

N32A455xxL8 series

Product Brief

N32A455xxL8 series adopts 32-bit ARM Cortex-M4F core, with a maximum operating frequency of 72 MHz, supporting floating-point unit and DSP instructions. It integrate up to 512KB of embedded flash, 144KB SRAM, high-performance analog devices such as 4x12bit 4.2Msps ADCs, 4x independent rail-to-rail operational amplifiers, seven high-speed comparators, 2x 1Msps 12bit DACs, multiple communication bus interfaces (U(S)ART, I2C, SPI, QSPI, CAN, etc). It also features a built-in hardware acceleration engine for cryptographic algorithms.

Key Features

- **CPU Core**
 - 32-bit ARM Cortex-M4F core with FPU, supporting single-cycle multiplication and hardware division, support DSP instructions and MPU
 - Built-in 8KB instruction Cache supports Flash acceleration unit for zero-wait program execution
 - Frequency up to 144MHZ, 180DMIPS
- **Memories**
 - Up to 512KByte of embedded Flash with ECC
 - Supports encryption, multi-user partition and data protection
 - 100,000 erase/write cycles, and 10 years data retention.
 - Up to 144KByte of SRAM (including 16KByte Retention RAM) with hardware parity checking
- **High Performance Analog Interfaces**
 - 4x 12bit ADCs with 4.2Msps
 - Multiple precision configuration
 - Sampling rate up to 9Msps in 6-bit mode
 - Up to 38 external single-ended input channels
 - Support differential mode
 - 4x rail-to-rail operational amplifiers with built-in maximum 32x programmable gain amplifier(PGA)
 - 7x high-speed analog comparators with internal 64-level adjustable comparison reference
 - 2x 12-bit DACs with sampling rate of 1Msps
 - External independent reference voltage source
 - Analog voltage operation from 1.8~3.6V
- **Clock**
 - HSE:4MHz~32MHz high speed external crystal oscillator
 - LSE:32.768KHz low-speed external crystal oscillator

- HSI:High-speed internal RC 8MHz
- LSI:Low-speed internal RC 40KHz
- Built-in high-speed PLL
- MCO:Support one clock output, which can be configured as system clock, HSE, HSI or PLL divisional output
- **Reset**
 - Support power-on/power-down/external pin reset
 - Support programmable low voltage detection and reset
 - Support watchdog reset
- **GPIOs**
 - Up to 80 GPIOs.
 - Support multiplexed functions
 - Maximum toggle speed of 50MHz
- **Communication Interfaces**
 - 7x U(S)ART interfaces, with maximum rate of 4.5 Mbps.
 - 3x USART interfaces (support 1xISO7816, 1xIrDA, LIN)
 - 4x UART interfaces
 - 3x SPI interfaces with speed up to 36 MHz, 2 of which support I2S communication
 - 1x QSPI interface with speed up to 144 Mbps
 - 4x I2C interfaces(Master/Slave) with speed up to 1 MHz where slave mode support dual address response response in slave mode
 - 2x CAN 2.0A/B bus interfaces
 - 1x SDIO interface, supports SD/SDIO/MMC format
- **DMA Controllers**
 - 2x high-speed DMA controllers
 - Each controller supports 8 channels
 - Channel source address and destination address can be configured arbitrarily
- **Real-time clock (RTC)**
 - Supports leap year perpetual calendar, alarm events, periodic wake-up
 - Support internal and external clock calibration
- **Timers**
 - 2x 16-bit advanced control timers with maximum control precision of 13.9ns
 - Support input capture, complementary output, quadrature encoding input
 - Each timer has 4 independent channels,3 of which support 6-channel complementary PWM output

- 4x 16bit general-purpose timers
 - Support input capture/output comparison/PWM output
 - Each timer has 4 independent channels
- 2x 16bit basic timers
- 1x 24bit SysTick timer
- 1x 7bit Window Watchdog (WWDG)
- 1x 12bit Independent Watchdog (IWDG)

- **Programming Methods**

- Supports SWD/JTAG debugging interface
- Supports UART Bootloader

- **Security Features**

- Built-in hardware acceleration engine for cryptographic algorithms
- Support DES/3DES, AES, SHA1/SHA224/SHA256, SM1, SM3, SM4, SM7 and MD5 algorithms
- Flash encryption, multi-user partition management (MMU)
- True random number generator(TRNG)
- CRC16/32 operation
- Supports write protection (WRP), multiple read protection (RDP) levels (L0/L1/L2)
- Supports program encryption download
- Supports clock failure detection, tamper detection

- **96-bit UID and 128-bit UCID**

- **Operating Conditions**

- Operating voltage range: 1.8V~3.6V
- Operating temperature range: -40°C~125°C
- Certified by AEC-Q100-G2
- ESD: ±4KV (HBM model), ±1KV (CDM model)

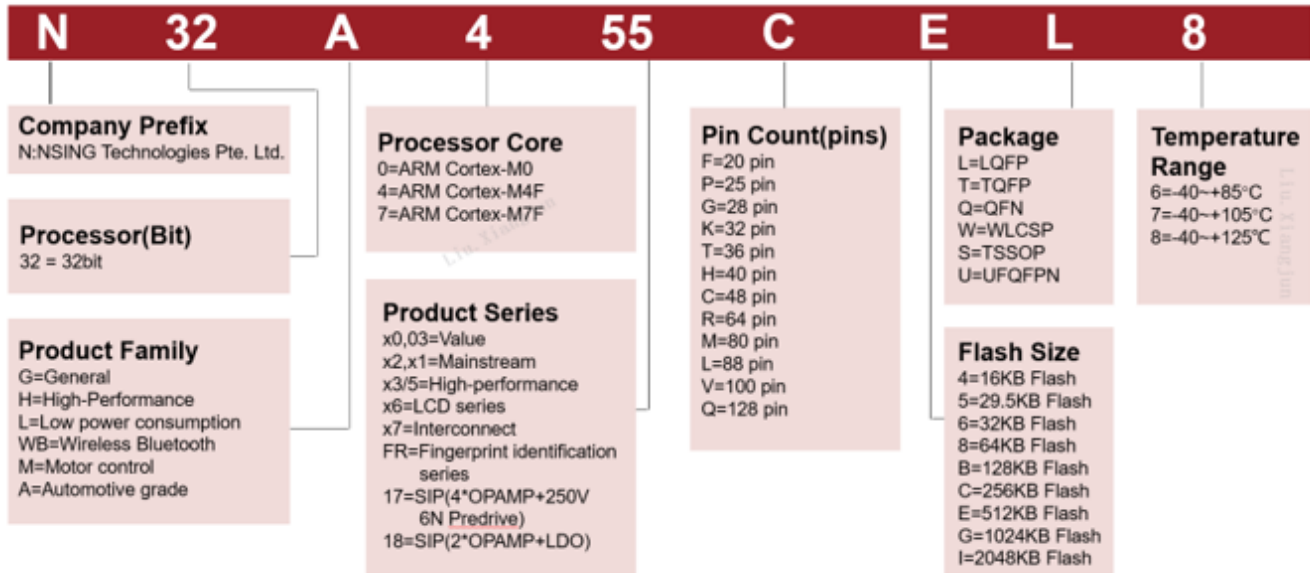
- **Packages**

- LQFP48(7mm x 7mm)
- LQFP64(10mm x 10mm)
- LQFP100(14mm x 14mm)

- **Ordering information**

Reference	Part Number
N32A455xxL8	N32A455CEL8,N32A455REL8, N32A455VEL8

Naming Convention



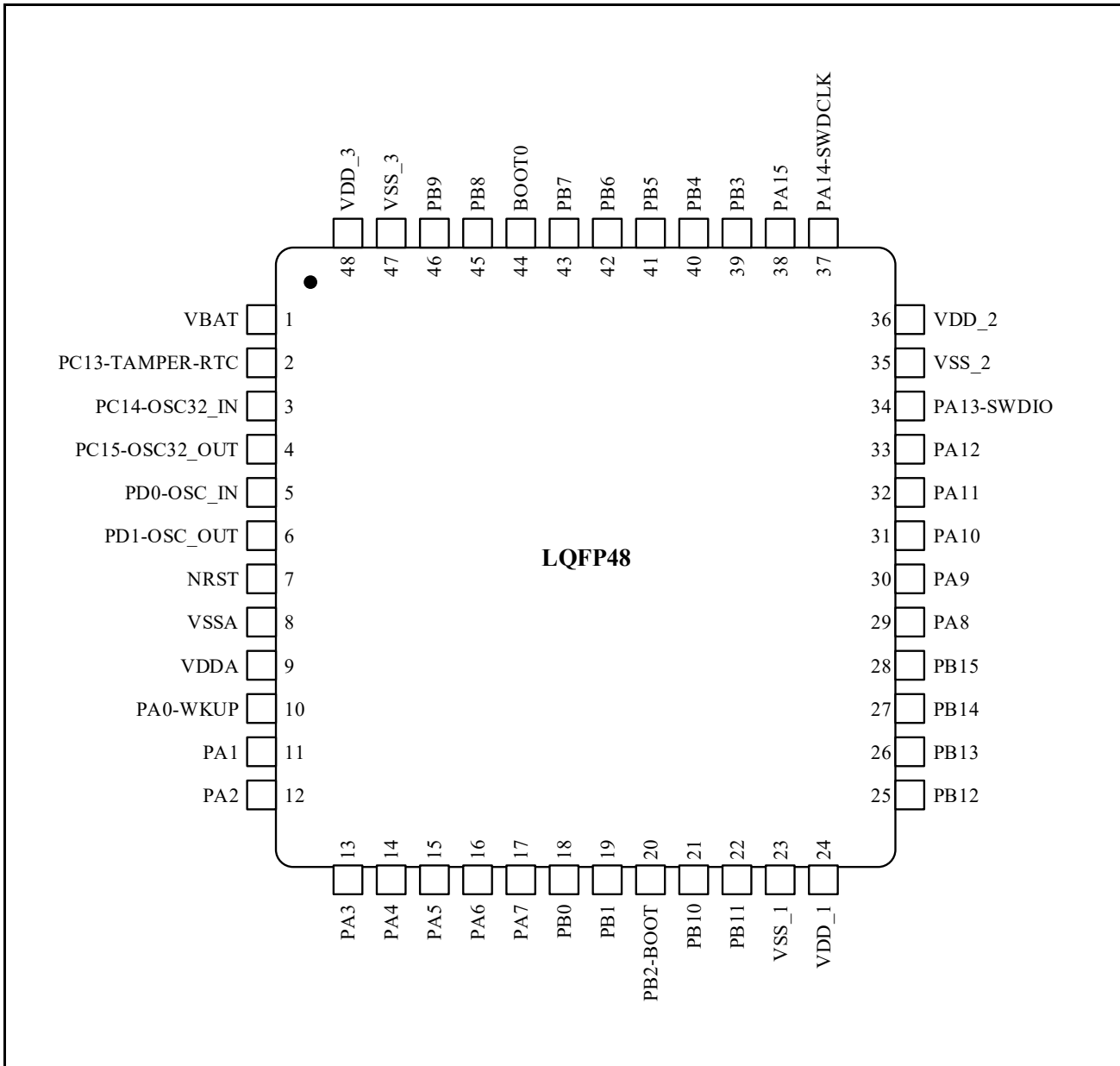
Product Configurations

Part number		N32A455CEL8	N32A455REL8	N32A455VEL8
Flash Capacity (KB)		512		
SRAM Capacity (KB)		144		
CPU Frequency		ARM Cortex-M4 @72MHz,90 DMIPS		
Operating Conditions		1.8~3.6V/-40~125°C		
Timer	General	4		
	Advanced	2		
	Basic	2		
Communication interface	SPI	3		
	I2S	2		
	QSPI	Only Single Wire	1	
	I2C	3	4	
	USART	3		
	UART	3	4	
	CAN	2		
	SDIO	No	1	
	GPIO		37	51
DMA		2		
DMA Channels		16Channel		
12bit ADC		4	4	4
ADC channels		16Channel	22Channel	38Channel
12bit DAC		2		
DAC channels		2Channel		
OPA/COMP		4/5	4/7	4/7
Algorithm support		DES/3DES、AES、SHA1/SHA224/SHA256、SM1、SM3、SM4、SM7、MD5、CRC16/CRC32、TRNG		
Security protection		Read-Write Protection (RDP/WRP), Storage Encryption, Partition Protection, Secure Boot		
Package		LQFP48	LQFP64	LQFP100

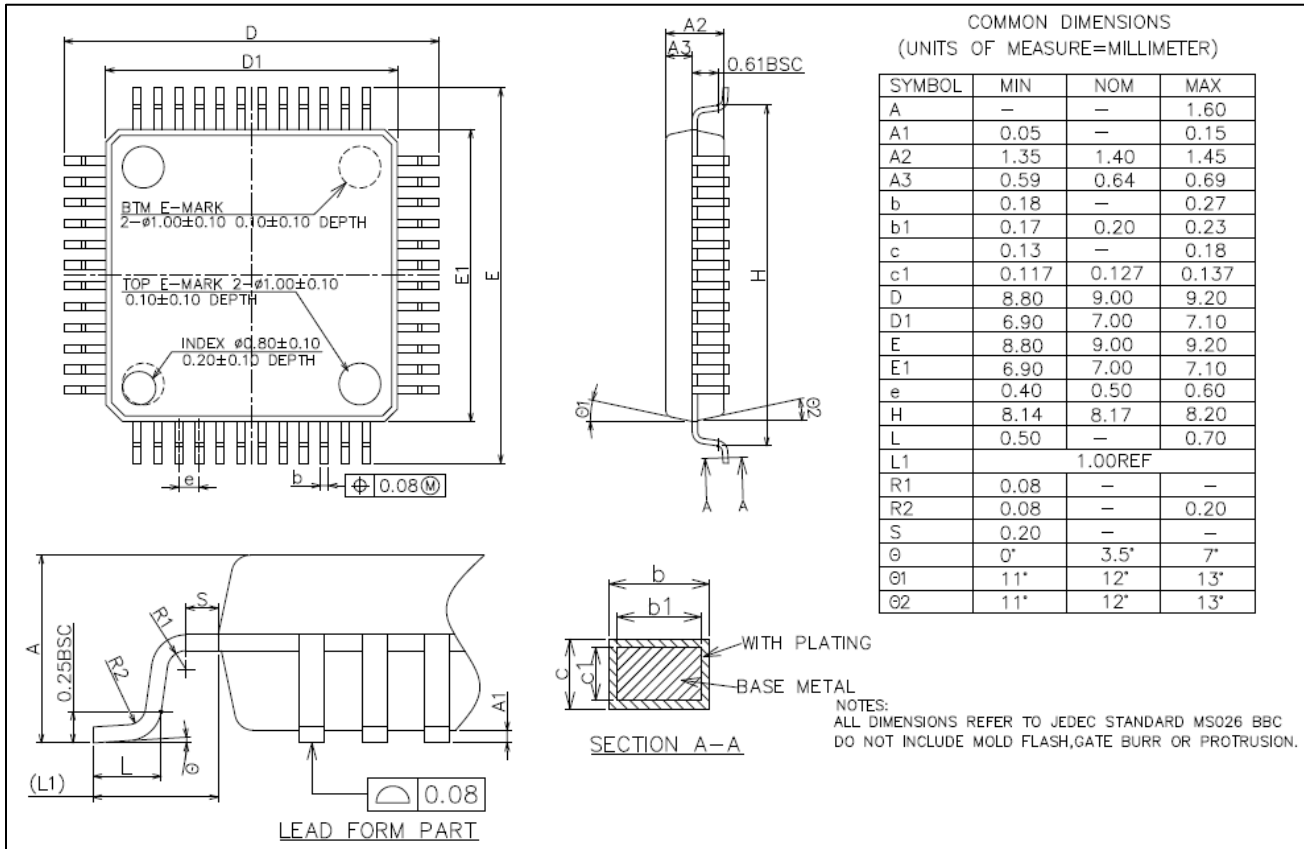
Packages

1.1 LQFP48 Package

1.1.1 LQFP48 Pin Assignment

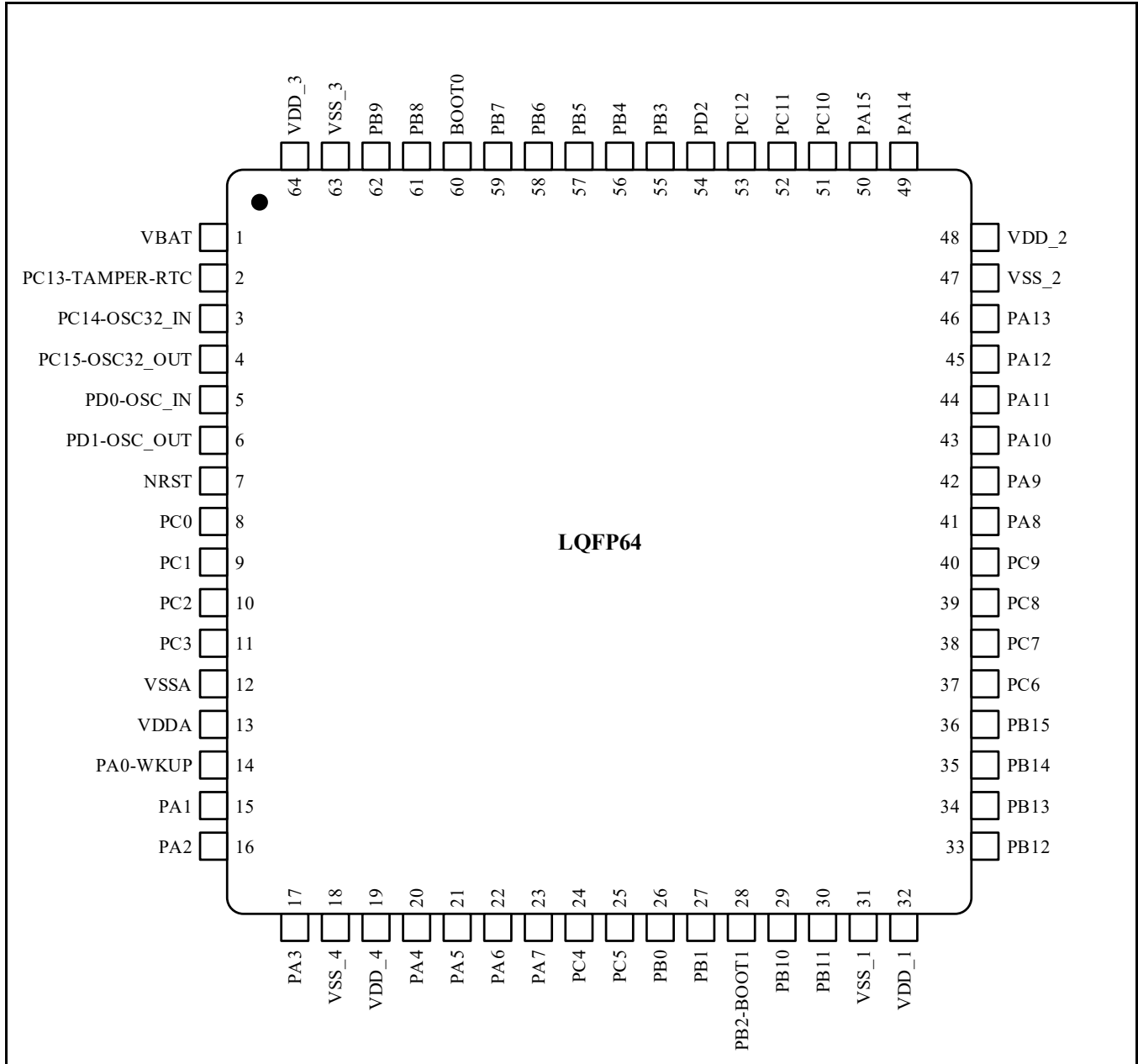


1.1.2 LQFP48(7mm x 7mm) Package Dimensions

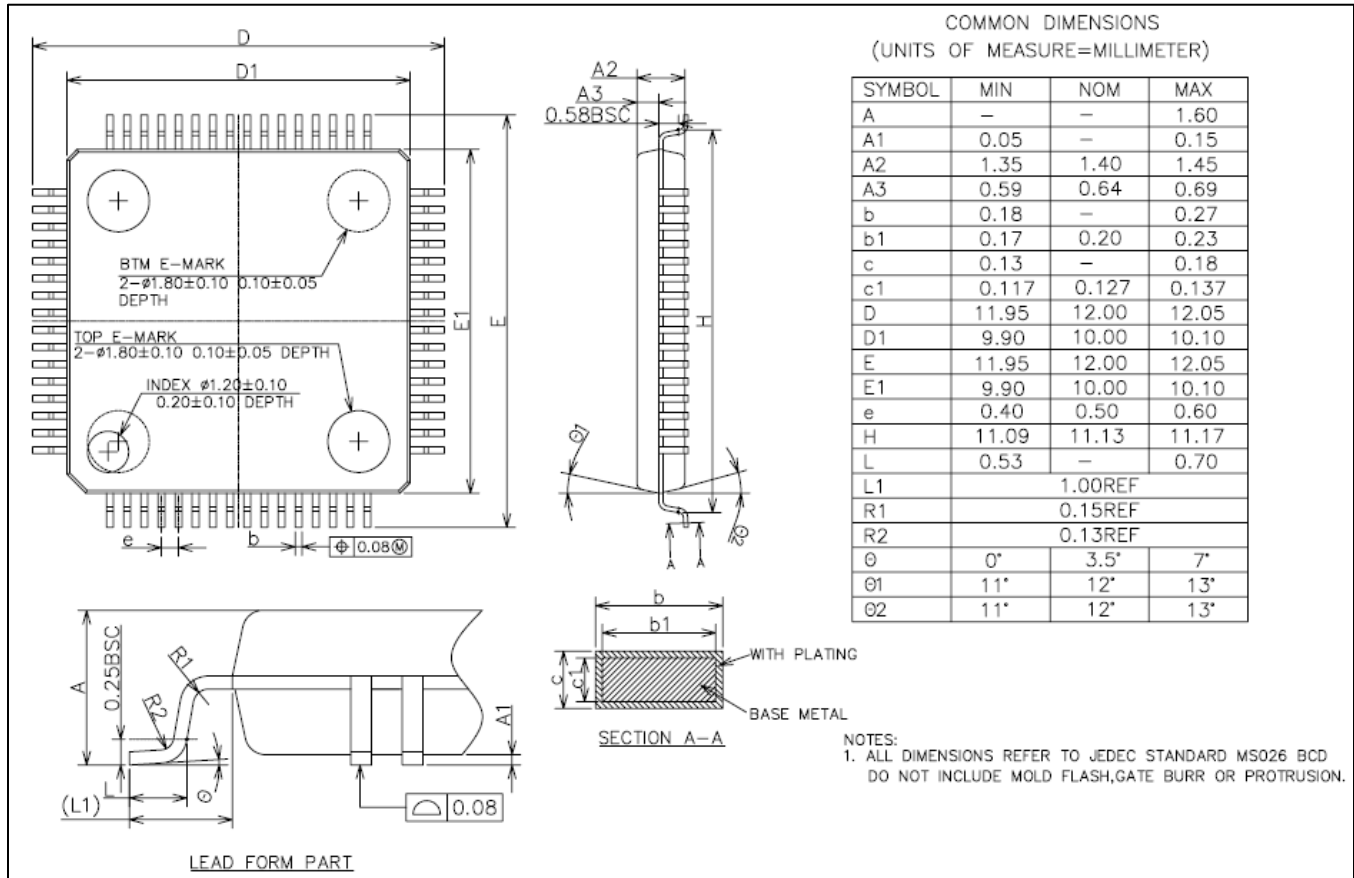


1.2 LQFP64 Package

1.2.1 LQFP64 Pin Assignment

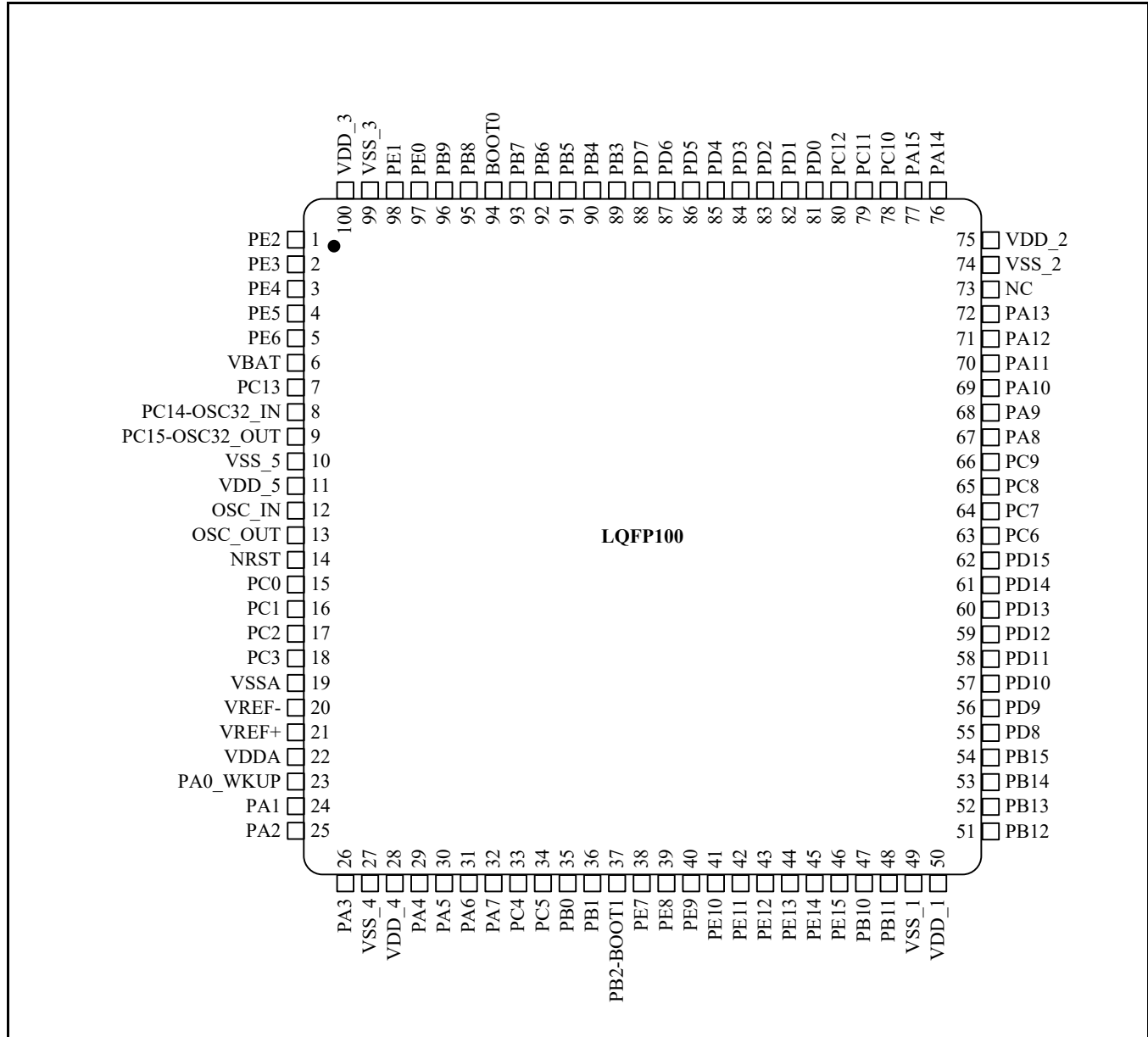


1.2.2 LQFP64(10mm x 10mm) Package Dimensions

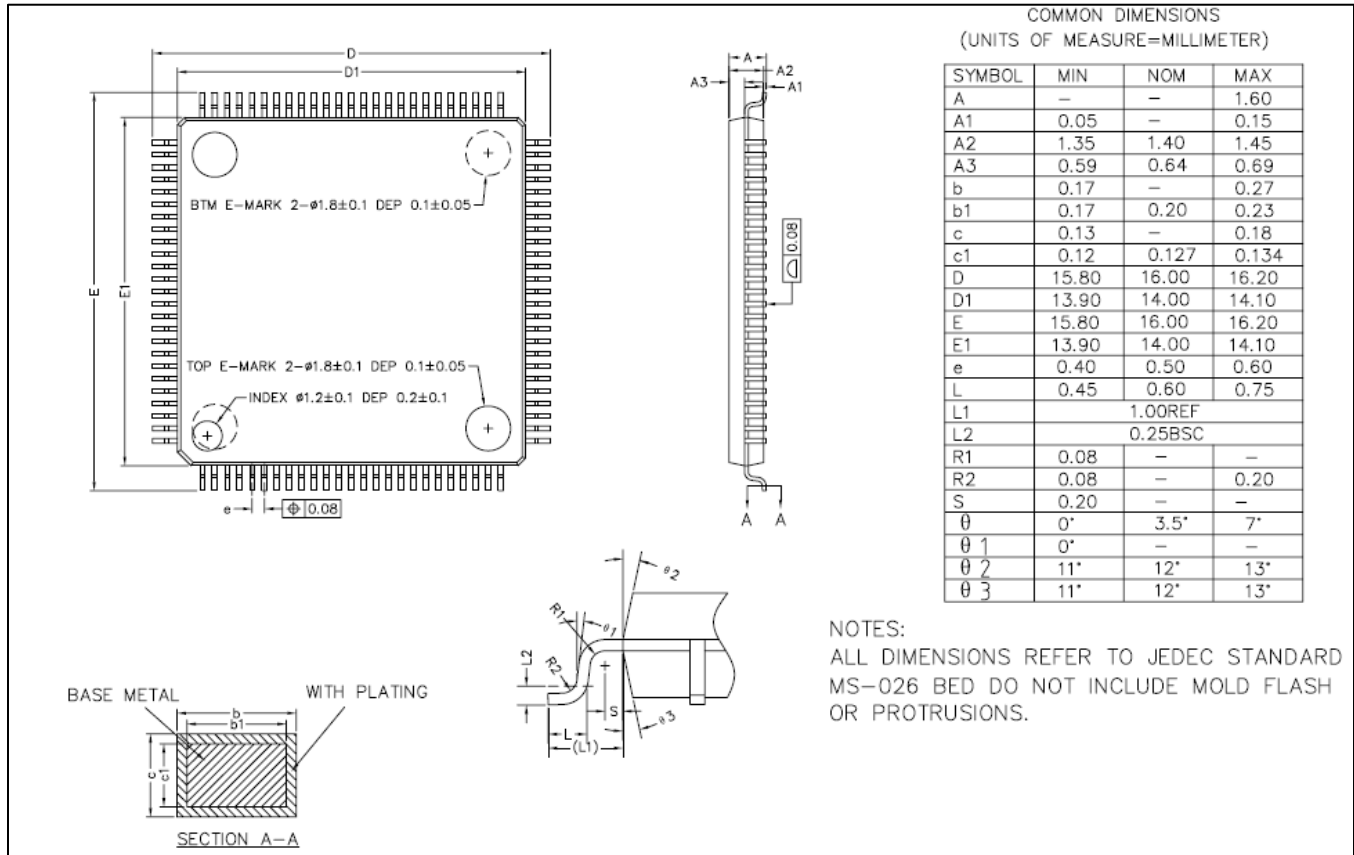


1.3 LQFP100 Package

1.3.1 LQFP100 Pin Assignment



1.3.2 LQFP100(14mm x 14mm) Package Dimensions



Version History

Version	Date	Changes
V1.0.0	2023.09.18	Initial version

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