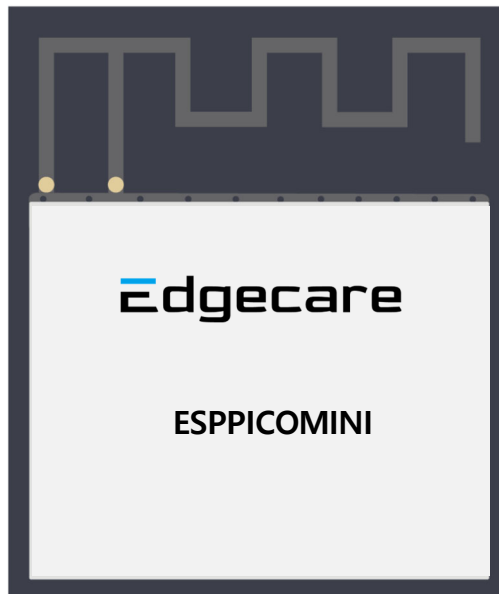


ESPPICOMINI

User Manual



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1. Features

CPU and On-Chip Memory

- ESP32-PICO-V3-02 embedded, Xtensa dual-core 32-bit LX6 microprocessor, up to 240 MHz
- 448 KB ROM for booting and core functions
- 520 KB SRAM for data and instructions
- 16 KB SRAM in RTC
- 8 MB SPI flash
- 2 MB PSRAM

WLAN

- 802.11b/g/n
- Bit rate: 802.11n up to 150 Mbps
- A-MPDU and A-MSDU aggregation
- 0.4 μ s guard interval support
- Center frequency range of operating channel: 2412 ~ 2484 MHz

Bluetooth®

- Bluetooth V4.2 BR/EDR and Bluetooth LE specification
- Class-1, class-2 and class-3 transmitter
- AFH
- CVSD and SBC

Peripherals

- Up to 27 GPIOs
- 5 strapping GPIOs

- 4 GPIOs used for in-package flash and PSRAM
- 6 input-only GPIOs
- 40 MHz crystal oscillator

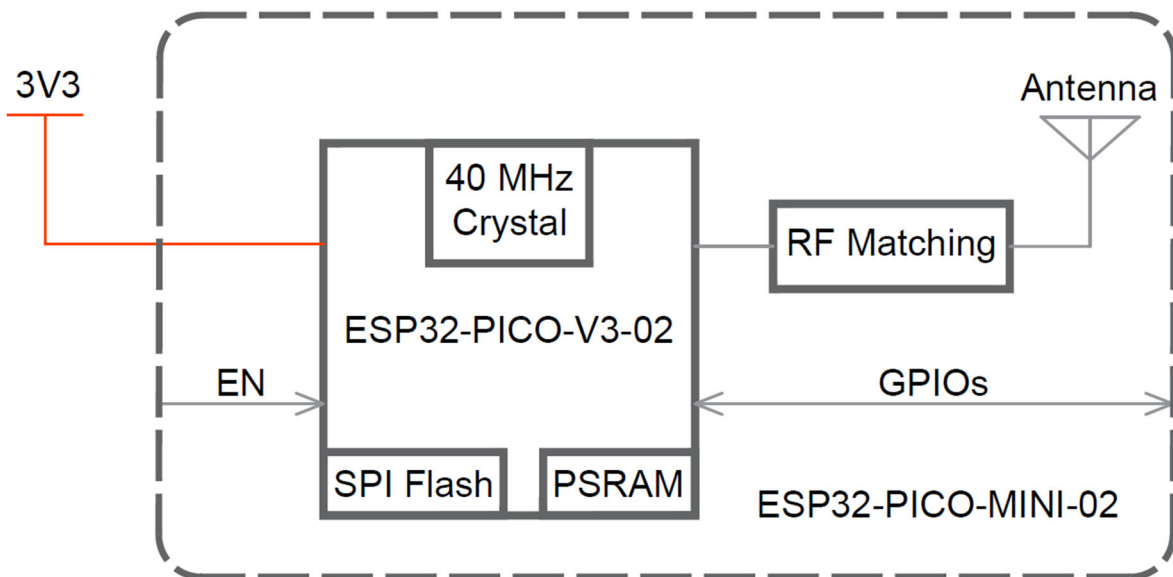
Antenna

- On-board PCB antenna

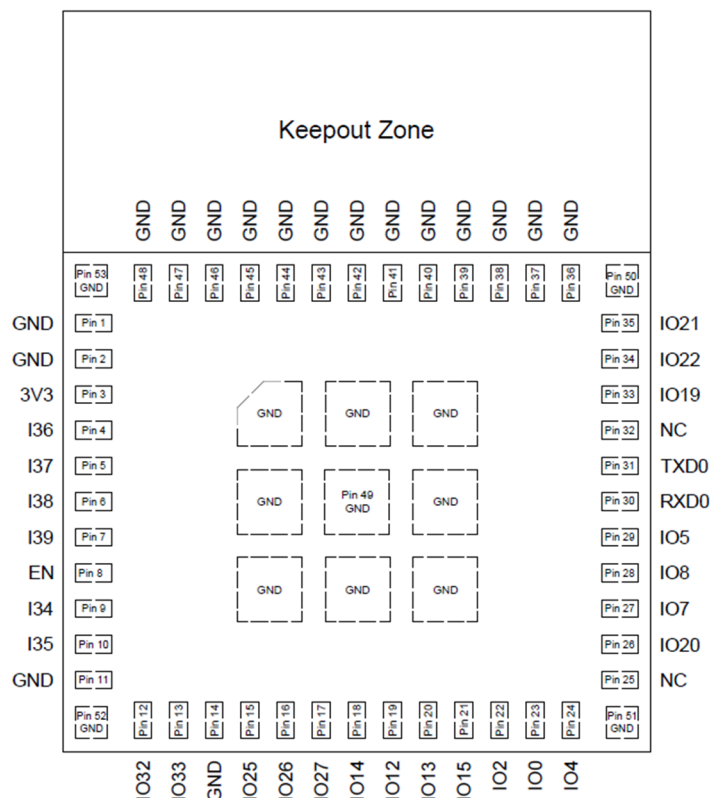
Operating Conditions

- Operating voltage/Power supply: 3.0 ~ 3.6 V
- Operating ambient temperature: -40 ~ 85 °C

2. Block diagram



3. Pin Definitions



Name	No.	Type ¹	Function
GND	1, 2, 11, 14, 36-53	P	Ground
3V3	3	P	Power supply
I36	4	I	GPIO36, ADC1_CH0, RTC_GPIO0
I37	5	I	GPIO37, ADC1_CH1, RTC_GPIO1
I38	6	I	GPIO38, ADC1_CH2, RTC_GPIO2
I39	7	I	GPIO39, ADC1_CH3, RTC_GPIO3
EN	8	I	High: On; enables the chip Low: Off; the chip shuts down Note: Do not leave EN pin floating.
I34	9	I	GPIO34, ADC1_CH6, RTC_GPIO4
I35	10	I	GPIO35, ADC1_CH7, RTC_GPIO5
IO32	12	I/O	GPIO32, XTAL_32K_P (32.768 kHz crystal oscillator input), ADC1_CH4, TOUCH9, RTC_GPIO9
IO33	13	I/O	GPIO33, XTAL_32K_N (32.768 kHz crystal oscillator output), ADC1_CH5, TOUCH8, RTC_GPIO8

Name	No.	Type ¹	Function
IO25	15	I/O	GPIO25, DAC_1, ADC2_CH8, RTC_GPIO6, EMAC_RXD0
IO26	16	I/O	GPIO26, DAC_2, ADC2_CH9, RTC_GPIO7, EMAC_RXD1
IO27	17	I/O	GPIO27, ADC2_CH7, TOUCH7, RTC_GPIO17, EMAC_RX_DV
IO14	18	I/O	GPIO14, ADC2_CH6, TOUCH6, RTC_GPIO16, MTMS, HSPICLK, HS2_CLK, SD_CLK, EMAC_TXD2
IO12	19	I/O	GPIO12, ADC2_CH5, TOUCH5, RTC_GPIO15, MTDI, HSPIQ, HS2_DATA2, SD_DATA2, EMAC_TXD3
IO13	20	I/O	GPIO13, ADC2_CH4, TOUCH4, RTC_GPIO14, MTCK, HSPID, HS2_DATA3, SD_DATA3, EMAC_RX_ER
IO15	21	I/O	GPIO15, ADC2_CH3, TOUCH3, RTC_GPIO13, MTD0, HSPICSO, HS2_CMD, SD_CMD, EMAC_RXD3
IO2	22	I/O	GPIO2, ADC2_CH2, TOUCH2, RTC_GPIO12, HSPIWP, HS2_DATA0, SD_DATA0
IO0	23	I/O	GPIO0, ADC2_CH1, TOUCH1, RTC_GPIO11, CLK_OUT1, EMAC_TX_CLK
IO4	24	I/O	GPIO4, ADC2_CH0, TOUCH0, RTC_GPIO10, HSPIHD, HS2_DATA1, SD_DATA1, EMAC_TX_ER
NC	25	-	-
IO20	26	I/O	GPIO20
IO7	27	I/O	GPIO7, HS1_DATA0, U2RTS, SD_DATA0
IO8	28	I/O	GPIO8, HS1_DATA1, U2CTS, SD_DATA1
IO5	29	I/O	GPIO5, VSPICSO, HS1_DATA6, EMAC_RX_CLK
RXD0	30	I/O	GPIO3, UORXD, CLK_OUT2
TXD0	31	I/O	GPIO1, UOTXD, CLK_OUT3, EMAC_RXD2
NC	32	-	-
IO19	33	I/O	GPIO19, VSPIQ, UOCTS, EMAC_TXD0
IO22	34	I/O	GPIO22, VSPIWP, UORTS, EMAC_TXD1
IO21	35	I/O	GPIO21, VSPIHD, EMAC_TX_EN

* P: power supply; I: input; O: output.

* Pins CMD/IO11 and CLK/IO6 are used for connecting the embedded flash, and pins SD2/IO9 and SD3/IO10 are used for connecting embedded PSRAM. These pins are not led out.

4. WLAN Radio

WLAN RF Characteristics

Name	Description
Center frequency range of operating channel	2412 ~ 2484 MHz
Wi-Fi wireless standard	IEEE 802.11b/g/n

WLAN RF Transmitter Characteristics

Rate	Min (dBm)	Typ (dBm)	Max (dBm)
802.11b, 1 Mbps	—	19.5	—
802.11b, 11 Mbps	—	19.5	—
802.11g, 6 Mbps	—	18.0	—
802.11g, 54 Mbps	—	14.0	—
802.11n, HT20, MCS0	—	18.0	—
802.11n, HT20, MCS7	—	13.0	—
802.11n, HT40, MCS0	—	18.0	—
802.11n, HT40, MCS7	—	13.0	—

5. Bluetooth Radio

Parameter	Conditions	Min	Typ	Max	Unit
RF Transmit power	-	-	0	-	dBm
Gain control step	-	-	3	-	dB
RF power control range	-	-12	-	+9	dBm
± 20 dB bandwidth	-	-	0.9	-	MHz
Adjacent channel transmit power	$F=F_0 \pm 2$ MHz	-	-55	-	dBm
	$F=F_0 \pm 3$ MHz	-	-55	-	dBm
	$F=F_0 \pm > 3$ MHz	-	-59	-	dBm
$\Delta f_{1_{avg}}$	-	-	-	155	kHz
$\Delta f_{2_{max}}$	-	127	-	-	kHz
$\Delta f_{2_{avg}} / \Delta f_{1_{avg}}$	-	-	0.92	-	-
ICFT	-	-	-7	-	kHz
Drift rate	-	-	0.7	-	kHz/50 μ s
Drift (DH1)	-	-	6	-	kHz
Drift (DH5)	-	-	6	-	kHz

6. User Information

FCC ID: 2BRIC-ESPPICOMINI

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution:

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For product available in the USA/Canada market, only channel 1~11 can be operated. Selection of other channels is not possible.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator & your body. This device and its antenna(s) must not be co-located or operation in conjunction with any other antenna or transmitter.