction: TTI-ENN-R/4-PLUS 32k -> 64k RAM. Version number added in the Header. Page order correction. Typographical and Design corrections.	September 21, 2020

Notes:

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