

## N32G401x6/x8

## Product Brief

N32G401 series based on 32-bit ARM Cortex-M4F kernel, run up to 72MHz, support floating-point unit and DSP instructions, up to 64KB embedded flash, 8KB SRAM, integrated high-performance analog interface, built-in 1x12bit 4.2Msps ADC, 3x high-speed comparators, Integrated multi-channel U(S)ART, I2C, SPI and other digital communication interfaces.

### Key features

- **CPU core**
  - 32-bit ARM Cortex-M4 + FPU, DSP instruction support
  - Built-in 1KB instruction Cache, which support Flash acceleration unit to execute program 0 wait
  - Run up to 72MHz, 90DMIPS
- **Encrypted memory**
  - Up to 64KByte of embedded Flash memory, supporting encrypted storage, multi-user partition management and data protection, 10,000 cycling and 10 years data retention.
  - 8KByte of SRAM, retention in Stop2 mode, configurable in Standby mode
- **Power consumption mode**
  - Support Run, Sleep, Stop0, Stop2, Standby mode
- **High-performance analog interface**
  - 1x 12bit 4.2Msps ADC, 12/10/8/6 bits configurable, up to 16 external single-ended input channels, 3 internal single-ended input channels, support differential mode
  - 3x COMP (each comparator has an internal independent 6bit DAC)
- **Clock**
  - HSE: 4MHz~32MHz external high-speed crystal
  - LSE: 32.768KHz external low-speed crystal
  - HSI: Internal high-speed RC 8MHz
  - LSI: Internal low speed RC 40KHz
  - Built-in high speed PLL
  - MCO: Support 2-way clock output, configurable SYSCLK, HSI, HSE, LSI, LSE, and PLL clock output that can be divided
- **Reset**
  - Supports power-on/power-off/external pin reset
  - Support watchdog reset, software reset
  - Support programmable voltage detection
- **Up to 39+1 GPIOs are supported**
- **Communication interface**
  - 4x U(S)ART interfaces, including 2x USART interfaces (supporting ISO7816, IrDA, LIN) and 2x UART interfaces

- 2x SPI interfaces, master mode up to 28Mbps(without CRC), 20Mbps(with CRC), slave mode up to 32Mbps, support I<sup>2</sup>S
- 2x I2C interfaces with a rate up to 1 MHz, which can be configured in master/slave mode and support dual address response in slave mode
- **1x DMA controller, each controller supports 8 channels, channel source address and destination address can be arbitrarily configurable**
- **1x RTC real-time clock, support leap year perpetual calendar, alarm clock event, periodic wake up, support internal and external clock calibration**
- **1x Beeper, support complementary output, 12mA output drive capability**
- **Timing counter**
  - 2x 16-bit advanced timer counters, support input capture, complementary output, orthogonal encoding input, maximum control accuracy 7.8ns; Each timer has four independent channels, Timer1 supports 4 channels and 8 complementary PWM output , Timer8 supports 3 channels and 6 complementary PWM output
  - 4x 16-bit general purpose timer counters, each timer has 4 independent channels, support input capture/output comparison /PWM output
  - 1x 16-bit basic timer counter
  - 1x 16-bit low power timer counter, support single pulse and double pulse counting function, can work in STOP2 mode
  - 1x 24-bit SysTick
  - 1x 14-bit Window Watchdog (WWDG)
  - 1x 12-bit Independent Watchdog (IWDG)
- **Programming mode**
  - Support SWD/JTAG online debugging interface
  - Supports UART Bootloader
- **Security features**
  - Flash Storage encryption, Multi-user partition Management Unit (MMU)
  - CRC16/32 operation
  - Support write protection (WRP), multiple read protection (RDP) levels (L0/L1/L2)
  - Support safe start, program encryption download, security updates
  - Support external clock failure detection, tamper detection
- **96-bit UID and 128-bit UCID**
- **Working conditions**
  - Operating voltage range: 2.4V~3.6V
  - Operating temperature range: -40°C ~ 105°C
  - ESD: ±4KV (HBM model), ±2KV (CDM model)
- **Encapsulation**
  - LQFP32(7mm x 7mm)
  - LQFP48(7mm x 7mm)
  - QFN20(3mm x 3mm)

- QFN28(4mm x 4mm)
- QFN32(4mm x 4mm)
- QFN48(6mm x 6mm)
- TSSOP20(6.5mm x 4.4mm)

● **Ordering information**

Series	Part Number
N32G401x6	N32G401C6L7, N32G401K6L7 N32G401C6Q7, N32G401K6Q7, N32G401G6Q7, N32G401F6Q7, N32G401F6S7-1
N32G401x8	N32G401C8L7, N32G401K8L7 N32G401C8Q7, N32G401K8Q7, N32G401G8Q7, N32G401F8Q7, N32G401F8S7-1



## 2 List of devices

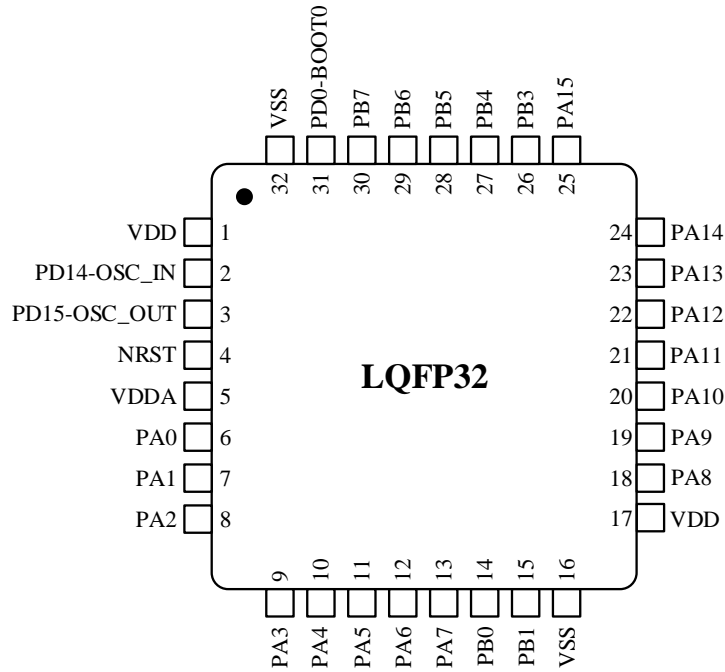
Table 2-1 N32G401 series resource configuration

Part Number	N32G401 F6S7-1	N32G401 F8S7-1	N32G401 F6Q7	N32G401 F8Q7	N32G401 G6Q7	N32G401 G8Q7	N32G401K6L7 N32G401K6Q7	N32G401K8L7 N32G401K8Q7	N32G401C6L7 N32G401C6Q7	N32G401C8L7 N32G401C8Q7	
Flash capacity (KB)	32	64	32	64	32	64	32	64	32	64	
SRAM capacity (KB)	8	8	8	8	8	8	8	8	8	8	
CPU frequency	ARM Cortex-M4F @72MHz, 90DMIPS										
working environment	2.4~3.6V/-40~105℃										
Timer	General	4									
	Advanced	2 (Timer1 supports 4 channels and 8 complementary output, Timer8 supports 3 channels and 6 complementary output)									
	Basic	1									
	LPTIM	1									
Communication interface	SPI	2									
	I2S	2									
	I2C	2									
	UART	1			2						
	USART	2									
BEEPER	1										
GPIO	15+1			23+1		25+1			39+1		
DMA Number of Channels	1 8 Channel										
12bit ADC Number of channels	1 9Channel		1 7Channel		1 10Channel			1 16Channel			
COMP	0		3								
security protection	Read and write protection (RDP/WRP), storage encryption, partition protection, secure boot										
Package	TSSOP20		QFN20		QFN28		LQFP32 QFN32		LQFP48 QFN48		

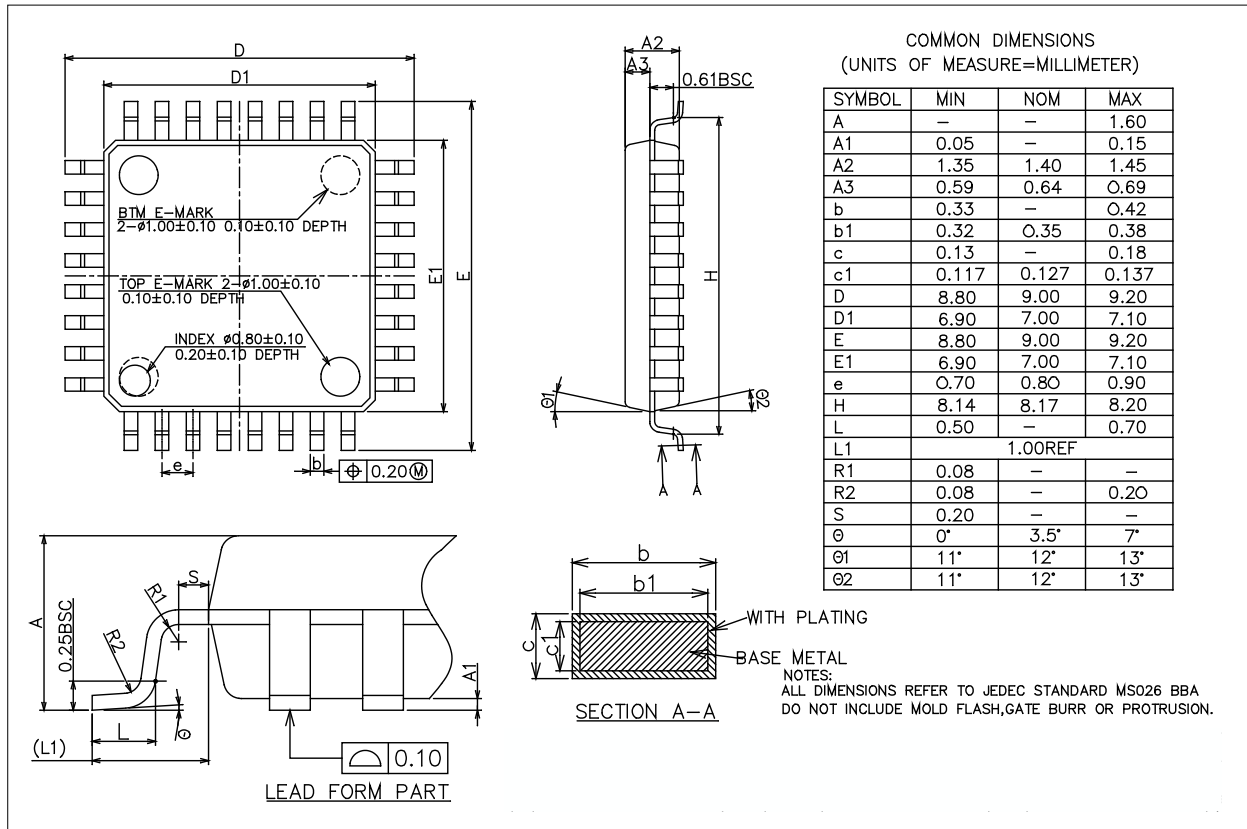
### 3 Package Information

#### 3.1 LQFP32

##### 3.1.1 LQFP32 Pinout

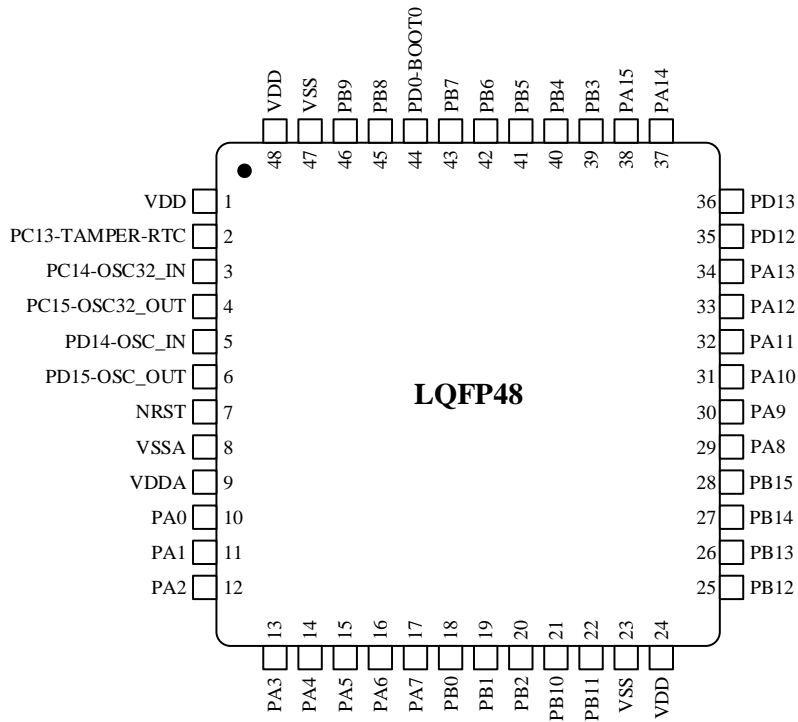


### 3.1.2 LQFP32 Package



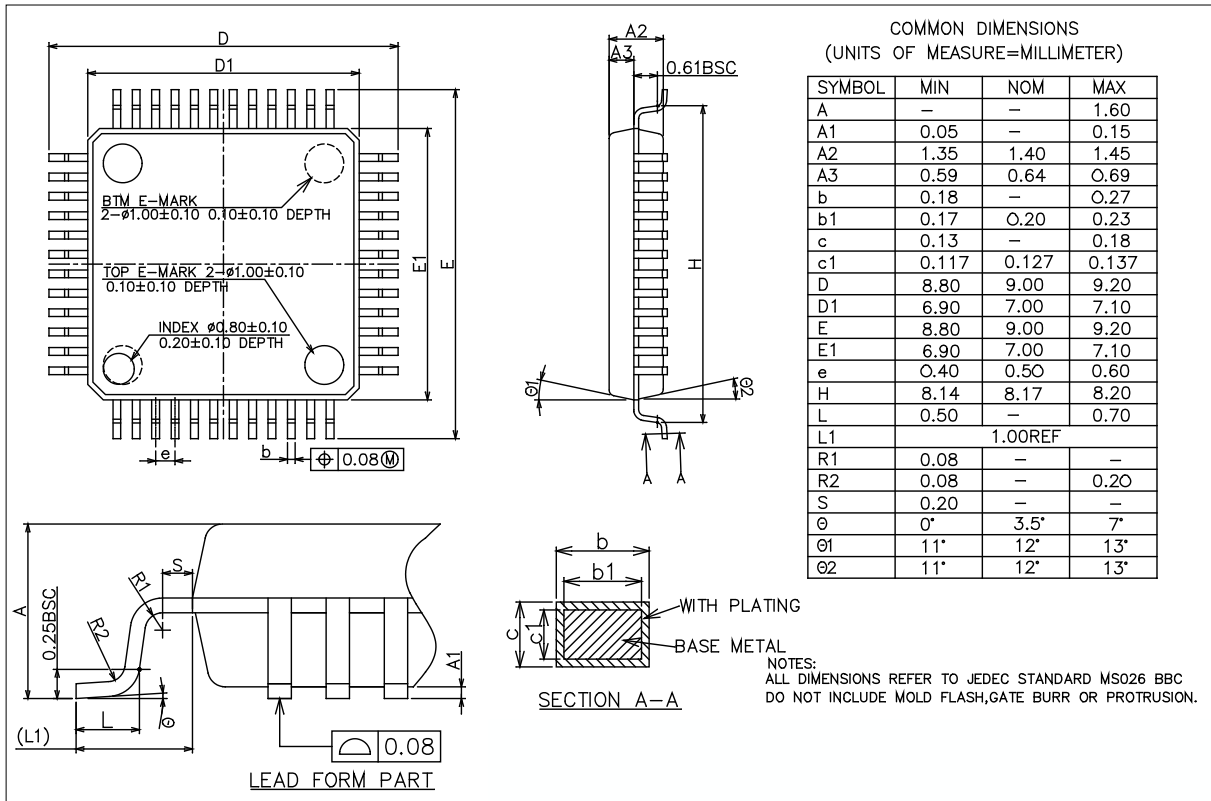
## 3.2 LQFP48

### 3.2.1 LQFP48 Pinout



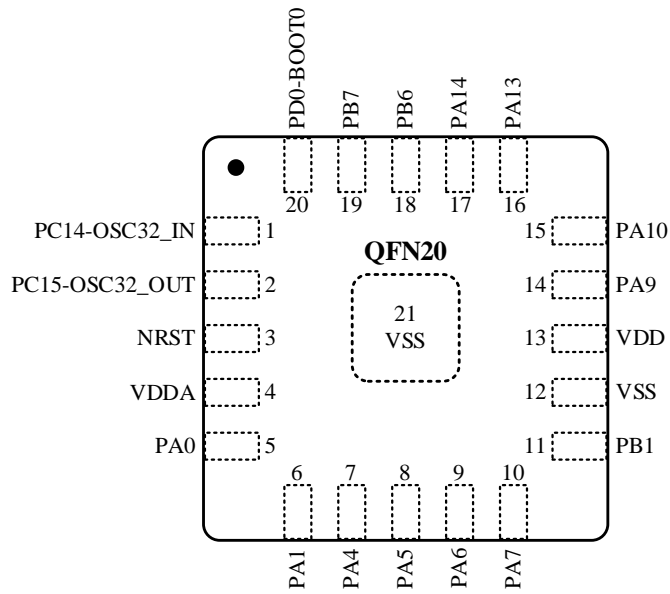


### 3.2.2 LQFP48 Package

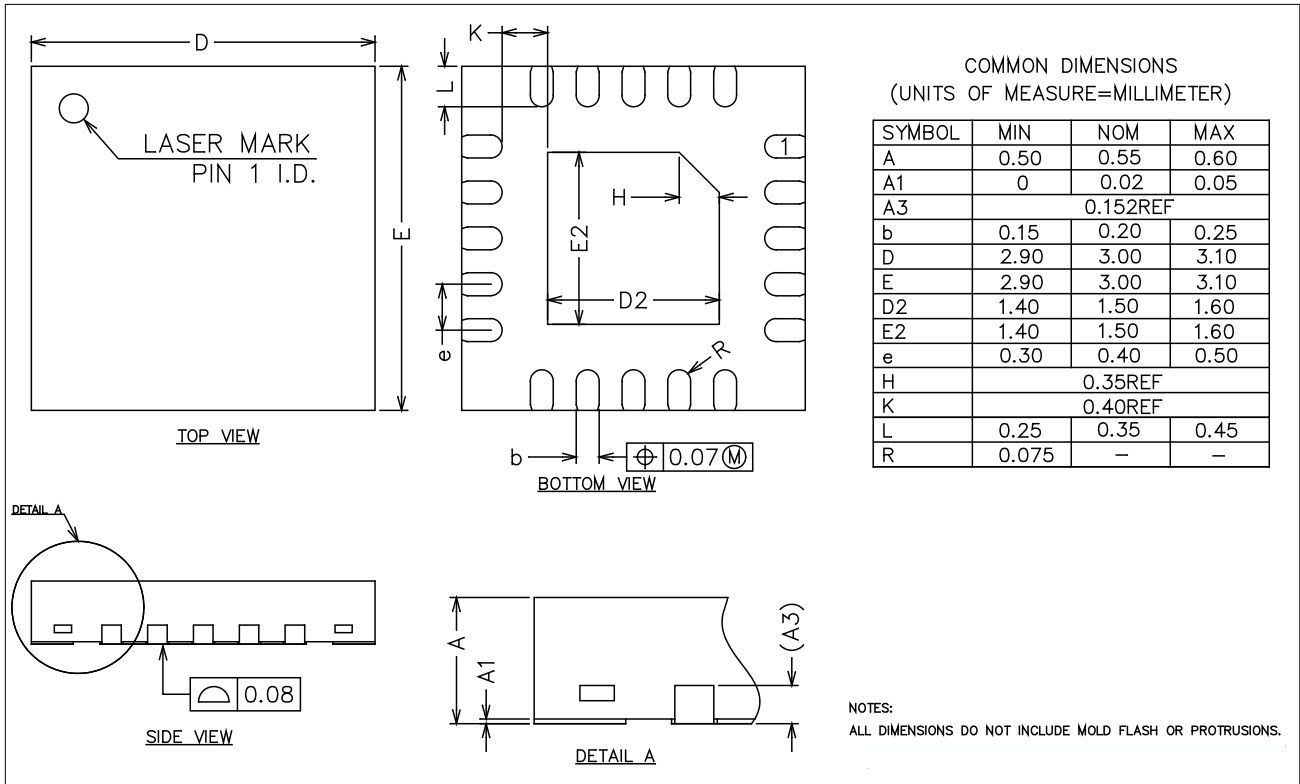


### 3.3 QFN20

#### 3.3.1 QFN20 Pinout

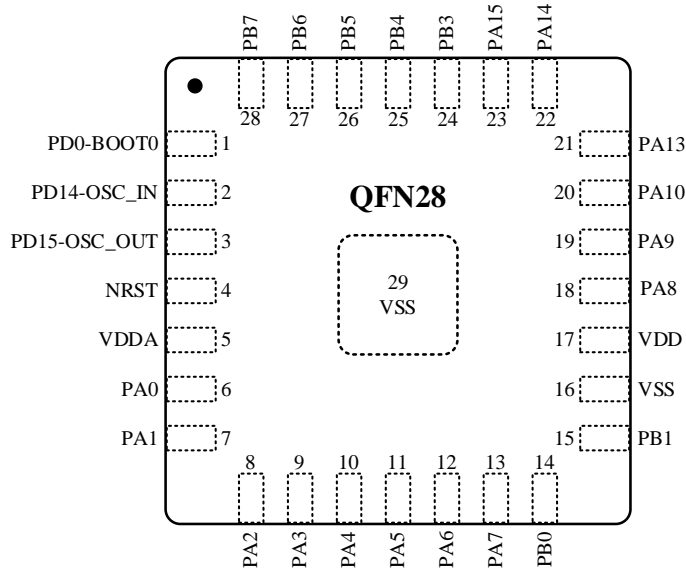


### 3.3.2 QFN20 Package

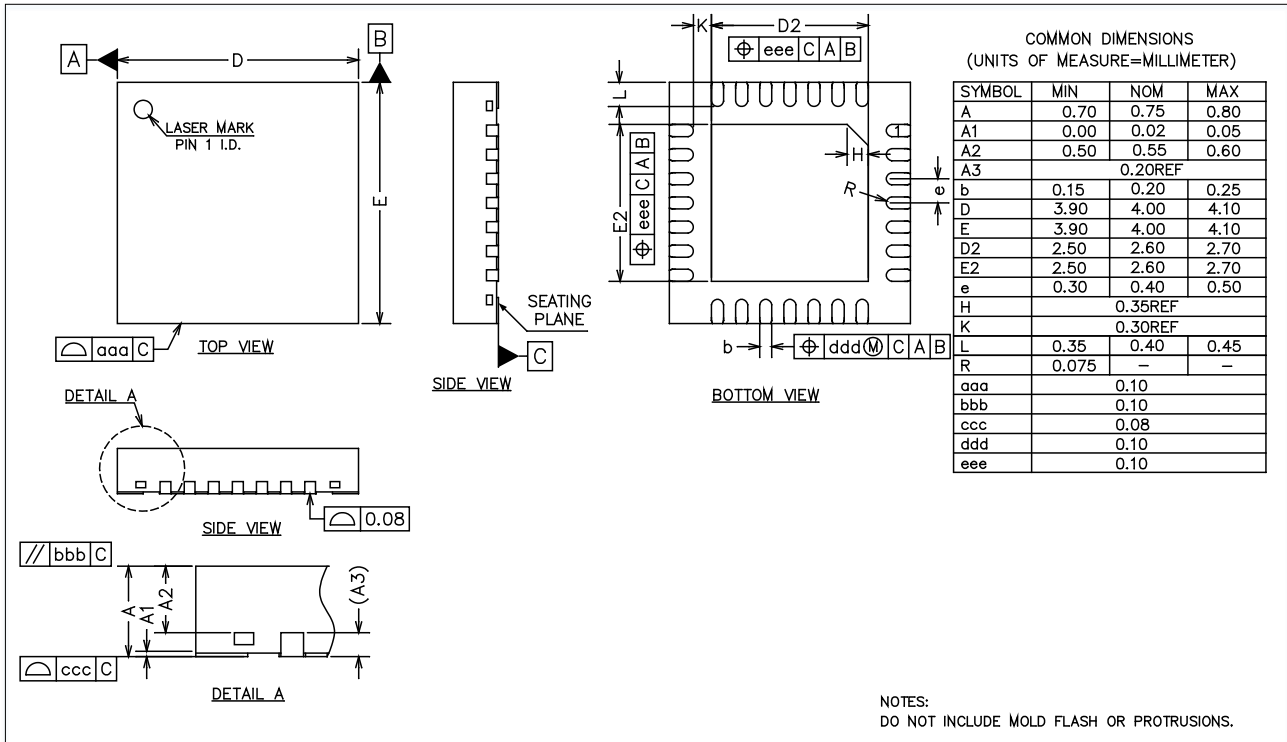


### 3.4 QFN28

#### 3.4.1 QFN28 Pinout

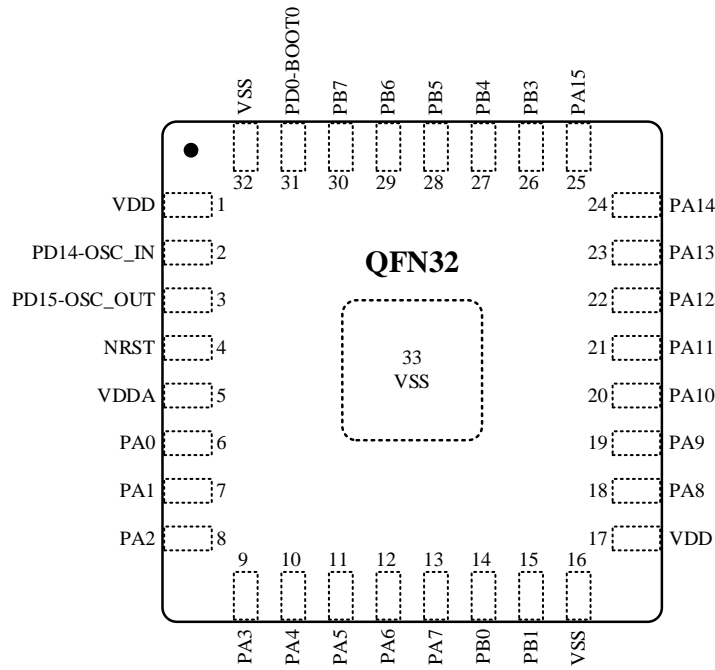


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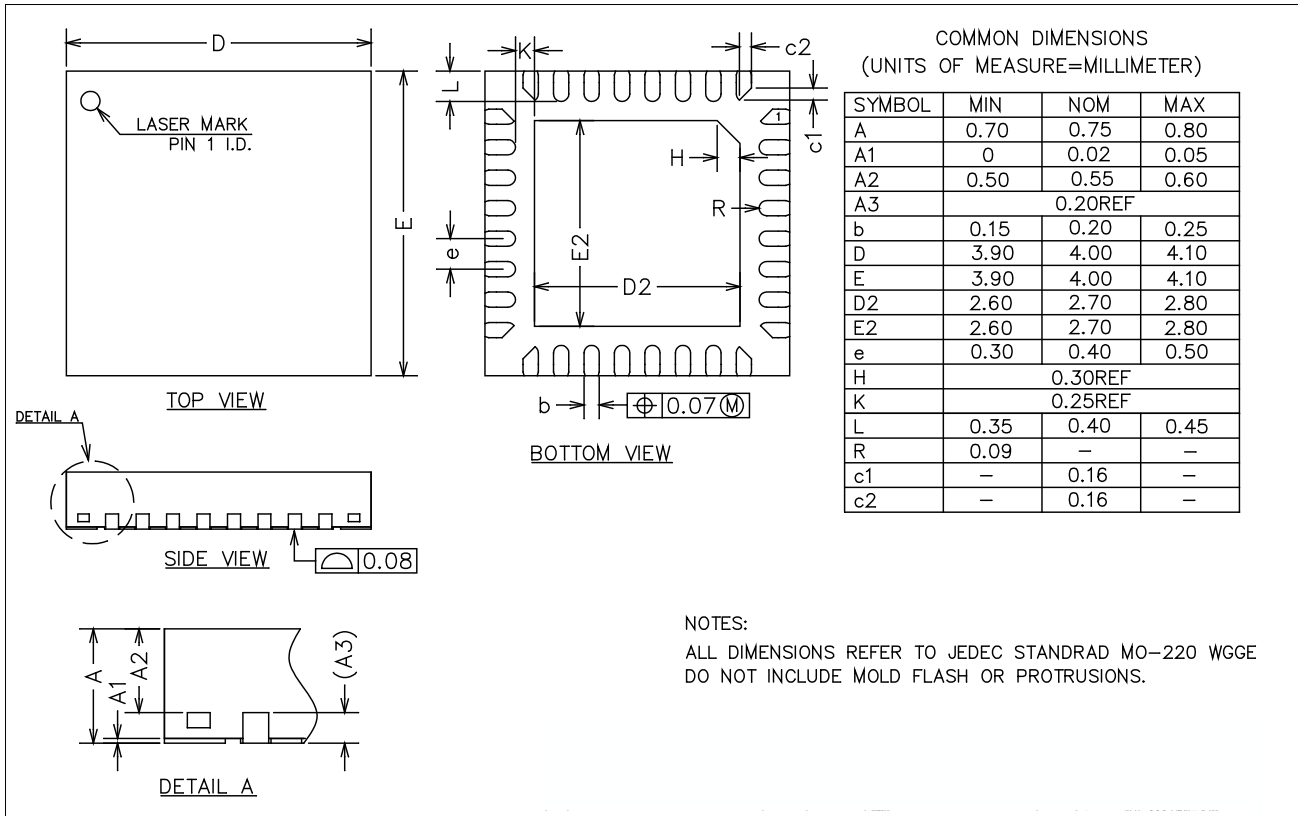


### 3.5 QFN32

#### 3.5.1 QFN32 Pinout

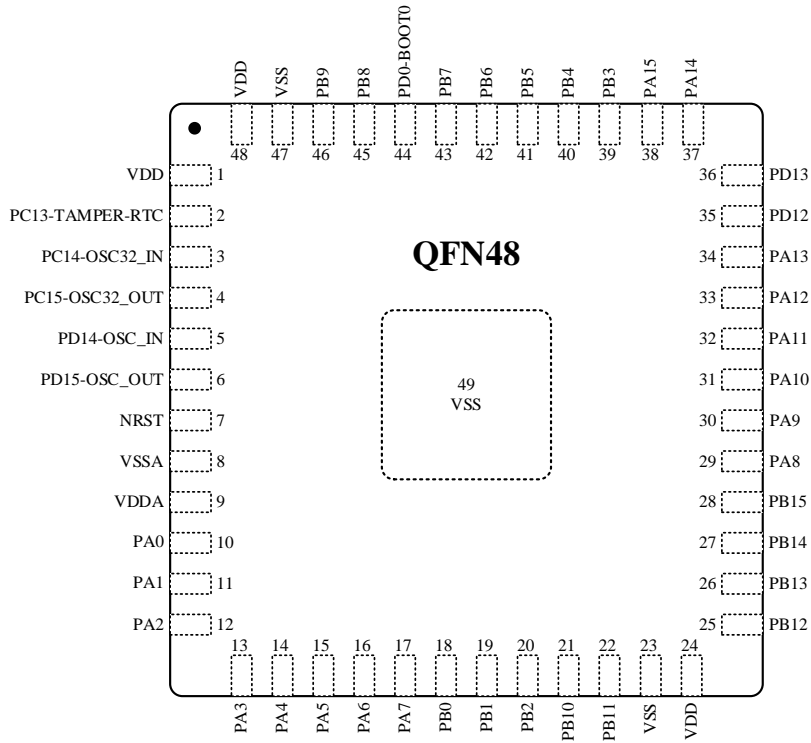


### 3.5.2 QFN32 Package



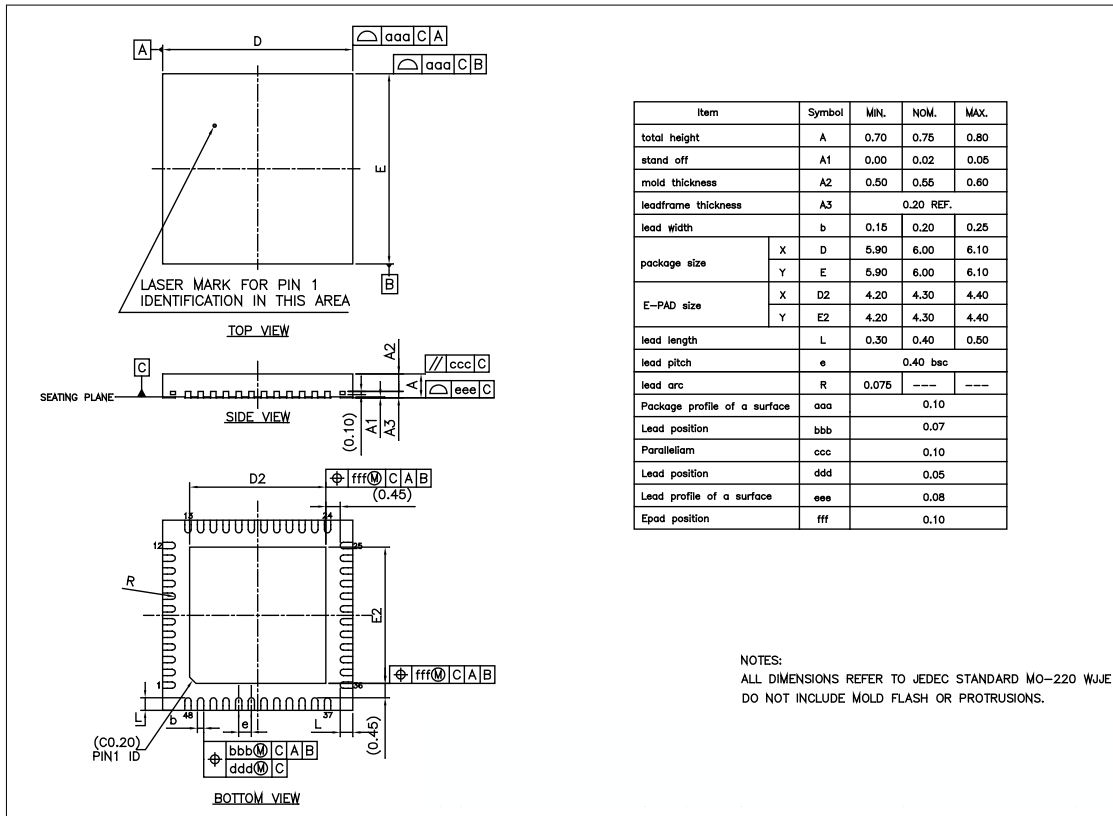
### 3.6 QFN48

#### 3.6.1 QFN48 Pinout



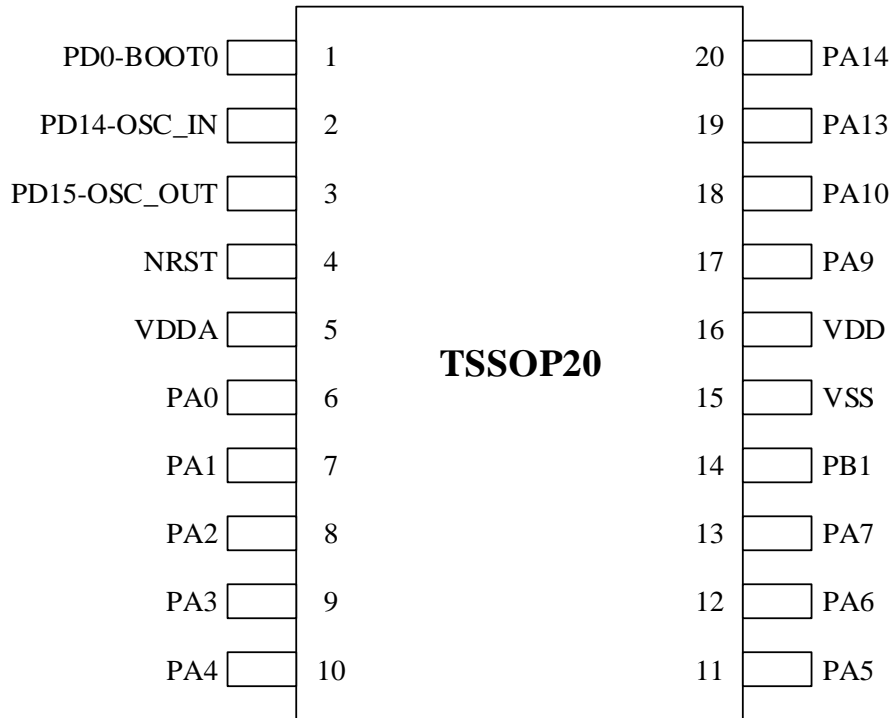


### 3.6.2 QFN48 Package

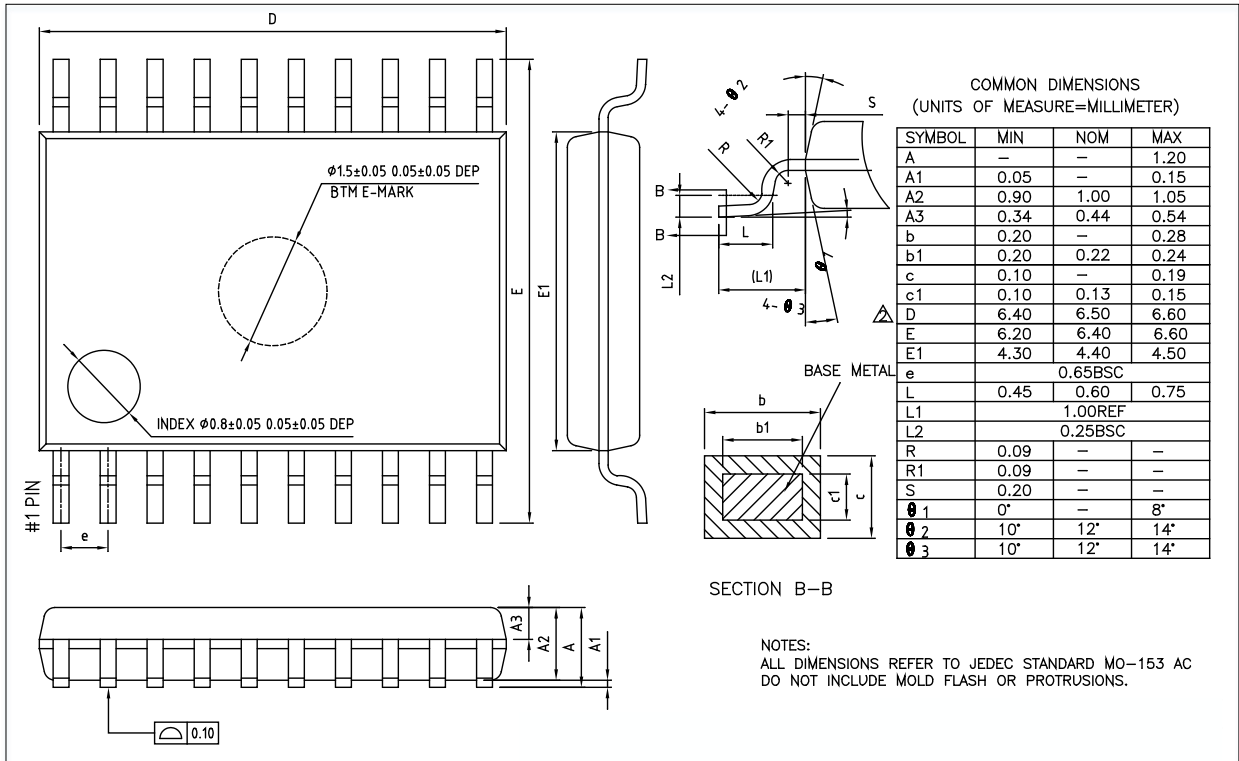


### 3.7 TSSOP20

#### 3.7.1 TSSOP20 Pinout



### 3.7.2 TSSOP20 Package



## 4 Version history

Version	Date	Remark
V1.0.0	2023.6.6	Initial release

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