



YC11XX



Bluetooth 5.0 BR/EDR/BLE

Product Brief

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General Description

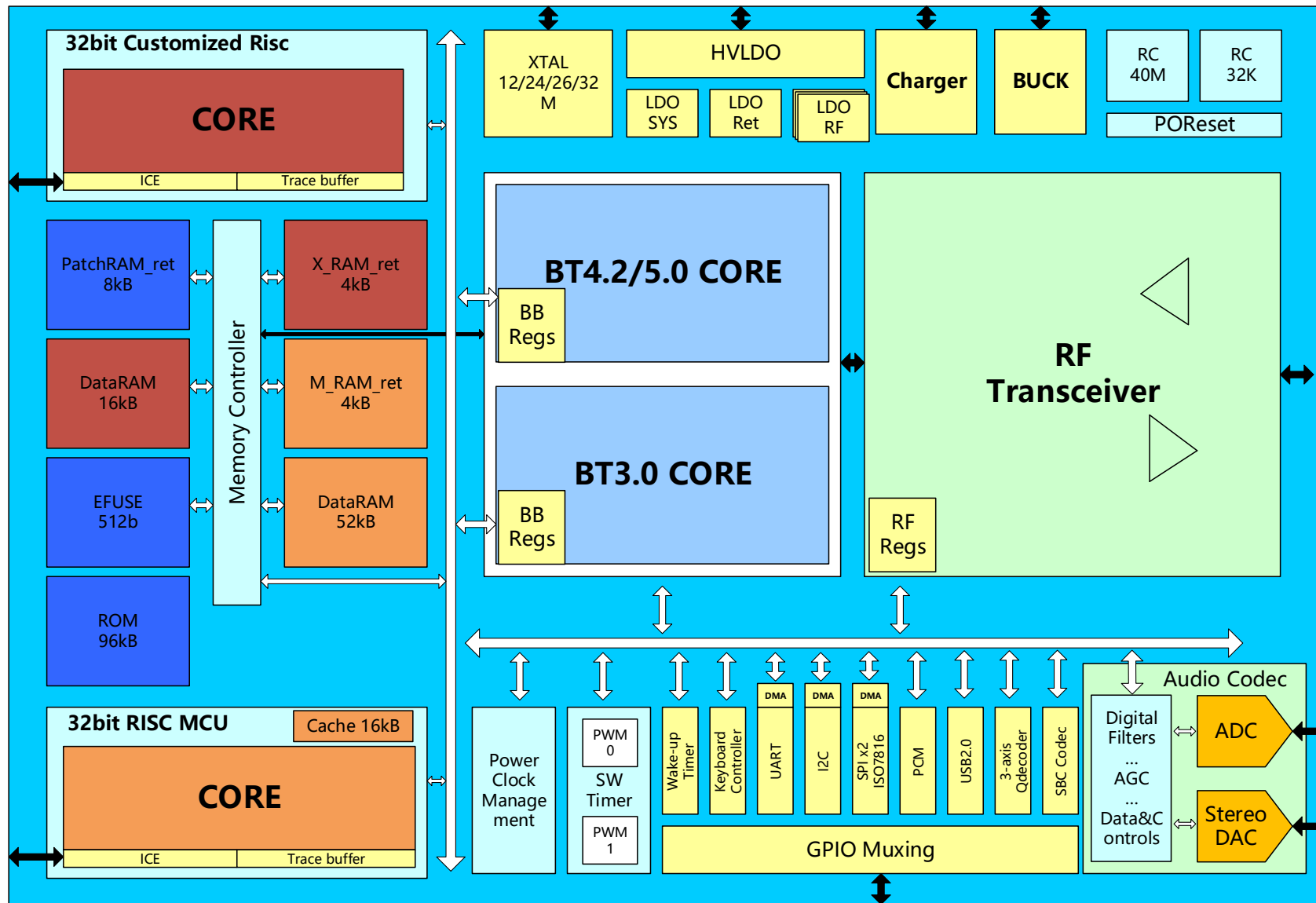
The YC11XX is a very low power, high performance and highly integrated Bluetooth 5.0 BR/EDR/BLE , designed for operation over the 2400MHz to 2483.5Mhz ISM frequency band.

YC11XX is manufactured using advanced 55nm CMOS low leakage process, which offers highest integration, lowest power consumption, lowest leakage current and reduced BOM cost while simplifying the overall system design. Rich peripherals including an 8-channel general purpose ADC, power-on-reset (POR), Arithmetic Accelerators, UART/SPI/I2C and up to 38 GPIOs, which further reduce overall system cost and size.

YC11XX operates with a power supply range from 1.8 to 5.5V and has very low power consumption in both Tx and Rx modes, enabling long lifetimes in battery-operated systems while maintaining excellent RF performance. The device can enter an ultra-low power sleep mode in which the registers and retention memory content are retained while low power Oscillator and sleep timer is ON.

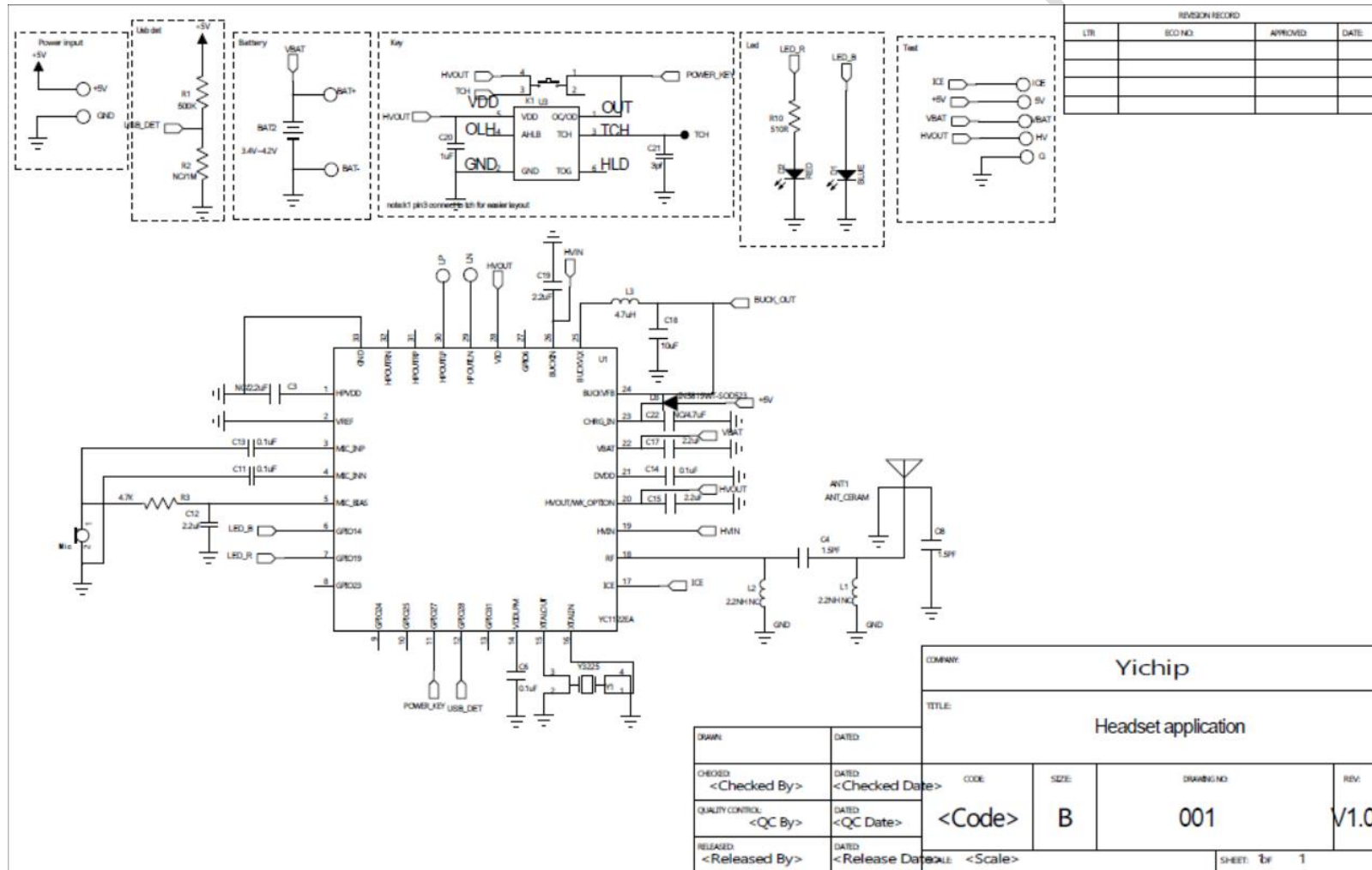
Key Features

- Bluetooth 5.0 Classical/BLE Proprietary double-mode RF SOC
- Charger/Buck integrated
- Very Low Power Consumption
 - 10nA shut down mode (external interrupts)
 - 620nA sleep mode (32kHz RC OSC, sleep timer and register ON)
 - 2uA retention mode (32kHz RC OSC, sleep timer, 2k retention memory and register ON)
 - Rx peak current w/o DCDC
 - 10mA in BLE/2.4G mode
 - Tx peak current w/o DCDC @ -2dBm
 - 18mA in BLE/2.4G mode
 - Rx peak current with DCDC
 - 6mA in BLE/2.4G mode
 - Tx peak current with DCDC @ -2dBm
 - 10mA in BLE/2.4G mode
 - <25uA avg, 500ms sniff hold connection
- 2.4GHz Transceiver
 - Single-end RFIO
 - -95dBm in BLE mode
 - support 250kbps, 1/2/3Mbps data rates
 - Tx Power up to +9dBm
- Audio function
 - Mic PGA 0-42dB, 6dB per step
 - 16-bits ADC
 - 2x16Bit DAC, Stereo
 - Audio SNR: ADC 80dB; DAC 100dB
- Oscillators
 - 16M/24M/32M XTAL supported (default 24M)
 - 40M RC oscillator
 - Low Jitter 20K RC oscillator
- Dual Core Digital Architecture
 - ARM Cortex-M0 Core for application
 - Data RAM 56kB+Cache 16kB
 - CPU clock speed up to 192Mhz
 - 32bit-Risc Core for link management
 - 96kB code ROM and 512bit EFUSE
 - 8kB patch RAM and 20kB data RAM
 - 4kB RAMs can be set to retention mode
- Analog Peripherals
 - 8 channel ADC with 10 bit accuracy/3MSPS
- Digital Peripherals
 - Two-wire Master (I2C compatible), up to 400kbps; UART(RTS/CTS) with HCI-H5 protocol, up to 3.25Mbps; SPI Master, up to 24Mbps, internal QSPI connect **4MB Flash**
 - Individual QSPI can connect external PSRAM
 - AES256 HW encryption
 - LED drive capability
 - PWM
 - 20x8 key scan
 - USB2.0 fullspeed, 4Eps, support host mode
 - SD Card Host Controller supported

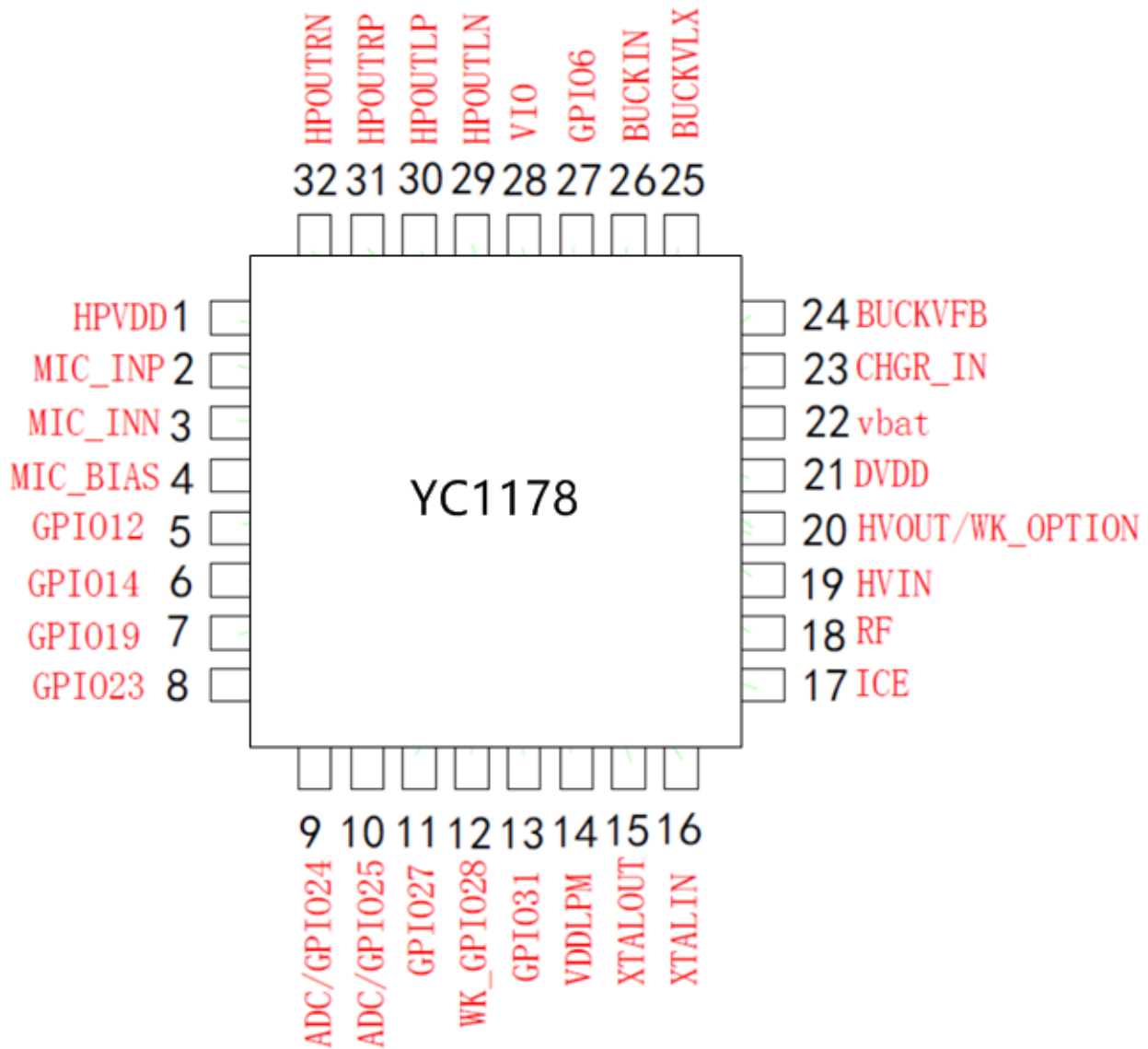


Application Schematic

The headset application



Package Information



7x7 68L	4x4 32L	Pin Name	Type	Function Description
1		NC		
2	1	HPVDD	Power_O	Connect an external decouple cap here 4.7uF,can optional.
3		LINE_INL	Ana_I	Line left input
4		LINE_INR	Ana_I	Line right input
5	2	VREF_OP8	Power_O	Connect an external decouple cap here 4.7uF,can optional.
6	3	MIC_INP	Ana_I	ADC positive input.
7	4	MIC_INN	Ana_I	ADC negative input.
8	5	MIC_BIAS	Ana_O	Power output for mic,1.5-2.8v,need 1uF bypass cap.
9		GPIO37	Dig_IO	pls check "sheet: GPIO_Muxing"
10		GPIO38	Dig_IO	pls check "sheet: GPIO_Muxing"
11		GPIO39	Dig_IO	pls check "sheet: GPIO_Muxing"

12		USB_DP	Dig_IO	USB port.
13		USB_DN	Dig_IO	USB port.
14		GPIO12	Dig_IO	pls check "sheet: GPIO_Muxing"
15		GPIO13	Dig_IO	pls check "sheet: GPIO_Muxing"
16	6	GPIO14	Dig_IO	pls check "sheet: GPIO_Muxing"
17		GPIO15	Dig_IO	pls check "sheet: GPIO_Muxing"
18	7	GPIO19	Dig_IO	pls check "sheet: GPIO_Muxing"
19		FLASH-VCC	Power_I	Internal FLASH power supply ,need 0.1uF bypass cap.
20	8	GPIO23	Dig_IO	pls check "sheet: GPIO_Muxing"
21	9	GPIO24	Dig_IO	pls check "sheet: GPIO_Muxing"
22	10	GPIO25	Dig_IO	pls check "sheet: GPIO_Muxing"
23		GPIO26	Dig_IO	pls check "sheet: GPIO_Muxing"
24	28	VDDIO	Power_O	GPIO power supply,need an external bypass cap here 10nF.
25		RSTN	Dig_IO	Global reset, active low. OR gated with internal POR. If not needed an external bypass cap here 10nF.
26	11	GPIO27	Dig_IO	pls check "sheet: GPIO_Muxing"
27	12	GPIO28	Dig_IO	pls check "sheet: GPIO_Muxing"
28		GPIO29	Dig_IO	pls check "sheet: GPIO_Muxing"
29		GPIO30	Dig_IO	pls check "sheet: GPIO_Muxing"
30	13	GPIO31	Dig_IO	pls check "sheet: GPIO_Muxing"
31	14	VDDLPM	Power_O	internal LDO output, 1.2V. Need an external bypass cap here 0.1uF.
32	15	XTALOUT	Ana_O	XTAL port.
33	16	XTALIN	Ana_I	XTAL port, or external CLK in.
34	17	ICE	Dig_IO	debug port, Tx & Rx.
35		SCANMODE	Dig_I	SCAN Test enable pin.
36	18	RFIO	RF Port	ANT port.
37	19	HVIN	Power_I	HVLDO input, 3.6~5.5V, 2.2uF bypass cap.
38	20	HVOUT	Power_O	HVLDO output, 3.3V. Bypass cap need here 2.2uF,max output current 150mA@3.3V.
39		NC		
40	20	WKOPT	Dig_IO	Shutdown pin.This pin need connect to logic high.
41	21	DVDD	Power_O	internal LDO output, 1.2V. Need an external bypass cap here 0.1uF.
42	22	CHGOUT	Power_O	Charger Output Pin. Connect this pin to the battery and charge current be set at 40mA .provides charge to 4.2V.
43	23	CHGIN	Power_I	Positive Input Supply Voltage. provides power to the charger,Chrgin can range from 4.25V to 5.5V .need bypassed with at least a 1uF capacitor and series a schottky diode.
44	24	VIN/BUCKOUT	Power_O	Buckout pin output 1.8~3.6V internal connect to VIN, 10uF bypass cap.
45	26	BUCKIN	Power_I	Buck input 3.6~4.2V,10uF bypass cap.
46	25	BUCKVLX	Power_adj	Need an external bypass inductor here 10uH connect to buckout.
47		NC		
48		NC		

49		GPIO36	Dig_IO	pls check "sheet: GPIO_Muxing"
50		GPIO35	Dig_IO	pls check "sheet: GPIO_Muxing"
51		GPIO34	Dig_IO	pls check "sheet: GPIO_Muxing"
52		NC		
53		GPIO2	Dig_IO	pls check "sheet: GPIO_Muxing"
54		GPIO3	Dig_IO	pls check "sheet: GPIO_Muxing"
55		GPIO33	Dig_IO	pls check "sheet: GPIO_Muxing"
56		GPIO32	Dig_IO	pls check "sheet: GPIO_Muxing"
57		GPIO4	Dig_IO	pls check "sheet: GPIO_Muxing"
58		GPIO5	Dig_IO	pls check "sheet: GPIO_Muxing"
59	27	GPIO6	Dig_IO	pls check "sheet: GPIO_Muxing"
60		GPIO7	Dig_IO	pls check "sheet: GPIO_Muxing"
61		GPIO8	Dig_IO	pls check "sheet: GPIO_Muxing"
62		GPIO9	Dig_IO	pls check "sheet: GPIO_Muxing"
63		GPIO10	Dig_IO	pls check "sheet: GPIO_Muxing"
64		GPIO11	Dig_IO	pls check "sheet: GPIO_Muxing"
65	29	HPOUTLN	Ana_O	DAC left channel negative output.
66	30	HPOUTLP	Ana_O	DAC left channel positive output.
67	31	HPOUTRP	Ana_O	DAC right channel positive output.
68	32	HPOUTRN	Ana_O	DAC right channel negative output.

Note: All GPIOs are by default configured to input status after power-on reset, and ICE are by default configured to high level by pull up. If a GPIO is not used as well as it is not configured to output, it can be connected to GND.

PWM, UART, SPI and other digital peripherals can be flexibly configured to any GPIO port.

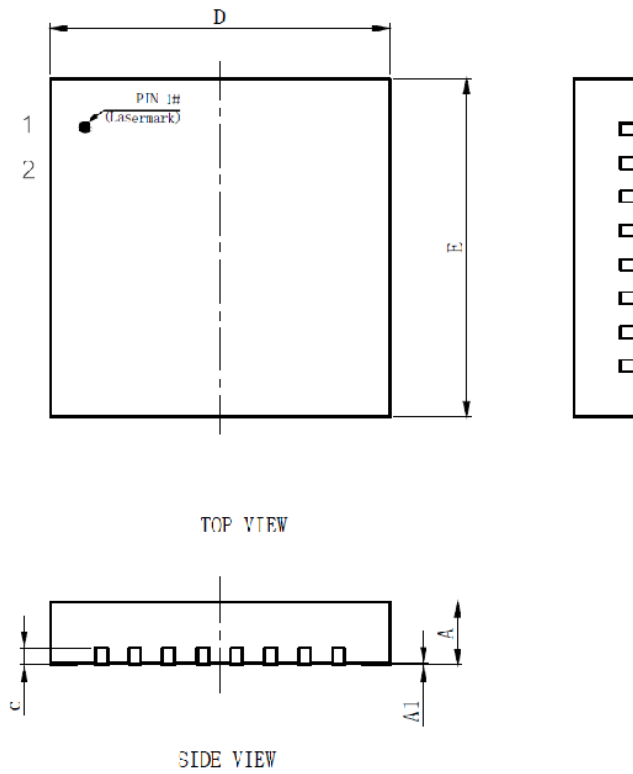
GPIO Muxing Table

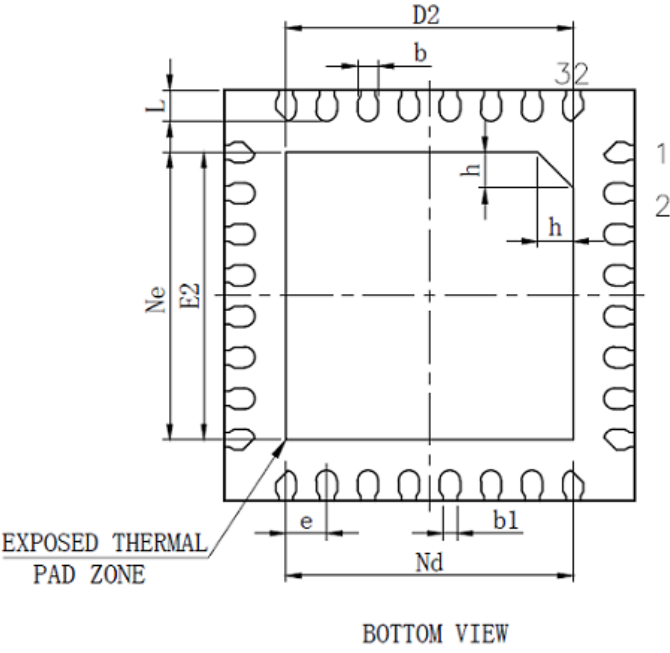
GPIOs	Function1	Function2
GPIO[0]		
GPIO[1]		
GPIO[2]		
GPIO[3]		
GPIO[4]		
GPIO[5]		
GPIO[6]	EXEN	
GPIO[7]		
GPIO[8]		
GPIO[9]		
GPIO[10]		
GPIO[11]		
GPIO[12]		
GPIO[13]		

GPIO[14]		
GPIO[15]		
GPIO[16]		
GPIO[17]		adc0
GPIO[18]		adc1
GPIO[19]		
GPIO[20]		adc2
GPIO[21]		adc3
GPIO[22]		adc4
GPIO[23]	SPI-IO2	adc5
GPIO[24]	SPI-IO1	adc6
GPIO[25]	SPI-NCS	adc7
GPIO[26]	SPI-IO3	
GPIO[27]	SPI-SCK	wakeup1
GPIO[28]	SPI-IO0	wakeup2
GPIO[29]	SDA	
GPIO[30]	SCL	
GPIO[31]		
GPIO[32]		
GPIO[33]		
GPIO[34]		
GPIO[35]		
GPIO[36]		
GPIO[37]		
GPIO[38]		
GPIO[39]		

Note: Drive capability of GPIO[20:40] is up to 100mA, other GPIO's drive capability is 10mA; Micbias output 1.5-2.8V@3mA.

Package Physical Dimension (QFN4x4_32L)

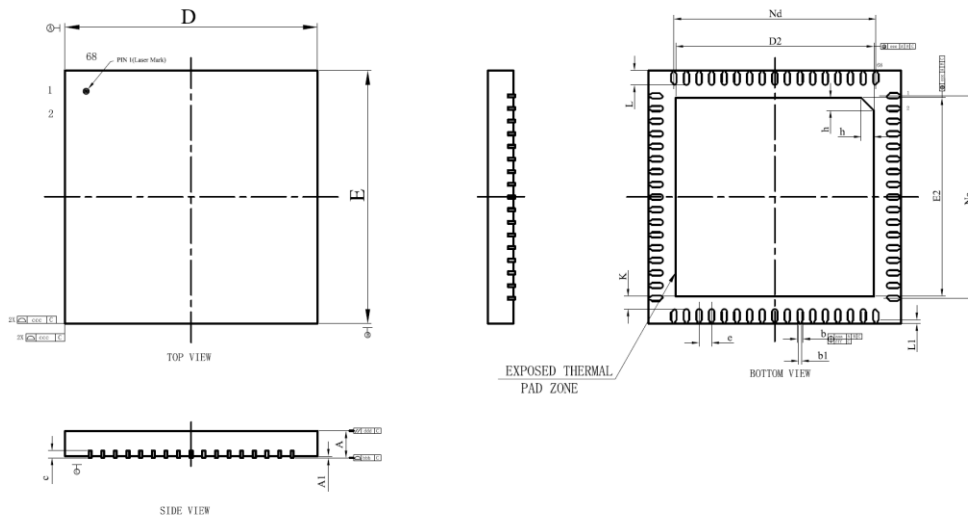




SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.70	0.75	0.80
	0.80	0.85	0.90
	0.85	0.90	0.95
A1	0	0.02	0.05
b	0.15	0.20	0.25
b1	0.14REF		
c	0.18	0.20	0.25
D	3.90	4.00	4.10
D2	2.70	2.80	2.90
e	0.40BSC		
Ne	2.80BSC		
Nd	2.80BSC		
E	3.90	4.00	4.10
E2	2.70	2.80	2.90
L	0.25	0.30	0.35
h	0.30	0.35	0.40
L/F载体尺寸	122X122		

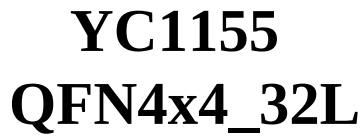


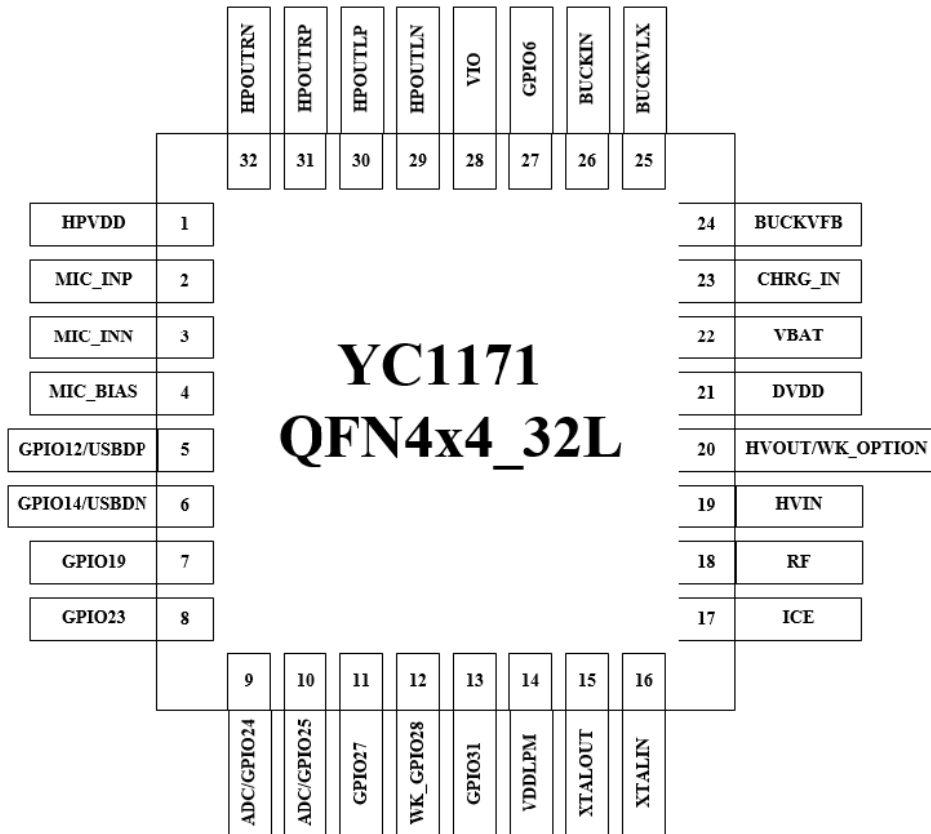
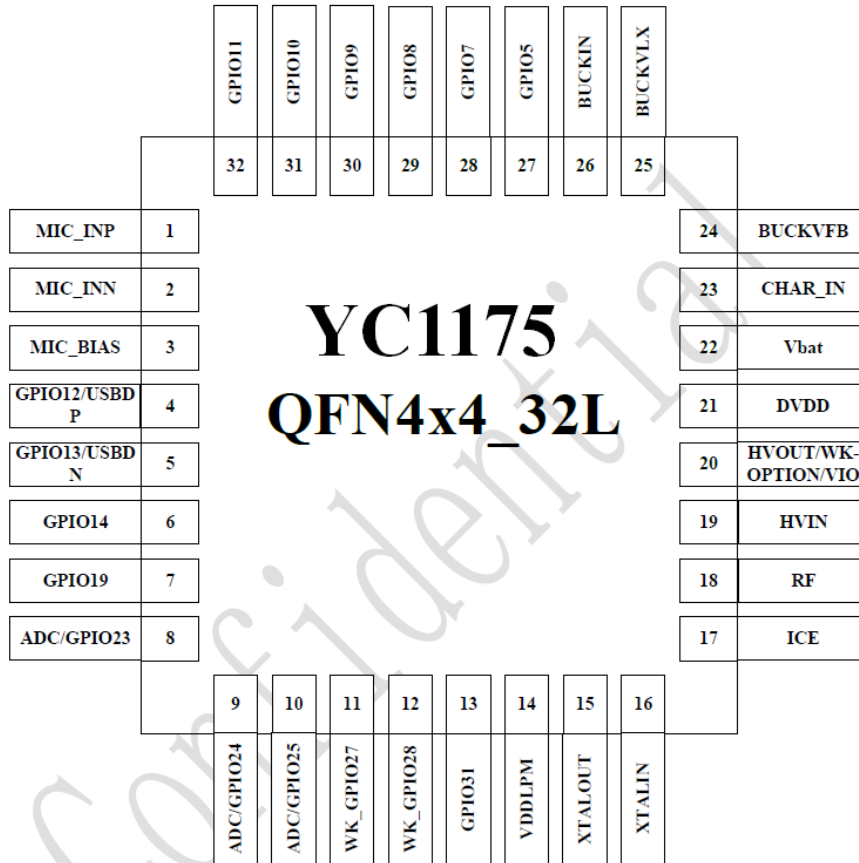
Package Physical Dimension (QFN7x7_68L)



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	—	0.02	0.05
b	0.10	0.15	0.20
b1	0.08REF		
c	0.18	0.20	0.25
D	6.90	7.00	7.10
D2	5.39	5.49	5.59
e	0.35BSC		
Nd	5.60BSC		
E	6.90	7.00	7.10
E2	5.39	5.49	5.59
Ne	5.60BSC		
L	0.35	0.40	0.45
L1	0.10REF		
K	0.20	—	—
h	0.30	0.35	0.40
aaa	0.07		
bbb	0.08		
ccc	0.10		
ddd	0.10		
eee	0.10		
fff	0.05		
L/P 载体尺寸 (mm)	232*232		

Other Packages





XTALOUT	1	YC1145	16	GPI031/ICE
XTALIN	2		15	GPI025/ADC
VSS	3		14	GPI024/ADC
RF	4		13	GPI015
HVOUT	5		12	GPI014/MIC BIAS
DVDD	6		11	MIC INP
VPP/HVIN	7		10	GPI011
GPI09	8		9	GPI010

